

POSTED 12/02/10

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**PN 74129**  
**Troop Housing - Phase 5**  
Kandahar, Afghanistan  
December 2, 2010



**US Army Corps of Engineers**  
**Middle East District**



**TETRA TECH**

Solicitation  
W912ER-10-X-XXXX

# INDEX OF DRAWINGS - 8 BARRACKS COMPLEX

## PN# 74129 - PHASE 5

CORRECTED  
FINAL  
DESIGN  
RE-ISSUED

SHEET REFERENCE NUMBER	ISSUE STATUS	DATE OF ISSUE	DRAWING TITLE
<b>GENERAL DRAWINGS</b>			
AF1082-G-000	REV 0	12/02/10	TITLE SHEET
AF1082-G-001	REV 0	12/02/10	INDEX OF DRAWINGS SHEET 1 OF 3
AF1082-G-002	REV 0	10/19/10	INDEX OF DRAWINGS SHEET 2 OF 3
AF1082-G-003	REV 0	10/19/10	INDEX OF DRAWINGS SHEET 3 OF 3
<b>SITE CIVIL DRAWINGS</b>			
AF1082-C-001	REV 0	12/02/10	CIVIL GENERAL NOTES, LEGEND AND ABBREVIATIONS
AF1082-C-002	REV 0	10/19/10	LOCATION AND VICINITY PLAN
AF1082-C-003	REV 0	10/19/10	OVERALL SITE LOCATION PLAN
AF1082-C-004	REV 0	10/19/10	DEMOLITION PLAN
AF1082-C-100	REV 0	10/19/10	OVERALL SITE PLAN
AF1082-C-110	REV 0	10/19/10	SITE UTILITY PLAN
AF1082-C-111	REV 0	10/19/10	ENLARGED SITE UTILITY PLAN SHEET 1 OF 2
AF1082-C-112	REV 0	10/19/10	ENLARGED SITE UTILITY PLAN SHEET 2 OF 2
AF1082-C-200	REV 0	10/19/10	TYPICAL SITE LAYOUT DETAILS SHEET 1 OF 3
AF1082-C-201	REV 0	10/19/10	TYPICAL SITE LAYOUT DETAILS SHEET 2 OF 3
AF1082-C-202	REV 0	10/19/10	TYPICAL SITE LAYOUT DETAILS SHEET 3 OF 3
AF1082-C-203	REV 0	12/02/10	TYPICAL SITE UTILITY DETAILS
AF1082-C-210	REV 0	12/02/10	WATER BOOSTER PUMP STATION PLAN, SECTION AND DETAILS
AF1082-C-211	REV 0	12/02/10	WATER STORAGE TANK PLAN AND DETAILS
AF1082-C-212	REV 0	12/02/10	WATER AND WASTEWATER STORAGE TANK PIPE DETAILS
AF1082-C-220	REV 0	12/02/10	SEWAGE LIFT STATION PLAN AND SECTIONS

SHEET REFERENCE NUMBER	ISSUE STATUS	DATE OF ISSUE	DRAWING TITLE
AF1082-C-221	REV 0	12/02/10	SEWAGE LIFT STATION VALVE PIT PLAN AND SECTIONS
AF1082-C-222	REV 0	10/19/10	SEWAGE LIFT STATION CONTROL PANEL DIAGRAMS AND DETAILS
AF1082-C-223	REV 0	12/02/10	WASTEWATER STORAGE TANK PLAN AND DETAILS
AF1082-C-300	REV 0	10/19/10	SITE INFRASTRUCTURE GENERAL NOTES AND TYPICAL DETAILS
AF1082-C-301	REV 0	10/19/10	PIPE SUPPORT DETAILS
AF1082-C-302	REV 0	10/19/10	STORAGE TANK FOUNDATION PLAN AND SECTIONS
AF1082-C-303	REV 0	10/19/10	SEWAGE LIFT STATION DETAILS
AF1082-C-304	REV 0	10/19/10	SEWAGE LIFT STATION VALVE PIT DETAILS
AF1082-C-305	REV 0	10/19/10	SEWER MANHOLE DETAILS
AF1082-C-306	REV 0	10/19/10	ELECTRIC VAULT DETAILS
AF1082-C-307	REV 0	10/19/10	FUEL STORAGE CONTAINMENT DETAILS
<b>SITE PLUMBING DRAWINGS</b>			
AF1082-P-001	REV 0	10/19/10	PLUMBING LEGEND, ABBREVIATIONS SYMBOLS AND GENERAL NOTES
AF1082-P-010	REV 0	10/19/10	FUEL TANK PLAN AND SCHEMATIC
<b>SITE ELECTRICAL DRAWINGS</b>			
AF1082-E-001	REV 0	10/19/10	ELECTRICAL LEGEND, ABBREVIATIONS, SYMBOLS AND GENERAL NOTES
AF1082-E-010	REV 0	10/19/10	ELECTRICAL OVERALL SITE PLAN
AF1082-E-011	REV 0	10/19/10	ELECTRICAL SITE PLAN SHEET 1 OF 3
AF1082-E-012	REV 0	10/19/10	ELECTRICAL SITE PLAN SHEET 2 OF 3
AF1082-E-013	REV 0	10/19/10	ELECTRICAL SITE PLAN SHEET 3 OF 3
AF1082-E-020	REV 0	10/19/10	ELECTRICAL SITE ONE-LINE DIAGRAM

