

STRUCTURAL DESIGN CRITERIA

ALL DESIGNS SHALL CONFORM TO THE PROVISIONS OF THE IBC 2006 AS APPLICABLE

1.0 DESIGN LOADS

1.1 DEAD LOADS

1.1.1 ROOF DEAD LOADS – CONVENTIONAL FRAMING

	MAXIMUM GRAVITY LOAD	MINIMUM GRAVITY LOAD
LIGHT GAUGE FRAMING	0.20 KPa	0.15 KPa
METAL ROOFING	0.14 KPa	0.05 KPa
INSULATION	0.10 KPa	0.05 KPa
MISC	0.05 KPa	0.00 KPa
	0.49 KPa	0.25 KPa

1.1.2 ROOF DEAD LOADS – CONCRETE FRAMING

	MAXIMUM GRAVITY LOAD
CONC FLAT SLAB	4.80 KPa
MECH/ELEC/PLUMBING	0.15 KPa
MISC	0.05 KPa
	5.00 KPa

1.2 LIVE LOADS (PER IBC 2006)

1.2.1 ROOF LIVE LOADS: ALL BUILDINGS

GREATER OF 1.0 KPa MINIMUM OR SNOW LOAD

1.2.2 SLAB-ON-GRADE LIVE LOADS

ALL BUILDINGS 4.80 KPa

1.3 SNOW LOADS (PER IBC 2006)

1.3.1 DESIGN PARAMETERS

GROUND SNOW LOAD (per UFC 3-310-01)	PER LOCAL CONDITION
SNOW IMPORTANCE FACTOR	1.0 KPa
SNOW EXPOSURE FACTOR	1.0 KPa

1.4 SEISMIC LOADS (PER IBC 2006 & UFC 3-310-04)

1.4.1 SEISMIC PARAMETERS – LOAD BEARING MASONRY

SEISMIC OCCUPANCY CATEGORY	II
SEISMIC IMPORTANCE FACTOR (I)	1.0
SEISMIC SITE CLASS	D
Ss	1.280
S1	0.510
Sds	0.853
Sd1	0.510
SEISMIC DESIGN CATEGORY	D
SEISMIC RESISTING SYSTEM	BEARING WALL SYSTEM
	SPECIAL REINF MASONRY SHEAR WALLS
RESPONSE MODIFICATION FACTOR (R)	5.0
RESPONSE COEFFICIENT (Cs)	0.17
SEISMIC ANALYTICAL PROCEDURE	EQUIV LATERAL FORCE
SEISMIC BASE SHEAR	49 kN

1.6 WIND LOADS (PER IBC 2006)

1.6.1 DESIGN PARAMETERS

BASIC WIND SPEED	137 Km/h
WIND IMPORTANCE FACTOR	1.0
WIND EXPOSURE CATEGORY	D
DIRECTIONALITY COEFFICIENT (Kd)	0.85
TOPOGRAPHIC FACTOR (Kzt)	1.0

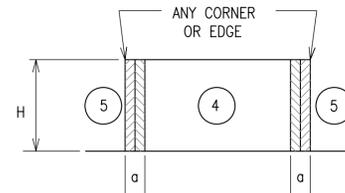
1.6.2 DESIGN WIND PRESSURE – MAIN WINDFORCE RESISTING SYSTEM

LOCATION	CORNER ZONE WIDTH "a"	MEAN ROOF HEIGHT (h)	WINDWARD WALL (@ MEAN ROOF HEIGHT)	LEEWARD WALL (@ MEAN ROOF HEIGHT)	ROOF
FIELD ZONE	N/A	3890mm	582 N/m ²	-463 N/m ²	-803 N/m ²
CORNER ZONE	900mm	3890mm	883 N/m ²	-689 N/m ²	-1244 N/m ²

a = 10% OF LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 0.9M.
h = MEAN ROOF HEIGHT, IN METERS, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR ANGLE GREATER THAN 10°.

1.6.3 DESIGN WIND PRESSURE – WALL COMPONENTS AND CLADDING

EXTERIOR WALL SYSTEMS & THEIR ATTACHMENTS TO THE PRIMARY STRUCTURE SHALL BE DESIGNED FOR THE PRESSURES SHOWN IN THE DIAGRAM BELOW.



LOCATION	WINDWARD PRESSURE N/m ² (inward)		LEEWARD PRESSURE N/m ² (outward)		a
	④	⑤	④	⑤	
MAIN BUILDING					(mm)
AREA = 1 m ²	627	627	-986	-1216	900
AREA = 2 m ²	589	589	-948	-1134.8	900
AREA = 5 m ²	565	565	-910	-1086.9	900
AREA = 10 m ²	565	565	-910	-1086.9	900

NOTES:

- DESIGN WIND PRESSURES ABOVE REPRESENT THE NET PRESSURE (SUM OF INTERNAL AND EXTERNAL PRESSURE) APPLIED NORMAL TO ALL SURFACES.
- LINEAR INTERPOLATION BETWEEN VALUES OF TRIBUTARY AREA IS PERMISSIBLE.
- PLUS AND MINUS SIGNS SIGNIFY PRESSURE TOWARD AND AWAY FROM THE EXTERIOR SURFACE, RESPECTIVELY.

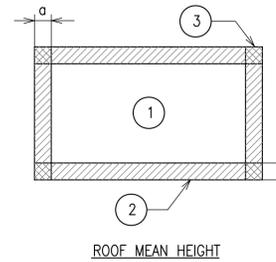
MASONRY CONCRETE LINTEL SCHEDULE

OPENING TYPE OR SIZE, BEAM LOCATION OR TYPE	MAX SPAN (mm)	BEAM DEPTH (mm)	MAIN REINFORCING			SHEAR REINF STIRRUPS
			TOP	BOTTOM	OTHER	
EXT WINDOW OR DOOR	900	400	(2)-#13	(2)-#13		----
INT WALL OPENING, NON-BEARING	1800	400	(2)-#13			----
INT WALL OPENING, NON-BEARING	900	200	(2)-#13			----

- STRUCTURAL DRAWINGS DO NOT INDICATE ALL OPENINGS IN MASONRY WALLS. VERIFY NUMBER, SIZE AND LOCATION OF ALL OPENINGS IN MASONRY WALLS FROM ARCHITECTURAL SHEETS AND APPROVED PLUMBING, MECHANICAL, AND ELECTRICAL SHOP DRAWINGS.
- PROVIDE 200mm BEARING EA END FOR 200mm DEEP CMU LINTEL PROVIDE 400mm BEARING EA END FOR 400mm DEEP CIPL.
- FOR HEAD DETAILS REFER TO ARCHITECTURAL SHEETS.
- REINFORCING SHALL BE ASTM A615M, GRADE 400. CONCRETE FOR CAST-IN-PLACE BEAMS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa AT 28 DAYS.
- CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS AND SCHEDULES SHOWING SIZE, DETAILS, LOCATIONS, ETC FOR ALL CAST-IN-PLACE BEAMS IN CMU WALLS.

1.6.4 DESIGN WIND PRESSURE – ROOF COMPONENTS AND CLADDING

ROOF COMPONENTS & THEIR ATTACHMENTS SHALL BE DESIGNED FOR THE PRESSURES SHOWN IN THE ADJACENT DIAGRAM & TABLE BELOW.



1.6 WIND LOADS (CON'T)

LOCATION	GROSS UPLIFT PRESSURE N/m ² (upward)			a
	①	②	③	
MAIN BUILDING				(mm)
AREA = 1 m ²	-838	-1460	-1460	900
AREA = 2 m ²	-838	-1460	-1460	900
AREA = 5 m ²	-838	-1460	-1460	900
AREA = 10 m ²	-838	-1460	-1460	900

NOTES:

- DESIGN WIND PRESSURES ABOVE REPRESENT THE NET PRESSURE (SUM OF INTERNAL AND EXTERNAL PRESSURE) APPLIED NORMAL TO ALL SURFACES.
- LINEAR INTERPOLATION BETWEEN VALUES OF TRIBUTARY AREA IS PERMISSIBLE.
- PLUS AND MINUS SIGNS SIGNIFY PRESSURE TOWARD AND AWAY FROM THE EXTERIOR SURFACE, RESPECTIVELY.

2.0 FOUNDATION DESIGN CRITERIA (TO BE CONFIRMED BY THE CONTRACTOR)

THE GEOTECHNICAL ANALYSIS FOR THIS PROJECT IS THE RESPONSIBILITY OF THE CONTRACTOR AWARDED THE WORK. DESIGN VALUES USED IN THE STRUCTURAL ANALYSIS OF THE BUILDINGS HEREIN INDICATED HAVE BEEN ASSUMED AND SHALL BE CONFIRMED AND VERIFIED AS PART OF THE GEOTECHNICAL INVESTIGATION. VALUES WHICH DO NOT MEET THE REQUIREMENTS INDICATED BELOW SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER FOR CONSIDERATION AND DETERMINATION ON THE NEXT APPROPRIATE COURSE OF ACTION.

2.1.1 SOIL DESIGN PARAMETERS

NET ALLOWABLE SOIL BEARING CAPACITY	96.0 KPa
UNIT WEIGHT OF SOIL (moist)	1800 Kg/m ³
COEFF ACTIVE EARTH PRESSURE (Kpa)	0.30
COEFF PASSIVE EARTH PRESSURE (Kpp)	3.33
COEFF AT-REST EARTH PRESSURE (Kpr)	.55
COEFF OF SOIL FRICTION	.35
SUBGRADE MODULUS	4120 g/m ³
MINIMUM BEARING DEPTH BELOW GRADE	800mm
SEISMIC SITE CLASS (based on in-situ soil)	D

CONCRETE COVER SCHEDULE

MINIMUM CONCRETE COVER PROTECTION FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS: (SEE ACI 318M-05, SECTION 7.7 FOR CONDITIONS NOT NOTED). DIMENSIONS FOR BAR PLACEMENT GIVEN IN SECTIONS AND DETAILS SHALL SUPERSEDE MINIMUM COVER REQUIREMENTS GIVEN HERE. DIMENSIONS ARE IN mm.

FOOTINGS (EARTH FORMED)	70
COLUMNS / PIERS (TO TIES)	40
GRADE BEAMS OR SLAB TURNED DOWN EDGES:	
TOP	40
BOTTOM (EARTH FORMED)	70
SIDES (EARTH FORMED)	70
SIDES (BOARD FORMED)	40
	#16 BAR & SMALLER
	#19 THRU #36 BAR
ELEVATED BEAMS & SLABS:	
BEAM TIES & STIRRUPS (NOT EXPOSED TO WEATHER)	40
BEAM TIES & STIRRUPS (EXPOSED TO WEATHER)	50
FLOOR SLABS (NOT EXPOSED TO WEATHER)	20
FLOOR SLABS (EXPOSED TO WEATHER)	
#19 & LARGER	50
#13 & SMALLER	40
ROOF SLAB BARS	25
SLABS-ON-GRADE (NO EXPOSURE TO WEATHER) FROM TOP	20
SLABS-ON-GRADE (EXPOSURE TO WEATHER) FROM TOP	40
UTILITY TUNNEL WALLS, RETAINING WALLS AND SHEAR WALLS, (NO SURFACES SHALL BE EARTH FORMED)	
EARTH SIDE AND FRONT SIDE (EXPOSED TO WEATHER):	
#16 BAR AND SMALLER	40
#19 THRU #36 BAR	50
PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED.	

US Army Corps of Engineers
Afghanistan Engineer District

DATE	DESCRIPTION	SYMBOL

DESIGNED BY:	DATE:	09-30-09
GDH	SUBMITTED BY:	BAKER
MOB	FILE NO.:	ANFSDS-002XXX
CWW		

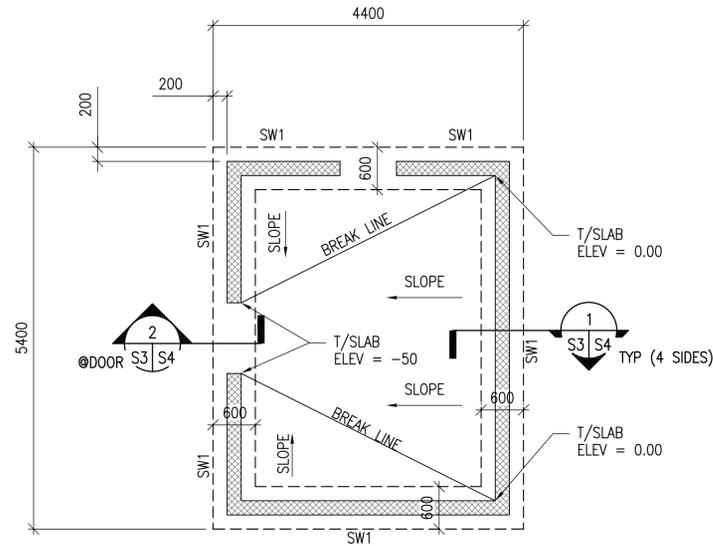
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AFGHAN NATIONAL POLICE
STANDARD DESIGN
WELL HOUSE
DESIGN CRITERIA & SCHEDULES

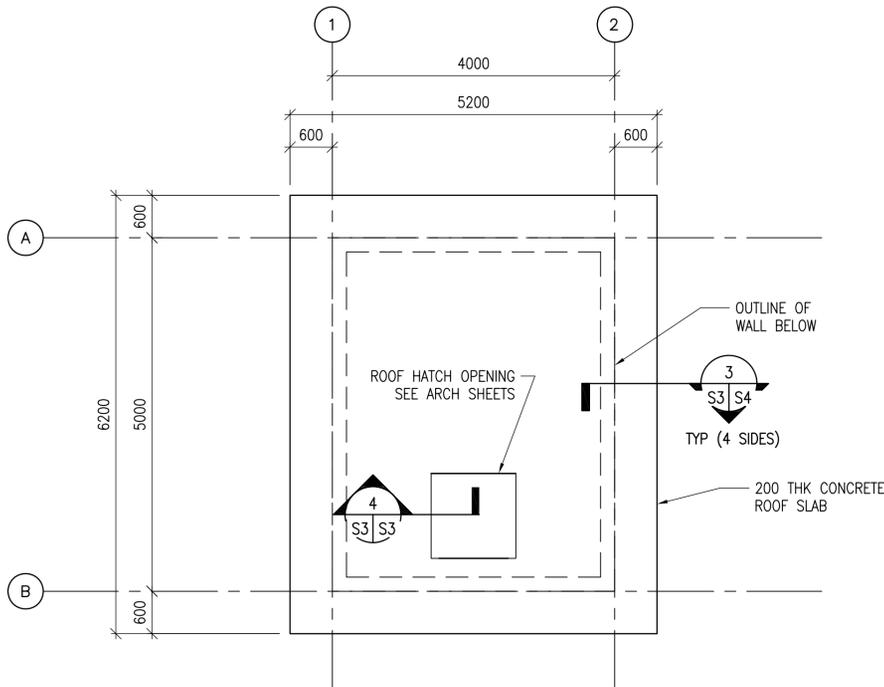
SHEET REFERENCE NUMBER:
S2

A B C D E F G H

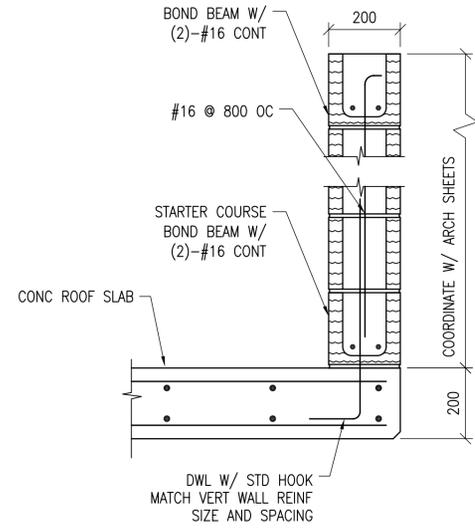
6
5
4
3
2
1



1 WELL HOUSE FOUNDATION PLAN
SCALE: 1:50



2 WELL HOUSE ROOF FRAMING PLAN
SCALE: 1:50



4 SECTION
SCALE: 1:10

- NOTES:**
1. FINISH FIRST FLOOR ELEVATION SHALL BE (DATUM 0.0) ALL PLUS OR MINUS DIMENSIONS INDICATED ON PLAN OR REFERRED TO IN NOTES RELATE TO FINISH FIRST FLOOR ELEVATION.
 2. TOP OF EXTERIOR FOOTINGS SHALL BE -600 UNLESS OTHERWISE INDICATED.
 3. UNLESS OTHERWISE INDICATED, FLOORS SHALL BE 150 THICK CONCRETE SLAB-ON-GRADE W/ 13 DIA REBAR @ 450 OC E.W. (38 CLR. TOP)
 4. REFER TO SHEET S1 AND S2 FOR STRUCTURAL NOTES, ABBREVIATIONS AND SYMBOLS.
 5. REFER TO ARCHITECTURAL SHEETS FOR MASONRY PARTITION TYPES AND SHEET S5 REINFORCEMENT.
 6. SEE MECHANICAL AND ELECTRICAL SHEETS FOR CONCRETE PAD LOCATIONS, SIZES, AND THICKNESS NOT SHOWN. SEE SHEET S5 FOR DETAILS.
 7. ——— INDICATES SLOPE IN SLAB ON GRADE. COORDINATE LOCATION AND ELEVATION WITH ARCHITECTURAL AND PLUMBING SHEETS (TYP).
 8. COORD W/ ARCHITECTURAL SHEETS FOR COLD-FORMED STEEL OVERBUILT FRAMING ABOVE ROOF SLAB.
 9. COLD-FORMED METAL OVERBUILT ROOF FRAMING NOT SHOWN FOR CLARITY. SEE OVERBUILT ROOF FRAMING DETAILS AND SECTIONS ON SHEET S4.

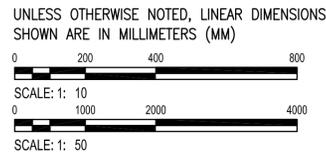
US Army Corps of Engineers
Afghanistan Engineer District

SYMBOL	DESCRIPTION	DATE	APP

DESIGNED BY: GDH	DATE: 09-30-09
DWN BY: MDB	SUBMITTED BY: BAKER
CHK BY: CWV	FILE NO: ANFSDS-103XXX

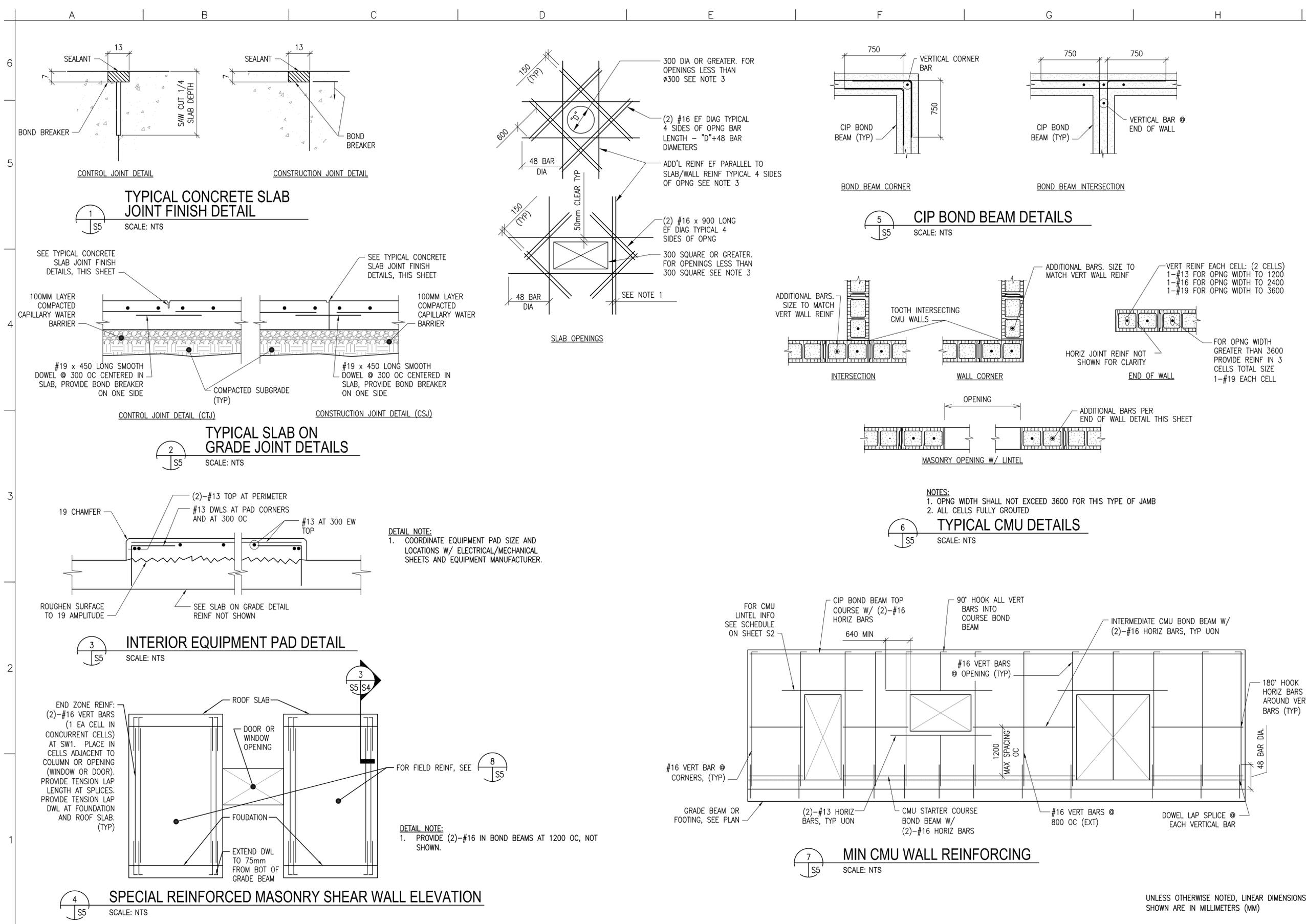
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AFGHAN NATIONAL POLICE
STANDARD DESIGN
WELL HOUSE
FOUNDATION & ROOF FRAMING PLANS



SHEET REFERENCE NUMBER:
S3

100% SUBMISSION



DATE	DESCRIPTION	SYMBOL
APR		

DESIGNED BY: GDH	DATE: 09-30-09
DWN BY: RCG	SUBMITTED BY: BAKER
CHK BY: CWV	FILE NO: ANPSDS-505XXX

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AFGHAN NATIONAL POLICE
STANDARD DESIGN
WELL HOUSE

TYPICAL DETAILS

SHEET REFERENCE NUMBER:
S5

100% SUBMISSION

SYMBOL	DESCRIPTION	DATE

DESIGNED BY:	BAKER	DATE:	09-30-09
DWN BY:	BAKER	SUBMITTED BY:	BAKER
CHK BY:	GPH	FILE NO.:	ANPSDP-501XXX

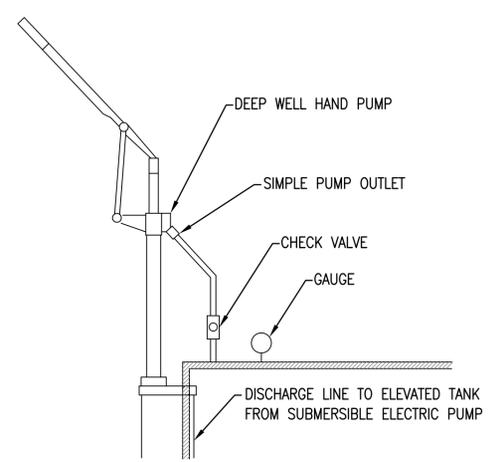
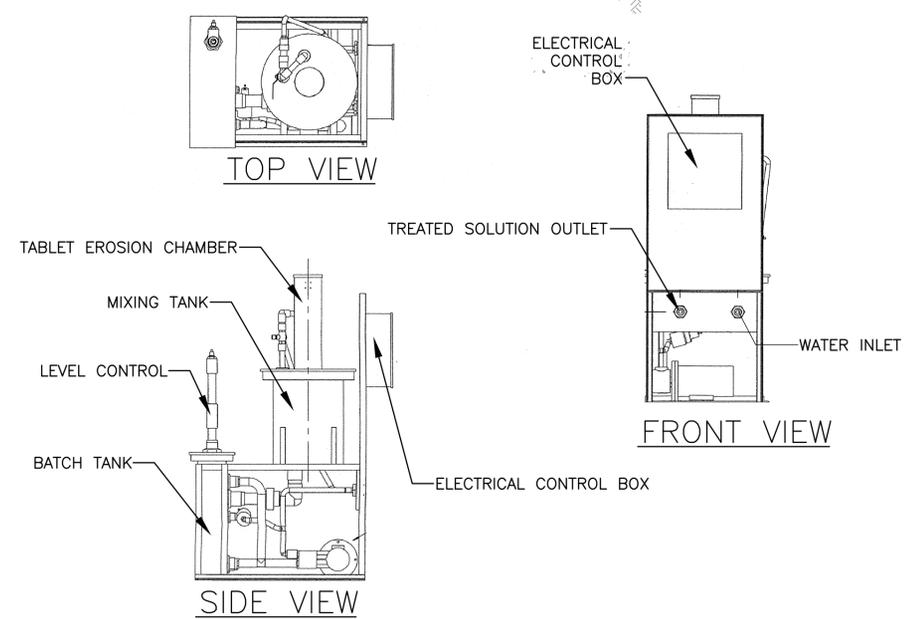
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WELL HOUSE
PLUMBING SCHEMATIC AND DETAILS

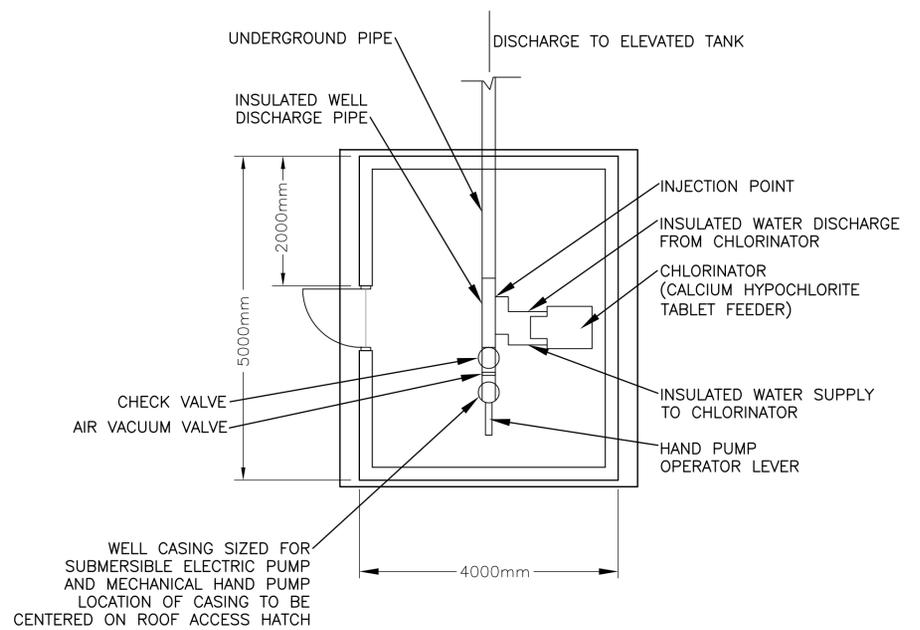
SHEET REFERENCE NUMBER:
P1

A B C D E F G H

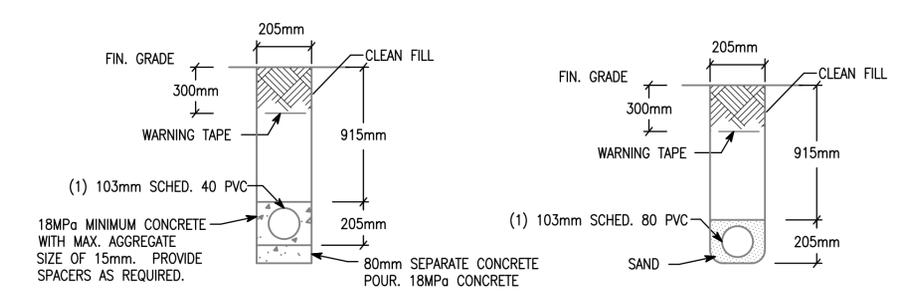
6
5
4
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2
1



HAND PUMP
INSTALLATION DETAIL
N.T.S.

