TM 5-302-2

TECHNICAL MANUAL

ARMY FACILITIES
COMPONENTS SYSTEM—DESIGNS

HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1973

TM 5-302-2

THIS IS VOLUME

2 OF 2

CHAPTER 1 THRU CHAPTER 6 AND
CHAPTER 7 DRAWINGS 01-01 THRU 52-03
ARE IN VOLUME 1 OF 2 (TM 5-302-1)

LIBRARY
USA CGSC FT LEAVENWORTH KAN.
SEP 4 1974
ACCESSION NO.
PO REGISTR

TECHNICAL MANUAL
No. 5-302

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *28 September 1973*

ARMY FACILITIES COMPONENTS SYSTEM—DESIGNS

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
	Purpose	1-1	3
	Scope	1-2	3
	Related publications	1-3	3
	Definitions	1-4	3
	Comments and requests for drawings	1-5	3
	Responsibilities	1-6	3
CHAPTER 2.	ORGANIZATION OF THE MANUAL		
	Drawings	2-1	4
	Allowances for material wastage and loss	2-2	4
	Construction standards	2-3	4
	Building structures	2-4	4
	Design criteria	2-5	4
	Construction effort	2-6	4
CHAPTER 3.	PREPACKAGED EXPENDABLE CONTINGENCY SUPPLIES (PECS)		
	Purpose	3-1	11
	Description and use	3-2	11
CHAPTER 4.	SUPPLY PROCEDURES		
	General	4-1	13
	Construction materiel coordinator	4-2	13
	US Army troop support command	4-3	13
	Requisitioning	4-4	13
	Method of shipment	4-5	13
	Procurement from foreign sources	4-6	13
CHAPTER 5.	CAMOUFLAGE		
	Treatment of camouflage in the AFCS	5-1	14
	The modular lightweight camouflage screening system	5-2	14
	Computation of required number of modules	5-3	14
	Available facilities	5-4	14
	Construction	5-5	14
CHAPTER 6.	USING TM 5-302		
	Hypothetical problem (under revision)	6-1	
CHAPTER 7.	INSTALLATION, FACILITY AND STANDARD DETAIL DRAWINGS		
	Index of drawings	7-1	17
		Sheet Number	
	Drawing symbols	01-01	
	Drawings, 04-01 to 99-98 (inclusive)	04-01	

* This manual supersedes TM 5-302, dated 15 December 1969, including all changes.

CHAPTER 7

INSTALLATION, FACILITY AND STANDARD DETAIL DRAWINGS

7-1. Index of Drawings.

	DWG No.
Administration 20'x30', 20'x50' and 40'x100'	61-11
Administration 1, 2 and 3, 30'x110', 30'x90' and 30'x80' hospital	51-11*
Administration hdqtrs.—E Shape, 10,000 SF	61-11
Administration hdqtrs.—U Shape, 5,000 SF	61-11
Administration post office, 40'x50', 40'x70' and 40'x90'	61-21
Administration, admission and disposition 1, 30'x110' hospital	51-11*
Admission and disposition, 1, 2 and 3, 40'x120' 40'x110' and 40'x90' hospital	51-12*
Admission and disposition, 4, 30'x90' hospital	51-13*
Administration Facilities:	
Administration 20'x30', 20'x50' and 40'x100'	61-11
Administration hdqtrs. E Shape, 10,000 SF, U Shape, 5,000 SF	61-11
Administration post office	61-21
Administration 1, 2 and 3, 30'x110', 30'x90' and 30'x80' hospital	51-11*
Administration, admission and disposition, 1, 30'x110' hospital	51-11*
Army post office	61-22
Base post office w/storeroom and sorting area	61-21
Headquarters and unit supply, 20'x40' and 20'x100'	61-11
Administration Installations:	
Administration 10,000 SF standards 3, 4 and 6	60-05
Administration 25,000 SF standards 3, 4 and 6	60-05
Administration 50,000 SF standards 3, 4 and 6	60-05
Base post office	60-28
Air Conditioning—hospital buildings:	
Centralized materiel section 1 and 2	52-09*
Surgery 1 and surgery 2	52-05*
Surgery CMS	52-09*
Ward, acute and standard	52-12*
X-ray 1 and X-ray 2	52-01*
X-ray, lab and dental, X-ray physical therapy	52-03*
Amphibious fueling—6-inch buoyant system	12-24
Approach trestle, railroad, 90' width	15-07
Army exchange, 5,000 man for tent, 40'x80' and building 40'x100'	74-22
Army exchange, 10,000 man 80'x120'	74-23
Artillery and fire control 180'x320' ordnance	21-51
Athletic court, combination, 60'x120'	75-21
Automotive armament rebuild 80'x180' ordnance	21-43
Automotive maintenance shop 80'x240'	21-41
Bakery, 10,800 lbs/10 hrs., 60'x140' w/20'x60' lean-to	72-71
Barracks prefab panel T-5 (20'x48') frigid climate	34-22
Barracks butlerhut 20'x48' and 20'x96'	35-23
Barracks type prefab 20'x48' round arch and arch rib for frigid climate	35-22
Barracks 1 and 2, 30'x100' and 30'x60' hospital	51-71*
Barracks 50 man, 20'x100'	72-21*
Barracks close confinement 25 man, 20'x50'	72-21*
Barracks type—wood frame bldg.—panel construction or built-in place const.	34-03
Barracks type steel frame building	35-21
Bathhouse tip tray 100, 250 and 500 man 20'x20', 20'x30' and 29'x59'	72-31
Bathhouse water borne 160 man or 80 officers 20'x20'	72-32
Bathhouse water borne 250 or 500 man, 20'x40' and 20'x50'	72-32
Bathhouse water borne 720 man, 20'x50'	72-35
Bathhouse and latrine, tip tray 100, 250, 500 man, 20'x30', 20'x50' and 20'x80'	72-31
Bathhouse and latrine, water borne 160 man or 80 officers 20'x30'	72-32
Bathhouse and latrine, water borne 250 and 500 man, 20'x60' and 20'x80'	72-32
Bathhouse and latrine, water borne 720 man and 20'x100'	72-35
Bills of construction materials (see Field requisition lists).	
Boiler house drycleaning plant 1,000, 2,500 and 5,000 man	82-11
Boiler house laundry, 2,500, 5000 and 10,000 man	82-11
Boiler house laundry, 500 and 1,000 bed hospital	82-11
Boiler house laundry, 60'x100' 27, 180 lb/hr	82-12
Boiler houses for messes, SURG-CMS and utility bldg No. 9	82-21
Booster station—1,400, 2,800 and 7,000 BPH, POL	12-31
Bridges—pipeline suspension 200'—400' Span for 8" Pipe	12-53*
Bridges, railroad E-45 loading:	
Substructures:	
Single track, timber and steel towers, various spans	86-15*
Single track, abutments, bents, piers and foundations	86-17*
Single track, bents and piers, concrete and timber foundations	86-18*
Substructures and superstructures:	
Single track, schedule of facilities	86-01*
Superstructures:	
Beam and girder construction types for various spans	86-02*
Deck and through truss construction details	86-19*
Walkway, refuge bay, crossing and stock bridge sets	86-21
Bridges, roads and railroads:	
Substructures:	
Steel, timber and concrete foundations for towers and piers	86-14*
Substructures and superstructures:	
Design criteria and selection tables	85-02*
Superstructures:	
Beam and girder details; narrow and wide gage	86-16*
Bridges, road:	
Substructure:	
Double lane abutments, bents and piers for various spans	85-22*
Double lane, concrete abutments and piers, various spans class 60	85-24*
Single lane abutments, bents and piers for timber and steel spans	85-11*
Single lane steel towers, 180' max combined steel spans	85-13*
Single and double lane timber and steel towers, class 25, 50, and 60	85-23*
Timber pile foundation for timber towers, all classes	85-26*
Substructures and superstructures:	
Schedule of facilities and various combinations, class 25, 50 and 60	85-01*
Superstructures:	
Double lane, various beams and girder structures, class 60	85-21*
Double lane, bailey, deck type, various spans and classes	85-41*
Single lane, 30' and 60' 1-Beam Spans, class 50 sections and details	85-15*
Single and Double lane, timber and steel spans, various classes	85-25*
Single and double lane, various depth beams and girder details	85-28*
Walkway, steel spans	85-21*
Walkway, wood spans	85-25*
Buildings—Steel Frame, metal roof:	
Barracks type, 8' min. clearance, basic bldg 20'x50' (length variable in 10' Increments)	35-21
Widening kit 10'x50'x8' min clearance for barracks type building	35-21
Warehouse type, 12' min clearance, basic bldg 40'x100' (length variable in 20' Increments)	35-36
Shop type, 20' min clearance, basic bldg 40'x100' (length variable in 10' increments)	35-46
Buildings—Wood Frame, wood and felt or corr metal roof:	
General purpose	34-05
Barracks type 8' min clearance, basic bldg 20'x20', 30'x40' and 40'x50'	34-03
Additional 10' bays x 20', 30' and 40' widths	34-03
Warehouse type 8' min clearance for personnel use, basic bldg 32'x32', 48'x32', 64'x32', 80'x32' and 96'x32'	34-11
Additional 10' bays x 32', 48', 64', 80' and 96' widths	34-11
Warehouse type 13'9" min clearance, basic bldg 32'x32', 48'x32', 64'x32', 80'x32' and 96'x32'	34-04
Additional 10' bays x 32', 48', 64', 80' and 96' widths	34-04
Shop type, 20' min clearance, basic bldg 40'x40', 60'x60', 80'x80', 100'x100' 140'x140'	34-19
Additional 20' bays x 40', 60', 80', 100', and 140' widths	34-19
Lean-to 15' min clearance, basic bldg 20'x40' and 40'x40'	34-19
Additional bay for lean-to 20'x20' and 40'x20'	34-19
Barracks prefab panel T-5 (20'x48') frigid climate	34-22
Barracks butlerhut 20'x48' and 20'x96'	35-23
Barracks type prefab 20'x48' round arch and arch rib for frigid climate	35-22
Bunkers, fighting (see Shelters—protective).	
Camp exchange, 20'x30', 20'x50' and 20'x80'	74-17
Camp exchange, 20'x100'	74-13
Camp exchange and recreation, 20'x60'	74-13
Camps (see Housing installations or site and utility layout).	
Car repair shop, railroad 60'x300'	86-31
Carpenter shop, window, door and wood panel work	34-01
Carrier and repeater communication building—intermediate station, 20'x40'	13-12
Carrier and repeater communication building terminal station, 40'x40'	13-12
Casualty receiving, holding treatment, 40'x260' hospital	51-15*
Cell block, occidental, 37 cells 40'x100'	71-01*
Cell block, oriental, 27 cells 22'x100'	71-01*
Centralized materiel section 1, 40'x120' hospital	51-45*
Centralized materiel section 2, 40'x100' hospital	51-46*
Centralized materiel surgery, 40'x100' hospital	51-44*
Chapel, 60, 100, 150 and 300 seats	74-47
Chlorine contact chamber, sewage disposal 30,000 GPD	83-13*
Chlorine contact chamber, sewage disposal 100,000 GPD	83-14*
Clinic, dental, 20,000 man 30'x130'	54-11*
Clinic, dental, 10,000 man 30'x90'	54-12*
Clinic, dental, 5,000 man 30'x40'	54-13*
Coal discharging trestle, railroad, 16'x156'	86-12
Coal loading platform, railroad, 12'x84'	86-11
Cold storage facilities (see Refrigerated warehouses and refrigerators).	
Communications facilities:	
Carrier and repeater bldg, intermediate station 20'x40'	13-12
Carrier and repeater bldg, terminal station 40'x40'	13-12
Signal maintenance shops 80'x200'	13-23
Radio receiver 40'x60'	13-21
Radio transmitter 4,800 SF	13-19
Relay station, 40'x80' and 40'x140'	13-11
Telephone, dial office, 40'x40' and 40'x60'	13-15
Telephone, long distance, manual, 40'x40' and 40'x60'	13-14
Telephone, manual, 20'x40'	13-15
Terminal station, 40'x60'	13-12
Construction Details for Facilities	99-98
Crafts shop, 5,000 man for tent 40'x80'	74-41
Crafts shop, 5,000 man 40'x100'	74-36
Crafts shop, 10,000 man 80'x120'	74-37
Day room, 40'x60'	74-13
Dental clinic, 20,000 man 30'x130'	54-11*
Dental clinic, 10,000 man 30'x90'	54-12*
Dental clinic, 5,000 man 30'x60'	54-13*
Dental and lab 1 and 2, 40'x120' and 40'x110' hospital	51-34
Dental and lab 3, 30'x110' hosptial	51-35*
Dental and lab, X-ray, 40'x110'	51-33*
Dispensary 1, 2 and 3, 30'x90', 30'x80' and 30'x70' hospital	51-23*
Dispensary (with 6 and 10 beds) 20'x70' and 20'x100'	55-12*
Dispensary, troop, 20'x60' and 20'x80'	55-11*
Distribution manifold—POL drum and can, tank car and truck loading	12-32
Dry cleaning plant, 1,000, 2,500 and 5,000 man	73-38
Drain field, sewage disposal, 10,000 GPD	83-11*
Drum washing, repairing and testing—POL	12-55
EE and pharmacy 2, 30'x60', EENT and pharmacy 1, 30'x70' hospital	51-21*
Education building, 20'x30' and 20'x50'	74-13
Electrical kits	81-41
Electric distribution, floodlighting details	81-24*
Electric distribution, line primary	81-21*
Electric distribution line secondary	81-23*
Electric distribution transformer installation	81-22*
Electric generating plants (see Engineering service facilities).	
Emplacement covers (see Shelters—protective).	
Engine house, 2 and 6 stall, railroad, 60'x80' and 60'x220'	86-32
Engineer Service Facilities:	
Electric distribution line primary	81-21*
Electric distribution line secondary	81-23*
Electric distribution, transformer installation	81-22*
Electric generating plants:	
2 or 3—15 KW units and 2 or 3—30 KW units	81-11*
2 or 3—60 KW units and 2 or 3—100 KW units	81-13*
3—300 KW units and 3—500 KW units	81-16*
3—625 and 1—375 KVA units	81-17
Sewage Disposal:	
Chlorine contact chamber, 30,000 GPD	83-13*
Chlorine contact chamber, 100,000 GPD	83-14*
Drainfield, 10,000 GPD	83-11*
Final settling tank 30,000 GPD	83-13*
Final settling tank 100,000 GPD	83-14*
Imhoff Tank—metal or wood 30,000 GPD	83-13*
Imhoff Tank—metal or wood 100,000 GPD	83-14*
Siphon chamber 10,000 GPD	83-11*
Siphon chamber 30,000 GPD	83-13*

See footnote at end of paragraph.

* Indicates drawing under revision.

Engineer Service Facilities—(*Continued*)	DWG No.
Siphon chamber 100,000 GPD	83–14*
Sludge drying beds	83–15*
Trickling filter, 30,000 GPD	83–13*
Trickling filter, 100,000 GPD	83–14*
Water purification:	
Erdlator and chemical storage, 60,000 and 120,000 GPD	84–17
Water supply:	
Deep well 20 GPM and 75 GPM	84–21
Engineer Service Installations:	
Sewage disposal plant, 10,000 GPD primary and complete treatment	80–01*
Sewage disposal plant, 30,000 GPD primary and complete treatment	80–02*
Sewage disposal plant, 100,000 GPD primary and complete treatment	80–03*
Water distribution, chlorination and storage details	84–21
Water purification, site layout 60,000 and 120,000 GPD	84–04
Fence, security, type W, X, Y and vehicle and man gate	71–09*
Field maintenance shop 80'x240' ordnance	21–42
Fighting bunkers, shelters, holes (see Shelters—protective)	
Film equipment and exchange facilities	
Motion picture laboratory 40'x100'	75–14
Class A, B and C 100'x200', 40'x100', 40'x50'	75–15
Final settling tank sewage disposal, 30,000 GPD	83–13*
Final settling tank sewage disposal, 100,000 GPD	83–14*
Finance office 15,000 man 40'x70'	61–27
Firehouse 1,600 SF	74–13
Fire protection sump, 2,000 and 10,000 GAL	84–21
Floodlighting details	81–24*
Flood pump and manifold 785 and 1355 BPH—POL	12–32
Footwear repair shops 5,000, 10,000, 15,000 and 20,000 man	73–51
Fuel unloading tank Car, 2 products 5 stations	12–47
Fuel supply pump station—POL 2 and 4 pumps	12–42
Air transportable hydrant refueling system	12–10
General purpose rebuild 120'x240' ordnance	21–82
Guardhouse 20'x60'	74–13
Guard tower 11'x11'	71–11*
Guard tower 16'x16'	71–12*
Guard tower 16'x24'	71–13*
Headquarters and unit supply, 20'x40' and 20'x100'	61–11
Hospital and Medical Facilities:	
Administration 1, 2 and 3, 30'x110', 30'x90' and 30'x80'	51–11*
Administration, admission and disposal 1, 30'x110'	51–11*
Admission and disposition 1, 2 and 3 40'x120', 40'x110' and 40'x90'	51–12*
Admission and disposition 4, 30'x90'	51–13*
Barracks 1 and 2, 30'x100' and 30'x60'	51–71*
Boiler house for messes, SURG-CMS and utility bldg No. 9	82–21
Casualty receiving, holding, treatment, 40'x260'	51–15*
Centralized materiel section 1, 40'x120'	51–45*
Centralized materiel section 2, 40'x100'	51–46*
Clinic dental, 5,000 man 30'x60'	54–13*
Clinic dental, 10,000 man 30'x90'	54–12*
Clinic dental, 20,000 man 30'x130'	54–11*
Dispensary 1, 2 and 3, 30'x90', 30'x80' and 30'x70'	51–23*
Dispensary troop, 20'x60' and 20'x80'	55–11*
Dispensary with 6 and 10 beds, 20'x70' and 20'x100'	55–12*
EE and pharmacy 2, 30'x60' and EENT and pharmacy 1, 30'x70'	51–21*
Laboratory and dental 1 and 2, 40'x140' and 40'x110'	51–34*
Laboratory and dental 3, 30'x110'	51–35*
Linen exchange 1 and 2, 30'x50' and 30'x40'	51–56*
Linen exchange and supply 1 and 2, 30'x110' and 30'x90'	51–56*
Mess 1—16,000 SF	51–63*
Mess 2—10,000 SF	51–64*
Mess 3—8,200 SF	51–65*
Mess 4—4,400 SF	51–66*
Physical medicine, PTOT—2, 30'x80'	51–36*
Physical and occupational therapy, PTOT—1, 40'x90'	51–36*
Professional services bldg 30'x100'	51–13*
Quarters, 13 female officers, 30'x60'	51–71*
Quarters, 23 female officers, 30'x100'	51–71*
Quarters, 14 male officers, 30'x60'	51–71*
Quarters, 24 male officers, 30'x100'	51–71*
Recreation building 1 and 2, 30'x60' and 30'x40'	51–91*
Special services A1 and A2, 40'x90' and 40'x70'	51–91*
Special services A3, B1 and B2, 40'x70', 30'x60' and 30'x60'	51–93*
Supply Storehouse 1, 2, 3 and 4, 30'x90', 30'x110', 30'x70' and 30'x100'	51–54*
Surgery 1, 40'x150'	51–41*
Surgery 2, 40'x110'	51–42*
Surgery, centralized materiel, 40'x100'	51–44*
Utility building 1 and 2, 40'x60' and 30'x60'	51–81*
Utility building 3, 4 and 5, 30'x60'	51–83*
Utility building 6, 7 and 8, 30'x60'	51–85*
Utility building 9 and 10, 30'x50' and 30'x40'	51–87*
Utility building for dental clinic, 30'x40'	54–13*
Walk-covered for hospitals—details	51–97*
Ward 1, standard, 30'x100' and ward 2, acute 30'x100'	51–51*
X-ray, 1 and 2, 40'x90' and 40'x80'	51–31*
X-ray, laboratory, dental, 40'x110'	51–33*
X-ray, physical therapy, 40'x90'	51–32*
Hospital and Medical Installations:	
Hospital—100 bed standards 2, 3, 4 and 6	50–03*
Hospital—100 bed standard 6 air conditioned	50–03*
Hospital—200 bed standards 2, 3, 4 and 6	50–04*
Hospital—200 bed standard 6 air conditioned	50–04*
Hospital—300 bed standards 2, 3, 4 and 6	50–05*
Hospital—300 bed standard 6 air conditioned	50–05*
Hospital—500 bed standards 2, 3, 4 and 6	50–06*
Hospital—500 bed standard 6 air conditioned	50–06*
Hospital—750 bed standards 2, 3, 4 and 6	50–07*
Hospital—750 bed standard 6 air conditioned	50–07*
Hospital—1,000 bed standards 2, 3, 4 and 6	50–08*
Hospital—1,000 bed standard 6 air conditioned	50–08*
Hospital—1,000 bed alternate, standard 6	50–08*
Hospital—1,000 bed alternate, standard 6 air Conditioned	50–08*
Housing Facilities:	
Barracks, 50 man, 20'x96' butlerhut, steel frame	35–23
Barracks type—wood frame 20', 30' and 40' widths various lengths	34–03
Barracks type steel frame bldg 20'x50' and 10'x50' widening kit	35–21
Barracks, 25 man, 20'x48' butlerhut, steel frame	72–53*
Barracks, 50 man, 20'x100'	72–21*
Barracks, close confinement, 25 man, 20'x50'	72–21*
Quarters, female employees, 20'x30' and 20'x40'	72–21*
Quarters, officers 16'x24', 20'x70' and 20'x100'	72–21*
Quarters, officers, female 1 and 2, 30'x100' and 30'x60' for hospital	51–71*
Quarters, officers, male, 1 and 2, 30'x100' and 30'x60' for hospital	51–71*
Shop type buildings (see Buildings).	
Tent floors and frames, 16'x32'	72–51
Warehouse type buildings (see Buildings).	
Housing Installations:	
Military prisoner stockade 250 man standards 2, 3, 4 and 5	70–21*
POW camp 250 man standard 2	70–31*
POW camp 500 man standards 2, 3, 4 and 5	70–31*
POW camp 1,000 man standards 3, 4 and 5	70–32*
POW camp 2,000 man standards 2, 3, 4 and 5	70–33*
POW Camp 4,000 man occidentals standards 3, 4 and 5	70–35*
Troop camp 250 man standards 3, 4, 5 and 6	70–01
Troop camp 500 man standards 3, 4, 5 and 6	70–02
Troop camp 1,000 man standards 3, 4, 5 and 6	70–03
Troop camp 1,500 man standards 3, 4, 5 and 6	70–04
Troop camp 3,000 man standards 3, 4, 5 and 6	70–05
Ice plant 1 ton	43–21
Ice plant 15 ton	43–23
Imhoff tank, sewage disposal—metal or wood, 30,000 GPD	83–13*
Imhoff tank, sewage disposal—metal or wood, 100,000 GPD	83–14*
Jetty w/40'x70' wharf—1,000'	12–57
Kitchen and mess hall, 200 man	72–61
Kitchen and mess hall, 500 man	72–62
Laboratory, petroleum base POL	12–35
Laboratory and dental, 1 and 2, 40'x120' and 40'x110' hospital	51–34*
Lab and dental, 3, 30'x110' hospital	51–35*
Lab, X-ray dental 40'x110' hospital	51–33*
Latrine, bucket type, 12 seats, 10'x30'	72–36
Latrine, pit type, 8 seats, 10'x20' and female 2 seats, 10'x10'	72–36
Latrine, water borne, 160 man or 80 officers, 10'x20'	72–35
Latrine and Bathhouse, tip tray, 100, 250 and 500 man, 20'x30', 20'x50' and 20'x80'	72–31
Latrine and Bathhouse, water borne, 160 man or 80 officers, 20'x30'	72–32
Latrine and bathhouse, water borne, 250 and 500 man, 20'x60' and 20'x80'	72–32
Latrine and bathhouse, water borne, 720 man, 20'x100'	72–35
Laundry, 2,500 man	73–34
Laundry, 5,000 man	73–35
Laundry, 10,000 man	73–36
Laundry, 500 and 1,000 bed hospital	73–37
Laundry, special details	73–39
Library, 5,000 man for tent 40'x80' and bldg 40'x100'	74–41
Library, 10,000 man, 80'x100'	74–43
Lighterage—wharf—35'x500'	15–26
Lighterage—wharf—rehab 35'x500' plans	15–24
Lighterage—wharf—rehab scheme I 35'x500'	15–25
Linen Exchange 1 and 2, 30'x50' and 30'x40' hospital	15–56*
Linen Exchange and supply 1 and 2, 30'x110' and 30'x90' hospital	51–56*
Liner and installation details	35–21
Loading pump and manifold, 700–1, 400 and 2,000–2,500 BPH—POL	12–31
Loading station, POL tank truck and tank car	12–32
Loading station, POL tank truck 2 sta, 5 and 10 station tank car	12–43*
Lubrication rack, 12'x56'	21–97
Machine shop, railroad, 80'x300'	86–31
Magazine—steel arch, 16' and 25' widths	42–14
Manifold, distribution—POL drum and can, tank car and truck loading	12–32
Manifold, switching—POL—4", 6", 8" and 12"	12–32
Marine Railway—1,800 and 500 ton	15–33
Marine railway repair	15–31
Marine shops, 40'x100' and 60'x180'	15–32
Mechanical Ventilation—hospital buildings:	
Barracks 1 and 2, 30'x100', 30'x60'	53–05*
Dispensary 1, 2 and 3, 30'x90', 30'x80' and 30'x70'	53–01*
EE and pharmacy 1 and 2, 30'x70' and 30'x60'	53–03*
Fan housing	99–98*
Lab and dental 1, 2 and 3, 40'x120', 40'x110' and 30'x110'	53–01*
Physical medicine PTOT—2, 30'x80'	53–03*
Physical and occupational therapy, PTOT—1, 40'x90'	53–03*
Quarters, female officers 1 and 2, 30'x100' and 30'x60'	53–05*
Quarters, male officers, 1 and 2, 30'x100' and 30'x60'	53–05*
Ward 1 and 2, standard and acute, 30'x100' and 30'x100'	53–03*
Mess 1—16,000 SF—hospital	51–63*
Mess 2—10,000 SF—hospital	51–64*
Mess 3—8,200 SF—hospital	51–65*
Mess 4—4,400 SF—hospital	51–66*
Mess hall and kitchen, 180, 250 man 20'x100' and 20'x130'	72–61
Mess hall and kitchen, 500 man 40'x140' and 70 officers 20'x80'	72–62
Military prisoner stockade (see Housing instal or site util layout).	
Mooring, tanker, POL 60', 90' and 120' Depth 3, 5 and 7 Leg	12–21
Motion picture lab, 40'x100'	75–14
Motor repair shop, 40'x40' and 40'x60'	21–41
Motor vehicle assembly shop, 120'x200' ordnance	22–41
Occupational and physical therapy, 40'x90' hospital	51–36*
Open areas—floodlighting details	81–24*
Ordnance Shops:	
Automotive armament rebuild, 80'x180'	21–43*
Artillery and fire control, 180'x320'	21–51
Field maintenance 80'x240'	21–42
General purpose rebuild, 120'x240'	21–82
Motor vehicle assembly, 120'x200'	22–41
Park company, 120'x160'	21–81
Lubrication rack	21–97
Park company shop, 120'x160'—ordnance	21–81
Personnel Services:	
Drycleaning plant 1,000 and 2,500 and 5,000 man	73–38
Footwear repair shop—5,000, 10,000, 15,000 and 20,000 man	73–51
Laundry, 2,500 man—64'x144'	73–34
Laundry, 5,000 man 64'x208'	73–35
Laundry, 10,000 man 128'x224'	73–36
Petroleum base laboratory	12–35
Physical medicine, 30'x80' hospital	51–36*
Physical and occupational therapy, 40'x90' hospital	51–36*
Physical therapy X-ray 40'x90' hospital	51–32*
Pier (see Ports).	
Pipeline pump station—POL	12–52
Pipeline submarine—6", 8" and 12"; 60', 90' and 120' Depth—POL	12–22
Pipeline submarine—8", 12", 16" and 20"; 60', 90' and 120' depths	12–23
Pipeline submarine—6"—1,000' long—25' depth	12–04
POL Facilities:	
Fuel drum cleaning filling and storage installation	12–13
Supplementary fittings and valve for reversing pumpings from collapsible storage tank farm (100,000, 50,000 and 40,000 gal)	12–04
Reversing manifold for booster pumps for loading shore to ship 6"—8" and 12" lines	12–04
Tanks, collapsible w/equipment, 4–10,000 gallon storage capacity	12–04
Mooring for barge or small vessel in shallow water, 25' depth	12–04
Tactical marine terminal 50,000 bbl w/6" submarine pipeline and 6" buoyant hoseline	12–12
Tanker, mooring, 3–5–7 leg, 60', 90', 120' depths	12–21
Pipeline, submarine, 1,000' long 25' depth 6"	12–04
Pipeline, submarine, 6", 8" and 12", 2750' long, 60, 90 and 120' depths	12–22
Pipeline, submarine, 1,000' long 25' depth 6"	12–04
Pipeline, submarine, 8", 12", 16" and 20", 5300' long, 60, 90 and 120' depth	12–23
Booster stations, 1400–2800–7000 BPH	12–31
Loading pump and manifold for 2—tank trucks, 5 and 10 railroad cars, drum and can	12–31
Manifold switching 4", 6", 8" and 12" lines	12–32
Flood pumps, 785 and 1355 BPH with 6", 8" and 12" manifolds	12–32
Tank pumps, 700–1400–2800 BPH with 6", 8" and 12" manifolds	12–32
Distribution manifold for can and drum and 10 tank car loading 6" and 8"	12–32

* Indicates drawing under revision.

* Indicates drawing under revision.

POL Facilities—(*Continued*)	DWG No.
Transfer pumps, 700–1400–2800 BPH w/6", 8" and 12" manifolds	12–33
Tanks, w/pipe and fittings, 100, 250, 500, 1,000, 3,000, 10,000 and 50,000 BBL, 4", 6", 8" and 12" lines	12–34
Base petroleum laboratory building with interior	12–35
Pump station fuel supply for 2 and 4 pumps	12–42
Loading for 2—tank trucks, 5 and 10 tank car	12–43*
Tanks, collapsible 50,000–100,000 gallons storage capacity	12–45
Tank car unloading, 5 stations, 2 products	12–47
Pump stations, 385, 785–1355 BPH, with 4", 6" and 8" manifolds	12–52
Pipeline suspension cable bridge, 200'–400' span for 8" pipe	12–53*
Drum washing, repairing and testing building w/equipment	12–55
Jetty, POL w/40'x70' wharf, 1,000' from shore/hose derricks and tanker watering service facilities	12–57
Pipe and accessories for existing dock, 4", 6", 8", 12" and 16"	12–58
Cleaning, testing and repairing for collapsible drums and tanks; 50–500 gal drums and 2 each 3,000–10,000–50,000 gal tanks per 10 hr day	12–48*
Support area fuel supply for rotary wing and fixed wing A/C refueling	12–46
POL Installations:	
Tank car loading, 5 and 10 car stations	12–02*
Tank truck loading, 5 stations, 2 products	12–47
Tank truck loading, 2 stations, 2 miles removed from Tank Farm	12–03*
Tank truck loading, 2 stations, at tank farm	12–07
Barge or small vessel unloading, loading in shallow water and tank farms, 300,000 and tank farms, 300,000 and 600,000 gal capacity	12–04
Pipeline pump stations 385–785–1355 BPH w/4", 6" and 8" lines	12–06
Tank farms, 50,000, 100,000, 150,000, 200,000 and 250,000 bbls storage capacities w/6", 8" and 12" pipelines	12–07
Tank farm complexes, 400,000, 600,000 800,000 and 1,000,000 BBL storage capacity w/6", 8" and 12" pipelines	12–08
Marine terminal with existing dock, 200,000, 400,000 and 1,000,000 BBL storage capacity	12–09
Marine terminal with 1,000' jetty and 40'x70' wharf, 200,000, 400,000 and 1,000,000 BBL storage capacity	12–09
Marine terminal with 12" submarine pipeline, 200,000, 400,000, 1,000,000 BBL storage capacity	12–09
Tactical marine terminal 50,000 BBL storage capacity with 6" submarine pipeline and 6" buoyant hoseline	12–12
Tank farm portable 50,000 and 100,000 gal storage capacity	12–45
Fuel drum cleaning, filling and storage installation	12–13
Ports, dry cargo:	
Rehab pier or wharf, scheme I, section and details	15–01
Rehab pier or wharf, scheme II, section and details	15–02
Rehab pier or wharf, scheme IIII, sections and details	15–03
Rehab pier or wharf, scheme IV, sections and details	15–04
Rehab pier or wharf, scheme V, sections and details	15–05
Rehab wharf—Lighterage 35'x500' plans and details	15–24
Rehab wharf—Lighterage 35'x500' scheme I	15–25
Pier, timber, 90'x500' with railroad approach trestle	15–06
Pier, timber, 90'x500' railroad approach trestle	15–07

* Indicates drawing under revision.

	DWG No.
Wharf, timber 60'x500', pile framing and deck plans	15–21
Wharf, timber 60'x500' railroad approach trestle, 100 LF	15–22
Wharf, timber 60'x500' road approach trestle, 100 LF	15–23
Wharf, lighterage 35'x500', sections elev and details	15–25
1440 tons/day, std 5, site and utility layout	15–08
Post office, army, 40'x60' and 40'x100'	61–22
Post office, base, 80'x240', 80'x200' and 80'x140'	61–21
Post office admin 1, 2 and 3, 40'x90', 40'x70' and 40'x50'	61–21
POW camps (see Housing installations or Site and utility layouts).	
Professional services building 1, 30'x100' hospital	51–13*
Protective bunkers, shelters (see Shelters—protective).	
Pump and manifold POL:	
Flood, 785 and 1,355 BPH	12–32
Loading, 700–1, 400 and 2,000–2,500 BPH	12–31
Tank, 700, 1,400 and 2,800 BPH	12–32
Transfer, 700, 1,400 and 2,800 BPH	12–33
Pump station—POL	
Fuel supply, 2 and 4 pumps	12–42
Pipeline, 385, 785, 1,355 BPH	12–52
Quarters, female employees 20'x30' and 20'x40'	72–21*
Quarters, officers, 16 and 24, 20'x70' and 20'x100'	72–21*
Quarters, officers, female 1 and 2, 30'x100' and 30'x60' hospital	51–71*
Quarters, officers, male 1 and 2, 30'x100' and 30'x60' hospital	51–71*
Radio receiver building, 40'x40', 40'x60' and 40'x80'	13–21
Radio transmitter buildings:	
4,800 SF	13–19
Railroad bridges (see Bridges).	
Railroad Facilities:	
Approach trestle, 90' width	15–07
Bridges (see Railroad bridge spans).	
Car repair shop, 60'x300'	86–31
Coal discharging trestle, 16'x156'	86–12
Coal loading platform, 12'x84'	86–11
Engine house, 2 stall and 6 stall, 60'x80' and 60'x220'	86–32
Machine shop	86–31
Turnout, track No. 8	86–13
Unloading platform 32'x172'	86–09
Water storage and tower, low, 21,000 gal and 42,000 gal	86–24
Water storage and tower, high, 21,000 gal	86–22
Water storage and tower, high, 126,000 gal.	86–23
Diesel oil, POL, storage and tower, low, 2–42,000 gal tanks	86–04
Railroad Installations:	
Railroad terminal, 20 trains per day	86–04
Railroad regulating station, 20 trains per day	86–05
Recreation building 1 and 2, 30'x60' and 30'x40' hospital	51–91*
Recreation and camp exchange, 20'x60'	74–13
Recreational Facilities:	
Army exchange, 5,000 man for tent, 40'x80' and building 40'x100'	74–22
Army exchange, 10,000 man, 80'x120'	74–23
Athletic court, combination, 60'x120'	75–21
Camp exchange, 20'x30', 20'x50' and 20'x80'	74–17
Camp exchange, 20'x100'	74–13
Camp exchange and recreation, 20'x60'	74–13
Chapel, 20'x30' and 20'x50'	74–47
Chapel, 300 seats and 150 seats, 40'x80' and 30'x60'	74–47
Crafts shop, 5,000 man, 40'x100'	74–36
Crafts shop, 10,000 man, 80'x120'	74–37
Day room, 40'x60'	74–13
Educational building, 20'x30' and 20'x50'	74–13
Library, 5,000 man for tent, 40'x80' and building 40'x100'	74–41
Library, 10,000 man 80'x100'	74–43
Recreation building 1 and 2, 30'x60' and 30'x40' hospital	51–91*
Service club, 5,000 man for tent, 40'x100'	74–17

Recreational Facilities: (*Continued*)	DWG No.
Snack bar in tent, 16'x32'	74–17
Snack bar kitchen tent, 12'x18'	74–17
Special activities, 5,000 man 60'x160'	74–31
Special activities, 10,000 man 60'x260'	74–32
Special services A1 and A2, 40'x90' and 40'x70', rec 1 and 2, 30'x60' and 30'x40'—hospital	51–91*
Special services A3, B1 and B2, 40'x70' and 30'x60' hospital	51–93*
Theater, motion picture, 750 seats, 60'x140'	74–46
Theater, motion picture, 350 seats for tent, 40'x100'	74–45
Theater, outdoor, 750 and 1500 seats	75–11
Recreation Installations:	
Recreation center 5,000 man standards 2, 3, 4 and 5	60–22
Recreation center 10,000 man standards 4 and 5	60–22
Refrigerated warehouse 32'x40' and 40'x60'	43–15
Refrigerated warehouse 80'x220'	43–16
Refrigerated, prefab 600, 1,200, 1,800 and 4,000 cf	43–17
Rehabilitation facilities:	
Lighterage, wharf 35'x500'	15–24
Lighterage, wharf, scheme I—1,000'	15–25
Pier or wharf, scheme I—30'x502'	15–01
Pier or wharf, scheme II—31'x502'	15–02
Pier or wharf, scheme III—36'x510'	15–03
Pier or wharf, scheme IV—37'x508'	15–04
Pier or wharf, scheme V—19'x502'	15–05
Relay communication station 40'x80' and 40'x140'	13–11
Roads—single and double lane and hardstands—Typical details	85–31*
Road Bridges (see Bridges).	
Security Facilities:	
Barracks, close confinement, 25 man, 20'x50'	72–21*
Cell block, Occidental, 37 cells, 40'x100'	71–01*
Cell block, Oriental, 2 7 cells, 22'x100'	71–01*
Fence, security, type W, X, Y and vehicle and man gate	71–09*
Guard tower 11'x11'	71–11*
Security Facilities—Continued	
Guard tower, 16'x16'	71–12*
Guard tower, 16'x24'	71–13*
Septic tank, 500 gallon	83–11*
Septic tank sewage disposal, 10.000 GPD	83–11*
Service club, 5,000 man for tent 40'x100'	74–17
Sewage disposal:	
Chlorine contact chamber, 30,000 GPD	83–13*
Chlorine contact chamber, 100,000 GPD	83–14*
Drainfield, 10,000 GPD	83–11*
Final settling tank, 30,000 GPD	83–13*
Final settling tank, 100,000 GPD	83–14*
Imhoff tank—metal or wood, 30,000 GPD	83–13*
Imhoff tank—metal or wood, 100,000 GPD	83–14*
Siphon chamber 10,000 GPD	83–11*
Siphon chamber 30,000 GPD	83–13*
Siphon chamber 100,000 GPD	83–14*
Sludge drying beds	83–15*
Trickling filter, 30,000 GPD	83–13*
Trickling filter, 100,000 GPD	83–14*
Shelters—Protective:	
Concrete arch	04–01
Steel multiplate arch	04–02
Concrete log bunker	04–03
Concrete arch bunker and corrugated steel pipe fighting hole	04–04
Timber frame fighting hole	04–05
Precast concrete parts yard for bunkers and shelters	04–06
Shop Facilities:	
Automotive maintenance, 80'x240'	21–41
Car repair shop, railroad, 60'x300'	86–31
Carpenter shop, windows and doors, 48'x96', work panel work 48'x112'	34–01
Footwear repair	73–51
Lubrication rack	21–97
Machine shop, railroad, 80'x300'	86–31*
Motor repair shop, 40'x40' and 40'x60'	21–41
Ordnance, artillery and fire control, 180'x320'	21–51
Ordnance, automotive armament rebuild, 80'x180'	21–43

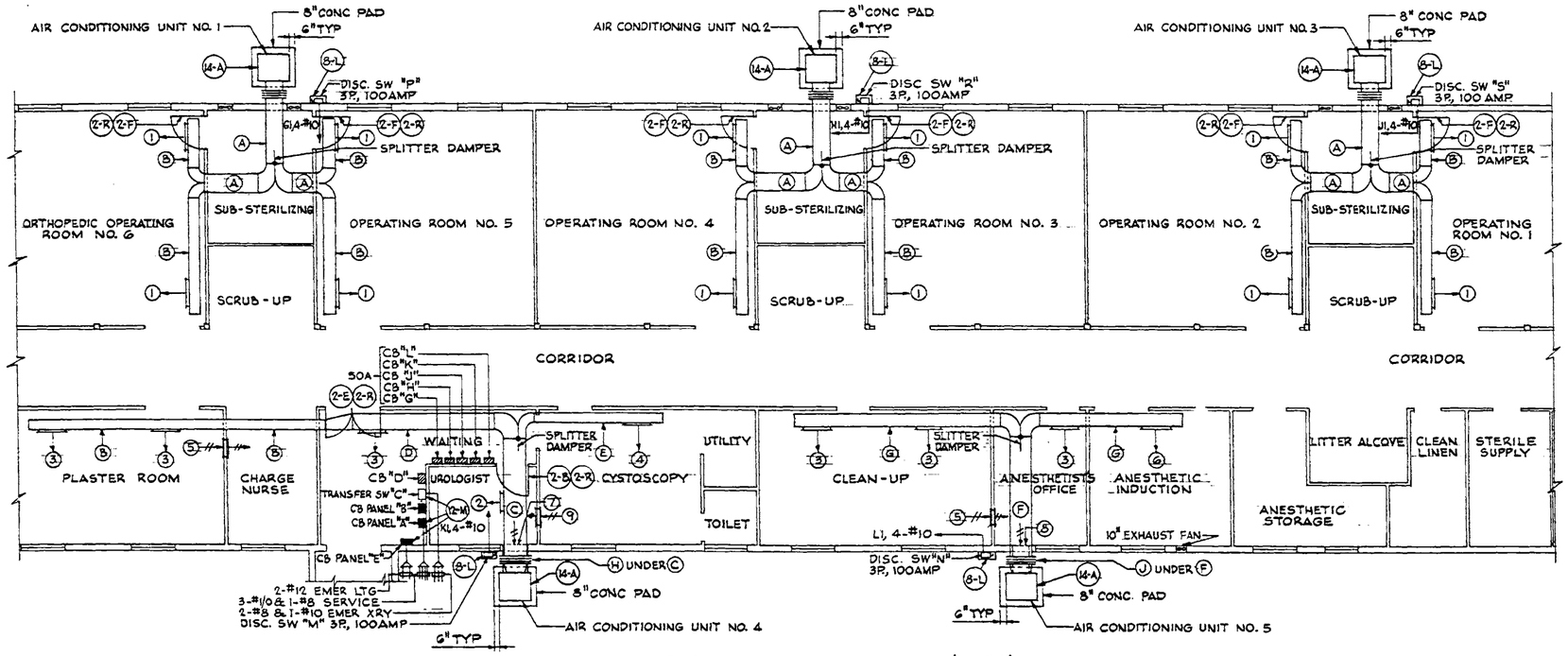
* Indicates drawing under revision.

	DWG No.
Ordnance, field maintenance, 80'x240'	21–42
Ordnance, general purpose rebuild, 120'x240'	21–82
Ordnance, motor vehicle assembly, 120'x200'	22–41
Ordnance, park company, 120'x160'	21–81
Signal maintenance, 80'x200', 80'x100' and 40'x100'	13–23
Shop Installations:	
Base Ordnance park	20–04
Marine railway repair	15–31
Ordnance, armament rebuild	20–05
Ordnance, automotive rebuild	20–06
Ordnance, collecting point	20–03
Shop, heavy duty, wood frame bldg various widths (see Buildings)	34–19
Shop, steel frame bldg (see Buildings)	35–46
Shop, marine, 40'x100' and 60' and 180'	15–32
Signal maintenance shop, 80'x200', 80'x100' and 40'x100'	13–23
Siphon chamber, sewage disposal, 10,000 GPD	83–11*
Siphon chamber, sewage disposal, 30,000 GPD	83–13*
Siphon chamber, sewage disposal, 100,000 GPD	83–14*
Site and Utility Layouts:	
Administration—10,000 SF standards 4 and 6	60–05
Administration—25,000 SF standards 4 and 6	60–05
Administration—50,000 SF standards 4 and 6	60–05
Army airfields (see Airfield installations)	
Base ordnance park	20–04
Base post office	60–28
Hospital—100 bed standards 2, 3, 4 and 6	50–03*
Hospital—100 bed standard 6 air conditioned	50–03*
Hospital—200 bed standards 2, 3, 4 and 6	50–04*
Hospital—200 bed standard 6 air conditioned	50–04*
Hospital—300 bed standards 2, 3, 4 and 6	50–05*
Hospital—300 bed standard 6 air conditioned	50–05*
Hospital—500 bed standards 2, 3, 4 and 6	50–06*
Hospital—500 bed standard 6 air conditioned	50–06*
Hospital—750 bed standards 2, 3 4 and 6	50–07*
Hospital—750 bed standard 6 air conditioned	50–07*
Hospital—1,000 bed standards 2, 3, 4 and 6	50–08*
Hospital—1,000 bed standard 6 air conditioned	50–08*
Hospital—1,000 bed alternate—standard 6	50–08*
Hospital—1,000 bed alternate—standard 6 air conditioned	50–08*
Marine POL terminal (tactical) 50,000 BBL storage	12–12
Marine POL terminal 200,000, 400,000 and 1,000,000 Bbl storage	12–09
Marine railway repair	15–31
Marine shop 40'x100' and 60'x180'	15–32
Military prisoner stockade—250 man standards 2, 3, 4 and 5	70–21*
Military prisoner stockade—500 man standards 3, 4 and 5	70–22*
Ordnance, armament rebuild	20–05
Ordnance, automotive rebuild	20–06
Ordnance, collecting point	20–03
Pump stations w/4", 6" and 8" lines	12–06
Port 1,440 tons per day standard 5	15–08
POW camp 250 man standard 2	70–31*
POW camp 500 man standards 2, 3, 4 and 5	70–31*
POW camp 1,000 man standards 2, 3, 4 and 5	70–32*
POW camp 2,000 man standards 2, 3, 4 and 5	70–33*
POW camp 4,000 man occidentals—standards 2, 3, 4 and 5	70–35*
POW camp 4,000 man orientals—standards 2, 3, 4 and 5	70–34*
Railroad terminal—20 trans per day	86–04
Railroad regulating station—20 trains per day	86–05
Recreation center—5,000 man—standards 2, 3, 4 and 5	60–22
Recreation center—10,000 man—standards 4 and 5	60–22
Sewage disposal plant—10,000 GPD—primary and complete treatment	80–01*
Sewage disposal plant—30,000 GPD—primary and complete treatment	80–02*
Sewage disposal plant—100,000 GPD—primary and complete treatment	80–03*

Site and Utility Layouts—(*Continued*)	DWG No.
Tank car loading, 5 and 10 rack, POL	12–02*
Tank farm—50,000, 100,000, 150,000, 200,000 and 250,000 Bbl storage—POL	12–07
Tank farm complex—400,000, 600,000 800,000 and 1,000,000 Bbl storage POL	12–08
Tank farm portable—50,000 and 100,000 gallon storage—POL	12–45
Tank truck loading, 2 station POL	12–03*
Troop camp 250 man standards 3, 4, 5 and 6	70–01*
Troop camp 500 man standards 3, 4, 5 and 6	70–02
Troop camp 1,000 man standards 3, 4, 5 and 6	70–03
Troop camp 1,500 man standards 3, 4, 5 and 6	70–04
Site and Utility Layouts—Continued	
Troop camp 3,000 man standards 3, 4, 5 and 6	70–05
Sludge drying bed, sewage disposal	83–15*
Snack bar kitchen tent, 12'x16'	74–17
Special activities, 5,000 man 60'x160'	74–31
Special activities, 10,000 man 60'x260'	74–32
Special services A1 and A2, 40'x90' and 40'x70', hospital	51–91*
Special services A3, B1 and B2, 40'x70' and 30'x60', hospital	51–93*
Water purification, 60,000 and 120,000 GPD	84–04
Standard details	99–98
Steel frame buildings (see Buildings).	
Stockade (see Housing installations or site and utility layouts).	
Storage Facilities:	
Ice plant—1 ton	43–21
Ice plant—15 ton	43–23
Refrigerators, prefabricated, 600, 1,200, 1,800 and 4,000 cubic feet	43–17
Magazine, steel arch 16' and 25' wide—variable lengths	42–14
Refrigerated warehouse—32'x40' and 40'x60'	43–15
Refrigerated warehouse—80'x220'	43–16
Storehouse, 20'x20', 20'x30', 20'x50' and 20'x100'	44–11
Supply storehouse 1 and 2, 30'x90' and 30'x110' hospital	51–54*
Supply storehouse 3 and 4, 30'x70' and 30'x100' hospital	51–54*
Unit supply and hdqtrs., 20'x40' and 20'x100'	61–11
Warehouse, closed, 40'x100' and 80'x220'	44–11
Warehouse storage and tower, low railroad, 21,000 and 42,000 gal.	86–24
Water storage and tower, high railroad, 21,000 gal	86–22
Water storage and tower, high railroad, 126,000 gal	86–23
Storage Installations:	
Ammunition 5,000 and 15,000 tons	40–01
Dry cargo-covered 12,000, 25,000, 50,000 and 100,000 SF	40–11
Dry—cargo—open 15,000, 100,000, 200,000 SF	40–12
Tank farm 50,000, 100,000, 150,000, 200,000 and 250,000 Bbl storage POL	12–07
Tank farm complex 400,000, 600,000 and 800,000 Bbl storage POL	12–08
Tank farm complex 1,000,000 Bbl storage POL	12–08
Tank farm portable 50,000 and 100,000 gallon storage POL	12–45
Tactical marine terminal 50,000 Bbl	12–12
Storehouse, 20'x20', 20'x30', 20'x50' and 20'x100'	44–11
Storehouse, whse, type bldg., 40'x100' and 80'x220'	44–11
Submarine pipeline, 6", 8" and 12", 60', 90' and 120' depths POL	12–22
Submarine pipeline, 6"	12–04
Submarine pipeline 8", 12", 16" and 20"	12–23
Sump, fire protection, 2,000 and 10,000 gal	84–21
Supply and linen exchange 1 and 2, 30'x110' and 30'x90' hospital	51–56*
Supply storehouse 1, 2, 3 and 4—30'x90', 30'x110', 30'x70' and 30'x100'	51–54*

* Indicates drawing under revision.

	DWG No.
Surgery 1, 40'x150' hospital	51–41*
Surgery 2, 40'x110' hospital	51–42*
Surgery, centralized materiel, 40'x100' hospital	51–44*
Switching manifold 4", 6", 8" and 12" POL	12–32
Tank, w/4", 6" and 12" Line—100, 250, 500, 1,000, 3,000, 10,000 and 50,000 Bbl	12–24
Tank pump and manifold, 700, 1,400 and 2,800 BPH—POL	12–32
Tanker mooring, 60', 90' and 120' depths—POL, 3, 5, 7 leg	12–21
Tanker unloading, POL, existing dock, 4", 6", 8" and 12" lines	12–58
Telephone, dial tel. bldgs, 40'x40', 40'x60' and manual tel bldgs 20'x40'	13–15
Telephone, long distance, manual, 40'x40', 40'x60'	13–14
Tent floors and frames, officers 16'x32' tent	72–51
Tent (Jamesway), frigid climate 16'x48'	72–55
Terminal station, 40'x60', communications	13–12
Theater, motion picture, 750 seats 60'x140'	74–46
Theater, motion picture, 350 seats for tent, 40'x100'	74–45
Theater, outdoor, 750 seats	75–11
Theater, outdoor, 1,500 and 1500 seats	75–12
Transfer pump and manifold, 700, 1,400 and 2,800 BPH—POL	12–33
Trickling filter, sewage disposal, 30,000 GPD	83–13*
Trickling filter, sewage disposal, 100,000 GPD	83–14*
Troop camps (see Housing installations or site and utility layouts).	
Turnout, No. 8, railroad track	86–13
Unloading platform, 32'x172'	86–09
Utilities, exterior (see Specific area—electric, water, etc.).	
Utility building 1 and 2, 40'x60' and 30'x60'—hospital	51–81*
Utility building 3, 4 and 5, 30'x60'—hospital	51–83*
Utility buildnig 6, 7 and 8, 30'x60'—hospital	51–85*
Utility building 9 and 10, 30'x50', 30'x40'—hospital	51–87*
Utility building for dental clinic, 30'x40'	54–13*
Walk-cover for hospitals—details	51–97*
Ward 1, standard, 30'x100' and ward 2, acute, 30'x100'	51–51*
Warehouse, closed, 40'x100' and 80'x220'	44–11
Warehouse, refrigerated, 32'x40' and 40'x60'	43–15
Warehouse, refrigerated, 80'x220'	43–16
Warehouse type building (see Buildings).	
Water chlorination and storage details	84–21
Water purification:	
Erdlator and chemical storage, 60,000 and 120,000 GPD	84–17
Installation, site layout, 60,000 and 120,000 GPD	84–04
Water tank and tower, sump—Fire protection	84–21
Water storage and tower, low railroad, 21,000 gal and 42,000 gal	86–24
Water storage and tower, high railroad, 21,000 gal	86–22
Water storage and tower, high railroad, 126,000 gal	86–23
Water supply	
Deepwell 20 GPM and 75 GPM	84–21
Wharf—(see Ports).	
Jetty w/40'x70' wharf, 1,000 LF	12–57
Lighterage—35'x500'	15–26
Lighterage—rehab 35'x500', plans	15–24
Lighterage—rehab scheme 1—35'x500'	15–25
Railroad approach trestle, 100 LF	15–22
Road approach—100 LF	15–23
Timber, 60'x500', 5', 15' and 25' tides	15–21
Wood frame buildings (see Buildings).	
X-ray 1 and 2, 40'x90' and 40'x80' hospital	51–31*
X-ray, laboratory, dental 40'x110' hospital	51–33*
X-ray, physical therapy—40'x90' hospital	51–32*



AIR CONDITIONING - SURG 1, 40'X150'
SCALE NO. 24
FACIL. NO. 520501 - AIR CONDITIONING ONLY

SURG 1 - 40'X150'

SCHEDULE OF DUCTS & GRILLES

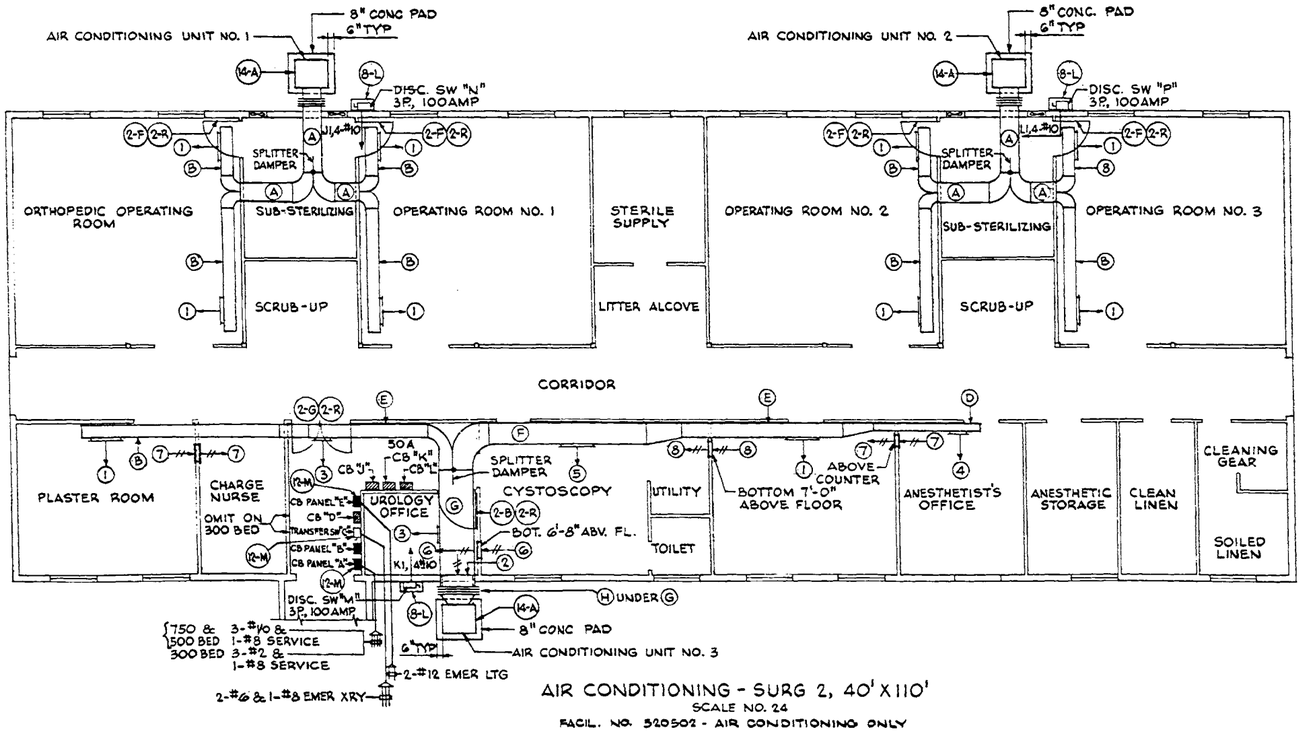
ITEM LTR.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	20"X 8"	1	30"X 6"
B	12"X 8"	2	20"X 4"
C	26"X 8"	3	24"X 4"
D	18"X 8"	4	24"X 6"
E	10"X 8"	5	18"X 8"
F	24"X 8"	6	30"X 4"
G	14"X 8"	7	28"X 12"
H	28"X 12"	8	18"X 12"
J	22"X 12"	9	16"X 8"

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	4.44 KW
RECP EST	3.40KW
POWER	34.00KW
TOTAL	41.84KW
EMER X-RAY	10.00KW
EMER LTG	1.91 KW

1. TOTAL ELECTRICAL LOAD INCLUDES AIR CONDITIONING.
2. SERVICE & BUS REPLACEMENTS AS NECESSARY.



AIR CONDITIONING - SURG 2, 40'X110'
SCALE NO. 24
FACIL. NO. 520502 - AIR CONDITIONING ONLY

SURG 2 - 40'X110'

SCHEDULE OF DUCTS & GRILLES

ITEM LTR.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	20"X 8"	1	30"X 6"
B	12"X 8"	2	32"X 12"
C	8"X 6"	3	16"X 6"
D	8"X 8"	4	20"X 6"
E	14"X 8"	5	36"X 6"
F	24"X 8"	6	30"X 8"
G	36"X 8"	7	16"X 8"
H	32"X 12"	8	18"X 8"

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	750 & 500 BED	300 BED
LIGHTING	3.25 KW	3.17 KW
RECP EST	2.00KW	2.00KW
POWER	20.40KW	20.40KW
X-RAY	10.00KW	
TOTAL	35.65KW	25.57KW
EMER LTG	1.35KW	1.23 KW
EMER X-RAY	10.00KW	

1. TOTAL ELECTRICAL LOAD INCLUDES AIR CONDITIONING.
2. SERVICE & BUS REPLACEMENTS AS NECESSARY.

GENERAL NOTES

1. INSTALL ½" INSULATION BOARD BETWEEN STUDS & WALL COVERING ON ONE SIDE OF ALL INTERIOR PARTITIONS.
2. ALL EXTERIOR WALLS TO HAVE ½" INSULATION BOARD COVERED WITH COMPOSITION WALLBOARD & 4'-0" FIBERBOARD HARDPRESSED WAINSCOT.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
52-05	PLANS	1 OF 1
51-41	SURG 1-PLAN	1,2 OF 2
51-42	SURG 2-PLAN	1 OF 1
99-98	AIR CONDITIONING DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES
0 5' 10'
NO.24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

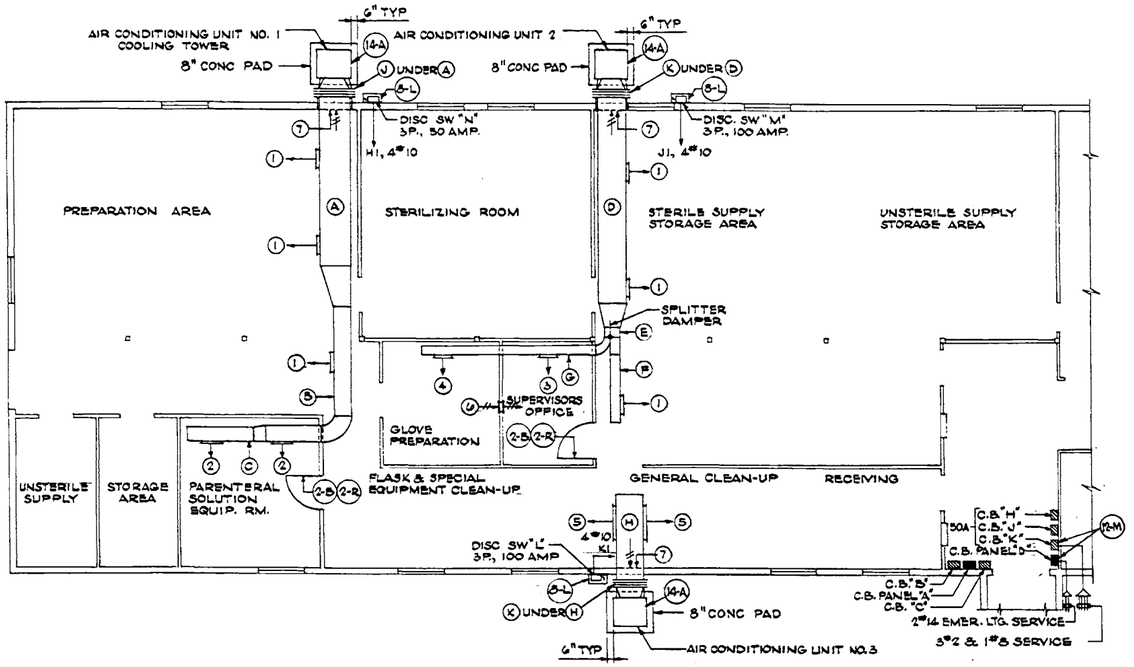
DRAWN BY: HORNE
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, ARCH'L-ENGR BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

THEATER OF OPERATIONS
AIR CONDITIONING
SURGERY
SURG 1 - 40'X150' & SURG 2 - 40'X110'
TEMP. CLIMATE

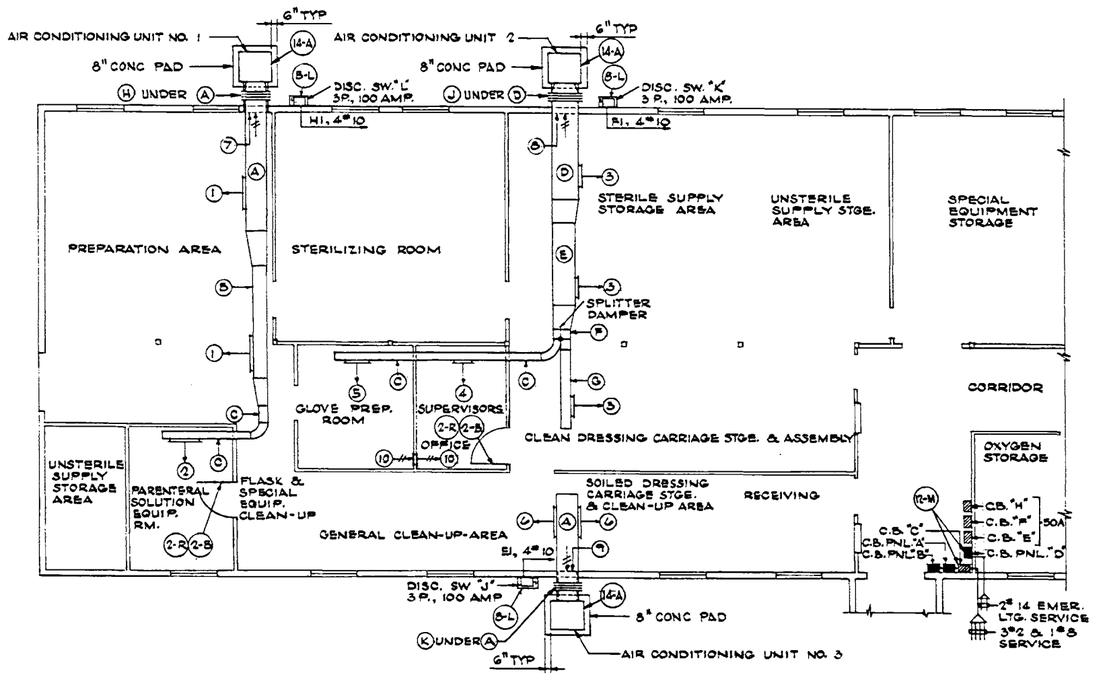
UNDER REVISION

APPROVED FOR PROPONENT AGENCY: Robert Bernstein 49510
DATE: 9 OCT 68

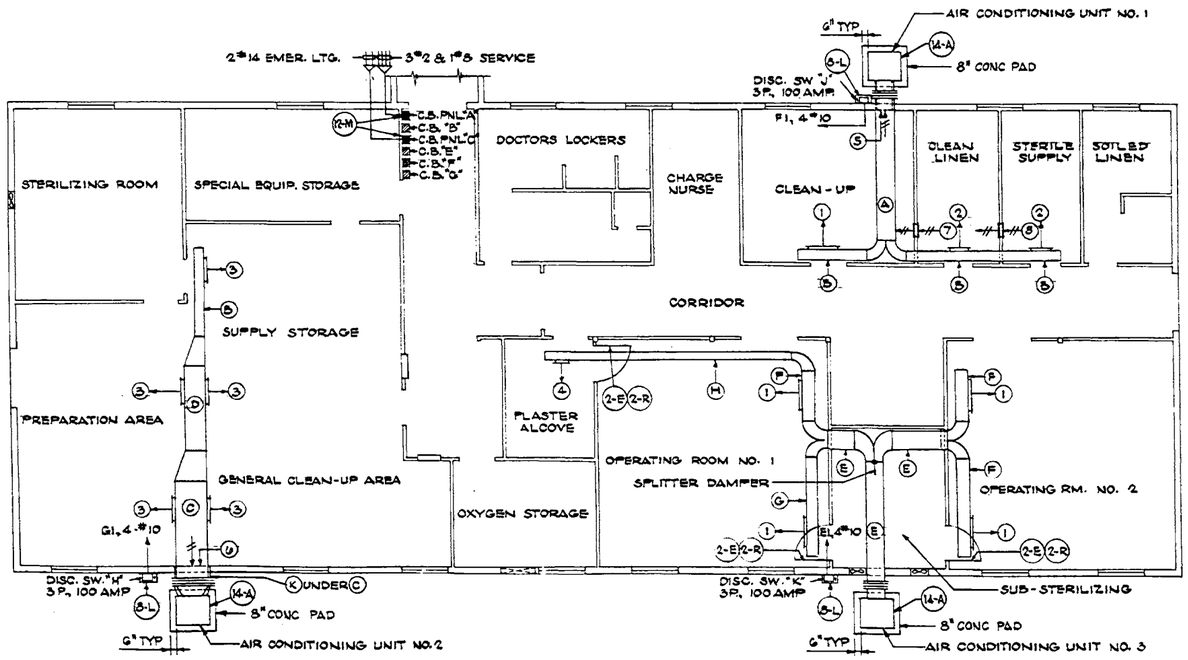
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 52-05
SHEET 1 OF 1



AIR CONDITIONING - CMS1, 40' X 120'
SCALE NO. 24
FACIL. NO. 520901 - AIR CONDITIONING ONLY



AIR CONDITIONING - CMS2, 40' X 100'
SCALE NO. 24
FACIL. NO. 520902 - AIR CONDITIONING ONLY



AIR CONDITIONING, SURG - CMS, 40' X 100'
SCALE NO. 24
FACIL. NO. 520903 - AIR CONDITIONING ONLY

SCHEDULE OF DUCTS & GRILLES

CMS 1 - 40' X 120'

ITEM LTR.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	34" X 8"	1	16" X 6"
B	20" X 8"	2	24" X 4"
C	14" X 8"	3	16" X 4"
D	28" X 8"	4	20" X 4"
E	16" X 8"	5	30" X 6"
F	10" X 8"	6	10" X 8"
G	8" X 8"	7	30" X 12"
H	30" X 8"		
J	36" X 12"		
K	50" X 12"		

CMS 2 - 40' X 100'

ITEM LTR.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	22" X 8"	1	36" X 4"
B	16" X 8"	2	30" X 4"
C	8" X 8"	3	20" X 6"
D	28" X 8"	4	18" X 4"
E	24" X 8"	5	24" X 4"
F	18" X 8"	6	30" X 6"
G	10" X 8"	7	22" X 12"
H	22" X 12"	8	28" X 12"
J	28" X 12"	9	20" X 12"
K	20" X 12"	10	8" X 8"

SURG - CMS, 40' X 100'

ITEM LTR.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	18" X 8"	1	30" X 6"
B	10" X 8"	2	20" X 4"
C	34" X 8"	3	24" X 6"
D	22" X 8"	4	12" X 4"
E	20" X 8"	5	10" X 12"
F	14" X 8"	6	36" X 12"
G	12" X 8"	7	14" X 8"
H	8" X 8"	A	10" X 8"
J	10" X 12"		
K	30" X 12"		

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	CMS 1 40' X 120'	CMS 2 40' X 100'	SURG-CMS 40' X 100'
LIGHTING	1.90 KW	1.56 KW	2.29 KW
RECP. EST.	.80 KW	.90 KW	2.15 KW
POWER	33.68 KW	31.76 KW	28.40 KW
TOTAL	34.38 KW	34.22 KW	32.84 KW
EMER. LTG.	.18 KW	.18 KW	.67 KW

1. TOTAL ELECTRICAL LOAD INCLUDES AIR CONDITIONING.
2. SERVICE & BUS REPLACEMENTS AS NECESSARY.

GENERAL NOTES

1. INSTALL 1/2" INSULATION BOARD BETWEEN STUDS & WALL COVERING ON ONE SIDE OF ALL INTERIOR PARTITIONS.
2. ALL EXTERIOR WALLS TO HAVE 1/2" INSULATION BOARD COVERED WITH COMPOSITION WALLBOARD & 4'-0" FIBERBOARD HARDPRESSED WAINSCOT.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
52-09	PLAN	1 OF 1
51-44	SURG-CMS	1 OF 1
51-45	CMS 1 - PLANS	1 OF 1
51-46	CMS 2 - PLANS	1 OF 1
99-98	AIR CONDITIONING DET.	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

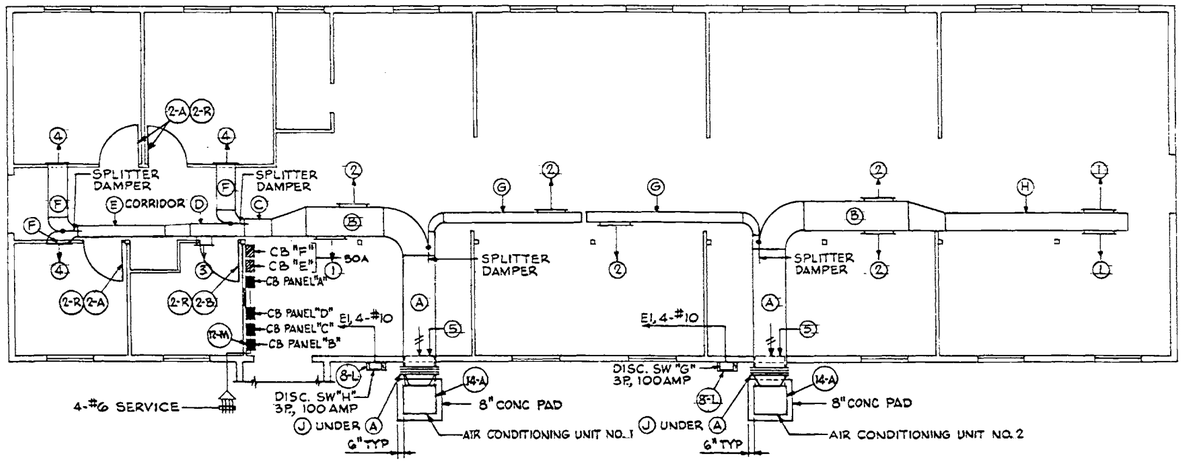
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS
AIR CONDITIONING, TEMP. CTM.
CENTRALIZED MATERIEL SECTIONS
CMS 1 & CMS 2
SURGERY-CENTRALIZED MATERIEL
SURG-CMS

UNDER REVISION

APPROVED: F. E. Kleiber, CHIEF, ARCHITECTURAL BRANCH
APPROVED: for H. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: Robert Bernstein 0/3540
DATE: 9 OCT 68
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 52-09
SHEET 1 OF 1



AIR CONDITIONING WRD 1, STANDARD
SCALE NO. 24
FACIL. NO. 521201 - AIR CONDITIONING ONLY

WRD 1, STANDARD

SCHEDULE OF DUCTS & GRILLES

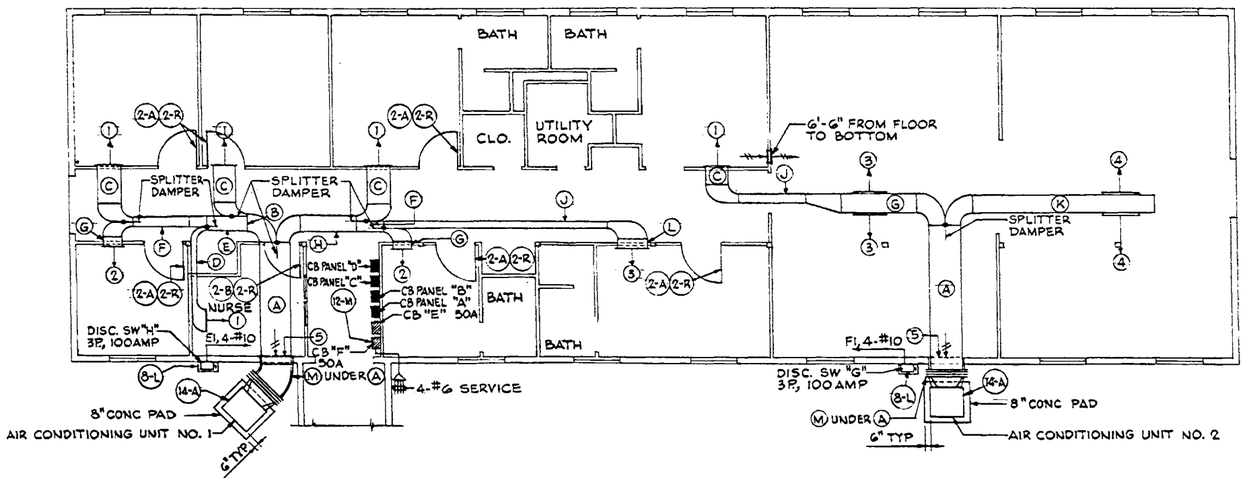
ITEM LTR.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	35"X 8"	1	36"X 4"
B	30"X 8"	2	30"X 4"
C	20"X 8"	3	16"X 4"
D	15"X 8"	4	20"X 4"
E	12"X 8"	5	34"X 12"
F	20"X 4"		
G	10"X 8"		
H	18"X 8"		
J	34"X 12"		

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	.71 KW
RECP EST	3.29 KW
POWER	13.60 KW
TOTAL	17.60 KW

1. TOTAL ELECTRICAL LOAD INCLUDES AIR CONDITIONING.
2. SERVICE & BUS REPLACEMENTS AS NECESSARY.



AIR CONDITIONING - WRD 2, ACUTE
SCALE NO. 24
FACIL. NO. 521202 - AIR CONDITIONING ONLY

WRD 2, ACUTE

SCHEDULE OF DUCTS & GRILLES

ITEM NO.	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	32"X 8"	1	24"X 4"
B	20"X 8"	2	20"X 4"
C	24"X 4"	3	30"X 4"
D	6"X 8"	4	36"X 4"
E	15"X 8"	5	34"X 12"
F	12"X 8"	6	12"X 12"
G	20"X 4"		
H	18"X 8"		
J	8"X 8"		
K	16"X 8"		
L	30"X 4"		
M	34"X 12"		

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	.84 KW
RECP EST	3.29 KW
POWER	13.60 KW
TOTAL	17.73 KW

1. TOTAL ELECTRICAL LOAD INCLUDES AIR CONDITIONING.
2. SERVICE & BUS REPLACEMENTS AS NECESSARY.

GENERAL NOTES

1. INSTALL ½" INSULATION BOARD BETWEEN STUDS & WALL COVERING ON ONE SIDE OF ALL INTERIOR PARTITIONS.
2. ALL EXTERIOR WALLS TO HAVE ½" INSULATION BOARD COVERED WITH COMPOSITION WALLBOARD & 4'-0" FIBERBOARD HARDPRESSED WAINSCOT.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
52-12	PLANS	1 OF 1
51-51	WRD 1 & WRD 2	1 OF 1
99-98	AIR CONDITIONING-DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, ARCH-ENGR BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: Robert Bernstein 0/9580
DATE 9 OCT 68
DATE 19 MAR 1969

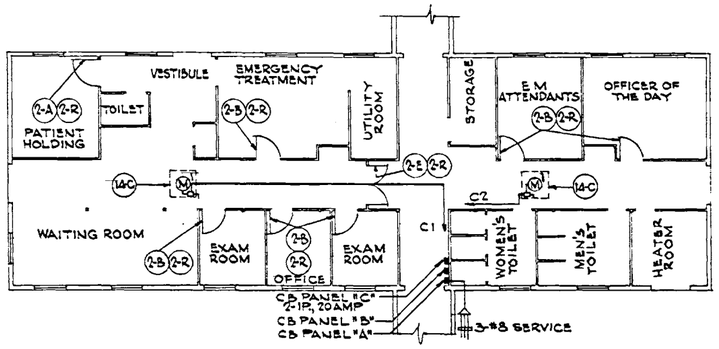
THEATER OF OPERATIONS
AIR CONDITIONING
WRD-30-X100'-STANDARD-WRD 1
WRD-30-X100'-ACUTE-WRD 2
TEMP. CLIMATE

UNDER REVISION

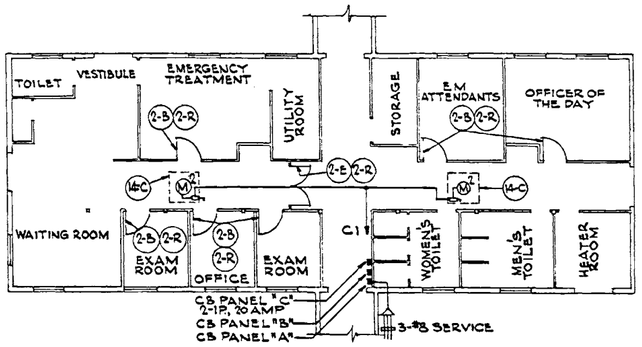
SCALE AS NOTED
SPEC. NO.
DRAWING NUMBER 52-12
SHEET 1 OF 1

SCHEDULE OF FAN EQUIPMENT

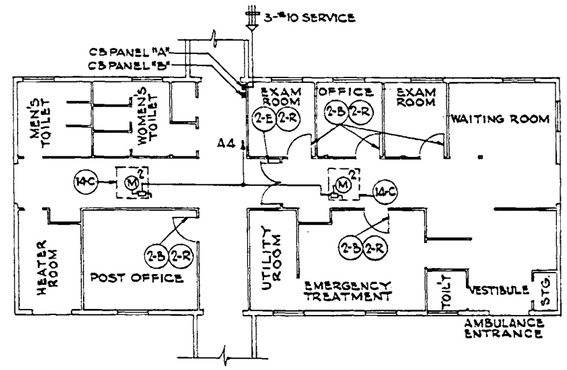
ITEM NO.	UNIT DESCRIPTION	QUANTITY						MOTOR HP	CEILING OPENING
		DSP1	DSP2	DSP3	LB-DN 1	LB-DN 2	LB-DN 3		
1	30" EXHAUST FAN, 6750 CFM	2	–	–	2	2	3	3/8	42"x42"
2	24" EXHAUST FAN, 4900 CFM	–	2	2	2	2	-	1/4	34"x34"



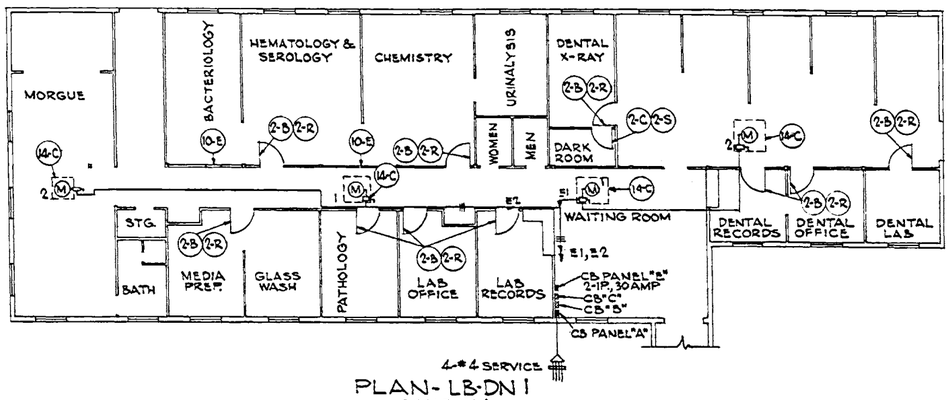
PLAN - DSP 1
SCALE NO. 1
FACILITY NO. 530103 - MECHANICAL VENTILATION ONLY



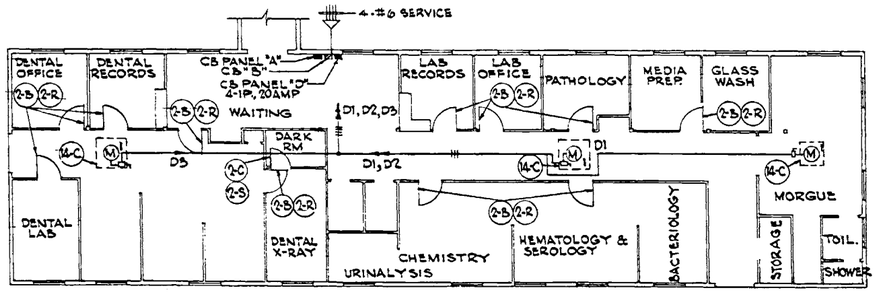
PLAN - DSP 2
SCALE NO. 1
FACILITY NO. 530102 - MECHANICAL VENTILATION ONLY



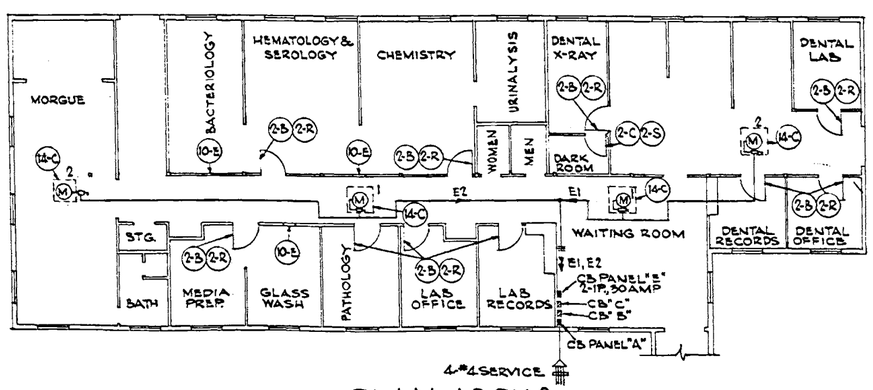
PLAN - DSP 3
SCALE NO. 1
FACILITY NO. 530101 - MECHANICAL VENTILATION ONLY



PLAN - LB-DN 1
SCALE NO. 1
FACILITY NO. 530106 - MECHANICAL VENTILATION ONLY



PLAN - LB-DN 3
SCALE NO. 1
FACILITY NO. 530104 - MECHANICAL VENTILATION ONLY



PLAN - LB-DN 2
SCALE NO. 1
FACILITY NO. 530105 - MECHANICAL VENTILATION ONLY

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	DSP 1	DSP 2	DSP 3	LB-DN 1	LB-DN 2	LB-DN 3
LIGHTING	1.12 KW	1.07 KW	.93 KW	2.64 KW	2.37 KW	1.98 KW
RECP EST	1.33 KW	1.35 KW	.60 KW	4.28 KW	4.17 KW	3.66 KW
POWER	.84 KW	0.71 KW	.70 KW	6.66 KW	5.41 KW	3.43 KW
TOTAL	3.31 KW	3.13 KW	2.23 KW	13.58 KW	11.95 KW	9.07 KW
EMER LTG	.13 KW	.13 KW	.13 KW	—	—	—

1. CONNECTED ELECTRICAL LOAD SHOWN ON THIS DRAWING IS A COMBINATION OF CONNECTED ELECTRICAL LOAD IN NORMAL CONSTRUCTION AND LOAD FOR MECHANICAL VENTILATION.
2. ALL FAN CIRCUITS SHALL BE WIRED WITH NO. 12 COPPER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
53-01	MECHANICAL VENTILATION	1 OF 1
51-23	PLANS-DSP 1, 2 & 3	1 OF 1
51-34	PLANS-LB-DN 1, 2 & 3	1 OF 1
99-98	STANDARD DETAILS	2

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] DATE: 19 MAR 1959
CHIEF, ARCH-ENGR BRANCH [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: Robert Bernstein 0/OS&O
DATE 9 OCT 58

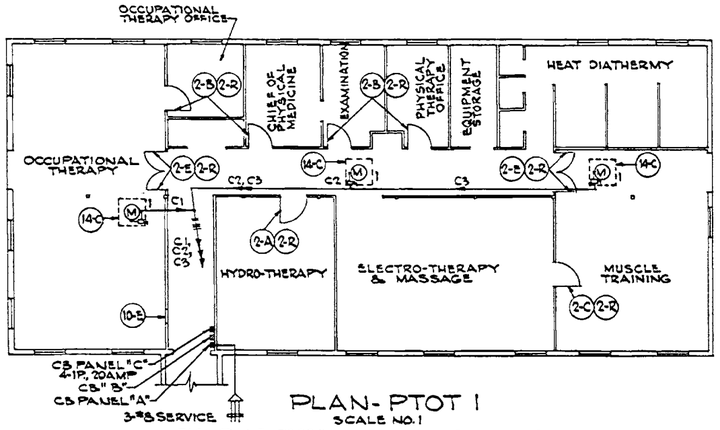
THEATER OF OPERATIONS
MECHANICAL VENTILATION
DISPENSARY 1, 2 & 3
LABORATORY & DENTAL 1, 2 & 3
TROPICAL & TEMPERATE CLIMATE

UNDER REVISION

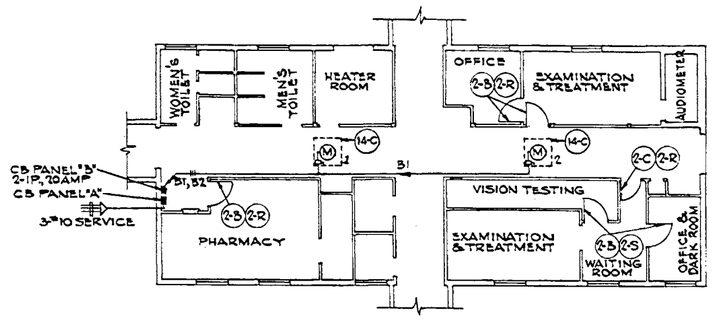
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 53-01
SHEET 1 OF 1

SCHEDULE OF FAN EQUIPMENT

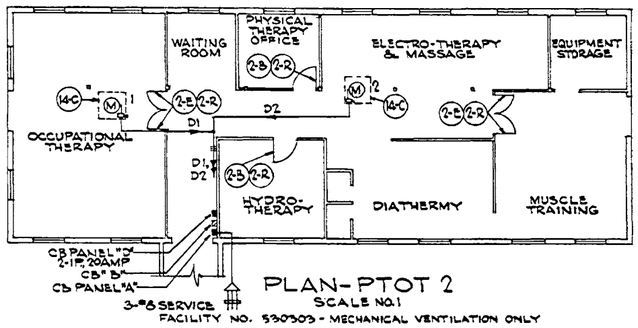
ITEM NO.	UNIT DESCRIPTION	QUANTITY						MOTOR HP	CEILING OPENING
		WRD 1	WRD 2	PTOT 1	PTOT 2	EE-PH 1	EE-PH 2		
1	30" EXHAUST FAN, 6750 CFM	2	2	3	2	1	–	3/8	42"x42"
2	24" EXHAUST FAN, 4900 CFM	1	1	–	–	1	2	1/4	34"x34"



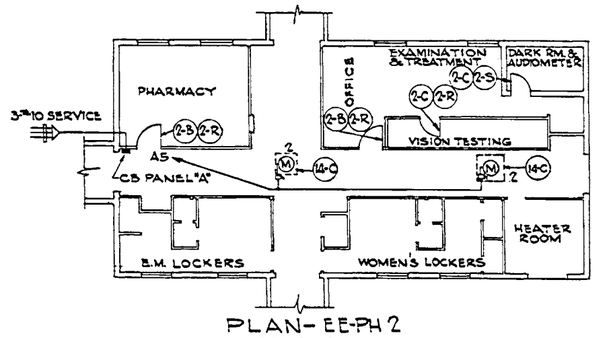
PLAN-PTOT 1
SCALE NO.1
FACILITY NO. 530304 - MECHANICAL VENTILATION ONLY



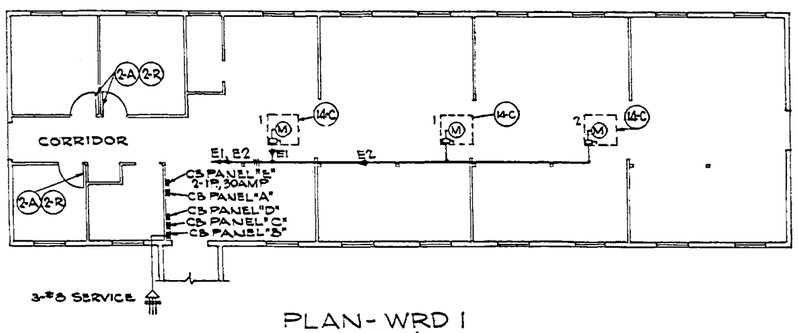
PLAN-EE-PH 1
SCALE NO. 1
FACILITY NO. 530302 - MECHANICAL VENTILATION ONLY



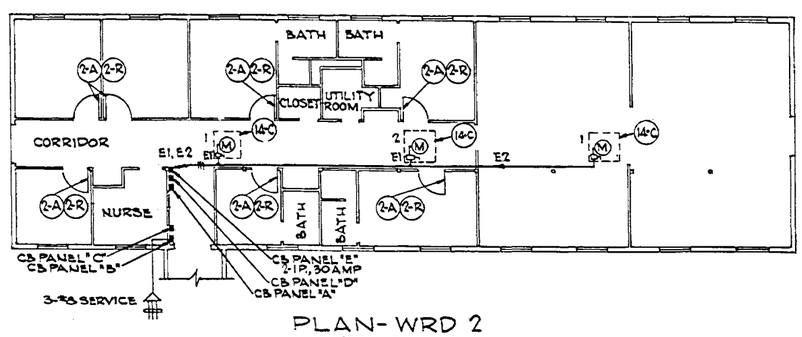
PLAN-PTOT 2
SCALE NO.1
FACILITY NO. 530303 - MECHANICAL VENTILATION ONLY



PLAN-EE-PH 2
SCALE NO. 1
FACILITY NO. 530301- MECHANICAL VENTILATION ONLY



PLAN-WRD 1
SCALE NO.1
FACILITY NO. 530305 - MECHANICAL VENTILATION ONLY



PLAN-WRD 2
SCALE NO.1
FACILITY NO. 530306 - MECHANICAL VENTILATION ONLY

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	WRD 1	WRD 2	PTOT 1	PTOT 2	EE-PH 1	EE-PH 2
LIGHTING	.71 KW	.84 KW	2.61 KW	1.59 KW	1.29 KW	.92 KW
RECP EST	3.29 KW	3.29 KW	2.70 KW	1.60 KW	1.44 KW	1.14 KW
POWER	0.59 KW	0.59 KW	2.22 KW	1.77 KW	1.06 KW	.96 KW
TOTAL	4.59 KW	4.72 KW	7.52 KW	4.96 KW	3.79 KW	3.02 KW

1. CONNECTED ELECTRICAL LOAD SHOWN ON THIS DRAWING IS A COMBINATION OF CONNECTED ELECTRICAL LOAD IN NORMAL CONSTRUCTION AND LOAD FOR MECHANICAL VENTILATION.
2. ALL FAN CIRCUITS SHALL BE WIRED WIRED WITH NO. 12 COPPER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
53-03	MECHANICAL VENTILATION	1 OF 1
51-21	PLANS- EE-PH 1 & 2	1 OF 1
51-36	PLANS- PTOT 1 & 2	1 OF 1
51-51	PLANS- WRD 1 & 2	1 OF 1
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO.1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: G. E. Johnson, Chief, Engineering Branch
APPROVED: for H. W. Williams, Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY: Robert Bernstein 10/9/58
DATE 9 OCT 58

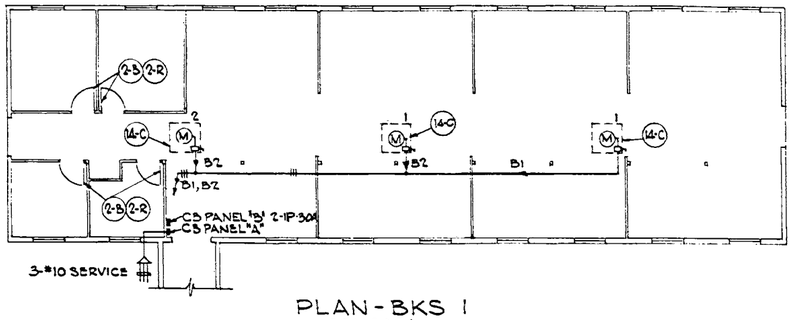
THEATER OF OPERATIONS
MECHANICAL VENTILATION
WARD 1 & 2 - PATIENT & PHARMACY 1 & 2
PHYSICAL - OCCUPATIONAL THERAPY 1 & 2
TROPICAL & TEMPERATE CLIMATE

UNDER REVISION

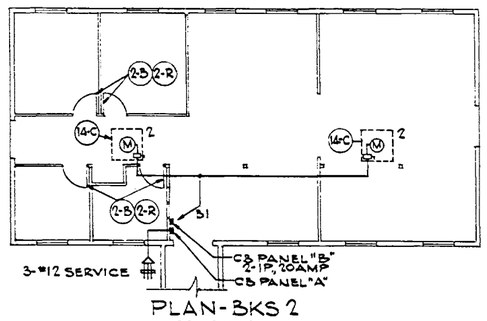
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 53-03
SHEET 1 OF 1

SCHEDULE OF FAN EQUIPMENT

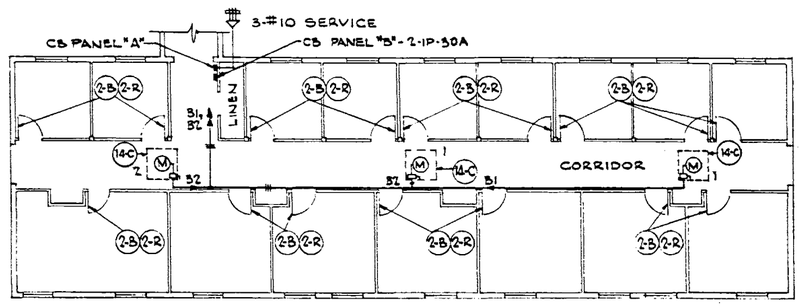
ITEM NO.	UNIT DESCRIPTION	QUANTITY						MOTOR HP	CEILING OPENING
		BKS 1	BKS 2	MOQ 1	MOQ 2	FOQ 1	FOQ 2		
1	30" EXHAUST FAN, 6750 CFM	2	—	2	—	2	—	3/8	47" x 47"
2	24" EXHAUST FAN, 4900 C.F.M	1	2	1	2	1	2	1/4	34" x 34"



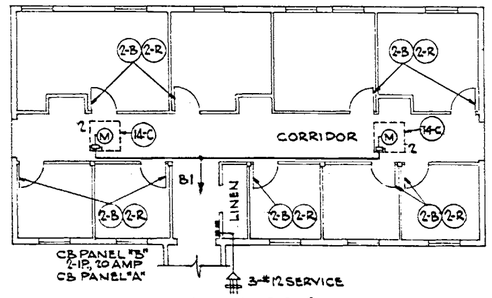
PLAN - BKS 1
SCALE NO. 1
FACILITY NO. 530502 - MECHANICAL VENTILATION ONLY



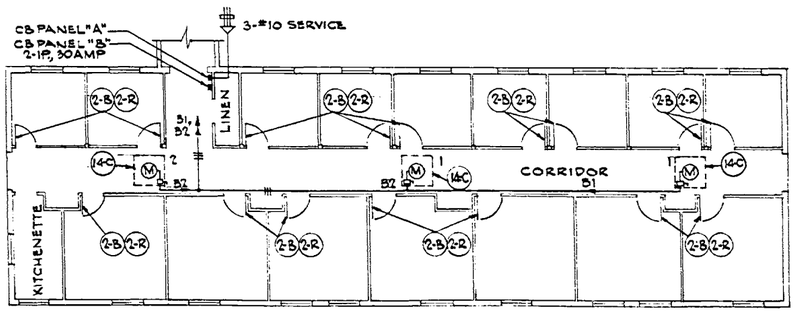
PLAN - BKS 2
SCALE NO. 1
FACILITY NO. 530501 - MECHANICAL VENTILATION ONLY



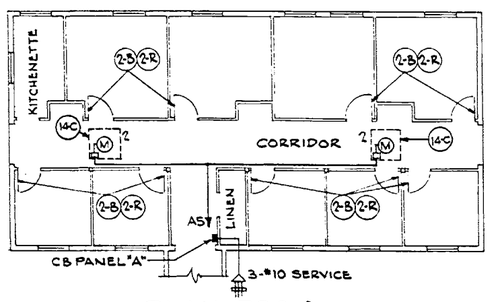
PLAN - MOQ 1
SCALE NO. 1
FACILITY NO. 530505 - MECHANICAL VENTILATION ONLY



PLAN - MOQ 2
SCALE NO. 1
FACILITY NO. 530503 - MECHANICAL VENTILATION ONLY



PLAN - FOQ 1
SCALE NO. 1
FACILITY NO. 530506 - MECHANICAL VENTILATION ONLY



PLAN - FOQ 2
SCALE NO. 1
FACILITY NO. 530504 - MECHANICAL VENTILATION ONLY

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	BKS 1	BKS 2	MOQ 1	MOQ 2	FOQ 1	FOQ 2
LIGHTING	.61 KW	.37 KW	.59 KW	.39 KW	.61 KW	.41 KW
RECP EST	1.20 KW	.80 KW	1.60 KW	.90 KW	1.60 KW	.90 KW
POWER	.72 KW	.42 KW	.46 KW	.30 KW	1.81 KW	1.68 KW
TOTAL	2.53 KW	1.59 KW	2.65 KW	1.59 KW	4.02 KW	2.99 KW

1. CONNECTED ELECTRICAL LOAD SHOWN ON THIS DRAWING IS A COMBINATION OF CONNECTED ELECTRICAL LOAD IN NORMAL CONSTRUCTION AND LOAD FOR MECHANICAL VENTILATION.
2. ALL FAN CIRCUITS SHALL BE WIRED WITH NO. 12 COPPER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
53-05	MECHANICAL VENTILATION	1 OF 1
51-71	PLANS - BKS 1 & 2	1 OF 1
51-71	PLANS - MOQ 1 & 2, FOQ 1 & 2	1 OF 1
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, ENGINEERING BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: Robert Bernstein 11/15/68 DATE 9 OCT 68

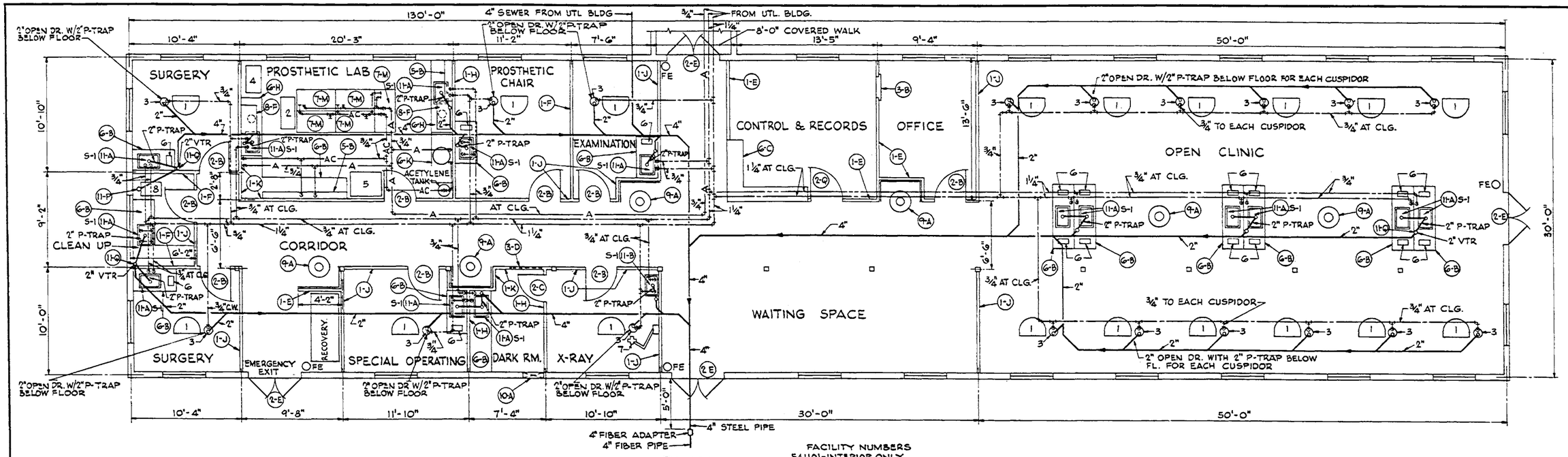
THEATER OF OPERATIONS
MECHANICAL VENTILATION
BARRACKS T & U, MALE OFFICERS QTRS 1 & 2
FEMALE OFFICERS QUARTERS 1 & 2
TROPICAL & TEMPERATE CLIMATE

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 53-05
SHEET 1 OF 1

CORPS OF ENGINEERS

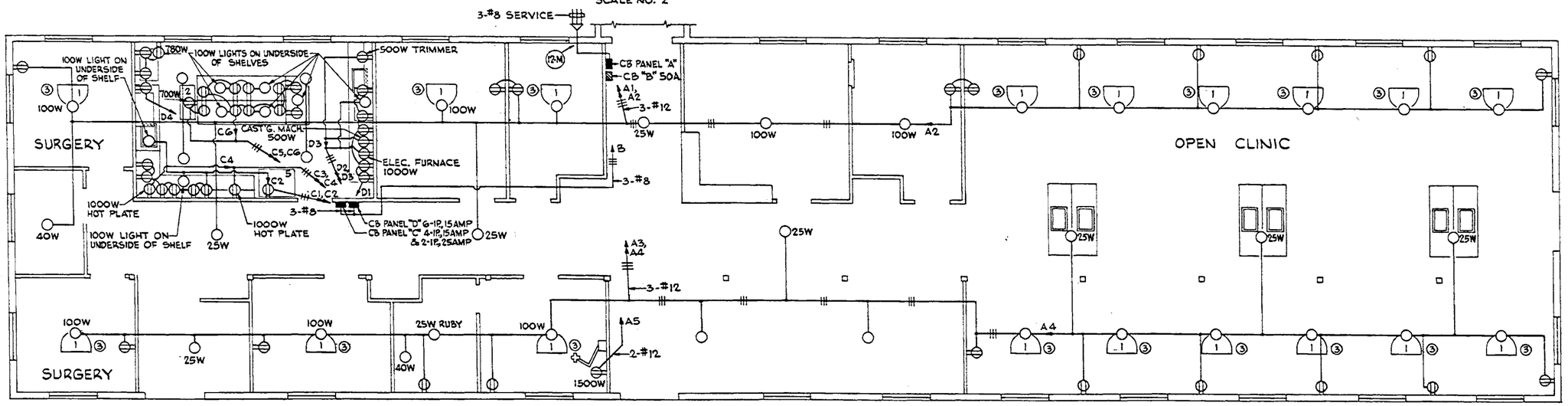
U. S. ARMY



PLAN

SCALE NO. 2

FACILITY NUMBERS
541101-INTERIOR ONLY
541111-STEEL FRAME W/INTERIOR
541121-WOOD FRAME W/INTERIOR

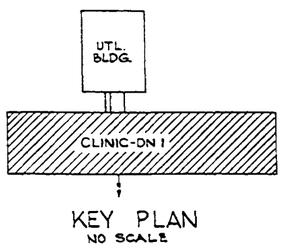


ELECTRICAL PLAN

SCALE NO. 2

SCHEDULE OF EQUIPMENT

ITEM NO.	DESCRIPTION	QTY
1	CHAIR, DENTAL, OPERATING, FOLDING	18
2	COLLECTOR, DUST, 4 HOOD CAPACITY - 1/3 HP	1
3	CUSPIDOR, FOUNTAIN	18
4	LATHE, DENTAL LABORATORY, POLISHING - 1/3 HP	1
5	REFRIGERATOR, 8 CU. FT., 36"X29"X65" - 1/6 HP	1
6	STERILIZER, INSTRUMENT, FSN 6530-782-6503	17
7	RADIOGRAPHIC UNIT, DENTAL, WALL MOUNTING	1
8	STERILIZER, DRESSING, PRESSURE, 16"X 24"	1



KEY PLAN

NO SCALE

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	2.95 KW
RECP EST	4.40 KW
POWER	6.01 KW
TOTAL	13.36 KW

1. UNLESS OTHERWISE NOTED ON PLAN, ALL LAMPS TO BE 60W.
2. ALL 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
54-11	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10'

NO.2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN

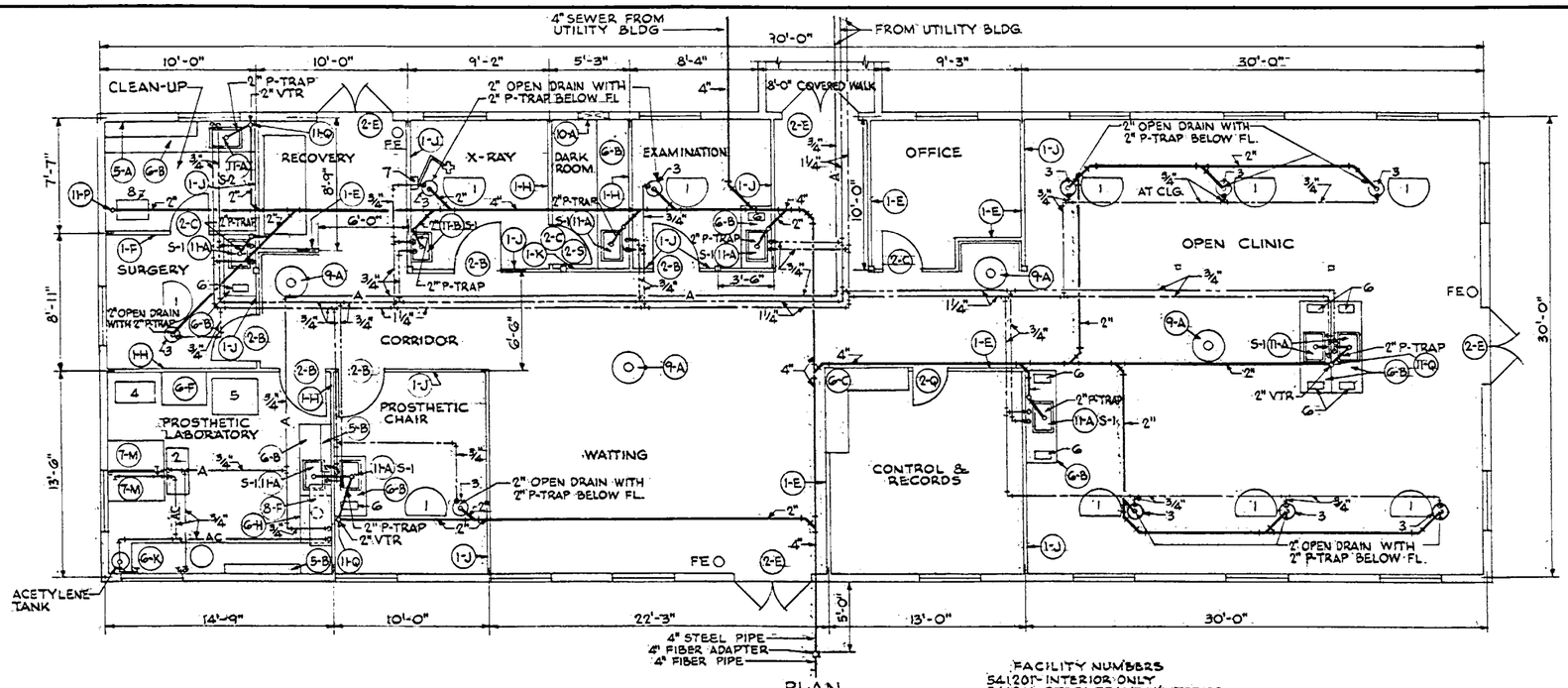
THEATER OF OPERATIONS
CLINIC-DENTAL-20 CHAIR, 4 DOC, MAN
CLINIC-DN 1 30'X130'
PLANS

UNDER REVISION

APPROVED: Graham for H.N. Williams DATE: 19 MAR 1959
CHIEF, DESIGN BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

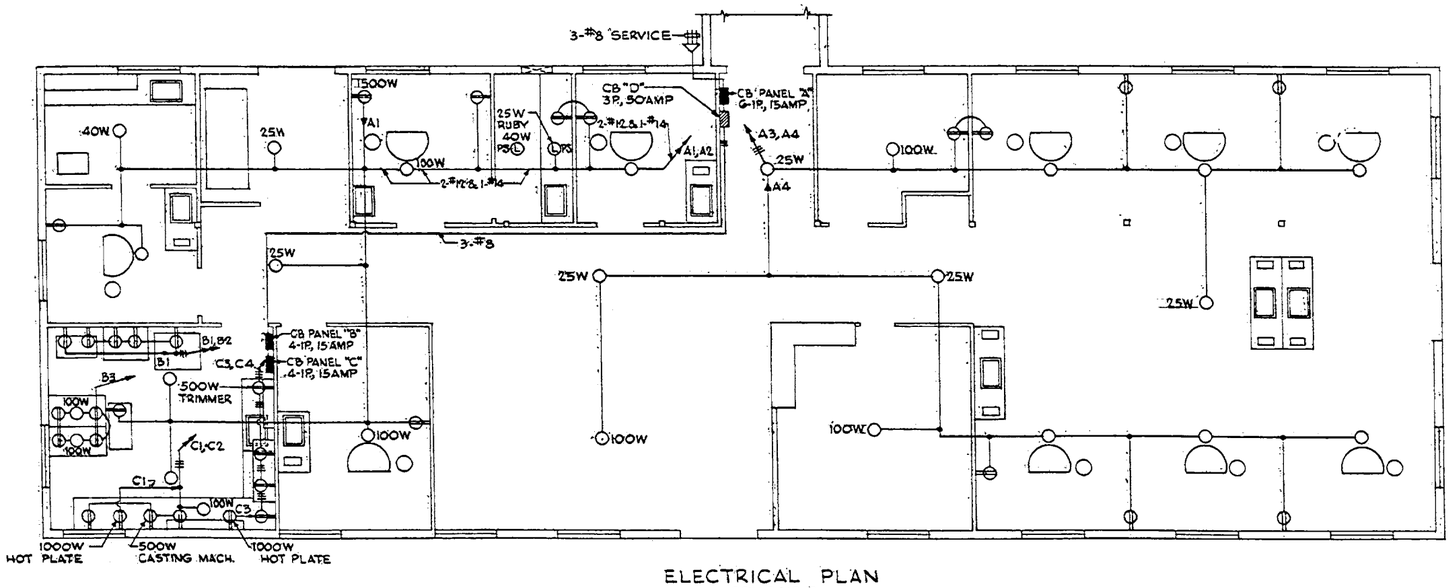
APPROVED FOR PROPONENT AGENCY: Robert Bernstein 4/25/60
DATE 9 OCT 60

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 54-11
SHEET 1 OF 1

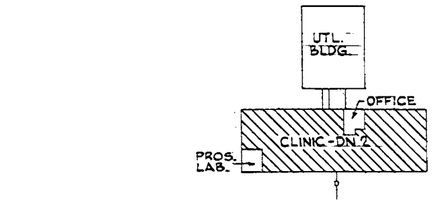


PLAN
SCALE NO. 2

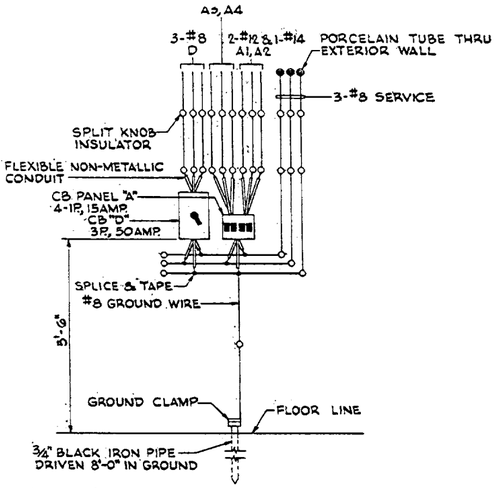
FACILITY NUMBERS
541201 - INTERIOR ONLY
541211 - STEEL FRAME W/INTERIOR
541221 - WOOD FRAME W/INTERIOR



ELECTRICAL PLAN
SCALE NO. 2



KEY PLAN
NO SCALE



CIRCUIT BREAKER INSTALLATION
NO SCALE

SCHEDULE OF EQUIPMENT

ITEM NO.	DESCRIPTION	QTY.
1	CHAIR, DENTAL OPERATING, FOLDING, FIELD	10
2	COLLECTOR, DUST, 4 HOOD CAPACITY - ⅓ HP	1
3	CUSPIDOR, FOUNTAIN	10
4	LATHE, DENTAL, LABORATORY, POLISHING, ⅓ HP	1
5	REFRIGERATOR, 8 CU FT, 36"X29"X65", ⅙ HP	1
6	STERILIZER, INSTRUMENT, FSN 6530-782-6503	9
7	RADIOGRAPHIC UNIT, DENTAL, WALL MOUNTING	1
8	STERILIZER, DRESSING, PRESSURE, 16"X24"	1

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	1.66KW
RECP EST	2.50KW
POWER	5.93KW
TOTAL	10.09KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 60W.
2. ALL 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
54-12	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1, 4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

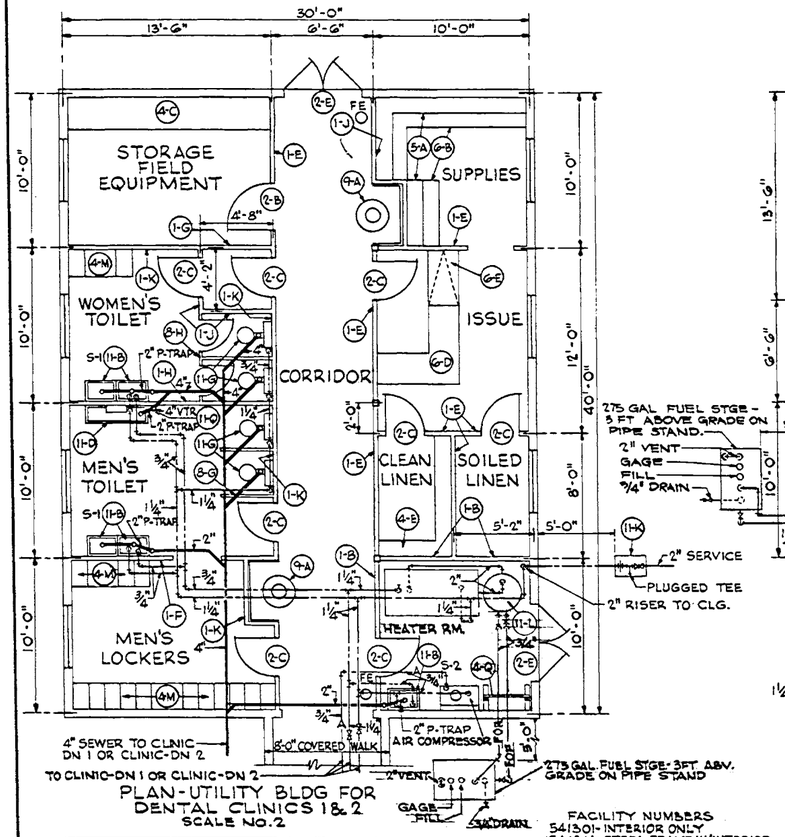
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I. LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [illegible] for A. M. Sullivan
CHIEF, ARCHITECT BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: Robert Bernstein USAES
DATE 9 OCT 68

THEATER OF OPERATIONS
CLINIC-DENTAL-18-300 MAN
CLINIC-DN 2 (2-305-390)
PLANS

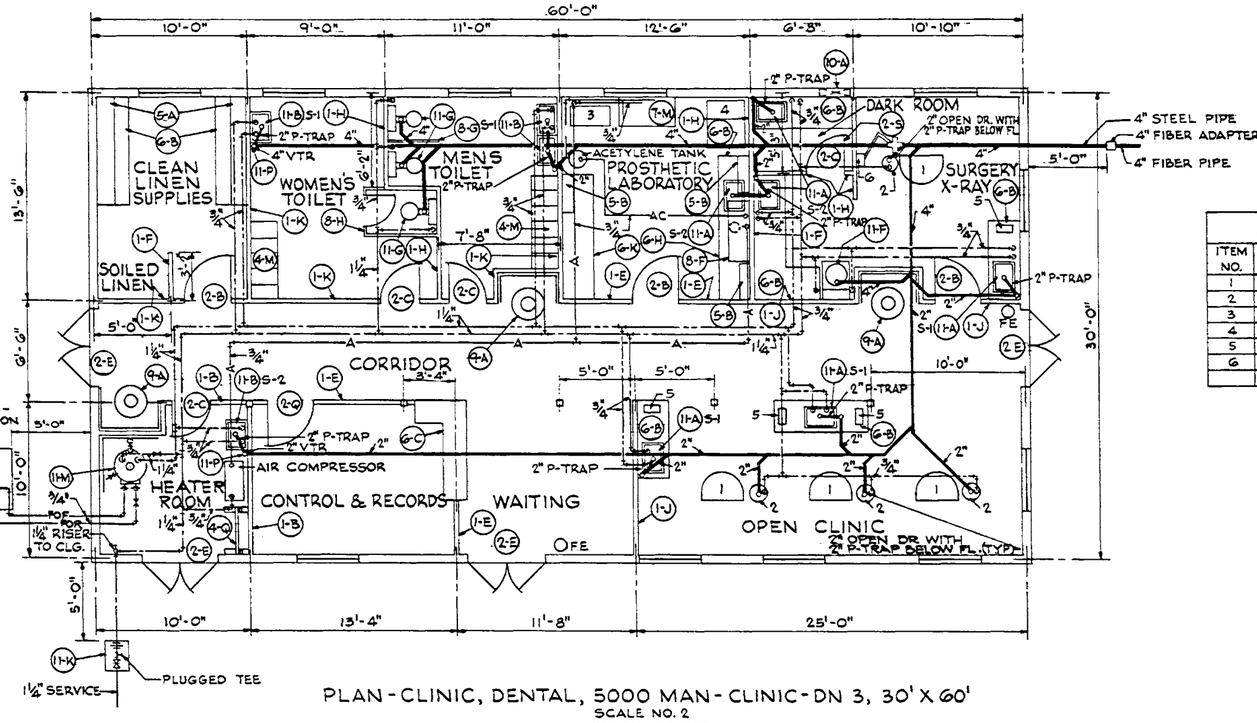
UNDER REVISION

DATE: 9 SEP 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 54-12
SHEET 1 OF 1



PLAN - UTILITY BLDG FOR DENTAL CLINICS 1 & 2
SCALE NO. 2

FACILITY NUMBERS
541301 - INTERIOR ONLY
541311 - STEEL FRAME W/INTERIOR
541321 - WOOD FRAME W/INTERIOR

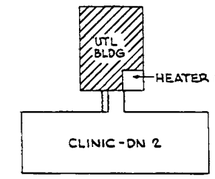


PLAN - CLINIC, DENTAL, 5000 MAN - CLINIC - DN 3, 30' X 60'
SCALE NO. 2

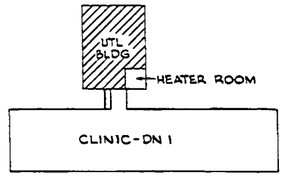
FACILITY NUMBERS
541302 - INTERIOR ONLY
541312 - STEEL FRAME W/INTERIOR
541322 - WOOD FRAME W/INTERIOR

SCHEDULE OF EQUIPMENT

ITEM NO.	DESCRIPTION	QTY.
1	CHAIR, DENTAL OPERATING, FOLDING	4
2	CUSPIDOR, FOUNTAIN	4
3	LATHE, DENTAL LABORATORY, POLISHING 1/3 HP	1
4	REFRIGERATOR, MECHANICAL, 6 CU. FT.	1
5	STERILIZER, INSTRUMENT, FSN 6530-782-6503	4
6	RADIOGRAPHIC UNIT, DENTAL, WALL MOUNTING	1

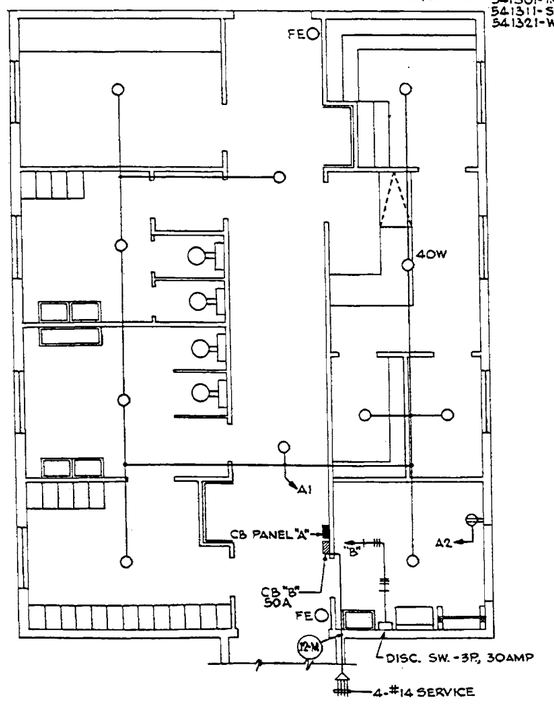


10,000 MAN

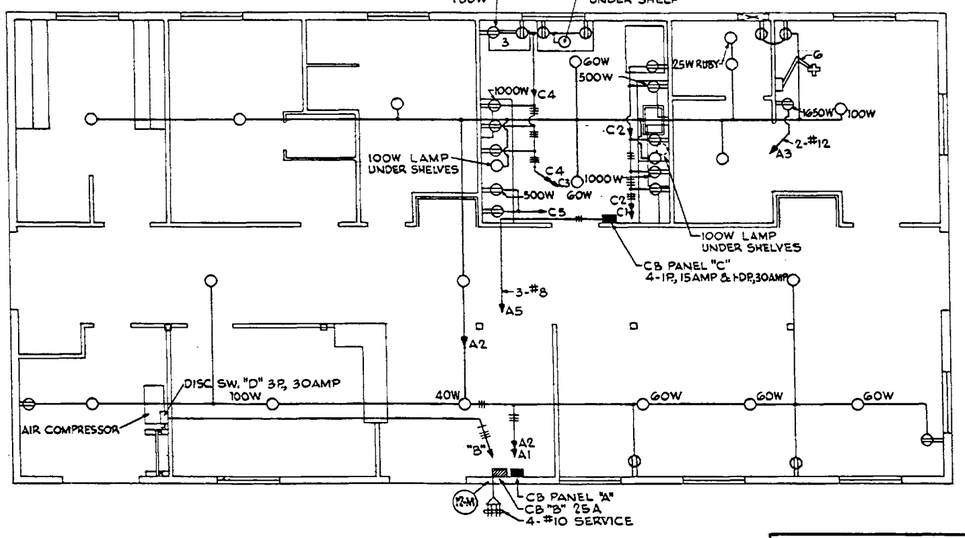


20,000 MAN

KEY PLANS
NO SCALE



ELECTRICAL PLAN - UTILITY BLDG FOR DENTAL CLINICS 1 & 2
SCALE NO. 2



ELECTRICAL PLAN - CLINIC - DN 3
SCALE NO. 2

ELECTRICAL NOTES

CONNECTED LOAD

FACILITY NO.	541302	541301
LIGHTING	1.09KW	0.29KW
RECP EST	1.30KW	0.00KW
POWER	7.90KW	3.96KW
TOTAL	10.29 KW	4.25KW

1. UNLESS OTHERWISE NOTED ON PLAN, ALL LAMPS TO BE 25W.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
54-13	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-40F 4

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS
CLINIC-DENTAL, 5000 MAN
CLINIC-DNS. 30'X60'
UTILITY BLDG FOR DENTAL CLINICS 1 & 2

UNDER REVISION

APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, SUPERVISORY BRANCH, & CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

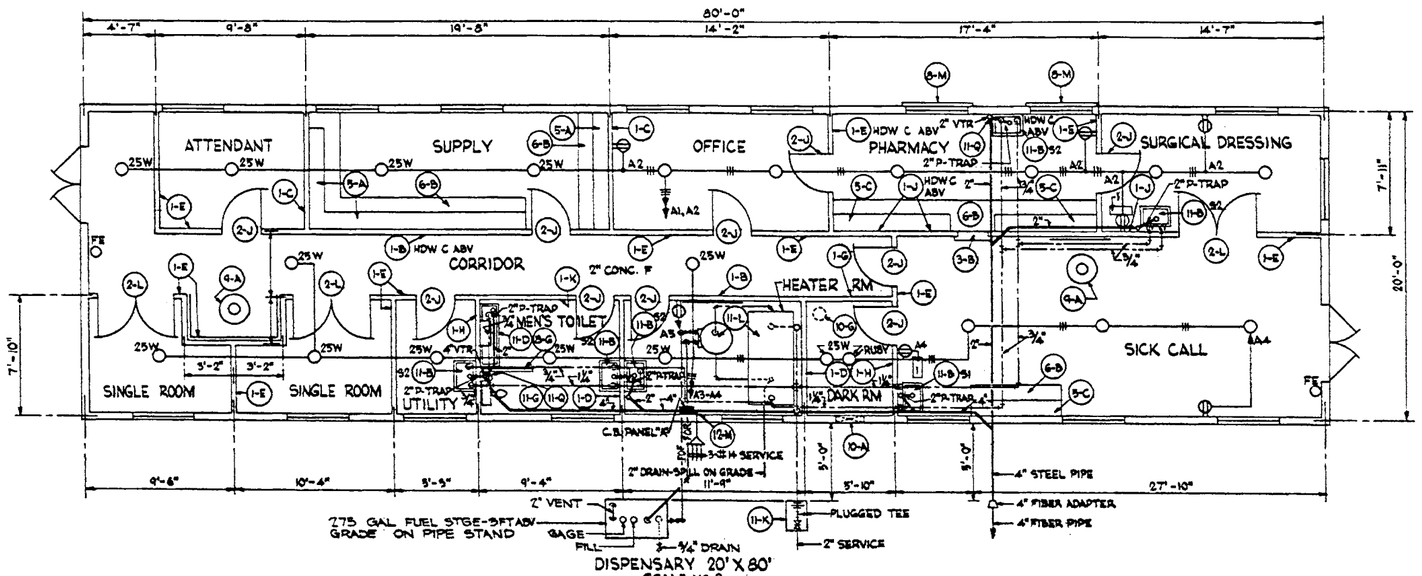
APPROVED FOR PROPONENT AGENCY: Robert Armstrong 8/13/69
DATE: 9 OCT 68

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 54-13
SHEET 1 OF 1

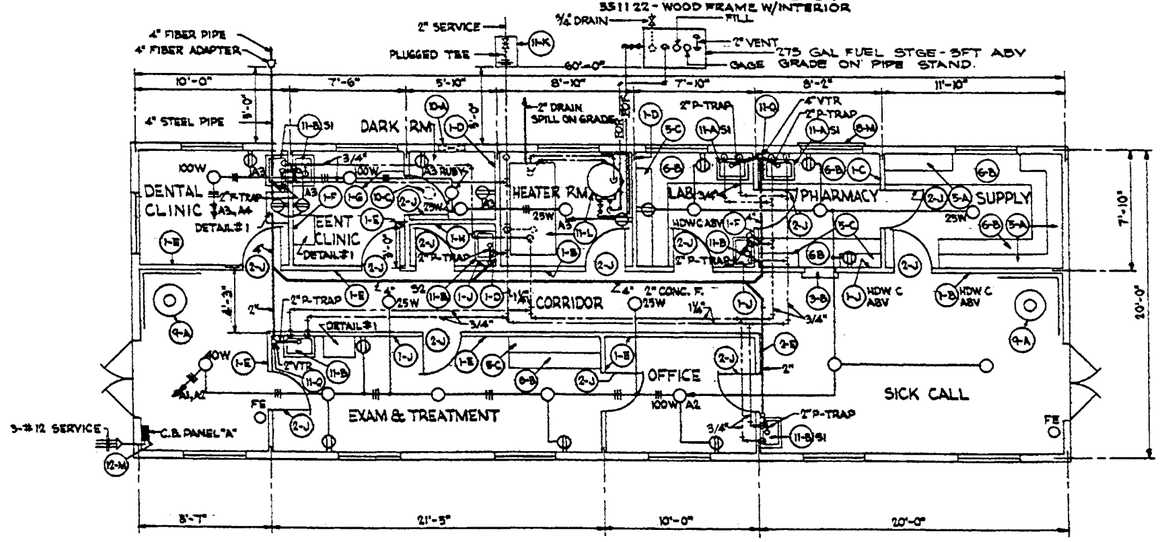
CORPS OF ENGINEERS

U. S. ARMY

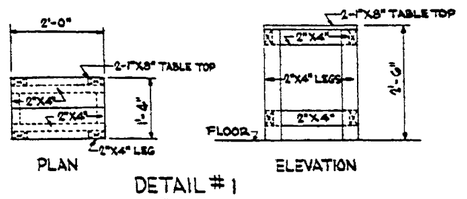
SCHEDULE OF EQUIPMENT			
ITEM NO.	DESCRIPTION	QUANITY 20'X80'	20'X60'
1	STERILIZER, INSTRUMENT, FSN 6530-782-6503	2	—



DISPENSARY 20'X80'
SCALE NO. 2
FACILITY NUMBERS
551102 - INTERIOR ONLY
551112 - STL FRAME W/INTERIOR
551122 - WOOD FRAME W/INTERIOR



DISPENSARY 20'X60'
SCALE NO. 2
FACILITY NUMBERS
551101 - INTERIOR ONLY
551111 - STL FRAME W/INTERIOR
551121 - WOOD FRAME W/INTERIOR



DETAIL #1
TABLE
SCALE NO. 5

ELECTRICAL NOTES

CONNECTED LOAD

	DSP- 20'X80'	DSP- 20'X60'
BUILDING		
LIGHTING	0.92 KW	0.91 KW
RECP. RST.	2.85 KW	3.20 KW
TOTAL	3.77 KW	4.11 KW

1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 60 W.
2. ALL 40, 60 & 100 W. LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

PLUMBING NOTES

1. ALL S-2 SINKS TO HAVE A 2'-4" MOUNTING HEIGHT.
2. ALL S-1 SINKS TO HAVE A 3'-0" MOUNTING HEIGHT.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
55-11	PLANS	1 OF 1
99-48	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' — NO. 2
0 1' 2' 3' — NO. 5

MAYER, BEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

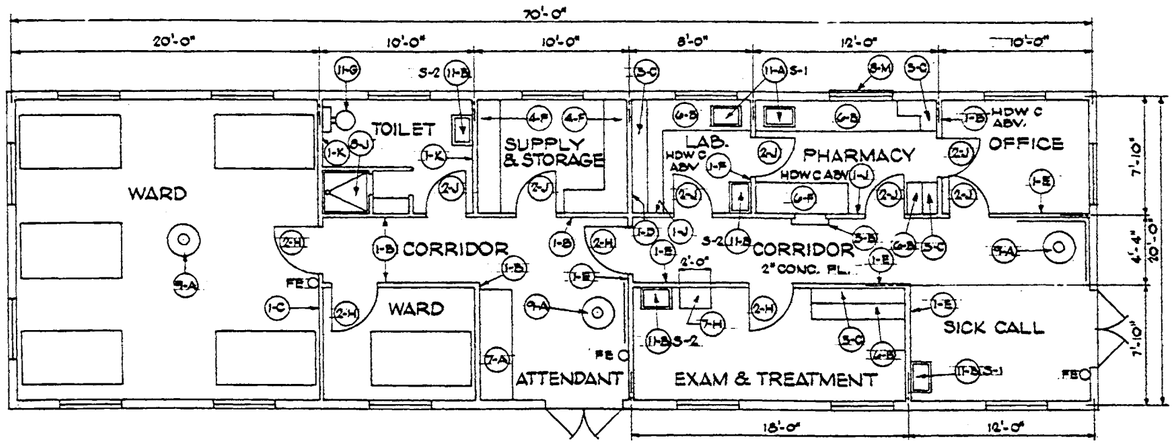
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEITCHMANN

THEATER OF OPERATIONS
DISPENSARY GROUP 20'X60' & 20'X80'
PLANS

UNDER REVISION

APPROVED: [signature] DATE: 19 MAR 1960
CHIEF, PLANS BRANCH
APPROVED: [signature] DATE: 19 MAR 1960
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
Robert Bernatz 9 OCT 60

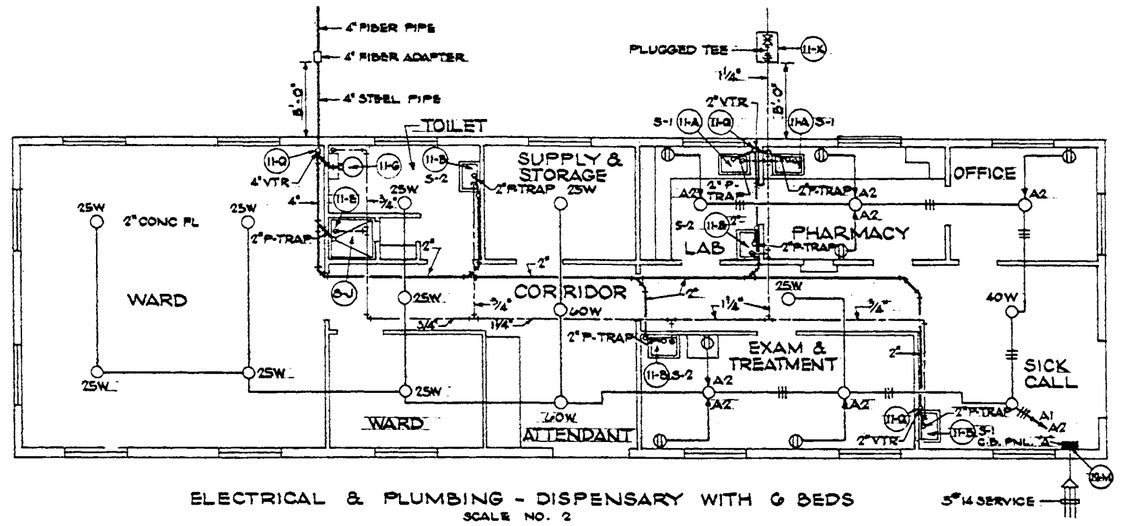
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 55-11
SHEET 1 OF 1



PLAN - DISPENSARY WITH 6 BEDS

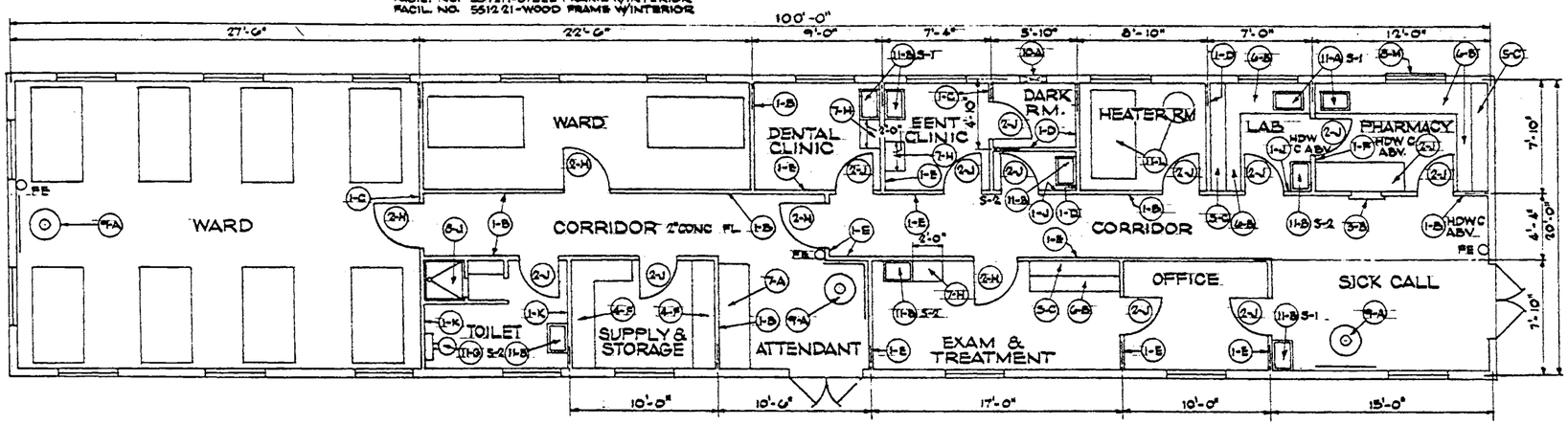
SCALE NO. 2

FACIL. NO. 551201 - INTERIOR ONLY
FACIL. NO. 551211 - STEEL FRAME W/INTERIOR
FACIL. NO. 551221 - WOOD FRAME W/INTERIOR



ELECTRICAL & PLUMBING - DISPENSARY WITH 6 BEDS

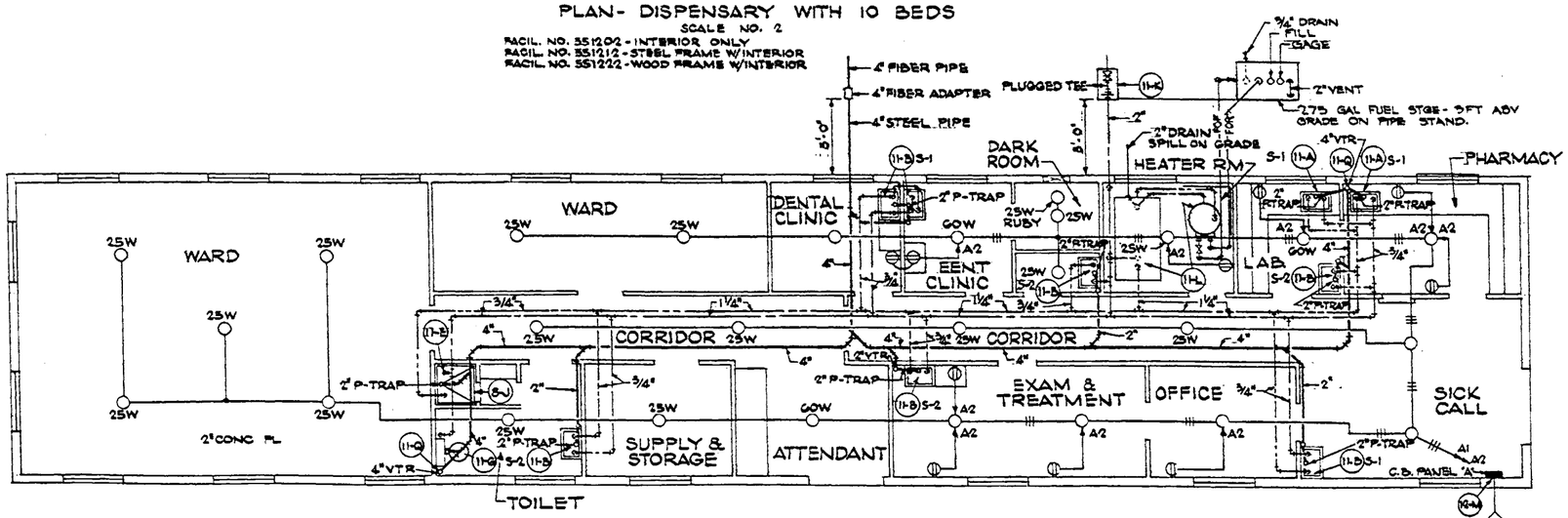
SCALE NO. 2



PLAN - DISPENSARY WITH 10 BEDS

SCALE NO. 2

FACIL. NO. 551202 - INTERIOR ONLY
FACIL. NO. 551212 - STEEL FRAME W/INTERIOR
FACIL. NO. 551222 - WOOD FRAME W/INTERIOR



ELECTRICAL & PLUMBING - DISPENSARY WITH 10 BEDS

SCALE NO. 2

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	DISP. 20' x 70'	DISP. 20' x 100'
LIGHTING	.99 KW	1.31 KW
RECP. EST.	.70 KW	.90 KW
POWER	-	.42 KW
TOTAL	1.69 KW	2.63 KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 100W.
2. ALL 40W, GOW & 100W LAMPS TO HAVE 8" CONICAL SHADES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
55-12	PLANS	1 OF 1
99-98	STANDARD DETAILS	
54-09	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1,7 OF 7
55-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1,4 OF 4

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 5' 10'

NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS

DISPENSARIES WITH BEDS 20'X70' & 20'X100'

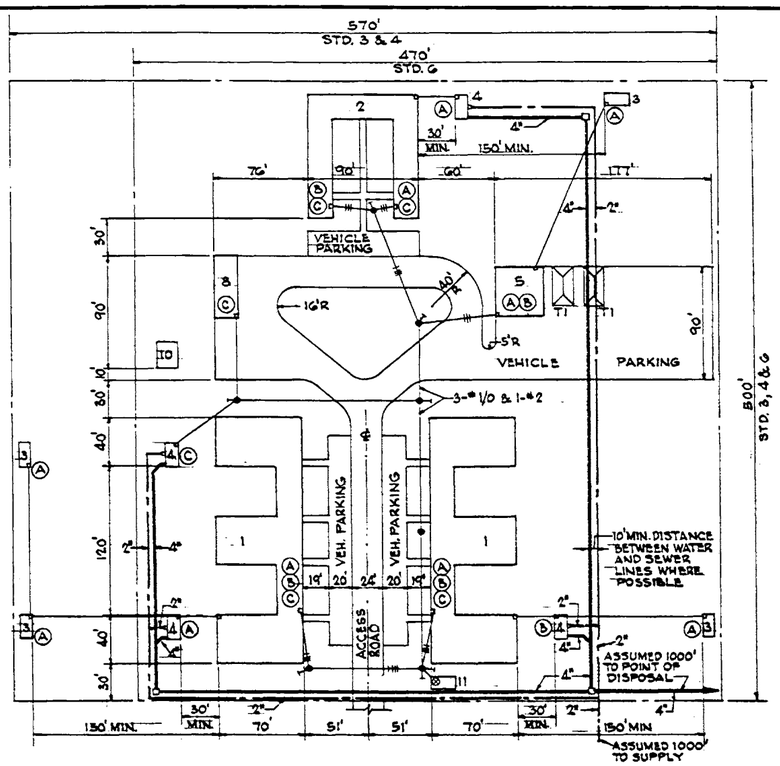
PLANS

UNDER REVISION

APPROVED: [signature] CHIEF, ENGINEERING BRANCH
APPROVED: [signature] for W. M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1963

APPROVED FOR PROPONENT AGENCY: Robert Bernstein 9 OCT 68
DATE

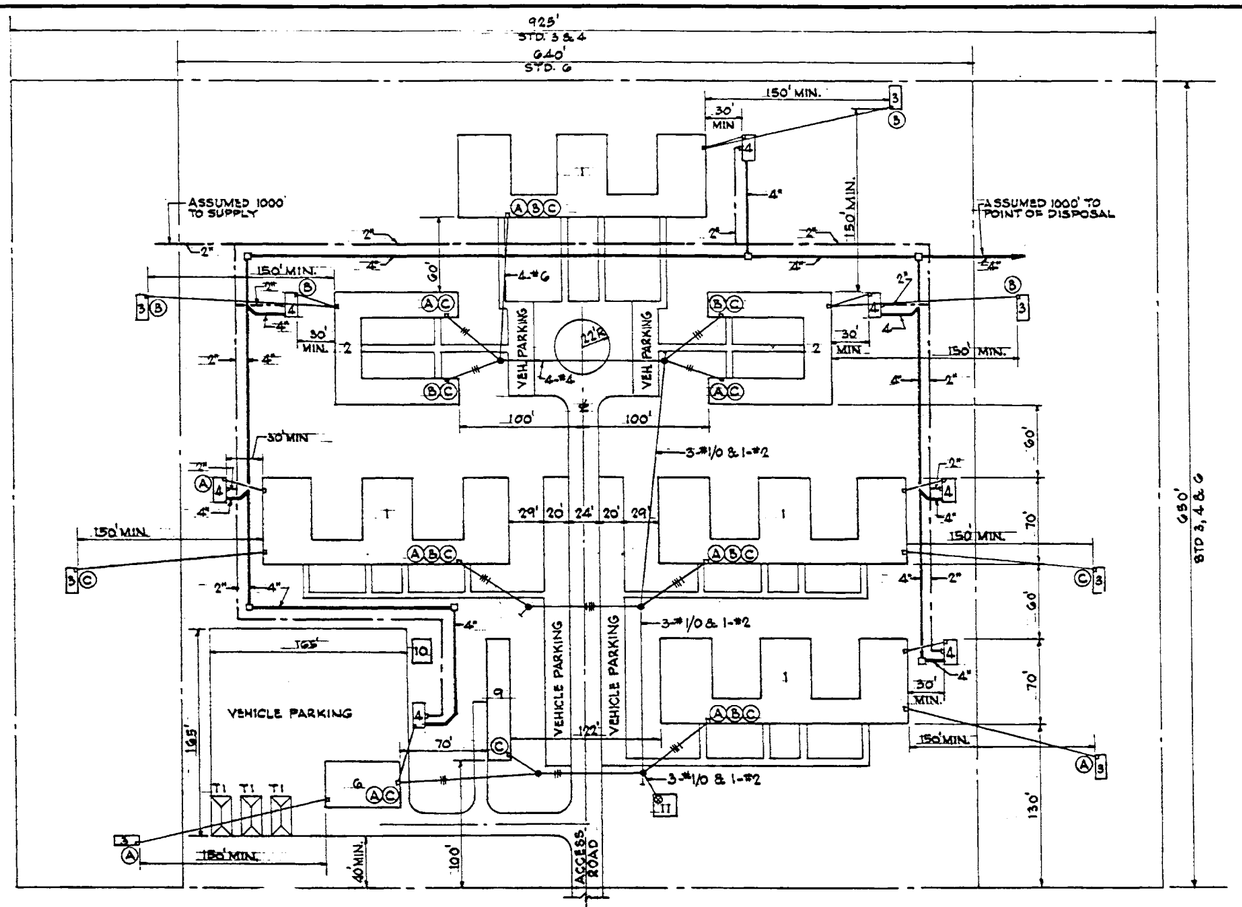
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 55-12
SHEET 1 OF 1



25000 SF ADMINISTRATION HEADQUARTERS

SCALE NO. 13

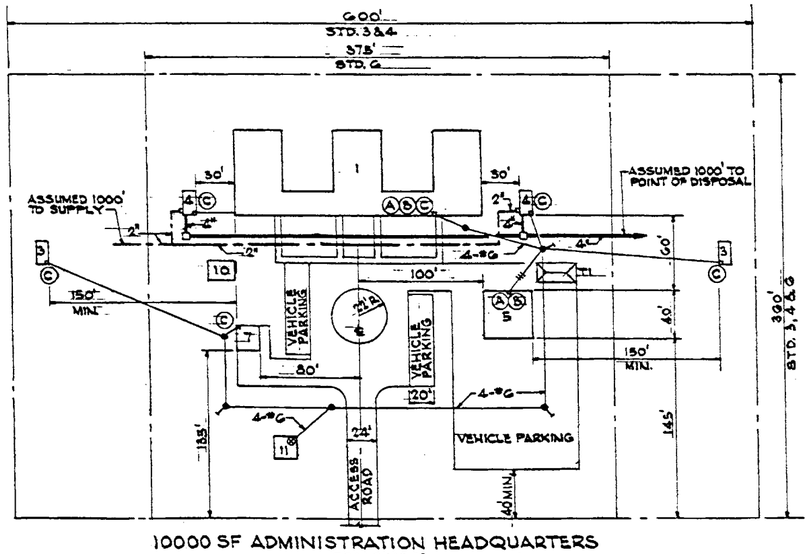
INSTALLATION NUMBERS		
ITR	TPR	BUILDINGS
AA 1051	AA 1071	STEEL FRAME BUILDINGS
AA 1061	AA 1081	WOOD FRAME BUILDINGS



50000 SF ADMINISTRATION HEADQUARTERS

SCALE NO. 13

INSTALLATION NUMBERS		
ITR	TPR	BUILDINGS
AA 1091	AA 1111	STEEL FRAME BUILDINGS
AA 1101	AA 1121	WOOD FRAME BUILDINGS



10000 SF ADMINISTRATION HEADQUARTERS

SCALE NO. 13

INSTALLATION NUMBERS		
ITR	TPR	BUILDINGS
AA 1011	AA 1031	STEEL FRAME BUILDINGS
AA 1021	AA 1041	WOOD FRAME BUILDINGS

SCHEDULE OF FACILITIES

NO.	FACILITY	SIZE	10000 SF ITR	10000 SF TPR	25000 SF ITR	25000 SF TPR	50000 SF ITR	50000 SF TPR	DWG. NO.
	TENTAGE								
T1	SHOP, MOTOR REPAIR	16'x32'							
	BUILDINGS								
1	ADMINISTRATION HQ BLDG-"E" SHAPE	10000 SF	1	1	2	2	4	4	61-11
2	ADMINISTRATION HQ BLDG-"U" SHAPE	5000 SF			1	1	2	2	61-11
3	LATRINE, PIT TYPE, 8 SEATS	10'x20'	2		4		7		72-36
4	LATRINE, WB, 160 MAN	10'x20'		2		4		7	72-35
5	SHOP, MOTOR REPAIR	40'x40'	1	1	1	1			21-41
6	SHOP, MOTOR REPAIR	40'x60'					1	1	21-41
7	STOREHOUSE	20'x20'	1	1					44-11
8	STOREHOUSE	20'x50'			1	1			44-11
9	STOREHOUSE	20'x100'					1	1	44-11
	OTHER CONSTRUCTION								
	HARDSTAND, 4" STABILIZED STONE	1000 SY	1.0		2.5		5.0		85-31
	HARDSTAND, 4" STAB. STONE, 1" COLD SURF.	1000 SY		1.0		2.5		5.0	85-31
	ROAD, 1 LANE, 4" STABILIZED STONE	1 MILE					.02		85-31
	ROAD, 1 LANE, 4" STAB. STONE, 1" COLD SURF.	1 MILE						.02	85-31
	ROAD, 2 LANE, 6" STABILIZED STONE	1 MILE	.02		.12		.10		85-31
	ROAD, 2 LANE, 6" STAB. STONE, 1" COLD SURF.	1 MILE		.02		.12		.10	85-31
10	SUMP, FIRE PROTECTION	10000 GAL	1	1	1	1	1	1	84-21
T1	GENERATOR BUILDING (IF REQUIRED)		1	1	1	1	1	1	
	SITE AREA	ACRES	4.9	3.0	6.6	5.4	13.8	9.8	
	UTILITIES								

ENGINEER SERVICES REQUIRED		10000 SF ITR	10000 SF TMP	25000 SF ITR	25000 SF TMP	50000 SF ITR	50000 SF TMP	DWG. NO.
WATER DISTRIBUTION	DEMAND-GPD	250	1250	625	3120	1250	6250	84-21
	FACILITY NO.		G00510		G00525		G00540	
SEWAGE/DRAINAGE	DEMAND-GPD		875		2180		4375	83-15
	FACILITY NO.		G00511		G00526		G00541	
ELECTRIC DISTRIBUTION	DEMAND-KW	12.6 KW		28.5 KW		52.9 KW		81-23
	FACILITY NO.	G00512		G00527		G00542		

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100'

NO. 13

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS

ADMINISTRATION
10000, 25000 & 50000 SF
STD ITR & TPR
SITE & UTILITY LAYOUTS

APPROVED: H. M. Williams for
CHIEF, STRUCTURES BRANCH, CONST. ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED

SPEC. NO.

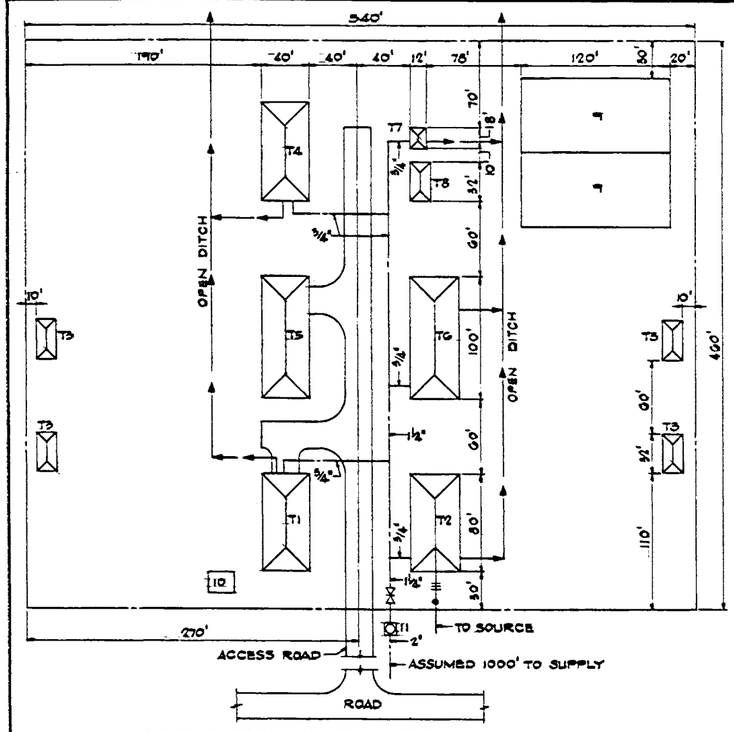
DRAWING NUMBER: 60-05

DATE

SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY

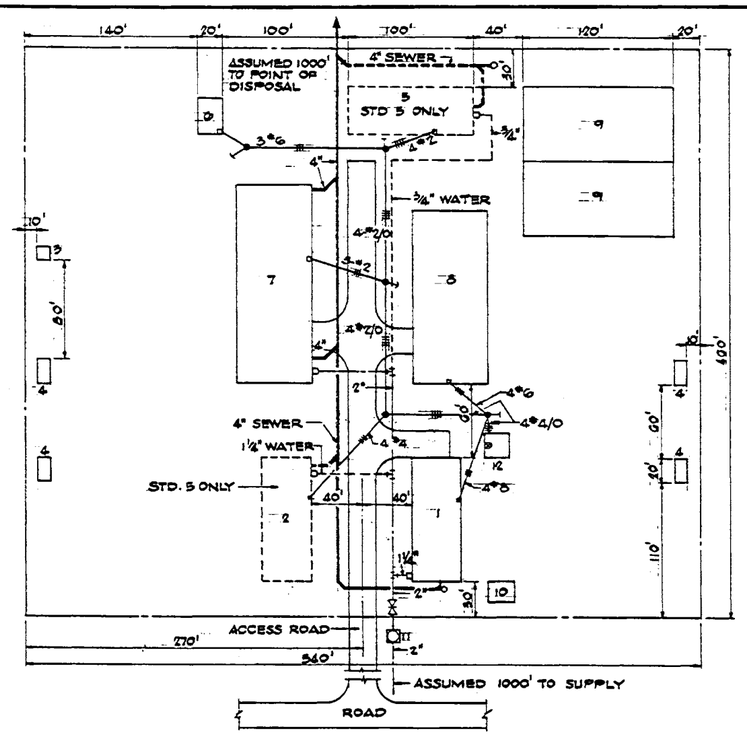


RECREATION CENTER-5000 MAN-INT

SCALE NO. 15

STD-INT IDENTICAL EXCEPT OMIT UTILITIES & FLOORS

STD-INT-INST. NO. AR1201 - TENTAGE ONLY

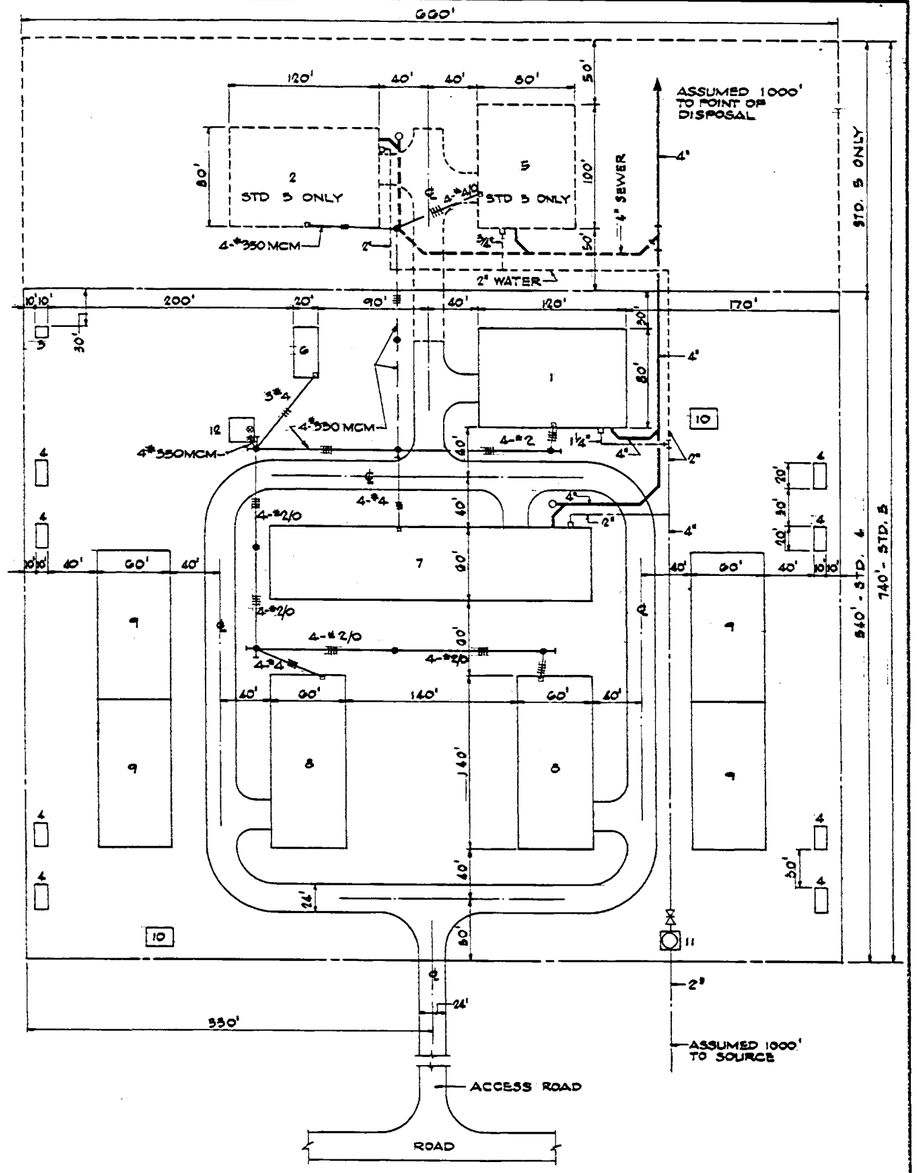


RECREATION CENTER-5000 MAN STD ITR & TPR

SCALE NO. 15

INST. NO. AR1411 & AR1511 - STEEL FRAME BLDGS

INST. NO. AR1421 & AR1521 - WOOD FRAME BLDGS



RECREATION CENTER - 10000 MAN STD ITR & TPR

SCALE NO. 15

INST. NO. AR2411 & AR2511 - STEEL FRAME BLDGS.

INST. NO. AR2421 & AR2521 - WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	5000 MAN STD-INT INST. NO. AR1201 QTY.	SIZE OR UNIT	DWG. NO.	5000 MAN STD-ITR INST. NO. AR1411, AR1421 QTY.	SIZE OR UNIT	DWG. NO.	5000 MAN STD-TPR INST. NO. AR1511, AR1521 QTY.	SIZE OR UNIT	DWG. NO.	10000 MAN STD-ITR INST. NO. AR2411, AR2421 QTY.	SIZE OR UNIT	DWG. NO.	10000 MAN STD-TPR INST. NO. AR2511, AR2521 QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE															
T1	ARMY EXCHANGE	1	40'X80'	74-22	—	—	—	—	—	—	—	—	—	—	—	—
T2	CRAFTS SHOP	1	40'X80'	74-41	—	—	—	—	—	—	—	—	—	—	—	—
T3	LATRINE, PIT TYPE, 8 SEATS	4	12'X32'	72-36	—	—	—	—	—	—	—	—	—	—	—	—
T4	LIBRARY	1	40'X80'	74-41	—	—	—	—	—	—	—	—	—	—	—	—
T5	MOTION PICTURE THEATER	1	40'X100'		—	—	—	—	—	—	—	—	—	—	—	—
T6	SERVICE CLUB	1	40'X100'	74-17	—	—	—	—	—	—	—	—	—	—	—	—
T7	SNACK BAR-KITCHEN	1	12'X18'	74-17	—	—	—	—	—	—	—	—	—	—	—	—
T8	SNACK BAR GEN. PURPOSE	1	12'X32'	74-17	—	—	—	—	—	—	—	—	—	—	—	—
	BUILDINGS															
1	ARMY EXCHANGE	—	—	—	1	40'X100'	74-22	1	40'X100'	74-22	1	80'X120'	74-23	1	80'X120'	74-23
2	CRAFTS SHOP	—	—	—				1	40'X100'	74-36				1	80'X120'	74-37
3	LATRINE, PIT TYPE, 2 SEATS, FEMALE	—	—	—	1	10'X10'	72-36	1	10'X10'	72-36	1	10'X10'	72-36	1	10'X10'	72-36
4	LATRINE, PIT TYPE, 8 SEATS	—	—	—	4	10'X20'	72-36	4	10'X20'	72-36	8	10'X20'	72-36	8	10'X20'	72-36
5	LIBRARY	—	—	—	—	—	—	1	40'X100'	74-41	—	—	—	1	80'X100'	74-45
6	QUARTERS-FEMALE EMPLOYEES	—	—	—	1	20'X30'	72-21	1	20'X30'	72-21	1	20'X40'	72-21	1	20'X40'	72-21
7	SPECIAL ACTIVITIES BLD'G.	—	—	—	1	60'X100'	74-31	1	60'X100'	74-31	1	60'X120'	74-32	1	60'X120'	74-32
8	THEATER, MOTION PICTURE	—	—	—	1	90'X140'	74-46	1	60'X140'	74-46	2	60'X140'	74-46	2	60'X140'	74-46
	OTHER CONSTRUCTION															
9	COMBINATION ATHLETIC COURT	2	60'X120'	75-21	2	60'X120'	75-21	2	60'X120'	75-21	4	60'X120'	75-21	4	60'X120'	75-21
	ROAD, 2 LANE, 6" STABILIZED STONE	0.1	MILE	85-31	0.1	MILE	85-31	0.1	MILE	85-31	0.3	MILE	85-31	0.5	MILE	85-31
10	SUMP-FIRE PROTECTION	1	10000 GAL	84-21	1	10000 GAL	84-21	1	10000 GAL	84-21	2	10000 GAL	84-21	2	10000 GAL	84-21
11	WATER TANK	—	—	—	1	4200 GAL	84-21	1	4200 GAL	84-21	1	10500 GAL	84-21	1	10500 GAL	84-21
12	GENERATOR BLDG (IF REQ'D)	—	—	—	1	—	—	1	—	—	1	—	—	1	—	—
	SITE AREA	5.7	ACRES	—	5.7	ACRES	—	5.7	ACRES	—	8.2	ACRES	—	11.2	ACRES	—
	UTILITIES															
	ENGINEERING SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS. FOR DETAILS	DEMAND	FACILITY NO.	DWGS. FOR DETAILS	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO	DWGS FOR DETAILS
	WATER DISTRIBUTION	—	—	—	300000 GPD	G02223	84-21	100000 GPD	G02240	84-21	200000 GPD	G02260	84-21	200000 GPD	G02270	84-21
	SEWAGE	NONE	—	—	70000 GPD	G02226	85-15	70000 GPD	G02241	85-15	140000 GPD	G02261	85-15	140000 GPD	G02271	85-15
	ELECTRIC DISTRIBUTION	NONE	—	—	640 KW	G02227	81-23	970 KW	G02242	81-23	1180 KW	G02262	81-23	1900 KW	G02272	81-23

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 50' 100'

NO. 13

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ILYUS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN

APPROVED: APPROVED: DATE:
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. 13 MAR 1969

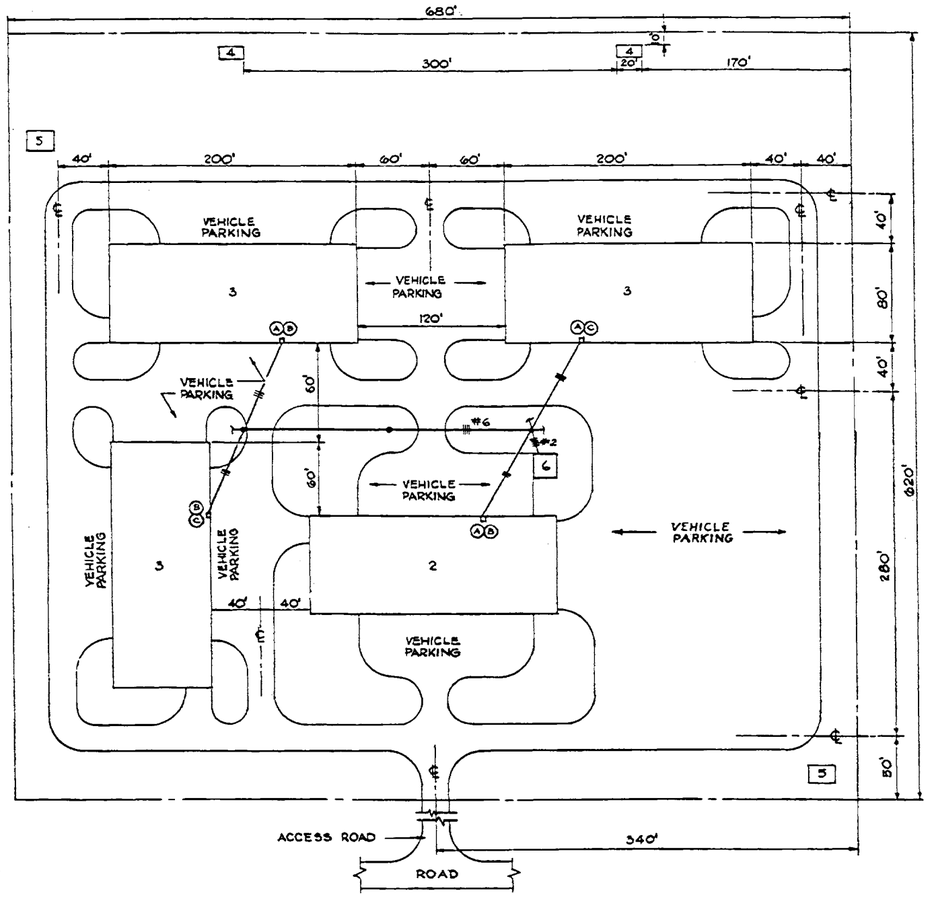
APPROVED FOR PROPONENT AGENCY:

DATE

THEATER OF OPERATIONS

RECREATION CENTERS
5000 & 10000 MAN
STD INT, ITR, TPR
SITE & UTILITY LAYOUTS

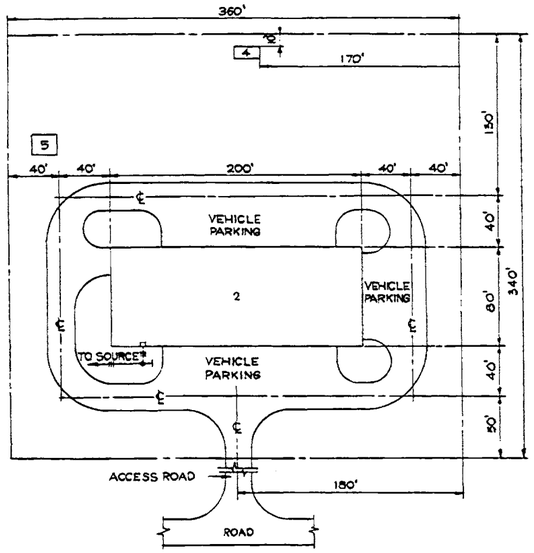
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
60-22



BASE POST OFFICE-TYPE F-64000 SF

SCALE NO. 13

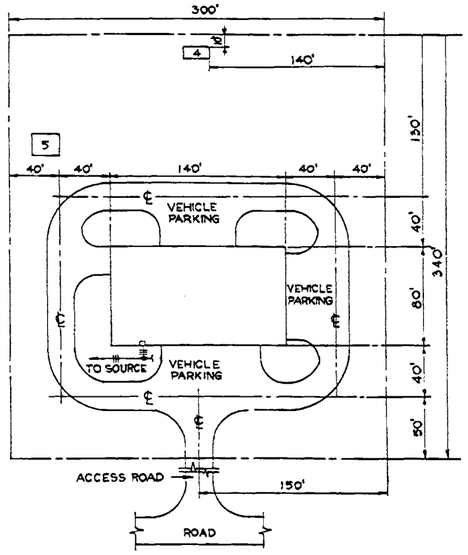
INST. NO. AP5311 -STEEL FRAME BLDGS.
INST. NO. AP5321 -WOOD FRAME BLDGS.



BASE POST OFFICE-TYPE B-16000 SF

SCALE NO. 13

INST. NO. AP2311 STEEL FRAME BLDGS.
INST. NO. AP2321 WOOD FRAME BLDGS.



BASE POST OFFICE-TYPE A-11200 SF

SCALE NO. 13

INST. NO. AP1311 -STEEL FRAME BLDGS.
INST. NO. AP1321 -WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	TYPE A - 11200 SF INST. NO. AP1311, AP1321 QTY.	SIZE OR UNIT	DWG. NO.	TYPE B - 16000 SF INST. NO. AP2311, AP2321 QTY.	SIZE OR UNIT	DWG. NO.	TYPE F - 64000 SF INST. NO. AP5311, AP5321 QTY.	SIZE OR UNIT	DWG. NO.
BUILDINGS										
1	BASE PO.-OPER., ADMIN. & SEC.	1	80'X140'	61 - 21						
2	BASE PO.-OPER., ADMIN. & SEC.				1	80'X200'	61 - 21	1	80'X200'	61-21
3	BASE PO.-OPER.							3	80'X200'	61-21
4	LATRINE, PIT TYPE, 8 SEATS	1	10'X 20'	72 - 36	1	10'X 20'	72-36	2	10'X 20'	72-36
OTHER CONSTRUCTION										
	ROAD, 2 LANE, 6" STABILIZED STONE	0.16	MILE	85 - 31	0.18	MILE	85-31	0.6	MILE	85-31
5	SUMP - FIRE PROTECTION	1	10000 GAL.	54 - 21	1	10000 GAL.	54-21	2	10000 GAL	54-21
	VEHICLE PARKING, 6" STABILIZED STONE	0.6	1000 SY	85 - 31	0.6	1000 SY	85-31	1	1000 SY	85-31
	SITE AREA	2.54	ACRES		2.81	ACRES		9.7	ACRES	
6	GENERATOR BLDG (IF REQD)	1			1			1		
UTILITIES										

ENGINEER SERVICES REQUIRED	TYPE A - 11200 SF DEMAND	FACILITY NO.	DWGS. FOR DETAILS	TYPE B - 16000 SF DEMAND	FACILITY NO.	DWGS. FOR DETAILS	TYPE F - 64000 SF DEMAND	FACILITY NO.	DWGS. FOR DETAILS
ELECTRIC DISTRIBUTION	6.6 KW	602812	81-23	9.5 KW	602827	81-23	47.1 KW	602842	81-23
WATER DISTRIBUTION	92 GPD			126 GPD			516 GPD		

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 50' 100'
NO. 13

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DE ICHMANN

THEATER OF OPERATIONS

BASE POST OFFICES
64000 SF, 16000 SF & 11200 SF

SITE & UTILITY LAYOUTS

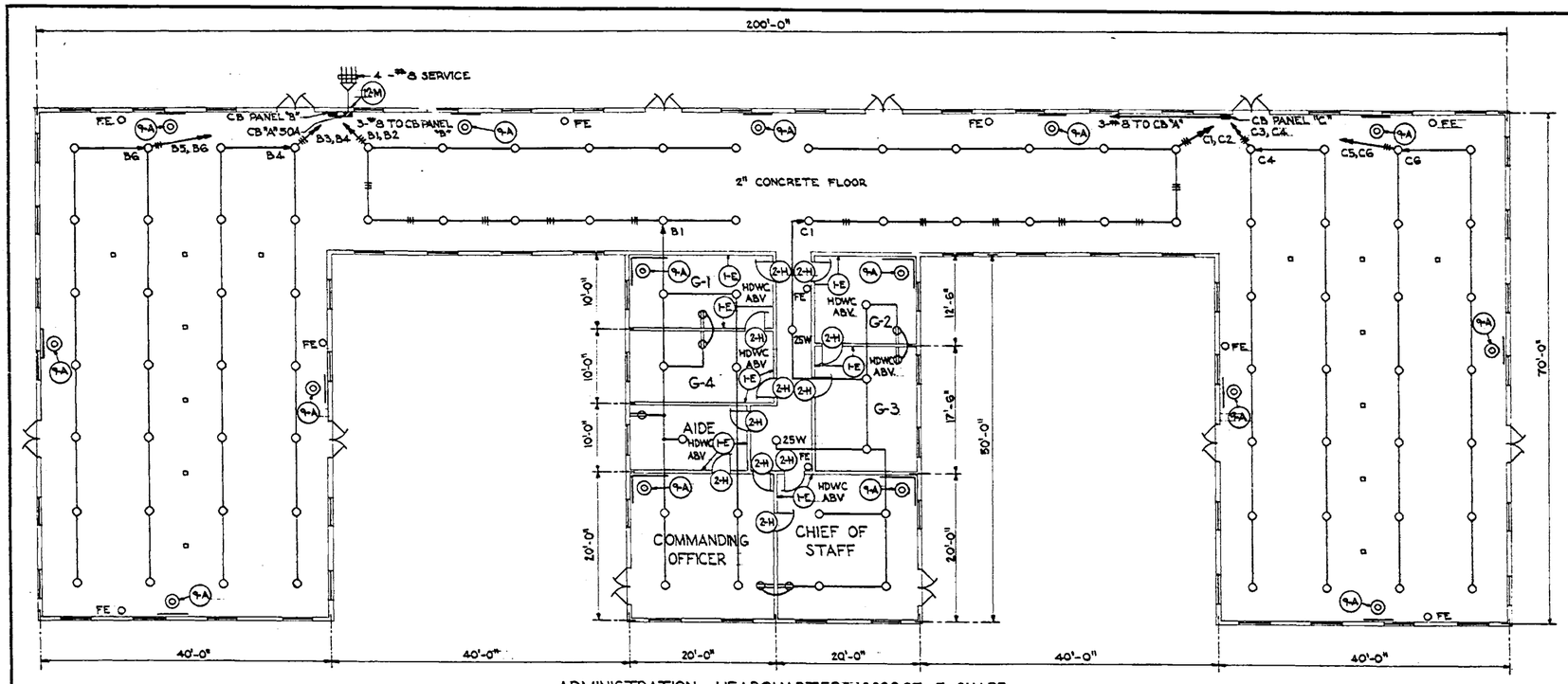
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROMULGATION: JOHN W. GRIFFITH, Lt Colonel, AGC, Director
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 60-28

DATE: 8 JAN 69 ARMY POSTAL SERVICE HEADQUARTERS, Washington, D.C. 20315
SHEET 1 OF 1

CORPS OF ENGINEERS

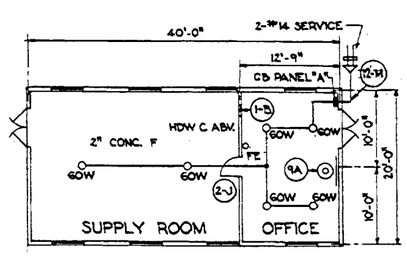
U. S. ARMY



ADMINISTRATION - HEADQUARTERS, 10000 SF, E SHAPE

SCALE NO. 1

FACIL. NO. 611107-INTERIOR ONLY FACIL. NO. 611117-STEEL FRAME W/INTERIOR FACIL. NO. 611127-WOOD FRAME W/INTERIOR



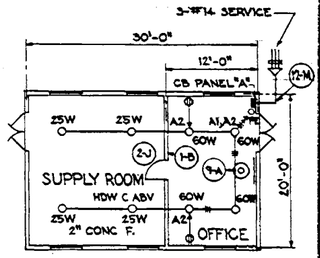
HEADQUARTERS & UNIT SUPPLY-COMPANY - 20' X 40'

SCALE NO. 1

FACIL. NO. 611104-INTERIOR ONLY

FACIL. NO. 611114-STEEL FRAME W/INTERIOR

FACIL. NO. 611124-WOOD FRAME W/INTERIOR



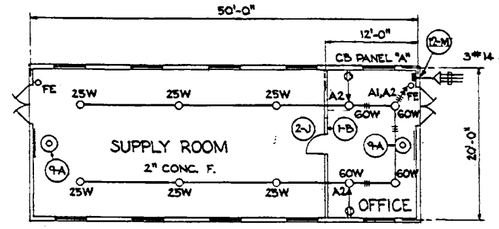
ADMINISTRATION - 20' X 30'

SCALE NO. 1

FACIL. NO. 611101 - INTERIOR ONLY

FACIL. NO. 611111 - STEEL FRAME W/INTERIOR

FACIL. NO. 611121 - WOOD FRAME W/INTERIOR



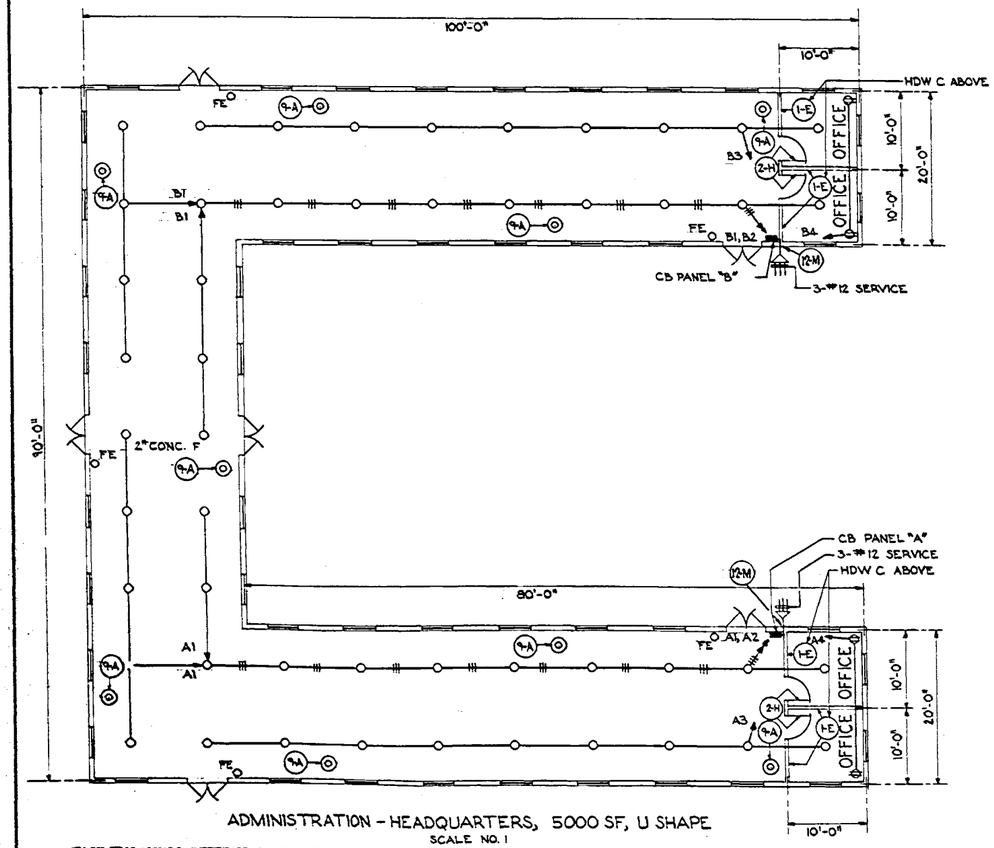
ADMINISTRATION - 20' X 50'

SCALE NO. 1

FACIL. NO. 611102 - INTERIOR ONLY

FACIL. NO. 611112 - STEEL FRAME W/INTERIOR

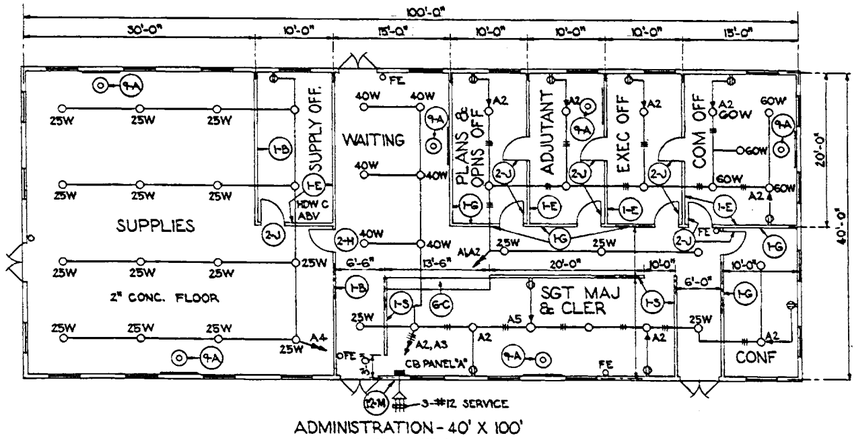
FACIL. NO. 611122 - WOOD FRAME W/INTERIOR



ADMINISTRATION - HEADQUARTERS, 5000 SF, U SHAPE

SCALE NO. 1

FACIL. NO. 611106-INTERIOR ONLY FACIL. NO. 611116-STEEL FRAME W/INTERIOR FACIL. NO. 611126-WOOD FRAME W/INTERIOR



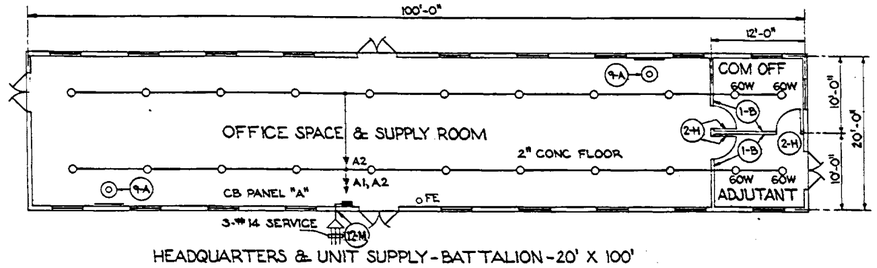
ADMINISTRATION - 40' X 100'

SCALE NO. 1

FACIL. NO. 611103 - INTERIOR ONLY

FACIL. NO. 611113 - STEEL FRAME W/INTERIOR

FACIL. NO. 611123 - WOOD FRAME W/INTERIOR



HEADQUARTERS & UNIT SUPPLY-BATTALION - 20' X 100'

SCALE NO. 1

FACIL. NO. 611105-INTERIOR ONLY FACIL. NO. 611115-STEEL FRAME W/INTERIOR FACIL. NO. 611125-WOOD FRAME W/INTERIOR

ELECTRICAL NOTES

CONNECTED LOAD

FACILITY	LIGHTING	RECPTST	TOTAL
ADMINISTRAT'N 20'x30'	0.34 KW	0.2 KW	0.54 KW
ADMINISTRAT'N 20'x50'	0.34 KW	0.2 KW	0.54 KW
ADMINISTRAT'N 40'x100'	2.52 KW	1.0 KW	3.52 KW
HQ & UNIT SUPPLY 20'x40'	0.36 KW	-	0.36 KW
HQ & UNIT SUPPLY 20'x100'	2.04 KW	-	2.04 KW
ADMIN. HQ 5000 SF	5.00 KW	0.3 KW	5.30 KW
ADMIN. HQ 10000 SF	9.65 KW	0.7 KW	10.35 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100W.
2. ALL 40W, 60W, AND 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-305 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
61-11	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES

0 5' 10' 15'

NO. 1

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS

TRACED BY:

CHECKED BY: HELTON

SUBMITTED BY: C. W. STEICHMANN

APPROVED: DATE: 19 MAR 1969

CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE

THEATER OF OPERATIONS

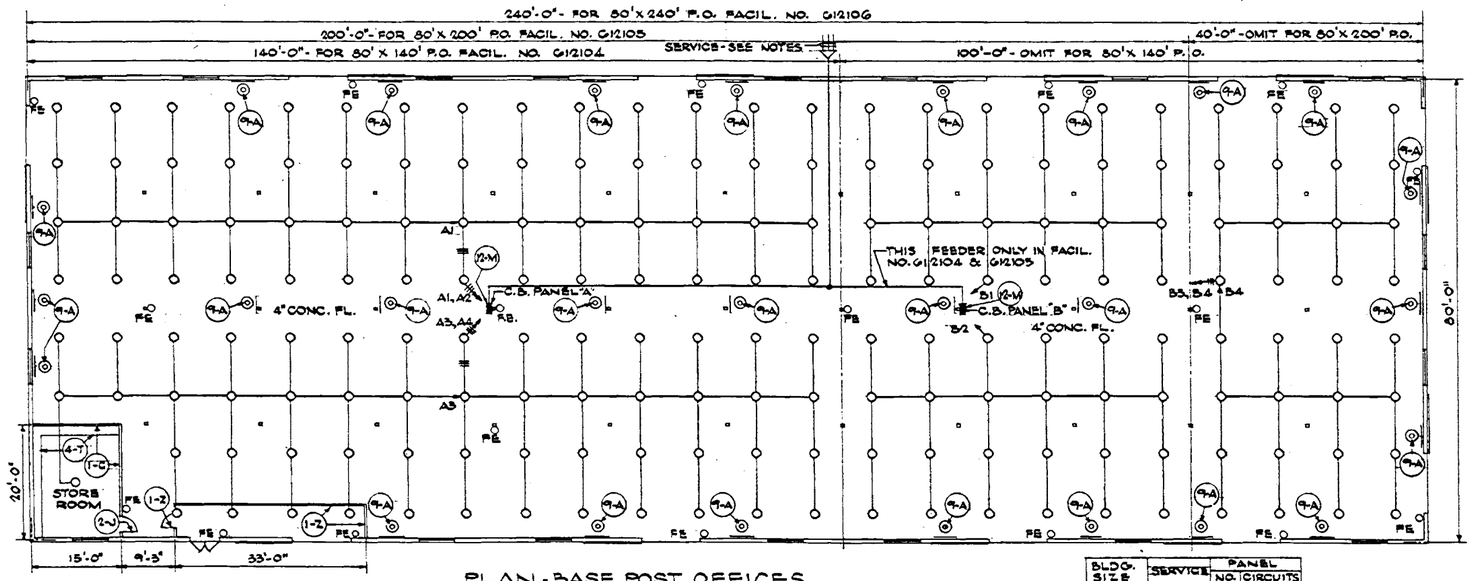
ADMINISTRATION, HEADQUARTERS, & UNIT SUPPLY PLANS

SCALE: AS NOTED

SPEC. NO.

DRAWING NUMBER: 61-11

SHEET 1 OF 1



PLAN - BASE POST OFFICES

SCALE NO. 1

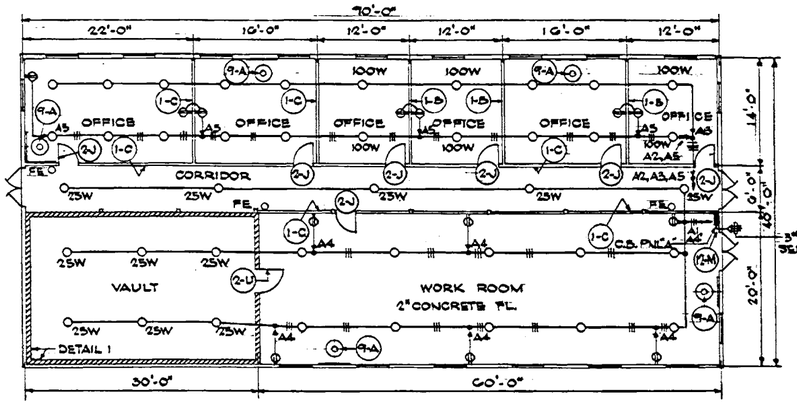
FACILITY NUMBERS -

80'x140'
G12104 - INTERIOR ONLY
G12114 - STEEL FRAME W/INTERIOR
G12124 - WOOD FRAME W/INTERIOR

80'x200'
G12105 - INTERIOR ONLY
G12115 - STEEL FRAME W/INTERIOR
G12125 - WOOD FRAME W/INTERIOR

80'x240'
G12106 - INTERIOR ONLY
G12116 - STEEL FRAME W/INTERIOR
G12126 - WOOD FRAME W/INTERIOR

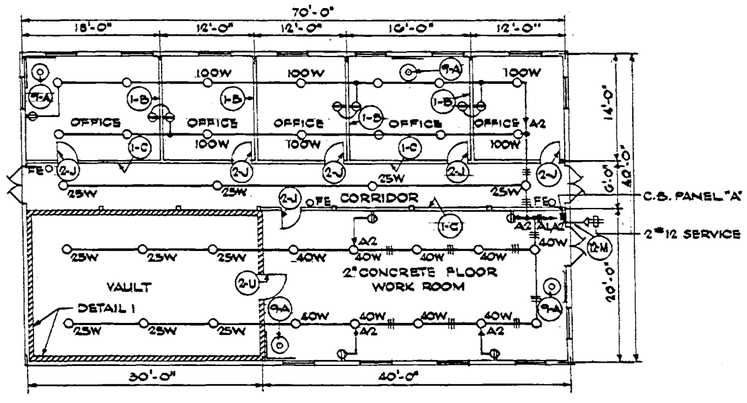
BLDG. SIZE	SERVICE	PANEL NO.	PANEL CIRCUITS
80'x240'	3" G	A	4
		B	4
80'x200'	3" B	A	4
		B	2
80'x140'	3" 10	A	4



PLAN - P.O. ADM. 1

SCALE NO. 1

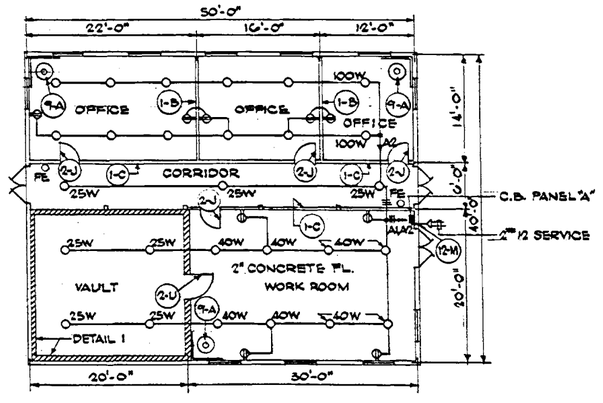
FACILITY NUMBERS
G12103 - INTERIOR ONLY
G12113 - STEEL FRAME W/INTERIOR
G12123 - WOOD FRAME W/INTERIOR



PLAN - P.O. ADM. 2

SCALE NO. 1

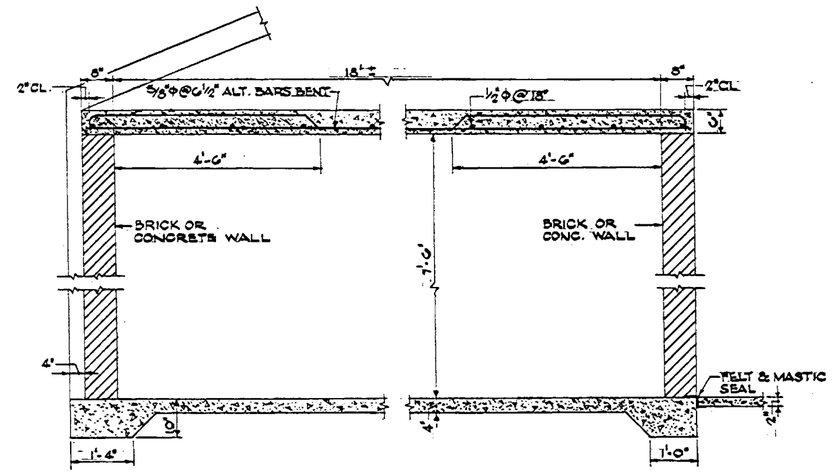
FACILITY NUMBERS
G12102 - INTERIOR ONLY
G12112 - STEEL FRAME W/INTERIOR
G12122 - WOOD FRAME W/INTERIOR



PLAN - P.O. ADM. 3

SCALE NO. 1

FACILITY NUMBERS
G12101 - INTERIOR ONLY
G12111 - STEEL FRAME W/INTERIOR
G12121 - WOOD FRAME W/INTERIOR



DETAIL 1

VAULT ROOF SLAB

SCALE NO. 5

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	P.O. ADM. 3	P.O. ADM. 2	P.O. ADM. 1	BASE POST OFFICE		
				80'x240'	80'x200'	80'x140'
FACIL. NO.	612101	612102	612103	612106	612105	612104
LIGHTING	1.30 KW	1.73 KW	2.32 KW	11.34 KW	9.42 KW	6.54 KW
RECP. RST.	0.90 KW	1.10 KW	1.30 KW	—	—	—
TOTAL	2.20 KW	2.83 KW	3.62 KW	11.34 KW	9.42 KW	6.54 KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 60W.
2. ALL 40, 60 & 100 W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
61-21	PLANS & DETAILS	1 OF 1
99-95	STANDARD DETAILS	
34-05	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
34-11	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4
35-56	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DRAWING SCALES
0 5' 10' 15' — NO. 1
0 1' 2' 3' — NO. 5
0 5' 10' 15' 20' — NO. 17

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

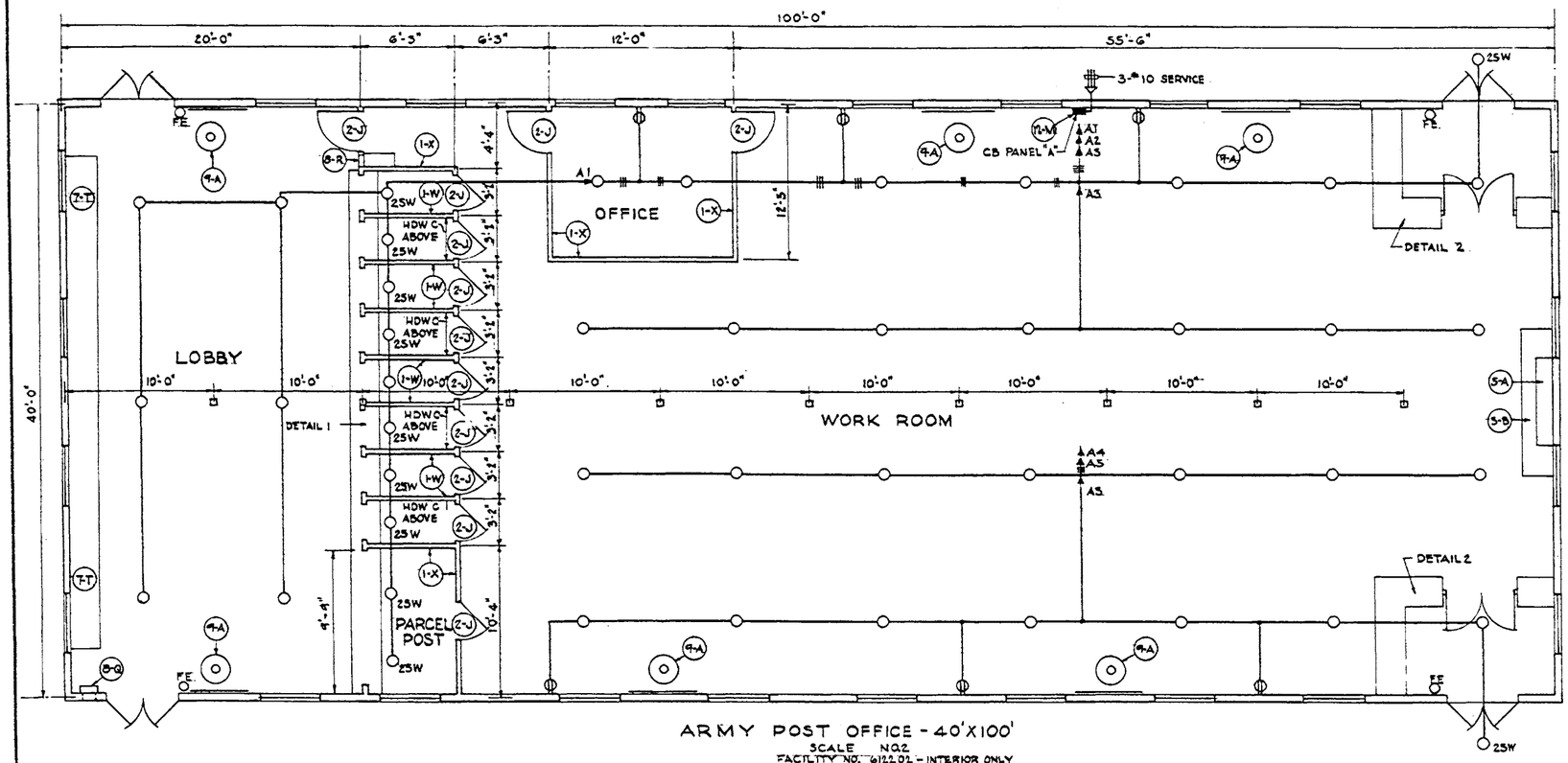
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

ADMINISTRATION POST OFFICES & BASE POST OFFICES PLANS & DETAILS

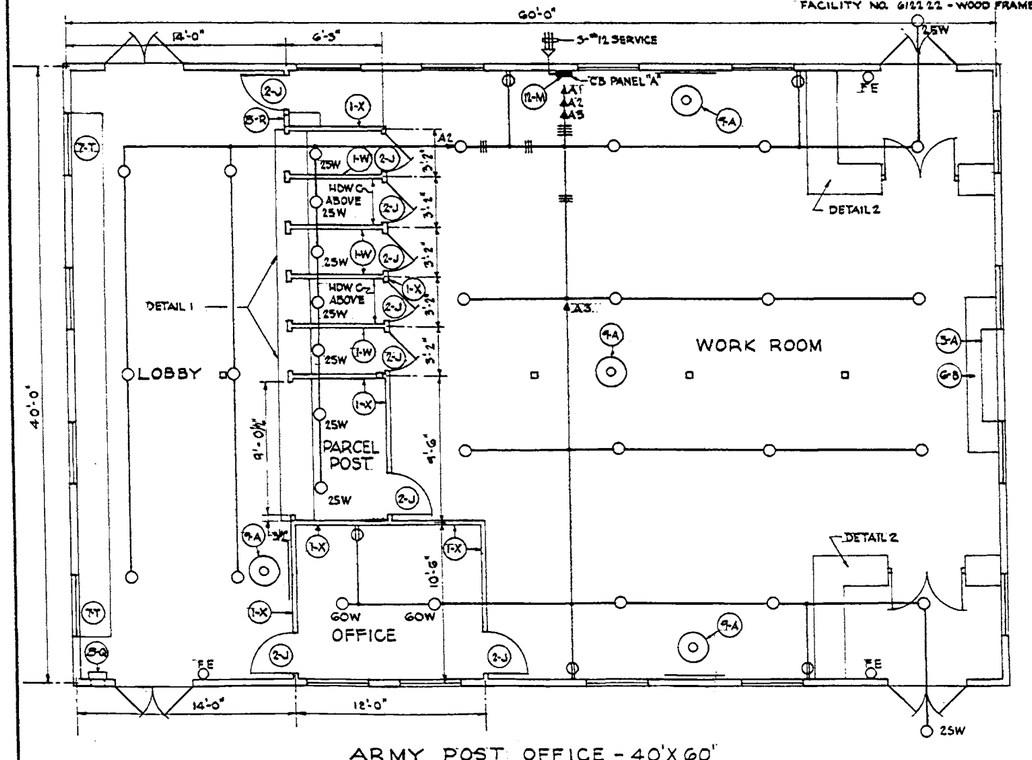
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROCUREMENT: JOHN M. CROWN Lt Colonel, CE Director
DATE: 19 MAR 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 61-21
DATE: 2 JUN 1969
ARMY POSTAL SERVICE HEADQUARTERS Washington, D.C. 20315
SHEET 1 OF 1



ARMY POST OFFICE - 40'X100'

SCALE NO.2

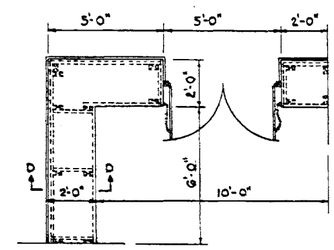
FACILITY NO. 612202 - INTERIOR ONLY
FACILITY NO. 612212 - STEEL FRAME W/INTERIOR
FACILITY NO. 612222 - WOOD FRAME W/ INTERIOR



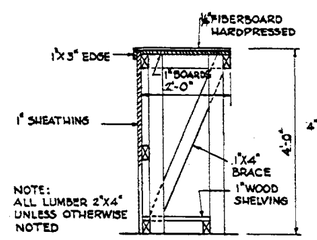
ARMY POST OFFICE - 40'X 60'

SCALE NO. 2

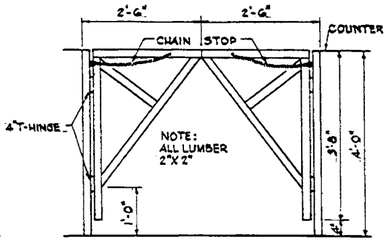
FACILITY NO. 612201 - INTERIOR ONLY
FACILITY NO. 612211 - STEEL FRAME W/INTERIOR
FACILITY NO. 612221 - WOOD FRAME W/ INTERIOR



PLAN
NO SCALE

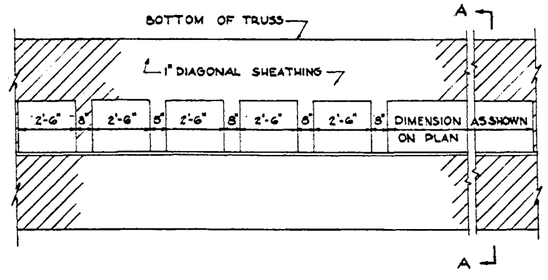


SECTION D-D
SCALE NO.5

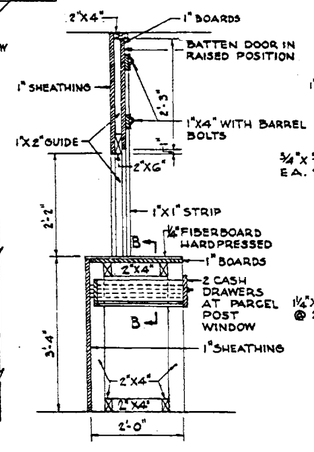


GATE DETAIL
SCALE NO.5

DETAIL 2
REAR COUNTER
SCALE AS NOTED

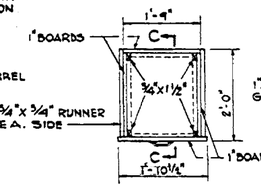


ELEVATION
SCALE NO.3

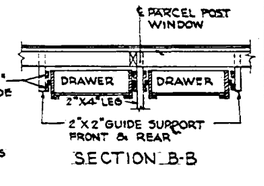


SECTION A-A
SCALE NO.5

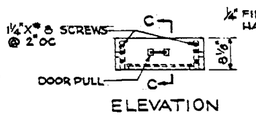
DETAIL 1
WICKET PARTITION
SCALE AS NOTED



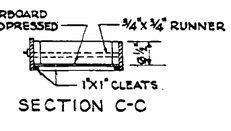
PLAN



SECTION B-B



ELEVATION



SECTION C-C

DRAWER DETAIL
SCALE NO.5

ELECTRICAL NOTES

CONNECTED LOAD		
BUILDING	40'X100'	40'X60'
LIGHTING	3.70 KW	2.45 KW
RECP EST	.60 KW	.50 KW
TOTAL	4.30 KW	2.95 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100W.
2. ALL GO & 100W LAMPS TO HAVE 6" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR F&I BILL OF MATERIALS REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
61-22	PLAN	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10' NO.2 · 0 1' 2' 3' NO.5 · 0 1' 2' 3' 4' 5' NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

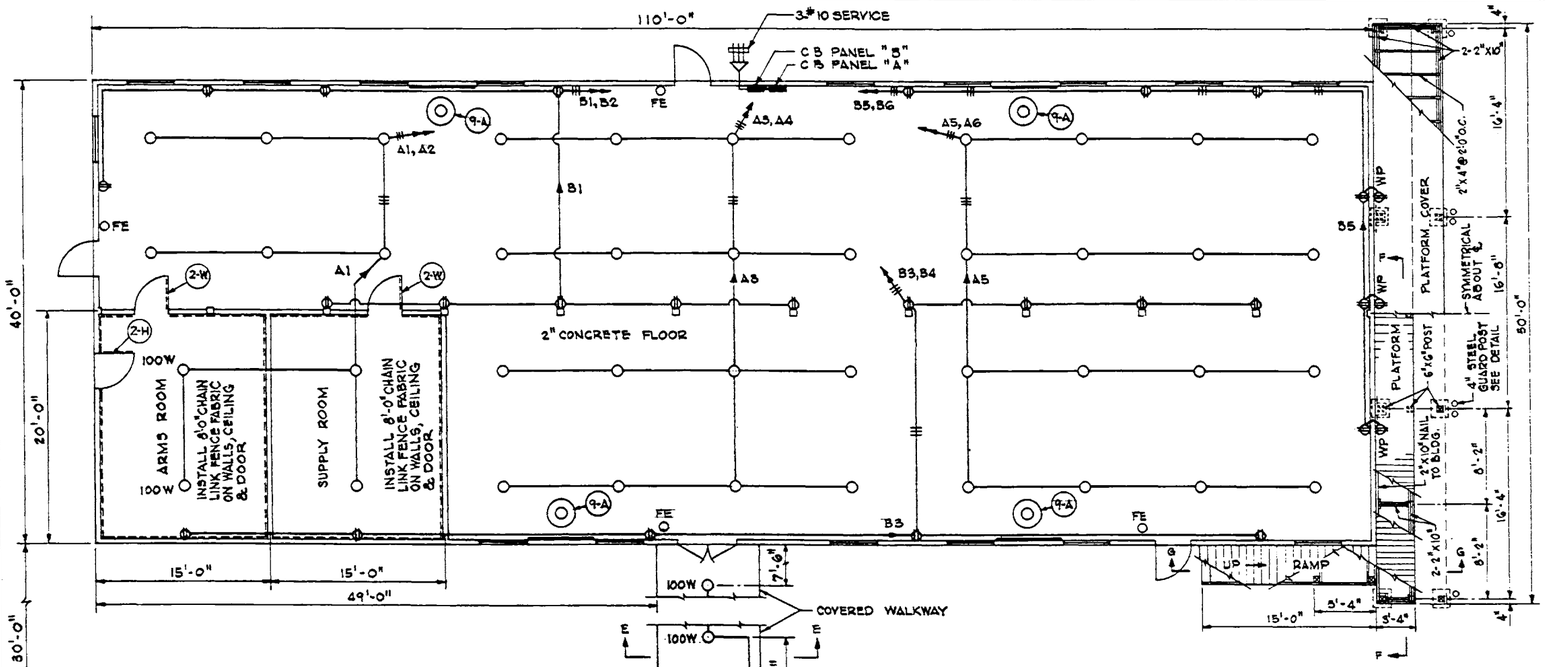
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

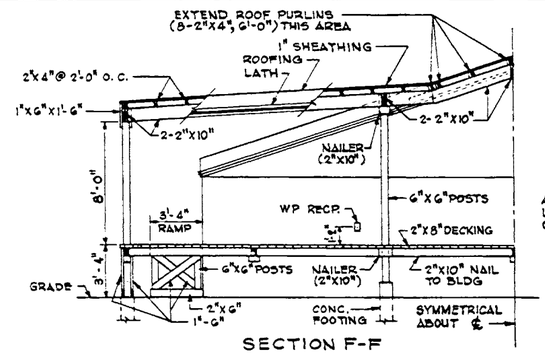
DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DEICHMANN
APPROVED: DATE:
CHIEF, STORAGE & MISC BRANCH

THEATER OF OPERATIONS

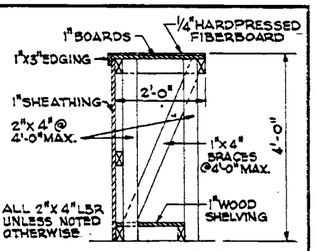
ARMY POST OFFICES
40'X100'
40'X60'

APPROVED: DATE: 19 MAR 1953
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT: JOHN A. DONOVAN, Lt Colonel, AGC, Director
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
DATE: 9 JAN 1953 ARMY POSTAL SERVICE HEADQUARTERS Washington, D.C. 20315
SHEET 1 OF 1
61-22

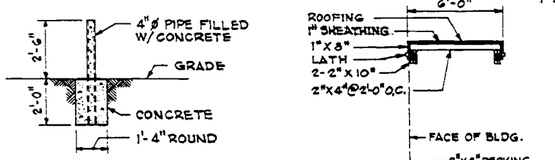




SECTION F-F
NO SCALE

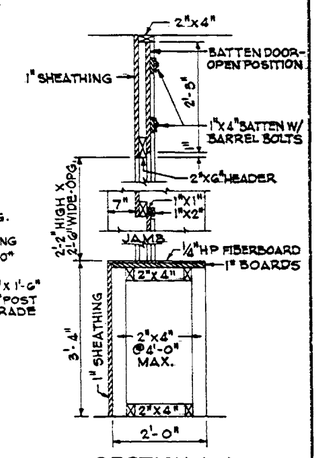


SECTION B-B
COUNTER
SCALE NO. 5

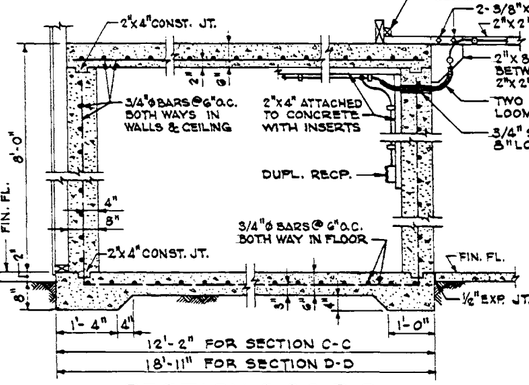


DETAIL TRUCK GUARD
NO SCALE

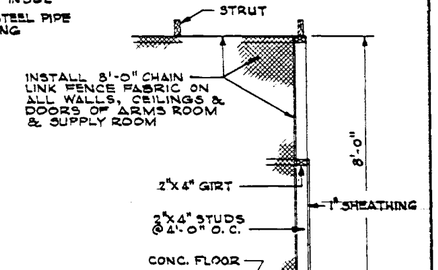
SECTION G-G
NO SCALE



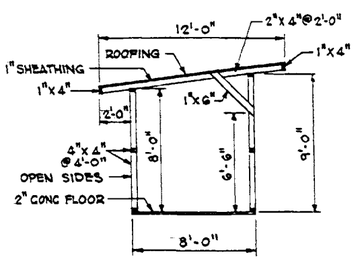
SECTION A-A
THRU PAY WINDOWS
SCALE NO. 5



SECTION C-C & D-D
THRU VAULT
SCALE NO. 5



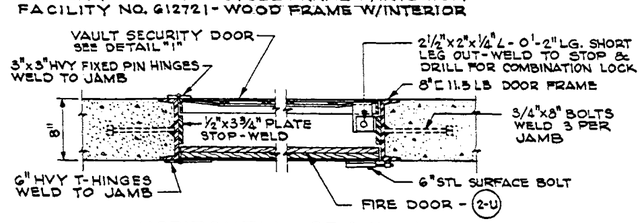
TYPICAL WALL SECTION
ARMS ROOM & SUPPLY ROOM
NO SCALE



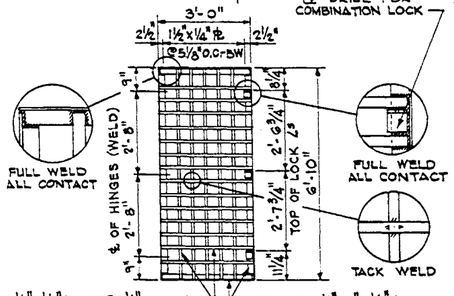
SECTION E-E
COVERED WALKWAY
NO SCALE

PLAN - 15000 MAN FINANCE OFFICE
SCALE NO. 24

FACILITY NO. 612701 - INTERIOR ONLY
FACILITY NO. 612711 - STEEL FRAME W/INTERIOR
FACILITY NO. 612721 - WOOD FRAME W/INTERIOR



HORIZONTAL SECTION
THRU VAULT DOOR OPG.
FRAME OPENING 3'-0 ¼" W X 6'-10¼" H
NO SCALE



DETAIL "1"
VAULT SECURITY DOOR
SCALE NO. 4

GENERAL NOTES

1. FOR FSN BILL OF MATERIAL - REFER TO TM5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL CONTAINS SUFFICIENT MATERIAL FOR BOTH BUILDINGS, COVERED WALKWAY, RAMP & PLATFORM.

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	13.2 KW
RECEP EST	5.2 KW
TOTAL	18.4 KW

1. UNLESS OTHERWISE NOTED ALL LAMPS TO BE 150W WITH 14" DIA. FLAT SHADES.
2. ALL 100W LAMPS TO HAVE 8" DIA. CONICAL SHADES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
61-27	PLAN & DETAILS	1 OF 1
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDG.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDG.	1-4 OF 4
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO. 24 — 0, 5', 10'
NO. 4 — 0, 1', 2', 3', 4'
NO. 5 — 0, 1', 2', 3'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA — WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C. W. DEICHMANN

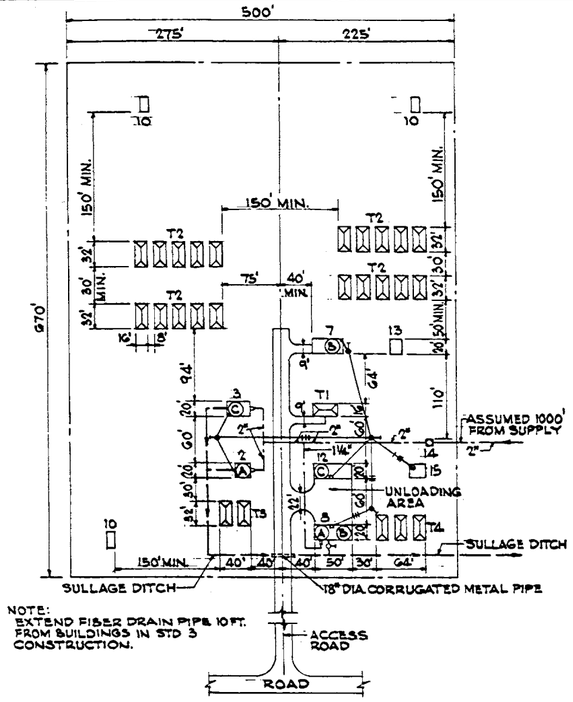
THEATER OF OPERATIONS

FINANCE OFFICE - 15000 MAN
PLAN & DETAILS

APPROVED: [signature] Chief, Engineering Branch — [signature] Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1969

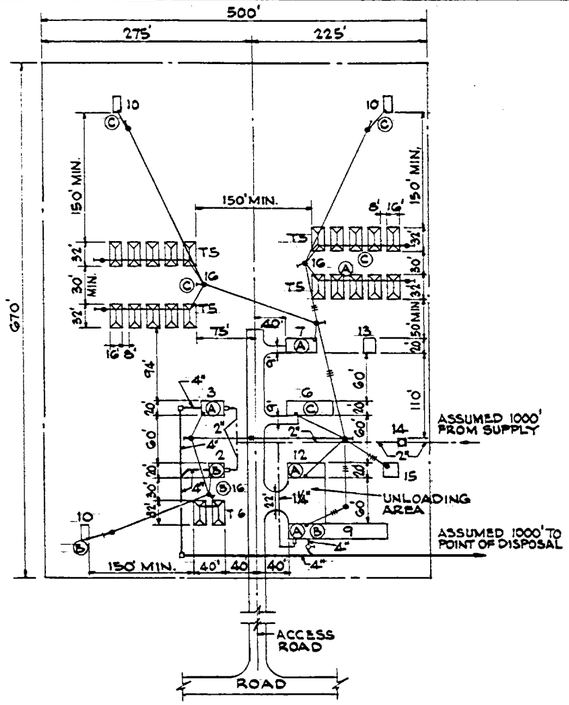
APPROVED FOR PROPONENT AGENCY: H. L. JONES, Brigadier General, US, Chief of Finance and Accounting
DATE: 11 SEP 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 61-27
SHEET 1 OF 1

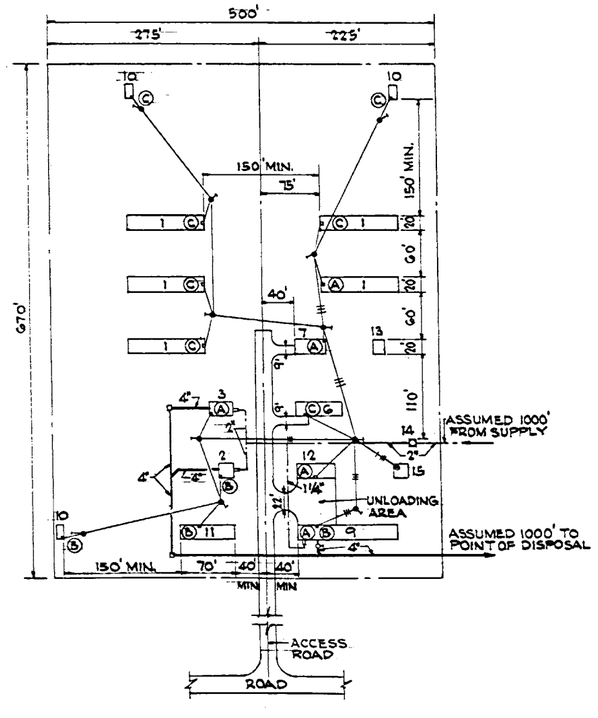


NOTE:
EXTEND FIBER DRAIN PIPE 10 FT. FROM BUILDINGS IN STD 3 CONSTRUCTION.

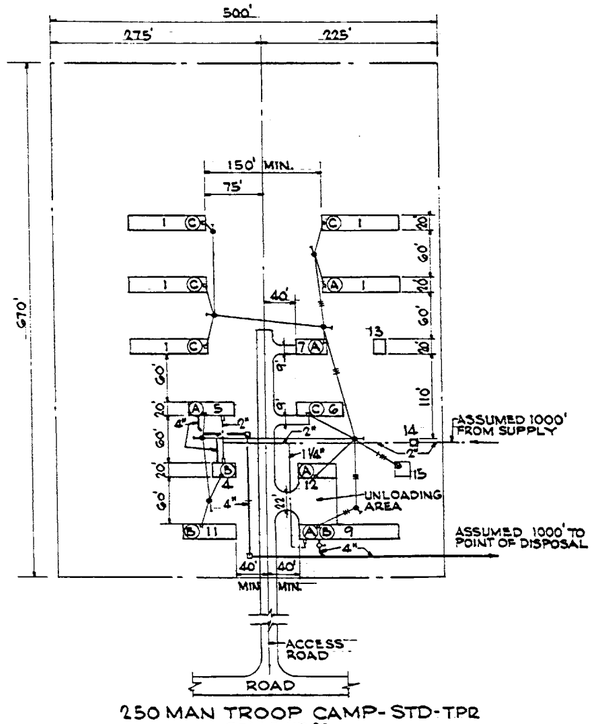
VOID



250 MAN TROOP CAMP - STD-ITR
SCALE NO. 26
INST. NO. NT 1411 - STL FRAME BLDGS.
INST. NO. NT 1421 - WOOD FRAME BLDGS.



VOID



250 MAN TROOP CAMP - STD-TPR
SCALE NO. 26
INST. NO. NT 1611 - STL FRAME BLDGS
INST. NO. NT 1621 - WOOD FRAME BLDGS

SCHEDULE OF FACILITIES

NO.	FACILITY	VOID			STD-ITR INST. NO. NT 1411, NT 1421			VOID			STD-TPR INST. NO. NT 1611, NT 1621		
		QTY.	SIZE OR UNIT	DWG. NO.	QTY.	SIZE OR UNIT	DWG. NO.	QTY.	SIZE OR UNIT	DWG. NO.	QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITHOUT FRAMES												
T1	CAMP EXCHANGE	1	16'x 32'										
T2	HOUSING-EM	20	16'x 32'										
T3	HOUSING-OFFICERS	2	16'x 32'										
T4	MESS	3	16'x 32'										
	TENTAGE WITH FRAMES												
T5	HOUSING-EM				20	16'x32'	72-51						
T6	HOUSING-OFFICERS				2	16'x32'	72-51						
	BUILDINGS												
1	BARRACKS - 50 MAN							5	20'x100'	72-21	5	20'x100'	72-21
2	BATHHOUSE-160 MAN OR 80 OFFICERS	1	20'x20'	72-32	1	20'x20'	72-32	1	20'x20'	72-32			
3	BATHHOUSE-250 MAN	1	20'x40'	72-32	1	20'x40'	72-32	1	20'x40'	72-32			
4	BATHHOUSE & LATRINE-160 MAN										1	20'x30'	72-32
5	BATHHOUSE & LATRINE-250 MAN										1	20'x60'	72-32
6	CAMP EXCHANGE & RECREATION				1	20'x60'	74-13	1	20'x60'	74-13	1	20'x60'	74-13
7	HQ & UNIT SUPPLY-CO	1	20'x40'	61-11	1	20'x40'	61-11	1	20'x40'	61-11	1	20'x40'	61-11
8	KITCHEN-250 MAN	1	20'x50'	72-61									
9	KITCHEN & MESS HALL-250 MAN				1	20'x130'	72-61	1	20'x130'	72-61	1	20'x130'	72-61
10	LATRINE-PIT TYPE-8 SEATS	3	10'x20'	72-36	3	10'x20'	72-36	3	10'x20'	72-36			
11	QUARTERS-OFFICERS-16							1	20'x70'	72-21	1	20'x70'	72-21
12	STOREHOUSE	1	20'x50'	44-11	1	20'x50'	44-11	1	20'x50'	44-11	1	20'x50'	44-11
	OTHER CONSTRUCTION												
	ROAD, 2 LANE-6" STABILIZED STONE	0.08	MILE	85-31	0.08	MILE	85-31	0.08	MILE	85-31			
	ROAD, 2 LANE-6" STONE, 1" COLD SURF.										0.08	MILE	85-31
	ROAD, 9' SERVICE-4" STABILIZED STONE	0.02	MILE	85-31	0.02	MILE	85-31	0.02	MILE	85-31			
	ROAD, 9' SERVICE-6" STONE, 1" COLD SURF.										0.02	MILE	85-31
T5	SUMP-FIRE PROTECTION	1	10000 GAL	84-21	1	10000 GAL	84-21	1	10000 GAL	84-21	1	10000 GAL	84-21
14	WATER TANK	1	4200 GAL	84-21	1	4200 GAL	84-21	1	4200 GAL	84-21	1	4200 GAL	84-21
15	GENERATOR BLDG (IF REQ'D)	1			1			1			1		
16	CIRCUIT BREAKER PANEL				3	2-12, 15 AMP							
	SITE AREA	7.7	ACRE		7.7	ACRE		7.7	ACRE		7.7	ACRE	
	UTILITIES												

ENGINEER SERVICES REQUIRED	DEMAND	FACIL. NO.	DWG. FOR DETAILS	DEMAND	FACIL. NO.	DWG FOR DETAILS	DEMAND	FACIL. NO.	DWG. FOR DETAILS	DEMAND	FACIL. NO.	DWG. FOR DETAILS
WATER DISTRIBUTION	3750 GPD	700110	84-21	3750 GPD	700110	84-21	3750 GPD	700110	84-21	6250 GPD	700113	84-21
SEWAGE	NONE	700111		2625 GPD	700126	83-15	2625 GPD	700126	83-15	4375 GPD	700124	83-15
ELECTRIC DISTRIBUTION	2.2 KW	700112	81-23	5.4 KW	700127	81-23	5.5 KW	700142	81-23	5.5 KW	700172	81-23

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 26

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. V. BEICHMANN
APPROVED: [signature] CHIEF, STRUCT. RESEARCH

THEATER OF OPERATIONS

TROOP CAMP
250 MAN
STD-ITR & STP-TPR
SITE & UTILITY LAYOUTS

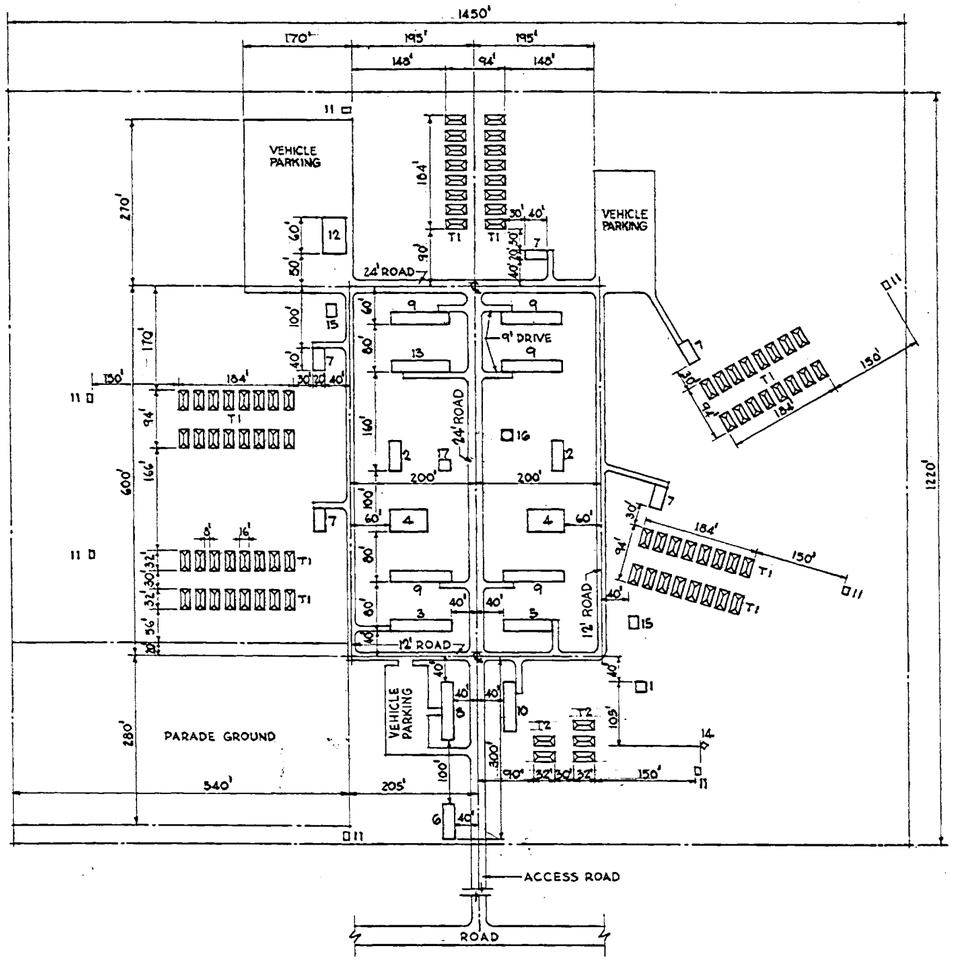
APPROVED: H. M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE Nov 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-01
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY

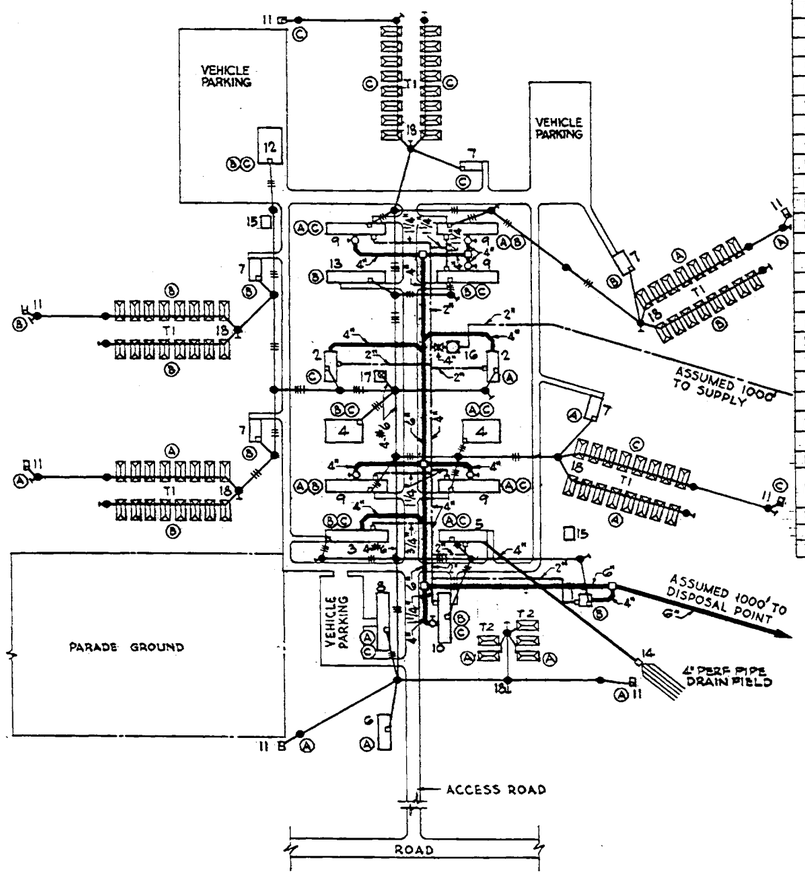


SITE LAYOUT

SCALE NO. 15

INST. NO. NT 3611 - STEEL FRAME BLDGS.

INST. NO. NT 3621 - WOOD FRAME BLDGS.



UTILITY LAYOUT

SCALE NO. 15

SCHEDULE OF FACILITIES

NO.	FACILITY	QTY	SIZE OR UNIT	DWG NO.
	TENTAGE WITH FRAMES			
T1	HOUSING - E M	80	16'X 32'	72-51
T2	HOUSING - OFFICERS	5	16'X32'	72-51
	BUILDINGS			
1	BATHHOUSE -120 MEN OR 80 OFFICERS	1	20'X20'	72-32
2	BATHHOUSE - 500 MAN	2	20'X50'	72-32
3	CAMP EXCHANGE	1	20'X100'	74-13
4	DAY ROOM	2	40'X60'	74-13
5	DISPENSARY - TROOP	1	20'X80'	55-11
6	GUARD HOUSE	1	20'X60'	74-13
7	HQ & UNIT SUPPLY - CO	5	20'X40'	61-11
8	HQ & UNIT SUPPLY - BN	1	20'X100'	61-11
9	KITCHEN & MESS HALL - 180 MAN	5	20'X100'	72-61
10	KITCHEN & MESS HALL-70 OFFICERS	1	20'X 80'	72-62
11	LATRINE, PIT TYPE, 8 SEATS	7	10'X 20'	72-36
12	SHOP - MOTOR REPAIR	1	40'X 60'	21-41
13	STOREHOUSE	1	20'X100'	44-11
	OTHER CONSTRUCTION			
	ROAD-2 LANE-6" STABILIZED STONE	0.24	MILE	85-31
	ROAD-1 LANE-4" STABILIZED STONE	0.30	MILE	85-31
	ROAD - 9' SERVICE-4" STABILIZED STONE	0.16	MILE	85-31
14	SEPTIC TANK	1	500 GAL	83-11
15	SUMP - FIRE PROTECTION	2	10,000 GAL	84-21
	VEHICLE PARKING-4" STABILIZED STONE	8	1000 SY	85-31
	SITE AREA	41	ACRES	—
16	WATER TANK	1	10,500 GAL	84-21
17	GENERATOR BLDG (IF REQD)	1	—	—
18	CB PANEL	7	2-112,20 AMP	—

UTILITIES

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS
WATER DISTRIBUTION	15,000 GPD	700325	84-21
SEWAGE	10,500 GPD	700326	83-15
ELECTRIC DISTRIBUTION	31.6 KW	700327	81-23

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' 200'

NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE

TRACED BY:

CHECKED BY: DEICHMANN

SUBMITTED BY: C. W. DEICHMANN

APPROVED: H. M. Williams DATE: 19 MAR 1969

CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: Multiple Agency

DATE Nov 1968

THEATER OF OPERATIONS

TROOP CAMP
1000 MAN
STD-ITO
SITE & UTILITY LAYOUTS

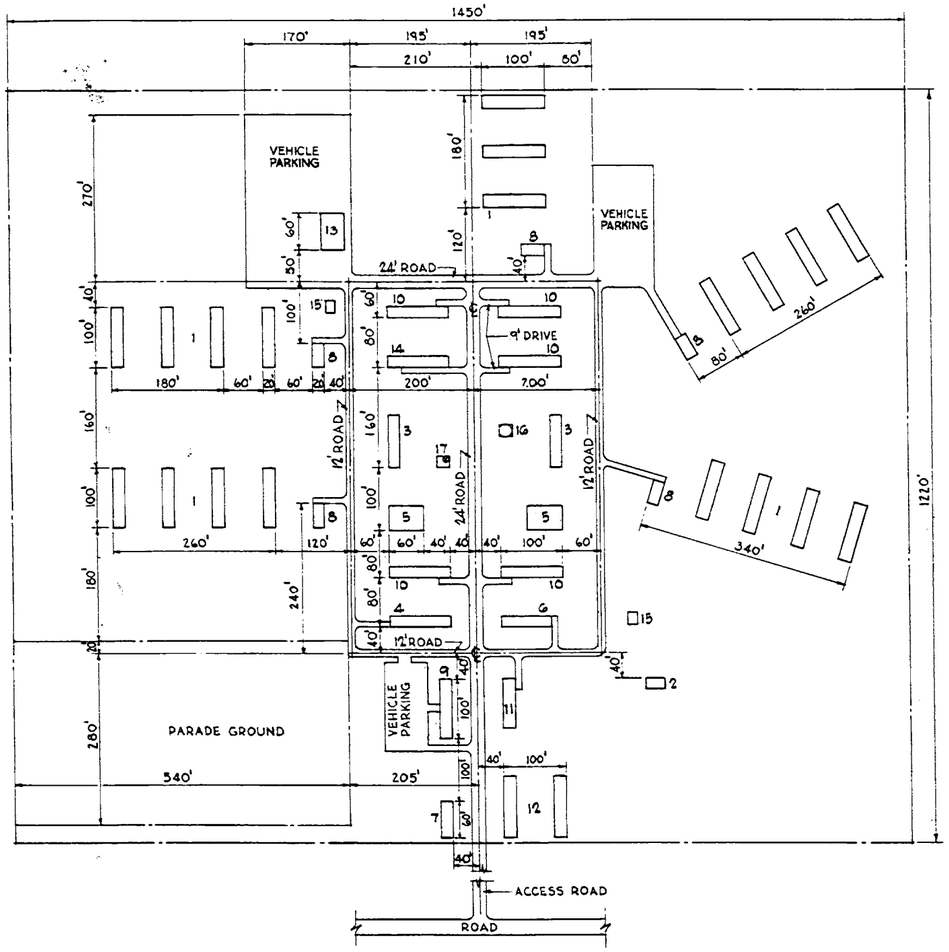
SCALE: AS NOTED

SPEC. NO.

DRAWING NUMBER: 70-03

SHEET 1 OF 2

70-03

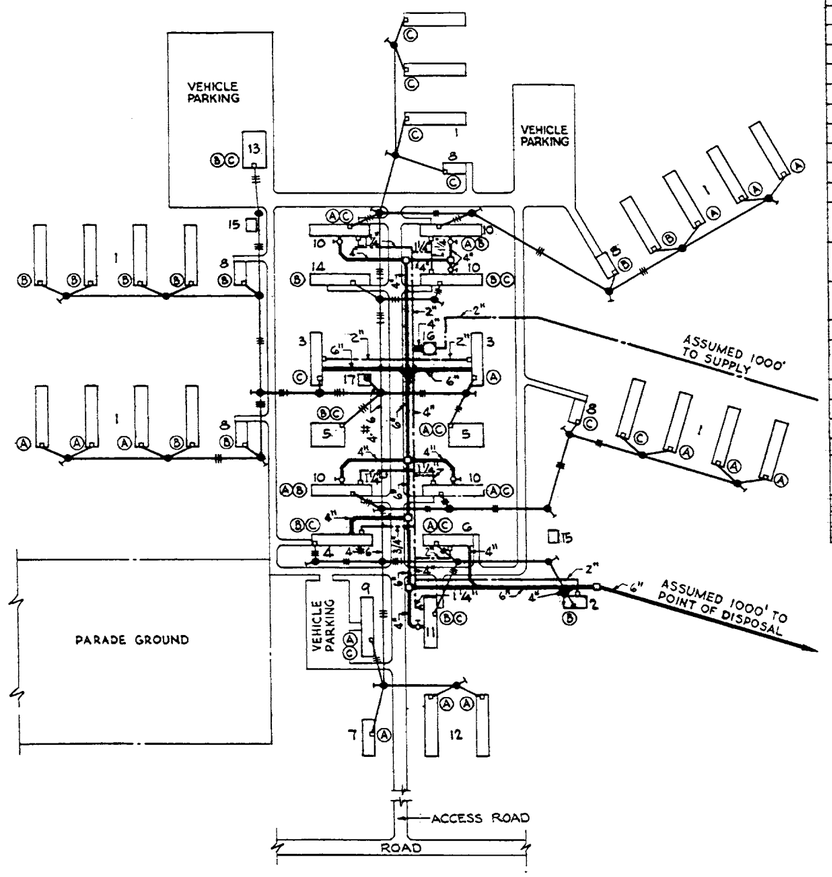


SITE LAYOUT

SCALE NO.15

INST. NO. NT 3G11 - STEEL FRAME BLDGS.

INST. NO. NT 3G21 - WOOD FRAME BLDGS.



UTILITY LAYOUT

SCALE NO.15

SCHEDULE OF FACILITIES

NO.	FACILITY	QTY	SIZE OR UNIT	DWG NO.
	BUILDINGS			
1	BARRACKS - 50 MAN	19	20'X100'	72-21
2	BATHHOUSE & LATRINE-WB-160MAN	1	20'X30'	72-32
3	BATHHOUSE & LATRINE-WB-500MAN	2	20'X80'	72-32
4	CAMP EXCHANGE	1	20'X100'	74-13
5	DAY ROOM	2	40'X60'	74-13
6	DISPENSARY - TROOP	1	20'X80'	55-11
7	GUARD HOUSE	1	20'X60'	74-13
8	HQ & UNIT SUPPLY - CO	5	20'X40'	61-11
9	HQ & UNIT SUPPLY - BN	1	20'X100'	61-11
10	KITCHEN & MESS HALL - 180 MAN	5	20'X100'	72-61
11	KITCHEN & MESS HALL-70 OFFICERS	1	20'X 80'	72-62
12	QUARTERS-OFFICERS-24	2	20'X100'	72-21
13	SHOP-MOTOR REPAIR	1	40'X 60'	21-41
14	STOREHOUSE	1	20'X100'	44-11
	OTHER CONSTRUCTION			
	ROAD-2 LANE, 6" STABILIZED STONE, 1" COLD MIX SURFACE	0.24	MILE	85-31
	ROAD-1 LANE, 4" STABILIZED STONE, 1" COLD MIX SURFACE	0.30	MILE	85-31
	ROAD - 9' SERVICE-4" STABILIZED STONE, 1" COLD MIX SURFACE	0.16	MILE	85-31
15	SUMP - FIRE PROTECTION	2	10,000 GAL	84-21
	VEHICLE PARKING-4" STABILIZED STONE, 1" COLD MIX SURFACE	8	1000 SY	85-31
	SITE AREA	41	ACRES	—
16	WATER TANK	1	10,500 GAL	84-21
17	GENERATOR BLDG (IF REQD)	1	—	—

UTILITIES

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS
WATER DISTRIBUTION	25,000 GPD	700340	84-21
SEWAGE	17,500 GPD	700371	83-15
ELECTRIC DISTRIBUTION	31.4 KW	700372	81-23

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' 200'

NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. B. DEICHMANN
APPROVED: G. Eckam
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

TROOP CAMP
1000 MAN
STD-TPR
SITE & UTILITY LAYOUTS

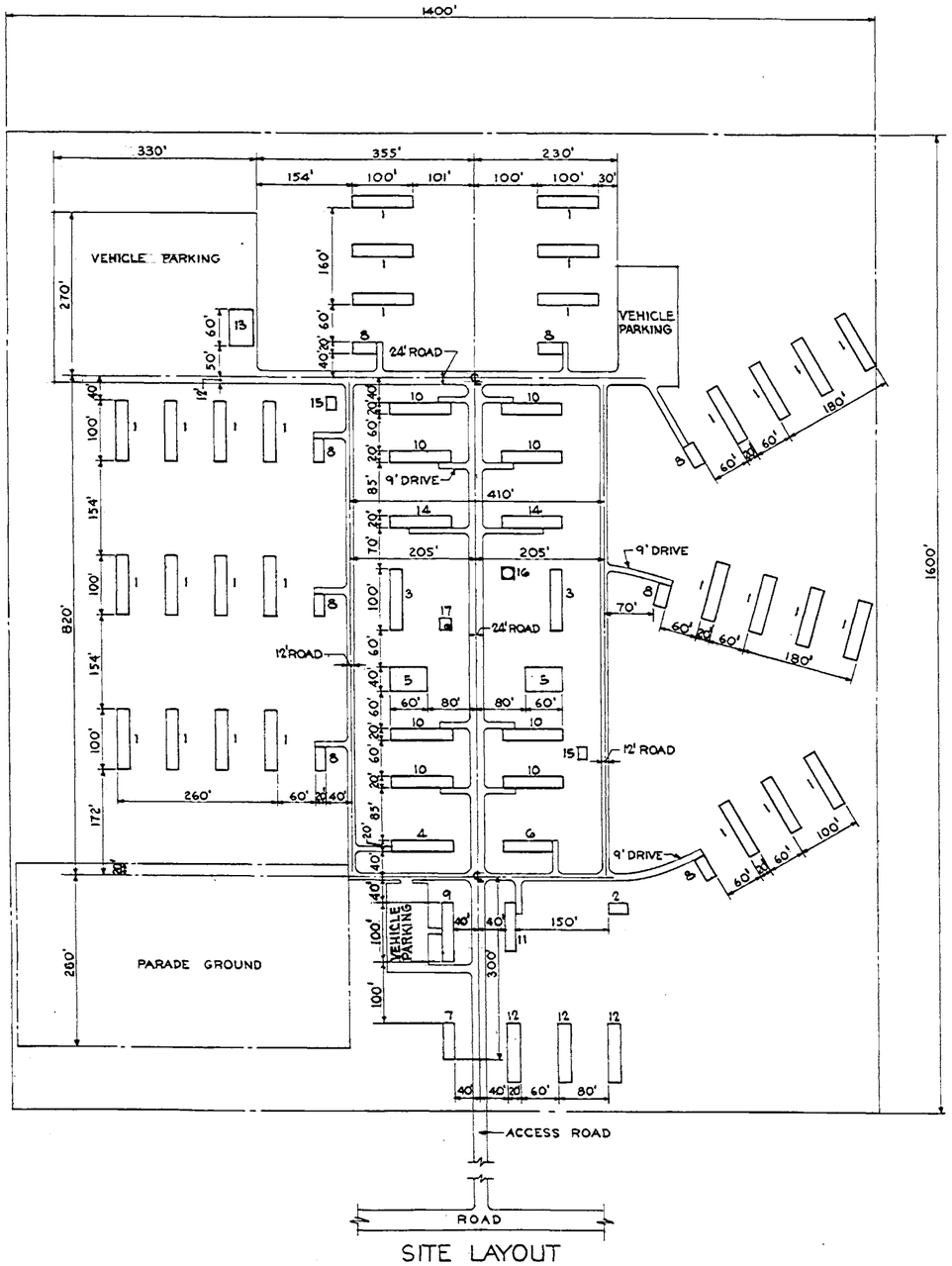
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE Nov 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-03
SHEET 2 OF 2

CORPS OF ENGINEERS

U. S. ARMY

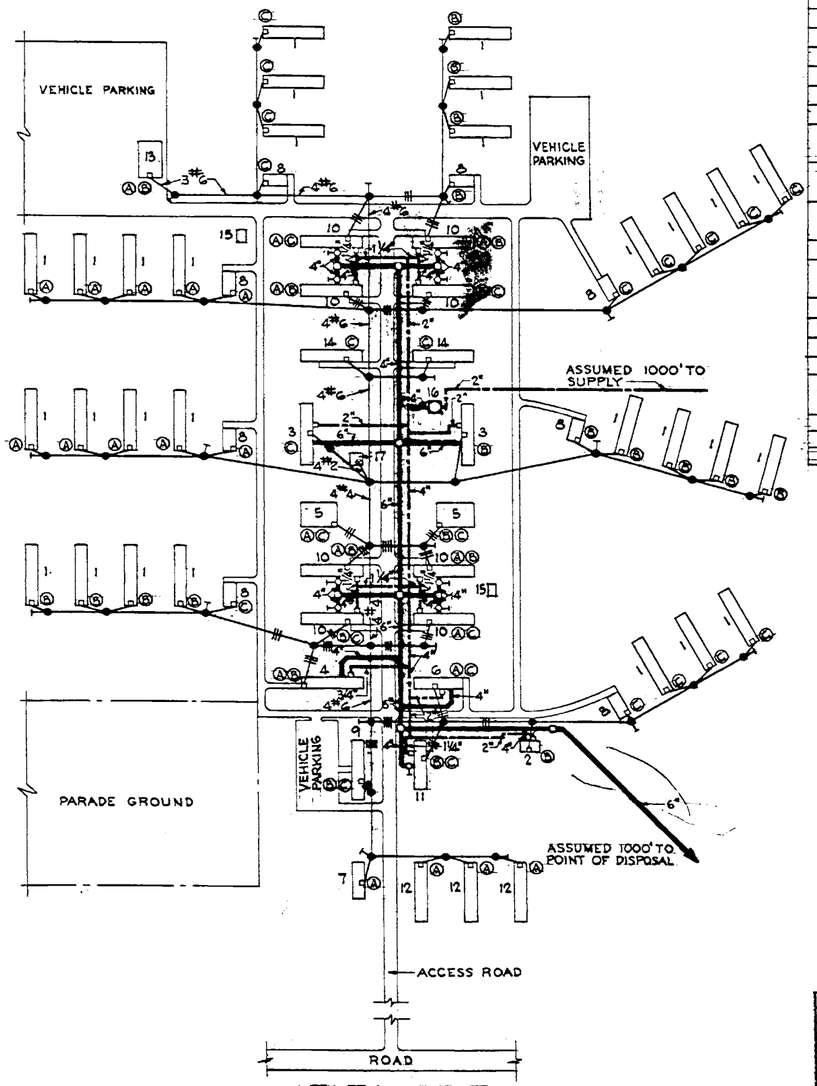


SITE LAYOUT

SCALE NO. 15

INST. NO. NT 4611 STEEL FRAME BLDGS.

INST. NO. NT 4621 WOOD FRAME BLDGS.



UTILITY LAYOUT

SCALE NO. 15

SCHEDULE OF FACILITIES

NO.	FACILITY	QTY	SIZE OR UNIT	DWG. NO.
	BUILDINGS			
1	BARRACKS - 50 MAN	29	20'X100'	72-21
2	BATHHOUSE & LATRINE-WB- 160 MAN	1	20'X30'	72-32
3	BATHHOUSE & LATRINE-WB- 720 MAN	2	20'X100'	72-35
4	CAMP EXCHANGE	1	20'X100'	74-13
5	DAY ROOM	2	40'X60'	74-13
6	DISPENSARY - TROOP	1	20'X80'	55-11
7	GUARD HOUSE	1	20'X60'	74-13
8	HQ & UNIT SUPPLY-CO	8	20'X40'	61-11
9	HQ & UNIT SUPPLY-BN	1	20'X100'	61-11
10	KITCHEN & MESS HALL-180 MAN	8	20'X100'	72-61
11	KITCHEN & MESS HALL-70 OFFICERS	1	20'X80'	72-62
12	QUARTERS-OFFICERS-24	3	20'X100'	72-21
13	SHOP-MOTOR REPAIR	1	40'X60'	21-41
14	STOREHOUSE	2	20'X100'	44-11
	OTHER CONSTRUCTION			
	ROAD-2 LANE-6" STABILIZED STONE 1" COLD MIX SURFACE	0.32	MILE	85-31
	ROAD-1 LANE-4" STABILIZED STONE 1" COLD MIX SURFACE	0.39	MILE	85-31
	ROAD-9' SERVICE-4" STABILIZED STONE 1" COLD MIX SURFACE	0.26	MILE	85-31
15	SUMP-FIRE PROTECTION	2	10,000GAL	84-21
	VEHICLE PARKING-4" STABILIZED STONE 1" COLD MIX SURFACE	12	1000 SY	85-31
	SITE AREA	51.4	ACRES	—
16	WATER TANK	1	10,500GAL	84-21
17	GENERATOR BLDG (IF REQD)	1	—	—

UTILITIES

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS
WATER DISTRIBUTION	37,500 GPD	700470	84-21
SEWAGE	26,250 GPD	700471	83-15
ELECTRIC DISTRIBUTION	39 KW	700472	81-23

SYMBOL	DESCRIPTION REVISIONS GRAPHIC SCALES	DATE	APPROVAL
	0 50' 100' 200' NO. 15		

MAYER, BEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

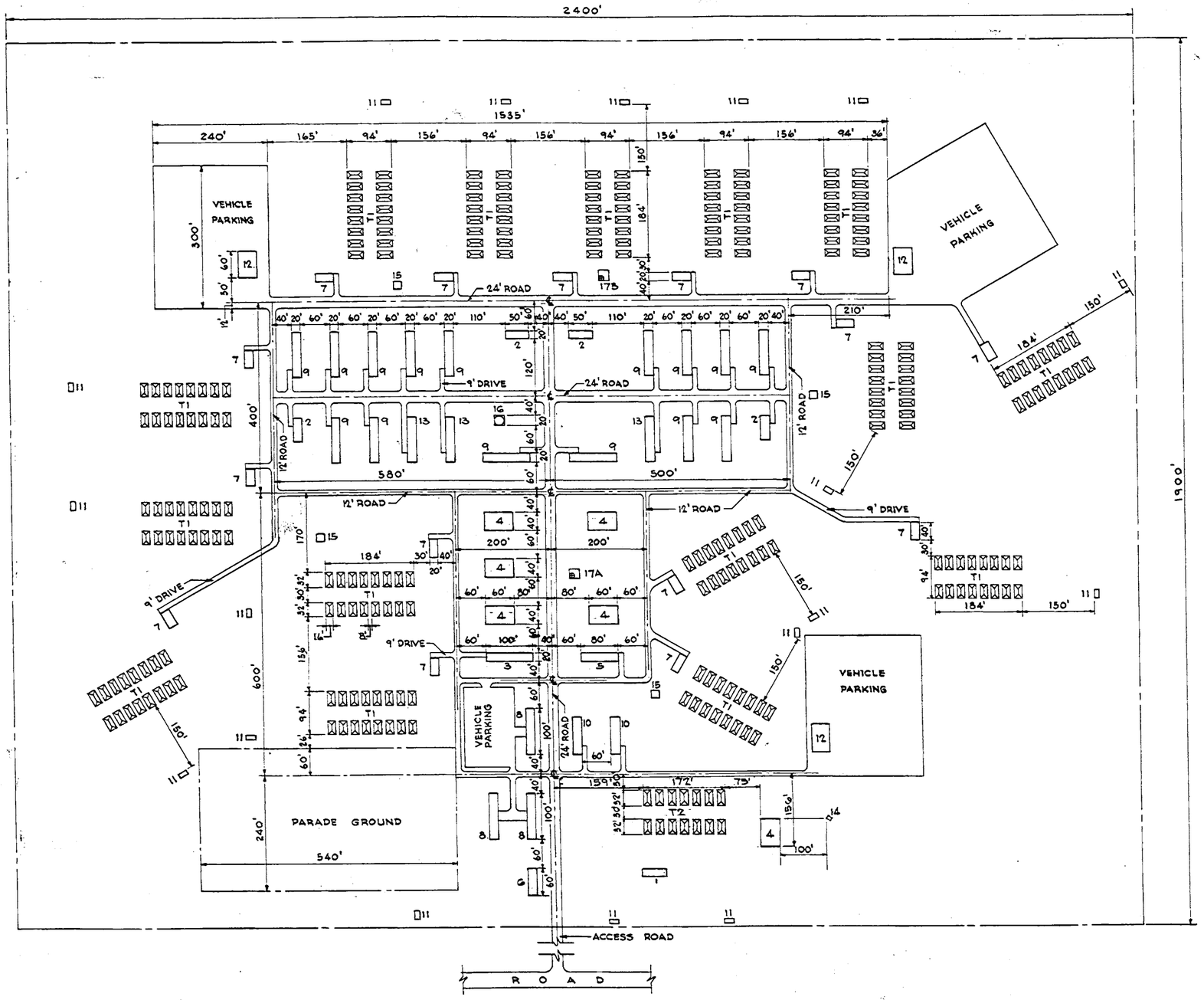
DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES DIVISION
APPROVED: [signature] for CHIEF, ENGINEERING DIVISION, WES, CORPS, CE.
DATE: 19 MAR 1969

THEATER OF OPERATIONS

TROOP CAMP
1500 MAN
STD-TPR
SITE & UTILITY LAYOUTS

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE Nov 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-04
SHEET 2 OF 2



SITE LAYOUT

SCALE NO. 15

INST. NO. NT 5411 - STEEL FRAME BLDGS.

INST. NO. NT 5421 - WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	QTY	SIZE OR UNIT	DWG NO.
	TENTAGE WITH FRAMES			
T1	HOUSING - E.M.	240	16'X32'	72-51
T2	HOUSING - OFFICERS	14	16'X32'	72-51
	BUILDINGS			
1	BATHHOUSE - 500 MAN	1	20'X50'	72-32
2	BATHHOUSE - 720 MAN	4	20'X50'	72-35
3	CAMP EXCHANGE	1	20'X100'	74-13
4	DAY ROOM	6	40'X60'	74-13A
5	DISPENSARY - TROOP	1	20'X80'	55-11
6	GUARD HOUSE	1	20'X60'	74-13
7	HQ & UNIT SUPPLY - CO.	15	20'X40'	61-11
8	HQ & UNIT SUPPLY - BN.	3	20'X100'	61-11
9	KITCHEN & MESS HALL - 150 MAN	15	20'X100'	72-61
10	KITCHEN & MESS HALL - 70 OFFICERS	2	20'X80'	72-62
11	LATRINE, PIT TYPE, 5 SEATS	18	10'X20'	72-36
12	SHOP - MOTOR REPAIR	3	40'X60'	21-41
13	STOREHOUSE	3	20'X100'	44-11
	OTHER CONSTRUCTION			
	ROAD - DOUBLE LANE - 6" STABILIZED STONE	0.69	MILE	85-31
	ROAD - SINGLE LANE - 4" STABILIZED STONE	0.78	MILE	85-31
	ROAD - 9' SERVICE - 4" STABILIZED STONE	0.48	MILE	85-31
14	SEPTIC TANK	1	500 GAL	83-11
15	SUMP - FIRE PROTECTION	4	10000 GAL	84-21
	VEHICLE PARKING - 4" STABILIZED STONE	24	1000 SY	85-31
	SITE AREA	104.7	ACRES	—
16	WATER TANK	1	21000 GAL	84-21
17	A & B GENERATOR BLDGS. (IF REQD)	2	—	—
18	C B PANEL	21	2-1R, 1S AMP	—

UTILITIES

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	45,000 GPD	700310	84-21
SEWAGE	31,500 GPD	700520	85-15
ELECTRIC DISTRIBUTION	89.4 KW	700527	81-25

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' 200'

NO. 15

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

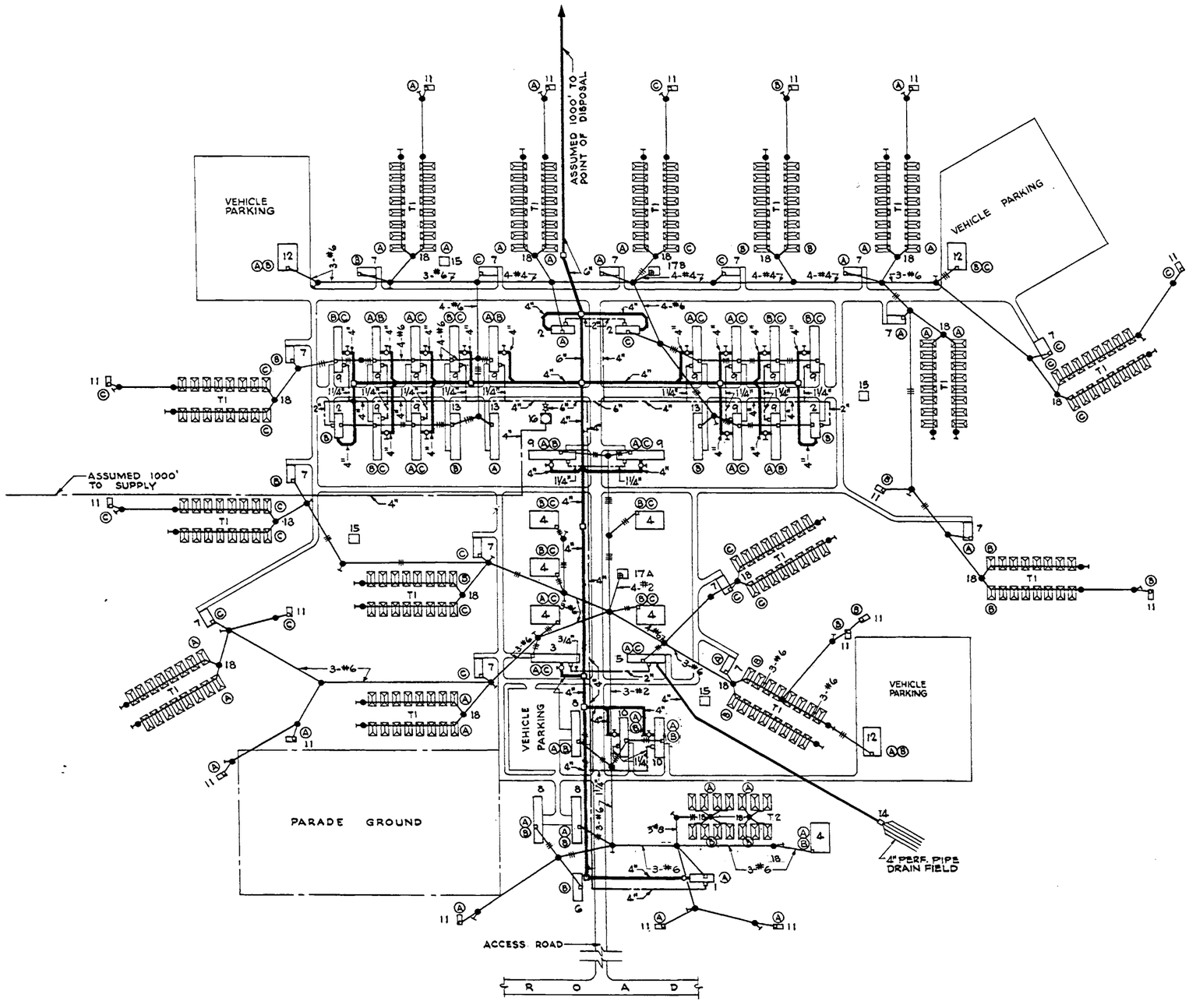
THEATER OF OPERATIONS

TROOP CAMP, 3000 MAN
STD-1TR
SITE LAYOUT

APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE Nov 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-05
SHEET 1 OF 4



UTILITY LAYOUT
SCALE NO. 15

FACILITIES	
NO.	FACILITY
	TENTAGE WITH FRAMES
T1	HOUSING - E.M.
T2	HOUSING - OFFICERS
	BUILDINGS
1	BATHHOUSE - 500 MAN
2	BATHHOUSE - 720 MAN
3	CAMP EXCHANGE
4	DAY ROOM
5	DISPENSARY - TROOP
6	GUARD HOUSE
7	HQ & UNIT SUPPLY - CO.
8	HQ & UNIT SUPPLY - BN.
9	KITCHEN & MESS HALL - 180 MAN
10	KITCHEN & MESS HALL - 70 OFFICERS
11	LATRINE, PIT TYPE, 8 SEATS
12	SHOP - MOTOR REPAIR
13	STOREHOUSE
	OTHER CONSTRUCTION
14	SEPTIC TANK
15	SUMP - FIRE PROTECTION
16	WATER TANK
17	A&B - GENERATOR BLDGS. (IF REQD)
18	C.B. PANEL - 2-1P, 15 AMP

ELECTRICAL NOTES

CONNECTED LOAD	
GENERATOR BLDG 17A	41.68 KW
GENERATOR BLDG 17B	36.01 KW
TOTAL CONNECTED LOAD	77.69 KW

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 15

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

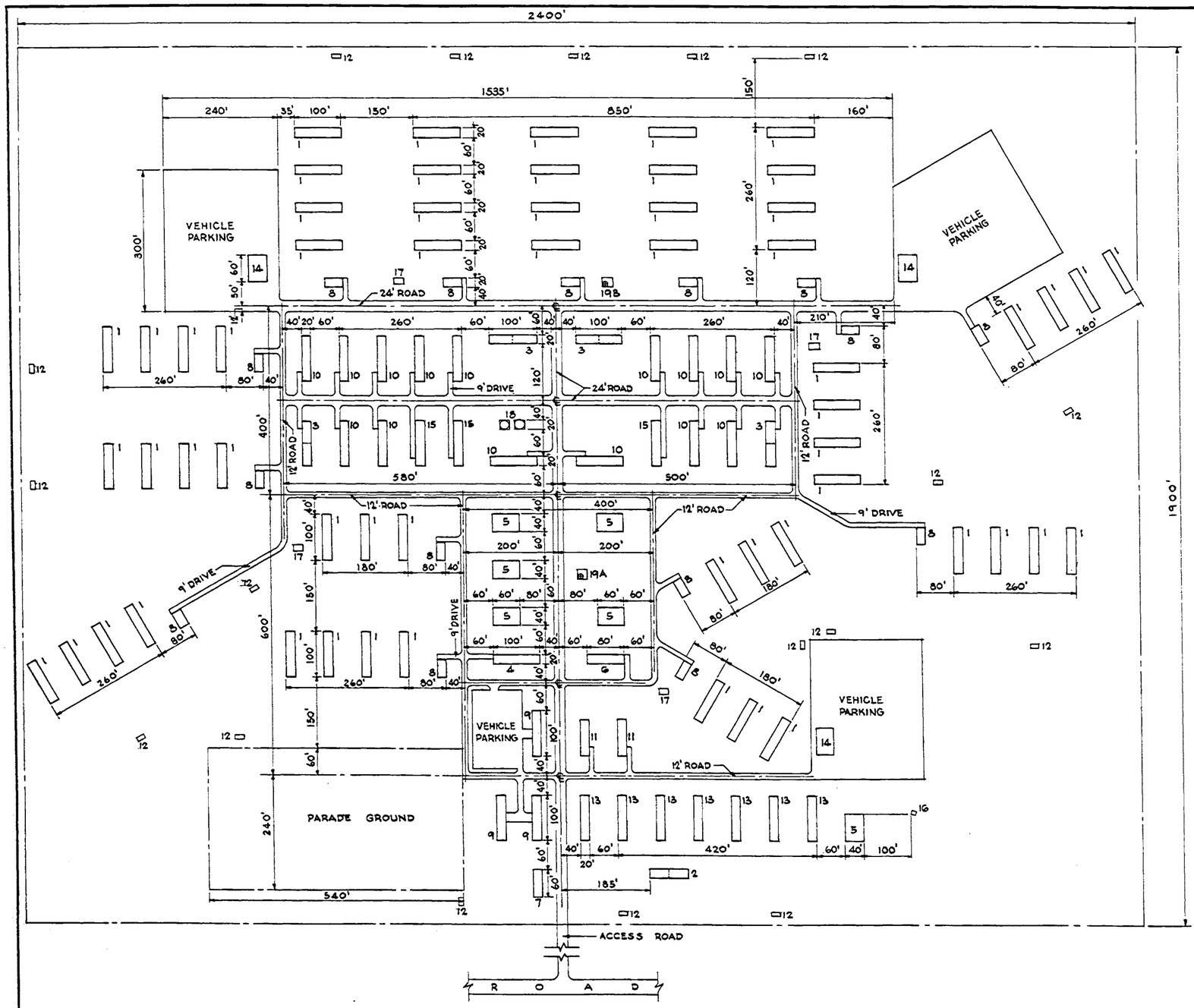
THEATER OF OPERATIONS

TROOP CAMP
3000 MAN
STD-IT2
UTILITY LAYOUT

APPROVED: H.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1963

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE Nov 1960

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-05
SHEET 2 OF 4



SITE LAYOUT

SCALE NO. 15

STD-TPQ { INST. NO. NT 5G11 - STEEL FRAME BLDGS.
INST. NO. NT 5G21 - WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	VOID QTY.	VOID SIZE OR UNIT	VOID DWG. NO.	STD-TPQ INST. NO. NT 5G11, NT 5G21 QTY.	STD-TPQ SIZE OR UNIT	STD-TPQ DWG. NO.
	BUILDINGS						
1	BARRACKS - 50 MAN	57	20'X100'	72-21	57	20'X100'	72-21
2	BATHHOUSE & LATRINE-WB-500MAN				1	20'X80'	72-32
2	BATHHOUSE - 500 MAN	1	20'X50'	72-32			
3	BATHHOUSE & LATRINE-WB-720MAN				4	20'X100'	72-35
3	BATHHOUSE - 720 MAN	4	20'X50'	72-35			
4	CAMP EXCHANGE	1	20'X100'	74-13	1	20'X100'	74-13
5	DAY ROOM	6	40'X60'	74-13	6	40'X60'	74-13
6	DISPENSARY- TROOP	1	20'X80'	55-11	1	20'X80'	55-11
7	GUARD HOUSE	1	20'X60'	74-13	1	20'X60'	74-13
8	HQ & UNIT SUPPLY - CO	15	20'X40'	61-11	15	20'X40'	61-11
9	HQ & UNIT SUPPLY- BN	3	20'X100'	61-11	3	20'X100'	61-11
10	KITCHEN & MESS HALL-180 MAN	15	20'X100'	72-61	15	20'X100'	72-61
11	KITCHEN & MESS HALL-70 OFFICER	2	20'X80'	72-62	2	20'X80'	72-62
12	LATRINE, PIT TYPE, 8 SEATS	18	10'X20'	72-36			
13	QUARTERS - OFFICERS - 24	7	20'X100'	72-21	7	20'X100'	72-21
14	SHOP-MOTOR REPAIR	3	40'X60'	21-41	3	40'X60'	21-41
15	STORSHOUSE	3	20'X100'	41-11	3	20'X100'	44-11
	OTHER CONSTRUCTION						
	ROAD, 2 LANE, 6" STABILIZED STONE	0.69	MILE	85-31			
	ROAD, 1 LANE, 4" STABILIZED STONE	0.78	MILE	85-31			
	ROAD, 9' SERVICE, 4" STABILIZED STONE	0.48	MILE	85-31			
	ROAD, 2 LANE, 6" STONE, 1" COLD MIX				0.69	MILE	85-31
	ROAD, 1 LANE, 4" STONE, 1" COLD MIX				0.78	MILE	85-31
	ROAD, 9' SERVICE, 4" STONE, 1" COLD MIX				0.48	MILE	85-31
16	SEPTIC TANK	1	500 GAL.	83-11			
17	SUMP-FIRE PROTECTION	4	10,000 GAL	84-21	4	10000 GAL	84-21
	VEHICLE PARKING, 4" STABILIZED STONE	24	1000 SY.	85-31			
	VEHICLE PARKING, 4" STONE, 1" COLD MIX				24	1000 SY	85-31
18	WATER TANK	1	21,000 GAL.	84-21	2	21,000 GAL.	84-21
19	A & B GENERATOR BLDGS. (IF REQD)	2			2		
	SITE AREA	104.7	ACRE	-	104.7	ACRE	-

UTILITIES ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS. FOR DETAILS	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	45000 GPD	700510	84-21	75000 GPD	700570	84-21
SEWAGE	315000 GPD	700541	83-15	525000 GPD	700571	83-15
ELECTRIC DISTRIBUTION	77.5 KW	700542	81-23	78.4 KW	700572	81-23

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 50' 100' 200'
NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

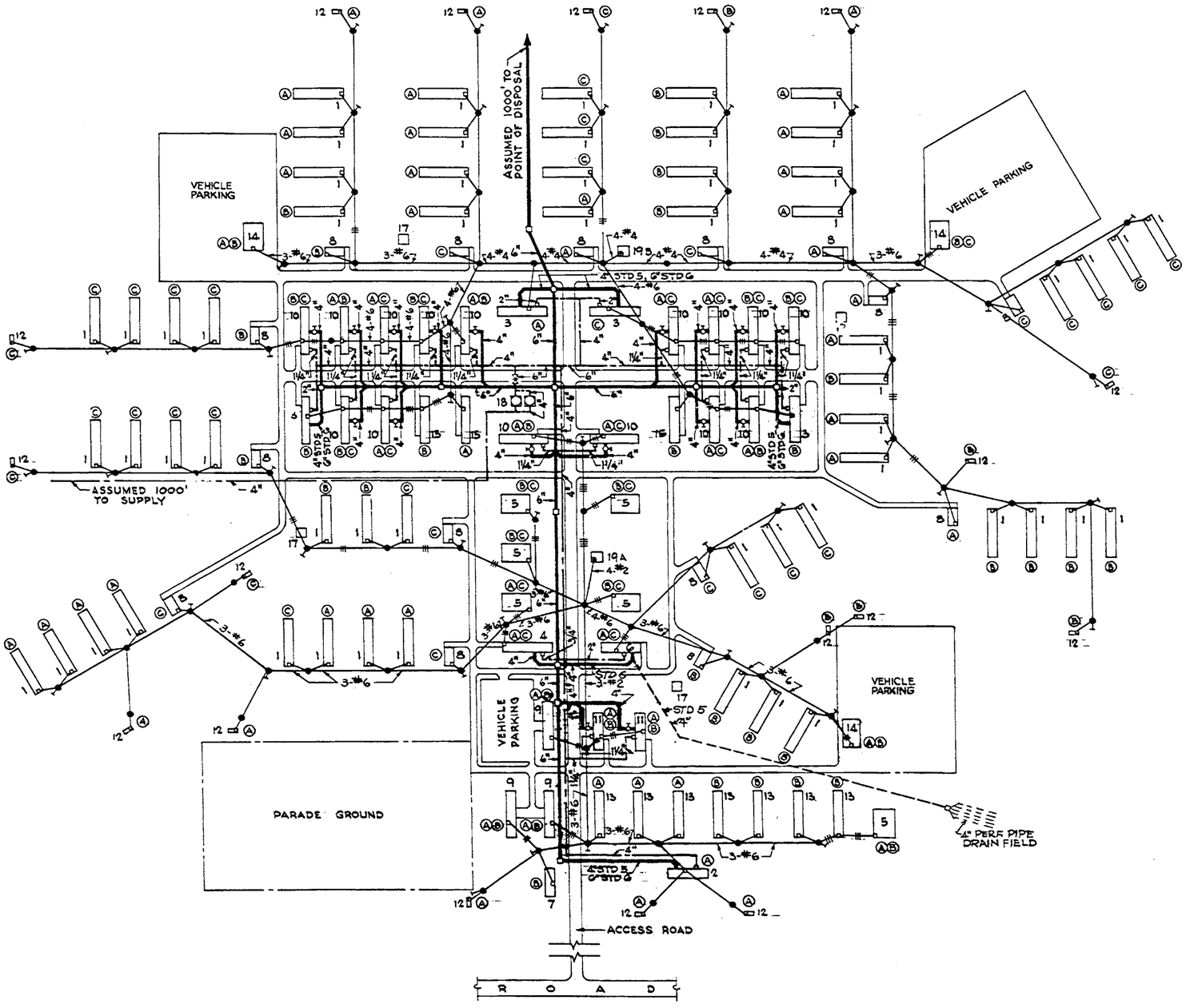
THEATER OF OPERATIONS

TROOP CAMP
3000 MAN
STD-TPQ
SITE LAYOUT

APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE: Nov. 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-05
SHEET 3 OF 4



UTILITY LAYOUT
SCALE NO. 15

	NO.	FACILITY
		BUILDING
STD 6	1	BARRACKS - 50 MAN
STD 6	2	BATHHOUSE & LATRINE-WB-500 MAN
STD 6	3	BATHHOUSE & LATRINE-WB-720 MAN
	4	CAMP EXCHANGE
	5	DAY ROOM
	6	DISPENSARY - TROOP
	7	GUARD HOUSE
	8	HQ & UNIT SUPPLY - CO.
	9	HQ & UNIT SUPPLY - BN.
	10	KITCHEN & MESS HALL - 180 MAN
	11	KITCHEN & MESS HALL - 70 OFFICERS
	13	QUARTERS - OFFICERS - 24
	14	SHOP - MOTOR REPAIR
	15	STOREHOUSE
STD 5	2	BATHHOUSE - 500 MAN
STD 5	3	BATHHOUSE - 720 MAN
STD 5	12	LATRINE - PIT TYPE, 8 SEATS
		OTHER CONSTRUCTION
	17	SUMP - FIRE PROTECTION
	18	WATER TANK
	19	A&B GENERATOR BLDGS. (IF REQD)
STD 5	16	SEPTIC TANK

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	STD. 5	STD. 6
GENERATOR BLDG. 19A	41.65 KW	42.20 KW
GENERATOR BLDG. 19B	35.89 KW	36.24 KW
TOTAL CONNECTED LOAD	77.54 KW	78.44 KW

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 15

MAYER, BRAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS

TROOP CAMP
3000 MAN
STD-TPR
UTILITY LAYOUT

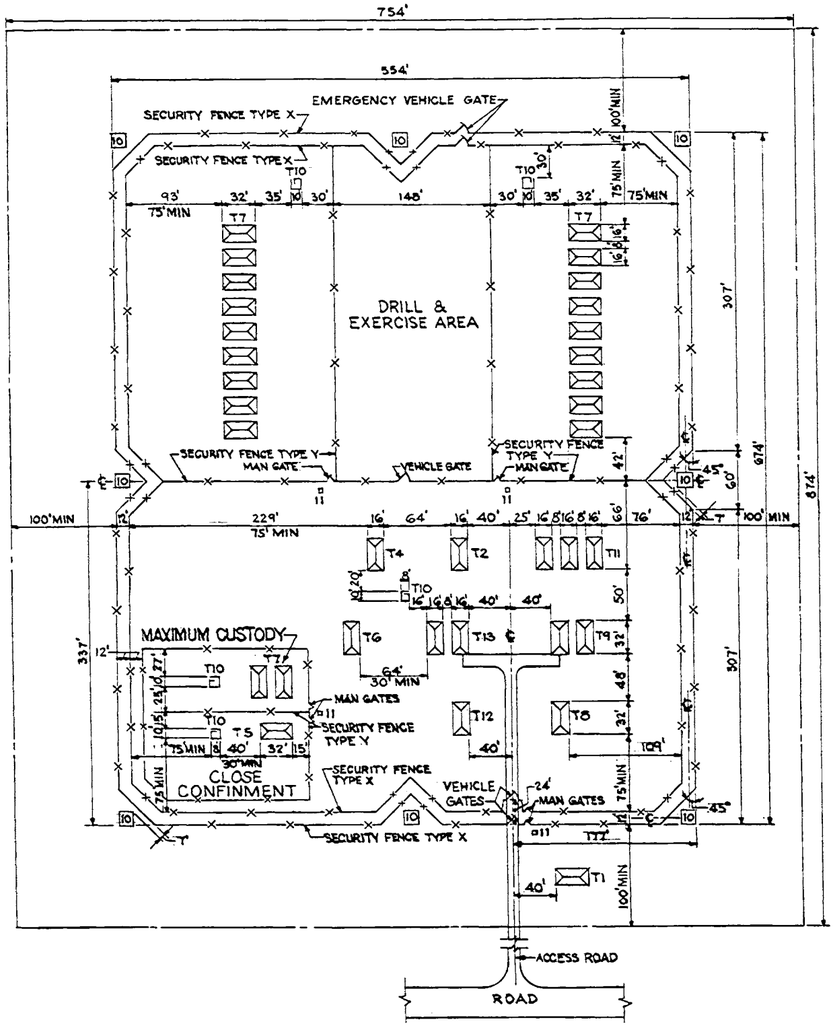
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY: Multiple Agency
DATE: Nov 1968

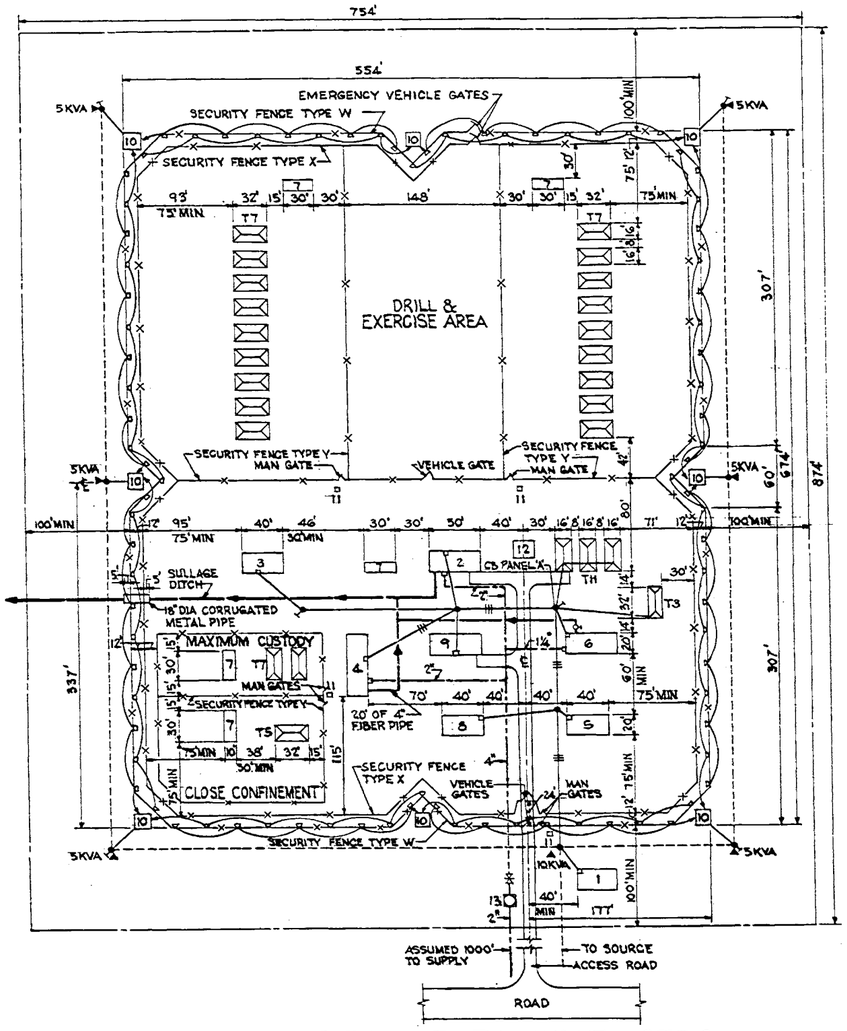
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-05
SHEET 4 OF 4

CORPS OF ENGINEERS

U. S. ARMY



SITE LAYOUT - STD INT
SCALE NO. 14
INST. NO. ND 1015 TENTAGE



SITE & UTILITY LAYOUT - STD 3
SCALE NO. 14
VOID

FOR GUARD TOWER PLACEMENT REFER TO (140) DWG NO. 99-98

SCHEDULE OF FACILITIES

NO.	FACILITY	STD.-INT INST. NO. ND 1015 QTY	SIZE OR UNIT	DWG. NO.	VOID QTY	SIZE OR UNIT	DWG. NO.
TENTAGE WITHOUT FRAMES							
T1	ADMINISTRATION	1	16' X 32'				
T2	BATH	1	16' X 32'				
T3	CAMP EXCHANGE				1	16' X 32'	
T4	CLASSROOM	1	16' X 32'				
T5	CLOSE CONFINEMENT	1	16' X 32'		1	16' X 32'	
T6	DISPENSARY	1	16' X 32'				
T7	HOUSING	20	16' X 32'		20	16' X 32'	
T8	INTERVIEW	1	16' X 32'				
T9	KITCHEN	2	16' X 32'				
T10	LATRINE-SCREEN TYPE	5	8' X 10'				
T11	MESS	3	16' X 32'		3	16' X 32'	
T12	PROCESSING	1	16' X 32'				
T13	SUPPLY	2	16' X 32'				
BUILDINGS							
1	ADMINISTRATION				1	20' X 40'	61-11
2	BATHHOUSE-250 MAN				1	20' X 40'	72-32
3	CLASSROOM				1	20' X 40'	61-11
4	DISPENSARY-TROOP				1	20' X 60'	55-11
5	INTERVIEW				1	20' X 40'	61-11
6	KITCHEN-250 MAN				1	20' X 50'	72-61
7	LATRINE-BUCKET TYPE				5	10' X 30'	72-36
8	PROCESSING				1	20' X 40'	61-11
9	STOREHOUSE				1	20' X 50'	44-11
OTHER CONSTRUCTION							
	FENCE-SECURITY-TYPE W				2.46	1000 FT	71-09
	FENCE-SECURITY-TYPE X	4.87	1000 FT	71-09	2.41	1000 FT	71-09
	FENCE-SECURITY-TYPE Y	1.90	1000 FT	71-09	1.92	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	5	EACH	71-09	5	EACH	71-09
10	GUARD TOWER	8	16' X 16'	71-12	8	16' X 16'	71-12
	ROAD, 1 LANE, DRAINED & GRADED	0.08	MILE	85-31			
	ROAD, 1 LANE, 4" STABILIZED STONE				0.08	MILE	85-31
11	SENTRY BOX	4	4' X 4'		4	4' X 4'	
12	SUMP-FIRE PROTECTION				1	10000 GAL	84-21
13	WATER TANK				1	4200 GAL	84-21
	SITE AREA	15.1	ACRE		15.1	ACRE	

UTILITIES	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS FOR DETAILS
ENGINEER SERVICES REQUIRED						
WATER DISTRIBUTION	125GPD			3750GPD	702110	84-21
SEWAGE					702111	83-15
ELECTRIC DISTRIBUTION				26.4 KW	702112	81-21, 81-22, 81-23

VOID

STD 3 - PLUMBING NOTES

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 150'
NO. 14

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

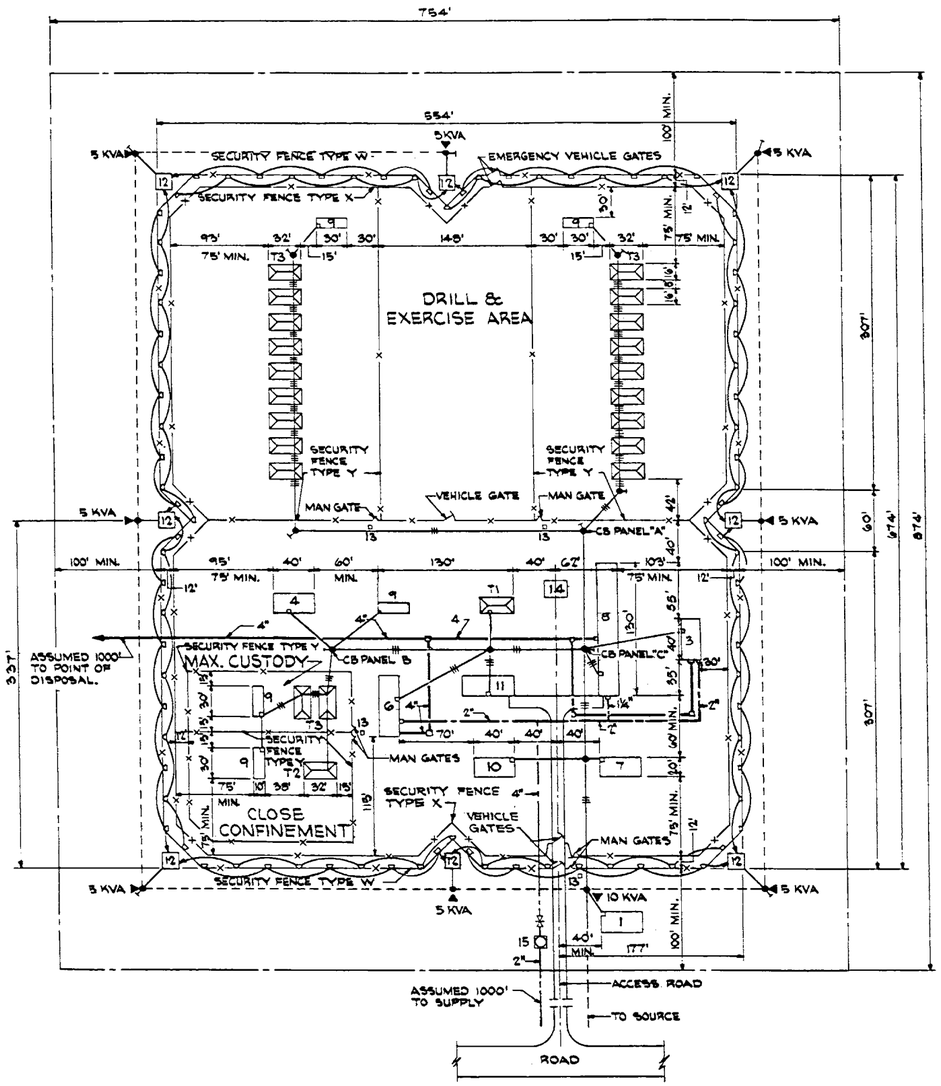
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ILYUS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, ARCHITECTURAL BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1963
APPROVED FOR PROPONENT AGENCY: DATE 11 Feb 63

THEATER OF OPERATIONS
MILITARY PRISONER STOCKADE
250 MAN
STD - INT
SITE & UTILITY LAYOUTS

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 70-21
SHEET 1 OF 2

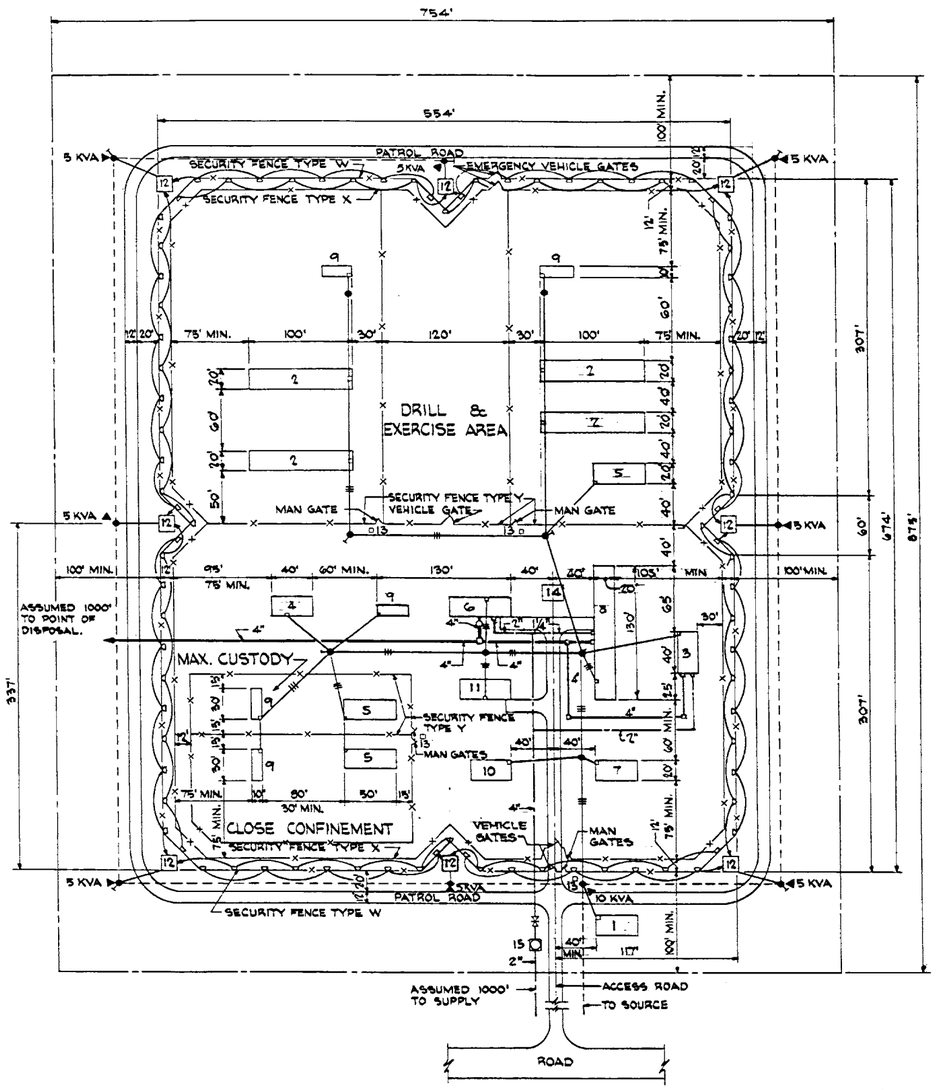


SITE & UTILITY LAYOUT - STD 4

SCALE NO. 14

INST. NOS. ND1021 STL FRAME BLDGS., ND1031 WOOD FRAME BLDGS.

FOR GUARD TOWER PLACEMENT REFER TO (14-D) DWG. NO. 99-98



SITE & UTILITY LAYOUT - STD-TPR

SCALE NO. 14

INST. NOS. ND1041 STL FRAME BLDGS, ND1051 WOOD FRAME BLDGS.

FOR GUARD TOWER PLACEMENT REFER TO (14-D) DWG. NO. 99-98

SCHEDULE OF FACILITIES

NO.	FACILITY	STD-1TR INST. NO. ND1021, ND1031 QTY.	SIZE OR UNIT	DWG. NO.	STD-TPR INST. NO. ND1041, ND1051 QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITH FRAMES						
T1	CAMP EXCHANGE	1	16' X 32'	72-51			
T2	CLOSE CONFINEMENT	1	16' X 32'	72-51			
T3	HOUSING	20	16' X 32'	72-51			
	BUILDINGS						
1	ADMINISTRATION	1	20'X40'	61-11	1	20'X40'	61-11
2	BARRACKS - 50 MAN				4	20'X100'	72-21
3	BATHHOUSE - 250 MAN	1	20'X40'	72-32	1	20'X40'	72-32
4	CLASSROOM	1	20'X40'	61-11	1	20'X40'	61-11
5	BARRACKS - 25 MAN				3	20'X50'	72-21
6	DISPENSARY - TROOP	1	20'X60'	55-11	1	20'X60'	55-11
7	INTERVIEW	1	20'X40'	61-11	1	20'X40'	61-11
8	KITCHEN & MESS HALL - 250 MAN	1	20'X130'	72-61	1	20'X130'	72-61
9	LATRINE-BUCKET TYPE	5	10'X30'	72-36	5	10'X30'	72-36
10	PROCESSING	1	20'X40'	61-11	1	20'X40'	61-11
11	STOREHOUSE	1	20'X50'	44-11	1	20'X50'	44-11
	OTHER CONSTRUCTION						
	FENCE - SECURITY - TYPE W	2.46	1000 FT.	87-21	2.46	1000 FT.	71-09
	FENCE - SECURITY - TYPE X	2.36	1000 FT.	71-09	2.71	1000 FT.	71-09
	FENCE - SECURITY - TYPE Y	2.0	1000 FT.	71-09	1.71	1000 FT.	71-09
	FENCE - SECURITY - VEHICLE & MAN GATE	5	EACH	71-09	5	EACH	71-09
12	GUARD TOWER	8	16' X 16'	71-12	8	16' X 16'	71-12
	ROAD, 1 LANE, 4" STABILIZED STONE	0.08	MILE	85-31	0.08	MILE	85-31
	ROAD, PATROL, 1 LANE GRADED				0.50	MILE	85-31
13	SENTRY BOX	4	4' X 4'		4	4' X 4'	
14	SUMP - FIRE PROTECTION	1	10,000 GAL	84-21	1	10,000 GAL	84-21
15	WATER TANK	1	4200 GAL	84-21	1	4200 GAL	84-21
	SITE AREA	15.1	ACRE		15.1	ACRE	
	UTILITIES						
	ENGINEER SERVICES REQUIRED	DEMAND	FACIL. NO.	DWG. FOR DETAILS	DEMAND	FACIL. NO.	DWG. FOR DETAILS
	WATER DISTRIBUTION	3750 GPD	702110	84-21	3750 GPD	702110	84-21
	SEWAGE	2625 GPD	702126	83-15	2625 GPD	702126	83-15
	ELECTRIC DISTRIBUTION	25.6 KW	702127	81-23	29.5 KW	702142	81-23 81-22 81-21

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 50' 100' 150'

NO. 14

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

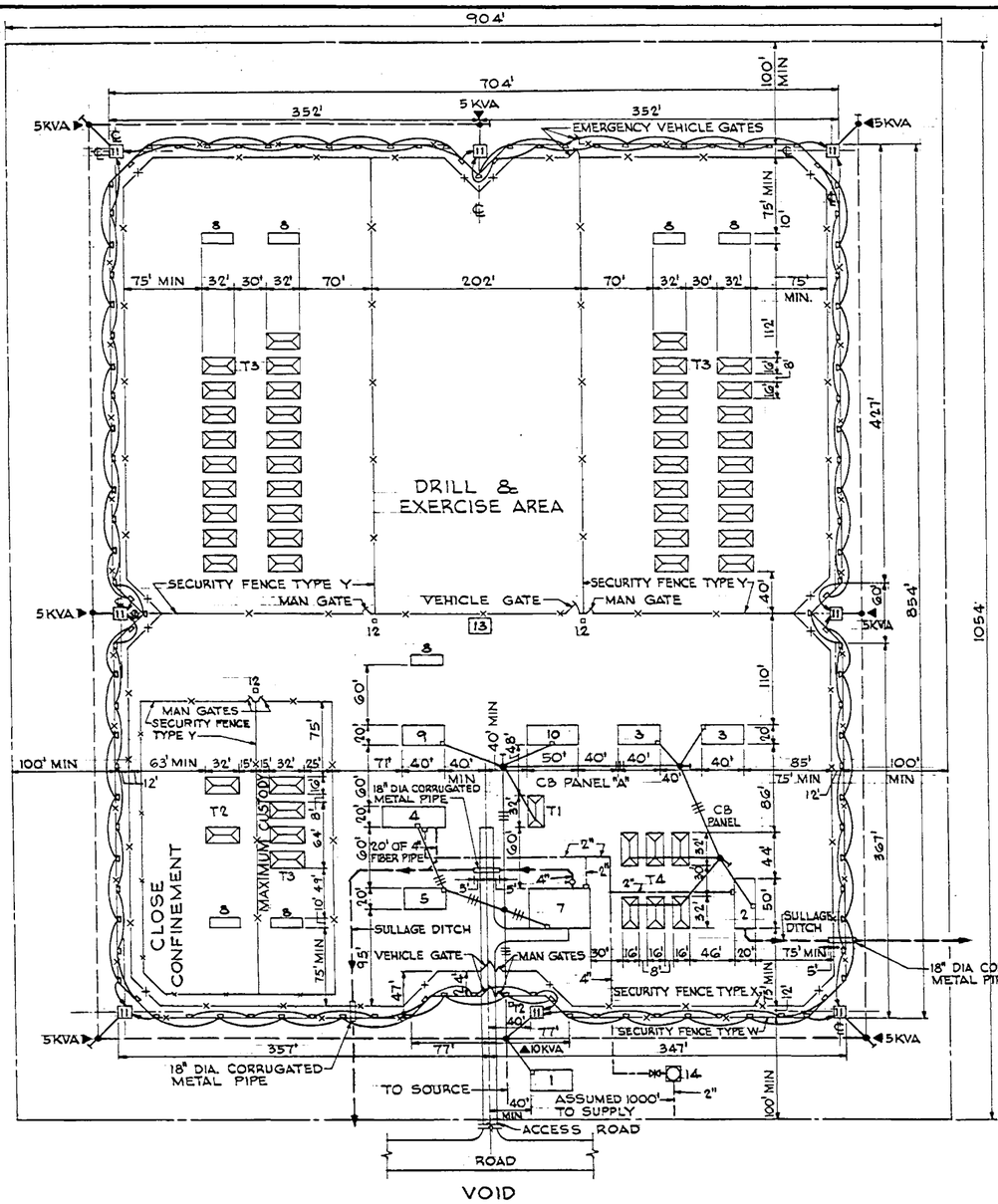
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

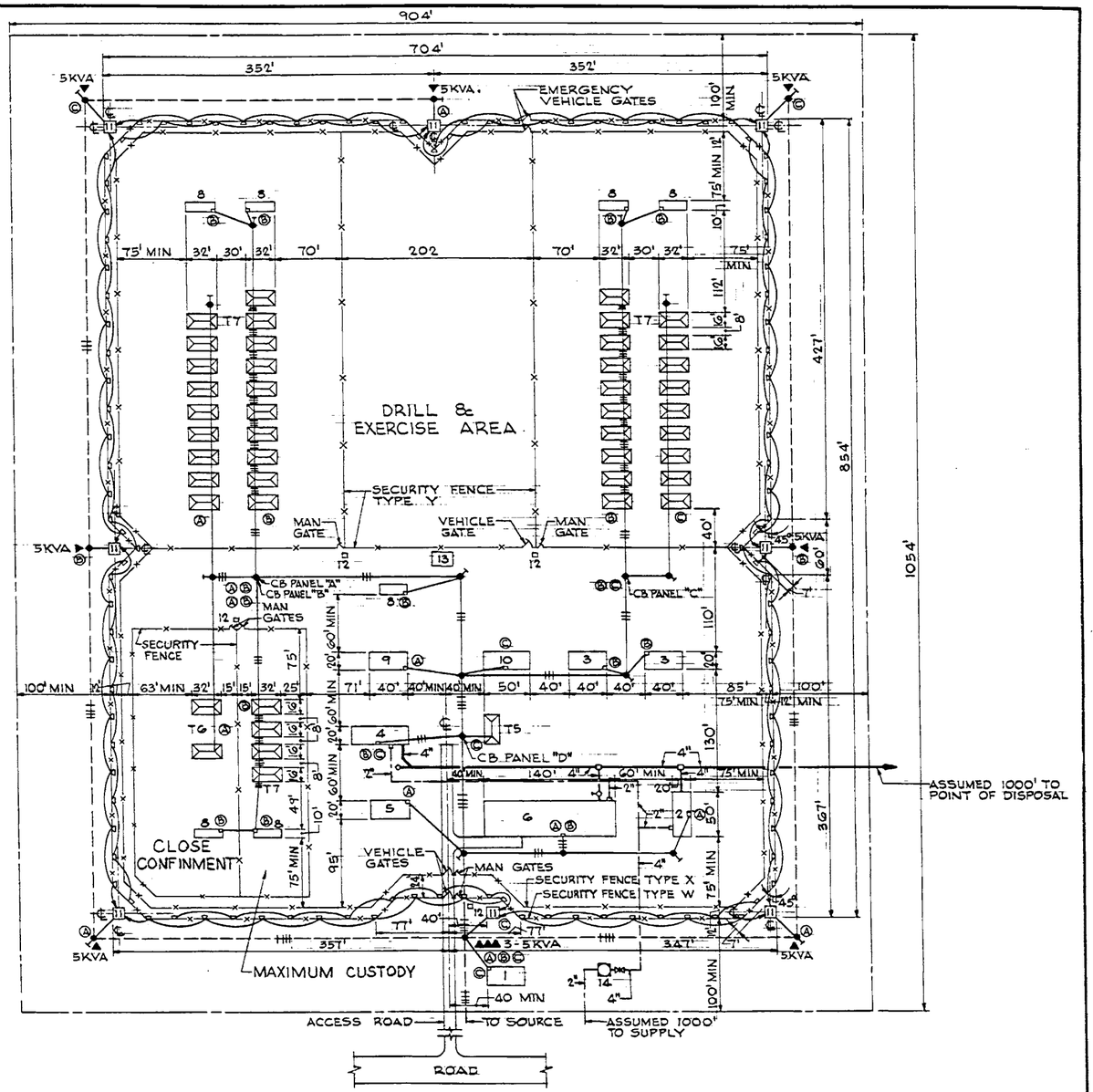
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. REICHMANN

THEATER OF OPERATIONS
MILITARY PRISONER STOCKADE
250 MAN
STD-1TR & STD-TPR
SITE & UTILITY LAYOUTS

UNDER REVISION

APPROVED: [signature] CHIEF, ENGINEERING DIVISION
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: [signature]
DATE: 11 Feb 69
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-21
SHEET 2 OF 2





SITE & UTILITY LAYOUT - STD-ITR

SCALE NO. 14

INST. NOS. ND1061 STL FRAME BLDGS., ND1071 WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	VOID QTY.	VOID SIZE OR UNIT	VOID DWG. NO.	STD-ITR INST. NO. ND1061, ND1071 QTY.	STD-ITR SIZE OR UNIT	STD-ITR DWG. NO.
	TENTAGE WITHOUT FRAMES						
T1	CAMP EXCHANGE	1	16'X32'				
T2	CLOSE CONFINEMENT	2	16'X32'				
T3	HOUSING	42	16'X32'				
T4	MESS	6	16'X32'				
	TENTAGE WITH FRAMES						
T5	CAMP EXCHANGE				1	16'X32'	72-51
T6	CLOSE CONFINEMENT				2	16'X32'	72-51
T7	HOUSING				42	16'X32'	72-51
	BUILDINGS						
1	ADMINISTRATION	1	20'X40'	61-11	1	20'X40'	61-11
2	BATHHOUSE	1	20'X50'	72-32	1	20'X50'	72-32
3	CLASSROOM	2	20'X40'	61-11	2	20'X40'	61-11
4	DISPENSARY-TROOP	1	20'X60'	55-11	1	20'X60'	55-11
5	INTERVIEW	1	20'X40'	61-11	1	20'X40'	61-11
6	KITCHEN & MESS HALL-500 MAN				1	40'X140'	72-62
7	KITCHEN-500 MAN	1	40'X60'	72-62			
8	LATRINE-BUCKET TYPE	7	10'X30'	72-36	7	10'X30'	72-36
9	PROCESSING	1	20'X40'	61-11	1	20'X40'	61-11
10	STOREHOUSE	1	20'X50'	44-11	1	20'X50'	44-11

NO.	FACILITY	VOID QTY.	VOID SIZE OR UNIT	VOID DWG. NO.	STD-ITR INST. NO. ND1061, ND1071 QTY.	STD-ITR SIZE OR UNIT	STD-ITR DWG. NO.
	OTHER CONSTRUCTION						
	FENCE-SECURITY-TYPE W	3.12	1000 FT	71-09	3.12	1000 FT	71-09
	FENCE-SECURITY-TYPE X	3.08	1000 FT	71-09	3.08	1000 FT	71-09
	FENCE-SECURITY-TYPE Y	2.73	1000 FT	71-09	2.73	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	5	EACH	71-09	5	EACH	71-09
11	GUARD TOWER *	8	16'X16'	71-12	8	16'X16'	71-12
	ROAD, LANE, 4" STABILIZED STONE	0.07	MILE	85-31	0.07	MILE	85-31
12	SENTRY BOX	4	4'X 4'		4	4'X4'	
13	SUMP-FIRE PROTECTION	1	10,000 GAL	84-21	1	10,000 GAL	84-21
14	WATER TANK	1	4200 GAL	84-21	1	4200 GAL	84-21
	SITE AREA	21.9	ACRE		21.9	ACRE	
	UTILITIES						

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS FOR DETAILS
WATER DISTRIBUTION	7500 GPD	702210	84-21	7500 GPD	702210	84-21
SEWAGE		702111	83-15	5250 GPD	702226	83-15
ELECTRIC DISTRIBUTION	34.1 KW	702212	81-23 81-22 81-21	37.6 KW	702227	81-23 81-22 81-21

* REFER TO (14) DWG. NO. 99-93 FOR GUARD TOWER PLACEMENT

STD 3-PLUMBING NOTES

1. UNLESS OTHERWISE NOTED ON LAYOUT, EXTEND FIBER DRAIN PIPE 10 FT FROM BUILDINGS.
2. WATER MAIN SHALL BE A MINIMUM OF 10 FT FROM SULLAGE DITCH AND 1 FT BELOW AT CROSSINGS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALE: 0 50' 100' 150'

NO. 14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STD/ITR BRANCH

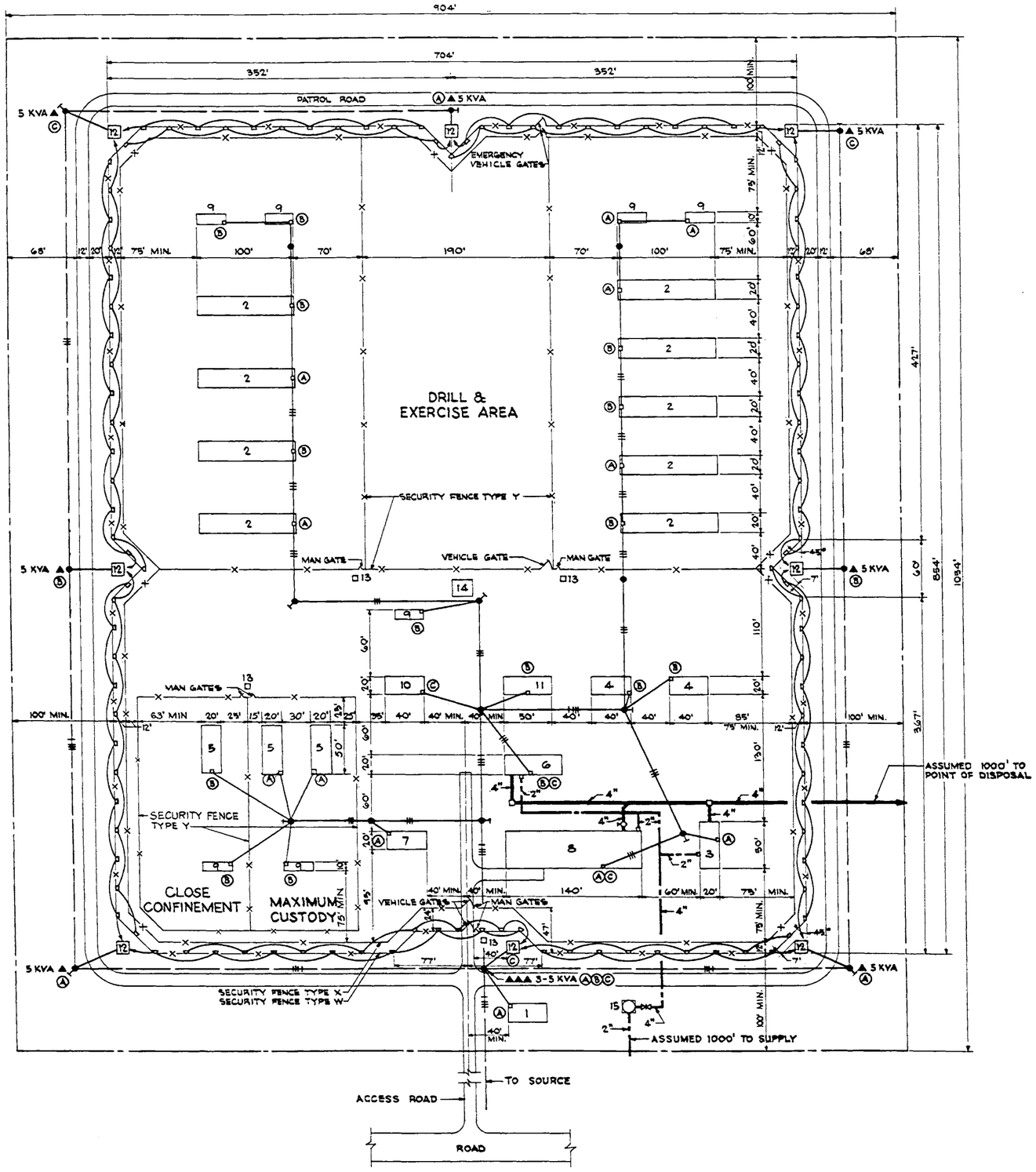
THEATER OF OPERATIONS
MILITARY PRISONER'S STOCKADE
500 MAN
STD-ITR
SITE & UTILITY LAYOUTS

UNDER REVISION

APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1962

APPROVED FOR PROPONENT AGENCY: [signature]
DATE 11 Feb 69

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-22
SHEET 1 OF 2



SITE & UTILITY LAYOUT

SCALE NO.13

INST. NOS. ND 1061 STL FRAME BLDGS, ND 1091 WOOD FRAME BLDGS.

FOR GUARD TOWER PLACEMENT REFER TO (14-C) DWG. NO. 99-98

SCHEDULE OF FACILITIES - STD-TPR

NO.	FACILITY	QTY.	SIZE OR UNIT	DWG. NO.
	BUILDINGS			
1	ADMINISTRATION	1	20' X 40'	61 - 11
2	BARRACKS - 50 MAN	9	20' X 100'	72 - 21
3	BATHHOUSE - 500 MAN	1	20' X 50'	72 - 32
4	CLASSROOM	2	20' X 40'	61 - 11
5	CLOSE CONFINEMENT	3	20' X 50'	72 - 21
6	DISPENSARY TROOP	1	20' X 60'	55 - 11
7	INTERVIEW	1	20' X 40'	61 - 11
8	KITCHEN & MESS HALL - 500 MAN	1	40' X 140'	72 - 62
9	LATRINE - BUCKET TYPE	7	10' X 30'	72 - 36
10	PROCESSING	1	20' X 40'	61 - 11
11	STOREHOUSE	1	20' X 50'	44 - 11
	OTHER CONSTRUCTION			
	FENCE - SECURITY - TYPE W	3.12	1000 FT.	71 - 09
	FENCE - SECURITY - TYPE X	3.08	1000 FT.	71 - 09
	FENCE - SECURITY - TYPE Y	2.73	1000 FT.	71 - 09
	FENCE - SECURITY - VEH. & MAN GATE	3	EACH	71 - 09
12	GUARD TOWER	8	16' X 16'	71 - 12
	ROAD, 1 LANE, 4" STABILIZED STONE	0.07	MILE	85 - 31
	ROAD, PATROL, 1 LANE - GRADED	0.6	MILE	85 - 31
13	SENTRY BOX	4	4' X 4'	
14	SUMP, FIRE PROTECTION	1	10,000 GAL.	84 - 21
15	WATER TANK	1	4200 GAL.	84 - 21
	SITE AREA	21.9	ACRES	

UTILITIES

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	7500 GPD	702210	84 - 21
SEWAGE	5250 GPD	702226	83 - 15
ELECTRIC DISTRIBUTION	337.5 KW	702242	81 - 23 81 - 22 81 - 21

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES 0 50' 100'

NO.13

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DEICHMANN
APPROVED: CHIEF, ARCHITECTURAL BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1963
APPROVED FOR PROPONENT AGENCY:
DATE: 11 Feb 63

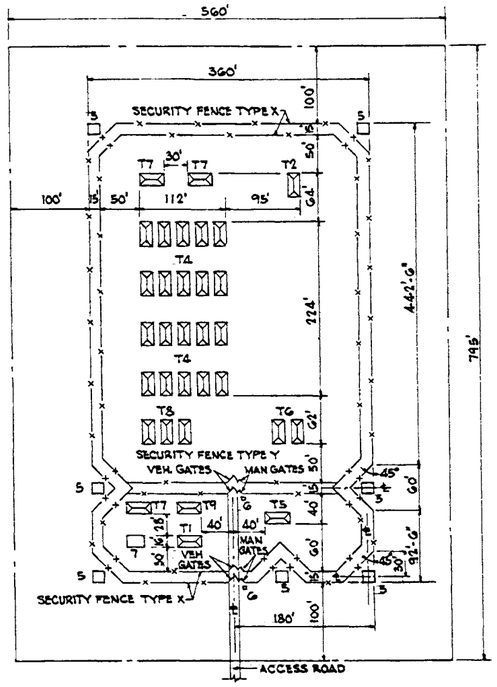
THEATER OF OPERATIONS

MILITARY PRISONER STOCKADE
500 MAN
STL-FPR

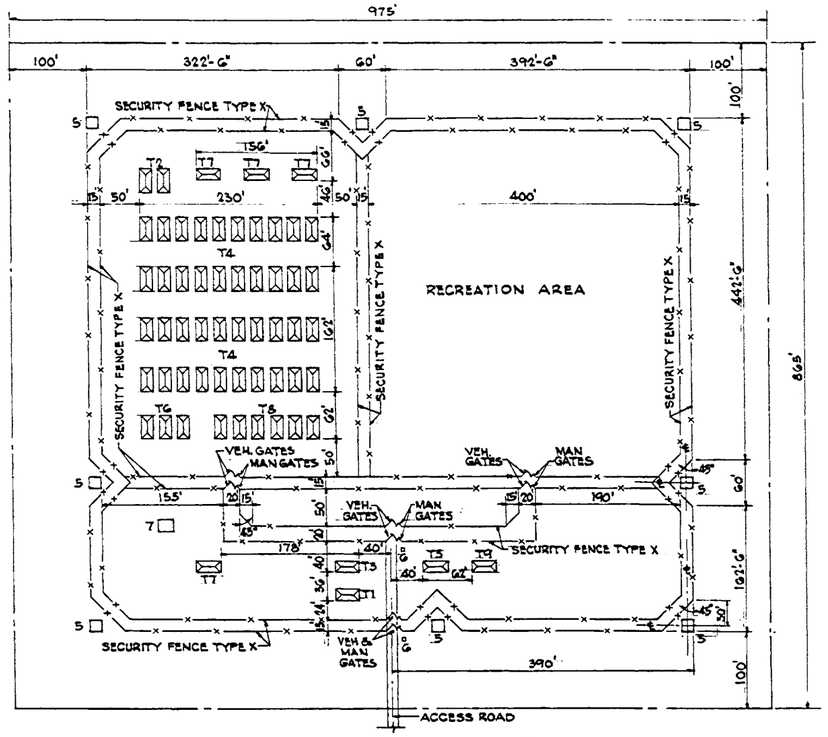
SITE & UTILITY LAYOUT

UNDER REVISION

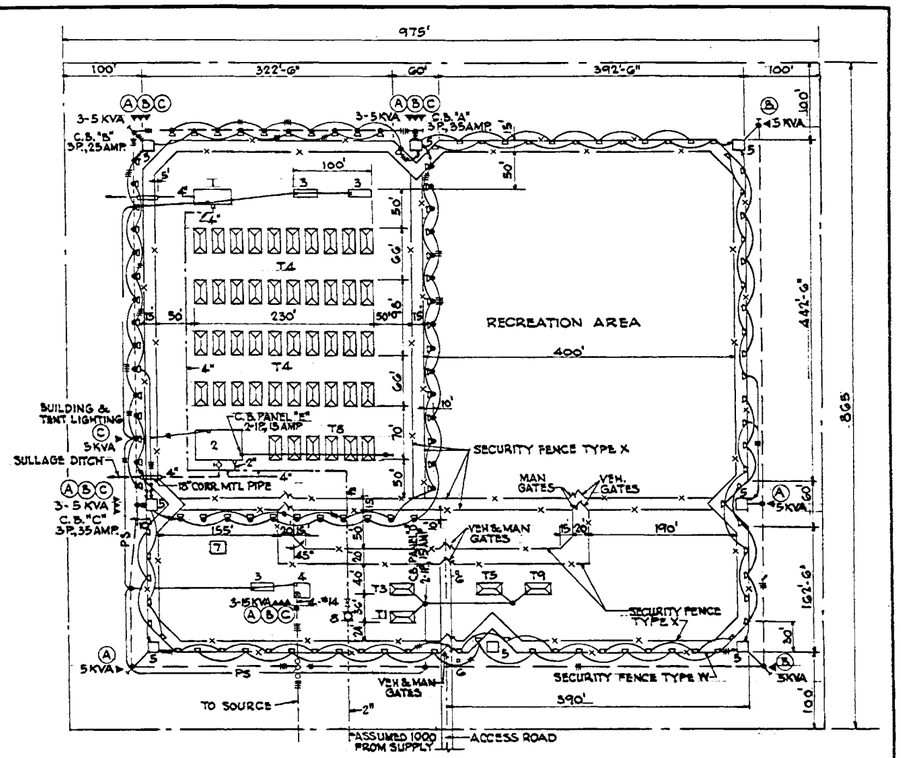
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-22
SHEET 2 OF 2



250 MAN POW CAMP - STD-INT
SCALE NO. 26
INST. NO. PW0011 TENTAGE



500 MAN POW CAMP - STD-INT
SCALE NO. 26
INST. NO. PW0021 TENTAGE



VOID

SCHEDULE OF FACILITIES

NO.	FACILITY	250 MAN-STD-INT INST. NO. PW0011 QTY.	SIZE OR UNIT	DWG. NO.	500 MAN-STD-INT INST. NO. PW0021 QTY.	SIZE OR UNIT	DWG. NO.	VOID QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITHOUT FRAMES									
T1	ADMINISTRATION	1	16'x32'		1	16'x32'		1	16'x32'	
T2	BATH	1	16'x32'		2	16'x32'				
T3	CAMP EXCHANGE				1	16'x32'		1	16'x32'	
T4	HOUSING	20	16'x32'		40	16'x32'		40	16'x32'	
T5	DISPENSARY	1	16'x32'		1	16'x32'		1	16'x32'	
T6	KITCHEN	2	16'x32'		3	16'x32'				
T7	LATRINE-BUCKET TYPE	3	16'x32'	72-36	4	16'x32'	72-36			
T8	MESS	3	16'x32'		6	16'x32'		6	16'x32'	
T9	SUPPLY	1	16'x32'		1	16'x32'		1	16'x32'	
	BUILDINGS									
1	BATHHOUSE-500 MAN							1	20'x50'	72-32
2	KITCHEN-500 MAN							1	40'x60'	72-02
3	LATRINE-BUCKET TYPE							3	10'x30'	72-36
4	GENERATOR BLDG.							1	3-15KW	81-11
	OTHER CONSTRUCTION									
	FENCE-SECURITY-TYPE W							1.94	1000 FT.	71-09
	FENCE-SECURITY-TYPE X	3.52	1000 FT.	71-09	8.4	1000 FT.	71-09	6.46	1000 FT.	71-09
	FENCE-SECURITY-TYPE Y	0.72	1000 FT.	71-09						
	FENCE-SECURITY-VEHICLE & MAN GATE	4	EACH	71-09	8	EACH	71-09	8	EACH	71-09
5	GUARD TOWER *	7	16'x16'	71-12	8	16'x16'	71-12	8	16'x16'	71-12
	ROAD, 1 LANE, 4" STABILIZED STONE	0.03	MILE	85-31	0.04	MILE	85-31	0.04	MILE	85-31
6	SENTRY BOX	2	4'x4'		2	4'x4'		2	4'x4'	
7	SUMP-FIRE PROTECTION	1	10000 GAL	84-21	1	10000 GAL	84-21	1	10000 GAL	84-21
8	WATER TANK							1	4200 GAL	84-21
	SITE AREA	10	ACRE		18	ACRE		18	ACRE	
	UTILITIES									

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS. FOR DETAILS	DEMAND	FACILITY NO.	DWGS. FOR DETAILS	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	12506PD			25006PD			5000GPD	703110	84-21
SEWAGE								703111	83-15
ELECTRIC DISTRIBUTION.							39.9 KW	703112	81-21 81-22 81-23

* REFER TO (14) DWG. NO. 99-98 FOR GUARD TOWER PLACEMENT.

GENERAL NOTES

1. UNLESS NOTED OTHERWISE ON LAYOUT, EXTEND DRAIN PIPE 10FT. FROM BLDGS.
2. WATER MAIN SHALL BE A MINIMUM OF 10 FT. FROM SULLAGE DITCH AND 1FT. BELOW AT CROSSINGS.

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500W AND LOAD TO BE BALANCED BETWEEN PHASES A, B AND C.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 26

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, BRANCH

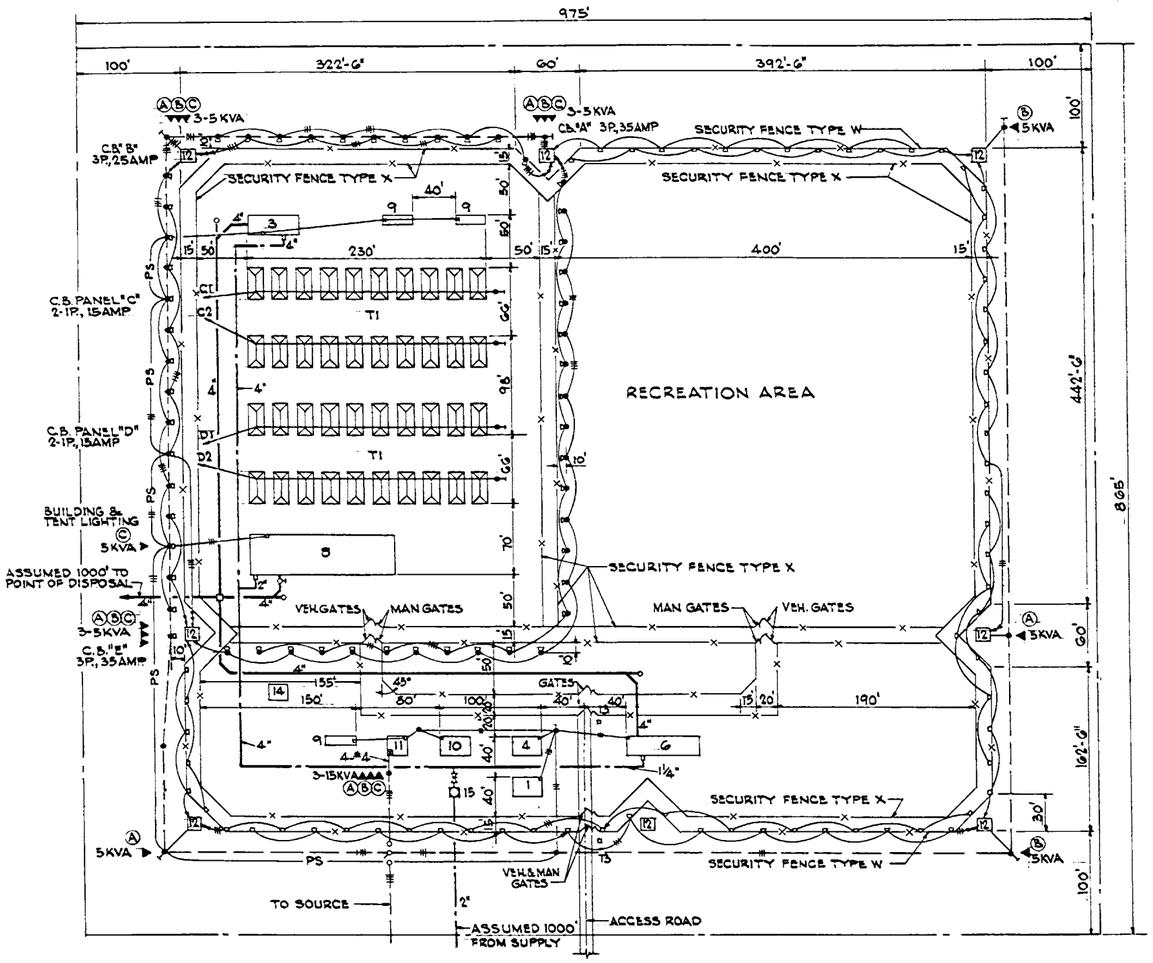
THEATER OF OPERATIONS
POW CAMPS
250 MAN-STD-INT
500 MAN-STD-INT
SITE & UTILITY LAYOUTS

UNDER REVISION

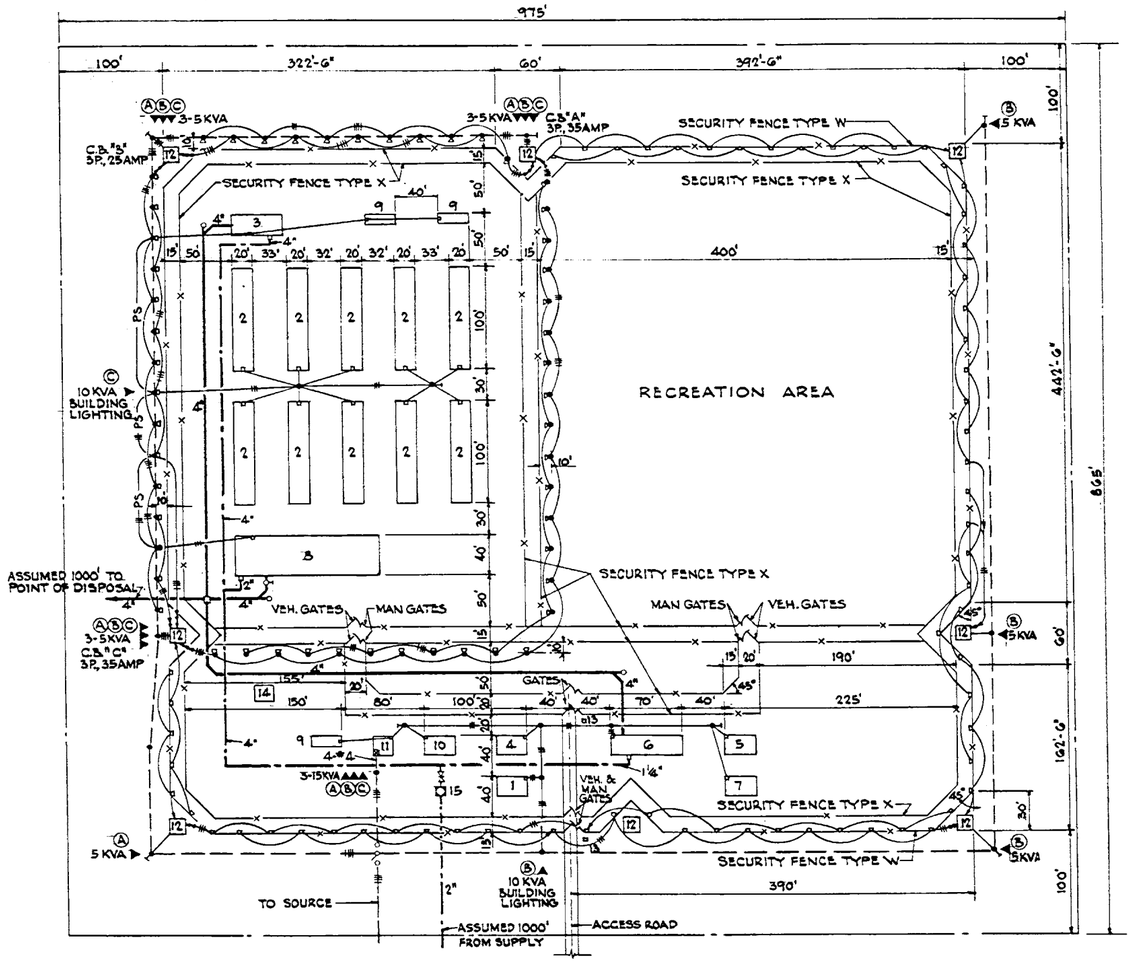
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE 1/6/1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-31
SHEET 1 OF 2



500 MAN POW CAMP - STD-ITR
SCALE NO. 14
INST. NO. PW 0031 STL FRAME BLDGS.
INST. NO. PW 0041 WOOD FRAME BLDGS.



500 MAN POW CAMP - STD-TPR
SCALE NO. 14
INST. NO. PW 0031 STL FRAME BLDGS.
INST. NO. PW 0061 WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	STD-ITR INST. NO. PW 0031, PW 0041 QTY.	SIZE OR UNIT	DWG. NO.	STD-TPR INST. NO. PW 0031, PW 0061 QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITH FRAMES						
T1	HOUSING	40	16'x32'	72-51			
	BUILDINGS						
1	ADMINISTRATION	1	20'x30'	G1-11	1	20'x30'	G1-11
2	BARRACKS - 50 MAN				10	20'x100'	72-21
3	BATHHOUSE - 500 MAN	1	20'x50'	72-32	1	20'x50'	72-32
4	CAMP EXCHANGE	1	20'x30'	74-17	1	20'x30'	74-17
5	CHAPEL				1	20'x30'	74-47
6	DISPENSARY	1	20'x70'	55-12	1	20'x70'	55-12
7	EDUCATIONAL BUILDING				1	20'x30'	74-13
8	KITCHEN & MESS HALL - 500 MAN	1	40'x140'	72-62	1	40'x140'	72-62
9	LATRINE - BUCKET TYPE	3	10'x30'	72-36	3	10'x30'	72-36
10	STOREHOUSE	1	20'x30'	44-11	1	20'x30'	44-11
11	GENERATOR BLDG. (IF REQ'D.)	1	3-15 KW	81-11	1	3-15 KW	81-11
	OTHER CONSTRUCTION						
	FENCE-SECURITY-TYPE W	1.94	1000 FT.	71-09	1.94	1000 FT.	71-09
	FENCE-SECURITY-TYPE X	6.46	1000 FT.	71-09	6.46	1000 FT.	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	8	EACH	71-09	8	EACH	71-09
12	GUARD TOWER *	8	16'x16'	71-12	8	16'x16'	71-12
	ROAD, 1 LANE, 4" STABILIZED STONE	0.04	MILE	85-31	0.04	MILE	85-31
13	SENTRY BOX	2	4'x4'		2	4'x4'	
14	SUMP-FIRE PROTECTION	1	10000 GAL	84-21	1	10000 GAL	84-21
15	WATER TANK	1	4200 GAL	84-21	1	4200 GAL	84-21
	SITE AREA	18	ACRE		18	ACRE	
	UTILITIES						

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	5000 GPD	703110	84-21	5000 GPD	703110	84-21
SEWAGE	3500 GPD	703126	83-15	3500 GPD	703126	83-15
ELECTRIC DISTRIBUTION	44.0 KW	703127	81-21 81-22 81-23	47.6 KW	703142	81-21 81-22 81-23

* REFER TO (14) DWG. NO. 99-95 FOR GUARD TOWER PLACEMENT.

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500W AND LOAD TO BE BALANCED BETWEEN PHASES A, B AND C.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED: DATE: 19 MAR 1969
CHIEF, BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE 16 Dec 1968

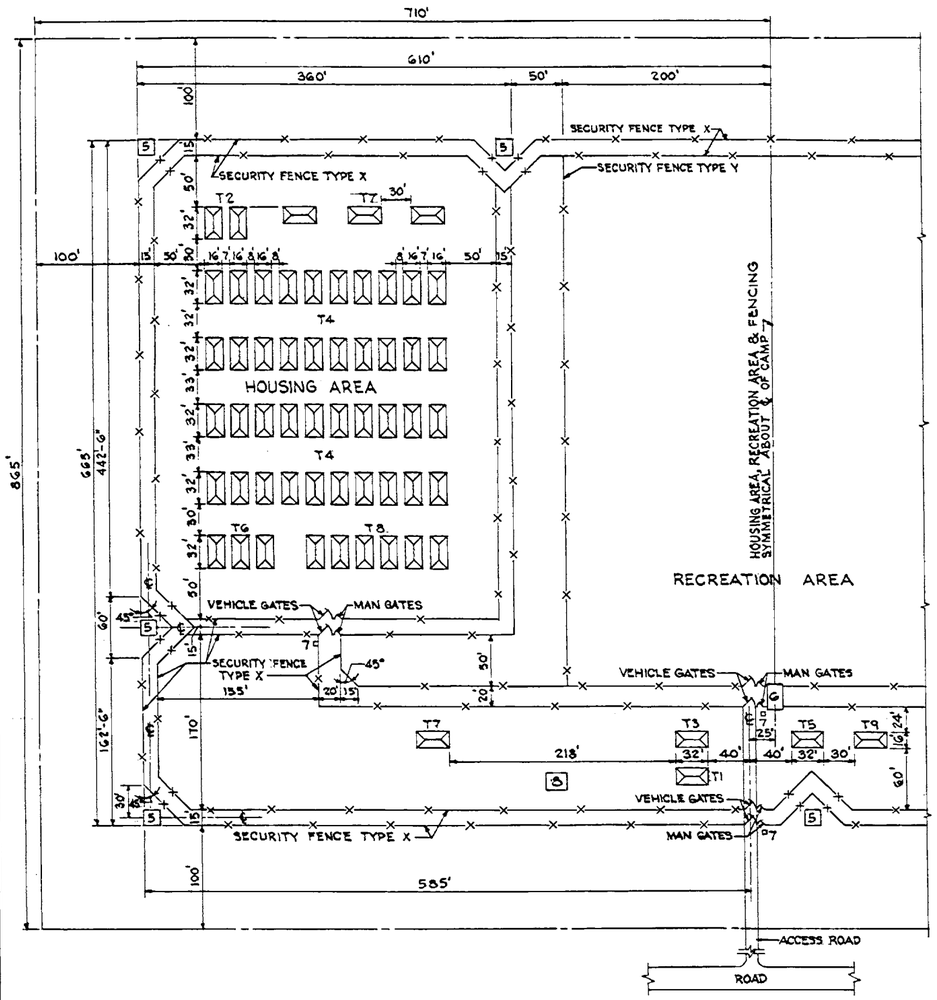
THEATER OF OPERATIONS
POW CAMPS
500 MAN-STD-ITR & STD-TPR
SITE & UTILITY LAYOUTS

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 70-31
SHEET 2 OF 2

CORPS OF ENGINEERS

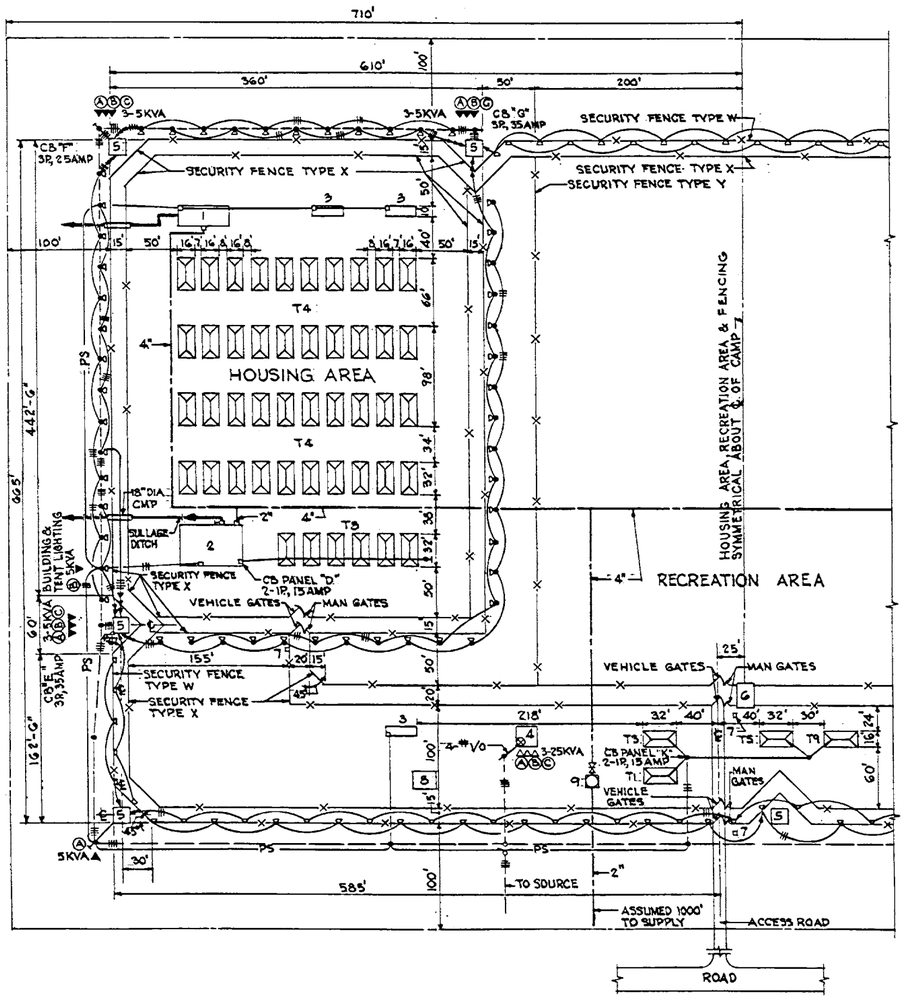
U. S. ARMY



SITE LAYOUT- STD-INT

SCALE NO. 14

INST. NO. PW0071



VOID

SCHEDULE OF FACILITIES

NO.	FACILITY	STD-INT INST. NO. PW0071 QTY.	SIZE OR UNIT	DWG. NO.	VOID QTY.	SIZE OR UNIT	DWG. NO.
TENTAGE WITHOUT FRAMES							
T1	ADMINISTRATION	1	16' X 32'		1	16' X 32'	
T2	BATH	4	16' X 32'				
T3	CAMP EXCHANGE	1	16' X 32'		1	16' X 32'	
T4	HOUSING	80	16' X 32'		80	16' X 32'	
T5	DISPENSARY	1	16' X 32'		1	16' X 32'	
T6	KITCHEN	6	16' X 32'				
T7	LATRINE-BUCKET TYPE	7	16' X 32'	72-36			
T8	MESS	12	16' X 32'		12	16' X 32'	
T9	SUPPLY	1	16' X 32'		1	16' X 32'	
BUILDINGS							
1	BATHHOUSE - 500 MAN				2	20'X 50'	72-32
2	KITCHEN - 500 MAN				2	40'X 60'	72-62
3	LATRINE-BUCKET TYPE				5	10' X 30'	72-36
4	GENERATOR BLDG (1# RBQ'D)				1	3-30KW	81-11
OTHER CONSTRUCTION							
	FENCE-SECURITY-TYPE W				1.97	1000 FT	71-09
	FENCE-SECURITY-TYPE X	13	1000 FT.	71-09	11	1000 FT	71-09
	FENCE-SECURITY-TYPEY	1.03	1000 FT.	71-09	1.03	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	8	EACH	71-09	8	EACH	71-09
5	GUARD TOWER *	9	16'X 16'	71-12	9	16'X 16'	71-12
6	GUARD TOWER	1	16' X 24'	71-13	1	16'X 24'	71-13
	ROAD, 1 LANE, 4" STABILIZED STONE	0.04	MILE	85-31	0.04	MILE	85-31
7	SENTRY BOX	4	4'X 4'		4	4'X 4'	
8	SUMP-FIRE PROTECTION	1	10000 GAL	84-21	1	10000GAL	84-21
9	WATER TANK				1	4200GAL	84-21
	SITE AREA	23	ACRE		23	ACRE	

NO.	FACILITY	STD-INT INST. NO. PW0071 DEMAND	FACILITY NO.	DWGS FOR DETAILS	VOID DEMAND	FACILITY NO.	DWGS FOR DETAILS
UTILITIES							
	ENGINEER SERVICES REQUIRED						
	WATER DISTRIBUTION	50000GPD	—	—	10000GPD	703210	84-21
	SEWAGE	-	—	—		703211	83-15
	ELECTRIC DISTRIBUTION	-	-	-	659KW	703212	81-21, 81-22, 81-23

* REFER TO (14-D) DWG. 99-98 FOR GUARD TOWER PLACEMENT.

VOID

STD 3-ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500 W AND LOAD TO BE BALANCED BETWEEN PHASES A, B AND C.

VOID

STD 3-PLUMBING NOTES

1. UNLESS OTHERWISE NOTED ON LAYOUT, EXTEND FIBER DRAIN PIPE 10 FT FROM BUILDINGS.
2. WATER MAIN SHALL BE A MINIMUM OF 10 FT. FROM SULLAGE DITCH AND 1 FT. BELOW AT CROSSINGS.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' 150'

NO. 14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

UNDER REVISION

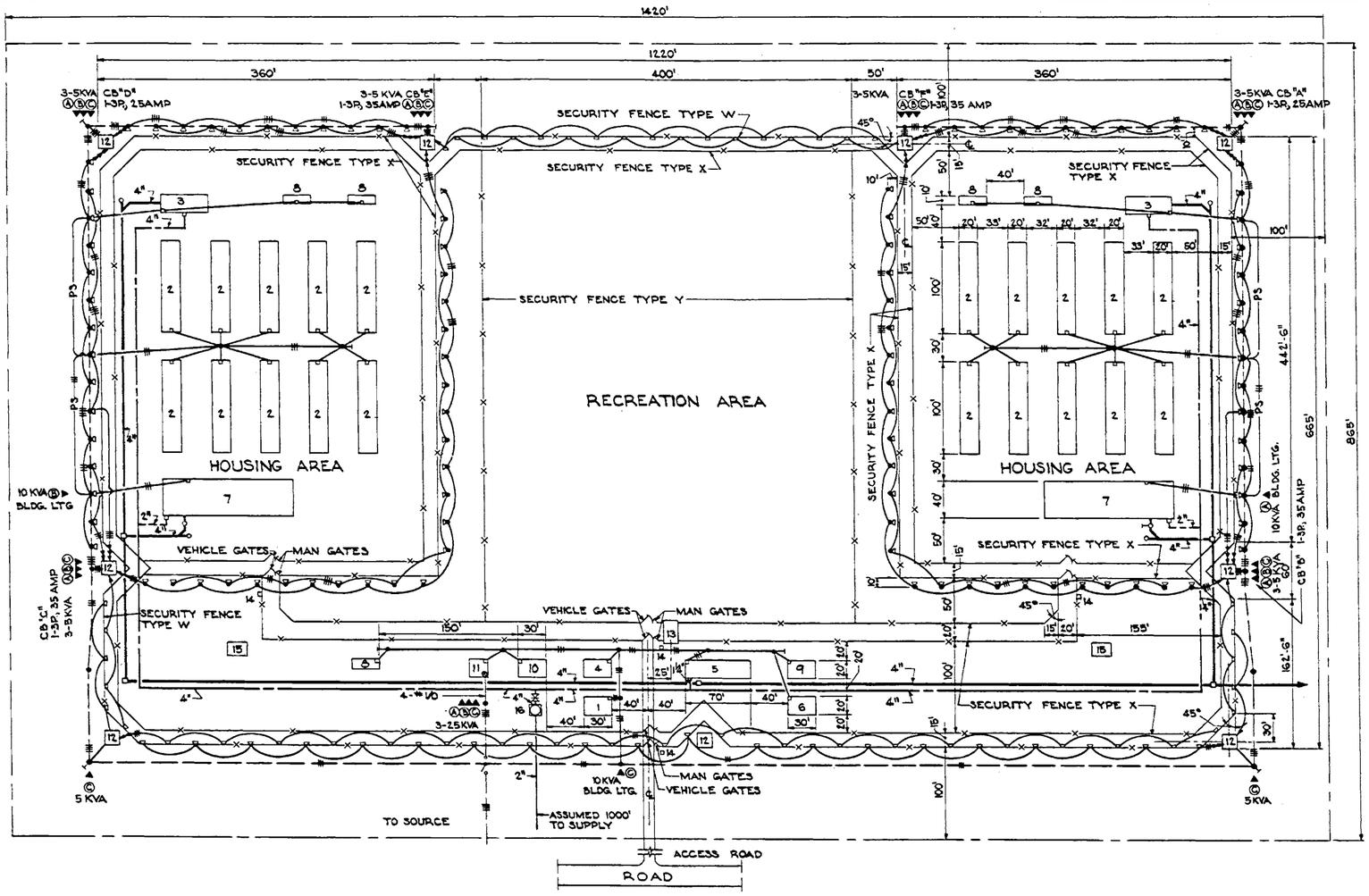
POW CAMP
1000 MAN
STD-INT
SITE & UTILITY LAYOUTS

APPROVED: DATE: 19 MAR 1969

CHIEF, BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
Emery Morgan Jr. Colonel, CE
DATE 1/16/68

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
70-32
SHEET 1 OF 2

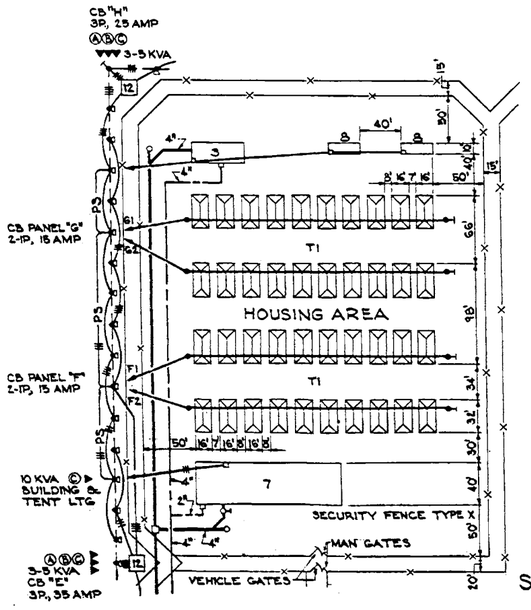


SITE & UTILITY LAYOUT-STD-TPR

SCALE NO. 14

INST. NO. PW0101 STL FRAME BLDGS.
INST. NO. PW0111 WOOD FRAME BLDGS.

SITE & UTILITY LAYOUT - STD-ITR
INST. NO. PW0081, PW0091
IDENTICAL TO STD-TPR EXCEPT FOR HOUSING AREA. LAYOUT FOR STD-ITR HOUSING AREA SHOWN ON THIS SHEET.



SITE & UTILITY LAYOUT-STD-ITR

SCALE NO. 14

INST. NOS. PW0081 STL FRAME BLDGS, PW0091 WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	STD-ITR INST. NO. PW0081, PW0091 QTY.	SIZE OR UNIT	DWG. NO.	STD-TPR INST. NO. PW0101, PW0111 QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITH FRAMES						
T1	HOUSING	80	16' X 32'	72-51			
	BUILDINGS						
1	ADMINISTRATION	1	20' X 30'	61-11	1	20 X 30'	61-11
2	BARRACKS - 50 MAN				20	20' X 100'	72-21
3	BATHHOUSE - 500 MAN	2	20' X 50'	72-32	2	20' X 50'	72-32
4	CAMP EXCHANGE	1	20' X 30'	74-17	1	20' X 30'	74-17
5	DISPENSARY	1	20' X 70'	55-12	1	20' X 70'	55-12
6	EDUCATION BUILDING				1	20' X 30'	74-13
7	KITCHEN & MESS HALL - 500 MAN	2	40' X 140'	72-62	2	40' X 140'	72-62
8	LATRINE - BUCKET TYPE	5	10' X 30'	72-36	5	10' X 30'	72-36
9	CHAPEL				1	20' X 30'	74-47
10	STOREHOUSE	1	20' X 30'	44-11	1	20' X 30'	44-11
11	GENERATOR BLDG (IF REQ'D.)	1	3-30KW	81-11	1	3-30 KW	81-11
	OTHER CONSTRUCTION						
	FENCE-SECURITY-TYPE W	1.97	1000 FT	71-09	1.97	1000 FT	71-09
	FENCE-SECURITY-TYPE X	11.	1000 FT	71-09	11.	1000 FT	71-09
	FENCE-SECURITY-TYPE Y	1.03	1000 FT	71-09	1.03	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	8	EACH	71-09	8	EACH	71-09
12	GUARD TOWER*	9	16' X 16'	71-12	9	16' X 16'	71-12
13	GUARD TOWER*	1	16' X 24'	71-13	1	16' X 24'	71-13
	ROAD, 1 LANE, 4" STABILIZED STONE	0.04	MILE	85-31	0.04	MILE	85-31
14	SENTRY BOX	4	4' X 4'		4	4' X 4'	
15	SUMP-FIRE PROTECTION	2	10000 GAL	84-21	2	10000 GAL	84-21
16	WATER TANK	1	4200 GAL	84-21	1	4200 GAL	84-21
	SITE AREA	23	ACRE		23	ACRE	
	UTILITIES						

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS FOR DETAILS
WATER DISTRIBUTION	10000GPD	703210	84-21	10000 GPD	703210	84-21
SEWAGE	7000GPD	703226	83-15	7000GPD	703226	83-15
ELECTRIC DISTRIBUTION	71.1KW	703227	81-21,22,23	78.3 KW	703242	81-21,22,23

* REFER TO (14-D) DWG. NO. 99-98 FOR GUARD TOWER PLACEMENT.

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500 W AND LOAD TO BE BALANCED BETWEEN PHASES A, B, AND C.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 150'
NO. 14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ILYUS
TRACED BY:
CHECKED BY: DE ICHMANN
SUBMITTED BY: C. W. DE ICHMANN
APPROVED:
CHIEF, BRANCH:

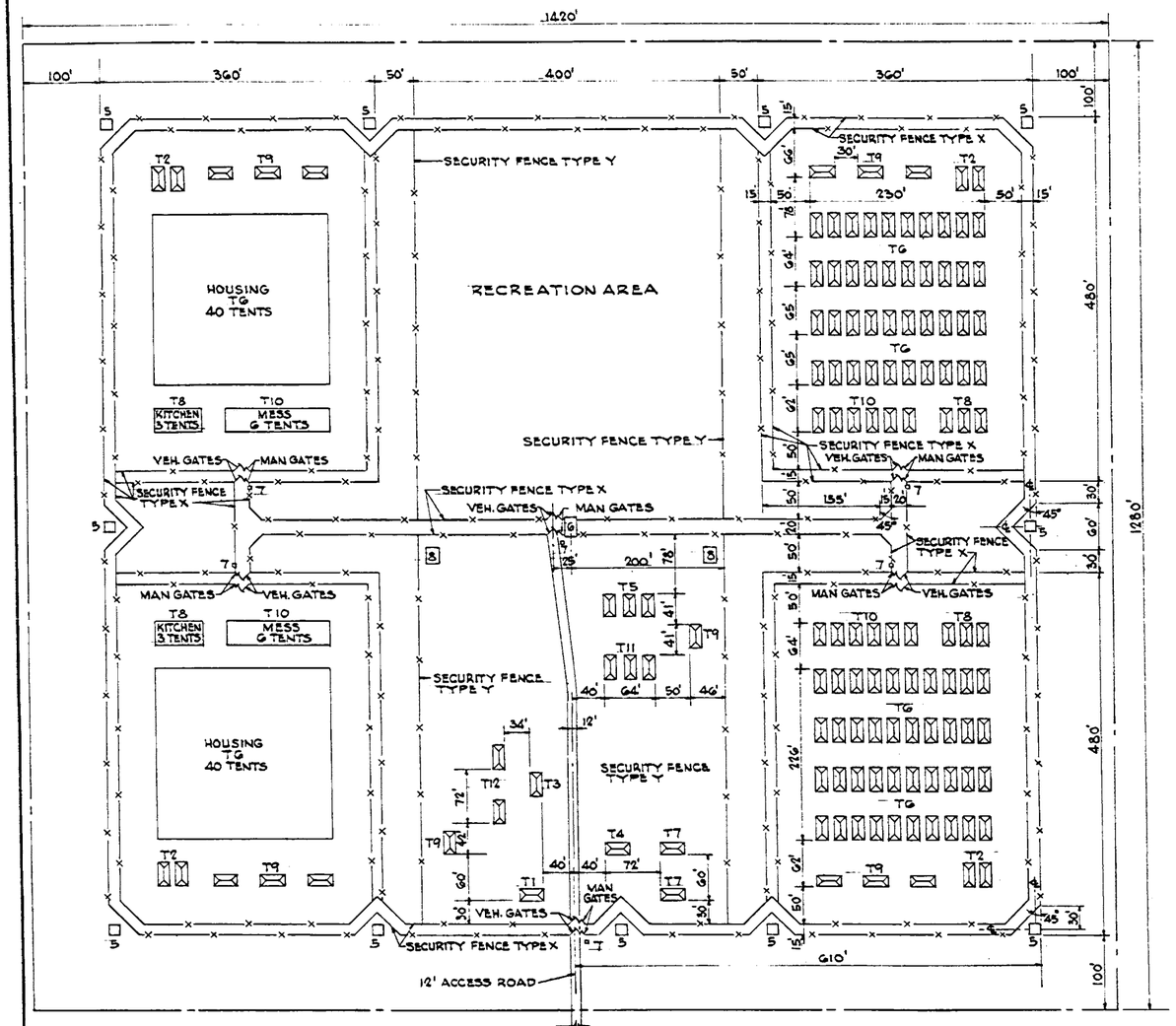
THEATER OF OPERATIONS
POW CAMP
1000 MAN
STD-ITR & STD-TPR
SITE & UTILITY LAYOUTS

UNDER REVISION

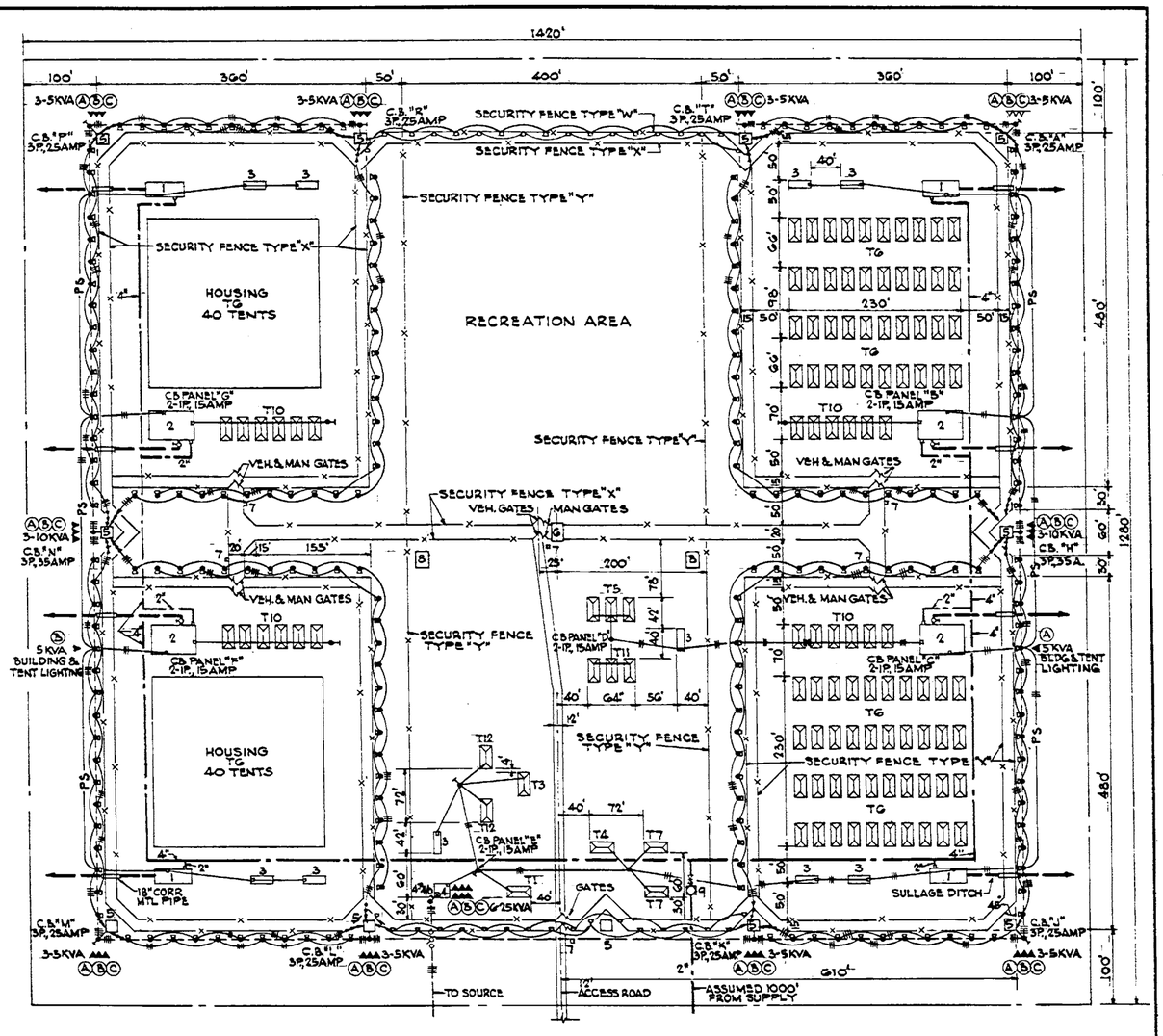
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
Lewis Chapman Lt. Col. M.C. Ch. Eng.
DATE 7/16/68

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 2
70-32



2000 MAN POW CAMP - STD-INT
SCALE NO. 26
INST. NO. PW 0121 TENTAGE.



VOID

SCHEDULE OF FACILITIES

NO.	FACILITY	STD-INT INST. NO. PW 0121 QTY.	STD-INT SIZE OR UNIT	STD-INT DWG. NO.	VOID QTY.	VOID SIZE OR UNIT	VOID DWG. NO.
	TENTAGE WITHOUT FRAMES						
T1	ADMINISTRATION	1	16'x32'		1	16'x32'	
T2	BATH	8	16'x32'				
T3	CAMP EXCHANGE	1	16'x32'		1	16'x32'	
T4	DISPENSARY	1	16'x32'		1	16'x32'	
T5	EDUCATIONAL	3	16'x32'		3	16'x32'	
T6	HOUSING	160	16'x32'		160	16'x32'	
T7	WARD	2	16'x32'		2	16'x32'	
T8	KITCHEN	12	16'x32'				
T9	LATRINE - BUCKET TYPE	14	16'x32'	72-36			
T10	MESS	24	16'x32'		24	16'x32'	
T11	RELIGIOUS	3	16'x32'		3	16'x32'	
T12	SUPPLY	2	16'x32'		2	16'x32'	
	BUILDINGS						
1	BATHHOUSE-500 MAN				4	20'x50'	72-32
2	KITCHEN-500 MAN				4	40'x60'	72-62
3	LATRINE-BUCKET TYPE				10	10'x30'	72-36
4	GENERATOR BLDG.				1	3-60 KW	81-13
	OTHER CONSTRUCTION						
	FENCE-SECURITY-TYPE W				1.18	1000 FT.	71-09
	FENCE-SECURITY-TYPE X	18.06	1000 FT.	71-09	16.35	1000 FT.	71-09
	FENCE-SECURITY-TYPE Y	2.06	1000 FT.	71-09	2.06	1000 FT.	71-09
	FENCE-SECURITY-VEH. & MAN GATE	12	EACH	71-09	12	EACH	71-09
5	GUARD TOWER *	11	16'x16'	71-12	11	16'x16'	71-12
6	GUARD TOWER *	1	16'x24'	71-13	1	16'x24'	71-13
	ROAD, 1 LANE, 4" STABILIZED STONE	0.11	MILE	85-31	0.11	MILE	85-31
7	SENTRY BOX	6	4'x4'		6	4'x4'	

NO.	FACILITY	STD-INT INST. NO. PW 0121 QTY.	STD-INT SIZE OR UNIT	STD-INT DWG. NO.	VOID QTY.	VOID SIZE OR UNIT	VOID DWG. NO.
	OTHER CONSTRUCTION (CONTINUED)						
8	SUMP, FIRE PROTECTION	2	10000GAL	84-21	2	10000GAL	84-21
9	WATER TANK				1	4200GAL	84-21
	SITE AREA	40	ACRE		40	ACRE	
	UTILITIES						

ENGINEER SERVICES REQUIRED	STD-INT DEMAND	STD-INT FACILITY NO.	STD-INT DWG. FOR DETAILS	VOID DEMAND	VOID FACILITY NO.	VOID DWG. FOR DETAILS
WATER DISTRIBUTION	10000GPD			20000GPD	703310	84-21
SEWAGE					703311	83-15
ELECTRIC DISTRIBUTION				126.8KW	703312	81-21 81-22 81-23

* REFER TO (14-9) DWG. 99-98 FOR GUARD TOWER PLACEMENT.

GENERAL NOTES

1. UNLESS NOTED OTHERWISE ON LAYOUT, EXTEND DRAIN PIPE 10FT FROM BLDGS.
2. WATER MAIN SHALL BE A MINIMUM OF 10 FT FROM SULLAGE DITCH AND 1FT. BELOW AT CROSSINGS.