SHEET REFERENCE NUMBER	ISSUE STATUS	DATE OF ISSUE	DRAWING TITLE
AF1082-E-021	REV 0	10/19/10	ELECTRICAL DETAILS SHEET 1 OF 4
AF1082-E-022	REV 0	10/19/10	ELECTRICAL DETAILS SHEET 2 OF 4
AF1082-E-023	REV 0	10/19/10	ELECTRICAL DETAILS SHEET 3 OF 4
AF1082-E-024	REV 0	10/19/10	ELECTRICAL DETAILS SHEET 4 OF 4
<b>SITE TELECOM DRAWINGS</b>			
AF1082-TC-001	REV 0	10/19/10	TELECOMMUNICATIONS LEGEND, ABBREVIATIONS, SYMBOLS AND GENERAL NOTES
AF1082-TC-010	REV 0	10/19/10	TELECOMMUNICATIONS OVERALL SITE PLAN
AF1082-TC-011	REV 0	10/19/10	TELECOMMUNICATIONS SITE PLAN SHEET 1 OF 3
AF1082-TC-012	REV 0	10/19/10	TELECOMMUNICATIONS SITE PLAN SHEET 2 OF 3
AF1082-TC-013	REV 0	10/19/10	TELECOMMUNICATIONS SITE PLAN SHEET 3 OF 3
AF1082-TC-020	REV 0	10/19/10	TELECOMMUNICATIONS DETAILS SHEET 1 OF 6
AF1082-TC-021	REV 0	10/19/10	TELECOMMUNICATIONS DETAILS SHEET 2 OF 6
AF1082-TC-022	REV 0	10/19/10	TELECOMMUNICATIONS DETAILS SHEET 3 OF 6
AF1082-TC-023	REV 0	10/19/10	TELECOMMUNICATIONS DETAILS SHEET 4 OF 6
AF1082-TC-024	REV 0	10/19/10	TELECOMMUNICATIONS DETAILS SHEET 5 OF 6
AF1082-TC-025	REV 0	10/19/10	TELECOMMUNICATIONS DETAILS SHEET 6 OF 6

SYMB	DATE	DESCRIPTION
0	12/02/10	SGW
0	10/19/10	SGW
0	10/05/10	SGW
B	10/05/10	SGW
A	08/31/10	SGW

DESIGNED BY: PJB	DATE: 12/02/10
DRAWN BY: PJB	SUBMITTED BY: TETRA TECH
CHECKED BY: PDC	FILE NO.: AF1082-GI-001GN

**US Army Corps of Engineers**  
Middle East District

**TETRA TECH**

THESE DRAWINGS ARE "NOT APPROVED FOR CONSTRUCTION" SINCE THESE ARE BASED UPON ASSUMED CONDITIONS. THE CONTRACTOR SHALL NOT PROCEED WITH CONSTRUCTION UNTIL THE ASSUMED CONDITIONS ARE VALIDATED AND APPROVAL IS RECEIVED FROM THE CONTRACTING OFFICER.



AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

INDEX OF DRAWINGS  
SHEET 1 OF 3

SHEET REFERENCE NUMBER:  
**AF1082 G-001**

# INDEX OF DRAWINGS - 8 BARRACKS COMPLEX PN# 74129 - PHASE 5

CORRECTED  
FINAL  
DESIGN  
SUBMITTAL

SHEET REFERENCE NUMBER	ISSUE STATUS	DATE OF ISSUE	DRAWING TITLE
<b>ARCHITECTURAL DRAWINGS</b>			
AF1082A-A-001	REV 0	09/15/10	ARCHITECTURAL SYMBOLS AND ABBREVIATIONS, BUILDING CODE AND CONSTRUCTION DATA
AF1082A-A-100	REV 0	09/15/10	GROUND FLOOR PLAN
AF1082A-A-101	REV 0	09/15/10	FIRST FLOOR PLAN
AF1082A-A-102	REV 0	09/15/10	GROUND FLOOR REFLECTED CEILING PLAN
AF1082A-A-103	REV 0	09/15/10	FIRST FLOOR REFLECTED CEILING PLAN
AF1082A-A-104	REV 0	09/15/10	ROOF PLAN
AF1082A-A-105	REV 0	09/15/10	EXTERIOR ELEVATIONS SHEET 1 OF 2
AF1082A-A-106	REV 0	09/15/10	EXTERIOR ELEVATIONS SHEET 2 OF 2
AF1082A-A-107	REV 0	09/15/10	BUILDING SECTIONS
AF1082A-A-200	REV 0	09/15/10	WALL SECTIONS SHEET 1 OF 2
AF1082A-A-201	REV 0	09/15/10	WALL SECTIONS SHEET 2 OF 2
AF1082A-A-202	REV 0	09/15/10	MISCELLANEOUS DETAILS SHEET 1 OF 2
AF1082A-A-203	REV 0	09/15/10	MISCELLANEOUS DETAILS SHEET 2 OF 2
AF1082A-A-204	REV 0	09/15/10	DOOR DETAILS, DOOR AND FINISH SCHEDULES
AF1082A-A-205	REV 0	09/15/10	ENLARGED STAIR PLANS AND SECTIONS
AF1082A-A-206	REV 0	09/15/10	STAIR DETAILS
AF1082A-A-300	REV 0	09/15/10	ENLARGED FLOOR PLAN, INTERIOR ELEVATIONS AND ACCESSORY SCHEDULE
AF1082A-A-303	REV 0	09/15/10	SIGNAGE DETAILS
<b>STRUCTURAL DRAWINGS</b>			
AF1082A-S-001	REV 0	09/15/10	STRUCTURAL GENERAL NOTES SHEET 1 OF 2
AF1082A-S-002	REV 0	09/15/10	STRUCTURAL GENERAL NOTES SHEET 2 OF 2