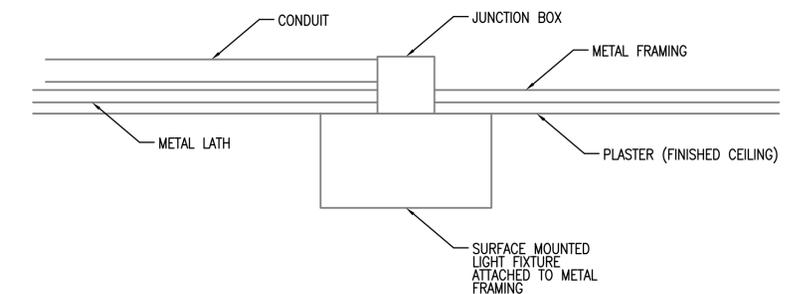


WELL HOUSE
PLUMBING SCHEMATIC
N.T.S.

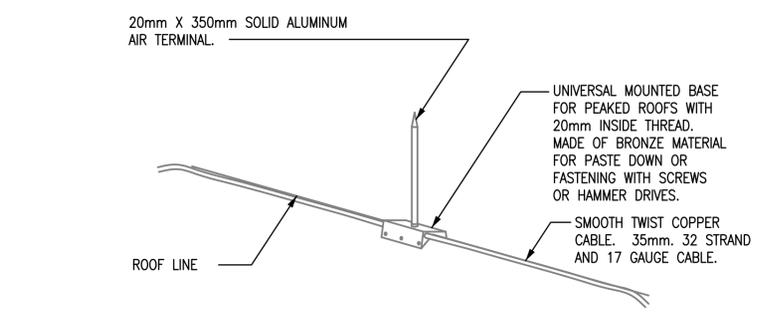


NOTE: PVC CONDUIT SHALL BE DIRECT BURIED SCHEDULE 80 FOR NO TRAFFIC AREAS AND CONCRETE-ENCASED SCHEDULE 40 FOR UNDER ROADWAYS OR TRAFFIC AREAS.

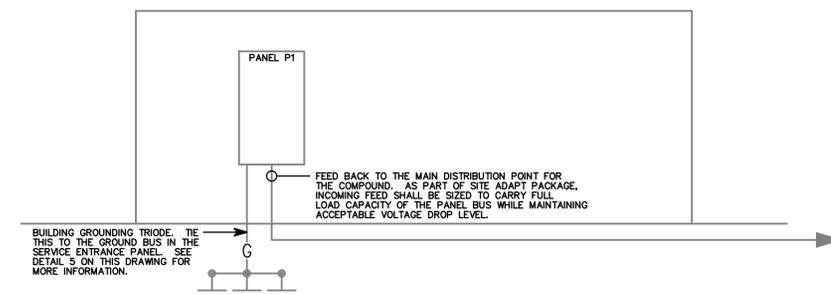
1
E2 E2
TYPICAL DUCT BANK DETAILS FOR CONDUIT IN SAND OR CONCRETE
SCALE: N.T.S.



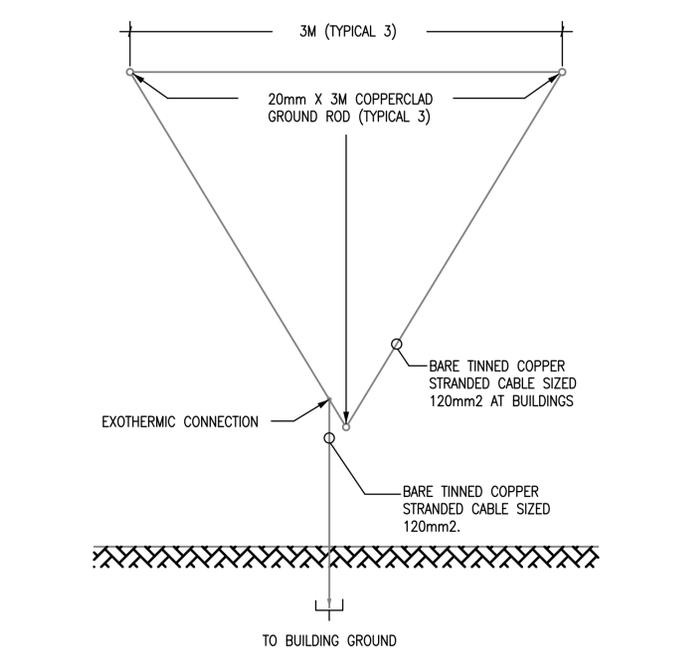
2
E2 E2
TYPICAL DETAIL FOR SURFACE MOUNTED LIGHT FIXTURES
SCALE: N.T.S.



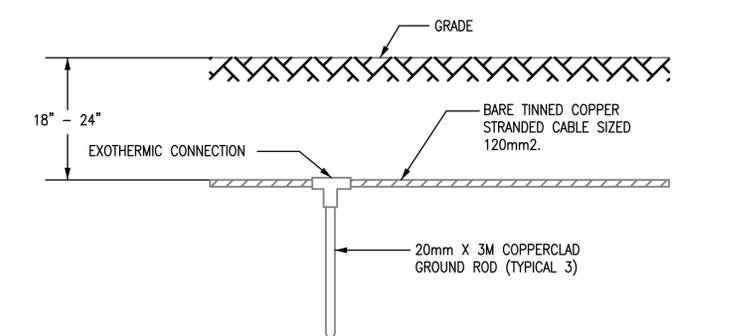
3
E2 E2
LIGHTNING PROTECTION AIR TERMINAL DETAIL
SCALE: N.T.S.



4
E2 E2
WELLHOUSE RISER DIAGRAM
SCALE: N.T.S.



5
E2 E2
GROUND TRIPOD SYSTEM DETAIL - PLAN
SCALE: N.T.S.



6
E2 E2
GROUND TRIPOD SYSTEM DETAIL - ELEVATION
SCALE: N.T.S.

US Army Corps of Engineers
Afghanistan Engineer District

SYMBOL	DESCRIPTION	DATE

DESIGNED BY: JRG	DATE: 09-30-09
DWN BY: JRG	SUBMITTED BY: BAKER
CHK BY: JRG	FILE NO: ANPSDE-502XXX

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STANDARD DESIGN
WELL HOUSE
DETAILS

SHEET REFERENCE NUMBER:
E2

100% SUBMISSION

A

B

C

D

E

F

G

H

6

5

4

3

2

1

05a

20 METER WATER TOWER



U.S. Army Corps
OF Engineers

AFGHANISTAN ENGINEER DISTRICT
AFGHANISTAN, APO AE, 09356

17 DECEMBER 2009

GENERAL:

- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AFFECTING THE WORK AT JOBSITE.
- ALL STRUCTURAL WORK AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF THE PROJECT.
- FOR LOCATION AND DIMENSIONS OF GROOVES, REGLETS, SLEEVES, OPENINGS, AND EMBEDDED OR ATTACHED ITEMS, REFER TO ELECTRICAL, AND PIPING DRAWINGS.

CODES:

- ALL PARTS SHALL BE FURNISHED AND ERECTED ACCORDING TO THE LATEST VERSION OF THE APPLICABLE CODES OF THE FOLLOWING:

AMERICAN CONCRETE INSTITUTE	(ACI)
AMERICAN INSTITUTE OF STEEL CONSTRUCTION	(AISC)
AMERICAN IRON AND STEEL INSTITUTE	(AISI)
AMERICAN WATER WORKS ASSOCIATION	(AWWA)

- ALL PARTS SHALL BE FURNISHED AND ERECTED ACCORDING TO THE APPLICABLE CODES OF THE FOLLOWING:

MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES	(ASCE 7-05)
INTERNATIONAL BUILDING CODE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE	(IBC-2006)
SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS	(ACI 318-08)
	(AISC 13TH EDITION)

DESIGN LOADS:

- ROOF LOADING

- LIVE LOAD 195 KG/SQ METER (40 PSF)
- SNOW LOAD 75 KG/SQ METER (15 PSF)
- COLLATERAL LOAD 50 KG/SQ METER (10 PSF)

- WIND LOADING

- BASIC WIND SPEED 135 KM/HR (85 MPH)
- EXPOSURE CATEGORY "B"
- IMPORTANCE FACTOR, $I_w = 1.00$
- BUILDING CATEGORY "II"

- SEISMIC LOADING:

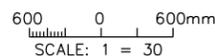
- $S_s = 1.28g$
- $S_1 = 0.51g$
- SEISMIC USE GROUP "I"
- SITE CLASSIFICATION "D"
- IMPORTANCE FACTOR $I = 1.0$

BASIC SEISMIC FORCE RESISTING SYSTEM:

CROSS-BRACED COLUMN-SUPPORTED ELEVATED TANK DESIGN BASE SHEAR: 0.284W

ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE METHOD

- THE WATER TOWER IS DESIGNED TO SUPPORT A 26,500 LITER (7,000 GALLON) WATER TANK, UNIFORMLY LOADING THE PLATFORM IN A BALANCED CONFIGURATION. SEE SHEET S-3 FOR TANK LIMITS.



UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.

FOUNDATIONS:

- ALL FOOTINGS SHALL BEAR ON SOIL CAPABLE OF SUSTAINING THE LOADS. GEOTECHNICAL INVESTIGATIONS TO VERIFY THIS REQUIREMENT ARE CONTAINED IN THE AED DESIGN GUIDE - GEOTECHNICAL INVESTIGATIONS (LATEST VERSION). ALL REQUIREMENTS OF THIS PUBLICATION SHALL BE FOLLOWED, WITH EMPHASIS ON PARAGRAPH 2.2, DEPTH, LOCATION, SPACINT OF EXPLORATION.
- FOUNDATION DESIGNED FOR A MAXIMUM BEARING CAPACITY OF 7323 KG/SQ. METER (1500 PSF).
- ELEVATIONS SHOWN ON PLANS FOR TOP OF FOOTINGS ARE MINIMUM DEPTH. BOTTOM OF FOOTING SHALL BE A MINIMUM 800mm BELOW GRADE. DIFFERENT OR UNUSUAL CONDITIONS SHALL BE REPORTED TO THE CONTRACTING OFFICER.
- ALL FOOTING REINFORCEMENT SHALL BE SECURELY SUPPORTED ABOVE GROUND. SUPPORT REINFORCEMENT WITH CONCRETE BRICK OR WITH ADEQUATE NUMBER AND SIZE OF REBAR CHAIRS.
- ALL FOUNDATION FORMWORK SHALL BE ADEQUATELY PREPARED FOR CONCRETE PLACEMENT; SUFFICIENTLY BRACED; PROPER ELEVATIONS AND ALIGNMENT; NO STANDING WATER OR DEBRIS; ETC.

CONCRETE:

- STRUCTURAL CONCRETE FOR THE BUILDING STRUCTURE SHALL HAVE THE FOLLOWING PROPERTIES:

ALL CONCRETE

UNLESS NOTED OTHERWISE: $f'c = 280$ KG/SQ. CM (4,000 PSI) AT 28 DAYS WITH MAXIMUM WATER/CEMENT RATIO OF 0.45. MIX DESIGN SHALL BE APPROVED BY COR PRIOR TO PLACEMENT.

- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60 UNLESS NOTED OTHERWISE.

- MINIMUM PROTECTIVE COVER OF REINFORCEMENT (SEE DETAILS) SHALL BE AS FOLLOWS:

FOOTINGS, 75mm CLEAR BOTTOM AND SIDES, 40mm CLEAR TOP.
CONCRETE PIERS, 40mm CLEAR TO TIES.

- MINIMUM CONCRETE SPLICES AND HOOKS FOR REINFORCING STEEL SHALL CONFORM TO ACI 318, CURRENT EDITION.

- CONCRETE WORK SHALL BE COORDINATED WITH DRAINS, UNDERGROUND UTILITIES, MECHANICAL, ELECTRICAL, AND ARCHITECTURAL PLANS. CONCRETE SHALL NOT BE CAST UNTIL THESE ITEMS HAVE BEEN INSTALLED AND ACCEPTED.

- CONCRETE OPERATIONS SHALL BE APPROVED BY COR PRIOR TO CONCRETE PLACEMENT. PLAN SHALL BE IN WRITING AND INCLUDE THE FOLLOWING:

- PORTLAND CEMENT CONCRETE (PCC) PLACEMENT.
- EMBEDDED METALS PLAN SHALL DESCRIBE HOW REINFORCEMENT AND TOWER LEG ANCHORAGE PLATES WILL BE INSTALLED. SPECIFIC DISCUSSION OF ANCHORAGE PLATES SHALL INCLUDE HOW THESE CRITICAL COMPONENTS WILL BE ACCURATELY LOCATED AND SECURED FOR TRUE PLAN, ELEVATION AND VERTICAL POSITION, WITH NO ROTATION, PRIOR TO, DURING AND AFTER CONCRETING OPERATIONS. THE FOUR CORNERS SHALL BE LAID OUT TO BE DIMENSIONALLY SQUARE AS PER DRAWINGS.
- PLAN SHALL ADDRESS CONCRETE DELIVERY (BATCHING EQUIPMENT, CAPACITY AND LOCATION); CONCRETE PLACEMENT OPERATIONS INTO THE FORMWORK; NUMBER AND USE OF VIBRATORS; FIELD AND LABORATORY TESTING REQUIRED; HOT OR COLD WEATHER PLACEMENT REQUIREMENTS; MANPOWER REQUIRED; AND OTHER PROCEDURES TO BE FOLLOWED TO COMPLETE SUCCESSFUL CONCRETING OPERATIONS. SUFFICIENT CONCRETE DELIVERY SHALL BE SHOWN TO ELIMINATE THE POTENTIAL FOR CONCRETE DEFECTS IN THE FINAL PRODUCT, INCLUDING COLD JOINTS, VOIDS, SEGREGATION OF AGGREGATE, AND EXCESSIVE REWORK LEADING TO STRENGTH REDUCTION.

STRUCTURAL STEEL:

- STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", 2005 (AISC MANUAL, 13TH EDITION).
- STEEL SHALL CONFORM TO THE FOLLOWING REQUIREMENTS UNLESS NOTED OTHERWISE:

MISCELLANEOUS PLATES AND ANGLES - ASTM A36 250MPa ($F_y = 36$ KSI)
"W" SHAPES - ASTM A36 250MPa ($F_y = 36$ KSI)
- NO STRUCTURAL STEEL SHALL BE FABRICATED OR ERECTED UNTIL SHOP DRAWINGS HAVE BEEN APPROVED.
- NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. FIELD CUTTING OF STEEL SHALL NOT BE PERMITTED WITHOUT APPROVAL OF THE CONTRACTING OFFICER.

- THE CONTRACTOR SHALL VERIFY ALL SHOP DRAWING DIMENSIONS WITH THE STRUCTURAL PLANS AND DETAILS, AND WITH DIMENSIONS OF COLUMN LAYOUT.

- BOLTED CONNECTIONS: BOLTS SHALL CONFORM TO ASTM A307, 20MM DIAMETER MINIMUM UNLESS NOTED OTHERWISE AND HOT-DIP GALVANIZED; NUTS SHALL CONFORM TO ASTM A563 HOT DIP GALVANIZED; WASHERS SHALL NOT BE USED.

- BOLTS SHALL BE TIGHTENED TO ADEQUATELY DEVELOP BOLT TENSION.

FABRICATION NOTES

- THE CONTRACTOR SHALL SUBMIT A SEPARATE, SPECIFIC ERECTION AND SAFETY PLAN ADDRESSING ALL FACETS OF TOWER CONSTRUCTION.

- THIS SET OF DRAWINGS WAS DEVELOPED AS A SOLUTION TO MEET AED REQUIREMENTS FOR THE CONSTRUCTION OF WATER TOWERS THAT MEET U.S. STANDARDS FOR DESIGN, TO INCLUDE SEISMIC CRITERIA, USING MATERIALS AND CONSTRUCTION METHODS THAT REDUCE OR ELIMINATE THE NEED FOR LARGE CRANES THAT MAY NOT BE ABLE TO ACCESS PROJECT SITES, AND ENABLE EASE OF CONSTRUCTION QUALITY CONTROL. WATER TOWER HAS BEEN DESIGNED TO SUPPORT A PRE-FABRICATED WATER TANK.

- ALL ANGLES, BEAMS AND PLATES ARE TO BE FABRICATED IN A SHOP WHERE THE STRICTEST TOLERANCES FOR FABRICATION (MEMBER LENGTHS, LOCATION AND SIZE OF BOLT HOLES) CAN BE MAINTAINED. THESE COMPONENTS WOULD THEN BE TRANSPORTED TO PROJECT SITES AND ERECTED WITHOUT THE USE OF HEAVY EQUIPMENT AS THE MAXIMUM WEIGHT PER PIECE IS UNDER 90 KG. THIS DESIGN SHALL NOT BE MODIFIED, IN EITHER THE FABRICATION SHOP OR AT THE PROJECT SITE. UNDER NO CONDITIONS SHALL BOLT HOLES BE MODIFIED OR ADDED AT THE PROJECT SITE AS A RESULT OF INACCURATE CONSTRUCTION PRACTICES. CONTRACTOR SHALL ASSEMBLE PLATFORM IN SHOP, POSITION STEEL CHECKER PLATE SECTIONS IN FINAL LOCATION, AND DRILL HOLES IN PLATE TO ALIGH WITH FLANGES OF STRUCTURAL MEMBERS (SEE FUTHER NOTES ON S-3). LIMITED FIELD DRILLING OF HOLES FOR WATER TANK ERECTION MAY BE REQUIRED AND WILL BE SUBMITTED FOR APPROVAL.

- IF THE CONTRACTOR CANNOT OBTAIN THE REQUIRED ANGLE, BEAM, OR PLATES, ANY MODIFICATIONS OR SUBSTITUTIONS WILL REQUIRE A SUBMISSION OF COMPLETE ALTERNATE FABRICATION DRAWINGS FOR REVIEW AND APPROVAL, AND ONLY INCREASES IN MEMBER SIZE WILL BE CONSIDERED.

- WELDING WILL ABSOLUTELY NOT BE ALLOWED ON THIS TOWER.

- FABRICATION SHALL BE DONE IN A SHOP WITH TOLERANCES PER AISC MANUAL OF STEEL CONSTRUCTION AND ALL ADDITIONAL CODES REFERENCED THERE IN. CONTRACTOR SHALL ESTABLISH A SYSTEM OF MARKING MEMBERS TO FACILITATE ASSEMBLY IN THE FIELD.

- STEEL FINISH REQUIREMENTS SHALL INCLUDE REMOVAL OF ALL SCALE AND RUST PRIOR TO APPLICATION OF A BASE COAT PRIMER ON ALL METAL SURFACES. THIS WILL BE FOLLOWED BY TWO FINISH COATS OF EPOXY ENAMEL PAINT. IF AVAILABLE, HOT-DIP GALVANIZING OF TOWER ELEMENTS IS ACCEPTABLE, BUT GALVANIZED BOLTS AND NUTS MUST THEN BE PROVIDED, AND CARE MUST BE TAKEN TO PREVENT DAMAGING THE SURFACE FINISH.

- TO AID IN MEANS OF CONSTRUCTION, THE 2L100x100 HANDRAIL PIECE HAS BEEN DESIGNED FOR A LOAD OF 250KG AT MIDSPAN. THE CONTRACTOR MAY USE THIS PIECE IN A PULLEY MECHANISM TO RAISE THE PLATFORM FRAMING TO THE REQUIRED ELEVATION. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR MEANS OF CONSTRUCTION AND SHALL NOT HOLD THE GOVERNMENT LIABLE.

- FIT-UP FOR DIMENSIONAL CHECK SHALL BE MADE BY THE CONTRACTOR.

WATER TANK

- WATER TOWER HAS BEEN DESIGNED TO ACCEPT A PRE-FABRICATED WATER TANK. ONLY METAL TANKS SHALL BE PERMITTED. FULL DETAILS OF THE PROPOSED TANK SHALL BE SUBMITTED FOR APPROVAL.

- A PARTIAL LIST OF WTER TANK SUPPLIERS:

[http://www.alibaba.com/product-free/100696118/Panel Water tank.html](http://www.alibaba.com/product-free/100696118/Panel%20Water%20tank.html)

<http://www.alibaba.com/product/my100479764-100277497-0/prodductdetail.html>

<http://www.modutank.com/>

<http://www.binasteel.com.my/stainless-steel-tank.html>

<http://www.sunnik.com.my/products01.htm>

<http://www.watertank.com/products.asp#elntank>

- CONTRACTOR SHALL COORDINATE WATER TANK CONNECTIONS WITH SHOP FABRICATOR.



Symbol No	Description	Date	Approved

Designed By:	Date:	Contract No:	CAD CODE:	Revision Number:	FILENAME:
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MOBILE, ALABAMA	17 DECEMBER 2009		M010TG17		
Drawn By:	Checked By:	Reviewed By:	SIZE:	559x864mm	

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
GENERAL NOTES

SHEET IDENTIFICATION
S-1



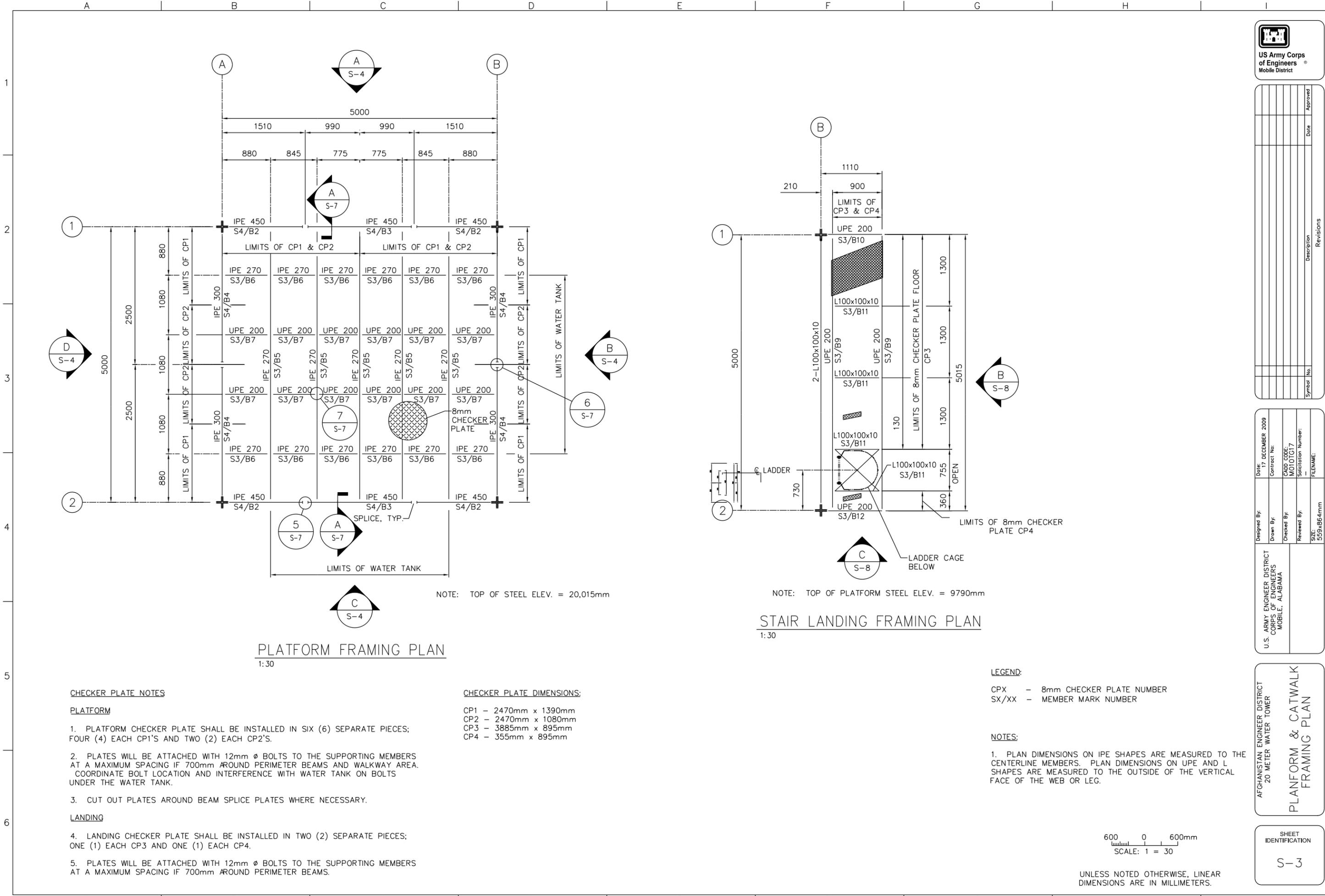
US Army Corps of Engineers
Mobile District

Symbol No	Description	Date	Approved

Designed By:	Date:	17 DECEMBER 2009
Drawn By:	Contract No:	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
	FILENAME:	

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
PLANFORM & CATWALK
FRAMING PLAN

SHEET IDENTIFICATION
S-3



NOTE: TOP OF STEEL ELEV. = 20,015mm

NOTE: TOP OF PLATFORM STEEL ELEV. = 9790mm

PLATFORM FRAMING PLAN
1:30

STAIR LANDING FRAMING PLAN
1:30

CHECKER PLATE NOTES

PLATFORM

1. PLATFORM CHECKER PLATE SHALL BE INSTALLED IN SIX (6) SEPARATE PIECES; FOUR (4) EACH CP1'S AND TWO (2) EACH CP2'S.
2. PLATES WILL BE ATTACHED WITH 12mm Ø BOLTS TO THE SUPPORTING MEMBERS AT A MAXIMUM SPACING IF 700mm AROUND PERIMETER BEAMS AND WALKWAY AREA. COORDINATE BOLT LOCATION AND INTERFERENCE WITH WATER TANK ON BOLTS UNDER THE WATER TANK.
3. CUT OUT PLATES AROUND BEAM SPLICE PLATES WHERE NECESSARY.