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500W AND LOAD TO BE BALANCED BETWEEN PHASES A, B AND C.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 26

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

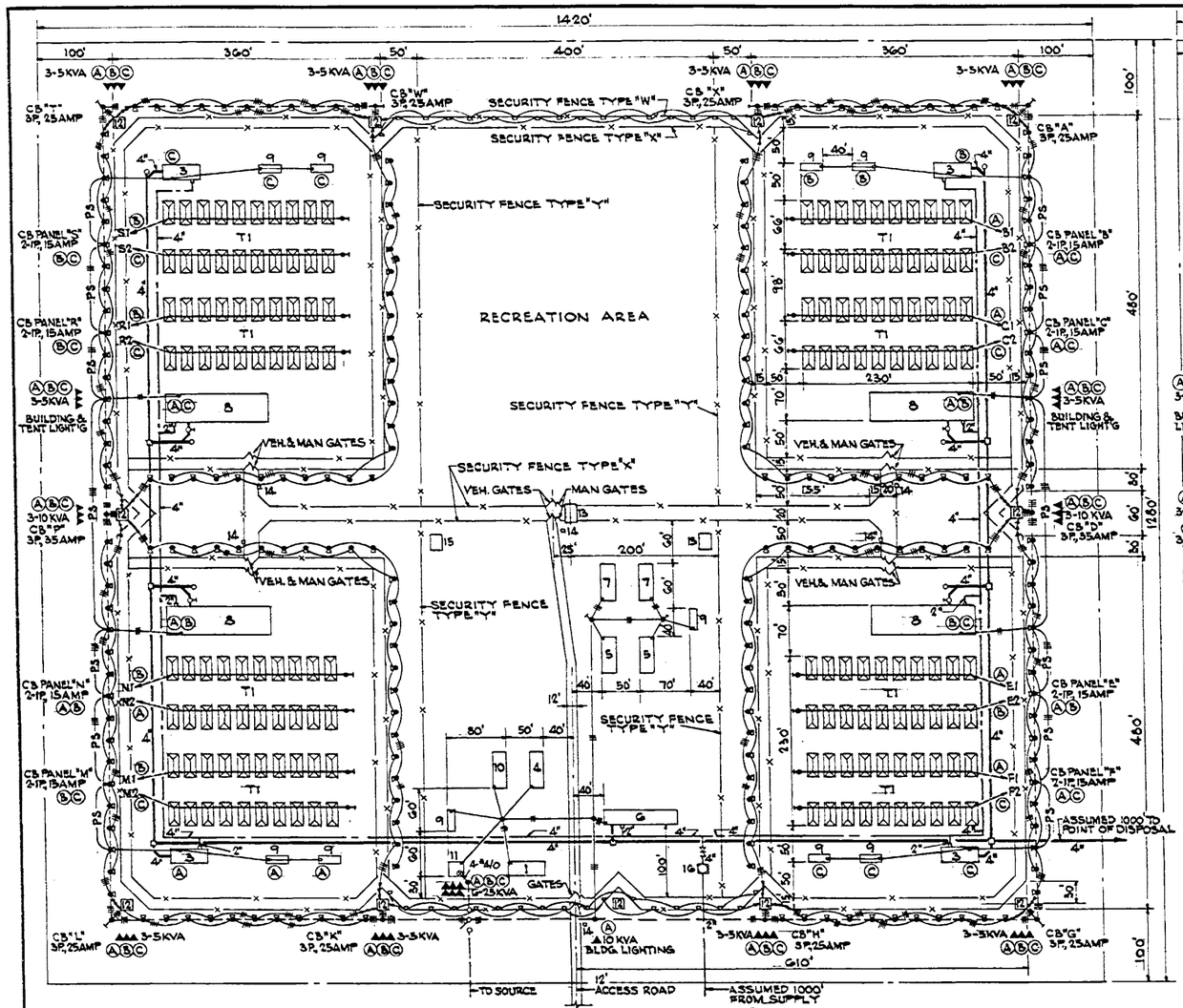
DRAWN BY: BALLOU
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
APPROVED FOR PROPONENT AGENCY:
CHIEF, BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

THEATER OF OPERATIONS
POW CAMP 2000 MAN STD-INT
SITE & UTILITY LAYOUTS
UNDER REVISION

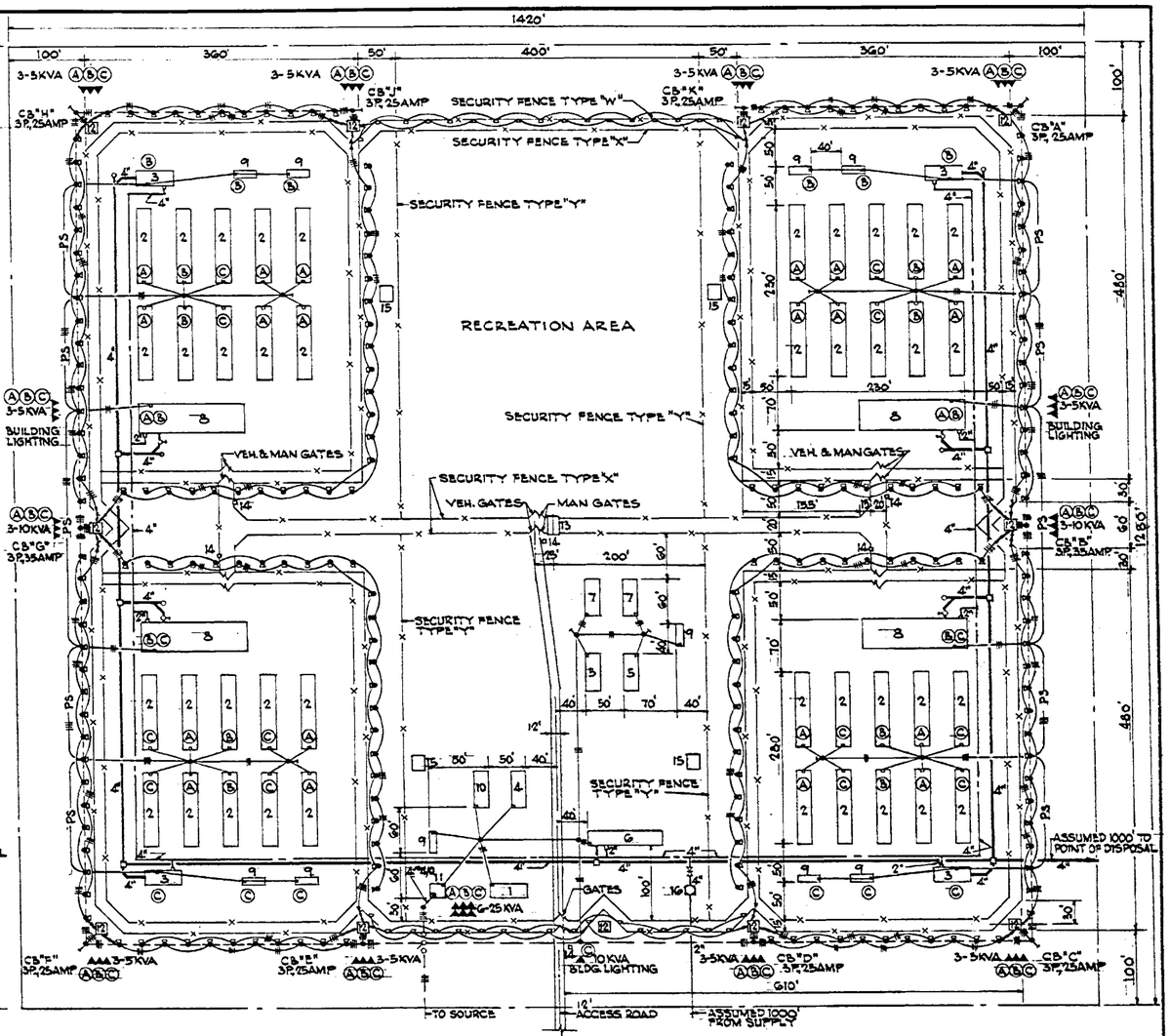
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-33
SHEET 1 OF 2

CORPS OF ENGINEERS

U. S. ARMY



2000 MAN POW CAMP - STD-ITR
SCALE NO. 26
INST. NO. PW 0131 STL FRAME BLDGS.
INST. NO. PW 0141 WOOD FRAME BLDGS.



2000 MAN POW CAMP - STD-TPR
SCALE NO. 26
INST. NO. PW 0151 STL FRAME BLDGS.
INST. NO. PW 0161 WOOD FRAME BLDGS.

SCHEDULE OF FACILITIES

NO.	FACILITY	STD-ITR INST. NO. PW 0131, PW 0141 QTY.	SIZE OR UNIT	DWG. NO.	STD-TPR INST. NO. PW 0151, PW 0161 QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITH FRAMES						
T1	HOUSING	160	16'x32'	72-51			
	BUILDINGS						
1	ADMINISTRATION	1	20'x50'	61-11	1	20'x50'	61-11
2	BARRACKS-50 MAN				40	20'x100'	72-21
3	BATHHOUSE-500 MAN	4	20'x50'	72-32	4	20'x50'	72-32
4	CAMP EXCHANGE	1	20'x50'	74-17	1	20'x50'	74-17
5	CHAPEL	2	20'x50'	74-47	2	20'x50'	74-47
6	DISPENSARY	1	20'x100'	55-12	1	20'x100'	55-12
7	EDUCATIONAL BLDG.	2	20'x50'	74-13	2	20'x50'	74-13
8	KITCHEN & MESS HALL-500 MAN	4	40'x140'	72-62	4	40'x140'	72-62
9	LATRINE-BUCKET TYPE	10	10'x30'	72-36	10	10'x30'	72-36
10	STOREHOUSE	1	20'x50'	44-11	1	20'x50'	44-11
11	GENERATOR BLDG. (1 REQ'D.)	1	3-60 KW	81-13	1	3-60 KW	81-13
	OTHER CONSTRUCTION						
	FENCE-SECURITY-TYPE W	1.18	1000 FT.	71-09	1.18	1000 FT.	71-09
	FENCE-SECURITY-TYPE X	16.88	1000 FT.	71-09	16.88	1000 FT.	71-09
	FENCE-SECURITY-TYPE Y	2.06	1000 FT.	71-09	2.06	1000 FT.	71-09

NO.	FACILITY	STD-ITR INST. NO. PW 0131, PW 0141 QTY.	SIZE OR UNIT	DWG. NO.	STD-TPR INST. NO. PW 0151, PW 0161 QTY.	SIZE OR UNIT	DWG. NO.
	OTHER CONSTRUCTION (CONTINUED)						
	FENCE-SECURITY-VEH. & MAN GATE	12	EACH	71-09	12	EACH	71-09
12	GUARD TOWER *	11	16'x16'	71-12	11	16'x16'	71-12
13	GUARD TOWER *	1	16'x24'	71-13	1	16'x24'	71-13
	ROAD, 1 LANE, 4" STABILIZED STONE	0.11	MILE	85-31	0.11	MILE	85-31
14	SENTRY BOX	6	4'x4'		6	4'x4'	
15	SUMP, FIRE PROTECTION	2	10000 GAL	84-21	4	10000 GAL	84-21
16	WATER TANK	1	4200 GAL	84-21	1	4200 GAL	84-21
	SITE AREA	40	ACRE		40	ACRE	
	UTILITIES						
	ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWG. FOR DETAILS	DEMAND	FACILITY NO.	DWG. FOR DETAILS
	WATER DISTRIBUTION	20000 GPD	703310	84-21	20000 GPD	703310	84-21
	SEWAGE	14000 GPD	703326	83-15	14000 GPD	703326	83-15
	ELECTRIC DISTRIBUTION	138.3 KW	703327	81-21, 81-22, 81-23	145.5 KW	703342	81-21, 81-22, 81-23

* REFER TO (40) DWG. NO 99-98 FOR GUARD TOWER PLACEMENT

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SSCONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500W, AND LOAD TO BE BALANCED BETWEEN PHASES A, B AND C.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES
0 50' 100' 200'

NO. 26

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

UNDER REVISION

2000 MAN POW CAMP
STD-ITR & STD-TPR
SITE & UTILITY LAYOUTS

APPROVED: DATE: 19 MAR 1969

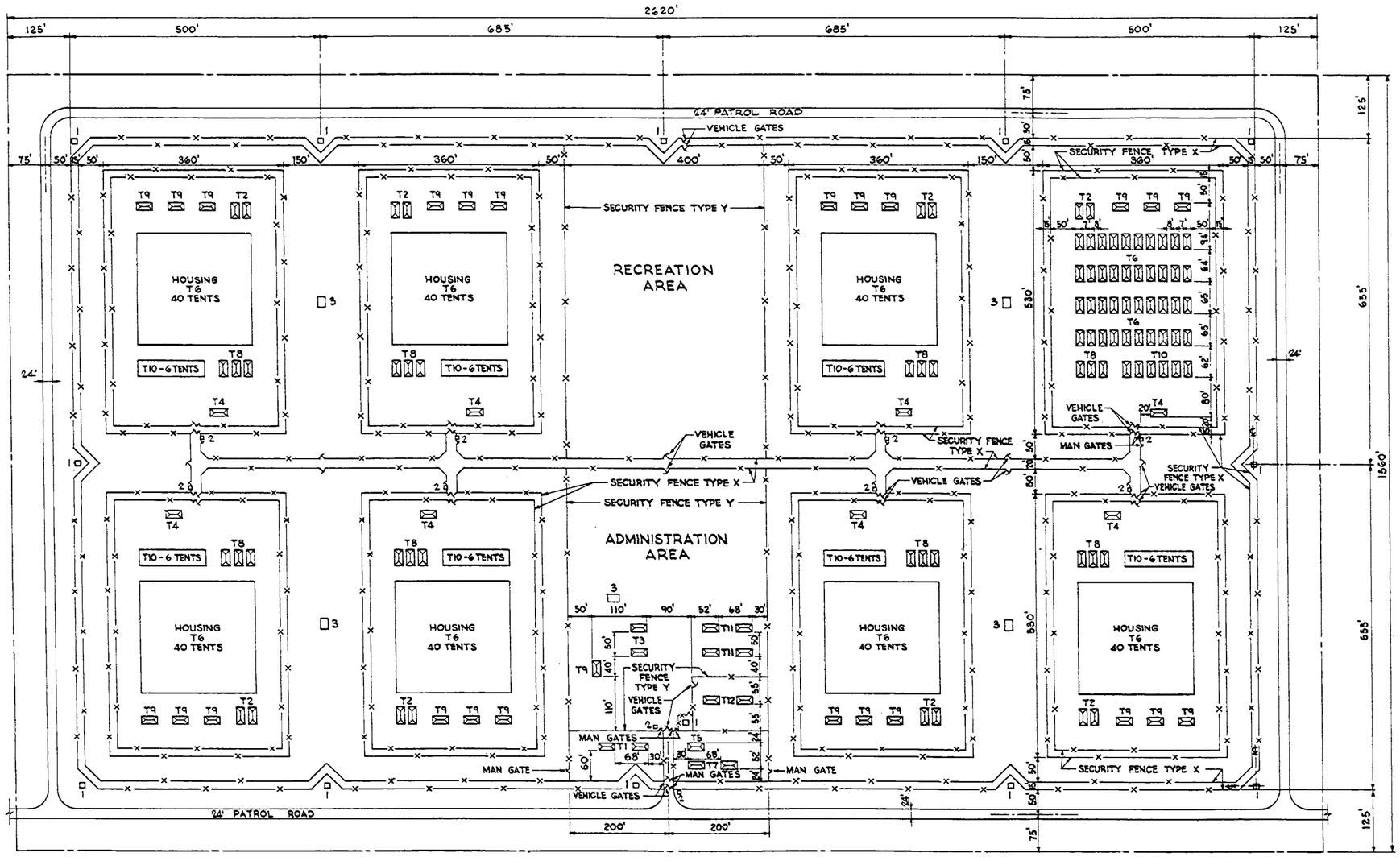
(CHIEF) BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
Denny Duncan Hayes & Mattern
DATE 16 Oct 68

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 70-33
SHEET 2 OF 2

CORPS OF ENGINEERS

U. S. ARMY



SITE LAYOUT

SCALE NO. 15

INST. NO. PIW0171 (TENTAGE)

SCHEDULE OF FACILITIES-STD-INT

NO.	FACILITY	QTY	SIZE OR UNIT	DWG NO.
	TENTAGE WITHOUT FRAMES			
T1	ADMINISTRATION	2	16'X 32'	——
T2	BATH	16	16'X 32'	——
T3	CAMP EXCHANGE	2	16'X 32'	——
T4	COMPOUND HQ & SUPPLY	8	16'X 32'	——
T5	DISPENSARY	1	16'X 32'	——
T6	HOUSING	320	16'X 32'	——
T7	WARD	2	16'X 32'	——
T8	KITCHEN	24	16'X 32'	——
T9	LATRINE-BUCKET TYPE	25	16'X 32'	72-36
T10	MESS	48	16'X 32'	——
T11	RELIGIOUS & EDUCATIONAL	4	16'X 32'	——
T12	SUPPLY	2	16'X 32'	——
	OTHER CONSTRUCTION			
	FENCE-SECURITY-TYPE X	46.76	1000 FT	71-09
	FENCE-SECURITY-TYPE Y	3.12	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	30	EACH	71-09
1	GUARD TOWER *	13	11'X11'	71-11
	ROAD — 2 LANE — DRAINED & GRADED	1.66	MILE	85-31
2	SENTRY BOX	10	4'X4'	——
3	SUMP-FIRE PROTECTION	5	10000GAL	84-21
	SITE AREA	94	ACRES	——
	UTILITIES			

ENGINEER SERVICES REQ'D.	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	200000GPD	—	—

* REFER TO 14-B DWG. NO. 99-98 FOR GUARD TOWER PLACEMENT

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' 200'

NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

POW CAMP-WOOD MAN OCCIDENTALIS

UNDER REVISION

SITE LAYOUT

APPROVED: DATE: 19 MAR 1969

CHIEF, BRANCH | CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

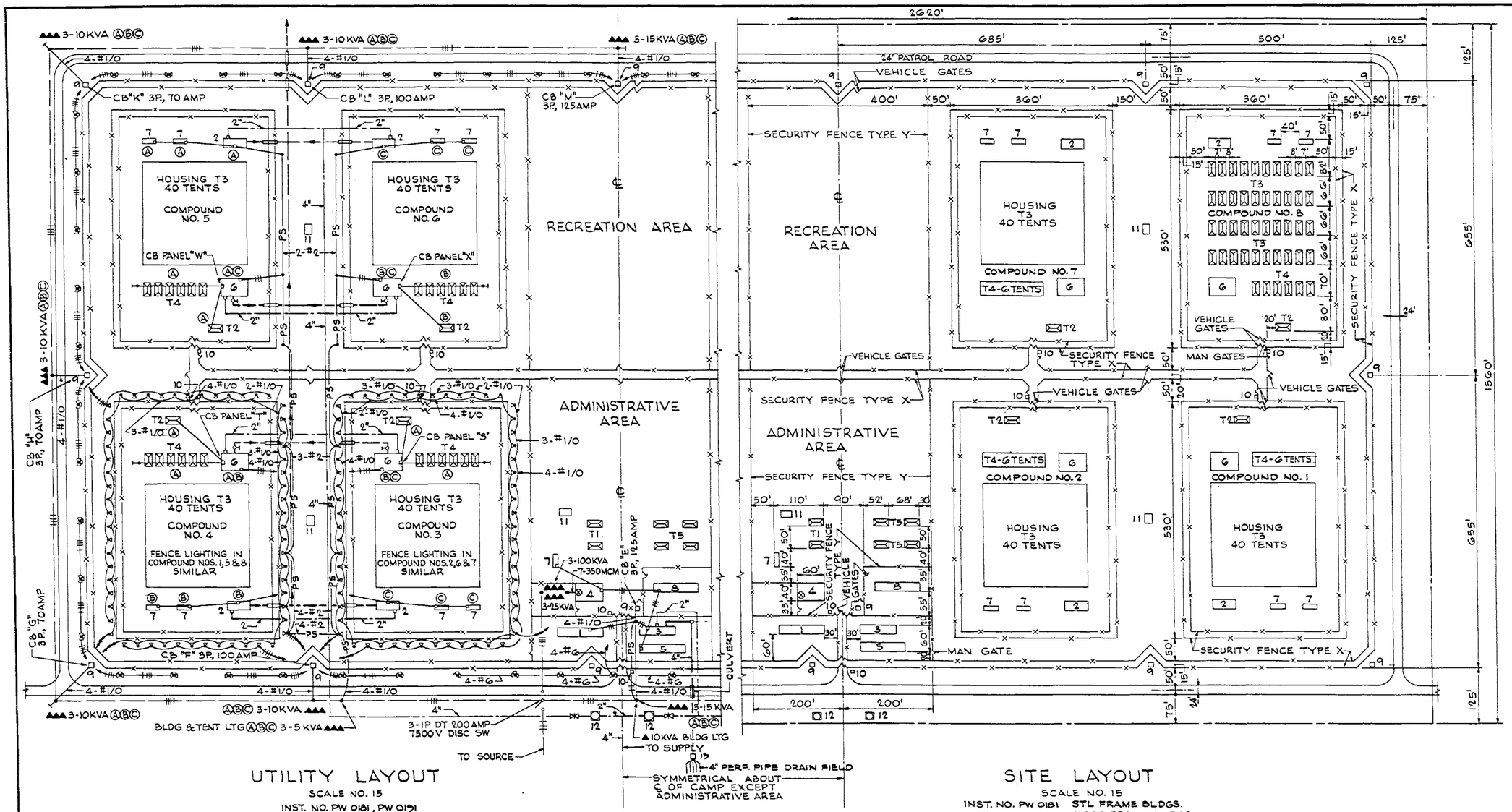
DATE 16 Oct 68

SCALE: AS NOTED

SPEC. NO.

DRAWING NUMBER: 70-35

SHEET 1 OF 3



UTILITY LAYOUT

SCALE NO. 15

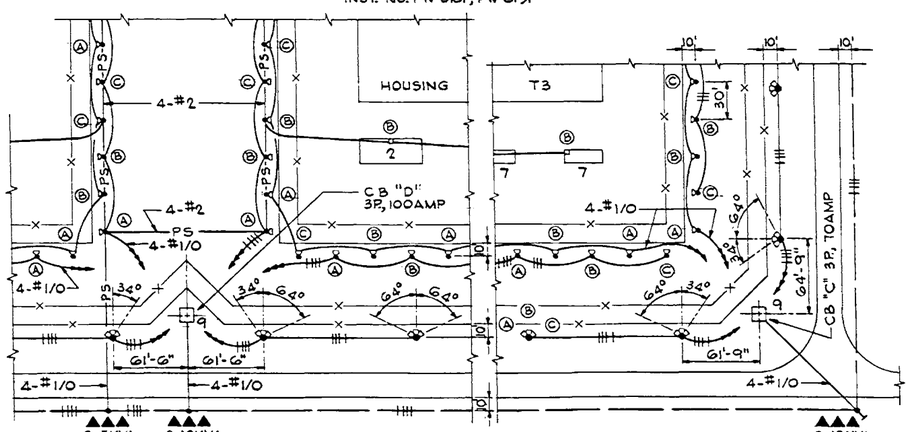
INST. NO. PW 0181, PW 0191

SITE LAYOUT

SCALE NO. 15

INST. NO. PW 0181 STL FRAME BLDGS.

INST. NO. PW 0191 WOOD FRAME BLDGS.



TYPICAL LIGHTING DETAIL

SCALE NO. 13

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGES.
2. ALL CB PANELS P, R, S, T, W, X, Y & Z TO BE 2-1P, 15 AMP.
3. ALL POLE MOUNTED FLOODLIGHTS TO BE 500W AND LOAD TO BE BALANCED.

PLUMBING NOTES

1. EXTEND 4" FIBER DRAIN PIPE 20FT FROM DISPENSARY AND 10FT FROM BATHHOUSE AND KITCHENS.
2. WATER MAIN SHALL BE A MINIMUM OF 10FT FROM SULLAGE DITCH AND 1FT BELOW AT CROSSING.
3. CORRUGATED METAL PIPE TO EXTEND 5'-0" EACH SIDE OF SALLYPORT.

STD-ITR - SCHEDULE OF FACILITIES

NO.	FACILITY	QTY.	SIZE OR UNIT	DWG. NO.
	TENTAGE WITHOUT FRAMES			
T1	CAMP EXCHANGE	2	16'X32'	
T2	COMPOUND HQ & SUPPLY	8	16'X32'	
T3	HOUSING	320	16'X32'	
T4	MESS	48	16'X32'	
T5	RELIGIOUS & EDUCATIONAL	4	16'X32'	
	BUILDINGS			
1	ADMINISTRATION	1	20'X100'	61-11
2	BATHHOUSE - 500 MAN	8	20'X50'	72-32
3	DISPENSARY - TROOP	1	20'X80'	55-11
4	GENERATOR BLDG. (1ST REQ'D)	1	2-300 KW	81-13
5	WARD BUILDING	1	20'X100'	72-21
6	KITCHEN - 500 MAN	8	40'X60'	72-62
7	LATRINE - BUCKET TYPE	17	10'X30'	72-36
8	STOREHOUSE	1	20'X100'	44-11

* REFER TO (4-2) DWG. NO. 99-98 FOR GUARD TOWER PLACEMENT.

NO.	FACILITY	QTY.	SIZE OR UNIT	DWG. NO.
	OTHER CONSTRUCTION			
	FENCE-SECURITY-TYPE X	46.76	1000 FT	71-09
	FENCE-SECURITY-TYPE Y	3.12	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	30	EACH	71-09
9	GUARD TOWER *	13	11'X11'	71-11
	ROAD - 2 LANE - DRAINED & GRADED	1.66	MILE	85-31
10	SENTRY BOX	10	4'X4'	
11	SUMP-FIRE PROTECTION	5	10,000 GAL	84-21
12	WATER TANK	2	10,500 GAL	84-21
13	SEPTIC TANK	1	5000 GAL	83-11
	SITE AREA	94	ACRES	

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	40,000 GPD	703510	84-21
SEWAGE	—	703511	83-15
ELECTRIC DISTRIBUTION	394.4 KW	703512	81-21,22,23

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' — NO. 13

0 50' 100' 200' — NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

UNDER REVISION

POW CAMP-4000-MAN OCCIDENTAL
STD-ITR
SITE & UTILITY LAYOUT

APPROVED: DATE: 19 MAR 1969

CHIEF, BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE 1 APR 1969

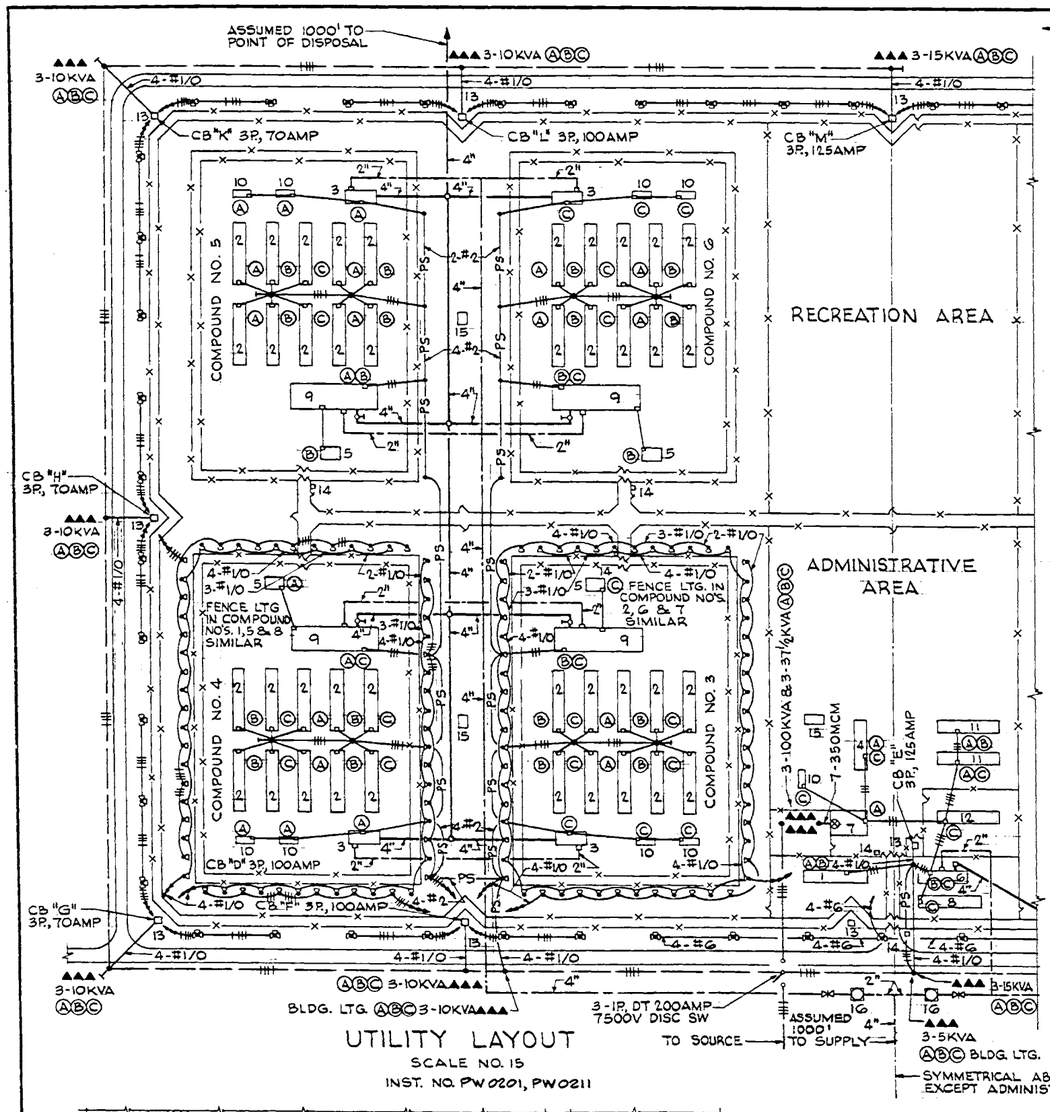
SCALE AS NOTED — SPEC. NO.

DRAWING NUMBER 70-35

SHEET 2 OF 3

CORPS OF ENGINEERS

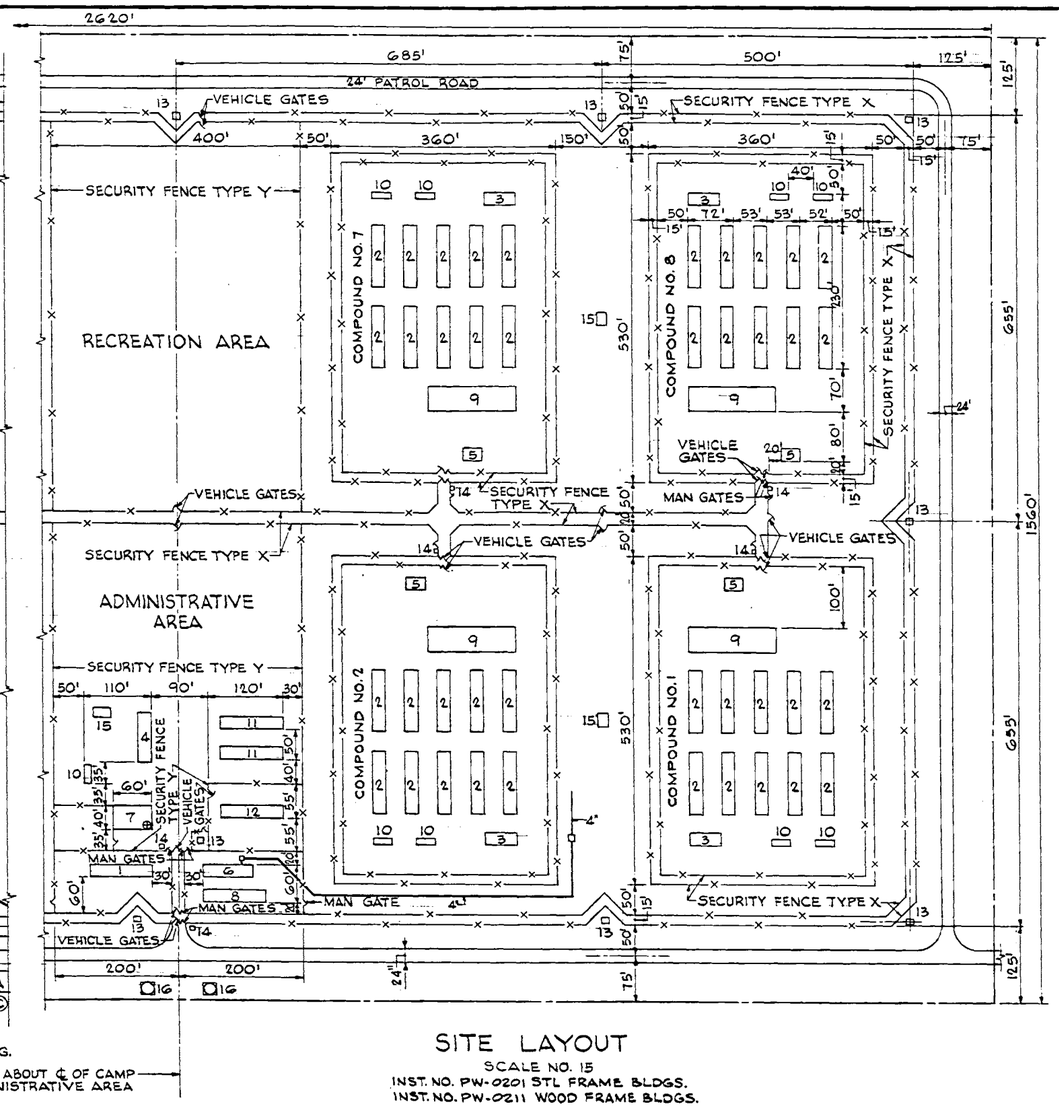
U. S. ARMY



UTILITY LAYOUT

SCALE NO. 15

INST. NO. PW 0201, PW 0211

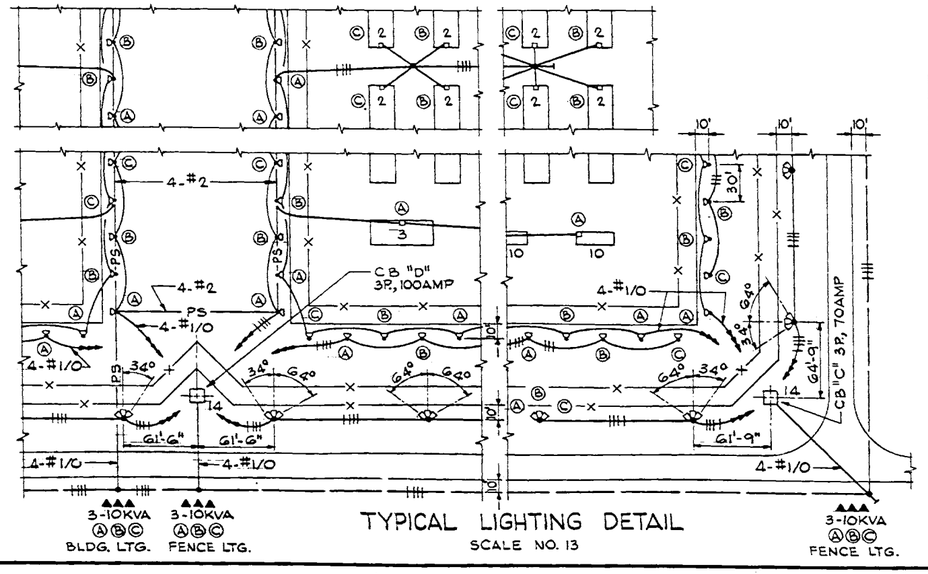


SITE LAYOUT

SCALE NO. 15

INST. NO. PW-0201 STL FRAME BLDGS.

INST. NO. PW-0211 WOOD FRAME BLDGS.



TYPICAL LIGHTING DETAIL

SCALE NO. 13

ELECTRICAL NOTES

1. SYMBOLIC DESIGNATION OF THE NUMBER OF WIRES INDICATES THE NUMBER OF WIRES BETWEEN CONNECTIONS TO PRIMARY TRANSMISSION OR SECONDARY DISTRIBUTION LINES OR WHERE THE NUMBER OF WIRES CHANGE.
2. ALL POLE MOUNTED FLOODLIGHTS TO BE 500W AND LOAD TO BE BALANCED BETWEEN PHASE A, B AND C.

STD 5-SCHEDULE OF FACILITIES

NO.	FACILITY	QTY.	SIZE OR UNIT	DWG. NO.
	BUILDINGS			
1	ADMINISTRATION	1	20'X100'	61-11
2	BARRACKS - 50 MAN	80	20'X100'	72-21
3	BATHHOUSE - 500 MAN	8	20'X50'	72-32
4	CAMP EXCHANGE	1	20'X80'	74-17
5	COMPOUND HQ & SUPPLY	8	20'X30'	61-11
6	DISPENSARY - TROOP	1	20'X80'	55-11
7	GENERATOR BLDG.(IF REQ'D.)	1	2-300KW	81-13
8	WARD BUILDING	1	20'X100'	72-21
9	KITCHEN & MESS HALL-500MAN	8	40'X140'	72-62
10	LATRINE - BUCKET TYPE	17	10'X30'	72-36
11	RELIGIOUS & EDUCATIONAL	2	20'X100'	61-11
12	STOREHOUSE	1	20'X100'	44-11

NO.	FACILITY	QTY	SIZE OR UNIT	DWG. NO.
	OTHER CONSTRUCTION			
	FENCE-SECURITY-TYPE X	4676	1000 FT	71-09
	FENCE-SECURITY-TYPE Y	3.12	1000 FT	71-09
	FENCE-SECURITY-VEHICLE & MAN GATE	30	EACH	71-09
13	GUARD TOWER*	13	11'X11'	71-11
	ROAD - 2 LANE - DRAINED & GRADED	1.66	MILE	85-31
14	SENTRY BOX	10	4'X 4'	
15	SUMP-FIRE PROTECTION	5	10,000 GAL	84-21
16	WATER TANK	2	10,500 GAL	84-21
	SITE AREA	94	ACRES	
	UTILITIES			

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS. FOR DETAILS
WATER DISTRIBUTION	40,000 GPD	703510	84-21
SEWAGE	28,000 GPD	703526	83-15
ELECTRIC DISTRIBUTION	430.4 KW	703527	81-21 81-22 81-23

* REFER TO (14-D) DWG. NO. 99-98 FOR GUARD TOWER PLACEMENT.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' — NO. 13

0 50' 100' 200' — NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, BRANCH

THEATER OF OPERATIONS

POW CAMP - 1000 MAN
OCCIDENTALIS
STD - TMPC

SITE & UTILITY LAYOUT

UNDER REVISION

APPROVED: DATE: 19 MAR 1969

CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

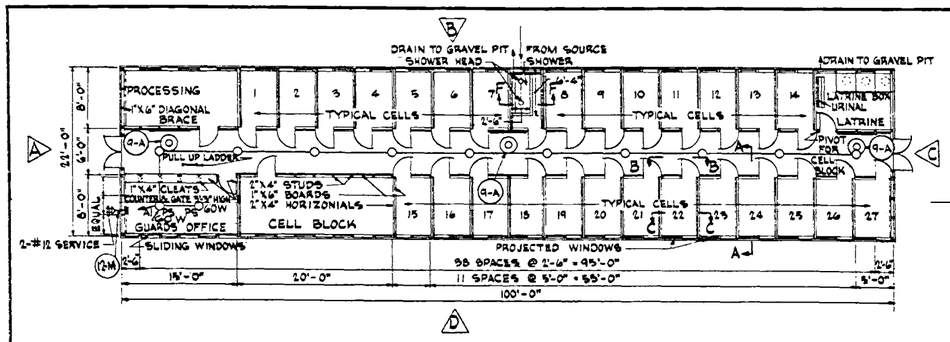
DATE 16 Oct 68

SCALE: AS NOTED

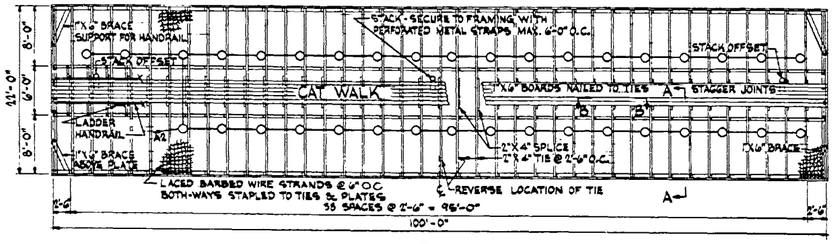
SPEC. NO.

DRAWING NUMBER: 70-35

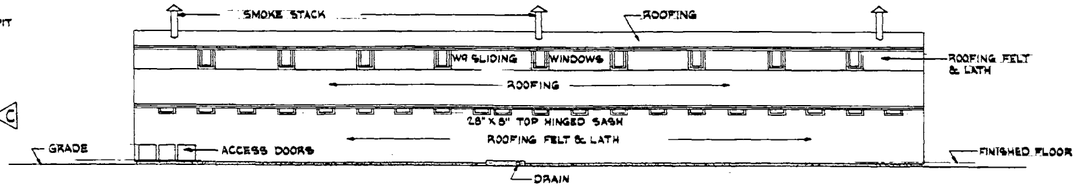
SHEET 3 OF 3



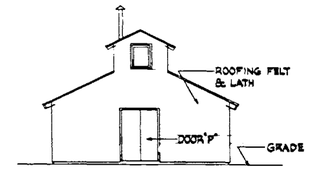
FLOOR PLAN
SCALE NO. 1
FACILITY NO. 710121 - WOOD FRAME W/INTERIOR



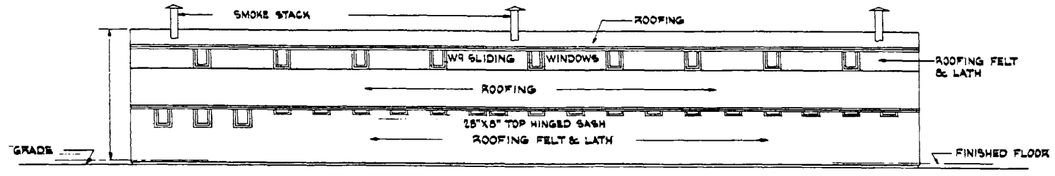
PLAN AT CATWALK
SCALE NO. 1



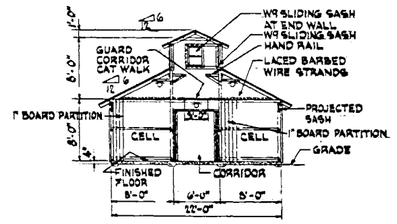
ELEVATION "B"
SCALE NO. 1



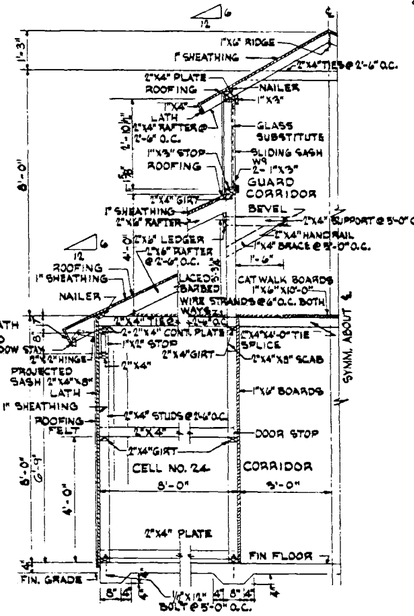
ELEVATION "A"
ELEVATION "C" - IDENTICAL OPPOSITE HAND
SCALE NO. 1



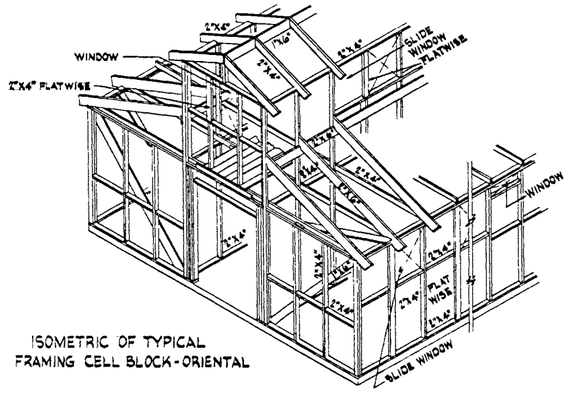
ELEVATION "D"
SCALE NO. 1



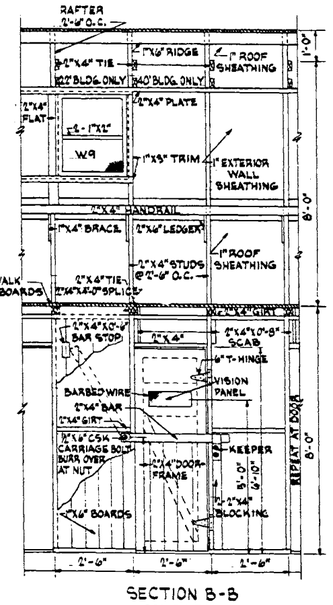
TYPICAL CROSS SECTION
SCALE NO. 1



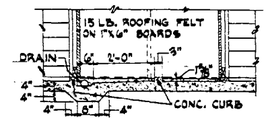
SECTION A-A
SCALE NO. 4



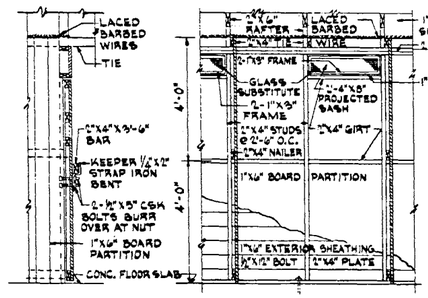
ISOMETRIC OF TYPICAL
FRAMING CELL BLOCK - ORIENTAL



SECTION B-B
SCALE NO. 4

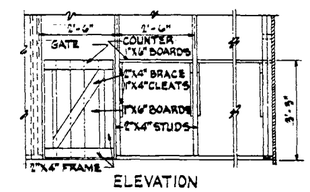


SECTION F-F
SCALE NO. 4

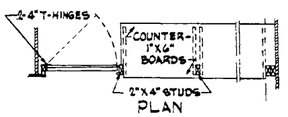


SECTION THRU CELL DOOR
SCALE NO. 4

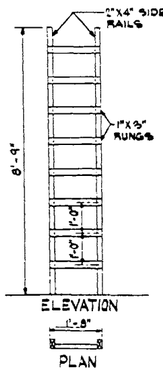
SECTION C-C
SCALE NO. 4



ELEVATION

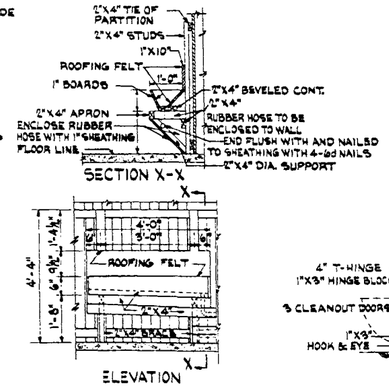


PLAN
DETAIL AT COUNTER
SCALE NO. 4



ELEVATION
PLAN

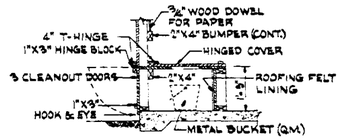
DETAIL OF LADDER
SCALE NO. 4



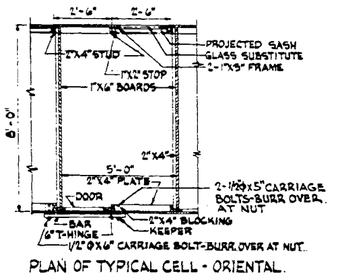
SECTION X-X

ELEVATION

DETAIL OF URINAL
SCALE NO. 4



SECTION THRU LATRINE BOX
SCALE NO. 4



PLAN OF TYPICAL CELL - ORIENTAL.
SCALE NO. 3

GENERAL NOTES

1. SECTIONS AND DETAILS NOTED ON THIS SHEET ARE ALSO APPLICABLE TO "CELL BLOCK OCCIDENTALS" DWG. NO. 71-01 SH. 2 OF 2.

ELECTRICAL NOTES

CELL BLOCK - ORIENTAL

1. TOTAL LIGHTING CONNECTED LOAD IS 1.27 K.W.
2. UNLESS OTHERWISE NOTED ALL LAMPS TO BE 25 W.
3. ALL LAMPS TO HAVE 14" FLAT SHADES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
71-01	CELL BLOCK - ORIENTALS	1 OF 2
71-01	CELL BLOCK - OCCIDENTALS	2 OF 2
54-18	WINDOW & DOOR DETAILS	1 & 2 OF 2
99-98	STANDARD DETAILS	

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' 0 1' 2' 3' 4' 5' 0 1' 2' 3' 4'
NO. 1 NO. 3 NO. 4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

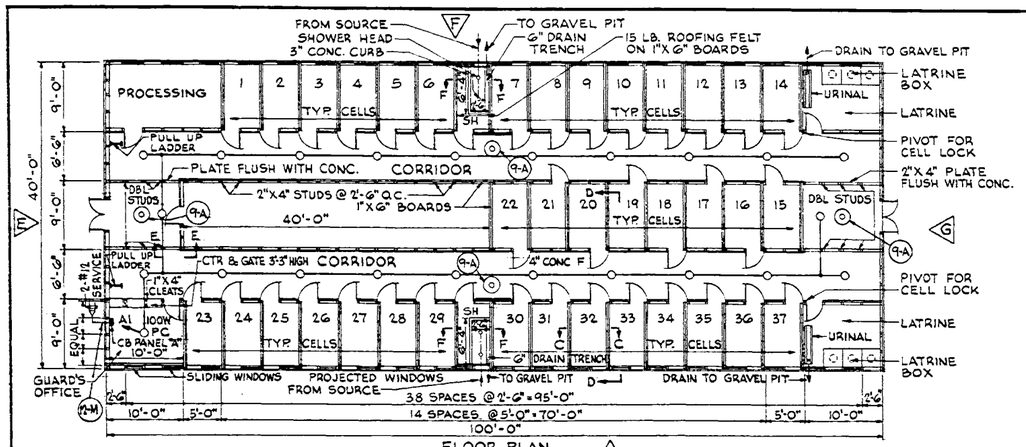
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

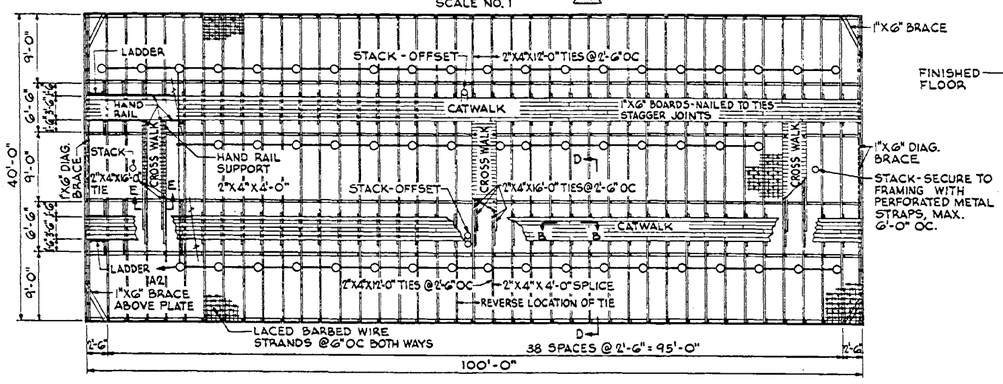
THEATER OF OPERATIONS
CELL BLOCK-ORIENTALS
27 CELLS-22'X100'
PLANS: ELEVATIONS & SECTIONS

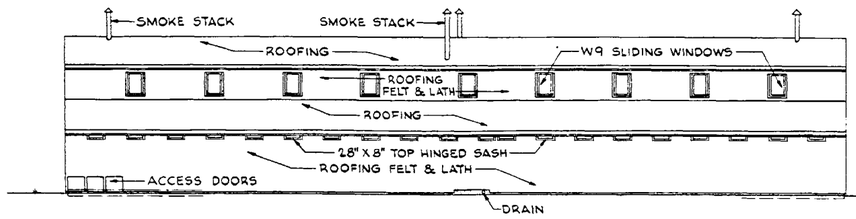
UNDER REVISION

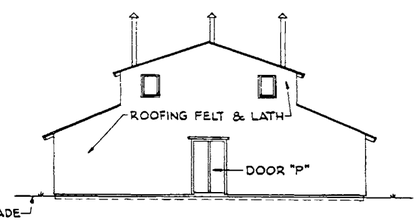
APPROVED: DATE: 19 MAR 1969
CHIEF / BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR / DEPARTMENT AGENCY:
DATE 16 Oct 68

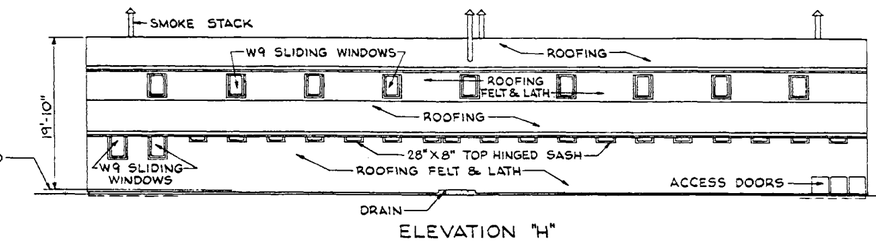
SCALE AS NOTED
SPEC. NO.
DRAWING NUMBER 71-01
SHEET 1 OF 2

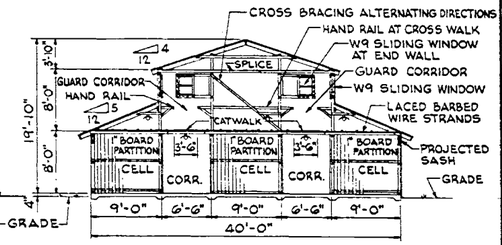


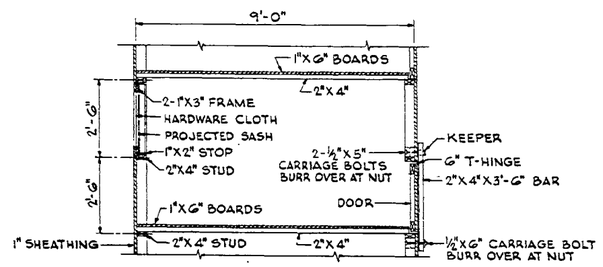


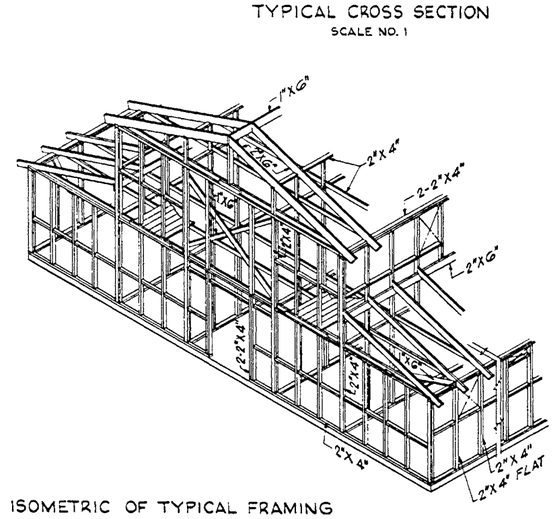


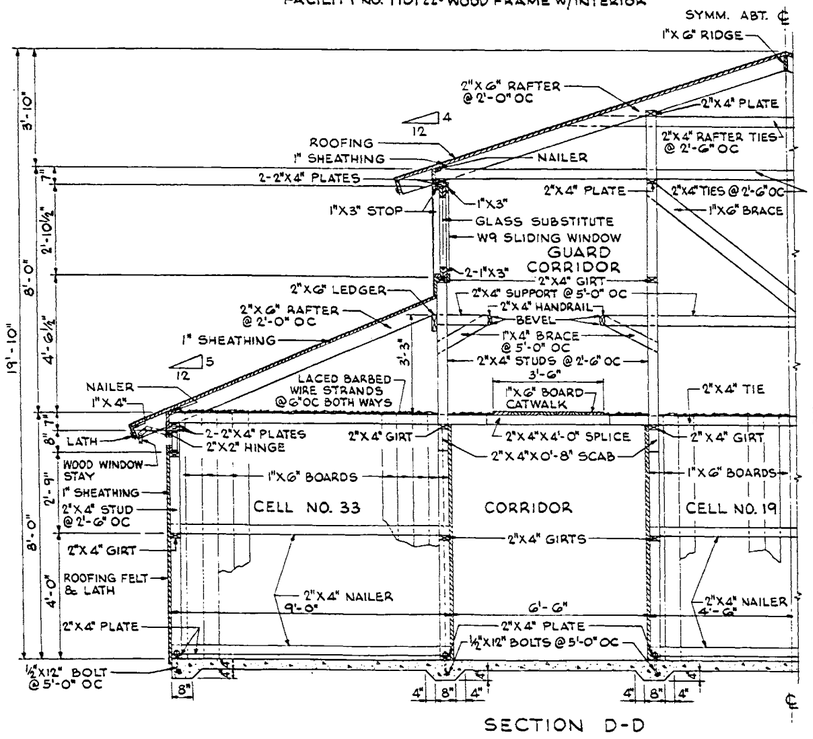


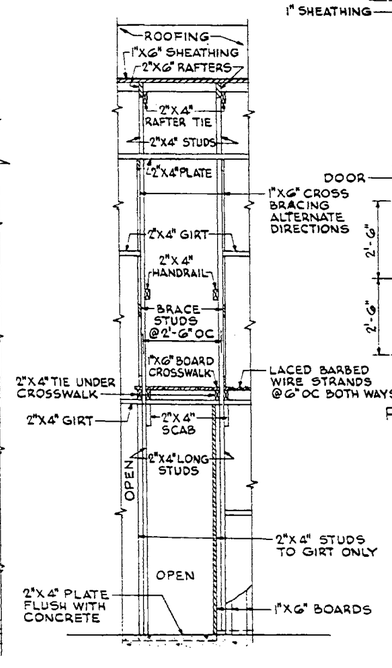


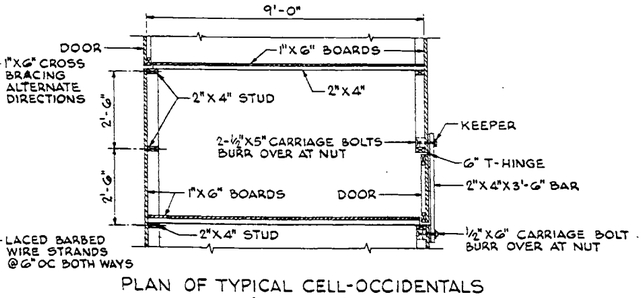












GENERAL NOTES

1. REFER TO DWG. NO. 71-01, SHEET 1 OF 2 FOR ADDITIONAL SECTIONS & DETAILS.

ELECTRICAL NOTES

CELL BLOCK-OCCIDENTALS

1. TOTAL LIGHTING CONNECTED LOAD IS 1.98 KW.
2. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 25W.
3. ALL LAMPS TO HAVE 14" DIA. FLAT SHADES.

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' NO. 1
0 1' 2' 3' 4' NO. 4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

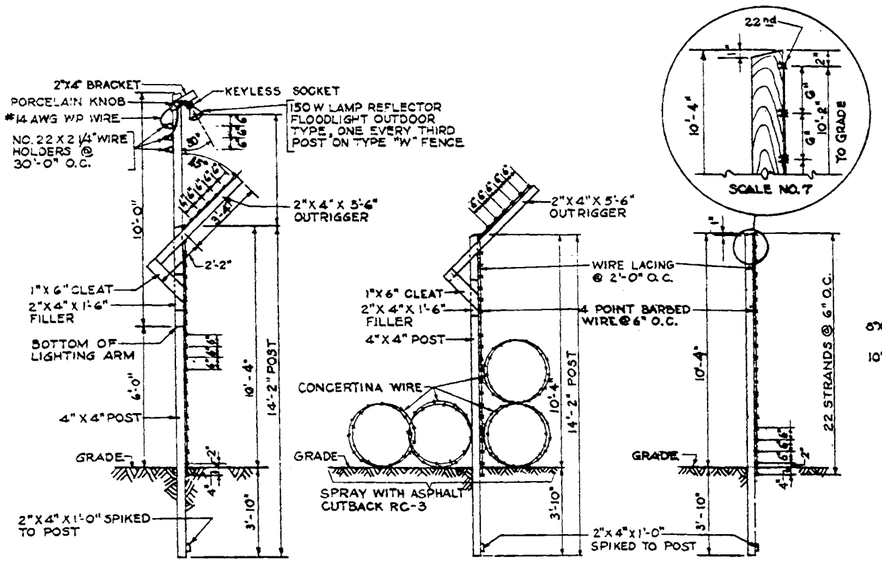
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, BRANCH
APPROVED FOR PROPONENT AGENCY:
Benny Morgan / Lt. Col. USA P.E. Br
DATE 16 Oct 68

THEATER OF OPERATIONS
CELL BLOCK-OCCIDENTALS
37' CELLS-40'X100'
PLANS-ELEVATIONS & SECTIONS

UNDER REVISION

APPROVED: DATE: 29 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 71-01
SHEET 2 OF 2



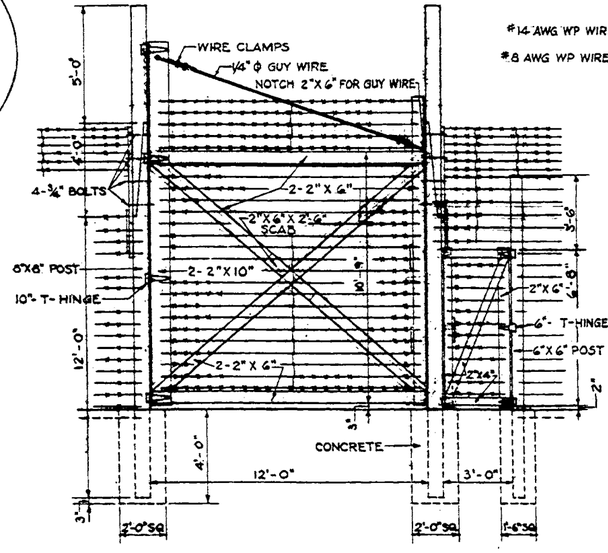
TYPE W — WARNING FENCE
FACILITY NO. 710901

TYPE X — PROTECTIVE FENCE
FACILITY NO. 710902

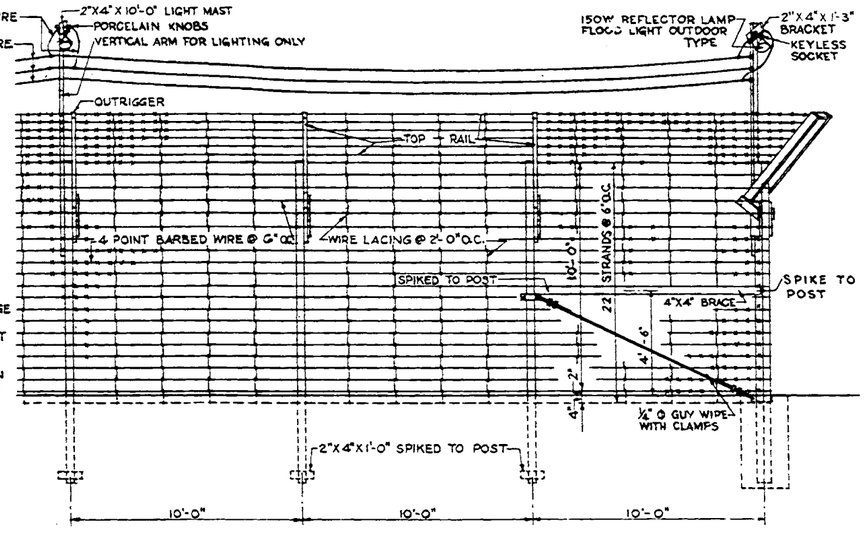
TYPE Y — INTERIOR FENCE
FACILITY NO. 710903

FENCE SECTIONS
SCALE NO. 3

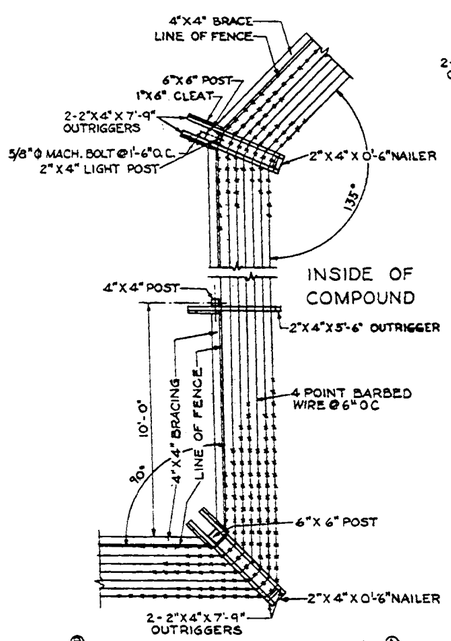
TYPE X CONVERTED TO TYPE W
FACILITY NO. 710905

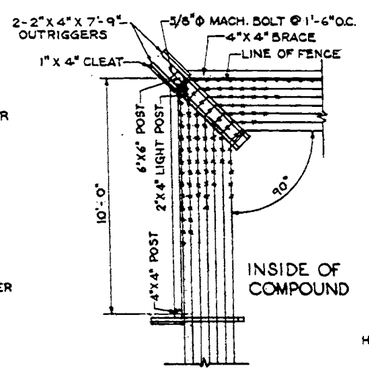


ELEVATION OF VEHICLE AND MAN GATES
SCALE NO. 3
FACILITY NO. 710904

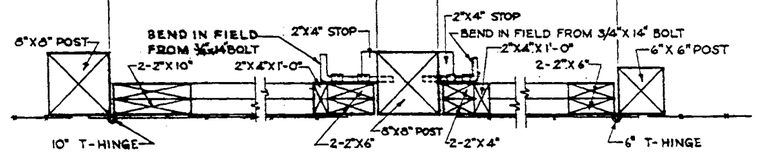


PARTIAL ELEVATION OF FENCE - TYPE W
TYPE X SIMILAR - WITHOUT FLOOD LIGHTING
TYPE Y SIMILAR - WITHOUT FLOOD LIGHTING, TOP RAIL & OUTRIGGERS
SCALE NO. 3

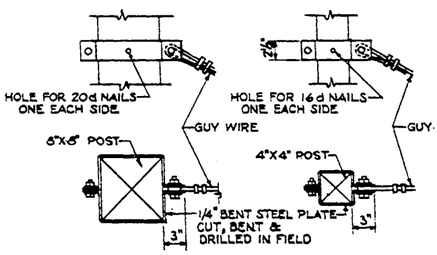




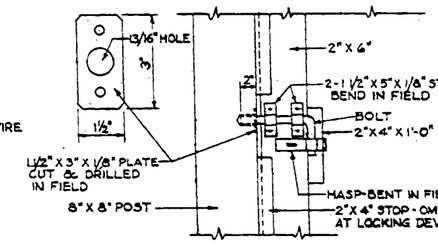
FENCE CORNER CONDITIONS
SCALE NO.3



DETAIL PLAN OF VEHICLE & MAN GATES
SCALE NO.7

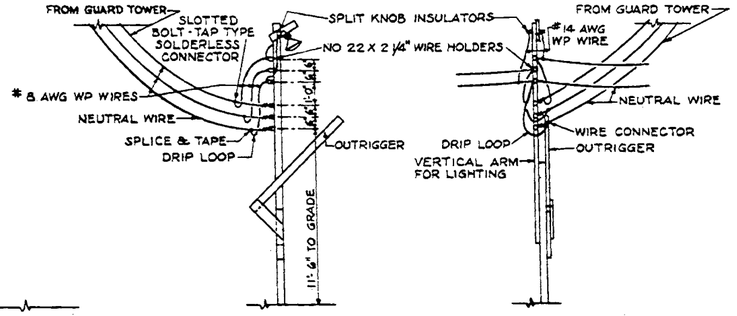


DETAILS OF GUY WIRE ANCHORS
SCALE NO.7



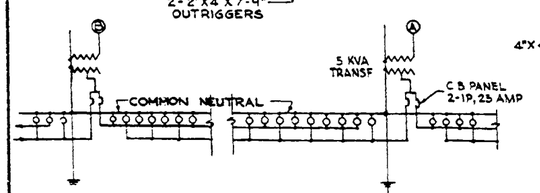
MAN GATE: ONE BOLT REQUIRED; 3'-6" ABOVE GRADE
VEHICLE GATE: TWO BOLTS REQUIRED; 3'-0" & 6'-6" ABOVE GRADE

ELEVATION OF LOCKING DEVICE
SCALE NO.7

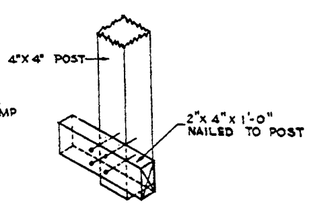


SIDE ELEVATION — DIRECT ELEVATION

TYPICAL ELECTRICAL CONNECTION FROM GUARD TOWER
SCALE NO. 3



FENCE LIGHTING DIAGRAM
NO SCALE



ISOMETRIC OF POST FOOTING
NO SCALE

ELECTRICAL NOTES

1. TOTAL ELECTRICAL LIGHTING CONNECTED LOAD IS 5.0 KW LIGHTING LOAD BASED ON 1000 FEET OF TYPE W FENCE WITH 150W LAMPS @ 30' OC ALTERNATE LAMPS ON SAME CIRCUIT.
2. FENCE LIGHTING CONTROLLED BY CIRCUIT BREAKERS IN GUARD TOWERS. SEE DWG 71-12 SHEET 1 OF 1.

GENERAL NOTES

1. MAXIMUM LENGTH OF UNBRACED FENCE SHALL NOT EXCEED 1000 FT. BRACING POST SHALL BE EQUIVALENT TO CORNER POST AND SHALL BE BRACED EACH SIDE WITH HORIZONTAL AND DIAGONAL BRACES SIMILAR TO CORNER BRACING.
2. BARBED WIRE SHALL BE FASTENED TO WOOD POST WITH STAPLES 1½ LONG, MADE OF #8 g WIRE. USE A MINIMUM OF TWO STAPLES PER STRAND PER POST.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5' — NO.3
0 3" 6" 9" 1' 2' — NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HALE
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, ARCHITECTURAL BRANCH

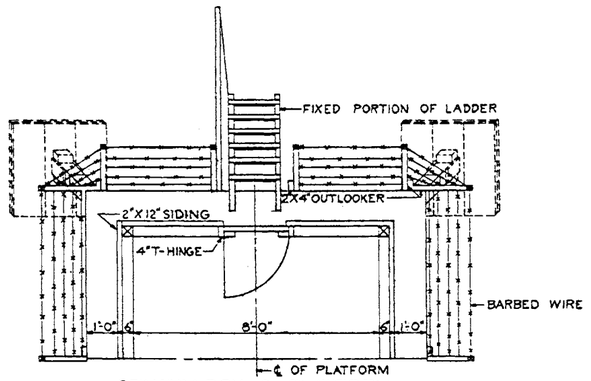
THEATER OF OPERATIONS
FENCE-SECURITY
TYPE W, X, Y & GATES

UNDER REVISION

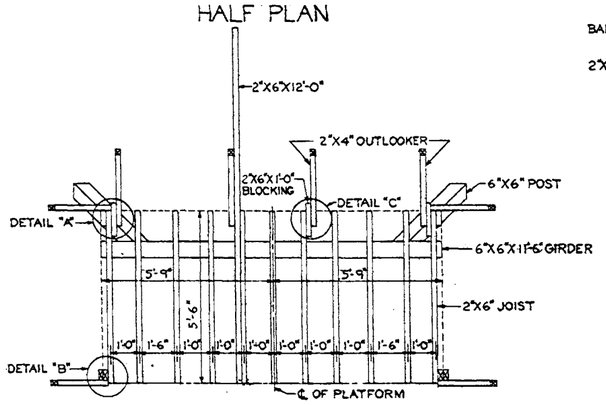
APPROVED: DATE: 19 MAR 70
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED, FOR PROPONENT AGENCY:
DATE

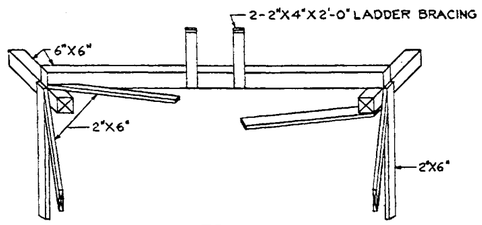
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 71-09
SHEET 1 OF 1



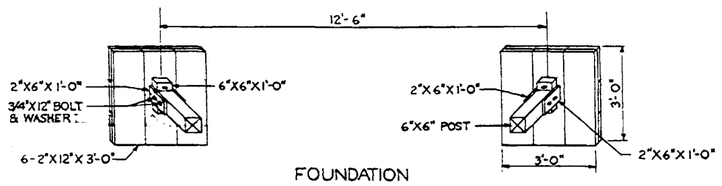
SENTRY BOX & PLATFORM
HALF PLAN



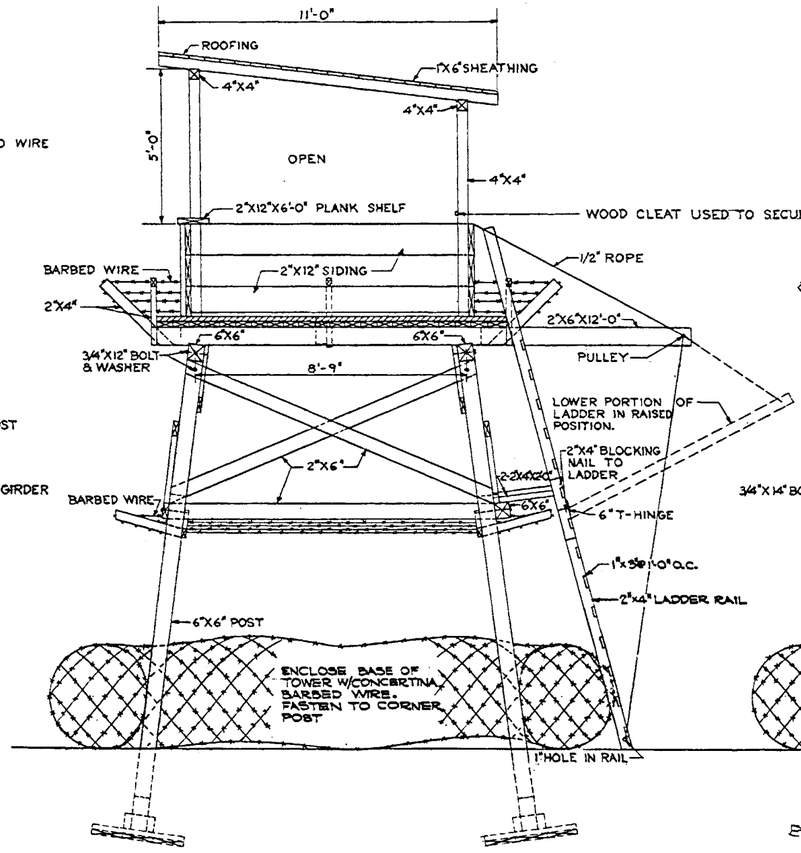
PLATFORM FRAMING
HALF PLAN



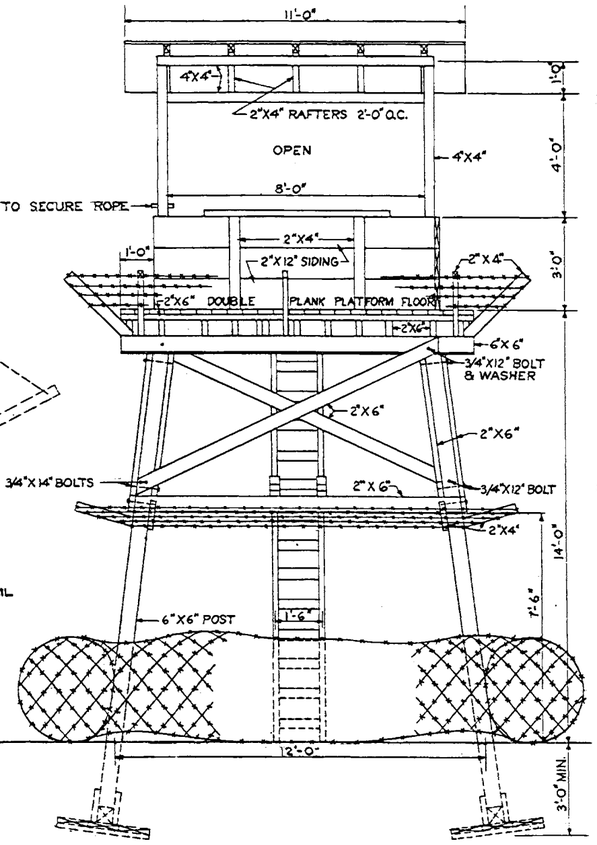
MID-FRAMING
HALF PLAN



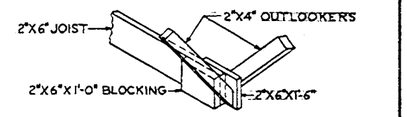
FOUNDATION
HALF PLAN
SCALE NO. 4



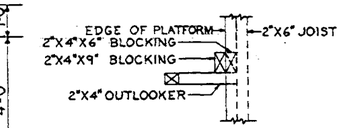
SECTION
SCALE NO.4



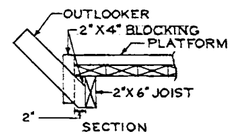
FRONT ELEVATION
SCALE NO. 4



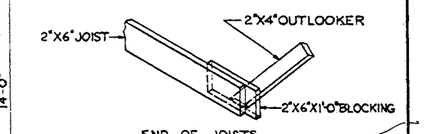
DETAIL "A"



PLAN



DETAIL "B"



END OF JOISTS
DETAIL "C"

OUTLOOKER DETAILS
NO SCALE

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
71-11	PLANS, ELEVATIONS, & SECTIONS	1 OF 1

UNDER REVISION

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES
0 1' 2' 3' 4'
NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ELLISON
TRACED BY:
CHECKED BY: TLYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS
GUARD TOWER-17'-6" H.
FACILITY NO. 711101

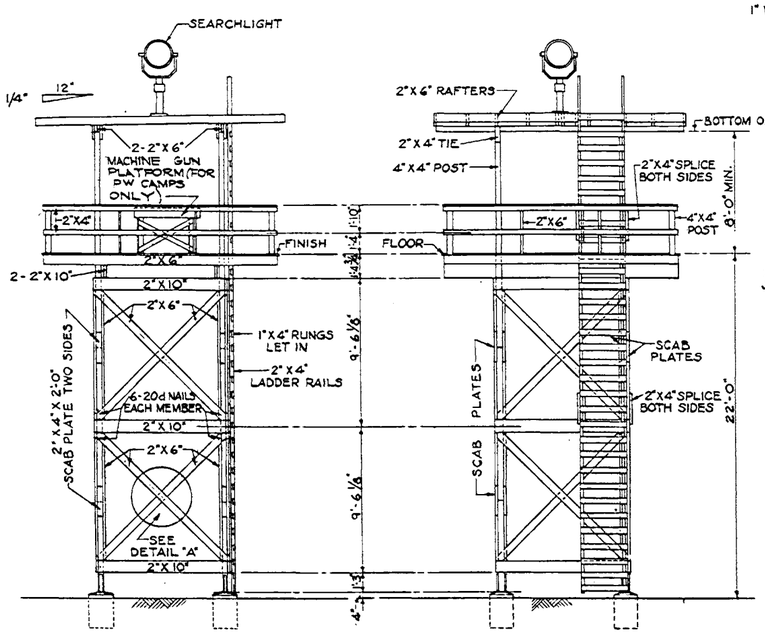
UNDER REVISION

APPROVED: DATE: 19 MAR 1969

CHIEF, BRANCH | CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR COMPONENT AGENCY:
DATE 16 Oct 67

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
71-11



ELEVATION "A"

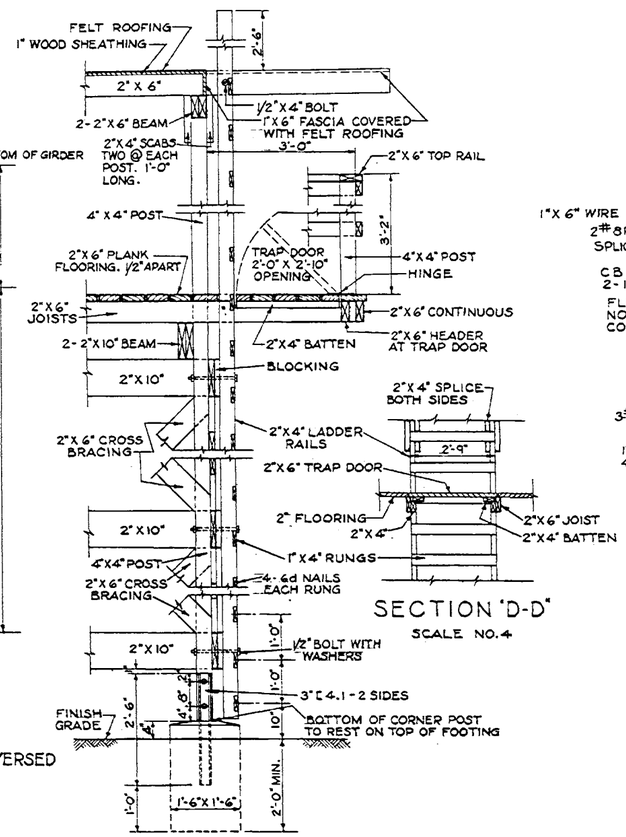
ELEVATION "C" SIMILIAR EXCEPT REVERSED

SCALE NO. 2

ELEVATION "B"

ELEVATION "D" SIMILIAR EXCEPT REVERSED

SCALE NO. 2

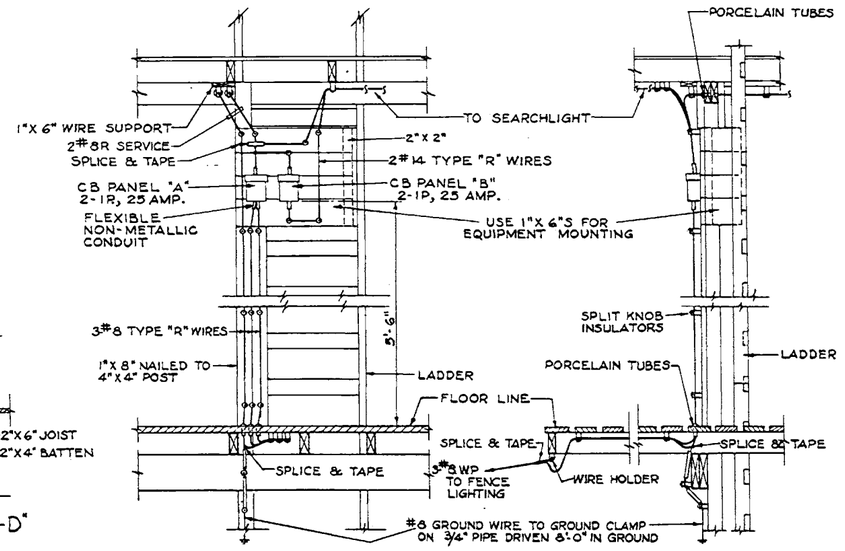


SECTION "D-D"

SCALE NO. 4

SECTION "C-C"

SCALE NO. 5

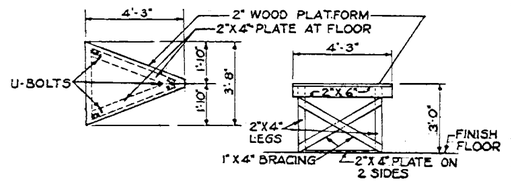


SECTION "B-B"

SCALE NO. 5

SECTION "A-A"

SCALE NO. 5

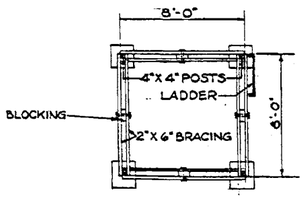


PLAN ELEVATION

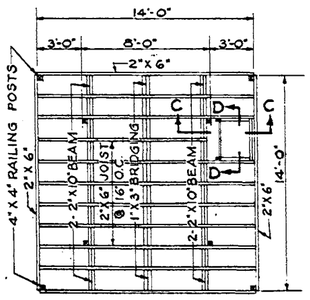
MACHINE GUN PLATFORM

SCALE NO. 3

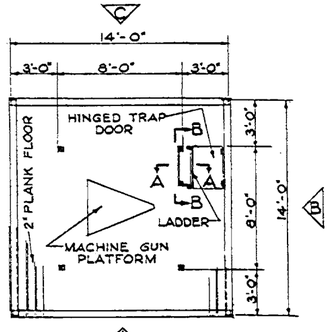
(FOR PW CAMPS ONLY)



BASE



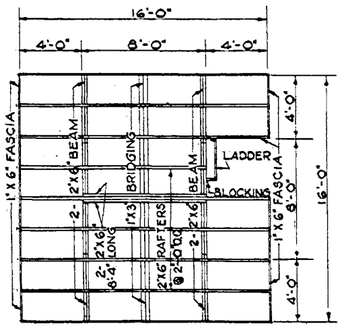
PLATFORM FRAMING



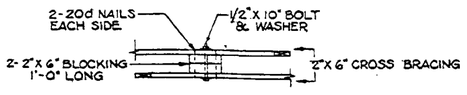
TOWER PLATFORM

PLAN

SCALE NO. 2



ROOF FRAMING



DETAIL "A"

SCALE NO. 4

GENERAL NOTES

1. CONCRETE FOOTINGS POURED WITH 'S' F IN PLACE. OMIT WOOD FORMS FOR CONCRETE BELOW GRADE.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
71-12	PLANS, ELEVATIONS, & SECTIONS	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10 — NO. 2: 0 1' 2' 3' 5' — NO. 3: 0 1' 2' 3' 5' — NO. 4: 0 1' 2' 3' 5' — NO. 5: 0 1' 2' 5'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D.C.

DRAWN BY: ELLISON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, ARCHITECTURAL BRANCH

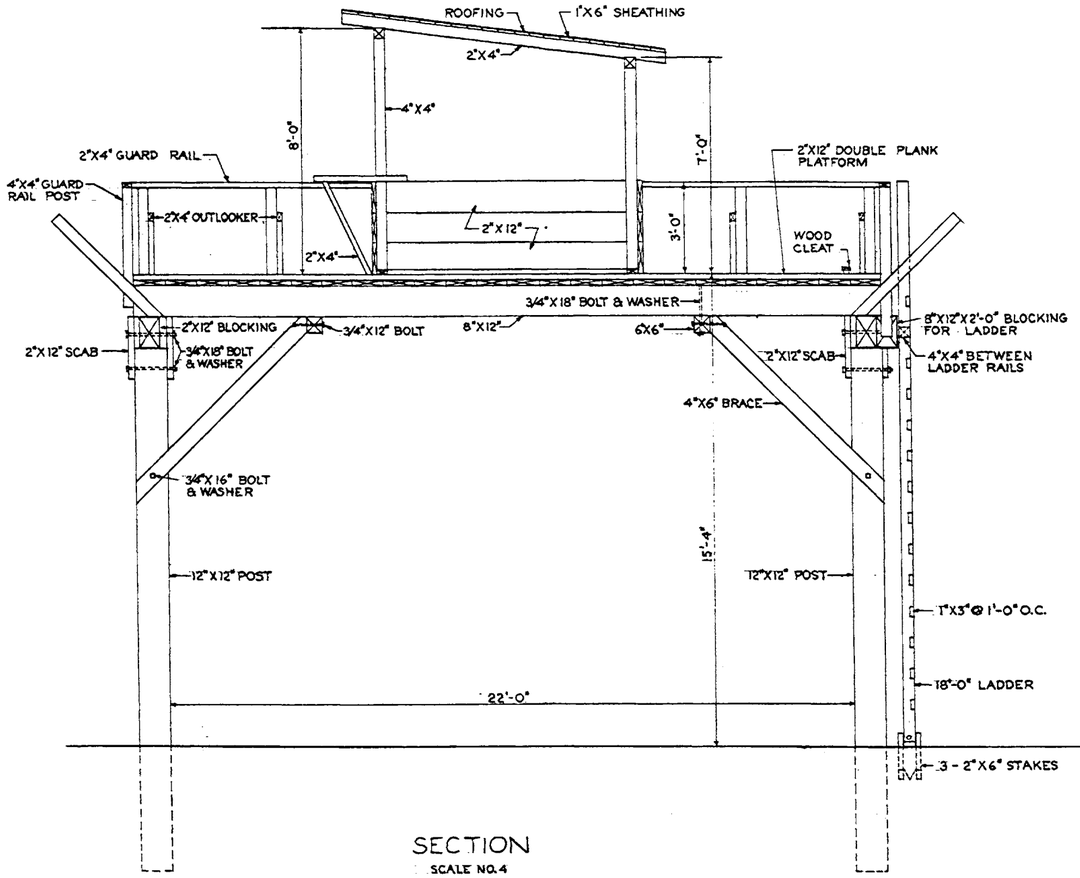
THEATER OF OPERATIONS
GUARD TOWER 16'X16'
FACILITY NO. 711201

UNDER REVISION

APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1962

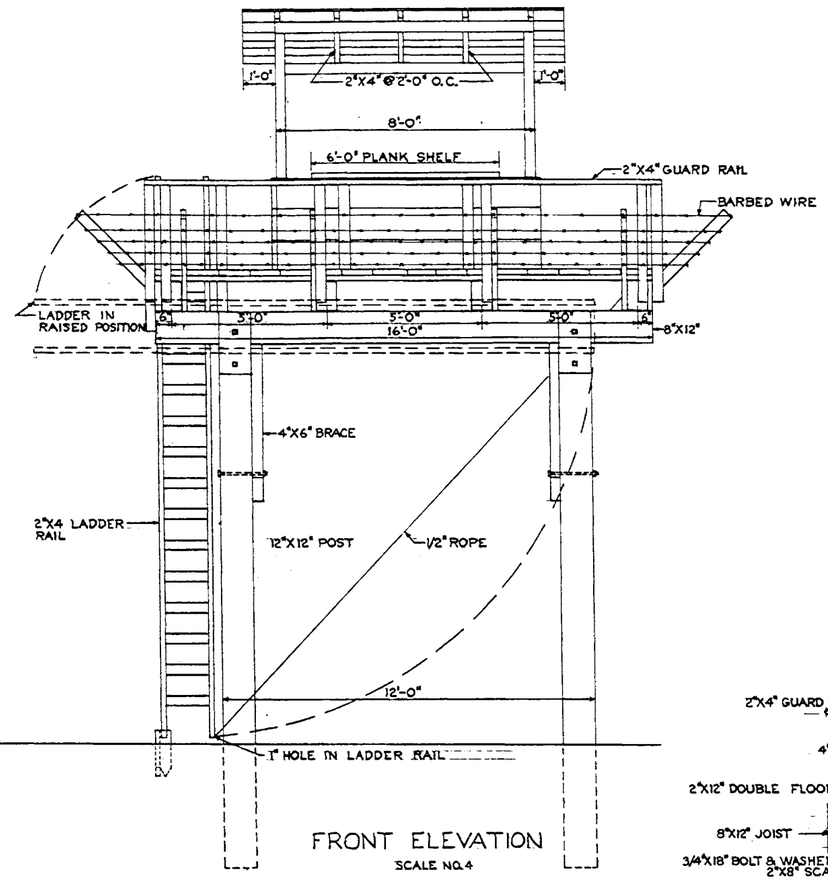
APPROVED FOR PROPONENT AGENCY:
DATE 11 Feb 62

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
71-12



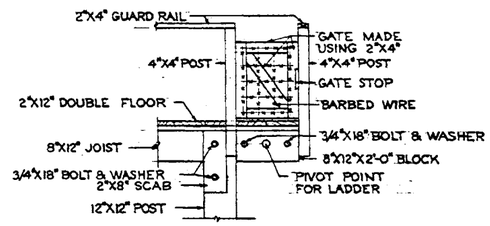
SECTION

SCALE NO.4



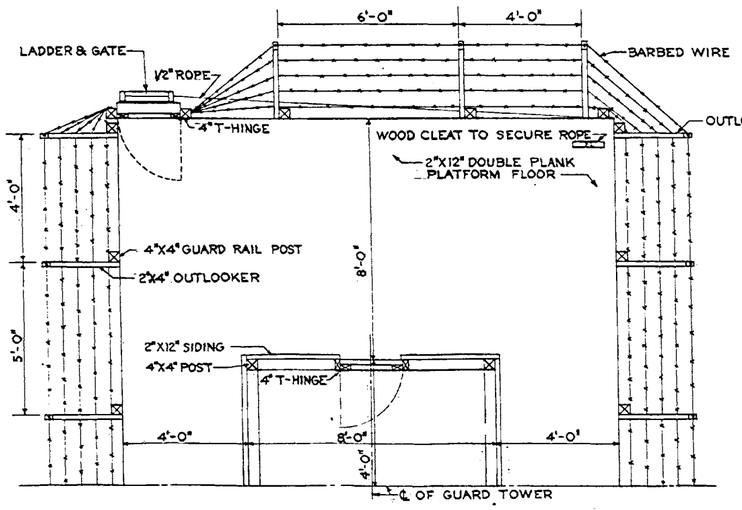
FRONT ELEVATION

SCALE NO.4



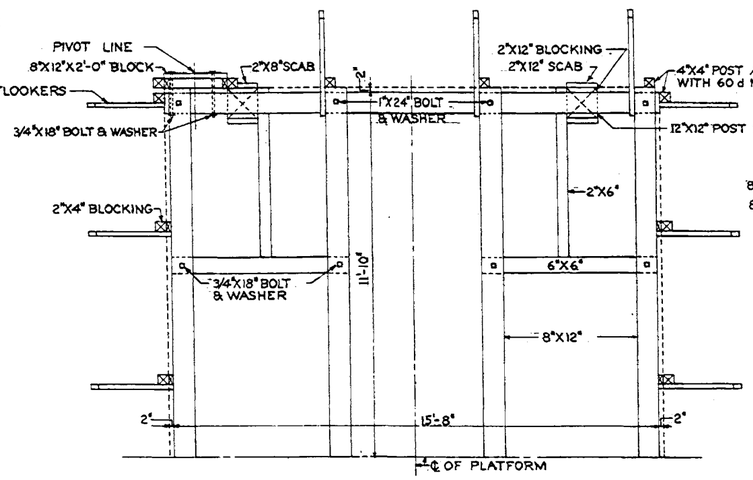
ELEVATION OF GATE

SCALE NO.4



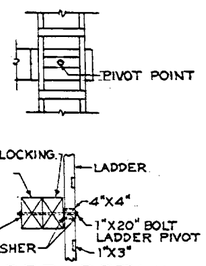
HALF PLAN OF SENTRY BOX AND PLATFORM

SCALE NO.4



HALF PLAN OF PLATFORM FRAMING

SCALE NO.4



LADDER DETAIL

SCALE NO.4

SCHEDULE OF DRAWINGS		
DWG. NO.	DESCRIPTION	SHEET NO.
71-13	PLANS, ELEVATIONS & SECTIONS	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	LATER REVISION		

REVISIONS

GRAPHIC SCALES

0 1' 2' 3' 4'

NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ELLISON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

GUARD TOWER 16'X24'

FACILITY NO. 711301

UNDER REVISION

APPROVED: DATE: 19 MAR 1969

CHIEF, BRANCH | CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

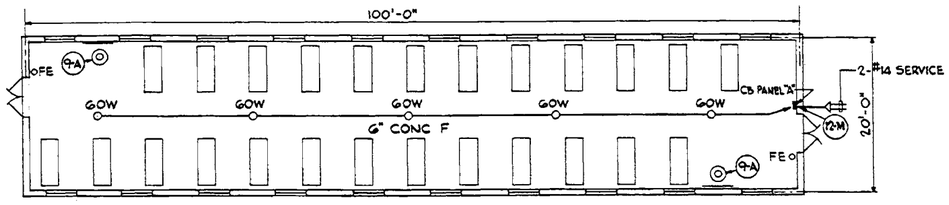
DATE 16 Oct 68

SCALE: AS NOTED

SPEC. NO.

DRAWING NUMBER: 71-13

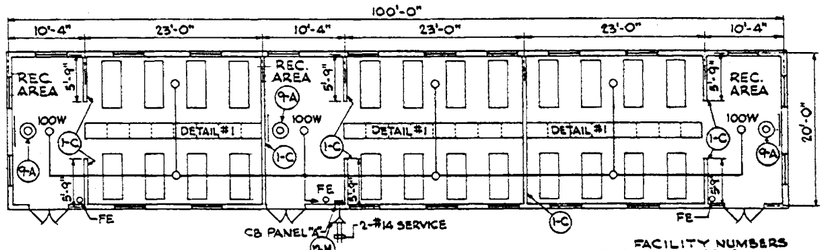
SHEET 1 OF 1



BARRACKS - 50 MAN

SCALE NO. 1

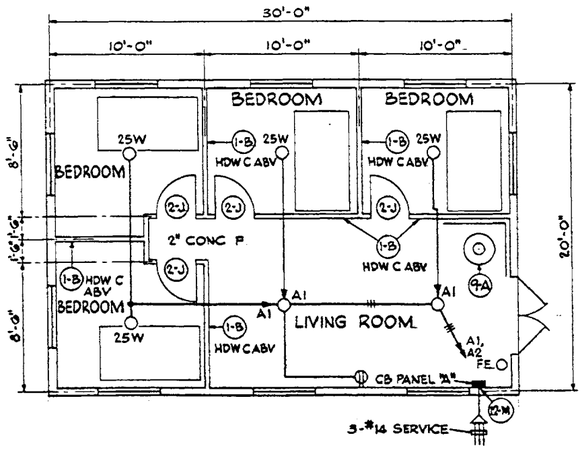
FACILITY NUMBERS
722105 - INTERIOR ONLY
722115 - STL FRAME W/INTERIOR
722125 - WOOD FRAME W/INTERIOR



QUARTERS - 24 OFFICERS

SCALE NO. 1

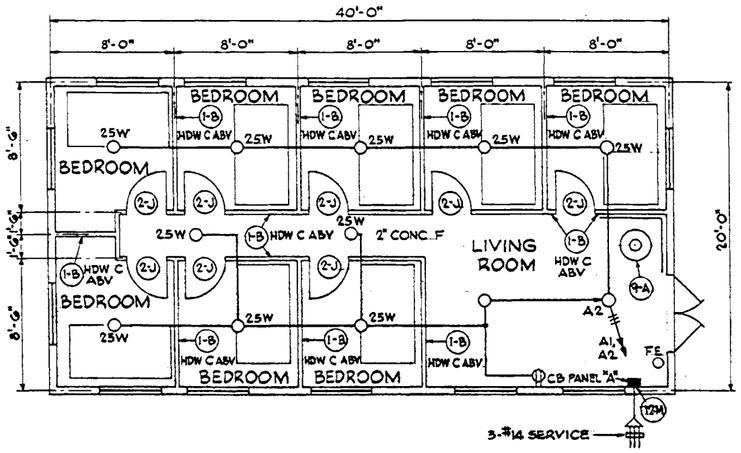
FACILITY NUMBERS
722106 - INTERIOR ONLY
722116 - STL FRAME W/INTERIOR
722126 - WOOD FRAME W/INTERIOR



QUARTERS - FEMALE EMPLOYEES - 20' X 30'

SCALE NO. 2

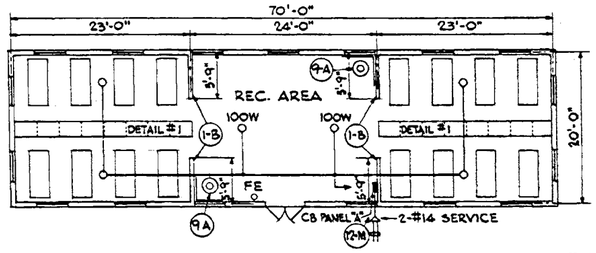
FACILITY NUMBERS
722101 - INTERIOR ONLY
722111 - STL FRAME W/INTERIOR
722121 - WOOD FRAME W/INTERIOR



QUARTERS - FEMALE EMPLOYEES - 20' X 40'

SCALE NO. 2

FACILITY NUMBERS
722102 - INTERIOR ONLY
722112 - STL FRAME W/INTERIOR
722122 - WOOD FRAME W/INTERIOR

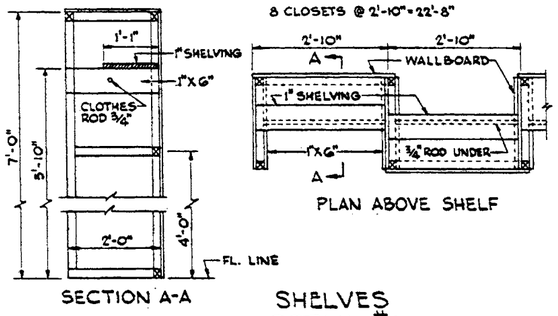


QUARTERS - 16 OFFICERS

SCALE NO. 1

FACILITY NUMBERS
722104 - INTERIOR ONLY
722114 - STL FRAME W/INTERIOR
722124 - WOOD FRAME W/INTERIOR

NOTE:
ALL LUMBER 2" X 2" EXCEPT AS NOTED

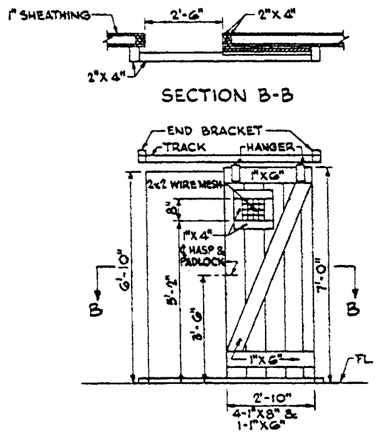


SECTION A-A

PLAN ABOVE SHELF

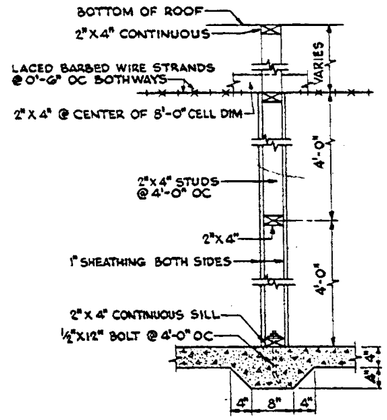
SHELVES DETAIL #1

SCALE NO. 5



SECTION B-B

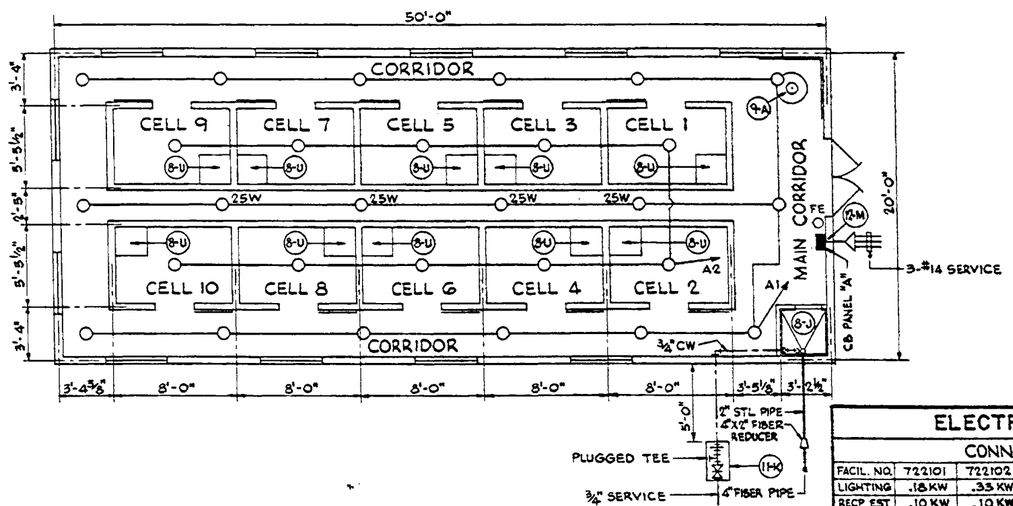
CELL DOOR
NO SCALE



TYPICAL SECTION
CELL WALL

SCALE NO. 6

CLOSE CONFINEMENT DETAILS



BARRACKS - CLOSE CONFINEMENT - 20' X 50'

SCALE NO. 2

FACILITY NUMBERS
722103 - INTERIOR ONLY
722113 - STL FRAME W/INTERIOR
722123 - WOOD FRAME W/INTERIOR

ELECTRICAL NOTES

CONNECTED LOAD

FACIL. NO.	722101	722102	722103	722104	722105	722106
LIGHTING	.18 KW	.33 KW	1.06 KW	.36 KW	.30 KW	.56 KW
RECP EST	.10 KW	.10 KW				
TOTAL	.28 KW	.43 KW	1.06 KW	.36 KW	.30 KW	.56 KW

1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 40W.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-21	PLANS & DETAILS	1 OF 1
99-98	STANDARD DETAILS	
34-05	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO. 1, NO. 2, NO. 5, NO. 6

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. BEICHMANN
APPROVED:
CHIEF, STRUCTURAL DIVISION

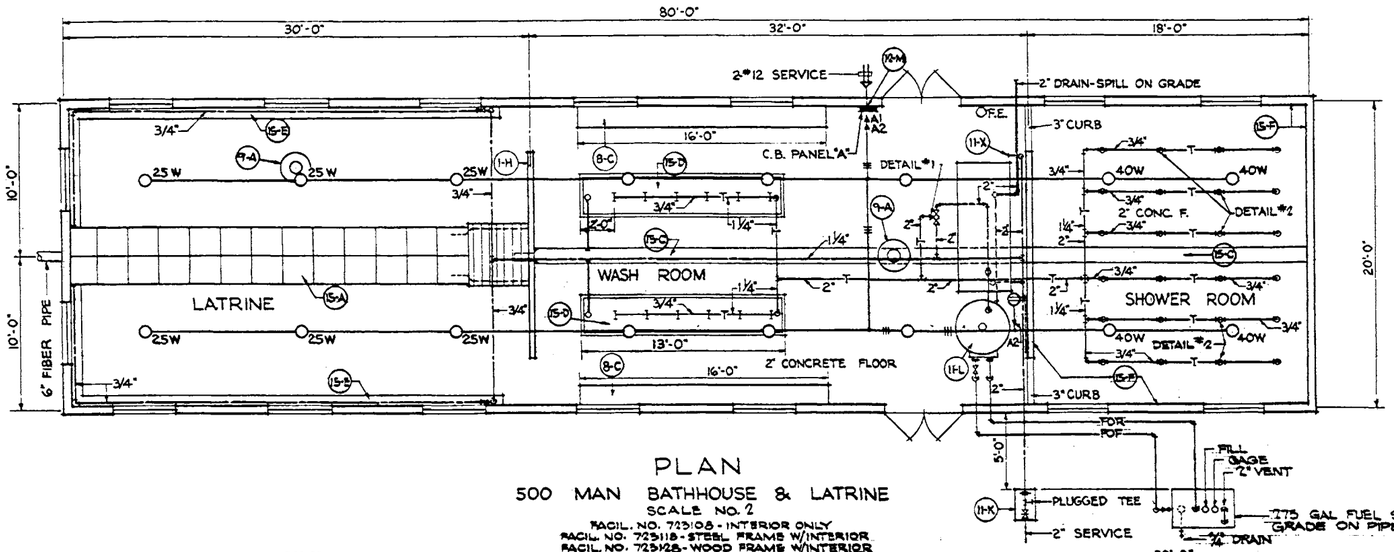
THEATER OF OPERATIONS
OFFICERS QUARTERS & EMPLOYEE QUARTERS
50 MAN BARRACKS
CLOSE CONFINEMENT BARRACKS
PLANS & DETAILS

UNDER REVISION

APPROVED: W. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-21
SHEET 1 OF 1

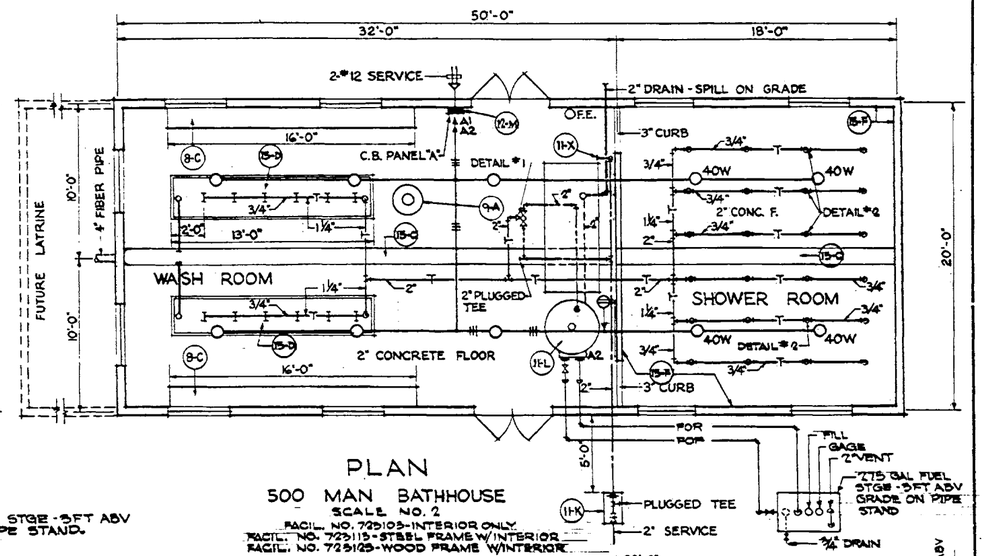


PLAN

500 MAN BATHHOUSE & LATRINE

SCALE NO. 2

FACIL. NO. 723108 - INTERIOR ONLY
FACIL. NO. 723118 - STEEL FRAME W/INTERIOR
FACIL. NO. 723128 - WOOD FRAME W/INTERIOR

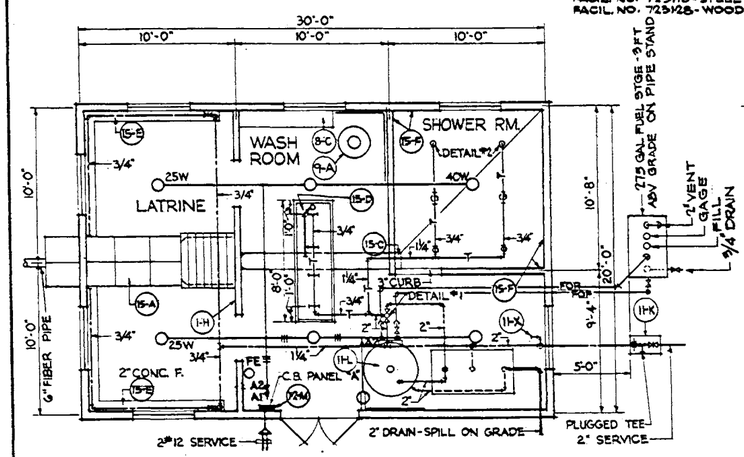


PLAN

500 MAN BATHHOUSE

SCALE NO. 2

FACIL. NO. 723109 - INTERIOR ONLY
FACIL. NO. 723113 - STEEL FRAME W/INTERIOR
FACIL. NO. 723123 - WOOD FRAME W/INTERIOR

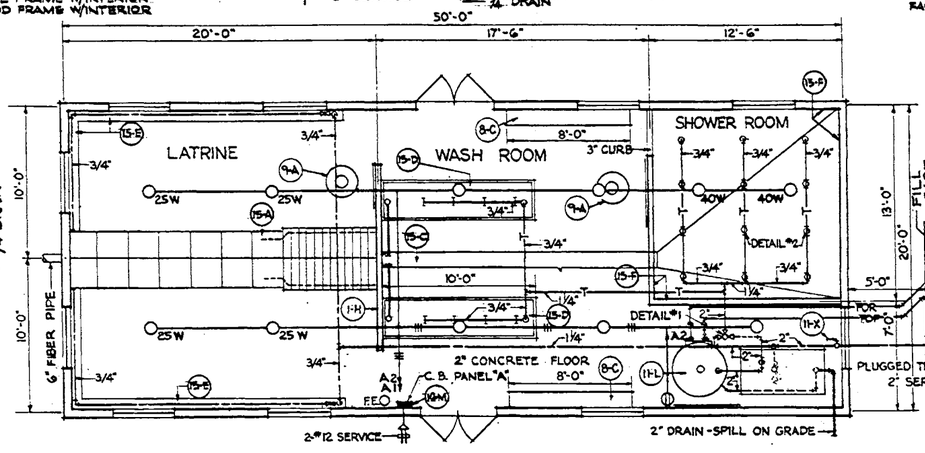


PLAN

100 MAN BATHHOUSE & LATRINE

SCALE NO. 2

FACIL. NO. 723106 - INTERIOR ONLY
FACIL. NO. 723116 - STEEL FRAME W/INTERIOR
FACIL. NO. 723126 - WOOD FRAME W/INTERIOR

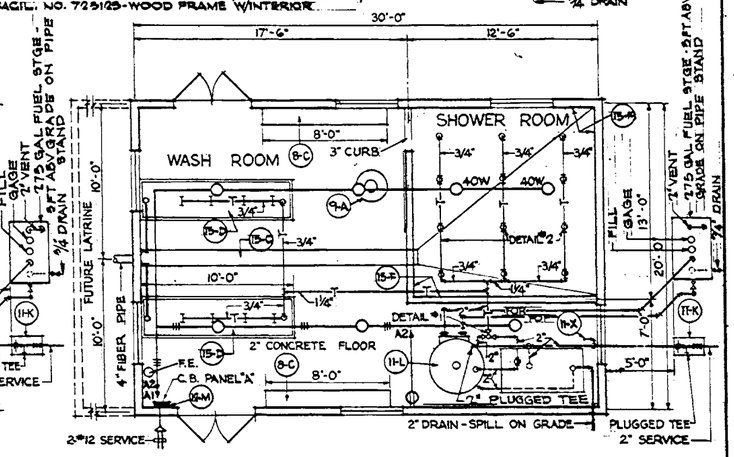


PLAN

250 MAN BATHHOUSE & LATRINE

SCALE NO. 2

FACIL. NO. 723107 - INTERIOR ONLY
FACIL. NO. 723117 - STEEL FRAME W/INTERIOR
FACIL. NO. 723127 - WOOD FRAME W/INTERIOR

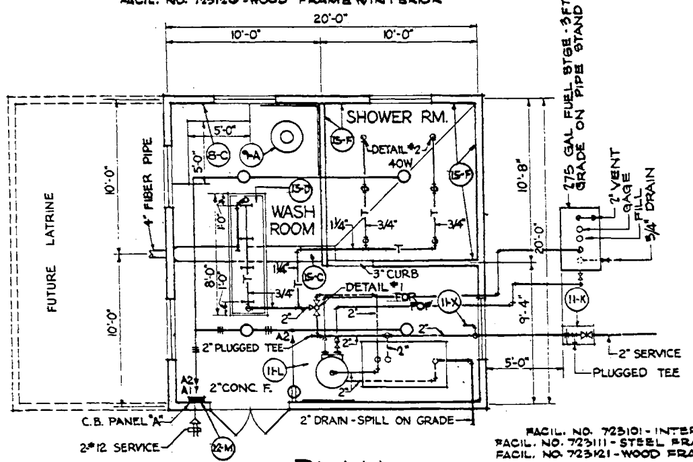


PLAN

250 MAN BATHHOUSE

SCALE NO. 2

FACIL. NO. 723102 - INTERIOR ONLY
FACIL. NO. 723112 - STEEL FRAME W/INTERIOR
FACIL. NO. 723122 - WOOD FRAME W/INTERIOR



FACIL. NO. 723101 - INTERIOR ONLY
FACIL. NO. 723111 - STEEL FRAME W/INTERIOR
FACIL. NO. 723121 - WOOD FRAME W/INTERIOR

PLAN

100 MAN BATHHOUSE

SCALE NO. 2

ELECTRICAL NOTES

	100 MAN BATH	250 MAN BATH	500 MAN BATH
BUILDING			
LIGHTING	.22 KW	.38 KW	.52 KW
RECP EST	.53 KW	.53 KW	.53 KW
TOTAL	.75 KW	.91 KW	1.05 KW
BUILDING	100 MAN BATH & LAT.	250 MAN BATH & LAT.	500 MAN BATH & LAT
LIGHTING	.27 KW	.48 KW	.67 KW
RECP EST	.53 KW	.53 KW	.53 KW
TOTAL	.80 KW	1.01 KW	1.20 KW

1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 60W.
2. ALL 60W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS.
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER
3. FLOOR IN SHOWER ROOMS TO SLOPE ¼" PER FOOT TO DRAIN
4. REMOVABLE DUCKBOARDS OVER ENTIRE FLOOR IN SHOWER ROOMS.
5. —T— INDICATES TEMPERED WATER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-31	PLANS	1 OF 1
72-32	PLUMBING DIAG. & DET.	2 OF 2
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 4
55-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

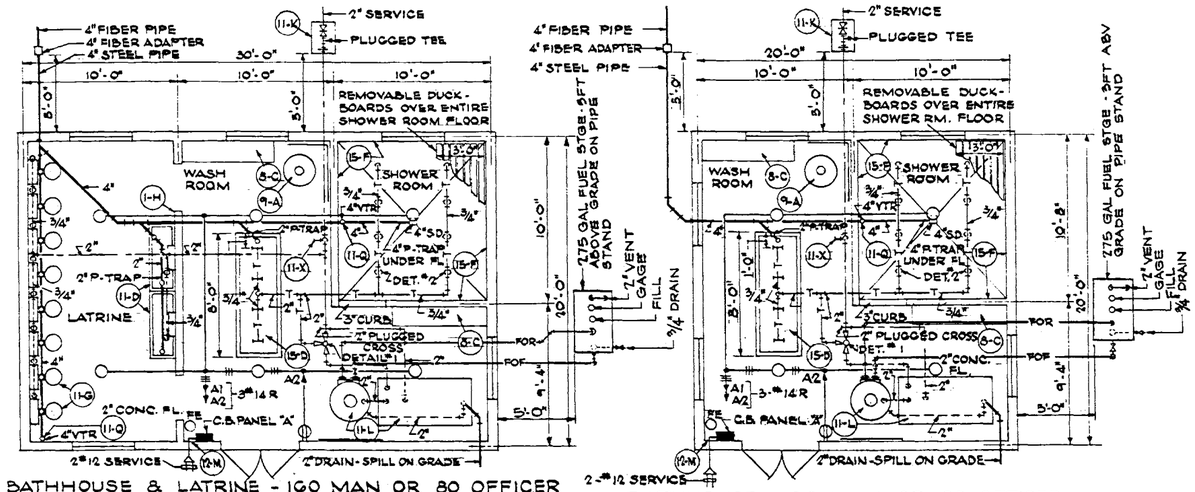
DRAWN BY: VASS
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN

APPROVED: H. M. Williams — DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

BATHHOUSE-100 MAN 20'X20'
250 MAN 20'X30'-500 MAN 20'X50'
BATHHOUSE & LATRINE-TIPPING TRAY TYPE
100 MAN 20'X30'-250 MAN 20'X50'-500 MAN 20'X80'

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-31
SHEET 1 OF 1



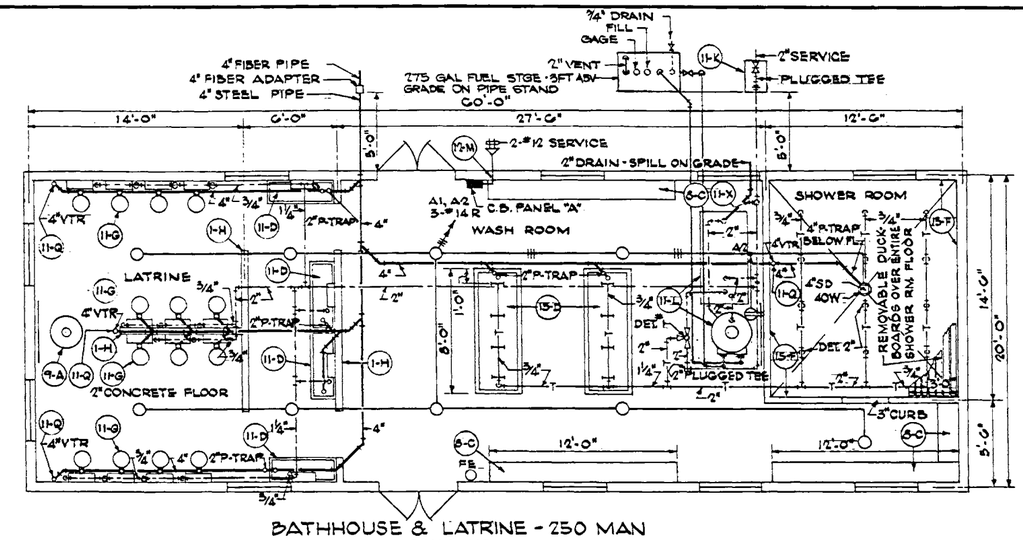
BATHHOUSE & LATRINE - 160 MAN OR 80 OFFICER

SCALE NO. 2

BATHHOUSE - 160 MAN OR 80 OFFICER

SCALE NO. 2

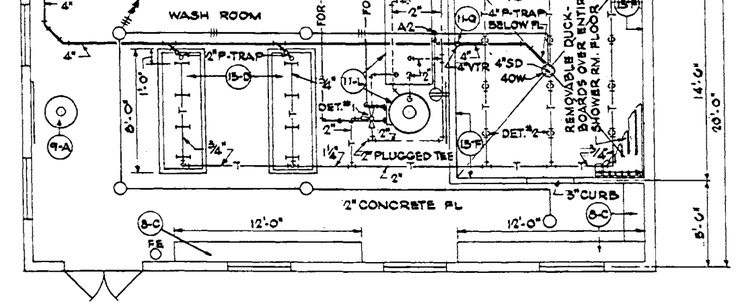
FACILITY NUMBERS
723201 - INTERIOR ONLY
723211 - STL FRAME W/INTERIOR
723221 - WOOD FRAME W/INTERIOR



BATHHOUSE & LATRINE - 250 MAN

SCALE NO. 2

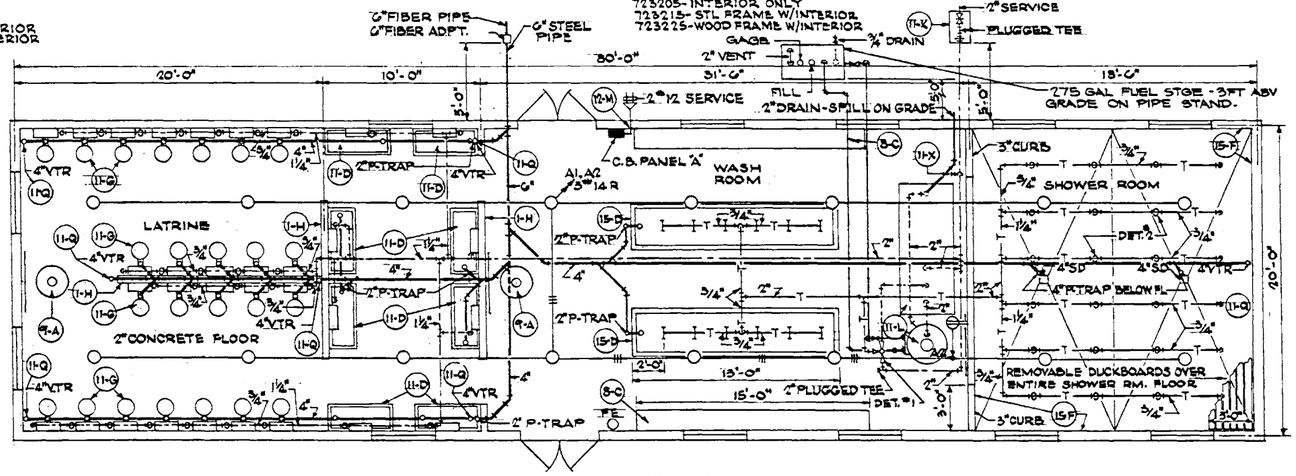
FACILITY NUMBERS
723205 - INTERIOR ONLY
723215 - STL FRAME W/INTERIOR
723225 - WOOD FRAME W/INTERIOR



BATHHOUSE - 250 MAN

SCALE NO. 2

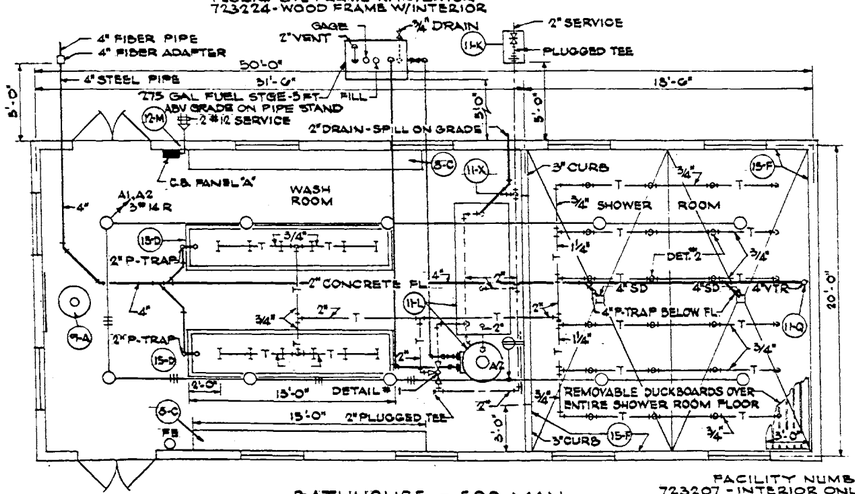
FACILITY NUMBERS
723204 - INTERIOR ONLY
723214 - STL FRAME W/INTERIOR
723224 - WOOD FRAME W/INTERIOR



BATHHOUSE & LATRINE - 500 MAN

SCALE NO. 2

FACILITY NUMBERS
723205 - INTERIOR ONLY
723215 - STL FRAME W/INTERIOR
723225 - WOOD FRAME W/INTERIOR



BATHHOUSE - 500 MAN

SCALE NO. 2

FACILITY NUMBERS
723207 - INTERIOR ONLY
723217 - STL FRAME W/INTERIOR
723227 - WOOD FRAME W/INTERIOR

BATHHOUSE & LATRINE - 500 MAN

SCALE NO. 2

FACILITY NUMBERS
723205 - INTERIOR ONLY
723215 - STL FRAME W/INTERIOR
723225 - WOOD FRAME W/INTERIOR

LATRINE ADDITION TO BATHHOUSE - FACILITY NOS.			
160 MAN	250 MAN	500 MAN	BUILDING
723203	723206	723209	INTERIOR ONLY
723213	723216	723219	STEEL FRAME W/INTERIOR
723223	723226	723229	WOOD FRAME W/INTERIOR

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	160 MAN OR 80 OFFICER		250 MAN		500 MAN	
	BATH & LATRINE	BATH	BATH & LATRINE	BATH	BATH & LATRINE	BATH
LIGHTING	.15 KW	.10 KW	.27 KW	.16 KW	.40 KW	.25 KW
RECP. EST.	.50 KW	.50 KW	.50 KW	.50 KW	.50 KW	.50 KW
TOTAL	.65 KW	.60 KW	.77 KW	.66 KW	.90 KW	.75 KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 25 W.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER
3. FOR DETAIL NO. 1, "MIXING CONTROL FOR GROUP SHOWER" & DETAIL NO. 2, "SHOWER HEAD & CONTROL VALVE," REFER TO DWG. NO. 72-35, SHEET 1 OF 1
4. —T— INDICATES TEMPERED WATER
5. INSTALL 45° Y-BRANCH WITH PLUG FOR C.O. ABOVE FLOOR WITH RISE FOR W.T.R.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72 - 32	PLANS	1 OF 1
72 - 35	PLUMBING DIAG & DETAILS	1 OF 1
99 - 98	STANDARD DETAILS	
34 - 03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35 - 21	STEEL FRAME CONST. BARRACKS TYPE BLDGS	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10'

NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

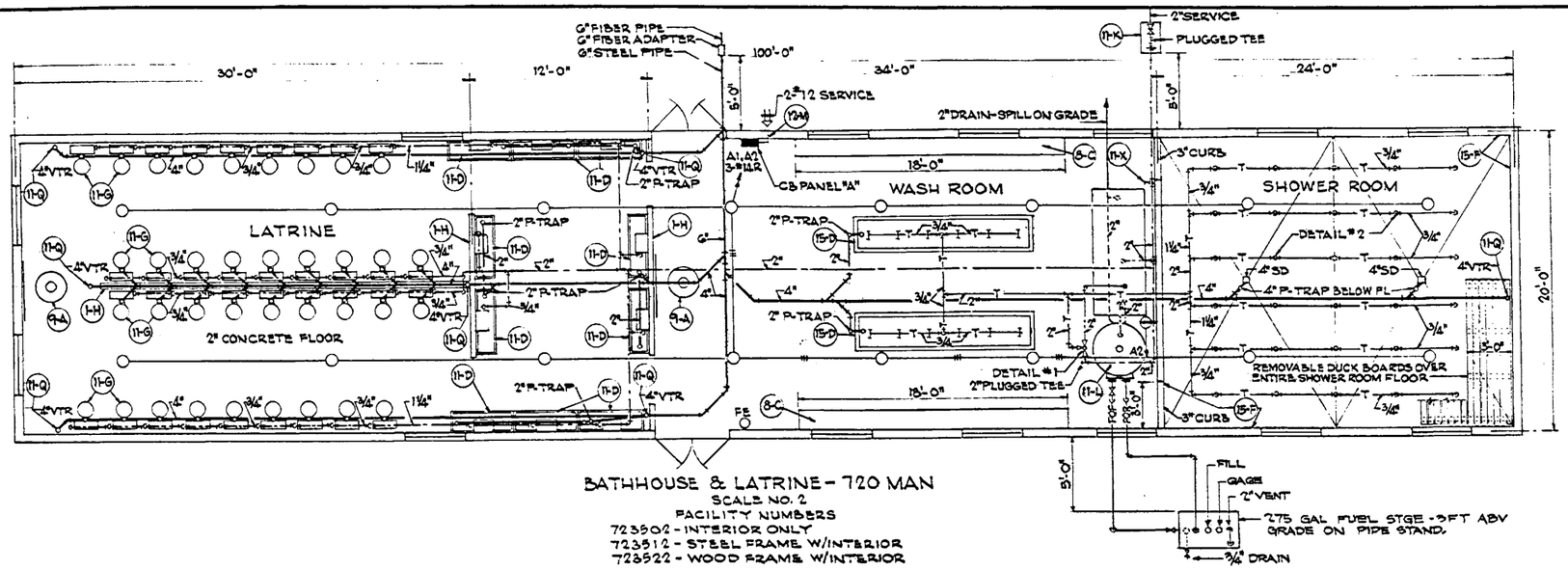
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: F. W. DEICHMANN
APPROVED: F. Deichmann
APPROVED: H. M. Williams
DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH, ENGR. ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

BATHHOUSE-BATHHOUSE & LATRINE
WATER BORNE
160 MAN OR 80 OFFICERS
250 MAN & 500 MAN

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
72-32

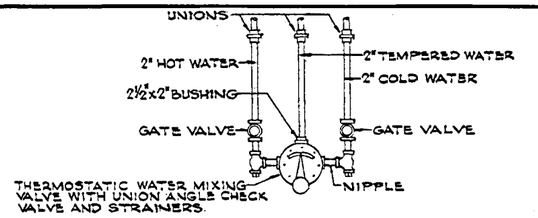


BATHHOUSE & LATRINE - 720 MAN

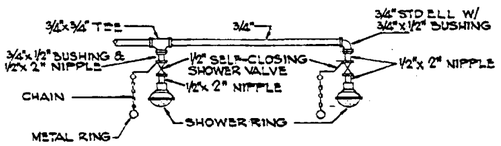
SCALE NO. 2

FACILITY NUMBERS

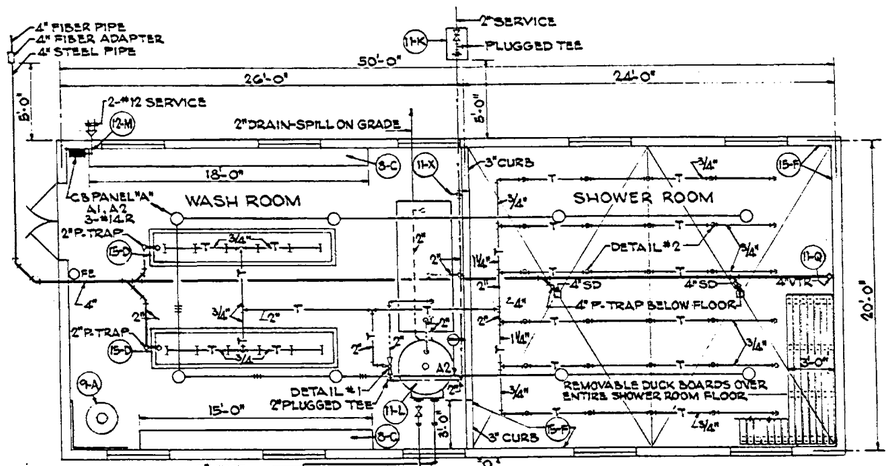
723502 - INTERIOR ONLY
723512 - STEEL FRAME W/INTERIOR
723522 - WOOD FRAME W/INTERIOR



MIXING CONTROL FOR GROUP SHOWER
DETAIL # 1
NO SCALE



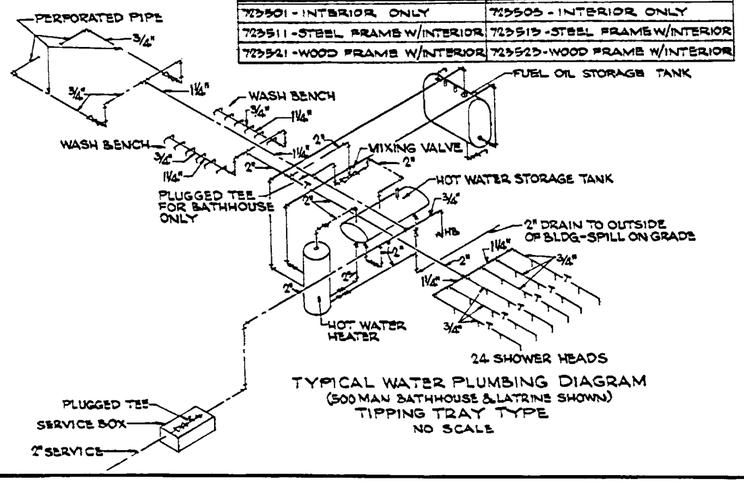
SHOWER HEAD & CONTROL VALVE
DETAIL # 2
NO SCALE



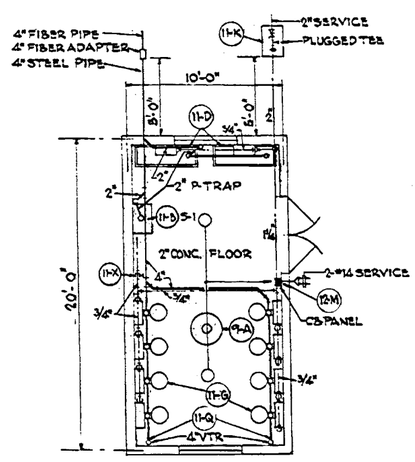
BATHHOUSE - 720 MAN

SCALE NO. 2

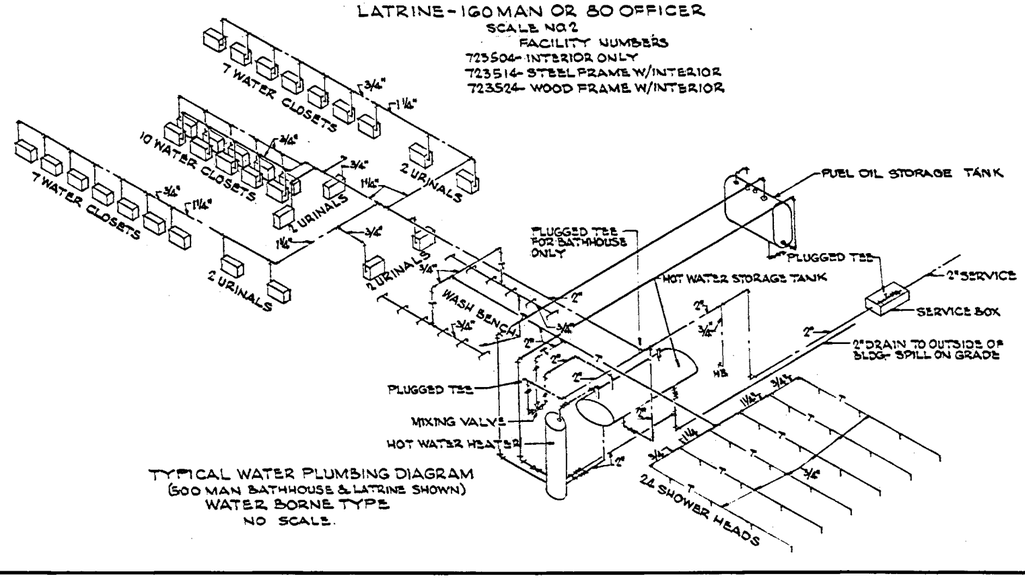
BATHHOUSE - 720 MAN	LATRINE ADDITION
FACILITY NUMBERS	FACILITY NUMBERS
723501 - INTERIOR ONLY	723503 - INTERIOR ONLY
723511 - STEEL FRAME W/INTERIOR	723513 - STEEL FRAME W/INTERIOR
723521 - WOOD FRAME W/INTERIOR	723523 - WOOD FRAME W/INTERIOR



TYPICAL WATER PLUMBING DIAGRAM
(500 MAN BATHHOUSE & LATRINE SHOWN)
TIPPING TRAY TYPE
NO SCALE



LATRINE - 160 MAN OR 80 OFFICER
SCALE NO. 2
FACILITY NUMBERS
723504 - INTERIOR ONLY
723514 - STEEL FRAME W/INTERIOR
723524 - WOOD FRAME W/INTERIOR



TYPICAL WATER PLUMBING DIAGRAM
(500 MAN BATHHOUSE & LATRINE SHOWN)
WATER BORNE TYPE
NO SCALE.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-35	PLANS	1 OF 1
99-98	STANDARD DETAILS	—
54-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
55-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

GENERAL NOTES

1. REFER TO TM5-303 FOR BLDG. SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NO.
3. —T— INDICATES TEMPERED WATER
4. INSTALL 45° Y-BRANCH WITH PLUG FOR C.O. ABOVE FLOOR WITH RISE FOR V.T.R.

ELECTRICAL NOTES

CONNECTED LOADS

BUILDING	BATH & LATRINE 720 MAN	BATHHOUSE 720 MAN	LATRINE 160 MAN OR 80 OFF.
LIGHTING	.40 KW	.20 KW	.05 KW
RECP EST	.50 KW	.50 KW	—
TOTAL	.90 KW	.70 KW	.05 KW

1. ALL LAMPS TO BE 25W.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 2

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN

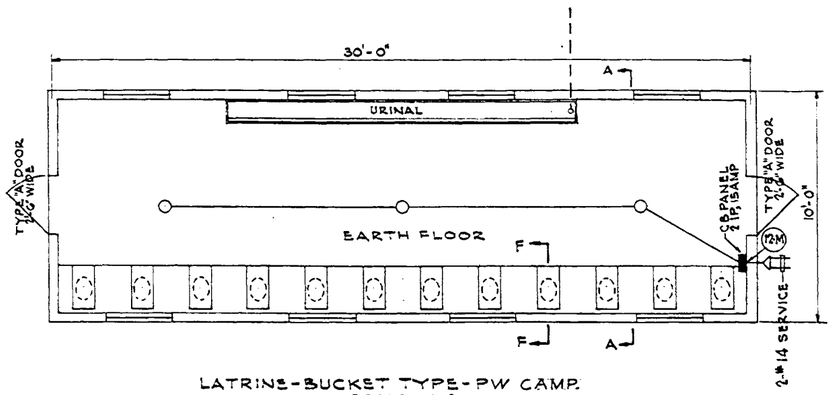
THEATER OF OPERATIONS

BATHHOUSE-BATHHOUSE & LATRINE-720 MAN
LATRINE-160 MAN OR 80 OFFICER
WATER BORNE
PLANS & DETAILS

APPROVED: H. A. Peterson — APPROVED: H. M. Williams — DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR. O.C.E.

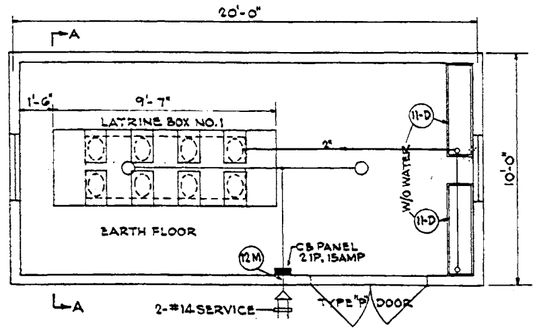
APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-35
DATE
SHEET 1 OF 1

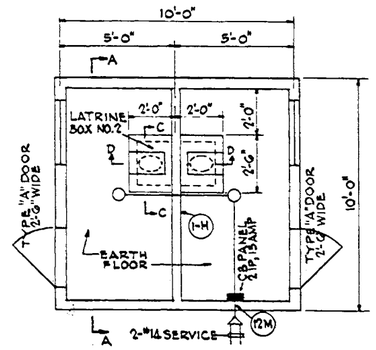


LATRINE-BUCKET TYPE-PW CAMP.
SCALE NO. 3
FACILITY NO. 723624 - INTERIOR ONLY
FACILITY NO. 723624 -WOOD FRAME W/INTERIOR

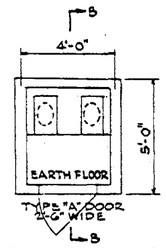
NOTE: ALL WINDOWS TO BE W9 SLIDING SASH FOR ALL FACILITIES.



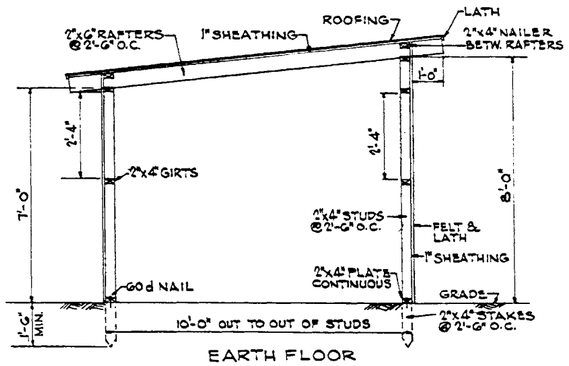
LATRINE-PIT TYPE-160 MAN OR 80 OFFICERS
SCALE NO. 3
FACILITY NO. 723623 - WOOD FRAME W/INTERIOR



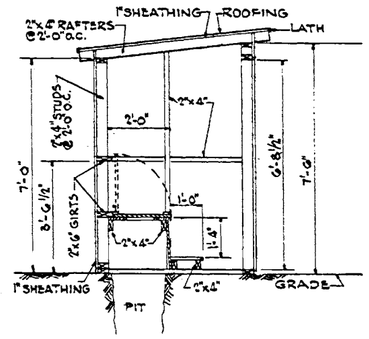
LATRINE-PIT TYPE-FEMALE-2 SEATS
SCALE NO. 3
FACILITY NO. 723622 - WOOD FRAME W/INTERIOR



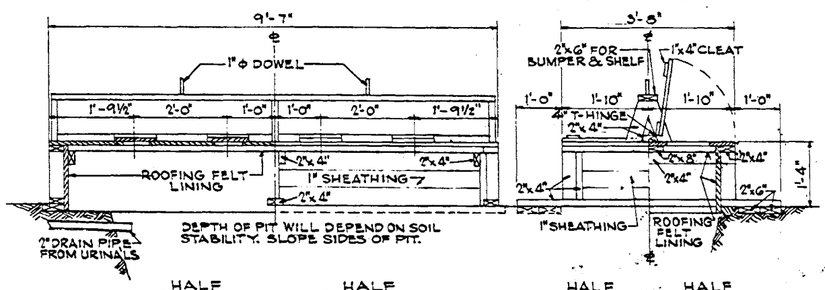
LATRINE-PIT TYPE-2 SEATS
SCALE NO. 3
FACILITY NO. 723621-WOOD FRAME W/INTERIOR



SECTION A-A THRU BUILDING
SCALE NO. 4

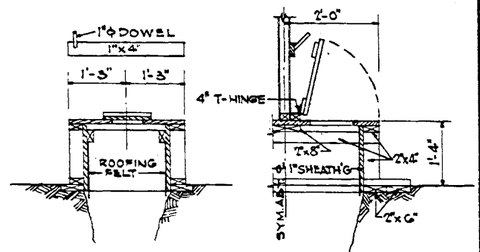


SECTION B-B
SCALE NO. 4



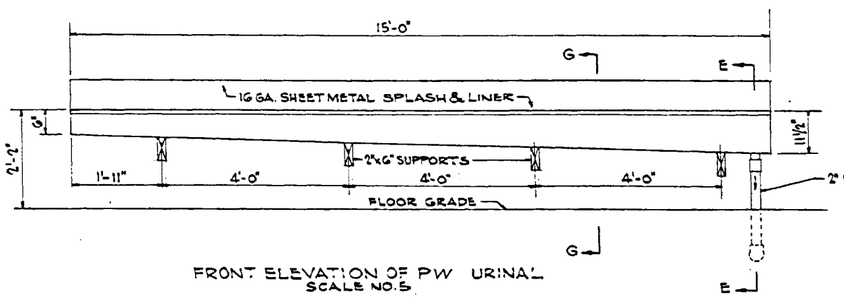
HALF SECTION | HALF ELEVATION | HALF ELEVATION | HALF SECTION

LATRINE BOX NO. 1
SCALE NO. 5

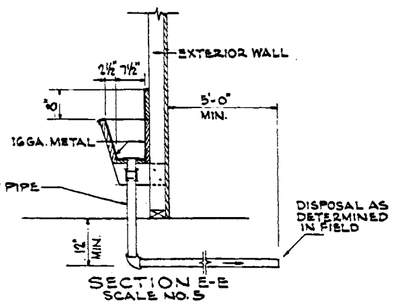


SECTION C-C | SECTION D-D

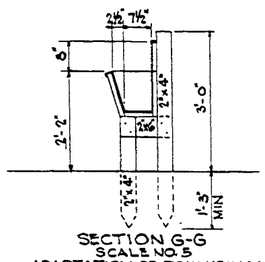
LATRINE BOX NO. 2
SCALE NO. 5



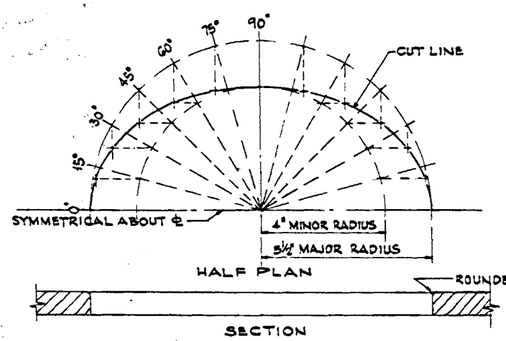
FRONT ELEVATION OF PW URINAL
SCALE NO. 5



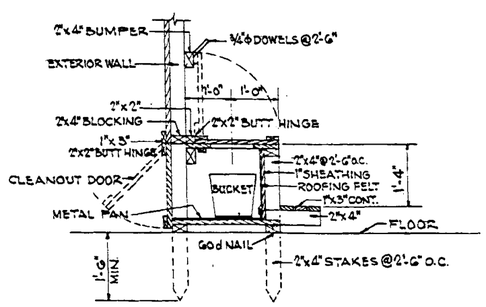
SECTION E-E
SCALE NO. 5



SECTION G-G
SCALE NO. 5
ADAPTATION OF POW URINAL FOR TENTAGE



LATRINE SEAT CUT-OUT
NO SCALE



SECTION F-F THRU BUCKET LATRINE BOX
SCALE NO. 5

NOTE: TO USE BUCKET LATRINE BOX WITH TENTAGE USE 2"x4"x 4'-0" UPRIGHTS @ 2'-6" O.C. IN POSITION OF EXTERIOR WALL. ALL OTHER DETAIL ARE IDENTICAL.

ELECTRICAL NOTES

1. LIGHTING CONNECTED LOADS:

FACILITY NO.	LOAD
723621	NONE
723622	.05 KW
723623	.05 KW
723624	.08 KW

2. ALL LAMPS TO BE 25W.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-36	PLANS & DETAILS	1 OF 1
34-18	WINDOW & DOOR DETAILS	1,2 OF 2
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO. 3
0 1' 2' 3' 4' NO. 4
0 1' 2' 3' NO. 5

MAYER, BEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

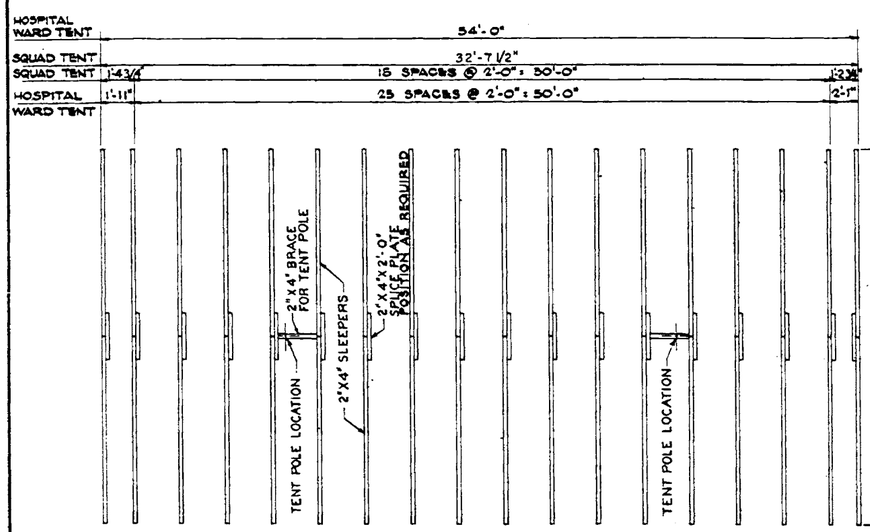
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH
APPROVED: [signature] for L.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
HOUSING FACILITIES
LATRINES
BUCKET TYPE & PIT TYPE
VARIOUS SIZES

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-36
SHEET 1 OF 1

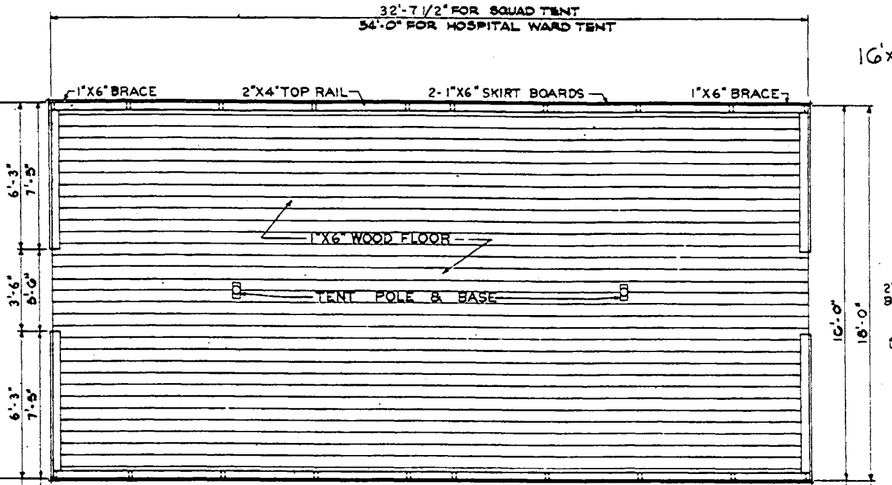
CORPS OF ENGINEERS

U. S. ARMY



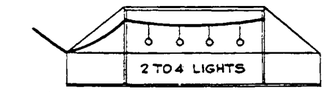
FRAMING PLAN

SCALE NO. 3



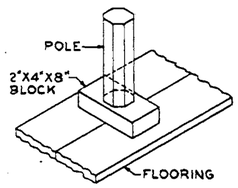
FLOORING PLAN

SCALE NO. 3



16'x32'-8" GENERAL PURPOSE TENT

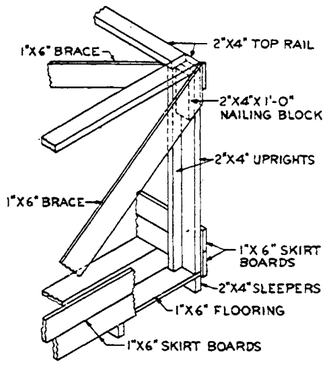
TENT LIGHTING	WATTS/SF
BARRACKS, QUARTERS	0.10
STORAGE, WARD, WHSE.	0.20
MESS, WRITING AREAS	0.30
RECR, BATH, KITCHEN & GENERAL WORK	0.50
READING, LAB, PX & PHARMACY	0.75
OFFICE, LAUNDRY & SHOPS	1.00



DETAIL AT "X"

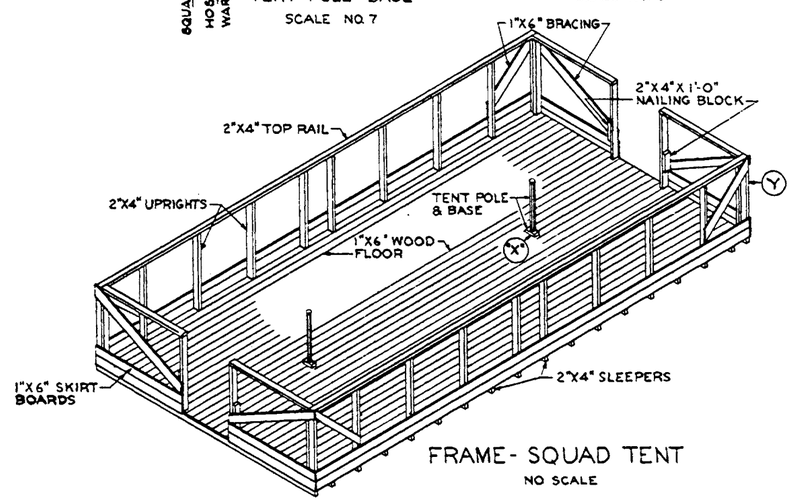
TENT POLE BASE

SCALE NO. 7



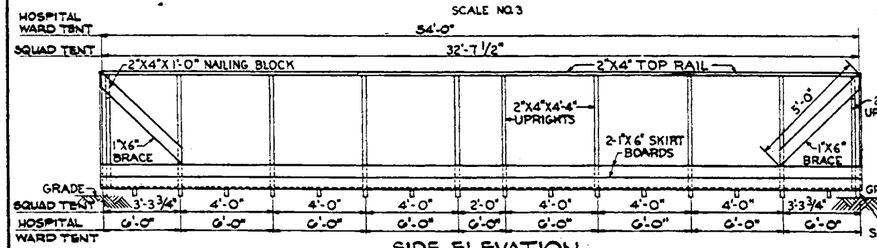
DETAIL AT "Y"

SCALE NO. 5



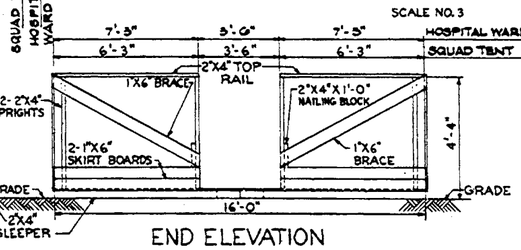
FRAME- SQUAD TENT

NO SCALE



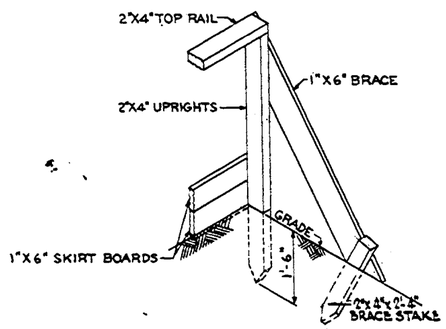
SIDE ELEVATION

SCALE NO. 3



END ELEVATION

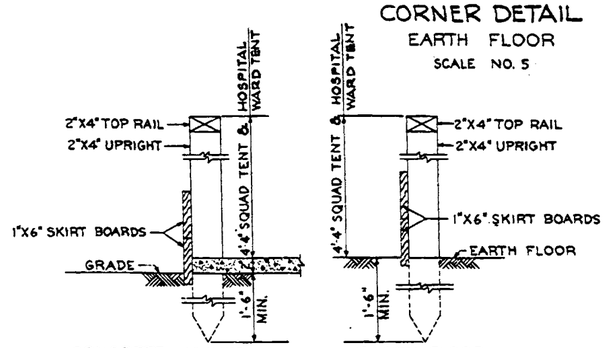
SCALE NO. 3



CORNER DETAIL

EARTH FLOOR

SCALE NO. 5



ALTERNATE UPRIGHT DETAILS

SCALE NO. 7

FACILITY NUMBERS

725111	WD	FRM	TENT	W/EARTH FLOOR FOR 16'x32'	SQUAD TENT
725112	WD	FRM	TENT	W/WOOD FLOOR FOR 16'x32'	SQUAD TENT
725113	WD	FRM	TENT	W/CONC FLOOR FOR 16'x32'	SQUAD TENT
725121	WD	FRM	TENT	W/EARTH FLOOR FOR 18'x54'	HOSPITAL TENT
725122	WD	FRM	TENT	W/WOOD FLOOR FOR 18'x54'	HOSPITAL TENT
725123	WD	FRM	TENT	W/CONC FLOOR FOR 18'x54'	HOSPITAL TENT

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-51	TENT FLOORS & FRAMES	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 1' 2' 3' 6' 5' NO.3; 0 3" 6" 9" 1' 2' NO.7; 0 1' 2' 3' NO.5

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

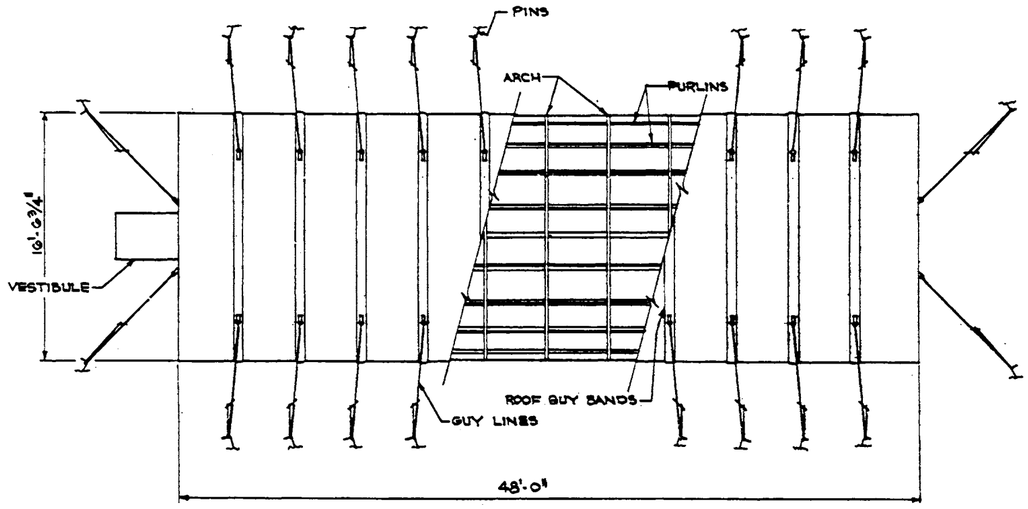
DRAWN BY: ELLISON
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

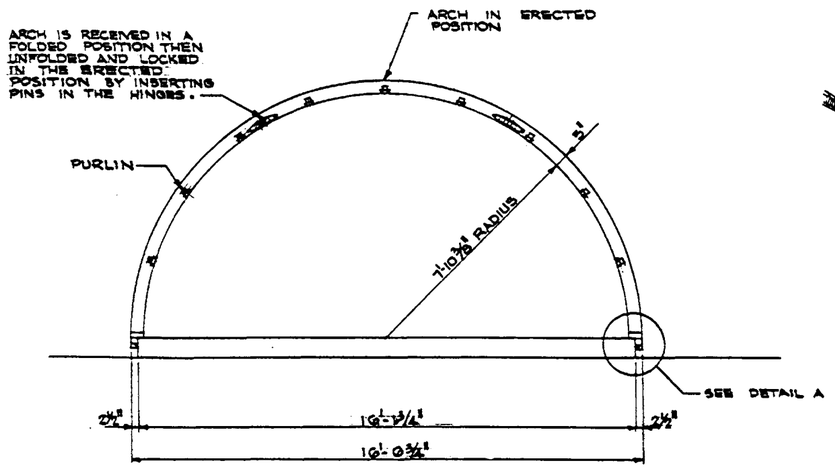
TENT FLOORS & FRAMES
SQUAD 16'X32'
HOSPITAL WARD 18'X54'

APPROVED: [signature] H.M. Williams DATE: 19 MAR 1969

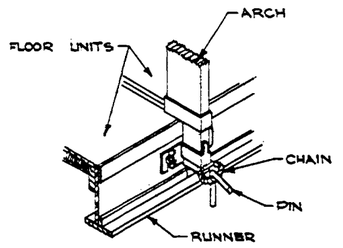
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-51
SHEET 1 OF 1



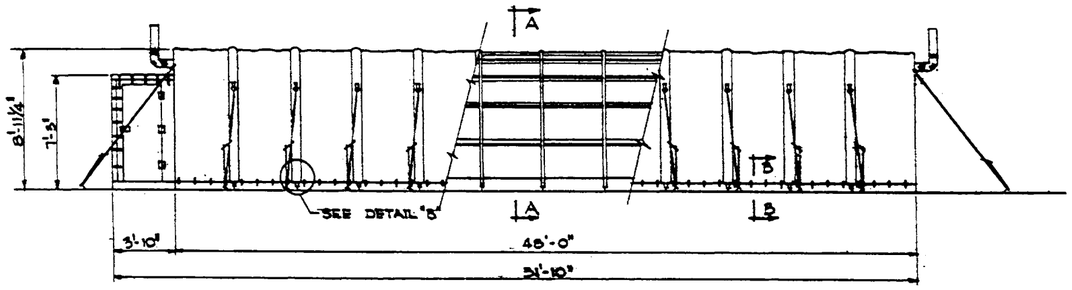
TOP VIEW
SCALE NO. 2



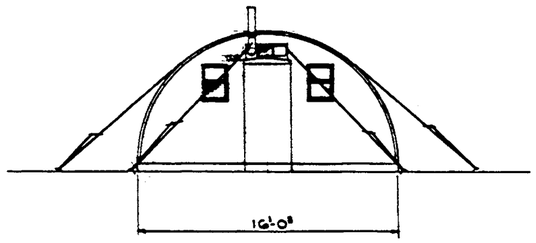
SECTION A-A
SCALE NO. 4



DETAIL A
NO SCALE



ELEVATION
SCALE NO. 2



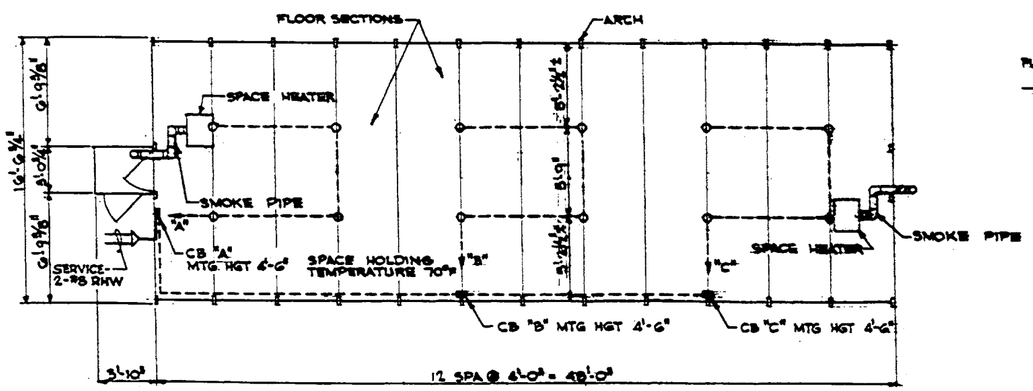
END VIEW
SCALE NO. 2

SCHEDULE OF EQUIPMENT	
QTY	DESCRIPTION
* 1	16'X16' TENT BARRACKS W/WD FL, VESTIBULE, CONN-SWITCH
* 8	4' TENT SECTIONS
* 2	CONNECTOR - SWITCH ASSEMBLY FOR TENT
2	70,000 BTU FUEL OIL SPACE HEATERS

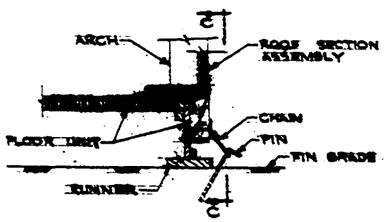
* REQUIRED FOR TENT STRUCTURE

NOTES:
1. THIS 16'x48' TENT BARRACKS IS DESIGNED FOR USE IN FRIGID CLIMATE. (-69°F)
2. ——— EXPOSED BRANCH CIRCUIT.

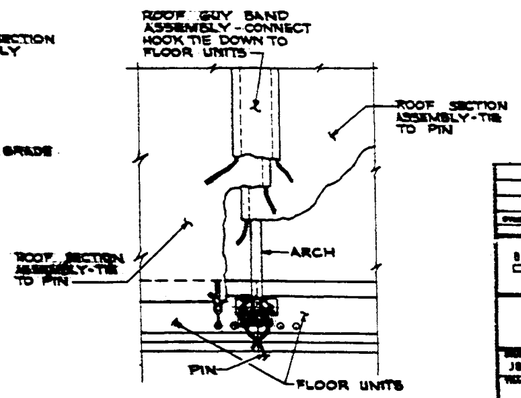
REFERENCES:
1. US ARMY NATICK LABORATORY DRAWINGS NO. 5-4-181 THRU 186 AND 299 FOR ERECTION DETAILS. THESE DRAWINGS ARE SHIPPED WITH EACH TENT.
2. TECHNICAL MANUAL TM 10-269



FLOOR PLAN
SCALE NO. 2
FACILITY NO. 729801



SECTION B-B
SCALE NO. 7



SECTION C-C
SCALE NO. 7

ORIGINAL	DESCRIPTION	DATE	APPROVAL

DRAWING SCALES
0 5' 10' 0 1' 2' 3' 4' 0 3" 6" 9" 1'
NO. 2 NO. 4 NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

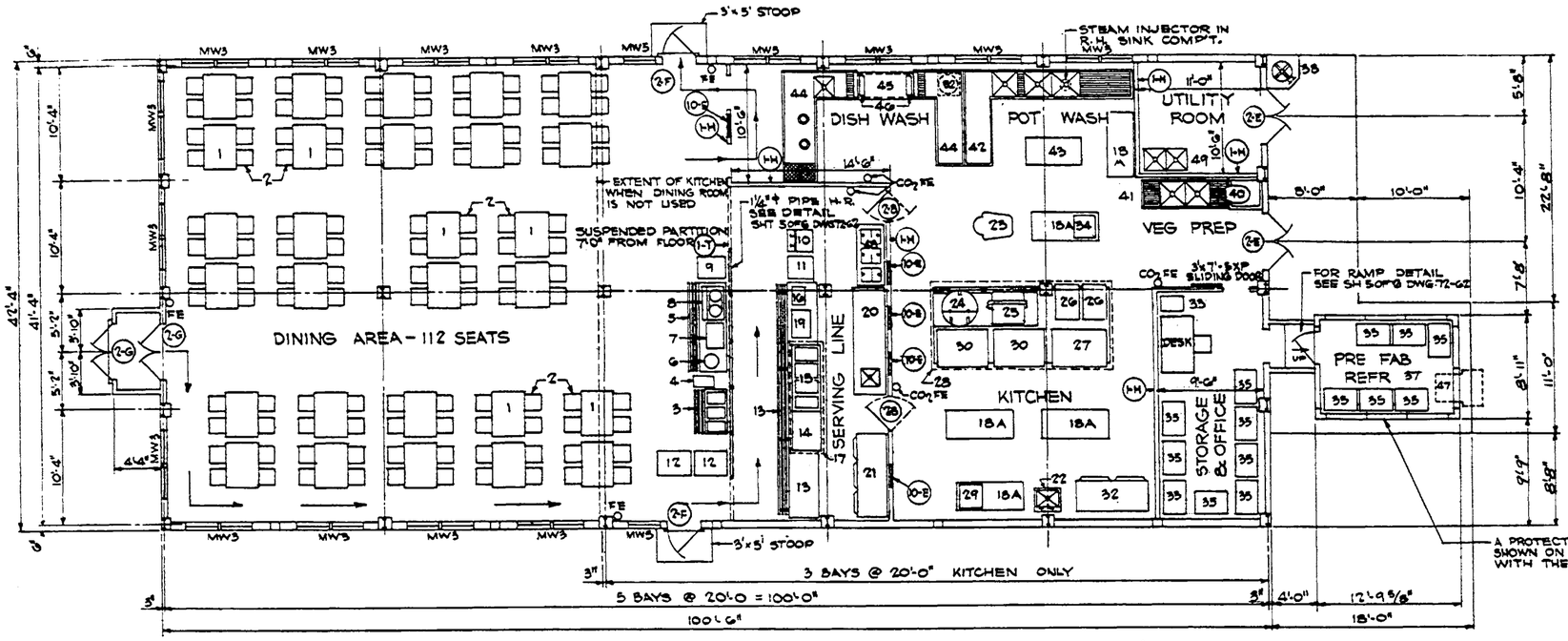
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DESIGNED BY: J.BIGGER
TRACED BY:
CHECKED BY: SHAFFER
QUANTITIES BY:
DESCRIPTION BY: J. BIGGER
APPROVED: DATE: 17 FEB 1971
APPROVED FOR PERMANENT RECORD:

THEATER OF OPERATIONS

TENT BARRACKS FOR FRIGID CLIMATE
16'X48' WITH WOOD FLOOR

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-55
DATE
SHEET 1 OF 1



EQUIPMENT AND FLOOR PLAN (STEEL FRAME BLDG)

SCALE NO. 24

FACILITY NUMBERS

	TROPIC ZONE	TEMP ZONE (-20°F)
INTERIOR ONLY	726101	726102
INTERIOR ONLY (KITCHEN ONLY)	726111	726112
STEEL FRAME BLDG. W/INTERIOR	726121	726122
STEEL FRAME BLDG. W/INTERIOR (KITCHEN ONLY)	726131	726132

STRUCTURAL NOTES

1. STEEL FRAME BUILDINGS
   PIPING AND OTHER CONCENTRATED LOADS MUST BE SUPPORTED INDEPENDENT OF BUILDING SHELL STRUCTURE.
2. WOOD FRAME BUILDINGS
   (A) ROOF SYSTEM FOR WOOD FRAME BUILDINGS IN ALL ZONES TO BE 2"X8" PURLINS @ 2'-0" O.C. SUPPORTED BY 2-3"X12" GIRDERS @ COLUMN LINES. REFER TO DWG NO.34-04 SHEET 3 OF 3 NOTE REGARDING PIPE LOADS - TEMPERATE CLIMATE NOTES 1 & 3.
   (B) ADD 4"X8" PURLIN FOR SUPPORT OF CEILING HUNG EXHAUST HOODS IN AREAS AS REQUIRED.

GENERAL NOTES

1. FOR FSN BILL OF MATERIAL - REFER TO TM 5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES YARD PIPING TO BOILER HOUSE.
3. FIRE PROOF ALL COLUMNS FROM FLOOR TO CEILING THAT PENETRATE KITCHEN HOODS (APPLY 1/4 INCH ASBESTOS BOARD OVER COLUMNS AND THEN ENCASE IN CRES STEEL, 10 GAGE SHEETS FASTENED BY SCREWS AND SOLDERED TIGHT).
4. USE REFLECTIVE TYPE (ALUMINUM FOIL) INSULATION IN THE CEILING LINER FOR THE TROPICAL ZONE.
5. TABLES AND CHAIRS CONFORMING TO DETAIL (7-V) CAN BE USED IN LIEU OF THE TABLES AND CHAIRS LISTED IN THE SCHEDULES IF SHIPMENT OF REGULAR ITEMS ARE DELAYED IN TRANSIT OR CANNOT BE SECURED IN A REASONABLE TIME.
6. THE MAXIMUM NUMBER OF MEN SERVED BY THIS MESS HALL MAY BE INCREASED TO 300 MEN BY EXTENDING THE SERVING TIME.

ELECTRICAL NOTES

1. HOOD LIGHTS SHALL BE FED WITH NUMBER 12 COPPER CONDUCTOR TYPE AYA INSULATION AND RUN IN 1/2 INCH RIGID GALVANIZED STEEL CONDUIT.
2. FEEDER CONDUCTORS NOT LARGER THAN NO.2 SHALL BE TYPE NM, NMC OR UF THREE-CONDUCTOR CABLE, WITH GROUND; AND THOSE LARGER THAN NO.2 SHALL BE TYPE MC STRANDED ALUMINUM FOUR-CONDUCTOR STEEL ARMORED CABLE.
3. BRANCH CIRCUIT CONDUCTORS SHALL BE NO.12 COPPER OR NO.10 ALUMINUM, TWO OR THREE-WIRE TYPE NM, NMC OR UF CABLE WITH GROUND.
4. INSTALLATION SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE.
5. MOTOR SYMBOL (M) DENOTES INCLUSION OF ASSOCIATED EQUIPMENT (UNLESS OTHERWISE INDICATED ON DRAWINGS), AS REQUIRED, WITH THE EQUIPMENT. FOR EACH MOTOR OR EQUIPMENT UNIT, A PROPERLY RATED SAFETY DISCONNECT SWITCH SHALL BE INSTALLED WITHIN SIGHT.
6. MOTORS IN OPEN FLOOR AREAS SHALL BE CONNECTED FROM A JUNCTION BOX ON A SECURED VERTICAL WOOD 2"x4" WIRING SUPPORT, OR EQUIVALENT, BY MEANS OF A SHORT FLEXIBLE LEAD OF METAL ARMORED CABLE OR FLEXIBLE METAL CONDUIT.
7. SERVICE ENTRANCE CONDUCTORS SHALL BE TYPE RHW OR THW SINGLE-CONDUCTOR COPPER CABLES IN HEAVY-WALL GALVANIZED STEEL CONDUIT.
8. LIGHTING IN THE DINING AREA AND THE STORAGE AND OFFICE AREAS TO BE OPEN INDUSTRIAL TYPE 2-40W RS LAMP FIXTURES (FLUORESCENT).
9. USE 150 WATT PAR-38 FLOOD TYPE LAMPS IN GASKETED HOLDERS IN THE SERVING AREAS.
10. USE BOX MOUNTED PORCELAIN LAMP HOLDERS WITH 150 WATT INCANDESCENT LAMPS AND RLM DOME REFLECTORS IN THE FOOD PREPARATION AREA.
11. USE VAPORTIGHT FIXTURE WITH GLOBE AND GUARD IN THE DISH WASHING, POT WASHING, VESTIBULE, EXTERIOR DOORS & INSIDE HOODS. THE WASHING AREA LIGHTS TO BE EQUIPPED WITH REFLECTORS.
12. MOUNTING HEIGHT OF ALL INTERIOR LIGHTING FIXTURES TO BE 10'-0" EXCEPT PAR FLOOD LIGHTS ON SERVING LINE WHICH ARE TO BE 3'-0" ABOVE SERVING COUNTER.
13. BRANCH CIRCUIT CONDUCTORS SHOWN ON PLANS DO NOT INDICATE A CONDUCTOR FOR GROUND. GROUNDS SHALL BE INSTALLED AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

MECHANICAL NOTES (CONT)

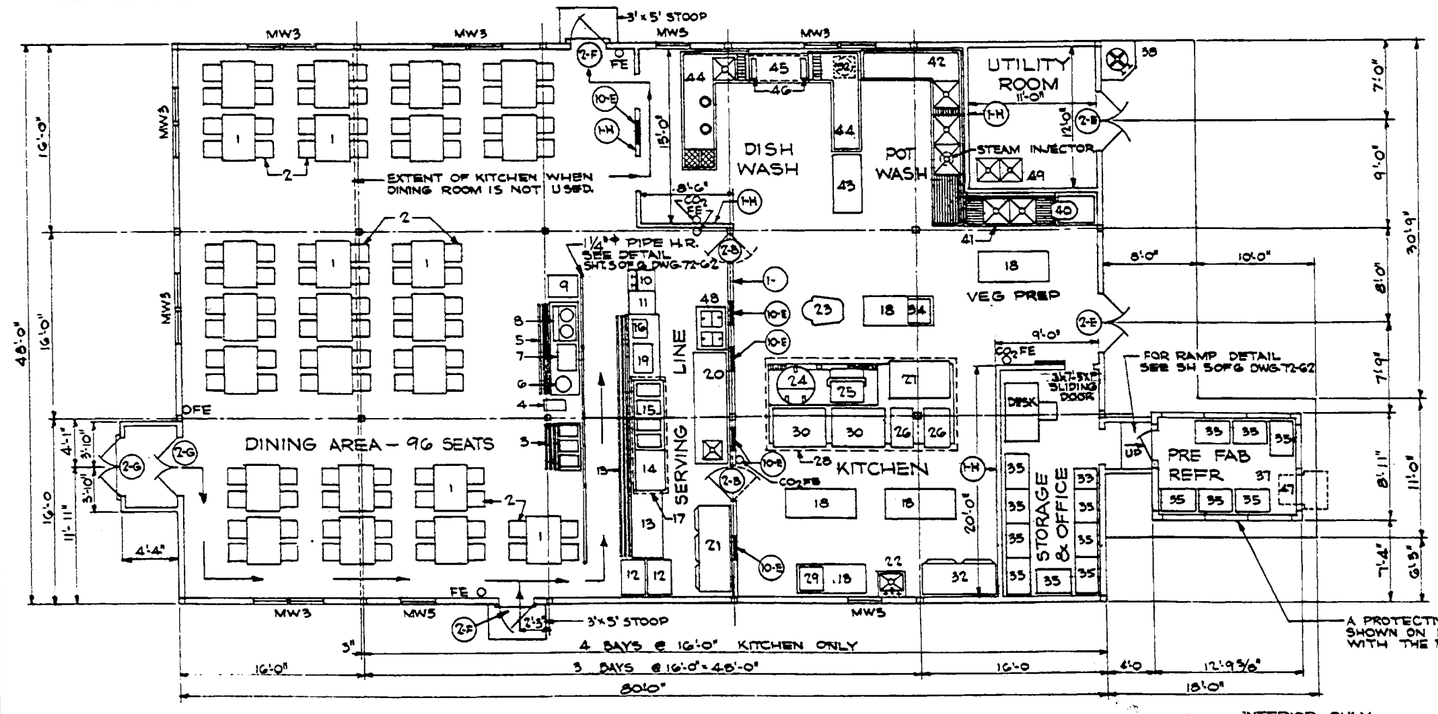
5. STEAM AND CONDENSATE MAINS ABOVE FLOOR ARE AS HIGH AS PRACTICABLE AND BELOW CEILING UNLESS OTHERWISE INDICATED. ALL BRANCH LINES TO UNIT HEATERS AND RADIATORS ARE SAME SIZE AS PIPE TAP OF EQUIPMENT.
6. WHERE REQUIRED NUMBER IN HEATING AND VENTILATING SCHEDULE IS INDICATED BY NUMBER/NUMBER - FIRST NUMBER REPRESENTS QUANTITY REQUIRED, AS BUILT AND SECOND NUMBER REPRESENTS QUANTITY REQUIRED EXCLUDING DINING ROOM.
7. HOT WATER GENERATOR BASED ON HEATING WATER FROM 40°F TO 140°F.
8. EXPANSION LOOPS OR BENDS FOR 2-INCH PIPE AND UNDER IN DIAMETER SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING FITTINGS.
9. ALL STEAM, STEAM RETURN AND PUMP CONDENSATE YARD PIPING SHALL BE INCASED IN A SINGLE INSULATED COVERING IN THE TEMPERATE ZONE WHERE THE TEMPERATURE FALLS BELOW 40°F.
10. 4" AND LARGER EXPANSION LOOPS TO BE CONSTRUCTED WITH WELD FITTINGS.
11. LOCATE ALL VENT OPENINGS (10-E) ADJACENT TO CEILING AND CONSTRUCT W/O SCREENS.
12. PIPE HANGERS TO BE TYPE 18A AND SPACED AS SHOWN ON DWG 99-98, SHEET 18.
13. OMIT SPACE HEATING IN THE TROPICAL ZONE.
14. ALL CHANGES IN STEAM MAIN SIZES TO BE MADE BY ECCENTRIC STAGGED REDUCERS.
15. PROVIDE SWING JOINTS FOR ALL STEAM OPERATED EQUIPMENT. SEE SH.8 OF 8 DWG 72-62 FOR THE LOCATION OF SWING JOINTS FOR UNIT HEATERS AND TEMPERING COILS. FOR ALL OTHER EQUIPMENT REPLACE NEAREST ELBOW TO EQUIPMENT WITH A SWING JOINT.
16. MAXIMUM SIZE OF EACH FILTER SHALL BE 16"X25"X1" AND PROVISION SHALL BE MADE TO INSERT FILTERS FROM THE BOTTOM OF TEMPERING COIL UNITS.

MECHANICAL NOTES

1. MAINTAIN 40°F TEMPERATURE IN DRY STORAGE ROOM AND 70°F TEMPERATURE IN DINING AND KITCHEN AREAS.
2. FOR STEAM QUENCHING SYSTEM IN EXHAUST HOODS W/GREASE FILTERS, SEE DETAIL ON SHEET 5 OF 8 DRAWING 72-82.
3. THE DESIGNS ARE BASED ON USING ONLY DIESEL OIL FOR RANGE AND OVEN FIRING.
4. HOT WATER, STEAM AND CONDENSATE LINES INSIDE THE BUILDING ARE TO BE INSULATED. PROVIDE TWO INCH INSULATION WITH 1/4 INCH HARD COAT FINISH FOR HOT WATER STEAM GENERATOR IN THE UTILITY ROOM.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-61	FLOOR PLANS MECHANICAL & ELEC	1-4OF 4
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDG.	1-70F7
87-11	BOILER HOUSES	1-4OF4
43-17	PREFAB REFRIGERATOR	10F1
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDG.	1-50F5
99-98	STANDARD DETAILS	
51-97	COVERED WALKWAY	1 OF 1

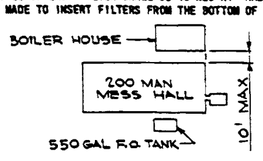


EQUIPMENT AND FLOOR PLAN (WOOD FRAME BLDG)

SCALE NO. 24

FACILITY NUMBERS

	TROPIC ZONE	TEMP ZONE (-20°F)
INTERIOR ONLY	726103	726104
INTERIOR ONLY (KITCHEN ONLY)	726113	726114
WOOD FRAME BLDG W/ INTERIOR	726123	726124
WOOD FRAME BLDG W/ INTERIOR (KITCHEN ONLY)	726133	726134



PLOT PLAN

SCALE NO. 13

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10'

NO.24

MAYER, BRAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.A. DEICHMANN
APPROVED:
CHIEF, STRUCTURES DIVISION

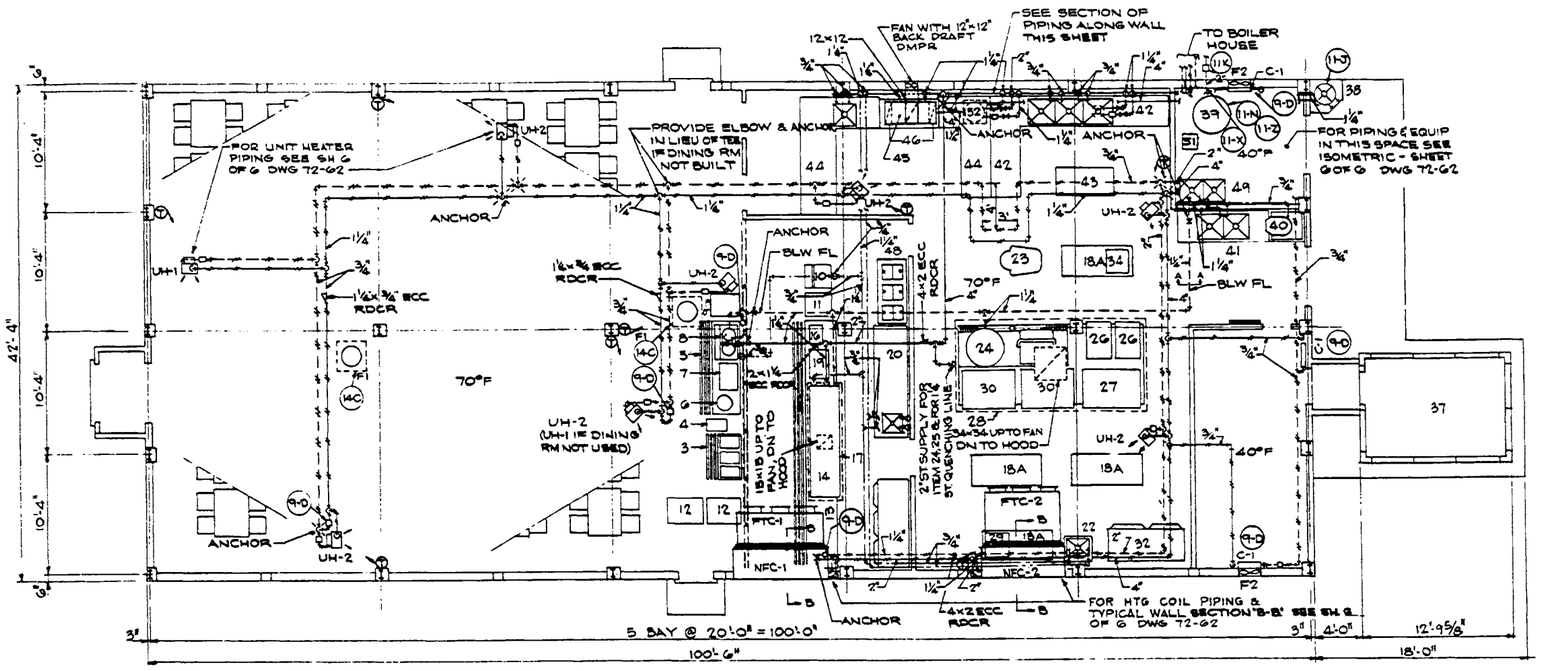
THEATER OF OPERATIONS

HOUSING FACILITIES
KITCHEN & MESS HALL - 200 MAN
42'X100' - STEEL FRAME
48'X80' - WOOD FRAME
EQUIPMENT PLAN

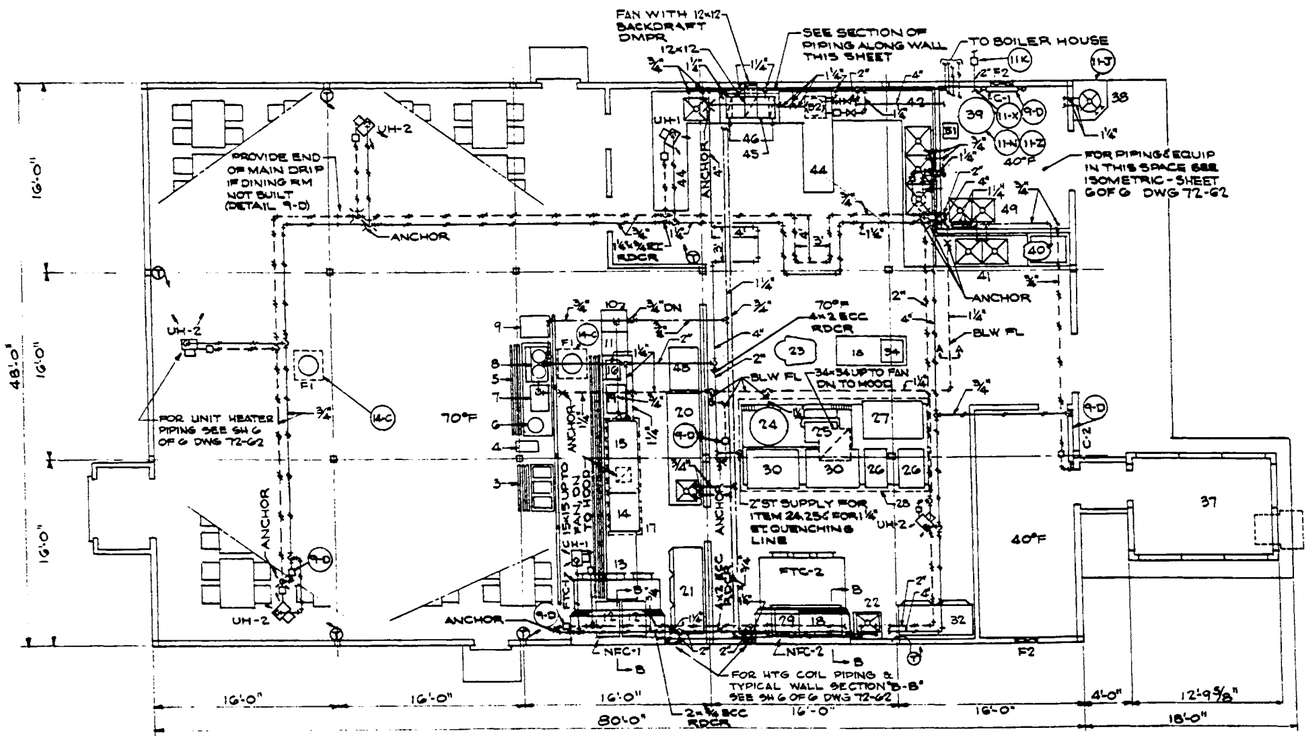
APPROVED:
CHIEF, ENGINEERING DIVISION, MIL. CONSTR. O.C.E.
DATE: 16 FEB 1971

APPROVED FOR COMPONENT ASSIGNMENT:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-61
SHEET 1 OF 4



MECHANICAL PLAN
STEEL FRAME BLDG
SCALE NO. 24



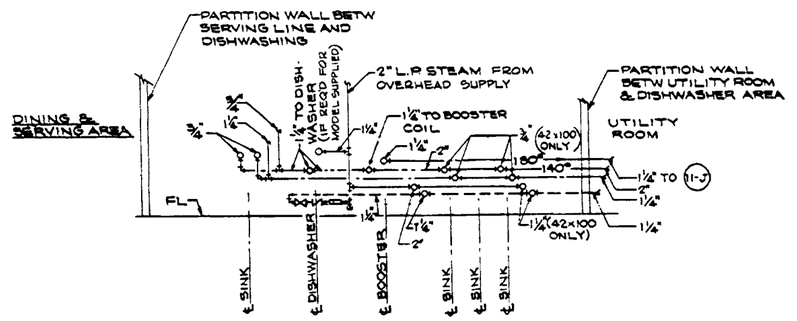
MECHANICAL PLAN
WOOD FRAME BLDG
SCALE NO. 24

HEATING & VENTILATING EQUIPMENT SCHEDULE

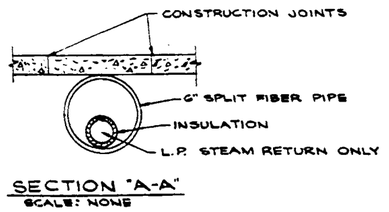
MARK	CFM OR BTU/HR	STATIC PRESS IN H2O	REQ'D 42-100	REQ'D 48-80	H.P.	TYPE OF FAN	ELEC CHAR
F1	6750	—	2½	2½	⅜	PROP	208V,1Φ
F2	1000	—	2	2	⅓	PROP	120V,1Φ
UH1	77,875	—	½	3½	⅛	—	120V,1Φ
UH2	27075	—	¾	4½	⅛	—	120V,1Φ
C-1	7670	—	3	1	—	—	—
C-2	11500	—	0	1	—	—	—
NFC-1	781,650	—	1	1	—	—	—
NFC-2	1,167,930	—	1	1	—	—	—
FANS FOR ITEM NO.	—	—	—	—	—	—	—
28	14000	5/8	1	1	3	DETERMINED BY SUPPLIER	208V,3Φ
46	1000	3/8	1	1	⅓	"	120V,1Φ
17	3000	3/8	1	1	¾	"	208V,3Φ
H.W. HEATER	366,520	—	1-750 GAL GENERATOR		—	—	—
FTC-1 (3 FAN UNIT)	7000	1.0	1	1	2	CNTFGL	208, 3Φ
FTC-2 (3 FAN UNIT)	12000	1.0	1	1	5	CNTFGL	208, 3Φ

* APPROXIMATE HORSEPOWER OF MOTOR

NOTE:
1. FOR MECHANICAL NOTES SEE SH 1 OF 4
2. REFER TO SH 6 OF 6 DWG 72-62 FOR DETAIL OF ITEM 51.



SECTION OF PIPING ALONG WALL
NO SCALE



SECTION "A-A"
SCALE: NONE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

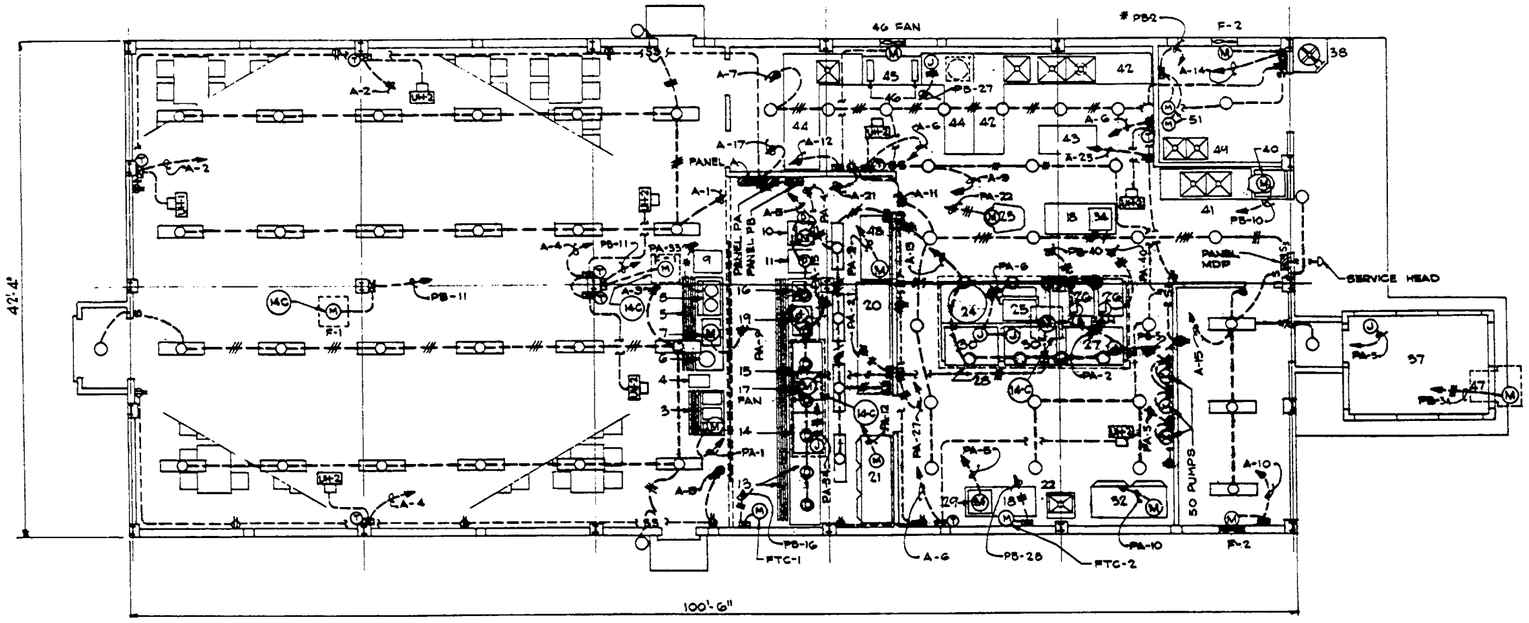
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON, ALBERT
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS
HOUSING FACILITIES
KITCHEN & MESS HALL - 200 MAN
42'X100'-STEEL FRAME
48'X80'-WOOD FRAME
MECHANICAL PLAN

APPROVED: DATE:
CHIEF, STRUCTURES BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR COMPONENT AGENCY:
18 FEB 1971

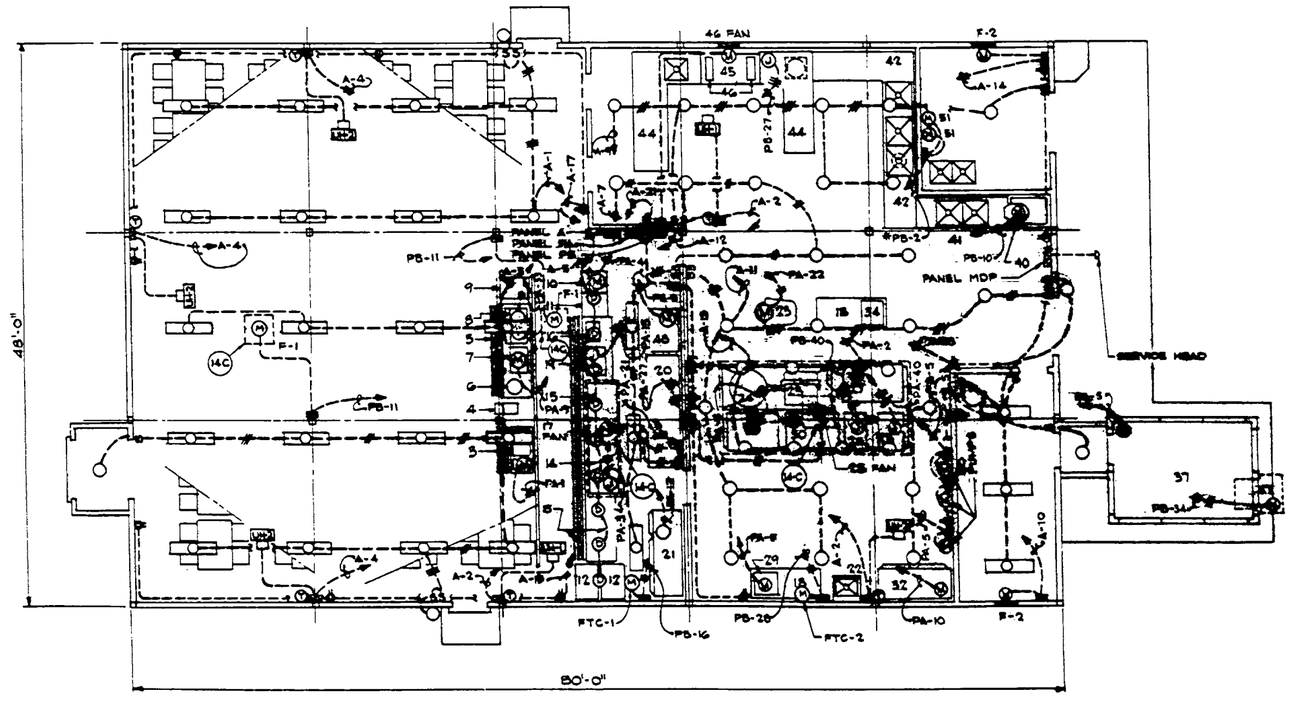
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
72-61
SHEET 2 OF 4



ELECTRICAL PLAN
STEEL FRAME BLDG
SCALE NO. 24

SCHEDULE OF ELECTRICAL EQUIPMENT REQUIREMENTS							
EQUIPMENT NO. & DESIGNATION	QTY	BREAKERS SIZE	BREAKERS NO OF POLES	CONDUCTORS SIZE	CONDUCTORS NO REQD	RATED CURRENT EACH IN AMPS	CIRCUIT NUMBER
3 COLD FOOD COUNTER	1	15	1	12	2	7.2	PA-1
7 BULK MILK DISPENSER	1	20	1	12	2	3.7	PA-9
10 ICE & WATER DISPENSER	1	20	1	12	2	9.8	PA-4
14 GRIDDLE	1	50	3	6	3	33.3	PA-34
19 TOASTER	1	30	2	10	2	19.2	PA-15
21 REFRIGERATOR	1	30	1	10	2	13.8	PA-12
23 MIXING MACHINE	1	15	3	12	3	5.3	PA-22
8 COFFEE URN	1	50	3	8	3	32.4	PA-33
26 FRYER	2	70	3	6	3	50.0	PA-40, PB-40
27 OVEN	1	15	1	12	2	0.9	PA-2
29 MEAT SLICER	1	20	1	12	2	5.8	PA-5
30 RANGE	2	20	1	12	2	0.9	PA-6
32 FROZEN FOOD CABINET	1	30	1	10	2	13.8	PA-10
37 PREFAB REFRIGERATOR	1	20	1	12	2	1.7	PA-5
40 VEGETABLE PEELING MACHINE	1	30	1	10	2	13.8	PB-10
45 DISHWASHER	1	20	3	12	3	10.4	PB-27
47 REFRIGERATION UNIT	1	50	3	8	3	23.3	PB-36
48 ICE CREAM CABINET	1	20	1	12	2	7.9	PA-9
50 F.D. PUMPS	3	20	1	12	2	5.8	PA-5, PB-5 (2)
28 FAN	1	20	3	10	3	9.5	PA-27
17 FAN	1	15	3	12	3	3.0	PA-21
FAN F-2 & 46 FAN (3 EA BLDG)	3	20	1	12	2	7.2	A-10, A-12, A-14
FAN F-1	2	15	2	12	2	9.0	PB-11
UNIT HEATER UH-1	1 2	20	1	12	2	6.4	A-2 STEEL BLDG A-2 WOOD BLDG
UNIT HEATER UH-2	7 4	20	1	12	2	6.4	A-2, A-4, A-6 STEEL BLDG A-4, A-2 WOOD BLDG
51 CONDENSATE PUMP, DUAL*	1	20	1	12	2	7.2	PB-2*
FTC-1	1	15	3	12	3	6.9	PB-16
FTC-2	1	40	3	10	3	15.9	PB-28

*CIRCUIT SERVES ALTERNATOR FURNISHED W/STANDBY PUMP.

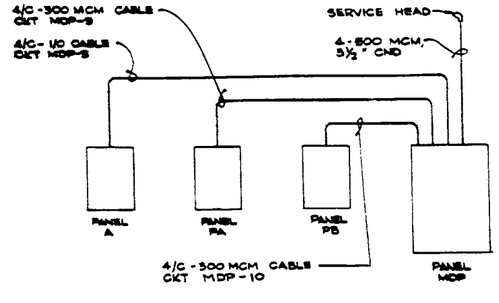


ELECTRICAL PLAN
WOOD FRAME BLDG
SCALE NO. 24

SCHEDULE OF PANELBOARDS

PANEL VOLTAGE MAINS	RATINGS POLES	RATINGS AMPS	BRANCH CIRCUIT BREAKER ACTIVE AND SPARE CKT NO'S.	BRANCH CIRCUIT BREAKER SPARE CKT NOS.	WIRE SIZE OTHER THAN NO. 12	REMARKS
A 208Y/120V, 3 PH, 4 WIRE 100 A MAINS LUGS ONLY	1	20	1 THRU 30	20, 22 24 THRU 30 5, 16, 18		SURFACE MOUNTED
PA 208Y/120V, 3 PH, 4 WIRE 225 AMP MAINS, LUGS ONLY	1 1 1 2 2 3 3 3 3 3	15 20 30 15 30 15 20 40 50 70	1, 2, 3 4 THRU 9 10, 12 11 13 16, 21, 22 27 28 33, 34 39, 40	3 7, 8 11 16 26 39	NO. 10 WIRE NO. 10 WIRE NO. 8 CABLE NO. 6 CABLE	SURFACE MOUNTED
PB 208Y/120V, 3 PH, 4 WIRE 225 AMP MAINS, LUGS ONLY	1 1 1 2 2 3 3 3 3 3	15 20 30 15 30 15 20 40 50 70	1, 2, 3 4 THRU 9 10, 12 11 13 16, 21, 22 27 28 33, 34 39, 40	1, 3 4, 6 THRU 9 12 15 21, 22 33 39	NO. 10 WIRE NO. 10 WIRE CKT 34 = 8 CABLE CKT 40 = 6 CABLE	SURFACE MOUNTED
MDP 208Y/120V, 3 PH, 4 WIRE 600 A MAIN LUGS ONLY	3 3	100 225	3, 4 9, 10, 15, 16	4 15, 16	SEE RISER DIAGRAM	SURFACE MOUNTED

NOTE:
FOR TYPICAL FIXTURE AND WIRING SUPPORT DETAIL SEE SHT 6 OR 9, DWG 72-62.



SINGLE LINE DIAGRAM
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO.24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

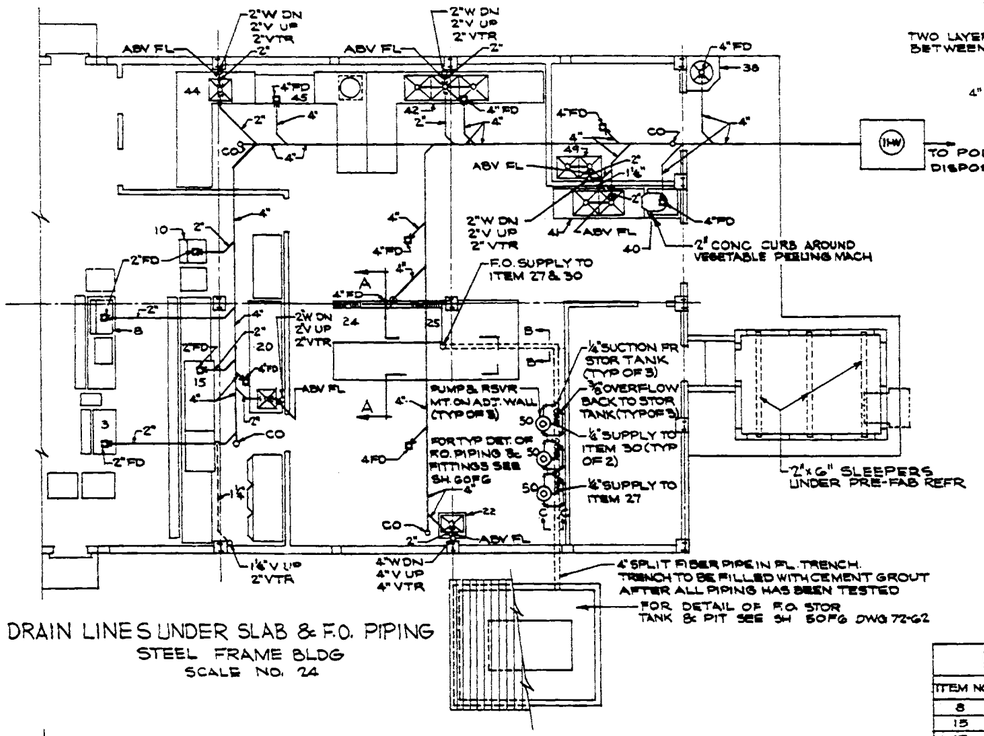
DRAWN BY: JOHNSON PLASTERS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. B. DEICHMANN
APPROVED: Chief, Engineering Division
CHIEF, ARCHITECTURE BRANCH

THEATER OF OPERATIONS
HOUSING FACILITIES
KITCHEN & MESS HALL - 200 MAN
42'X100'-0" - STEEL FRAME
48'X80'-0" - WOOD FRAME
ELECTRICAL PLAN

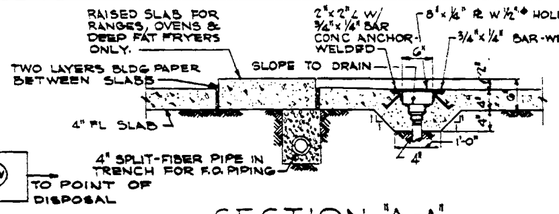
APPROVED: Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 11 FEB 1971

APPROVED FOR THE ENGINEMENT AGENCY:
DATE: 18 FEB 1971

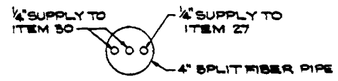
SCALE: AS NOTED SPEC. NO.
DRAWING NUMBER: 72-61
SHEET 3 OF 4



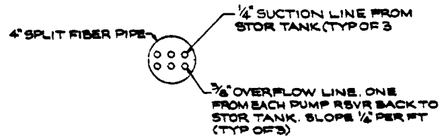
DRAIN LINES UNDER SLAB & F.O. PIPING
STEEL FRAME BLDG
SCALE NO. 24



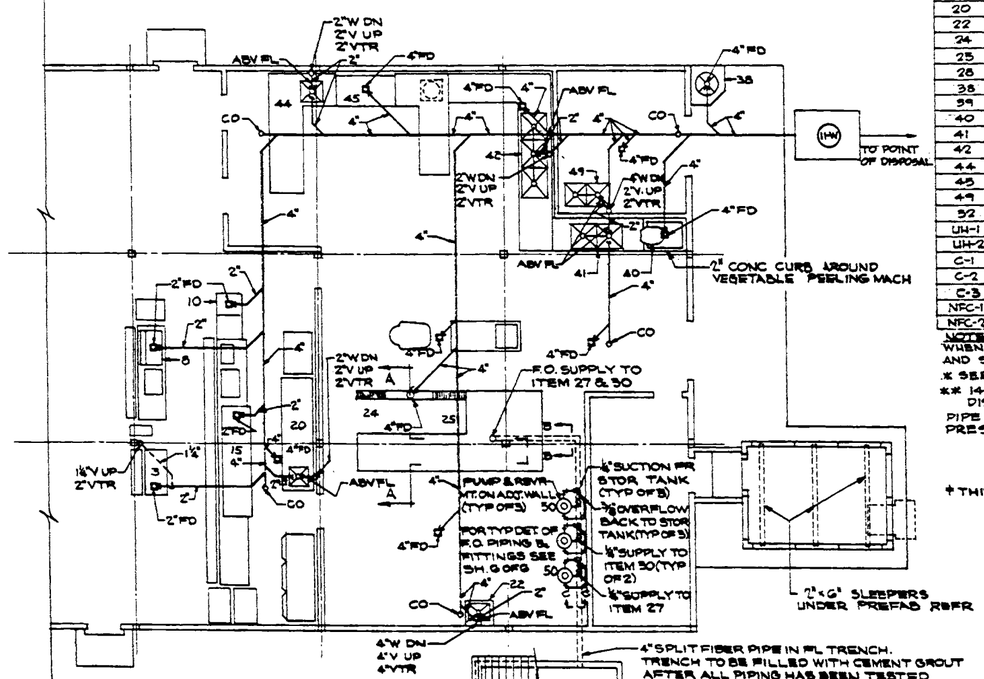
SECTION "A-A"
NO SCALE



SECTION "B-B"
NO SCALE



SECTION "C-C"
NO SCALE



DRAIN LINES UNDER SLAB & F.O. PIPING
WOOD FRAME BLDG
SCALE NO. 24

RUN-OUT PIPE SIZE SCHEDULE †

ITEM NO.	H.P. STEAM	H.P. COND'S	L.P. STEAM	L.P. COND'S	180°WATER	140°WATER	COLD WATER
8	—	—	1¼	1¼	—	—	¾
15	—	—	1¼	1¼	—	—	¾
17	—	—	1¼	—	—	—	—
20	—	—	—	—	—	¾	¾
22	—	—	—	—	—	¾	¾
24	—	—	2	1¼	—	—	—
25	—	—	2	—	—	—	—
28	—	—	1¼	—	—	—	—
38	—	—	—	—	1¼	—	1¼
39	2	1¼	—	—	—	2	2
40	—	—	—	—	—	—	¾
41	—	—	—	—	—	¾	¾
42	—	—	1¼	1¼	—	¾	¾
44	—	—	—	—	—	¾	¾
45	—	—	1¼-2	—	1¼	1¼**	—
49	—	—	—	—	—	¾	¾
52	—	—	2-4	1¼-2	1¼	1¼	—
UH-1	x	x	—	—	—	—	—
UH-2	x	x	—	—	—	—	—
C-1	¾	¾	—	—	—	—	—
C-2	¾	¾	—	—	—	—	—
C-3	¾	¾	—	—	—	—	—
NFC-1	2	1¼	—	—	—	—	—
NFC-2	2	1¼	—	—	—	—	—

NOTES:
WHEN 2 PIPE SIZES ARE GIVEN, FIRST SIZE APPLIES TO DWG 72-G1 AND SECOND SIZE APPLIES TO DWG 72-G2.
* SEE MECHANICAL NOTE NO.5, SH.1 OF 4, DWG 72-G1.
** 140°F WATER CONNECTION MAY NOT BE REQUIRED FOR DISHWASHER SUPPLIED FOR 72-G1, CHECK MODEL SUPPLIED.
PIPE SIZES ARE BASED ON THE FOLLOWING PERMISSABLE PRESSURE DROP PER 100 FEET: HIGH PRESSURE STEAM 1 PSI; HIGH PRESSURE CONDENSATE ¾ PSI; LOW PRESSURE STEAM ½ PSI; LOW PRESSURE CONDENSATE ½ PSI; WATER 5 PSI

† THIS SCHEDULE APPLIES TO 72-G2 ALSO

EQUIPMENT FURNISHED BY CORPS OF ENGINEERS (EFCS)

ITEM NO.	DESCRIPTION	QUANTITY	CAPACITY	ELECTRIC RATING VOLTAGE	ELECTRIC RATING H.P.	ELECTRIC RATING K.W.	STEAM LBS/HR	STEAM PRESSURE P.S.I.	FUEL OIL GALLONS PER HR
5	SELF-SERVICE COUNTER 96"x42"x36"	1	—	—	—	—	—	—	—
13	SERVING COUNTER 21'-0" x 3'-6" x 34"	1	—	—	—	—	—	—	—
17	EXHAUST HOOD W/GREASE FILTERS	1	—	—	—	—	NEGLECT	10	—
20	COUNTER W/SINK, 9'-6"x2'-6"x3'-4"	1	—	—	—	—	—	—	—
21	REFRIGERATOR 90" x 36" x 81"	1	65 CU FT	120-1ϕ	¾	—	—	—	—
22	COOK'S SINK - 28"x24"x44" W/B. SPL.	1	—	—	—	—	—	—	—
28	EXHAUST HOOD W/GREASE FILTERS	1	—	—	—	—	NEGLECT	10	—
37	PREFABRICATED REFRIGERATOR	1	900 CU FT	120-1ϕ	—	0.2	—	—	—
39	VERT. STEAM HEATED H.W. GEN.	1	750 GAL	—	—	—	422	125	—
41	SCULLERY SINK - 2 COMPT	1	—	—	—	—	—	—	—
42	POT & PAN COUNTER, 3 COMPT	1	—	—	—	—	34	10	—
44	CLEAN & SOILED DISH TABLE	1	—	—	—	—	—	—	—
46	EXHAUST HOOD, WALL MTG, PANT LEG	1	—	—	—	—	—	—	—
47	REFRIGERATION UNIT	1	10000 BTUH	208-3ϕ	7	1½	—	—	—
49	FILTER WASH TANK	1	—	—	—	—	—	—	—
51	DUPLEX CONDENSATE PUMPS & RCVR	1	4000# RAD	115-1ϕ	2-⅓	—	—	—	—

EQUIPMENT FURNISHED BY OTHERS

ITEM NO.	DESCRIPTION	QUANTITY	CAPACITY	ELECTRIC RATING VOLTAGE	ELECTRIC RATING H.P.	ELECTRIC RATING K.W.	STEAM LBS/HR	STEAM PRESSURE P.S.I.	FUEL OIL GALLONS PER HR
1	DINING TABLE (STEEL FRAME BLDG)	28	—	—	—	—	—	—	—
1	DINING TABLE (WOOD FRAME BLDG)	24	—	—	—	—	—	—	—
2	CHAIR W/O ARMS (STEEL FRAME BLDG)	112	—	—	—	—	—	—	—
2	CHAIR W/O ARMS (WOOD FRAME BLDG)	96	—	—	—	—	—	—	—
3	COLD FOOD COUNTER - 38"W x 48"L	1	—	120-1ϕ	½	—	—	—	—
4	TABLEWARE DISPENSERS, PLATES	1	136 PLATES	—	—	—	—	—	—
6	VACUUM JUG - 15" ϕ	1	10 GAL	—	—	—	—	—	—
7	BULK MILK DISPENSER - 27"x20"x41"	1	10 GAL	115-1ϕ	⅛	—	—	—	—
8	COFFEE URN, TWIN - 35"x20"x28⅛"	1	6 GAL	208-3ϕ	—	13.5	67	10	—
9	TABLEWARE DISPENSER, CUPS	1	144	—	—	—	—	—	—
10	ICE & WATER DISPENSER 31⅝"x26x85	1	225 LB	115-1ϕ	½	—	—	—	—
11	TABLEWARE DISPENSER, GLASSES	1	216	—	—	—	—	—	—
12	TRAY RACKS - 36"x 27"x 68¾"	2	160	—	—	—	—	—	—
14	GRIDDLE - 38"x 26"x 36"	1	—	208-3ϕ	—	12	—	—	—
15	STEAM TABLES - 63⅜"x30"x34"	1	4 COMPT	—	—	—	24	10	—
16	SILVERWARE DISPENSER - 15"x12"x9"	1	6 HOLE	—	—	—	—	—	—
18	FOOD PREP TABLES & RACKS - 72"x30"	5	(WOOD FRAME	BLDG	ONLY)		—	—	—
18A	FOOD PREP TABLES & RACKS - 72"x30"	5	(STEEL FRAME	BLDG	ONLY)		—	—	—
23	MIXING MACH W/ATTACHMENTS	1	60 QT	208-3ϕ	1½	—	—	—	—
24	KETTLES, STEAM - JACKETED - 41" ϕ	1	40 GAL	—	—	—	70	10	—
25	COOKERS, STEAM - 43"x36"	1	4 BU	—	—	—	75	10	—
26	FRYERS, DEEP FAT - 26½"x38"x37"	2	90 LB/HR	208-3ϕ	—	18	—	—	—
27	OVEN, BAKING & ROASTING - OIL FIRED	1	—	120-1ϕ	⅓ & ⅔	—	—	—	1.5EA
29	MEAT SLICER, 26"x20"	1	—	115-1ϕ	¼	—	—	—	—
30	RANGES, OIL FIRED - 54"x36"x34"	2	—	115-1ϕ	⅓	—	—	—	1.5EA
32	FROZEN FOOD CABINET - 76"x36½"	1	45 CU FT	120-1ϕ	¾	—	—	—	—
33	SCALE, FLOOR TYPE - 16"x 24"	1	500 LB	—	—	—	—	—	—
34	SCALE, COUNTER TYPE	1	10 LB	—	—	—	—	—	—
35	SHELVING - 36"x 24"x 68"	14	—	—	—	—	—	—	—
38	RINSER - SANITIZER - 23"ϕ x 28¾ H.	1	—	—	—	—	—	—	—
40	VEGETABLE PEELING MACHINE	1	80 LB/CHARGE	120-1ϕ	¾	—	—	—	—
43	TRUCK, HAND, 4 SHELVES - 60"x30"	1	800 LB	—	—	—	—	—	—
45	DISHWASHER	1	50 RACKS/HR	208-3ϕ	1	2.43	35	10	—
48	ICE CREAM CABINET - 44"x31"x 33½"	1	15 GAL	120-1ϕ	—	0.95	—	—	—
19	TOASTERS - 23"x18"	1	540 SL/HR	208-1ϕ	—	4	—	—	—
52	BOOSTER COIL FOR ITEMS 38&45	1	21 GAL/MIN	—	—	—	109	10	—
50	FUEL PUMPS	3	3 GAL/HR	115-1ϕ	⅛	—	—	—	—

SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ RATED CAPACITY OF INSTALLED EQUIP ON 60 MINUTE OPERATING CYCLE 42'x100'	48'x80'
STEAM FOR TEMPERING MAKE-UP EXHAUST AIR @ 125 PSIG	1,016 LB	2,016 LB
COLD WATER (15,000 GAL. PER DAY)	2230 GAL	2230 GAL
HOT WATER @ 140°F (3000 GAL. PER DAY)	440 GAL	440 GAL
SEWAGE (15,000 GAL. PER DAY)	2230 GAL	2230 GAL
STEAM FOR COOKING @ 10 PSI	236 LB	236 LB
STEAM FOR GENERATION OF HOT WATER @ 125 PSI	422 LB	422 LB
STEAM FOR DISHWASHER & SCULLERY SINK COILS @ 10 PSI	178 LB	178 LB
STEAM FOR SPACE HEATING @ 125 PSI	270 LB	270 LB
ELECTRIC POWER AND LIGHTING	95 KVA	95 KVA
FUEL OIL FOR RANGE AND OVEN COOKING	4.3 GAL	4.3 GAL

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES 0 5' 10'
NO. 24

MAYER, BEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

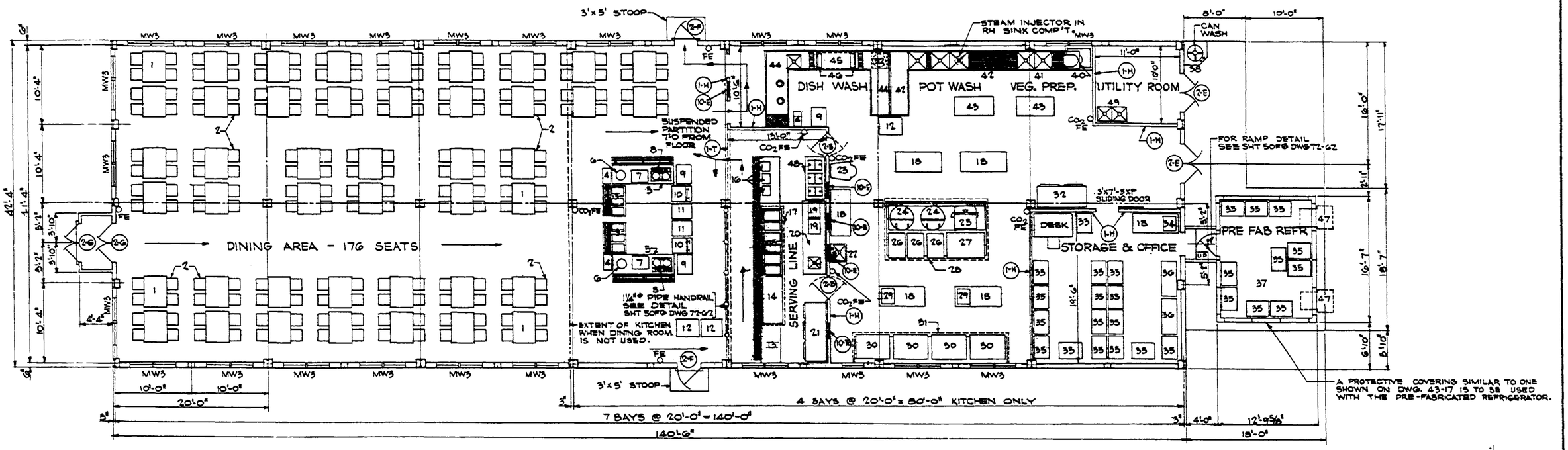
DRAWN BY: JOHNSON, ALBERT
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.B. DEICHMANN

THEATER OF OPERATIONS
HOUSING FACILITIES
KITCHEN & MESS HALL - 200 MAN
42'X100' - STEEL FRAME
48'X80' - WOOD FRAME
DRAIN LINES UNDER SLAB - F.O. PIPING - EQUIP. SCHEDULE

APPROVED: DATE: 18 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR THE GOVERNMENT AGENCY: DATE: 18 FEB 1971
SCALE: AS NOTED SPEC. NO.
DRAWING NUMBER 72-G1
SHEET 4 OF 4

CORPS OF ENGINEERS

U. S. ARMY



EQUIPMENT AND FLOOR PLAN (STEEL FRAME BLDG)

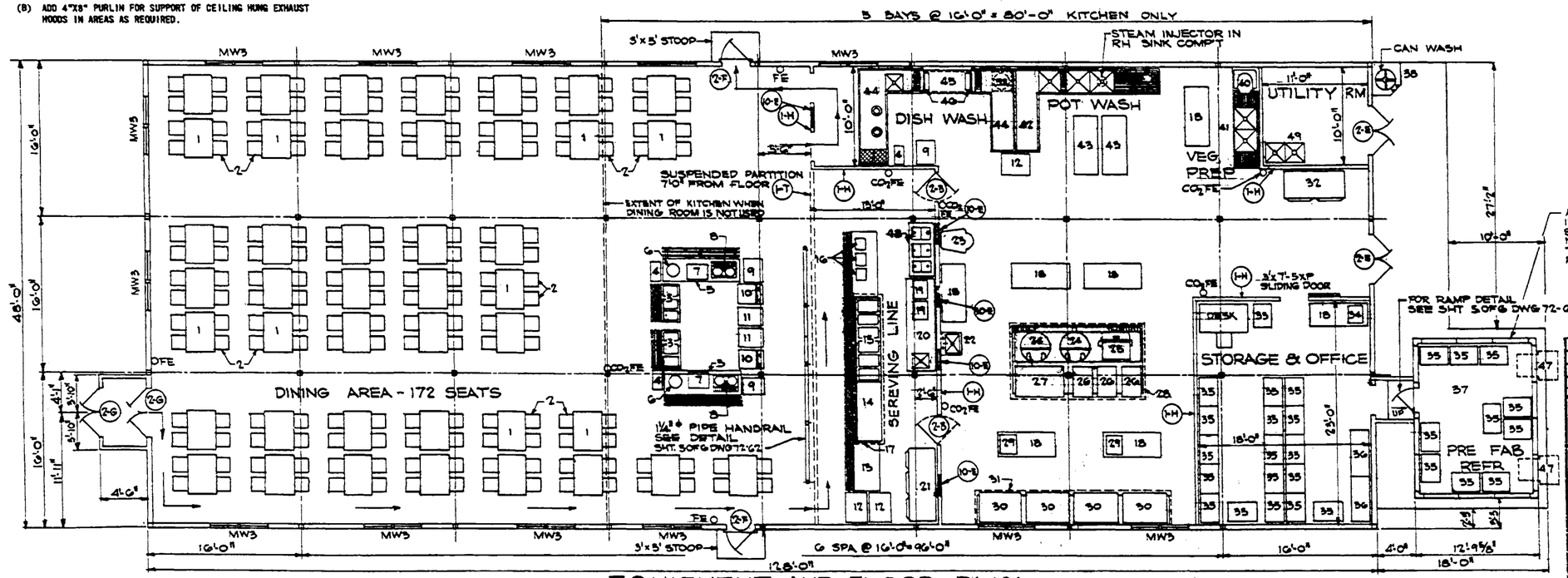
SCALE NO. 24

STRUCTURAL NOTES

1. STEEL FRAME BUILDINGS
   PIPING AND OTHER CONCENTRATED LOADS MUST BE SUPPORTED INDEPENDENT OF BUILDING SHELL STRUCTURE.
2. WOOD FRAME BUILDINGS
   (A) ROOF SYSTEM FOR WOOD FRAME BUILDINGS IN ALL ZONES TO BE 2"X8" PURLINS @ 2'-0" O.C. SUPPORTED BY 2-3"X12" GIRDERS @ COLUMN LINES. REFER TO DWG NO.34-04 SHEET 3 OF 3 NOTE REGARDING PIPE LOADS - TEMPERATE CLIMATE NOTES 1 & 3.
   (B) ADD 4"X8" PURLIN FOR SUPPORT OF CEILING HUNG EXHAUST HOODS IN AREAS AS REQUIRED.

FACILITY NUMBERS

	TROPIC ZONE	TEMP ZONE (-20°F)
INTERIOR ONLY	726201	726202
INTERIOR ONLY (KITCHEN ONLY)	726211	726212
STEEL FRAME BLDG. W/INTERIOR	726221	726222
STEEL FRAME BLDG. W/INTERIOR (KITCHEN ONLY)	726231	726232



EQUIPMENT AND FLOOR PLAN (WOOD FRAME BLDG)

SCALE NO. 24

FACILITY NUMBERS

	TROPIC ZONE	TEMP ZONE (-20°F)
INTERIOR ONLY	726203	726204
INTERIOR ONLY (KITCHEN ONLY)	726213	726214
WOOD FRAME BLDG. W/INTERIOR	726223	726224
WOOD FRAME BLDG. W/INTERIOR (KITCHEN ONLY)	726233	726234

PLOT PLAN

SCALE NO. 13

NOTE:
FOR GENERAL NOTES SEE SHT 5 OF 8

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-62	FLOOR PLANS MECHANICAL & ELEC.	1 OF 8
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDG.	1-7 OF 7
82-11	BOILER HOUSES	1-4 OF 4
43-17	PREFAB REFRIGERATOR	1 OF 1
35-36	STEEL FRAME CONST. WAREHOUSE TYP BLDG.	1-3 OF 3
99-98	STANDARD DETAILS	
51-97	COVERED WALKWAY	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

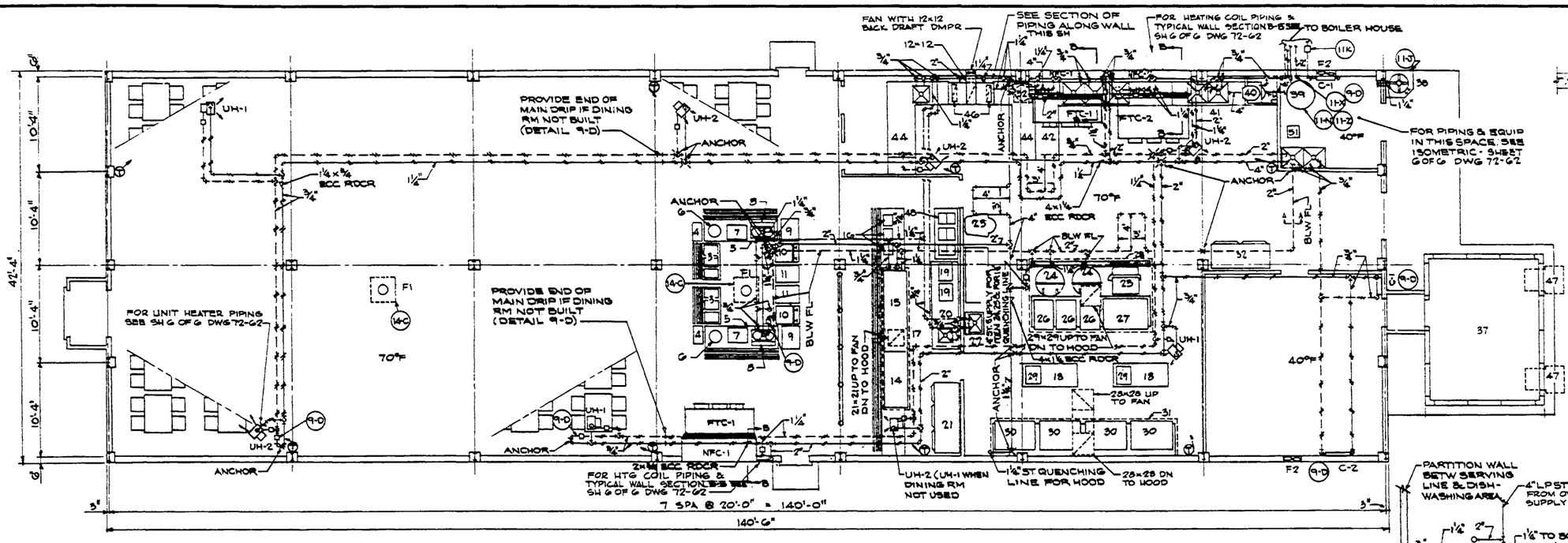
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.D. DEICHMANN
APPROVED: DATE: 18 FEB 1971
CHIEF, STRUCTURAL BRANCH
APPROVED FOR PRESIDENT AGENCY: DATE: 18 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

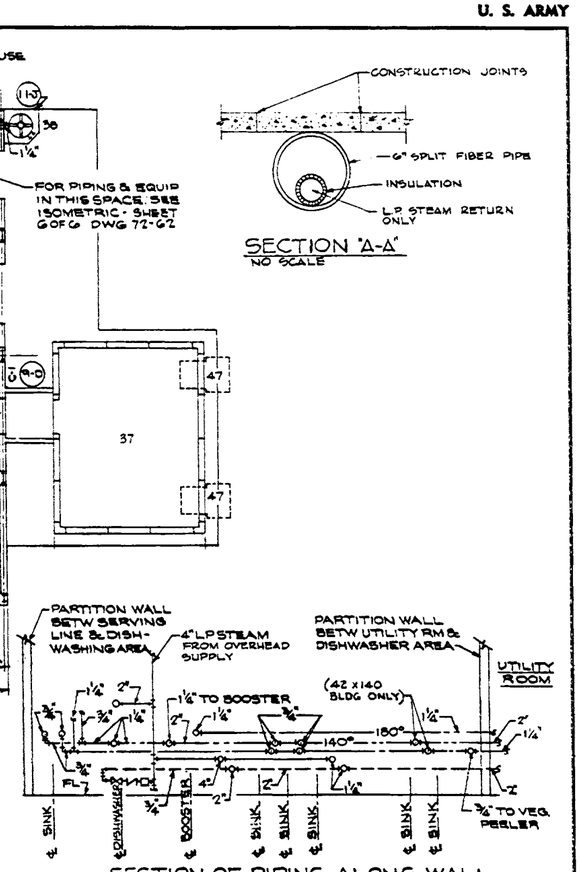
THEATER OF OPERATIONS

HOUSING FACILITIES
KITCHEN & MESS HALL - 500 MAN
42'X140' - STEEL FRAME
48'X128' - WOOD FRAME
EQUIPMENT PLAN

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-62
SHEET 1 OF 8

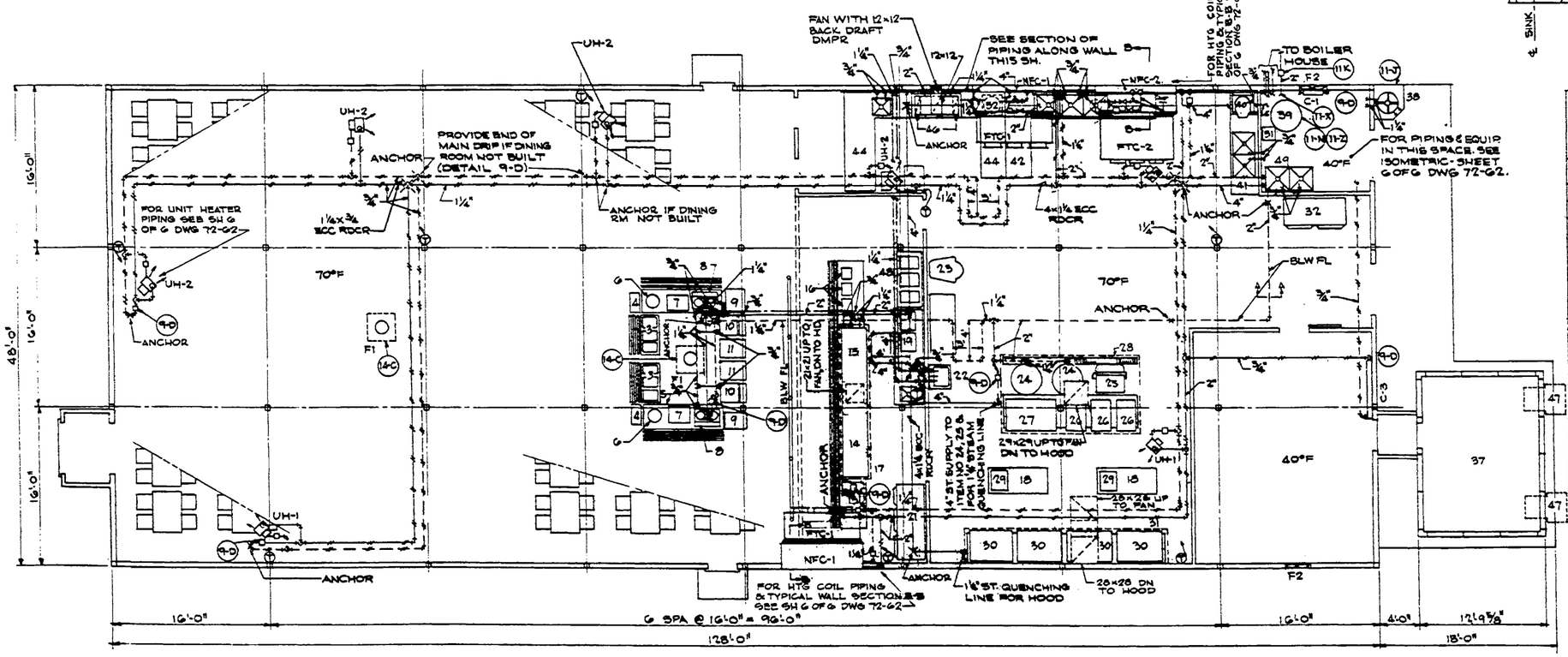


MECHANICAL PLAN
STEEL FRAME BLDG
SCALE NO. 24



SECTION "A-A"
NO SCALE

SECTION OF PIPING ALONG WALL
NO SCALE



MECHANICAL PLAN
WOOD FRAME BLDG
SCALE NO. 24

NOTE:
1. ~~SEE~~ MECHANICAL NOTES SEE SH 8 OF G
2. REFER TO SH G OF G FOR DETAIL OF ITEM 51.

HEATING & VENTILATING EQUIPMENT SCHEDULE

*APPROX H.P.

MARK	CFM OR BTU/HR	STATIC PRESS IN. H2O	MOTOR REQ'D 60~	MOTOR REQ'D 25~	H.P.*	TYPE OF FAN	ELEC CHAR
F1	6750	—	3/1	3/1	3/6	PROP	208V, 1φ
F2	1000	—	2	2	1/3	PROP	120V, 1φ
UH1	77875	—	3/2	3/2	1/6	—	120V, 1φ
UH2	27075	—	3/3	3/3	1/6	—	120V, 1φ
C-1	7670	—	2	1	—	—	—
C-2	11500	—	1	0	—	—	—
C-3	23000	—	0	1	—	—	—
NFC-1	681,650	—	2	2	—	—	—
NFC-2	1,161,950	—	1	1	—	—	—
VALVE FOR ITEM NO.	—	—	—	—	—	—	—
31	9225	5/8	1	1	3	DETERMINED BY SUPPLIER	208V, 3φ
28	10800	5/8	1	1	3	"	208V, 3φ
46	1000	5/8	1	1	1/3	"	120V, 1φ
17	4650	5/8	1	1	1	"	208V, 3φ
HW HTR	674730	—	1750 GAL GENERATOR		—	—	—
ETC-1	7000	1.0	2	2	2	—	208, 3φ
ETC-2	12,000	1.0	1	1	5	—	208, 3φ

SYMBOL	DESCRIPTION REVISIONS GRADING DETAILS	DATE	APPROVAL

0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA

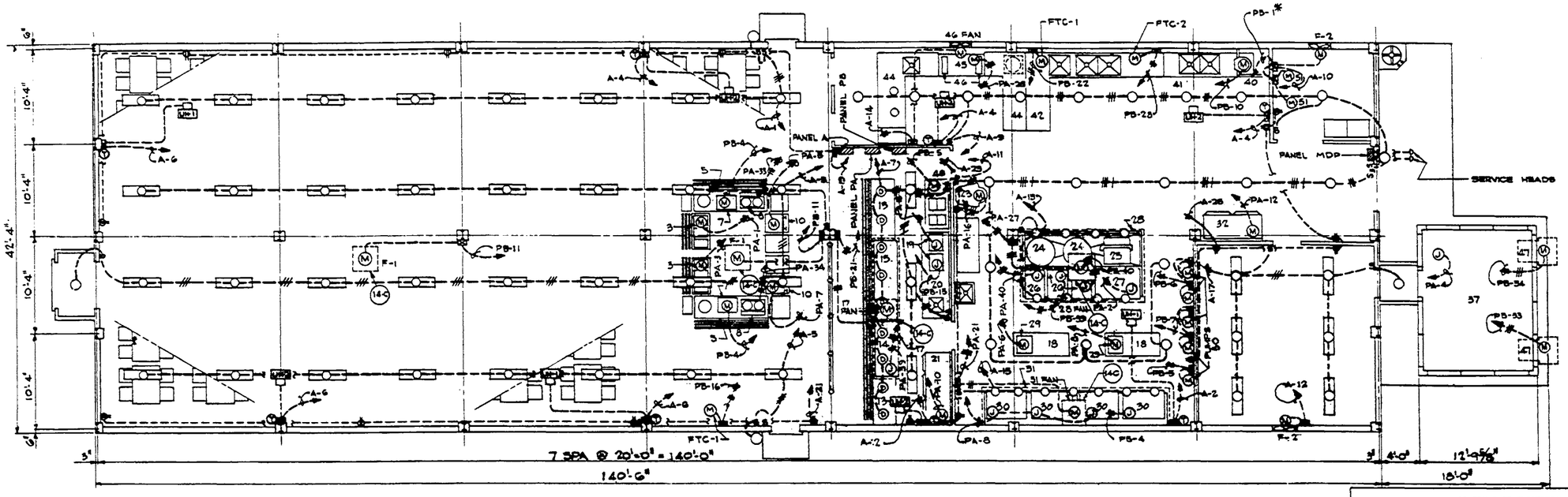
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON :BM
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] 18 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
RECOMMENDED FOR PROPONENT AGENCY: [signature] 18 FEB 1971

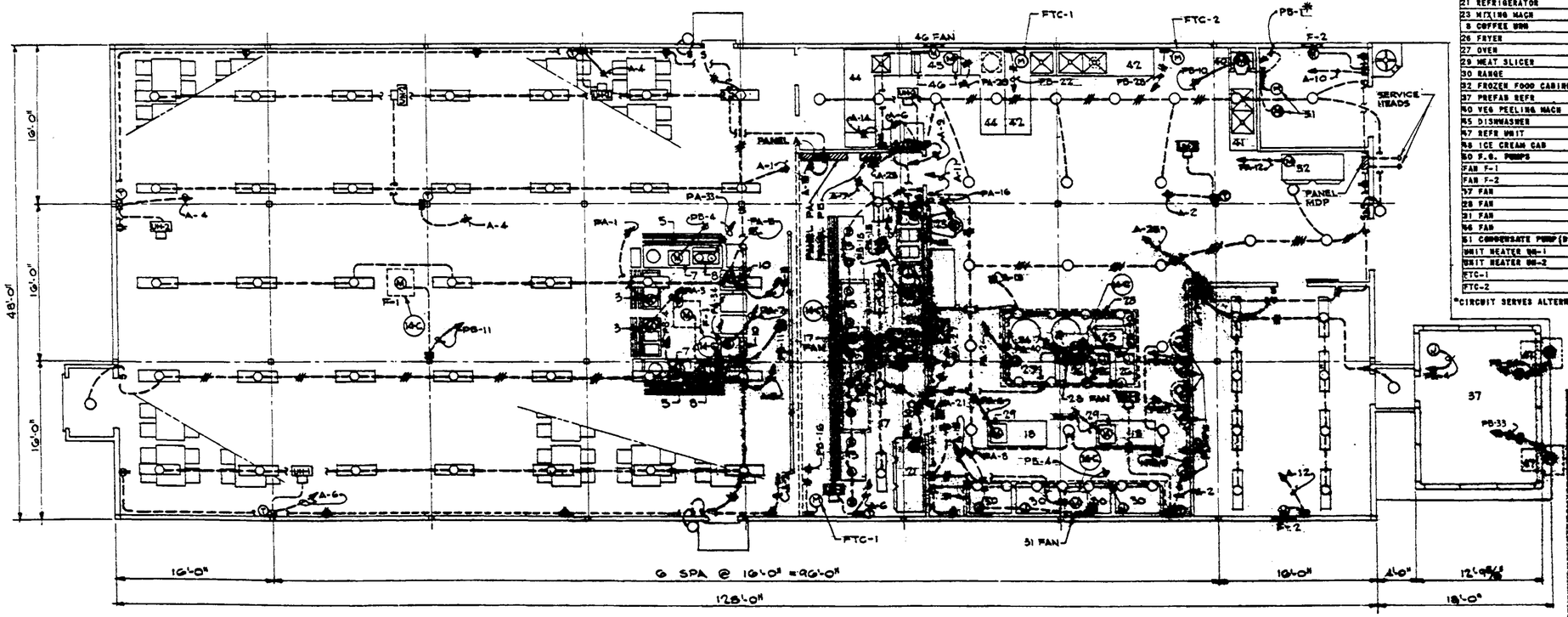
THEATER OF OPERATIONS

HOUSING FACILITIES
KITCHEN & MESS HALL - 500 MAN
42'X140' - STEEL FRAME
48'X128' - WOOD FRAME
MECHANICAL PLAN

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 8
72-62



ELECTRICAL PLAN
STEEL FRAME BLDG.
SCALE NO. 24



ELECTRICAL PLAN
WOOD FRAME BLDG.
SCALE NO. 24

SCHEDULE OF ELECTRICAL EQUIPMENT REQUIREMENTS

EQUIP NO. & DESIGNATION	QTY	BREAKERS SIZE	BREAKERS NO. OF POLES	CONDUCTORS SIZE	CONDUCTORS NO. REQD	RATED CURRENT EACH IN AMPS	CIRCUIT NUMBER
3 COLD FOOD COUNTER	2	15	1	12	2	7.2	PA-1, PA-3
7 BULK MILK DISP	2	20	1	12	2	9.7	PB-4
10 ICE & WATER DISP	2	20	1	12	2	9.8	PA-5, PA-7
14 GRIDDLE	1	70	3	6	3	33.3	PA-39
19 TOASTER	2	30	2	10	2	19.2	PA-15, PB-15
21 REFRIGERATOR	1	30	1	10	2	13.8	PA-10
23 MIXING MACH	1	15	3	12	3	6.9	PA-16
8 COFFEE URN	2	60	3	8	3	32.4	PA-33, PA-34
26 FRYER	3	70	3	6	3	50.0	PA-40, PB-39, PB-40
27 OVEN	1	15	1	12	2	0.9	PA-2
29 MEAT SLICER	2	20	1	12	2	5.8	PA-6
30 RANGE	4	20	1	12	2	0.9	PA-8 (3), PB-4
32 FROZEN FOOD CABINET	1	30	1	10	2	13.8	PA-12
37 PREFAB REFR	1	20	1	12	2	1.7	PA-4
40 VEG PEELING MACH	1	30	1	12	2	13.8	PB-10
45 DISHWASHER	1	40	3	10	3	20.3	PA-28
47 REFR UNIT	2	50	3	8	3	23.3	PB-33, PB-34
48 ICE CREAM CAB	1	20	1	12	2	7.8	PB-5
50 F.O. PUMPS	5	20	1	12	2	5.8	PB-5, PB-6 (2), PB-7 (2)
FAN F-1	2	15	2	12	2	6.0	PB-11
FAN F-2	2	20	1	12	2	7.2	A-10, A-12
17 FAN	1	15	3	12	3	3.7	PB-21
28 FAN	1	20	3	12	3	9.5	PA-27
31 FAN	1	15	3	12	3	6.9	PA-21
46 FAN	1	20	1	12	2	7.2	A-16
51 CONDENSATE PUMP (DUAL)*	1	15	1	12	2	7.2	PB-1*
UNIT HEATER UH-1	3	20	1	12	2	6.4	A-2, A-6
UNIT HEATER UH-2	5	20	1	12	2	6.4	A-2, A-4, A-6
FTC-1	2	15	3	12	3	6.9	PB-16, PB-22
FTC-2	1	40	3	10	3	15.9	PB-28

*CIRCUIT SERVES ALTERNATOR FURNISHED W/STANDBY PUMP. #CIRCUIT SERVES ALTERNATOR

NOTES:
FOR ELECTRICAL NOTES SEE SHT 5 OF 6
FOR PANELBOARD SCHEDULE AND SINGLE LINE DIAGRAM SEE SHT 6 OF 6.
FOR TYPICAL FIXTURE & WIRING SUPPORT DETAIL SEE SHT 6 OF 6.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DRAFTING SCALES 0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

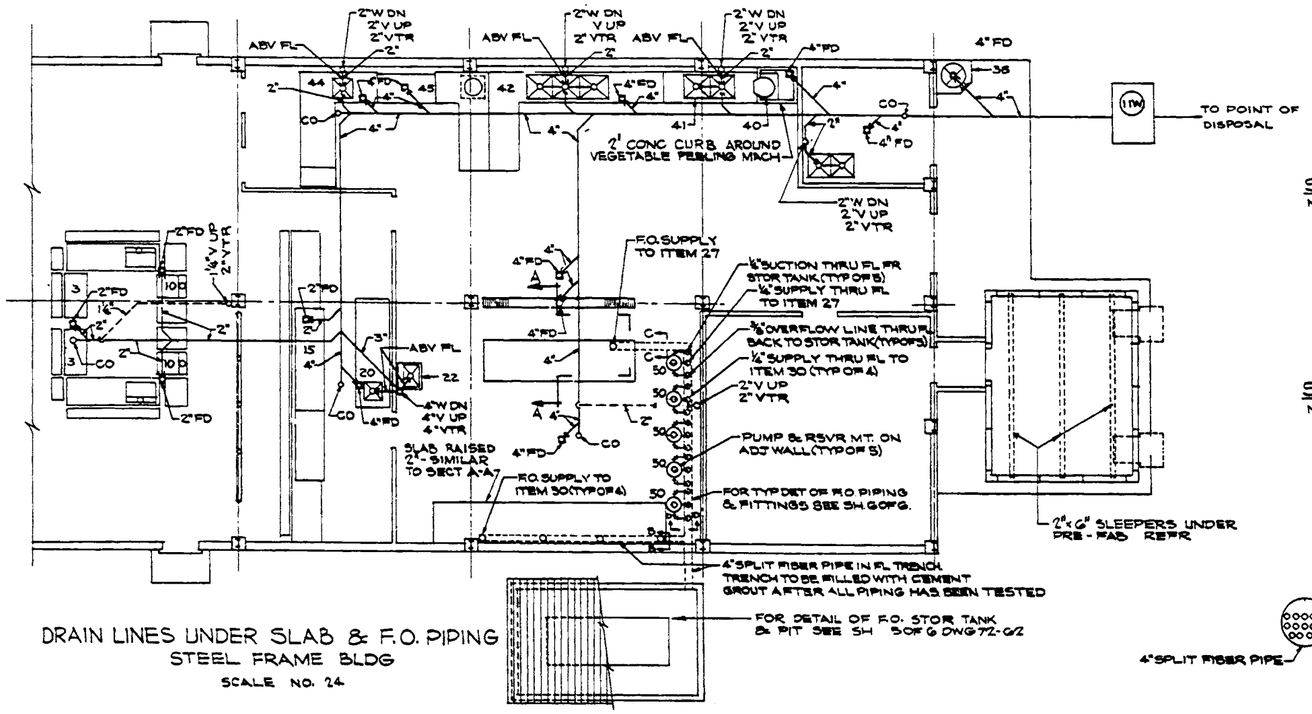
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON, PLASTERS
TRACED BY:
DESIGNED BY: DIETCHMANN
QUANTITIES BY:
CHECKED BY: C. W. DIETCHMANN
APPROVED: Hayes Seay Mattern & Mattern
CHIEF, ENGINEERING DIVISION

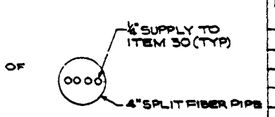
THEATER OF OPERATIONS
HOUSING FACILITIES
KITCHEN & MESS HALL - 500 MAN
42'X140' - STEEL FRAME
48'X128' - WOOD FRAME
ELECTRICAL PLAN

APPROVED: DATE: 18 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

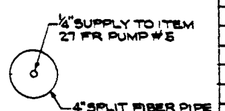
CONCUR IN FOR CONSTRUCTING AGENCY: DOUGLAS NOTED SPEC. NO.
DATE: 18 Feb 71
DRAWING NUMBER: 72-62
SHEET 3 OF 8



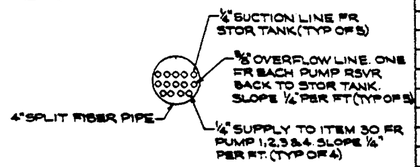
DRAIN LINES UNDER SLAB & F.O. PIPING
STEEL FRAME BLDG
SCALE NO. 24



SECTION B-B
NO SCALE



SECTION C-C
NO SCALE



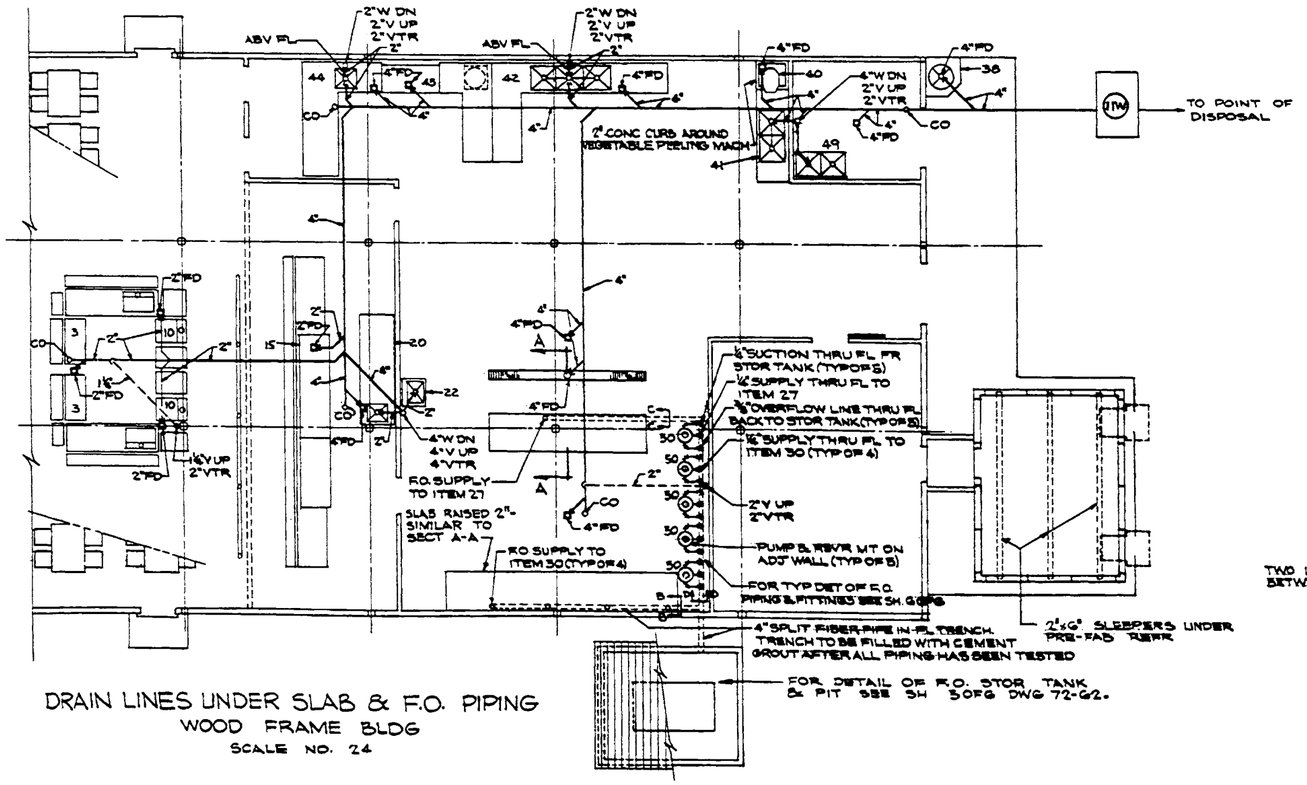
SECTION D-D
NO SCALE

EQUIPMENT FURNISHED BY CORPS OF ENGINEERS (EFCS)

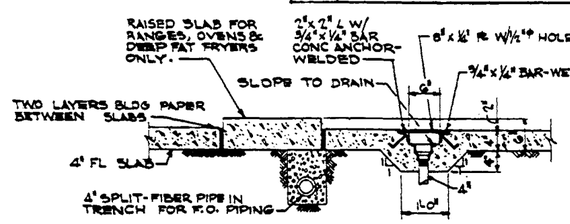
ITEM NO.	DESCRIPTION	QUANTITY	CAPACITY	ELECTRIC RATING VOLTAGE	H.P.	K.W.	STEAM LBS/HR	STEAM PRESSURE P.S.I.	FUEL OIL GALLONS PER HR
5	SELF-SERVICE COUNTER, 96"X42"X36"	2	—	—	—	—	—	—	—
13	SERVING COUNTER, 24'-6"X3'-6"X2'-10"	1	—	—	—	—	—	—	—
17	EXHAUST HOOD W/GREASE FILTERS	1	—			—	NEGLECT	10	—
20	COUNTER W/SINK 9'-6"X2'-6"X3'-4"	1	—	—	—	—	—	—	—
21	REFRIGERATOR - 90"X36"X81"	1	65 CU FT	120	¾	—	—	—	—
22	COOK'S SINK - 28"X24"X44"-W/B. SPL	1	—	—	—		—	—	—
28	EXHAUST HOOD W/GREASE FILTERS	1	—			—	NEGLECT	10	—
31	EXHAUST HOOD W/GREASE FILTERS	1	—			—	NEGLECT	10	—
37	PREFABRICATED REFRIGERATOR	1	1200 CU FT	120	—	0.2	—	—	—
39	VERT. STEAM HEATED H.W. GEN.	1	730 GAL	—	—	—	777	125	—
41	SCULLERY SINK - 2 COMP.	1	—	—	—	—	—	—	—
42	POT & PAN COUNTER - 3 COMP	1	—	—	—	—	34	10	—
44	CLEAN & SOILED DISH TABLE	1	—	—	—	—	—	—	—
46	EXHAUST HOOD, WALL MTG, PANT LEG	1	—			—	—	—	—
47	REFRIGERATION UNIT	2	10000 BTUH	208-3Φ	7 ½	—	—	—	—
49	FILTER WASH TANK	1	—	—	—	—	—	—	—
51	DUPLEX CONDENSATE PUMPS & RECVR	1	4000 D'RAD	115	2-⅓	-	—	—	—

EQUIPMENT FURNISHED BY OTHERS

ITEM NO.	DESCRIPTION	QUANTITY	CAPACITY	ELECTRIC RATING VOLTAGE	H.P.	K.W.	STEAM LBS/HR	STEAM PRESSURE P.S.I.	FUEL OIL GALLONS PER HR
-1	DINING TABLE (STEEL FRAME BLDG)	44	—	—	—	—	—	—	—
1	DINING TABLE (WOOD FRAME BLDG)	43	—	—	—	—	—	—	—
2	CHAIR W/O ARMS (STEEL FRAME BLDG)	176	—	—	—	—	—	—	—
2	CHAIR W/O ARMS (WOOD FRAME BLDG)	172	—	—	—	—	—	—	—
3	COLD FOOD COUNTER - 48"X36"	2	—	115	⅓	—	—	—	—
4	TABLEWARE DISPENSER, PLATES	3	136	—	—	—	—	—	—
6	VACUUM JUG - 15"Φ	2	10 GAL	—	—	—	—	—	—
7	BULK MILK DISPENSER 27"X20"X41"	2	10 GAL	115	⅛	—	—	—	—
8	COFFEE URN, TWIN - 3 GAL	2	6 GAL	208-3Φ	—	13.5	67 EA	10	—
9	TABLEWARE DISPENSER, CUPS	3	144	—	—	—	—	—	—
10	ICE & WATER DISPENSER	2	225 LB	115	½	—	—	—	—
11	TABLEWARE DISPENSER, GLASSES	2	216	—	—	—	—	—	—
12	TRAY RACKS - 36"X27"X68¾"	3	160	—	—	—	—	—	—
14	GRIDDLE - 72"X25½"X36"	1	—	208-3Φ		12	—	—	—
15	STEAM TABLES - 6 COMPT - 91⅞"X30"X34"	1	—	—	—	—	25	10	—
16	SILVERWARE DISPENSER - 6 HOLE	3	—	—	—	—	—	—	—
18	FOOD PREP TABLES & RACKS	6	—	—	—	—	—	—	—
19	TOASTERS - 23"X18"	2	540 SL/HR	208-1Φ	—	4	—	—	—
23	MIXING MACH W/ATTACHMENTS	1	80 QT	208-3Φ	2	—	—	—	—
24	KETTLES, STEAM-JACKETED - 41"Φ	2	60 GAL	—	—	—	105 BA	10	—
25	COOKERS, STEAM - 45"X36"	1	4 BU	—	—	—	75	10	—
26	FRYERS, DEEP FAT - 26½"X38"X37"	3	90 LB/HR	208-3Φ	—	18	—	—	—
27	OVEN, BAKING & ROASTING-OIL FIRED	1	—	120	1/6 + 1/10	—	—	—	1.5 EA
29	MEAT SLICER - 26"X20"	2	—	115	¼	—	—	—	—
30	RANGES - OIL FIRED - 54"X38"X 34"	4	—	115	1/6	—	—	—	1.5 EA
32	FROZEN FOOD CABINET	1	45 CU FT	120	¾	—	—	—	—
33	SCALE, FLOOR TYPE - 16"X24"	1	500 LB	—	—	—	—	—	—
34	SCALE, COUNTER TYPE	1	10 LB	—	—	—	—	—	—
35	SHELVING - 36"X24"X66"	25	—	—	—	—	—	—	—
36	RACK, DUNNAGE - 36"X21"X12"	2	—	—	—	—	—	—	—
38	RINSER-SANITIZER - 25"Φ X 28¾" H.	1	—	—	—	—	—	—	—
40	VEGETABLE PEELING MACHINE	1	30 LB	120	¾	—	—	—	—
43	TRUCK, HAND, 4 SHELVES - 60"X30"X62"	2	800 LB	—	—	—	—	—	—
45	DISHWASHER	1	165 RKS/HR	208-3Φ	4¼	2.43	70	10	—
48	ICE CREAM CABINET	1	35 GAL	120	⅛	—	—	—	—
52	BOOSTER COIL FOR ITEMS 38 & 45	1	15.6 GPM	—	—	—	223	10	—
50	RANGE AND OVEN FUEL PUMPS	5	5 GAL/HR	115	⅛	—	—	—	—



DRAIN LINES UNDER SLAB & F.O. PIPING
WOOD FRAME BLDG
SCALE NO. 24



SECTION "A-A"
NO SCALE

SYMBOL	DESCRIPTION BY/CHECKED	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10'
NO. 24

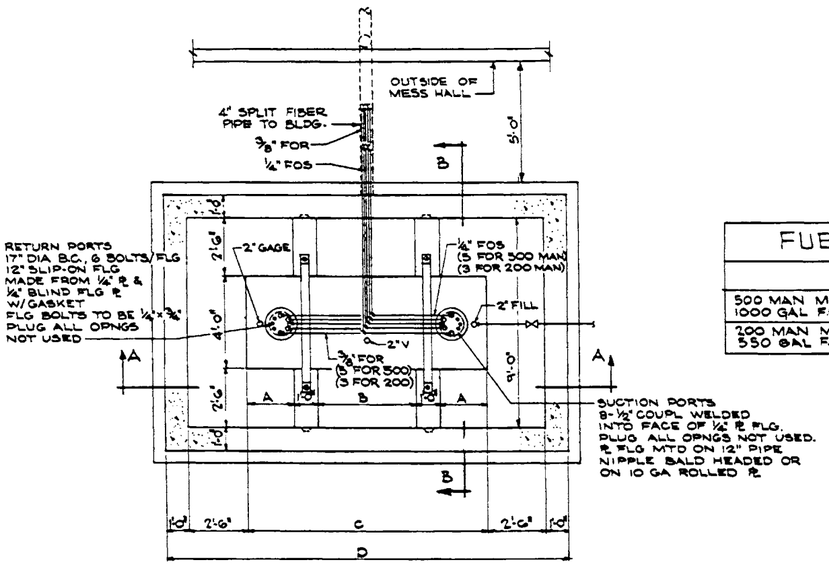
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON BA
TRACED BY:
CHECKED BY: DEICHMANN
QUANTITIES BY: G.W. DEICHMANN
APPROVED: [signature] DATE: 18 FEB 1971
APPROVED FOR DEPARTMENT AGENCY: [signature] DATE: 18 FEB 71

THEATER OF OPERATIONS
HOUSING FACILITIES
KITCHEN & MESS HALL - 500 MAN
42'X140' - STEEL FRAME
48'X128' - WOOD FRAME
DRAINLINES UNDER SLAB - F.O. PIPING - EQUIP. SCHED.

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-62
SHEET 4 OF 6

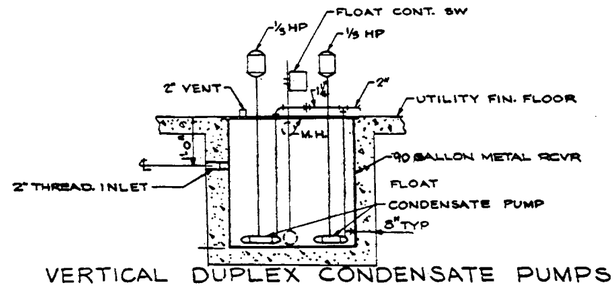


FUEL OIL STORAGE TANKS

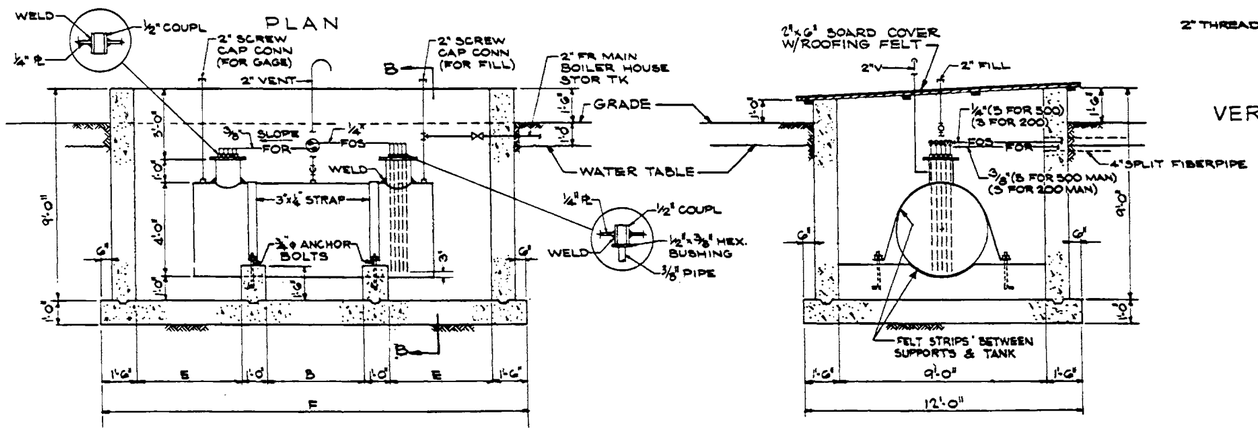
	A	B	C	D	E	F
500 MAN MESS HALL 1000 GAL F.O. STO TANK	2'-1"	4'-3"	10'-5"	17'-5"	4'-7"	18'-5"
200 MAN MESS HALL 550 GAL F.O. STO TANK	1'-0"	1'-10"	5'-10"	12'-10"	3'-6"	13'-10"

SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ RATED CAPACITY OF INSTALLED EQUIP. ON 60 MINUTE OPERATING CYCLE	
	42'x140'	48'x128'
COLD WATER (22,300 GALLONS PER DAY)	2660 GAL	2660 GAL
HOT WATER @ 140°F (6750 GALLONS PER DAY)	810 GAL	810 GAL
SEWAGE (22,500 GALLONS PER DAY)	2660 GAL	2660 GAL
STEAM FOR COOKING @ 10 PSI	447 LB	447 LB
STEAM FOR GENERATION OF HOT WATER @125 PSI	777 LB	777 LB
STEAM FOR DISHWASHER & SCULLERY SINK COILS @10 PSI	327 LB	327 LB
STEAM FOR SPACE HEATING @ 1.25 PSI	409 LB	409 LB
ELECTRIC POWER AND LIGHTING	133 KVA	135 KVA
FUEL OIL FOR RANGE AND OVEN COOKING	7.5 GAL	7.5 GAL
STEAM FOR TEMPERING MAKE-UP EXHAUST AIR @ 12.5 PSI	2875 LB	2875 LB

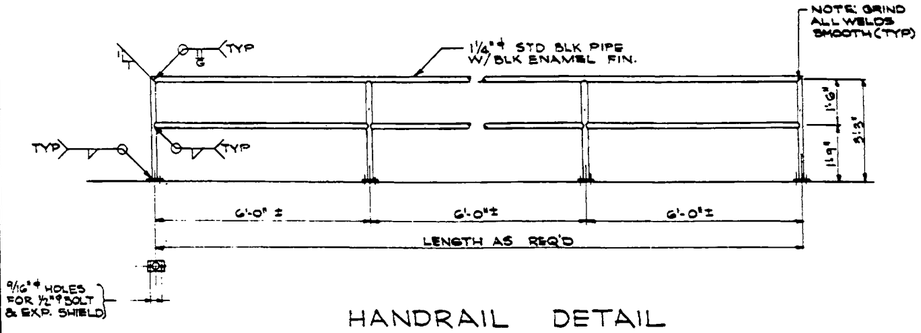


VERTICAL DUPLEX CONDENSATE PUMPS
ITEM NO. 51
NO SCALE



1000 GAL & 550 GAL FUEL OIL STORAGE TANKS

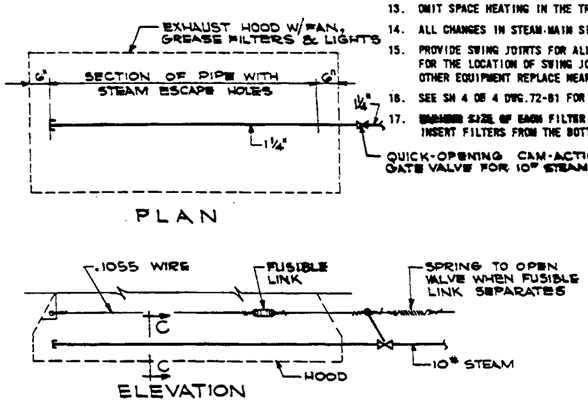
NO SCALE



HANDRAIL DETAIL

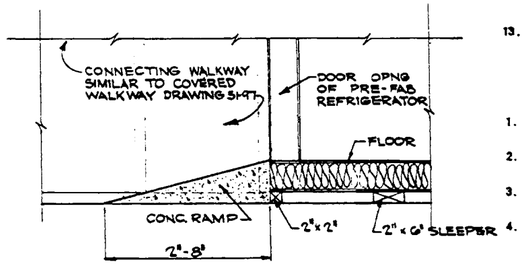
FOR 200 & 500 MAN MESS HALLS

NO SCALE



STEAM QUENCHING DETAILS

NO SCALE



CONCRETE RAMP DETAIL @ PRE-FAB REFRIGERATOR

GENERAL NOTES

1. FOR FSN BILL OF MATERIAL - REFER TO TM 5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES YARD PIPING TO BOILER HOUSE.
3. FIRE PROOF ALL COLUMNS FROM FLOOR TO CEILING THAT PENETRATE KITCHEN HOODS (APPLY 1/4 INCH ASBESTOS BOARD OVER COLUMNS AND THEN ENCASE IN CRES STEEL, 10 GAGE SHEETS FASTENED BY SCREWS AND SOLDERED TIGHT).
4. USE REFLECTIVE TYPE (ALUMINUM FOIL) INSULATION IN THE CEILING LINER FOR THE TROPICAL ZONE.
5. TABLES AND CHAIRS CONFORMING TO DETAIL (7-V) CAN BE USED IN LIEU OF THE TABLES AND CHAIRS LISTED IN THE SCHEDULES IF SHIPMENT OF REGULAR ITEMS ARE DELAYED IN TRANSIT OR CANNOT BE SECURED IN A REASONABLE TIME.
6. THE MAXIMUM NUMBER OF MEN SERVED BY THIS MESS HALL MAY BE INCREASED TO 750 MEN BY EXTENDING THE SERVING TIME.

ELECTRICAL NOTES

1. HOOD LIGHTS SHALL BE FED WITH NUMBER 12 COPPER CONDUCTOR TYPE AVA INSULATION AND RUN IN 1/2 INCH RIGID GALVANIZED STEEL CONDUIT.
2. FEEDER CONDUCTORS NOT LARGER THAN NO.2 SHALL BE TYPE NM, NMC OR UF THREE-CONDUCTOR CABLE, WITH GROUND; AND THOSE LARGER THAN NO.2 SHALL BE TYPE MC STRANDED ALUMINUM FOUR-CONDUCTOR STEEL ARMORED CABLE.
3. BRANCH CIRCUIT CONDUCTORS SHALL BE NO.12 COPPER OR NO.10 ALUMINUM, TWO OR THREE-WIRE TYPE NM, NMC OR UF CABLE WITH GROUND.
4. INSTALLATION SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE.
5. MOTOR SYMBOL (M) DENOTES INCLUSION OF ASSOCIATED EQUIPMENT (UNLESS OTHERWISE INDICATED ON DRAWINGS) AS REQUIRED, WITH THE EQUIPMENT. FOR EACH MOTOR OR EQUIPMENT UNIT, A PROPERLY RATED SAFETY DISCONNECT SWITCH SHALL BE INSTALLED WITHIN SIGHT.
6. MOTORS IN OPEN FLOOR AREAS SHALL BE CONNECTED FROM A JUNCTION BOX ON A SECURED VERTICAL WOOD 2"x4" WIRING SUPPORT, OR EQUIVALENT, BY MEANS OF A SHORT FLEXIBLE LEAD OF METAL ARMORED CABLE OR FLEXIBLE METAL CONDUIT.
7. SERVICE ENTRANCE CONDUCTORS SHALL BE TYPE RHW OR THW SINGLE-CONDUCTOR COPPER CABLES IN HEAVY-WALL GALVANIZED STEEL CONDUIT.
8. LIGHTING IN THE DINING AREA AND THE STORAGE AND OFFICE AREA TO BE OPEN INDUSTRIAL TYPE 2-40W RS LAMP FIXTURES (FLUORESCENT).
9. USE 150 WATT PAR-38 FLOOD TYPE LAMPS IN GASKETED HOLDERS IN THE SERVING AREAS.
10. USE BOX MOUNTED PORCELAIN LAMP HOLDERS WITH 150 WATT INCANDESCENT LAMPS AND RLM DOME REFLECTORS IN THE FOOD PREPARATION AREA.
11. USE VAPORTIGHT FIXTURE WITH GLOBE AND GUARD IN THE DISH WASHING, POT WASHING, VESTIBULE, EXTERIOR DOORS & INSIDE HOODS. THE WASHING AREA LIGHTS TO BE EQUIPPED WITH REFLECTORS.
12. MOUNTING HEIGHT OF ALL INTERIOR LIGHTING FIXTURES TO BE 10'-0" EXCEPT PAR FLOOD LIGHTS ON SERVING LINE WHICH ARE TO BE 3'-0" ABOVE SERVING COUNTER.
13. BRANCH CIRCUIT CONDUCTORS SHOWN ON PLANS DO NOT INDICATE A CONDUCTOR FOR GROUND. GROUNDS SHALL BE INSTALLED AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.

MECHANICAL NOTES

1. MAINTAIN 40°F TEMPERATURE IN DRY STORAGE ROOM AND 70°F TEMPERATURE IN DINING AND KITCHEN AREAS.
2. FOR STEAM QUENCHING SYSTEM IN EXHAUST HOODS W/GREASE FILTERS, SEE DETAIL ON THIS SHEET.
3. THE DESIGNS ARE BASED ON USING ONLY DIESEL OIL FOR RANGE AND OVEN FIRING.
4. HOT WATER, STEAM AND CONDENSATE LINES INSIDE THE BUILDING ARE TO BE INSULATED. PROVIDE TWO INCH INSULATION WITH 1/4 INCH HARD COAT FINISH FOR HOT WATER STEAM GENERATOR IN THE UTILITY ROOM.
5. STEAM AND CONDENSATE MAINS ABOVE FLOOR ARE AS HIGH AS PRACTICABLE AND BELOW CEILING UNLESS OTHERWISE INDICATED. ALL BRANCH LINES TO UNIT HEATERS AND RADIATORS ARE SAME SIZE AS PIPE TAP OF EQUIPMENT.
6. WHERE REQUIRED NUMBER IN HEATING AND VENTILATING SCHEDULE IS INDICATED BY NUMBER/NUMBER - FIRST NUMBER REPRESENTS QUANTITY REQUIRED AS BUILT AND SECOND NUMBER REPRESENTS QUANTITY REQUIRED EXCLUDING DINING ROOM.
7. HOT WATER GENERATOR BASED ON HEATING WATER FROM 40°F TO 140°F.
8. EXPANSION LOOPS OR BENDS FOR 2-INCH PIPE AND UNDER IN DIAMETER SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING FITTINGS.
9. ALL STEAM, STEAM RETURN AND PUMPED CONDENSATE YARD PIPING SHALL BE ENCLOSED IN A SINGLE INSULATION COVERING IN THE TEMPERATE ZONE WHERE THE TEMPERATURE DROPS BELOW 40°F.
10. 4" AND LARGER EXPANSION LOOPS SHALL BE CONSTRUCTED WITH WELD FITTINGS.

MECHANICAL NOTES (CONT)

11. LOCATE VENT OPENINGS (10-E) ADJECENT TO CEILING AND CONSTRUCTED WITHOUT SCREENS.
12. PIPE HANGERS TO BE TYPE 18A AND SPACED AS SHOWN ON DWG. 99-98, SH 18.
13. OMIT SPACE HEATING IN THE TROPICAL ZONE.
14. ALL CHANGES IN STEAM MAIN SIZES TO BE MADE BY ECCENTRIC SWAGGED REDUCERS.
15. PROVIDE SWING JOINTS FOR ALL STEAM OPERATED EQUIPMENT. SEE SH 6 OF 8 DWG. 72-62 FOR THE LOCATION OF SWING JOINTS FOR UNIT HEATERS AND TEMPERING COILS. FOR ALL OTHER EQUIPMENT REPLACE NEAREST ELBOW TO EQUIPMENT WITH A SWING JOINT.
16. SEE SH 4 OF 4 DWG. 72-81 FOR RUN-OUT PIPE SIZE SCHEDULE.
17. [redacted] SIZE OF EACH FILTER SHALL BE 16"X25"X1" AND PROVISION SHALL BE MADE TO INSERT FILTERS FROM THE BOTTOM OF TEMPERING COIL UNITS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRADING SCALES: NONE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. P. DEICHMANN

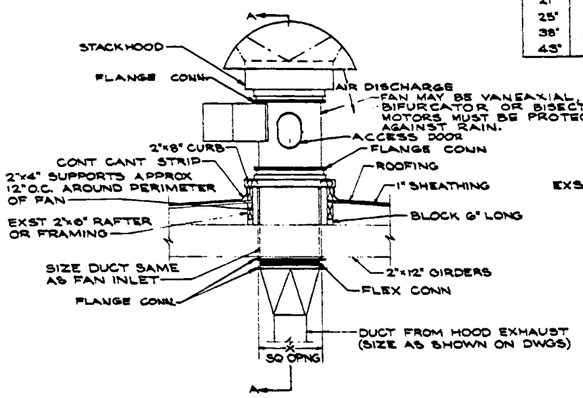
THEATER OF OPERATIONS

HOUSING FACILITIES
KITCHEN & MESS HALL - 500 MAN
42'X140' - STEEL FRAME
48'X128' - WOOD FRAME
SPECIAL DETAILS

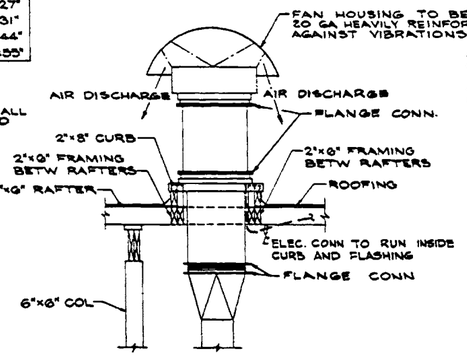
APPROVED: [signature] DATE: 1st FEB 1971
APPROVED: [signature]
CHIEF, CONSTRUCTION DIVISION — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., U.S.A.E.
APPROVED FOR RECIPIENT AGENCY: [signature]
DATE: 18 FEB 1971

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-62
SHEET 5 OF 8

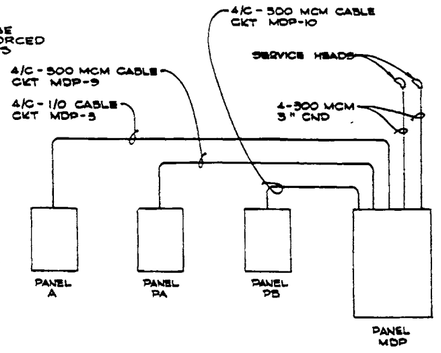
FAN SIZE	HOUSING SIZE "X"
21"	27"x27"
25"	31"x31"
38"	44"x44"
43"	55"x55"



EXHAUST FAN HOUSING FROM HOODS
SCALE NO. 4



SECTION "A-A"

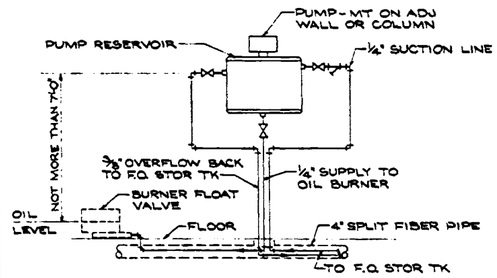


SINGLE LINE DIAGRAM
FOR 500 MAN MESS HALL
NO SCALE

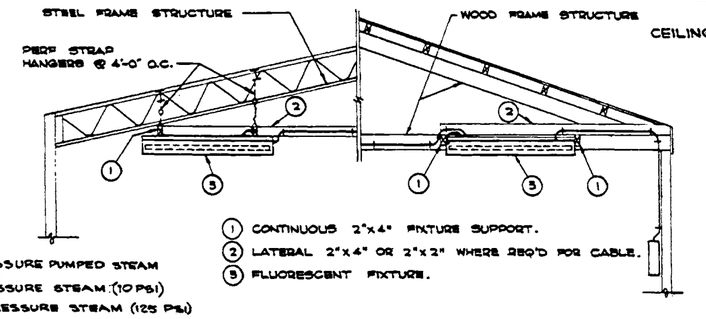
SCHEDULE OF PANELBOARDS *

PANEL VOLTAGE MAINS	RATINGS POLES	RATINGS AMPS	BRANCH CIRCUIT BREAKER ACTIVE AND SPARE CKT NO'S.	BRANCH CIRCUIT BREAKER SPARE CKT NO'S.	WIRE SIZE OTHER THAN NO. 12	REMARKS
A 208Y/120V, 3 PH, 4 WIRE 100 A	1	20	1 THRU 30	8, 16, 18 20, 22, 24 26 THRU 30	CKT 1, 5, 9 & 11 NO. 10 WIRE	SURFACE MOUNTED
PA 208Y/120V, 3 PH, 4 WIRE 225 AMP MAINS, LUGS ONLY	1	15	1, 2, 3	9		SURFACE MOUNTED
	1	20	4 THRU 9			
	1	30	10, 12		NO. 10 WIRE	
	2	15	11	11		
	2	50	15		NO. 10 WIRE	
	3	15	16, 21, 22	22		
	3	20	27			
	3	40	28		NO. 10 WIRE	
	3	50	33, 34		NO. 8 CABLE	
	3	70	39, 40		NO. 6 CABLE	
PB 208Y/120V, 3 PH, 4 WIRE 225 AMP MAINS, LUGS ONLY	1	15	1, 2, 3	2, 3		SURFACE MOUNTED
	1	20	4 THRU 9	8, 9		
	1	30	10, 12	12	NO. 10 WIRE	
	2	15	11			
	2	50	15		NO. 10 WIRE	
	3	15	16, 21, 22			
	3	20	27	27		
	3	40	28		NO. 10 WIRE	
	3	50	33, 34		NO. 8 CABLE	
	3	70	39, 40		NO. 6 CABLE	
MDP 208Y/120V, 3 PH, 4 WIRE 600 A MAINS LUGS ONLY	3	100	3, 4	4	SEE RISER DIAGRAM	SURFACE MOUNTED
	3	225	9, 10, 15, 16	15, 16		

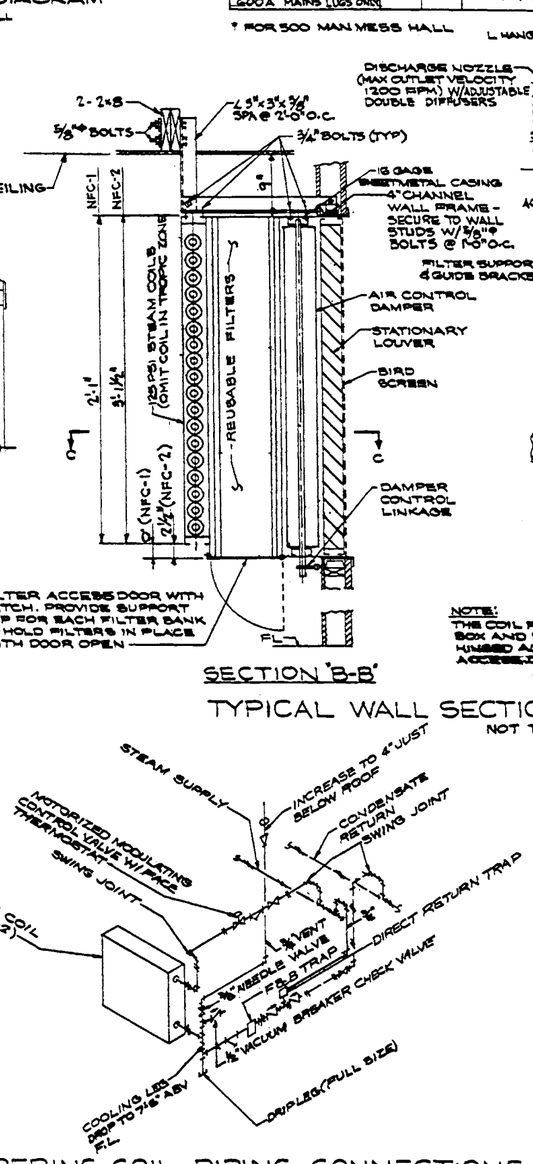
* FOR 500 MAN MESS HALL



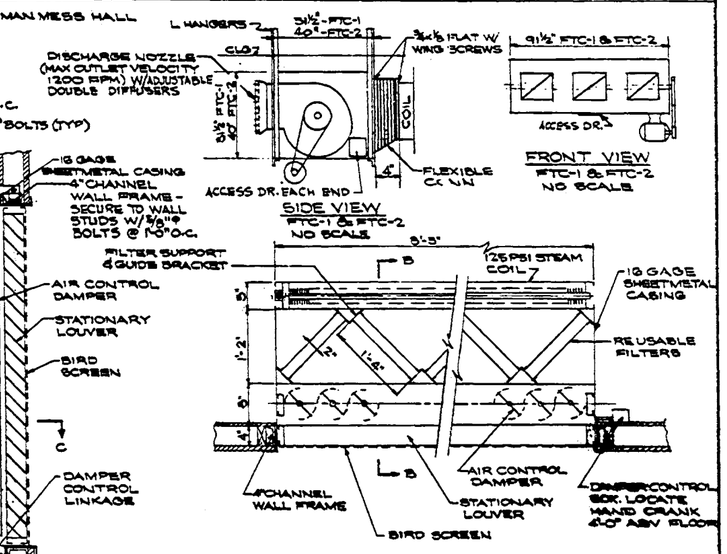
FUEL OIL PUMP FOR SUPPLY TO RANGE OR OVEN
NO SCALE



TYPICAL FIXTURE AND WIRING SUPPORT
NO SCALE



SECTION "B-B"

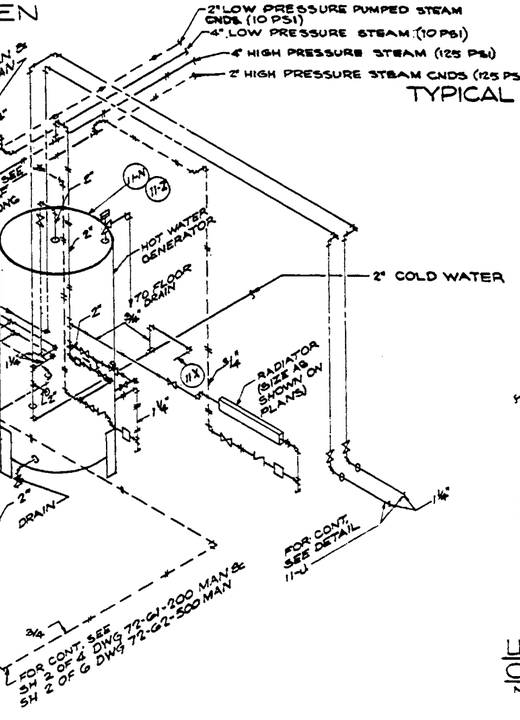


SECTION "C-C"

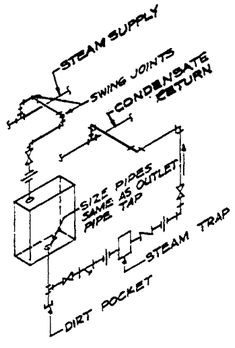
NOTE:
THIS COIL FACE THERMOSTAT SHALL BE MOUNTED IN THE FAN SUCTION BOX AND BE ACCESSIBLE FOR REPLACEMENT OR REPAIRS THROUGH THE HINGED ACCESS DOORS ON EACH SIDE OF BOX OR THAT A SINGLE BOTTOM ACCESS DOOR SERVING SAME PURPOSE MAY BE USED.

TYPICAL WALL SECTIONS FOR TEMPERING COIL UNITS
NOT TO SCALE

NOTE:
DETAILS ON THIS SHEET ARE TYPICAL FOR THE 200 MAN MESS HALL (DWG 72-G1) AND 500 MAN MESS HALL (DWG 72-G2) UNLESS OTHERWISE NOTED.



ISOMETRIC - UTILITY ROOM - 200 & 500 MAN
NO SCALE



UNIT HEATER PIPING CONNECTIONS
NO SCALE

TEMPERING COIL PIPING CONNECTIONS
NO SCALE

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4'
NO. 4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HOCKETT
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C. A. DE LUHMANN
APPROVED FOR THE CHIEF: Fred Farmer
CHIEF, STRUCTURES BRANCH

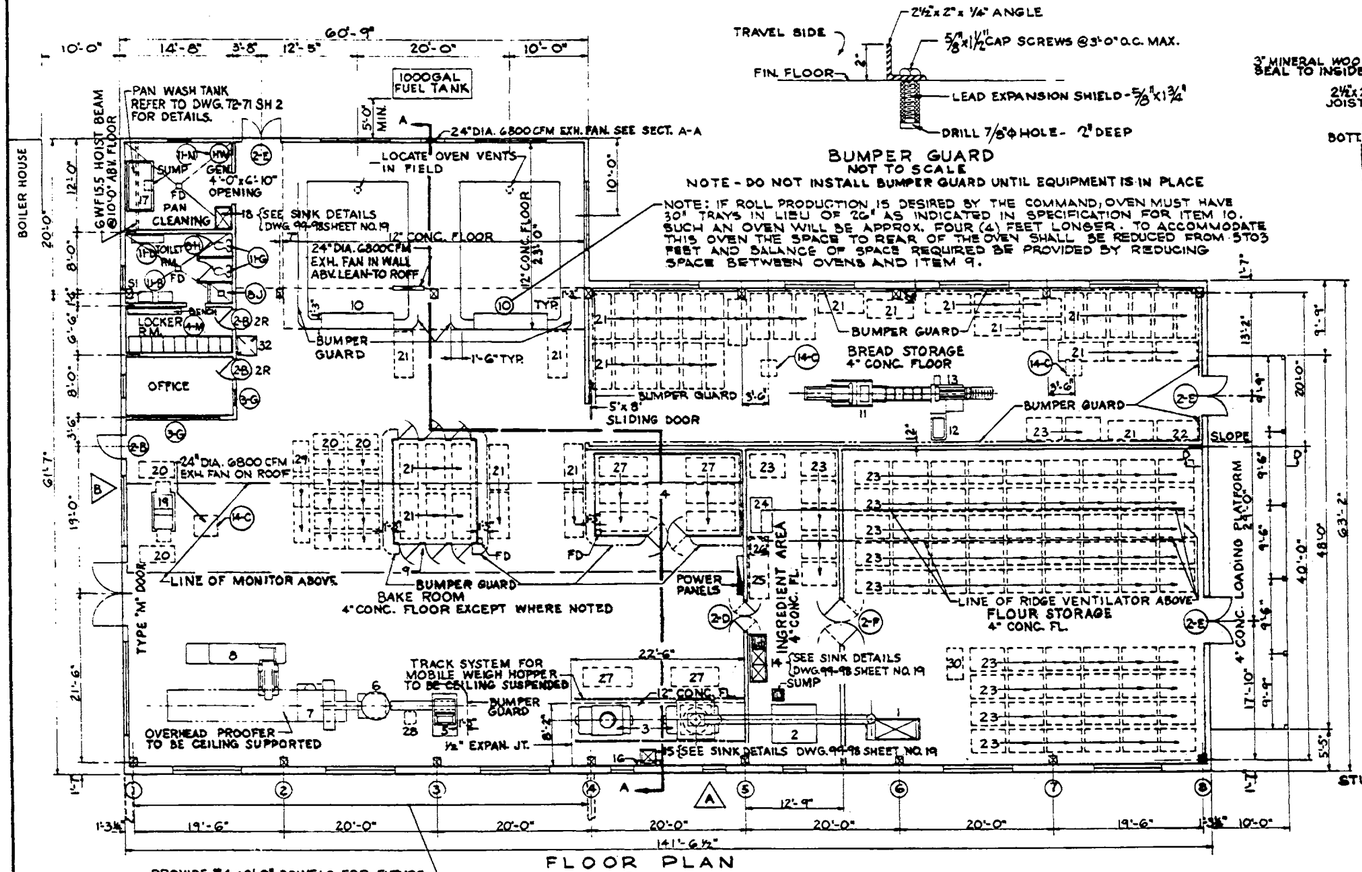
THEATER OF OPERATIONS
HOUSING FACILITIES
KITCHEN & MESS HALL - 500 MAN
42'X140' - STEEL FRAME
48'X128' - WOOD FRAME
MECHANICAL & ELECTRICAL DETAILS

APPROVED: M. Gunlaw
DATE: 1st FEB 1971
CHIEF, ENGINEERING DIVISION, M.C. CONSTR., O.C.E.

APPROVED FOR THE CONSTRUCTING AGENCY: Johnnie Johnnie Collier
18 FEB 1971
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-62
SHEET 8 OF 8

CORPS OF ENGINEERS

U. S. ARMY

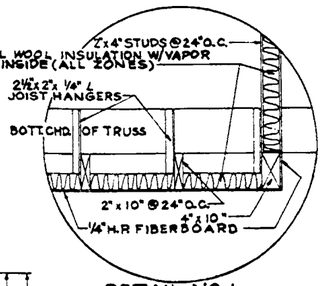


FLOOR PLAN
SCALE NO. 1

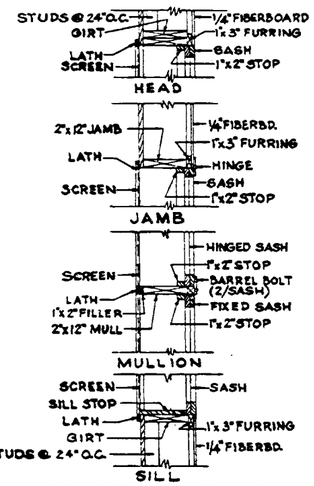
BUMPER GUARD
NOT TO SCALE

NOTE - DO NOT INSTALL BUMPER GUARD UNTIL EQUIPMENT IS IN PLACE

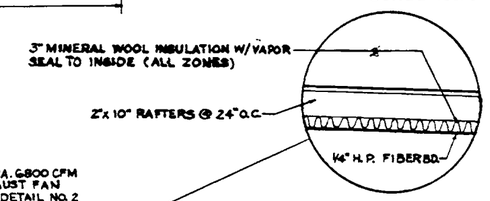
NOTE: IF ROLL PRODUCTION IS DESIRED BY THE COMMAND, OVEN MUST HAVE 30" TRAYS IN LIEU OF 20" AS INDICATED IN SPECIFICATION FOR ITEM 10. SUCH AN OVEN WILL BE APPROX. FOUR (4) FEET LONGER. TO ACCOMMODATE THIS OVEN THE SPACE TO REAR OF THE OVEN SHALL BE REDUCED FROM 5'10½ FEET AND BALANCE OF SPACE REQUIRED BE PROVIDED BY REDUCING SPACE BETWEEN OVENS AND ITEM 9.

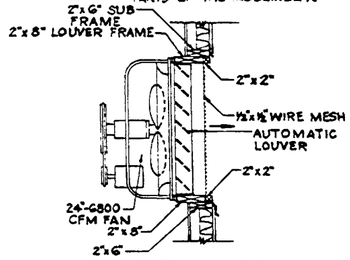


DETAIL NO. 1
SCALE NO. 5

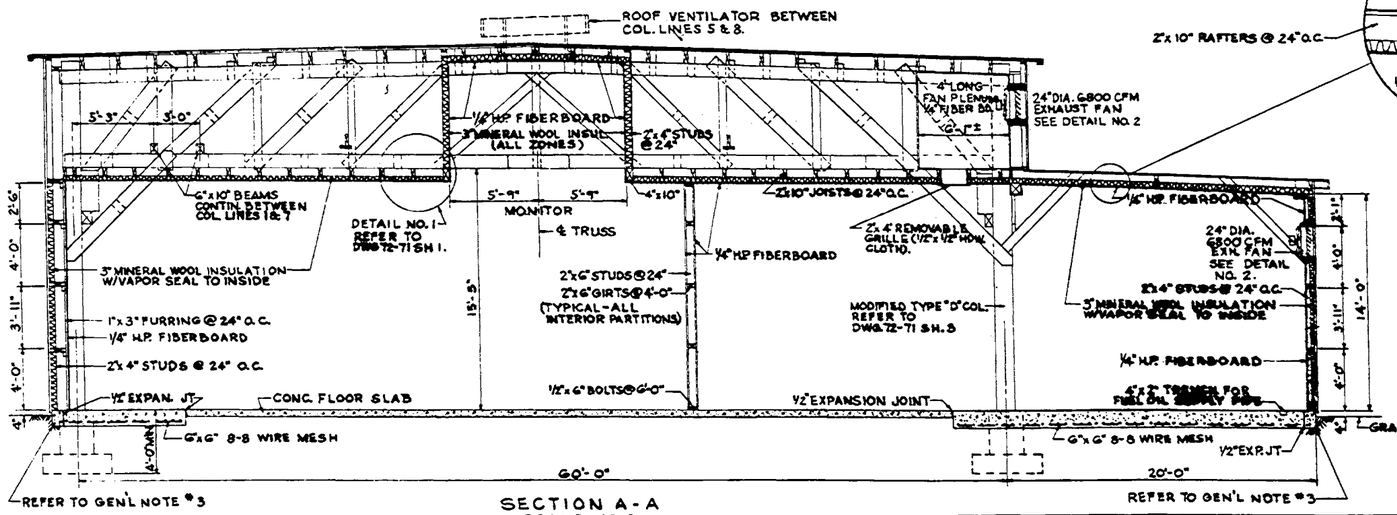


WINDOW DETAILS
SCALE NO. 5





DETAIL NO. 2
NO SCALE



SECTION A-A
SCALE NO. 2

60 FT. WIDE SHOP TYPE BLDG. W/20 FT. WIDE LEAN-TO MODIFIED IN HEIGHT & GIRT SPACING.

SCHEDULE OF EQUIPMENT

(FURNISHED BY OTHER AGENCIES EXCEPT FOR EFCS EQUIPMENT)

ITEM NO.	DESCRIPTION	QTY.	CAPAC. OR SIZE	ELEC H.P.	RATG K.W.	STEAM LBS/HR.	REMARKS
1	FLOUR HANDLING PLANT W/ WEIGHING HOPPER	1	1000LB BIN	2	—	—	208V 3PH
2	CHILLED WATER UNIT	1	100 G/HR	7½	—	—	208V 3PH
3	DOUGH MIXING MACHINE	2	720 LBS	20	—	—	208V 3PH
4	DOUGH FERMENTATION ROOM (PREFABRICATED)	1	19'x10'-9"	1½	—	52	208V 3PH
5	DOUGH DIVIDING MACHINE-2 POCKET	1	2 POCKETS 30 PCS. DOUGH/MIN.	2	—	—	208V 3PH
6	DOUGH ROUNDING MACHINE	1	60PCS/MIN	1½	—	—	220V 3PH
7	DOUGH INTERMEDIATE PROOFING MACHINE	1	450 POCKETS	1½	—	—	208V 3PH
8	DOUGH MOLDING MACHINE-LOAF-CROSS GRAIN	1	13'-0"x 7'-1½"x 5'-6"	2	—	—	208V 3PH
9	DOUGH PROOFING BOX W/ HUMIDIFIER & AIR CONDITIONG	1	6 RACK	2½	—	52	208V 3PH
10	OVEN-TRAVELING TRAY OIL FIRED	2	10 TRAY	3, 2 ¾, ¾	—	138	4 STEAM SPRAYS 208V 3PH ELEC. PWR.
** 11	BREAD SLICING & WRAPPING UNIT	1	1500/HR	½ & 1	—	—	208V 3PH
** 12	BREAD BAGGING MACHINE	1	14'-0"x8'-3" x 8'-0"	1	—	—	COMP. AIR-32 C.F.M. 60 PSI. - 208V 3PH
** 13	TWIST TIE MACHINE	1	2'x 1'-4"	—	—	—	208V 3PH
* †14	SINK, 2 COMPT., FIELD FABR.	1	6'x2'-3½"	—	—	—	STD DETL. 7-AA
* †15	SINK, 1 COMPT., FIELD FABR.	1	2'x2'-3½"	—	—	—	STD DETL. 7-BB
16	WATER METER-BAKERY TYPE (300 LB. DIAL)	1	2'-0"x 6"x 1'-0"	—	—	—	MEASURING RATE 100 LB/MIN.
†17	PAN WASHING TANK, FIELD FABR.	1	6'-6"x3'-6"	—	—	—	—
* †18	SINK, 1 COMPT., FIELD FABR.	1	3'x 2'-3½"	—	—	—	STD DETL. 7-CC
19	GREASING MACH-BREAD PAN (MECH. OPER. SPRAY NOZZLE)	1	100 PANS /MIN	¼	0.75 HTR.	—	115 V 1PH
20	TRUCK, HAND, PLATFORM	17	1000 LB.	—	—	—	STL. W/STL. TIRES
21	BREAD RACK W/CASTERS	45	2'9"x 70"	—	—	—	10 SHELVES
22	TABLE, FOOD PREPARATION	1	6'x 2'-6"	—	—	—	—
23	SKID PLATFORMS	77	54"x36"x 9"	—	—	—	—
* 24	REFRIGERATOR	1	20 CU. FT.	¼	—	—	115 V 1PH
25	TABLE, FOOD PREPARATION	1	6'x 2'-6"	—	—	—	—
26	SCALE-DIAL & BEAM DIAL 0-75, 2 BEAMS 0-30 & 0-10	1	2'-6"x2'-2" x 5'-0"	—	—	—	—
27	DOUGH TROUGHS-27"W x 72"L x 20"D	8	—	—	—	—	—
28	SCALE-DIAL & BEAM FAN DIAL, 1 BEAM 0-5 LB.	1	11-8"x 8" x 1'-6"	—	—	—	—
29	BREAD PANS	1000	4 LVS/PAN	—	—	—	—
30	TRUCK, HAND LIFT, SKID	1	2500 LB.	—	—	—	—
31	BREADBOX, DELIVERY, ALUMINUM	—	33⅛"x 25⅛"	—	—	—	CHG. TO USING MESS
* 32	DISPENSER, DRINKING WATER	1	4.5 G/HR.	⅓	—	—	110/125V, AIR COOLED

* FURNISHED BY EFCS

† SEE SINK DETAILS DWG 99-98 SHEET NO. 19

** ITEMS 11, 12 & 13 ARE A BREAD SLICING, BAGGING AND TYING ASSEMBLY AND THE ITEMS HAVE BEEN NUMBERED SEPARATELY TO IDENTIFY COMPONENT PARTS OF THE ASSEMBLY.

FACILITY NUMBERS

727101 - INTERIOR ONLY, TROPICAL CLIMATE
727102 - HEATING FOR TEMPERATE CLIMATE (-20°F)
727121 - WOOD FRAME BLDG, METAL CLAD, W/INTERIOR, TROPICAL CLIMATE
727122 - WOOD FRAME BLDG, WOOD & FELT CLAD, W/INTERIOR & HEATING, TEMPERATE CLIMATE (-20°F)

SERVICE REQUIREMENTS

COLD WATER	1085 GPH
HOT WATER @ 180°F	340 GPH
SEWAGE	965 GPH
STEAM @ 100 PSI FOR HEATING	355 LB/HR
* STEAM @ 100 PSI FOR HOT WATER GENERATOR	568 LB/HR
STEAM @ 10 PSI FOR EQUIPMENT	380 LB/HR
ELECTRIC LOAD	89 KVA

* INCLUDES STEAM FOR PAN WASHING TANK COILS

GENERAL NOTES

1. ALL INTERIOR FINISH TO BE ¼" HARD-PRESSED FIBERBOARD.
2. SHOP TYPE BUILDING AS MODIFIED ON THESE DRAWINGS IS USED FOR BAKERY. REFER TO DWG. NO. 34-19 FOR ROOF TRUSS, COLUMNS, LEAN-TO, BRACING AND OTHER BUILDING DETAILS NOT SHOWN.
3. ALL FOOTINGS SHALL EXTEND BELOW FROST LINE WHEN REQUIRED.
4. ALL INTERIOR SURFACES SHALL BE PAINTED WITH A PRIME COAT OF ALUMINUM FOLLOWED WITH A FLAT WHITE SECOND COAT AND A GLOSS WHITE ENAMEL FINISH COAT TO PROVIDE A PERMANENT WASHABLE SURFACE.
5. THE BAKERY MACHINERY ANCHOR BOLTS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
72-71	FLOOR PLAN & DET'LS	1 OF 4
72-71	ELECTRICAL PLAN & ELEV.	2 OF 4
72-71	PLUMBING PLAN & DETAILS	3 OF 4
72-71	HEATING PROCESS STEAM & MISC	4 OF 4
34-19	WOOD FRAME CONSTRUCTION SHOP TYPE BUILDINGS	1-12 OF 12
34-18	WINDOW & DOOR DETAILS	1-2 OF 2
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DRAWING SCALES: 0 5' 10' 15' (NO. 1) 0 5' 10' (NO. 2) 0 1' 2' 3' (NO. 5)

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY: HOLLOWAY
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

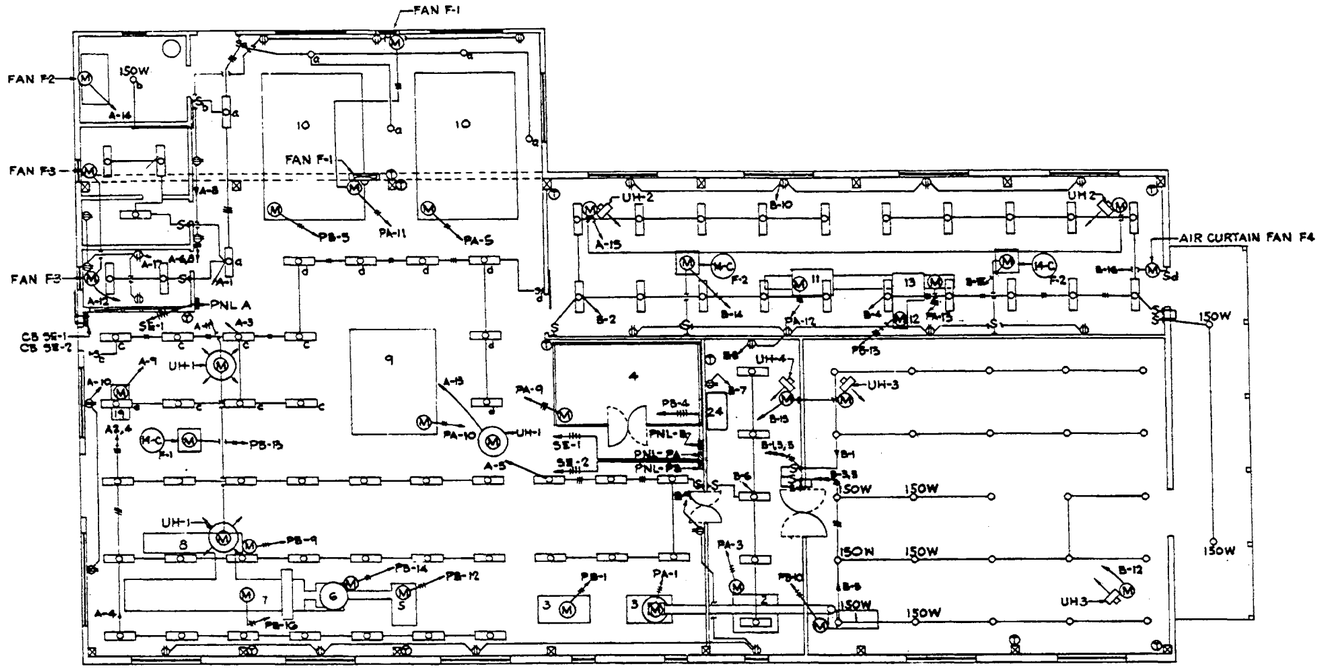
THEATER OF OPERATIONS

BAKERY
(BREAD - 8400 LBS/8 HRS OR 10800 LBS/10 HRS)
60'X190' WITH 20'X80' LEAN-TO
FLOOR PLANS & DETAILS

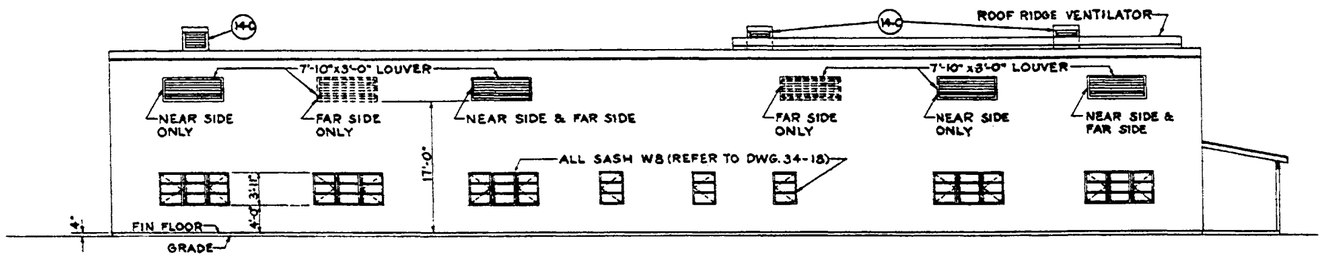
APPROVED: DATE: 18 FEB 1971
CHIEF, STRUCTURAL BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED: PROCUREMENT AGENCY:
DATE: 18 FEB 1971

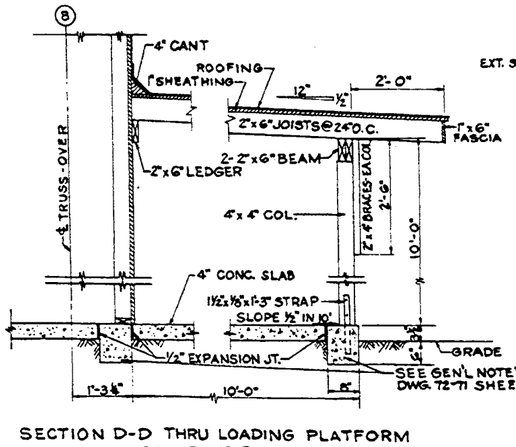
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-71
SHEET 1 OF 4



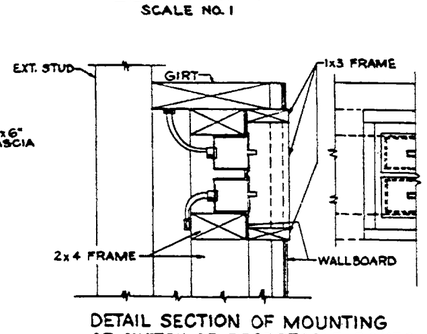
ELECTRICAL PLAN
SCALE NO. 1



ELEVATION "A"
SCALE NO. 1



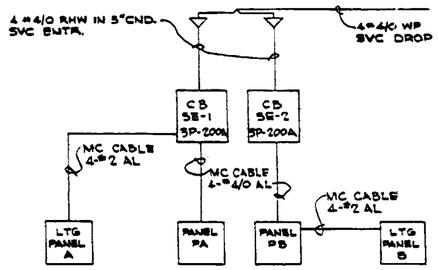
SECTION D-D THRU LOADING PLATFORM
SCALE NO. 5



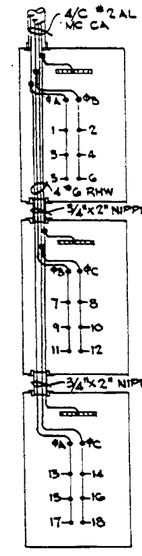
DETAIL SECTION OF MOUNTING OF SWITCH OR RECEPTACLE BOXES WHERE SUBJECT TO CONTACT BY MOVING BREAD RACKS
NO SCALE

SCHEDULE OF PANELBOARDS

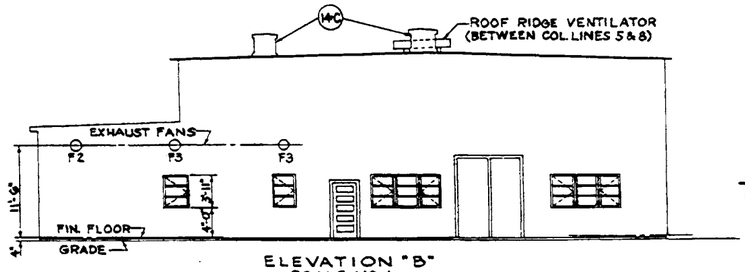
PANEL VOLTAGE MAINS	RATINGS POLES	RATINGS AMPS	BRANCH CIRCUIT BREAKER ACTIVE AND SPARE CKT NO'S.	BRANCH CIRCUIT BREAKER SPARE CKT NO'S.	WIRE SIZE OTHER THAN NO. 12	REMARKS
A 208Y/120V, 3PH 4 WIRE CONSISTING OF 3 LOAD CENTERS EACH W/6-1P-20A CKTS AS IN DET.	1	20	1 THRU 18	7, 16, 18		SURFACE MOUNTED.
B 208Y/120V, 3PH 4 WIRE CONSISTING OF 3 LOAD CENTERS EACH W/6-1P-20A CKTS AS IN DET.	1	20	1 THRU 18	11, 17, 18		SURFACE MOUNTED.
PA 208Y/120V, 3PH, 4 WIRE, 225 AMP MAINS, LUGS ONLY.	3 3 3 3 3 3 3	15 20 30 50 125 70 40	9 THRU 16 7 8 3 1 4 5 AND 6	4, 6, 7, 8 14 THRU 16	CKTS 5 AND 5 # 10 WIRE CKT 1 # 2 AL CABLE	SURFACE MOUNTED. CKT 2 SPACE ONLY
PB 208Y/120V, 3PH, 4 WIRE 225 AMP. MAINS, LUGS ONLY.	3 3 3 3 3 3 3	15 20 30 50 125 70 40	9 THRU 16 7 8 3 1 4 5 AND 6	3, 6, 7, 8 11, 15	CKT 5 # 10 WIRE CKT 1 # 2 AL CABLE	SURFACE MOUNTED CKT 2 SPACE ONLY



SINGLE-LINE DIAGRAM



TYPICAL LIGHTING PANEL DETAIL
NO SCALE



ELEVATION "B"
SCALE NO. 1

FAN SCHEDULE

MARK	QUAN.	CFM	H.P.	SIZE
F-1	3	6800	1	24" DIA.
F-2	3	3000	1/3	16" DIA.
F-3	2	1400	1/6	16" DIA.
F-4	1	2530	1/3	AIRCURTAIN

ELECTRICAL NOTES

ESTIMATED MAXIMUM LOAD	
LIGHTING	10.35 KVA
POWER	77.97 KVA
TOTAL	88.32 KVA

1. ALL LIGHTING FIXTURES NOT OTHERWISE NOTED SHALL BE FLUORESCENT 2-40W RS INDUSTRIAL TYPE, HPF CBM FOR 120V. SERVICE, AND CEILING OR SUSP. MOUNTING 9' ABOVE FLOOR.
2. WIRING NOT OTHERWISE NOTED SHALL BE TYPE NMC W/GND, MINIMUM NO. 12 COPPER. ALL CONDUCTOR ENCLOSURES, EQUIPMENT MOTORS, METAL FIXTURES, PANELS AND RECEPTACLES SHALL BE GROUNDED VIA SEPARATE GROUNDING CONDUCTOR OF THE DESIGNATED CABLE, OR BY THREADED CONDUIT, OR RACEWAY, OR AN ADDED NO. 8 COPPER CONDUCTOR; TO THE COLD WATER SUPPLY PIPE OR OTHER APPROVED GROUND.
3. SYMBOL (M) INDICATES MOTOR, CONTROLLER, AND OVERLOAD PROTECTION AS FURNISHED WITH EQUIPMENT. IF CONTROLLER DOES NOT HAVE A COMBINED DISCONNECT SWITCH OR BREAKER, A 30-AMP. SAFETY DISCONNECT SWITCH SHALL BE PROVIDED UNLESS OTHERWISE NOTED.
4. WIRING IN FLOUR STORAGE AND PAN WASHING ROOMS SHALL BE TYPE RHW, MINIMUM NO. 12 COPPER, IN RIGID THREADED STEEL CONDUIT AND ALL FITTINGS AND BOXES SHALL HAVE THREADED HUB VAPOR-OR DUST-TIGHT DESIGNS. THE CONDUITS CONNECTING THIS SYSTEM TO THE GENERAL WIRING SYSTEM SHALL EACH INCLUDE A VERTICAL SECTION OUTSIDE THE ROOM FOR 5' TERMINATING IN A STANDARD JUNCTION BOX AT THE BOTTOM.
5. LIGHTING FIXTURES IN THE FLOUR STORAGE, PLATFORM, PAN CLEANING ROOM AND BACK OF THE OVENS SHALL BE INCANDESCENT VAPOR-TIGHT OR AIRTIGHT TYPES WITH PROTECTIVE GLOBE AND GUARD, 100 WATT OR AS NOTED.
6. ALL EQUIPMENT IN THE FLOUR STORAGE SHALL MEET REQUIREMENTS OF THE NEC FOR CLASS II, DIV. 2, GR. G ATMOSPHERES.
7. ALL CONDUCTOR HORIZONTAL RUNS SHALL BE CONCEALED ABOVE CEILING OR BEHIND WALLBOARD.
8. ALL WIRING BETWEEN PENDENT MOUNTED FLUORESCENT LIGHTING FIXTURE SHALL BE RUN IN RIGID THINWALL CONDUIT HORIZONTAL BETWEEN LIGHTING FIXTURE.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' 15' NO. 1
0 1' 2' 3' NO. 5

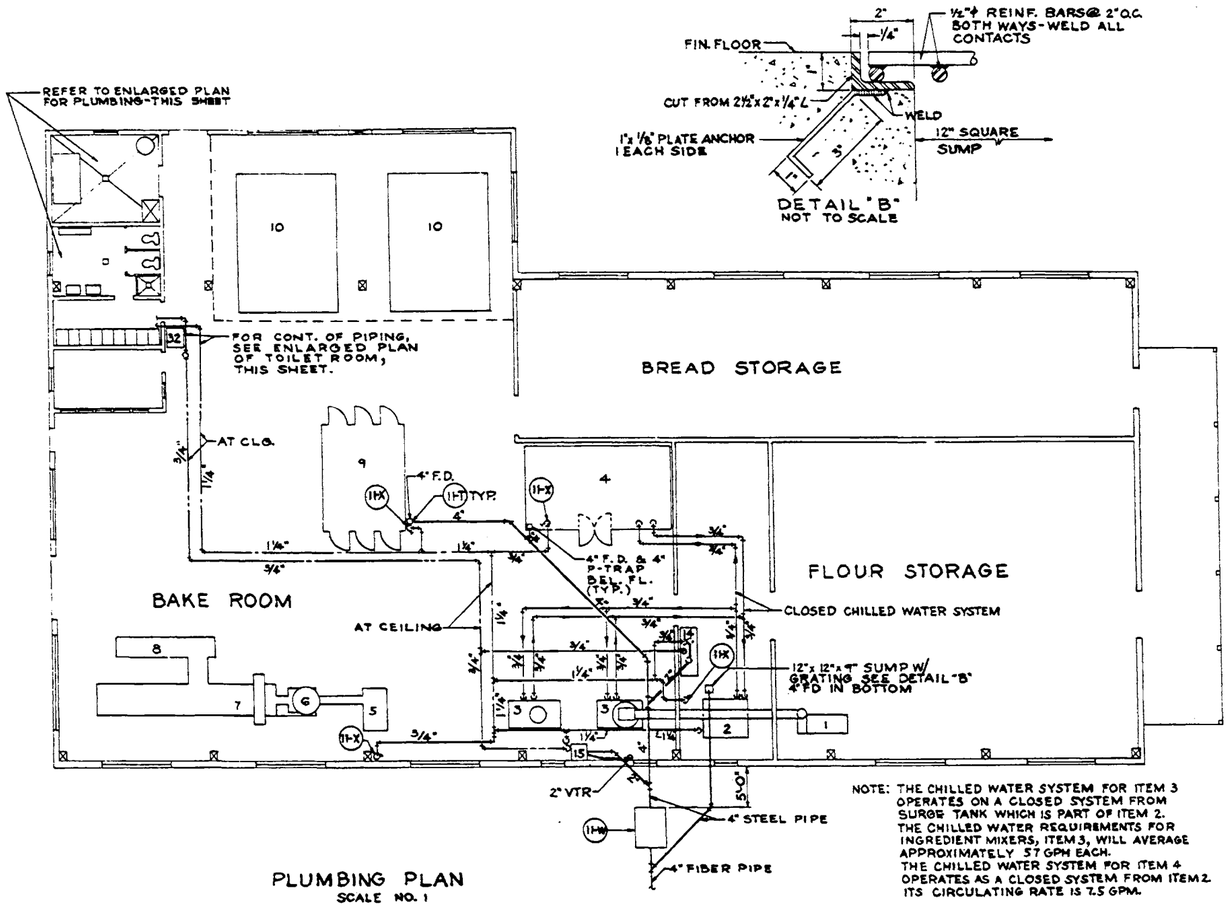
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

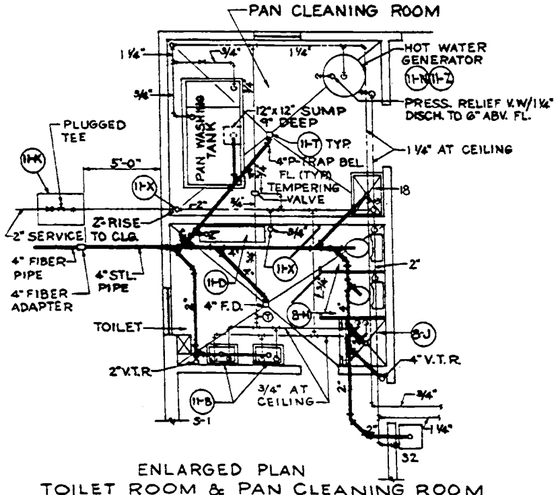
DRAWN BY: HELTON
TRACED BY: HOLLOWAY
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DE LONGMANN
APPROVED: Fred Severud
CHIEF, STRUCTURES BRANCH
APPROVED: M. Parker
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR THE PROCURING AGENCY: John Quinn Corbett
DATE: 18 FEB 47

THEATER OF OPERATIONS
BAKERY
(BREAD - 8400 LBS/8 HRS OR 10800 LBS/10 HRS)
60'X140' WITH 20'X60' LEAN-TO
ELECTRICAL PLAN & ELEVATIONS

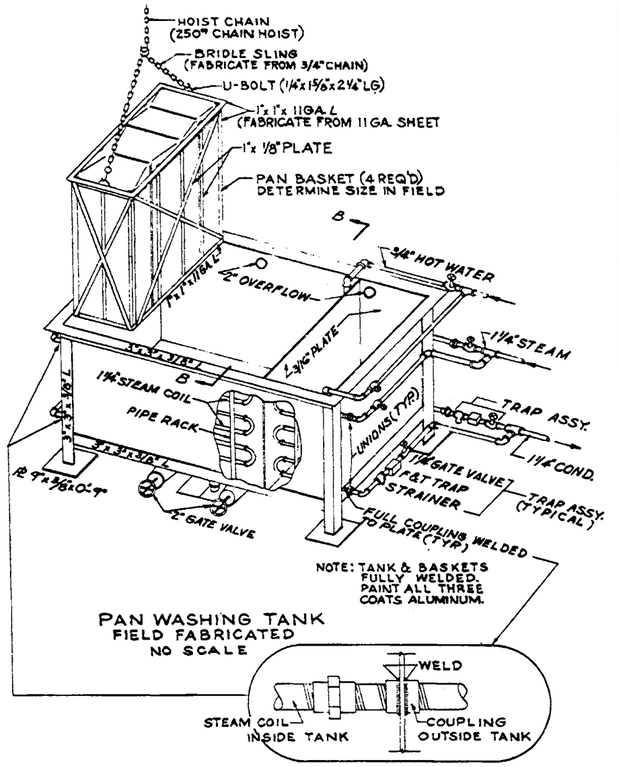
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 4
72-71

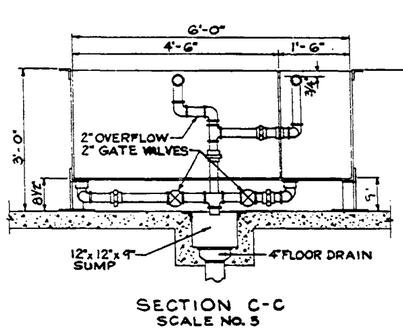


PLUMBING PLAN
SCALE NO. 1

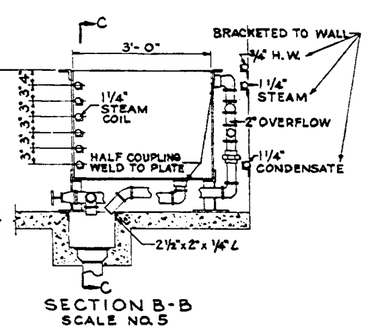


ENLARGED PLAN
TOILET ROOM & PAN CLEANING ROOM
SCALE NO. 2





SECTION C-C
SCALE NO. 5



SECTION B-B
SCALE NO. 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO. 1: 0, 5', 10', 15'
NO. 2: 0, 5', 10'
NO. 5: 0, 1', 2', 3'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: MELTON
TRACED BY: MOLLOWAY
CHECKED BY: DIETCHMANN
SUBMITTED BY: DIETCHMANN

THEATER OF OPERATIONS

BAKERY
(BREAD - 8400 LBS/8 HRS OR 10800 LBS/10 HRS)
60'X140' WITH 20'X80' LEAN-TO
PLUMBING PLAN & DETAILS

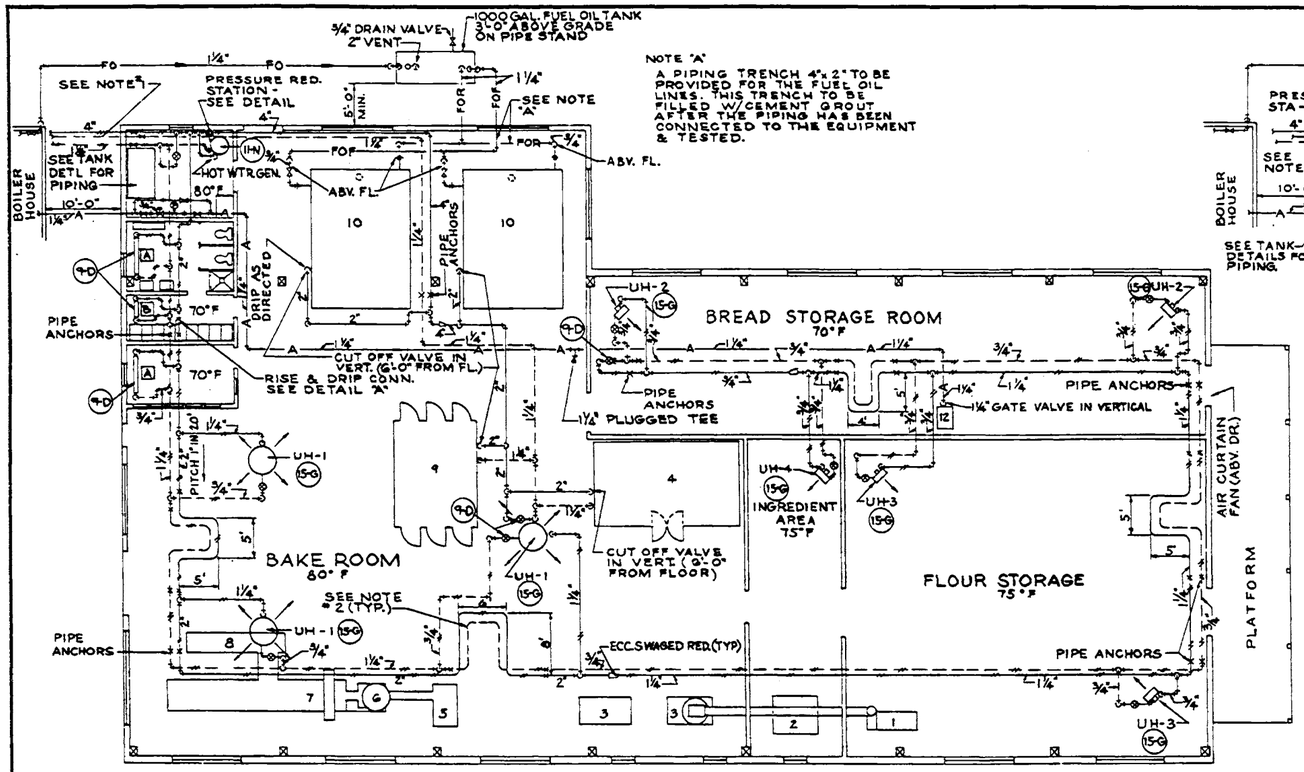
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 FEB 1971

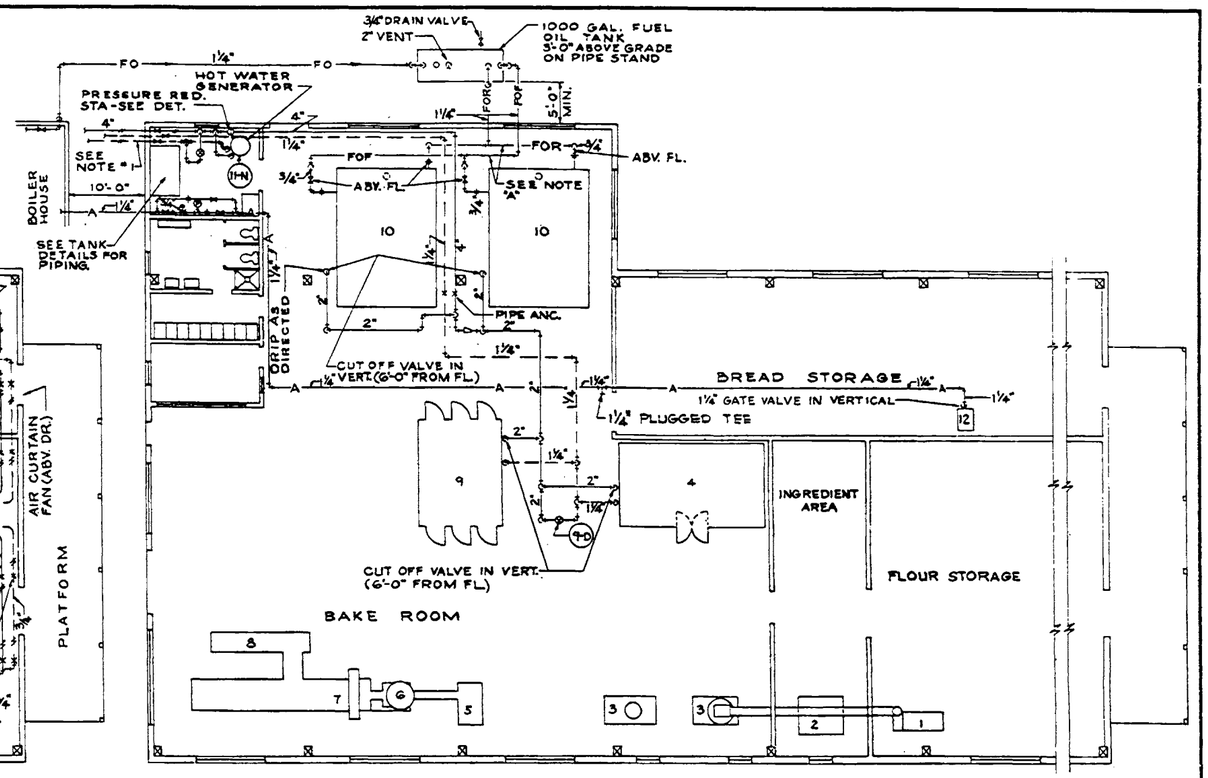
APPROVED FOR GOVERNMENT AGENCY
DATE: 18 FEB 1971

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-71
SHEET 3 OF 4

CORPS OF ENGINEERS

U. S. ARMY





HEATING & PROCESS STEAM PLAN
TEMPERATE ZONE (-20°F)
SCALE NO. 1

*UNIT HEATER SCHEDULE

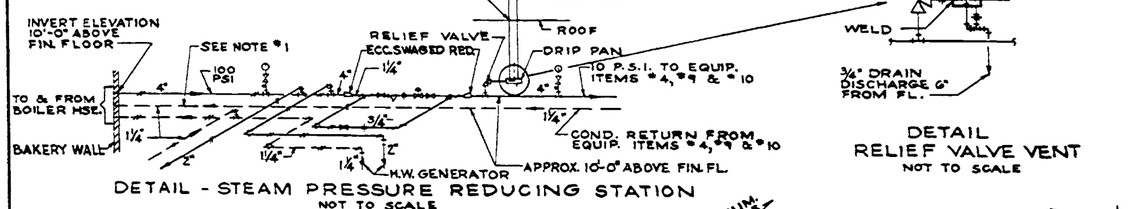
MARK	QUAN.	E.A.T.	B.T.U./HR. @ 100PSI STEAM	H.P.
UH-1	3	80°F	178,200	1/6
UH-2	2	70°F	73,460	1/6
UH-3	2	75°F	81,120	1/6
UH-4	1	75°F	23,390	1/6

* MOUNT UNIT HEATERS HIGH AS POSSIBLE.

RADIATOR SCHEDULE
STEEL MULTIFIN TYPE *
(TEMPERATE ZONE -20°F)

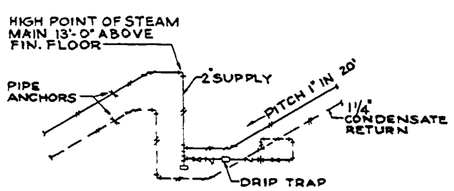
SYMBOL	QUAN.	BTU/HR. @100 PSI	ACTIVE FIN LGTH.
A	2	8,130	3'-0"
B	1	5,560	2'-0"

MOUNT RADIATORS 3'-0" ABOVE FIN. FL. IN OFFICE & TOILET-LOCKER RM.
* RADIATORS WITH 2" IPS CORE

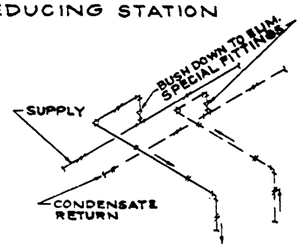


DETAIL - STEAM PRESSURE REDUCING STATION
NOT TO SCALE

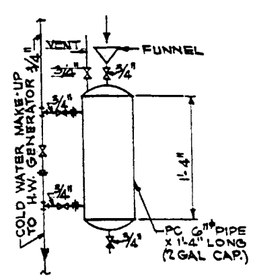
DETAIL
RELIEF VALVE VENT
NOT TO SCALE



DETAIL "A"
RISE & DRIP CONNECTION
NOT TO SCALE

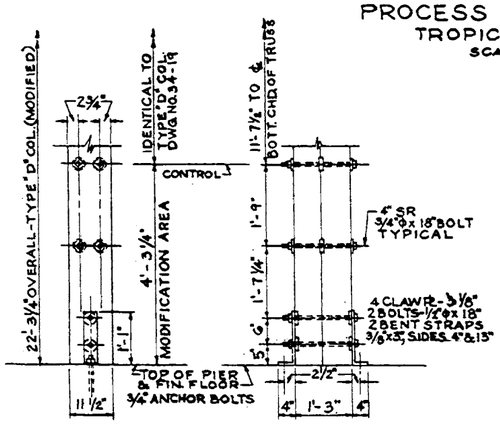


DETAIL-TYPICAL RUN-OUT
CONNECTION TO STEAM &
CONDENSATE MAINS
NOT TO SCALE

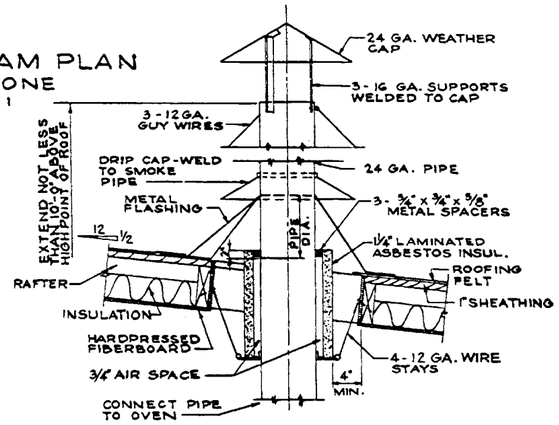


BY-PASS TYPE
CHEMICAL FEEDER
SCALE NO. 7

PROCESS STEAM PLAN
TROPICAL ZONE
SCALE NO. 1



MODIFICATION OF TYPE "D" COLUMN FROM DWG. NO. 34-19
NOT TO SCALE



SECTION THRU SMOKE JACK
NOT TO SCALE
(WOOD & FELT ROOFING SHOWN - SIMILAR INSTALLATION FOR METAL ROOFING)

MECHANICAL NOTES

1. THE HIGH POINT OF THE BOILER ROOM FLASH TANK INLET SHALL NOT BE OVER 10 FT. ABOVE THE BAKERY BLDG. FIN. FL. LINE. IF THIS LOCATION OF THE FLASH TANK CANNOT BE OBTAINED DUE TO FIELD CONDITIONS, THEN THE CONDENSATE FROM EQUIP. ITEMS #4 & #9 SHALL DISCHARGE INTO A GRAVEL PIT NEAR THE LEAN TO.
2. EXPANSION LOOPS TO BE FABRICATED FROM BEVELED PIPE SUITABLE FOR WELDING & FIELD BENT TO CONFIGURATION SHOWN ON THE PLAN. NO FITTINGS SHALL BE USED.
3. STEAM PRESSURE DROP 1#/100 FT. CONDENSATE RETURN DROP 3#/100 FT.
4. ALL FITTINGS 1¼" & SMALLER AND FITTINGS WITH 1¼" OR SMALLER OUTLETS SHALL BE MALLEABLE IRON.
5. ALL STEAM AND RETURN PIPING TO BE FULLY INSULATED.
6. THE ROOF AND SIDEWALL EXHAUST VENTILATORS FOR THE BAKE ROOM ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATS SET TO OPERATE FANS WHEN THE ROOM TEMPERATURE EXCEEDS 85°F.
7. THE STEAM, CONDENSATE AND AIR BETWEEN THE BOILERHOUSE AND THE BAKERY BUILDING IN THE ZONES WHERE THE TEMPERATURE FALLS BELOW 40°F SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES 0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY: HOLLOWAY
CHECKED BY: LOW
SUBMITTED BY: C. DE LEONARDIS

THEATER OF OPERATIONS

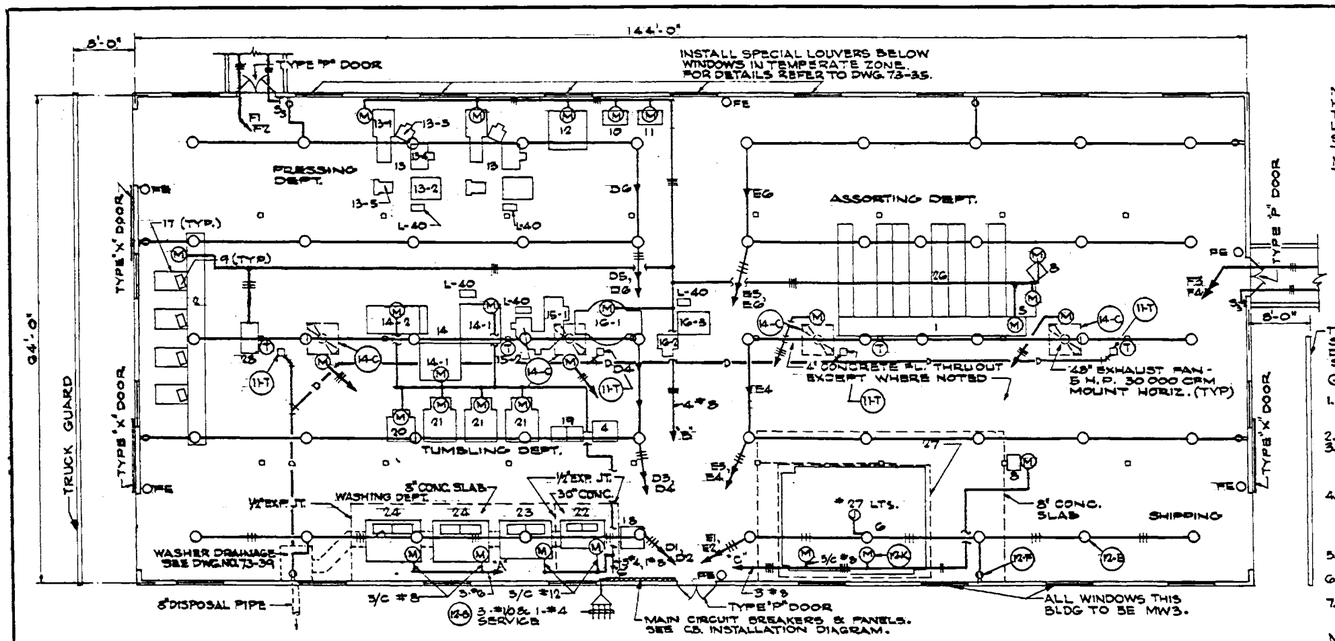
BAKERY
(BREAD - 8400 LBS/8 HRS OR 10800 LBS/10 HRS)
60'X190' WITH 20'X60' LEAN-TO
HEATING PROCESS STEAM & MISCELLANEOUS

APPROVED: DATE: 18 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED: DATE: 18 FEB 1971
CHIEF, ENGINEERING BRANCH
APPROVED: DATE: 18 FEB 1971
CHIEF, DESIGN SECTION
APPROVED: DATE: 18 FEB 1971
CHIEF, ARCHITECTURAL & MECHANICAL BRANCH

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 72-71
SHEET 4 OF 4

CORPS OF ENGINEERS

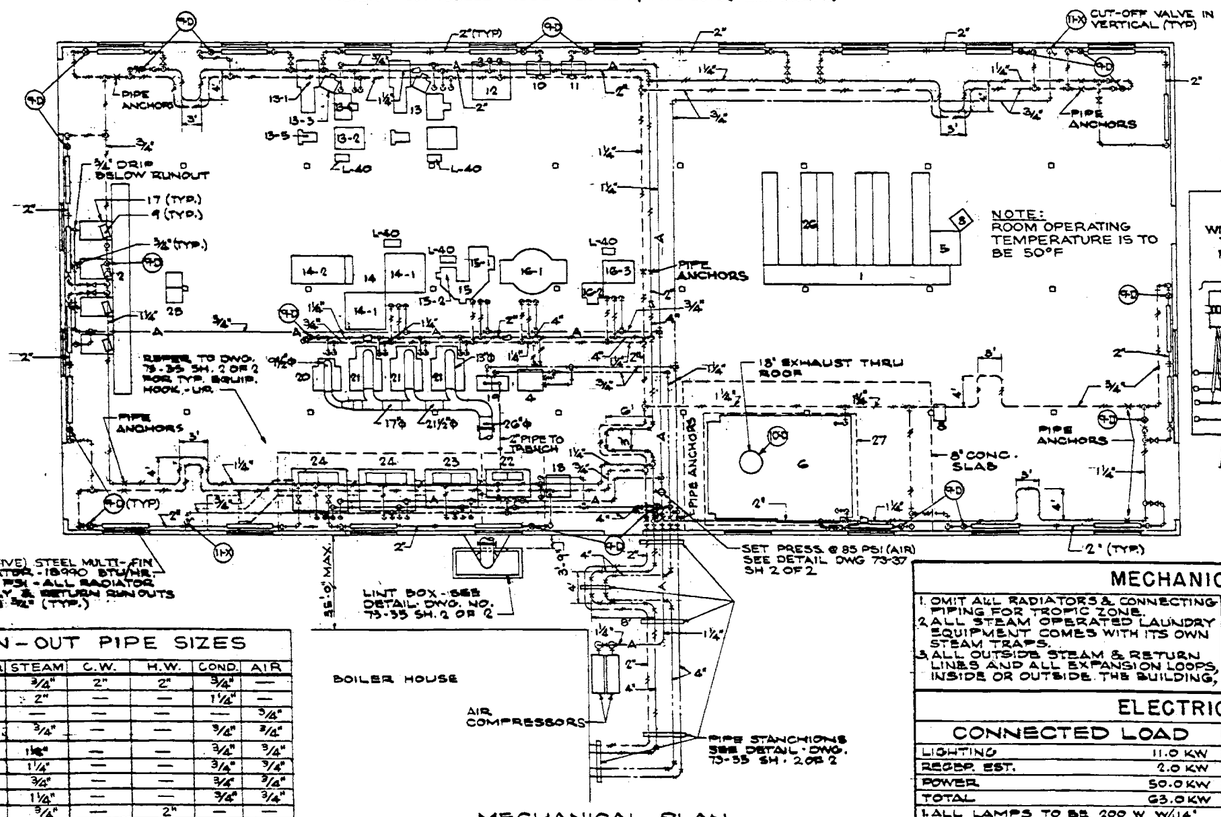
U. S. ARMY



PLAN

SCALE NO. 1

FACILITY NO. 733401 - INTERIOR ONLY (TROPIC)
FACILITY NO. 733421 - WOOD FRAME W/INTERIOR (TROPIC)
FACILITY NO. 733402 - INTERIOR ONLY (TEMPERATE -20°F)
FACILITY NO. 733422 - WOOD FRAME W/INTERIOR (TEMPERATE)



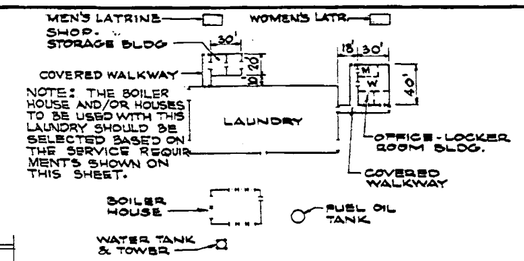
MECHANICAL PLAN

SCALE NO. 1

NOTE:
RADIATION IS SUFFICIENT TO MAINTAIN 40°F INSIDE TEMPERATURE WHEN LAUNDRY EQUIPMENT IS IDLE AND OUTSIDE TEMPERATURE IS -20°F

RUN-OUT PIPE SIZES

ITEM NO.	STEAM	C.W.	H.W.	COND.	AIR
4	3/4"	2"	2"	3/4"	—
6	2"	—	—	1 1/2"	—
9	—	—	—	—	3/4"
12	3/4"	—	—	3/4"	3/4"
13	1 1/2"	—	—	3/4"	3/4"
14	1 1/4"	—	—	3/4"	3/4"
15	3/4"	—	—	3/4"	3/4"
16	1 1/2"	—	—	3/4"	3/4"
18	3/4"	—	2"	—	—
19	—	3/4"	3/4"	—	—
20	1 1/2"	—	—	3/4"	—
21	1 1/2"	—	—	3/4"	—
22	3/4"	2"	2"	—	3/4"
23	3/4"	2"	2"	—	3/4"
24	3/4"	2"	2"	—	3/4"



NOTE: THE BOILER HOUSE AND/OR HOUSES TO BE USED WITH THIS LAUNDRY SHOULD BE SELECTED BASED ON THE SERVICE REQUIREMENTS SHOWN ON THIS SHEET.

KEY PLAN

SCALE NO. 14

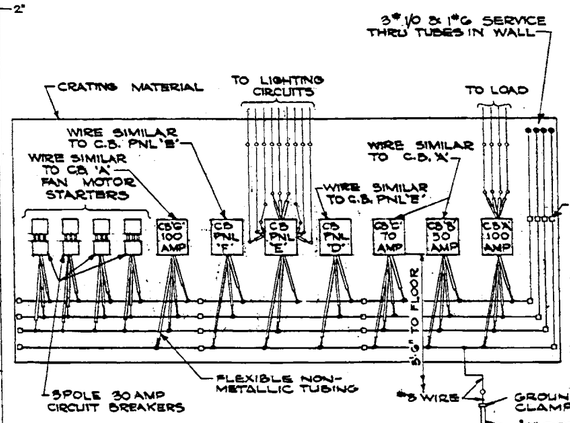
TRUCK GUARD SEE DETAIL DWG 73-35, SH. 1 OF 2 (TYP.)

GENERAL NOTES

1. B/Ms FOR INTERIOR INCLUDES SUFFICIENT MATERIALS FOR THE SHOP-STORAGE, OFFICE-LOCKER BUILDINGS, AND YARD PIPING TO BOILERHOUSE.
2. NO RIDGE VENTILATORS WILL BE REQUIRED.
3. THE LAUNDRY MACHINERY ANCHOR BOLTS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
4. EXTERIOR WALLS SHALL BE SO CONSTRUCTED TO PERMIT PARTIAL REMOVAL TO ALLOW MAINTENANCE ON THE 8-ROLL IRONER AND THAT ALL OTHER OPERATING EQUIPMENT SHALL BE NOT LESS THAN 3'-0" FROM EXTERIOR WALLS SO AS TO PROVIDE ADEQUATE MAINTENANCE OPERATING SPACE.
5. ALL SLABS OVER 4" SHALL REQUIRE WIRE MESH REINFORCEMENT AND IT SHALL BE LISTED IN B/Ms.
6. FOR SUPPORT STRUCTURES (OFFICE-LOCKER ROOM, BLDG AND SHOP-STORAGE BLDG) SEE DRAWING 73-37 SHEET 1 OF 2.
7. STRUCTURAL STEEL BEARING PLATES 8"x 1/4" x 1'-1" SHALL BE INSTALLED UNDER THE FLATWORK IRONER SUPPORTING LEGS.

MECHANICAL NOTES

1. ALL ROOF EXHAUST VENTILATORS ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATS SET TO OPERATE FANS WHEN ROOM TEMP EXCEEDS 75°F.
2. ALL PIPING BETWEEN THE BOILER HOUSES & THE LAUNDRY BLDGS IN THE TEMPERATE ZONE (WHERE TEMP FALLS BELOW 40°F) SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.
3. ALL ECCENTRIC REDUCERS ARE TO BE SWAGED NIPPLES.
4. ALL CW, HW, STEAM & CONDENSATE LINES INSIDE BUILDINGS TO BE FULLY INSULATED.



MAIN CIRCUIT BREAKER INSTALLATION

NO SCALE

MECHANICAL NOTES

1. OMIT ALL RADIATORS & CONNECTING PIPING FOR TROPIC ZONE.
2. ALL STEAM OPERATED LAUNDRY EQUIPMENT COMES WITH ITS OWN STEAM TRAPS.
3. ALL OUTSIDE STEAM & RETURN LINES AND ALL EXPANSION LOOPS, INSIDE OR OUTSIDE THE BUILDING, SHALL BE FABRICATED USING BEVELED PIPE & WELDING FITTINGS. EXPANSION LOOPS FOR 2" & UNDER IN DIAMETER SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING WELDING FITTINGS.
4. REFER TO DWG. NO. 73-35 FOR ADDITIONAL NOTES.

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	11.0 KW
RECEP. EST.	2.0 KW
POWER	50.0 KW
TOTAL	63.0 KW

1. ALL LAMPS TO BE 200 W W/14" DIA. FLAT SHADES EXCEPT AS NOTED. MOUNT @ 9'-0" ABOVE FLR.
2. 100W LAMPS TO HAVE 8" CONICAL SHADES.
3. ALL CIRCUIT BREAKERS TO BE 3-POLE.
4. ALL C.B. PANELS TO HAVE 6 1-POLE 20 AMP BREAKERS.
5. FEEDER CONDUCTORS TO BE SIZED THROUGHOUT AS INDICATED AT HOME RUN ARROW.
6. SYMBOL (M) INDICATES MOTOR CONTROLLER & OVERLOAD PROTECTION FURNISHED WITH EQUIPMENT. EACH MOTOR SHALL BE PROVIDED WITH A 30 AMP. DISC. SWITCH EXCEPT WHERE NOTED OTHERWISE.
7. ALL MOTOR TAPS SHALL BE 3/C #14 EXCEPT WHERE NOTED OTHERWISE.
8. CONNECTED LOAD INCLUDES THE LOADS FROM THE SHOP & STORAGE BLDG. AND THE OFFICE-LOCKER ROOM BLDG.

GENERAL NOTES

1. FOR ESN BILL OF MATERIAL - REFER TO TM 5-303 BY FACILITY NUMBER.
2. FIN TYPE RADIATORS SHALL BE MOUNTED 18" (MAX) ABOVE FLOOR LINE, MEASURING FROM TOP OF FIN TO FLOOR LINE.
3. 1/4" HARDBOARD LINER WALLS & CEILING W/FIBERGLASS BATT INSUL. IN CEILING - ALL ZONES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-34	FLOOR PLANS MECHANICAL & ELEC.	1 OF 1
34-04	WOOD FRAME CONST. WAREHOUSE TYPE B BLDG	1-3 OF 3
34-03	WOOD FRAME CONST. BARRACKS TYPE B BLDG	1-7 OF 7
99-98	STANDARD DETAILS	
51-97	COV. WALKWAY DET.	1 OF 1
73-35	LAUNDRY-5000 MAN	1-2 OF 2
73-39	LAUNDRY-SPEC. DTLS.	1 OF 1
73-37	500-1000 BED HOSP LAUNDRY	1-2 OF 2

SCHEDULE OF EQUIPMENT *

ITEM NO.	DESCRIPTION	QTY.	CAP.	ELEC. RATE H.P.	ELEC. RATE K.W.	STEAM LBS/HR.	AIR CU. FT. @ 85 P.S.I.
1	CONVEYOR, LAUNDRY, ASSORTING, MODIFIED TO LENGTH SHOWN ON DRAWINGS	1		1			
2	CONVEYOR, LAUNDRY, POWER OPERATED, 21'-0" X 2'-2"	1		1			
4	COOKER, STARCH	1	50 GAL.			16	
5	CUTTING & MEASURING MACHINE, PAPER	1		1/4			
6	IRONER, FLATWORK, 8 ROLL	1	550 LBS	10		618	
8	MACHINE, BUNDLE TYING	2		1/4			
9	MACH. MARKING, 8 CHARACTER	4					.05
10	MACHINE, SEWING, BUTTON	1		1/6			
11	MACHINE, SEWING, GENERAL	1		1/2			
12	PRESS, HANDKERCHIEF, ROTARY	1	180	1/3		40	0.50
13	PRESS UNIT, SHIRT, 2 OPER. EA. UNIT CONSISTS OF: ITEM 0-1, PRESS, SHIRT, BODY-BOSOM; ITEM 13-2, PRESS, SLEEVE; ITEM 13-3, PRESS, YOKE & SHOULDER; ITEM 13-4, PRESS, CUFF & COLLAR; ITEM 13-5, MACH., SHIRT FOLDING	2	70 SHIRTS /HR.	1		185	1.714
14	PRESS UNIT, TROUSER, EA. UNIT CONSISTS OF: ITEM 14-1, 2 CABINET TYPE, SGL. LAY TROUS. PRESSES; ITEM 14-2, CABINET DRYER	1	110 TROUSERS /HR.	4 1/2		170	1.524
15	PRESS UNIT, UTILITY EA. UNIT CONSISTS OF: ITEM 15-1, PRESS, 54"; ITEM 15-2, 2 PRESSES, 21"	1				70	0.64
16	PRESS UNIT COAT, 2 OPER. EA. UNIT CONSISTS OF: ITEM 16-1, ROTARY CABINET; ITEM 16-2, PRESS, YOKE; ITEM 16-3, PRESS, SLEEVE	1	120	1		200	0.90
17	TABLE, MARKING MACHINE	4					
18	TANK, SOAP	1	100 GAL.			25	
19	TUB, WASH, 2 COMPARTMENT	1					
20	TUMBLER, NONREVERSING	1	40 LBS	1/3-3/4		150	
21	TUMBLER, REVERSING	3	100 LBS	1/2-1		250	
22	WASHER - EXTRACTOR	1	50 LBS	2-3		27	0.13
23	WASHER - EXTRACTOR	1	100 LBS	2 1/2-5		70	0.13
24	WASHER - EXTRACTOR	2	200 LBS	5-10		116	0.13
26	BINS, METAL, BUNDLE ASSORTING, CLOSED BACK 78"H, 24"W, 138"L, W/36 COMPARTMENTS, 18"H, 15"W.	6					
27	CANOPY, VENTILATOR, USE W/ 8 ROLL, 120' IRONER	1		3			
28	MACHINE, LAUNDRY TAG ATTACHING	1			2		
30	BASKETS, CANVAS LINER W/ CASTERS, 5 BU.	24					
31	BASKETS, CANVAS LINER W/ CASTERS, 12 BU.	20					
32	BASKETS, CANVAS LINER W/ CASTERS, 10 BU.	50					
L-33	TRUCK, HAND, 72" L x 48" W	5					
L-34	HANDCART, 4 COMP. 19"W x 42"L	10					
L-35	HANDCART, 4 COMP. 19"W x 30"L	10					
L-36	TRUCK, HAND, 66" L x 20" W	10					
L-37	TRUCK, HAND, 2000# CAP., 66" L	2					
L-38	TABLE, STACKING, 10' L x 32" W	1					
L-39	TABLE, BUNDLE, 40" L x 30" W	3					
L-40	DAMP BOX, 2' x 2'	6					
L-41	LOCKERS, STL. 18" W x 24" D	43	(1/3 IN MEN'S RM.)	(2/3 IN WOMEN'S RM.)			

* EQUIPMENT FURNISHED BY OTHERS.

SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ RATED CAP. OF INSTALLED EQUIP. ON 60 MINUTE OPERATING CYCLE	REQUIREMENTS @ RATED OUTPUT OF 23000 LBS. PER 60 HR. WEEK
COLD WATER @ 50° F	1100 GPH	767 GPH
HOT WATER @ 150° F	1950 GPH	1150 GPH
SEWAGE	2750 GPH	1917 GPH
STEAM @ 125 PSI FOR EQUIPMENT	2409 LBS/HR.	2409 LBS/HR
STEAM @ 125 PSI FOR HEATING *	491 LBS/HR.	491 LBS/HR
STEAM @ 125 PSI FOR GEN. OF H.W.	2034 LBS/HR	1418 LBS/HR
AIR @ 85 PSI	6 CFM	6 CFM
ELECTRIC LOAD CONNECTED	63 KW	63 KW

* OMIT IN TROPIC ZONE

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 5' 10' 15' NO.1

0 50' 100' 150' NO.14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C.R. OEICHMANN

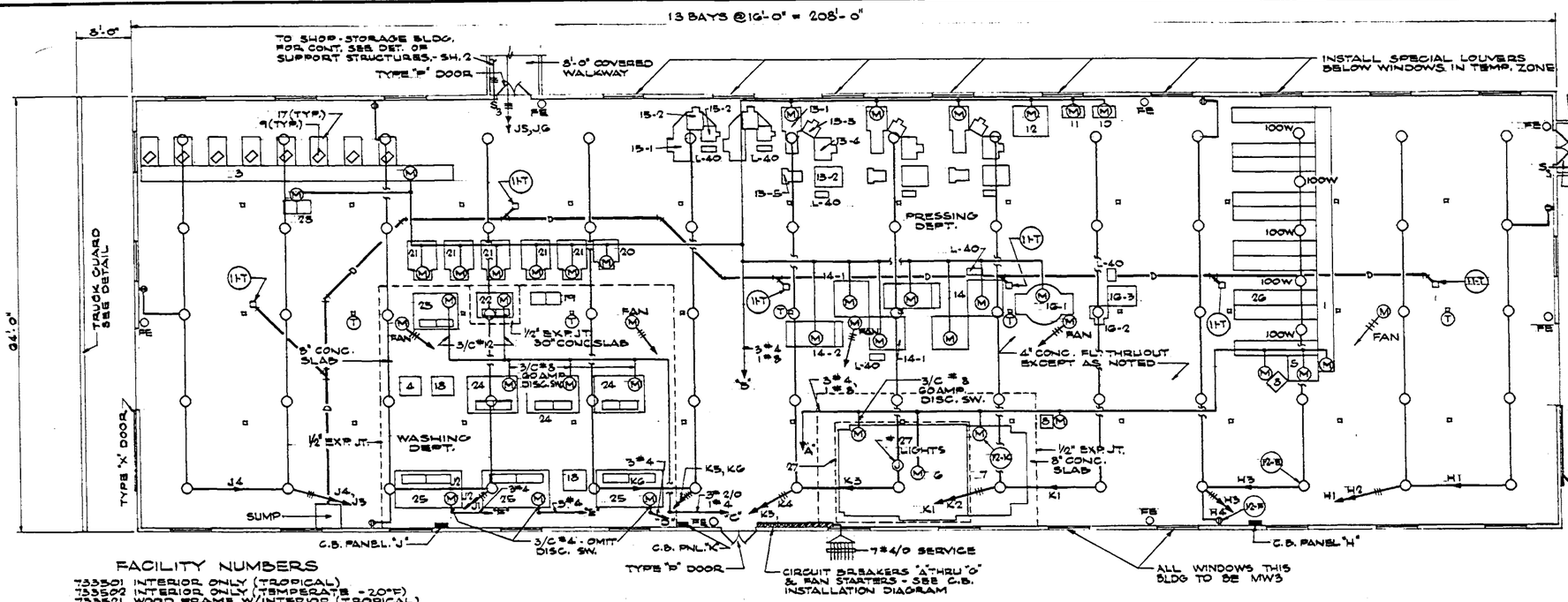
THEATER OF OPERATIONS

LAUNDRY - 2500 MAN
64' X 144'
FLOOR PLANS
23,000 LBS PER 60 HR WEEK

APPROVED: DATE: 19 MAR 1959
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: James P. Jennings Colonel, GS
DATE: 11 February 1969

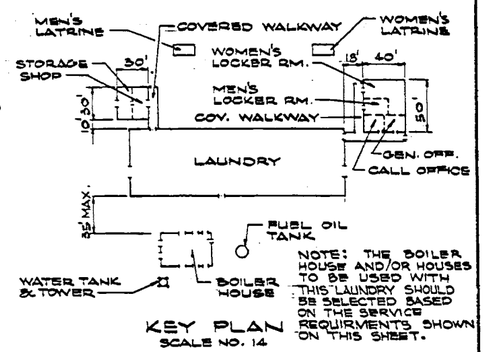
SCALE: AS NOTED SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1 73-34



FACILITY NUMBERS

733501 INTERIOR ONLY (TROPICAL)
733502 INTERIOR ONLY (TEMPERATE -20°F)
733521 WOOD FRAME W/INTERIOR (TROPICAL)
733522 WOOD FRAME W/INTERIOR (TEMPERATE)

FLOOR PLAN & ELECTRICAL
SCALE NO. 1



NOTE: THE BOILER HOUSE AND/OR HOUSES TO BE USED WITH THIS LAUNDRY SHOULD BE SELECTED BASED ON THE SERVICE REQUIRMENTS SHOWN ON THIS SHEET.

KEY PLAN
SCALE NO. 14

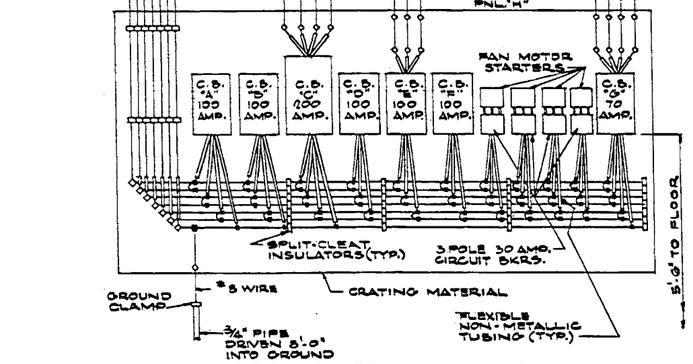
SCHEDULE OF EQUIPMENT *

ITEM NO.	DESCRIPTION	QTY.	CAP.	ELECTRIC RATING H.P.	ELECTRIC RATING K.W.	STEAM LBS/HR.	AIR C.F.M.@ 85 P.S.I.
1	CONVEYOR, LAUNDRY ASSORTING, MODIFIED TO LENGTH SHOWN ON DRAWING	1		1			
3	CONVEYOR, LAUNDRY, POWER OPERATED, 4'-5"-6" x 2'-2"	1		1½			
4	COOKER, STARCH	1	50 GAL.			16	
5	CUTTING & MEASURING MACHINE, PAPER	1		¼			
6	IRONER, FLATWORK, 8 ROLL	1	550 LBS.	10		618	
7	MACHINE, FOLDING, SINGLE LANE	1		¾			1.00
8	MACHINE, BUNDLE TYING	2		¼			
9	MACHINE, MARKING, 8 CHARACTER	8					.05
10	MACHINE, SEWING, BUTTON	1		1/6			
11	MACHINE, SEWING, GENERAL	1		½			
12	PRESS, HANDKERCHIEF, ROTARY	1	180	1/3		40	.50
13	PRESS UNIT, SHIRT, 2 OPERATOR EACH UNIT CONSISTS OF: ITEM 13-1, PRESS SHIRT BODY - BOSOM; ITEM 13-2, PRESS, SLEEVE; ITEM 13-3, PRESS, YOKE & SHOULDER; ITEM 13-4, PRESS, CUFF & COLLAR; ITEM 13-5, MACH. SHIRT FOLDING	5	70 SHIRT /HR.	1		185	1.714
14	PRESS UNIT, TROUSER EACH UNIT CONSISTS OF: ITEM 14-1, 2-CABINET TYPE, SOL. LAY PRESSES; ITEM 14-2, CABINET DRYER	2	110 TROUSER /HR.	4½		170	1.524
15	PRESS UNIT, UTILITY EACH UNIT CONSISTS OF: ITEM 15-1, PRESS, 54"; ITEM 15-2, 2 PRESSES, 21"	2				70	.54
16	PRESS UNIT, COAT EACH UNIT CONSISTS OF: ITEM 16-1, ROTARY CABINET; ITEM 16-2, PRESS, YOKE; ITEM 16-3, PRESS, SLEEVER	1	120	1		200	.90
17	TABLE, MARKING MACHINE	8					
18	TANK, SOAP	2	100 GAL.			25	

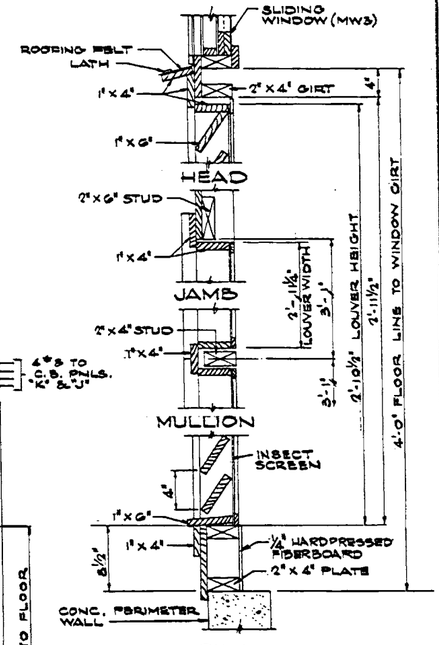
ITEM NO.	DESCRIPTION	QTY.	CAP.	ELECTRIC RATING H.P.	ELECTRIC RATING K.W.	STEAM LBS/HR.	AIR C.F.M.@ 85 P.S.I.
19	TUB, WASH, 2 COMPARTMENT	1					
20	TUMBLER, NONREVERSING	1	40 LBS	⅓-¾		150	
21	TUMBLER, REVERSING	5	100 LBS	½-1		250	
22	WASHER-EXTRACTOR	1	50 LBS	2-3		27	0.13
23	WASHER-EXTRACTOR	1	100 LBS	2½-5		70	0.13
24	WASHER-EXTRACTOR	3	200 LBS	3-10		116	0.13
25	WASHER-EXTRACTOR	3	400 LBS	5-10/20		185	0.13
26	BINS, METAL, SUNDLE ASSORTING CLOSED BACK, 78"H x 24"W x 138"L W/30 EQUAL COMPARTMENTS 16"H x 15"W	10					
27	CANOPY, VENTILATOR, USE W/ 8 ROLL, 120" IRONER	1			3		
28	MACHINE, TAG ATTACHING	1			2		
30	BASKETS, CANVAS LINER W/ CASTERS, 8 BU.	30					
31	BASKETS, CANVAS LINER W/ CASTERS, 12 BU.	30					
32	BASKETS, CANVAS LINER W/ CASTERS, 16 BU.	30					
L-33	TRUCK, HAND, 72"L x 48"W	10					
L-34	HANDCART, 4 COMP. 19"W x 45"L	15					
L-35	HANDCART, 4 COMP. 19"W x 60"L	15					
L-36	TRUCK, HAND, 60"L x 20"W	20					
L-37	TRUCK, HAND, 2000# CAP, 60"L x 42"W	4					
L-38	TABLE, STACKING, 10'L x 32"W	1					
L-39	TABLE, BUNDLE, 40"L x 30"W	5					
L-40	DAMP BOX, 2'x 2'	9					
L-41	LOCKERS, STEEL, 18"W x 24"D x 72"H	63	(⅓ IN MENS ROOM)		(⅔ IN WOMENS ROOM)		

* EQUIPMENT FURNISHED BY OTHERS.