SHEET REFERENCE NUMBER	ISSUE STATUS	DATE OF ISSUE	DRAWING TITLE
AF1082A-S-100	REV 0	09/15/10	FOUNDATION MAT LAYOUT PLAN
AF1082A-S-101	REV 0	09/15/10	GROUND FLOOR WALL LAYOUT PLAN
AF1082A-S-102	REV 0	09/15/10	FIRST FLOOR SLAB/BEAM FRAMING PLAN
AF1082A-S-103	REV 0	09/15/10	FIRST FLOOR WALL LAYOUT PLAN
AF1082A-S-104	REV 0	09/15/10	ROOF SLAB/BEAM FRAMING PLAN
AF1082A-S-105	REV 0	09/15/10	ENLARGED SLAB PLAN LATRINE AREA
AF1082A-S-200	REV 0	09/15/10	SHEARWALL ELEVATIONS
AF1082A-S-300	REV 0	09/15/10	MAT SLAB DETAILS SHEET 1 OF 2
AF1082A-S-301	REV 0	09/15/10	MAT SLAB DETAILS SHEET 2 OF 2
AF1082A-S-310	REV 0	09/15/10	CONCRETE BEAM AND COLUMN DETAILS SHEET 1 OF 3
AF1082A-S-311	REV 0	09/15/10	CONCRETE BEAM AND COLUMN DETAILS SHEET 2 OF 3
AF1082A-S-312	REV 0	09/15/10	CONCRETE BEAM AND COLUMN DETAILS SHEET 3 OF 3
AF1082A-S-313	REV 0	09/15/10	SHEARWALL SECTIONS SHEET 1 OF 2
AF1082A-S-314	REV 0	09/15/10	SHEARWALL SECTIONS SHEET 2 OF 2
AF1082A-S-320	REV 0	09/15/10	MASONRY DETAILS SHEET 1 OF 4
AF1082A-S-321	REV 0	09/15/10	MASONRY DETAILS SHEET 2 OF 4
AF1082A-S-322	REV 0	09/15/10	MASONRY DETAILS SHEET 3 OF 4
AF1082A-S-323	REV 0	09/15/10	MASONRY DETAILS SHEET 4 OF 4
AF1082A-S-330	REV 0	09/15/10	STEEL STAIR DETAILS SHEET 1 OF 2
AF1082A-S-331	REV 0	09/15/10	STEEL STAIR DETAILS SHEET 2 OF 2
AF1082A-S-332	REV 0	09/15/10	RCU SUPPORT PLAN, SECTIONS AND DETAILS

SHEET REFERENCE NUMBER	ISSUE STATUS	DATE OF ISSUE	DRAWING TITLE
<b>MECHANICAL DRAWINGS</b>			
AF1082A-M-001	REV 0	09/15/10	MECHANICAL SYMBOLS, ABBREVIATIONS, LEGEND AND GENERAL NOTES
AF1082A-M-100	REV 0	09/15/10	GROUND FLOOR MECHANICAL PLAN
AF1082A-M-101	REV 0	09/15/10	FIRST FLOOR MECHANICAL PLAN
AF1082A-M-102	REV 0	09/15/10	ROOF MECHANICAL PLAN
AF1082A-M-103	REV 0	09/15/10	ENLARGED MECHANICAL PLANS LATRINE AREA
AF1082A-M-200	REV 0	09/15/10	MECHANICAL SECTIONS AND ELEVATIONS
AF1082A-M-201	REV 0	09/15/10	MECHANICAL DETAILS SHEET 1 OF 2
AF1082A-M-202	REV 0	09/15/10	MECHANICAL DETAILS SHEET 2 OF 2
AF1082A-M-203	REV 0	09/15/10	MECHANICAL CONTROL SCHEMATICS
AF1082A-M-204	REV 0	09/15/10	MECHANICAL SCHEDULES
<b>PLUMBING DRAWINGS</b>			
AF1082A-P-001	REV 0	09/15/10	PLUMBING LEGEND, ABBREVIATIONS SYMBOLS AND GENERAL NOTES
AF1082A-P-100	REV 0	09/15/10	GROUND FLOOR AND FOUNDATION PLANS
AF1082A-P-101	REV 0	09/15/10	FIRST FLOOR AND FIRST FLOOR SANITARY PLANS
AF1082A-P-102	REV 0	09/15/10	SANITARY AND VENT ISOMETRIC PLANS
AF1082A-P-103	REV 0	09/15/10	PLUMBING WATER RISER DIAGRAM
AF1082A-P-104	REV 0	09/15/10	PLUMBING DETAILS

DATE	10/19/10
DESCRIPTION	CORRECTED FINAL DESIGN SUBMITTAL
DATE	10/05/10
DESCRIPTION	FINAL DESIGN SUBMITTAL
DATE	
DESCRIPTION	