LANDING

4. LANDING CHECKER PLATE SHALL BE INSTALLED IN TWO (2) SEPARATE PIECES; ONE (1) EACH CP3 AND ONE (1) EACH CP4.
5. PLATES WILL BE ATTACHED WITH 12mm Ø BOLTS TO THE SUPPORTING MEMBERS AT A MAXIMUM SPACING IF 700mm AROUND PERIMETER BEAMS.

CHECKER PLATE DIMENSIONS:

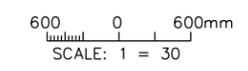
- CP1 - 2470mm x 1390mm
- CP2 - 2470mm x 1080mm
- CP3 - 3885mm x 895mm
- CP4 - 355mm x 895mm

LEGEND:

- CPX - 8mm CHECKER PLATE NUMBER
- SX/XX - MEMBER MARK NUMBER

NOTES:

1. PLAN DIMENSIONS ON IPE SHAPES ARE MEASURED TO THE CENTERLINE MEMBERS. PLAN DIMENSIONS ON UPE AND L SHAPES ARE MEASURED TO THE OUTSIDE OF THE VERTICAL FACE OF THE WEB OR LEG.



UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



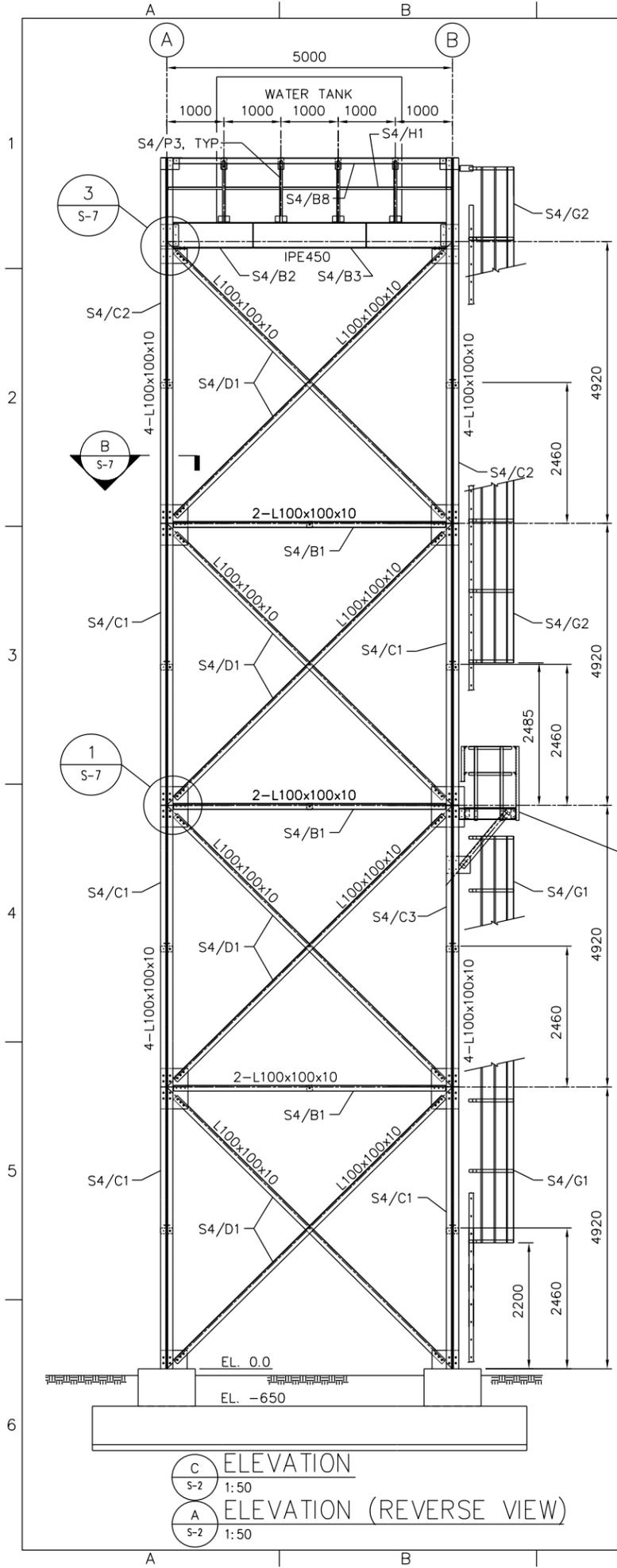
US Army Corps
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Mobile District

Symbol No.	Description	Date	Approved

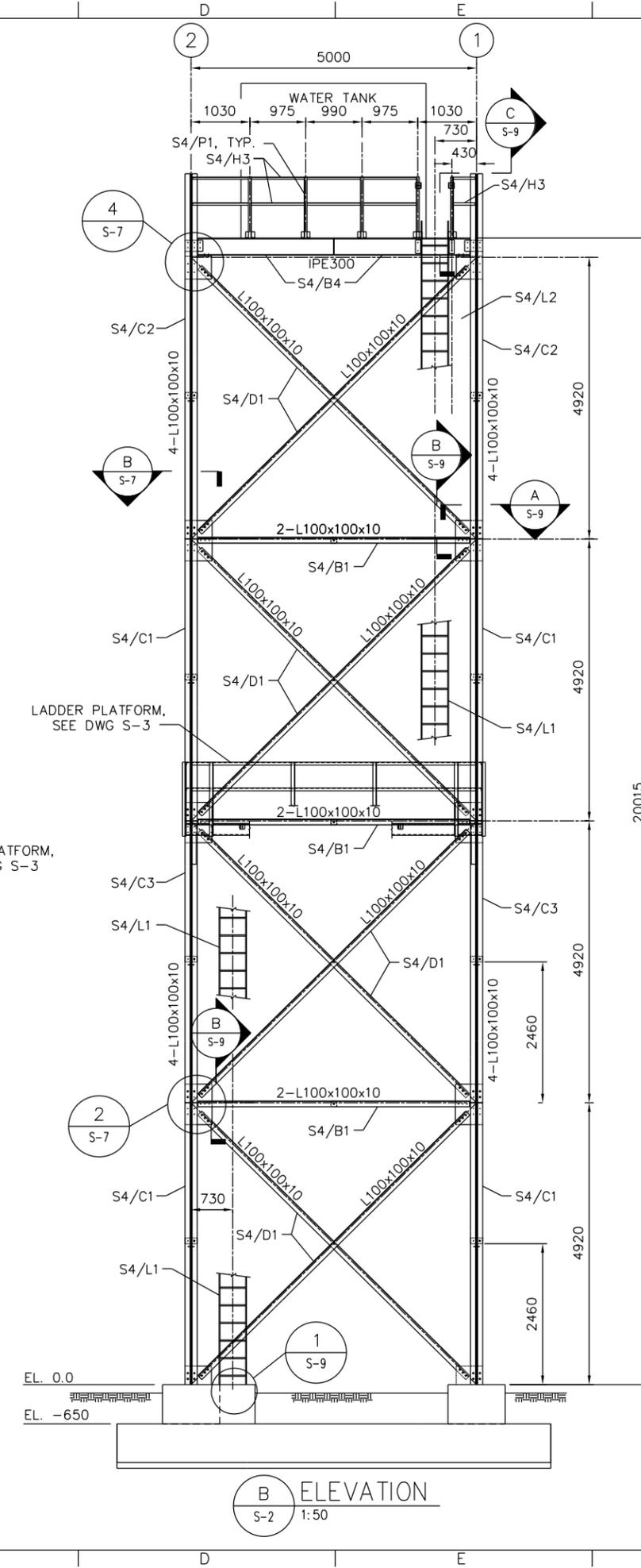
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Checked By:	CADD CODE: M010TC17
Reviewed By:	Solicitation Number:
SIZE: 559x864mm	FILENAME:

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MOBILE, ALABAMA

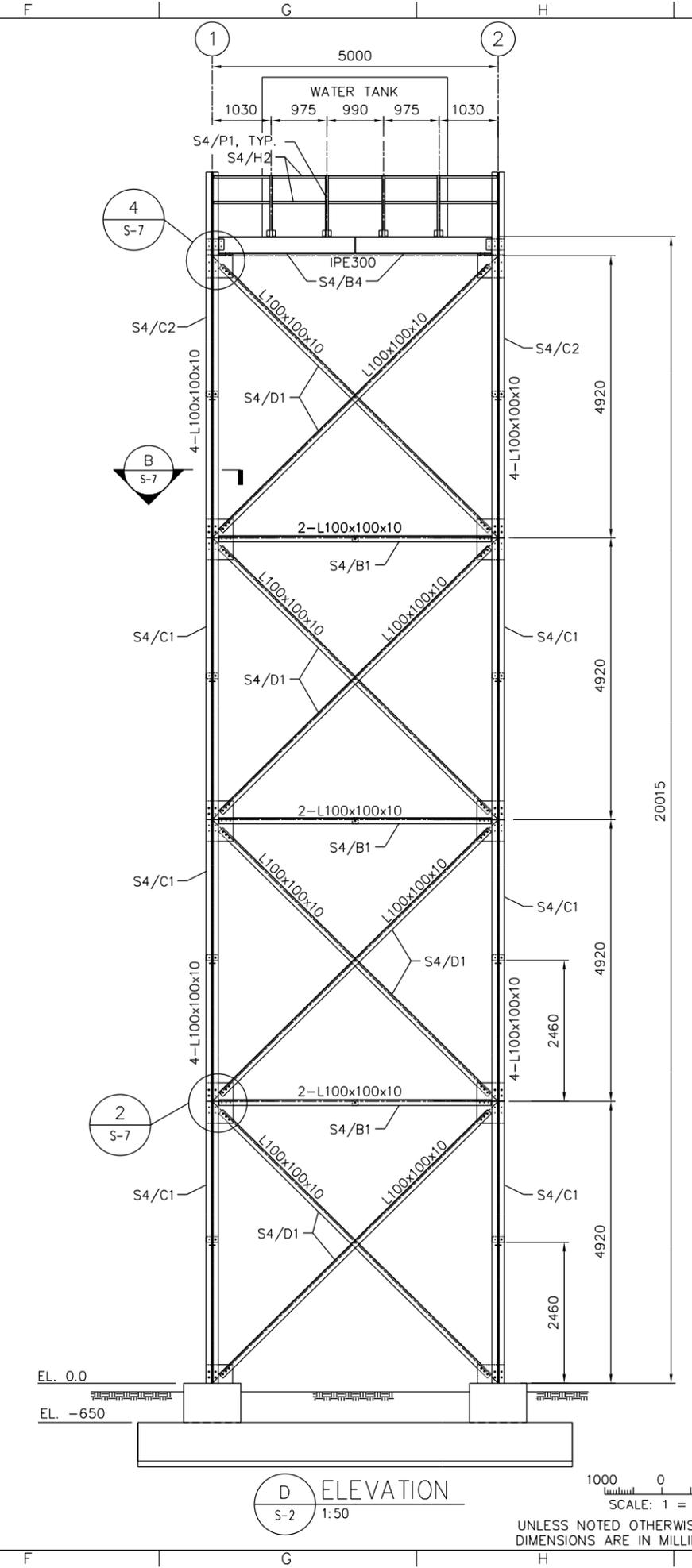
SHEET IDENTIFICATION
S-4



A ELEVATION (REVERSE VIEW)
S-2 1:50



B ELEVATION
S-2 1:50



D ELEVATION
S-2 1:50

1000 0 1000mm
SCALE: 1 = 50

UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



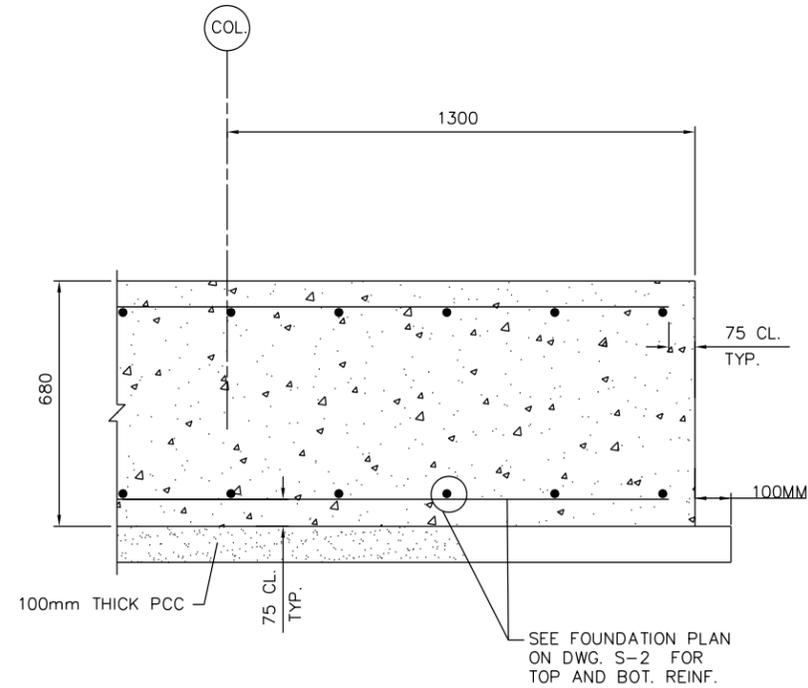
US Army Corps of Engineers
Mobile District

Symbol No.	Description	Date	Approved

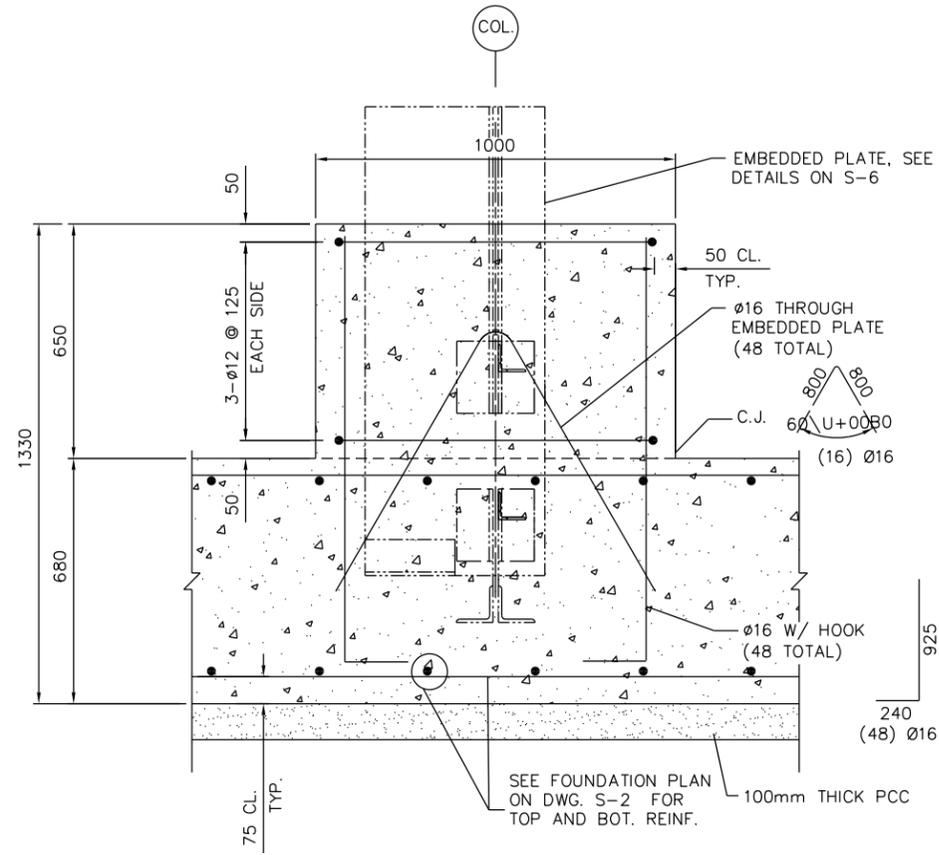
Designed By:	Date:
Drawn By:	17 DECEMBER, 2009
Checked By:	Contract No:
Reviewed By:	CADD CODE:
SIZE:	MO10TG17
559x864mm	Solicitation Number:
	FILENAME:

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
FOUNDATION SECTIONS

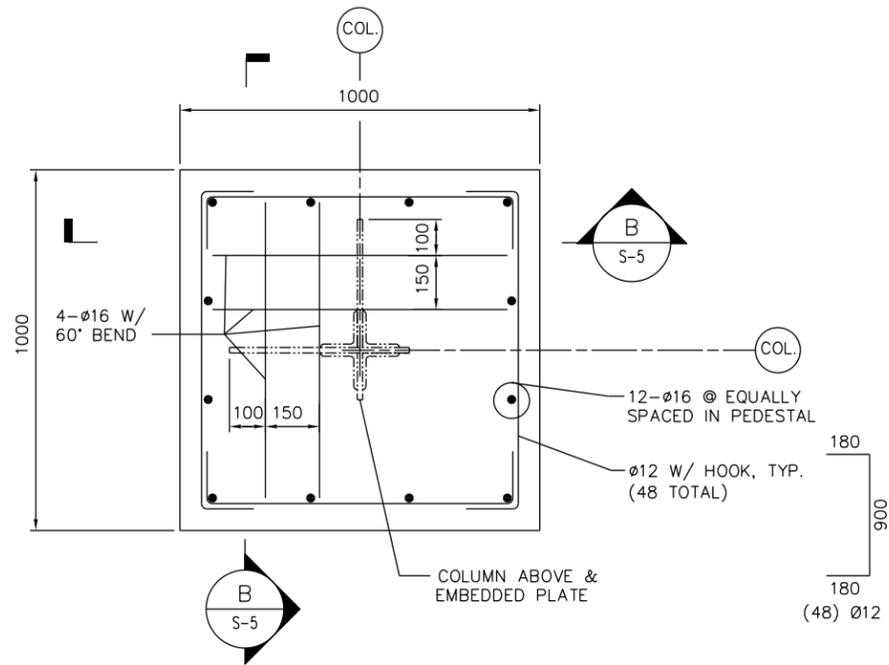
SHEET IDENTIFICATION
S-5



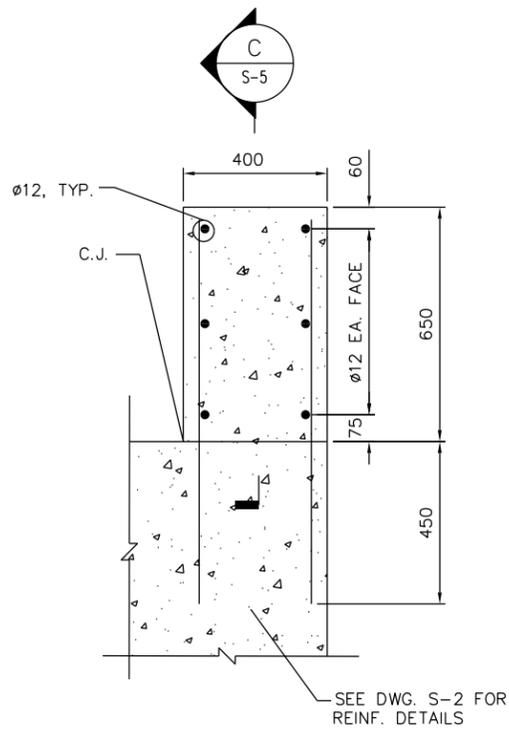
SECTION A
1:10
S-2



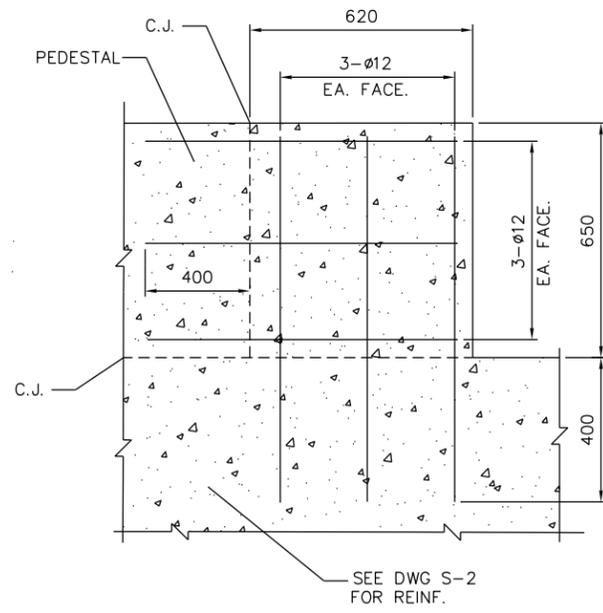
SECTION B
1:10
S-2
S-5



DETAIL 1
1:10
S-2

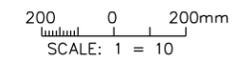


DETAIL 2
1:10
S-2



SECTION C
1:10
S-5

NOTE: SEPARATE CONCRETE PLACEMENT. SEE DETAIL 1 ON DRAWING S-9 FOR ANCHOR BOLT REQUIREMENTS.



UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.

A B C D E F G H

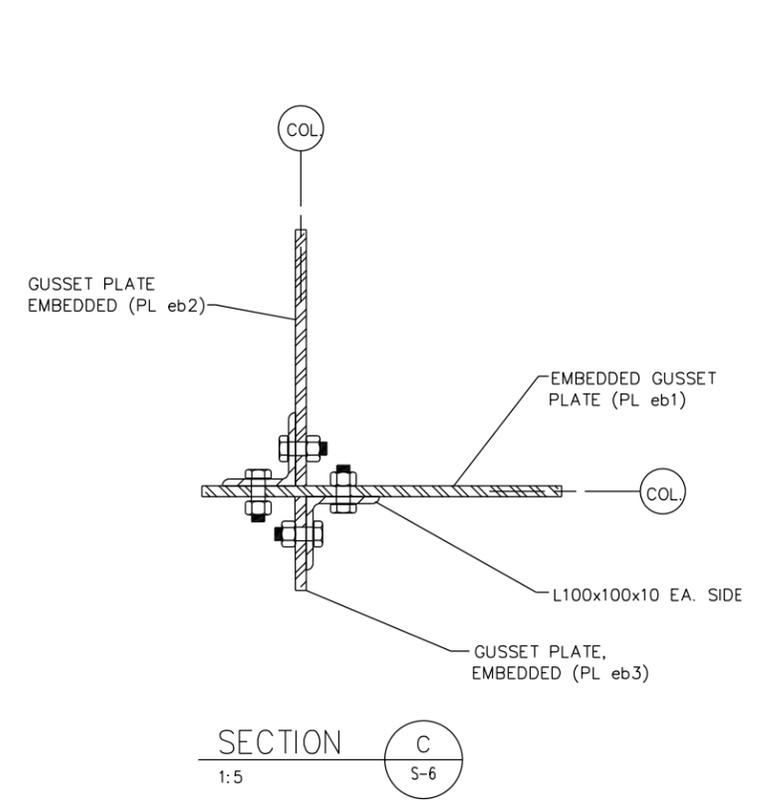
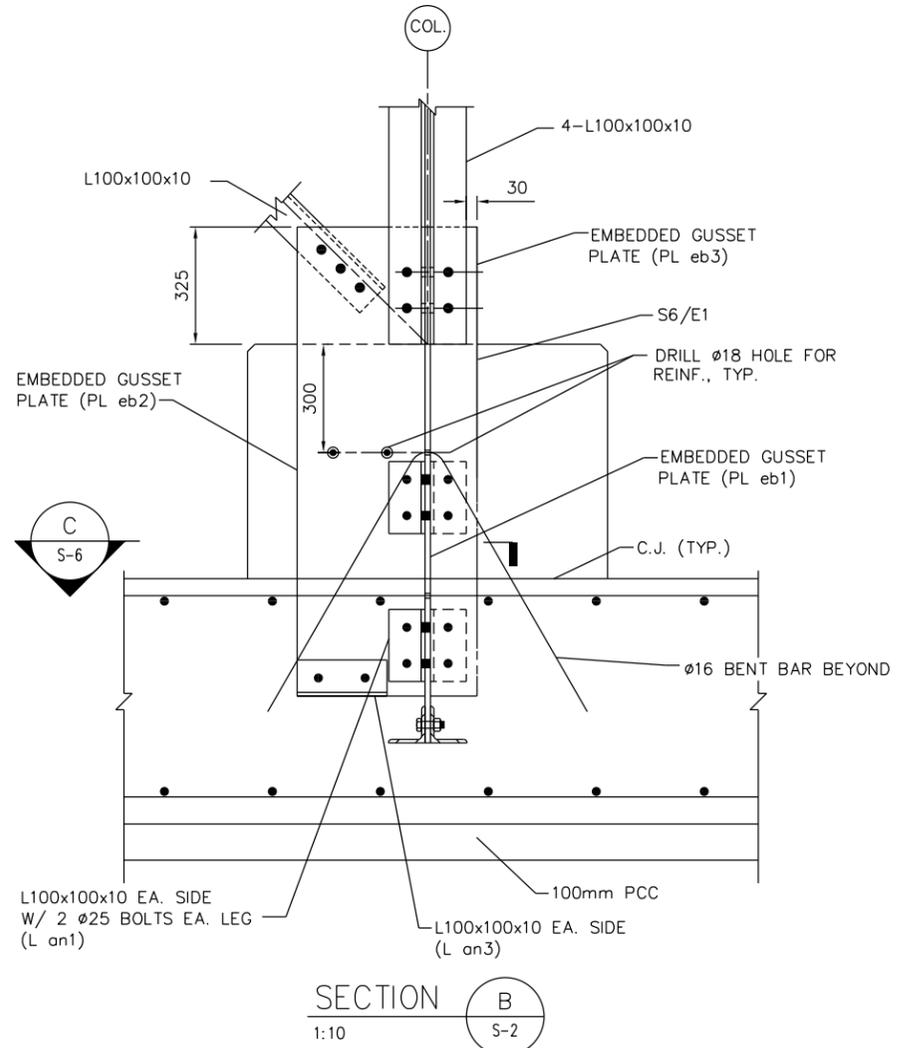
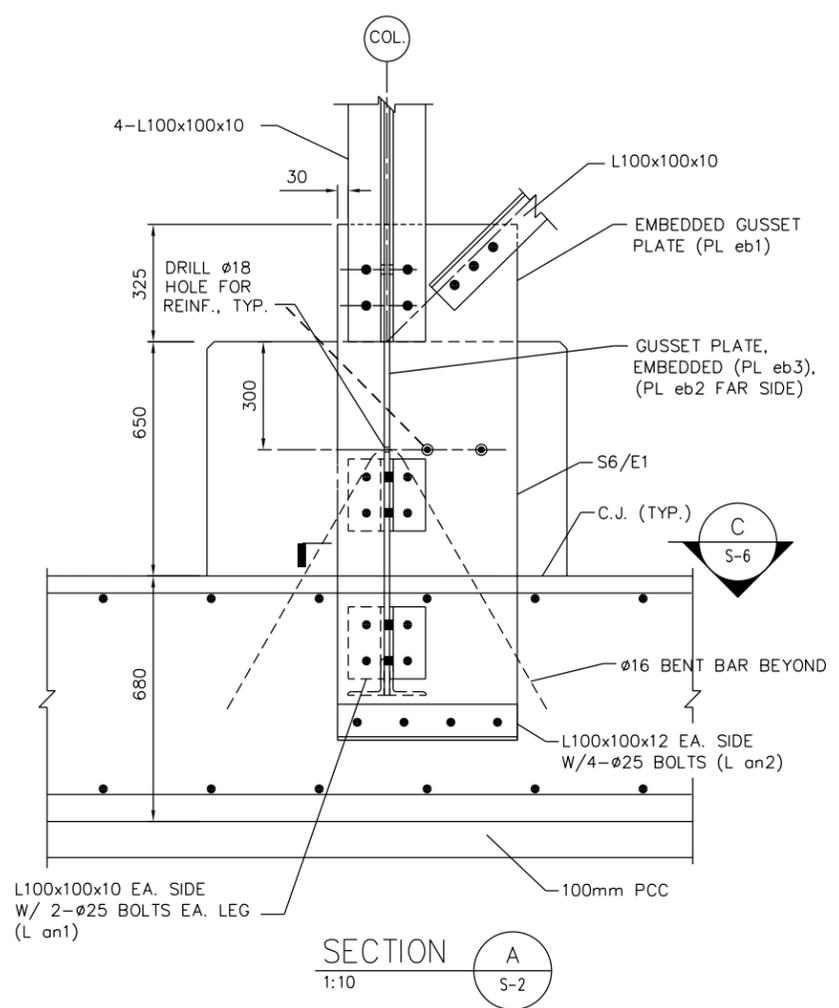