NOTE "A"
1 CFM OF AIR AT 85 PSI EQUALS 6.78 CFM OF FREE AIR.



MAIN CIRCUIT BREAKER INSTALLATION



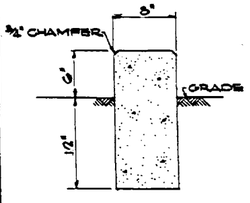
SPECIAL LOUVER DETAILS
TEMPERATE ZONE
PRESSING DEPT. AREA
NOT TO SCALE

NOTE:
TO CLOSE IN COLD WEATHER, INSTALL ¾" EXT. GRADE PLYWOOD ON OUTSIDE TRIM W/ 1½" LG. NO. 8 WD. SCREWS @ 12" CTS. & CAULK ALL CONTACT.

SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ OUTPUT OF 46 000 LBS. PER 60 HR. WEEK	REQUIREMENTS @ RATED CAP. OF INSTALLED EQUIP. ON GOVERN OPER. CYCLE
COLD WATER @ 50°F	1533 GPH	3900 GPH
HOT WATER @ 180°F	2300 GPH	5850 GPH
SEWAGE	3833 GPH	9750 GPH
AIR @ 85 PSI (SEE NOTE "A")	14 CFM	14 CFM
STEAM @ 125 PSI FOR EQUIPMENT	3359 LBS/HR	3359 LBS/HR
STEAM @ 125 PSI FOR HEATING *	676 LBS/HR	676 LBS/HR
STEAM @ 125 PSI FOR GAL. OR H.W.	2836 LBS/HR	7213 LBS/HR
ELECTRIC LOAD (CONNECTED)	100.05 KW	100.05 KW

* OMIT IN TROPIC ZONE.



DETAIL - TRUCK GUARD
NOT TO SCALE

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	16.05 KW
RECEP. EST.	4.00 KW
POWER	86.00 KW
TOTAL	106.05 KW

1. ALL LAMPS TO BE 200W W/14" DIA. FLAT SHADES, EXCEPT AS NOTED. MOUNT 9'-0" ABOVE FLOOR.
2. 100W LAMPS TO HAVE 8" CONICAL SHADES.
3. ALL C.B. PANELS TO HAVE 6 1-POLE 20 AMP BREAKERS.
4. FEEDER CONDUCTORS TO BE SIZED THROUGHOUT AS INDICATED AT HOME RUN ARROW.
5. SYMBOL Ⓜ INDICATES MOTOR, CONTROLLER AND OVERLOAD PROTECTION, FURNISHED W/EQUIPMENT. EACH MOTOR SHALL BE PROVIDED WITH A 30AMP. DISC. SW. EXCEPT WHERE NOTED OTHERWISE.
6. ALL MOTOR TAPS SHALL BE #10 IN 1" EMT EXCEPT WHERE NOTED OTHERWISE.
7. CONNECTED LOAD INCLUDES THE LOADS FROM THE SHOP & STORAGE BLDG. & THE OFFICE, LOCKER ROOM BLDG.

GENERAL NOTES

1. FOR F&N BILL OF MATERIAL - REFER TO TM 5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES SUFFICIENT MATERIAL FOR YARD PIPING TO BOILER HOUSE.
3. ¼" HARDBOARD LINER WALL & CEILING W/FIBERGLASS BATT INSUL. IN CEILING - ALL ZONES.
4. SEE SHEET 2 FOR ADDITIONAL GENERAL NOTES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-35	FLOOR PLAN & ELEC	1 OF 2
73-36	MECH. PLAN & DETAILS	2 OF 2
54-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDG	1-3 OF 3
51-97	COV. WALKWAY DET.	1 OF 1
99-98	STANDARD DETAILS	
54-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
73-39	SPECIAL DETAILS	1 OF 1
73-34	LAUNDRY - 2500 MAN	1 OF 1
73-30	LAUNDRY - 10,000 MAN	1-2 OF 2

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' — NO.1
0 50' 100' 150' — NO.14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

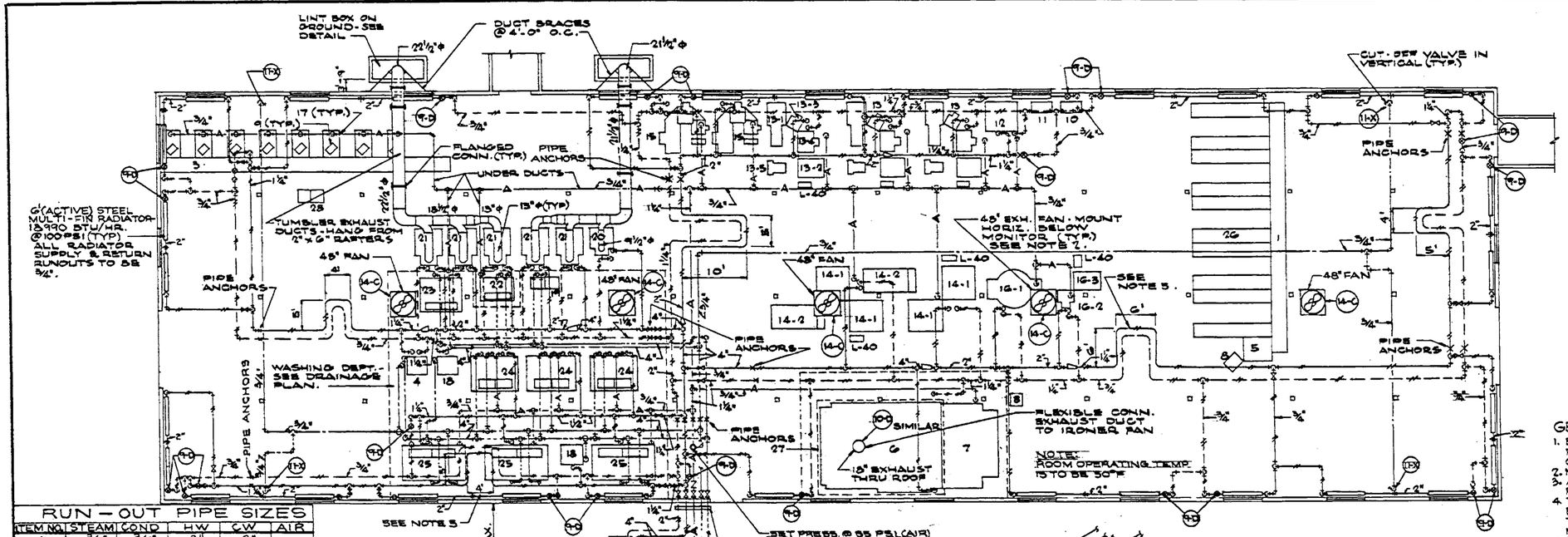
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

LAUNDRY -- 5000 MAN
64' X 208'
FLOOR PLAN & ELECTRICAL
46 000 LBS. PER 60 HR WEEK

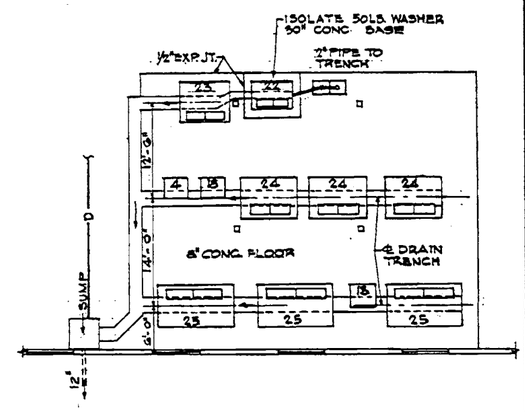
APPROVED: DATE: 19 MAR 1963
CHIEF, ARCHITECTURAL BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE 11 February 1963
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 2
73-35



RUN - OUT PIPE SIZES

ITEM NO.	STEAM	COND	HW	CW	AIR
4	3/4"	3/4"	2"	2"	—
6	2"	1¼"	—	—	—
7	—	—	—	—	¾"
9	—	—	—	—	¾"
12	⅜"	¾"	—	—	¾"
13	1⅛"	¾"	—	—	¾"
14	1¼"	¾"	—	—	¾"
15	¾"	¾"	—	—	¾"
16	1¼"	¾"	—	—	¾"
19	1¼"	—	2"	—	—
19	—	—	3¼"	¾"	—
20	1⅛"	¾"	—	—	—
21	1⅛"	¾"	—	—	—
22	¾"	—	2"	2"	¾"
23	¾"	—	2"	2"	¾"
24	¾"	—	2"	2"	¾"
25	¾"	—	2"	2"	¾"

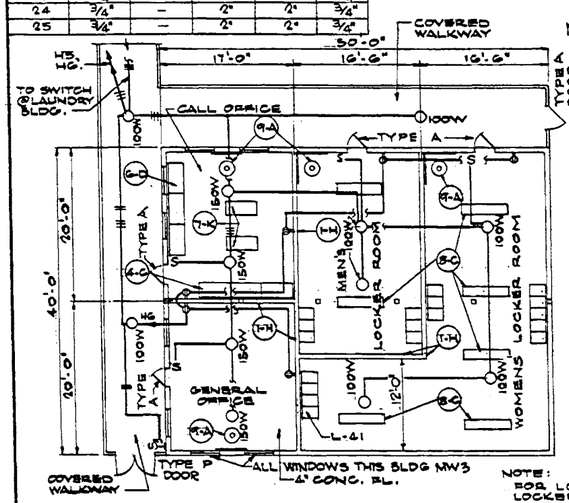
MECHANICAL PLAN
SCALE NO. 1



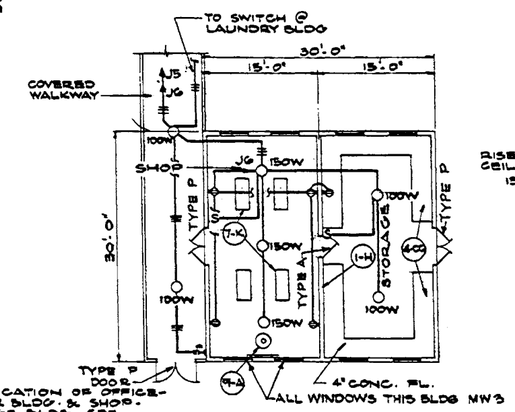
DRAINAGE PLAN FOR WASHING DEPARTMENT
SCALE NO. 1

GENERAL NOTES:

1. BILL OF MATERIAL FOR INTERIOR INCLUDES SUFFICIENT MATERIALS FOR THE SHOP-STORAGE BLDG, OFFICE-LOCKER BLDG. AND COVERED WALKWAYS.
2. NO RIDGE VENTILATORS WILL BE REQUIRED.
3. ALL CONC SLABS OVER 4" SHALL REQUIRE WIRE MESH REINFORCEMENT AND IT SHALL BE LISTED IN B/MS.
4. THE LAUNDRY MACHINERY ANCHOR BOLTS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
5. EXTERIOR WALLS SHALL BE SO CONSTRUCTED TO PERMIT PARTIAL REMOVAL TO ALLOW MAINTENANCE ON THE 8-ROLL IRONERS AND THAT ALL OTHER OPERATING EQUIPMENT SHALL BE NOT LESS THAN 3'-0" FROM EXTERIOR WALLS SO AS TO PROVIDE ADEQUATE MAINTENANCE OPERATING SPACE.
6. STRUCTURAL STEEL BEARING PLATES 8"x ½" x 1'-1" SHALL BE INSTALLED UNDER FLATWORK IRONER SUPPORTING LEGS. SET PLATE ON ¾" GROUT.



OFFICE - LOCKER BLDG.

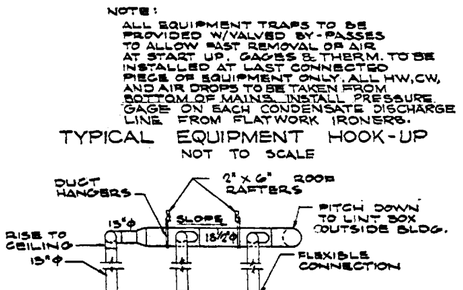


NOTE: FOR LOCATION OF OFFICE-LOCKER BLDG. & SHOP-STORAGE BLDG, SEE KEY PLAN.

SHOP - STORAGE BLDG.

SUPPORT STRUCTURES
SCALE NO. 1

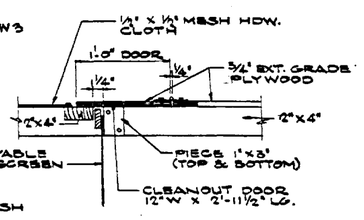
NOTE: SEE NOTE 3, GENERAL NOTES SHEET 1 OF 2 DWG 73-35



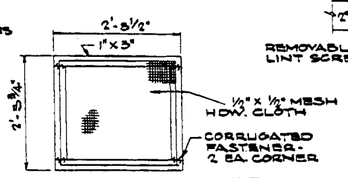
TYPICAL EQUIPMENT HOOK-UP
NOT TO SCALE

NOTE:
ALL EQUIPMENT TRAPS TO BE PROVIDED W/VALVED BY-PASSES TO ALLOW EASY REMOVAL OF AIR AT START UP. GAGES & THERM. TO BE INSTALLED AT LAST CONNECTED PIECE OF EQUIPMENT ONLY. ALL HW, CW, AND AIR DROPS TO BE TAKEN FROM BOTTOM OF MAINS. INSTALL PRESSURE GAGE ON EACH CONDENSATE DISCHARGE LINE FROM FLATWORK IRONERS.

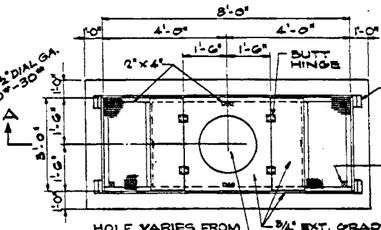
TYPICAL DUCT LAYOUT FROM TUMBLERS
NOT TO SCALE



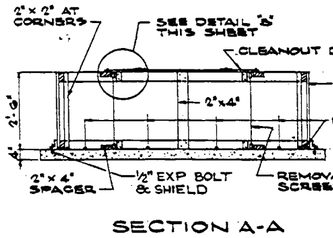
DETAIL "B"
NOT TO SCALE



DETAIL - LINT SCREEN
NOT TO SCALE

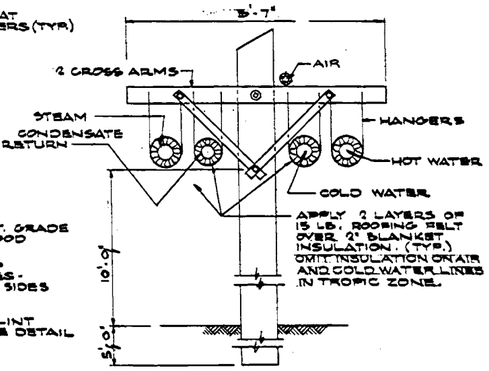


PLAN



SECTION A-A

DETAIL OF LINT BOX
SCALE NO. 4



TYPICAL DETAIL OF PIPE STANCHION
NOT TO SCALE

MECHANICAL NOTES

1. ALL ECCENTRIC REDUCERS SHALL BE SWAGED NIPPLES.
2. 48" EXHAUST FAN RATING: 5 HP, 30,000 CFM
3. OMIT ALL RADIATORS & CONNECTING PIPING FOR TROPIC ZONE.
4. ALL STEAM OPERATED LAUNDRY EQUIPMENT COMES WITH ITS OWN STEAM TRAPS
5. ALL OUTSIDE STEAM & RETURN LINES & ALL EXP. LOOPS, INSIDE OR OUTSIDE THE BLDG, SHALL BE FABRICATED USING BEVELED PIPE & WELDING FITTINGS. EXP. LOOPS FOR 2" AND UNDER IN DIA. SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING WELDING FITTINGS.
6. RADIATION IS SUFFICIENT TO MAINTAIN 40°F INSIDE TEMP. WHEN LAUNDRY EQUIP. IS IDLE AND OUTSIDE TEMP. IS -20°F.
7. ALL ROOF EXHAUST VENTILATORS ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATS SET TO OPERATE FANS WHEN ROOM TEMP. EXCEEDS 75° F.
8. ALL PIPING BETWEEN THE BOILER HOUSES & THE LAUNDRY BLDGS. IN THE TEMPERATE ZONE (WHERE THE TEMP. FALLS BELOW 40°F) SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.
9. FIN TYPE RADIATORS SHALL BE MOUNTED 18" (MAX) ABOVE FLOOR LINE MEASURING FROM TOP OF FIN TO FLOOR LINE.
10. ALL HW, CW, STEAM & CONDENSATE LINES TO BE FULLY INSULATED INSIDE BUILDING.
11. STEAM PRESSURE DROP CALCULATED AS 1#/100' AND CONDENSATE RETURN DROP CALCULATED AS ¾#/100'.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

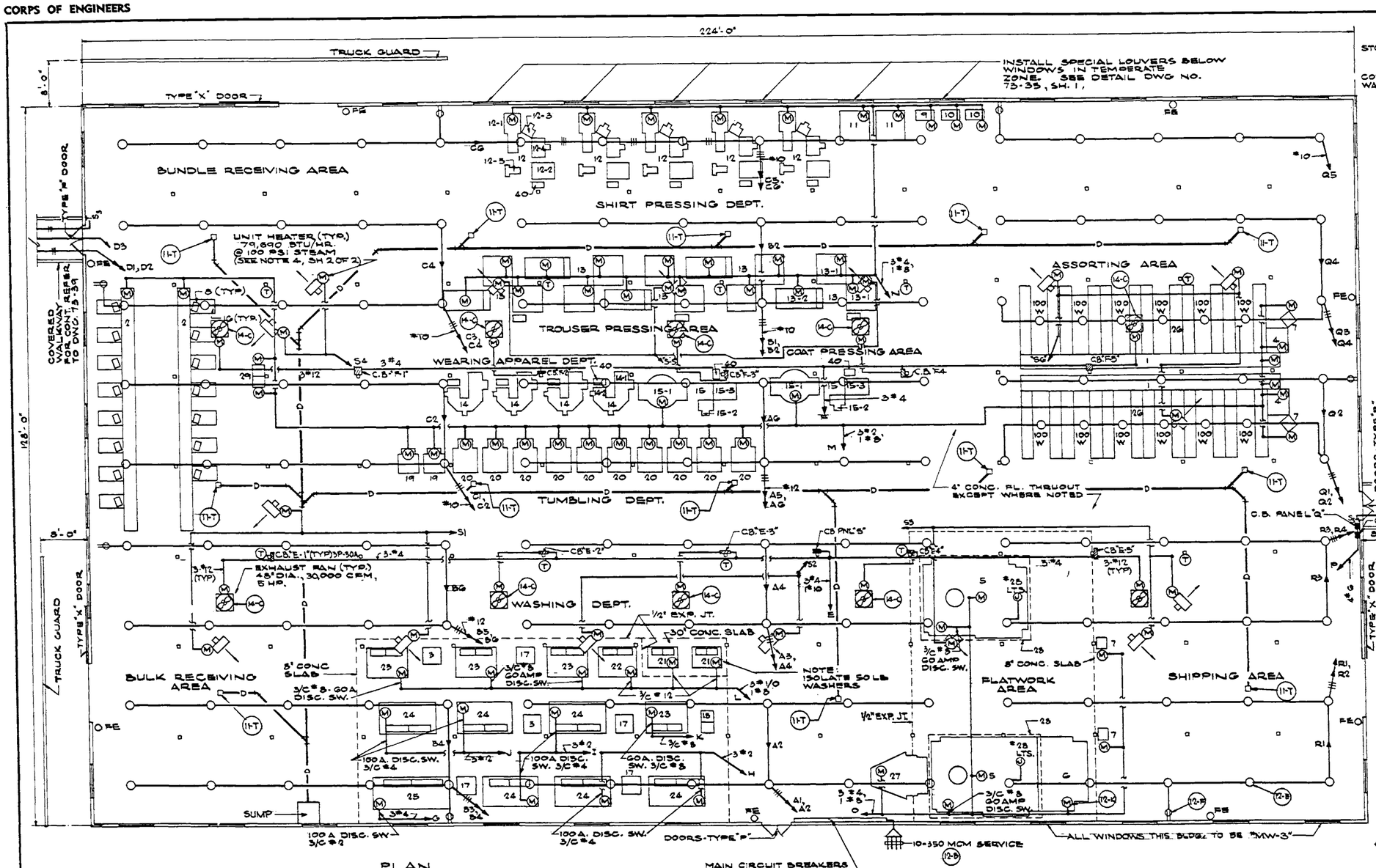
GRAPHIC SCALES
0 5' 10' 15' NO. 1 | 0 1' 2' 3' 4' NO. 4 | 0 1' 2' 3' NO. 5

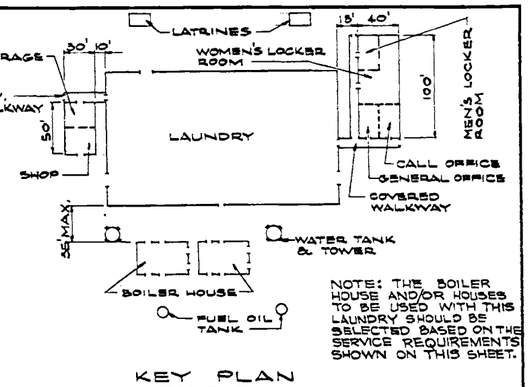
HAYES, SEAY, MATTERN & MATTERN ARCHITECTS - ENGINEERS ROANOKE, VIRGINIA WASHINGTON, D. C.	DEPARTMENT OF THE ARMY OFFICE OF THE CHIEF OF ENGINEERS MILITARY CONSTRUCTION - ENGINEERING DIVISION WASHINGTON, D. C.

DRAWN BY: HELTON TRACED BY: CHECKED BY: LOW SUBMITTED BY: C.W. DEICHMANN	THEATER OF OPERATIONS LAUNDRY - 5000 MAN 91' X 208' MECHANICAL PLAN & DETAILS 46,000 LBS PER 60 HR WEEK
APPROVED: H. Colebaugh CHIEF, ARCHITECTURE BRANCH	APPROVED: W.F. Cochran CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. — DATE: 19 MAR 1963
APPROVED FOR PROPONENT AGENCY: James P. Simmons, OCofEngrs DATE: 11 February 1963	SCALE: AS NOTED SPEC. NO. DRAWING NUMBER SHEET 2 OF 2 — 73-35

CORPS OF ENGINEERS

U. S. ARMY





NOTE: THE BOILER HOUSE AND/OR HOUSES TO BE USED WITH THIS LAUNDRY SHOULD BE SELECTED BASED ON THE SERVICE REQUIREMENTS SHOWN ON THIS SHEET.

KEY PLAN
SCALE NO. 14

PLAN
10,000 MAN LAUNDRY
SCALE NO. 1

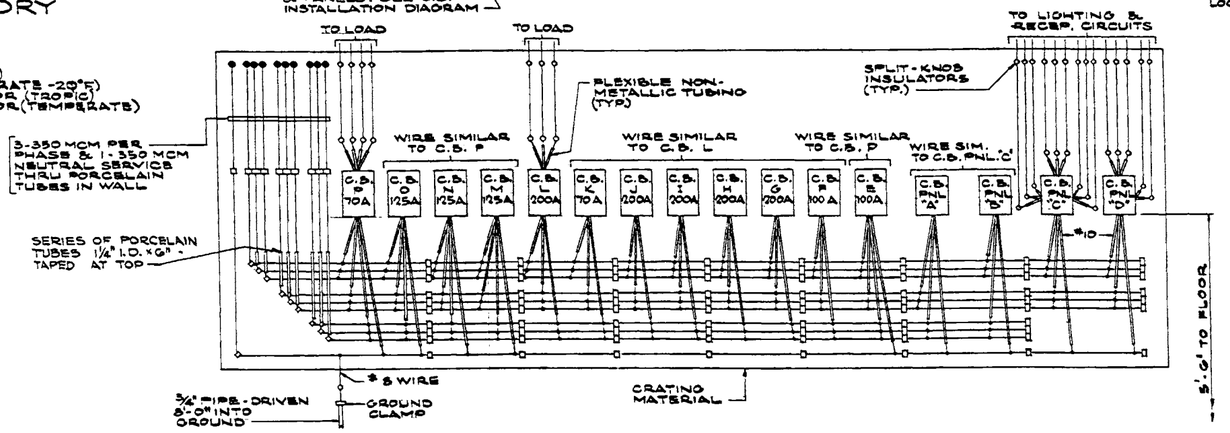
FACILITY NUMBERS

733601 - INTERIOR ONLY (TROPIC)
733602 - INTERIOR ONLY (TEMPERATE -20°F)
733621 - WOOD FRAME W/INTERIOR (TROPIC)
733622 - WOOD FRAME W/INTERIOR (TEMPERATE)

SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ RATED CAP. OF INSTALLED EQUIP. ON 60 MINUTE OPERATING CYCLE	REQUIREMENTS @ RATED OUTPUT OF 112,500 LBS. PER 60 HOUR WEEK
COLD WATER @ 50°F	80000 GPH	3750 GPH
HOT WATER @ 180°F	12000 GPH	5625 GPH
SEWAGE	200000 GPH	9375 GPH
STEAM @ 125 PSI FOR EQUIPMENT	6703 LBS/HR	6703 LBS/HR
STEAM @ 125 PSI FOR HEATING *	1242 LBS/HR	1242 LBS/HR
STEAM @ 125 PSI FOR GEN. OR H.W.	14793 LBS/HR	9926 LBS/HR
AIR @ 35 PSI	27 CFM	27 CFM
ELECTRIC LOAD (CONNECTED)	298.6 KW	298.6 KW

* OMIT IN TROPIC ZONE



MAIN CIRCUIT BREAKER INSTALLATION DIAGRAM
NOT TO SCALE

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-36	FLOOR PLAN & ELEC.	1 OF 2
73-36	MECHANICAL PLAN	2 OF 2
54-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDG	1-3 OF 3
54-03	WOOD FRAME CONST. BARRACKS TYPE BLDG	1-7 OF 7
99-98	STANDARD DETAILS	
51-97	COV. WALKWAY DET'LS.	1 OF 1
73-35	MISCELLANEOUS DET.	1, 2 OF 2
73-39	SPECIAL DETAILS	1 OF 1

GENERAL NOTES

1. FOR FSN BILL OF MATERIALS - REFER TO TM 5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES SUFFICIENT MATERIAL FOR YARD PIPING TO BOILER HSE.
3. NO RIDGE VENTILATOR ON BLDG.
4. 1/4" HARDBOARD LINER WALLS & CEILING W/FIBERGLASS BATT INSUL. IN CEILING - ALL ZONES.

ELECTRICAL NOTES

CONNECTED LOAD*	
LIGHTING	34.6 KW
RECEP. EST.	4.0 KW
POWER	260.0 KW
TOTAL	298.6 KW

1. ALL LAMPS 200W W/16" DIA. FLAT SHADES, EXCEPT AS NOTED, MOUNT 9'-0" ABOVE FLOOR.
2. 100W LAMPS TO HAVE 8" CONICAL SHADES, MOUNT 9'-0" ABOVE FLOOR.
3. ALL CIRCUIT BREAKERS TO BE 3 POLE.
4. ALL C.B. PANELS TO HAVE 6 1-POLE 20 AMP BREAKERS.
5. FEEDER CONDUCTORS TO BE SIZED THRUOUT AS INDICATED AT HOME RUN ARROW.
6. SYMBOL (M) INDICATES MOTOR, CONTROLLER & OVERLOAD PROTECTION FURNISHED W/EQUIPMENT. EACH MOTOR SHALL BE PROVIDED WITH A 30 AMP. DISC. SW. EXCEPT AS NOTED.
7. ALL MOTOR TAPS SHALL BE 3/C #14 EXCEPT AS NOTED.
8. GROUND #8 MOTOR, CONTROL, DISC. SW., & C.B. W/#8 WIRE. (NOT INDICATED)

* CONNECTED LOAD INCLUDES THE LOADS FROM THE SHOP-STORAGE BLDG & THE OFFICE-LOCKER ROOM BLDG.

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES
0 5' 10' 15' NO.1
0 50' 100' 150' NO.14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, ENGINEERING BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1968
APPROVED FOR PROPONENT AGENCY: [signature]
DATE 11 JUNE 1969

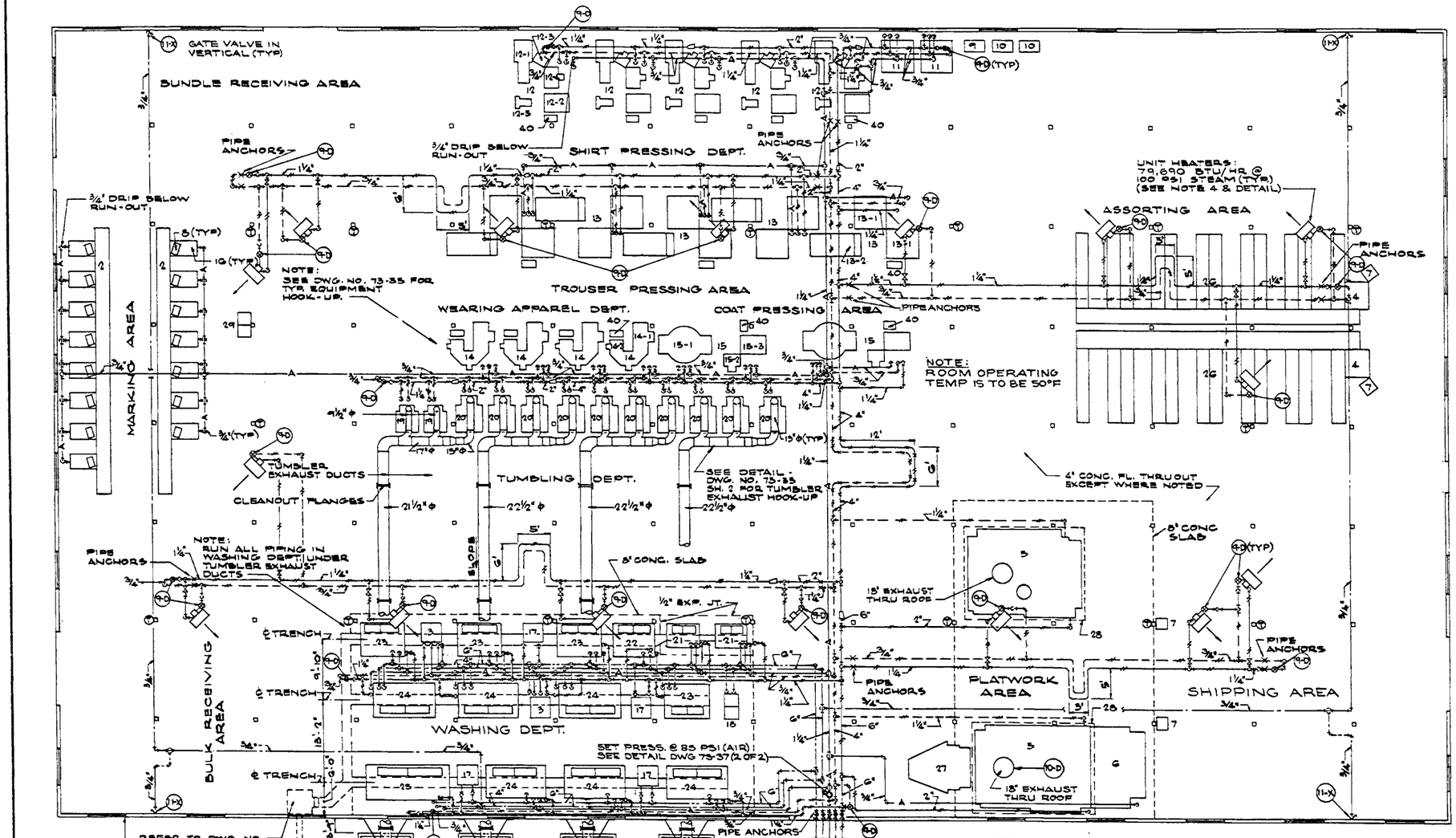
THEATER OF OPERATIONS

LAUNDRY-10,000 MAN
128'X224'
FLOOR PLAN & ELECTRICAL
112,500 LBS PER 60 HR. WEEK

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 73-36
SHEET 1 OF 2

CORPS OF ENGINEERS

U. S. ARMY



SCHEDULE OF EQUIPMENT *

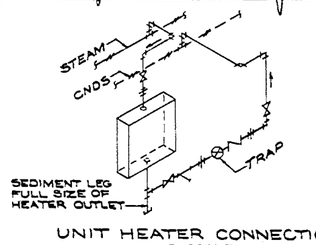
ITEM NO.	DESCRIPTION	QTY.	CAP	ELEC. RATG. H.P.	ELEC. RATG. K.W.	STEAM LBS./HR.	AIR: CU. FT. @ 85 P.S.I.
1	CONVEYOR, LAUNDRY, ASSORTING MODIFIED TO LENGTH SHOWN ON DWGS. 45' X 2'-6"	2		1½			
2	CONVEYOR, LAUNDRY, POWER OPERATED, 45' X 2'-3"	2		1½			
3	COOKER, STARCH	2	50 GAL.			16	
4	CUTTING & MEASURING MACHINE, PAPER	2		¼			
5	IRONER, FLATWORK, 8 ROLL	2	550 LBS	10		615	
6	MACHINE, FOLDING, SGL. LANE	1		¾			1.00
7	MACHINE, BUNDLE TYING	4		¼			
8	MACHINE, MARKING, LAUNDRY 5 CHARACTER	15					0.05
9	MACHINE, SEWING, BUTTON	1		1/6			
10	MACHINE SEWING, GENERAL	2		½			
11	PRESS, HANDKERCHIEF, ROTARY	2	180	⅓		40	.50
12	PRESS UNIT, SHIRT, 2 OPER. EA. UNIT CONSISTS OF: ITEM 12-1, PRESS, SHIRT BODY - BOSOM ITEM 12-2, PRESS, SHIRT SLEEVE ITEM 12-3, PRESS, SHIRT YOKE & SHOULDER ITEM 12-4, PRESS, SHIRT CUFF & COLLAR ITEM 12-5, MACH., SHIRT FOLDING	5	70 SHIRTS PER HR	1		185	1.714
13	PRESS UNIT, TROUSER, EACH UNIT CONSISTS OF: ITEM 13-1, 2-CAB. TYPE, SGL. LAY PRESSES ITEM 13-2 CABINET DRYER	5	110/PR. TROUSER PER HR	4½		170	1.524
14	PRESS UNIT, UTILITY - EACH CONSISTING OF: ITEM 14-1, PRESS, GARMENT, 54" ITEM 14-2, 2-PRESSES, G'ARM., 21"	4				70	.54
16	DAMP BOX, 2' X 2'	16					
18	TABLE, MARKING MACHINE	15					
17	TANK, SOAP	4	100 GAL.			25	
18	TUB, WASH, 2 COMPARTMENT	1					
19	TUMBLER, NON-REVERSING	2	40 LBS	⅓-¾		150	
20	TUMBLER, REVERSING	10	100 LBS	½-1		250	
21	WASHER-EXTRACTOR	2	50 LBS	2-3		27	0.13
22	WASHER-EXTRACTOR	1	100 LBS	2½-5		70	0.13
23	WASHER-EXTRACTOR	4	200 LBS	3-10		116	0.13
24	WASHER-EXTRACTOR	6	400 LBS	5-10/10		185	0.13
25	WASHER-EXTRACTOR	1	600 LBS	7½ 10.5/25		255	0.13
26	BINS, METAL, BUNDLE ASSORTING, CLOSED BACK 78" H, 24" W, 138" L W/ 30 COMPARTMENTS 16" H, 15" W	24					
27	SPREADING & FEEDING DEVICE	1		1			
28	CANOPY, VENTILATOR, USE W/ 8 ROLL, 120" IRONER	2		3			
29	MACHINE, TAG ATTACHING	2			2		
30	BASKETS, CANVAS LINER W/ CASTERS, 8 BU.	72					
31	BASKETS, CANVAS LINER W/ CASTERS, 12 BU.	55					
32	BASKETS, CANVAS LINER W/ CASTERS, 16 BU.	54					
33	TRUCK, HAND, BULK OR BUNDLE RECEIVING, 48" X 72"	15					
34	HANDCART, GARMENT, SHIRTS	25					
35	HANDCART, GARMENT, 4 COMPT.	25					
36	TRUCK, HAND, FINISHED BUNDLE, 2 COMPARTMENT	38					
37	TRUCK, HAND, PLATFORM, 2000 LB. CAPACITY, SHIPPING	6					
38	TABLE, STACKING, FLATWORK, STEEL W/PLASTIC TOP	2					
39	TABLE, BUNDLE CHECKING, STEEL W/PLASTIC TOP, 4 SWIVEL CASTERS & DRAWER	12					
15	PRESS UNIT, COAT, 2 OPER. EA. UNIT CONSISTS OF: ITEM 15-1, ROTARY CABINET ITEM 15-2, PRESS, YOKE ITEM 15-3, PRESS, SLEEVER	2	120 COATS PER HR	1		200	.900
L-41	LOCKER, STL. 18"W X 24"D X 72"H 43 FOR MEN, 87 FOR WOMEN	130					

* EQUIPMENT FURNISHED BY OTHERS

RUN OUT PIPE SIZES

ITEM NO.	STEAM	COND.	AIR	HW	CW
11	3/4"	3/4"	3/4"	—	—
12	1 1/4"	3/4"	3/4"	—	—
13	1 1/4"	3/4"	3/4"	—	—
14	3/4"	3/4"	3/4"	—	—
15	3/4"	3/4"	3/4"	—	—
17	3/4"	—	—	2"	—
18	—	—	—	3/4"	3/4"
19	3/4"	3/4"	—	—	—
20	1 1/4"	3/4"	—	—	—
21	3/4"	—	3/4"	2"	2"
22	3/4"	—	3/4"	2"	2"
23	3/4"	—	3/4"	2"	2"
24	3/4"	—	3/4"	2"	2"
25	3/4"	—	3/4"	4"	4"

ITEM NO.	STEAM	COND.	AIR	H.W.	C.W.
5	3/4"	3/4"	—	2"	2"
6	2"	1 1/4"	—	—	—
8	—	—	3/4"	—	—
UNIT HTR.	3/4"	3/4"	—	—	—
	—	—	3/4"	—	—



UNIT HEATER CONNECTION
NO SCALE

NOTES:
1. ALL STEAM OPERATED LAUNDRY EQUIPMENT COMES WITH ITS OWN STEAM TRAPS.
2. ALL OUTSIDE STEAM & RETURN LINES & ALL EXPANSION LOOPS, INSIDE OR OUTSIDE THE BUILDING SHALL BE FABRICATED USING BEVELED PIPE & WELDING FITTINGS. EXPANSION LOOPS 2" & UNDER IN DIA. SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING WELDING FITTINGS.
3. 14 UNIT HEATERS OPERATING ARE SUFFICIENT TO MAINTAIN 40°F INSIDE WHEN LAUNDRY IS IDLE AND OUTSIDE TEMPERATURE IS -20°F.
4. IN TROPIC ZONE, OMIT ALL UNIT HEATERS & CONNECTING PIPING.
5. ALL ROOF EXHAUST VENTILATORS ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATS SET TO OPERATE FANS WHEN ROOM TEMP EXCEEDS 75°F.
6. ALL PIPING BETWEEN THE BOILER HOUSES & LAUNDRY BLDGS IN THE TEMPERATE ZONE (WHERE THE TEMP FALLS BELOW 40°F) SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.
7. STRUCTURAL STEEL BEARING PLATES 8"x1½"x1'-1" W/ ¾" GROUT SHALL BE INSTALLED UNDER FLATWORK IRONER LEGS.

GENERAL NOTES

1. BILL OF MATERIAL FOR INTERIOR INCLUDES SUFFICIENT MATERIALS FOR THE SHOP-STORAGE, OFFICE-LOCKER BUILDINGS, AND COVERED WALKWAY.
2. NO RIDGE VENTILATORS WILL BE REQUIRED.
3. ALL CONCRETE SLABS OVER 4" SHALL REQUIRE WIRE MESH REINFORCEMENT AND IT SHALL BE LISTED IN BILL OF MATERIAL.
4. THE LAUNDRY MACHINERY ANCHOR BOLTS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
5. EXTERIOR WALLS SHALL BE SO CONSTRUCTED TO PERMIT PARTIAL REMOVAL TO ALLOW MAINTENANCE ON THE 8-ROLL IRONERS AND THAT ALL OTHER OPERATING EQUIPMENT SHALL BE NOT LESS THAN 3'-0" FROM EXTERIOR WALLS SO AS TO PROVIDE ADEQUATE MAINTENANCE OPERATING SPACE.
6. UNIT HEATERS SHALL BE MOUNTED 9'-0" (MAX) ABOVE FLOOR LINE MEASURING FROM BOTTOM OF UNIT TO FLOOR LINE.
7. ALL CW, HW, STEAM & CONDENSATE LINES TO BE FULLY INSULATED INSIDE BUILDINGS.
8. ALL ECCENTRIC REDUCERS ARE TO BE SWAGED NIPPLES.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' 15'
NO.1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C. W. DETTMANN
APPROVED: [signature] CHIEF, DETACHED BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: [signature] James K. Jennings, QC of Staffs
DATE 11 February 1969

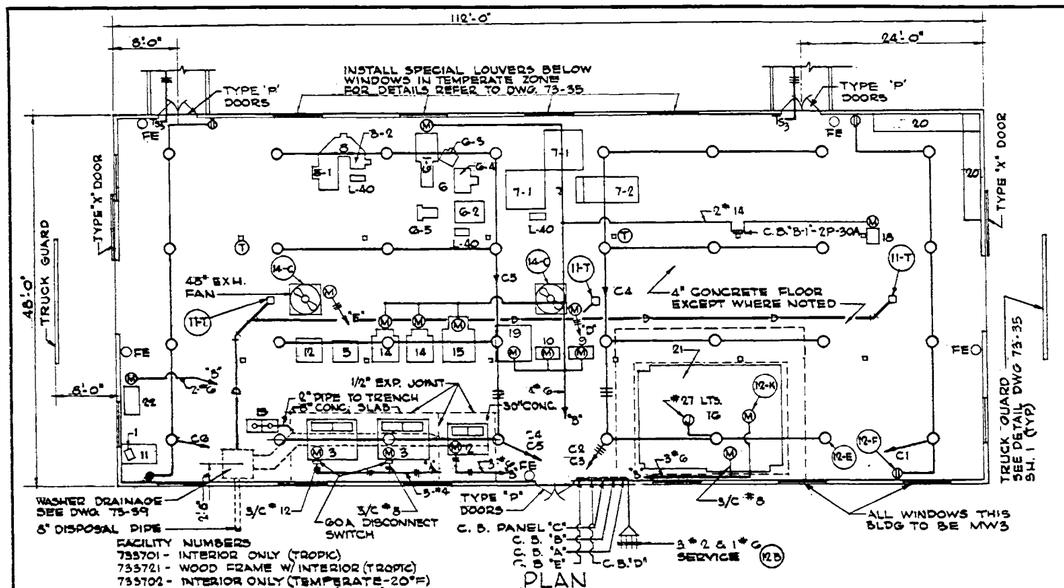
THEATER OF OPERATIONS

LAUNDRY-10.000 MAN
128' X224'
MECHANICAL PLAN
112.500 LBS PER 60 HR. WEEK

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-36
SHEET 2 OF 2

CORPS OF ENGINEERS

U. S. ARMY

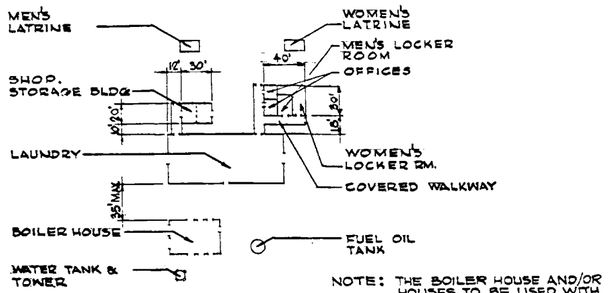


FACILITY NUMBERS
733701 - INTERIOR ONLY (TROPIC)
733721 - WOOD FRAME W/ INTERIOR (TROPIC)
733702 - INTERIOR ONLY (TEMPERATE-20°F)
733722 - WOOD FRAME W/INT'R (TEMP.)

PLAN

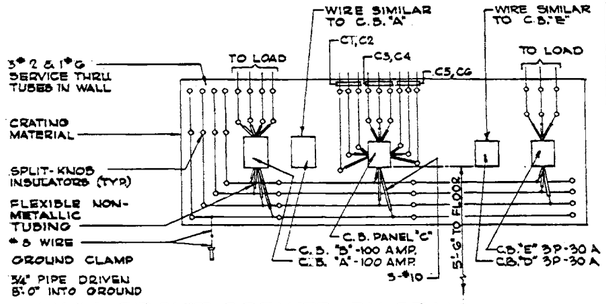
500 BED HOSPITAL LAUNDRY

SCALE NO. 1



KEY PLAN
SCALE NO.14

NOTE: THE BOILER HOUSE AND/OR HOUSES TO BE USED WITH THIS LAUNDRY SHOULD BE SELECTED BASED ON THE SERVICE REQUIREMENTS SHOWN ON THIS SHEET.



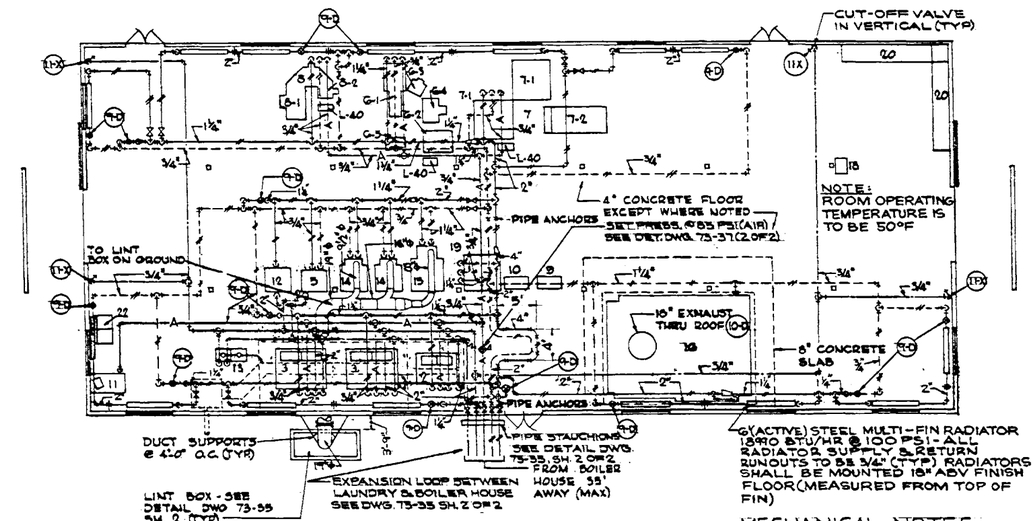
MAIN CIRCUIT BREAKER DIAGRAM

NOT TO SCALE

SCHEDULE OF EQUIPMENT *

ITEM NO.	DESCRIPTION	QUAN.	CAPACITY	ELEC. RATING H.P.	ELEC. RATING K.W.	STEAM LBS/HR	AIR-CU. FT. @ 85 P.S.I.
1	MACHINE, MARKING, LAUNDRY, & CHARACTER	1					0.05
2	WASHER, EXTRACTOR	1	50 LBS.	2, 3		27	0.13
3	WASHER, EXTRACTOR	2	200 LBS	5, 10		116	0.13
5	COOKER, STARCH	1	50 GAL.			16	
6	PRESS UNIT, SHIRT, 2 OPERATOR EACH UNIT CONSISTS OF: ITEM G-1, PRESS, SHIRT, BODY-BOSOM ITEM G-2, PRESS, SHIRT SLEEVE ITEM G-3, PRESS, SHIRT YOKE & SHOULDER ITEM G-4, PRESS, SHIRT CUFF & COLLAR ITEM G-5, MACH, SHIRT FOLDING	1	70 SHIRTS /HR	1		185	1.714
7	PRESS UNIT, TROUSER EACH UNIT CONSISTS OF: ITEM 7-1, 2-CABINET TYPE 50L. LAY TROUSER PRESSES ITEM 7-2, CABINET DRYER	1	110 TROUSERS /HR.	4 1/2		170	1.524
8	PRESS UNIT, UTILITY, EACH UNIT CONSISTS OF ITEM 8-1, PRESS, GARMENT, 54" ITEM 8-2, PRESS, GARMENT, 21"	1				70	0.54
9	MACHINE, SEWING, GENERAL	1		1/2			
10	MACHINE, SEWING, BUTTON	1		1/3			
11	TABLE, MAKING MACHINE	1	52" X 28"				
12	TANK, SOAP	1	100 GAL			25	
13	TUB, WASH, 2 COMPARTMENT	1	24" X 48"				
14	TUMBLER, NON-REVERSING	2	40 LBS	1/2, 3/4		130	
15	TUMBLER, REVERSING	1	100 LBS	1/2, 1		250	
16	IRONER, FLATWORK, 8 ROLL	1	850 LBS	10		618	
18	MACHINE, BUNDLE TYING	1		1/4			
19	PRESS, HANDKERCHIEF, ROTARY	1	180/HR.	1/3		40	0.50
20	BINS, METAL, BUNDLE ASSORTING, CLOSED BACK, 78" L X 24"W X 138" L. W/36 EQUAL COMPARTMENTS 10" H X 15" W	2					
21	CANOPY, VENTILATOR, USE W/ 8 ROLL, 140" IRONER	1		5			
22	MACHINE, LAUNDRY TAG ATTACHING	1			2		
30	BASKETS, CANVAS LINER W/ CASTERS	12	8 BU.				
31	BASKETS, CANVAS LINER W/CASTERS	8	12 BU.				
32	BASKETS, CANVAS LINER W/CASTERS	8	16 BU.				
L-33	TRUCK, HAND, 72" L X 48" W	10					
L-34	HANDCART, 4 COMP. 19" W X 45" L	5					
L-35	HANDCART, 6 COMP. 19" W X 90" L	10					
L-36	TRUCK, HAND, 60" L X 20" W	5					
L-37	TRUCK, HAND, 2000 # CAP. 60" L	2					
L-38	TABLE, STACKING, 10'L X 32" W	1					
L-39	TABLE, STACKING, 40" L X 30" W	1					
L-40	DAMP BOX 2' X 2'	6					
L-41	LOCKERS, STL., 18" W X 24" D X 72" H 1/3 FOR MEN - 2/3 FOR WOMEN	20					

* EQUIPMENT FURNISHED BY OTHERS.



NOTE: ROOM OPERATING TEMPERATURE IS TO BE 50°F

G (ACTIVE) STEEL MULTI-FIN RADIATOR 18990 BTU/HR @ 100 PSI - ALL RADIATOR SUPPLY & RETURN RUNOUTS TO BE 3/4" (TYP) RADIATORS SHALL BE MOUNTED 18" ADV FINISH FLOOR (MEASURED FROM TOP OF FIN)

MECHANICAL PLAN

SCALE NO. 1

RUN-OUT PIPE SIZES

ITEM NO.	STEAM	COND.	H.W.	C.W.	AIR
2	3/4"	–	2"	2"	3/4"
3	3/4"	–	2"	2"	3/4"
5	3/4"	3/4"	2"	2"	–
6	1 1/4"	3/4"	–	–	3/4"
7	1 1/4"	3/4"	–	–	3/4"
8	3/4"	3/4"	–	–	3/4"
12	3/4"	–	2"	–	–
13	–	–	3/4"	3/4"	–
14	3/4"	3/4"	–	–	–
15	1 1/4"	1 1/4"	–	–	–
16	2"	1 1/4"	–	–	–
18	3/4"	3/4"	–	–	3/4"
1	–	–	–	–	3/4"

MECHANICAL NOTES

1. ALL HW, CW, STEAM & CONDENSATE LINES INSIDE BUILDING TO BE FULLY INSULATED
2. ALL ECCENTRIC REDUCERS TO BE SWAGED NIPPLES.
3. ALL HW, CW, & AIR DROPS TO BE TAKEN FROM BOTTOM OF MAINS.

GENERAL NOTES (CON'T)

9. STRUCTURAL STEEL BEARING PLATES 8" X 1/2" X 1'-1" W/3/4" GROUT SHALL BE INSTALLED UNDER FLATWORK IRONER SUPPORTING LEGS.
10. SUPPORT BLDGS IN KEY PLAN ARE SHOWN OPPOSITE HAND TO SUPPORT BLDG DETAIL.

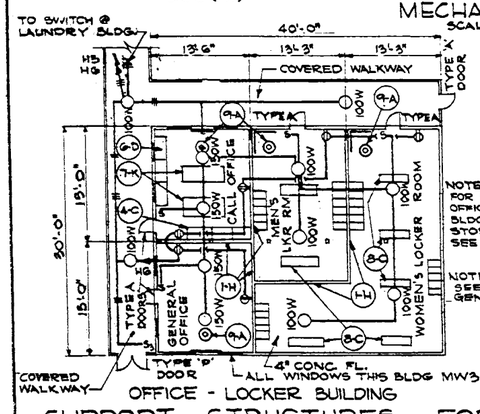
SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ RATED CAPACITY OF INSTALLED EQUIPMENT ON 60 MINUTE OPERATING CYCLE	REQUIREMENTS @ RATED OUTPUT OF 8,750 LBS. PER 60 HR WEEK
COLD WATER @ 30°	900 GPH	292 GPH
HOT WATER @ 180° F	1350 GPH	438 GPH
SEWAGE	2250 GPH	730 GPH
STEAM @ 125 PSI: FOR EQUIPMENT	1674 LBS/HR.	1674 LBS/HR.
STEAM @ 125 PSI: FOR HEATING **	320 LBS/HR	320 LBS/HR
STEAM @ 125 PSI: FOR GEN. OF H.W.	766 LBS/HR.	540 LBS/HR
AIR @ 85 PSI	5 C.F.M.	5 C.F.M.
ELECTRIC LOAD (CONNECTED)	48.6 KW	48.6 KW

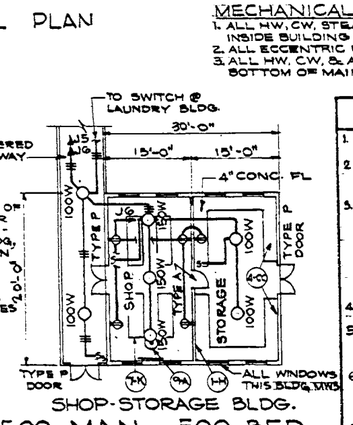
** GMIT IN TROPIC ZONE

GENERAL NOTES (CON'T)

5. BILL OF MATERIAL FOR INTERIOR INCLUDES SUFFICIENT MATERIALS FOR THE SHOP-STORAGE, OFFICE-LOCKER BUILDINGS, AND COVERED WALKWAY.
6. THE LAUNDRY MACHINERY ANCHOR BOLTS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED ACCORDING TO MANUFACTURERS RECOMMENDATIONS.
7. EXTERIOR WALLS SHALL BE SO CONSTRUCTED TO PERMIT PARTIAL REMOVAL TO ALLOW MAINTENANCE ON THE 8-ROLL IRONERS AND THAT ALL OTHER OPERATING EQUIPMENT SHALL BE NOT LESS THAN 3'-0" FROM EXTERIOR WALLS SO AS TO PROVIDE ADEQUATE MAINTENANCE OPERATING SPACE.
8. ALL CONC. SLABS OVER 4" REQUIRE WIRE MESH REINFORCEMENT.



OFFICE - LOCKER BUILDING



SHOP-STORAGE BLDG.

SUPPORT STRUCTURES FOR 2500 MAN, 500 BED AND 1000 BED HOSPITAL LAUNDRIES

NOT TO SCALE

MECHANICAL NOTES

1. OMIT ALL RADIATORS & CONNECTING PIPING FOR TROPIC ZONE.
2. ALL STEAM OPERATED LAUNDRY EQUIPMENT COMES WITH ITS OWN STEAM TRAPS.
3. ALL OUTSIDE STEAM & RETURN LINES AND ALL EXPANSION LOOPS INSIDE OR OUTSIDE THE BUILDING, SHALL BE FABRICATED USING BEVELED PIPE & WELDING FITTINGS. EXPANSION LOOPS FOR 2" & UNDER IN DIAMETER SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING WELDING FITTINGS.
4. REFER TO DWG. NO. 73-35 FOR ADDITIONAL NOTES.
5. RADIATION IS SUFFICIENT TO MAINTAIN 40°F INSIDE TEMPERATURE WHEN LAUNDRY EQUIPMENT IS IDLE AND OUTSIDE TEMPERATURE IS -20° F.
6. ALL ROOF EXHAUST VENTILATORS ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATE SET TO OPERATE FAN WHEN ROOM TEMP EXCEEDS 75°F.
7. ALL PIPING BETWEEN THE BOILER HOUSES & LAUNDRY BLDGS IN THE TEMPERATE ZONE (WHERE TEMP FALLS BELOW 40°F) SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	8.6 KW
RECEP. EST.	2.0 KW
POWER	40.0 KW
TOTAL	48.6 KW

1. 100W LAMPS TO HAVE 8" CONICAL SHADES.
2. ALL CIRCUIT BREAKERS TO BE 3-POLE.
3. ALL C. B. PANELS TO HAVE 6-1-POLE 20 AMP BREAKERS.
4. FEEDER CONDUCTORS TO BE SIZED THROUGH AS INDICATED AT HOME RUN ARROW.
5. SYMBOL (M) INDICATES MOTOR, CONTROLLER & OVERLOAD PROTECTION FURNISHED W/EQUIPMENT EACH MOTOR SHALL BE PROVIDED W/A 30 AMP. DISC. SWITCH EXCEPT WHERE NOTED OTHERWISE.
6. ALL MOTOR TAPS SHALL BE 3/C #14 EXCEPT WHERE NOTED OTHERWISE.
7. CONNECTED LOAD INCLUDES THE LOADS FROM THE SHOP & STORAGE BLDG. & THE OFFICE-LOCKER ROOM BLDG.
8. ALL LAMPS TO BE 200 W W/14" DIA. FLAT SHADES, EXCEPT AS NOTED. MOUNT 9" ABOVE FL.

GENERAL NOTES

1. FOR FSN BILL OF MATERIAL - REFER TO TM 5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES YARD PIPING TO BOILER HOUSE.
3. NO RIDGE VENTILATOR ON BLDG.
4. 1/2" HARDBOARD LINER WALLS & CEILING W/ FIBERGLASS BATT INSULATION IN CEILING - ALL ZONES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-37	FLOOR PLANS MECHANICAL & ELECTRICAL	1 OF 2
54-04	WOOD FRAME CONSTRUCTION WAREHOUSE TYPE BLDG.	1-3 OF 6
34-05	WOOD FRAME CONSTRUCTION BARRACKS TYPE BLDG	1-7 OF 7
99-96	STANDARD DETAILS	
51-97	COVERED WALKWAY DETAIL	1 OF 1
73-35	LAUNDRY - 5000 MAN	1-2 OF 2
73-39	LAUNDRY - SPEC. DETAILS	1 OF 1
73-36	LAUNDRY - 10000 MAN	1-2 OF 2

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' 15' NO.1
0 50' 100' 150' NO.14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: MELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

500 BED HOSPITAL LAUNDRY
48' X 112'
PLANS & DETAILS
8750 LBS PER 60 HR WEEK

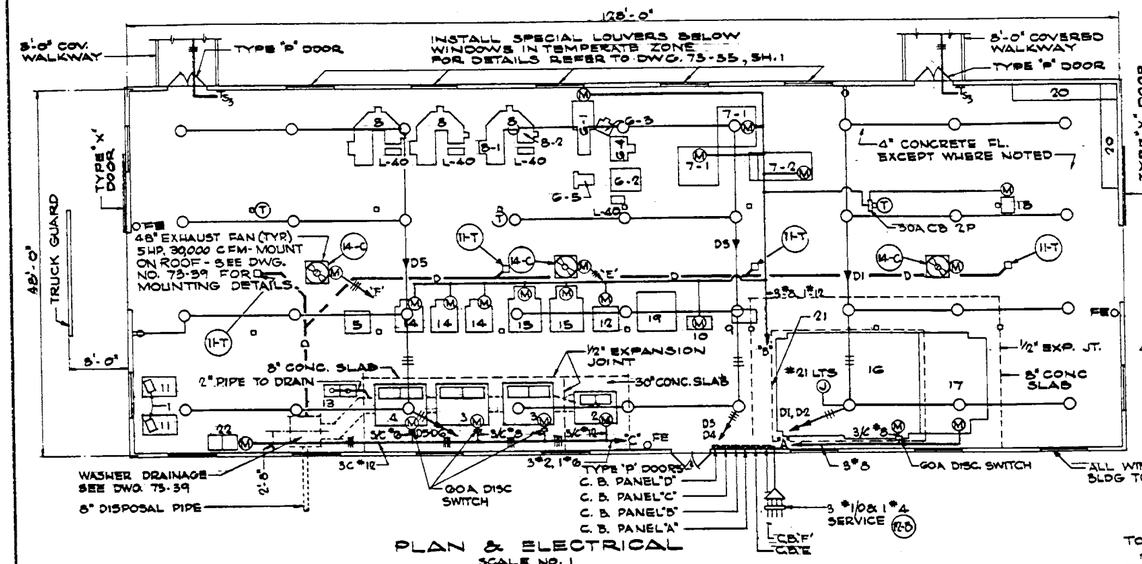
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: DATE: 11 February 1969

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-37
SHEET 1 OF 2

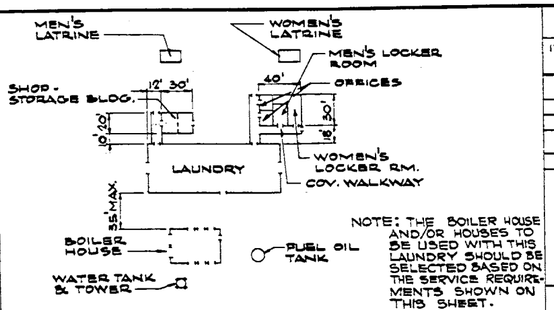
CORPS OF ENGINEERS

U. S. ARMY

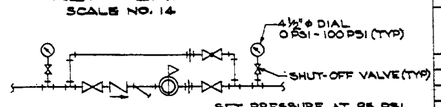


PLAN & ELECTRICAL
SCALE NO. 1

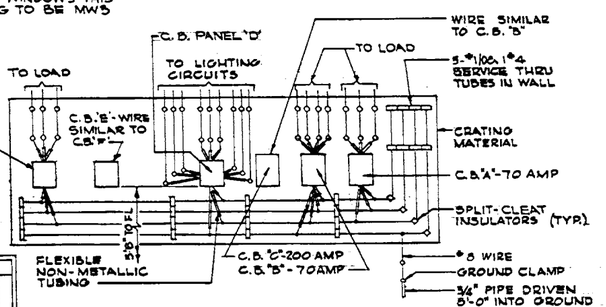
FACILITY NUMBERS
753703 - INTERIOR ONLY (TROPIC)
753704 - INTERIOR ONLY (TEMPERATE -20°)
753725 - WOOD FRAME W/ INTERIOR (TROPIC)
753724 - WOOD FRAME W/ INTERIOR (TEMPERATE)



KEY PLAN
SCALE NO. 14



DETAIL - PRESS. RED. STA. (AIR)
NO SCALE

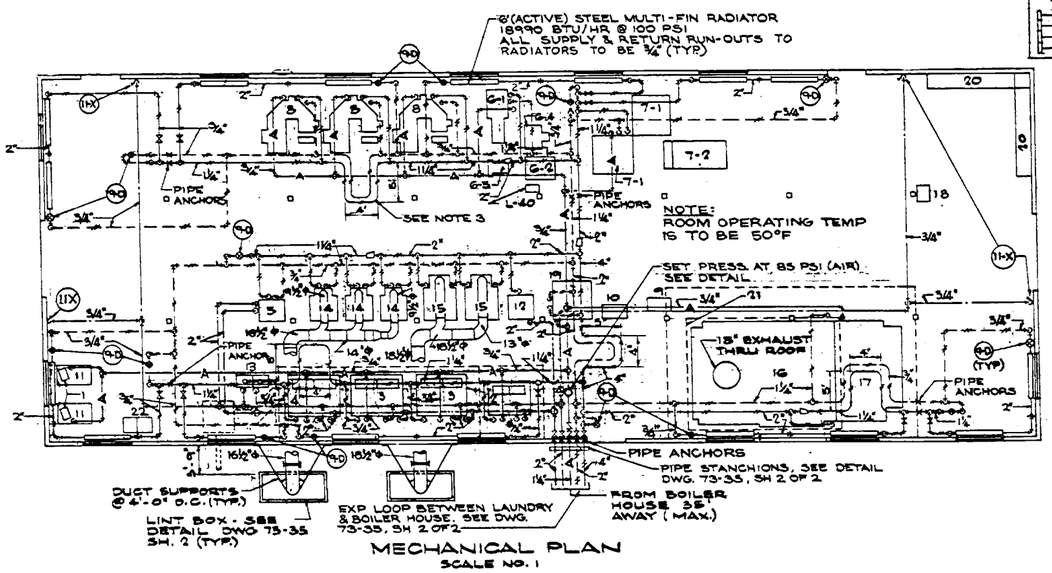


MAIN CIRCUIT BREAKER DIAGRAM
NOT TO SCALE

SCHEDULE OF EQUIPMENT *

ITEM NO.	DESCRIPTION	QUAN.	CAPACITY	ELEC. RATING H.P.	ELEC. RATING KW.	STEAM LBS/HR.	AIR CU FT @ 85 P.S.I.
1	MACHINE, MARKING, LAUNDRY, 8 CHARACTER	2					0.05
2	WASHER, EXTRACTOR	1	50 LBS	2&3		27	0.13
3	WASHER, EXTRACTOR	2	100 LBS	5,10		116	0.13
4	WASHER, EXTRACTOR	1	400 LBS	5,7.5 15		185	0.13
5	COOKER, STARCH	1	500 AL.			10	
6	PRESS UNIT, SHIRT, 2 OPERATOR EACH UNIT CONSISTS OF: ITEM 6-1, PRESS, SHIRT, BODY-BOSOM, ITEM 6-2, PRESS, SHIRT SLEEVE & SHOULDER, ITEM 6-3, PRESS, SHIRT YOKE & SHOULDER, ITEM 6-4, PRESS, SHIRT CUFF & COLLAR, ITEM 6-5, MACH, SHIRT, FOLDING	1	70 SHIRTS /HR.	1		185	1.714
7	PRESS UNIT, TROUSER EACH UNIT CONSISTS OF: ITEM 7-1, 2 CABINET TYPE SGL. TROUSER PRESSES ITEM 7-2, CABINET DRYER	1	110 TROUSER /HR.	4½		170	1.524
8	PRESS UNIT, UTILITY EACH UNIT CONSISTS OF ITEM 8-1, PRESS, GARMENT, 54" ITEM 8-2, PRESS, GARMENT, 21"	3				70	0.54
9	MACHINE, SEWING, GENERAL	1		½			
10	MACHINE, SEWING, BUTTON	1		¼			
11	TABLE, MARKING MACHINE	2	52" X 29"				
12	TANK, SOAP	1	100 GAL			25	
13	TUB, WASH, 2 COMPARTMENT	1	24" X 48"				
14	TUMBLER, NON-REVERSING	3	40 LBS	⅓, ¾		150	
15	TUMBLER, REVERSING	2	100 LBS	½, 1		250	
16	IRONER, FLATWORK, 8 ROLL	1	550 LBS	10		618	
17	MACHINE, FOLDING, SINGLE LANE	1		¾			1.00
18	MACHINE, BUNDLE TYING	1		¼			
19	PRESS, HANDKERCHIEF, ROTARY	1	180/HR.	⅓		40	0.50
20	BINS, METAL, BUNDLE ASSORTING, CLOSED BACK, 78"H X 24"W X 138"L, W/36 EQUAL COMPARTMENTS 12"H X 15"W	2					
21	CANOPY, VENTILATOR, USE W/ 8 ROLL 120" IRONER	1		¾			
22	MACHINE, LAUNDRY TAG ATTACHING	1			¼		
30	BASKETS, CANVAS LINER W/ CASTERS	12	8 BU.				
31	BASKETS, CANVAS LINER W/ CASTERS	15	12 BU.				
32	BASKETS, CANVAS LINER W/ CASTERS	12	16 BU.				
L-35	TRUCK, HAND, 72"L X 48"W	15					
L-36	HANDCART, 4 COMP. 19"W X 48"L	10					
L-37	HANDCART, 4 COMP. 19"W X 60"L	15					
L-38	TRUCK, HAND, 60"L X 20"W	10					
L-39	TRUCK, HAND, 2000# CAP. 80"L	4					
L-39	TABLE, STACKING, 10'L X 32"W	1					
L-39	TABLE, BUNDLE, 40"L X 30"W	2					
L-40	DAMP BOX 2'X 2'	9					
L-41	LOCKERS, STL. 18"W X 24"D X 72"H 1/3 FOR MEN - 2/3 FOR WOMEN	43					

* EQUIPMENT FURNISHED BY OTHERS.



MECHANICAL PLAN
SCALE NO. 1

SERVICE REQUIREMENTS

ITEM	REQUIREMENTS @ RATED CAP. OF INSTALLED EQUIP. ON 60 MINUTE OPERATING CYCLE	REQUIREMENTS @ RATED OUTPUT OF 17,500 LBS FOR 60 HR. WEEK.
COLD WATER @ 50°F	1500 GPM	583 GPM
HOT WATER @ 180°F	2350 GPM	875 GPM
SEWAGE	3750 GPM	1458 GPM
STEAM @ 125 PSI FOR EQUIP.	2214 LBS/HR	2214 LBS/HR
STEAM @ 125 PSI FOR HEATING **	360 LBS/HR	360 LBS/HR
STEAM @ 125 PSI FOR GEN. OR H.W.	2774 LBS/HR	1079 LBS/HR
AIR @ 85 PSI	7.4 CFM	7.4 CFM
ELECTRIC LOAD (CONNECTED)	69.4 KW	69.4 KW

** OMIT IN TROPIC

MECHANICAL NOTES

1. OMIT ALL RADIATORS & CONNECTING PIPING IN TROPIC ZONE.
2. ALL STEAM OPERATED LAUNDRY EQUIPMENT COMES WITH ITS OWN STEAM TRAP.
3. ALL OUTSIDE STEAM & RETURN LINES & ALL EXPANSION LOOPS, INSIDE OR OUTSIDE THE BUILDING SHALL BE FABRICATED USING BEVELED ENDS & WELDING FITTINGS. EXPANSION LOOPS FOR 2" & UNDER IN DIA. SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING WELDING FITTINGS.
4. RADIATION IS SUFFICIENT TO MAINTAIN 40° INSIDE TEMPERATURE WHEN LAUNDRY EQUIPMENT IS IDLE AND OUTSIDE TEMPERATURE IS -20°F
5. ALL ROOF EXHAUST VENTILATORS ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATS SET TO OPERATE FAN WHEN ROOM TEMP EXCEEDS 75°F.
6. ALL PIPING BETWEEN THE BOILER HOUSES &c. LAUNDRY BLDGS IN THE TEMPERATE ZONE (WHERE THE TEMP FALLS BELOW 40°F) SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.
7. ALL CW, HW, STEAM & CNDS LINES INSIDE BUILDINGS TO BE FULLY INSULATED.
8. ALL CW, HW, & AIR DROPS TO BE TAKEN FROM BOTTOM OF MAINS.
9. ALL ECCENTRIC REDUCERS TO BE SWAGED NIPPLES.
10. ALL FIN TYPE RADIATORS TO BE MOUNTED 18" (MAX) ABOVE FLOOR LINE MEASURING FROM TOP OF FIN TO FLOOR.

RUN-OUT PIPE SIZES

ITEM NO.	STEAM	COND.	H.W.	C.W.	AIR
2	¾"	—	2"	2"	¾"
3	¾"	—	2"	2"	¾"
4	¾"	—	2"	2"	¾"
5	¾"	¾"	2"	2"	—
6	1¼"	¾"	—	—	¾"
7	1¼"	1¼"	—	—	¾"
8	¾"	¾"	—	—	¾"
12	¾"	¾"	2"	—	—
13	—	—	¾"	¾"	—
14	¾"	¾"	—	—	—
15	1¼"	1¼"	—	—	—
16	2"	1¼"	—	—	—
17	—	—	—	—	¾"
19	¾"	¾"	—	—	¾"
1	—	—	—	—	¾"

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	7.4 KW
RECEP. EST.	2.0 KW
POWER	60.0 KW
TOTAL	69.4 KW

1. 100W LAMPS TO HAVE 8" CONICAL SHADES.
2. ALL CIRCUIT BREAKERS TO BE 3-POLE.
3. ALL C.B. PANELS TO HAVE G-1-POLE 20 AMP BREAKERS.
4. FEEDER CONDUCTORS TO BE SIZED THRUOUT AS INDICATED AT HOME RUN ARROW.
5. SYMBOL (M) INDICATES MOTOR CONTROLLER & OVERLOAD PROTECTION FURNISHED W/EQUIPMENT EACH MOTOR SHALL BE PROVIDED W/A 30 AMP. DISC. SWITCH EXCEPT WHERE NOTED OTHERWISE.
6. ALL MOTOR TAPS SHALL BE 3/6 # 16 EXCEPT WHERE NOTED OTHERWISE.
7. CONNECTED LOAD INCLUDES THE LOADS FROM THE SHOP & STORAGE BLDG. & THE OFFICE-LOCKER ROOM BLDG.
8. ALL LAMPS TO BE 200 W W/14" DIA. FLAT SHADES, EXCEPT AS NOTED, MOUNT 9' ABOVE FL.

GENERAL NOTES

1. FOR FSN BILL OF MATERIAL - REFER TO TM 5-303 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES YARD PIPING TO BOILER HOUSE.
3. NO RIDGE VENTILATOR ON BLDG.
4. ½" HARDBOARD LINER WALLS AND CEILING W/FIBERGLASS BATT INSULATION IN CEILING - ALL ZONES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-57	FLOOR PLANS MECHANICAL & ELECTRICAL	2 OF 2
34-06	WOOD FRAME CONSTRUCTION WAREHOUSE TYPE BLDG.	1-3 OF 3
56-03	WOOD FRAME CONSTRUCTION BARRACKS TYPE BLDG	1-7 OF 7
99-98	STANDARD DETAILS	
51-97	COVERED WALKWAY DETAIL	1 OF 1
73-55	LAUNDRY - 5000 MAN	1-2 OF 2
73-59	LAUNDRY - SPEC. DETAILS	1 OF 1
73-56	LAUNDRY - 10000 MAN	1-2 OF 2

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' — NO. 1
0 50' 100' 150' — NO. 14

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

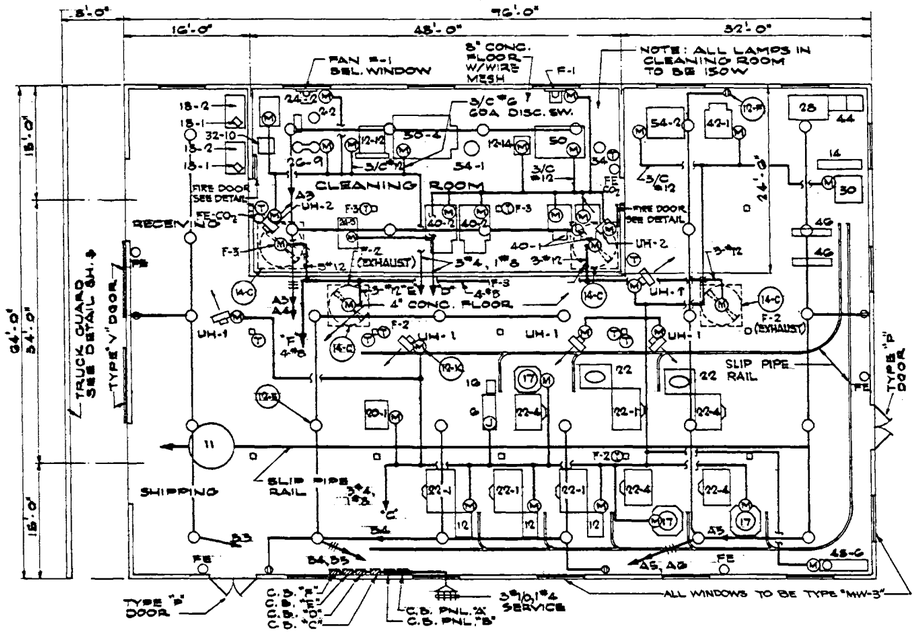
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] DATE: 19 MAR 1969
APPROVED: [signature]
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE 11 February 1969

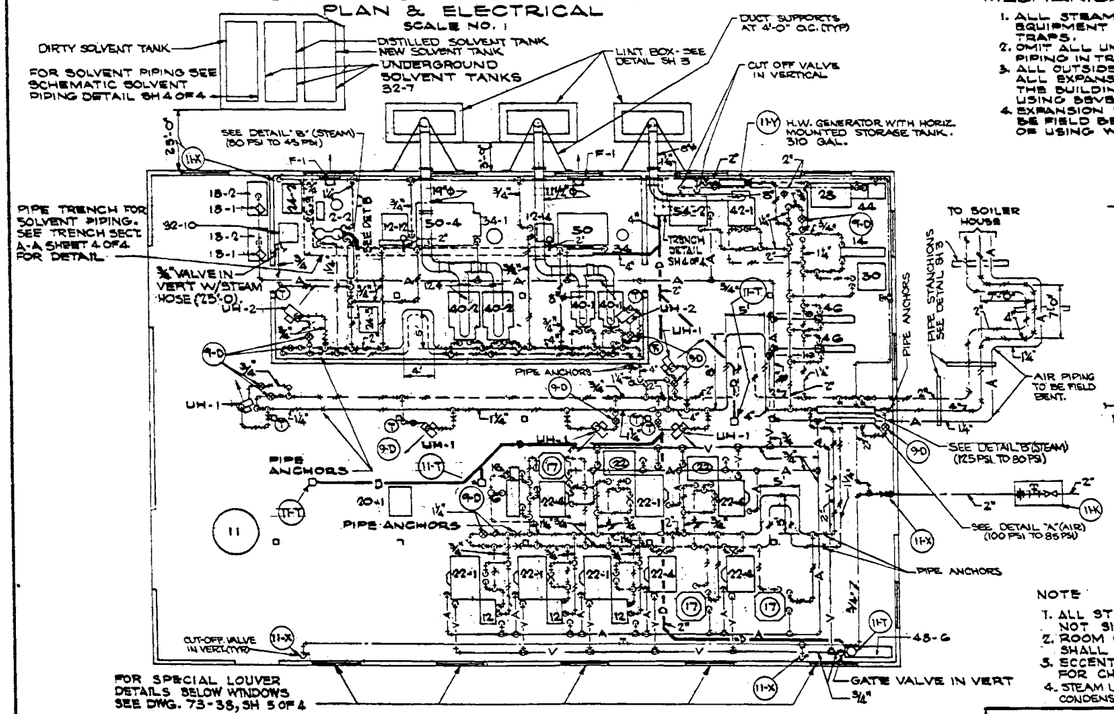
THEATER OF OPERATIONS
1000 BED HOSPITAL LAUNDRY
48' X 128'
FLOOR PLANS
17,500 LBS PER 60 HR WEEK

SCALE: AS NOTED SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 2 73-37

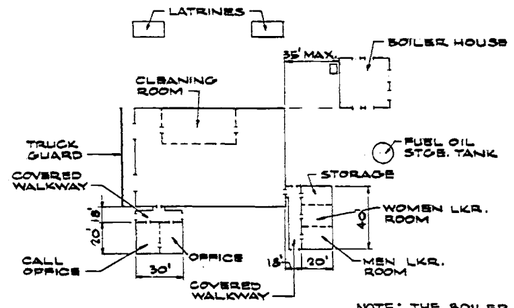
NOTE:
CLEANING ROOM TO BE LINED (WALLS, CEILING, COLUMNS, FAN HOUSINGS & KNEE BRACING) WITH ¼" ASBESTOS BOARD.



5000 MAN DRY CLEANING PLANT
PLAN & ELECTRICAL
SCALE NO. 1



5000 MAN DRY CLEANING PLANT
MECHANICAL PLAN
SCALE NO. 1



TYPICAL KEY PLAN
FOR 5000 MAN & 2500 MAN PLANTS
NO SCALE

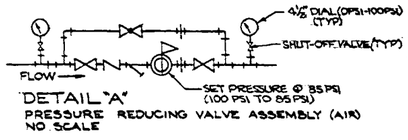
NOTE: THE BOILER HOUSE AND/OR HOUSES TO BE USED WITH THIS DRY CLEANING PLANT SHOULD BE SELECTED BASED ON THE SERVICE REQUIREMENTS SHOWN ON SHEET 2 OF 4.

SCHEDULE OF FACILITIES

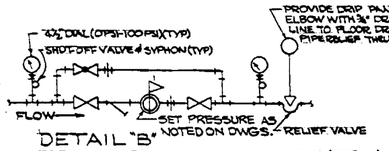
DESCRIPTION	PLANT SIZE		
	5000 MAN	2500 MAN	1000 MAN
INTERIOR ONLY (TROPICAL)	733801	733805	733805
INTERIOR ONLY (TEMPERATE -20°F)	733802	733804	733806
WD. FR. W/INTERIOR (TROPICAL)	733821	7338 23	733825
WD. FR. W/INTERIOR (TEMPERATE -20°F)	733822	7338 24	733826

MECHANICAL NOTES:

1. ALL STEAM OPERATED DRY CLEANING EQUIPMENT COMES WITH ITS OWN STEAM TRAPS.
2. OMIT ALL UNIT HEATERS & CONNECTING PIPING IN TROPIC ZONE.
3. ALL OUTSIDE STEAM & RETURN LINES & ALL EXPANSION LOOPS, INSIDE OR OUTSIDE THE BUILDING, SHALL BE FABRICATED USING BEVELED PIPE & WELDING FITTINGS.
4. EXPANSION LOOPS FOR 2" & UNDER SHALL BE FIELD BENT TO CONFIGURATION IN LIEU OF USING WELDING FITTINGS.



DETAIL "A"
PRESSURE REDUCING VALVE ASSEMBLY (AIR)
NO SCALE



DETAIL "B"
PRESSURE REDUCING VALVE ASSEMBLY (STEAM)
NO SCALE

NOTE
1. ALL STEAM SUPPLY & RETURN RUN-OUTS NOT SIZED TO BE 3/4".
2. ROOM OPERATING TEMPERATURE SHALL BE 50 DEGREES F.
3. ECCENTRIC SWAGED NIPPLES SHALL BE USED FOR CHANGING STEAM MAIN PIPE SIZES.
4. STEAM LINES DESIGNED FOR 1#/100' PRESSURE DROP AND CONDENSATE LINES DESIGNED FOR ½#/100' PRESSURE DROP.

SCHEDULE OF EQUIPMENT FURNISHED BY OTHERS

ITEM NO.	DESCRIPTION	PLANT SIZE (QUAN) 5000 MAN	2500 MAN	1000 MAN	CAPACITY	ELEC. RATING H.P.	K.W.	50 PSI STEAM LBS/HR	AIR CU. FT.@ 85 PSI
2-2	ABSORBER, MOISTURE FOR 250 GPH STILL	1	–	–					
2-3	ABSORBER, MOISTURE FOR 125 GPH STILL	–	1	–					
2-4	ABSORBER, MOISTURE FOR 55 GPH STILL	–	–	1					
6	FINISHING BOARD	1	1	1			* 1	20	
11	SORTING REEL 62" DIA.	1	1	1					
12	PRESS, TROUSER	3	–	–		½	*	40	.05
12-4	FILTER, D.C. SOLVENT	–	–	1	3000 GPH	2			
12-12	FILTER, D.C. SOLVENT	1	–	–	10000 GPH	5			
12-13	FILTER, D.C. SOLVENT	–	1	–	5000 GPH	3			
12-14	FILTER, D.C. SOLVENT	1	1	1	2000 GPH	1½			
14	TROUSER FORMER, DOUBLE FORM	1	1	1				40	
16	PUFF IRON, MUSHROOM & DOUBLE HEAD TYPE	1	1	1				35	
17	FINISHING FORM ADJUSTABLE	3	1	–		¼	*	40	.05
18-1	MARKING MACHINE	2	2	1					.05
18-2	TABLE FOR MARKING MACHINE 32"L X 25"W	2	2	1					
20-1	SEWING MACHINE, GENERAL	1	1	1		1/3	**		
22	PRESS, DRY CLEANING	2	1	1				28	.275
22-1	PRESS, TROUSER	4	2	1				33	.519
22-4	PRESS, UTILITY	4	2	2				33	.275
24-2	PUMP, SOLVENT	1	–	–	900 GPM	5			
24-3	PUMP, SOLVENT	–	1	–	500 GPM	2			
24-4	PUMP, SOLVENT	–	–	1	350 GPM	1/2			
26-8	STILL, VACUUM	–	–	1	500 GPH	1/3		100	
26-9	STILL, VACUUM	1	1	–	2000 GPH	1		397	
28	TABLE, WET CLEANING 30"X80"	1	1	1	SEE DETAIL SHEET 4	(FIELD FABRICATED)			
30	CABINET, DRYING	1	1	1		3	*	150	
32-7	TANK, SOLVENT, UNDERGROUND	3	–	–	1000 GAL				
32-8	TANK, SOLVENT, UNDERGROUND	–	3	–	550 GAL				
32-9	TANK, SOLVENT, UNDERGROUND	–	–	3	275 GAL				
32-10	TANK, SOLVENT, ABV GROUND	1	1	1	200 GAL				
34	TRAP, BUTTON (SEE ITEM NO. 30)	1	1	1					
34-1	TRAP, BUTTON (SEE ITEM NO. 30-4)	1	1	1					
40-1	TUMBLER, DRYING	2	1	2	55 LB	1/3-3/4		150	
40-2	TUMBLER, DRYING	2	1	–	100 LB	2 - 3		230	
42-1	TUMBLER, DRYING	1	1	–	40 LB	1/3-3/4		150	
42-2	TUMBLER, DRYING	–	–	1	9 LB	1/3-1/3	**5		
44	TUB, LAUNDRY, 2 COMP., STL.	1	1	1					
46	SPOTTING BOARD UNIT	2	1	1				35	
48-6	AIR VACUUM UNIT	1	–	–	15-20 PRESS.	2			
48-7	AIR VACUUM UNIT	–	1	1	6 PRESS.	1			
50	WASHER - EXTRACTOR	1	1	1	30 LB	1-3			0.20
50-4	WASHER - EXTRACTOR	1	–	–	280 LB	5-15			0.90
50-5	WASHER - EXTRACTOR	–	1	–	100 LB	2-7½			0.90
50-6	WASHER - EXTRACTOR	–	–	1	70 LB	1½-5			0.80
54-2	WASHER - EXTRACTOR	1	1	–	50 LB	2-3			0.10
54-3	WASHER - EXTRACTOR	–	–	1	10-12 LB	⅓-⅓	*		
	BASKET, W/CASTERS	5	5	5	5 BU				
	BASKET, W/CASTERS	–	–	5	12 BU				
	BASKET, W/CASTERS	12	7	–	18 BU				
	LOCKERS, STL., 18"W X 24"D	18	9	5					
24-5	ROTARY SERVICE PUMP	1	1	1	90 GPM	5			

*115V 1Ø; **115/230 OR 120/240 V. 1 Ø
(ELECTRICAL CHARACTERISTICS NOT OTHERWISE NOTED ARE 220V. 3 Ø)

NOTES:
PROVIDE AN EXPANSION JOINT BETWEEN THE 4" CONC. FLOOR SLAB & 8" CONC FLOOR SLAB AND ALONG THE PERIMETER WALL FOOTING.
2. THE WASHER-EXTRACTOR FOUNDATIONS SHALL BE PROVIDED WITH A CONTINUOUS FLEXIBLE EXPANSION JOINT WHICH EFFECTIVELY ISOLATES THEM FROM THE FLOOR SLAB.
3. WHEN A DRY CLEANING PLANT IS CONSTRUCTED IN CONJUNCTION WITH A LAUNDRY PLANT, THE BOILER PLANT, THE CALL OFFICE, AND THE ADMINISTRATIVE OFFICE WILL NOT BE REQUIRED FOR THE DRY CLEANING PLANT. UTILITIES REQUIRED BY THE DRY CLEANING PLANT CAN BE SUPPLIED BY THE LAUNDRY BOILER PLANT AND ADEQUATE SPACE HAS BEEN PROVIDED IN LAUNDRY PLANS TO ABSORB THE ADMINISTRATIVE REQUIREMENTS OF THE DRY CLEANING PLANT.

NOTES:
1. FOR FSN BILL OF MATERIAL - REFER TO TM 5-305 BY FACILITY NUMBER.
2. BILL OF MATERIAL FOR INTERIOR INCLUDES SUFFICIENT MATERIAL FOR SUPPORT BUILDING AND VAPED. PIPING TO BOILER HOUSE.
3. CIRCUIT BREAKERS PROTECTING THE BRANCH CIRCUITS TO THE DRY CLEANING ROOM SHALL BE FURNISHED WITH AN ATTACHMENT FOR PADLOCKING IN OFF POSITION.

EQUIPMENT FOUNDATION WASHER - EXTRACTOR

ITEM NO.	SIZE	DESCRIPTION
50	30#/CAP.	2'-4"X 7'-8" X 2'-6" DEEP
50-4	280#/CAP.	10'-0"X 12'-10"X 4'-6" DEEP
50-5	100#/CAP.	7'-10¼"X 9'-8¼"X 5'-0" DEEP
50-6	70#/CAP.	6'-7½"X 9'-5½"X 2'-6" DEEP
54-2	50#/CAP.	5'-0"X 6'-8"X 2'-6" DEEP

REINFORCEMENT OF EQUIP. FDN. IS TO BE SIMILAR TO DETAIL ON DWG. 73-39 SHEET 10 OF 1.

CAPACITY OF DRY CLEANING PLANTS (20 MINUTE CLEANING CYCLE)

SIZE FACILITY	LBS CLOTHES PER HOUR
5000 MAN	620 #/HR
2500 MAN	260 #/HR
1000 MAN	200 #/HR

QUANTITIES OF DRY CLEANING WORK PER PERSON PER WEEK INCL STATION COMPLEMENT FOR THE TROPICAL ZONE IS 3/4 LB AND THE TEMPERATE ZONE IS 2½ LBS.

NOTES:
1. UNIT HEATERS TO BE MOUNTED 9'-0" ABOVE FLOOR. (TYP.)
2. TUMBLER EXHAUST DUCTS TO RUN DIRECTLY UNDER RAFTERS AND SLOPE DOWN TO LINT BOX. (TYP.)
3. TUMBLER EXHAUST DUCTS TO HAVE FLANGED CONNECTIONS FOR CLEANOUT PURPOSES. (TYP.)
4. HOT WATER STORAGE TANKS AND HOT WATER GENERATORS SHALL BE INSULATED W/2" MAGNESIUM BLOCKS W/½" HARD FINISH COAT.

ELECTRICAL NOTES

CONNECTED LOAD

PLANT SIZE	5000 MAN	2500 MAN	1000 MAN
LIGHTING	7.7 KW	6.5 KW	5.5 KW
RECEP. EST.	1.8 KW	1.8 KW	1.8 KW
POWER	78.2 KW	49.7 KW	38.6 KW
TOTAL	89.7 KW	58.0 KW	45.9 KW

1. ALL LAMPS TO BE 200W W/14" DIA. FLAT SHADES, EXCEPT AS NOTED.
2. 150W LAMPS TO HAVE 14" DIA. FLAT SHADES.
3. 100W LAMPS TO HAVE 8" CONICAL SHADES.
4. UNLESS OTHERWISE SHOWN ON DWGS THE WIRING TO BE #14 RUBBER COVERED CONDUCTORS INSTALLED EXPOSED ON INSULATORS.
5. ALL WIRING IN THE CLEANING ROOM SHALL BE IN ½" CONDUIT WITH WRENCH TIGHT THREADED FITTINGS. FIXTURES SHALL BE EXPLOSION PROOF AND THE E-P SEALING FITTINGS PLACED AT THE WALLS WHERE THE CONDUIT ENTERS THEREFROM.
6. ALL C. D. PANELS TO HAVE 6 1-P 15 AMP BREAKERS.
7. FEEDER CONDUCTORS TO BE SIZED THRU OUT AS INDICATED AT HOME RUN ARROW.
8. SYMBOL (11Y) INDICATES MOTOR, CONTROLLER & OVERLOAD PROTECTION FURNISHED W/ EQUIP. EACH MOTOR SHALL BE PROVIDED WITH A 50 AMP DISC. SW EXCEPT WHERE NOTED OTHERWISE.
9. CONNECTED LOAD INCLUDES THE LOADS OF THE SHOP & STOR. BLDG. & THE OFFICE ROOM BLDG.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-38	FLOOR PLANS & SCHED.	1 OF 4
73-38	FLOOR PLANS & SCHED.	2 OF 4
73-38	PLANS & DETAILS	3 OF 4
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDG.	1-3 OF 3
31-97	COV. WALKWAY DET.	1 OF 1
99-98	STANDARD DETAILS	-
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDG.	1-7 OF 7
34-18	WINDOW & DOOR DETAILS	1, 2 OF 2
73-38	SPECIAL DETAILS	4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C. W. DEICHMANN

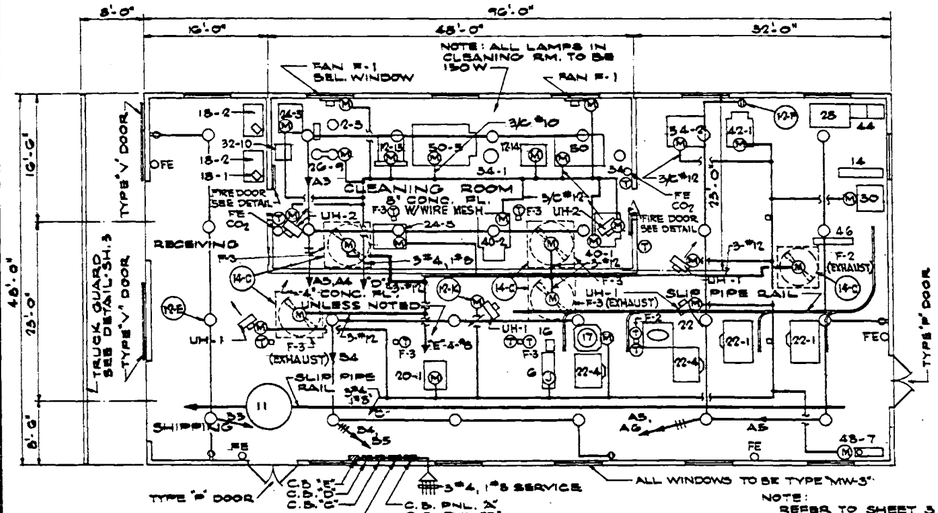
APPROVED: [signature] DATE: 28 MAR 1969
CHIEF, OTSCOSBO BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: [signature] Chief of Staff
DATE 11 February 1969

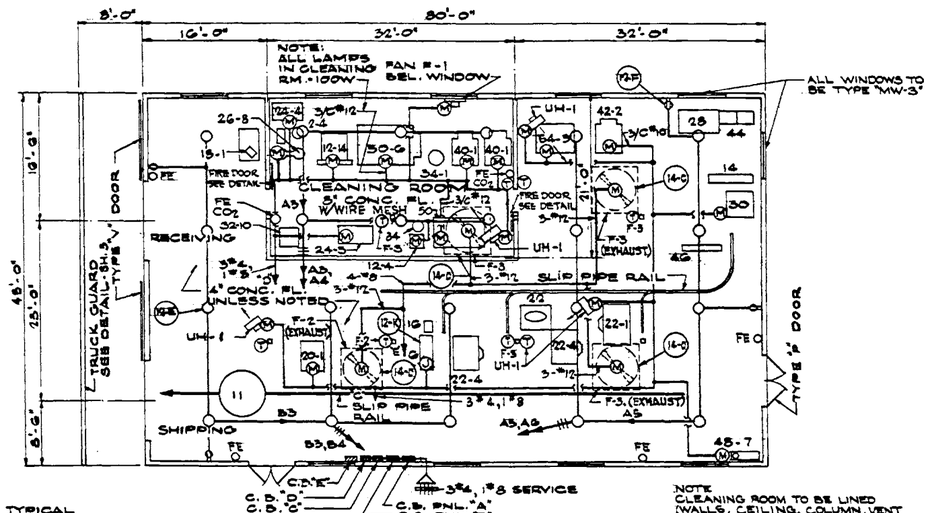
THEATER OF OPERATIONS
DRY CLEANING PLANTS
5000 MAN - 64'X96'
2500 MAN - 48'X96'
1000 MAN - 48'X80'
PLANS AND SCHEDULES

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 73-38
SHEET 1 OF 4

CORPS OF ENGINEERS

U. S. ARMY

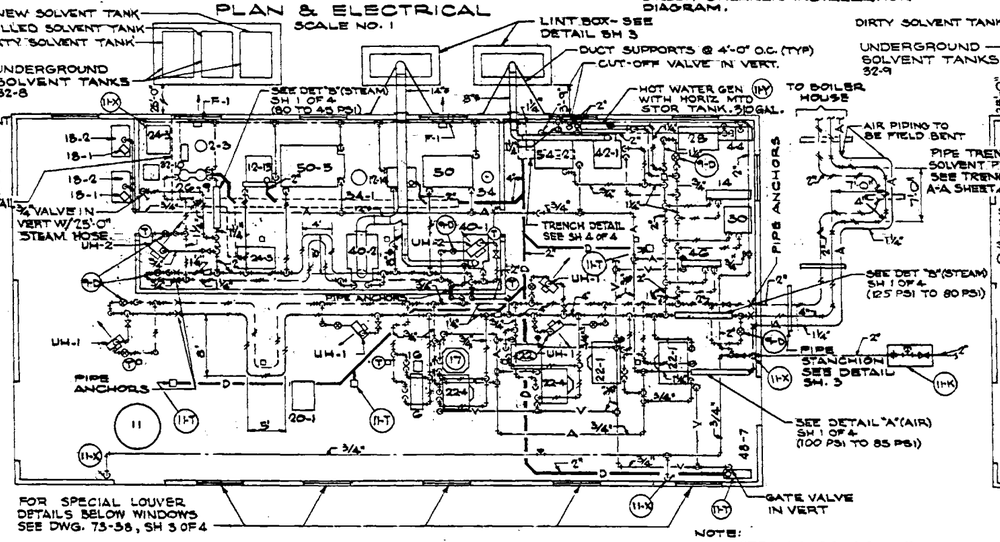




NOTE: REFER TO SHEET 3 FOR TYPICAL CIRCUIT BREAKER INSTALLATION DIAGRAM.

NOTE: CLEANING ROOM TO BE LINED (WALLS, CEILING, COLUMNS, VENT FAN HOUSINGS & KNEE BRACING) WITH 1/4" ASBESTOS BOARD IN 2500 & 1000 MAN DRYCLEANERS.

PLAN & ELECTRICAL
SCALE NO. 1

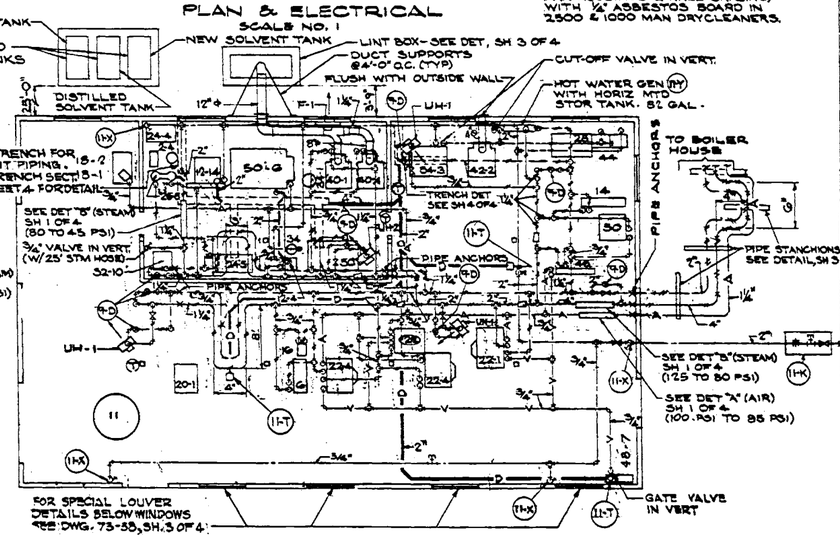


MECHANICAL PLAN
SCALE NO. 1

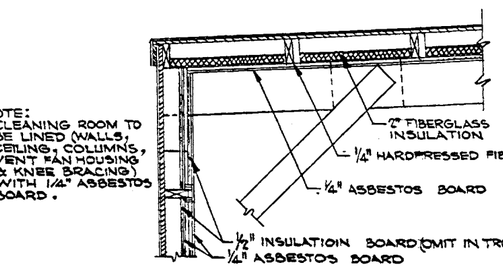
NOTE:
1. ALL STEAM SUPPLY & RETURN RUN-OUTS NOT SIZED TO BE 3/4".
2. ROOM OPERATING TEMPERATURE SHALL BE 50 DEGREES F.
3. ECCENTRIC SWAGED NIPPLE SHALL BE USED FOR CHANGING STEAM MAIN PIPE SIZES.
4. STEAM LINES DESIGNED FOR 1#/100' PRESS. DROP AND CNDS LINES FOR 3/4#/100' PRESSURE DROP.

PLANS - 2500 MAN DRYCLEANING PLANT
FOR TYPICAL KEY PLAN SEE DWG. 73-38, SH. 1 OF 4

PLANS - 1000 MAN DRYCLEANING PLANT

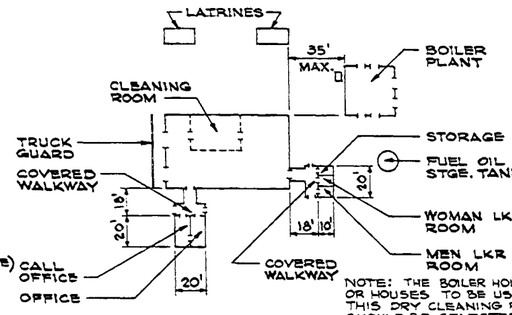


MECHANICAL PLAN
SCALE NO. 1



NOTE: CLEANING ROOM TO BE LINED (WALLS, CEILING, COLUMNS, VENT FAN HOUSING & KNEE BRACING) WITH 1/4" ASBESTOS BOARD.

TYPICAL WALL & CEILING DETAIL FOR CLEANING ROOM
NOT TO SCALE



NOTE: THE BOILER HOUSE AND/OR HOUSES TO BE USED WITH THIS DRY CLEANING PLANT SHOULD BE SELECTED BASED ON THE SERVICE REQUIREMENTS SHOWN ON THIS SHEET.

KEY PLAN
1000 MAN DRYCLEANING PLANT
NO SCALE

SERVICE REQUIREMENTS

DESCRIPTION	5000 MAN	2500 MAN	1000 MAN
COLD WATER	474 GPH	474 GPH	128 GPH
HOT WATER @ 180°F	171 GPH	171 GPH	57 GPH
SEWAGE	645 GPH	645 GPH	185 GPH
STEAM @ 80 PSI FOR HEATING	419 LB/HR	360 LB/HR	277 LB/HR
STEAM @ 80 PSI FOR HOT WATER GENERATOR	288 LB/HR	288 LB/HR	91 LB/HR
STEAM @ 80 PSI FOR EQUIPMENT	2192 LB/HR	1397 LB/HR	807 LB/HR
ELECTRIC LOAD (CONNECTED)	89.7 KW	58.0 KW	45.9 KW
COMPRESSED AIR @ 85 PSI	6 CFM	4 CFM	3 CFM

UNIT HEATER SCHEDULE

MARK	QUANTITY 5000 MAN	2500 MAN	1000 MAN	BTU/HR. @ 80 PSI STEAM
UH-1	5	4	3	75,880
*UH-2	2	2	1	75,880

*UH-2 TO BE EXPLOSION-PROOF.

FAN SCHEDULE

MARK	QUANTITY 5000 MAN	2500 MAN	1000 MAN	CFM	HP
F-1	2	2	1	700	1/6
F-2	2	1	1	30000	5
F-3	2	4	3	9,800	1

RUN-OUT PIPE SIZE

ITEM NO	STEAM	CNDS	CW	HW	AIR	SOLVENT SUPPLY	SOLVENT RETURN	VACUUM
2-2	–	–	–	–	–	–	–	–
2-3	–	–	–	–	–	–	–	–
2-4	–	–	–	–	–	–	–	–
6	3/4	3/4	–	–	–	–	–	–
11	–	–	–	–	3/4	–	–	–
12	3/4	3/4	–	–	–	–	–	–
12-4	3/4	–	3/4	–	–	1 1/4	1 1/4	–
12-12	3/4	–	3/4	–	–	4	4	–
12-13	3/4	–	3/4	–	–	2	2	–
12-14	3/4	–	3/4	–	–	2	2	–
14	3/4	3/4	–	–	–	–	–	–
16	3/4	3/4	–	–	–	–	–	–
17	3/4	3/4	–	–	3/4	–	–	–
18-1	–	–	–	–	3/4	–	–	–
18-2	–	–	–	–	–	–	–	–
20-1	–	–	–	–	–	–	–	–
22	3/4	3/4	–	–	3/4	–	–	3/4
22-1	3/4	3/4	–	–	3/4	–	–	3/4
22-4	3/4	3/4	–	–	3/4	–	–	3/4
24-2	–	–	–	–	–	–	–	–
24-3	–	–	–	–	–	–	–	–
24-4	–	–	–	–	–	–	–	–
26-8	1 1/4	3/4	3/4	–	–	3/4	1 1/4	–
26-9	1 1/4	3/4	1 1/4	–	–	3/4	2	–
28	–	–	–	–	–	–	–	–
30	1 1/4	3/4	–	–	–	–	–	–
32-7	–	–	–	–	–	4	4	–
32-8	–	–	–	–	–	2	2	–
32-9	–	–	–	–	–	1 1/4	1 1/4	–
32-10	–	–	–	–	–	–	–	–
34	–	–	–	–	–	–	–	–
34-1	–	–	–	–	–	–	–	–
40-1	1 1/4	3/4	–	–	–	–	–	–
40-2	1 1/4	1 1/4	–	–	–	–	–	–
42-1	1 1/4	3/4	–	–	–	–	–	–
42-2	–	–	–	–	–	–	–	–
44	–	–	3/4	3/4	–	–	–	3/4
46	3/4	3/4	–	–	–	–	–	3/4
48-6	–	–	–	–	–	–	–	3/4
48-7	–	–	–	–	–	–	–	3/4
50	3/4	–	–	–	3/4	1 1/4	1 1/4	–
50-4	3/4	–	–	–	3/4	4	2	–
50-5	3/4	–	–	–	3/4	2	2	–
50-6	3/4	–	–	–	3/4	2	2	–
54-2	3/4	–	2	2	3/4	–	–	–
54-3	3/4	–	2	2	–	–	–	–
11-N	1 1/4	1 1/4	2	2	–	–	–	–
UH-1	3/4	3/4	–	–	–	–	–	–
UH-2	3/4	3/4	–	–	–	–	–	–

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

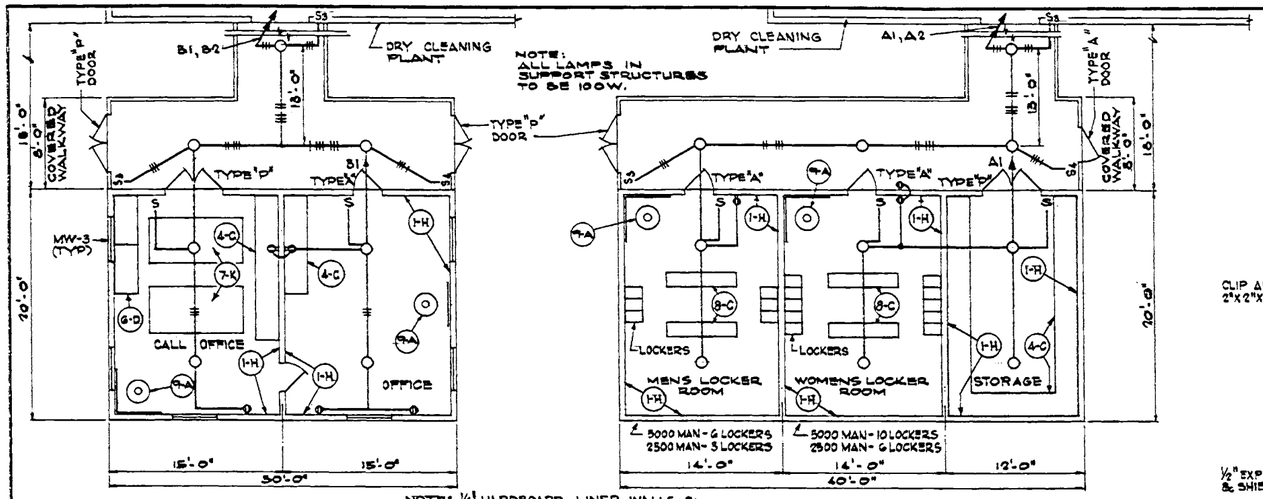
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, J/ TECHNICS BRANCH

THEATER OF OPERATIONS
DRY CLEANING PLANTS
5000 MAN - 69'X96'
2500 MAN - 48'X96'
1000 MAN - 48'X80'
PLANS AND SCHEDULES

APPROVED: [signature] DATE: 1 9 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: [signature] DATE 11 February 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-38
SHEET 2 OF 4



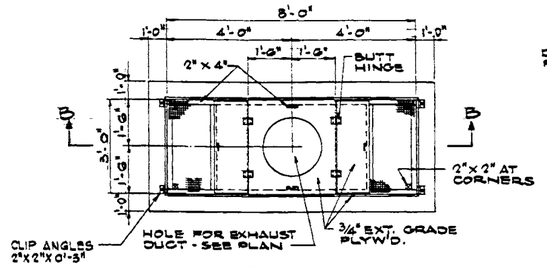
NOTE: ½" HARDBOARD LINER WALLS & CEILING W/ 3" FIBERGLASS BATT INSULATION IN CEILING - ALL ZONES.

PLAN

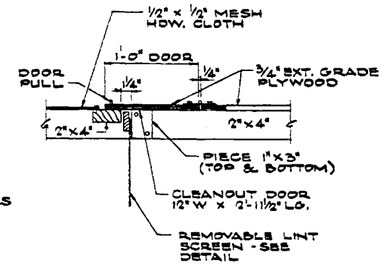
OFFICE BUILDING

PLAN

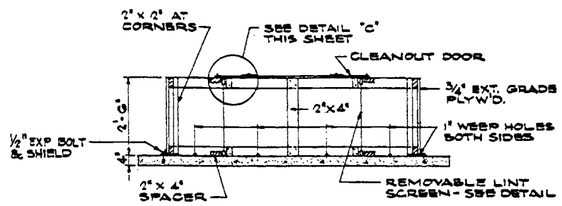
LOCKER ROOM & STORAGE BLDG.



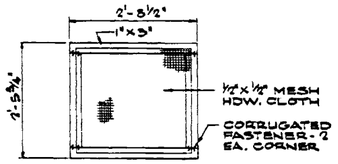
PLAN



DETAIL "C"
NOT TO SCALE

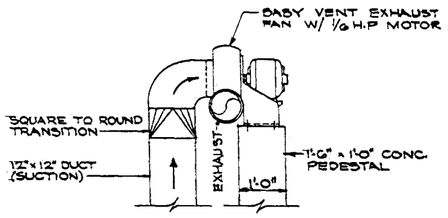


SECTION B-B

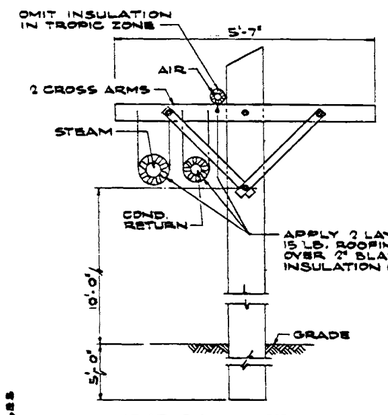


SUPPORT STRUCTURES

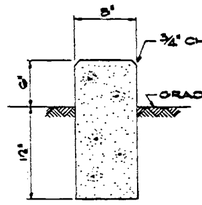
FOR 5000 MAN & 2500 MAN PLANTS
SCALE NO. 24



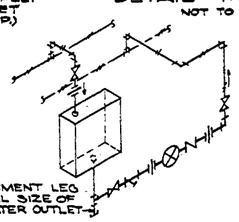
SECTION A
SCALE NO. 5



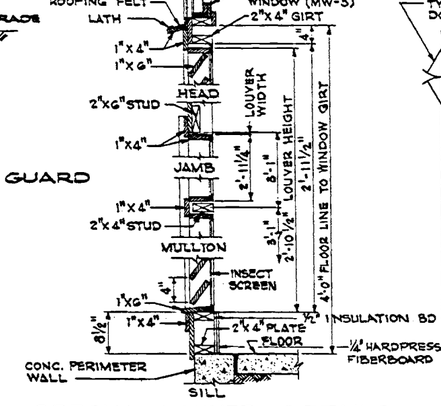
TYPICAL DETAIL OF PIPE STANCHION
NOT TO SCALE



DETAIL - TRUCK GUARD
NOT TO SCALE



UNIT HEATER CONNECTION
NO SCALE



SPECIAL LOUVER DETAILS
TEMPERATE ZONE
PRESSING DEPT. AREA
NO SCALE

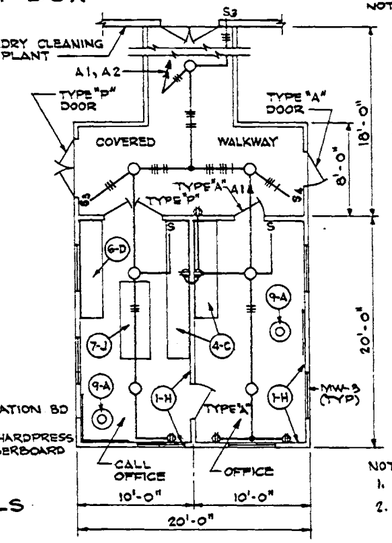
NOTE: TO CLOSE IN COLD WEATHER, INSTALL ⅝" EXT. GRADE PLYWOOD ON OUTSIDE TRIM W/1½" LG. NO. 8 W.D. SCREWS @12" CTS. & CAULK ALL CONTACT.

DETAIL OF LINT BOX

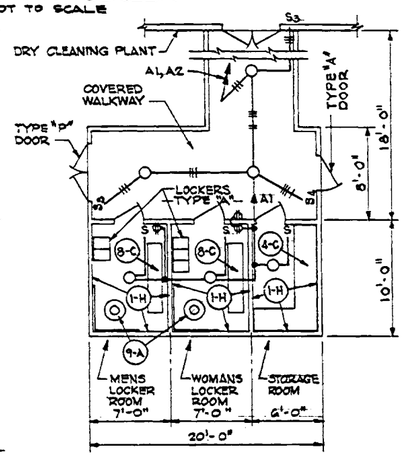
SCALE NO. 4

DETAIL - LINT SCREEN

NOT TO SCALE



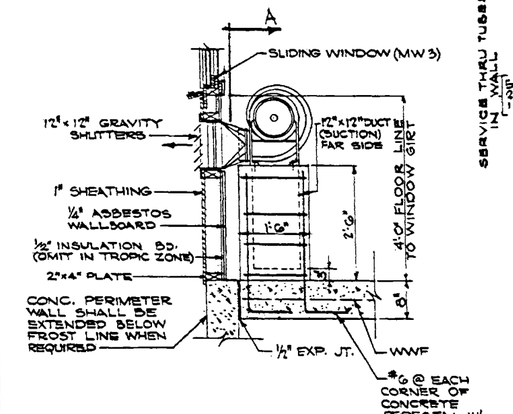
OFFICE BLDG.



LOCKER ROOM & STORAGE BLDG.

NOTE
1. ALL LAMPS IN SUPPORT STRUCTURES TO BE 100 W.
2. ½" HARDBOARD LINER WALLS & CEILING W/3" FIBERGLASS BATT INSULATION IN CEILING - ALL ZONES

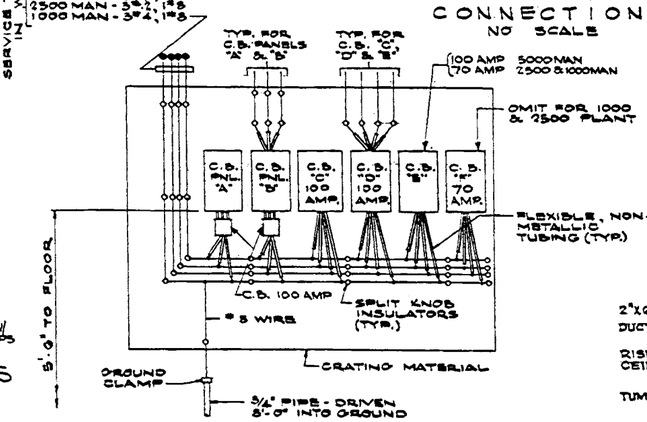
SUPPORT STRUCTURES 1000 MAN PLANT
SCALE NO. 24



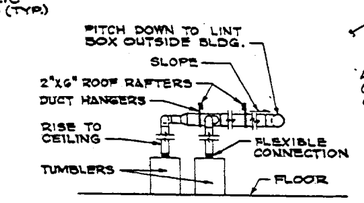
EXPLOSIVE GAS EXHAUST DETAILS

SCALE NO. 5

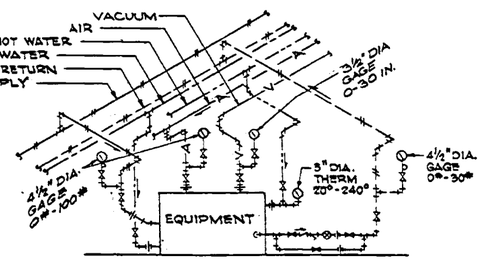
NOTE: EXPLOSIVE GAS EXHAUST FAN OCCURS ONLY AT WINDOWS DESIGNATED AS HAVING EXHAUST FANS BELOW THE WINDOW. -



TYPICAL CIRCUIT BREAKER INSTALLATION DIAGRAM
NOT TO SCALE



TYPICAL DUCT LAYOUT
FROM TUMBLERS
NO SCALE



NOTE:
ALL EQUIPMENT TRAPS TO BE PROVIDED W/VALVED BY-PASSES TO ALLOW FAST REMOVAL OF AIR AT START UP. GAGES AND THERMOMETER TO BE INSTALLED AT LAST CONNECTED PIECE OF EQUIPMENT ONLY. ALL HW, CW, AIR AND VACUUM DROPS TO BE TAKEN FROM BOTTOM OF MAINS.

TYPICAL EQUIPMENT HOOK-UP
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' — NO. 4
0 1' 2' 3' — NO. 5
0 5' 10' — NO. 24

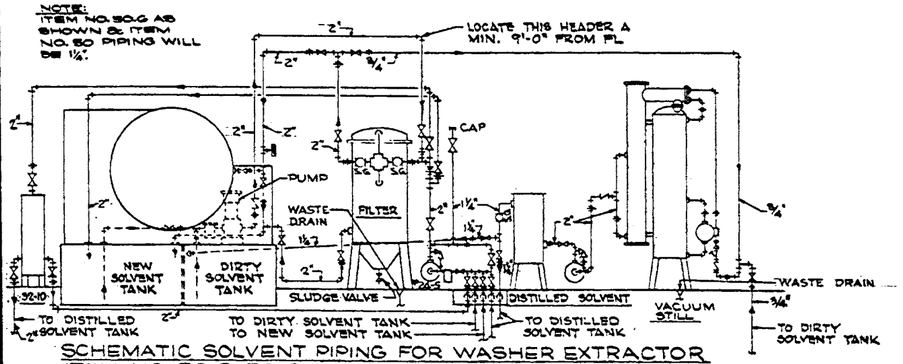
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS
DRY CLEANING PLANTS
5000 MAN - 64'X96'
2500 MAN - 48'X96'
1000 MAN - 48'X80'
PLANS & DETAILS

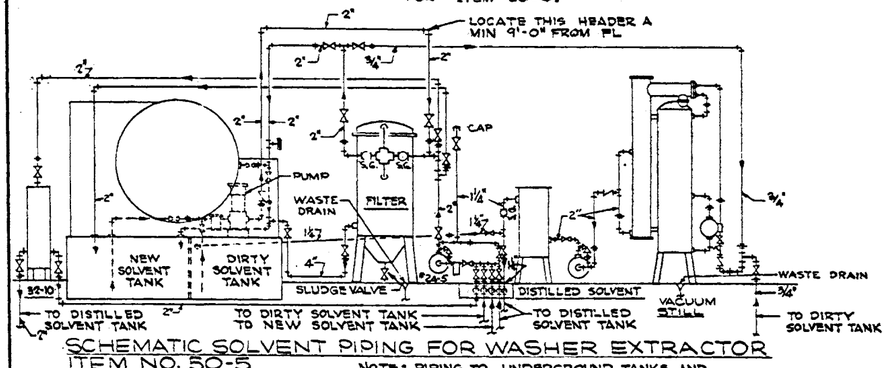
APPROVED: H. B. Jackson — DATE: 19 MAR 1959
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: Joanna R. Timmons, OCofficer — DATE: 11 February 1942
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-38
SHEET 3 OF 4



SCHEMATIC SOLVENT PIPING FOR WASHER EXTRACTOR ITEM NO. 50 & 50-6

NO SCALE

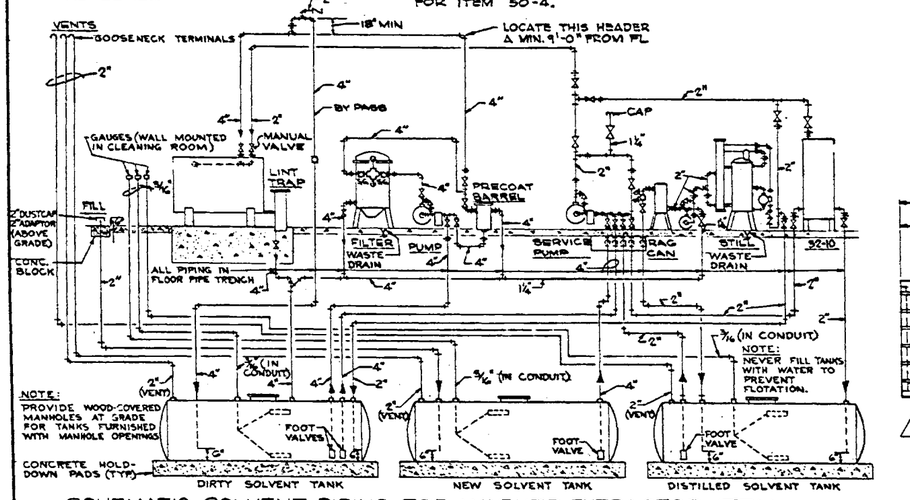
NOTE: PIPING TO UNDERGROUND TANKS AND SERVICE PUMP SIMILAR TO DETAIL FOR ITEM 50-4.



SCHEMATIC SOLVENT PIPING FOR WASHER EXTRACTOR ITEM NO. 50-5

NO SCALE

NOTE: PIPING TO UNDERGROUND TANKS AND SERVICE PUMP SIMILAR TO DETAIL FOR ITEM 50-4.

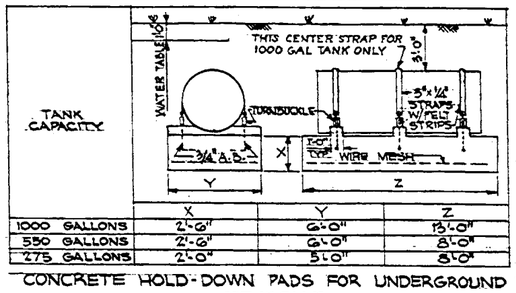


SCHEMATIC SOLVENT PIPING FOR WASHER EXTRACTOR ITEM NO. 50-4

NO SCALE

LEGEND	
	SIGHT GLASS
	GATE VALVE
	CHECK VALVE
	STRAINER (SCREWED)
	THERMOMETER
	RELIEF VALVE

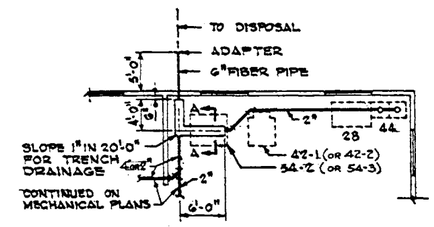
NOTE FOR HOLD DOWN PADS: CONC OR STEEL TANK SADDLE WITH DOUBLE THICKNESS 45# ROOFING FELT LEVELING PADS BETWEEN SADDLE AND TANK AND BETWEEN HOLD DOWN STRAPS AND TANK.



TANK CAPACITY	X	Y	Z
1000 GALLONS	2'-6"	6'-0"	13'-0"
550 GALLONS	2'-6"	6'-0"	8'-0"
275 GALLONS	2'-0"	5'-0"	8'-0"

CONCRETE HOLD-DOWN PADS FOR UNDERGROUND TANKS

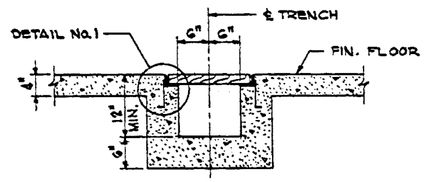
NO SCALE



TYPICAL DRAINAGE - PART PLAN

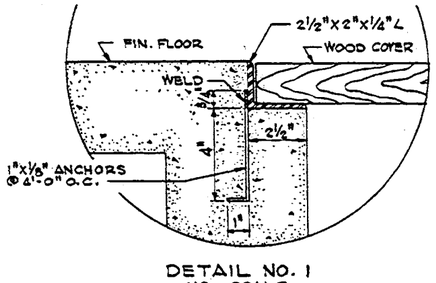
5000, 2500 & 1000 MAN

NO SCALE



SECTION A-A

NO SCALE

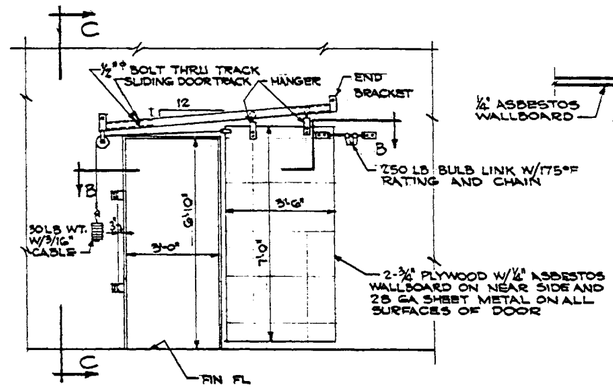


DETAIL NO. 1

NO SCALE

GENERAL EQUIPMENT NOTES

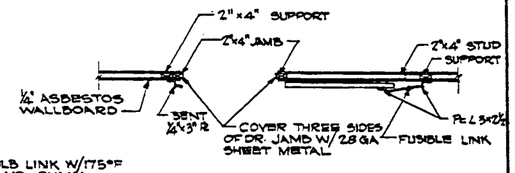
1. THE PIPING (STEAM, CONDENSATE & COMPRESSED AIR) BETWEEN THE BOILERHOUSES AND THE DRY CLEANING PLANTS IN THE TEMPERATE ZONE WHERE THE TEMPERATURE FALLS BELOW 40 DEGREES F. SHALL BE LAGGED TOGETHER IN A SINGLE COVERING.
2. ALL ROOF EXHAUST VENTILATORS ARE THERMOSTATICALLY CONTROLLED BY INDIVIDUAL THERMOSTATS SET TO OPERATE THE FANS WHEN THE ROOM TEMPERATURE EXCEEDS 75 DEGREES F.
3. THE CONTINUOUS LOUVERS ALONG THE OUTSIDE WALLS IN THE TROPICAL ZONE SHALL BE OMITTED FROM THE EXTERIOR WALL OF THE CLEANING ROOMS.
4. THE DRY CLEANING MACHINERY ANCHOR BOLTS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
5. NO RIDGE VENTILATORS WILL BE REQUIRED.
6. ALL EQUIPMENT STEAM TRAPS SHALL BE PROVIDED WITH VALVED BY-PASSES TO ALLOW FAST REMOVAL OF AIR WHEN THE EQUIPMENT IS STARTED AT THE BEGINNING OF EACH SHIFT.
7. ALL FITTINGS 1¼" OR SMALLER AND FITTINGS WITH 1¼" OR SMALLER OUTLETS SHALL BE MALLEABLE IRON.
8. ALL HOT WATER, COLD WATER, STEAM AND CONDENSATE LINES WITHIN THE BUILDINGS SHALL BE FULLY INSULATED.
9. ALL PLANT EQUIPMENT, UNIT HEATERS AND HOT WATER GENERATORS SHALL BE EQUIPPED WITH SHUT-OFF VALVES IN THE SUPPLY AND RETURN.



SELF-CLOSING SLIDING FIRE-DOOR DETAIL

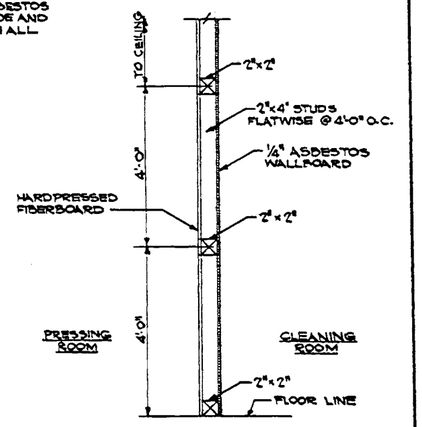
SCALE NO. 4

NOTE: FIRE-DOOR TO AUTOMATICALLY CLOSE WHEN FUSIBLE LINK MELTS AT A PREDETERMINED TEMPERATURE.



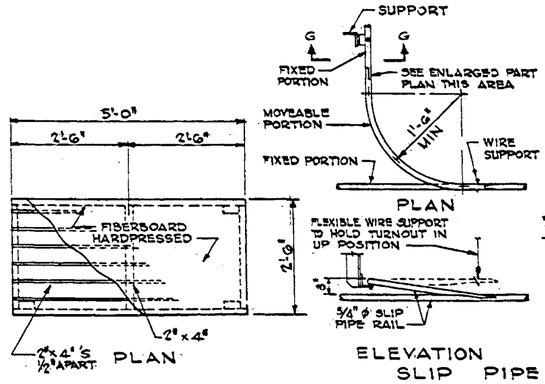
SECTION B-B

SCALE NO. 4

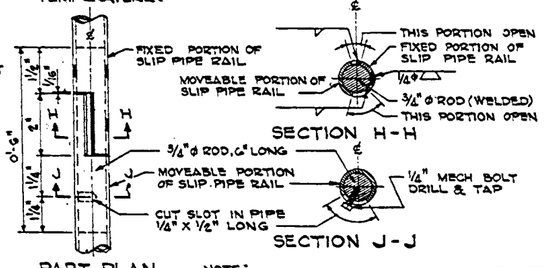


SECTION C-C

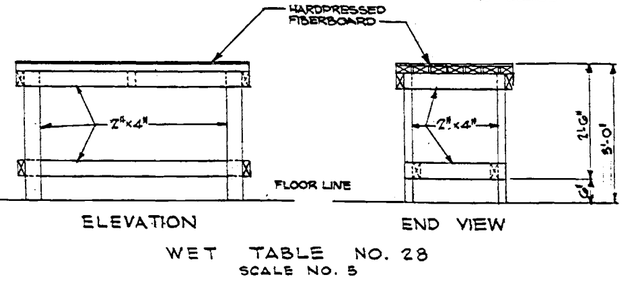
FIREWALL CONSTRUCTION DETAIL NO SCALE



NO SCALE

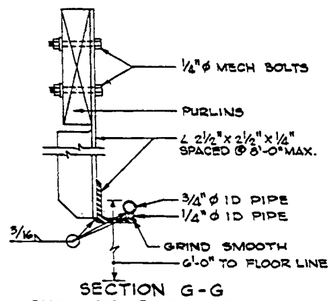


NOTE: SLIP PIPE RAIL SHALL BE GROUND SMOOTH SO HANGERS WILL SLIDE OVER ALL JOINTS FREELY.



WET TABLE NO. 28

SCALE NO. 5



SECTION G-G

SUPPORT SLIP PIPE RAIL

NO SCALE

SYMBOL	REVISIONS DESCRIPTION	DATE	APPROVAL

GRAPHIC SCALES

NO. 4: 0 1' 2' 3' 4'

NO. 5: 0 1' 2' 3'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] DATE: 15 MAR 1949
CHIEF, ARCHITECT BRANCH

THEATER OF OPERATIONS

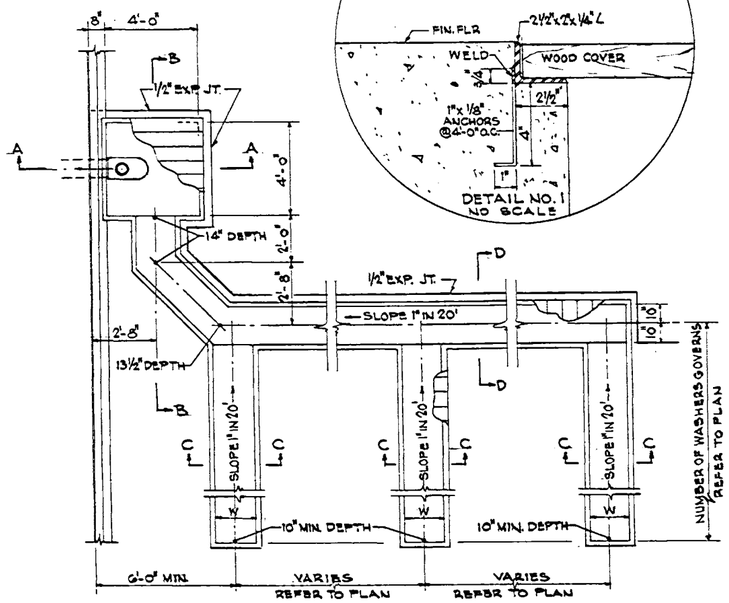
DRY CLEANING PLANTS

SPECIAL DETAILS

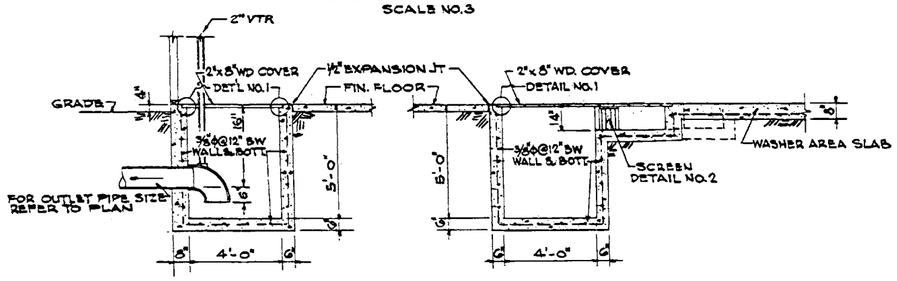
APPROVED: [signature]
CHIEF, CONSTRUCTION DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: [signature]
DATE 11 February 1949

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 4 OF 4
73-38

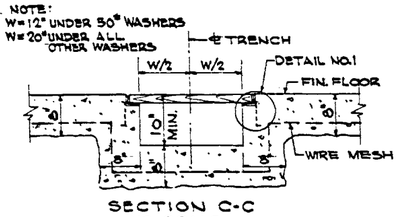


TYPICAL WASHER DRAINAGE PLAN
SCALE NO. 3

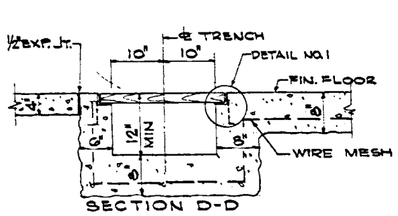


SECTION A-A
SCALE NO. 3

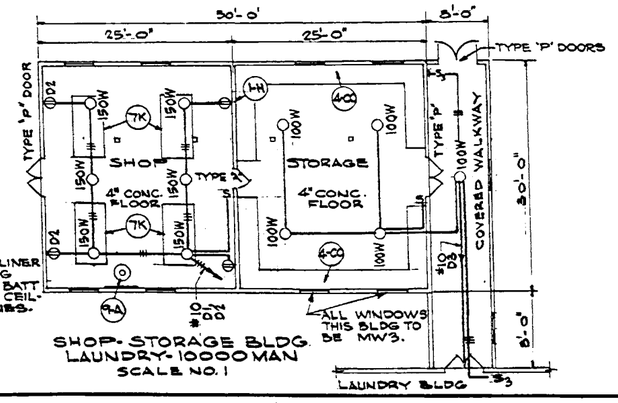
SECTION B-B
SCALE NO. 3



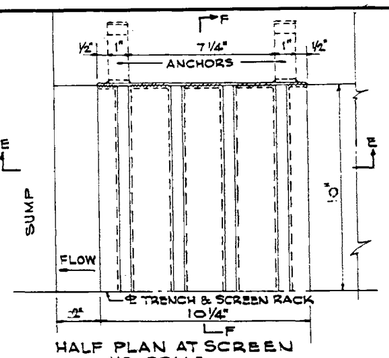
SECTION C-C
NO SCALE



SECTION D-D
NO SCALE

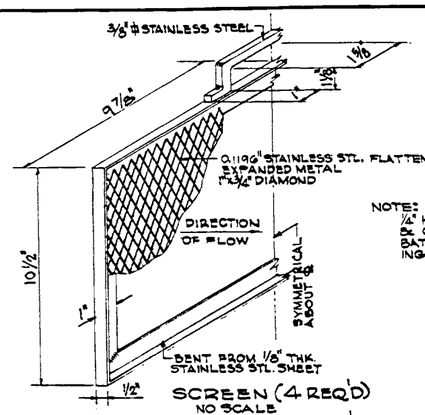


SHOP-STORAGE BLDG.
LAUNDRY-10000 MAN
SCALE NO. 1

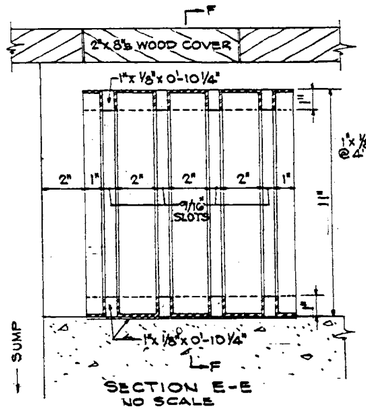


HALF PLAN AT SCREEN
NO SCALE

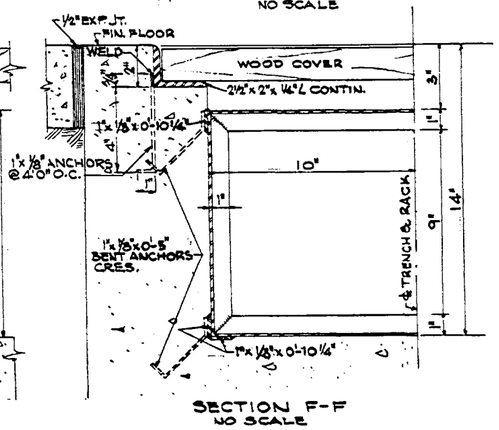
NOTE: RACK & SCREEN FRAME TO BE FIELD FABRICATED FROM ⅛" THICK STAINLESS STEEL SHEET AND FULLY WELDED.



SCREEN (4 REQ'D)
NO SCALE

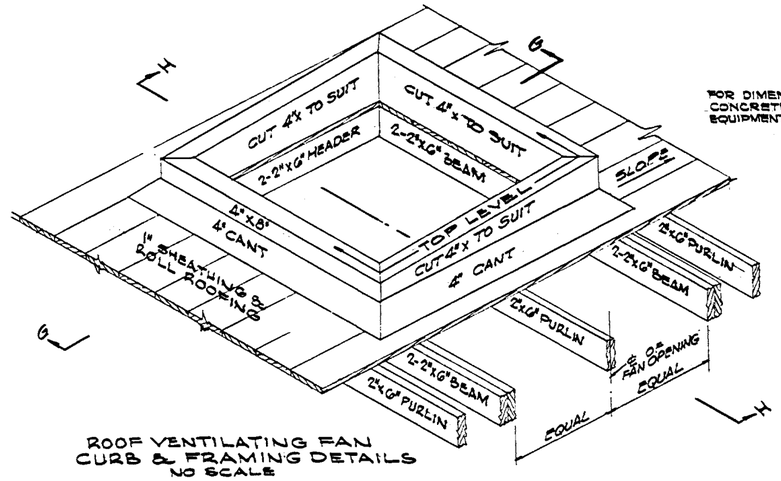


SECTION E-E
NO SCALE

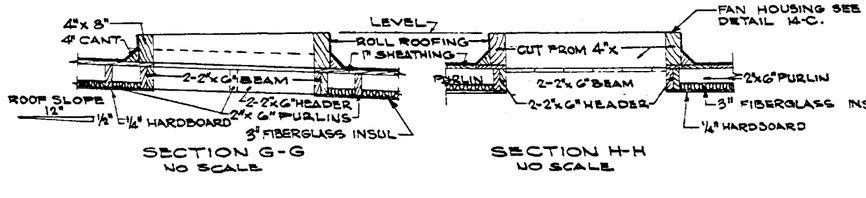


SECTION F-F
NO SCALE

WASHER TRENCH SCREEN- DETAIL NO. 2

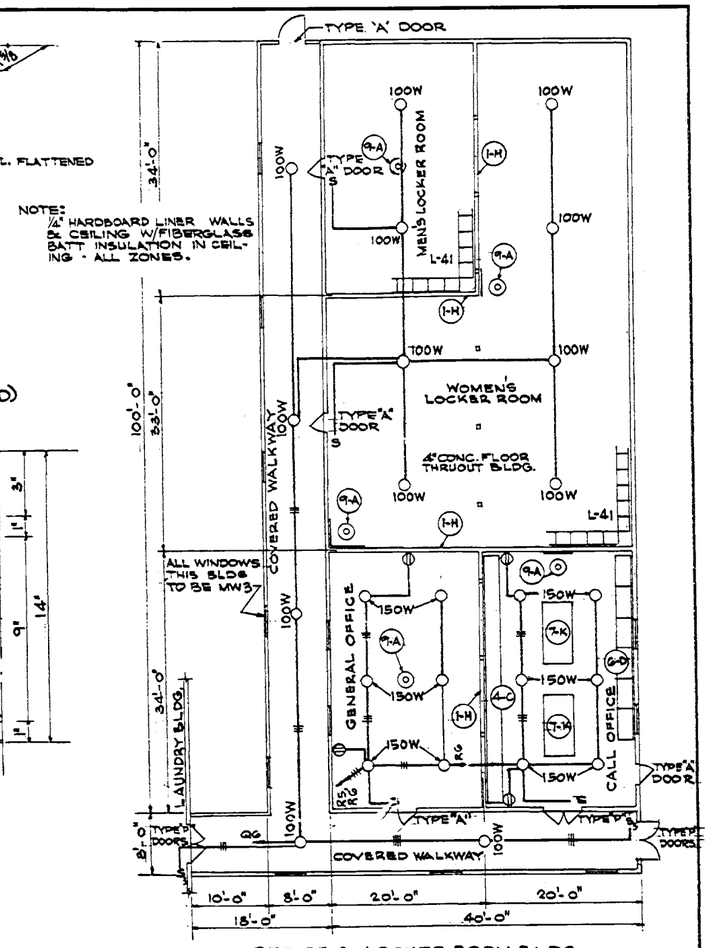


ROOF VENTILATING FAN
CURB & FRAMING DETAILS
NO SCALE



SECTION G-G
NO SCALE

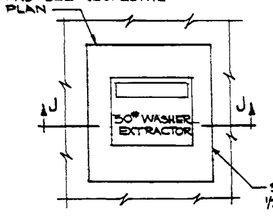
SECTION H-H
NO SCALE



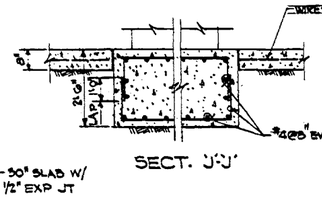
NOTE:
¼" HARDBOARD LINER WALLS & CEILING W/FIBERGLASS BATT INSULATION IN CEILING - ALL ZONES.

OFFICE & LOCKER ROOM BLDG.
LAUNDRY-10000 MAN
SCALE NO. 1

FOR DIMENSIONS OF ISOLATED CONCRETE PAD SEE RESPECTIVE EQUIPMENT PLAN



TYP. PLAN



SECT. J-J'

TYPICAL REINFORCEMENT
50# WASHER-EXTRACTOR EACH LAUNDRY
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' — NO. 1
0 1' 2' 3' 4' 5' — NO. 3

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

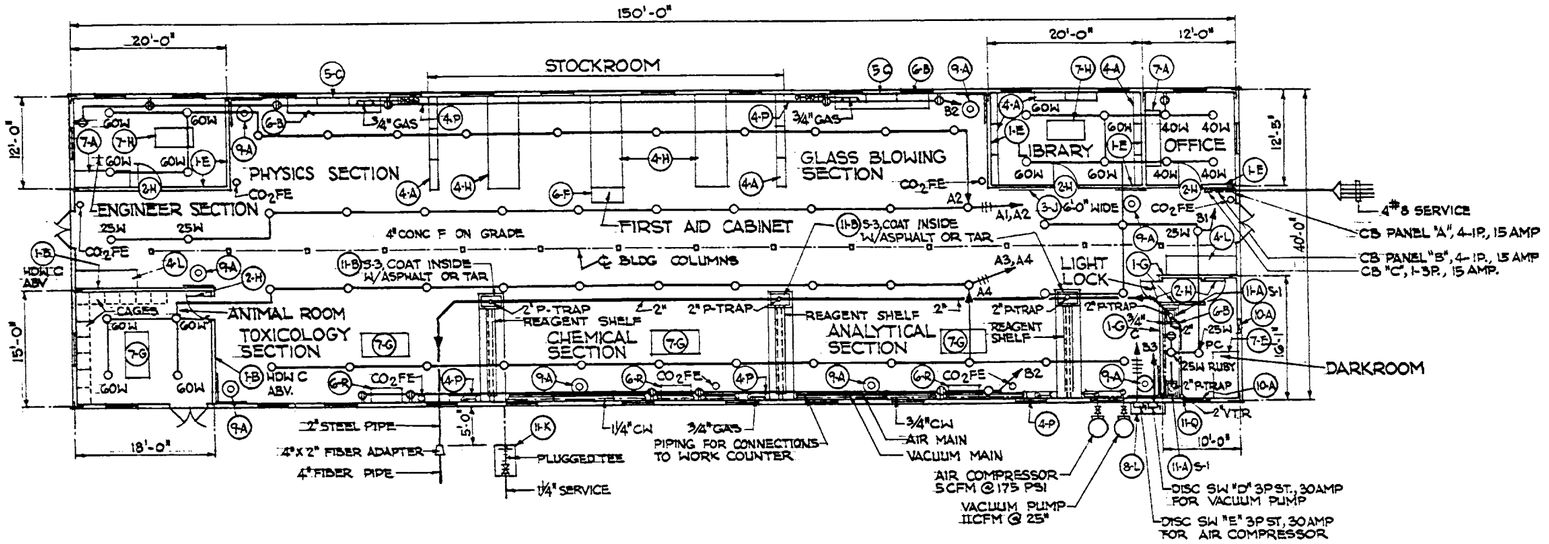
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: LOW
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, ENGINEERING BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY: [signature] DATE 11 February 1959

THEATER OF OPERATIONS

LAUNDRY

SPECIAL DETAILS

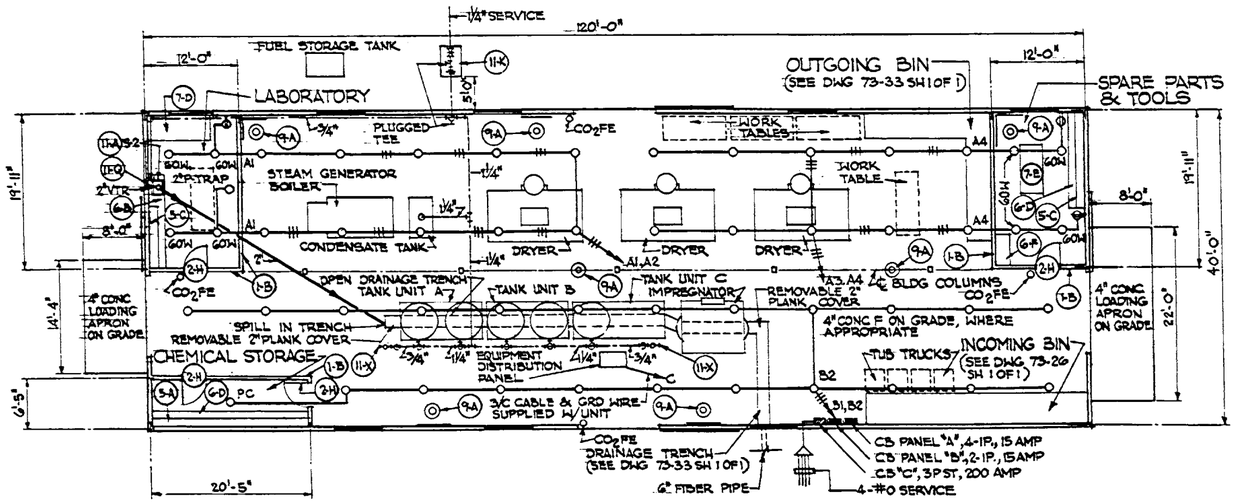
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
73-39



PLAN — CHEMICAL LABORATORY

SCALE NO 1

FACIL. NO. 754105 - INTERIOR ONLY
FACIL. NO. 754113 - STEEL FRAME W/INTERIOR
FACIL. NO. 754123 - WOOD FRAME W/INTERIOR



PLAN — CLOTHING IMPREGNATING PLANT

SCALE NO 1

FACIL. NO. 734101 - INTERIOR ONLY
FACIL. NO. 734111 - STEEL FRAME W/INTERIOR
FACIL. NO. 734121 - WOOD FRAME W/INTERIOR
FACIL. NO. 734112 - STEEL FRAME SHED W/INTERIOR
FACIL. NO. 734122 - WOOD FRAME SHED W/INTERIOR

GENERAL NOTES

1. REFER TO TM5-508 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.
3. CHEMICAL LAB. DESIGNED TO BE INSTALLED IN A BLDG. SHELL WITH AN 8' HIGH INTERIOR SUCH AS A BARRACKS TYPE BUILDING.
4. CLOTHING IMPREGNATING PLANT DESIGNED TO BE INSTALLED IN A BLDG. SHELL WITH A MIN. 12' HIGH INT. SUCH AS A WHOUSE TYPE BUILDING
5. SEE TM3-409 FOR OPERATION & MAINT. OF EQUIPMENT IN PLANT.

ELECTRICAL NOTES

CONN. LOAD-CLOTHING IMPREG.		CONN. LOAD - CHEMICAL LAB	
LIGHTING	4.78 KW	LIGHTING	5.61 KW
RECP EST.	0.48 KW	RECP EST	1.40 KW
POWER	50.00 KW	POWER	1.07 KW
TOTAL	55.18 KW	TOTAL	8.08 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100W.
2. ALL LAMPS TO HAVE 8" CONICAL SHADES.

1. UNLESS OTHERWISE NOTED ON PLAN. ALL LAMPS TO BE 100W
2. ALL 40,60,& 100W LAMPS TO HAVE 8" CONICAL SHADES

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-41	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES 0 5' 10' 15'

NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

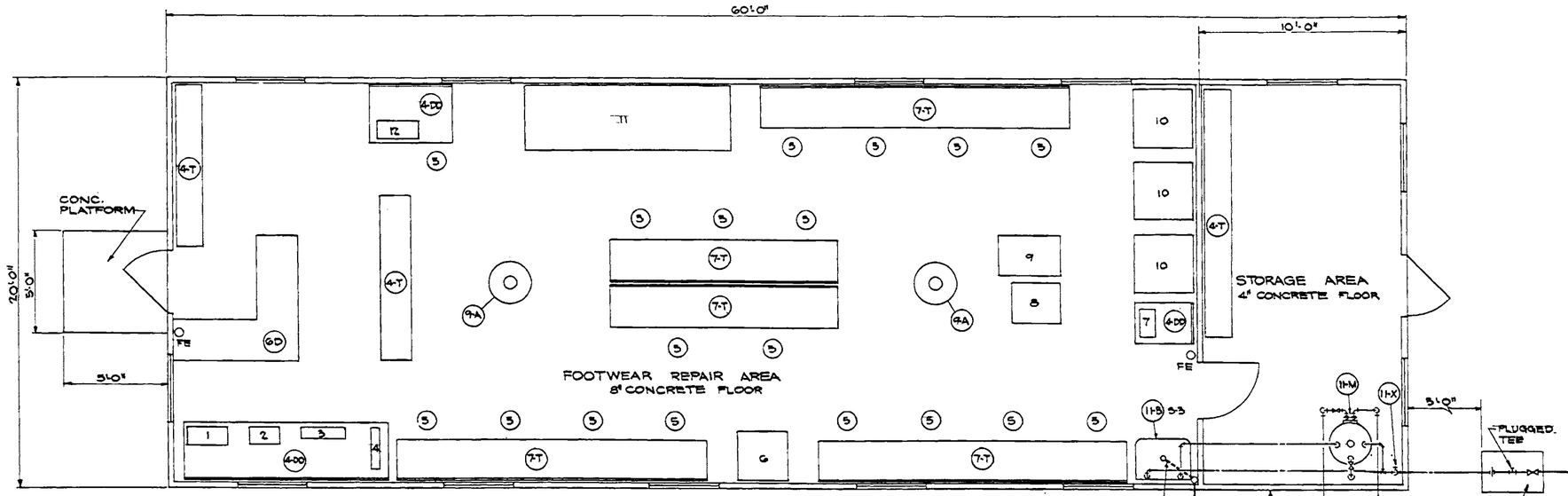
THEATER OF OPERATIONS

CHEMICAL LABORATORY 40'X150'
CLOTHING IMPREGNATING PLANT 40'X120'

DRAWN BY: MCGAVOK
TRACED BY:
CHECKED BY: J.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: F.T. Grisson — CHIEF, STRUCTURES BRANCH
APPROVED: H.M. Williams — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. — DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: AMC HQ DEV ENGR DIR — Charles N. Gam — INDIV & GEN EQUIP OFC
DATE: 15 Oct 1968 — C.N. GARDNER
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-41
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY



15001 TO 20000 MAN SHOP PLAN

SCALE NO. 3

FACILITY NO. 735103 - INTERIOR ONLY
FACILITY NO. 735113 - STEEL FRAME W/INTERIOR
FACILITY NO. 735123 - WOOD FRAME W/INTERIOR

SCHEDULE OF EQUIPMENT
(FURNISHED BY OTHERS)

ITEM NO.	DESCRIPTION	H.P. *	SHOP SIZE 5000 - 10000 MAN	10001 - 15000 MAN	15001 - 20000 MAN
1	LEATHER SKIVING MACHINE BENCH MOUNTED	1/4	1	1	1
2	LEATHER SPLITTING MACHINE - HAND OPERATED, 6" LG. BLADE	-	1	1	1
3	SOLE TRIMMING MACHINE HAND OPERATED	-	1	1	1
4	HEEL REMOVING AND REDUCING MACHINE, HAND OPERATED	-	1	1	1
5	STAND, LAST, W/LASTS, LARGE, MEDIUM, SMALL	-	10	14	18
6	SANDING AND BOTTOMING MACHINE	3/4	1	1	1
7	MACHINE, COMB, SOLE TRIMMER, CUTTER, SKIVER, WELT ROLLER		1	1	1
8	TESTER, LEAK, INSULATED BOOT	1/4	1	1	1
9	SHOEPRESS, CEMENTING MACHINE	1000 W	1	1	1
10	SHOE STITCHING MACHINE, RHEOSTAT CONTROL	1/3	2	3	3
11	SHOE FINISHING MACHINE 4 MOTORS	1-1/3 2-1/2 1-1/2	1	1	1
12	MACHINE, SHOE PATCHING BENCH MOUNTED	1/3	1	1	1
13	RACK, SHOE, WD. W/CASTERS 34½"L x 15"W x 52½"H		12	16	20

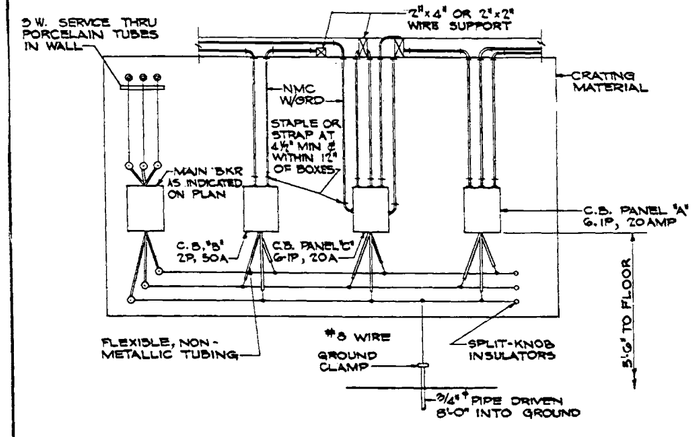
* ALL MOTORS 110/220V., 1φ

FAN SCHEDULE

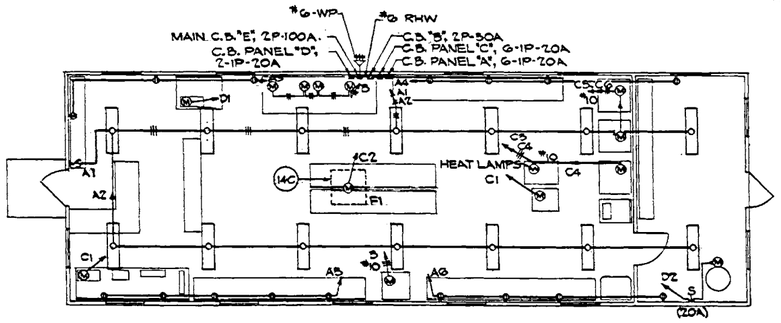
MARK	FREE AIR CFM	H.P.	SIZE
F-1	4900	1/2	24" DIA.
F-2	3000	1/3	16" DIA.

HAND TOOLS REQUIRED
(FURNISHED BY OTHERS)

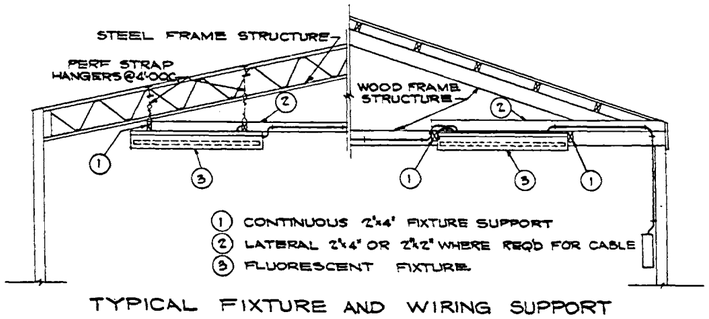
DESCRIPTION	SHOP SIZE 5000 - 10000 MAN	10001 - 15000 MAN	15001 - 20000 MAN
STONE, SHARPENING, W/HANDLE ¾" x 1¼" x 14"	10	14	18
AWL, SADDLERS, SEWING, 3 NEEDLES	2	2	2
BRUSH, SHOE INKING, 7 IN TOOTHBRUSH	5	5	5
CLAW, TACK, 6 IN. LG.	10	14	18
HAFT, SADDLERS AWL W/CHUCK WRENCH	2	2	2
HAMMER, HAND SHOEMAKER, 15 OZ.	10	14	18
HEEL REMOVER, HAND, CURVED BLADE	10	14	18
KNIFE, CRAFTSMAN, RD. POINT, 6 IN. BLADE	10	14	18
KNIFE, CRAFTSMAN, STRAIGHT, LEFT HAND LIP, LEATHER CUTTING, 2½ IN. BLADE	10	14	18
KNIFE, CRAFTSMAN, STRAIGHT, RIGHT HAND LIP, LEATHER CUTTING, 2½ IN. BLADE	10	14	18
KNIFE, CRAFTSMANS, SQ. POINT, 3⅛ IN. BLADE	10	14	18
NAIL DISH, REVOLVING, 6 CUP	10	14	18
NAIL SET, 3/32 IN. DIA. AT POINT	10	14	18
NIPPER, END CUTTING INTEGRAL CUTTERS 7 IN. LG.	10	14	18
NIPPER, END CUTTING INTEGRAL CUTTERS 12 IN. LG.	3	3	3
PINCERS, CARPENDERS, 8 IN. LG.	10	14	18
PRESS, GROMMET AND EYELET, HAND OPER LEVER TYPE W/10 EYELET SOCKETS, 2 HOOK POCKETS, 7 PTS. 22 IN THROAT DEPTH	1	1	1
PUNCH, CUTTING REVOLVIN HEAD, 5/64", 3/32", 7/64", 1/8", 5/32", 3/16" DIA.	3	3	3
RASP, HAND, 3 STD. CUT, 10 IN. LG.	6	6	6
REMOVER, EYELET	1	1	1
SETTING IRON, SHOE EDGING, SIZE 16	4	4	4
SETTING IRON, SHOE EDGING, SIZE 24	4	4	4



TYPICAL CIRCUIT BREAKER INSTALLATION
NO SCALE



ELECTRICAL PLAN
NO SCALE



TYPICAL FIXTURE AND WIRING SUPPORT
NO SCALE

GENERAL NOTES

1. FOR FSN BILL OF MATERIAL - REFER TO TM5-303 BY FACILITY NUMBER.

ELECTRICAL NOTES

CONNECTED LOAD - KVA

SHOP SIZE	5000 - 10000 MAN	10001 - 15000 MAN	15001 - 20000 MAN
LIGHTING	0.8	1.2	1.4
RECEP. EST.	1.8	2.3	2.9
POWER	12.5	13.4	13.4
TOTAL	15.1	16.9	17.7

1. ALL LIGHTING FIXTURES TO BE FLUORESCENT CLG. SUSP. OR SFC. MTG. TYPE UNSHIELDED 48" W/2-40W RS LAMPS AND H.P.F. BALLAST, W/RS FILECTOR.
2. ALL BRANCH CKT. WIRING TO BE N.M.C. WITH BARE GROUND WIRE AND SHALL BE #12 WHERE NOT OTHERWISE NOTED (2/C W/GRD OR 3/C W/GRD).
3. CONNECT MOTORS TO BALANCE LOAD ON 3-WIRE CKTS. (M) INDICATES MOTOR COMPLETE WITH DISCONNECT, STARTER, AND OVERLOAD PROTECTION, EXCEPT THAT DISCONNECT AT OIL BURNER IS SEPARATELY SHOWN.
4. ALL DUPLEX RECP. TO BE NEMA STD. 2P 3W GROUNDING TYPE 15A 125V.
5. GRD COND. OF N.M.C. TO BE CONTINUOUSLY INTERCONNECTED AND BONDED TO EACH LTG. FIXTURE HOUSING, WIRING ENCL. MOTOR FRAME OR ENCL. OF ELEC. OPERATED EQUIPMENT, GRDG. TERMINAL OF EACH RECP. AND SYSTEM GROUND.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
73-51	FLOOR PLANS	1&2 OF 2
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDG.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDG.	1-4 OF 4
99-98	STANDARD DETAILS	

SYMBOL	REVISIONS DESCRIPTION	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN

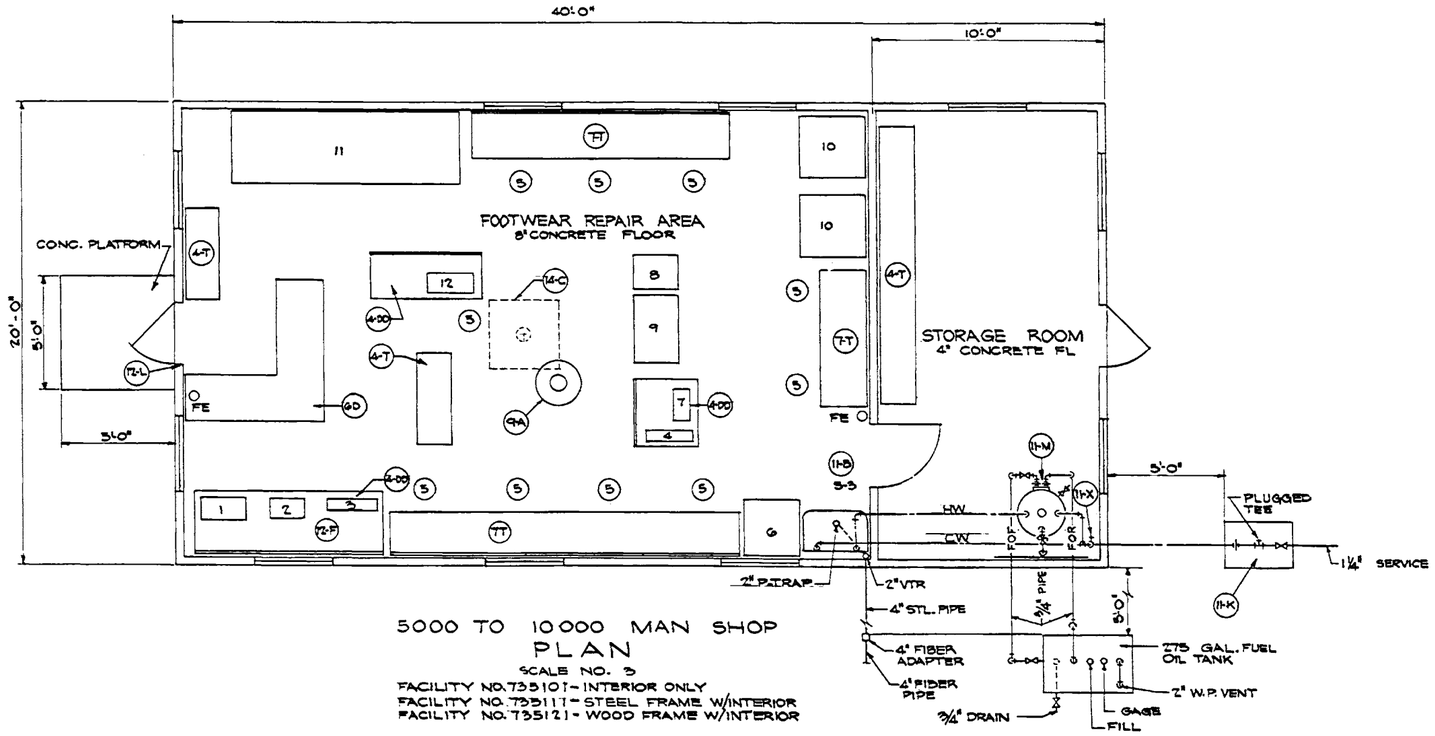
THEATER OF OPERATIONS

FOOTWEAR REPAIR SHOPS
20'X40' - 5000 TO 10000 MAN
20'X50' - 10001 TO 15000 MAN
20'X60' - 15001 TO 20000 MAN

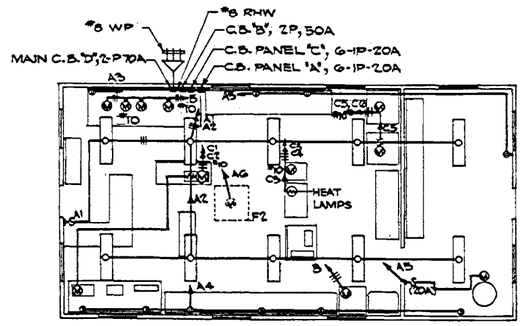
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

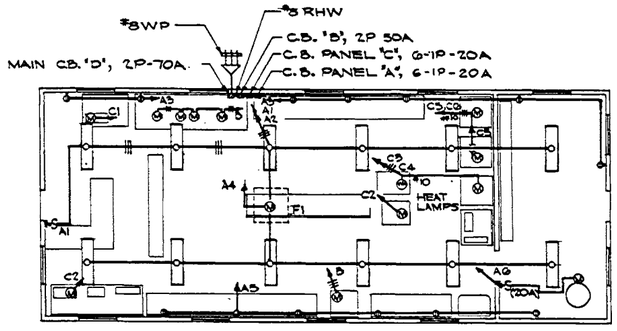
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-51
DATE: 12 Sept 1968
SHEET 1 OF 2



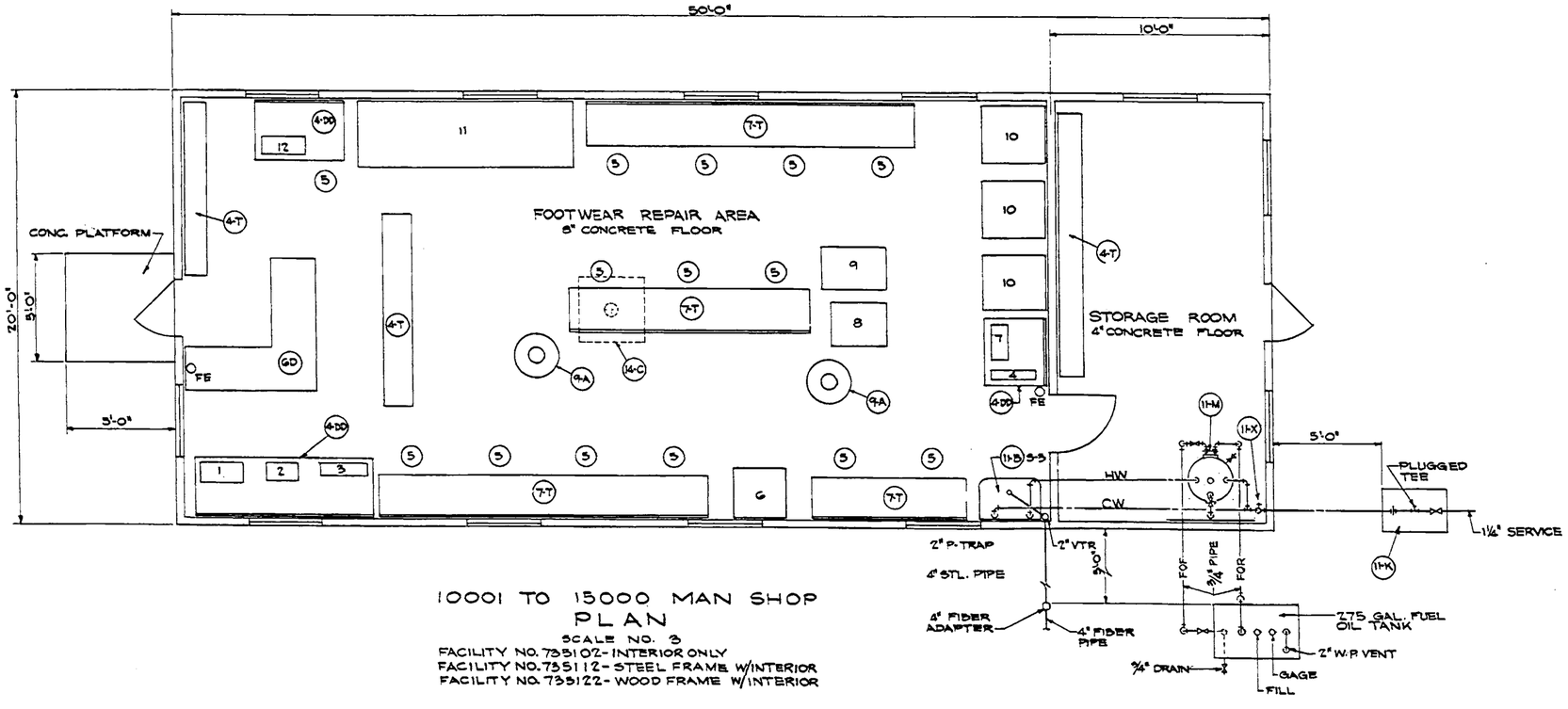
5000 TO 10000 MAN SHOP
PLAN
SCALE NO. 3
FACILITY NO. 735101 - INTERIOR ONLY
FACILITY NO. 735111 - STEEL FRAME W/INTERIOR
FACILITY NO. 735121 - WOOD FRAME W/INTERIOR



ELECTRICAL PLAN
5000 TO 10000 MAN SHOP
NO SCALE



ELECTRICAL PLAN
10001 TO 15000 MAN SHOP
NO SCALE



10001 TO 15000 MAN SHOP
PLAN
SCALE NO. 3
FACILITY NO. 735102 - INTERIOR ONLY
FACILITY NO. 735112 - STEEL FRAME W/INTERIOR
FACILITY NO. 735122 - WOOD FRAME W/INTERIOR

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: H. M. Williams
CHIEF, [illegible] BRANCH

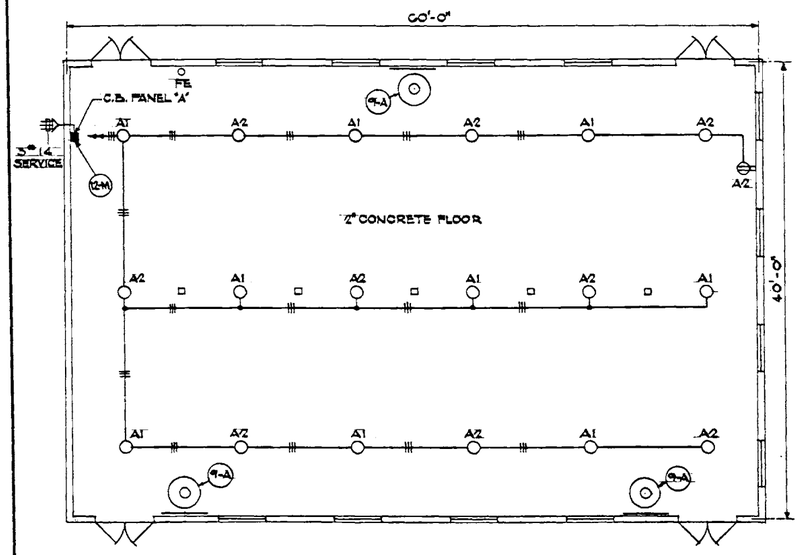
THEATER OF OPERATIONS

FOOTWEAR REPAIR SHOPS
20'X40' - 5000 TO 10000 MAN
20'X50' - 10001 TO 15000 MAN
20'X60' - 15001 TO 20000 MAN

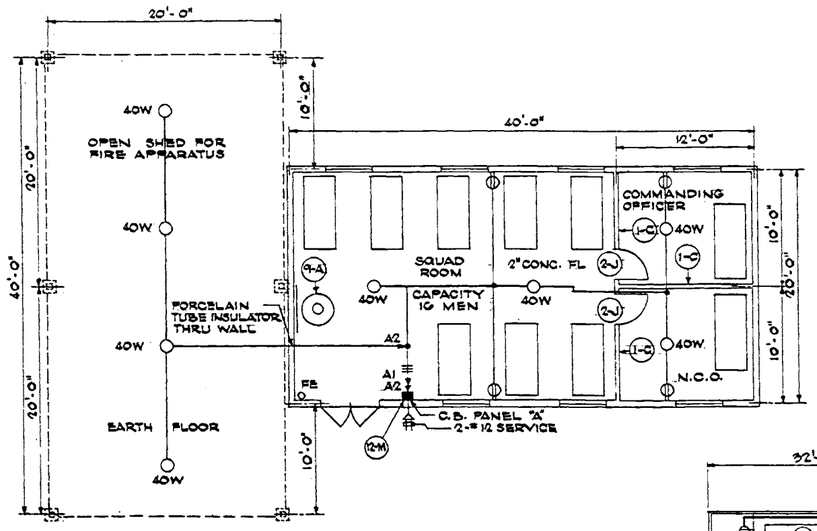
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
J.R. Erickson MCD, DCSLOG, DA
DATE 12 Sept 1968.

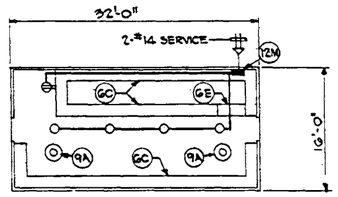
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 73-51
SHEET 2 OF 2



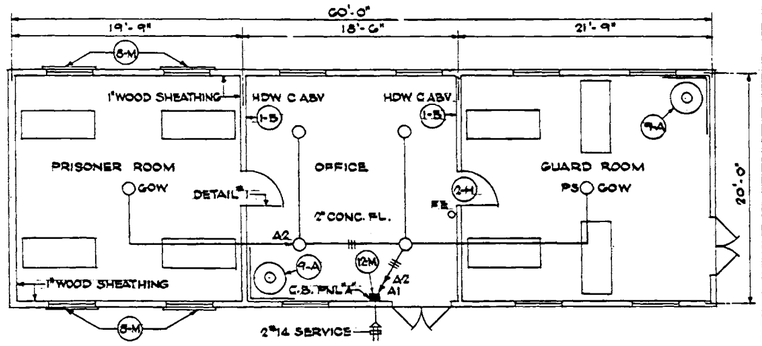
DAY ROOM 40'X60'
SCALE NO. 24
FACIL. NO. 741301 - INTERIOR ONLY
FACIL. NO. 741311 - STEEL FRAME W/INTERIOR
FACIL. NO. 741321 - WOOD FRAME W/INTERIOR



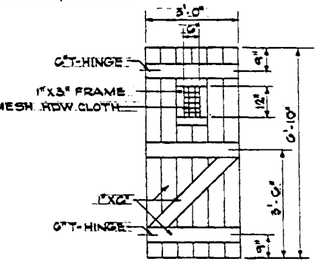
FIREHOUSE - 20'x40' WITH 20'x40' SHED
SCALE NO. 24
FACIL. NO. 741302 - INTERIOR ONLY
FACIL. NO. 741312 - STEEL FRAME W/INTERIOR
FACIL. NO. 741322 - WOOD FRAME W/INTERIOR



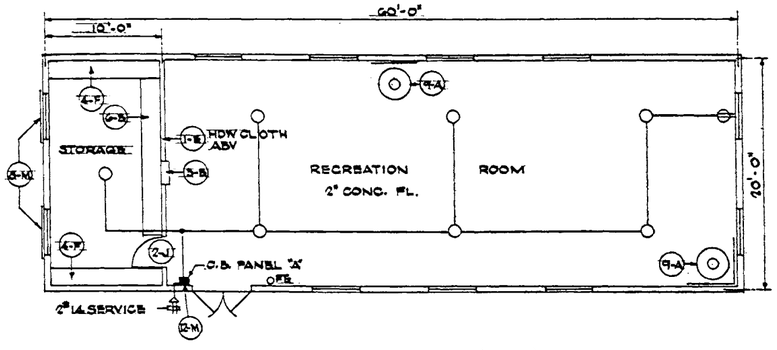
CAMP EXCHANGE - 250 MAN
16'x32' TENT W/FRAME
SCALE NO. 1
FACILITY NO. 741308 - INTERIOR ONLY



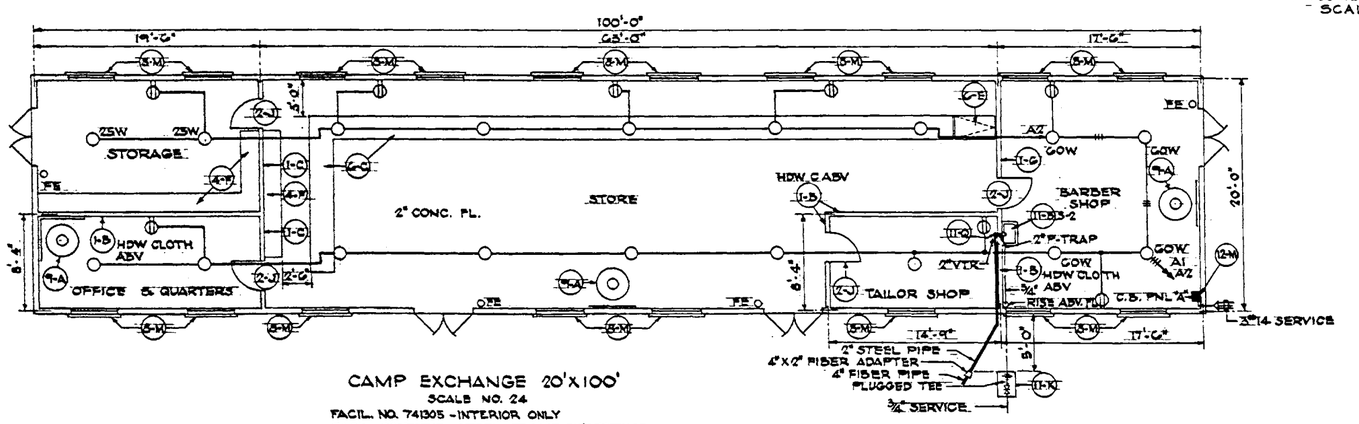
GUARD HOUSE
SCALE NO. 24
FACIL. NO. 741303 - INTERIOR ONLY
FACIL. NO. 741313 - STEEL FRAME W/INTERIOR
FACIL. NO. 741323 - WOOD FRAME W/INTERIOR



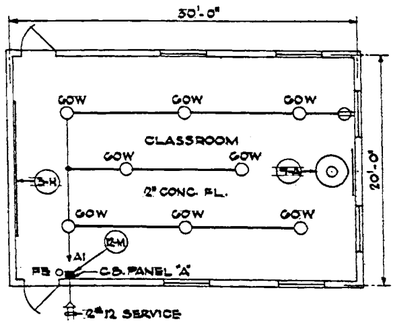
DETAIL # 1
PRISONER ROOM DOOR
SCALE NO. 4



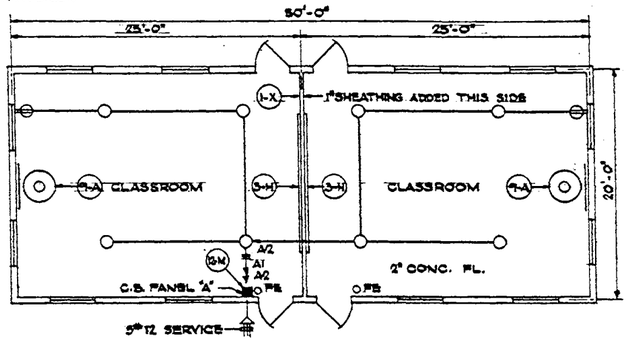
CAMP EXCHANGE 20' X 60'
SCALE NO. 24
FACIL. NO. 741304 - INTERIOR ONLY
FACIL. NO. 741314 - STEEL FRAME W/INTERIOR
FACIL. NO. 741324 - WOOD FRAME W/INTERIOR



CAMP EXCHANGE 20'X100'
SCALE NO. 24
FACIL. NO. 741305 - INTERIOR ONLY
FACIL. NO. 741315 - STEEL FRAME W/INTERIOR
FACIL. NO. 741325 - WOOD FRAME W/INTERIOR



EDUCATION BUILDING 20'X30'
SCALE NO. 24
FACIL. NO. 741306 - INTERIOR ONLY
FACIL. NO. 741316 - STEEL FRAME W/INTERIOR
FACIL. NO. 741326 - WOOD FRAME W/INTERIOR



EDUCATION BUILDING 20'X50'
SCALE NO. 24
FACIL. NO. 741307 - INTERIOR ONLY
FACIL. NO. 741317 - STEEL FRAME W/INTERIOR
FACIL. NO. 741327 - WOOD FRAME W/INTERIOR

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	DAY ROOM 40'X60'	FIRE HOUSE 20'X40'	GUARDHOUSE 20'X60'	CAMP EXCHANGE 20'X60'	CAMP EXCHANGE 20'X100'	EDUCATION BUILDING 20'X30'	EDUCATION BUILDING 20'X50'
LIGHTING	1.80 KW	0.32 KW	0.32 KW	0.70 KW	1.49 KW	0.48 KW	0.80 KW
RECP. EST.	0.10 KW	0.40 KW	—	.10 KW	0.80 KW	0.10 KW	0.10 KW
TOTAL	1.90 KW	0.72 KW	0.32 KW	0.80 KW	2.29 KW	0.58 KW	0.90 KW

1. ALL LAMPS TO BE 100W UNLESS OTHERWISE NOTED ON PLANS.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN, BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-13	PLAN	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' 15' NO. 1
0 1' 2' 3' 4' NO. 4
0 5' 10' NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

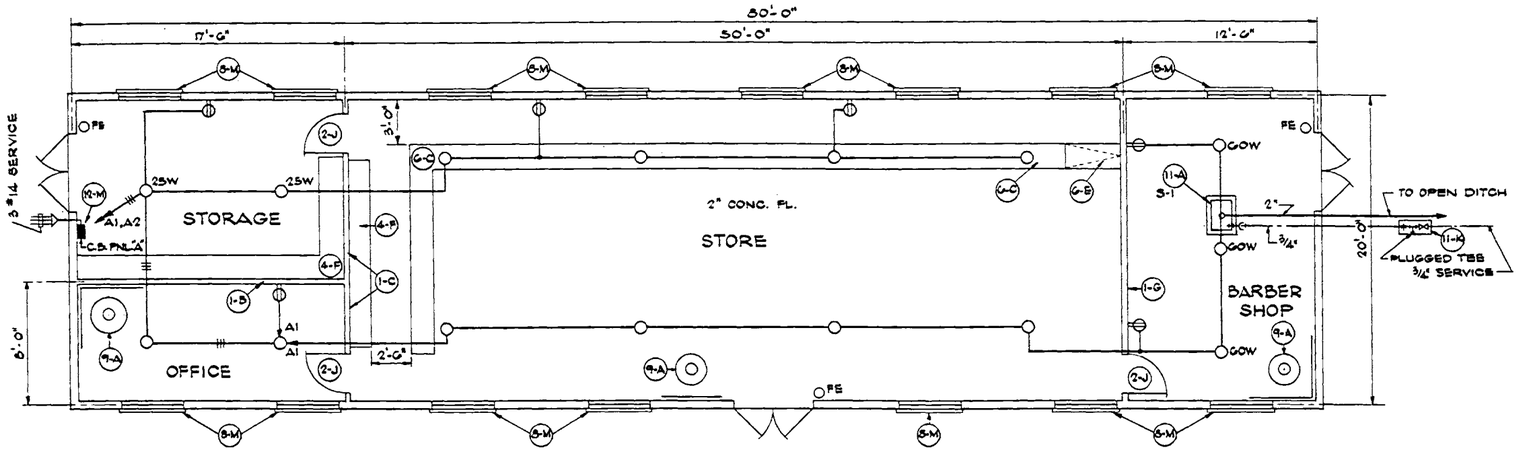
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature]
CHIEF, STRUCTURES BRANCH
APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:

THEATER OF OPERATIONS

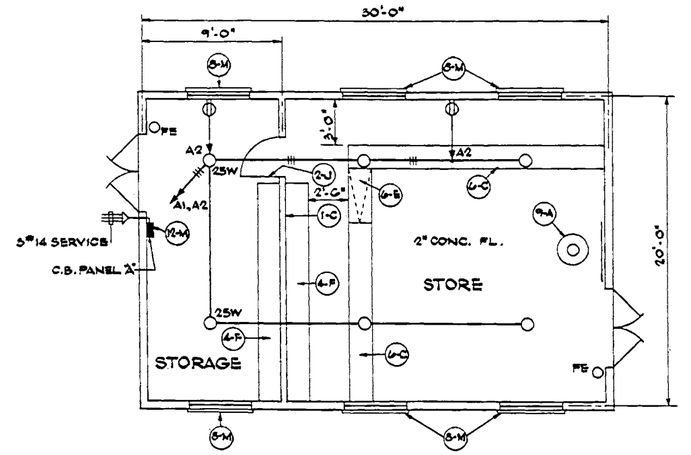
CAMP EXCHANGES, DAY ROOM, EDUCATION BUILDINGS GUARDHOUSE & FIREHOUSE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-13
SHEET 1 OF 1



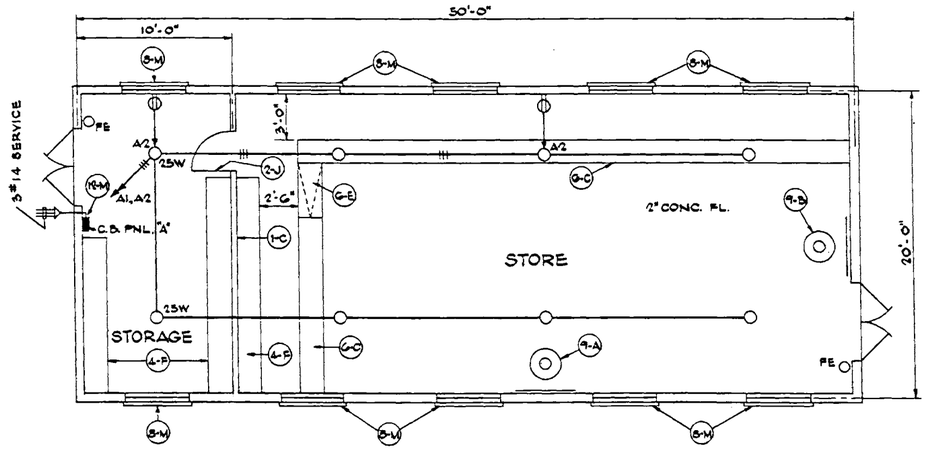
PLAN
CAMP EXCHANGE 20' X 80', 4000 MAN
SCALE NO. 2

FACILITY NO. 741705 - INTERIOR ONLY
FACILITY NO. 741713 - STEEL FRAME W/INTERIOR
FACILITY NO. 741725 - WOOD FRAME W/INTERIOR



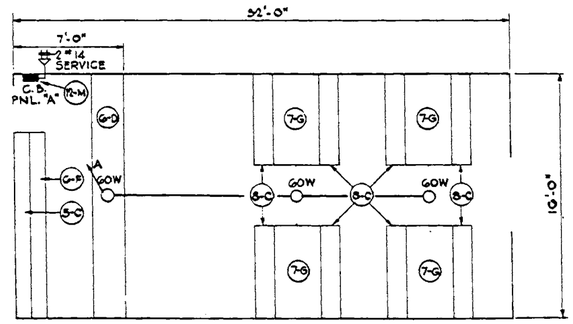
PLAN
CAMP EXCHANGE 20' X 30', 500 & 1000 MAN
SCALE NO. 2

FACILITY NO. 741701 - INTERIOR ONLY
FACILITY NO. 741711 - STEEL FRAME W/ INTERIOR
FACILITY NO. 741721 - WOOD FRAME W/ INTERIOR



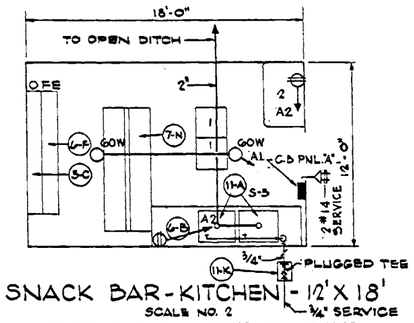
PLAN
CAMP EXCHANGE 20' X 50', 2000 MAN
SCALE NO. 2

FACILITY NO. 741702 - INTERIOR ONLY
FACILITY NO. 741712 - STEEL FRAME W/ INTERIOR
FACILITY NO. 741722 - WOOD FRAME W/ INTERIOR



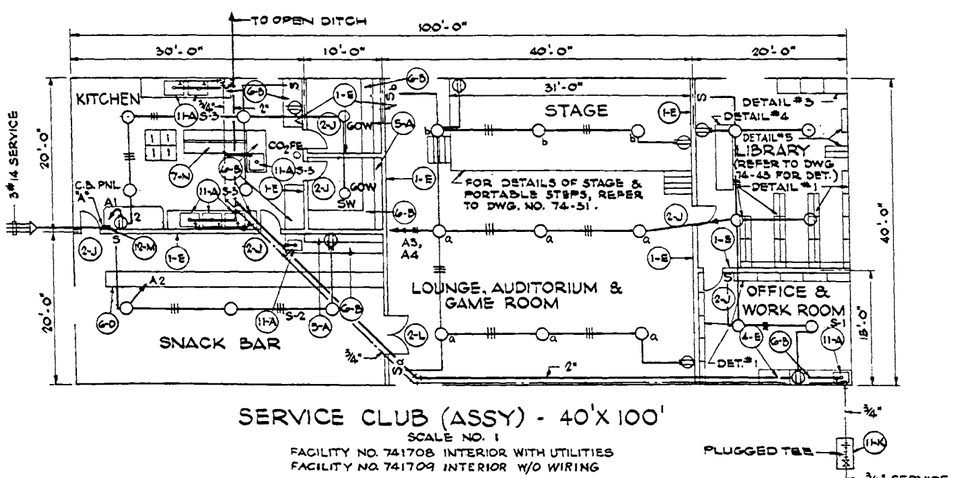
SNACK BAR - GENERAL PURPOSE - 16'X32'
SCALE NO. 2

FACILITY NO. 741706 INTERIOR WITH WIRING
FACILITY NO 741707 INTERIOR W/O WIRING



SNACK BAR-KITCHEN - 12'X18'
SCALE NO. 2

FACILITY NO. 741704 INTERIOR WITH UTILITIES
FACILITY NO. 741705 INTERIOR W/O WIRING



SERVICE CLUB (ASSY) - 40'X100'
SCALE NO. 1

FACILITY NO. 741708 INTERIOR WITH UTILITIES
FACILITY NO. 741709 INTERIOR W/O WIRING

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	CAMP EXCHANGES			SERVICE CLUB	SNACK BAR -	
	20'X 30'	20'X 50'	20'X 80'	ASSY. - 40'X 100'	GEN. PURP. 16'X32'	KITCHEN-12'X 18'
LIGHTING	.45 KW	.65 KW	1.23 KW	2.32 KW	0.18 KW	0.12 KW
RECP. EST.	.20 KW	.25 KW	.60 KW	1.68 KW	—	0.30 KW
TOTAL	.65 KW	.85 KW	1.35 KW	4.00 KW	0.18 KW	0.42 KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 100W.
2. ALL GO & 100W LAMPS TO HAVE 8" CONICAL SHADES

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-17	PLANS	1 OF 1
99-98	STANDARD DETAILS	
74-45	LIBRARY - 80' X 100'	1 OF 1
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SCHEDULE OF EQUIPMENT

ITEM NO.	UNIT DESCRIPTION	SERVICE CLUB (ASSY) QUANTITY	SNACK BAR-KITCHEN QUANTITY
1	RANGE, FIELD, FUEL OPERATED	4	2
2	REFRIGERATOR, U.S. NO. 65, 65 CU. FT., 90"X36"X78"	1	1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' NO. 1
0 5' 10' NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN
APPROVED: DATE:
CHIEF, DRAWING BRANCH
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE: 16 Sept 1968

THEATER OF OPERATIONS

SERVICE CLUB-ASSEMBLY
POW CAMP EXCHANGES
& SNACK BARS

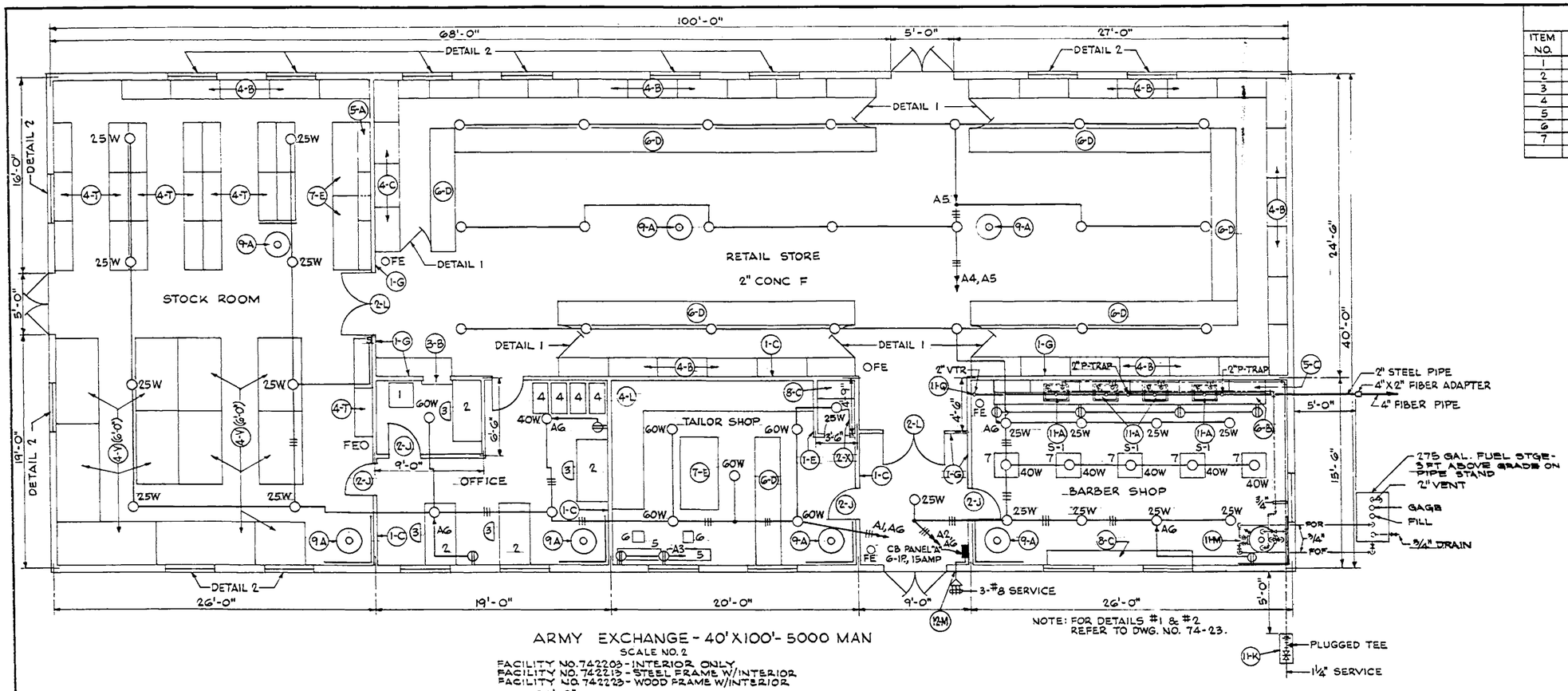
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-17
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY

SCHEDULE OF EQUIPMENT

ITEM NO.	DESCRIPTION	QUANTITY 742201	QUANTITY 742202
1	SAFE	1	
2	DESK	4	4
3	CHAIR, DESK	4	4
4	CABINET, FILE	4	4
5	SEWING MACHINE ½ HP	2	2
6	STOOL	2	2
7	CHAIR, BARBER	5	4

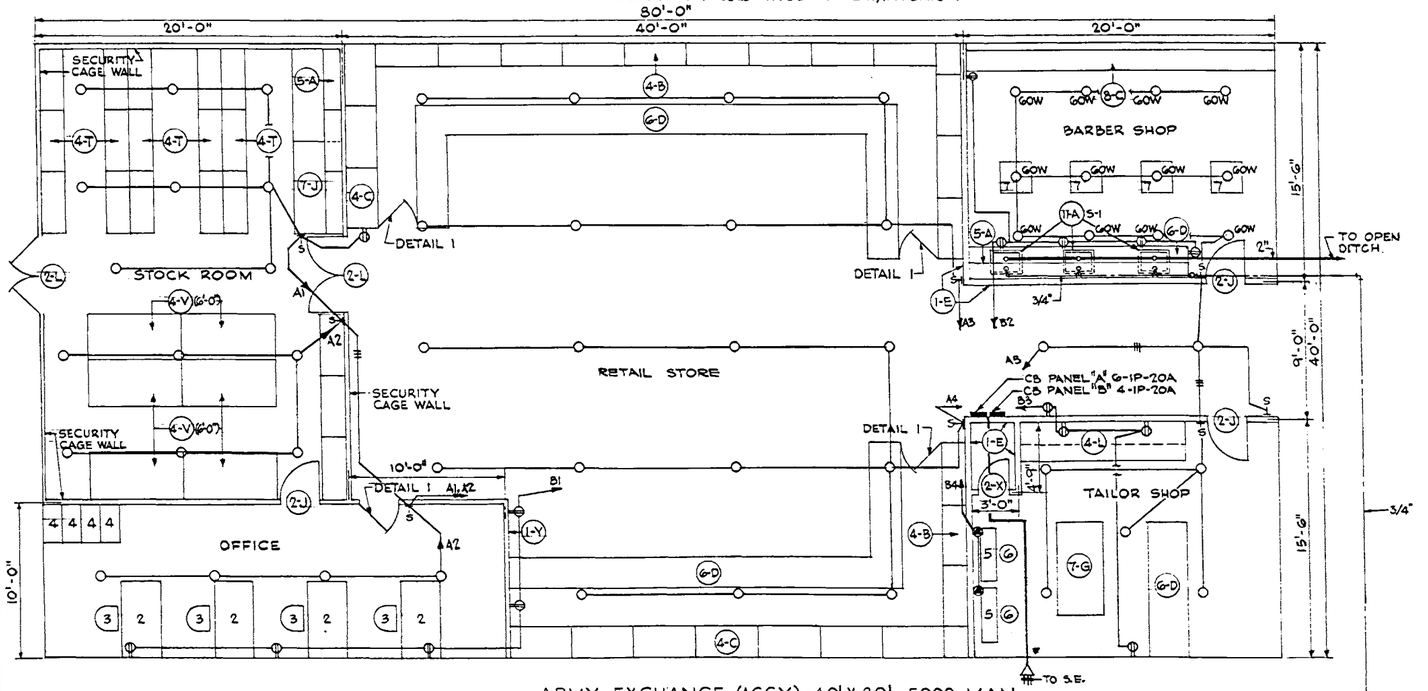


ARMY EXCHANGE - 40'X100'- 5000 MAN

SCALE NO. 2

FACILITY NO. 742203 - INTERIOR ONLY
FACILITY NO. 742213 - STEEL FRAME W/INTERIOR
FACILITY NO. 742223 - WOOD FRAME W/INTERIOR

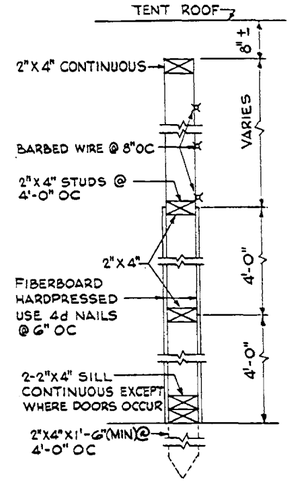
NOTE: FOR DETAILS #1 & #2 REFER TO DWG. NO. 74-23.



ARMY EXCHANGE (ASSY)-40'X80'-5000 MAN

SCALE NO. 2

FACILITY NO. 742201- INTERIOR WITH UTILITIES



SECURITY CAGE WALL

SCALE NO. 7

ELECTRICAL NOTES

CONNECTED LOAD

FACILITY NO.	742203	742201
LIGHTING	3.35KW	5.12 KW
RECP EST	.60KW	2.70KW
POWER	.85KW	1.08KW
TOTAL	4.80KW	8.90 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100W.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-22	PLANS & DETAILS	1 OF 1
99-98	STANDARD DETAILS	
54-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
55-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' — NO. 2

0 3" 8" 9" 1' 2' — NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN

APPROVED: H. M. Williams — DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE

THEATER OF OPERATIONS

ARMY EXCHANGES
40'X100'
40'X80' TENT
PLANS

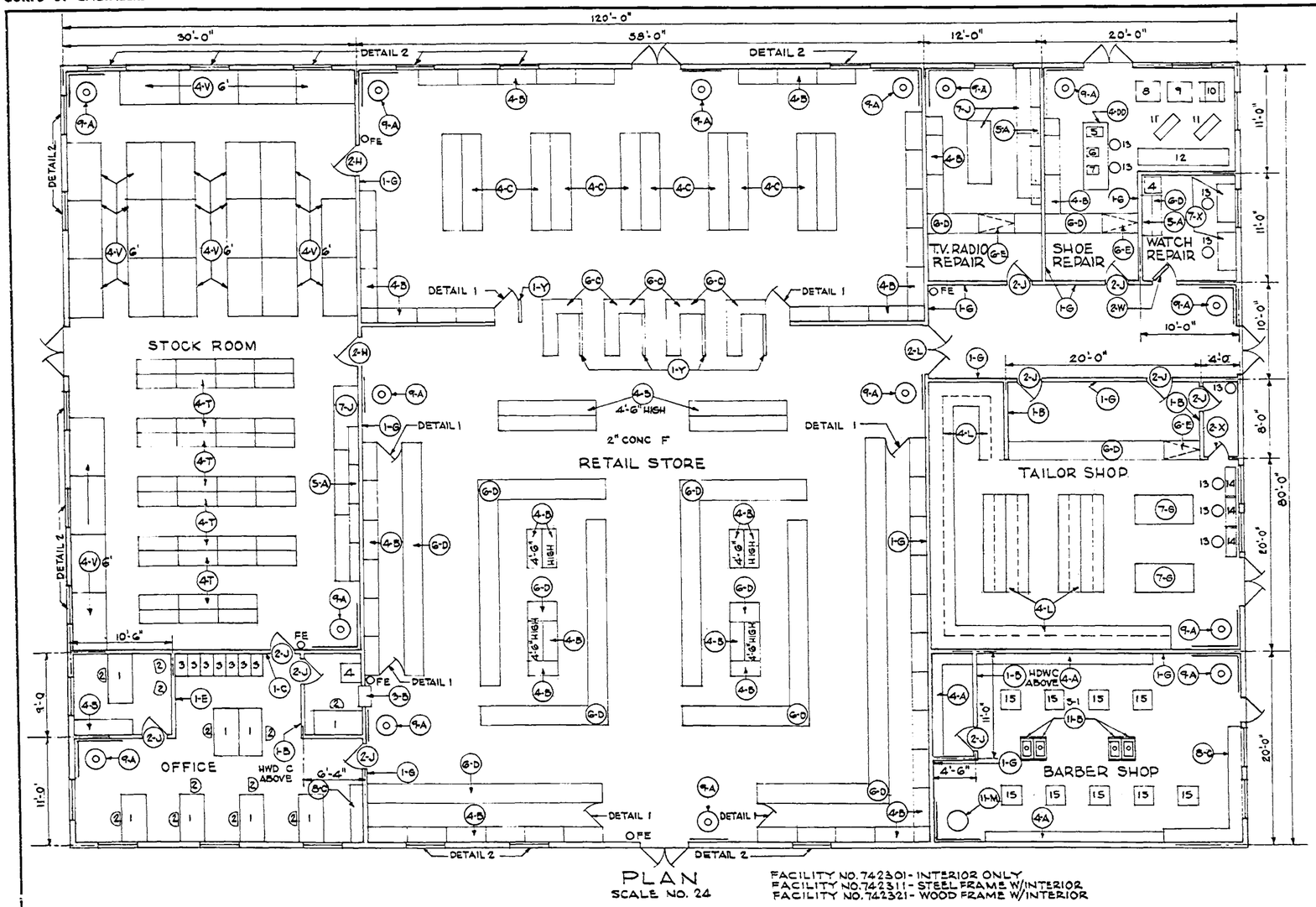
SCALE AS NOTED — SPEC. NO.

DRAWING NUMBER 74-22

SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY

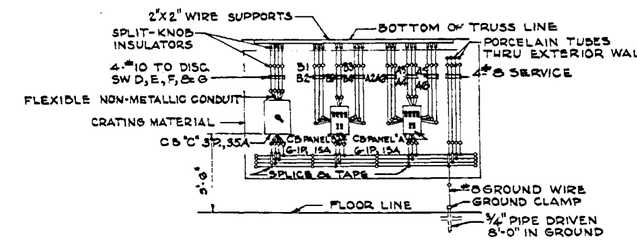


PLAN
SCALE NO. 24

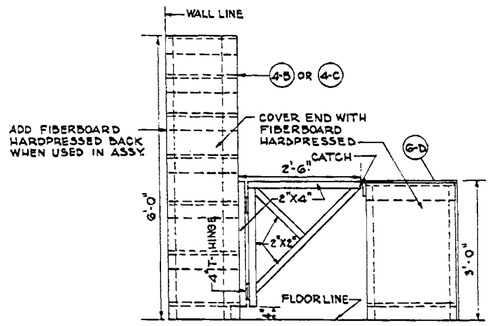
FACILITY NO. 742301 - INTERIOR ONLY
FACILITY NO. 742311 - STEEL FRAME W/INTERIOR
FACILITY NO. 742321 - WOOD FRAME W/INTERIOR

SCHEDULE OF EQUIPMENT

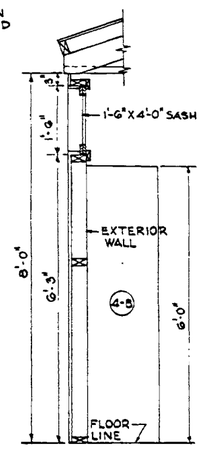
ITEM NO.	UNIT DESCRIPTION	QTY	MOTOR H.P.	FLEX CABLE
1	DESK	8		
2	CHAIR, DESK	12		
3	CABINET, FILE	7		
4	SAFE	2		
5	LEATHER SPLITTER	1		
6	COMB. SOLE CUTTER & SKIVER	1	1/3	2C-#16
7	SOLE TRIMMER	1		
8	OUTSOLE STICHER	1	1/2	2C-#14
9	LOCK STITCH MC KAY STITCHER	1	1/2	2C-#14
10	SHOE CEMENT PRESS	1		
11	SHELF ON WHEELS	2		
12	FINISHER	1	2	3C-#12 & 1-#16
13	STOOL	8		
14	SEWING MACHINE	3	1/4	2C-#14
15	CHAIR, BARBER	9		



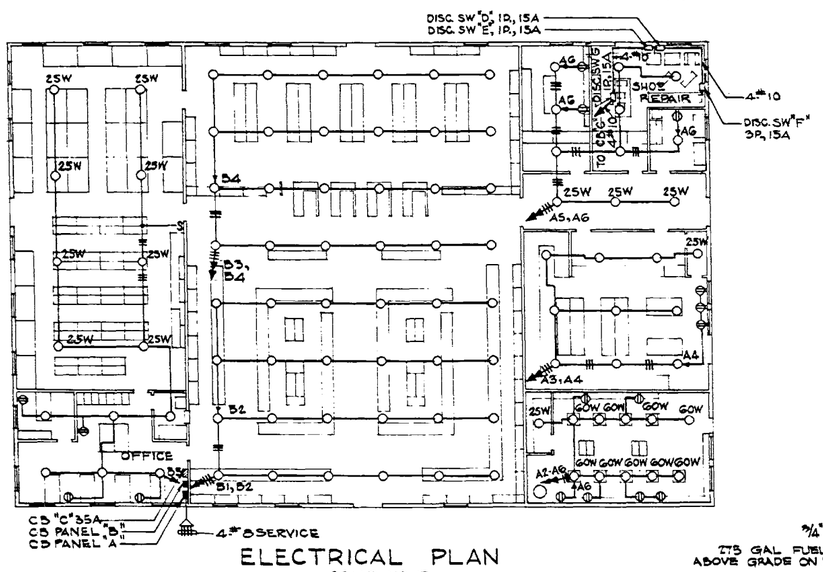
CIRCUIT BREAKER INSTALLATION
NO SCALE



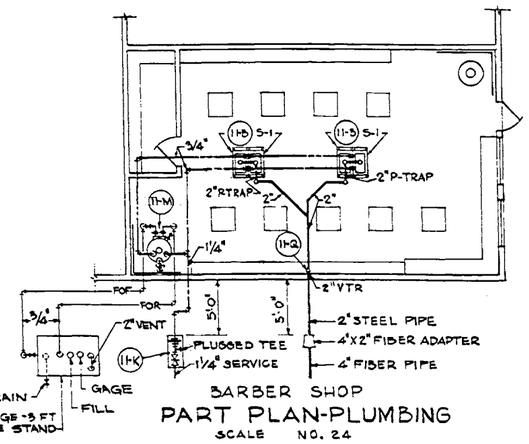
GATE
DETAIL NO. 1
SCALE NO. 5



HIGH WINDOW
DETAIL NO. 2
SCALE NO. 5



ELECTRICAL PLAN
SCALE NO. 17



BARBER SHOP
PART PLAN-PLUMBING
SCALE NO. 24

GENERAL NOTES

1. REFER TO TM5-305 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-305 BY FACILITY NUMBER

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	8.03 KW
RECP EST	1.30 KW
POWER	4.96 KW
TOTAL	14.29 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100W.
2. ALL 60W & 100W LAMPS TO HAVE 8" CONICAL SHADES.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-23	PLANS & DETAILS	1 OF 1
99-98	STANDARD DETAILS	
34-11	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 1' 2' 3' NO. 5 | 0 5' 10' NO. 24 | 0 5' 10' 15' 20' NO. 17

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

ARMY EXCHANGE
80'X120'
PLANS & DETAILS

APPROVED: H.M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED SPEC. NO.

DRAWING NUMBER: 74-23

DATE

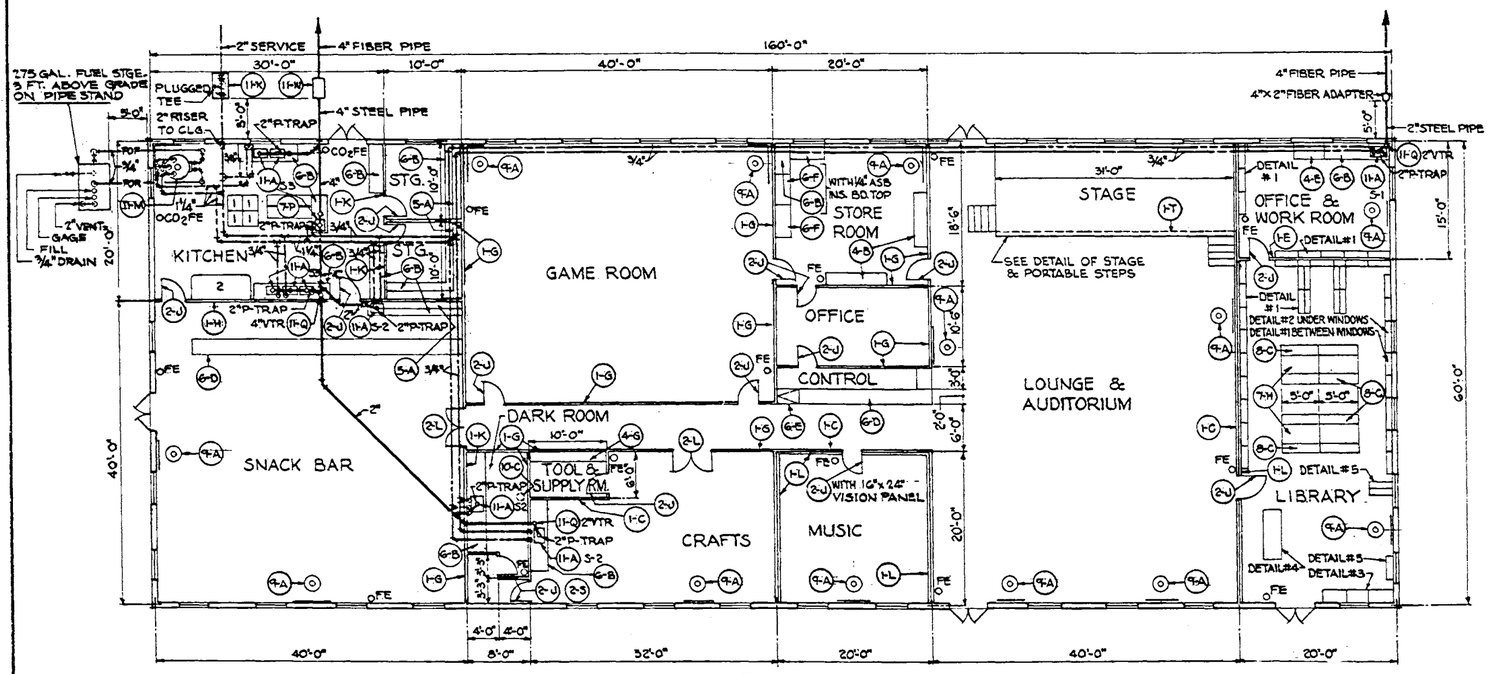
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY

SCHEDULE OF EQUIPMENT

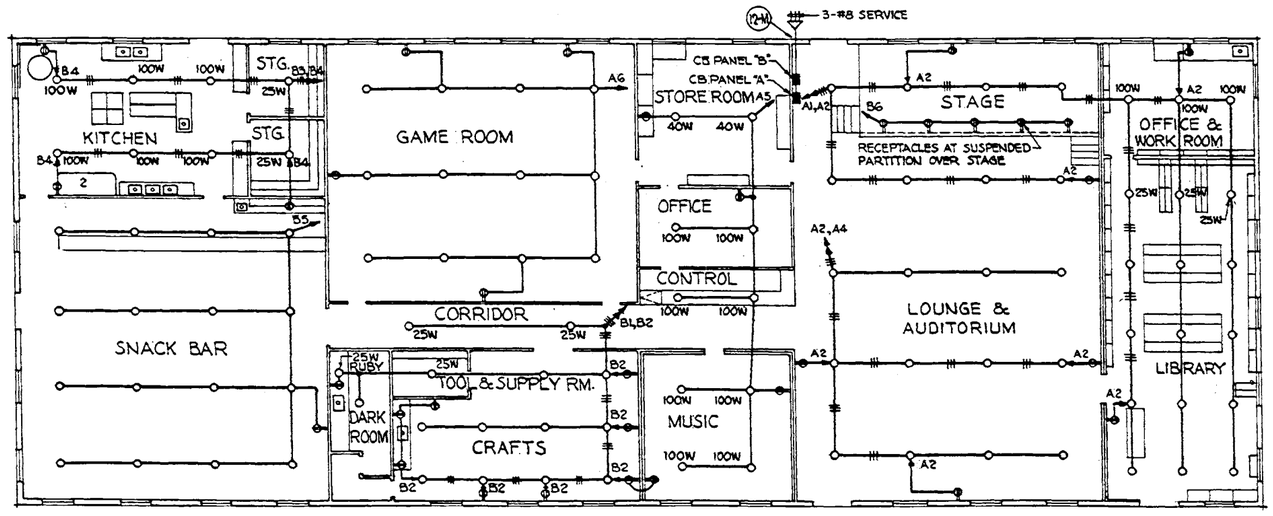
ITEM NO.	DESCRIPTION	QTY.
1	RANGE, FIELD, FUEL OPERATED	4
2	REFRIGERATOR, U.S. NO. G5, G5 CU. FT., 90"X36"X78"	1



PLAN

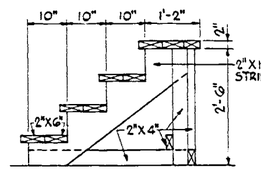
SCALE NO. 1

FACILITY NO. 743101 - INTERIOR ONLY
FACILITY NO. 743111 - STEEL FRAME W/INTERIOR
FACILITY NO. 743121 - WOOD FRAME W/INTERIOR

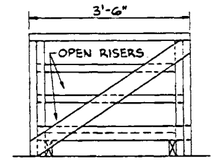


ELECTRICAL PLAN

SCALE NO. 1



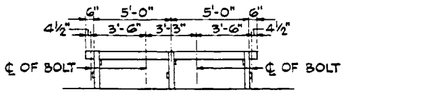
SIDE ELEVATION



REAR ELEVATION

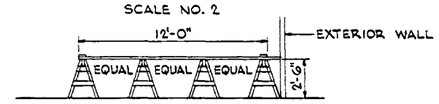
PORTABLE STEPS

SCALE NO. 5



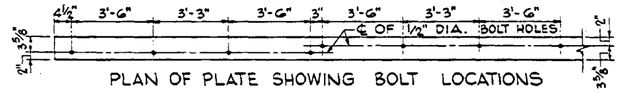
ELEVATION OF TRESTLE

SCALE NO. 2



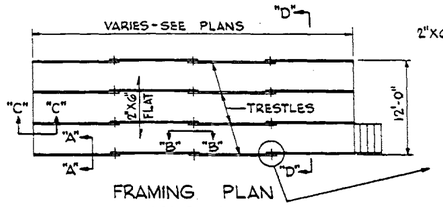
SECTION "D-D" THRU STAGE

SCALE NO. 2



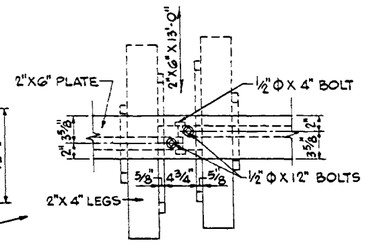
PLAN OF PLATE SHOWING BOLT LOCATIONS

NO SCALE



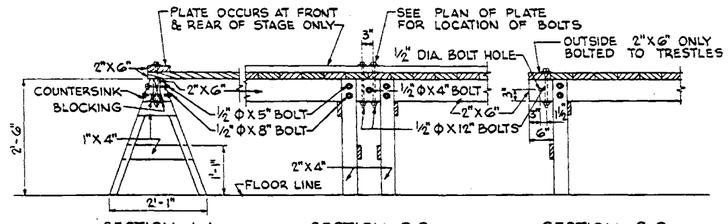
FRAMING PLAN

SCALE NO. 1



PLAN AT CONNECTION OF TRESTLES

SCALE NO. 7



SECTION A-A SECTION B-B SECTION C-C

REMOVABLE STAGE DETAILS

SCALE NO. 5

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	6.27 KW
RECP EST	2.70 KW
POWER	1.04 KW
TOTAL	10.01 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 60W.
2. ALL 40, 60, & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-31	PLANS & DETAILS	1 OF 1
74-43	LIBRARY DETAILS	1 OF 1
99-98	STANDARD DETAILS	
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: PENDLETON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:

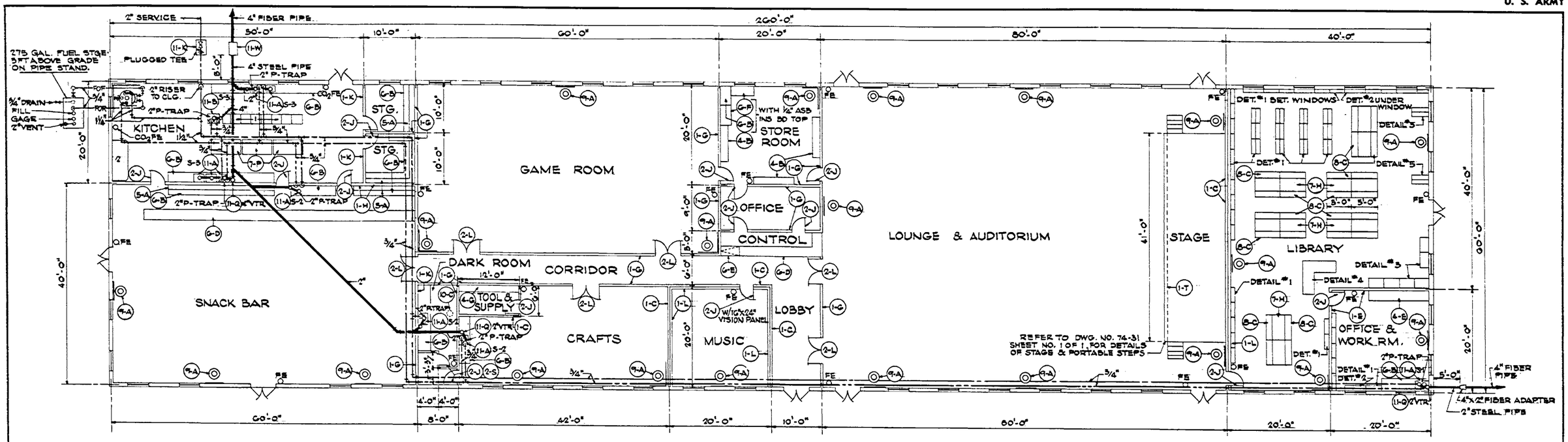
THEATER OF OPERATIONS

SPECIAL ACTIVITIES BUILDING
60'X160'
PLANS & DETAILS

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-31
SHEET 1 OF 1

CORPS OF ENGINEERS

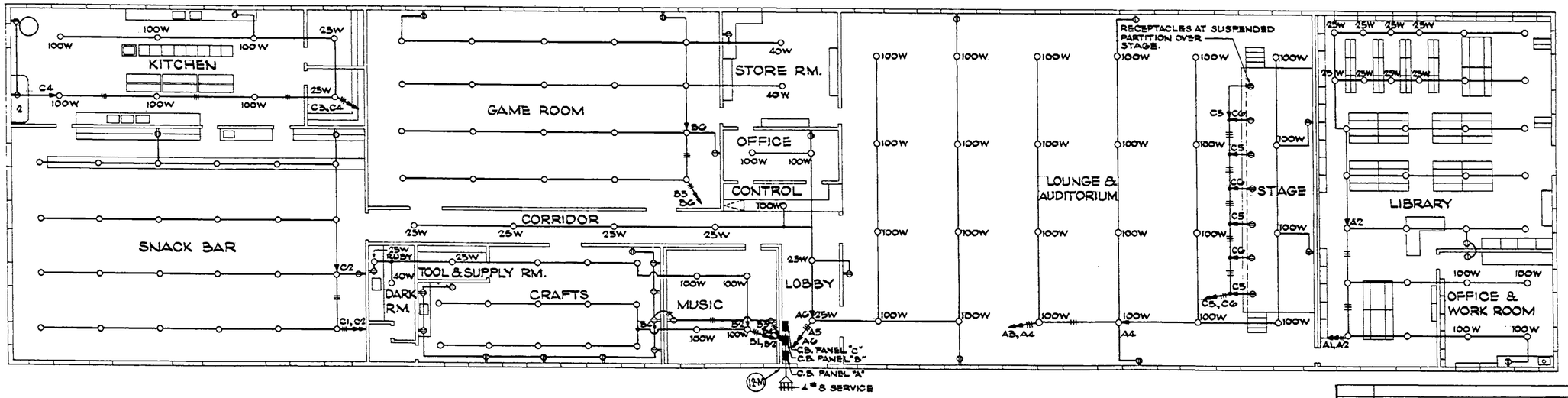
U. S. ARMY



PLAN

SCALE NO. 1

FACILITY NO. 743201 - INTERIOR ONLY
FACILITY NO. 743211 - STEEL FRAME W/INTERIOR
FACILITY NO. 743221 - WOOD FRAME W/INTERIOR



ELECTRICAL PLAN

SCALE NO. 1

SCHEDULE OF EQUIPMENT

ITEM NO.	UNIT DESCRIPTION	QUANTITY
1	RANGE, FIELD, FUEL OPERATED	8
2	REFRIGERATOR, U.S. NO. 65, 65 CU. FT., 90"X36"X78"	1

ELECTRICAL NOTES

CONNECTED LOAD	
LIGHTING	9.29 K.W.
RECP. EST.	4.00 K.W.
POWER	1.04 K.W.
TOTAL	14.33 K.W.

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 60W.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303. BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-32	PLANS	1 OF 1
74-43	LIBRARY DETAILS	1 OF 1
99-98	STANDARD DETAILS	
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES 0 5' 10' 15'

NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

SPECIAL ACTIVITIES BUILDING
60'X260'
PLANS

APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH, CMED, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

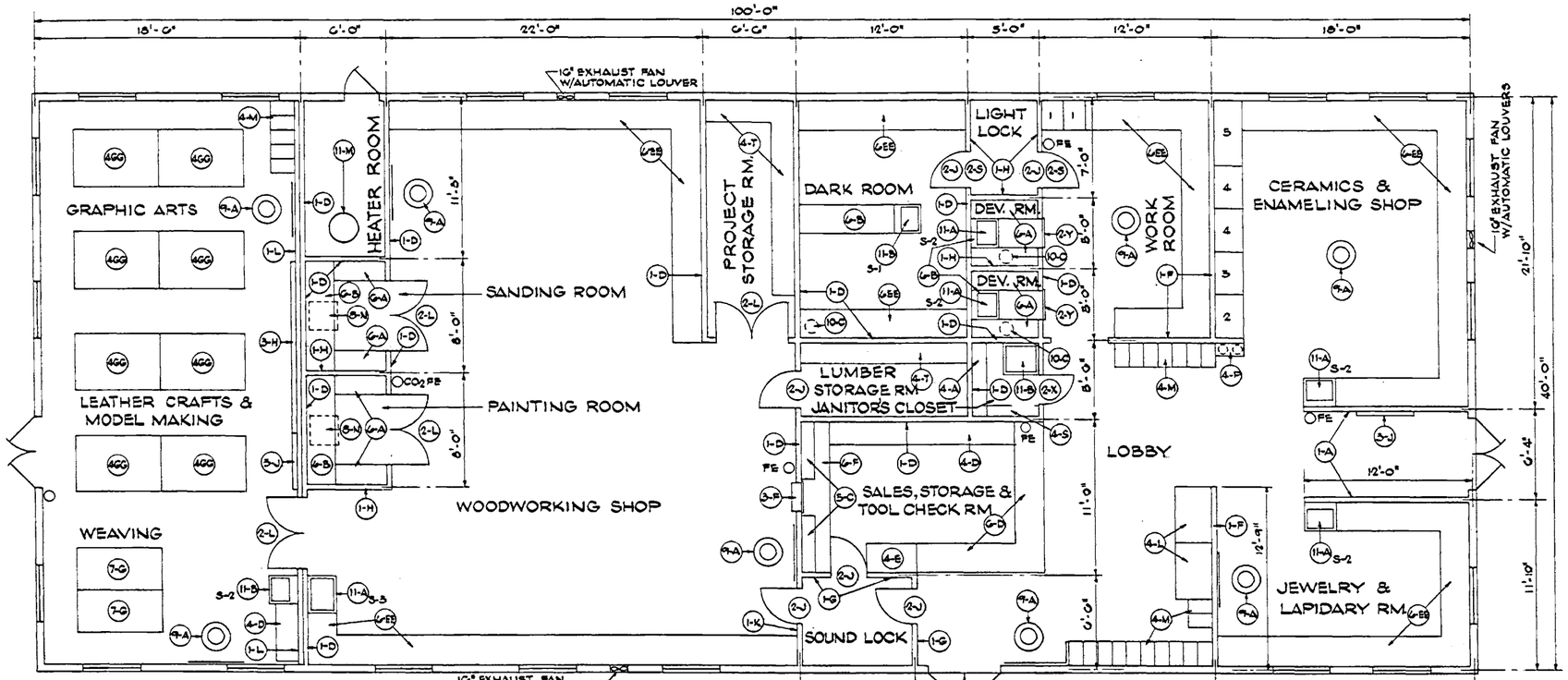
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-32
SHEET 1 OF 1

CORPS OF ENGINEERS

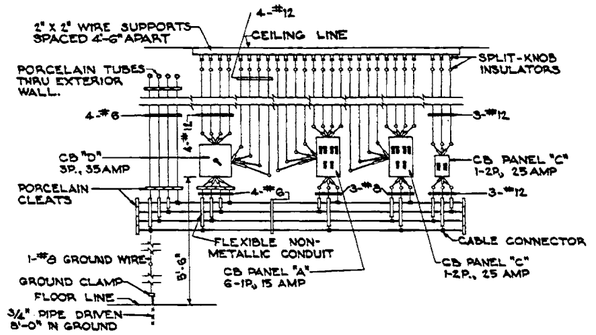
U. S. ARMY

SCHEDULE OF EQUIPMENT		
ITEM NO.	UNIT DESCRIPTION	QTY.
1	DRYERS	2
2	DAMP CABINET	1
3	DRYING CABINET	1
4	KILN	2
5	GLAZING BOOTH	1

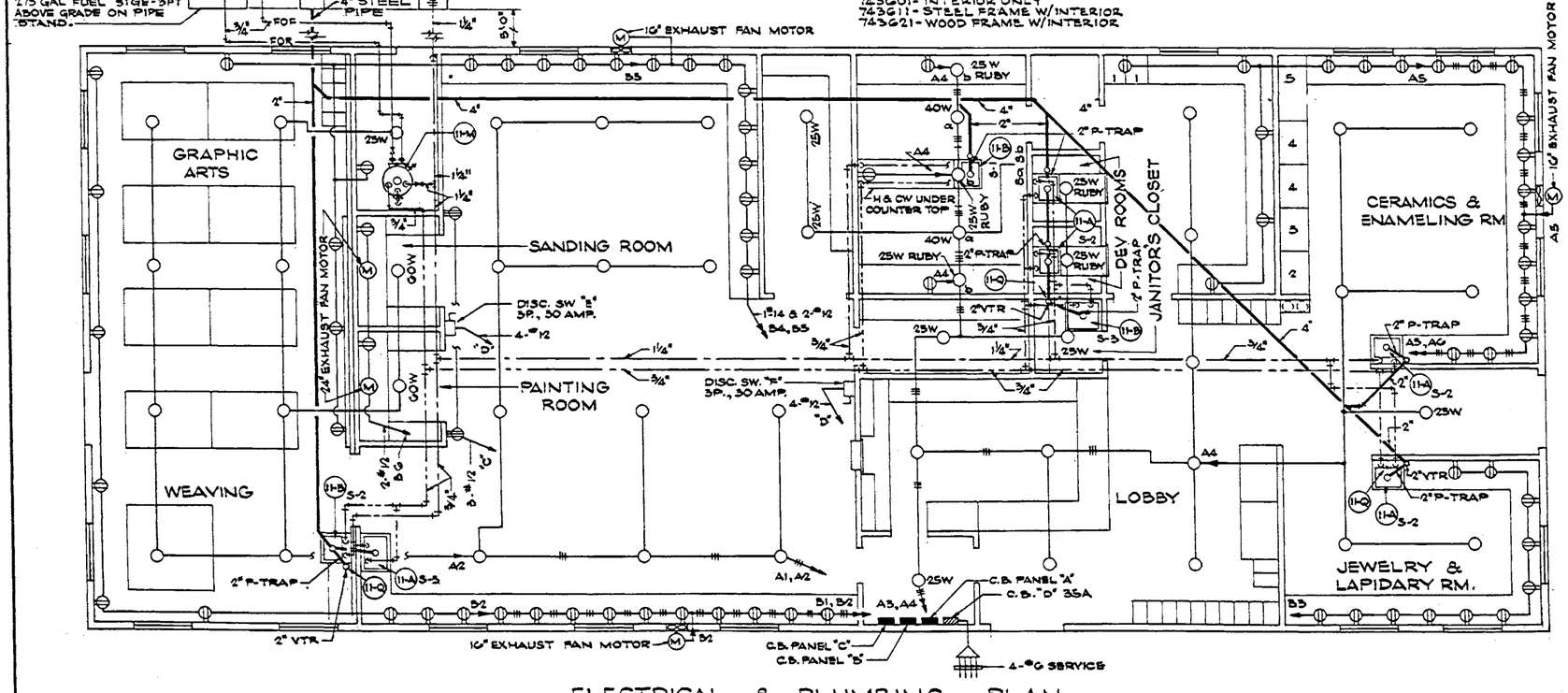


PLAN
SCALE NO. 2

FACILITY NUMBERS
743G01 - INTERIOR ONLY
743G11 - STEEL FRAME W/INTERIOR
743G21 - WOOD FRAME W/INTERIOR



CIRCUIT BREAKER INSTALLATION
NO SCALE



ELECTRICAL & PLUMBING PLAN
SCALE NO. 2

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	3.90 KW
RECP. EST.	7.20 KW
POWER EST.	14.35 KW
TOTAL	25.45 KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 100W.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN. BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER
3. INSTALL EXHAUST FANS 5'-0" ABOVE FLOOR LEVEL

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-36	PLANS	1 OF 1
99-98	STANDARD DETAILS	
54-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
55-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 2

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: EDWARDS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

CRAFT SHOPS 90'X100'

PLANS

APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1969

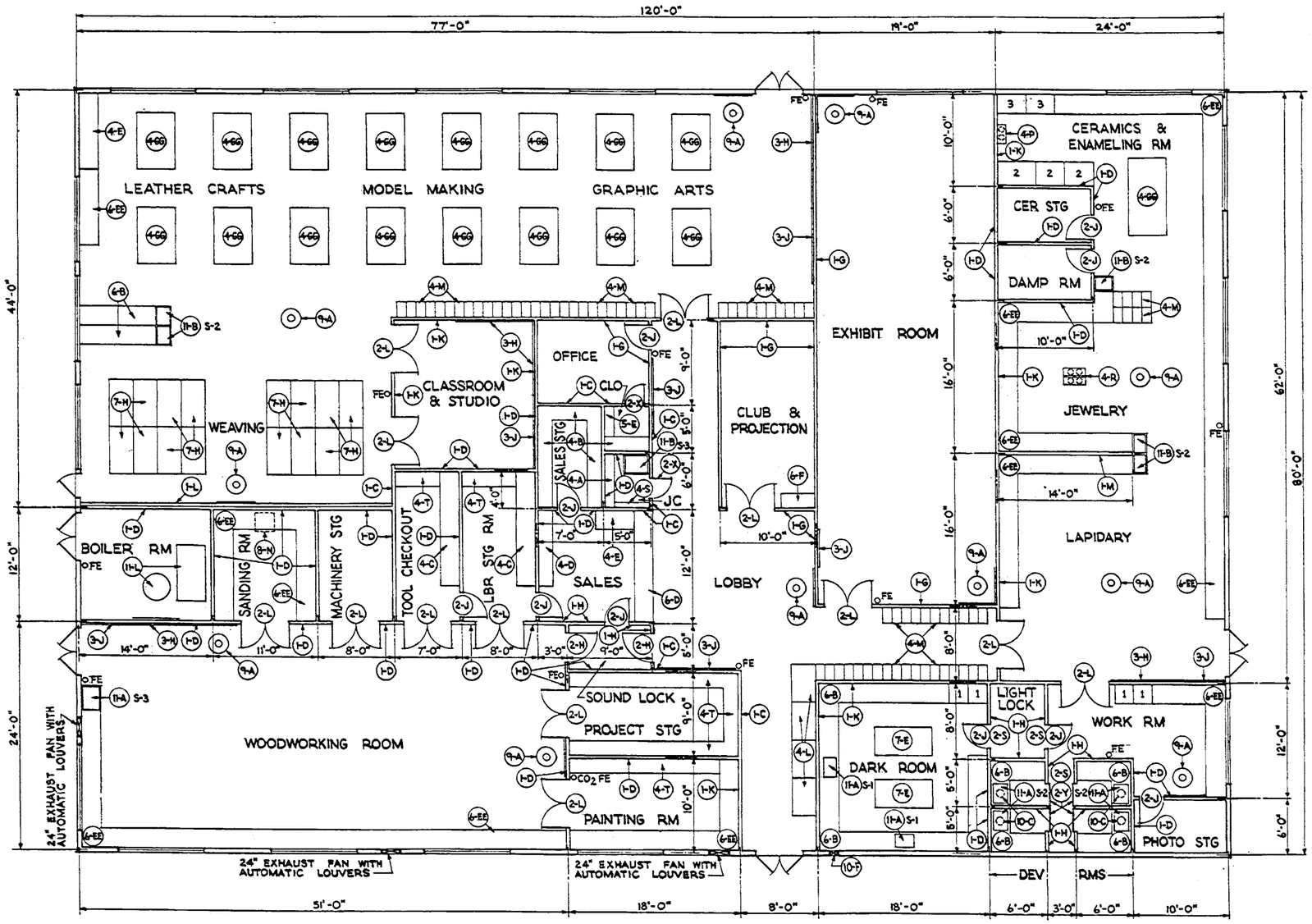
APPROVED FOR PROPONENT AGENCY:
DATE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-36
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY

SCHEDULE OF EQUIPMENT		
ITEM NO.	UNIT DESCRIPTION	QTY.
1	DRYERS	4
2	GLAZING BOOTHS	3
3	KILN	2



PLAN

SCALE NO. 24

FACIL. NO. 743701 - INTERIOR ONLY
FACIL. NO. 743711 - STEEL FRAME W/INTERIOR
FACIL. NO. 743721 - WOOD FRAME W/INTERIOR

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFE. TO TM5-303 BY FACILITY NUMBER
3. INSTALL EXHAUST FANS 5'-0" ABOVE FLOOR LEVEL

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-37	PLAN	1 OF 3
74-37	ELECTRICAL	2 OF 3
74-37	PLUMBING	3 OF 3
99-98	STANDARD DETAILS	
34-11	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

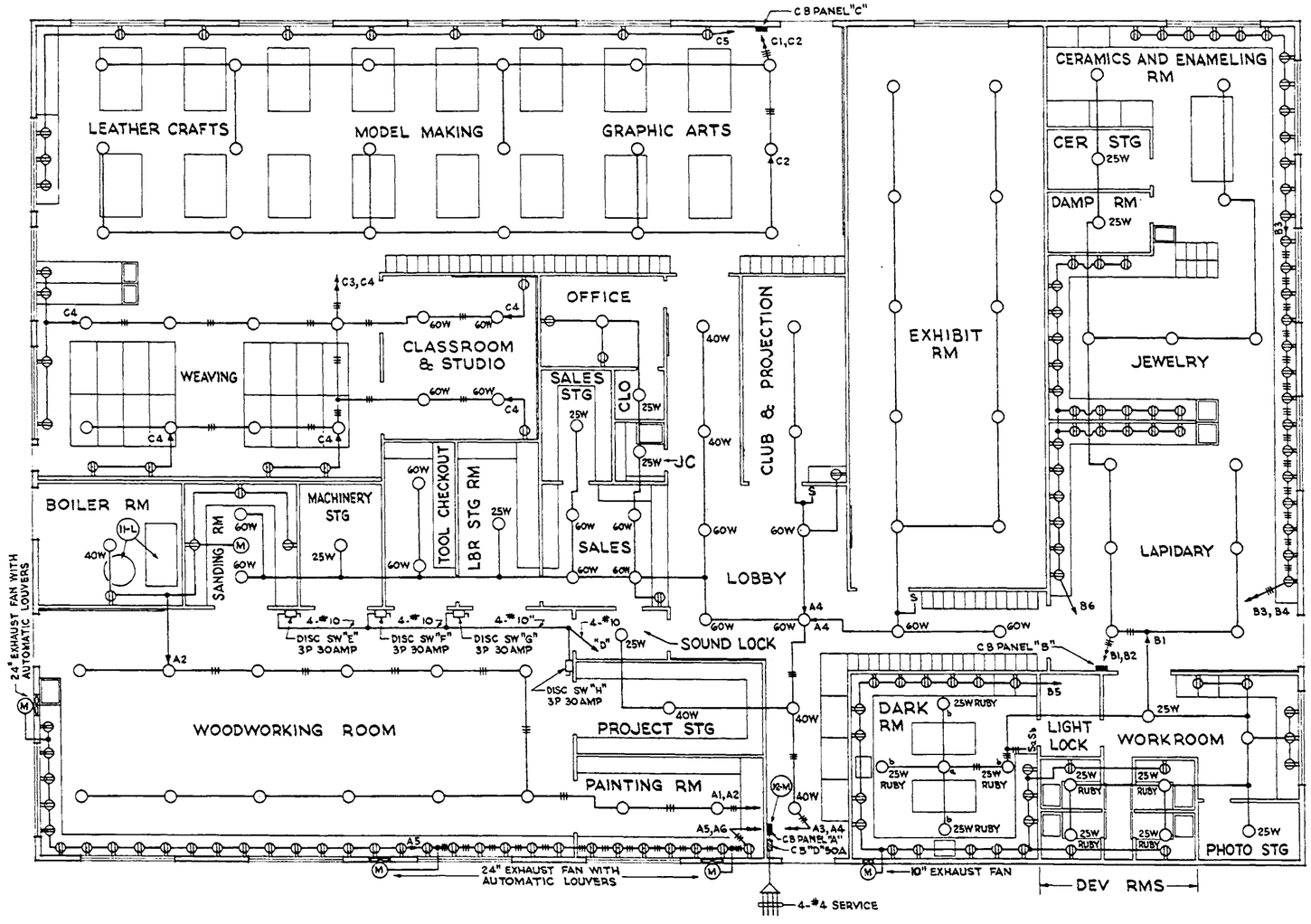
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: PENDLETON
SUBMITTED BY: R. W. DEICHMANN
APPROVED: APPROVED: DATE: 18 MAR 1969
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

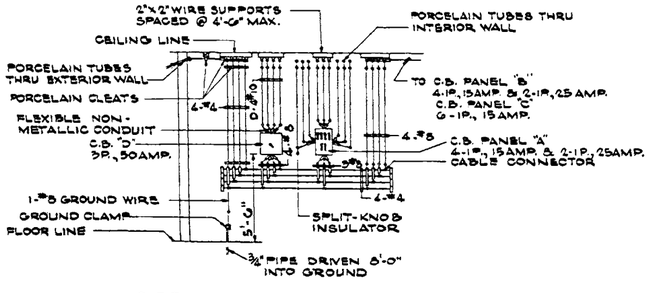
CRAFTS SHOP
80'X120'

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 3
74-37



PLAN

SCALE NO. 24



CIRCUIT BREAKER INSTALLATION

NO SCALE

ELECTRICAL NOTES

CONNECTED LOAD	
LIGHTING	8.47 KW
RECP EST	13.80 KW
POWER EST	16.60 KW
TOTAL	38.87 KW

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100W.
2. ALL 40W, 60W & 100W LAMPS TO HAVE 8" CONICAL SHADES.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES 0 5' 10'

NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: PENDLETON
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

CRAFTS SHOP
ELECTRICAL
80'X120'

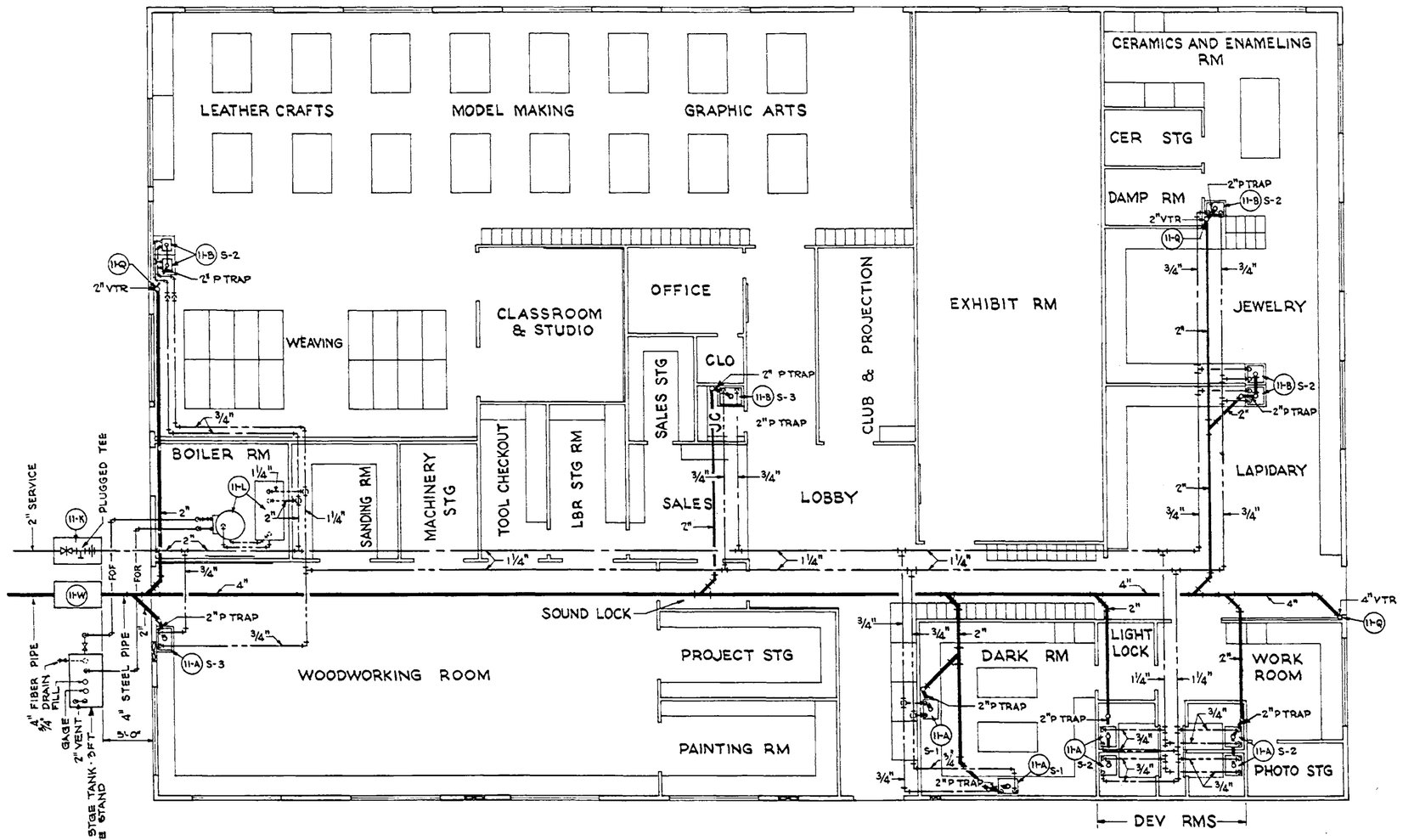
APPROVED: APPROVED: DATE:
H. M. Williams 19 MAR 1969
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
74-37

DATE

SHEET 2 OF 3



PLAN
SCALE NO. 24

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: PENDLETON
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS

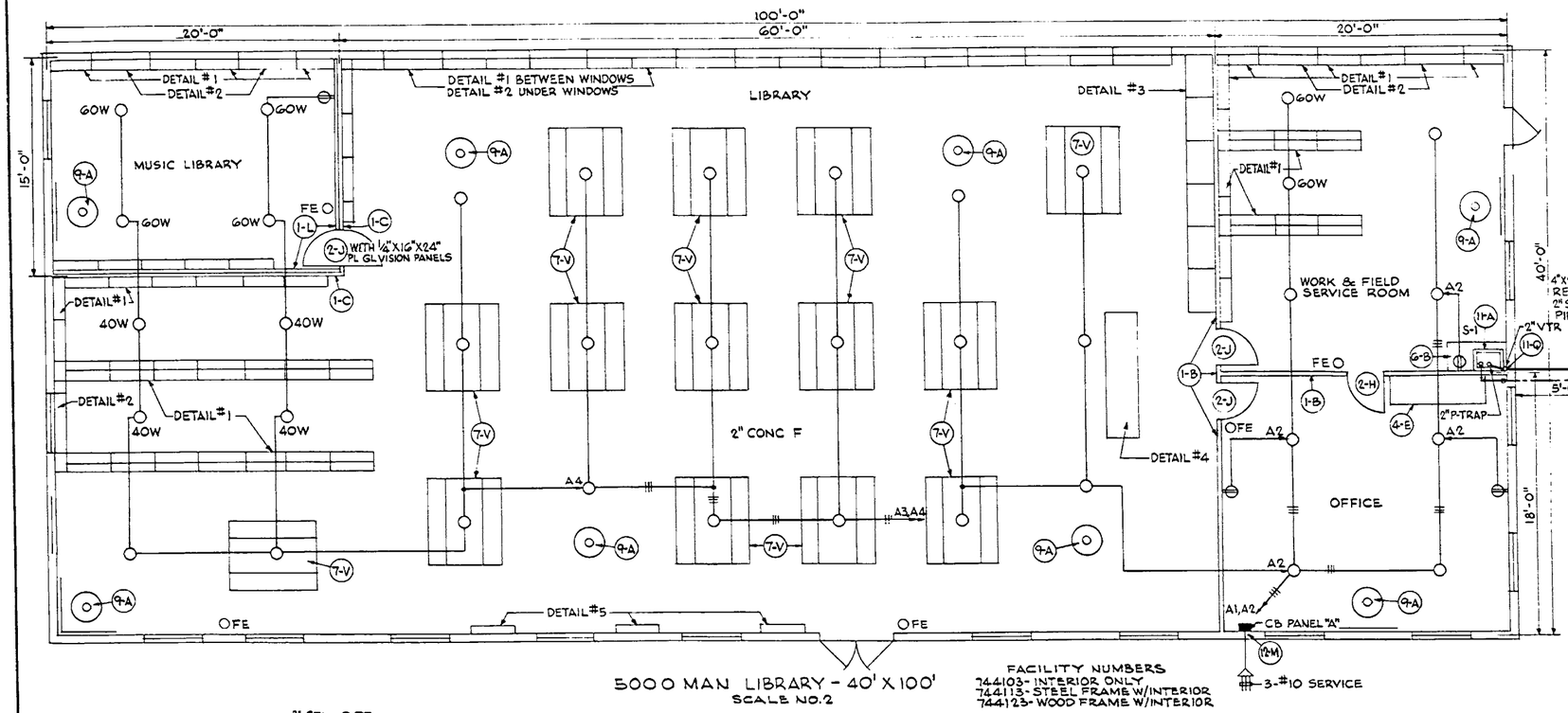
CRAFTS SHOP
PLUMBING
80'X120'

APPROVED: [signature] DATE:
CHIEF, STRUCTURES BRANCH
APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 3 OF 3 74-37

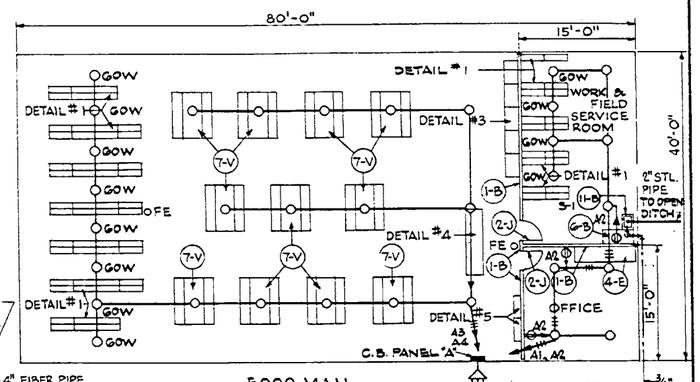
CORPS OF ENGINEERS

U. S. ARMY

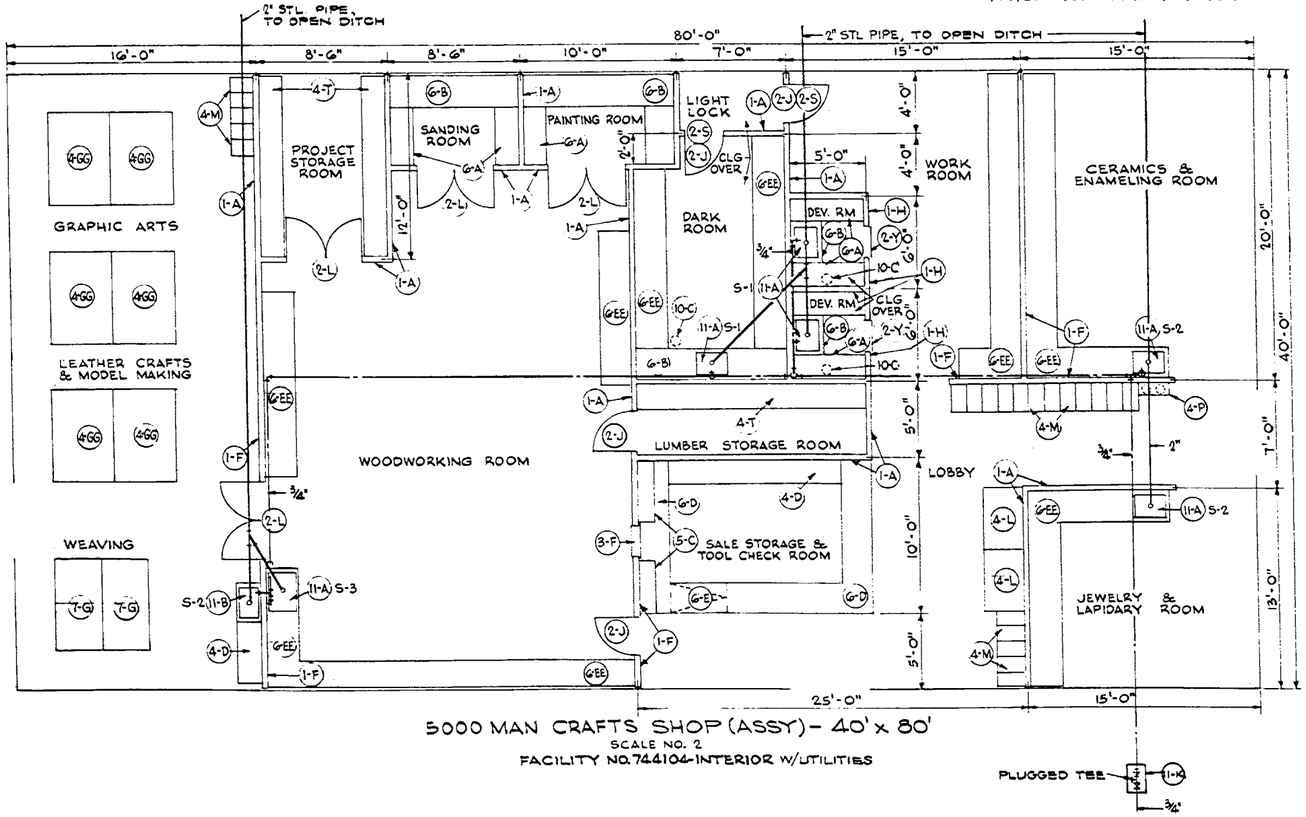


5000 MAN LIBRARY - 40' X 100'
SCALE NO.2

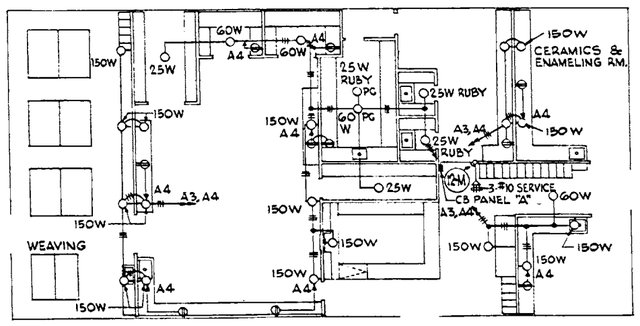
FACILITY NUMBERS
744103- INTERIOR ONLY
744113- STEEL FRAME W/INTERIOR
744123- WOOD FRAME W/INTERIOR



5000 MAN
LIBRARY (ASSY.) - 40' X 80'
SCALE NO. 1
FACILITY NO. 744101 - INTERIOR W/UTILITIES



5000 MAN CRAFTS SHOP (ASSY) - 40' x 80'
SCALE NO. 2
FACILITY NO. 744104-INTERIOR W/UTILITIES



CRAFTS SHOP ELECTRICAL PLAN
SCALE NO. 1

ELECTRICAL NOTES

CONNECTED LOAD

FACIL. NO.	744101	744103	744104
LIGHTING	2.82	3.22 KW	2.97 KW
RECP EST	0.30	.40 KW	1.00 KW
TOTAL	3-1/2	3.62 KW	3.97 KW

1. UNLESS OTHERWISE NOTED ON PLAN, ALL LAMPS TO BE 100W.
2. ALL 40, 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.
3. ALL 150W LAMPS TO HAVE 14" DIA. FLAT SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIRMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER
3. CEILING HEIGHT IN DARK ROOM, LIGHT LOCK, AND DEVELOPING ROOMS OF CRAFTS SHOP TO BE 8'-0" CEILING JOISTS TO BE 2" X 6" FRAMED ON SHORT SPAN AND COVERED ON UNDERSIDE WITH COMPOSITION WALLBOARD.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-41	PLANS	1 OF 1
74-43	LIBRARY DETAILS	1 OF 1
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' NO.1
0 5' 10' NO.2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

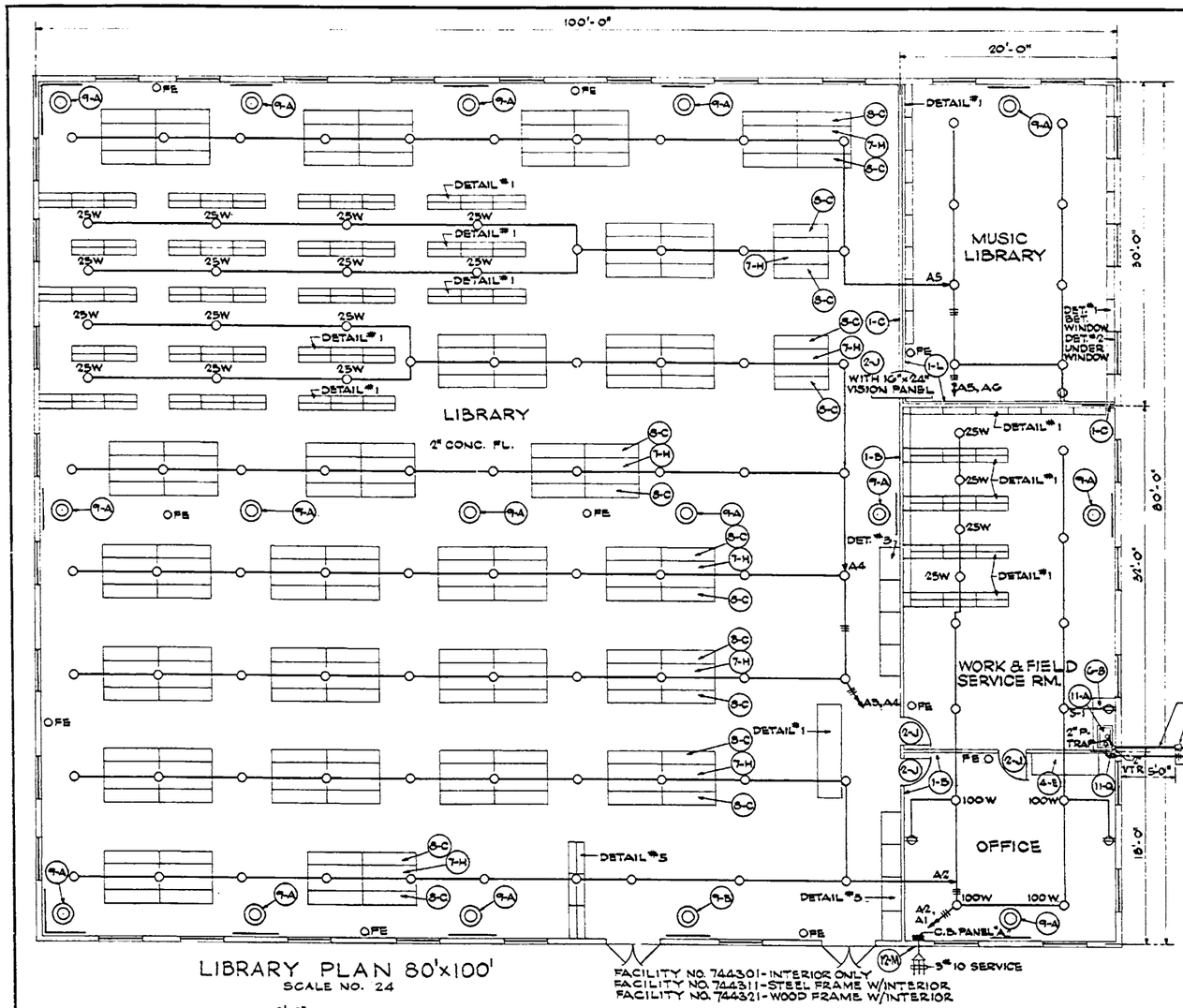
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: SHAFFER
SUBMITTED BY: C.W. DEICHMANN
APPROVED: H. Eichmann — CHIEF, STRUCTURES BRANCH
APPROVED: H.M. Williams — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE

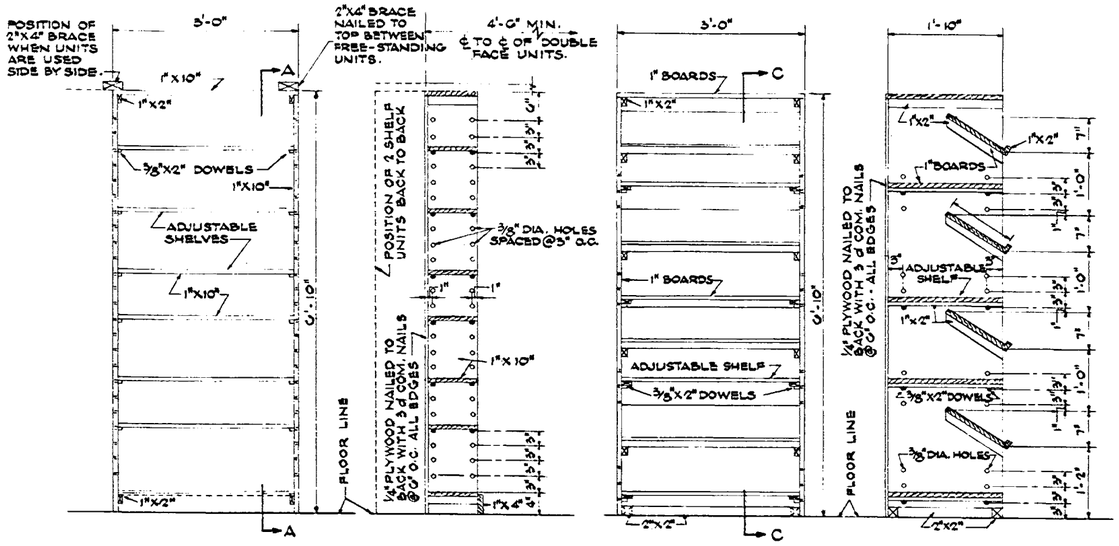
THEATER OF OPERATIONS

CRAFTS SHOP ASSY
LIBRARY ASSY
& LIBRARY PLANS

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-41
SHEET 1 OF 1



LIBRARY PLAN 80'x100'
SCALE NO. 24

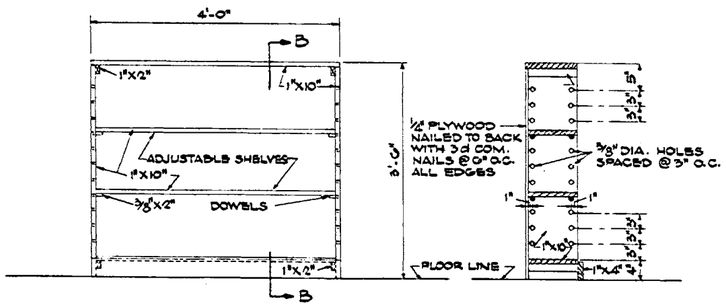


ELEVATION SECTION A-A

ELEVATION SECTION C-C

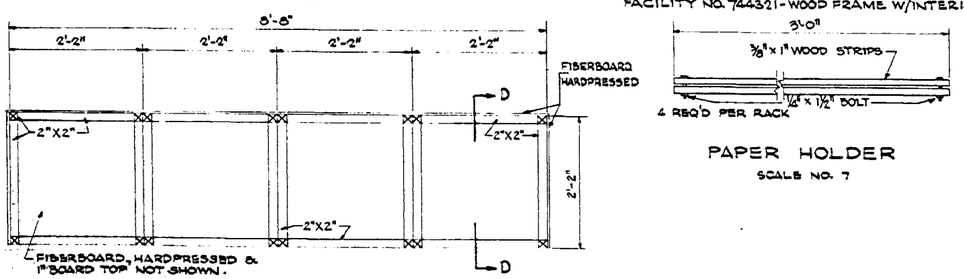
DETAIL # 1 - BOOK SHELVES
SCALE NO. 6

DETAIL # 3 - MAGAZINE RACK
SCALE NO. 6

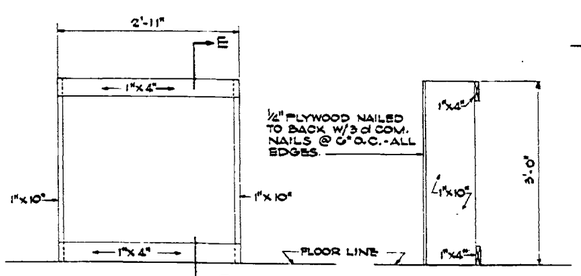


ELEVATION SECTION B-B

DETAIL # 2 - BOOK SHELVES
SCALE NO. 6

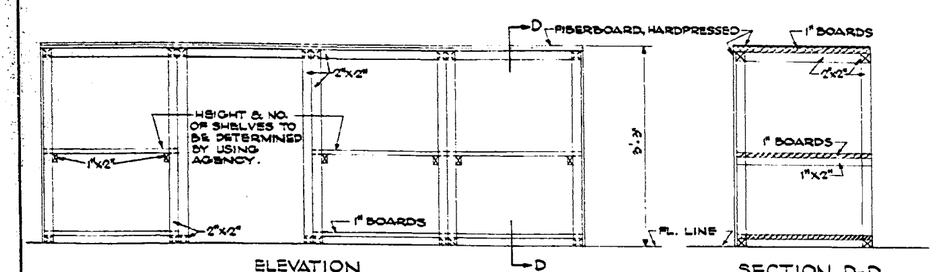


PAPER HOLDER
SCALE NO. 7



ELEVATION SECTION E-E

DETAIL # 5 - NEWSPAPER RACK
SCALE NO. 6



ELEVATION SECTION D-D

DETAIL # 4 - CHARGING DESK
SCALE NO. 6

ELECTRICAL NOTES

CONNECTED LOAD	
LIGHTING	5.89 KW
RECP. EST.	.40 KW
TOTAL	6.29 KW

1. UNLESS OTHERWISE NOTED ON PLAN, ALL LAMPS TO BE 60W.
2. ALL 60W & 100W LAMPS TO HAVE 8" CONICAL SHADES.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR PSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-45	PLAN & DETAILS	1 OF 1
99-98	STANDARD DETAILS	
34-11	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3OF3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3OF3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 0 3" 6" 9" 1' 2' 0 5' 10'
NO. 6 NO. 7 NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

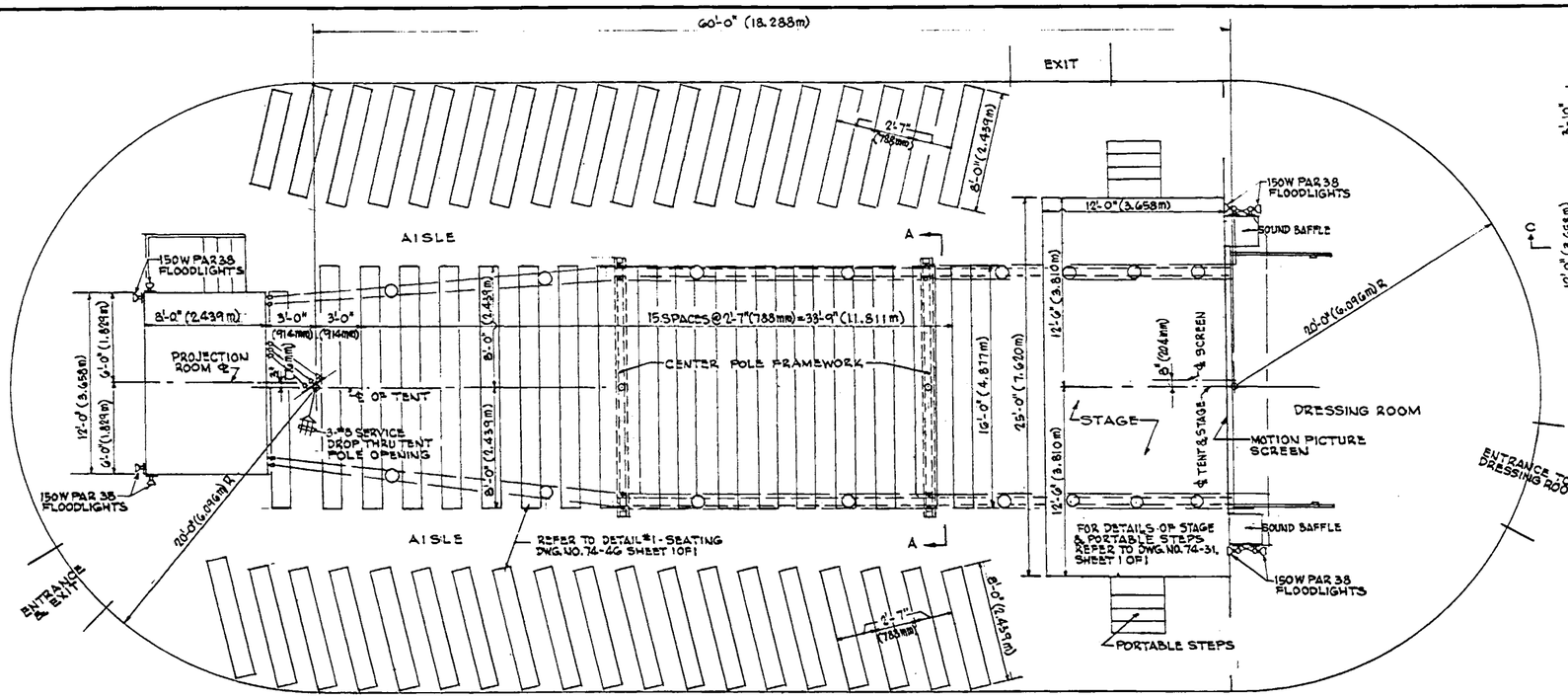
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED: G. E. Schaaman
CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE:

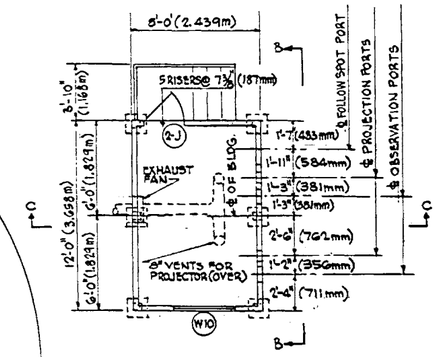
THEATER OF OPERATIONS

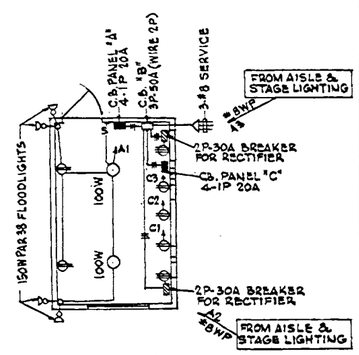
LIBRARY
80'X100'
PLAN & DETAILS

DATE: 19 MAR 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-43
SHEET 1 OF 1

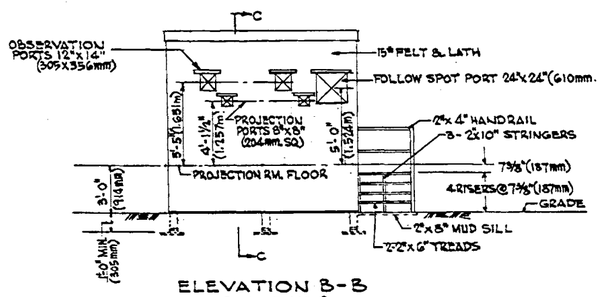


PLAN
SCALE NO. 2
FACILITY NO. 744501

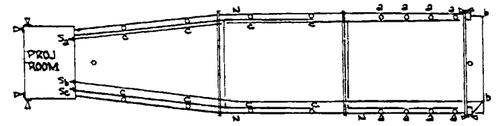


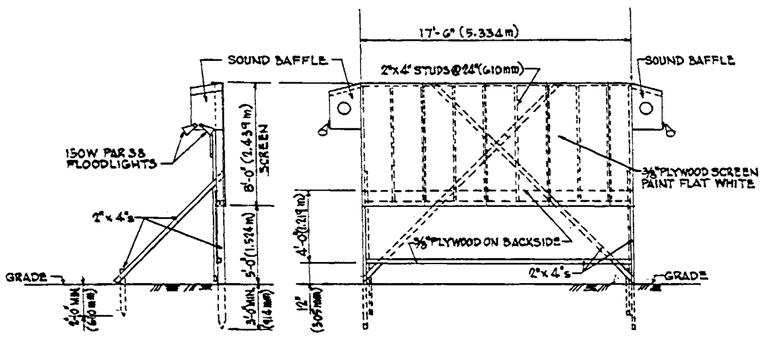


PROJECTION ROOM
SCALE NO. 2

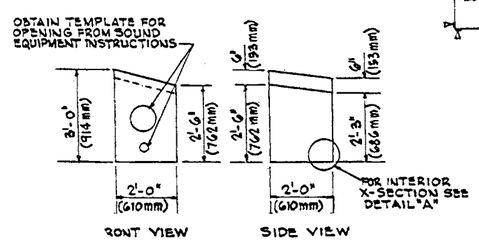


ELEVATION B-B
SCALE NO. 2

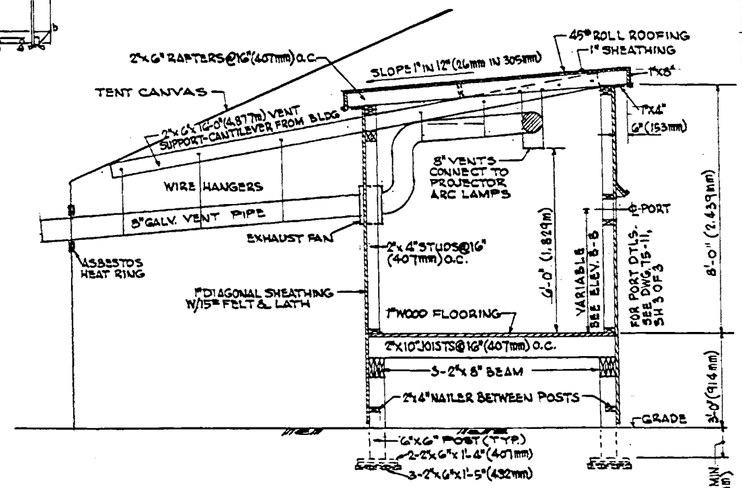




MOTION PICTURE SCREEN
SCALE NO. 2



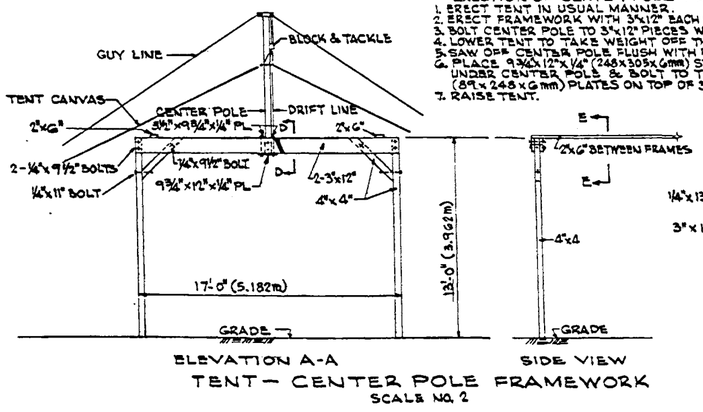
SOUND BAFFLE
NOT TO SCALE.



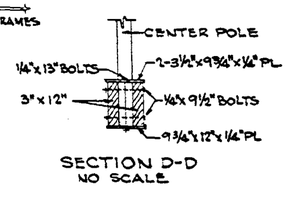
SECTION C-C
SCALE NO. 4

ERECTION OF CENTER POLE FRAMEWORK

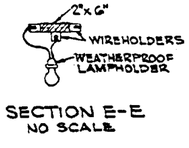
1. ERECT TENT IN USUAL MANNER.
2. ERECT FRAMEWORK WITH 3"x12" EACH SIDE OF CENTER POLE.
3. BOLT CENTER POLE TO 3"x12" PIECES W/2 - ⅛"x 9½" BOLTS.
4. LOWER TENT TO TAKE WEIGHT OFF THE CENTER POLE.
5. SAW OFF CENTER POLE FLUSH WITH BOTTOM OF 3"x12".
6. PLACE 9¾"x12"x¼" (248x305x6mm) STEEL SUPPORTING PLATE UNDER CENTER POLE & BOLT TO TWO 3/16"x9¾"x¼" (89 x 248 x 6 mm) PLATES ON TOP OF 3"x12" W/2 - ⅛"x 13" BOLTS.
7. RAISE TENT.



TENT - CENTER POLE FRAMEWORK
SCALE NO. 2



SECTION D-D
NO SCALE



SECTION E-E
NO SCALE

GENERAL NOTES

1. SOUND AND PROJECTION EQUIPMENT TO BE FURNISHED BY USING AGENCY.
2. FOR PORT OPENING DETAILS AND PROJECTION EQUIPMENT RATINGS, SEE OUTDOOR THEATER DRAWING NO. 75-11 SHEET 3 OF 3.
3. ALL LIGHTING TO BE 100W INCANDESCENT LAMPS UNLESS OTHERWISE NOTED.
4. FOR DWG & STD CONSTR DETAIL SYMBOLS, SEE SH 1 OF 10 OF INTRODUCTION TO TM 5-302.

SCHEDULE OF DRAWINGS

DWG NO.	DESCRIPTION	SHEET NO.
74-45	PLANS & DETAILS	1 OF 1
74-48	SEATING DETAIL	1 OF 1
75-11	PORT OPGS & PROJ EQUIP SCHED	3 OF 3
34-18	WINDOW DETAILS	1 OF 2
99-98	STANDARD DETAILS	

GRAPHIC SCALES
0 5' 10' 0 1' 2' 3' 4'
0 1m 2m 3m 0 1m
NO.2 NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D.C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D.C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN, CHIEF, ARCS OFFICE, MILITARY ENGINEERING, OCE.

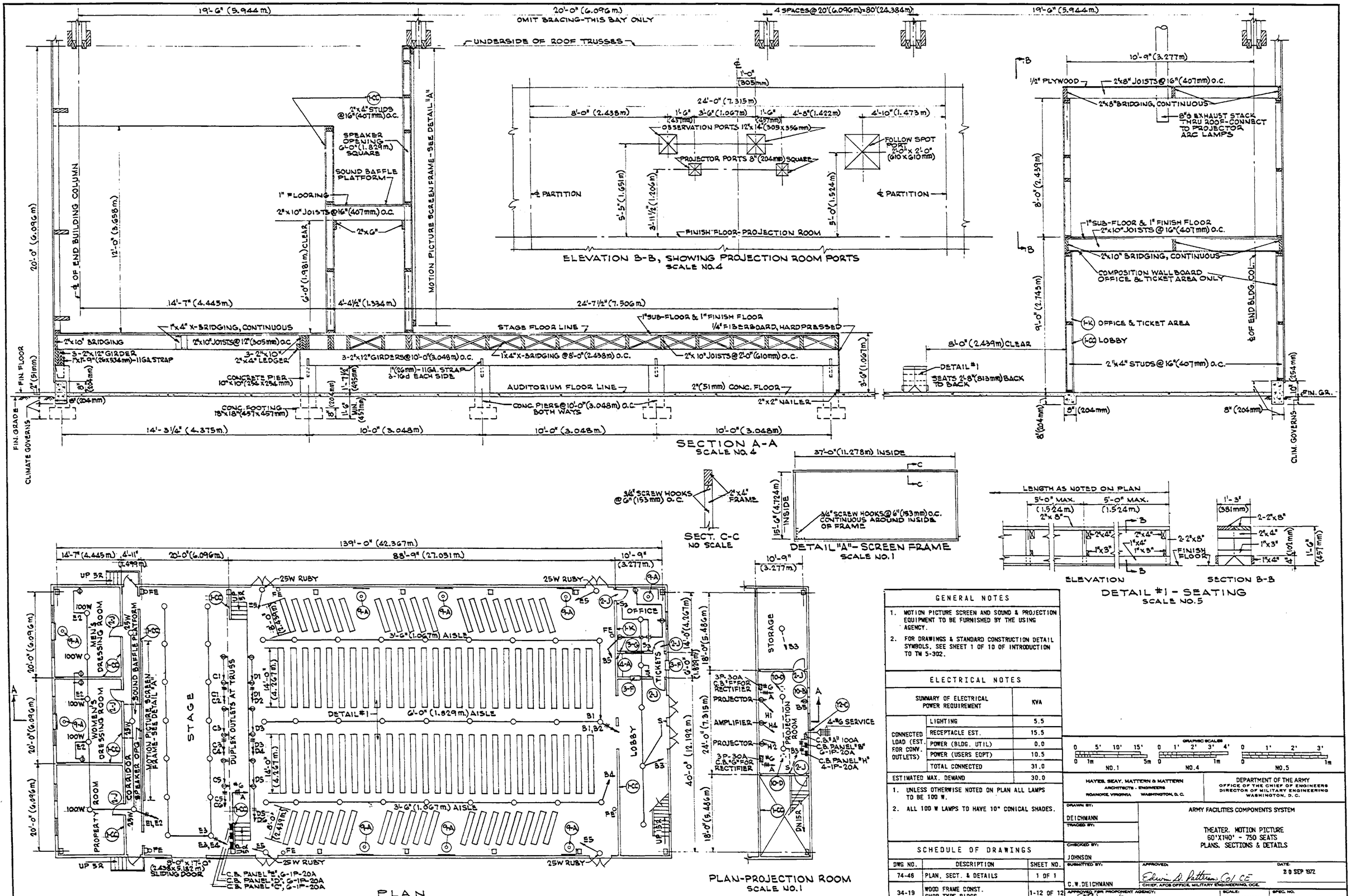
ARMY FACILITIES COMPONENTS SYSTEM

THEATER, MOTION PICTURE (ASSY TENT)
40'X100' - 350 SEATS

APPROVED: Edwin A. Patterson Col CE
DATE: 20 SEP 1972

APPROVED FOR PROPONENT AGENCY: MGC ENGINEERING DEPOT, ANNISTON
DATE: 18 September 1972

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-45
SHEET 1 OF 1



GENERAL NOTES

1. MOTION PICTURE SCREEN AND SOUND & PROJECTION EQUIPMENT TO BE FURNISHED BY THE USING AGENCY.
2. FOR DRAWINGS & STANDARD CONSTRUCTION DETAIL SYMBOLS, SEE SHEET 1 OF 10 OF INTRODUCTION TO TM 5-302.

ELECTRICAL NOTES

SUMMARY OF ELECTRICAL POWER REQUIREMENT		KVA
CONNECTED LOAD (EST. FOR CONV. OUTLETS)	LIGHTING	5.5
	RECEPTACLE EST.	15.5
	POWER (BLDG. UTIL)	0.0
	POWER (USERS EQPT)	10.5
	TOTAL CONNECTED	31.0
ESTIMATED MAX. DEMAND		30.0

1. UNLESS OTHERWISE NOTED ON PLAN ALL LAMPS TO BE 100 W.
2. ALL 100 W LAMPS TO HAVE 10" CONICAL SHADES.

SCHEDULE OF DRAWINGS

DWG NO.	DESCRIPTION	SHEET NO.
74-46	PLAN, SECT. & DETAILS	1 OF 1
34-19	WOOD FRAME CONST. SHOP TYPE BLDGS.	1-12 OF 12
99-98	STANDARD DETAILS	

GRAPHIC SCALES
NO. 1: 0, 5', 10', 15' / 0, 1m, 5m
NO. 4: 0, 1', 2', 3', 4' / 0, 1m
NO. 5: 0, 1', 2', 3' / 0, 1m

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

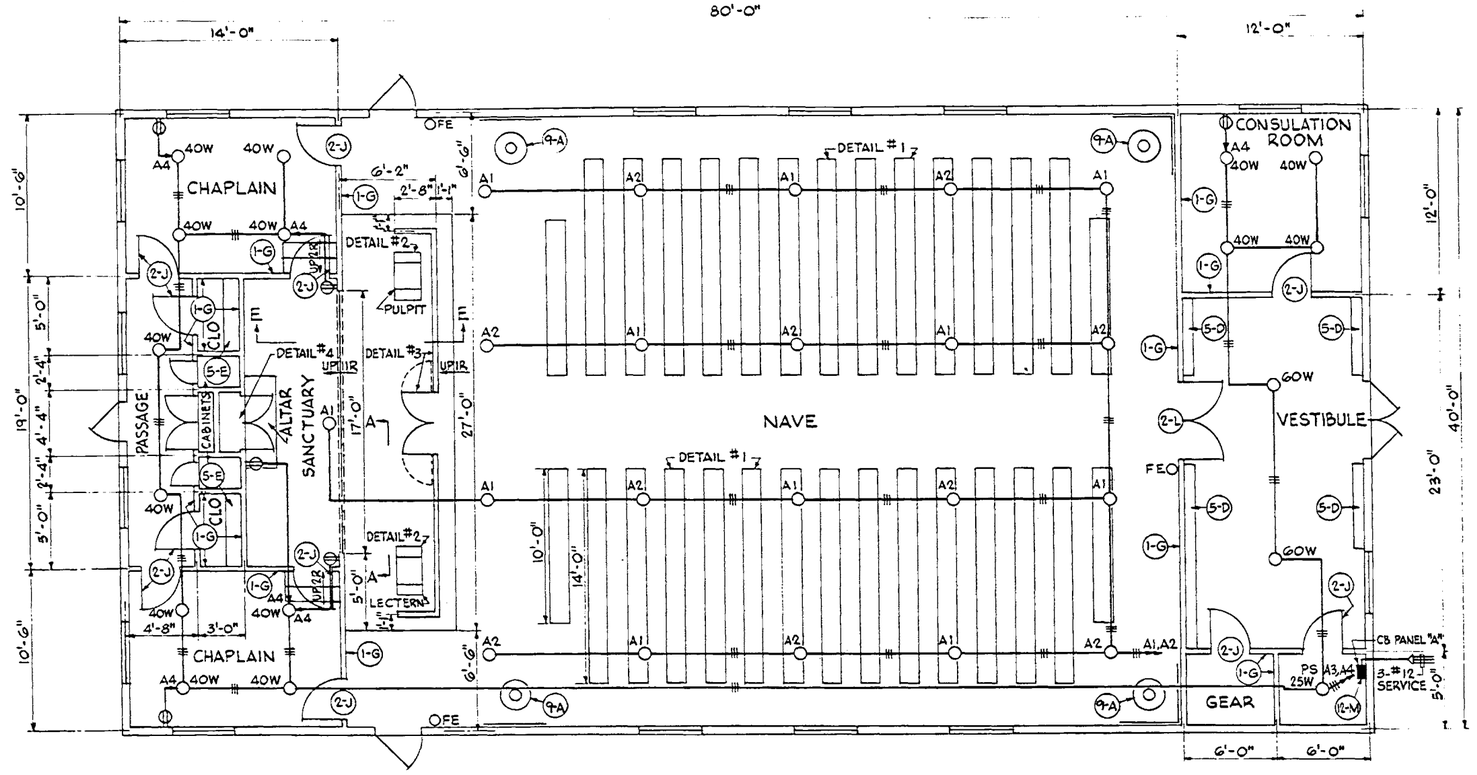
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: Edwin A. Patterson Col CE
DATE: 20 SEP 1972
CHIEF, APCS OFFICE, MILITARY ENGINEERING, OCE.
APPROVED FOR PROPONENT AGENCY: MGE ENGINEERING OFFICE ANFMD
DATE: 18 September 1972

ARMY FACILITIES COMPONENTS SYSTEM

THEATER, MOTION PICTURE
60'X140' - 750 SEATS
PLANS, SECTIONS & DETAILS

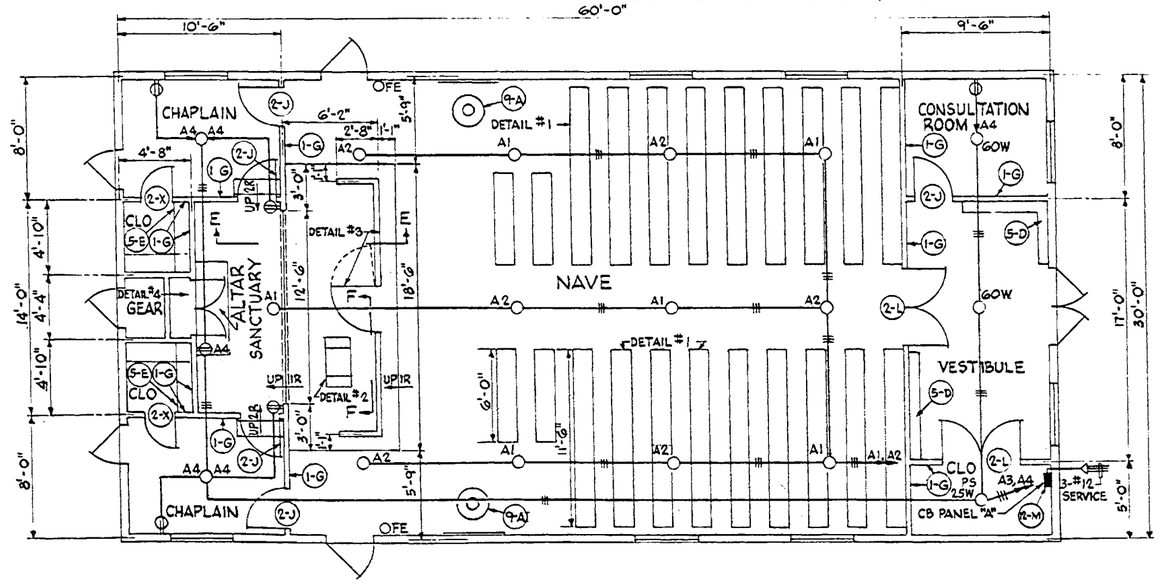
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-46
SHEET 1 OF 1



CHAPEL-300 SEATS

SCALE NO. 2

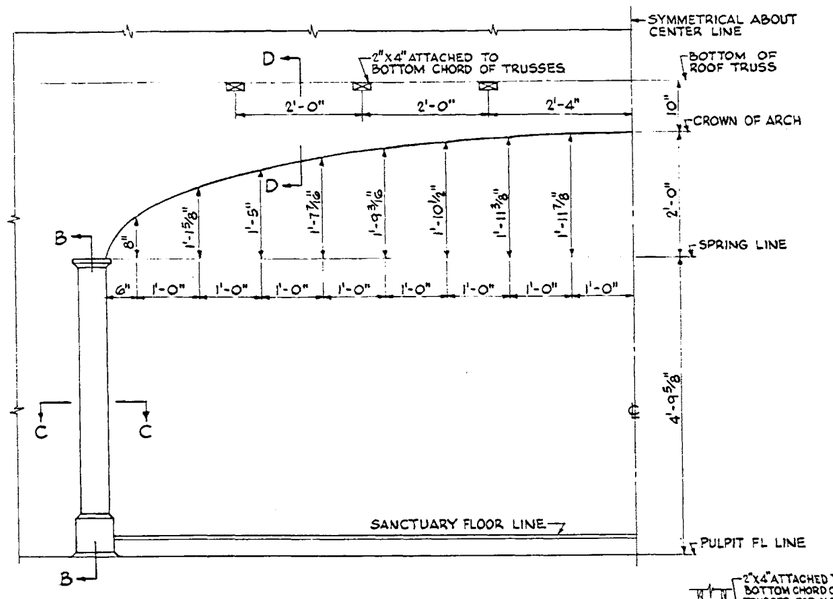
FACILITY NO. 744701 - INTERIOR ONLY
FACILITY NO. 744711 - STEEL FRAME W/INTERIOR
FACILITY NO. 744761 - WOOD FRAME W/INTERIOR



CHAPEL-150 SEATS

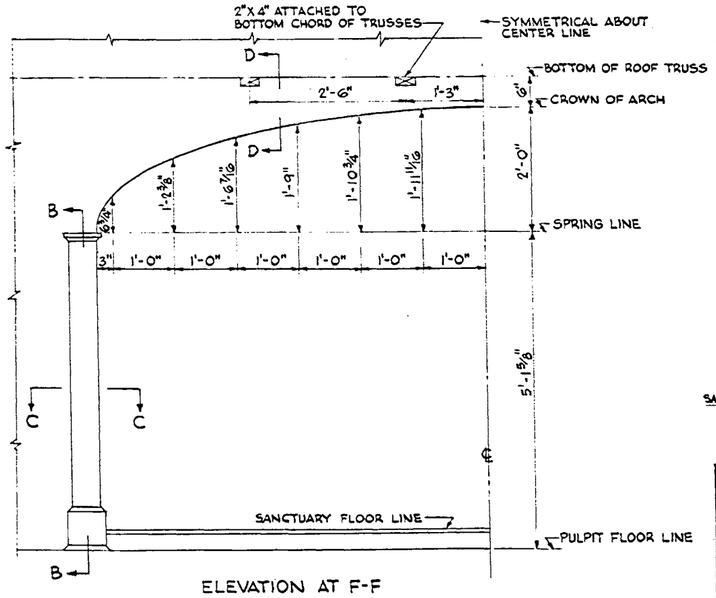
SCALE NO. 2

FACILITY NO. 744702 - INTERIOR ONLY
FACILITY NO. 744712 - STEEL FRAME W/INTERIOR
FACILITY NO. 744722 - WOOD FRAME W/INTERIOR



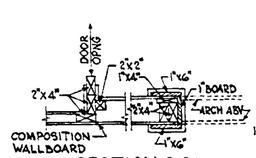
ELEVATION AT A-A

SCALE NO. 6



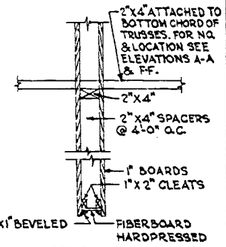
ELEVATION AT F-F

SCALE NO. 6



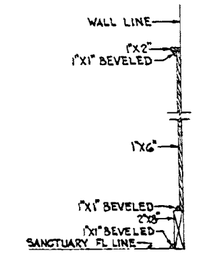
SECTION C-C

SCALE NO. 6



SECTION D-D

SCALE NO. 6



SECTION B-B

SCALE NO. 6

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR ESTIMATE OF MATERIALS - REFER TO TM 5-303 BY FACILITY NUMBER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
74-47	PLANS	1 OF 2
74-47	PLANS & DETAILS	2 OF 2
99-98	STANDARD DETAILS	
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

ELECTRICAL NOTES

300 SEATS - 40' X 80'		150 SEATS - 30' X 60'	
CONNECTED LOAD		CONNECTED LOAD	
LIGHTING	2.81 KW	LIGHTING	1.55 KW
RECP EST	.60 KW	RECP EST	.60 KW
TOTAL	3.41 KW	TOTAL	2.15 KW
1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 100W. 2. ALL 40, 60, & 100W LAMPS TO HAVE 8" CONICAL SHADES.		1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 100W. 2. ALL 60 & 100W LAMPS TO HAVE 8" CONICAL SHADES.	

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 5' 10' — NO. 2

0 1' 2' — NO. 6

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN

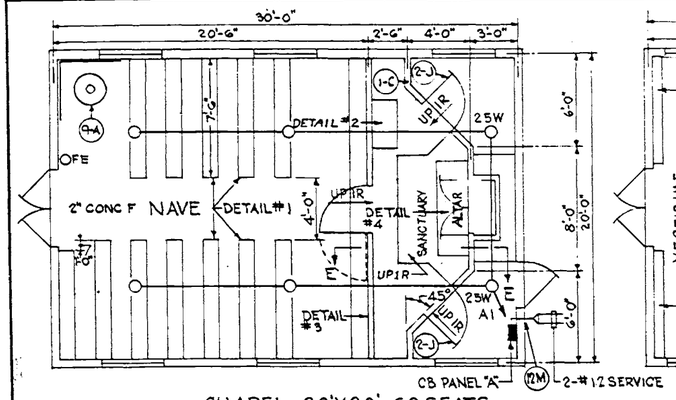
APPROVED: H. Edwards, CHIEF STRUCTURES BRANCH
APPROVED: H. N. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1959

APPROVED FOR PROPONENT AGENCY: Lowell B. Wilson, Chaplain (Col) USA, Adm & Mgt. DATE: 4 OCT 1958

THEATER OF OPERATIONS

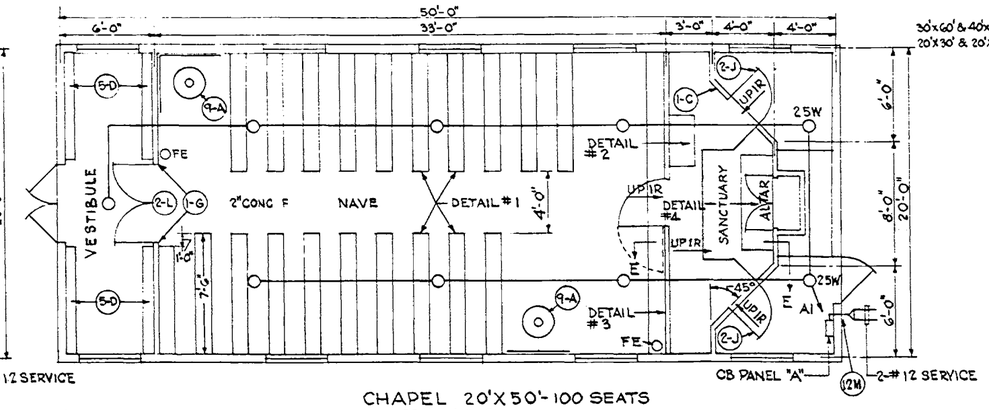
CHAPELS
300 SEATS-40'X80'
150 SEATS-30'X60'

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-47
SHEET 1 OF 2



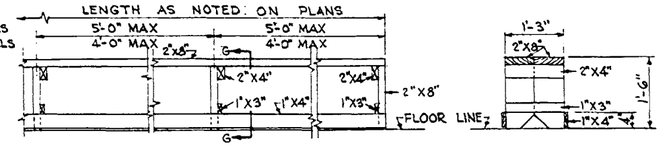
CHAPEL 20'X30'-60 SEATS
SCALE NO. 2

FACILITY NO. 744703 - INTERIOR ONLY
FACILITY NO. 744713 - STEEL FRAME W/INTERIOR
FACILITY NO. 744723 - WOOD FRAME W/INTERIOR



CHAPEL 20'X50'-100 SEATS
SCALE NO. 2

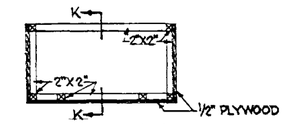
FACILITY NO. 744704 - INTERIOR ONLY
FACILITY NO. 744714 - STEEL FRAME W/INTERIOR
FACILITY NO. 744724 - WOOD FRAME W/INTERIOR



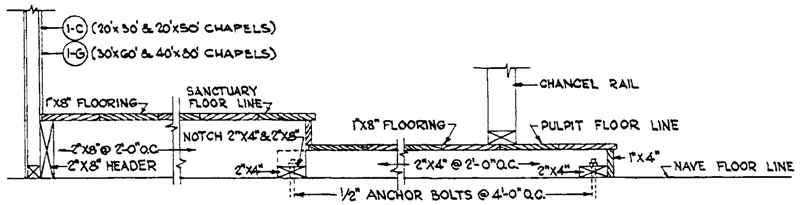
ELEVATION

SECTION G-G

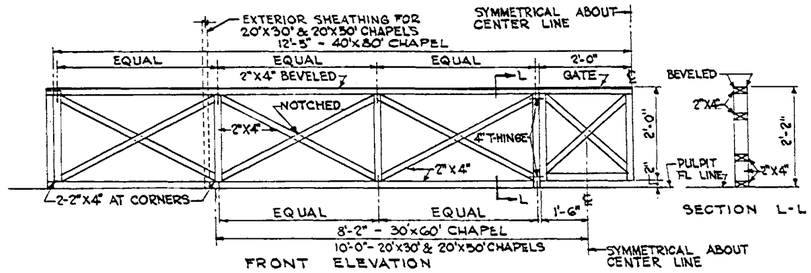
DETAIL #1
SEATING
SCALE NO. 5



SECTION H-H



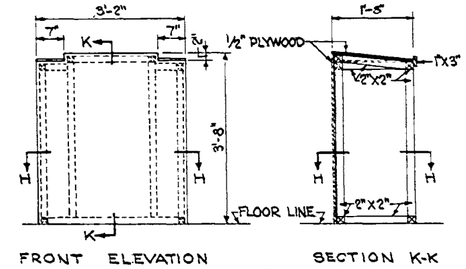
SECTION E-E
SCALE NO.7



FRONT ELEVATION

SECTION L-L

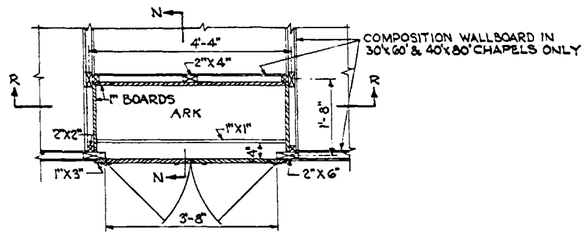
DETAIL #3
CHANCEL RAIL & GATE
SCALE NO. 5



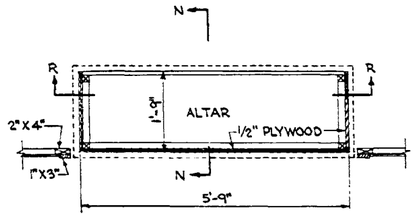
FRONT ELEVATION

SECTION K-K

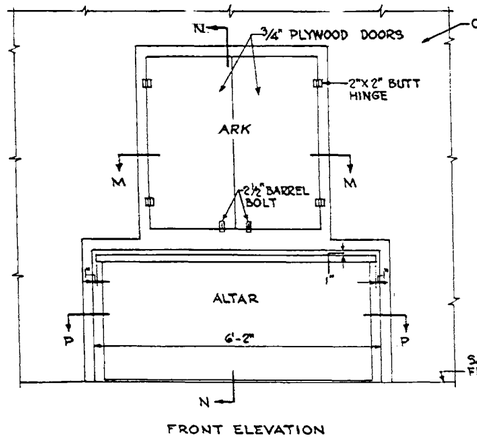
DETAIL #2
PULPIT & LECTERN
SCALE NO. 5



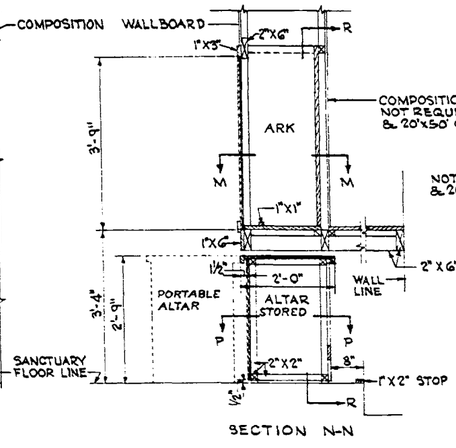
SECTION M-M



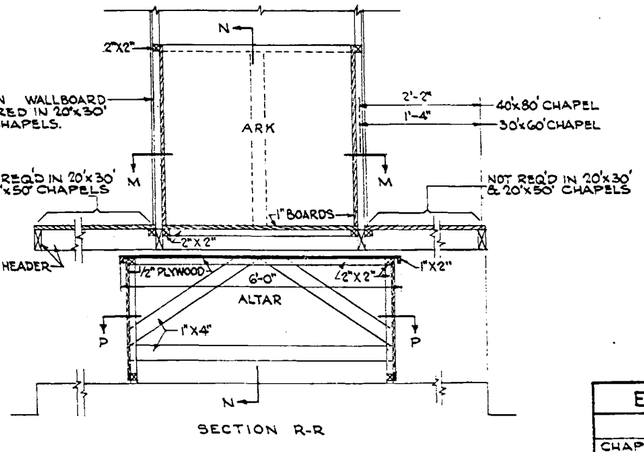
SECTION P-P



FRONT ELEVATION



SECTION N-N



SECTION R-R

DETAIL #4
ALTAR & ARK
SCALE NO. 5

ELECTRICAL NOTES

CONNECTED LOAD

CHAPEL	20'X50'	20'X30'
LIGHTING	.47 KW	.29 KW

1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 60W.
2. ALL 60W LAMPS TO HAVE 8" CONICAL SHADES.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 0 1' 2' 0' 3" 6" 9" 1' 2'
NO.2 NO.5 NO.7

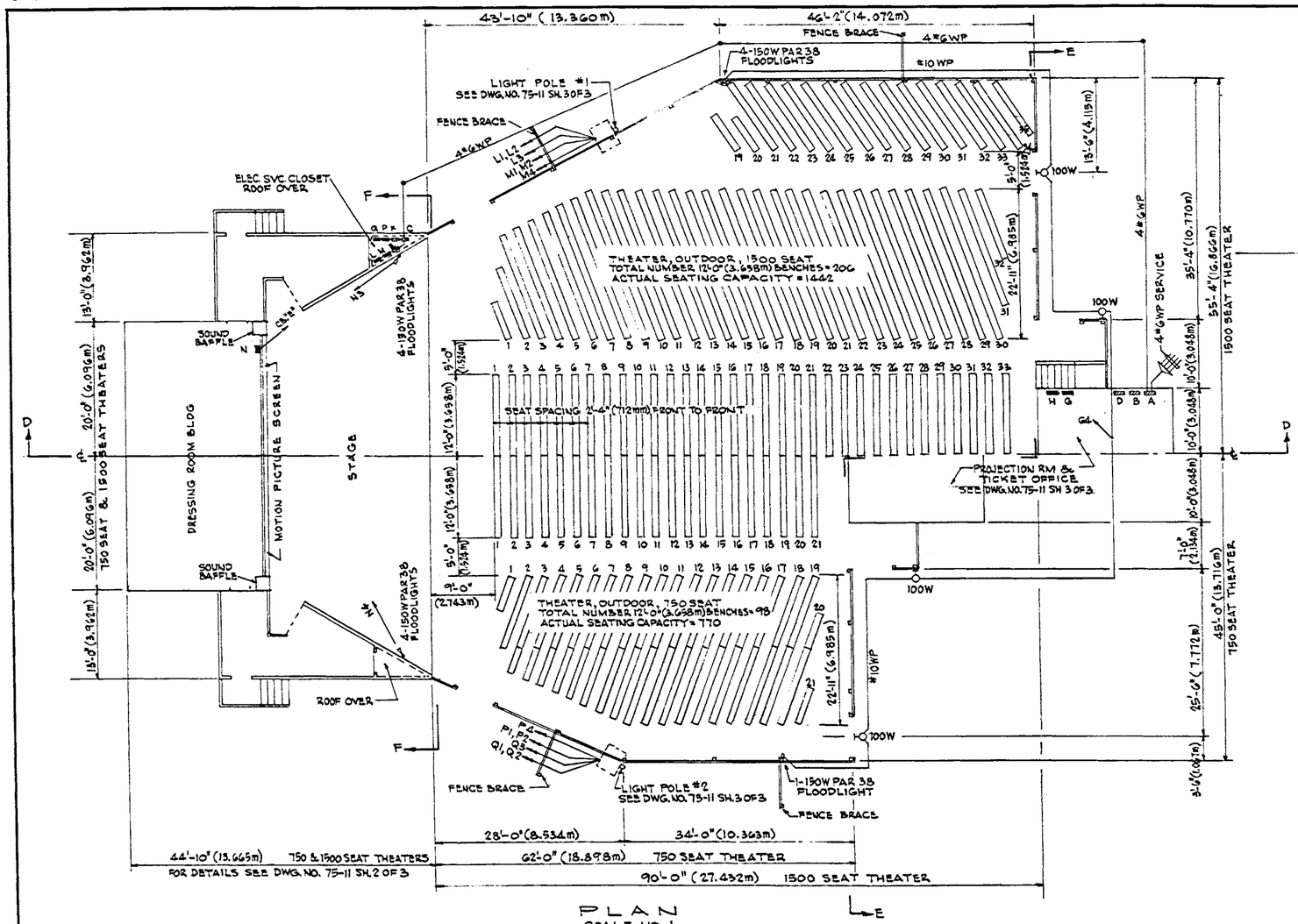
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

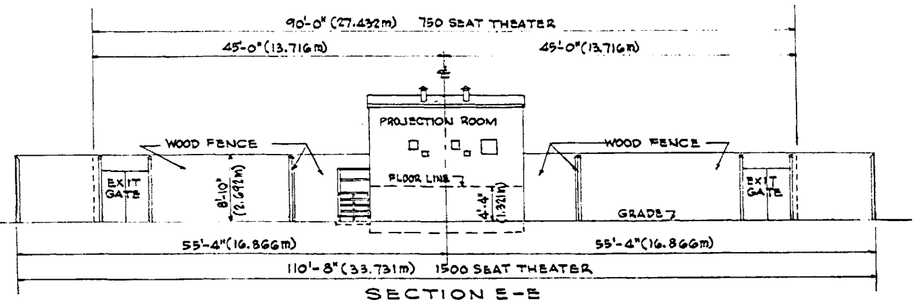
DRAWN BY: I.LYUS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: H. Eddleman, CHIEF, ARCHITECTURAL BRANCH
APPROVED: H.N. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

THEATER OF OPERATIONS
CHAPELS
60 SEATS-20'X30'-100 SEATS-20'X50'
PLANS & DETAILS

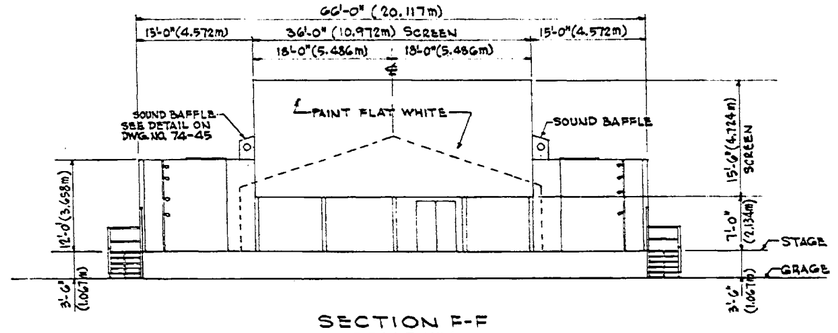
APPROVED FOR PROPONENT AGENCY: Lloyd B. Wilson, Chaplain (Col) USA, Adm & Mgt
DATE: 4 OCT 1958
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 74-47
SHEET 2 OF 2



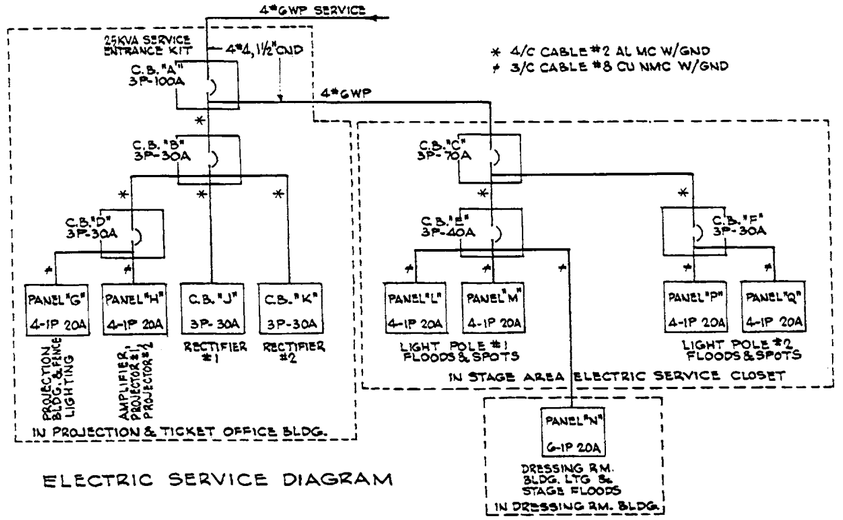
PLAN
SCALE NO. 1
FACILITY NO. 751101 - THEATER, OUTDOOR, 750 SEATS
FACILITY NO. 751102 - THEATER, OUTDOOR, 1500 SEATS



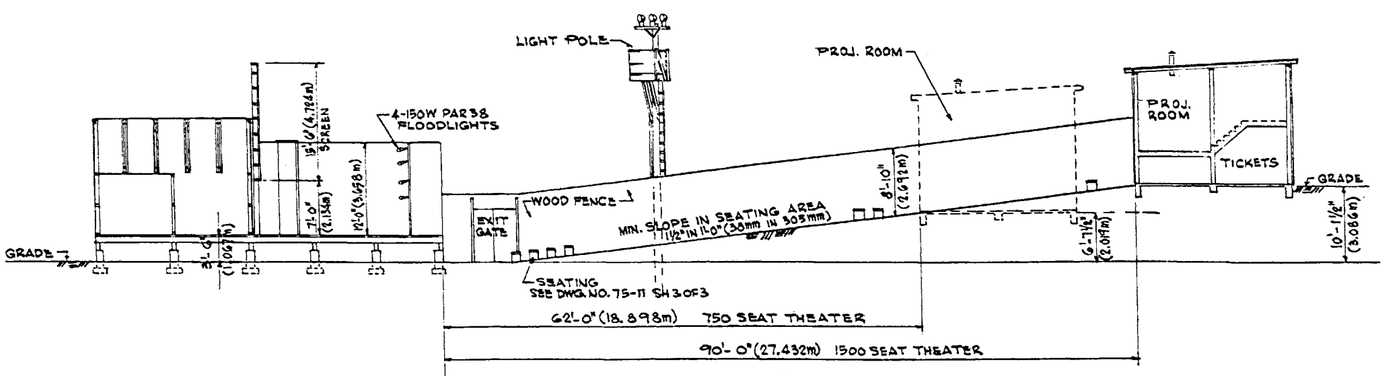
SECTION E-E
SCALE NO. 1



SECTION F-F
SCALE NO. 1



ELECTRIC SERVICE DIAGRAM



SECTION D-D
SCALE NO. 1

GENERAL NOTES

1. SOUND AND PROJECTION EQUIPMENT TO BE FURNISHED BY USING AGENCY.
2. ALL LIGHTING TO BE 100W INCANDESCENT LAMPS UNLESS OTHERWISE NOTED.
3. FOR DWG & STD CONSTR. DETAIL SYMBOLS, SEE SH 1 OF 10 OF INTRODUCTION TO TM 5-302.

SCHEDULE OF DRAWINGS

DWG NO.	DESCRIPTION	SHEET NO.
75-11	PLANS & DETAILS	1-3 OF 3
34-03	WOOD FRAME CONST BARRACKS TYPE BLDGS	1-7 OF 7
34-18	WINDOW DETAILS	1 OF 2
99-98	STANDARD DETAILS	

GRAPHIC SCALES: 0 5' 10' 15' / 0 1m 5m NO.1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D.C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D.C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C. W. DEICHMANN

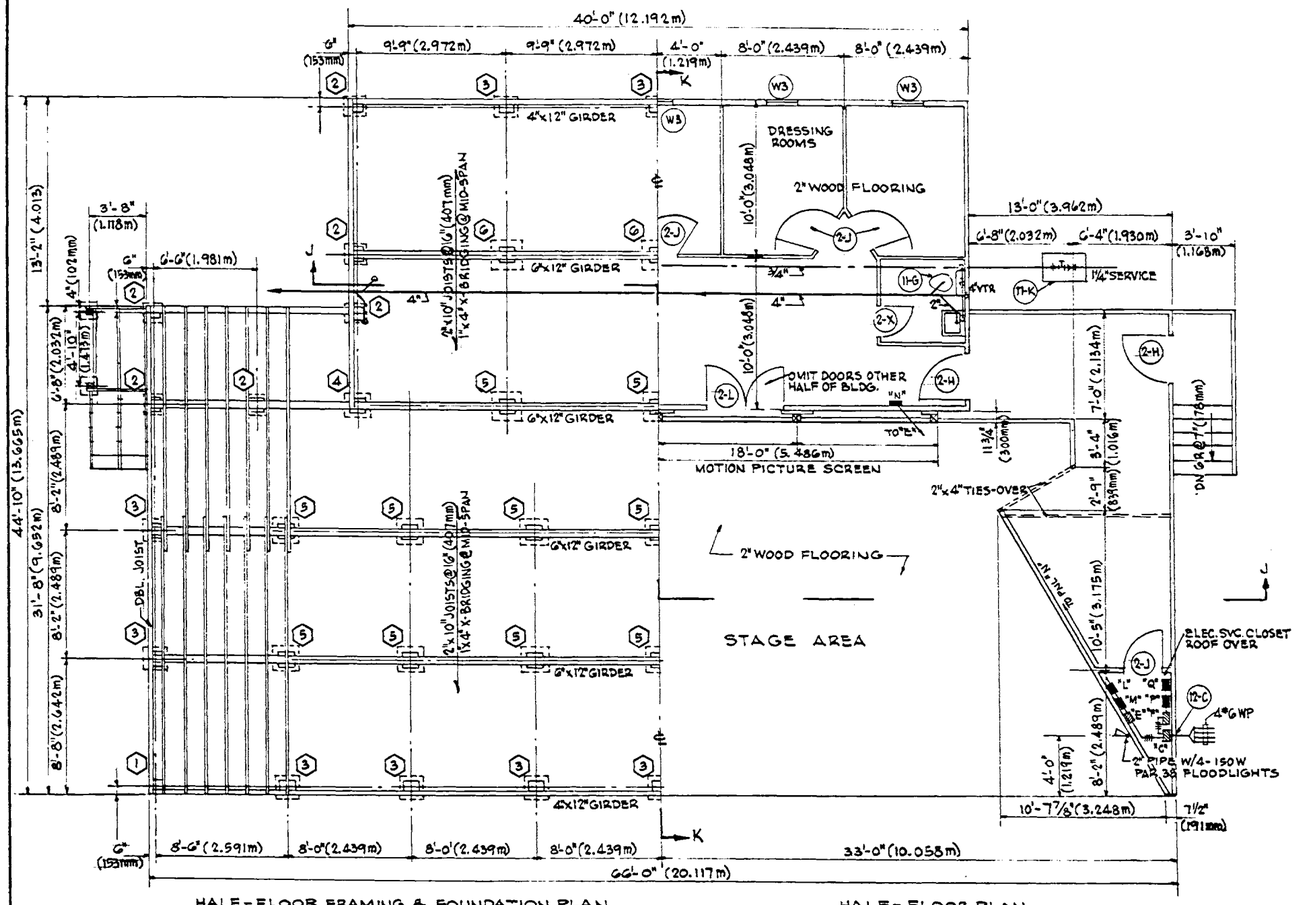
ARMY FACILITIES COMPONENTS SYSTEM

THEATER - OUTDOOR
750 & 1500 SEATS
PLAN & SECTIONS
ELECTRIC SERVICE DIAGRAM

APPROVED: Edwin A. Patterson, Col, CE, CHIEF, A/E/S OFFICE, MILITARY ENGINEERING, OCE
DATE: 20 SEP 1972

APPROVED FOR PROPONENT AGENCY:
DATE: 18 September 1972

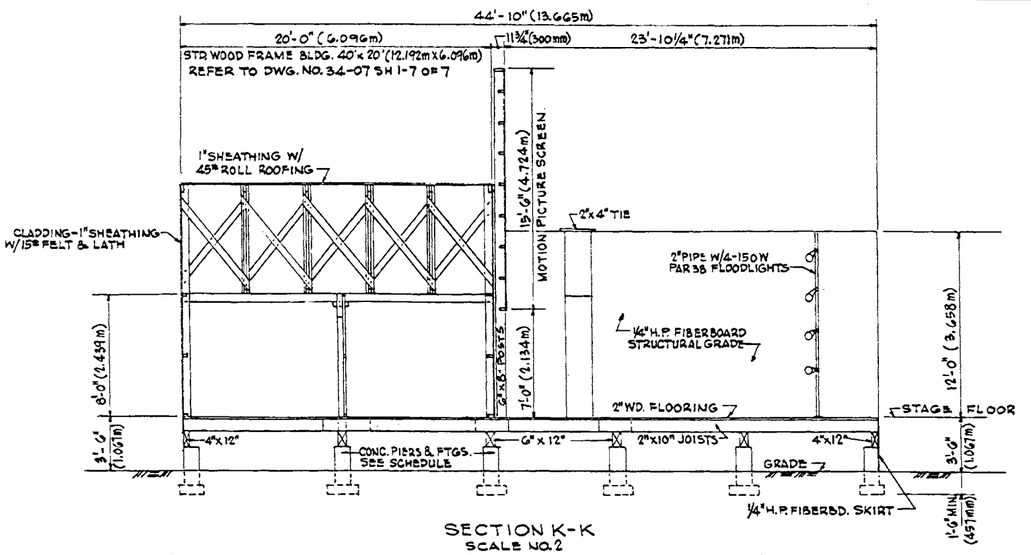
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 75-11
SHEET 1 OF 3



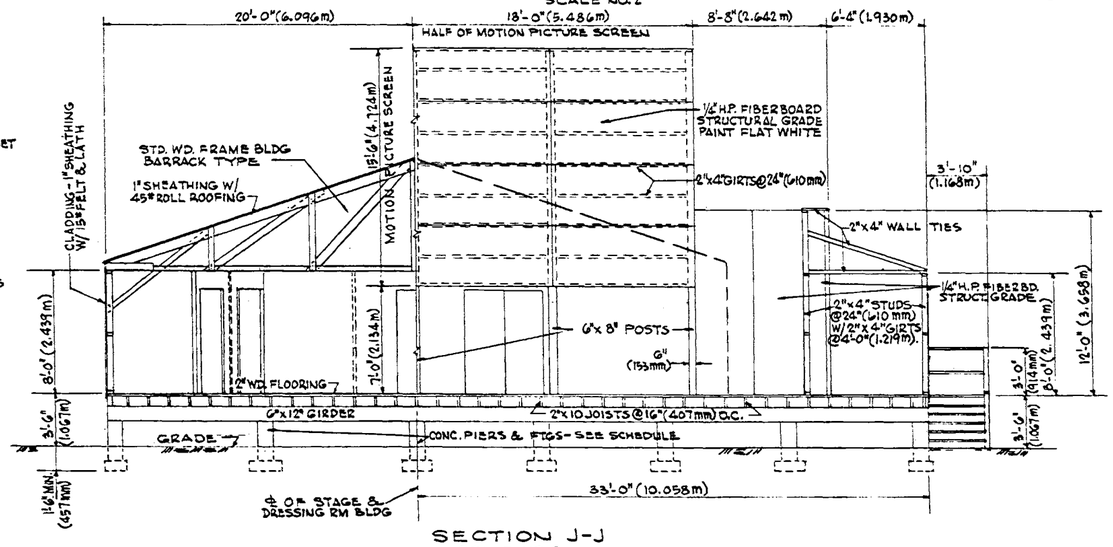
HALF-FLOOR FRAMING & FOUNDATION PLAN

HALF-FLOOR PLAN

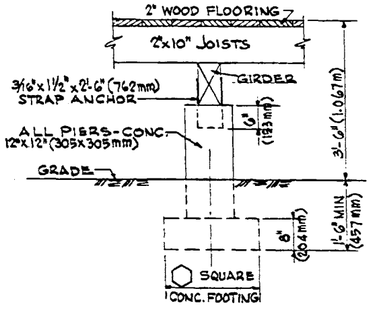
STAGE & DRESSING ROOMS
(SYMMETRICAL ABOUT ℄ EXCEPT AS NOTED)
SCALE NO. 2



SECTION K-K
SCALE NO. 2

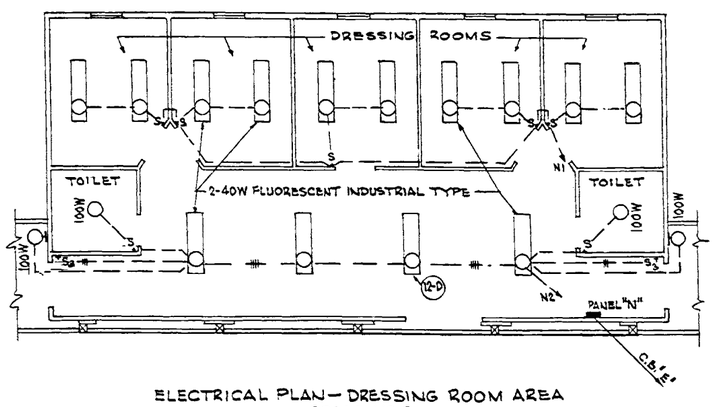


SECTION J-J
SCALE NO. 2



CONCRETE FOOTINGS	
FOOTING	DIMENSION
①	12" (305mm)
②	15" (381mm)
③	18" (457mm)
④	20" (508mm)
⑤	22" (559mm)
⑥	24" (610mm)

CONCRETE PIERS & FOOTINGS
NOT TO SCALE



ELECTRICAL PLAN - DRESSING ROOM AREA
SCALE NO. 2

GRAPHIC SCALES
0 5' 10'
0 1m 2m 3m
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN

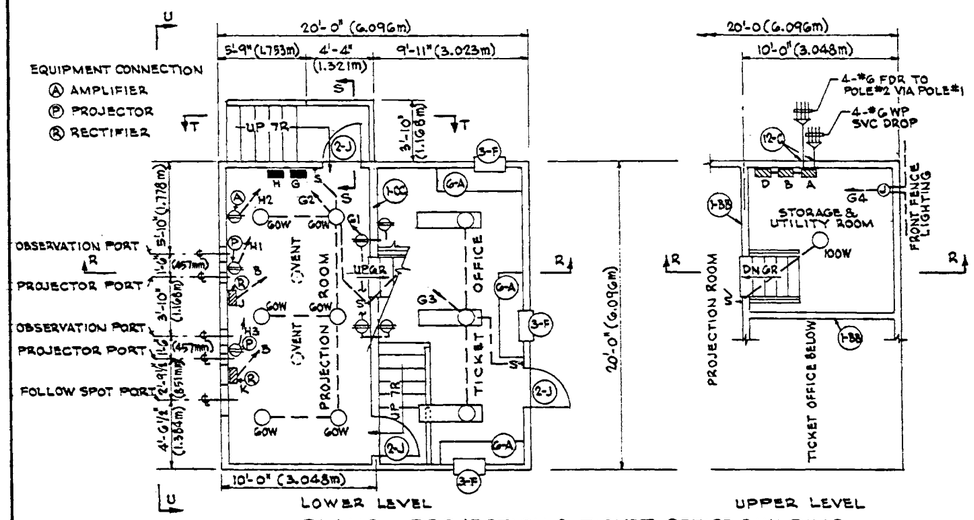
ARMY FACILITIES COMPONENTS SYSTEM

THEATER - OUTDOOR
750 & 1500 SEATS
STAGE & DRESSING ROOM
PLANS & DETAILS

APPROVED: Edwin A. Patterson, Col CE
CHIEF, AFCS OFFICE, MILITARY ENGINEERING, OCE.
DATE: 20 SEP 1972

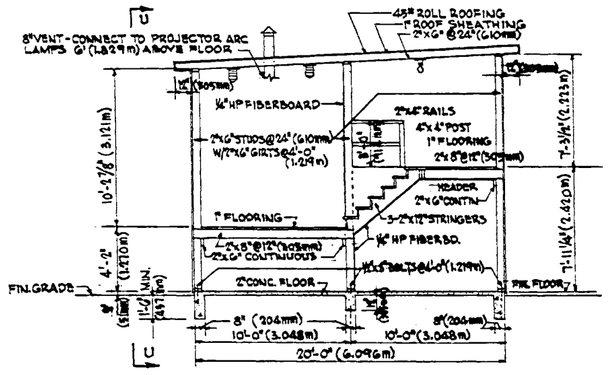
APPROVED FOR PROPONENT AGENCY:
CHIEF, ENGINEERING DEVIT. ARMFC
DATE 18 September 1972

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 3
75-11

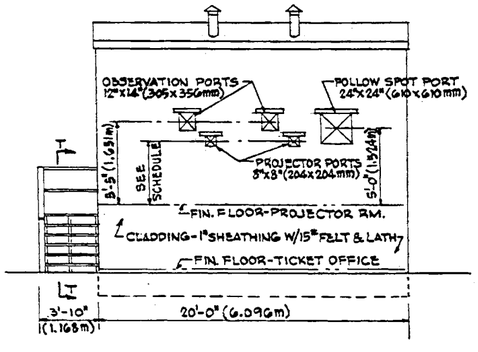


PLANS — PROJECTION & TICKET OFFICE BUILDING
SCALE NO. 2

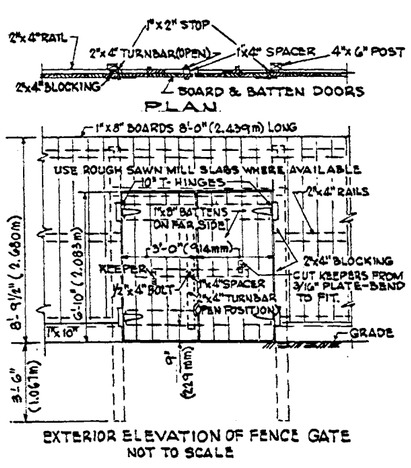
NOTE.
1. FOR ELECTRICAL CONDUCTOR AND DEVICE RATINGS REFER TO SINGLE LINE CIRCUIT DIAGRAM.
2. INCANDESCENT LAMPS IN PROJECTION ROOM SHALL HAVE GLOBES AND GUARDS.

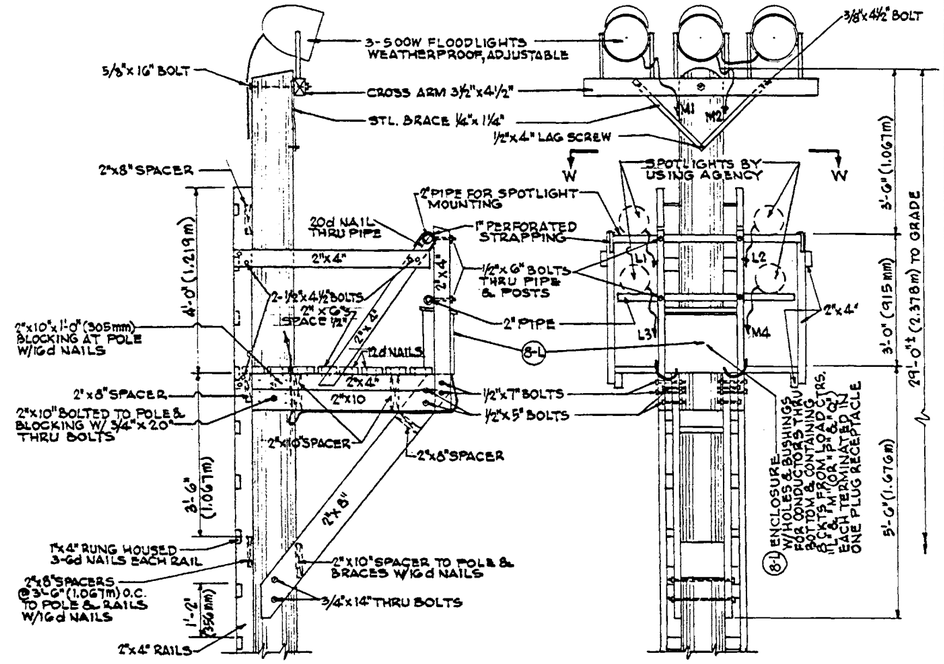


SECTION R-R
SCALE NO. 2

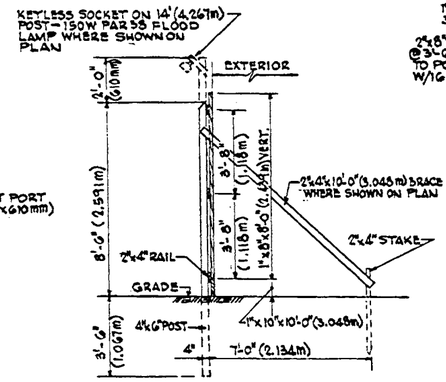


ELEVATION U-U
SCALE NO. 2

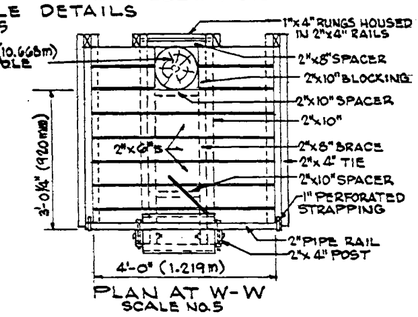




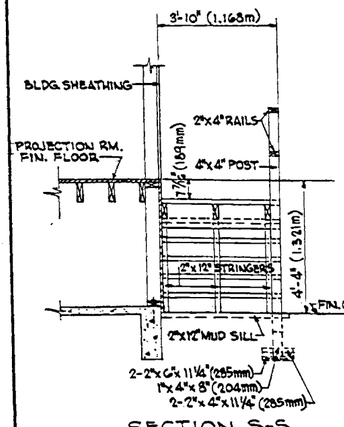
FLOODLIGHT POLE DETAILS
SCALE NO. 5



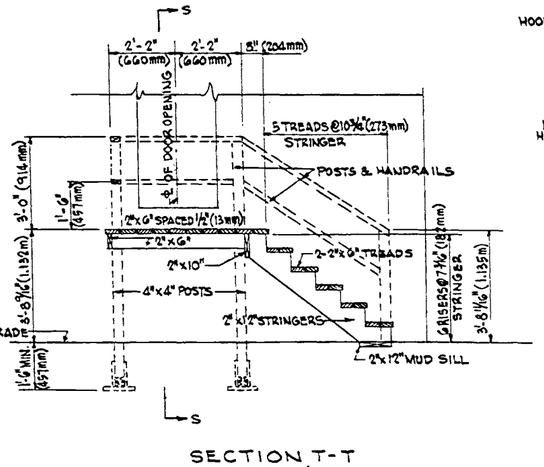
SECTION THRU FENCE
NOT TO SCALE



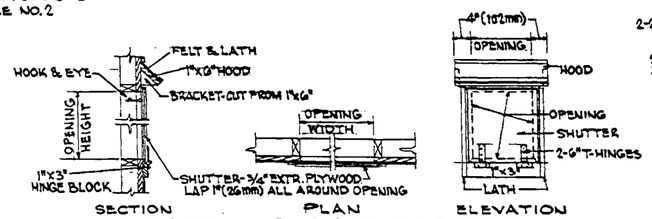
PLAN AT W-W
SCALE NO. 5



SECTION S-S
SCALE NO. 4



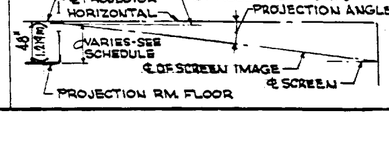
SECTION T-T
SCALE NO. 4

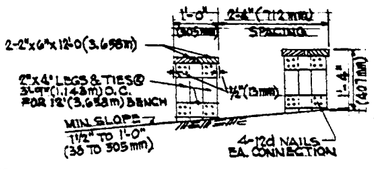


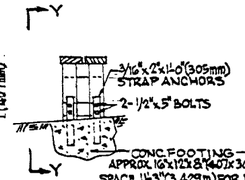
TYPICAL PORT OPENING DETAILS
NO SCALE

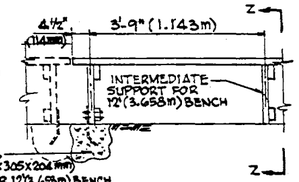
SCHEDULE FOR PROJECTION PORT HEIGHTS	
PROJECTION ANGLE	℄ OF PROJECTION PORT ABOVE FLOOR
0°	48" (1.219m)
3°	46" (1.168m)
7°	44" (1.118m)
10°	42" (1.067m)
13°	40" (1.016m)
15°	39" (991mm)

PROJECTION ANGLE IS DETERMINED FROM A POINT 48" (1.219m) ABOVE PROJECTION ROOM FLOOR TO ℄ OF SCREEN IMAGE.









SEAT DETAILS
SCALE NO. 5

SCHEDULE OF MOTION PICTURE PROJECTION EQUIPMENT.										
				FOR THEATERS SEATING						
				LESS THAN 450			450 OR MORE			
EQUIPMENT	VOLTS (RATED)	PHASE	AMPS (RATED)	QUAN. REQD.	IF ON 30-1W 208Y/120V SYS. KVA EA.	KVA TOT.	QUAN. REQD.	IF ON 30-1W 208Y/120V SYS. KVA EA.	KVA TOT.
AMPLIFIER	120	1	10	1	1.2	1.2	1	1.2	1.2
PROJECTOR MOTOR	120	1	5	2	0.6	1.2	2	0.6	1.2
RECTIFIER	220	1	9	2	2.36	4.7	—	—	—
RECTIFIER	220	3	12	—	—	—	2	4.1	8.2

GRAPHIC SCALES
0 5' 10' NO. 2 · 0 1m 2m 3m
0 1' 2' 3' 4' NO. 4 · 0 1m NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS · ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C. W. DEICHMANN

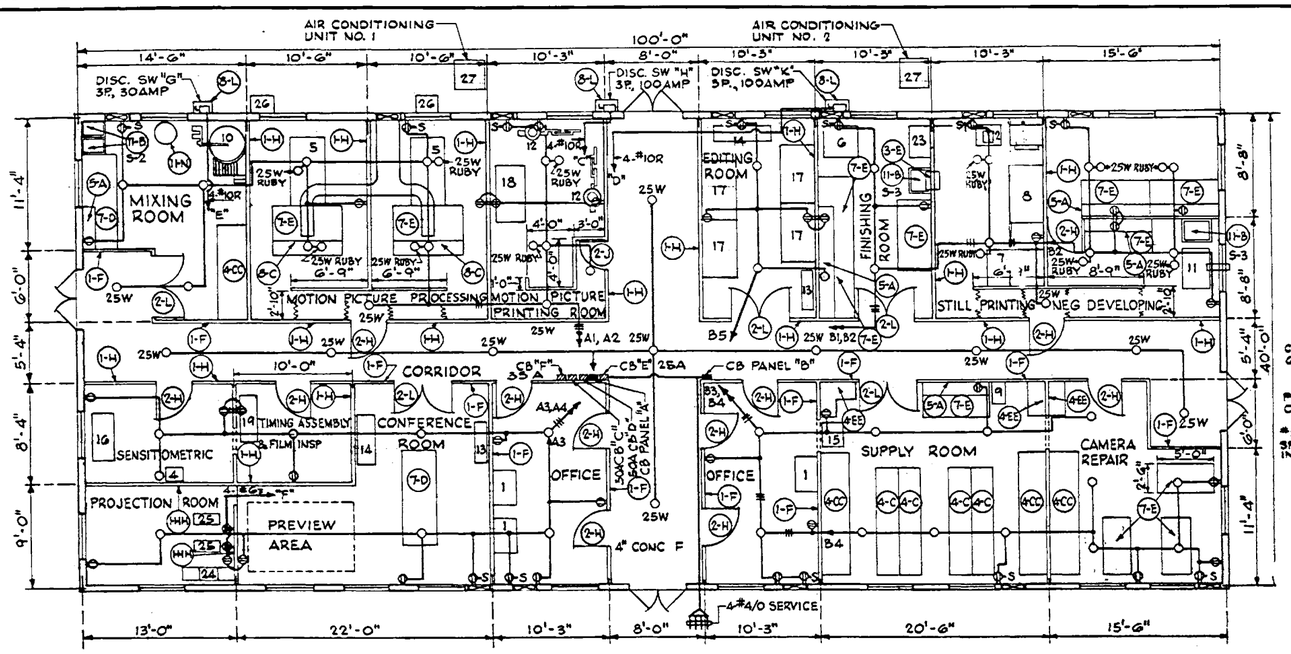
ARMY FACILITIES COMPONENTS SYSTEM

THEATER - OUTDOOR
750 & 1500 SEATS
PROJECTION & TICKET OFFICE BUILDING
MISCELLANEOUS DETAILS & SCHEDULES

APPROVED: Elvin A. Patterson Col CE
CHIEF, APCS OFFICE, MILITARY ENGINEERING, OCE.
DATE: 20 SEP 1972

APPROVED FOR PROPONENT AGENCY: HQS, ENGINEERING DEPOT ARMED
DATE: 18 September 1972

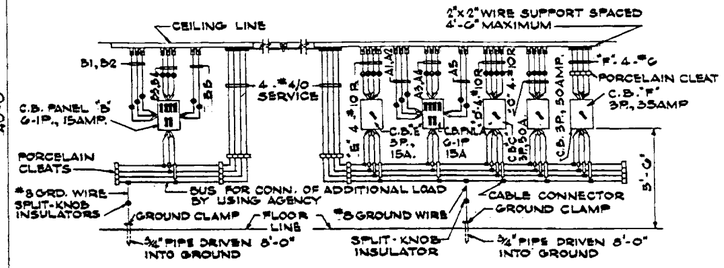
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 3 OF 3
75-11



PLAN & ELECTRICAL LAYOUT

SCALE NO. 24

FACIL. NO. 751401-INTERIOR ONLY
FACIL. NO. 751411-STEEL FRAME W/INTERIOR
FACIL. NO. 751421-WOOD FRAME W/INTERIOR



CIRCUIT BREAKER INSTALLATION

NO SCALE

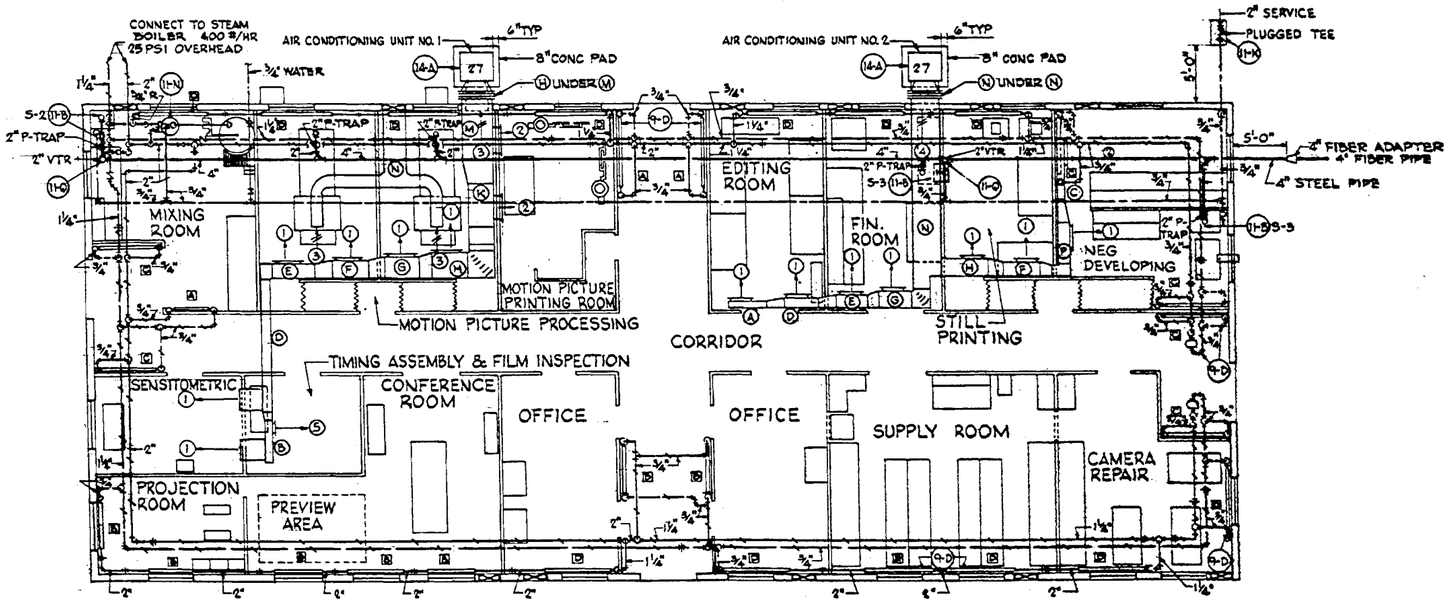
SCHEDULE OF EQUIPMENT

ITEM NO.	DESCRIPTION	QTY.
1	CABINET, CLASSIFIED MATERIAL	3
2	CONTACT EN-9	1
3	CONTACT PH-G49/U	1
4	DENSITOMETER PH-320	1
5	DEVELOPING MACHINE PH-295	2
6	DRYER, PHOTOGRAPHIC PRINT EL-5	1
7	PRINTER PROJ. PHOTO EN-8	1
8	ENLARGER PH-179-A	1
9	FILE	1
10	MIXING TANK & EQUIPMENT	1
11	DRYER, PHOTOGRAPHIC PRINT EL-4	1
12	PRINTER PH-67	2
13	RACK, FILM PH-213	2
14	RACK, FILM PH-214	2
15	REFRIGERATOR	1
16	SENSITOMETER PH-329	1
17	TABLE, CUTTING PH-102	4
18	TABLE, REWIND & SPLICING PH-102	1
19	TABLE, TIMING PH-315	1
20	TOOL EQUIPMENT TK-24/GF	
21	TOOL EQUIPMENT TK-25/GF	
22	TOOL EQUIPMENT TK-28/SF	
23	WASHER, PRINT PHOTOGRAPHIC EK-1	1
24	PROJ. SET, MOTION PIC. SOUND AS-2	1
25	35MM PROJECTOR PH-405	2
26	AIR COMPRESSOR	2
27	AIR CONDITIONING UNIT 60000 BTU/HR	2

SCHEDULE OF EQUIPMENT IS FOR PRELIMINARY PLANNING PURPOSES ONLY AND THE ACTUAL REQUIREMENTS MUST BE DETERMINED PRIOR TO CONSTRUCTION.

SCHEDULE OF DUCTS & GRILLES

ITEM LTR	DUCT SIZE	ITEM NO.	GRILLE SIZE
A	8" x 8"	1	24" x 4"
B	7" x 10"	2	28" x 4"
C	8" x 10"	3	18" x 8"
D	10" x 10"	4	28" x 10"
E	13" x 10"	5	10" x 5"
F	15" x 10"		
G	17" x 10"		
H	18" x 10"		
K	22" x 10"		
M	26" x 10"		
N	28" x 10"		
P	12" x 10"		



MECHANICAL PLAN

SCALE NO. 24

HEATING NOTES

RADIATION

SYMBOL	QUANTITY	FT ACTIVE PIPE LGTH	BTU/HR @ 25 PSI
A	1	3	5733
B	7	4	7944
C	6	5	9555
D	15	6	11466

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS.
2. FOR FSN BILL OF MATERIALS-REFER TO TM5-309 BY FACILITY NUMBER.
3. APERTURES FOR PROJECTORS TO BE CUT IN PARTITION TO FIT PROJECTORS.
4. ALL EXHAUST FANS TO BE 24" MOUNTING HEIGHT TO BE 9'-6" ABOVE FLOOR.

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	4.85 KW
RECP EST	9.40 KW
POWER	21.13 KW
POWER, EST. USING AGENCY	80.00 KW
TOTAL	115.36 KW

1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 100W.
2. ALL 100W LAMPS TO HAVE 8" CONICAL SHADES.
3. SERVICE PROVIDES FOR 80.00 KW ADDITIONAL LOAD FOR EQUIPMENT BY USING AGENCY.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
75-14	PLAN	1 OF 1
99-98	STANDARD DETAILS	
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS	1-3 OF 3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: EDWARDS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] DATE:
CHIEF, ENGINEERING BRANCH
APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: ACofS, Communications, Dir. for Sys.
DATE

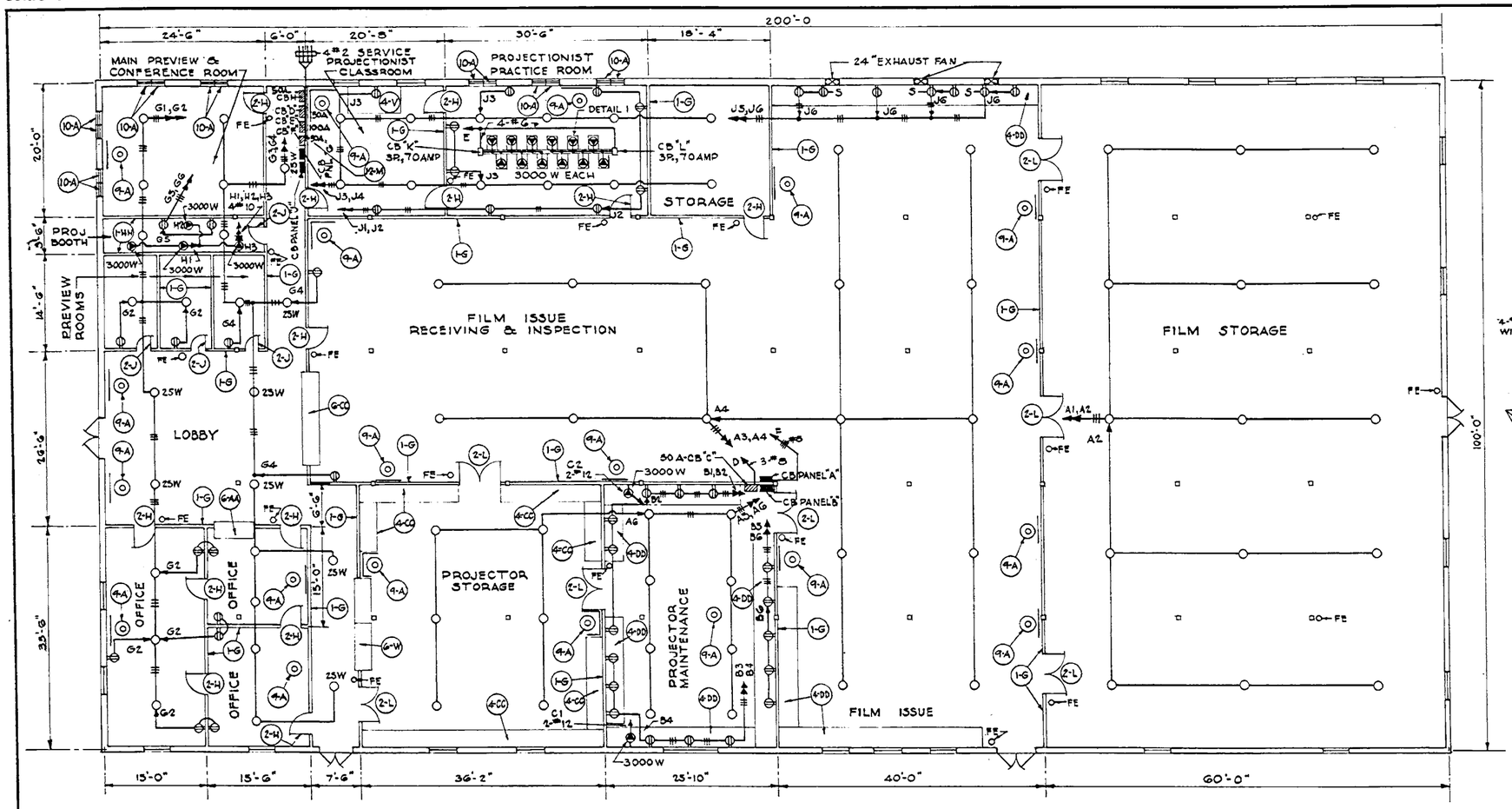
THEATER OF OPERATIONS

MOTION PICTURE LABORATORY
40'X100'

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 75-14
SHEET 1 OF 1

CORPS OF ENGINEERS

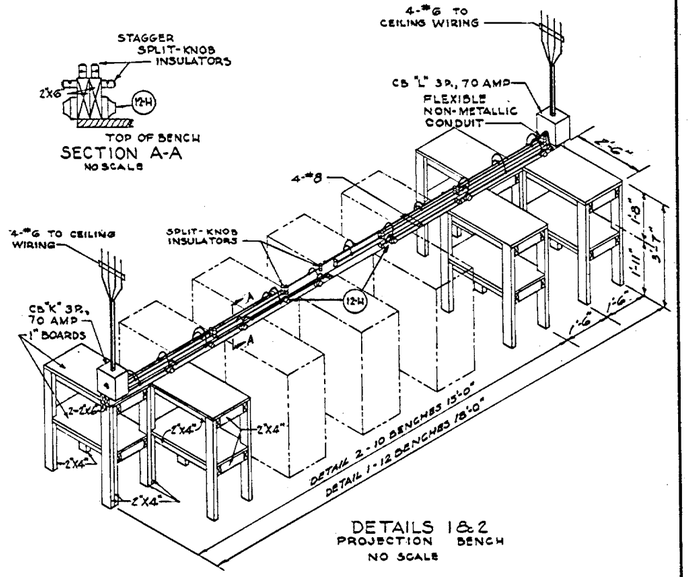
U. S. ARMY



CLASS A - 100'X200'

SCALE NO. 1

FACIL. NO. 751501 - INTERIOR ONLY
FACIL. NO. 751511 - STEEL FRAME W/INTERIOR
FACIL. NO. 751521 - WOOD FRAME W/INTERIOR



DETAILS 1 & 2
PROJECTION BENCH
NO SCALE

ELECTRICAL NOTES

CONNECTED LOAD	CLASS A	CLASS B	CLASS C
	100' x 200'	40'X 100'	40'x 60'
LIGHTING	7.50 KW	3.75 KW	1.90 KW
RECP EST	4.50 KW	3.20 KW	.90 KW
POWER	55.59 KW	36.84 KW	7.62 KW
TOTAL	67.59 KW	43.79 KW	10.42 KW

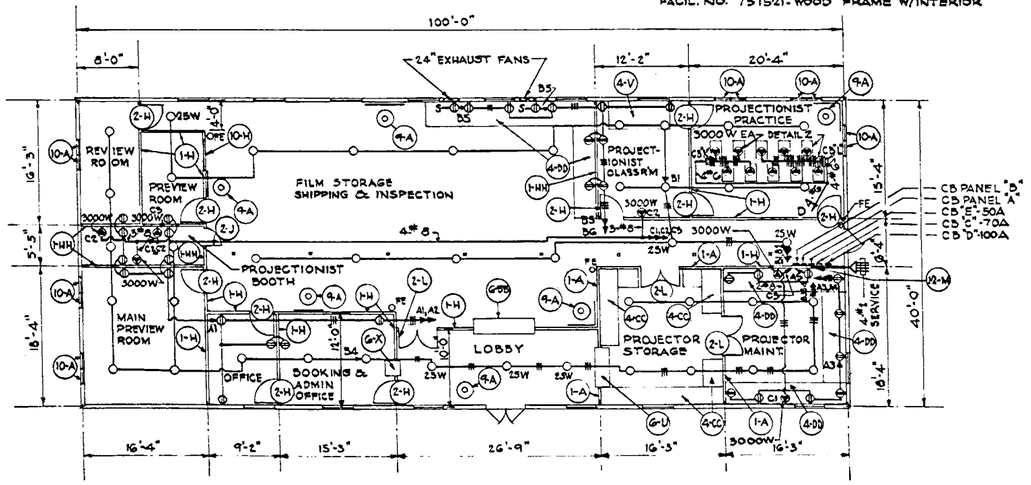
1. UNLESS OTHERWISE NOTED ON PLANS ALL LAMPS TO BE 100W.
2. ALL 40,60,& 100 W LAMPS TO HAVE 8" CONICAL SHADES.
3. ALL CB PANELS NOT OTHERWISE NOTED SHALL HAVE 6-1P-20A. BRKRS.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS.
2. FOR FSN BILL OF MATERIAL - REFER TO TM5-303 BY FACILITY NUMBER.
3. BOTTOM OF LOUVERS TO BE MOUNTED 2'-6" ABOVE FLOOR.
4. EXHAUST FAN MOUNTING HEIGHT TO BE 9'-6" ABOVE FLOOR.
5. APERTURES FOR PROJECTORS TO BE CUT IN PARTITION TO FIT PROJECTORS.