DESIGNED BY: DATE: 10/19/10  
 PJB  
 DRAWN BY: SUBMITTED BY: TETRA TECH  
 PJB  
 CHECKED BY: FILE NO.: AF1082-GI-002GN  
 PDC

**US Army Corps of Engineers**  
Middle East District

**TETRA TECH**

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AUSTERE STANDARD DESIGNS - PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

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SHEET REFERENCE NUMBER:  
**AF1082  
 G-002**



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**GENERAL NOTES:**

1. INFORMATION REGARDING APPROXIMATE SITE LIMITS, ADJACENT ROAD AND WALKWAYS AND LOCATIONS OF EXISTING IMPROVEMENTS PROVIDED BY USACE-MED ON JULY 16, 2010 VIA ELECTRONIC TRANSMISSION. THIS IS NOT INTENDED TO BE AS-BUILT INFORMATION AND IS TO BE VERIFIED BY THE CONTRACTOR.
2. CONTRACTOR SHALL PERFORM SITE SURVEY AND GEOTECHNICAL INVESTIGATION PRIOR TO STARTING CONSTRUCTION IN ACCORDANCE WITH SPECIFICATION SECTION 02 21 00 AND 02 33 00.
3. CONTRACTOR SHALL SUBMIT SITE GRADING AND DRAINAGE PLANS TO CONTRACTING OFFICER FOR APPROVAL FOLLOWING SITE SURVEY AND GEOTECHNICAL REPORT PRIOR TO COMMENCING CONSTRUCTION. THE DRAINAGE PLANS SHALL BE DESIGNED FOR THE 10 YEAR DESIGN STORM IN ACCORDANCE WITH UFC 3-230-17FA DRAINAGE IN AREAS OTHER THAN AIRFIELDS. REFER TO SPECIFICATION SECTION 31 00 00 FOR ADDITIONAL INFORMATION.
4. APPROXIMATE SITE LIMITS HAVE BEEN PROVIDED BY USACE-MED. ALL LAYOUT DIMENSIONS TO THE SITE LIMITS SHALL BE CONFIRMED BY THE CONTRACTOR BASED ON THE SITE SURVEY AND THROUGH COORDINATION WITH CONTRACTING OFFICER.
5. ALL BUILDING LAYOUT DIMENSIONS ARE TO THE OUTSIDE EDGE OF THE BUILDING WALL.
6. ALL CONCRETE PAD LAYOUT DIMENSIONS SHOWN ON THE SITE PLAN ARE REPRESENTATIVE OF SPECIFIC EQUIPMENT INSTALLATION SELECTED DURING THE DESIGN PROCESS. THE CONTRACTOR SHALL DETERMINE THE ACTUAL CONCRETE PAD DIMENSIONS BASED ON THE SELECTED AND APPROVED EQUIPMENT INSTALLATION.
7. ALL SUN SHADES AND MISC. ENCLOSURES SHALL BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR IN ACCORDANCE WITH SPECIFICATION 05 50 13. A MINIMUM OF 1 METER CLEARANCE ON ALL SIDES AND ABOVE THE TALLEST ELEMENT OF EACH UNIT SHALL BE PROVIDED. ALL DIMENSIONS SHOWN ON THE SITE PLAN ARE REPRESENTATIVE OF SPECIFIC EQUIPMENT INSTALLATION SELECTED DURING THE DESIGN PROCESS. THE CONTRACTOR SHALL DETERMINE THE ACTUAL CONCRETE PAD DIMENSIONS BASED ON THE SELECTED AND APPROVED EQUIPMENT INSTALLATION. SUNSHADE FOUNDATION DESIGN SHALL BE PERFORMED BY THE MANUFACTURERS ENGINEER.
8. REFER TO CONCRETE SPECIFICATIONS 03 31 00.00 10 FOR CONCRETE STRENGTH REQUIREMENTS.
9. ALL SITE PLAN DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
10. SET FINISH FLOOR ELEVATION AT 150mm ABOVE FINISH GRADE. PLACE 100mm OF NATIVE COMPACTED CRUSHED STONE WITHIN THE SITE LIMITS SLOPED AWAY FROM BUILDING.
11. SIDEWALKS SHALL BE INSTALLED BETWEEN BUILDINGS AND EXISTING WALKWAYS AS SHOWN ON PLAN. SIDEWALK MATERIAL FOR BASE BID SHALL BE 150mm THICK COMPACTED GRAVEL; BID OPTION SHALL BE CONCRETE PER DETAIL SHEETS FOR MORE INFORMATION.
12. ALL WORK DONE OUTSIDE SITE LIMIT ASSOCIATED WITH SITE ENTRANCE TO BE DONE BY OTHERS.
13. FINISH FLOOR ELEVATION IS BASED ON AN ASSUMED DATUM. REFER TO ARCHITECTURAL DRAWINGS FOR FINISH FLOOR ELEVATION.
14. CONCRETE BARRIER WALLS SHOULD BE DESIGNED AS APPROPRIATE TO ALLOW FOR SHIPMENT AND HANDLING BY COMMONLY AVAILABLE MEANS. HOWEVER, TO PROVIDE NECESSARY WEAPON PROTECTION, IN NO CASE SHOULD THE CONCRETE BARRIERS BE LESS THAN 300mm THICK AND 2000mm HIGH. WITH REGARDS TO PLACEMENT, WALLS MUST BE CONNECTED TO ADJACENT SECTIONS TO MINIMIZE OVERTURNING.
15. REFER TO ELECTRICAL DRAWINGS FOR GENERATOR AND OTHER SITE ELECTRICAL INFORMATION.
16. REFER TO PLUMBING DRAWINGS FOR DIESEL FUEL STORAGE TANK AND ASSOCIATED PIPING INFORMATION WITHIN APPROXIMATE SITE LIMITS.
17. REFER TO SPECIFICATION 05 50 13 FOR WATER BOOSTER PUMP ENCLOSURE INFORMATION.
18. INFORMATION REGARDING EXISTING CONTROL POINTS PROVIDED BY USACE-AES ON SEPTEMBER 12, 2010 VIA ELECTRONIC TRANSMISSION. REFERENCED CONTROL POINT DATUM IS WGS 84/UTM 41. THIS IS NOT INTENDED TO BE AS-BUILT INFORMATION AND IS TO BE VERIFIED BY THE CONTRACTOR.
19. BUILDING FOUNDATIONS TO BE PARALLEL AND PERPENDICULAR TO THE NORTHWEST PARCEL LINE.