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AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
FOUNDATION STEEL
FRAMING SECTIONS

SHEET IDENTIFICATION
S-6



UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



US Army Corps of Engineers
Mobile District

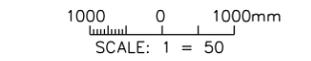
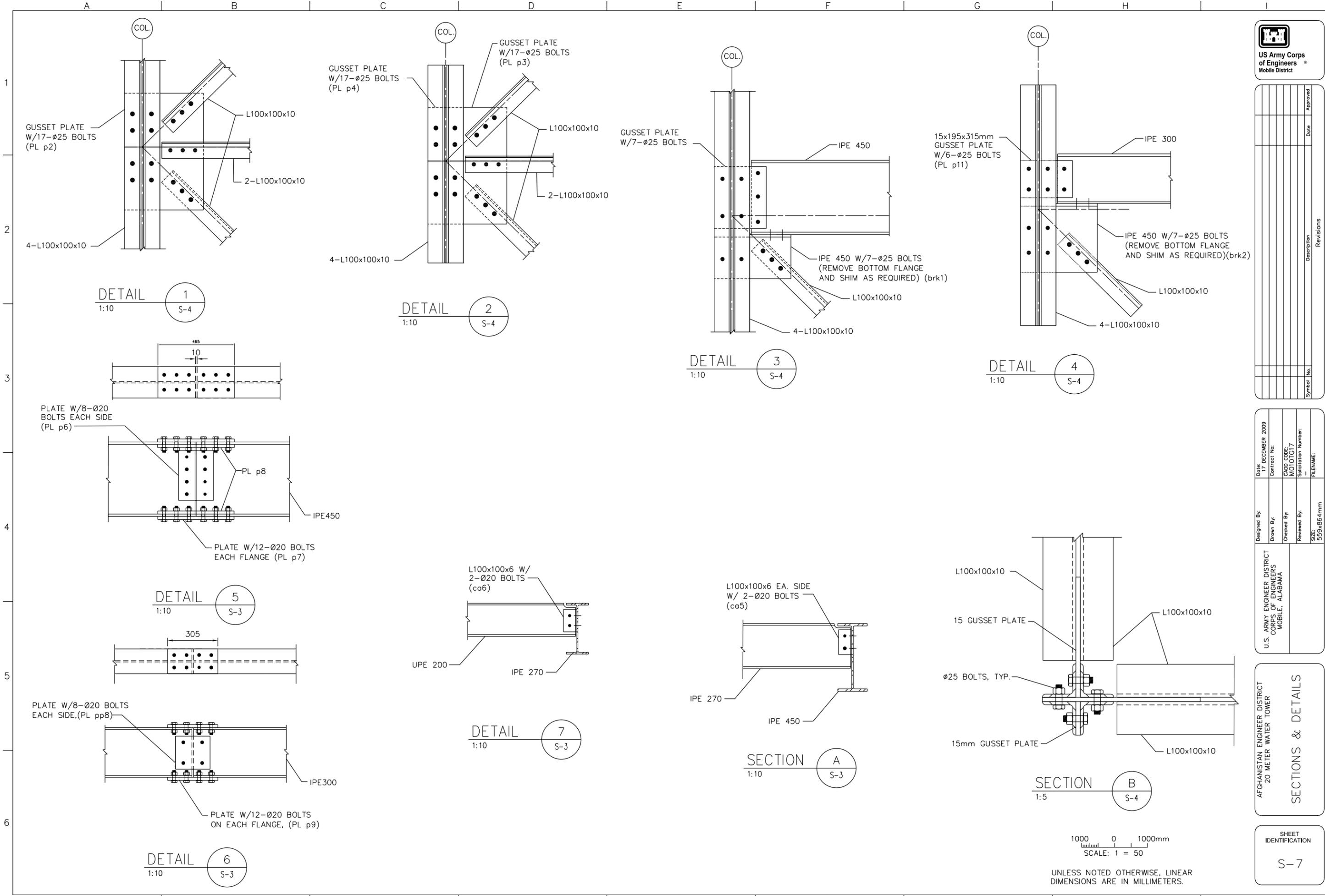
Symbol No	Description	Date	Approved

Designed By:	Date:	17 DECEMBER 2009
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Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
	FILENAME:	
	SIZE:	559x864mm

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MOBILE, ALABAMA

SHEET IDENTIFICATION
S-7

SECTIONS & DETAILS



UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



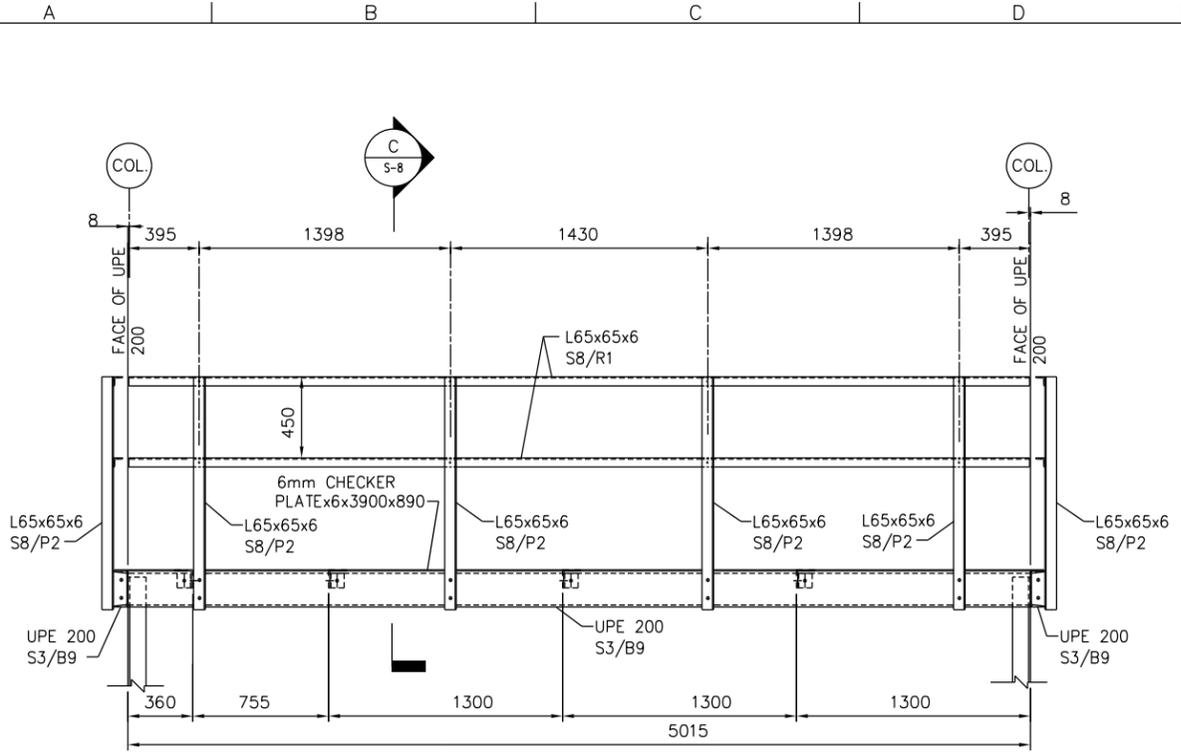
US Army Corps of Engineers
Mobile District

Symbol No.	Description	Date	Approved

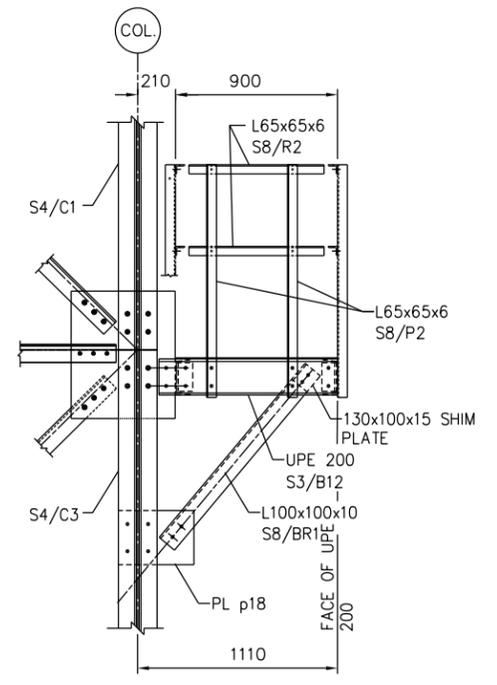
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Drawn By:	17 DECEMBER 2009	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
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	SIZE:	559x864mm

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER

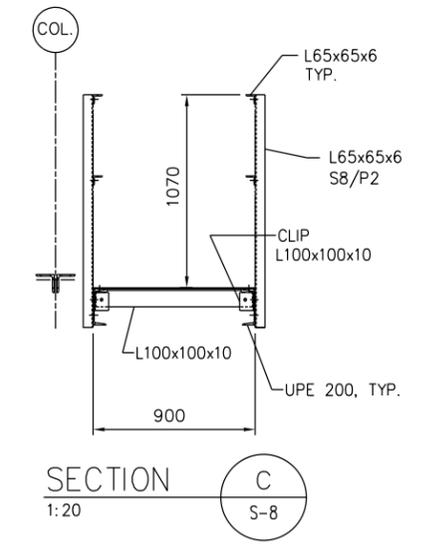
SHEET IDENTIFICATION
S-8



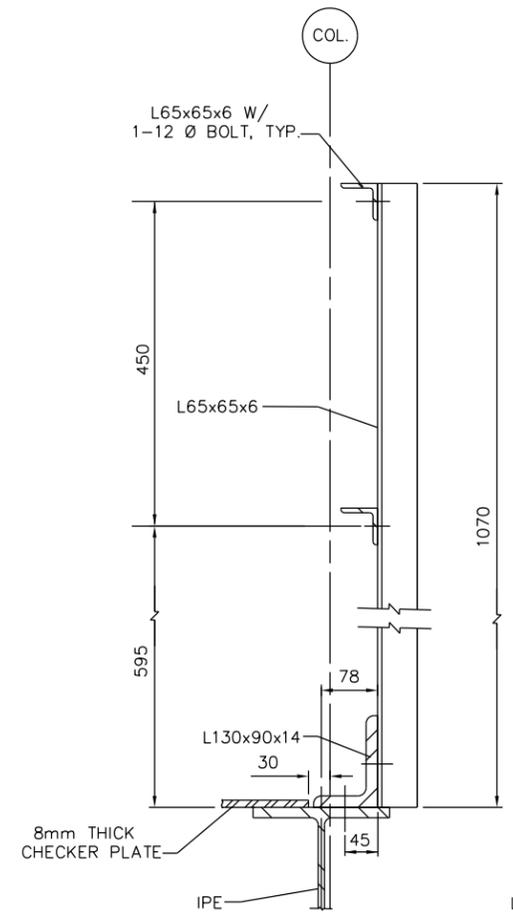
PLATFORM ELEVATION A
1:20



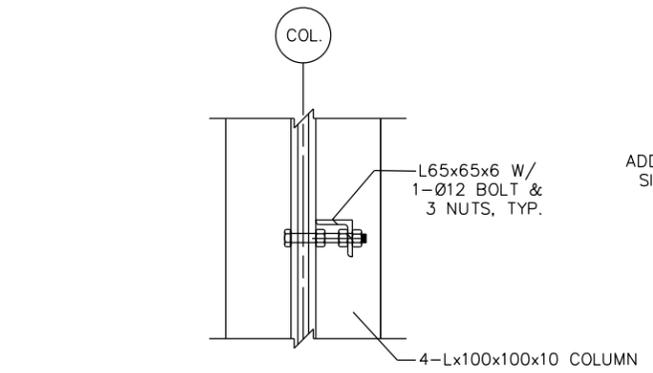
PLATFORM ELEVATION B
1:20



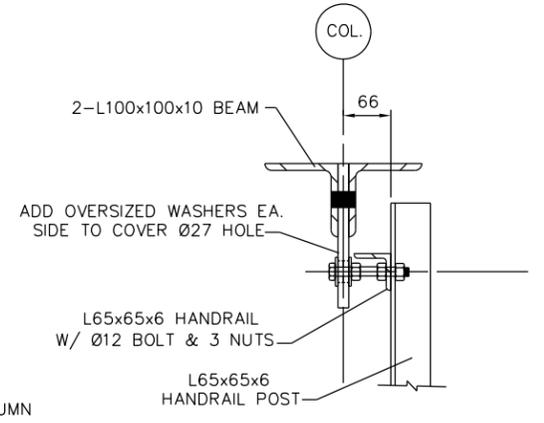
SECTION C
1:20



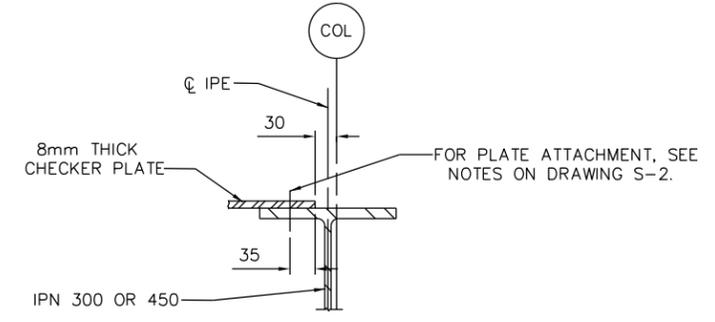
PLATFORM HANDRAIL DETAIL
1:5



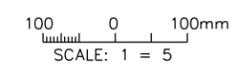
COLUMN/HANDRAIL CONNECTION DETAIL
1:5



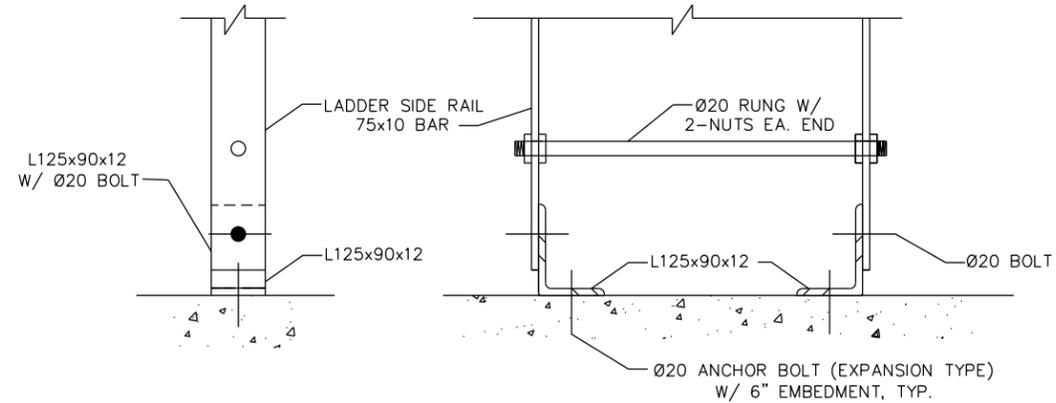
BEAM/HANDRAIL CONNECTION DETAIL
1:5



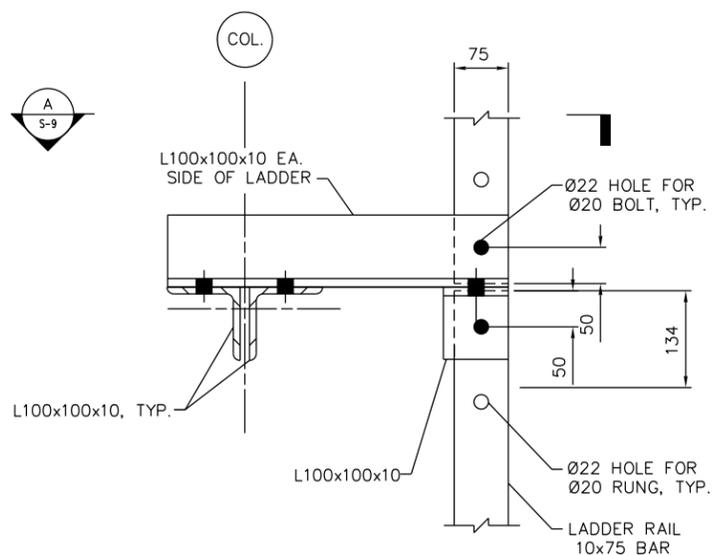
CHECKER PLATE ATTACHMENT DETAIL
1:5



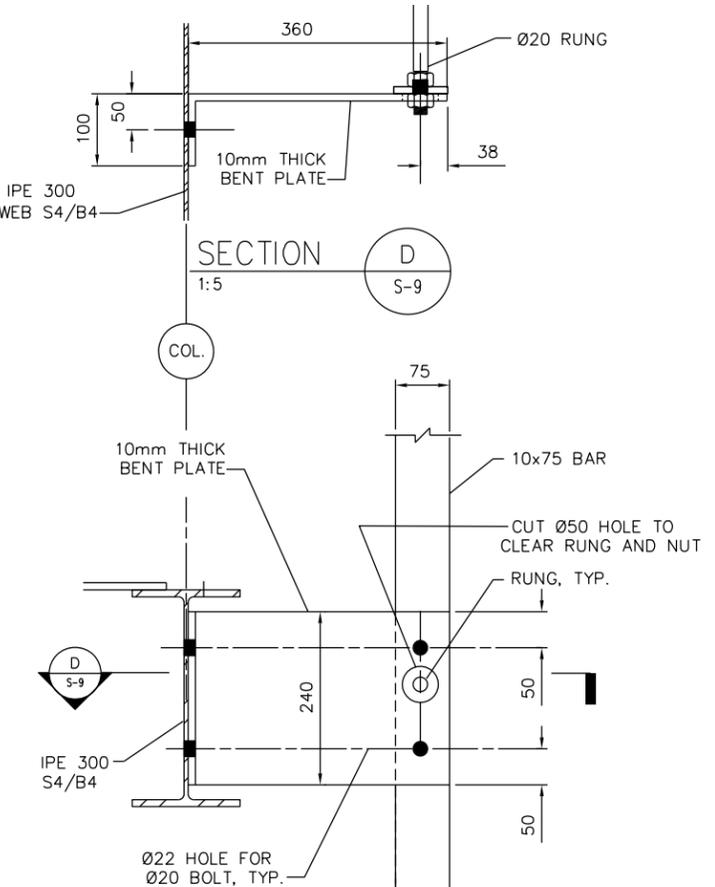
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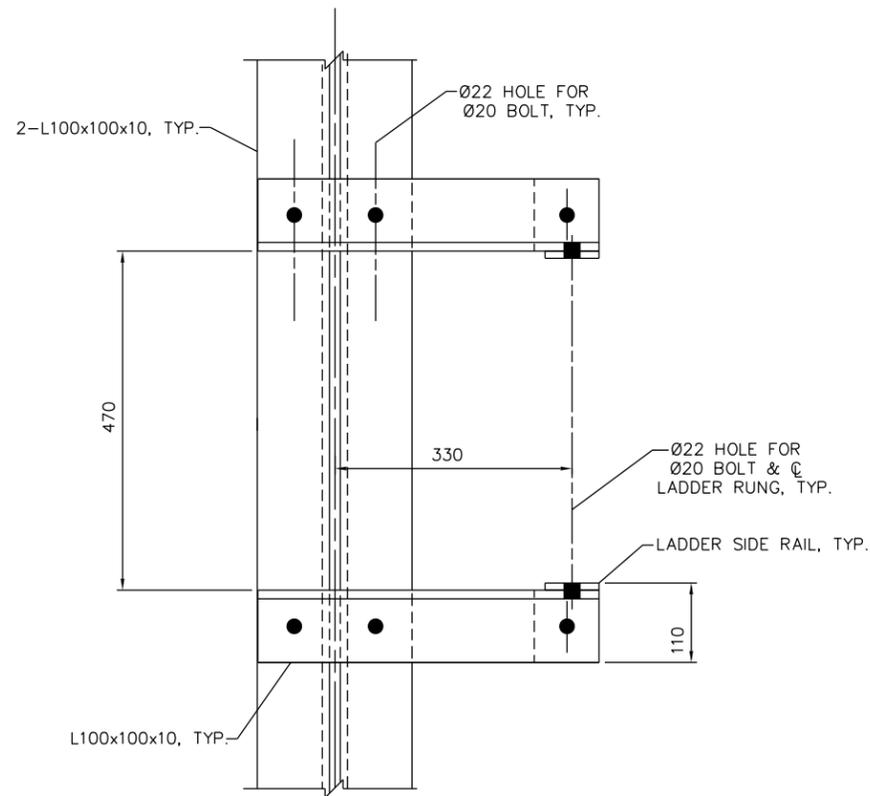
DETAIL 1
1:5



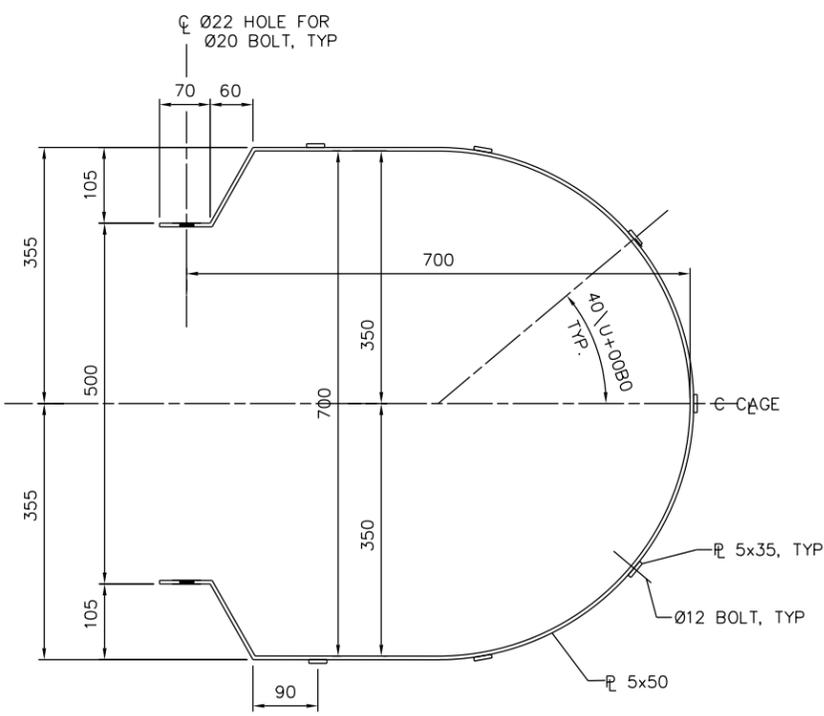
SECTION B
1:5



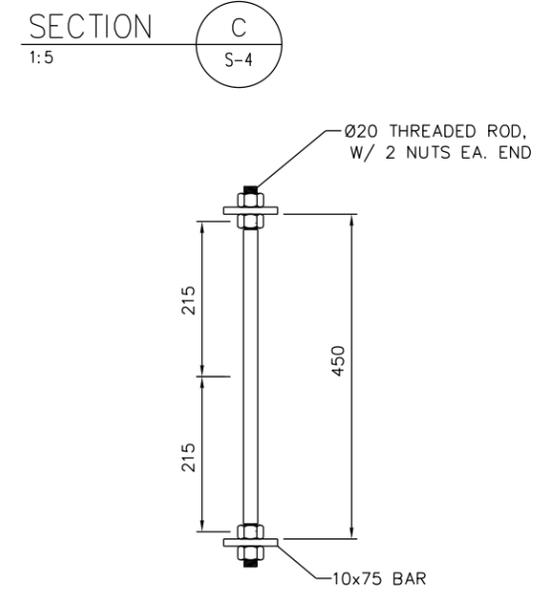
SECTION D
1:5



SECTION A
1:5

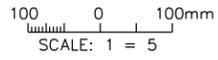


LADDER CAGE DETAIL
1:5



SECTION C
1:5

LADDER RUNG & SIDE RAIL
1:5



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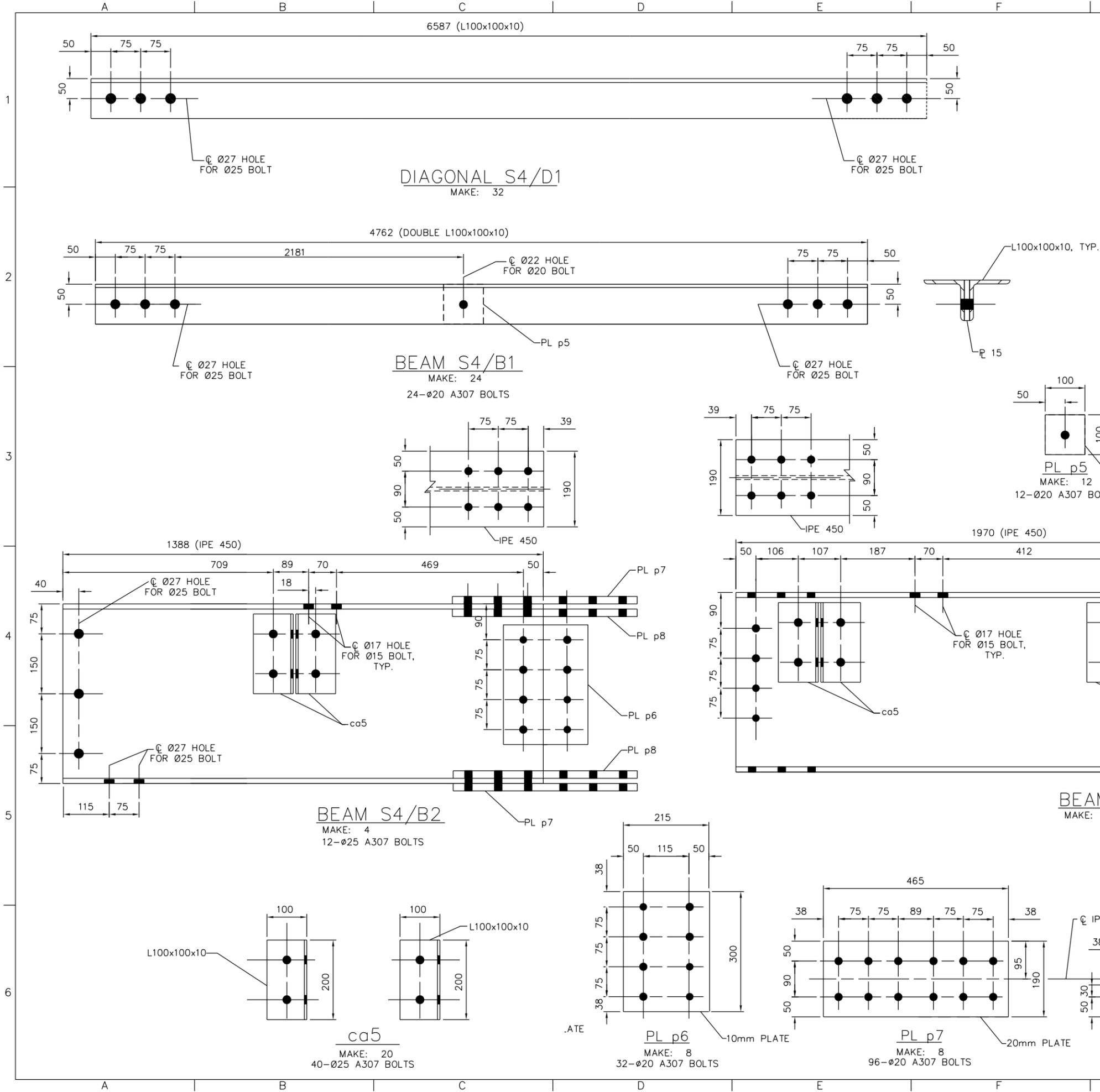
Symbol No	Description	Date	Approved

Designed By:	Date:	Contract No:
Drawn By:	17 DECEMBER 2009	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
	FILENAME:	

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER

SECTION & DETAILS

SHEET IDENTIFICATION
S-9



SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	NOTES
32	S4/D1		L100x100x10	6587		
24	S4/B1		2L100x100x10	4762		
		12	PL 15x100	100	PL p5	
4	S4/B2		IPE 450	1388		
		4	PL 10x215	300	PL p6	
		8	PL 20x190	465	PL p7	
		16	PL 20x80	465	PL p8	
		8	L100x100x10	200	ca5	
2	S4/B3		IPE 450	1970		
		12	L100x100x10	200	ca5	



Symbol No	Description	Date	Approved

Designed By:	Date:	Contract No:
Drawn By:	17 DECEMBER 2009	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
	FILENAME:	
	SIZE:	559x864mm

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER

MEMBER DETAILS

SHEET IDENTIFICATION

S-10

OUTSIDE FACE OF FLANGE

Ø 17 HOLE FOR Ø15 BOLT, TYP.