SCHEDULE OF DRAWINGS

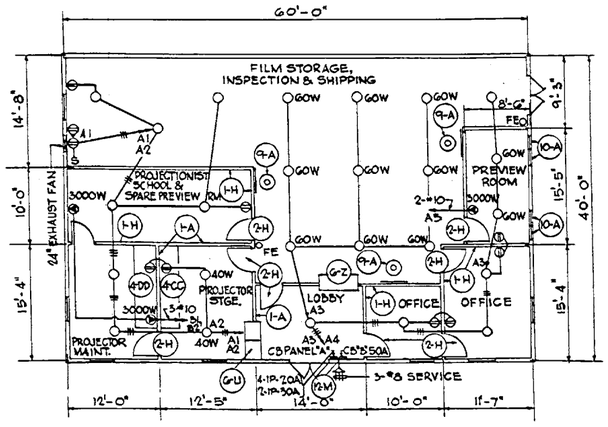
DWG. NO.	DESCRIPTION	SHEET NO.
75-15	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-04	WOOD FRAME CONST. WAREHOUSE TYPE BLDGS.	1-3 OF 3
35-36	STEEL FRAME CONST. WAREHOUSE TYPE BLDGS	1-3 OF 3



CLASS B-40'X100'

SCALE NO.1

FACIL. NO. 751502 - INTERIOR ONLY
FACIL. NO. 751512 - STEEL FRAME W/INTERIOR
FACIL. NO. 751522 - WOOD FRAME W/INTERIOR



CLASS C-40'X60'

SCALE NO.1

FACIL. NO. 751503 - INTERIOR ONLY
FACIL. NO. 751513 - STEEL FRAME W/INTERIOR
FACIL. NO. 751523 - WOOD FRAME W/INTERIOR

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO.1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

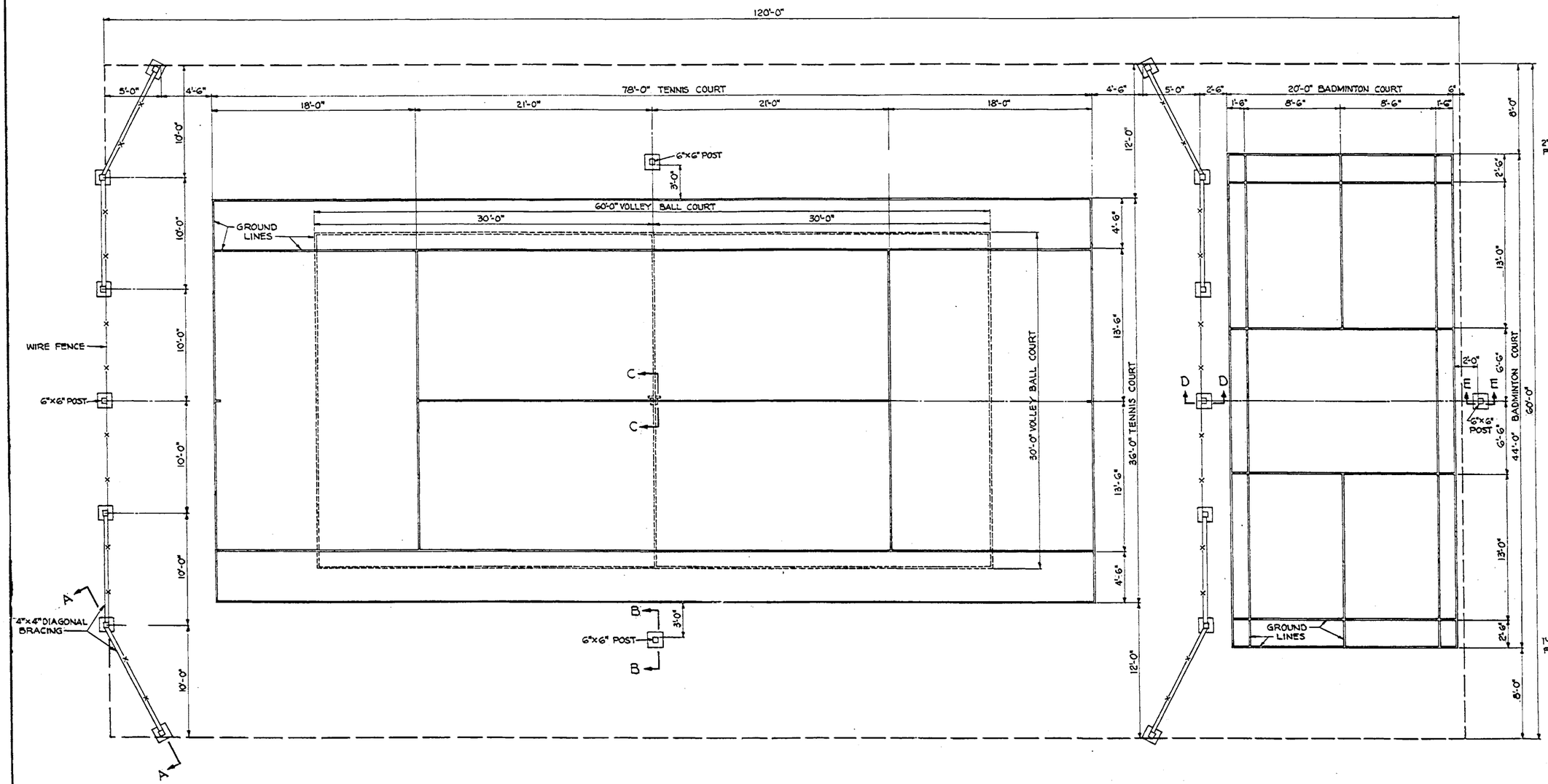
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. REICHMANN
APPROVED: [signature] CHIEF, ARCHITECTURAL BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: AC of S, Communication, Dir for Sys.
DATE:

THEATER OF OPERATIONS

FILM EQUIPMENT & EXCHANGE
CLASS A-100'X200'
CLASS B-40'X100' & CLASS C-40'X60'

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 75-15
SHEET 1 OF 1

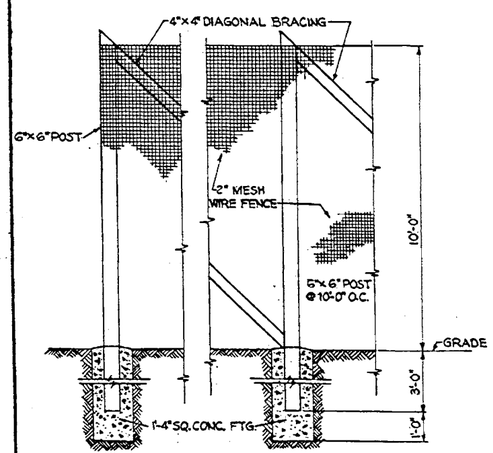


PLAN
SCALE NO. 2

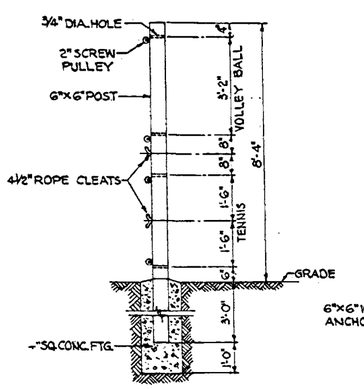
FACILITY NO. 752101

SECTION D-D
SCALE NO. 4

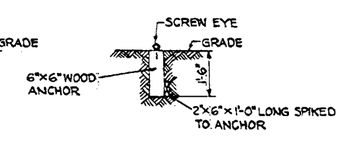
SECTION E-E
SCALE NO. 4



SECTION A-A
SCALE NO. 4



SECTION B-B
SCALE NO. 4



SECTION C-C
SCALE NO. 4

GENERAL NOTES

1. GROUND LINES FOR THE BADMINTON & TENNIS COURTS TO BE 1½" WIDE.
2. GROUND LINES FOR THE VOLLEY BALL COURT TO BE 2" WIDE.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
75-21	PLAN	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10' NO.2 — 0 1' 2' 3' NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

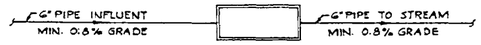
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] for H. M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

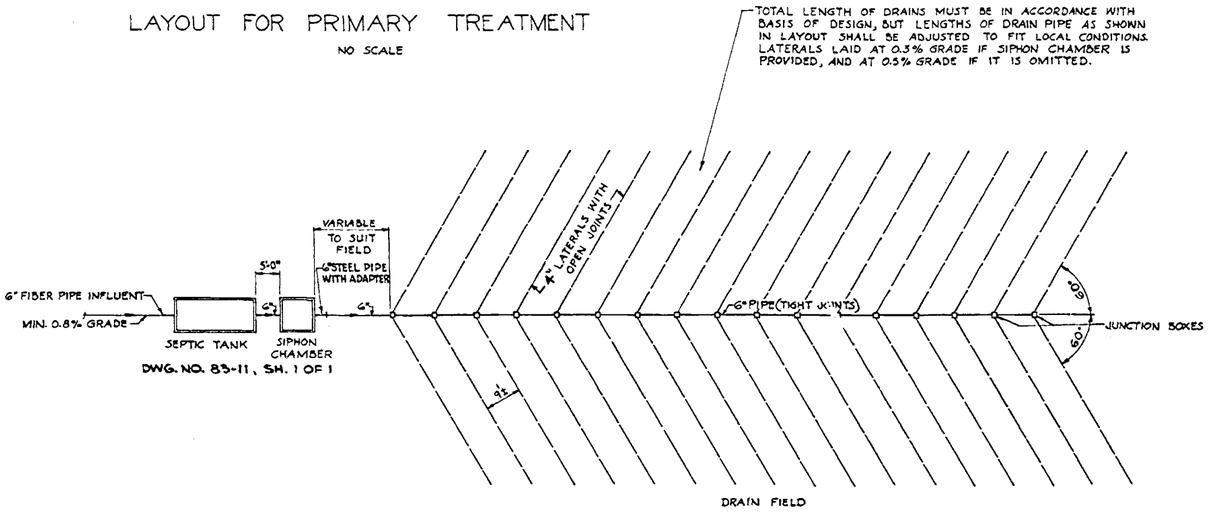
COMBINATION ATHLETIC COURT
60'X120'

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 75-21
SHEET 1 OF 1



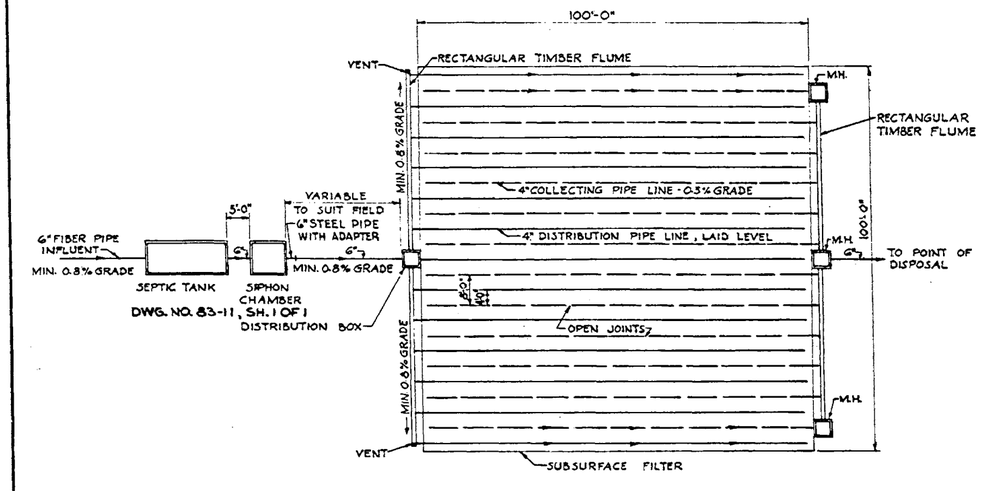
LAYOUT FOR PRIMARY TREATMENT

NO SCALE



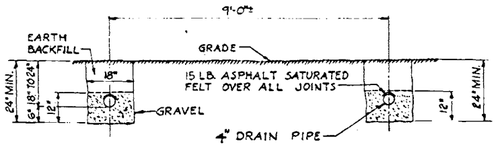
LAYOUT FOR DRAIN FIELD

NO SCALE



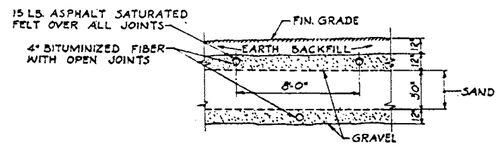
LAYOUT FOR SECONDARY TREATMENT

NO SCALE



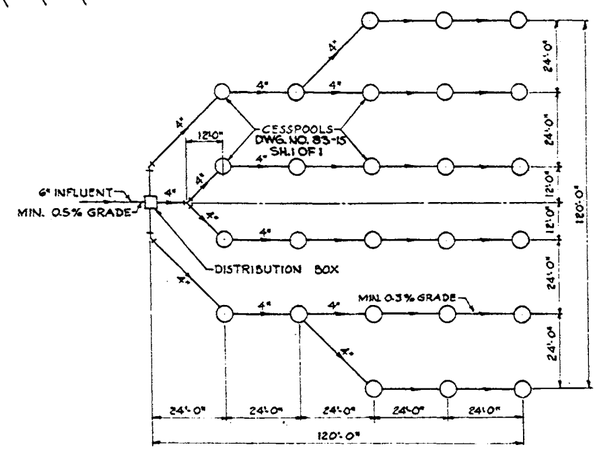
TYPICAL METHOD OF CONSTRUCTING DRAIN FIELD

NO SCALE



TYPICAL METHOD OF CONSTRUCTING SUBSURFACE FILTER

NO SCALE



LAYOUT FOR CESSPOOLS

NO SCALE

BASIS OF DESIGN

100 BED HOSPITAL OR EQUIVALENT RESIDENT POPULATION OF 200 PERSONS.
AVERAGE DAILY RATE OF SEWAGE FLOW = 100 GALLONS PER BED
SEPTIC TANK: DETENTION PERIOD = 16 HOURS; SLUDGE STORAGE 25 PCT.
SIPHON CHAMBER FOR DRAIN FIELD: BASED ON LENGTH OF PIPE
SIPHON CHAMBER FOR COMPLETE TREATMENT: BASED ON CAPACITY OF PIPE IN FILTER.
DRAIN FIELD: BASED ON SOIL ABSORPTION TEST; SEE TABLE I
LAYOUT SHOWN IS FOR PERCOLATION TEST OF 1 MINUTE FOR VARIATION, SEE TABLE I
WHEN TIME REQUIRED IN PERCOLATION TEST EXCEEDS 10 MINUTES USE COMPLETE TREATMENT
SUBSURFACE FILTER = 1 SQUARE FOOT PER GALLON PER DAY

SIPHON CHAMBER AND DRAIN FIELD SIZES

SOIL ABSORPTION OR PERCOLATION TEST-

DIG HOLES 1 FT. SQ. AND 18" DEEP. FILL WITH WATER TO DEPTH OF 1 FT. WAIT UNTIL ALL WATER HAS PERCOLATED INTO SOIL AND THEN REFILL TO 6" DEPTH OF WATER. TAKE TIME FOR WATER SURFACE TO FALL AT LEAST 3". DETERMINE AVERAGE TIME PER INCH OF FALL. ENTER TABLE I WITH THIS AVERAGE VALUE TO DETERMINE LENGTH OF TILE AND SIPHON CHAMBER REQUIRED.

TABLE I

TIME IN MINUTES REQUIRED FOR WATER TO FALL 1" IN TEST HOLE	LENGTH OF DRAIN PIPE REQUIRED	SIZE OF SIPHON AND DRAWING DEPTH	SIPHON CHAMBER	
			WIDTH	LENGTH
1	1700'	5" - 23" D.D.	8'-0"	8'-0"
2	2000'	5" - 23" D.D.	8'-0"	9'-0"
5	2800'	5" - 23" D.D.	8'-0"	12'-6"
10	3900'	5" - 23" D.D.	8'-0"	17'-6"

ALTERNATE METHOD OF DISPOSAL BY CESSPOOLS

SOIL ABSORPTION OR PERCOLATION TEST-
TEST IS SIMILAR TO ONE DESCRIBED ABOVE FOR DRAIN FIELD, EXCEPT THAT 1 SQ.FT. HOLE SHOULD BE MADE AT DEPTH OF 60".

TABLE II

TIME IN MINUTES REQUIRED FOR WATER TO FALL 1" IN TEST HOLE	NUMBER OF CESSPOOLS REQUIRED
1	11 *
2	14
5	18
10	26

*-CESSPOOLS SHOULD BE ARRANGED IN SERIES.

GENERAL NOTES

1. ALL DRAIN PIPE, EXCEPT AS NOTED, IS BITUMINIZED FIBER PIPE; 6" IS NON-PERFORATED, 4" IS PERFORATED

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
80-01	LAYOUT	1 OF 1
83-11	SEWAGE DISPOSAL PLANT DETAILS-10,000 GPD	1 OF 1
83-15	SPECIAL DETAILS	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

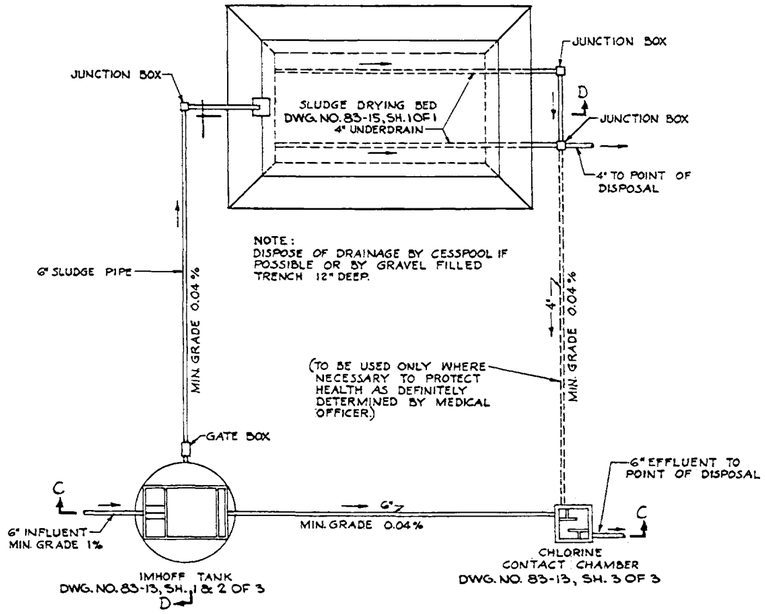
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. E. Schramm, Chief, Structures Branch
APPROVED: H. M. Williams, Chief, Engineering Division, Mil. Constr., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

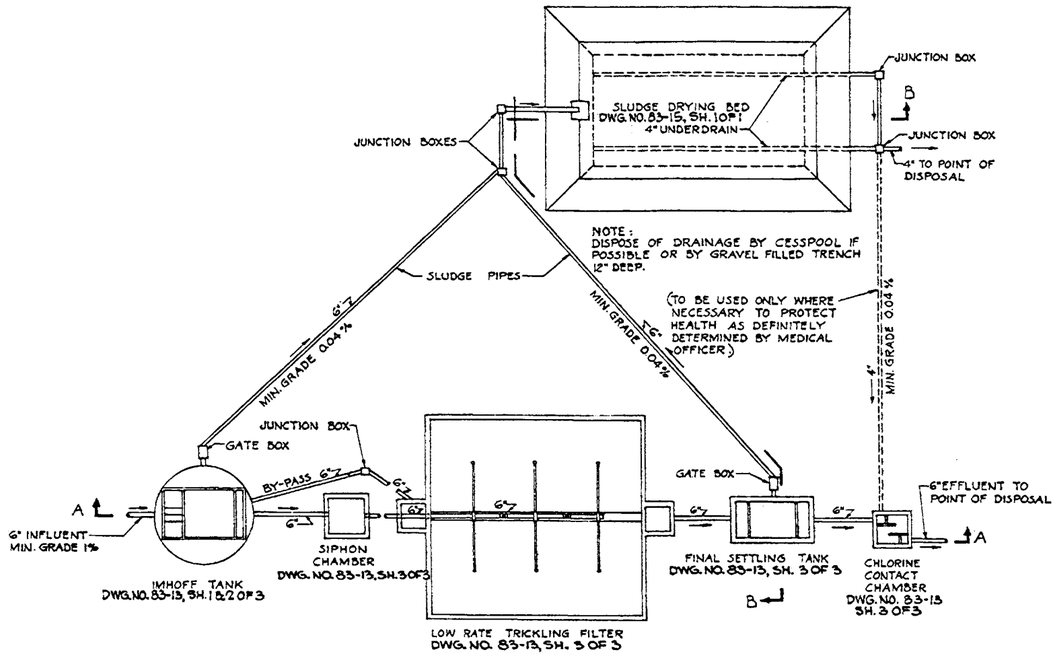
THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT
PRIMARY & SECONDARY TREATMENT
10,000 GPD

UNDER REVISION

DATE: 19 MAR 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 80-01
SHEET 1 OF 1



PLAN



PLAN

BASIS OF DESIGN

300 BED HOSPITAL OR EQUIVALENT RESIDENT POPULATION OF 600 PERSONS.

AVERAGE DAILY RATE OF SEWAGE FLOW = 100 GALLONS PER BED.

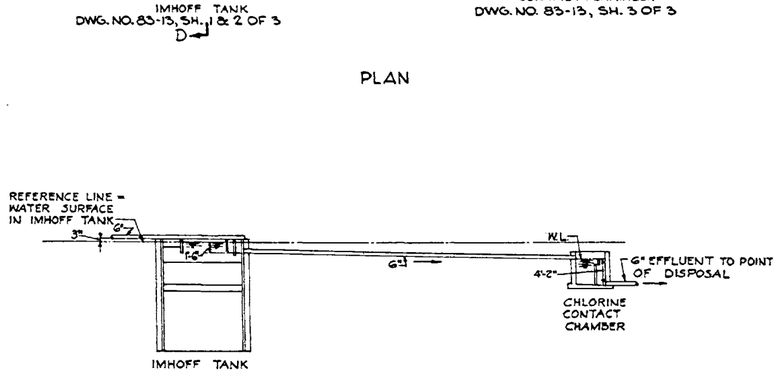
IMHOFF TANK:
- FLOWING THRU CHANNEL = 2½ HR. DETENTION PERIOD
- SLUDGE STORAGE COMPARTMENT = .5 CU. FT. PER CAPITA BELOW A PLANE 18" BELOW THE SLOT OF FLOWING THRU CHANNEL.

TRICKLING FILTER:
- FILTER LOADING = 600 LBS. OF BOD PER ACRE-FOOT
- BOD CONTENTS OF RAW SEWAGE = 0.2 LBS. PER DAY PER CAPITA
- AMOUNT OF BOD REMOVED IN IMHOFF TANK = 35 PCT.
- AMOUNT OF BOD PASSING TO TRICKLING FILTER = 65 PCT.
- DEPTH OF STONE IN FILTER = 6 FT.

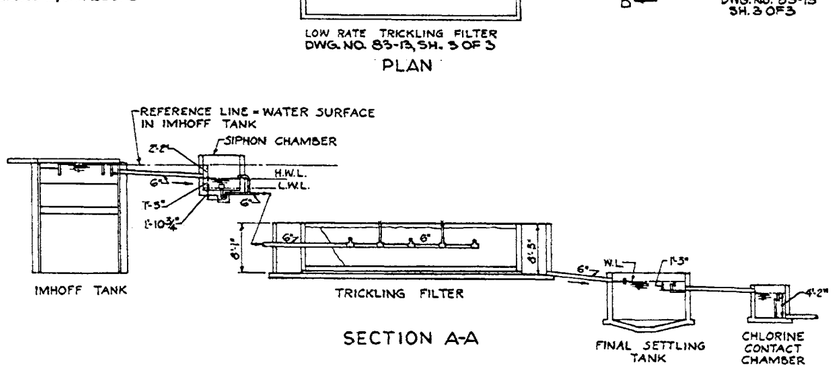
FINAL SETTLING TANK:
- DETENTION PERIOD = 2½ HR.
- SURFACE LOADING = 800 GALLONS PER DAY PER SQ. FT.
- OVERFLOW WEIR = 12,500 GALLONS PER DAY PER FOOT OF WEIR.

SLUDGE DRYING BEDS:
- WITH UNDERDRAINS = 1 SQ. FT. PER CAPITA
- WITHOUT UNDERDRAINS = 3 SQ. FT. PER CAPITA

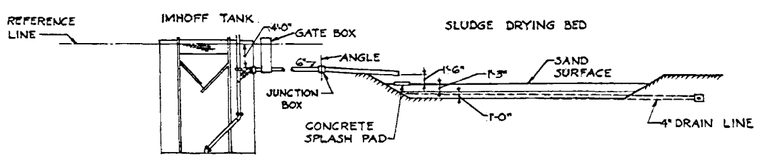
CHLORINE CONTACT TANK:
- DETENTION PERIOD = 15 MINUTES AT MAXIMUM DAILY FLOW, WHICH IS ABOUT 175 PCT. OF AVERAGE DAILY FLOW.



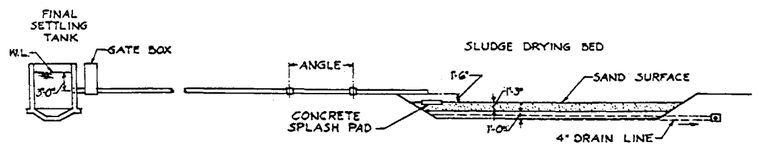
SECTION C-C



SECTION A-A



SECTION D-D



SECTION B-B

PRIMARY TREATMENT

NO SCALE

SECONDARY TREATMENT

NO SCALE

GENERAL NOTES

1. USE A STEEL IMHOFF TANK WHERE LEAKAGE WILL ENDANGER WATER SUPPLY OR WATER LEVEL IS MORE THAN 3 FT. ABOVE GRADE.
2. AN 8 FT. WIDE BERM OF SUITABLE SOIL THOROUGHLY COMPACTED TO APPROX. 6" BELOW THE TOP OF TANK IS REQD. IF THE TOP OF THE TANK IS ABOVE GRADE.
3. WHERE SOIL AT SITE OF SLUDGE DRYING BED HAS GOOD ABSORPTIVE QUALITY, THE UNDERDRAINAGE SYSTEM MAY BE OMITTED, BUT THE TOTAL AREA OF BED SHOULD BE INCREASED IN ACCORDANCE WITH ABOVE BASIS OF DESIGN.
4. PROVIDE SECONDARY TREATMENT AND POST CHLORINATION ONLY WHEN DEFINATELY DETERMINED NECESSARY BY MEDICAL OFFICER.
5. GIVE CONSIDERATION TO OPEN, INTERMITTENT SAND FILTERS AND TO OXIDATION PONDS AS OTHER SUITABLE MEANS FOR SECONDARY TREATMENT (SEE TM5-283 FOR DESIGN CRITERIA.)
6. ALL DRAIN PIPE, EXCEPT AS NOTED, IS BITUMINIZED FIBER PIPE, 6" IS NON-PERFORATED, 4" IS PERFORATED.
7. UNITS OF PLANT SHOULD BE ARRANGED TO MINIMIZE AMOUNT OF PIPE AND TO TAKE ADVANTAGE OF NATURAL SLOPE OF GROUND. CALCULATE PLANT UNIT ELEVATIONS FOR EACH PLANT SITE FROM PIPE SLOPE AND DISTANCE BETWEEN PLANT UNITS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
80-02	LAYOUT	1 OF 1
83-13	SEWAGE DISPOSAL PLANT	1-3 OF 3
83-15	SPECIAL DETAILS	1 OF 1

SYMBOL	DESCRIPTION (REVISIONS)	DATE	APPROVAL

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

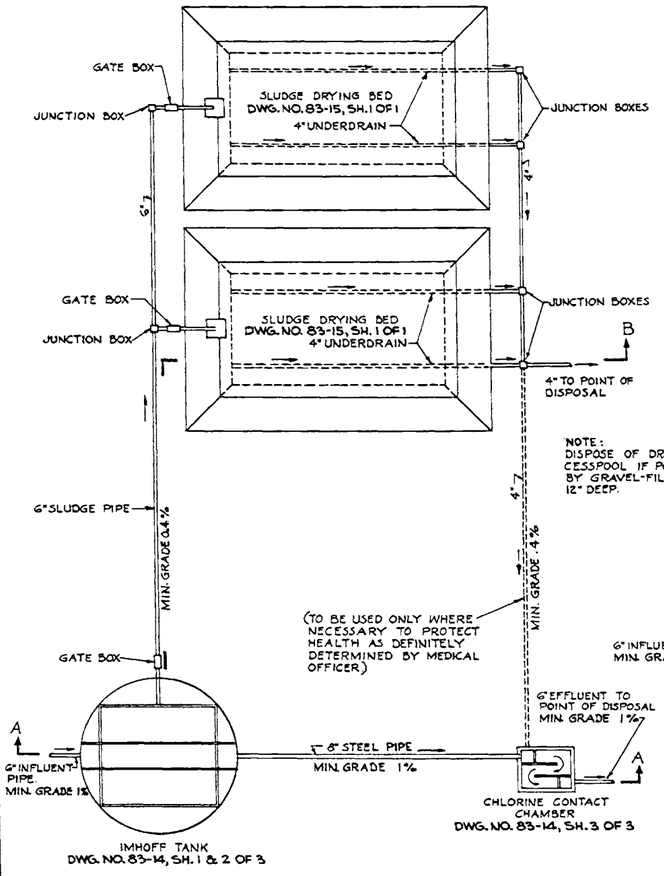
THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT
PRIMARY & SECONDARY TREATMENT
30,000 GPD

UNDER REVISION

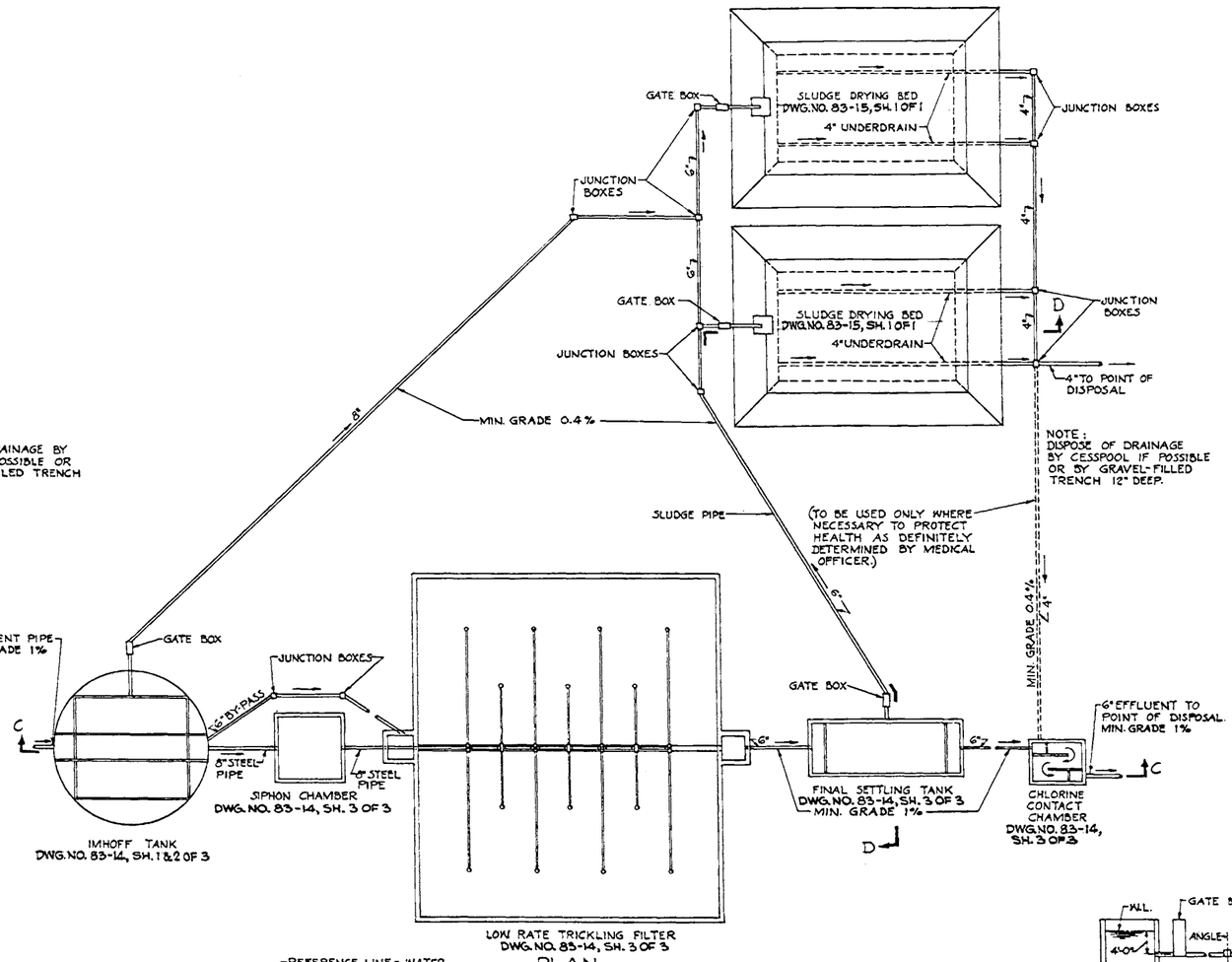
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
80-02



PLAN



PLAN

BASIS OF DESIGN

1000 BED HOSPITAL OR EQUIVALENT RESIDENT POPULATION OF 1700 PERSONS.
AVERAGE DAILY RATE OF SEWAGE FLOW = 100 GALLONS PER BED

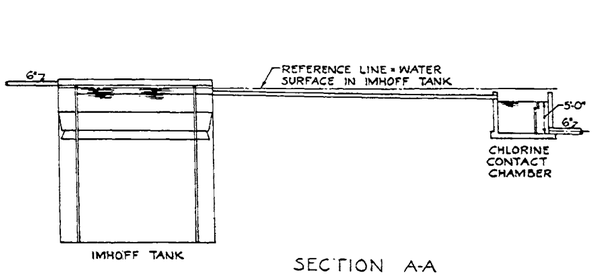
IMHOFF TANK:
- FLOWING-THRU CHANNEL = 2½ HR. DETENTION PERIOD
- SLUDGE STORAGE COMPT. = 3 CU. FT. PER CAPITA BELOW A PLANE 18" BELOW THE SLOT OF FLOWING-THRU CHANNEL.

TRICKLING FILTER:
- FILTER LOADING = 600 LB. OF BOD PER ACRE-FOOT
- BOD CONTENT OF RAW SEWAGE = 0.2 LB. PER DAY PER CAPITA
- AMOUNT OF BOD REMOVED IN IMHOFF TANK = 35 PCT.
- AMOUNT OF BOD PASSING TO TRICKLING FILTER = 65 PCT.
- DEPTH OF STONE IN FILTER = 6 FT.

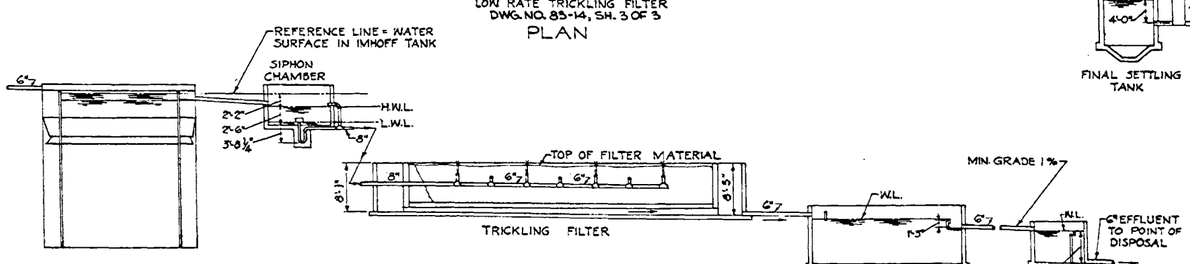
FINAL SETTLING TANK:
- DETENTION PERIOD = 2½ HR.
- SURFACE LOADING = 800 GALLONS PER DAY PER SQ. FT.
- OVERFLOW WEIR = 12,500 GALLONS PER DAY PER FT. OF WEIR.

SLUDGE DRYING BEDS:
- WITH UNDERDRAINS = 1 SQ. FT. PER CAPITA
- WITHOUT UNDERDRAINS = 3 SQ. FT. PER CAPITA

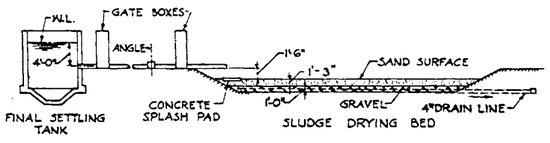
CHLORINE CONTACT TANK:
- DETENTION PERIOD = 15 MINUTES AT MAXIMUM DAILY FLOW, WHICH IS ABOUT 175 PCT. OF AVERAGE DAILY FLOW.



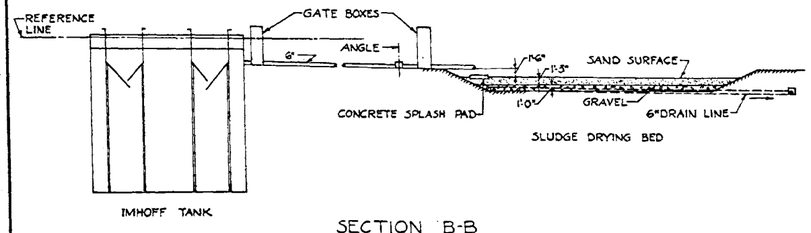
SECTION A-A



SECTION C-C



SECTION D-D



SECTION B-B

PRIMARY TREATMENT

NO SCALE

SECONDARY TREATMENT

NO SCALE

GENERAL NOTES

1. USE A STEEL IMHOFF TANK WHERE LEAKAGE WILL ENDANGER WATER SUPPLY OR WATER LEVEL IS MORE THAN 3 FT. ABOVE GRADE.
2. AN EIGHT FT. WIDE BERM OF SUITABLE SOIL THOROUGHLY COMPACTED TO APPROX. 6" BELOW THE TOP OF THE TANK IS REQD IF THE TOP OF THE TANK IS ABOVE GRADE.
3. WHERE SOIL AT SITE OF SLUDGE DRYING BED HAS GOOD ABSORPTIVE QUALITY, THE UNDERDRAINAGE SYSTEM MAY BE OMITTED, BUT THE TOTAL AREA OF BED SHOULD BE INCREASED IN ACCORDANCE WITH ABOVE BASIS OF DESIGN.
4. PROVIDE SECONDARY TREATMENT AND POST CHLORINATION ONLY WHEN DEFINATELY DETERMINED NECESSARY BY MEDICAL OFFICER.
5. GIVE CONSIDERATION TO OPEN, INTERMITTENT SAND FILTERS AND TO OXIDATION PONDS AS OTHER SUITABLE MEANS FOR SECONDARY TREATMENT. (SEE TM5-285 FOR DESIGN CRITERIA.)
6. ALL DRAIN PIPE, EXCEPT AS NOTED, IS BITUMINIZED FIBER; 6" IS NON-PERFORATED, 4" IS PERFORATED.
7. UNITS OF PLANT SHOULD BE ARRANGED TO MINIMIZE AMOUNT OF PIPE AND TO TAKE ADVANTAGE OF NATURAL SLOPE OF GROUND. CALCULATE PLANT UNIT ELEVATIONS FOR EACH PLANT SITE FROM PIPE SLOPE AND DISTANCE BETWEEN PLANT UNITS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
80-03	LAYOUT	1 OF 1
83-14	SEWAGE DISPOSAL PLANT	1-3 OF 3
85-15	SPECIAL DETAILS	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: DATE:
CHIEF, STRUCTURES BRANCH
APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

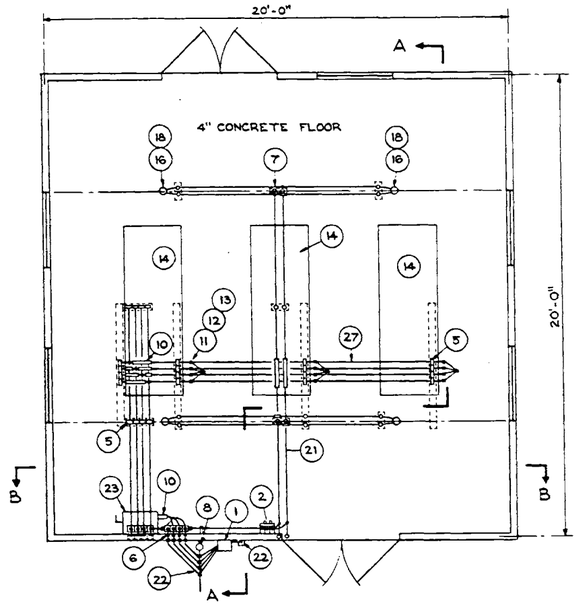
THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT
PRIMARY & SECONDARY TREATMENT
100,000 GPD

UNDER REVISION

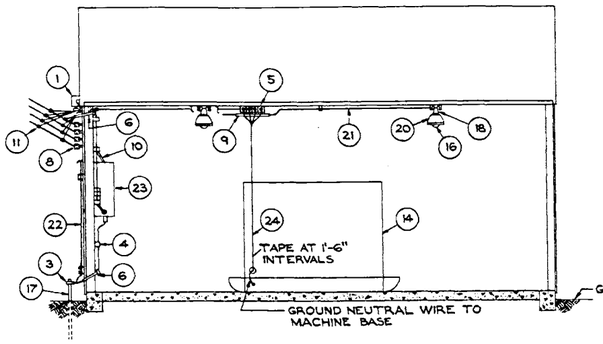
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
80-03

CORPS OF ENGINEERS

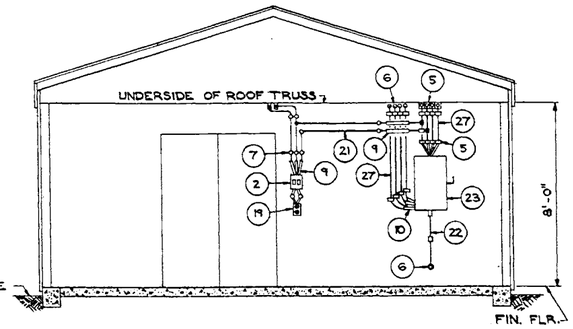
U. S. ARMY



PLAN
SCALE NO. 3



SECTION A-A
SCALE NO. 3



SECTION B-B
SCALE NO. 3

SCHEDULE OF MATERIALS

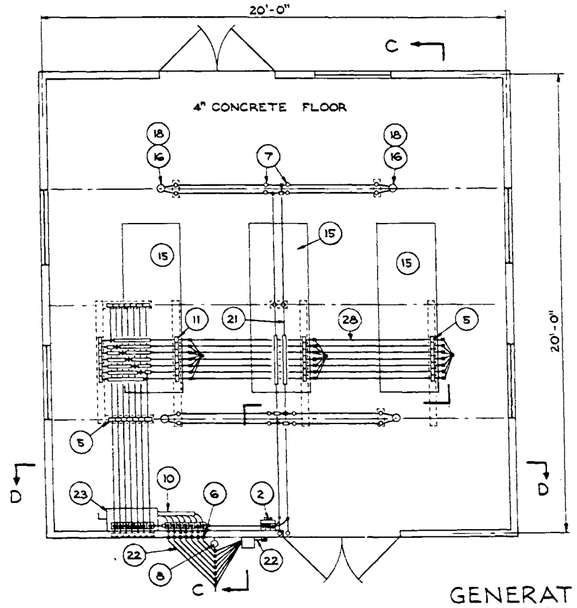
ITEM NO.	DESCRIPTION
1	ARRESTER, LIGHTNING, 0-650 VOLTS, 3 POLE
2	CIRCUIT BREAKER, 2-1P, 15 AMP
3	CLAMP, GROUND
4	CLEAT, PORCELAIN, NO. 6 TO NO. 4
5	CLEAT, PORCELAIN, NO. 2 TO NO. 1/0
6	TUBE, PORCELAIN
7	INSULATOR, SPLIT-KNOB
8	CLEVIS, INSULATOR, SECONDARY
9	CONDUIT, FLEXIBLE, NON-METALLIC, 3/8" DIA.
10	CONDUIT, FLEXIBLE, NON-METALLIC, 3/4" DIA.
11	CONNECTOR, CABLE, NO. 1/0
12	CONNECTOR, CABLE, NO. 2
13	CONNECTOR, CABLE, NO. 6
14	GENERATOR, ELECTRIC, DIESEL, SKID MOUNTED, 15KW, 120/208V
15	GENERATOR, ELECTRIC, DIESEL, SKID MOUNTED, 30KW, 120/208V
16	LAMP, INCANDESCENT, 100 WATTS
17	PIPE, 3/4" STEEL- DRIVEN 8FT. INTO GROUND
18	RECEPTACLE, LAMP
19	RECEPTACLE, PLUG
20	SHADE, 8" DIA., CONICAL
21	WIRE, NO. 12
22	WIRE, NO. 6
23	SWITCH, SAFETY, UNFUSED, 3 POLE, SINGLE THROW-2 UNIT-200A 3 UNITS-400A
24	WIRE, 4 NO. 6
25	WIRE, 4 NO. 1/0
26	WIRE, 7 NO. 1/0
27	WIRE,- 2 UNIT - 4 NO. 2 3 UNIT - 4 NO. 1/0
28	WIRE,- 2 & 3 UNITS - 7 NO. 1/0

GENERATING PLANT, 3-15 KW UNITS

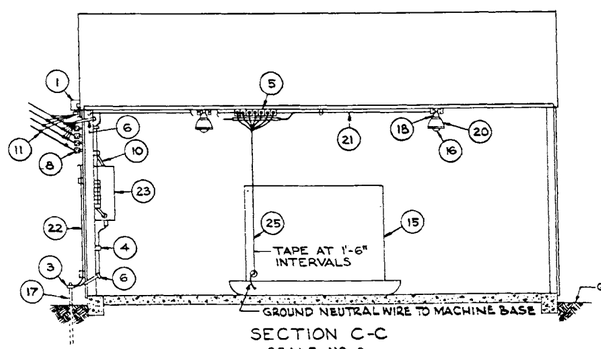
FACILITY NO. 811103 - INTERIOR ONLY
FACILITY NO. 811113 - STEEL FRAME W/INTERIOR
FACILITY NO. 811123 - WOOD FRAME W/INTERIOR

GENERATING PLANT, 2-15 KW UNITS

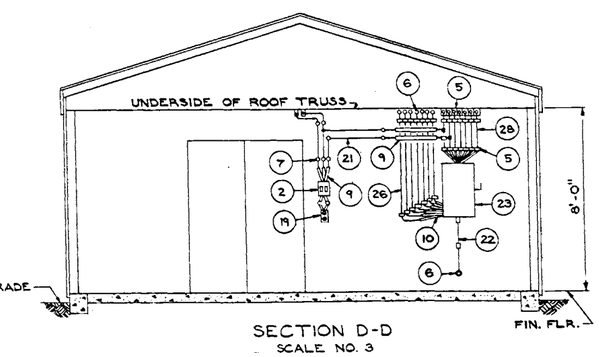
FACILITY NO. 811102 - INTERIOR ONLY
FACILITY NO. 811112 - STEEL FRAME W/INTERIOR
FACILITY NO. 811122 - WOOD FRAME W/INTERIOR
FACILITY NO. 811105 - CONV. TO 3 UNITS



PLAN
SCALE NO. 3



SECTION C-C
SCALE NO. 3



SECTION D-D
SCALE NO. 3

GENERATING PLANT, 3-30 KW UNITS

FACILITY NO. 811107 - INTERIOR ONLY
FACILITY NO. 811117 - STEEL FRAME W/INTERIOR
FACILITY NO. 811127 - WOOD FRAME W/INTERIOR

GENERATING PLANT, 2-30 KW UNITS

FACILITY NO. 811106 - INTERIOR ONLY
FACILITY NO. 811116 - STEEL FRAME W/INTERIOR
FACILITY NO. 811126 - WOOD FRAME W/INTERIOR
FACILITY NO. 811109 - CONV. TO 3 UNITS

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	0.4 KW
RECP EST	0.1 KW
TOTAL	0.5 KW

1. ALL LAMPS TO BE 100W
2. ALL LAMPS TO HAVE 8" CONICAL SHADES
3. 3/4" GROUND PIPE TO BE DRIVEN 8'-0" IN GROUND.
4. THE ABOVE CONNECTED LOADS ARE FOR USE WITH EITHER FACILITY.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.
3. ENGINE EXHAUST EXTENDED TO OUTDOORS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
81-11	PLANS & SECTIONS	1 OF 1
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

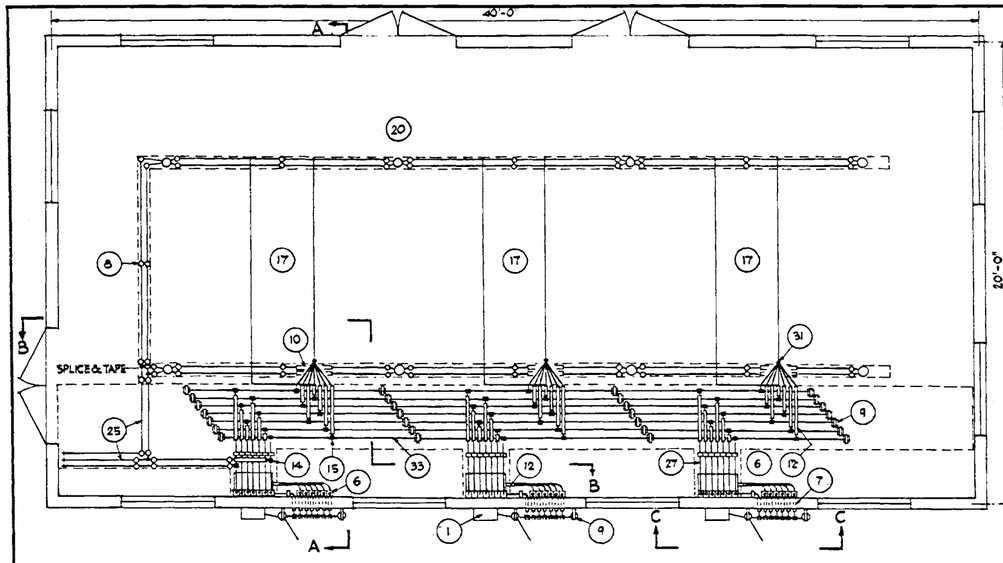
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: LYUS
SUBMITTED BY: C. W. DE ICHMANN
APPROVED:
APPROVED: H. M. Williams
DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH & CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

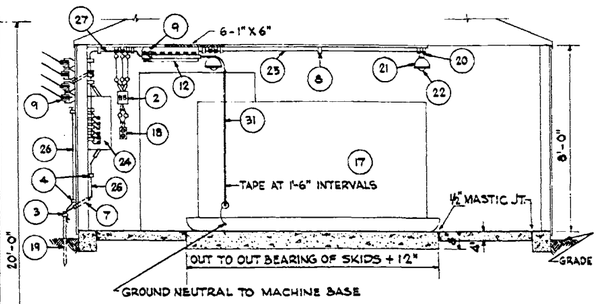
THEATER OF OPERATIONS
ELECTRIC GENERATING PLANTS
2-3-5-15 KW UNITS & 2 & 3-30 KW UNITS
PLANS & SECTIONS

UNDER REVISION

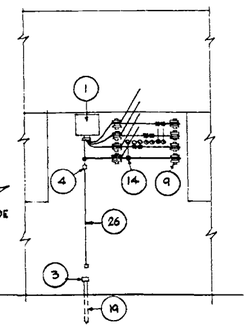
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
81-11
SHEET 1 OF 1



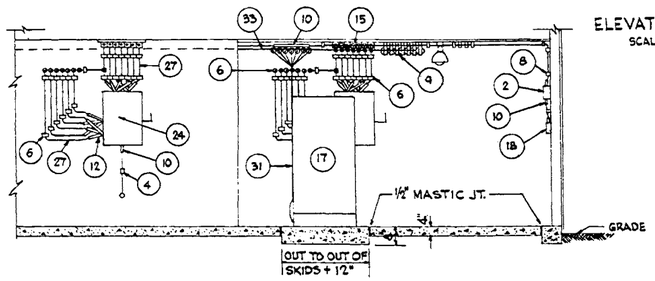
PLAN
SCALE NO. 3



SECTION A-A
SCALE NO. 3

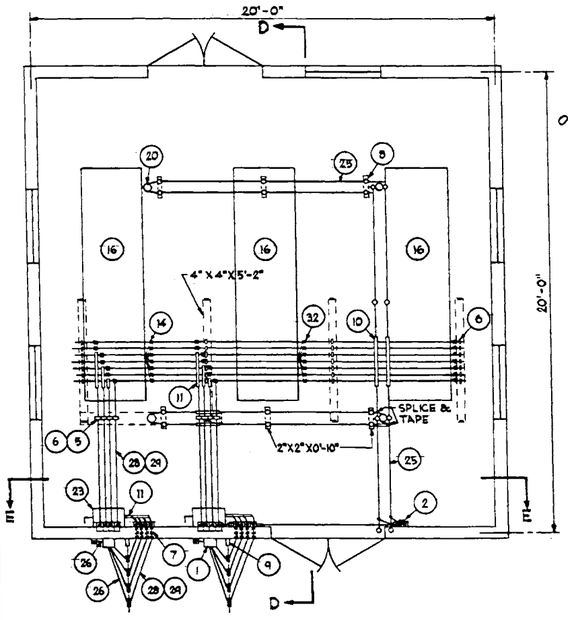


ELEVATION C-C
SCALE NO. 3



SECTION B-B
SCALE NO. 3

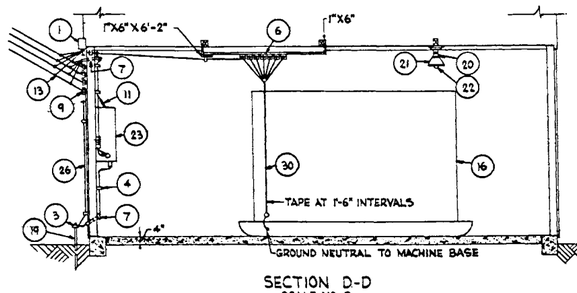
SCHEDULE OF MATERIALS	
ITEM NO.	DESCRIPTION
1	ARRESTER, LIGHTNING, 0-650 VOLTS, 3 POLE
2	CIRCUIT BREAKER, 2-1P, 15 AMP.
3	CLAMP, GROUND
4	CLEAT, PORCELAIN, NO. 6 TO NO. 4
5	CLEAT, PORCELAIN, NO. 2 TO NO. 1/0
6	CLEAT, PORCELAIN, NO. 2 TO NO. 4/0
7	TUBE, PORCELAIN
8	INSULATOR, SPLIT KNOB
9	CLEVIS, INSULATED SECONDARY
10	CONDUIT, FLEXIBLE NON METALIC 3/8" DIA.
11	CONDUIT, FLEXIBLE NON METALIC 3/4" DIA.
12	CONDUIT, FLEXIBLE NON METALIC 1 1/2" DIA.
13	CONNECTOR, CABLE NO. 1/0
14	CONNECTOR, CABLE NO. 4/0
15	CONNECTOR, CABLE NO. 350 MCM
16	GENERATOR, ELEC., DIESEL, SKID MOUNTED, 60 KW, 120/208 V
17	GENERATOR, ELEC., DIESEL, SKID MOUNTED, 100 KW, 120/208 V
18	RECEPTACLE, PLUG
19	PIPE, 3/4" STEEL, DRIVE 8 FT INTO GROUND
20	RECEPTACLE, LAMP
21	SHADE, 8" DIA. CONICAL
22	LAMP, INCANDESCENT, 100 W.
23	SWITCH, SAFETY, UNFUSED 3 POLE SINGLE THROW, 2 & 3 UNIT 2-400A
24	SWITCH, SAFETY, UNFUSED 3 POLE SINGLE THROW, 2 & 3 UNIT 3-400A
25	WIRE, NO. 12
26	WIRE, NO. 6
27	WIRE, NO. 4/0
29	WIRE, 4 NO. 4/0-2 & 3 UNITS
30	WIRE, 7 NO. 2/0
31	WIRE, 7 NO. 4/0
32	WIRE, 2 & 3 UNITS 7 NO. 4/0
33	WIRE, 2 & 3 UNITS 7 NO. 350 MCM



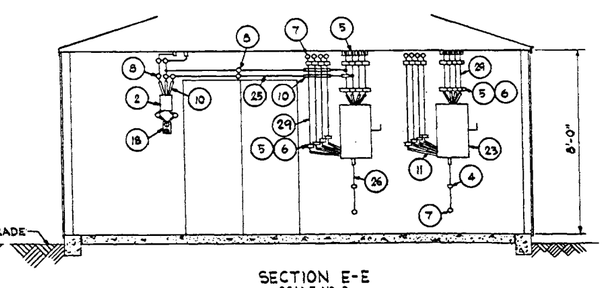
PLAN
SCALE NO. 3

GENERATING PLANT, 3-100 KW UNITS

FACILITY NUMBERS
811306 - INTERIOR ONLY FOR 2-100 KW UNITS
811307 - INTERIOR ONLY FOR 3-100 KW UNITS
811309 - INTERIOR ONLY-CONVERSION FROM 2 TO 3 UNITS.
811316 - STL FRAME W/INTERIOR FOR 2-100 KW UNITS.
811317 - STL FRAME W/INTERIOR FOR 3-100 KW UNITS.
811326 - WOOD FRAME W/INTERIOR FOR 2-100 KW UNITS.
811327 - WOOD FRAME W/INTERIOR FOR 3-100 KW UNITS



SECTION D-D
SCALE NO. 3



SECTION E-E
SCALE NO. 3

GENERATING PLANT, 3-60 KW UNITS

FACILITY NUMBERS
811302 - INTERIOR ONLY FOR 2-60 KW UNITS
811303 - INTERIOR ONLY FOR 3-60 KW UNITS
811305 - INTERIOR ONLY-CONVERSION FROM 2 TO 3 UNITS
811312 - STL FRAME W/INTERIOR FOR 2-60 KW UNITS
811313 - STL FRAME W/INTERIOR FOR 3-60 KW UNITS
811322 - WOOD FRAME W/INTERIOR FOR 2-60 KW UNITS
811323 - WOOD FRAME W/INTERIOR FOR 3-60 KW UNITS

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	100 KW UNITS	60 KW UNITS
LIGHTING	0.8 KW	0.4 KW
RECP. EST.	0.1 KW	0.1 KW
TOTAL	0.9 KW	0.5 KW

1. ALL LAMPS TO BE 100 W.
2. ALL LAMPS TO HAVE 8" CONICAL SHADES.
3. 3/4" GROUND PIPE TO BE DRIVEN 8'-0" IN GROUND.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS.
2. FOR FSN BILL OF MATERIALS- REFER TO TM5-303 BY FACILITY NUMBER.
3. CONCRETE FLOORS AND GENERATOR FOOTING ARE OPTIONAL.
4. ENGINE EXHAUST EXTENDED TO OUTDOORS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
81-13	PLANS, SECTIONS & ELEVATIONS	1 OF 1
34-03	WOOD FRAME CONST. BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS.	1-4 OF 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

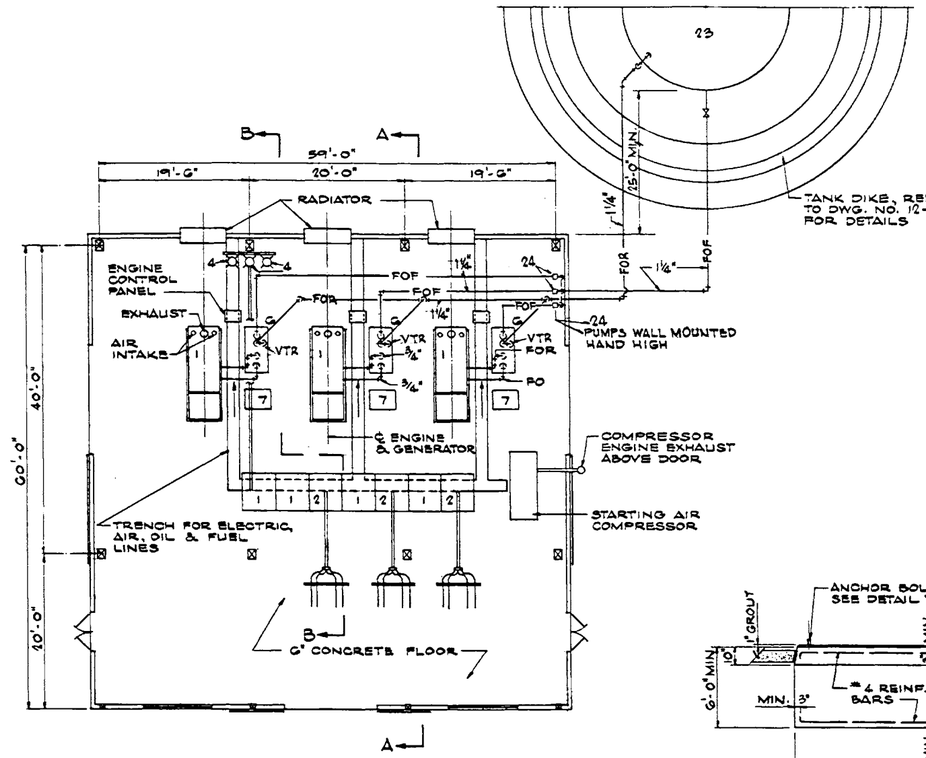
THEATER OF OPERATIONS
ELECTRIC GENERATING PLANTS
2 OR 3-100 KW UNITS
2 OR 3-60 KW UNITS

UNDER REVISION

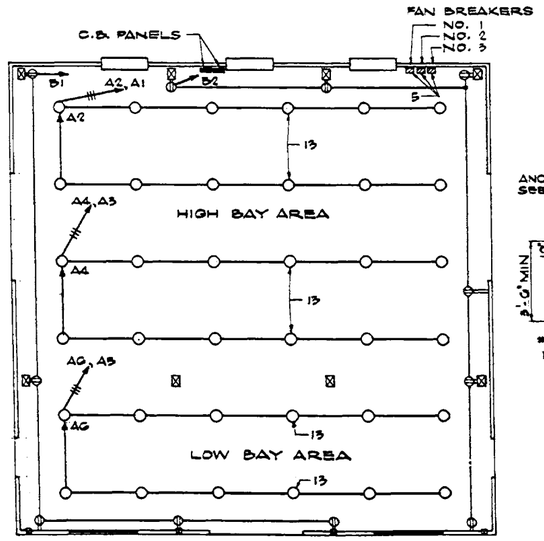
APPROVED: H.M. Williams
DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE

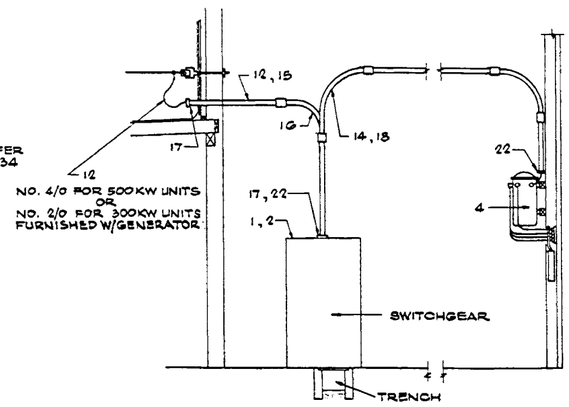
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
81-13



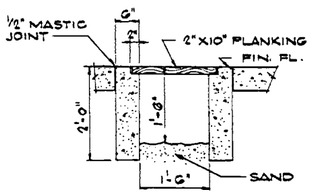
PLAN - EQUIPMENT LAYOUT
SCALE NO. 1



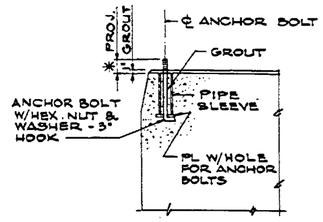
ELECTRICAL PLAN
SCALE NO. 1



SECTION B-B
NO SCALE



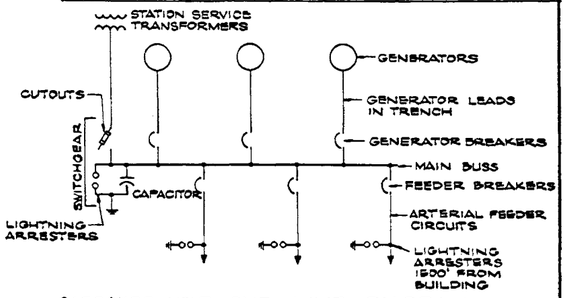
FLOOR TRENCH
TYPICAL SECTION
NO SCALE



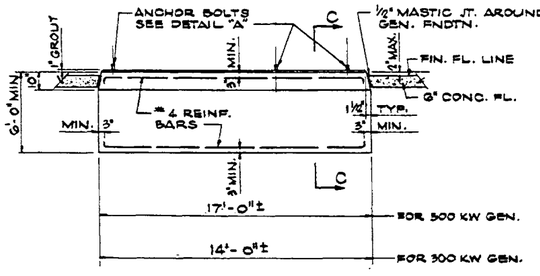
DETAIL "A"
SCALE NO. 5

SCHEDULE OF EQUIPMENT

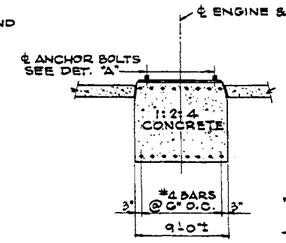
ITEM NO.	DESCRIPTION
1	DIESEL ENGINE GENERATORS COMP. W/AUXILIARY EQUIP. & PIPING, INCLUDING ONE GEN. EXCITER PANEL FOR EACH GEN. PLUS ONE SYNC. PANEL & ONE AUXILLARY PANEL FOR THE GROUP.
2	SWITCHGEAR GEN. STA. 1200 AMP. FEEDER PANELS
3	ARRESTER, LIGHTNING, PELLET TYPE - INSTALLED APPROX. 1500 FT. FROM BUILDING
4	TRANSFORMER - 25 KVA, 1 PH, 2400 - 4160/120 - 208 V
5	CIRCUIT BREAKER, 3P - 125 AMP
6	DAY TANK - 275 GALLON
7	OIL RESERVOIR, LUB
8	CLEAT, PORCELAIN, NO. 2/0 WIRE
9	LAMP, INCAND., SEALED REFLECTOR, 150 W
10	LAMP, INCAND., 100 W
11	WIRE, NO. 2/0
12	WIRE, NO. 2/0 OR 4/0, 5000V, RUBBER OR NEOPRENE
13	WIRE, NO. 4/0 STRANDED, BARE COPPER
14	WIRE, NO. 8, 5000 V, TYPE AVA-50
15	CONDUIT, RIGID STEEL, 3" FOR NO. 2/0 WIRE - 3½" FOR NO. 4/0 WIRE
16	CONDUIT BENDS, 90°, 3" OR 3½" AS REQUIRED
17	LOCKNUT & BUSHING, 3" OR 3½" AS REQUIRED
18	CONDUIT, 1½" RIGID STEEL
19	PIPE, BITUMINIZED FIBER, 4" DIA.
20	COUPLING, BITUMINIZED FIBER, 4" DIA.
21	CUTOUT, PORC. ENCLOSED, 15 AMP, 5000V IN SWITCHBOARD
22	LOCKNUT & BUSHING, 1½" DIA.
23	FUEL OIL STOR. TANK - 250 BBL FOR 2 OR 3 - 500 KW GEN, 500 BBL FOR 2 OR 3 - 500 KW GEN.
24	TRANSFER PUMP, HAND OPER, WALLMTD, POS. DISPLACEMENT



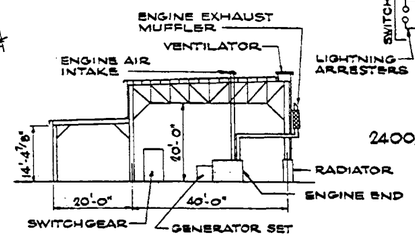
2400/4160 VOLT ONE-LINE DIAGRAM
NO SCALE



ELEVATION

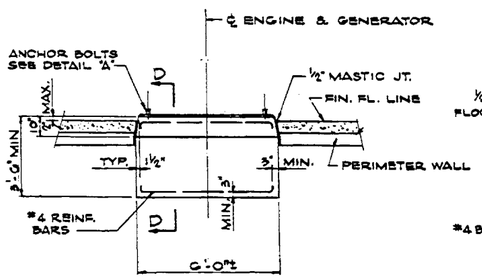


SECTION C-C

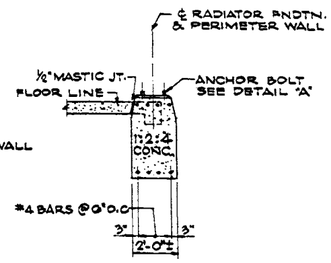


SECTION A-A
NO SCALE

DIESEL GENERATOR* FOUNDATION DETAILS
NO SCALE



ELEVATION



SECTION D-D

DIESEL RADIATOR* FOUNDATION DETAILS
NO SCALE

FACILITY NUMBERS

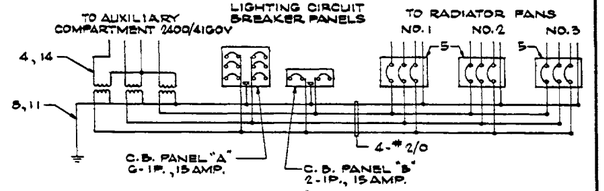
3-300 KW UNIT GENERATING PLANT
- 811603 - INTERIOR ONLY
- 811615 - STEEL FRAME W/INTERIOR
- 811623 - WOOD FRAME W/INTERIOR

3-500 KW UNIT GENERATING PLANT
- 811607 - INTERIOR ONLY
- 811617 - STEEL FRAME W/INTERIOR
- 811627 - WOOD FRAME W/INTERIOR

2-300 KW UNIT GENERATING PLANT
- 811602 - INTERIOR ONLY
- 811612 - STEEL FRAME W/INTERIOR
- 811622 - WOOD FRAME W/INTERIOR
- 811605 - CONVERSION TO 3 UNITS

2-500 KW UNIT GENERATING PLANT
- 811606 - INTERIOR ONLY
- 811616 - STEEL FRAME W/INTERIOR
- 811626 - WOOD FRAME W/INTERIOR
- 811609 - CONVERSION TO 3 UNITS

* FOUNDATION NOTE - ALL LAYOUT DIMENSIONS ARE APPROXIMATE. SOME UNITS ARE FURNISHED WITH RECOMMENDED LAYOUTS OF SEPARATE FOUNDATIONS FOR ENGINE, GENERATOR, RADIATOR, FAN MOTOR & CONTROL CONSOLE. OBTAIN DWGS FROM MFR. FOR ACTUAL FOUNDATION & ANCHOR BOLT LAYOUT DIMENSIONS AND FOR THE SIZE, NUMBER AND PROJECTIONS OF BOLTS.



WIRING DIAGRAM
LOW VOLTAGE DISTRIBUTION
NO SCALE

ELECTRICAL NOTES

CONNECTED LOAD

LIGHTING	4.8 KW
RECP. EST.	1.2 KW
POWER EST.	20.0 KW
TOTAL	26.0 KW

1. ALL WIRING BETWEEN ENGINE GEN, EXCITER & SWITCHGEAR SHALL BE RUN IN FLOOR TRENCH.
2. ALL ELECT. EQUIP. SHALL BE TIED TOGETHER & GROUNDED WITH #4/0 STRANDED BARE COPPER WIRE. GROUND WIRE SHALL BE ADEQUATELY PROTECTED FROM MECH. DAMAGE. CONNECT TO GROUND RODS.
3. GEN. LIGHTNING ARRESTERS & CAPACITORS TO BE INCLUDED IN SWITCHGEAR GROUP.
4. LOCATE SERVICE POLE OR POLES NOT MORE THAN 25' FROM SERVICE RACK.
5. ALL UNITS SHALL BE COORDINATED FOR THE CONTROL OF 3 GENERATORS FEEDING A COMMON BUS FROM WHICH 3 FEEDERS ARE TAKEN. ONE OF THE FEEDER PANELS SHALL BE CAPABLE OF BEING USED TO SUPPLY POWER TO THE BUSS IN THE MANNER OR A TIE LINE IF ONLY 2 FEEDERS ARE USED.
6. PORC. CUTOUTS SHALL BE INSTALLED IN THE AUXILIARY COMPARTMENT TO PROVIDE MEANS FOR DISCONNECTING SERVICE TRANSFORMER FROM LINE.
7. RUN WIRING TO RADIATOR MOTORS IN TRENCH.
8. ALL LAMPS TO HAVE 14° FLAT CONE REFL.

GENERAL NOTES

1. FOR INSTALLATION WITH 2 GENERATORS, OMIT ONE GENERATOR & ASSOCIATED AUXILIARIES.
2. THE INVERT ELEVATION OF THE DAY TANKS TO BE ABOVE THE TOP OF THE MAIN FUEL OIL STORAGE TANK.
3. DAY TANKS TO BE FLOOR SUPPORTED BY PIPE STANDARDS OR STRUCTURAL ANGLES.
4. PROVIDE A FIELD FABRICATED STRUCT. A-FRAME ARRANGED TO ACCOMMODATE A 2-TON CHAIN HOIST FOR PISTON REMOVAL.
5. REFER TO TM 5-303 FOR BUILDING SHELL REQUIREMENTS.
6. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
81-16	PLANS, SECT. & DETAILS	1 OF 1
34-19	WOOD FRAME CONST. SHOP TYPE BLDGS.	1-12 OF 12
35-46	STEEL FRAME CONST. SHOP TYPE BLDGS.	1-3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' NO. 1
0 1' 2' 3' NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D.C.

DRAWN BY: HELTON
TRACED BY: ILYUS
CHECKED BY: C.W. DEICHMANN
SUBMITTED BY: -

THEATER OF OPERATIONS
ELECTRIC GENERATING PLANTS
2-300 KW UNITS & 3-500 KW UNITS
PLANS-SECTIONS & DETAILS

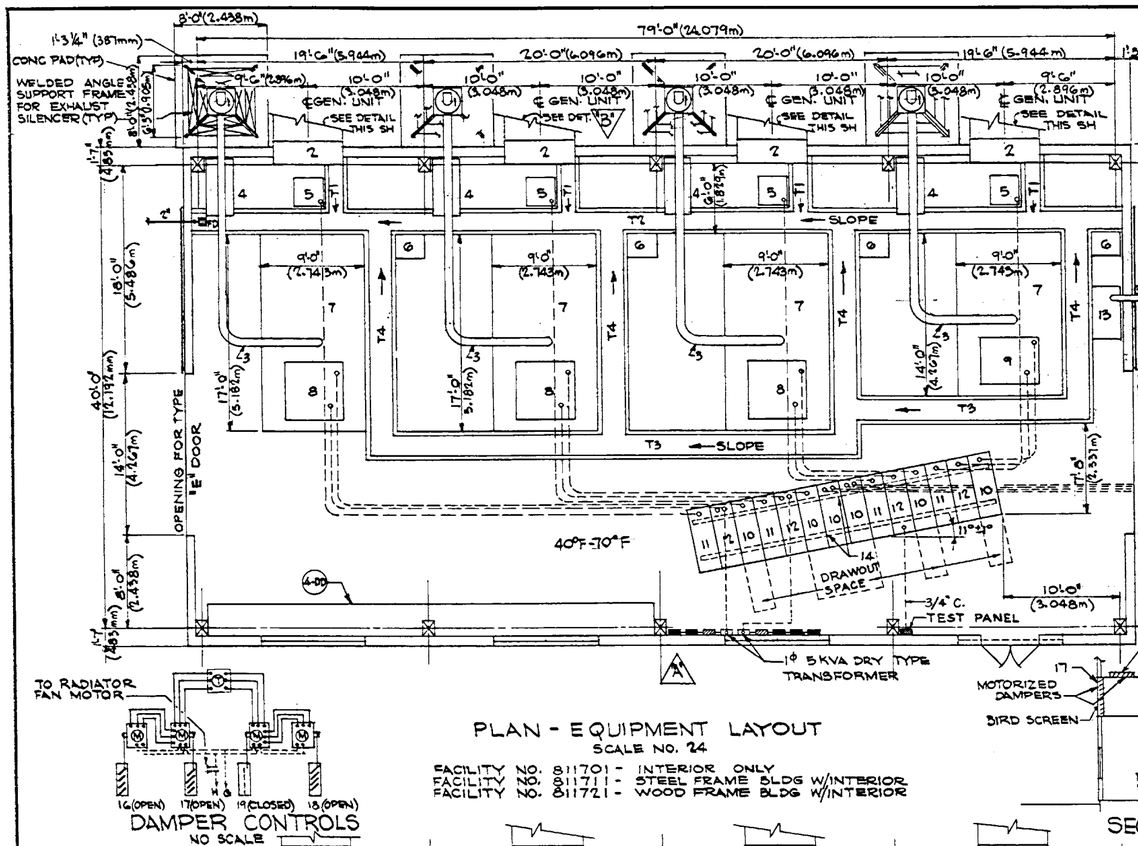
UNDER DIRECTION

APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH, CONST. ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 81-16
SHEET 1 OF 1

CORPS OF ENGINEERS

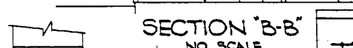
U. S. ARMY



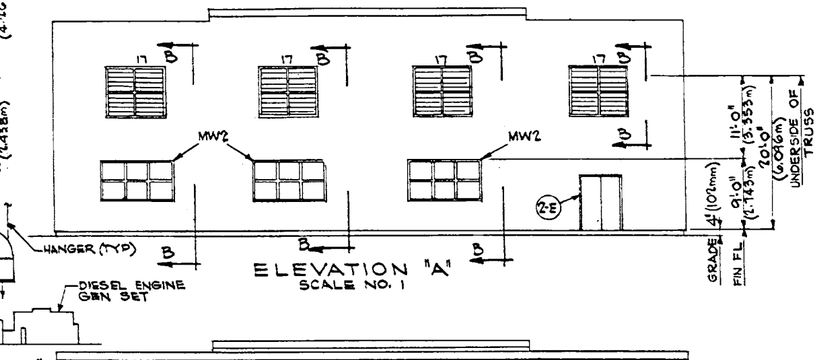
PLAN - EQUIPMENT LAYOUT
SCALE NO. 24

FACILITY NO. 811701 - INTERIOR ONLY
FACILITY NO. 811711 - STEEL FRAME BLDG W/INTERIOR
FACILITY NO. 811721 - WOOD FRAME BLDG W/INTERIOR

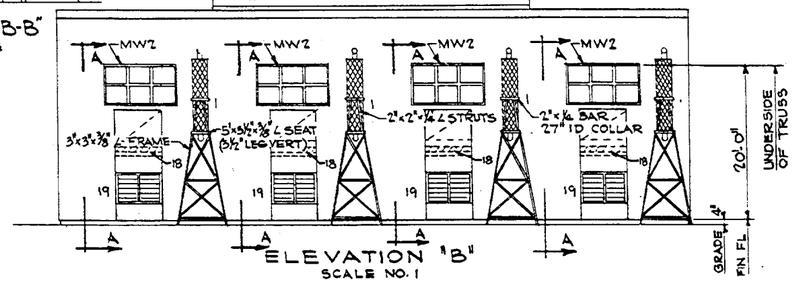
DAMPER CONTROLS
NO SCALE



SECTION "B-B"
NO SCALE



ELEVATION "A"
SCALE NO. 1

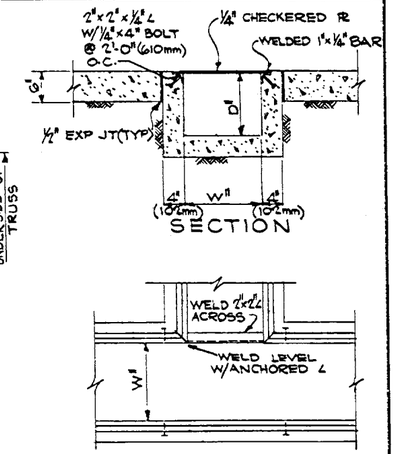


ELEVATION "B"
SCALE NO. 1

ELECTRICAL PLAN
SCALE NO. 24

NOTES
1. THE LIGHTS IN THE ELECTRIC GENERATING PLANT ARE TO BE MERCURY VAPOR, INDUSTRIAL TYPE, VENTILATED PORCELAIN ENAMELED REFLECTOR, HIGH BAY, FOR PENDANT MOUNTING ON ½" CONDUIT WITH H-33 400 W LAMP FOR USE WITH SEPARATE 120 V 2-LAMP BALLAST.
2. ADDITIONAL GROUND RODS SHALL BE INSTALLED AT THE LOCATIONS AS RECOMMENDED BY THE MANUFACTURER FOR THE INSTALLATION OF LIGHTNING ARRESTERS, SURGE CAPACITORS, SWITCHGEAR, AND GENERATOR SET FRAMES FOR EACH GENERATOR SET, IN ACCORDANCE WITH THE INSTRUCTIONS FROM ITS MANUFACTURERS.

4160Y/2400 VOLT ONE-LINE DIAGRAM

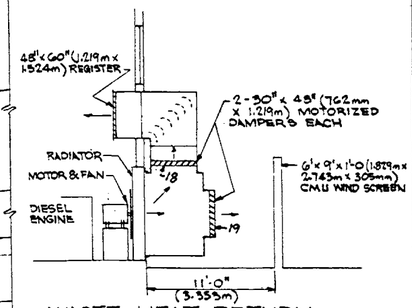


SECTION

PLAN AT INTERSECTION

SCHEDULE OF EQUIPMENT	
ITEM NO.	DESCRIPTION
1	EXHAUST SILENCER
2	RADIATOR
3	EXHAUST PIPE
4	DAY TANK - 275 GAL.
5	FAN MOTOR
6	ENGINE CONSOLE
7	DIESEL ENGINE
8	ALTERNATOR - 625 KVA
9	ALTERNATOR - 375 KVA
10	AIR CIRCUIT BREAKER
11	FAN MOTOR TRANSFORMER & CONTROLLER
12	ALTERNATOR CONTROL COMP.
13	AIR COMPRESSOR
14	4" CHANNEL
15	FUEL OIL TANK - 1000 BBL
16	MOTOR CONTROLLED DAMPER - 2-30"x48" SECT
17	MOTOR CONTROLLED DAMPER - 4-36"x42" SECT
18	MOTOR CONTROLLED DAMPER - 2-30"x48" SECT
19	MOTOR CONTROLLED DAMPER - 2-30"x48" SECT
20	40,000 CFM IN-LINE FAN

WASTE HEAT RETURN DETAIL
SECTION "A-A"
NO SCALE



TRENCH SCHEDULE		
	W	D
T1	15" (381mm)	12" (305mm)
T2	18" (457mm)	15" (381mm)
T3	21" (534mm)	15" (381mm)
T4	24" (610mm)	18" (457mm)

PIPE TRENCH DETAILS
NO SCALE

NOTES:
1. SILENCER SUPPORT FRAME TO BE FABRICATED IN FIELD OF 3"x3"x⅜" L WITH 5"x3½"x⅜" L SEAT ON TOP.
2. ANCHOR SILENCER SUPPORT FRAME TO CONCRETE PAD WITH ⅝" EXPANSION SHIELDS.
3. EXHAUST PIPING IN THE INTERIOR OF BUILDING TO BE SUPPORTED BY STRAP HANGERS FROM TIMBERS FRAMED INTO THE BOTTOM CHORDS OF ROOF TRUSSES.
4. USE 12"ø PIPE SLEEVE AND ¼" ASBESTOS BOARD WHERE EXHAUST PIPING PASSES THRU EXT. WALL.
5. THERE SHALL BE A FLEXIBLE EXHAUST ADAPTER FOR EACH EXHAUST OUTLET ON ENGINE.

EQUIPMENT FOUNDATIONS			
ITEM NO	MINIMUM DIMENSIONS W	L	D
1	8'-0"(2.438m)	8'-0"(2.438m)	1'-0"(305mm)
2	2'-0"(610mm)	6'-0"(610mm)	3'-6"(1.067m)
3	2'-6"(762mm)	2'-6"(762mm)	3'-0"(914mm)
7	9'-0"(2.743m)	17'-0"(5.182m)	6'-0"(1.829m)
7	9'-0"(2.743m)	14'-0"(4.267m)	6'-0"(1.829m)
8	5'-0"(1.524m)	5'-0"(1.524m	6'-0"(1.829m)
9	4'-0"(1.219m)	5'-0"(1.524m)	6'-0"(1.829m)

NOTE:
REFER TO DWG B1-16 SHEET 1 OF 1 FOR TYPICAL MACHINERY FOUNDATION DETAILS

ELECTRICAL NOTES

CONNECTED LOAD	
LIGHTING	5.1 KVA
RECP EST	2.6 KVA
POWER	145.0 KVA
TOTAL CONNECTED	151.7 KVA
EST. MAX. DEMAND	150.0 KVA

WHERE NOT OTHERWISE NOTED:
1. FEEDER CONDUCTORS NOT LARGER THAN NO. 2 SHALL BE TYPE NM, NMC OR UF CABLE WITH GROUND.
2. BRANCH CIRCUIT CONDUCTORS SHALL BE NO. 12 COPPER OR NO. 10 ALUMINUM, TWO-OR THREE-WIRE TYPE NM, NMC OR UF CABLE WITH GROUND.
3. MOTOR SYMBOL (M) DENOTES INCLUSION OF CONTROLLERS, OVERLOAD PROTECTION AND REMOTE CONTACT DEVICES, AS REQUIRED, WITH THE EQUIPMENT FOR EACH MOTOR OR EQUIPMENT UNIT, A PROPERLY RATED SAFETY DISCONNECT SWITCH SHALL BE INSTALLED WITHIN SIGHT.
4. UNDERFLOOR AND UNDERGROUND CONDUIT FOR THE 4160 VOLT SYSTEM, TO A POINT 5' (1.524m) AWAY FROM THE BUILDING, SHALL BE HEAVY-WALL STEEL ENCASED IN 2½" (64mm) MIN. COVERAGE OF 2500 PSI CONCRETE; AND 5' (1.524m) AWAY FROM THE BUILDING SHALL BE TYPE I BITUMINOUS FIBER OR ASBESTOS CEMENT, 4" SIZE, SIMILARLY ENCASED IN CONCRETE. FOR EACH CONDUIT DESIGNATED TO BE WIRED IN THE 4160 VOLT SYSTEM, ONE SPARE CONDUIT SHALL BE LAID ADJACENT.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS.
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.
3. SLOPE PIPE TRENCHES 0.4% GRADE TO DRAIN @ P-TRAP.
4. THE "EQUIPMENT FOUNDATIONS" SCHEDULE IS ONLY FOR ESTIMATING CONCRETE AND FORM MATERIALS. ACTUAL FOUNDATION DIMENSIONS TO BE OBTAINED FROM EQUIP. MANUF. BEFORE SETTING FORMS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
81-17	PLANS & ELEV.	1 OF 1
34-19	WOOD FRAME CONST. SHOP TYPE BLDGS.	1-12 OF 12
35-46	PREFAB STEEL BLDG 20 FT HIGH BLDG	1-3 OF 3
12-34	BERM DETAILS	1 OF 1
99-98	STANDARD DETAILS	

"UNDER REVISION"

SYMBOL	NO.	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES
NO. 1: 0 5' 10' 15' / 0 1m 5m
NO. 2: 0 2' 4' 6' 8' 10' / 0 1m 3m

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D. C.

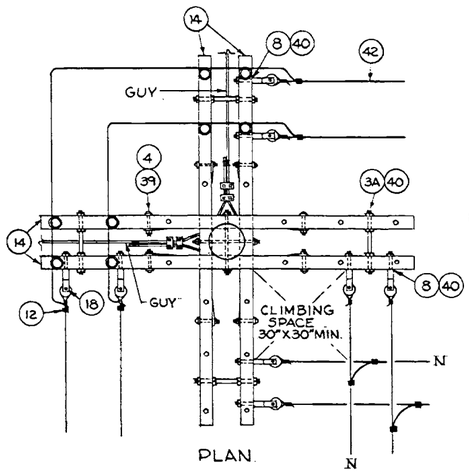
DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, BRANCH

ARMY FACILITIES COMPONENTS SYSTEM
UNDER REVISION
ELECTRIC GENERATING PLANT
1-625 & 1-375 KVA UNITS
PLANS, ELEVATIONS & DETAILS

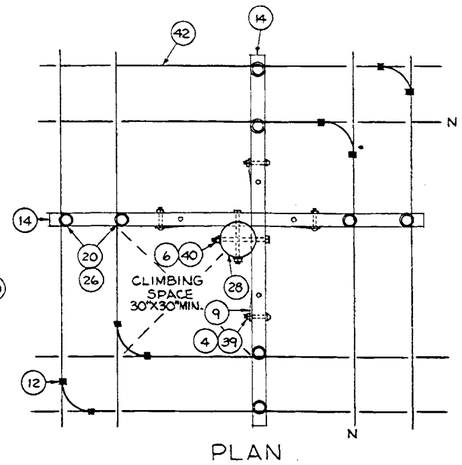
APPROVED: Edwin A. Patterson, Col CE — DATE: 23 February 1972
CHIEF, AFCS OFFICE, MILITARY ENGINEERING, OCE

APPROVED FOR PROCUREMENT AGENCY:
John D. Altman COL, CE
DATE 1 DEC 72

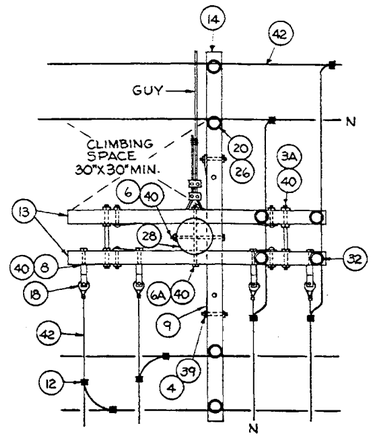
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 81-17
SHEET 1 OF 1



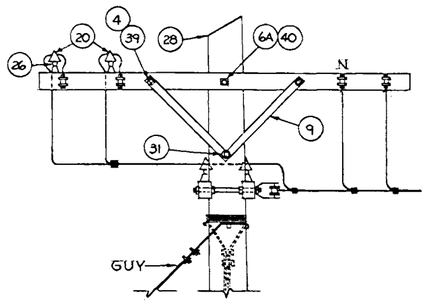
PLAN



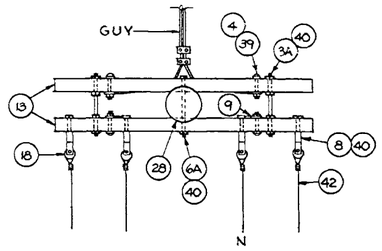
PLAN
X-CORNER
NO SCALE



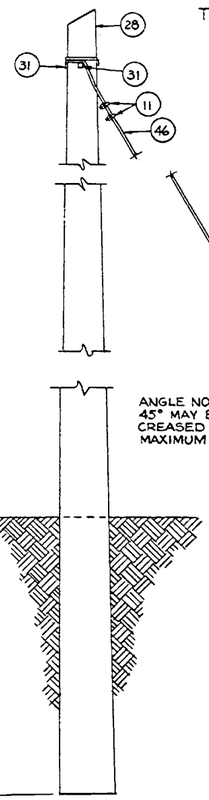
PLAN
T-CORNER
NO SCALE



ELEVATION
L-CORNER
NO SCALE

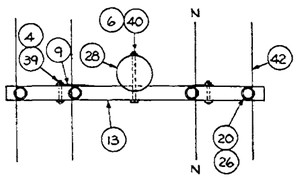


PLAN
DEAD-END

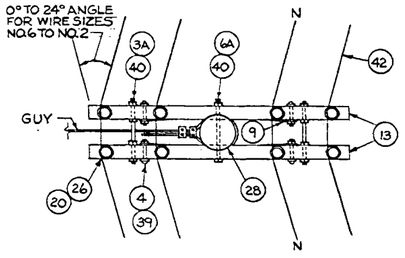


ANGLE NORMALLY 45° MAY BE IN-CREASED TO 60° MAXIMUM

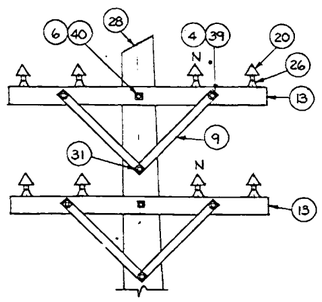
ELEVATION
GUY DETAIL
NO SCALE



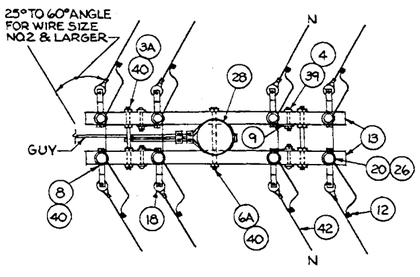
PLAN



PLAN
NO. 6 TO NO. 2 WIRE



ELEVATION
THROUGH LINE
NO SCALE



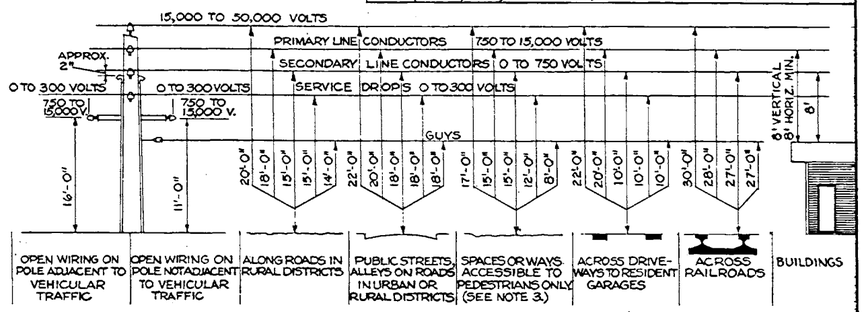
PLAN
NO. 2 & LARGER WIRE
DOUBLE-ARM
NO SCALE

SAG IN INCHES FOR DIFFERENT SPAN LENGTHS

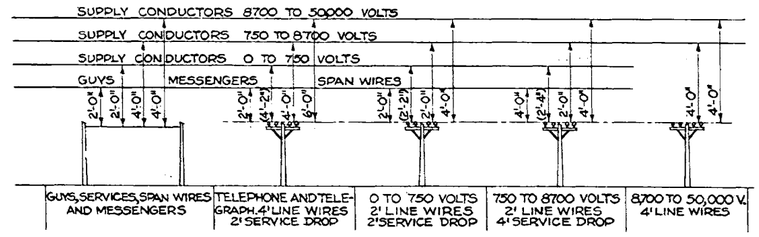
SPAN	TEMPERATURE F°		
	30°	60°	90°
50'	2	3	3
60'	3	4	5
70'	4	6	7
80'	6	7	9
90'	8	9	11
100'	9	12	14
110'	12	14	17
120'	14	17	20
130'	16	20	23
140'	18	23	26
150'	21	26	30
160'	24	30	34
170'	27	34	39
180'	31	38	44

SCHEDULE OF MATERIALS

ITEM NO.	DESCRIPTION
1	ANCHOR, EXPANDING, 3 WAY, 5000-LB.
3A	BOLT, CROSS ARM, DOUBLE ARMING W/4 SQ. NUTS 5/8"X 20"
4	BOLT, CARRIAGE, BLACK W/SQ. NUT, 3/8"X 4 1/2"
6	BOLT, MACHINE, SQ. HEAD W/SQ. NUT, BLACK, 5/8"X 14"
6A	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, BLACK, 5/8"X 18"
8	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, BLACK, 5/8"X 6"
9	BRACE, CROSS ARM, STEEL, GALV., FLAT, 28"X 1 7/32" X 7/32"
11	CLIP, WIRE ROPE, STEEL, GALV. 3/8"
12	CONNECTOR, CABLE, SOLDERLESS, (DETERMINED BY WIRE SIZE)
13	CROSS ARM, N.E.L.A., 4 PIN, 5'-7"X 3 1/2" X 4 1/2"
14	CROSS ARM, N.E.L.A., 6 PIN, 8'-0"X 3 1/2" X 4 1/2"
18	CLEVIS, INSULATED, STEEL, GALV., PRIMARY TYPE
20	INSULATOR, ELEC., PIN TYPE, 1" PIN HOLE, 5000 V.
26	PIN, INSULATOR, WOOD, 9"X 1 1/2 DIA., W/1" TOP
28	POLE, WOOD, 35', CLASS 4
30	ROD, ANCHOR, STEEL, GALV., THIMBLE EYE, 1/2" X 6'-0"
31	SCREW, LAG, STEEL, SQ. HEAD BLACK, 1/2" X 4"
32	WIRE, COPPER, BARE, SOLID, NO.6 A.W.G.
39	WASHER, ROUND, 1 3/8" O.D. FOR 1/2" BOLT
40	WASHER, ROUND, 1 3/4" O.D. FOR 5/8" BOLT
42	WIRE, COPPER, BARE, SOLID
46	WIRE, GUY, STRANDED, SIEMENS MARTIN 3/8" DIA.



NOTES: 1. FOR SPANS IN EXCESS OF 250', ADD 0.1' FOR EACH ADDITIONAL 10' IN MEDIUM LOADING DISTRICT.
2. FOR SPANS IN EXCESS OF 350', ADD 0.1' FOR EACH ADDITIONAL 10' IN LIGHT LOADING DISTRICT.
3. SUPPLY WIRES 0 TO 150 VOLTS TO GROUND 10' CLEAR AT BLDG. ENTRANCE ACCESSIBLE TO PEDESTRIANS.



NOTES: 1. THE ABOVE CLEARANCES APPLY WHERE THE SPAN LENGTH OF THE UPPER CONDUCTOR DOES NOT EXCEED 250' FOR MEDIUM LOADING DISTRICT AND 350' FOR LIGHT LOADING DISTRICT. FOR LONGER SPANS, INCREASE THE CLEARANCE 0.13' FOR MEDIUM LOADING AND 0.10' FOR LIGHT LOADING DISTRICT FOR EACH 10' IN SPAN LENGTH.
2. CLEARANCE MARKED ( ) INDICATES THAT, IN GENERAL, THE LINES OPERATING AT THE CORRESPONDING VOLTAGE SHOULD NOT CROSS OVER LINES AT THE HIGHER VOLTAGE.

MINIMUM CLEARANCES
NO SCALE

ELECTRICAL NOTES

1. MINIMUM CONDUCTOR SIZE TO BE #6.
2. AVERAGE POLE SPACING TO BE 135'.
3. MAXIMUM POLE SPACING TO BE AS SHOWN ON SAG AND CLEARANCE TABLES.
4. SERVICE DROP FROM POLE TO BUILDING SHALL NOT EXCEED 100'.
5. POLES SHALL BE SET IN FIRM EARTH TO DEPTH OF 6'-0" FOR STRAIGHT RUNS. DEPTH SHALL BE INCREASED TO 6'-6" FOR CURVES, SWAMPY OR SOFT SOIL AND AT POINTS OF STRAIN.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

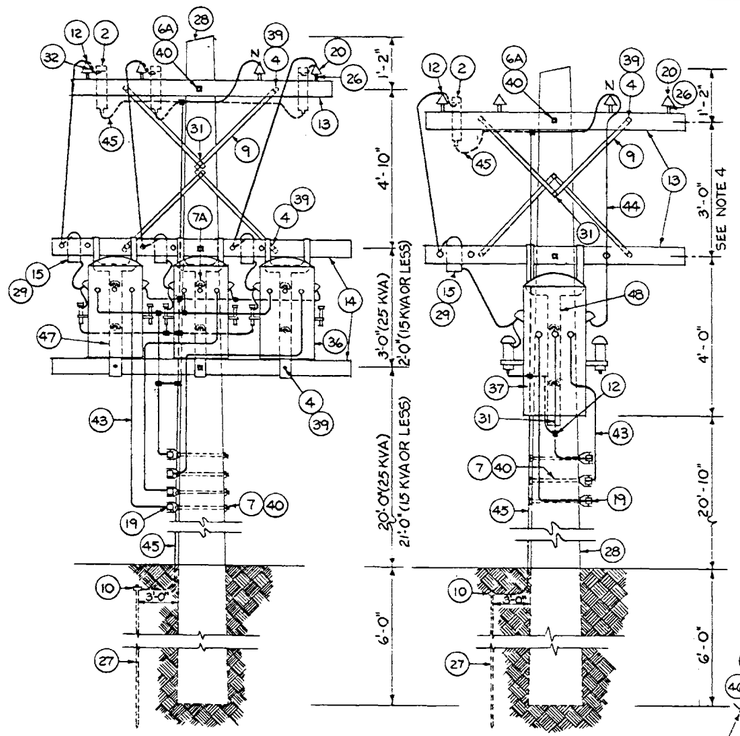
DRAWN BY: PENDLETON
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH
APPROVED: H.M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1952
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
ELECTRIC DISTRIBUTION PRIMARY LINE CONSTRUCTION
UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 81-21
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY



3-25 KVA MAXIMUM SINGLE PHASE TRANSFORMER INSTALLATION

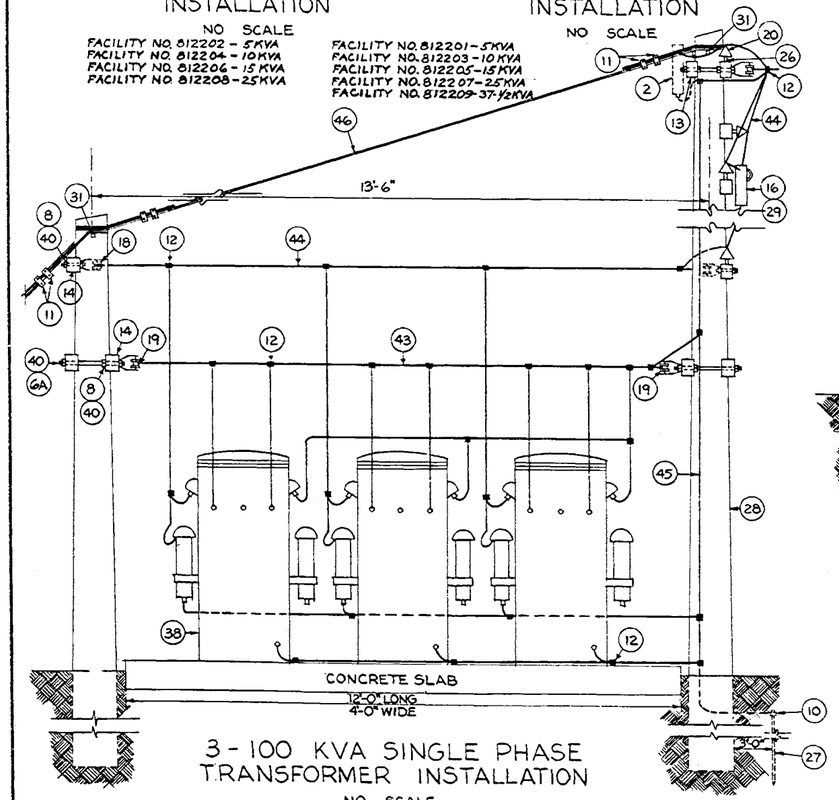
NO SCALE

FACILITY NO. 812202 - 5 KVA
FACILITY NO. 812204 - 10 KVA
FACILITY NO. 812206 - 15 KVA
FACILITY NO. 812208 - 25 KVA

1-37 1/2 KVA MAXIMUM SINGLE PHASE TRANSFORMER INSTALLATION

NO SCALE

FACILITY NO. 812201 - 5 KVA
FACILITY NO. 812203 - 10 KVA
FACILITY NO. 812205 - 15 KVA
FACILITY NO. 812207 - 25 KVA
FACILITY NO. 812209 - 37 1/2 KVA

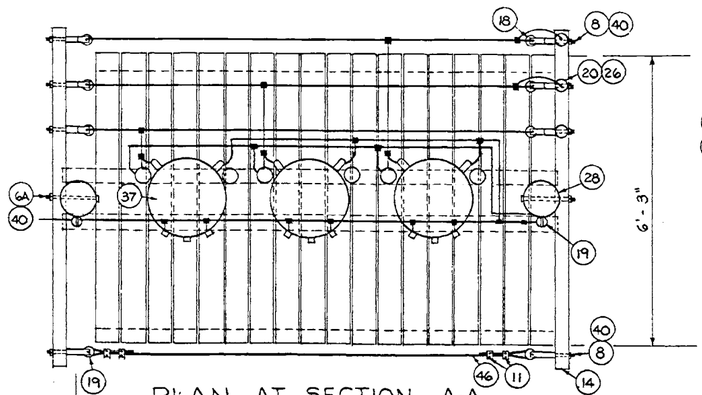


3-100 KVA SINGLE PHASE TRANSFORMER INSTALLATION

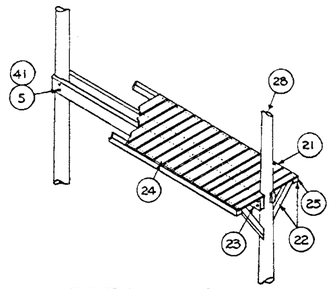
NO SCALE

FACILITY NO. 812216

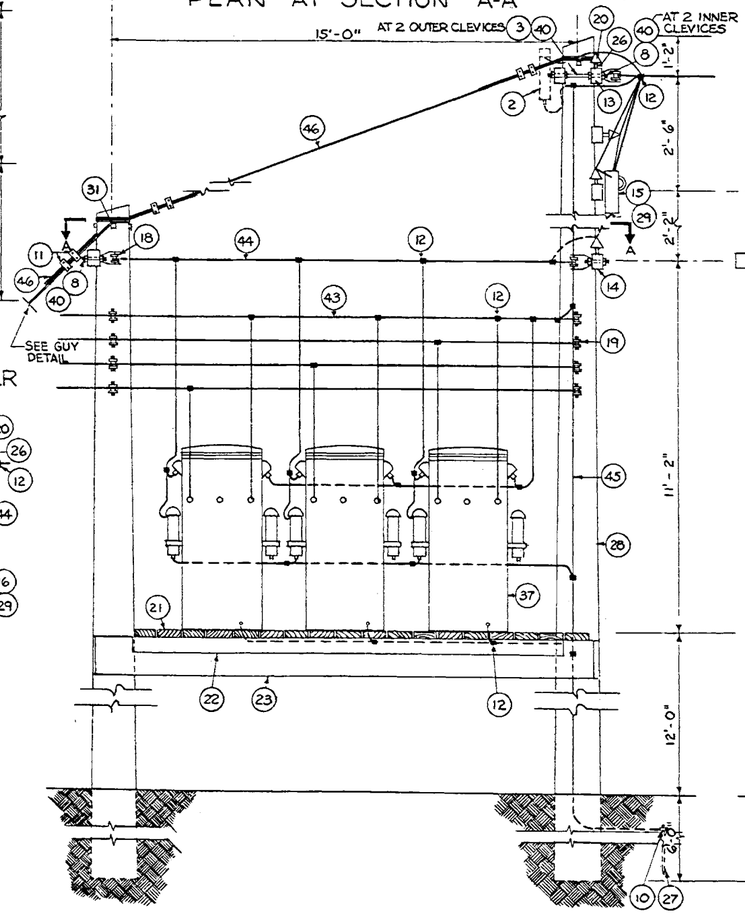
NOTE: ADD FENCING WHEN TRANSFORMER INSTALLATION IS ON GRADE.

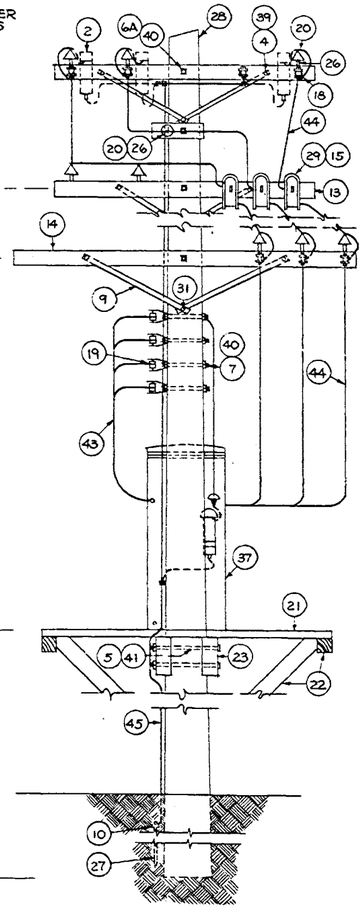


PLAN AT SECTION A-A



DETAIL NO. 1
PLATFORM CONSTRUCTION
NO SCALE





3-37 1/2 KVA SINGLE PHASE TRANSFORMER INSTALLATION

NO SCALE

FACILITY NO 812210

SCHEDULE OF MATERIALS

ITEM NO.	DESCRIPTION
1	ANCHOR, EXPANDING, 3 WAY, 5000 LB
2	ARRESTER, LIGHTNING, PELLET TYPE
3	BOLT, CROSS ARM, DOUBLE ARMING W/4 SQ NUTS 5/8"X 16"
4	BOLT, CARRIAGE, W/ SQ. NUT, 3/8"X 4 1/2"
5	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, 1"X 20"
6A	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, 5/8" X 18"
7	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, 5/8" X 10"
7A	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, 5/8" X 12"
8	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, 5/8" X 6"
9	BRACE, CROSS ARM, STEEL, GALV., 28"X1 7/32" X 7/32"
10	CLAMP, GROUND, 1" ROD X 1/4" CABLE
11	CLIP, WIRE ROPE, STEEL, GALV., 3/8"
12	CONNECTOR, CABLE, SOLDERLESS (DETERMINED BY WIRE SIZE)
13	CROSS ARM, N.E.L.A., 4 PIN, 5'-7" X 3 1/2" X 4 1/2"
14	CROSS ARM, N.E.L.A., 6 PIN, 8'-0" X 3 1/2" X 4 1/2"
15	CUTOUT, NON-INDICATING, FUSE TYPE, 50 AMP
16	CUTOUT, NON-INDICATING, FUSE TYPE, 100 AMP
17	BOLT, MACHINE, SQ. HEAD, W/SQ. NUT, 3/4" X 12"
18	CLEVIS, INSULATED, STEEL, GALV., PRIMARY TYPE
19	CLEVIS, INSULATED, STEEL, GALV., SECONDARY TYPE
20	INSULATOR, ELEC., PIN TYPE, 1" PINHOLE, 5000 V.
21	LUMBER, 2" X 6" X 14'-0"
22	LUMBER, 4" X 4" X 14'-0"
23	LUMBER, 4" X 10" X 16'-0"
24	NAIL, WIRE, STEEL, COMMON, 40 d
25	NAIL, WIRE, STEEL, COMMON, 60 d
26	PIN, INSULATOR, WOOD, 9" X 1 1/2" DIA., W/1" TOP
27	PIPE, STEEL, BLACK, THREADED, 3/4" DIA., 8'-0" LONG
28	POLE, WOOD, 35', CLASS 4
29	LINK, RENEWABLE FUSE, UNIV. CABLE TYPE, (SIZES AS REQD)
30	ROD, ANCHOR, STEEL, GALV., THIMBLEYE, 1/2" X 6'-0"
31	SCREW, LAG, STEEL, SQ. HEAD, 1/2" X 4"
32	WIRE, COPPER, BARE, SOLID, NO. 6 A.W.G.
33	TRANSFORMER, 60 CY., 1PH. 2400/4160-120/240 V., 5 KVA
34	TRANSFORMER, 60CY., 1PH. 2400/4160-120/240V, 10 KVA
35	TRANSFORMER, 60CY., 1PH. 2400/4160-120/240V, 15 KVA
36	TRANSFORMER, 60CY., 1PH. 2400/4160-120/240V., 25 KVA
37	TRANSFORMER, 60CY., 1PH. 2400/4160-120/240V., 37 1/2 KVA
38	TRANSFORMER, 60CY., 1PH. 2400/4160-120/240V., 100 KVA
39	WASHER, ROUND, 1 3/8" O.D FOR 1/2" BOLT
40	WASHER, ROUND, 1 3/4" O.D. FOR 5/8" BOLT
41	WASHER, ROUND, 2 1/2" O.D. FOR 1" BOLT
43	WIRE, ELEC., WP, COPPER, 3 BRAID COVERED (SIZES AS REQD)
44	WIRE, ELEC., WP, COPPER, 3 BRAID COVERED, NO. 6 SOLID
45	WIRE, ELEC., WP, COPPER, 3 BRAID COVERED, NO. 4 SOLID
46	WIRE, GUY, STRANDED, SIEMENS-MARTIN, 3/8" DIA.
47	T-CROSSARM HANGER, FOR TRANSFORMER
48	T-CROSSARM HANGER, WITH KICKER, FOR TRANSFORMERS

ELECTRICAL NOTES

1. ALL PRIMARY WIRING TO TRANSFORMERS SHALL BE #6 AWG, TYPE "TBWP" WIRE.
2. SINGLE PHASE TRANSFORMERS SHALL BE BALANCED AS NEARLY AS POSSIBLE ON 3 PHASES.
3. SOLID LINE SHOWS CONNECTION FOR SELF PROTECTED TRANSFORMERS; DASHED LINE SHOWS CONNECTION FOR CONVENTIONAL TYPE TRANSFORMERS.
4. 25 KVA, 1 PHASE TRANSFORMERS AND SMALLER SHALL BE INSTALLED BELOW UPPER CROSS ARM, ELIMINATING LOWER CROSS ARM.
5. SIZE OF NEUTRAL SHALL NOT BE REDUCED BETWEEN TRANSFORMER TERMINALS AND OUTGOING END OF BUS ON INSTALLATIONS OF BANKS OF TRANSFORMERS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

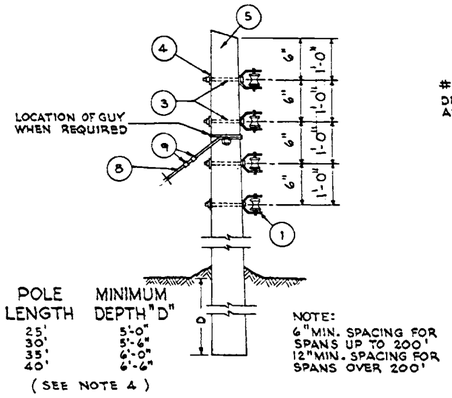
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: PENDLETON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. Graham
APPROVED: H. M. Williams
DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

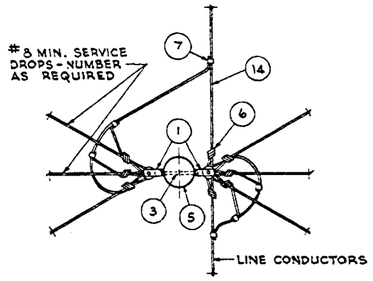
THEATER OF OPERATIONS
ELECTRIC DISTRIBUTION TRANSFORMER INSTALLATIONS

UNDER REVISION

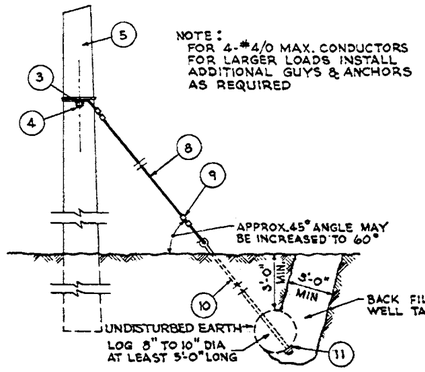
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 81-22
SHEET 1 OF 1



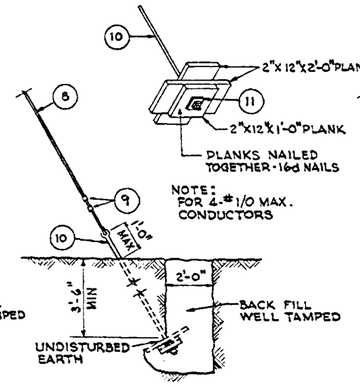
VERTICAL SPACINGS
NO SCALE



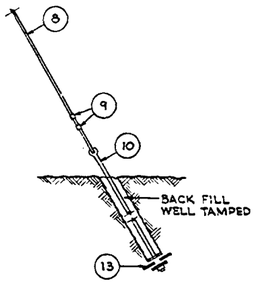
TYPICAL POLE SERVICE CONNECTIONS
NO SCALE



LOG



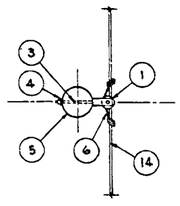
PLANK
TYPICAL ANCHOR INSTALLATION
NO SCALE



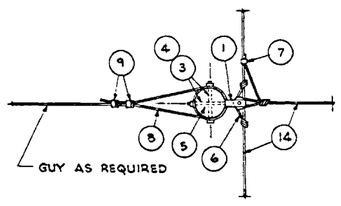
EXPANSION

SCHEDULE OF MATERIALS

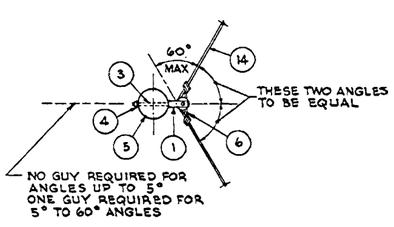
ITEM NO.	DESCRIPTION
1	CLEVIS, INSULATOR, STRAIN
3	BOLT, MACHINE 5/8" X 10"
4	WASHER, 5/8"
5	POLE, CLASS 5, SEE NOTE 1
6	WIRE, NO 8
7	CONNECTOR, CABLE
8	ROPE, WIRE, GUY 3/8"
9	CLIP, WIRE ROPE 3/8"
10	ROD, ANCHOR, 1/2" X 6'-0"
11	WASHER, 2 1/2" X 2 1/2" SQ.
13	ANCHOR, EXPANDING
14	WIRE, DISTRIBUTION, SEE NOTE 6



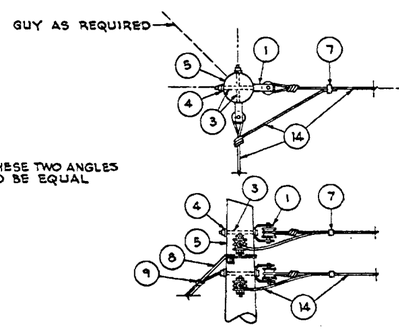
STRAIGHT LINE



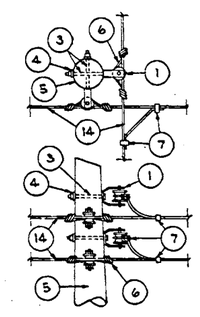
TEE TAP



ANGLE
60° MAX. ANGLE

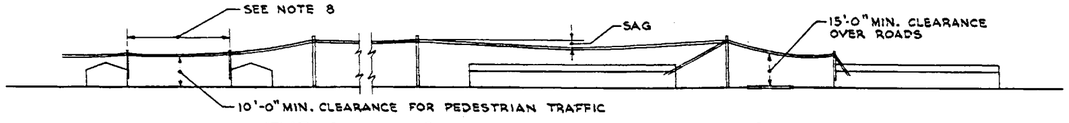


CORNER
OVER 60° ANGLE



CROSS

TYPICAL POLE LINE INSTALLATION
NO SCALE



TYPICAL INSTALLATION OF SECONDARIES
WHEN BUILDINGS ARE CONSTRUCTED IN LINE
NO SCALE
FACILITY NO. 812300

* SAG IN INCHES FOR DIFFERENT SPAN LENGTHS

WIRE SIZE AWG NO.	STRINGING TEMPERATURE F°	SPAN 100'	125'	150'	175'	200'	250'	300'
8	30°	15	23	36	—	—	—	—
	60°	18	27	40	—	—	—	—
	90°	21.5	31	44	—	—	—	—
6	30°	8.5	14	22	31	—	—	—
	60°	12	18	27	36	—	—	—
	90°	15.5	22.5	32	40	—	—	—
4	30°	8.5	14	21.5	31	43	—	—
	60°	12	18	27	36	48	—	—
	90°	17	22.5	32	41	54	—	—
2	30°	8.5	14	21.5	23.5	30	53	89
	60°	12	18	27	30	36	60	96
	90°	17	22.5	32	35	42	67	103
1	30°	8.5	13.5	21	23	27	44	72
	60°	12	18	36	29	33	52	80
	90°	15.5	22.5	31	34	39	59	87
1/0	30°	8.5	13.5	20.5	22.5	26	42	66
	60°	12	18	26	28	32	49	72
	90°	15.5	22.5	31	34	38	56	82
2/0	30°	8.5	13.5	20	22.5	25	38	57
	60°	12	18	25	28	31	46	66
	90°	16	22.5	30	34	38	53	73
4/0	30°	8.5	13.5	18.5	21	24	31	43
	60°	12	18	24	27	30	38	50
	90°	16	22.5	29	33	36	46	59

* FOR LIGHT TO MEDIUM LOADING. IN HEAVY LOADING AREAS ADD 50%

LOADING DEFINITION	LIGHT	MEDIUM	HEAVY
DEGREES F. TEMPERATURE	30	15	0
LBS/SQ FT HORIZONTAL WIND LOAD	8	8	8
RADIAL INCHES THICKNESS OF ICE	0	1/4	1/2

ELECTRICAL NOTES

1. LENGTH OF POLE TO BE DETERMINED BY MINIMUM CLEARANCE-25' MINIMUM LENGTH.
2. POLE SPACING SHALL AVERAGE APPROXIMATELY 150'. MAXIMUM FOR #8 CONDUCTORS SHALL BE 150'.
3. POLE LINES SHALL BE CONSTRUCTED IN STRAIGHT LINES FOR AT LEAST 3 OR 4 SPANS WHERE POSSIBLE.
4. POLES SHALL BE SET IN FIRM EARTH TO DEPTH INDICATED. IN SWAMPY OR SOFT SOIL, DEPTH OF POLE SETTING SHALL BE INCREASED TO PROVIDE ROAD SUPPORT.
5. MASTS TO BE INSTALLED ON BUILDINGS WHERE REQUIRED TO PROVIDE MINIMUM CLEARANCE.
6. ALL CONDUCTORS TO BE #8 (MINIMUM) UNLESS OTHERWISE INDICATED.
7. SERVICE DROP FROM POLE TO BUILDING SHALL NOT EXCEED 100'.
8. CONDUCTORS SHALL BE INSTALLED ON POLES. WHERE DISTANCE BETWEEN BUILDING MASTS EXCEEDS 80', SINGLE PHASE LOADS SHALL BE BALANCED AS NEARLY AS POSSIBLE ON ALL 3 PHASES.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

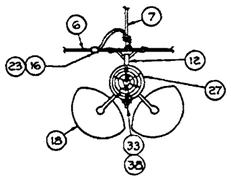
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W.DEICHMANN
APPROVED: Chief, Structural Branch
APPROVED: H.M. Williams, Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:

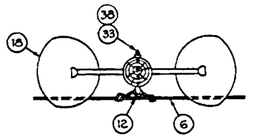
THEATER OF OPERATIONS
ELECTRIC DISTRIBUTION SECONDARY LINE CONSTRUCTION DETAILS

UNDER REVISION

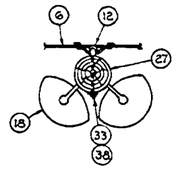
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
81-23



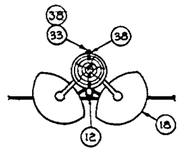
PLAN-DETAIL "A"



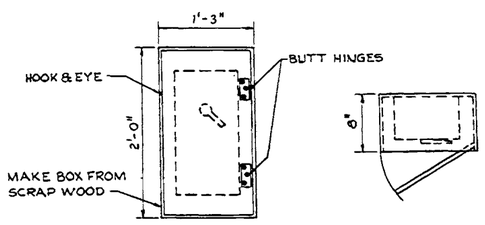
PLAN-DETAIL "C"



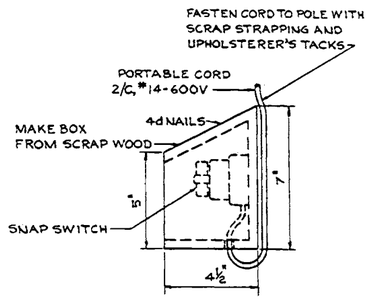
PLAN-DETAIL "B"



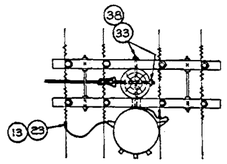
PLAN-DETAIL "D"



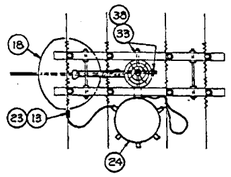
CABINET FOR CIRCUIT BREAKER
NO SCALE



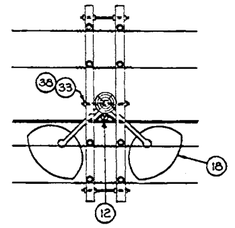
BOX FOR SNAP SWITCH
NO SCALE



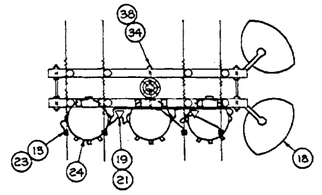
PLAN



PLAN

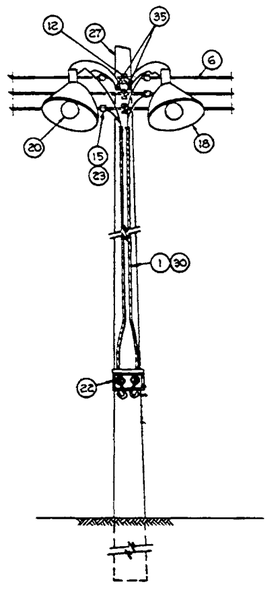


PLAN

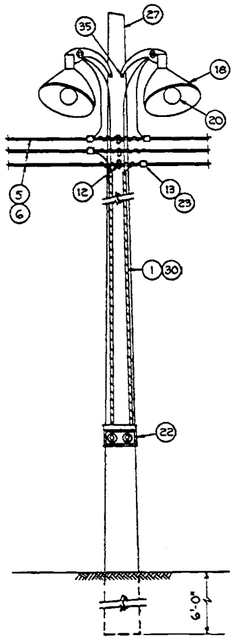


PLAN

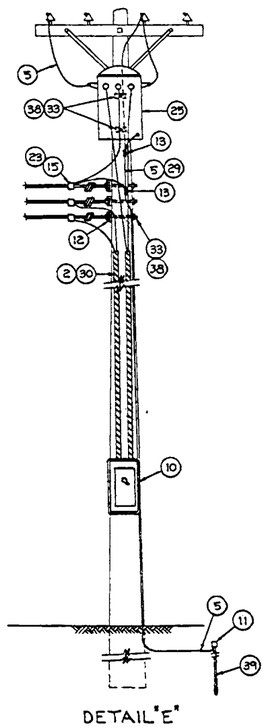
NO.	UNIT DESCRIPTION
1	CORD, PORTABLE, 2/C, #14
2	CORD, PORTABLE, 2/C, #6
3	CORD, PORTABLE, 3/C, #6
4	WIRE, ELEC., W.P., COPPER, 3 BRAID COVERED, #4 STRANDED
5	WIRE, ELEC., W.P., COPPER, 3 BRAID COVERED, #6 SOLID
6	WIRE, ELEC., W.P., COPPER, 3 BRAID COVERED, #2 STRANDED
7	WIRE, ELEC., W.P., COPPER, 3 BRAID COVERED, #1/0 STRANDED
8	BOLT, CROSS ARM, DOUBLE ARMING WITH 4 SQ. NUTS, 5/8" x 16"
9	BRACE, CROSS ARM, STEEL, GALV., 28" x 17/32" x 7/32"
10	CIRCUIT BREAKER, SIZE AS REQUIRED
11	CLAMP, GROUND, 1" ROD X 1/4" CABLE
12	CLEVIS, INSULATED, STEEL, GALV., PRIMARY TYPE
13	CONNECTOR, CABLE, #6 SOLDERLESS
14	CONNECTOR, CABLE, #4 SOLDERLESS
15	CONNECTOR, CABLE, #1 SOLDERLESS
16	CONNECTOR, CABLE, #1/0 SOLDERLESS
17	CROSS ARM, N.E.L.A., 4 PIN, 5'-7" x 3½" x 4½"
18	FLOODLIGHT
19	INSULATOR, ELEC., PIN TYPE, 1" PINHOLE, 5000 V.
20	LAMP - 500 W.
21	PIN, INSULATOR, WOOD, 9" x 1½" DIA. WITH 1" TOP
22	SWITCH, SNAP
23	TAPE, FRICTION
24	TRANSFORMER, 60CY., 1PH., 2400/4160-120/240V., 5 KV.A.
25	TRANSFORMER, 60CY., 1PH., 2400/4160-120/240V., 10 K.V.A.
26	WIRE, GUY, STRANDED, SIEMENS-MARTIN, 3/8" DIA.
27	POLE, WOOD, 35', CLASS 4
28	CLIP, WIRE ROPE, STEEL, GALV., 3/8"
29	STAPLE
30	TACKS, UPHOLSTERERS'
31	BOLT, CARRIAGE WITH SQ. NUT 3/8" x 4½"
32	BOLT, MACHINE, SQ. HEAD WITH SQ. NUT, 5/8" x 10"
33	BOLT, MACHINE, SQ. HEAD WITH SQ. NUT, 5/8" x 16"
34	BOLT, MACHINE, SQ. HEAD WITH SQ. NUT, 5/8" x 18"
35	SCREW, LAG, STEEL, SQ. HEAD, 3/8" x 3"
36	SCREW, LAG, STEEL, SQ. HEAD, 1/2" x 4"
37	WASHER, ROUND, 1 3/8" O.D. FOR 1/2" BOLT
38	WASHER, ROUND, 1 3/4" O.D. FOR 5/8" BOLT
39	PIPE, STEEL, BLACK, THREADED, 3/4" DIA., 8'-0" LONG
40	T CROSS ARM HANGER, SIZE 1



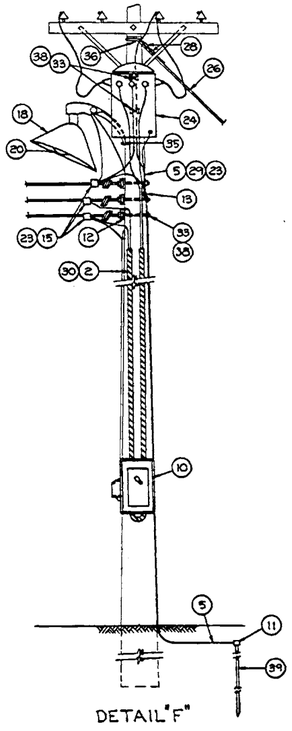
DETAIL "A" OR "B"



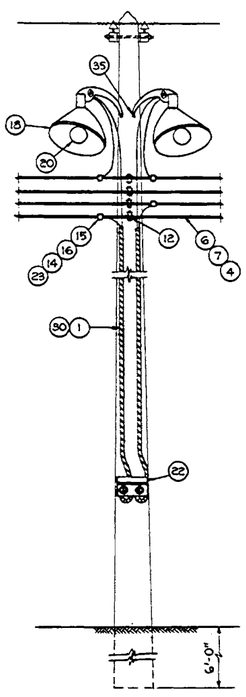
DETAIL "C" OR "D"



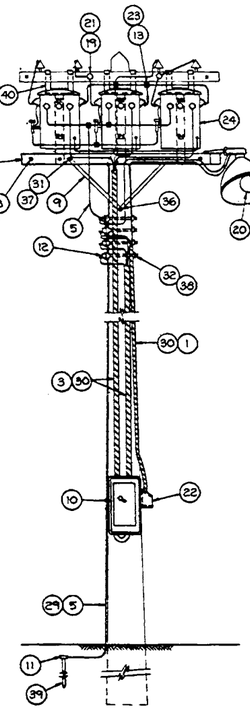
DETAIL "E"



DETAIL "F"



DETAIL "G"



DETAIL "H"

TYPICAL ELEVATIONS & PLANS
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

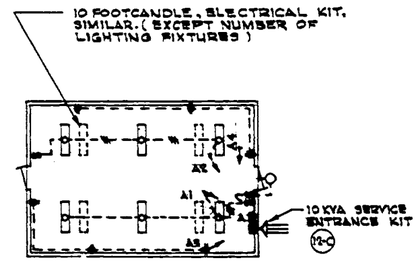
DRAWN BY: PENDLETON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

THEATER OF OPERATIONS
ELECTRIC DISTRIBUTION & LIGHTING DETAILS

UNDER REVISION

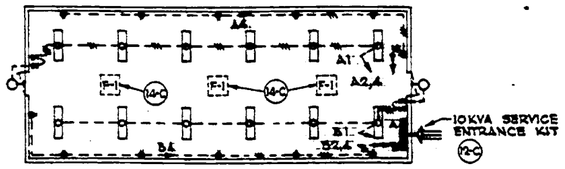
APPROVED FOR PROPONENT AGENCY:
DATE

SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 81-24
SHEET 1 OF 1



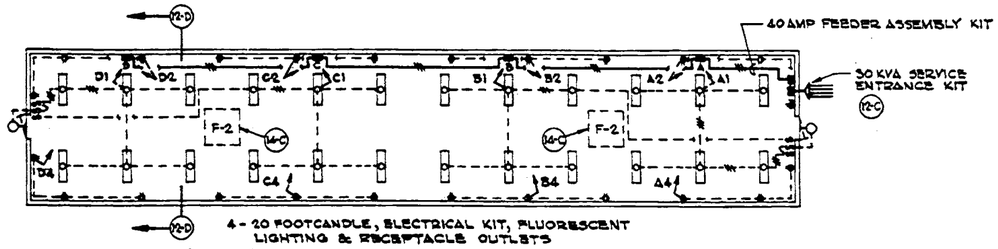
1-20 FOOTCANDLE, ELECTRICAL KIT, FLUORESCENT LIGHTING & RECEPTACLE OUTLETS.

20'X30' PLAN - BARRACKS TYPE BUILDING
SCALE NO. 1



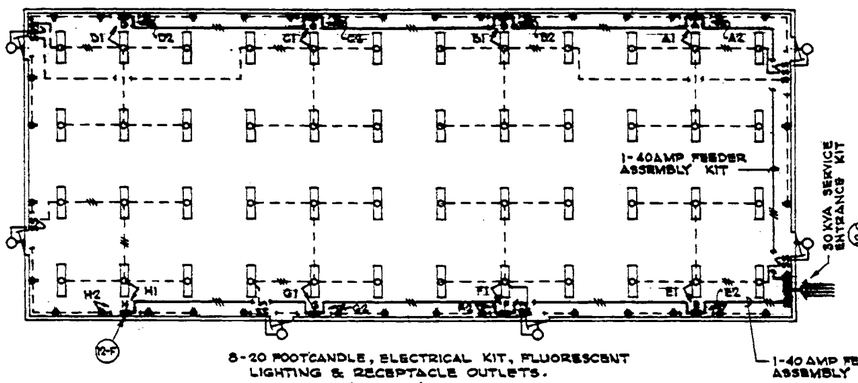
2-20 FOOTCANDLE, ELECTRICAL KIT, FLUORESCENT LIGHTING & RECEPTACLE OUTLETS

20'X 50' PLAN - BARRACKS TYPE BUILDING
SCALE NO. 1



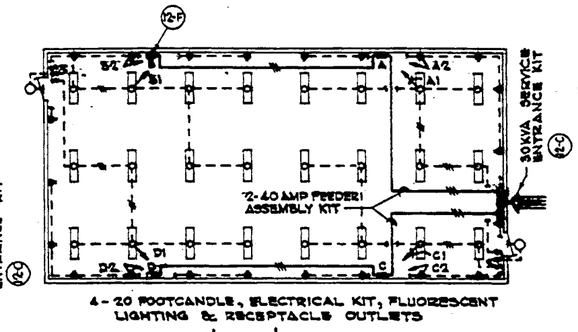
4-20 FOOTCANDLE, ELECTRICAL KIT, FLUORESCENT LIGHTING & RECEPTACLE OUTLETS

20'X100' PLAN - BARRACKS TYPE BUILDING
SCALE NO. 1



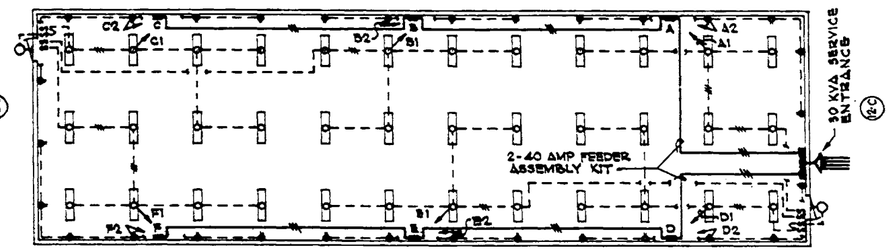
8-20 FOOTCANDLE, ELECTRICAL KIT, FLUORESCENT LIGHTING & RECEPTACLE OUTLETS.

40' X 100' PLAN WAREHOUSE TYPE BUILDING
SCALE NO. 1



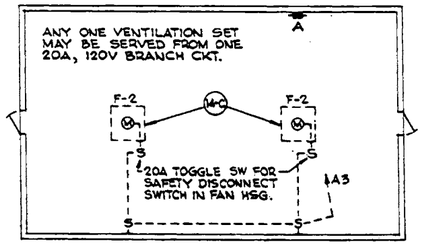
4-20 FOOTCANDLE, ELECTRICAL KIT, FLUORESCENT LIGHTING & RECEPTACLE OUTLETS

30' X 50' PLAN WAREHOUSE TYPE BUILDING
SCALE NO. 1



6-20 FOOTCANDLE, ELECTRICAL KIT, FLUORESCENT LIGHTING & RECEPTACLE OUTLETS.

30' X 100' PLAN WAREHOUSE TYPE BUILDING
SCALE NO. 1

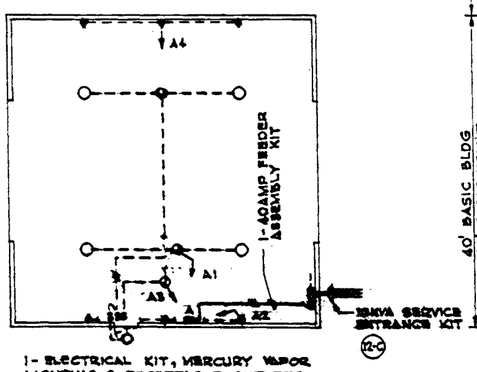


WIRING CIRCUIT FOR ONE TYPICAL VENTILATION SET

30'x 50' PLAN BARRACKS TYPE BUILDING
SCALE NO. 1

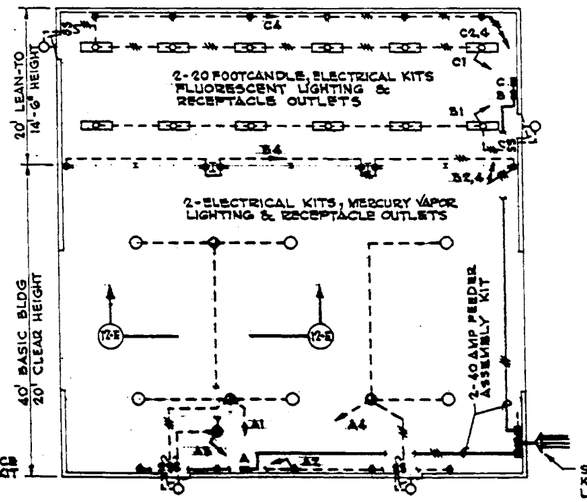
SCHEDULE OF VENTILATION SETS

FACILITY NO.	HD. SF	FANS F-1	FANS F-2	TOTAL CFM	AUTOMATIC LOUVERS	HOOK, EYE DOOR, 3"	HINGE, 2" BUTT, PR	BOLT MACH. ½"x4½"	WIRE, PAPER 2x2 MESH ROLL	WASHER NON-MET. FOR ¼" BOLT	WASHER FLAT, FOR ½" BOLT	CONN. LOAD KVA
900001	10	3	–	4800	3	7	7	15	0.25	30	1	1.33
900002	15	–	2	9400	2	5	5	10	0.25	20	0.67	1.39
900003	20	–	2	9400	2	5	5	10	0.25	20	0.67	1.39



1-ELECTRICAL KIT, MERCURY VAPOR LIGHTING & RECEPTACLE OUTLETS

40'X 40' PLAN SHOP TYPE BUILDING
SCALE NO. 1



60'X 60' PLAN SHOP TYPE BUILDING
SCALE NO. 1

SCHEDULE OF ELECTRICAL KITS

FACILITY NO	DESCRIPTION	TOTAL KW
814101	*10 FOOTCANDLE, FLUORESCENT LIGHTING & RCPT.	1.6
814102	*20 FOOTCANDLE, FLUORESCENT LIGHTING & RCPT.	1.8
814103	10 FOOTCANDLE, INCANDESCENT LIGHTING & RCPT.	1.8
814104	20 FOOTCANDLE, INCANDESCENT LIGHTING & RCPT.	2.4
814105	*20 FOOTCANDLE, DISCHARGE ARC LIGHTING & RCPT.	4.0
814106	*35 FOOTCANDLE, DISCHARGE ARC LIGHTING & RCPT.	
814107	*44 FOOTCANDLE, DISCHARGE ARC LIGHTING & RCPT.	
815001	10 KVA, SERVICE ENTRANCE	
815002	30 KVA, SERVICE ENTRANCE	
815003	50 KVA, SERVICE ENTRANCE	
816001	40 AMP FEEDER ASSEMBLY	
816022	70 AMP FEEDER ASSEMBLY	
816023	100 AMP FEEDER ASSEMBLY	
816024	125 AMP FEEDER ASSEMBLY	

*NOT APPLICABLE BELOW +40° F.
†NOT APPLICABLE BELOW -20° F.

LEGEND

APPLIES TO THIS SHEET ONLY

SYMBOL	DESCRIPTION
▨	CIRCUIT BREAKER
▬	LOAD CENTER
▭	FIXTURE, FLUORESCENT CEILING OR PENDENT MOUNTED
⊢	FIXTURE, INCANDESCENT EXTERIOR MOUNT 12" ABOVE DOOR
○	FIXTURE, MERCURY VAPOR W/BALLAST

LIGHTING FIXTURES

BUILDING TYPE	MTG. HGT.
BARRACKS (PERSONNEL)	8'-0"
WAREHOUSE (PERSONNEL)	8'-0"
WAREHOUSE	13'-9"
SHOP	20'-0"
SHOP LEAN-TO	18'-6"

VENTILATING FANS

F-1: 16" DIA. PROP FAN, ⅛ HP, 1600 CFM

F-2: 24" DIA. PROP FAN, ¼ HP, 4700 CFM

ELECTRICAL NOTES

1. INSTALLATION SHALL CONFORM TO THE NATIONAL ELECTRIC CODE.
2. ALL WIRING FOR PENDENT MOUNTED LIGHTING FIXTURES SHALL BE RUN IN RIGID CONDUIT.
3. PLANS SHOW TYPICAL LIGHTING ARRANGEMENT LAYOUT, FOR SIZES OF COMPONENT SEE ELECTRICAL KITS, FACILITY NUMBERS ARE LISTED ON THIS SHEET.
4. INCANDESCENT LIGHTING NOT SHOWN ELECTRICAL KITS FOR INCANDESCENT LIGHTING & RECEPTACLE OUTLETS SIMILAR TO FLUORESCENT LIGHTING SHOWN ON 20'X30' PLAN. TWO FOOTCANDLE LEVELS OF LIGHTING INTENSITY ARE OBTAINED BY USING DIFFERENT LAMP WATTAGE.
   LOW LEVEL USE 100 WATT LAMPS
   HIGH LEVEL USE 200 WATT LAMPS
5. FOR ELECTRICAL INSTALLATION DETAILS REFER TO STANDARD DETAIL SHEETS.
6. FLUORESCENT AND INCANDESCENT LIGHTING KITS INCLUDE ELECTRICAL WIRING MATERIALS TO SERVE THE VENTILATING FANS INDICATED ON TYPICAL PLANS FOR BARRACKS TYPE BUILDINGS. IN LARGER PARTITIONED BUILDINGS WHERE THESE FANS ARE NOT USED, THESE MATERIALS WILL BE APPLIED TO THE ADAPTATION OF THE LIGHTING KIT TO THE PARTITIONED SPACES.
7. FLUORESCENT LIGHTING SHALL BE USED FOR NORMAL OCCUPANCY INDOOR GENERAL USE WHERE THE HEIGHT DOES NOT EXCEED THAT OF THE WAREHOUSE TYPE BUILDING AND WHERE NORMAL USAGE IS CONTINUOUS FOR A PERIOD OF HOURS.
8. INCANDESCENT LIGHTING SHALL BE USED ONLY WHERE DISCHARGE LIGHTING IS UNSUITABLE FOR SPECIFIC REASONS SUCH AS TEMPERATURE, MOISTURE, HAZARDOUS ATMOSPHERE, INFREQUENT USE, RADIO INTERFERENCE, NON-STANDARD FREQUENCY, ETC.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
99-98	STANDARD DETAILS	15, 16

SYMBOL	DESCRIPTION	DATE	APPROVAL

0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
DESIGNED BY: JOHNSON
QUANTITIES BY: C. W. DEICHMANN
CHIEF, CONSTRUCTION DIVISION

THEATER OF OPERATIONS
ELECTRICAL KITS
TYPICAL INSTALLATION OF LIGHTING & RECEPTACLE OUTLET KIT SERVICE ENTRANCE KIT, FEEDER KIT & WIRING FOR VENTILATION KITS

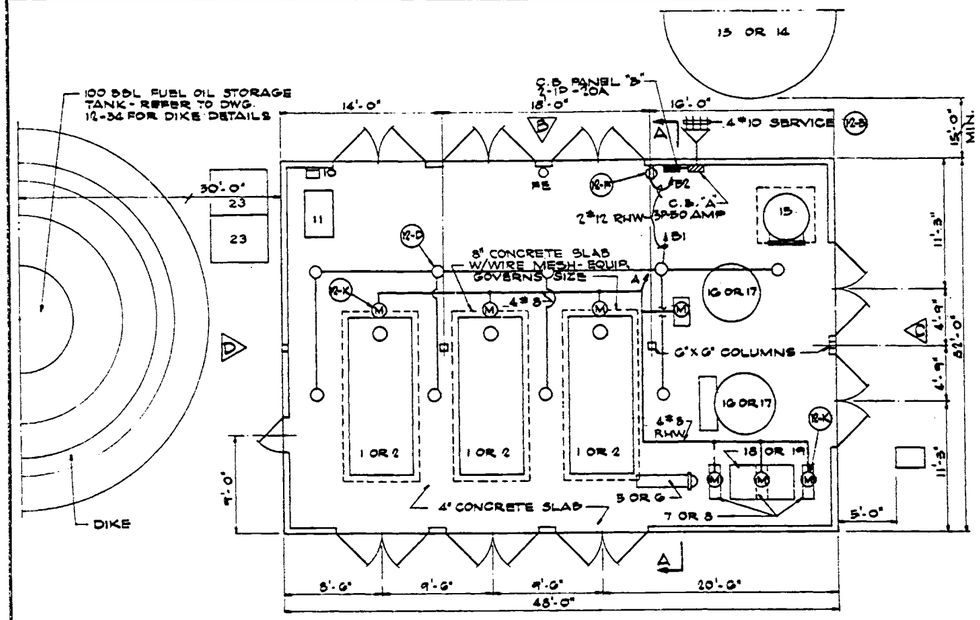
APPROVED: DATE: 17 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE

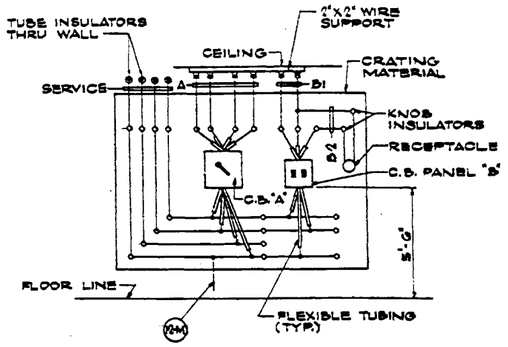
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
81-41

CORPS OF ENGINEERS

U. S. ARMY



PLAN - BOILER HOUSE
FOR 2500 MAN LAUNDRY - FACIL. NO. 821128
FOR 5000 MAN LAUNDRY - FACIL. NO. 821122
SCALE NO. 24



TYPICAL CIRCUIT BREAKER INSTALLATION
NO SCALE

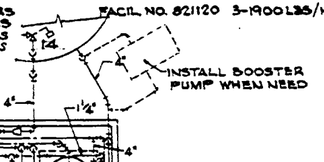
SCHEDULE OF EQUIPMENT

ITEM NO.	UNIT DESCRIPTION	FACILITY NUMBER 821128	821122	821123	821124	821125	821126	821127
1	BOILER, 125 P.S.I., CAP. 1150#/HR.	3	—	—	2	—	2	—
2	BOILER, 125P.S.I., CAP. 1900#/HR.	—	3	—	—	—	—	2
3	BOILER, 125P.S.I., CAP. 4600#/HR.	—	—	2	—	—	—	—
4	HEATER, RECLAIMER, WATER, CLOSED TYPE, 20 S.F.	—	—	—	—	—	1	—
5	HEATER, RECLAIMER, WATER, CLOSED TYPE, 30 S.F.	1	—	—	—	—	—	1
6	HEATER, RECLAIMER, WATER, CLOSED TYPE, 75 S.F.	—	1	1	—	—	—	—
7	PUMP, FEED WATER, SINGLE, 5.2 G.P.M.	3	—	—	2	—	2	—
8	PUMP, FEED WATER, SINGLE, 8.2 G.P.M.	—	3	—	—	—	—	2
9	PUMP, FEED WATER, SINGLE, 20.5 G.P.M.	—	—	2	—	—	—	—
10	PUMP, TRANSFER, FUEL OIL, MANUAL, 22 G.P.M.	1	1	1	1	1	1	1
11	TANK, FUEL OIL, DAY OR MAIN STGE., 275 GAL.	1	1	1	1	3	1	1
12	TANK, FUEL OIL, MAIN STORAGE 100 BBL	1	1	1	1	—	1	1
13	TANK, WATER STORAGE, W/STL. TOWER, 4,200 GAL.	1	—	—	—	—	1	—
14	TANK, WATER STORAGE, W/STL. TOWER, 10,500 GAL.	—	1	1	—	—	—	1
15	GENERATOR, HOT WATER STORAGE TYPE 750 GAL.	1	2	4	—	—	1	2
	UNIT WATER SOFTENER, ZEOLITE TYPE, GRAVITY F	—	—	—	—	—	—	—
16	384,000 GRAINS PER REGENERATION @ 15 GPM	1	—	—	—	—	1	—
17	640,000 GRAINS PER REGENERATION @ 75 GPM	—	1	2	—	—	—	1
18	TANK, CONDENSATE, HORIZ. TYPE 100 GAL.	1	—	—	1	—	1	—
19	TANK, CONDENSATE, HORIZ. TYPE 100 GAL.	—	1	—	—	—	—	1
20	TANK, CONDENSATE, HORIZ. TYPE 250 GAL.	—	—	1	—	—	—	—
21	BOILER, 100 P.S.I. CAP. 400#/HR.	—	—	—	—	3	—	—
▲ 23	BOOSTER PUMP - INLINE, 40 GPM @ 15 FT HD	1	1	1	—	—	—	—
23	COMPRESSOR, AIR, W/RECEIVER, 100 PSI, 125 CFM	2	2	—	2	2	2	2
24	COMPRESSOR, AIR, W/RECEIVER, 100 PSI, 250 CFM	—	—	2	—	—	—	—

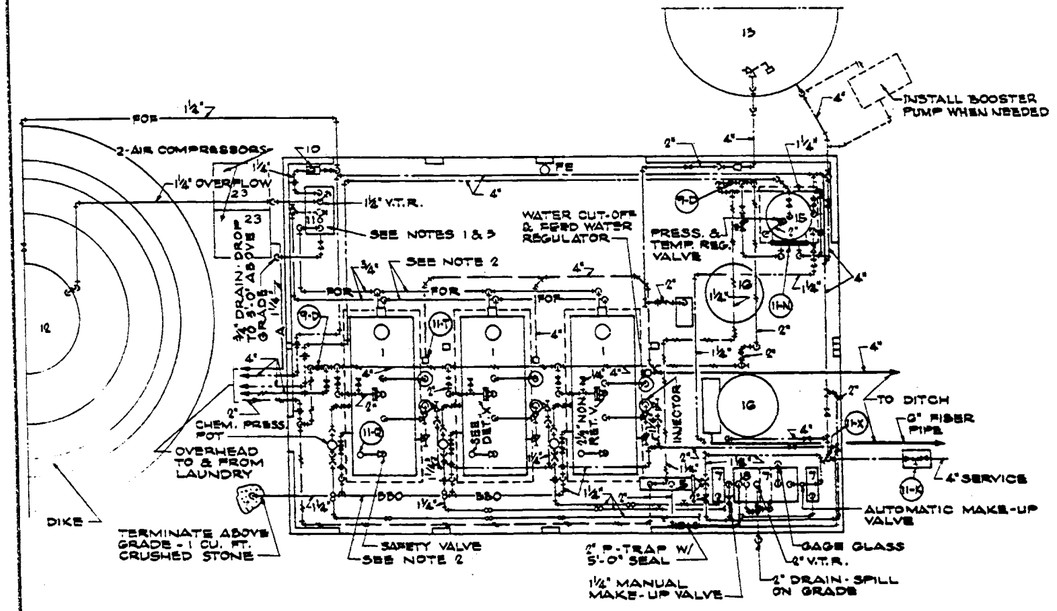
▲ ADDITIONAL FACILITY NUMBERS

BOILER PLANTS W/INTERIOR FOR THE GENERATION OF 125 PSI STEAM BY MEANS OF BOILERS AND BOILER FEED PUMPS — WATER SOFTENING EQUIPMENT, GENERATION OF HOT WATER, ELEVATED WATER TOWER & TANK FOR STORAGE OF TREATED WATER, AIR COMPRESSORS AND CONNECTING PIPING & FITTINGS NOT INCLUDED.

FACIL. NO. 821119 3-1150 LBS/HR BOILERS
FACIL. NO. 821121 2-4600 LBS/HR BOILERS
FACIL. NO. 821129 3-4600 LBS/HR BOILERS
FACIL. NO. 821230 3-12500 LBS/HR BOILERS
FACIL. NO. 821120 3-1900 LBS/HR BOILERS



MECHANICAL PLAN - BOILER HOUSE
FOR 5000 MAN LAUNDRY - FACIL. NO. 821122
SCALE NO. 24



MECHANICAL PLAN - BOILER HOUSE
FOR 2500 MAN LAUNDRY - FACIL. NO. 821128
SCALE NO. 24

NOTES

NOTE 1 - THE INVERT ELEVATION OF THE FUEL OIL DAY TANKS SHALL BE ABOVE THE TOP OF THE MAIN FUEL OIL STORAGE TANKS.
NOTE 2 - A PIPING TRENCH SHALL BE PROVIDED FOR FUEL OIL & BOILER BLOWDOWN PIPING. THESE TRENCHES SHALL BE FILLED WITH CEMENT GROUT AFTER THE PIPING HAS BEEN TESTED AND CONNECTED TO THE EQUIPMENT.
NOTE 3 - STRUCTURAL FLOOR MOUNTED SUPPORTS SHALL BE PROVIDED FOR THE FUEL OIL DAY TANKS.
NOTE 4 - HEAT RECLAIMER AND FLASH TANK INVERTS TO BE ABOVE TOP OF CONDENSATE RECEIVER TANKS.
NOTE 5 - NO CONDENSATE LINES TO BE INSULATED EXCEPT THOSE WITHIN 6'-0" OF BOILER ROOM FLOOR.
NOTE 6 - ALL HORIZONTAL PIPES, FLANGES & VALVE PARTS SHALL BE A MINIMUM OF 7'-0" CLEAR ABOVE BOILER ROOM FLOOR.
NOTE 7 - WRAP BLOWOFF LINES WITH INSULATION BEFORE ENCASING IN TRENCH TO ALLOW FOR EXPANSION.
NOTE 8 - AIR COMPRESSOR TO SET ON 8" CONC. SLAB W/WIRE MESH AND W/HOLD DOWN BOLTS.

ELECTRICAL NOTES

CONNECTED LOAD

FACIL. NO.	821128	821122	821123	821124	821125	821126	821127
LIGHTING	0.9 KW	0.9KW	0.9KW	0.3 KW	0.3KW	0.6KW	0.6KW
POWER	9.6 KW	11.5KW	20.5KW	5.5 KW	6.3KW	7.5KW	7.5KW
TOTAL	10.5 KW	12.4 KW	21.2KW	6.1 KW	8.7 KW	7.1 KW	8.1 KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 100 W., WITH 8" CONICAL SHADES.
2. (M) INDICATES MOTOR, CONTROLLER AND DISCONNECTING DEVICE
3. FLEXIBLE MOTOR LEADS SHALL BE 3/C NO. 12 CORD.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
82-11	PLANS & ELEVATIONS	1 & 3 OF 4
84-18	EXTERIOR DOOR DETAILS	4 OF 4
12-84	TANK & DIKE DETAILS	1, 2 OF 2
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
▲	ADDITIONAL FACILITIES	AUG. '62	CWD

REVISIONS

GRAPHIC SCALES
0 5' 10'
NO. 24

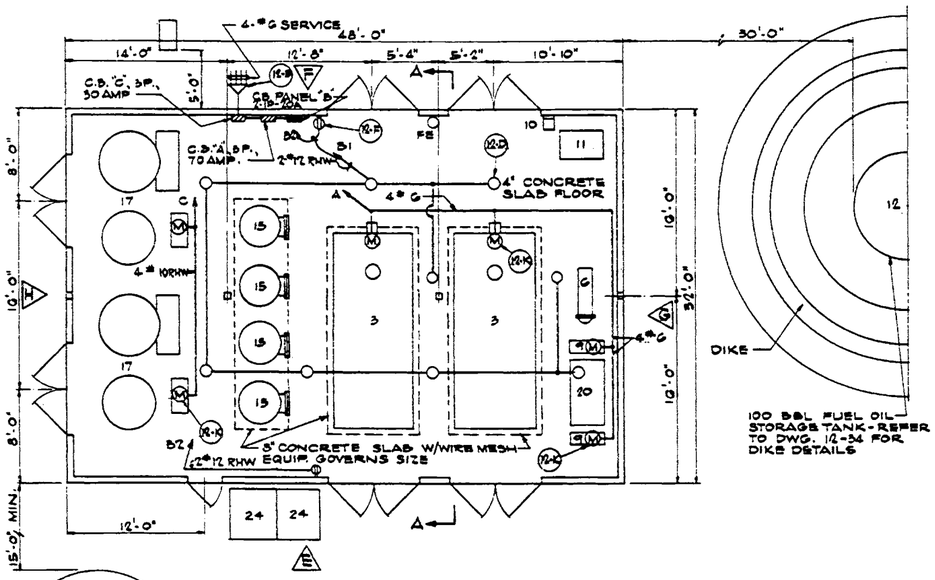
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

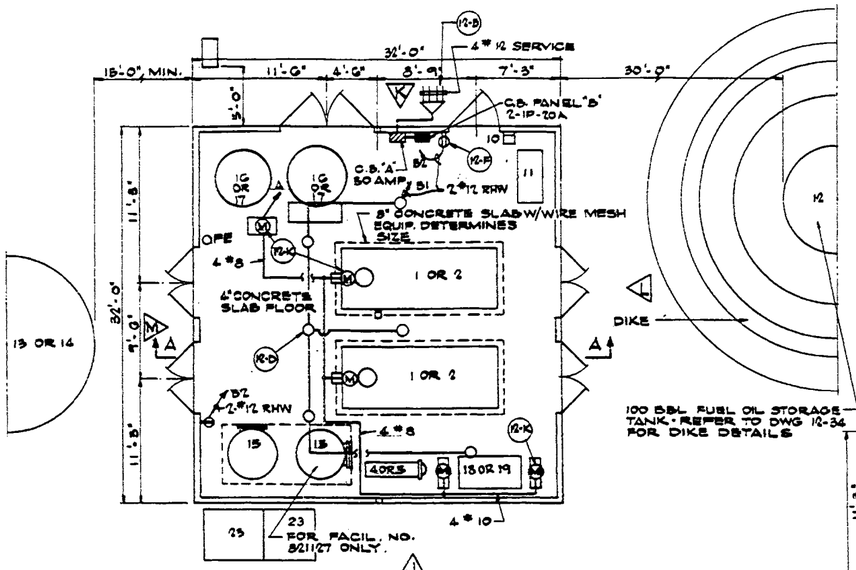
DRAWN BY: MELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] DATE: 19 MAR 1962
APPROVED: [signature]
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: Support Services Laundry Br. [signature]
DATE: 16 SEPT 1962

THEATER OF OPERATIONS
BOILER HOUSES FOR LAUNDRIES & DRY CLEANING PLANTS

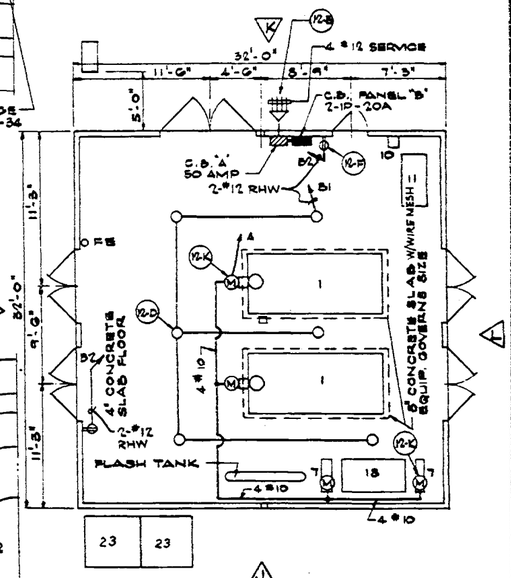
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-11
SHEET 1 OF 4



PLAN - BOILER HOUSE
FOR 10000 MAN LAUNDRY - FACIL. NO. 821123
SCALE NO. 24

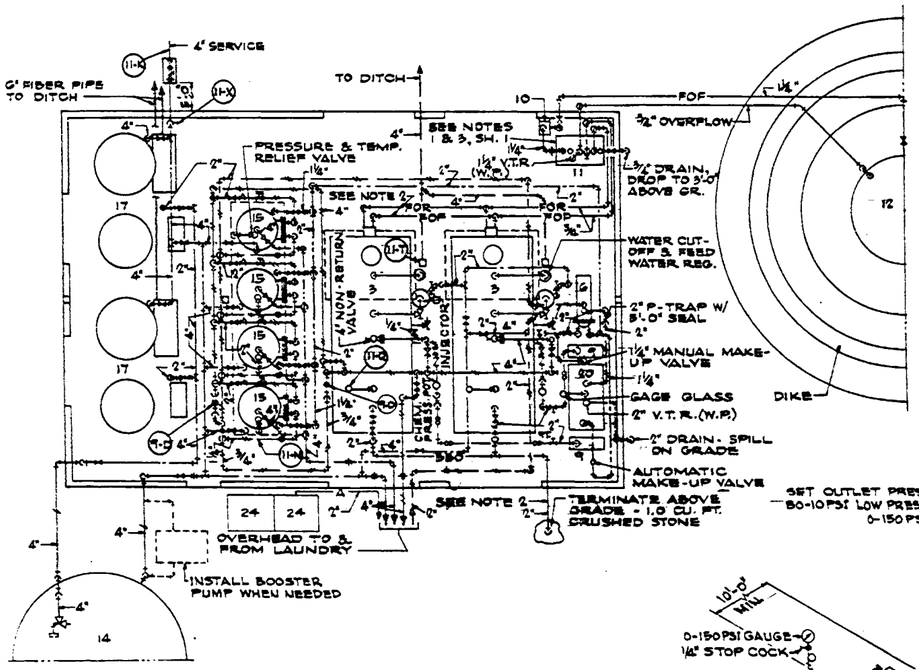


PLAN - BOILER HOUSE
FOR 500 BED HOSPITAL LAUNDRY FACIL. NO. 821126
FOR 1000 BED HOSPITAL LAUNDRY FACIL. NO. 821127
SCALE NO. 24

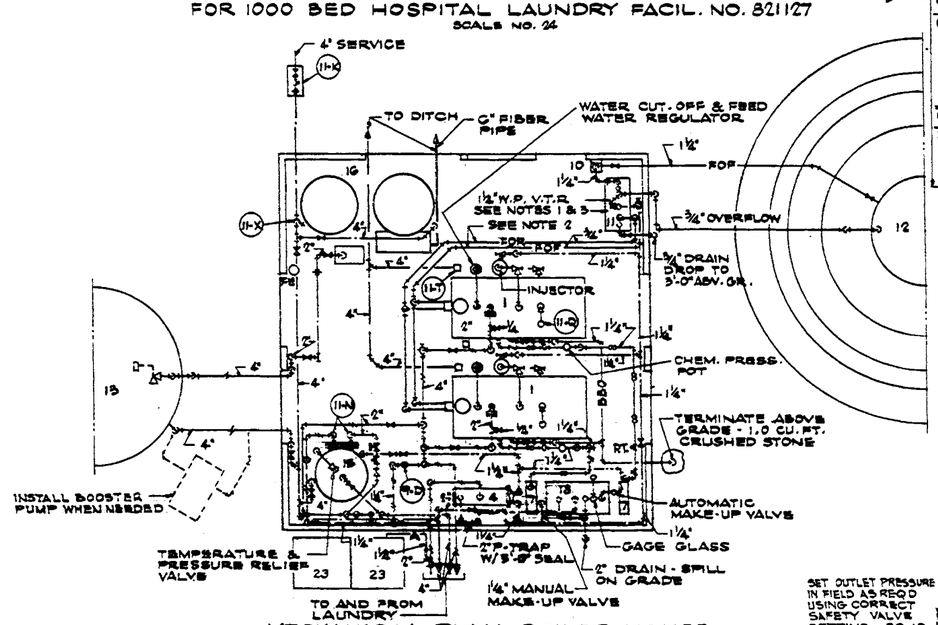


PLAN - BOILER HOUSE
FOR 5000 MAN DRYCLEANING PLANT
FACIL. NO. 821124
SCALE NO. 24

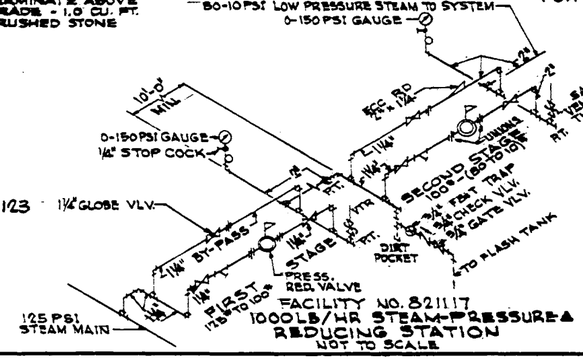
NOTE: FOR MECHANICAL PLAN & ADDITIONAL DETAILS REFER TO DWG. NO. 82-11, SH. 3 OF 4



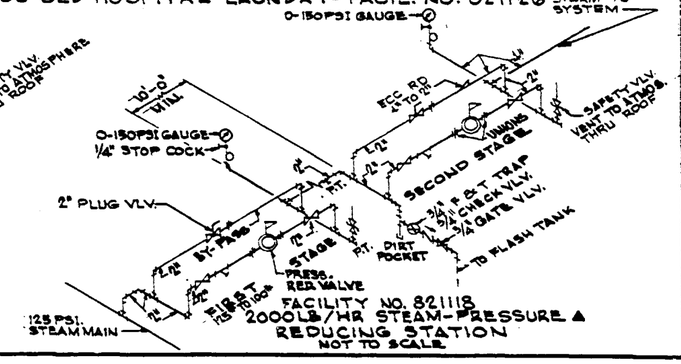
MECHANICAL PLAN - BOILER HOUSE
FOR 10000 MAN LAUNDRY - FACIL. NO. 821123
SCALE NO. 24



MECHANICAL PLAN - BOILER HOUSE
FOR 500 BED HOSPITAL LAUNDRY - FACIL. NO. 821126



FACILITY NO. 821117
1000 LB/HR STEAM-PRESSURE REDUCING STATION
NOT TO SCALE



FACILITY NO. 821118
2000 LB/HR STEAM-PRESSURE REDUCING STATION
NOT TO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
▲	PRESSURE REDUCING STATION DTLS. ADDED	AUG '70	CWD

REVISIONS
DRAWING SCALES
0 5' 10'
NO. 24

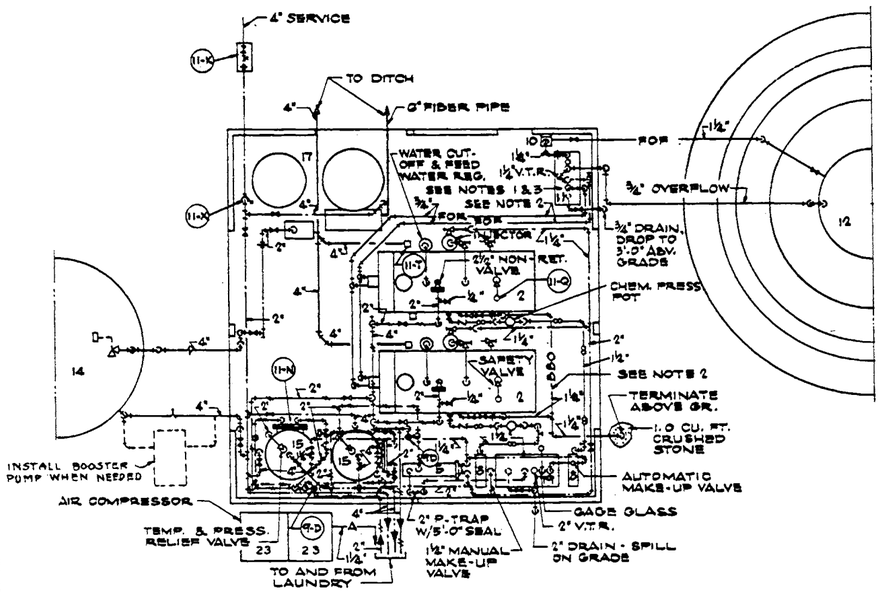
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

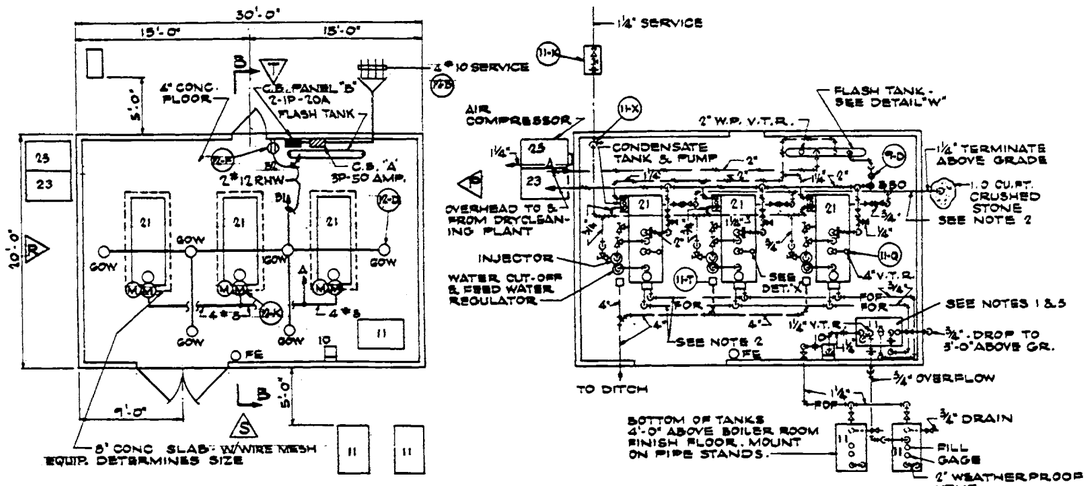
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS
BOILER HOUSES FOR LAUNDRIES & DRY CLEANING PLANTS

APPROVED: [signature] DATE:
CHIEF, ENGINEERING BRANCH
APPROVED: [signature] DATE: 19 MAR 71
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY: Support Services Laundry Br.
DATE: 16 Oct 1968
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 4
82-11

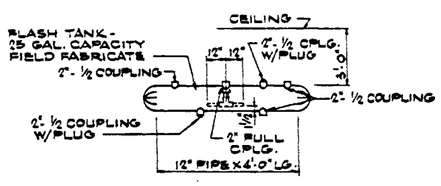


MECHANICAL PLAN - BOILER HOUSE
FOR 1000 BED HOSPITAL LAUNDRY FACIL. NO. 821127
SCALE NO. 24

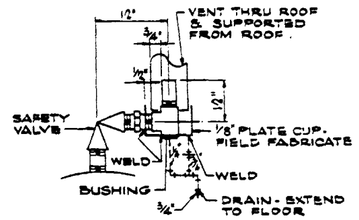


PLAN MECHANICAL PLAN

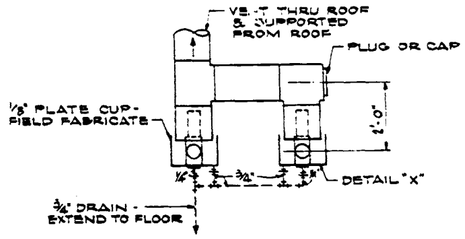
BOILER HOUSE FOR 1000 & 2500 MAN
DRY CLEANING PLANT - FACIL. NO. 821125
SCALE NO. 24



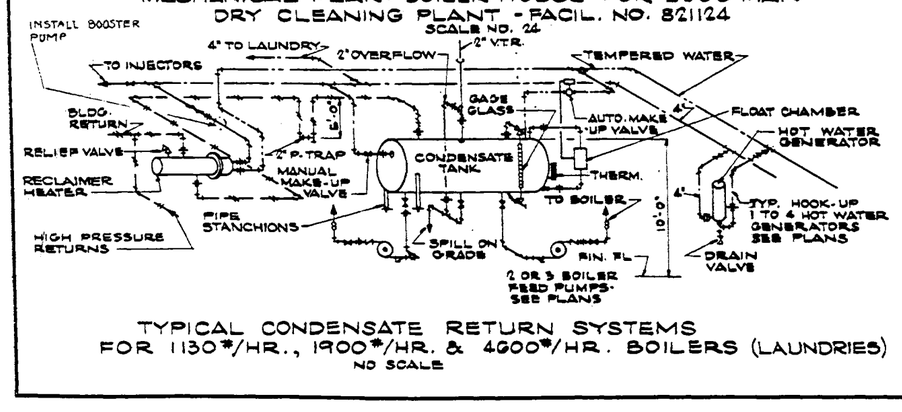
FLASH TANK
DETAIL "W"
NO SCALE



SINGLE BOILER
SAFETY VALVE VENT
& DRAIN ASSEMBLY
DETAIL "X"
NO SCALE

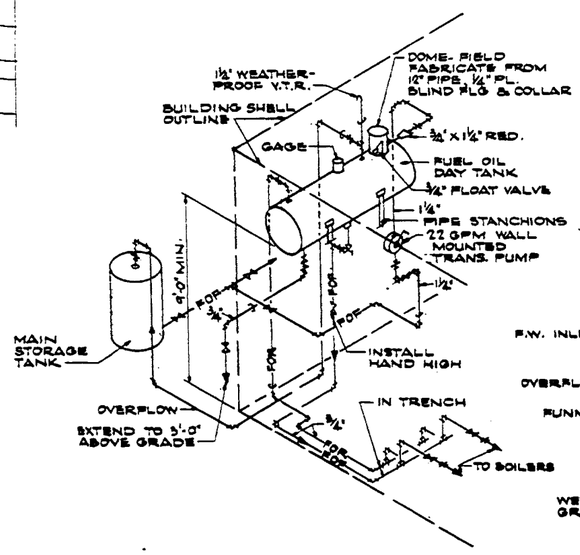


MULTIPLE BOILER
SAFETY VALVE VENT
& DRAIN ASSEMBLY
DETAIL "Y"
NO SCALE

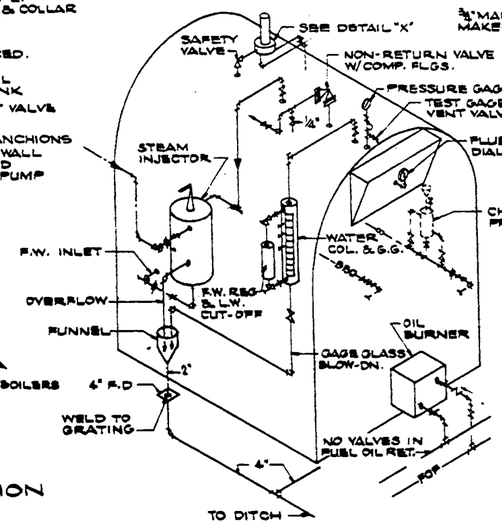


TYPICAL CONDENSATE RETURN SYSTEMS
FOR 1130*/HR., 1900*/HR. & 4000*/HR. BOILERS (LAUNDRIES)
NO SCALE

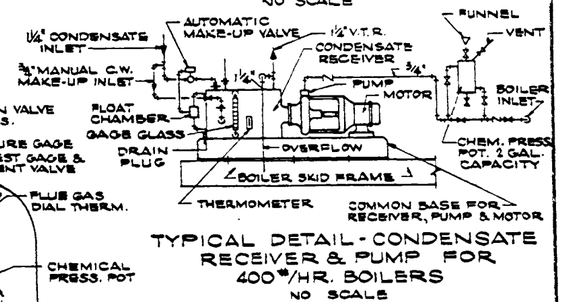
MECHANICAL PLAN - BOILER HOUSE FOR 5000 MAN
DRY CLEANING PLANT - FACIL. NO. 821124
SCALE NO. 24



TYPICAL DAY TANK INSTALLATION
NO SCALE



TYPICAL INSTALLATION FOR
1130*/HR., 1900*/HR. & 4000*/HR. BOILERS
NOTE: INJECTOR, F.W. REG. & W.C. HOOK-UP SIMILAR FOR 400*/HR. BOILERS
NO SCALE



TYPICAL DETAIL - CONDENSATE
RECEIVER & PUMP FOR
400*/HR. BOILERS
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature]
CHIEF, CONSTRUCTING BRANCH

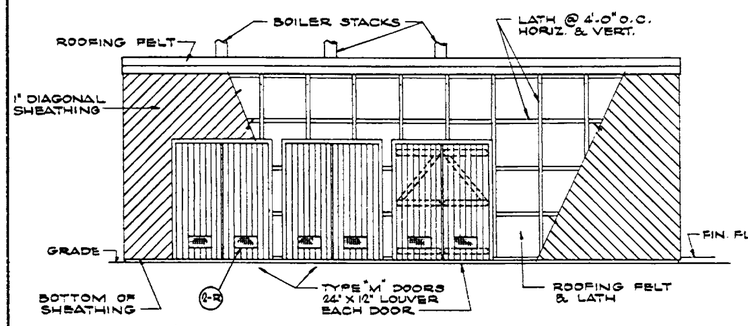
THEATER OF OPERATIONS

BOILER HOUSES
FOR
LAUNDRIES & DRY CLEANING PLANTS

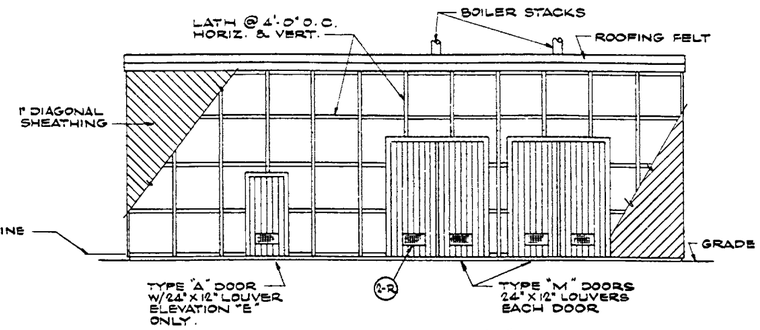
APPROVED: [signature] DATE:
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: Support Services, Laundry Br.
DATE: 16 Sept. 1948

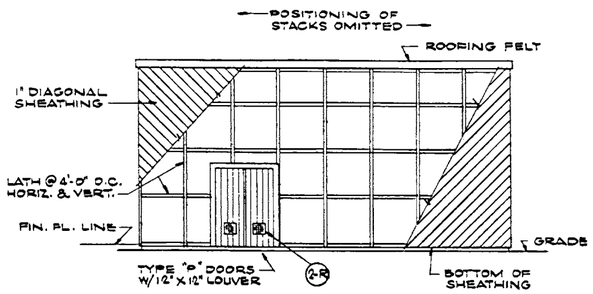
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 3 OF 4
82-11



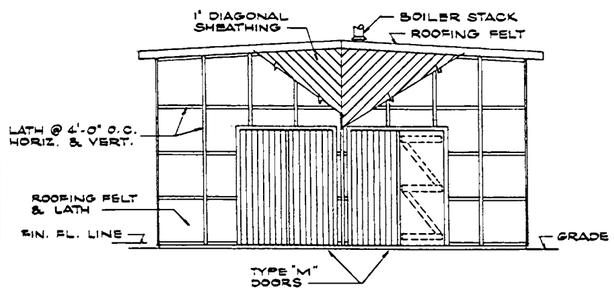
ELEVATION "A"
FACILITY NO. 821128 & 821122
ELEVATION "B" IDENTICAL OPPOSITE HAND
SCALE NO. 24



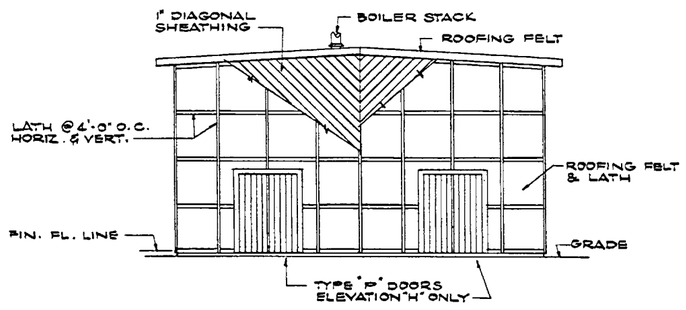
ELEVATION "E"
FACILITY NO. 821123
ELEVATION "S" IDENTICAL OPPOSITE HAND EXCEPT OMIT TYPE "A" DOOR
SCALE NO. 24



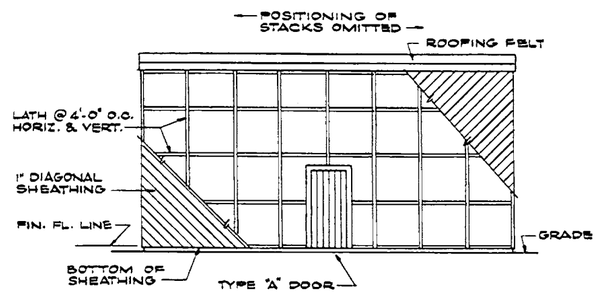
ELEVATION "S"
FACILITY NO. 821125
ELEVATION "N" SIMILAR
SCALE NO. 24



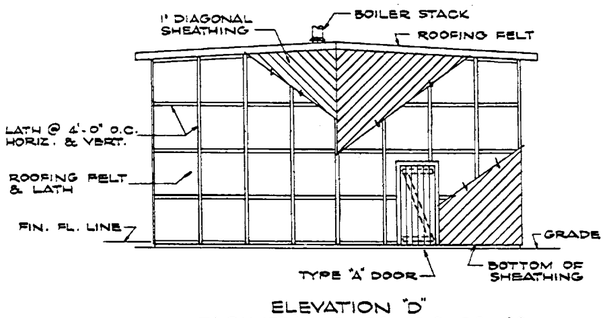
ELEVATION "C"
FACILITY NO. 821128 & 821122
SCALE NO. 24



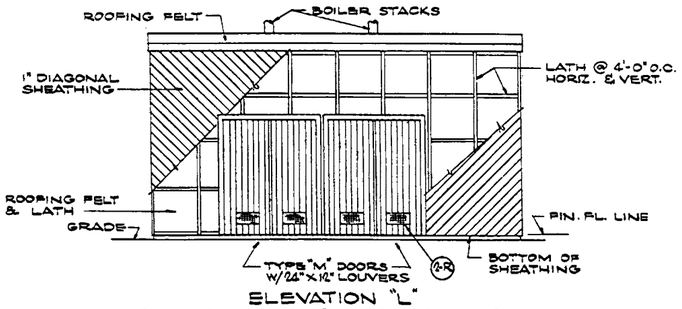
ELEVATION "H"
FACILITY NO. 821123
ELEVATION "G" IDENTICAL OPPOSITE HAND EXCEPT OMIT TYPE "P" DOORS
SCALE NO. 24



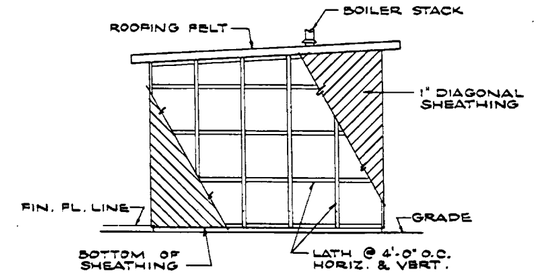
ELEVATION "T"
FACILITY NO. 821125
ELEVATION "O" SIMILAR
SCALE NO. 24



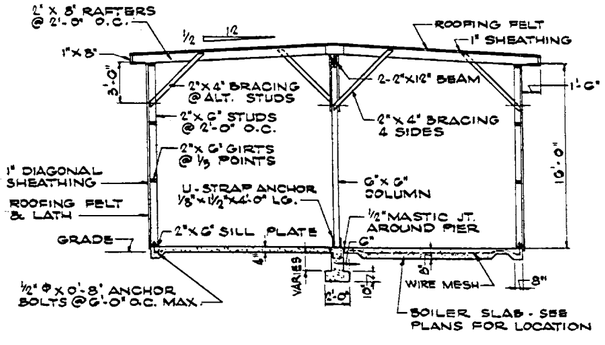
ELEVATION "D"
FACILITY NO. 821128 & 821122
SCALE NO. 24



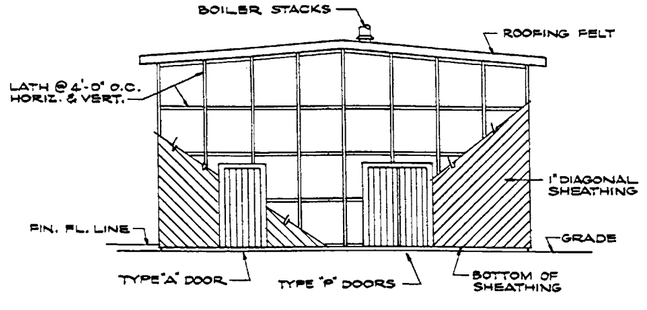
ELEVATION "L"
FACILITY NO. 821124, 821126 & 821127
ELEVATION "M" IDENTICAL OPPOSITE HAND
SCALE NO. 24



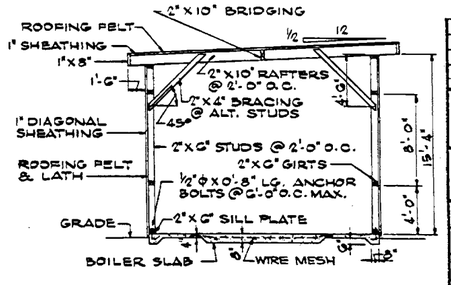
ELEVATION "P"
FACILITY NO. 821125
ELEVATION "R" IDENTICAL OPPOSITE HAND
SCALE NO. 24



SECTION A-A
SCALE NO. 24



ELEVATION "K"
FACILITY NO. 821124, 821126 & 821127
ELEVATION "J" IDENTICAL OPPOSITE HAND
EXCEPT OMIT DOORS
SCALE NO. 24



SECTION B-B
SCALE NO. 24

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature]
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

BOILER HOUSES FOR LAUNDRIES & DRY CLEANING PLANTS

APPROVED: [signature] DATE: 19 MAR 1963
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: [signature] Support Service Laundry Br.
DATE 12 Sept 1962

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 82-11
SHEET 4 OF 4

BUILDING SHELL REQUIREMENTS

1. BASIC BUILDING IS 60'-0" WIDE (NOMINAL) AND 100'-0" LONG (NOMINAL) WITH 5 BAYS AT 20'-0" CENTERS WITH A 20'-0" EAVE HEIGHT (NOMINAL). COMPLETE SHOP DRAWINGS OF THE BUILDING WITH ALL APPURTENANCES SHALL BE FURNISHED.
2. THE BASIC BUILDING SHALL BE PRE-ENGINEERED AND PREFABRICATED BOLTED TRUSS AND COLUMN METAL BUILDING WITH UNIFORMLY SPACED 4'-0" ON CENTERS STRUCTURAL SHAPED CEILING JOISTS BOLTED FLUSH TO THE BOTTOM LINE OF THE BUILDING TRUSSES. THE BUILDING SHALL BE CAPABLE OF BEING DISMANTLED AND RE-ERECTED AT A NEW SITE. SUFFICIENT REPLACEMENT MATERIALS SHALL BE FURNISHED FOR THIS RE-ERECTION. STRUCTURAL STEEL ITEMS SHALL NOT BE GREATER THAN 40'-0" IN LENGTH.
3. DESIGN REQUIREMENTS FOR BASIC BUILDING ARE ACCORDING TO THE RECOMMENDED DESIGN PRACTICES MANUAL AS PUBLISHED BY THE METAL BUILDING MANUFACTURERS EXCEPT WHERE MODIFIED HEREAFTER:
   (a). 40 PSF LIVE LOAD ON ROOF FOR THE TEMPERATE AND FRIGID CLIMATIC ZONES.
   (b). 20 PSF LIVE LOAD ON ROOF FOR THE TROPICAL AND DESERT CLIMATIC ZONES.
   (c). 5 PSF LIVE LOAD HUNG FROM CEILING JOISTS FOR THE PIPING AND ELECTRICAL WORK IN ADDITION TO THE CONCENTRATED LOADS HEREAFTER SPECIFIED AND SHOWN ON THE CEILING JOIST LOADING DETAIL SHOWN ON THE DRAWINGS FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
   (d). THE CEILING JOISTS OF THE BASIC BUILDINGS FOR THE SUPPORT OF PIPING, ELECTRICAL WORK, MONORAILS AND CONCENTRATED LOADS SHALL BE OF STRUCTURAL SHAPES OF ADEQUATE STRENGTH TO DISTRIBUTE THE LOADS AND TO RESIST THE STATIC AND DYNAMIC LOADING.
   (e). 110 MPH WIND LOAD FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
   (f). 4:12 ROOF PITCH, GABLE TYPE FOR THE BASIC BUILDING IN THE TEMPERATE AND FRIGID CLIMATIC ZONES.
   (g). 1:12 ROOF PITCH, GABLE TYPE FOR THE BASIC BUILDING MAY BE FURNISHED IN THE TROPICAL AND DESERT CLIMATIC ZONES IF TRUSS AND COLUMN ARRANGEMENT PERMIT SUCH ROOF PITCH; OTHERWISE USE 4:12 ROOF PITCH.
   (h). ROOF TRUSSES, PURLINS, CEILING JOIST, GIRTS AND COLUMNS SHALL BE CAPABLE OF SUPPORTING ALL THE LOADS HERETOFORE SPECIFIED AND AS SHOWN ON THE DRAWINGS.
4. WALL COVERING SHALL BE MADE FROM HOT DIPPED GALVANIZED SHEETS NOT LESS THAN 26 GAGE WEATHERTIGHT, PANEL TYPE STANDARD WITH THE MANUFACTURER WITH CONTINUOUS HOODED AND GALVANIZED SCREENED VENTILATION OPENING APPROXIMATELY 2'-2" HIGH ALONG ALL EXTERIOR WALLS NEAR THE FLOOR LINE EXCEPT FOR PORTIONS UNDER THE SLIDING DOORS AND DOORS FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
5. ROOF COVERING SHALL BE MADE FROM HOT DIPPED GALVANIZED SHEETS NOT LESS THAN 26 GAGE WEATHERTIGHT, PANEL TYPE STANDARD WITH MANUFACTURER EXCEPT FIVE (5%) PERCENT OF THE ROOF AREA SHALL CONSIST OF PLASTIC SKYLIGHT PANELS. A CONTINUOUS GALVANIZED ROOF VENTILATOR WITH 12-INCH THROAT, CHAIN OPERATED DAMPER WITH GALVANIZED BIRD SCREEN SHALL BE PROVIDED FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
6. ALL ROOF AND WALL PANELS, EAVE TRIM, FLASHING FOR ALL BOILER ROOM EQUIPMENT VENTS, AND SMOKE JACKS, SANITARY PLUMBING VENTS, CLOSURE STRIPS AND OTHER TRIM SHALL BE GALVANIZED AND FACTORY PAINTED (4 COAT PROTECTION BOTH SIDES).
   (a). THE ROOF PANELS AND TRIM SHALL BE FROST WHITE OUTSIDE AND GRAYISH OFF-WHITE INSIDE.
   (b). THE WALL PANELS AND TRIM SHALL BE CACTUS GREEN OUTSIDE AND GRAYISH OFF-WHITE INSIDE.
   (c). THE CONTINUOUS GALVANIZED ROOF VENTILATOR SHALL BE PAINTED IN THE SAME COLOR AND MANNER AS THE ROOF PANELS.
7. THE STRUCTURAL STEEL FRAME WORK SHALL BE COATED WITH RED OXIDE. THE PERSONNEL, PERSONNEL SCREEN AND SLIDING DOORS SHALL BE FACTORY PAINTED GRAY (4 COAT PROTECTION BOTH SIDES).
8. THE ALUMINUM WINDOWS WITH PLASTIC GLAZING AND REMOVABLE PLASTIC SCREEN WITH ALUMINUM FRAMES AND HARDWARE SHALL BE OF THE SIZE AND NUMBER SHOWN ON THE DRAWINGS.
9. THE PLASTIC GLAZING AND PLASTIC SCREEN MATERIALS FOR WINDOWS AND DOOR SCREENS WILL BE GOVERNMENT FURNISHED.
10. THE PERSONNEL, PERSONNEL SCREEN AND SLIDING DOORS AND HARDWARE SHALL BE OF THE SIZE AND NUMBER SHOWN ON THE DRAWINGS.
11. ONE STRUCTURAL STEEL MONORAIL AND SUPPORTS COMPLETE WITH 1000 POUNDS SPUR GEAR TYPE, CHAIN FALLS WITH TROLLEY AND 15 FEET LONG CONTINUOUS LOOP OPERATING CHAIN OVER THE HOT WATER GENERATOR SERVICE AISLE FOR TUBE BUNDLE REMOVAL SHALL BE INCLUDED WITH THE BASIC BUILDING FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
12. ONE STRUCTURAL STEEL MONORAIL AND SUPPORTS COMPLETE WITH 6000 POUNDS, SPUR GEAR TYPE, CHAIN FALLS WITH TROLLEY AND 15 FEET LONG CONTINUOUS LOOP OPERATING BETWEEN THE SALT STORAGE AREA AND THE BRINE TANKS OF THE WATER SOFTENERS SHALL BE INCLUDED WITH THE BASIC BUILDING FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
13. INDIVIDUAL STRUCTURAL STEEL SUPPORTS BOLTED TO THE BOTTOM OF THE CEILING JOIST SHALL BE PROVIDED FOR SPUR GEAR TYPE CHAIN FALLS OVER EACH PIECE OF MAJOR BOILER PLANT EQUIPMENT SUCH AS CIRCULATING WATER PUMPS, HEAT EXCHANGERS, HOT WATER GENERATORS, BOILER FEED PUMPS, DEAREATOR, WATER SOFTENER TANKS AND PUMPS, AIR COMPRESSORS, ETC. MULTIPLE SUPPORTS SHALL BE PROVIDED OVER THE HEAT EXCHANGERS, HOT WATER HEATERS, AND DEAREATOR. EACH PIECE OF EQUIPMENT SHALL BE ASSUMED AS REQUIRING STRUCTURAL SUPPORT FROM THE CEILING JOISTS FOR PLACING AND SERVICING. THE CEILING JOIST LOADING DIAGRAM SHALL INDICATE THE LOCATION AND POUNDS OF FORCE FOR EACH CONCENTRATED STATIC AND DYNAMIC LOAD REQUIRED FOR THE BASIC BUILDING. THE SUPPORTS FOR THE CHAIN FALLS SHALL BE INCLUDED WITH THE BASIC BUILDING FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES.
14. ALL STRUCTURAL STEEL BUILDING ANCHORS AND HORIZONTAL BUILDING TIES FOR THE TROPICAL, DESERT, TEMPERATE AND FRIGID CLIMATIC ZONES SHALL BE FURNISHED.

MECHANICAL NOTES

1. ALL PIPING SHALL BE 3/8", 1 1/4", 2", 4", 6", 8" OR 12" EXCEPT FOR THE LAST FEW INCHES CONNECTING TO THE EQUIPMENT. THE CONNECTING PIPING SHALL BE SIZED ACCORDING TO THE MANUFACTURERS PIPE OPENINGS ON THE EQUIPMENT. THE PIPE REDUCTION IN SIZE SHALL BE MADE BY REDUCING FITTINGS AND NIPPLES.
2. ALL PIPING SHALL BE SCHEDULE 40, GALVANIZED STEEL ACCORDING TO THE REQUIREMENTS OF API STD 5L, GRADE B.
3. ALL PIPING SHALL BE GRADED 1" IN 40FT (26mm IN 12.192 m) IN DIRECTION OF THE FLOW.
4. ALL AIR LINES SHALL BE PITCHED TO LOW POINTS AND PROVIDED WITH DRAIN VALVES AT EVERY LOW POINT.
5. THREADED TYPE FITTINGS WITH ANY OUTLET LESS THAN 2 INCHES SHALL BE MALLEABLE IRON. THREADED TYPE FITTINGS OF SIZE 2 THROUGH 6 INCHES MAY BE EITHER MALLEABLE IRON OR CAST IRON, UNLESS SPECIFIED HEREINAFTER AS WELDED TYPE. ALL FITTINGS FOR 8 INCH AND 12 INCH PIPE SHALL BE WELDED TYPE. ALL THD FITTINGS GALVANIZED.
6. ALL STEAM AND CONDENSATE PIPE FITTING 4" AND LARGER SHALL BE WELDED TYPE.
7. EXPANSION LOOPS OR BENDS FOR 2 INCH PIPE AND UNDER IN DIAMETER SHALL BE FIELD BENT TO DESIRED CONFIGURATION IN LIEU OF USING FITTINGS
8. ECCENTRIC THREADED SWAGED NIPPLES OR ECCENTRIC WELD TYPE REDUCING FITTINGS SHALL BE USED FOR CHANGING STEAM AND AIR PIPE SIZES.
9. ALL PIPING SHALL BE HYDROSTATICALLY TESTED TO 150% OF WORKING PRESSURE. INSULATION SHALL NOT BE INSTALLED UNTIL AFTER THE HYDROSTATIC TESTS HAVE BEEN MADE.
10. 3/4" HOSE BIBBS SHALL BE PROVIDED WHERE INDICATED ON THE DRAWINGS.
11. ALL EQUIPMENT PIPING SHALL BE PROVIDED WITH SECTIONALIZING VALVES AND UNIONS.
12. STEAM PIPING IS SIZED ON A PRESSURE DROP OF 1#/100' AND CONDENSATE PIPING IS SIZED ON A PRESSURE DROP OF 3/4#/100'.
13. AIR PIPING IS SIZED ON A PRESSURE DROP OF 1.5#/100'.
14. THE FINNED RADIATORS SHALL HAVE 2-INCH CORE AND CONFORM TO THE REQUIREMENTS OF MILITARY SPECIFICATION MIL-R-11723.
15. ALL PIPE HANGERS WITH HANGER RODS, BOLTS, WASHERS AND TURNBUCKLES SHALL CONFORM TO TYPE 18-A AND THE CEILING HOIST ATTACHMENT SHALL BE TYPE 18-V AND BE SPACED AS CALLED FOR ON DRAWING 99-98, SHEET 18.
16. ALL PIPING INSULATIONS FOR THE STEAM, CONDENSATE, HOT WATER, HOT WATER RETURN AND COLD WATER PIPING 8" OR LESS SHALL BE MOULDED AND IN 3'-0" LENGTHS. ALL PIPING AS ABOVE 8" AND LARGER SHALL BE WRAPPED WITH 2 LAYERS OF 1-INCH INSULATION MATS AND FINISHED WITH A 85% MAGNESIA AND PORTLAND CEMENT HARD COAT AT LEAST 1/2" THICK. FITTINGS SHALL BE COVERED WITH INSULATION MATS TO THE SAME THICKNESS AS THE PIPE INSULATION AFTER COVERING MATTING WITH A HARD COAT OF MAGNESIA AND PORTLAND CEMENT AS HERETOFORE DESCRIBED. THE HOT WATER GENERATORS, HEAT EXCHANGERS AND DEAREATOR-CONDENSATE RECEIVER TANKS SHALL BE COVERED WITH 2 LAYERS OF 1-INCH THICK MAGNESIA BLOCKS WIRED IN PLACE AND COATED WITH A PORTLAND CEMENT AND MAGNESIA HARD COAT AT LEAST 1/2" THICK. THE OUTSIDE TREATED WATER STORAGE TANK IN THE TEMPERATE AND FRIGID ZONES SHALL BE COVERED IN THE SAME MANNER AS DESCRIBED ABOVE FOR THE HOT WATER GENERATORS AND IN ADDITION THE SIDES AND ROOF OF THE WATER TANK SHALL BE COVERED WITH 2 LAYERS OF 15 POUND ROOFING FELT, HOT MOPPED.

ELECTRICAL NOTES

SUMMARY OF ELECTRICAL REQUIREMENT		KVA
CONNECTED LOAD (EST. FOR CONV. OUTLETS)	LIGHTING	5.7
	RECEPTACLE EST.	2.2
	POWER (EQUIPMENT)	417.7
	TOTAL CONNECTED	425.6
ESTIMATED MAX. DEMAND		380.0

1. ALL ELECTRICAL WIRING SHALL BE RUN IN RIGID GALVANIZED STEEL CONDUIT.
2. LAMPS SHALL BE PROVIDED FOR ALL LIGHTING FIXTURES. FLUORESCENT LAMPS SHALL BE COOL WHITE RAPID START. INCANDESCENT LAMPS SHALL BE INSIDE FROSTED.
3. ALL LIGHTING FIXTURES NOT OTHERWISE INDICATED ARE FLUORESCENT INDUSTRIAL TYPE, UNSHIELDED, 2-40W-RS, WITH 120 VOLT BALLASTS, MOUNTED AT 12'-0"; EXCEPT IN OFFICE AND TOILET MOUNT AT CEILING.

SCHEDULE OF EQUIPMENT

ITEM	QUANTITY	DESCRIPTION	CAPACITY	ELECTRIC RATING CIRCUIT	ELECTRIC RATING H.P.
1	3	SCOTCH MARINE OIL FIRED PACKAGE BOILER	10,192 LB/HR TO 13,590 LB/HR OF 125 PSIG STEAM	208V-3PH	15,5,1/2
		DEAERATING HEATER ASSEMBLY:			
2A	1	CONDENSATE SURGE TANK	2200 GAL		
2B	1	DEAERATOR	60,000 LB/HR AND 168 CF. FT. STORAGE		
2C	2	CONDENSATE TRANSFER PUMP	85GPM @ 50 FT. HEAD	208V-3PH	3
2D	4	BOILER FEEDWATER PUMP	58GPM @ 350 FT. HEAD	208V-3PH	15
3	1	BOILER BLOWDOWN TANK			
4	3	OIL DAY TANK	1000 GAL		
5	2	OIL STORAGE TANK	1000 BBL		
		WATER SOFTENER PACKAGE:	182GPM, 137# K. GRAINS OF $CaCO_3$ PER REGENERATION		
6A	3	SOFTENER TANK	---		
6B	3	BRINE TANK	---		
7	1	TREATED STORAGE TANK	1000 BBL		
8	4	TREATED WATER PUMPS	550GPM @ 165 FT. HEAD	208V-3PH	30
9	6	HOT WATER STORAGE TANK W/HEATER	1700 GAL W/ 85 $FT.^2$ OF HEATING SURFACE		
10	1	CONDENSATE COOLER	17,528 LB/HR CONDENSATE		
11	2	TEMPERED WATER BOOSTER PUMP	72,58PM @ 122 FT. HEAD	208V-3PH	5
		AIR COMPRESSOR PACKAGE:	---		
12A	2	AIR COMPRESSOR	300 CFM (FREE AIR)	208V-3PH	75
12B	2	AFTERCOOLER	---		
12C	2	MOISTURE SEPARATOR	---		
12D	2	AIR RECEIVER	---		
12E	2	CIRCULATING WATER RADIATOR	---	120V-1PH	1/4
12F	2	CIRCULATING WATER PUMP	---	208V-3PH	3/4
12G	2	CIRCULATING WATER TANK	---		
12H	2	INTAKE AIR FILTER AND SILENCER	---		

DOOR SCHEDULE

EXTERIOR DOORS W/SCREEN DOORS FURNISHED BY BLDG SHELL FABRICATOR

NO.	OPENING SIZE	TYPE OF DOOR	THICK	REMARKS
ED-1	12'-0"x13'-2"	DOUBLE SLIDING W/PILOT DOOR 3'-0"x6'-8" (RHOS)	WFGR	SCREEN DOOR NOT REQUIRED WITH PILOT DOOR
ED-2	6'-0"x6'-8"	DOUBLE 3068	1 3/8"	PLASTIC GLAZING & SCREENING BY THE GOVERNMENT (AFCS)
ED-3	3'-0"x6'-8"	3068	1 3/8"	

WINDOW SCHEDULE

WINDOWS WITH SCREENS FURNISHED OPEN BY BLDG SHELL FABRICATOR

NO.	OPENING SIZE	SILL HGT	STYLE	REMARKS
W1	6'-0"x3'-8"	3'-6"±	ALUM. ROLLING	PLASTIC GLAZING & SCREENING BY THE GOVERNMENT (AFCS)
W2	2-6'-0"x3'-8" W/MULLION	3'-6"±	ALUM. ROLLING	

FACILITY NUMBERS

FACIL. NO.	DESCRIPTION
821201	INTERIOR ONLY - DESERT & TROPIC ZONES
821202	INTERIOR ONLY - TEMPERATE ZONE (-20°F)
821211	STEEL FRAME BLDG W/INTERIOR - DESERT & TROPIC ZONES
821212	STEEL FRAME BLDG W/INTERIOR - TEMPERATE ZONE (-20°F
821221	WOOD FRAME BLDG W/INTERIOR - DESERT & TROPIC ZONES
821222	WOOD FRAME BLDG W/INTERIOR - TEMPERATE ZONE (-20°F)
821213	STEEL FRAME BLDG W/INTERIOR OMITTING WATER SOFTENING EQUIPMENT, TREATED WATER STORAGE TANK & CIRCULATING PUMPS AND AIR EQUIPMENT WITH ASSOCIATED PIPING - DESERT & TROPIC ZONES
821214	STEEL FRAME BLDG W/INTERIOR OMITTING WATER SOFTENING EQUIPMENT, TREATED WATER STORAGE TANK & CIRCULATING PUMPS AND AIR EQUIPMENT WITH ASSOCIATED PIPING - TEMPERATE ZONE (-20°F)
821223	WOOD FRAME BLDG W/INTERIOR OMITTING WATER SOFTENING EQUIPMENT, TREATED WATER STORAGE TANK & CIRCULATING PUMPS AND AIR EQUIPMENT WITH ASSOCIATED PIPING - DESERT & TROPIC ZONES
821224	WOOD FRAME BLDG W/INTERIOR OMITTING WATER SOFTENING EQUIPMENT, TREATED WATER STORAGE TANK & CIRCULATING PUMPS AND AIR EQUIPMENT WITH ASSOCIATED PIPING - TEMPERATE ZONE (-20°F)

GENERAL NOTES

1. FOR FSN BILL OF MATERIALS, REFER TO TM 5-303 BY FACILITY NUMBER.
2. THE EXPANSION BOLTS WITH SHIELDS FOR ALL FIXED EQUIPMENT SHALL BE FIELD FABRICATED AND INSTALLED. THE ANCHOR BOLTS SHALL BE SIZED IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS' RECOMMENDATIONS.
3. ALL FOOTINGS AND FOUNDATIONS ARE DESIGNED FOR ALLOWABLE SOIL BEARING PRESSURE OF 3,000 PSF. IN EARTHQUAKE AND TYPHOON AREAS, REQUEST ADDITIONAL DESIGN INFORMATION FROM OCE. EXTEND FOOTINGS 6" BELOW FROST LINE.
4. ALL EXPOSED PIPING, PIPE HANGERS, HANGER RODS, METAL SUPPORTS AND EQUIPMENT NOT FURNISHED WITH FACTORY PAINT FINISH SHALL BE PAINTED WITH BLACK ENAMEL HEAT RESISTING PAINT. STRUCTURAL PIPE HANGER SUPPORTS ATTACHED TO ROOF BEAMS SHALL BE PAINTED WITH RED LEAD. ALL OTHER EXPOSED STRUCTURAL STEEL NOT FURNISHED WITH FACTORY FINISH PAINT COAT OR WHEN FINISH COAT IS DAMAGED SHALL BE PAINTED WITH 2 COATS OF SEMIGLOSS PAINT. THE COLOR SHALL BE SELECTED BY THE CONTRACTING OFFICER.
5. ALL BARE AND INSULATED PIPE SHALL BE COLOR CODED ACCORDING TO THE REQUIREMENTS OF MILITARY STANDARD MIL-STD-101.
6. CONCRETE COMPRESSIVE DESIGN STRENGTH IS 2500 PSI AT 28 DAYS AND REINFORCING BARS SHOULD BE HARD BILLET OR RAIL STEEL CONFORMING TO FEDERAL SPECIFICATIONS QQ-S-632, TYPE 2.
7. THE BOILER PLANT GENERAL FLOOR AREAS SHOULD BE 6-INCH REINFORCED CONCRETE. THE AREAS SUPPORTING THE BOILERS, TANKS, COMPRESSORS, ETC., SHOULD BE 8" OR 12" REINFORCED CONCRETE AS INDICATED ON THE DRAWING. MASS CONCRETE BASES FOR THE AIR COMPRESSORS AND CIRCULATING WATER PUMPS ARE TO BE AS INDICATED ON THE DRAWING.

SERVICE REQUIREMENTS

COLD WATER @ 50 PSI	33,392 GPH
SEWAGE	600 GPH
ELECTRIC LOAD	426 KVA

SCHEDULE OF DRAWINGS

DWG NO.	DESCRIPTION	SHEET NO.
82-12	PLANS, SCHEDULES & DETAILS	1-4 OF 4
99-98	STANDARD DETAILS	

GRAPHIC SCALES: NONE

HAYES, SEAY, MATTERN & MATTERN, ARCHITECTS - ENGINEERS, ROANOKE, VIRGINIA, WASHINGTON, D.C.

DEPARTMENT OF THE ARMY, OFFICE OF THE CHIEF OF ENGINEERS, DIRECTOR OF MILITARY ENGINEERING, WASHINGTON, D.C.

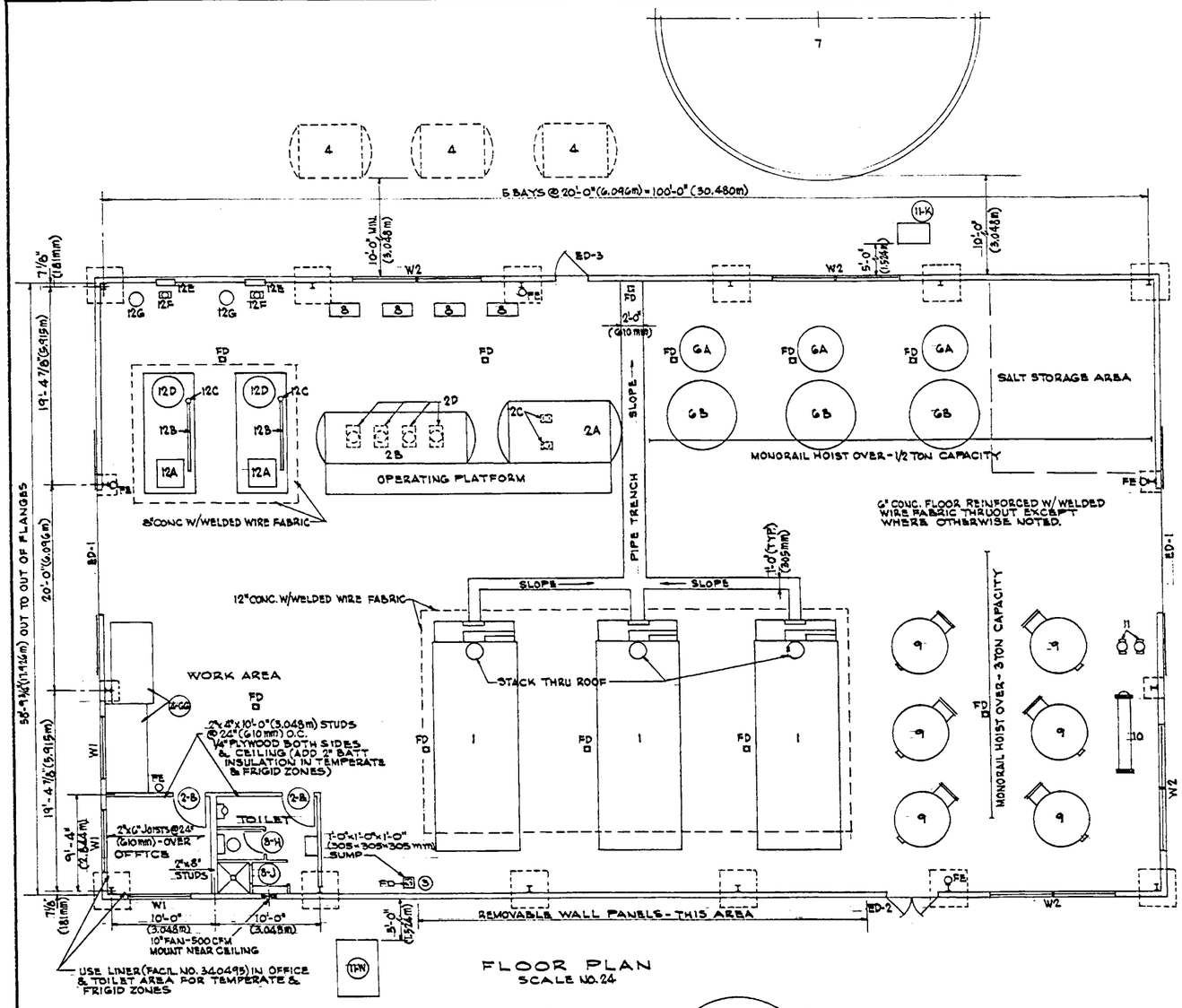
DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN

ARMY FACILITIES COMPONENTS SYSTEM
BOILER PLANT - 60'X100'
NET OUTPUT 44 CFM COMPRESSED AIR @ 100 PSI
NET OUTPUT 14,300 GPH TREATED COLD WATER
NET OUTPUT 14,290 GPH TREATED HOT WATER
NET OUTPUT 27,180 LB/HR SATURATED STEAM @ 125 PSI
BLDG SHELL REQUIREMENTS, NOTES & SCHEDULES

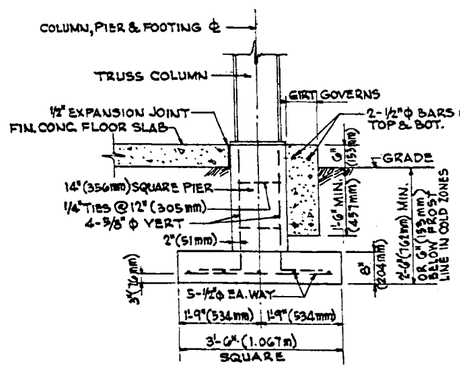
APPROVED: Edwin D. Patterson, Col CE — DATE: 23 May 73
CHIEF, AFCS OFFICE, MILITARY ENGINEERING, OCE.

APPROVED FOR PROPONENT AGENCY: L. C. DeBaun, DALO-SMT-L
DATE: 23 May 1973

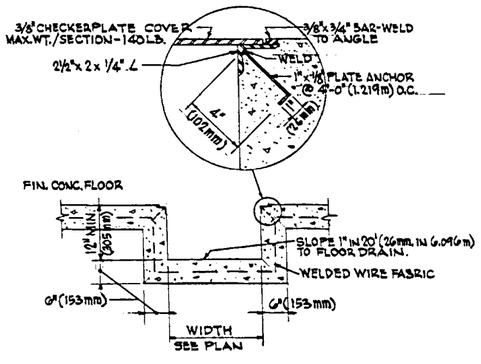
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-12
SHEET 1 OF 4



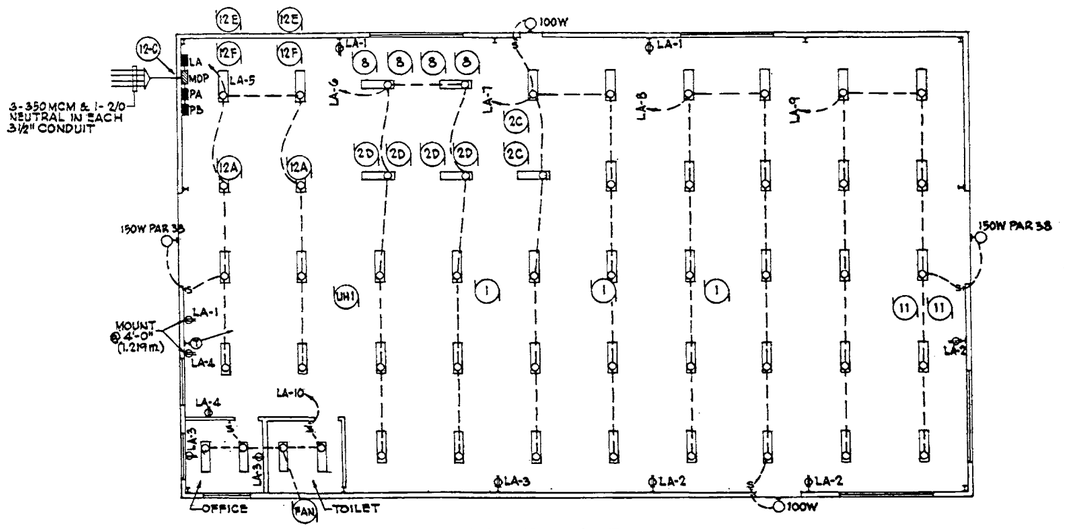
FLOOR PLAN
SCALE NO. 24



TRUSS COLUMN FOOTINGS
SCALE NO. 5



TYPICAL PIPE TRENCH AND SUMP
NOT TO SCALE



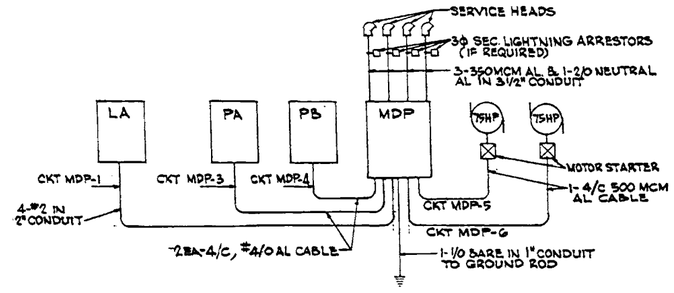
ELECTRICAL PLAN
SCALE NO. 1

EQUIPMENT POWER SCHEDULE

ITEM NO.	DESCRIPTION	QUAN	CIRCUIT NO.	CIRCUIT BRKR POLES	CIRCUIT BRKR RATING	PHASE	H.P.	VOLTS	AMPS	CONDUCTOR SIZE	CONDUCTOR NO.	CONDUIT SIZE
1	BOILER	3	PA-9&10, PB-9	3	150	3	15,5,1/2	208	60	4	3	1 1/4
2C	CONDENSATE PUMP	2	PA-2, PB-2	3	20	3	3	208	10	12	3	3/4
2D	FEEDWATER PUMP	4	PA-5&6, PB-7&8	3	100	3	15	208	44	6	3	1
8	TREATED WTR. PUMP	4	PA-11&12, PB-11&12	3	175	3	30	208	86	1/0 AL	4	—
11	TEMPERED WTR. PUMP	2	PB-3&4	3	40	3	5	208	17	12	3	3/4
12A	AIR COMPRESSOR	2	MDP 5 & 6	3	400	3	75	208	196	500 MCM AL	4	—
12E	RADIATOR FAN	2	LA-12&13	1	20	1	1/4	120	5.8	12	2	3/4
12F	CIRCULATING WTR. PUMP	2	PA-1, PB-1	3	15	3	1	208	4	12	3	3/4
UH-1	HEATER FAN	1	LA-11	1	20	1	1/4	120	5.8	12	2	3/4

SCHEDULE OF PANELBOARDS

PANEL VOLTAGE MAINS	RATINGS POLES	RATINGS AMPS	BRANCH CIRCUIT BREAKERS ACTIVE & SPARE CIRCUIT NOS	SPARE CKT. NO.'S	SPACE ONLY	WIRE SIZE OTHER THAN NO. 12	REMARKS
LA 208Y/120V, 3PH. 4WIRE 100AMP LUGS ONLY	1	20	1 THRU 15	14&15	16,17,18	CKTS 2,8,9 - #10	SURFACE MOUNTED
PA 208Y/120V, 3PH. 4WIRE 400AMP LUGS ONLY	3	20	2				SURFACE MOUNTED
	3	100	5&6			#6	
	3	150	9&10			#4	
	3	175	11&12			#1/0 AL	
	3	15	1		3,4,7,8		
PB 208Y/120V, 3PH. 4WIRE 400AMP LUGS ONLY	3	20	2				SURFACE MOUNTED
	3	40	3&4				
	3	100	7&8			#6	
	3	150	9			#4	
	3	175	11&12			#1/0 AL	
	3	15	1		5,6,10		
MDP 208Y/120V, 3PH. 4WIRE 1000AMP LUGS ONLY	3	100	1			#2	SURFACE MOUNTED
	3	100			2		
	3	400	3&4			#4/0 AL	
	3	400	5&6			500 MCM AL	



SINGLE LINE DIAGRAM
NOT TO SCALE

GRAPHIC SCALES
0 5' 10' 15' 0 1m 5m NO. 1
0 5' 10' 0 1m 3m NO. 24
0 1' 2' 3' 0 1m NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D. C.

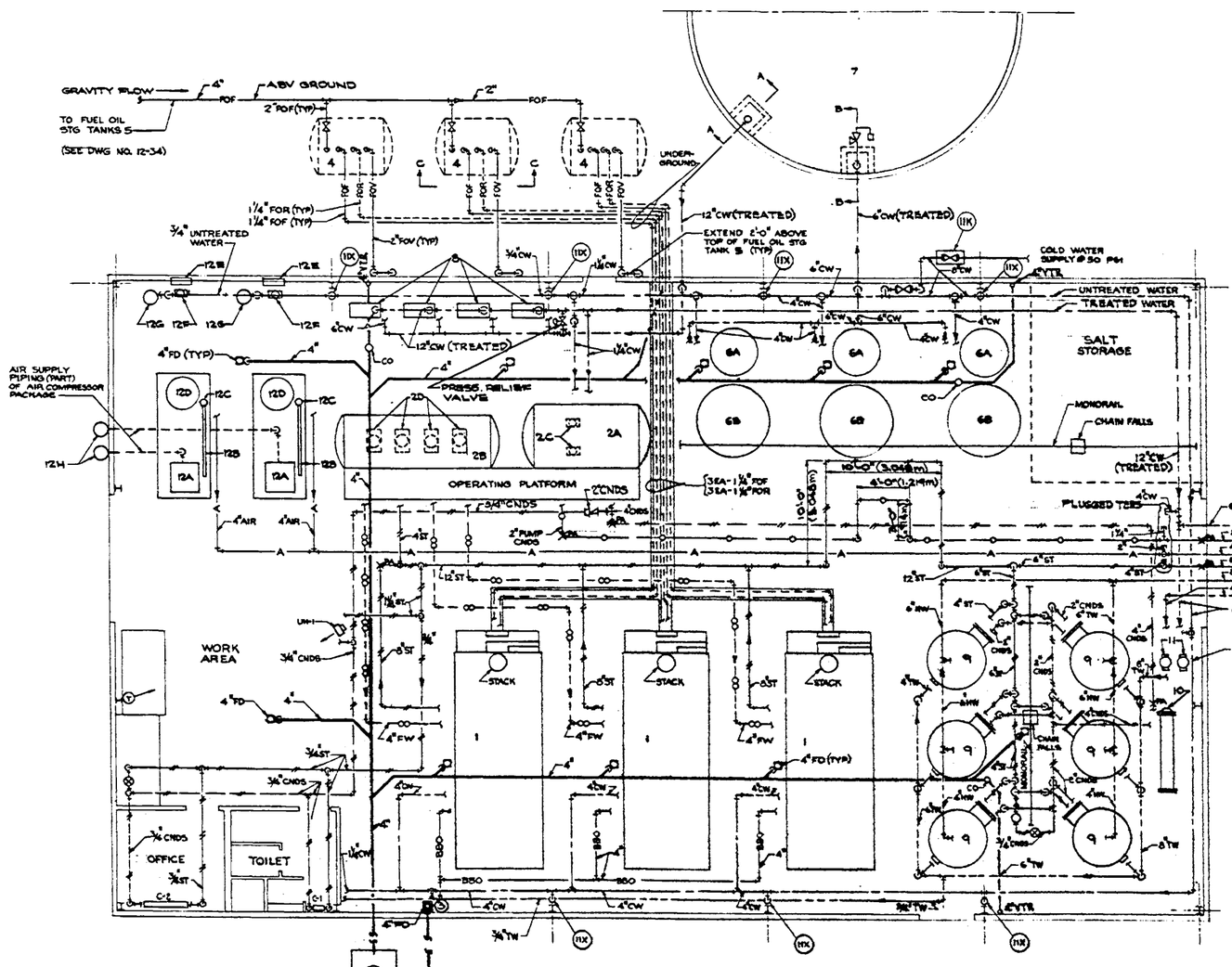
DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY: C.W. DEICHMANN

ARMY FACILITIES COMPONENTS SYSTEM
BOILER PLANT - 60'X100'
NET OUTPUT 44 CFM COMPRESSED AIR @ 85 PSI
NET OUTPUT 14,300 GPH TREATED COLD WATER
NET OUTPUT 14,290 GPH TREATED HOT WATER
NET OUTPUT 27,180 LB/HR SATURATED STEAM @ 125 PSI
ARCHITECTURAL AND ELECTRICAL PLANS

APPROVED: Edwin A. Patterson, Col CE
CHIEF, APCS OFFICE, MILITARY ENGINEERING, OCE
DATE: 23 May 1973

APPROVED FOR PROPONENT AGENCY: W C Building DALO-SMT-L
DATE: 23 May 1973

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-12
SHEET 2 OF 4



MECHANICAL PLAN
SCALE NO. 24

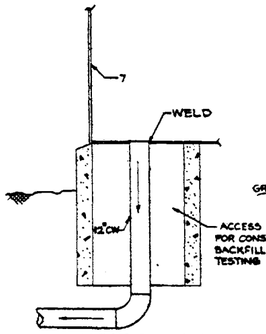
PARTIAL PLAN — TOILET
SCALE NO. 3

UNIT HEATER SCHEDULE						
MARK	CAPACITY BTU/HR	E.A.T. °F	APPROX HP	HUNGOUTS SUPPLY	HUNGOUTS TRAP	NO. REQ'D
UH-1	28,000	90°	1/8	1 1/2"	3/4"	1

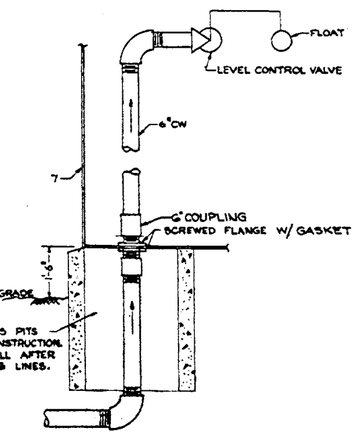
NOTE:
CAPACITY BASED ON 125 PSI STEAM

FINNED TUBE CONVECTOR SCHEDULE				
MARK	CAPACITY BTU/HR	NOM. ELEMENT LENGTH	RUNOUTS SUPPLY	RUNOUTS TRAP
C-1	8,000	2'-0"	3/4"	3/4"
C-2	12,000	6'-0"	3/4"	3/4"

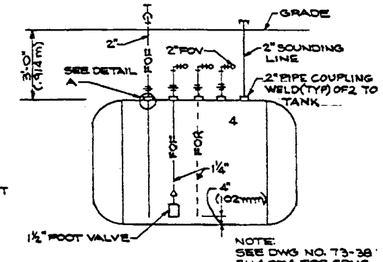
NOTE:
CAPACITY BASED ON 125 PSI STEAM



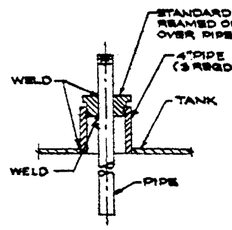
SECTION A-A
NOT TO SCALE



SECTION B-B
NOT TO SCALE



SECTION C-C
SCALE NO. 3

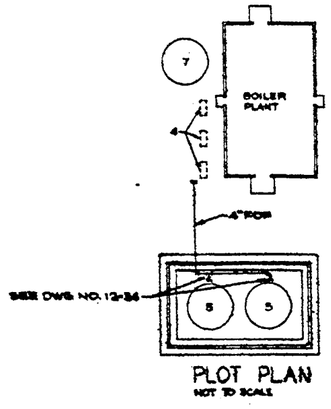


DETAIL A
NOT TO SCALE

SCHEDULE OF EQUIPMENT			
ITEM	QUANTITY	DESCRIPTION	CAPACITY
1	3	SCOTCH MARINE OIL FIRED PACKAGE BOILER	10,192 LB/HR TO 13,590 LB/HR OF 125 PSIG STEAM
		DEAERATING HEATER ASSEMBLY:	
2A	1	CONDENSATE SURGE TANK	2200 GAL
2B	1	DEAERATOR	60,000 LB/HR AND 168 CF. FT. STORAGE
2C	2	CONDENSATE TRANSFER PUMP	85GPM @ 50 FT. HEAD
2D	½	BOILER FEEDWATER PUMP	58GPM @ 350 FT. HEAD
3	1	BOILER BLOWDOWN TANK	
4	3	OIL DAY TANK	1000 GAL
5	2	OIL STORAGE TANK	1000 BBL
		WATER SOFTENER PACKAGE:	182GPM, 137% K. GRAINS OF $CaCO_3$ PER REGENERATION
6A	3	SOFTENER TANK	---
6B	3	BRINE TANK	---
7	1	TREATED STORAGE TANK	1000 BBL
8	½	TREATED WATER PUMPS	550GPM @ 166 FT. HEAD
9	6	HOT WATER STORAGE TANK W/ HEATER	1700 GAL W/ 85 FT.2 OF HEATING SURFACE
10	1	CONDENSATE COOLER	17,528 LB/HR CONDENSATE
11	2	TEMPERED WATER BOOSTER PUMP	72.5GPM @ 122 FT. HEAD
		AIR COMPRESSOR PACKAGE:	---
12A	2	AIR COMPRESSOR	300 CFM (FREE AIR)
12B	2	AFTERCOOLER	---
12C	2	MOISTURE SEPARATOR	---
12D	2	AIR RECEIVER	---
12E	2	CIRCULATING WATER RADIATOR	---
12F	2	CIRCULATING WATER PUMP	---
12G	2	CIRCULATING WATER TANK	---
12H	2	INTAKE AIR FILTER AND SILENCER	---

SPECIAL PIPE SYMBOLS

- TEMPERED WATER (T.W.)
- BOILER BLOWDOWN
- FUEL OIL TANK VENT
- CONCENTRIC REDUCER (ECCENTRIC REDUCER MAY BE SUBSTITUTED)



PLOT PLAN
NOT TO SCALE

GRAPHIC SCALES
0 5' 10' — 0 1' 2' 3' 4' 5'
0 1m 3m — 0 1m 2m
NO.24 NO.3

MAYER, BRAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
FALLS CHURCH, VIRGINIA WASHINGTON, D.C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D.C.

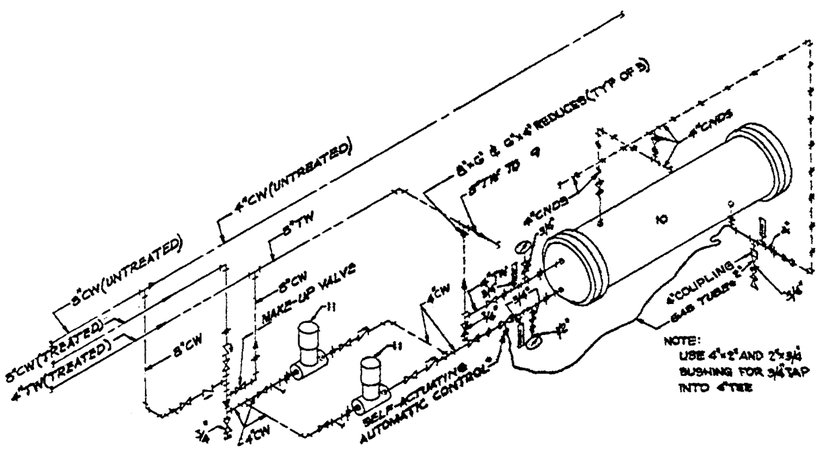
DRAWN BY: WINTER
TRACED BY:
CHECKED BY: RICKETTS, WEBB
SUBMITTED BY: C.W. DEICHMANN

ARMY FACILITIES COMPONENTS SYSTEM
BOILER PLANT - 60'X100'
NET OUTPUT 149 CFM COMPRESSED AIR @ 85 PSI
NET OUTPUT 114,300 GPH TREATED COLD WATER
NET OUTPUT 114,290 GPH TREATED HOT WATER
NET OUTPUT 27,180 LB/HR SATURATED STEAM @ 125 PSI
MECHANICAL PLANS AND DETAILS

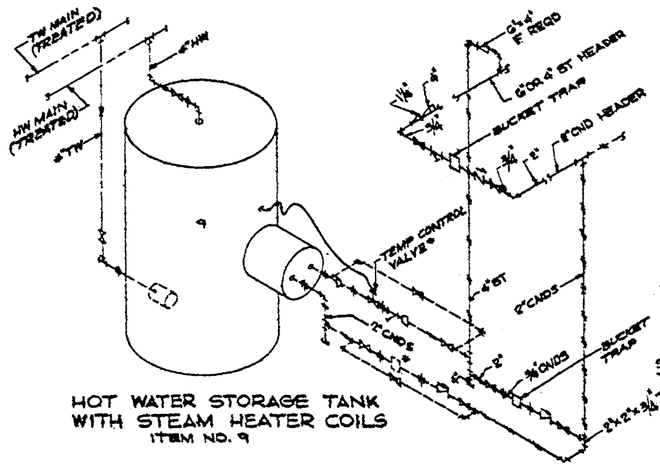
APPROVED: Edwin A. Patterson Col CE — DATE: 23 May 73
CHIEF, APOR OFFICE, MILITARY ENGINEERING, OCE

APPROVED FOR PROPONENT AGENCY: W. C. Weddell, DALO-SMT-L
DATE: 23 May 1973

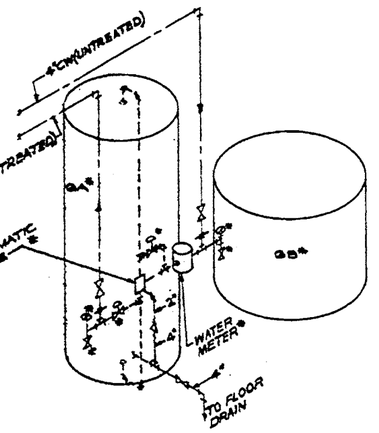
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-12
SHEET 3 OF 4



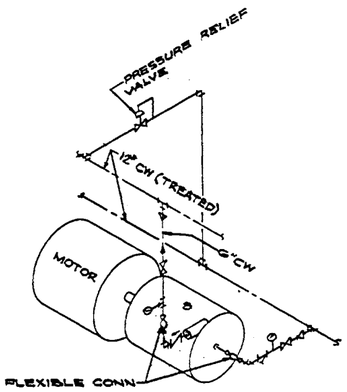
CONDENSATE COOLER AND TEMPERED WATER BOOSTER PUMPS
ITEMS NO. 10 AND 11



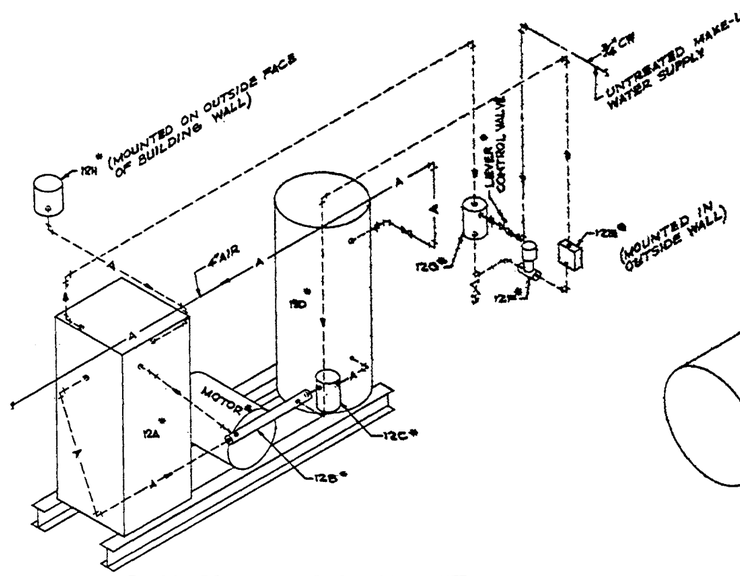
HOT WATER STORAGE TANK
WITH STEAM HEATER COILS
ITEM NO. 9



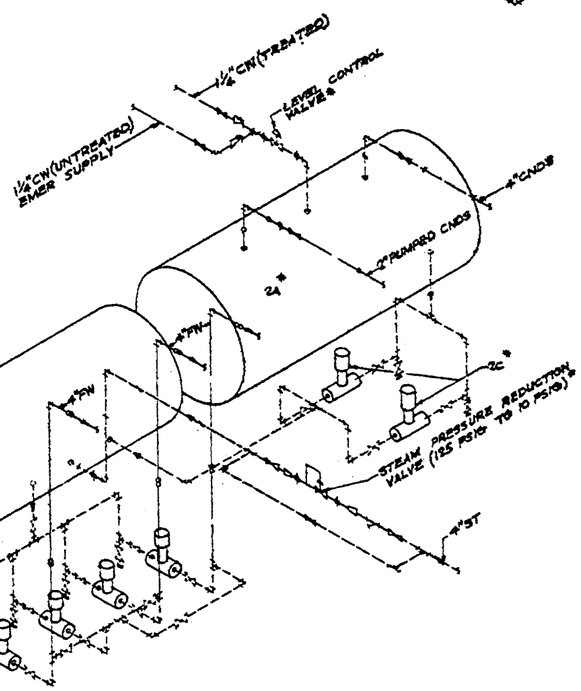
WATER SOFTENER UNIT
ITEM NO. 6



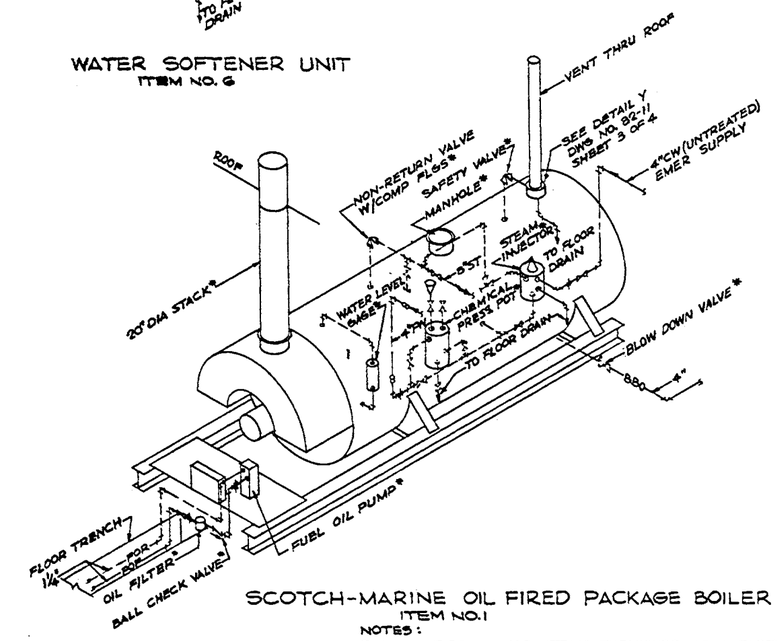
TREATED WATER BOOSTER PUMP
ITEM NO. 8



AIR COMPRESSOR PACKAGE UNIT
ITEM NO. 12

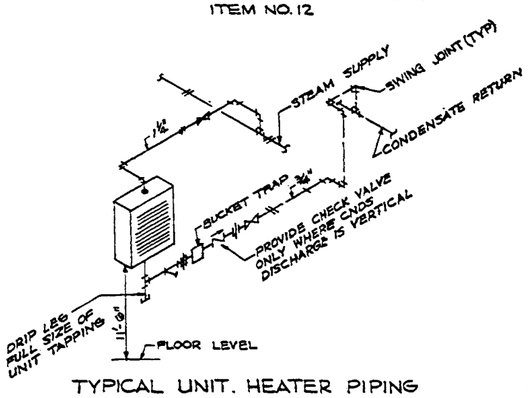


DEAERATING HEATER ASSEMBLY
ITEM NO. 2

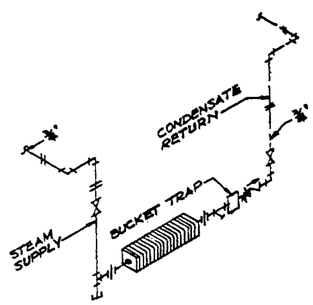


SCOTCH-MARINE OIL FIRED PACKAGE BOILER
ITEM NO.1

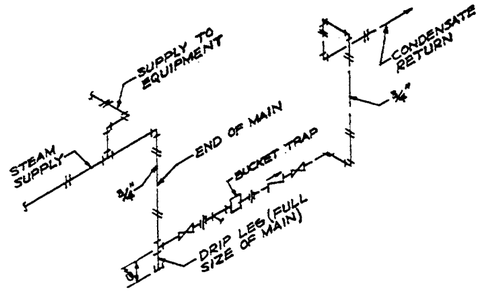
NOTES:
* IDENTIFIES MAJOR ITEMS FURNISHED AS A PART OF THE PACKAGE UNIT.
---- IDENTIFIES MAJOR PIPING FURNISHED AS A PART OF THE PACKAGE UNIT.
FOR EQUIPMENT PIPING NOT INDICATED SEE EQUIPMENT MANUFACTURER'S DRAWINGS.



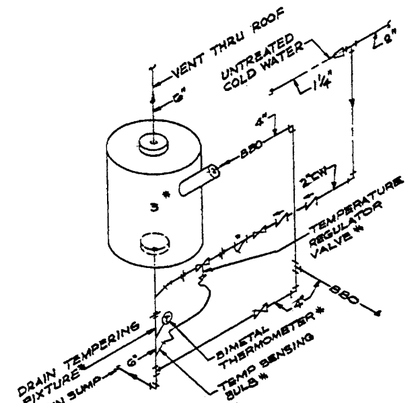
TYPICAL UNIT. HEATER PIPING



FINNED TUBE RADIATOR PIPING



TYPICAL END OF MAIN DRIP



BOILER BLOWDOWN TANK
ITEM NO. 3

GRAPHIC SCALES
NONE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D.C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
DIRECTOR OF MILITARY ENGINEERING
WASHINGTON, D.C.

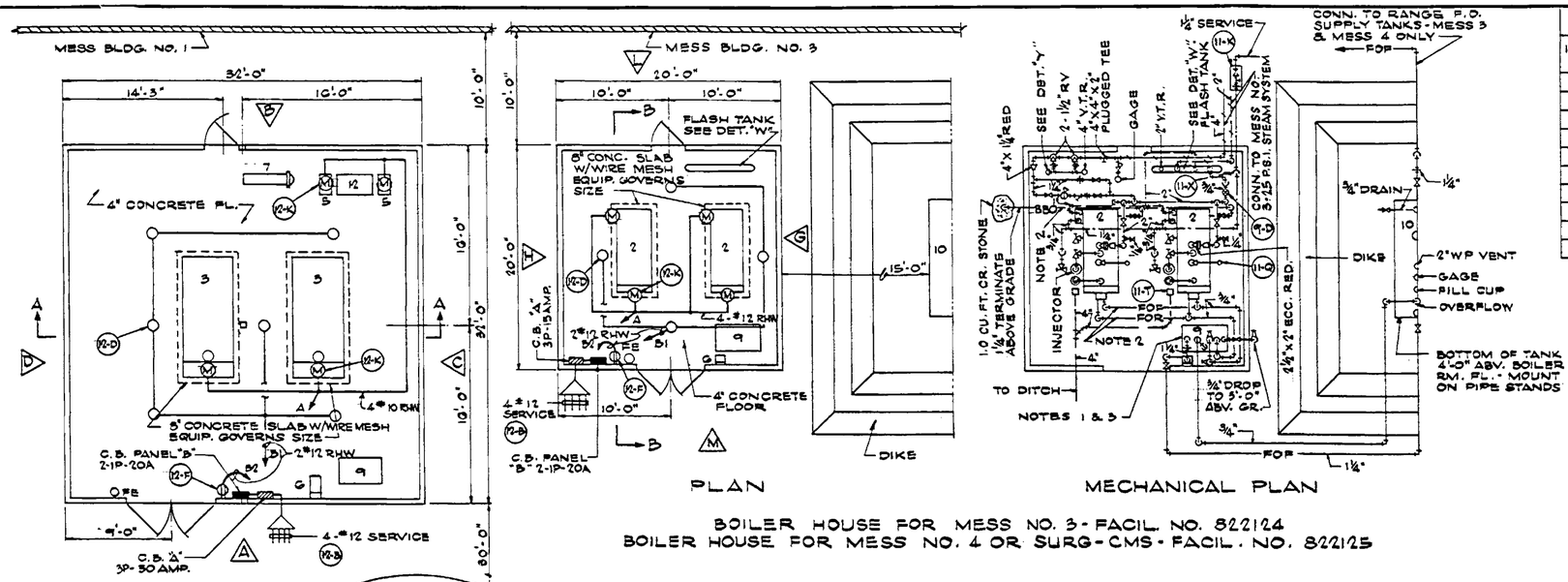
DRAWN BY: ENGLEMAN, ANDERSON
TRACED BY:
CHECKED BY: RICKETTS, WEBB
SUBMITTED BY: C.W. DEICHMANN

ARMY FACILITIES COMPONENTS SYSTEM
BOILER PLANT - 80'X100'
NET OUTPUT 44 CFM COMPRESSED AIR @ 85 PSI
NET OUTPUT 14,300 GPH TREATED COLD WATER
NET OUTPUT 19,290 GPH TREATED HOT WATER
NET OUTPUT 27,180 LB/HR SATURATED STEAM @ 125 PSI
PIPING ISOMETRIC DIAGRAMS

APPROVED: Edwin D. Patterson COL CE DATE: 23 May 23
CHIEF, AFCS OFFICE, MILITARY ENGINEERING, OCE.

APPROVED FOR PROPONENT AGENCY: W.C. Dowling DALO-SMT-L
DATE 23 May 1973

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-12
SHEET 4 OF 4



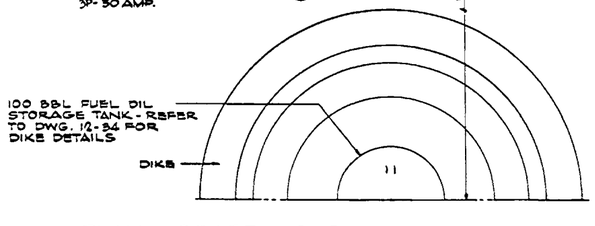
BOILER HOUSE FOR MESS NO. 3 - FACIL. NO. 822124
BOILER HOUSE FOR MESS NO. 4 OR SURG-CMS - FACIL. NO. 822125

SCHEDULE OF EQUIPMENT

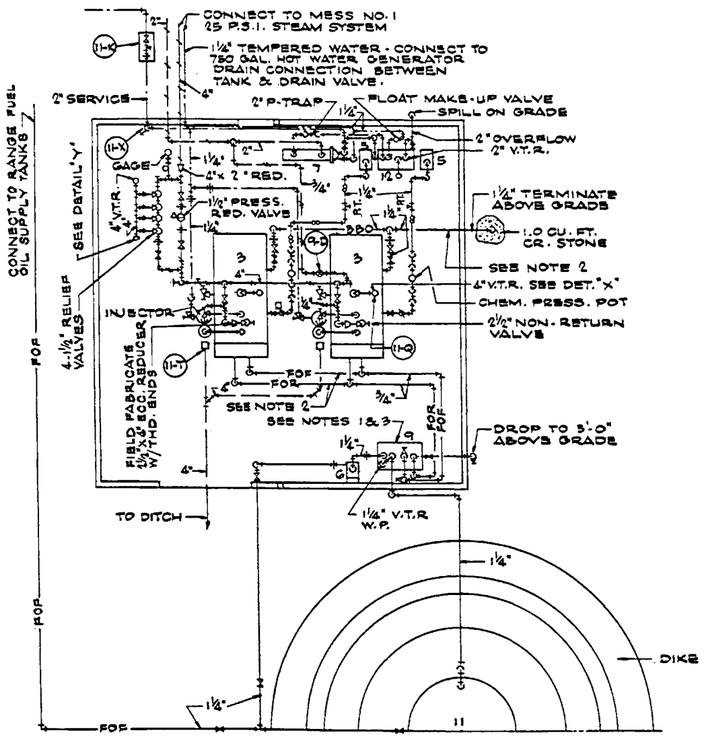
ITEM NO.	UNIT DESCRIPTION	FACILITY NUMBER				
		822121	822122	822123	822124	822125
1	BOILER, 100 PSI, CAP. 200#/HR.	—	1	1	—	—
2	BOILER, 100 PSI, CAP. 400#/HR.		1	2	2	2
3	BOILER, 125 PSI, CAP. 1130#/HR.	2	—	—	—	—
5	PUMP, FEED WATER SINGLE, 5.2 GPM	2	—	—	—	—
6	PUMP, FUEL OIL, HAND OPERATED, 22 GPM	1	1	1	1	1
7	HEATER, RECLAIMER, CLOSED TYPE 20 SF	1	—	—	—	—
9	TANK, FUEL OIL, 275 GAL.	1	1	1	1	1
10	TANK, FUEL OIL, 1000 GAL.	—	1	2	1	1
11	TANK, OIL STORAGE, 100 BBL	1	—	—	—	—
12	TANK, CONDENSATE, HORIZ. STEEL, 100 GAL.	1	—	—	—	—

NOTES

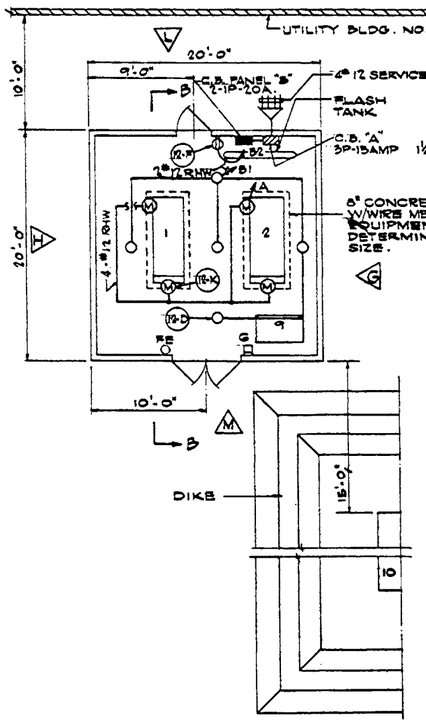
NOTE 1 - THE INVERT ELEVATION OF THE FUEL OIL DAY TANKS SHALL BE ABOVE THE TOPS OF THE MAIN FUEL OIL STORAGE TANKS.
NOTE 2 - A PIPING TRENCH SHALL BE PROVIDED FOR BOILER BLOW-DOWN PIPING & FUEL OIL PIPING. THESE TRENCHES SHALL BE FILLED WITH CEMENT GROUT AFTER THE PIPING HAS BEEN TESTED & CONNECTED TO THE EQUIPMENT.
NOTE 3 - STRUCTURAL FLOOR MOUNTED PIPE SUPPORTS SHALL BE PROVIDED FOR THE FUEL OIL DAY TANKS.
NOTE 4 - FEED WATER HEATER AND FLASH TANK INVERTS TO BE ABOVE TOP OF CONDENSATE RECEIVER TANK.
NOTE 5 - NO CONDENSATE LINES TO BE INSULATED EXCEPT THOSE WITHIN 6'-0" OF BOILER ROOM FLOOR.
NOTE 6 - ALL HORIZONTAL PIPES, FLANGES AND VALVE PARTS SHALL BE 7'-0" CLEAR ABOVE BOILER ROOM FLOOR.
NOTE 7 - WRAP BLOW-OFF LINE WITH INSULATION BEFORE ENCASING IN TRENCH TO ALLOW FOR EXPANSION.

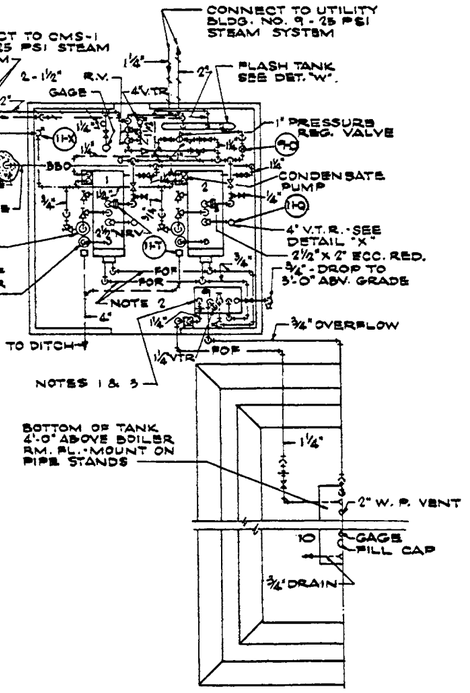


PLAN - BOILER HOUSE FOR MESS NO. 1 - FACIL. NO. 822121

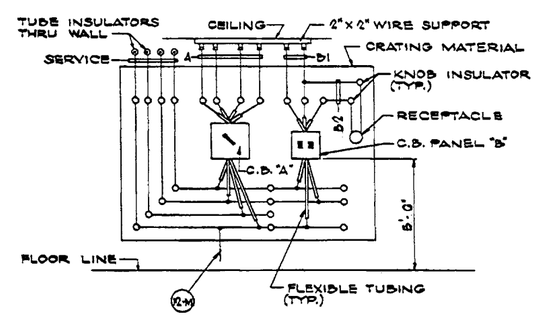


MECHANICAL PLAN - BOILER HOUSE FOR MESS NO. 1 - FACIL. NO. 822121





BOILER HOUSE FOR UTILITY BLDG. NO. 9 - FACIL. NO. 822122



TYPICAL CIRCUIT BREAKER INSTALLATION
NO SCALE

ELECTRICAL NOTES

CONNECTED LOAD

FACIL. NO.	822121	822122	822123	822124	822125
LIGHTING	0.6KW	0.5KW	0.4KW	0.4KW	0.4KW
POWER	6.0KW	3.0KW	4.0KW	3.5KW	3.5KW
TOTAL	6.6KW	3.5KW	4.4KW	3.9KW	3.9KW

1. UNLESS OTHERWISE NOTED ON PLANS, ALL LAMPS TO BE 100W, WITH 8" CONICAL SHADES.
2. (M) INDICATES MOTOR, CONTROLLER & DISCONNECTING DEVICE.
3. FLEXIBLE MOTOR LEADS SHALL BE S/C NO. 12 CORD.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
82-21	PLANS & ELEVATIONS	1,2,3 OF 3
54-15	EXTERIOR DOOR DETAILS	2 OF 2
12-34	TANK & DIKE DETAILS	1,2 OF 2
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

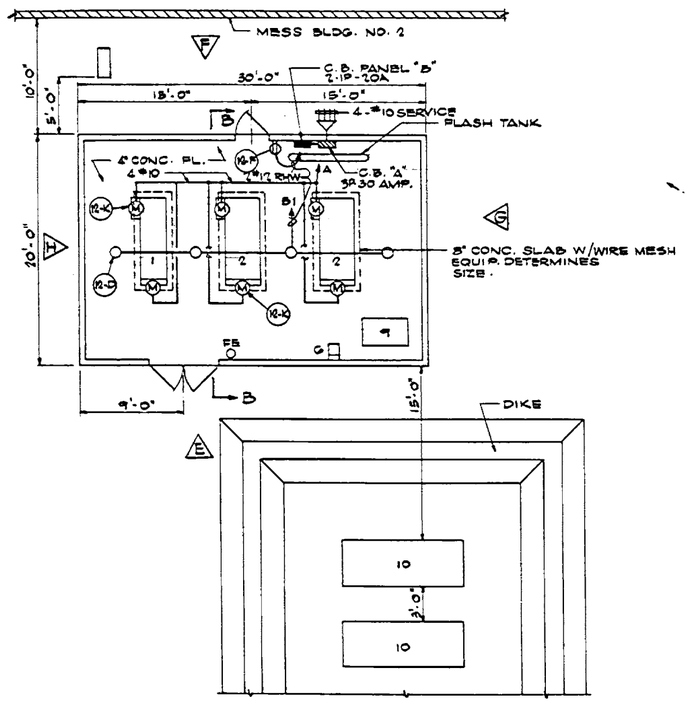
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

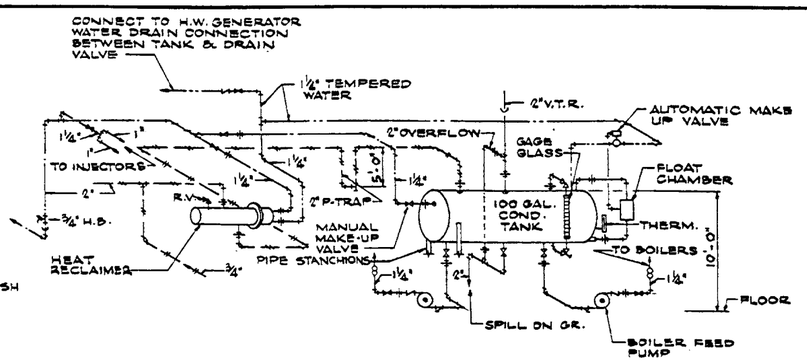
BOILER HOUSES FOR HOSPITAL MESSES, SURG-CMS AND UTILITY BLDG. NO. 9

APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1963
APPROVED FOR PROPONENT AGENCY: [signature] Colonel, GSC DATE: 26 Sept 1962

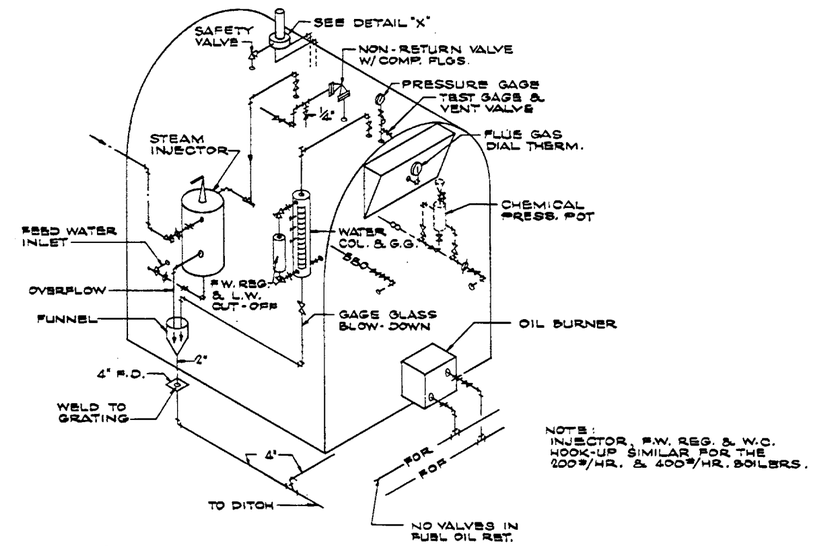
SCALE: AS NOTED
SPEC. NO. 0655-010
DRAWING NUMBER 82-21
SHEET 1 OF 3



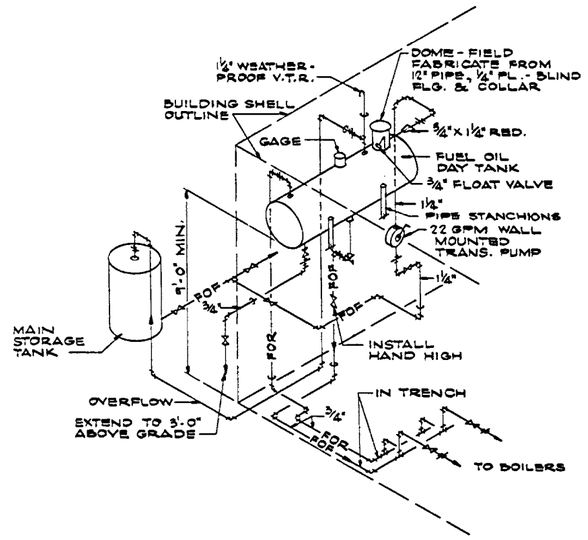
PLAN - BOILER HOUSE
FOR MESS BLDG. NO. 2 - FACIL. NO. 822123



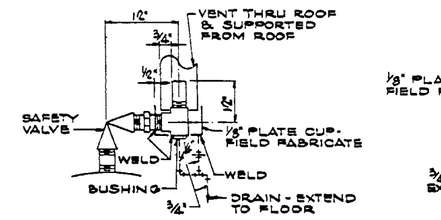
CONDENSATE RETURN SYSTEM FOR
FACIL. NO. 822121 ONLY
NO SCALE



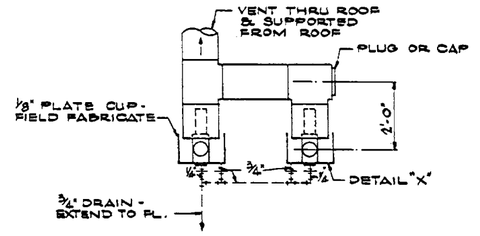
BOILER INSTALLATION
FACIL. NO. 822121
NO SCALE



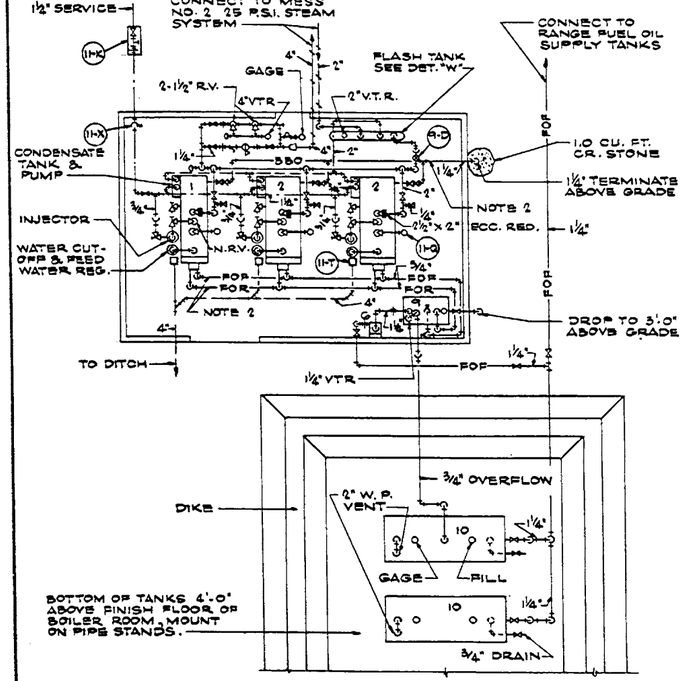
TYPICAL DAY TANK INSTALLATION
NO SCALE



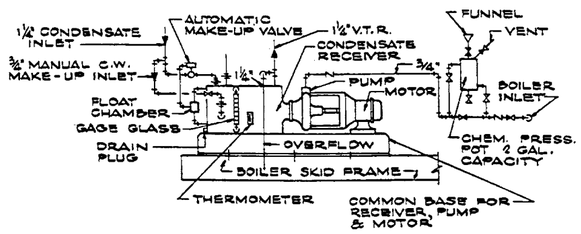
SINGLE BOILER OR PRESSURE
REDUCING STATION - SAFETY
VALVE VENT & DRAIN ASSEMBLY
DETAIL "X"
NO SCALE



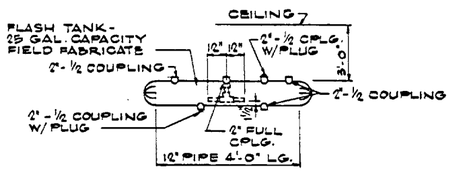
MULTIPLE BOILER OR PRESSURE
REDUCING STATION - SAFETY
VALVE VENT & DRAIN ASSEMBLY
DETAIL "Y"
NO SCALE



MECHANICAL PLAN - BOILER HOUSE
FOR MESS BLDG. NO. 2 - FACIL. NO. 822123



TYPICAL DETAIL - CONDENSATE
RECEIVER & PUMP FOR
200#/HR. & 400#/HR. BOILERS
NO SCALE



FLASH TANK
DETAIL "W"
NO SCALE
FOR FACILITIES 822122, 822123, 822124 & 822125

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, PLANNING BRANCH

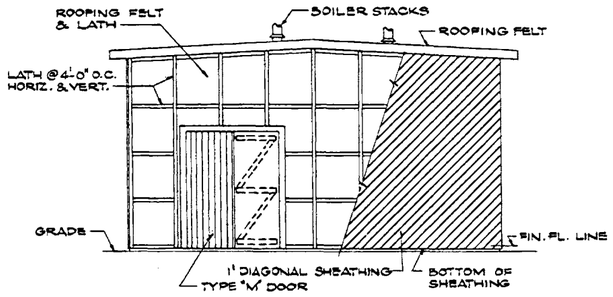
THEATER OF OPERATIONS

BOILER HOUSES
FOR
HOSPITAL MESSES, SURG-CMS AND UTILITY BLDG. NO. 9

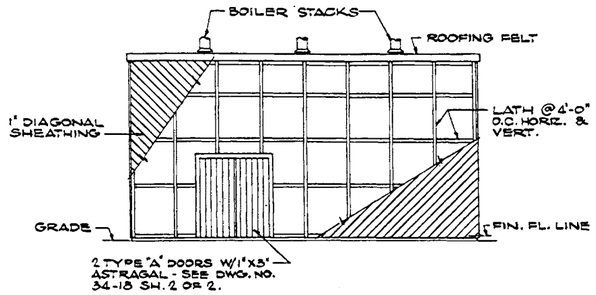
APPROVED: H.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1951

APPROVED FOR PROPONENT AGENCY:
Colonel, CMC
DATE 14 Sept 1950

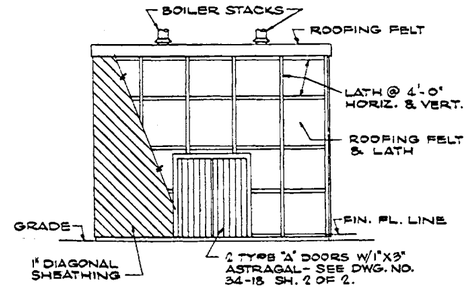
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-21
SHEET 2 OF 3



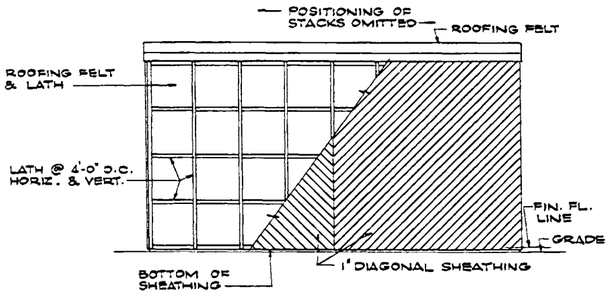
ELEVATION "A"
FACILITY NO. 822121



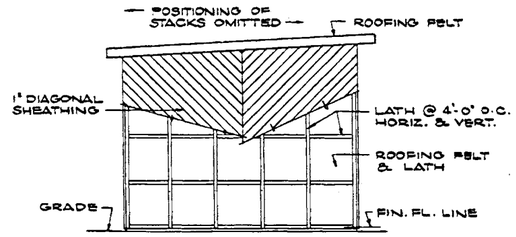
ELEVATION "E"
FACILITY NO. 822123



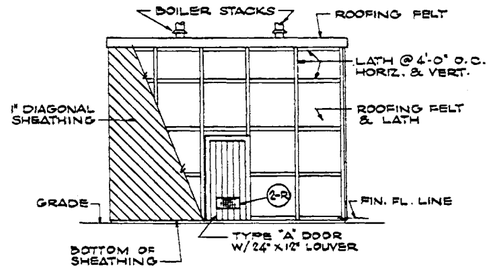
ELEVATION "M"
FACILITY NO. 822122, 822124 & 822125



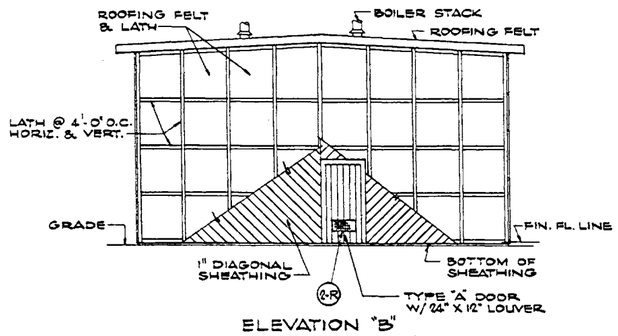
ELEVATION "C"
FACILITY NO. 822121
ELEVATION "D" - IDENTICAL OPPOSITE HAND



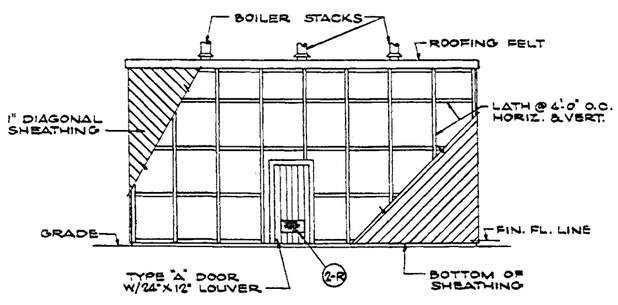
ELEVATION "H"
FACILITY NO. 822122, 822123, 822124 & 822125
ELEVATION "G" IDENTICAL OPPOSITE HAND



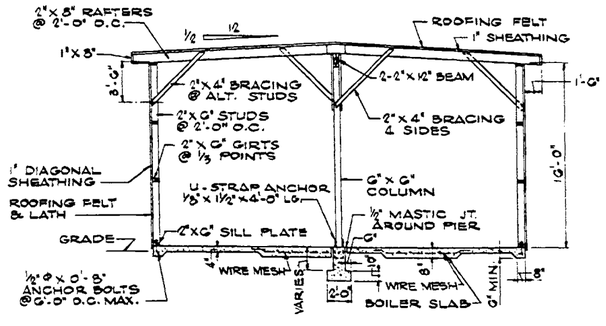
ELEVATION "L"
FACILITY NO. 822122, 822124 & 822125



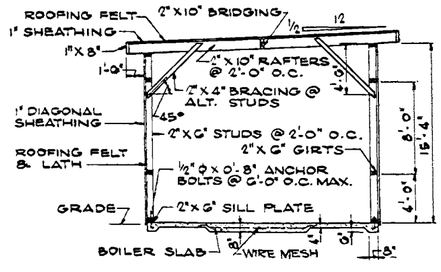
ELEVATION "B"
FACILITY NO. 822121



ELEVATION "F"
FACILITY NO. 822123



SECTION A-A



SECTION B-B

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO.24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: RYAN
SUBMITTED BY: C.W. DEICHMANN

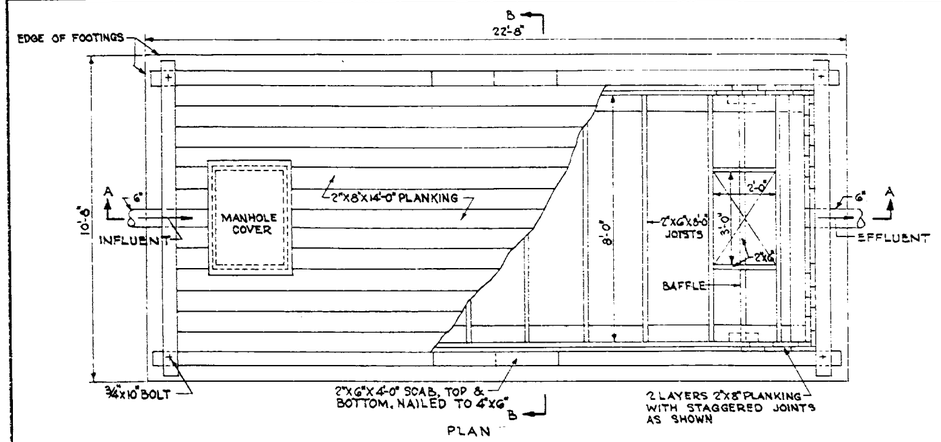
THEATER OF OPERATIONS

BOILER HOUSES
FOR
HOSPITAL MESSES, SURG-CMS AND UTILITY BLDG. NO. 9

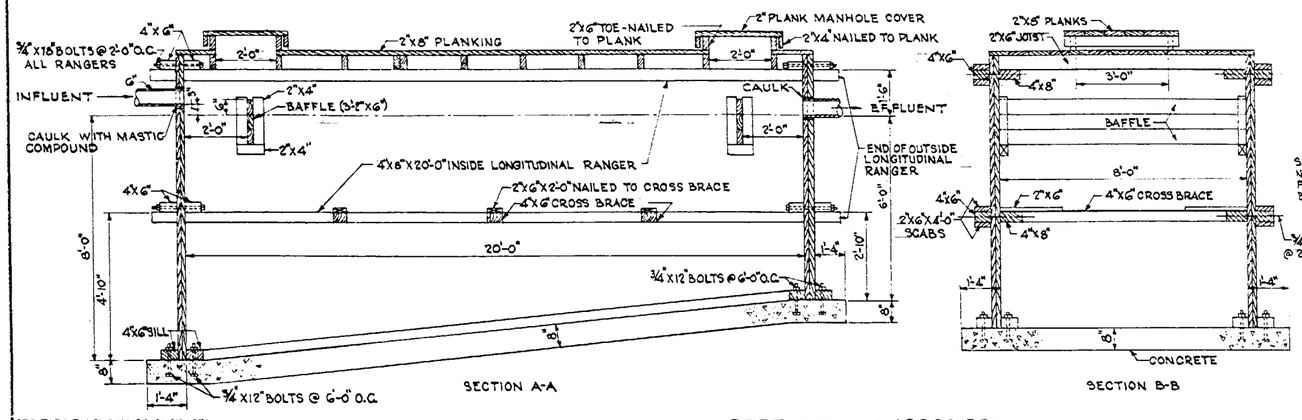
APPROVED: CHIEF, STANDARDS BRANCH
APPROVED: DATE: 19 MAR 1941
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE: 1st Sept 1941

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 82-21
SHEET 3 OF 3



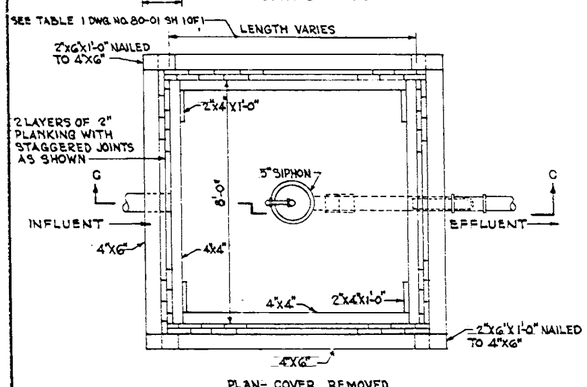
PLAN



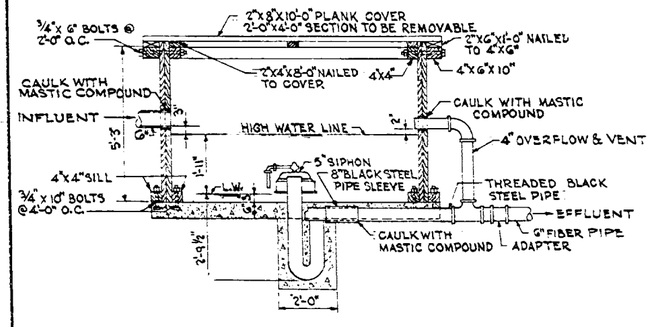
SECTION A-A

SECTION B-B

SEPTIC TANK-10000 GPD
SCALE NO. 4
FACILITY NO. 831102



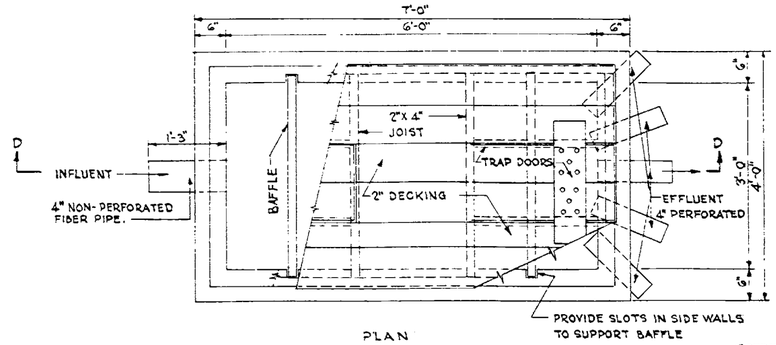
PLAN- COVER REMOVED



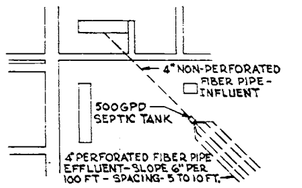
SECTION C-C

SIPHON CHAMBER-10000 GPD
NO SCALE
FACILITY NO. 831103

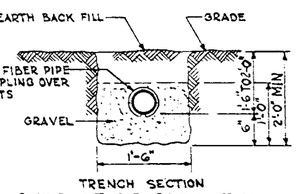
FACILITY NO 831104
DRAIN FIELD - 10,000 GPD
(SEE DWGS. NO. 80-01 & 83-15)



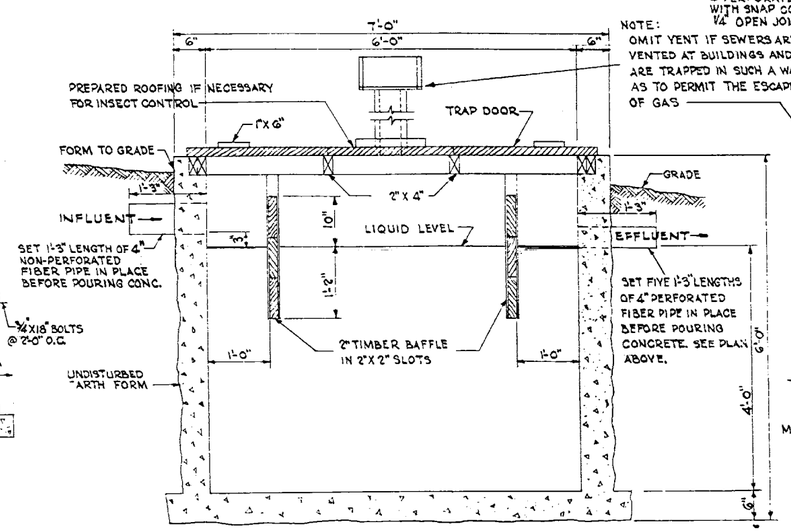
PLAN



PLAN



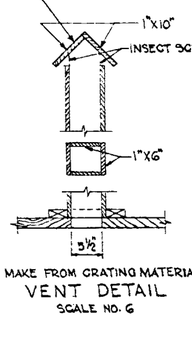
TRENCH SECTION
SUBSURFACE IRRIGATION
NO SCALE



SECTION D-D

SEPTIC TANK- 500 GPD
SCALE NO. 6
FACILITY NO. 831101

NOTE:
OMIT VENT IF SEWERS ARE VENTED AT BUILDINGS AND ARE TRAPPED IN SUCH A WAY AS TO PERMIT THE ESCAPE OF GAS



MAKE FROM GRATING MATERIAL
VENT DETAIL
SCALE NO. 6

DESIGN DATA - 500 GPD SEPTIC TANK

DESIGN OF SEPTIC TANK

TANK CAPACITY SHOULD PROVIDE APPROXIMATELY 24 HOURS DETENTION AT THE RATE OF 500 GALLONS PER DAY. LENGTH SHOULD NOT BE LESS THAN TWO OR MORE THAN THREE TIMES THE WIDTH. PROVIDE LIQUID DEPTH OF 4 FEET.

SOIL TEST

TO DETERMINE ABSORPTION CAPACITY OF GROUND FOR SUB SOIL DISPOSAL, DIG TEST HOLES ONE FOOT SQUARE TO PROPOSED DEPTH OF TILE AND FILL WITH WATER TO A DEPTH OF ONE FOOT. AFTER WATER HAS SEEPED AWAY AND WHILE BOTTOM OF HOLE IS STILL WET, REFILL WITH WATER TO A DEPTH OF 6 INCHES AND NOTE AVERAGE TIME REQUIRED FOR SURFACE TO DROP ONE INCH & COMPUTE TRENCH LENGTH FROM THE TABLE.

APPLICATION RATES OF SEWAGE BY SUB-SURFACE IRRIGATION

TIME IN MINUTES REQUIRED FOR WATER TO FALL 1 INCH IN TEST HOLE	ABSORPTION IN GALS PER DAY PER 100 FT OF TRENCH BOTTOM 1'-6" WIDE IN TILE FIELDS.
1	600
2	480
5	360
15	255
30	120
60	90

EXAMPLE: 30 MINUTES FOR WATER TO FALL 1 INCH THEREFORE: ABSORPTION = 120 GPD PER 100 FT OF TRENCH. 500 GPD / 120 = 417 FT OF PERFORATED PIPE.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4'
NO. 4
0 1' 2'
NO. 6

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I.LYUS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

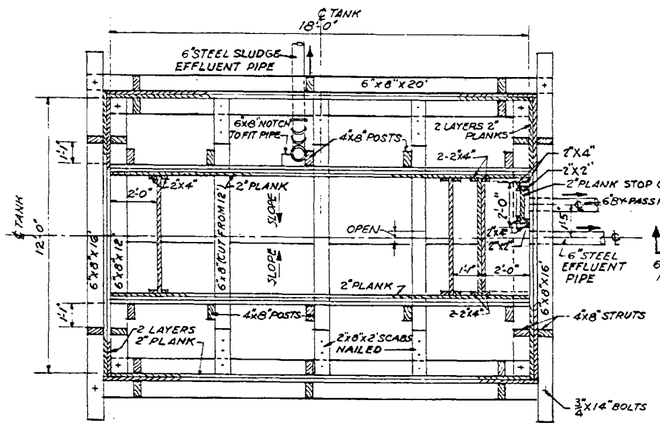
THEATER OF OPERATIONS

UNDER REVISION

SEPTIC TANK-500 GPD
SEPTIC TANK-10,000 GPD
SIPHON CHAMBER-10,000 GPD
PLANS & DETAILS

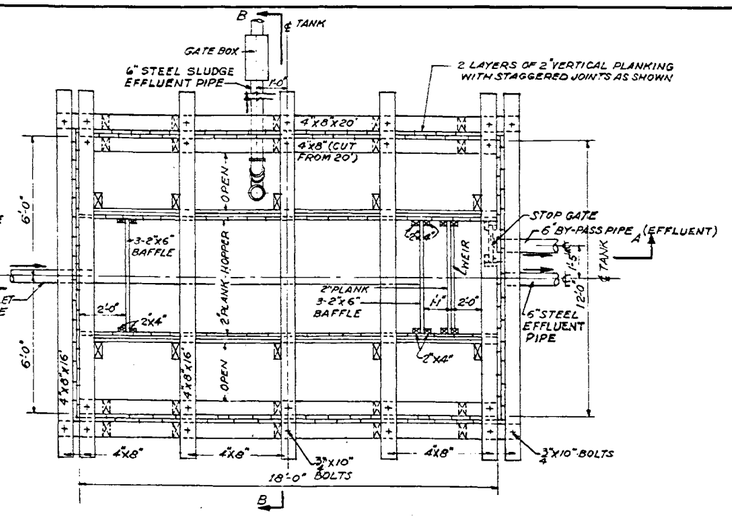
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
83-11



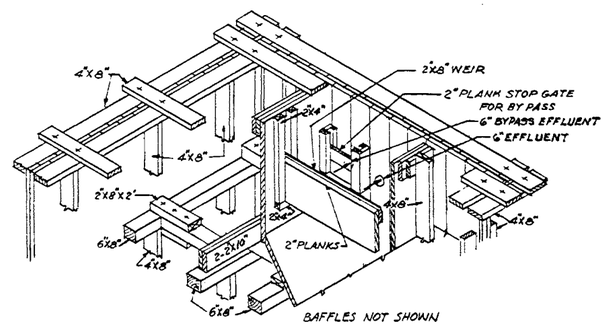
PLAN AT 3-3

SCALE NO. 3



PLAN AT TANK TOP

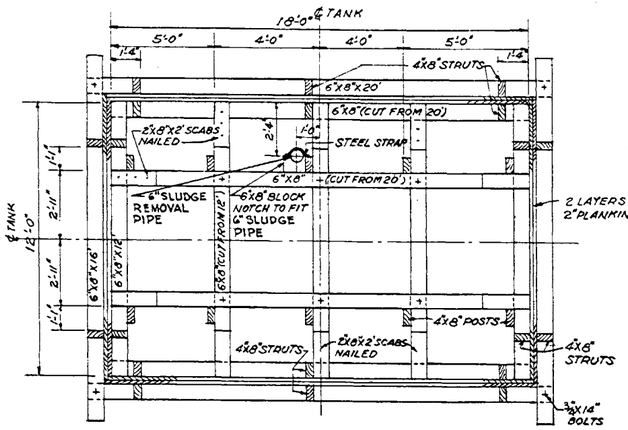
SCALE NO. 3



ISOMETRIC VIEW OF TANK AT OUTLET END SHOWING CONSTRUCTION DETAILS

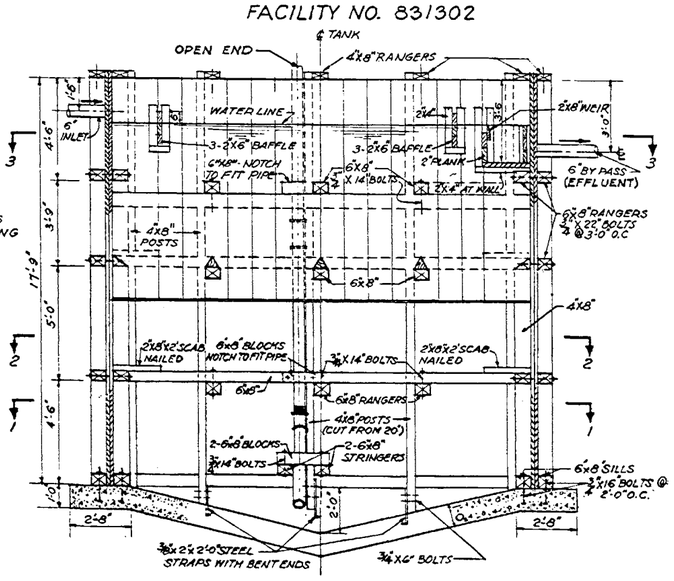
NO SCALE

FACILITY NO. 831302



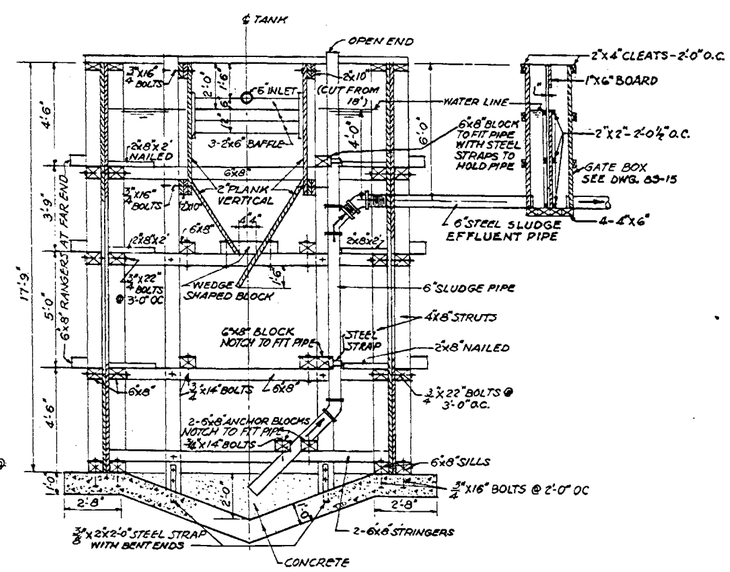
PLAN AT 2-2

SCALE NO. 3



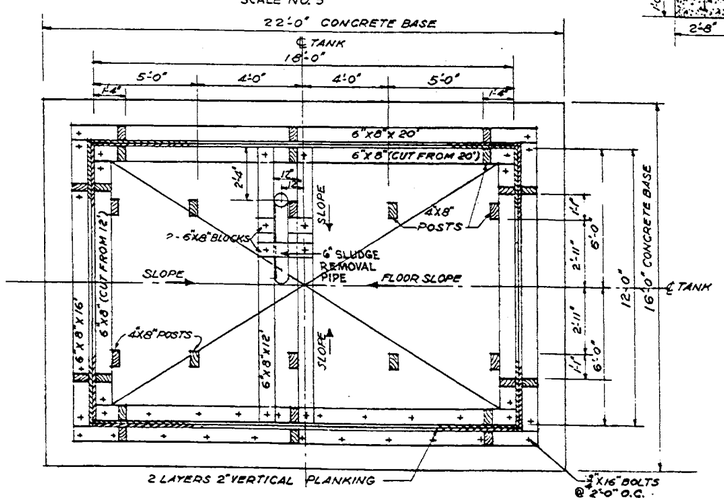
SECTION A-A

SCALE NO. 3



SECTION B-B

SCALE NO. 3



PLAN AT 1-1

SCALE NO. 3

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
83-13	SEWAGE DISPOSAL PLANT	1,2,3 OF 3
83-15	SLUDGE DRYING BED	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' 4' 5'

NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

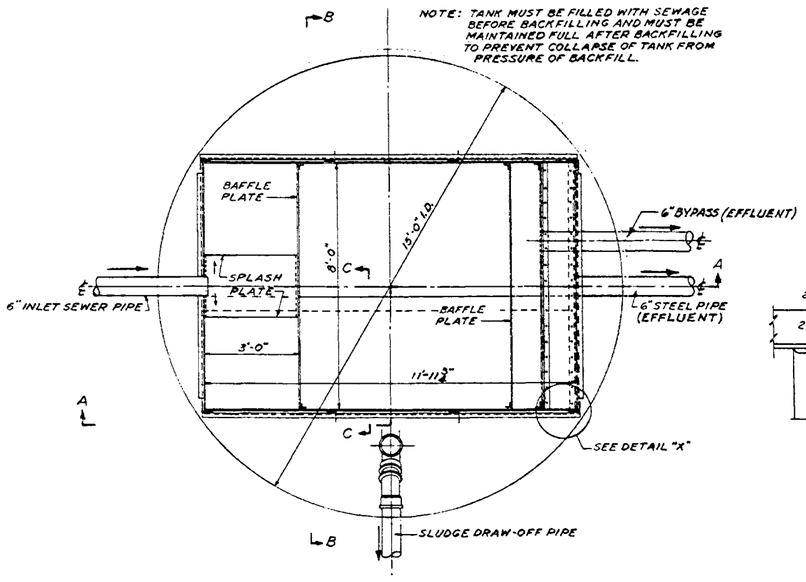
DRAWN BY: FAY
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT
IMHOFF TANK-WOOD-10000 GPD

UNDER REVISION

APPROVED: DATE: 19 MAR 1969

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 3
83-13



PLAN
SCALE NO. 4
FACILITY NO. 831306

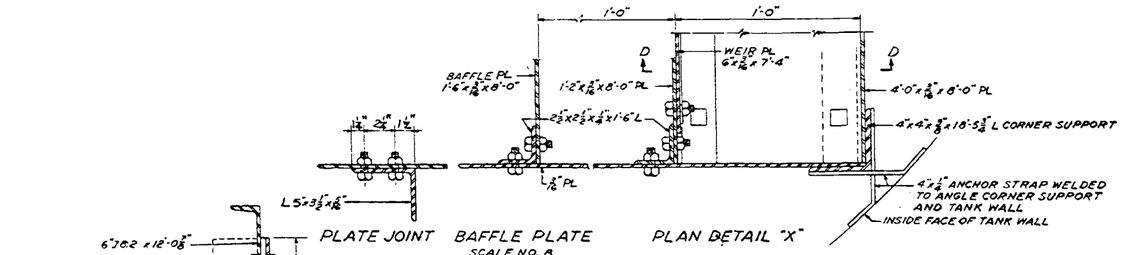
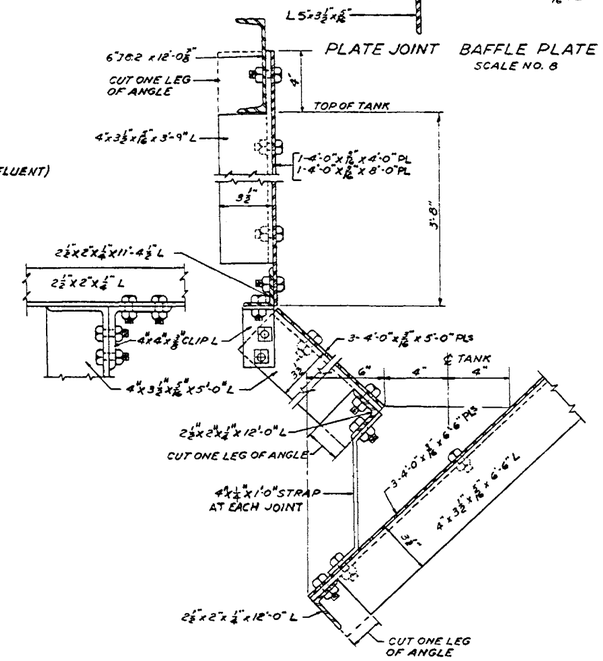
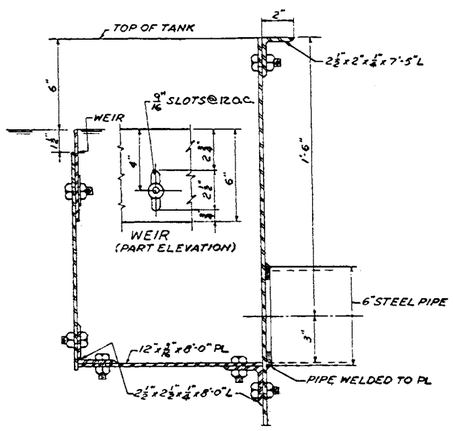


PLATE JOINT BAFFLE PLATE
SCALE NO. 8

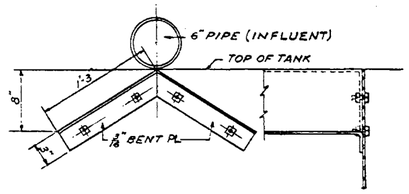
PLAN DETAIL "X"



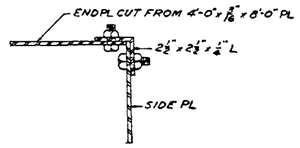
SECTION C-C
NO SCALE



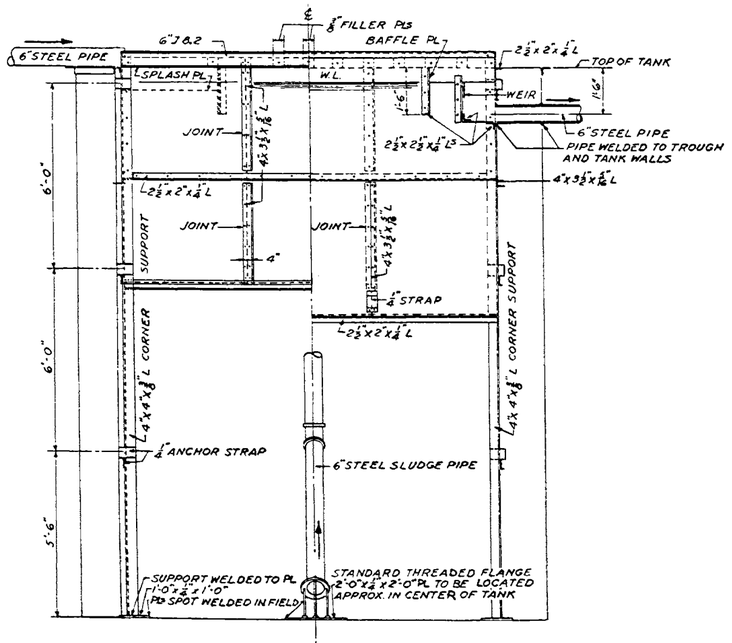
SECTION D-D
SCALE NO. 8



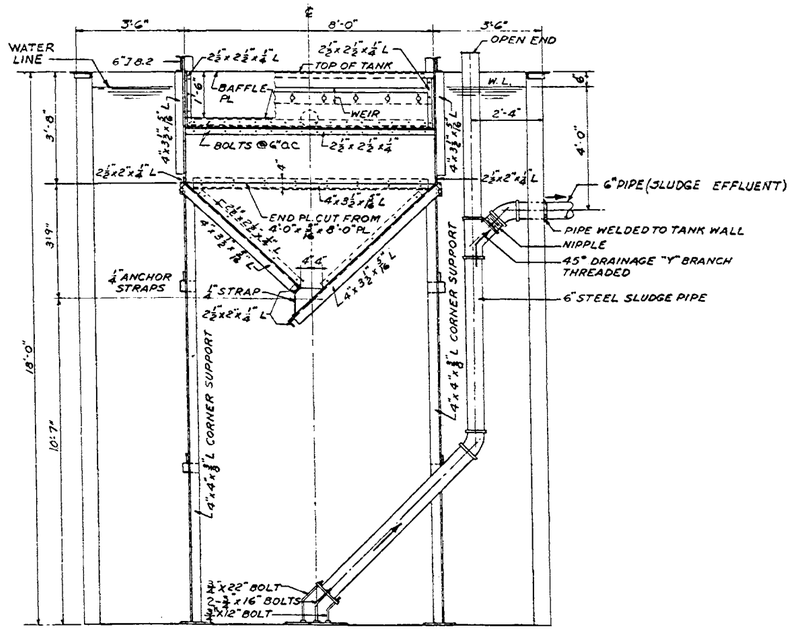
DETAILS OF SPLASH PLATE
SCALE NO. 7



DETAIL AT END PLATE
SCALE NO. 8



SECTION A-A
SCALE NO. 4



SECTION B-B
SCALE NO. 4

NOTES:
1. USE STEEL IMHOFF TANK WHERE LEAKAGE WILL ENDANGER WATER SUPPLY OR WATER LEVEL IS MORE THAN 3 FT. ABOVE GRADE.
2. ALL BOLTS TO BE ¾ x 2" WITH ⅞" HOLES; SPACING OF BOLTS TO BE 12" O.C. UNLESS OTHERWISE SHOWN.
3. ALL PLATES TO BE ¼" THICK UNLESS OTHERWISE NOTED.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 6' NO. 4
0 3" 6" 9" 1' 2' NO. 7
0 1" 2" 3" 6" 9" 1' NO. 8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

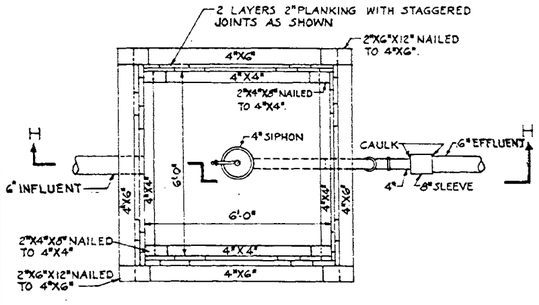
DRAWN BY: FAY
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. Schaaf

THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT DETAILS
IMHOFF TANK, METAL - 30000 GPD

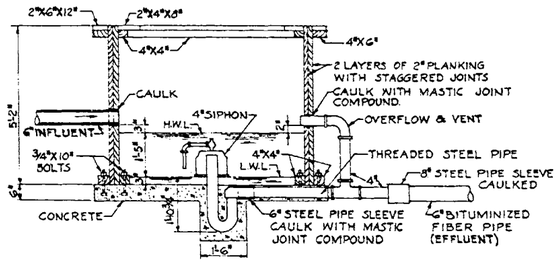
UNDER REVISION

APPROVED: W. H. Williams DATE: 19 MAR 1959
CHIEF, STRUCTURES BRANCH, ENGR. ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 83-13
SHEET 2 OF 3

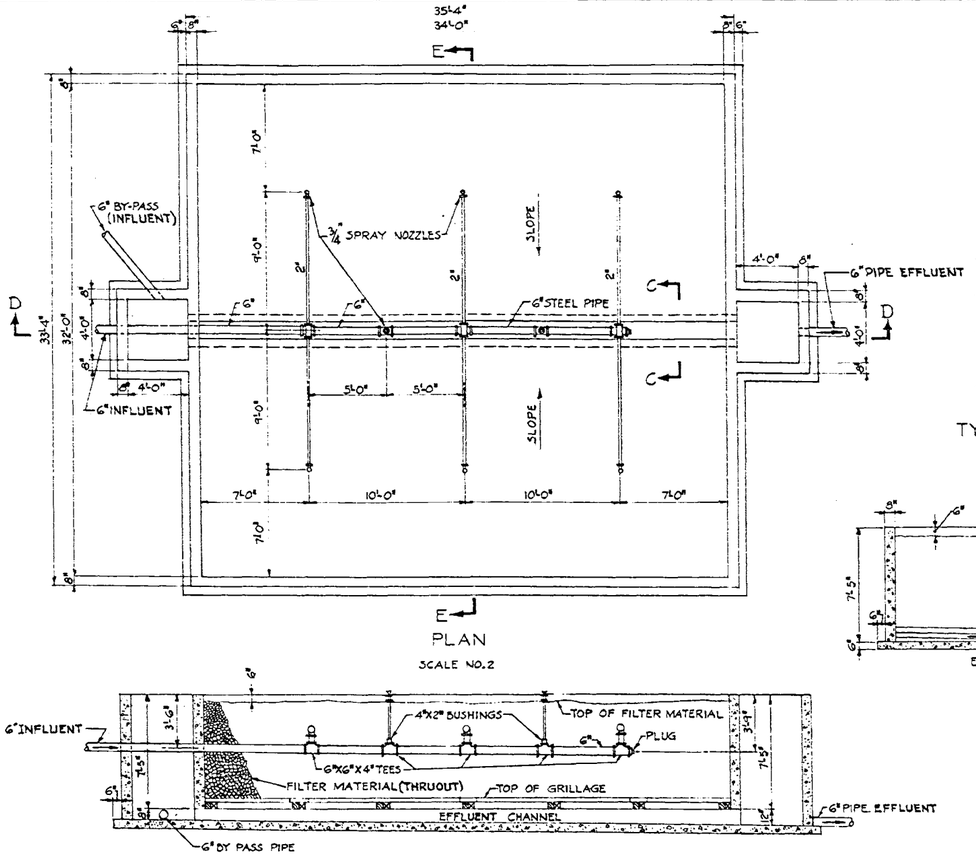


PLAN



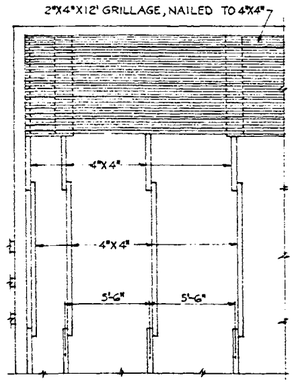
SECTION HH

SIPHON CHAMBER
SCALE NO. 4
FACILITY NO. 831301

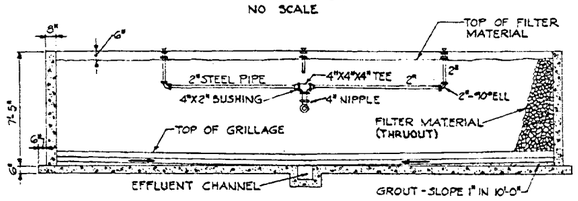


PLAN
SCALE NO. 2

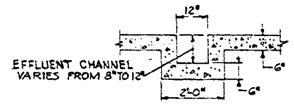
SECTION D-D
SCALE NO. 2



TYPICAL LAYOUT PLAN OF GRILLAGE AND GRILLAGE SUPPORTS (WOOD)
NO SCALE



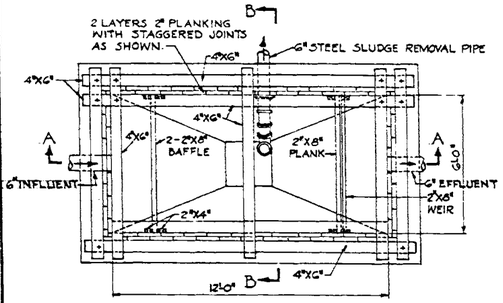
SECTION E-E
SCALE NO. 2



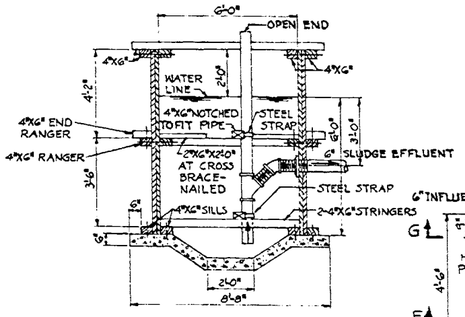
SECTION C-C
SCALE NO. 4

FILTER MATERIAL SPECIFICATIONS

MATERIAL FOR FILTER MEDIA SHOULD BE SOUND HARD PIECES, CLEAN AND FREE FROM DUST, SCREENINGS, AND OTHER FINE MATERIAL. IT SHOULD BE AS NEARLY UNIFORM IN SIZE AS POSSIBLE. THE MATERIAL SHOULD NOT DISINTEGRATE UNDER SERVICE CONDITION, EITHER BY BREAKING INTO SMALLER PIECES OR BY CRUMBLING INTO FINE MATERIAL. THE USE OF FLAT ELONGATED OR GLASSY PIECES SHOULD BE AVOIDED. MATERIAL MAY BE GRAVEL, BROKEN STONE, SLAG, OR OTHER HARD DURABLE SUBSTANCE. THE MATERIAL SHALL BE OF A SIZE THAT WILL PASS A 2 1/2" SCREEN AND BE RETAINED ON A 1 3/4" ROUND SCREEN. THE SODIUM SULPHATE SOUNDNESS TEST MAY BE USED TO DETERMINE DURABILITY OF STONE.

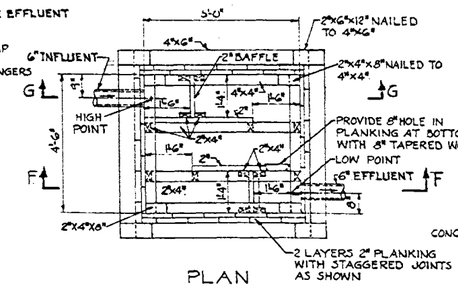


PLAN

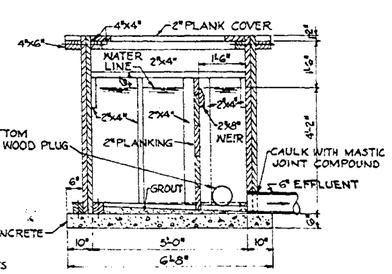


SECTION B-B

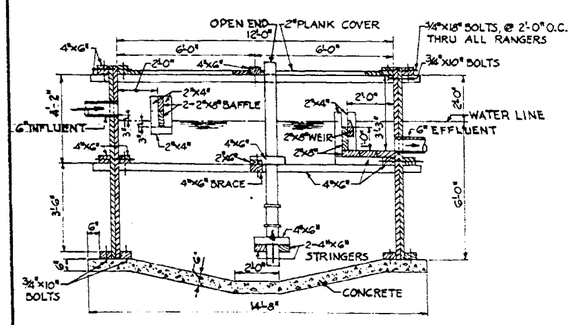
TRICKLING FILTER
FACILITY NO. 831304



PLAN

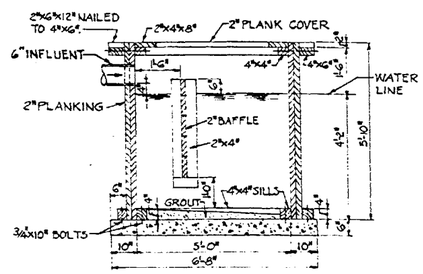


SECTION F-F



SECTION A-A

FINAL SETTLING TANK
SCALE NO. 3
FACILITY NO. 831305



SECTION G-G

CHLORINE CONTACT CHAMBER
SCALE NO. 4
FACILITY NO. 831303

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' NO. 2 | 0 1' 2' 3' 4' 5' NO. 3 | 0 1' 2' 3' 4' NO. 4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

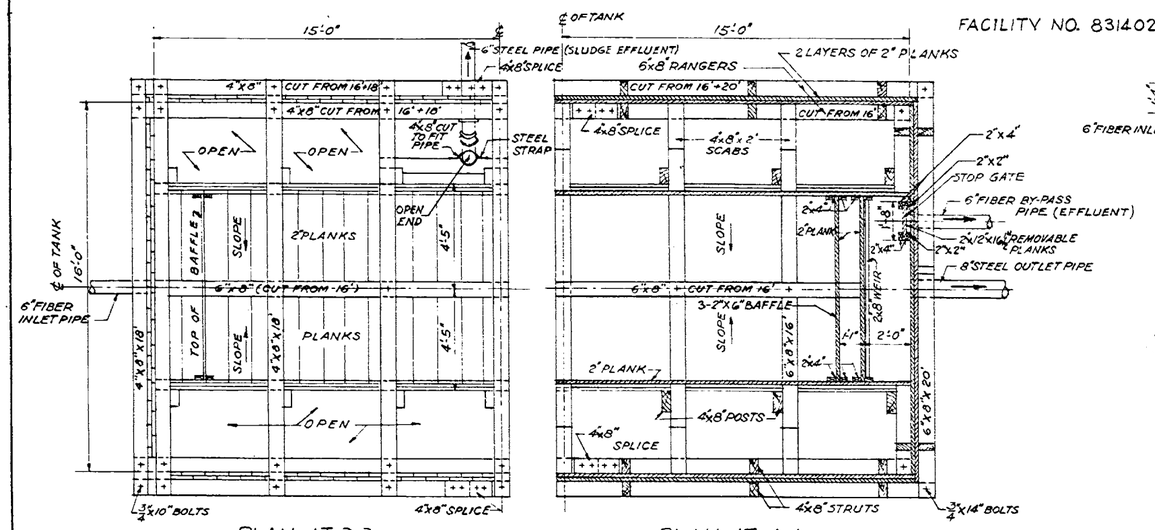
DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT DETAILS
SIPHON CHAMBER-TRICKLING FILTER-FINAL SETTLING TANK-CHLORINE CONTACT CHAMBER
30,000 GPD

UNDER REVISION

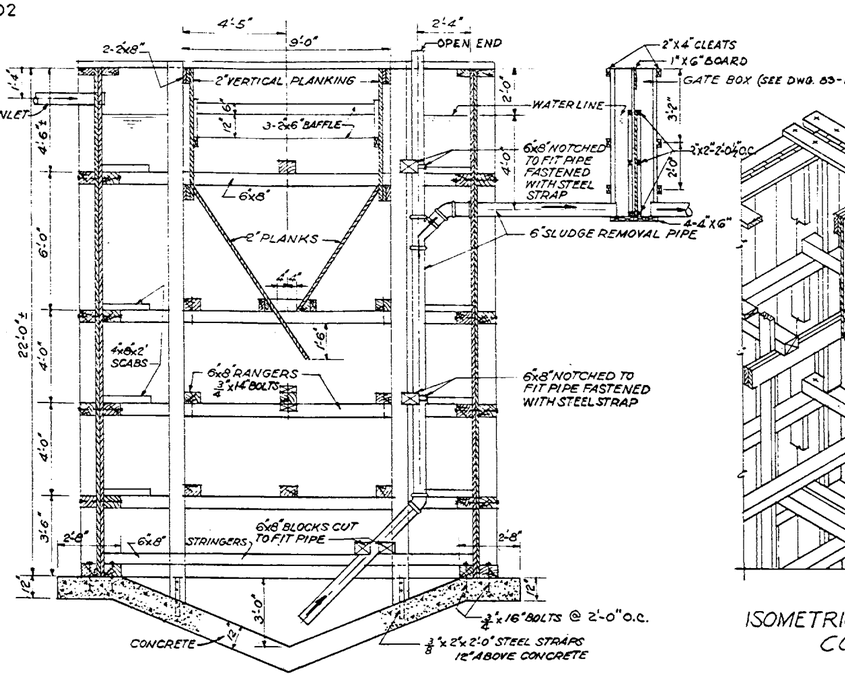
APPROVED: H.M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 83-13
SHEET 3 OF 3

FACILITY NO. 831402

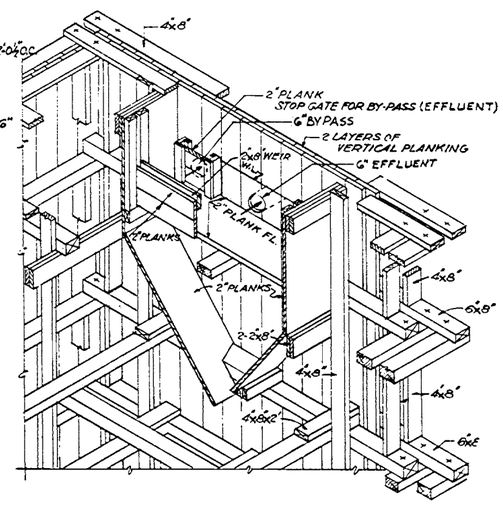


PLAN AT 3-3
SCALE NO.3

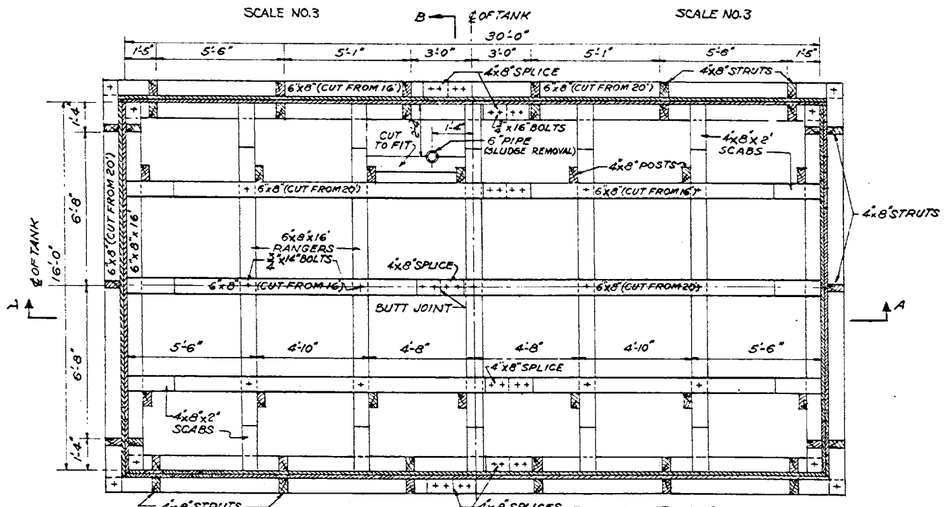
PLAN AT 4-4
SCALE NO.3



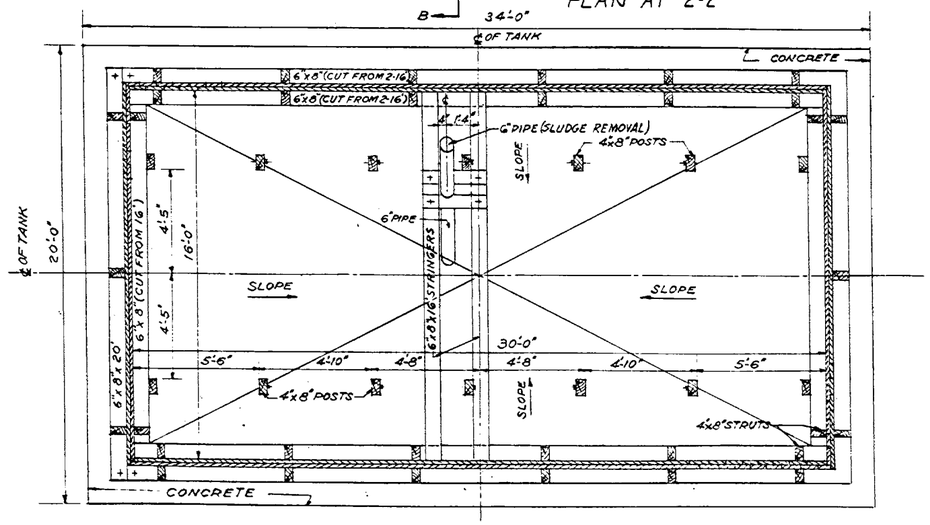
SECTION B-B
SCALE NO.3



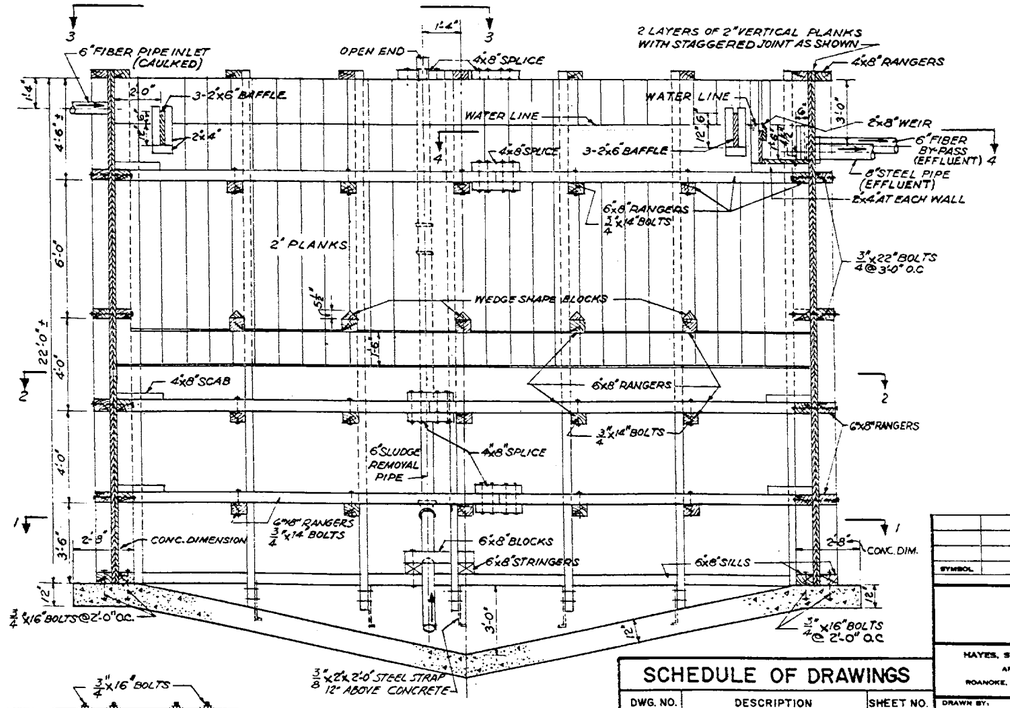
ISOMETRIC VIEW OF TANK SHOWING CONSTRUCTION DETAILS
NO SCALE



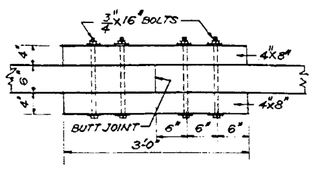
PLAN AT 2-2
SCALE NO.3



PLAN AT 1-1
SCALE NO.3



SECTION A-A
SCALE NO.3



TYPICAL JOINT
SCALE NO.6

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
83-14	SEWAGE DISPOSAL PLANT	1,2,3 OF 3
83-15	SLUDGE DRYING BED	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5' NO.3
0 1' 2' NO.6

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

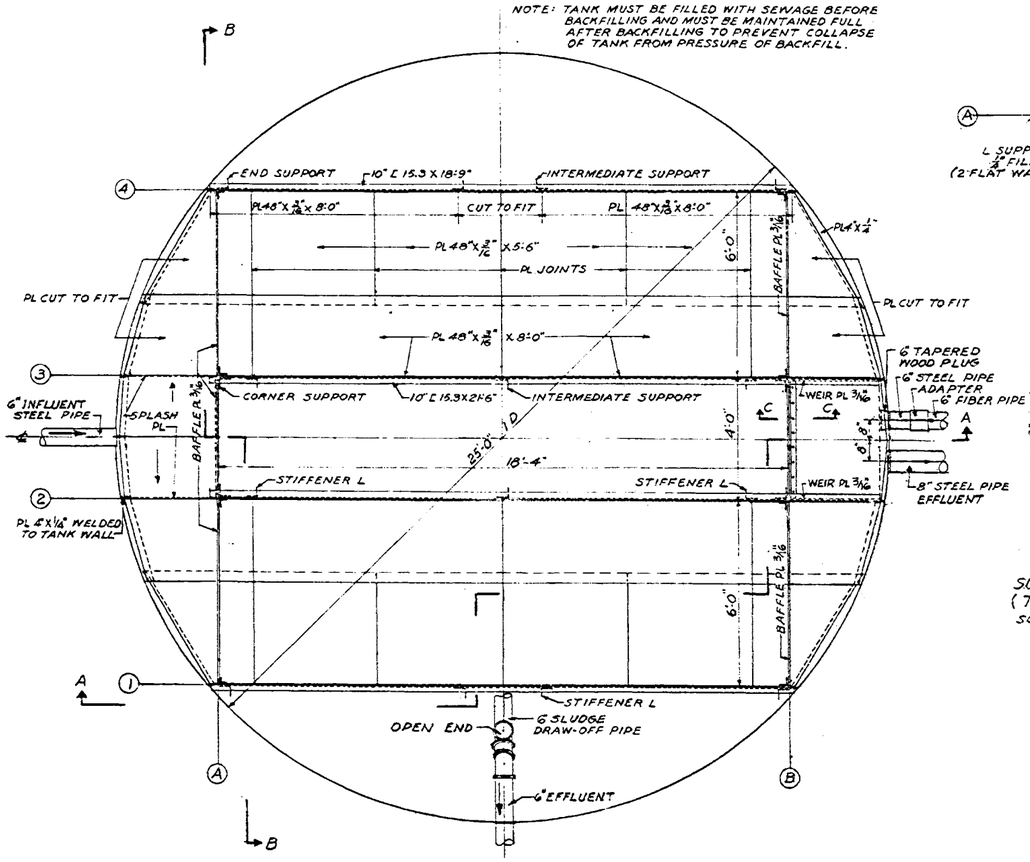
DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: H. M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT DETAILS
IMHOFF TANK-WOOD-100000 GPD

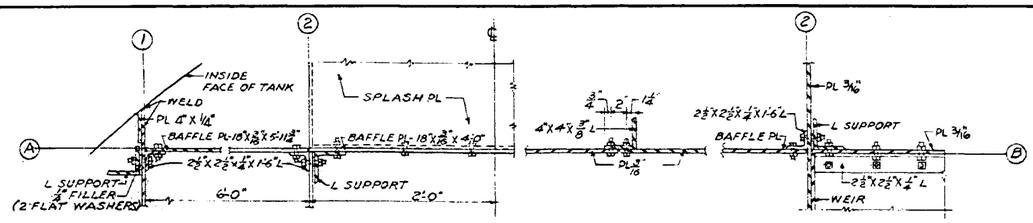
UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 83-14
SHEET 1 OF 3

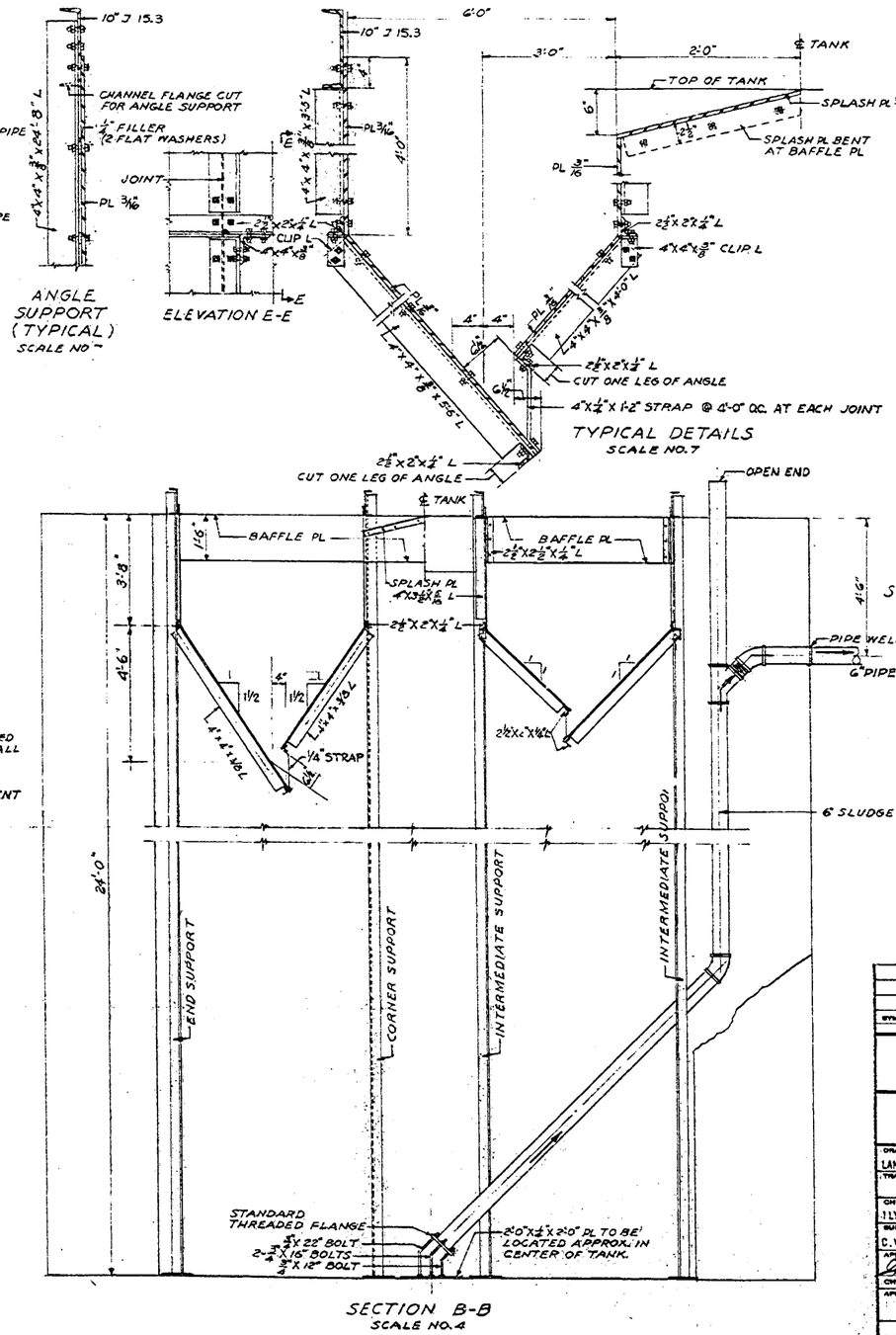
NOTE: TANK MUST BE FILLED WITH SEWAGE BEFORE BACKFILLING AND MUST BE MAINTAINED FULL AFTER BACKFILLING TO PREVENT COLLAPSE OF TANK FROM PRESSURE OF BACKFILL.



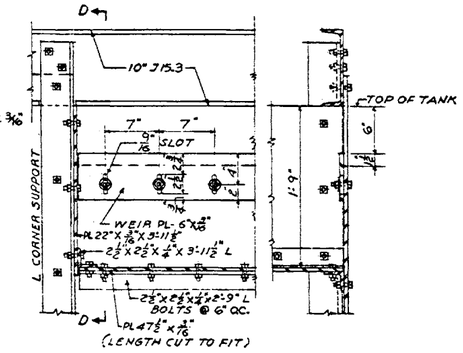
PLAN
SCALE NO. 4
FACILITY NO. 831406



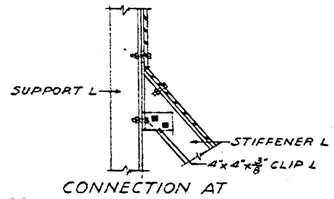
TYPICAL CONNECTIONS - PLAN SECTIONS
SCALE NO. 7



SECTION B-B
SCALE NO. 4

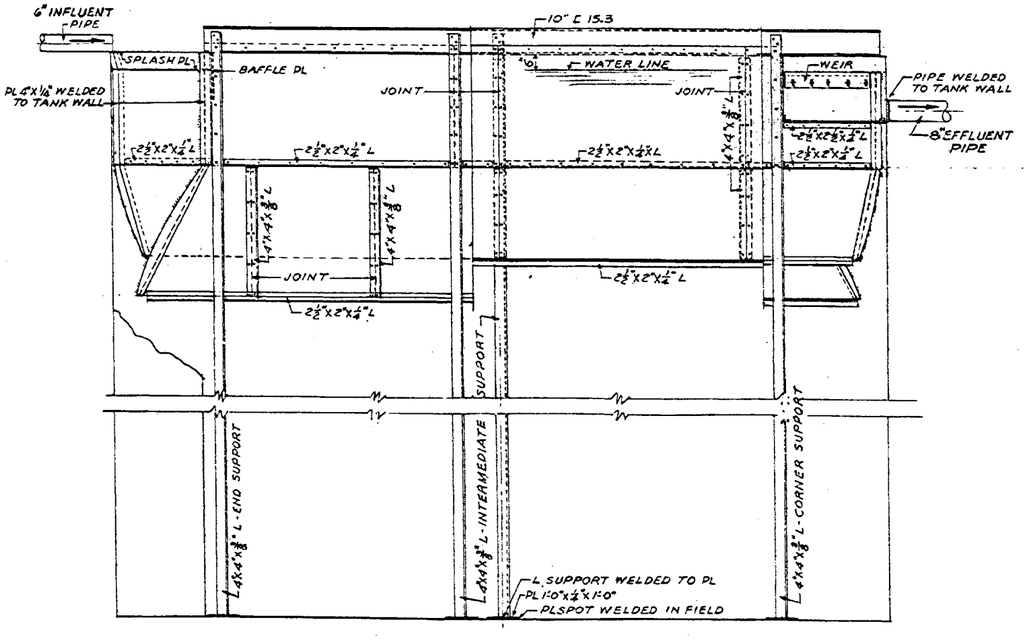


SECTION C-C SECTION D-D
SCALE NO. 7



CONNECTION AT SUPPORT & STIFFENER ANGLES
SCALE NO. 7

NOTES:
ALL BOLTS TO BE 3/4"X2" WITH 13/16" HOLES; SPACING OF BOLTS TO BE 12" O.C., UNLESS OTHERWISE SHOWN.



SECTION A-A
SCALE NO. 4

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
NO. 4: 0 1' 2' 3' 4'
NO. 7: 0 3" 6" 9" 1' 2'

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

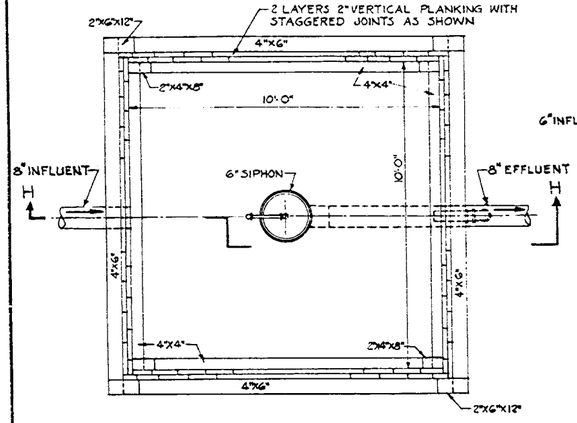
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: I LYLIS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, CONSTRUCTION BRANCH, DIVISION, MIL. CONSTR., O.C.E.
APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

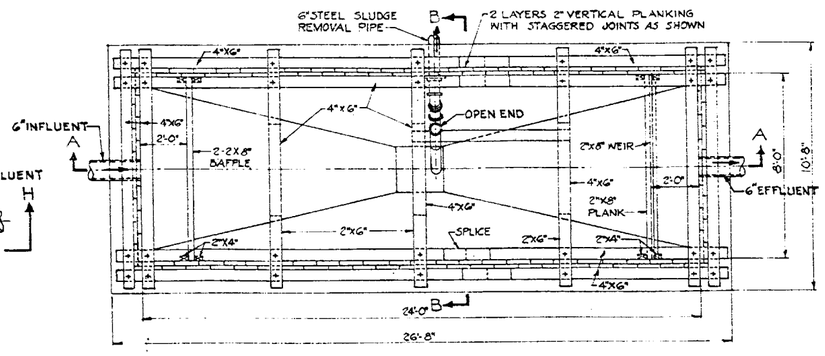
THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT DETAILS
IMHOFF TANK-METAL-1000000 GPD

UNDER REVISION

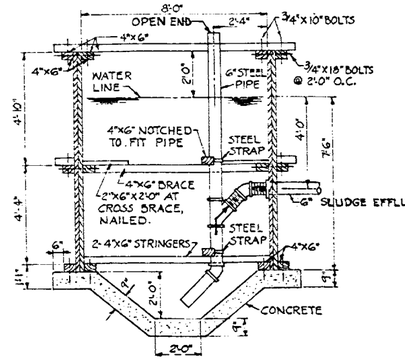
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 83-14
SHEET 2 OF 3



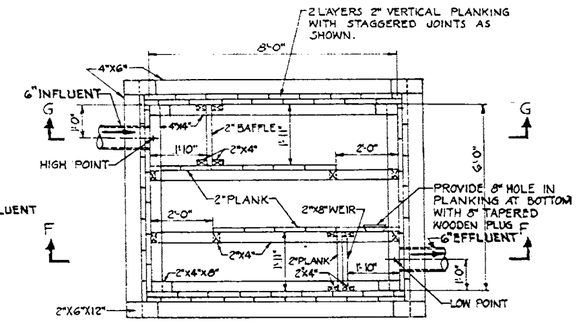
PLAN



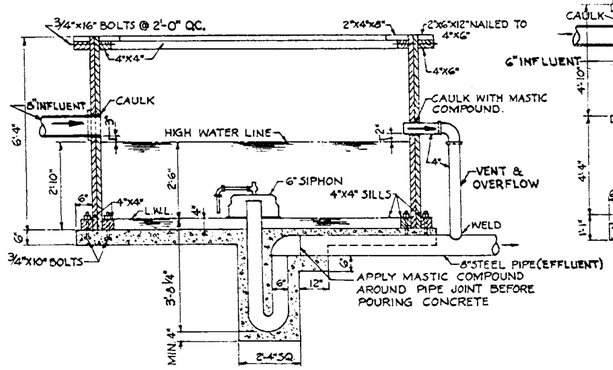
PLAN



SECTION B-B

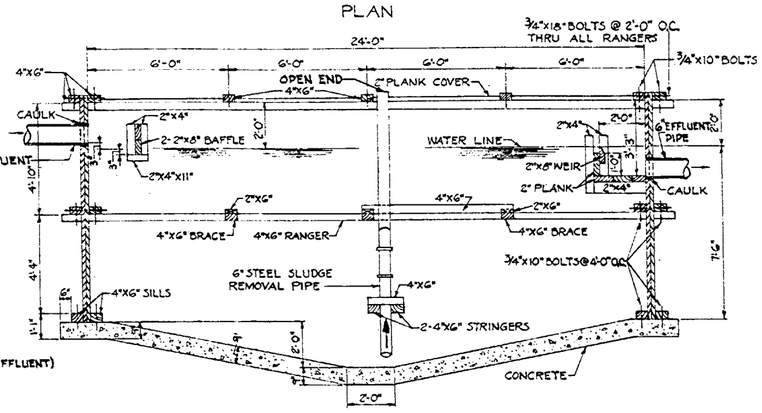


PLAN

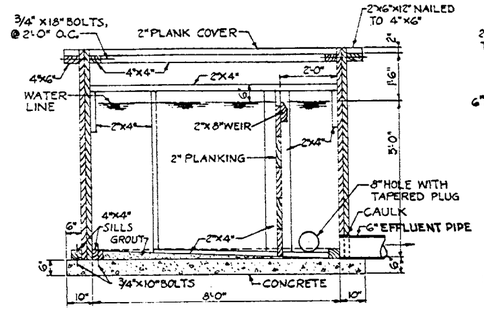


SECTION H-H

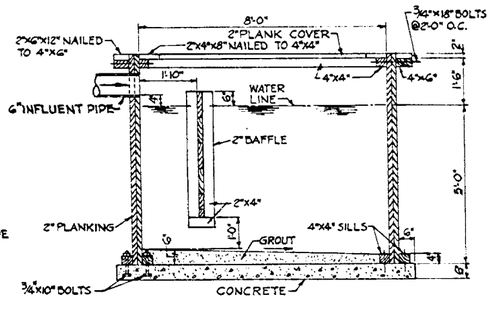
SIPHON CHAMBER
SCALE NO.4
FACILITY NO. 831401



SECTION A-A



SECTION F-F



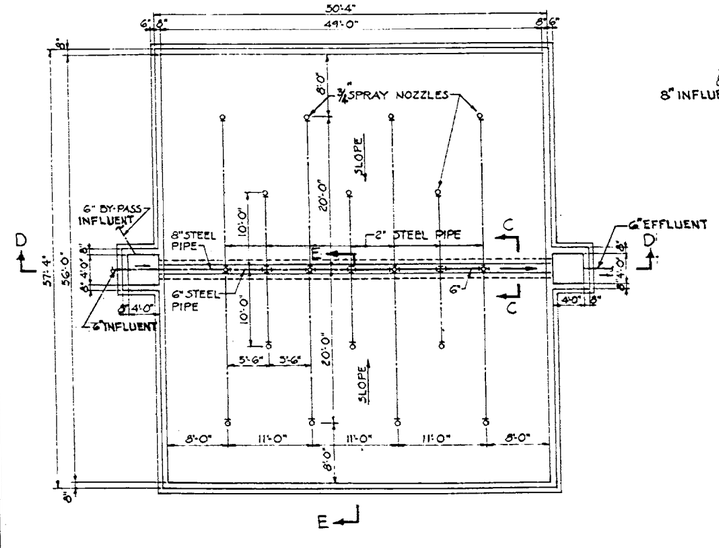
SECTION G-G

FINAL SETTLING TANK
SCALE NO. 3
FACILITY NO. 831405

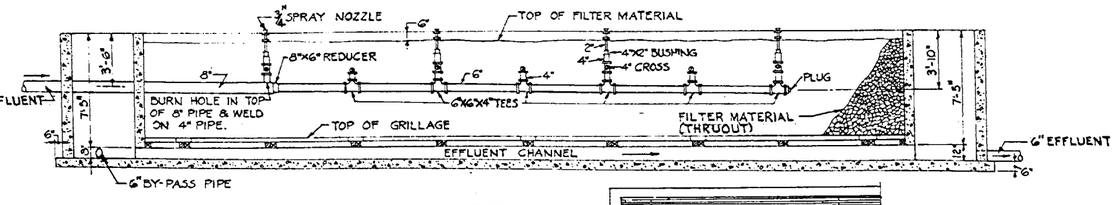
CHLORINE CONTACT CHAMBER
SCALE NO. 4
FACILITY NO. 831403

FILTER MATERIAL SPECIFICATIONS

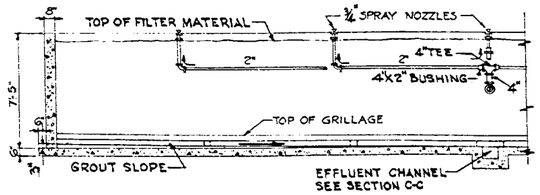
MATERIAL FOR FILTER MEDIA SHOULD BE SOUND HARD PIECES, CLEAN AND FREE FROM DUST, SCREENINGS, AND OTHER FINE MATERIAL. IT SHOULD BE AS NEARLY UNIFORM IN SIZE AS POSSIBLE. THE MATERIAL SHOULD NOT DISINTEGRATE UNDER SERVICE CONDITION, EITHER BY BREAKING INTO SMALLER PIECES OR BY CRUMBLING INTO FINE MATERIAL. THE USE OF FLAT ELONGATED OR GLASSY PIECES SHOULD BE AVOIDED. MATERIAL MAY BE GRAVEL, BROKEN STONE, SLAG, OR OTHER HARD DURABLE SUBSTANCE. THE MATERIAL SHALL BE OF A SIZE THAT WILL PASS A 2½" SCREEN AND BE RETAINED ON A 1¾" ROUND SCREEN. THE SODIUM SULPHATE SOUNDNESS TEST MAY BE USED TO DETERMINE DURABILITY OF STONE.



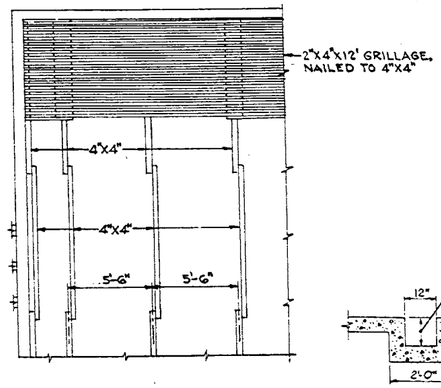
PLAN
SCALE NO. 1



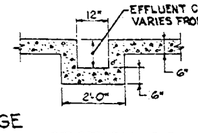
SECTION D-D
SCALE NO. 2



SECTION E-E
SCALE NO. 2



TYPICAL LAYOUT PLAN OF GRILLAGE AND GRILLAGE SUPPORTS (WOOD)
NO SCALE



SECTION C-C
EFFLUENT CHANNEL
SCALE NO. 4

TRICKLING FILTER
FACILITY NO. 831404

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO.1: 0 5' 10' 15'
NO.2: 0 1' 2' 3' 4'
NO.3: 0 1' 2' 3' 4' 5'
NO.4: 0 5' 10'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

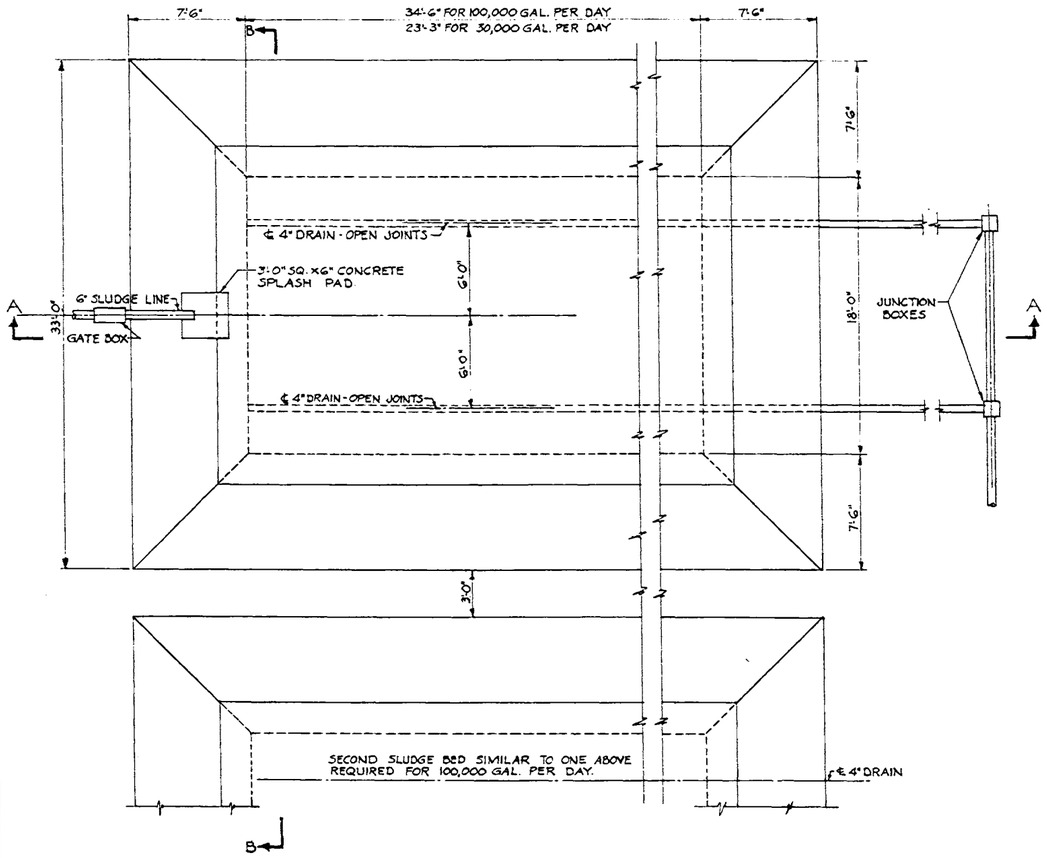
THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT DETAILS
STATION CHAMBER-TRICKLING FILTER-FINAL SETTLING TANK-CHLORINE CONTACT CHAMBER
100,000 GPD

UNDER REVISION

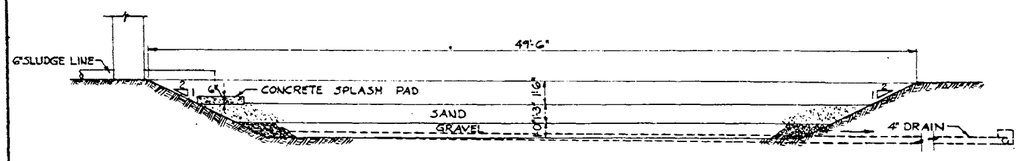
APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE:

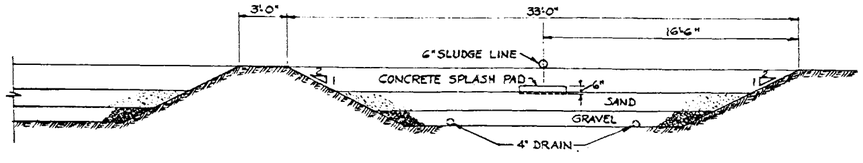
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 83-14
SHEET 3 OF 3



PLAN



SECTION A-A

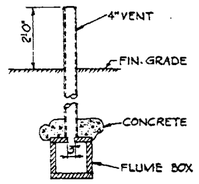


SECTION B-B

DETAIL - SLUDGE DRYING BEDS

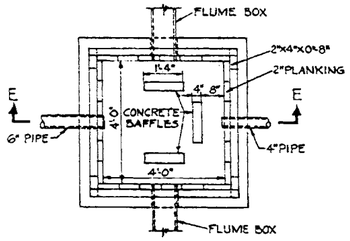
SCALE NO. 2

FACILITY NO. 831501 - 30,000 GPD
FACILITY NO 831502 - 100,000 GPD



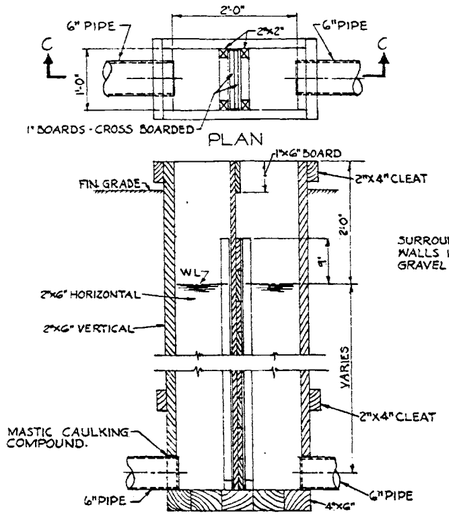
DETAIL - VENT

SCALE NO. 4



PLAN

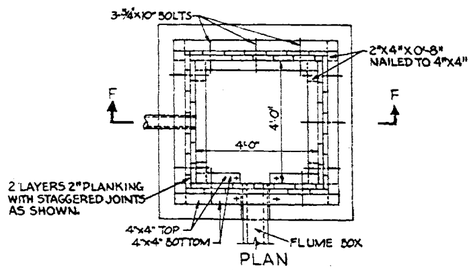
WITH COVER OFF



SECTION C-C

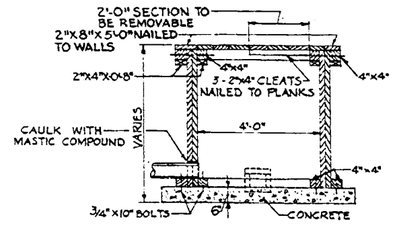
DETAIL - GATE BOX

SCALE NO. 6



PLAN

WITH COVER OFF

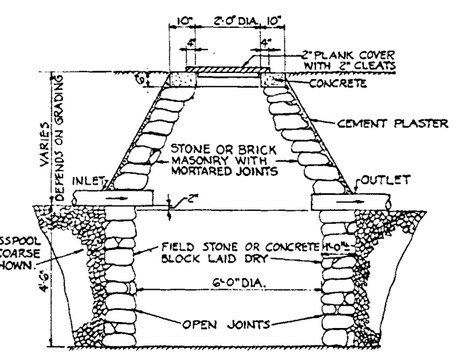


NOTE:
USE CRATING MATERIAL.

SECTION F-F

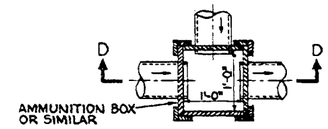
DETAIL - MANHOLE

SCALE NO. 4



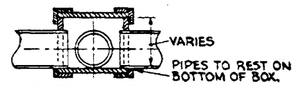
DETAIL - CESSPOOL

SCALE NO. 4



PLAN

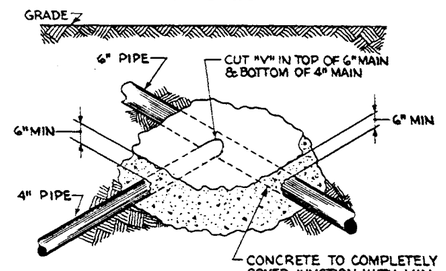
WITH COVER OFF



SECTION D-D

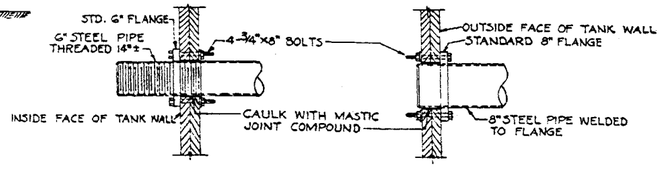
DETAIL - JUNCTION BOX

SCALE NO. 6



DETAIL - SOIL PIPE JUNCTION

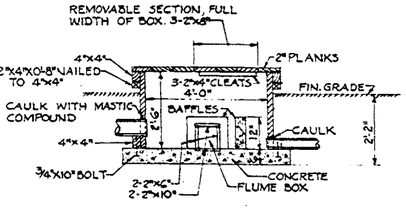
NO SCALE



FOR SLUDGE DRAW-OFF PIPE FOR INLET PIPE FOR OUTLET PIPE

DETAILS - PIPE PASSING THRU TANK OR CHAMBER WALL

SCALE NO. 6



SECTION E-E

DETAIL - DISTRIBUTION BOX

SCALE NO. 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10' 0 1' 2' 3' 4' 0 1' 2' — NO. 2 NO. 4 NO. 8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

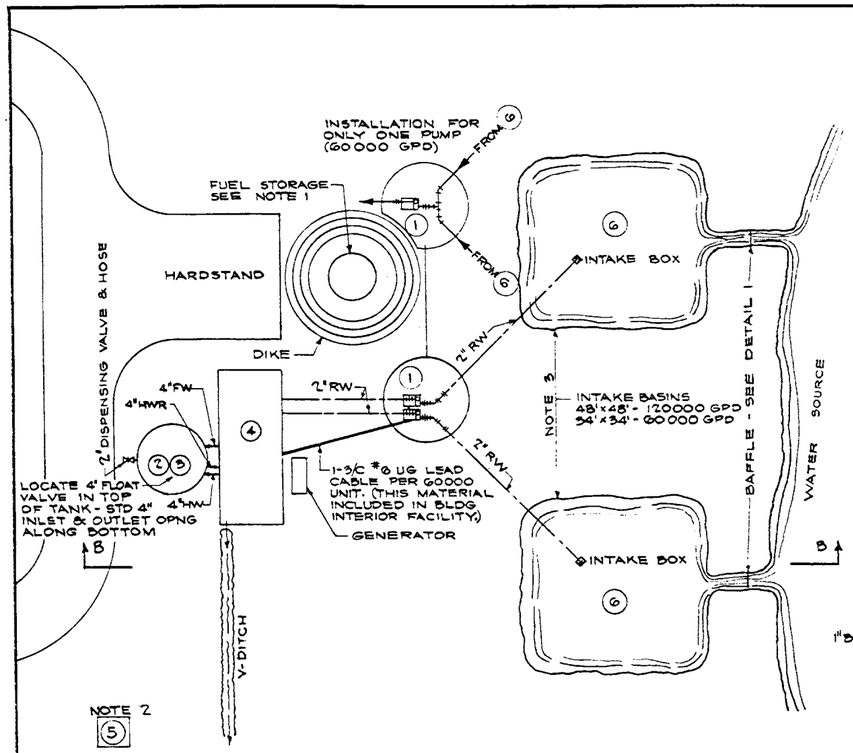
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LANKFORD
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DE ICHMANN
APPROVED: [signature] CHIEF, STRUCTURES DIVISION
APPROVED: [signature] L. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:

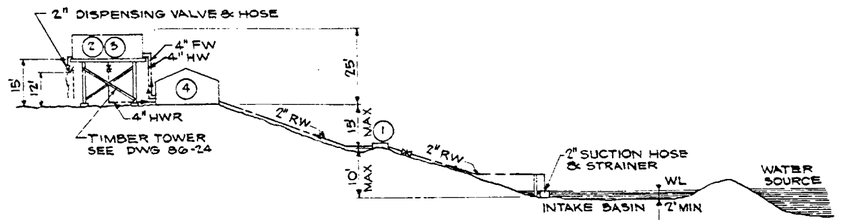
THEATER OF OPERATIONS
SEWAGE DISPOSAL PLANT DETAILS
SLUDGE DRYING BEDS
SPECIAL DETAILS

UNDER PERMISSION

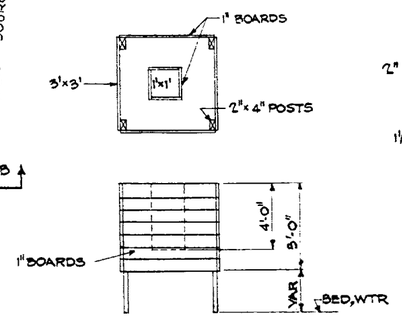
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 83-15
SHEET 1 OF 1



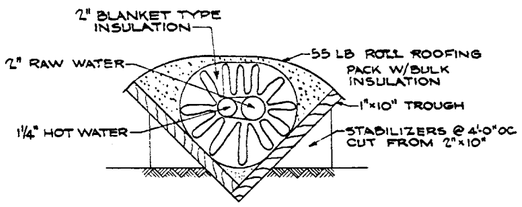
SITE LAYOUT
60000 & 120000 GPD - TEMPERATE & TROPICAL CLIMATES
SCALE NO. 11



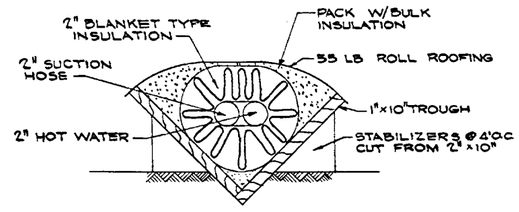
ELEVATION B-B - TEMPERATE & TROPICAL CLIMATES
SCALE NO. 11



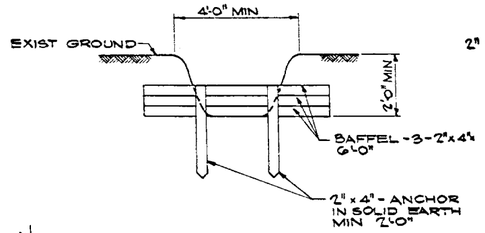
INTAKE BOX - FRIGID CLIMATE
TEMPERATE WHEN REQUIRED
NO SCALE



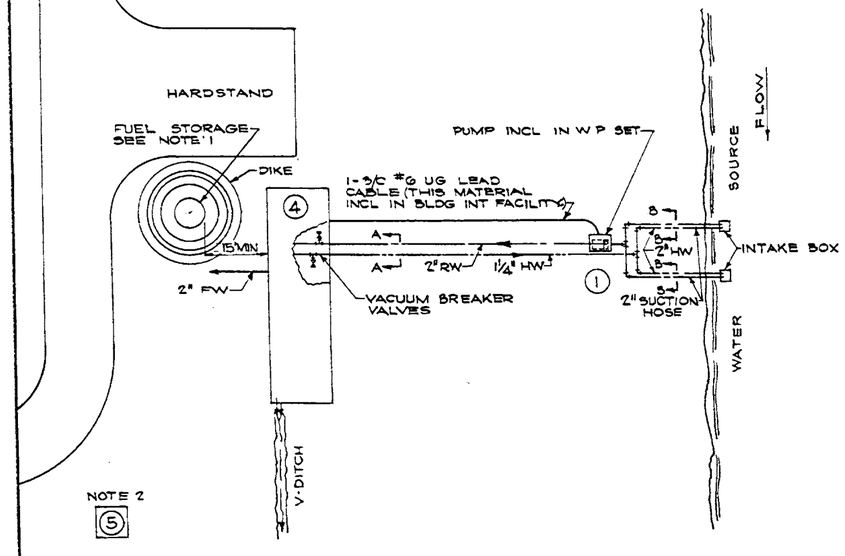
SECTION A-A
FRIGID CLIMATE
TEMPERATE WHEN REQUIRED
NO SCALE



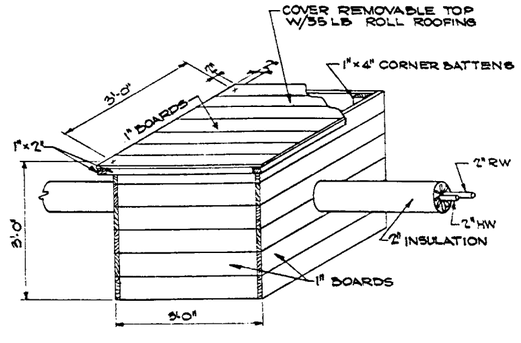
SECTION B-B
FRIGID CLIMATE
TEMPERATE WHEN REQUIRED
NO SCALE



DETAIL 1
NO SCALE



SITE LAYOUT
60000 GPD - FRIGID CLIMATE
SCALE NO. 11



PUMP ENCLOSURE - FRIGID CLIMATE
TEMPERATE CLIMATE WHEN REQUIRED
NO SCALE

SCHEDULE OF EQUIPMENT & FACILITIES

TROPICAL CLIMATE

SIZE INSTALLATION	60000 GPD		120000 GPD	
INSTALLATION STANDARD	STD-ITR	STD-TPR	STD-ITR	STD-TPR
STEEL FRAME BLDG	WS 1312	WS 1512	-	WS 2512
WOOD FRAME BLDG	WS 1322	WS 1522	-	WS 2522
FACILITY NUMBER (INTERIOR)	841701		841704	

NO.	DESCRIPTION	QTY	SIZE OR UNIT	DWG NO.	QTY	SIZE OR UNIT	DWG NO.
1	PUMP, CENTRIFUGAL, 1½", 65GPM, 50 FT HD, ELEC DRIVE	1			2		
2	TANK, WATER, VERTICAL	1	250 BBL				
3	TANK, WATER, VERTICAL				1	500 BBL	
4	ERDLATOR & CHEMICAL STGE	1	20'x40'	84-17	1	20'x50'	84-17
5	LATRINE, PIT TYPE, 2 SEATS	1	10'x10'	72-36	1	10'x10'	72-36
6	INTAKE BASIN, 2' MIN DEPTH	2	17500 GAL		2	34500 GAL	
	HARDSTAND, 4" EARTH OR STABILIZED CRUSHED STONE	0.27	1000 SY	85-31	0.27	1000 SY	85-31
	ROAD, 2 LANE, 6" EARTH OR STABILIZED CRUSHED STONE	0.08	MILE	85-31	0.08	MILE	85-31
	SITE AREA	3	ACRE		3	ACRE	

TEMPERATE CLIMATE

SIZE INSTALLATION	60000 GPD		120000 GPD	
INSTALLATION STANDARD	STD-ITR	STD-TPR	STD-ITR	STD-TPR
STEEL FRAME BLDG	WS 1311	WS 1511	-	WS 2511
WOOD FRAME BLDG	WS 1321	WS 1521	-	WS 2521
FACILITY NUMBER (INTERIOR)	841702		841705	

NO.	DESCRIPTION	QTY	SIZE OR UNIT	DWG NO.	QTY	SIZE OR UNIT	DWG NO.
1	PUMP, CENTRIFUGAL, 1½", 65 GPM, 50 FT HD, ELEC DRIVE	1			2		
2	TANK, WATER, VERTICAL	1	250 BBL				
3	TANK, WATER, VERTICAL				1	500 BBL	
4	ERDLATOR & CHEMICAL STGE	1	20'x40'	84-17	1	20'x50'	84-17
5	LATRINE, PIT TYPE, 2 SEATS	1	10'x10'	72-36	1	10'x10'	72-36
6	INTAKE BASIN, 2' MIN DEPTH	2	17500 GAL		2	34500 GAL	
	HARDSTAND, 4" EARTH OR STABILIZED CRUSHED STONE	0.27	1000 SY	85-31	0.27	1000 SY	85-31
	ROAD, 2 LANE, 6" EARTH OR STABILIZED CRUSHED STONE	0.08	MILE	85-31	0.08	MILE	85-31
	SITE AREA	3	ACRE		3	ACRE	

FRIGID CLIMATE

SIZE INSTALLATION	60000 GPD	
INSTALLATION STANDARD	STD-ITR	STD-TPR
STEEL FRAME BLDG	-	WS 1513
WOOD FRAME BLDG	-	WS 1523
FACILITY NUMBER (INTERIOR)	841703	

NO.	DESCRIPTION	QTY	SIZE OR UNIT	DWG NO.
1	PUMP, CENTRIFUGAL, 1½", 65GPM, 50 FT HEAD, ELEC DRIVE.	1		
4	ERDLATOR & CHEMICAL STGE	1	20'x70"	84-17
5	LATRINE, PIT TYPE, 2 SEATS	1	10'x10'	72-36
	HARDSTAND, 4" EARTH OR STABILIZED CRUSHED STONE	0.27	1000 SY	85-31
	ROAD, 2 LANE, 6" EARTH OR STABILIZED CRUSHED STONE	0.08	MILE	85-31
	SITE AREA	3	ACRE	

UTILITIES

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS FOR DETAILS
* ELECTRIC DISTRIBUTION TEMPERATE & TROPICAL CLIMATES	14.3KW			26.8KW		
* ELECTRIC DISTRIBUTION FRIGID CLIMATE	14.7KW					
WATER SUPPLY TO ERDLATOR, FRIG. CLIM		840425				
WATER SUPPLY TO ERDL TEMP & TROP		840410			840440	

* ELECTRICAL DISTRIBUTION MATERIAL INCLUDED IN INTERIOR FACILITIES.

GENERAL NOTES

1. FUEL STORAGE MAY BE SUPPLIED BY MEANS OF 55 GAL DRUMS IN LIEU OF A SINGLE TANK IN THOSE AREAS WHERE IT IS IMPOSSIBLE TO MAINTAIN ALL WEATHER ACCESS ROADS TO THE FACILITY.
2. LATRINE SHOULD NOT BE DUG BELOW WATER LEVEL IN THE GROUND, NOR LOCATED WHERE IT MAY DRAIN INTO POTABLE WATER SOURCE.
3. IN ALL CASES, ERDLATOR & CHEMICAL STORAGE BLDG WILL BE LOCATED AS CLOSE TO WATER SOURCE AS IS PRACTICABLE.
4. DISTANCE BETWEEN INTAKE BASINS TO BE DETERMINED IN FIELD WHEN PERCOLATION THRU SOIL HAS BEEN INVESTIGATED.
5. ALL LINES SHALL HAVE POSTIVE PITCH FROM STORAGE BLDG TO PUMP AND PUMP TO WATER, INTAKE OF 15' & 10' MAXIMUM RESPECTIVELY.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 20' 30' 40'
NO. 11

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED BY: Gilchrist
CHIEF, ENGINEERING BRANCH

THEATER OF OPERATIONS

WATER PURIFICATION
SITE LAYOUTS
60000 & 120000 GPD-FRESHWATER SOURCE
ALL CLIMATES

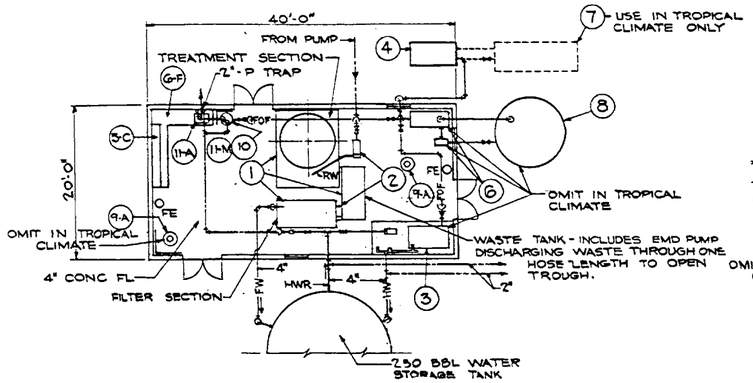
APPROVED: L.M. Williams
DATE: 19 MAR 1951
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: AMC HQ DEV ENGR DIR INDUS & GEN EQUIP OFC
C.N. GARDNER
DATE: 15 MAR 51

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 84-04
SHEET 1 OF 1

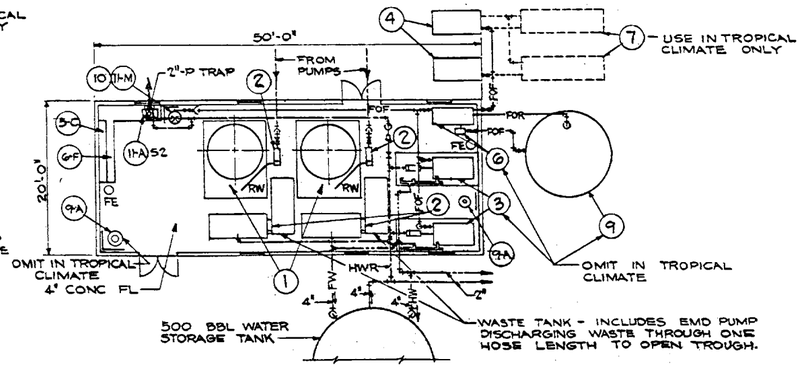
CORPS OF ENGINEERS

U. S. ARMY



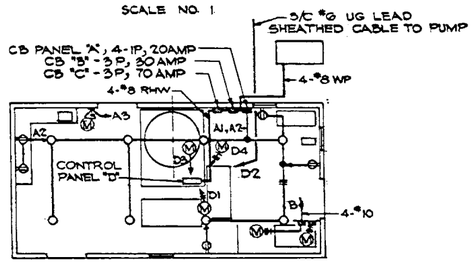
PLAN

SCALE NO. 1



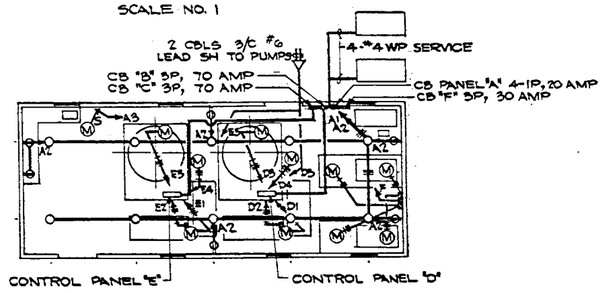
PLAN

SCALE NO. 1



ELECTRICAL PLAN

SCALE NO. 1



ELECTRICAL PLAN

SCALE NO. 1

ERDLATOR & CHEMICAL STORAGE - 60000 GPD

ERDLATOR & CHEMICAL STORAGE - 120000 GPD

TEMPERATE & TROPICAL CLIMATES

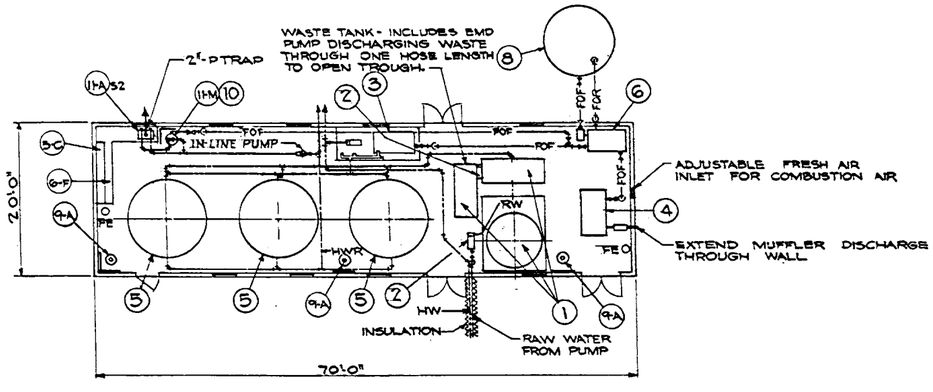
SCHEDULE OF EQUIPMENT AND FACILITIES

ITEM NO.	EQUIPMENT	PLANT CAPACITY	60,000 GPD			120,000 GPD	
		CLIMATE ZONE	TROPICAL	TEMPERATE	FRIGID	TROPICAL	TEMPERATE
		BUILDING DIM.	20'x40'	20'x40'	20'x70'	20'x50'	20'x50'
1.	WATER PURIFICATION UNIT, BASE MOUNTED, 3000 GPH		1	1	1	2	2
2.	PUMP, CENTRIFUGAL, 1½", 65GPM @ 50'HD, ELEC. DRIVEN, 2HP		2	2	3	4	4
3.	WATER HEATER, OIL FIRED, 3000 GPH, 2HP BURNER, 2HP PUMP		–	1	1	–	2
4.	GENERATOR SET, DIESEL DRIVEN, 15KW, 3PH. 208Y/120V. 60C.		1	1	1	2	2
5.	WATER STORAGE TANK, 3000 GAL, NYLON, RUBBER COATED		–	–	2	–	–
6.	FUEL STORAGE TANK, 275 GAL, ELEVATED, W/MAN. PUMP		–	1	1	–	1
7.	FUEL STORAGE TANK, 1000 GAL		1	–	–	2	–
8.	FUEL STORAGE TANK, 100 BBL		–	1	1	–	–
9.	FUEL STORAGE TANK, 250 BBL		–	–	–	–	1
10.	HOT WATER HEATER, OIL FIRED, 50 GPH		1	1	1	1	1
	FACILITY NUMBERS						
	INTERIOR ONLY		841701	841702	841703	841704	841705
	STEEL FRAME W/INTERIOR		841711	841712	841713	841714	841715
	WOOD FRAME W/INTERIOR		841721	841722	841723	841724	841725

ELECTRICAL NOTES

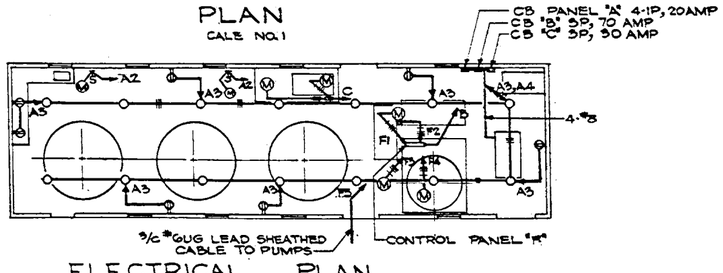
CONN LOAD - 60000 GPD - TEMPERATE		CONN LOAD - 60000 GPD - TROPICAL	
LIGHTING	.70KW	LIGHTING	.70 KW
RECP EST	.50KW	RECP EST	.50KW
POWER	12.43 KW	POWER	8.43 KW
TOTAL	13.63 KW	TOTAL	9.63 KW
CONN LOAD - 60000 GPD - FRIGID		**CONN LOAD - 120000 GPD - TEMPERATE**	
LIGHTING	1.00KW	LIGHTING	.80 KW
RECP EST	.50KW	RECP EST	.50 KW
POWER	12.43KW	POWER	24.86 KW
TOTAL	13.93 KW	TOTAL	26.16 KW
CONN LOAD - 120000 GPD - TROPIC			
LIGHTING	.80 KW		
RECP EST	.50 KW		
POWER	20.86 KW		
TOTAL	22.16 KW		

1. ALL LAMPS TO BE 100W & TO HAVE 8" CONICAL SHADES.
2. PORTABLE CABLES ARE PROVIDED WITH WATER PURIFICATION SET TO CONNECT ALL INDOOR COMPONENTS OF SET TO 3 PH - 4W SERVICE UP TO 100 FT FROM CONTROL PANEL. SET INCLUDES FILTER SECTION, WATER HEATER AND PUMPS.