**UTILITY NOTES:**

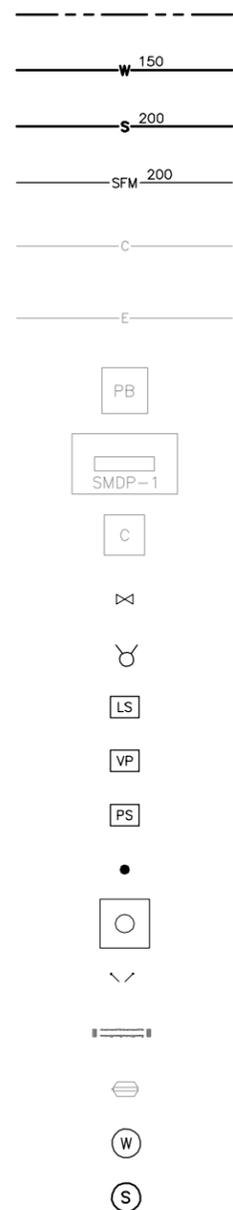
1. INFORMATION REGARDING LOCATIONS OF EXISTING AND FUTURE BASE UTILITIES (WATER DISTRIBUTION AND SEWER SYSTEM) PROVIDED BY USACE-MED ON MAY 14TH 2010 AND THE FIRST OF JUNE 2010 VIA ELECTRONIC TRANSMISSION. IF EITHER OR BOTH UTILITY CONNECTION BID OPTIONS ARE SELECTED, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE CONNECTION LOCATIONS.
2. CONTRACTOR TO PROVIDE A 150mm DIAMETER SEWER LATERAL SLOPED AT A MINIMUM OF 1.0% FROM THE BUILDING REFER TO PLUMBING DRAWINGS FOR CONNECTION POINT.
3. CONTRACTOR TO PROVIDE A 200mm SEWER MAIN SLOPED AT A MINIMUM OF 0.5% FROM SMH #1 TO SEWER LIFT STATION.
4. UNDERGROUND PRESSURE PIPING SHALL BE SCH-80 PVC UNLESS OTHERWISE NOTED
5. ALL ABOVE GROUND PIPE INCLUDING ALL PIPING IN THE SEWAGE LIFT STATION AND VALVE PIT SHALL BE SCH 80 GALVANIZED STEEL OR DUCTILE IRON UNLESS OTHERWISE NOTED AND PAINTED BLUE IN ACCORDANCE WITH SPECIFICATION 09 90 00.