TYP. PLAN FOR Ø17 HOLES

PL p8 MAKE: 16

20mm PLATE UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



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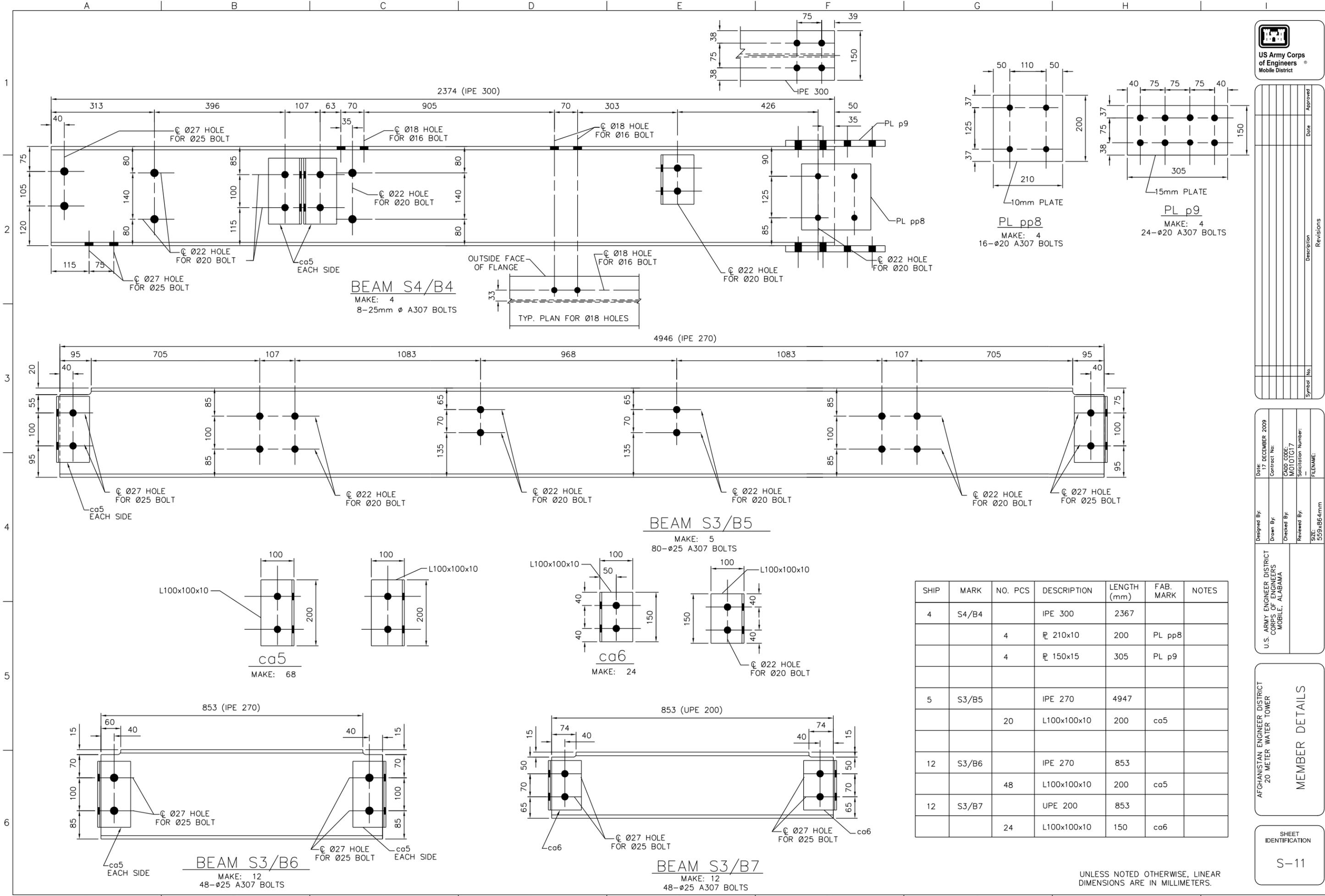
Symbol No.	Description	Date	Approved

Designed By:	Date:	7 DECEMBER 2009
Drawn By:	Contract No.:	
Checked By:	CADD CODE:	M010TG17
Reviewed By:	Solicitation Number:	
SIZE:	FILENAME:	

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
MOBILE, ALABAMA

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

SHEET IDENTIFICATION
S-11



SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	NOTES
4	S4/B4		IPE 300	2367		
		4	ϕ 210x10	200	PL pp8	
		4	ϕ 150x15	305	PL p9	
5	S3/B5		IPE 270	4947		
		20	L100x100x10	200	ca5	
12	S3/B6		IPE 270	853		
		48	L100x100x10	200	ca5	
12	S3/B7		UPE 200	853		
		24	L100x100x10	150	ca6	

UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



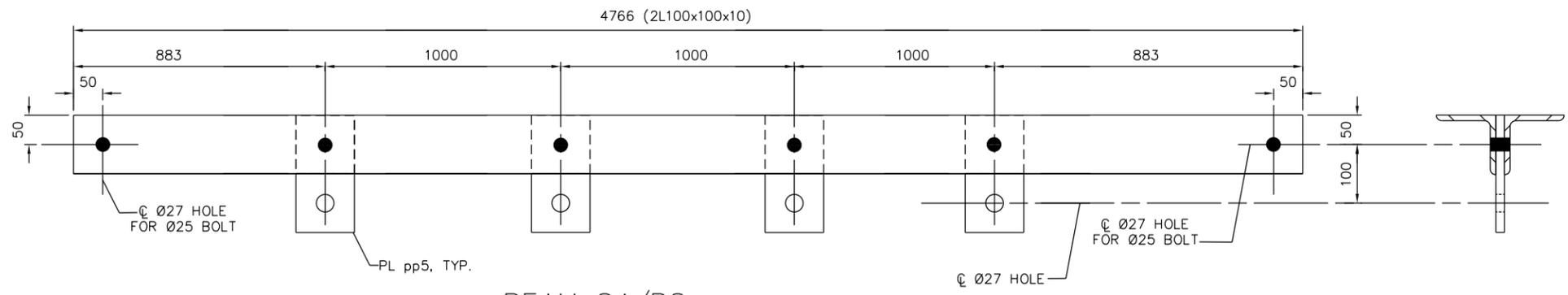
US Army Corps
of Engineers
Mobile District

Symbol No	Description	Date	Approved

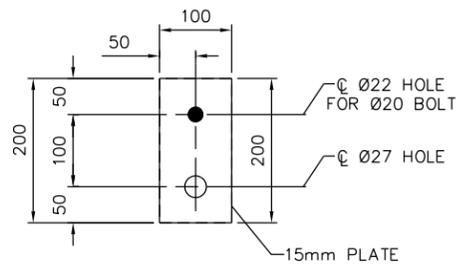
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Drawn By:	Contract No:	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
SIZE:	FILENAME:	
U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS MOBILE, ALABAMA		

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

SHEET IDENTIFICATION
S-12



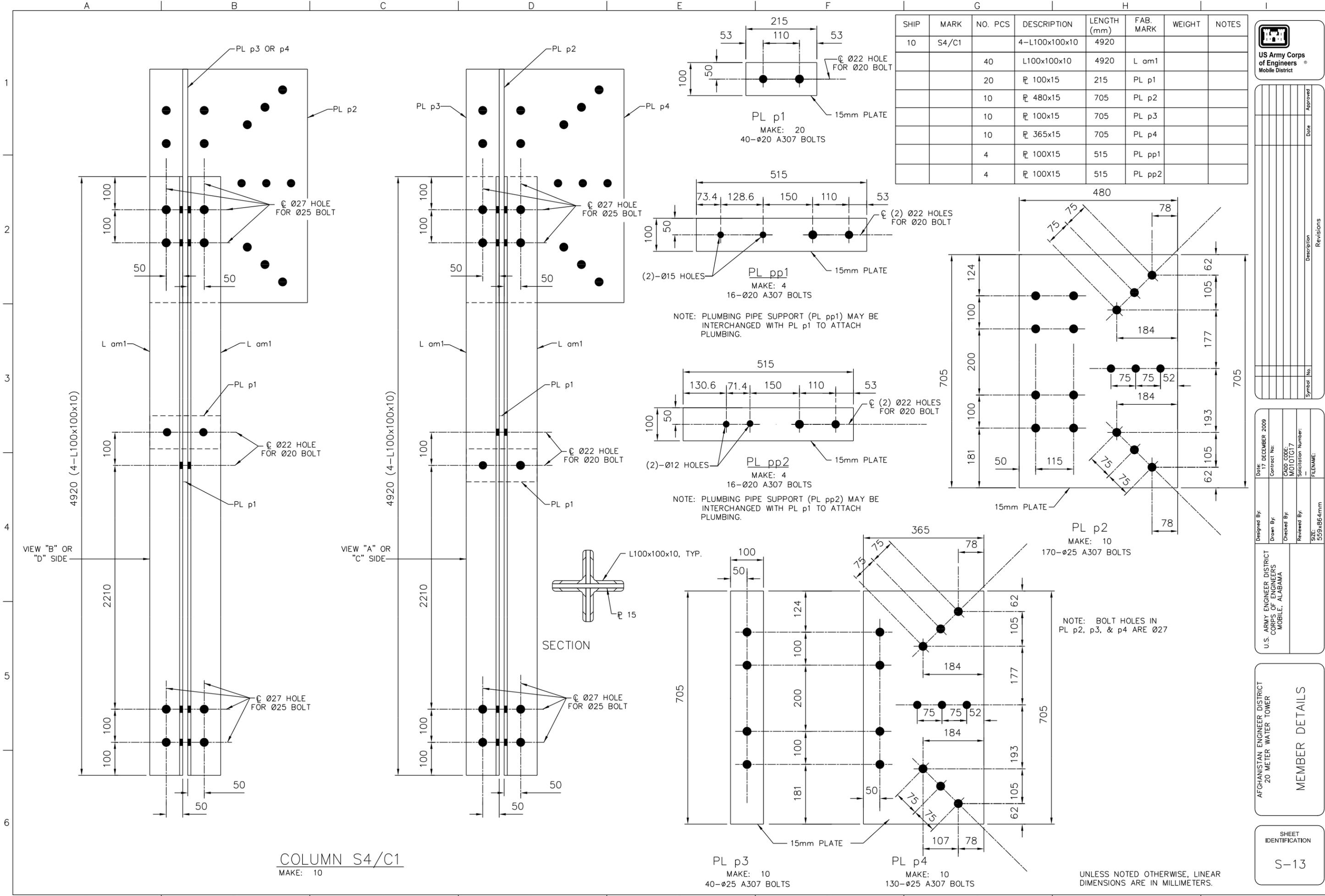
BEAM S4/B8
MAKE: 2
4-Ø25 A307 BOLTS



PL pp5
MAKE: 8
8-Ø20 A307 BOLTS

SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	NOTES
4	S4/B8		2L100x100x10	4766		
		4	PL 15x100	200	PL pp5	

UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



US Army Corps of Engineers
Mobile District

Symbol No	Description	Date	Approved

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Checked By:	CADD CODE: M010TG17
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SIZE: 559x864mm	FILENAME:

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

SHEET IDENTIFICATION
S-13



US Army Corps of Engineers
Mobile District

Symbol No	Description	Date	Approved

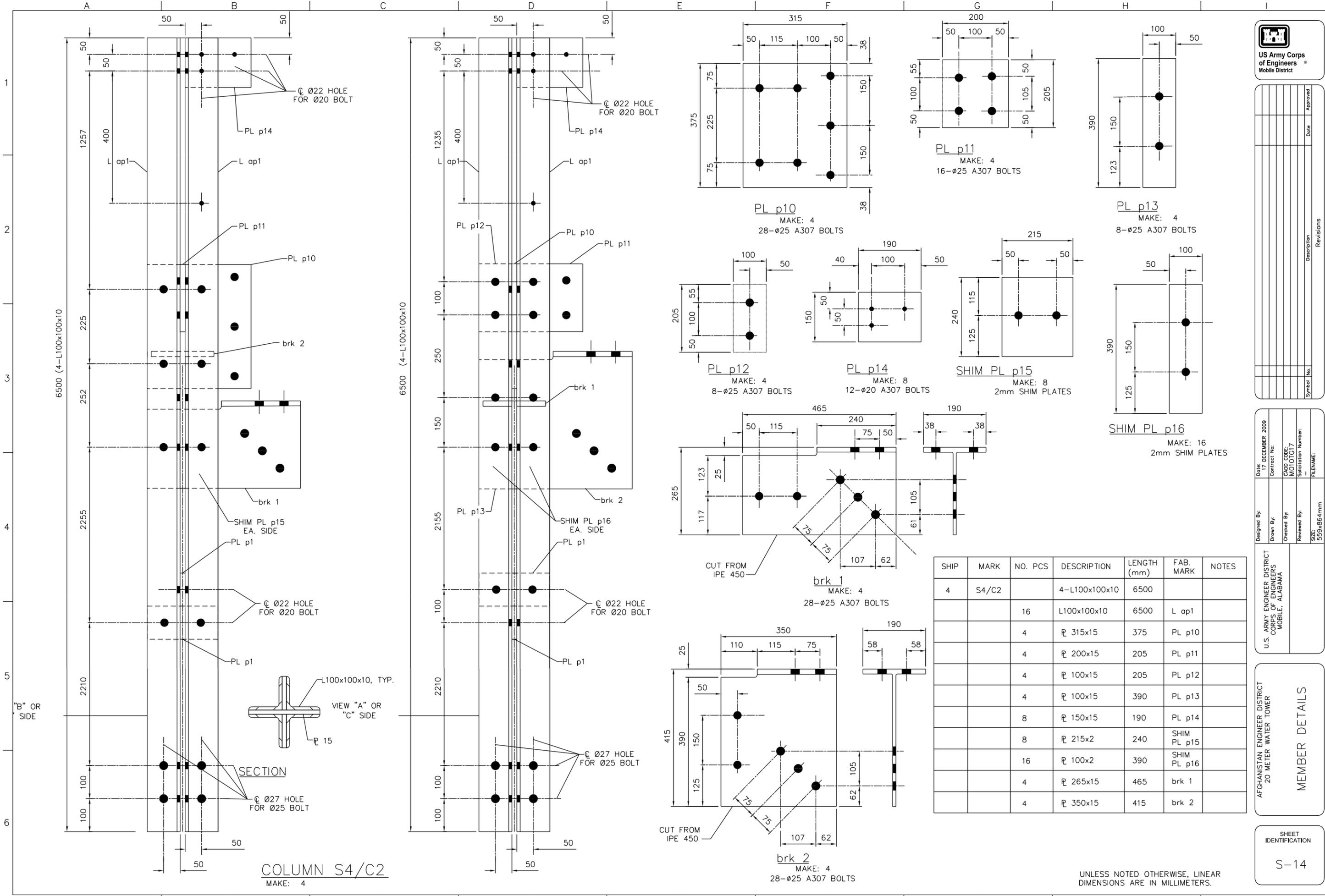
Designed By:	Date:	Contract No:
Drawn By:	17 DECEMBER 2009	
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AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

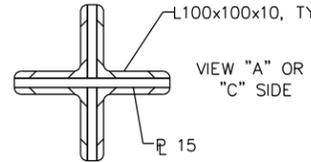
SHEET IDENTIFICATION

S-14

UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	NOTES
4	S4/C2		4-L100x100x10	6500		
		16	L100x100x10	6500	L op1	
		4	PL 315x15	375	PL p10	
		4	PL 200x15	205	PL p11	
		4	PL 100x15	205	PL p12	
		4	PL 100x15	390	PL p13	
		8	PL 150x15	190	PL p14	
		8	PL 215x2	240	SHIM PL p15	
		16	PL 100x2	390	SHIM PL p16	
		4	PL 265x15	465	brk 1	
		4	PL 350x15	415	brk 2	



COLUMN S4/C2
MAKE: 4



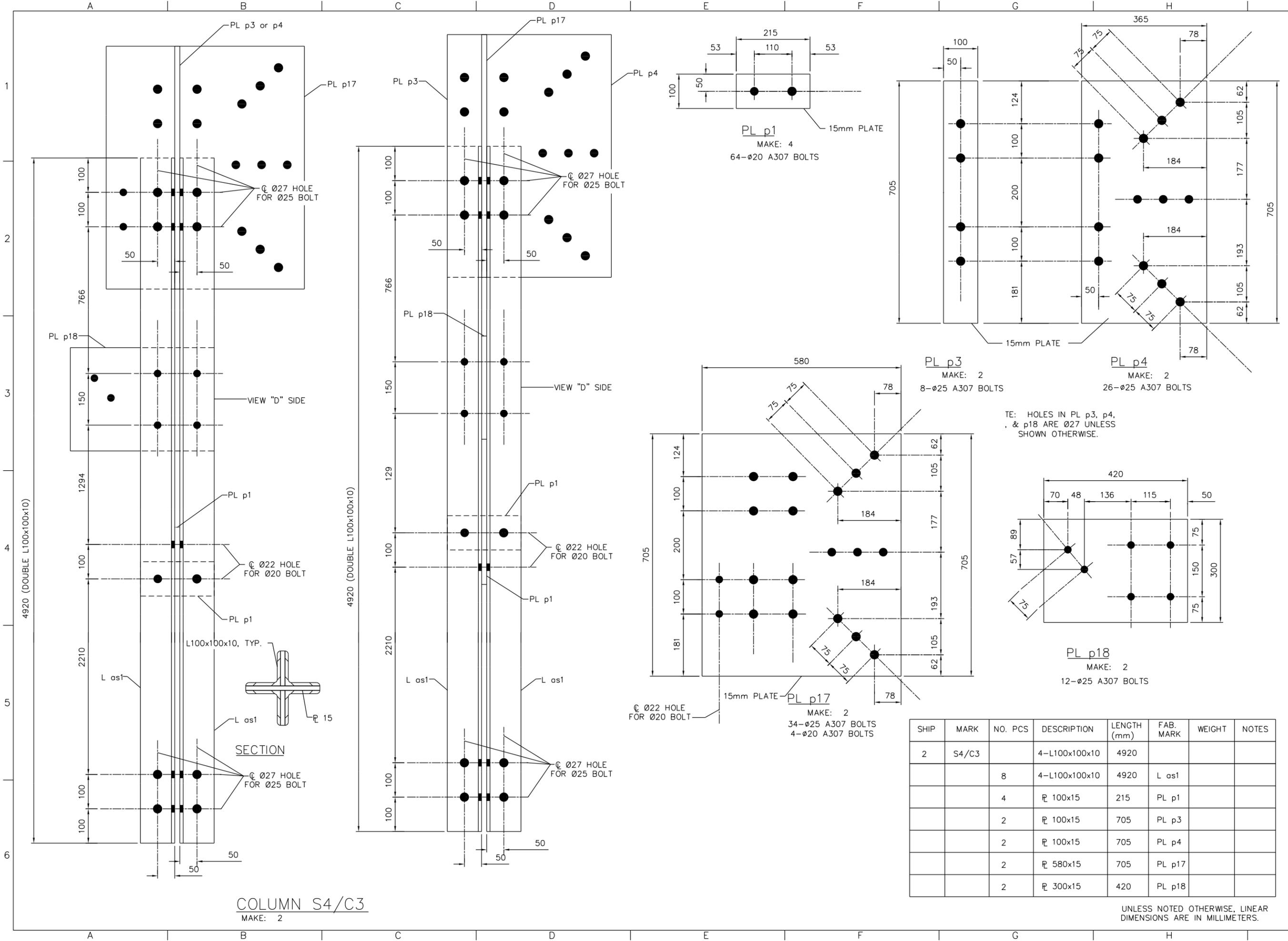
US Army Corps
of Engineers
Mobile District

Symbol No	Description	Date	Approved

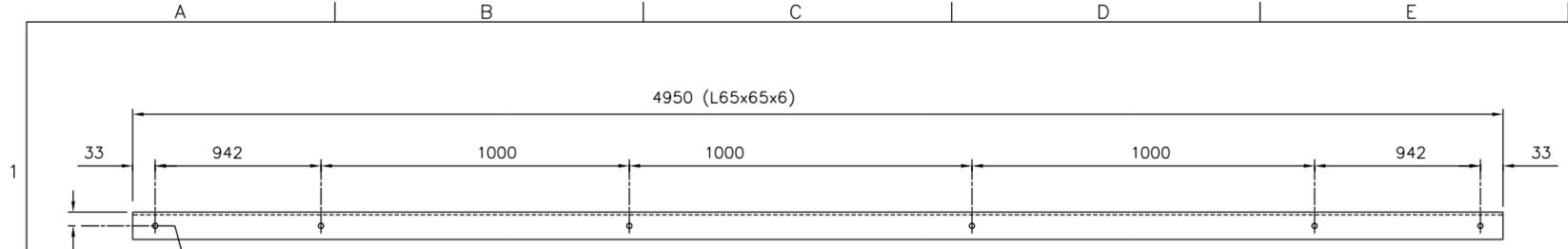
Designed By:	Date:	17 DECEMBER, 2009
Drawn By:	Contract No:	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
SIZE:	FILENAME:	559-864mm

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

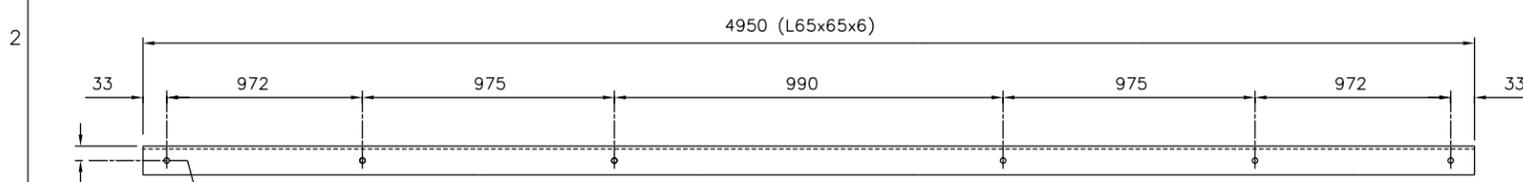
SHEET IDENTIFICATION
S-15



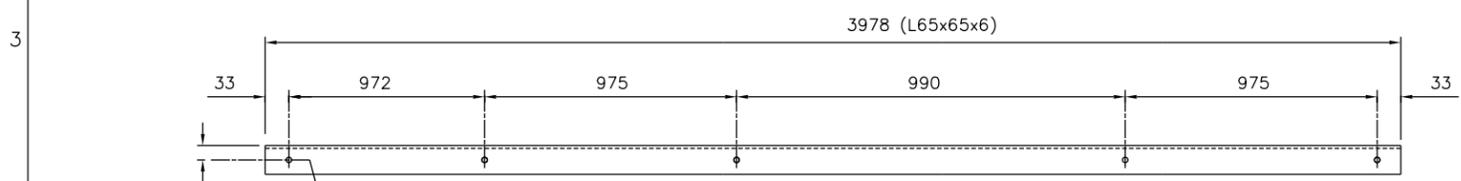
COLUMN S4/C3
MAKE: 2



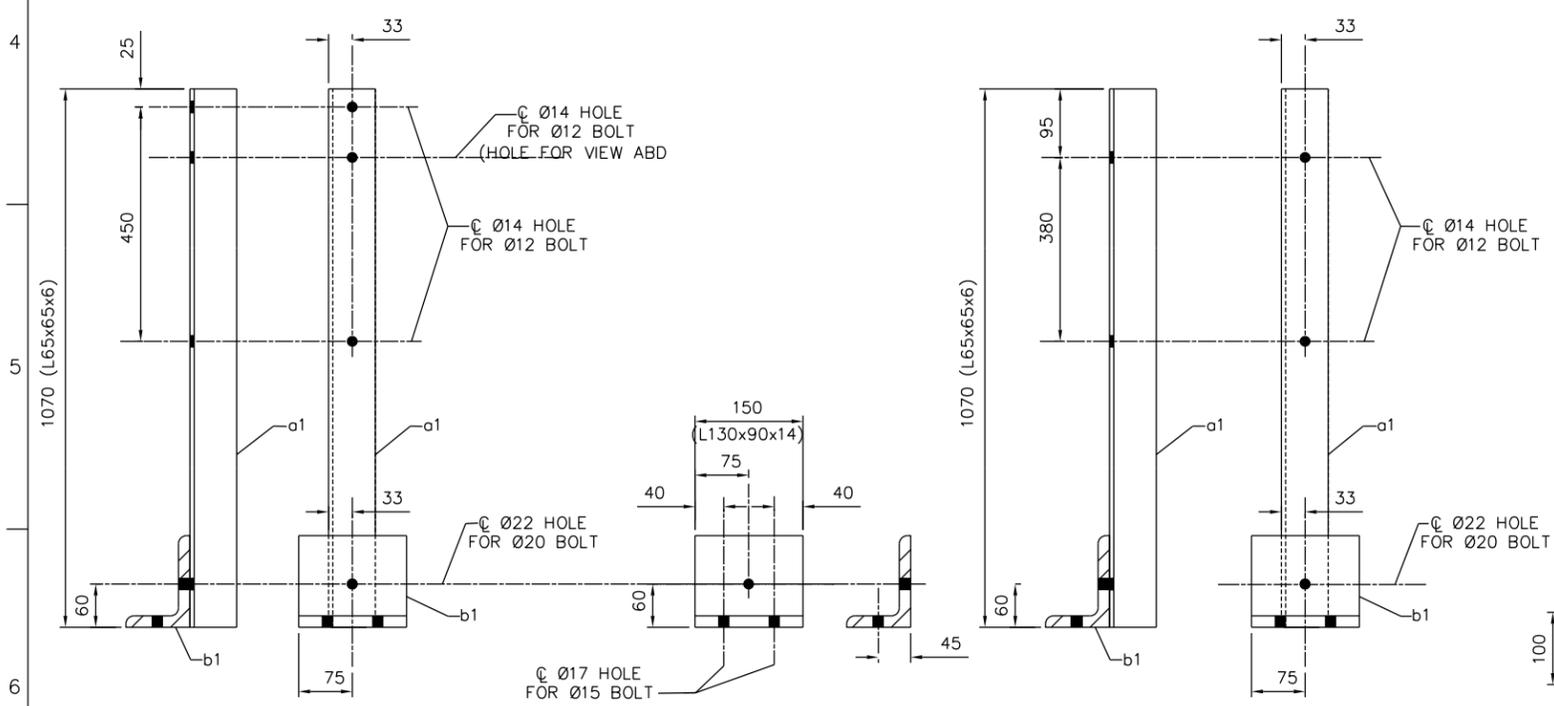
HANDRAIL S4/H1
MAKE: 2
24-Ø12 A307 BOLTS