PLAN

SCALE NO. 1

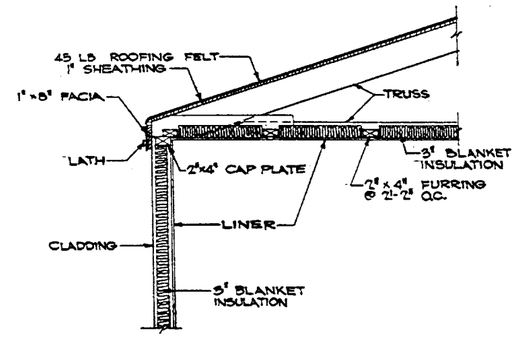


ELECTRICAL PLAN

SCALE NO. 1

ERDLATOR & CHEMICAL STORAGE - 60000 GPD

FRIGID CLIMATE



INSULATION DETAIL

FRIGID CLIMATE

SCALE NO. 5

NOTE: TANKS USED FOR POTABLE WATER STORAGE SHOULD HAVE NO ADVERSE EFFECT ON THE HEALTH OF PERSONNEL. QUESTIONS REGARDING THE USE OF THESE TANKS SHOULD BE REFERRED TO THE MEDICAL OFFICER.

GENERAL NOTES

1. OMIT CONCRETE FLOORS IN STD 3 CONSTRUCTION, TEMPERATE & TROPICAL CLIMATES.
2. IN FRIGID CLIMATE - EXTERIOR WALLS & ROOF TO HAVE 3" BLANKET INSULATION BETWEEN CLADDING & INTERIOR LINER.
3. ALL FIRE EXTINGUISHERS NOTED ARE CO_2 TYPE.
4. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS.
5. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER.
6. THE WATER LINES LEAVING AND ENTERING BUILDING TO THE ELEVATED TANKS SHALL BE 4" BURIED LINES

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
84-17	PLANS	1 OF 1
34-03	WOOD FRAME CONST BARRACKS TYPE BLDGS.	1-7 OF 7
35-21	STEEL FRAME CONST. BARRACKS TYPE BLDGS	1-4 OF 4
99-98	STANDARD DETAILS	

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' 15'

NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature]
CHIEF, STRUCTURES BRANCH

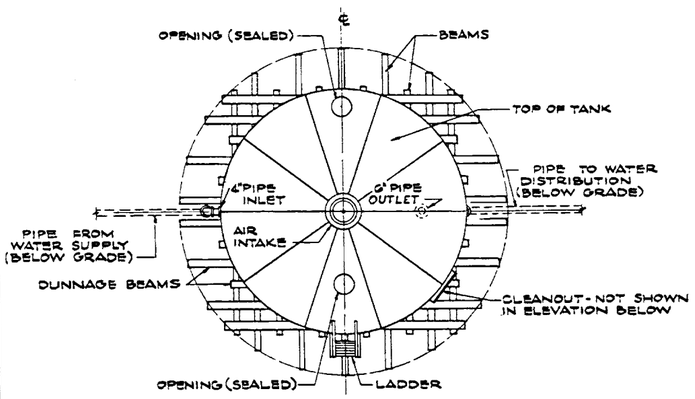
THEATER OF OPERATIONS

WATER PURIFICATION
ERDLATOR & CHEM. STGE. - 60000 & 120000 GPD
ALL CLIMATES

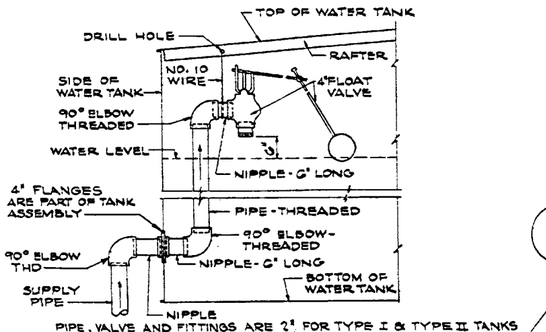
APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY: AMC HQ
DEV ENG DIR INDIV & GEN EQUIP OFC
C.N. GARDNER
DATE 15 Jan 1969

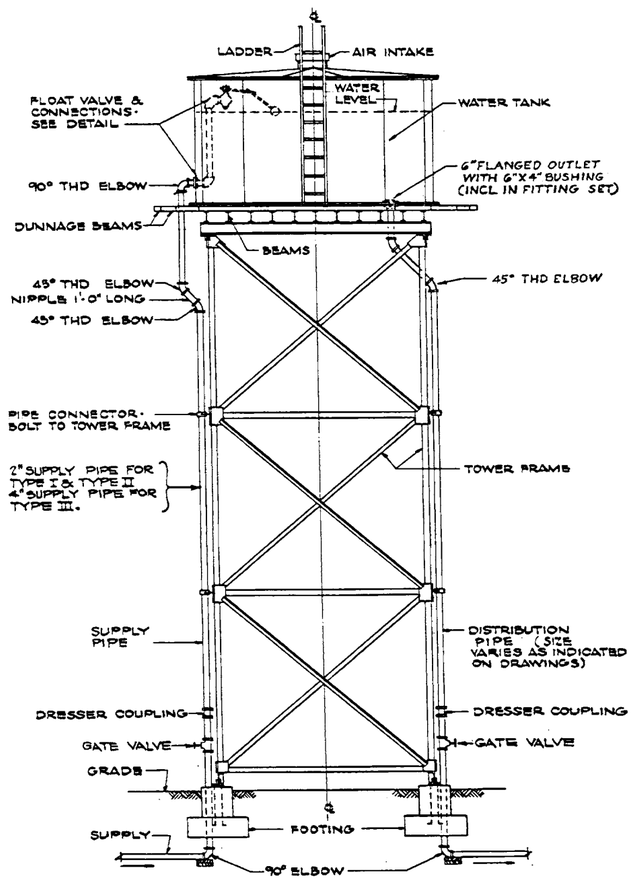
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
84-17



ROOF PLAN OF WATER TANK & TOWER
SHOWING PIPING CONNECTIONS

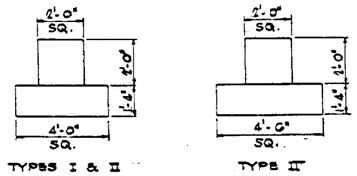


DETAIL OF FLOAT VALVE CONNECTION
NO SCALE



ELEVATION OF WATER TANK & TOWER
SHOWING PIPING CONNECTIONS

TYPICAL WATER TANK & TOWER
SCALE NO. 2

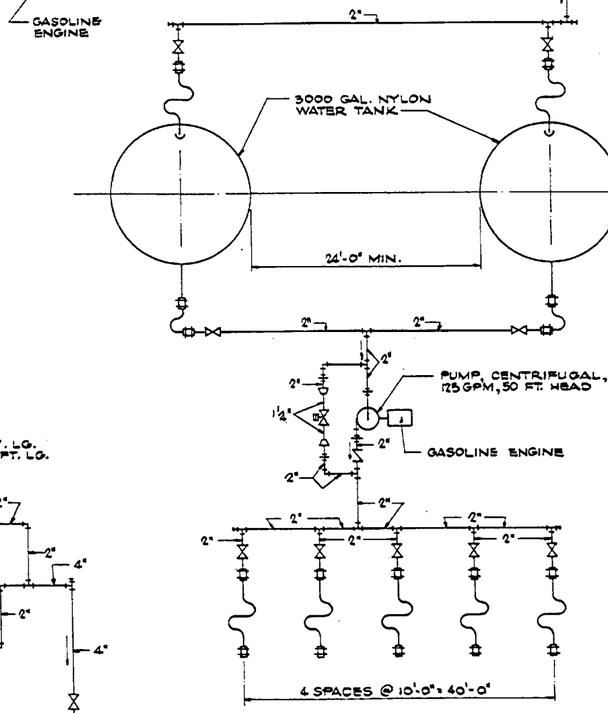


TOWER FOOTINGS
SCALE NO. 3

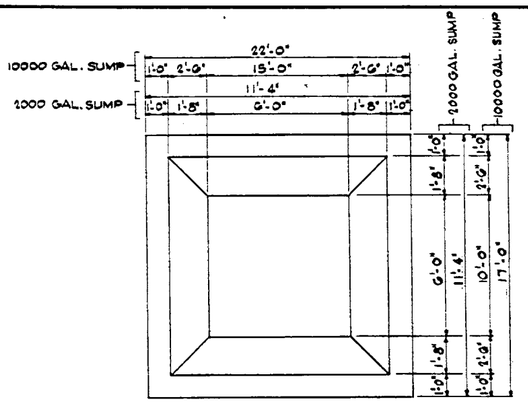
DEEP WELL ASSEMBLY - 75 GPM
300 FT. 6" WELL CASING.
1 - DEEP WELL PUMP, TURBINE TYPE, 4", 200 GPM, 200 FT. HEAD.
50 FT. DEEP WELL PUMP COLUMN ASSEMBLY.
1 - WATER WELL STRAINER, WITH 0.010 IN SLOTS, 10 FT. LG.
1 - WATER WELL STRAINER, WITH 0.040 IN SLOTS, 10 FT. LG.
13 - PIPE NIPPLES, 4" X 0'-6" LG.
1 - 4" FOOT VALVE

WATER SUPPLY - DEEP WELL - 75 GPM
FACILITY NO. 842102
NO SCALE

DEEP WELL ASSEMBLY - 20 GPM
300 FT. 6" WELL CASING.
1 - DEEP WELL PUMP, ROTARY SCREW TYPE, 4", 50 GPM, 250 FT. HEAD.
50 FT. DEEP WELL PUMP COLUMN ASSEMBLY.
1 - WATER WELL STRAINER, WITH 0.010 IN. SLOTS, 10 FT. LG.
1 - WATER WELL STRAINER, WITH 0.040 IN. SLOTS, 10 FT. LG.
2 - PIPE NIPPLES, 4" X 0'-6" LG.
1 - PIPE REDUCER, 4"X 2" CONCENTRIC
1 - 2" FOOT VALVE

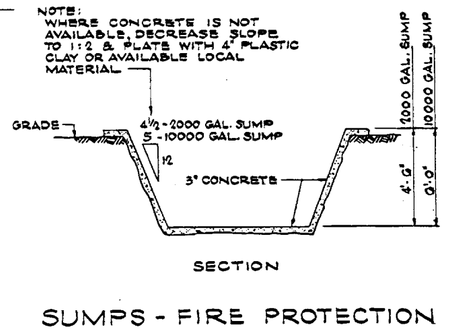


WATER SUPPLY - DEEP WELL - 20 GPM
FACILITY NO. 842101
NO SCALE



NOTE:
20 SACKS CEMENT REQ'D. FOR 2000 GAL. SUMP & 61 SACKS CEMENT REQ'D. FOR 10000 GAL. SUMP.

PLAN



SECTION

SUMPS - FIRE PROTECTION
2000 GAL. - FACILITY NO. 842109
10000 GAL. - FACILITY NO. 842110
NO SCALE

NOTE:
TANKS USED FOR POTABLE WATER STORAGE SHOULD HAVE NO ADVERSE EFFECT ON THE HEALTH OF PERSONNEL. QUESTIONS REGARDING THE USE OF THESE TANKS SHOULD BE REFERRED TO THE MEDICAL OFFICER.

WATER TANK & TOWER SCHEDULE

TYPE	CAPACITY BBL.	CAPACITY GAL.	SIZE INLET	SIZE OUTLET	TOWER DIA.	TOWER HEIGHT	TOWER DUNNAGE BM.	TOWER STEEL BEAM	TOWER WEIGHT	FACILITY NO. TANK & TOWER
I	100	4200	4"	6"	9'-2⅜"	8'-0"	4"X6"@1'-4"OC	GB12 @1'-4"OC	3G'	842103
II	250	10500	4"	6"	15'-0"	8'-0"	4"X6"@1'-4"OC	8B13 @1'-5"OC	3G'	842104
III	500	21000	4"	6"	21'-7"	8'-0"	4"X6"@1'-6"OC	10WF21@1'-8"OC	3G'	842105

NOTE:
1- ERECTION DRAWINGS WILL BE PROVIDED WITH EACH TANK & TOWER.

SYMBOL	DESCRIPTION (REVISIONS)	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' — NO.2
0 1' 2' 3' 4' — NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS
WATER TANK & TOWER
WATER SUPPLY-DEEP WELL
SUMPS-FIRE PROTECTION

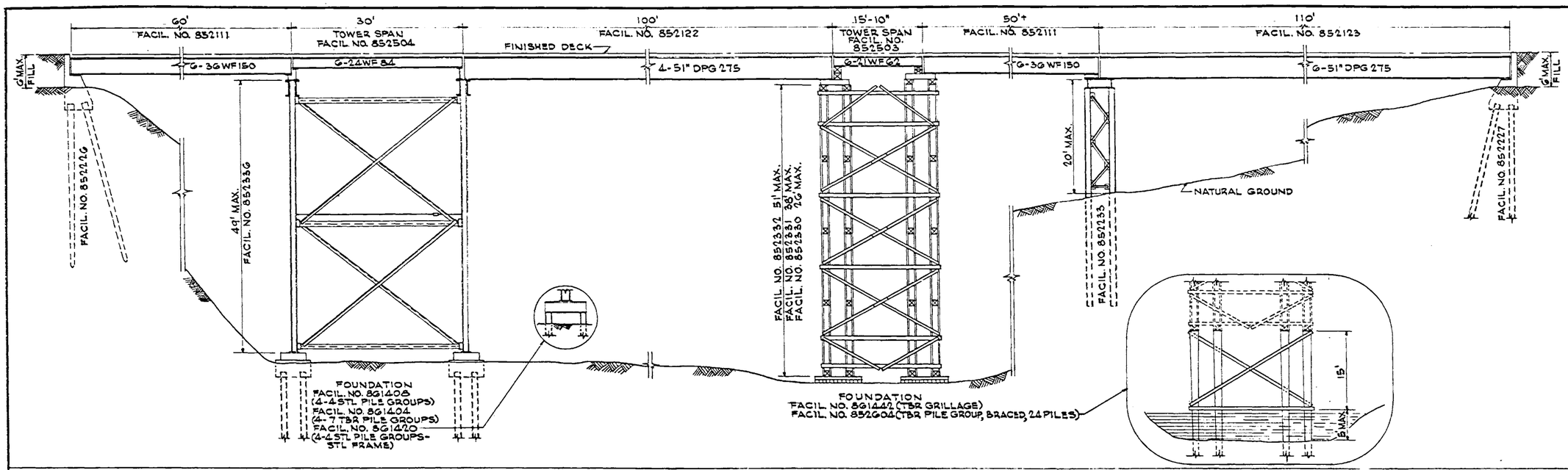
APPROVED: DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

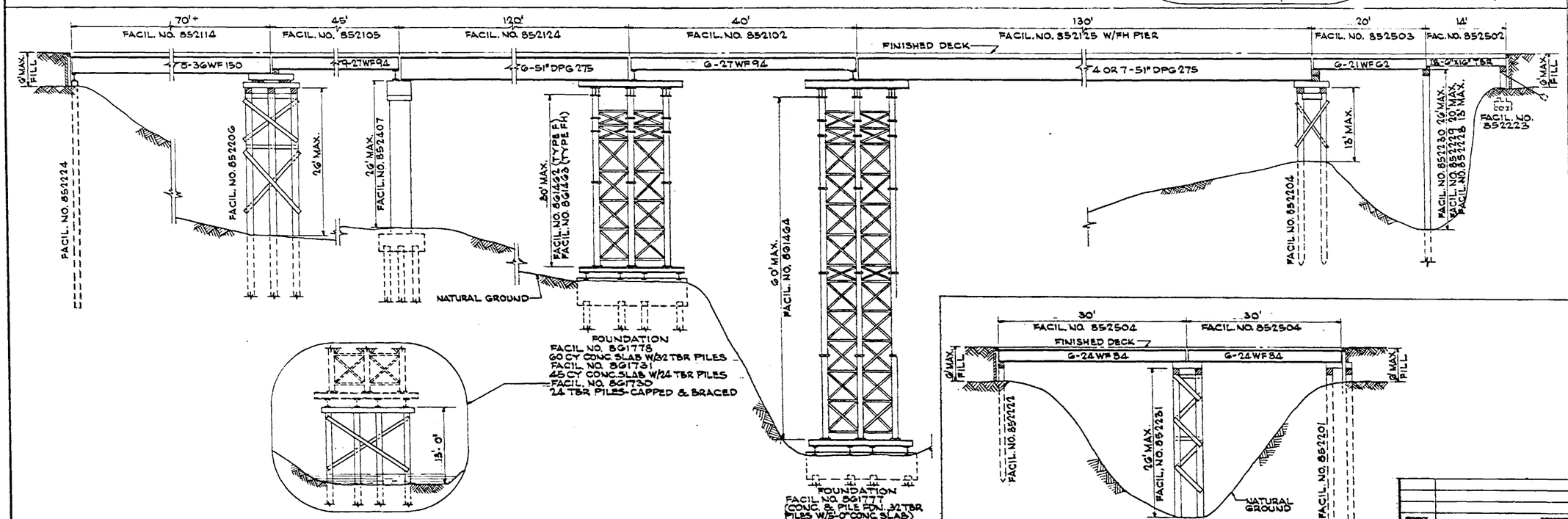
APPROVED FOR PROPONENT AGENCY: AMC HQ DEV ENGR DIR INDIV & GEN EQUIP DEC
DATE 15 MAR 1969
C.N. GARDNER

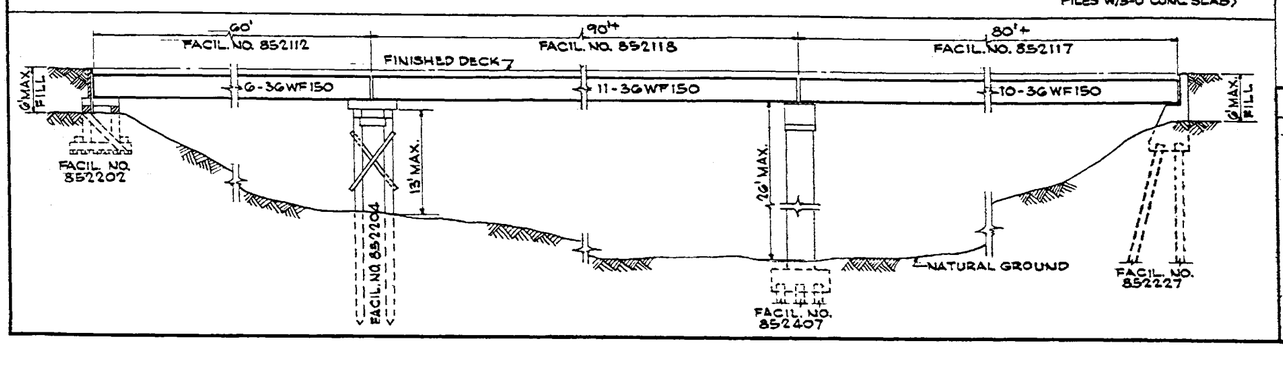
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 84-21
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY







INSTALLATION FB2575

SCHEDULE OF FACILITIES

SUPERSTRUCTURES

FACILITY NO.	QUANTITY REQ'D.
852502	27
852503	8
852504	12
852102	7
852105	3
852111	9
852151	3
852114	4
852117	2
852118	2
852123	1
852124	2
852125	1
852122	1
852187	50.5
852188	2
852501	60

SUBSTRUCTURES

FACILITY NO.	QUANTITY REQ'D.
852201	3
852202	2
852206	3
852204	4
852222	10
852223	6
852224	4
852226	3
852227	3
852228	12
852229	14
852230	16
852231	6
852330	4
852331	7
852332	3
852336	8
852407	1
852604	14
861404	4
861420	2
861442	28
861462	3
861463	4
861464	3
861408	2
861778	3
861777	4
861780	3
861731	4
852233	7
861470	6

GENERAL NOTES

1. NOT FOR CONSTRUCTION.
2. TO BE USED ONLY FOR PLANNING PURPOSES IN CONNECTION WITH STAFF TABLE FBH-2.057

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-01	SCHEDULE OF FACILITIES AND VARIOUS COMBINATIONS OF SUPERSTRUCTURES & SUBSTRUCTURES	1 OF 3
85-21	SUPERSTRUCTURES	1-9 OF 9
85-25	SUPERSTRUCTURES	1-20F2
85-22	SUBSTRUCTURES	1-70F7
85-23	SUBSTRUCTURES	1-50F5
85-24	SUBSTRUCTURES	1-30F5
85-26	SUBSTRUCTURES	1OF1
86-14	SUBSTRUCTURES	1-110F11
86-17	SUBSTRUCTURES	1-90F9

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED & RECOMMENDED: [signature] Chief, Engineering Division, MIL. CONSTR., O.C.E.
APPROVED: [signature] DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:

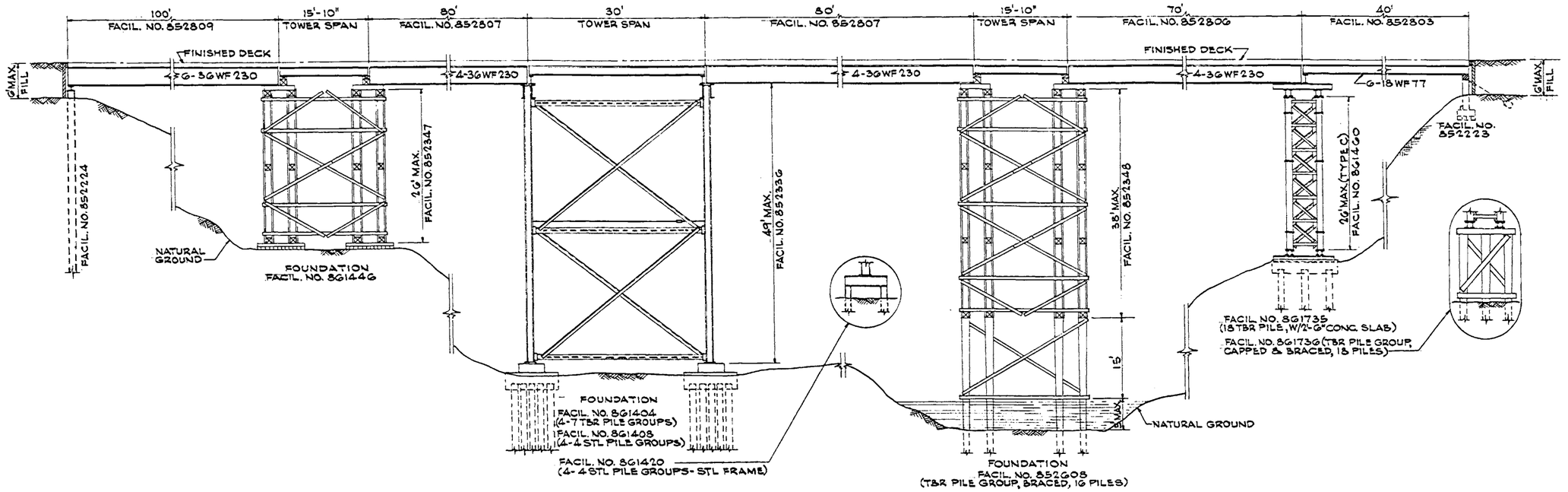
THEATER OF OPERATIONS
ROAD BRIDGES
DOUBLE LANE-CLASS 60
SCHEDULE OF FACILITIES AND VARIOUS COMBINATIONS OF SUPERSTRUCTURES & SUBSTRUCTURES

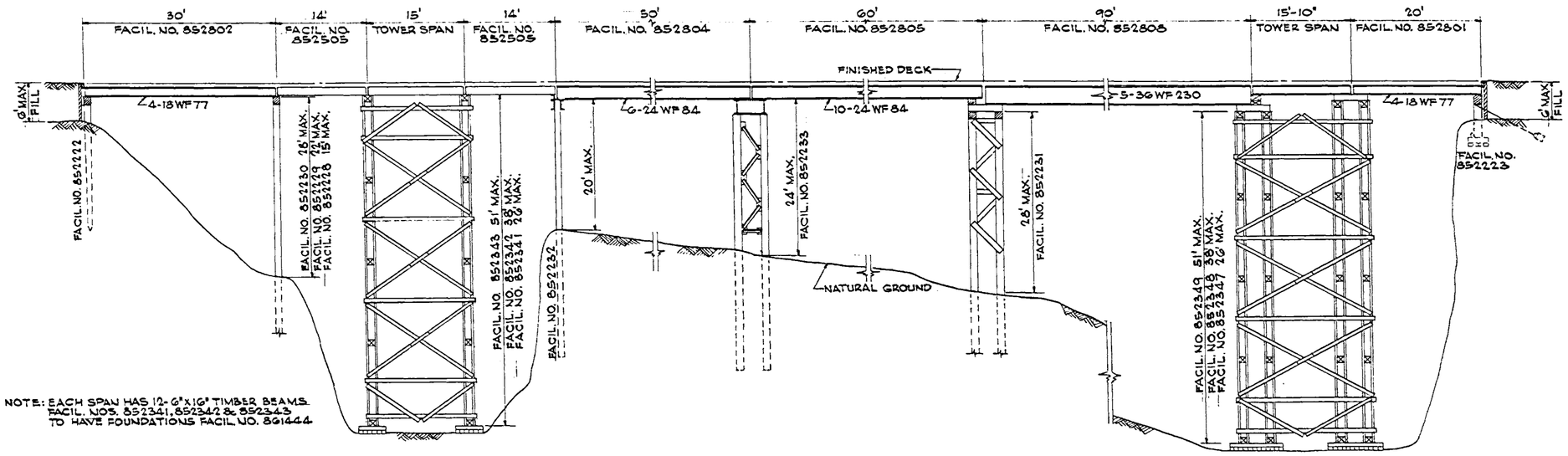
UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 3
85-01

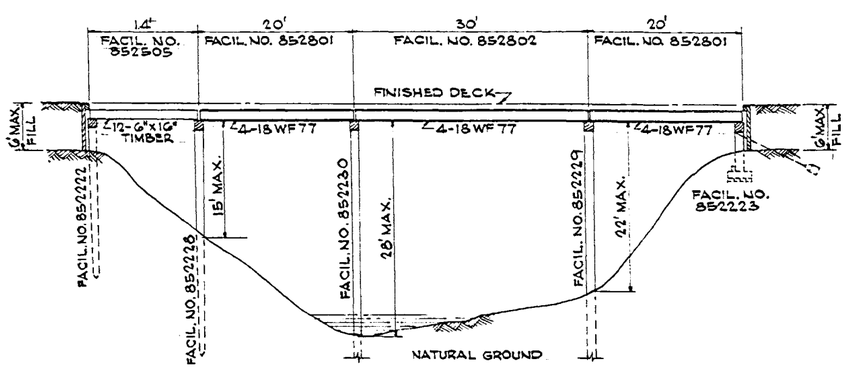
CORPS OF ENGINEERS

U. S. ARMY





NOTE: EACH SPAN HAS 12-6"X16" TIMBER BEAMS. FACIL. NOS. 852341, 852342 & 852343 TO HAVE FOUNDATIONS FACIL. NO. 861444



INSTALLATION FB2275

SCHEDULE OF FACILITIES

SUPERSTRUCTURES FACILITY NO.	QUANTITY REQ'D
852505	52
852801	16
852802	5
852803	3
852804	7
852805	4
852806	4
852807	3
852808	3
852809	3
852187	20.2
852188	25.2
852501	60.0
852151	3

SUBSTRS. FACILITY NO.	QUANTITY REQ'D
861400	3
861446	7
852222	9
852223	9
852224	2
852228	12
852229	14
852230	16
852231	6
852232	9
852233	5
852336	8
852341	2
852342	4
852343	2
852347	2
852348	3
852349	1
852608	7
861404	4
861408	2
861420	2
861735	2
861736	1
861470	6
861444	8

GENERAL NOTES

1. NOT FOR CONSTRUCTION.
2. TO BE USED ONLY FOR PLANNING PURPOSES IN CONNECTION WITH STAFF TABLE FBH-2-027.
3. THE BEAMS OF THE PARTICULAR SIZE & WEIGHT SHOWN ON THIS DRAWING ARE TO BE USED ONLY UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCKS ARE EXHAUSTED.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-01	SCHEDULE OF FACILITIES & VARIOUS COMBINATIONS OF SUPERSTRUCTURES & SUBSTRUCTURES	2 OF 3
85-21	SUPERSTRUCTURES	1-90F9
85-28	SUPERSTRUCTURES	1-30F3
85-22	SUBSTRUCTURES	1-70F7
85-23	SUBSTRUCTURES	1-50F5
85-25	SUBSTRUCTURES	1&2 OF 2
85-26	SUBSTRUCTURES	1 OF 1
86-14	SUBSTRUCTURES	1-110F11
86-17	SUBSTRUCTURES	1-90F9

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' 15'

NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D.C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

NON-STANDARD ROAD BRIDGES
SCHEDULE OF FACILITIES & VARIOUS COMBINATIONS OF STRUCTURES
DOUBLE LANE-CLASS 25

UNDER REVISION

APPROVED: DATE: 19 MAR 1969

H. E. Schaeman Jr. H. M. Williams

CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE:

SCALE: AS NOTED

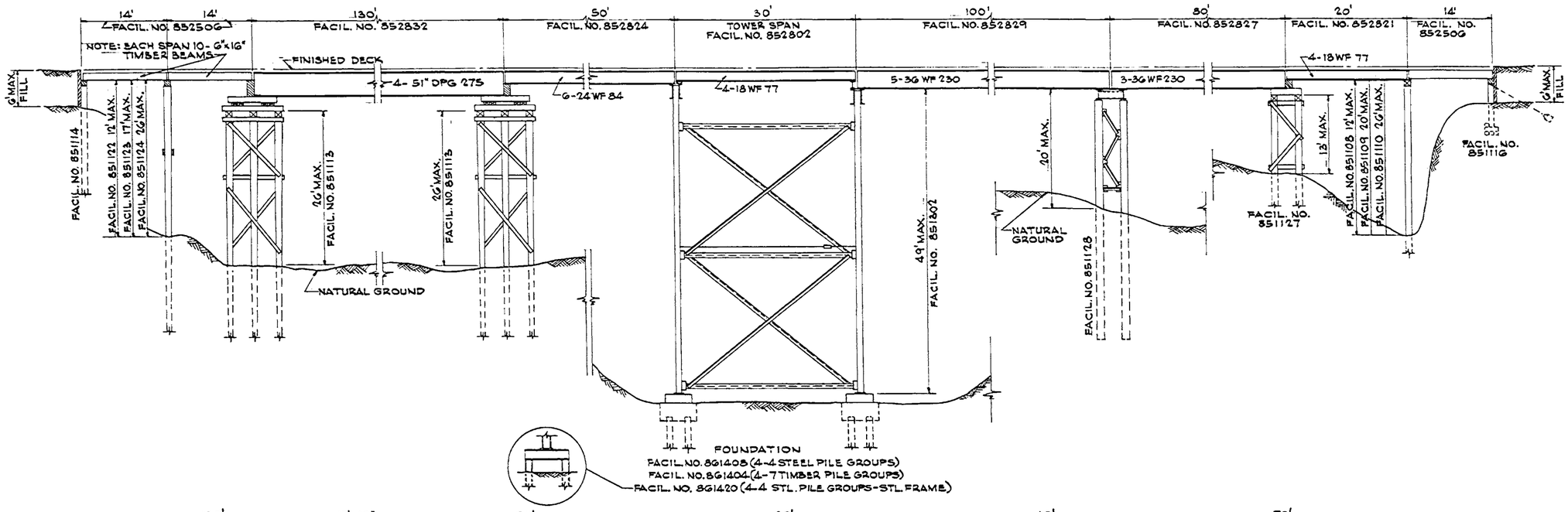
SPEC. NO.

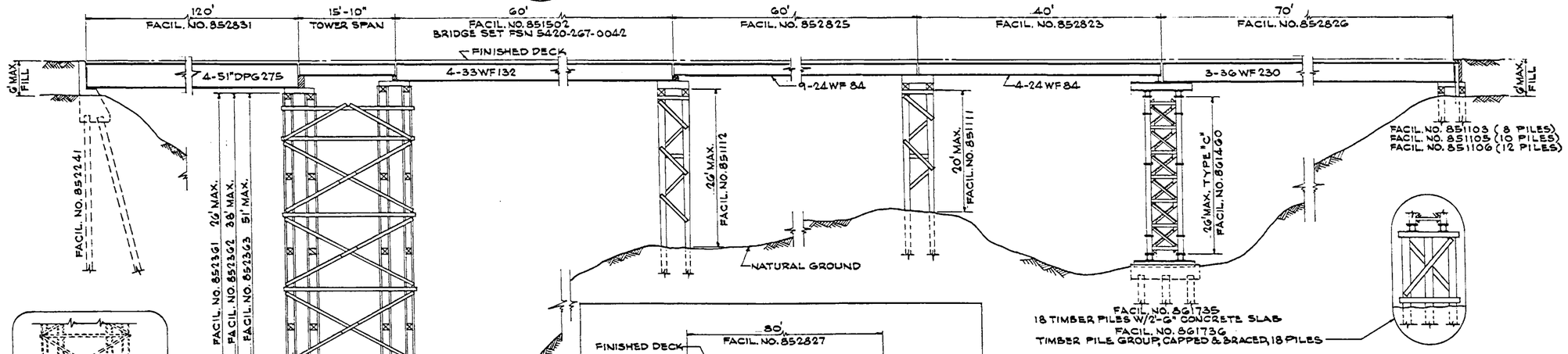
DRAWING NUMBER: 85-01

SHEET 2 OF 3

CORPS OF ENGINEERS

U. S. ARMY





INSTALLATION FB 1475 SCHEDULE OF FACILITIES

SUPERSTRUCTURES

FACILITY NO.	QUAN. REQ'D.
852151	3
852506	53
852821	30
852822	9
852823	3
852824	4
852825	3
852826	3
852827	2
852828	1
852829	1
852830	1
852831	1
852832	1
852189	40
852190	6
852501	60

SUBSTRUCTURES

FACILITY NO	QUAN. REQ'D.
851101	1
851102	1
851103	2
851104	2
851105	2
851106	2
851107	1
851108	9
851109	10
851110	11
851111	7
851112	4
851113	2
851302	7
851114	4
851115	2
851116	4
851121	2
851122	9
851123	10
851124	10
851127	8
851128	3
861460	11
861446	26
852361	5
852362	7
852363	3
852608	15
861402	13
861408	2
861420	2
861470	6
861735	5
861736	6
852241	3

GENERAL NOTES

1. NOT FOR CONSTRUCTION.
2. TO BE USED ONLY FOR PLANNING PURPOSES IN CONNECTION WITH STAFF TABLE FBH-1.047.
3. THE BRIDGE SETS SHOWN ARE LIMITED STANDARD AND ARE TO BE USED ONLY UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCK ARE EXHAUSTED. NO ADDITIONAL SETS WILL BE PURCHASED.
4. THE BEAMS OF THE PARTICULAR SIZE AND WEIGHT SHOWN ON THIS DRAWING ARE TO BE USED ONLY UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCKS ARE EXHAUSTED.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-01	SCHEDULE OF FACILITIES & VARIOUS COMBINATIONS OF SUPERSTRUCTURES & SUBSTRUCTURES	3 OF 3
85-15	SUPERSTRUCTURES	1 OF 1
85-21	SUPERSTRUCTURES	1-9 OF 9
85-28	SUPERSTRUCTURES	1-3 OF 3
85-11	SUBSTRUCTURES	1-4 OF 4
85-13	SUBSTRUCTURES	1 & 2 OF 2
85-22	SUBSTRUCTURES	1-7 OF 7
85-23	SUBSTRUCTURES	1-5 OF 5
85-25	SUBSTRUCTURES	1 & 4 OF 4
85-26	SUBSTRUCTURES	1 OF 1
86-14	SUBSTRUCTURES	1-11 OF 11
86-17	SUBSTRUCTURES	1-9 OF 9

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' 15'

NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

NON-STANDARD ROAD BRIDGES
SCHEDULE OF FACILITIES & VARIOUS COMBINATIONS OF STRUCTURES
SINGLE LANE-CLASS 50

UNDER REVISION

APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-01
SHEET 3 OF 3

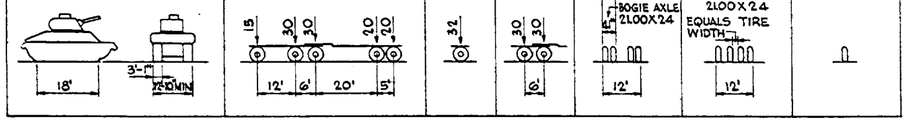
DESIGN SPECIFICATIONS

LOADS

LIVE LOADS FOR ROAD BRIDGES

HYPOTHETICAL VEHICLES FOR CLASS 100

TRACKED VEHICLES	WHEELED VEHICLES				
	AXLE LOADS AND SPACING	MAXIMUM SINGLE AXLE	BOGIE AXLES	MINIMUM WHEEL SPACING AND TIRE SIZES OF CRITICAL AXLES	CRITICAL TIRE LOAD AND TIRE SIZE
100 TONS	115 TONS	TONS	TONS	SINGLE AXLE 2100X24; BOGIE AXLE 2100X24 / SINGLE AXLE 2100X24; BOGIE AXLE 2100X24; EQUALS TIRE WIDTH	20,000# ON 24.00X29



IMPACT

(1) STEEL - 15 PERCENT OF LIVE LOAD MOMENT.
(2) TIMBER - NONE.

LATERAL DISTRIBUTION FACTOR

REQUIRED SECTION MODULUS, TO ACCOUNT FOR UNEQUAL DISTRIBUTION OF LIVE LOAD AND IMPACT TO STRINGERS, EQUALS THE SECTION MODULUS FOR LIVE LOAD AND IMPACT MULTIPLIED BY 1.5 (LATERAL DISTRIBUTION FACTOR). THE LATERAL DISTRIBUTION FACTOR DOES NOT APPLY TO THE REQUIRED SECTION MODULUS FOR DEAD LOAD.

WIND LOADS

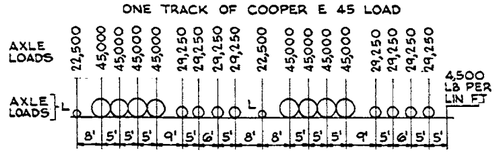
IN CONSIDERATION OF THE HIGH WIDTH-LENGTH RATIO OF THE SPANS, THE CONTINUOUSLY SPIKED TIMBER DECK AND THE MULTIPLICITY OF MAIN CARRYING MEMBERS, WIND LOADS ARE NEGLECTED.

TEMPERATURE

VARIATION OF PLUS 60° F. AND MINUS 130° F. FROM A NORMAL TEMP. OF 65° F.

LOADS

LIVE LOADS FOR RAILROAD BRIDGES



IMPACT

EQUAL TO THE SUM OF (a) AND (b) (FROM A.R.E.A. 1950 SPECS.)
(a) ROLLING EFFECT.
VERTICAL FORCES DUE TO ROLLING OF TRAIN FROM SIDE TO SIDE, ACTING DOWNWARD ON ONE RAIL AND UPWARD ON THE OTHER, THE FORCES ON EACH RAIL BEING EQUAL TO 10% OF THE AXLE LOADS.
(b) DIRECT VERTICAL EFFECT.
1. FOR BEAM SPANS, STRINGERS, GIRDERS, FLOORBEAMS, POSTS OF DECK TRUSS SPANS CARRYING LOAD FROM FLOORBEAM ONLY, AND FLOORBEAM HANGERS, IN PERCENT

FOR L LESS THAN 100FT $60 - \frac{L^2}{500}$

FOR L 100FT OR MORE $\frac{1800}{L-40} + 10$

2. FOR TRUSS SPANS

$$\frac{4000}{L+25} + 15$$

L = LENGTH IN FEET, CENTER TO CENTER OF SUPPORTS FOR STRINGERS, LONGITUDINAL GIRDERS AND TRUSSES (MAIN MEMBERS), OR L = LENGTH, IN FEET, OF THE LONGER ADJACENT SUPPORTED STRINGER, LONGITUDINAL BEAM, GIRDER OR TRUSS FOR IMPACT IN FLOORBEAMS, FLOORBEAM HANGERS, SUBDIAGONALS OF TRUSSES, TRANSVERSE GIRDERS, SUPPORTS FOR LONGITUDINAL AND TRANSVERSE GIRDERS AND VIADUCT COLUMNS.

LONGITUDINAL FORCE

LONGITUDINAL FORCE ACTING ON TRACK 6 FT. ABOVE TOP OF RAIL.
USE LARGER OF:
(a) FORCE DUE TO BRAKING.
FIFTEEN PERCENT OF LIVE LOAD WITHOUT IMPACT.
(b) FORCE DUE TO TRACTION.
TWENTY-FIVE PERCENT OF WEIGHT OF DRIVING WHEELS, WITHOUT IMPACT.

NOSING OF LOCOMOTIVES

FOR BRACING SYSTEMS, THE LATERAL FORCE TO PROVIDE FOR THE EFFECT OF NOSING OF LOCOMOTIVES (IN ADDITION TO THE OTHER LATERAL FORCES SPECIFIED) SHALL BE A SINGLE MOVING FORCE OF 20,000 LBS. APPLIED TO THE TOP OF THE RAIL, IN EITHER LATERAL DIRECTION, AT ANY POINT OF THE SPAN. THE RESULTING VERTICAL FORCES SHALL BE DISREGARDED.

WIND LOADS

FORCE OF WIND SHALL BE CONSIDERED AS MOVING LOAD IN ANY HORIZONTAL DIRECTION. ON LIVE LOADS, WIND FORCE SHALL BE 300 LBS. PER LIN. FT. OF LIVE LOAD APPLIED 8 FT. ABOVE TOP OF RAIL.
FORCE ON BRIDGE SHALL BE TAKEN AS 30 LBS. PER SQ. FT. ON FOLLOWING SURFACES:
(A) FOR GIRDER SPANS, 1½ TIMES THE VERTICAL PROJECTION OF THE SPAN.
(B) FOR TRUSS SPANS, THE VERTICAL PROJECTION OF THE SPAN PLUS ANY PORTION OF THE LEEWARD TRUSSES NOT SHIELDED BY THE FLOOR SYSTEM.
WIND FORCE, HOWEVER, SHALL NOT BE LESS THAN 200 LBS PER LINEAR FT. FOR LOADED CHORD, AND 150 LBS. PER LINEAR FT. FOR UNLOADED CHORD.

TEMPERATURE

VARIATION OF PLUS 60° F. AND MINUS 130° F. FROM A NORMAL TEMP. OF 65° F.

GENERAL SPECIFICATIONS

UNIT STRESSES

THE ALLOWABLE UNIT STRESSES FOR DEAD LOAD, LIVE LOAD, AND IMPACT ARE AS SHOWN BELOW. THE ALLOWABLE UNIT STRESSES FOR THESE LOADS IN COMBINATION WITH LONGITUDINAL AND TRANSVERSE LOADS SHALL BE 11 PERCENT HIGHER THAN SHOWN BELOW. VALUES ARE IN POUNDS PER SQ. IN. UNLESS OTHERWISE NOTED.

STEEL

AXIAL TENSION, NET SECTION----------27,000
MAX. L/r MAIN TENSION MEMBERS----------200
MAX. L/r SECONDARY TENSION MEMBERS----------240
TENSION IN EXTREME FIBERS OF MEMBERS SUBJECT TO BENDING----------27,000
AXIAL COMPRESSION FOR COLUMNS CENTRALLY LOADED GROSS SECTION:
RIVETED ENDS----------$21{,}300 - \frac{3}{8}(L/r)^2$
PINNED ENDS----------$21{,}300 - \frac{1}{2}(L/r)^2$
MAX. L/r MAIN COMPRESSION MEMBERS----------120
MAX. L/r SECONDARY COMPRESSION MEMBERS----------160
COMPRESSION IN EXTREME FIBERS OF MEMBERS SUBJECT TO BENDING, L/b NOT TO EXCEED 40----------$27{,}000 - 7.5(L/b)^2$
COMPRESSION IN SPLICE MATERIAL, GROSS SECTION------27,000
TENSION OR COMPRESSION IN EXTREME FIBER OF PINS IN BENDING----------33,000
SHEAR IN WEBS OF BEAMS, GROSS SECTION----------16,500
SHEAR IN POWER DRIVEN RIVETS AND PINS----------20,000
SHEAR IN TURNED BOLTS----------16,500
SHEAR IN TURNED BOLTS (50,000 Y.P.)----------20,000
SHEAR IN UNFINISHED BOLTS----------13,200
BEARING ON PINS----------33,000
BEARING ON POWER DRIVEN RIVETS, MILLED STIFFENERS AND OTHER STEEL PARTS IN CONTACT----------35,000
BEARING ON TURNED BOLTS----------30,000
BEARING ON UNFINISHED BOLTS----------24,000
BEARING ON EXPANSION ROLLERS AND ROCKERS, POUNDS PER LINEAR INCH: $\frac{S-13{,}000}{20{,}000} \times D$----------900D
DIAMETERS UP TO 25"
DIAMETERS FROM 25" TO 125"---------- $\frac{S-13{,}000}{20{,}000} \times 4{,}500\sqrt{D}$
WHERE S = YIELD STRENGTH OF STEEL
D = DIAMETER

WELDS

STRESS IN FILLET WELDS CONSIDERED AS SHEAR ON THROAT AREA OF WELDS FOR ANY DIRECTION OF APPLIED STRESSES. AREA OF FIELD WELDS DETERMINED BY USE OF APPLICABLE FORMULA GIVEN BELOW. AREA OF SHOP WELDS DETERMINED BY USE OF APPLICABLE FORMULA GIVEN BELOW, EXCEPT DENOMINATOR INCREASED BY 25%

WELD AREAS

TYPE OF WELD	TYPE OF STRESSES	REQD EFFECTIVE WELD AREA, A
BUTT	TENSION OR COMPRESSION	$A = \frac{\text{MAX.} - \frac{1}{4}\text{ MIN.}}{13{,}500}$; NOT LESS THAN $\frac{\text{MAX.}}{16{,}000}$
BUTT	SHEAR	$A = \frac{\text{MAX.} - \frac{1}{2}\text{ MIN.}}{9{,}000}$; NOT LESS THAN $\frac{\text{MAX.}}{12{,}000}$
FILLET	TENSION, SHEAR OR COMPRESSION	$A = \frac{\text{MAX.} - \frac{1}{2}\text{ MIN.}}{7{,}200}$; NOT LESS THAN $\frac{\text{MAX.}}{9{,}600}$

LUMBER

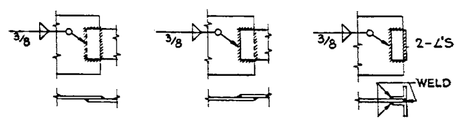
TENSION OR COMPRESSION IN EXTREME FIBERS OF MEMBERS SUBJECT TO BENDING----------2,400
HORIZONTAL SHEAR----------150
COMPRESSION PERPENDICULAR TO GRAIN----------400

CONCRETE

BEARING----------1,000

WELDING SYMBOLS

SPECIAL SIGNIFICANCE OF WELDING SYMBOLS USED FOR DETAILS (ALL OTHER WELDING SYMBOLS IN ACCORDANCE WITH AMERICAN WELDING SOCIETY.)



MATERIAL

1. ALL PARTS SHALL BE CARBON STRUCTURAL STEEL CONFORMING TO FEDERAL SPECIFICATION QQ-S-741, TYPE II, GRADE A, CLASS 1, EXCEPT AS OTHERWISE SHOWN OR NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS, OR TO A.S.T.M. DESIGNATION A7.
2. STEEL FOR RIVETS SHALL CONFORM TO FEDERAL SPECIFICATIONS QQ-S-741, TYPE I, GRADE A, CLASS 1, OR TO A.S.T.M. DESIGNATION A7.
3. STEEL FOR PINS AND TURNED BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION QQ-S-633, COLD FINISHED, FS1035 OR FS1040, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 50,000 POUNDS PER SQ. IN., A MINIMUM TENSILE STRENGTH OF 70,000 POUNDS PER SQ. IN., AND A MINIMUM ELONGATION OF 20 PERCENT IN 2 INCHES.
4. BOLTS, CAP SCREWS, AND NUTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-B-571 EXCEPT AS OTHERWISE SPECIFIED. STEEL FOR BOLTS AND CAP SCREWS SHALL BE CLASS B, EXCEPT FOR TURNED BOLTS WHICH SHALL BE AS SPECIFIED ELSEWHERE. THE BODY OF ALL BOLTS AND CAP SCREWS SHALL BE UNFINISHED, EXCEPT FOR TURNED BOLTS WHICH SHALL BE AS NOTED ELSEWHERE. ALL BOLTS AND CAP SCREWS SHALL HAVE UNFINISHED HEXAGONAL HEADS, EXCEPT THAT ON TURNED BOLTS AND CAP SCREWS THE BEARING SURFACE OF THE HEAD SHALL RECEIVE A FINE FINISHING CUT. ALL NUTS SHALL BE UNFINISHED REGULAR HEXAGONAL NUTS. THREADS SHALL BE AMERICAN NATIONAL COARSE THREAD SERIES, CLASS 2, FREE FIT. THE LENGTH OF THREAD ON BOLTS AND CAP SCREWS SHALL BE 1¼" UNLESS OTHERWISE SHOWN OR NOTED. NUTS SHALL BE SHOP ASSEMBLED ON THE BOLTS, AND ONLY THOSE WASHERS WHICH ARE SHOWN ASSEMBLED ON THE DRAWINGS OR NOTED TO BE ASSEMBLED SHALL BE SHOP ASSEMBLED ON THE BOLTS. ALL OTHER WASHERS SHALL BE SHIPPED UNASSEMBLED. NUTS SHALL BE RECESSED ⅛ IN. WHERE NOTED ON THE DRAWINGS.
5. STANDARD WASHERS SHALL BE STEEL OR WROUGHT IRON, AND SHALL CONFORM TO THE DIMENSIONS SPECIFIED IN THE SPECIFICATIONS. LOCK WASHERS SHALL BE MEDIUM SERIES SPRING LOCK WASHERS CONFORMING TO S.A.E. STANDARD SPECIFICATIONS.
6. THE ARC-WELDING ELECTRODES SHALL CONFORM TO LATEST REVISION OF A.S.T.M. SPECIFICATION A 233, CLASSIFICATIONS E6010, E6011, E6012, E6013, E6020 AND E6030.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED: APPROVED: DATE: 19 MAR 1963
CHIEF, STANDARD BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
ROAD AND RAILROAD BRIDGE SUPERSTRUCTURES DESIGN SPECIFICATIONS & GENERAL SPECIFICATIONS

UNDER REVISION

SCALE: NONE SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 2 85-02

FOR ECONOMY OF SINGLE SPAN LENGTHS.

CLASS 60 ROAD BRIDGING

(1)

MAX. SPAN OF BRIDGE	OUT TO OUT DIMENSIONS	SIZE OF BEAMS	NO. OF BEAMS	WT. IN LBS/FT.	NO. OF MH
39'- 2 1/4"	39'-11 3/4"	27"	6	830	304
41'-11 1/2"	42'- 9"	27"	8	1120	392
45'- 6"	46'- 3 1/2"	27"	9	1230	438
48'-11 1/2"	49'- 9"	27"	10	1320	534
52'- 3 1/2"	53'- 1"	27"	11	1430	601
60'- 9"	61'- 6 1/2"	36"	6	1170	597
67'- 7 1/2"	68'- 5"	36"	7	1330	740
74'- 1 1/2"	74'-11"	36"	8	1480	725
79'-11 1/2"	80'- 9"	36"	9	1690	871
85'- 1"	85'-10 1/2"	36"	10	1890	991
89'- 7"	90'- 4 1/2"	36"	11	2070	1062
99'- 1 3/4"	99'-11 1/4"	51" DPG	4	1540	1310
122'- 0"	122'- 9 1/2"	51" DPG	6	2159	1613
128'- 1 1/2"	128'- 11"	51" DPG	7	2477	1879

E45 RR BRIDGING

(2)

MAX. SPAN OF BRIDGE	OUT TO OUT DIMENSIONS	SIZE OF BEAMS	NO. OF BEAMS	WT. IN LBS/FT.	NO. OF MH
17'- 0"	17'- 9 1/2"	18"	4	300	100
22'- 4 1/2"	23'- 2"	27"	2	319	89
33'-11"	34'- 8 1/2"	27"	4	512	170
35'- 1"	35'-10 1/2"	36"	2	436	152
39'- 2 1/2"	39'-11 3/4"	27"	6	670	196
45'- 2 1/2"	46'- 0"	36"	4	774	249
55'-10"	56'- 7 1/2"	51" DPG	2	800	280
57'- 0 1/2"	57'-10"	36	6	1046	399
70'- 0"	70'- 9 1/2"	82" GRDR	2	2076	1100
81'- 6"	82'- 3 1/2"	51" DPG	4	1442	619
100'-10 1/2"	101'- 8"	51" DPG	6	2047	1313
123'- 0"	123'- 9 1/2"	164" TRUSS	2	2173	7200
143'- 6"	144'- 3 1/2"	164" TRUSS	2	2281	8700
153'- 9"	154'- 6 1/2"	164" TRUSS	2	2244	9000

ROAD & RAILROAD BRIDGE SUBSTRUCTURES

(5)

LIMITS OF SUBSTRUCTURE			
* SUBSTR FACTOR	MAX. HT. OF SUBSTR.	DESCRIPTION OF MATERIALS	MAX. COMBINED SPANS
0.40	12'	CHANNEL BENT, 6 TIMBER PILES	32' RR, 60' ROAD
0.62	20'	DOUBLE LANE PILE BENT, 4 STEEL PILES, WELDED	60' RR, 80' ROAD
0.86	13'	DOUBLE LANE PIER, 12 TIMBER PILES	90' ROAD
1.23	20'	PIER, 6 STEEL PILES	70' RR, 100' ROAD
2.59	20'	PILE BENT, 16 STEEL PILES (50' BETWEEN BENTS)	100' RR, 160' ROAD
2.77	26'	PIER, 18 TIMBER PILES	115' RR, 160' ROAD
2.84	26'	DOUBLE LANE PILE PIERS, STEEL BEAMS, 18 TIMBER PILES	80' ROAD
3.23	2-STORY	39' STEEL TOWER (NO FOUNDATION)	100' RR, 160' ROAD
4.42	2-STORY	39' STEEL TOWER ON F137 PEDESTALS	100' RR, 160' ROAD
5.01	2-STORY	49' STEEL TOWER (NO FOUNDATION)	100' RR
5.48	3-STORY	59' STEEL TOWER (NO FOUNDATION)	100' RR
6.01	3-STORY	67' STEEL TOWER (NO FOUNDATION)	100' RR
6.20	2-STORY	49' STEEL TOWER ON F138 PEDESTALS	100' RR
6.67	3-STORY	59' STEEL TOWER ON F140 PEDESTALS	100' RR
7.20	3-STORY	67' STEEL TOWER ON PEDESTALS	100' RR

* FACTOR MUST BE SMALLER THAN PROFITABLE SUBSTRUCTURE EXPENDITURE FACTORS IN PRECEDING TABLE. THE HEIGHT AND MAXIMUM SPAN LIMITS MUST BE MET IN ORDER TO USE THE SUBSTRUCTURE.

EXAMPLE OF HOW TABLES (3), (4) & (5) ARE USED:

TABLE (3) (SAME METHOD FOR TABLE (4)).
A 90' STEEL SPAN OF ROAD BRIDGING HAS THE FOLLOWING FACTORS: (FACTORS COMPUTED FROM MANHOURS AND WEIGHTS IN TABLE (1) AND EQUIVALENTS, NOTES 4 & 5)

LABOR AND EQUIPMENT: 1.77
MATERIAL: 4.64
TOTAL: 6.41

SINCE, 1 BN HR = 600 MN HR = 20 TONS STEEL = 35 TONS TIMBER, THE LABOR & EQUIPMENT FACTOR = $\frac{1662 \text{ MH}}{600 \text{ MH}} = 1.77$

MATERIAL FACTOR = $\frac{89.6' \times 2070 \text{ LB/FT}}{40000 \text{ LBS}} = 4.64$

IF IT IS DETERMINED, FROM THE TABLES, THAT IT IS MORE ECONOMICAL TO CONSTRUCT A COMBINATION OF SHORT SPANS RATHER THAN ONE LONG SPAN, THE DIFFERENCE IN THE TOTAL FACTORS CAN BE USED TO CONSTRUCT WHAT IS CALLED A PROFITABLE SUBSTRUCTURE. A PROFITABLE SUBSTRUCTURE CAN BE CONSTRUCTED IN THIS CASE BECAUSE THE 90' SPAN IS EQUIVALENT TO TWO 45'-6" SPANS WHICH HAVE A TOTAL FACTOR OF 2 × 2.13 = 4.26 (TABLE (3)).** NOW SUBTRACTING THE TOTAL FACTOR OF THE 90' SPAN GIVES 6.41 - 4.26 = 2.15, WHICH IS THE PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR.

** NOT ALWAYS ARE TWO SPANS OF THE SAME LENGTH THE MOST ECONOMICAL COMBINATION TO GET A PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR.

NOW TAKE THE PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR (2.15) TO TABLE (5). THE SUBSTRUCTURE FACTOR IN TABLE (5) MUST BE SMALLER THAN THE PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR IN ORDER TO USE TABLE (5). THE ONLY SUBSTRUCTURE FACTORS WHICH ARE SMALLER ARE 0.40, 0.62, 0.86 AND 1.23. ONLY THE THIRD AND FOURTH SUBSTRUCTURES CAN BE USED BECAUSE OF THE LIMITS OF THE SUBSTRUCTURE.

SUMMARY (TABLES 1 THRU 5)

WHEN ECONOMICAL SINGLE SPAN ROAD OR RAILROAD BRIDGING IS REQUIRED USE TABLE (1) & (2). WHEN TERRAIN ALLOWS A CHOICE BETWEEN SINGLE AND MULTIPLE SPAN ROAD OR RAILROAD BRIDGING, USE TABLE (3) OR (4). IF TABLE (3) OR (4) IS USED, TAKE THE PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR, IF THERE IS ONE, TO TABLE (5) AND DETERMINE THE SUBSTRUCTURE FOR THE ROAD OR RAILROAD BRIDGE.

FOR ECONOMY OF SINGLE SPAN VS MULTIPLE SPAN STRUCTURES IF TERRAIN ALLOWS A CHOICE.

CLASS 60 ROAD BRIDGING

(3)

MAX. SPAN OF BRIDGE	TYPE OF MAT'L USED	LABOR AND EQUIP FACTOR	MATERIAL FACTOR	TOTAL FACTOR	PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR
39'- 2 1/4"	STEEL	0.50	0.83	1.33	
41'-11 1/2"	STEEL	0.65	1.18	1.83	
45'- 6"	STEEL	0.73	1.40	2.13	
48'-11 1/2"	STEEL	0.89	1.62	2.51	
52'- 3 1/2"	STEEL	1.00	1.88	2.88	
60'- 9"	STEEL	1.00	1.78	2.78	
67'- 7 1/2"	STEEL	1.23	2.25	3.48	1.02
74'- 1 1/2"	STEEL	1.21	2.74	3.95	1.49
79'-11 1/2"	STEEL	1.45	3.38	4.83	1.77
85'- 1"	STEEL	1.65	4.02	5.67	1.71
89'- 7"	STEEL	1.77	4.64	6.41	2.15
99'- 1 1/4"	STEEL	2.18	3.81	5.99	0.60
122'- 0"	STEEL	2.69	6.58	9.27	3.01
128'- 1 1/2"	STEEL	3.13	7.93	11.06	4.80

E45 RR BRIDGING

(4)

MAX. SPAN OF BRIDGE	TYPE OF MAT'L USED	LABOR AND EQUIP FACTOR	MATERIAL FACTOR	TOTAL FACTOR	PROFITABLE SUBSTRUCTURE EXPENDITURE FACTOR
17'- 0"	STEEL	0.17	0.13	0.30	
22'- 4 1/2"	STEEL	0.15	0.18	0.33	
33'-11"	STEEL	0.28	0.44	0.72	
35'- 1"	STEEL	0.25	0.38	0.63	
39'- 2 1/4"	STEEL	0.33	0.66	0.99	
45'- 2 1/2"	STEEL	0.42	0.87	1.29	
55'-10"	STEEL	0.47	1.12	1.59	0.54
57'- 0 1/2"	STEEL	0.67	1.49	2.16	0.72
70'- 0"	STEEL	1.83	3.63	5.46	4.20
81'- 6"	STEEL	1.03	2.94	3.97	1.69
100'-10 1/2"	STEEL	2.19	5.17	7.36	4.48
123'- 0"	STEEL	12.00	6.68	18.68	11.63
143'- 6"	STEEL	14.50	8.18	22.68	14.03
153'- 9"	STEEL	15.00	8.63	23.63	14.68

TABLE OF USEFUL AND ECONOMIC SPANS

(6)

(C. TO C. OF SUPPORTS — ADD 9 1/2" FOR OUT TO OUT LENGTH)

DEPTH & WT/FT. OF BEAMS OR GIRDERS	WEIGHT CLASS OF BRIDGE	24'-2 LANE ROADWAY, NUMBER OF BEAMS OR GIRDERS: 4	5	6	7	8	9	10	11	13.5'-1 LANE ROADWAY, NUMBER OF BEAMS OR GIRDERS: 3	4	5	6
27"-94* WF BEAM	60	•	*34'-2"	39'-2"	•	41'-11"	45'-6"	48'-11"	52'-3"	*34'-2"	41'-11"	45'-6"	52'-3"
	50	*29'-2"	*39'-2"	44'-2"	45'-6"	47'-9"	52'-3"	53'-9"	59'-2"	*36'-0"	42'-6"	54'-0"	59'-2"
	40	34'-2"	39'-2"	49'-2"	49'-2"	54'-2"	54'-2"	64'-2"	74'-2"	39'-2"	49'-2"	64'-2"	74'-2"
	30	39'-2"	49'-2"	59'-2"	69'-2"	79'-2"	•	•	•	49'-2"	69'-2"	79'-2"	•
	20	59'-2"	69'-2"	79'-2"	•	•	•	•	•	64'-2"	79'-2"	•	•
36"-150* WF BEAM	60	*39'-2"	*49'-2"	60'-9"	67'-7"	74'-1"	79'-2"	85'-1"	89'-7"	*49'-2"	67'-9"	79'-2"	89'-2"
	50	*49'-2"	*59'-2"	69'-2"	79'-2"	84'-2"	89'-2"	94'-2"	99'-2"	*59'-2"	79'-2"	89'-2"	99'-2"
	40	59'-2"	79'-2"	89'-2"	94'-2"	99'-2"	104'-2"	109'-2"	114'-2"	79'-2"	89'-2"	99'-2"	109'-2"
	30	79'-2"	89'-2"	99'-2"	104'-2"	109'-2"	114'-2"	119'-2"	•	89'-2"	99'-2"	109'-2"	119'-2"
	20	89'-2"	99'-2"	109'-2"	114'-2"	119'-2"	•	•	•	99'-2"	109'-2"	119'-2"	•
51"-275* DPG	60	*99'-2"	*109'-2"	122'-0"	128'-11"	•	•	•	•	*109'-2"	129'-2"	•	•
	50	*109'-2"	119'-2"	129'-2"	•	•	•	•	•	*129'-2"	•	•	•
	40	119'-2"	129'-2"	•	•	•	•	•	•	•	•	•	•
	30	129'-2"	•	•	•	•	•	•	•	•	•	•	•

* 2"x8" DECKING FOR THESE SPANS
• SPACES NOT FILLED ARE UNSAFE DUE TO EXCESSIVE DEFLECTION OF EITHER STRUCTURAL STEEL OR WOOD DECKING, OR ARE EXCESSIVE IN USE OF MATERIAL.

(7) TABLE OF MAXIMUM SPAN LENGTHS SUPPORTED BY ROAD SUBSTRUCTURES

THE SUBSTRUCTURE FACILITIES LISTED BELOW WERE DESIGNED FOR THE SPAN LENGTHS THAT ARE UNDERLINED; HOWEVER THEY MAY BE USED FOR OTHER SPANS AND CLASS LOADING AS SHOWN.
EXAMPLE - FACILITY NO 851122 WAS DESIGNED FOR A MAXIMUM COMBINED SPAN OF 50' CLASS 50 LOADING. THIS SAME FACILITY MAY BE USED FOR SPANS OF 39'-2" (CLASS 40) OR 60' (CLASS 25).

TYPE SS = MAXIMUM LENGTH OF SINGLE SPAN SUPPORTED
TYPE CS = MAXIMUM LENGTH OF COMBINED SPANS SUPPORTED

FACILITY NOS.	851-101 & 102	851-103 THRU 107	851-108 THRU 110	851-111	851-112	851-113	851-115	851-121	851-122 THRU 124	851-127	851-128	851-302 THRU 304	851-201 & 202	851-203	851-204 THRU 206	852-222 & 223	852-224 & 225	852-226	852-228	852-229 & 230	852-251	852-252	852-253	852-254	852-241	852-360 THRU 365	852-401 THRU 403	852-407 THRU 410
TYPE	SS	SS	CS	CS	CS	CS	SS	SS	CS	CS	CS	CS	SS	SS	CS	SS	SS	SS	CS	CS	CS	SS	CS	CS	SS	CS	SS	CS
CLASS 60	39'-2"	79'-2"	—	80'	100'	160'	79'-2"	39'-2"	—	80'	160'	160'	70'	80'	160'	30'	70'	60'	40'	40'	60'	80'	160'	200'	119'-2"	120'	90'	180'
CLASS 50	50'	80'	40'	100'	120'	180'	90'	60'	30'	100'	180'	180'	79'-2"	99'-2"	180'	39'-2"	79'-2"	70'	60'	50'	79'-2"	90'	180'	250'	130'	180'	99'-2"	200'
CLASS 40	60'	99'-2"	60'	120'	160'	200'	99'-2"	79'-2"	39'-2"	120'	200'	200'	99'-2"	99'-2"	200'	50'	99'-2"	79'-2"	79'-2"	60'	99'-2"	99'-2"	200'	260'	130'	200'	99'-2"	240'
CLASS 25	79'-2"	99'-2"	80'	160'	200'	260'	99'-2"	99'-2"	60'	160'	260'	200'	99'-2"	99'-2"	260'	60'	99'-2"	99'-2"	99'-2"	79'-2"	99'-2"	99'-2"	200'	260'	130'	200'	99'-2"	260'

GENERAL NOTES

1. DECKING NOT INCLUDED IN ROAD BRIDGING TABLE.
2. TIMBER TIES ARE INCLUDED IN RAILROAD BRIDGING TABLE.
3. FACTORS ARE NUMBER OF BN HR EQUIVALENTS.
4. LABOR EQUIVALENTS: 1 BN HR = 600 MN HR WITH ALL EQUIPMENT NECESSARY.
5. MATERIAL EQUIVALENTS:
   a. 1 BN HR = 20 TONS STEEL, DELIVERED.
   b. 1 BN HR = 35 TONS TIMBER, DELIVERED.
6. THE ABOVE TABLES APPLY GENERALLY TO DRAWINGS 85-21 AND 86-16, HOWEVER, THE SAME PRINCIPLES CAN BE APPLIED TO OTHER BRIDGING SYSTEMS.
7. ALL DATA SHOWN FOR ROAD BRIDGES IN THE 85-21 DRAWINGS IS FOR 2-LANE BRIDGES. SINGLE LANE BRIDGES OF CLASS 60 OR BRIDGES OTHER THAN CLASS 60 CAN BE CONSTRUCTED OF THESE SAME MATERIALS. TABLE 6 SHOWS USEFUL SPANS FOR BOTH SINGLE AND DOUBLE LANE BRIDGES OF CLASS 60 DOWNWARD TO CLASS 20. THOSE SPANS UNDERLINED HAVE DETAILED DRAWINGS IN THIS MANUAL.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: K. W. DEICHMANN
APPROVED:

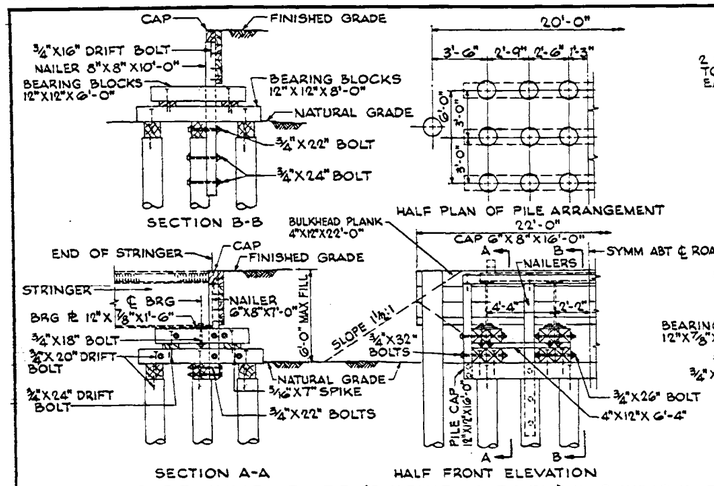
THEATER OF OPERATIONS
BRIDGE SELECTION TABLES FOR ROAD & RAILROAD

UNDER REVISION

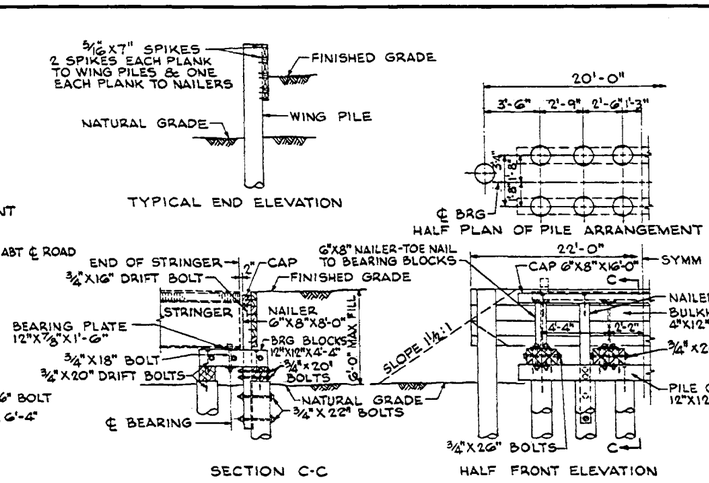
APPROVED: W. M. Williams for H. G. Loeser
CHIEF, CONSTRUCTION BRANCH & CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

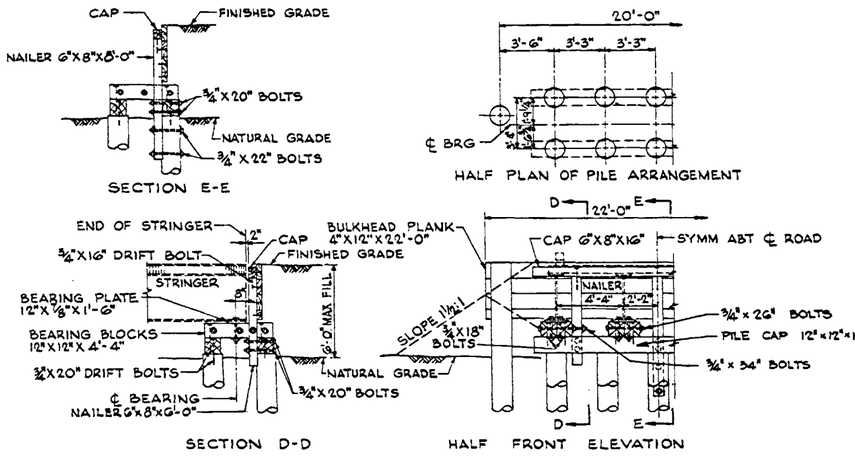
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-02
SHEET 2 OF 2



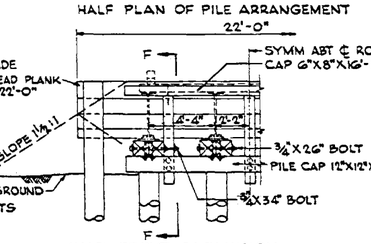
18 BEARING PILES (3 ROWS, 6 EACH) & 2 WING PILES
80' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851107



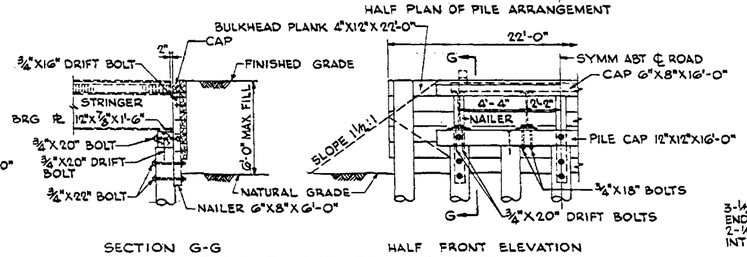
12 BEARING PILES (2 ROWS, 6 EACH) & 2 WING PILES
80' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851106



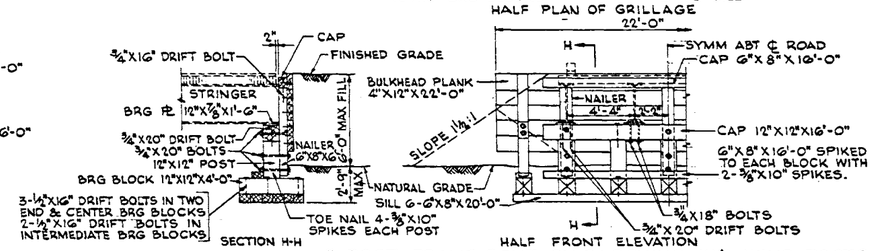
10 BEARING PILES (2 ROWS, 5 EACH) & 2 WING PILES
80' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851105



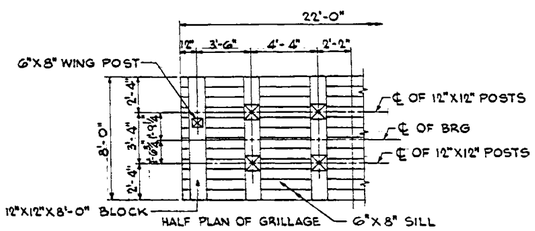
8 BEARING PILES (2 ROWS, 4 EACH) & 2 WING PILES
80' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851103

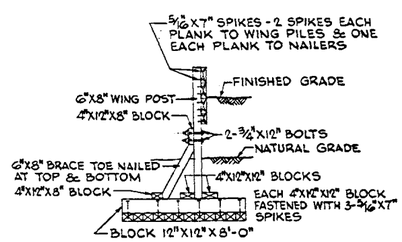


5 BEARING PILES & 2 WING PILES
50' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851101



5 POST FRAME BENT ON BLOCKING W/2 WING POSTS
50' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851102





8 POST (2 ROWS, 4 EACH) FRAME BENT ON BLOCKING W/2 WING POSTS
80' SPAN-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851104

GENERAL NOTES

1. CLASS 100 LOADING OPTIONS ARE NOT APPLICABLE TO FACIL. NO. 851101 & 851102.
2. FOR CLASS 100 WITH 80' SPAN USE 9-36WF BEAMS SPACED AT 1'-4½" OC ON CONTINUOUS CORBELS. FACIL. NO. 851103, 851104 & 851105.
3. FOR CLASS 100 WITH 80' SPAN USE 9-36WF BEAMS SPACED AT 1'-4½" OC ON CONTINUOUS CORBELS OR 4-51"DPG'S WITH TOP CORBELS OMITTED. FACIL. NO. 851106 & 851107.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W.DEICHMANN
APPROVED:

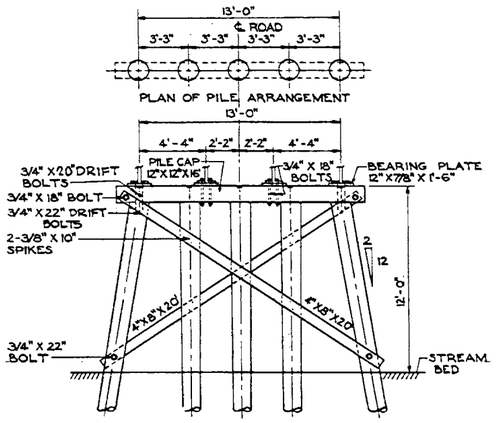
THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURES
SINGLE LANE ABUTMENTS
50ft-80ft STEEL SPANS
CLASS 50 & 100

UNDER REVISION

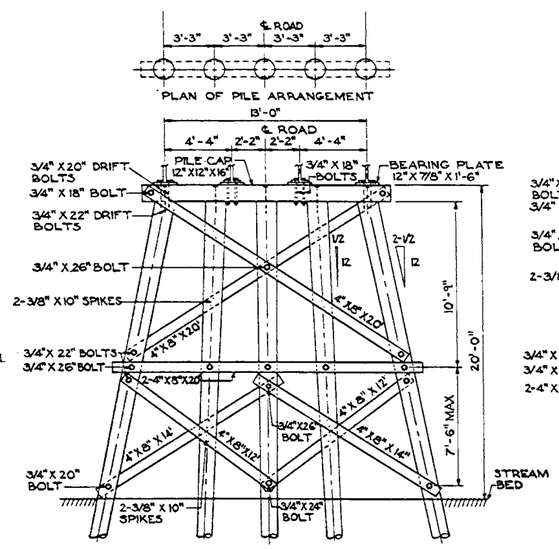
APPROVED: DATE: 1-9 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

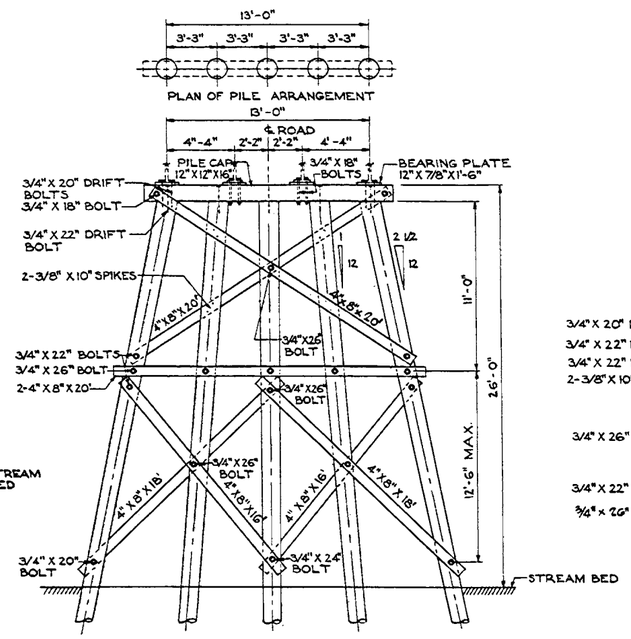
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
DATE
SHEET 1 OF 4
85-11



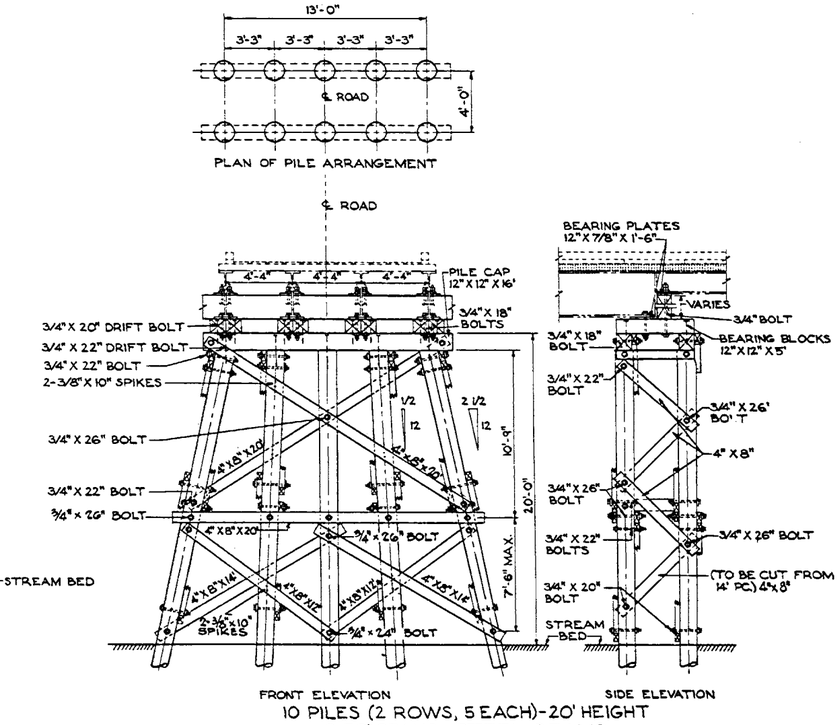
ELEVATION
5 PILE BENT- 12' HEIGHT
2-20' SPANS-STEEL SPANS CLASS 50
SCALE NO. 2
FACILITY NO. 851108



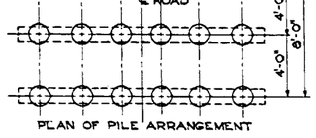
ELEVATION
5 PILE BENT-20' HEIGHT
2-20' SPANS-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851109

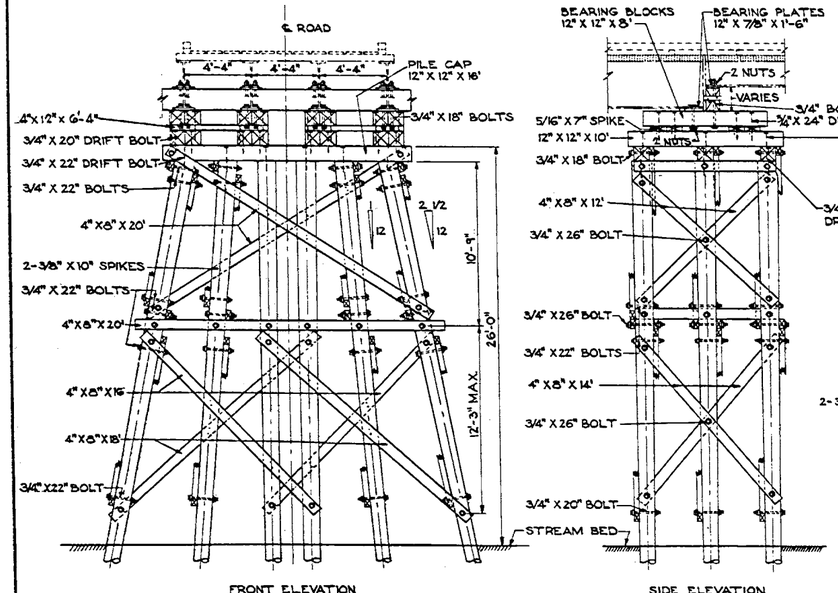


ELEVATION
5 PILE BENT-26' HEIGHT
2-20' SPANS-STEEL BEAMS CLASS 50
SCALE NO. 2
FACILITY NO. 851110

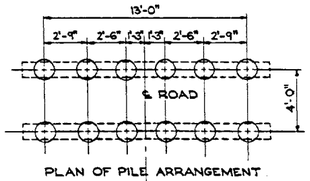


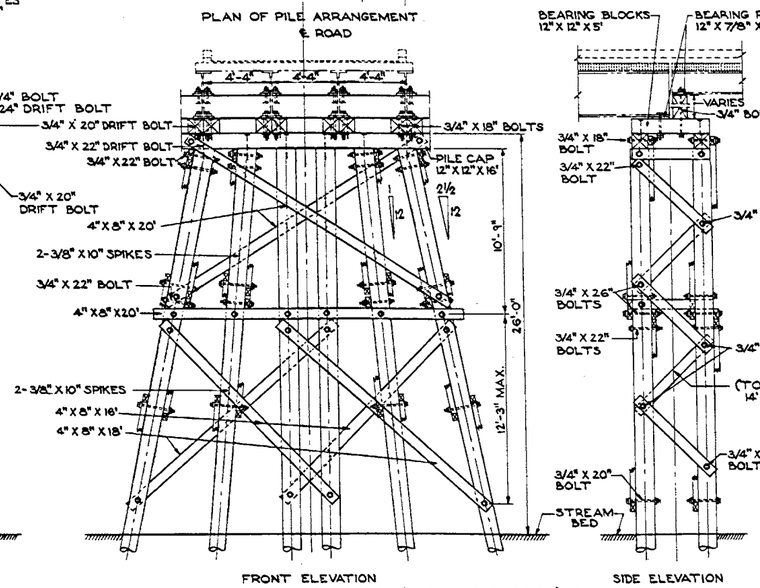
10 PILES (2 ROWS, 5 EACH)-20' HEIGHT
2-50' SPANS - STEEL BEAMS
SCALE NO. 2
FACILITY NO. 851111





18 PILES (3 ROWS, 6 EACH) 26' HEIGHT
2-90' SPANS - STEEL BEAMS
SCALE NO. 2
FACILITY NO. 851113





12 PILES (2 ROWS, 6 EACH)-26' HEIGHT
2-60' SPANS - STEEL BEAMS
SCALE NO. 2
FACILITY NO. 851112

GENERAL NOTES

1. CLASS 100 LOADING OPTIONS NOT APPLICABLE TO FACILITIES 851108, 851109, 851110.
2. 20' PIER IS FOR CLASS 100 LOADING WITH 56" WF BEAMS OF 150#/FT. OR HEAVIER. 26' PIER CONVERTED TO CLASS 100 LOADING WILL SUPPORT 6 BEAMS CENTERED OVER EACH OF THE 6 PILES WITH 36"-150# OR HEAVIER WF BEAMS. FACILITIES NO. 851111 & 851112.
3. FOR CLASS 100 LOADING REDUCE SPANS TO 80'. FACILITY NO. 851113.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO.2

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

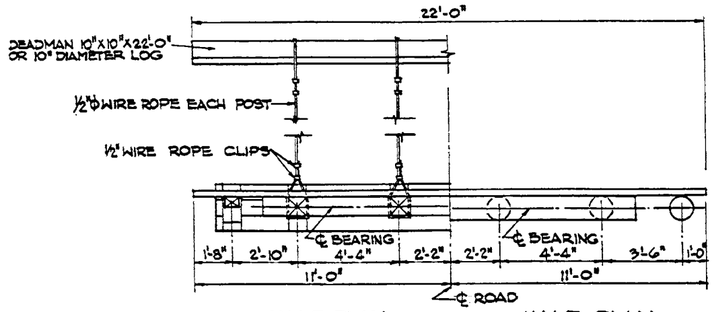
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. BEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

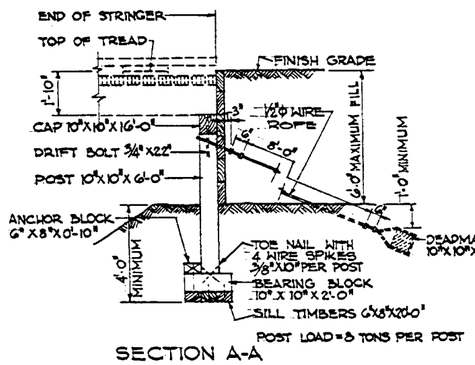
THEATER OF OPERATIONS
ROAD-BRIDGE SUPERSTRUCTURES
SINGLE LANE CHANNEL BENTS
CLASS 50 & 100
VARIOUS SPANS & VARIOUS HEIGHTS

UNDER REVISION

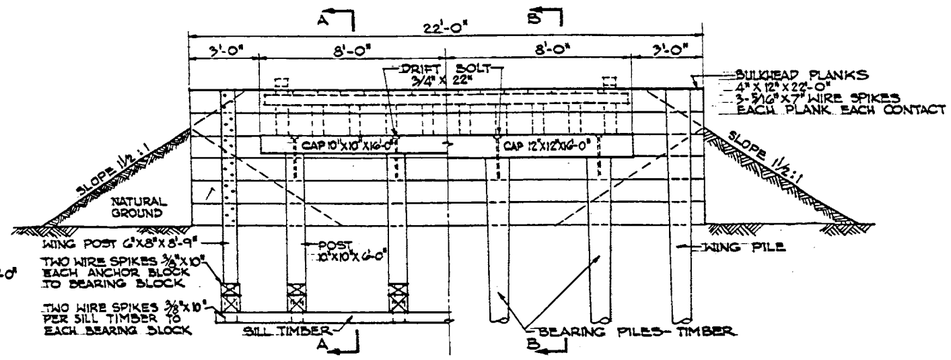
APPROVED: [signature] DATE: 19 MAR 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-11
SHEET 2 OF 4



HALF PLAN HALF PLAN



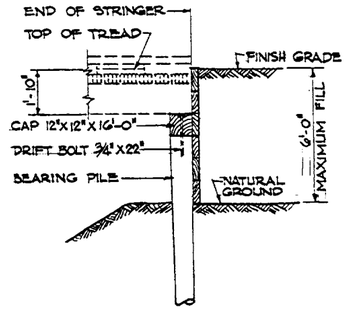
SECTION A-A



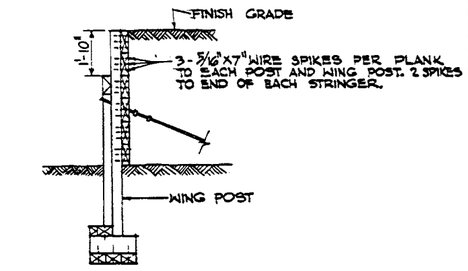
HALF FRONT ELEV.
4 POST FRAME ON BLOCKING W/2 WING POSTS
FACILITY NO. 851116

HALF FRONT ELEV.
4 BEARING PILES & 2 WING PILES
FACILITY NO. 851114

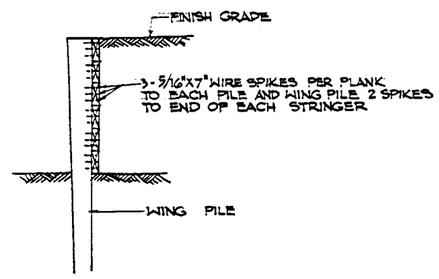
14' SPAN - TIMBER STRINGER - CLASS 50
SCALE NO. 3



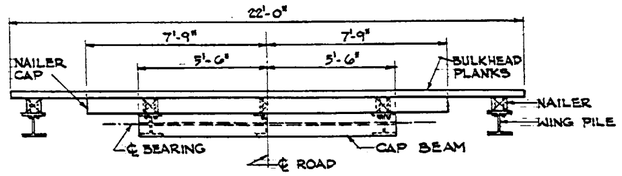
SECTION B-B



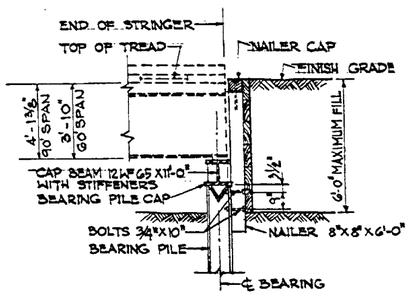
END ELEVATION - FACILITY NO. 851116



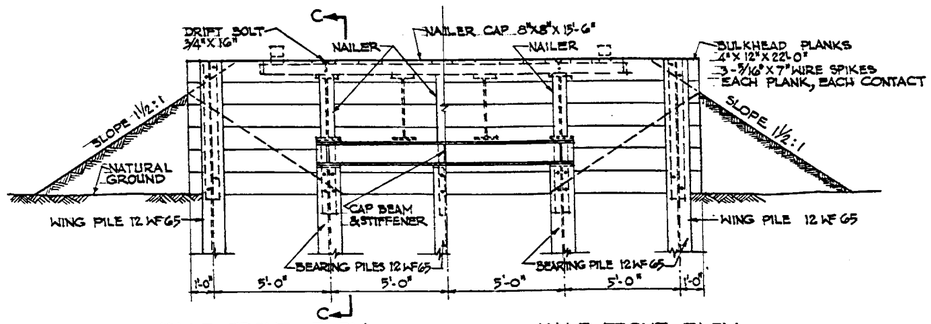
END ELEVATION - FACILITY NO. 851114



HALF PLAN HALF PLAN



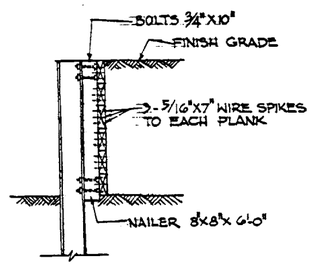
SECTION C-C



HALF FRONT ELEV.
3 STEEL BEARING PILES & 2 WING PILES
90' SPAN - STEEL BEAMS - CLASS 50
FACILITY NO. 851113

HALF FRONT ELEV.
2 STEEL BEARING PILE & 2 WING PILES
60' SPAN - STEEL BEAMS - CLASS 50
FACILITY NO. 851121

SCALE NO. 3



END ELEVATION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS

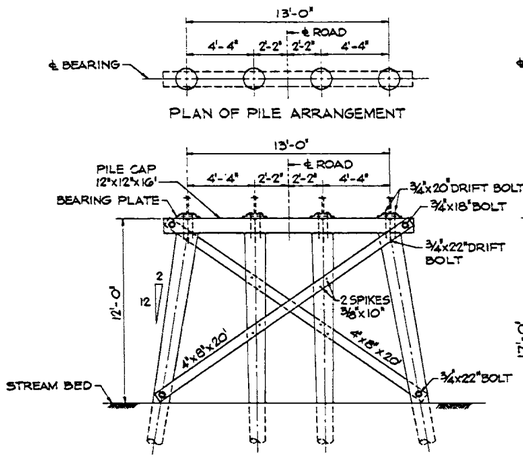
UNDER REVISION

ROAD BRIDGE SUBSTRUCTURES
ABUTMENTS: CLASS 50
16'-0" TIMBER SPANS
60'-0" & 90'-0" STEEL SPANS

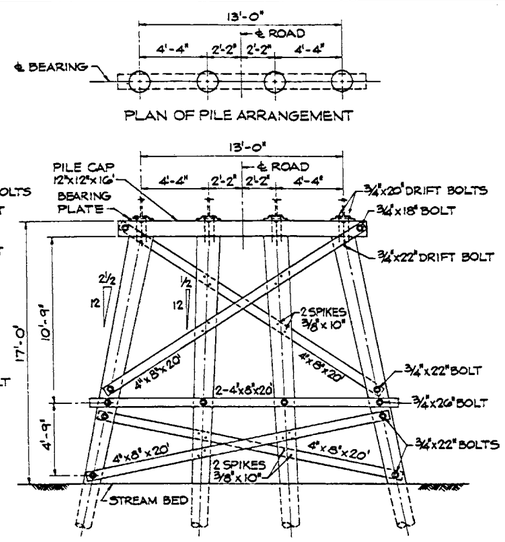
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE:

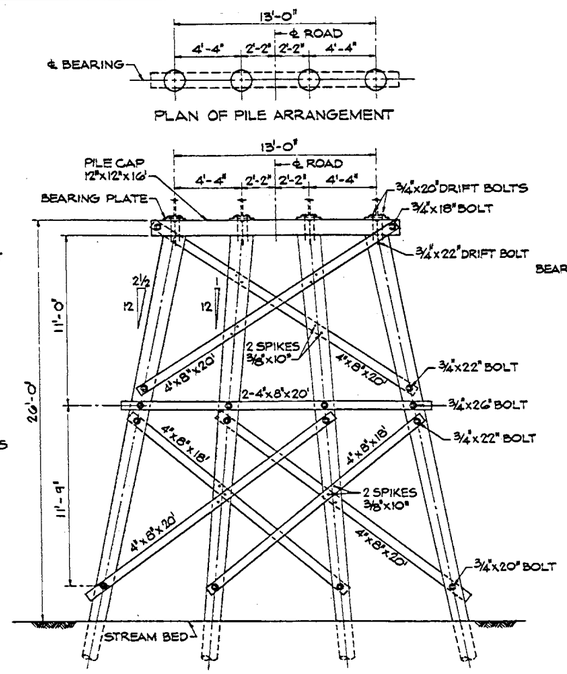
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 3 OF 4
85-11



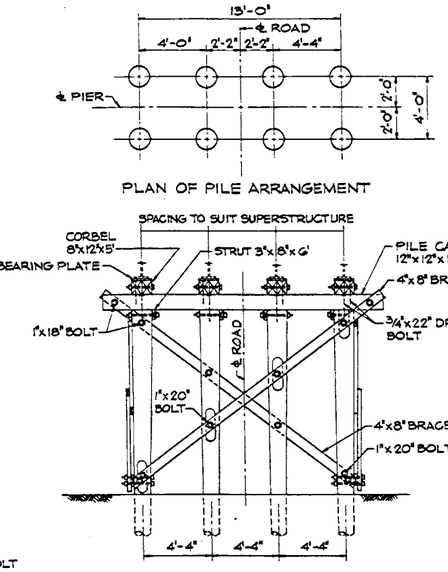
4 TIMBER PILE BENT-12' HEIGHT
30FT MAXIMUM COMBINED SPANS
SCALE NO. 2
FACILITY NO. 851122



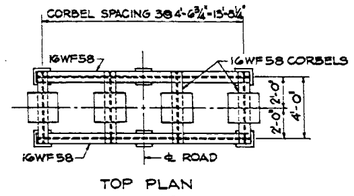
4 TIMBER PILE BENT-17' HEIGHT
30FT MAXIMUM COMBINED SPANS
SCALE NO. 2
FACILITY NO. 851123



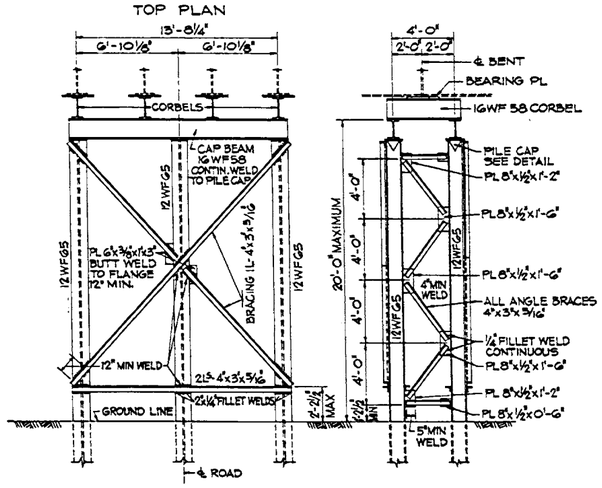
4 TIMBER PILE BENT-26' HEIGHT
30FT MAXIMUM COMBINED SPANS
SCALE NO. 2
FACILITY NO. 851124



8 TIMBER PILE PIER - 13' HEIGHT
100FT MAXIMUM COMBINED SPANS
SCALE NO. 2
FACILITY NO. 851127



TOP PLAN

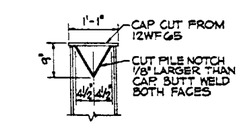


TRANSVERSE ELEV. LONGITUDINAL ELEV.

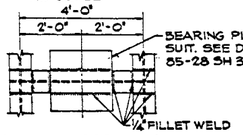
6 STEEL PILE BENT, WELDED - 20' HEIGHT
180FT MAXIMUM COMBINED SPANS
SCALE NO. 2
FACILITY NO. 851128

NOTE: DIAPHRAGM SPACING SHOWN FOR TWO (2) EQUAL SPANS OF 90 FT. FOR OTHER SUPERSTRUCTURE SELECTIONS REFER TO DWG. NO. 85-28 SH 2 OF 3

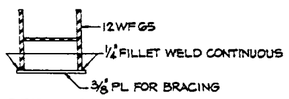
PILE ORIENTATION "A"



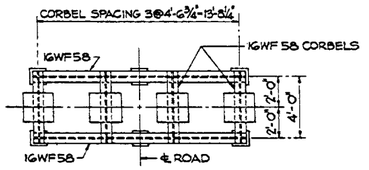
PILE CAP DETAIL
NO SCALE



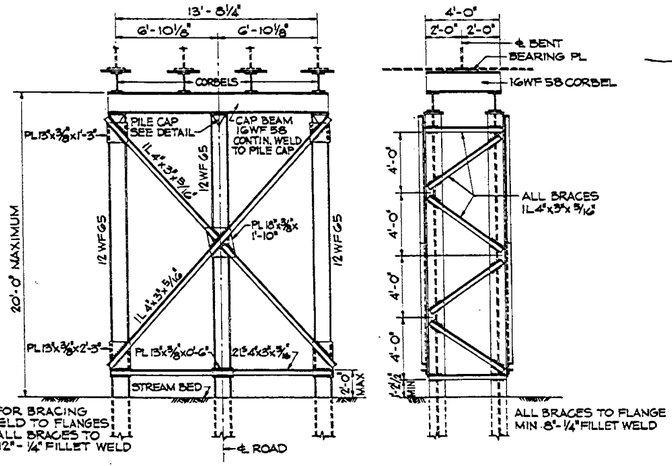
PLAN AT CORBELS
NO SCALE
FOR FACILITY NO. 851128



DETAIL "A"
NO SCALE
TYPICAL FOR ORIENTATION "B"



TOP PLAN



ALL PLATES FOR BRACING ¼" FILLET WELD TO FLANGES - DETAIL "A". ALL BRACES TO PLATES MIN. 12" - ¼" FILLET WELD

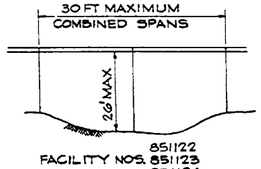
ALL BRACES TO FLANGE MIN .8" - ¼" FILLET WELD

TRANSVERSE ELEV. LONGITUDINAL ELEV.

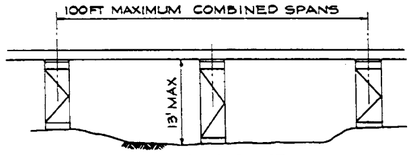
6 STEEL PILE BENT, WELDED - 20' HEIGHT
180FT MAXIMUM COMBINED SPANS
SCALE NO. 2
FACILITY NO. 851128

NOTE: THE ABOVE ORIENTATION OF PILES IS USED WHERE STREAM FLOW AND DEBRIS CHARACTERISTICS CONTRIBUTE TO HIGH LATERAL LOADS.

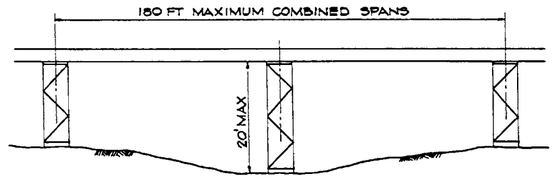
PILE ORIENTATION "B"



851122
FACILITY NOS. 851123
851124



FACILITY NO. 851127



FACILITY NO. 851128

DIAGRAMS SHOWING HEIGHT & SPAN LIMITATIONS
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DRAWING SCALES
0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: G.W. DEJCHMANN
APPROVED:

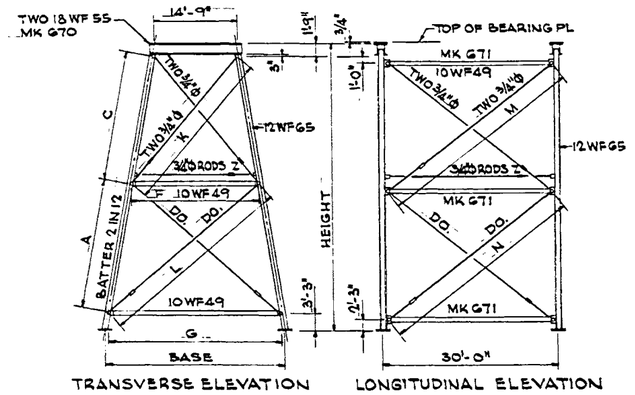
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
STEEL I-BEAM BENTS & PIERS-CLASS 50
30FT TO 180FT MAXIMUM COMBINED SPANS

UNDER REVISION

APPROVED: DATE: 19 MAR 1963
for H.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
CHIEF, STRUCTURES BRANCH

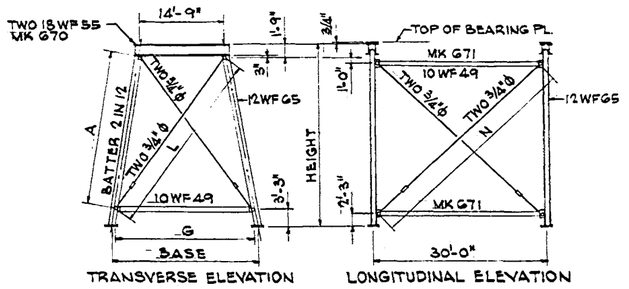
APPROVED FOR PROPONENT AGENCY:
DATE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 4 OF 4
85-11



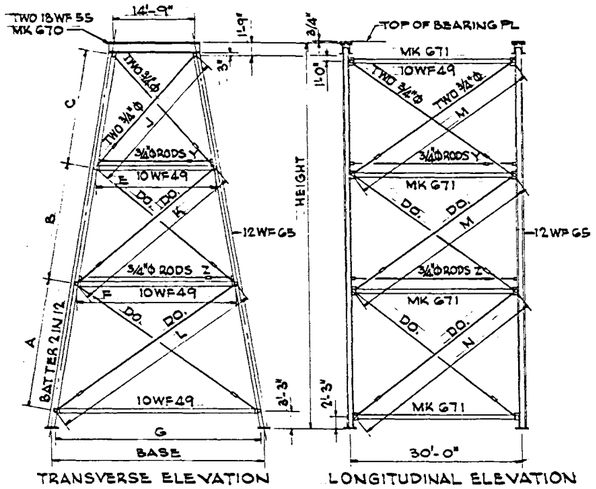
TRANSVERSE ELEVATION LONGITUDINAL ELEVATION

TWO STORY TOWER
SCALE NO. 17
FACILITY NO. 851302
49 FT. HIGH-WELDED



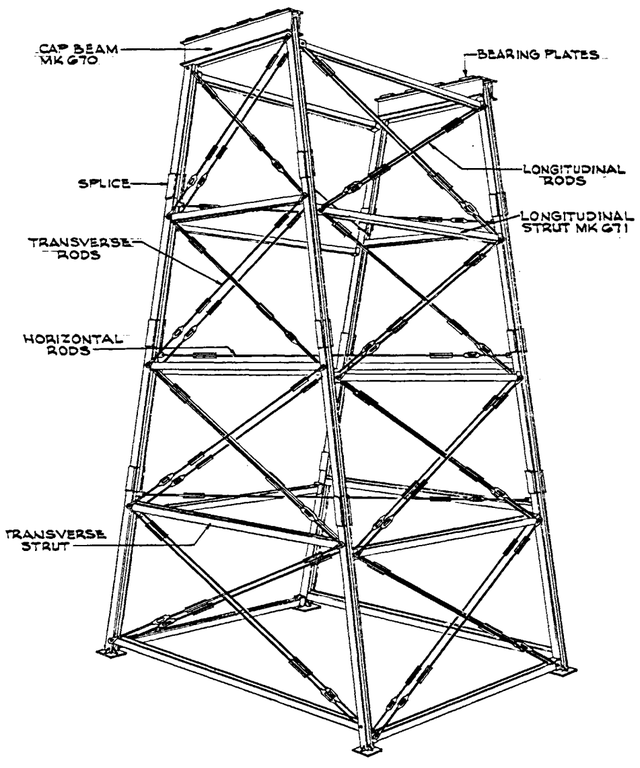
TRANSVERSE ELEVATION LONGITUDINAL ELEVATION

ONE STORY TOWER
SCALE NO. 17
FACILITY NO. 851301
31 FT. HIGH-WELDED



TRANSVERSE ELEVATION LONGITUDINAL ELEVATION

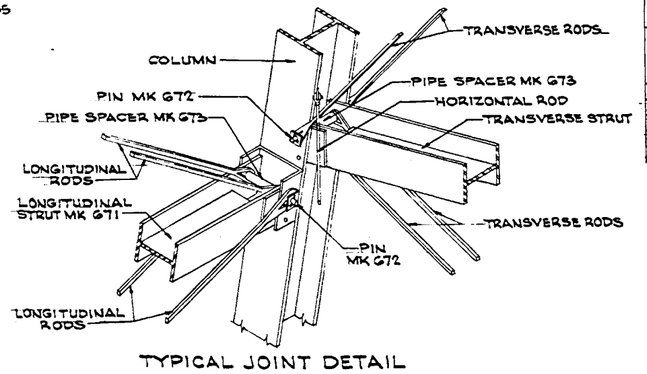
THREE STORY TOWER
SCALE NO. 17
FACILITY NO. 851303
67 FT. HIGH-WELDED



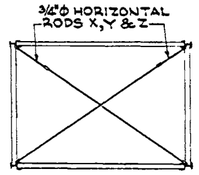
ASSEMBLED VIEW - FOUR STORY TOWER
.10 SCALE

TRANSVERSE ELEVATION LONGITUDINAL ELEVATION

FOUR STORY TOWER
SCALE NO. 17
FACILITY NO. 851304
77 FT. HIGH-WELDED



TYPICAL JOINT DETAIL
NO SCALE



SECTION A-A
SCALE NO. 17

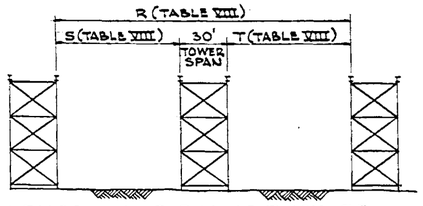


DIAGRAM FOR SUPERSTRUCTURE SPAN LIMITATIONS
S + T = 180 FT. MAXIMUM

TABULATION OF TOWER DIMENSIONS AND ERECTION MARKS.

FOUR STORY TOWER

HEIGHT		77'	75'	73'	71'	69'
BASE		40'-5"	39'-9"	39'-1"	38'-5"	37'-9"
A	MARK	1504	1505	1506	1507	1508
	DIM.	18'-3"	17'-8⅞"	17'-2¾"	16'-8¾"	16'-2⅝"
B	MARK	1514	1515	1516	1517	1518
	DIM.	18'-3"	17'-8⅞"	17'-2⅞"	16'-8¾"	16'-2⅝"
C	MARK	1524	1525	1526	1527	1774
	DIM.	18'-3"	17'-8⅞"	17'-2⅞"	16'-8¾"	16'-2⅝"
D	MARK	1578	1579	1580	1581	1582
	DIM.	20'-10"	20'-8"	20'-6"	20'-4"	20'-2"
E	MARK	1562	1563	1564	1565	1566
	DIM.	26'-10"	26'-8"	26'-2"	25'-10"	25'-6"
F	MARK	1550	1551	1552	1553	1555
	DIM.	32'-1⅛"	32'-4"	31'-10"	31'-4"	30'-10"
G	MARK	1540	1541	1542	1543	1544
	DIM.	38'-10"	38'-2"	37'-6"	36'-10"	36'-2"
H	MARK	830	832	834	837	838
	DIM.	25'-4"	24'-11⅛"	24'-6¼"	24'-1⅜"	23'-8½"
J	MARK	800	803	809	814	816
	DIM.	29'-10⅜"	29'-4⅜"	28'-10⅜"	28'-4½"	27'-10⅜"
K	MARK	743	750	760	767	777
	DIM.	34'-10⅛"	34'-2¾"	33'-7⅜"	33'-0"	32'-4¾"
L	MARK	709	711	718	723	729
	DIM.	40'-1¼"	39'-4½"	38'-7⅜"	37'-10⅜"	37'-1½"
M	MARK	757	761	765	768	772
	DIM.	33'-8¾"	33'-5½"	33'-2¼"	32'-11⅛"	32'-8⅛"
N	MARK	757	761	765	768	772
	DIM.	33'-8¾"	33'-5½"	33'-2¼"	32'-11⅛"	32'-8⅛"
X	MARK	956	957	958	959	960
	DIM.	34'-6⅝"	34'-5½"	34'-4⅜"	34'-3¼"	34'-2¼"
Y	MARK	944	945	946	947	948
	DIM.	38'-3¼"	38'-0⅝"	37'-10"	37'-7⅜"	37'-4¾"
Z	MARK	920	923	926	927	928
	DIM.	42'-6"	42'-1⅜"	41'-9¼"	41'-4⅞"	41'-0⅜"

ONE STORY TOWER

HEIGHT		31'	29'	27'	25'	23'	21'	19'	17'	15'
BASE		25'-1"	24'-5"	23'-9"	23'-1"	22'-5"	21'-9"	21'-1"	20'-5"	19'-9"
A	MARK	1531	1532	1533	1534	1535	1536	1537	1538	1539
	DIM.	26'-4½"	24'-4"	22'-3⅜"	20'-3¼"	18'-3"	16'-2⅝"	14'-2⅜"	12'-2"	10'-1⅝"
G	MARK	1570	1571	1572	1573	1578	1582	1584	1585	1586
	DIM.	23'-6"	22'-10"	22'-2"	21'-6"	20'-10"	20'-2"	19'-6"	18'-10"	18'-2"
L	MARK	779	795	811	823	830	838	847	851	857
	DIM.	32'-3⅜"	30'-6⅛"	28'-8⅞"	27'-0¼"	25'-4"	23'-8½"	22'-1⅞"	20'-8⅛"	19'-4⅜"
N	MARK	715	726	735	742	757	824	785	792	799
	DIM.	38'-8⅜"	37'-4½"	36'-1"	34'-10⅜"	33'-8¾"	32'-8⅛"	31'-8⅝"	30'-10⅜"	30'-1½"

TWO STORY TOWER

HEIGHT		49'	47'	45'	43'	41'	39'	37'	35'	33'
BASE		31'-1"	30'-5"	29'-9"	29'-1"	28'-5"	27'-9"	27'-1"	26'-5"	25'-9"
A	MARK	1500	1501	1502	1503	1504	1505	1508	1509	1510
	DIM.	22'-3⅜"	21'-3½"	20'-3¼"	19'-3⅛"	18'-3"	17'-2⅞"	16'-2⅝"	15'-2½"	14'-2⅜"
C	MARK	1520	1773	1521	1523	1524	1526	1774	1529	1530
	DIM.	22'-3⅜"	21'-3½"	20'-3¼"	19'-3⅛"	18'-3"	17'-2⅞"	16'-2⅝"	15'-2½"	14'-2⅜"
F	MARK	1572	1574	1573	1576	1578	1580	1582	1583	1584
	DIM.	22'-2"	21'-10"	21'-6"	21'-2"	20'-10"	20'-6"	20'-2"	19'-10"	19'-6"
G	MARK	1557	1559	1558	1561	1562	1564	1566	1568	1569
	DIM.	29'-6"	28'-10"	28'-2"	27'-6"	26'-10"	26'-2"	25'-6"	24'-10"	24'-2"
K	MARK	811	816	823	828	830	838	843	843	847
	DIM.	28'-8⅜"	27'-10½"	27'-0¼"	26'-2⅛"	25'-4"	24'-6¼"	23'-8½"	22'-11⅛"	22'-1⅞"
L	MARK	754	770	784	793	1054	809	816	823	829
	DIM.	33'-11⅛"	32'-10⅞"	31'-10⅜"	30'-10½"	29'-10⅜"	28'-10⅜"	27'-10⅜"	27'-0¼"	25'-11¼"
M	MARK	735	738	742	749	757	765	771	780	785
	DIM.	36'-1"	35'-5⅜"	34'-10⅜"	34'-3⅜"	33'-8¾"	33'-2¼"	32'-6¼"	32'-2¼"	31'-8⅜"
N	MARK	735	738	742	749	757	765	771	780	785
	DIM.	36'-1"	35'-5⅜"	34'-10⅜"	34'-3⅜"	33'-8¾"	33'-2¼"	32'-6¼"	32'-2¼"	31'-8⅜"
Z	MARK	951	952	953	974	956	958	989	962	990
	DIM.	35'-4"	35'-1⅜"	34'-11¼"	34'-9"	34'-6⅜"	34'-4⅜"	34'-2¼"	34'-0"	33'-9⅞"

THREE STORY TOWER

HEIGHT		67'	65'	63'	61'	59'	57'	55'	53'	51'
BASE		37'-1"	36'-5"	35'-9"	35'-1"	34'-5"	33'-9"	33'-1"	32'-5"	31'-9"
A	MARK	1500	1502	1503	1504	1504	1506	1506	1508	1509
	DIM.	22'-3⅜"	20'-3¼"	19'-3⅛"	18'-3"	18'-3"	17'-2¾"	17'-2¾"	16'-2⅝"	15'-2½"
B	MARK	1511	1511	1512	1513	1514	1515	1517	1518	1519
	DIM.	20'-3¼"	20'-3¼"	19'-9¼"	19'-3⅛"	18'-3"	17'-8⅞"	16'-8¾"	16'-2⅝"	15'-8⅝"
C	MARK	1521	1521	1522	1523	1524	1525	1527	1774	1528
	DIM.	20'-3¼"	20'-3¼"	19'-9¼"	19'-3⅛"	18'-2"	17'-8⅞"	16'-8¾"	16'-2⅝"	15'-8⅝"
E	MARK	1573	1573	1575	1576	1578	1579	1581	1582	1577
	DIM.	21'-6"	21'-6"	21'-4"	21'-2"	20'-10"	20'-8"	20'-4"	20'-2"	20'-0"
F	MARK	1558	1558	1560	1561	1562	1563	1565	1566	1567
	DIM.	28'-2"	28'-2"	27'-10"	27'-6"	26'-10"	26'-6"	25'-10"	25'-6"	25'-2"
G	MARK	1545	1546	1547	1548	1550	1549	1554	1555	1556
	DIM.	35'-0"	34'-10"	34'-2"	33'-6"	32'-10"	32'-2"	31'-6"	30'-10"	30'-2"
H	MARK	823	823	825	828	830	832	837	838	841
	DIM.	27'-0¼"	27'-0¼"	26'-7⅛"	26'-2⅛"	25'-4"	24'-11⅛"	24'-1⅜"	23'-8½"	23'-3¾"
K	MARK	784	784	787	793	800	803	814	816	819
	DIM.	31'-10⅜"	31'-10⅜"	31'-4½"	30'-10½"	29'-10⅜"	29'-4⅜"	28'-4½"	27'-10⅜"	27'-4¾"
L	MARK	716	728	733	740	743	755	763	777	788
	DIM.	38'-8⅜"	37'-3¾"	36'-4⅛"	35'-5"	34'-10⅛"	33'-10⅞"	33'-4"	32'-4¾"	31'-5⅞"
M	MARK	742	742	745	749	757	761	768	772	774
	DIM.	34'-10⅜"	34'-10⅜"	34'-6⅞"	34'-3⅜"	33'-8¾"	33'-5½"	32'-11⅛"	32'-8⅛"	32'-5⅛"
N	MARK	735	742	749	757	757	765	765	772	780
	DIM.	36'-1"	34'-10⅜"	34'-3⅜"	33'-8¾"	33'-8¾"	33'-2¼"	33'-2¼"	32'-8⅛"	32'-2¼"
Y	MARK	953	952	954	955	956	957	959	960	961
	DIM.	34'-11⅛"	34'-11¼"	34'-10⅛"	34'-9"	34'-6⅝"	34'-5½"	34'-3¼"	34'-2⅛"	34'-1⅛"
Z	MARK	937	941	943	944	945	947	948	949	
	DIM.	39'-2⅛"	39'-2⅛"	38'-11⅜"	38'-3¼"	38'-0⅝"	37'-7⅜"	37'-4¾"	37'-2⅛"	

TABLE VIII

LENGTH R	SUPERSTRUCTURE SPANS S	T	TYPE OF SUPERSTRUCTURE SPAN	BEARING PLATE MARK	BEARING PLATE NO. REQ'D. PER TOWER	REFER TO DWG. NO. FOR POSITIONING OF BEARING PLATES DWG. NO.	SH. NO.
130'	50'	50'	G-24WF84	BP-1	12	85-28	2 OF 3
150'	60'	60'	9-24WF84	BP-1	18	85-28	2 OF 3
170'	70'	70'	3-36WF230	BP-2	6	85-28	2 OF 3
190'	80'	80'	3-36WF230	BP-2	6	85-28	2 OF 3
210'	90'	90'	4-36WF230	BP-2	8	85-28	2 OF 3

GENERAL NOTES

1. ALL HOLES IN STEEL ARE 15/16" DIAM. UNLESS OTHERWISE NOTED.
2. ALL WELDS ARE ¼" FILLET WELDS UNLESS OTHERWISE NOTED.
3. TOWER MAY BE DESIGNATED CLASS 60 IF COMBINED SPANS ARE REDUCED TO 160 FT.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-13	SINGLE LANE STEEL TOWERS	1 OF 2
85-13	SINGLE LANE STEEL TOWERS-DETAILS FOR BOLTED & WELDED CONST.	2 OF 2
85-23	DOUBLE & SINGLE LANE STEEL TOWERS-DETAILS FOR BOLTED & WELDED CONST.	5 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 17

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

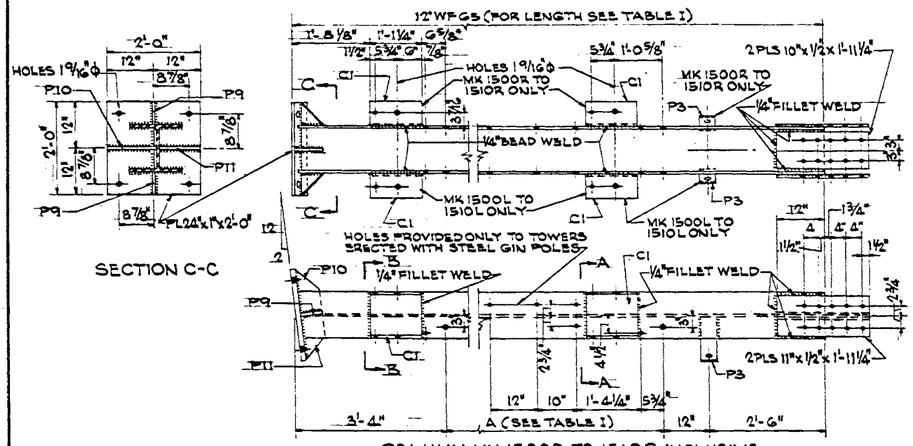
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS

UNDER REVISION

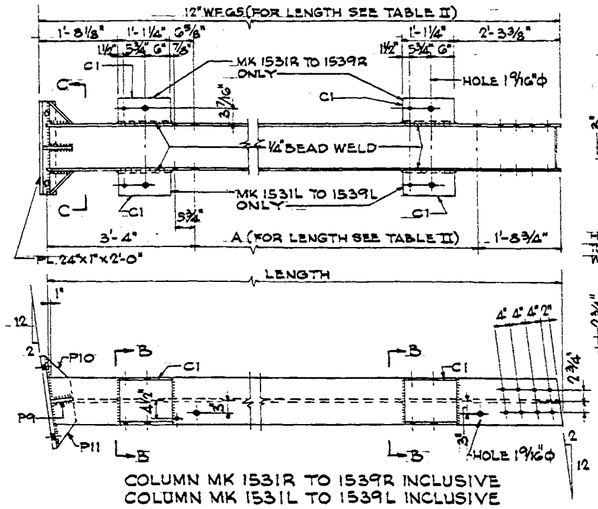
ROAD BRIDGE SUBSTRUCTURES
SINGLE LANE STEEL TOWERS
160 FT. MAXIMUM COMBINED STEEL SPANS
CLASS 50 & 60

APPROVED: Chief, Structures Branch, Chief, Engineering Division, Mil. Constr., O.C.E.
APPROVED: W. M. Williams
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-13
SHEET 1 OF 2

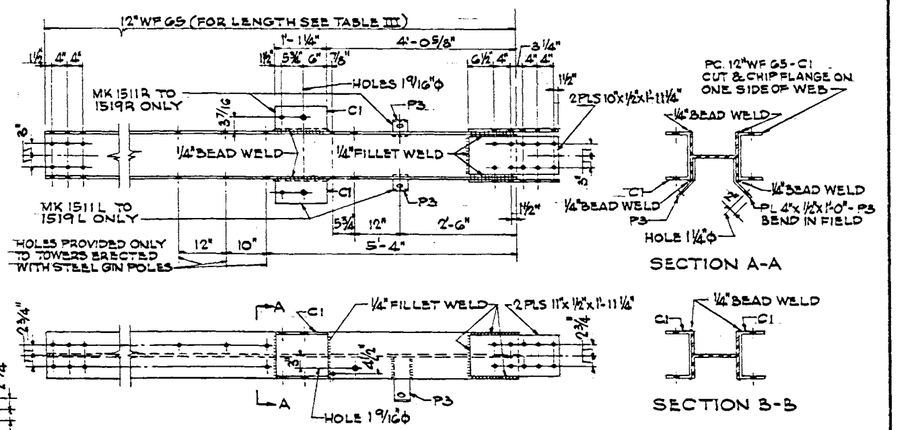


SECTION C-C

COLUMN MK 1500R TO 1510R INCLUSIVE
COLUMN MK 1500L TO 1510L INCLUSIVE
SCALE NO. 5



COLUMN MK 1531R TO 1539R INCLUSIVE
COLUMN MK 1531L TO 1539L INCLUSIVE
SCALE NO. 5

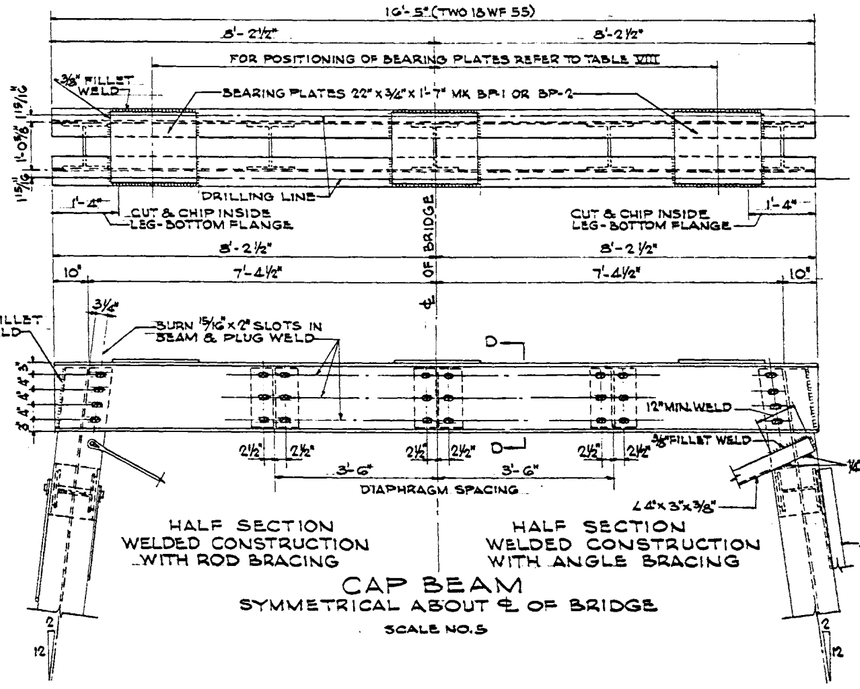


SECTION A-A

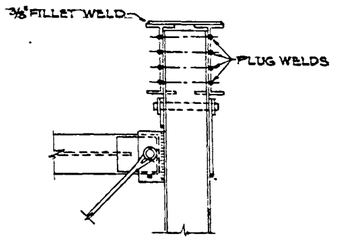
SECTION B-B

COLUMN MK 1511R TO 1519R INCLUSIVE
COLUMN MK 1511L TO 1519L INCLUSIVE
SCALE NO. 5

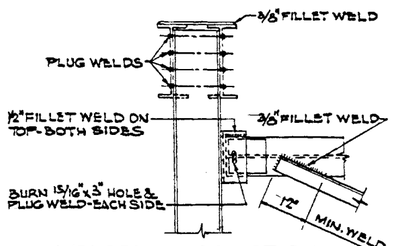
TABLE I				TABLE II				TABLE III		
MARK	A	LENGTH	WEIGHT	MARK	A	LENGTH	WEIGHT	MARK	LENGTH	WEIGHT
1500	22'-3 5/8"	29'-1 5/8"	2385	1531	26'-4 1/4"	31'-5"	2312	1511	20'-3"	1572
1501	21'-3 1/2"	28'-1 1/2"	2317	1532	24'-4"	29'-4 3/8"	2182	1512	19'-9"	1539
1502	20'-3 1/4"	27'-1 1/4"	2250	1533	22'-3 5/8"	27'-4 3/8"	2042	1513	19'-2 7/8"	1507
1503	19'-3 1/8"	26'-1 1/8"	2188	1534	20'-3 1/4"	25'-4"	1914	1514	18'-2 3/4"	1440
1504	18'-3"	25'-1"	2121	1535	18'-3"	23'-3 3/4"	1779	1515	17'-8 5/8"	1406
1505	17'-8 7/8"	24'-7 7/8"	2090	1536	16'-2 5/8"	21'-3 3/8"	1650	1516	17'-2 5/8"	1374
1506	17'-2 3/4"	24'-1 3/4"	2053	1537	14'-2 3/8"	19'-3 1/8"	1521	1517	16'-8 1/2"	1341
1507	16'-8 3/4"	23'-7 3/4"	2013	1538	12'-2"	17'-2 3/4"	1392	1518	16'-2 3/8"	1308
1508	16'-2 5/8"	23'-1 5/8"	1992	1539	10'-1 5/8"	15'-2 3/8"	1257	1519	15'-8 3/4"	1275
1509	15'-2 1/2"	22'-1 1/2"	1924							
1510	14'-2 3/8"	21'-1 3/8"	1857							



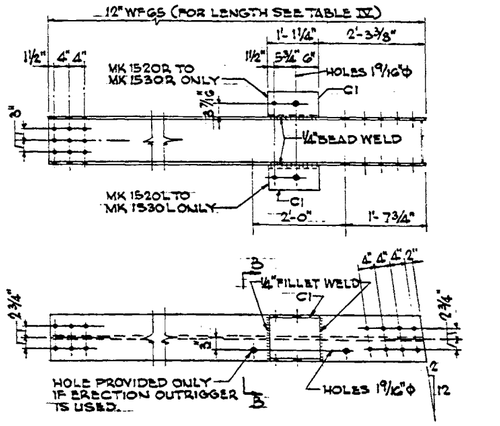
CAP BEAM
SYMMETRICAL ABOUT ℄ OF BRIDGE
SCALE NO. 5



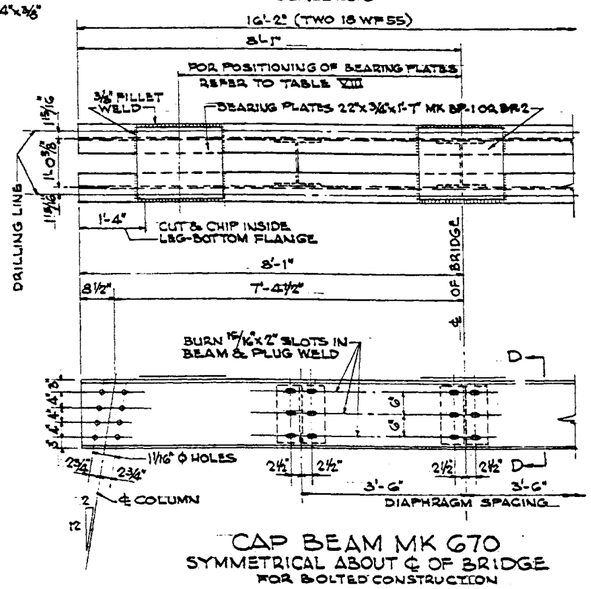
WELDED CONSTRUCTION
TYPICAL SIDE VIEW AT CAP
WITH ROD BRACING
SCALE NO. 5



WELDED CONSTRUCTION
TYPICAL SIDE VIEW AT CAP
WITH ANGLE BRACING
SCALE NO. 5

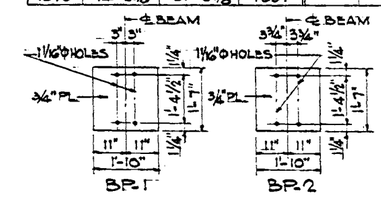


COLUMN MK 1520R TO 1530R INCLUSIVE
COLUMN MK 1520L TO 1530L INCLUSIVE
SCALE NO. 5

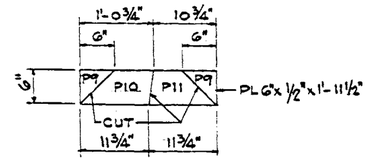


CAP BEAM MK G70
SYMMETRICAL ABOUT ℄ OF BRIDGE
FOR BOLTED CONSTRUCTION
SCALE NO. 5

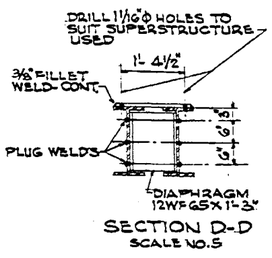
TABLE IV		
MARK	LENGTH	WEIGHT
1520	20'-6 1/8"	1371
1773	19'-6"	1309
1521	18'-5 3/4"	1242
1522	17'-11 3/8"	1211
1523	17'-5 5/8"	1190
1524	16'-5 1/8"	1112
1525	15'-11 1/2"	1081
1526	15'-5 1/4"	1045
1527	14'-11 1/4"	1009
1774	14'-5 1/8"	978
1528	13'-11 1/8"	942
1529	13'-5"	911
1530	12'-4 7/8"	844



BEARING PLATES FOR USE WITH CAP BEAMS
NO SCALE



COLUMN BEARING PLATE STIFFENERS
MK P9, P10 & P11
NO SCALE



SECTION D-D
SCALE NO. 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'
NO. 5

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

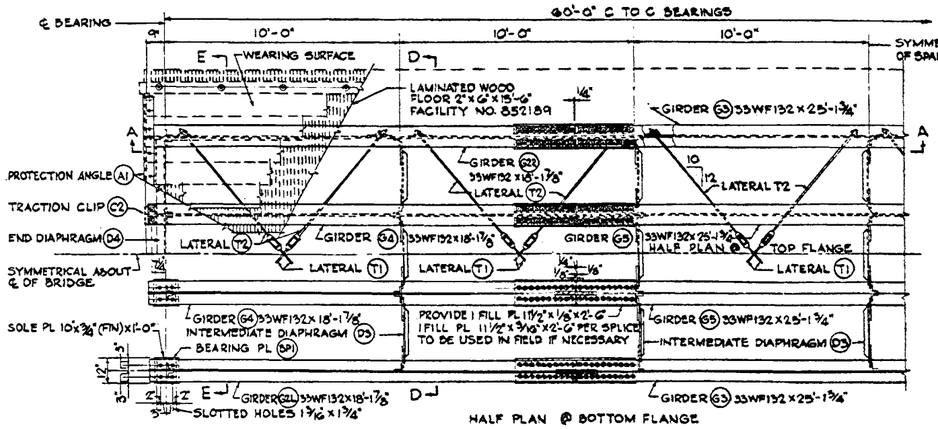
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: R. W. DEICHMANN
APPROVED: H. C. Johnson
CHIEF, STRUCTURES BRANCH

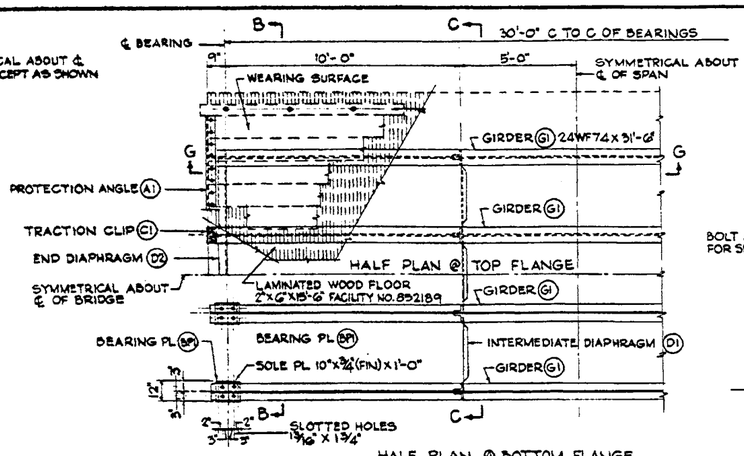
THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURES
SINGLE LANE-STEEL TOWERS
DETAILS FOR BOLTED & WELDED CONSTRUCTION

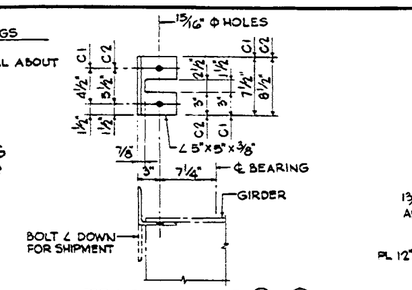
UNDER REVISION

APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 2
85-13

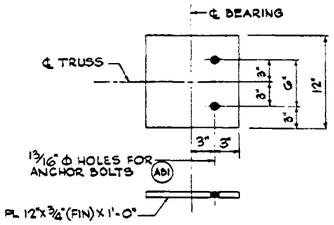






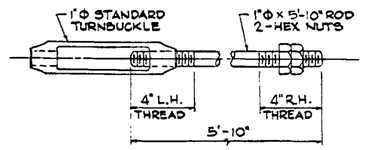
TRACTION CLIP C1 & C2

NO SCALE



BEARING PLATE BP

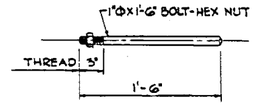
NO SCALE



FOR 60FT BRIDGE

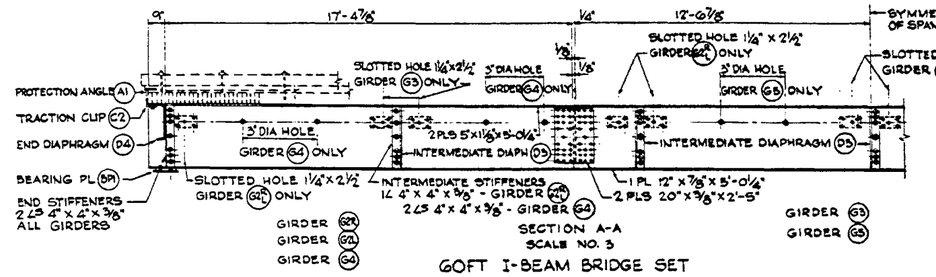
LATERAL T2

NO SCALE



ANCHOR BOLT A81

NO SCALE



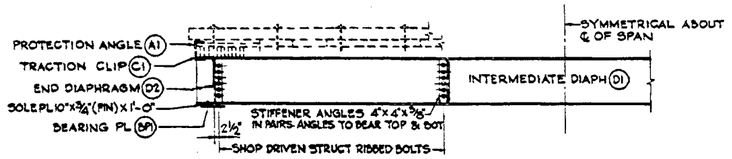
SECTION A-A

SCALE NO. 3

60FT I-BEAM BRIDGE SET

FACILITY NO. 851302

LAMINATED FLOOR NOT INCLUDED WITH BRIDGE SET



SECTION G-G

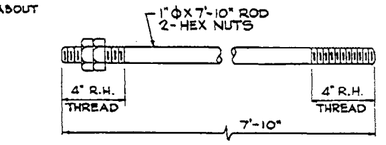
GIRDER G1

SCALE NO. 3

30FT I-BEAM BRIDGE SET

FACILITY NO. 851301

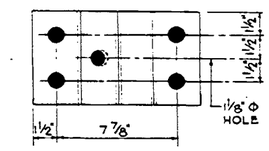
LAMINATED FLOOR NOT INCLUDED WITH BRIDGE SET

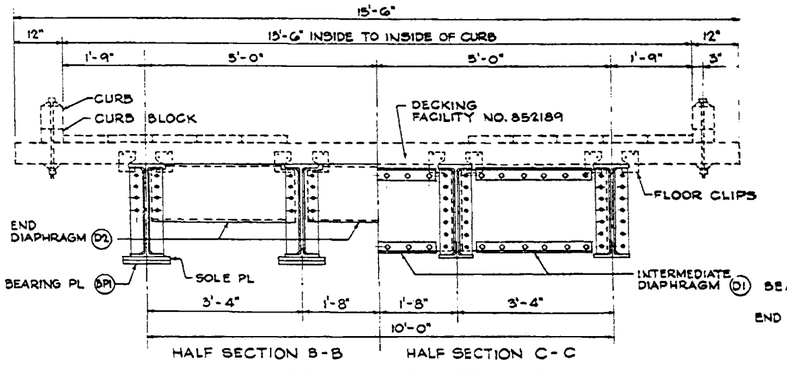


FOR 60FT BRIDGE

LATERAL T1

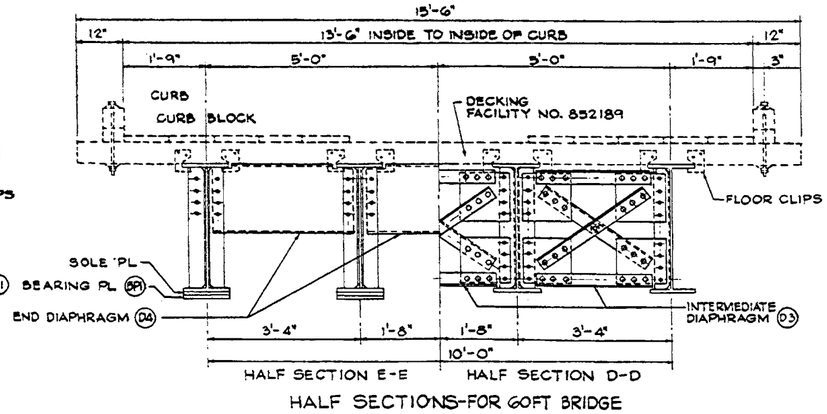
NO SCALE





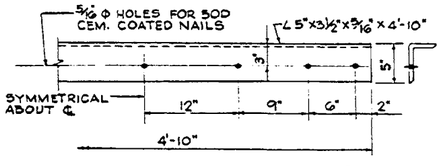
HALF SECTIONS-FOR 30FT BRIDGE

SCALE NO. 5



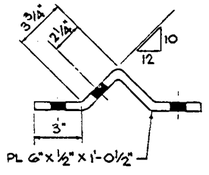
HALF SECTIONS-FOR 60FT BRIDGE

SCALE NO. 5



PROTECTION ANGLE A1

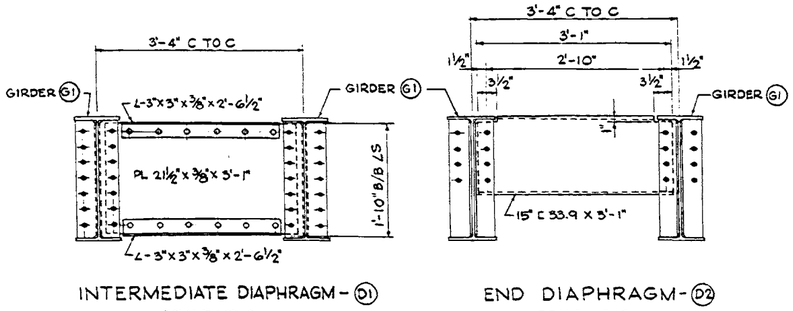
NO SCALE



FOR 60FT BRIDGE

DETAIL X

NO SCALE

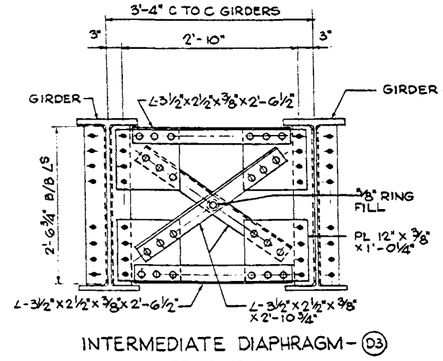


INTERMEDIATE DIAPHRAGM-D1

SCALE NO. 6

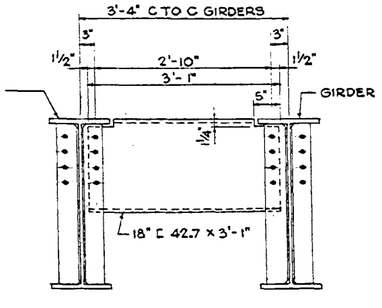
END DIAPHRAGM-D2

SCALE NO. 6



INTERMEDIATE DIAPHRAGM-D3

SCALE NO. 6



END DIAPHRAGM-D4

SCALE NO. 6

SYMBOL	DESCRIPTION / REVISIONS	DATE	APPROVAL

GRAPHIC SCALES: NO.3 (0 1' 2' 3' 4' 5'); NO.5 (0 1' 2' 3'); NO.8 (0 1' 2')

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
ROAD-BRIDGE SUPERSTRUCTURES
30FT OR 60FT I-BEAM SPANS
PLANS, SECTIONS & DETAILS
SINGLE LANE CLASS 50

UNDER REVISION

APPROVED: DATE: 19 MAR 1959
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE

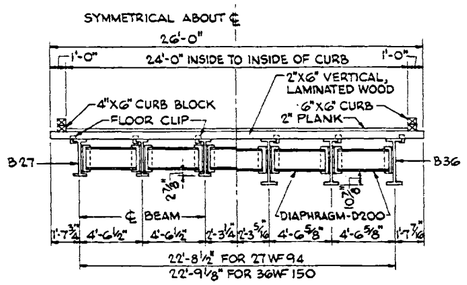
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
85-15

6-27WF94 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	26.5	259.2
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	292.3	2,862.6

6-27WF94 SPLICED-SPAN 34'-4½"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	24.1	206.9
LIVE LOAD	147.6	1,269.0
IMPACT	22.2	190.3
50%(L.L.+I)	84.9	729.7
TOTAL	278.8	2,395.9



HALF SECTION 6-27WF BEAM BRIDGE

HALF SECTION 6-36WF BEAM BRIDGE

6-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	32.7	320.6
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I.)	88.6	867.6
TOTAL	298.5	2,924.0

6-36WF150 SPLICED-SPAN 60'-9"

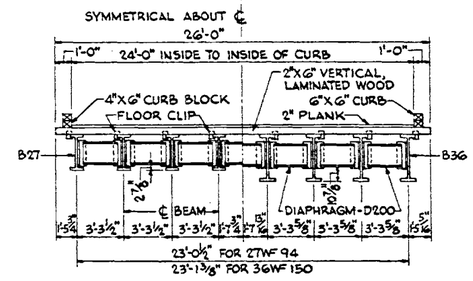
	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	52.2	793.4
LIVE LOAD	170.4	2,587.0
IMPACT	25.5	388.0
50%(L.L.+I)	97.9	1,487.5
TOTAL	346.0	5,255.9

8-27WF94 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	30.4	297.6
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	296.2	2,901.0

8-27WF94 SPLICED-SPAN 41'-11½"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	34.0	356.5
LIVE LOAD	157.1	1,648.0
IMPACT	23.6	247.2
50%(L.L.+I)	90.4	947.6
TOTAL	305.1	3,199.3



HALF SECTION 8-27WF BEAM BRIDGE

HALF SECTION 8-36WF BEAM BRIDGE

8-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	39.2	384.0
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	305.0	2,987.4

8-36WF150 SPLICED-SPAN 74'-1½"

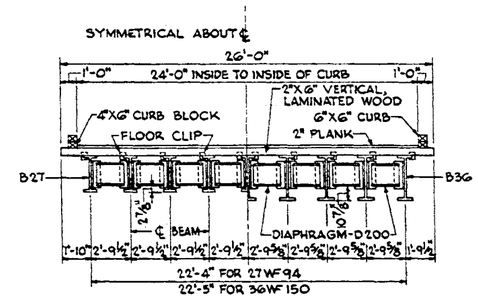
	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	75.2	1,394.4
LIVE LOAD	175.7	3,256.5
IMPACT	26.4	488.5
50%(L.L.+I)	101.0	1,872.5
TOTAL	378.3	7,011.9

9-27WF94 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	32.5	318.7
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	298.3	2,922.1

9-27WF94 SPLICED- SPAN 45'-6"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	39.1	445.1
LIVE LOAD	160.4	1,825.0
IMPACT	24.1	273.7
50%(L.L.+I)	92.3	1,049.4
TOTAL	315.9	3,593.2



HALF SECTION 9-27WF BEAM BRIDGE

HALF SECTION 9-36WF BEAM BRIDGE

9-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	42.3	414.7
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	308.1	3,018.1

9-36WF150 SPLICED-SPAN 79'-11½"

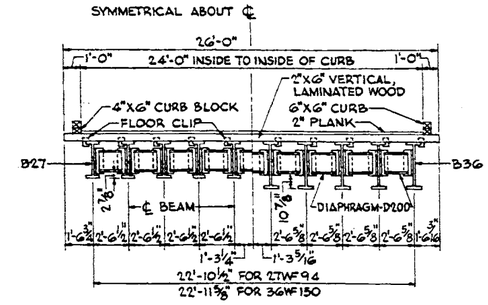
	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	88.4	1,766.2
LIVE LOAD	177.5	3,548.0
IMPACT	26.7	532.2
50%(L.L.+I)	102.1	2,040.1
TOTAL	394.7	7,886.5

10-27WF94 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	34.7	339.8
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	300.5	2,943.2

10-27WF94 SPLICED-SPAN 48'-11½"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	45.0	551.3
LIVE LOAD	163.2	1,998.0
IMPACT	24.5	299.7
50%(L.L.+I)	93.9	1,148.9
TOTAL	326.6	3,997.9



HALF SECTION 10-27WF BEAM BRIDGE

HALF SECTION 10-36WF BEAM BRIDGE

10-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	45.5	445.4
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	311.3	3,048.8

10-36WF150 SPLICED - SPAN 85'-1"

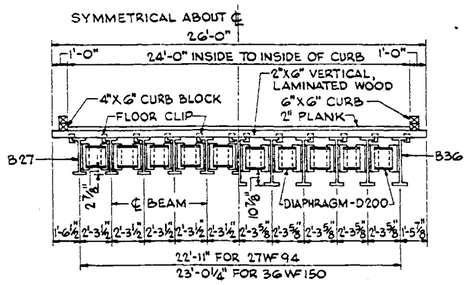
	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	103.4	2,199.2
LIVE LOAD	178.8	3,804.0
IMPACT	26.8	570.6
50%(L.L.+I)	102.8	2,187.3
TOTAL	411.8	8,761.1

11-27WF94 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	36.6	359.9
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	302.4	2,962.4

11-27WF94 SPLICED-SPAN 52'-3½"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	50.5	659.9
LIVE LOAD	165.6	2,165.0
IMPACT	24.9	324.7
50%(L.L.+I)	95.2	1,244.9
TOTAL	336.2	4,394.5



HALF SECTION 11-27WF BEAM BRIDGE

HALF SECTION 11-36WF BEAM BRIDGE

11-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	48.6	476.1
LIVE LOAD	154.1	1,509.1
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	314.4	3,079.5

11-36WF150 SPLICED-SPAN 89'-7"

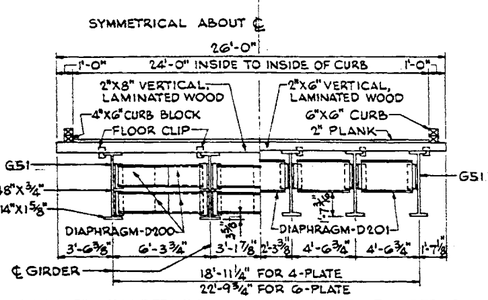
	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	116.9	2,618.0
LIVE LOAD	179.9	4,029.0
IMPACT	27.0	604.4
50%(L.L.+I)	103.5	2,316.7
TOTAL	427.3	9,568.1

4 GIRDER UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	48.1	463.8
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	313.9	3,067.2

4 GIRDER SPLICED-SPAN 99'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	128.8	3,135.8
LIVE LOAD	181.9	4,509.6
IMPACT	27.3	676.4
50%(L.L.+I)	104.6	2,593.0
TOTAL	442.6	10,914.8



HALF SECTION 4-PLATE GIRDER BRIDGE

HALF SECTION 6-PLATE GIRDER BRIDGE

6-GIRDER UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	49.6	485.7
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(LL+I)	88.6	867.6
TOTAL	315.4	3,089.1

6-GIRDER SPLICED-SPAN 122'-0"

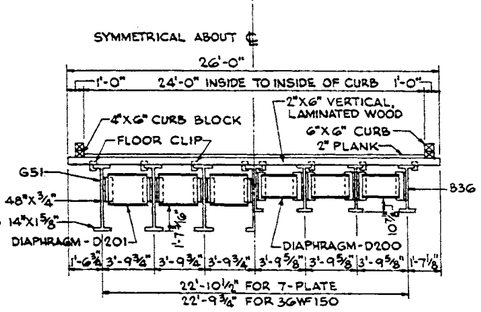
	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	168.4	5,132.4
LIVE LOAD	190.2	5,671.2
IMPACT	28.5	850.6
50%(L.L.+I)	109.3	3,260.9
TOTAL	496.4	14,915.1

7-GIRDER UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	55.1	539.5
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	320.9	3,142.9

7-GIRDER SPLICED-SPAN 128'-1½"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	198.0	6,341.2
LIVE LOAD	192.6	6,025.8
IMPACT	28.9	903.9
50%(L.L.+I)	110.8	3,464.9
TOTAL	530.3	16,735.8



HALF SECTION 7-PLATE GIRDER BRIDGE

HALF SECTION 7-36WF BEAM BRIDGE

7-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	35.9	351.3
LIVE LOAD	154.1	1,509.5
IMPACT	23.1	226.3
50%(L.L.+I)	88.6	867.6
TOTAL	301.7	2,954.7

7-36WF150 SPLICED- SPAN 67'-7½"

	MAX. SHEAR	MAX. MOMENT
DEAD LOAD	63.6	1,074.8
LIVE LOAD	173.4	2,931.0
IMPACT	25.9	439.6
50%(L.L.+I)	99.6	1,685.3
TOTAL	362.5	6,130.7

BEAM OR GIRDER	SECTION MODULUS INCHES³			BENDING MOMENT CAPACITY KIP FT.		
	GROSS SECTION	NET SECTION ALONG BEAM	NET SECTION @SPLICE	GROSS SECTION	NET SECTION ALONG BEAM	NET SECTION @SPLICE
27WF94	242.8	237.3	177.6	546.3	533.9	399.5
36WF150	502.9	496.7	389.4	1,131.5	1,117.5	876.2
PLATE GIRDER	1,363.3	1,326.3	1,105.2	3,067.4	2,984.3	2,486.8

SPANS ARE CENTER TO CENTER OF BEARINGS.

SHEAR IN KIPS, MOMENTS IN FOOT-KIPS, PER BRIDGE.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-21	CROSS-SECTS 27WF, 36WF & SIDPG	1 OF 9
85-21	PLANS 27WF & 36WF BRIDGES SQUARE ENDS	2 OF 9
85-21	PLANS 51 DPG BRIDGES	3 OF 9
85-21	PLANS 27WF BRIDGES SKEW ENDS	4 OF 9
85-21	PLANS 36WF BRIDGES 30° SKEW ENDS	5 OF 9
85-21	PLANS 36WF BRIDGES 45° SKEW ENDS	6 OF 9
85-21	ASSEMBLY DETAILS	7 OF 9
85-21	END ASSEMBLIES	8 OF 9
85-21	FLOORING, TIMBER & STEEL DETAILS	9 OF 9
86-16	WELDED SPLICES	14 OF 16
86-16	DETAILS	15 OF 16
86-16	DETAILS	16 OF 16

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

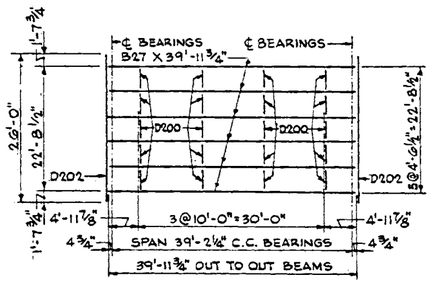
DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS

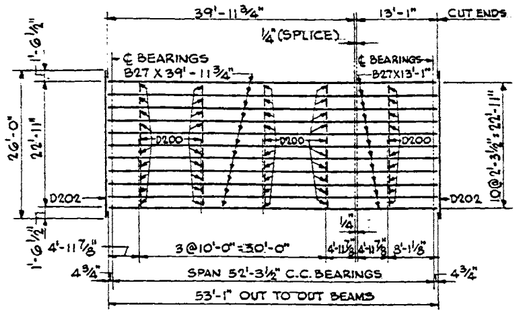
UNDER REVISION

ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE (24'-0") ROADWAY
CLASS 60
CROSS SECTIONS-27 WF, 36 WF & 51"DPG

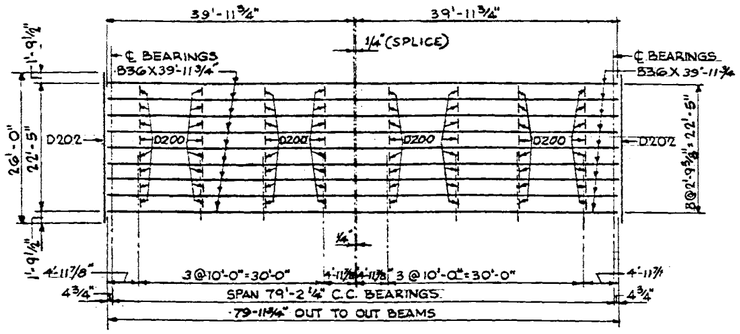
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-21
SHEET 1 OF 9



6-27WF BEAM BRIDGE
FACILITY NO. 852102



11-27WF BEAM BRIDGE
FACILITY NO. 852107

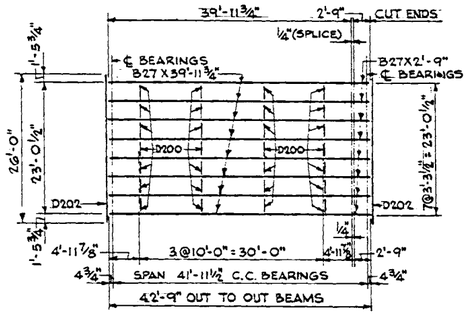


9-36WF BEAM BRIDGE
FACILITY NO. 852115

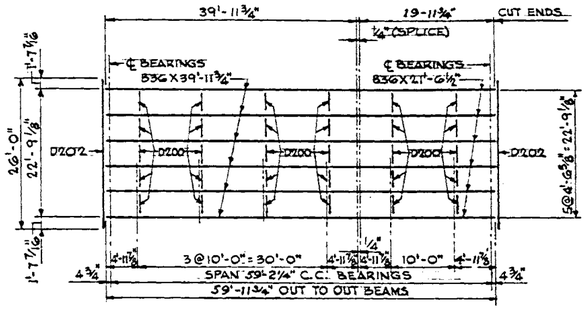
PIECES PER BEARING	
FIXED	EXPANSION
BP100	BP100
MP100	MP101
2-AB100	2-AB100

MATERIAL PER B27 SPLICE	
WEB	2-SP102
FLANGE	4-SP103

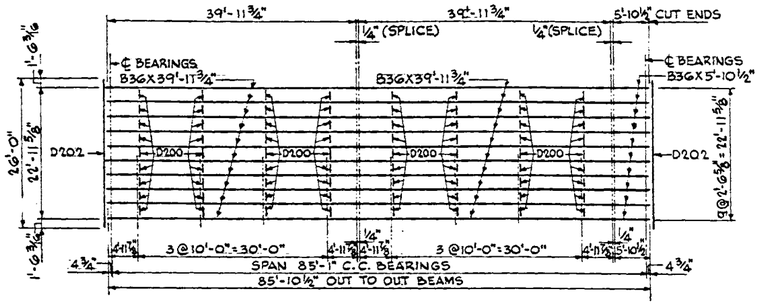
MATERIAL PER B36 SPLICE	
WEB	2-SP104
FLANGE	4-SP105



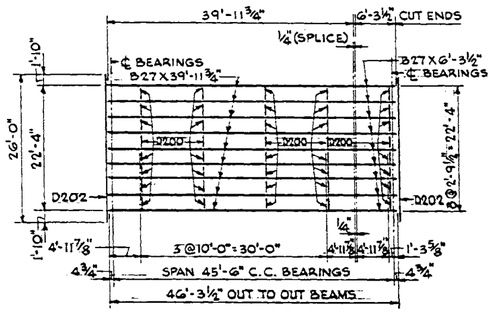
8-27WF BEAM BRIDGE
FACILITY NO. 852104



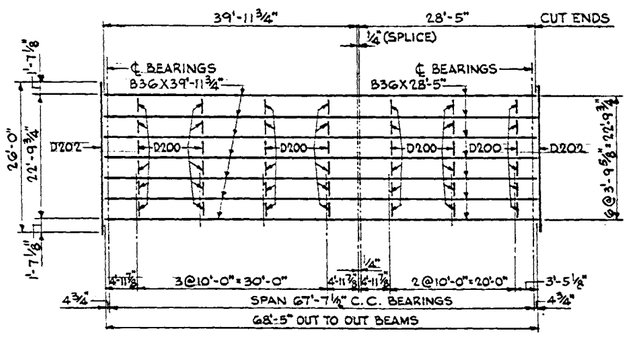
6-36WF BEAM BRIDGE
FACILITY NO. 852111



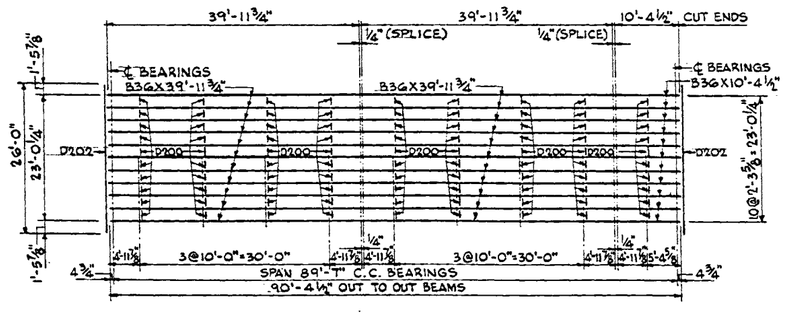
10-36WF BEAM BRIDGE
FACILITY NO. 852117



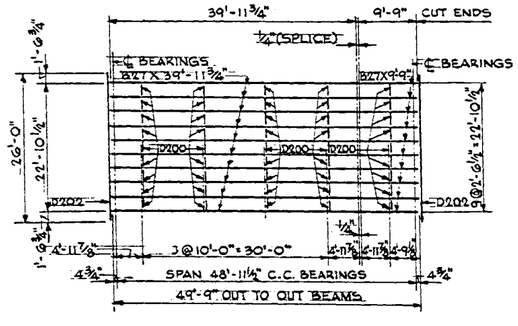
9-27WF BEAM BRIDGE
FACILITY NO. 852105



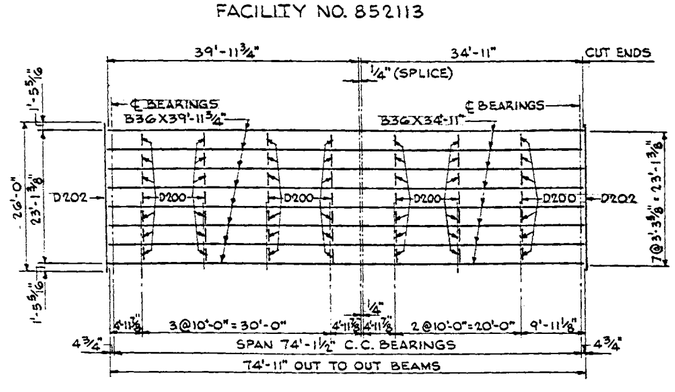
7-36WF BEAM BRIDGE
FACILITY NO. 852113



11-36WF BEAM BRIDGE
FACILITY NO. 852118



10-27WF BEAM BRIDGE
FACILITY NO. 852106



8-36WF BEAM BRIDGE
FACILITY NO. 852114

SKEW BRIDGES

THE ENDS OF THE BEAM OR GIRDER BRIDGES MAY BE SKEWED TO FIT VARIOUS PIER OR ABUTMENT CONDITIONS. SKEWING THE ENDS OF THE BRIDGES IS DONE BY ONE OF TWO METHODS. THE FIRST AND MORE GENERAL METHOD IS TO CUT THE ENDS OF THE BEAMS OF A SQUARE END BRIDGE, SO THAT THE DESIRED SKEW ANGLE RESULTS AND WITH THE ADVANCED END OF THE SKEW BRIDGE, COINCIDING WITH THE END OF THE SQUARE BRIDGE FROM WHICH IT WAS MADE. THE SECOND METHOD, WHICH MINIMIZES THE FIELD CUTTING REQUIRED, IS TO LOCATE THE END OF EACH MEMBER SO THAT IT IS ADVANCED AHEAD OF THE NEXT ADJACENT MEMBER BY A MULTIPLE OF 2'-6" IF IT IS A BEAM AND BY A MULTIPLE OF 5'-0" IF IT IS A GIRDER. THESE DISTANCES ARE FIXED BY THE NECESSITY TO LINE UP THE HOLES FOR BOLTING THE DIAPHRAGM CONNECTION TEES. WHEN BEAMS OR GIRDERS REQUIRE SPLICING, THE CENTER LINES OF THE SPLICES MUST BE NOT LESS THAN A FIXED DISTANCE FROM THE ENDS OF THE ASSEMBLED BEAMS OR GIRDERS TO AVOID INTERFERENCE BETWEEN THE SPLICES AND THE END DETAILS. THIS FIXED DISTANCE IS 1'-9" FOR 27 WF BEAMS, 2'-3" FOR 36WF BEAMS, AND 4'-3" FOR GIRDERS.

TYPICAL EXAMPLES OF THE MAXIMUM SPANS OF SKEW BRIDGES ARE SHOWN ON DWG. NO. 85-21, SHEETS 3,4,5 & 6, FOR ANGLES OF APPROXIMATELY 30° AND 45°. TO OBTAIN SKEW ANGLES DIFFERENT FROM THOSE SHOWN, ADDITIONAL OR RELOCATED CUTS AT THE ENDS OF THE BEAMS OR GIRDERS ARE REQUIRED.

BEFORE CUTTING ANY BEAMS, A LIST SHOULD BE MADE OF ALL LENGTHS OF BEAMS OR GIRDERS REQUIRED FOR THE BRIDGE TO BE CONSTRUCTED. IF POSSIBLE, THE LENGTHS TO BE CUT, SHOULD THEN BE GROUPED IN PAIRS TO OBTAIN THE MAXIMUM TOTAL LENGTHS NOT TO EXCEED 39'-11½". EACH PAIR OF LENGTHS SHOULD THEN BE CUT FROM ONE BEAM OR GIRDER, 39'-11¾" LONG WITH THE MEASUREMENTS TAKEN FROM OPPOSITE ENDS OF THE BEAM OR GIRDER SO THAT EACH PIECE WILL HAVE THE HOLES REQUIRED FOR ONE FIELD BOLTED SPLICE.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

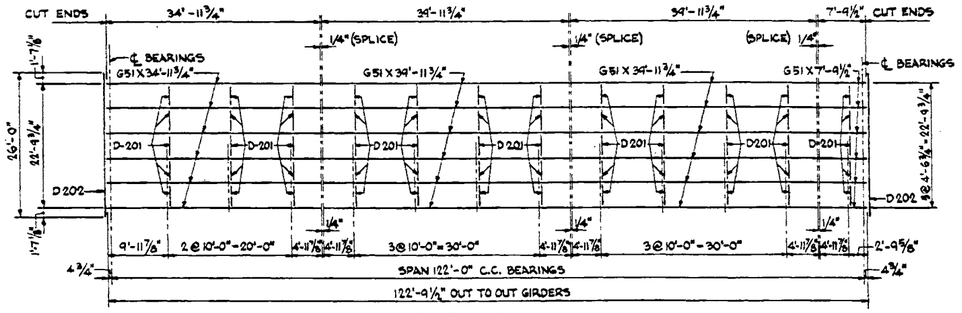
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE, 24FT LOAD, 30 END
CLASS 60
27 WF BEAMS & 36 WF BEAMS

UNDER REVISION

APPROVED: H.W. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

CHIEF, STRUCTURES BRANCH
APPROVED FOR EMPLOYMENT AGENCY:
DATE:

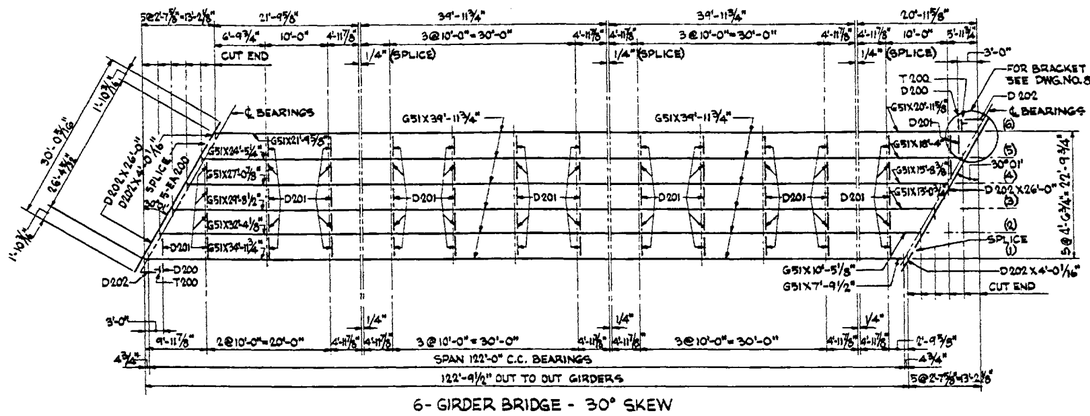
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-21
SHEET 2 OF 9



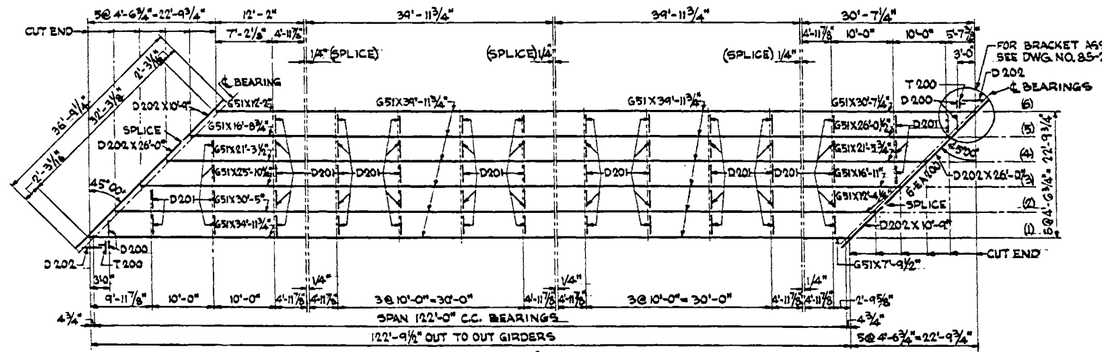
6- GIRDER BRIDGE - SQ. END
FACILITY NO. 852124

PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB 100	2-AB 100

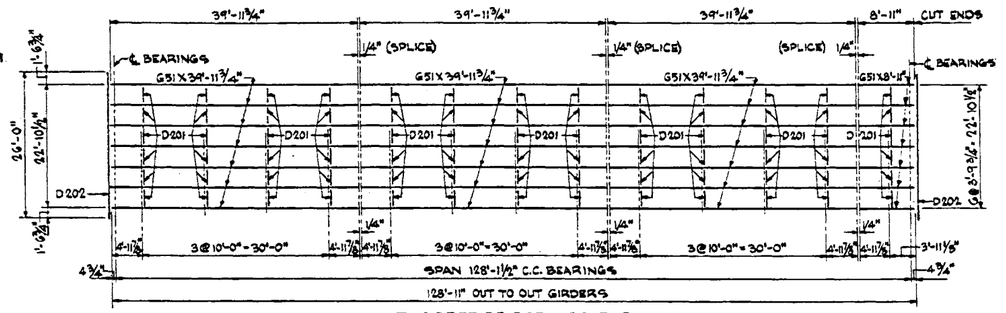
MATERIAL PER G51 SPLICE	
WEB	2-SP100
FLANGE	4-SP101



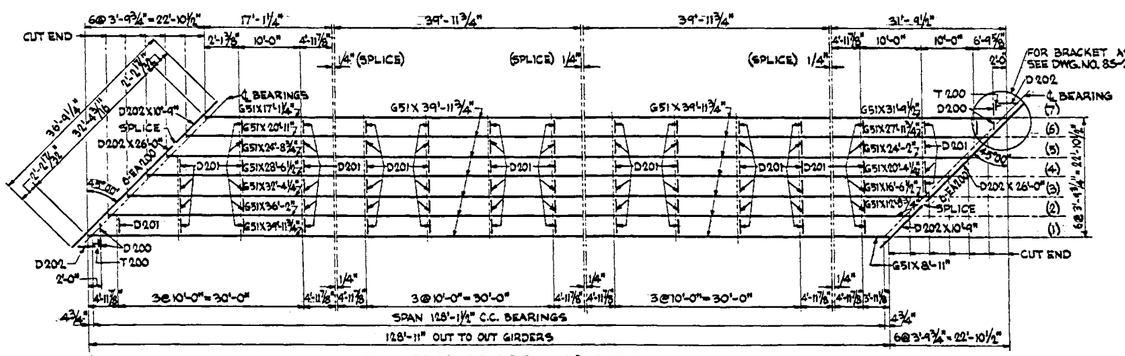
6- GIRDER BRIDGE - 30° SKEW



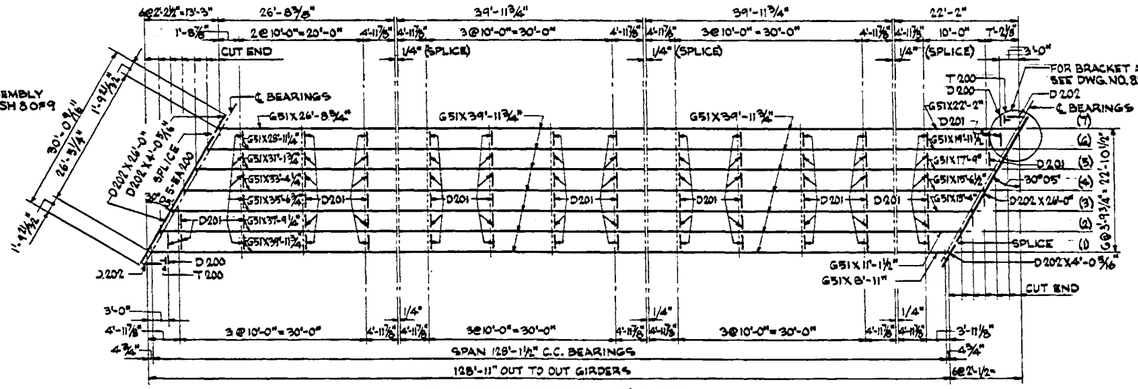
6-GIRDER BRIDGE - 45° SKEW



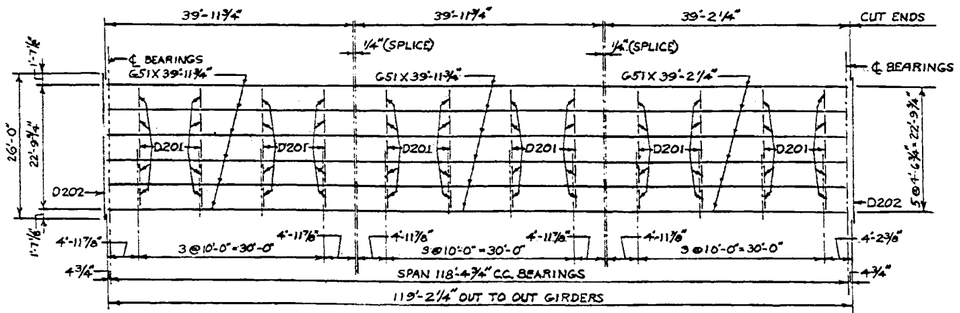
7-GIRDER BRIDGE - SQ. END
FACILITY NO. 852125



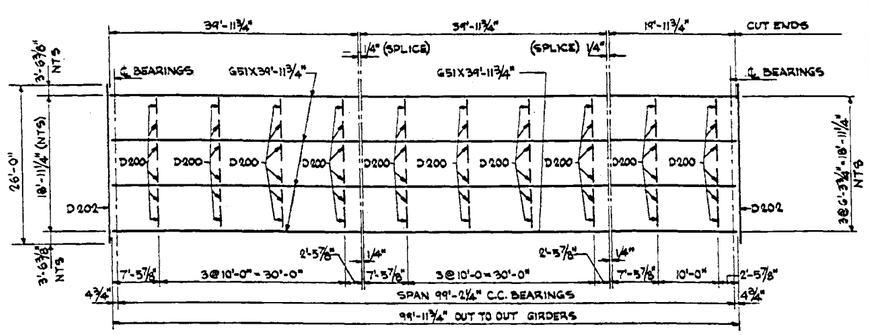
7- GIRDER BRIDGE - 45° SKEW



7- GIRDER BRIDGE - 30° SKEW



6- GIRDER BRIDGE - SQ. END
FACILITY NO. 852123



4- GIRDER BRIDGE- SQ. END
FACILITY NO. 852122

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
RECOMMENDED:
CHIEF, STRUCTURES BRANCH

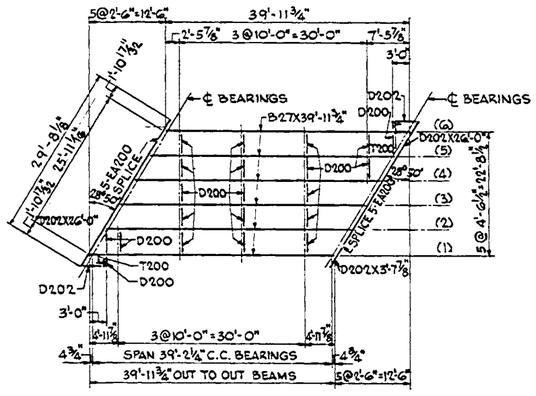
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE 24FT ROAD SO. L SKEW
CLASS 60
51"DECK PLATE GIRDERS

UNDER REVISION

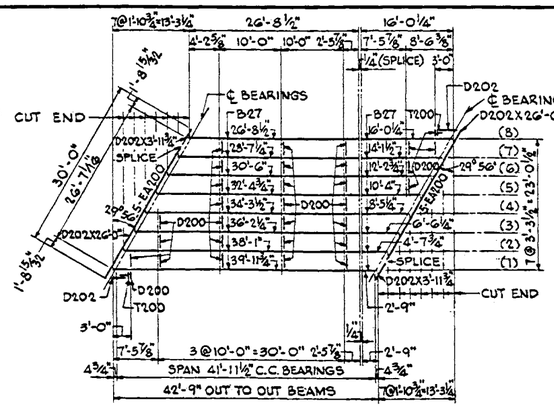
APPROVED: [signature] for H.M. Williamson
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

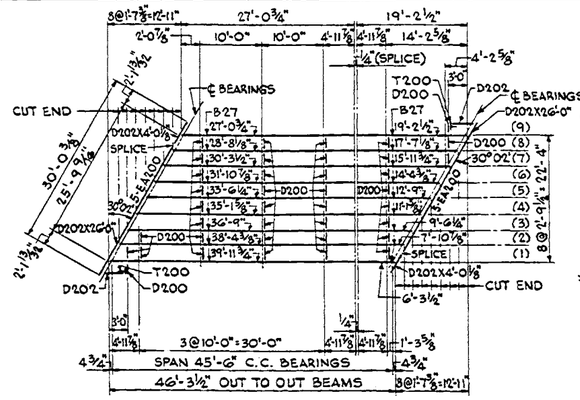
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-21
SHEET 3 OF 9



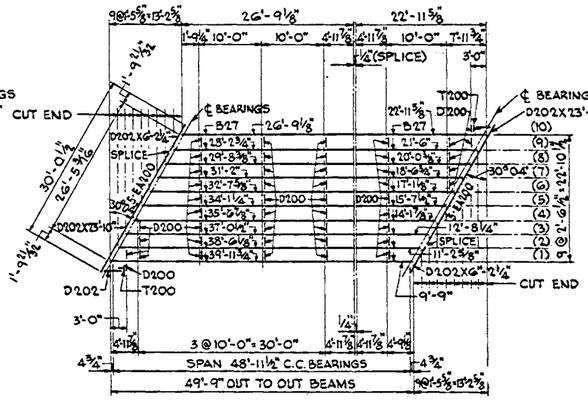
6-27WF BEAM BRIDGE-30° SKEW



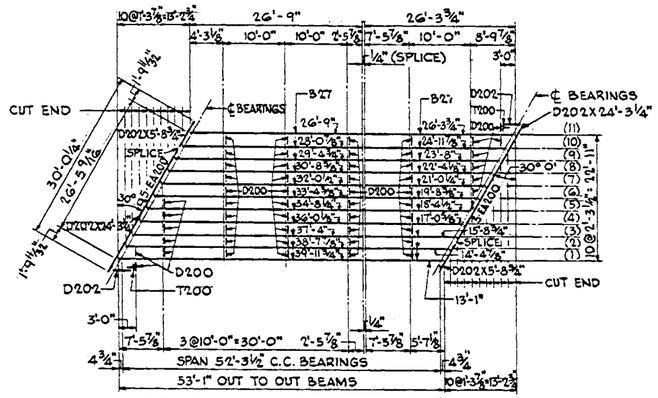
8-27WF BEAM BRIDGE-30° SKEW



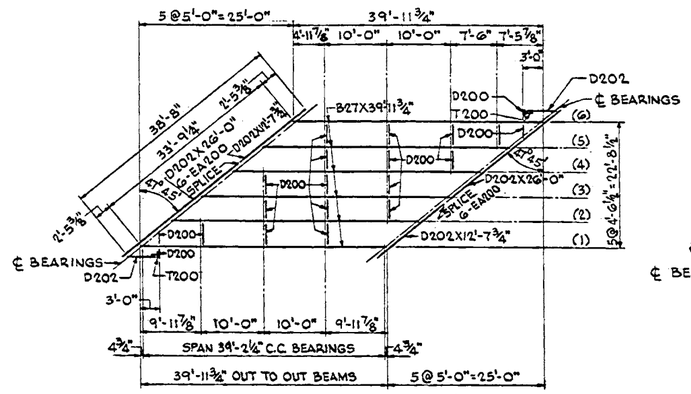
9-27WF BEAM BRIDGE-30° SKEW



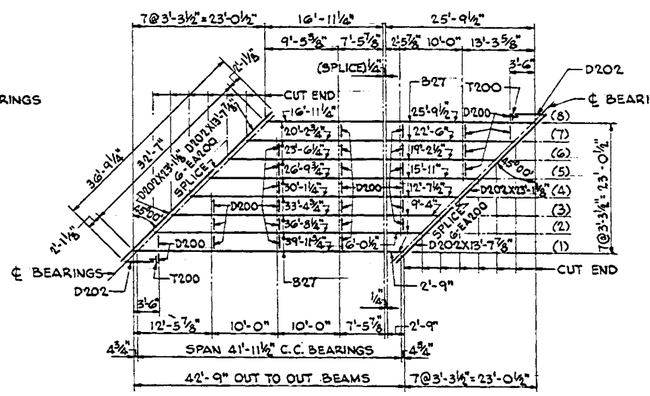
10-27WF BEAM BRIDGE - 30° SKEW



11-27WF BEAM BRIDGE - 30° SKEW



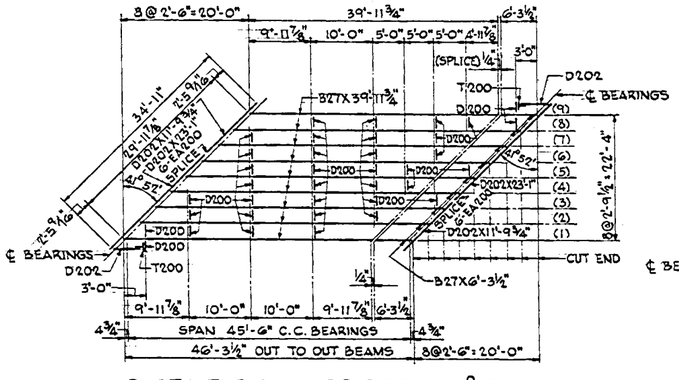
6-27WF BEAM BRIDGE - 45° SKEW



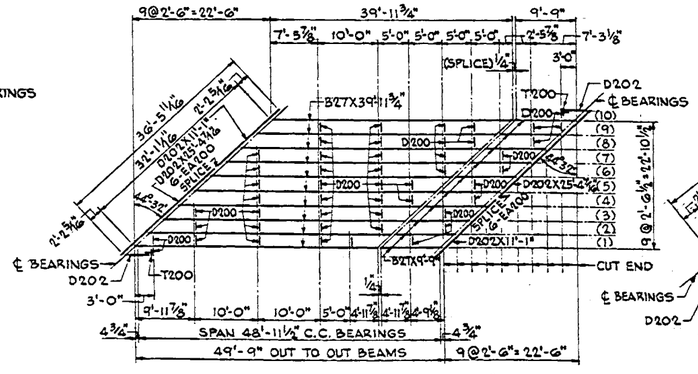
8-27WF BEAM BRIDGE - 45° SKEW

PIECES PER BEARING	
FIXED	EXPANSION
BP100	BP100
MP100	MP101
2-AB100	2-AB100

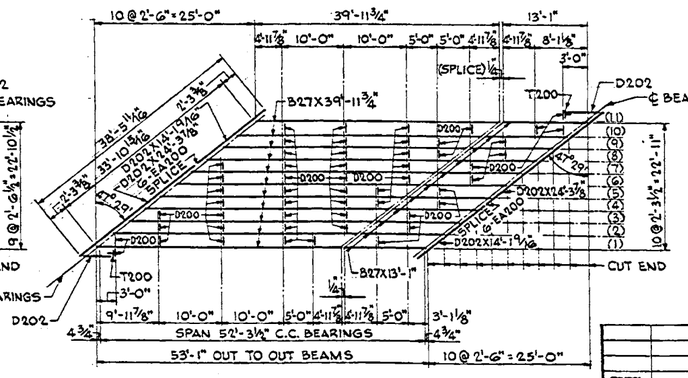
MATERIAL PER B27 SPLICE	
WEB	2-SP102
FLANGE	4-SP103



9-27WF BEAM BRIDGE - 45° SKEW



10-27WF BEAM BRIDGE - 45° SKEW



11-27WF BEAM BRIDGE - 45° SKEW

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

NO SCALE

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

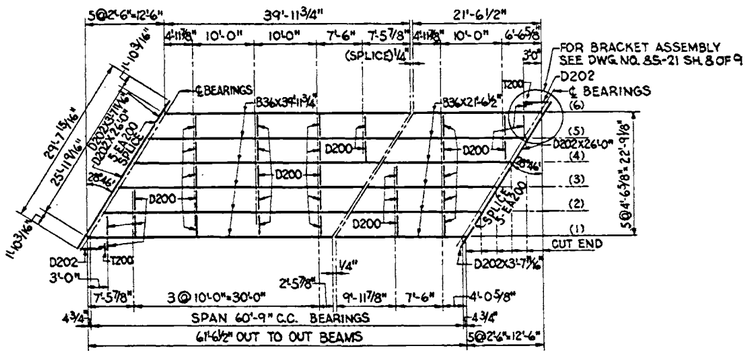
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. E. Eschmann, CHIEF, STRUCTURES BRANCH
APPROVED: H. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:

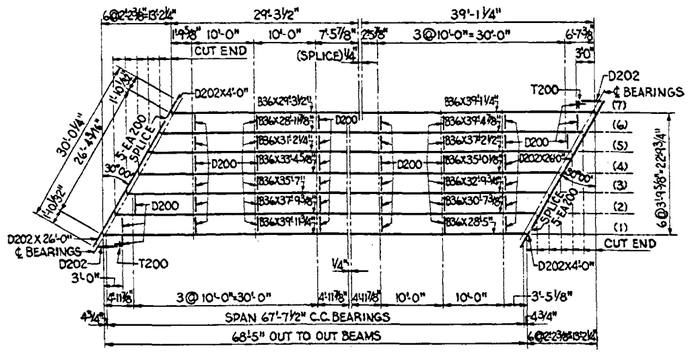
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE DUAL-24FT ROAD, SKEW ENDS
CLASS 60
24 WF BEAMS

UNDER REVISION

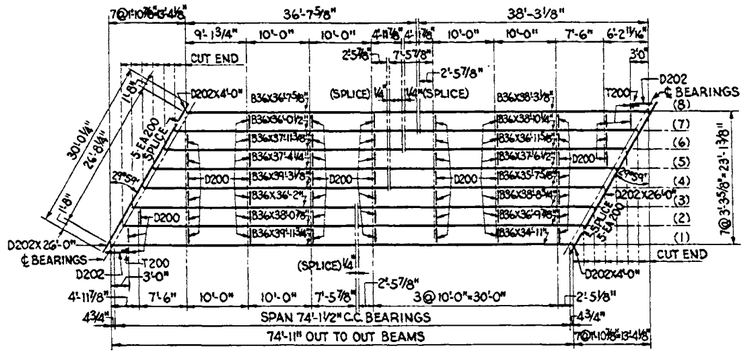
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-21
SHEET 4 OF 9



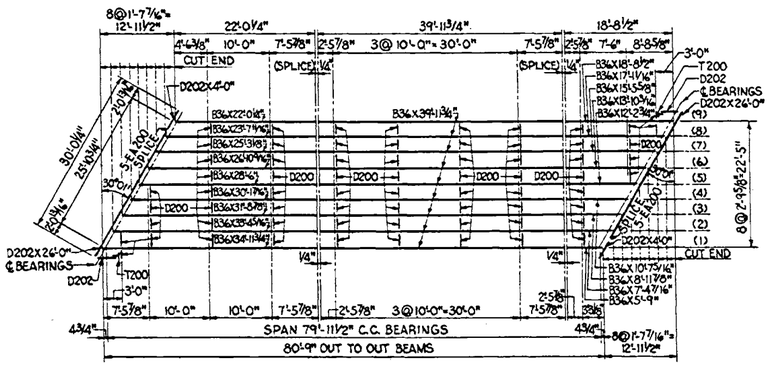
PLAN OF 6-36 WF BEAM BRIDGE



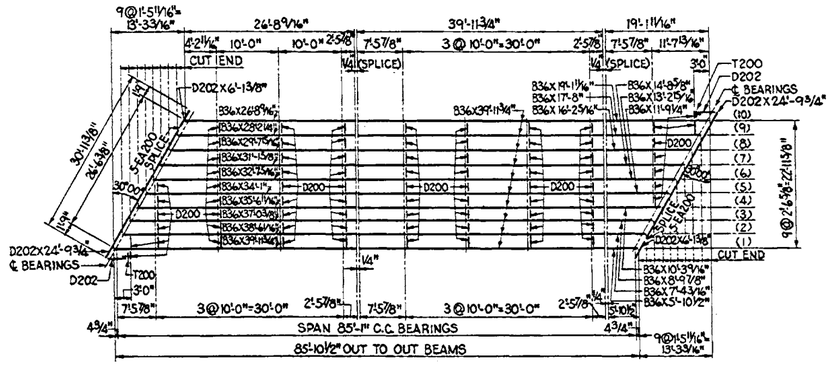
PLAN OF 7-36 WF BEAM BRIDGE



PLAN OF 8-36 WF BEAM BRIDGE



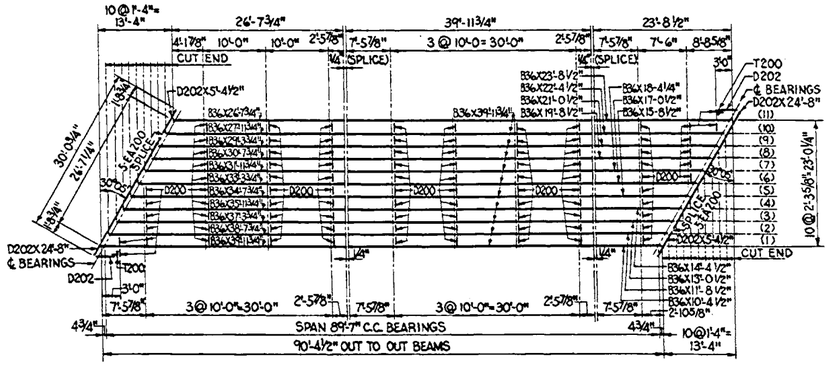
PLAN OF 9-36 WF BEAM BRIDGE



PLAN OF 10-36 WF BEAM BRIDGE

PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB100	2-AB100

MATERIAL PER B36 SPLICE	
WEB	2-SP104
FLANGE	4-SP105



PLAN OF 11-36 WF BEAM BRIDGE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: PENDLETON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

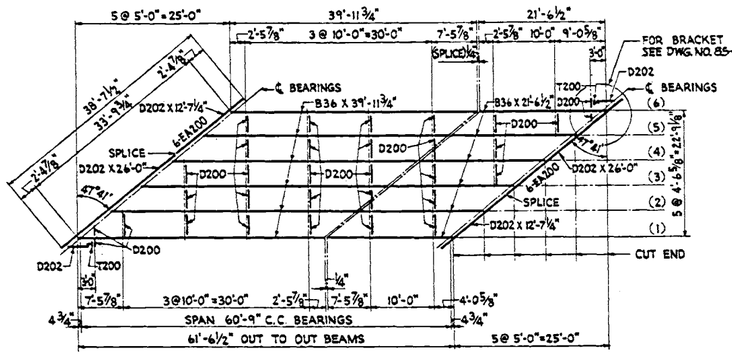
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE-24FT ROAD-30° SKEW
CLASS 60
36 WF BEAMS

UNDER REVISION

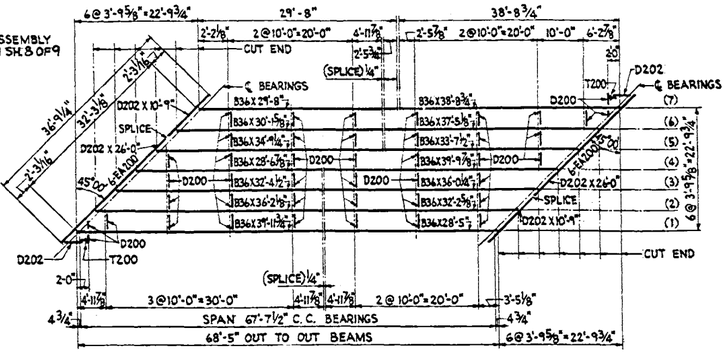
APPROVED: H. M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

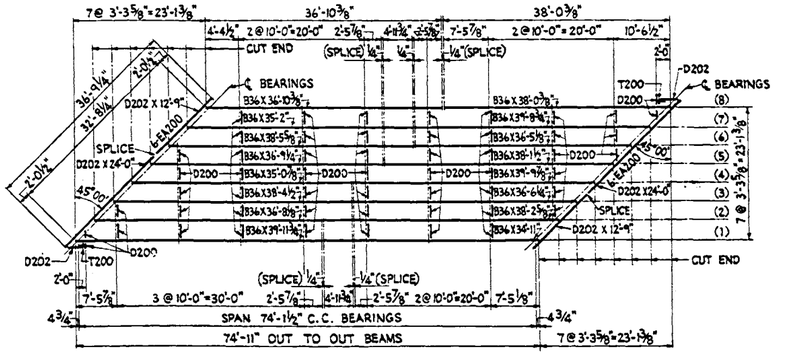
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-21
SHEET 5 OF 9



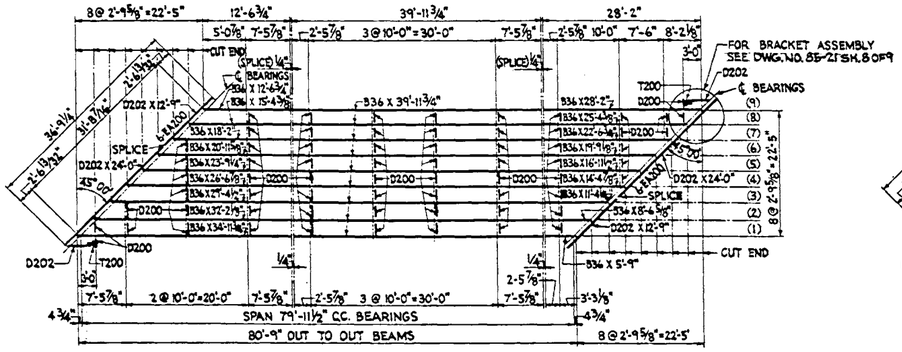
PLAN OF 6-36WF BEAM BRIDGE



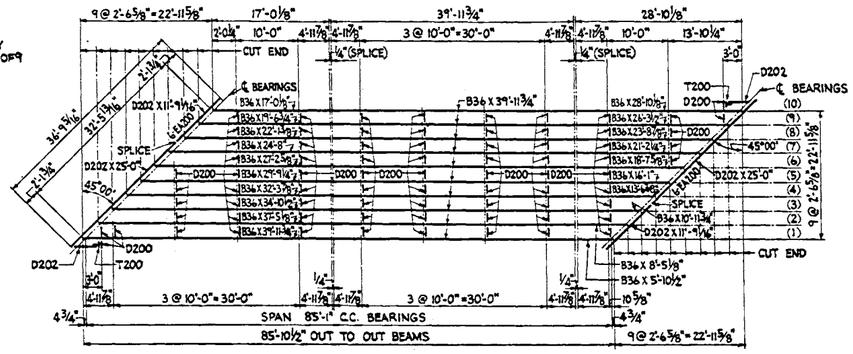
PLAN OF 7-36WF BEAM BRIDGE



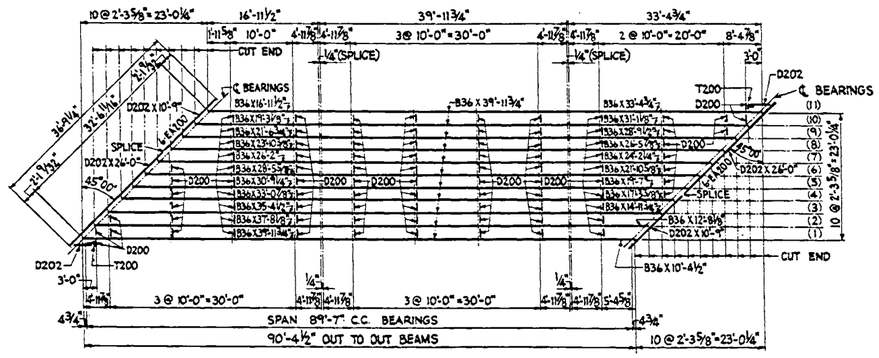
PLAN OF 8-36WF BEAM BRIDGE



PLAN OF 9-36WF BEAM BRIDGE



PLAN OF 10-36WF BEAM BRIDGE



PLAN OF 11-36WF BEAM BRIDGE

PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB 100	2-AB 100

MATERIAL PER B36 SPLICE	
WEB	2-SP104
FLANGE	4-SP105

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

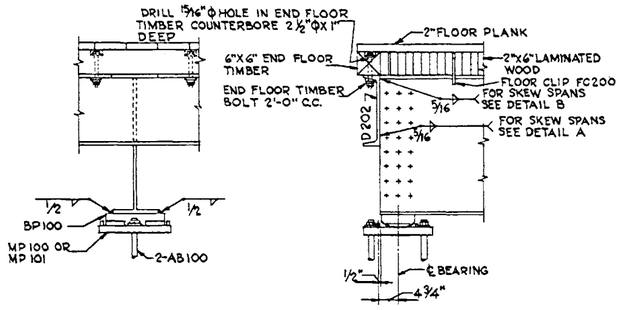
DRAWN BY: VASS
TRACED BY:
CHECKED BY: J.LYUS
SUBMITTED BY: E.W. DEJCHMANN
APPROVED: for E.C. Scharmann
APPROVED: for H.W. Williams
DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE-24FT ROAD-45° SKEW
CLASS 60
36 WF BEAMS

UNDER REVISION

SCALE: NONE
SPEC. NO.
DRAWING NUMBER
SHEET 8 OF 9
85-21

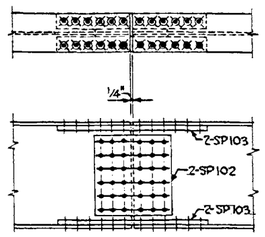
TYPE OF BRIDGE	27 WF	36 WF	51 GIRDER
DISTANCE FROM BOTTOM OF BEARING TO TOP OF BEAM OR GIRDER	2'-7 7/8" ± 1/8"	3'-4 7/8" ± 1/8"	4'-8 1/4"



ASSEMBLY AT BEARING FOR B36

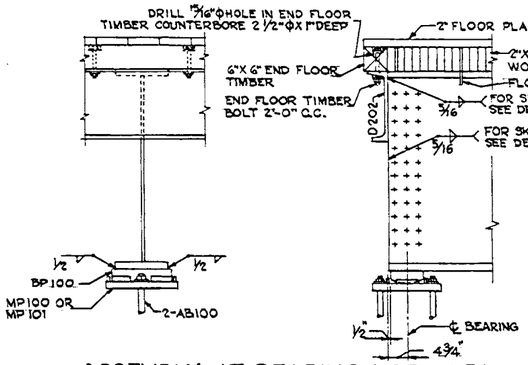
ASSEMBLY AT BEARING FOR B27- SIMILAR

SCALE NO. 5



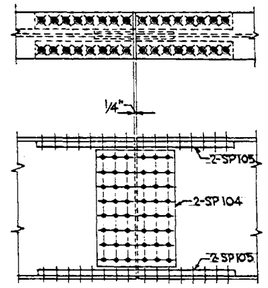
SPLICE FOR B27

SCALE NO. 5



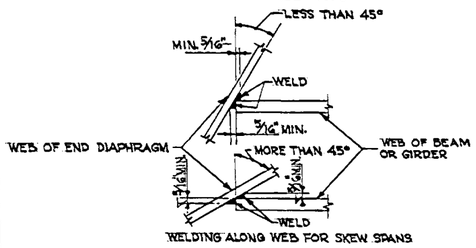
ASSEMBLY AT BEARING FOR G51

SCALE NO. 5



SPLICE FOR B36

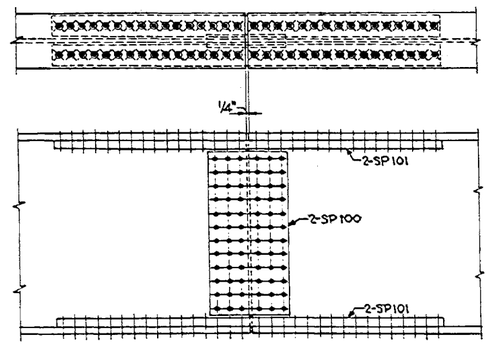
SCALE NO. 5



WELDING ALONG WEB FOR SKEW SPANS

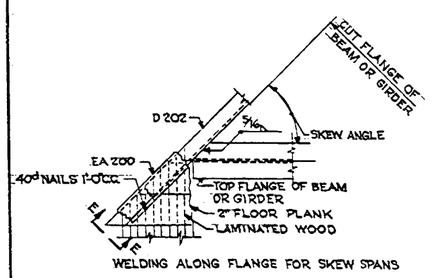
DETAIL A

SCALE NO. 8



SPLICE FOR G51

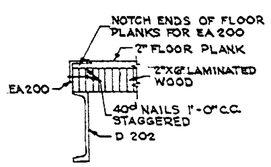
SCALE NO. 5



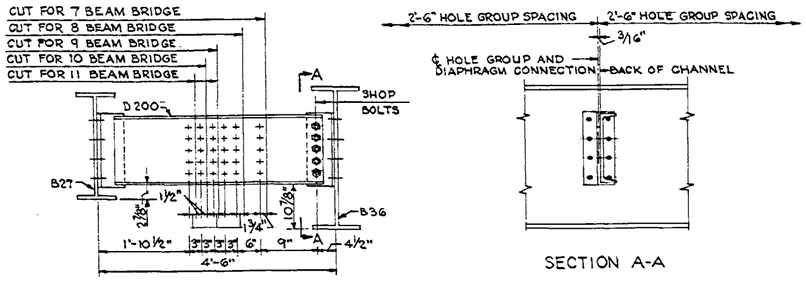
WELDING ALONG FLANGE FOR SKEW SPANS

DETAIL B

SCALE NO. 5



SECTION E-E

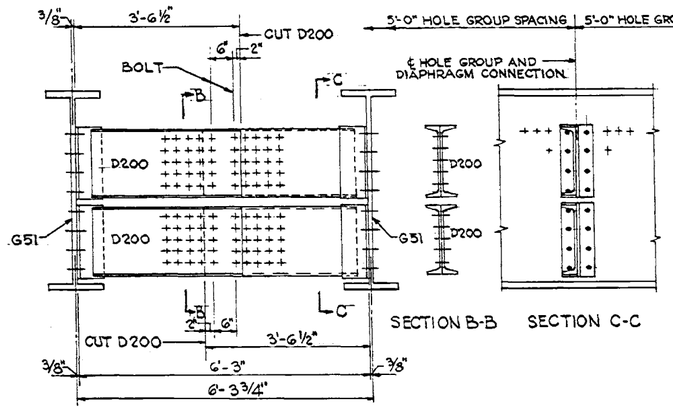


SECTION A-A

ASSEMBLY OF DIAPHRAGM D200 FOR 6 BEAM BRIDGE

NO SCALE

FOR 6,7,8,&9 BEAM BRIDGES CUT CHANNEL AS INDICATED AND RELOCATE BOLTED CONNECTION TEE AT CUT END. FOR 10 &11 BEAM BRIDGES CUT CHANNEL AS INDICATED AND, USING 2-T200 BOLT CONNECTION TEES TO CUT ENDS TO MAKE 2 DIAPHRAGMS.

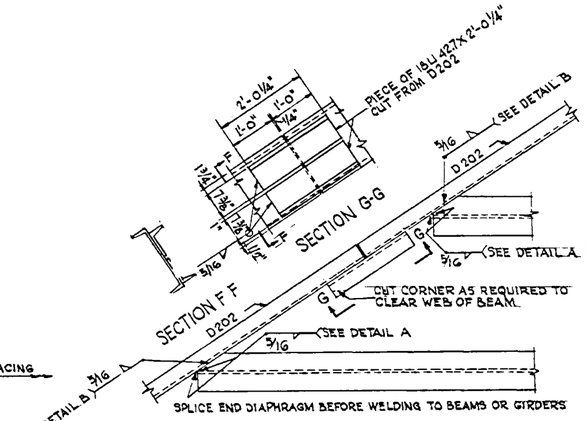


SECTION B-B SECTION C-C

ASSEMBLY OF DIAPHRAGM D200 FOR 4 GIRDER BRIDGE

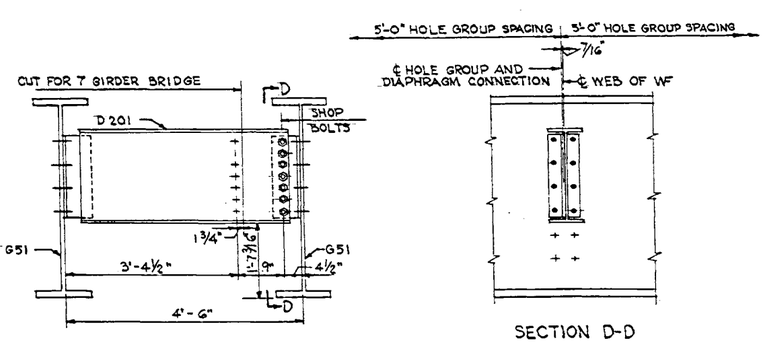
SCALE NO. 5

CUT D200 CHANNELS AS INDICATED AND MAKE BOLTED SPLICE



SPLICE OF END DIAPHRAGM D 202

SCALE NO. 5



SECTION D-D

ASSEMBLY OF DIAPHRAGM D201 FOR 6 GIRDER BRIDGE

NO SCALE

FOR 7 GIRDER BRIDGE CUT BEAM AS INDICATED AND RELOCATE BOLTED CONNECTION TEE AT CUT END

GENERAL NOTES

DETAILS FOR WELDED SPLICES ARE SHOWN ON DWG. NO. 86-16 SHEET 14 OF 14

+ HOLE FOR FIELD BOLTED CONNECTION
+ HOLE NOT USED

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' NO.5

0 1" 2" 3" 8" 9" 1' NO.8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

ROAD BRIDGE SUPERSTRUCTURES BEAM & GIRDER CONSTRUCTION ASSEMBLY DETAILS CLASS 60

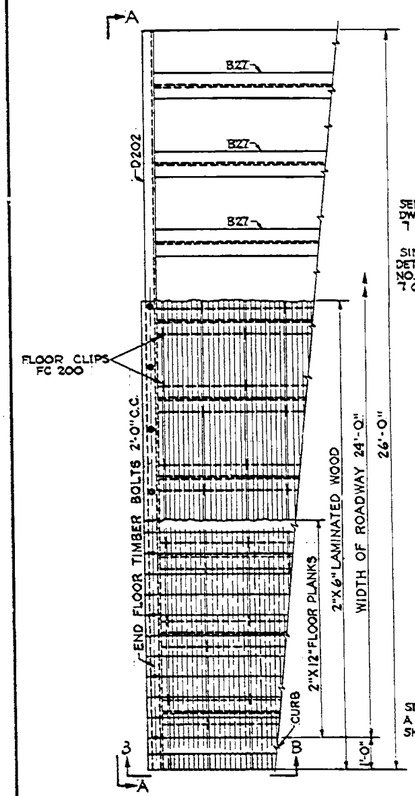
UNDER REVISION

APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

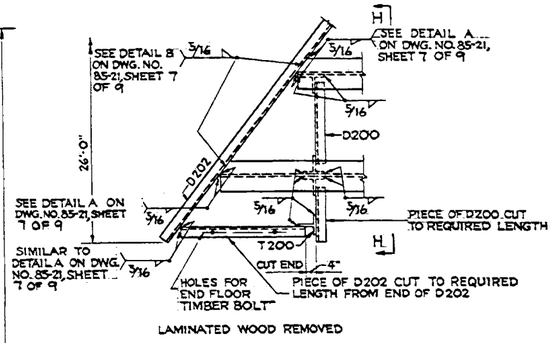
DATE

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 85-21
SHEET 7 OF 9



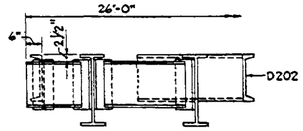
TYPICAL PLAN OF END OF SQUARE SPAN

SCALE NO. 4



LAMINATED WOOD REMOVED

PLAN



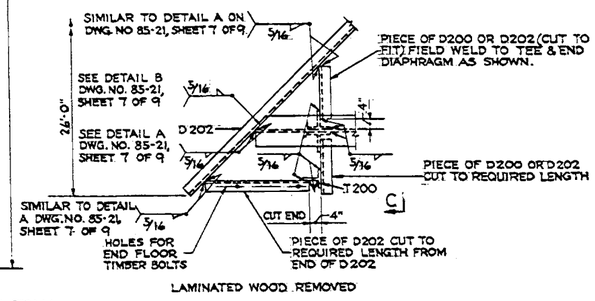
LAMINATED WOOD REMOVED

SECTION H-H

DETAIL G

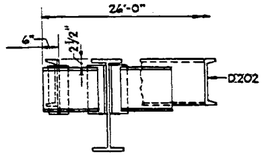
SCALE NO. 4

FOR LOCATION, SEE DWG. NO. 85-21, SHEET 3, 4, 5 & 6 OF 9.



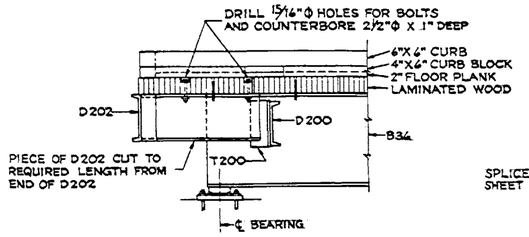
LAMINATED WOOD REMOVED

PLAN



LAMINATED WOOD REMOVED

SECTION C-C

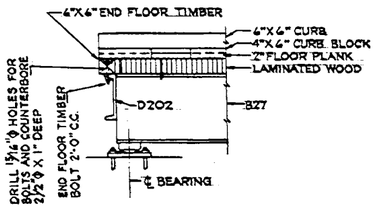


ELEVATION E-E

SCALE NO. 4

TYPICAL PLAN OF END OF SKEW SPAN

SCALE NO. 4



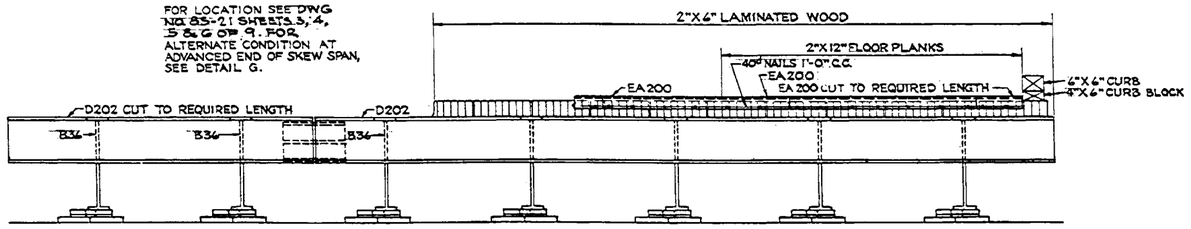
ELEVATION B-B

SCALE NO. 4

DETAIL D

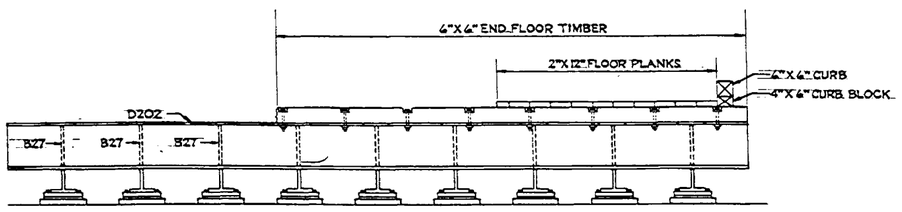
SCALE NO. 4

FOR LOCATION SEE DWG NO. 85-21 SHEETS 3, 4, 5 & 6 OF 9. FOR ALTERNATE CONDITION AT ADVANCED END OF SKEW SPAN, SEE DETAIL G.



ELEVATION F-F

SCALE NO. 4



ELEVATION A-A

SCALE NO. 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' 4'

NO. 4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SKEEN
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

ROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
END ASSEMBLIES
CLASS 60

UNDER REVISION

APPROVED: Herman H. Williams DATE: 19 MAR 1969

CHIEF, STRUCTURES BRANCH | CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

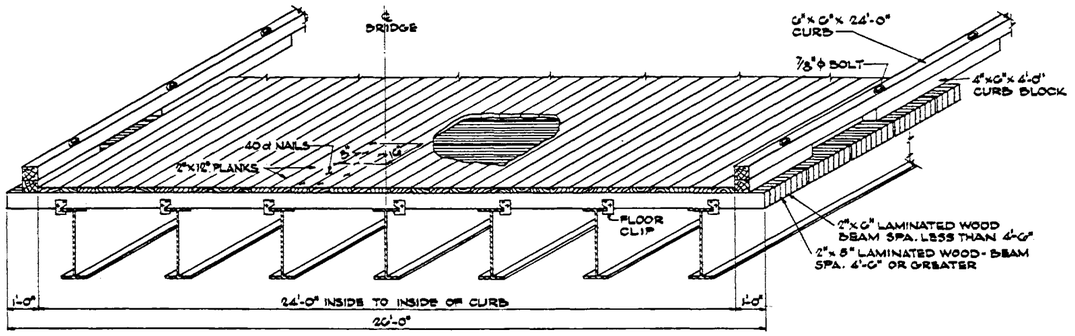
DATE

SCALE: AS NOTED

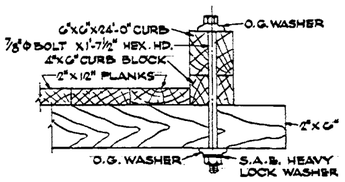
SPEC. NO.

DRAWING NUMBER: 85-21

SHEET 8 OF 9

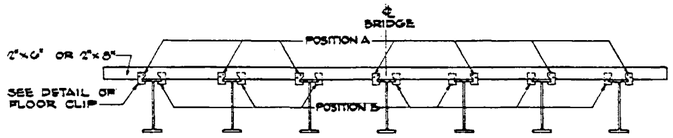


PERSPECTIVE VIEW OF BRIDGE



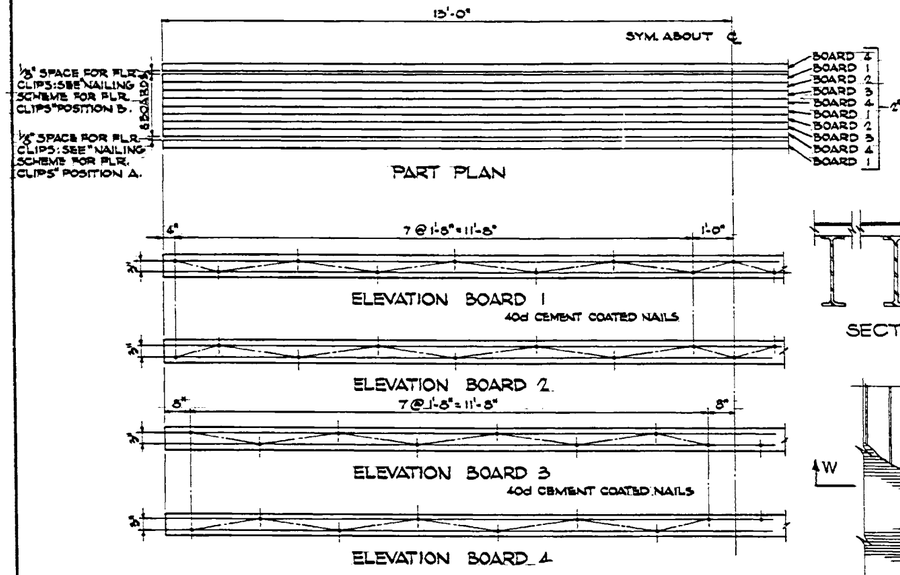
CURB BOLT DETAILS

FLOOR CLIPS FC200 ARE USED FOR THE FULL LENGTH OF ALL BEAM AND GIRDER BRIDGES EXCEPT AT THE THE SPLICES OF THE BEAMS OR GIRDERS WHERE FLOOR CLIPS FC201 ARE USED.

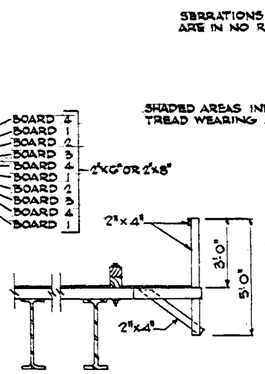


FLOOR CLIPS TO BE PULLED UP TIGHT AGAINST STEEL AND FASTENED WITH 40d CEMENT COATED NAILS. ALTERNATE "POSITION A" & "B" AT EVERY EIGHTH BOARD. SCHEME SHOWN IS TYPICAL FOR ALL ROAD BRIDGES. SEE DWG. NO. 85-21 SHEET 1 OR 9 FOR NUMBER AND SPACING OF FLOOR BEAMS.

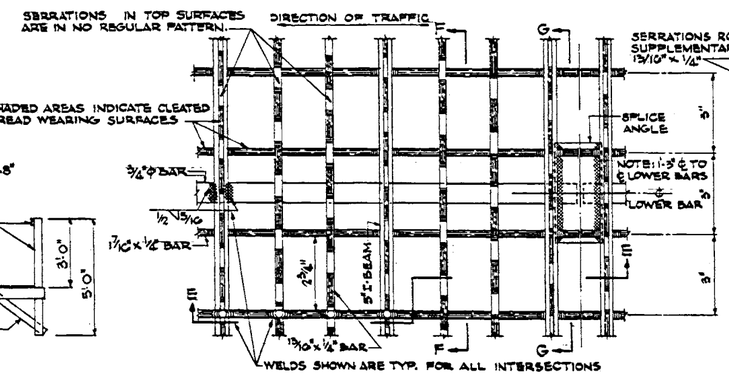
NAILING SCHEME FOR FLOOR CLIPS



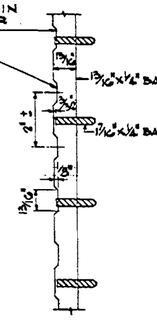
LAMINATED FLOOR SYSTEM NAILING SCHEME



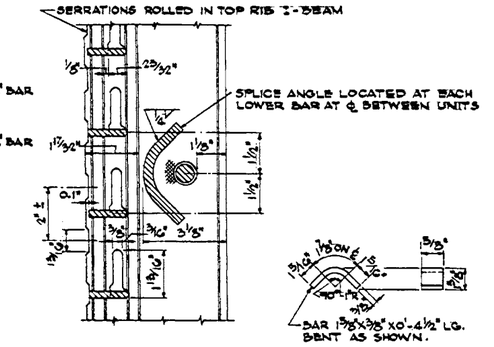
SECTION W-W
NO SCALE



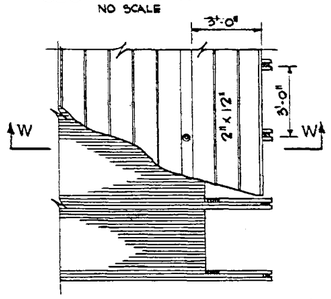
PART PLAN



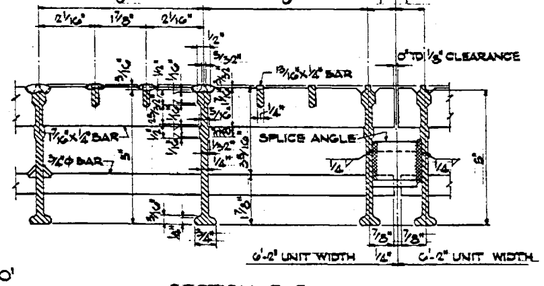
SECTION F-F



SECTION G-G SPLICE ANGLE DETAIL

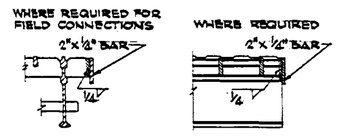


PART PLAN - WALKWAY & HANDRAIL 3'x50'
NO SCALE



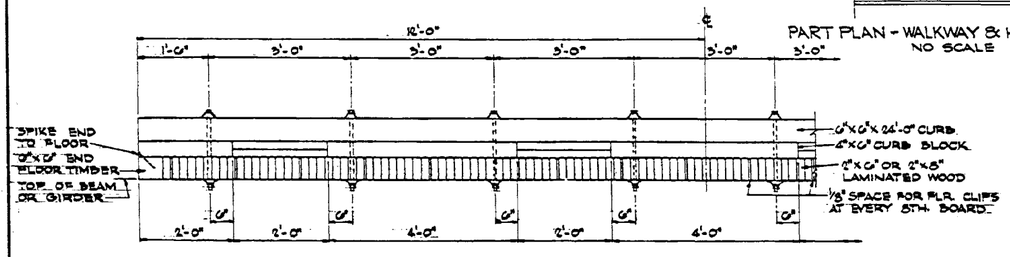
SECTION E-E

NOTE: RESID. PROPERTIES OF CROSS SECTION PER 6" WIDTH.
SECTION MODULUS (BOTTOM) = 1.68 CU. IN.
SECTION MODULUS (TOP) = 1.68 CU. IN.
WEIGHT PER SQUARE FOOT (APPROX) = 19 LBS.
FLOORING UNITS SHALL BE 6'-2" x 25'-0"

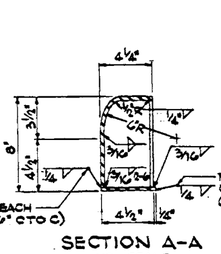


SIDE TRIM END TRIM FIELD WELDING TO STRINGERS

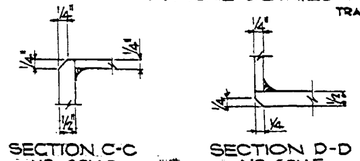
TYPICAL DETAILS FOR I-BEAM STEEL OPEN FLOOR
TRANSVERSE TO TRAFFIC TYPE
NO SCALE



SIDE ELEVATION OF WOOD DECK



SECTION A-A
NO SCALE

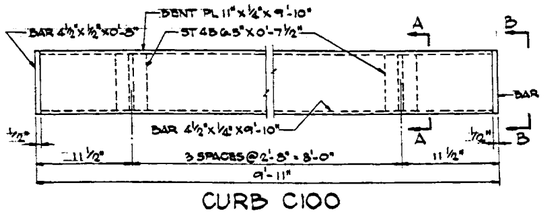


SECTION C-C
NO SCALE

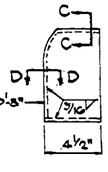
SECTION D-D
NO SCALE

NOTE:
WHEN SPACES BETWEEN FLANGES ARE LESS THAN 2'-0", ROUGH PLANKING 4" THICK MAY BE SAFELY USED IN LIEU OF 2" PLANKING & VERTICAL LAMINATED WOOD.

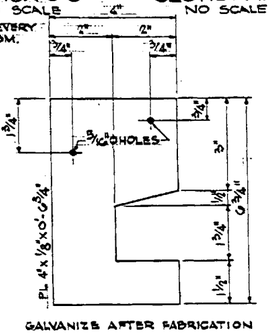
TIMBER FLOORING - FACILITY NUMBERS	
FACILITY NO.	DESCRIPTION
852187	6" LAMINATED WOOD FLOORING - 26' x 50' UNIT
852188	8" LAMINATED WOOD FLOORING - 26' x 50' UNIT
852189	6" LAMINATED WOOD FLOORING - 15½' x 50' UNIT
852190	8" LAMINATED WOOD FLOORING - 15½' x 50' UNIT
852192	WALKWAY & HANDRAIL 3'x50' FOR 6" FLOORING
852193	WALKWAY & HANDRAIL 3'x50' FOR 8" FLOORING



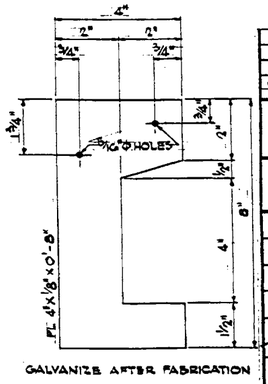
CURB C100



VIEW B-B
NO SCALE



GALVANIZE AFTER FABRICATION
FLOOR CLIP FC200



GALVANIZE AFTER FABRICATION
FLOOR CLIP FC201

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

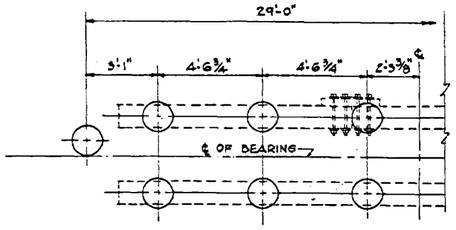
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature]
CHIEF, STRUCTURES BRANCH

APPROVED: [signature]
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

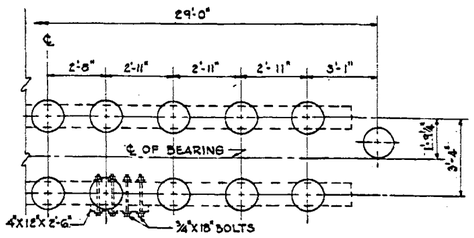
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
FLOORING: TIMBER & STEEL DETAILS

UNDER REVISION

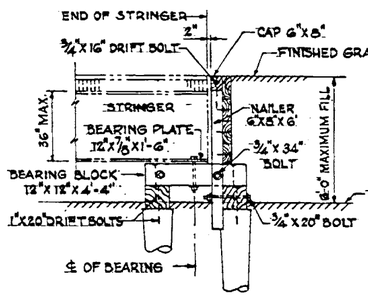
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-21
SHEET 9 OF 9



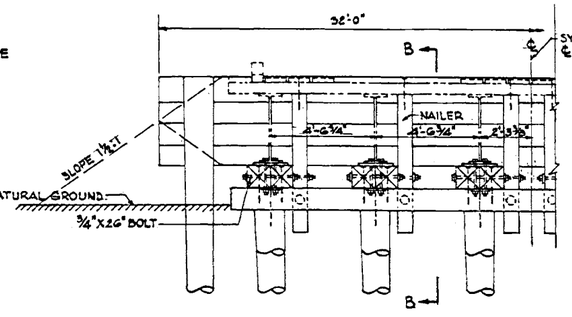
HALF PLAN - PILE ARRANGEMENT



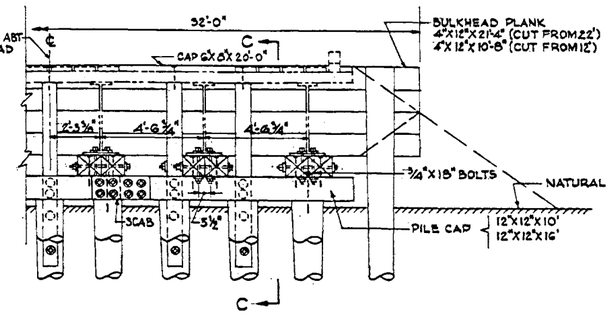
HALF PLAN - PILE ARRANGEMENT



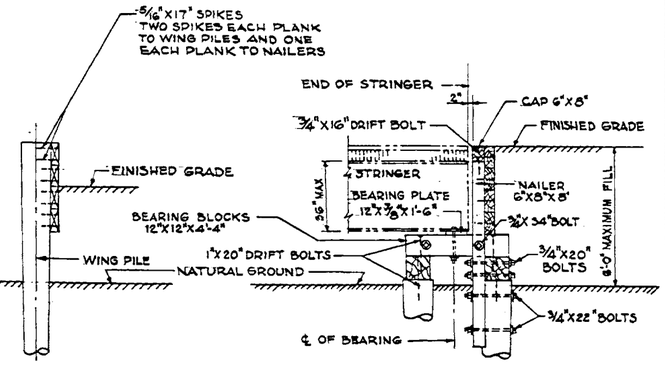
SECTION B-B



HALF FRONT ELEVATION



HALF FRONT ELEVATION

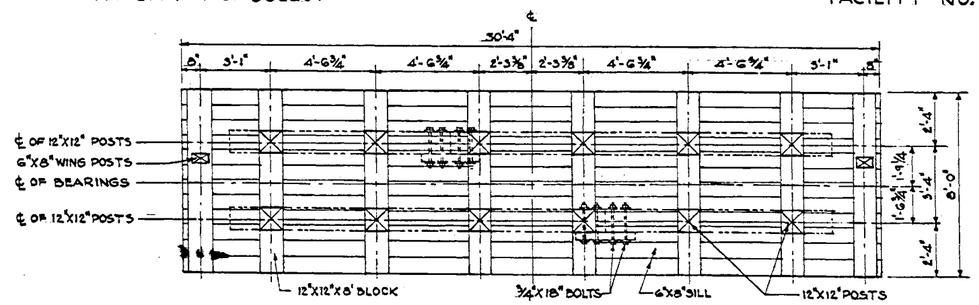


TYPICAL END ELEVATION

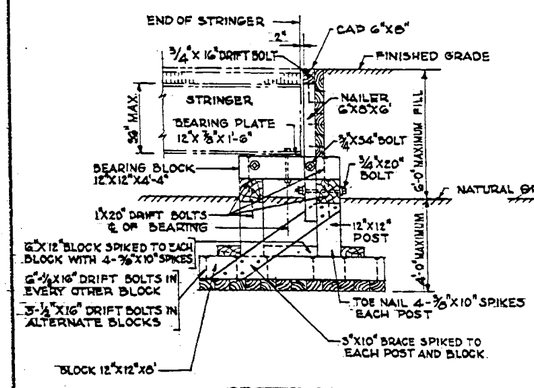
SECTION C-C

12 BEARING PILES (2 ROWS, 6 EACH) AND 2 WING PILES
70' SPAN - STEEL BEAMS
SCALE NO. 3
FACILITY NO. 852201

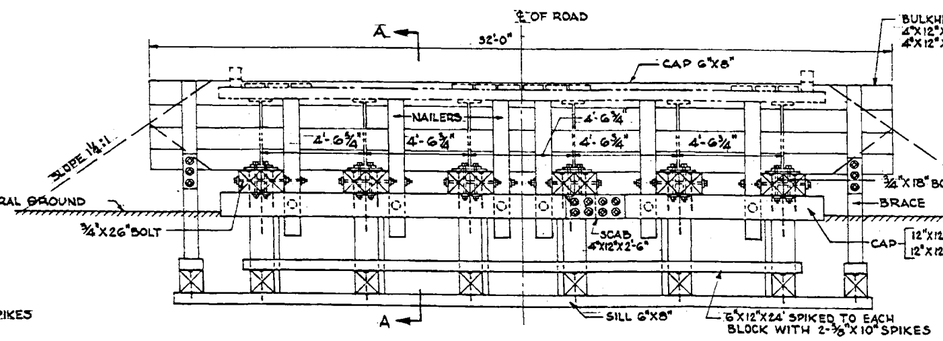
18 BEARING PILES (2 ROWS, 9 EACH) AND 2 WING PILES
80' SPAN - STEEL BEAMS
SCALE NO. 3
FACILITY NO. 852203



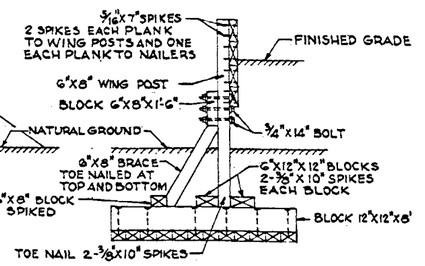
PLAN OF GRILLAGE



SECTION A-A



FRONT ELEVATION



END ELEVATION

12 POST (2 ROWS, 6 EACH) FRAME BENTS W/2 WING POSTS
70' SPAN - STEEL BEAMS
SCALE NO. 3
FACILITY NO. 852202

GENERAL NOTES

1. AS DRAWN THESE STRUCTURES ARE FOR CLASS 30 LOADING FOR 2-WAY TRAFFIC OR CLASS 80 LOADING FOR CONTROLLED 1-WAY TRAFFIC.
2. TO CONVERT TO CLASS 60 LOADING FOR 2-WAY TRAFFIC AND CLASS 100 CONTROLLED 1-WAY TRAFFIC, REDUCE SPAN TO 60' MAX. FACILITIES 852201 & 852202.
3. TO CONVERT TO CLASS 60 2-WAY TRAFFIC OR CLASS 100 CONTROLLED 1-WAY TRAFFIC USE 1-36 WF BEAM CENTERED OVER EACH PILE PAIR. FACILITY NO. 852203.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

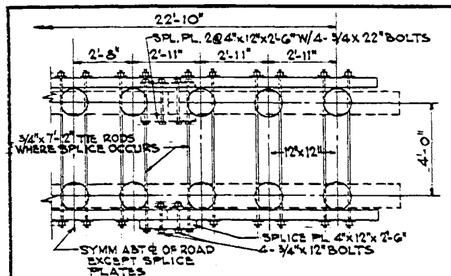
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHANNON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. Eckam, CHIEF, STRUCTURES BRANCH
APPROVED: for H. W. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY:
DATE:

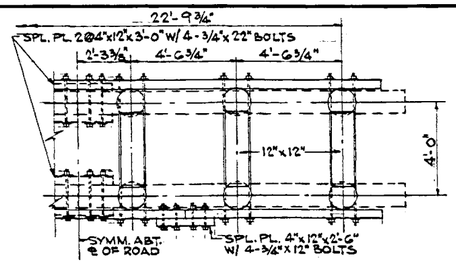
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE BRIDGE ABUTMENTS
70'-0" & 80'-0" STEEL SPANS
CLASS 50, 60, 80, OR 100

UNDER REVISION

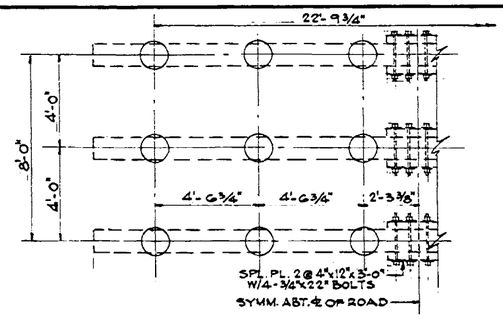
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-22
SHEET 1 OF 7



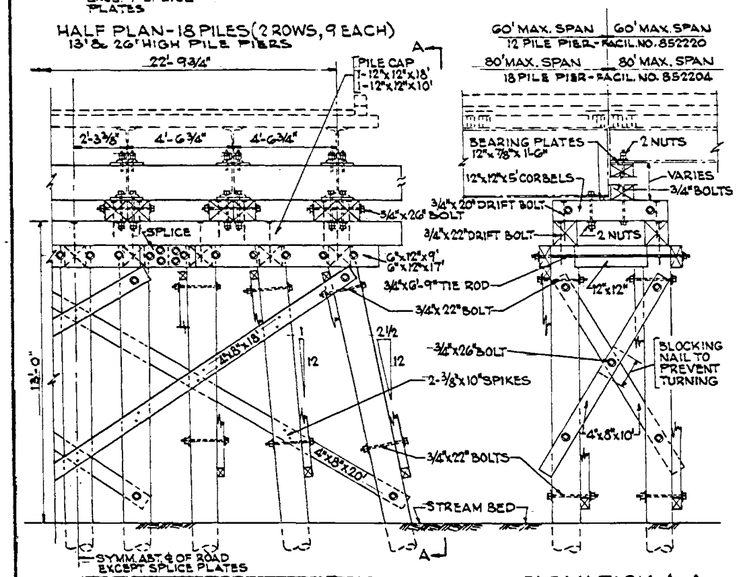
HALF PLAN-18 PILES (2 ROWS, 9 EACH)
13' & 26' HIGH PILE PIERS



HALF PLAN-12 PILES (2 ROWS, 6 EACH)
13' HIGH PILE PIER

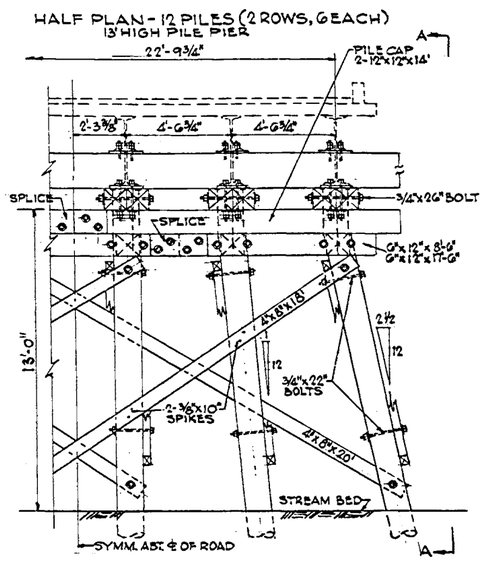


HALF PLAN-18 PILES (3 ROWS, 6 EACH)
26' HIGH PILE PIER

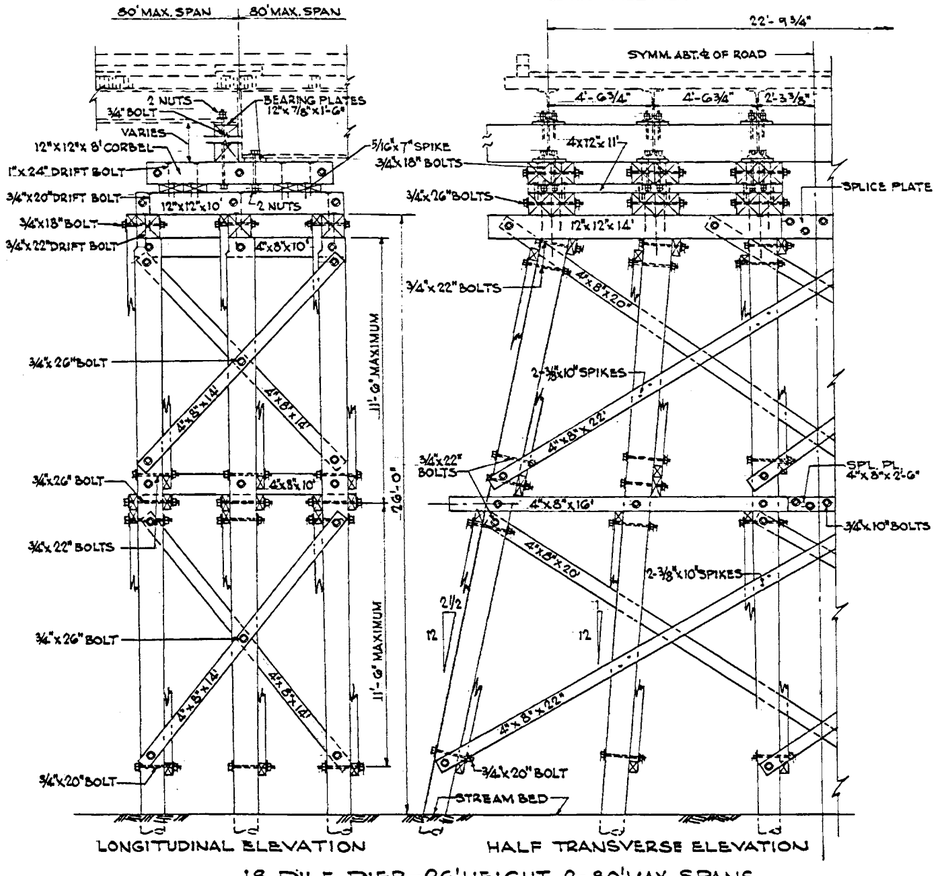


HALF TRANSVERSE ELEVATION
18 PILE PIER-13' HEIGHT, 2-80' MAX SPANS
SCALE NO. 3
FACILITY NO. 852204

ELEVATION A-A



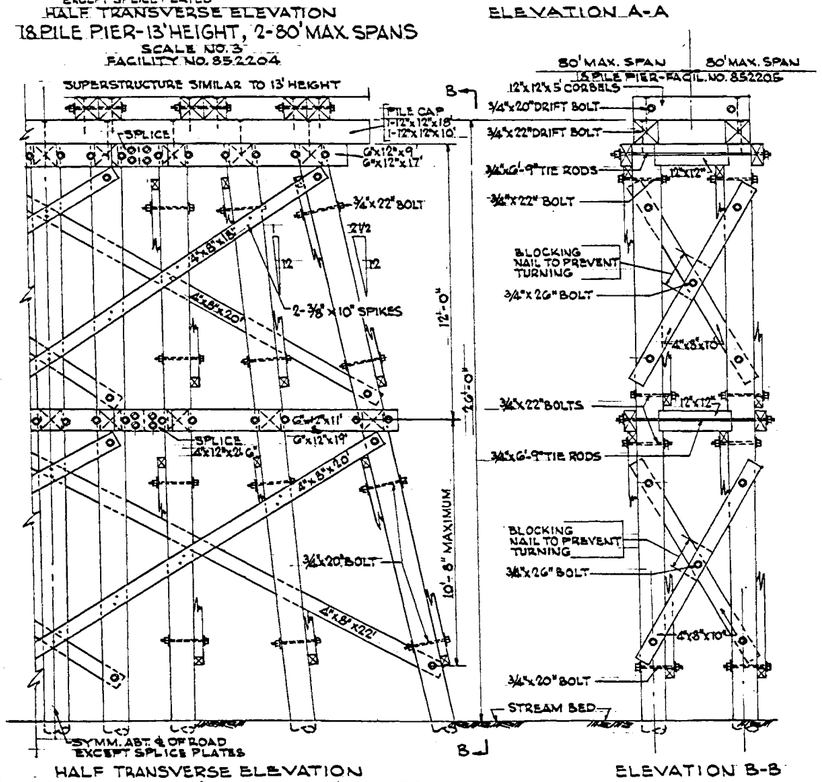
HALF TRANSVERSE ELEVATION
12 PILE PIER-13' HEIGHT, 2-60' MAX. SPANS
SCALE NO. 3
FACILITY NO. 852220



LONGITUDINAL ELEVATION

HALF TRANSVERSE ELEVATION

18 PILE PIER-26' HEIGHT, 2-80' MAX. SPANS
SCALE NO. 3
FACILITY NO. 852206



HALF TRANSVERSE ELEVATION
18 PILE PIER-26' HEIGHT, 2-80' MAX. SPANS
SCALE NO. 3
FACILITY NO. 852205



ELEVATION B-B

GENERAL NOTES

1. AS DRAWN, THESE STRUCTURES ARE FOR CLASS 50 LOADING FOR 2-WAY TRAFFIC AND CLASS 80 LOADING FOR CONTROLLED 1-WAY TRAFFIC.
2. TO CONVERT TO CLASS 60 LOADING FOR 2-WAY TRAFFIC AND CLASS 100 FOR CONTROLLED 1-WAY TRAFFIC, REDUCE SPANS TO:-
   60' FOR FACILITY NO. 852204
   60' FOR FACILITY NO. 852205
   60' FOR FACILITY NO. 852206
   30' FOR FACILITY NO. 852220

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES

0 1' 2' 3' 4' 5'

NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

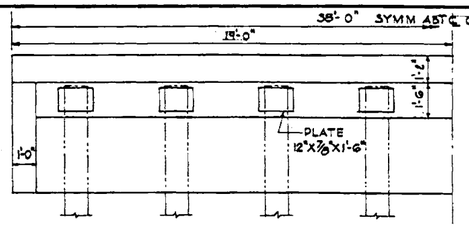
DRAWN BY: SHANNON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: L. W. DEICHMANN

THEATER OF OPERATIONS

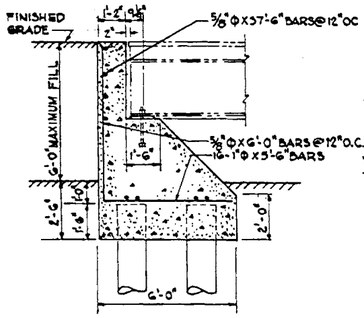
UNDER REVISION

TRUSS BRIDGE, SUBSTRUCTURE
DOUBLE LANE BAILEY PIERS
120 FT. OR 160 FT. MAX. COMBINED SPANS
CLASS 50, 60, 80 OR 100

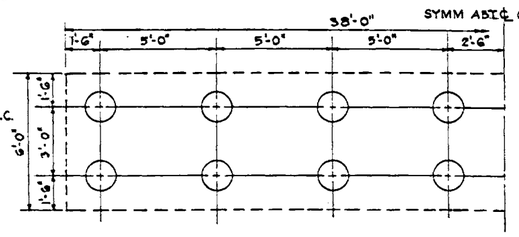
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-22
SHEET 2 OF 7



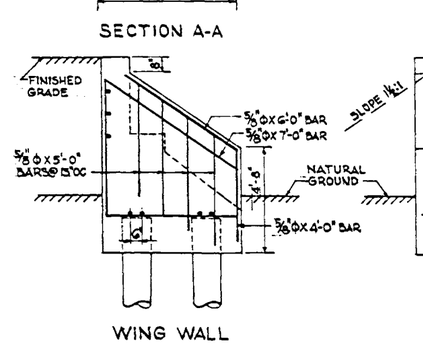
HALF ABUTMENT PLAN



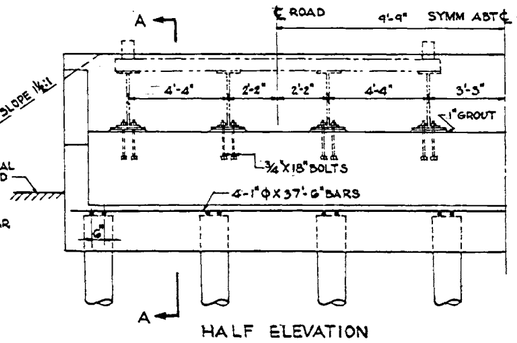
SECTION A-A



HALF PILE PLAN



WING WALL

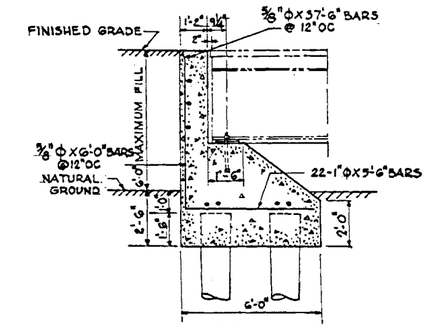


HALF ELEVATION

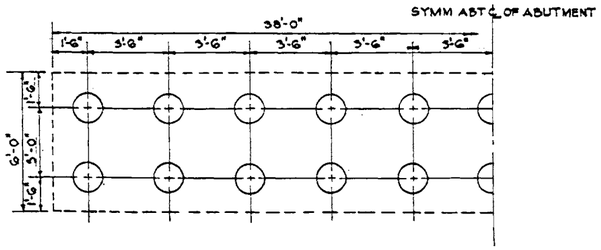
CONCRETE ABUTMENT-16 PILES
30' SPAN-STEEL BEAMS
CLASS 50
SCALE NO.3

FACILITY NO. 852207

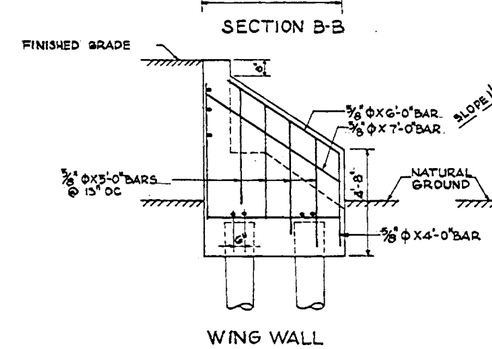
HALF ABUTMENT PLAN



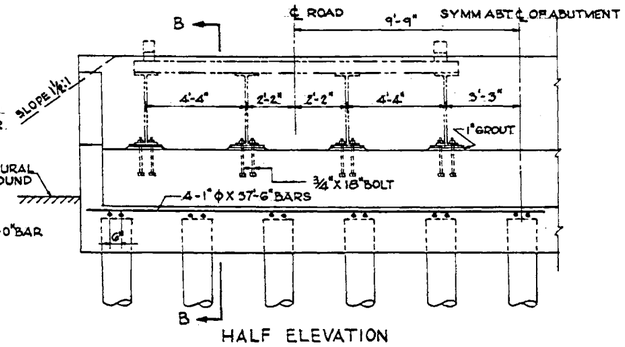
SECTION B-B



HALF PILE PLAN



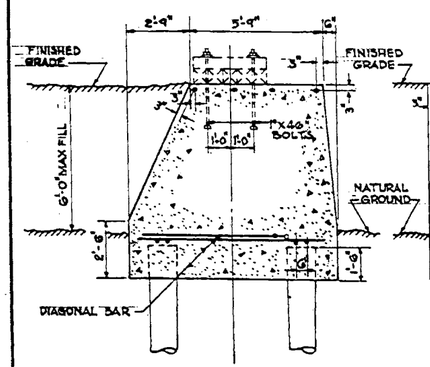
WING WALL



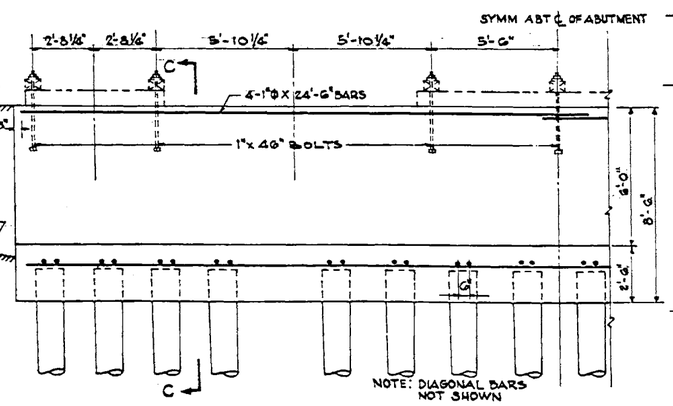
HALF ELEVATION

CONCRETE ABUTMENT-22 PILES
60' SPAN-STEEL BEAMS
CLASS 50
SCALE NO.3

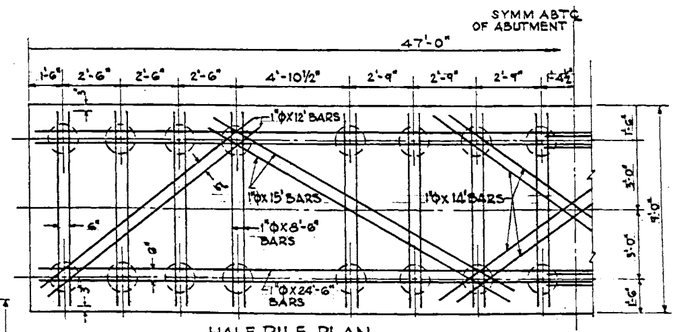
FACILITY NO. 852208



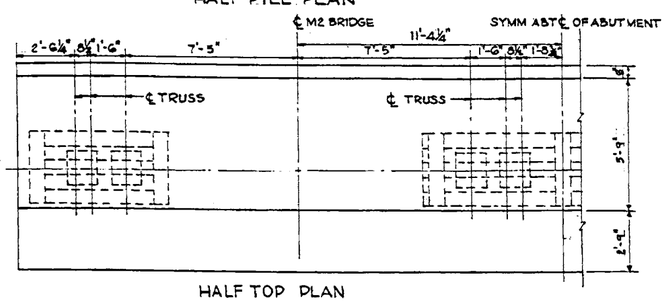
SECTION C-C



HALF ELEVATION



HALF PILE PLAN



HALF TOP PLAN

CONCRETE ON 32 PILES 90' BAILEY BRIDGE
THRU TRUSSES FOR TWO SINGLE LANES
SCALE NO.3

FACILITY NO. 852209

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

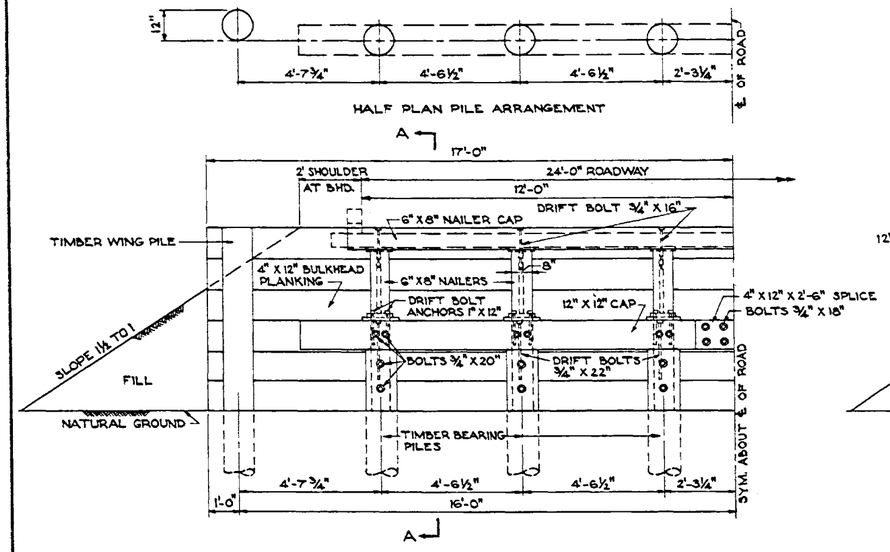
DRAWN BY: SHANNON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: P.W. DEICHMANN

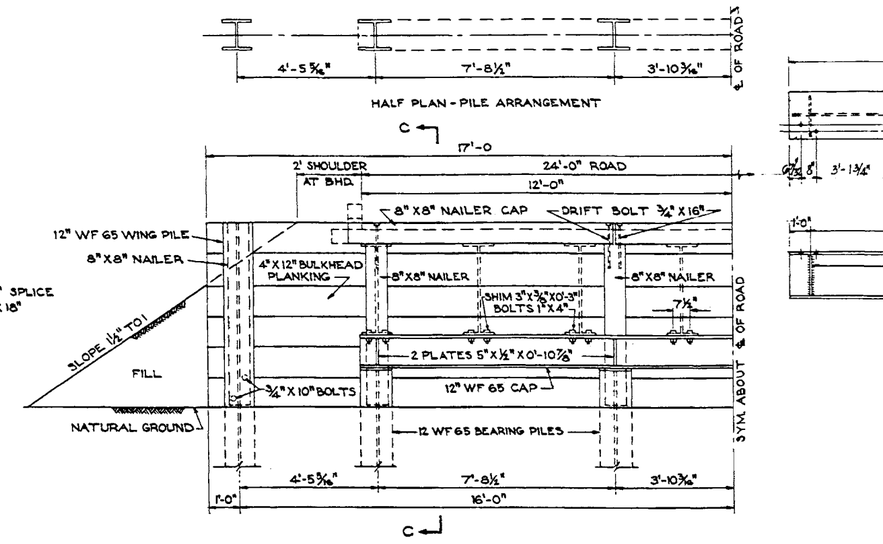
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
ABUTMENTS FOR TWO SINGLE LANE BRIDGES
CONCRETE ON TIMBER PILES
30. 60 & 90 FT SPANS

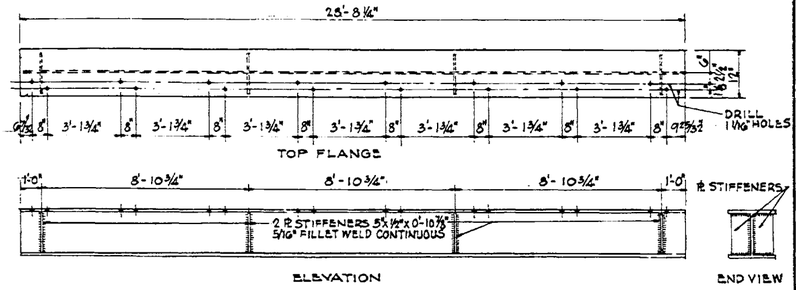
UNDER REVISION

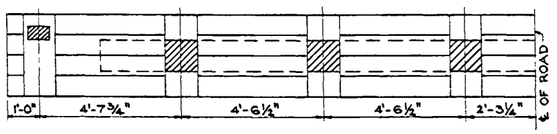
APPROVED: H. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE

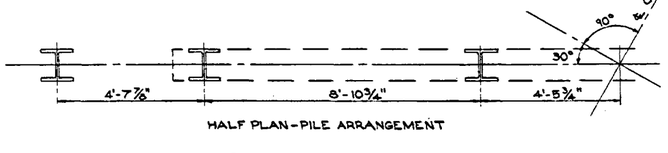
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
85-22
SHEET 3 OF 7

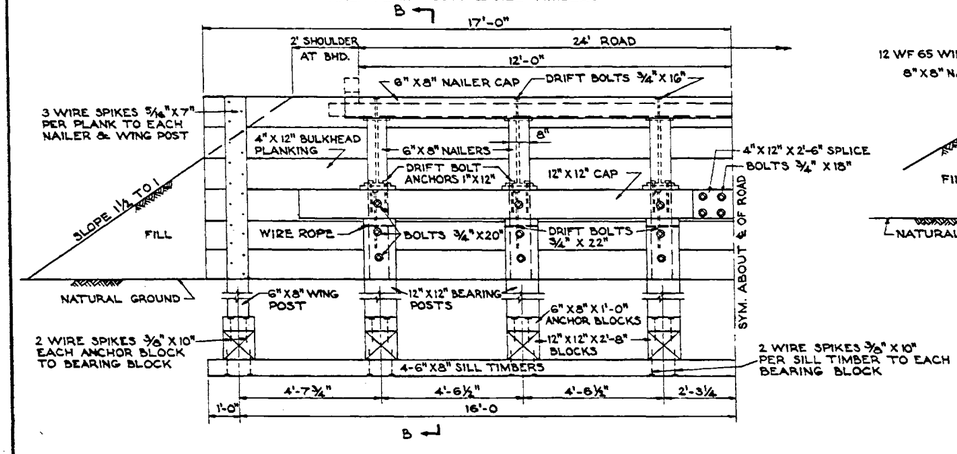


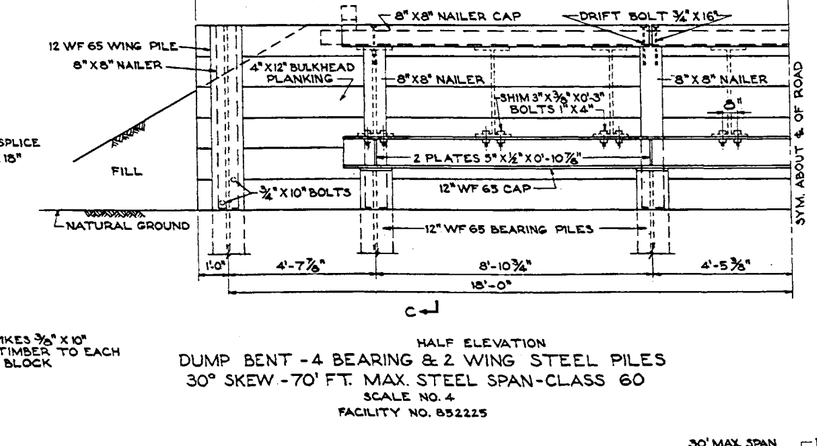


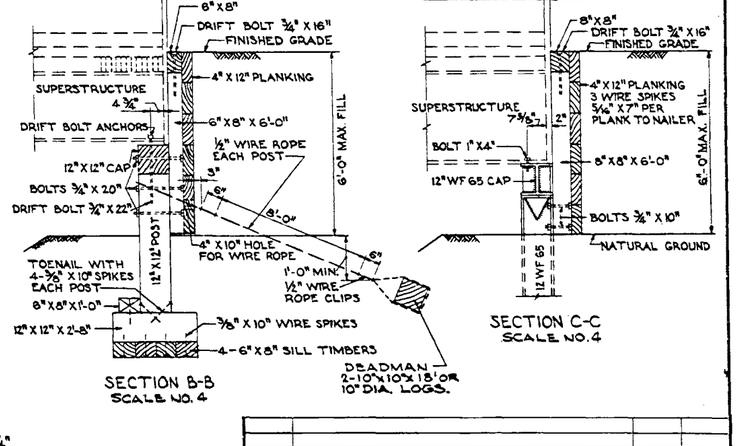


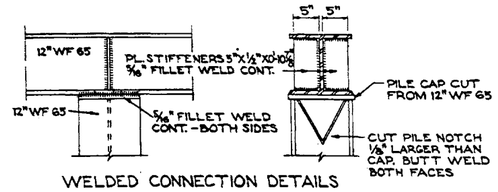


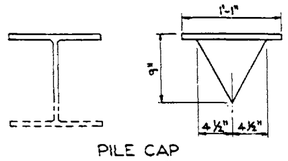


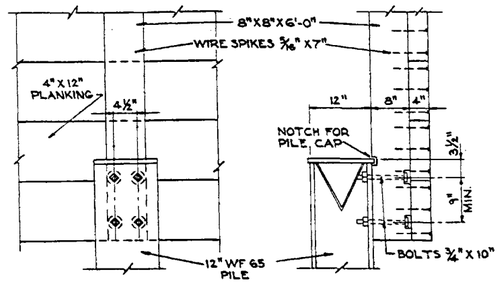


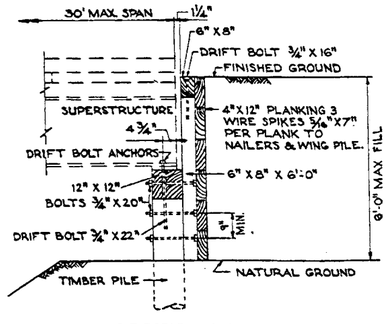












SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 0 1' 2' 0 3" 6" 9" 1' 2'
NO. 4 NO. 5 NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

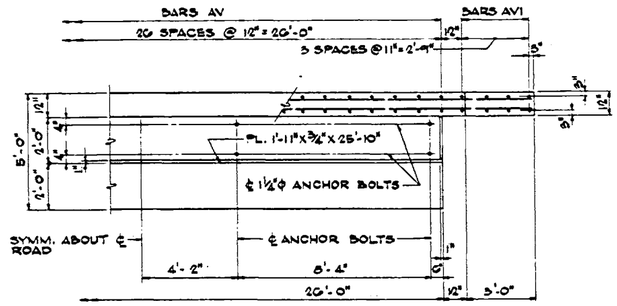
DRAWN BY: BALLOU
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DEITCHMANN
APPROVED:

THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE DUMP BENTS
30 FT. & 70 FT. MAX. STEEL SPANS

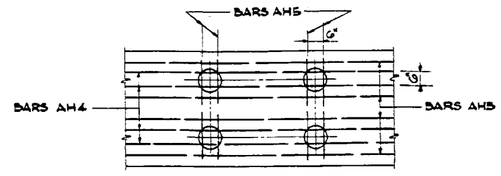
UNDER REVISION

APPROVED: L. W. Williams
DATE: 18 MAR 1969
CHIEF, STRUCTURES BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

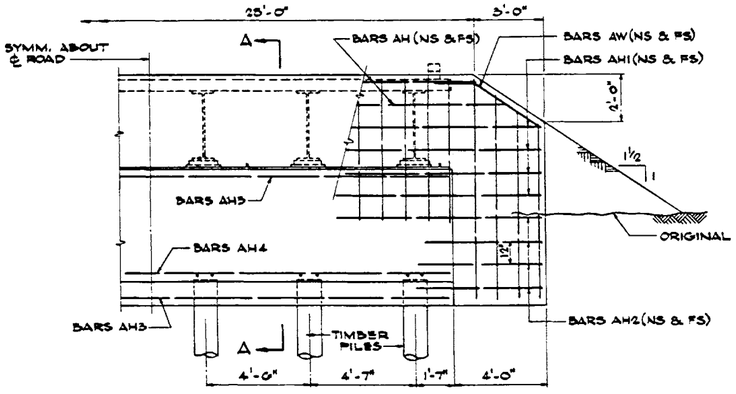
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-22
SHEET 4 OF 7



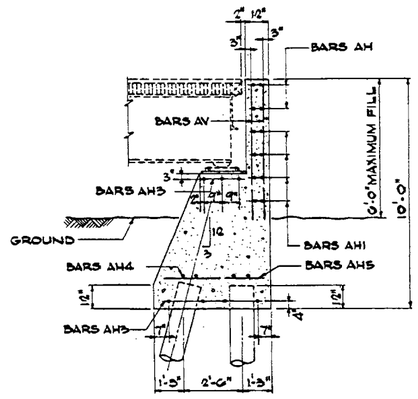
HALF PLAN



PART PILE PLAN



HALF ELEVATION

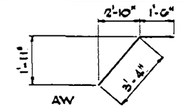


SECTION A-A

REINFORCING SCHEDULE

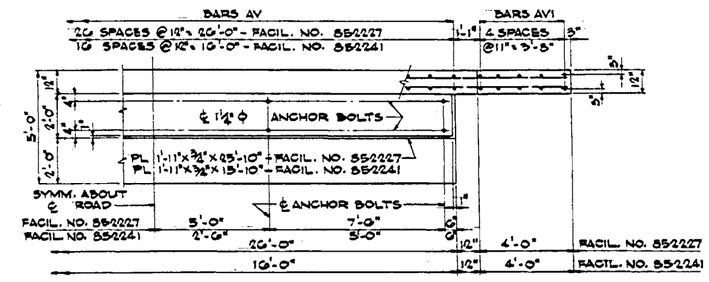
MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION	BENDING DIAGRAMS
AH	4	1/2" ϕ	28'-0" TO 31'-0"		BACKWALL	
AH1	8	1/2" ϕ	33'-6"		BACKWALL	
AH2	16	1/2" ϕ	5'-3"		WINGS	
AH3	7	3/4" ϕ	25'-6"		BEAM SEAT & FTG.	
AH4	4	1/2" ϕ	25'-6"		FOOTING	
AH5	12	1/2" ϕ	4'-6"		FOOTING	
AV	54	1/2" ϕ	6'-0"		BACKWALL	
AV1	16	1/2" ϕ	7'-8" TO 9'-5"		WINGS	
AW	4	1/2" ϕ	4'-10"	1"	WINGS	

AH 28'-0" TO 31'-0" VARY BY 3'-0" - 2 EA. LG.
AV1 7'-8" TO 9'-5" VARY BY 7 1/2" - 4 EA. LG.
AH, AV1

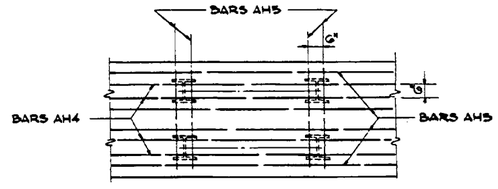


DOUBLE LANE CONCRETE ABUTMENT
60FT. MAXIMUM SPAN - CLASS 60
12 TIMBER PILES

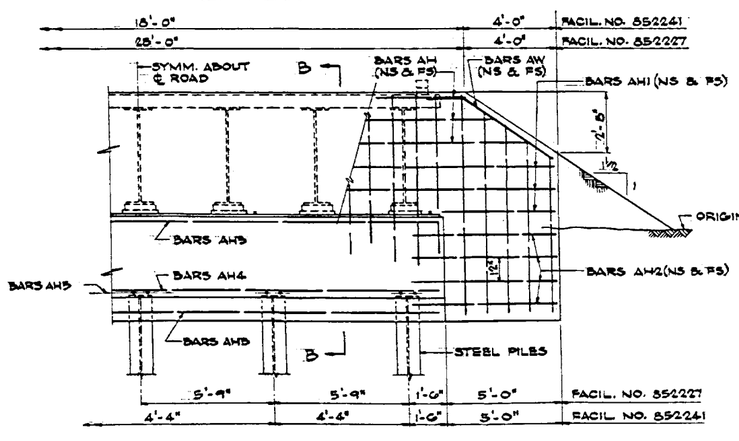
SCALE NO. 3
FACILITY NO. 852226



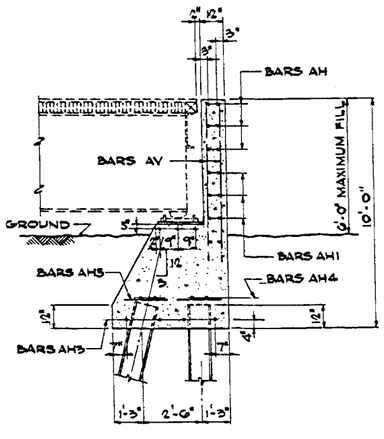
HALF PLAN



PART PILE PLAN



HALF ELEVATION

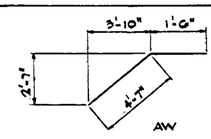


SECTION B-B

REINFORCING SCHEDULE

MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION	BENDING DIAGRAMS
AH	6	1/2" ϕ	28'-0" TO 34'-0"		BACKWALL	
AH1	6	1/2" ϕ	35'-7"		BACKWALL	
AH2	16	1/2" ϕ	6'-4"		WINGS	
AH3	7	3/4" ϕ	25'-6"		BEAM SEAT & FTG.	
AH4	4	1/2" ϕ	25'-6"		FOOTING	
AH5	12	1/2" ϕ	4'-6"		FOOTING	
AV	54	1/2" ϕ	7'-0"		BACKWALL	
AV1	20	1/2" ϕ	7'-0" TO 9'-6"		WINGS	
AW	4	1/2" ϕ	6'-1"	1"	WINGS	

AH 28'-0" TO 34'-0" VARY BY 3'-0" - 4 EA. LG.
AV1 7'-0" TO 9'-0" VARY BY 7 1/2" - 4 EA. LG.
AH, AV1



CONCRETE ABUTMENTS - 130 FT. MAX. SPAN
DBL. LANE - 10 STL. PILES - CLASS 60 - FACILITY NO. 852227
SGL. LANE - 8 STL. PILES - CLASS 50 - FACILITY NO. 852241

SCALE NO. 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: O. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

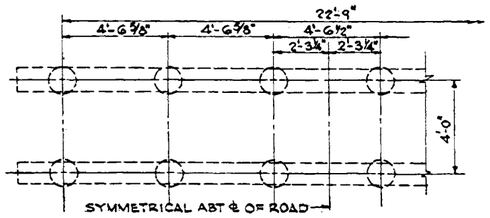
THEATER OF OPERATIONS
ROAD, BRIDGE, SUBSTRUCTURES
CONCRETE ABUTMENTS
60FT. & 130FT. MAX. SPANS

UNDER REVISION

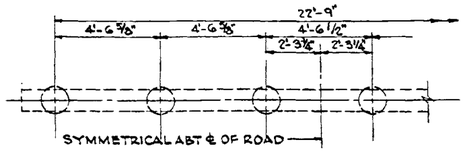
APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE

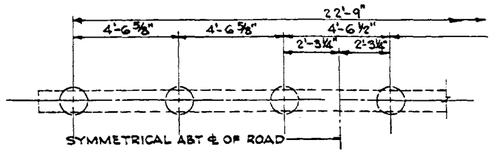
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-22
SHEET 5 OF 7



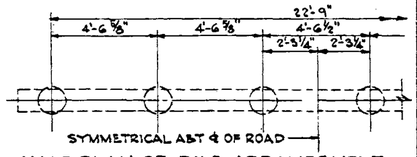
HALF PLAN OF PILE ARRANGEMENT



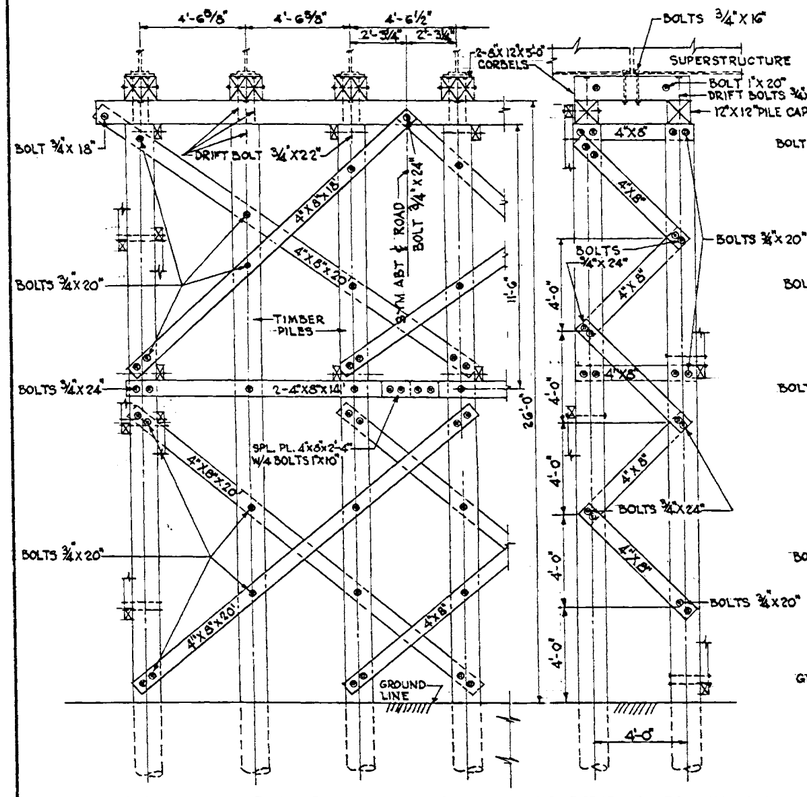
HALF PLAN OF PILE ARRANGEMENT



HALF PLAN OF PILE ARRANGEMENT

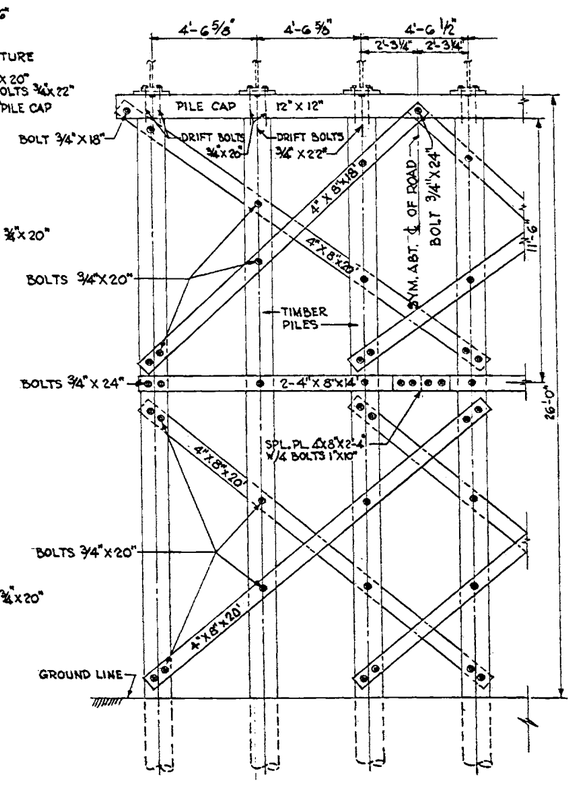


HALF PLAN OF PILE ARRANGEMENT



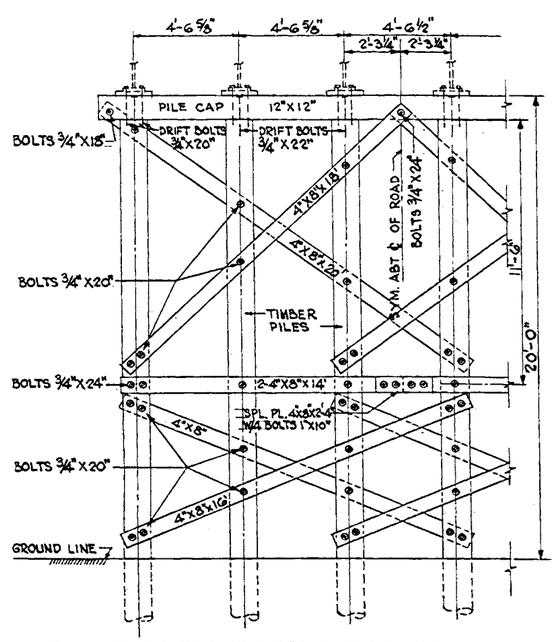
HALF TRANSVERSE ELEVATION LONGITUDINAL ELEVATION

12 TIMBER PILE PIER - 26 FT. HIGH
FOR 60 FT. MAX. COMBINED SPANS - CLASS 60
SCALE NO. 3
FACILITY NO. 852231



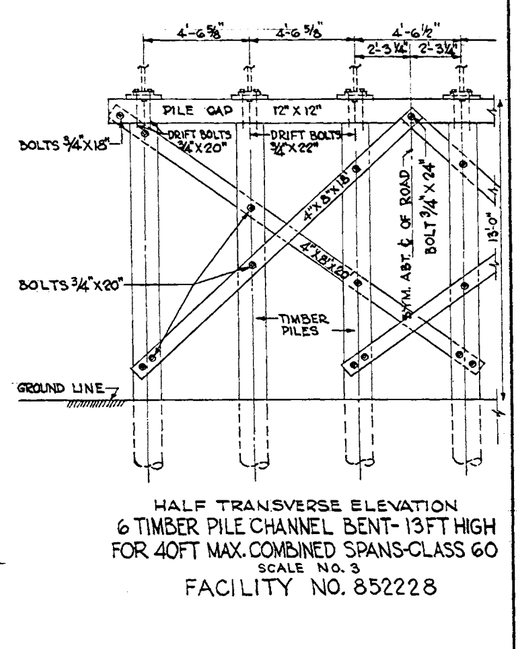
HALF TRANSVERSE ELEVATION

6 TIMBER PILE CHANNEL BENT - 26 FT HIGH
FOR 40 FT. MAX. COMBINED SPANS - CLASS 60
SCALE NO. 3
FACILITY NO. 852230

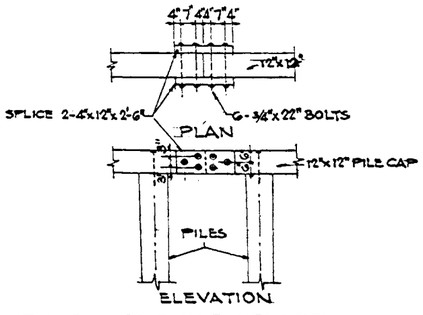


HALF TRANSVERSE ELEVATION

6 TIMBER PILE CHANNEL BENT - 20 FT HIGH
FOR 40 FT MAX. COMBINED SPANS - CLASS 60
SCALE NO. 3
FACILITY NO. 852229



HALF TRANSVERSE ELEVATION
6 TIMBER PILE CHANNEL BENT - 13 FT HIGH
FOR 40 FT MAX. COMBINED SPANS - CLASS 60
SCALE NO. 3
FACILITY NO. 852228



TYPICAL PILE CAP SPLICE
SCALE NO. 3

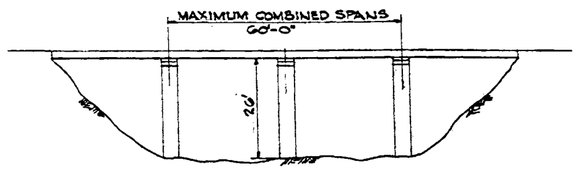


DIAGRAM SHOWING HEIGHT
& SPAN LIMITATIONS
NOT TO SCALE

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

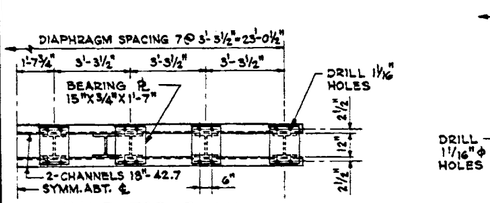
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

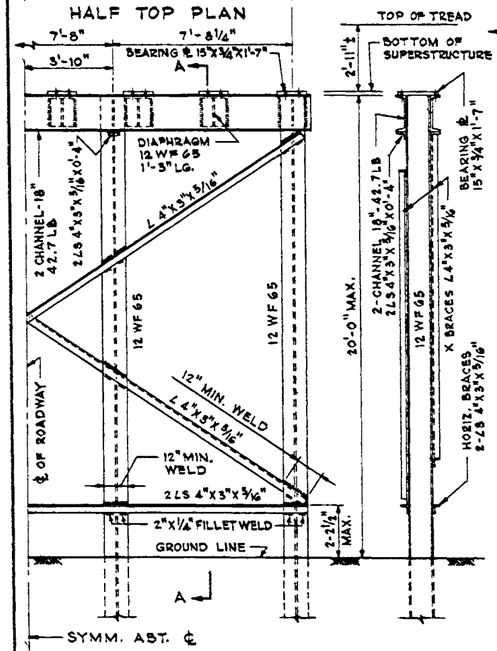
DRAWN BY: ILYUS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: E. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
CONCRETE BRIDGE SUBSTRUCTURES
DOUBLE LINE BENTS & PIER
60 FT. MAXIMUM COMBINED SPANS
13, 20 & 26 FT HIGH

UNDER REVISION

DATE: 19 MAR 1963
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-22
SHEET 8 OF 7





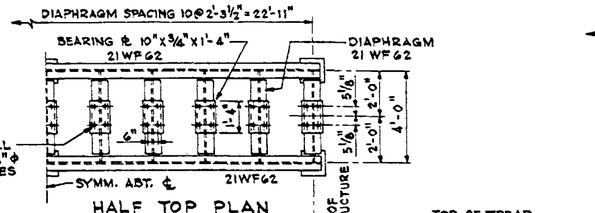
HALF ELEVATION SECTION A-A

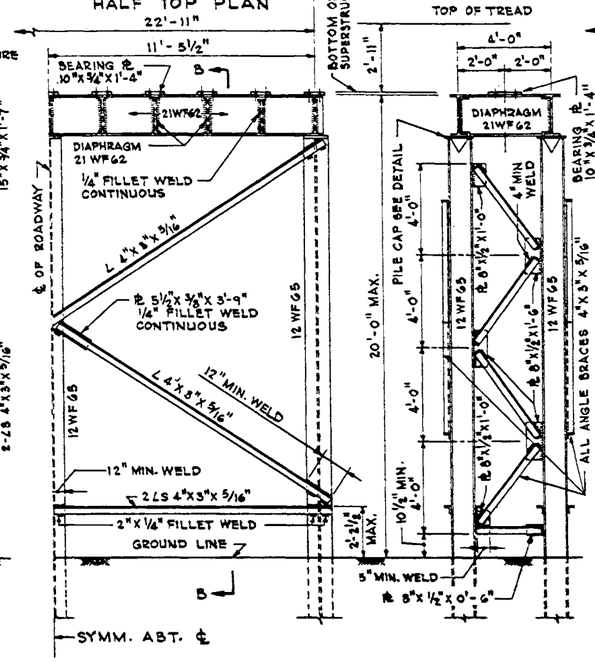
DOUBLE LANE PILE BENT- 4 STEEL PILES, WELDED
20 FT HIGH- 80 FT MAX. COMBINED SPANS - CLASS 60

SCALE NO. 3

FACILITY NO. 852232

NOTE: DIAPHRAGM & BEARING PLATE SPACING SHOWN FOR TWO (2) EQUAL SPANS — 8-27" WF BEAMS.





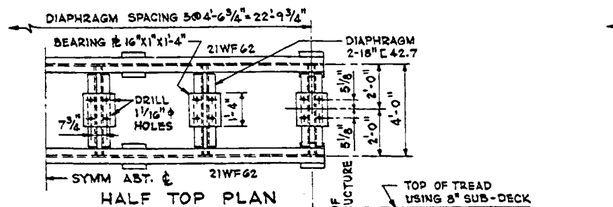
HALF ELEVATION SECTION B-B

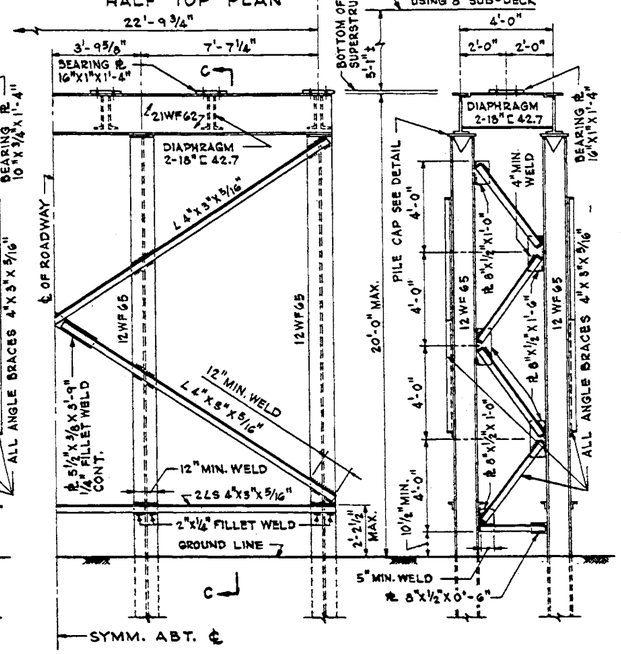
DOUBLE LANE PILE PIER, 6 STEEL PILES, WELDED
20 FT. HIGH, FOR 160 FT MAX. COMBINED SPANS - CLASS 60

SCALE NO. 3

FACILITY NO. 852233

NOTE: DIAPHRAGM & BEARING PLATE SPACING SHOWN FOR TWO (2) EQUAL SPANS — 11-27" WF BEAMS.





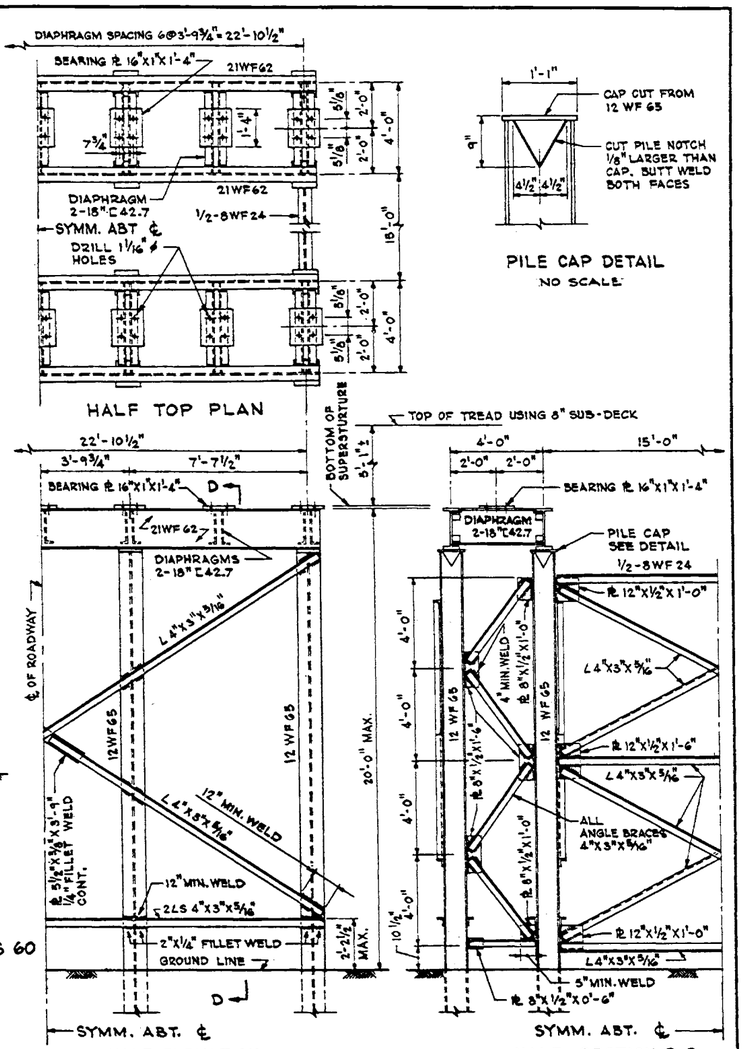
HALF ELEVATION SECTION C-C

DOUBLE LANE PILE PIER, 8 STEEL PILES, WELDED
20 FT. HIGH, FOR 200 FT. MAX. COMBINED SPANS - CLASS 60

SCALE NO. 3

FACILITY NO. 852234

NOTE: DIAPHRAGM & BEARING PLATE SPACING SHOWN FOR TWO (2) EQUAL SPANS — 6-51" GIRDERS.

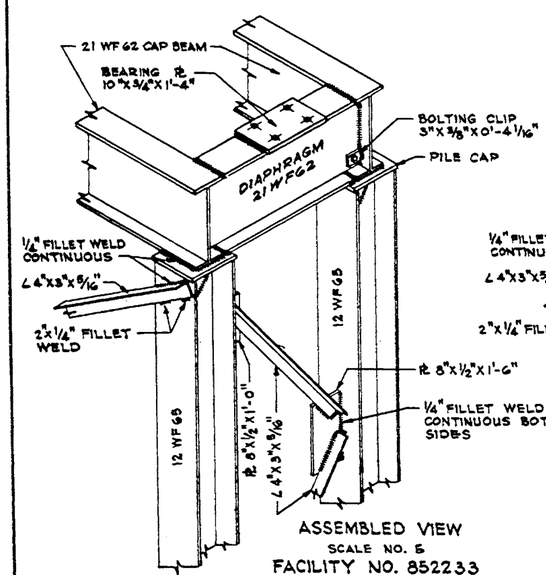


DOUBLE LANE PILE PIER, 16 STEEL PILES, WELDED
20 FT. HIGH, FOR 260 FT. MAX. COMBINED SPANS - CLASS 60

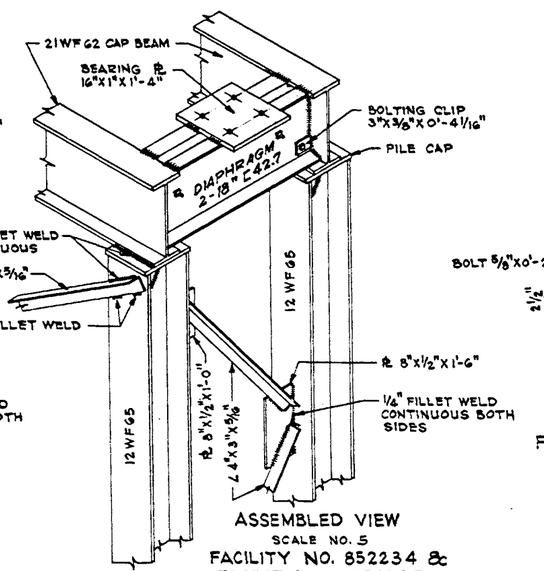
SCALE NO. 3

FACILITY NO. 852235

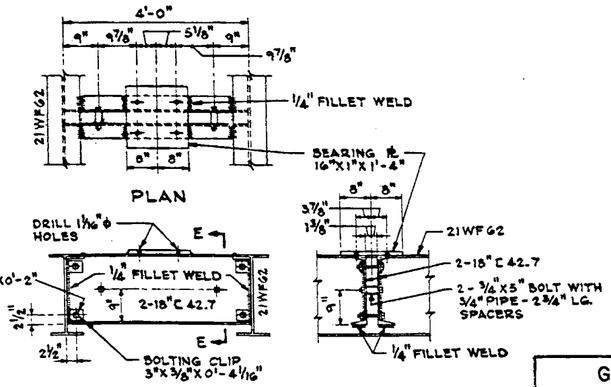
NOTE: DIAPHRAGM & BEARING PLATE SPACING SHOWN FOR TWO (2) EQUAL SPANS — 7-51" GIRDERS.



ASSEMBLED VIEW
SCALE NO. 5
FACILITY NO. 852233



ASSEMBLED VIEW
SCALE NO. 5
FACILITY NO. 852234 & FACILITY NO. 852235



DIAPHRAGM DETAILS
FACILITY NO. 852234 & FACILITY NO. 852235

SCALE NO. 5

GENERAL NOTES

1. ALL WELDS SHOWN ARE 1/4" FILLET WELDS UNLESS OTHERWISE NOTED.
2. FOR OTHER SUPERSTRUCTURE SELECTIONS REFER TO DWG. NO. 85-21 FOR DIAPHRAGM & BEARING PLATE SPACING.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' 4' 5' 8' NO.3

0 1' 2' 3' NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: F. W. DEICHMANN

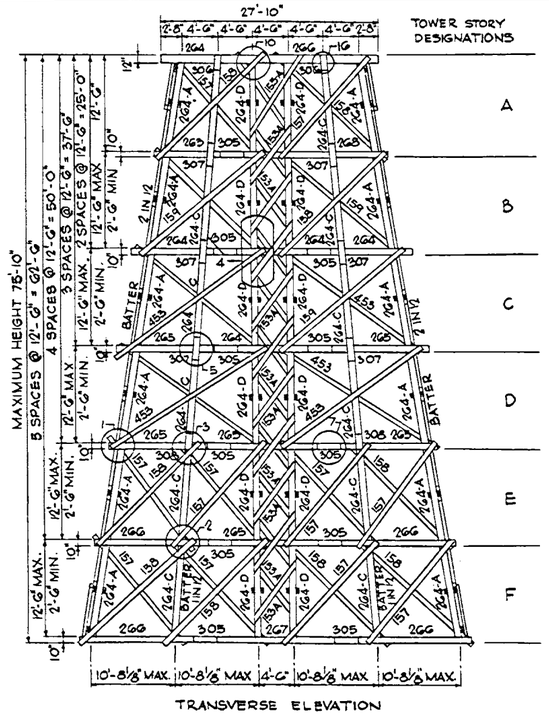
THEATER OF OPERATIONS
ROAD-BRIDGE SUPERSTRUCTURES
DOUBLE LANE PILE BENT, 4 PIERS
VARIOUS SPANS
WELDED-20 FT. HEIGHT-CLASS 60

UNDER REVISION

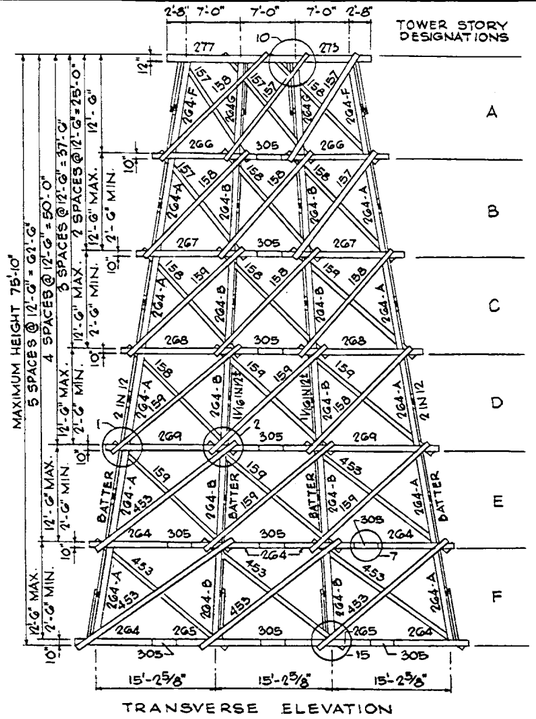
APPROVED: DATE: 13 MAR 1969
CHIEF, STRUCTURES BRANCH, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-22
DATE
SHEET 7 OF 7

CORPS OF ENGINEERS

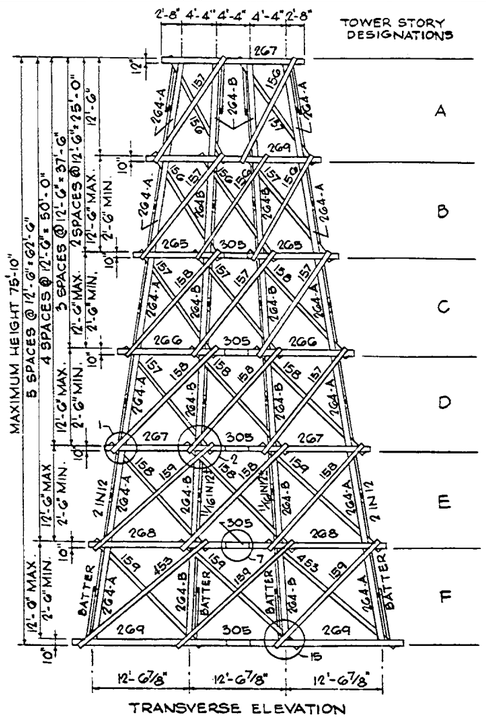
U. S. ARMY



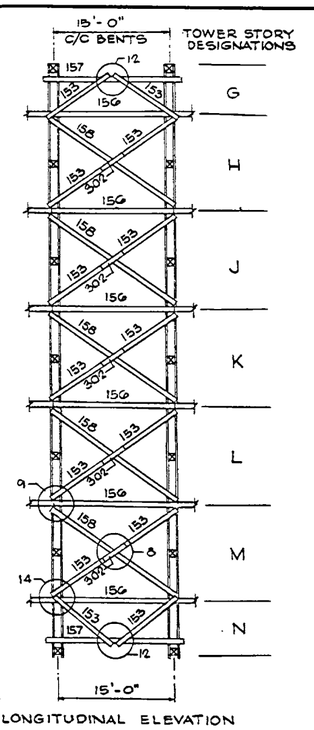
CLASS 60 - DOUBLE LANE, STEEL & TIMBER SPANS
SCALE NO. 1



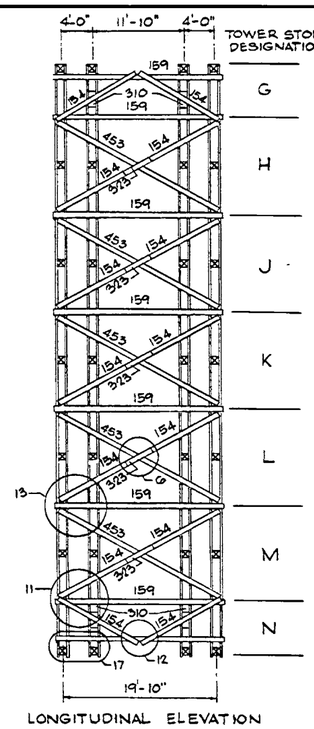
CLASS 25 - DOUBLE LANE, STEEL & TIMBER SPANS
SCALE NO. 1



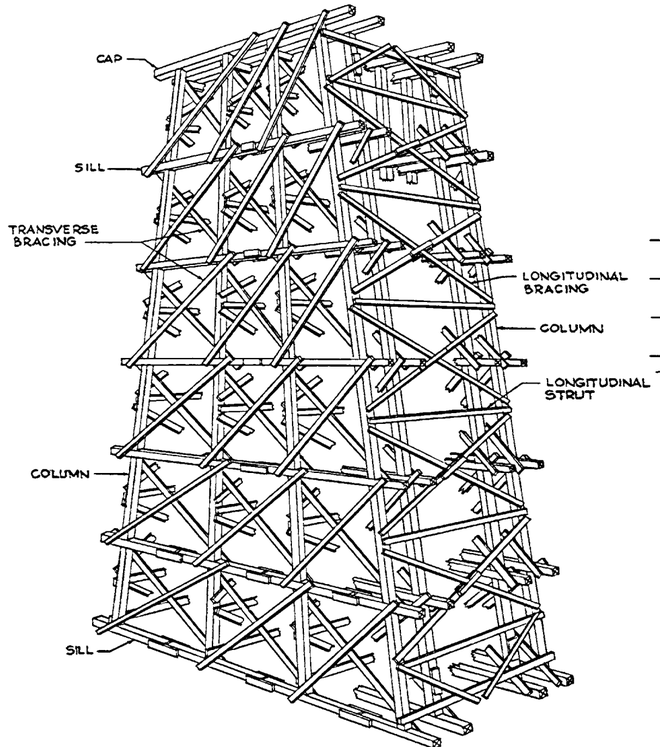
CLASS 50 - SINGLE LANE, STEEL SPANS
SCALE NO. 1



TIMBER SPANS - ALL CLASSES
SCALE NO. 1



STEEL SPANS - ALL CLASSES
SCALE NO. 1



ASSEMBLED VIEW-SIX STORY CLASS 25 DOUBLE LANE TOWER
NO SCALE

REFER TO TRANSVERSE & LONGITUDINAL ELEVATIONS FOR STRUCTURAL DIFFERENCES FOR OTHER CLASSES & USES

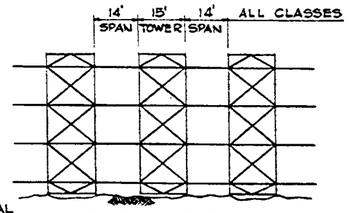


DIAGRAM SHOWING TIMBER SPAN LIMITATIONS
NO SCALE

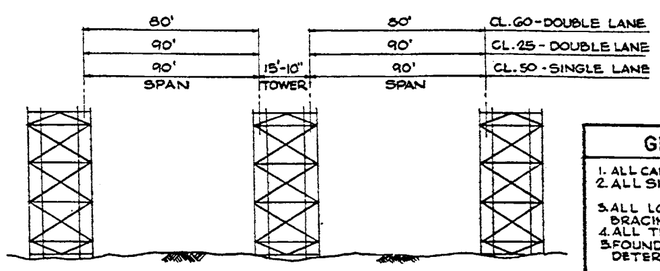


DIAGRAM SHOWING STEEL SPAN LIMITATIONS
NO SCALE

TOWER STORY - SELECTION CHART

NUMBER OF STORIES & HEIGHT	FACILITY NUMBERS: DBL. LANE TOWER CLASS 60, 25' MAX. COMB. TIMBER SPANS	DBL. LANE TOWER CLASS 60, 160' MAX. COMB. STEEL SPANS	DBL. LANE TOWER CLASS 25, 25' MAX. COMB. TIMBER SPANS	DBL. LANE TOWER CLASS 25, 180' MAX. COMB. STEEL SPANS	SGL. LANE TOWER CLASS 50, 180' MAX. COMB. STEEL SPANS	TOWER STORY - DESIGNATIONS: TRANSVERSE VIEW	LONGITUDINAL VIEW
ONE STORY 15' HIGH	852323	852329	852340	852346	852360	A	N G
TWO STORY 20' HIGH	852324	852330	852341	852347	852361	B	A N G H
THREE STORY 35' HIGH	852325	852331	852342	852348	852362	C	B A N G H J
FOUR STORY 51' HIGH	852326	852332	852343	852349	852363	D	C B A N G H J K
FIVE STORY 69' HIGH	852327	852333	852344	852350	852364	E	D C B A N G H J K L
SIX STORY 76' HIGH	852328	852334	852345	852351	852365	F	E D C B A N G H J K L M

GENERAL NOTES

1. ALL CAPS 10 X 12.
2. ALL SILLS 10 X 10.
3. ALL LONGITUDINAL STRUTS & BRACING 4 X 8.
4. ALL TRANSVERSE BRACING 4X8.
5. FOUNDATIONS FOR TOWERS TO BE DETERMINED BY FIELD CONDITIONS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-23	SGL. & DBL. LANE T&R. TOWERS-GEN. VIEWS	1 OF 5
85-25	CONNECTIONS	2 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

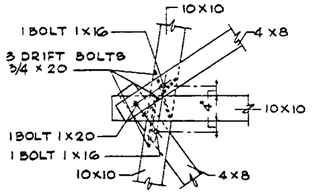
DRAWN BY: HORNE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: DEICHMANN

THEATER OF OPERATIONS
TIMBER & STEEL BRIDGE SUBSTRUCTURE
SINGLE & DOUBLE LANE TIMBER TOWERS
TIMBER & STEEL SPANS
GENERAL VIEWS

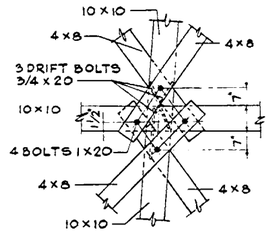
UNDER REVISION

APPROVED: H. M. Williams DATE: 19 MAR 1959
CHIEF, STRUCTURES BRANCH, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

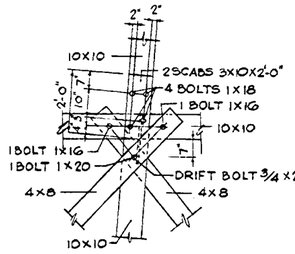
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-23
SHEET 1 OF 5



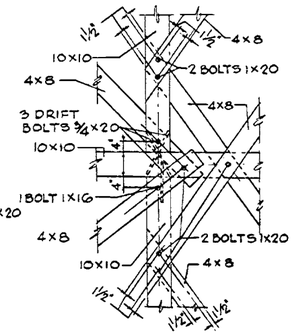
DETAIL 1
SCALE NO. 4



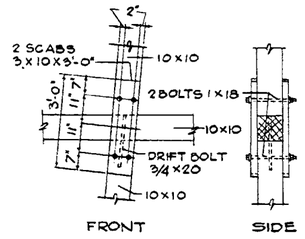
DETAIL 2
SCALE NO. 4



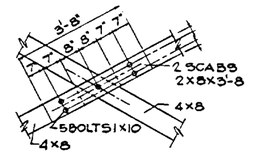
DETAIL 3
SCALE NO. 4



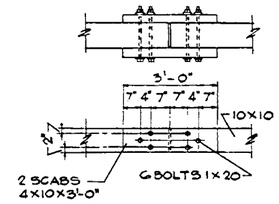
DETAIL 4
SCALE NO. 4



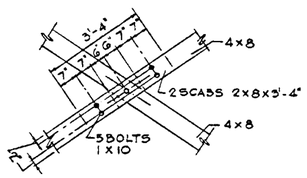
DETAIL 5
SCALE NO. 4



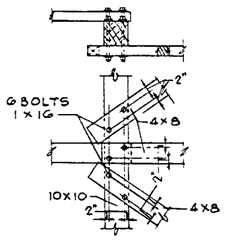
DETAIL 6
SCALE NO. 4



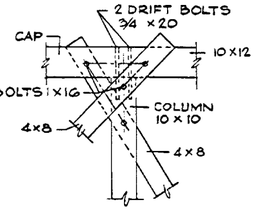
DETAIL 7
SCALE NO. 4



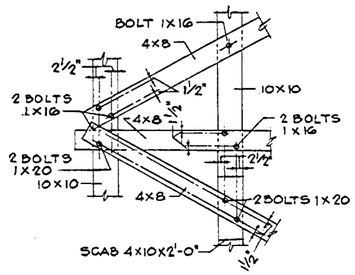
DETAIL 8
SCALE NO. 4



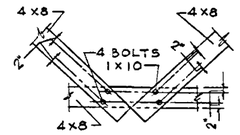
DETAIL 9
SCALE NO. 4



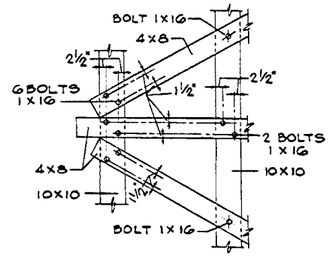
DETAIL 10
SCALE NO. 4



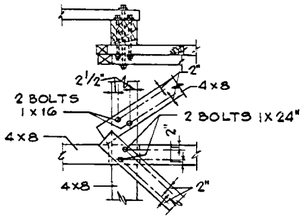
DETAIL 11
SCALE NO.4



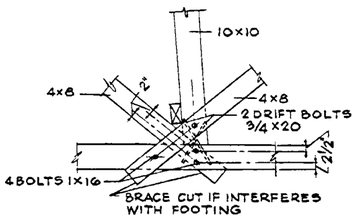
DETAIL 12
SCALE NO. 4



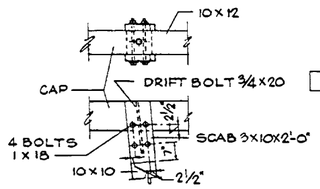
DETAIL 13
SCALE NO. 4



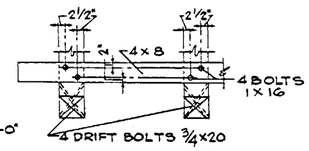
DETAIL 14
SCALE NO. 4



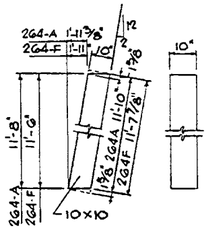
DETAIL 15
SCALE NO. 4



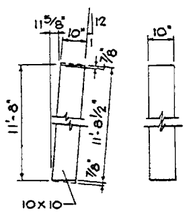
DETAIL 16
SCALE NO. 4



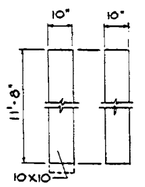
DETAIL 17
SCALE NO. 4



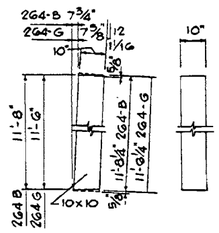
COLUMN 2G4-A
COLUMN 2G4-F
NO SCALE



COLUMN 2G4-C
NO SCALE



COLUMN 2G4-D
NO SCALE



COLUMN 2G4-B
COLUMN 2G4-G
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4'
NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

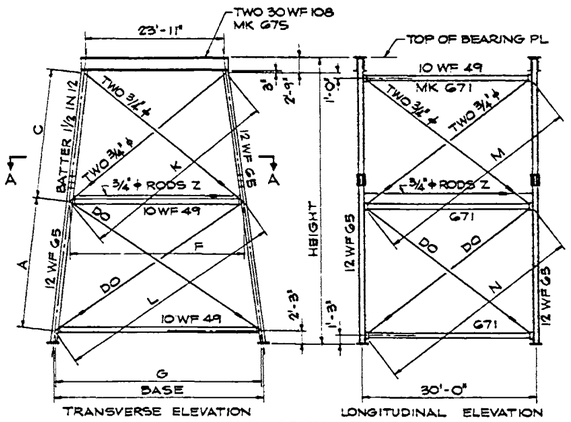
THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURES
TIMBER TOWERS
CONNECTIONS

UNDER REVISION

APPROVED: W.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

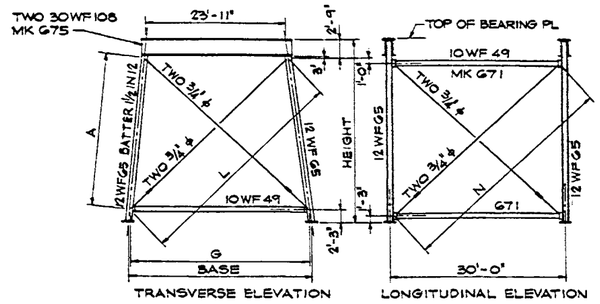
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 5
85-23



TWO STORY TOWER

SCALE NO. 17

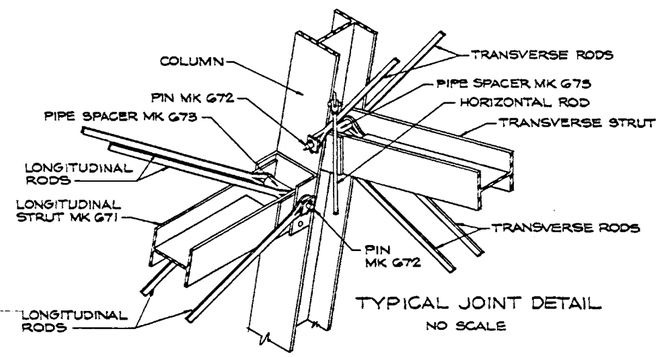
FACILITY NO. 852336 49 FT HIGH-WELDED



ONE STORY TOWER

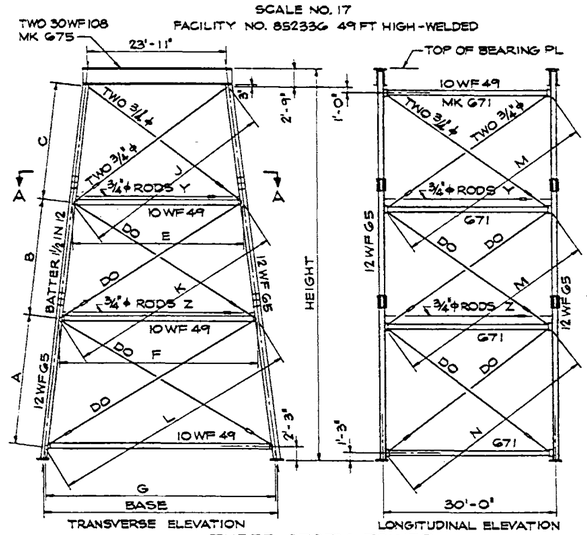
SCALE NO. 17

FACILITY NO. 852335
31 FT HIGH-WELDED



TYPICAL JOINT DETAIL

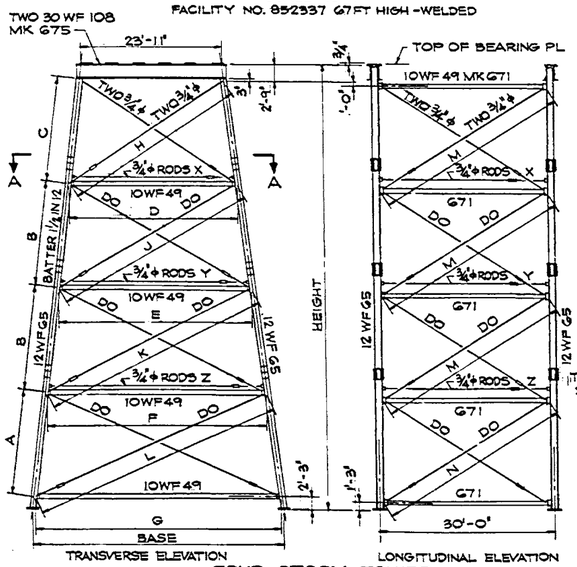
NO SCALE



THREE STORY TOWER

SCALE NO. 17

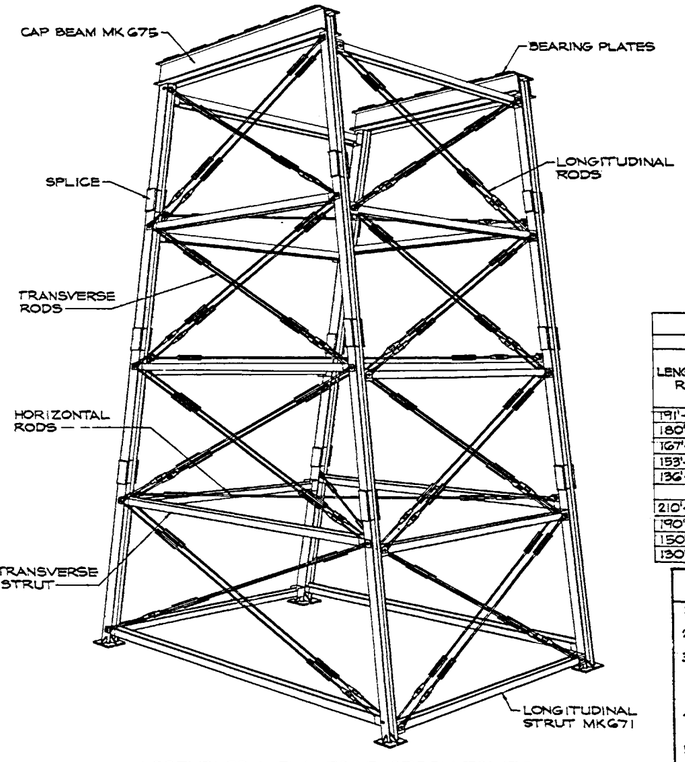
FACILITY NO. 852337 67 FT HIGH-WELDED



FOUR STORY TOWER

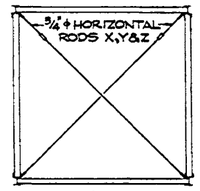
SCALE NO. 17

FACILITY NO 852338 77FT HIGH-WELDED



ASSEMBLED VIEW - FOUR STORY TOWER

NO SCALE



SECTION A-A

SCALE NO. 17

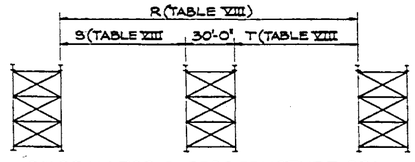


DIAGRAM FOR SUPERSTRUCTURE SPAN LIMITATIONS

S+T = 180FT MAXIMUM-FOR CLASS 25

S+T = 160FT MAXIMUM-FOR CLASS 50 & 60

TABULATION OF TOWER DIMENSIONS AND ERECTION MARKS

FOUR STORY TOWER

HEIGHT		77'	75'	73'	71'	69'
BASE		43'-2"	42'-8"	42'-2"	41'-8"	41'-2"
A	MARK	1G37	1G38	1G39	1G40	1G41
	DIM.	18'-1⅝"	17'-7⅝"	17'-1⅝"	16'-7½"	16'-1½"
B	MARK	1G47	1G48	1G49	1G50	1G51
	DIM.	18'-1⅝"	17'-7⅝"	17'-1⅝"	16'-7½"	16'-1½"
C	MARK	1G57	1G58	1G59	1G60	1G61
	DIM.	18'-1⅝"	17'-7⅝"	17'-1⅝"	16'-7½"	16'-1½"
D	MARK	1G23	1G24	1G25	1G26	1G27
	DIM.	28'-7¼"	28'-5¾"	28'-4¼"	28'-2¾"	28'-1¼"
E	MARK	1G08	1G09	1G10	1G11	1G12
	DIM.	33'-1¼"	32'-10⅛"	32'-7¼"	32'-4¼"	32'-1¼"
F	MARK	1595	1596	1598	1599	1601
	DIM.	37'-7¼"	37'-2¾"	36'-10¼"	36'-5¾"	36'-1¼"
G	MARK	1586	1587	1588	1589	1590
	DIM.	42'-1¼"	41'-7⅛"	41'-1¼"	40'-7⅛"	40'-1¼"
H	MARK	783	786	790	792	794
	DIM.	31'-1"	31'-7"	31'-3⅛"	30'-11⅛"	30'-7⅜"
J	MARK	737	741	742	747	751
	DIM.	35'-8⅝"	35'-3¾"	34'-10⅞"	34'-5⅞"	34'-1⅜"
K	MARK	710	712	717	721	725
	DIM.	39'-8⅛"	39'-2"	38'-8"	38'-2"	37'-8"
L	MARK	700	701	703	704	706
	DIM.	43'-8⅜"	43'-1½"	42'-6⅛"	41'-11⅛"	41'-3⅞"
M	MARK	758	762	766	769	772
	DIM.	33'-8⅞"	33'-5⅝"	33'-2½"	32'-11¼"	32'-8⅜"
N	MARK	758	762	766	769	772
	DIM.	33'-8⅞"	33'-5⅝"	33'-2½"	32'-11¼"	32'-8⅜"
X	MARK	934	935	936	937	938
	DIM.	39'-0½"	39'-5½"	39'-4⅝"	39'-3⅝"	39'-2⅝"
Y	MARK	920	921	922	923	924
	DIM.	42'-9¼"	42'-7⅛"	42'-4⅞"	42'-2⅝"	42'-0½"
Z	MARK	912	913	914	915	916
	DIM.	46'-2⅝"	45'-11⅛"	45'-7⅝"	45'-4⅛"	45'-0⅝"

ONE STORY TOWER

HEIGHT		31'	29'	27'	25'	23'	21'	19'	17'	15'
BASE		31'-8"	31'-2"	30'-8"	30'-2"	29'-8"	29'-2"	28'-8"	28'-2"	27'-8"
A	MARK	1G65	1G66	1G67	1G68	1G69	1G70	1G71	1G72	1G73
	DIM.	26'-2⅜"	24'-2¼"	22'-2"	20'-1⅞"	18'-1⅝"	16'-1½"	14'-1⅛"	12'-1⅛"	10'-0⅞"
G	MARK	1G16	1G17	1G19	1G18	1G23	1G27	1G31	1G28	1G32
	DIM.	30'-7¼"	30'-1¼"	29'-7¼"	29'-1¼"	28'-7⅛"	28'-1¼"	27'-7⅛"	27'-1¼"	26'-7⅛"
L	MARK	724	734	744	764	783	794	806	815	820
	DIM.	37'-8⅞"	36'-2⅜"	34'-8⅝"	33'-3⅜"	31'-11"	30'-7⅜"	29'-4⅛"	28'-3⅜"	27'-3"
N	MARK	717	728	736	743	758	772	785	793	798
	DIM.	38'-8"	37'-4⅛"	36'-0⅜"	34'-10⅜"	33'-8⅞"	32'-8⅜"	31'-9"	30'-11"	30'-2⅛"

TWO STORY TOWER

HEIGHT		49'	47'	45'	43'	41'	39'	37'	35'	33'
BASE		36'-2"	35'-8"	35'-2"	34'-8"	34'-2"	33'-8"	33'-2"	32'-8"	32'-2"
A	MARK	1G33	1G34	1G35	1G36	1G37	1G39	1G41	1G42	1G43
	DIM.	22'-2"	21'-2"	20'-1⅞"	19'-1¾"	18'-1⅝"	17'-1⅝"	16'-1½"	15'-1⅜"	14'-1¼"
C	MARK	1772	1G53	1G54	1G56	1G57	1G59	1G61	1G63	1G64
	DIM.	22'-2"	21'-2"	20'-1⅞"	19'-1¾"	18'-1⅝"	17'-1⅝"	16'-1½"	15'-1⅜"	14'-1¼"
F	MARK	1G19	1G20	1G18	1G22	1G23	1G25	1G27	1G30	1G31
	DIM.	29'-7¼"	29'-4¼"	29'-1⅛"	28'-10¼"	28'-7¼"	28'-4¼"	28'-1¼"	27'-10¼"	27'-7¼"
G	MARK	1G03	1G04	1G05	1G07	1G08	1G10	1G12	1G14	1G15
	DIM.	35'-1¼"	34'-7⅛"	34'-1¼"	33'-7⅛"	33'-1¼"	32'-7¼"	32'-1¼"	31'-7¼"	31'-1¼"
K	MARK	744	753	764	773	783	790	794	801	806
	DIM.	34'-8⅝"	33'-11⅞"	33'-3⅜"	32'-7⅛"	31'-11"	31'-3⅛"	30'-7⅜"	30'-0"	29'-4⅛"
L	MARK	713	720	727	732	737	742	751	764	774
	DIM.	39'-1½"	38'-8⅛"	37'-4⅜"	36'-6⅝"	35'-8⅝"	34'-10⅜"	34'-1⅛"	33'-3⅜"	32'-6¼"
M	MARK	736	739	743	1056	758	766	772	781	785
	DIM.	36'-0⅜"	35'-5½"	34'-10⅜"	34'-3½"	33'-8⅞"	33'-2½"	32'-8⅜"	32'-2⅝"	31'-9"
N	MARK	736	739	743	1056	758	766	772	781	785
	DIM.	36'-0⅜"	35'-5½"	34'-10⅜"	34'-3½"	33'-8⅞"	33'-2½"	32'-8⅜"	32'-2⅝"	31'-9"
Z	MARK	929	930	931	933	934	936	938	940	942
	DIM.	40'-2⅞"	40'-0⅜"	39'-10⅝"	39'-8⅜"	39'-6½"	39'-4⅜"	39'-2⅜"	39'-0⅜"	38'-10¼"

THREE STORY TOWER

HEIGHT		67'	65'	63'	61'	59'	57'	55'	53'	51'
BASE		40'-8"	40'-2"	39'-8"	39'-2"	38'-8"	38'-2"	37'-8"	37'-2"	36'-8"
A	MARK	1G33	1G35	1G36	1G37	1G37	1G39	1G39	1G41	1G42
	DIM.	22'-2"	20'-1⅞"	19'-1¾"	18'-1⅝"	18'-1⅝"	17'-1⅝"	17'-1⅝"	16'-1½"	15'-1⅜"
B	MARK	1G44	1G44	1G45	1G46	1G47	1G48	1G50	1G51	1G52
	DIM.	20'-1⅞"	20'-1⅞"	19'-7⅞"	19'-1¾"	18'-1⅝"	17'-7⅝"	16'-7½"	16'-1½"	15'-7½"
C	MARK	1G54	1G54	1G55	1G56	1G57	1G58	1G60	1G61	1G62
	DIM.	20'-1⅞"	20'-1⅞"	19'-7⅞"	19'-1¾"	18'-1⅝"	17'-7⅝"	16'-7½"	16'-1½"	15'-7½"
E	MARK	1G18	1G18	1G21	1G22	1G23	1G24	1G26	1G27	1G29
	DIM.	29'-1¼"	29'-1¼"	28'-11¾"	28'-10¼"	28'-7¼"	28'-5¾"	28'-2¾"	28'-1¼"	27'-11⅜"
F	MARK	1G05	1G05	1G06	1G07	1G08	1G09	1G11	1G12	1G13
	DIM.	34'-1¼"	34'-1¼"	33'-10½"	33'-7¼"	33'-1¼"	32'-10¼"	32'-4¼"	32'-1¼"	31'-10¼"
G	MARK	1591	1592	1593	1594	1595	1597	1600	1601	1602
	DIM.	39'-1¼"	39'-1¼"	38'-7¼"	38'-1¼"	37'-7¼"	37'-1¼"	36'-7¼"	36'-1¼"	35'-7¼"
J	MARK	764	764	769	773	783	786	792	794	797
	DIM.	33'-3⅜"	33'-3⅜"	32'-11¼"	32'-7⅛"	31'-11"	31'-7"	30'-11½"	30'-7⅜"	30'-3⅝"
K	MARK	727	727	730	732	737	741	747	751	759
	DIM.	37'-4⅜"	37'-4⅜"	36'-11¾"	36'-6⅝"	35'-8⅝"	35'-3¾"	34'-5⅞"	34'-1⅛"	33'-8⅜"
L	MARK	702	705	707	708	710	714	719	725	731
	DIM.	42'-11"	41'-8½"	40'-10⅛"	40'-1⅜"	39'-8⅛"	38'-10⅝"	38'-5¼"	37'-8"	36'-11"
M	MARK	743	743	746	1056	758	762	769	772	776
	DIM.	34'-10⅜"	34'-10⅜"	34'-6⅛"	34'-3½"	33'-8⅛"	33'-5⅝"	32'-11¼"	32'-8⅜"	32'-5½"
N	MARK	736	743	748	758	758	766	766	772	781
	DIM.	36'-0¾"	34'-10⅜"	34'-3½"	33'-8⅛"	33'-8⅛"	33'-2½"	33'-2½"	32'-8⅜"	32'-2⅝"
Y	MARK	931	931	932	933	934	935	937	938	939
	DIM.	39'-10⅝"	39'-10⅝"	39'-9⅝"	39'-8⅝"	39'-6½"	39'-5½"	39'-3⅜"	39'-2⅜"	39'-1⅜"
Z	MARK	917	917	918	919	920	921	923	924	925
	DIM.	43'-6¼"	43'-6¼"	43'-4"	43'-1⅜"	42'-9¼"	42'-7⅛"	42'-2⅝"	42'-0½"	41'-10⅛"

TABLE VIII

CLASS 50 & 60 LOADINGS

LENGTH R	SUPERSTRUCTURE SPANS S	SUPERSTRUCTURE SPANS T	TYPE OF SUPERSTRUCTURE SPAN	BEARING PLATE MARK	BEARING PLATE NO. REQD PER TOWER	REFER TO DWG NO. FOR POSITIONING OF BEARING PLATES DWG. NO.	SHT. NO.
191'-8"	80'-10"	80'-10"	9-36"WF	BP-2	18	85-21	2 OF 9
180'-0"	75'-0"	75'-0"	8-36" WF	BP-2	16	85-21	2 OF 9
167'-0"	68'-6"	68'-6"	7-36" WF	BP-2	14	85-21	2 OF 9
153'-3"	61'-7½"	61'-7½"	6-36" WF	BP-2	12	85-21	2 OF 9
136'-4"	53'-2"	53'-2"	11-27" WF	BP-1	22	85-21	2 OF 9
CLASS 25 LOADING							
210'-0"	90'-0"	90'-0"	5-36 WF 230	BP-2	10	85-28	1 OF 3
190'-0"	80'-0"	80'-0"	4-36 WF 230	BP-2	8	85-28	1 OF 3
150'-0"	60'-0"	60'-0"	10-24 WF 84	BP-1	20	85-28	1 OF 3
130'-0"	50'-0"	50'-0"	6-24 WF 84	BP-1	12	85-28	1 OF 3

GENERAL NOTES

1. ALL HOLES IN STEEL ARE 15/16" DIAM. UNLESS OTHERWISE NOTED.
2. ALL WELDS ARE ¼" FILLET WELDS UNLESS OTHERWISE NOTED.
3. FOR CLASS 25 LOADING, COLUMNS MAY BE REDUCED FROM 12WF65 MEMBERS TO 12WF53 MEMBERS & CAP BEAMS MAY BE REDUCED FROM TWO 30WF108 MEMBERS TO TWO 24WF76 MEMBERS.
4. FOR CLASS 25 LOADING, ALL LONGITUDINAL & TRANSVERSE STRUTS WILL REMAIN 10WF49 MEMBERS AS SHOWN.
5. ALL OTHER STRUCTURAL ELEMENTS SUCH AS LONGITUDINAL & TRANSVERSE RODS, PIPE SPACERS, PINS, HORIZONTAL RODS, ETC. WILL REMAIN AS SHOWN FOR CLASS 50 & 60.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-23	DOUBLE LANE STEEL TOWERS	3 OF 5
85-23	DOUBLE LANE STEEL TOWER DETAILS FOR BOLTED & WELDED CONST.	4,5 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' 15'

NO. 17

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE

TRACED BY:

CHECKED BY: DEICHMANN

SUBMITTED BY: C. W. DEICHMANN

APPROVED: H. E. Schaum

APPROVED: for H. M. Williams

DATE: 18 MAR 1959

CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE

THEATER OF OPERATIONS

ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE STEEL TOWERS
150FT MAX. COMBINED STL. SPANS-CLASS 50 & 60
180FT. MAX. COMBINED STL. SPANS-CLASS 25

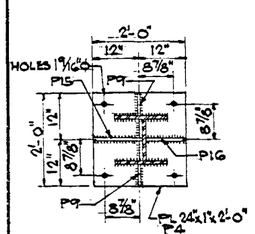
UNDER REVISION

SCALE: AS NOTED

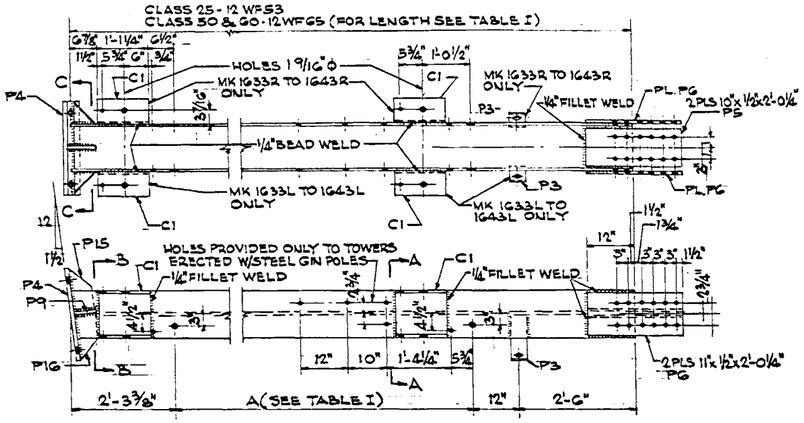
SPEC. NO.