**UTILITY NOTES (CONT'D)**

6. PIPING RESTRAINTS TO BE THRUST BLOCKS, MECHANICAL RESTRAINT OR APPROVED EQUAL. CONTRACTOR TO PROVIDE SUPPORT DOCUMENTATION FOR PIPE RESTRAINTS ON ALL PIPING UNDER PRESSURE.
7. DOMESTIC WATER STORAGE TANK AND THE WASTEWATER STORAGE TANKS VOLUMES LISTED ON THE APPROPRIATE DRAWINGS ARE MINIMUM USABLE VOLUMES WHICH MUST EXIST ABOVE THE OUTLET AND A MINIMUM OF 150mm BELOW THE OVERFLOW. CONTRACTOR MAY PROVIDE EITHER A CIRCULAR OR RECTANGULAR STEEL BOLTED TANK FOR THE DOMESTIC WATER STORAGE TANK AND THE WASTEWATER STORAGE TANK.
8. INSTALLATION OF WATER AND SEWER SERVICES TO THE BUILDINGS SHALL BE PERFORMED BY THE CONTRACTOR. THE CONTRACTOR SHALL COORDINATE THE TYPE, SIZE, AND MATERIAL FOR CONNECTION TO THE BUILDING SERVICE CONNECTION.
9. ELEVATION OF TANK PENETRATIONS AND TANK FILL AND OUTLET PIPES TO BE COORDINATED WITH TANK MANUFACTURER'S REQUIREMENTS.
10. THE CONTRACTOR SHALL COORDINATE WITH THE CONTRACTING OFFICER THE SIZE AND TYPE OF PIPE CONNECTION REQUIRED FOR THE REMOTE DOMESTIC WATER FILL POINT AND SEWER TANK SUCTION POINT TO ENSURE COMPATIBILITY WITH TANKER TRUCKS. PROVIDE LOCKABLE CAP AND BRASS CHAIN AT FILL AND SUCTION POINTS. SIZE TO BE COORDINATED WITH FIELD CONTRACTING OFFICER.
11. FLEXIBLE COUPLINGS ARE REQUIRED BETWEEN THE TRANSITION OF UNDERGROUND AND ABOVE GROUND PIPING AT THE CONNECTION TO THE BUILDING PIPING, OR AS SHOWN ON THE DRAWINGS. FLEXIBLE COUPLING WILL BE NEOPRENE TUBE REINFORCED WITH MULTIPLE PLYS OF NYLON TIRE CORD WITH A NEOPRENE COVER. FLEXIBLE COUPLINGS 600MM ID OR LESS SHALL BE SINGLE SPHERE FURNISHED WITH A SET OF FLOATING GALVANIZED STEEL FLANGES WITH RECESSED GROOVE TO INTERLOCK WITH RUBBER CONNECTOR'S RAISED FACE FLANGE BEAD. FLANGE BEAD WILL BE WIRE REINFORCED. FLANGES WILL BE DRILLED 125/150# ANSI. FLEXIBLE EXPANSION FITTINGS TO ACCOMMODATE APPROXIMATELY 38MM TO 50MM OF SETTLEMENT. FITTING TO BE RESISTANT TO UV EXPOSURE AND COMPLY WITH PIPE TESTING REQUIREMENTS AS STATED IN SPECIFICATIONS.
12. ALL PIPE SIZES ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
13. CONTRACTOR TO PERFORM BUOYANCY CALCULATIONS ON ALL UNDERGROUND STRUCTURES BASED ON GEOTECHNICAL REPORT RECORDED HIGH WATER ELEVATION.
14. CONTRACTOR SHALL PROVIDE FOR FUTURE CONNECTION TO BASE SUPPLIED ELECTRIC, COMMUNICATIONS, WATER AND SEWER PURSUANT TO THE APPLICABLE SPECIFICATIONS AND AS SHOWN ON THE DRAWINGS.
15. ALL VALVES ABOVE GRADE SHALL BE FLANGE MOUNTED DUCTILE IRON. VALVES SHALL BE MADE TAMPER PROOF BY PASSING A HEAVY DUTY CHAIN THROUGH HAND WHEEL AND AROUND VALVE BODY AS TO NOT ALLOW HAND WHEEL TO ROTATE MORE THAN ¼ TURN AND LOCKING ENDS TOGETHER WITH A WEATHER PROOF LOCK.
16. CONTRACTOR TO INSTALL PIPE SUPPORTS FOR ALL ABOVE-GRADE PIPING. REFER TO C-301 FOR PIPE SUPPORT DETAILS AND MINIMUM SPACING REQUIREMENTS.
17. CONTRACTOR TO INSTALL 100mm VENT PIPE WITH MINIMUM 600mm COVER. ALL EXPOSED PIPING TO BE PAINTED BLUE IN ACCORDANCE WITH SPECIFICATION 09 90 00.

**LEGEND**

**PROPOSED**



**DESCRIPTION**

PARCEL LINE/SITE BOUNDARY

DOMESTIC WATER LINE (W/SIZE)

GRAVITY SEWER (W/SIZE)

SEWER FORCE MAIN (W/SIZE)

COMMUNICATION DUCT BANK, REFER TO COMMUNICATION SITE PLANS FOR MORE INFORMATION

ELECTRICAL DUCT BANK, REFER TO ELECTRICAL SITE PLANS FOR MORE INFORMATION

ELECTRIC PULL BOX, REFER TO ELECTRICAL SITE PLANS FOR MORE INFORMATION

ELECTRIC DISTRIBUTION PANEL, REFER TO ELECTRICAL SITE PLANS FOR MORE INFORMATION

COMMUNICATION MANHOLE, REFER TO COMMUNICATION SITE PLANS FOR MORE INFORMATION

GATE VALVE

FIRE HYDRANT

SEWAGE LIFT STATION

SEWAGE VALVE PIT

PUMP STATION

BOLLARD

SEWER MANHOLE

SWING GATE

BUNKER WITH T-WALL (CONTRACTOR OPTION)

CONCRETE BARRIER WALL (ALASKA BARRIER)