HANDRAIL S4/H2
MAKE: 2
20-Ø12 A307 BOLTS

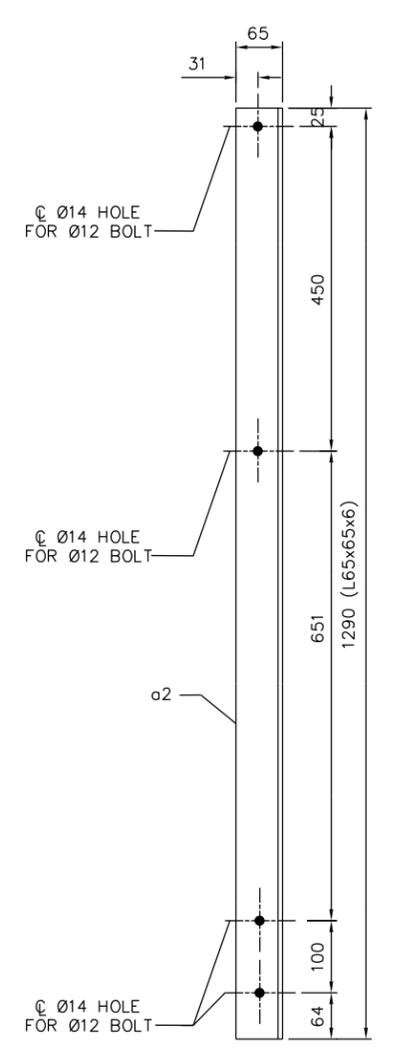


HANDRAIL S4/H3
MAKE: 2
10-Ø12 A307 BOLTS

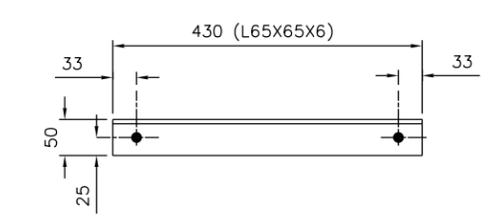


HANDRAIL POST S4/P1
MAKE: 9
28-Ø12 A307 BOLTS
42-Ø15 A307 BOLTS

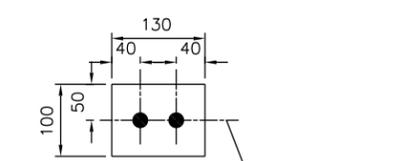
HANDRAIL POST S4/P3
MAKE: 8
28-Ø12 A307 BOLTS
42-Ø15 A307 BOLTS



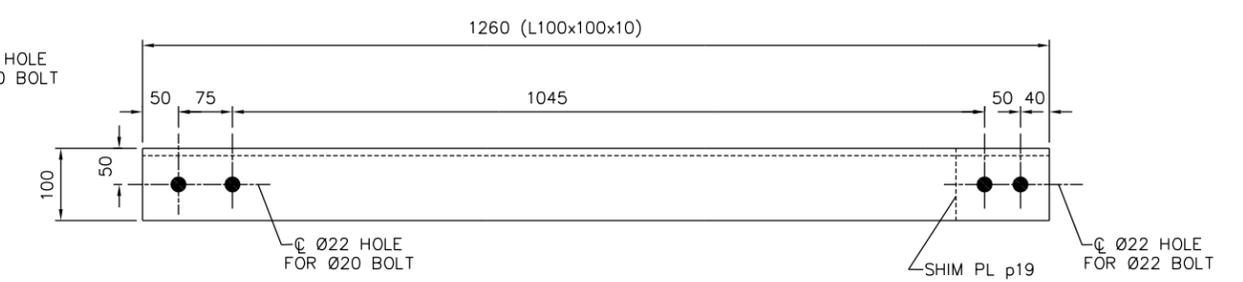
HANDRAIL POST S8/P2
MAKE: 12
48-12 Ø A307 BOLTS



HANDRAIL S4/H4
MAKE: 2
4-Ø12 A307 BOLTS



SHIM PL_p19
MAKE: 2
15mm SHIM PLATES



BEAM S8/BR1
MAKE: 2
4-Ø15 A307 BOLTS

UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.

SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	NOTES
2	S4/H1		L65x65x6	4950		
2	S4/H2		L65x65x6	4950		
2	S4/H3		L65x65x6	3978		
2	S4/H4		L65x65x6	3978		
14	S4/P1		L65x65x6	1070		
		14	L130x90x14	150	b1	
12	S4/P2		HANDRAIL POST	1290		
		14	L65x65x6	1290	a2	
2	S8/BR1		L100x100x10	1260		
		2	PL 100x15	130	PL p19	



US Army Corps of Engineers
Mobile District

Symbol No	Description	Date	Approved

Designed By:	Date:	17 DECEMBER 2009
Drawn By:	Contract No:	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
SIZE:	FILENAME:	

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

SHEET IDENTIFICATION
S-16



US Army Corps
of Engineers
Mobile District

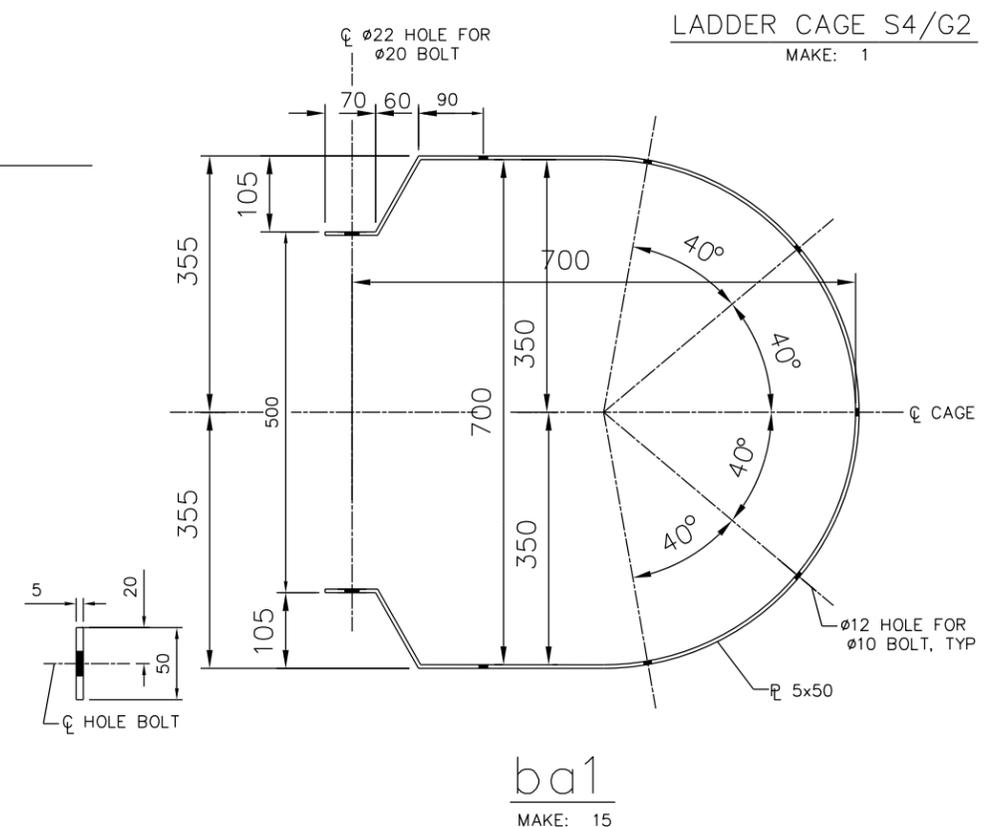
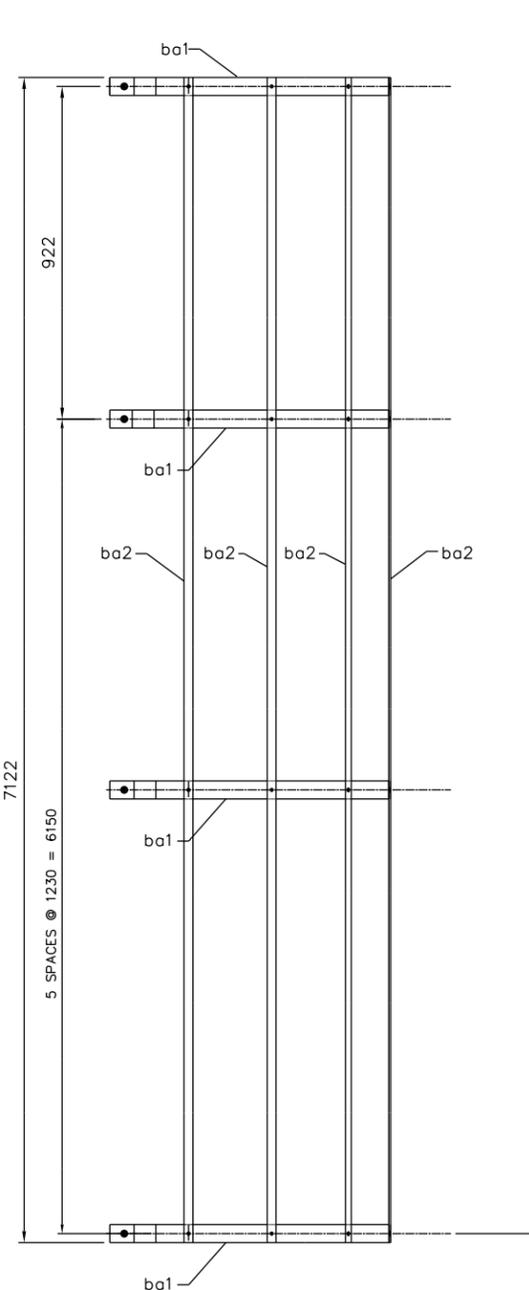
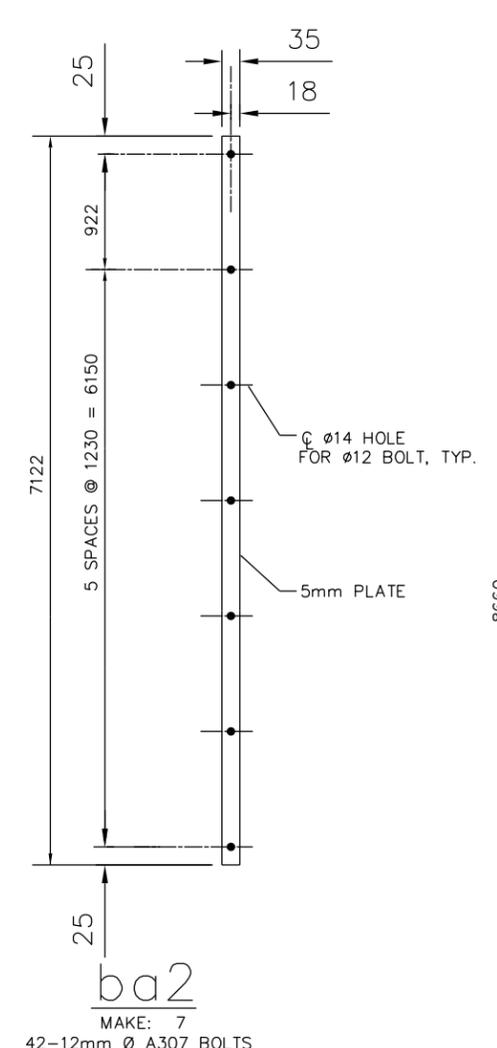
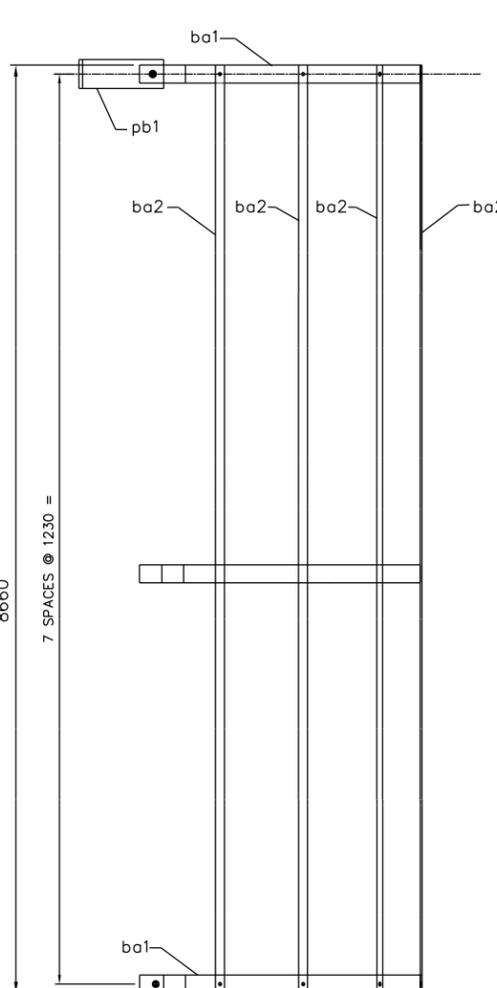
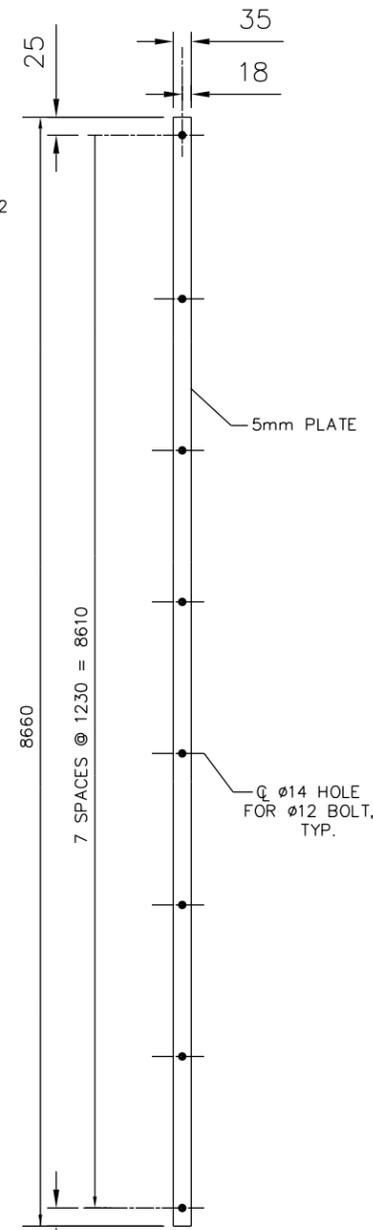
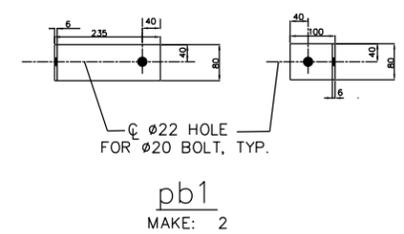
Symbol No	Description	Date	Approved

Designed By:	Date:
Drawn By:	17 DECEMBER 2009
Checked By:	Contract No:
Reviewed By:	CADD CODE:
SIZE: 559x864mm	MO10TG17
	Solicitation Number:
	FILENAME:

AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER
MEMBER DETAILS

SHEET IDENTIFICATION

S-19



SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	WEIGHT	NOTES
1	S4/G1		LADDER CAGE	7150			
		6	PL 5x50	1990	ba1		
		7	PL 5x35	7122	ba2		
1	S4/G2		LADDER CAGE	8660			
		8	PL 5x50	1990	ba1		
		7	PL 5x35	8660	ba2		
		2	PL 6x80	335	pb1		

UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.



US Army Corps of Engineers
Mobile District

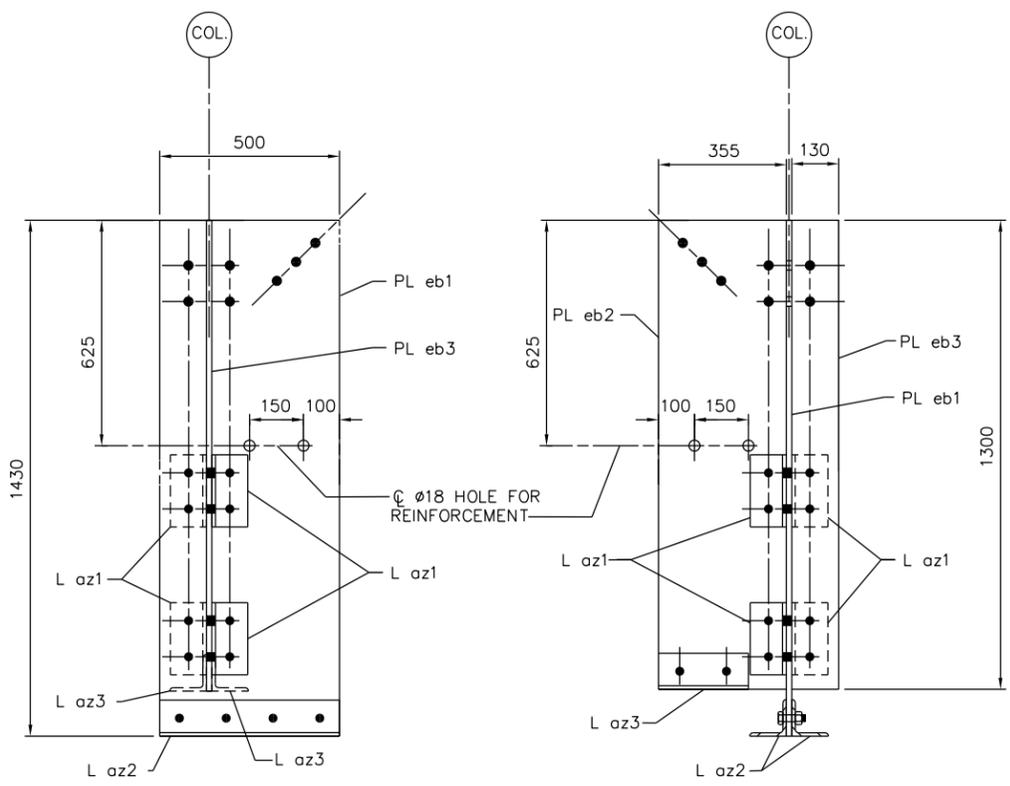
Symbol No	Description	Date	Approved

Designed By:	Date:	Contract No:
Drawn By:	17 DECEMBER 2009	
Checked By:	CADD CODE:	MO10TG17
Reviewed By:	Solicitation Number:	
	FILENAME:	

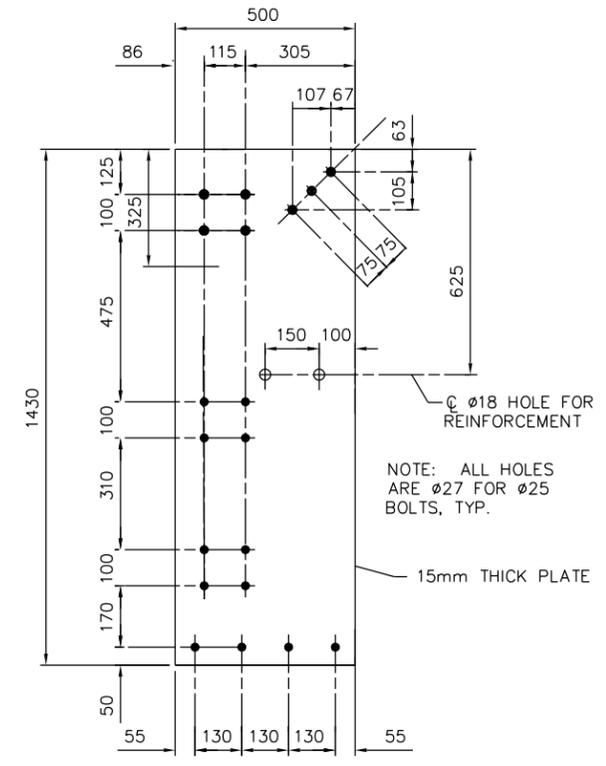
AFGHANISTAN ENGINEER DISTRICT
20 METER WATER TOWER

MEMBER DETAILS

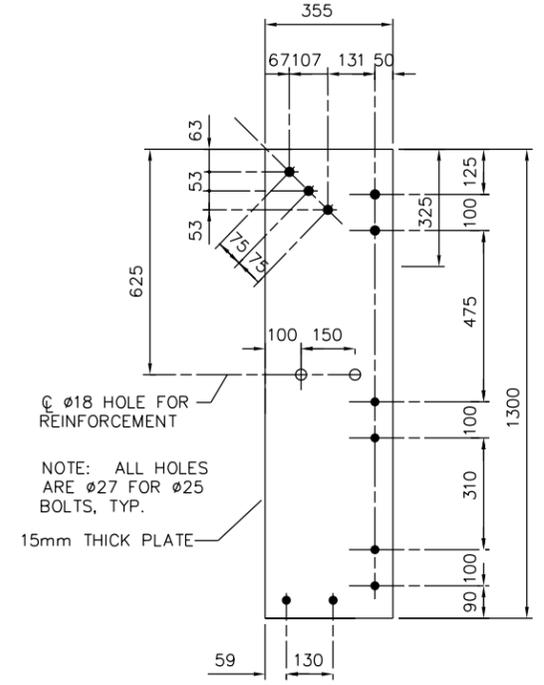
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S-20



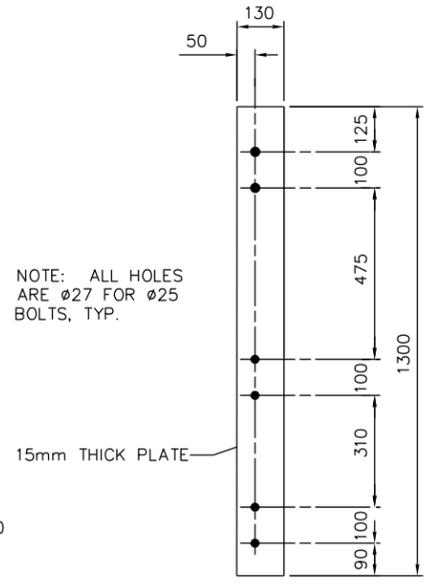
EMBEDDED ANCHOR PLATE S6/E1
MAKE: 4



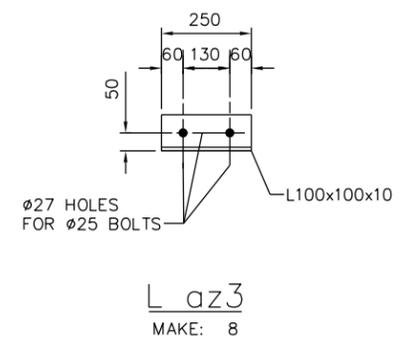
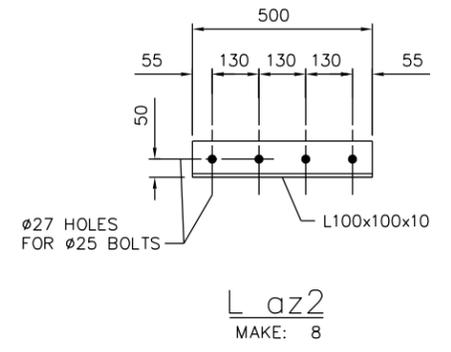
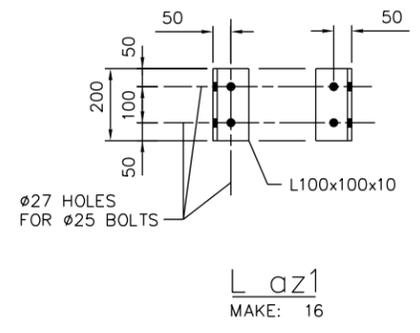
PL eb1
MAKE: 4
76-Ø25 A307 BOLTS



PL eb2
MAKE: 4
44-Ø25 A307 BOLTS



PL eb3
MAKE: 4
24-Ø25 A307 BOLTS

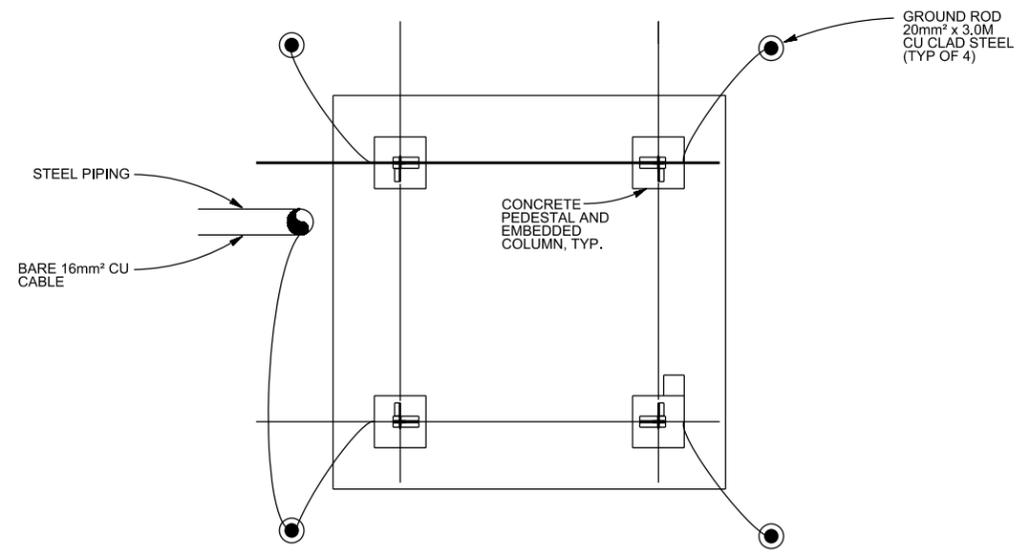


SHIP	MARK	NO. PCS	DESCRIPTION	LENGTH (mm)	FAB. MARK	WEIGHT	NOTES
4	S6/E1		EMBEDDED ANCHOR PLATE	1430			
		4	PL 15x500	1430	PL eb1		
		4	PL 15x355	1300	PL eb2		
		4	PL 15x130	1300	PL eb3		
		16	L100x100x10	200	L az1		
		8	L100x100x10	500	L az2		
		8	L100x100x10	250	L az3		

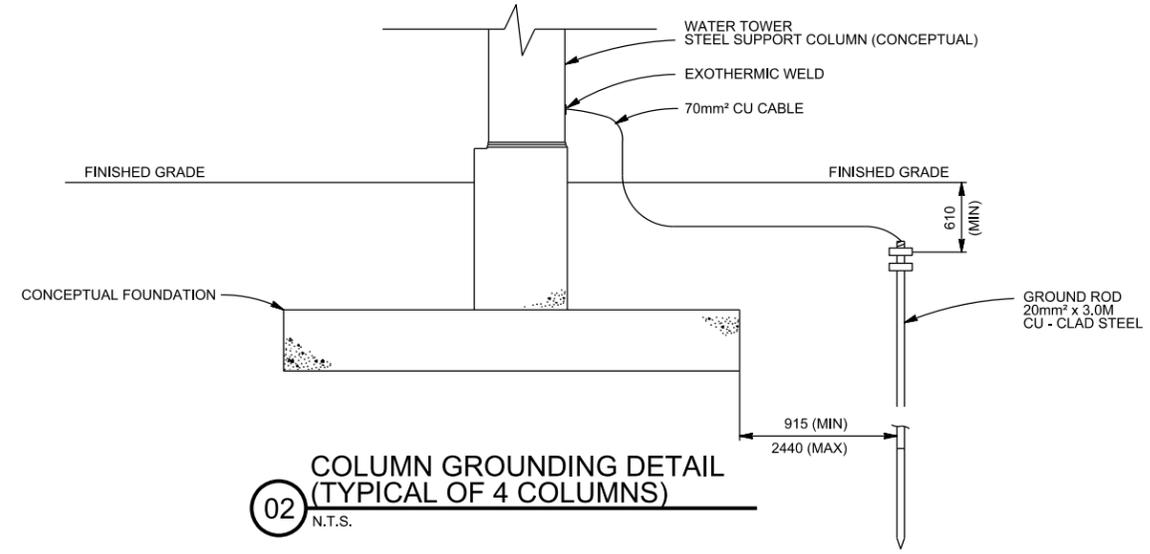
UNLESS NOTED OTHERWISE, LINEAR DIMENSIONS ARE IN MILLIMETERS.