DRAWING NUMBER: 85-23

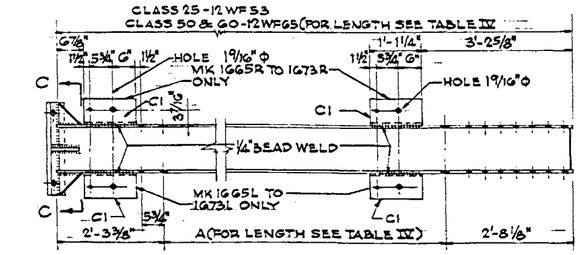
SHEET 3 OF 5

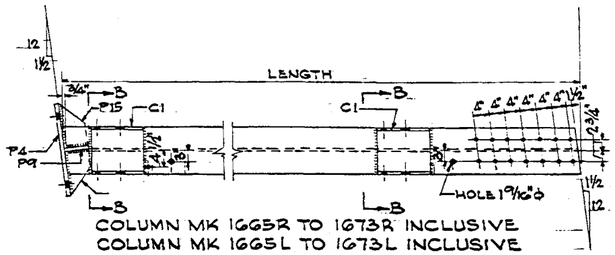


SECTION C-C



COLUMN MK 1633R TO 1643R INCLUSIVE
COLUMN MK 1633L TO 1643L INCLUSIVE
SCALE NO.5





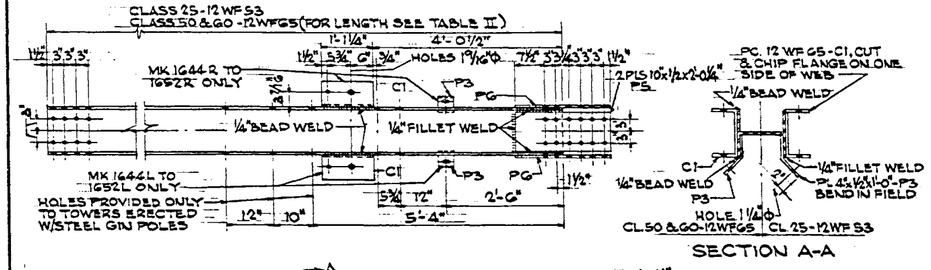
COLUMN MK 1665R TO 1673R INCLUSIVE
COLUMN MK 1665L TO 1673L INCLUSIVE
SCALE NO.5

TABLE I				
MARK	A	LENGTH	CL.50,60 WEIGHT	CL.25 WEIGHT
1633	22'-2"	27'-11⅝"	2237	1902
1634	21'-2"	26'-11⅜"	2170	1847
1635	20'-1⅞"	25'-11¼"	2103	1792
1636	19'-1¾"	24'-11⅛"	2041	1742
1637	18'-1⅝"	23'-11"	1974	1687
1638	17'-1⅝"	23'-5"	1943	1662
1639	17'-1⅜"	22'-11"	1907	1632
1640	16'-1½"	22'-4⅞"	1876	1607
1641	16'-1¼"	21'-10⅞"	1840	1577
1642	15'-1⅜"	20'-10¾"	1778	1527
1643	14'-1¼"	19'-10⅝"	1716	1477

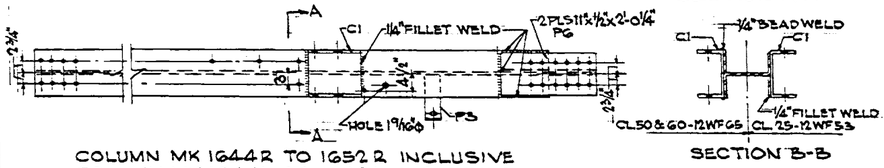
TABLE II			
MARK	LENGTH	CL.50,60 WEIGHT	CL.25 WEIGHT
1644	20'-1⅝"	1537	1295
1645	19'-7⅝"	1522	1286
1646	19'-1½"	1496	1266
1647	18'-1⅜"	1428	1211
1648	17'-7⅜"	1397	1186
1649	17'-1⅜"	1366	1161
1650	16'-7¼"	1330	1131
1651	16'-1¼"	1299	1106
1652	15'-7¼"	1263	1076

TABLE III			
MARK	LENGTH	CL.50,60 WEIGHT	CL.25 WEIGHT
1653	20'-3⅞"	1384	1140
1654	19'-3¾"	1319	1087
1655	18'-9¾"	1286	1060
1656	18'-3⅝"	1253	1033
1657	17'-3½"	1187	980
1658	16'-9½"	1154	953
1659	16'-3½"	1122	927
1660	15'-9⅜"	1089	900
1661	15'-3⅜"	1056	873
1662	14'-9⅜"	1023	846
1663	14'-3¼"	991	820
1664	13'-3⅛"	925	766
1772	21'-3⅞"	1450	1194

TABLE IV				
MARK	A	LENGTH	CL.50,60 WEIGHT	CL.25 WEIGHT
1665	26'-2⅜"	31'-1⅞"	2261	1887
1666	24'-2 1/16"	29'-1⅜"	2152	1782
1667	22'-2"	27'-1 1/2"	2003	1668
1668	20'-1⅞"	25'-1⅜"	1873	1572
1669	18'-1⅝"	23'-1⅛"	1744	1467
1670	16'-1 1/2"	21'-1"	1610	1357
1671	14'-1¼"	19'-0¾"	1481	1252
1672	12'-1⅛"	17'-0⅝"	1352	1147
1673	10'-0⅞"	15'-0⅜"	1217	1037

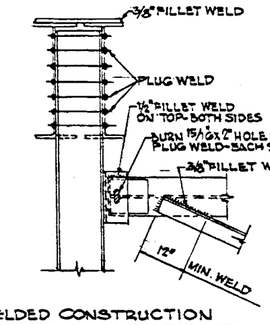


SECTION A-A

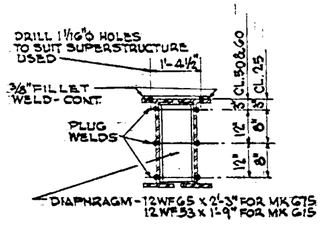


COLUMN MK 1644R TO 1652R INCLUSIVE
COLUMN MK 1644L TO 1652L INCLUSIVE
SCALE NO.5

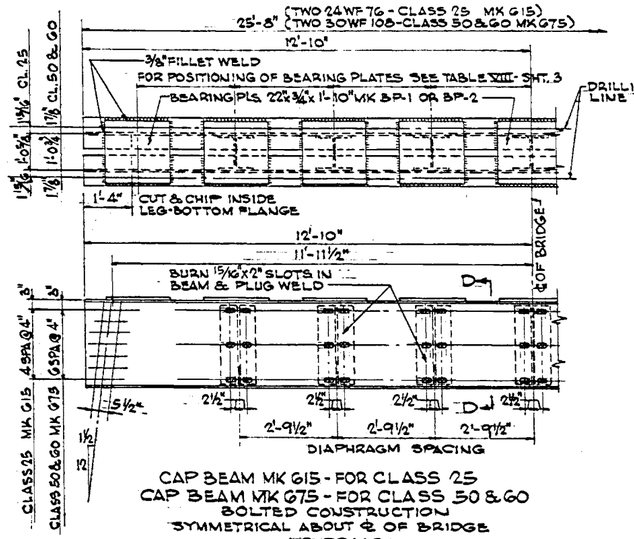
SECTION B-B



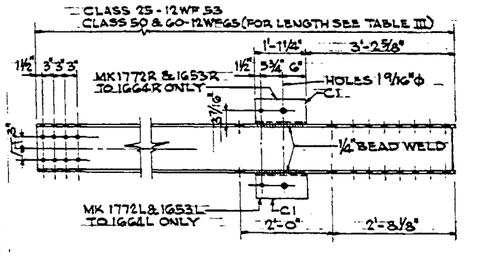
WELDED CONSTRUCTION
TYPICAL SIDE VIEW AT CAP
WITH ANGLE BRACING
SCALE NO. 5

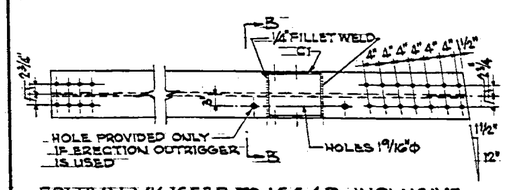


SECTION D-D
NO SCALE

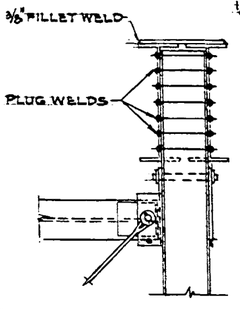


CAP BEAM MK G15 - FOR CLASS 25
CAP BEAM MK G75 - FOR CLASS 50 & 60
BOLTED CONSTRUCTION
SYMMETRICAL ABOUT ℄ OF BRIDGE
NO SCALE

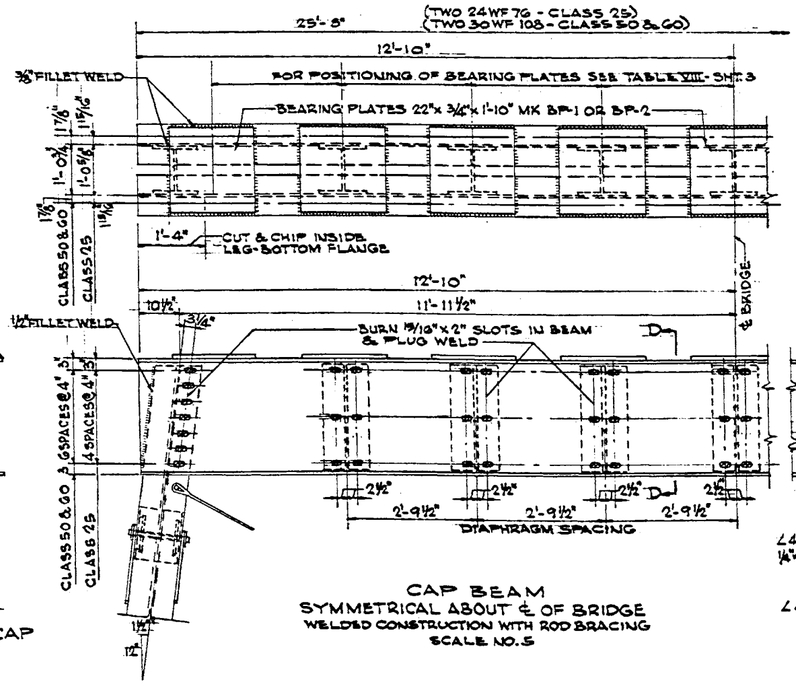




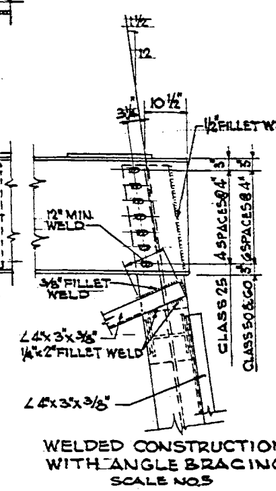
COLUMN MK 1653R TO 1664R INCLUSIVE
COLUMN MK 1653L TO 1664L INCLUSIVE
COLUMN MK 1772R & 1772L
SCALE NO.5



TYPICAL SIDE VIEW AT CAP
WITH ROD BRACING
SCALE NO.5



CAP BEAM
SYMMETRICAL ABOUT ℄ OF BRIDGE
WELDED CONSTRUCTION WITH ROD BRACING
SCALE NO.5



WELDED CONSTRUCTION
WITH ANGLE BRACING
SCALE NO.5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'
NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

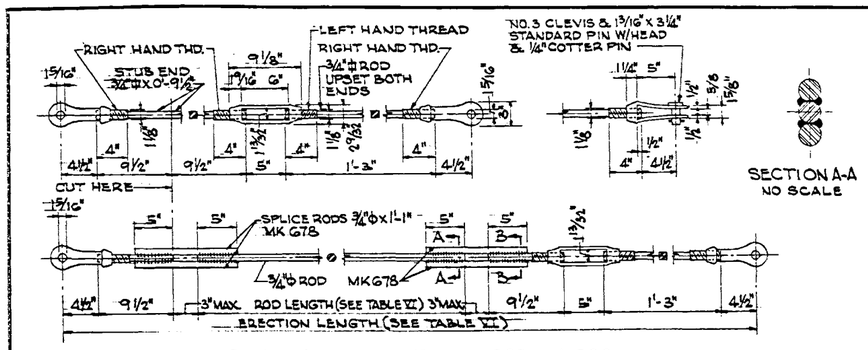
THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURES
DOUBLE LANE STEEL TOWERS
DETAILS FOR BOLTED & WELDED CONSTRUCTION
CLASS 25, 50 & 60

UNDER REVISION

APPROVED: H. M. Williams
DATE: 19 MAR 1959
CHIEF, MILITARY ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

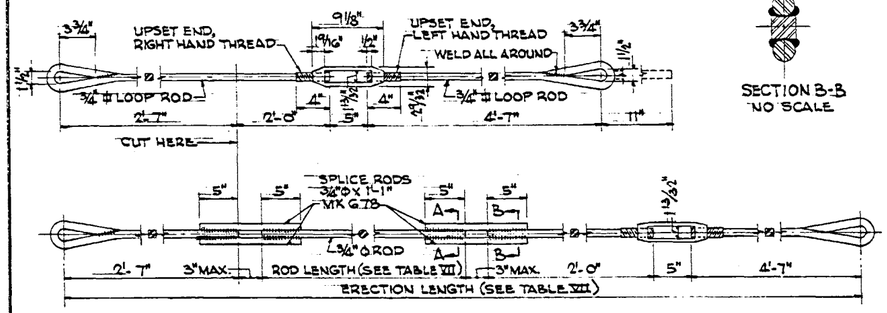
APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-23
SHEET 4 OF 5



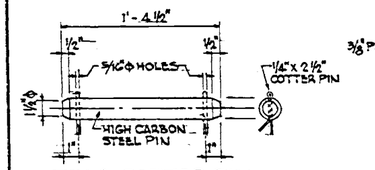
SECTION A-A
NO SCALE

CLEVIS, TURNBUCKLE & STUB END ROD MK 680
NO SCALE

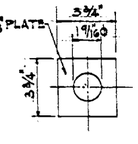


SECTION B-B
NO SCALE

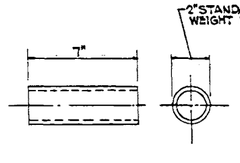
LOOP ROD WITH TURNBUCKLE MK G77
NO SCALE



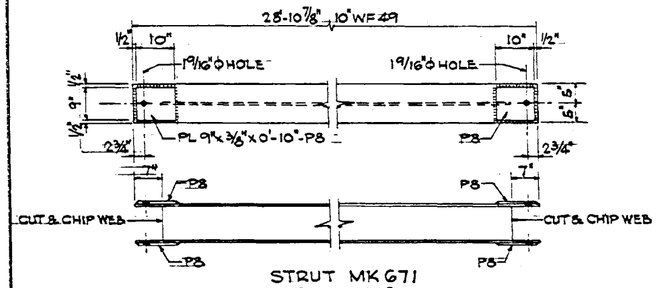
PIN & COTTER PIN
MK G72
NO SCALE



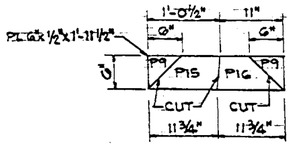
WASHER
MK G58
NO SCALE



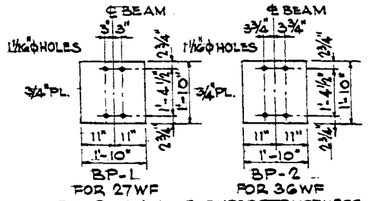
PIPE SPACER
MK G73
NO SCALE



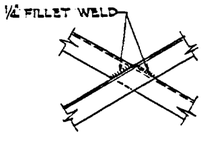
STRUT MK G71
SCALE NO.5



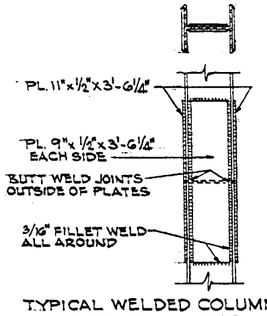
COLUMN BASE PLATE STIFFENERS
DOUBLE LANE TOWERS
MK P9, P15 & P16
NO SCALE



DOUBLE LANE SUPERSTRUCTURES
BEARING PLATES FOR USE WITH CAP BEAMS
NO SCALE



WELDED
BRACING INTERSECTION
NO SCALE



TYPICAL WELDED COLUMN SPLICE
DETAILS OF COLUMNS NOT SHOWN ARE SAME AS COLUMNS FOR BOLTED DESIGN
SCALE NO.5

TABLE VI - FOR SINGLE LANE TOWERS

ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
920	42'-0"	995	38'-6"	945	38'-0 5/8"	1003	34'-0"	955	34'-9"	1008	30'-6"
923	42'-1 5/8"	996	38'-0"	946	37'-10"	1003	34'-0"	956	34'-6 3/8"	1008	30'-6"
926	41'-9 1/4"	997	37'-6"	947	37'-7 3/8"	1004	33'-6"	957	34'-5 1/2"	1008	30'-6"
927	41'-4 7/8"	997	37'-6"	948	37'-4 3/8"	1004	33'-6"	958	34'-4 3/8"	1009	30'-0"
928	41'-0 3/8"	998	37'-0"	949	37'-2 1/8"	1005	33'-0"	959	34'-3 1/4"	1009	30'-0"
937	39'-2 1/8"	1001	35'-0"	951	35'-4"	1007	31'-0"	960	34'-2 1/4"	1009	30'-0"
941	38'-11 3/8"	1001	35'-0"	952	35'-1 5/8"	1007	31'-0"	961	34'-1 1/8"	1009	30'-0"
943	38'-8 5/8"	1002	34'-6"	953	34'-11 1/4"	1007	31'-0"	962	34'-0"	1009	30'-0"
944	38'-3 1/4"	1003	34'-0"	954	34'-10 1/8"	1008	30'-6"	963	33'-9 7/8"	1010	29'-6"

TABLE VI - FOR DOUBLE LANE TOWERS

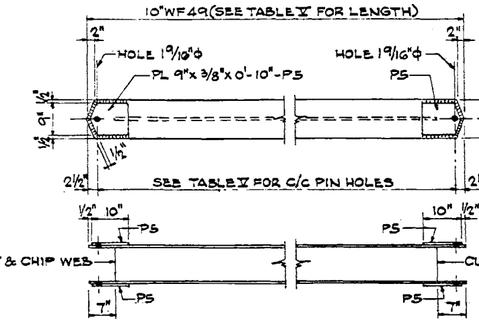
ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
912	46'-2 5/8"	990	42'-0"	921	42'-7 1/8"	995	38'-6"	933	39'-8 5/8"	1000	35'-6"
913	45'-11 1/8"	991	41'-6"	922	42'-4 7/8"	996	38'-0"	934	39'-6 1/2"	1000	35'-6"
914	45'-7 3/8"	991	41'-6"	923	42'-2 5/8"	996	38'-0"	935	39'-5 1/2"	1001	35'-0"
915	45'-4 1/8"	992	41'-0"	924	42'-0 1/2"	996	38'-0"	936	39'-4 3/8"	1001	35'-0"
916	45'-0 5/8"	992	41'-0"	925	41'-10 1/8"	997	37'-6"	937	39'-3 3/8"	1001	35'-0"
917	43'-6 1/4"	993	39'-6"	929	40'-2 7/8"	999	36'-0"	938	39'-2 3/8"	1001	35'-0"
918	43'-4"	994	39'-0"	930	40'-0 3/4"	999	36'-0"	939	39'-1 3/8"	1001	35'-0"
919	43'-1 3/4"	994	39'-0"	931	39'-10 5/8"	1000	35'-6"	940	39'-0 3/8"	1001	35'-0"
920	42'-9 1/4"	995	38'-6"	932	39'-9 3/8"	1000	35'-6"	942	38'-10 1/4"	1002	34'-6"

TABLE VII - FOR SINGLE LANE TOWERS

ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
709	40'-1¼"	870	30'-6"	760	33'-7 3/8"	882	24'-0"	800	29'-10 3/8"	890	20'-0"
711	39'-4 1/2"	871	29'-6"	761	33'-5 1/2"	883	23'-6"	803	29'-4 3/8"	891	19'-6"
715	38'-8 5/8"	872	29'-0"	763	33'-4"	883	23'-6"	809	28'-10 3/8"	892	19'-0"
716	38'-8 3/8"	872	29'-0"	765	33'-2 1/4"	883	23'-6"	811	28'-8 7/8"	892	19'-0"
718	38'-7 3/8"	872	29'-0"	767	33'-0"	884	23'-0"	814	28'-4 1/2"	893	18'-6"
723	37'-10 3/8"	874	28'-0"	768	32'-11 1/8"	884	23'-0"	816	27'-10 5/8"	894	18'-0"
726	37'-4 1/2"	875	27'-6"	770	32'-10 7/8"	884	23'-0"	819	27'-4 3/4"	895	17'-6"
728	37'-3 1/2"	875	27'-6"	772	32'-8 1/8"	885	22'-6"	823	27'-0 1/4"	896	17'-0"
729	37'-1 1/2"	875	27'-6"	771	32'-6 1/4"	885	22'-6"	825	26'-7 1/8"	897	16'-6"
733	36'-4 1/2"	877	26'-6"	774	32'-5 1/8"	885	22'-6"	828	26'-2 1/8"	897	16'-6"
735	36'-1"	877	26'-6"	777	32'-4 3/4"	885	22'-6"	829	25'-11 1/4"	898	16'-0"
738	35'-5 5/8"	879	25'-6"	779	32'-3 5/8"	885	22'-6"	830	25'-4"	899	15'-6"
740	35'-5"	879	25'-6"	780	32'-2 1/4"	885	22'-6"	832	24'-11 1/8"	900	15'-0"
742	34'-10 3/8"	880	25'-0"	784	31'-10 5/8"	886	22'-0"	834	24'-6 1/4"	901	14'-6"
743	34'-10 1/8"	880	25'-0"	785	31'-8 5/8"	886	22'-0"	837	24'-1 3/8"	901	14'-6"
745	34'-7 3/4"	880	25'-0"	787	31'-4 1/2"	887	21'-6"	838	23'-8 1/2"	902	14'-0"
749	34'-3 3/8"	881	24'-6"	788	31'-5 5/8"	887	21'-6"	841	23'-3 3/4"	903	13'-6"
750	34'-2 3/4"	881	24'-6"	792	30'-10 3/8"	888	21'-0"	843	22'-11 1/8"	904	13'-0"
754	33'-11 1/8"	882	24'-0"	793	30'-10 1/2"	888	21'-0"	847	22'-1 7/8"	905	12'-6"
755	33'-10 7/8"	882	24'-0"	795	30'-6 1/8"	889	20'-6"	851	20'-8 1/8"	907	11'-0"
757	33'-8 3/4"	882	24'-0"	799	30'-1 1/2"	889	20'-6"	857	19'-4 3/8"	910	9'-6"

TABLE VII - FOR DOUBLE LANE TOWERS

ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH	ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
700	43'-8 3/4"	863	34'-0"	730	36'-11 3/4"	877	27'-0"	769	32'-11 1/4"	885	23'-0"
701	43'-1 1/2"	864	33'-6"	731	36'-11	877	27'-0"	772	32'-8 3/8"	885	23'-0"
702	42'-11"	865	33'-0"	732	36'-6 5/8"	878	26'-6"	773	32'-7 1/8"	885	23'-0"
703	42'-6 1/4"	866	32'-6"	734	36'-2 3/8"	878	26'-6"	774	32'-6 1/4"	886	22'-6"
704	41'-11 1/8"	867	32'-0"	736	36'-0 3/4"	879	26'-0"	776	32'-5 1/2"	886	22'-6"
705	41'-8 1/2"	867	32'-0"	737	35'-8 5/8"	879	26'-0"	781	32'-2 5/8"	886	22'-6"
706	41'-3 7/8"	868	31'-6"	739	35'-5 1/2"	880	25'-6"	783	31'-11"	887	22'-0"
707	40'-10 7/8"	869	31'-0"	741	35'-3 3/4"	880	25'-6"	785	31'-9"	887	22'-0"
708	40'-1 3/8"	870	30'-6"	742	34'-10 3/4"	881	25'-0"	786	31'-7"	887	22'-0"
710	39'-8 1/8"	871	30'-0"	743	34'-10 3/8"	881	25'-0"	790	31'-3 1/8"	888	21'-6"
712	39'-2"	872	29'-6"	744	34'-8 5/8"	881	25'-0"	792	30'-11 1/4"	889	21'-0"
713	39'-1 1/2"	872	29'-6"	746	34'-6 7/8"	881	25'-0"	793	30'-11"	889	21'-0"
714	38'-10 3/8"	873	29'-0"	747	34'-5 1/8"	882	24'-6"	794	30'-7 3/8"	889	21'-0"
717	38'-8"	873	29'-0"	748	34'-3 1/2"	882	24'-6"	797	30'-3 5/8"	890	20'-6"
719	38'-5 1/4"	874	28'-6"	751	34'-1 1/8"	882	24'-6"	798	30'-2 1/8"	890	20'-6"
720	38'-3 1/8"	874	28'-6"	753	33'-11 7/8"	883	24'-0"	801	30'-0"	891	20'-0"
721	38'-2"	874	28'-6"	758	33'-8 7/8"	883	24'-0"	806	29'-4 7/8"	892	19'-6"
724	37'-8 7/8"	875	28'-0"	759	33'-5 3/8"	883	24'-0"	815	28'-3 3/8"	893	18'-6"
725	37'-8"	875	28'-0"	762	33'-5 5/8"	884	23'-6"	820	27'-3"	895	17'-6"
727	37'-4 3/4"	876	27'-6"	764	33'-3 3/8"	884	23'-6"				
728	37'-4 1/8"	876	27'-6"	766	33'-2 1/2"	884	23'-6"				



STRUTS MK 1540 TO 1632 INCLUSIVE
SCALE NO.5

TABLE V - FOR SINGLE LANE TOWERS

MARK	C/C PIN HOLE	LENGTH	WEIGHT	MARK	C/C PIN HOLE	LENGTH	WEIGHT
1540	38'-10"	39'-3"	1962	1564	26'-2"	26'-7"	1341
1541	38'-2"	38'-7"	1929	1565	25'-10"	26'-3"	1324
1542	37'-6"	37'-11"	1896	1566	25'-6"	25'-11"	1308
1543	36'-10"	37'-3"	1864	1567	25'-2"	25'-7"	1287
1544	36'-2"	36'-7"	1831	1568	24'-10"	25'-3"	1276
1545	35'-6"	35'-11"	1798	1569	24'-2"	24'-7"	1239
1546	34'-10"	35'-3"	1766	1570	23'-6"	23'-11"	1210
1547	34'-2"	34'-7"	1733	1571	22'-10"	23'-3"	1178
1548	33'-6"	33'-11"	1700	1572	22'-2"	22'-7"	1145
1549	32'-2"	32'-7"	1635	1573	21'-6"	21'-11"	1112
1550	32'-10"	33'-3"	1667	1574	21'-10"	22'-3"	1129
1551	32'-4"	32'-9"	1643	1575	21'-4"	21'-9"	1104
1552	31'-10"	32'-3"	1619	1576	21'-2"	21'-7"	1096
1553	31'-4"	31'-9"	1594	1577	20'-0"	20'-5"	1039
1554	31'-6"	31'-11"	1602	1578	20'-10"	21'-3"	1080
1555	30'-10"	31'-3"	1569	1579	20'-8"	21'-1"	1072
1556	30'-2"	30'-7"	1537	1580	20'-6"	20'-11"	1063
1557	29'-6"	29'-11"	1504	1581	20'-4"	20'-9"	1055
1558	28'-2"	28'-7"	1439	1582	20'-2"	20'-7"	1047
1559	28'-10"	29'-3"	1472	1583	19'-10"	20'-3"	1031
1560	27'-10"	28'-3"	1423	1584	19'-6"	19'-11"	1014
1561	27'-6"	27'-11"	1406	1585	18'-10"	19'-3"	982
1562	26'-10"	27'-3"	1374	1586	18'-2"	18'-7"	949
1563	26'-6"	26'-11"	1357				

TABLE V - FOR DOUBLE LANE TOWERS

MARK	C/C PIN HOLE	LENGTH	WEIGHT	MARK	C/C PIN HOLE	LENGTH	WEIGHT
1586	42'-1¼"	42'-6¼"	2093	1610	32'-7¼"	33'-0¼"	1629
1587	41'-7¼"	42'-0¼"	2069	1611	32'-4¼"	32'-9¼"	1616
1588	41'-1¼"	41'-6¼"	2046	1612	32'-1¼"	32'-6¼"	1605
1589	40'-7¼"	41'-0¼"	2021	1613	31'-10¼"	32'-3¼"	1592
1590	40'-1¼"	40'-6¼"	1997	1614	31'-7¼"	32'-0¼"	1579
1591	39'-7¼"	40'-0¼"	1972	1615	31'-1¼"	31'-6¼"	1556
1592	39'-1¼"	39'-6¼"	1948	1616	30'-7¼"	31'-0¼"	1531
1593	38'-7¼"	39'-0¼"	1923	1617	30'-1¼"	30'-6¼"	1507
1594	38'-1¼"	38'-6¼"	1909	1618	29'-1¼"	29'-6¼"	1459
1595	37'-7¼"	38'-0¼"	1874	1619	29'-7¼"	30'-0¼"	1482
1596	37'-2⅜"	37'-7⅜"	1856	1620	29'-4¼"	29'-9¼"	1469
1597	37'-1¼"	37'-6¼"	1850	1621	28'-11⅜"	29'-4⅜"	1452
1598	36'-10½"	37'-3¼"	1837	1622	28'-10½"	29'-3½"	1445
1599	36'-5⅜"	36'-10⅜"	1819	1623	28'-7¼"	29'-0¼"	1433
1600	36'-7¼"	37'-0¼"	1825	1624	28'-5⅜"	28'-10⅜"	1427
1601	36'-1¼"	36'-6¼"	1801	1625	28'-4¼"	28'-9¼"	1420
1602	35'-7¼"	36'-0¼"	1776	1626	28'-2⅜"	28'-7⅜"	1415
1603	35'-1¼"	35'-6¼"	1752	1627	28'-1¼"	28'-6¼"	1409
1604	34'-7½"	35'-0¼"	1727	1628	27'-11¼"	27'-6¼"	1360
1605	34'-1¼"	34'-6¼"	1703	1629	27'-11⅜"	28'-4⅜"	1403
1606	33'-10¼"	34'-3½"	1685	1630	27'-10½"	28'-3½"	1396
1607	33'-7¼"	34'-0¼"	1679	1631	27'-7¼"	28'-0¼"	1385
1608	33'-1¼"	33'-6¼"	1654	1632	26'-7¼"	27'-0¼"	1335
1609	32'-10½"	33'-3½"	1641				

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'
NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: J. C. W. DEICHMANN

THEATER OF OPERATIONS
ROADBRIDGE SUBSTRUCTURES
SINGLE & DOUBLE LANE STEEL TOWERS
DETAILS FOR BOLTED & WELDED CONSTRUCTION
CLASS 25, 50 & 60

UNDER REVISION

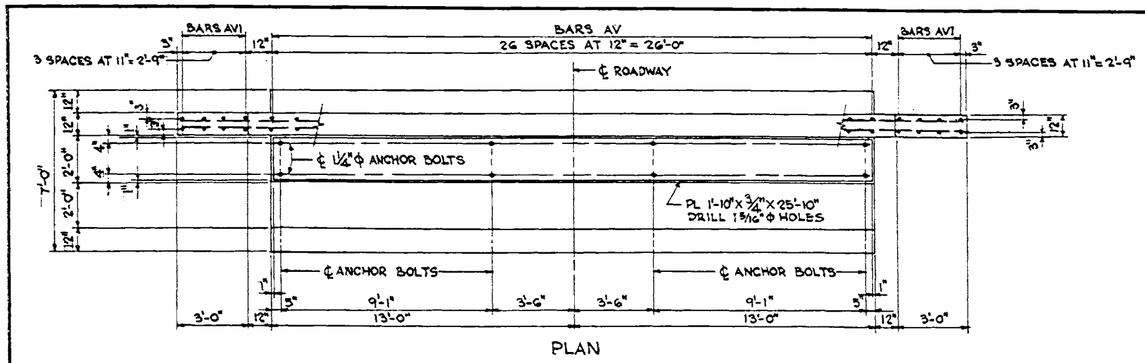
APPROVED: [signature] DATE: 19 MAY 1969
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE

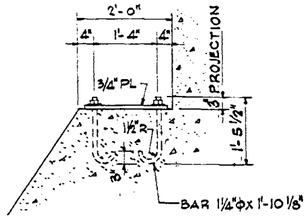
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 5 OF 5
85-23

CORPS OF ENGINEERS

U. S. ARMY

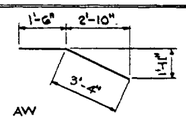


PLAN

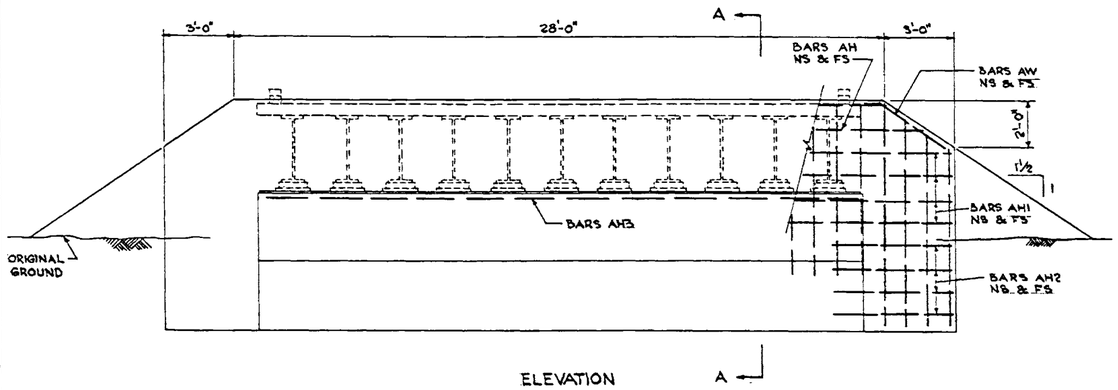


ANCHOR BOLT DETAIL
NO SCALE

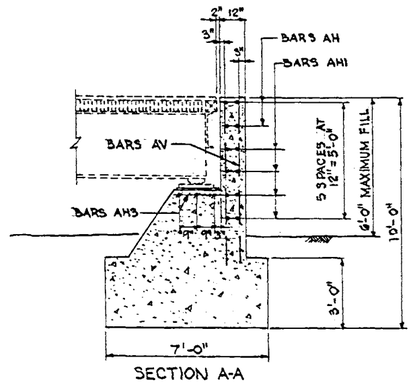
REINFORCING SCHEDULE FOR FACILITY NO. 852401						
MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION	BENDING DIAGRAMS
AH	4	½"ϕ	28'-0" TO 31'-0"		BACKWALL	
AH1	8	½"ϕ	33'-6"		BACKWALL	
AH2	16	½"ϕ	5'-3"		WINGS	
AH3	3	¾"ϕ	25'-6"		BEAM SEAT	
AV	54	½"ϕ	7'-0"		BACKWALL	
AV1	16	½"ϕ	7'-8" TO 9'-5"		WINGS	
AW	4	½"ϕ	4'-10"	1"	WINGS	



AH 28'-0" TO 31'-0" VARY BY 3'-0" 2 EA LG
AV1 7'-8" TO 9'-5" VARY BY 7½" 4 EA LG
AH, AV1

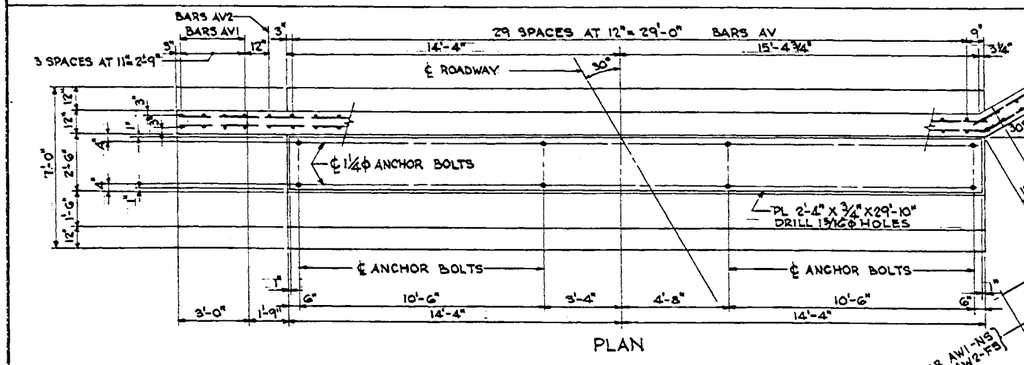


ELEVATION

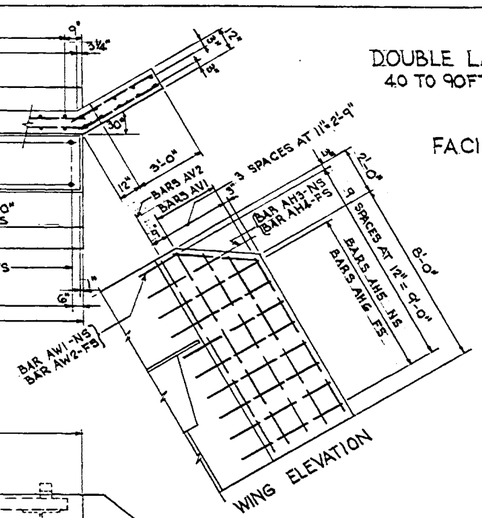


SECTION A-A

DOUBLE LANE CONCRETE ABUTMENT
40 TO 90FT STEEL SPANS – SQUARE END
CLASS 60
SCALE NO3
FACILITY NO. 852401

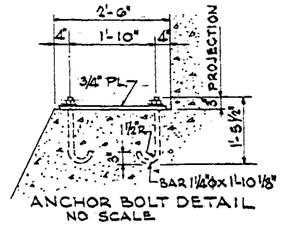


PLAN



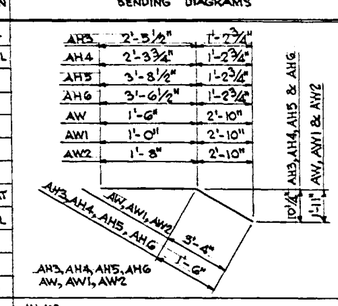
WING ELEVATION

DOUBLE LANE CONCRETE ABUTMENT
40 TO 90FT STEEL SPANS - 30° SKEW
CLASS 60
SCALE NO. 3
FACILITY NO. 852402

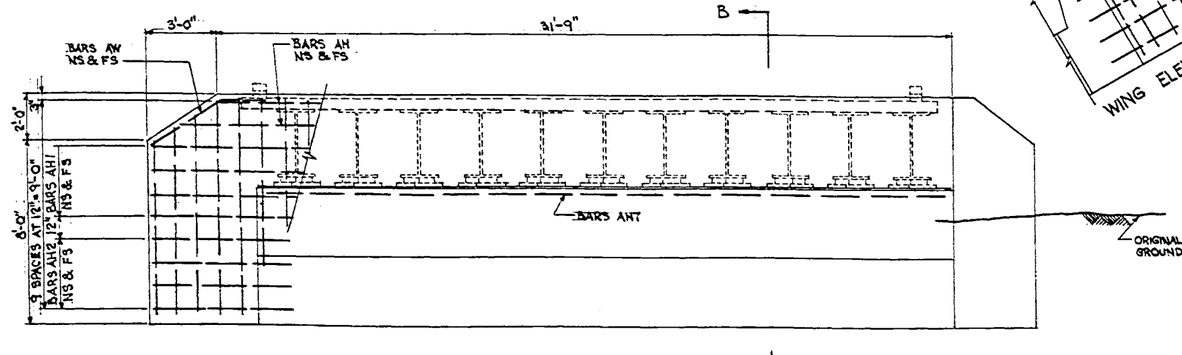


ANCHOR BOLT DETAIL
NO SCALE

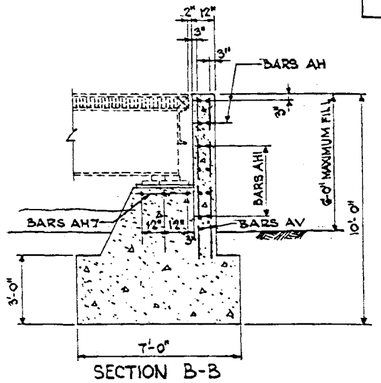
REINFORCING SCHEDULE FOR FACILITY NO. 852402						
MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION	BENDING DIAGRAMS
AH	4	½"ϕ	31'-9" TO 33'-3"		BACKWALL	
AH1	8	½"ϕ	34'-6"		BACKWALL	
AH2	8	½"ϕ	6'-3"		WING	
AH3	1	½"ϕ	3'-11"	1"	WING	
AH4	1	½"ϕ	3'-10"	1"	WING	
AH5	8	½"ϕ	5'-2"	1"	WING	
AH6	8	½"ϕ	5'-0"	1"	WING	
AH7	3	¾"ϕ	29'-6"		BEAM SEAT	
AV	60	½"ϕ	7'-0"		BACKWALL	
AV1	16	½"ϕ	7'-8" TO 9'-5"		WINGS	
AV2	4	½"ϕ	9'-6"		WINGS	
AW	2	½"ϕ	4'-10"	1"	WINGS	
AW1	1	½"ϕ	4'-4"	1"	WING	
AW2	1	½"ϕ	5'-0"	1"	WING	



AH, AV1
AH 31'-9" TO 33'-3" VARY BY 1'-6" 2 EA LG
AV1 7'-8" TO 9'-5" VARY BY 7½" 4 EA LG



ELEVATION



SECTION B-B

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: CASSEL
SUBMITTED BY: C. W. DEICHMANN

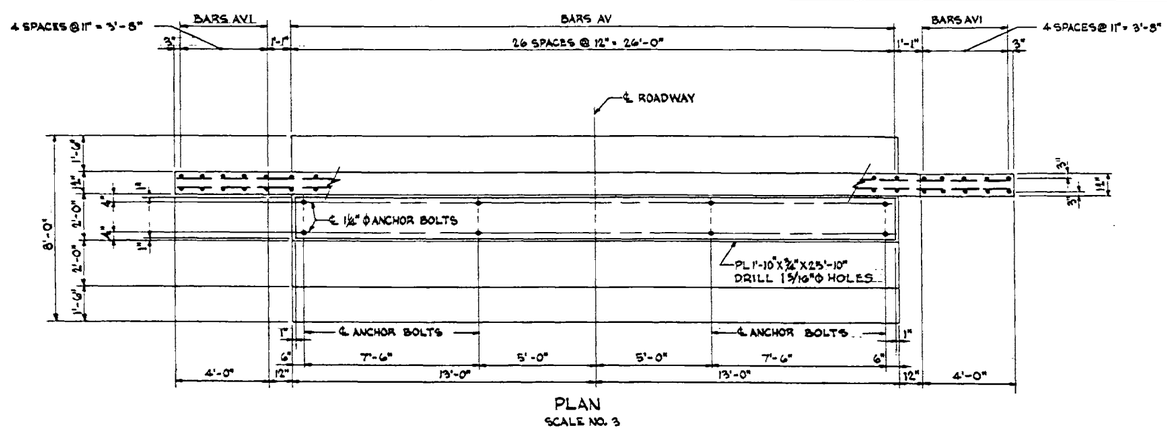
THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURES
DOUBLE LANE CONCRETE ABUTMENTS
40 TO 90FT SPANS-SQ. & 30° SKEW
CLASS 60

UNDER REVISION

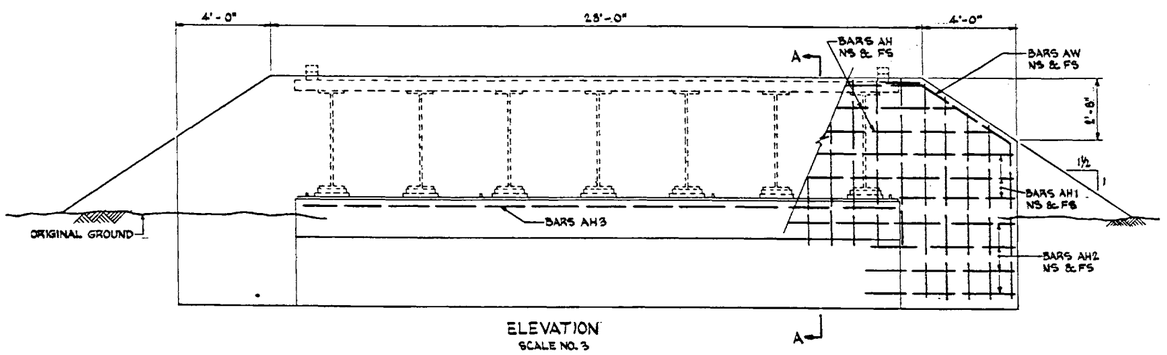
APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

CHIEF, ARCHITECTURAL DIVISION
APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-24
DATE
SHEET 1 OF 5

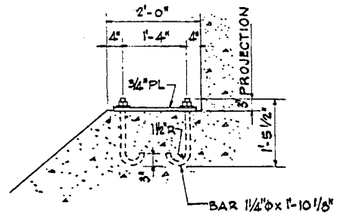


PLAN
SCALE NO. 3

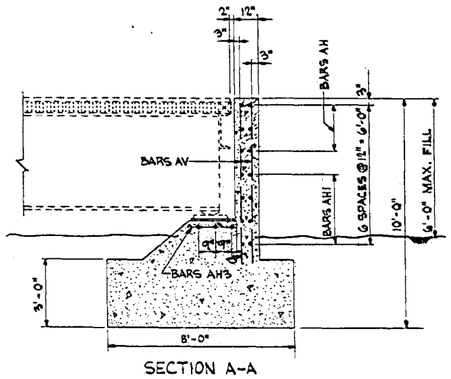


ELEVATION
SCALE NO. 3

DOUBLE LANE CONCRETE ABUTMENT
110 TO 128 FT STEEL SPANS - SQUARE END
CLASS 60
SCALE NO. 3
FACILITY NO. 852404



ANCHOR BOLT DETAIL
NO SCALE

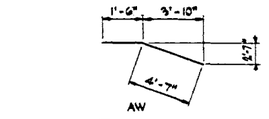


SECTION A-A
SCALE NO. 3

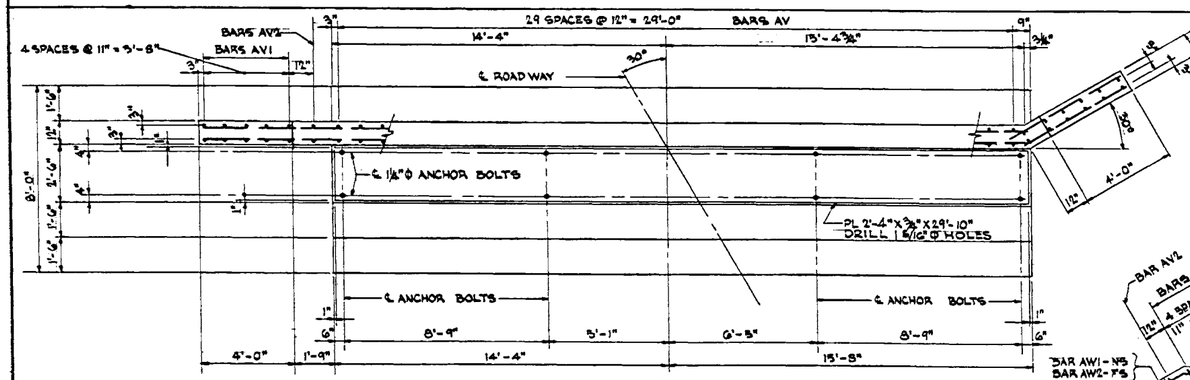
REINFORCING SCHEDULE FOR FACILITY NO. 852404

MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION
AH	6	½"ϕ	28'-0" TO 34'-0"		BACK WALL
AH1	6	½"ϕ	33'-7"		BACK WALL
AH2	16	½"ϕ	6'-4"		WINGS
AH3	3	⅝"ϕ	25'-6"		BEAM SEAT
AV	54	½"ϕ	7'-0"		BACK WALL
AV1	20	½"ϕ	7'-0" TO 9'-6"		WINGS
AW	4	½"ϕ	6'-1"	1"	WINGS

BENDING DIAGRAMS

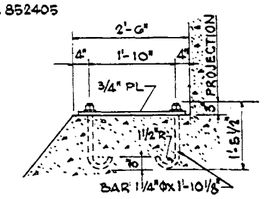


AH	28'-0" TO 34'-0" VARY BY 9'-0" - 2 EA LG
AV1	7'-0" TO 9'-6" VARY BY 7½" - 4 EA LG

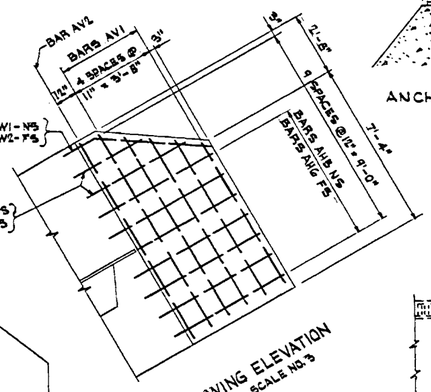


PLAN
SCALE NO. 3

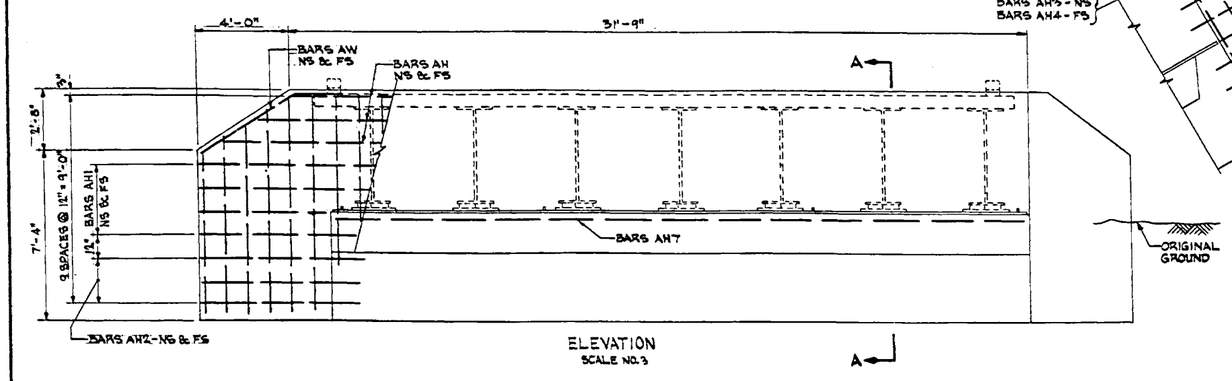
DOUBLE LANE CONCRETE ABUTMENT
110 TO 128 FT STEEL SPANS - 30° SKEW
CLASS 60
SCALE NO. 3
FACILITY NO. 852405



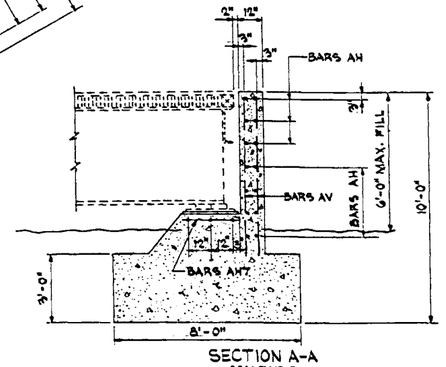
ANCHOR BOLT DETAIL
NO SCALE



WING ELEVATION
SCALE NO. 3



ELEVATION
SCALE NO. 3

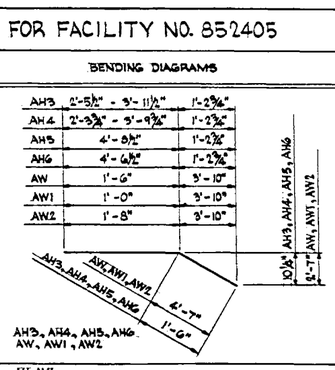


SECTION A-A
SCALE NO. 3

REINFORCING SCHEDULE FOR FACILITY NO. 852405

MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION
AH	6	½"ϕ	31'-9" TO 34'-9"		BACK WALL
AH1	8	½"ϕ	33'-6"		BACK WALL
AH2	6	½"ϕ	7'-3"		WING
AH3	2	½"ϕ	9'-11" TO 14'-5"	1"	WING
AH4	2	½"ϕ	9'-10" TO 5'-4"	1"	WING
AH5	7	½"ϕ	6'-2"	1"	WING
AH6	7	½"ϕ	6'-0"	1"	WING
AH7	3	¾"ϕ	29'-6"		BEAM SEAT
AV	60	½"ϕ	7'-0"		BACK WALL
AV1	20	½"ϕ	7'-0" TO 9'-6"		WINGS
AV2	4	½"ϕ	9'-6"		WINGS
AW	2	½"ϕ	6'-1"	1"	WING
AW1	1	½"ϕ	5'-7"	1"	WING
AW2	1	½"ϕ	6'-3"	1"	WING

BENDING DIAGRAMS



AH, AV1	
AH	31'-9" TO 34'-9" VARY BY 1'-6" - 2 EA LG
AV1	7'-0" TO 9'-6" VARY BY 7½" - 4 EA LG

SYMBOL	DESCRIPTION REVISIONS GRAPHIC SCALES	DATE	APPROVAL

0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: CASSEL
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. E. Edgerton
CHIEF, STRUCTURES BRANCH

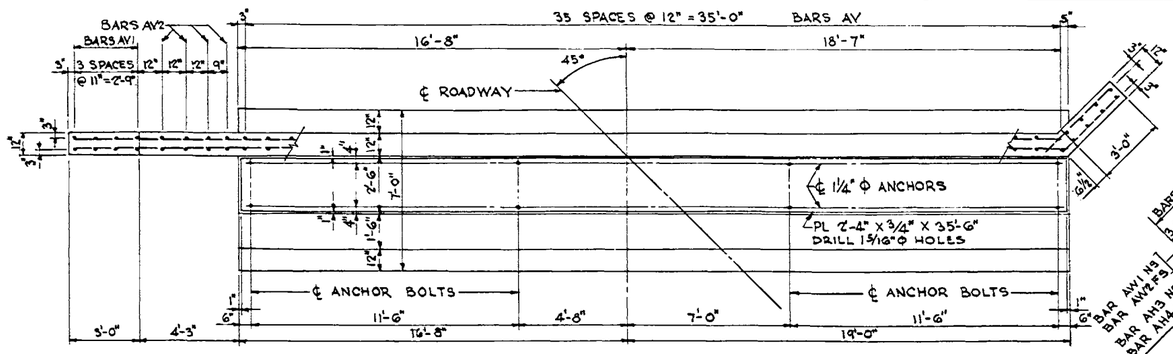
THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURE
DOUBLE LANE CONCRETE ABUTMENTS
110 TO 128 FT SPANS-SQ & 30° SKEW
CLASS 60

UNDER REVISION

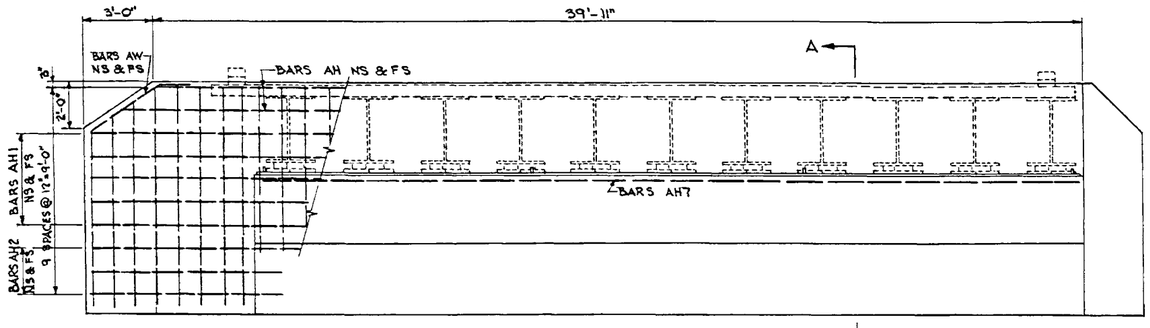
APPROVED: W. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1963

APPROVED FOR PROPONENT AGENCY:
DATE

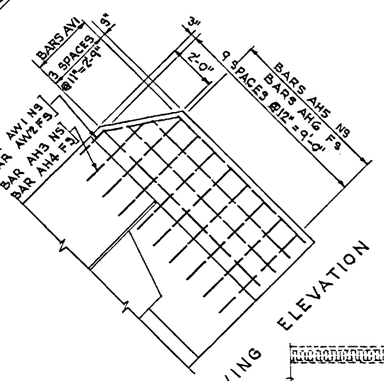
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 5
85-24



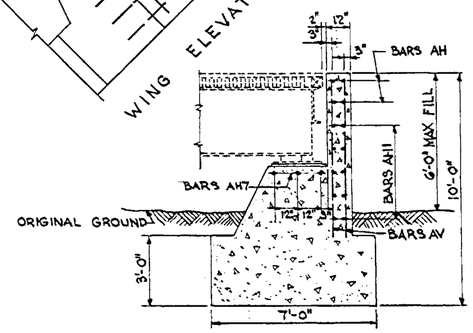
PLAN



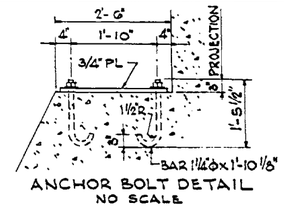
ELEVATION



WING ELEVATION

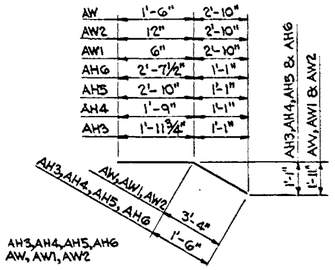


SECTION A-A



ANCHOR BOLT DETAIL
NO SCALE

REINFORCING SCHEDULE FOR FACILITY NO. 852403						
MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION	BENDING DIAGRAMS
AH	4	½" ϕ	39'-11" TO 41'-5"		BACKWALL	
AH1	10	½" ϕ	42'-11"		BACKWALL	
AH2	6	½" ϕ	8'-9"		WING	
AH3	1	½" ϕ	3'-6"	1"	WING	
AH4	1	½" ϕ	3'-3"	1"	WING	
AH5	8	½" ϕ	4'-4"	1"	WING	
AH6	8	½" ϕ	4'-1"	1"	WING	
AH7	3	¾" ϕ	35'-2"		BEAM SEAT	
AV	72	½" ϕ	7'-0"		BACKWALL	
AV1	16	½" ϕ	7'-8" TO 9'-5"		WINGS	
AV2	8	½" ϕ	9'-6"		WING	
AW	2	½" ϕ	4'-10"	1"	WING	
AW1	1	½" ϕ	3'-10"	1"	WING	
AW2	1	½" ϕ	4'-4"	1"	WING	



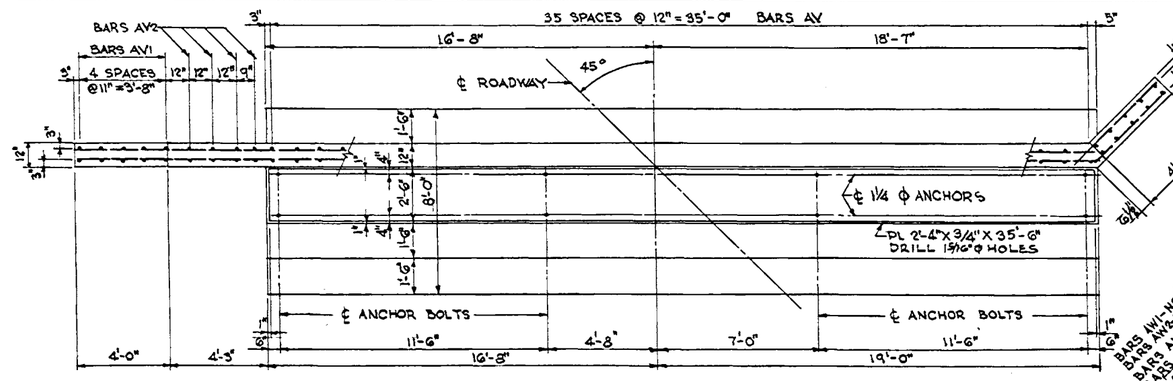
AH3, AH4, AH5, AH6
AW, AW1, AW2

AH, AV1

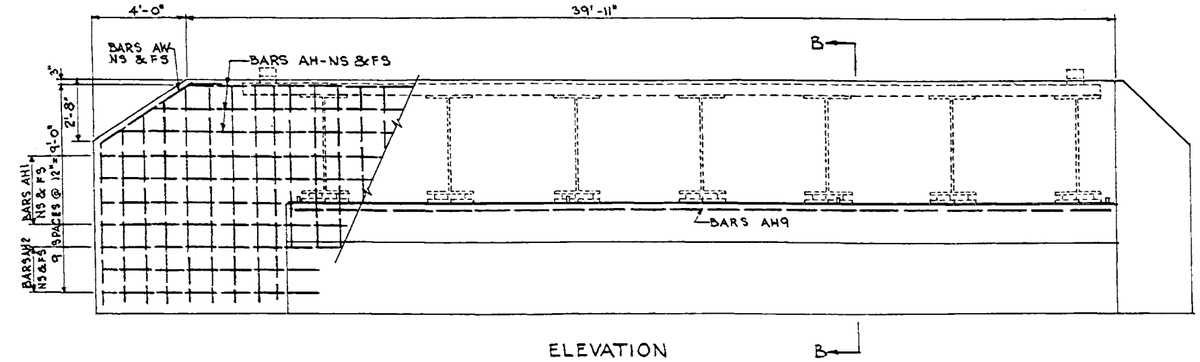
AH	39'-11" TO 41'-5" VARY BY 1'-6" - 2 EA LG.
AV1	7'-8" TO 9'-5" VARY BY 7½" - 4 EA LG.

DOUBLE LANE CONCRETE ABUTMENT
40 TO 90FT STEEL SPANS - 45° SKEW
CLASS 60
SCALE NO. 3

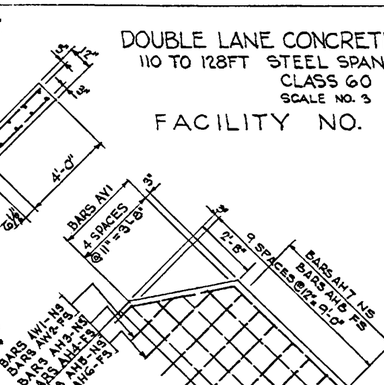
FACILITY NO. 852403



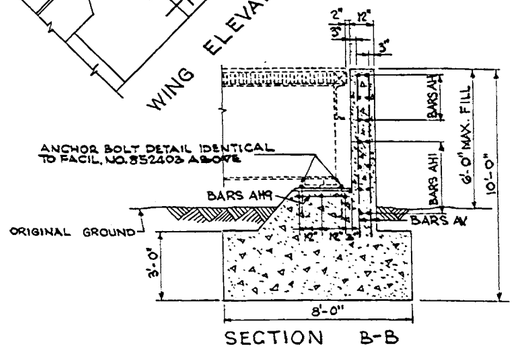
PLAN



ELEVATION

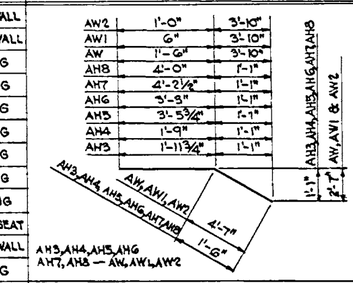


WING ELEVATION



SECTION B-B

REINFORCING SCHEDULE FOR FACILITY NO. 852406						
MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION	BENDING DIAGRAMS
AH	6	½" ϕ	39'-11" TO 42'-11"		BACKWALL	
AH1	8	½" ϕ	43'-8"		BACKWALL	
AH2	6	½" ϕ	9'-6"		WING	
AH3	1	½" ϕ	3'-6"	1"	WING	
AH4	1	½" ϕ	3'-3"	1"	WING	
AH5	1	½" ϕ	5'-0"	1"	WING	
AH6	1	½" ϕ	4'-9"	1"	WING	
AH7	7	½" ϕ	5'-8"	1"	WING	
AH8	7	½" ϕ	5'-6"	1"	WING	
AH9	3	¾" ϕ	35'-2"		BEAM SEAT	
AV	72	½" ϕ	7'-0"		BACKWALL	
AV1	20	½" ϕ	7'-0" TO 9'-6"		WING	
AV2	8	½" ϕ	9'-6"		WING	
AW	2	½" ϕ	6'-1"	1"	WING	
AW1	1	½" ϕ	5'-1"	1"	WING	
AW2	1	½" ϕ	5'-7"	1"	WING	



AH3, AH4, AH5, AH6
AH7, AH8 — AW, AW1, AW2

AH	39'-11" TO 42'-11" VARY BY 1'-6" - 2 EA LG
AV1	7'-0" TO 9'-6" VARY BY 7½" - 4 EA LG

AH, AV1

DOUBLE LANE CONCRETE ABUTMENT
110 TO 128FT STEEL SPANS - 45° SKEW
CLASS 60
SCALE NO. 3

FACILITY NO. 852406

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

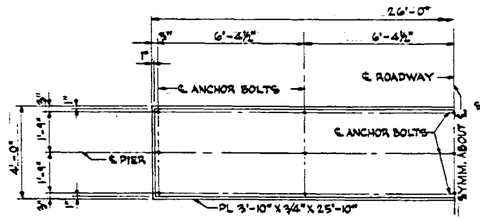
DRAWN BY: I.LYUS
TRACED BY:
CHECKED BY: CASSEL
SUBMITTED BY: J.C.W. DEICHMANN

THEATER OF OPERATIONS
ROAD BRIDGE SUBSTRUCTURES
DOUBLE LANE CONCRETE ABUTMENTS
DESIGNED FOR 110 TO 128FT SPANS-45° SKEW
CLASS 60

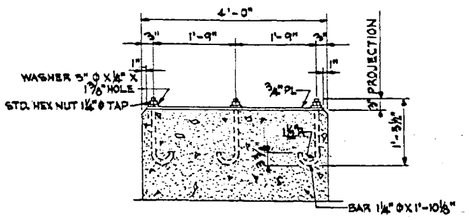
UNDER CONSTRUCTION

APPROVED: W.M. Williams DATE: 18 MAR 1963
CHIEF, CAD/LRD BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

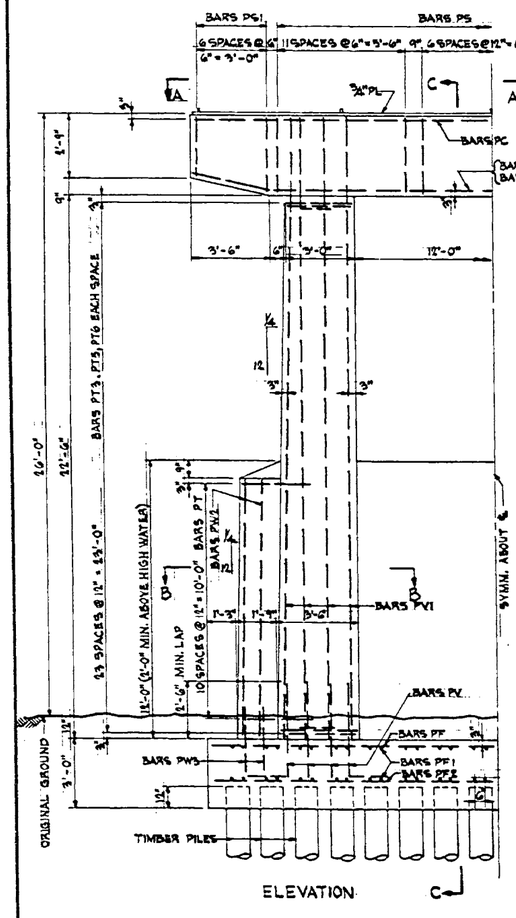
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-24
SHEET 3 OF 5



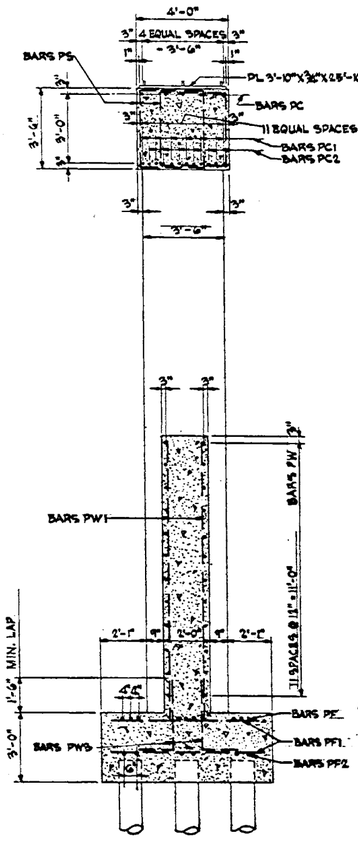
HALF PLAN A-A
SCALE NO. 3



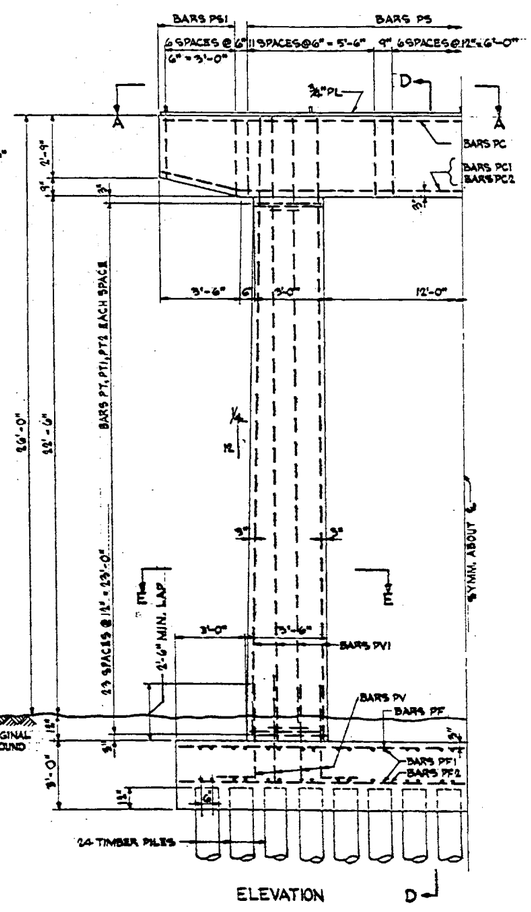
ANCHOR BOLT DETAIL
SCALE NO. 3



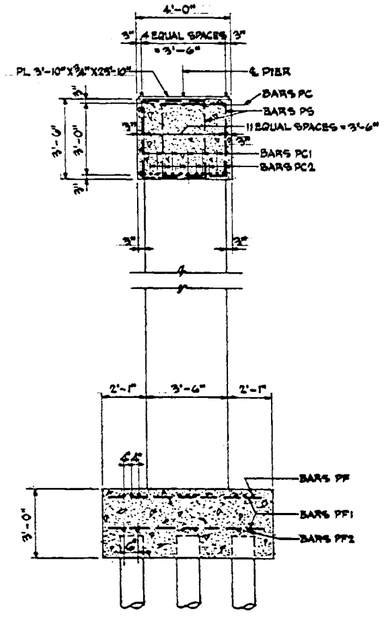
ELEVATION C



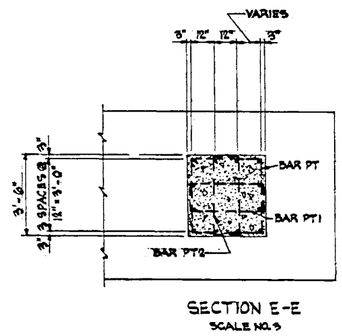
SECTION C-C



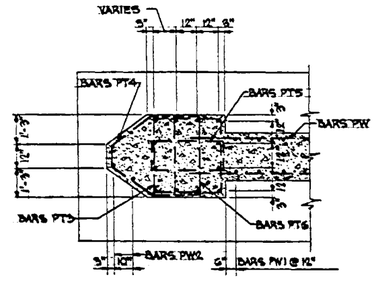
ELEVATION D



SECTION D-D



SECTION E-E
SCALE NO. 3

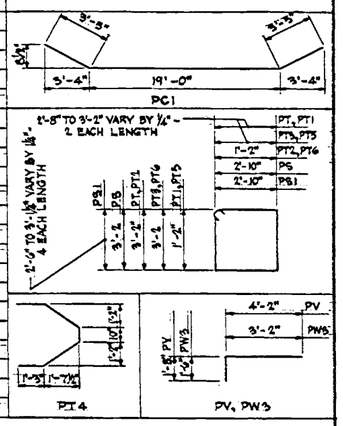


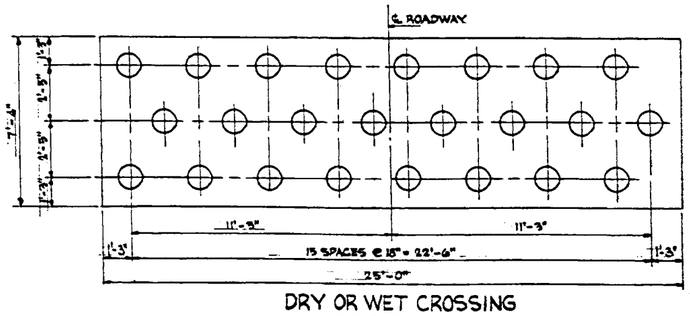
SECTION B-B
SCALE NO. 3

REINFORCING SCHEDULE

MARK	SIZE	LENGTH	BENDING RADIUS	LOCATION	FACIL. NO. 852407 DRY CROSSING QUANITY	FACIL. NO. 852408 WET CROSSING QUANITY
PC	1" Ø	25'-8"		CAP	5	5
PC1	1" Ø	25'-10"	4"	CAP	6	6
PC2	1" Ø	19'-0"		CAP	6	6
PF	1" Ø	24'-6"		FOOTING	9	9
PF1	⅝" Ø	6'-10"		FOOTING	64	64
PF2	⅝" Ø	24'-6"		FOOTING	6	6
PS	½" Ø	12'-7"	1"	CAP	62	62
PS1	½" Ø	11'-3" TO 12'-6"	1"	CAP	28	28
PT	⅝" Ø	12'-3" TO 13'-3"	¾"	STEMS	48	0
PT1	⅝" Ø	8'-9" TO 9'-3"	¾"	STEMS	48	0
PT2	⅝" Ø	9'-3"	¾"	STEMS	48	0
PT3	⅝" Ø	12'-3" TO 13'-3"	¾"	STEMS	0	48
PT4	⅝" Ø	6'-11"	¾"	NOSING	0	24
PT5	⅝" Ø	8'-3" TO 9'-3"	¾"	STEMS	0	48
PT6	⅝" Ø	9'-3"	¾"	STEMS	0	48
PV	1" Ø	3'-9"	4"	FOOTING	24	24
PV1	1" Ø	26'-9"		STEMS	24	24
PW	½" Ø	15'-0"		WEB		24
PW1	½" Ø	11'-9"		WEB		24
PW2	½" Ø	11'-0"		NOSING		8
PW3	½" Ø	4'-7"	1"	FOOTING		32

BENDING DIAGRAMS





DRY OR WET CROSSING
PILE PLAN
SCALE NO. 3

WET CROSSING PIER FACILITY NO. 852408
SCALE NO. 3

DRY CROSSING PIER FACILITY NO. 852407
SCALE NO. 3

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5' NO. 3
0 1' 2' 3' NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: CASSEL
SUBMITTED BY: E. W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE CONCRETE PIERS
160 FT. MAX. COMBINED SPANS-CLASS 60
36 FT HIGH ON 24 TIMBER PILES-DRY & WET CROSSING

APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

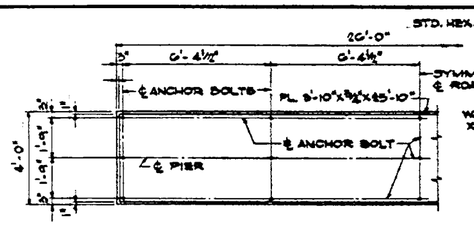
APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-24
SHEET 4 OF 5

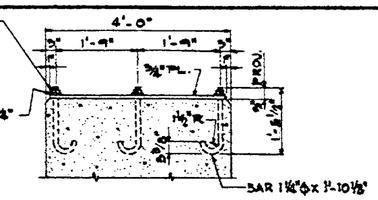
UNDER REVISION

CORPS OF ENGINEERS

U. S. ARMY

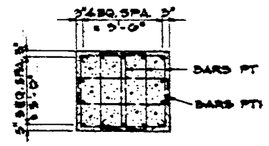


HALF PLAN A-A



ANCHOR BOLT DETAIL

SCALE NO. 3

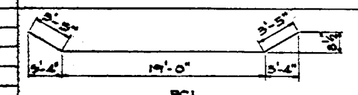


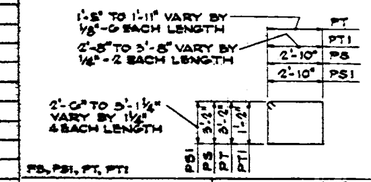
SECTION D-D

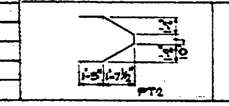
SCALE NO. 3

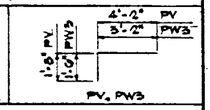
REINFORCING SCHEDULE						
MARK	SIZE	LENGTH	BENDING RADIUS	LOCATION	FACIL. NO. 852409 DRY CROSSING QUANTITY	FACIL. NO. 852410 WET CROSSING QUANTITY
PC	1"ϕ	23'-8"		CAP	5	5
PC1	1"ϕ	25'-10"	4"	CAP	6	6
PC2	1"ϕ	19'-0"		CAP	6	6
PF	1"ϕ	27'-0"		FOOTING	10	10
PF1	⅝"ϕ	9'-3"		FOOTING	72	72
PF2	⅝"ϕ	27'-6"		FOOTING	12	12
PS	½"ϕ	12'-7"	1"	CAP	62	62
PS1	½"ϕ	3'-5 TO 16'-6"	1"	CAP	28	28
PT	⅝"ϕ	9'-7" TO 10'-1"	⅜"	STEMS	286	286
PT1	⅝"ϕ	8'-5" TO 10'-3"	⅜"	STEMS	96	96
PT2	⅝"ϕ	6'-11"	4½"	NOSING	0	48
PV	1"ϕ	5'-0"	4"	FOOTING	28	28
PV1	1"ϕ	27'-11"		STEMS	30	50
PW	½"ϕ	15'-8"		WEB	0	48
PW1	½"ϕ	23'-9"		WEB	0	24
PW2	½"ϕ	25'-0"		NOSING	0	8
PW3	½"ϕ	4'-7"	1"	FOOTING	0	32

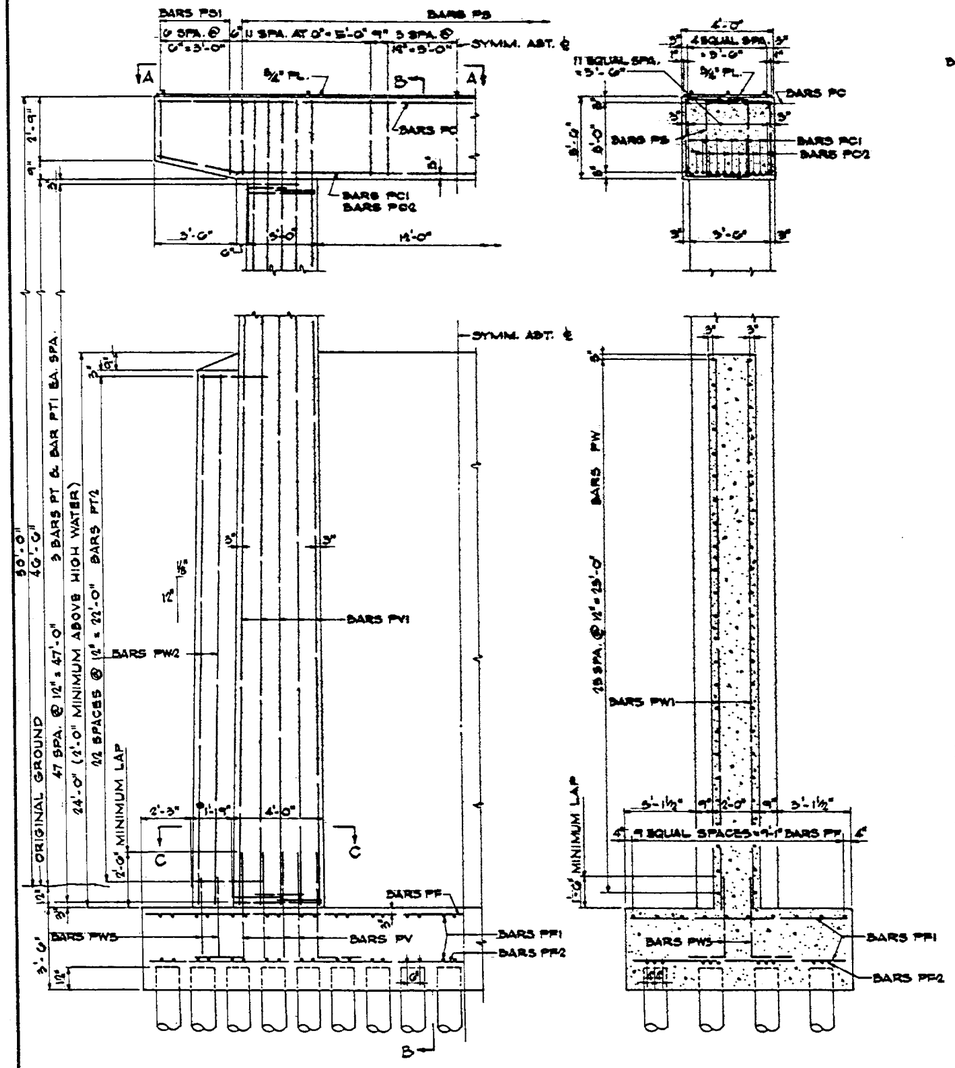
BENDING DIAGRAMS









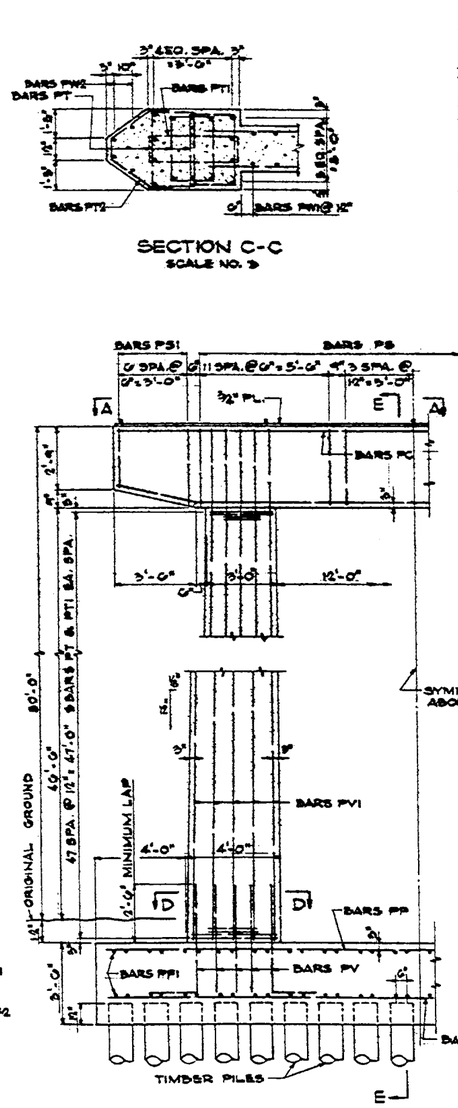


HALF ELEVATION

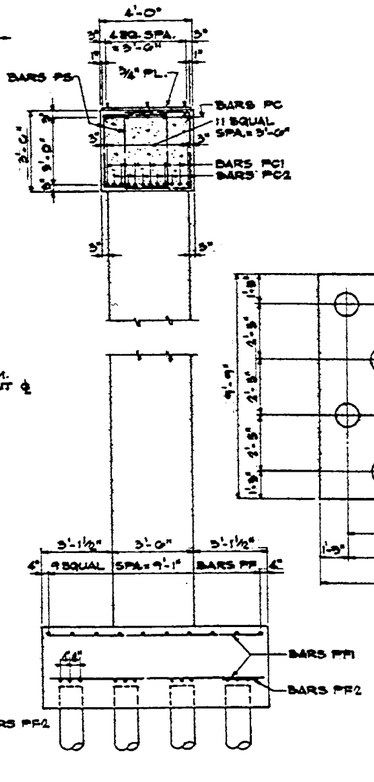
SECTION B-B

WET CROSSING PIER - FACILITY NO. 852410

SCALE NO. 3



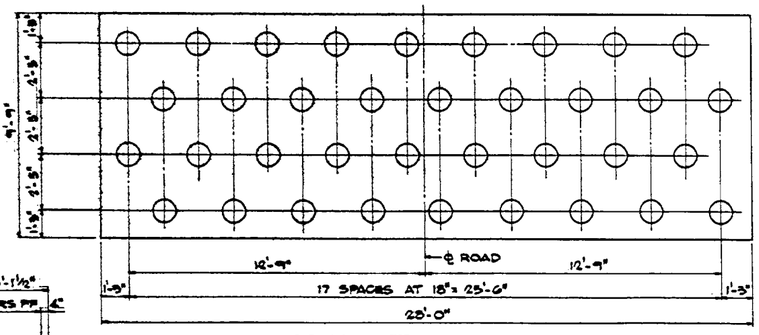
HALF ELEVATION



SECTION E-E

DRY CROSSING PIER - FACILITY NO. 852409

SCALE NO. 3



DRY OR WET CROSSINGS
PILE PLAN

SCALE NO. 3

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 1' 2' 3' 4' 5' — NO.3

0 1' 2' 3' — NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: CASSEL
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

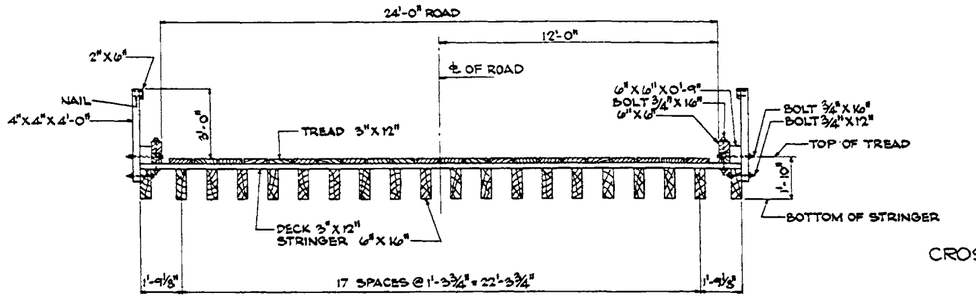
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURE
DOUBLE LANE CONCRETE PIERS
180 FT. ALL COMBINED SPANS-CLASS 60
50 FT. HIGH ON 36 TIMBER PILES

UNDER REVISION

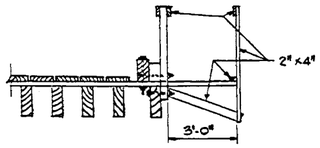
APPROVED: H.M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 5 OF 5
85-24

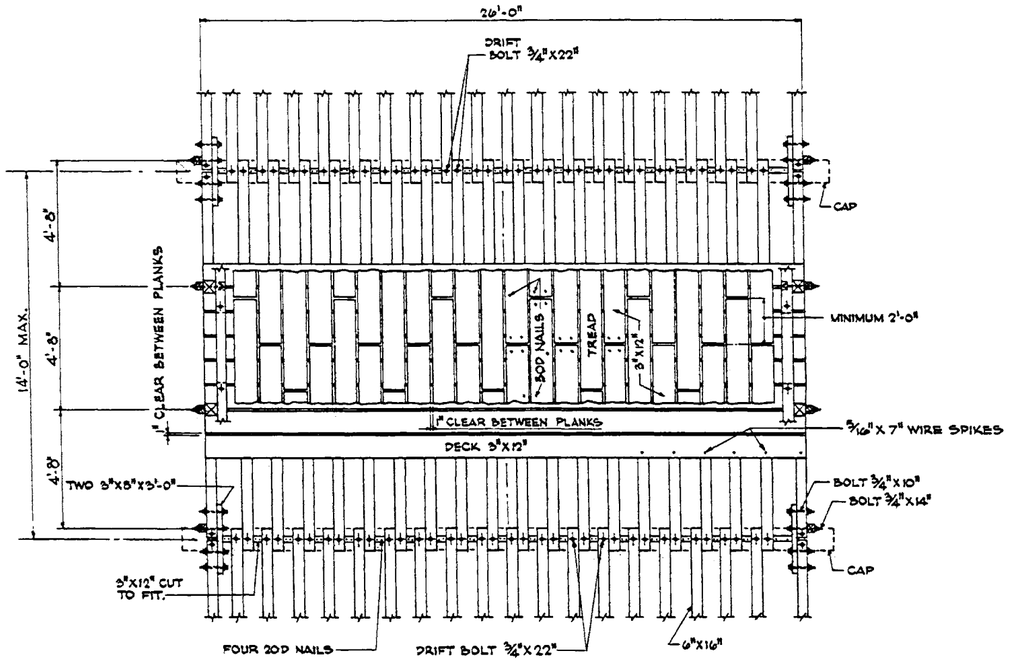


CROSS SECTION
SCALE NO. 3



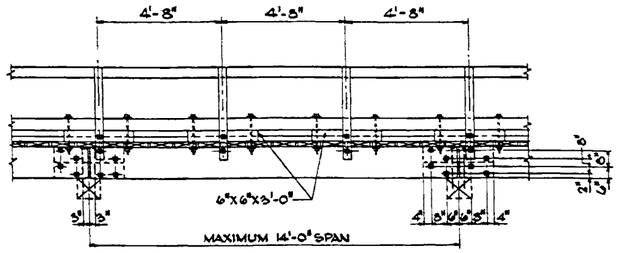
CROSS SECTION - WALKWAY & HANDRAIL
SCALE NO. 3

ASSEMBLED VIEW
NO SCALE



PLAN - DOUBLE LANE, 14 FT. SPAN, CLASS 60
NOT TO SCALE
FACILITY NO. 852502

PART PLAN - WALKWAY
NO SCALE



SIDE ELEVATION
NOT TO SCALE

FACILITY NO.	DESCRIPTION
852501	WALKWAY & HANDRAIL - 3' x 50'
852502	14 FT. SPAN, DOUBLE LANE - CLASS 60 OR SINGLE LANE, CLASS 80 & 100
852503	14 FT. SPAN, DOUBLE LANE - CLASS 25
852506	14 FT. SPAN, SINGLE LANE - CLASS 50

GENERAL NOTES

1. TO ADAPT 14 FT. TIMBER SPAN FOR CLASS 25, DOUBLE LANE SUPER-STRUCTURE USE 12-0"X10" STRINGERS @ 2'-3 1/2" O.C.
2. TO ADAPT 14 FT. TIMBER SPAN FOR CLASS 50 SINGLE LANE SUPER-STRUCTURE USE 10-6"X10" STRINGERS @ 1'-7 3/4" O.C.
3. FACILITY NO. 852502 IS ADEQUATE FOR CLASS 80 OR CLASS 100 1-WAY CONTROLLED TRAFFIC.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

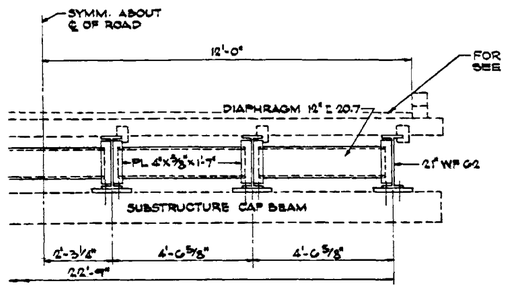
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: E. W. DEICHMANN
APPROVED: W. Ehlers
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURE
14FT TIMBER SPAN
DOUBLE LANE. CLASSES 25 & 60
SINGLE LANE. CLASSES 50. 80 & 100

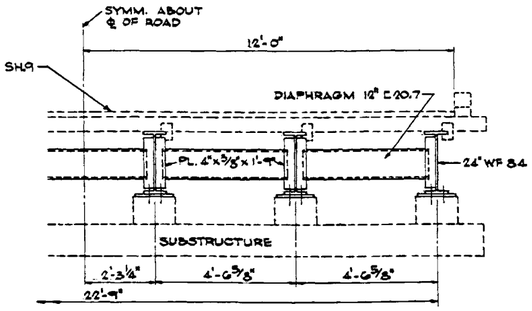
UNDER REVISION

APPROVED: A.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR. O.C.E.
DATE: 18 MAR 1963

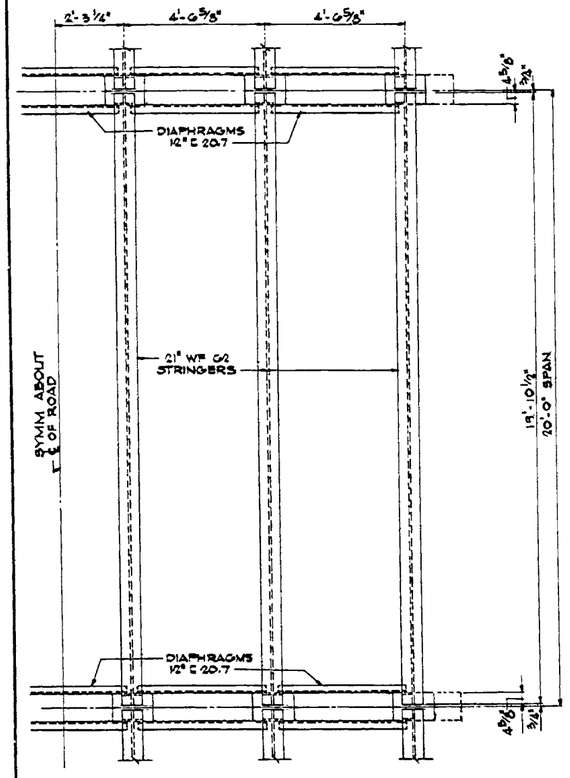
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-25
SHEET 1 OF 2



HALF TRANSVERSE SECTION
SCALE NO. 4

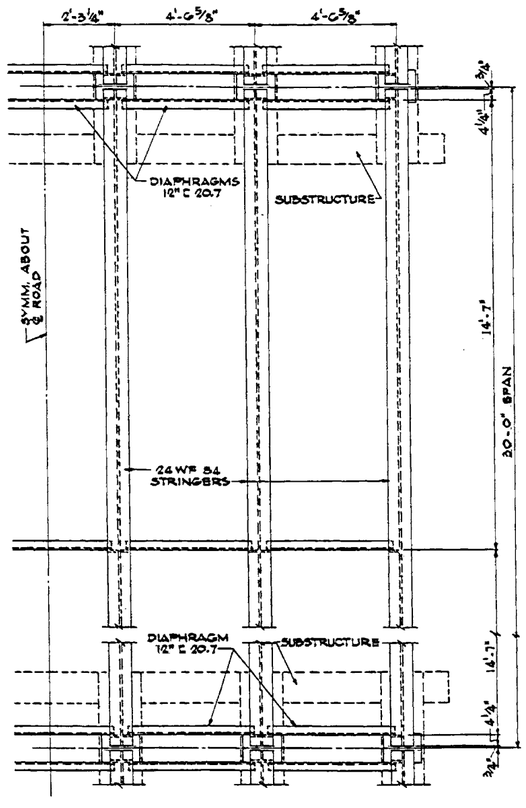


HALF TRANSVERSE SECTION
SCALE NO. 4



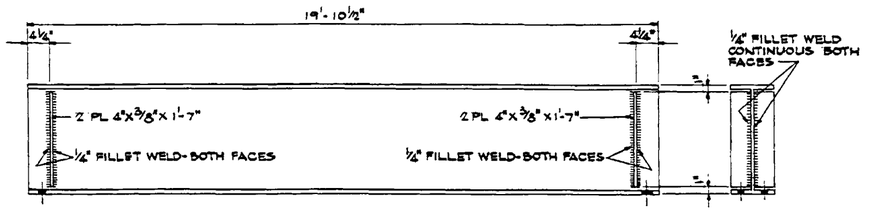
HALF PLAN
SCALE NO. 4

20FT. SPAN - WELDED
FACILITY NO. 852503

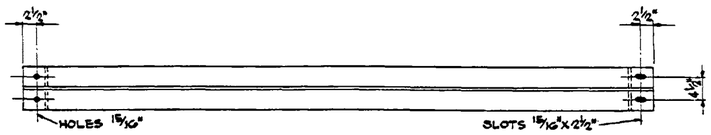


HALF PLAN
SCALE NO. 4

30FT. SPAN - WELDED
FACILITY NO. 852504

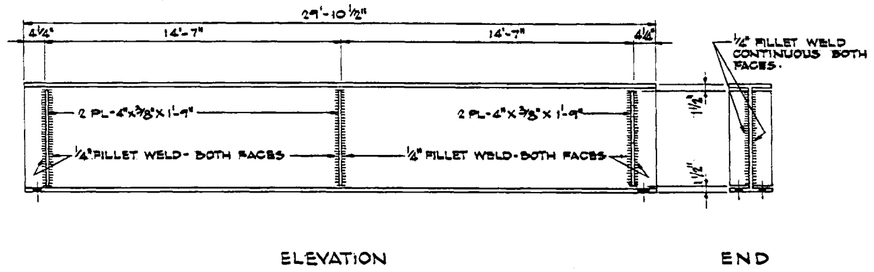


ELEVATION END

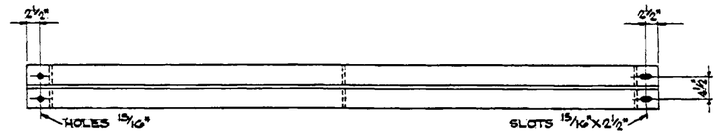


PLAN-BOTTOM FLANGE

DETAILS OF 21 WF 62 STRINGER
NO SCALE

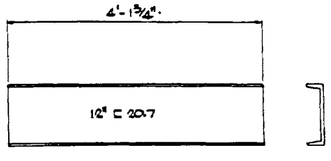


ELEVATION END

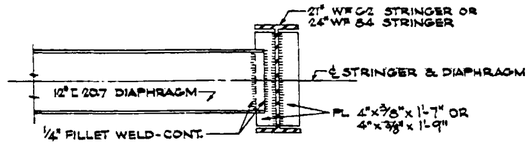


PLAN-BOTTOM FLANGE

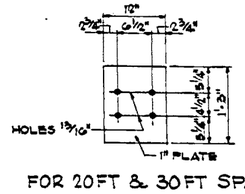
DETAILS OF 24 WF 84 STRINGER
NO SCALE



DIAPHRAGM - 10 REQ'D. PER 20FT. SPAN
DIAPHRAGM - 15 REQ'D. PER 30FT. SPAN
NO SCALE



DIAPHRAGM CONNECTION
NO SCALE



FOR 20FT & 30FT SPANS
BEARING PLATES
NO. SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4'
NO. 4

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH

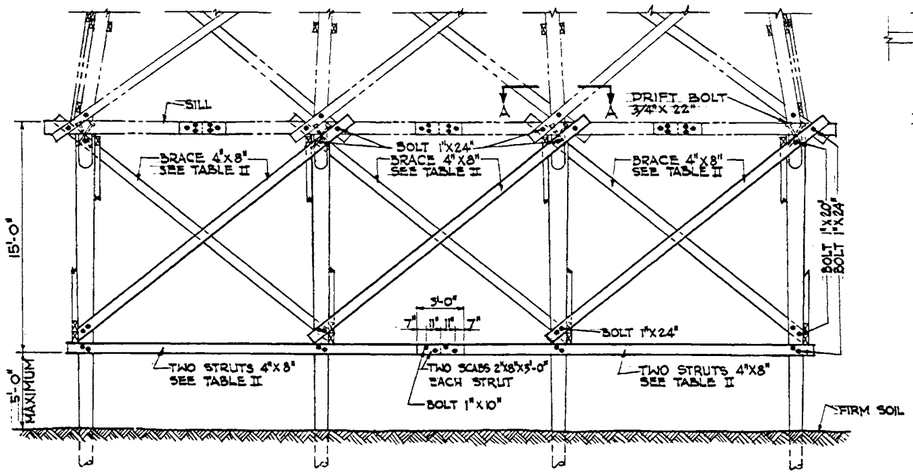
THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURE
DOUBLE LANE CLASS 60
WELDED STEEL SPANS
20FT. & 30FT.

UNDER REVISION

APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE:

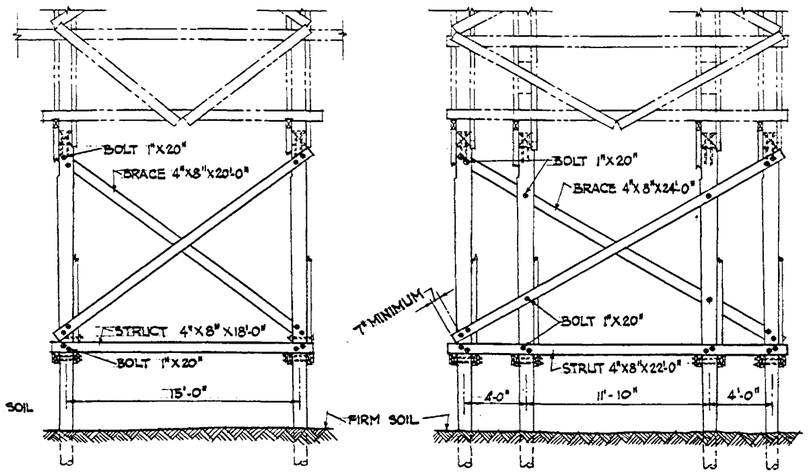
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 2
85-25



TRANSVERSE ELEVATION

CLASS 50 SINGLE LANE & CLASS 25 DOUBLE LANE

SCALE NO. 2



TIMBER SPANS

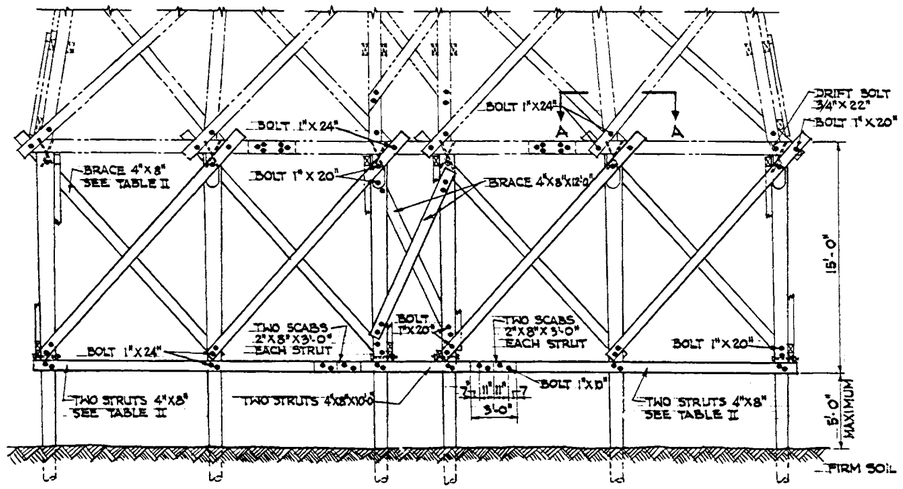
STEEL SPANS

LONGITUDINAL ELEVATIONS

ALL CLASSES

SCALE NO. 2

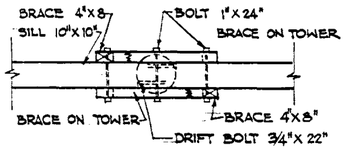
TABLE I TRANSVERSE PILE SPACING			
TOWER HEIGHT	CL 50-SGL LANE DIMEN "A"	CL 25-DBL LANE DIMEN "A"	CL 50 & 60-DBL LANE DIMEN "A"
13'-4"	5'-7 1/2"	8'-3"	5'-3 3/8"
16'	5'-11"	8'-7"	5'-8"
18'	6'-2"	8'-10"	5'-10"
20'	6'-4"	9'-0"	6'-0"
22'	6'-7"	9'-3"	6'-2"
24'	6'-10"	9'-6"	6'-4"
25'-10"	7'-0 1/4"	9'-8"	6'-6 1/4"
28'	7'-3"	9'-11"	6'-8"
30'	7'-6"	10'-2"	6'-10"
32'	7'-8"	10'-4"	7'-0"
34'	7'-11"	10'-7"	7'-2"
36'	8'-2"	10'-10"	7'-4"
38'-4"	8'-4 7/8"	11'-1"	7'-6 5/8"
40'	8'-7"	11'-3"	7'-8"
42'	8'-10"	11'-6"	7'-10"
44'	9'-0"	11'-8"	8'-0"
46'	9'-3"	11'-11"	8'-2"
48'	9'-6"	12'-2"	8'-4"
50'-10"	9'-9 1/2"	12'-5"	8'-7 1/8"
53'	10'-0"	12'-8"	8'-9"
55'	10'-3"	12'-11"	8'-11"
57'	10'-6"	13'-2"	9'-1"
59'	10'-8"	13'-4"	9'-3"
61'	10'-11"	13'-7"	9'-5"
63'-4"	11'-2 1/4"	13'-10"	9'-7 5/8"
65'	11'-4"	14'-0"	9'-9"
67'	11'-7"	14'-3"	9'-11"
69'	11'-10"	14'-6"	10'-1"
71'	12'-0"	14'-8"	10'-3"
73'	12'-3"	14'-11"	10'-5"
75'-10"	12'-6 7/8"	15'-3"	10'-8 1/8"



TRANSVERSE ELEVATION

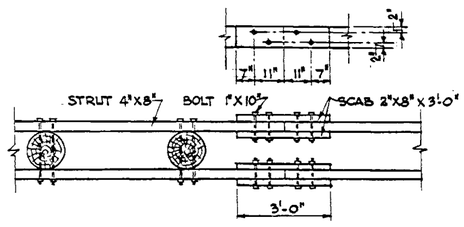
CLASS 50 & 60 DOUBLE LANE

SCALE NO. 2



SECTION A-A

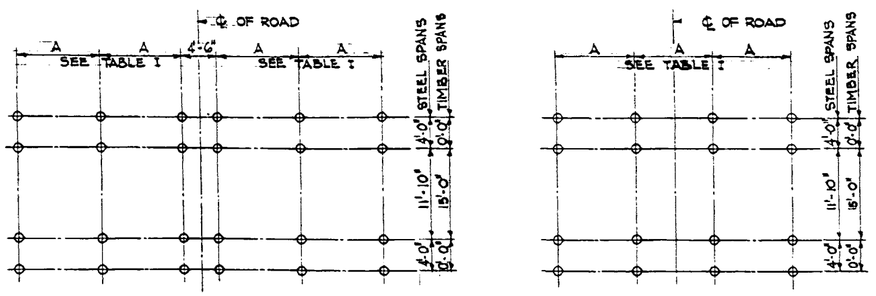
NO SCALE



DETAIL OF TRANSVERSE STRUT SPLICE

NO SCALE

TABLE II-TRANSVERSE BRACING		
CLASS 50-SGL LANE		
TOWER HEIGHT	BRACE LENGTH	STRUT LENGTH
15' TO 17'	18'-0"	20'-0"
19' TO 23'	18'-0"	22'-0"
25' TO 30'	18'-0"	24'-0"
32' TO 40'	18'-0"	14'-0"
42' TO 53'	20'-0"	16'-0"
55' TO 65'	20'-0"	18'-0"
67' TO 75'	20'-0"	20'-0"
CLASS 25-DBL LANE		
TOWER HEIGHT	BRACE LENGTH	STRUT LENGTH
15' TO 21'	18'-0"	16'-0"
23' TO 28'	20'-0"	16'-0"
30' TO 40'	20'-0"	18'-0"
42' TO 50'	20'-0"	20'-0"
50' TO 63'	22'-0"	22'-0"
65' TO 75'	22'-0"	24'-0"
CLASS 50 & 60-DBL LANE		
TOWER HEIGHT	BRACE LENGTH	STRUT LENGTH
15' TO 21'	16'-0"	10'-0"
23' TO 32'	18'-0"	12'-0"
34' TO 44'	18'-0"	14'-0"
46' TO 57'	18'-0"	16'-0"
59' TO 69'	20'-0"	18'-0"
71' TO 75'	20'-0"	20'-0"



CLASS 50 & 60 DOUBLE LANE

CLASS 50 SGL LANE & CLASS 25 DBL LANE

PILE ARRANGEMENT PLANS

NO SCALE

FACILITY DESCRIPTIONS		
TYPE SPAN	FACILITY NO	TIMBER PILE FOUNDATIONS
TIMBER	852601	UNBRACED-12 PILES-CLASS 50 & 60 DOUBLE LANE
STEEL	852602	UNBRACED-24 PILES-CLASS 50 & 60 DOUBLE LANE
TIMBER	852603	BRACED-12 PILES-CLASS 50 & 60 DOUBLE LANE
STEEL	852604	BRACED-24 PILES-CLASS 50 & 60 DOUBLE LANE
TIMBER	852605	UNBRACED-8 PILES-CLASS 25 DOUBLE LANE, CLASS 50-SINGLE LANE
STEEL	852606	UNBRACED-16 PILES-CLASS 25 DOUBLE LANE CLASS 50-SINGLE LANE
TIMBER	852607	BRACED-8 PILES-CLASS 25 DOUBLE LANE CLASS 50-SINGLE LANE
STEEL	852608	BRACED-16 PILES-CLASS 25 DOUBLE LANE CLASS 50-SINGLE LANE

GENERAL NOTES

1. MAXIMUM HEIGHT OF STRUCTURE GRADE TO GROUND = 80 FEET
2. REQUIRED BEARING CAPACITY OF PILES - 18 TONS PER PILE
3. THE LONGITUDINAL & TRANSVERSE ELEVATIONS, AS SHOWN ABOVE ARE FOR TIMBER PILE FDTNS IN WATER.
4. TIMBER PILE FDTNS IN GROUND MAY BE DRIVEN USING PILE ARRANGEMENT PLANS AS SHOWN, WITH PILES CUT OFF 1 FT ABOVE GRADE, & TOWER PLACED THEREON.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-26	TIMBER PILE FNDTNS	1 OF 1
85-23	SINGLE & DOUBLE LANE TIMBER TOWERS	1 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10'

NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: D.W. DEICHMANN

THEATER OF OPERATIONS

ROAD BRIDGE SUBSTRUCTURES
TIMBER PILE FOUNDATIONS
FOR TIMBER TOWERS
ALL CLASSES

UNDER REVISION

APPROVED: DATE: 19 MAR 1959

CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

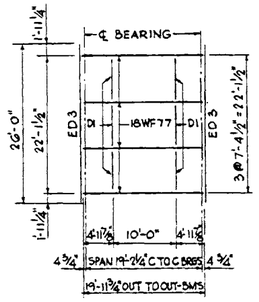
DATE

SCALE: AS NOTED

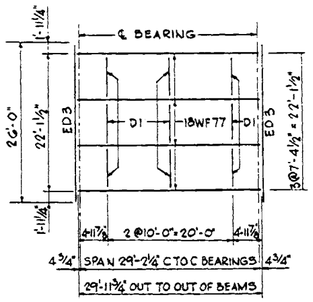
SPEC. NO.

DRAWING NUMBER: 85-26

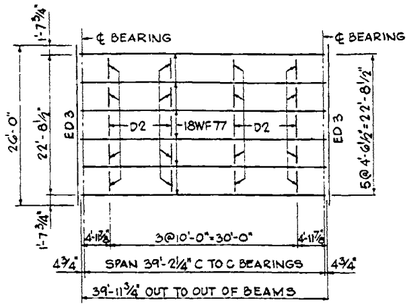
SHEET 1 OF 1



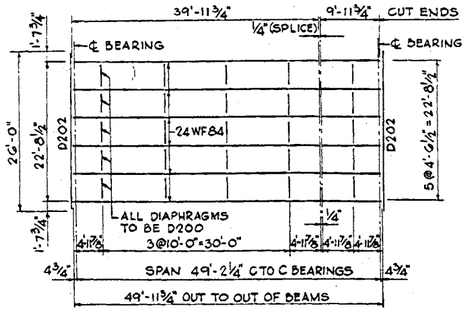
4-18WF77 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852801



4-18WF77 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852802



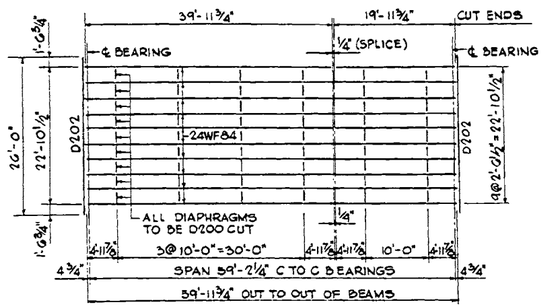
6-18WF77 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852803



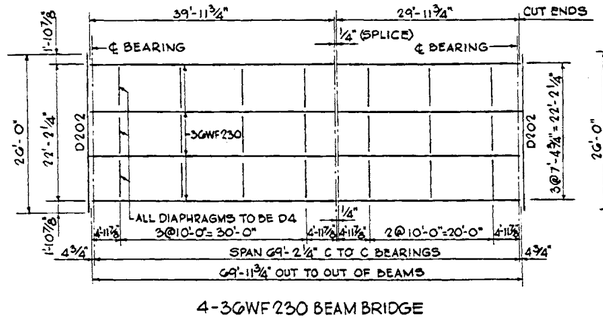
6-24WF84 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852804

STRESS TABLE

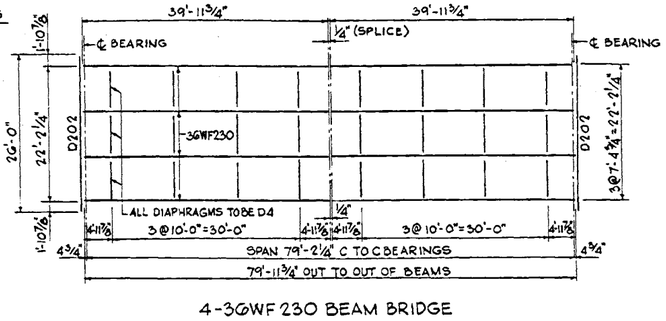
FACILITY NO.	DESCRIPTION	MAXIMUM SHEAR					MAXIMUM MOMENT				
		D.L.	L.L.	IMPACT	50%LL+I	TOTAL	D.L.	L.L.	IMPACT	50%LL+I	TOTAL
852801	4-18WF77 UNSPLICED SPAN 19'-2¼"	13.7	79.6	11.9	45.8	151.0	66.8	382.5	57.4	220.0	726.7
852802	4-18WF77 UNSPLICED SPAN 29'-2¼"	20.2	87.2	13.1	50.1	170.6	74.5	633.3	95.0	364.2	1167.0
852803	6-18WF77 UNSPLICED SPAN 39'-2¼"	30.0	91.6	13.7	52.7	188.0	148.4	881.8	132.3	507.1	1669.6
852804	6-24WF84 SPLICED SPAN 49'-2¼"	36.6	94.0	14.1	54.1	198.8	452.8	1156.7	173.5	665.1	2448.1
852805	10-24WF84 SPLICED SPAN 59'-2¼"	54.1	95.6	14.3	55.0	219.0	804.8	1443.3	216.5	829.9	3294.5
852806	4-36WF230 SPLICED SPAN 69'-2¼"	71.6	96.8	14.5	55.7	238.6	1245.1	1741.7	261.3	1001.5	4249.6
852807	4-36WF230 SPLICED SPAN 79'-2¼"	81.1	99.2	14.9	57.1	252.3	1612.1	2025.0	303.8	1164.4	5105.3
852808	5-36WF230 SPLICED SPAN 89'-2¼"	102.1	100.8	15.1	58.0	276.0	2280.0	2313.3	347.0	1330.2	6276.8
852809	6-36WF230 SPLICED SPAN 99'-2¼"	116.2	102.4	15.4	58.9	292.9	2892.2	2600.0	390.0	1495.0	7377.2



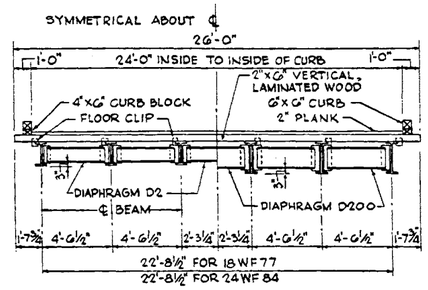
10-24WF84 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852805



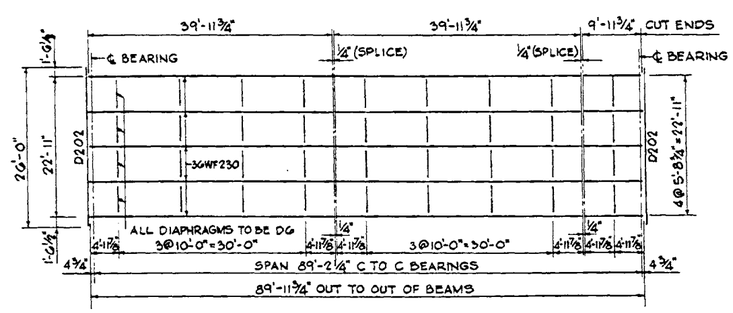
4-36WF230 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852806



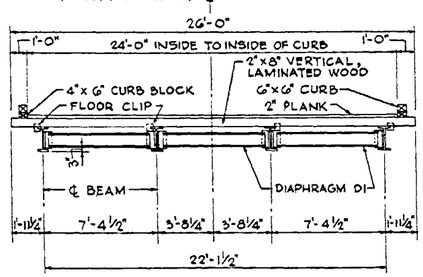
4-36WF230 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852807



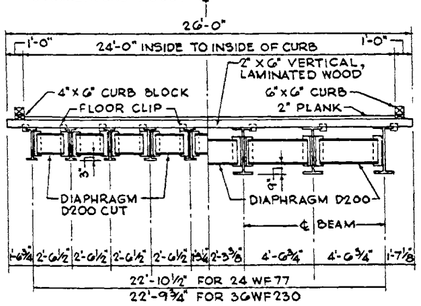
HALF SECTION HALF SECTION
6-18WF77 BEAM BRIDGE 6-24WF84 BEAM BRIDGE
SCALE NO. 2



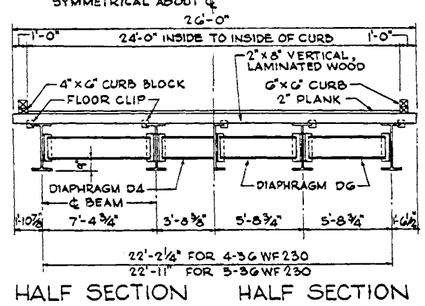
5-36WF230 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852808



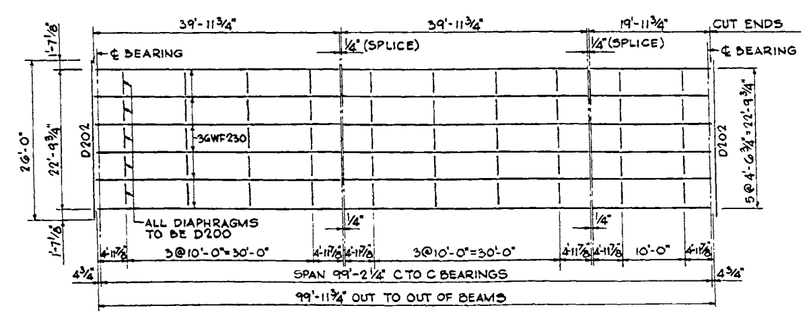
CROSS SECTION
4-18WF77 BEAM BRIDGE
SCALE NO. 2



HALF SECTION HALF SECTION
10-24WF84 BEAM BRIDGE 6-36WF230 BEAM BRIDGE
SCALE NO. 2



HALF SECTION HALF SECTION
4-36WF230 BEAM BRIDGE 5-36WF230 BEAM BRIDGE
SCALE NO. 2



6-36WF230 BEAM BRIDGE
SCALE NO. 10
FACILITY NO. 852809

GENERAL NOTES

1. SPANS ARE CENTER TO CENTER OF BEARINGS.
2. SHEAR IN KIPS, MOMENTS IN FOOT-KIPS, PER BRIDGE.
3. BRIDGES USING 18WF77, 24WF84 & 36WF230 AS SHOWN ON THIS DRAWING ARE TO BE CONSTRUCTED ONLY UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCK ARE EXHAUSTED.
4. DIMENSIONS LOCATING DIAPHRAGMS ARE TO THE ℄ OF CONNECTION TEES.
5. BEAMS 39'-11¾" IN LENGTH, AS SHOWN, DO NOT NECESSARILY REPRESENT THE LENGTH OF BEAMS WHICH MAY BE AVAILABLE IN DEPOT STOCKS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-28	PLANS-DBL LANE, CLASS 25	1 OF 3
85-28	PLANS-SGL LANE, CLASS 50	2 OF 3
85-28	DETAILS	3 OF 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' NO.2
0 5' 10' 15' 20' NO.10

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
RECOMMENDED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
ROAD BRIDGE SUPERSTRUCTURES
6-18WF77, 24WF84, 36WF230 BEAM CONSTRUCTION
DETAILS & SECTIONS
DOUBLE LANE CLASS 25-2 WAY OR CLASS 50 CONTROLLED

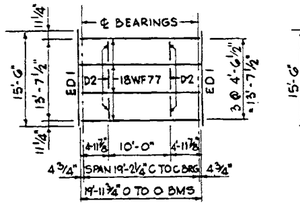
UNDER REVISION

APPROVED: [signature] H. M. Williams DATE: 18 MAR 1969

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 3
85-28

CORPS OF ENGINEERS

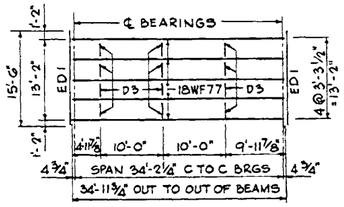
U. S. ARMY



4-18WF 77 BRIDGE

SCALE NO. 10

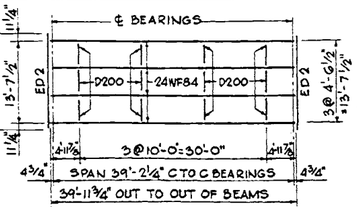
FACILITY NO 852821



5-18 WF 77 BRIDGE

SCALE NO. 10

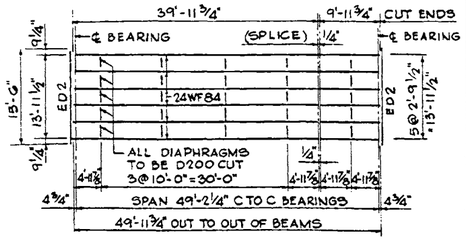
FACILITY NO. 852822



4-24 WF84 BRIDGE

SCALE NO. 10

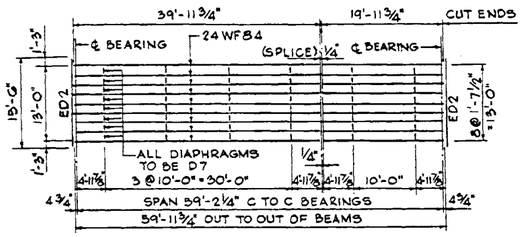
FACILITY NO. 852823



6-24 WF 84 BRIDGE

SCALE NO. 10

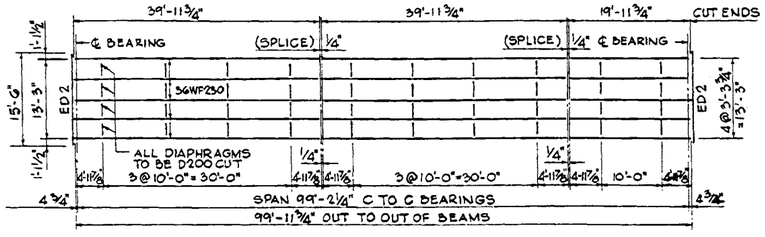
FACILITY NO. 852824



9-24 WF 84 BRIDGE

SCALE NO. 10

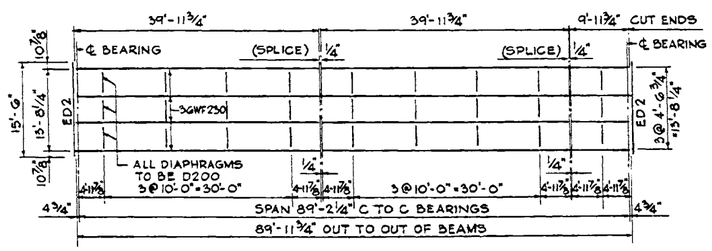
FACILITY NO. 852825



5-36WF 230 BRIDGE

SCALE NO. 10

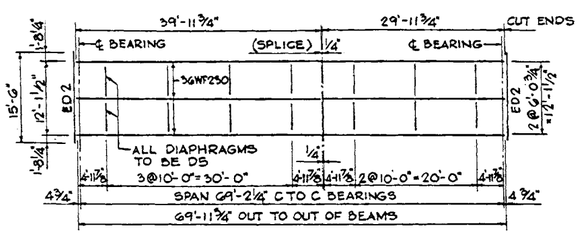
FACILITY NO. 852829



4-36WF 230 BRIDGE

SCALE NO. 10

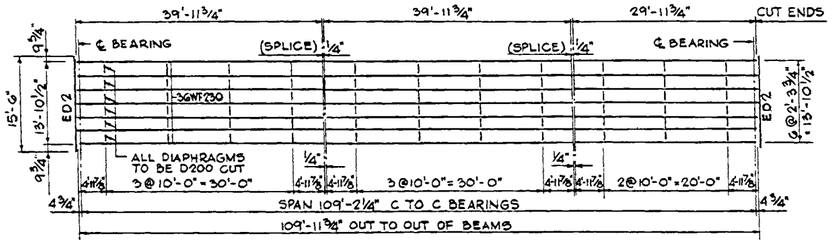
FACILITY NO. 852828



3-36WF 230 BRIDGE

SCALE NO. 10

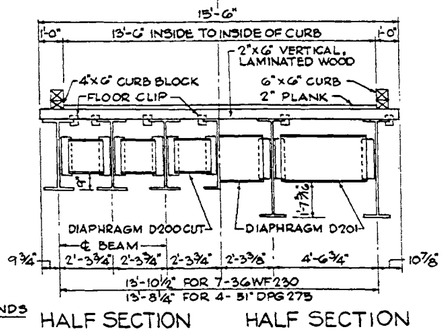
FACILITY NO. 852826 - SPAN - 69'-2⅛" (SHOWN)
FACILITY NO. 852827 - SPAN - 79'-2⅛"



7-36WF 230 BRIDGE

SCALE NO. 10

FACILITY NO. 852830



HALF SECTION HALF SECTION

7-36WF230 BEAM BRIDGE 4-51" DPG 275 GIRDER BRIDGE

SCALE NO. 3

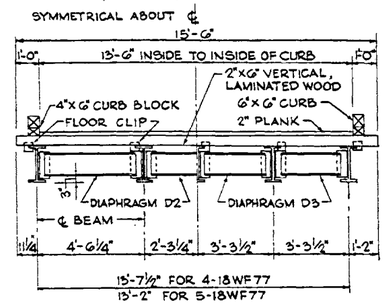
4-51" DPG BRIDGE

SCALE NO. 10

FACILITY NO. 852831 - SPAN 119'-2⅛" (SHOWN)
FACILITY NO. 852832 - SPAN 129'-2⅛"

STRESS TABLE

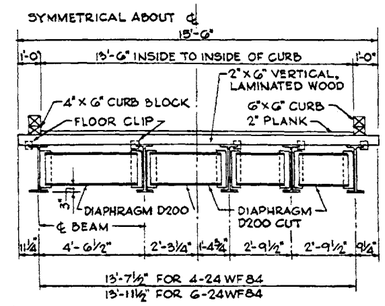
FACILITY NO.	DESCRIPTION	MAXIMUM SHEAR					MAXIMUM MOMENT				
		D.L.	L.L.	IMPACT	50%L.L+I	TOTAL	D.L.	L.L.	IMPACT	50%L.L+I	TOTAL
852821	4-18WF77 UNSPLICED SPAN 19'-2⅛"	8.7	67.1	10.1	38.6	125.0	42.5	337.6	50.6	194.1	624.8
852822	5-18WF77 UNSPLICED SPAN 34'-2⅛"	16.5	81.4	12.2	40.8	150.9	142.6	712.6	106.9	409.8	1371.9
852823	4-24WF84 UNSPLICED SPAN 39'-2⅛"	18.4	83.8	12.6	48.2	163.0	181.5	857.5	125.6	481.6	1626.2
852824	6-24WF84 SPLICED SPAN 49'-2⅛"	28.0	87.0	13.1	50.1	178.2	346.3	1080.0	162.0	621.0	2209.3
852825	9-24WF84 SPLICED SPAN 59'-2⅛"	42.3	89.2	13.4	51.3	196.2	629.8	1338.3	200.7	769.5	2938.3
852826	3-36WF230 SPLICED SPAN 69'-2⅛"	48.6	93.4	14.0	53.7	209.7	845.1	1587.4	238.1	912.8	3583.4
852827	3-36WF230 SPLICED SPAN 79'-2⅛"	55.6	96.2	14.4	55.3	221.5	883.9	1838.3	275.7	1057.0	4054.9
852828	4-36WF230 SPLICED SPAN 89'-2⅛"	68.6	98.4	14.8	56.6	238.4	1534.9	2102.4	315.4	1208.9	5161.6
852829	5-36WF230 SPLICED SPAN 99'-2⅛"	87.5	100.2	15.0	57.6	260.8	2180.4	2404.9	360.7	1382.8	6328.8
852830	7-36WF230 SPLICED SPAN 109'-2⅛"	122.1	101.5	15.3	58.6	297.5	3342.9	2679.9	402.0	1541.0	7965.8
852831	4-51 DPG275 SPLICED SPAN 119'-2⅛"	112.5	102.4	15.4	58.9	289.2	3359.6	2970.7	445.6	1708.2	8484.1
852832	4-51 DPG275 SPLICED SPAN 129'-2⅛"	122.6	104.0	15.6	59.8	302.0	3977.5	3260.7	489.1	1874.9	9602.2



HALF SECTION HALF SECTION

4-18WF77 BEAM BRIDGE 5-18WF77 BEAM BRIDGE

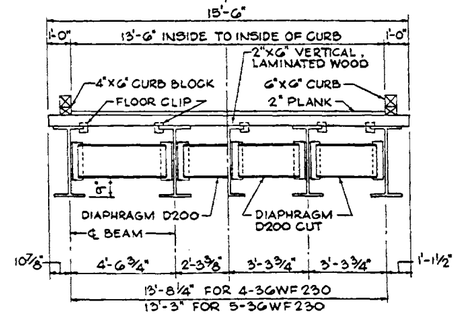
SCALE NO. 3



HALF SECTION HALF SECTION

4-24WF84 BEAM BRIDGE 6-24WF84 BEAM BRIDGE

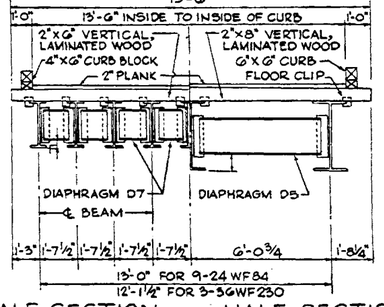
SCALE NO. 3



HALF SECTION HALF SECTION

4-36WF230 BEAM BRIDGE 5-36WF230 BEAM BRIDGE

SCALE NO. 3



HALF SECTION HALF SECTION

9-24WF84 BEAM BRIDGE 3-36WF230 BEAM BRIDGE

SCALE NO. 3

GENERAL NOTES

1. SPANS ARE CENTER TO CENTER OF BEARINGS
2. SHEAR IN KIPS, MOMENTS IN FOOT-KIPS, PER BRIDGE.
3. BRIDGES USING 18 WF 77, 24 WF 84 & 36 WF 230 AS SHOWN ON THIS DRAWING ARE TO BE CONSTRUCTED ONLY UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCK ARE EXHAUSTED.
4. DIMENSIONS LOCATING DIAPHRAGMS ARE TO THE ℄ OF CONNECTION TEES.
5. BEAMS 39'-11¾" IN LENGTH, AS SHOWN, DO NOT NECESSARILY REPRESENT THE LENGTH OF BEAMS WHICH MAY BE AVAILABLE IN DEPOT STOCK.
6. WHEN SPACES BETWEEN FLANGES ARE LESS THAN 3'-0", ROUGH PLANKING 4" THICK MAY BE SAFELY USED IN LIEU OF 2" PLANKING AND LAMINATED WOOD.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
85-28	PLANS-DBL LANE, CLASS 25	1 OF 3
85-28	PLANS-SGL LANE, CLASS 50	2 OF 3
85-28	DETAILS	3 OF 3
85-21	DETAILS	8, 9 OF 9
86-16	DETAILS	14, 15, 16 OF 16

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 1' 2' 3' 4' 5' NO. 3

0 5' 10' 15' 20' NO. 10

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED (JOINT PROPONENT AGENCY):
DATE

THEATER OF OPERATIONS

ROAD BRIDGE SUPERSTRUCTURES
4-18WF77, 5-18WF77, 4-24WF84, 6-24WF84, 4-36WF230, 5-36WF230, 7-36WF230, 4-51" DPG 275 GIRDER BRIDGES
PLANS & SECTIONS
SINGLE LANE-CLASS 50 POSTED

UNDER REVISION

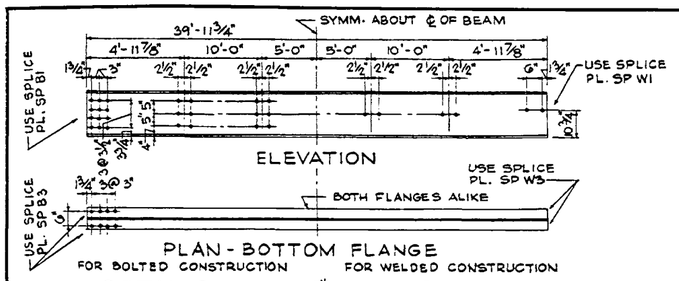
DATE 19 JAN 1959

SCALE: AS NOTED

SPEC. NO.

DRAWING NUMBER 85-28

SHEET 2 OF 3

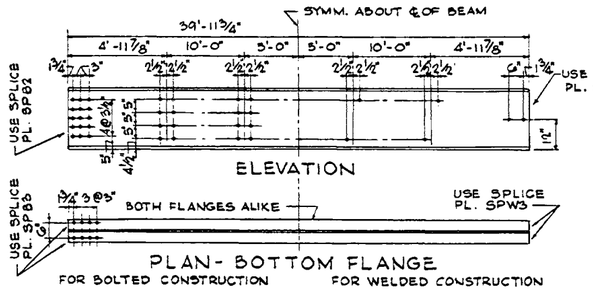


ELEVATION

PLAN - BOTTOM FLANGE

FOR BOLTED CONSTRUCTION FOR WELDED CONSTRUCTION

DETAILS FOR 18"WF77 BEAMS

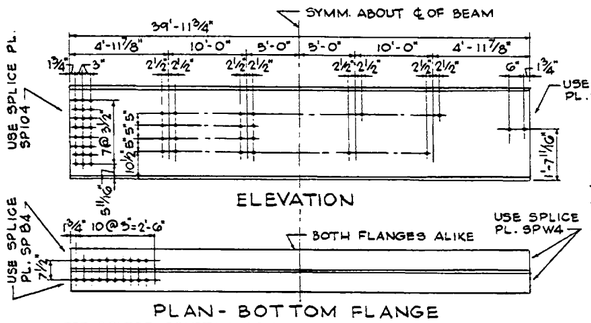


ELEVATION

PLAN - BOTTOM FLANGE

FOR BOLTED CONSTRUCTION FOR WELDED CONSTRUCTION

DETAILS FOR 24"WF 84 BEAMS

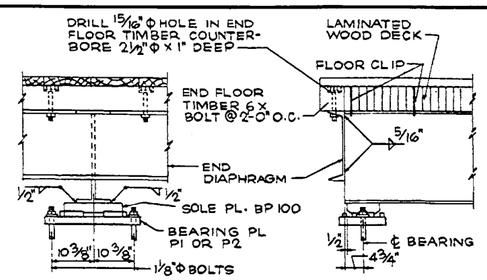


ELEVATION

PLAN - BOTTOM FLANGE

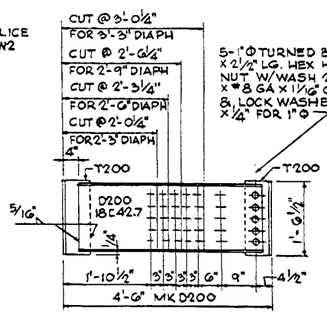
FOR BOLTED CONSTRUCTION FOR WELDED CONSTRUCTION

DETAILS FOR 36"WF230 BEAMS



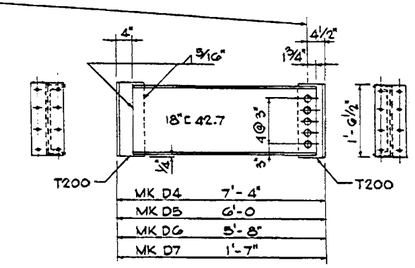
END SIDE

TYPICAL ASSEMBLY AT END BEARING



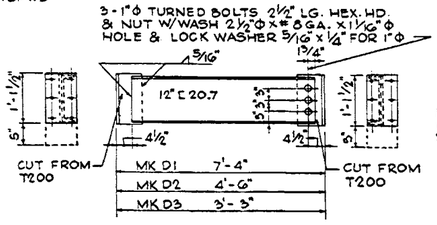
INTERIOR DIAPHRAGMS

D200 & D200 CUT



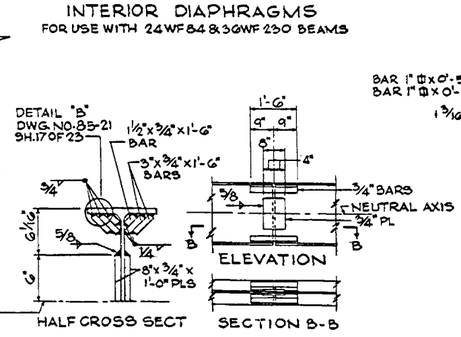
INTERIOR DIAPHRAGMS

FOR USE WITH 24WF84 & 36WF230 BEAMS

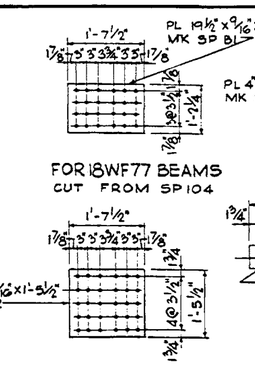


INTERIOR DIAPHRAGMS

FOR USE WITH 18WF77 BEAMS



WELDED SPLICE FOR 24WF84



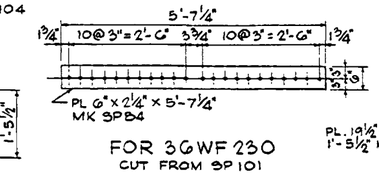
FOR 18WF77 BEAMS CUT FROM SP104

FOR 18WF77 & 24WF84 CUT FROM SP103

FOR 24WF84 BEAMS CUT FROM SP 102

WEB SPLICE PLATES

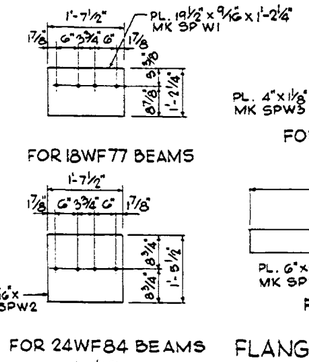
FOR BOLTED CONSTRUCTION



FOR 36WF 230 CUT FROM SP 101

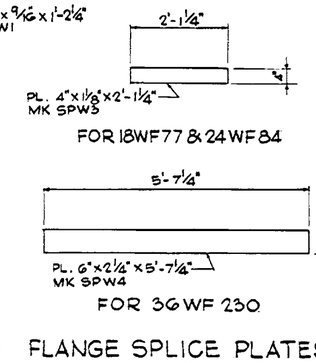
FLANGE SPLICE PLATES

FOR BOLTED CONSTRUCTION



FOR 36WF 230

FOR 24WF84 BEAMS

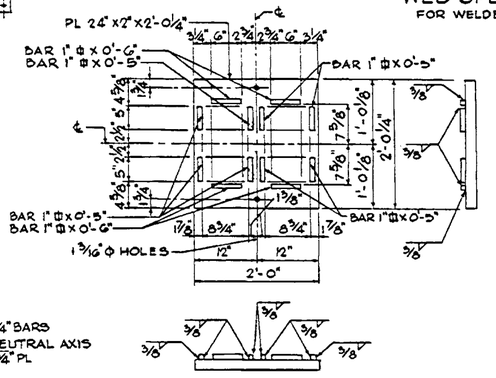


FOR 18WF77 & 24WF84

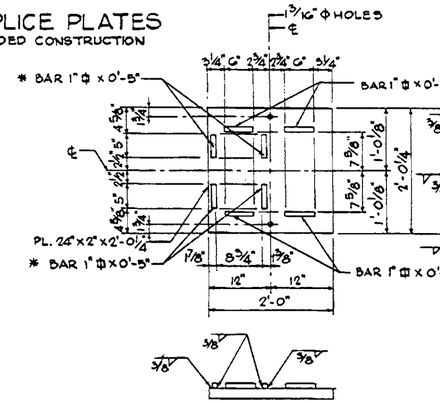
FOR 36WF 230

FLANGE SPLICE PLATES

FOR WELDED CONSTRUCTION



2 FIXED BEARINGS - MK P3

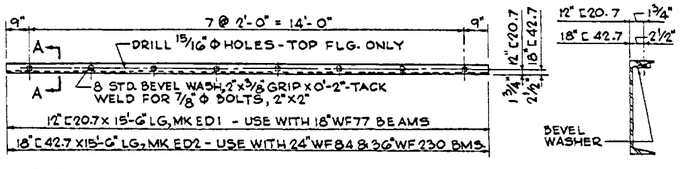


1 FIXED & 1 EXPANSION BEARING - MK P5

2 EXPANSION BEARINGS - MK P4

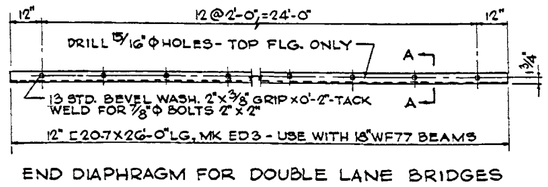
(* BARS TO BE OMITTED FOR P4)

BEARING PLATES FOR MULTIPLE SPANS

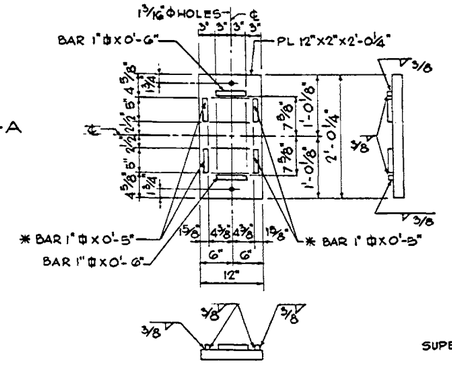


END DIAPHRAGMS FOR SINGLE LANE BRIDGES

SECTION A-A



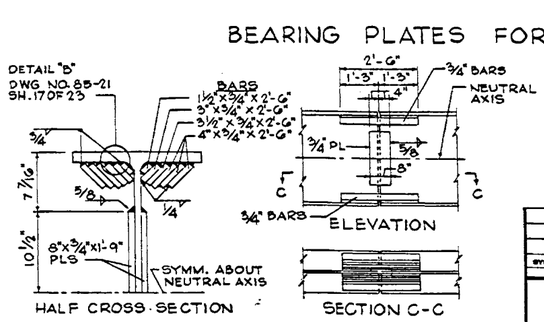
END DIAPHRAGM FOR DOUBLE LANE BRIDGES



FIXED BEARING - MK P1

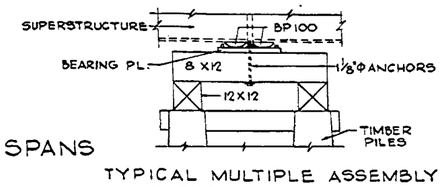
EXPANSION BEARING - MK P2

(* BARS TO BE OMITTED FOR P2)

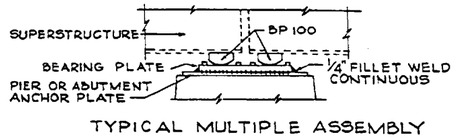


WELDED SPLICE FOR 36WF230

BEARING PLATES FOR END SPANS



TYPICAL MULTIPLE ASSEMBLY ACROSS TIMBER PIER



TYPICAL MULTIPLE ASSEMBLY ACROSS CONCRETE PIER

GENERAL NOTES

1. BEAMS 39'-11¾" IN LENGTH, AS SHOWN, DO NOT NECESSARILY REPRESENT THE LENGTH OF BEAMS WHICH MAY BE AVAILABLE IN DEPOT STOCKS.
2. THE DETAILS REPRESENT BOLTED AND/OR WELDED CONSTRUCTION WELDED CONSTRUCTION OF THESE BRIDGES MAY BE ACCOMPLISHED, AS AN ALTERNATE CHOICE, BY FIELD UNITS CHARGED WITH ERECTION OF THESE SPANS.
3. THE ABOVE DETAILED BEARING PLATES ARE FOR USE WITH ALL STEEL BRIDGE SPANS AS SHOWN ON DWGS. NO. 85-21 & 85-28

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: R. W. DEITCHMANN
APPROVED:

THEATER OF OPERATIONS

ROAD BRIDGE SUPERSTRUCTURE 18WF77, 24WF84, & 36WF230 BEAM CONSTRUCTION DETAILS

UNDER REVISION

APPROVED: H. M. Williams DATE: 19 MAR 1969

CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

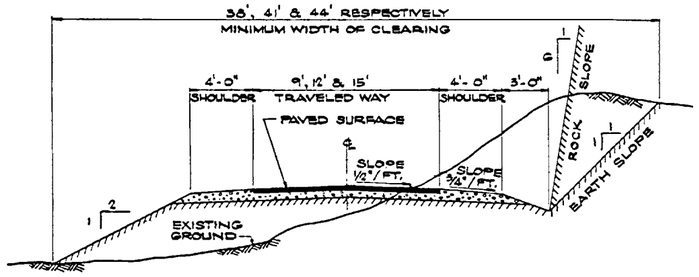
APPROVED FOR PROPONENT AGENCY:

DATE

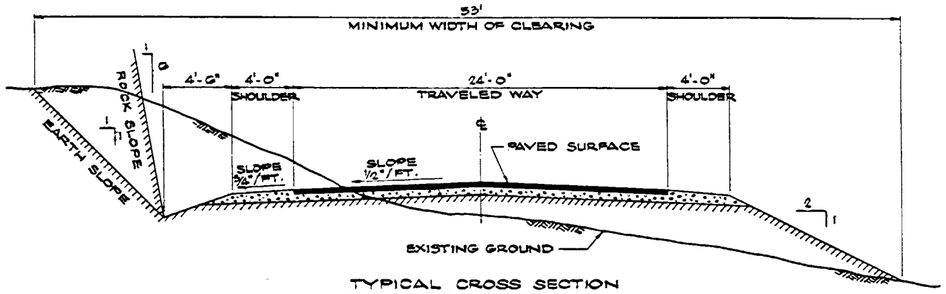
SCALE: NONE SPEC. NO.

DRAWING NUMBER 85-28

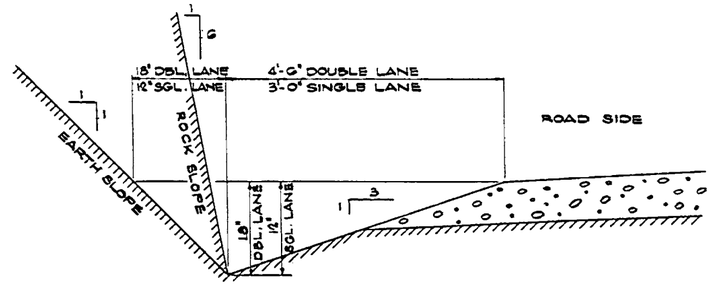
SHEET 3 OF 3



TYPICAL CROSS SECTION
SINGLE LANE ROAD
NO SCALE



TYPICAL CROSS SECTION
DOUBLE LANE ROAD
NO SCALE



TYPICAL "V" DITCH SECTION
NO SCALE

SCHEDULE OF FACILITIES

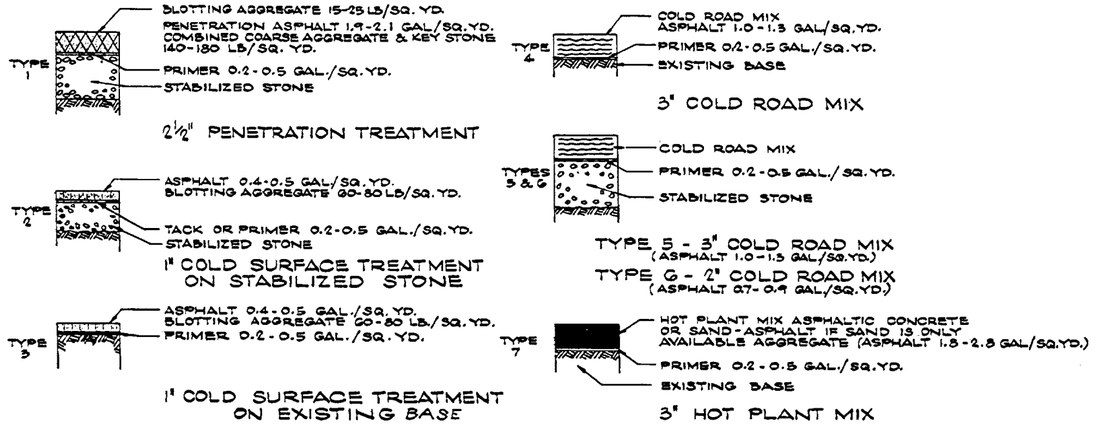
DESCRIPTION	PAVING TYPE	ROAD SINGLE LANE (1 MILE)	ROAD DOUBLE LANE (1 MILE)	RUNWAYS, HARDSTAND, APRONS & TAXIWAYS 1000 S.Y.
GRADED & DRAINED	-	853110	853120	853130
4 IN. STABILIZED EARTH OR STONE	-	853111	NONE	853131
6 IN. STABILIZED EARTH OR STONE	-	NONE	853121	NONE
1 IN. COLD SURFACE TREATMENT, BLOTTED ON 4 IN. STABILIZED STONE	2	853112	NONE	853132
1 IN. COLD SURFACE TREATMENT, BLOTTED ON 6 IN. STABILIZED STONE	2	NONE	853122	NONE
1 IN. COLD SURFACE TREATMENT, BLOTTED ON PRIMED EXISTING BASE	3	853113	853123	853133
2 IN. COLD ROAD MIX, COLD LAID ASPHALT ON 6 IN. PRIMED STABILIZED STONE.	6	853114	853124	NONE
3 IN. COLD ROAD MIX, COLD LAID ASPHALT ON 6 IN. PRIMED STABILIZED STONE	5	853115	853125	853135
3 IN. COLD ROAD MIX, COLD LAID ASPHALT ON PRIMED EXISTING BASE	4	853116	853126	NONE
3 IN. HOT PLANT MIX, HOT LAID ASPHALT ON PRIMED EXISTING BASE	7	NONE	853127	NONE
3 IN. HOT MIX SAND ASPHALT LAID ON PRIMED EXISTING BASE	7	NONE	853128	NONE
2½ IN. PENETRATION TREATMENT, BLOTTED ON PRIMED 6 IN. STABILIZED STONE	1	NONE	NONE	853134
1 LANE WIDEN TO 2 LANE - 3 IN. COLD ROAD MIX, COLD LAID ASPHALT ON PRIMED 6 IN. STABILIZED STONE	5	NONE	853129	NONE

ROADS
VOLUME OF EARTHWORK*
CUBIC YARDS PER LINEAL FOOT OF ROAD

CUT	SINGLE LANE 9' ROAD	SINGLE LANE 12' ROAD	SINGLE LANE 15' ROAD	DOUBLE LANE 24' ROAD	FILL	SINGLE LANE 9' ROAD	SINGLE LANE 12' ROAD	SINGLE LANE 15' ROAD	DOUBLE LANE 24' ROAD
1'	1.46	1.53	1.67	2.01	1'	0.70	0.82	0.90	1.26
2'	2.64	2.78	3.08	3.74	2'	1.60	1.78	2.00	2.67
3'	3.90	4.12	4.56	5.56	3'	2.60	2.89	3.20	4.23
4'	5.23	5.54	6.12	7.44	4'	3.70	4.15	4.60	5.93
5'	6.64	7.00	7.75	9.41	5'	5.00	5.55	6.10	7.78
6'	8.11	8.56	9.46	11.44	6'	6.40	7.10	7.80	9.78
7'	9.67	10.20	11.24	13.50	7'	8.10	8.80	9.60	11.92
8'	11.34	11.88	13.09	15.74	8'	9.80	10.67	11.60	14.22
9'	13.02	13.65	15.03	17.97	9'	11.70	12.68	13.70	16.67
10'	14.75	15.54	17.00	20.31	10'	13.70	14.80	15.90	19.25

* THESE QUANTITIES ARE COMPUTED ON THE BASIS OF "TRAPEZOIDAL" SECTIONS WITH "V" DITCH VOLUMES INCLUDED. (IN PLACE QUANTITIES)

TYPICAL BITUMINOUS PAVING SECTIONS



LEGEND

- CLEARED COMPACTED NATIVE SOIL
- CRUSHER RUN STONE, CRUSHER RUN GRAVEL, WELL GRADED RIVER OR BANK RUN GRAVEL (STABILIZED STONE)
- ASPHALT WITH BLOTTING FINES ADDED.
- COLD ROAD MIX
- HOT MIX ASPHALTIC CONCRETE OR SAND-ASPHALT
- CRUSHED ROCK LAID PENETRATION ASPHALT ADDED
- FINISHED TEMPLATE

ESTIMATED WEIGHT OF AGGREGATE IS 2600 LBS/CU.YD. IN LOOSE CONDITION.

TEMPERATURE LIMITS
(DEGREES FAHRENHEIT)

BITUMINOUS MATERIAL	SPRAYING	MIXING	FLASH POINT
MC 800 (MC 3)	180 - 255	170 - 210	150+
RC 800 (RC 3)	180 - 255	170 - 210	80+
AC 85-100 (AP 3)	285 - 350	275 - 325	347+
MC 3 + 15% JP4 OR KEROSENE	110 - 185	80 - 150	100+

GENERAL NOTES

1. WHERE SERVICE ROADS ARE ADJACENT TO BUILDINGS, SHOULDERS AND MINIMUM WIDTH OF CLEARING DIMENSIONS SHOULD BE ALTERED AS REQUIRED.
2. WHERE ROADS MEET ABUTMENTS, SHOULDERS MAY BE NARROWED, IF NECESSARY.
3. PROVIDE TURNOUTS ON SINGLE LANE ROADS EVERY ¼ MILE OR WHEREVER NEEDED.

HARDSTANDS

1. FOR HARDSTANDS OR AIRFIELD APRONS, THE PAVEMENT SLOPE IN ANY DIRECTION SHALL BE:
   MINIMUM GRADIENT - 1.0%
   MAXIMUM GRADIENT - 3.0%
2. FOR GENERAL PURPOSE VEHICULAR HARDSTANDS, USE 40 SQ. YD. PER VEHICLE.
3. FOR VEHICULAR HARDSTANDS FOR WHICH ONE TYPE OF VEHICLE IS PREDOMINATE, USE 2½ TIMES THE SQUARE YARDS OCCUPIED BY ONE VEHICLE TIMES THE NUMBER OF VEHICLES CONSIDERED.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

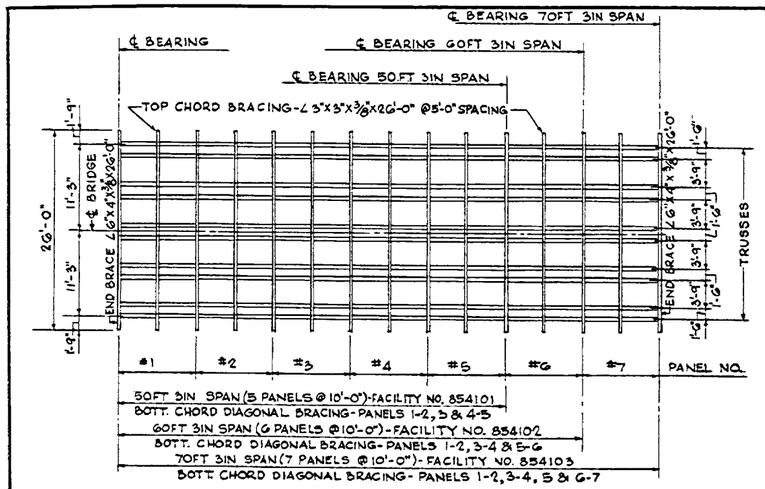
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS
ROADS & HARDSTANDS TYPICAL DETAILS
UNDER REVISION

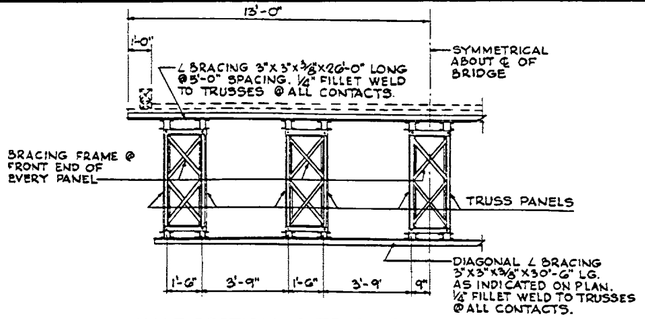
ACCEPTED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] for H. H. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1952

APPROVED FOR PROPONENT AGENCY:
DATE:

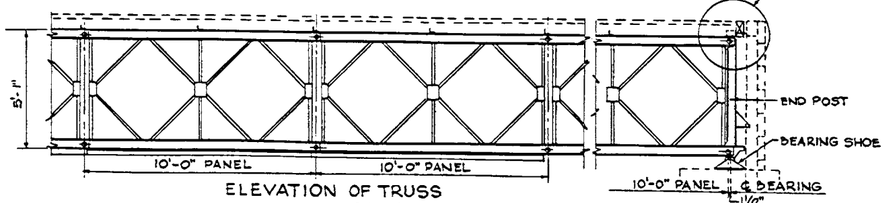
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 85-31
SHEET 1 OF 1



PLAN OF 10 TRUSS BRIDGES
SCALE NO. 1

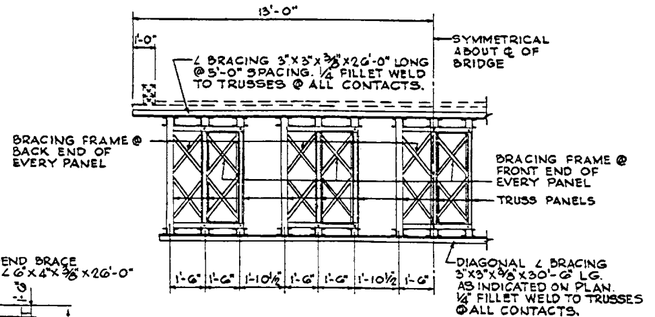


HALF SECTION-10 TRUSS BRIDGE
SCALE NO. 3

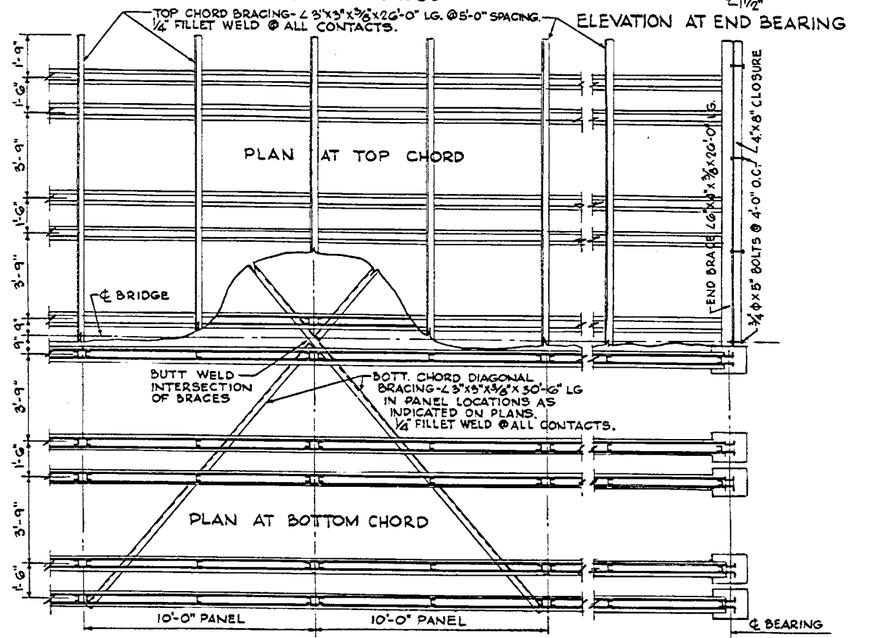


ELEVATION OF TRUSS

ELEVATION AT END BEARING



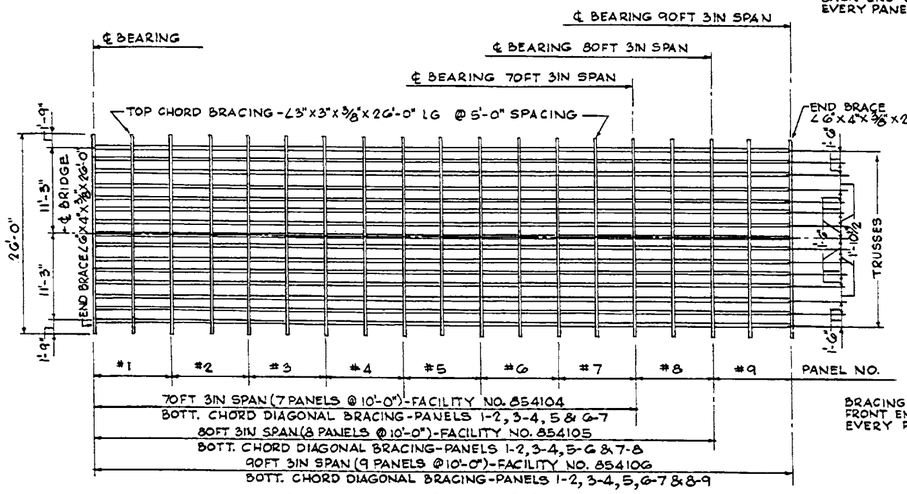
HALF SECTION-15 TRUSS BRIDGE
SCALE NO. 3



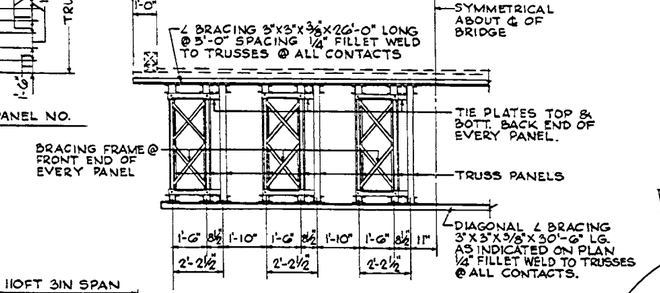
PLAN-AREA OF BOTTOM CHORD BRACING

PLAN AT END BEARING

10 TRUSS CONDITION SHOWN
(15 & 18 TRUSS CONDITIONS SIMILAR)
SCALE NO. 3

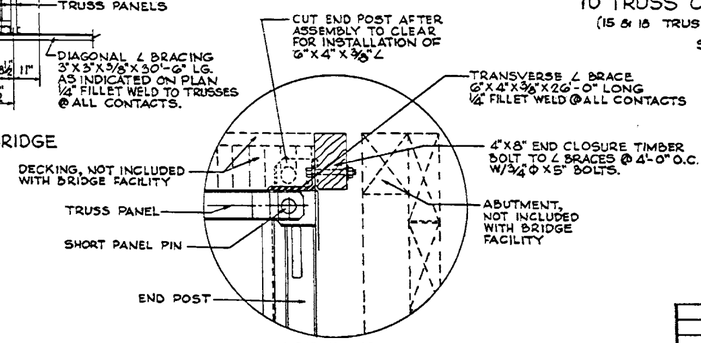


PLAN OF 15 TRUSS BRIDGES
SCALE NO. 1



HALF SECTION-18 TRUSS BRIDGE
SCALE NO. 3

PLAN OF 18 TRUSS BRIDGES
SCALE NO. 1



DETAIL NO. 1
NO SCALE

MAXIMUM SPANS & LOADINGS
DOUBLE LANE, DECK TYPE, BAILEY TYPE BRIDGE

SPAN	CLASSES OF LOADING: 10 TRUSS BRIDGE WHEEL VEHICLE	10 TRUSS BRIDGE TRACK VEHICLE	15 TRUSS BRIDGE WHEEL VEHICLE	15 TRUSS BRIDGE TRACK VEHICLE	18 TRUSS BRIDGE WHEEL VEHICLE	18 TRUSS BRIDGE TRACK VEHICLE	FACILITY NO.
50FT	80	70					854101
60FT	70	65					854102
70FT	60	60					854103
70FT			100	90			854104
80FT			100	90			854105
90FT			65	65			854106
80FT					100	90	854107
90FT					100	90	854108
100FT					80	70	854109
110 FT					65	65	854110

GENERAL NOTES

1. REFERENCE IS MADE TO ARMY TECHNICAL MANUAL TM 5-277, ENTITLED "PANEL BRIDGE, BAILEY TYPE, M2" FOR MORE DETAILED INFORMATION REGARDING THE ABOVE BRIDGES AND THEIR COMPONENT PARTS.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 5' 10' 15' NO.1
0 1' 2' 3' 4' 5' NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: [signature]
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

ROAD BRIDGE SUPERSTRUCTURES
DOUBLE LANE BRIDGES-BAILEY TYPE
DECK TYPE-PANEL CONSTRUCTION
VARIOUS SPANS VARIOUS CLASSES

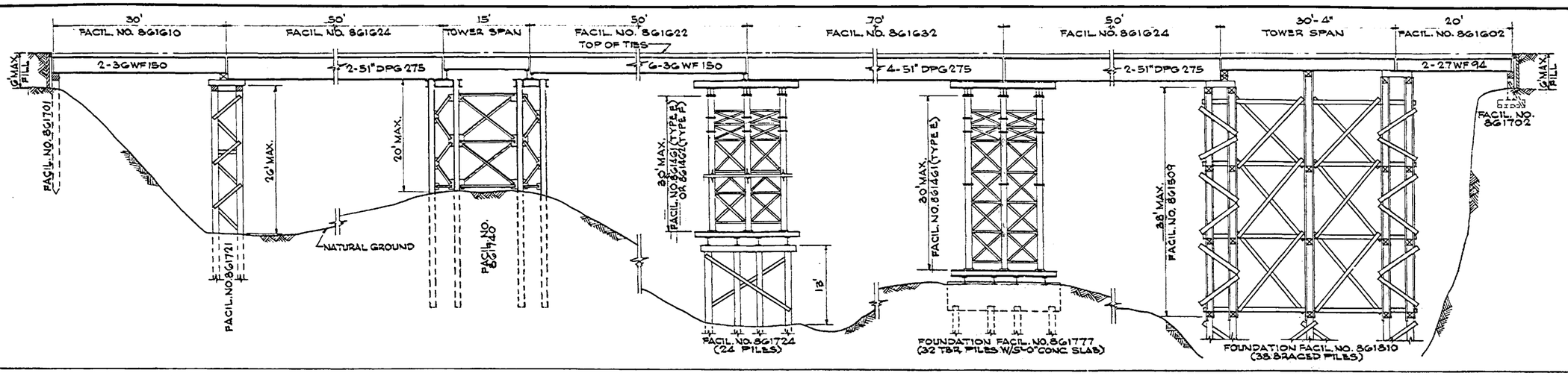
UNDER REVISION

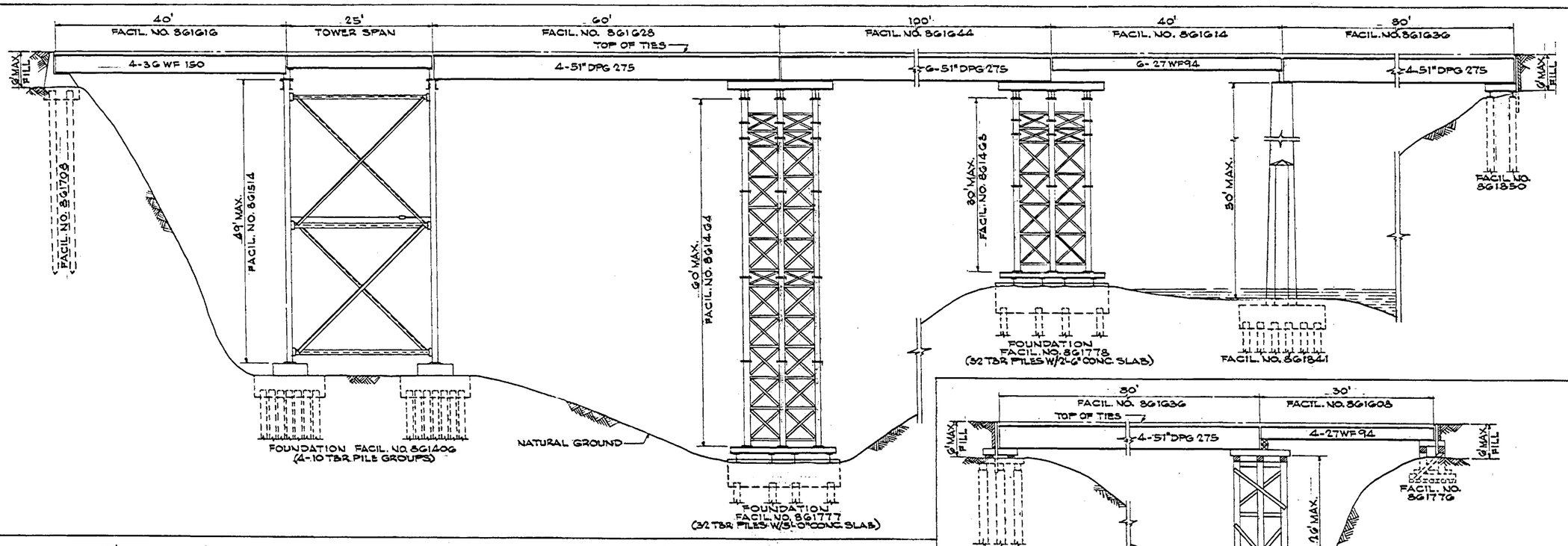
APPROVED: [signature] DATE: 19 MAR 1963
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

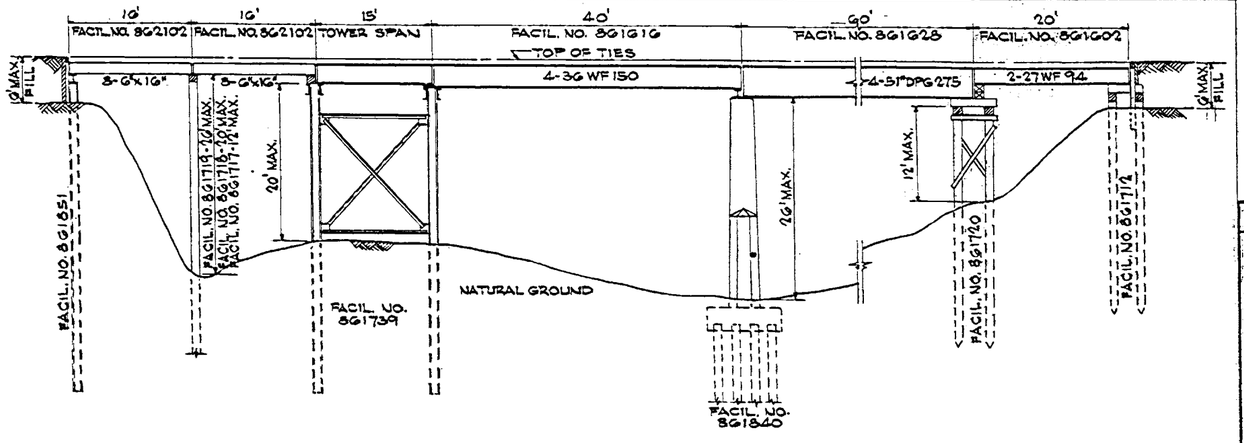
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 85-41
SHEET 1 OF 1

CORPS OF ENGINEERS

U. S. ARMY







INSTALLATION FB2675

SCHEDULE OF FACILITIES

SUPERSTRUCTURES

FACILITY CODE NO.	QUANTITY REQ'D.
861G02	11
861G05	6
861G10	6
861G14	4
861G16	5
861G22	4
861G28	3
861G32	3
861G36	7
861G44	3
862102	30
861G24	3
862120	25
862121	5
862101	28

SUBSTRUCTURES

FACILITY CODE NO.	QUANTITY REQ'D.
861461	3
861462	3
861464	1
861514	4
861701	7
861702	6
861406	4
861708	6
861712	2
861716	4
861717	9
861718	8
861719	18
861720	6
861721	11
861722	18
861724	6
861739	9
861740	2
861470	6
861776	2
861777	2
861778	5
861810	5
861840	1
861841	2
861850	4
861851	2
861509	5
861463	5

GENERAL NOTES

1. NOT FOR CONSTRUCTION.
2. TO BE USED ONLY FOR PLANNING PURPOSES IN CONJUNCTION WITH STAFF TABLE PBR-1-057.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-01	SCHEDULE OF FACILITIES AND VARIOUS COMBINATIONS OF SUPERSTRUCTURES & SUBSTRUCTURES	1 OF 2
86-16	SUPERSTRUCTURES	1-16 OF 16
86-21	SUPERSTRUCTURES	1-20F2
86-14	SUBSTRUCTURES	1-110F11
86-15	SUBSTRUCTURES	1-50F5
86-17	SUBSTRUCTURES	1-90F9
86-18	SUBSTRUCTURES	1-40F4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO. 1

MAYER, STAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH, MILITARY ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

RAILROAD BRIDGES
SINGLE TRACK-E-45 LOADING
SCHEDULE OF FACILITIES AND VARIOUS COMBINATIONS OF SUPERSTRUCTURES & SUBSTRUCTURES

APPROVED: H. M. Williams DATE: 19 MAR 1963

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-01
SHEET 1 OF 1

TYPE OF BRIDGE FOR VARIOUS LENGTH RAILROAD SPANS

SPAN LENGTHS C.C. BEARINGS	DESCRIPTION OF BRIDGE: NUMBER OF BEAMS OR GIRDERS PER BRIDGE	DESCRIPTION OF BRIDGE: SIZE OF BEAM OR GIRDER	WEIGHT PER FOOT OF BRIDGE IN LBS.: NARROW GAGE	WEIGHT PER FOOT OF BRIDGE IN LBS.: WIDE GAGE	NUMBER OF 40 FT UNITS REQUIRED	LENGTHS OF PIECES REQUIRED PER LINE OF BEAMS OR GIRDERS: NO.	MARK	LENGTH	NUMBER OF SPLICES PER LINE OF BEAM OR GIRDER	PLAN OF 40 FT. UNIT SHEET NO. OF DWG. 86-16: NARROW	WIDE
TO 22'-4½" INCL.	2	27 WF BEAM	303	319	1	1	B27	C.C. BRGS.+0'-9½"	0	3	4
	2	36 WF BEAM	419	436	1	1	B36	C.C. BRGS.+0'-9½"	0	5	6
22'-4½" TO 33'-11" INCL.	2	36 WF BEAM	419	436	1	1	B36	C.C. BRGS.+0'-9½"	0	5	6
	4	27 WF BEAM	446	512	1	1	B27	C.C. BRGS.+0'-9½"	0	3	4
33'-11" TO 35'-1" INCL.	2	36 WF BEAM	419	436	1	1	B36	C.C. BRGS.+0'-9½"	0	5	6
	6	27 WF BEAM	657	670	1	1	B27	C.C. BRGS.+0'-9½"	0	3	4
35'-1" TO 39'-2⅛" INCL.	6	27 WF BEAM	657	670	1	1	B27	C.C. BRGS.+0'-9½"	0	3	4
	4	36 WF BEAM	705	774	1	1	B36	C.C. BRGS.+0'-9½"	0	5	6
39'-2⅛" TO 44'-2½" INCL.	4	36 WF BEAM	705	774	2	1 1	B36 B36	34'-11¾" C.C. BRGS.-34'-2½"	1	5	6
	2	GIRDER	770	800	2	1 1	G51 G51	34'-11¾" C.C. BRGS.-34'-2½"	1	8	9
44'-2½" TO 45'-2½" INCL.	4	36 WF BEAM	705	774	2	1 1	B36 B36	39'-11¾" C.C. BRGS.-39'-2½"	1	5	6
	2	GIRDER	770	800	2	1 1	G51 G51	39'-11¾" C.C. BRGS.-39'-2½"	1	8	9
45'-2½" TO 55'-10" INCL.	2	GIRDER	770	800	2	1 1	G51 G51	39'-11¾" C.C. BRGS.-39'-2½"	1	8	9
	6	36 WF BEAM	1032	1046	2	1 1	B36 B36	39'-11¾" C.C. BRGS.-39'-2½"	1	5	6
55'-10" TO 57'-0½" INCL.	6	36 WF BEAM	1032	1046	2	1 1	B36 B36	39'-11¾" C.C. BRGS.-39'-2½"	1	5	6
	4	GIRDER	1330	1442	2	1 1	G51 G51	39'-11¾" C.C. BRGS.-39'-2½"	1	8	9
57'-0½" TO 79'-2¼" INCL.	4	GIRDER	1330	1442	2	1 1	G51 G51	39'-11¾" C.C. BRGS.-39'-2½"	1	8	9
79'-2¼" TO 81'-6" INCL.	4	GIRDER	1330	1442	3	1 1 1	G51 G51 G51	39'-11¾" 34'-11¾" C.C. BRGS.-74'-2½"	2	8	9
81'-6" TO 84'-2½" INCL.	6	GIRDER	2045	2047	3	1 1 1	G51 G51 G51	39'-11¾" 34'-11¾" C.C. BRGS.-74'-2½"	2	8	9
84'-2½" TO 100'-10½" INCL.	6	GIRDER	2045	2047	3	2 1	G51 G51	39'-11¾" C.C. BRGS.-79'-2½"	2	8	9

1. NARROW GAGE BRIDGES ARE USED FOR TRACK GAGES OF 3'-0", 3'-3⅜" & 3'-6".
2. WIDE GAGE BRIDGES ARE USED FOR TRACK GAGES OF 4'-8½", 5'-0", 5'-3" & 5'-6".
3. WEIGHT PER FOOT OF BRIDGE IS BASED ON MATERIAL INCLUDED IN BILL OF MATERIAL FOR 40 FOOT SQUARE END UNITS AND DOES NOT INCLUDE TIES, RAILS AND RAIL FASTENINGS.
4. THE SPAN LENGTHS, CENTER TO CENTER OF BEARINGS, OF ALL 27 WF BEAM BRIDGES AND THE 2-36 WF BEAM BRIDGES ARE BASED ON UNSPLICED BEAMS. IF SPLICES ARE USED, MAXIMUM SPANS ARE REDUCED. SEE DWG. NO. 86-16, SHEETS 1 & 2 OF 16 FOR MAXIMUM SPANS FOR SPLICED BEAMS.
5. THE NUMBER OF SPLICES SHOWN FOR ALL GIRDER BRIDGES AND FOR THE 4-36 WF AND 6-36 WF BEAM BRIDGES IS THE MINIMUM NUMBER THAT CAN BE USED, BASED ON THE LENGTHS OF PIECES SHOWN IN THE TABLE. IF DIFFERENT LENGTHS OF PIECES ARE USED, ADDITIONAL SPLICES MAY BE REQUIRED.

PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SQUARE END RAILROAD BRIDGES

1. BEAM AND GIRDER RAILROAD BRIDGES MAY BE USED FOR ANY SPAN UP TO 100'-10½" CENTER TO CENTER OF BEARINGS. TYPES OF BRIDGES ARE DETERMINED BY THE NUMBER OF LINES OF BEAMS OR GIRDERS, THE SIZE OF THE BEAMS OR GIRDERS AND BY THE GAGE. NARROW GAGE BRIDGES ARE USED FOR TRACK GAGES OF 3'-0" 3'-3⅜" AND 3'-6". WIDE GAGE BRIDGES ARE USED FOR TRACK GAGES OF 4'-8½", 5'-0", 5'-3" AND 5'-6".
2. TO SELECT THE TYPE OF BRIDGE REQUIRED FOR ANY GIVEN SPAN, DETERMINE THE GAGE OF THE TRACK AND THE SPAN LENGTH CENTER TO CENTER OF BEARINGS. WITH THIS INFORMATION, CONSULT THE TABLE ENTITLED TYPE OF BRIDGE FOR VARIOUS LENGTH RAILROAD SPANS AND SELECT THE TYPE OF BRIDGE TO BE USED. FOR ANY SPAN LESS THAN 57'-0½" CENTER TO CENTER OF BEARINGS, TWO TYPES OF BRIDGES MAY BE USED.
3. DETERMINE FROM THE SAME TABLE THE NUMBER OF 40 FOOT UNITS REQUIRED TO CONSTRUCT THE BRIDGE, THE OVERALL CUT LENGTH OF THE PIECES PER LINE OF BEAMS OR GIRDERS, THE NUMBER OF SPLICES PER LINE OF BEAMS OR GIRDERS, AND THE NUMBER OF THE SHEET WHICH SHOWS THE PLAN OF THE 40 FOOT UNIT. THE PLAN OF THE 40 FOOT UNIT SHOWS THE GENERAL LAYOUT OF THE BRIDGE, AND INDICATES THE LOCATION AND ERECTION MARKS OF LATERALS, LATERAL PLATES, SPACERS, SPLICE PLATES AND BEARINGS.
4. WHEN ENDS OF BEAMS OR GIRDERS ARE CUT OFF, END STIFFENERS OR END SPACERS AND, IN SOME INSTANCES, LATERALS AND LATERAL PLATES ARE TO BE FIELD WELDED IN PLACE. EXAMPLES OF THIS FIELD WELDING ARE SHOWN ON DWG. NO. 86-16, SHEET 8 & 9 OF 16.

EXAMPLES

1. ASSUME THE SPAN OF A BRIDGE TO BE 61'-0" CENTER TO CENTER OF BEARINGS AND THE GAGE OF THE TRACK TO BE 5'-0". A WIDE GAGE BRIDGE IS REQUIRED FOR A 5'-0" TRACK GAGE. CONSULT THE TABLE ENTITLED TYPE BRIDGE FOR VARIOUS LENGTH RAILROAD SPANS, USING A SPAN OF 61'-0" CENTER TO CENTER OF BEARINGS. THE TABLE INDICATES THAT A 4-GIRDER WIDE GAGE BRIDGE IS REQUIRED TO CONSTRUCT THE BRIDGE. THERE WILL BE 4 LINES OF GIRDERS CONSISTING OF TWO PIECES EACH. ONE PIECE IS 39'-11¾" LONG AND THE OTHER IS 61'-0" MINUS 39'-2½" OR 21'-9½". THERE WILL BE ONE SPLICE IN EACH LINE OF GIRDERS. THE TABLE ALSO INDICATES THAT DWG. NO. 86-16, SHEET 9 OF 16 SHOWS THE PLAN OF A 40' UNIT OF THIS BRIDGE.
2. THE LAYOUT OF THE SPAN IS DETERMINED FROM DWG. NO. 86-16, SHEET 9 OF 16 EXCEPT THAT AT THE CUT END OF THE BRIDGE, THE END STIFFENERS, SPACERS, LATERAL PLATES AND LATERALS ARE TO BE FIELD WELDED IN PLACE. THE LAYOUT OF THE SPAN AND DETAILS OF THE FIELD WELDING ARE SHOWN ON DWG. NO. 86-16, SHEET 8 & 9 OF 16.
3. THE LAYOUT OF A 4-GIRDER NARROW GAGE BRIDGE WITH A SPAN OF 63'-0" CENTER TO CENTER OF BEARINGS IS SHOWN ON DWG. NO. 86-16, SHEET 8 OF 16.

SKEW SPANS

1. THE ENDS OF THE BEAM AND GIRDER BRIDGES MAY BE SKEWED TO FIT VARIOUS PIER OR ABUTMENT CONDITIONS. SKEWING THE ENDS OF THE BRIDGES IS DONE BY ADVANCING THE MEMBERS UNDER ONE RAIL BY A MULTIPLE OF 2'-6" IF THEY ARE BEAMS AND BY A MULTIPLE OF 5'-0" IF THEY ARE GIRDERS. THESE DISTANCES ARE FIXED BY THE NECESSITY TO LINE UP HOLES FOR BOLTING SPACERS AND LATERAL SYSTEMS. THEN THE BEAMS OR GIRDERS UNDER EITHER RAIL MAY BE CUT TO FURNISH THE REQUIRED SKEW ANGLE. WHEN BEAMS OR GIRDERS REQUIRE SPLICING, THE SPLICES MUST BE LOCATED AT LEAST 5'-0" FROM THE ENDS OF THE ASSEMBLED BEAMS OR GIRDERS TO AVOID INTERFERENCE BETWEEN THE SPLICES AND THE END DETAILS.
2. TYPICAL EXAMPLES OF SKEW BRIDGES ARE SHOWN ON DWG. NO. 86-16, SHEETS 10, 11, 12 & 13 OF 16. WHERE THE BEAMS AND GIRDERS UNDER ONE RAIL ARE ADVANCED 5'-0", THE SKEW ANGLES ARE APPROXIMATELY 45°. WHERE THE BEAMS UNDER ONE RAIL ARE ADVANCED 2'-6", THE SKEW ANGLES ARE APPROXIMATELY 30°. TO OBTAIN SKEW ANGLES DIFFERENT FROM THOSE SHOWN, CUTTING OF THE ENDS OF THE BEAMS UNDER ONE RAIL IS REQUIRED. AS GIRDERS MAY ONLY BE ADVANCED IN MULTIPLES OF 5'-0", IT IS NECESSARY TO CUT THE GIRDERS UNDER ONE RAIL TO OBTAIN A SKEW ANGLE OF APPROXIMATELY 30°. IN THE EXAMPLES SHOWN, THE RETARDED GIRDERS ARE CUT TO FURNISH SKEW ANGLES OF EXACTLY 30°.
3. THE DATA BELOW GIVE THE PROCEDURE FOR DETERMINING THE TYPE OF BRIDGE FOR VARIOUS LENGTHS OF SKEW SPANS AND THE MATERIAL REQUIRED FOR CONSTRUCTING THEM FOR THE SKEW ANGLES GIVEN IN THE EXAMPLES ON DWG. NO. 86-16, SHEETS 10, 11, 12 & 13 OF 16. FOR SKEW ANGLES DIFFERENT FROM THOSE GIVEN IN THE EXAMPLES, SLIGHT MODIFICATION OF THE BILL OF MATERIAL MAY BE REQUIRED.

PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH 45° (APPROXIMATE) SKEW RAILROAD SPANS

1. FOLLOW THE PROCEDURE FOR SQUARE END BRIDGES AND USE THE TABLE ENTITLED TYPE OF BRIDGE FOR VARIOUS LENGTH RAILROAD SPANS FOR ALL INFORMATION CONTAINED THEREIN EXCEPT REFER TO DWG. NO. 86-16, SHEETS 10, 11, 12 & 13 OF 16 FOR THE LAYOUT OF THE ENDS OF THE BRIDGE AND THE GENERAL LAYOUT OF THE BRACING SYSTEM IN LIEU OF THE SHEET INDICATED IN THE COLUMN ENTITLED PLAN OF 40 FT. UNIT.

PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH 30° (APPROXIMATE) SKEW RAILROAD SPANS

1. FOLLOW THE PROCEDURE FOR 45° (APPROXIMATE) SKEW BRIDGES EXCEPT THAT IF A GIRDER BRIDGE IS TO BE CONSTRUCTED, USE THE TABLE ENTITLED TYPE OF GIRDER BRIDGE FOR VARIOUS LENGTH 30 DEGREE SKEW RAILROAD SPANS.

TYPE OF GIRDER BRIDGE FOR VARIOUS LENGTH 30° SKEW RAILROAD SPANS

SPAN LENGTHS C.C. BEARINGS	DESCRIPTION OF GIRDER BRIDGE: NUMBER OF GIRDERS PER BRIDGE	DESCRIPTION OF GIRDER BRIDGE: GAGE	NUMBER OF 40 FT UNITS REQUIRED	LENGTH OF PIECES REQUIRED PER LINE OF GIRDERS: NO.	MARK	LENGTH UNDER ONE RAIL	LENGTH UNDER OTHER RAIL	NUMBER OF SPLICES PER LINE OR GIRDER
39'-2¼" TO 44'-2½" INCL.	2	NARROW	2	1 1	G51 G51	32'-4⅛" C.C. BRGS.-31'-6⅞"	34'-11¾" C.C. BRGS.-34'-2½"	1
	2	WIDE	2	1 1	G51 G51	31'-5¾" C.C. BRGS.-30'-8½"	34'-11¾" C.C. BRGS.-34'-2½"	1
44'-2½" TO 55'-10" INCL.	2	NARROW	2	1 1	G51 G51	37'-4⅛" C.C. BRGS.-36'-6⅞"	39'-11¾" C.C. BRGS.-39'-2½"	1
	2	WIDE	2	1 1	G51 G51	36'-5¾" C.C. BRGS.-35'-8½"	39'-11¾" C.C. BRGS.-39'-2½"	1
55'-10" TO 76'-4 13/16" INCL.	4	NARROW	2	1 1	G51 G51	37'-2 9/16" C.C. BRGS.-36'-5 1/16"	39'-11¾" C.C. BRGS.-39'-2½"	1
55'-10" TO 75'-6 21/32" INCL.	4	WIDE	2	1 1	G51 G51	36'-4 5/32" C.C. BRGS.-35'-6 23/32"	39'-11¾" C.C. BRGS.-39'-2½"	1
76'-4 9/16" TO 79'-2¼" INCL.	4	NARROW	2**	1 1 1	G51 G51 G51	27'-2 9/16"* 39'-11¾" C.C. BRGS.-66'-5 1/16"*	39'-11¾" C.C. BRGS.-39'-2½"	2 UNDER ONE RAIL 1 UNDER OTHER RAIL
75'-6 21/32" TO 79'-2¼" INCL.	4	WIDE	2**	1 1 1	G51 G51 G51	26'-4 5/32"* 39'-11¾" C.C. BRGS.-66'-6 23/32"*	39'-11¾" C.C. BRGS.-39'-2½"	2 UNDER ONE RAIL 1 UNDER OTHER RAIL
79'-2¼" TO 81'-6" INCL.	4	NARROW	3	1 1 1	G51 G51 G51	27'-2 9/16" 39'-11¾" C.C. BRGS.-66'-5 1/16"	29'-11¾" 39'-11¾" C.C. BRGS.-69'-2½"	2
	4	WIDE	3	1 1 1	G51 G51 G51	26'-4 5/32" 39'-11¾" C.C. BRGS.-66'-6 23/32"	29'-11¾" 39'-11¾" C.C. BRGS.-69'-2½"	2
81'-6" TO 84'-2½" INCL.	6	NARROW	3	1 1 1	G51 G51 G51	26'-11 13/16" 39'-11¾" C.C. BRGS.-66'-2 9/16"	29'-11¾" 39'-11¾" C.C. BRGS.-69'-2½"	2
	6	WIDE	3	1 1 1	G51 G51 G51	26'-2 9/16" 39'-11¾" C.C. BRGS.-65'-5 1/16"	29'-11¾" 39'-11¾" C.C. BRGS.-69'-2½"	2
84'-2½" TO 100'-10½" INCL.	6	NARROW	3	1 1 1	G51 G51 G51	36'-11 13/16" 39'-11¾" C.C. BRGS.-76'-2 9/16"	39'-11¾" 39'-11¾" C.C. BRGS.-79'-2½"	2
	6	WIDE	3	1 1 1	G51 G51 G51	36'-2 9/16" 39'-11¾" C.C. BRGS.-75'-5 1/16"	39'-11¾" 39'-11¾" C.C. BRGS.-79'-2½"	2

* THESE TWO PIECES TO BE CUT FROM OPPOSITE ENDS OF GIRDER G51 39'-11¾" LONG SO THAT EACH PIECE WILL HAVE THE HOLES REQUIRED FOR ONE FIELD BOLTED SPLICE.
** IN ADDITION TO 2-40 FT. UNITS, TWO EXTRA SPLICES FOR GIRDER G51 ARE REQUIRED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

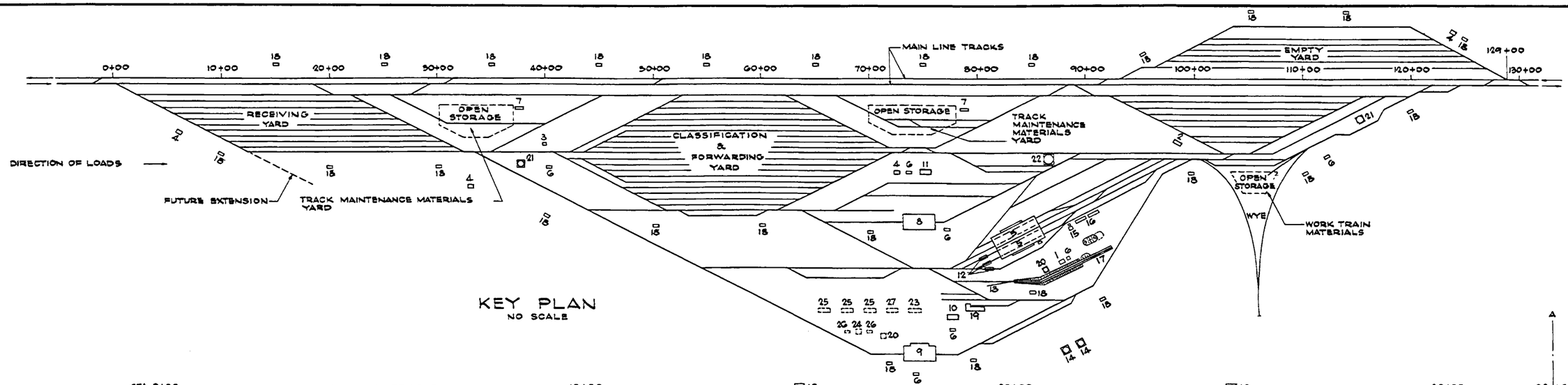
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
TYPES FOR VARIOUS SPANS

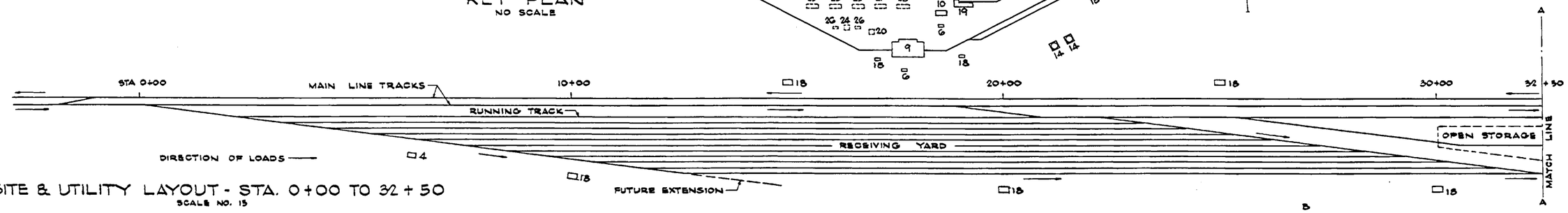
UNDER REVISION

APPROVED: [signature] H. M. Williams
DATE: 19 MAR 1969
CHIEF, ENGINEERS BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

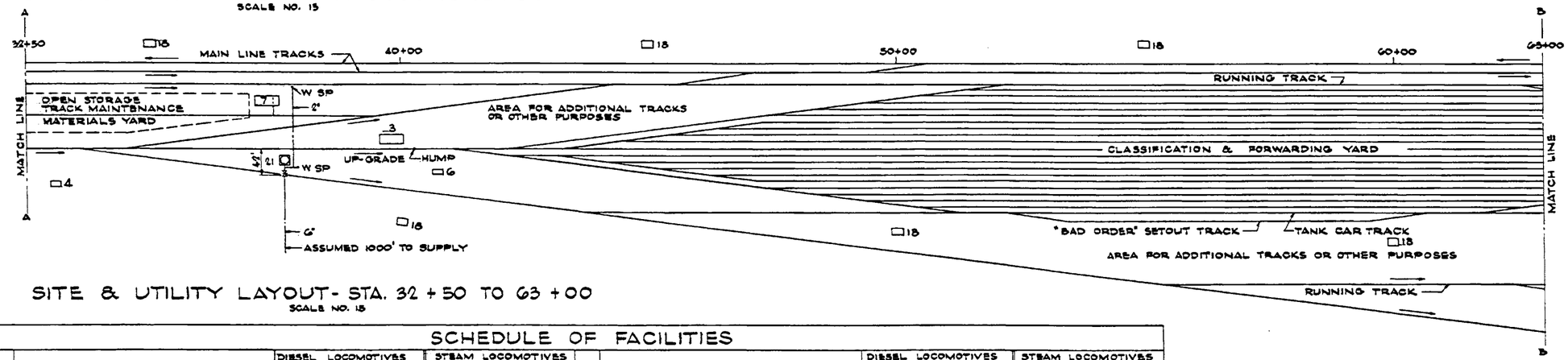
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 86-02
SHEET 1 OF 1



KEY PLAN
NO SCALE



SITE & UTILITY LAYOUT - STA. 0+00 TO 32+50
SCALE NO. 15



SITE & UTILITY LAYOUT - STA. 32+50 TO 63+00
SCALE NO. 15

SCHEDULE OF FACILITIES

NO	FACILITY	DIESEL LOCOMOTIVES STD.-TPR INST. NO. FT1551, FT1561 QTY.	SIZE OR UNIT	DWG. NO.	STEAM LOCOMOTIVES STD-TPR INST. NO. FT1571, FT1581 QTY.	SIZE OR UNIT	DWG. NO.
	BUILDINGS						
1	BATHHOUSE, 5 SHOWERS	1	20'X 20'	72-32	1	20'X 20'	72-32
2	CABIN, CABOOSE	1	10'X 20'		1	10'X 20'	
3	CABIN, CONTROL	1	20'X 50'	44-11	1	20'X 50'	44-11
4	CABIN, SWITCHMANS	4	10'X 20'		4	10'X 20'	
5	ENGINE HOUSE, 6 STALL-STEAM				2	10800 SF	86-32
5	ENGINE HOUSE, 4 STALL-DIESEL	2	7900 SF	86-34			
6	LATRINE, PIT TYPE, 8 SEAT	6	10'X 20'	72-36	6	10'X 20'	72-36
7	SECTION HOUSE	2	20'X 50'	44-11	2	20'X 50'	44-11
8	SHOP, CAR REPAIR	1	60'X 300'	86-31	1	60'X 300'	86-31
9	SHOP, MACHINE	1	20800 SF	86-31	1	20800 SF	86-31
10	WAREHOUSE	1	40'X 100'	44-11	1	40'X 100'	44-11
11	YARD OFFICE	1	20'X 60'	61-11	1	20'X 60	61-11
	OTHER CONSTRUCTION						
12	ASH PIT				3	8'X 12'-6"	86-11
13	DERAILER (STOCK ITEM)	1		*	1		
14	DIESEL OIL STORAGE TANK (MODIFIED)	2	1000 BBL	12-84			
15	ENGINE SAND PROCESSING & STORAGE	1			1		
	RAILROAD - SINGLE TRACK	32	MILE		32	MILE	
	RAILROAD TURNOUT	193	NO. 8	86-13	191	NO. 8	86-13
16	RAILROAD COAL LOADING PLATFORM				2	12'X 84'	86-11
17	RAILROAD COAL DISCHARGE TRESTLE				2	16'X 150'	86-12
18	SUMP - FIRE PROTECTION	20	10000 GAL	84-21	20	10000 GAL	84-21
19	UNLOADING PLATFORM	3.3	1000 SF	86-09	3.3	1000 SF	86-09
20	WATER TANK - POTABLE	1	10500 GAL	84-21	1	10500 GAL	84-21
21	WATER TANK - STEAM ENGINE				2	21000 GAL	86-24
22	WATER TANK - STEAM ENGINE				1	42000 GAL	86-24

NO	FACILITY	DIESEL LOCOMOTIVES STD.-TPR INST. NO. FT1551, FT1561 QTY.	SIZE OR UNIT	DWG. NO.	STEAM LOCOMOTIVES STD-TPR INST. NO. FT1571, FT1581 QTY.	SIZE OR UNIT	DWG. NO.
	TROOP CAMP FACILITIES NOT INCLUDED IN THESE INSTALLATIONS						
23	ADMINISTRATION & OFFICERS QUARTERS	1	20'X 100'	61-11	1	20'X 100'	61-11
24	BATHHOUSE, 5 SHOWERS	1	20'X 20'	72-32	1	20'X 20'	72-32
25	BARRACKS, 50 B.M.	3	20'X 100'	72-21	3	20'X 100'	72-21
26	LATRINE, PIT TYPE, 8 SEAT	2	10'X 20'	72-36	2	10'X 20'	72-36
27	KITCHEN & MESS HALL - 150 MAN	1	20'X 100'	72-61	1	20'X 100'	72-61
	UTILITIES						
	ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWG. FOR DETAILS	DEMAND	FACILITY NO.	DWG. FOR DETAILS
	WATER DISTRIBUTION, POTABLE	100000 GPD	86-0510	84-21	100000 GPD	86-0510	84-21
	LOCOMOTIVE WATER				150000 GPD	86-0415	
	DRAINAGE		86-0511	83-15		86-0511	83-15
	ELECTRIC DISTRIBUTION	215.7 KW	86-0412	81-23 81-22 81-21	214.7 KW	86-0412	81-23 81-22 81-21
	FUEL OIL FACILITY	100 BBL/TRAIN	86-0428				

BASIS OF DESIGN

TERMINAL CAPACITY:
20 TRAINS PER DAY.
TRAINS:
50-40 FT LENGTH CARS.
TURNOUTS:
ALL NO. 8 FROGS
TRACK CENTERS:
AT 15 FT UNLESS OTHERWISE NOTED.

GENERAL NOTES

1. THIS LAYOUT APPLIES WHEN MAIN LINE TRAFFIC OPERATES ON RIGHT HAND TRACK OF DOUBLE TRACK SYSTEM.
2. FOR LEFT HAND OPERATION, LAYOUT MUST BE OPPOSITE HAND ABOUT MAIN LINE AXIS.
3. TROOP HOUSING FACILITIES ARE NOT SUPPLIED BY THIS INSTALLATION.
4. VEHICLE TRAFFIC FOR UNLOADING PURPOSES WILL TRAVEL ON TRACK BALLAST IN YARD AREAS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

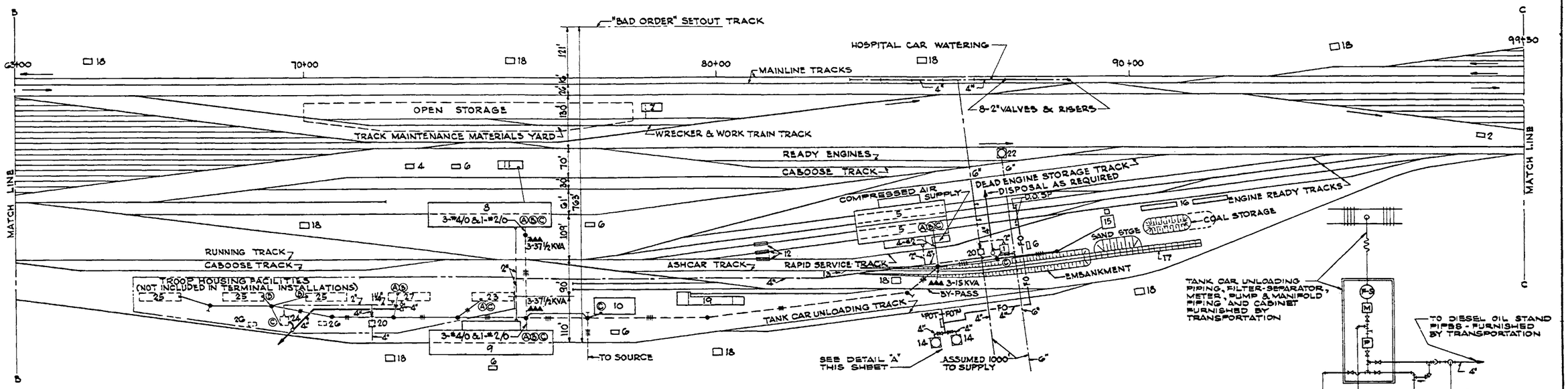
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, ARCHITECT-ENGINEER BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1969

THEATER OF OPERATIONS
RAILROAD TERMINAL
20 TRAINS PER DAY
STD-TPR
SITE & UTILITY LAYOUT

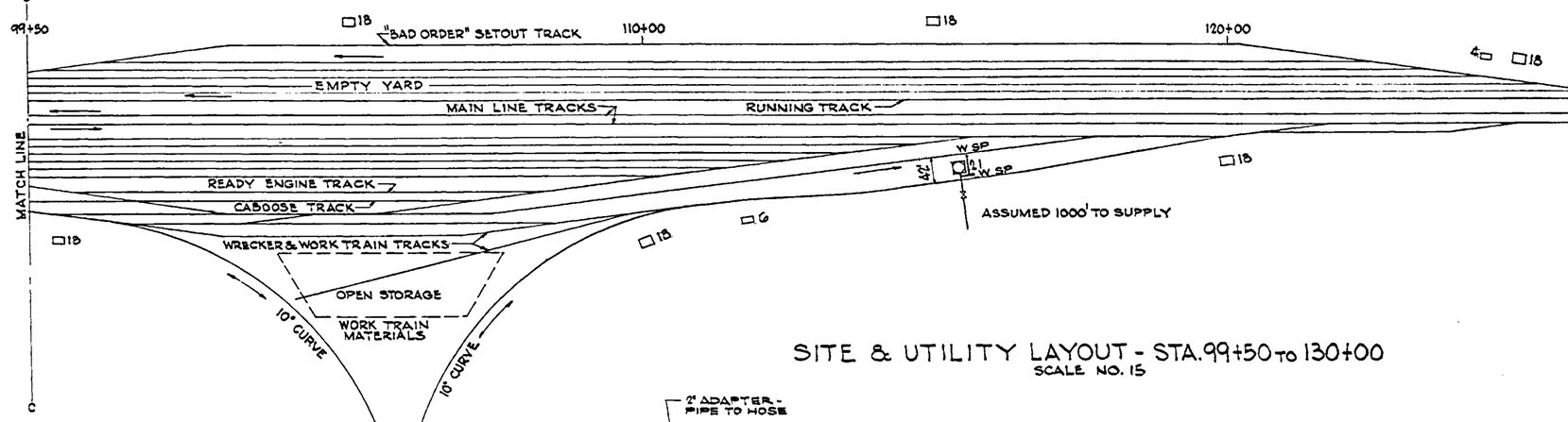
APPROVED FOR PROPONENT AGENCY: [signature] ROBERT W. GENTLEMAN, Colonel, GS, Deputy Chief, Transportation Resources Division, Directorate of Army Transportation
DATE 2 NOV 1969

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 86-04
SHEET 1 OF 2

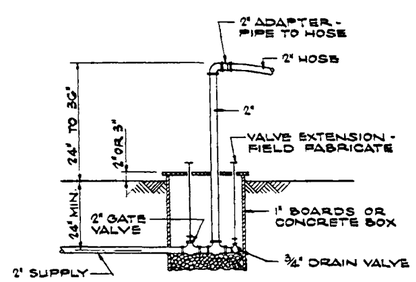


SITE & UTILITY LAYOUT - STA. 63+00 TO 99+50
SCALE NO. 15

DETAIL "A"
FUEL OIL TRANSFER
NO SCALE



SITE & UTILITY LAYOUT - STA. 99+50 TO 130+00
SCALE NO. 15



TYPICAL STANDPIPE
FOR DIESEL LOCOMOTIVE OR HOSPITAL CAR WATER SUPPLY (W SP)
NO SCALE

NOTE:
TRANSPORTATION WILL FURNISH A TRANSPORTABLE DIESEL LOCOMOTIVE SERVICING STATION CONSISTING OF:

1. A PORTABLE STEEL CABINET, HOUSING A 100 GPM FUEL PUMP, W/5HP ELECTRIC MOTOR, FUEL METER, FUEL FILTER AND WATER SEPARATOR UNIT, A REEL, HOSE AND VALVING NECESSARY TO CONTROL FUELING OPERATIONS.
2. A TANK CAR UNLOADING ASSEMBLY.
3. TWO LOCOMOTIVE FUELING HYDRANTS.
4. AN OIL BURNING, SAND DRYING STOVE W/FUEL OIL TANK.
5. A DRY-SAND-ELEVATING DRUM.
6. A 20 C.F.M. AIR COMPRESSOR W/ELECTRIC MOTOR.
7. A 42 FT. SAND TOWER W/DRY SAND STORAGE TANK, 60 CU. FT. CAPACITY.
8. A DIESEL DRIVEN GENERATOR SET FOR 15 K.W., 120/208 V, 60 CYCLE, 3 PHASE SERVICE.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 50' 100' 200'
NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

RAILROAD TERMINAL
20 TRAINS PER DAY
STD-TP12
SITE & UTILITY LAYOUT

APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 28 MAR 1969

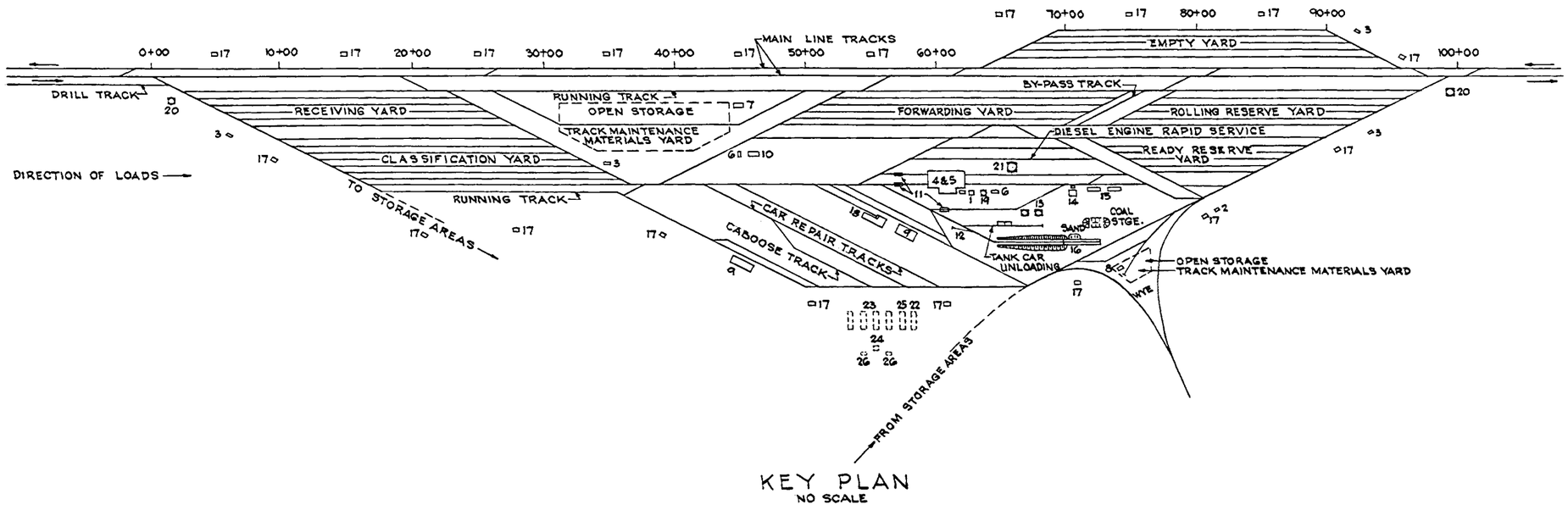
APPROVED FOR PROCUREMENT AGENCY:
[signature] ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE: 13 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 2
86-04

SCHEDULE OF FACILITIES

NO.	FACILITY	DIESEL LOCOMOTIVES STD-TPR INST. NO. FR 1511, FR 1521			STEAM LOCOMOTIVES STD-TPR INST. NO. FR 1531, FR 1541		
		QTY	SIZE OR UNIT	DWG. NO.	QTY	SIZE OR UNIT	DWG. NO.
	BUILDINGS						
1	BATHHOUSE, 8 SHOWERS	1	20' X 20'	72-32	1	20' X 20'	72-32
2	CABIN, CABOOSE	1	10' X 20'		1	10' X 20'	
3	CABIN, SWITCHMAN'S	4	10' X 20'		4	10' X 20'	
4	ENGINE HOUSE, 6 STALL-STEAM				1	10,800 SF	86-32
5	ENGINE HOUSE, 4 STALL-DIESEL	1	7600 SF	86-34			
6	LATRINE, PIT TYPE, 8 SEAT	2	10' X 20'	72-36	2	10' X 20'	72-36
7	SECTION HOUSE	1	20' X 50'	44-11	1	20' X 50'	44-11
8	TOOL & SPARES, WAREHOUSE	1	20' X 50'	44-11	1	20' X 50'	44-11
9	WAREHOUSE	2	40' X 100'	44-11	2	40' X 100'	44-11
10	YARD OFFICE	1	20' X 60'	61-11	1	20' X 60'	61-11
	OTHER CONSTRUCTION						
11	ASH PIT				3	8' X 12'-6"	86-11
12	DERAILER (STOCK ITEM)	1			1		
13	DIESEL OIL STORAGE TANK	2	1000 BBL	41-51			
14	ENGINE SAND PROCESSING & STORAGE	1			1		
	RAILROAD, SINGLE TRACK	23	MILE		23	MILE	
	RAILROAD TURNOUT	153	NO. 8	86-13	153	NO. 8	86-13
15	RAILROAD COAL LOADING PLATFORM				2	12' X 84'	86-11
16	RAILROAD COAL DISCHARGE TRESTLE				2	16' X 156'	86-12
17	SUMP, FIRE PROTECTION	18	10,000 GAL	84-21	18	10,000 GAL	84-21
18	UNLOADING PLATFORM	3.3	1000 SF	86-09	3.3	1000 SF	86-09
19	WATER TANK, POTABLE	1	10,500 GAL	84-21	1	10,500 GAL	84-21
20	WATER TANK, STEAM ENGINE				2	21,000 GAL	86-24
21	WATER TANK, STEAM ENGINE				1	42,000 GAL	86-24
	TROOP CAMP FACILITIES NOT INCLUDED IN THESE INSTALLATIONS						
22	ADMINISTRATION & OFFICERS' QUARTERS	1	20' X 100'	61-11	1	20' X 100'	61-11
23	BARRACKS, 50 EM	4	20' X 100'	72-21	4	20' X 100'	72-21
24	BATHHOUSE, 8 SHOWERS	1	20' X 20'	72-32	1	20' X 20'	72-32
25	KITCHEN & MESS HALL, 180 MAN	1	20' X 100'	72-61	1	20' X 100'	72-61
26	LATRINE, PIT TYPE, 8 SEAT	2	10' X 20'	72-36	2	10' X 20'	72-36
	UTILITIES						

ENGINEER SERVICES REQUIRED	DEMAND	FACILITY NO.	DWGS FOR DETAILS	DEMAND	FACILITY NO.	DWGS FOR DETAILS
WATER DISTRIBUTION, POTABLE	10,000 GAL	860510	84-21	10,000 GAL	860510	84-21
LOCOMOTIVE WATER				150,000 GPD	860513	
DRAINAGE		860511	83-13		860511	83-13
ELECTRIC DISTRIBUTION	25 KW	860512	81-21 81-22 81-23	24.6 KW	860512	81-21 81-22 81-23
FUEL OIL FACILITY	100 BBL/TR	860628				



KEY PLAN
NO SCALE

BASIS OF DESIGN

STATION CAPACITY: 20 TRAINS PER DAY
TRAINS: 30-40 FT LENGTH CARS.
TURNOUTS: ALL NO. 8 FROGS.
TRACK CENTERS: AT 13 FT UNLESS OTHERWISE REQUIRED.

GENERAL NOTES

1. THIS LAYOUT APPLIES WHEN MAIN LINE TRAFFIC OPERATES ON RIGHT HAND TRACK OF DOUBLE TRACK SYSTEM.
2. FOR LEFT HAND OPERATION, LAYOUT MUST BE OPPOSITE HAND ABOUT MAIN LINE AXIS.
3. TROOP HOUSING FACILITIES ARE NOT SUPPLIED BY THIS INSTALLATION
4. VEHICLE TRAFFIC FOR UNLOADING PURPOSES WILL TRAVEL ON TRACK BALLAST IN YARD AREAS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

APPROVED: CHIEF, STRUCTURES BRANCH

APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation
Resources Division
Directorate of Army Transportation
DATE: 2 NOV 1969

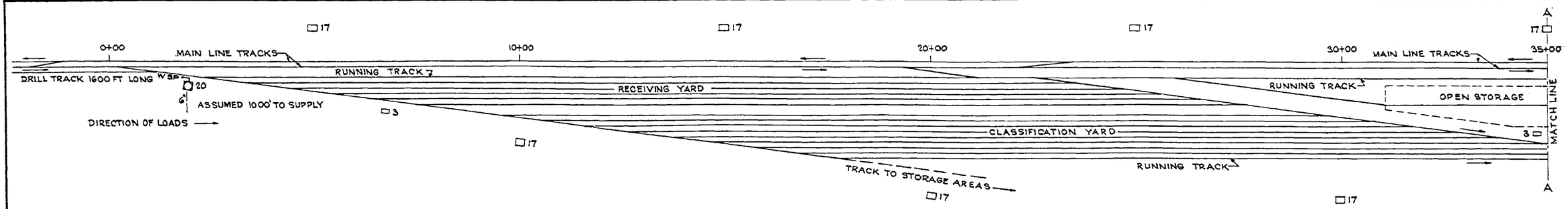
THEATER OF OPERATIONS

RAILROAD REGULATING STATION
20 TRAINS PER DAY
STD-TPR
KEY PLAN

SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 86-05
SHEET 1 OF 2

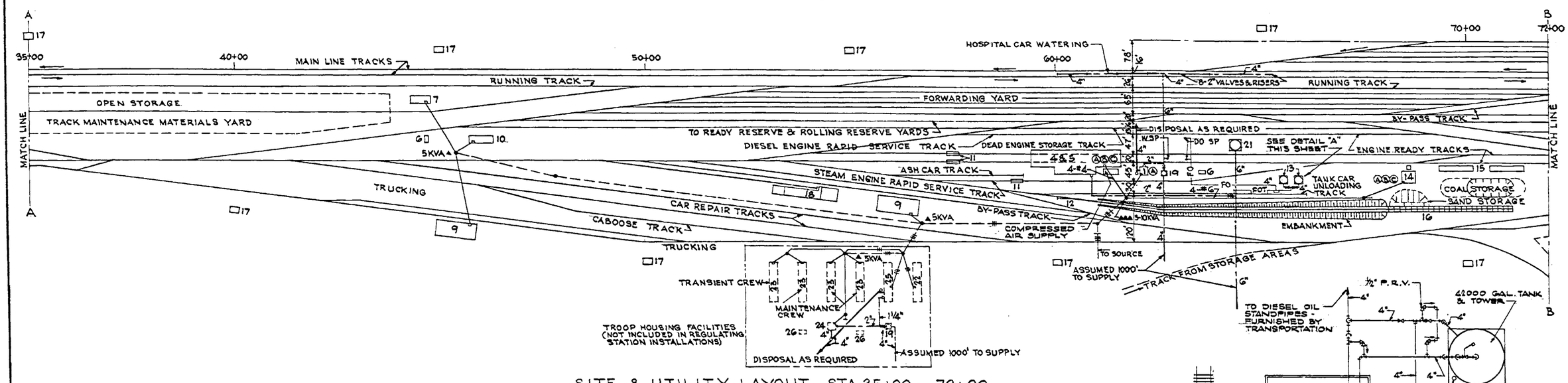
CORPS OF ENGINEERS

U. S. ARMY



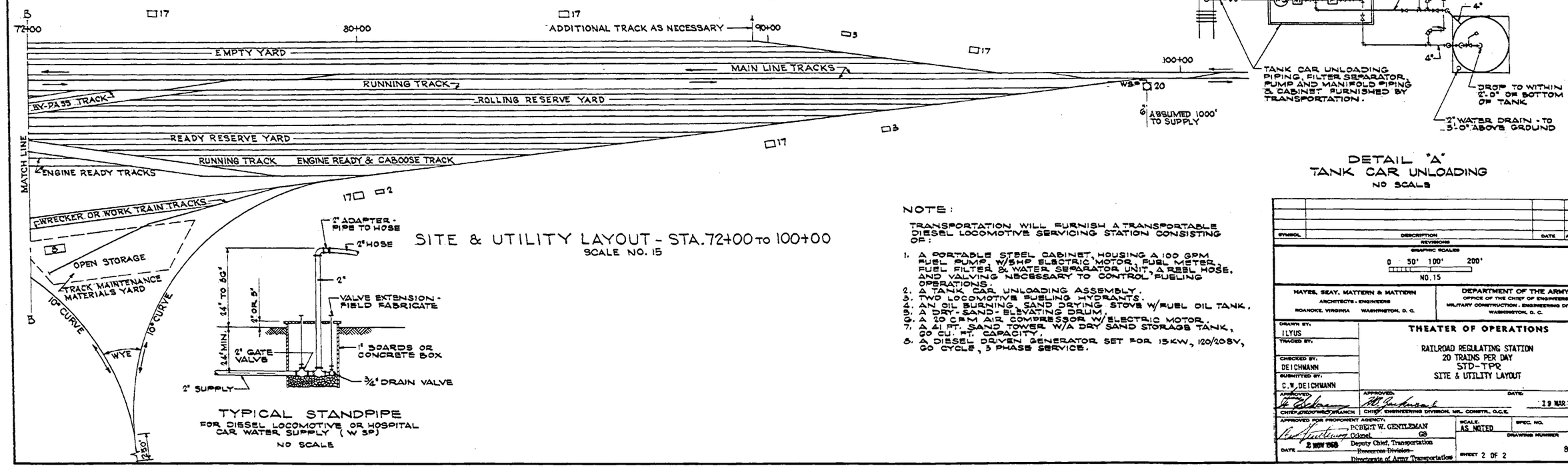
SITE & UTILITY LAYOUT - STA. 0+00 TO 35+00

SCALE NO. 15



SITE & UTILITY LAYOUT - STA. 35+00 TO 72+00

SCALE NO. 15



SITE & UTILITY LAYOUT - STA. 72+00 TO 100+00

SCALE NO. 15

TYPICAL STANDPIPE

FOR DIESEL LOCOMOTIVE OR HOSPITAL CAR WATER SUPPLY (W SP)

NO SCALE

DETAIL "A" TANK CAR UNLOADING

NO SCALE

NOTE:

TRANSPORTATION WILL FURNISH A TRANSPORTABLE DIESEL LOCOMOTIVE SERVICING STATION CONSISTING OF:

1. A PORTABLE STEEL CABINET, HOUSING A 100 GPM FUEL PUMP W/5HP ELECTRIC MOTOR, FUEL METER, FUEL FILTER & WATER SEPARATOR UNIT, A REEL, HOSE, AND VALVING NECESSARY TO CONTROL FUELING OPERATIONS.
2. A TANK CAR UNLOADING ASSEMBLY.
3. TWO LOCOMOTIVE SUSLING HYDRANTS.
4. AN OIL BURNING, SAND DRYING STOVE W/FUEL OIL TANK.
5. A DRY-SAND-ELEVATING DRUM.
6. A 20 CFM AIR COMPRESSOR W/ELECTRIC MOTOR.
7. A 41 FT. SAND TOWER W/A DRY SAND STORAGE TANK, 60 CU. FT. CAPACITY.
8. A DIESEL DRIVEN GENERATOR SET FOR 15KW, 120/208V, 60 CYCLE, 3 PHASE SERVICE.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 50' 100' 200'

NO. 15

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ILYUS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN

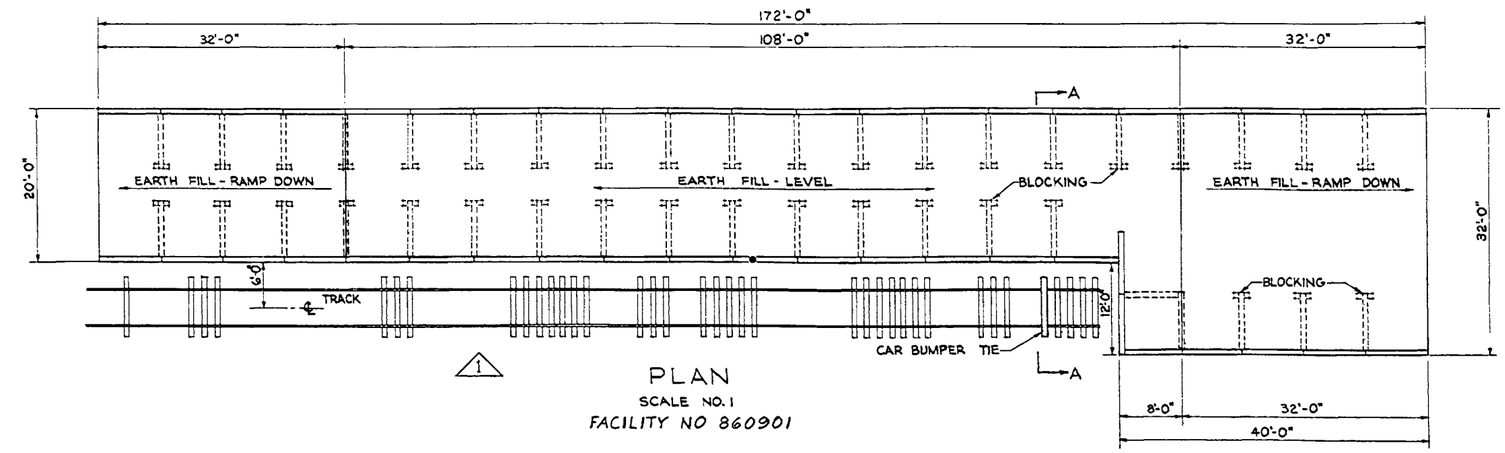
THEATER OF OPERATIONS

RAILROAD REGULATING STATION
20 TRAINS PER DAY
STD-TPR
SITE & UTILITY LAYOUT

APPROVED: Chief, Engineering Branch
APPROVED: Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY: ROBERT W. GENTLEMAN, Colonel, GS, Deputy Chief, Transportation Resources Division, Directorate of Army Transportation
DATE: 2 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 2
86-05



PLAN

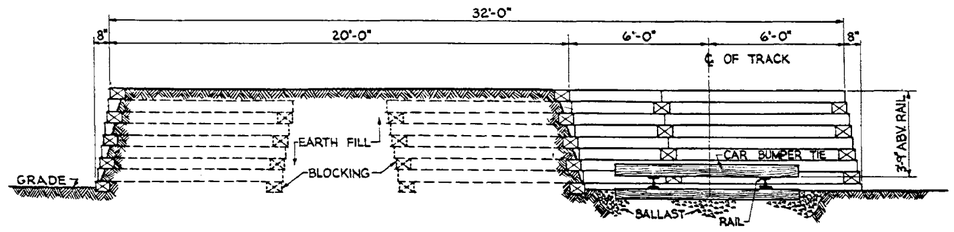
SCALE NO. 1

FACILITY NO 860901



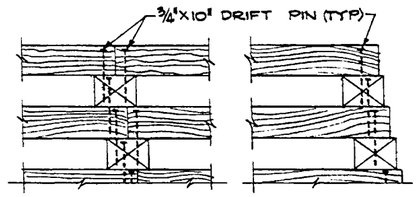
ELEVATION 1

SCALE NO. 1



SECTION A-A

SCALE NO. 3



TYPICAL DETAIL FOR DRIFT PIN CONNECTIONS

NO SCALE

GENERAL NOTES

1. ALL MEMBERS TO BE DRIFT PINNED TOGETHER.
2. ALL BLOCKING MEMBERS TO BE STANDARD RAILROAD TIES.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' 15' NO. 1

0 1' 2' 3' 4' 5' NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HALE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. REICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

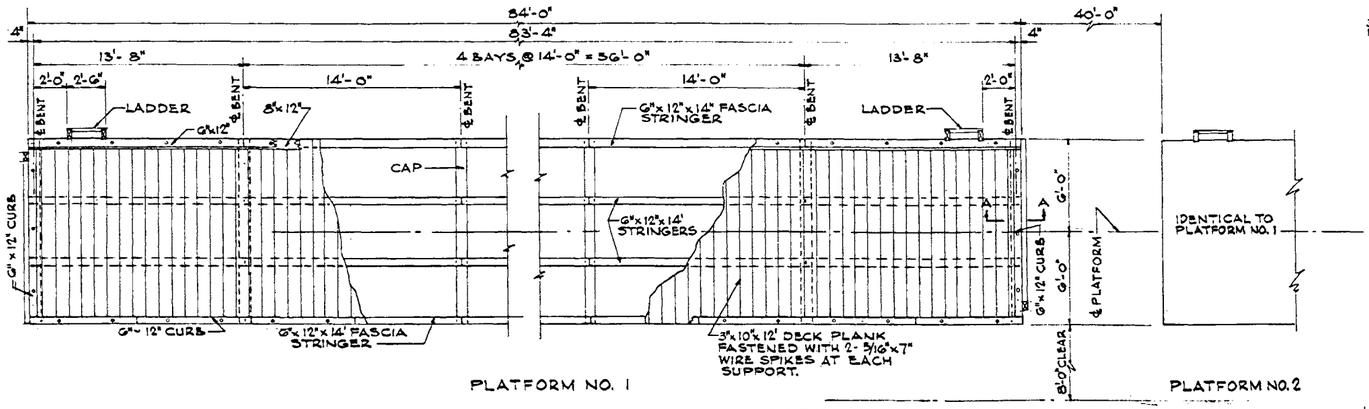
THEATER OF OPERATIONS

UNLOADING PLATFORM
32'X172'

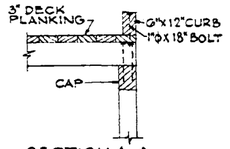
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE: 2 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-09
SHEET 1 OF 1

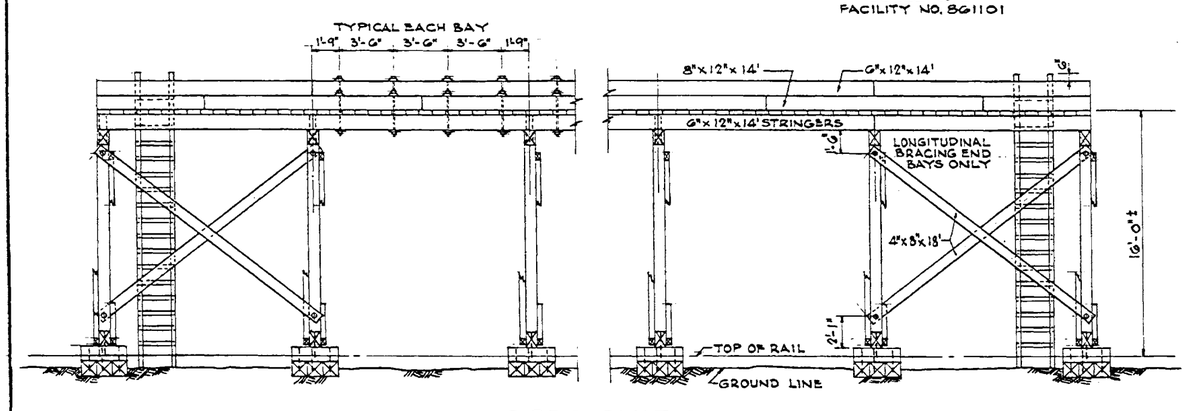


PLATFORM NO. 1 PLATFORM NO. 2

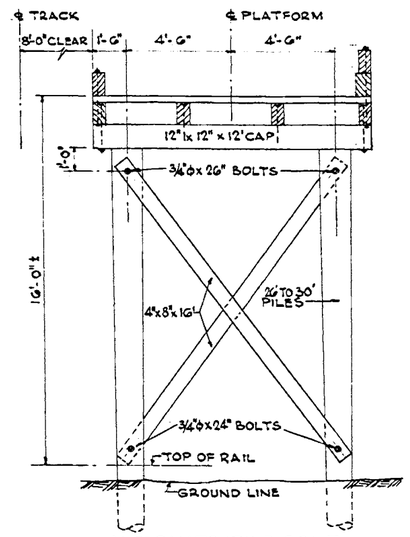


SECTION A-A
SCALE NO. 3

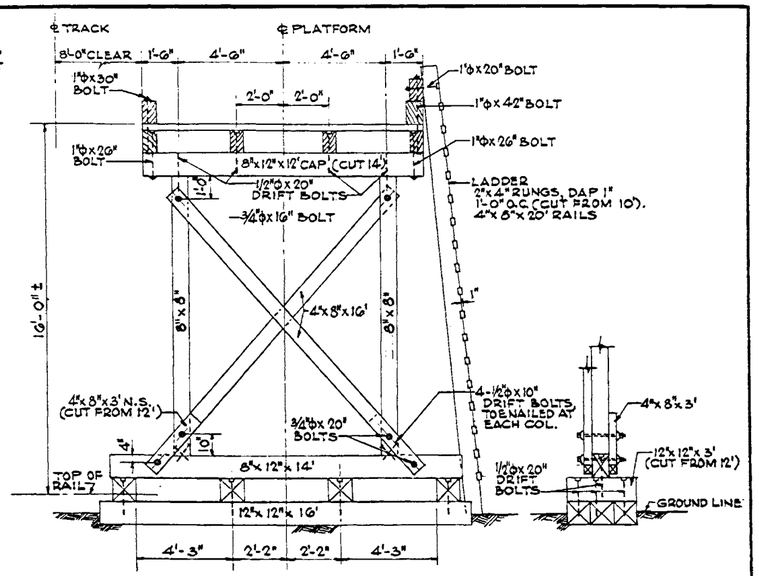
DECK PLANS
COAL LOADING PLATFORM
SCALE NO. 2
FACILITY NO. 861101



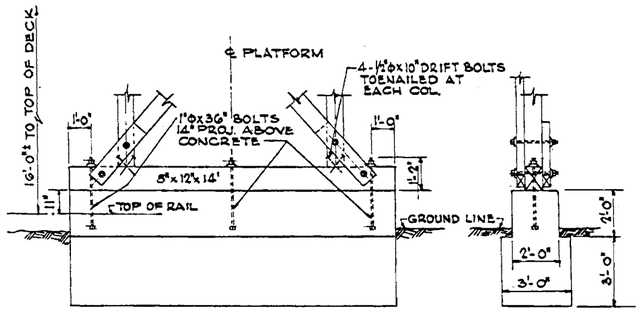
SIDE ELEVATION
COAL LOADING PLATFORM
SCALE NO. 2



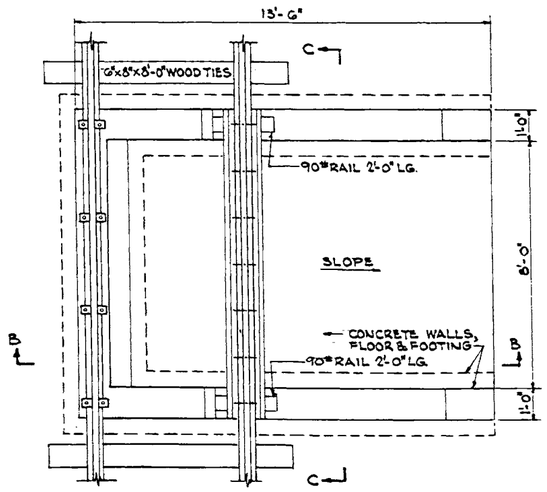
ALTERNATE PILE BENT
COAL LOADING PLATFORM
SCALE NO. 3



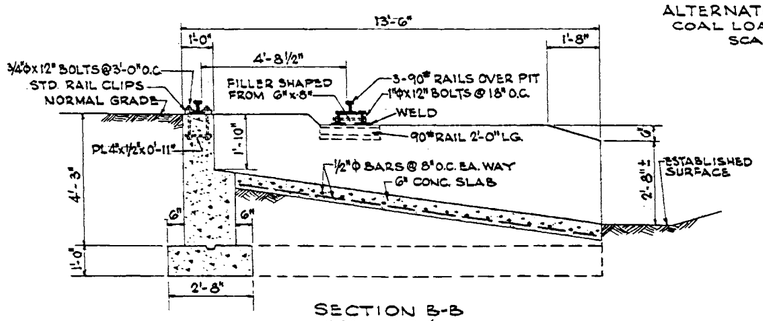
TYPICAL CROSS-SECTION
TIMBER BENT
COAL LOADING PLATFORM
SCALE NO. 3



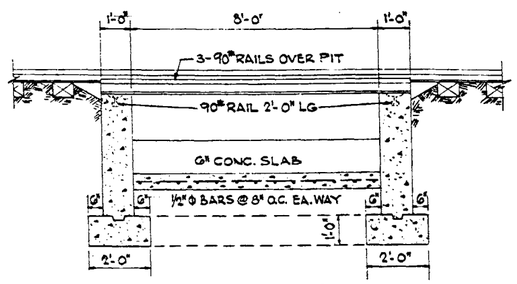
ALTERNATE CONCRETE FOOTING
COAL LOADING PLATFORM
SCALE NO. 3
(FOR FRAMING OF BENT SEE TYPICAL CROSS-SECTION)



PLAN - ASH PIT
SCALE NO. 4
FACILITY NO. 861102



SECTION B-B
SCALE NO. 4



SECTION C-C
SCALE NO. 4

COAL LOADING PLATFORM
BASIS OF DESIGN

LIVE LOADING 250 PSF.
PILE BEARING VALUE 20000 LBS.
EXTREME FIBER STRESS, WOOD - 1500 PSI.
COMPRESSION PARALLEL TO GRAIN, WOOD - 1500 PSI.
COMPRESSION PERPENDICULAR TO GRAIN, WOOD - 450 PSI.
HORIZONTAL SHEAR, WOOD - 150 PSI.
MODULUS OF ELASTICITY, WOOD - 1,600,000 PSI.
THE LENGTH OF PILES AS SHOWN ASSUMES A PENETRATION OF 15'-0". THE PENETRATION REQUIRED SHOULD BE DETERMINED BY DRIVING TESTS WHERE POSSIBLE AND THE LENGTH OF PILE ADJUSTED ACCORDINGLY.

GENERAL NOTES

HOLES FOR DRIFT BOLTS SHALL BE 1/8" SMALLER THAN DRIFT BOLTS.
HOLES FOR THROUGH BOLTS SHALL BE THE SAME DIAMETER AS THE BOLT.
NO BOLT HEADS SHALL PROJECT BEYOND THE FACE OF TIMBER ON OUTSIDE FACE OF FENDER SYSTEM.
USE O.G. CAST IRON WASHERS WITH ALL BOLTS IN WOOD.
TIMBER DIMENSIONS ARE BASED ON NOMINAL SIZES.
PROJECTING ENDS OF ALL BOLTS SHALL BE PEENED AFTER LOCK NUTS HAVE BEEN DRAWN UP TIGHT.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10' (NO. 2) | 0 1' 2' 3' 4' 5' (NO. 3) | 0 1' 2' 3' 4' (NO. 4)

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED (Author): [signature]
CHIEF, A/E PRACTICE BRANCH

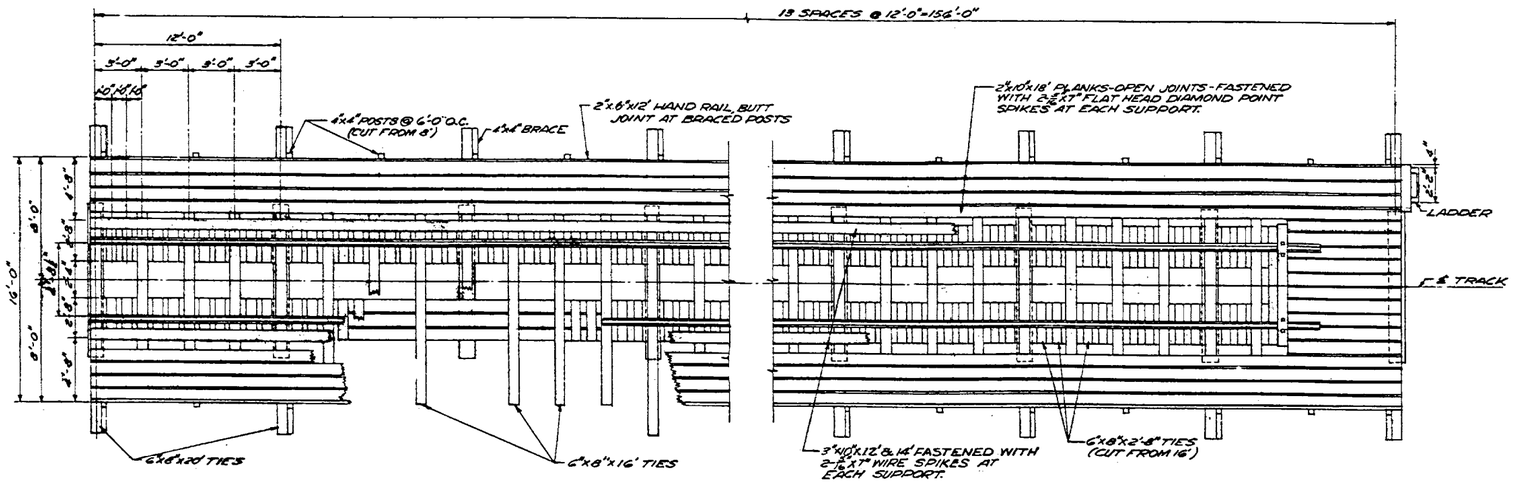
APPROVED: [signature]
DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE: 2 NOV 1968

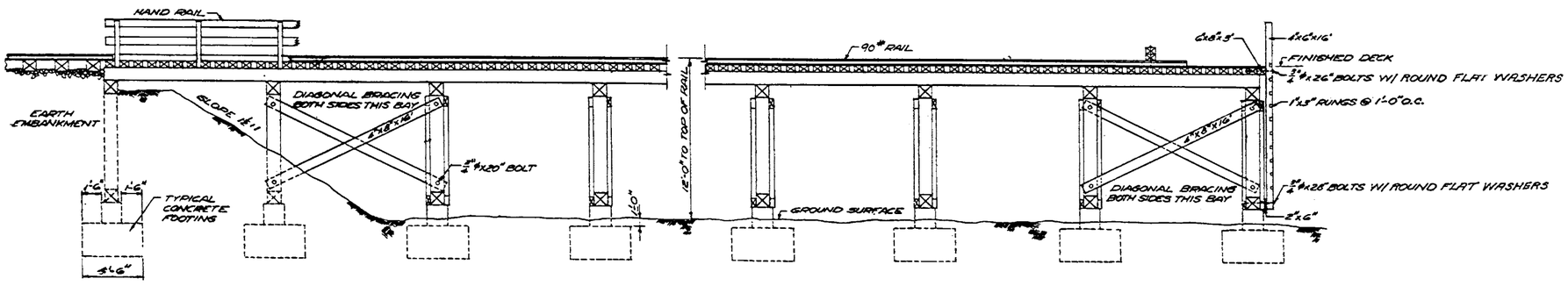
THEATER OF OPERATIONS

RAILROAD COAL LOADING PLATFORM & ASH PIT

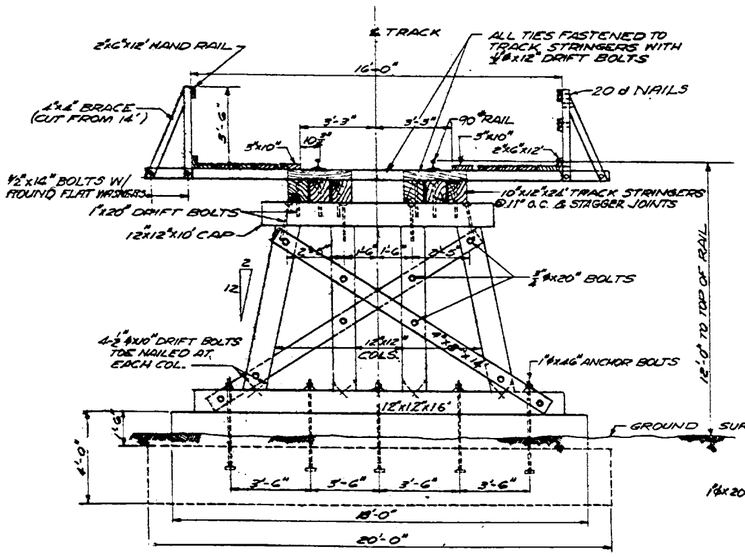
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-11
SHEET 1 OF 1



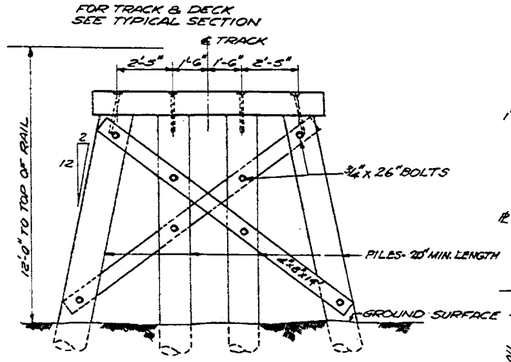
DECK PLAN
SCALE NO. 2



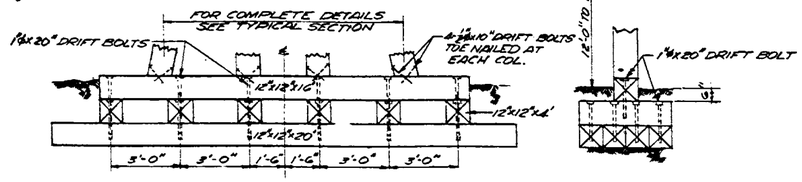
ELEVATION
SCALE NO. 2



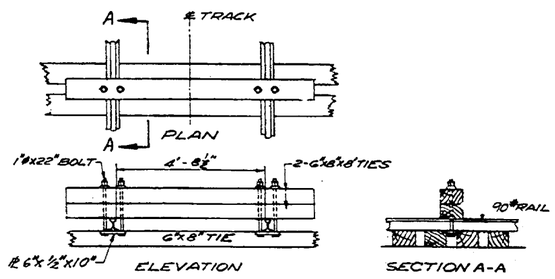
TYPICAL SECTION
TIMBER BENT - CONCRETE FOOTING
SCALE NO. 3



ALTERNATE PILE BENT
SCALE NO. 3



ALTERNATE TIMBER FOOTING
SCALE NO. 3



RAIL STOP DETAIL
SCALE NO. 4

BASIS OF DESIGN

PILE BEARING VALUE 40,000 LBS.
SAFE AXLE LOAD 40,000 LBS.
EXTREME FIBER STRESS, WOOD - 1,800 PSI.
COMPRESSION PARALLEL TO GRAIN, WOOD - 1,500 PSI.
COMPRESSION PERPENDICULAR TO GRAIN, WOOD - 450 PSI.
HORIZONTAL SHEAR, WOOD - 150 PSI.
MODULUS OF ELASTICITY, WOOD - 1,600,000 PSI.
THE LENGTH OF PILES REQUIRED SHOULD BE DETERMINED BY DRIVING TESTS WHERE POSSIBLE AND THE LENGTH OF PILES TO BE ADJUSTED ACCORDINGLY.

GENERAL NOTES

HOLES FOR DRIFT BOLTS SHALL BE 1/8" SMALLER THAN DRIFT BOLTS.
HOLES FOR THROUGH BOLTS SHALL BE THE SAME DIAMETER AS THE BOLT.
USE O.G. CAST IRON WASHERS WITH ALL BOLTS IN WOOD, EXCEPT AS NOTED.
TIMBER DIMENSIONS ARE BASED ON NOMINAL SIZES.
PROJECTING ENDS OF ALL BOLTS SHALL BE PEENED AFTER LOCK NUTS HAVE BEEN DRAWN UP TIGHT.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' NO.2 | 0 1' 2' 3' 4' 5' NO.3 | 0 1' 2' 3' 4' NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

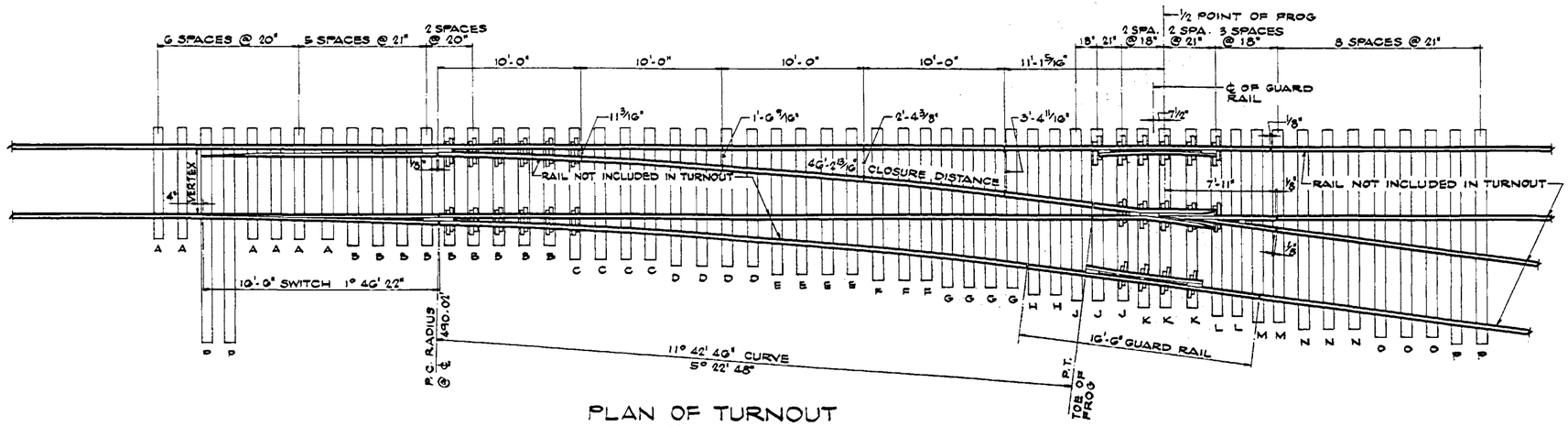
DRAWN BY: ROTH
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1959

THEATER OF OPERATIONS

RAILROAD COAL
DISCHARGING TRESTLE
FACILITY NO. 861201

APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE: 12 NOV 1958

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-12
SHEET 1 OF 1



PLAN OF TURNOUT

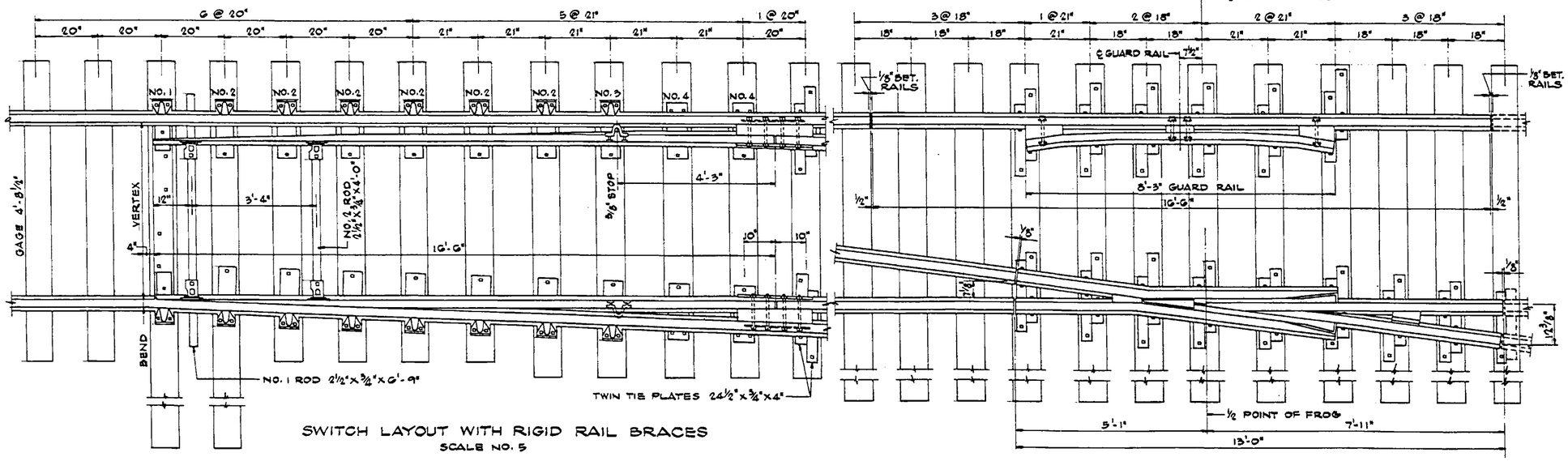
SCALE NO. 2

FACIL. NO. 8G1301

TIES FOR TURNOUT
55 - 6"X8" TIES

MARK	LENGTH	NO. REQ'D.
A	8'-0"	6
B	8'-6"	9
C	9'-6"	4
D	10'-0"	4
E	10'-6"	4
F	11'-0"	5
G	11'-6"	4
H	12'-0"	4
J	12'-6"	3
K	13'-0"	3
L	13'-6"	2
M	14'-0"	2
N	14'-6"	3
O	15'-0"	3
P	15'-6"	4

NOTE:
FROG & GUARD RAIL BOLTS SHALL BE FOR 90# RAIL.



SWITCH LAYOUT WITH RIGID RAIL BRACES

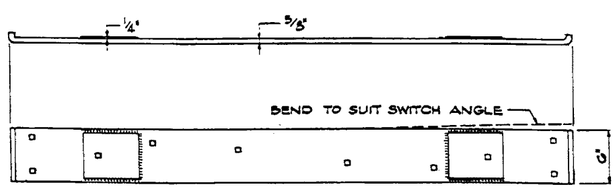
SCALE NO. 5

FROG & GUARD RAIL LAYOUT

SCALE NO. 5

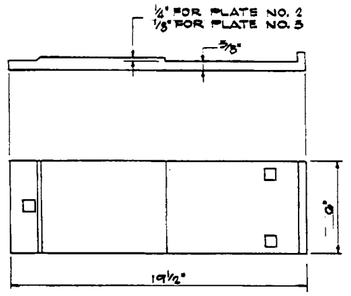
ELEVATION OF SWITCH RAIL

SCALE NO. 5



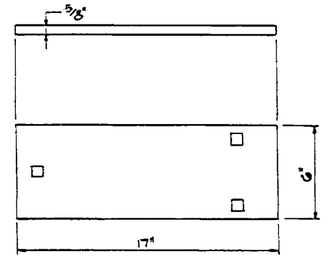
GAGE PLATE NO. 1

SCALE NO. 7



SLIDE PLATES NO. 2 & 3

SCALE NO. 5



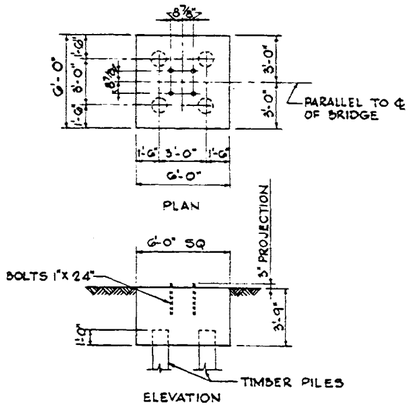
SLIDE PLATE NO. 4

SCALE NO. 5

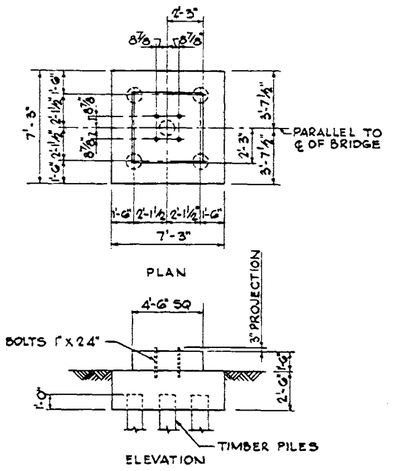
SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 5' 10' NO. 2; 0 1' 2' 3' NO. 5; 0 3" 6" 9" 1' 2' NO. 7; 0 1" 2" 3" 6" 9" 1' NO. 8

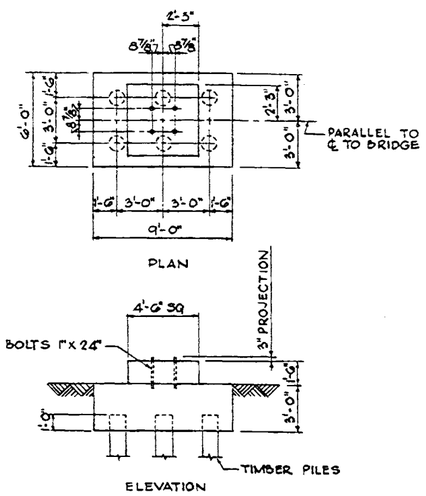
HAYES, SEAY, MATTERN & MATTERN ARCHITECTS - ENGINEERS ROANOKE, VIRGINIA WASHINGTON, D. C.	DEPARTMENT OF THE ARMY OFFICE OF THE CHIEF OF ENGINEERS MILITARY CONSTRUCTION - ENGINEERING DIVISION WASHINGTON, D. C.
DRAWN BY: HELTON TRACED BY: CHECKED BY: EDWARDS SUBMITTED BY: C. W. DEICHMANN APPROVED: CHIEF, DESIGNERS BRANCH	THEATER OF OPERATIONS RAILROAD TRACK NO. 8 TURNOUT APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: ROBERT W. GENTLEMAN, Colonel, GS, Deputy Chief, Transportation Resources Division, Directorate of Army Transportation DATE 2 NOV 1968	SCALE: AS NOTED SPEC. NO. DRAWING NUMBER SHEET 1 OF 1 86-13



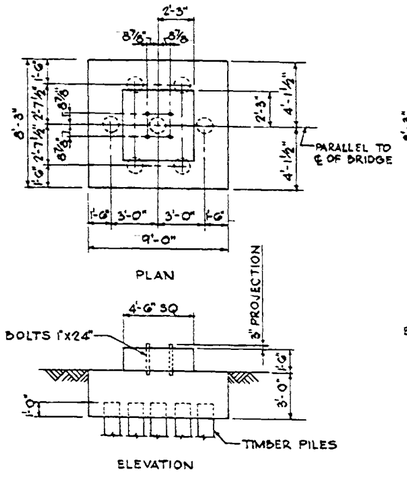
4-PILE FOOTING
SCALE NO. 2



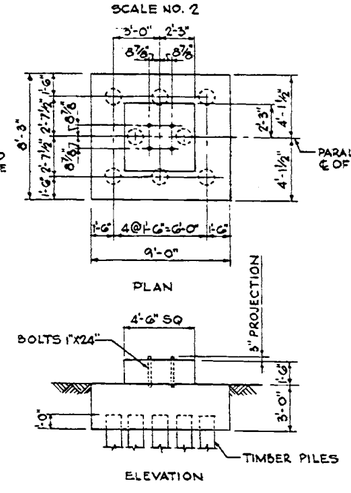
5-PILE FOOTING
SCALE NO. 2



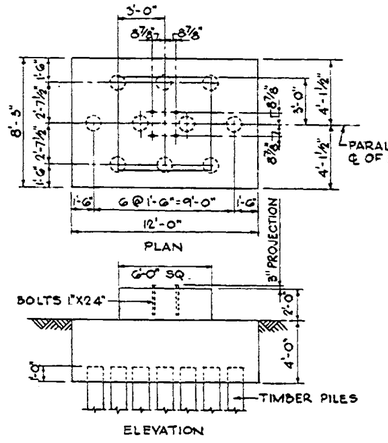
6-PILE FOOTING
SCALE NO. 2



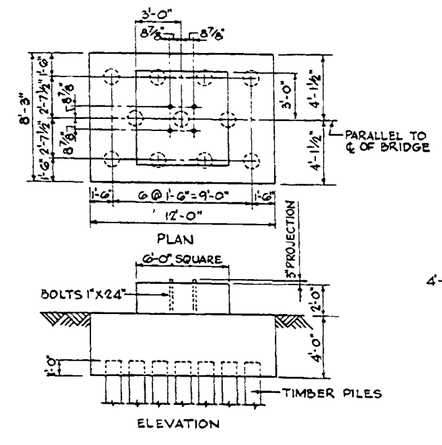
7-PILE FOOTING
SCALE NO. 2



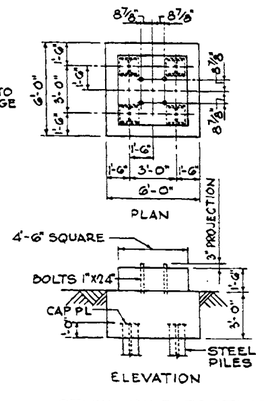
8-PILE FOOTING
SCALE NO. 2



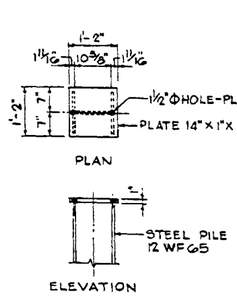
10-PILE FOOTING
SCALE NO. 2



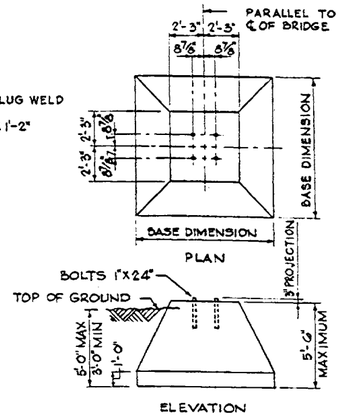
11 PILE-FOOTING
SCALE NO. 2



STEEL PILE FOOTING
SCALE NO. 2



DETAIL OF CAP PLATE
FOR STEEL PILE
NO SCALE



CONCRETE PEDESTAL FOR STEEL TOWERS
SCALE NO. 2

CONCRETE & TIMBER PILE FOUNDATIONS

ROAD STEEL TOWERS - CLASS 25

ADJACENT SPAN	HEIGHT OF TOWER	NO. OF PILES PER FOOTING	NO. OF FTGS. REQ'D.	GROUP OF 4 FTGS FACILITY NO.
15' TO 70'	77' OR LOWER	4	4	861401
80'	57' OR LOWER 59' TO 77'	4 5	4 4	861401 861402
90'	57' OR LOWER 59' TO 77'	4 5	4 4	861401 861402

PILE BEARING CAPACITY-18 TONS EA

ROAD STEEL TOWERS - CLASS 50 & 60

ADJACENT SPAN	HEIGHT OF TOWER	NO. OF PILES PER FOOTING	NO. OF FTGS. REQ'D	GROUP OF 4 FTGS FACILITY NO.
15'	57' OR LOWER 59' TO 77'	5 6	4 4	861402 861403
20'	57' OR LOWER 59' TO 77'	5 6	4 4	861402 861403
30'	57' OR LOWER 59' TO 77'	5 6	4 4	861402 861403
40'	39' OR LOWER 41' TO 77'	5 6	4 4	861402 861403
50'	21' OR LOWER 23' TO 77'	5 6	4 4	861402 861403
60'	57' OR LOWER 59' TO 77'	6 7	4 4	861403 861404
70'	39' OR LOWER 41' TO 77'	6 7	4 4	861403 861404
80'	21' OR LOWER 23' TO 77'	6 7	4 4	861403 861404

PILE BEARING CAPACITY - 18 TONS EACH

RR STEEL TOWERS - E-45 LOADING

ADJACENT SPAN	HEIGHT OF TOWER	NO. OF PILES PER FOOTING	NO. OF FTGS. REQ'D.	GROUP OF 4 FTGS. FACILITY NO.
25'	41' OR LOWER 43' TO 57' 59' TO 77'	5 6 7	4 4 4	861402 861403 861404
30'	21' OR LOWER 23' TO 41' 43' TO 77'	5 6 7	4 4 4	861402 861403 861404
35'	21' OR LOWER 23' TO 41' 43' TO 57' 59' TO 77'	5 6 7 8	4 4 4 4	861402 861403 861404 861405
40'	21' OR LOWER 23' TO 41' 43' TO 77'	6 7 8	4 4 4	861403 861404 861405
45'	21' OR LOWER 23' TO 57' 59' TO 77'	7 8 10	4 4 4	861404 861405 861406
50'	41' OR LOWER 43' TO 57' 59' TO 77'	8 10 11	4 4 4	861405 861406 861407

PILE BEARING CAPACITY - 18 TONS EACH

TABLE OF DIMENSIONS FOR ONE CONCRETE PEDESTAL WITHOUT PILES

ADJACENT SPAN	HEIGHT OF TOWER	GROUP OF 4 FTGS FACILITY NO.	BASE DIMENSION (FEET)	CONCRETE* (CUBIC YARDS)
ROAD TOWERS - CLASS 25				
15'	39' OR LOWER	861409	6'-0"	6.0
	41' TO 77'	861410	7'-0"	7.4
20'	21' OR LOWER	861409	6'-0"	6.0
	23' TO 77'	861410	7'-0"	7.4
30'	21' OR LOWER	861409	6'-0"	6.0
	23' TO 77'	861410	7'-0"	7.4
40'	57' OR LOWER	861410	7'-0"	7.4
	59' TO 77'	861411	8'-0"	9.1
50'	39' OR LOWER	861410	7'-0"	7.4
	41' TO 77'	861411	8'-0"	9.1
60'	39' OR LOWER	861410	7'-0"	7.4
	41' TO 77'	861411	8'-0"	9.1
70'	21' OR LOWER	861410	7'-0"	7.4
	23' TO 77'	861411	8'-0"	9.1
80'	21' OR LOWER	861410	7'-0"	7.4
	23' TO 77'	861411	8'-0	9.1
90 MAX	57' OR LOWER	861411	8'-0"	9.1
	59' TO 77'	861412	9'-0"	10.8
ROAD TOWERS - CLASS 50 & 60				
15'	39' OR LOWER	861411	8'-0"	9.1
	41' TO 77'	861412	9'-0"	10.8
20'	21' OR LOWER	861411	8'-0"	9.1
	23' TO 77'	861412	9'-0"	10.8
30'	21' OR LOWER	861411	8'-0"	9.1
	23' TO 77'	861412	9'-0"	10.8
40'	57' OR LOWER	861412	9'-0"	10.8
	59' TO 77'	861413	10'-0"	12.9
50'	57' OR LOWER	861412	9'-0"	10.8
	59' TO 77'	861413	10'-0"	12.9
60'	39' OR LOWER	861412	9'-0"	10.8
	41' TO 77'	861413	10'-0"	12.9
70'	21' OR LOWER	861412	9'-0"	10.8
	23' TO 77'	861413	10'-0"	12.9
80' MAX	57' OR LOWER	861413	10'-0"	12.9
	59' TO 77'	861414	11'-0"	15.1
RAILROAD TOWERS				
25'	39' OR LOWER	861412	9'-0"	10.8
	41' TO 77'	861413	10'-0"	12.9
30'	39' OR LOWER	861412	9'-0"	10.8
	41' TO 77'	861413	10'-0"	12.9
35'	21' OR LOWER	861412	9'-0"	10.8
	23' TO 57'	861413	10'-0"	12.9
	59' TO 77'	861414	11'-0"	15.1
40'	39' OR LOWER	861413	10'-0"	12.9
	41' TO 77'	861414	11'-0"	15.1
45'	21' OR LOWER	861413	10'-0"	12.9
	23' TO 77'	861414	11'-0"	15.1
50'	21' OR LOWER	861413	10'-0"	12.9
	23' TO 77'	861414	11'-0"	15.1

* BASED ON 5'-6" PEDESTAL HEIGHT

FACILITY NO. 861408 - CONCRETE & STEEL PILE FOUNDATION, FOUR-4 STEEL PILE GROUPS

REQUIRED BEARING CAPACITY OF PILES TONS PER PILE

ADJACENT SPAN	CLASS 25 ROAD TOWER HEIGHT OF TOWER				CLASS 50 & 60 ROAD TOWER HEIGHT OF TOWER			
	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57	59' TO 77
15'	12	13	14	16	16	18	19	21
20'	12	13	15	17	17	18	20	22
30'	13	14	16	18	18	20	22	24
40'	14	15	17	19	19	21	23	25
50'	14	16	18	20	20	22	24	26
60'	15	17	19	21	22	24	26	28
70'	16	18	20	22	23	25	27	29
80'	17	19	21	23	24	26	28	31
90'	18	20	22	—	25	28	30	32
	MAX SPAN				MAX SPAN			

ADJACENT SPAN	E-45 LOADING RAILROAD TOWER HEIGHT OF TOWER			
	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'
25'	25	26	29	32
30'	25	29	32	36
35'	28	32	35	39
40'	30	35	39	43
45'	33	37	42	47
50'	35	40	45	50
	MAX SPAN			

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-14	CONCRETE & PILE FOUNDATIONS	1 OF 11
86-15	RAILROAD - SINGLE TRACK STEEL TOWERS	3 OF 5
85-13	ROAD - SINGLE LANE STEEL TOWERS	1 OF 3
85-23	ROAD - DOUBLE LANE STEEL TOWERS	3 OF 5

SYMBOL	DESCRIPTION REVISIONS GRAPHIC SCALES	DATE	APPROVAL

0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

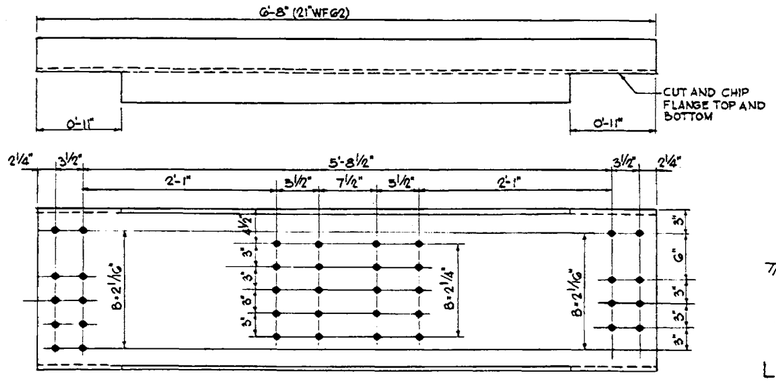
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. REICHMANN
APPROVED: [signature] H. M. Williams DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
ROAD & RAILROAD BRIDGE SUBSTRUCTURES
CONCRETE & PILE FOUNDATIONS
CONCRETE PEDESTAL FOUNDATIONS FOR STEEL TOWERS

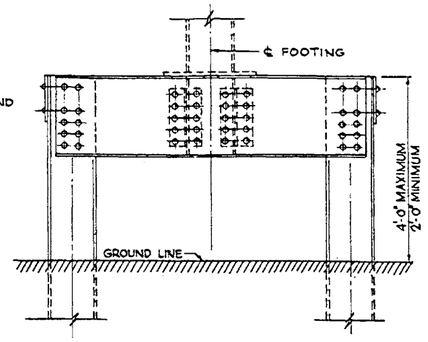
UNDER DIVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 11
86-14



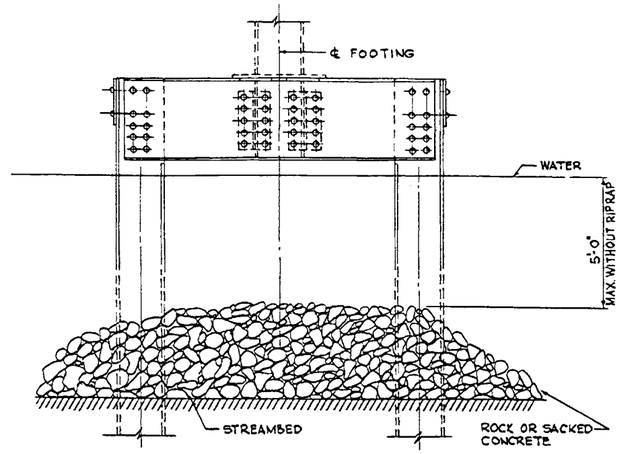
BEAM MK 9052

SCALE NO. 7



LEFT ELEVATION-FOOTINGS IN SOIL

SCALE NO. 5



LEFT ELEVATION FOOTINGS IN WATER

SCALE NO. 5

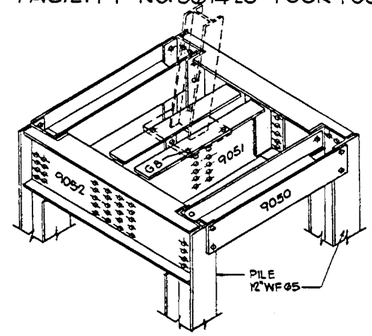
LINE	SCHEDULE OF PARTS FOR ONE FOOTING				
	DESCRIPTION	MARK	SIZE	LENGTH	QUANTITY
1	PILE		12" WF 65		4
2	BEAM	9052	21" WF 62	6'-8"	2
3	BEAM	9051	21" WF 62	5'-9⅜"	2
4	BEAM	9050	12" WF 65	5'-9"	2
5	CONNECTION	9053	21" WF 62	1'-3"	4
6	DIAPHRAGM	9054	12" WF 65	1'-3"	1
7	RIBBED BOLT		⅞"	2¼6"	40
8	RIBBED BOLT		⅞	2¼"	80
9	RIBBED BOLT		⅞"	2⅞6"	16
10	RIBBED BOLT		⅞	3"	4
11	WASHER, FLAT ROUND		15/16 ID		4

NOTE: LENGTH OF PILE DETERMINED BY CONDITIONS AT SITE AND BEARING CAPACITY REQUIRED.

REQUIRED BEARING CAPACITY OF PILES TONS PER PILE

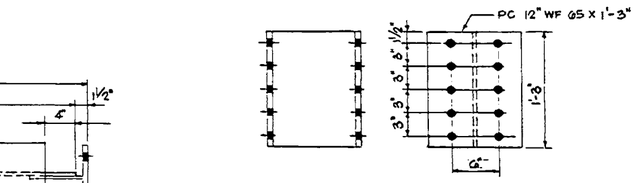
ADJACENT SPAN	CLASS 25 ROAD TOWER				CLASS 50 & 60 ROAD TOWER				E-45 LOADING RAILROAD TOWER			
	HEIGHT OF TOWER				HEIGHT OF TOWER				HEIGHT OF TOWER			
	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'
15'	12	13	14	16	20	22	23	26	—	—	—	—
20'	12	13	15	17	21	22	24	27	23	26	29	32
30'	13	14	16	18	22	24	27	29	25	29	32	36
40'	14	15	17	19	23	26	28	30	30	35	39	43
50'	14	16	18	20	24	27	29	32	35	40	45	50
60'	15	17	19	21	26	29	32	34	MAX. SPAN			
70'	16	18	20	22	27	30	33	35				
80'	17	19	21	23	28	32	34	38				
90'	18	20	22	24	MAX. SPAN							
MAX. SPAN												

FACILITY NO. 801420- FOUR FOOTINGS



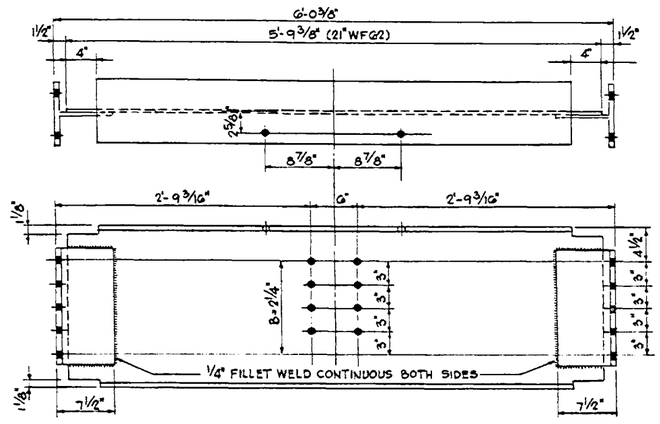
ASSEMBLED VIEW

NO SCALE



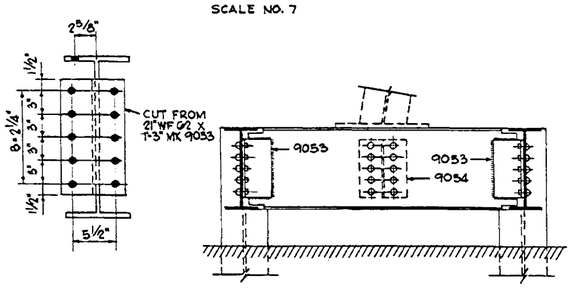
DIAPHRAGM MK 9054

SCALE NO. 7



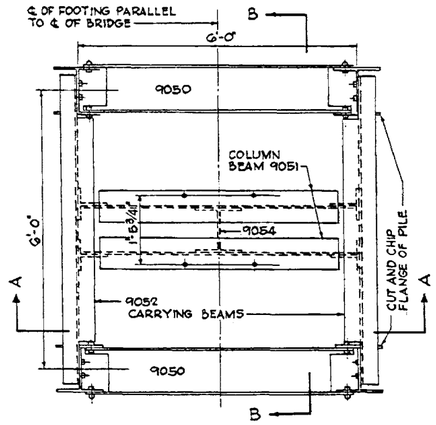
BEAM MK 9051

SCALE NO. 7



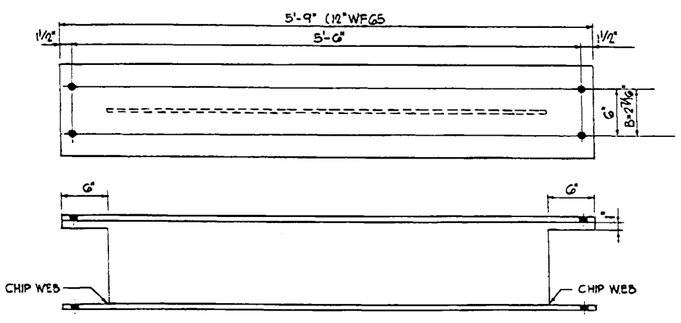
SECTION A-A

SCALE NO. 5



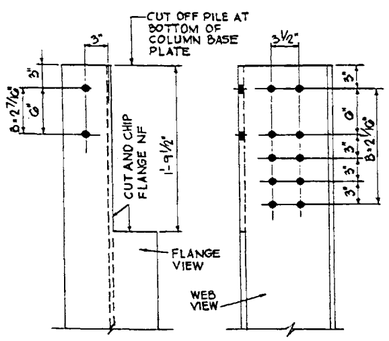
PLAN

SCALE NO. 5



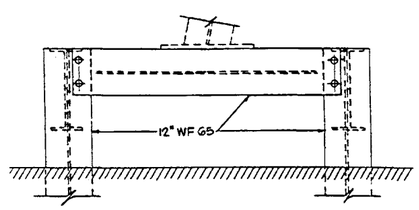
BEAM MK 9050

SCALE NO. 7



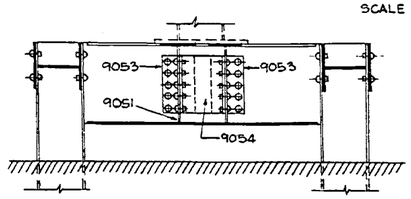
DETAIL AT TOP OF PILE

SCALE NO. 7



END VIEW

SCALE NO. 5



SECTION B-B

SCALE NO. 5

GENERAL NOTES

1. ALL WELDS SHOWN ARE ¼" FILLET WELDS UNLESS OTHERWISE NOTED.
2. DRILL OR REAM ALL HOLES FOR ⅞" RIBBED NECK BOLTS.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 1' 2' 3' — NO.5

0 3" 6" 9" 1' 2' — NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

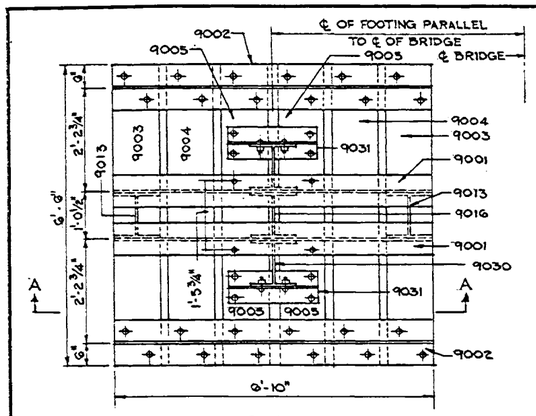
DRAWN BY: HOFNE
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. F. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
ROAD & RAILROAD BRIDGE SUBSTRUCTURE
STEEL FRAME & PILE FOUNDATION
FOR STEEL TOWERS

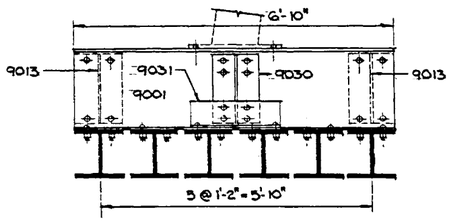
UNDER REVISION

DATE: 29 MAR 1943

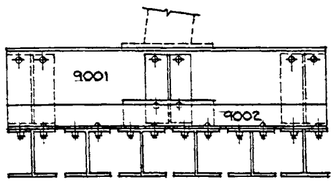
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 11
86-14



PLAN



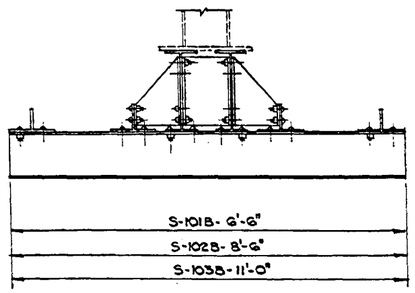
SECTION A-A



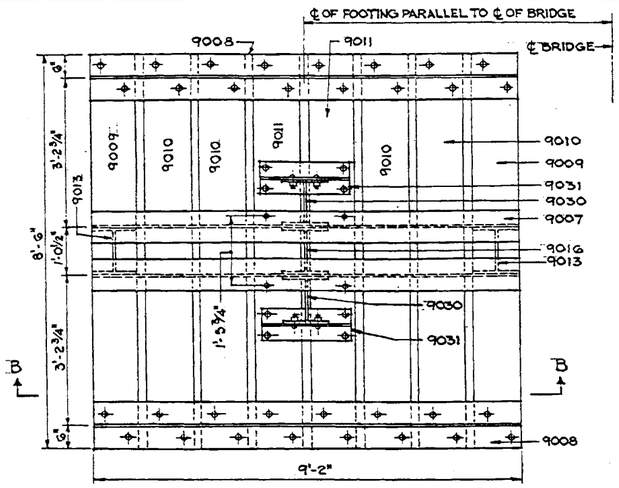
END VIEW

GRILLAGE FOOTINGS S-101B

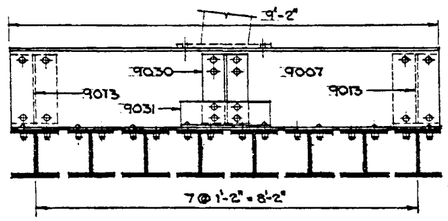
SCALE NO. 5



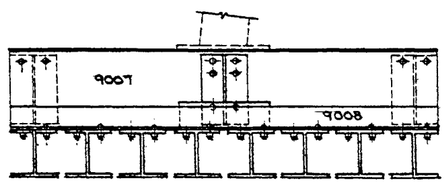
TYPICAL SIDE VIEW



PLAN



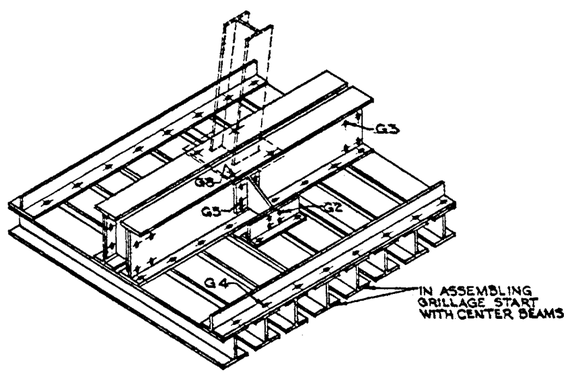
SECTION B-B



END VIEW

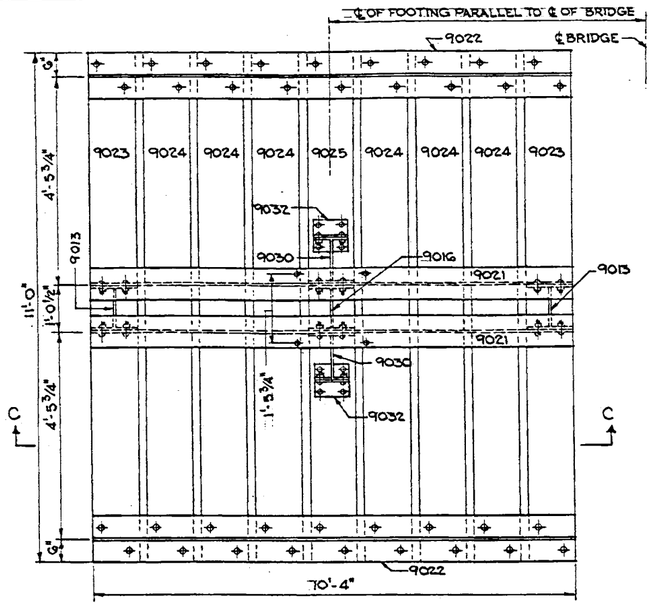
GRILLAGE FOOTINGS S-102B

SCALE NO. 5

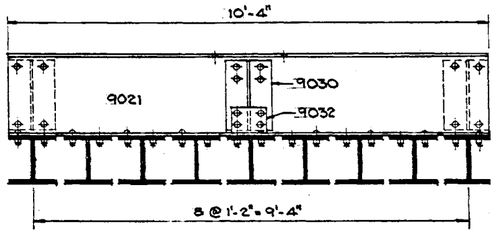


ASSEMBLED VIEW S-102B
S-101B & S-103B GRILLAGE SIMILAR

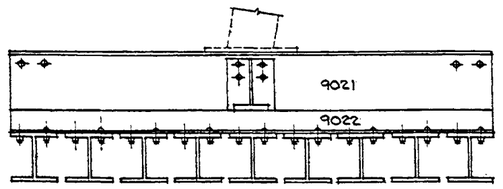
NO SCALE



PLAN



SECTION C-C



END VIEW

GRILLAGE FOOTINGS S-103B

SCALE NO. 5

SCHEDULE OF PARTS FOR ONE GRILLAGE FOOTING

MARK	DESCRIPTION	SIZE	LENGTH	S-101B QUAN.	S-102B QUAN.	S-103B QUAN.
9001	TOP TIER BEAM	21WFG2	6'-10"	2		
9002	TOP TIER HALF BEAM	12WFG5	6'-10"	2		
9003	BOTTOM TIER BEAM	12WFG5	6'-6"	2		
9004	BOTTOM TIER BEAM	12WFG5	6'-6"	2		
9005	BOTTOM TIER BEAM	12WFG5	6'-6"	2		
9007	TOP TIER BEAM	21WFG2	9'-2"		2	
9008	TOP TIER HALF BEAM	12WFG5	9'-2"		2	
9009	BOTTOM TIER BEAM	12WFG5	8'-6"		2	
9010	BOTTOM TIER BEAM	12WFG5	8'-6"		4	
9011	BOTTOM TIER BEAM	12WFG5	8'-6"		2	
9021	TOP TIER BEAM	21WFG2	10'-4"			2
9022	TOP TIER HALF BEAM	12WFG5	10'-4"			2
9023	BOTTOM TIER BEAM	12WFG5	11'-0"			2
9024	BOTTOM TIER BEAM	12WFG5	11'-0"			6
9025	BOTTOM TIER BEAM	12WFG5	11'-0"			1
9013	SEPARATOR	12WFG5	1'-6"	2	2	2
9016	SEPARATOR	12WFG5	1'-6"	1	1	1
9030	BRACE	12WFG5	1'-6"	2	2	2
9031	BRACE	21WFG2	1'-11"	2	2	
9032	BRACE	21WFG2	0'-9"			2
G2	RIBBED BOLT	7/8"	2 1/16"	8	8	8
G3	RIBBED BOLT	7/8"	2 1/4"	16	16	16
G4	RIBBED BOLT	7/8"	2 7/16"	48	60	68
G5	RIBBED BOLT	7/8"	3"	16	16	16
G8	RIBBED BOLT W/WASHER	7/8"	3"	4	4	4

SCHEDULE FOR SELECTION OF GRILLAGE FOOTING

ADJACENT SPANS	CLASS 25 ROAD TOWER			CLASS 50 & 60 ROAD TOWER				E-45 LOADING RAILROAD TOWER			
	HEIGHT OF TOWER			HEIGHT OF TOWER				HEIGHT OF TOWER			
	39' OR LOWER	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'
15'	S-101B	S-101B	S-101B	S-102B	S-102B	S-102B	S-102B	S-102B	S-102B	S-102B	S-102B
20'	S-101B	S-101B	S-101B	S-102B	S-102B	S-102B	S-102B	S-102B	S-102B	S-102B	S-102B
30'	S-101B	S-101B	S-101B	S-102B	S-102B	S-103B	S-103B	S-102B	S-102B	S-103B	S-103B
40'	S-101B	S-101B	S-101B	S-102B	S-103B	S-103B	S-103B	S-102B	S-103B	S-103B	S-103B
50'	S-101B	S-101B	S-102B	S-103B	S-103B	S-103B	S-103B	S-103B	S-103B	S-103B	S-103B
60'	S-101B	S-101B	S-102B	S-103B	S-103B	S-103B	S-103B	MAX. SPAN			
70'	S-101B	S-101B	S-102B	S-103B	S-103B	S-103B	S-103B				
80'	S-101B	S-102B	S-102B	S-103B	S-103B	S-103B	S-103B				
90'	S-101B	S-102B	S-102B	MAX. SPAN							
MAX. SPAN											

FACILITY NO. 861421 - FOUR S-103B GRILLAGES
861423 - FOUR S-102B GRILLAGES
861425 - FOUR S-101B GRILLAGES

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-14	STEEL GRILLAGE FNDTNS. BOLTED CONSTRUCTION	3 OF 11
86-14	STEEL GRILLAGE FNDTNS DETAILS	5 OF 11

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'
NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D.C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

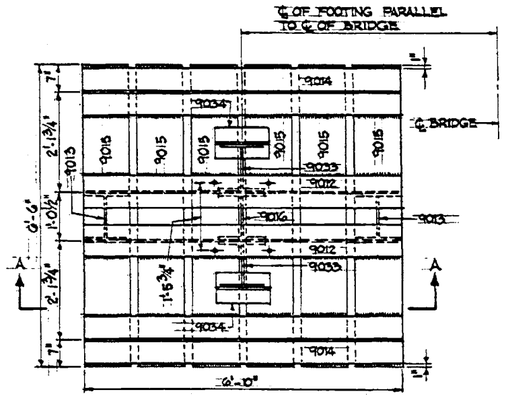
THEATER OF OPERATIONS
ROAD & AIR BRIDGE SUPERSTRUCTURE
STEEL GRILLAGE FOUNDATIONS
FOR STEEL TOWERS
BOLTED CONSTRUCTION

UNDER REVISION

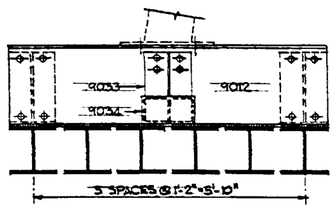
APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 15 JAN 1969

APPROVED FOR PROPONENT AGENCY:
DATE

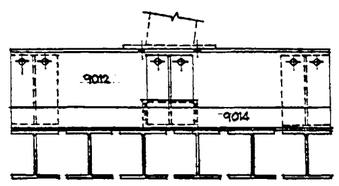
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 3 OF 11
86-14



PLAN

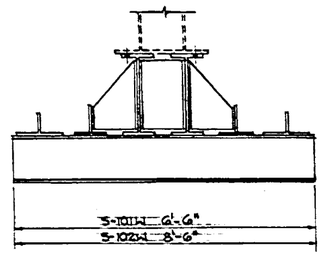


SECTION A-A

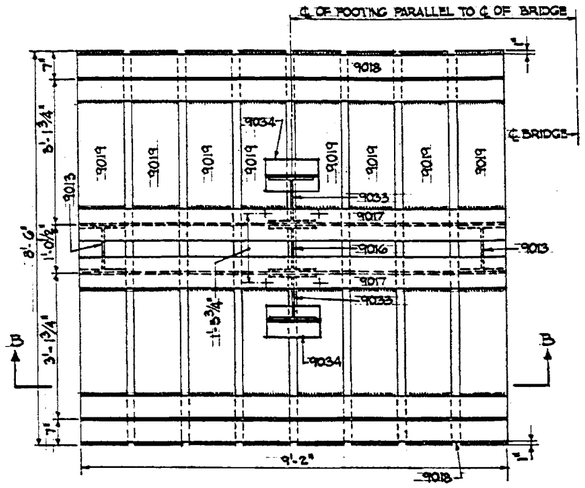


END VIEW

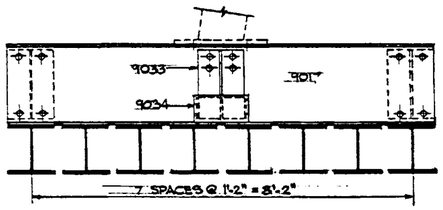
GRILLAGE FOOTING S-101W
SCALE NO.5



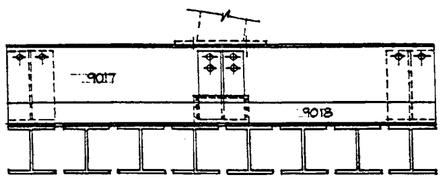
TYPICAL SIDE VIEW
S-101W & S-102W



PLAN

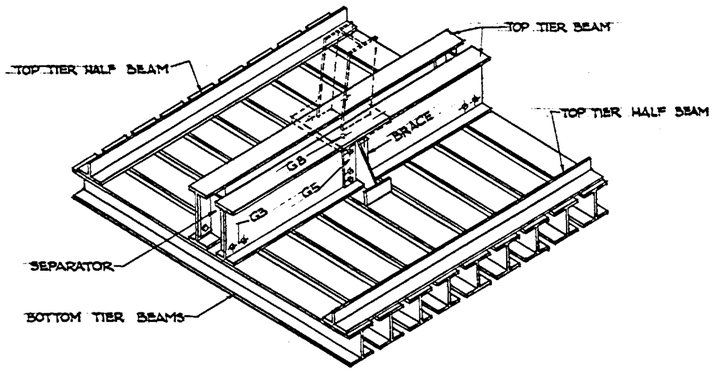


SECTION B-B

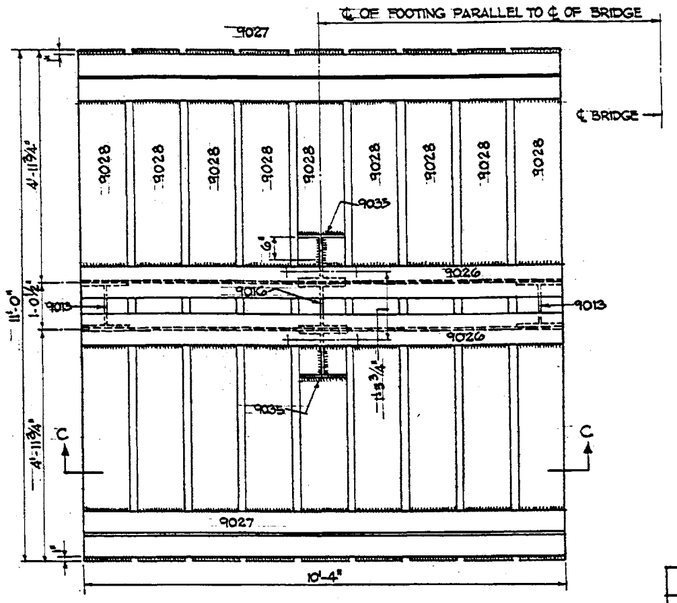


END VIEW

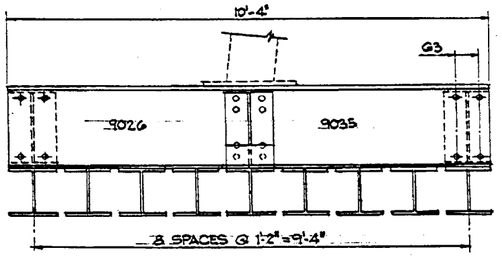
GRILLAGE FOOTING S-102W
SCALE NO.5



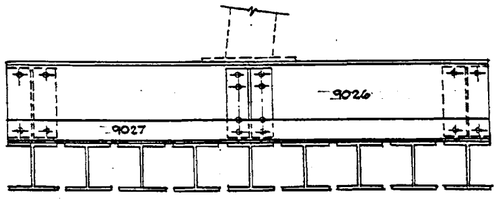
ASSEMBLED VIEW S-103W
NOT TO SCALE
GRILLAGES S-101W & 102W SIMILAR



PLAN

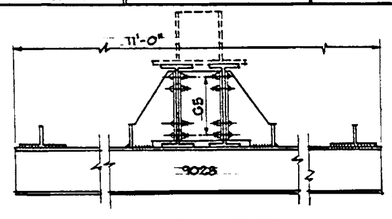


SECTION C-C



END VIEW

GRILLAGE FOOTING S-103W
SCALE NO.5



SIDE VIEW-S-103W

SCHEDULE OF PARTS FOR ONE GRILLAGE FOOTING

MARK	DESCRIPTION	SIZE	LENGTH	S-101W QUAN.	S-102W QUAN	S-103W QUAN
9012	TOP TIER BEAM	21WF62	6'-10"	2		
9014	TOP TIER HALF BEAM	12WF65	6'-10"	2		
9015	BOTTOM TIER BEAM	12WF65	6'-6"	6		
9017	TOP TIER BEAM	21WF62	9'-2"		2	
9018	TOP TIER HALF BEAM	12WF65	9'-2		2	
9019	BOTTOM TIER BEAM	12WF65	8'-6"		8	
9026	TOP TIER BEAM	21WF62	10'-4"			2
9027	TOP TIER HALF BEAM	12WF65	10'-4"			2
9028	BOTTOM TIER BEAM	12WF65	11'-0"			9
9013	SEPARATOR	12WF65	1'-6"	2	2	2
9016	SEPARATOR	12WF65	1'-6"			1
9033	BRACE	12WF65	1'-6"	2	2	
9034	BRACE	21WF62	1'-2"	2	2	
9035	BRACE	12WF65	1'-7½"			2
G-3	RIBBED BOLT	7/8"	2¼"	16	16	16
G-5	RIBBED BOLT	7/8"	3"	16	16	16
G-8	RIBBED BOLT W/WASHER	7/8"	3"	4	4	4
	WELDING ELECTRODE	3/16"	—	9 LBS	12 LBS	13 LBS

SCHEDULE FOR SELECTION OF GRILLAGE FOOTING

ADJACENT SPANS	CLASS 25 ROAD TOWER			CLASS 50 & 60 ROAD TOWER				E-45 LOADING RAILROAD TOWER			
	HEIGHT OF TOWER			HEIGHT OF TOWER				HEIGHT OF TOWER			
	39' OR LOWER	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'	21' OR LOWER	23' TO 39'	41' TO 57'	59' TO 77'
15'	S-101W	S-101W	S-101W	S-102W	S-102W	S-102W	S-102W	S-102W	S-102W	S-102W	S-102W
20'	S-101W	S-101W	S-101W	S-102W	S-102W	S-102W	S-102W	S-102W	S-102W	S-102W	S-102W
30'	S-101W	S-101W	S-101W	S-102W	S-102W	S-103W	S-103W	S-102W	S-102W	S-103W	S-103W
40'	S-101W	S-101W	S-101W	S-102W	S-103W	S-103W	S-103W	S-102W	S-103W	S-103W	S-103W
50'	S-101W	S-101W	S-102W	S-103W	S-103W	S-103W	S-103W	S-103W	S-103W	S-103W	S-103W
60'	S-101W	S-101W	S-102W	S-103W	S-103W	S-103W	S-103W	MAX SPAN			
70'	S-101W	S-101W	S-102W	S-103W	S-103W	S-103W	S-103W				
80'	S-101W	S-102W	S-102W	S-103W	S-103W	S-103W	S-103W				
90'	S-101W	S-102W	S-102W	MAX SPAN							
MAX SPAN											

GENERAL NOTES

1. ALL WELDS SHOWN ARE ¼" FILLET WELDS UNLESS OTHERWISE NOTED

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-14	STEEL GRILLAGE FNDTNS WELDED CONSTRUCTION	4 OF 11
86-14	STEEL GRILLAGE FNDTNS DETAILS	5 OF 11

FACILITY NO. 861422 - FOUR S-103W GRILLAGES
861424 - FOUR S-102W GRILLAGES
861426 - FOUR S-101W GRILLAGES

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3'
NO.5

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LAIL
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. V. DEITCHMANN
APPROVED: E. Schaum
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
ROAD & RR BRIDGE SUBSTRUCTURE
STEEL GRILLAGE FOUNDATIONS
ROAD STEEL TOWERS
WELDED CONSTRUCTION

UNDER REVISION

APPROVED: H. H. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

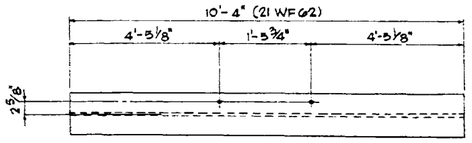
APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-14
SHEET 4 OF 11

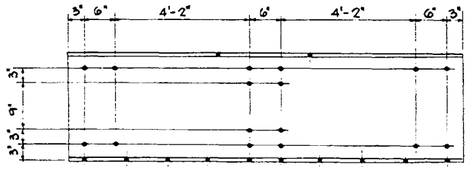
CORPS OF ENGINEERS

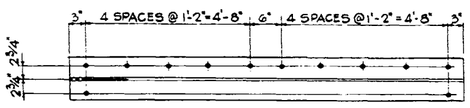
U. S. ARMY

FABRICATION DETAILS FOR BOLTED CONSTRUCTION



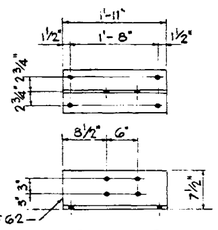
TOP FLANGE



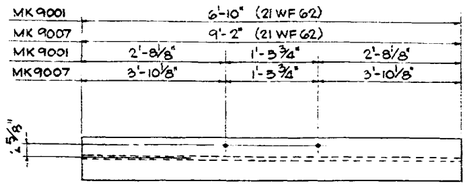


SECTION SHOWING BOTTOM FLANGE

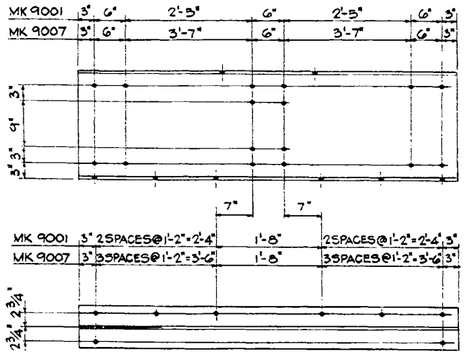
BEAM MK 9021



BRACE MK 9031

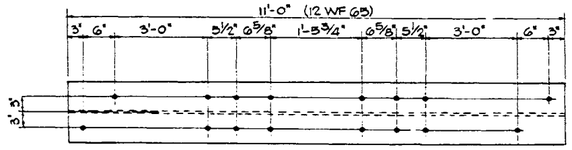


TOP FLANGE

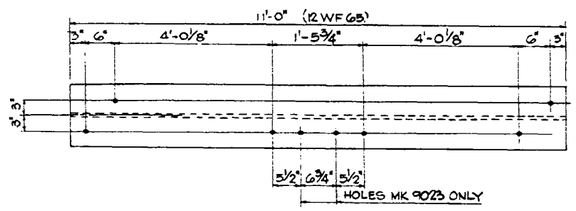


SECTION SHOWING BOTTOM FLANGE

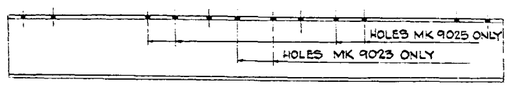
BEAM MK 9001
BEAM MK 9007



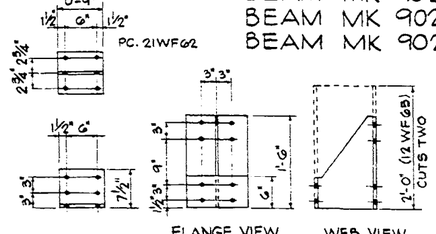
TOP FLANGE MK 9025



TOP FLANGE MK 9023
TOP FLANGE MK 9024



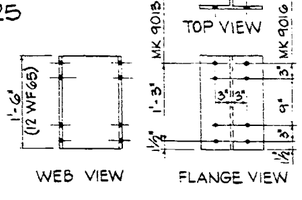
BEAM MK 9023
BEAM MK 9024
BEAM MK 9025



BRACE MK 9032

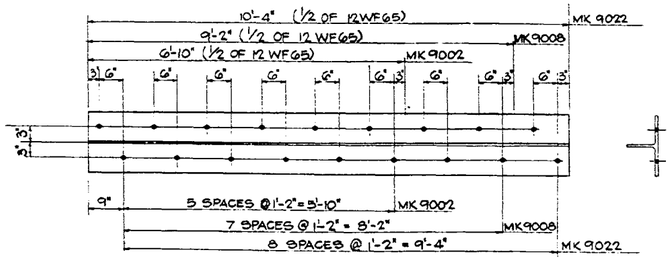
FLANGE VIEW WEB VIEW

BRACE MK 9030

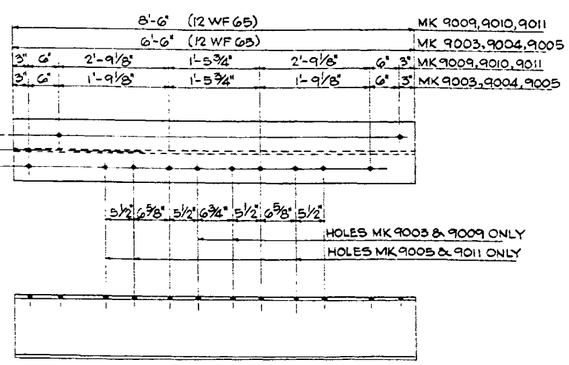


WEB VIEW FLANGE VIEW

SEPARATOR MK 9013
SEPARATOR MK 9016

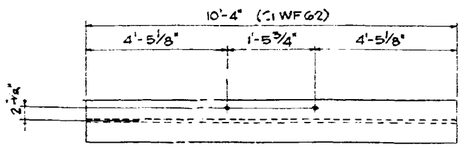


HALF BEAM MK 9002
HALF BEAM MK 9008
HALF BEAM MK 9022

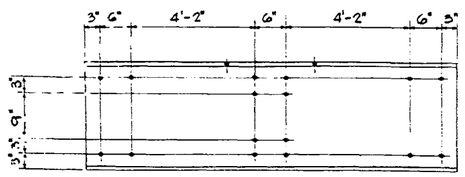


BEAM MK 9003 BEAM MK 9009
BEAM MK 9004 BEAM MK 9010
BEAM MK 9005 BEAM MK 9011

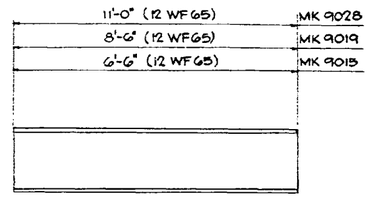
FABRICATION DETAILS FOR WELDED CONSTRUCTION



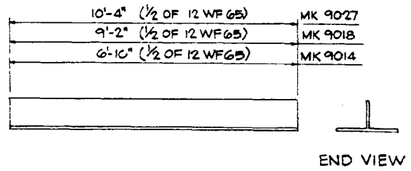
TOP FLANGE



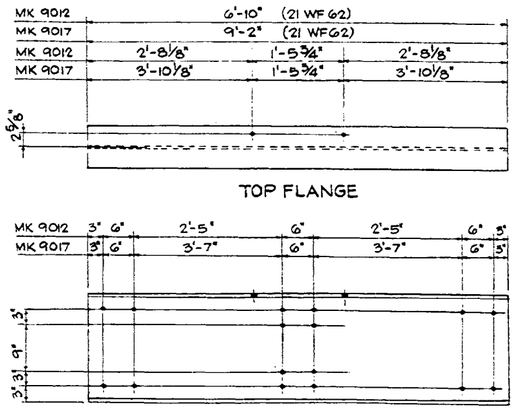
BEAM MK 9026



BEAM MK 9015
BEAM MK 9019
BEAM MK 9028

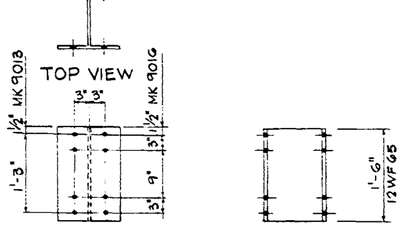


HALF BEAM MK 9014
HALF BEAM MK 9018
HALF BEAM MK 9027

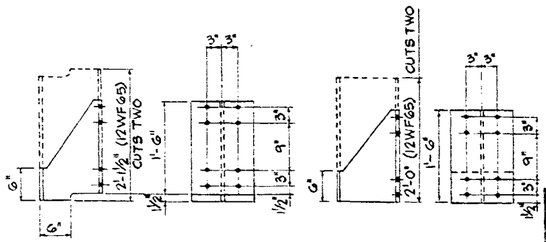


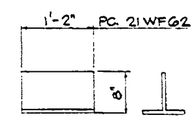
TOP FLANGE

BEAM MK 9012
BEAM MK 9017



SEPARATOR MK 9013
SEPARATOR MK 9016





BRACE MK 9034

GENERAL NOTES

1. DRILL OR REAM ALL HOLES FOR 7/8" RIBBED NECK BOLTS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: R. W. DELICHMANN

THEATER OF OPERATIONS
ROAD & RR BRIDGE SUBSTRUCTURE
STEEL TRILLAGE-FOUNDATIONS
FOR STEEL TOWERS
DETAILS FOR BOLTED & WELDED CONST

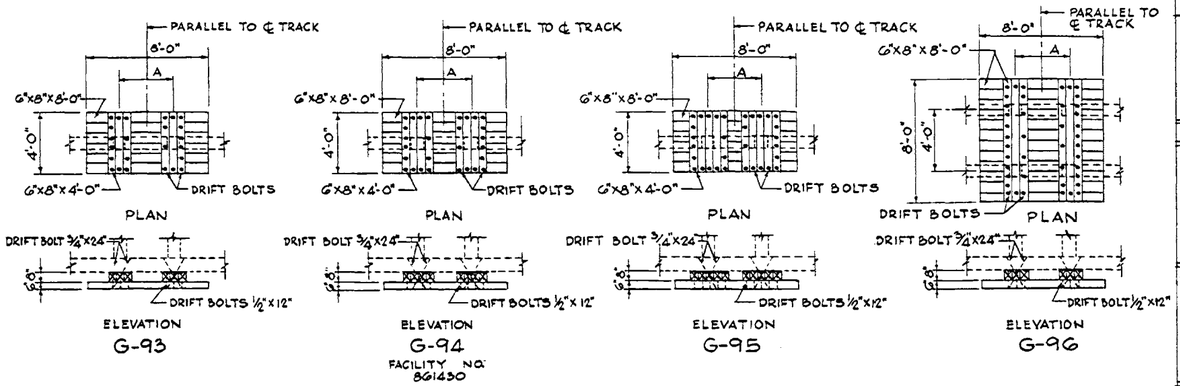
UNDER REVISION

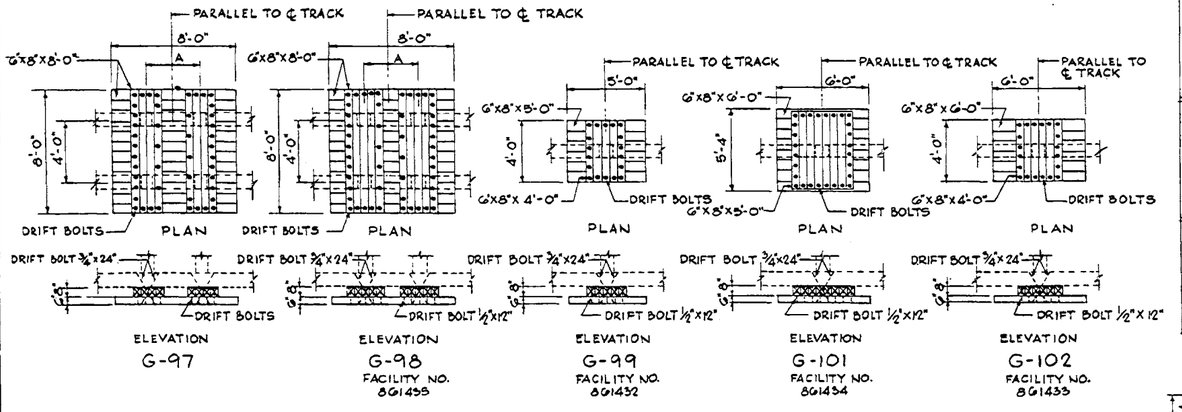
APPROVED: H. M. Williams — DATE: 15 MAR 1963
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

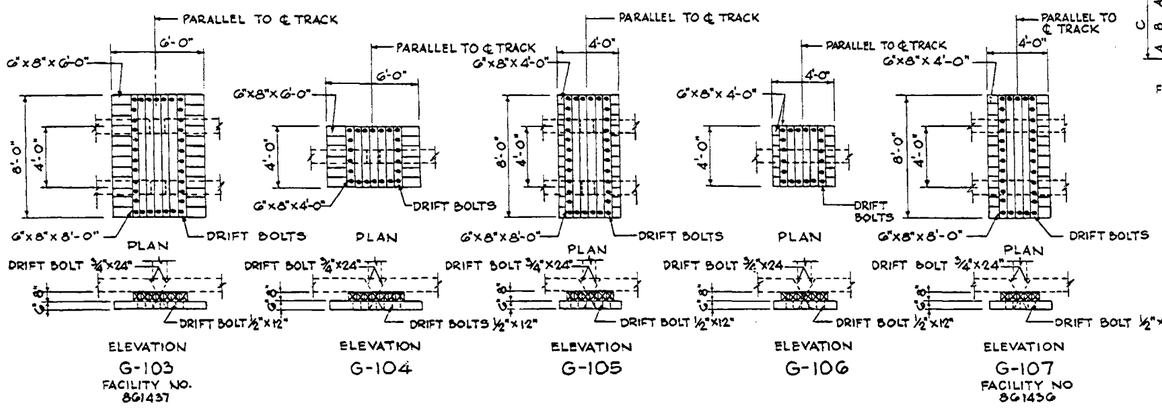
APPROVED FOR PROPONENT AGENCY:

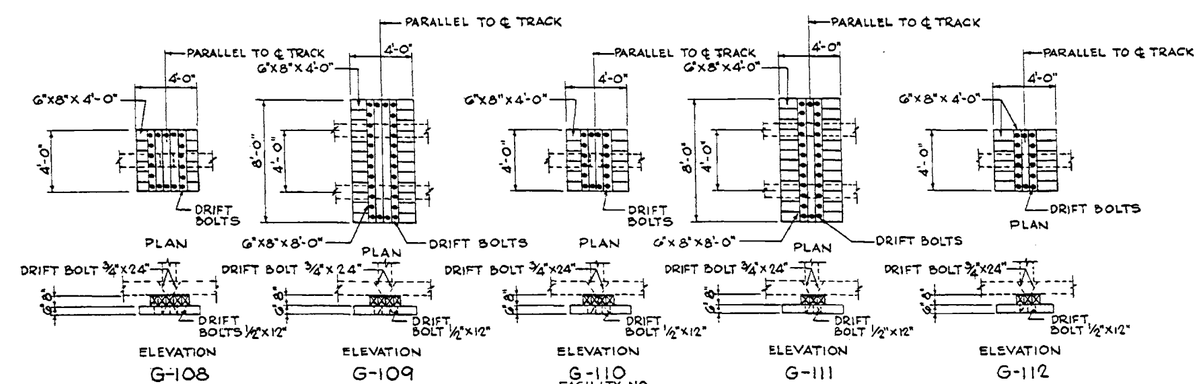
SCALE: NONE
SPEC. NO.
DRAWING NUMBER
SHEET 5 OF 11
86-14

DATE



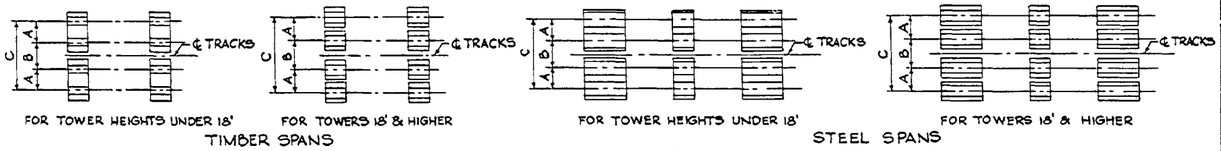






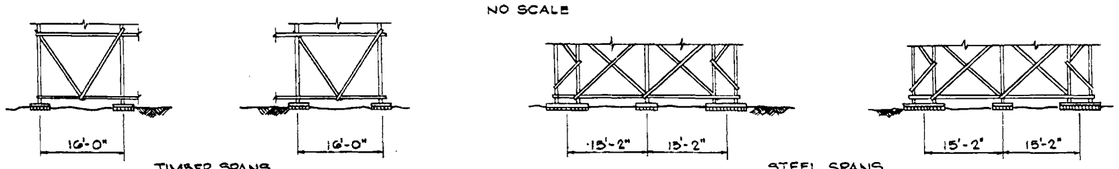
TIMBER GRILLAGE FOOTINGS

STORIES	TOWER HEIGHT	A	B	C	TIMBER SPANS	STEEL SPANS 50'		45'		40'		35'		30'		25'		20'	
					FOOTING MARK														
					ALL FOOTINGS	DOUBLE BENT	SINGLE BENT	DOUBLE BENT	SINGLE BENT	DOUBLE BENT	SINGLE BENT	DOUBLE BENT	SINGLE BENT	DOUBLE BENT	SINGLE BENT	DOUBLE BENT	SINGLE BENT	DOUBLE BENT	SINGLE BENT
1	13'-4"	3'-5½"	4'-11¾"	11'-10¾"	G-94	G-98	G-95	G-98	G-95	G-98	G-95	G-97	G-94	G-97	G-94	G-97	G-94	G-96	G-93
2	16'	3'-9½"	5'-2"	12'-9"	G-94	G-98	G-95	G-98	G-95	G-98	G-95	G-97	G-94	G-97	G-94	G-97	G-94	G-96	G-93
	18'	4'-0½"	5'-4"	13'-5"	G-110	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	20'	4'-3½"	5'-6"	14'-1"	G-110	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	22'	4'-6½"	5'-8"	14'-9"	G-110	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	24'	4'-9½"	5'-10"	15'-5"	G-110	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	25'-10"	5'-0¼"	6'-0½"	16'-0¾"	G-110	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
3	28'	5'-3½"	6'-2"	16'-9"	G-99	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	30'	5'-6½"	6'-4"	17'-5"	G-99	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	32'	5'-9½"	6'-6"	18'-1"	G-99	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	34'	6'-0½"	6'-8"	18'-9"	G-99	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	36'	6'-3½"	6'-10"	19'-5"	G-99	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	38'-4"	6'-7"	7'-0¾"	20'-2¾"	G-99	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
4	40'	6'-9½"	7'-2"	20'-9"	G-102	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	42'	7'-0½"	7'-4"	21'-5"	G-102	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	44'	7'-3½"	7'-6"	22'-1"	G-102	G-107	G-108	G-107	G-108	G-109	G-110	G-109	G-110	G-109	G-110	G-111	G-112	G-111	G-112
	46'	7'-6½"	7'-8"	22'-9"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	48'	7'-9½"	7'-10"	23'-5"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	50'-10"	8'-1¾"	8'-1½"	24'-4¾"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
5	53'	8'-5"	8'-3"	25'-1"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	55'	8'-8"	8'-5"	25'-9"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	57'	8'-11"	8'-7"	26'-5"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	59'	9'-2"	8'-9"	27'-1"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	61'	9'-5"	8'-11"	27'-9"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	63'-4"	9'-8½"	9'-1¾"	28'-6¾"	G-102	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
6	65'	9'-11"	9'-3"	29'-1"	G-101	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	67'	10'-2"	9'-5"	29'-9"	G-101	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	69'	10'-5"	9'-7"	30'-5"	G-101	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	71'	10'-8"	9'-9"	31'-1"	G-101	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	73'	10'-11"	9'-11"	31'-9"	G-101	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108
	75'-10"	11'-3¼"	10'-2¼"	32'-8¾"	G-101	G-103	G-104	G-103	G-104	G-103	G-104	G-105	G-106	G-105	G-106	G-107	G-108	G-107	G-108



PLAN OF TIMBER GRILLAGE FOOTINGS

NO SCALE



TIMBER SPANS

STEEL SPANS

LONGITUDINAL ELEVATIONS

NO SCALE

GENERAL NOTES

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 5' 10'

NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

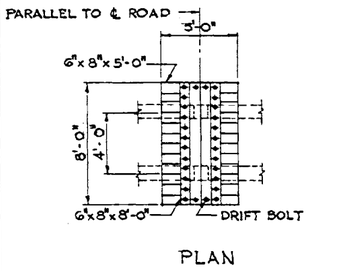
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: J.LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
RAILROAD BRIDGED SUBSTRUCTURES
TIMBER GRILLAGE FOOTINGS
FOR TIMBER TOWERS

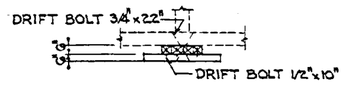
UNDER REVISION

APPROVED: By H.M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAY 1959

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-14
SHEET 8 OF 11

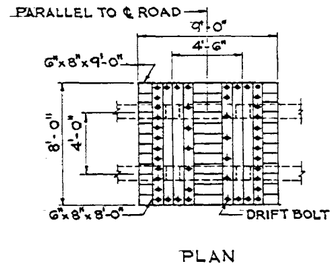


PLAN

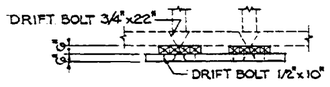


ELEVATION

G-113

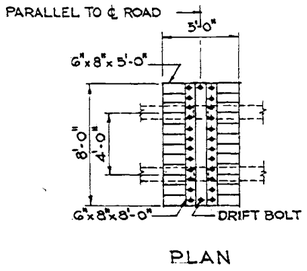


PLAN

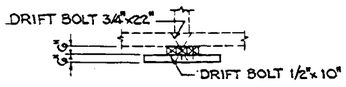


ELEVATION

G-115

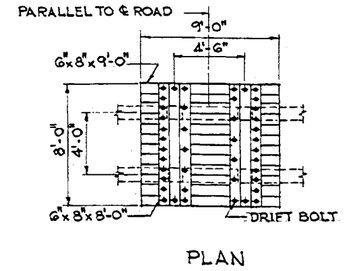


PLAN



ELEVATION

G-117

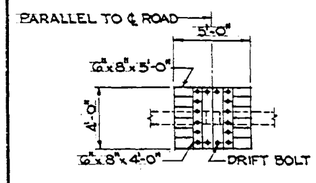


PLAN

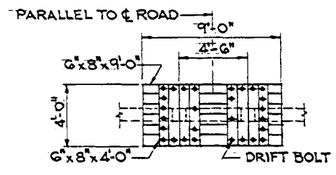


ELEVATION

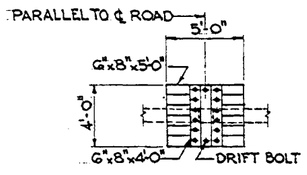
G-119



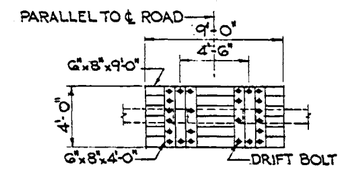
PLAN



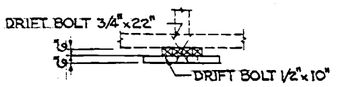
PLAN



PLAN

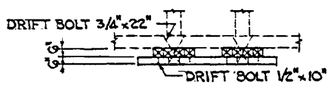


PLAN



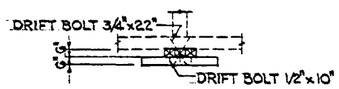
ELEVATION

G-114



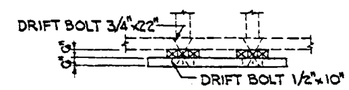
ELEVATION

G-116



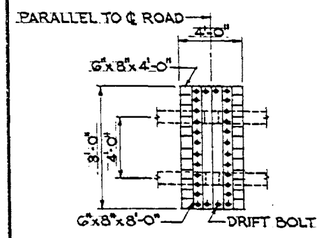
ELEVATION

G-118

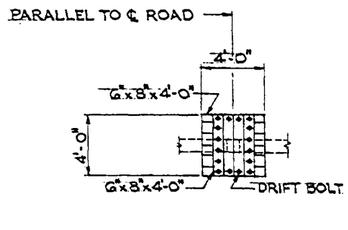


ELEVATION

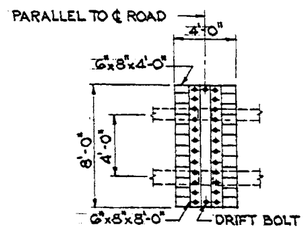
G-120



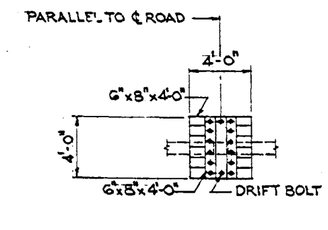
PLAN



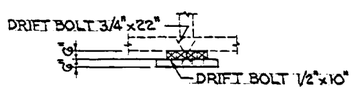
PLAN



PLAN

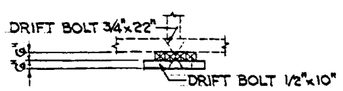


PLAN



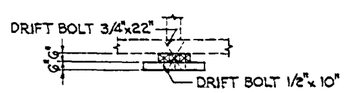
ELEVATION

G-121



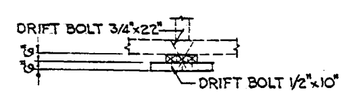
ELEVATION

G-122



ELEVATION

G-123

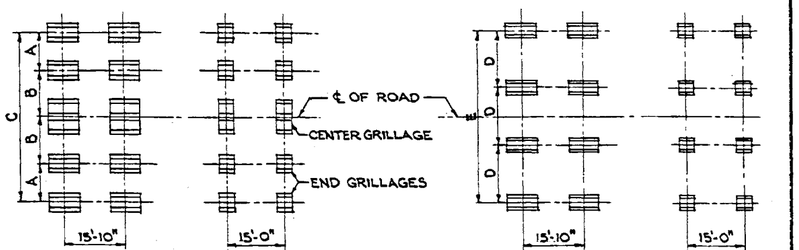


ELEVATION

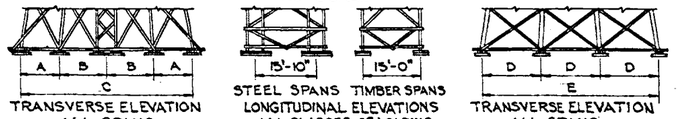
G-124

TIMBER GRILLAGE FOOTINGS

STORIES	TOWER HEIGHT	CLASS 50 & 60 DBL LANE GRILLAGE LOCATIONS A	B	C	CLASS 50 & 60 FACILITY NOS. TIMBER SPANS	STEEL SPANS	CLASS 50 3GL LANE GRILLAGE LOCATIONS D	E	CLASS 25 DBL LANE GRILLAGE LOCATIONS D	E	CLASS 50 3GL LANE CLASS 25 DBL LANE FACILITY NOS. TIMBER SPANS	STEEL SPANS
1	13'-4"	5'-5⅜"	7'-8⅝"	26'-4½"	FACILITY NO. BG1440 8 END GRILLAGES G-118 & 2 CENTER GRILLAGES G-120 PER TOWER	FACILITY NO. BG1442 8 END GRILLAGES G-117 & 2 CENTER GRILLAGES G-119 PER TOWER	5'-7½"	16'-10½"	8'-3⅜"	24'-10⅛"	FACILITY NO. BG1444 8 GRILLAGES G-124 PER TOWER	FACILITY NO. BG1446 8 GRILLAGES G-123 PER TOWER
2	16'	5'-8"	7'-11"	27'-2"			5'-11"	17'-9"	8'-7"	25'-9"		
	18'	5'-10"	8'-1"	27'-10"			6'-2"	18'-6"	8'-10"	26'-6"		
	20'	6'-0"	8'-3"	28'-6"			6'-4"	19'-0"	9'-0"	27'-0"		
	22'	6'-2"	8'-5"	29'-2"			6'-7"	19'-9"	9'-3"	27'-9"		
	24'	6'-4"	8'-7"	29'-10"			6'-10"	20'-6"	9'-6"	28'-6"		
	25'-10"	6'-6⅛"	8'-9⅛"	30'-6½"			7'-0¼"	21'-0¾"	9'-8"	29'-0"		
3	28'	6'-8"	8'-11"	31'-2"			7'-3"	21'-9"	9'-11"	29'-9"		
	30'	6'-10"	9'-1"	31'-10"			7'-6"	22'-6"	10'-2"	30'-6"		
	32'	7'-0"	9'-3"	32'-6"			7'-8"	23'-0"	10'-4"	31'-0"		
	34'	7'-2"	9'-5"	33'-2"			7'-11"	23'-9"	10'-7"	31'-9"		
	36'	7'-4"	9'-7"	33'-10"			8'-2"	24'-6"	10'-10"	32'-6"		
	38'-4"	7'-6⅝"	9'-9⅝"	34'-8½"			8'-4⅞"	25'-2⅝"	11'-0⅝"	33'-1⅞"		
4	40'	7'-8"	9'-11"	35'-2"			8'-7"	25'-9"	11'-3"	33'-9"		
	42'	7'-10"	10'-1"	35'-10"			8'-10"	26'-6"	11'-6"	34'-6"		
	44'	8'-0"	10'-3"	36'-6"			9'-0"	27'-0"	11'-8"	35'-0"		
	46'	8'-2"	10'-5"	37'-2"			9'-3"	27'-9"	11'-11"	35'-9"		
	48'	8'-4"	10'-7"	37'-10"			9'-6"	28'-6"	12'-2"	36'-6"		
	50'-10"	8'-7⅛"	10'-10⅛"	38'-10½"			9'-9½"	29'-4½"	12'-5⅜"	37'-4⅛"		
5	53'	8'-9"	11'-0"	39'-6"	FACILITY NO. BG1441 8 END GRILLAGES G-114 & 2 CENTER GRILLAGES G-116 PER TOWER	FACILITY NO. BG1443 8 END GRILLAGES G-113 & 2 CENTER GRILLAGES G-115 PER TOWER	10'-0"	30'-0"	12'-8"	38'-0"	FACILITY NO. BG1445 8 GRILLAGES G-122 PER TOWER	FACILITY NO. BG1447 8 GRILLAGES G-121 PER TOWER
	55'	8'-11"	11'-2"	40'-2"			10'-3"	30'-9"	12'-11"	38'-9"		
	57'	9'-1"	11'-4"	40'-10"			10'-6"	31'-6"	13'-2"	39'-6"		
	59'	9'-3"	11'-6"	41'-6"			10'-8"	32'-0"	13'-4"	40'-0"		
	61'	9'-5"	11'-8"	42'-2"			10'-11"	32'-9"	13'-7"	40'-9"		
	63'-4"	9'-7⅝"	11'-10⅝"	43'-0½"			11'-2¼"	33'-6¾"	13'-10"	41'-6"		
6	65'	9'-9"	12'-0"	43'-6"			11'-4"	34'-0"	14'-0"	42'-0"		
	67'	9'-11"	12'-2"	44'-2"			11'-7"	34'-9"	14'-3"	42'-9"		
	69'	10'-1"	12'-4"	44'-10"			11'-10"	35'-6"	14'-6"	43'-6"		
	71'	10'-3"	12'-6"	45'-6"			12'-0"	36'-0"	14'-8"	44'-0"		
	73'	10'-5"	12'-8"	46'-2"			12'-3"	36'-9"	14'-11"	44'-9"		
	75'-10"	10'-8⅛"	12'-11⅛"	47'-2½"			12'-6⅞"	37'-8⅝"	15'-2⅝"	45'-7⅞"		



PLANS - TIMBER GRILLAGES
NO SCALE



TRANSVERSE ELEVATION ALL SPANS CLASS 50 & 60 DBL LANE

STEEL SPANS LONGITUDINAL ELEVATIONS TIMBER SPANS ALL CLASSES OF LOADING

TRANSVERSE ELEVATION ALL SPANS CL 50 3GL LANE & CL 25 DBL LANE

ELEVATIONS
NO SCALE

SYMBOL	DESCRIPTION REVISIONS GRAPHIC SCALES	DATE	APPROVAL

0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEJCHMANN

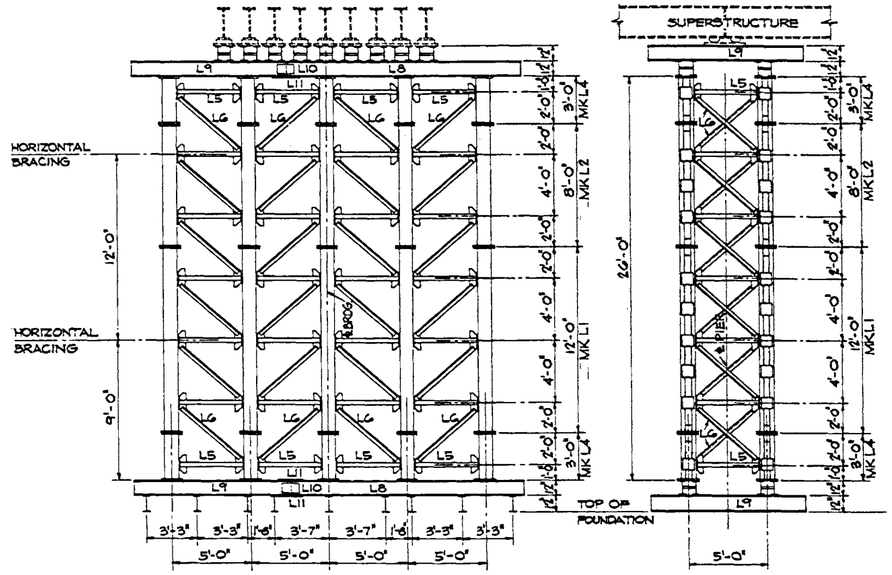
THEATER OF OPERATIONS
ROAD-BRIDGE-CULVERT STRUCTURES
TIMBER GRILLAGE FOOTINGS
180A TIMBER TOWERS
ALL CLASSES

UNDER REVISION

APPROVED: DATE: 19 MAR 1969
H. M. Williams
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE

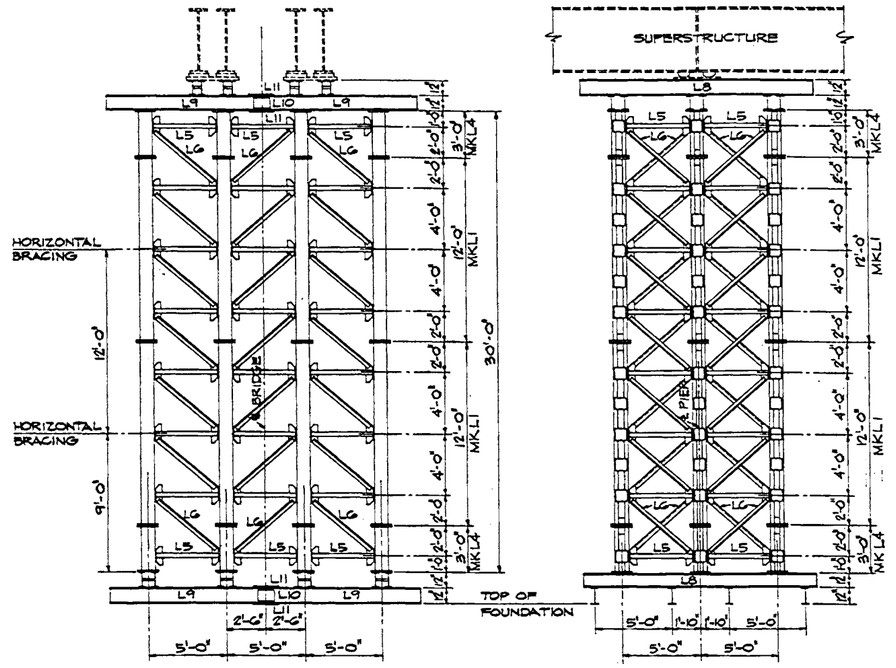
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-14
SHEET 7 OF 11



TRANSVERSE ELEVATION
SCALE NO. 2

LONGITUDINAL ELEVATION
SCALE NO. 2

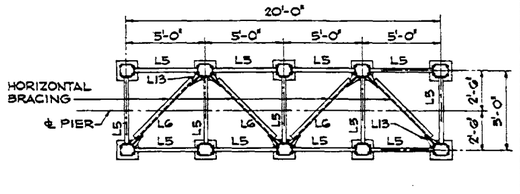
LIGHT UNIT TRESTLE PIER-26FT HIGH-TYPE C
FACILITY NO. 861460



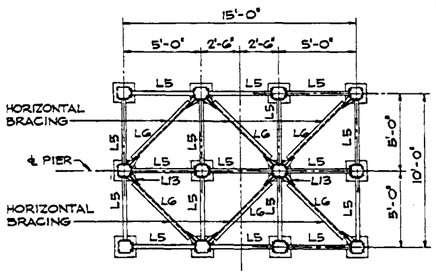
TRANSVERSE ELEVATION
SCALE NO. 2

LONGITUDINAL ELEVATION
SCALE NO. 2

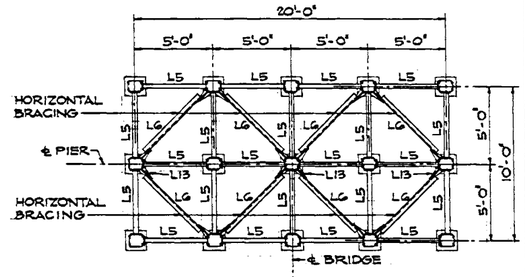
LIGHT UNIT TRESTLE PIER-30FT HIGH-TYPE E
FACILITY NO. 861461



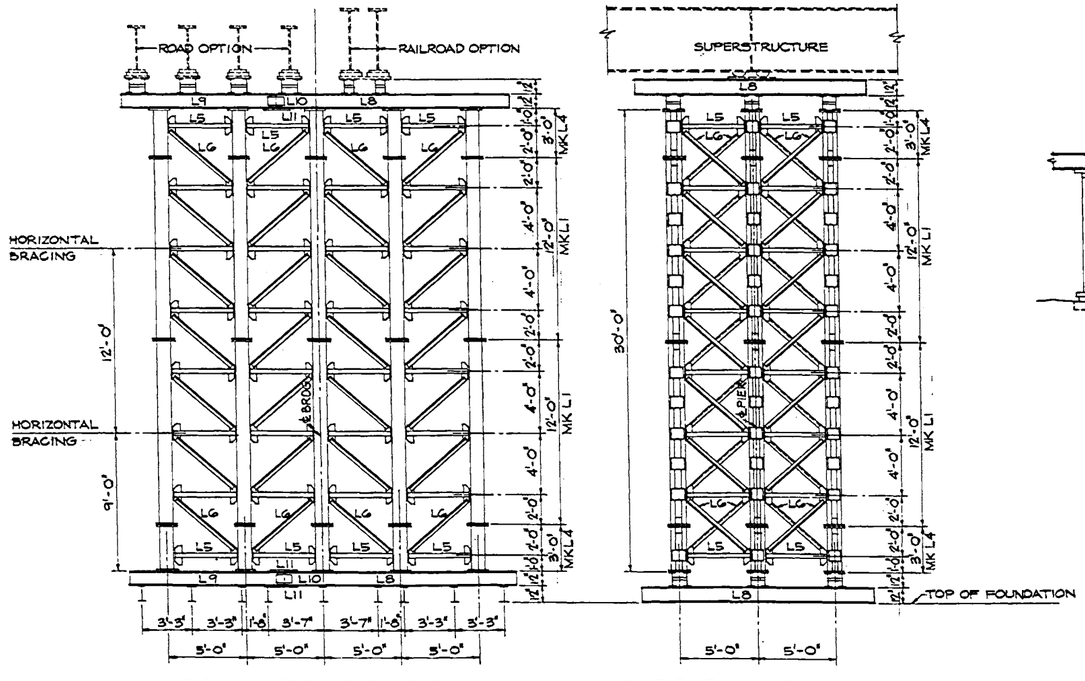
TYPE C
PLAN AT HORIZONTAL BRACING LEVELS
SCALE NO. 2



TYPE E
PLAN AT HORIZONTAL BRACING LEVELS
SCALE NO. 2



TYPE F
PLAN AT HORIZONTAL BRACING LEVELS
SCALE NO. 2



TRANSVERSE ELEVATION
SCALE NO. 2

LONGITUDINAL ELEVATION
SCALE NO. 2

LIGHT UNIT TRESTLE PIER-30FT HIGH-TYPE F
FACILITY NO. 861462

MAX. COMBINED SPANS = 120FT - ROAD, SGL LANE, CLASS 50	TYPE C TRESTLE
MAX. COMBINED SPANS = 120FT - RAILROAD, SGL TRACK, E-45 LOAD	TYPE E TRESTLE
MAX. COMBINED SPANS = 140FT - RAILROAD, SGL TRACK, E-45 LOAD	TYPE F
OR 160FT - ROAD, DBL LANE, CLASS 50 & 60	TRESTLE

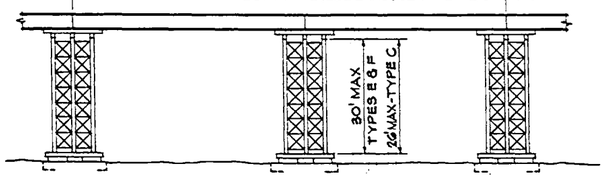


DIAGRAM
SHOWING HEIGHT & SPAN LIMITATIONS
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 2

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: APPROVED: DATE: 19 MAY 1960
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

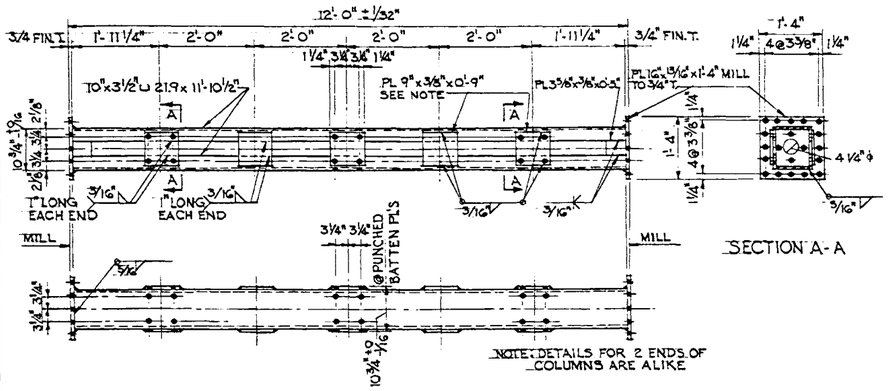
THEATER OF OPERATIONS
ROAD OR RR BRIDGE SUBSTRUCTURES
LIGHT UNIT TRESTLE PIERS
TYPES C, E & F

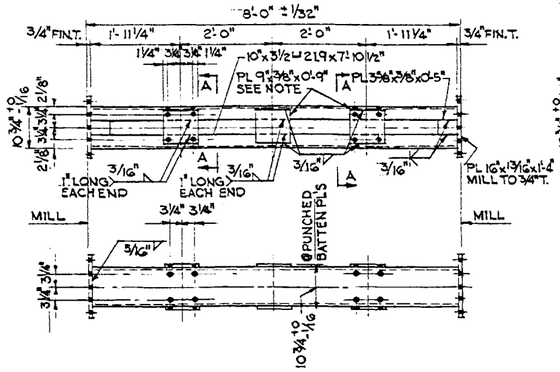
UNDER REVISION

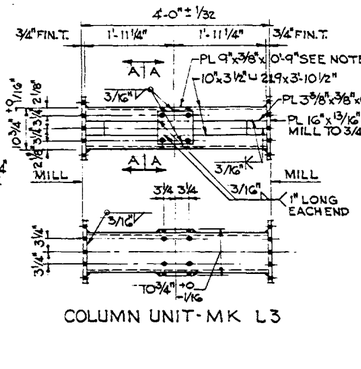
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 8 OF 11
86-14

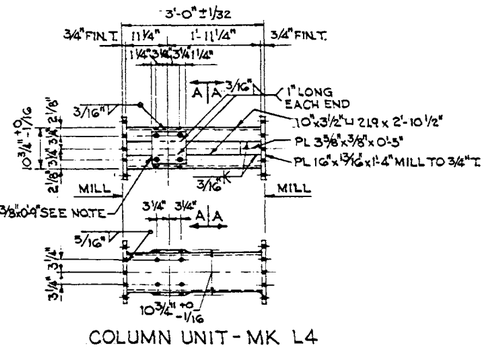
SCHEDULE OF DRAWINGS

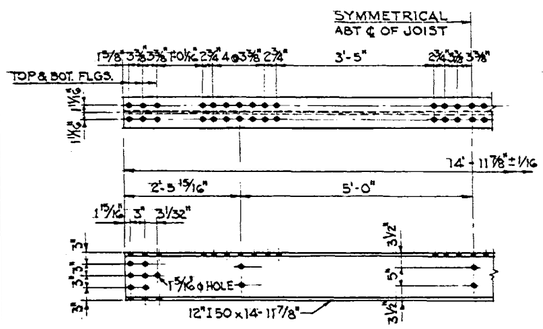
DWG. NO.	DESCRIPTION	SHEET NO.
86-14	LIGHT TRESTLE PIERS	8 OF 11
86-14	DETAILS	9 OF 11

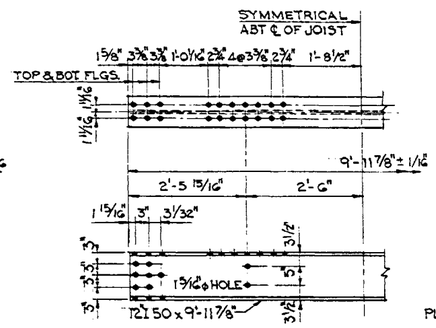


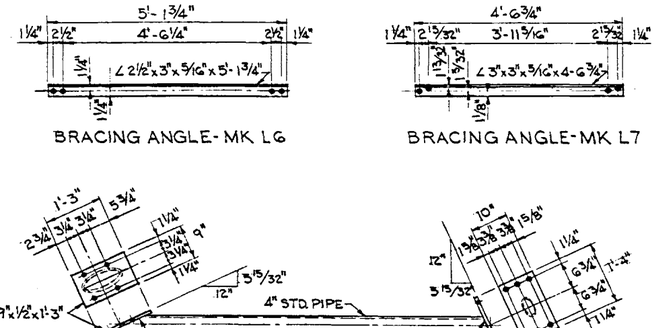


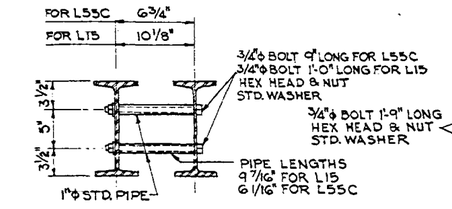


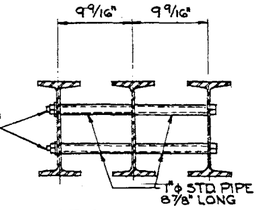


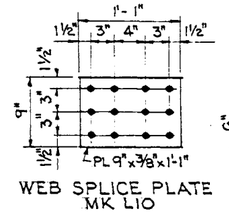


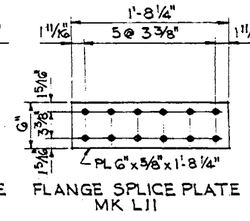


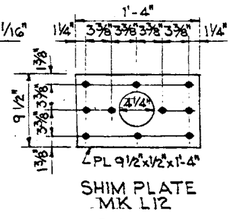


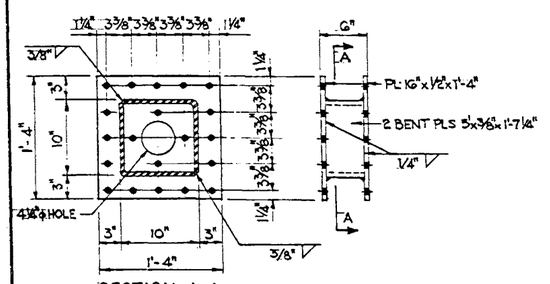


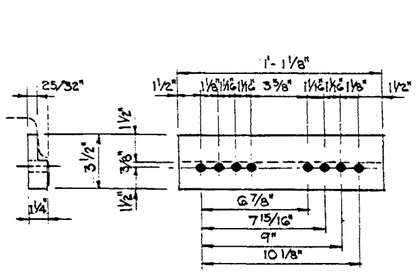


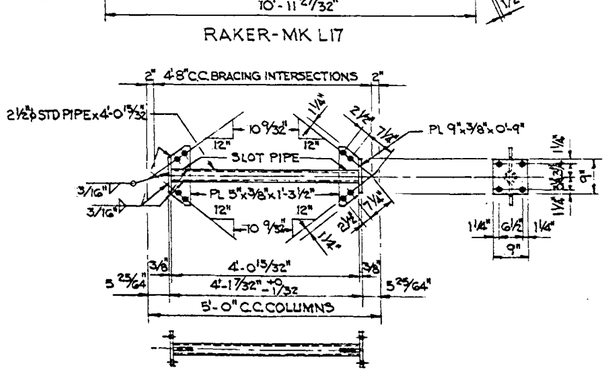


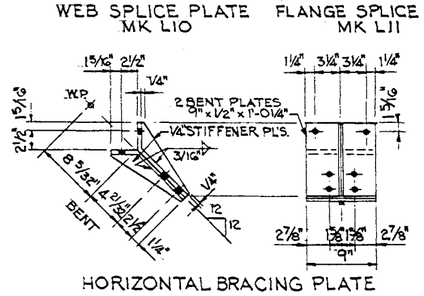


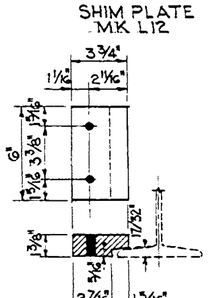


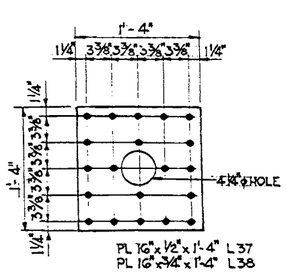


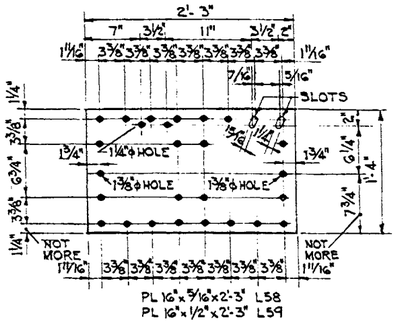


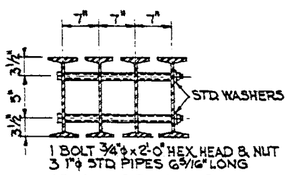


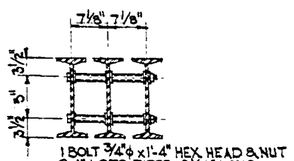


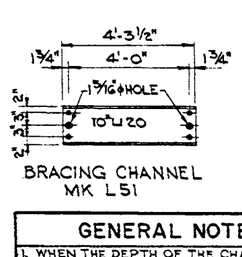












GENERAL NOTES

1. WHEN THE DEPTH OF THE CHANNELS FOR COLUMN UNITS L1, L2, L3 & L4 OVER RUN OR UNDER RUN, THE OVERALL DEPTH AT THE PUNCHED 3/8" BATTEN PLATES SHALL BE HELD WITHIN THE TOLERANCES NOTED BY VARYING THE THICKNESS OF EITHER ONE OR BOTH OF THE BATTEN PLATES.
2. THE EXACT DEPTH OF JOIST UNITS L8 & L9 SHALL BE STAMPED & PAINTED AT EACH END TO THE NEAREST 1/16, THUS 12 1/16
3. HOLES 13/16 ϕ UNLESS OTHERWISE NOTED.

SYMBOL	DESCRIPTION REVISIONS GRAPHIC SCALES	DATE	APPROVAL
	NO SCALE		

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

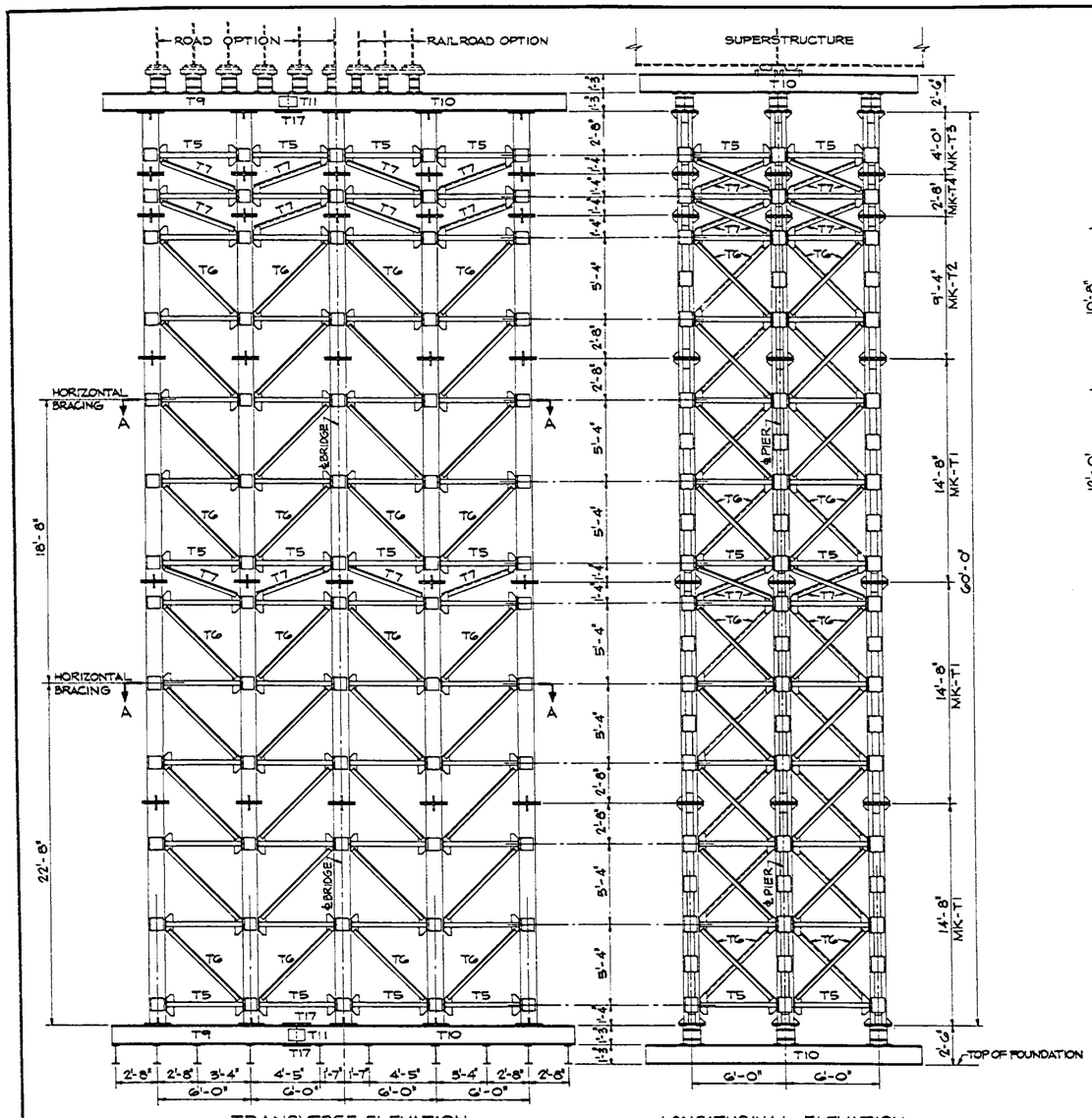
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: for H. M. Williams
DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
ROAD & RR BRIDGE SUBSTRUCTURE
LIGHT UNIT TRESTLE PIERS
DETAILS

UNDER REVISION

SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 86-14
SHEET 9 OF 11

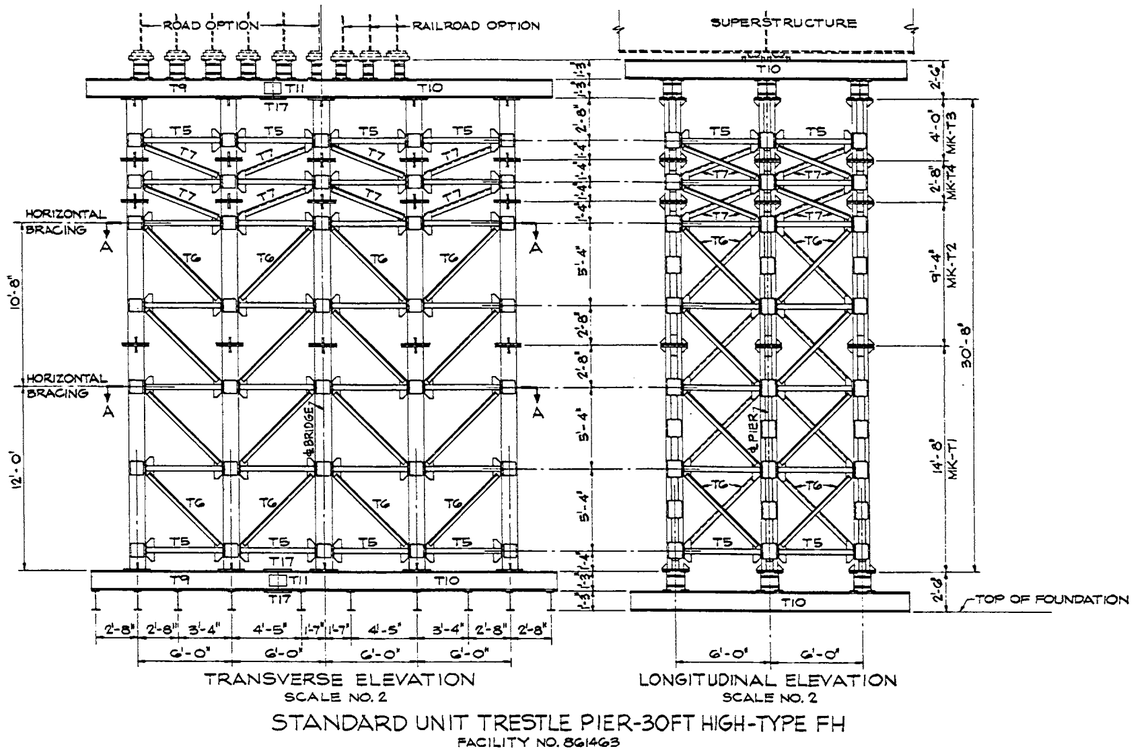


TRANSVERSE ELEVATION
SCALE NO. 2

LONGITUDINAL ELEVATION
SCALE NO. 2

STANDARD UNIT TRESTLE PIER-60FT HIGH-TYPE FH

FACILITY NO. 861464

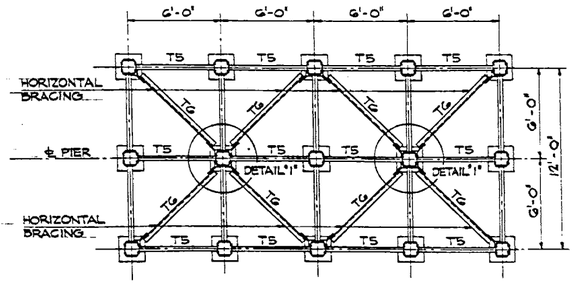


TRANSVERSE ELEVATION
SCALE NO. 2

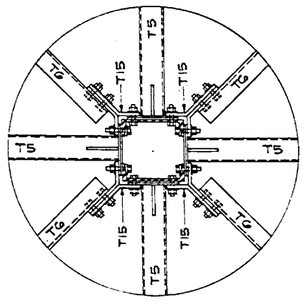
LONGITUDINAL ELEVATION
SCALE NO. 2

STANDARD UNIT TRESTLE PIER-30FT HIGH-TYPE FH

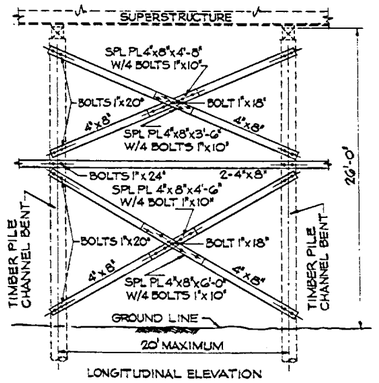
FACILITY NO. 861463



PLAN A-A AT HORIZONTAL BRACING LEVELS
SCALE NO. 2

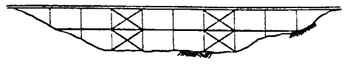


DETAIL "I"
NO SCALE



LONGITUDINAL ELEVATION

LONGITUDINAL BRACING BETWEEN TIMBER PILE CHANNEL BENTS
FACILITY NO. 861470
NO SCALE



LONGITUDINAL BRACING OF TIMBER PILE BENTS
BENTS OVER 13 FEET HIGH REQUIRE LONGITUDINAL CROSS BRACING EVERY THIRD SPAN. LONGITUDINAL STRUTS ARE CARRIED TO BANK & FASTENED TO BENT NEAR GROUND LINE.

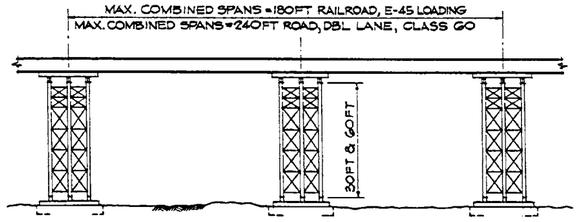


DIAGRAM
SHOWING HEIGHT & SPAN LIMITATIONS
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALE
0 5' 10'
NO. 2

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-14	STANDARD TRESTLE PIERS	10 OF 11
86-14	DETAILS	11 OF 11

MAYER, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

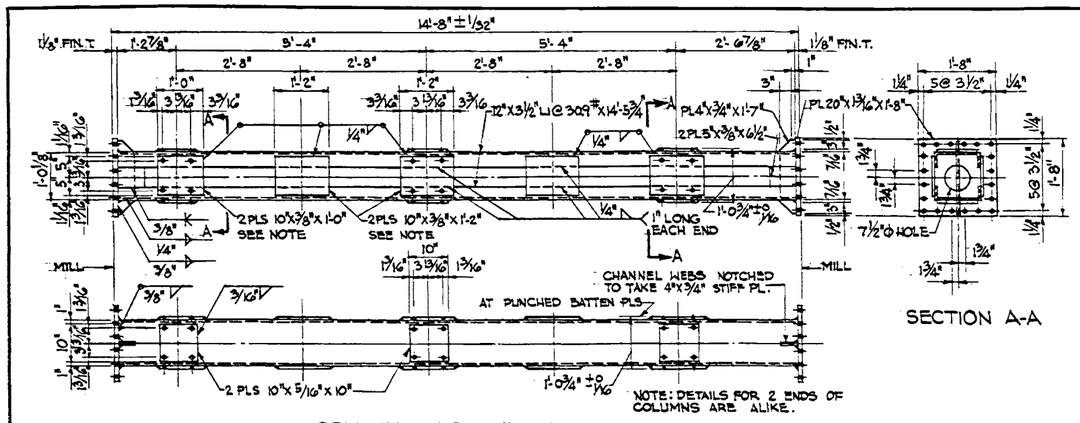
DRAWN BY: LALL
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: D.W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS
ROAD OR RAILROAD BRIDGE SUBSTRUCTURES
STANDARD UNIT TRESTLE PIERS
TYPE FH
LONGITUDINAL BRACING OF TIMBER PILE CHANNEL BENTS

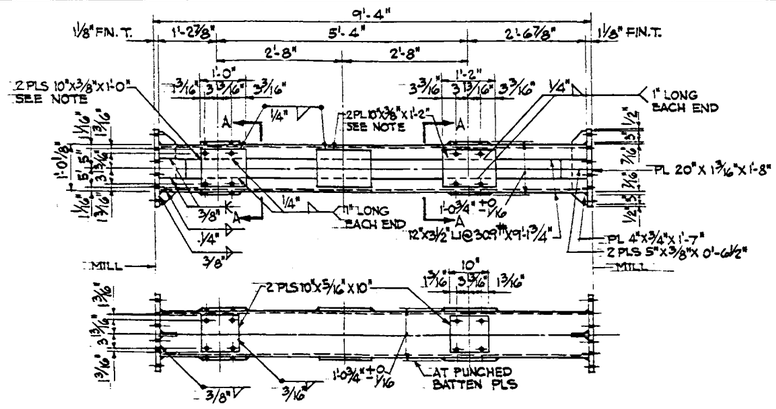
UNDER REVISION

APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

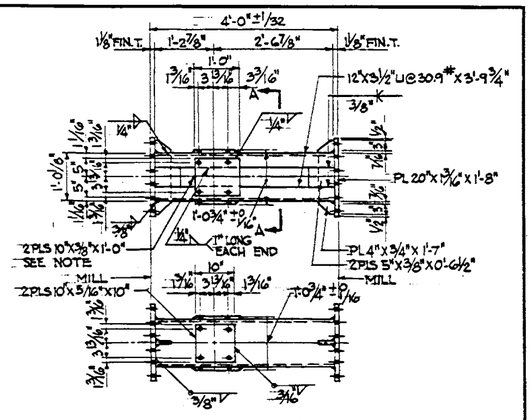
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-14
SHEET 10 OF 11



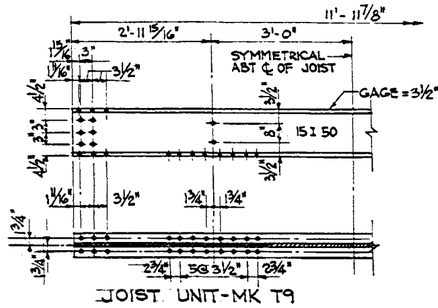
COLUMN UNIT - MK T1



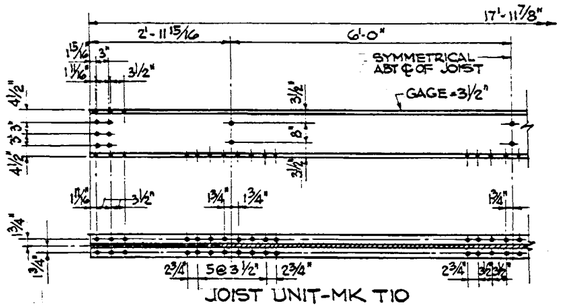
COLUMN UNIT - MK T2



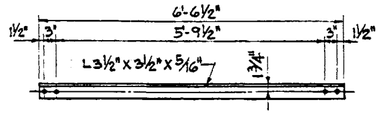
COLUMN UNIT - MK T3



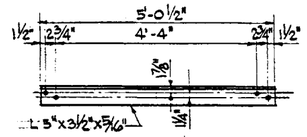
JOIST UNIT - MK T9



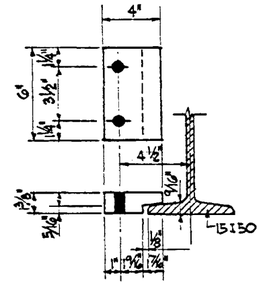
JOIST UNIT - MK T10



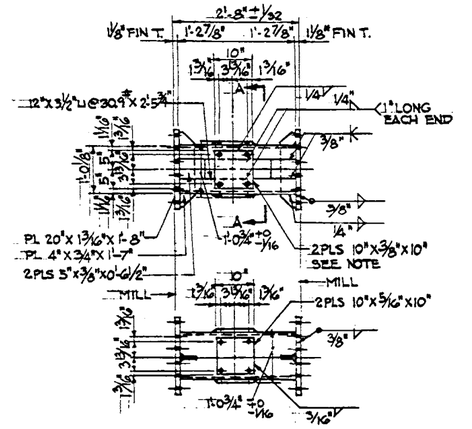
BRACING ANGLE - MK T6



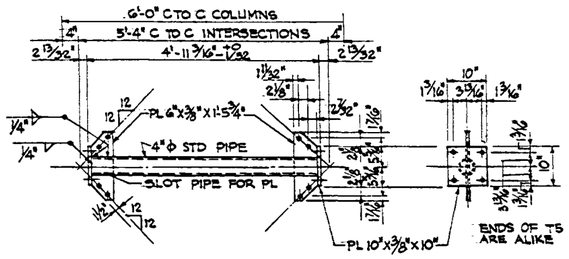
BRACING ANGLE - MK T7



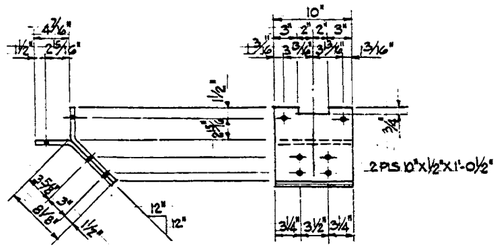
JOIST CLIP - MK T16



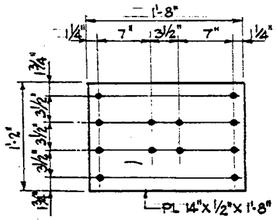
COLUMN UNIT - MK T4



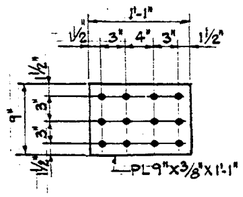
BRACING STRUT - MK T5



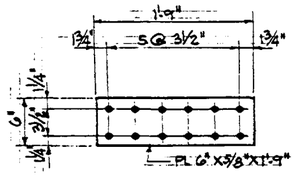
HORIZONTAL BRACING PLATES - MK T15



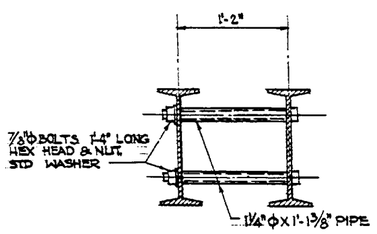
SHIM PLATE - MK T8



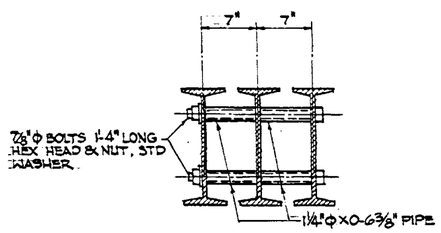
WEB SPLICE PLATE - MK T11



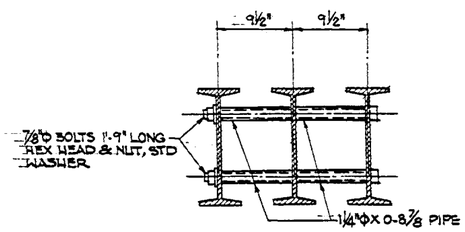
FLANGE SPLICE PLATE - MK T17



JOIST SPACERS - MK T12



JOIST SPACERS - MK T13



JOIST SPACERS - MK T14

GENERAL NOTES

1. WHEN THE DEPTH OF THE CHANNELS FOR COLUMN UNITS T1, T2, T3 & T4 OVERRUN OR UNDER RUN 1/16 THE OVERALL DEPTH AT THE PUNCHED 3/8" BATTERN PLATES SHALL BE HELD WITHIN THE TOLERANCES NOTED BY VARYING THE THICKNESS OF EITHER ONE OR BOTH OF THE BATTEN PLATES.
2. THE EXACT DEPTH OF JOIST UNITS T9, & T10 SHALL BE STAMPED AND PAINTED AT EACH END TO THE NEAREST 1/16", THUS 15 1/16".
3. ALL OPEN HOLES 15/16" ϕ.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:

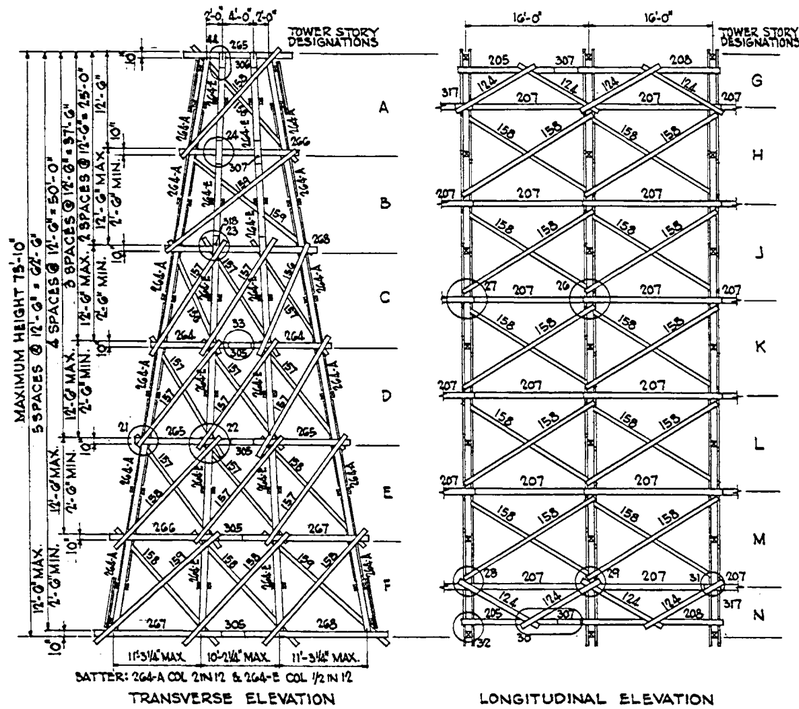
THEATER OF OPERATIONS
ROAD & RR BRIDGE SUBSTRUCTURES
STANDARD UNIT PRESTLE PIERS
DETAILS

UNDER REVISION

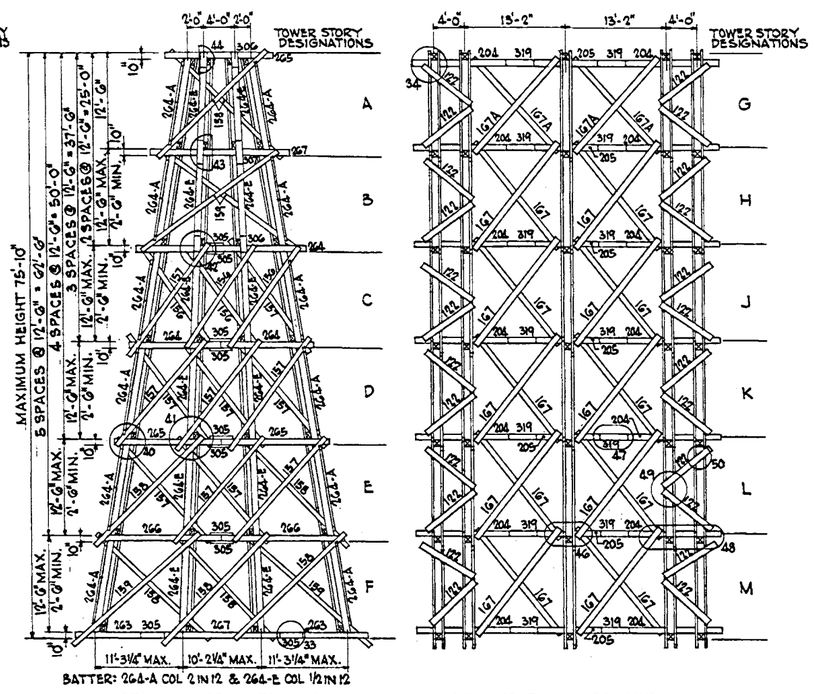
APPROVED: H.M. Williams DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 86-14
SHEET 11 OF 11



SINGLE TRACK- TIMBER SPANS- E 45 LOADING
SCALE NO. 1



SINGLE TRACK- STEEL SPANS- E 45 LOADING
SCALE NO. 1

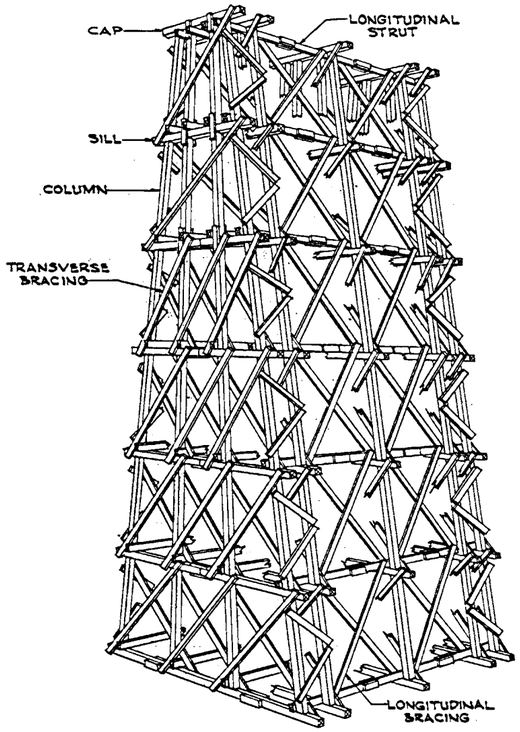
TOWER STORY - SELECTION CHART

NUMBER OF STORIES & HEIGHT	FACILITY NUMBERS: SGL TRACK TOWER E-45 LOADING 32' MAX. COMB. TIMBER SPANS	FACILITY NUMBERS: SGL TRACK TOWER E-45 LOADING 100' MAX. COMB. STEEL SPANS	TOWER STORY DESIGNATIONS: TRANSVERSE VIEW	TOWER STORY DESIGNATIONS: LONGITUDINAL VIEW
ONE STORY 13' HIGH	861501	861507		A N G
TWO STORY 26' HIGH	861502	861508		B A N G H
THREE STORY 38' HIGH	861503	861509		C B A N G H J
FOUR STORY 51' HIGH	861504	861510		D C B A N G H J K
FIVE STORY 63' HIGH	861505	861511		E D C B A N G H J K L
SIX STORY 76' HIGH	861506	861512		F E D C B A N G H J K L M

NOTE: DESIGNATION "N" IS NOT USED FOR FACILITIES NO. 861507-861512 INCL.