WATER STORAGE TANK

WASTEWATER STORAGE TANK

**ABBREVIATIONS**

CONC CONCRETE

CPVC CHLORINATED POLYVINYL CHLORIDE

EW EACH WAY

FM FORCE MAIN

GV GATE VALVE

MJ MECHANICAL JOINT

NIC NOT IN CONTRACT

PB PULL BOX

PN PROJECT NUMBER

PS PUMP STATION

PVC POLYVINYL CHLORIDE

R&D REMOVE & DISPOSE

S SEWER

SFM SEWER FORCE MAIN

SMDP SITE MAIN DISTRIBUTION PANEL

T TRANSFORMER

T&B TOP & BOTTOM

TYP TYPICAL

UNO UNLESS NOTED OTHERWISE

W/ WITH

W WATER

LS LIFT STATION

NZL NOZZLE

CORRECTED  
FINAL  
DESIGN  
RE-ISSUED

DATE	DESCRIPTION
12/02/10	DMG
10/19/10	DMG
10/05/10	DMG
08/31/10	DMG
	PRP

DESIGNED BY:	DATE:	12/02/10
DRAWN BY:	PUB:	
CHECKED BY:	SER:	
	FILE NO.:	AF1082--CS001GN
	TECH:	TETRA

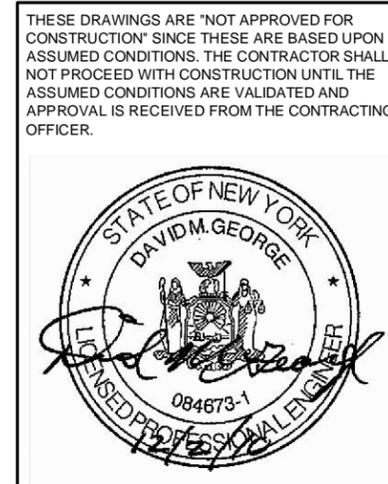
US Army Corps of Engineers  
Middle East District

TETRA TECH

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

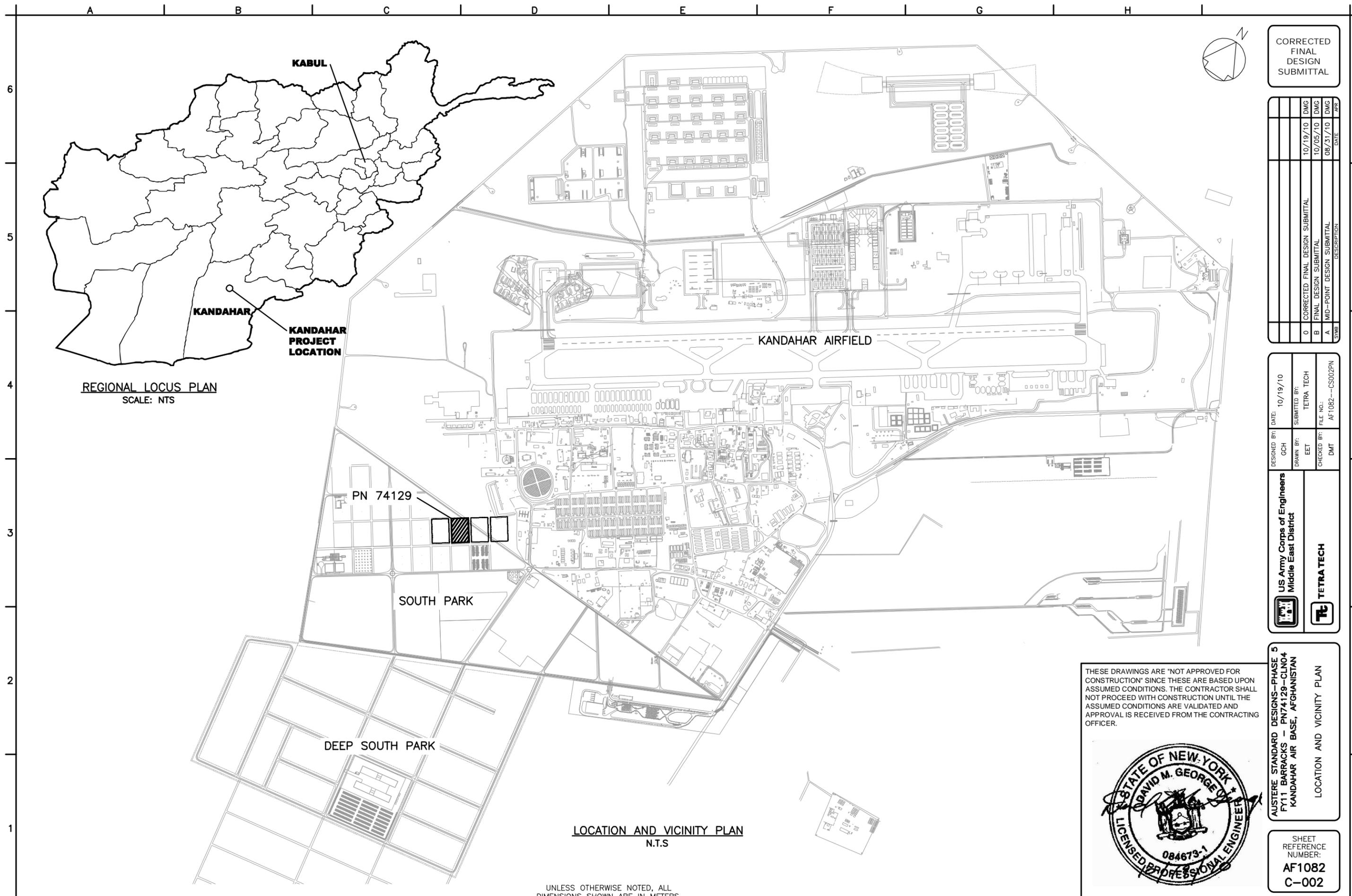
CIVIL GENERAL NOTES,  
LEGEND AND ABBREVIATIONS

SHEET  
REFERENCE  
NUMBER:  
**AF1082  
C-001**



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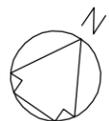
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REGIONAL LOCUS PLAN  
SCALE: NTS

LOCATION AND VICINITY PLAN  
N.T.S

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN METERS.