A B C D E F G H

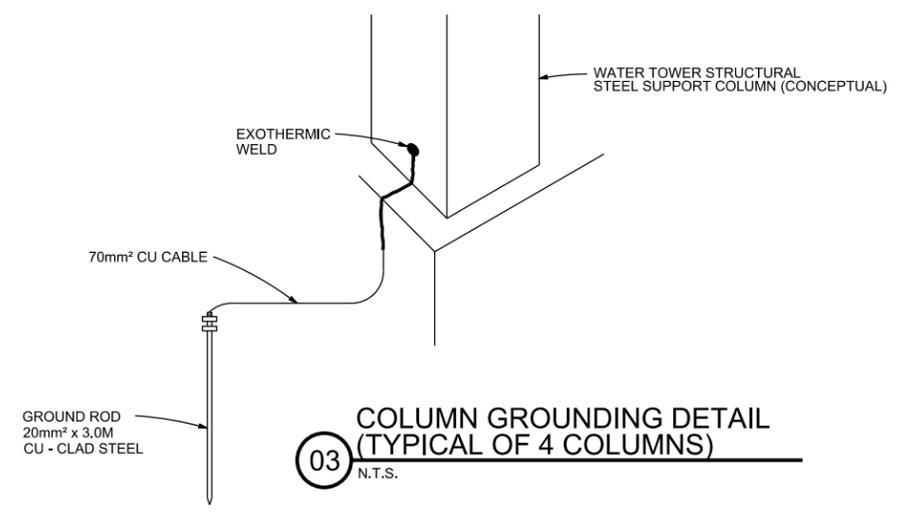
6
5
4
3
2
1



01 GROUNDING ELECTRODE PLAN
N.T.S.



02 COLUMN GROUNDING DETAIL (TYPICAL OF 4 COLUMNS)
N.T.S.



03 COLUMN GROUNDING DETAIL (TYPICAL OF 4 COLUMNS)
N.T.S.

LIGHTING PROTECTION PLANS AND DETAILS
N.T.S.

- NOTES:**
1. CONTRACTOR SHALL MAKE ALL METALLIC ELEMENTS OF WATER TOWER TANK AND SUPPORT STRUCTURE ELECTRICALLY CONTINUOUS BY BOLTING REINFORCEMENT STEEL SHALL BE MADE ELECTRICALLY CONTINUOUS BY METALLIC WIRE TIES.
 2. BOND EACH METALLIC UNDERGROUND PIPE TO AT LEAST ONE GROUND ROD WITH 16mm² CU CABLE.
 3. EACH COLUMN SHALL BE BONDED TO A 20mm² x 3.0M CU CLAD STEEL GROUND ROD VIA A BARE 70mm² CU CABLE. CABLE SHALL BE EXOTHERMIC ALLY WELDED TO COLUMN 150mm ABOVE CONCRETE FOUNDATION.



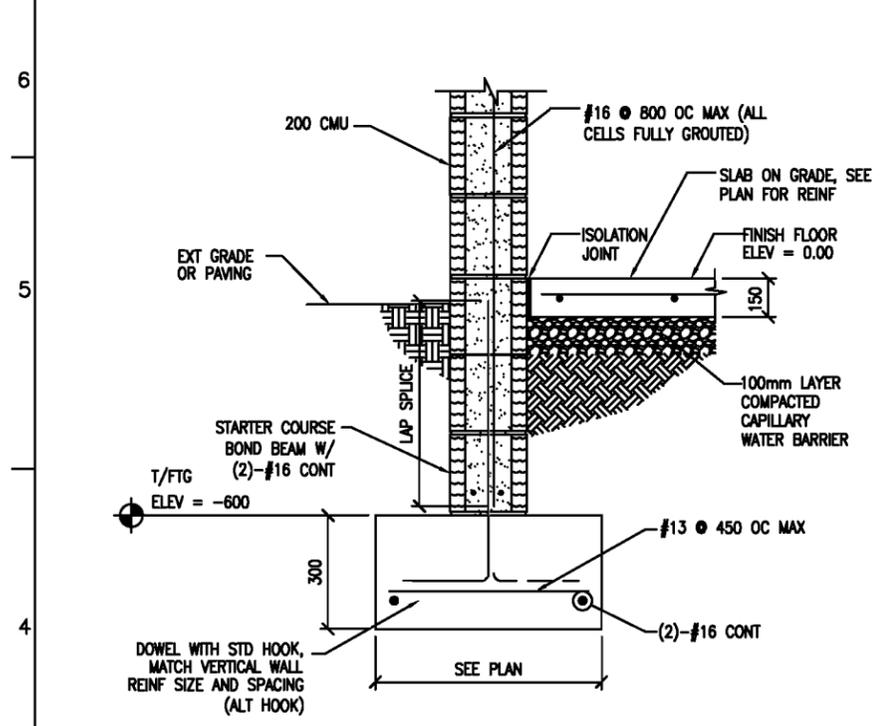
US ARMY CORPS OF ENGINEERS
AFGHANISTAN ENGINEER DISTRICT

SYMBOL	DESCRIPTION	DATE	APPR.	STATION	DATE	APPR.

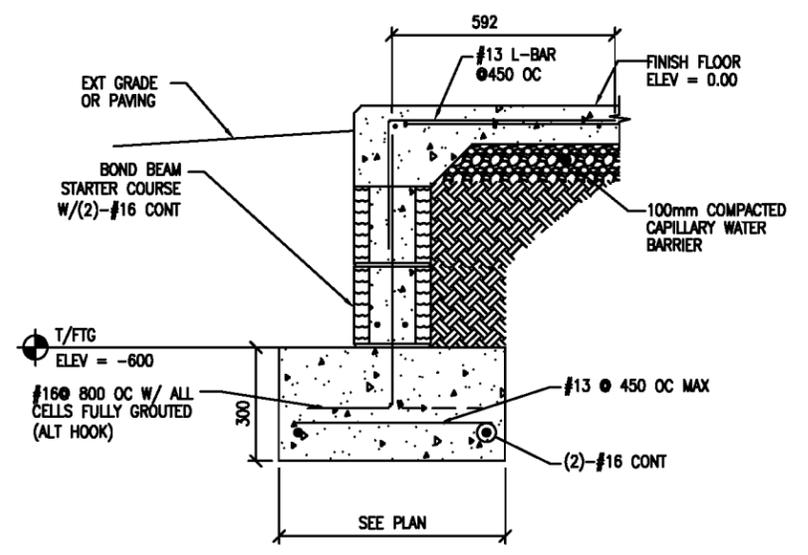
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DRAWN BY: _____	DESIGN FILE NO. _____	FILE NAME: _____
REVIEWED BY: _____	DRAWING CODE: _____	PLOT SCALE: _____
SUBMITTED BY: _____	PROJECT NO. _____	PLOT DATE: _____
U.S. ARMY ENGINEER DISTRICT AFGHANISTAN		
CORPS OF ENGINEERS		
APO AE 96338		
ENGINEERING AND CONSTRUCTION DIVISION		

20 METER WATER TANK
AFGHANISTAN
LIGHTING PROTECTION DETAILS

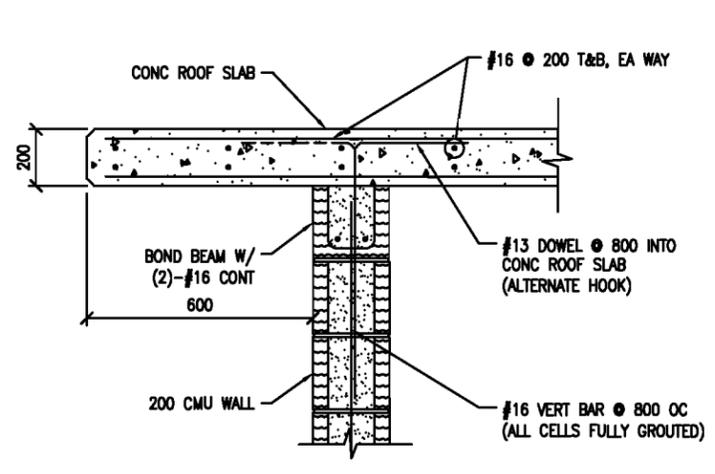
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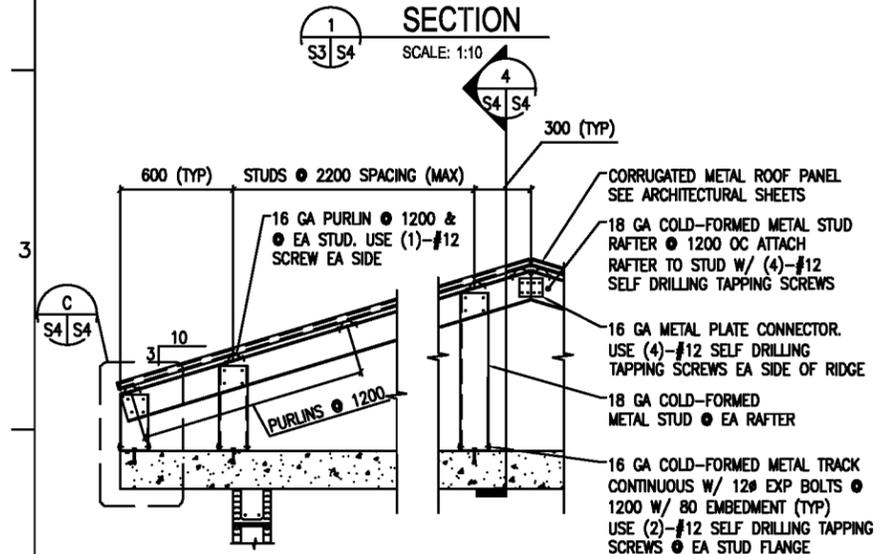
SECTION 1
SCALE: 1:10



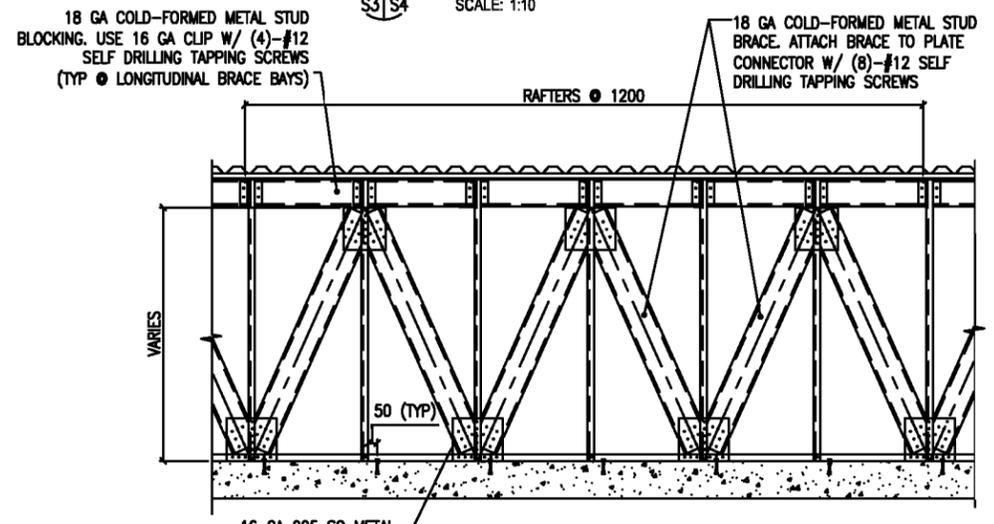
SECTION 2
SCALE: 1:10



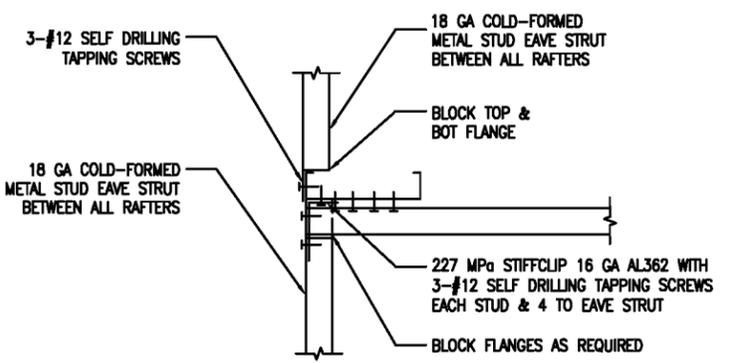
SECTION 3
SCALE: 1:10



SECTION 4
SCALE: 1:10



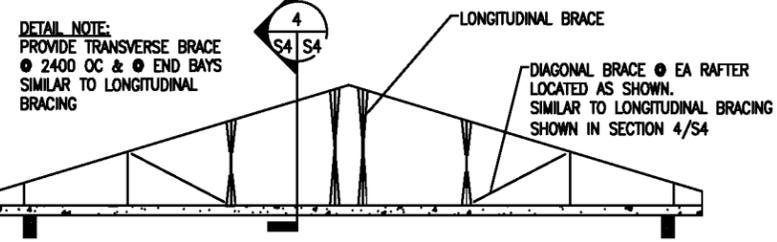
SECTION 5
SCALE: NTS



SECTION 6
SCALE: 1:5

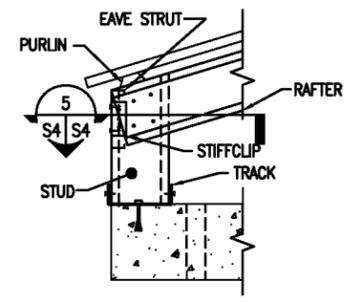
- NOTES:**
- SEE NOTES ON SHEET S1 FOR OVERBUILT ROOF FRAMING MEMBER SECTION PROPERTY MINIMUM REQUIREMENTS
 - AT END OF BLDG PROVIDE TRANSVERSE BRACE @ 2400 OC SIMILAR TO LONGITUDINAL BRACING

TYPICAL OVERBUILT ROOF FRAMING DETAIL
SCALE: 1:20

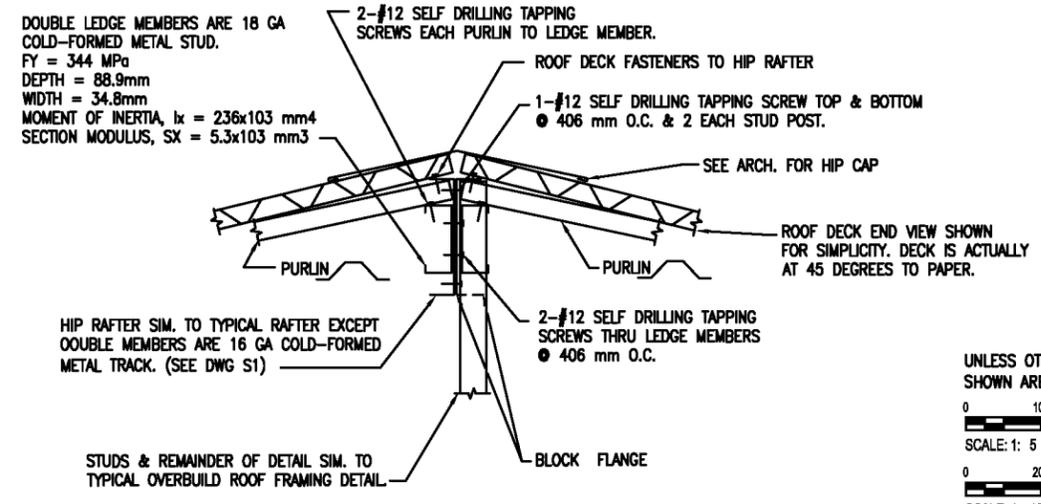


DETAIL NOTE:
PROVIDE TRANSVERSE BRACE @ 2400 OC & @ END BAYS SIMILAR TO LONGITUDINAL BRACING

TYPICAL ROOF BRACE LAYOUT DETAIL
SCALE: NTS



DETAIL 5
SCALE: 1:10



DOUBLE LEDGE MEMBERS ARE 18 GA COLD-FORMED METAL STUD.
FY = 344 MPa
DEPTH = 88.9mm
WIDTH = 34.8mm
MOMENT OF INERTIA, I_x = 236x103 mm⁴
SECTION MODULUS, S_x = 5.3x103 mm³

TYPICAL HIP FRAMING DETAIL
SCALE: 1:5

UNLESS OTHERWISE NOTED, LINEAR DIMENSIONS SHOWN ARE IN MILLIMETERS (MM)

SCALE: 1: 5
SCALE: 1: 10
SCALE: 1: 20

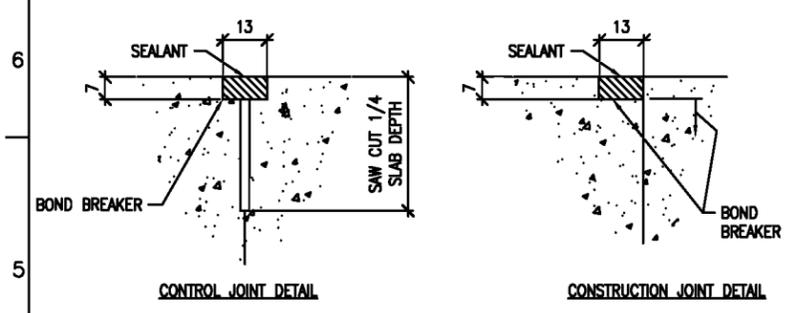
NO.	DATE	DESCRIPTION

DESIGNED BY: CDH	DATE: 08-30-08
DWN BY: MDB	SUBMITTED BY: BAKER
CHK BY: CWW	FILE NO.: ANIPSDS-3040XX
Michael Baker Jr., Inc. A unit of Michael Baker Corporation 100 Arcade Business Park Moon Township, PA 15108 www.mbakercorp.com	

STANDARD DESIGN WELL HOUSE

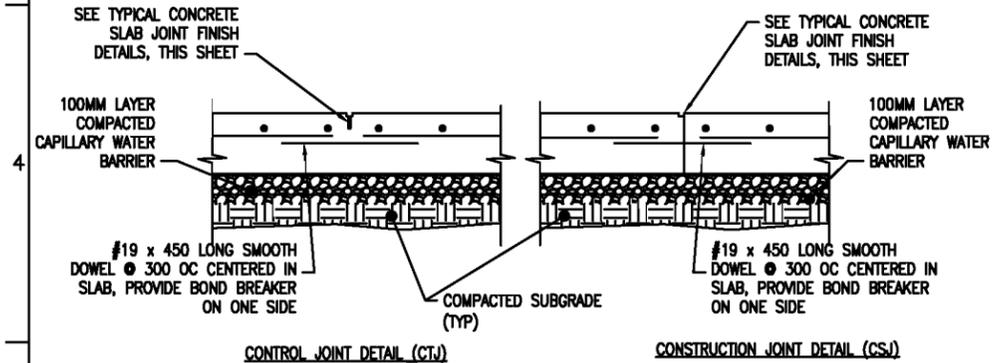
SECTIONS AND DETAILS

SHEET REFERENCE NUMBER:
S4



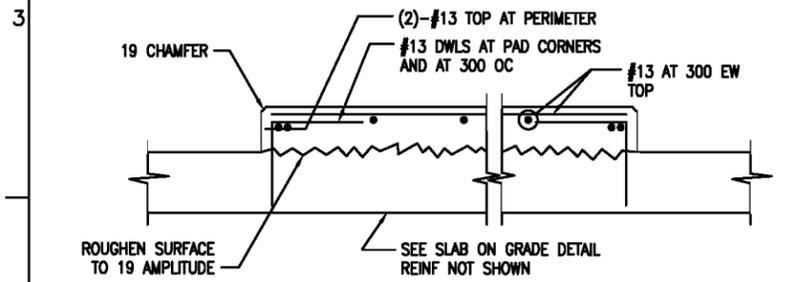
TYPICAL CONCRETE SLAB JOINT FINISH DETAIL

1 S5 SCALE: NTS



TYPICAL SLAB ON GRADE JOINT DETAILS

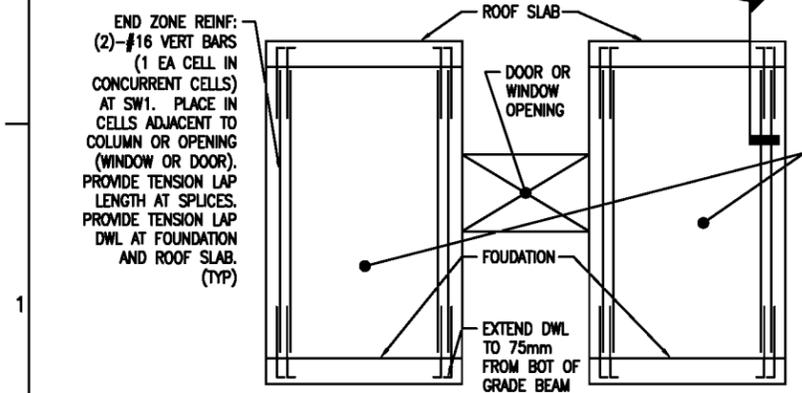
2 S5 SCALE: NTS



INTERIOR EQUIPMENT PAD DETAIL

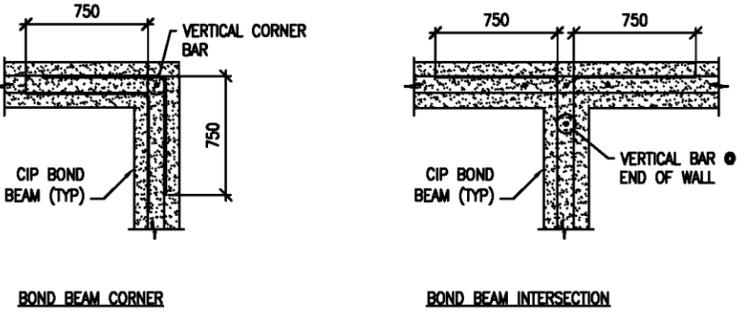
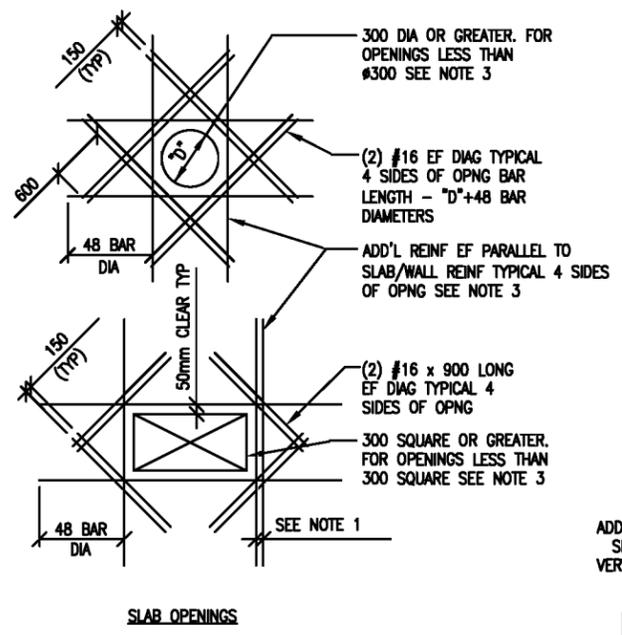
3 S5 SCALE: NTS

DETAIL NOTE:
 1. COORDINATE EQUIPMENT PAD SIZE AND LOCATIONS W/ ELECTRICAL/MECHANICAL SHEETS AND EQUIPMENT MANUFACTURER.