LUMBER SCHEDULE

LOCATION	MARK	ITEM
CAP	265	10"x10"x14'
SILL	263	10"x10"x 10'
SILL	264	10"x10"x 12'
SILL	265	10"x10"x 14'
SILL	266	10"x10"x 16'
SILL	267	10"x10"x 18'
SILL	268	10"x10"x 20
COLUMN	264A	10"x10"x 12'
COLUMN	264E	10"x10"x 12'
STRUT	204	6"x10"x 14"
STRUT	205	6"x10"x 12"
STRUT	207	6"x10"x 18'
STRUT	208	6"x10"x 20'
BRACING	122	3"x10"x 8'
BRACING	124	3"x10"x 12'
BRACING	156	4"x8"x 16'
BRACING	157	4"x8"x 18'
BRACING	158	4"x8"x 20'
BRACING	159	4"x8"x 22'
BRACING	167	4"x10"x 18'
BRACING	167A	4"x10"x 18'
SCAB	305	4"x10"x 3'
SCAB	306	3"x10"x 2'
SCAB	307	3"x10"x 3'
SCAB	318	3"x10"x 2'-8"
SCAB	319	3"x10"x 3'-8"



ASSEMBLED VIEW- SIX STORY TOWER FOR SINGLE TRACK STEEL SPANS
NO SCALE

REFER TO TRANSVERSE & LONGITUDINAL ELEVATIONS FOR STRUCTURAL DIFFERENCES OF TOWER FOR TIMBER SPANS

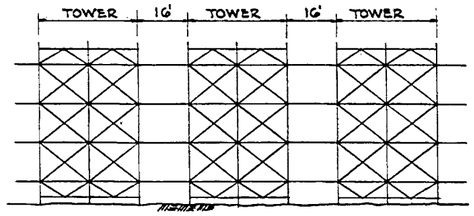


DIAGRAM SHOWING
TIMBER SPAN LIMITATIONS
NO SCALE

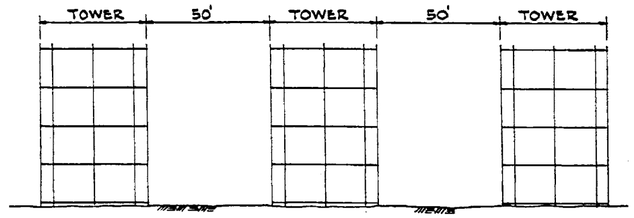


DIAGRAM SHOWING STEEL SPAN LIMITATIONS
NO SCALE

GENERAL NOTES

1. FOUNDATIONS FOR TOWERS TO BE DETERMINED BY FIELD CONDITIONS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-15	SINGLE TRACK TIMBER TOWERS-GENERAL VIEWS	1 OF 5
86-15	CONNECTIONS	2 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15'
NO.1

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

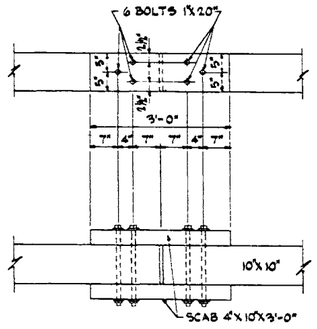
DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: A. W. DE CHIANN
APPROVED:
CHIEF, STRUCTURES BRANCH

APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

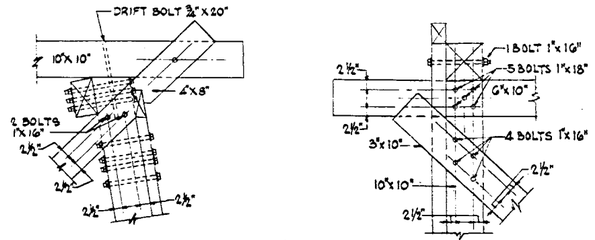
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK TIMBER TOWERS-E-45 LOADING
32'-0" MAXIMUM COMBINED TIMBER SPANS
100 FT. MAXIMUM COMBINED STEEL SPANS

UNDER REVISION

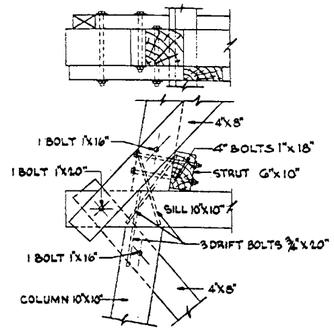
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-15
SHEET 1 OF 5



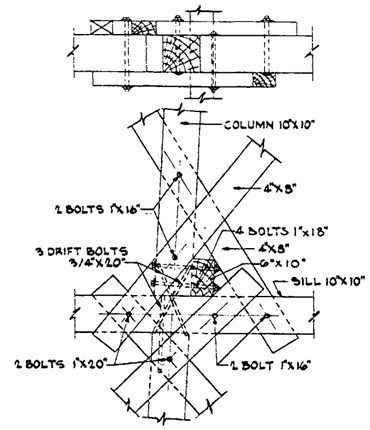
DETAIL 33
SCALE NO. 5



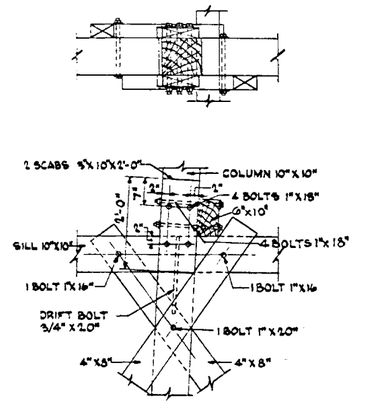
DETAIL 34
SCALE NO. 5



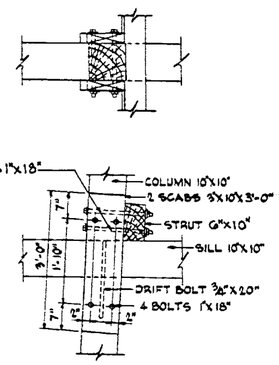
DETAIL 40
SCALE NO. 5



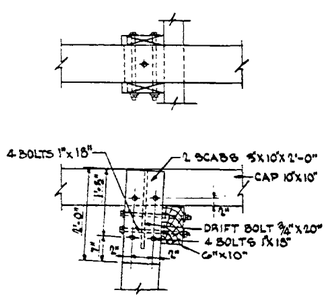
DETAIL 41
SCALE NO. 5



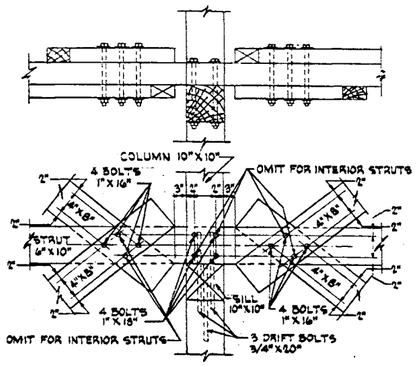
DETAIL 42
SCALE NO. 5



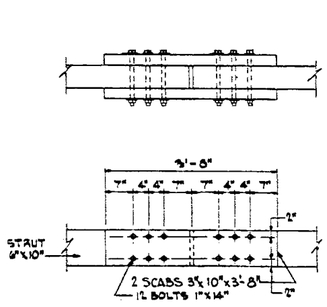
DETAIL 43
SCALE NO. 5



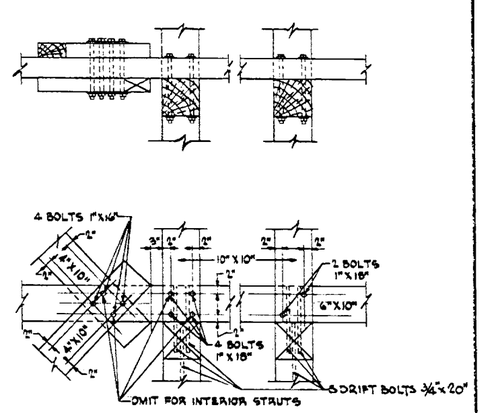
DETAIL 44
SCALE NO. 5



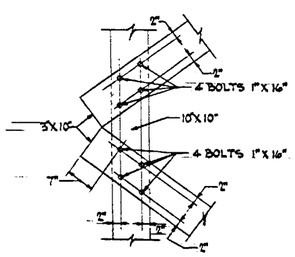
DETAIL 46
SCALE NO. 5



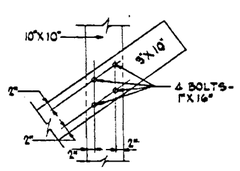
DETAIL 47
SCALE NO. 5



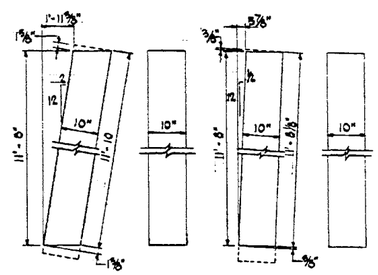
DETAIL 48
SCALE NO. 5



DETAIL 49
SCALE NO. 5



DETAIL 50
SCALE NO. 5



COLUMN 264A
NO SCALE

COLUMN 264E
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES

0 1' 2' 3'

NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURE
SINGLE TRACK TIMBER TOWERS
CONNECTIONS

UNDER REVISION

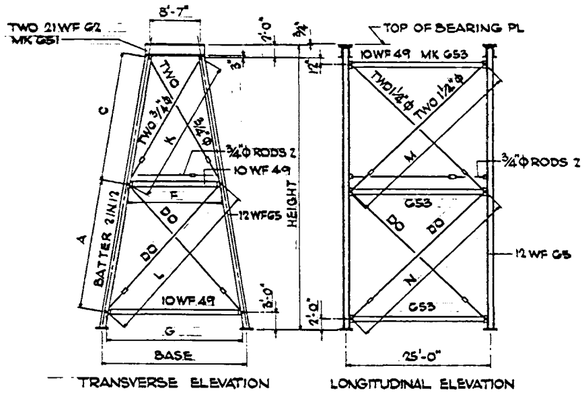
APPROVED: _____ DATE: 19 MAR 1959
CHIEF, STRUCTURES BRANCH

APPROVED: _____
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

DATE _____

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 5
86-15

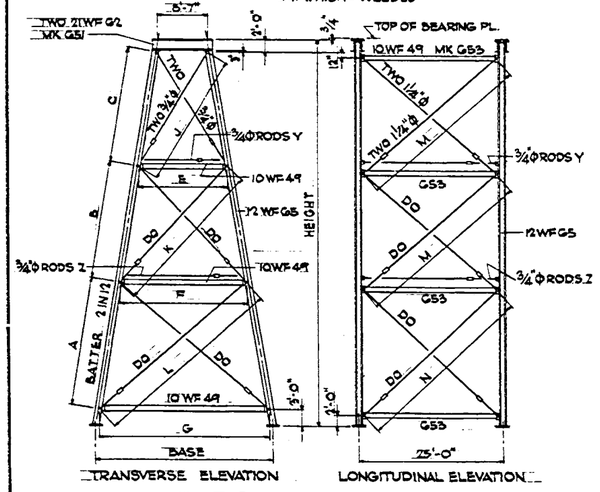


TWO STORY TOWER

SCALE NO. 17

FACILITY NO. SG1514

49FT. HIGH - WELDED

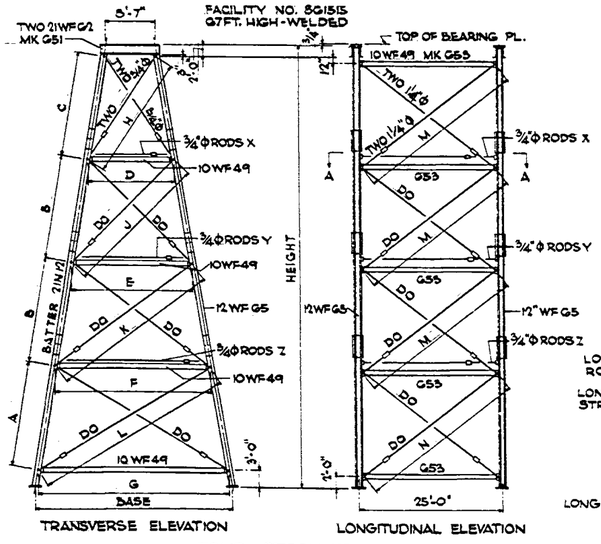


THREE STORY TOWER

SCALE NO. 17

FACILITY NO. SG1515

97FT. HIGH-WELDED

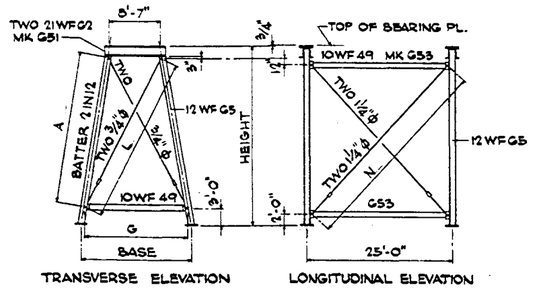


FOUR STORY TOWER

SCALE NO. 17

FACILITY NO. SG1516

77FT. HIGH - WELDED

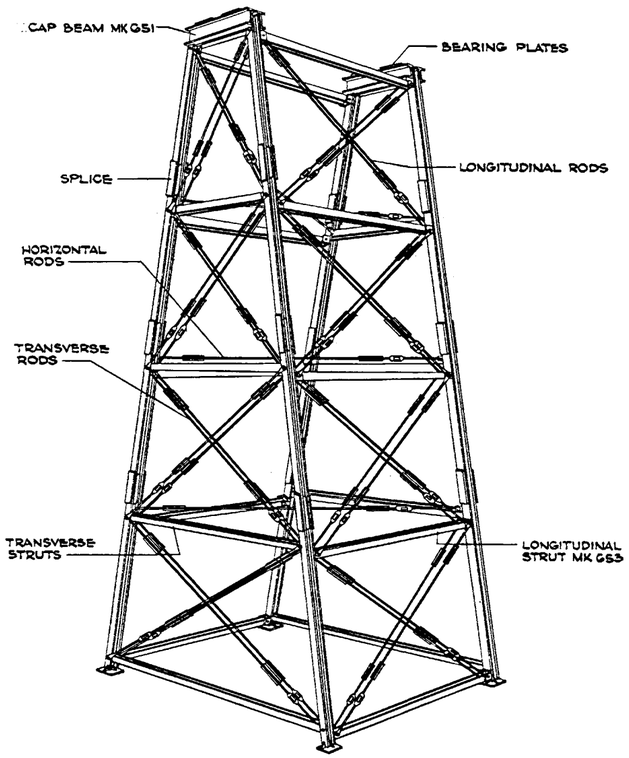


ONE STORY TOWER

SCALE NO. 17

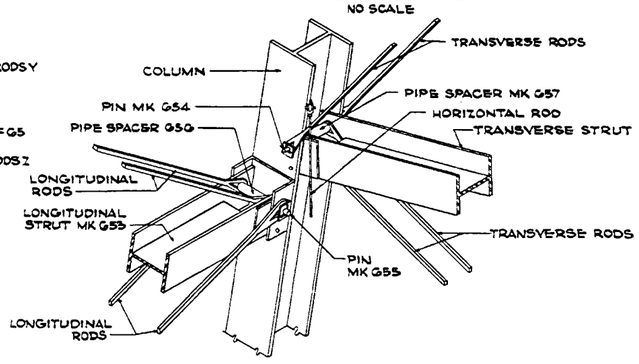
FACILITY NO. SG1513

31FT HIGH WELDED



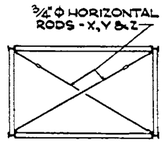
ASSEMBLED VIEW

NO SCALE



TYPICAL JOINT DETAIL

NO SCALE



SECTION A-A

SCALE NO. 17

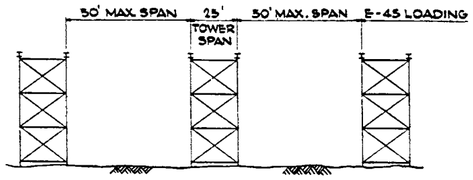


DIAGRAM SHOWING SPAN LIMITATIONS

STEEL TOWERS FOR STEEL SUPERSTRUCTURES

NO SCALE

TABULATION OF TOWER DIMENSIONS AND ERECTION MARKS

FOUR STORY TOWER

HEIGHT		77'	75'	73'	71'	69'
BASE		34'-3"	33'-7"	32'-11"	32'-3"	31'-7"
A	MARK	1728	1730	1729	1731	1732
	DIM.	18'-3"	17'-8 7/8"	17'-2 1/8"	16'-8 3/4"	16'-2 5/8"
B	MARK	1741	1742	1743	1751	1752
	DIM.	18'-3"	17'-8 7/8"	17'-2 1/8"	16'-8 3/4"	16'-2 5/8"
C	MARK	1750	1760	1761	1757	1762
	DIM.	18'-3"	17'-8 7/8"	17'-2 1/8"	16'-8 3/4"	16'-2 5/8"
D	MARK	1709	1710	1711	1712	1713
	DIM.	14'-9"	14'-7"	14'-5"	14'-3"	14'-1"
E	MARK	1694	1695	1696	1698	1697
	DIM.	20'-9"	20'-5"	20'-1"	19'-9"	19'-5"
F	MARK	1681	1771	1685	1686	1687
	DIM.	29'-9"	26'-3"	25'-9"	25'-3"	24'-9"
G	MARK	1674	1675	1676	1769	1770
	DIM.	32'-9"	32'-1"	31'-5"	30'-9"	30'-1"
H	MARK	848	850	852	853	854
	DIM.	21'-6"	21'-0 3/8"	20'-6 7/8"	20'-1 3/8"	19'-7 7/8"
J	MARK	831	833	836	838	842
	DIM.	25'-3 3/8"	24'-9"	24'-2 5/8"	23'-8 1/4"	23'-2"
K	MARK	803	807	812	816	820
	DIM.	29'-9 5/8"	29'-2"	28'-6 3/8"	27'-10 7/8"	27'-3 1/4"
L	MARK	743	752	705	775	785
	DIM.	34'-9 1/4"	34'-0 1/8"	33'-3 1/8"	32'-6"	31'-8 1/8"
M	MARK	1028	1030	1031	1032	1033
	DIM.	29'-8 1/4"	29'-4 1/2"	29'-0 7/8"	28'-9 3/8"	28'-5 7/8"
N	MARK	1028	1030	1031	1032	1033
	DIM.	29'-8 1/4"	29'-4 1/2"	29'-0 7/8"	28'-9 3/8"	28'-5 7/8"
X	MARK	981	982	983	984	985
	DIM.	27'-0 7/8"	26'-11 5/8"	26'-10 1/8"	26'-9 1/8"	26'-9"
Y	MARK	968	969	970	971	973
	DIM.	30'-0 1/8"	30'-3 5/8"	30'-1 1/8"	29'-10 5/8"	29'-8 1/8"
Z	MARK	955	959	960	963	964
	DIM.	34'-7 3/4"	34'-3 1/4"	33'-11"	33'-0 3/8"	33'-2 3/8"

ONE STORY TOWER

HEIGHT		31'	29'	27'	25'	23'	21'	19'	17'	15'
BASE		18'-11"	18'-3"	17'-7"	16'-11"	16'-3"	15'-7"	14'-11"	14'-3"	13'-7"
A	MARK	1719	1720	1721	1722	1723	1724	1725	1726	1727
	DIM.	20'-4 1/4"	24'-4"	22'-3 5/8"	20'-3 1/4"	18'-3"	16'-2 5/8"	14'-2 3/8"	12'-2"	10'-1 7/8"
G	MARK	1702	1703	1704	1700	1709	1713	1716	1717	1718
	DIM.	17'-5"	16'-9"	16'-1"	15'-5"	14'-9"	14'-1"	13'-5"	12'-9"	12'-1"
L	MARK	808	821	831	859	848	854	860	861	862
	DIM.	29'-1 1/4"	27'-2 1/8"	25'-3 3/8"	23'-4 3/8"	21'-6"	19'-7 1/8"	17'-10 1/4"	16'-1 5/8"	14'-5 1/4"
N	MARK	1021	1022	1023	1025	1028	1033	1037	1038	1039
	DIM.	35'-3 1/8"	33'-9 1/4"	32'-4 1/8"	30'-11 3/4"	29'-8 1/4"	28'-5 1/8"	27'-4 3/8"	26'-4 5/8"	25'-6 1/4"

TWO STORY TOWER

HEIGHT		49'	47'	45'	43'	41'	39'	37'	35'	33'
BASE		24'-11"	24'-3"	23'-7"	22'-11"	22'-5"	21'-7"	20'-11"	20'-3"	19'-7"
A	MARK	1734	1735	1735	1739	1728	1729	1732	1733	1740
	DIM.	22'-3 5/8"	21'-3 1/2"	20'-3 1/4"	19'-3 1/8"	18'-3"	17'-2 3/4"	16'-2 5/8"	15'-2 1/2"	14'-2 3/8"
C	MARK	1765	1766	1767	1759	1756	1761	1762	1764	1768
	DIM.	22'-3 5/8"	21'-3 1/2"	20'-3 1/4"	19'-3 1/8"	18'-3"	17'-2 3/4"	16'-2 5/8"	15'-2 1/2"	14'-2 1/8"
F	MARK	1704	1705	1706	1708	1709	1711	1713	1715	1716
	DIM.	10'-1"	15'-9"	15'-5"	15'-1"	14'-9"	14'-5"	14'-1"	13'-9"	13'-5"
G	MARK	1689	1690	1691	1693	1694	1696	1697	1700	1701
	DIM.	23'-5"	22'-9"	22'-1"	21'-5"	20'-9"	20'-1"	19'-5"	18'-9"	18'-1"
K	MARK	831	835	839	840	848	852	854	859	860
	DIM.	25'-3 3/8"	24'-3 3/4"	23'-4 3/8"	22'-5 1/8"	21'-6"	20'-6 7/8"	19'-7 7/8"	18'-8"	17'-10 1/4"
L	MARK	804	813	818	826	831	836	842	847	849
	DIM.	29'-6 1/4"	28'-5 7/8"	27'-5"	26'-4 1/8"	25'-3 3/8"	24'-2 5/8"	23'-2"	22'-1 3/8"	21'-0 7/8"
M	MARK	1023	1024	1025	1026	1028	1031	1032	1036	1037
	DIM.	32'-4 1/8"	31'-7 3/4"	30'-11 3/4"	30'-5 7/8"	29'-8 1/4"	29'-0 7/8"	28'-5 7/8"	27'-11"	27'-4 3/8"
N	MARK	1023	1024	1025	1026	1028	1031	1032	1036	1037
	DIM.	32'-4 1/8"	31'-7 3/4"	30'-11 3/4"	30'-5 7/8"	29'-8 1/4"	29'-0 7/8"	28'-5 7/8"	27'-11"	27'-4 3/8"
Z	MARK	976	977	978	980	981	982	985	986	988
	DIM.	27'-9 1/8"	27'-7"	27'-5"	27'-2 7/8"	27'-0 7/8"	26'-10 7/8"	26'-9"	26'-7"	26'-5"

THREE STORY TOWER

HEIGHT		67'	65'	63'	61'	59'	57'	55'	53'	51'
BASE		30'-11"	30'-3"	29'-7"	28'-11"	28'-3"	27'-7"	26'-11"	26'-3"	25'-7"
A	MARK	1734	1735	1736	1728	1728	1729	1729	1732	1733
	DIM.	22'-3 5/8"	20'-3 1/4"	11'-3 1/8"	18'-3"	18'-3"	17'-2 7/8"	17'-2 7/8"	16'-2 5/8"	15'-2 1/2"
B	MARK	1746	1746	1747	1748	1749	1750	1751	1752	1753
	DIM.	20'-3 1/4"	20'-3 1/4"	19'-9 1/4"	19'-3 1/8"	18'-3"	17'-8 7/8"	16'-8 3/4"	16'-2 5/8"	15'-8 5/8"
C	MARK	1767	1767	1758	1759	1756	1760	1757	1762	1763
	DIM.	20'-8 1/2"	20'-3 1/4"	19'-9 1/2"	19'-3 1/8"	18'-3"	17'-8 7/8"	16'-8 3/4"	16'-2 5/8"	15'-8 5/8"
E	MARK	1706	1706	1707	1708	1709	1710	1712	1713	1714
	DIM.	15'-5"	15'-5"	15'-3"	15'-1"	14'-9"	14'-7"	14'-5"	14'-1"	13'-11"
F	MARK	1691	1691	1692	1693	1694	1695	1695	1697	1699
	DIM.	22'-1"	22'-1"	21'-9"	21'-5"	20'-9"	20'-5"	19'-9"	19'-5"	19'-1"
G	MARK	1677	1678	1679	1680	1681	1683	1684	1687	1688
	DIM.	24'-5"	28'-9"	28'-1"	27'-5"	26'-9"	26'-1"	25'-5"	25'-9"	24'-1"
J	MARK	839	839	844	846	848	850	853	854	858
	DIM.	25'-4 3/8"	23'-4 3/8"	22'-10 3/4"	22'-5 1/8"	21'-6"	21'-0 3/8"	20'-1 3/8"	19'-7 7/8"	19'-2 3/8"
K	MARK	817	822	824	826	830	833	838	842	845
	DIM.	27'-5 3/8"	27'-5"	26'-10 1/2"	26'-4 1/8"	25'-3 3/8"	24'-9"	23'-5 1/2"	23'-2"	22'-7 3/8"
L	MARK	756	778	789	796	803	810	815	820	827
	DIM.	33'-10 1/4"	32'-4 1/8"	31'-4"	30'-4"	29'-9 5/8"	28'-9 5/8"	28'-5 1/4"	27'-3 1/4"	26'-3 3/8"
M	MARK	1025	1025	1027	1029	1028	1030	1032	1033	1035
	DIM.	30'-11 3/4"	30'-11 3/4"	30'-7 3/4"	30'-3 7/8"	29'-8 1/4"	29'-4 1/2"	28'-9 3/8"	28'-5 7/8"	28'-2 3/8"
N	MARK	1023	1025	1029	1028	1028	1031	1031	1033	1036
	DIM.	32'-4 1/8"	30'-11 3/4"	30'-3 7/8"	29'-8 1/4"	29'-8 1/4"	29'-0 7/8"	29'-0 1/8"	28'-5 7/8"	27'-11"
Y	MARK	978	978	979	980	981	982	984	985	987
	DIM.	27'-5"	27'-5"	27'-3 7/8"	27'-2 7/8"	27'-0 7/8"	26'-10 7/8"	26'-10"	26'-9"	26'-8"
Z	MARK	905	905	906	907	908	909	971	973	975
	DIM.	31'-4 1/2"	31'-4 1/2"	31'-1 7/8"	30'-11 3/4"	30'-8 3/8"	30'-3 5/8"	29'-10 5/8"	29'-8 1/8"	29'-5 3/4"

GENERAL NOTES

1. ALL HOLES IN STEEL ARE 15/16" DIAM. UNLESS OTHERWISE NOTED.
2. ALL WELDS ARE 1/4" FILLET WELDS UNLESS OTHERWISE NOTED.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-15	SINGLE TRACK STEEL TOWERS	3 OF 5
86-15	SGL. TRACK STL. TOWER DET. FOR BOLTED CONST.	4,5 OF 5
86-15	SGL. TRACK STL. TOWER DET. FOR WELDED CONST.	5 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10' 15'

NO. 17

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

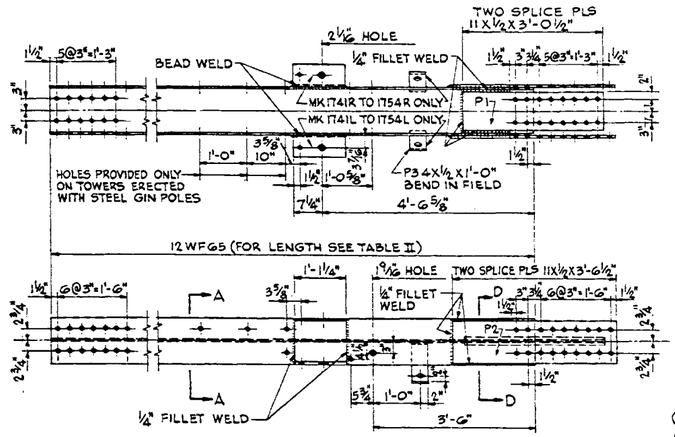
RAILROAD BRIDGE SUBSTRUCTURE
SINGLE TRACK STEEL TOWER
100FT. MAXIMUM COMBINED STEEL SPANS

UNDER REVISION

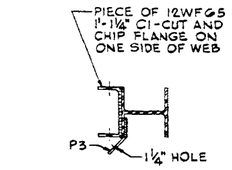
APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

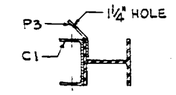
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-15
DATE
SHEET 3 OF 5



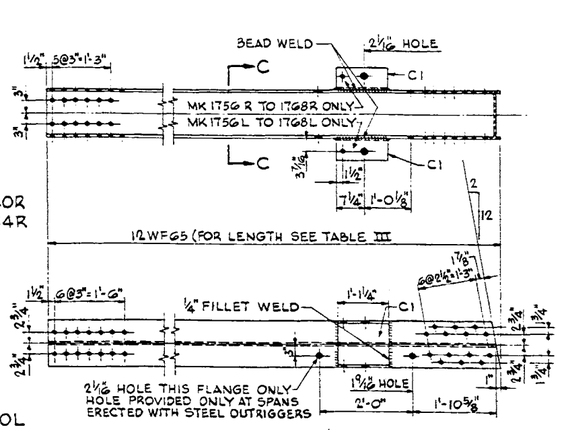
COLUMN MK 1741R TO MK 1754R
COLUMN MK 1741L TO MK 1754L
SCALE NO. 5



SECTION A-A
COLUMN MK 1728R TO MK1740R
COLUMN MK 1741R TO MK 1754R
SCALE NO. 5



SECTION A-A
COLUMN MK 1728L TO MK 1740L
COLUMN MK1741L TO MK 1754L
SCALE NO. 5



COLUMN MK 1756R TO MK 1768R
COLUMN MK 1756L TO MK 1768L
SCALE NO. 5

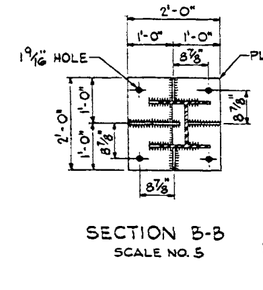
TABLE I			
MARK	A	LENGTH	WEIGHT
1728	18'-3"	24'-10"	2180
1729	17'-2⅞"	23'-9⅞"	2115
1730	17'-8⅞"	24'-3⅞"	2145
1731	16'-8¾"	23'-3¾"	2085
1732	16'-2⅝"	22'-9⅝"	2050
1733	15'-2½"	21'-9½"	1980
1734	22'-3⅝"	28'-10⅝"	2445
1735	20'-3½"	26'-10¼"	2315
1736	19'-3⅛"	25'-10⅛"	2250
1738	21'-3½"	27'-10½"	2380
1739	19'-3⅛"	25'-10⅛"	2250
1740	14'-2⅜"	20'-9⅜"	1920

TABLE II		
MARK	LENGTH	WEIGHT
1741	18'-2¾"	1530
1742	17'-8⅝"	1505
1743	17'-2⅝"	1465
1746	20'-3"	1660
1747	19'-9"	1630
1748	19'-2⅞"	1595
1749	18'-2¾"	1530
1750	17'-8⅝"	1505
1751	16'-8½"	1435
1752	16'-2⅜"	1400
1753	15'-8⅜"	1370

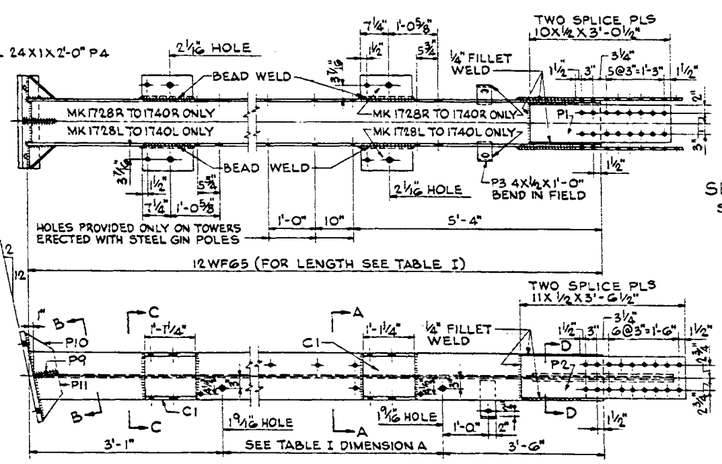
TABLE III		
MARK	LENGTH	WEIGHT
1756	16'-8⅜"	1164
1757	15'-2⅛"	1065
1758	18'-2⅝"	1263
1759	17'-8½"	1230
1760	16'-2¼"	1131
1761	15'-8¼"	1098
1762	14'-8"	1032
1763	14'-2"	999
1764	13'-7⅞"	966
1765	20'-9"	1427
1766	19'-8⅞"	1361
1767	18'-8⅜"	1295
1768	12'-7¾"	981

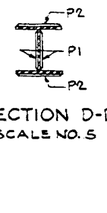
TABLE V			
MARK	C/C PIN HOLES	LENGTH	WEIGHT
1674	32'-9"	33'-2"	1662
1675	32'-1"	32'-6"	1630
1676	31'-5"	31'-10"	1597
1677	29'-5"	29'-10"	1509
1678	28'-9"	29'-2"	1466
1679	28'-1"	28'-6"	1434
1680	27'-5"	27'-10"	1401
1681	26'-9"	27'-2"	1378
1683	26'-1"	26'-6"	1336
1684	25'-5"	25'-10"	1303
1685	25'-9"	26'-2"	1319
1686	25'-3"	25'-8"	1295
1687	24'-9"	25'-2"	1271
1688	24'-1"	24'-6"	1238
1689	23'-5"	23'-10"	1205
1690	22'-9"	23'-2"	1172
1691	22'-1"	22'-6"	1140
1692	21'-9"	22'-2"	1123
1693	21'-5"	21'-10"	1107
1694	20'-9"	21'-2"	1074
1695	20'-5"	20'-10"	1058
1696	20'-1"	20'-6"	1042
1697	19'-5"	19'-10"	1009
1698	19'-9"	20'-2"	1025
1699	19'-1"	19'-6"	993
1700	18'-9"	19'-2"	976
1701	18'-1"	18'-6"	944
1702	17'-5"	17'-10"	911
1703	16'-9"	17'-2"	878
1704	16'-1"	16'-6"	846
1705	15'-9"	16'-2"	829
1706	15'-5"	15'-10"	813
1707	15'-3"	15'-8"	804
1708	15'-1"	15'-6"	797
1709	14'-9"	15'-2"	780
1710	14'-7"	15'-0"	772
1711	14'-5"	14'-10"	764
1712	14'-3"	14'-8"	756
1713	14'-1"	14'-6"	748
1714	13'-11"	14'-4"	739
1715	13'-9"	14'-2"	731
1716	13'-5"	13'-10"	715
1717	12'-9"	13'-2"	682
1718	12'-1"	12'-6"	650
1769	30'-9"	31'-2"	1574
1770	30'-1"	30'-6"	1532
1771	26'-3"	26'-8"	1344

TABLE IV			
MARK	A	LENGTH	WEIGHT
1719	26'-4¼"	31'-4⅛"	2315
1720	24'-4"	29'-4⅝"	2185
1721	22'-3⅝"	27'-4¼"	2055
1722	20'-3⅛"	25'-3⅞"	1920
1723	18'-3"	23'-3⅝"	1790
1724	16'-2⅝"	21'-3¼"	1655
1725	14'-2⅜"	19'-3"	1525
1726	12'-2"	17'-2⅝"	1395
1727	10'-1⅝"	15'-2¼"	1260

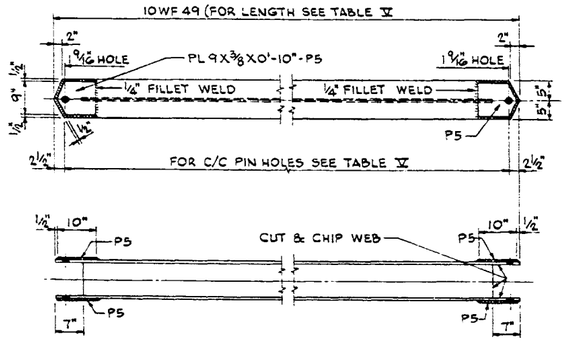


SECTION B-B
SCALE NO. 5

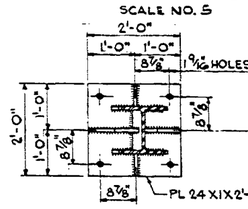




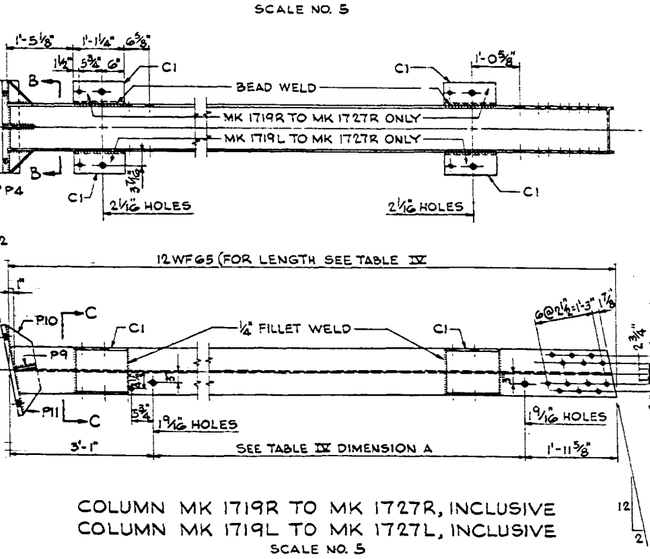
SECTION D-D
SCALE NO. 5



STRUTS MK 1674 TO 1681, INCLUSIVE
STRUTS MK 1683 TO 1718, INCLUSIVE
STRUTS MK 1769 TO 1771, INCLUSIVE
SCALE NO. 5

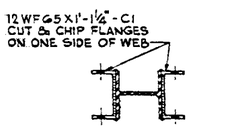


SECTION C-C
SCALE NO. 5



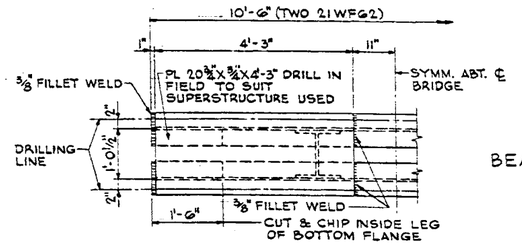
COLUMN MK 1728R TO MK 1740R
COLUMN MK 1728L TO MK 1740L
SCALE NO. 5

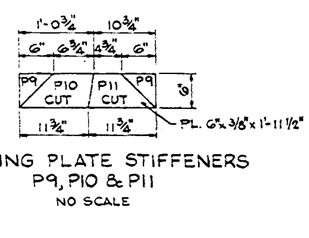
SECTION B-B
SCALE NO. 5



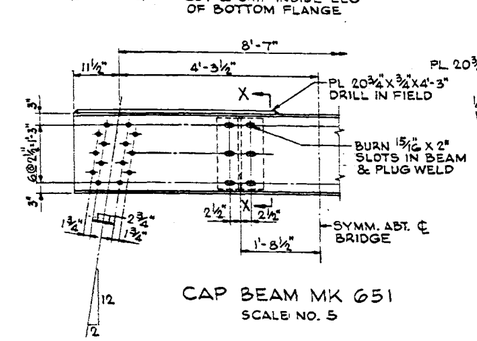
SECTION C-C
SCALE NO. 5

COLUMN MK 1719R TO MK 1727R, INCLUSIVE
COLUMN MK 1719L TO MK 1727L, INCLUSIVE
SCALE NO. 5

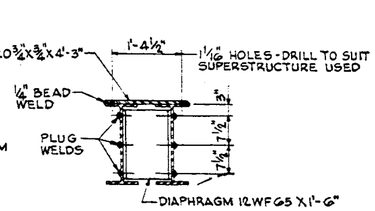




BEARING PLATE STIFFENERS
P9, P10 & P11
NO SCALE



CAP BEAM MK 651
SCALE NO. 5



SECTION X-X
SCALE NO. 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'
NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

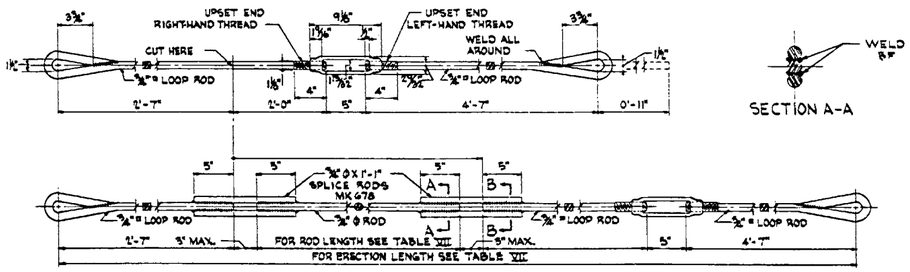
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: H.M. Williams DATE: 19 MAR 1965
CHIEF, STRUCTURES BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

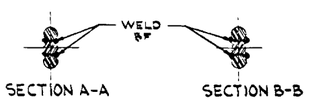
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURE
SINGLE TRACK STEEL TOWERS
DETAILS FOR BOLTED CONSTRUCTION

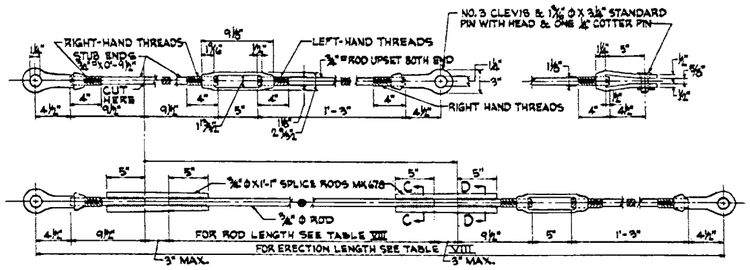
UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 4 OF 5
86-15

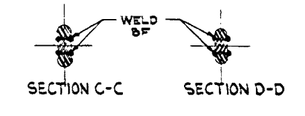


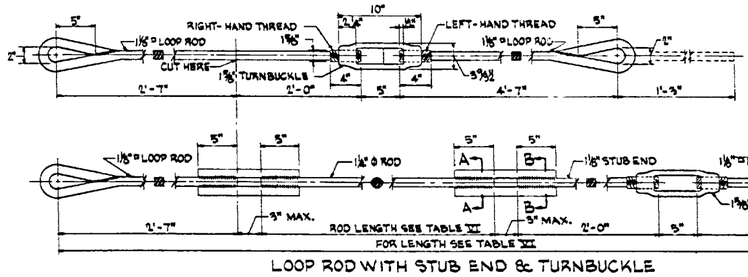
LOOP ROD WITH TURNBUCKLE MK 677
NO SCALE



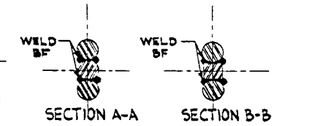


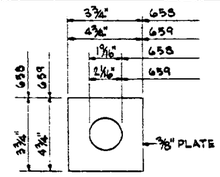
CLEVIS, TURNBUCKLE & STUB-END ROD MK 680
NO SCALE



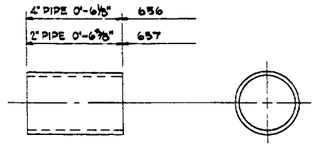


LOOP ROD WITH STUB END & TURNBUCKLE
NO SCALE

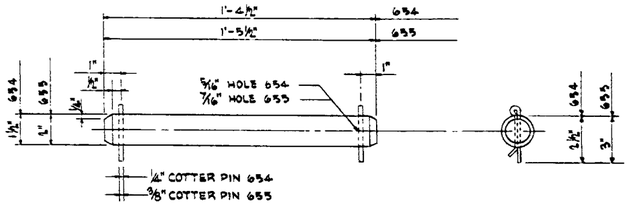




WASHER MK 658
WASHER MK 659
NO SCALE



PIPE SPACER MK 656
PIPE SPACER MK 657
NO SCALE

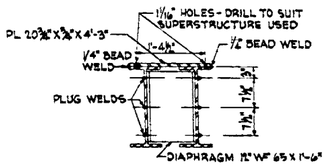


PIN & COTTERS
NO SCALE

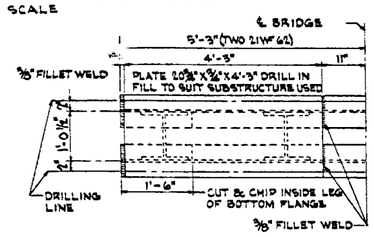
TABLE VI			
ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
1021	33' - 3⅜"	1040	23'-6"
1022	33' - 9¼"	1041	24'-0"
1023	32' - 4½"	1042	22'-6"
1024	31' - 7⅜"	1043	22'-0"
1025	30' - 11⅜"	1044	21'-0"
1026	30' - 3⅞"	1045	20'-6"
1027	30' - 7⅜"	1046	21'-0"
1028	29' - 8¼"	1046	20'-0"
1030	29' - 4¼"	1047	19'-6"
1031	29' - 0⅞"	1047	19'-6"
1032	28' - 9⅜"	1048	19'-0"
1033	28' - 5⅞"	1048	19'-0"
1035	28' - 2⅜"	1049	18'-6"
1036	27' - 11"	1049	18'-6"
1037	27' - 4⅝"	1050	17'-6"
1038	26' - 4⅜"	1051	16'-6"
1039	25' - 6¼"	1052	16'-0"

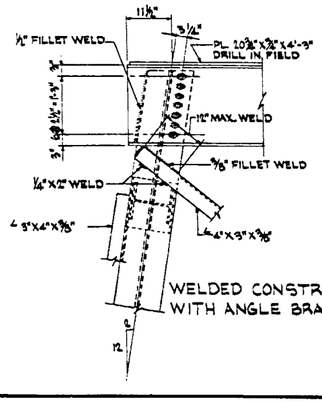
TABLE VII			
ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
743	34' - 9¼"	880	25'-0"
752	34' - 0⅛"	882	24'-0"
756	33' - 10½"	882	24'-0"
763	33' - 3⅛"	883	23'-6"
775	32' - 6"	885	23'-6"
778	32' - 4½"	885	22'-6"
785	31' - 8⅞"	886	22'-0"
789	31' - 4"	881	21'-6"
796	30' - 4	889	20'-6"
803	29' - 9⅝"	890	20'-6"
804	29' - 6⅜"	891	19'-6"
807	29' - 2"	891	19'-6"
808	29' - 1¼"	891	18'-6"
810	28' - 9⅝"	892	19'-6"
812	28' - 6⅛"	893	18'-6"
813	28' - 5⅞"	893	18'-6"
815	28' - 3¼"	893	18'-6"
816	27' - 10⅞"	894	18'-0"
817	27' - 5⅞"	895	17'-6"
818	27' - 5"	895	17'-6"
820	27' - 3¼"	896	17'-6"
821	27' - 2⅛"	895	17'-6"
822	27' - 2"	895	17'-6"
824	26' - 10¼"	896	17'-0"
826	26' - 4⅛"	897	16'-6"
827	26' - 3⅞"	897	16'-6"
831	25' - 3⅜"	899	15'-6"
833	24' - 9"	900	15'-0"
835	24' - 3⅜"	901	14'-6"
836	24' - 2⅞"	901	14'-6"
838	23' - 8¼"	902	14'-0"
839	23' - 4⅝"	903	13'-6"
842	23' - 2"	903	13'-6"
844	22' - 10⅜"	904	13'-0"
845	22' - 7⅝"	904	13'-0"
846	22' - 5⅛"	905	12'-6"
847	22' - 1⅞"	905	12'-6"
848	21' - 6"	906	11'-6"
849	21' - 0⅞"	906	11'-6"
850	21' - 0⅜"	907	11'-0"
852	20' - 6⅞"	907	11'-0"
853	20' - 1⅜"	908	10'-6"
854	19' - 7⅞"	909	10'-0"
855	19' - 2⅜"	910	9'-6"
859	18' - 9"	911	9'-0"
860	17' - 10⅛"	912	8'-0"
861	16' - 1⅜"	913	6'-6"
862	14' - 5¼"	914	4'-6"

TABLE VIII			
ERECTION MARK	ERECTION LENGTH	ROD MARK	ROD LENGTH
955	34' - 7¾"	1007	30'-6"
959	34' - 3⅛"	1008	30'-0"
960	33' -11"	1008	30'-0"
963	33' - 6⅝"	1009	29'-6"
964	33' - 2⅜"	1010	29'-0"
965	31' - 4½"	1012	27'-0"
966	31' - 1⅞"	1012	27'-0"
967	30' - 11¼"	1012	27'-0"
968	30' - 6⅛"	1013	26'-6"
969	30' - 3⅝"	1014	26'-0"
970	30' - 1⅛"	1014	26'-0"
971	29' - 10⅝"	1015	25'-6"
973	29' - 8⅛"	1015	25'-6"
975	29' - 5⅜"	1015	25'- 6"
976	27' - 9⅛"	1016	23'- 6"
977	27' - 7"	1016	23'- 6"
978	27' - 5"	1017	23'- 0"
979	27' - 3⅛"	1017	23'- 0"
980	27' - 2⅛"	1017	23'- 0"
981	27' - 0⅛"	1017	23'- 0"
982	26' - 11⅛"	1017	23'- 0"
983	26' -10⅞"	1018	22'- 6"
984	26' - 9⅞"	1018	22'- 6"
985	26' - 9"	1018	22'- 6"
986	26' - 7"	1018	22'- 6"
987	26' - 5"	1018	22'- 6"
988	26' - 5"	1018	22'- 6"

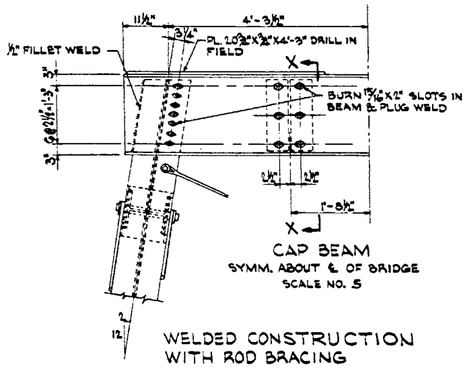


SECTION X-X
SCALE NO. 5

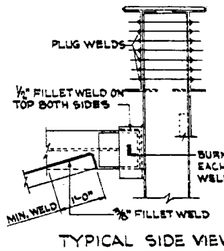




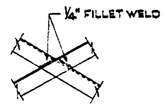
WELDED CONSTRUCTION WITH ANGLE BRACING



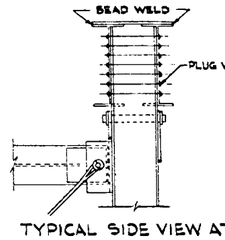
WELDED CONSTRUCTION WITH ROD BRACING



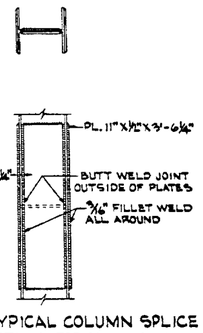
TYPICAL SIDE VIEW AT CAP WITH ANGLE BRACING
SCALE NO. 5



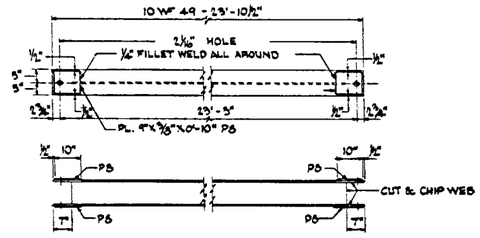
WELDED BRACING CONNECTION
SCALE NO. 5



TYPICAL SIDE VIEW AT CAP WITH ROD BRACING
SCALE NO. 5



TYPICAL COLUMN SPLICE
DETAILS FOR COLUMNS NOT SHOWN ARE SAME AS COLUMNS FOR BOLTED DESIGN.
SCALE NO. 5



LONGITUDINAL STRUT MK 653
SCALE NO. 4

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' — NO. 5
0 1' 2' 3' 4' — NO. 4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

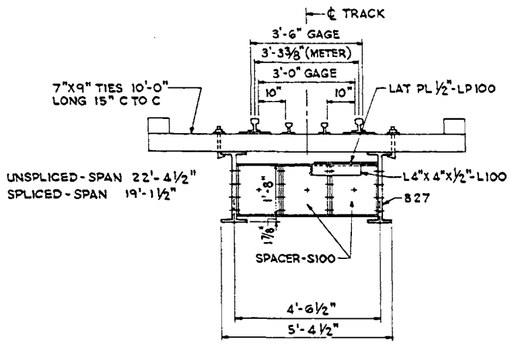
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: D. W. DEJCHMANN
APPROVED: DATE:
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. — 19 MAR 1959

THEATER OF OPERATIONS

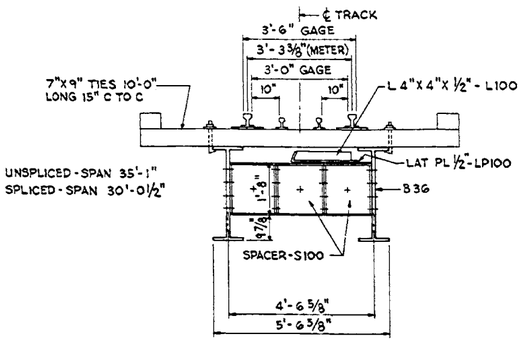
UNDER REVISION

RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK STEEL TOWERS
DETAILS FOR BOLTED & WELDED CONSTRUCTION

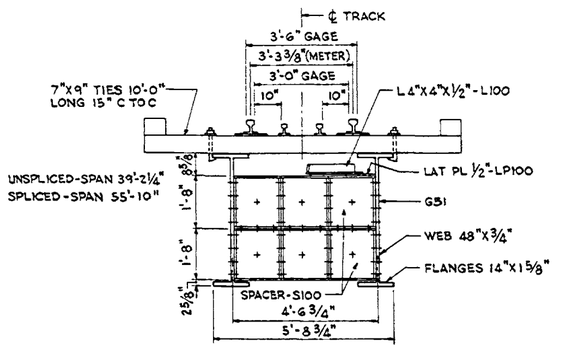
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-15
SHEET 5 OF 5



2-27 WF 94 BEAM BRIDGE
SCALE NO 4

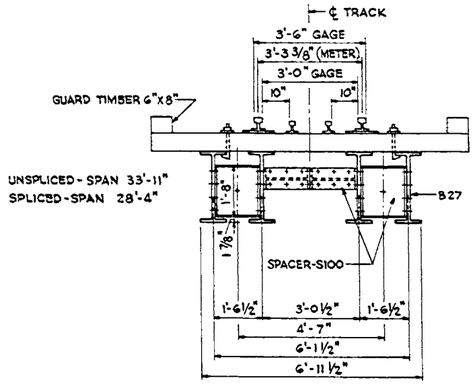


2-36 WF 150 BEAM BRIDGE
SCALE NO. 4

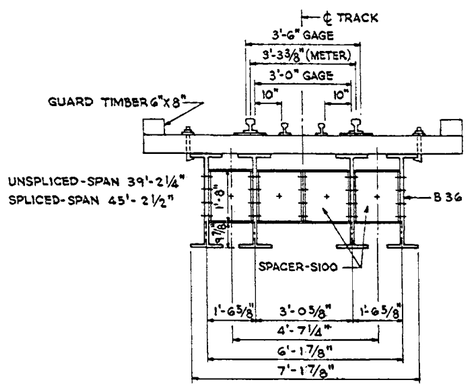


2-PLATE GIRDER BRIDGE
SCALE NO. 4

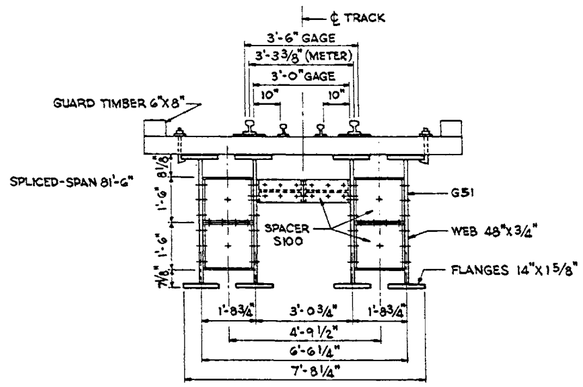
BEAM OR GIRDER	SECTION MODULUS INCHES³			BENDING MOMENT CAPACITY KIP FT		
	GROSS SECTION	NET SECTION ALONG BEAM	NET SECTION @ SPLICE	GROSS SECTION	NET SECTION ALONG BEAM	NET SECTION @ SPLICE
27WF 94	242.8	237.3	177.6	546.3	533.9	399.5
36WF 150	502.9	496.7	389.4	1131.5	1117.5	876.2
PLATE GIRDER	1363.3	1326.3	1105.2	3067.4	2984.3	2486.8



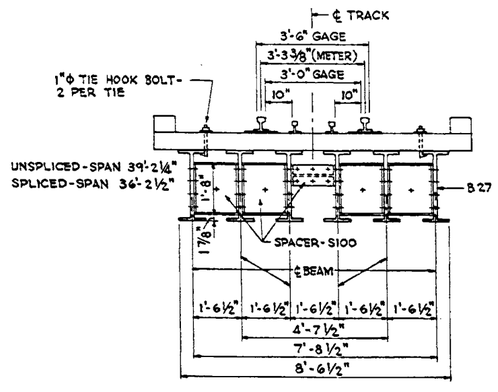
4-27 WF 94 BEAM BRIDGE
SCALE NO. 4



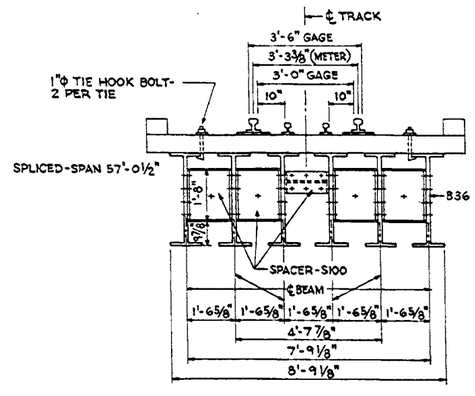
4-36 WF 150 BEAM BRIDGE
SCALE NO. 4



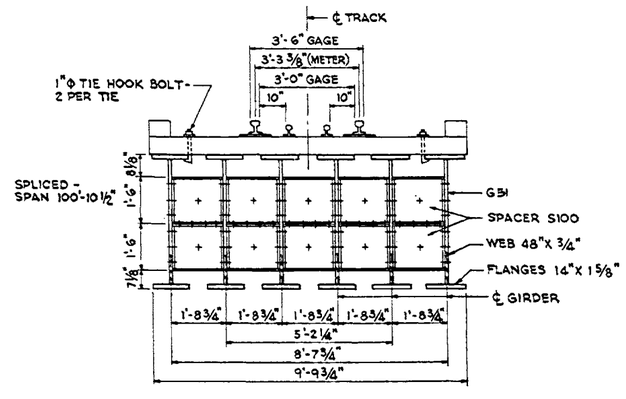
4-PLATE GIRDER BRIDGE
SCALE NO. 4



6-27 WF 94 BEAM BRIDGE
SCALE NO. 4



6-36 WF 150 BEAM BRIDGE
SCALE NO. 4



6-PLATE GIRDER BRIDGE
SCALE NO. 4

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-16	CROSS SECTIONS NARROW GAGE	1 OF 16
86-16	CROSS SECTIONS WIDE GAGE	2 OF 16
86-16	PLANS 2,4 & 6-27WF BRIDGES NARROW GAGE	3 OF 16
86-16	PLANS 2,4 & 6-27WF BRIDGES WIDE GAGE	4 OF 16
86-16	PLANS 2,4 & 6-36WF BRIDGES NARROW GAGE	5 OF 16
86-16	PLANS 2,4 & 6-36WF BRIDGES WIDE GAGE	6 OF 16
86-16	PLANS & CROSS SECTIONS 36WF 230 BRIDGE VARIOUS GAGES	7 OF 16
86-16	PLANS 2,4 & 6-51DPG BRIDGES NARROW GAGE	8 OF 16
86-16	PLANS 2,4 & 6-51DPG BRIDGES WIDE GAGE	9 OF 16
86-16	PLANS 27WF & 36WF BRIDGES NARROW GAGE-SKEW ENDS	10 OF 16
86-16	PLANS 27WF & 36WF BRIDGES WIDE GAGE-SKEW ENDS	11 OF 16
86-16	PLANS 51DPG BRIDGES NARROW GAGE-SKEW ENDS	12 OF 16
86-16	PLANS 51DPG BRIDGES WIDE GAGE-SKEW ENDS	13 OF 16
86-16	WELDED SPLICES	14 OF 16
86-16	DETAILS	15 OF 16
86-16	DETAILS	16 OF 16

NARROW GAGE BRIDGES

GENERAL NOTES

1. SPANS ARE CENTER TO CENTER OF BEARINGS.
2. SHEAR IN KIPS, MOMENTS IN FOOT-KIPS, PER RAIL, ARE SHOWN ON DWG NO. 86-16 SHEET 2 OF 16.

+ HOLE NOT USED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4'
NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

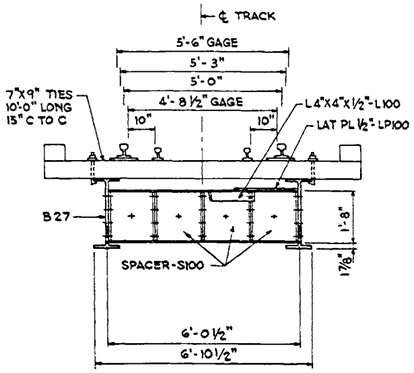
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
CROSS-SECTIONS
NARROW GAGE

UNDER REVISION

APPROVED: L.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 1 OF 16



2-27 WF 94 BEAM BRIDGE

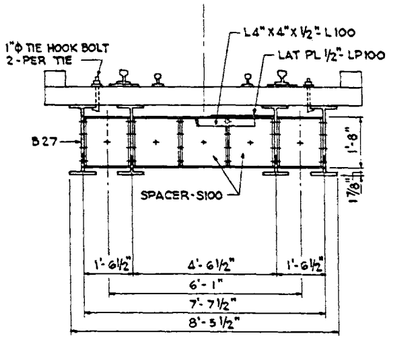
SCALE NO. 4

27WF94 UNSPLICED-SPAN 22'-4½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	4.3	24.2
LIVE LOAD	59.9	284.6
IMPACT	47.3	224.8
TOTAL	111.5	533.6

27WF94 SPLICED-SPAN 19'-1½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	3.7	17.7
LIVE LOAD	54.8	212.9
IMPACT	43.5	169.0
TOTAL	102.0	399.6



4-27 WF 94 BEAM BRIDGE

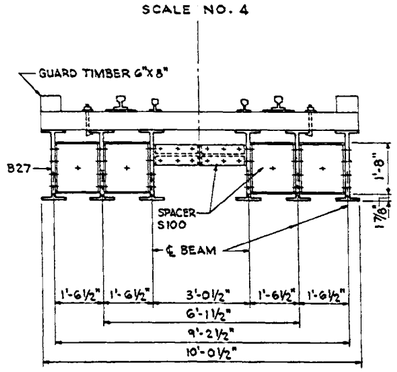
SCALE NO. 4

2-27WF94 UNSPLICED-SPAN 33'-11"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	8.2	69.8
LIVE LOAD	76.5	561.7
IMPACT	59.4	436.4
TOTAL	144.1	1,067.9

2-27WF94 SPLICED-SPAN 28'-4"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	6.9	48.7
LIVE LOAD	68.4	420.0
IMPACT	53.6	329.3
TOTAL	128.9	798.0



6-27 WF 94 BEAM BRIDGE

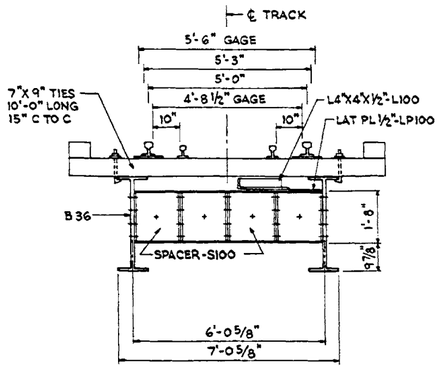
SCALE NO. 4

3-27WF94 UNSPLICED-SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	11.1	108.5
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	159.3	1,366.4

3-27WF94 SPLICED-SPAN 36'-2½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	10.2	92.7
LIVE LOAD	79.7	623.6
IMPACT	61.7	482.6
TOTAL	151.6	1,198.9



2-36 WF 150 BEAM BRIDGE

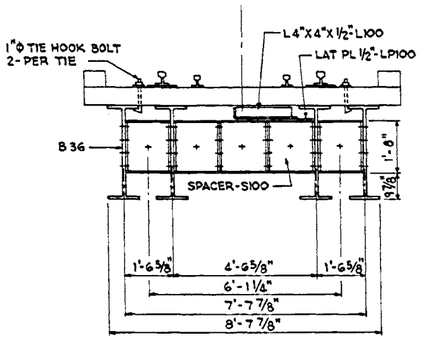
SCALE NO. 4

36WF150 UNSPLICED-SPAN 35'-1"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	7.8	68.6
LIVE LOAD	77.9	590.7
IMPACT	60.4	457.8
TOTAL	146.1	1,117.1

36WF150 SPLICED-SPAN 30'-0½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	6.7	50.4
LIVE LOAD	71.0	463.2
IMPACT	55.5	362.2
TOTAL	133.2	875.8



4-36 WF 150 BEAM BRIDGE

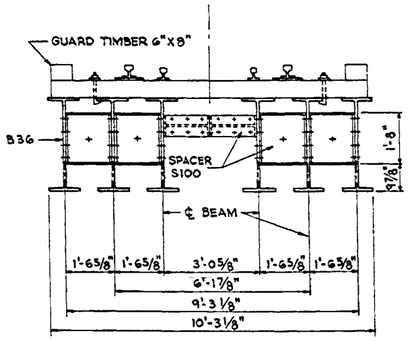
SCALE NO. 4

2-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	12.0	117.5
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	160.2	1375.4

2-36WF150 SPLICED-SPAN 45'2½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	13.8	150.3
LIVE LOAD	92.9	907.3
IMPACT	70.5	688.6
TOTAL	177.2	1,752.2



6-36 WF 150 BEAM BRIDGE

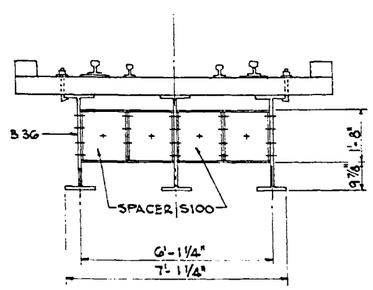
SCALE NO. 4

3-36WF150 UNSPLICED-SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	14.7	143.6
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	162.9	1,401.5

3-36WF150 SPLICED-SPAN 57'-0½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	21.3	304.5
LIVE LOAD	106.7	1,339.2
IMPACT	78.4	984.3
TOTAL	206.4	2,628.0



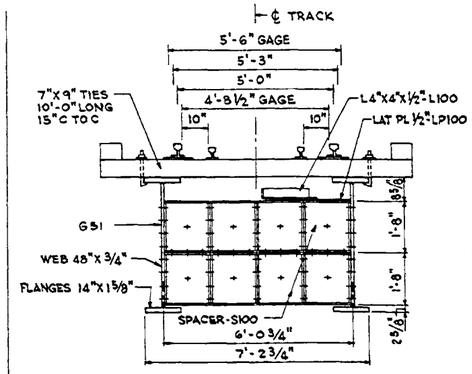
3-36 WF 150 BEAM BRIDGE

SCALE NO. 4

36WF150 UNSPLICED SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	10.8	105.6
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	159.0	1,363.5

BEAM OR GIRDER	SECTION MODULUS INCHES³			BENDING MOMENT CAPACITY KIP FT.		
	GROSS SECTION	NET SECTION ALONG BEAM	NET SECTION @ SPLICE	GROSS SECTION	NET SECTION ALONG BEAM	NET SECTION @ SPLICE
27 WF 94	242.8	237.3	177.6	546.3	533.9	399.5
36 WF 150	502.9	496.7	389.4	1,131.5	1,117.5	876.2
PLATE GIRDER	1,363.3	1,326.3	1,105.2	3,067.4	2,984.3	2,486.8



2-PLATE GIRDER BRIDGE

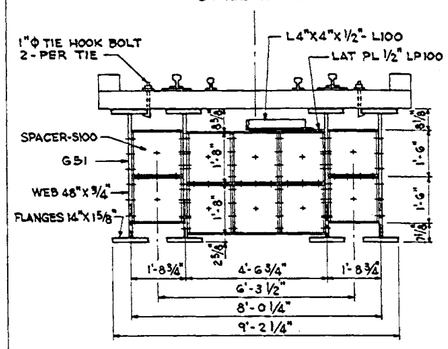
SCALE NO. 4

GIRDER UNSPLICED-SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	12.2	120.0
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	160.4	1,377.9

GIRDER SPLICED-SPAN 55'-10"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	17.5	243.7
LIVE LOAD	105.3	1,290.5
IMPACT	77.7	952.3
TOTAL	200.5	2,486.5



4-PLATE GIRDER BRIDGE

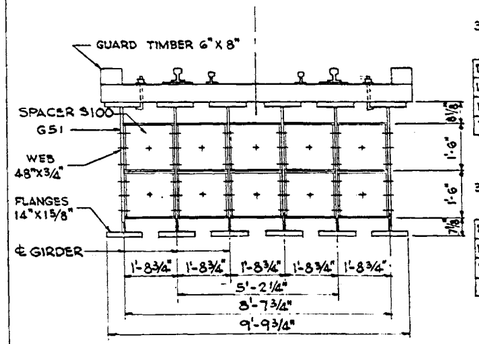
SCALE NO. 4

2-GIRDER UNSPLICED-SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	18.5	181.6
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	166.7	1,439.5

2-GIRDER SPLICED-SPAN 81'-6"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	38.6	785.8
LIVE LOAD	142.1	2,312.3
IMPACT	94.8	1,675.7
TOTAL	275.5	4,973.8



6-PLATE GIRDER BRIDGE

SCALE NO. 4

3-GIRDER UNSPLICED-SPAN 39'-2¼"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	24.5	239.8
LIVE LOAD	83.8	711.1
IMPACT	64.4	546.8
TOTAL	172.7	1,497.7

3-GIRDER SPLICED-SPAN 100'-10½"

	MAX SHEAR	MAX MOMENT
DEAD LOAD	63.0	1,588.5
LIVE LOAD	169.9	3,678.9
IMPACT	101.3	2,192.6
TOTAL	334.2	7,460.0

GENERAL NOTES

1. SPANS ARE CENTER TO CENTER OF BEARINGS.
2. SHEAR IN KIPS, MOMENTS IN FOOT-KIPS, PER RAIL.

+ HOLE NOT USED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' 4'

NO.4

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

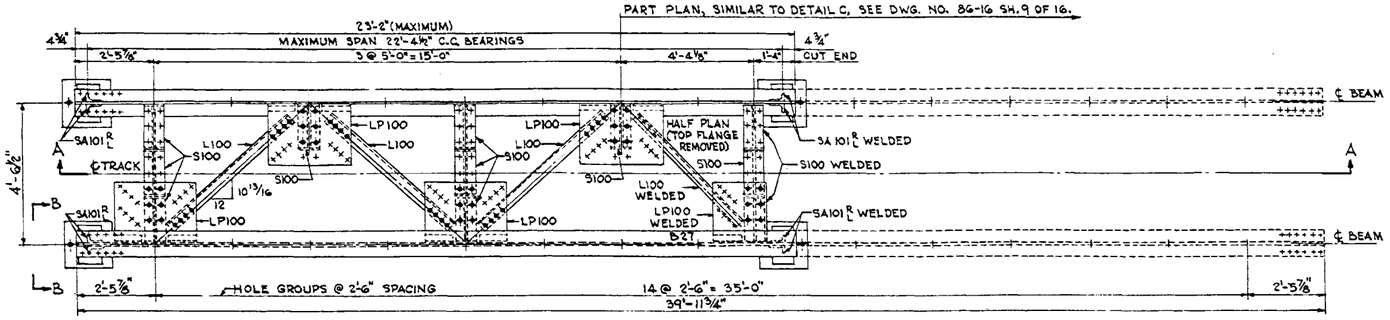
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
CROSS-SECTIONS
WIDE GAGE

UNDER REVISION

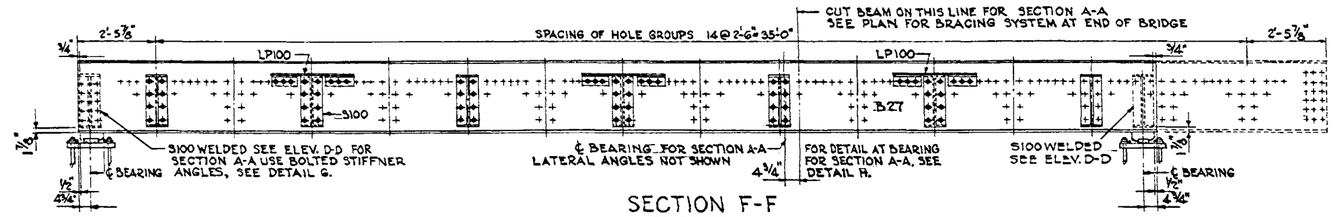
APPROVED: for H. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

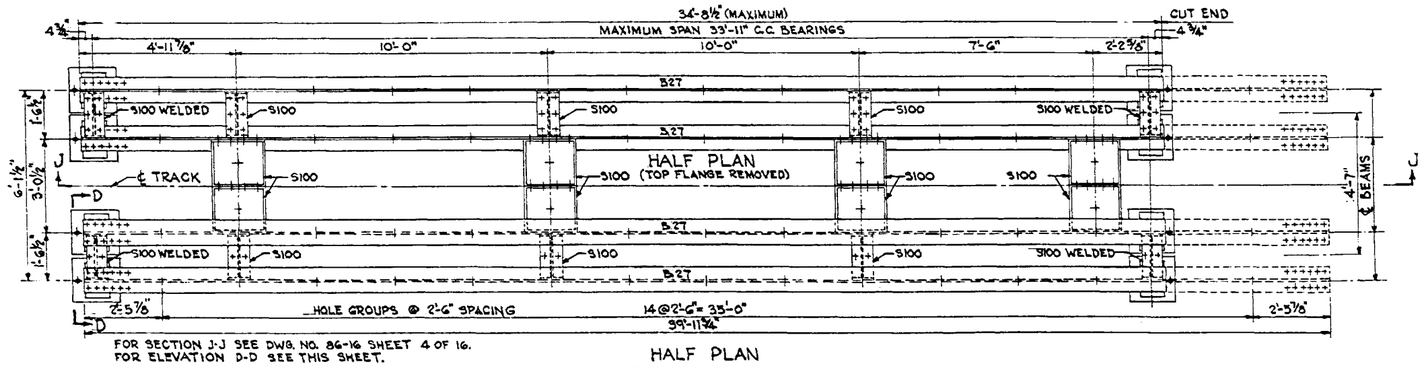
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 16
86-16



HALF PLAN
PLAN FOR 2-27 WF BEAM BRIDGE FACILITY NO. 861601
NARROW GAGE
SCALE NO. 4

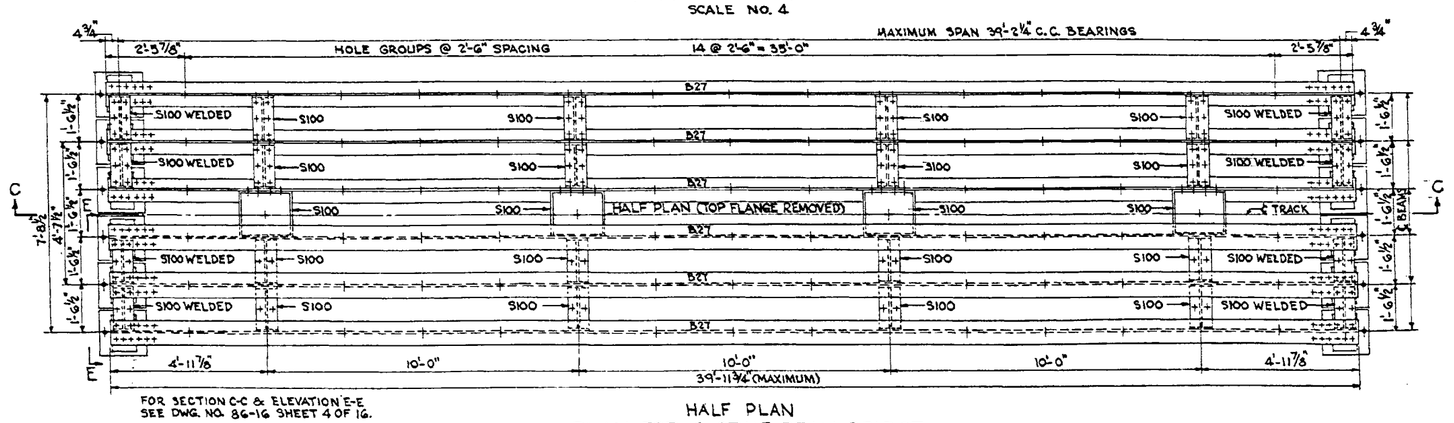


SECTION F-F
SCALE NO. 4
SECTION A-A SIMILAR EXCEPT AS NOTED.
SECTION A-A LOCATION ON THIS SHEET AND ON DWG. NO. 86-16 SHEET 4 OF 16.
SECTION F-F LOCATION ON DWG. NO. 86-16 SHEET 4 OF 16.



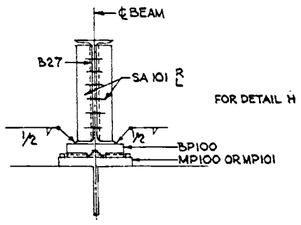
FOR SECTION J-J SEE DWG. NO. 86-16 SHEET 4 OF 16.
FOR ELEVATION D-D SEE THIS SHEET.

HALF PLAN
PLAN FOR 4-27 WF BEAM BRIDGE FACILITY NO. 861607
NARROW GAGE
SCALE NO. 4

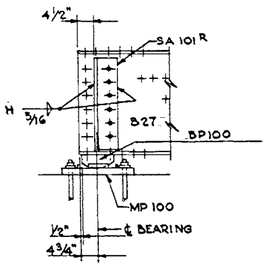


FOR SECTION C-C & ELEVATION E-E SEE DWG. NO. 86-16 SHEET 4 OF 16.

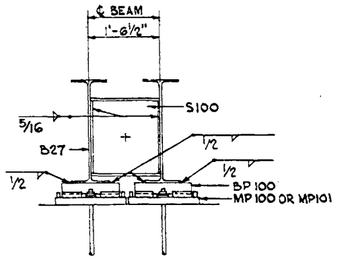
HALF PLAN
PLAN FOR 6-27 WF BEAM BRIDGE FACILITY NO. 861613
NARROW GAGE
SCALE NO. 4



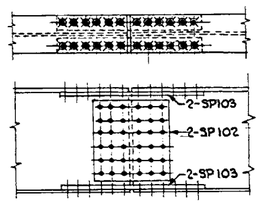
ELEVATION B-B
SCALE NO. 5
LOCATION ON THIS SHEET AND DWG. NO. 86-16 SHEET 4 OF 16.



DETAIL G
SCALE NO. 5
DETAIL H - SIMILAR AND OPPOSITE HAND BOLT HOLES NOT USED FOR DETAIL H
SEE NOTES ON SECTION A-A ON THIS SHEET.



ELEVATION D-D
SCALE NO. 5
LOCATION ON THIS SHEET AND DWG. NO. 86-16 SHEET 4 OF 16.



DETAIL OF SPLICE FOR 27 WF 94
SCALE NO. 5

MATERIAL PER SPLICE	
WEB	2- SP102
FLANGE	4- SP103

PIECES PER BEARING	
FIXED	EXPANSION
MP100	MP101
BP100	BP100
2-AB100	2-AB100

DISTANCE FROM BOTTOM OF BEARING TO TOP OF BEAM = 2'-7⅞" ± 1/8"

GENERAL NOTES

1. THE ASSEMBLY OF THE 27 WF BEAM BRIDGES ARE SHOWN FOR THE MAXIMUM SPAN. FOR SPANS LESS THAN THE MAXIMUM, THE BRIDGE MUST BE CUT DOWN IN LENGTH IN A MANNER SIMILAR TO THAT SHOWN ON DWG. NO. 86-16, SHEETS 8 & 9 OF 16.
2. FOR MAXIMUM SPAN LENGTHS SEE DWG. NO. 86-16 SHEET 1 OF 16.

→ HOLE FOR FIELD BOLTED CONNECTION.
+ HOLE NOT USED.

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
NO. 4: 0 1' 2' 3' 4'
NO. 5: 0 1' 2' 3'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA · WASHINGTON, D. C.

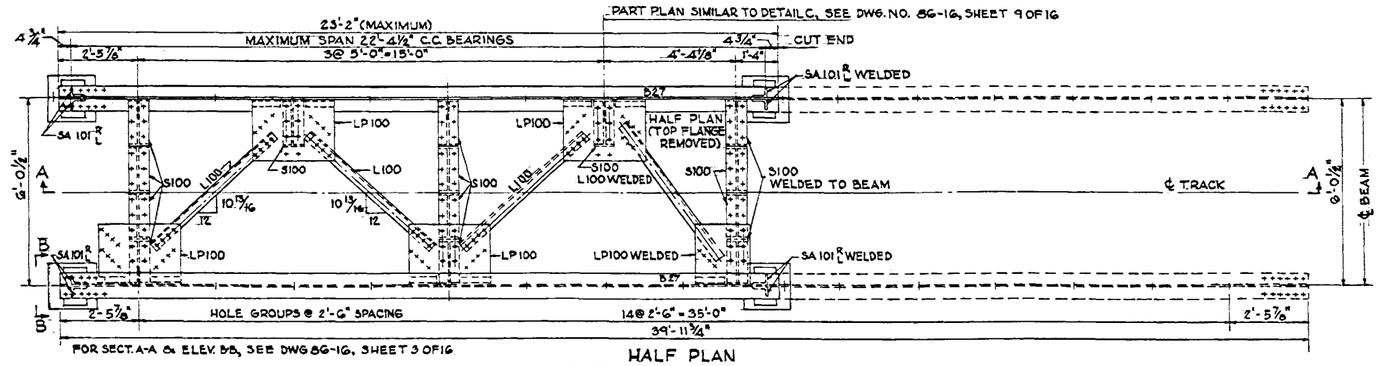
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I. LYUS
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: J. W. DEICHMANN

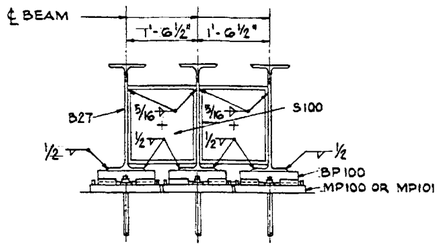
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
4 & 6-27 WF BEAMS
NARROW GAGE

UNDER REVISION

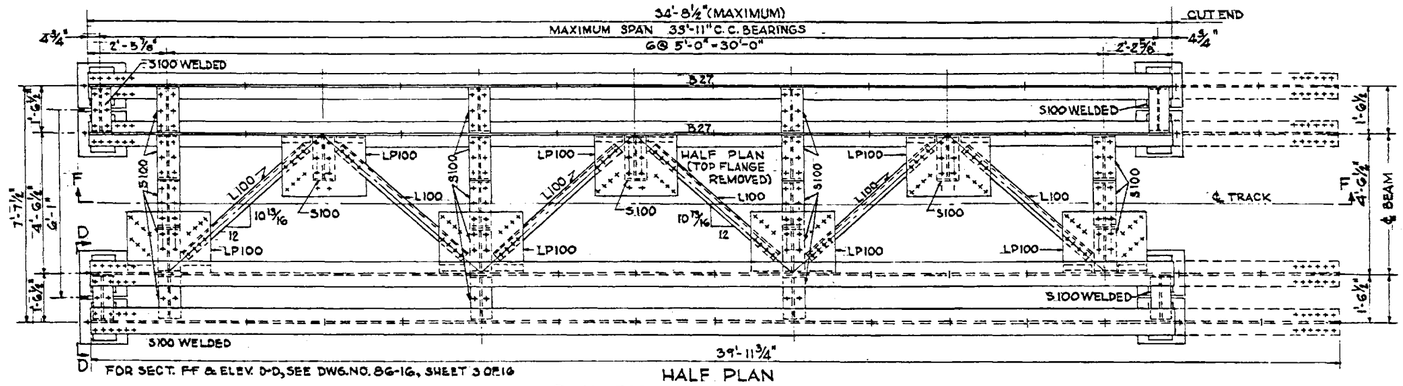
RECOMMENDED: Chief, Structures Branch
APPROVED: Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 18 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 3 OF 18



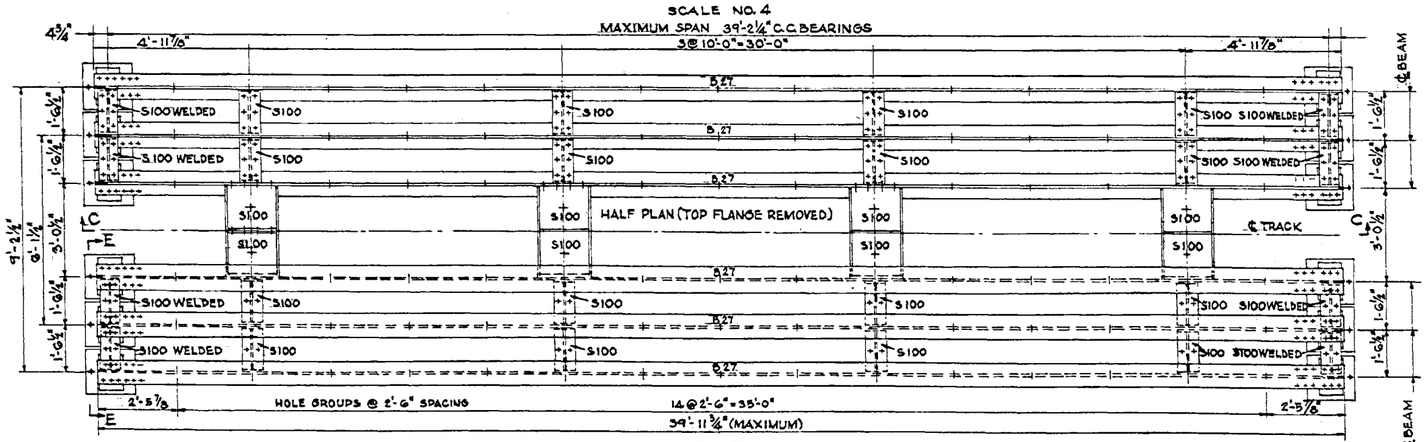
HALF PLAN
PLAN FOR 2-27 WF BEAM BRIDGE FACILITY NO. 861602
WIDE GAGE
SCALE NO. 4



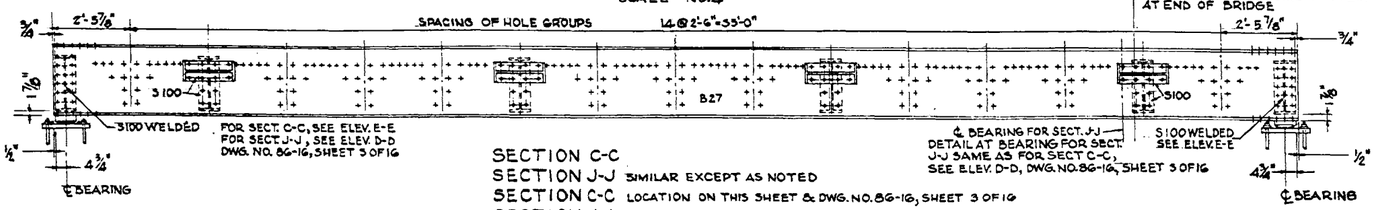
ELEVATION E-E
LOCATION ON THIS SHEET &
DWG. NO. 86-16, SHEET 3 OF 16
SCALE NO. 3



HALF PLAN
PLAN FOR 4-27 WF BEAM BRIDGE FACILITY NO. 861608
WIDE GAGE
SCALE NO. 4



HALF PLAN
PLAN FOR 6-27 WF BEAM BRIDGE FACILITY NO. 861614
WIDE GAGE
SCALE NO. 4



SECTION C-C
SECTION J-J SIMILAR EXCEPT AS NOTED
SECTION C-C LOCATION ON THIS SHEET & DWG. NO. 86-16, SHEET 3 OF 16
SECTION J-J LOCATION ON DWG. NO. 86-16, SHEET 3 OF 16
SCALE NO. 4

MATERIAL PER SPLICE	
WEB	2-SP102
FLANGE	4-SP103

PIECES PER BEARING	
FIXED	EXPANSION
MP100	MP101
BP100	BP100
2-AB100	2-AB100

DISTANCE FROM BOTTOM OF BEARING TO TOP OF BEAM = 2'-7 7/8" ± 1/8"

GENERAL NOTES

1. THE ASSEMBLIES OF THE 27 WF BEAM BRIDGES ARE SHOWN FOR THE MAXIMUM SPANS. FOR SPANS LESS THAN THE MAXIMUM, THE BRIDGES MUST BE CUT DOWN IN LENGTH IN A MANNER SIMILAR TO THAT SHOWN ON DWG. NO. 86-16, SHEETS 8 & 9 OF 16.
2. FOR MAXIMUM SPAN LENGTHS, SEE DWG. NO. 86-16, SHEET 2 OF 16.

+ HOLE FOR FIELD BOLTED CONNECTION
+ HOLE NOT USED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO. 4
0 1' 2' 3' NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

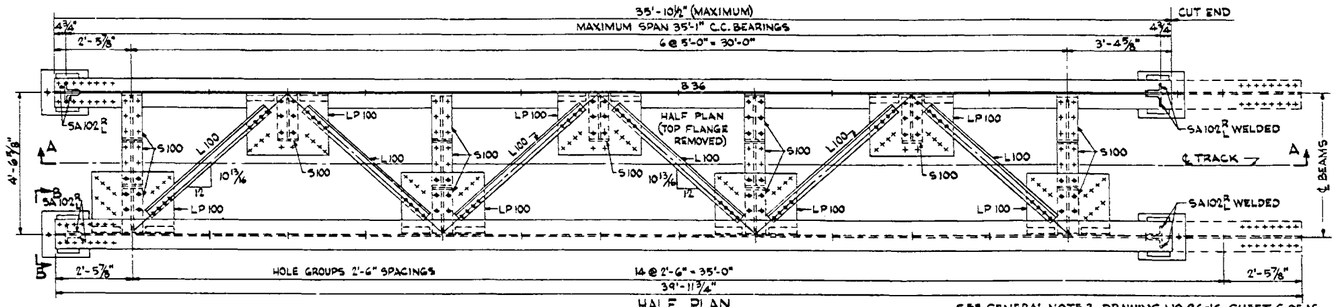
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: C. W. DEICHMANN
RECOMMENDED:
APPROVED: H. M. Williams DATE: 13 MAR 1969
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURE
BEAM & GIRDER CONSTRUCTION
2, 4, 6-36' WF BEAMS
WIDE GAGE

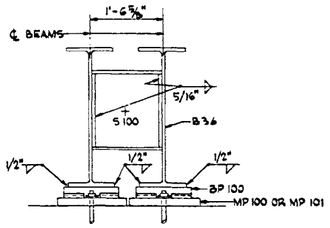
UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 4 OF 18
86-16

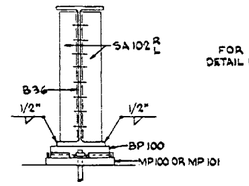


HALF PLAN
PLAN FOR 2-36 WF BEAM BRIDGE - FACILITY NO. 86IG09 & 86IG03
NARROW GAGE
SCALE NO. 4

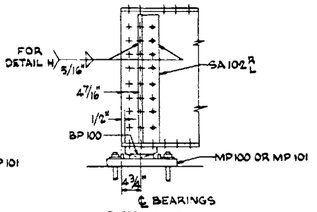
SEE GENERAL NOTE 3, DRAWING NO. 86-16 SHEET 6 OF 16



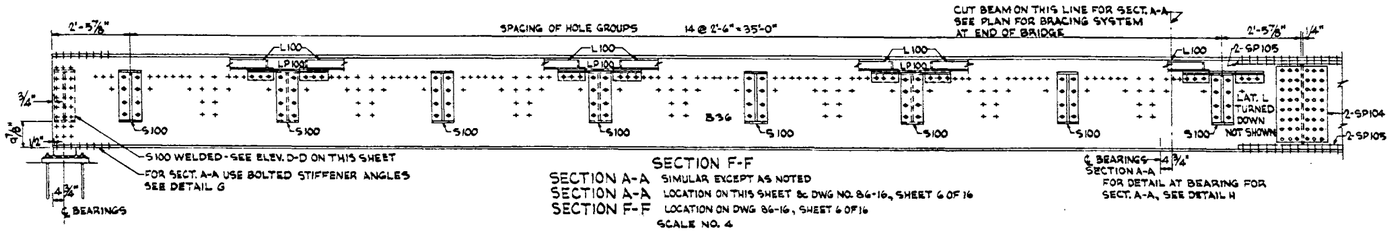
ELEVATION D-D
SCALE NO. 5
LOCATION ON THIS SHEET & DWG NO. 86-16, SHEET 6 OF 16



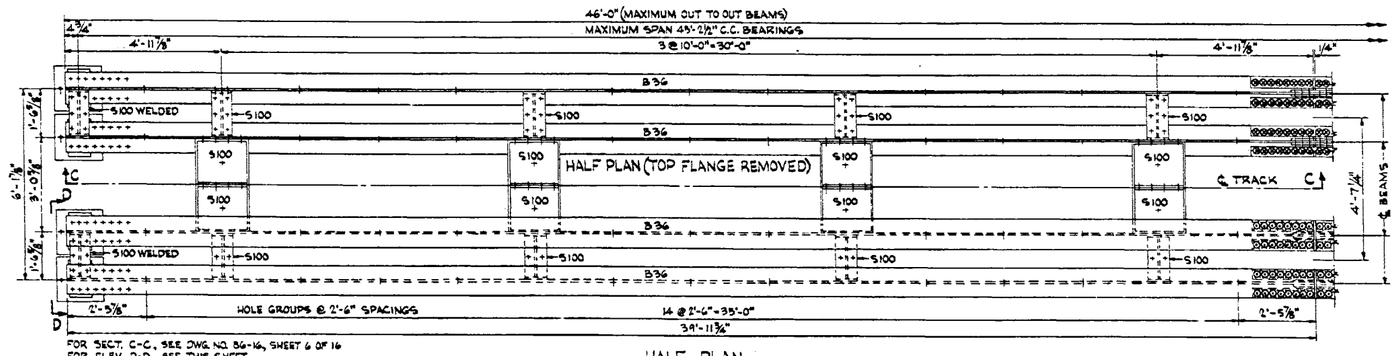
ELEVATION B-B
SCALE NO. 5
LOCATION ON THIS SHEET & DWG NO. 86-16, SHEET 6 OF 16



DETAIL G
SCALE NO. 5
DETAIL H SIMULAR AND OPPOSITE HAND
BOLT HOLES NOT USED FOR DETAIL H.
SEE NOTES ON SECT. A-A ON THIS SHEET

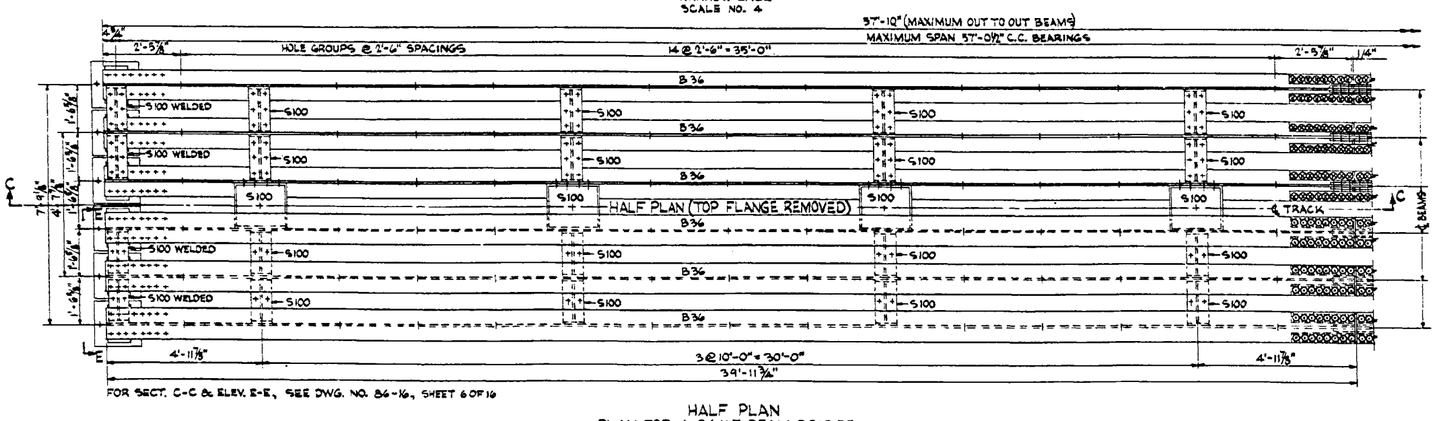


SECTION F-F
SECTION A-A SIMULAR EXCEPT AS NOTED
SECTION A-A LOCATION ON THIS SHEET & DWG NO. 86-16, SHEET 6 OF 16
SECTION F-F LOCATION ON DWG 86-16, SHEET 6 OF 16
SCALE NO. 4



FOR SECT. C-C, SEE DWG. NO. 86-16, SHEET 6 OF 16
FOR ELEV. D-D, SEE THIS SHEET

HALF PLAN
PLAN FOR 4-36 WF BEAM BRIDGE - FACILITY NO. 86IG15
NARROW GAGE
SCALE NO. 4



FOR SECT. C-C & ELEV. E-E, SEE DWG. NO. 86-16, SHEET 6 OF 16

HALF PLAN
PLAN FOR 6-36 WF BEAM BRIDGE - FACILITY NO. 86IG21
NARROW GAGE
SCALE NO. 4

MATERIAL PER SPLICE	
WEB	2-SP104
FLANGE	4-SP105

PIECES PER BEARING	
FIXED	EXPANSION
BP100	BP100
MP100	MP101
2-AB100	2-AB100

DISTANCE FROM BOTTOM OF BEARING TO TOP OF BEAM = 3'-4⅞" ± 1/8"

GENERAL NOTES

1. THE ASSEMBLIES OF THE 36 WF BEAM BRIDGES ARE SHOWN FOR THE BASIC 40 FT. UNIT. FOR SPANS UP TO THE MAXIMUM, THE BASIC UNIT MUST BE EXTENDED OR CUT DOWN IN A MANNER SIMULAR TO THAT SHOWN ON DWG. NO. 86-16, SHEET 8 & 9 OF 16.
2. FOR MAXIMUM SPAN LENGTHS, SEE DWG. NO. 86-16, SHEET 10F16.

+ HOLES FOR FIELD BOLTED CONNECTIONS.
+ HOLES NOT USED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO.4
0 1' 2' 3' NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

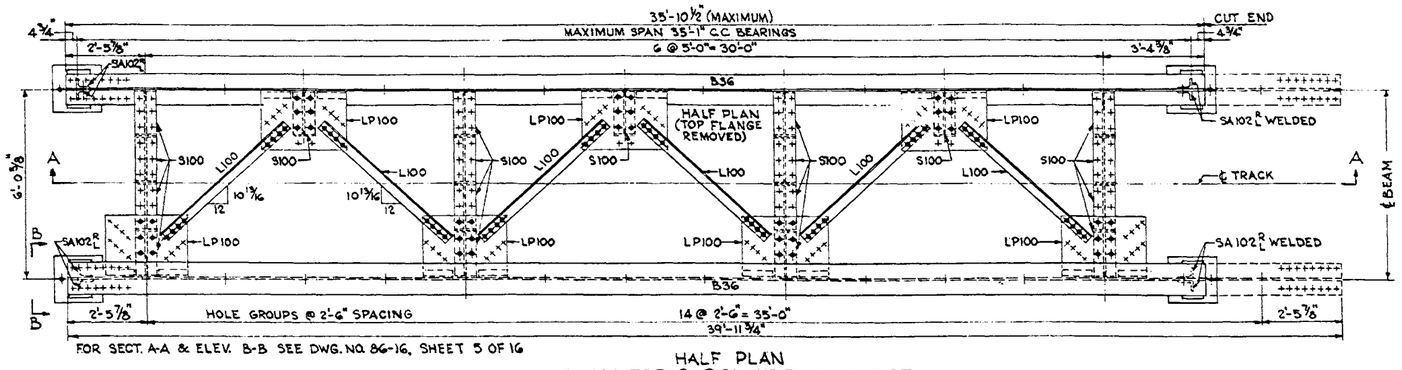
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY:	HORNE
TRACED BY:	
CHECKED BY:	WADE
SUBMITTED BY:	E.W. DEICHMANN
APPROVED:	APPROVED: DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH	CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:	
DATE	

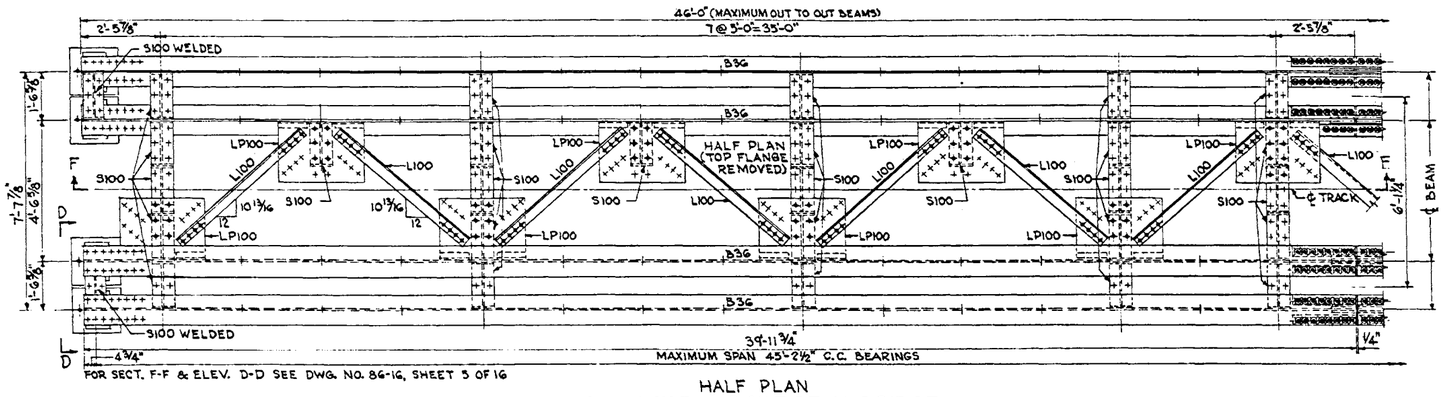
THEATER OF OPERATIONS
RAILROAD BRIDGE-SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
2-4-& 6-36 WF BEAMS
NARROW GAGE

UNDER REVISION

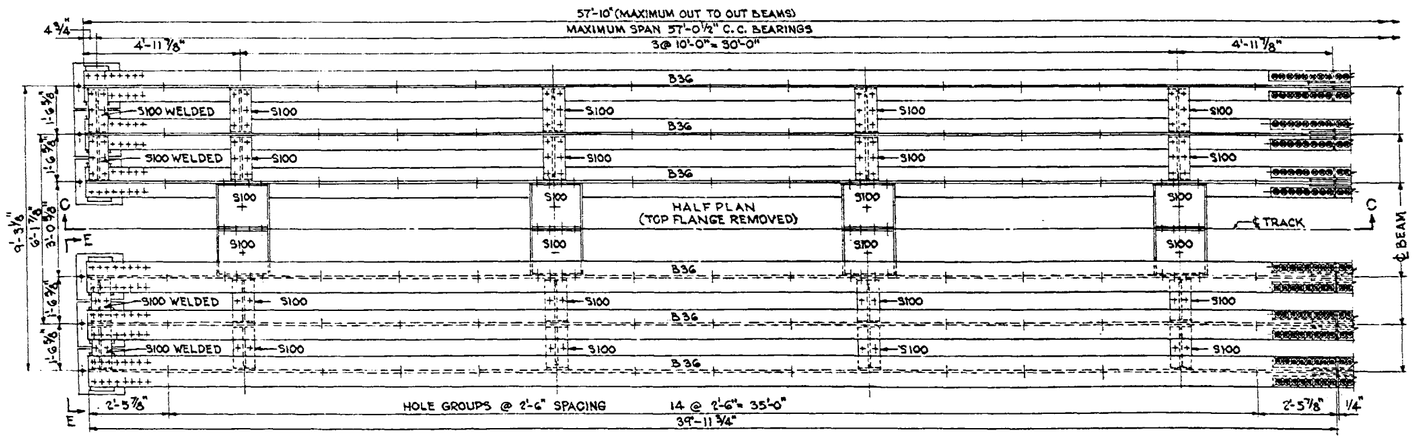
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 86-16
SHEET 5 OF 16



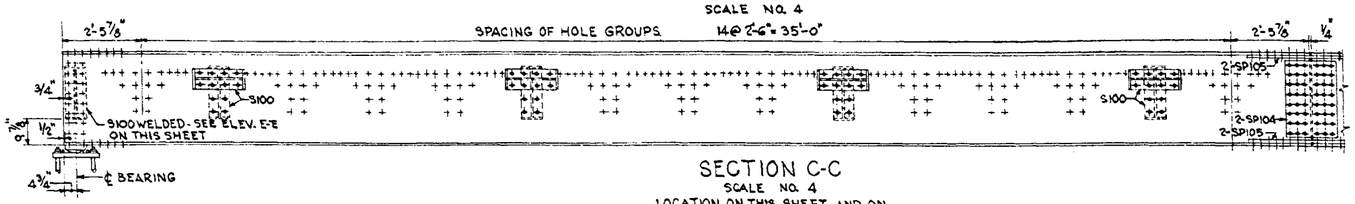
HALF PLAN
PLAN FOR 2-36 WF BEAM BRIDGE - FACILITY NO. 861G10 & NO. 861G04
FACILITY NO. 861G12 - 3 BEAM BRIDGE (SEE GENERAL NOTE 3).
WIDE GAGE
SCALE NO. 4



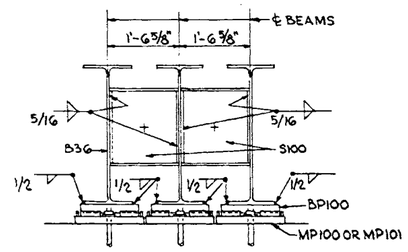
HALF PLAN
PLAN FOR 4-36 WF BEAM BRIDGE - FACILITY NO. 861G16
WIDE GAGE
SCALE NO. 4



HALF PLAN
PLAN FOR 6-36 WF BEAM BRIDGE - FACILITY NO. 861G22
WIDE GAGE
SCALE NO. 4



SECTION C-C
SCALE NO. 4
LOCATION ON THIS SHEET AND ON
DWG. NO. 86-16, SHEET 5 OF 16.



ELEVATION E-E
SCALE NO. 5

LOCATION ON THIS SHEET &
ON DWG. NO. 86-16, SHEET 5 OF 16.

PIECES PER BEARING	
FIXED	EXPANSION
BP100	BP100
MP100	MP101
2-AB100	2-AB100

MATERIAL PER SPLICE	
WEB	2-SP104
FLANGE	4-SP105

DISTANCE FROM BOTTOM OF BEARING
TO TOP OF GIRDER 3'-4⅞" ± 1/8"

+ HOLE FOR FIELD BOLTED CONNECTION
+ HOLE NOT USED

GENERAL NOTES

1. THE ASSEMBLIES OF THE 36 WF BEAM BRIDGES ARE SHOWN FOR THE BASIC 40 FOOT UNIT. FOR SPANS UP TO THE MAXIMUM, THE BASIC UNIT MUST BE EXTEND OR CUT DOWN IN LENGTH IN A MANNER SIMILAR TO THAT SHOWN ON DWG. NO. 86-16, SHEETS 8 & 9 OF 16.
2. FOR MAXIMUM SPAN LENGTHS, SEE DWG. NO. 86-16, SHEET 2 OF 16.
3. TO UTILIZE FULL LENGTH OF BEAMS WITHOUT CUTTING, ADD 1-36" WF BEAM AT ℄ OF TRACK AND SHIFT SPACERS 2'-6" TO THE RIGHT. THE 4 SETS OF SPACERS INSTALLED VERTICALLY ARE AS INDICATED IN 3-36" WF 150 BEAM BRIDGE, DWG. NO. 86-16, SHEET 2. A SET OF 4 SPACERS IS INSTALLED HORIZONTALLY MIDWAY BETWEEN THE VERTICAL SPACERS REPLACING THE L100'S & LP100'S USED IN THE 2-BEAM BRIDGE. THIS 3-BEAM BRIDGE MAY BE USED FOR EITHER NARROW OR WIDE GAGE TRACKS.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' — NO. 4
0 1' 2' 3' — NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DEICHMANN

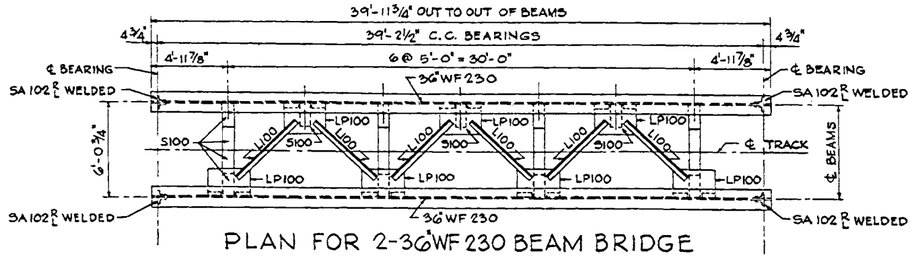
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
2-3 & 6-36 WF BEAMS
WIDE GAGE

UNDER REVISION

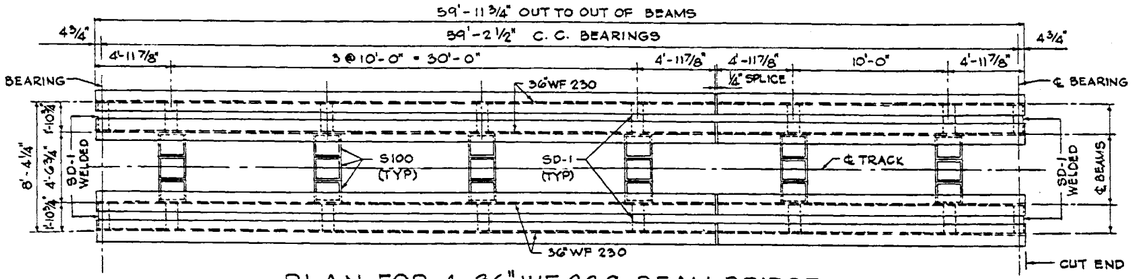
APPROVED: W. M. Williams
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 1 8 MAR 1963

APPROVED FOR PROPONENT AGENCY:
DATE

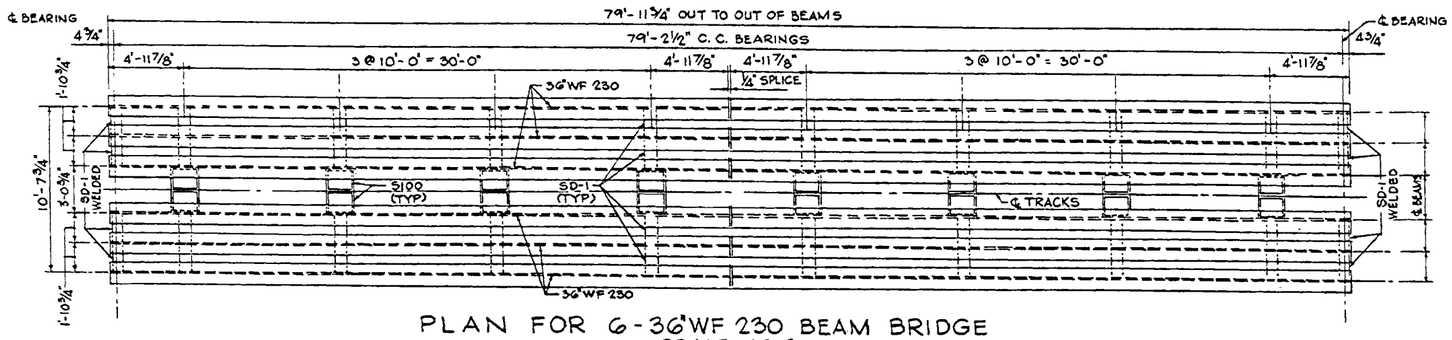
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 6 OF 16



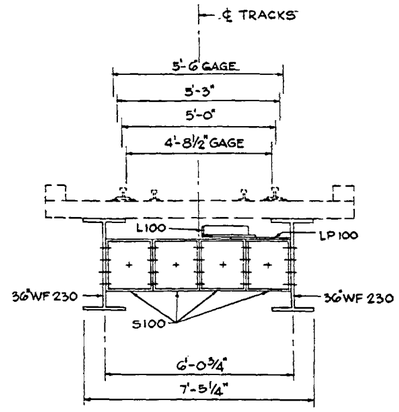
PLAN FOR 2-36"WF 230 BEAM BRIDGE
SCALE NO. 2
FACILITY NO. 861600



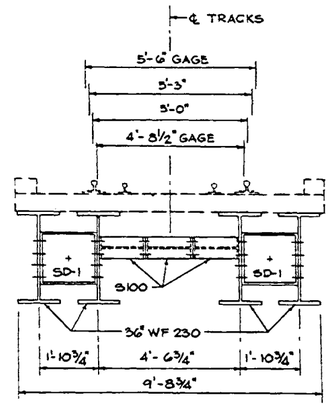
PLAN FOR 4-36" WF 230 BEAM BRIDGE
SCALE NO. 2
FACILITY NO. 861601



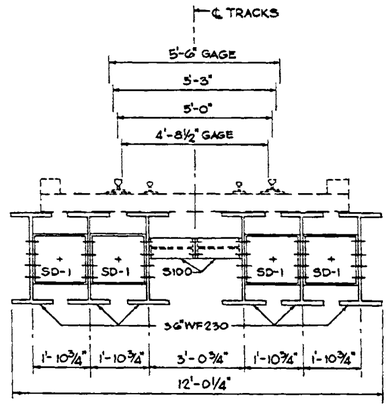
PLAN FOR 6-36"WF 230 BEAM BRIDGE
SCALE NO. 2
FACILITY NO. 861602



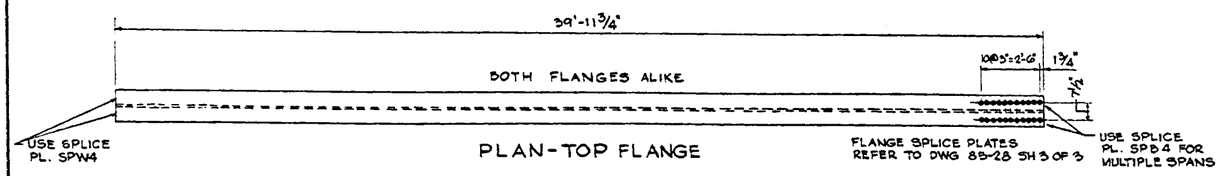
SECTION - 2-36"WF 230 BEAM BRIDGE
SCALE NO. 4



SECTION - 4-36"WF230 BEAM BRIDGE
SCALE NO. 4

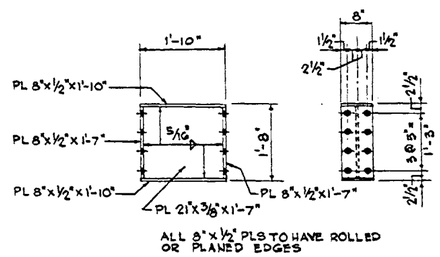


SECTION - 6-36"WF 230 BEAM BRIDGE
SCALE NO. 4



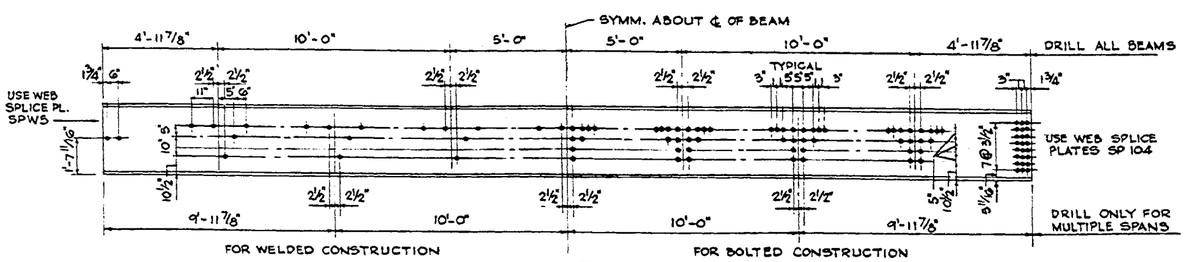
PLAN-TOP FLANGE

FLANGE SPLICE PLATES REFER TO DWG 85-28 SH 3 OF 3



ALL 8"x1/2" PLS TO HAVE ROLLED OR PLANED EDGES

SPACER SD-1
SCALE NO. 3



ELEVATION

DETAILS FOR 36"WF 230 BEAMS
SCALE NO. 3

GENERAL NOTES

1. OPEN HOLE 1 1/16"ø UNLESS NOTED.
2. ALL HOLE IN FLANGES OF 36"WF230 ARE TO BE COUNTER SUNK AS SHOWN ON DWG NO. 86-16 SHEET 15 OF 16.
3. WHERE WELDED BEAM SPLICES ARE DESIRED REFER TO DWG NO. 85-28 SHEET 2 OF 3 FOR DETAILS.
4. DETAILS FOR BEARING PLATES ARE SHOWN ON DWG NO. 85-28, SH 3 OF 3

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-16	36"WF 230 R.R BRIDGE SUPERSTRUCTURES	7 OF 16
86-16	RAILWAY BRIDGE SPANS-DETAILS	14, 15, 16 OF 16

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES: NO. 2, NO. 3, NO. 4, NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DE LCHMANN

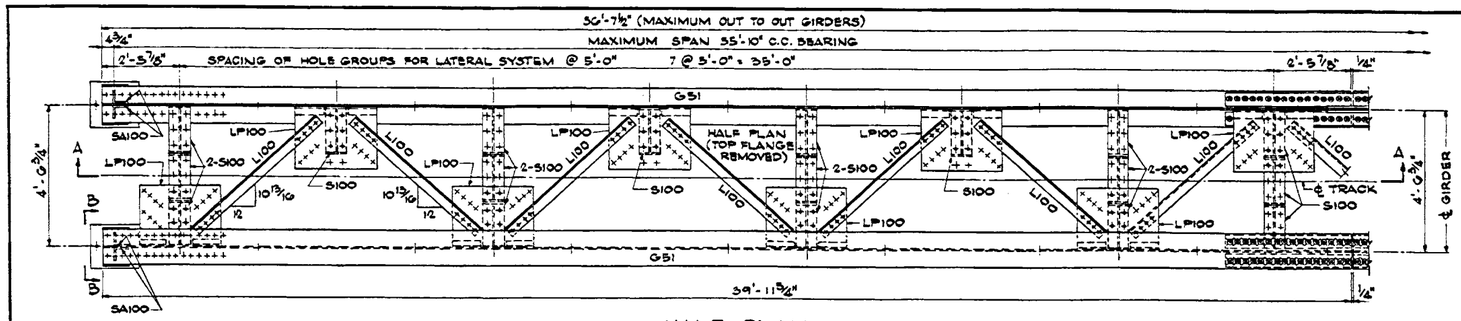
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
36"WF 230 BEAM CONSTRUCTION
PLATE GIRDER SECTIONS & DETAILS
SINGLE TRACK-WIDE GAGE-E-45 LOADING

UNDER REVISION

ASSISTANT CHIEF, STRUCTURES BRANCH
APPROVED: W. M. Williams, HDQRS, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1963

APPROVED FOR PROPONENT AGENCY:
DATE

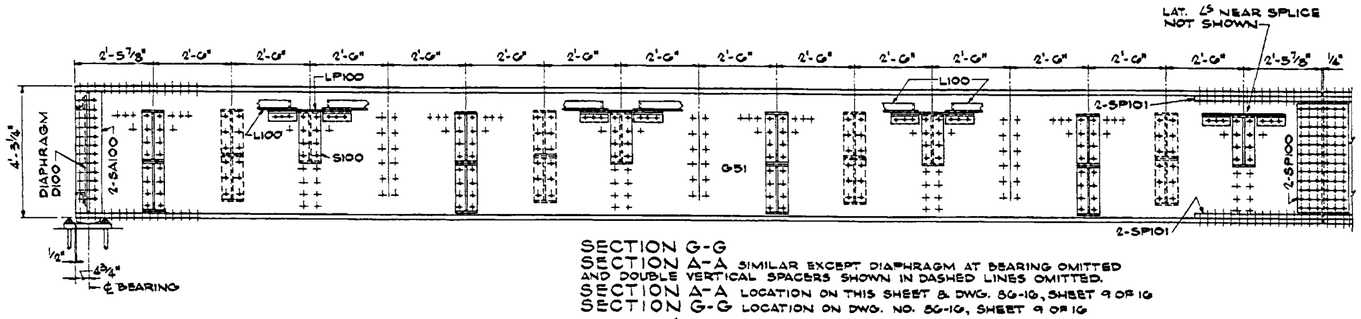
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 7 OF 16



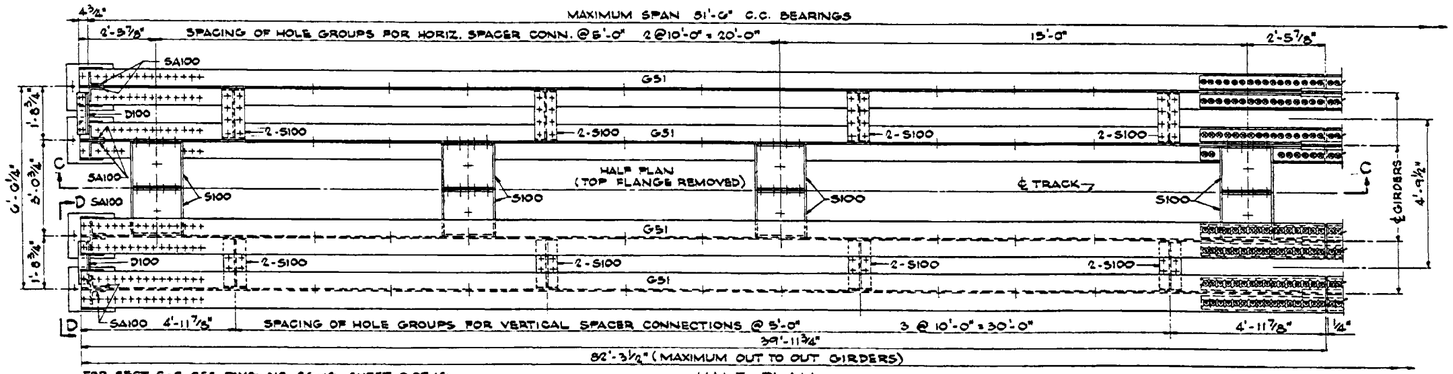
HALF PLAN

PLAN FOR 2-PLATE GIRDER BRIDGE - FACILITY NO. 8G1G23 & NO. 8G1G17

NARROW GAGE
SCALE NO. 4



SECTION G-G
SECTION A-A SIMILAR EXCEPT DIAPHRAGM AT BEARING OMITTED AND DOUBLE VERTICAL SPACERS SHOWN IN DASHED LINES OMITTED.
SECTION A-A LOCATION ON THIS SHEET & DWG. 8G-16, SHEET 9 OF 16
SECTION G-G LOCATION ON DWG. NO. 8G-16, SHEET 9 OF 16
SCALE NO. 4

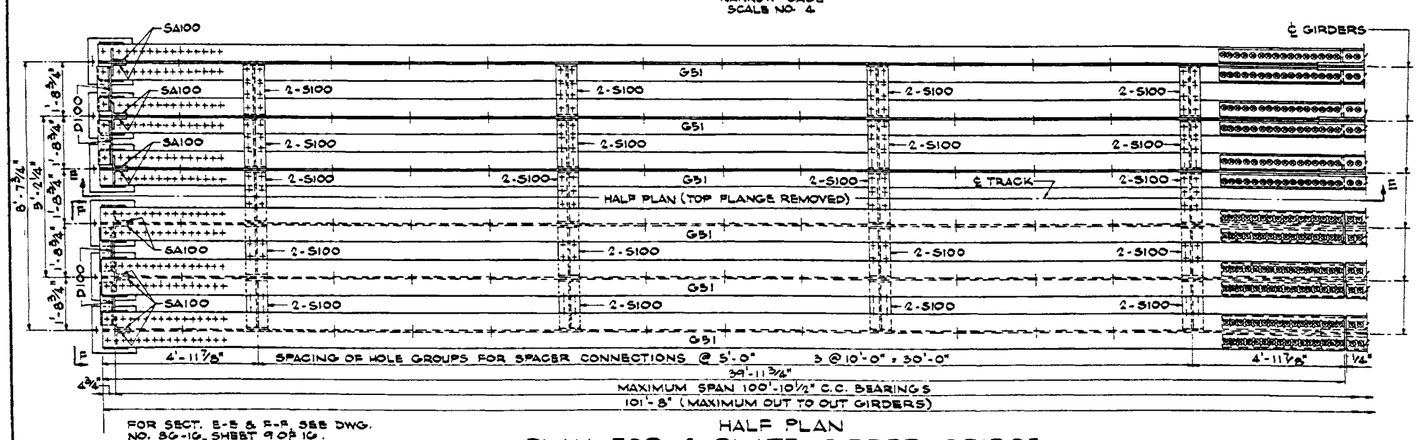


FOR SECT. C-C, SEE DWG. NO. 8G-16, SHEET 9 OF 16.
FOR ELEV. D-D, SEE THIS SHEET.

HALF PLAN

PLAN FOR 4-PLATE GIRDER BRIDGE - FACILITY NO. 8G1G35, NO. 8G1G31 & NO. 8G1G27

NARROW GAGE
SCALE NO. 4

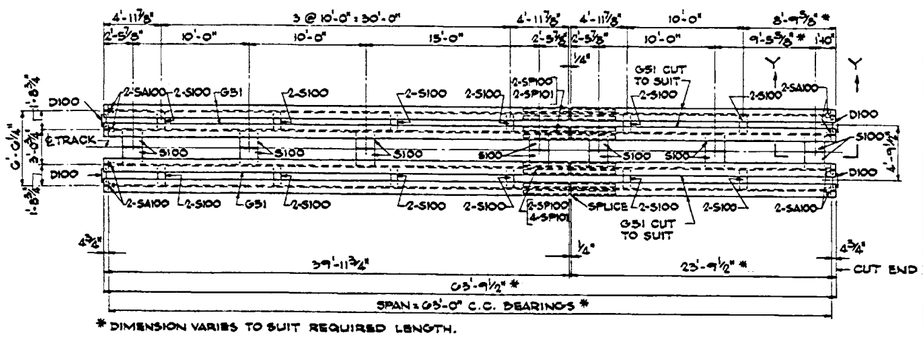


FOR SECT. E-E & F-F, SEE DWG. NO. 8G-16, SHEET 9 OF 16.

HALF PLAN

PLAN FOR 6-PLATE GIRDER BRIDGE - FACILITY NO. 8G1G43 & NO. 8G1G39

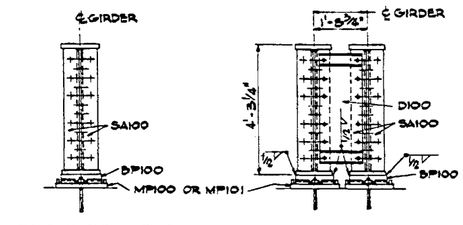
NARROW GAGE
SCALE NO. 4



* DIMENSION VARIES TO SUIT REQUIRED LENGTH.

TYPICAL PLAN FOR 4 PLATE GIRDER NARROW GAGE BRIDGE

SCALE NO. 24



ELEVATION B-B
SCALE NO. 4
LOCATION ON THIS SHEET & ON DWG. NO. 8G-16 SHEET 9 OF 16

ELEVATION D-D
SCALE NO. 4
LOCATION ON THIS SHEET & DWG. NO. 8G-16 SHEET 9 OF 16

SECTION Y-Y
SCALE NO. 4

PIECES PER BEARING	
FIXED	EXPANSION
BP100	BP100
MP100	MP101
2-AB100	2-AB100

MATERIAL PER SPLICE	
WEB	2-SP100
FLANGE	4-SP101

DISTANCE FROM BOTTOM OF BEARING TO TOP OF GIRDER 4'-8¼"

GENERAL NOTES

1. THE ASSEMBLIES OF THE GIRDER BRIDGES ARE SHOWN FOR THE BASIC 40 FT. UNITS, FOR SPANS UP TO THE MAXIMUM. THE BASIC UNIT MUST BE EXTENDED IN LENGTH IN A MANNER SIMILAR TO THAT SHOWN ON DWG. NO. 8G-16 SHEETS 5 & 9 OF 16.
2. FOR MAXIMUM SPAN LENGTHS, SEE DWG. NO. 8G-16, SHEET 1 OF 16.
3. THE PLANS, SECTIONS & DETAILS SHOWN SERVE AS EXAMPLES OF FIELD MODIFICATIONS FOR BEAM & GIRDER BRIDGES. SEE DWGS. NO. 8G-01, SH. 1 OF 1, SECTIONS TITLED PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SQUARE END RAILROAD BRIDGES & EXAMPLES.

\+ HOLE FOR FIELD BOLTED CONNECTION.
\+ HOLE NOT USED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' — NO. 4
0 1' 5' 10' — NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

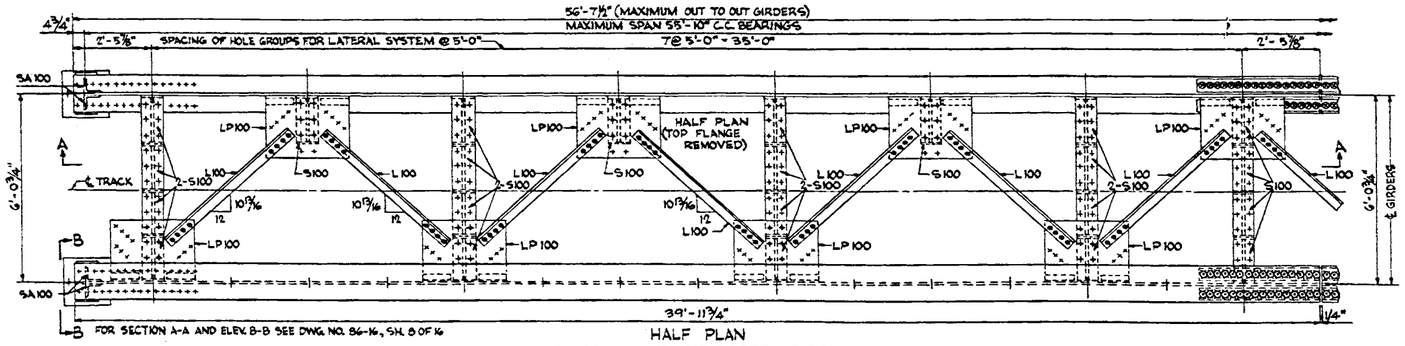
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: E.W. DEICHMANN
APPROVED:
APPROVED: DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
2-4 X 16-51" GIRDERS, NARROW GAGE
& TYP. GIRDER FIELD MODIFICATIONS

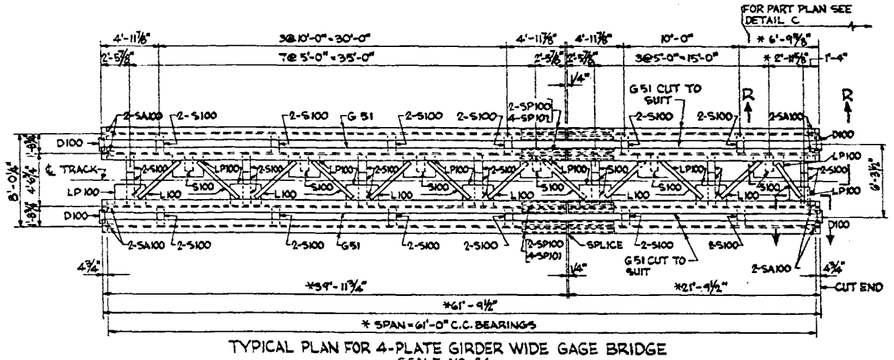
UNDER REVISION

APPROVED FOR PROPONENT AGENCY:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
DATE
SHEET 8 OF 16
86-16

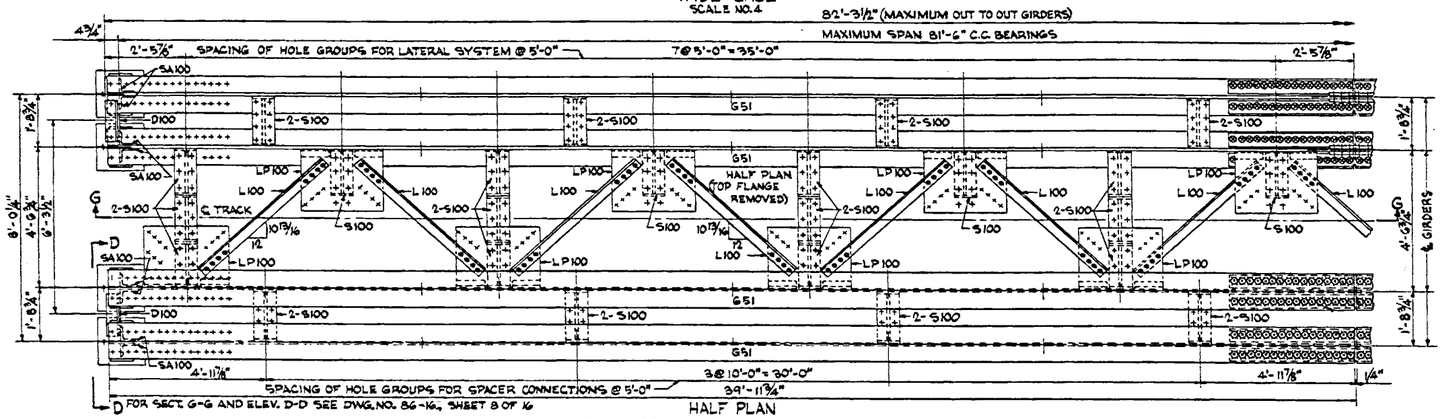


HALF PLAN

PLAN FOR 2-PLATE GIRDER BRIDGE - FACILITY NO. 861624 & NO 861618
WIDE GAGE
SCALE NO.4

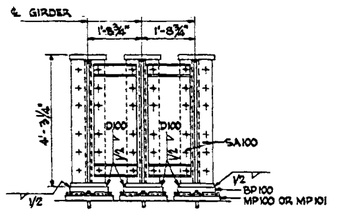


TYPICAL PLAN FOR 4-PLATE GIRDER WIDE GAGE BRIDGE
SCALE NO. 24
* DIMENSION VARIES TO SUIT REQUIRED LENGTH

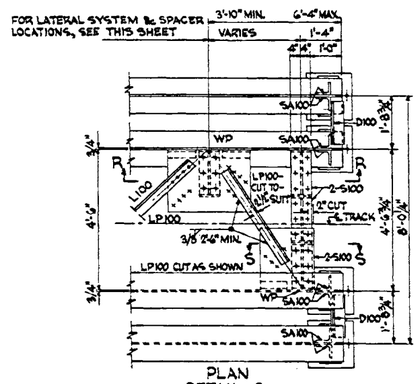


HALF PLAN

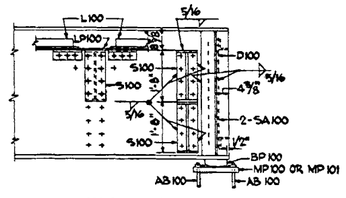
PLAN FOR 4-PLATE GIRDER BRIDGE - FACILITY NO. 861636, NO.861628 & NO 861632
WIDE GAGE
SCALE NO. 4



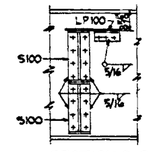
ELEVATION F-F
LOCATION ON THIS SH. AND ON DWG. NO. 86-16, SH. 8 OF 16
SCALE NO. 4



PLAN
DETAIL C
SCALE NO. 4



SECTION R-R
SCALE NO. 4



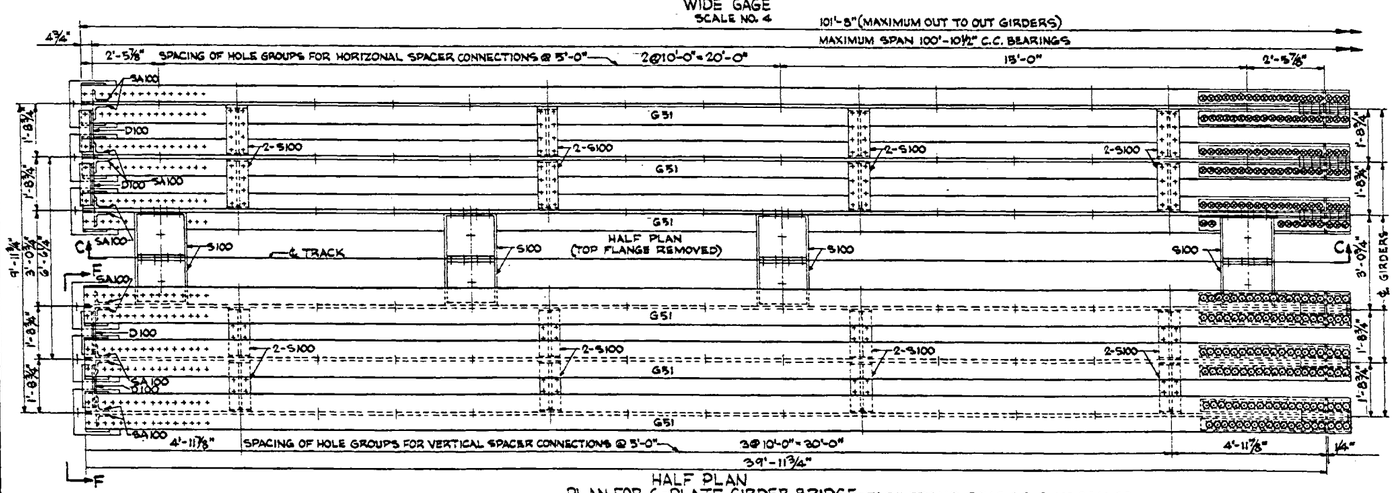
SECTION S-S
SCALE NO. 4

FACILITY NO. 861651 - ADDITIONAL MATERIAL FOR CONVERSION TO SKEW ENDS

PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB 100	2-AB 100

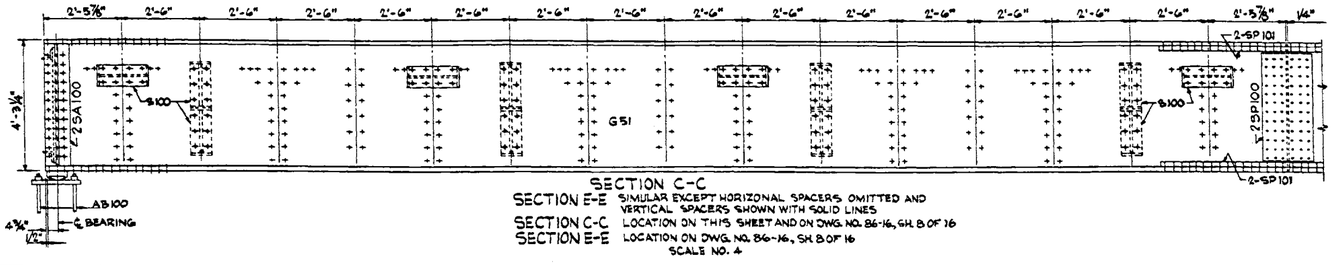
MATERIAL PER SPLICE	
WEB	2-SP 100
FLANGE	4-SP101

DISTANCE FROM BOTTOM OF BEARING TO TOP OF GIRDER 4'-8⅛".



HALF PLAN

PLAN FOR 6-PLATE GIRDER BRIDGE-FACILITY NO. 861644 & NO 861640
WIDE GAGE
SCALE NO.4



SECTION C-C
SECTION E-E SIMULAR EXCEPT HORIZONAL SPACERS OMITTED AND VERTICAL SPACERS SHOWN WITH SOLID LINES
SECTION C-C LOCATION ON THIS SHEET AND ON DWG. NO. 86-16, SH. 8 OF 16
SECTION E-E LOCATION ON DWG. NO. 86-16, SH. 8 OF 16
SCALE NO. 4

GENERAL NOTES

1. THE ASSEMBLIES OF THE GIRDER BRIDGES ARE SHOWN FOR THE BASIC 40 FOOT UNITS. FOR SPANS UP TO THE MAXIMUM, THE BASIC UNIT MUST BE EXTENDED IN LENGTH IN A MANNER SIMILAR TO THAT SHOWN ON DWG. NO. 86-16 SHEETS 8 & 9 OF 16.
2. FOR MAXIMUM SPAN LENGTHS SEE DWG. NO. 86-16 SHEET 2 OF 16.
3. THE PLANS, SECTIONS AND DETAILS SHOWN SERVE AS EXAMPLES OF FIELD MODIFICATIONS FOR BEAM AND GIRDER BRIDGES. SEE DWG. NO. 86-01, 1 OF 1, SECTIONS TITLED PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SQUARE END RAILROAD BRIDGES AND EXAMPLES.

+ HOLE FOR FIELD BOLTED CONNECTION.
+ HOLE NOT USED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO.4
0 5' 10' NO.24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

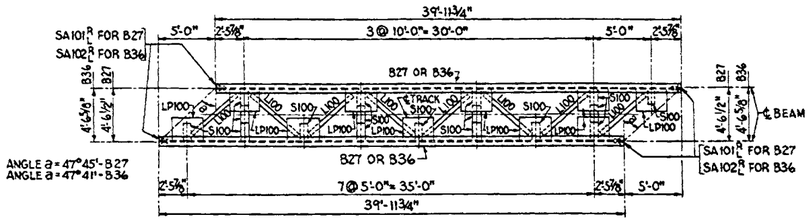
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: G. W. DEICHMANN

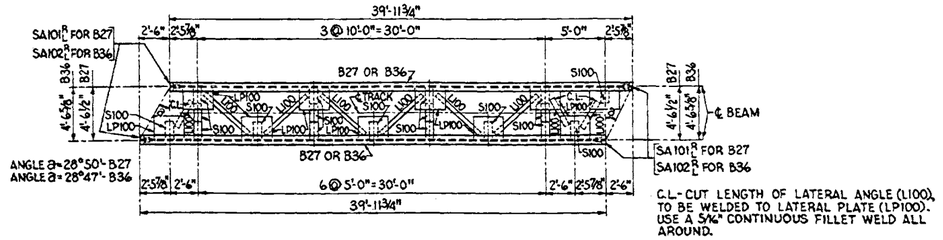
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
2-4 & 6-51" GIRDERS-WIDE GAGE

UNDATED REVISION

APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: H. M. Williams COL, CORPS. ENGINEERS, DIV. ENGINEERING, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1963
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 9 OF 16

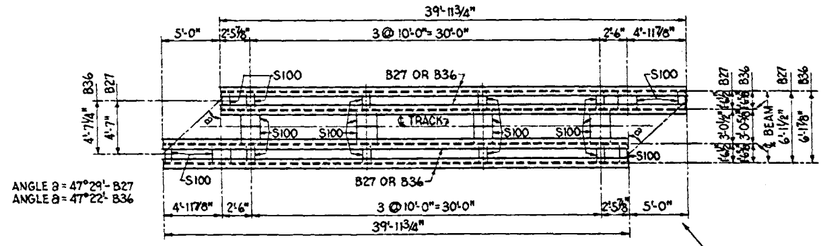


PLAN OF 2-27 WF OR 2-36 WF 45° (APPROX) SKEW

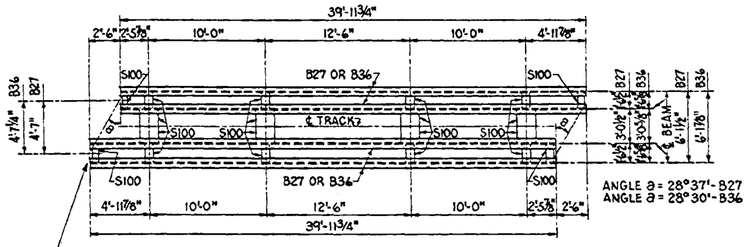


C.L.- CUT LENGTH OF LATERAL ANGLE (L100), TO BE WELDED TO LATERAL PLATE (LP100). USE A 5/16" CONTINUOUS FILLET WELD ALL AROUND.

PLAN OF 2-27 WF OR 2-36 WF 30° (APPROX) SKEW

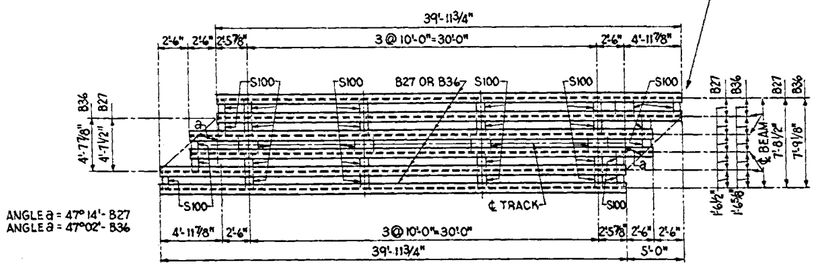


PLAN OF 4-27 WF OR 4-36 WF 45° (APPROX) SKEW

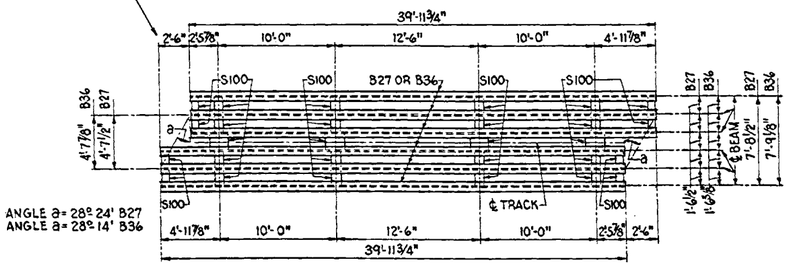


PLAN OF 4-27 WF OR 4-36 WF 30° (APPROX) SKEW

END SPACERS (S100) WELDED TO BEAM WEBS @ EACH END.
SEE ELEVATION D-D ON SHEET 9 OF 16 AND ELEVATION E-E ON SHEET 4 OF 16, DWG NO. 86-16, FOR B27.
SEE ELEVATION D-D ON SHEET 5 OF 16 AND ELEVATION E-E ON SHEET 6 OF 16, DWG NO. 86-16, FOR B36.



PLAN OF 6-27 WF OR 6-36 WF 45° (APPROX) SKEW



PLAN OF 6-27 WF OR 6-36 WF 30° (APPROX) SKEW

PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB100	2-AB 100

MATERIAL PER B36 SPLICE	
WEB	2-SP104
FLANGE	4-SP105

TYPE OF BRIDGE	27 WF	36 WF
DISTANCE FROM BOTTOM OF BEARING TO TOP OF BEAM	2'-7⅞" ± ⅛"	3'-4⅞" ± ⅛"

NARROW GAGE SKEW BRIDGES

SCALE NO. 24

GENERAL NOTES

1. PLANS SHOW ASSEMBLY OF 40 FT UNITS. ALL 27 WF BEAM BRIDGES AND THE 2-36 WF BEAM BRIDGE ARE USED FOR SPANS UP TO OR LESS THAN 39'-2 1/4" CENTER TO CENTER OF BEARINGS, AS SHOWN ON DWG NO. 86-16, SHEET 1 OF 16. FOR THE 4-36 WF AND 6-36 WF BEAM BRIDGES, ADDITIONAL LENGTH UP TO MAXIMUM ALLOWABLE SPAN CENTER TO CENTER OF BEARINGS, AS SHOWN ON DWG NO. 86-16, SHEET 1 OF 16 IS OBTAINED BY SPLICING MATERIAL FROM ADDITIONAL UNITS TO ASSEMBLIES SHOWN ON THIS SHEET.
2. FOR THE PLANS AND SECTIONS OF THE SQUARE END 27 WF AND 36 WF BEAM BRIDGES, SEE DWG NO. 86-16, SHEETS 3 AND 5 OF 16.
3. REFER TO DWG NO. 86-01, SHEET 1 OF 1 FOR PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SKEW RAILROAD BRIDGES.
4. DIMENSIONS FOLLOWED BY B27 APPLY TO 27 WF BEAM BRIDGE.
5. DIMENSIONS FOLLOWED BY B36 APPLY TO 36 WF BEAM BRIDGE.
6. DIMENSIONS NOT FOLLOWED BY ANY SYMBOL APPLY TO BOTH 27 WF AND 36 WF BEAM BRIDGES.
7. LATERAL ANGLES (L100) FOR 27 WF BEAM BRIDGES ARE TO BE FASTENED BELOW LATERAL PLATE (LP100).
8. LATERAL ANGLES (L100) FOR 36 WF BEAM BRIDGES ARE TO BE FASTENED ABOVE LATERAL PLATE (LP100) EXCEPT AT SPLICE WHERE THEY WILL BE FASTENED BELOW.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

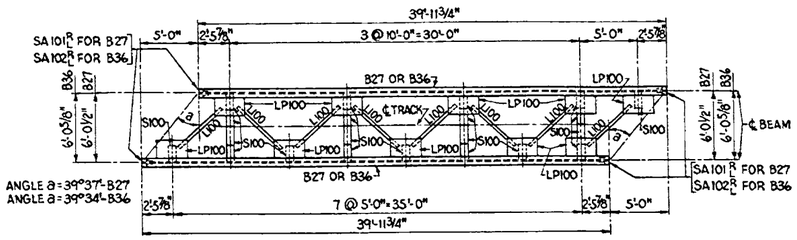
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. W. DEICHMANN
RECOMMENDED: [signature]
CHIEF, ELECTRICITY BRANCH
APPROVED: [signature] DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE:

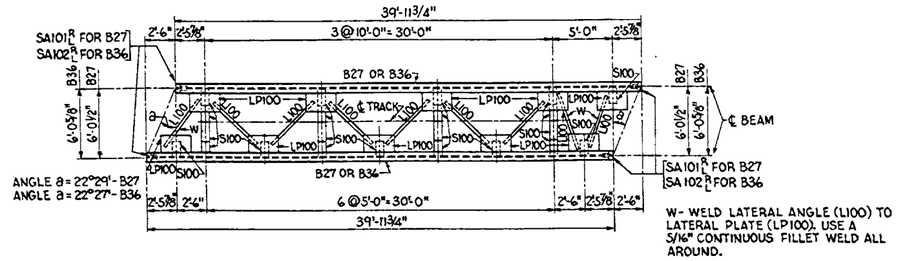
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM GIRDER CONSTRUCTION
27 & 36 WF-SKEWED ENDS
NARROW GAGE

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 10 OF 16

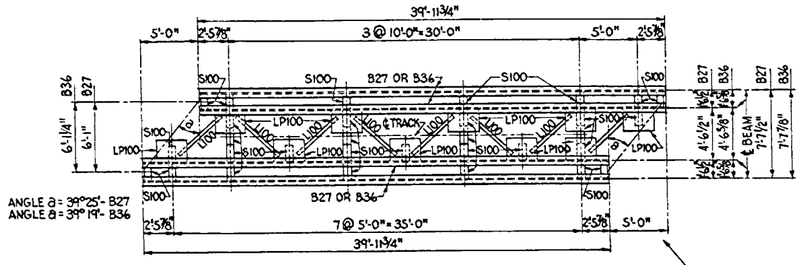


PLAN OF 2-27 WF OR 2-36 WF 45° (APPROX) SKEW

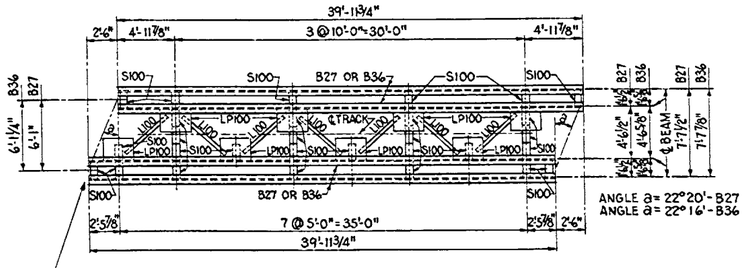


W- WELD LATERAL ANGLE (L100) TO LATERAL PLATE (LP100). USE A 5/16" CONTINUOUS FILLET WELD ALL AROUND.

PLAN OF 2-27 WF OR 2-36 WF 30° (APPROX) SKEW

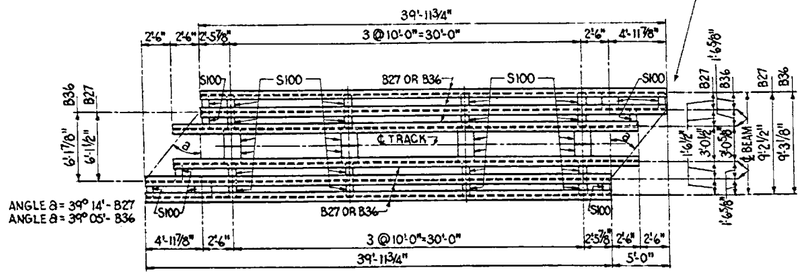


PLAN OF 4-27 WF OR 4-36 WF 45° (APPROX) SKEW

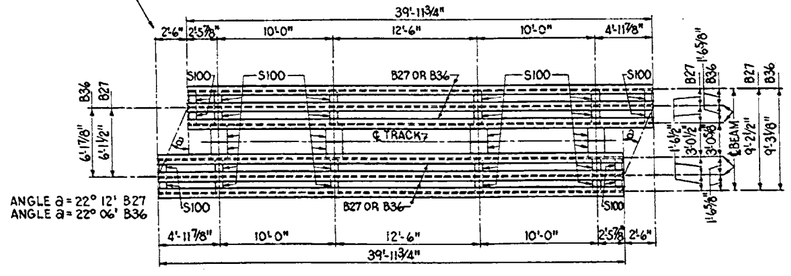


PLAN OF 4-27 WF OR 4-36 WF 30° (APPROX) SKEW

END SPACERS (S100) WELDED TO BEAM WEBS @ EACH END.
SEE ELEVATION D-D ON SHEET 3 OF 16 AND ELEVATION E-E ON SHEET 4 OF 16, DWG NO. 86-16, FOR B27.
SEE ELEVATION D-D ON SHEET 5 OF 16 AND ELEVATION E-E ON SHEET 6 OF 16, DWG NO. 86-16, FOR B36.



PLAN OF 6-27 WF OR 6-36 WF 45° (APPROX) SKEW



PLAN OF 6-27 WF OR 6-36 WF 30° (APPROX) SKEW

PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB100	2-AB 100

MATERIAL PER B36 SPLICE	
WEB	2-SP104
FLANGE	4-SP105

TYPE OF BRIDGE	27WF	36WF
DISTANCE FROM BOTTOM OF BEARING TO TOP OF BEAM	2'-7⅞" ± ⅛"	3'-4⅜" ± ⅛"

WIDE GAGE SKEW BRIDGES

SCALE NO. 24

GENERAL NOTES

1. PLANS SHOW ASSEMBLY OF 40 FT UNITS. ALL 27 WF BEAM BRIDGES AND THE 2-36 WF BEAM BRIDGE ARE USED FOR SPANS UP TO OR LESS THAN 39'-2¼" CENTER TO CENTER OF BEARINGS, AS SHOWN ON DWG NO. 86-16, SHEET 2 OF 16. FOR THE 4-36 WF AND 6-36 WF BEAM BRIDGES, ADDITIONAL LENGTH UP TO MAXIMUM ALLOWABLE SPAN CENTER TO CENTER OF BEARINGS, AS SHOWN ON DWG NO 86-16, SHEET 2 OF 16 IS OBTAINED BY SPLICING MATERIAL FROM ADDITIONAL UNITS TO ASSEMBLIES SHOWN ON THIS SHEET.
2. FOR THE PLANS AND SECTIONS OF THE SQUARE END 27 WF AND 36 WF BEAM BRIDGES, SEE DWG NO. 86-16, SHEETS 4 AND 6 OF 16.
3. REFER TO DWG NO. 86-01, SHEET 1 OF 1 FOR PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SKEW RAILROAD BRIDGES.
4. DIMENSIONS FOLLOWED BY B27 APPLY TO 27 WF BEAM BRIDGE.
5. DIMENSIONS FOLLOWED BY B36 APPLY TO 36 WF BEAM BRIDGE.
6. DIMENSIONS NOT FOLLOWED BY ANY SYMBOL APPLY TO BOTH 27 WF AND 36 WF BEAM BRIDGES.
7. LATERAL ANGLES (L100) FOR 27 WF BEAM BRIDGES ARE TO BE FASTENED BELOW LATERAL PLATE (LP100).
8. LATERAL ANGLES (L100) FOR 36 WF BEAM BRIDGES ARE TO BE FASTENED ABOVE LATERAL PLATE (LP100) EXCEPT AT SPLICE WHERE THEY WILL BE FASTENED BELOW.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

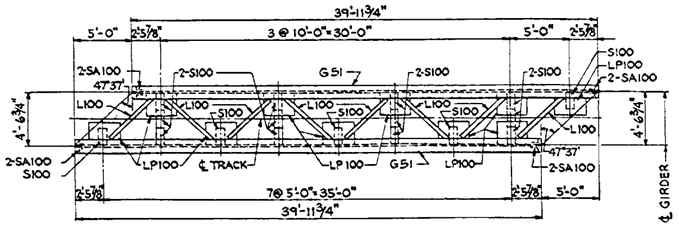
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: J. W. DEICHMANN
APPROVED: H. Eckhardt, CHIEF, STRUCTURES BRANCH
APPROVED: for D. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1963
APPROVED FOR PROPONENT AGENCY:
DATE:

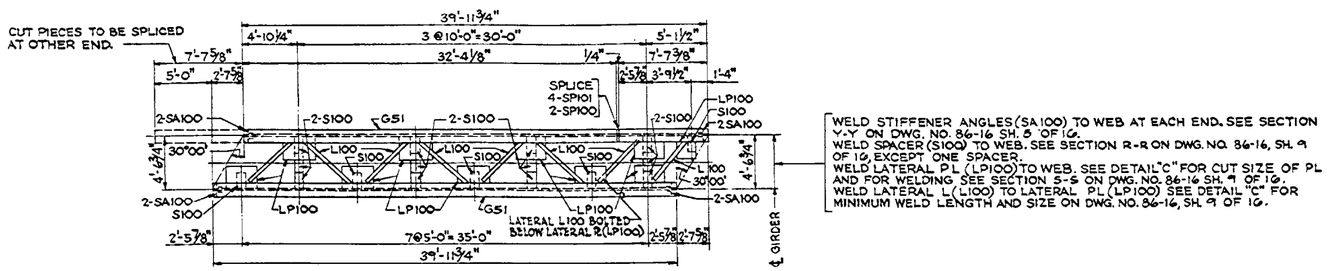
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
27 & 36 WF - SKEWED ENDS
WIDE GAGE

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 11 OF 16

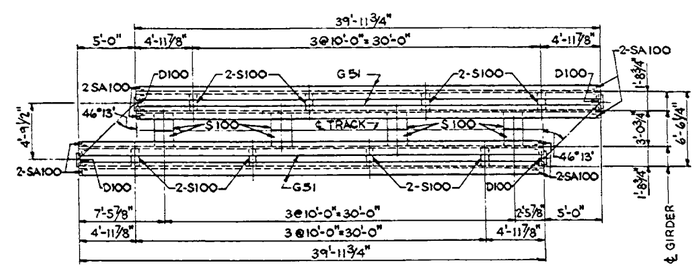


PLAN OF 2-GIRDER 45° (APPROX.) SKEW

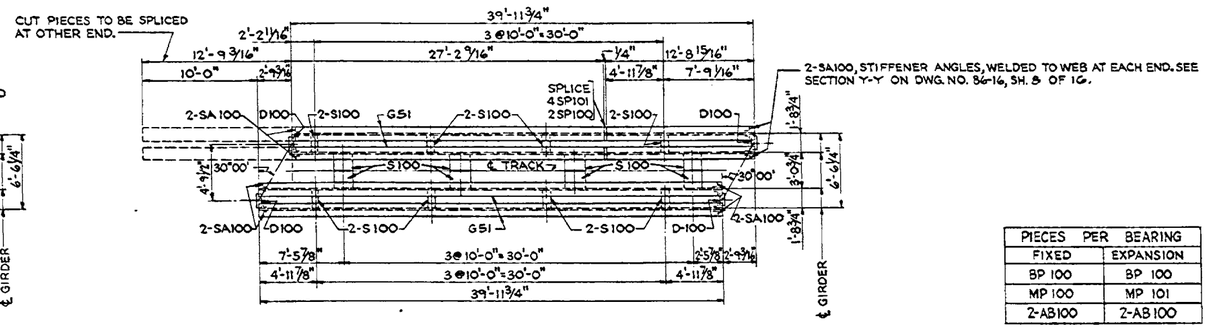


WELD STIFFENER ANGLES (SA100) TO WEB AT EACH END. SEE SECTION Y-Y ON DWG. NO. 86-16 SH. 8 OF 16.
WELD SPACER (S100) TO WEB. SEE SECTION R-R ON DWG. NO. 86-16, SH. 9 OF 16, EXCEPT ONE SPACER.
WELD LATERAL PL (LP100) TO WEB. SEE DETAIL "C" FOR CUT SIZE OF PL AND FOR WELDING. SEE SECTION S-S ON DWG. NO. 86-16 SH. 9 OF 16.
WELD LATERAL L (L100) TO LATERAL PL (LP100) SEE DETAIL "C" FOR MINIMUM WELD LENGTH AND SIZE ON DWG. NO. 86-16, SH. 9 OF 16.

PLAN OF 2-GIRDER 30° SKEW



PLAN OF 4-GIRDER 45° (APPROX.) SKEW



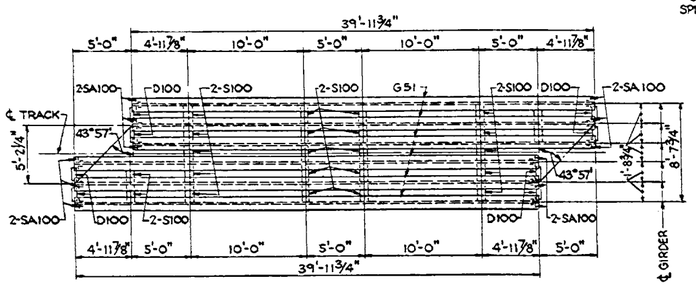
2-SA100, STIFFENER ANGLES, WELDED TO WEB AT EACH END. SEE SECTION Y-Y ON DWG. NO. 86-16, SH. 8 OF 16.

PLAN OF 4-GIRDER 30° SKEW

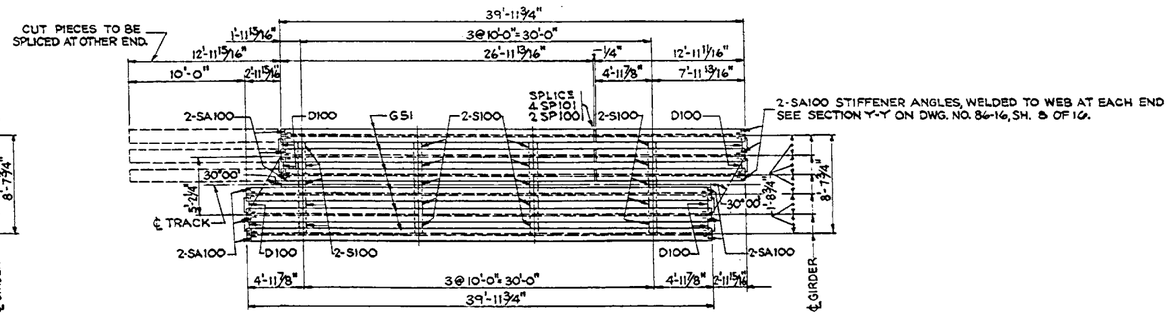
PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB100	2-AB100

DISTANCE FROM BOTTOM OF BEARING TO TOP OF GIRDER 4'-8¼".

MATERIAL PER G51 SPLICE	
WEB	2-SP100
FLANGE	4-SP101



PLAN OF 6-GIRDER 45° (APPROX.) SKEW



PLAN OF 6-GIRDER 30° SKEW

NARROW GAGE SKEW BRIDGES

SCALE NO. 24

GENERAL NOTES

1 PLANS SHOW ASSEMBLY OF 40 FT. UNITS. ADDITIONAL LENGTH UP TO MAXIMUM ALLOWABLE SPAN CENTER TO CENTER OF BEARINGS, AS SHOWN ON DWG. NO. 86-16 SH. 1 OF 16, IS OBTAINED BY SPLICING MATERIAL FROM ADDITIONAL UNITS TO ASSEMBLIES SHOWN ON THIS SHEET.
2 FOR THE PLANS AND SECTIONS OF THE SQUARE END 51" GIRDER BRIDGES, SEE DWG. NO. 86-16, SHEET 8 OF 16.
3 REFER TO DWG. NO. 86-01, SH. 1 OF 1 FOR PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SKEW RAILROAD BRIDGES.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10'
NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

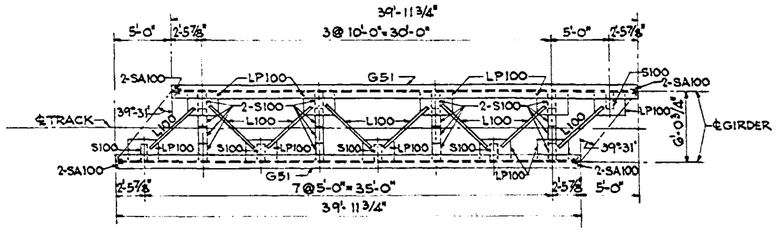
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C.W. DEICHMANN
APPROVED: H. Williams
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
BENT & GIRDER CONSTRUCTION
51" GIRDER-SKEWED ENDS
NARROW GAGE

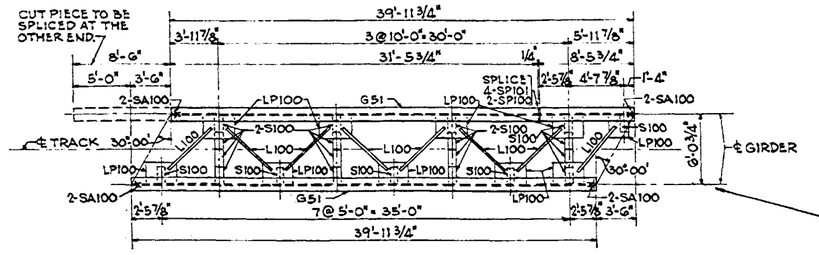
UNDER REVISION

APPROVED: H.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 12 OF 16



PLAN OF 2-GIRDER 45° (APPROX.) SKEW



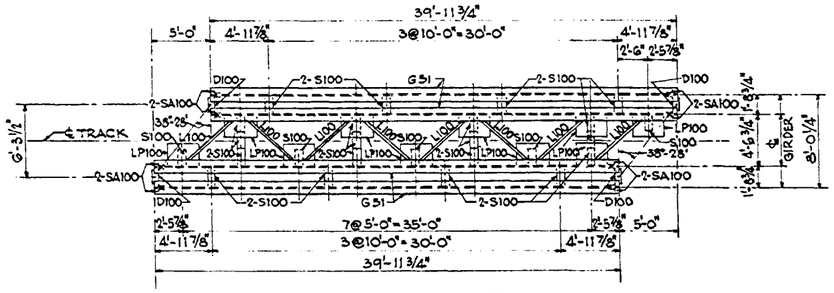
PLAN OF 2-GIRDER 30° SKEW

WELD STIFFENER ANGLES (SA100) TO WEB AT EACH END. SEE SECTION Y-Y ON DWG. NO. 86-16, SHEET 8 OF 16
WELD SPACER (S100) TO WEB - SEE SECTION R-R ON DWG. NO. 86-16, SHEET 9 OF 16, EXCEPT ONE SPACER.
WELD LATERAL PL (LP100) TO WEB - SEE DETAIL "C" FOR CUT SIZE OF PL AND FOR WELDING SEE SECTION S-S ON DWG. NO. 86-16, SHEET 9 OF 16.
WELD LATERAL ANGLE (L100) TO LATERAL PL (LP100) SEE DETAIL "C" FOR MINIMUM WELD LENGTH AND SIZE ON DWG. NO. 86-16, SHEET 9 OF 16.

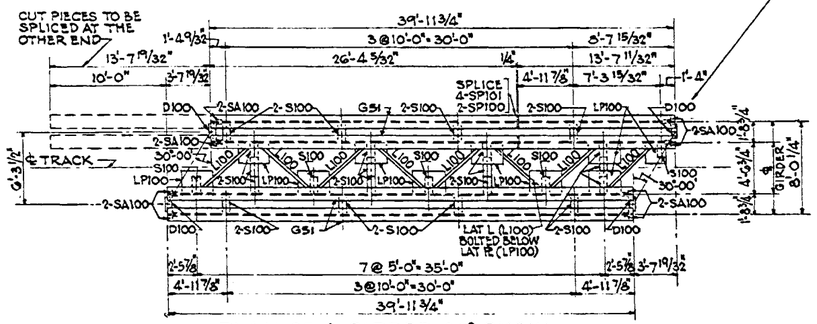
PIECES PER BEARING	
FIXED	EXPANSION
BP 100	BP 100
MP 100	MP 101
2-AB100	2-AB100

MATERIAL PER G51 SPLICE	
WEB	2-SP100
FLANGE	4-SP101

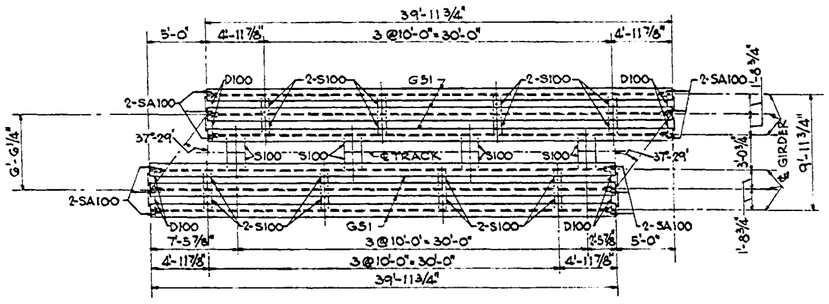
DISTANCE FROM BOTTOM OF BEARING TO TOP OF GIRDER 4'-8 1/4"



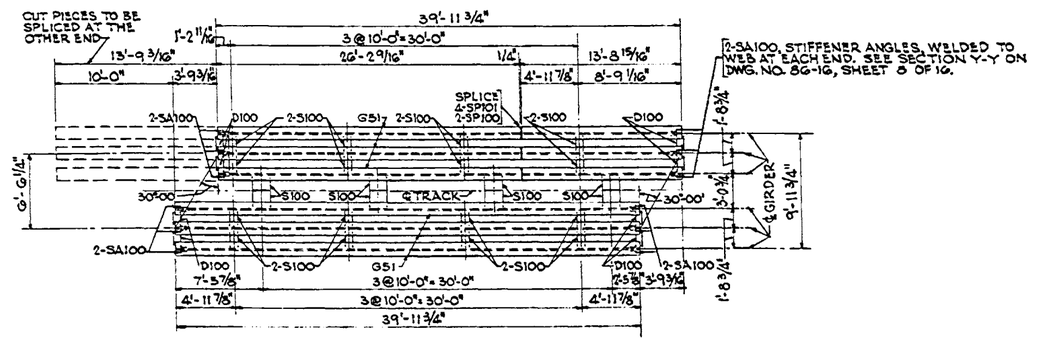
PLAN OF 4-GIRDER 45° (APPROX.) SKEW



PLAN OF 4-GIRDER 30° SKEW



PLAN OF 6-GIRDER 45° (APPROX.) SKEW



PLAN OF 6-GIRDER 30° SKEW

WIDE GAGE SKEW BRIDGES

SCALE NO. 24

GENERAL NOTES

1. PLANS SHOW ASSEMBLY OF 40 FT. UNITS. ADDITIONAL LENGTH UP TO MAXIMUM ALLOWABLE SPAN CENTER TO CENTER OF BEARINGS, AS SHOWN ON DWG. 86-16, SHEET 2 OF 16, IS OBTAINED BY SPLICING MATERIAL FROM ADDITIONAL UNITS TO ASSEMBLIES SHOWN ON THIS SHEET.
2. FOR THE PLANS AND SECTIONS OF THE SQUARE END 81" GIRDER BRIDGES, SEE DWG. NO. 86-16, SHEET 9 OF 16.
3. REFER TO DWG. NO. 86-01, SHEET 1 OF 1, FOR PROCEDURE FOR DETERMINING TYPE OF BRIDGE FOR VARIOUS LENGTH SKEW RAILROAD BRIDGES.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 5' 10'

NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

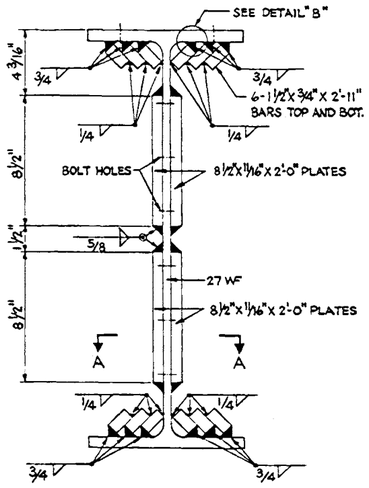
APPROVED FOR PROPONENT AGENCY:

DATE

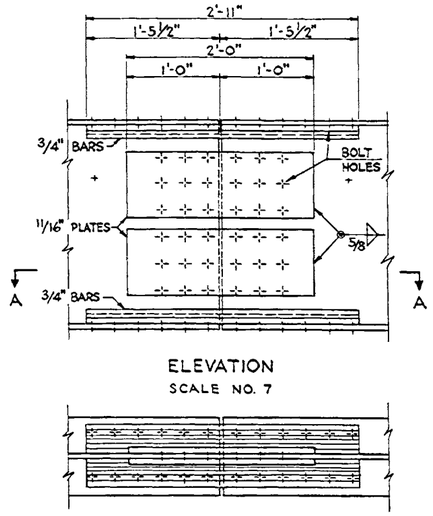
THEATER OF OPERATIONS
24 TIE RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
81" GIRDER-SKEWED ENDS
WIDE GAGE

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 13 OF 16



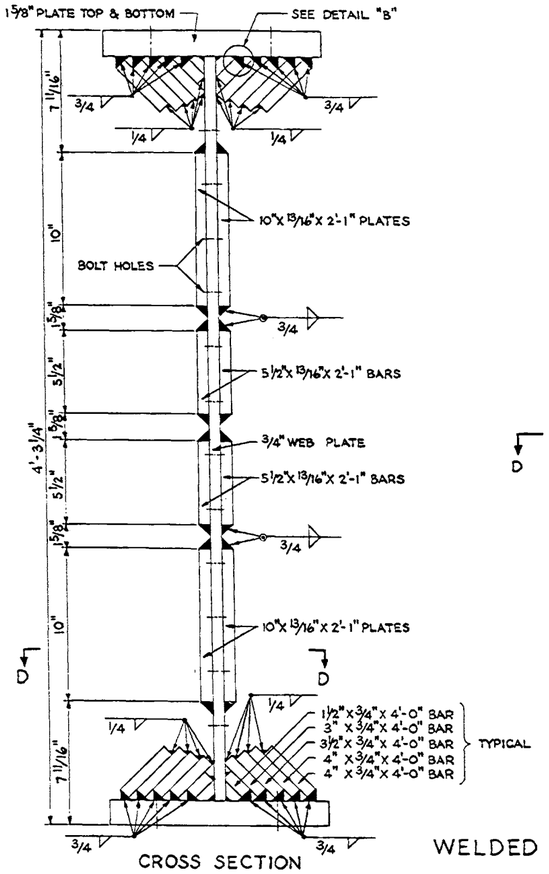
CROSS SECTION
SCALE NO. 8



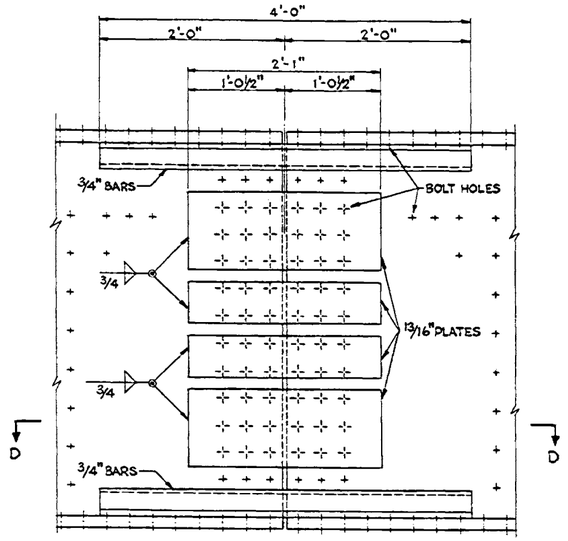
ELEVATION
SCALE NO. 7

SECTION A-A
SCALE NO. 7

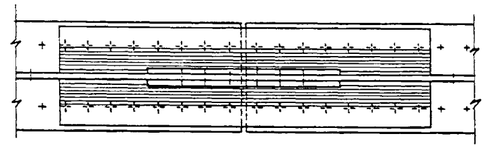
WELDED SPLICE FOR 27 WF 94



CROSS SECTION
SCALE NO. 8

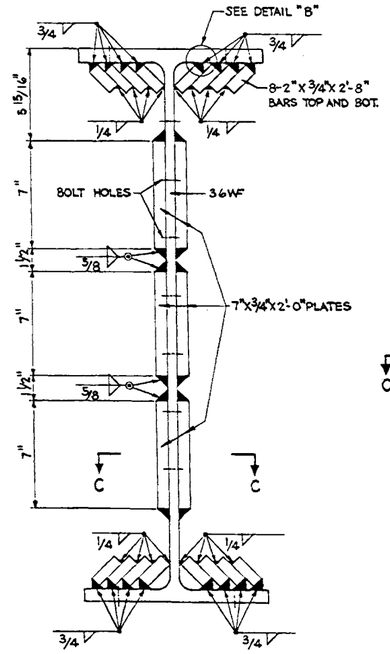


ELEVATION
SCALE NO. 7

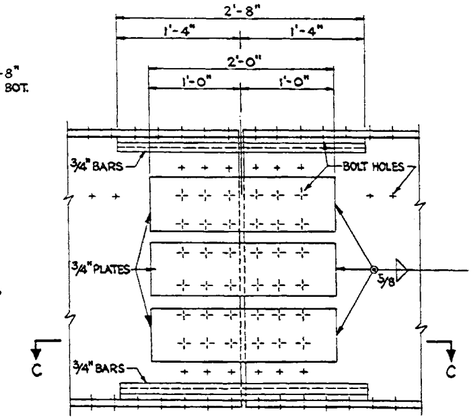


SECTION D-D
SCALE NO. 7

WELDED SPLICE FOR 51" GIRDER



CROSS SECTION
SCALE NO. 8



ELEVATION
SCALE NO. 7

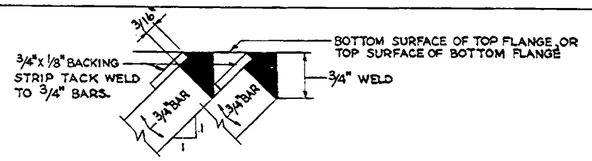


SECTION C-C
SCALE NO. 7

WELDED SPLICE FOR 36 WF 150

MATERIAL REQUIRED PER SPLICE

ITEM	27 WF 94			36 WF 150			51" GIRDER		
	SIZE	NO.	WEIGHT POUNDS	SIZE	NO.	WEIGHT POUNDS	SIZE	NO.	WEIGHT POUNDS
FLANGE BARS	1 1/2"x 3/4"x 2'-11"	12	133.9	2"x 3/4"x 2'-8"	16	217.6	1 1/2"x 3/4"x 4'-0" 3"x 3/4"x 4'-0" 3 1/2"x 3/4"x 4'-0" 4"x 3/4"x 4'-0"	4 4 4 8	61.3 122.4 142.9 326.4
WEB PLATES	8 1/2"x 11/16"x 2'-0"	4	159.2	7"x 3/4"x 2'-0"	6	214.8	10"x 13/16"x 2'-1" 5 1/2"x 13/16"x 2'-1"	4 4	230.0 126.7
BACKING STRIPS	3/4"x 1/8"x 2'-11"	12	11.2	3/4"x 1/8"x 2'-8"	16	13.6	3/4"x 1/8"x 4'-0"	20	25.6
WELD	3/4" 5/8" 1/4"		37.1 15.8 5.3	3/4" 5/8" 1/4"		45.2 22.7 6.5	3/4" 1/4"		131.1 12.1
TOTAL WT. IN LBS.			362.5			520.4			1178.5



DETAIL "B" (TYPICAL)
NO SCALE

GENERAL NOTES

1. WEB SPLICE PLATES TO BE WELDED BEFORE WELDING OF FLANGE BARS.
2. FOR DETAILS OF BOLTED SPLICE SEE SHEETS 5 OF 16 & 15 OF 16.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 3" 6" 9" 1' NO. 7
0 1"2" 3" 6" 9" 1' NO. 8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DE LCHMANN
APPROVED:

THEATER OF OPERATIONS
ROAD & RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
WELDED SPLICES

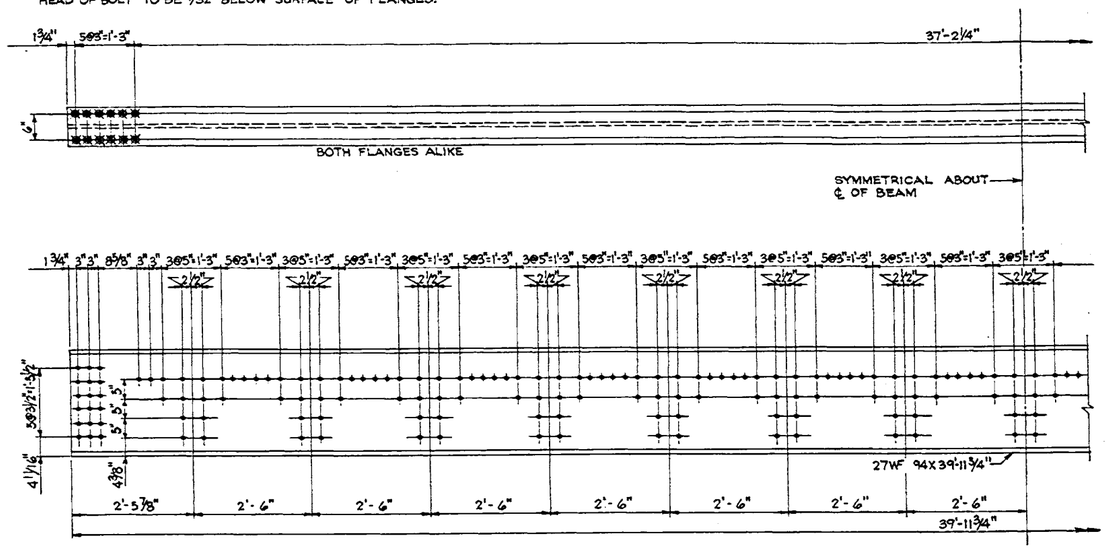
UNDER REVISION

APPROVED: H. M. Williams DATE: 19 MAR 1943
CHIEF, STRUCTURES BRANCH & CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
DATE
SHEET 14 OF 16

COUNTERSUNK HOLES TO BE MADE TO ALLOW TOP OF COUNTERSUNK HEAD OF BOLT TO BE 1/32" BELOW SURFACE OF FLANGES.

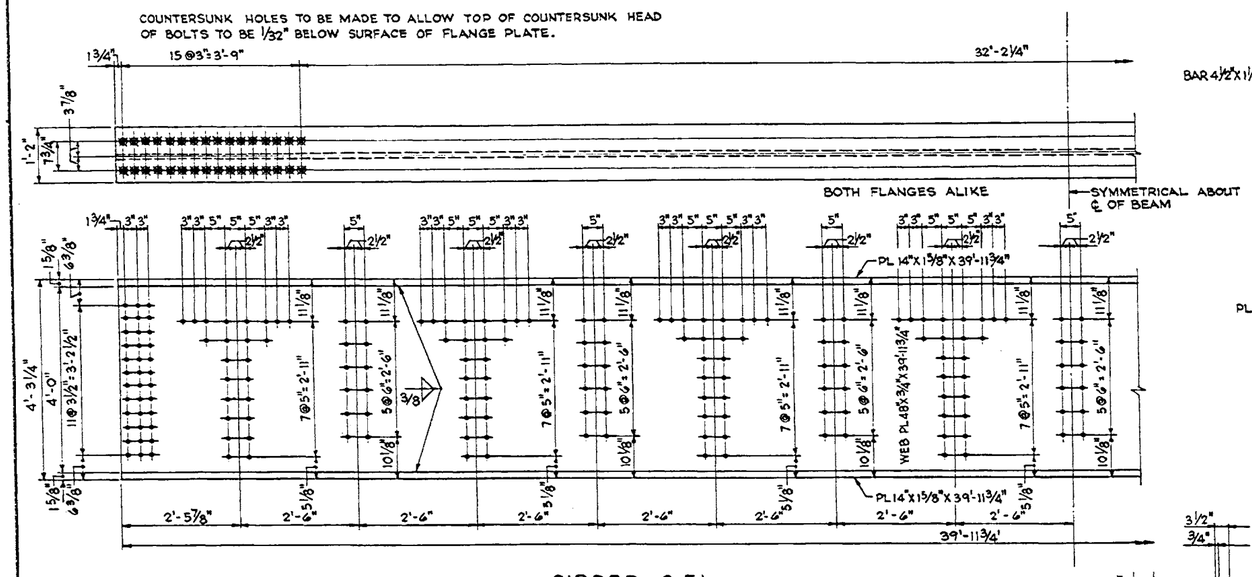


BEAM B 27

WEIGHT = 3707 LBS.

SCALE NO. 5

COUNTERSUNK HOLES TO BE MADE TO ALLOW TOP OF COUNTERSUNK HEAD OF BOLTS TO BE 1/32" BELOW SURFACE OF FLANGE PLATE.



GIRDER G 51

WEIGHT = 10,992 LBS

SCALE NO. 5

SPLICE PLATE SP 100

WEIGHT = 135 LBS.

SCALE NO. 5

SPLICE PLATE SP 102

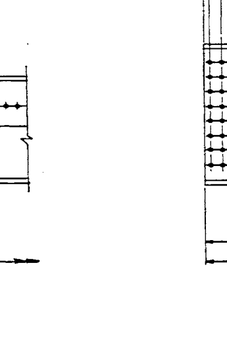
WEIGHT = 60 LBS.

SCALE NO. 5

SPLICE PLATE SP 104

WEIGHT = 81 LBS.

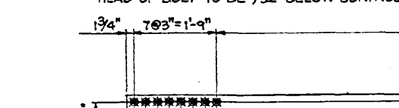
SCALE NO. 5



STIFFENER ANGLE SA 100

WEIGHT = 110 LBS.

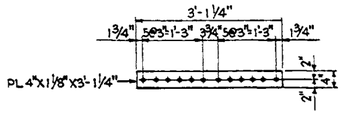
SCALE NO. 5



SPLICE PLATE SP 105

WEIGHT = 88 LBS.

SCALE NO. 5



SPLICE PLATE SP 103

WEIGHT = 44 LBS.

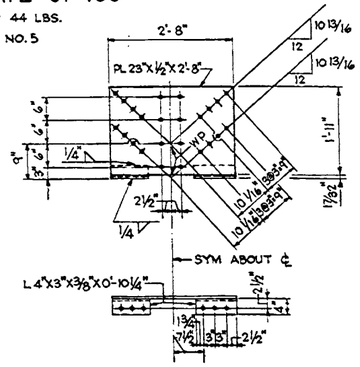
SCALE NO. 5

COUNTERSUNK HOLES TO BE MADE TO ALLOW TOP OF COUNTERSUNK HEAD OF BOLT TO BE 1/32" BELOW SURFACE OF FLANGES.

BEAM B 36

WEIGHT = 5927 LBS.

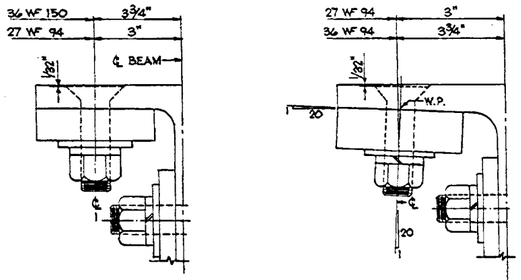
SCALE NO. 5



LATERAL PLATE LP 100

WEIGHT = 116 LBS.

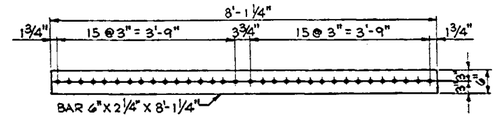
SCALE NO. 5



BEAM WITH PARALLEL FLANGES — FOR BEAM WITH SLOPING FLANGES

DETAIL OF COUNTERSUNK HOLE

NO SCALE



SPLICE PLATE SP 101

WEIGHT = 354 LBS.

SCALE NO. 5

GENERAL NOTES

1 OPEN HOLES 1 1/16 ϕ UNLESS NOTED.
2 WEIGHTS ARE NET WEIGHT FOR EACH PIECE.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'
NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

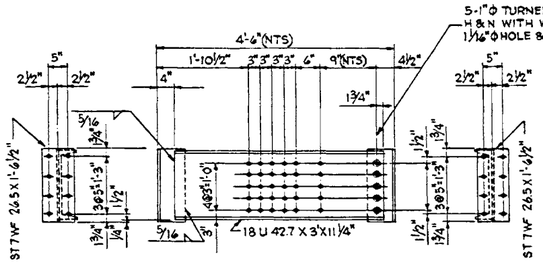
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: D.W. DEICHMANN
APPROVED: H.M. Williams DATE: 19 MAR 1959
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
ROAD & RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
DETAILS

UNDER REVISION

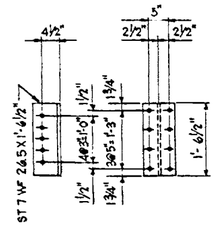
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 15 OF 18
86-16



DIAPHRAGM D200

WEIGHT = 250 LBS.

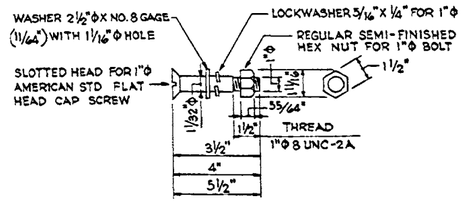
SCALE NO. 5



TEE T200

WEIGHT 39 LBS.

SCALE NO. 5



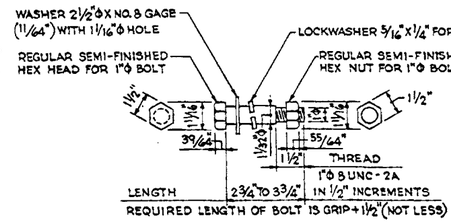
TURNED BOLT WITH COUNTERSUNK HEAD

3½" BOLT - WEIGHT = 1.56 LBS

4" BOLT - WEIGHT = 1.68 LBS

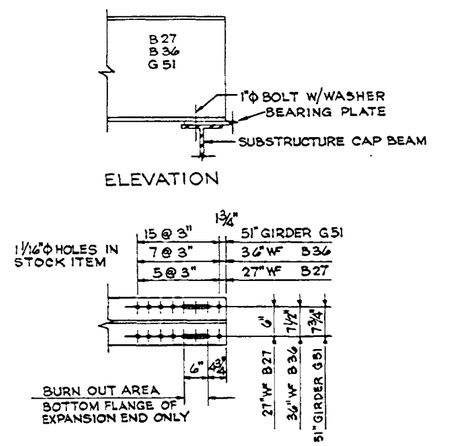
5½" BOLT - WEIGHT = 2.03 LBS

NO SCALE



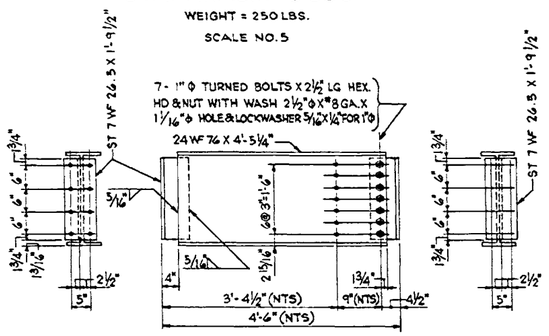
TURNED BOLT

NO SCALE



ADAPTATION OF BEAMS & GIRDERS WITH BEARING PL & OMITTING SOLE PLATE BP100

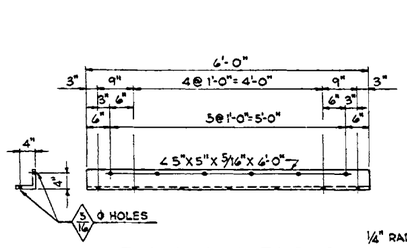
NOT TO SCALE



DIAPHRAGM D 201

WEIGHT = 400 LBS

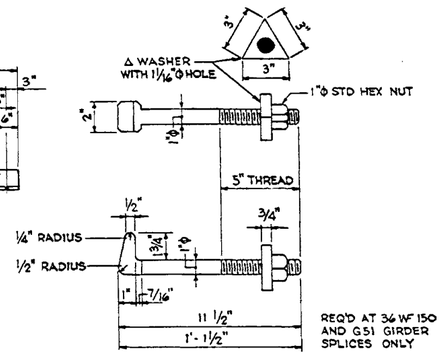
SCALE NO. 5



END ANGLE EA200

WEIGHT = 62 LBS.

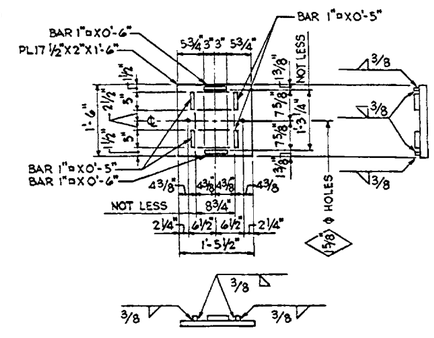
SCALE NO. 5



TIE HOOK BOLT

WEIGHT = 5 LBS

NO SCALE



MASONRY PLATE MP 100

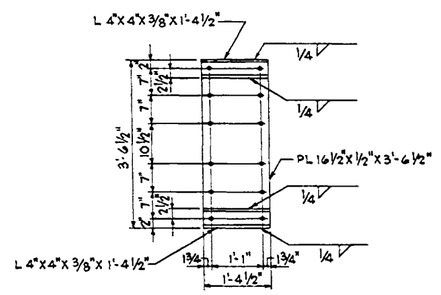
WEIGHT = 186 LBS

SCALE NO. 5

ANCHOR BOLT AB 100

WEIGHT = 9 LBS

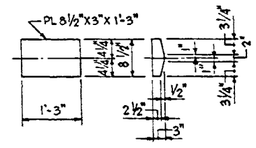
SCALE NO. 7



DIAPHRAGM D100

WEIGHT = 125 LBS

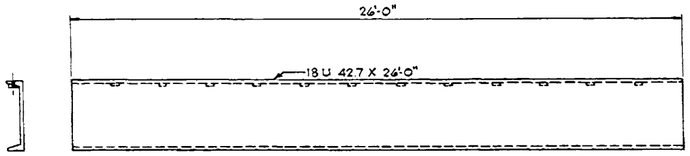
SCALE NO. 5

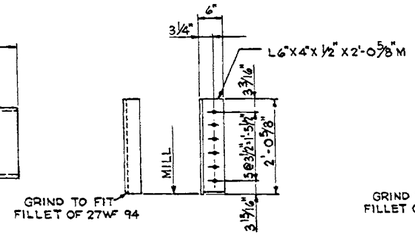


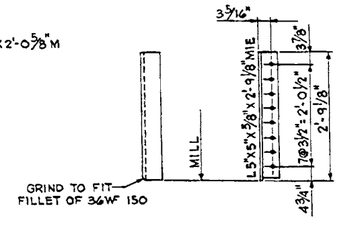
SOLE PLATE BP 100

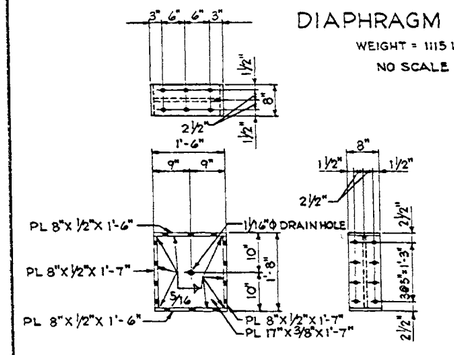
WEIGHT = 101 LBS

SCALE NO. 5







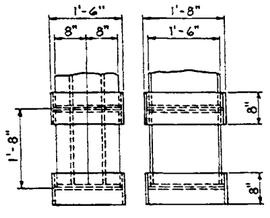


ALL 8"X ½" PL'S TO HAVE ROLLED OR PLANED EDGES.

SPACER S100

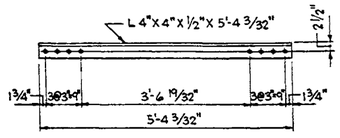
WEIGHT = 118 LBS

SCALE NO. 5



NESTING OF SPACER UNITS FOR SHIPMENT

SCALE NO. 5



LATERAL ANGLE L100

WEIGHT = 67 LBS.

SCALE NO. 5

STIFFENER ANGLE SA101R

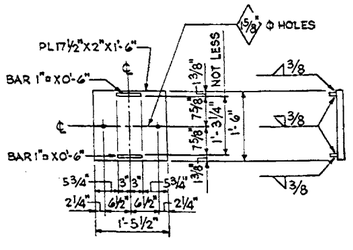
WEIGHT = 32 LBS.

SCALE NO. 5

STIFFENER ANGLE SA102R

WEIGHT = 54 LBS.

SCALE NO. 5



MASONRY PLATE MP 101

WEIGHT = 180 LBS

SCALE NO. 5

GENERAL NOTES

1 ERECTION MARKS ENDING WITH "R" INDICATES PIECES TO BE FABRICATED AS DETAILED. WHERE TABLES LIST ERECTION MARKS ENDING WITH "L" PIECES ARE TO BE FABRICATED OPPOSITE HAND.

2 OPEN HOLES 1 1/16"Φ UNLESS NOTED.

3 WEIGHTS ARE NET WEIGHT FOR EACH PIECE.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 1' 2' 3' — NO.5; 0 3" 6" 9" 1' 2' — NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

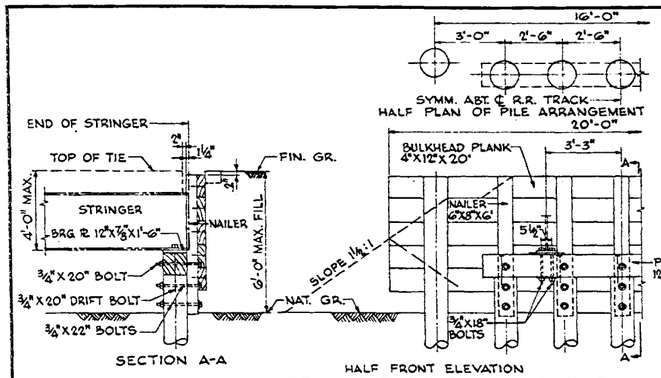
DRAWN BY: LALL
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: J.C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
ROAD & RAILROAD BRIDGE SUPERSTRUCTURES
BEAM & GIRDER CONSTRUCTION
DETAILS

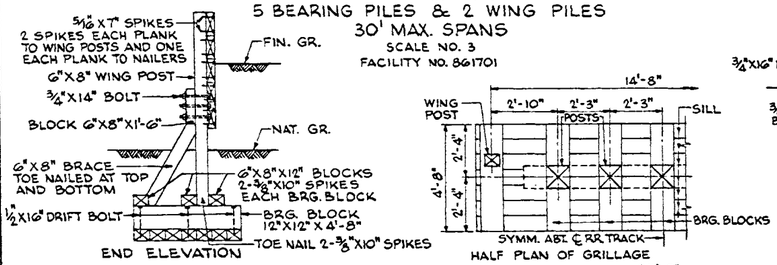
UNDER REVISION

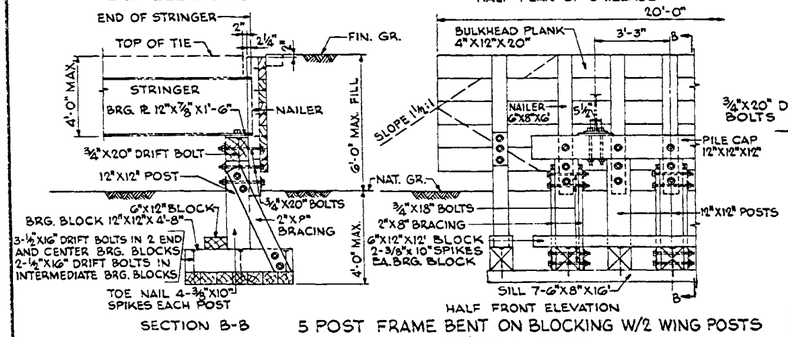
APPROVED: U.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 18 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-16
SHEET 16 OF 16

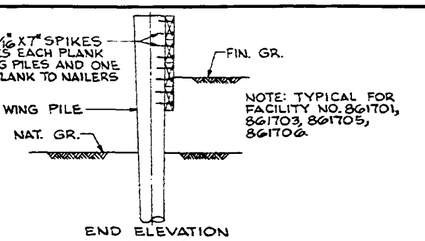


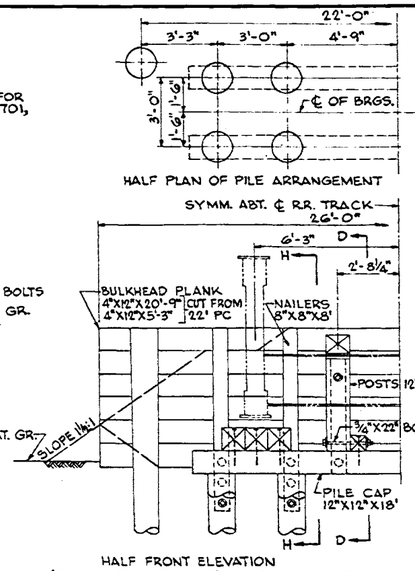
5 BEARING PILES & 2 WING PILES
30' MAX. SPANS
SCALE NO. 3
FACILITY NO. 861701



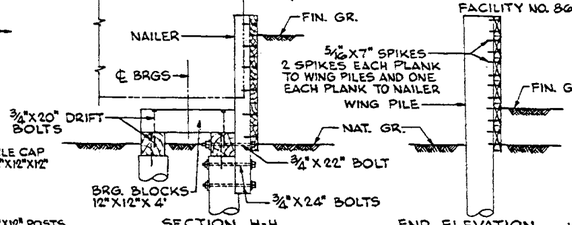


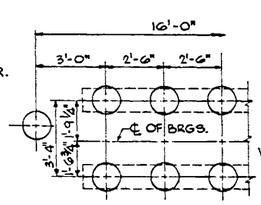
5 POST FRAME BENT ON BLOCKING W/2 WING POSTS
30' MAX. SPANS
SCALE NO. 3
FACILITY NO. 861702

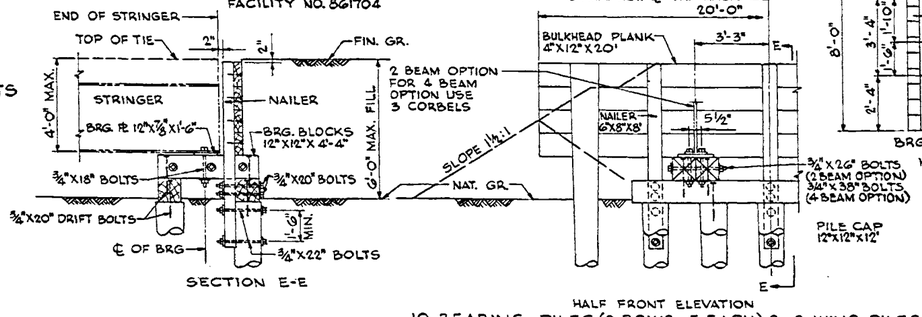




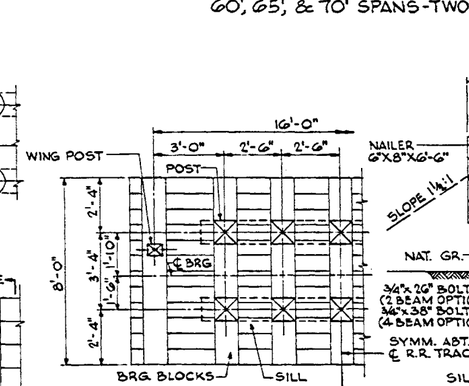
8 BEARING PILES (2 ROWS, 4 EACH) & 2 WING PILES
55' SPAN-TWO GIRDER THRU-TYPE UNIT CONSTRUCTION
SCALE NO. 3
FACILITY NO. 861704

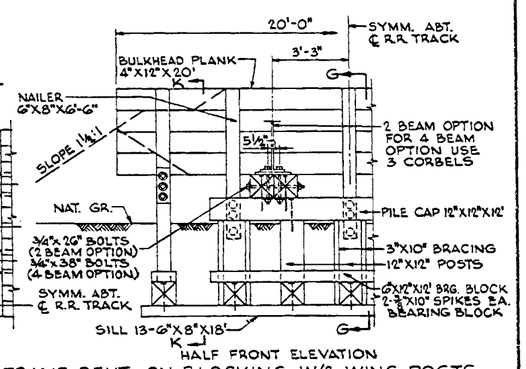




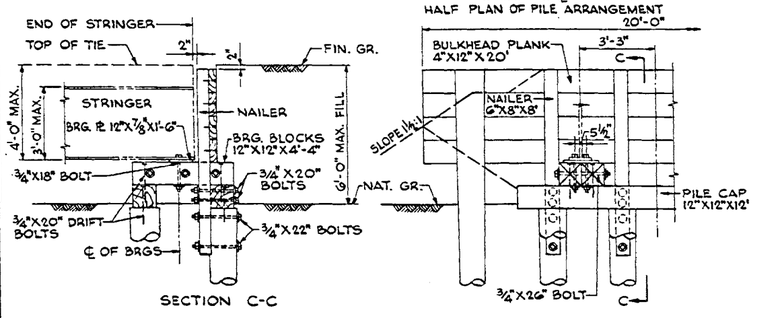


10 BEARING PILES (2 ROWS, 5 EACH) & 2 WING PILES
45' MAX. SPANS-2 BEAM OPTION-FACILITY NO. 861705
50' MAX. SPANS-4 BEAM OPTION-FACILITY NO. 861706
SCALE NO. 3

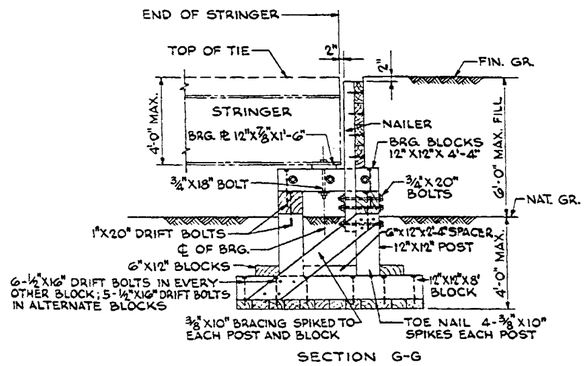


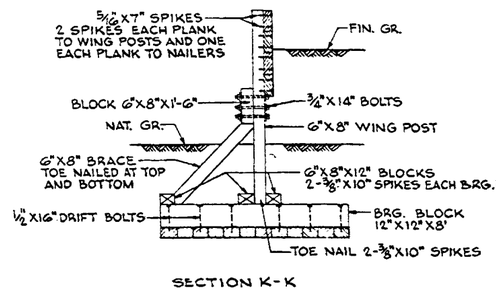


10 POST FRAME BENT ON BLOCKING W/2 WING POSTS
45' MAX. SPANS-STEEL BEAMS
SCALE NO. 3
FACILITY NO. 861776



8 BEARING PILES (2 ROWS 4 EACH) & 2 WING PILES
45' MAX. SPANS-STEEL BEAMS
SCALE NO. 3
FACILITY NO. 861703





FACILITY NO. 861776
SCALE NO. 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

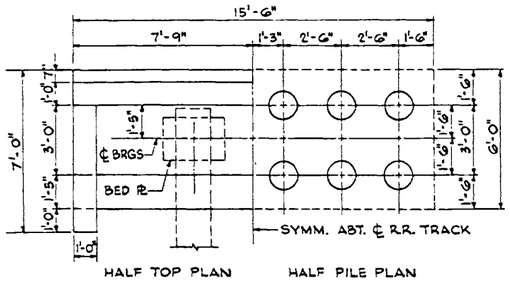
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

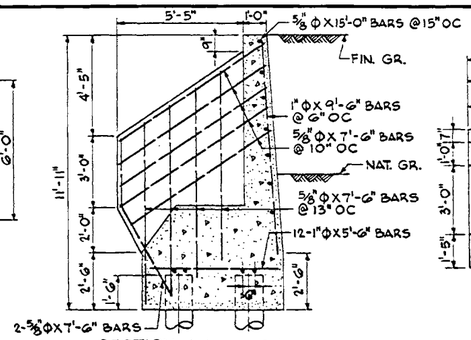
DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: J. C. W. DEICHMANN
APPROVED: E. Graham
APPROVED: for W. M. Williams
DATE: 19 MAR 1959
CHIEF, STRUCTURES BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

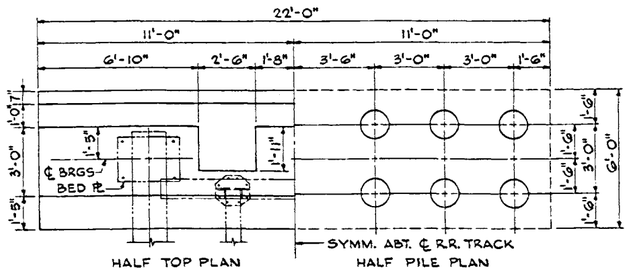
THEATER OF OPERATIONS
RAILROAD BRIDGE TIMBER STRUCTURES
SINGLE TRACK MOUNTS
VARIOUS SPANS

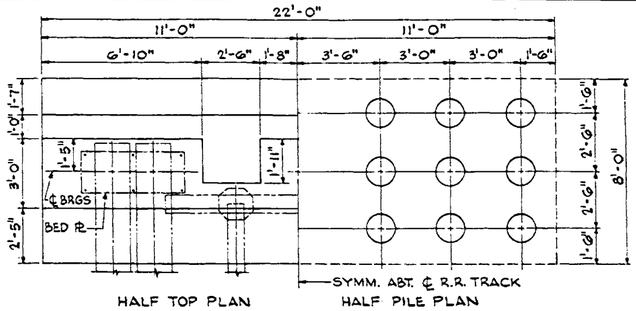
UNDER REVISION

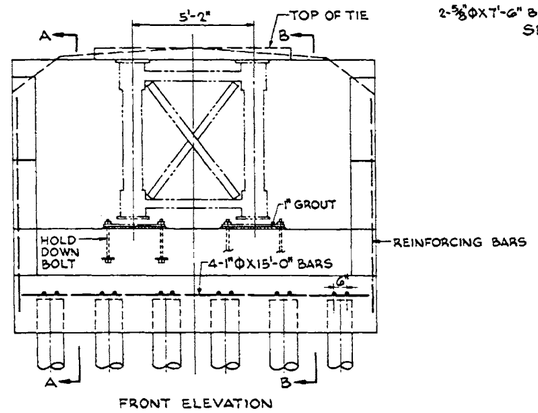
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 9
86-17

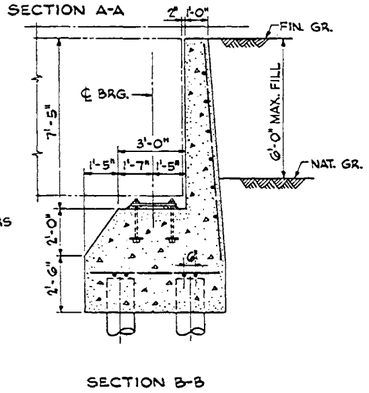


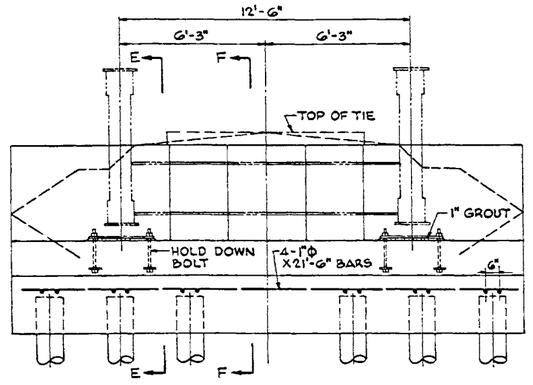


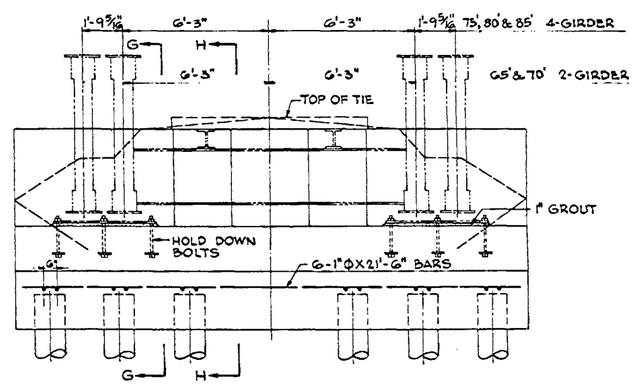








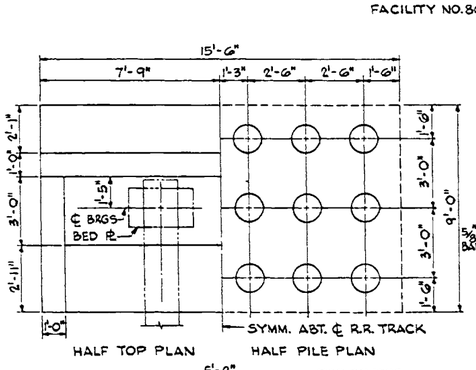


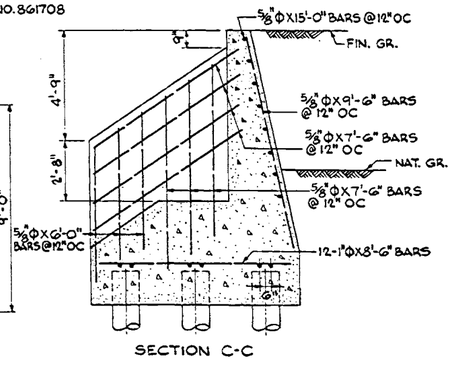


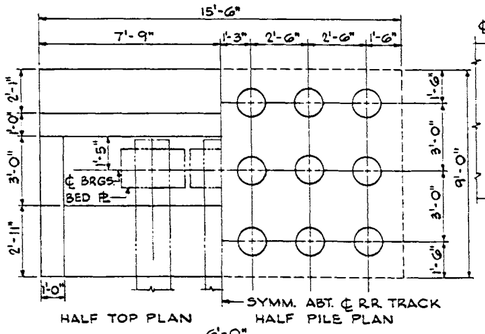
CONCRETE ON 12 TIMBER PILES
55' & 60' SPANS TWO-GIRDER DECK-TYPE UNIT CONSTRUCTION
SCALE NO. 3
FACILITY NO. 861708

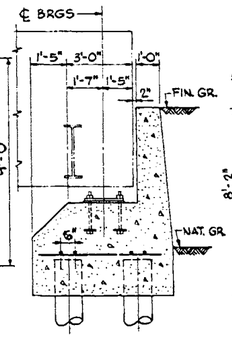
CONCRETE ON 12 TIMBER PILES
55' & 60' SPANS TWO-GIRDER THRU-TYPE UNIT CONSTRUCTION
SCALE NO. 3
FACILITY NO. 861709

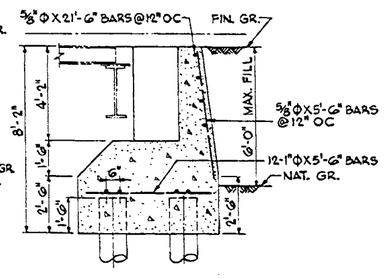
CONCRETE ON 18 TIMBER PILES
65', 70', 75', 80' & 85' SPANS, TWO OR FOUR-GIRDER THRU-TYPE UCB
SCALE NO. 3
FACILITY NO. 861711

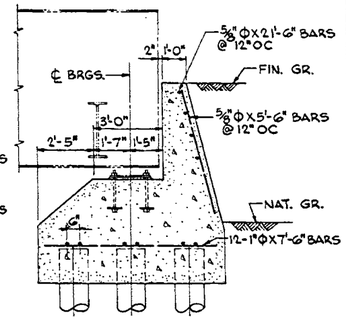


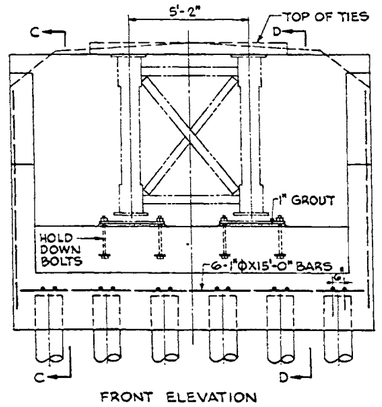


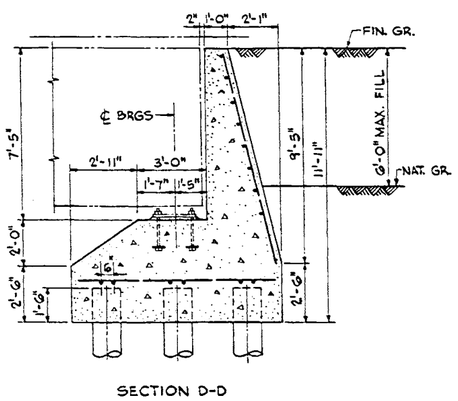


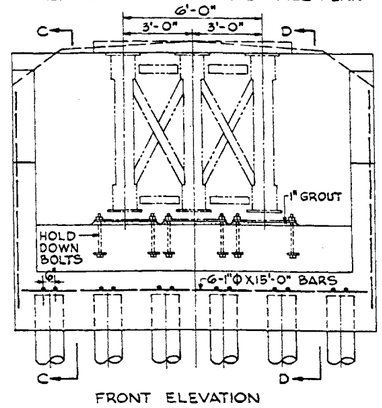


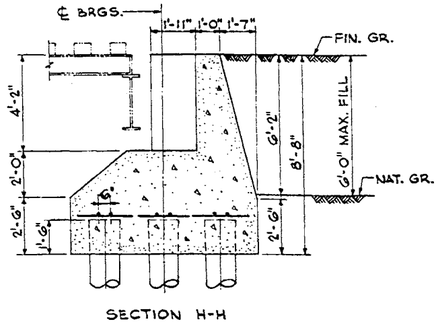












CONCRETE ON 18 TIMBER PILES
65', 70' & 75' SPANS TWO-GIRDER DECK-TYPE UNIT CONSTRUCTION
SCALE NO. 3
FACILITY NO. 861710

CONCRETE ON 18 TIMBER PILES
75', 80' & 85' SPANS THREE-GIRDER DECK-TYPE UNIT CONSTRUCTION
SCALE NO. 3

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

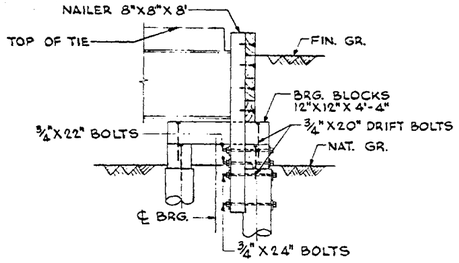
DRAWN BY: WADE
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. Williams
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK ABUTMENTS
VARIOUS LENGTHS & TYPES OF STEEL SPANS

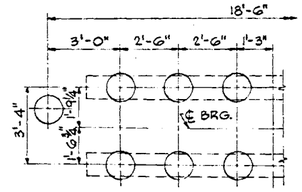
UNDER REVISION

APPROVED: H. M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959

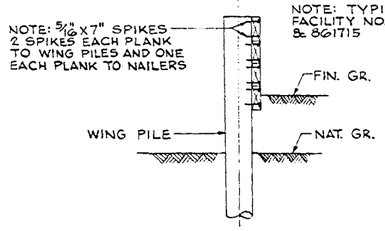
APPROVED FOR PROPONENT AGENCY:
DATE:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-17
SHEET 2 OF 9



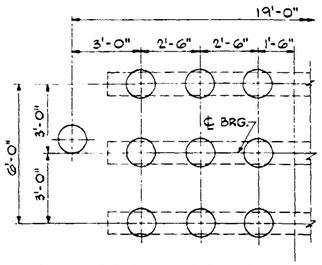
SECTION A-A



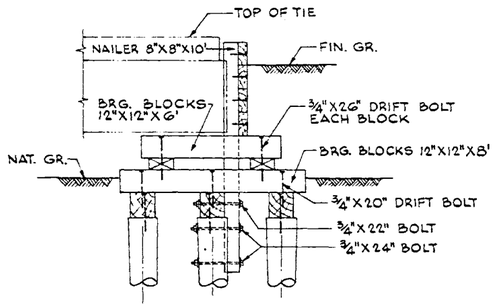
HALF PLAN OF PILE ARRANGEMENT



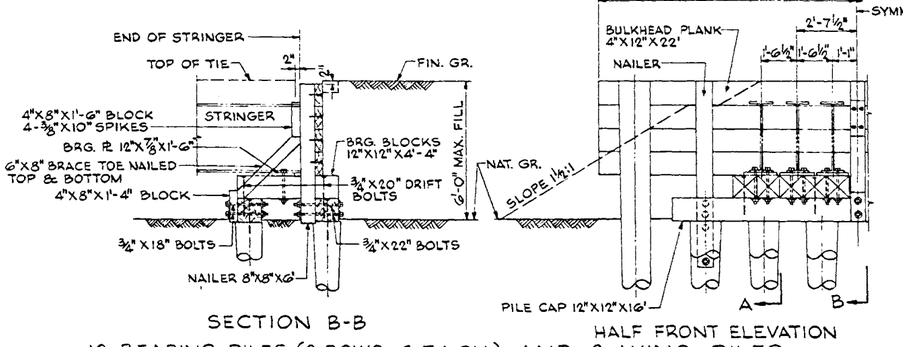
END ELEVATION



HALF PLAN OF PILE ARRANGEMENT



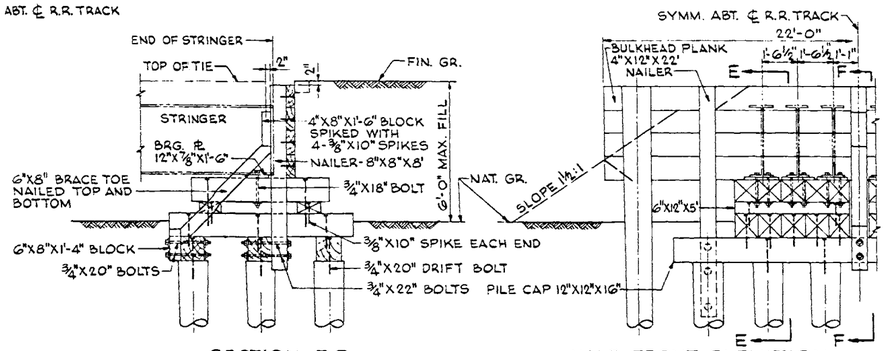
SECTION E-E
SCALE NO. 3



SECTION B-B

HALF FRONT ELEVATION

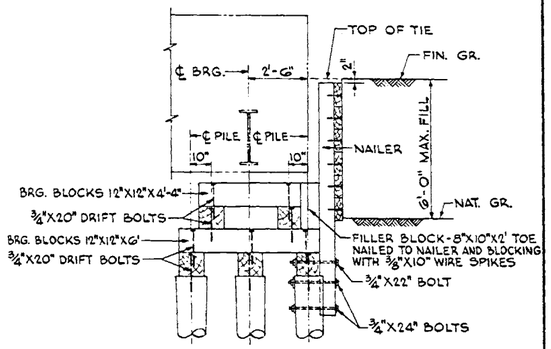
12 BEARING PILES (2 ROWS, 6 EACH) AND 2 WING PILES
57'-10" SPAN 6 STEEL BEAMS
SCALE NO. 3
FACILITY NO. 861712



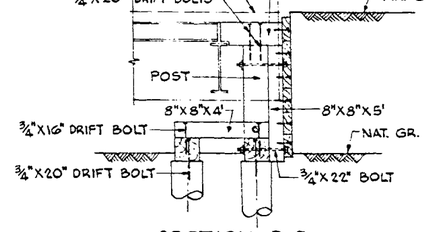
SECTION F-F

HALF FRONT ELEVATION

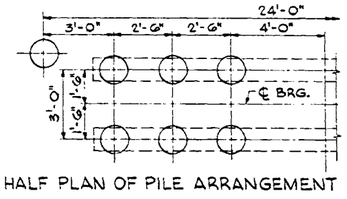
18 BEARING PILES (3 ROWS, 6 EACH) AND 2 WING PILES
57'-10" SPAN-6 STEEL BEAMS
SCALE NO. 3
FACILITY NO. 861715



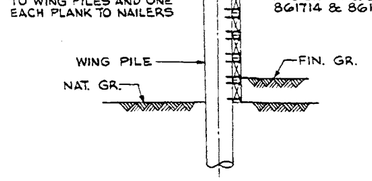
SECTION G-G
SCALE NO. 3



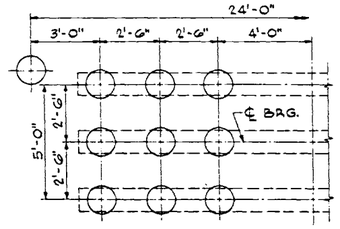
SECTION D-D



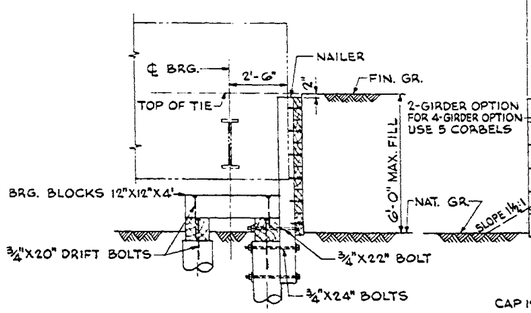
HALF PLAN OF PILE ARRANGEMENT



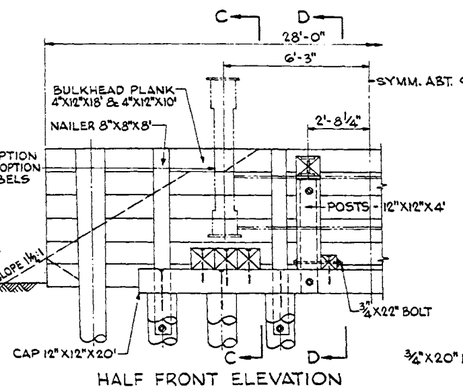
END ELEVATION



HALF PLAN OF PILE ARRANGEMENT

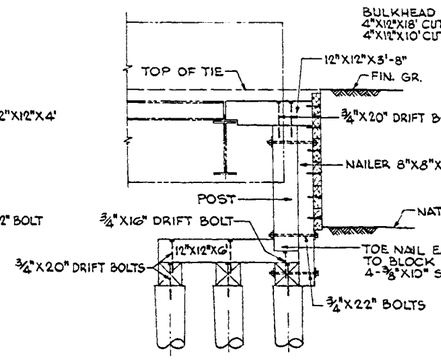


SECTION C-C

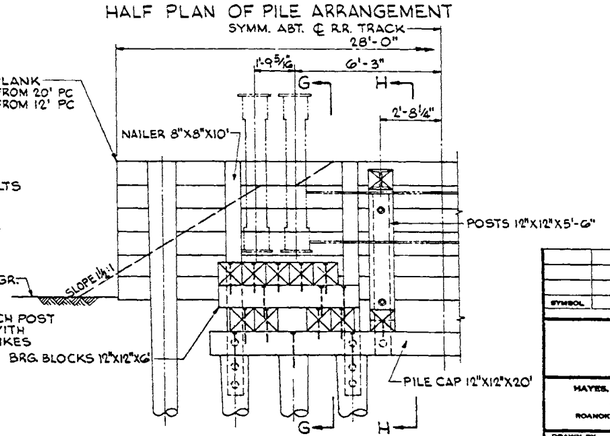


HALF FRONT ELEVATION

12 BEARING PILES (2 ROWS, 6 EACH) AND 2 WING PILES
70' SPAN, TWO-GIRDER THRU-TYPE UCB
75', 80'& 85' SPANS, FOUR-GIRDER THRU-TYPE UCB
SCALE NO. 3
TWO GIRDER-FACILITY NO. 861713
FOUR GIRDER-FACILITY NO. 861714



SECTION H-H



HALF FRONT ELEVATION

18 BEARING PILES (3 ROWS, 6 EACH) AND 2 WING PILES
80' & 85' SPANS, FOUR-GIRDER THRU-TYPE UCB
SCALE NO. 3
FACILITY NO. 861716

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

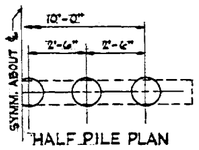
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HORNE
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: R. W. DEICHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE

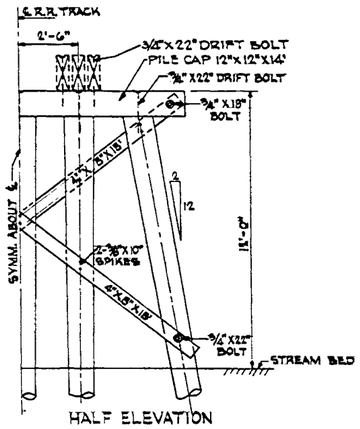
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK ABUTMENTS
12 & 18 TIMBER PILES
VARIOUS SPANS

UNDER REVISION

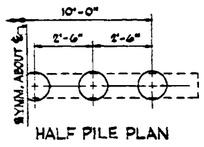
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 3 OF 9
86-17



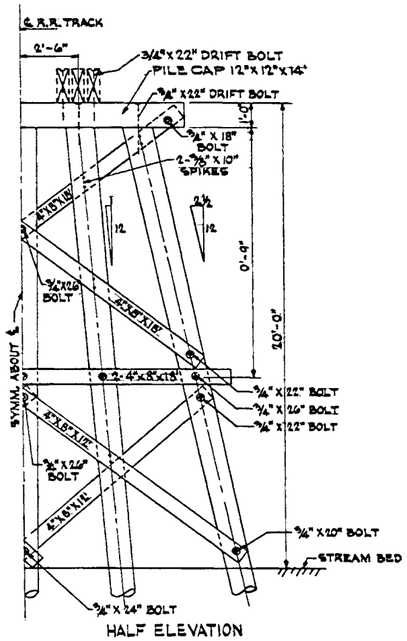
HALF PILE PLAN



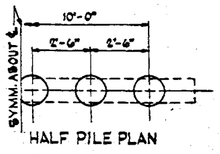
HALF ELEVATION
5 PILE BENT- 12' HEIGHT
2-16' MAX. TIMBER SPANS
SCALE NO. 3
FACILITY NO. 861717



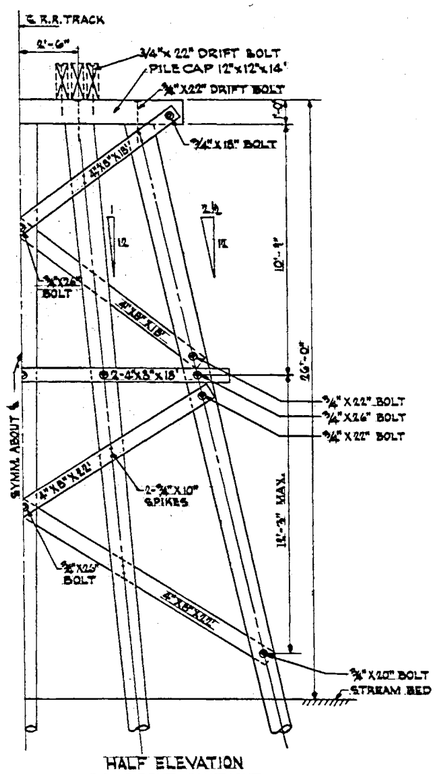
HALF PILE PLAN



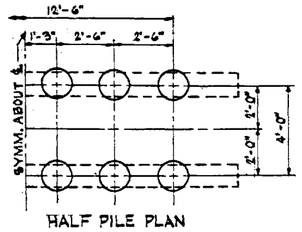
HALF ELEVATION
5 PILE BENT-20' HEIGHT
2-16' MAX. TIMBER SPANS
SCALE NO. 3
FACILITY NO. 861718



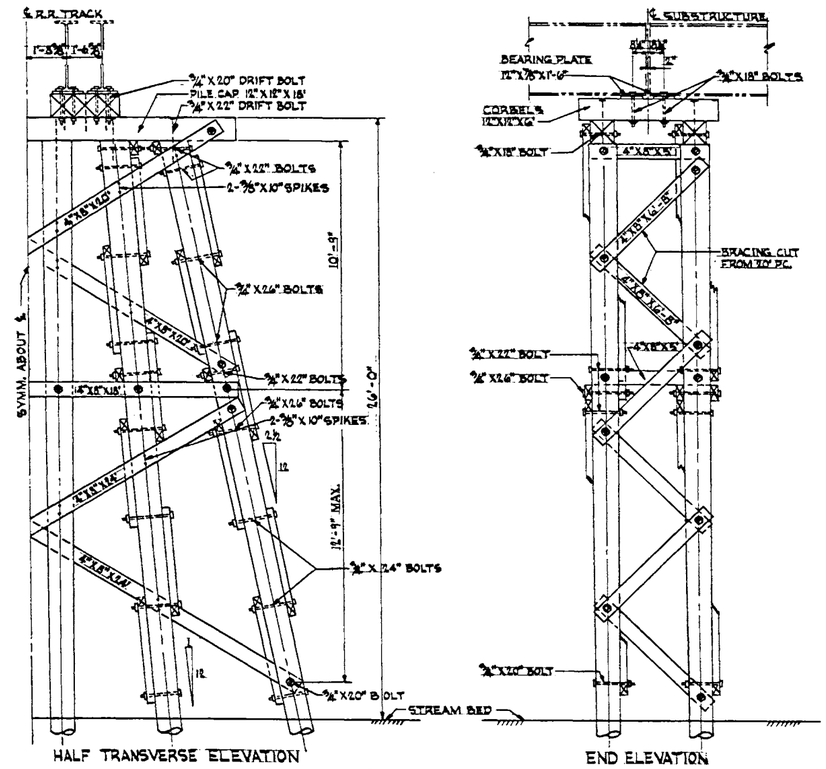
HALF PILE PLAN



HALF ELEVATION
5 PILE BENT-26' HEIGHT
2-16' MAX. TIMBER SPANS
SCALE NO. 3
FACILITY NO. 861719

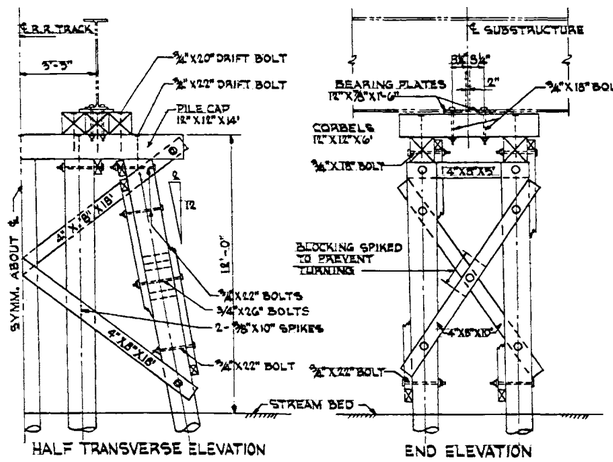


HALF PILE PLAN



HALF TRANSVERSE ELEVATION END ELEVATION

12 PILES (2 ROWS, 6 EACH) -26' HEIGHT
2-45' SPANS - STEEL BEAMS
SCALE NO. 3
FACILITY NO. 861721



HALF TRANSVERSE ELEVATION END ELEVATION

10 PILES (2 ROWS, 5 EACH)-12' HEIGHT
2-50' SPANS - STEEL DPG'S
SCALE NO. 3
FACILITY NO. 861720

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

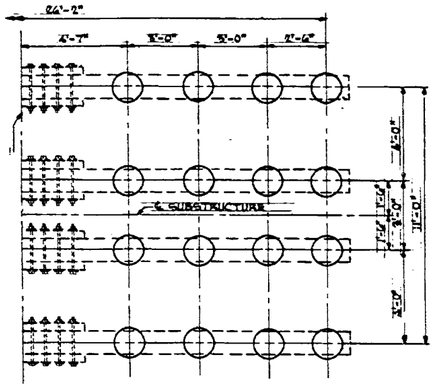
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN
RECOMMENDED: [signature]
APPROVED: [signature] DATE: 1 8 MAR 1963
CHIEF, STRUCTURES BRANCH / CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

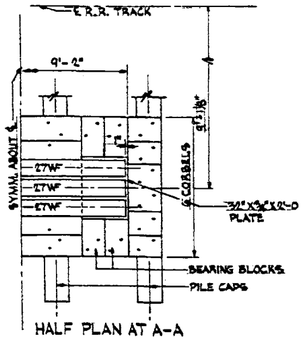
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK BENTS & PIERS
12, 20, 26 FEET HIGH FOR TIMBER & STEEL SPANS

UNDER REVISION

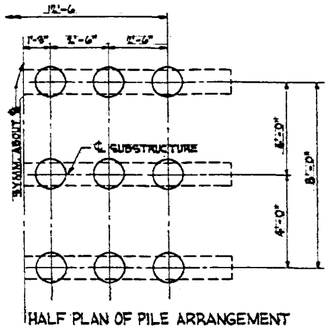
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-17
SHEET 4 OF 9



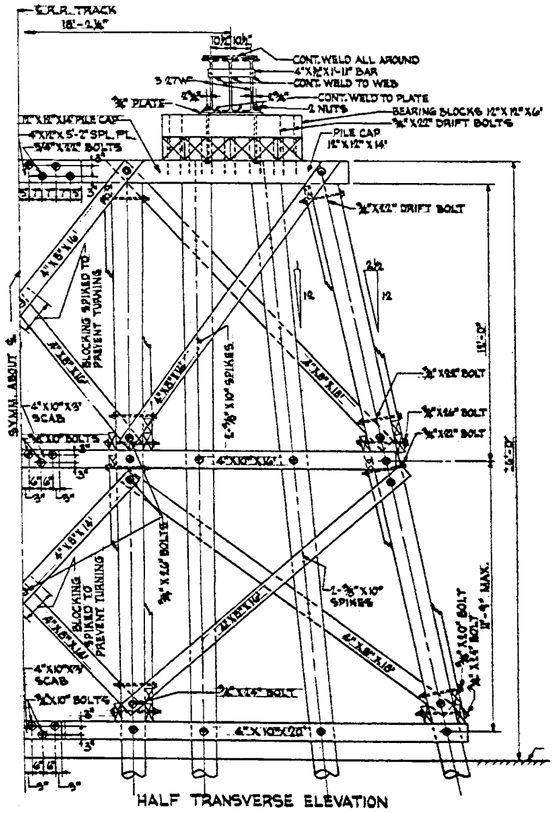
HALF PLAN OF PILE ARRANGEMENT



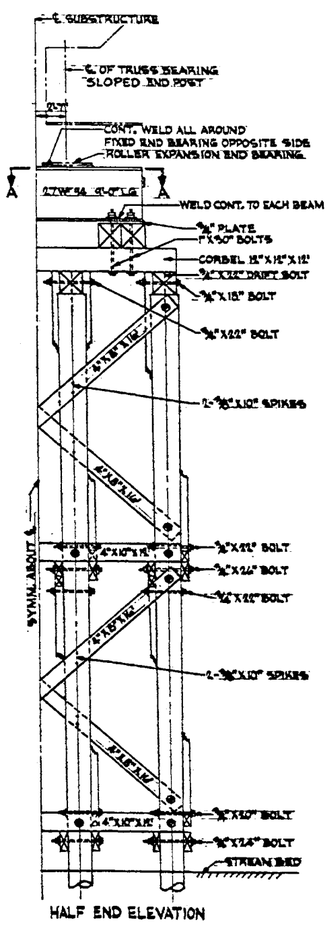
HALF PLAN AT A-A



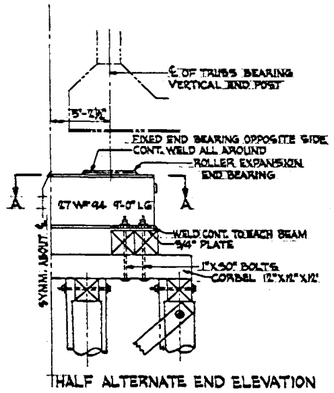
HALF PLAN OF PILE ARRANGEMENT



HALF TRANSVERSE ELEVATION

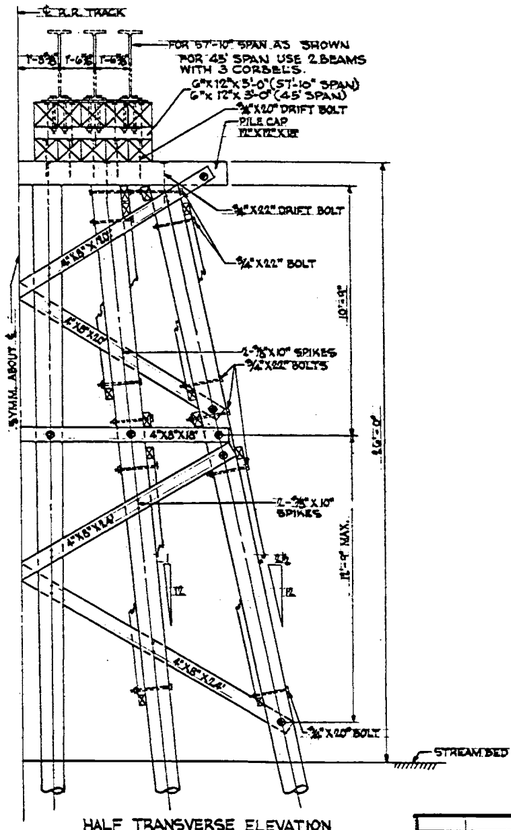


HALF END ELEVATION



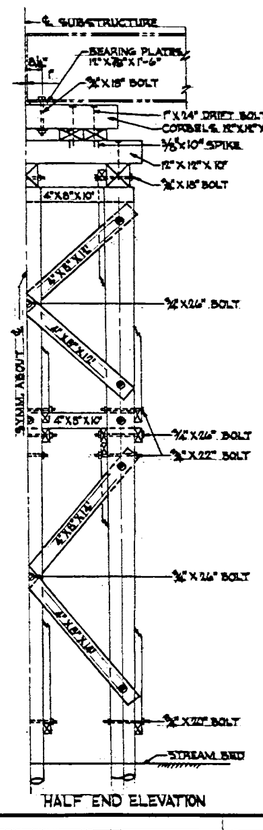
HALF ALTERNATE END ELEVATION

32 PILES (4 ROWS-8 EACH) 26' HEIGHT
TWO 133'-9" THUR TRUSS SPANS
SCALE NO. 3
FACILITY NO. 861723



HALF TRANSVERSE ELEVATION

18 PILES (3 ROWS - 6 EACH)-26' HEIGHT
2- 57'-10" SPANS-6 STEEL BEAMS
2-45' SPANS - 4 STEEL BEAMS
SCALE NO. 3
FACILITY NO. 861722



HALF END ELEVATION

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DRAWING SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: LALL
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN

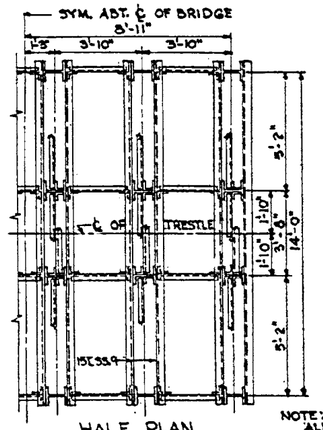
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURE
SINGLE TRACK PIERS
266'-8 HIGH BEAM & TRUSS SPANS

UNDER REVISION

APPROVED: W. Schaeffer
APPROVED: DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

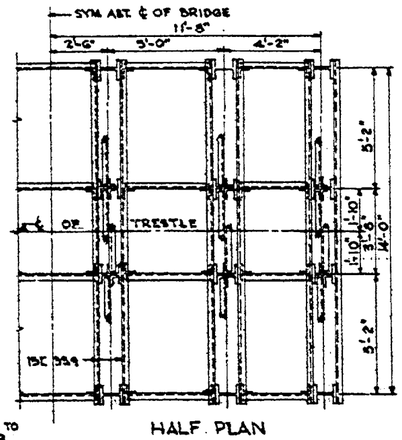
APPROVED FOR PROPONENT AGENCY:
DATE:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-17
SHEET 5 OF 9

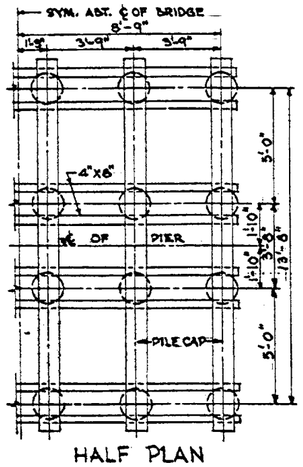


HALF PLAN

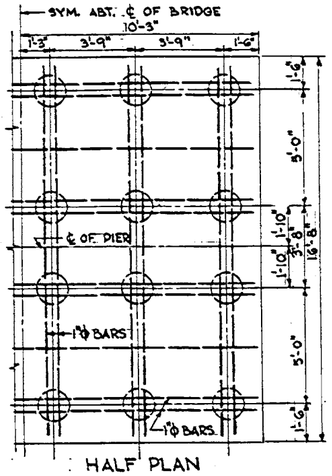
NOTE:
ALL STEEL MEMBERS TO BE WELDED TOGETHER



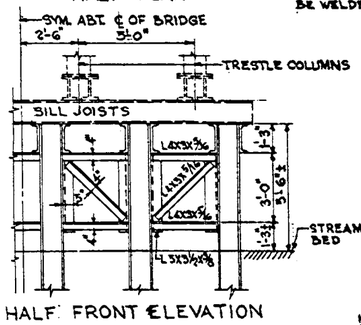
HALF PLAN



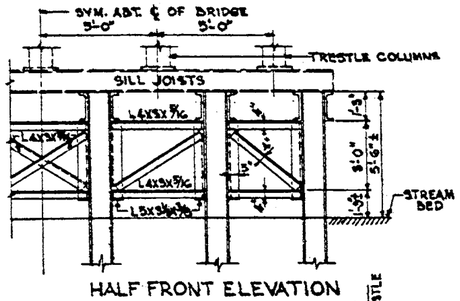
HALF PLAN



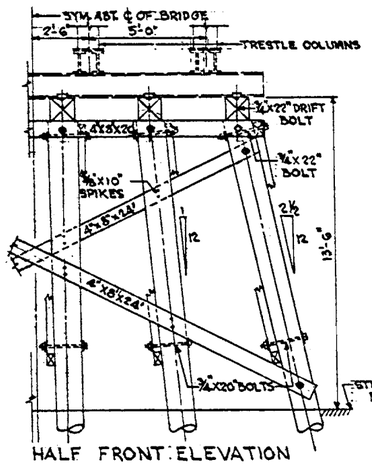
HALF PLAN



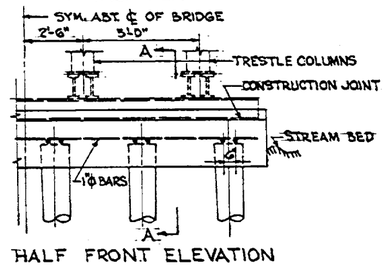
HALF FRONT ELEVATION



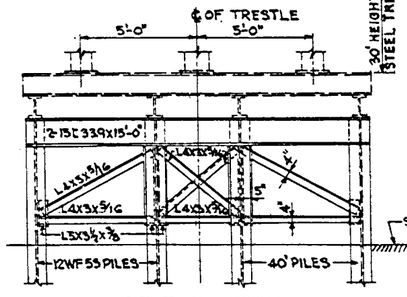
HALF FRONT ELEVATION



HALF FRONT ELEVATION

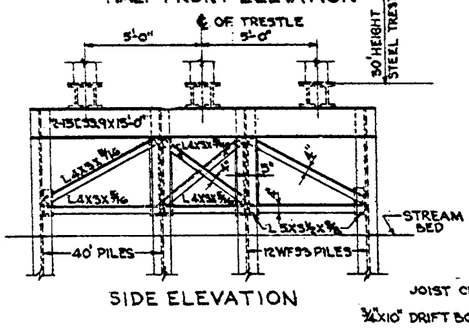


HALF FRONT ELEVATION



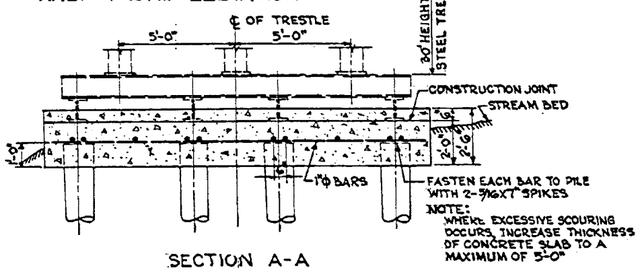
SIDE ELEVATION

FACILITY NO. 861726



SIDE ELEVATION

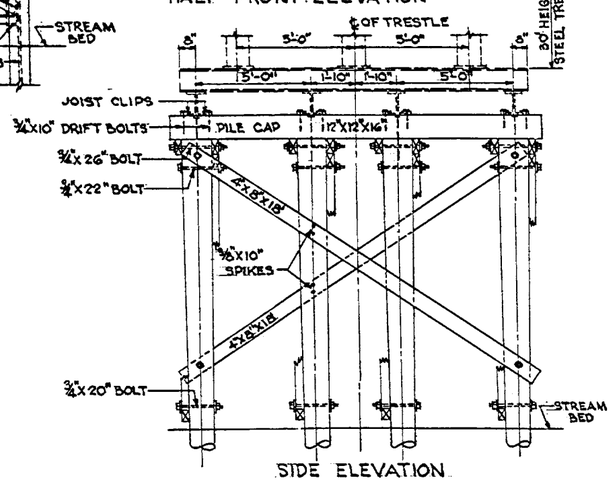
FACILITY NO. 861727



SECTION A-A

CONCRETE SLAB ON 24 TIMBER PILES
2-75' SPANS - TWO GIRDER THRU-TYPE UCB
FACILITY NO. 861725

24 STEEL PILES CAPPED AND BRACED
2-85' SPANS - TWO GIRDER THRU-TYPE UCB
2-85' SPANS - FOUR GIRDER THRU-TYPE UCB
2-100' SPANS - SIX 51" 275# DPG
2-156'-4" SPANS - STANDARD THRU-TRUSS BRIDGES



SIDE ELEVATION

24 TIMBER PILES CAPPED AND BRACED
2-80' SPANS - FOUR GIRDER THRU-TYPE UCB
2-85' SPANS - TWO GIRDER THRU-TYPE UCB
FACILITY NO. 861724

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: R. W. DEITCHMANN

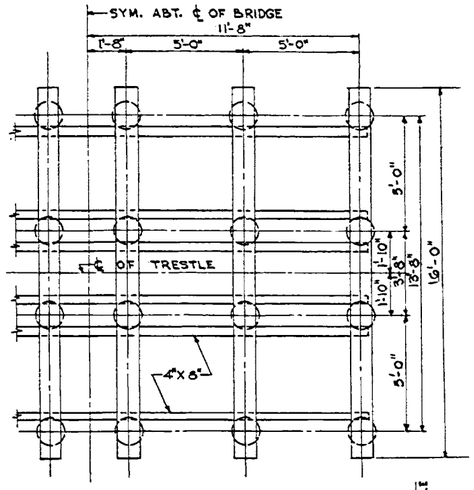
THEATER OF OPERATIONS
U.S. ROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK TRESTLE FOUNDATIONS
FOR TYPES C.E. & F-TRESTLES
TIMBER & STEEL PILES

UNDER REVISION

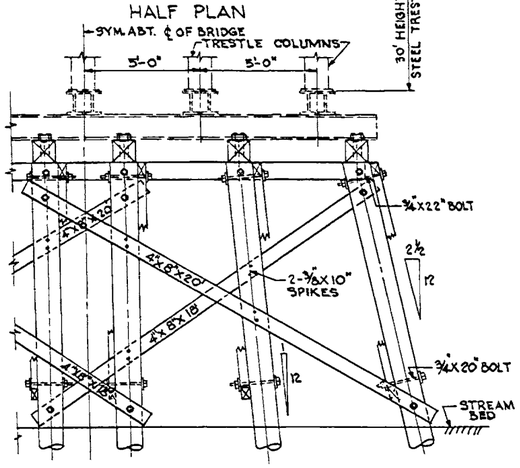
RECOMMENDED: W. Eckhaus, CHIEF, STRUCTURES BRANCH, R. & T. DIV., ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED: H. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 1-9 MAR 1959

APPROVED FOR PROPONENT AGENCY:
DATE

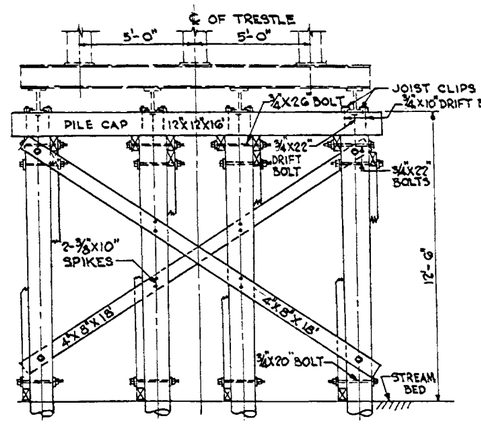
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-17
SHEET 8 OF 9



HALF PLAN

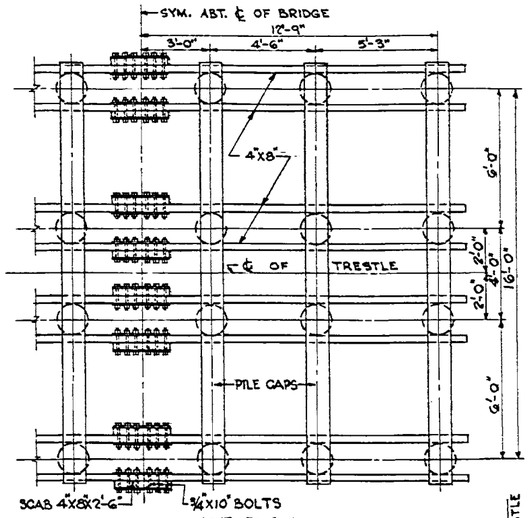


HALF FRONT ELEVATION

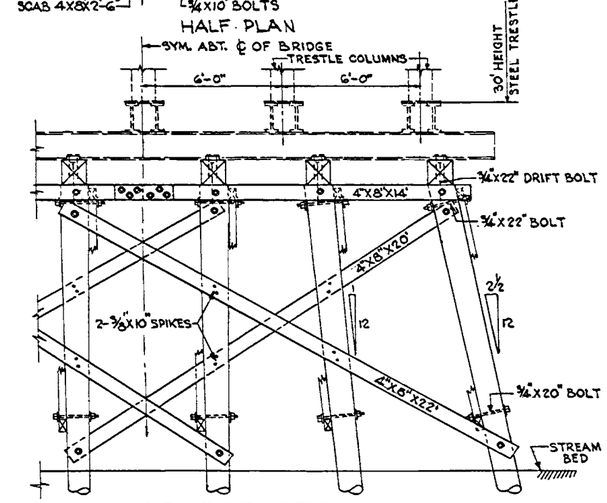


SIDE ELEVATION

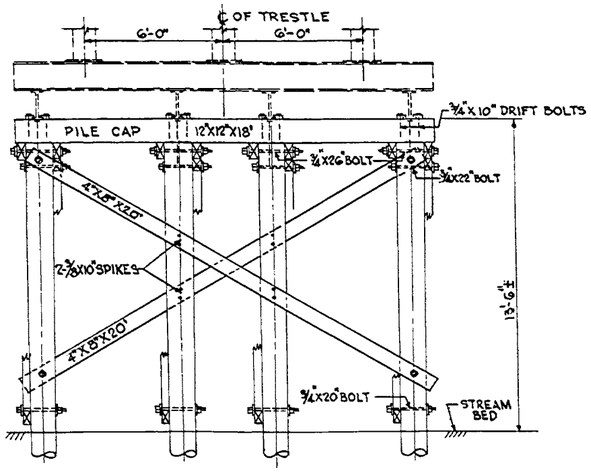
24 PILES-CAPPED AND BRACED
2-85' SPANS-TWO GIRDER THRU-TYPE UCB
2-80' SPANS-FOUR GIRDER THRU-TYPE UCB
2-143'-6" SPANS-STANDARD THRU TRUSS BRIDGE
2-80' SPANS-FOUR 51" 275# DPG
2-100' SPANS-SIX 51" 275# DPG
FACILITY NO 861728



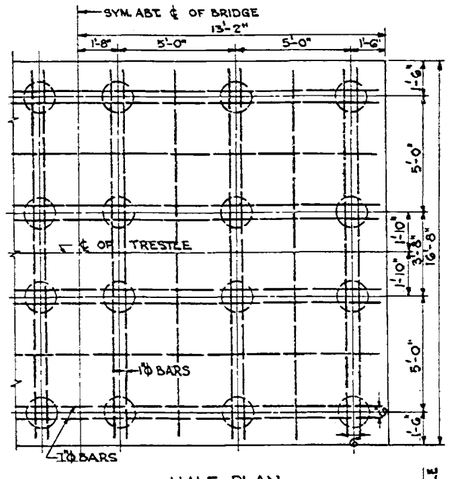
HALF PLAN



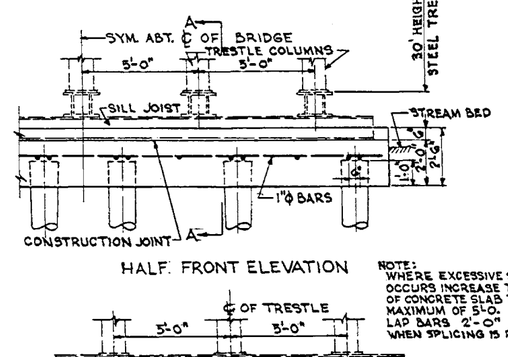
HALF FRONT ELEVATION



SIDE ELEVATION
24 PILES CAPPED AND BRACED
2-85'-SPANS-TWO GIRDER THRU-TYPE UCB
FACILITY NO. 861730

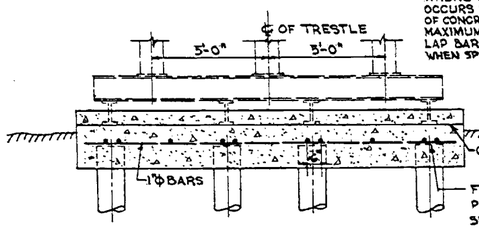


HALF PLAN



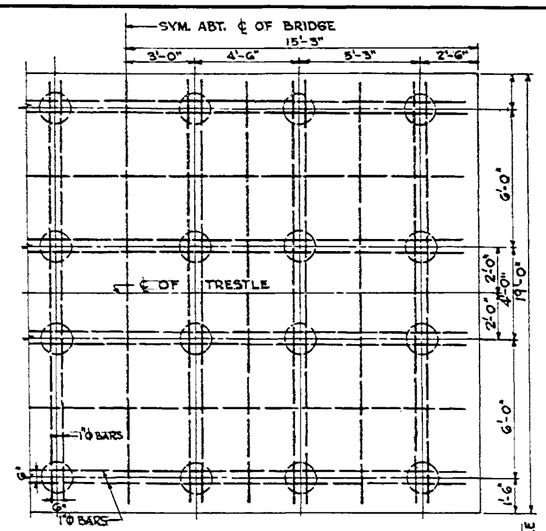
HALF FRONT ELEVATION

NOTE:
WHERE EXCESSIVE SCOURING OCCURS INCREASE THICKNESS OF CONCRETE SLAB TO A MAXIMUM OF 5'-0".
LAP BARS 2'-0"
WHEN SPLICING IS REQUIRED.

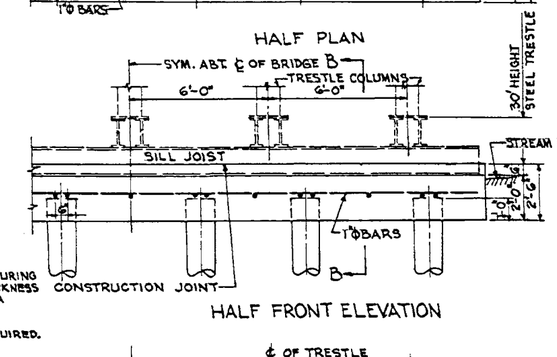


SECTION A-A

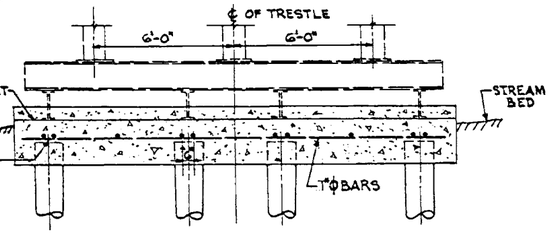
CONCRETE SLAB ON 24 PILES
2-65' SPANS-TWO GIRDER THRU-TYPE UCB
2-102'-6" SPANS- STANDARD THRU-TRUSS BRIDGES
2-80' SPANS- FOUR 51" 275# DPG
2-100 SPANS- SIX 51" 275# DPG
FACILITY NO. 861729



HALF PLAN



HALF FRONT ELEVATION



SECTION B-B
CONCRETE SLAB ON 24 PILES
2-55' SPANS-TWO GIRDER THRU-TYPE UCB
FACILITY NO. 861731

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

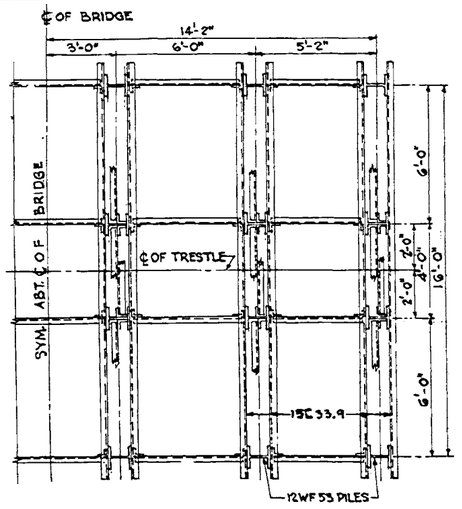
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: R. W. DEJCHMANN
APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] for H. M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

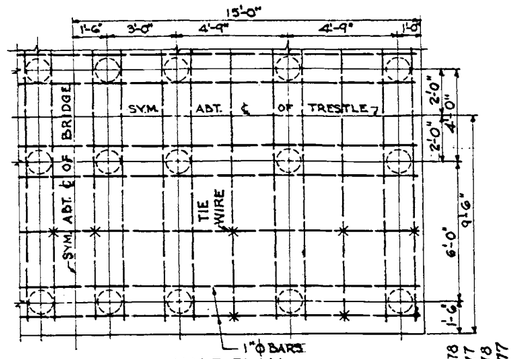
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK TRESTLE FOUNDATIONS
FOR TYPES F & FA TRESTLES
TIMBER PILES

UNDER REVISION

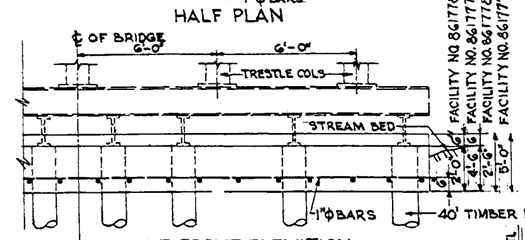
APPROVED: DATE: 19 MAR 1969
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 7 OF 9
86-17



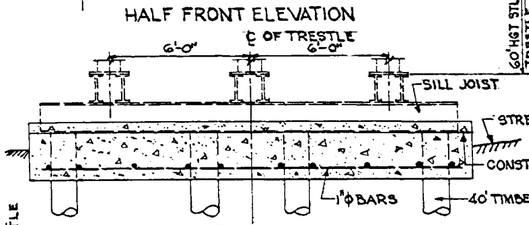
HALF PLAN



HALF PLAN

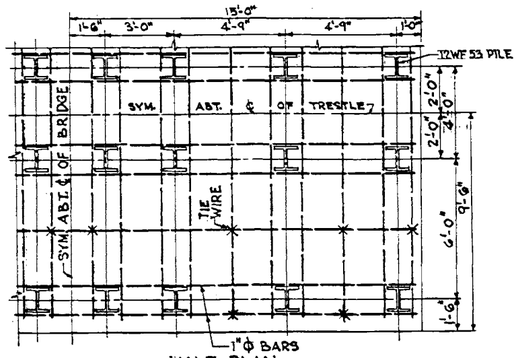


HALF FRONT ELEVATION

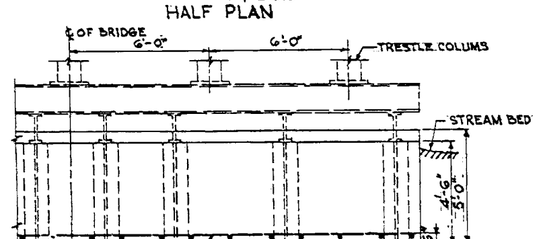


SECTION

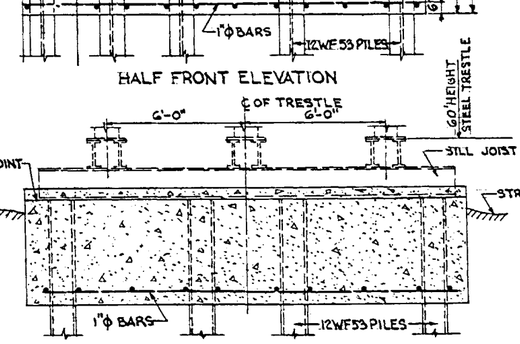
2-100'DPG SPANS-TIMBER PILES WITH 5' CONCRETE SLAB
FACILITY NO. 861777
2-80'DPG SPANS-TIMBER PILES WITH 2'-6" CONCRETE SLAB
FACILITY NO. 861778



HALF PLAN



HALF FRONT ELEVATION

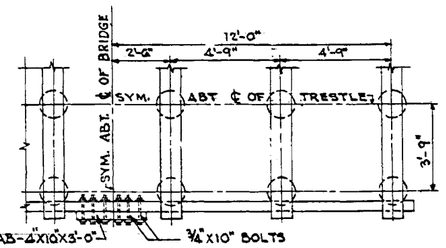


SECTION

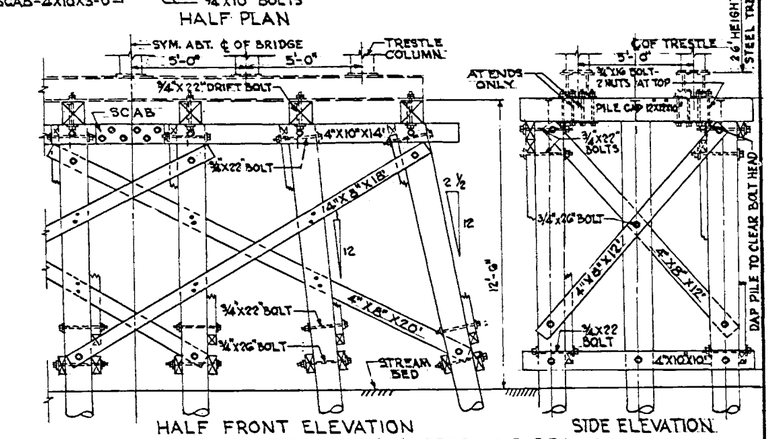
2-153'-9" SPANS-STEEL PILES WITH 5' CONCRETE SLAB
FACILITY NO. 861733

NOTES:
1. WELDED CONSTRUCTION THROUGHOUT.
2. WELD BARS TO PILES WHERE NECESSARY TO HOLD IN POSITION DURING CONSTRUCTION.
3. LAP BARS 2'-0" WHERE SPLICES ARE REQUIRED.

CONCRETE SLAB ON 32 PILES FOR 60' HIGH PIER
STANDARD THRU TRUSS BRIDGES

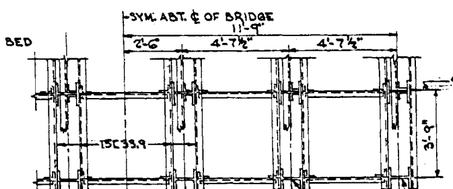


HALF PLAN



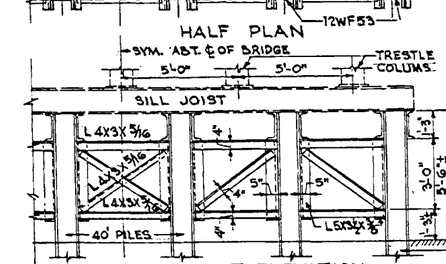
HALF FRONT ELEVATION
18 TIMBER PILES CAPPED AND BRACED
2-65' SPANS-TWO GIRDER THRU-TYPE UCB
FACILITY NO. 861736

SIDE ELEVATION



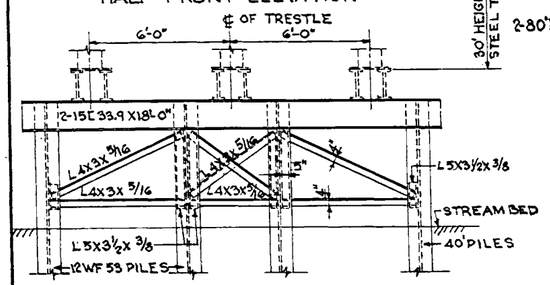
HALF PLAN

NOTE:
WELDED CONSTRUCTION THROUGHOUT.

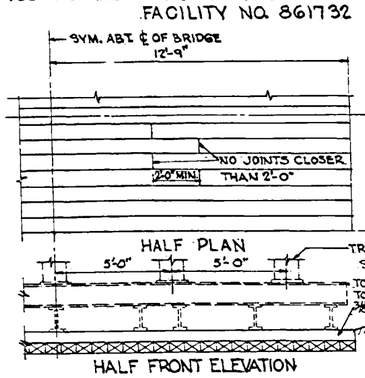


HALF FRONT ELEVATION
18 STEEL PILES CAPPED AND BRACED
2-156'-4" SPANS- STANDARD THRU-TRUSS BRIDGE
FACILITY NO. 861737

SIDE ELEVATION



SIDE ELEVATION
24 STEEL PILES-CAPPED AND BRACED-30'HEIGHT
2-153'-9" SPANS-TWO STANDARD THRU TRUSS BRIDGES
FACILITY NO. 861732



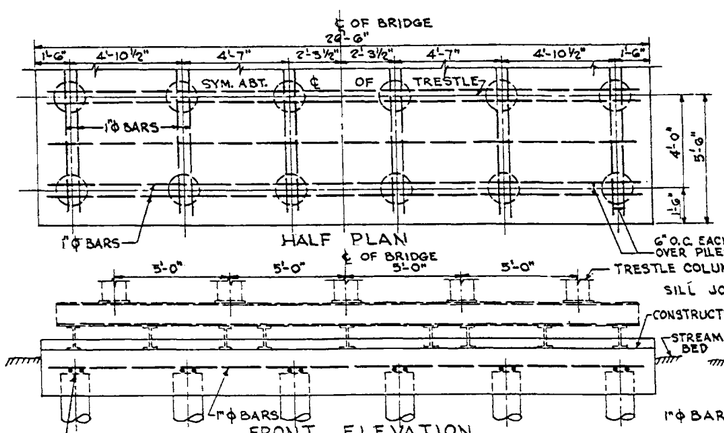
HALF FRONT ELEVATION

HALF PLAN

HALF FRONT ELEVATION

SIDE ELEVATION

TIMBER GRILLAGE
2-85' SPANS-FOUR GIRDER THRU-TYPE UCB
FACILITY NO. 861734



HALF PLAN

FRONT ELEVATION

SIDE ELEVATION

NOTE:
WHERE EXCESSIVE SCOURING OCCURS, INCREASE THE THICKNESS OF CONCRETE SLAB TO A MAXIMUM OF 5'-0"

CONCRETE SLAB ON 18 PILES
2-55' SPANS-TWO GIRDER THRU-TYPE UCB
FACILITY NO. 861735

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE VIRGINIA WASHINGTON, D. C.

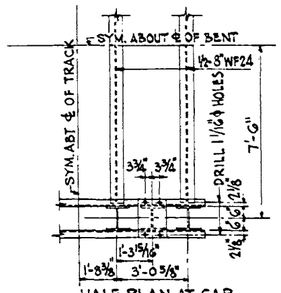
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I.LYUS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: J. W. DEJCHMANN
APPROVED: G. Eschamann
APPROVED: Wm Williams
DATE: 13 MAR 1959
CHIEF, STRUCTURES BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

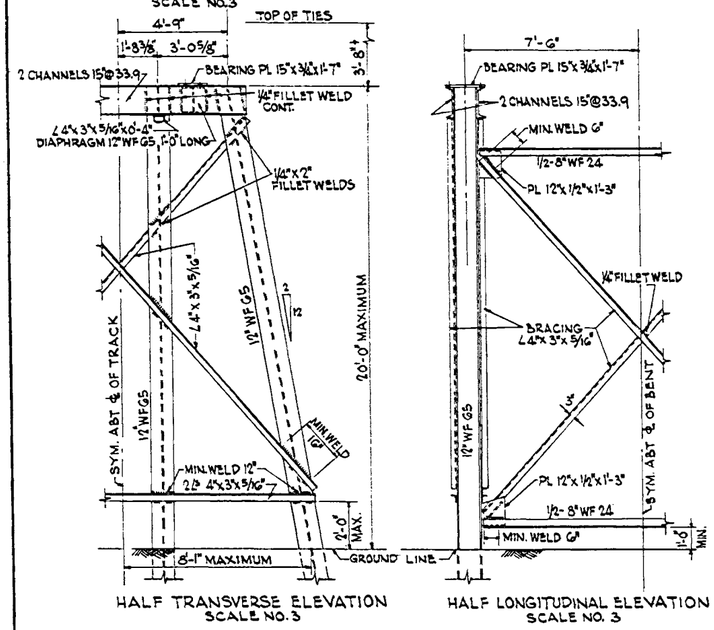
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK TRESTLE FOUNDATIONS
FOR TYPE C & FH TRESTLES
TIMBER & STEEL PILES AND GRILLAGE

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
86-17
SHEET 8 OF 9



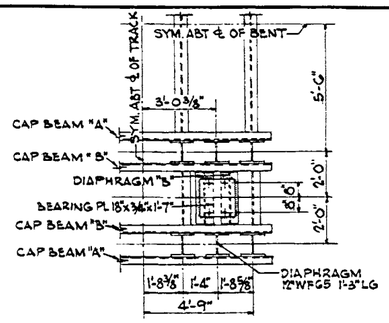
HALF PLAN AT CAP
SCALE NO.3



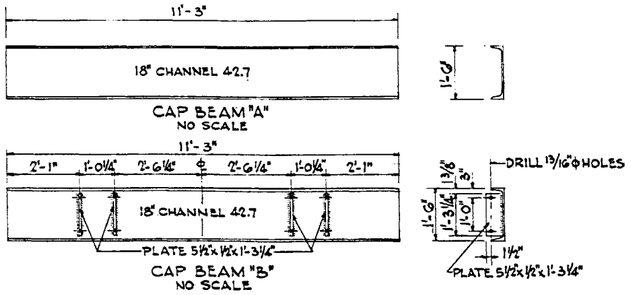
HALF TRANSVERSE ELEVATION
SCALE NO.3

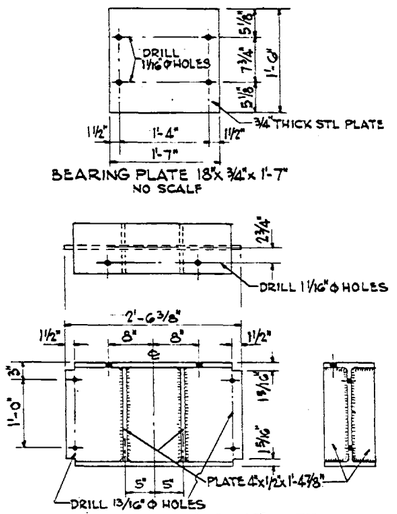
HALF LONGITUDINAL ELEVATION
SCALE NO. 3

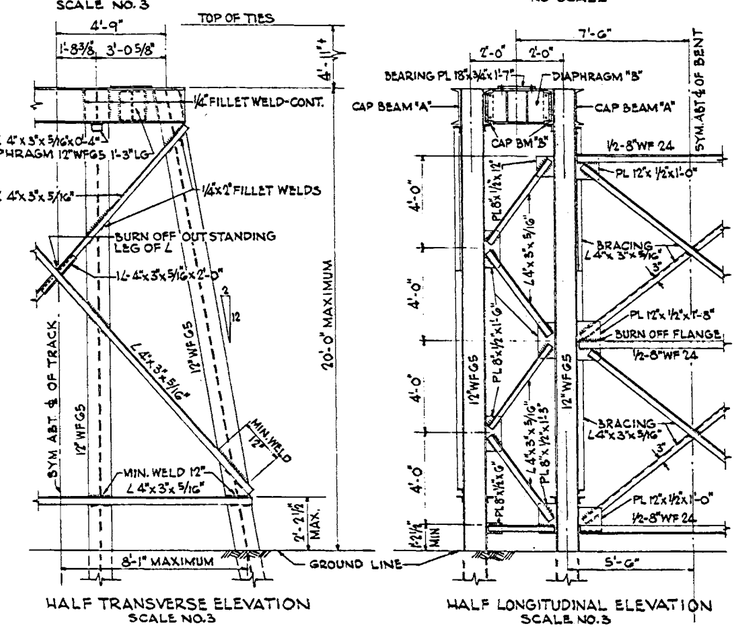
SINGLE TRACK PILE BENT
8 STEEL PILES — 20 FT HIGH
FACILITY NO. 861739
MAXIMUM 30 FT. BETWEEN BENTS



HALF PLAN AT CAP
SCALE NO. 3







HALF TRANSVERSE ELEVATION
SCALE NO.3

HALF LONGITUDINAL ELEVATION
SCALE NO.3

SINGLE TRACK PILE BENT
16 STEEL PILES - 20 FT HIGH
FACILITY NO. 861740
MAXIMUM 50 FT. BETWEEN BENTS

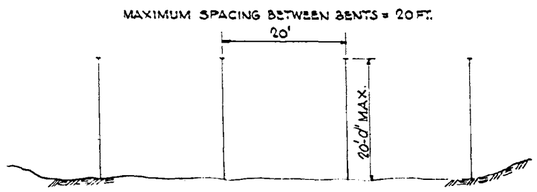


DIAGRAM
SHOWING HEIGHT & SPAN LIMITATIONS
4 PILE BENT - FACILITY NO. 861738
NO SCALE

GENERAL NOTES

1. ALL WELDS SHOWN ARE ¼" FILLET WELDS UNLESS OTHERWISE NOTED.
2. FOR 20FT SPANS, SINGLE BENTS OF 4 STEEL PILES MAY BE USED. FACILITY NO. 861738

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4'
NO.3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

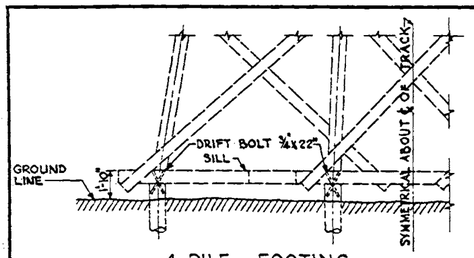
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHAFFER
SUBMITTED BY: C. W. DEICHMANN
APPROVED: Chief, Structures Branch
APPROVED: Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY:
DATE:

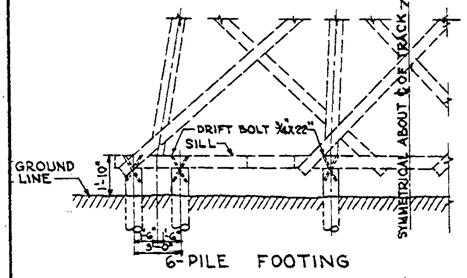
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK PILE BENTS
STEEL PILES
20FT HIGH

UNDER REVISION

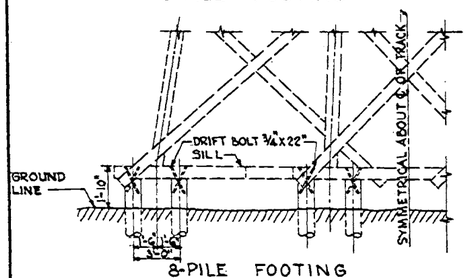
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-17
SHEET 9 OF 9



4-PILE FOOTING

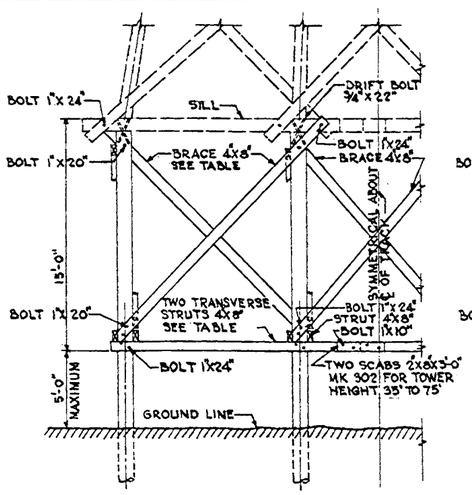


6-PILE FOOTING

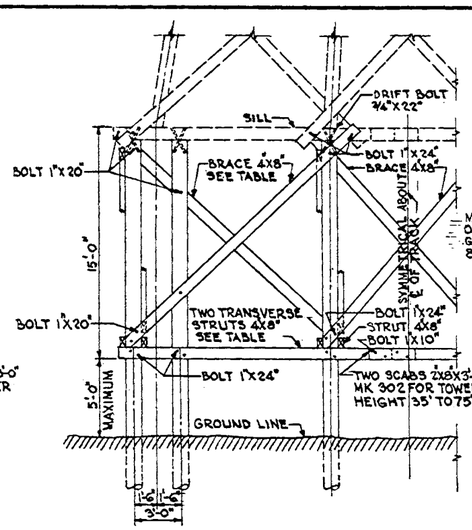


8-PILE FOOTING

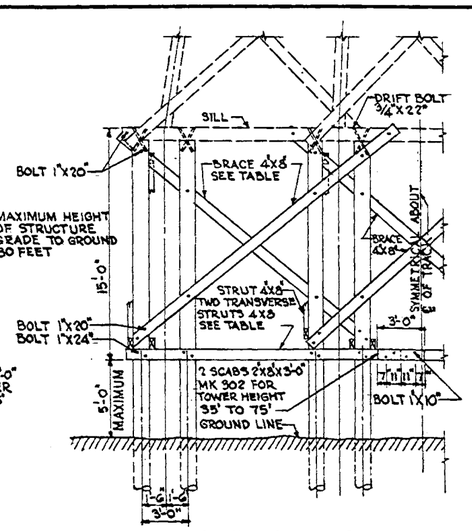
UNBRACED FOUNDATIONS



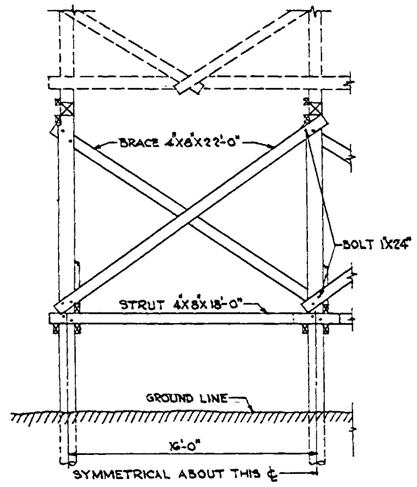
4-PILE FOOTING



6-PILE FOOTING



8-PILE FOOTING

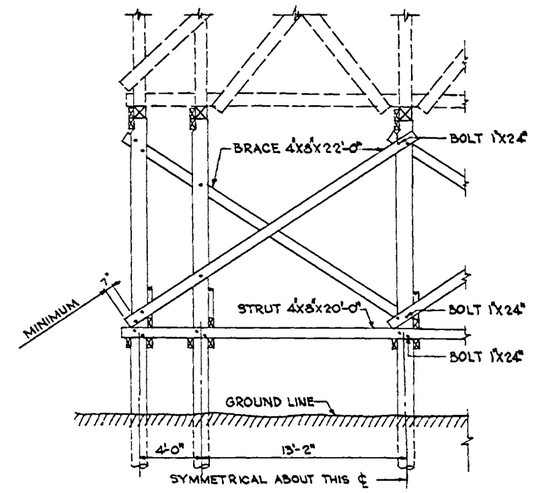


TIMBER SPANS

LENGTH OF TRANSVERSE BRACING

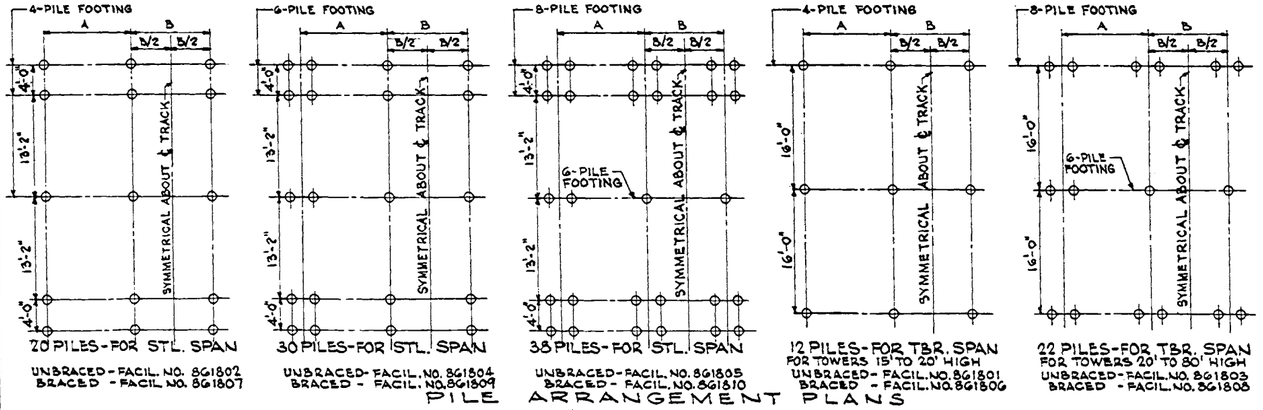
TOWER HEIGHT	4-PILE FOOTING				6-PILE FOOTING				8-PILE FOOTING			
	BRACE		STRUT		BRACE		STRUT		BRACE		STRUT	
	LENGTH	MARK	LENGTH	MARK	LENGTH	MARK	LENGTH	MARK	LENGTH	MARK	LENGTH	MARK
15' TO 21'	16'-0"	156	16'-0"	156	16'-0"	156	20'-0"	158	16'-0"	157	20'-0"	158
23' TO 27'	18'-0"	156	18'-0"	157	18'-0"	157	22'-0"	159	18'-0"	157	22'-0"	159
29' TO 33'	16'-0"	156	20'-0"	158	18'-0"	157	24'-0"	160	20'-0"	158	24'-0"	160
35' TO 40'	18'-0"	157	22'-0"	159	18'-0"	157	14'-0"	155	20'-0"	158	14'-0"	155
42' TO 46'	18'-0"	157	24'-0"	160	18'-0"	157	14'-0"	155	20'-0"	158	14'-0"	155
48' TO 56'	18'-0"	157	14'-0"	155	20'-0"	158	16'-0"	156	20'-0"	158	16'-0"	156
58' TO 69'	20'-0"	158	16'-0"	156	20'-0"	158	18'-0"	157	22'-0"	159	18'-0"	157

BRACED FOUNDATIONS



STEEL SPANS

HALF LONGITUDINAL ELEVATIONS



20 PILES-FOR STL. SPAN
UNBRACED-FACIL. NO. 861802
BRACED - FACIL. NO. 861807

30 PILES-FOR STL. SPAN
UNBRACED-FACIL. NO. 861804
BRACED - FACIL. NO. 861809

38 PILES-FOR STL. SPAN
UNBRACED-FACIL. NO. 861805
BRACED - FACIL. NO. 861810

12 PILES-FOR TBR. SPAN FOR TOWERS 15' TO 20' HIGH
UNBRACED-FACIL. NO. 861801
BRACED - FACIL. NO. 861806

22 PILES-FOR TBR. SPAN FOR TOWERS 20' TO 80' HIGH
UNBRACED-FACIL. NO. 861803
BRACED - FACIL. NO. 861808

PILE ARRANGEMENT PLANS

PILE SCHEDULE FOR TOWERS WITH STEEL SPANS

SPAN LENGTH	TOWER HEIGHT	PILES PER TOWER
50'	30' TO 80'	38
	20' TO 30'	30
	15' TO 20'	20
45'	35' TO 80'	38
	25' TO 35'	30
	15' TO 25'	20
40'	40' TO 80'	38
	30' TO 40'	30
	15' TO 30'	20
35'	45' TO 80'	38
	35' TO 45'	30
	15' TO 35'	20
30'	55' TO 80'	38
	40' TO 55'	30
	15' TO 40'	20
25'	65' TO 80'	38
	45' TO 65'	30
	15' TO 45'	20
20'	55' TO 80'	30
	15' TO 55'	20

TOWER HEIGHT AND DIMENSIONS

HEIGHT OF TOWER	A	B	HEIGHT OF TOWER	A	B
13'-4"	3'-5½"	4'-11¾"	46'	7'-6½"	7'-8"
16'	3'-9½"	5'-2"	48'	7'-9½"	7'-10"
18'	4'-0½"	5'-4"	50'-10"	8'-1¾"	8'-1¼"
20'	4'-3½"	5'-6"	53'	8'-5"	8'-5"
22'	4'-6½"	5'-8"	55'	8'-8"	8'-8"
24'	4'-9½"	5'-10"	57'	8'-11"	8'-7"
25'-10"	5'-0¼"	6'-0⅛"	59'	9'-2"	8'-9"
28'	5'-3½"	6'-2"	61'	9'-5"	8'-11"
30'	5'-6½"	6'-4"	63'-4"	9'-8½"	9'-1¾"
32'	5'-9½"	6'-6"	65'	9'-11"	9'-3"
34'	6'-0½"	6'-8"	67'	10'-2"	9'-6"
36'	6'-3½"	6'-10"	69'	10'-5"	9'-7"
38'-4"	6'-7"	7'-0¾"	71'	10'-8"	9'-9"
40'	6'-9½"	7'-2"	73'	10'-11"	9'-11"
42'	7'-0½"	7'-4"	75'-10"	11'-3¼"	10'-2¼"
44'	7'-3½"	7'-6"			

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-18	BRACED & UNBRACED TIMBER PILE FOUNDATIONS	1 OF 4
86-15	SINGLE TRACK TIMBER TOWERS	1 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: NO SCALE

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA

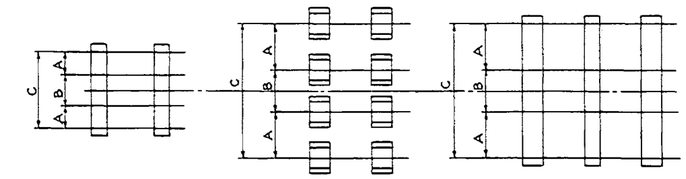
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: I LYUS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: G. W. DEICHMANN

THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
BRACED & UNBRACED TIMBER PILE FOUNDATIONS FOR TIMBER TOWERS

UNDER REVISION

APPROVED: H. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959
APPROVED: CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: NONE
SPEC. NO.
DRAWING NUMBER: 86-18
SHEET 1 OF 4



TIMBER SPANS

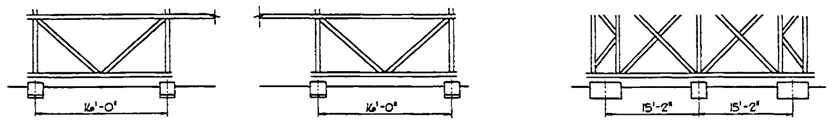
FOR TOWER HEIGHTS UNDER 36'

FOR TOWER HEIGHTS 36' AND HIGHER

STEEL SPANS

PLAN OF CONCRETE PEDESTALS

NO SCALE



TIMBER SPANS

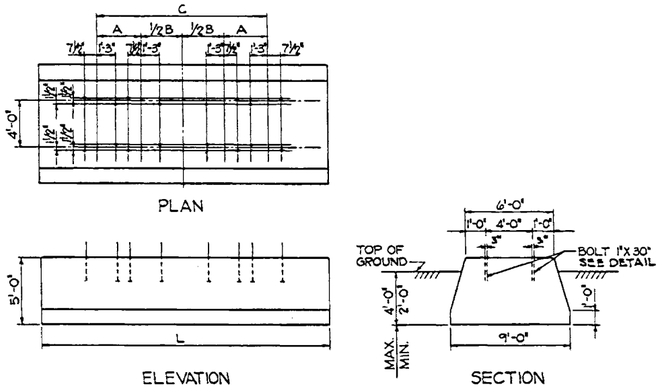
STEEL SPANS

LONGITUDINAL ELEVATIONS

NO SCALE

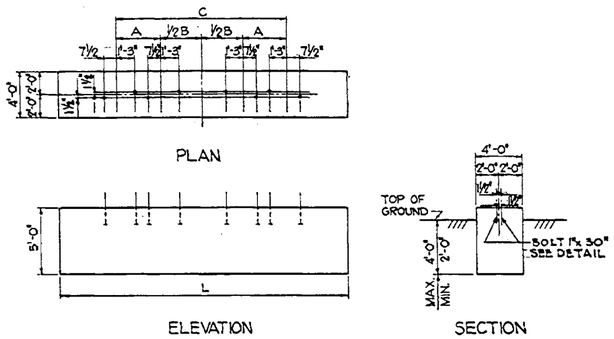
CONCRETE PEDESTALS

	HEIGHT OF TOWER	A	B	C	TIMBER SPANS	STEEL SPANS 50', 45', DOUBLE BENT	STEEL SPANS 50', 45', SINGLE BENT	STEEL SPANS 30', 25', DOUBLE BENT	STEEL SPANS 30', 25', SINGLE BENT
1	13'-4"	3'-5½"	4'-11¾"	11'-10¾"	F 99	F 86	F 99	F 92	F 99
2	14'	3'-9½"	5'-2"	12'-9"	F 99	F 85	F 97	F 91	F 97
	18'	4'-0½"	5'-4"	13'-5"					
	20'	4'-3½"	5'-6"	14'-1"					
	22'	4'-6½"	5'-8"	14'-9"					
	24'	4'-9½"	5'-10"	15'-5"					
	25'-10"	5'-0¼"	6'-0¼"	16'-0¾"					
3	28'	5'-3½"	6'-2"	16'-9"	F 98	F 84	F 96	F 90	F 96
	30'	5'-6½"	6'-4"	17'-5"					
	32'	5'-9½"	6'-6"	18'-1"					
	34'	6'-0½"	6'-8"	18'-9"					
	36'	6'-3½"	6'-10"	19'-5"	F 103				
	38'-4"	6'-7"	7'-0¼"	20'-2¾"					
4	40'	6'-9½"	7'-2"	20'-9"	F 103	F 83	F 95	F 89	F 95
	42'	7'-0½"	7'-4"	21'-5"					
	44'	7'-3½"	7'-6"	22'-1"	F 102				
	46'	7'-6½"	7'-8"	22'-9"					
	48'	7'-9½"	7'-10"	23'-5"					
	50'-10"	8'-1¾"	8'-11¼"	24'-4¾"					
5	53'	8'-5"	8'-3"	25'-1"	F 102	F 82	F 94	F 88	F 94
	55'	8'-8"	8'-5"	25'-9"					
	57'	8'-11"	8'-7"	26'-5"					
	59'	9'-0"	8'-9"	27'-1"					
	61'	9'-3"	8'-11"	27'-9"	F 101				
	63'-4"	9'-8½"	9'-1¾"	28'-6¾"					
6	65'	9'-1"	9'-3"	29'-1"	F 101	F 81	F 93	F 87	F 93
	67'	10'-2"	9'-5"	29'-9"					
	69'	10'-5"	9'-7"	30'-5"					
	71'	10'-8"	9'-9"	31'-1"					
	73'	10'-11"	9'-11"	31'-9"					
	75'-10"	11'-3¼"	10'-2½"	32'-8¾"					



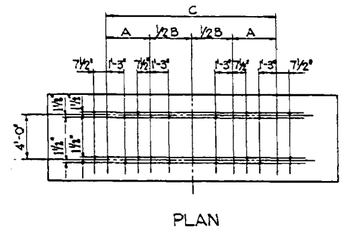
PEDESTALS F 81, F 82, F 83, F 84, F 85, F 86

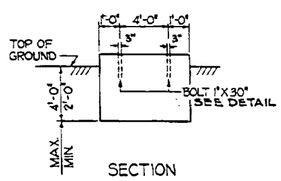
NO SCALE



PEDESTALS F 93, F 94, F 95, F 96, F 97, F 98, F 99

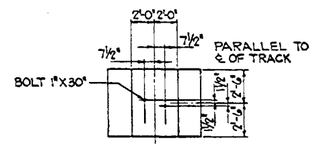
NO SCALE

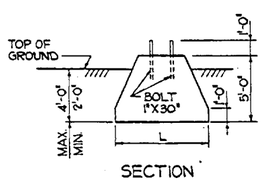




PEDESTALS F 87, F 88, F 89, F 90, F 91, F 92

NO SCALE



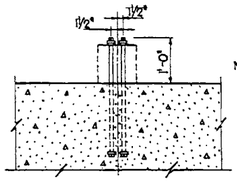


PEDESTALS F 101, F 102, F 103

NO SCALE

TABLE OF DIMENSIONS AND CONCRETE QUANTITY FOR ONE PEDESTAL

FOOTING MARK	FACILITY NUMBER	L	CONCRETE CUBIC YARDS PER FOOTING
F 81	861811	36'-0"	52
F 82	861812	32'-0"	46
F 83	861813	29'-0"	42
F 84	861814	26'-0"	38
F 85	861815	23'-0"	33
F 86		20'-0"	29
F 87	861816	36'-0"	40
F 88	861817	32'-0"	36
F 89	861818	29'-0"	32
F 90	861819	26'-0"	29
F 91	861820	23'-0"	26
F 92	861821	20'-0"	22
F 93	861822	36'-0"	27
F 94	861823	32'-0"	24
F 95	861824	29'-0"	22
F 96	861825	26'-0"	19
F 97	861826	23'-0"	17
F 98	861827	22'-0"	16
F 99	861828	20'-0"	15
F 101	861829	8'-0"	5.9
F 102	861830	7'-0"	5.4
F 103	861831	6'-0"	4.8



NOTE:
TYPICAL FOR ALL CONCRETE PEDESTALS FOR ALL FRAMED TIMBER TOWERS

ANCHOR BOLT DETAIL

SCALE NO. 5

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-18	CONCRETE PEDESTALS	2 OF 4
86-15	SINGLE TRACK TIMBER TOWERS	1&2 OF 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3'

NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: VASS
TRACED BY:
CHECKED BY: PENDLETON
SUBMITTED BY: C. W. DEICHMANN
APPROVED: DATE:
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS

RAILROAD BRIDGE SUBSTRUCTURES
CONCRETE PEDESTAL FOUNDATIONS
FOR
TIMBER TOWERS

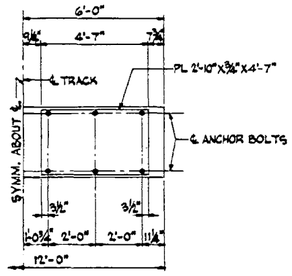
UNDER REVISION

APPROVED: DATE: 18 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

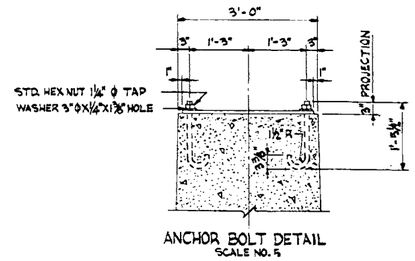
APPROVED FOR PROPONENT AGENCY:

DATE

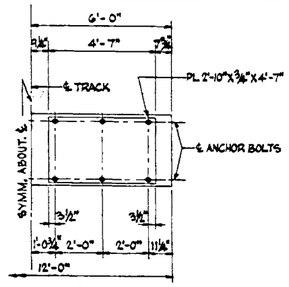
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 2 OF 4
86-18



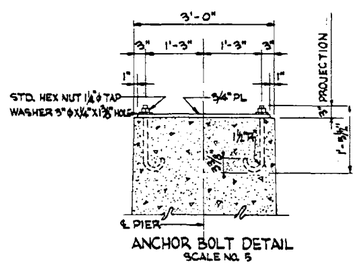
PLAN
SCALE NO. 3



ANCHOR BOLT DETAIL
SCALE NO. 5



PLAN
SCALE NO. 3

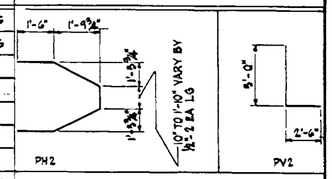


ANCHOR BOLT DETAIL
SCALE NO. 5

REINFORCING SCHEDULE FOR FACILITY NO. 861841

MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION
PF	12	1" ϕ	19'-1"		FOOTING
PF1	36	1⅛" ϕ	14'-1"		FOOTING
PH	36	½" ϕ	11'-6" TO 14'-8"		STEM
PH1	36	½" ϕ	2'-6" TO 4'-7"		STEM
PH2	48	½" ϕ	8'-6" TO 9'-6"	1"	NOSING
PV	44	1" ϕ	50'-9"		STEM
PV1	8	1" ϕ	23'-9"		NOSING
PV2	52	1" ϕ	7'-4"	4"	FOOTING

BENDING DIAGRAMS

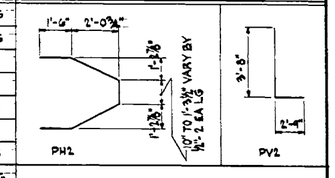


PH 11'-6" TO 14'-8" VARY BY 1⅛"-2 EA LG
PH1 2'-6" TO 4'-7" VARY BY ¾"-2 EA LG
PH, PH1

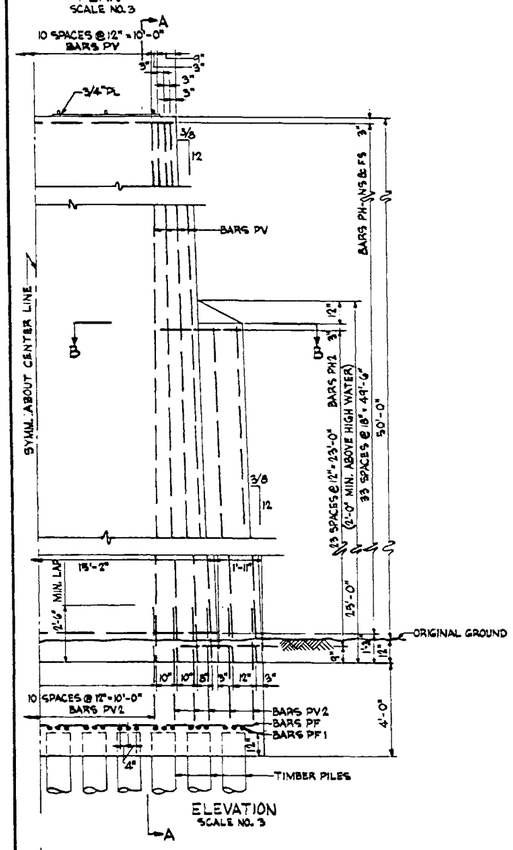
REINFORCING SCHEDULE FOR FACILITY NO. 861840

MARK	NO.	SIZE	LENGTH	BENDING RADIUS	LOCATION
PF	24	1" ϕ	9'-3"		FOOTING
PF1	8	1" ϕ	18'-6"		FOOTING
PH	36	½" ϕ	11'-6" TO 13'-1"		STEM
PH1	36	½" ϕ	2'-6" TO 3'-7"		STEM
PH2	24	½" ϕ	8'-7" TO 9'-0"	1"	NOSING
PV	34	¾" ϕ	26'-9"		STEM
PV1	8	¾" ϕ	11'-9"		NOSING
PV2	42	¾" ϕ	6'-4"	2⅛"	FOOTING

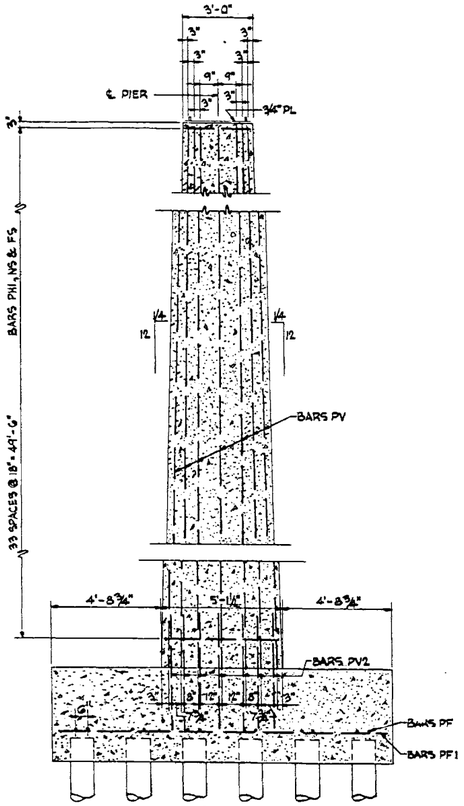
BENDING DIAGRAMS



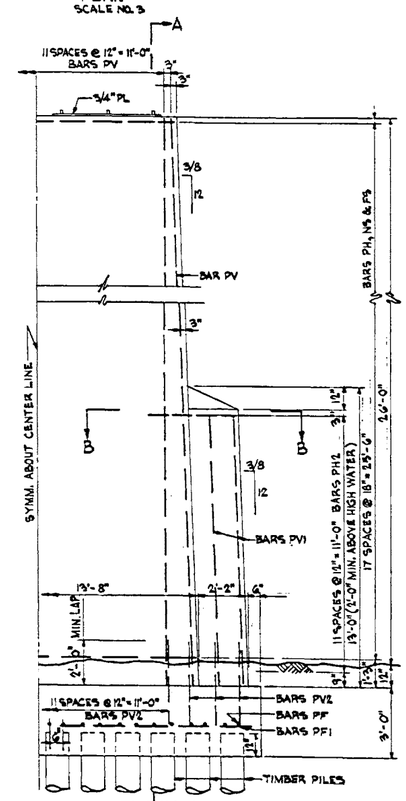
PH 11'-6" TO 13'-1" VARY BY 1⅛"-2 EA LG
PH1 2'-6" TO 3'-7" VARY BY ¾"-2 EA LG
PH, PH1



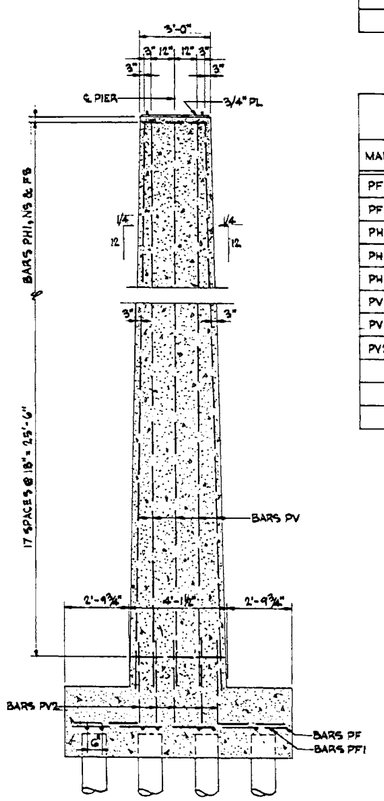
ELEVATION
SCALE NO. 3



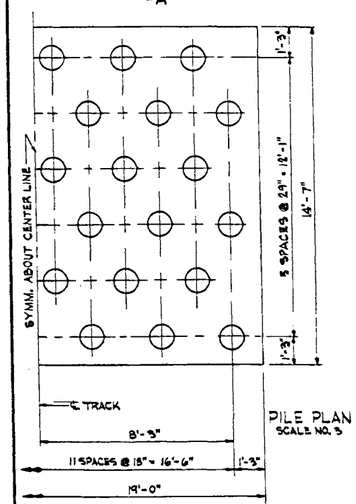
SECTION A-A
SCALE NO. 3



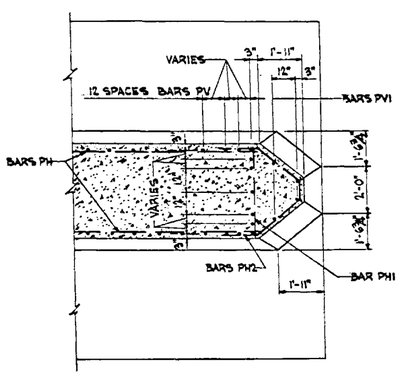
ELEVATION
SCALE NO. 3



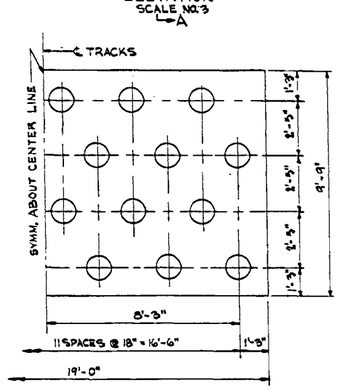
SECTION A-A
SCALE NO. 3



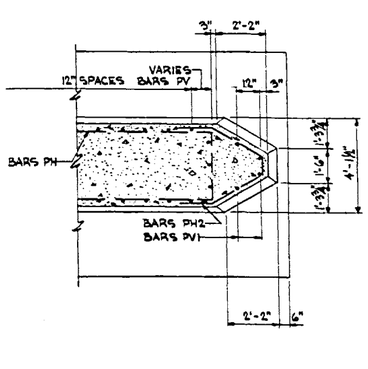
PILE PLAN
SCALE NO. 3



SECTION B-B
SCALE NO. 3



PILE PLAN
SCALE NO. 3



SECTION B-B
SCALE NO. 3

50 FT HIGH PIER ON 36 TIMBER PILES
FACILITY NO. 861841

26 FT HIGH PIER ON 24 TIMBER PILES
FACILITY NO. 861840

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5' NO. 3
0 1' 2' 3' NO. 5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

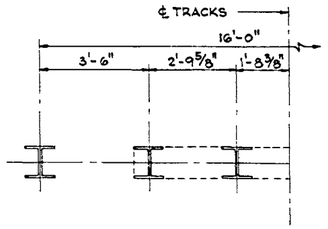
DRAWN BY: CASSEL
TRACED BY:
CHECKED BY: EDWARDS
SUBMITTED BY: E. W. DEICHMANN

THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURES
SINGLE TRACK CONCRETE PIER
20 FT MAXIMUM COMBINED SPANS
25FT & 50FT HIGH ON TIMBER PILES

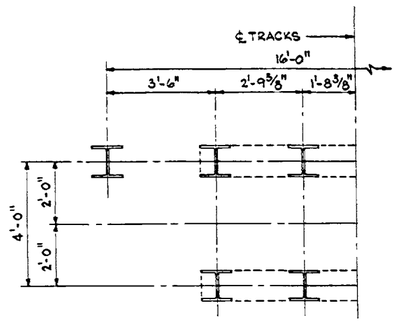
UNDER REVISION

APPROVED: H. M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE

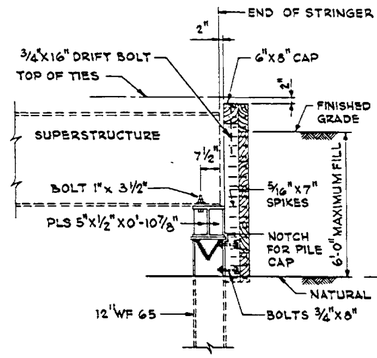
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-18
SHEET 3 OF 4



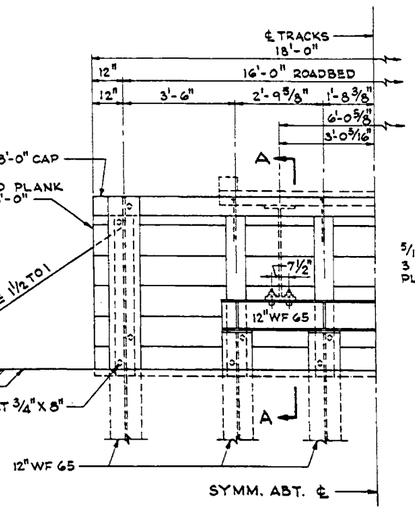
PLAN OF PILE ARRANGEMENT



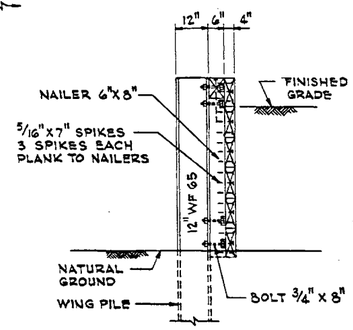
PLAN OF PILE ARRANGEMENT



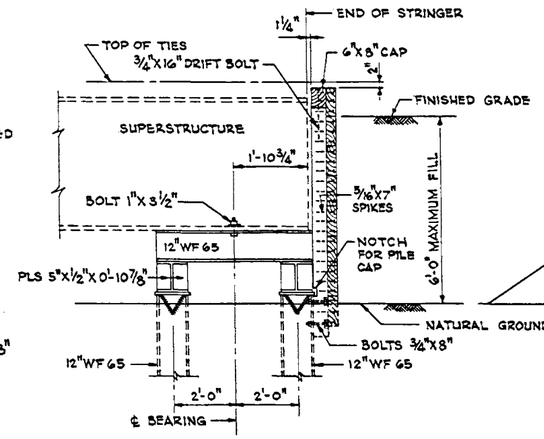
SECTION A-A



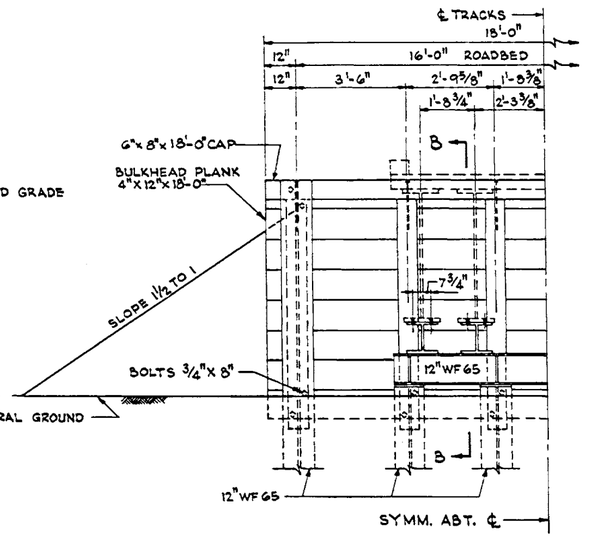
TRANSVERSE ELEVATION



TYPICAL
END ELEVATION



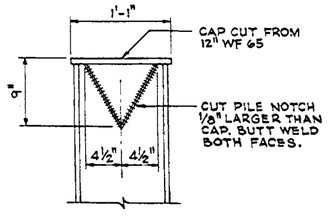
SECTION B-B



TRANSVERSE ELEVATION

DUMP BENT - 4 BEARING & 2 WING STEEL PILES
50FT MAX. STEEL SPAN
SCALE NO. 4
FACILITY NO. 861851

DUMP BENT - 8 BEARING & 2 WING STEEL PILES
100FT. MAX. STEEL SPAN
SCALE NO. 4
FACILITY NO. 861850



PILE CAP DETAIL
SCALE NO. 7

GENERAL NOTES

1. ALL WELDS ARE ¼" FILLET WELDS UNLESS OTHERWISE NOTED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO.4
0 3" 6" 9" 1' 2' NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: R.W. DEICHMANN
APPROVED: (CHIEF, STRUCTURES BRANCH)

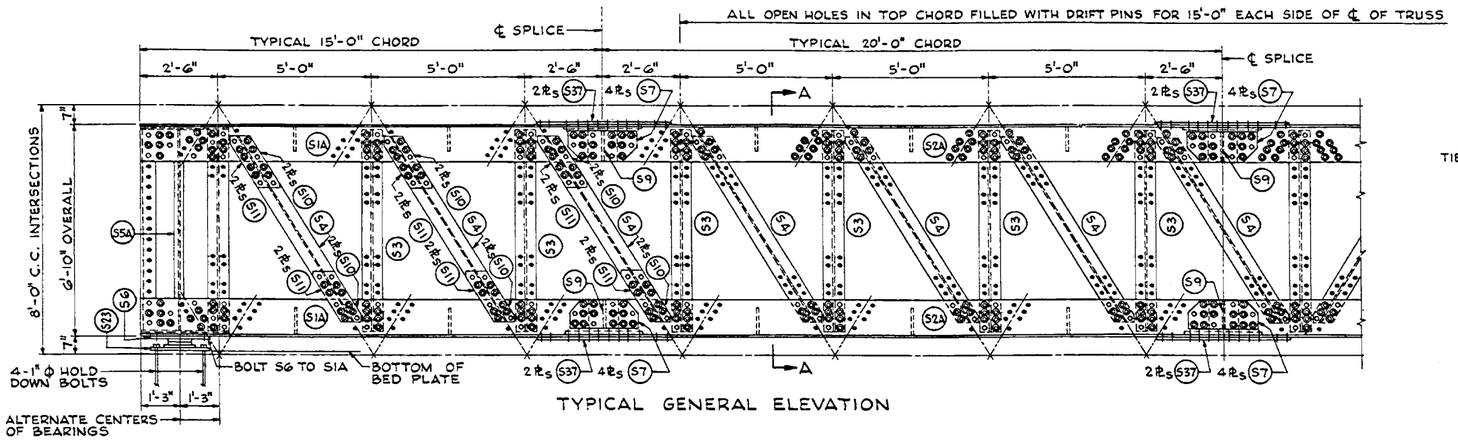
THEATER OF OPERATIONS
RAILROAD BRIDGE SUBSTRUCTURE
SINGLE TRACK DUMP BENT
50FT & 100FT SPANS
STEEL PILES

UNDER REVISION

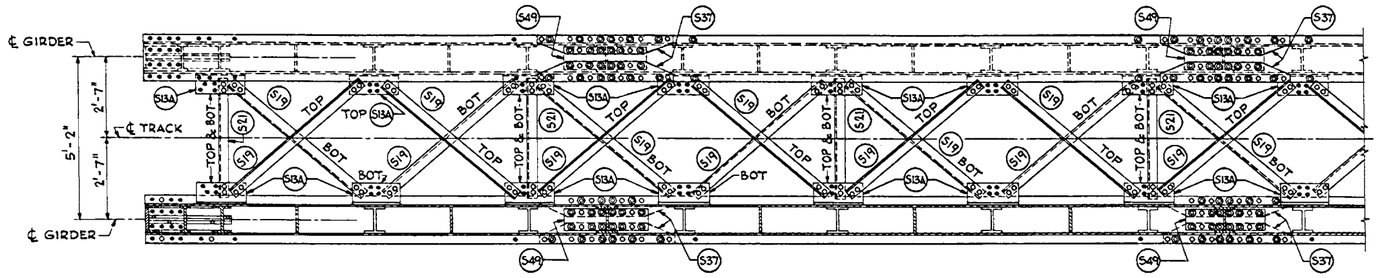
APPROVED: H.M. Williams (CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.) DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE

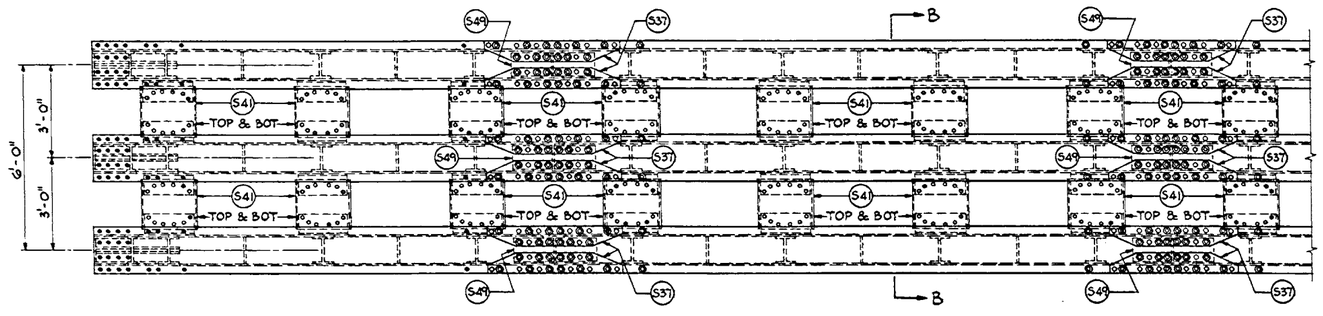
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-18
SHEET 4 OF 4



TYPICAL GENERAL ELEVATION



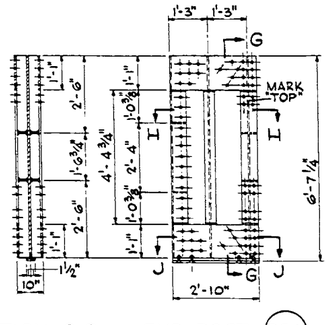
TWO GIRDER — HALF PLAN
HALF SECTIONAL PLAN



THREE GIRDER PLAN

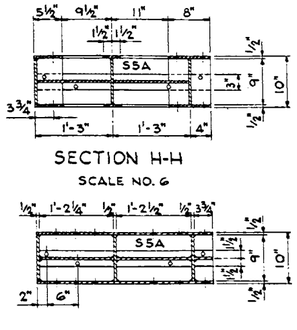
TYPICAL TWO & THREE GIRDER DECK-TYPE ASSEMBLIES

SCALE NO. 4



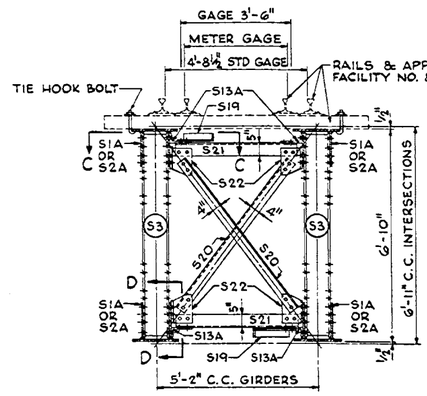
SECTION G-G
SCALE NO. 4

END POST S5A
SCALE NO. 4

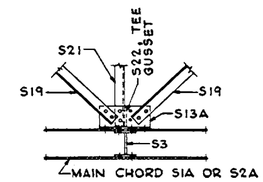


SECTION H-H
SCALE NO. 6

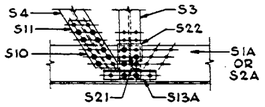
SECTION J-J
SCALE NO. 6



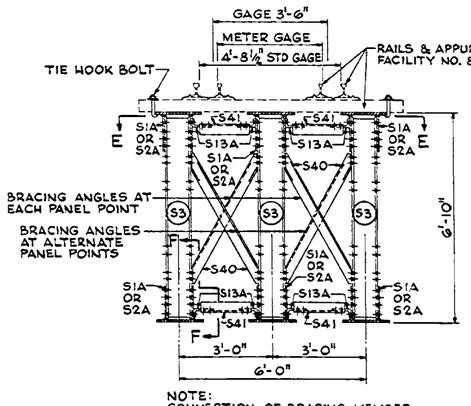
SECTION A-A
SCALE NO. 4



SECTION C-C
SCALE NO. 4

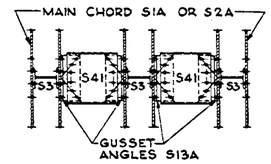


SECTION D-D
SCALE NO. 4

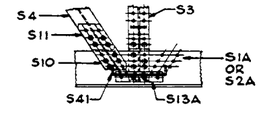


NOTE:
CONNECTION OF BRACING MEMBER S40 TO POST SHALL BE MADE WITH 2 DRIFT PINS & 2-1" BOLTS.

SECTION B-B
SCALE NO. 4



SECTION E-E
SCALE NO. 4



SECTION F-F
SCALE NO. 4

KEY TO SYMBOLS

- • INDICATES OPEN HOLE
- ○ INDICATES 1-IN BOLT
- ⊛ INDICATES DRIFT PIN

GENERAL NOTES

1. THE BRIDGE SETS SHOWN ARE LIMITED STANDARD AND ARE TO BE USED UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCKS ARE EXHAUSTED. NO ADDITIONAL SETS WILL BE PURCHASED.
2. REFER TO DWG. NO. 86-19 SHEET 2 OF 9 FOR FACILITY NUMBERS.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-19	UNIT CONSTRUCTION-DECK TYPE TYP. 2 GIRDER & 3 GIRDER PLANS	1 OF 9
86-19	UNIT CONSTRUCTION - THRU TYPE TYP. 2 GIRDER & 4 GIRDER PLANS	2 OF 9
86-19	UNIT CONSTRUCTION-DECK TYPE & THRU TYPE - DETAILS	3 OF 9

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO. 4
0 1' 2' NO. 6

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

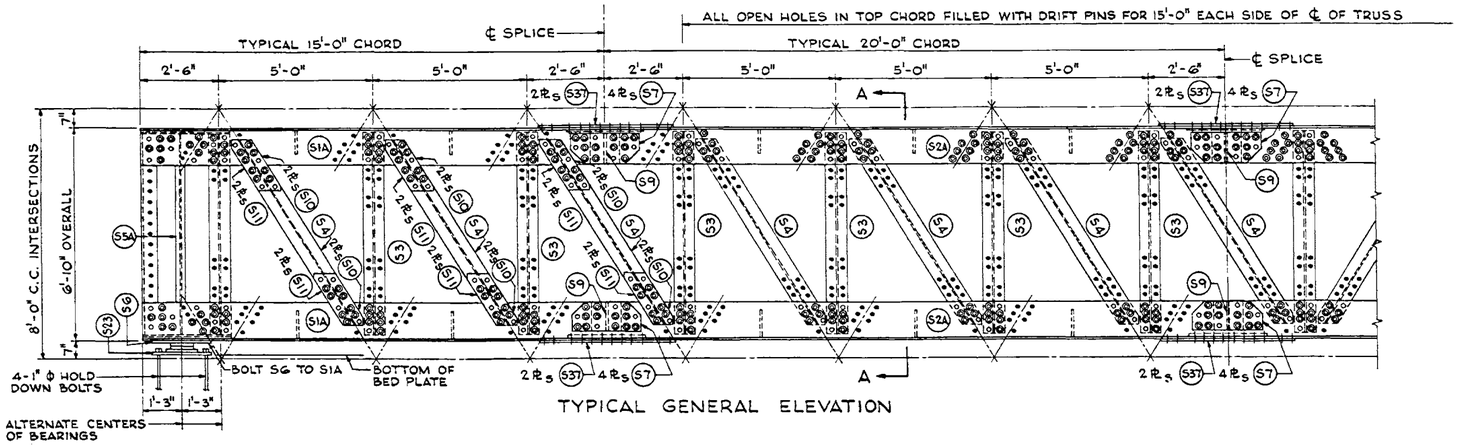
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: E.W. DEICHMANN
APPROVED:

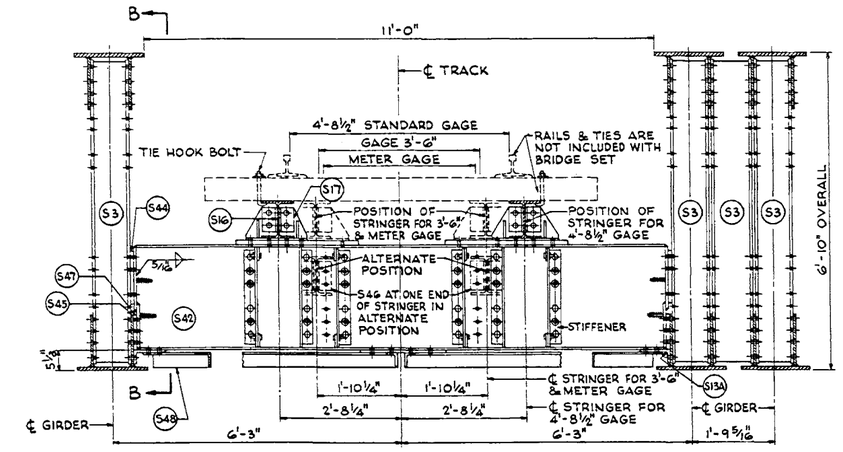
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
UNIT CONSTRUCTION-DECK TYPE
TYPICAL 2 GIRDER & 3 GIRDER
PLANS & DETAILS

UNDER REVISION

APPROVED: H. M. Williams DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-19
DATE
SHEET 1 OF 9

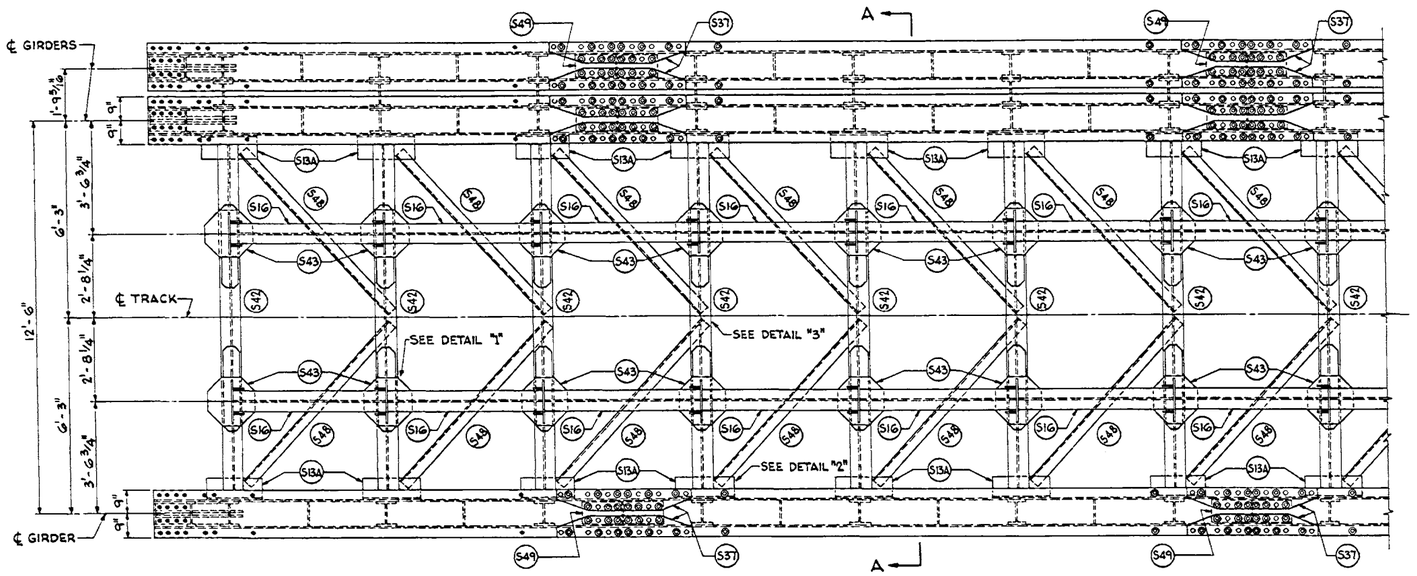


TYPICAL GENERAL ELEVATION



SECTION A-A

SCALE NO. 5

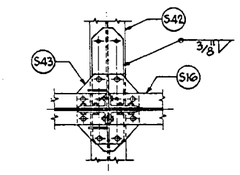


NOTE: STIFFENERS ON ALL FLOOR BEAMS SHALL FACE THE SAME DIRECTION.

HALF PLAN ABOVE ℄ SHOWS FOUR GIRDER THRU-ASSEMBLY
HALF PLAN BELOW ℄ SHOWS TWO GIRDER THRU-ASSEMBLY

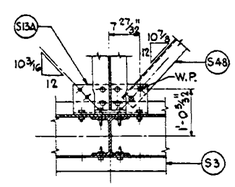
TYPICAL TWO & FOUR GIRDER THRU-TYPE ASSEMBLIES

SCALE NO. 4



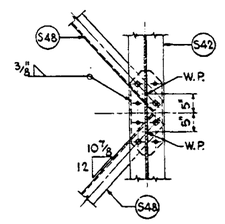
DETAIL "1"

SCALE NO. 5



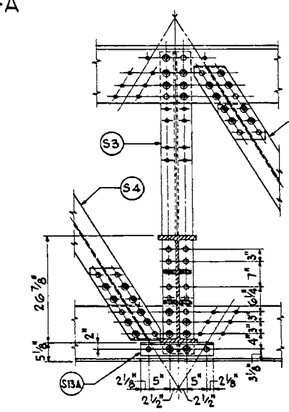
DETAIL "2"

SCALE NO. 5



DETAIL "3"

SCALE NO. 5



SECTION B-B

SCALE NO. 5

KEY TO SYMBOLS

- • INDICATES OPEN HOLE
- ○ INDICATES 1-IN BOLT
- ⊕ INDICATES DRIFT PIN
- ○ INDICATES SHOP BOLT

* IN ADDITION TO FACILITY SHOWN BELOW ADD 4 EACH, 20 FOOT CHORD SECTIONS, MARK S2A, FSN 5420-355-6576

** THE MATERIAL COMPRISING THESE FACILITIES IS OBSOLETE FOR ANY THEATER NOT HAVING PREPOSITIONED STOCKAGE OF UNIT CONSTRUCTION BRIDGES. NO MATERIAL IS AVAILABLE FOR SHIPMENT FROM CONUS OR INTERTHEATER.

GENERAL NOTES

1. THE BRIDGE SETS SHOWN ARE LIMITED STANDARD AND ARE TO BE USED UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCKS ARE EXHAUSTED. NO ADDITIONAL SETS WILL BE PURCHASED.

UNIT CONSTRUCTION RAILWAY BRIDGES-ARRANGEMENTS OF MEMBERS FOR VARIOUS TYPES AND SPAN LENGTHS

BRIDGE SPAN LENGTHS	50'	55'	60'	65'	70'	75'	80'	85'
CHORD SECTION ARRANGEMENTS	15'+20'+15'	20'+20'+15'	20'+20'+20'	15'+15'+15'+20'	15'+20'+20'+15'	20'+20'+20'+15'	20'+20'+20'+20'	20'+15'+15'+15'+20'
DECK TYPE TWO-GIRDER	861930	861930	861930*	861930	861930	861932**	NA	NA
THRU TYPE TWO-GIRDER	861931	861931	861931*	861931	861931	861933**	NA	NA
DECK TYPE THREE-GIRDER	NA	NA	NA	NA	NA	861934**	861936**	861938
THRU TYPE FOUR-GIRDER	NA	NA	NA	NA	NA	NA	861937**	861939**
C.TO C. OF BEARING POSSIBLE CHOICES	47'-6", 46'-3", 45'-0"	52'-6", 51'-3", 50'-0"	57'-6", 56'-3", 55'-0"	62'-6", 61'-3", 60'-0"	67'-6", 66'-3", 65'-0"	72'-6", 71'-3", 70'-0"	77'-6", 76'-3", 75'-0"	82'-6", 81'-3", 80'-0"

NA= NOT APPLICABLE

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

NO.4: 0 1' 2' 3' 4'

NO.5: 0 1' 2' 3'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: J.C.W. DEICHMANN
APPROVED:

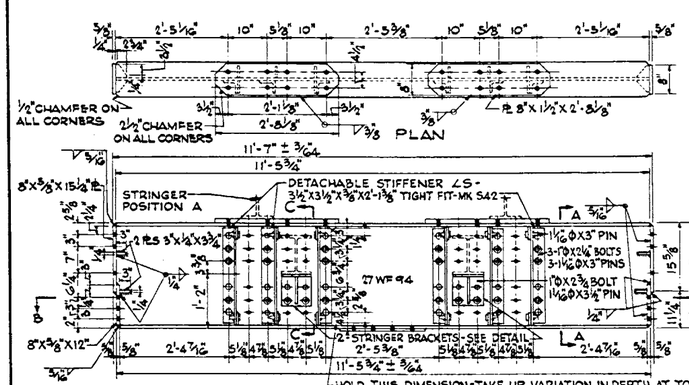
THEATER OF OPERATIONS

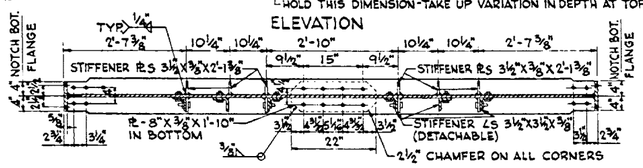
RAILROAD BRIDGE SUPERSTRUCTURES
UNIT CONSTRUCTION-THRU TYPE
TYPICAL 2 GIRDER & 4 GIRDER
PLANS & DETAILS

UNDER REVISION

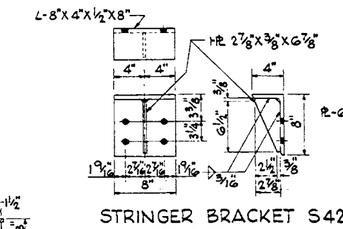
APPROVED: H.M. Williams DATE: 18 MAR 1963
CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR ENDORSEMENT AGENCY:
DATE

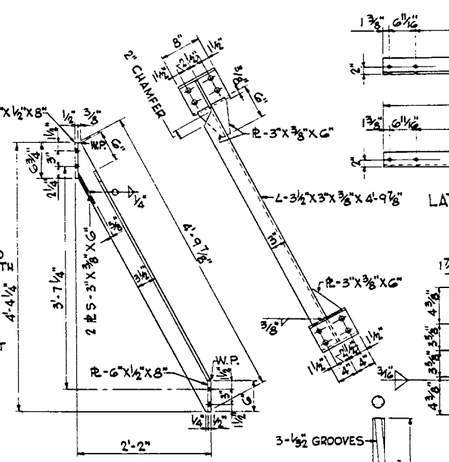
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-19
SHEET 2 OF 9

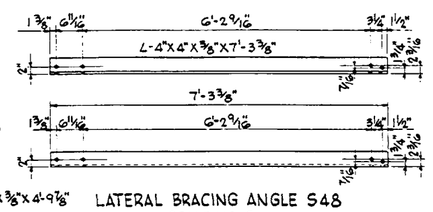


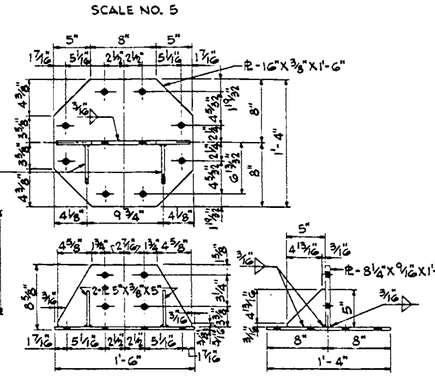


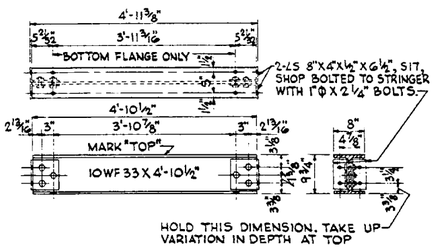
NOTE: STRINGER BRACKETS SECTION C-C & DETACHABLE STIFFENERS TO BE SHOP BOLTED TO FLOOR BEAM WITH 1" Φ BOLTS & 1 1/16" Φ DRIFT PINS AS SHOWN.

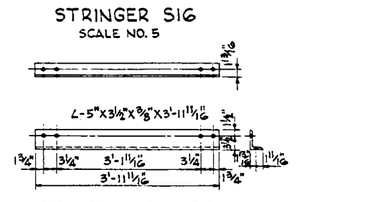


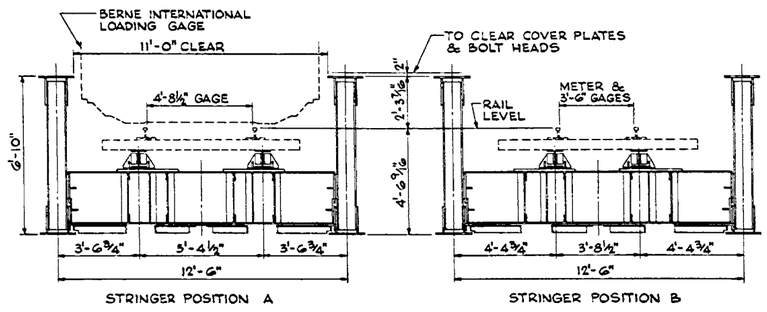


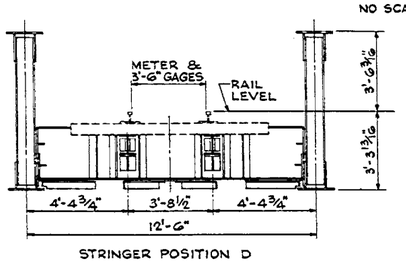


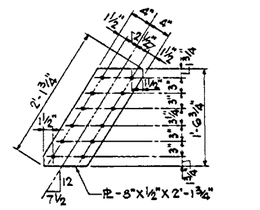


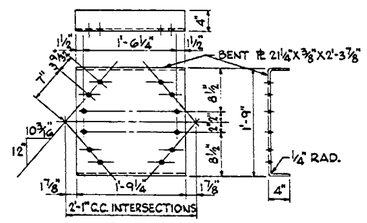


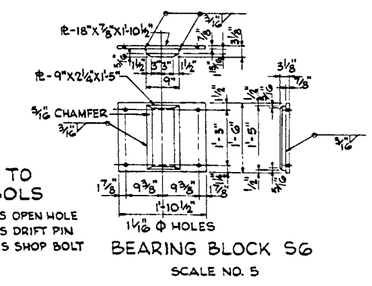




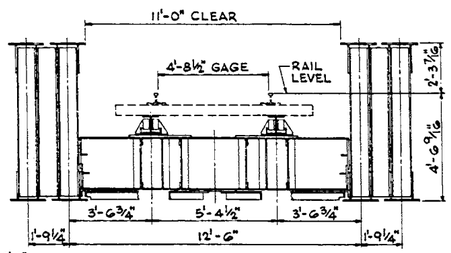




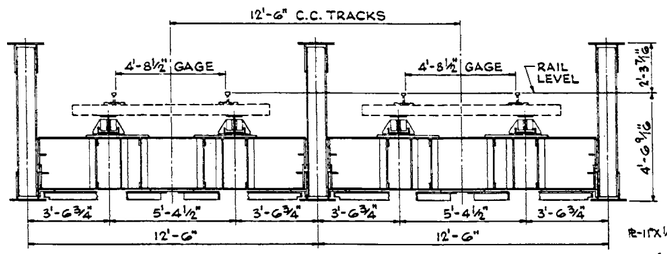




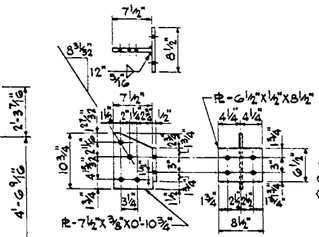
SINGLE-GIRDER THRU BRIDGES

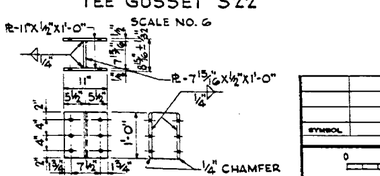


DOUBLE-GIRDER THRU BRIDGES



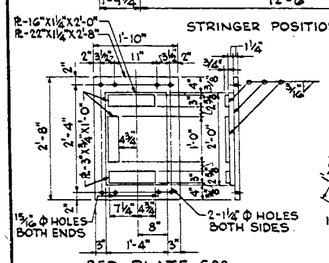
DOUBLE-TRACK THRU BRIDGES

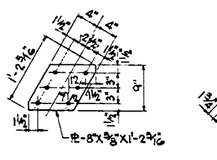


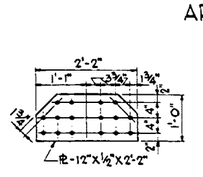


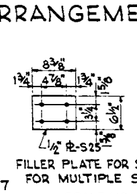
ARRANGEMENT OF STRINGERS

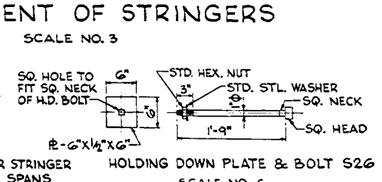
SCALE NO. 3

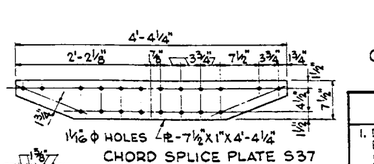


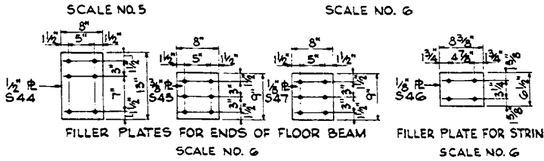


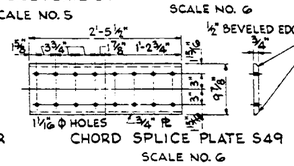


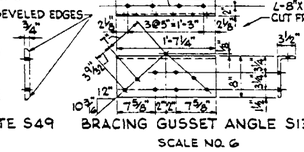


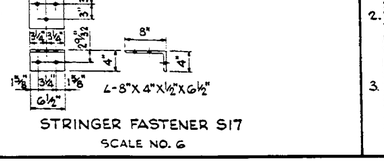












GENERAL NOTES

1. DOUBLE-TRACK THREE GIRDER TYPE BRIDGE FOR EMERGENCY USE ONLY. OPERATING CONTROL NECESSARY TO PREVENT MAXIMUM LOADS FROM PASSING OVER BOTH ROADS AT THE SAME TIME.
2. WHEN STRINGERS ARE TO BE FIXED TO WEBS OF FLOOR BEAM, FLOOR BEAMS MUST BE PLACED IN POSITION WITH WELDED STIFFENERS ALWAYS FACING IN THE SAME DIRECTION SO THAT STRINGERS MAY BE SWUNG INTO PLACE.
3. THE BRIDGE SETS SHOWN ARE LIMITED STANDARD AND ARE TO BE USED UNTIL SUPPLIES CURRENTLY EXISTING ARE EXHAUSTED. NO ADDITIONAL SETS WILL BE PURCHASED.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

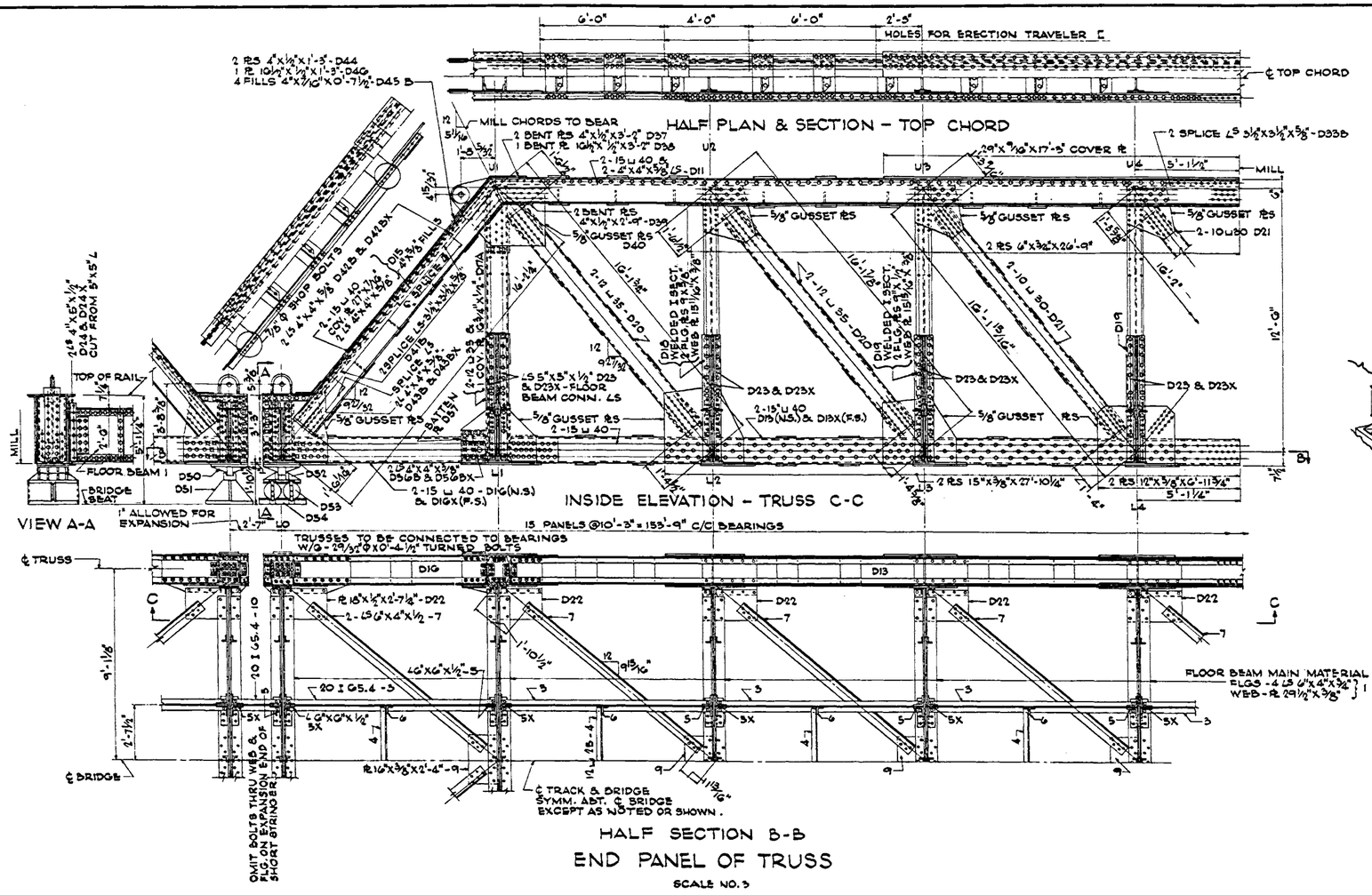
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

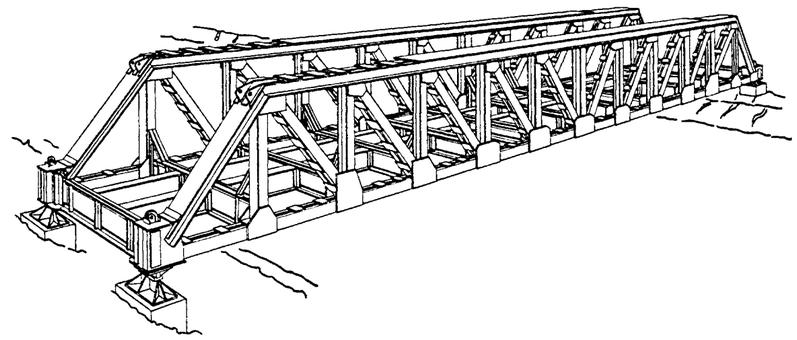
DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: W. DEICHMANN
APPROVED: H. M. Williams for
CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
UNIT CONSTRUCTION
DECK TYPE & THRU TYPE
DETAILS

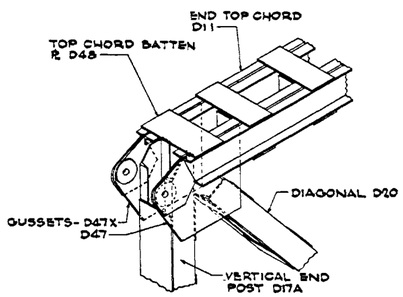
UNDER REVISION

APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-19
SHEET 3 OF 9

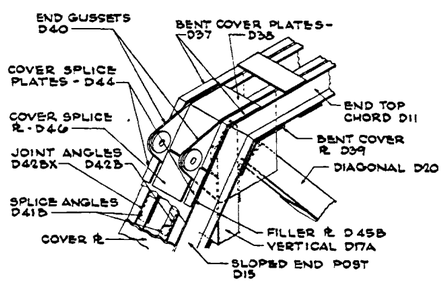




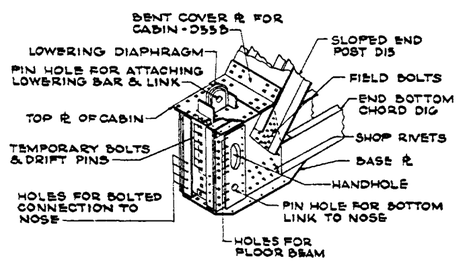
ASSEMBLED VIEW
NO SCALE



JOINT U1 - SHOWING CONNECTION USING VERTICAL END POST
NO SCALE



JOINT U1 - SHOWING ARRANGEMENT OF GUSSETS, SPLICE ℞S & ANGLES
NO SCALE



CABIN AT L0 - SHOWING LOWERING DIAPHRAGM & CONNECTIONS
NO SCALE

THROUGH TRUSS RAILWAY BRIDGE
ARRANGEMENT OF SECTIONS - VARIOUS SPAN LENGTHS

FACILITY	10'-3" PANELS	C. TO C. BEARINGS	END SECTION W/SLOPED END POST - 4½ EFFECTIVE PANELS	END SECTION W/VERTICAL END POST - 3½ EFFECTIVE PANELS	CENTER SECTION - 3 EFFECTIVE PANELS
861952	12	123'-0"	BOTH ENDS	0	1
861953	13	133'-3"	0	BOTH ENDS	2
861954	14	143'-6"	ONE END	ONE END	2
861955	15	153'-9"	BOTH ENDS	0	2

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-19	ASSEMBLED VIEW-DETAILS	4 OF 9
86-19	DETAILS	5 OF 9
86-19	DETAILS	6 OF 9
86-19	DETAILS	7 OF 9
86-19	DETAILS	8 OF 9
86-19	DETAILS	9 OF 9

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALE
0 1' 2' 3' 4' 5'
NO. 3

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

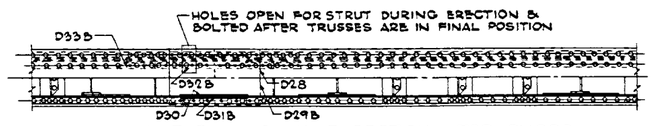
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: J.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH
APPROVED:
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1959
APPROVED FOR PROPONENT AGENCY:
DATE

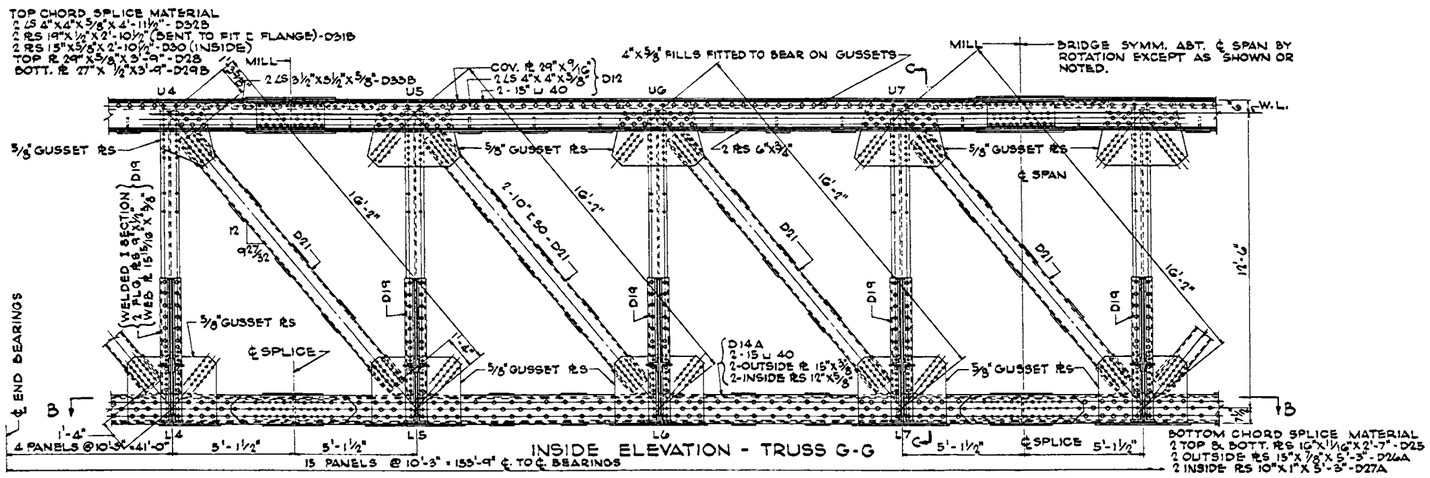
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURE
THROUGH TRUSS
VARIOUS SPANS
ASSEMBLED VIEW & DETAILS

UNDER REVISION

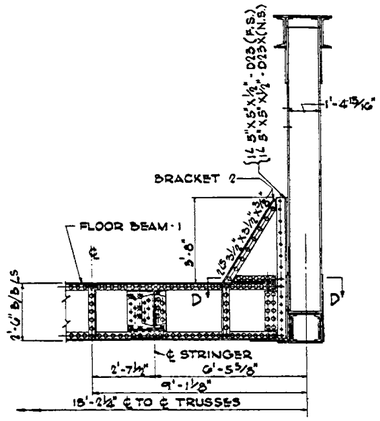
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-19
SHEET 4 OF 9



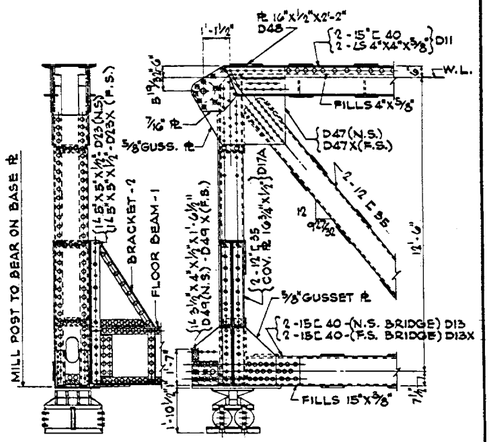
HALF PLAN & HALF SECTION - TOP CHORD



INSIDE ELEVATION - TRUSS G-G

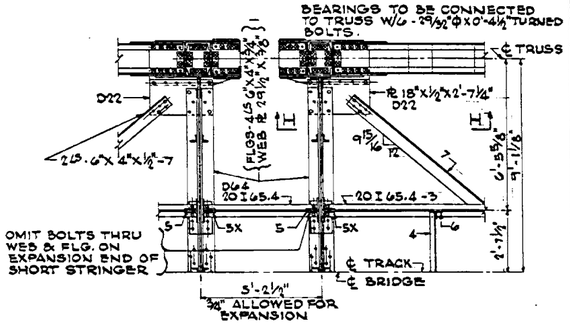


HALF SECTION C-C
SCALE NO. 3

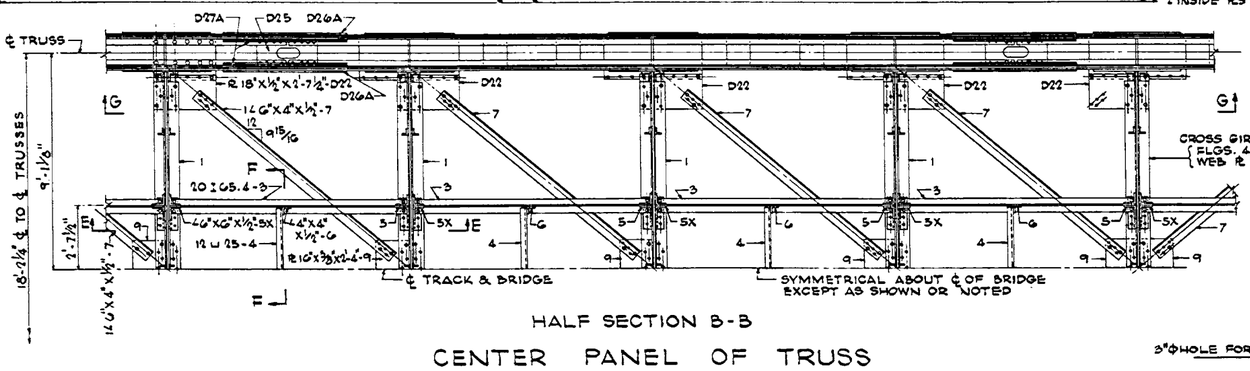


END VIEW

INSIDE ELEVATION OF VERTICAL END POST H-H



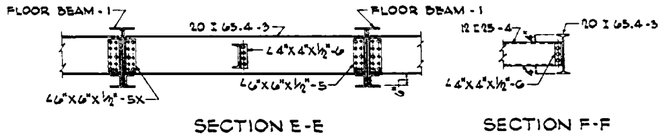
SECTION D-D
SCALE NO. 3



HALF SECTION B-B

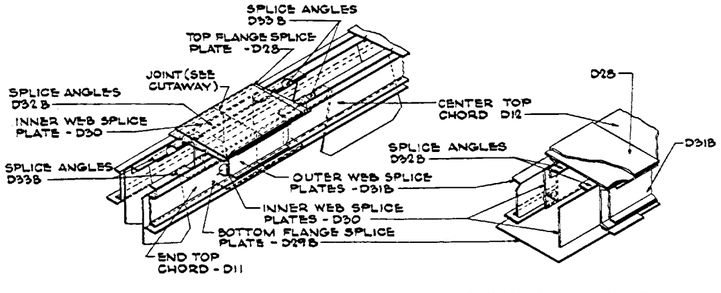
CENTER PANEL OF TRUSS

SCALE NO. 3



SECTION E-E
SCALE NO. 3

SECTION F-F
SCALE NO. 3

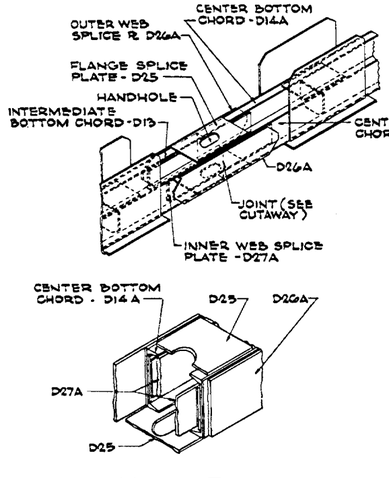


CUTAWAY AT JOINT

TOP CHORD SPLICE

SHOWING ARRANGEMENT OF SPLICE PLS & ANGLES

NO SCALE

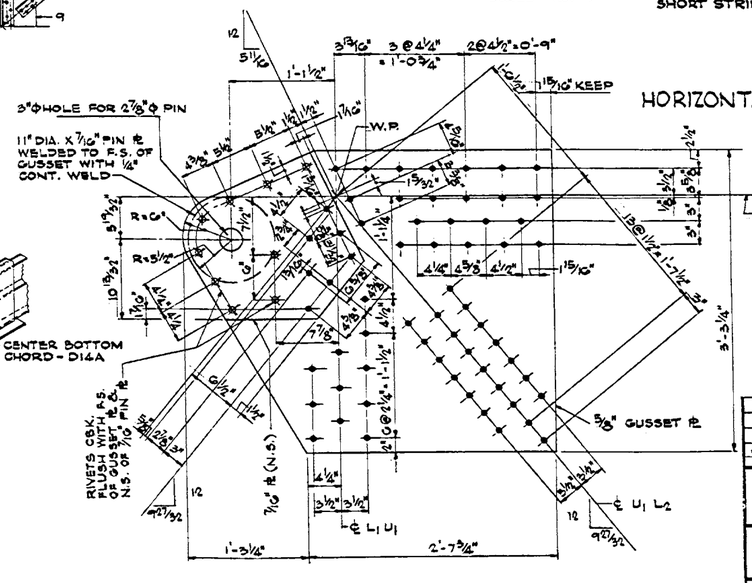


CUTAWAY AT JOINT

BOTTOM CHORD SPLICE

SHOWING ARRANGEMENT OF SPLICE PLS & ANGLES

NO SCALE



GUSSET PLATE AT U_1 FOR TRUSS WITH VERTICAL END POST - MARK D47 & D47X

SCALE NO. 7

HORIZONTAL SECTION THRU BOTTOM CHORD

SHOWING TWO ADJACENT SPANS WITH VERTICAL END POSTS

SCALE NO. 3

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES

0 1' 2' 3' 4' 5' NO. 3

0 3" 6" 9" 1' 2' NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURE THROUGH TRUSS DETAILS

UNDER REVISION

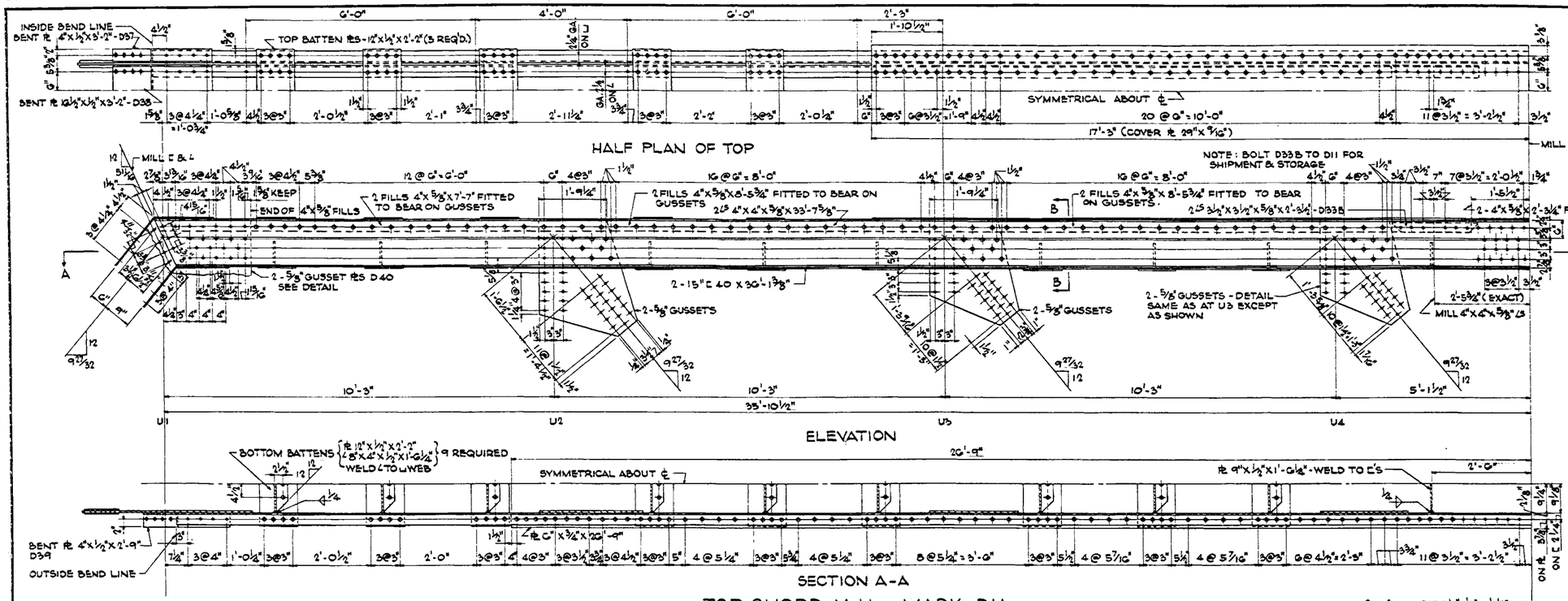
APPROVED: C.W. Deichmann for H.M. Williams — DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

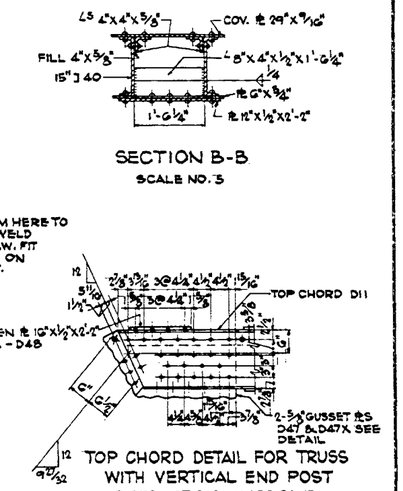
APPROVED FOR PROPONENT AGENCY:
DATE

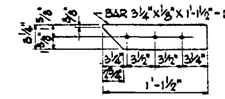
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 86-19
SHEET 5 OF 9

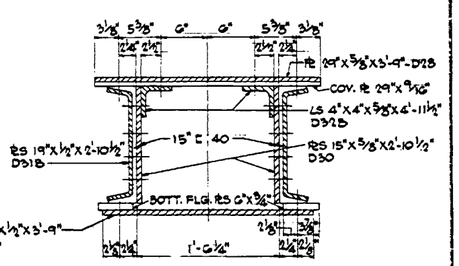
CORPS OF ENGINEERS

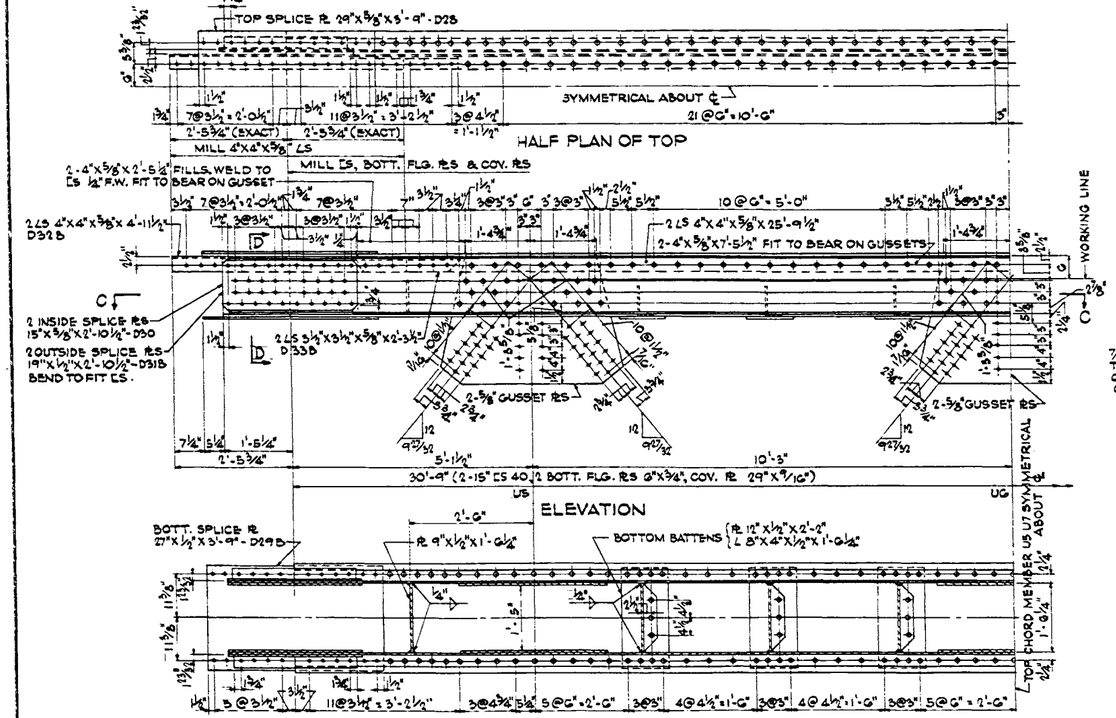
U. S. ARMY

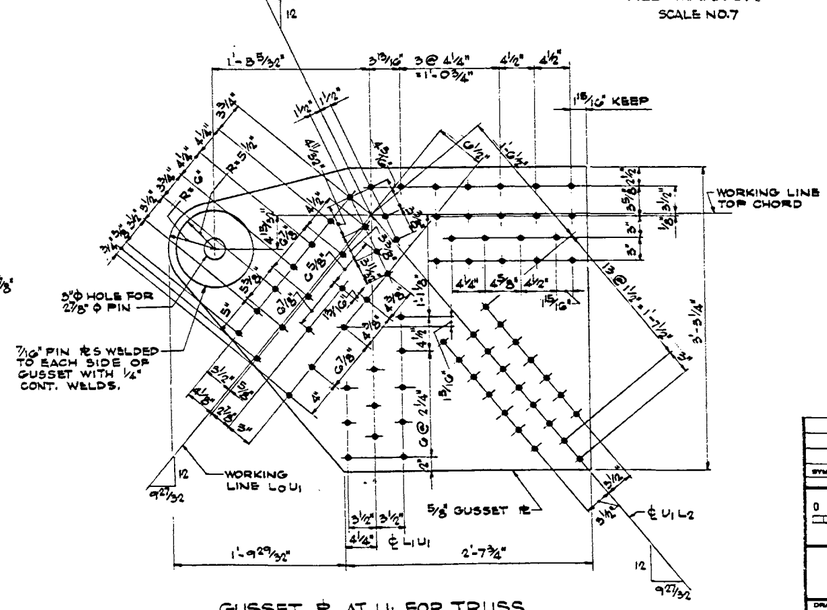


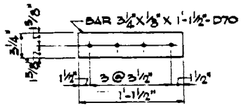












SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' — NO.5

0 3" 6" 9" 1' 2' — NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS-ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION: ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. E. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

RAILROAD BRIDGE SUPERSTRUCTURE
THROUGH TRUSS
DETAILS

UNDER REVISION

APPROVED: DATE: 19 MAR 1969

CHIEF, STRUCTURES BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED: FOR PROPONENT AGENCY:

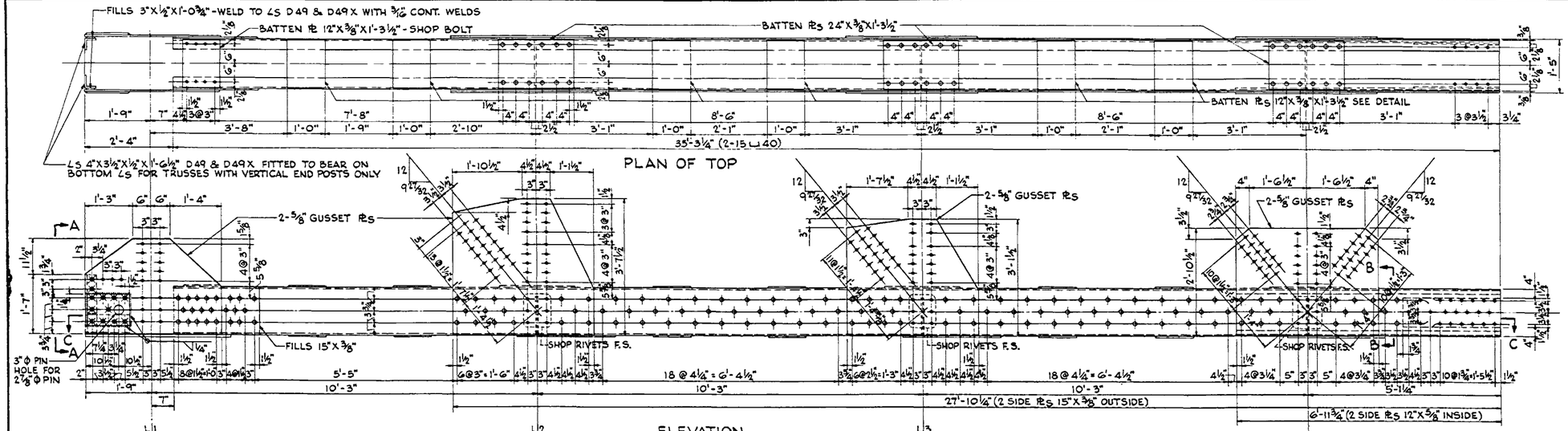
DATE

SCALE: AS NOTED

SPEC. NO.

DRAWING NUMBER: 86-19

SHEET 8 OF 9

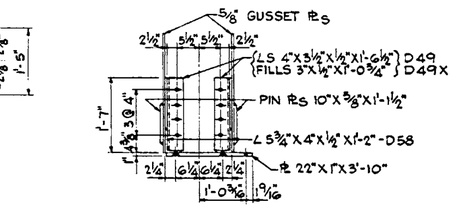


SECTION C-C

BOTTOM CHORD L1 L4 MARK D13 & D13X

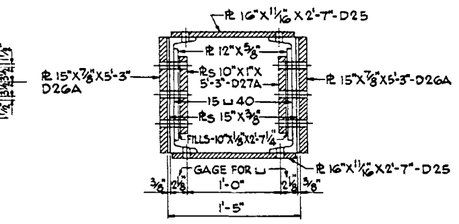
SCALE NO. 5

2-LS 4"X3½"X 1'-6½"
2-FILLS 3"X½"X1'-0¾" - D49 & D49X
2-LS 5½"X4"X½"X1'-2" - D58



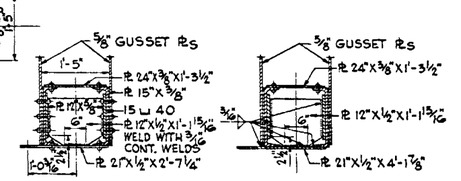
END VIEW A-A

SCALE NO. 5



SECTION E-E

SCALE NO. 7

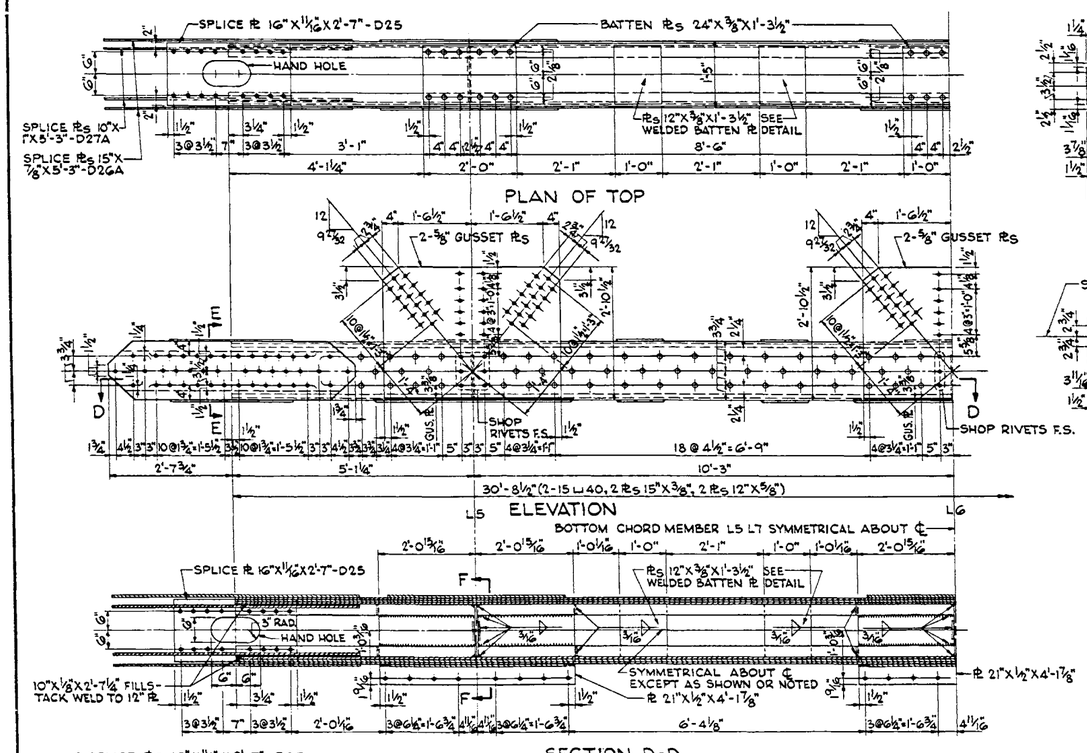


SECTION B-B

SCALE NO. 5

SECTION F-F

SCALE NO. 5

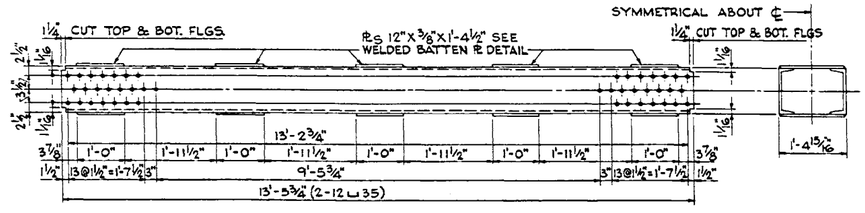


4 SPLICE PLS 16"X1½"X2'-7" - D25
4 SPLICE PLS 15"X⅞"X5'-3" - D26A
4 SPLICE PLS 10"X1"X5'-3" - D27A

SECTION D-D

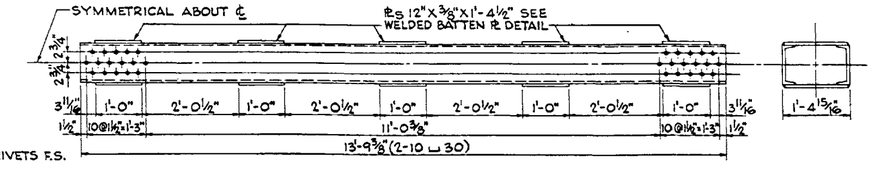
BOTTOM CHORD L5 L7 MARK D14A

SCALE NO. 5



DIAGONALS U1 L2 & U2 L3 MARK D20

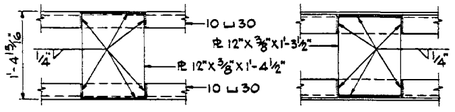
SCALE NO. 5



DIAGONALS L5 U4, L6 U5, L7 U6, L8 U7 ARE SAME AS L4 U3

DIAGONAL L4 U3 MARK D21

SCALE NO. 5



WELDED BATTEN PLATE DETAILS

SCALE NO. 6

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3'0 1' 2' 0 3" 6" 9" 1' 2'

NO.5 NO.6 NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: R.W. DEICHMANN

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURE THROUGH TRUSS DETAILS

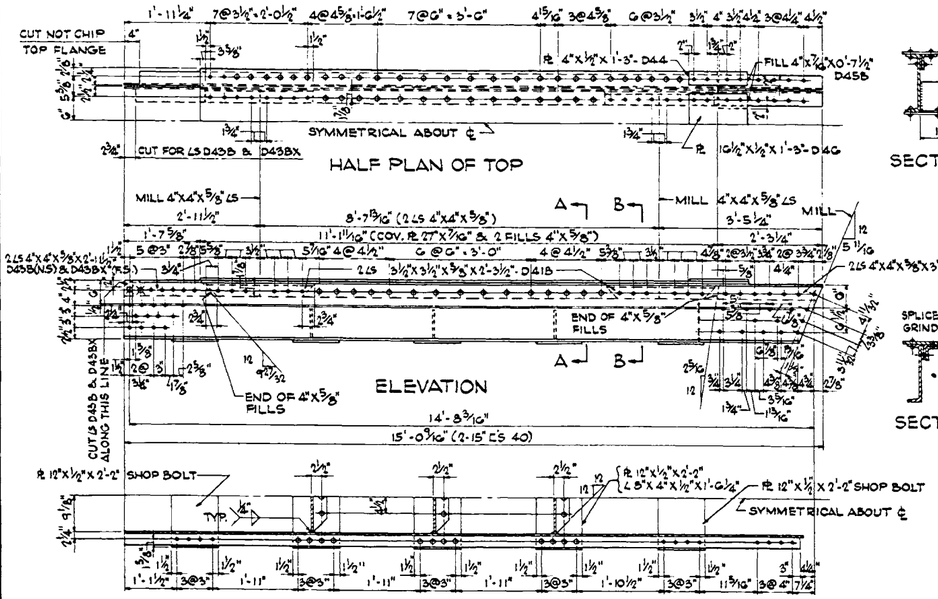
UNDER REVISION

APPROVED: H.M. Williams DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
CHIEF, STRUCTURES BRANCH

APPROVED FOR PROPONENT AGENCY:

DATE

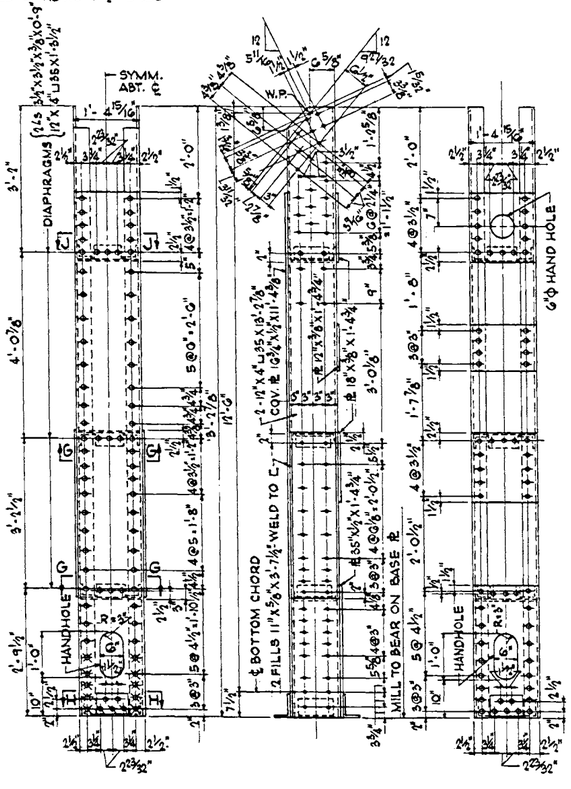
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-19
SHEET 7 OF 9



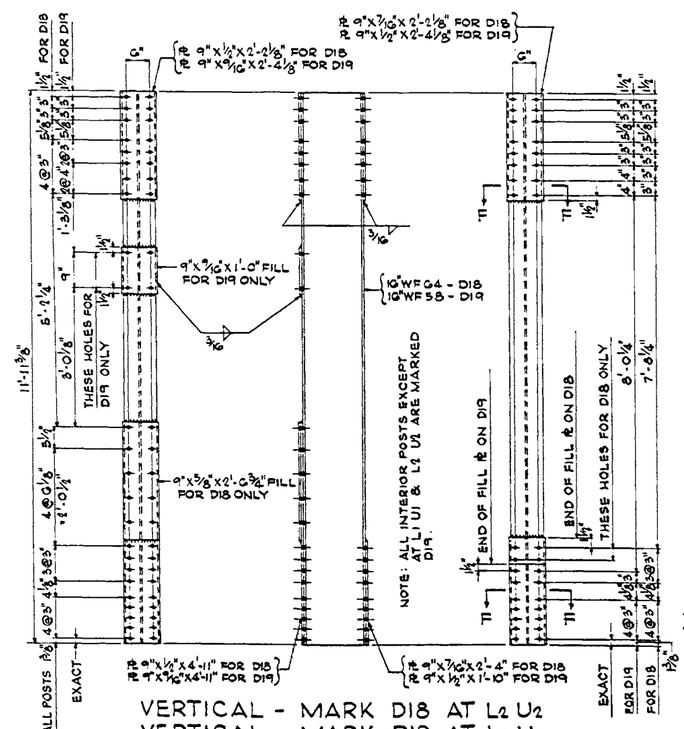
END POST Lo U1 - MARK D15

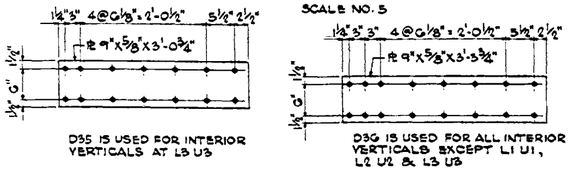
SCALE NO. 5

2 LS 4"X4"X5/16"X2'-11½" - D43B & D43BX
2 LS 4"X4"X5/16"X3'-5½" - D42B & D42BX
4 SPLICE LS 3½"X3½"X5/16"X2'-3½" - D41B
2 TOP SPLICE PS 4"X½"X1'-9" - D44
1 TOP SPLICE PL 10½"X½"X1'-3" - D46
4 FILLS 4"X7/16"X0'-7½" - D45B

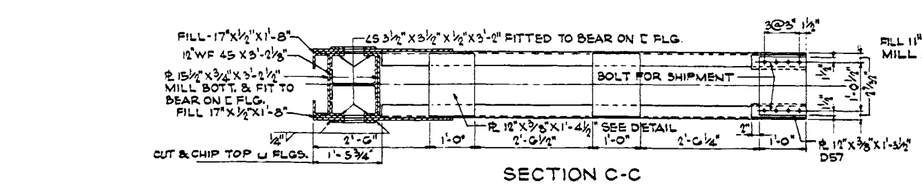


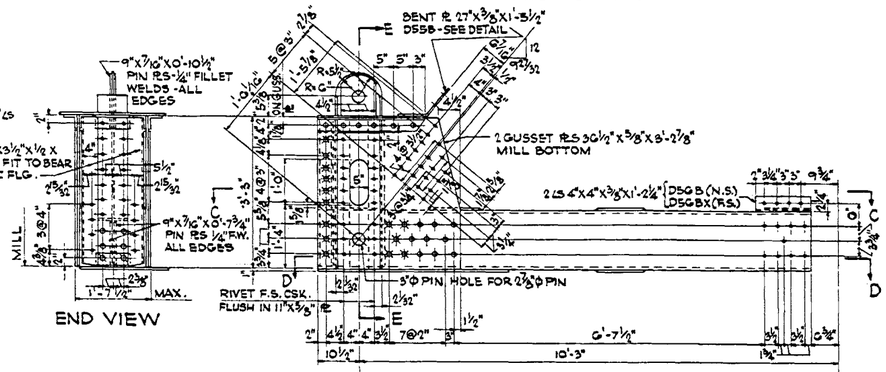
SCALE NO. 5

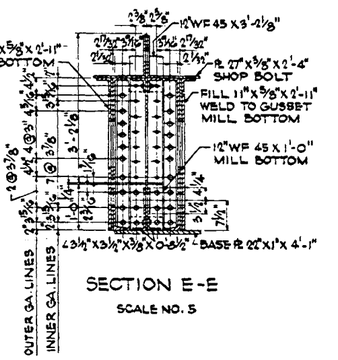


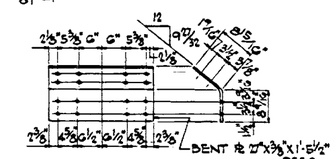


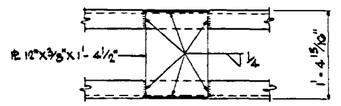
SCALE NO. 5

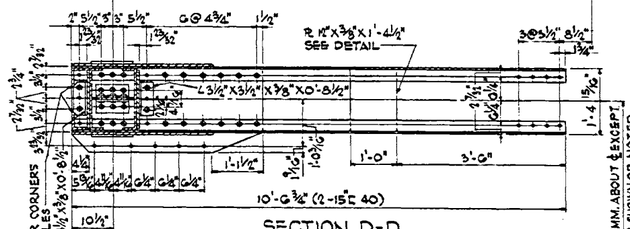


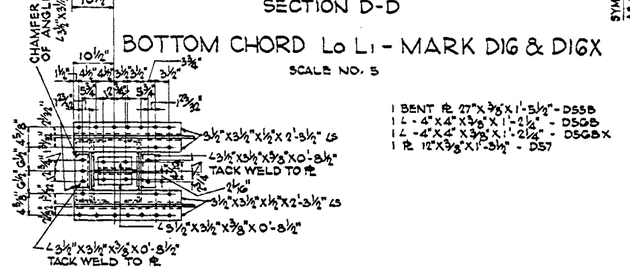


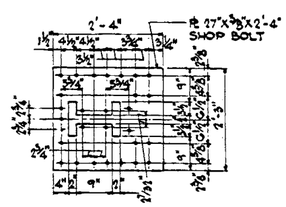


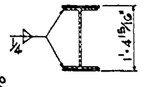


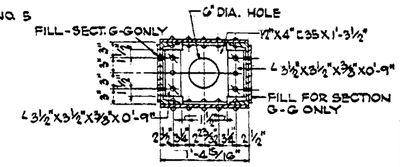


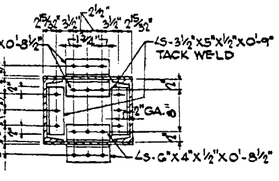












SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES: 0 1' 2' 3' NO. 5 — 0 1' 2' NO. 6

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

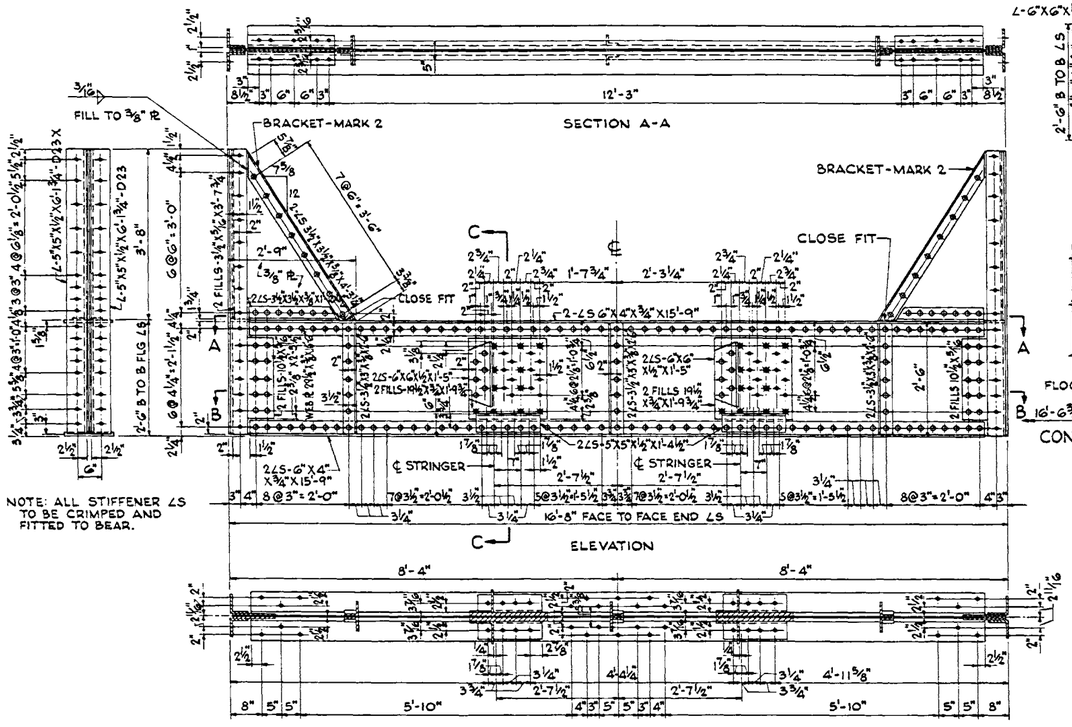
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: R. R. DEICHMANN
APPROVED: H. M. Williams — DATE: 19 MAR 1959
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:

THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURE
THROUGH TRUSS
DETAILS

UNDER REVISION

SCALE: AS NOTED — SPEC. NO.
DRAWING NUMBER: 86-19
DATE
SHEET 8 OF 9

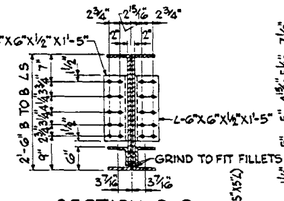


FOR INTERIOR BEAM:
2∠S-5"X5"X1/2"X6'-1 3/4"-D23
2∠S-5"X5"X1/2"X6'-1 3/4"-D23X
2 BRACKETS-MARK 2

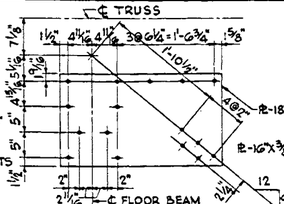
FOR END BEAM:
2∠S-5"X4"X1/2"X2'-10 1/2"-D24
2∠S-5"X4"X1/2"X2'-10 1/2"-D24X

FLOOR BEAM MARK 1

SCALE NO. 5

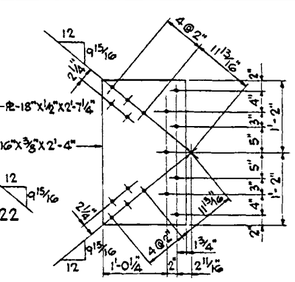


SCALE NO. 5



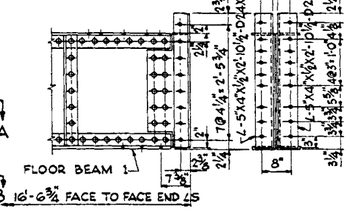
LATERAL PLATE MARK D22

SCALE NO. 6



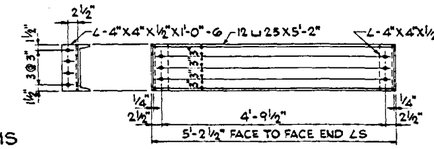
LATERAL PLATE MARK 9

SCALE NO. 6



CONNECTION ∠S FOR END FLOOR BEAMS

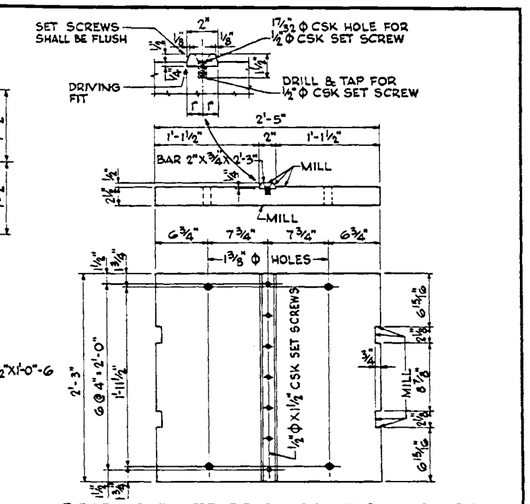
SCALE NO. 5



STRUT MARK 4

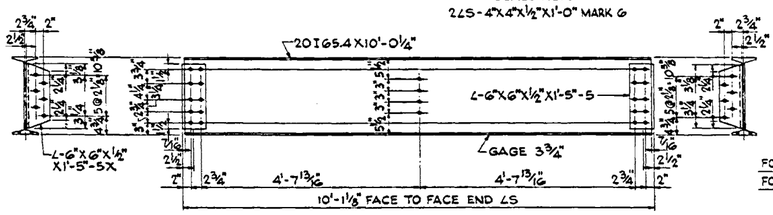
SCALE NO. 5

2∠S-4"X4"X1/2"X1'-0" MARK 6



BEARING PLATE BELOW ROLLERS MARK D54

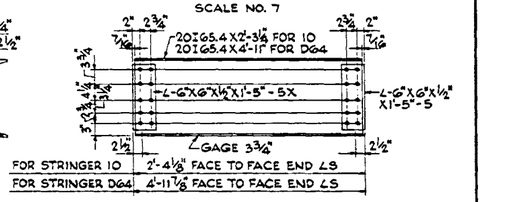
SCALE NO. 7



STRINGER MARK 3

SCALE NO. 5

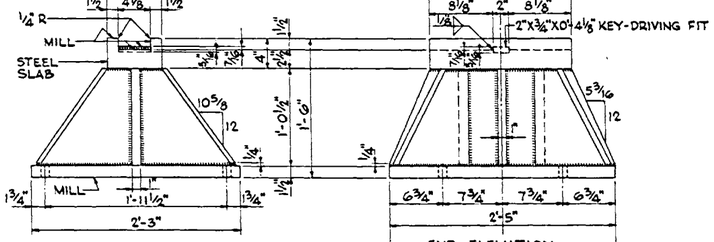
1-∠ 6"X6"X1/2"X1'-5"-MARK 5
1-∠ 6"X6"X1/2"X1'-5"-MARK 5X



STRINGERS MARK 10 & MARK D64

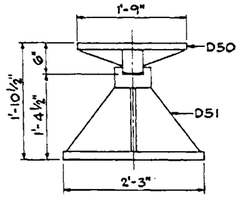
SCALE NO. 5

1-∠ 6"X6"X1/2"X1'-5"-MARK 5
1-∠ 6"X6"X1/2"X1'-5"-MARK 5X



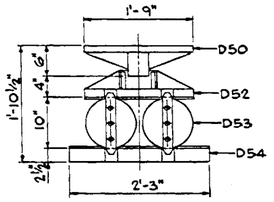
FIXED END BEARINGS MARK D51

SCALE NO. 7



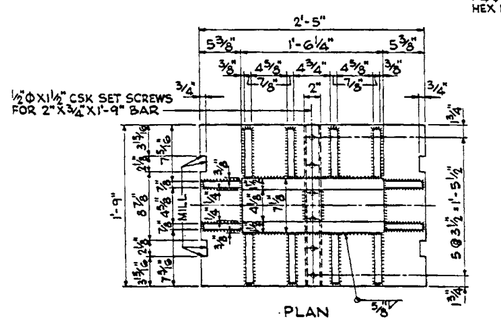
ASSEMBLY OF FIXED END BEARINGS

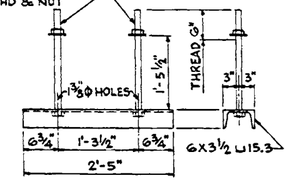
SCALE NO. 6



ASSEMBLY OF EXPANSION END BEARINGS

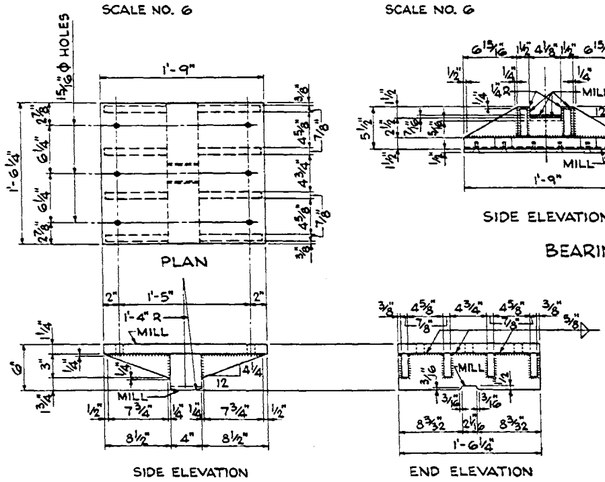
SCALE NO. 6





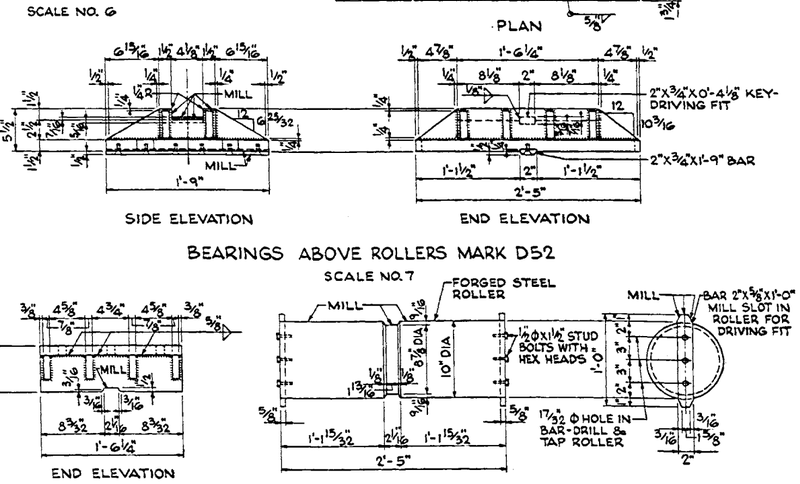
CLAMP TO GRILLAGE JOISTS MARK T34

SCALE NO. 6



BOLSTER DETAIL MARK D50

SCALE NO. 7

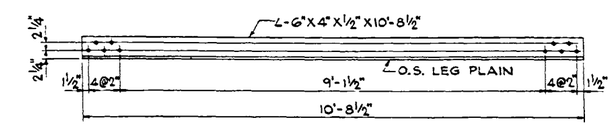


BEARINGS ABOVE ROLLERS MARK D52

SCALE NO. 7

ROLLER MARK D53

SCALE NO. 7



LATERAL ∠S MARK 7

SCALE NO. 5

REVISIONS

SYMBOL	DESCRIPTION	DATE	APPROVAL

SCALE NO. 5 · SCALE NO. 6 · SCALE NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: E.W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
RAILROAD BRIDGED SUPERSTRUCTURE
THROUGH TRUSS
DETAILS

UNDER REVISION

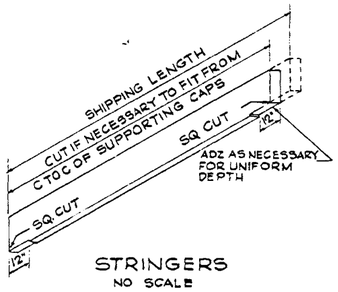
APPROVED: H.M. Williams, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1963

APPROVED FOR PROPONENT AGENCY:
DATE

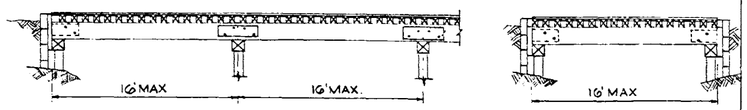
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-19
SHEET 9 OF 9

CORPS OF ENGINEERS

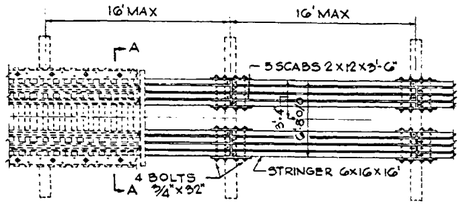
U. S. ARMY



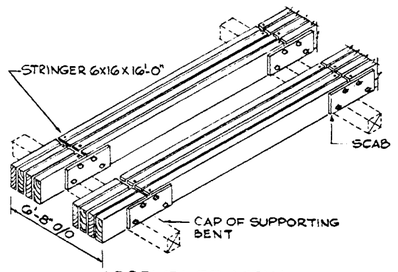
STRINGERS
NO SCALE



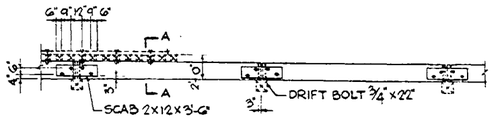
SPAN LENGTH DESIGNATIONS
NO SCALE



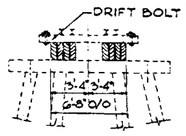
PLAN
SCALE NO 24



ASSEMBLED VIEW
NO SCALE

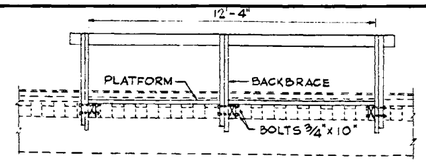


ELEVATION
SCALE NO. 24

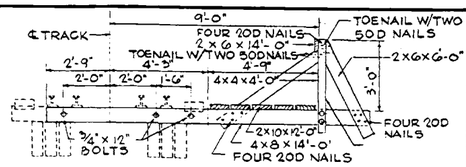


SECTION A-A
SCALE NO. 24

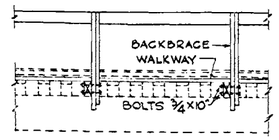
SINGLE TRACK-16FT. TIMBER SPAN SUPERSTRUCTURE
FACILITY NO. 862102



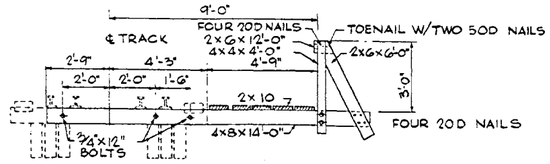
ELEVATION OF REFUGE BAY
SCALE NO. 3



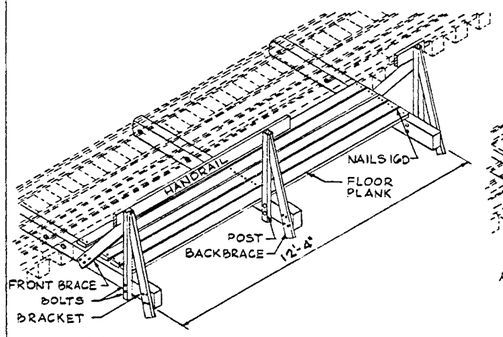
SECTION THRU REFUGE BAY
SCALE NO 3



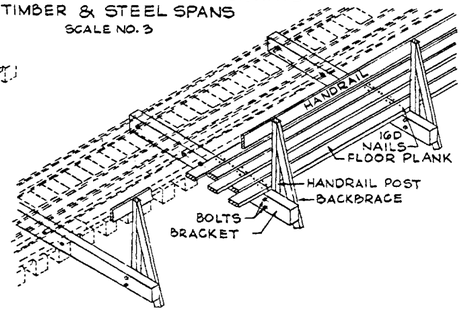
ELEVATION OF TYPICAL WALKWAY PANEL
SCALE NO. 3



SECTION THRU TYPICAL WALKWAYS TIMBER & STEEL SPANS
SCALE NO. 3



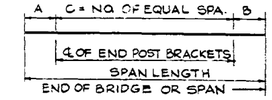
ASSEMBLED VIEW OF REFUGE BAY
NO SCALE



ASSEMBLED VIEW OF TYPICAL WALKWAY PANELS
NO SCALE

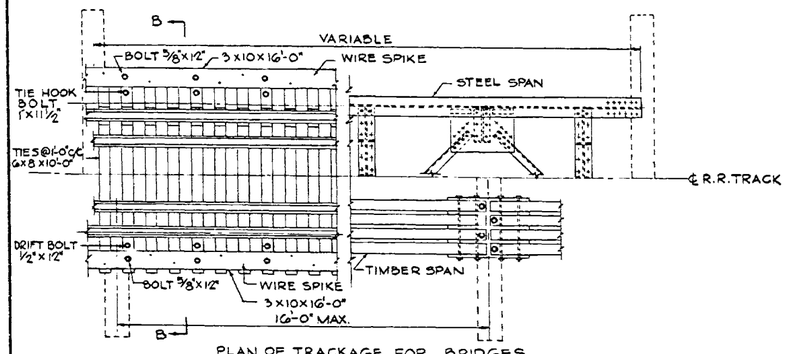
TABLE OF WALKWAY POST SPACING FOR SINGLE & MULTIPLE SPANS

SPAN LENGTH	SPAN TYPE	A	B	C	MAX. SPACE
INTERIOR SPAN					
12'-0"	TIMBER	0'-11"	0'-11"	12SPA	5'-2"
14'-0"	DO	0'-11"	0'-11"	2 DO	6'-2"
16'-0"	DO	1'-11"	1'-11"	2 DO	6'-2"
SINGLE SPAN					
12'-0"	TIMBER	1'-11"	1'-11"	12SPA	4'-2"
14'-0"	DO	2'-11"	0'-11"	2 DO	5'-2"
16'-0"	DO	2'-11"	1'-11"	2 DO	6'-0"
END SPAN					
12'-0"	TIMBER	1'-11"	1'-11"	12SPA	4'-2"
14'-0"	DO	1'-11"	1'-11"	2 DO	5'-2"
15'-0"	STEEL	0'-11"	0'-11"	2 DO	7'-0"
16'-0"	TIMBER	2'-11"	2'-11"	2 DO	5'-2"
20'-0"	STEEL	0'-11"	0'-11"	3 DO	6'-2"
25'-0"	DO	0'-11"	0'-11"	4 DO	6'-0"
30'-0"	DO	0'-11"	0'-11"	5 DO	6'-0"
35'-0"	DO	0'-11"	0'-11"	5 DO	7'-0"
40'-0"	DO	0'-11"	0'-11"	6 DO	7'-0"
45'-0"	DO	0'-11"	0'-11"	7 DO	6'-10"
50'-0"	DO	0'-11"	0'-11"	8 DO	6'-2"

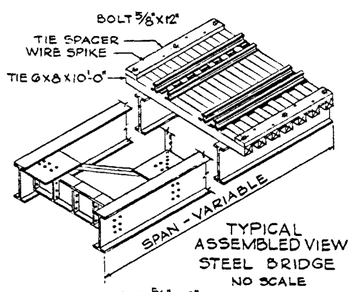


WALKWAY POST SPACING
NO SCALE

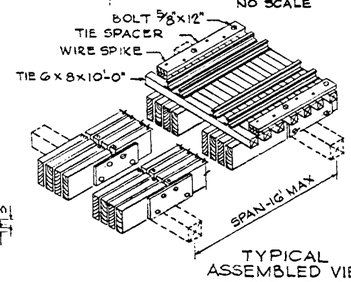
WALKWAY & REFUGE BAY DETAILS - FACILITY NO. 862101



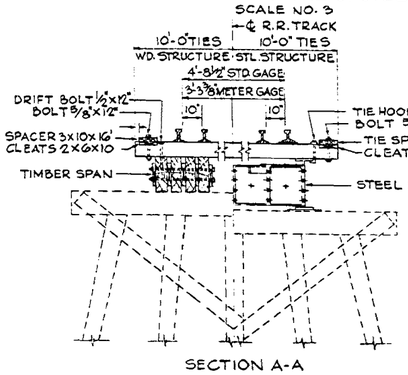
PLAN OF TRACKAGE FOR BRIDGES
TIMBER SUPERSTRUCTURE & STEEL SUPERSTRUCTURE
SCALE NO. 3



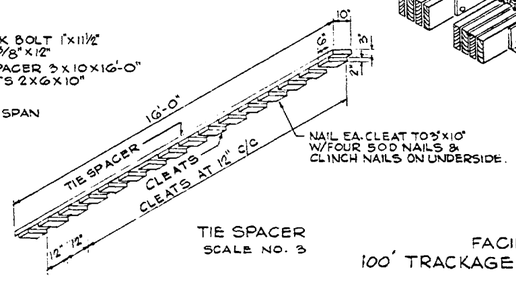
TYPICAL ASSEMBLED VIEW STEEL BRIDGE
NO SCALE



TYPICAL ASSEMBLED VIEW TIMBER BRIDGE
NO SCALE



SECTION A-A
TIMBER SUPERSTRUCTURE - STEEL SUPERSTRUCTURE
SCALE NO. 3



TIE SPACER
SCALE NO. 3

FACILITY NO. 862120
100' TRACKAGE FOR STEEL SPANS

FACILITY NO 862121
100' TRACKAGE FOR TIMBER SPANS

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5' NO. 3
0 1' 5' 10' NO. 24

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

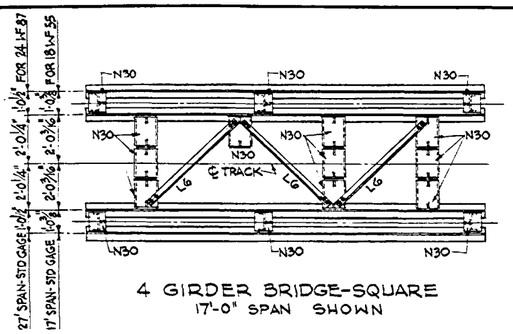
THEATER OF OPERATIONS

UNDER REVISION

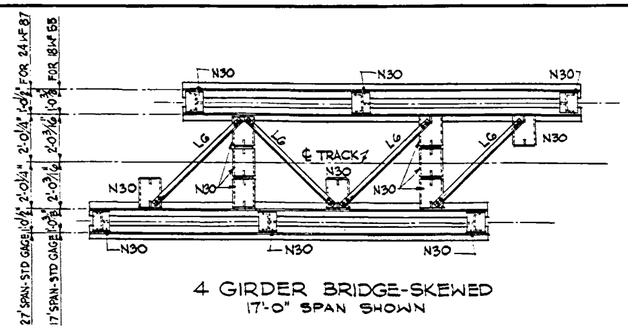
RAILROAD BRIDGE SUPERSTRUCTURE
WALKWAY & REFUGE BAY DETAILS.
15FT. TIMBER SPAN SUPERSTRUCTURE
& SINGLE TRACK BRIDGE CROSSING DETAILS

APPROVED: H. M. Williams DATE: 19 MAR 1963
CHIEF, STRUCTURES BRANCH HQ'S, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

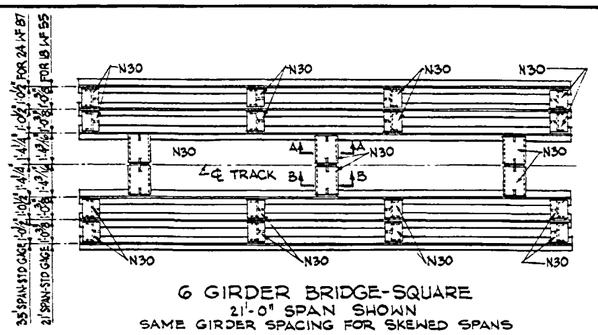
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-21
SHEET 1 OF 2



4 GIRDER BRIDGE-SQUARE
17'-0" SPAN SHOWN

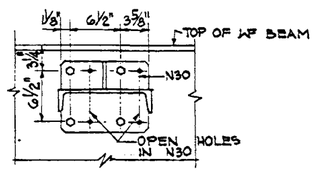


4 GIRDER BRIDGE-SKEWED
17'-0" SPAN SHOWN

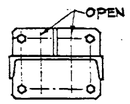


6 GIRDER BRIDGE-SQUARE
21'-0" SPAN SHOWN
SAME GIRDER SPACING FOR SKEWED SPANS

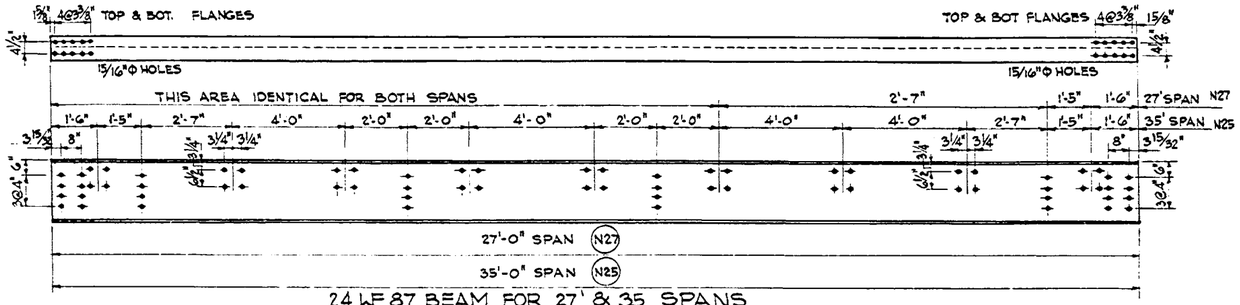
TYPICAL HORIZONTAL SECTIONS
SCALE NO. 3



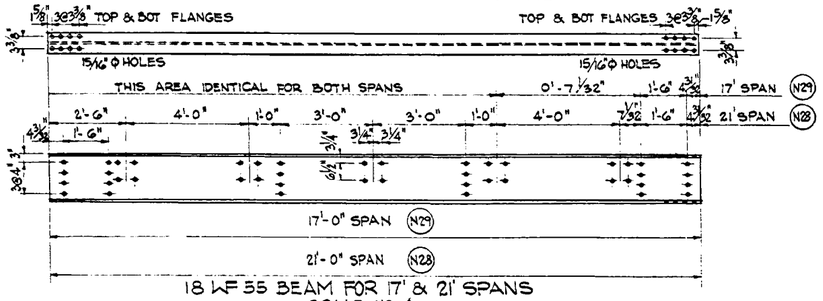
SECTION A-A
NO SCALE



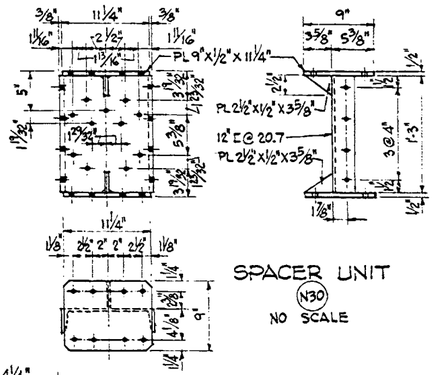
SECTION B-B
NO SCALE



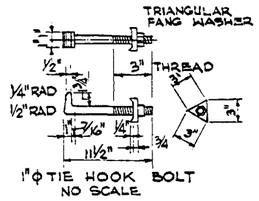
24 WF 87 BEAM FOR 27' & 35 SPANS
SCALE NO.4



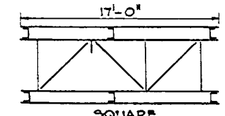
18 WF 55 BEAM FOR 17' & 21' SPANS
SCALE NO 4

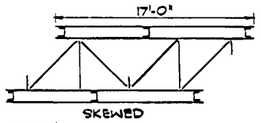


SPACER UNIT
(N30)
NO SCALE

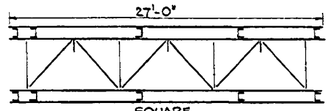


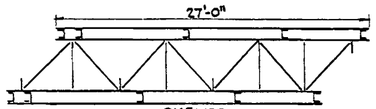
1"Φ TIE HOOK BOLT
NO SCALE





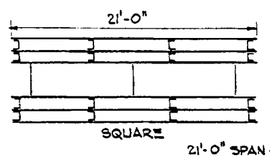
17'-0" SPAN - FACILITY NO. 862104

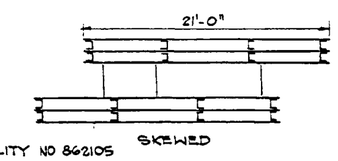




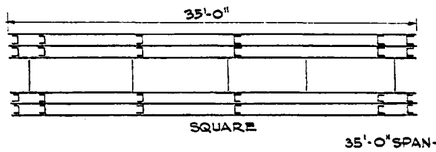
27'-0" SPAN - FACILITY NO. 862106

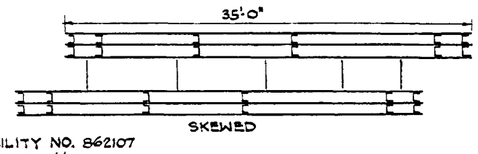
4-GIRDER SPANS - 4'-8 1/2" STD GAGE
3'-6" AND METER GAGES ARE SIMILAR EXCEPT BRACING AND EXTRA SPACERS N30 ARE OMITTED.





21'-0" SPAN - FACILITY NO 862105

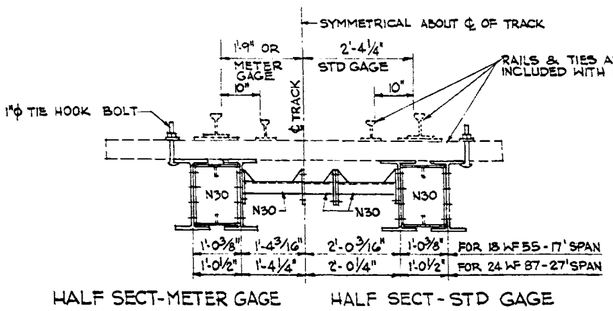




35'-0" SPAN - FACILITY NO. 862107

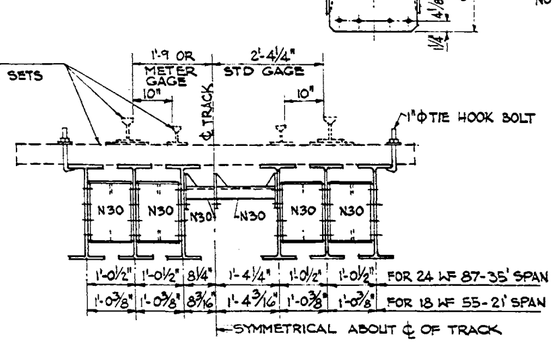
6-GIRDER SPANS - 4'-8 1/2", STD GAGE
3'-6" AND METER GAGES ARE SIMILAR EXCEPT EXTRA SPACERS N30 ARE OMITTED.

KEY DIAGRAMS
NO SCALE



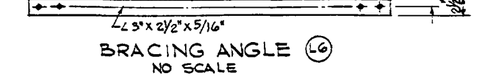
HALF SECT-METER GAGE HALF SECT-STD GAGE

4- GIRDER BRIDGE
SCALE NO 5

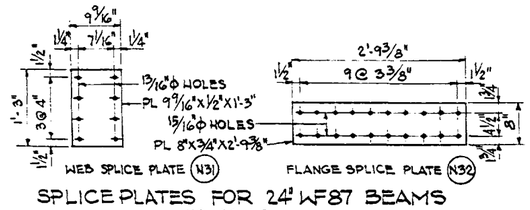


HALF SECT-METER GAGE HALF SECT-STD GAGE

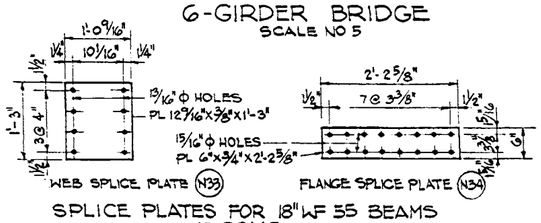
6-GIRDER BRIDGE
SCALE NO 5



BRACING ANGLE (LG)
NO SCALE



SPLICE PLATES FOR 24" WF87 BEAMS
NO SCALE



SPLICE PLATES FOR 18" WF 55 BEAMS
NO SCALE

GENERAL NOTES

1. THE BRIDGE SETS SHOWN ARE LIMITED STANDARD AND ARE TO BE USED ONLY UNTIL SUPPLIES CURRENTLY EXISTING IN DEPOT STOCKS ARE EXHAUSTED. NO ADDITIONAL SETS WILL BE PURCHASED.
2. ALL BOLT HOLES TO BE 13/16"Φ UNLESS OTHERWISE NOTED.
3. BRIDGES MAY BE ASSEMBLED WITH RIGHT- OR LEFT-HAND SKEWS OF 4 FEET.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-21	17, 21, 27 & 35 FT PLANS, SECTIONS & DETAILS	2 OF 2

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO.3 0 1' 2' 3' 4'
NO.4 0 1' 2' 3' 4'
NO.5 0 1' 2' 3'

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

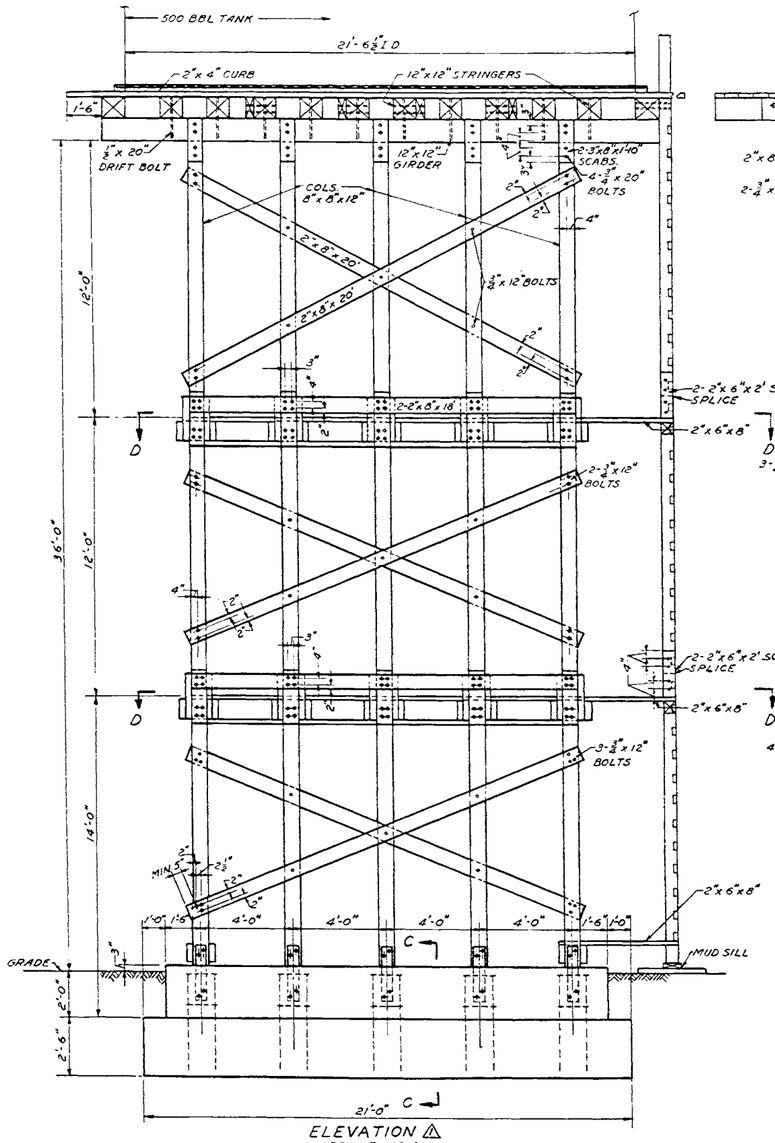
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

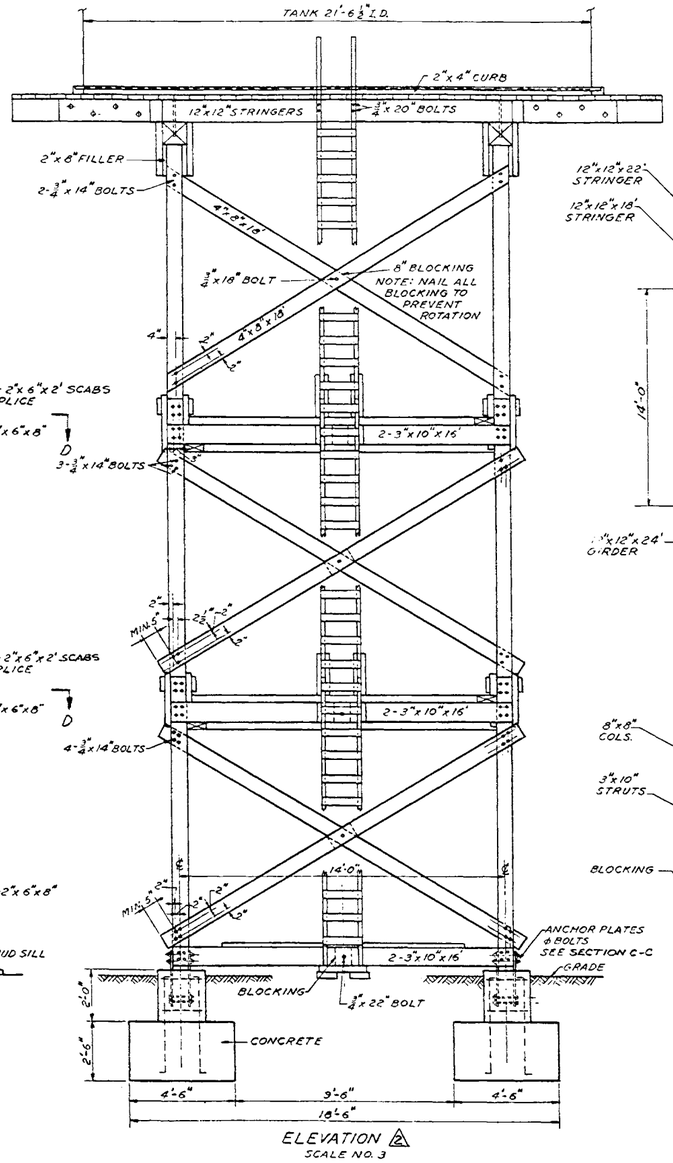
DRAWN BY: BARLEY
TRACED BY:
CHECKED BY: SHANNON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH
APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E. DATE: 18 MAR 1959
APPROVED FOR PROPONENT AGENCY:
DATE

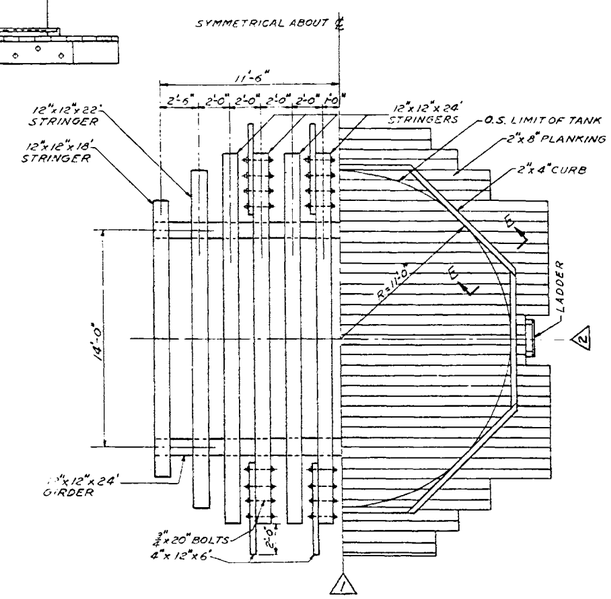
THEATER OF OPERATIONS
RAILROAD BRIDGE SUPERSTRUCTURES
17, 21, 27 & 35 FT. LENGTHS
STOCK BRIDGE SETS
PLANS, SECTIONS & DETAILS

UNDER REVISION

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-21
SHEET 2 OF 2







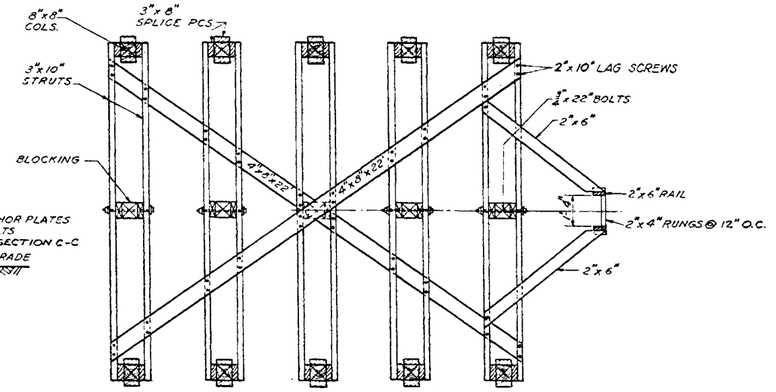
HALF PLAN FRAMING - HALF PLAN PLATFORM
SCALE NO. 2

BASIS OF DESIGN

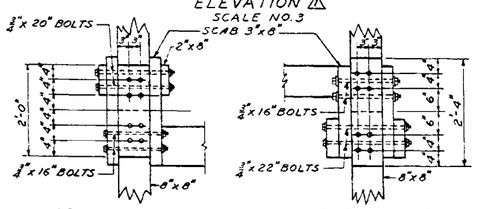
LIVE LOADING 600 PSF.
WIND LOAD 30 PSF.
EXTREME FIBER STRESS, WOOD - 1,800 PSI.
COMPRESSION PARALLEL TO GRAIN, WOOD - 1,500 PSI.
COMPRESSION PERPENDICULAR TO GRAIN, WOOD - 450 PSI.
HORIZONTAL SHEAR, WOOD - 150 PSI.
MODULUS OF ELASTICITY, WOOD - 1,600,000 PSI.
FOUNDATIONS DESIGNED FOR BEARING ON SOIL OF 3,000 PSF.

GENERAL NOTES

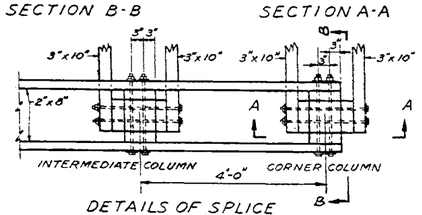
HOLES FOR DRIFT BOLTS SHALL BE 1/8" SMALLER THAN DRIFT BOLTS.
HOLES FOR THROUGH BOLTS SHALL BE THE SAME DIAMETER AS THE BOLT.
USE O.G. CAST IRON WASHERS WITH ALL BOLTS IN WOOD.
TIMBER DIMENSIONS ARE BASED ON NOMINAL SIZES.
PROJECTING ENDS OF ALL BOLTS SHALL BE PEENED AFTER LOCK NUTS HAVE BEEN DRAWN UP TIGHT.



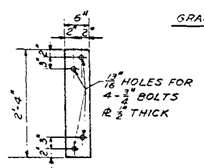
LATERAL BRACING AT ELEV 12'&24'
PLAN AT D-D
SCALE NO. 3



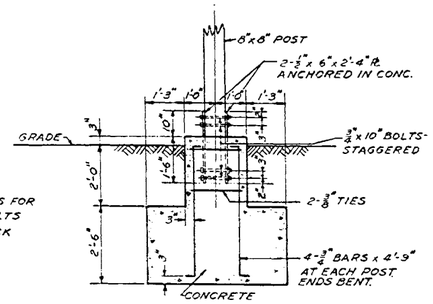
SECTION B-B
SECTION A-A



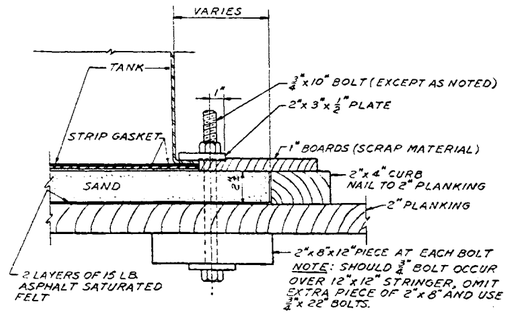
DETAILS OF SPLICE FOR 8" x 8" POST
SCALE NO. 5



ANCHOR STRAP DETAIL
SCALE NO. 5



SECTION C-C
SCALE NO. 4



SECTION E-E
(TYPICAL AT EVERY OTHER STAVE)
SCALE NO. 8

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES: 0 1' 2' 3' 6' 9' 1' NO.5 | 0 5' 10' NO.2 | 0 1' 2' 3' 4½' 6' NO.3 | 0 1' 2' 3' 4½' 5' NO.4 | NO.8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: FAY
TRACED BY:
CHECKED BY: ELLISON
SUBMITTED BY: C.W. DEICHMANN
APPROVED: DATE:
CHIEF, MAINTENANCE BRANCH

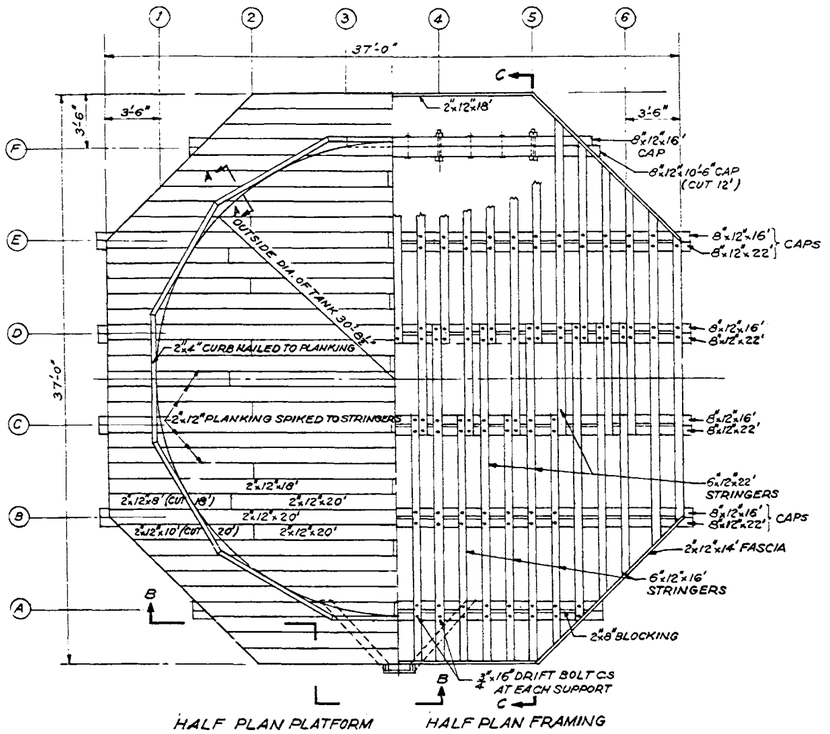
THEATER OF OPERATIONS

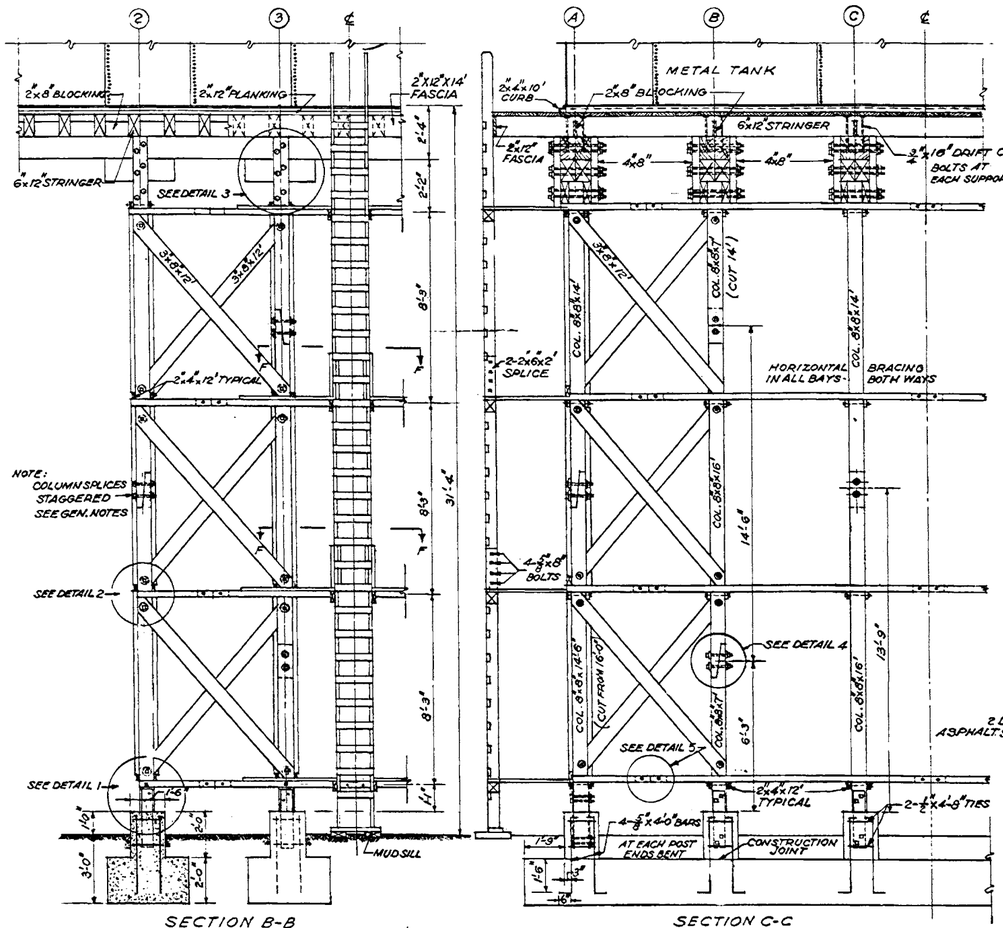
RAILROAD WATER STORAGE & TOWER
HIGH LEVEL-21,000 GAL.
FACILITY NO. 862201

APPROVED: DATE: 19 MAR 1959
CHIEF, ENGINEERING DIVISION, MIL. CONSTR. O.C.E.

APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation
~~Resources Division~~
Directorate of Army Transportation
DATE: 2 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-22
SHEET 1 OF 1





SECTION B-B
BRACING SIMILAR FOR LINES F, 1 AND 6
SCALE NO.3

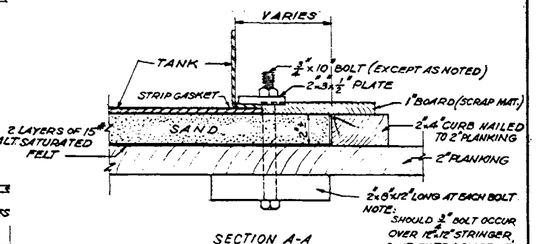
SECTION C-C
BRACING SIMILAR FOR LINES B, C, D, E, 2, 3 & 4
SCALE NO.3

BASIS OF DESIGN

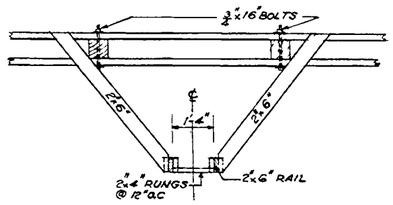
LIVE LOADING 600 PSF.
WIND LOAD 30 PSF.
EXTREME FIBER STRESS, WOOD - 1,800 PSI.
COMPRESSION PARALLEL TO GRAIN, WOOD - 1,500 PSI.
COMPRESSION PERPENDICULAR TO GRAIN, WOOD - 450 PSI.
HORIZONTAL SHEAR, WOOD - 150 PSI.
MODULUS OF ELASTICITY, WOOD - 1,600,000 PSI.
FOUNDATIONS DESIGNED FOR BEARING ON SOIL OF 3,000 PSF.

GENERAL NOTES

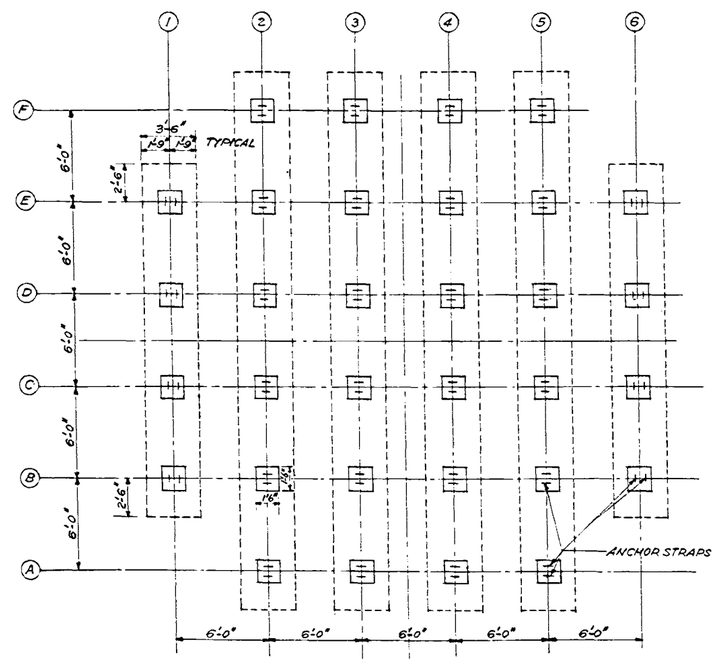
HOLES FOR DRIFT BOLTS SHALL BE 1/8" SMALLER THAN DRIFT BOLTS.
HOLES FOR THROUGH BOLTS SHALL BE THE SAME DIAMETER AS THE BOLT.
USE O.G. CAST IRON WASHERS WITH ALL BOLTS IN WOOD.
TIMBER DIMENSIONS ARE BASED ON NOMINAL SIZES.
PROJECTING ENDS OF ALL BOLTS SHALL BE PEENED AFTER LOCK NUTS HAVE BEEN DRAWN UP TIGHT.
COLUMN SPLICES ARE TO BE ARRANGED SO THAT ONE HALF OF THE SPLICES WILL COME AT EACH LEVEL AND ARE TO BE STAGGERED AS SHOWN IN ELEVATIONS.



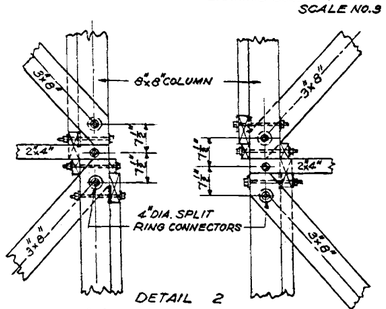
SECTION A-A
TYPICAL AT EVERY OTHER STAVE
SCALE NO.8.



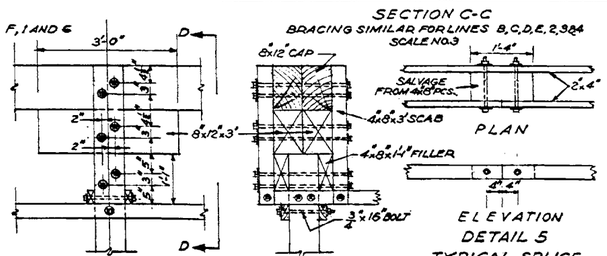
PLAN AT F-F
LADDER SUPPORT
SCALE NO. 4



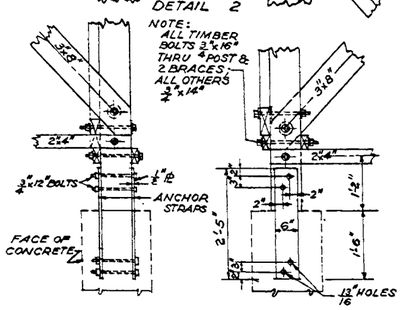
FOUNDATION PLAN
SCALE NO.2



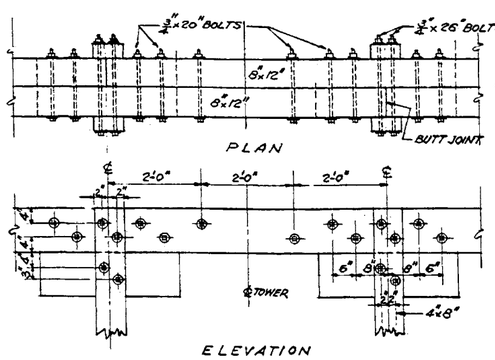
DETAIL 2



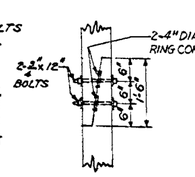
ELEVATION
SECTION D-D
PLAN
ELEVATION
DETAIL 5
TYPICAL SPLICE FOR HORIZ. BRACING
SCALE NO.5
DETAIL 3
SCALE NO.5



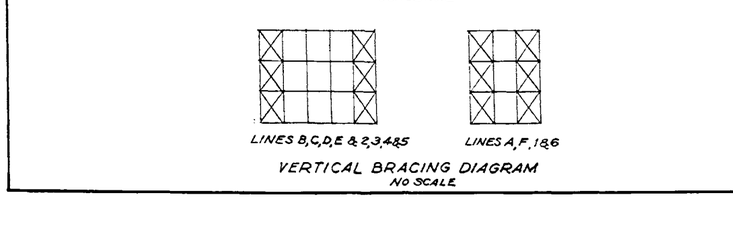
DETAIL 1
SCALE NO.5



PLAN
ELEVATION
DETAIL OF CAP SPLICE
SCALE NO.5



DETAIL 4
COLUMN SPLICE
SCALE NO.5



VERTICAL BRACING DIAGRAM
NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO.2 NO.3 NO.4 NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: FAY
TRACED BY:
CHECKED BY: ELLISON
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

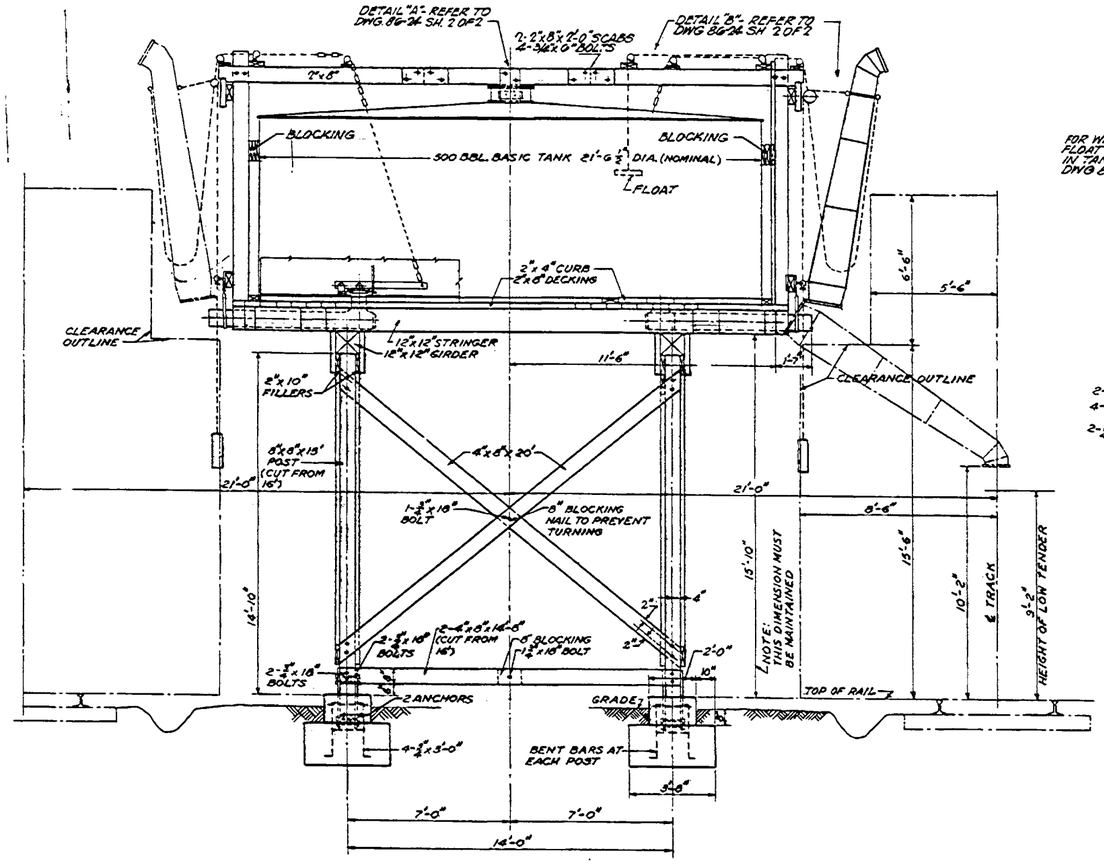
THEATER OF OPERATIONS

RAILROAD WATER STORAGE & TOWER
HIGH LEVEL-126,000 GAL.
FACILITY NO. 862301

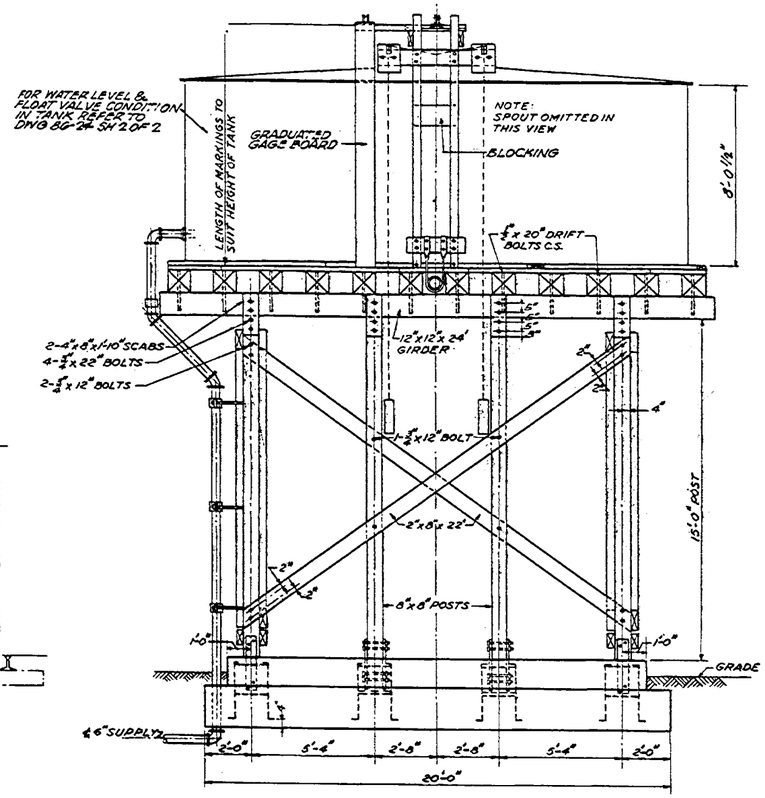
APPROVED: DATE: 19 MAR 1969
CHIEF, STRUCTURES BRANCH | CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE 3 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
86-23



FRONT ELEVATION
SCALE NO. 3



SIDE ELEVATION
SCALE NO. 3

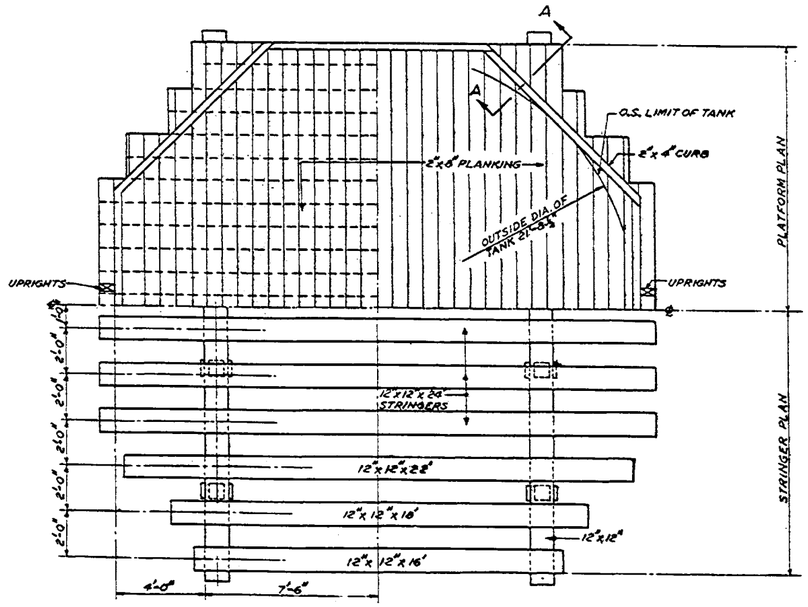
BASIS OF DESIGN

LIVE LOADING 600 PSF.
WIND LOAD 30 PSF.
EXTREME FIBER STRESS, WOOD - 1,800 PSI.
COMPRESSION PARALLEL TO GRAIN, WOOD - 1,500 PSI.
COMPRESSION PERPENDICULAR TO GRAIN, WOOD - 450 PSI.
HORIZONTAL SHEAR, WOOD - 150 PSI.
MODULUS OF ELASTICITY, WOOD - 1,600,000 PSI.
FOUNDATIONS DESIGNED FOR BEARING ON SOIL OF 3,000 PSF.

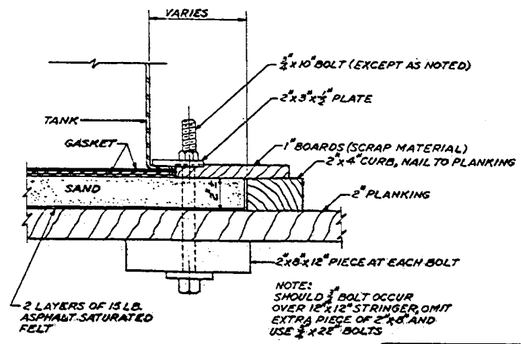
GENERAL NOTES

HOLES FOR DRIFT BOLTS SHALL BE 1/8" SMALLER THAN DRIFT BOLTS.
HOLES FOR THROUGH BOLTS SHALL BE THE SAME DIAMETER AS THE BOLT.
USE O.G. CAST IRON WASHERS WITH ALL BOLTS IN WOOD.
TIMBER DIMENSIONS ARE BASED ON NOMINAL SIZES.
PROJECTING ENDS OF ALL BOLTS SHALL BE PEENED AFTER LOCK NUTS HAVE BEEN DRAWN UP TIGHT.

TYPICAL SECTION OF FOUNDATION
SCALE NO. 4



PLAN
SCALE NO. 3
FACILITY NO. 86240 I



SECTION A-A
(TYPICAL AT EVERY OTHER STAVE)
SCALE NO. 6

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-24	RR WATER STGE & TOWER LOW LEVEL-21000 GAL.	1 OF 2
86-24	RR WATER STGE & TOWER LOW LEVEL-42000 GAL.	2 OF 2

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
NO. 3: 0 1' 2' 3' 5' 5'
NO. 5: 0 1' 2' 3' 4'
NO. 8: 0 1' 2" 3" 6" 9" 1'

MAYER, BEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

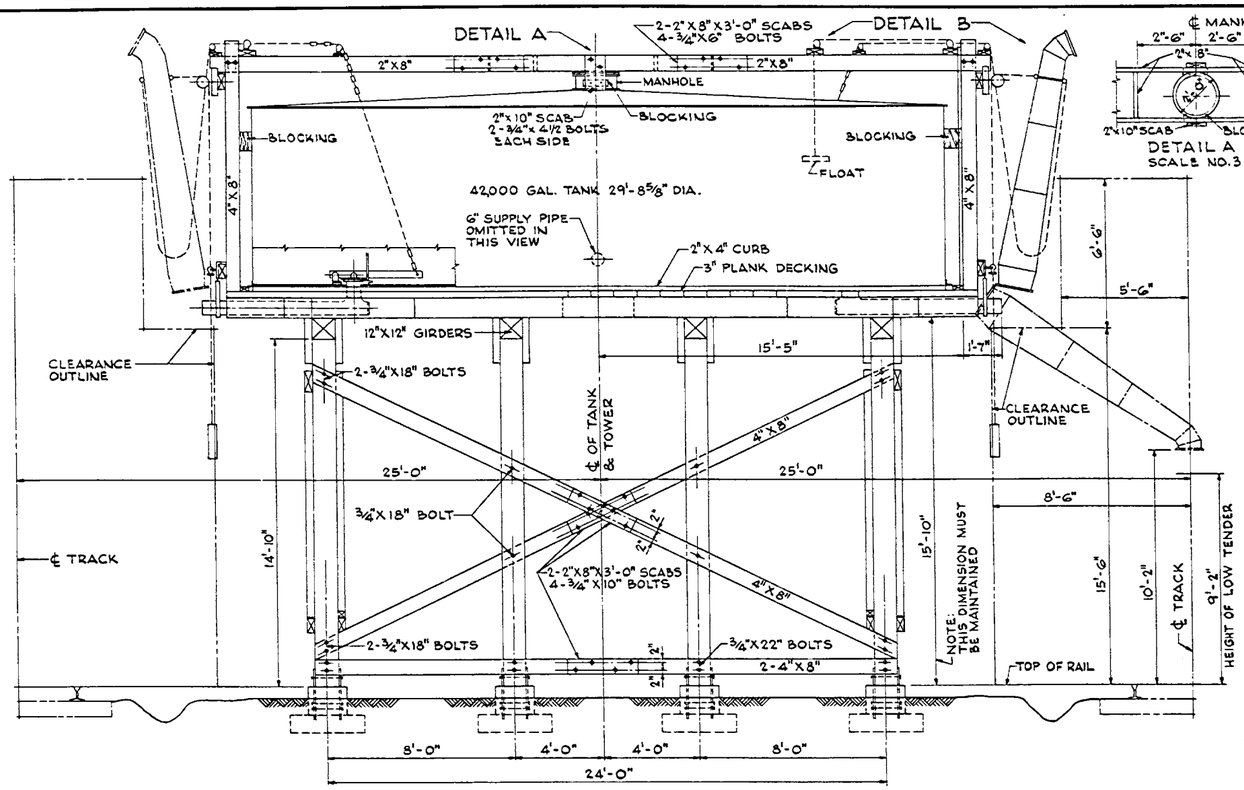
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: FAY
TRACED BY:
CHECKED BY: ELLISON
SUBMITTED BY: K.W. DEICHMANN

THEATER OF OPERATIONS

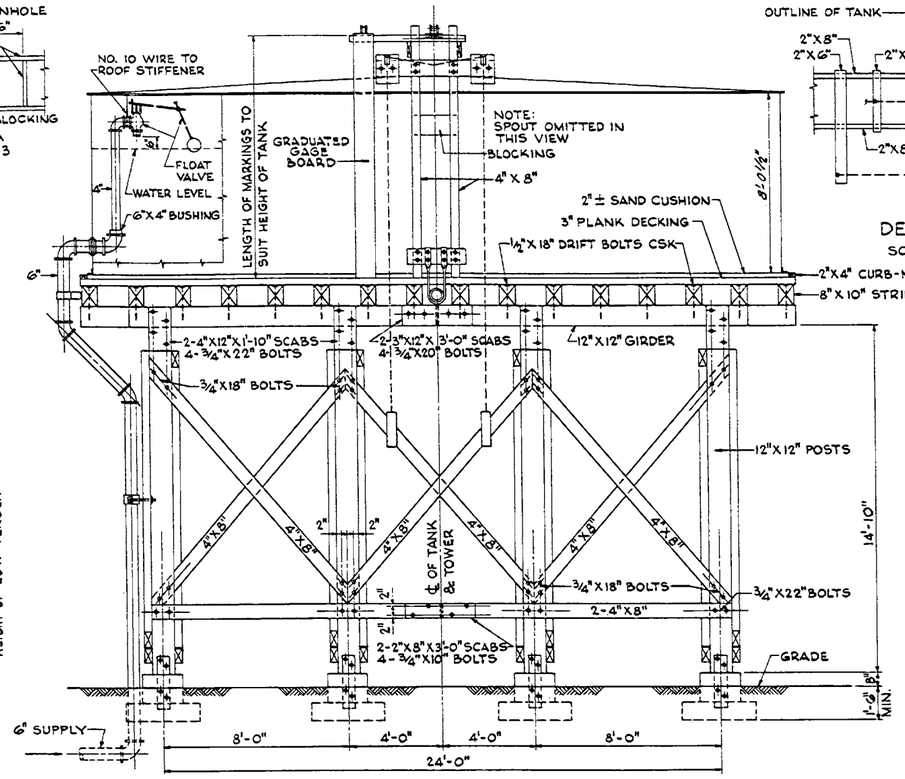
RAILROAD WATER STORAGE & TOWER
LOW LEVEL-21,000 GAL.

APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969
APPROVED AND PROPONENT AGENCY: ROBERT W. GENTLEMAN, Colonel, GS, Deputy Chief, Transportation Resources Division, Directorate of Army Transportation
DATE: 2 NOV 1968
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-24
SHEET 1 OF 2

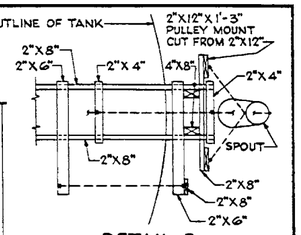


TRANSVERSE ELEVATION
SCALE NO. 3

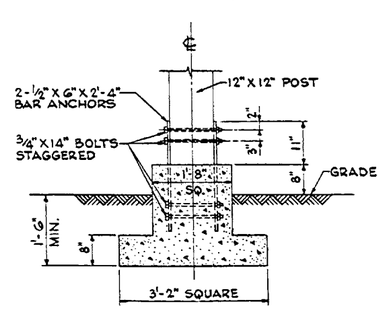
DETAIL A
SCALE NO.3



SIDE ELEVATION
SCALE NO. 3



DETAIL B
SCALE NO.3



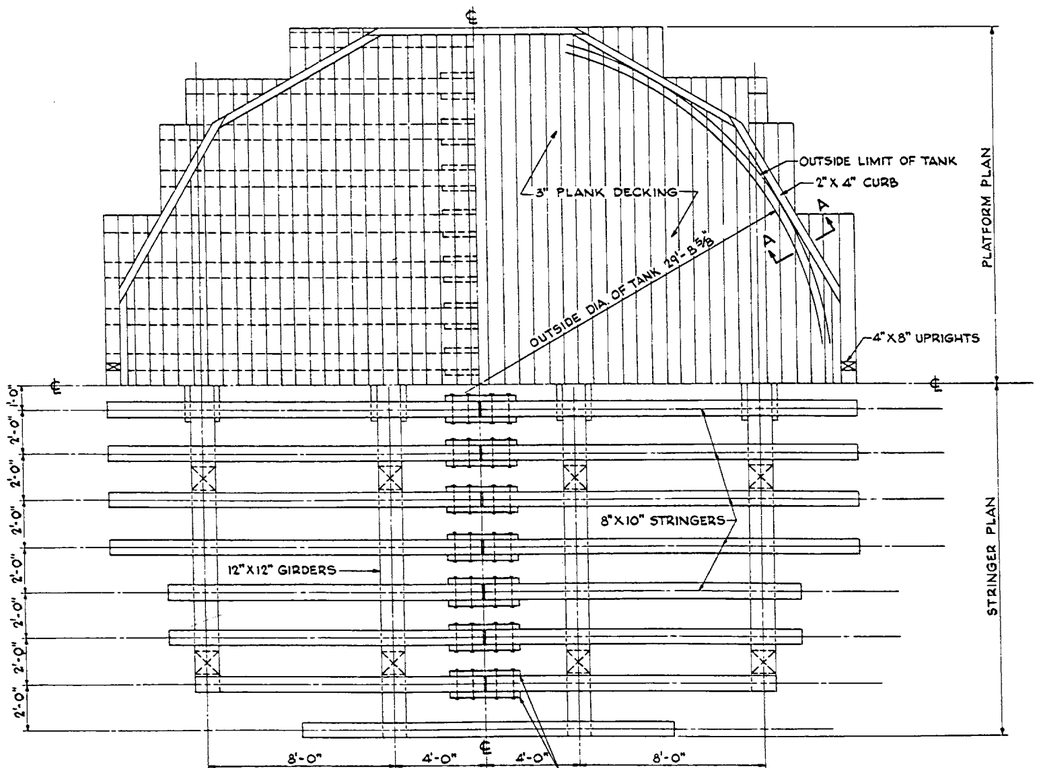
PLAIN CONCRETE FOOTINGS
SCALE NO. 5

BASIS OF DESIGN

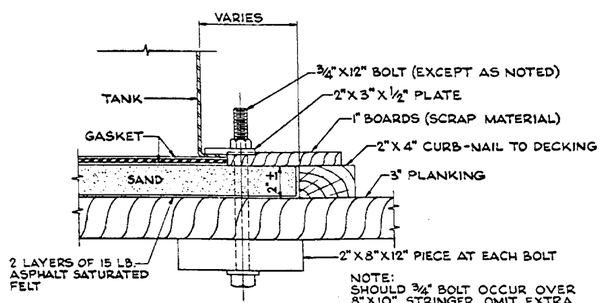
LIVE LOADING 600 PSF.
WIND LOAD 30 PSF.
EXTREME FIBER STRESS, WOOD-1800 PSI.
COMPRESSION PARALLEL TO GRAIN, WOOD - 1500 PSI.
COMPRESSION PERPENDICULAR TO GRAIN, WOOD - 450 PSI.
HORIZONTAL SHEAR, WOOD-150 PSI.
MODULUS OF ELASTICITY, WOOD-1,600,000 PSI.
FOUNDATIONS DESIGNED FOR BEARING ON SOIL OF 3000 PSF.
COMPRESSIVE STRENGTH-CONCRETE 2500 PSI.

GENERAL NOTES

HOLES FOR DRIFT BOLTS SHALL BE ⅛" SMALLER THAN DRIFT BOLTS.
HOLES FOR THROUGH BOLTS SHALL BE THE SAME DIAMETER AS THE BOLTS.
USE WASHERS WITH ALL BOLTS IN WOOD.
TIMBER DIMENSIONS ARE BASED ON NOMINAL SIZES.
PROJECTING ENDS OF ALL BOLTS SHALL BE PEENED AFTER LOCK NUTS HAVE BEEN DRAWN UP TIGHT.



PLAN
SCALE NO. 3
FACILITY NO. 862402
STRINGER SPLICE-
2-3"X8"X 3'-0" SCABS
4-¾"X16" BOLTS



SECTION A-A
NO SCALE

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' 5' NO.3
0 1' 2' 3' NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: WADE
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: O.W. DEJCHMANN

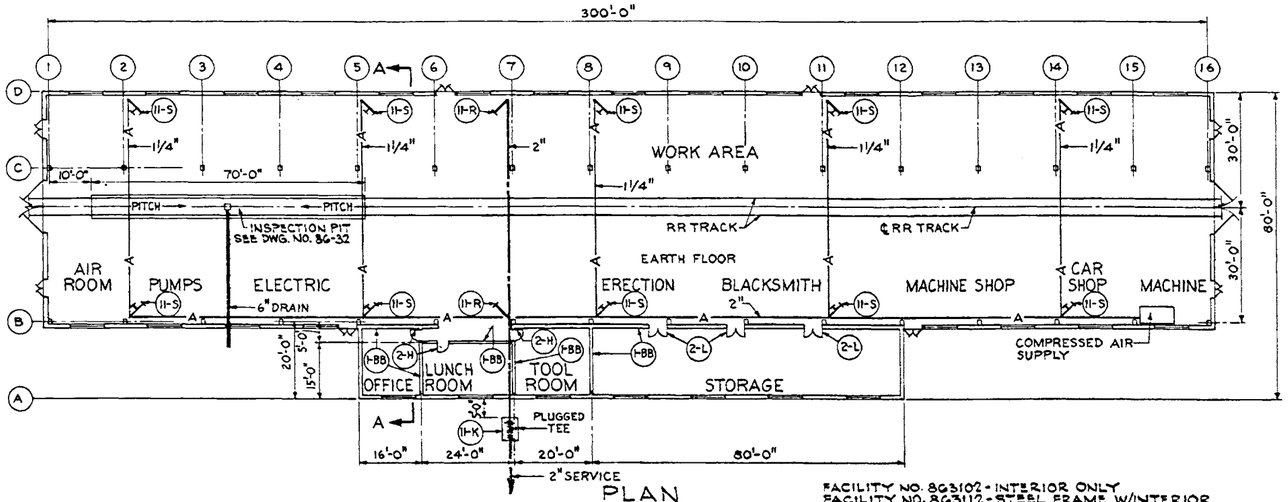
THEATER OF OPERATIONS

RAILROAD WATER STORAGE & TOWER
LOW LEVEL-42,000 GAL.

APPROVED: DATE: 18 MAR 1969
CHIEF, STRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

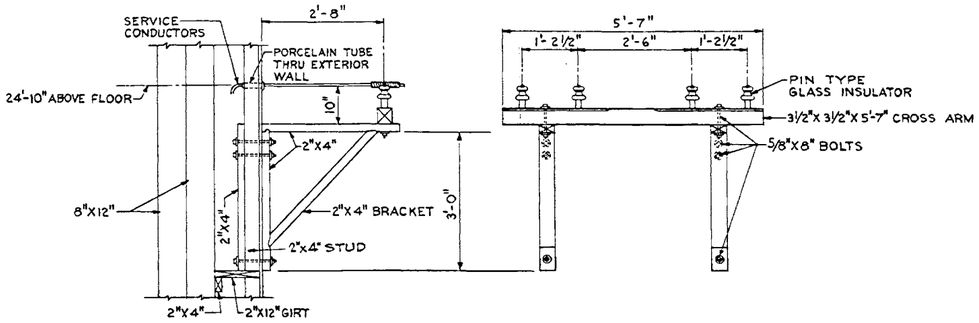
APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation
Resources Division
Directorate of Army Transportation
DATE 8 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 86-24
SHEET 2 OF 2

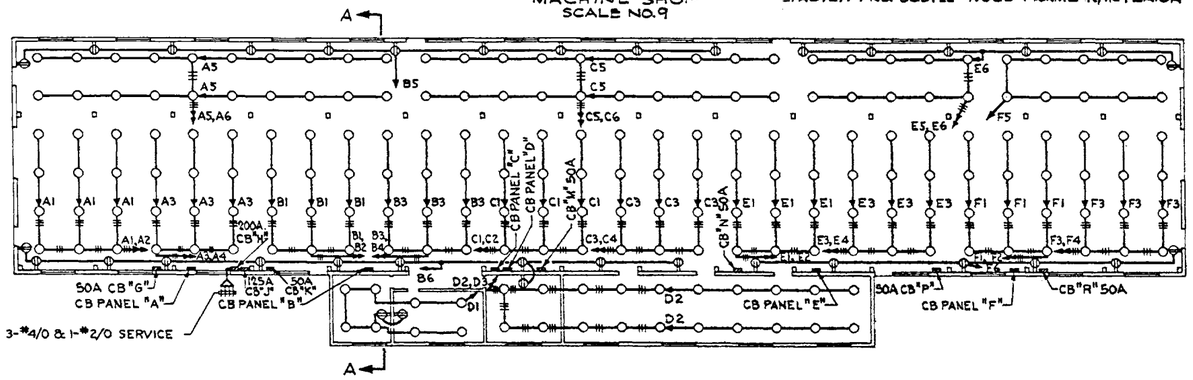


PLAN
MACHINE SHOP
SCALE NO. 9

FACILITY NO. 863102 - INTERIOR ONLY
FACILITY NO. 863112 - STEEL FRAME W/INTERIOR
FACILITY NO. 863122 - WOOD FRAME W/INTERIOR



SERVICE ENTRANCE RACK
SCALE NO. 5



ELECTRICAL PLAN
MACHINE SHOP
SCALE NO. 9

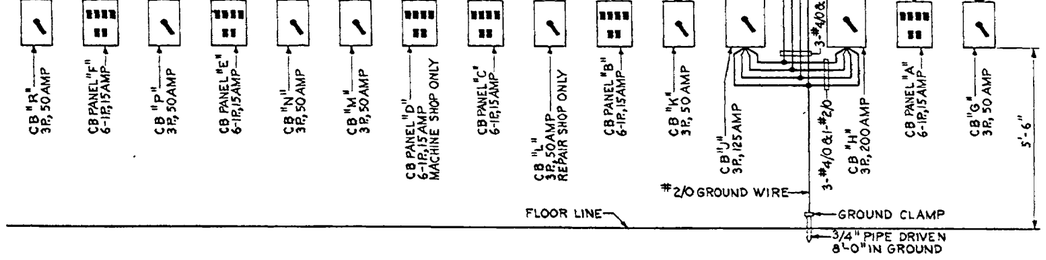
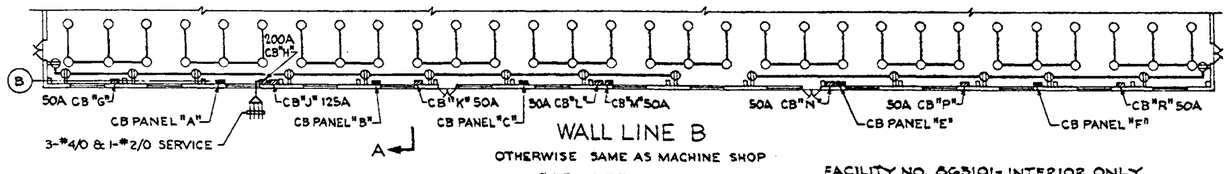
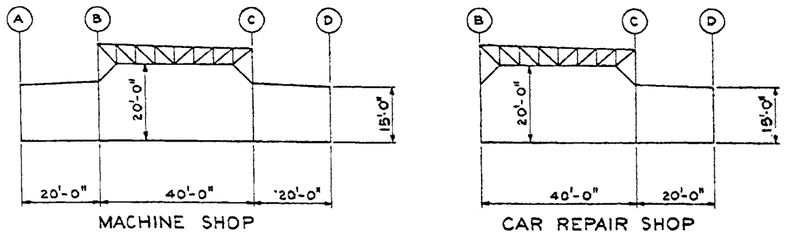


DIAGRAM OF FEEDER
NO SCALE



WALL LINE B
OTHERWISE SAME AS MACHINE SHOP
CAR REPAIR SHOP
60'x300'
SCALE NO. 9

FACILITY NO. 863101 - INTERIOR ONLY
FACILITY NO. 863111 - STEEL FRAME W/INTERIOR
FACILITY NO. 863121 - WOOD FRAME W/INTERIOR



DIAGRAMMATIC SECTION A-A
SCALE NO. 9

ELECTRICAL NOTES

CONNECTED LOAD

BUILDING	MACHINE SHOP	CAR REPAIR SHOP
LIGHTING	26.80 KW	24.00 KW
RECP. EST	3.50 KW	3.20 KW
POWER	57.90 KW	57.90 KW
TOTAL	88.20 KW	85.10 KW

1. ALL LAMPS IN LOW BAY AREAS TO BE 100W WITH 8" CONICAL SHADES.
2. ALL LAMPS IN HIGH BAY AREAS TO BE 150W PAR 38 PROJECTOR FLOOD.
3. IF SERVICE POLE IS MORE THAN 10' FROM SERVICE RACK, DEAD END FEEDER ON CLEVISES LOCATED ON SERVICE RACK.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-31	PLANS, SECTIONS & DETLS	1 OF 1
99-98	STANDARD DETAILS	
34-19	WOOD FRAME CONST SHOP TYPE BLDGS.	1-12 OF 12

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' NO.5
0 10' 20' 30' NO.9

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

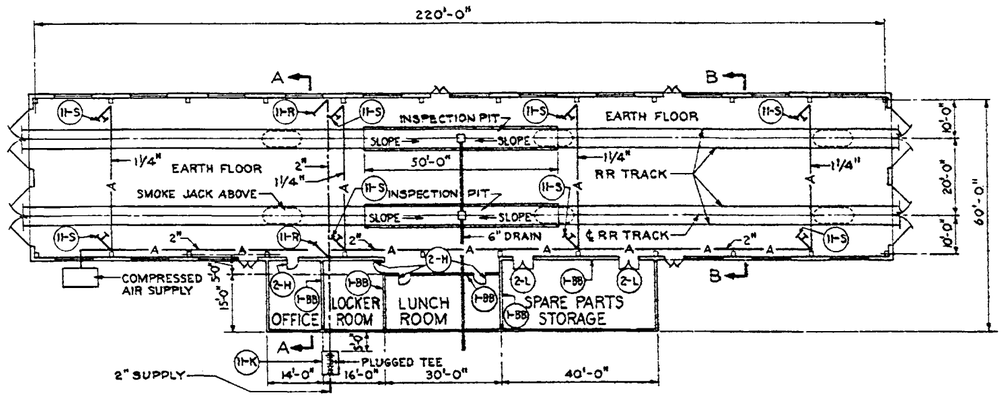
DRAWN BY: ELLISON
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: O. W. DE SCHMANN

THEATER OF OPERATIONS
RAILROAD
CAR REPAIR & MACHINE SHOP
PLANS, SECTIONS & DETAILS

APPROVED: DATE: 19 MAR 1969
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
CHIEF, STRUCTURES BRANCH

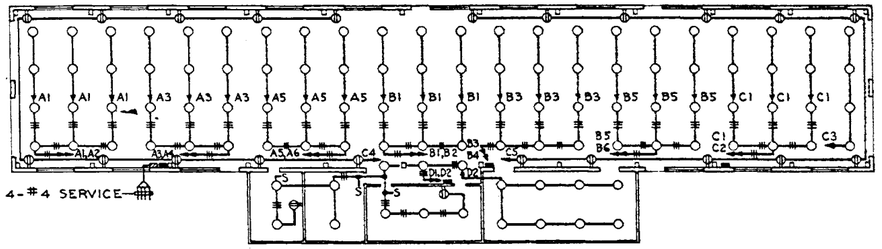
APPROVED FOR PROPONENT AGENCY:
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE 2 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-31
SHEET 1 OF 1

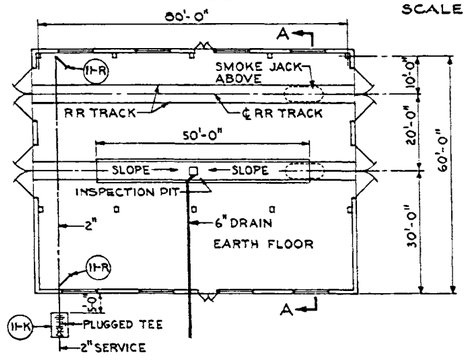


PLAN- ENGINE HOUSE - 6 STALL
SCALE NO. 9

FACILITY NO. 863202 - INTERIOR ONLY
FACILITY NO. 863212 - STEEL FRAME W/INTERIOR
FACILITY NO. 863222 - WOOD FRAME W/INTERIOR

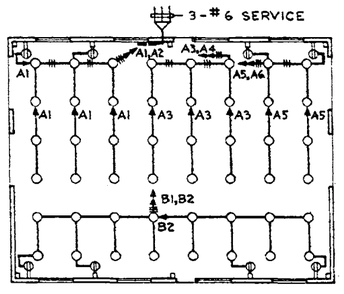


ELECTRICAL- ENGINE HOUSE-6 STALL
SCALE NO. 9

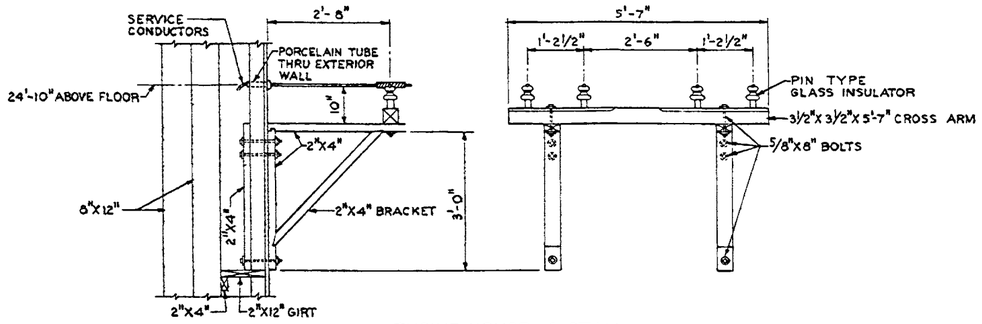


PLAN- ENGINE HOUSE - 2 STALL
SCALE NO. 9

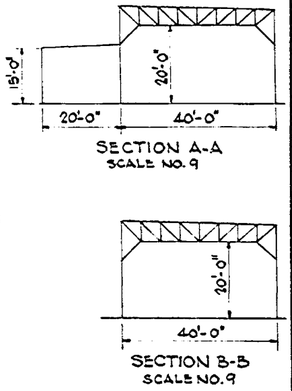
FACILITY NO. 863201 - INTERIOR ONLY
FACILITY NO. 863211 - STEEL FRAME W/INTERIOR
FACILITY NO. 863221 - WOOD FRAME W/INTERIOR

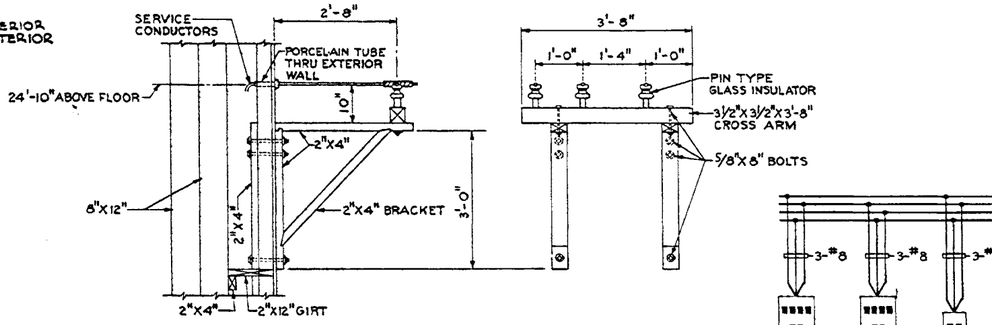


ELECTRICAL-ENGINE HOUSE-2 STALL
SCALE NO. 9



ENGINE HOUSE - 6 STALL





ENGINE HOUSE - 2 STALL

SERVICE ENTRANCE RACK

SCALE NO. 5

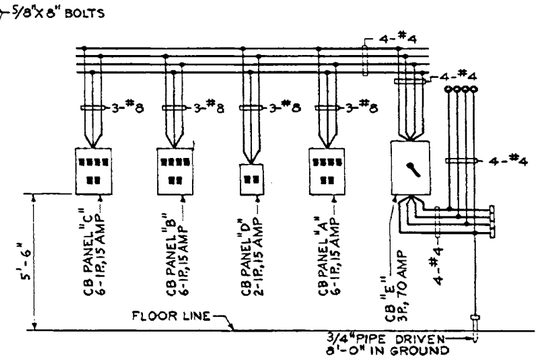
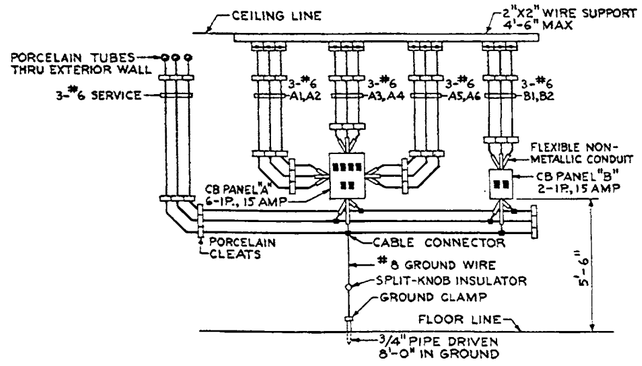


DIAGRAM OF FEEDER

ENGINE HOUSE - 6 STALL

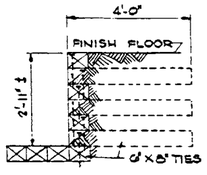
NO SCALE



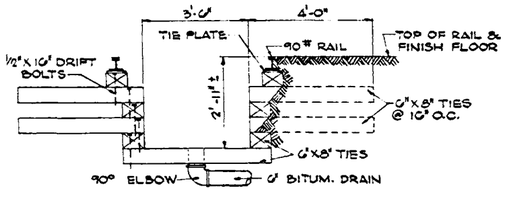
CIRCUIT BREAKER INSTALLATION

ENGINE HOUSE - 2 STALL

NO SCALE



SECTION OF END WALLS



CROSS SECTION

INSPECTION PIT

NO. SCALE

ELECTRICAL NOTES

CONNECTED LOAD

	6 STALL	2 STALL
BUILDING	15.00KW	6.40KW
LIGHTING	2.30KW	.80KW
RECP EST.	17.30KW	7.20KW
TOTAL		

1. ALL LAMPS IN LOW BAY AREAS TO BE 100W WITH 8" CONICAL SHADES.
2. ALL LAMPS IN HIGH BAY AREAS TO BE 150W PAR 38 PROJECTOR FLOOD.
3. IF SERVICE POLE IS MORE THAN 10' FROM SERVICE RACK, DEAD END FEEDER ON CLEVISES LOCATED ON SERVICE RACK.

GENERAL NOTES

1. REFER TO TM5-303 FOR BUILDING SHELL REQUIREMENTS
2. FOR FSN BILL OF MATERIALS - REFER TO TM5-303 BY FACILITY NUMBER

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-32	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-19	WOOD FRAME CONST. SHOP TYPE BLDGS	1-12 OF 12
86-11	COAL LOADING PLAT. & ASH PIT	1 OF 1

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' — NO. 5
0 10' 20' 30' — NO. 9

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

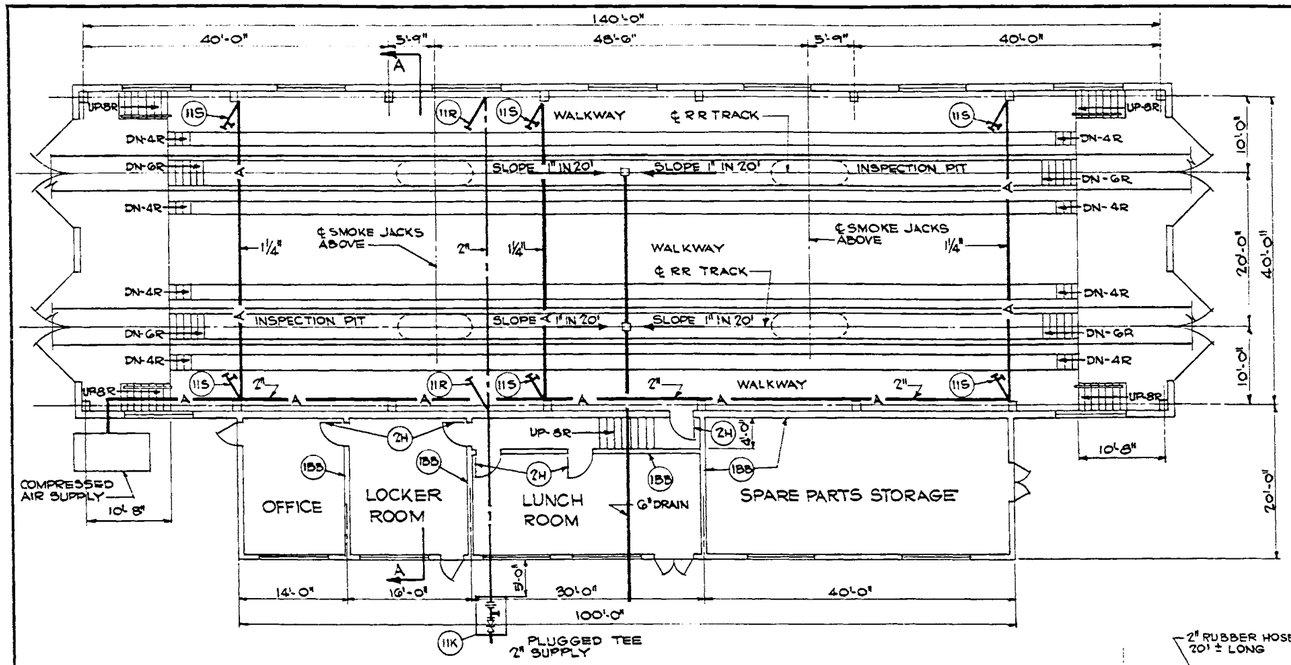
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: ELLISON
TRACED BY:
CHECKED BY: VASS
SUBMITTED BY: /C. W. DEJCHMANN
APPROVED: DATE: 19 MAR 1969
APPROVED FOR PROPONENT AGENCY: ROBERT W. GENTLEMAN, Colonel, GS, Deputy Chief, Transportation Resources Division, Directorate of Army Transportation
DATE 2 NOV 1968

THEATER OF OPERATIONS

RAILROAD
STEAM ENGINE HOUSES
6 STALL-60'X220' & 2 STALL-60'X80'

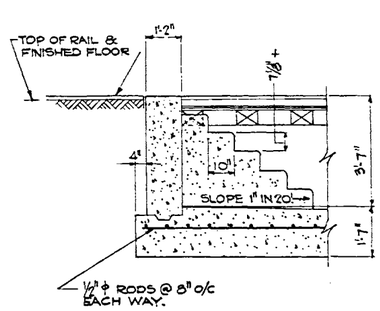
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1
86-32



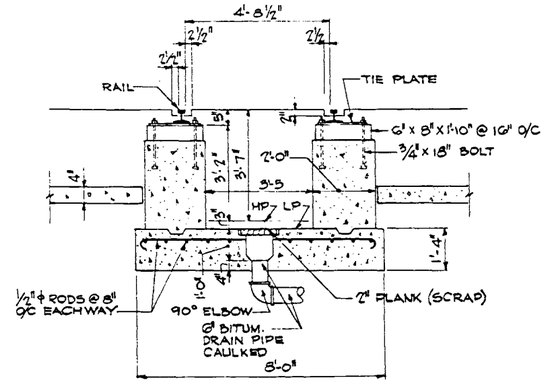
PLAN

SCALE NO. 1

FACILITY NO. 863401 - INTERIOR ONLY
FACILITY NO. 863411 - STEEL FRAME W/INTERIOR
FACILITY NO. 863421 - WOOD FRAME W/INTERIOR



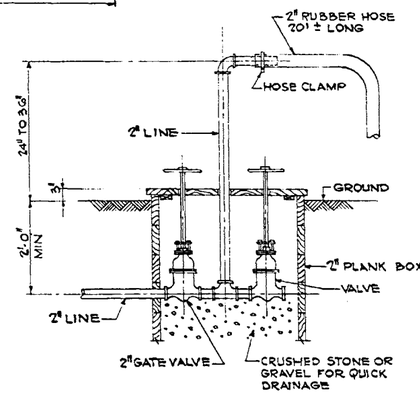
SECTION OF END WALLS



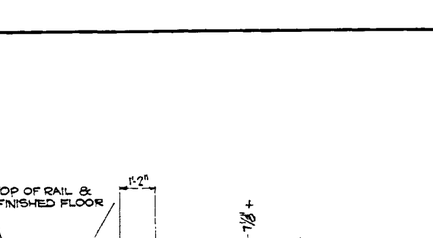
CROSS SECTION

INSPECTION PIT

SCALE NO. 4



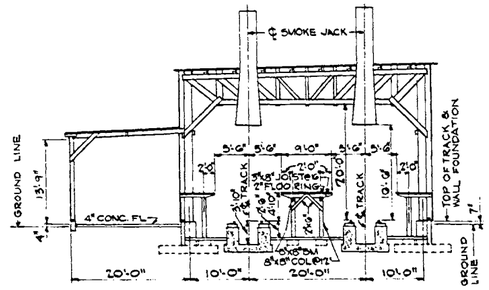
SECTION B-B



PLAN

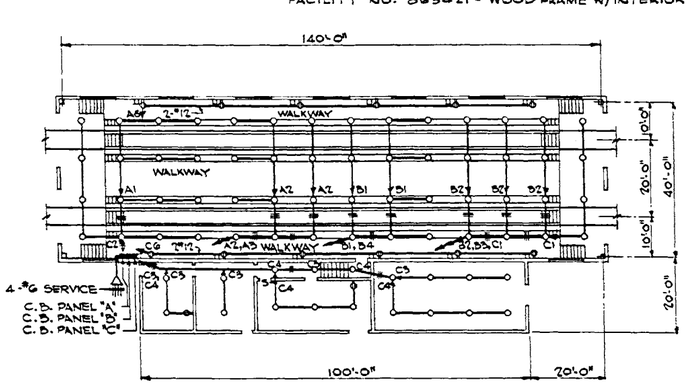
LOCOMOTIVE WATER HYDRANT

SCALE NO. 3



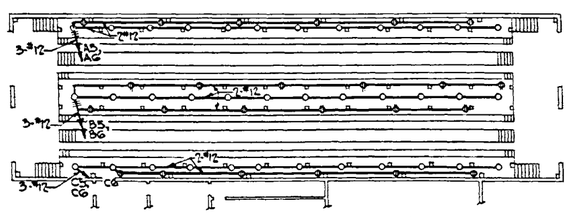
SECTION A-A
WOOD FRAME BLDG. SHELL

NO SCALE



PLAN ABOVE WALKWAY

SCALE NO. 9



PLAN BELOW WALKWAY

SCALE NO. 9

ELECTRICAL NOTES

CONNECTED LOADS	
LIGHTING	13.80 KW
RECP. EST.	3.80 KW
TOTAL	17.60 KW

1. ALL LAMPS IN LOW BAY AREAS & UNDER WALKWAYS TO BE 100W WITH 8" CONICAL SHADES.
2. ALL LAMPS IN HIGH BAY AREAS TO BE 150W PAR 38 PROJECTOR FLOOD.

SCHEDULE OF DRAWINGS

DWG. NO.	DESCRIPTION	SHEET NO.
86-34	PLANS	1 OF 1
99-98	STANDARD DETAILS	
34-19	WOOD FRAME BUILDING SHOP-LIVY DUTY-STD DET. 20' CLEARANCE	1-12 OF 12

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' 10' 15' NO.1 | 0 1' 2' 3' NO.5 | 0 10' 20' 30' NO.9

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

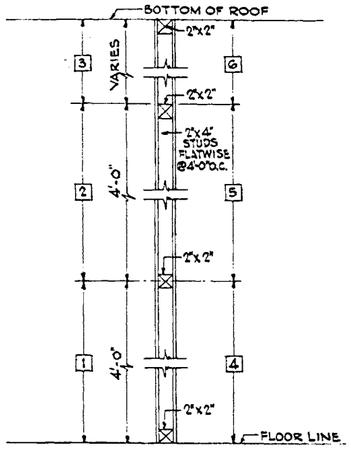
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: Chief, Structures Branch
APPROVED: H.M. Williams, Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1969

THEATER OF OPERATIONS
RAILROAD - DIESEL ENGINE HOUSE
4 STALL
60' X 140'

APPROVED FOR PROPONENT AGENCY
ROBERT W. GENTLEMAN
Colonel, GS
Deputy Chief, Transportation Resources Division
Directorate of Army Transportation
DATE 2 NOV 1968

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 86-34
SHEET 1 OF 1

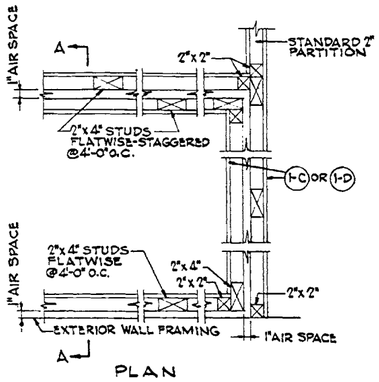


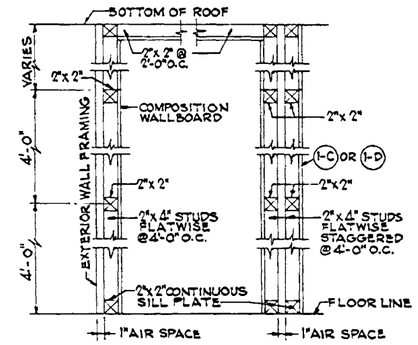
SECTION
SCALE NO.7

SCHEDULE OF WALL FINISHES

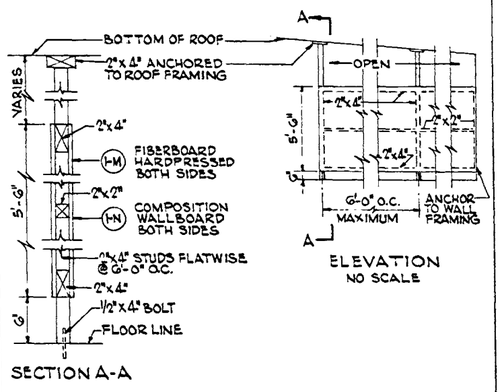
DETAIL NO.	1	2	3	4	5	6	WIRE FABRIC ONLY WHEN NOTED ON PLANS	FIBERBOARD HARDPRESSED WAINSCOT IF CORRIDOR SIDE
1-A	NONE	NONE	NONE	FIBERBOARD HARDPRESSED		NONE	6	4
1-B	NONE	NONE	NONE	COMPOSITION WALLBOARD		NONE	6	4
1-C	NONE	NONE	NONE	COMPOSITION WALLBOARD			—	4
1-D	NONE	NONE	NONE	FIBERBOARD HARDPRESSED			—	4
1-E	COMPOSITION WALLBOARD		NONE	COMPOSITION WALLBOARD		NONE	6	1 OR 4
1-F	FIBERBOARD HARDPRESSED		NONE	FIBERBOARD HARDPRESSED		NONE	6	1 OR 4
1-G	COMPOSITION WALLBOARD						—	1 OR 4
1-H	FIBERBOARD HARDPRESSED						—	1 OR 4
1-J	COMPOSITION WALLBOARD		NONE	FIBERBOARD HARDPRESSED		NONE	6	1 OR 4
1-K	COMPOSITION WALLBOARD			FIBERBOARD HARDPRESSED			—	1 OR 4
1-X	1" WOOD SHEATHING			NONE			—	—

INTERIOR PARTITIONS

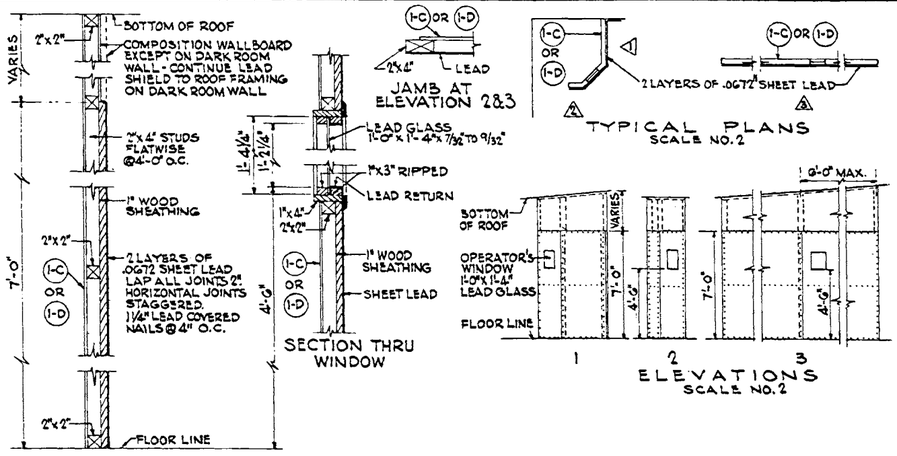




SOUNDPROOF PARTITION (1-L)
SCALE NO.7

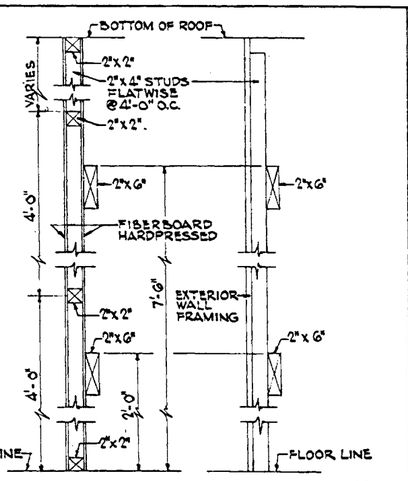


INTERIOR PARTITIONS (1-M) (1-N)
SCALE NO.7

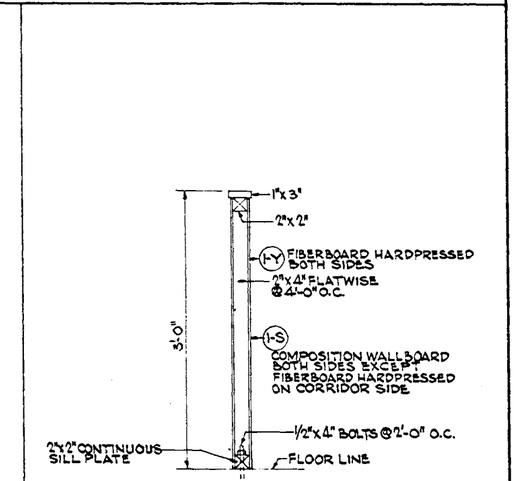


SECTIONS & JAMB
SCALE NO.7

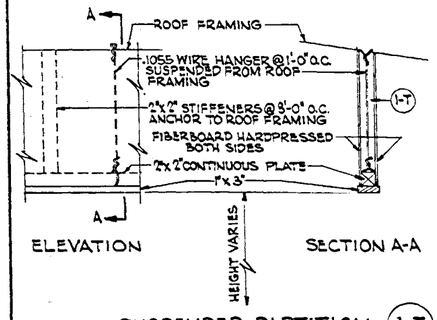
LEADED PARTITION & WINDOW (1-P)



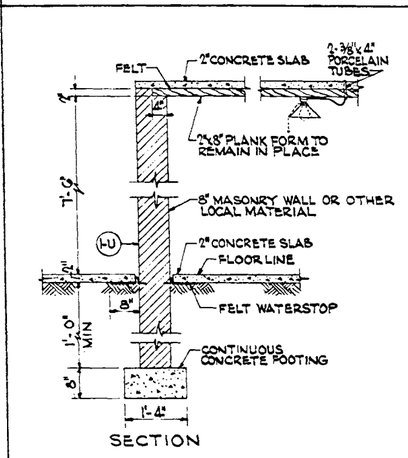
PHYSICAL TRAINING EQUIPMENT PARTITIONS (1-Q) (1-R)
SCALE NO. 7



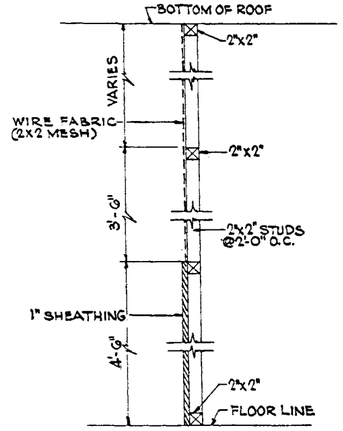
RAILING (1-S) (1-Y)
SCALE NO.7



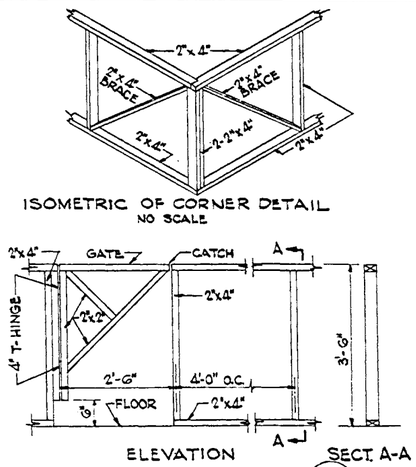
SUSPENDED PARTITION (1-T)
SCALE NO.7



VAULT (1-U)
SCALE NO. 5



INTERIOR PARTITION (1-W)
SCALE NO.7



RAILING & GATE (1-Z)
SCALE NO.5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 5' NO.2 | 0 1' 2' 3' NO.5 | 0 3" 6" 9" 1' 2' NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

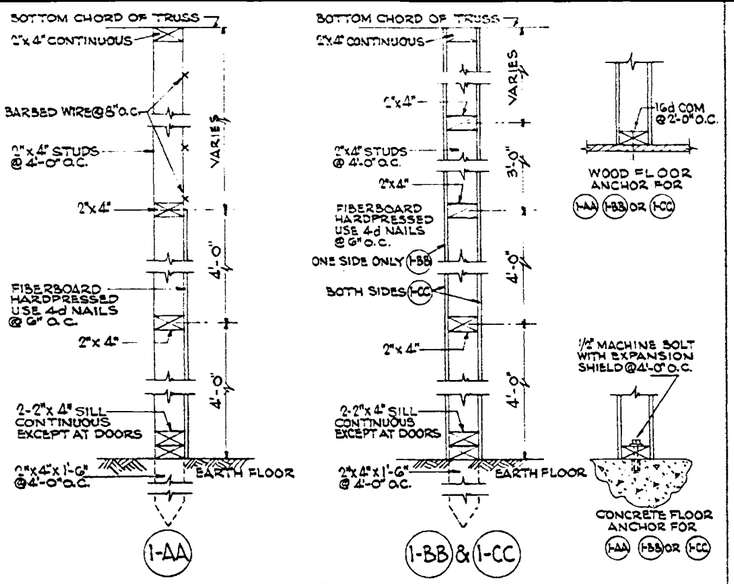
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: ILYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH

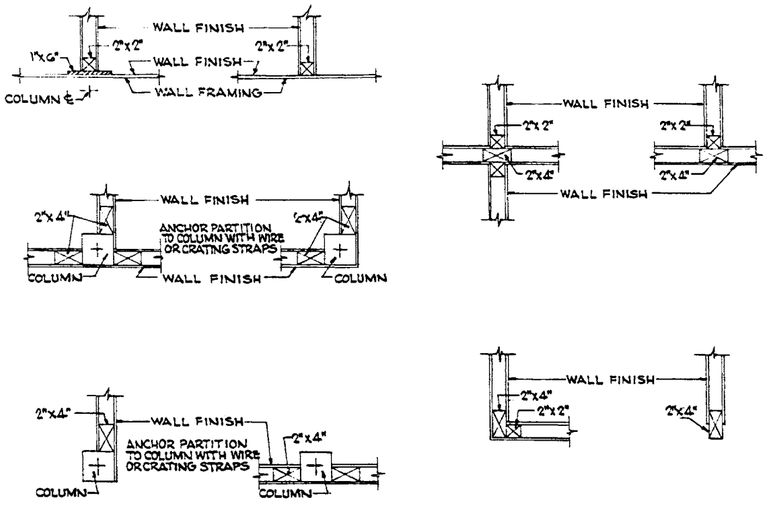
THEATER OF OPERATIONS
STANDARD DETAILS
1-A THRU 1-Z

APPROVED: H.M. Williams
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 1 8 MAR 1968

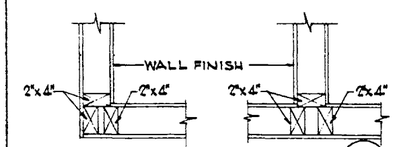
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 1



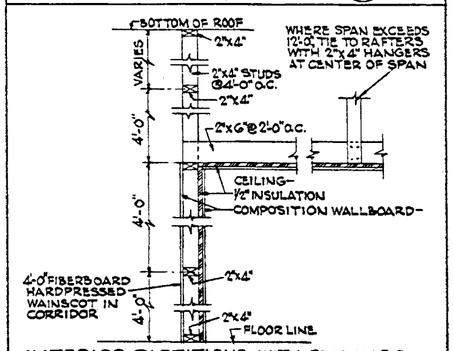
INTERIOR PARTITIONS
SCALE NO.7



PARTITION INTERSECTIONS 1-DD
SCALE NO.7

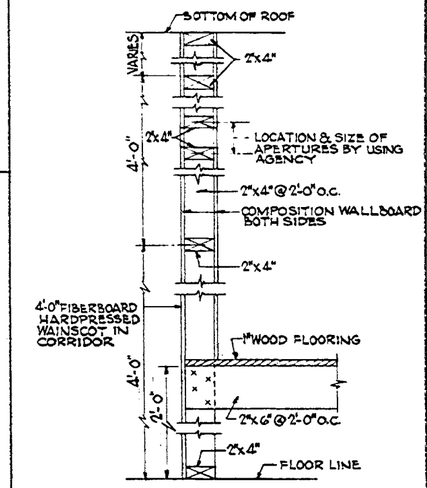


PARTITION INTERSECTIONS 1-EE
SCALE NO.7

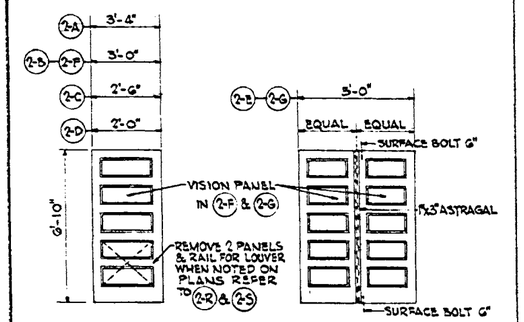


INTERIOR PARTITIONS WITH CEILINGS
SCALE NO.5

WITHOUT INSULATION 1-FF, WITH INSULATION 1-GG



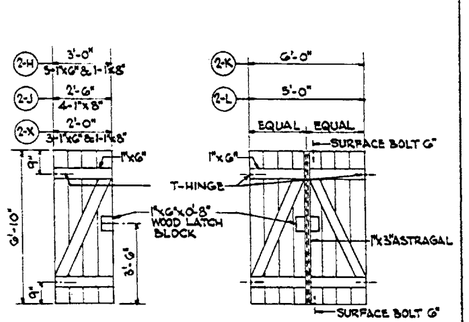
PROJECTION BOOTH PARTITION 1-HH
SCALE NO. 7



PANEL DOORS & VISION PANEL DOORS
NO SCALE

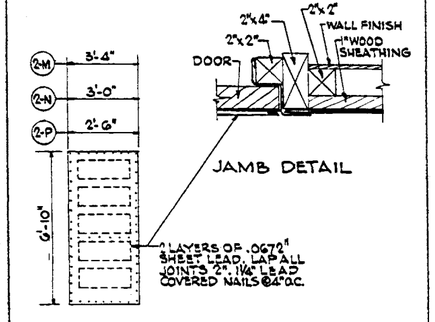
2-A 2-B 2-C 2-D 2-E 2-F 2-G

NOTE
USE TWO 6" SURFACE BOLTS ON FIXED LEAF OF DOUBLE DOOR.



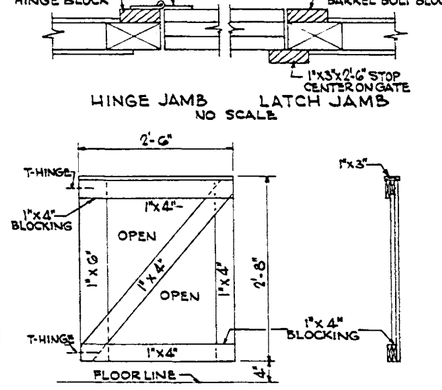
BOARD & BATTEN DOORS
NO SCALE

2-H 2-J 2-K 2-L 2-X



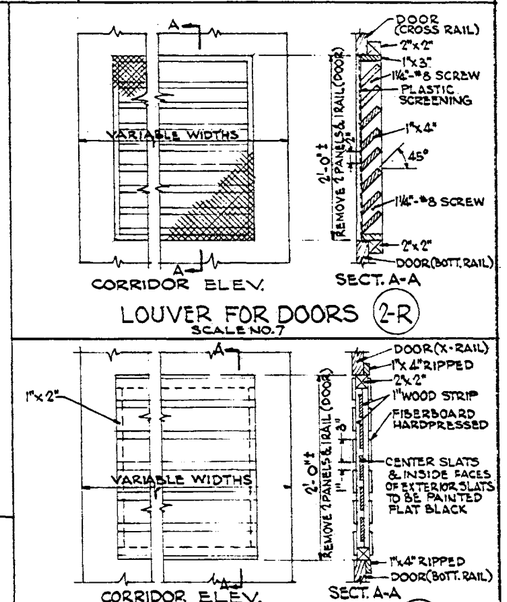
LEAD FACED DOORS
NO SCALE

2-M 2-N 2-P



GATE
SCALE NO.6

2-Q



LOUVER FOR DOORS
SCALE NO.7

2-R

LIGHT-PROOF LOUVER FOR DOORS
SCALE NO.7

2-S

DOOR JAMBS
NO SCALE

2-T

METAL COVERED DOOR 2-U
SCALE NO.7

DUTCH DOOR 2-W

NOTE: ADJUST HANGERS 30 DOOR SLIDES AGAINST WALL FINISH.

SLIDING DOOR
SCALE NO. 4

2-Y

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES 0 1' 2' 3' NO.6 — 0 1' 2' NO.7 — 0 1' 2' 3' NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

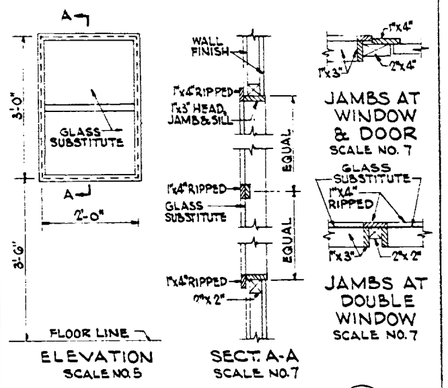
DRAWN BY: DEICHMANN
TRACED BY: ILYUS
CHECKED BY:
SUBMITTED BY: C. W. DEICHMANN
APPROVED: H. E. Schramm, Chief, Structures Branch
APPROVED: H. M. Williams, Chief, Engineering Division, Mil. Constr., O.C.E.
DATE: 19 MAR 1958
APPROVED FOR PROPONENT AGENCY:
DATE:

THEATER OF OPERATIONS

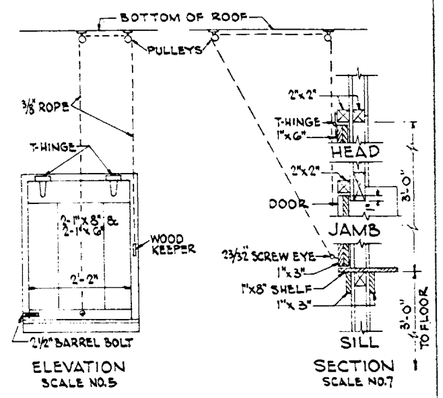
STANDARD DETAILS

1-AA THRU 1-HH
2-A THRU 2-Y

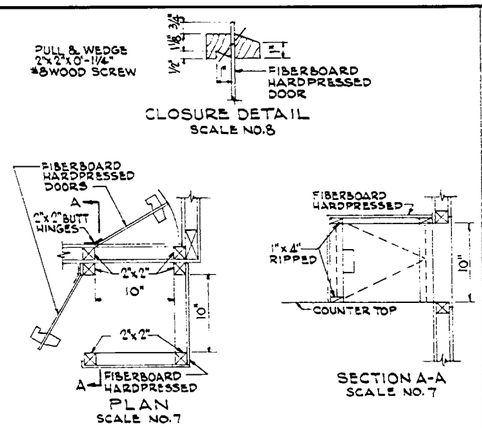
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 2



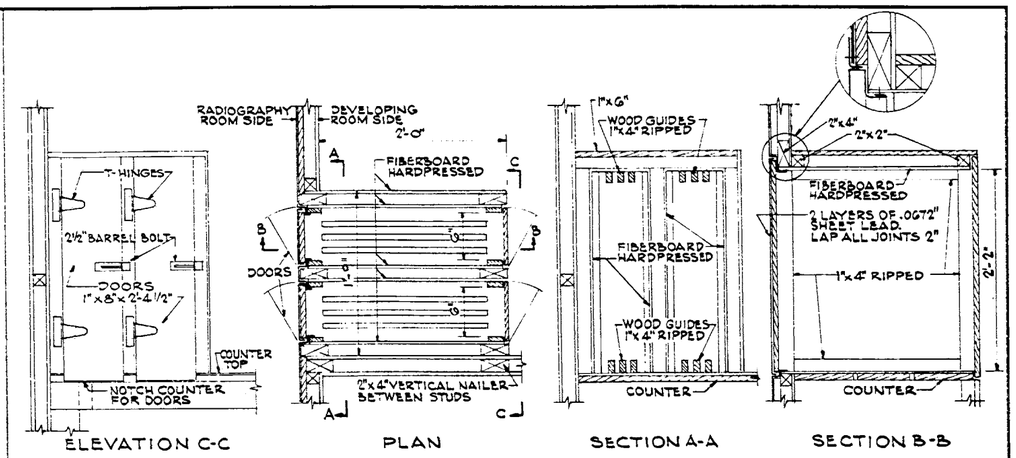
INTERIOR WINDOW 3-A
SCALE AS NOTED



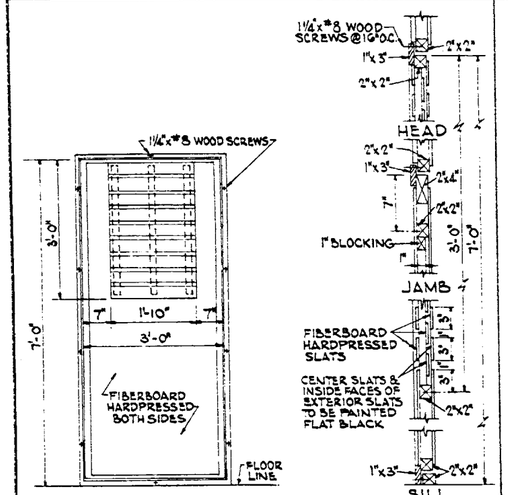
WICKET 3-B
SCALE AS NOTED



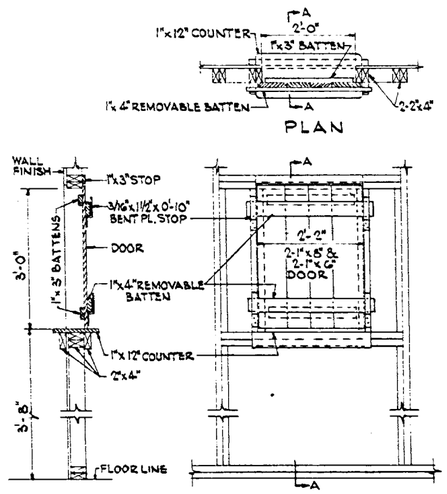
URINALYSIS PASS BOX 3-C
SCALE AS NOTED



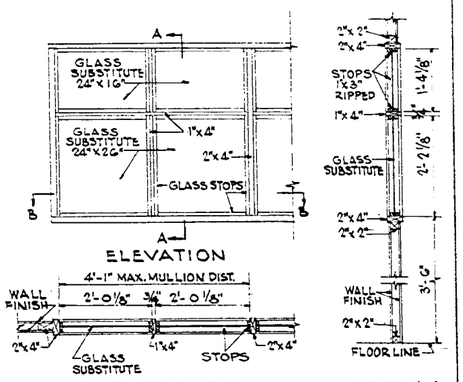
FILM PASS BOX 3-E
SCALE NO.7



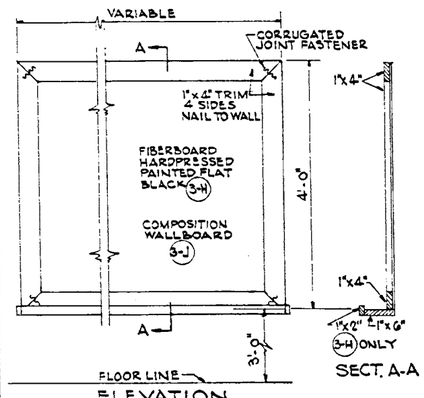
REMOVABLE PANEL WITH LIGHT-PROOF LOUVER 3-D
SCALE AS NOTED



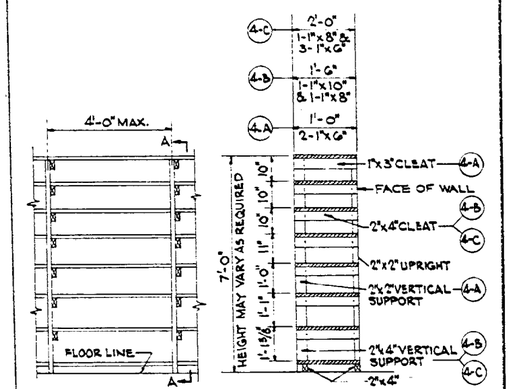
WICKET 3-F
SCALE NO.5



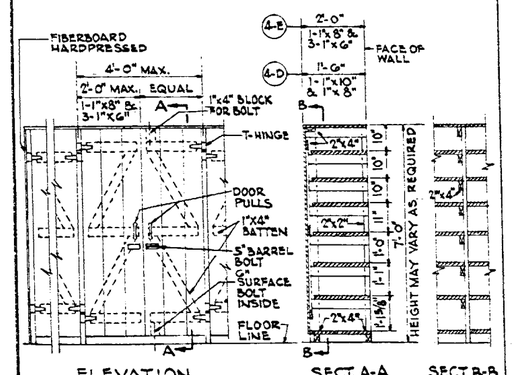
INTERIOR WINDOW 3-G
SCALE NO. 5



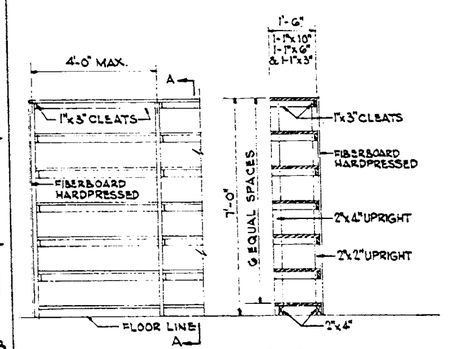
BLACKBOARD 3-H; BULLETIN 3-J
SCALE NO. 6



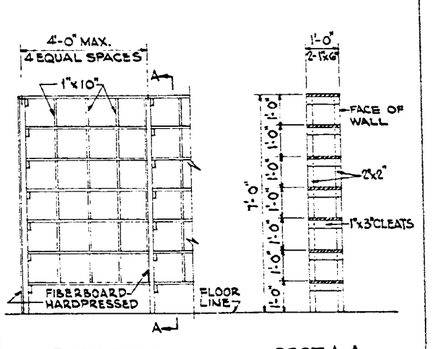
SHELVES 4-A 4-B 4-C
SCALE NO. 4



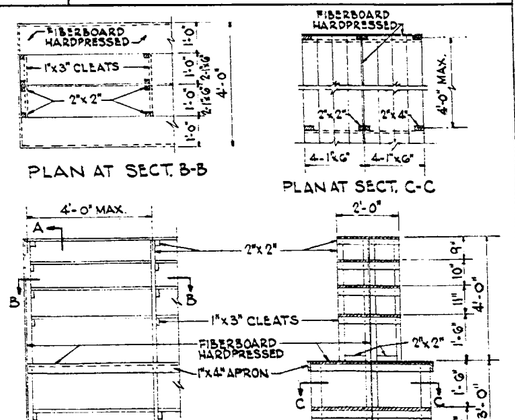
SHELVES WITH DOORS 4-D 4-E
SCALE NO. 4



CLOTHING SHELVES 4-F
SCALE NO. 4



COMPARTMENT SHELVES 4-G
SCALE NO. 4



COUNTER & SHELVES 4-H
SCALE NO. 4

SYMBOL | DESCRIPTION | DATE | APPROVAL
REVISIONS

GRAPHIC SCALES
NO.4 NO.5 NO.6 NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

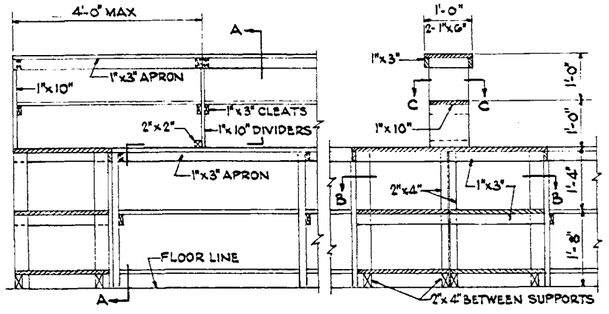
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: DEICHMANN
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED: CHIEF, STRUCTURES BRANCH

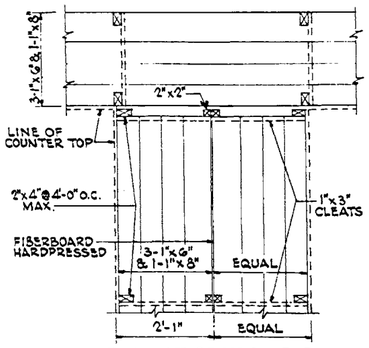
THEATER OF OPERATIONS
STANDARD DETAILS
3-A THRU 3-J
4-A THRU 4-H

APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

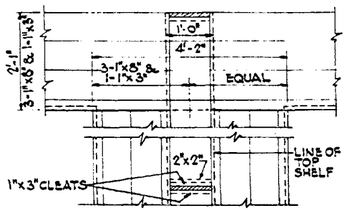
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 3



ELEVATION SECTION A-A

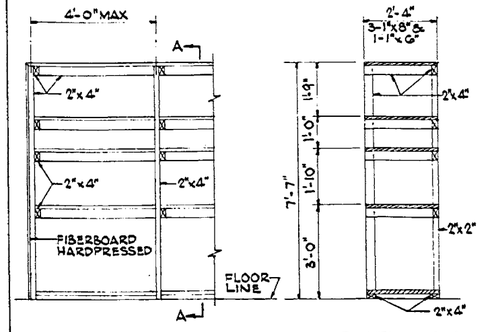


PLAN AT SECTION B-B



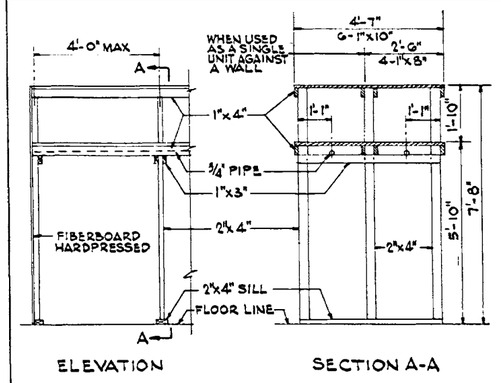
PLAN AT SECTION C-C

COUNTER & SHELVES (4-J)
SCALE NO. 5



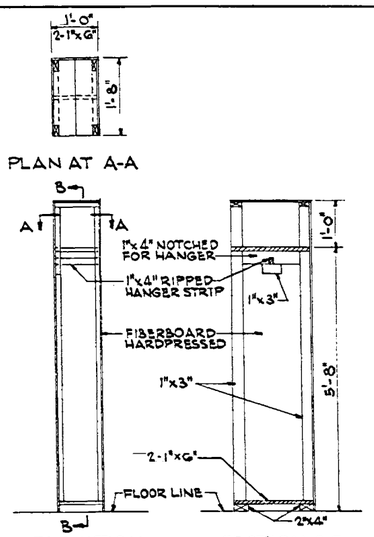
ELEVATION SECTION A-A

LUGGAGE RACK (4-K)
SCALE NO. 4



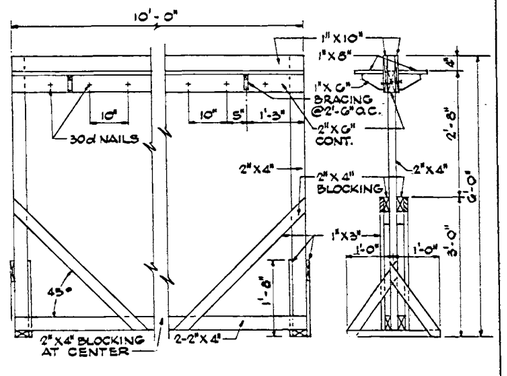
ELEVATION SECTION A-A

CLOTHES HANGING RACK (4-L)
SCALE NO. 4



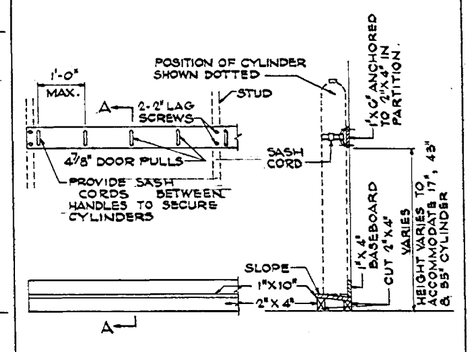
ELEVATION SECTION B-B

LOCKER (4-M)
SCALE NO. 5



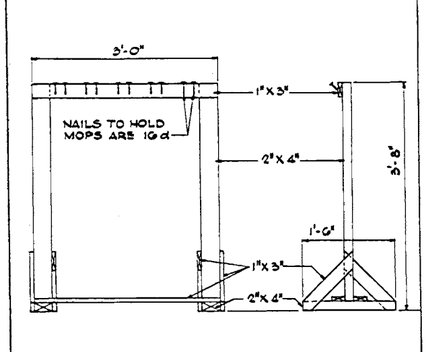
FRONT ELEVATION SIDE ELEVATION

MOVABLE CLOTHES RACK (4-N)
SCALE NO. 5



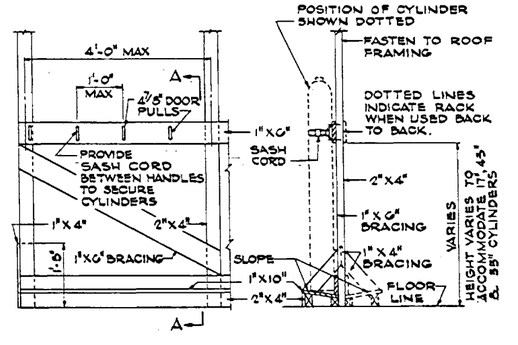
ELEVATION SECTION A-A

GAS CYLINDER STORAGE RACK WALL MOUNTED (4-P)
SCALE NO. 5



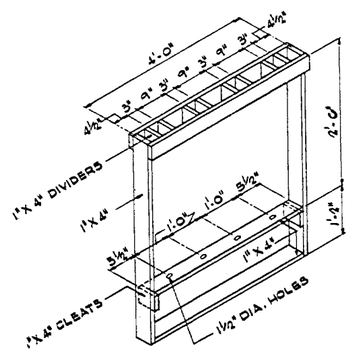
FRONT SIDE ELEVATIONS

MOP RACK (4-Q)
SCALE NO. 6

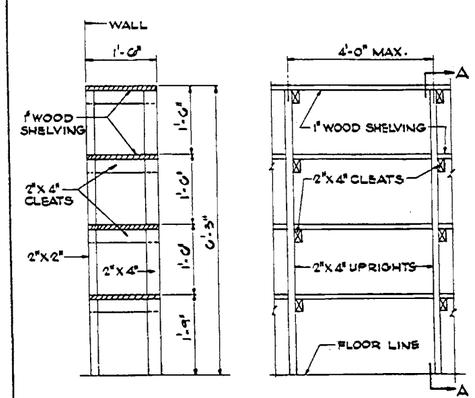


ELEVATION SECTION A-A

GAS CYLINDER STORAGE RACK FREE STANDING (4-R)
SCALE NO. 5

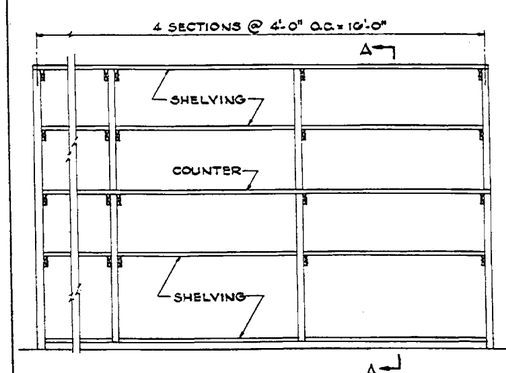


WALL MOUNTED MOP RACK (4-S)
NO SCALE

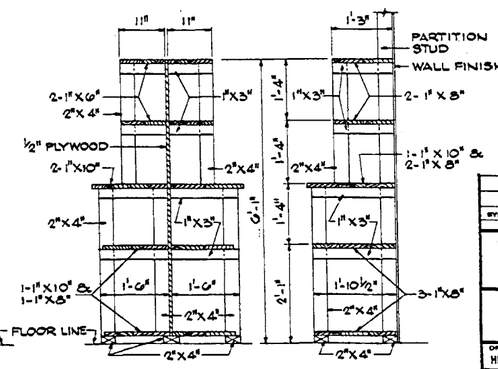


SECTION A-A ELEVATION

SHELVES (4-T)
SCALE NO. 5



ELEVATION



SECTION A-A SECTION A-A

COUNTER & SHELVES (4-U) (4-W)
SCALE NO. 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' — NO.4
0 1' 2' 3' — NO.5
0 1' 2' — NO.6

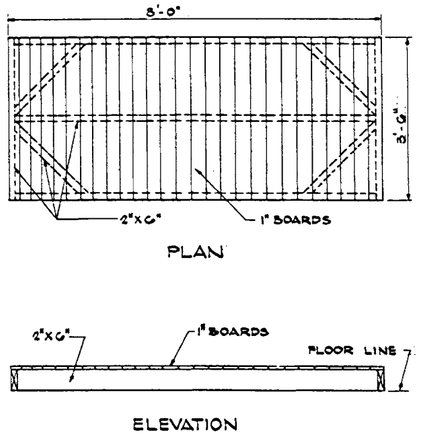
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W.DEICHMANN

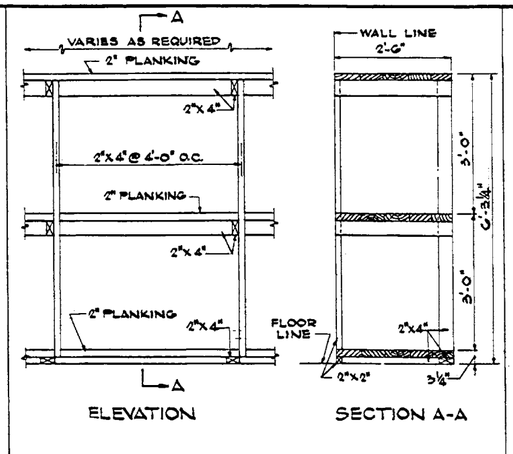
THEATER OF OPERATIONS
STANDARD DETAILS
4J THRU 4T, 4U & 4W

APPROVED: DATE: 19 MAR 1943
CHIEF, STRUCTURAL BRANCH, CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
DATE
SHEET 4



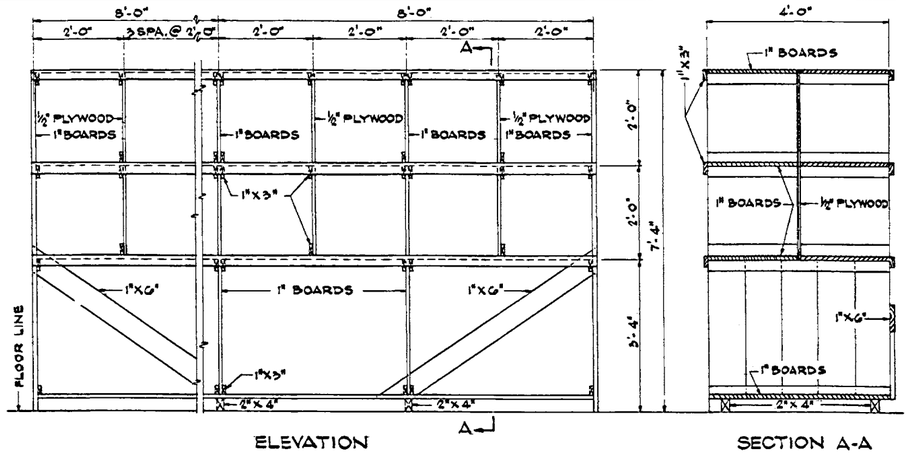
PLATFORM
SCALE NO. 5

4-V



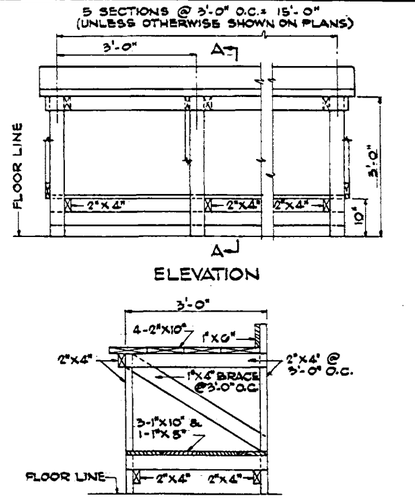
SHELVES
SCALE NO. 5

4-CC



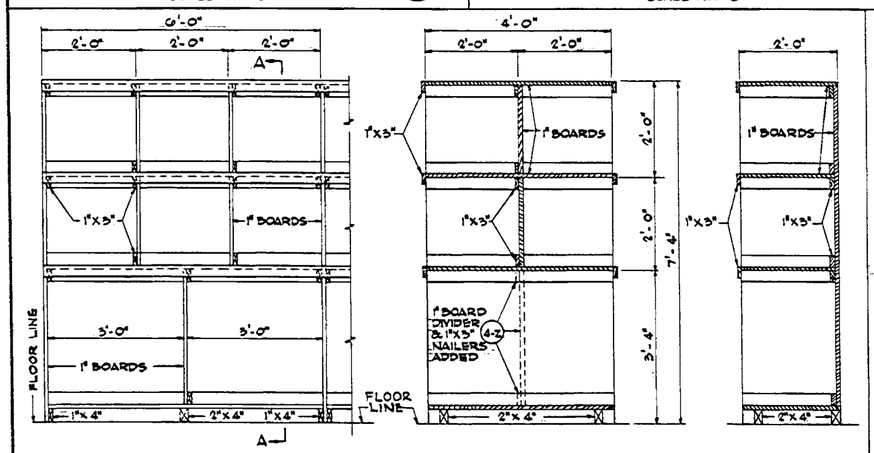
STORAGE BINS
SCALE NO. 5

4-AA



PORTABLE WORK BENCH
SCALE NO. 5

4-X

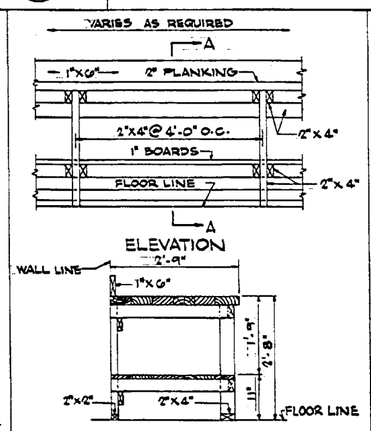


4-Y 4-Z

4-BB

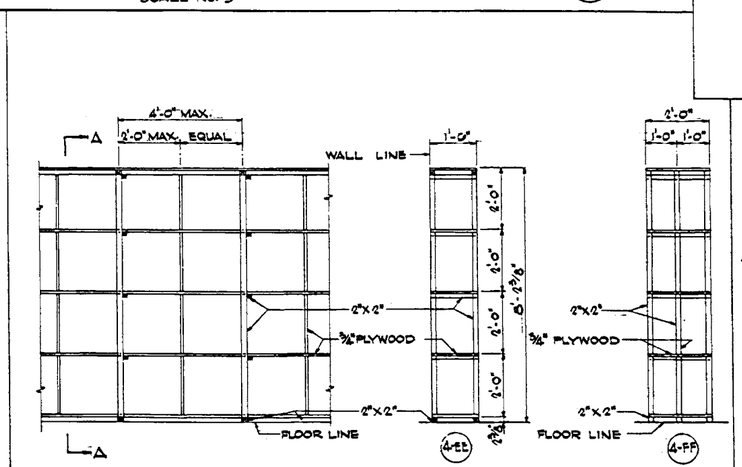
STORAGE BINS
SCALE NO. 5

4-Y 4-Z 4-BB



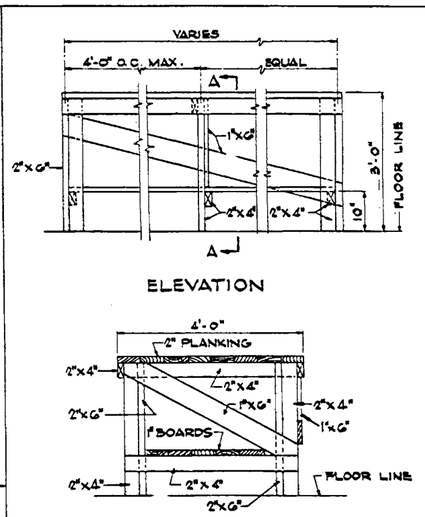
WORK BENCH
SCALE NO. 5

4-DD



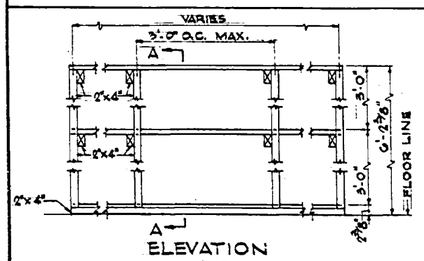
STORAGE BINS
SCALE NO. 4

4-EE 4-FF



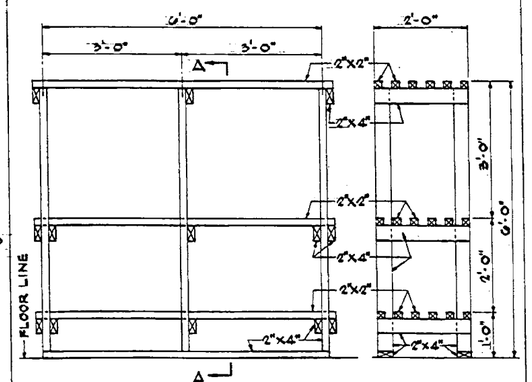
WORK TABLE
SCALE NO. 5

4-GG



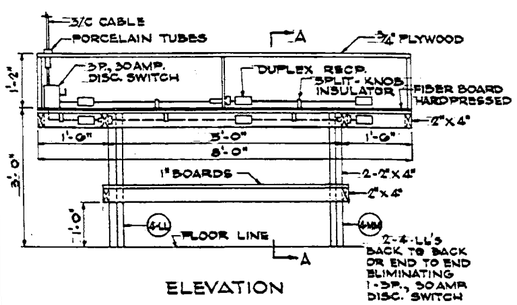
STORAGE RACK
SCALE NO. 5

4-HH



DRYING RACK
SCALE NO. 5

4-KK



WORK BENCHES
SCALE NO. 5

4-LL 4-MM

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4' NO.4
0 1' 2' 3' NO.5

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

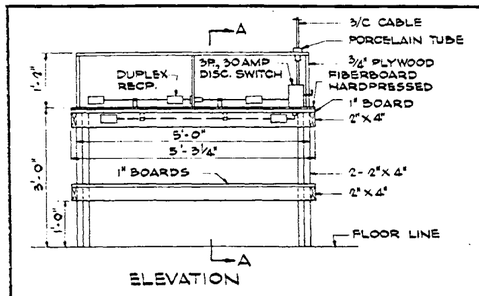
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: I.LYUS
SUBMITTED BY: C.W. DEICHMANN

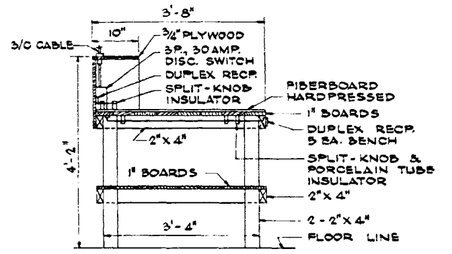
THEATER OF OPERATIONS
STANDARD DETAILS
4V. 4X THRU 4Z & 4AA THRU 4MM

APPROVED: [signature] CHIEF, STRUCTURES BRANCH
APPROVED: [signature] for H.M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 99-98
SHEET 5



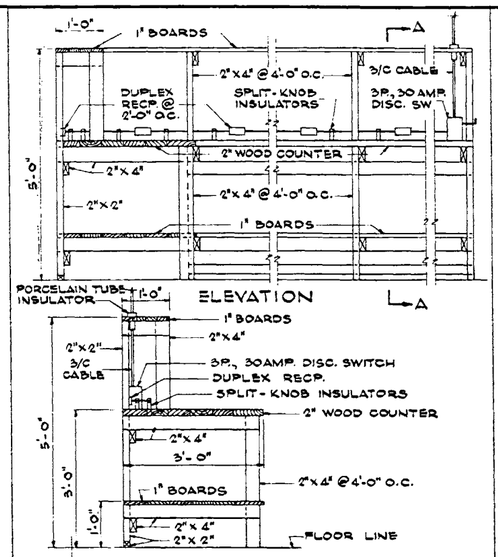
ELEVATION



SECTION A-A

WORK BENCH (4-NN)

SCALE NO. 5

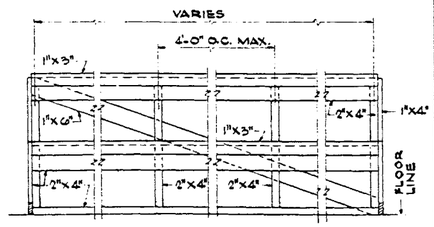


ELEVATION

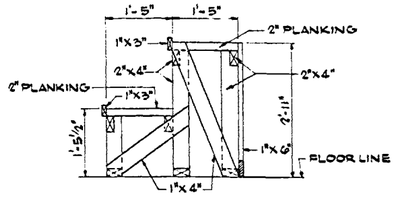
SECTION A-A

WORK BENCH (4-PP)

SCALE NO. 5



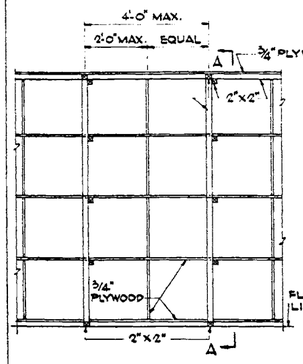
FRONT ELEVATION



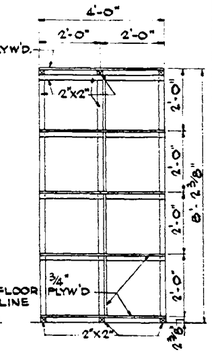
END ELEVATION

BATTERY RACK (4-RR)

SCALE NO. 5



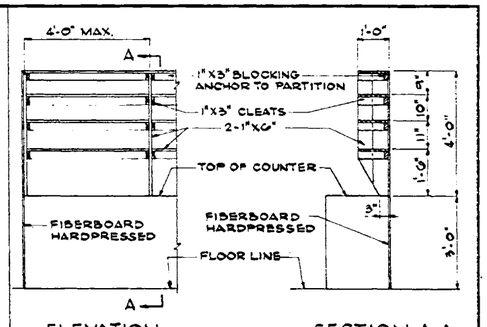
ELEVATION



SECTION A-A

STORAGE BINS (4-SS)

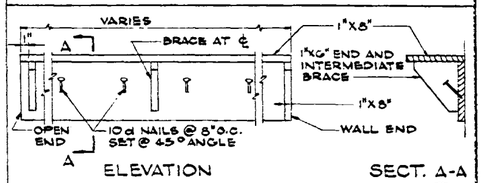
SCALE NO. 4



ELEVATION SECTION A-A

WALL SHELVES (5-A)

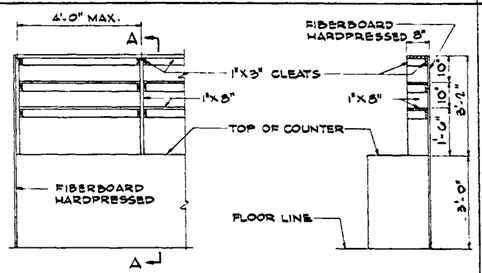
SCALE NO. 4



ELEVATION SECT. A-A

SHELF AND HOOK STRIP (5-D)

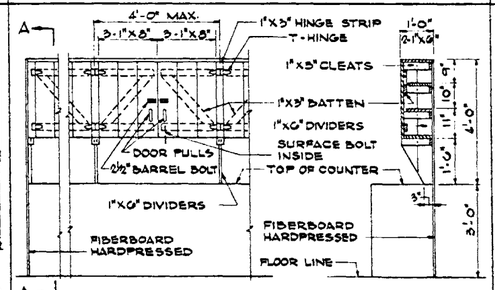
SCALE NO. 7



ELEVATION SECTION A-A

WALL SHELVES (5-B)

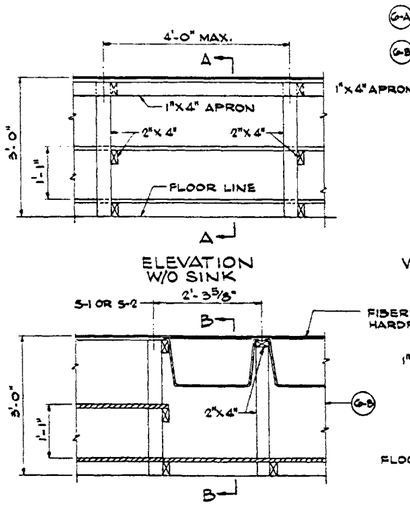
SCALE NO. 4



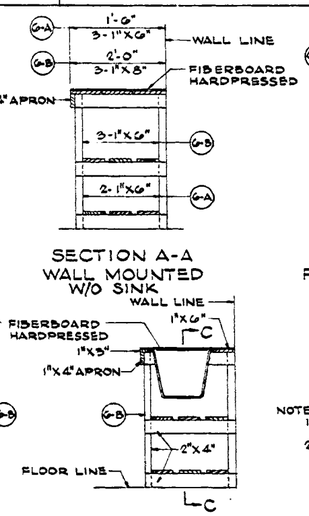
ELEVATION SECTION A-A

WALL SHELVES WITH DOORS (5-C)

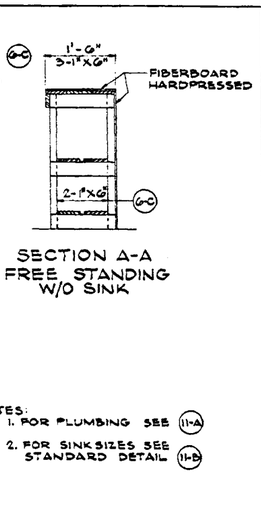
SCALE NO. 4



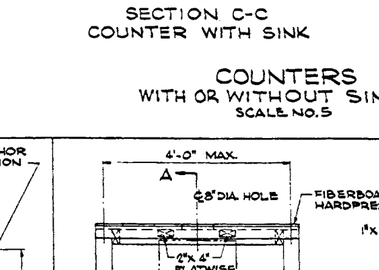
ELEVATION W/O SINK



SECTION A-A WALL MOUNTED W/O SINK



SECTION A-A FREE STANDING W/O SINK



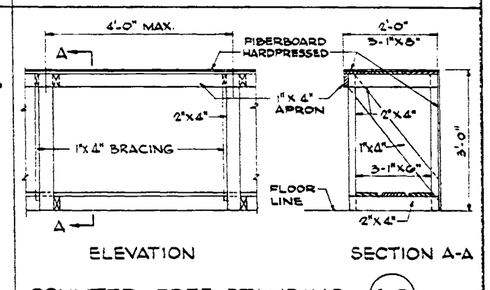
SECTION C-C COUNTER WITH SINK

SECTION B-B COUNTER WITH SINK

NOTES:
1. FOR PLUMBING SEE (11-A)
2. FOR SINK SIZES SEE STANDARD DETAIL (11-B)

COUNTERS WITH OR WITHOUT SINK (G-A) (G-B) (G-C)

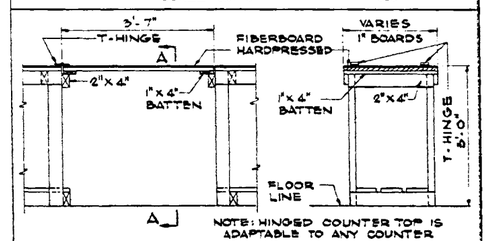
SCALE NO. 5



ELEVATION SECTION A-A

COUNTER-FREE STANDING (G-D)

SCALE NO. 5

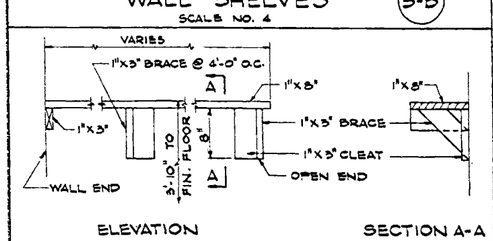


NOTE: HINGED COUNTER TOP IS ADAPTABLE TO ANY COUNTER

ELEVATION SECTION A-A

HINGED COUNTER TOP (G-E)

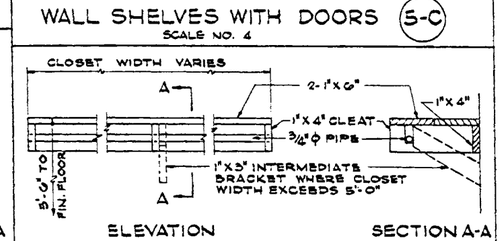
SCALE NO. 5



ELEVATION SECTION A-A

SCRUB-UP SHELF (5-F)

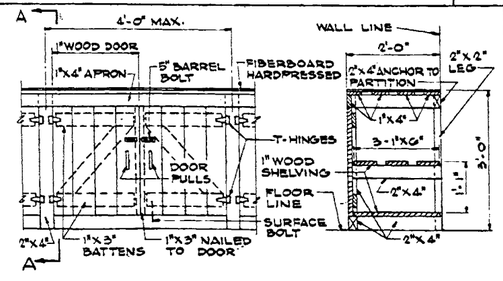
SCALE NO. 7



ELEVATION SECTION A-A

CLOSET SHELF AND POLE (5-E)

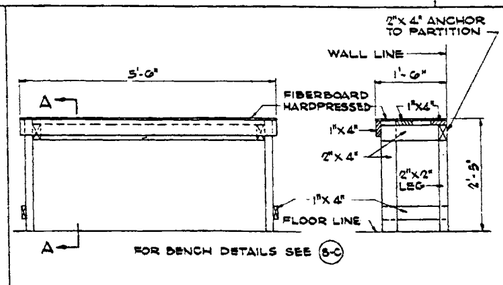
SCALE NO. 7



ELEVATION SECTION A-A

COUNTER WITH DOORS (G-F)

SCALE NO. 5

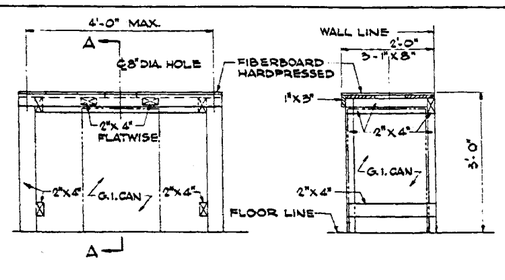


FOR BENCH DETAILS SEE (5-C)

ELEVATION SECTION A-A

KITCHENETTE COUNTER (G-G)

SCALE NO. 5



ELEVATION SECTION A-A

COUNTER FOR DISPOSAL CAN (G-H)

SCALE NO. 5

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' NO. 4
0 1' 2' 3' NO. 5
0 3" 6" 9" 1' 2' NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature] CHIEF, ST RUCTURES BRANCH

THEATER OF OPERATIONS

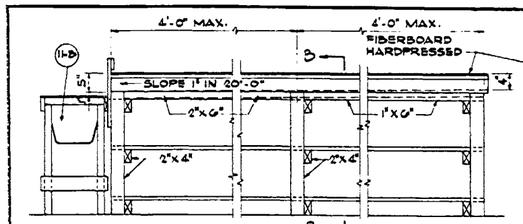
STANDARD DETAILS
4NN THRU 4SS
5A THRU 5F
& 6A THRU 6H

APPROVED: [signature] CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1943

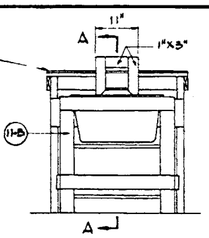
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 5

CORPS OF ENGINEERS

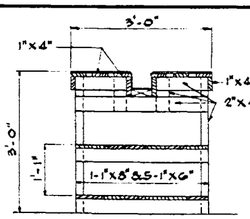
U. S. ARMY



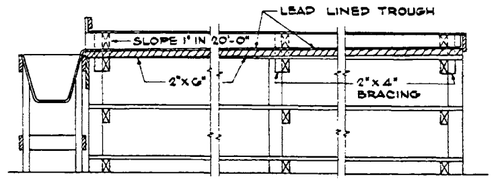
ELEVATION
SCALE NO. 5



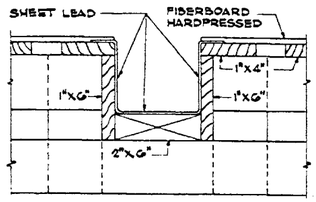
LEFT END ELEVATION
SCALE NO. 5



SECTION B-B
SCALE NO. 5



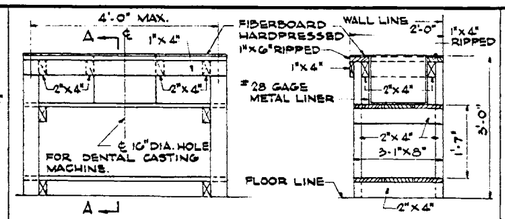
SECTION A-A
SCALE NO. 5



SECTION THRU TROUGH
SCALE NO. 5

LEAD LINED TROUGH IN COUNTER
AS NOTED

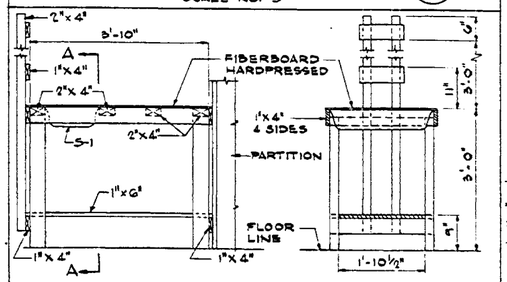
(G-J)



ELEVATION SECTION A-A

DENTAL COUNTER
SCALE NO. 5

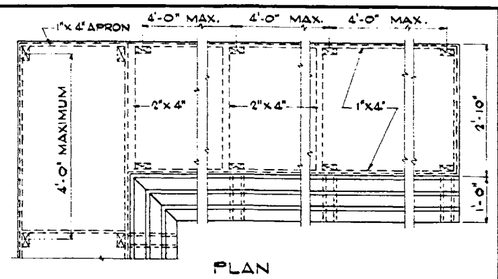
(G-K)



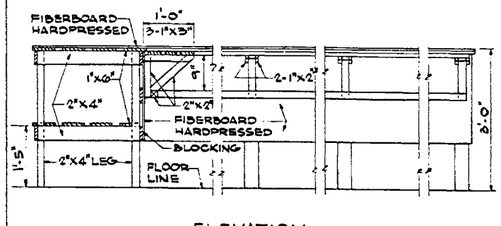
ELEVATION SECTION A-A

COUNTER WITH SINK
SCALE NO. 5

(G-L)



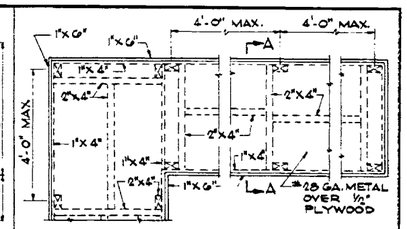
PLAN



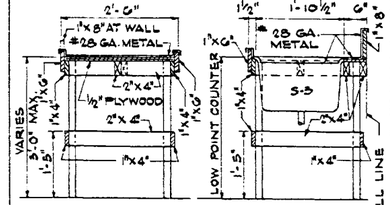
ELEVATION

SERVING COUNTER
SCALE NO. 5

(G-M)



FRAMING PLAN

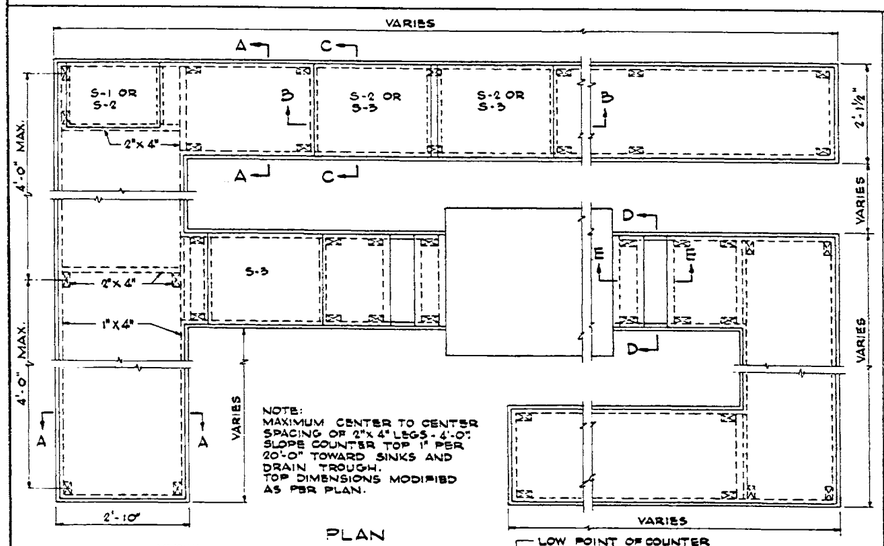


SECTION A-A SECTION THRU SINK

NOTE:
SLOPE COUNTER TOP 1" IN 20'-0" TOWARD SINK & SCRAPING COUNTER.
FOR SINK SIZE SEE DETAIL (11-B)

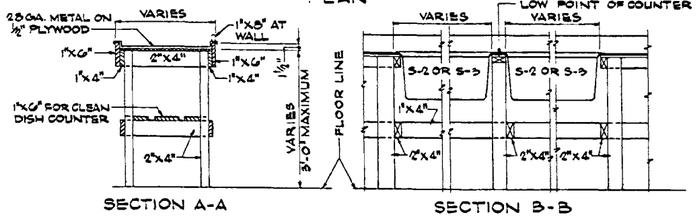
POT WASHING COUNTER
SCALE NO. 5

(G-Q)

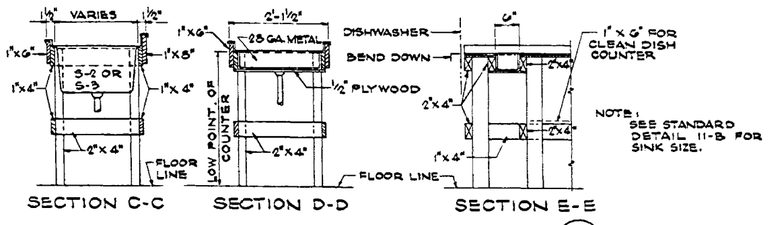


NOTE:
MAXIMUM CENTER TO CENTER SPACING OF 2"x 4" LEGS - 4'-0".
SLOPE COUNTER TOP 1" PER 20'-0" TOWARD SINKS AND DRAIN TROUGH.
TOP DIMENSIONS MODIFIED AS PER PLAN.

PLAN



SECTION A-A SECTION B-B

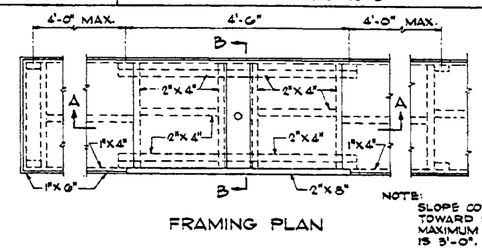


SECTION C-C SECTION D-D SECTION E-E

NOTE:
SEE STANDARD DETAIL 11-B FOR SINK SIZE.

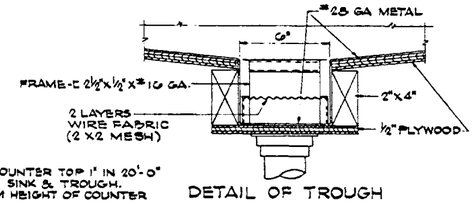
DISHWASHING COUNTER
SCALE NO. 5

(G-S)

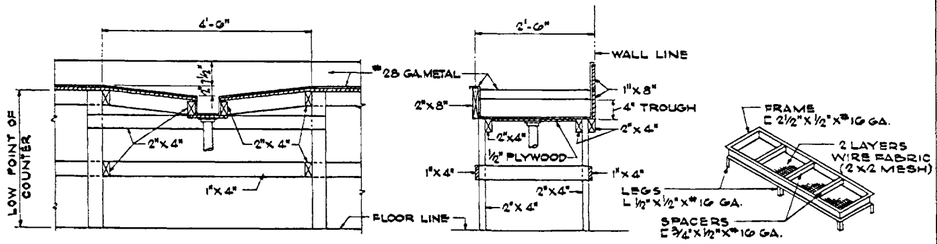


FRAMING PLAN

NOTE:
SLOPE COUNTER TOP 1" IN 20'-0" TOWARD SINK & TROUGH. MAXIMUM HEIGHT OF COUNTER IS 3'-0".



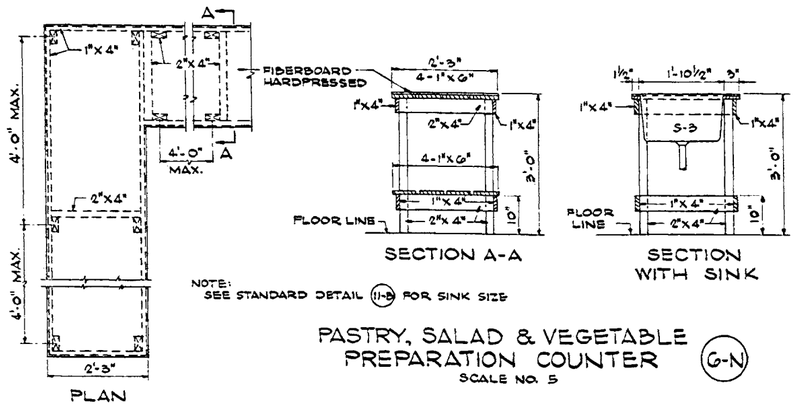
DETAIL OF TROUGH
NO SCALE



SECTION A-A SECTION B-B BASKET
NO SCALE

POT SCRAPING COUNTER
SCALE NO. 5

(G-T)

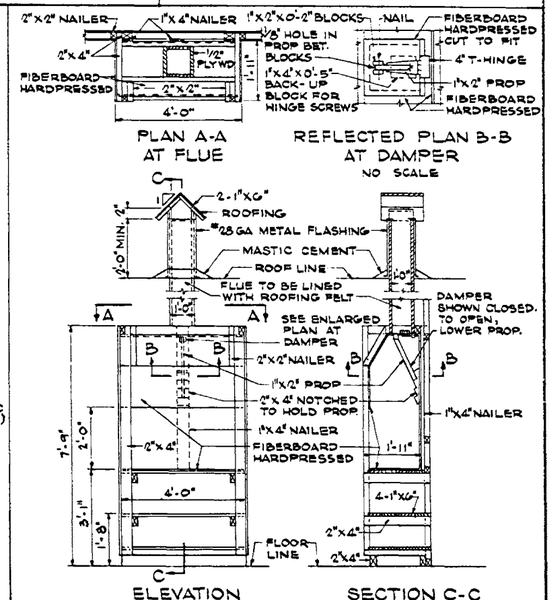


PLAN SECTION A-A SECTION WITH SINK

NOTE:
SEE STANDARD DETAIL (11-B) FOR SINK SIZE

PASTRY, SALAD & VEGETABLE PREPARATION COUNTER
SCALE NO. 5

(G-N)



FUME HOOD & COUNTER
SCALE NO. 4

(G-R)

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 4'0 — NO.4
0 1' 2' 3'0 — NO.5
0 1" 2" 3" 6" 9" 1' — NO.8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

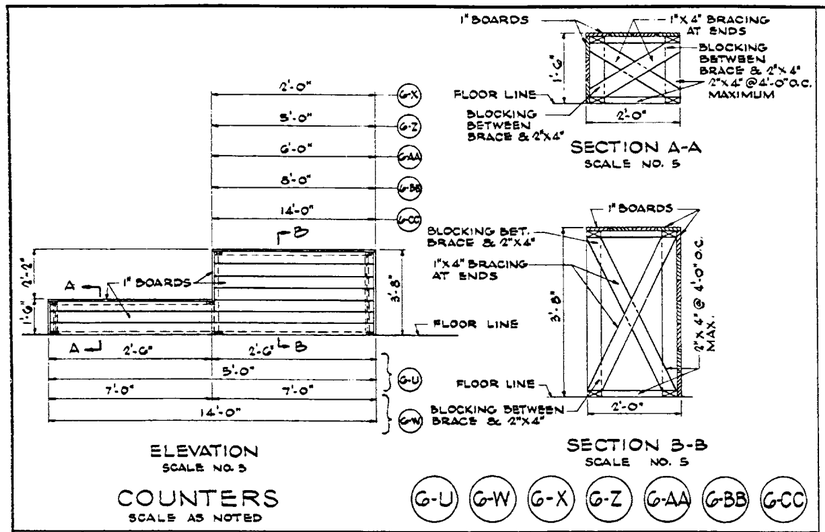
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION, ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: W. Eichmann CHIEF, STRUCTURES BRANCH

THEATER OF OPERATIONS
STANDARD DETAILS
6J THRU 6T

APPROVED: A.M. Williams CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
DATE: 19 MAR 1969

APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 7



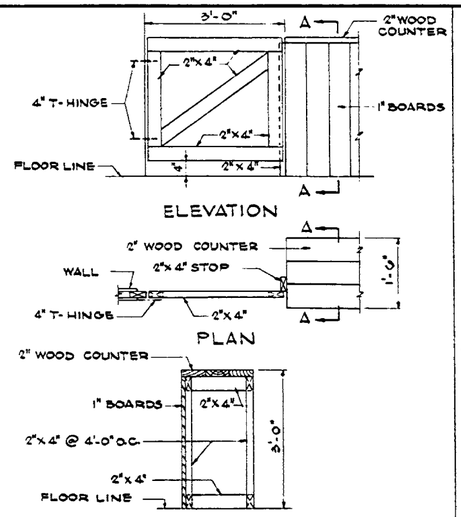
ELEVATION
SCALE NO. 5

SECTION A-A
SCALE NO. 5

SECTION B-B
SCALE NO. 5

COUNTERS
SCALE AS NOTED

G-U G-W G-X G-Z G-AA G-BB G-CC



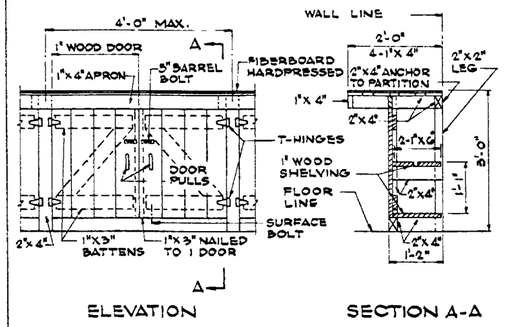
ELEVATION

PLAN

SECTION A-A

COUNTER & SWINGING GATE
SCALE NO. 5

G-DD

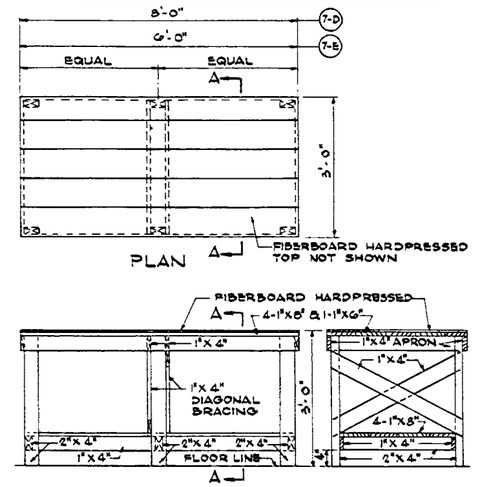


ELEVATION

SECTION A-A

COUNTER WITH DOORS
(VARIABLE LENGTH)
SCALE NO. 5

G-EE



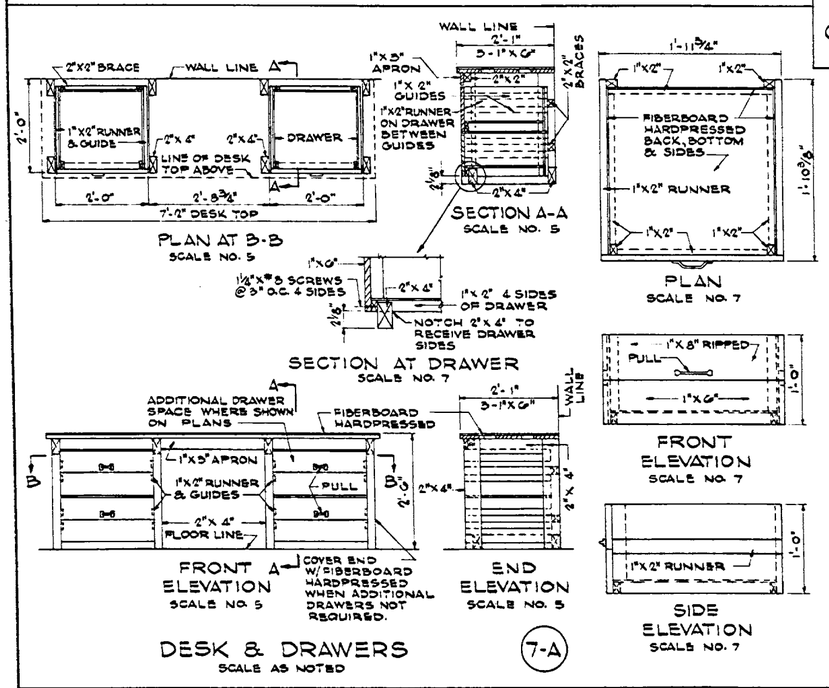
PLAN

ELEVATION

SECTION A-A

WORK TABLE
SCALE NO. 5

7-D 7-E



PLAN AT B-B
SCALE NO. 5

SECTION A-A
SCALE NO. 5

SECTION AT DRAWER
SCALE NO. 7

FRONT ELEVATION
SCALE NO. 5

END ELEVATION
SCALE NO. 5

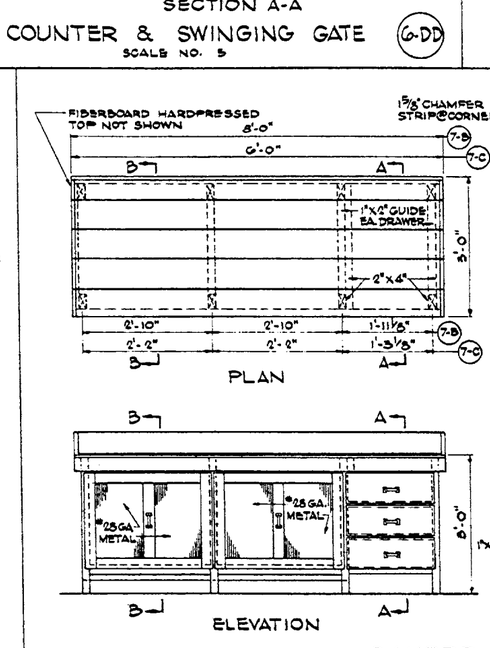
PLAN
SCALE NO. 7

FRONT ELEVATION
SCALE NO. 7

SIDE ELEVATION
SCALE NO. 7

DESK & DRAWERS
SCALE AS NOTED

7-A



PLAN

ELEVATION
DRAWER

SECTION C-C

ELEVATION
BIN

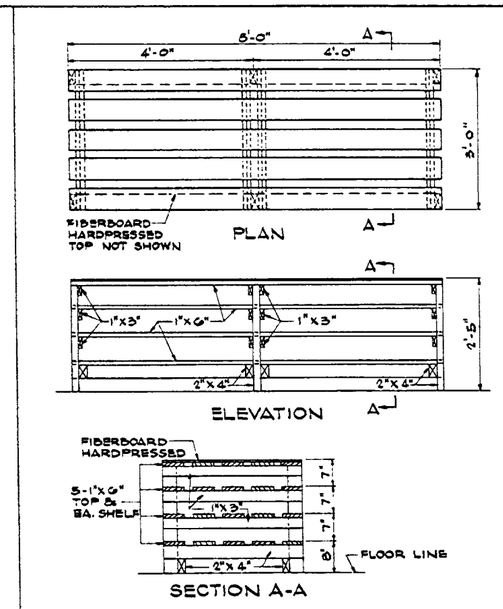
ELEVATION

SECTION A-A

SECTION B-B

BAKERS TABLE
SCALE NO. 5

7-B 7-C

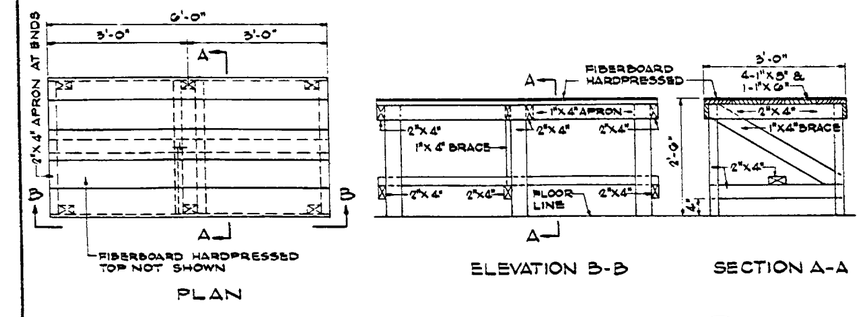


ELEVATION

SECTION A-A

TABLE WITH TRAY RACK
SCALE NO. 5

7-F



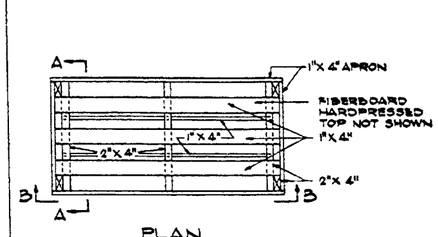
PLAN

ELEVATION B-B

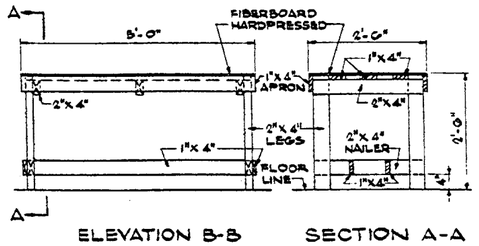
SECTION A-A

GENERAL UTILITY TABLE
SCALE NO. 5

7-G



PLAN



ELEVATION B-B

SECTION A-A

LIBRARY TABLE
SCALE NO. 5

7-H

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3' 4' 5' NO. 3
0 1' 2' 3' NO. 5
0 3" 6" 9" 1' 2' NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

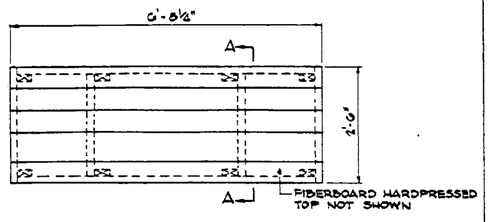
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN
APPROVED: DATE:
CHIEF, STRUCTURES BRANCH

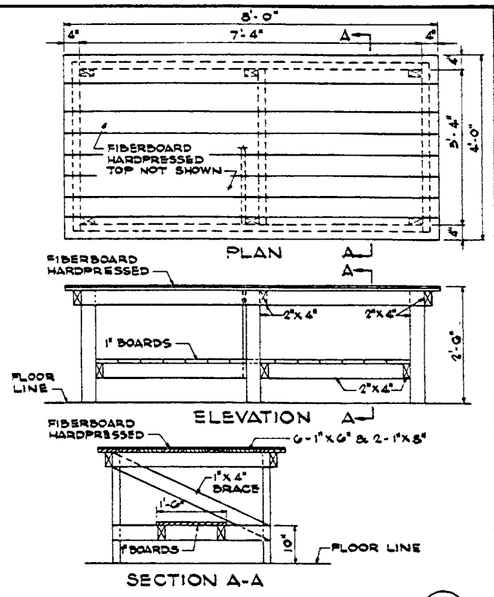
THEATER OF OPERATIONS
STANDARD DETAILS
6U THRU 6Z & 6AA THRU 6EE
& 7A THRU 7H

APPROVED: DATE: 19 MAY 1944
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

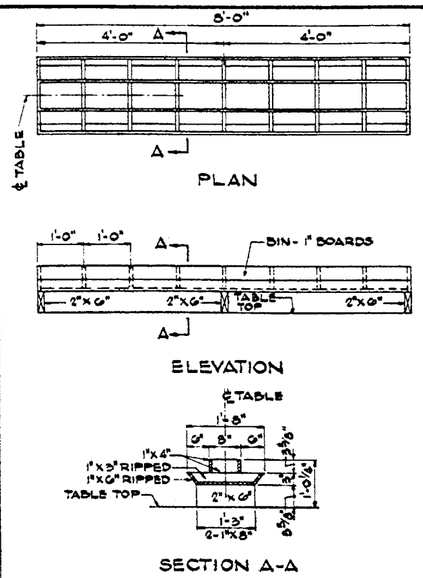
APPROVED FOR PROPONENT AGENCY:
DATE
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 8



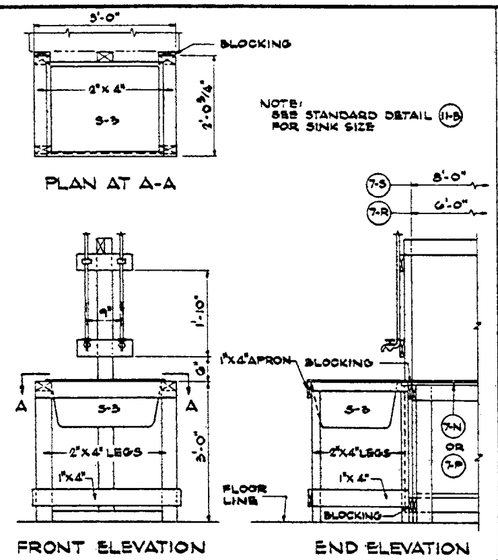
WORK TABLE
SCALE NO. 5 (7-J)



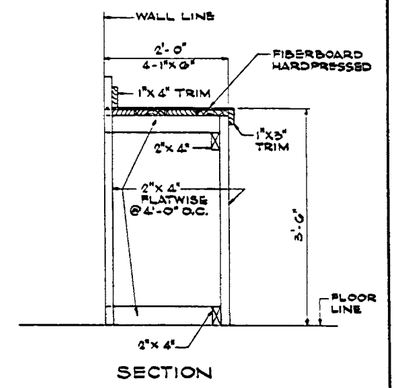
WORK TABLE
SCALE NO. 5 (7-K)



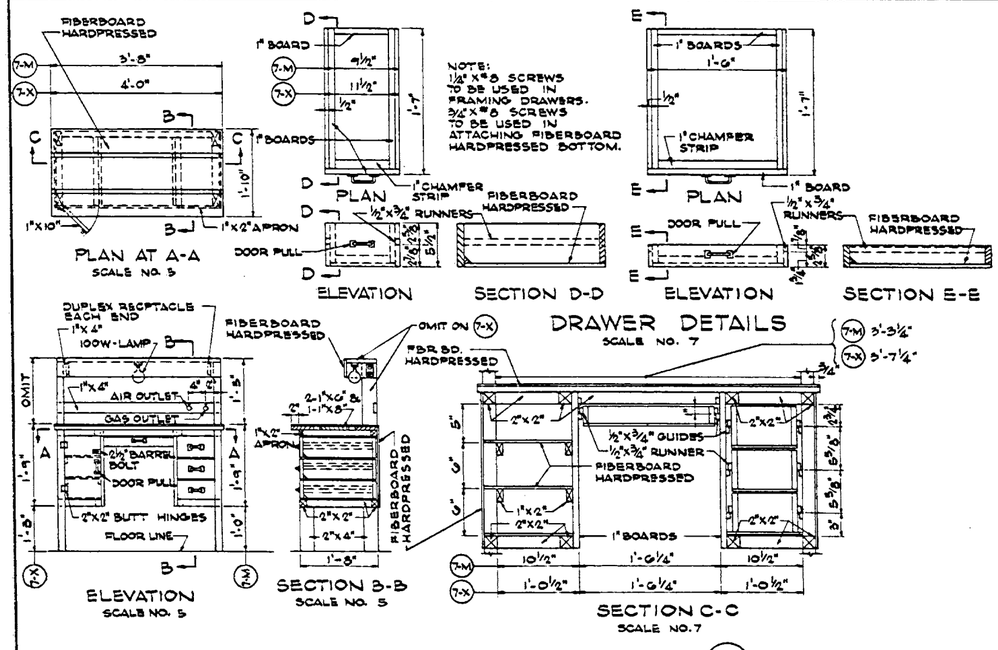
BINS FOR WORK TABLE (7-K) (7-L)
SCALE NO. 5



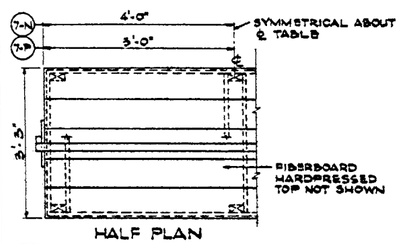
COOKS TABLE WITH SINK (7-R) (7-S)
SCALE NO. 5

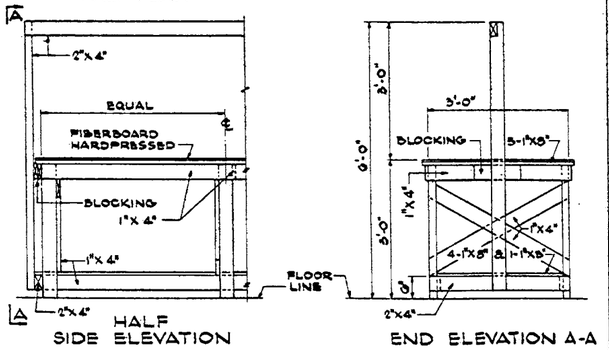


WRITING TABLE (7-T)
SCALE NO. 6

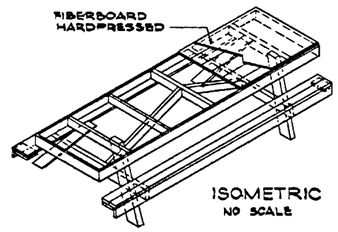


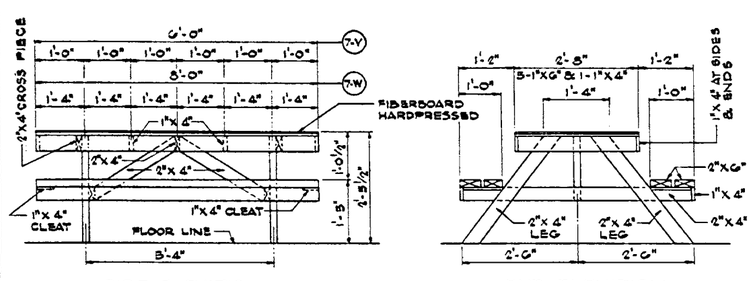
DENTAL WORK TABLE (7-M)
SCALE AS NOTED
JEWELER WORK TABLE (7-X)





COOKS TABLE (7-N) (7-P)
SCALE NO. 5





MESS TABLE
SCALE NO. 5 (7-V) (7-W)

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1' 2' 3'0 1' 2'0 3" 6" 9" 1' 2'
NO.5 NO.6 NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

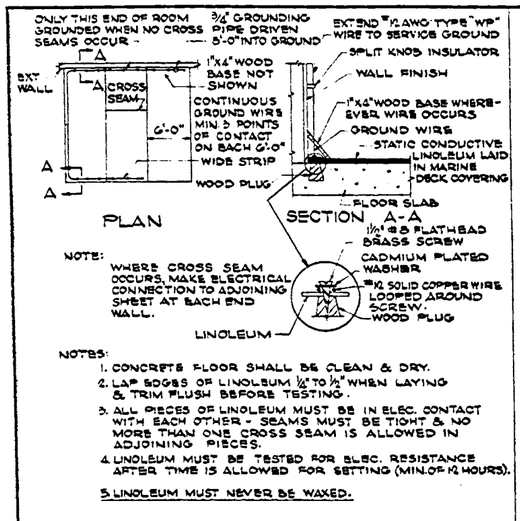
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS
STANDARD DETAILS
7J THRU 7X

APPROVED: [signature] DATE:
CHIEF, STRUCTURES BRANCH
APPROVED: [signature] DATE: 3 MAR 1943
CHIEF, ENGINEERING DIVISION, MIL. CONSTR. O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

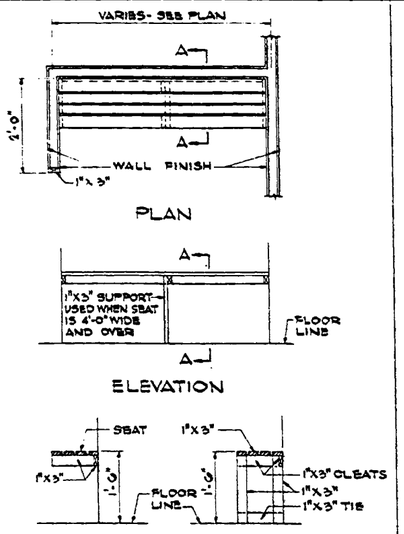
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER 99-98
SHEET 9



GROUND WIRE WITH STATIC CONDUCTIVE LINOLEUM

NO SCALE

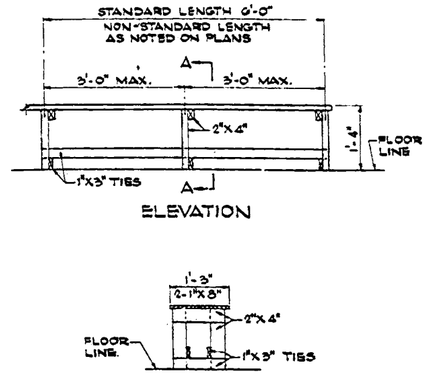
8-A



BOOTH SEAT

SCALE NO. 5

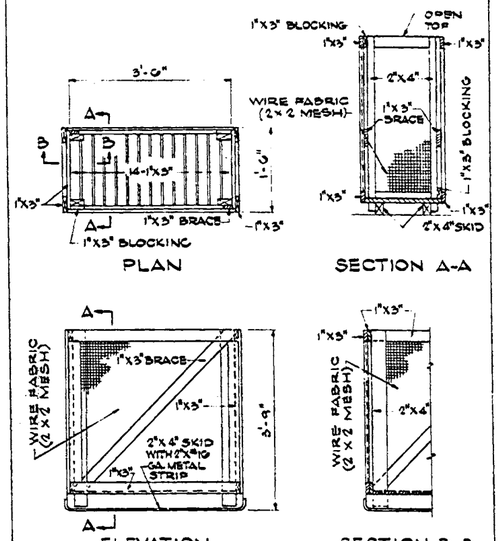
8-B



BENCH

SCALE NO. 5

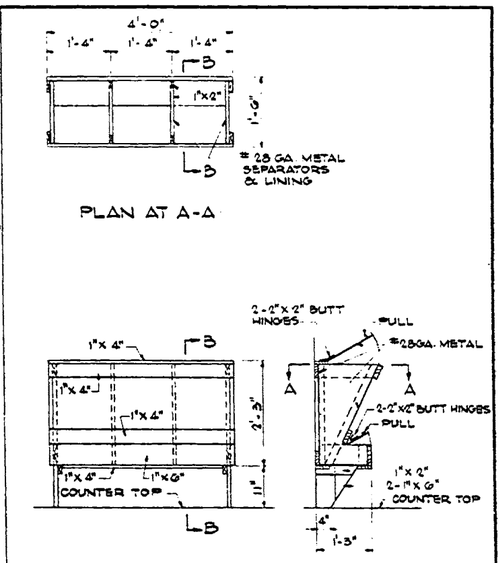
8-C



MOVABLE CLOTHES HAMPER

SCALE NO. 5

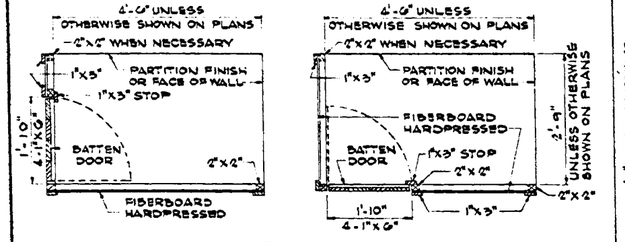
8-D



PLASTER BIN

SCALE NO. 5

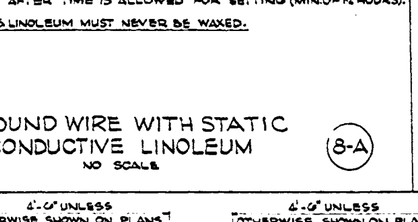
8-F

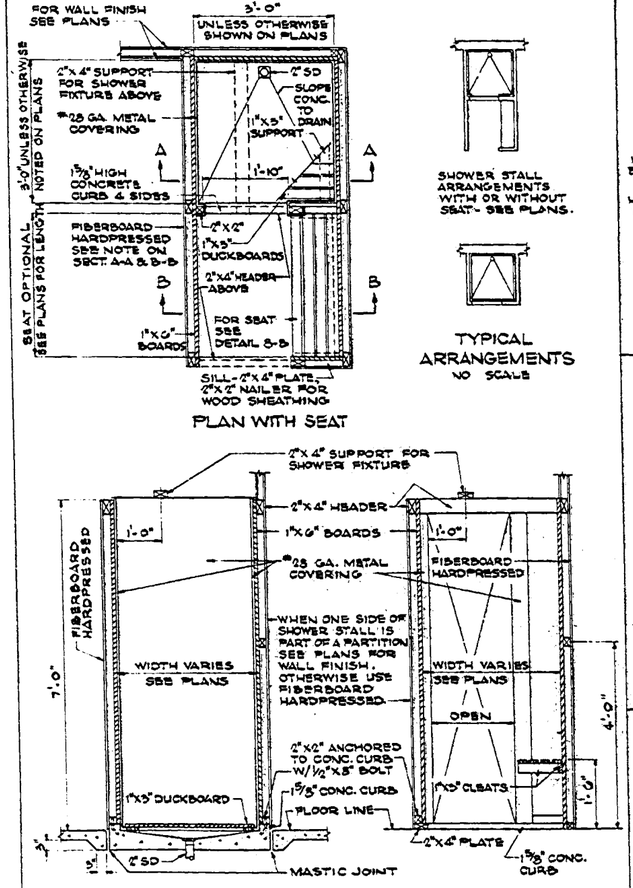


WATER CLOSET STALL WITH DOORS

SCALE NO. 5

8-H



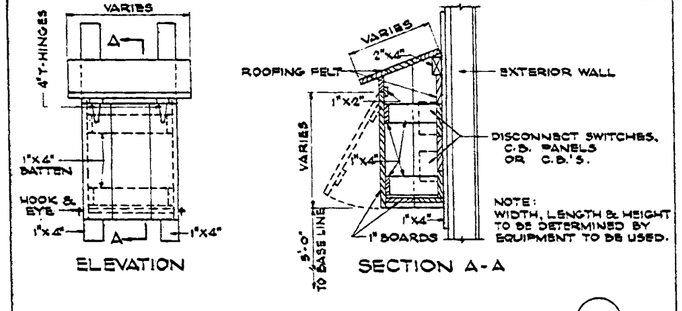


SINGLE SHOWER STALL

SCALE NO. 5

8-J

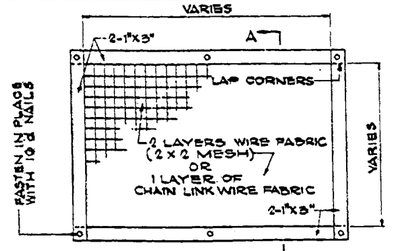
NOTE: DRESSING BOOTH OPTIONAL-SEE DETAIL 11-B FOR SHOWER FIXTURE

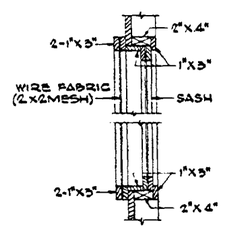


WEATHERPROOF ENCLOSURE

SCALE NO. 6

8-L

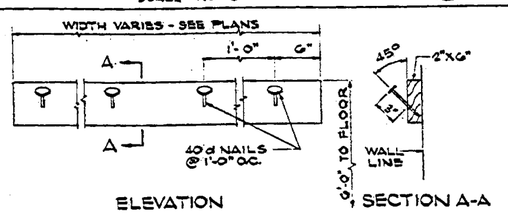




WINDOW GUARD

SCALE NO. 6

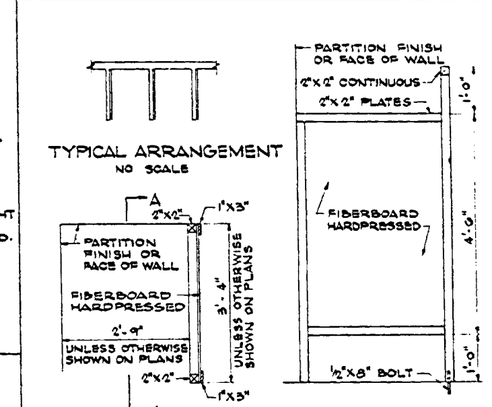
8-M



PEG BOARD

NO SCALE

8-E



WATER CLOSET STALL WITHOUT DOORS

SCALE NO. 5

8-G

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' NO.5

0 3" 6" 9" 1' 2' NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

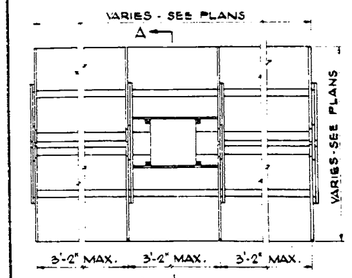
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C. W. DE ICHMANN
APPROVED: W. Eichmann
APPROVED: H. M. Williams
DATE: 19 MAR 1949
CHIEF, MTL/CIV/DOD BRANCH
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

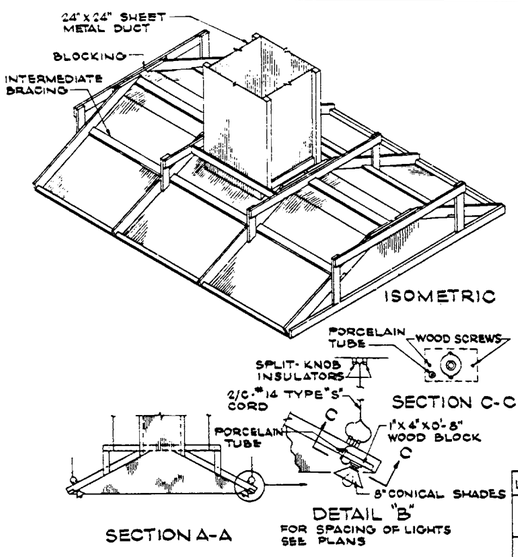
THEATER OF OPERATIONS

STANDARD DETAILS

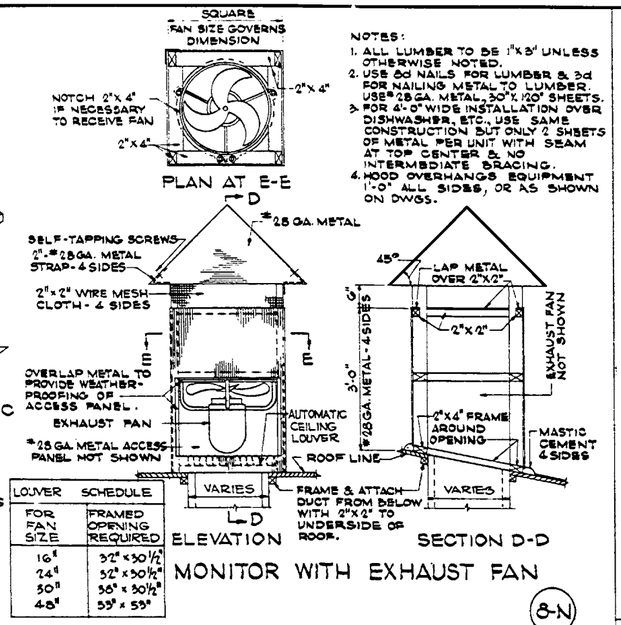
8A THRU 8M

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 10





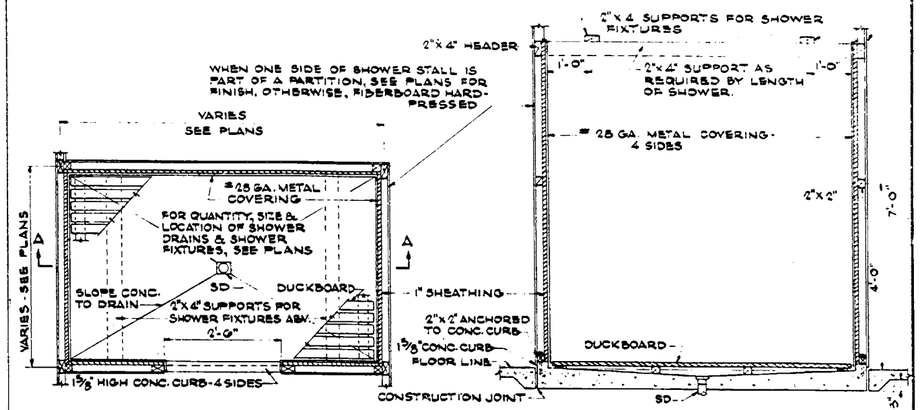
HOOD
NO SCALE



LOUVER FOR FAN SIZE	SCHEDULE FRAMED OPENING REQUIRED
16"	32" x 30½"
24"	32" x 30½"
30"	38" x 30½"
48"	55" x 55"

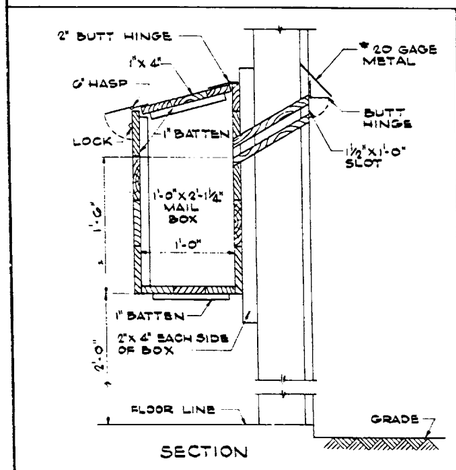
MONITOR WITH EXHAUST FAN

8-N



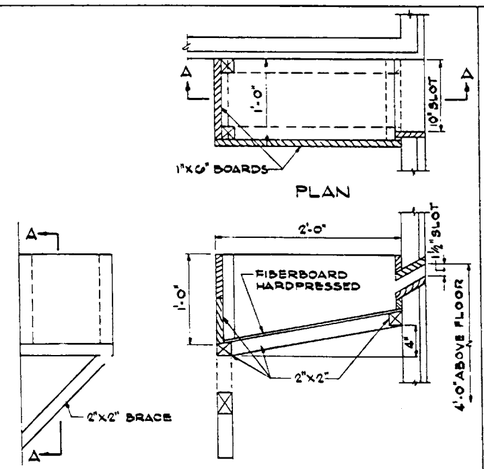
SHOWER STALL FOR 2 OR MORE FIXTURES
SCALE NO. 5

8-P



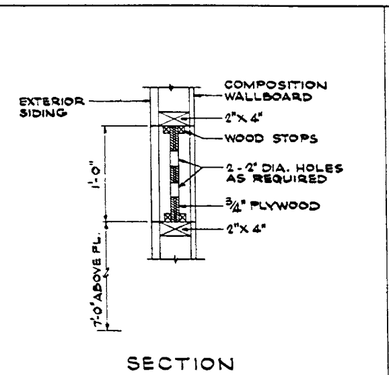
EXTERIOR MAIL BOX & SLOT
SCALE NO. 7

8-Q



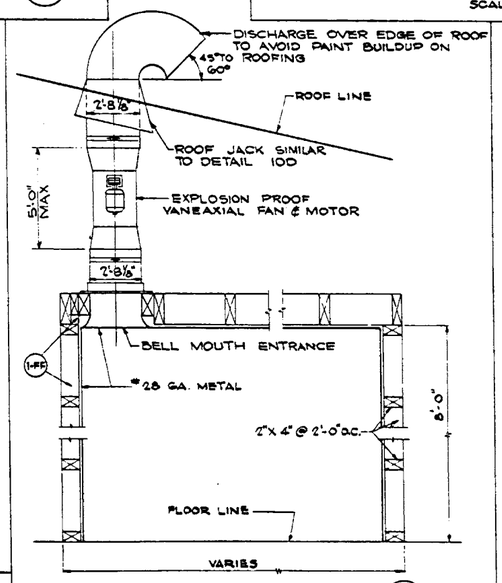
INTERIOR MAIL BOX & SLOT
SCALE NO. 7

8-R



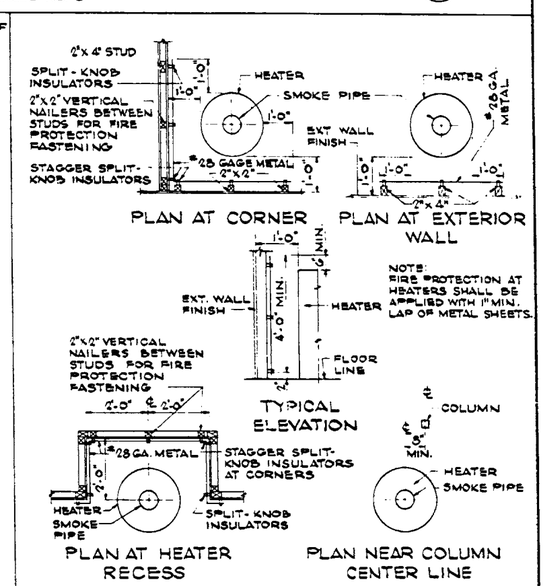
TRANSMISSION LINE ENTRANCE PANEL
SCALE NO. 7

8-S



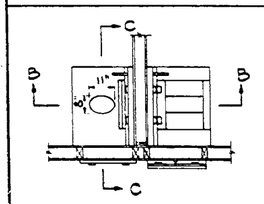
SPRAY BOOTH
NO SCALE

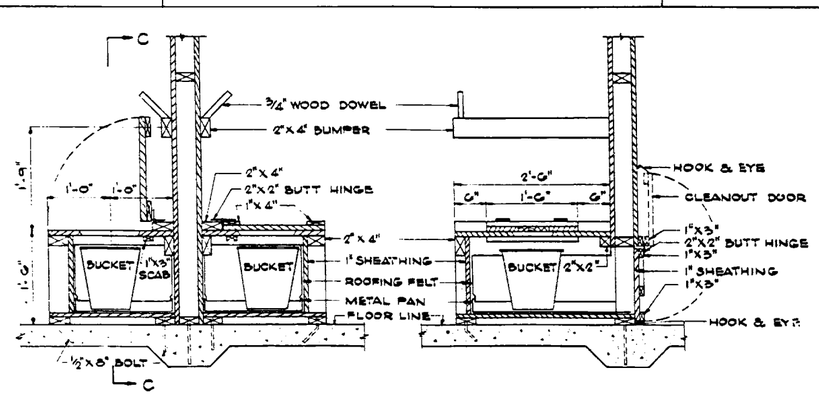
8-T



SPACE HEATERS
SCALE NO. 4

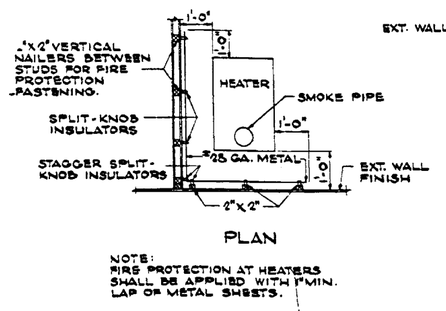
9-A





BUCKET LATRINE DETAILS
SCALE: AS NOTED

8-U



NOTE:
FIRE PROTECTION AT HEATERS SHALL BE APPLIED WITH 1" MIN. LAP OF METAL SHEETS.

*OBSOLETE, USE 9M

DRUM TYPE CONVERSION SPACE HEATER*
SCALE NO. 4

9-B

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES 0 1' 2' 3' | 0 NO.6 1' 2' | 0 3" 6" 9" 1' NO.5 2' | NO.6 NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

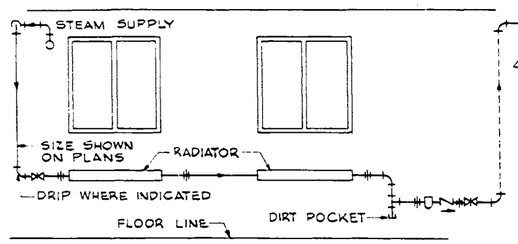
DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED:
CHIEF, STRUCTURAL BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE

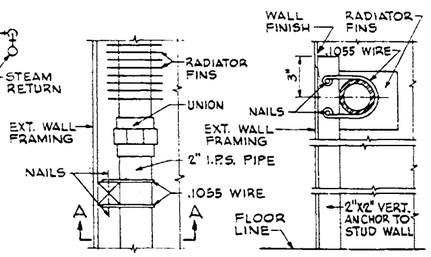
THEATER OF OPERATIONS
STANDARD DETAILS
8N THRU 8U.
9A & 9B

APPROVED: H.M. Wilson DATE: 19 MAR 1953
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

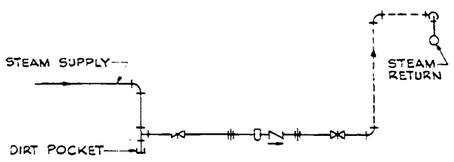
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 11



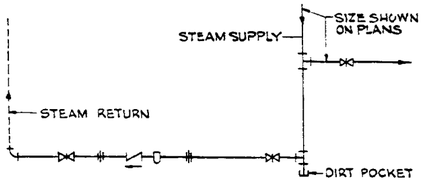
ELEVATION OF TYPICAL RADIATION



RADIATOR PIPE SUPPORT



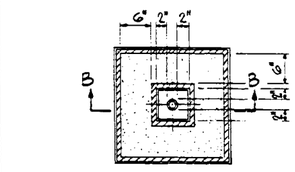
DRIP CONNECTION AT CEILING LEVEL

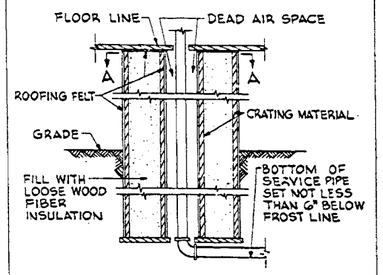


DRIP CONNECTION AT RADIATION LEVEL

RADIATION CONNECTIONS
NO SCALE

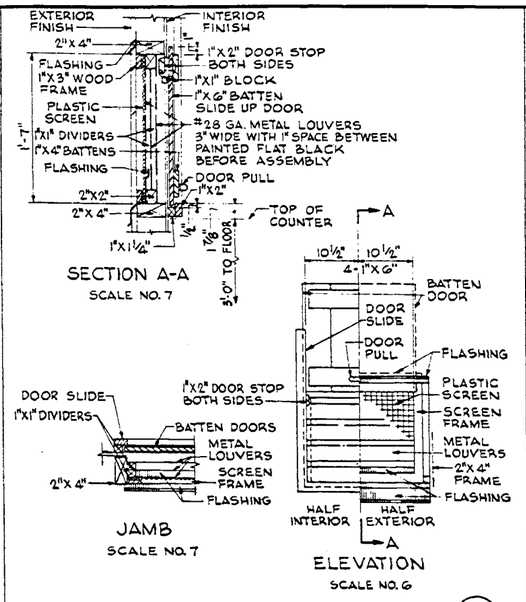
9-D





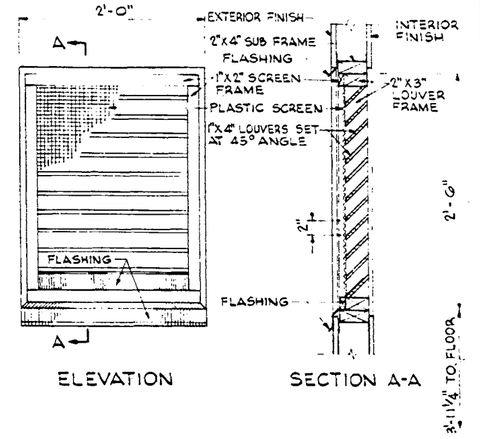
COLD WATER SERVICE PIPE CONNECTION
SCALE NO. 6

9-F



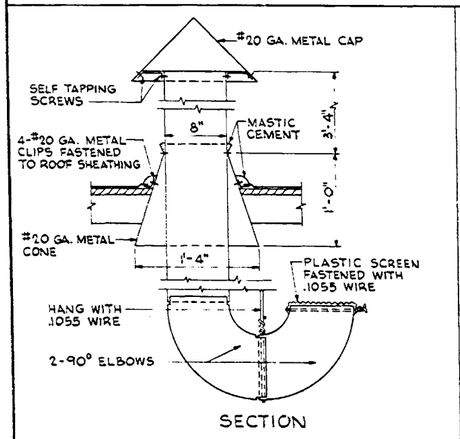
EXTERIOR LIGHTPROOF LOUVER
SCALE AS NOTED

10-A



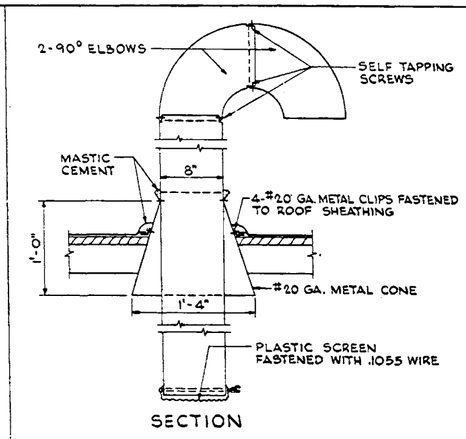
EXTERIOR WOOD LOUVER
SCALE NO. 7

10-B



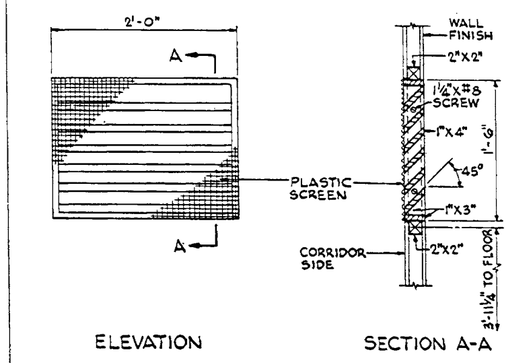
LIGHTPROOF AIR VENT
SCALE NO. 7

10-C



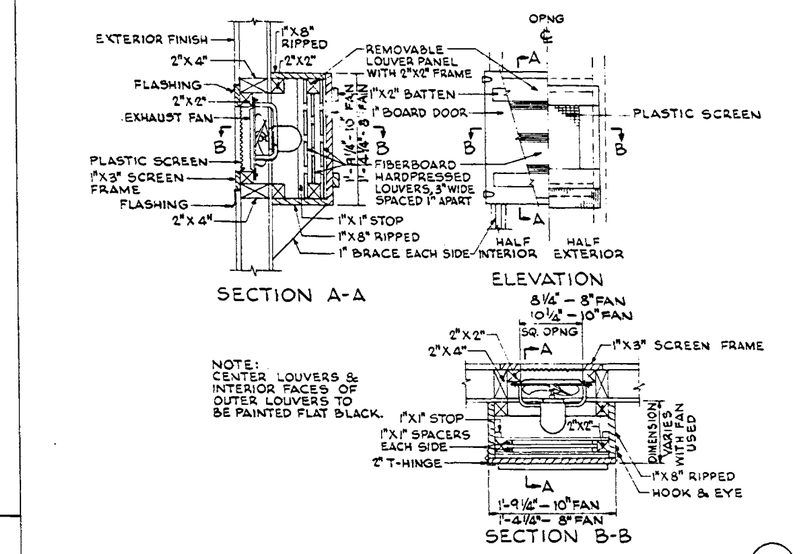
AIR VENT
SCALE NO. 7

10-D



INTERIOR WOOD LOUVER
SCALE NO. 7

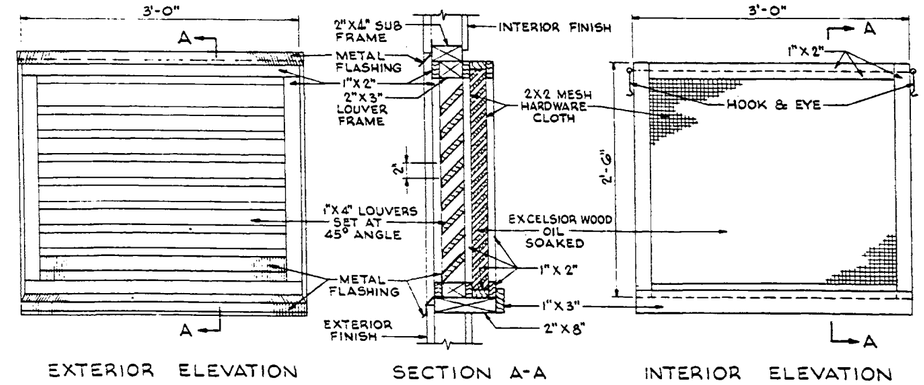
10-E



NOTE:
CENTER LOUVERS & INTERIOR FACES OF OUTER LOUVERS TO BE PAINTED FLAT BLACK.

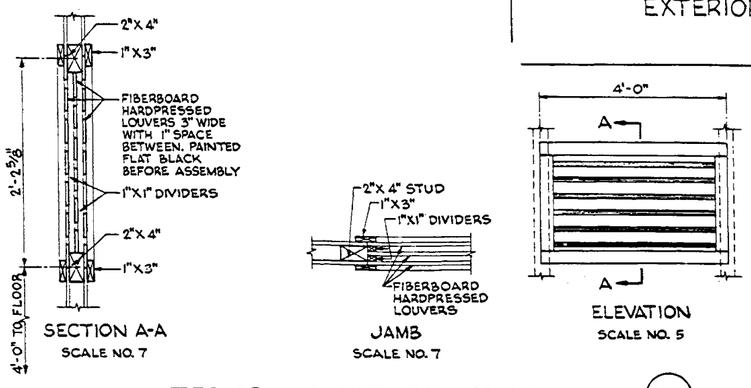
EXTERIOR LIGHTPROOF LOUVERS WITH FAN
SCALE NO. 7

10-F



EXTERIOR LOUVER FILTER
SCALE NO. 7

10-G



INTERIOR LIGHTPROOF LOUVER
SCALE AS NOTED

10-H

SYMBOL	DESCRIPTION REVISIONS	DATE	APPROVAL

GRAPHIC SCALES
0 1' 2' 3' 0 1' 2' 0 3" 6" 9" 1' 2'
NO. 5 NO. 6 NO. 7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: I LYUS
SUBMITTED BY: C. W. DEICHMANN
APPROVED:

THEATER OF OPERATIONS

STANDARD DETAILS

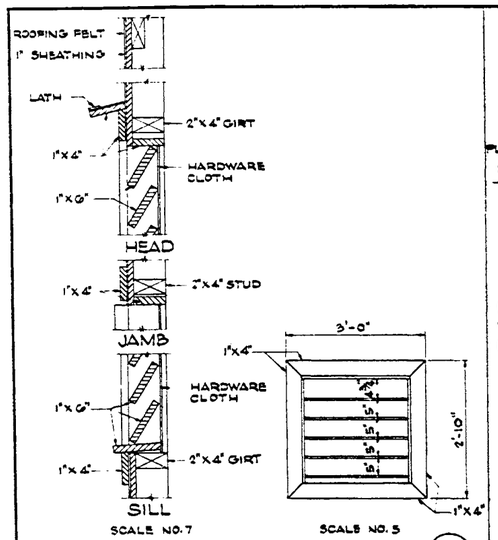
9-D & 9-F
10-A THRU 10-H

APPROVED: DATE: 19 MAR 1943
CHIEF, STRUCTURES BRANCH CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 12
99-98

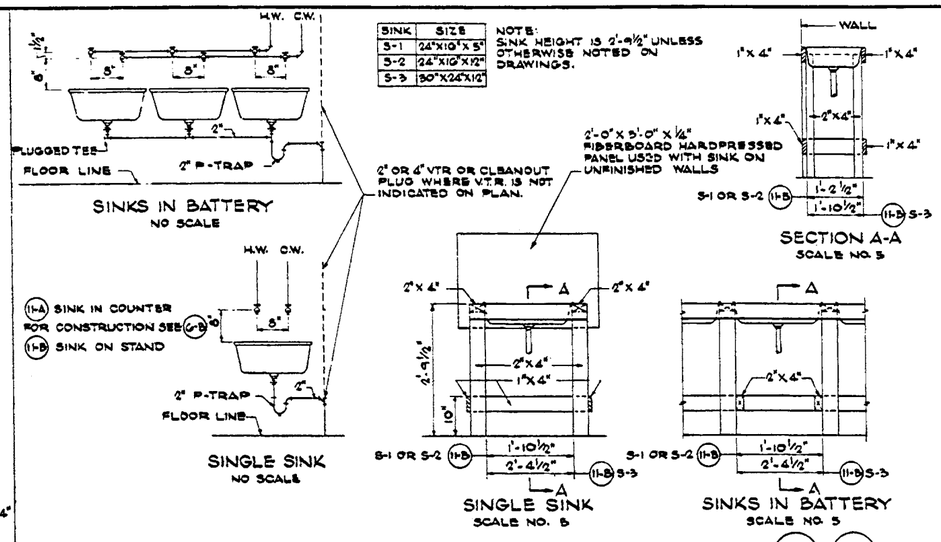
DATE



EXTERIOR WOOD LOUVER

SCALE: AS NOTED

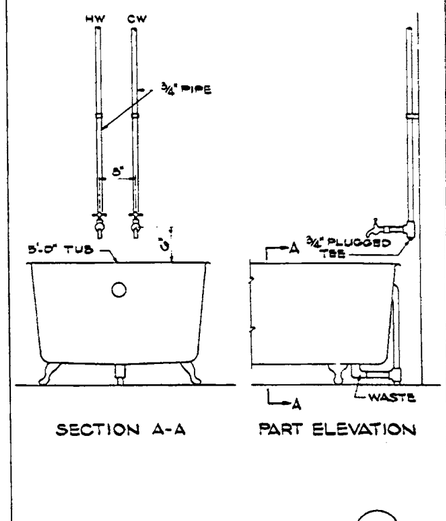
(10-J)



SINK PLUMBING & SUPPORT

SCALE: AS NOTED

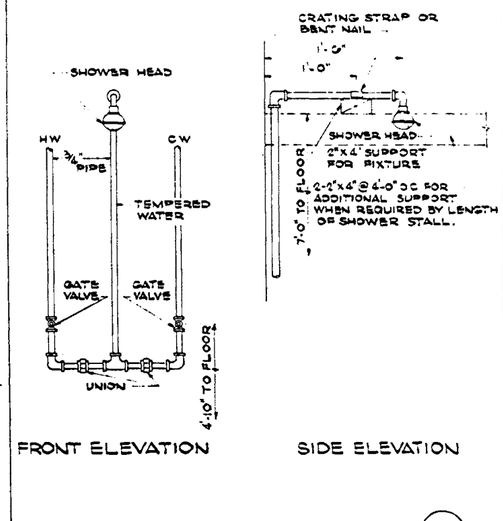
(11-A) (11-B)



BATHTUB

NO SCALE

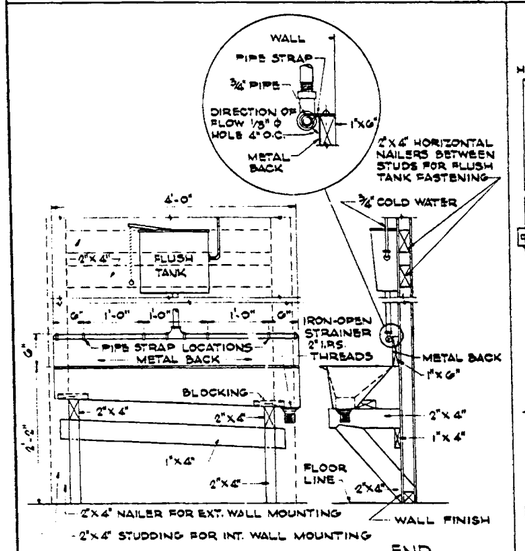
(11-C)



SHOWER PLUMBING

NO SCALE

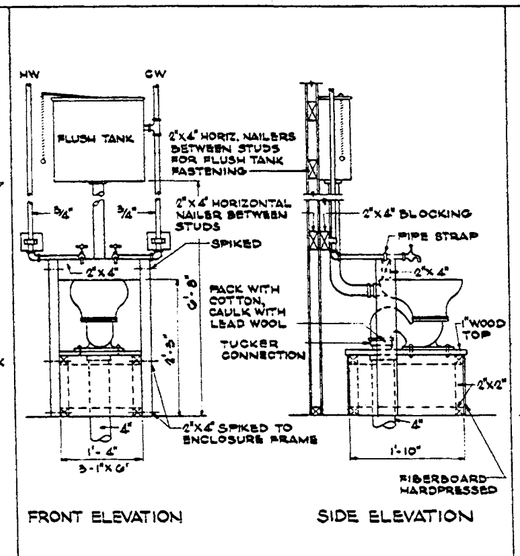
(11-E)



URINAL PLUMBING & SUPPORT

SCALE NO. 6

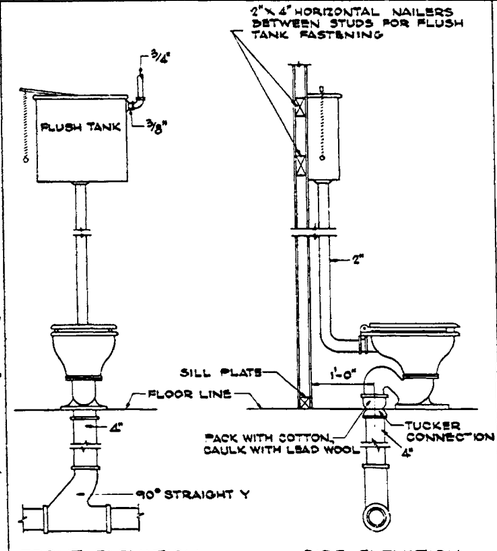
(11-D)



DISPOSAL SINK PLUMBING & SUPPORT

NO SCALE

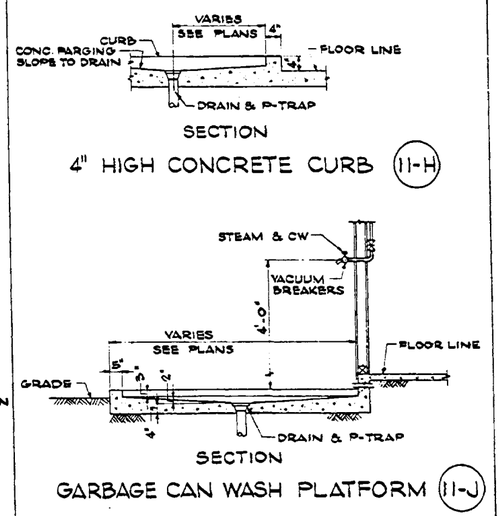
(11-F)



WATER CLOSET PLUMBING

NO SCALE

(11-G)



4" HIGH CONCRETE CURB

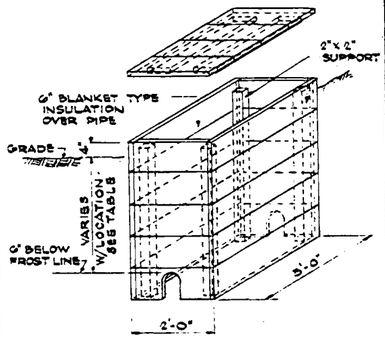
(11-H)

GARBAGE CAN WASH PLATFORM

(11-J)

NO SCALE

COLD WATER SERVICE PIPE PROTECTION	
DEPTH BELOW GRADE FOR PIPE	
TEMPERATE	FRIGID
+20° TO +40° - 3'-0"	0° TO -20° - 6'-0"
0° TO +20° - 4'-0"	-20° TO -40° - 8'-0"

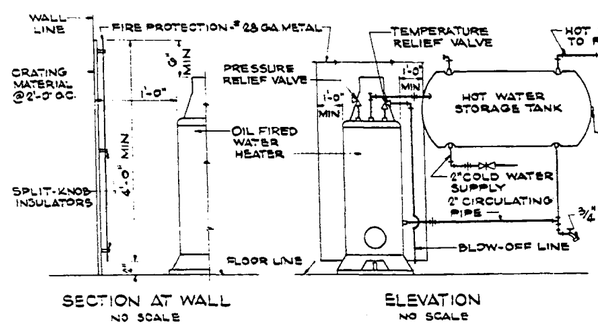


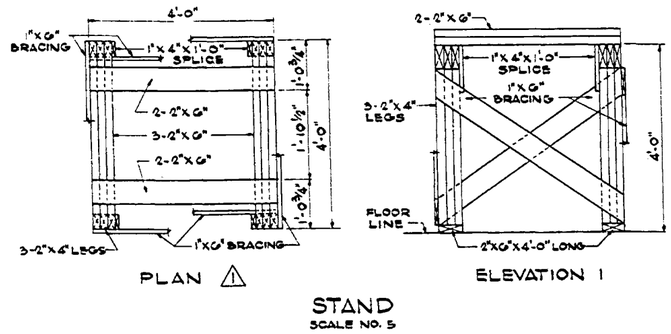
NOTE: MADE FROM CRATING MATERIAL

WATER SERVICE BOX

NO SCALE

(11-K)





OIL FIRED WATER HEATER WITH HORIZONTAL WATER TANK

SCALE AS NOTED

(11-L)

WATER HEATER: FORCED DRAFT, MOTOR DRIVEN LIQUID FUEL BURNING, 600 GPH, 250,000 BTU PER HOUR.

HOT WATER STORAGE TANK: 310 GAL. CAPACITY.

WATER HEATER: FORCED DRAFT, MOTOR DRIVEN LIQUID FUEL BURNING, 2000 GPH, 850,000 BTU PER HOUR

HOT WATER STORAGE TANK: 575 GAL. CAPACITY.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3'0 1' 2'0 3" 6" 9" 1' 2'

NO.5 NO.6 NO.7

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

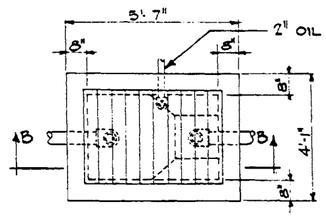
DRAWN BY: HELTON
TRACED BY:
CHECKED BY: WADE
SUBMITTED BY: C. F. DEICHMANN
APPROVED: H. M. Williams
DATE: 19 MAR 1943
CHIEF, STRUCTURES BRANCH
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS

STANDARD DETAILS

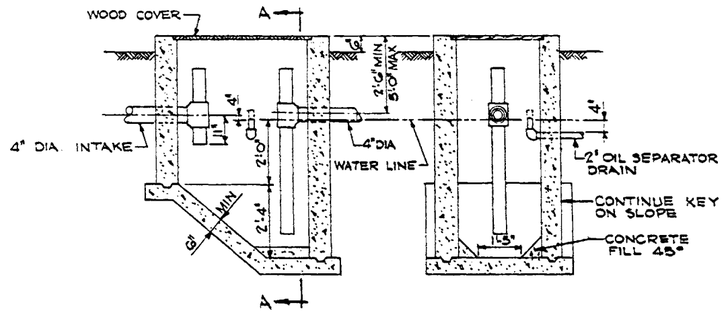
10J & 11A THRU 11L

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 13
99-98



PLAN

WHEN USED AS OIL SEPARATOR, INSTALL 2" DRAIN WITH TOP OF NIPPLE ADJUSTABLE 1/2" TO 3" ABOVE WATER LINE. RUN THIS DRAIN TO VENTED COLLECTING TANK OR DITCH AS DESIRED. ALL PIPING INDICATED TO BE STEEL.

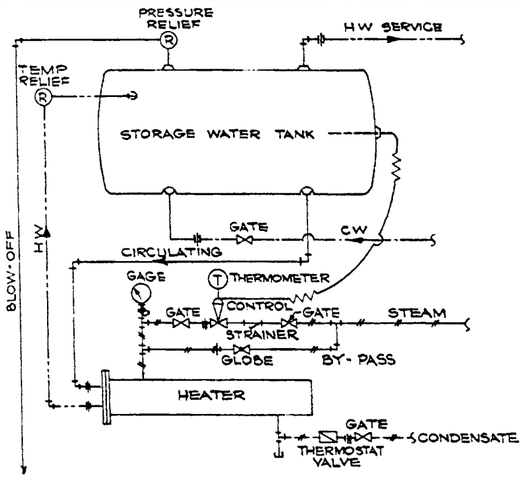


SECTION B-B

SECTION A-A

GREASE INTERCEPTOR OR OIL SEPARATOR - CONCRETE (11-W)

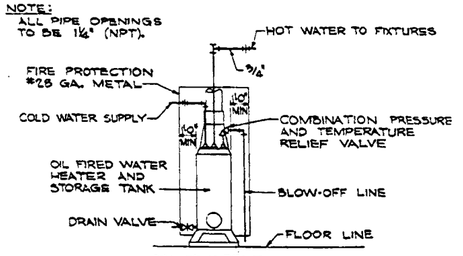
SCALE NO. 4



HOT WATER HEATING - INSTANTANEOUS (11-Y)

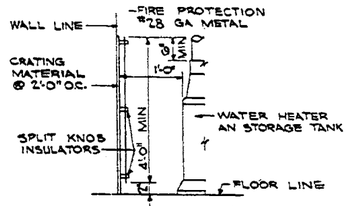
NO SCALE

NOTE:
ALL PIPE OPENINGS TO BE 1¼" (NPT).



ELEVATION

NO SCALE

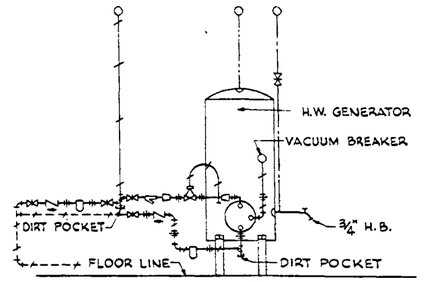


SECTION AT WALL

NO SCALE

OIL FIRED WATER HEATER AND STORAGE TANK (11-M)

SCALE AS NOTED



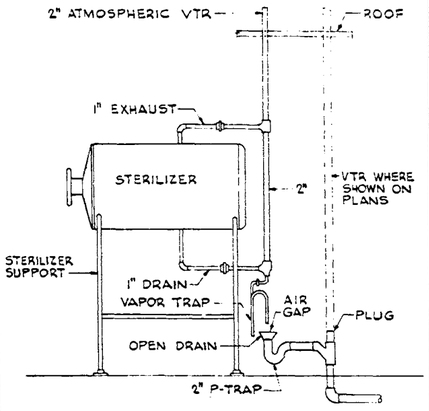
ELEVATION

GENERATOR SCHEDULE		
CAPACITY GALLONS	TANK SIZE INCHES	SQUARE FOOT HEAT SURFACE
220	30"X72"	5
365	36"X84"	10
750	48"X96"	33

NOTE:
STEAM SUPPLY & RETURN MAINS SHALL GRADE DOWN IN DIRECTION INDICATED BY ARROWS ON PLAN 1" IN 40'-0". ALL STEAM SUPPLY & RETURN PIPING EXPOSED ON OUTSIDE OF BUILDING SHALL BE COVERED & WATERPROOFED.

HOT WATER GENERATOR STEAM & WATER PLUMBING (11-N)

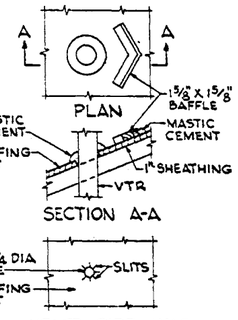
NO SCALE



ELEVATION

STERILIZER PLUMBING (11-P)

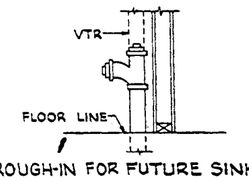
NO SCALE



PLAN

SECTION A-A

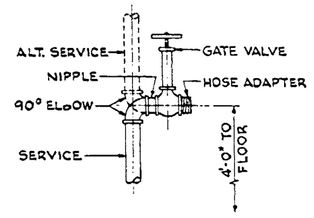
VENT PIPE HOLE



ROUGH-IN FOR FUTURE SINK

VENT STACK FLASHING & ROUGH-IN (11-Q)

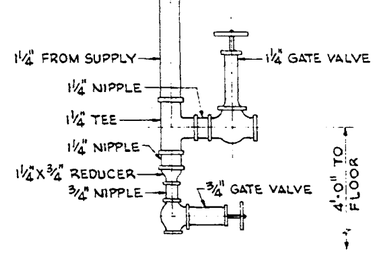
NO SCALE



TYPICAL VALVE HOSE CONNECTION (11-R)

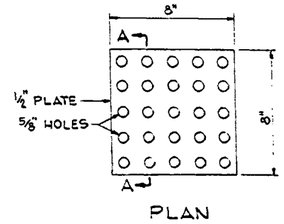
NO SCALE

NOTE:
COMPRESSED AIR MAIN AND SERVICE LINES TO BE SUPPORTED FROM BOTTOM OF TRUSSES.

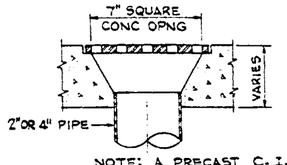


TYPICAL COMPRESSED AIR SERVICE CONNECTION (11-S)

NO SCALE



PLAN

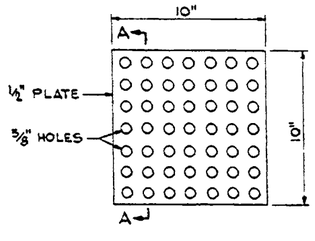


NOTE: A PRECAST C.I. FLOOR-DRAIN MAY BE USED.

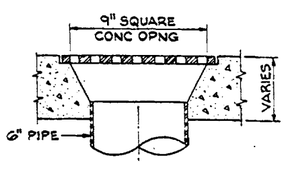
SECTION A-A

FLOOR DRAIN FOR 2" OR 4" PIPE (11-T)

SCALE NO. 8



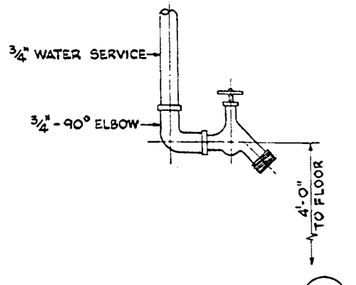
PLAN



SECTION A-A

FLOOR DRAIN FOR 6" PIPE (11-U)

SCALE NO. 8



TYPICAL HOSE BIBB (11-X)

NO SCALE

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES

0 1' 2' 3' NO.5

0 1" 2" 3" 6" 9" 1' NO.8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: EDWARDS
TRACED BY:
CHECKED BY: HELTON
SUBMITTED BY: C. W. DEICHMANN

THEATER OF OPERATIONS

STANDARD DETAILS

11-M & 11-N
11-P THRU 11-U
11-W, 11-X, 11-Y

APPROVED: APPROVED: DATE: 19 MAR 1969

CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

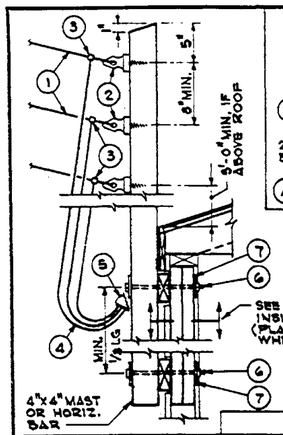
APPROVED FOR PROPONENT AGENCY:

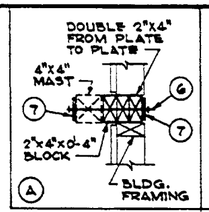
SCALE: AS NOTED SPEC. NO.

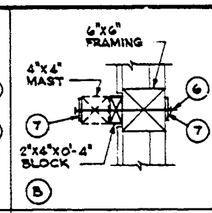
DRAWING NUMBER

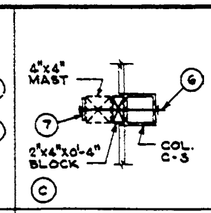
DATE

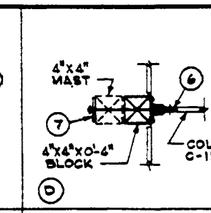
SHEET 14 99-98

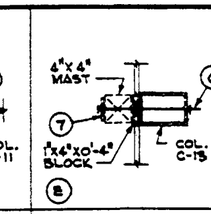


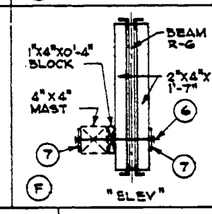


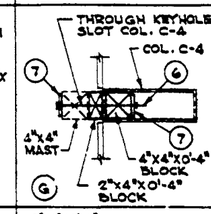


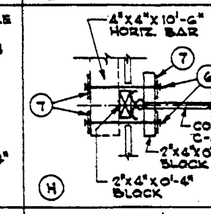


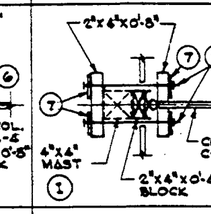








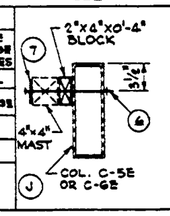


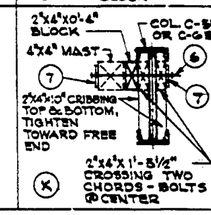


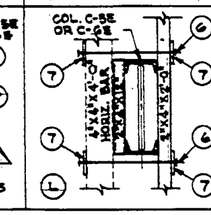
SCHEDULE OF MATERIALS

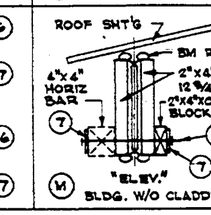
ITEM NO	DESCRIPTION
1	CONDUCTOR, COPPER, WEATHERPROOF SIZE AS SHOWN ON PLAN.
2	INSULATOR, PORCELAIN, WIREHOLDER
3	CONNECTOR, CABLE, SPLIT-BOLT TYPE, SOLDERLESS SIZE FOR SVC. ENTR. CONDUCTORS SHOWN.
4	CABLE, SERVICE ENTRANCE, COPPER, SINGLE CONDUCTOR, SIZE AS SHOWN ON PLAN.
5	ENTRANCE CAP CONDUIT, WEATHERPROOF, SIZE FOR SVC. ENTR. CONDUIT SHOWN.
6	BOLT, MACHINE, STEEL, SQUARE HEAD WITH SQUARE NUT, BLACK 5/8"X 12", 4½" MIN. THD.
7	WASHER, STEEL, SQUARE, 2"X 2"x 3/32"

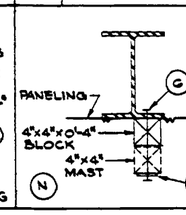
KEY TO INSIDE FASTENING DETAIL			WOOD FRAME	OPEN WEB & TUBING SHAPES								WIDE FLANGE SHAPES
BLDG. TYPE →			ALL	SHOPS			BKS	WAREHOUSES				ALL
ATTACHMENT TO →			2X6 2X6	4X6	C-11	C-13	R-6	C-1	C-3	C-4	C-5E C-6E	R-5	FLANGE
SUPPORT	MAST	TOP	A	B	D	E		C	C	G	J		N
		BOT.	A	B	D	E		C	C	I	K		N
	BAR	RT OR LEFT OPP. END	A		D		F	C	H	L		M	P
			A		D		F	H	C			M	

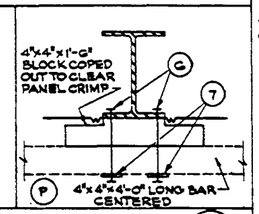






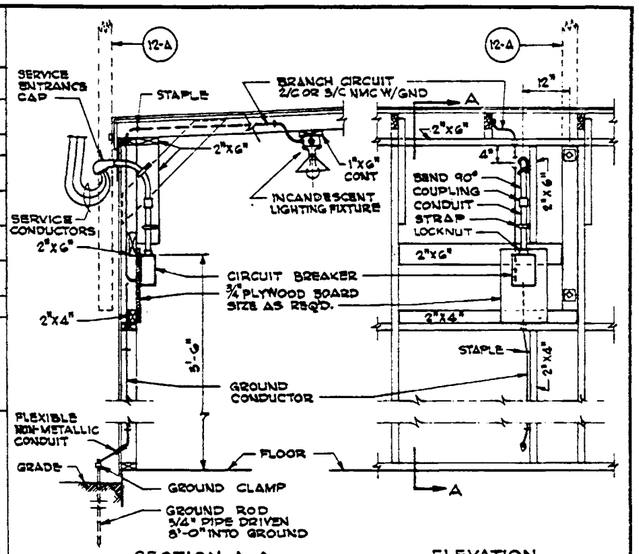






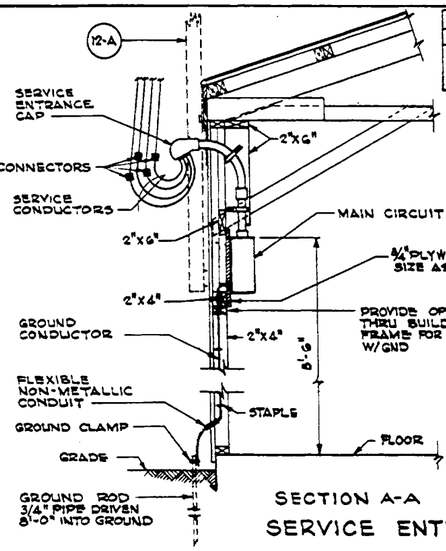
BUILDING MAST INSTALLATION
NO SCALE

12-A

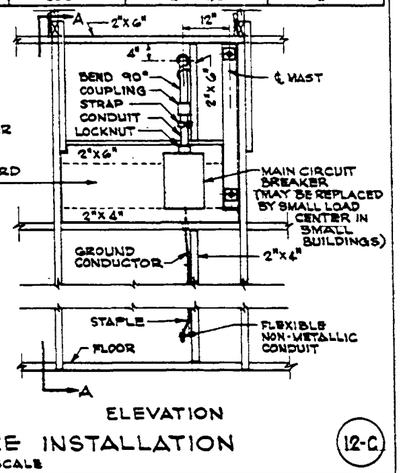


SERVICE ENTRANCE & CIRCUIT BREAKER PANEL INSTALLATION FOR LIGHTS IN COVERED WALKS
NO SCALE

12-B

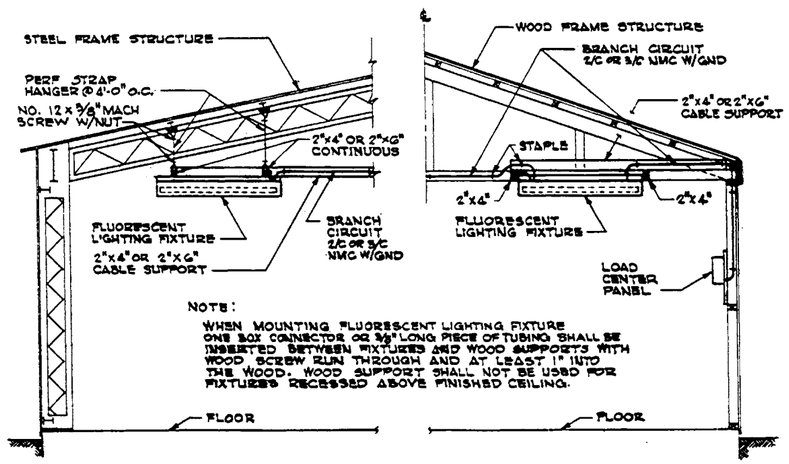


SERVICE ENTRANCE KIT RATING - 208 VOLT			
KVA	BREAKER-AMP	CONDUCTORS	CONDUIT
10	50	3-#6	1"
30	100	4-#4	1½"
50	200	4-#1/0	2"



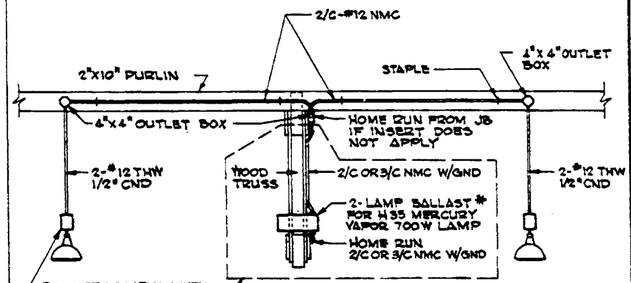
SERVICE ENTRANCE INSTALLATION
NO SCALE

12-C



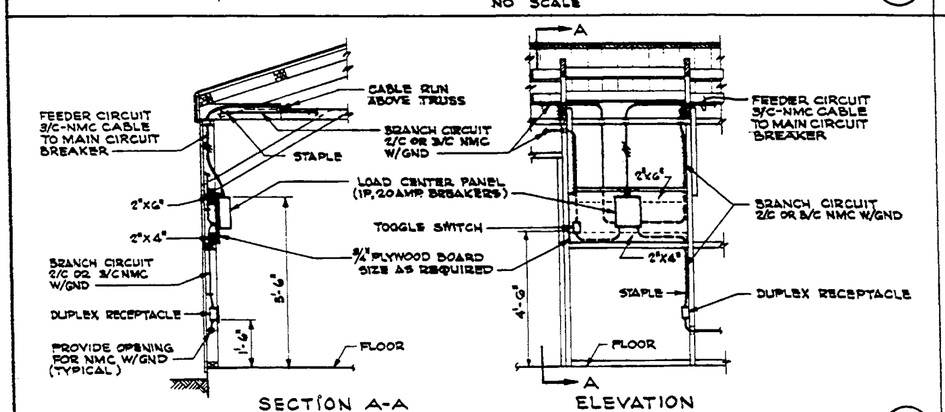
FLUORESCENT LIGHTING FIXTURE INSTALLATION
NO SCALE

12-D



DISCHARGE ARC LIGHTING FIXTURE INSTALLATION
NO SCALE

12-E



LOAD CENTER INSTALLATION
NO SCALE

12-F

NOTES:
1 INTERIOR LINER FOR BUILDINGS NOT SHOWN.
2 ADDITIONAL ITEMS OF MATERIAL THAT ARE REQUIRED FOR THE INSTALLATION OF ELECTRICAL SERVICE ARE SIZED; ITEMS NOT SIZED ARE PART OF BUILDING SHELL.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

DRAWING SCALES: NONE

HAYES, SEAY, MATTERN & MATTERN — ARCHITECTS - ENGINEERS — ROANOKE, VIRGINIA

DEPARTMENT OF THE ARMY — OFFICE OF THE CHIEF OF ENGINEERS — MILITARY CONSTRUCTION - ENGINEERING DIVISION — WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: JOHNSON
SUBMITTED BY:
C. A. DEIDERICH
CHIEF, ENGINEERING DIVISION

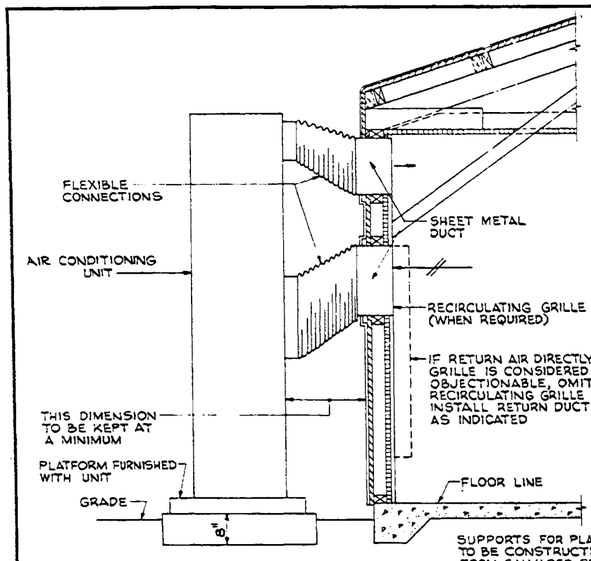
THEATER OF OPERATIONS

STANDARD DETAILS 12-A THRU 12-F

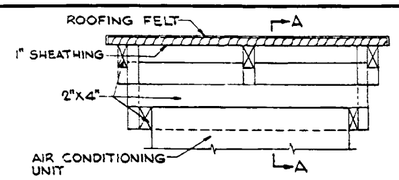
APPROVED: DATE: 17 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

CHIEF, STRUCTURES SECTION
APPROVED FOR PROPONENT AGENCY:
DATE

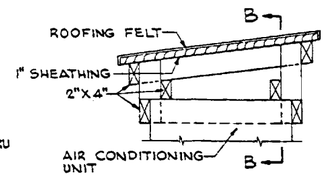
SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER
SHEET 15
39-98



FLOOR ON GRADE
SCALE NO. 5

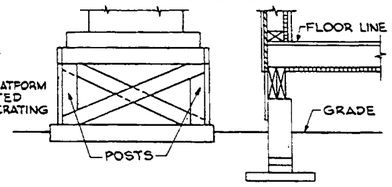


SECTION B-B



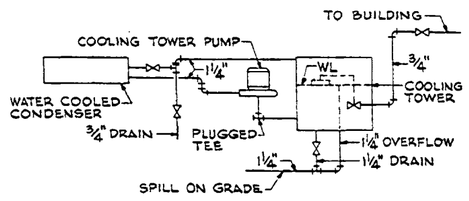
SECTION A-A

HOOD FOR AIR CONDITIONING UNIT
NO SCALE

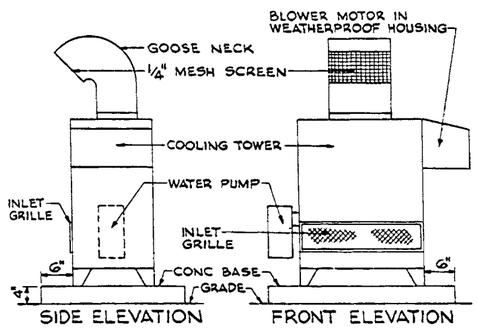


FLOOR ABOVE GRADE
SCALE NO. 5

AIR CONDITIONING UNIT INSTALLATION (14-A)
FOR AIR COOLED OR WATER COOLED UNITS
SCALE AS NOTED

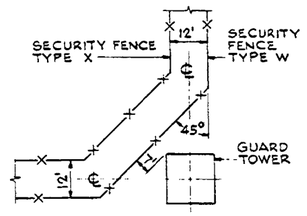


PIPING DIAGRAM

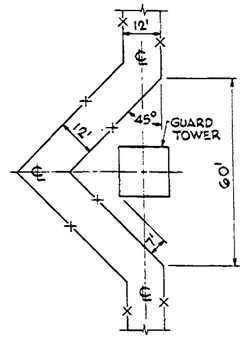


SIDE ELEVATION FRONT ELEVATION

COOLING TOWER (14-B)
NO SCALE

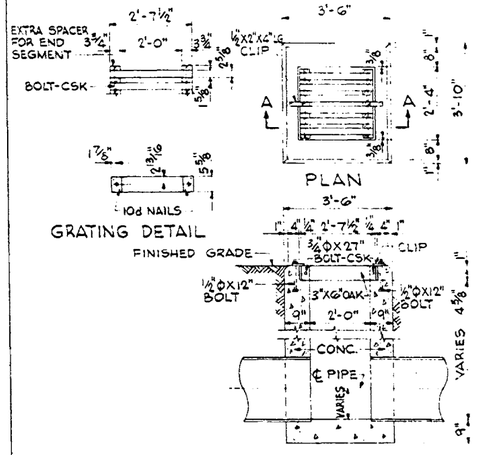


CORNER LOCATION

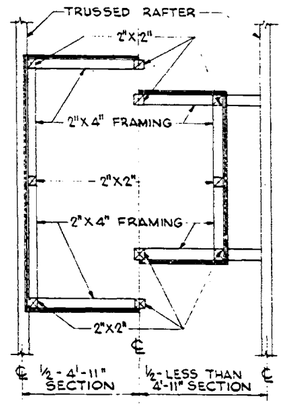


INTERMEDIATE LOCATION

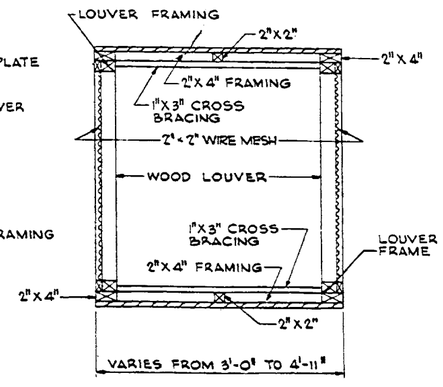
TOWER PLACEMENT (14-D)
SCALE NO. 11



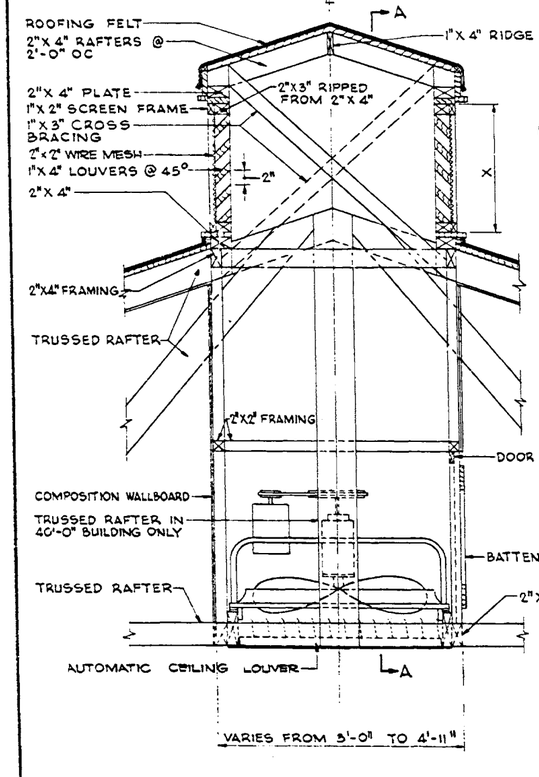
CATCH BASIN (14-E)
SCALE NO. 4



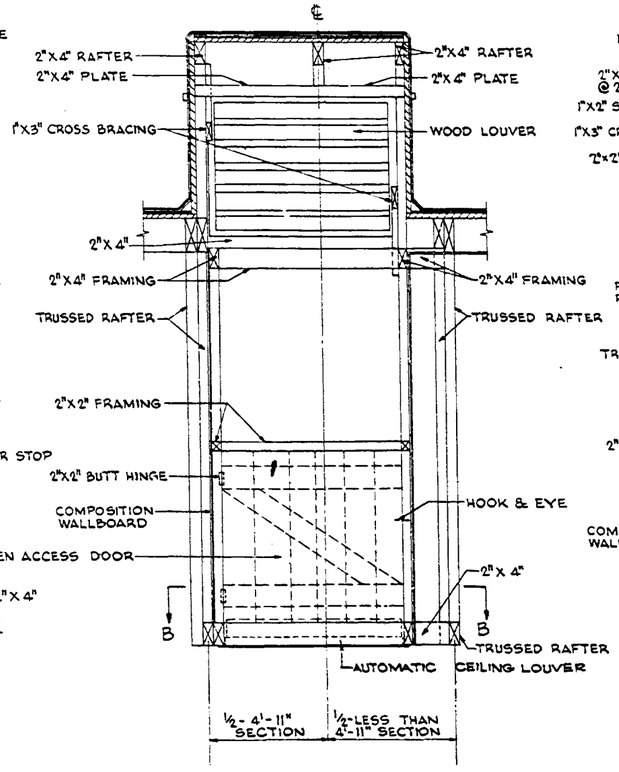
SECTION B-B
FRAMING PLAN
BETWEEN TRUSSES



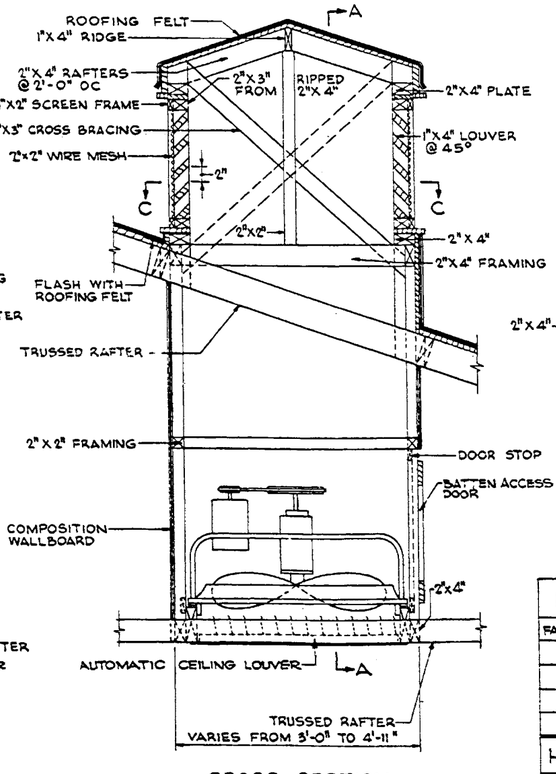
SECTION C-C
FRAMING PLAN
BETWEEN TRUSSES



CROSS SECTION
AT ROOF RIDGE



SECTION A-A



CROSS SECTION
AT ROOF SLOPE

EXHAUST FAN HOUSING (14-C)
BARRACKS TYPE BUILDING
SCALE NO. 6

LOUVER SCHEDULE

FAN SIZE	X	WIDTH
16"	1'-4"	3'-0"
24"	2'-0"	3'-0"
30"	2'-6"	3'-4"
48"	4'-0"	4'-11"

HOUSING SCHEDULE

FAN SIZE	HOUSING SIZE
16"	3'-0" x 3'-0"
24"	3'-0" x 3'-0"
30"	3'-4" x 3'-4"
48"	4'-11" x 4'-11"

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS
GRAPHIC SCALES NO. 8 NO. 5 NO. 6 NO. 11

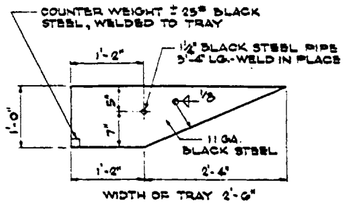
HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

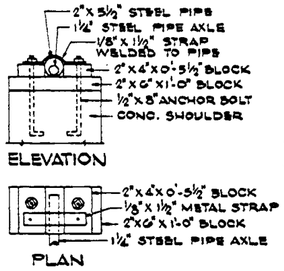
DRAWN BY: EDWARDS
TRACED BY: SHAFFER
CHECKED BY:
SUBMITTED BY: C. W. DEICHMANN
APPROVED:
CHIEF, STRUCTURES BRANCH, TECH. ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
APPROVED FOR PROPONENT AGENCY:
DATE

THEATER OF OPERATIONS
STANDARD DETAILS
14-A THRU 14-E

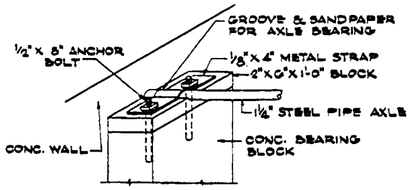
APPROVED: DATED: 19 MAR 1942
SCALE: AS NOTED SPEC. NO.
DRAWING NUMBER
SHEET 16 99-98



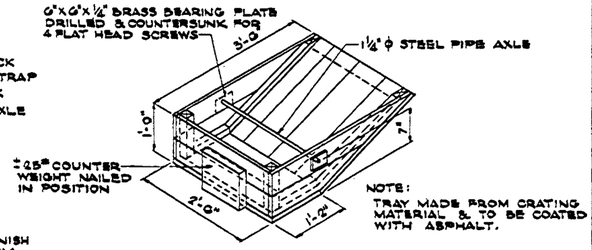
TIPPING TRAY
SCALE NO. 6



HOPPER AXLE BEARING
SCALE NO. 7

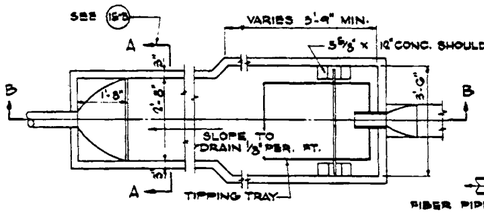


ALTERNATE HOPPER AXLE BEARING
NO SCALE

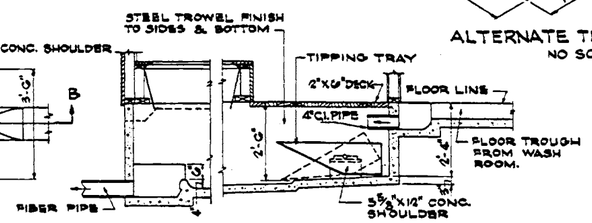


NOTE:
TRAY MADE FROM CRATING MATERIAL & TO BE COATED WITH ASPHALT.

ALTERNATE TIPPING TRAY
NO SCALE

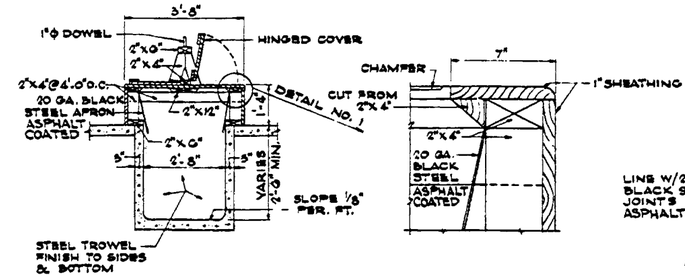


TROUGH PLAN
SCALE NO. 4



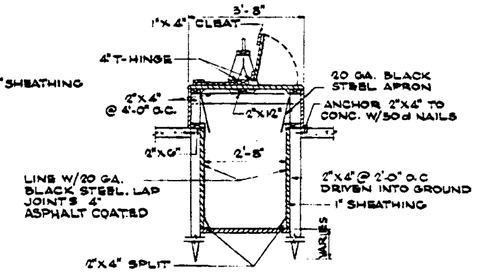
SECTION B-B
SCALE NO. 4

LATRINE TROUGH
SCALE AS NOTED
15-A



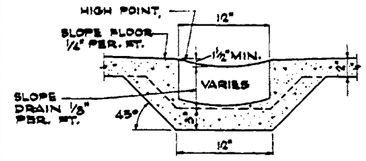
SECTION A-A
SCALE NO. 4
SEE DETAIL 15-A

DETAIL NO. 1
SCALE NO. 8

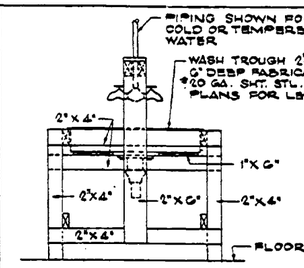


ALTERNATE SECTION A-A
SCALE NO. 4
SEE DETAIL 15-A

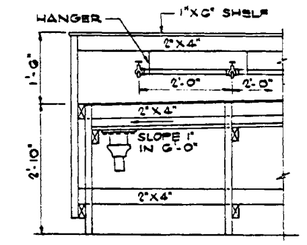
LATRINE SEAT & COVER
SCALE AS NOTED
15-B



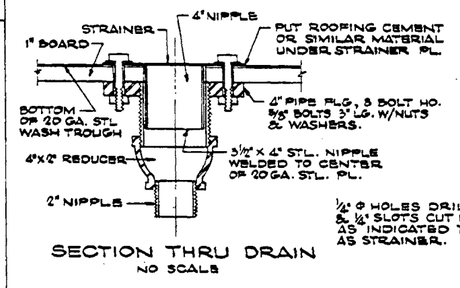
LATRINE FLOOR TROUGH
SCALE NO. 7
15-C



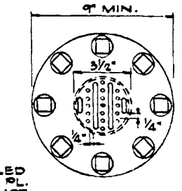
END ELEVATION
SCALE NO. 5



SIDE ELEVATION
SCALE NO. 5



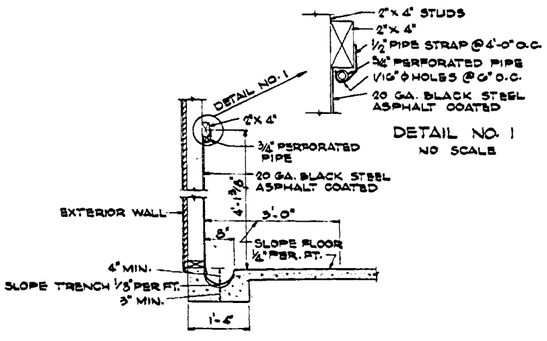
SECTION THRU DRAIN
NO SCALE



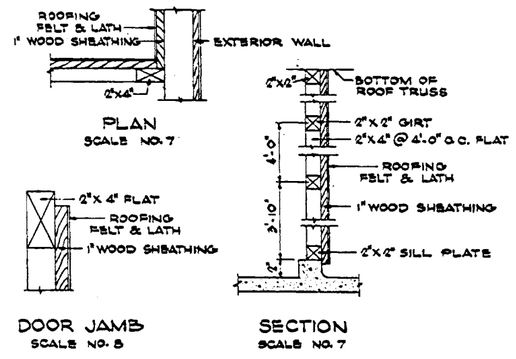
PLAN - STRAINER FOR WASH BENCH

ALTERNATE CONSTRUCTION
USE 1" BOARDS IN CONSTRUCTION OF WATER TROUGH & LINE INSIDE WITH ROOFING FELT.

BATHHOUSE WASH BENCH
SCALE AS NOTED
15-D

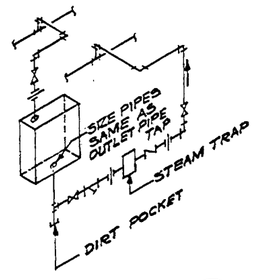


URINAL TRENCH
SCALE NO. 8
15-E



SCALE NO. 8
SCALE NO. 7

SHOWER PARTITION
SCALE AS NOTED
15-F



UNIT HEATER CONNECTION
NO SCALE
15-G

SYMBOL	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 1" 2" 3" 6" NO. 4
0 1" 2" 3" NO. 5
0 1" 2" NO. 6
0 3" 6" 9" 1' NO. 7
0 1" 2" 3" 6" 9" 1' NO. 8

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: HELTON
TRACED BY:
CHECKED BY: SHAFFER
SUBMITTED BY: C.W. REICHMANN
APPROVED:

THEATER OF OPERATIONS

STANDARD DETAILS

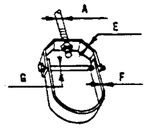
15-A THRU 15-F

APPROVED: DATE: 19 MAR 1963
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

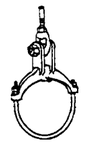
APPROVED FOR PROPONENT AGENCY:

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 17

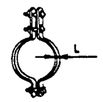
DATE



ADJUSTABLE STEEL CLEVIS - SIZES 3/4" THRU 20" IPS — 18-A



ALLOY STEEL PIPE CLAMP - SIZES 4" THRU 24" IPS — 18-B



STEEL DOUBLE BOLT PIPE CLAMP - SIZES 1 1/2" THRU 24" IPS — 18-C



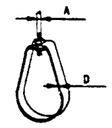
STEEL PIPE CLAMP SIZES 1 1/2" THRU 24" IPS — 18-D



ADJUSTABLE MI SWIVEL PIPE RING SOLID RING TYPE SIZES 3/4" THRU 8"IPS — 18-E



ADJUSTABLE MI SWIVEL PIPE RING SPLIT RING TYPE SIZES 3/4" THRU 8"IPS — 18-F



ADJUSTABLE STEEL BAND HANGER SIZES 1/2" THRU 8" IPS-3/4" THRU 4" TBG — 18-G



EXTENSION PIPE OR RISER CLAMP SIZES 3/4" THRU 20"IPS-1/2" THRU 8" TBG — 18-H



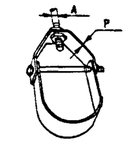
ADJUSTABLE BAND HANGER - SIZES 1/2" THRU 8" IPS 1/2" THRU 4" TBG — 18-J



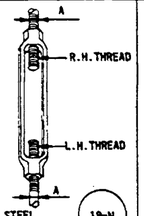
ADJUSTABLE SWIVEL RING HANGER SIZES 1/2" THRU 8"IPS-1/2" THRU 4" TBG — 18-K



MI SPLIT PIPE RING W/NO TURNBUCKLE ADJ. SIZES 1/2" THRU 8"IPS-1/2" THRU 4" TBG — 18-L



LIGHT DUTY CLEVIS HANGER SIZES 1/2" THRU 4" — 18-M



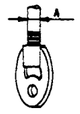
FORGED STEEL TURNBUCKLE - SIZES 3/8" THRU 1 1/2" ROD — 18-N



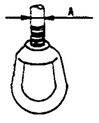
FORGED STEEL CLEVIS - SIZES 3/8" THRU 1 1/2" ROD — 18-P



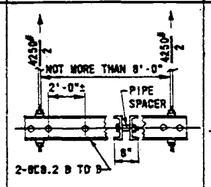
ADJUSTABLE MI TURNBUCKLE - SIZES 3/8" THRU 3/4" ROD — 18-Q



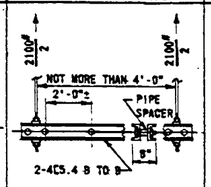
MI SOCKET ONLY FOR SPLIT RING HANGER - SIZES 3/8" THRU 7/8" ROD — 18-R



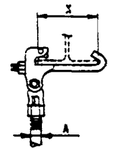
FORGED STEEL WELDLESS EYE NUT SIZES 3/8" THRU 1 1/2" ROD — 18-S



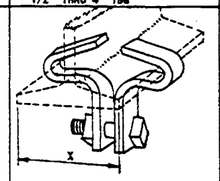
FIELD FABRICATED TRAPEZE HANGER — 18-T



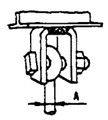
FIELD FABRICATED TRAPEZE HANGER — 18-U



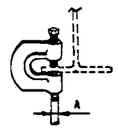
SIDE BEAM CLAMP FOR CHANNEL OR I BEAM — 18-V



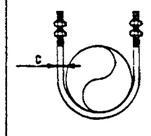
CENTER I BEAM CLAMP — 18-W



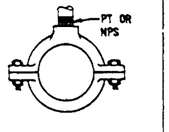
WELDED ATTACHMENT AS SHOWN OR INVERTED W/O BOLT — 18-X



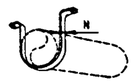
MI OR STEEL C-CLAMP - SIZES 3/8" THRU 7/8" — 18-Y



U-BOLT 1/2" THRU 24" IPS — 18-Z



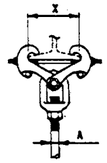
MI EXTENSION SPLIT RING HANGER - SIZES 3/8" THRU 4" IPS 1/2" THRU 3" TBG — 18-AA



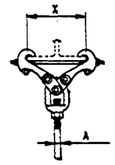
LONG CLIP - SIZES 3/4" THRU 4" IPS — 18-BB



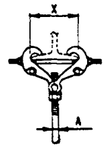
OFFSET J HOOK SIZES 1/2" THRU 3" IPS — 18-CC



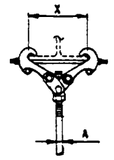
I BEAM CLAMP WITH EYE NUT — 18-DD



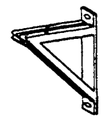
WF BEAM CLAMP WITH EYE NUT — 18-EE



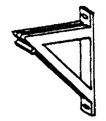
I BEAM CLAMP WITH SWING NUT — 18-FF



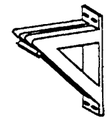
WF BEAM CLAMP WITH LINKS & SWING NUT — 18-GG



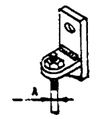
LIGHT WELDED STEEL BRACKET MAX LOAD 750 LBS — 18-HH



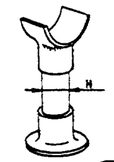
MEDIUM WELDED STEEL BRACKET - MAX LOAD 1500 LBS — 18-JJ



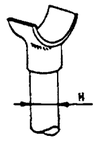
HEAVY WELDED STEEL BRACKET - MAX LOAD 3000 LBS — 18-KK



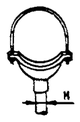
SIDE BEAM BRACKET FIELD FABRICATED — 18-LL



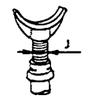
SADDLE SUPPORT WITH BASE SIZES 4" THRU 36" IPS — 18-MM



PIPE SADDLE SUPPORT - SIZES 4" THRU 36" IPS — 18-NN



PIPE STANCHION SADDLE - SIZES 4" THRU 36" IPS — 18-PP



ADJ PIPE SADDLE SUPPORT - SIZES 2 1/2 THRU 36" IPS — 18-QQ



NOT LESS THAN 12" LONG STEEL PIPE COVERING PROTECTION SADDLE THICKNESS OF METAL
5 I.P.S. DIA & SMALLER 1/8" MIN
6 I.P.S. DIA & LARGER 3/16" MIN

**STEEL PIPE COVERING PROTECTION SADDLE- SIZES UP TO AND INCLUDING 10" IPS — 18-RR

CENTER PLATE FOR 12" PIPE & LARGER

**STEEL PIPE COVERING PROTECTION SADDLE SIZES 12" AND OVER — 18-SS

*INSULATION PROTECTION SHIELD SIZES 3/4" THRU 12" IPS — 18-TT

SINGLE PIPE ROLL SIZES 1" THRU 24" IPS — 18-UU

MALLEABLE IRON ADJUSTABLE SWIVEL PIPE ROLL - SIZES 2" THRU 12" IPS — 18-VV

ADJUSTABLE ROLLER HANGER - SIZES 1" THRU 20" IPS — 18-WW

PIPE ROLL COMPLETE — 18-XX

PIPE ROLL & PLATE — 18-YY

ADJUSTABLE PIPE ROLL & BASE — 18-ZZ

ADJUSTABLE PIPE ROLL — 18-AAA

REFERENCE: FEDERAL SPECIFICATION WW-H-171, PIPE HANGERS AND SUPPORTS

PIPE, HANGER AND SUPPORT PARTS SIZES[A]

PIPE SIZES[C]	A[B] (ROD)	B	C	D	E (CLEVIS TOP)	F (CLIPPER BOLT)	G (C.BOLT)	H[B]	J[B]	K	L	M[B]	N	P[D]
1/2	3/8	1/8 X 1	1/4	16g X 7/8	---	---	---	-	---	3/16 X 1 1/4	---	---	1/8 X 1 1/8	15g X 3/4
3/4	3/8	1/8 X 1	1/4	16g X 7/8	1/8 X 1	1/8 X 1	1/4	-	---	3/16 X 1 1/4	---	---	1/8 X 1 1/8	15g X 3/4
1	3/8	1/8 X 1	1/4	16g X 7/8	1/8 X 1	1/8 X 1	1/4	-	---	3/16 X 1 1/4	---	3/8	1/8 X 1 1/8	14g X 7/8
1 1/4	3/8	1/8 X 1	3/8	16g X 7/8	1/8 X 1	1/8 X 1	1/4	-	---	3/16 X 1 1/4	---	3/8	1/8 X 1 1/8	14g X 7/8
1 1/2	3/8	1/8 X 1	3/8	16g X 7/8	1/8 X 1 1/4	1/8 X 1	1/4	-	---	3/16 X 1 1/4	1/4 X 1 1/4	3/8	1/8 X 1 1/8	13g X 3/4
2	3/8	3/16 X 1 1/4	3/8	14g X 1	1/8 X 1 1/4	1/8 X 1	1/4	-	---	3/16 X 1 1/4	1/4 X 1 1/4	3/8	1/8 X 1 1/8	13g X 3/4
2 1/2	1/2	3/16 X 1 1/4	1/2	14g X 1	3/16 X 1 1/4	3/16 X 1 1/4	5/16	-	1 1/2	3/16 X 1 1/4	1/4 X ? 1/4	1/2	1/4 X 1 1/8	1/8 X 1 1/8
3	1/2	3/16 X 1 1/4	1/2	13g X 1	3/16 X 1 1/4	3/16 X 1 1/4	5/16	-	1 1/2	3/16 X 1 1/4	1/4 X 1 1/4	1/2	1/4 X 1 1/8	1/8 X 1 1/8
3 1/2	1/2	3/16 X 1 1/4	1/2	13g X 1	3/16 X 1 1/4	3/16 X 1 1/4	3/8	-	1 1/2	1/4 X 1 1/4	1/4 X 1 1/4	1/2	1/4 X 1 1/8	1/8 X 1 1/8
4	5/8	1/4 X 1 1/4	1/2	12g X 1 1/2	1/4 X 1 1/4	3/16 X 1 1/4	3/8	3	2 1/2	1/4 X 1 1/2	3/8 X 2	5/8	1/4 X 1 1/8	3/16 X 1 1/8
5	5/8	1/4 X 1 1/4	1/2	12g X 1 1/2	1/4 X 1 1/4	3/16 X 1 1/4	1/2	3	2 1/2	1/4 X 1 1/2	3/8 X 2	5/8	---	---
6	3/4	3/8 X 1 1/2	5/8	10g X 1 1/2	1/4 X 1 1/2	3/16 X 1 1/2	1/2	3	2 1/2	1/4 X 1 1/2	3/8 X 2 1/2	3/4	---	---
8	7/8	3/8 X 1 1/2	5/8	10g X 1 1/2	1/4 X 1 3/4	3/16 X 1 3/4	3/8	3	2 1/2	3/8 X 1 1/2	3/8 X 2 1/2	7/8	---	---
10	7/8	1/2 X 2	3/4	---	3/8 X 1 3/4	1/4 X 1 3/4	3/4	3	2 1/2	3/8 X 2	1/2 X 2 1/2	7/8	---	---
12	7/8	1/2 X 2	7/8	---	3/8 X 2	1/4 X 2	3/4	3	2 1/2	1/2 X 2	1/2 X 2 1/2	7/8	---	---
14	1	1/2 X 2 1/2	7/8	---	1/2 X 2	1/4 X 2	3/4	4	3	1/2 X 2	5/8 X 3	1	---	---
16	1	1/2 X 2 1/2	7/8	---	1/2 X 2 1/2	1/4 X 2 1/2	7/8	4	3	5/8 X 2 1/2	5/8 X 3	1	---	---
18	1 1/8	5/8 X 2 1/2	1	---	1/2 X 2 1/2	1/4 X 2 1/2	7/8	6	3 1/2	5/8 X 2 1/2	5/8 X 3	1 1/8	---	---
20	1 1/4	5/8 X 2 1/2	1	---	5/8 X 3	5/8 X 3	1	6	3 1/2	5/8 X 2 1/2	3/4 X 3	1 1/4	---	---
24	1 1/2	5/8 X 3	1	---	---	---	---	6	4	---	3/4 X 3	1 1/2	---	---

HANGER LOAD REQUIREMENTS

NOMINAL TUBING O.D.	N.P.S.	MINIMUM FAILURE LOAD LBS.
1/2 THRU 2	3/4 THRU 2	750
2 1/2	2 1/2	850
3	3	1050
3 1/2 & 4	3 1/2	1250
	4	1500
	5	2000
	6	2550
	8	3800

RECOMMENDED HANGER SPACING

SIZE TUBING INCHES	MAX. SPAN FEET	SIZE PIPE INCHES	MAX. SPAN FEET	SIZE PIPE INCHES	MAX. SPAN FEET
3/8 THRU 3/4	5	1/2 THRU 1	7	5	14
1	6	1 1/2	9	6	17
1 1/4	7	2	10	8	19
1 1/2 AND 2	8	2 1/2	11	10	22
2 1/2	9	3	12	12	23
3	10	3 1/2	13	14	25
3 1/2	11	4	14	16	27

*INSULATION SHIELDS

NOMINAL PIPE OR TUBING SIZE INCHES	LENGTH OF SHIELD INCHES	GAGE NUMBER
1/2 THRU 3 1/2	12	18
4	12	16
5	15	16
6	18	16
8	24	14

NOTES:

1. ALL SHIELDS SHALL BE MADE FOR AN ARC OF APPROXIMATELY 180°
2. STANDARD DETAIL 18-TT(INSULATION PROTECTION SHIELDS) MUST BE USED ON INSULATIONS HAVING A VAPOR BARRIER SUCH AS USED ON REFRIGERATION AND AIR CONDITIONING SYSTEMS.

* #3. STANDARD DETAILS 18-RR & 18-SS (PIPE COVERING PROTECTION SADDLES) MUST BE USED ON INSULATED STEEL LINES WHERE THE USE OF A ROLLER (STD DETAILS 18-UU THRU 18-AAA) IS WARRANTED.

NOTES:

[A] THIS TABLE APPLIES TO STANDARD DETAILS 18-A THRU 18-AAA. (IPS RADIUS ONLY). [C] FOR PIPE OR TUBING.

THE DESIGN OF MEMBERS NOT DIMENSIONALLY DETAILED HEREIN SHALL BE BASED ON THE TEMPERATURE AND WEIGHT OF THE MEDIUM TRANSPORTED AND THE WEIGHT OF THE PIPING SYSTEM INCLUDING INSULATION.

CARBON STEEL SHALL NOT BE USED IN ANY MEMBER OF THE HANGER OR SUPPORT WHICH CONTACTS THE PIPING SYSTEM WHERE TEMPERATURES EXCEED 750°F, BUT MAY BE USED IN THE CONNECTING PARTS.

[A] ALL ABOVE DIMENSIONS ARE IN INCHES. NOMINAL IPS.

[B] SINGLE ROD HANGERS ONLY.

[D] SIZE 26 THRU 36R = 6 INCHES.

[D] SIZE 30 THRU 36J = 6 INCHES.

[E] WHERE DETAIL 18-UU IS USED ON INSULATED LINES, ROD SIZES MAY BE REDUCED IN ACCORDANCE WITH MANUFACTURERS CATALOG RECOMMENDATIONS.

HANGER ROD LOAD LIMITATIONS (ASTM A-197)

NOMINAL ROD DIAMETER INCHES	ROOT AREA OF THREAD SQUARE INCHES	MAXIMUM SAFE LOAD AT ROD TEMPERATURE OF 650°F POUNDS
3/8	0.068	610
1/2	0.126	1,130
5/8	0.202	1,810
3/4	0.302	2,710
7/8	0.419	3,770
1	0.552	4,960
1 1/8	0.693	6,230
1 1/4	0.889	8,000
1 3/8	1.053	9,470
1 1/2	1.293	11,630
1 5/8	1.515	13,630
1 3/4	1.744	15,690
1 7/8	2.048	18,430
2	2.292	20,690

SYMBOL	DESCRIPTION	DATE	APPROVAL

REVISIONS

GRAPHIC SCALES

NONE

MAYER, BEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY: REED
CHECKED BY: SHAFFER
SUBMITTED BY: C. B. DELCHMANN

THEATER OF OPERATIONS

STANDARD DETAILS
(PIPE HANGERS AND SUPPORTS)
18A THRU 18-AAA

APPROVED: DATE: 17 FEB 1971
CHIEF, STRUCTURES BRANCH

APPROVED: CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

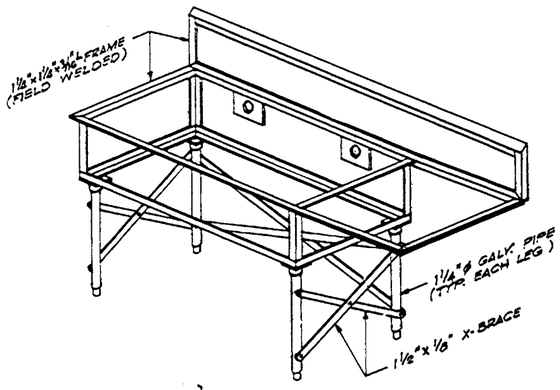
SCALE: AS NOTED SPEC. NO.

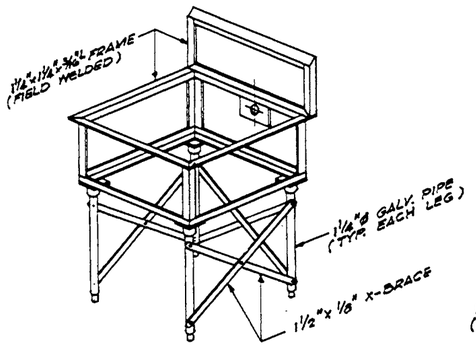
DRAWING NUMBER

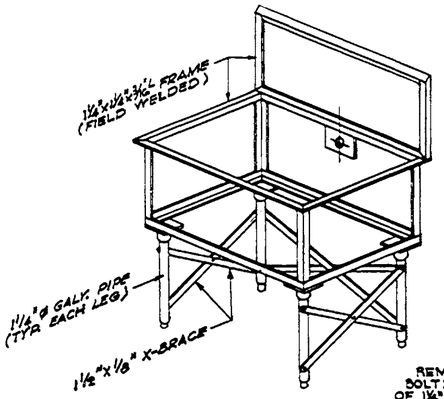
DATE

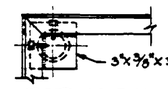
SHEET 18

39-98

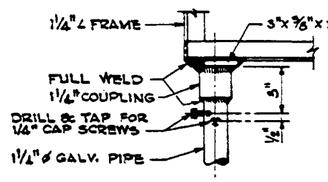


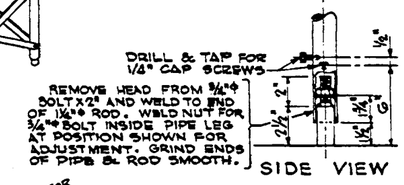




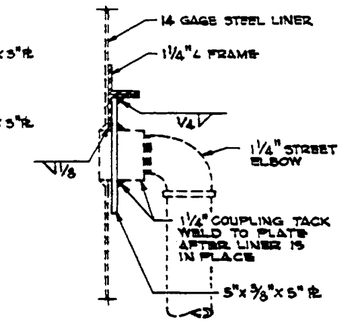


TOP VIEW



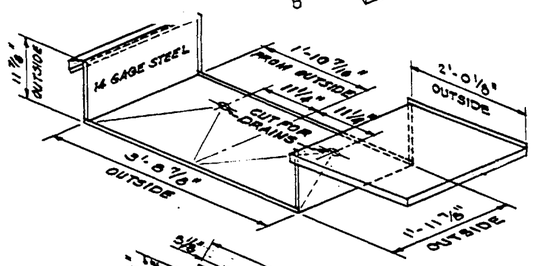


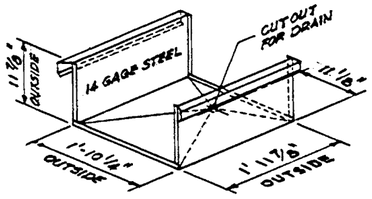
SIDE VIEW

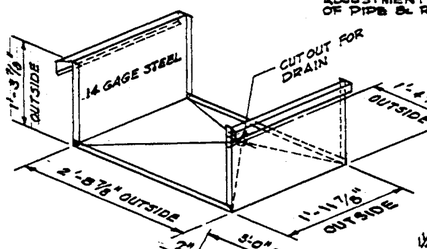


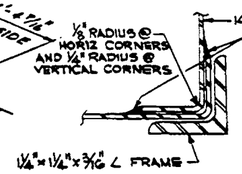
OVERFLOW PIPE DETAIL
NO SCALE

LEG DETAIL
SCALE NO. 8

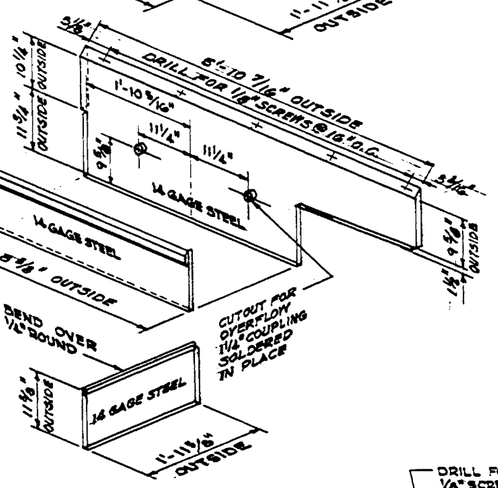


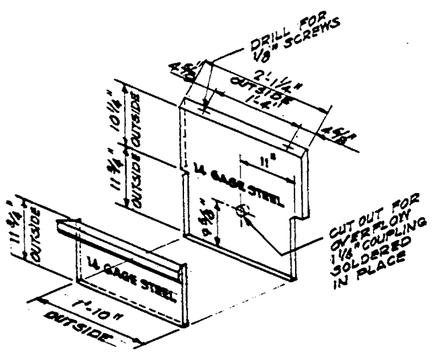


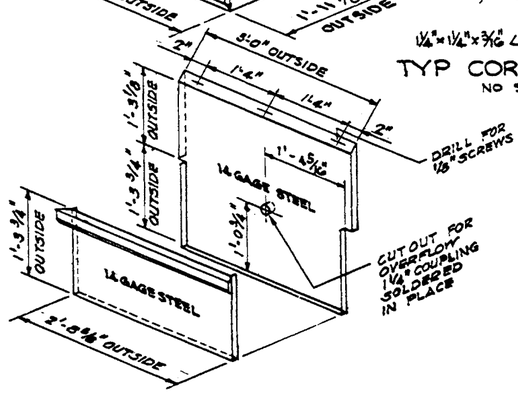


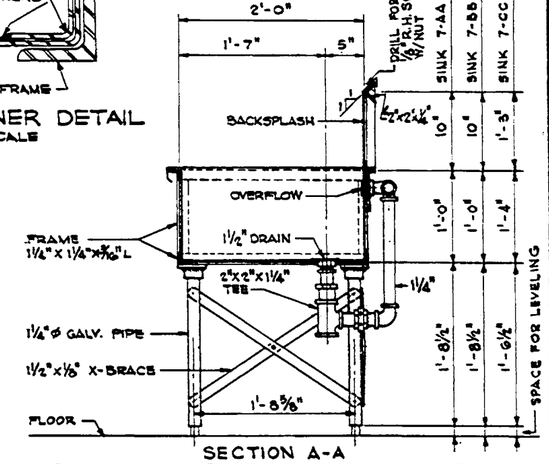


TYP CORNER DETAIL
NO SCALE





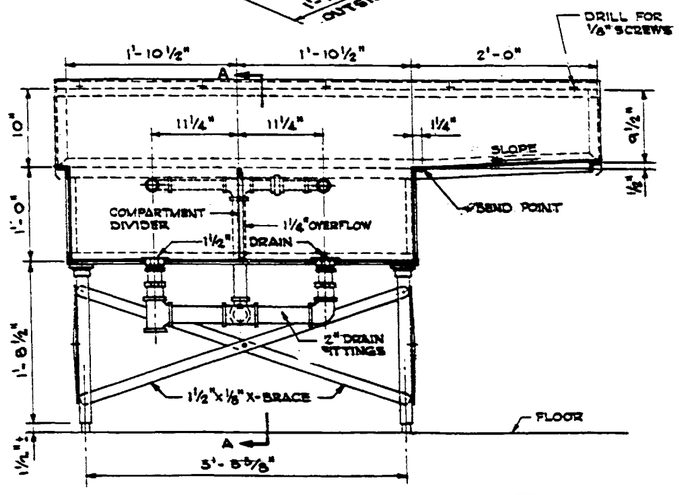




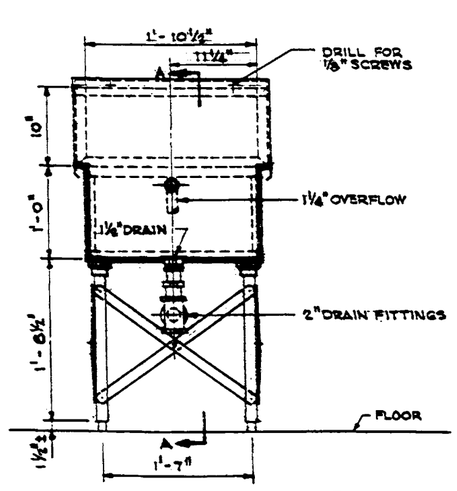
SECTION A-A
TYPICAL SECTION FOR 7-AA, 7-BB & 7-CC
SCALE NO. 7

GENERAL NOTES

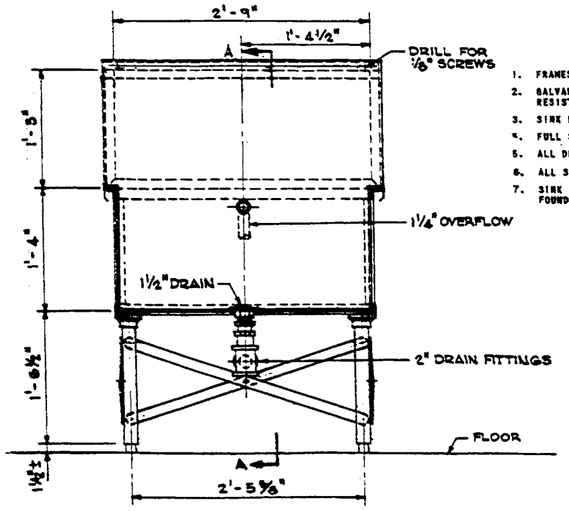
1. FRAMES TO BE CONSTRUCTED OF GALVANIZED PIPE, PLATE AND ANGLES FULLY WELDED.
2. GALVANIZING BURNED DURING WELDING SHALL BE RE-GALVANIZED OR PAINTED WITH HEAT RESISTING ALUMINUM PAINT.
3. SINK LINERS AND DRAINBOARD TO BE FABRICATED WITH 14 GA. GALVANIZED SHEET STEEL.
4. FULL SOLDER ALL SHEET METAL JOINTS FOR WATER TIGHTNESS.
5. ALL DRAIN PIPING TO BE GALVANIZED PIPE.
6. ALL SHARP EDGES ARE TO BE GROUND SMOOTH TO PREVENT INJURY.
7. SINK FABRICATION SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL SANITATION FOUNDATION STANDARDS NO. 2.



2-COMPARTMENT SINK WITH DRAINBOARD (7-AA)
SCALE NO. 7



SINGLE COMPARTMENT SINK (7-BB)
SCALE NO. 7



SINGLE COMPARTMENT SINK (7-CC)
SCALE NO. 7

OWNER	DESCRIPTION	DATE	APPROVAL
	REVISIONS		

GRAPHIC SCALES
0 3" 6" 9" 1' 2' — NO. 7
0 1" 2" 3" 6" 9" 1' — NO. 8

MAYER, BRAY, MATTERN & MATTERN — ARCHITECTS - ENGINEERS — ROANOKE, VIRGINIA — WASHINGTON, D. C.

DEPARTMENT OF THE ARMY — OFFICE OF THE CHIEF OF ENGINEERS — MILITARY CONSTRUCTION - ENGINEERING DIVISION — WASHINGTON, D. C.

DRAWN BY: SHAFFER
TRACED BY:
CHECKED BY: DEICHMANN
SUBMITTED BY:
APPROVED: C. W. DEICHMANN

THEATER OF OPERATIONS

STANDARD DETAILS

7-AA, 7-BB & 7-CC (SINKS)

APPROVED: DATE: 17 FEB 1971
CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.
CHIEF, ARCHITECTURAL BRANCH

APPROVED FOR PROCUREMENT AGENCY

SCALE: AS NOTED
SPEC. NO.
DRAWING NUMBER: 99-98
SHEET 18

DATE

APPENDIX A

REFERENCES

I TECHNICAL MANUALS

TM-3-281 Impregnating Plant, Clothing, M2
TM 5-200 Camouflage Nets and Net Sets
TM 5-210 Military Floating Bridge Equipment
TM 5-220 Passage of Obstacles other than Minefields
TM 5-258 Pile Construction
TM 5-270 Cableways, Tramways and Suspension Bridge
TM 5-277 Bailey Bridge
TM 5-285 Semipermanent Highway Steel Bridge, 30, 80 & 90 Ft. Spans
TM 5-286 Semipermanent Highway and Railway Trestle Bridges
TM 5-297 Well Drilling Operations
TM 5-301 Staff Tables of Engineer Functional Components System
TM 5-303 Bills of Materials & Equipment of Engineer Functional Components System
TM 5-312 Military Fixed Bridges
TM 5-330 Planning, and Design of Roads, Airbases and Heliports in the Theater of Operations
TM 5-331 Utilization of Engineer Construction Equipment
TM 5-335 Drainage Structures, Subgrades and Base Courses
TM 5-337 Paving and Surfacing Operations
TM 5-337-1 Asphalt Plant Layouts, 90 to 120 TPH Paving Set
TM 5-343 Military Petroleum Pipeline Systems
TM 5-349 Arctic Construction
TM 5-360 Port Construction and Rehabilitation
TM 5-370 Railroad Construction
TM 5-371 I-Beam Railway Bridge
TM 5-372 Unit Construction Railway Bridge
TM 5-373 Through Truss Railway Bridges
TM 5-374 Light Standard Unit Steel Trestles
TM 5-460 Carpentry and Building Construction
TM 5-461 Engineer Handtools
TM 5-530 Materials Testing
TM 5-617 Roofing; Repairs and Utilities
TM 5-618 Painting; Repairs and Utilities
TM 5-619 Plumbing; Repairs and Utilities
TM 5-622 Wharves, Shores Structures, and Dredging; Repairs and Utilities
TM 5-624 Roads, Runways and Miscellaneous Pavements; Repairs and Utilities
TM 5-627 Railway Track Maintenance; Repairs and Utilities
TM 5-636 Kitchen Equipment; Repairs and Utilities
TM 5-637 Inspection and Preventive Maintenance Services for Kitchen Equipment
TM 5-640 Ranges, Bake Ovens and Burners for Mess Equipment; Repairs and Utilities
TM 5-641 Inspections and Preventive Maintenance, Ranges, Bake Ovens and Burners for other Mess Equipment
TM 5-644 Boiler Heating; Repairs and Utilities
TM 5-648 Space Heaters; Repairs and Utilities
TM 5-650 Repairs and Utilities; Central Boiler Plants.
TM 5-651 Central Boiler Plants; Inspection and Preventive Maintenance Service
TM 5-660 Operation of Water Supply and Treatment Facilities at Fixed Army Installations.
TM 5-665 Operation of Sewerage and Sewage Treatment Facilities at Fixed Army Installations.
TM 5-670 Repairs and Utilities: Refrigeration, Air Conditioning, Mechanical Ventilation & Evaporative Cooling
TM 5-678 Repair and Utilities: Petroleum, Oils and Lubricants (POL)
TM 5-680 Electrical Facilities; General, Engineering Data and Practices, Tools and Equipment, and Safety Practices; Repairs and Utilities.
TM 5-680A Electrical Facilities: Utilization Equipment and Controls; Repairs and Utilities
TM 5-680B Repairs and Utilities: Electrical Facilities; Interior Electric Systems
TM 5-680C Repairs and Utilities: Electrical Facilities; Overhead Distribution System
TM 5-680D Electrical Facilities: Underground Distribution Systems; Repairs and Utilities
TM 5-680E Electrical Facilities: Exterior Lighting; Repairs and Utilities
TM 5-680F Electrical Facilities: Substations; Repairs and Utilities
TM 5-680G Electrical Facilities: Generating Plants; Repairs and Utilities.
TM 5-700 Field Water Supply
TM 5-725 Rigging
TM 5-742 Concrete and Masonry
TM 5-744 Structural Steelwork
TM 5-745 Heating, Ventilating and Sheet Metal Work
TM 5-748 Plumbing and Pipefitting
TM 5-760 Electrical Wiring
TM 5-765 Electric Power Transmission and Distribution
TM 5-766 Electric Power Generation in the Field
TM 5-785 Army, Navy and Air Force Manual: Engineering Weather Data
TM 5-800-1 Basic Criteria and Construction Standards for Army Facilities
TM 5-803-1 Installations: Master Planning Principles and Procedures
TM 5-803-3 Installations Planning: Site Planning--General
TM 5-805-1 Building Construction Materials and Practices: Standard Practice for Concrete Military Structures
TM 5-805-8 Builder's Hardware.
TM 5-809-1 Load Assumption for Buildings
TM 5-809-2 Concrete Structural Design for Buildings
TM 5-809-5 Wood Structural Design for Buildings
TM 5-809-6 Structural Design: Structures other than Buildings
TM 5-809-8 Engineering and Design Criteria for Corrugated Roofing and Siding (Protected Steel)
TM 5-809-11 Design Criteria for Facilities in Area Subject to Typhoons and Hurricanes
TM 5-810-1 Mechanical Design: Heating, Ventilating and Air Conditioning
TM 5-810-3 Mechanical Design, Mechanical Refrigeration and Ventilation in Cold Storage Facilities
TM 5-810-5 Mechanical Design: Plumbing
TM 5-811-1 Electrical Design: Electric Power Supply and Distribution
TM 5-811-2 Electrical Design, Interior Electrical Systems
TM 5-811-4 Engineering and Design: Corrosion Control
TM 5-813-1 Water Supply, General Considerations
TM 5-813-2 Water Supply, Water Sources
TM 5-813-3 Water Supply, Water Treatment
TM 5-813-5 Water Supply, Water Distribution Systems
TM 5-814-1 Engineering and Design: Sanitary and Industrial Waste Sewers
TM 5-814-3 Engineering and Design: Sewage-Treatment Plants
TM 5-820-1 Drainage and Erosion Control: Surface Drainage Facilities for Airfields and Heliports
TM 5-822-5 Engineering and Design: Road, Streets, Walks and Open Storage Areas Flexible-Pavement Design
TM 5-822-6 Roads, Streets and Pavements Generally: Rigid Pavements for Roads Streets, Walks and Open Storage Areas
TM 5-838-2 Medical Facilities: Design of Army Medical Facilities
TM 5-840-1 Engineering and Design: Cold Storage Facilities
TM 5-840-2 Storage Facilities: Storage Depots
TM 5-842-1 Engineering and Design: Food Service Facilities
TM 5-842-2 Engineering and Design: Laundries and Dry Cleaning Plants
TM 5-842-3 Dining Facilities for Enlisted Personnel
TM 5-848-1 Ammunition Facilities
TM 5-850-1 Transportation Facilities, Military Ports
TM 5-850-2 Engineering and Design: Railroads
TM 5-882-2 Engineering and Design: Structural Design Emergency Construction
TM 5-882-3 Engineering and Design: Heating, Ventilating and Air Conditioning, Emergency Construction
TM 5-882-4 Engineering and Design: Plumbing and Gasfitting, Emergency Construction
TM 5-882-5 Engineering and Design: Interior Electrical Systems Emergency Construction
TM 5-882-8 Engineering and Design: Refrigeration, Emergency Construction
TM 5-884-1 Engineering and Design: Electric Power Supply and Distribution-Emergency Construction
TM 5-884-2 Engineering and Design: Water Supply, Emergency Construction
TM 5-884-3 Engineering and Design: Sanitary Sewage Systems, Emergency Construction
TM 5-890-3 Engineering and Design: Laundry, Dry Cleaning and Food Service Facilities, Emergency Construction
TM 5-890-8 Railroads, Emergency Construction
TM 9-237 Welding Theory and Application
TM 9-237-1 Materials Used for Brazing, Welding, Soldering, Arc Cutting and Metallizing
TM 9-254 General Maintenance Procedures for Fire Control Materiel
TM 10-200 Pipefitting
TM 10-288 General Repair of Footwear and Leather Goods
TM 10-290 Field Laundry, Bath and Clothing Exchange Operations
TM 10-300 Military Fixed Dry Cleaning Plant
TM 10-354 Army Fixed Laundry Organization
TM 10-1101 Petroleum Handling Equipment and Operations
TM 10-1105 Inspecting and Testing Petroleum Products
TM 11-486-10 Electrical Communications Systems Engineering Handbook

II FIELD MANUALS

FM 5-1 Engineer Troop Organizations and Operations
FM 5-13 The Engineer Soldier's Handbook
FM 5-15 Field Fortifications
FM 5-20 Camouflage, Basic Principles and Field Camouflage
FM 5-22 Camouflage Materials
FM 5-23 Field Decoy Installations
FM 5-25 Explosives and Demolitions
FM 5-29 Passage of Mass Obstacles
FM 5-31 Boobytraps
FM 5-34 Engineer Field Data
FM 5-35 Engineer's Reference and Logistical Data
FM 5-36 Route Reconnaissance and Classification
FM 5-142 Nondivisional Engineer Combat Units
FM 5-162 Engineer Construction and Construction Support Units
FM 9-5 Ammunition Service in the Theater of Operations
FM 10-64 Quartermaster Class II And IV Supply in Theaters of Operations
FM 10-67-1 Petroleum Supply in Theaters of Operations
FM 11-20 Signal Operations, Theater of Operations
FM 14-1 Finance Service in the Field Army
FM 19-40 Enemy Prisoners of War and Civilian Internees
FM 19-80 Confinement of Military Prisoners
FM 20-15 Pole and Frame Supported Tents
FM 20-32 Landmine Warfare
FM 21-10 Military Sanitation
FM 20-13 The Soldier's Guide
FM 21-30 Military Symbols
FM 21-31 Topographic Symbols
FM 38-1 Logistics Supply Management
FM 55-8 Transportation Services in Theaters of Operations
FM 100-10 Field Service Regulations Administration
FM 100-15 Field Service Regulations, Larger Units
FM 101-10-1 Staff Officer's Field Manual Organization, Technical, and Logistical Data, Unclassified Data
FM 101-10-2 Staff Officer's Field Manual: Organizational, Technical, and Logistical Data Extracts of Organization and Equipment

III ARMY REGULATIONS

AR 10-5 Department of the Army
AR 10-11 United States Army Materiel Command
AR 10-12 United States Army Combat Developments Command
AR 11-8 Logistic Policies
AR 210-130 Laundry and Dry Cleaning
AR 320-5 Dictionary of the United States Army Terms
AR 320-50 Authorized Abbreviations and Brevity Codes
AR 415-10 General Provisions
AR 415-16 Engineer Functional Components System (Theater of Operations Construction Planning)
AR 415-28 Department of the Army Facility Classes and Construction Categories
AR 700-1 Distribution of Supply Management Data Army Master Data File
AR 725-50 Requisitioning Receipt and Issue System

IV ARMY BULLETINS

TB5-15-1 Prefabricated Shelters, Bunkers and Emplacement Covers

V MISCELLANEOUS REFERENCES

Air Conditioning and Refrigeration Institute (ARI), All Standards, 1815 North Fort Myer Drive, Arlington, Va.
American Electricians Handbook - Croft, McGraw - Hill, Inc., 330 W. 42nd St. New York, N.Y. 10036.
American Institute of Steel Construction, (AISC), Manual of Steel Construction, 101 Park Ave., N.Y.,N.Y.
American Iron & Steel Institute (AISI), 633 Third Ave., N.Y., N.Y.
American Society for Testing Materials, when applicable, 1916 Race St., Philadelphia, Pa.
American Society of Heating, Refrigerating and Air-Conditioning Engineers-Applications, 345 East 47th St., N.Y.,N.Y. 10017.
American Society of Heating, Refrigerating and Air-Conditioning Engineers-Fundamentals, 345 East 47th St., N.Y.,N.Y. 10017.
American Society of Heating, Refrigerating and Air-Conditioning Engineers-Systems, 345 East 47th St. N.Y..N.Y. 10017.
American Society of Mech. Engrs., Boiler & Vessel Codes, 345 East 47th St., N.Y., N.Y. 10017.
Base Development for Contingency Operations, Office of the Deputy Assistant Secretary of Defense (Properties and Installations), Washington, D.C.
Base Development Planning Guide, Engineer Strategic Studies Group, Office, Chief of Engineers, Department of the Army, Washington, D.C.
Centrifugal Hydraulic Data, Ingersoll-Rand Company - 11 Broadway, N.Y., N.Y.
Casing, Tubing and Drill Pipe, API Standard 5A, American Petroleum Institute, Division of Production, Dallas 1, Texas.
Cast Iron Pipeline Valves MSS, SP-52, 420 Lexington Ave., N.Y., N.Y.
Civil Engineering Handbook, Urquhart, 4th Ed. McGraw-Hill, Inc., 330 W. 42nd St. New York, N.Y. 10036.
Code for Pressure Piping, ASA B 31.1, U.S.A. Standards Institute, 10 East 40th St., N.Y., N.Y.
Concrete Pipe Handbook, American Concrete Pipe Association, Chicago 1, Ill.
Design Manual, Electrical Engineering, NAVDOCKS DM-4, Dept. of the Navy, Washington, D.C.
Federal Specifications, when applicable, 5001 Tabor Ave., Philadelphia, Pa.
High-Test Line Pipe, API Standard 5LX, American Petroleum Institute, Division of Production, Dallas 1, Texas
Highway Engineering, by Newes and Oglesby - John Wiley & Sons, Inc., New York
Illuminating Engineering Society, Lighting Handbook, 345 East 47th St. N.Y., N.Y.10017
Institute of Electrical and Electronic Engineers Transactions, 345 East 47th St. N.Y., N.Y.10017
Line Pipe, API Standard 5L, American Petroleum Institute, Division of Production, Dallas 1, Texas
Metal Building Manufacturer's Association (MBMA), 2130 Keith Bldg., Cleveland, Ohio
Military Specifications, when applicable, 5001 Tabor Ave., Philadelphia, Pa.
Military Standard Abbreviations for use on Drawings, Specifications, Standards and in Technical Documents (MIL-STD-12c), 5001 Tabor Ave., Philadelphia, Pa.
Military Standards, when applicable, 5001 Tacor Ave., Philadelphia, Pa.
Monthly publications: Electrical Construction & Maintenance - McGraw-Hill, Inc., 330 W. 42nd St. New York, N.Y. 10036.
National Association of Fan Manufacturers (NAFM), Bulletin No. 110, 209 West Touhy Ave., Park Ridge, Ill.
National Board of Fire Underwriters, NBFU No. 30, Storage Combustible Liquids, 85 John St., N.Y., N.Y.
National Board of Fire Underwriters, NBFU No. 31, Oil Burning Equipment, 85 John St., N.Y., N.Y.
National Bureau of Standards Handbook H28, Government Printing Office, Washington, D.C.
National Electric Light Association, Overhead Systems Reference Book, 29 West 39th St., N.Y., N.Y.
National Electrical Code, 60 Batterymarch St., Boston, Mass.
National Electrical Safety Code, Government Printing Office, Washington, D.C.
National Fire Protection Association, Standards No. 90B, 60 Batterymarch St., Boston, Mass.
National Sanitation Foundation Standards, P.O. Box 1468, Ann Arbor, Mich.
Operating Data Development, Department of the Army, OCE, Engineer Strategic Studies Group, Washington, D.C., 1969. (Unpublished Study).
Rat Proofing Buildings, Dept. of Commerce - Bulletin 18, Government Printing Office, Washington, D.C.
Seabee Planner's and Estimator's Handbook, NAVDOCKS P-405, Dept. of the Navy, Washington, D.C.
Sewerage and Sewage Treatment by Harold E. Babbitt and Robert Baumann, John Wiley & Sons, Inc., New York
Space Utilization Plans and Design Criteria for Army Permanent Type Laundries, Chief Support Services, D.A.
Square & Hexagonal Bolts and Nuts, American Standard ASA B 18.2, USA Standards Institute, 10 East 40th St.N.Y.
Standard Handbook for Electrical Engineers, McGraw-Hill, Inc., 330 W. 42nd St. New York, N.Y. 10036.
Standard Test Code for Steam Unit Heaters, AHCA, Bulletin No. 20, 205 West Touhy Ave, Park Ridge, Ill.
Steel Gate, Plug, Ball and Check Valves, API Standard 6D, American Petroleum Institute, Division of Production, Dallas 1, Texas.
Testing and Rating Code for Finned Tube Radiation, IBR, 393 Seventh Ave., N.Y., N.Y.
Underwriter's Laboratories Standards, 85 John St, N.Y. 38, N.Y.
Unified Screw Threads, ASA B 1.1, 345 East 47th St., N.Y., N.Y.
United States of America Standards Institute (USASI), all standards, 10 East 40th St.,N.Y.,N.Y.
Water Supply and Waste Disposal, by W. A. Hardenbergh and Edward R. Rodie, International Textbook Co., Scranton, Pa.

SYMBOL	DESCRIPTION	DATE	APPROVAL
	GENERAL REVISION	JAN 71	

REVISIONS
DRAFTING DETAILS

HAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY: JACKSON
DESIGNED BY: DEICHMANN
SUBMITTED BY: C.W.DEICHMANN

THEATER OF OPERATIONS

APPENDIX A

REFERENCES

APPROVED: DATE: 19 MAY 1969
CHIEF, STRUCTURES BRANCH, CONSTR. ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:

SCALE: SPEC. NO.

DRAWING NUMBER

DATE

SHEET 1 OF 1

APPENDIX C

CONVERSION FACTORS

MULTIPLY	BY	TO OBTAIN
acres	43,560	square feet
acres	4047	square meters
acres	1.562×10^{-3}	square miles
acres	4840	square yards
acre-feet	43,560	cubic feet
acre-feet	325,851	gallons
atmospheres	76.0	cms of mercury
atmospheres	29.92	inches of mercury
atmospheres	33.90	feet of water
atmospheres	10,333	kgs per sq meter
atmospheres	14.70	lbs per sq inch
atmospheres	1.058	tons per sq foot
atu	14.22	kgs per sq cm
bars	0.98692	atmospheres
bars	1×10^{6}	dynes per sq cm
bars	1.01971×10^{4}	kgs per sq meter
bars	2089	lbs per sq foot
bars	14.504	lbs per sq inch
board-feet	144	cubic inches
Btu	0.2520	kilogram-calories
Btu	778.0	foot-pounds
Btu	3.93×10^{-4}	horsepower-hours
Btu	1055	joules
Btu	107.8	kilogram-meters
Btu	2.930×10^{-4}	kilowatt-hours
Btu per min	12.97	foot-pounds per sec
Btu per min	0.02358	horsepower
Btu per min	0.01758	kilowatts
Btu per min	17.58	watts
Btu per sq ft per min	0.12208	watts per sq inch
bushels	1.244	cubic feet
bushels	2150	cubic inches
bushels	0.03524	cubic meters
bushels	4	pecks
bushels	64	pints (dry)
bushels	32	quarts (dry)
barrel (POL)	158.98	liters
barrel (POL)	42.00	gallons
centares	1	square meters
centigrams	0.01	grams
centiliters	0.01	liters
centimeters	0.3937	inches
centimeters	0.01	meters
centimeters	393.7	mils
centimeters	10	millimeters
centimeter-dynes	1.020×10^{-3}	centimeter-grams
centimeter-dynes	1.020×10^{-8}	meter-kilograms
centimeter-dynes	7.378×10^{-8}	pound-feet
centimeter-grams	980.7	centimeter-dynes
centimeter-grams	10^{-5}	meter-kilograms
centimeter-grams	7.233×10^{-5}	pound-feet
centimeters of mercury 0°C	0.01316	atmospheres
centimeters of mercury 0°C	0.4461	feet of water @ 39.1°F
centimeters of mercury 0°C	136.0	kgs per square meter
centimeters of mercury 0°C	27.85	pounds per square foot
centimeters of mercury 0°C	0.1934	pounds per square inch
centimeters per second	1.968	feet per minute
centimeters per second	0.03281	feet per second
centimeters per second	0.036	kilometers per hour
centimeters per second	0.6	meters per minute
centimeters per second	0.02237	miles per hour
centimeters per second	3.728×10^{-4}	miles per minute
cms per sec per sec	0.03281	feet per sec per sec
cms per sec per sec	0.036	kms per hour per sec
cms per sec per sec	0.02237	miles per hour per sec
circular mils	5.067×10^{-6}	square centimeters
circular mils	7.854×10^{-7}	square inches
circular mils	0.7854	square mils
cord-feet	4'x4'x1'	cubic feet
cords	8'x4'x4'	cubic feet
coulombs	1/10	abcoulombs
coulombs	3×10^{9}	statcoulombs
coulombs per sq inch	0.01550	abcoulombs per sq cm
coulombs per sq inch	0.1550	coulombs per sq cm
coulombs per sq inch	4.650×10^{8}	statcoulombs per sq cm
cubic centimeters	3.531×10^{-5}	cubic feet
cubic centimeters	6.102×10^{-2}	cubic inches
cubic centimeters	10^{-6}	cubic meters
cubic centimeters	1.308×10^{-6}	cubic yards
cubic centimeters	2.642×10^{-4}	gallons
cubic centimeters	10^{-3}	liters
cubic centimeters	2.113×10^{-3}	pints (liq)
cubic centimeters	1.057×10^{-3}	quarts (liq)
cubic feet	2.832×10^{4}	cubic cms
cubic feet	1728	cubic inches
cubic feet	0.02832	cubic meters
cubic feet	0.03704	cubic yards
cubic feet	7.481	gallons
cubic feet	28.32	liters
cubic feet	59.84	pints (liq)
cubic feet	29.92	quarts (liq)
cubic feet per min	472.0	cubic cms per sec
cubic feet per min	0.1247	gallons per sec
cubic feet per min	0.4720	liters per sec
cubic feet per min	62.4	lbs of water per min
cubic inches	16.39	cubic centimeters
cubic inches	5.787×10^{-4}	cubic feet
cubic inches	1.639×10^{-5}	cubic meters
cubic inches	2.143×10^{-5}	cubic yards
cubic inches	4.329×10^{-3}	gallons
cubic inches	1.639×10^{-2}	liters
cubic inches	0.03463	pints (liq)
cubic inches	0.01732	quarts (liq)
cubic meters	10^{6}	cubic centimeters
cubic meters	35.31	cubic feet
cubic meters	61.023	cubic inches
cubic meters	1.308	cubic yards
cubic meters	264.2	gallons
cubic meters	10^{3}	liters

MULTIPLY	BY	TO OBTAIN
cubic meters	2113	pints (liq)
cubic meters	1057	quarts (liq)
cubic yards	7.646×10^{5}	cubic centimeters
cubic yards	27	cubic feet
cubic yards	46,656	cubic inches
cubic yards	0.7646	cubic meters
cubic yards	202.0	gallons
cubic yards	764.6	liters
cubic yards	1616	pints (liq)
cubic yards	807.9	quarts (liq)
cu yards per min	0.45	cu ft per sec
cu yards per min	3.367	gallons per second
cu yards per min	12.74	liters per second
days	24	hours (mean solar)
days	1440	minutes (mean solar)
days	86,400	seconds (mean solar)
decigram	0.1	grams
deciliters	0.1	liters
decimeters	0.1	meters
degrees (angle)	60	minutes
degrees (angle)	0.01745	radians
degrees (angle)	3600	seconds
degrees per sec	0.01745	radians per second
degrees per sec	0.1667	revolutions per min
degrees per sec	0.002778	revolutions per sec
dekagrams	10	grams
dekaliters	10	liters
dekameters	10	meters
drams	1.772	grams (avoir)
drams	0.1250	ounces (apoth)
dynes	1.020×10^{-3}	grams
dynes	2.248×10^{-6}	pounds
dynes per square cm	1	bars
ergs	9.480×10^{-11}	Btu
ergs	1	dyne-centimeters
ergs	7.378×10^{-8}	foot-pounds
ergs	1.020×10^{-3}	gram-centimeters
ergs	10^{-7}	joules
ergs	2.389×10^{-11}	kilogram-calories
ergs	1.020×10^{-8}	kilogram-meters
ergs per sec	5.688×10^{-9}	Btu per min
ergs per sec	4.427×10^{-6}	foot-pounds per min
ergs per sec	7.378×10^{-8}	foot-pounds per sec
ergs per sec	1.341×10^{-10}	horsepower
ergs per sec	1.43×10^{-9}	kg-calories per min
ergs per sec	10^{-10}	kilowatts
fathoms	6	feet
feet	30.48	centimeters
feet	12	inches
feet	1/3	yards
feet of water	0.02950	atmospheres
feet of water	0.8826	inches of mercury
feet of water	304.8	kgs per sq meter
feet of water	62.43	lbs per sq ft
feet of water	0.4335	lbs per sq inch
feet per minute	0.5080	centimeters per sec
feet per minute	0.01667	feet per sec
feet per minute	0.01829	kilometers per hour
feet per minute	0.3048	meters per minute
feet per minute	0.01136	miles per hour
feet per second	30.48	centimeters per sec
feet per second	1.097	kilometers per hour
feet per second	0.5921	knots
feet per second	18.29	meters per minute
feet per second	0.6818	miles per hour
feet per second	0.01136	miles per minute
feet per 100 feet	1	per cent grade
ft per sec per sec	30.48	cms per sec per sec
ft per sec per sec	1.097	kms per hr per sec
ft per sec per sec	0.3048	meters per sec per sec
ft per sec per sec	0.6818	miles per hr per sec
foot-pounds	1.285×10^{-3}	British thermal units
foot-pounds	1.356×10^{7}	ergs
foot-pounds	5.050×10^{-7}	horsepower hours
foot-pounds	1.356	joules
foot-pounds	3.238×10^{-4}	kilogram-calories
foot-pounds	0.1383	kilogram-meters
foot-pounds	3.766×10^{-7}	kilowatt hours
foot-pounds per min	1.285×10^{-3}	Btu's per minute
foot-pounds per min	0.01667	foot-pounds per sec
foot-pounds per min	3.030×10^{-5}	horsepower
foot-pounds per min	3.238×10^{-4}	kg calories per minute
foot-pounds per min	2.260×10^{-5}	kilowatts
foot-pounds per sec	7.712×10^{-2}	Btu's per minute
foot-pounds per sec	1.818×10^{-3}	horsepower
foot-pounds per sec	1.943×10^{-2}	kg calories per min
foot-pounds per sec	1.356×10^{-3}	kilowatts
furlongs	40	rods
gallons	3785	cubic centimeters
gallons	0.1337	cubic feet
gallons	231	cubic inches
gallons	3.785×10^{-3}	cubic meters
gallons	4.951×10^{-3}	cubic yards
gallons	3.785	liters
gallons	8	pints (liq)
gallons	4	quarts (liq)
gallons per minute	2.228×10^{-3}	cubic feet per sec
gallons per minute	0.06308	liters per sec
gauss (abs)	6.452	lines per sq inch
gills	0.1183	liters
gills	0.25	pints (liq)
grams	10^{-3}	kilograms
grams	10^{3}	milligrams
grams	0.03527	ounces
grams	0.07093	poundals
grams	2.205×10^{-3}	pounds
gram-calories	3.968×10^{-3}	British thermal units
gram-centimeters	9.297×10^{-8}	British thermal units
gram-centimeters	980.7	ergs (avoir)
gram-centimeters	7.233×10^{-5}	foot-pounds
gram-centimeters	9.807×10^{2}	joules
gram-centimeters	2.344×10^{-6}	kilogram-calories
gram-centimeters	10^{-5}	kilogram-meters
grams per cm	5.600×10^{-3}	pounds per inch

MULTIPLY	BY	TO OBTAIN
grams per cu cm	62.43	pounds per cubic foot
grams per cu cm	0.03613	pounds per cubic inch
hectares	2.471	acres
hectares	1.076×10^{5}	square feet
hectograms	100	grams
hectoliters	100	liters
hectometers	100	meters
hectowatts	100	watts
horsepower	42.418	Btu per min
horsepower	33,000	foot-pounds per min
horsepower	550	foot-pounds per sec
horsepower	1.0139	horsepower (metric)
horsepower	10.69	kg-calories per min
horsepower	0.7457	kilowatts
horsepower	2545	Btu's per hr
horsepower (boiler)	9.803	kilowatts
horsepower (boiler)	33,475	Btu's per hr
horsepower-hours	2545	British thermal units
horsepower-hours	1.98×10^{6}	foot-pounds
horsepower-hours	2.684×10^{6}	joules
horsepower-hours	641.3	kilogram-calories
horsepower-hours	2.737×10^{5}	kilogram-meters
horsepower-hours	0.7457	kilowatt hours
hours (mean solar)	60	minutes
hours (mean solar)	3600	seconds
inches	2.540	centimeters
inches	1000	mils
inches of mercury 32°F	0.03342	atmospheres
inches of mercury 32°F	1.133	feet of water 39.1°F
inches of mercury 32°F	345.3	kgs per sq meter
inches of mercury 32°F	70.73	pounds per sq foot
inches of mercury 32°F	0.4912	pounds per sq inch
inches of water 4°C	0.002458	atmospheres
inches of water 4°C	0.07355	inches of mercury
inches of water 4°C	25.40	kgs per sq meter
inches of water 4°C	0.5782	ounces per square inch
inches of water 4°C	5.202	pounds per sq foot
inches of water 4°C	0.03614	pounds per sq inch
joules	9.480×10^{-4}	British thermal units
joules	10^{7}	ergs
joules	0.7376	foot-pounds
joules	2.390×10^{-4}	kilogram-calories
joules	0.1020	kilogram-meters
joules	2.778×10^{-4}	watt-hours
kilograms	980.665×10^{3}	dynes
kilograms	1000	grams
kilograms	2.2046	pounds
kilograms	1.102×10^{-3}	tons (short)
kilogram-calories	3.968	British thermal units
kilogram-calories	3088	foot-pounds
kilogram-calories	1.559×10^{-3}	horsepower-hours
kilogram-calories	4186	joules
kilogram-calories	426.85	kilogram meters
kilogram-calories	1.163×10^{-3}	kilowatt hours
kg-calories per min	51.48	foot pounds per sec
kg-calories per min	0.0935	horsepower
kg-calories per min	0.06977	kilowatts
kgs-cms squared	2.373×10^{-3}	pounds-feet squared
kgs-cms squared	0.3417	pound-inches squared
kilogram-meters	9.297×10^{-3}	British thermal units
kilogram-meters	9.807×10^{7}	ergs
kilogram-meters	7.233	foot-pounds
kilogram-meters	9.807	joules
kilogram-meters	2.343×10^{-3}	kilogram-calories
kilogram-meters	2.724×10^{-6}	kilowatt-hours
kgs per cu meter	10^{-3}	grams per cubic cm
kgs per cu meter	0.06243	pounds per cu foot
kgs per cu meter	3.813×10^{-5}	pounds per cu inch
kgs per cu meter	3.405×10^{-10}	pounds per mil foot
kgs per meter	0.6720	pounds per foot
kgs per sq meter	9.678×10^{-5}	atmospheres
kgs per sq meter	98.07×10^{-6}	bars
kgs per sq meter	3.281×10^{-3}	feet of water
kgs per sq meter	2.896×10^{-3}	inches of mercury
kgs per sq meter	0.2048	pounds per sq foot
kgs per sq meter	1.422×10^{-3}	pounds per sq inch
kgs per sq millimeter	10^{6}	kgs per square meter
kiloliters	10^{3}	liters
kilometers	10^{5}	centimeters
kilometers	3281	feet
kilometers	10^{3}	meters
kilometers	0.6214	miles
kilometers	1093.6	yards
kilometers per hour	27.78	centimeters per sec
kilometers per hour	54.68	feet per minute
kilometers per hour	0.9113	feet per second
kilometers per hour	0.5396	knots
kilometers per hour	16.67	meters per minute
kilometers per hour	0.6214	miles per hour
kms per hour per sec	27.78	cms per sec per sec
kms per hour per sec	0.9113	ft per sec per sec
kms per hour per sec	0.2778	meters per sec per sec
kms per hour per sec	0.6214	miles per hr per sec
kilometers per min	60	kilometers per hour
kilowatts	56.88	Btu per min
kilowatts	4.425×10^{4}	foot-pounds per min
kilowatts	737.6	foot-pounds per sec
kilowatts	1.341	horsepower
kilowatts	14.33	kg-calories per min
kilowatts	10^{3}	watts
kilowatt-hours	3413	British thermal units
kilowatt-hours	2.655×10^{6}	foot-pounds
kilowatt-hours	1.341	horsepower-hours
kilowatt-hours	3.6×10^{6}	joules
kilowatt-hours	860	kilogram-calories
kilowatt-hours	3.671×10^{5}	kilogram-meters
nautical miles	6080	feet
nautical miles	1.853	kilometers
nautical miles	1.152	statute miles
nautical miles	2027	yards
knots	51.48	cms per sec
knots	1.689	feet per sec
knots	1.853	kilometers per hour
knots	1.152	miles per hour
lines per square cm	1	gauss

MULTIPLY	BY	TO OBTAIN
lines per square inch	0.1550	gauss
links (engineer's)	12	inches
links (surveyor's)	7.92	inches
liters	10^{3}	cubic cms
liters	0.035316	cubic feet
liters	61.025	cubic inches
liters	10^{-3}	cubic meters
liters	1.308×10^{-3}	cubic yards
liters	0.2642	gallons
liters	2.113	pints (liq)
liters	1.057	quarts (liq)
liters per min	5.855×10^{-4}	cubic feet per second
liters per min	4.403×10^{-3}	gallons per second
$\log_{10}N$	2.303	$\log_e N$ or ln N
$\log_e N$ or ln N	0.4343	$\log_{10} N$
lumens per sq ft	1	foot-candles
meters	100	centimeters
meters	3.2808	feet
meters	39.37	inches
meters	10^{-3}	kilometers
meters	10^{3}	millimeters
meters	1.0936	yards
meter-kilograms	9.807×10^{7}	centimeter-dynes
meter-kilograms	10^{5}	centimeter-grams
meter-kilograms	7.233	pound-feet
meters per minute	1.667	centimeters per sec
meters per minute	3.281	feet per minute
meters per minute	0.05468	feet per second
meters per minute	0.06	kilometers per hour
meters per minute	0.03728	miles per hour
meters per second	196.8	feet per minute
meters per second	3.281	feet per second
meters per second	3.6	kilometers per hour
meters per second	0.06	kilometers per min
meters per second	2.237	miles per hour
meters per second	0.03728	miles per minute
meters per second per sec	3.281	feet per sec per sec
meters per sec per sec	3.6	kms per hour per sec
meters per sec per sec	2.237	miles per hour per sec
microns	10^{-6}	meters
miles	1.609×10^{5}	centimeters
miles	5280	feet
miles	1.6093	kilometers
miles	1760	yards
miles per hour	44.70	centimeters per mile
miles per hour	88	feet per minute
miles per hour	1.467	feet per second
miles per hour	1.6093	kilometers per hour
miles per hour	0.8684	knots
miles per hour	26.82	meters per minute
miles per hour per sec	44.70	cms per sec per sec
miles per hour per sec	1.467	feet per sec per sec
miles per hour per sec	1.6093	kms per hour per sec
miles per hour per sec	0.4470	M per sec per sec
miles per minute	2682	centimeters per sec
miles per minute	88	feet per second
miles per minute	1.6093	kilometers per minute
miles per minute	60	miles per hour
milligrams	10^{-3}	grams
milliliters	10^{-3}	liters
millimeters	0.1	centimeters
millimeters	0.03937	inches
millimeters	39.37	mils
mils	0.002540	centimeters
mils	0.001	inches
miner's inches	1.5	cubic feet per min
minutes (angle)	60	seconds
months (mean)	30.42	days
months (mean)	730	hours
months (mean)	43,800	minutes
months (mean)	2.628×10^{6}	seconds
ounces (troy or apoth)	8	drams
ounces (avoir)	437.5	grains
ounces (avoir)	28.35	grams
ounces (avoir)	0.0625	pounds
ounces (fluid)	1.805	cubic inches
ounces (fluid)	0.02957	liters
ounces per sq inch	0.0625	pounds per sq inch
pints (liq)	28.87	cubic inches
pounds (avoir)	7000	grains
pounds (avoir)	453.6	grams
pounds (avoir)	16	ounces
pound-feet	1.356×10^{7}	centimeter-dynes
pound-feet	13,825	centimeter-grams
pound-feet	0.1383	meter-kilograms
pounds-feet squared	421.3	kgs-cms squared
pounds-feet squared	144	pounds-in squared
pounds-inches squared	2.926	kgs-cms squared
pounds-inches squared	6.945×10^{-3}	pounds-ft squared
pounds of water	0.01602	cubic feet
pounds of water	27.68	cubic inches
pounds of water	0.1198	gallons
pounds of water per min	2669×10^{-7}	cu ft per sec
pounds per cu ft	0.01602	grams per cu cm
pounds per cu ft	16.02	kgs per cu meter
pounds per cu ft	5.787×10^{-4}	pounds per cu inch
pounds per cu inch	27.68	grams per cu cm
pounds per cu inch	2.768×10^{4}	kgs per cu meter
pounds per cu inch	1728	pounds per cu foot
pounds per foot	1.488	kgs per meter
pounds per inch	178.6	grams per cm
pounds per sq ft	0.01602	feet of water 39.1°F
pounds per sq ft	4.882	kgs per sq meter
pounds per sq ft	6.944×10^{-3}	pounds per sq inch
pounds per sq inch	0.06804	atmospheres
pounds per sq inch	2.307	feet of water 39.1°F
pounds per sq inch	2.036	inches of mercury 32°F
pounds per sq inch	703.1	kgs per sq meter
pounds per sq inch	144	pounds per sq foot
quadrants (angle)	90	degrees
quadrants (angle)	5400	minutes
quarts (liq)	57.75	cubic inches
quintals (metric)	100	kilograms
revolutions	360	degrees
revolutions	4	quadrants
revolutions per min	6	degrees per sec
revolutions per min	0.01667	revolutions per sec

MULTIPLY	BY	TO OBTAIN
revs per min per min	2.778×10^{-4}	revs per sec per sec
revs per min per min	0.01667	revs per min per sec
revolutions per sec	360	degrees per sec
revolutions per sec	60	revs per min
revs per sec per sec	3600	revs per min per min
revs per sec per sec	60	revs per min per sec
rods	16.5	feet
square centimeters	1.973×10^{5}	circular mils
square centimeters	1.076×10^{-3}	square feet
square centimeters	0.1550	square inches
square centimeters	10^{-4}	square meters
square centimeters	100	square millimeters
square feet	2.296×10^{-5}	acres
square feet	929.0	square centimeters
square feet	144	square inches
square feet	0.09290	square meters
square feet	3.587×10^{-8}	square miles
square feet	1/9	square yards
square inches	1.273×10^{6}	circular mils
square inches	6.452	square centimeters
square inches	6.944×10^{-3}	square feet
square inches	10^{6}	square mils
square inches	645.2	square millimeters
square kilometers	247.1	acres
square kilometers	10.76×10^{6}	square feet
square kilometers	10^{6}	square meters
square kilometers	0.3861	square miles
square kilometers	1.196×10^{6}	square yards
square meters	2.471×10^{-4}	acres
square meters	10.764	square feet
square meters	3.861×10^{-7}	square miles
square meters	1.196	square yards
square miles	640	acres
square miles	27.88×10^{6}	square feet
square miles	2.590	square kilometers
square miles	3.098×10^{6}	square yards
square millimeters	1.973×10^{3}	circular mils
square millimeters	0.01	square centimeters
square millimeters	1.550×10^{-3}	square inches
square mils	1.273	circular mils
square mils	6.452×10^{-6}	square centimeters
square mils	10^{-6}	square inches
square yards	2.066×10^{-4}	acres
square yards	9	square feet
square yards	0.8361	square meters
square yards	3.228×10^{-7}	square miles
temp (degs C) +273	1	abs temp (degs K)
temp (degs C) +17.8	1.8	temp (deg F)
temp (degs F) +460	1	abs temp (degs R)
temp (degs F) -32	5/9	temp (degs C)
tons (long)	1016	kilograms
tons (long)	2240	pounds (avoir)
tons (metric)	10^{3}	kilograms
tons (metric)	2205	pounds (avoir)
tons (short)	907.2	kilograms
tons (short)	2000	pounds (avoir)
tons (short) per sq ft	9765	kgs per sq meter
tons (short) per sq ft	13.89	pounds per sq inch
tons (short) per sq in	1.406×10^{6}	kgs per sq meter
tons (short) per sq in	2000	pounds per sq inch
watts	0.05688	Btu per min
watts	1×10^{7}	ergs per second
watts	44.27	foot-pounds per min
watts	0.7378	foot-pounds per sec
watts	1.341×10^{-3}	horsepower
watts	0.01433	kg-calories per min
watts	1×10^{-3}	kilowatts
watt-hours	3.413	British thermal units
watt-hours	2655	foot-pounds
watt-hours	1.341×10^{-3}	horsepower-hours
watt-hours	0.8601	kilogram-calories
watt-hours	367.1	kilogram-meters
watt-hours	1×10^{-3}	kilowatt-hours
weeks	168	hours
weeks	10,080	minutes
weeks	604,800	seconds
yards	91.44	centimeters
yards	3	feet
yards	36	inches
yards	0.9144	meters
years (common)	365	days
years (common)	8760	hours
years (leap)	366	days
years (leap)	8784	hours

SYMBOL	DESCRIPTION	DATE	APPROVAL
	MINOR REVISION	JAN 71	

REVISIONS
GRAPHIC SCALES

MAYES, SEAY, MATTERN & MATTERN
ARCHITECTS - ENGINEERS
ROANOKE, VIRGINIA WASHINGTON, D. C.

DEPARTMENT OF THE ARMY
THE CHIEF OF ENGINEERS
MILITARY CONSTRUCTION - ENGINEERING DIVISION
WASHINGTON, D. C.

DRAWN BY: JOHNSON
TRACED BY: REED
DESIGNED BY: DEICHMANN
SUBMITTED BY: C.W. DEICHMANN
APPROVED: [signature]

THEATER OF OPERATIONS

APPENDIX B

CONVERSION FACTORS

APPROVED: [signature] for H.N. Williams
DATE: 18 MAR 1969
CHIEF, CONSTRUCTURES BRANCH — CHIEF, ENGINEERING DIVISION, MIL. CONSTR., O.C.E.

APPROVED FOR PROPONENT AGENCY:
DATE:
DGMLB.
SPEC. NO.
DRAWING NUMBER
SHEET 1 OF 1

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:
VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:
Active Army, ARNG and USAR: To be distributed in accordance with DA Form 12–9A (qty rqr block no 350), requirements for Construction—B.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1974 O 508-374