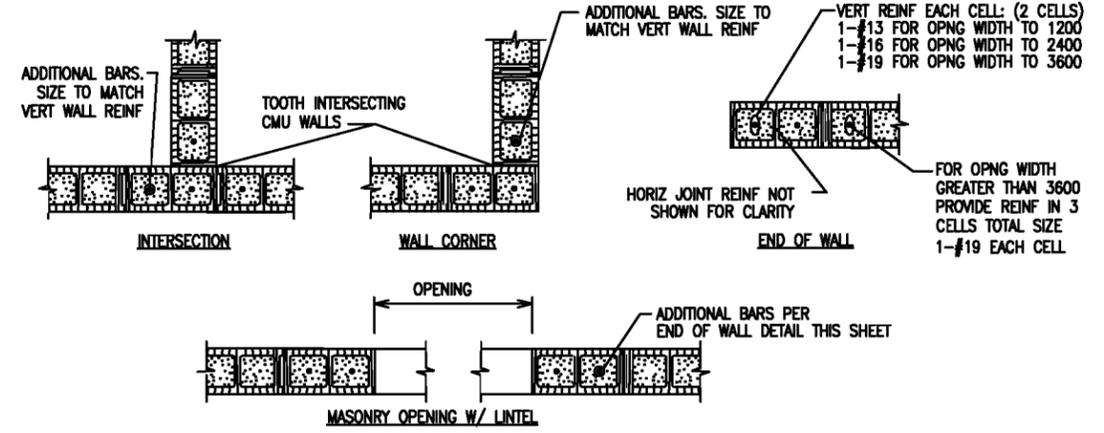
SPECIAL REINFORCED MASONRY SHEAR WALL ELEVATION

4 S5 SCALE: NTS



CIP BOND BEAM DETAILS

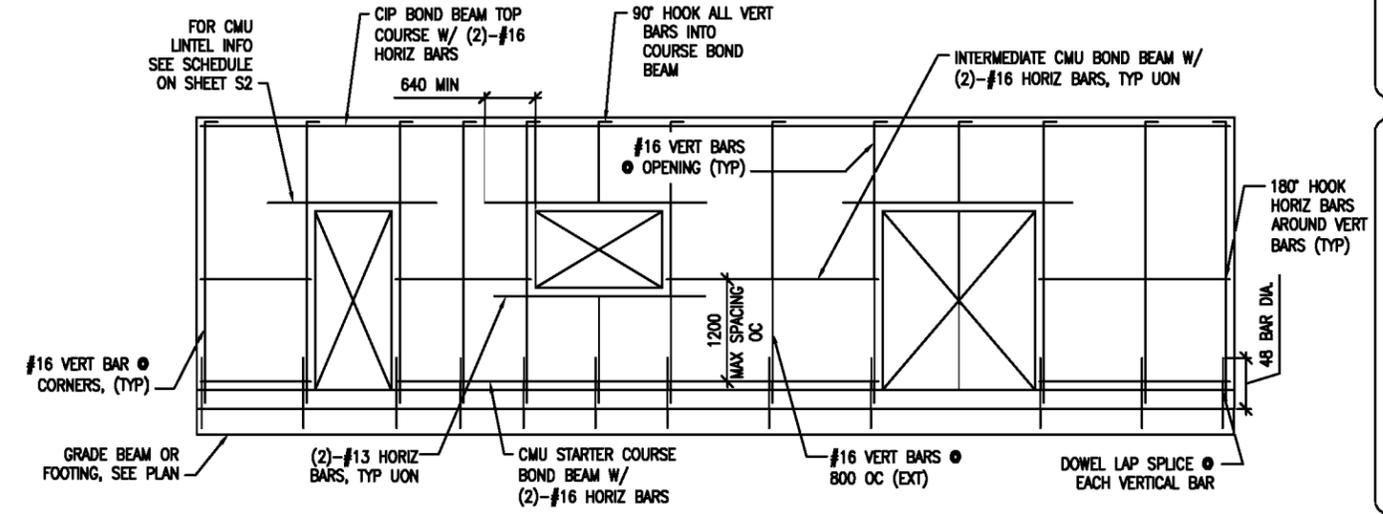
5 S5 SCALE: NTS



NOTES:
 1. OPNG WIDTH SHALL NOT EXCEED 3600 FOR THIS TYPE OF JAMB
 2. ALL CELLS FULLY GROUTED

TYPICAL CMU DETAILS

6 S5 SCALE: NTS



MIN CMU WALL REINFORCING

7 S5 SCALE: NTS

NO.	DATE	DESCRIPTION

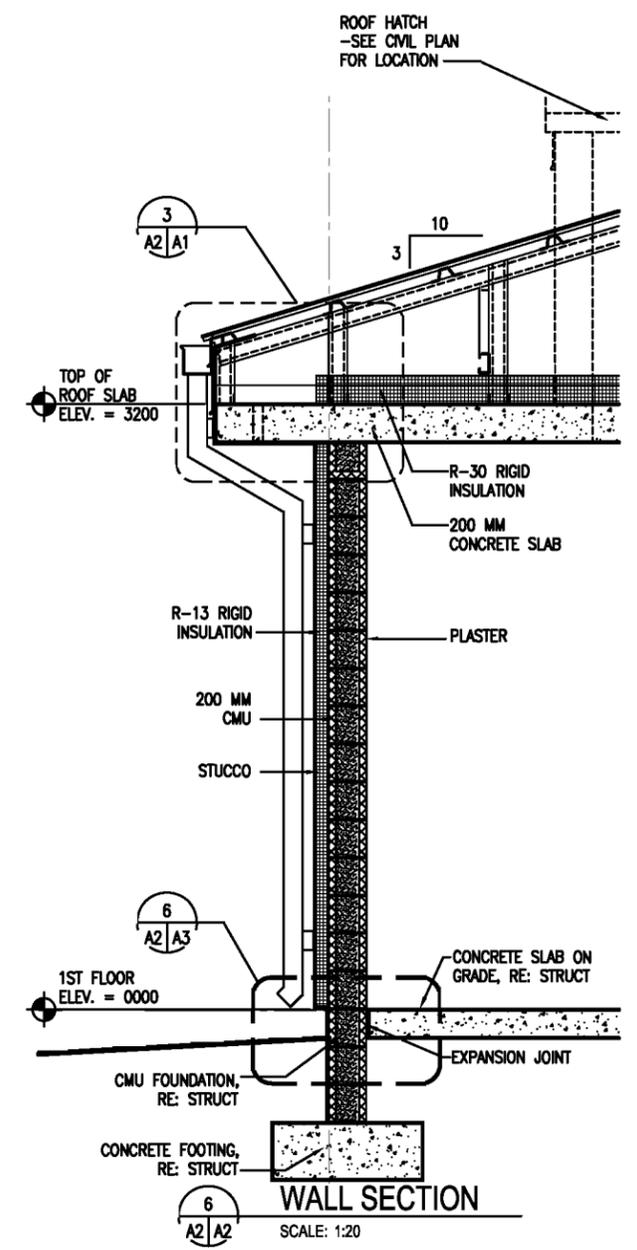
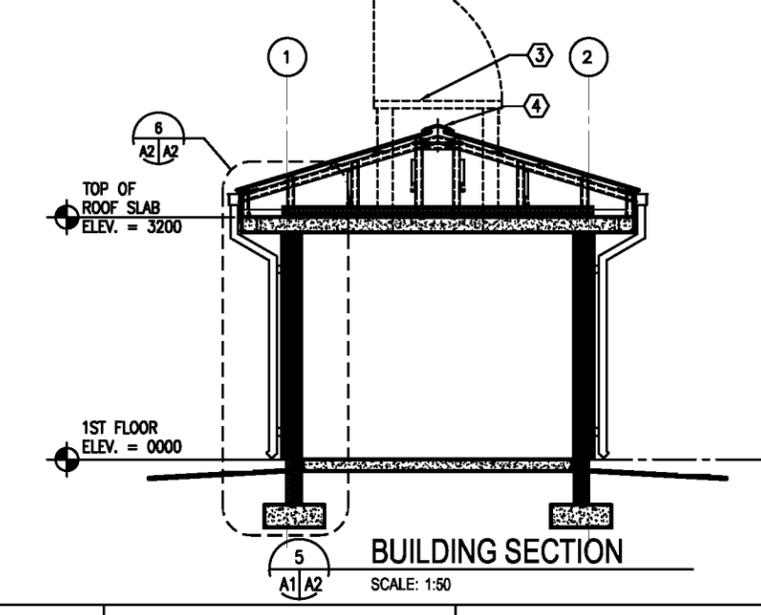
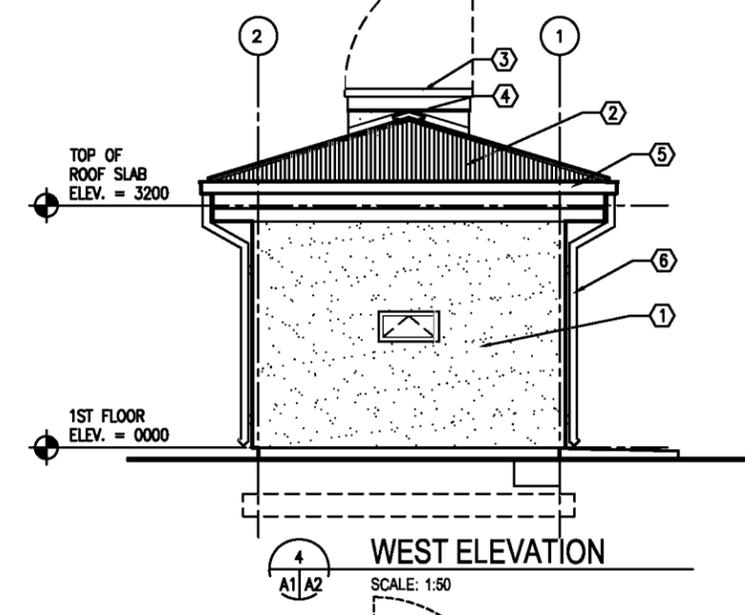
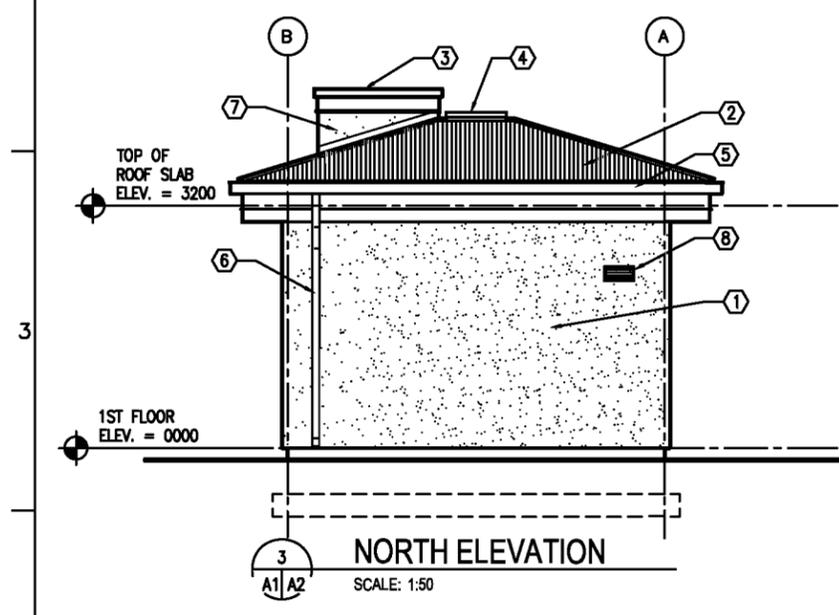
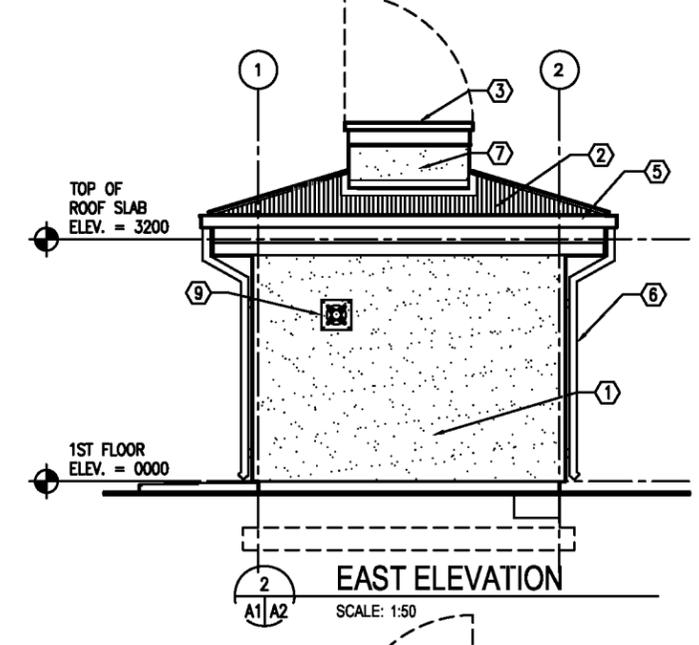
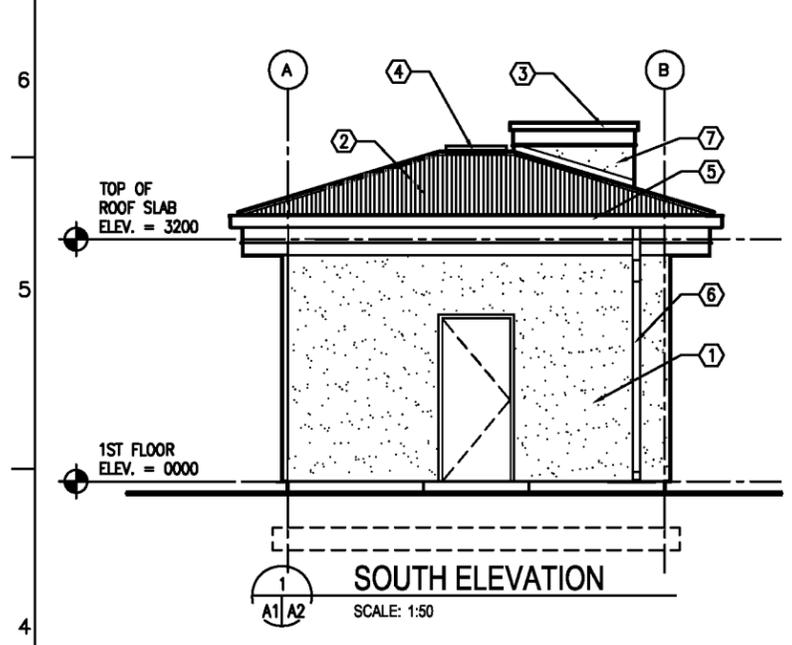
DESIGNED BY:	CDH	DATE:	08-30-08
DWN BY:	RCG	SUBMITTED BY:	BAKER
CHK BY:	CWV	FILE NO.:	ANPSDS-5050XX

Michael Baker Jr., Inc.
 A unit of Michael Baker Corporation
 100 Arcade Business Park
 100 Arcade Drive
 Moon Township, PA 15108
 www.mbakercorp.com

STANDARD DESIGN WELL HOUSE
 TYPICAL DETAILS

SHEET REFERENCE NUMBER:
S5

UNLESS OTHERWISE NOTED, LINEAR DIMENSIONS SHOWN ARE IN MILLIMETERS (MM)



- KEY NOTES:**
1. STUCCO AND RIGID INSULATION SYSTEM ON CMU
 2. CORRUGATED METAL ROOF PANELS ON COLD-FORMED METAL FRAMING
 3. ROOF HATCH WITH CURB. CENTER ON WELL PUMP - RE: CML
 4. RIDGE VENT
 5. METAL GUTTER
 6. METAL DOWNSPOUT WITH SPLASH BLOCK
 7. STUCCO ON CMU
 8. LOUVER - RE: MECHANICAL
 9. EXHAUST FAN - RE: MECHANICAL



NO.	DATE	DESCRIPTION

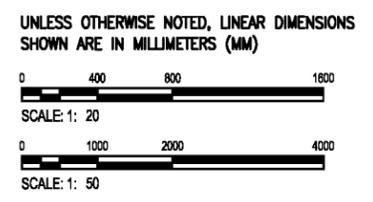
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CHK BY:	NLJ	FILE NO.:	ANPSDA-20200X

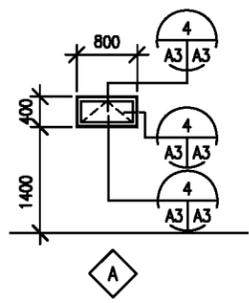
Michael Baker Jr., Inc.
A unit of Michael Baker Corporation
Arlindo Business Park
100 Arlindo Drive
Moon Township PA 15108
www.mbakercorp.com

STANDARD DESIGN
WELL HOUSE

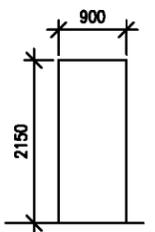
EXTERIOR ELEVATIONS

SHEET
REFERENCE
NUMBER:
A2

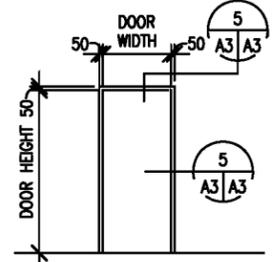




1 WINDOW TYPES
SCALE: 1:50



2 DOOR TYPES
SCALE: 1:50



3 FRAME TYPES
SCALE: 1:50

WINDOW TYPES NOTES:

1. ALL EXTERIOR WINDOWS SHALL BE WOOD WITH INSECT SCREENS. WINDOWS SHALL BE COMMERCIAL GRADE.
2. GLAZING SHALL BE ACRYLIC SHEET.

DOOR TYPES NOTES:

1. INTERIOR AND EXTERIOR METAL DOORS AND FRAME COLORS SHALL MATCH ADJACENT WALL COLORS AS SELECTED BY THE CONTRACTING OFFICER.
2. HARDWARE SHALL BE HEAVY DUTY, COMMERCIAL GRADE, STAINLESS STEEL WITH A MATTE FINISH.
3. FRAMES, EXCEPT FIRE-RATED FRAMES, SHALL BE MOUNTED AND ADJUSTED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. FRAMES SHALL BE FASTENED WITH MINIMUM OF THREE FASTENING POINTS PER SIDE AT REGULAR INTERVALS.
4. DIMENSIONS SHOWN ON DOOR SCHEDULE ARE BASED UPON MODULAR MASONRY (OR ROUGH OPENING), HEIGHT OF 2200mm FOR STANDARD PERSONNEL DOORS. CONTRACTOR SHALL COORDINATE WITH DOOR SUPPLIER TO ENSURE THAT DIMENSIONS OF DOORS AND FRAMES PROVIDED ARE COMPATIBLE WITH DOOR OPENING DIMENSIONS.



HARDWARE TYPES:

- HW-6 1-1/2 PR HINGES
 1 EA LOCKSET, F04 ENTRY LOCK W/LEVERS, GRADE 1
 1 EA DOOR CLOSER, C02061, LOW RESISTANCE
 1 EA THRESHOLD J32130



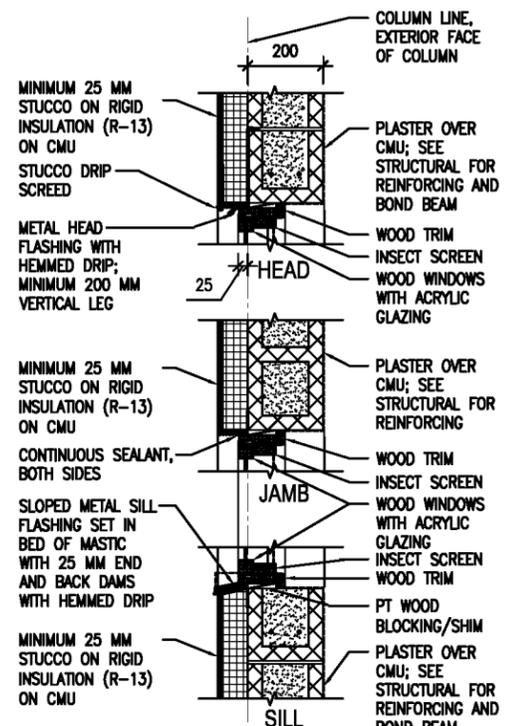
NO.	DATE	DESCRIPTION

DESIGNED BY:	PFF	DATE:	08-30-08
DWN BY:	ECN	SUBMITTED BY:	BAKER
CHK BY:	NLJ	FILE NO.:	ANPSDA-303XXX

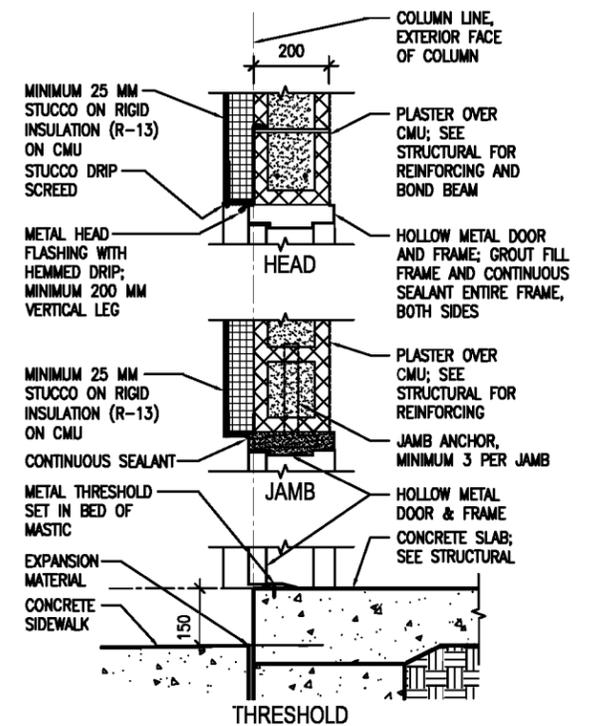
Michael Baker Jr., Inc.
 A unit of Michael Baker Corporation
 Arade Business Park
 100 Arade Drive
 Moon Township PA 15108
 www.mbakercorp.com

STANDARD DESIGN WELL HOUSE
 DOOR, WINDOW & FINISH TYPES & DETAILS

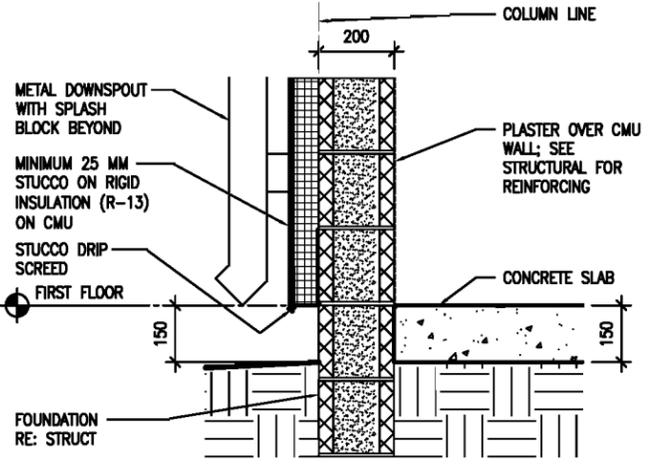
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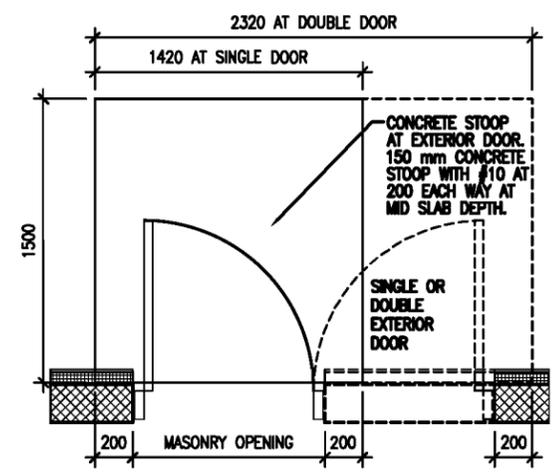
4 WINDOW DETAILS
SCALE: 1:10



5 EXTERIOR DOOR DETAILS
SCALE: 1:10



6 STUCCO BASE DETAIL
SCALE: 1:10



7 CONCRETE STOOP PLAN DETAIL
SCALE: 1:20

UNLESS OTHERWISE NOTED, LINEAR DIMENSIONS SHOWN ARE IN MILLIMETERS (MM)



FIXTURE MARK 'A'



PARABOLIC SURFACE/PENDANT MOUNTED 300MM x 1200MM FLUORESCET FIXTURE WITH ELECTRONIC BALLAST.

FIXTURE MARK 'A2': SAME FIXTURE AS 'A' WITH EMERGENCY BALLAST.

FIXTURE MARK 'C'



INCANDESCENT ONE PIECE WITH APPROVED LENS, STABILIZED HIGH IMPACT POLY CARBONATE

FIXTURE MARK 'H'



REMOTE HEAD EXTERIOR LIGHT HEAD POWERED FROM EXIT SIGN BATTERY- 12V DOUBLE HEAD CORROSION RESISTANT WITH UL34 WEATHERPROOF CONSTRUCTION

FIXTURE MARK 'E'



UNIVERSAL MOUNT ENGINEER GRADE THERMOPLASTIC HOUSING EXIT SIGN WITH LED LAMPS, RED LETTERS 6" IN HEIGHT WITH ARROWS AS INDICATED, WITH 12V CADMIUM BATTERY

LIGHTING FIXTURE SCHEDULE

FIXTURE MARK	STYLE NUMBER AND TYPE	NUMBER AND TYPE OF LAMPS	VOLTAGE	MOUNTING	NOTES
A	PARABOLIC SURFACE/PENDANT MOUNTED 300MM X 1200MM FLUORESCENT FIXTURE WITH ELECTRONIC BALLAST	(2) 32W 3500K	220V - 1ø 50HZ	PENDANT MOUNTED FROM SLOPED CEILINGS	FURNISHED WITH ELECTRONIC BALLAST. PARABOLIC LOUVER SHALL BE SPECULAR LENS IRADESCENCE TYPE.
A2	SAME AS FIXTURE 'A' WITH EMERGENCY BALLAST	(2) 32W 3500K	220V - 1ø 50HZ	PENDANT MOUNTED FROM SLOPED CEILINGS	FURNISHED WITH ELECTRONIC BALLAST. PARABOLIC LOUVER SHALL BE SPECULAR LENS IRADESCENCE TYPE. EMERGENCY BALLAST SELF TEST.
C	INCANDESCENT ONE PIECE W/ APPROVED LENS STABILIZED HIGH IMPACT POLY CARBONATE.	(1) A19 - 100W INCANDESCENT	220V - 1ø 50HZ	WALL MOUNTED ABOVE EXTERIOR DOORS	
H	REMOTE HEAD EXTERIOR LIGHT HEAD POWERED FROM EXIT SIGN BATTERY- 12V DOUBLE HEAD CORROSION RESISTANT WITH UL34 WEATHERPROOF CONSTRUCTION	(2) 12W/12V HALOGEN LAMP	12V - 1ø 50HZ	EXTERIOR WALL MOUNTED AT TOP OF DOOR HEIGHT	
E	UNIVERSAL MOUNT ENGINEER GRADE THERMOPLASTIC HOUSING EXIT SIGN WITH LED LAMPS, RED LETTERS 6" IN HEIGHT WITH ARROWS AS INDICATED, WITH 12V CADMIUM BATTERY WITH REMOTE HEAD CAPABILITY	LED LAMPS	220V - 1ø 50HZ	UNIVERSAL MOUNTING	

US Army Corps of Engineers
Afghanistan Engineer District

SYMBOL	DESCRIPTION	DATE	BY

DESIGNED BY: JRC DATE: 08-30-08
 DWN BY: JRC SUBMITTED BY: BAKER
 CHK BY: JRC FILE NO.: ANPSDE-603XXX

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STANDARD DESIGN WELL HOUSE
 LIGHT FIXTURE SCHEDULE

SHEET REFERENCE NUMBER:
E3

100% SUBMISSION