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SUBMITTAL

SYMB	DESCRIPTION	DATE	PRP
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	DMG
B	FINAL DESIGN SUBMITTAL	10/05/10	DMG
A	MID-POINT DESIGN SUBMITTAL	08/31/10	DMG

DESIGNED BY:	GCH	DATE:	10/19/10
DRAWN BY:	EET	SUBMITTED BY:	TETRA TECH
CHECKED BY:	DMT	FILE NO.:	AF1082--CS002PN

US Army Corps of Engineers  
Middle East District

TETRA TECH

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AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

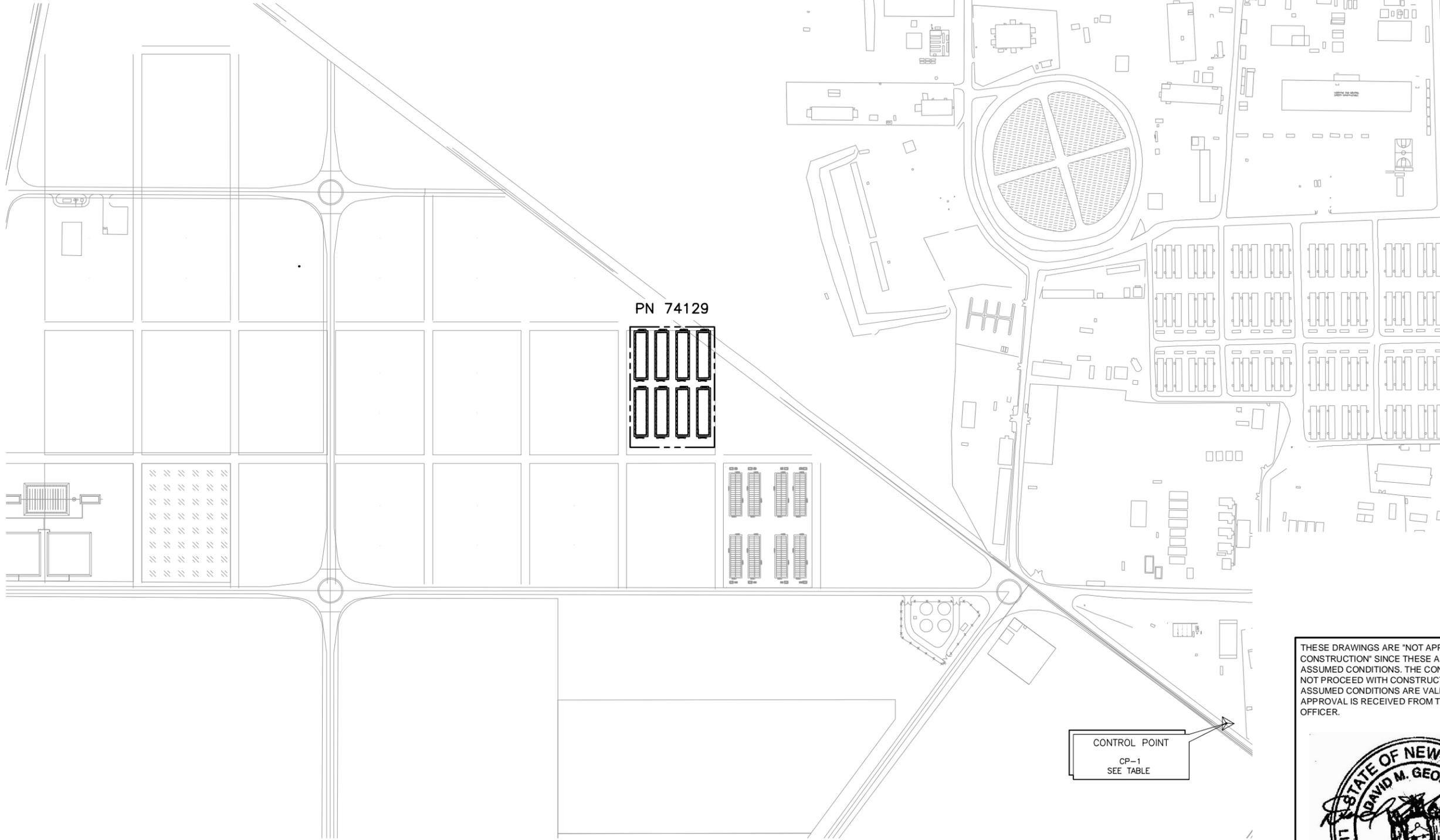
LOCATION AND VICINITY PLAN

SHEET  
REFERENCE  
NUMBER:  
AF1082  
C-002

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CONTROL POINT SCHEDULE					
NO.	NORTHING	EASTING	ELEV.	DESCRIPTION	DATUM
CP-1	3487132.776	770169.132	1007.75	CONCRETE COLUMN	*
CP-2	3487668.257	769226.491	1006.35	CONCRETE COLUMN	*

\* SEE GENERAL NOTE 18 ON SHEET C-001 FOR DATUM INFORMATION



**OVERALL SITE LOCATION PLAN**  
SCALE: 1:2500

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN METERS.

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SYMB	DESCRIPTION	DATE	PR
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	DMG
A	FINAL DESIGN SUBMITTAL	10/05/10	DMG

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DRAWN BY:	EET	SUBMITTED BY:	TETRA TECH
CHECKED BY:	DMT	FILE NO.:	AF1082--CS003PN

**US Army Corps of Engineers**  
Middle East District

**TETRA TECH**

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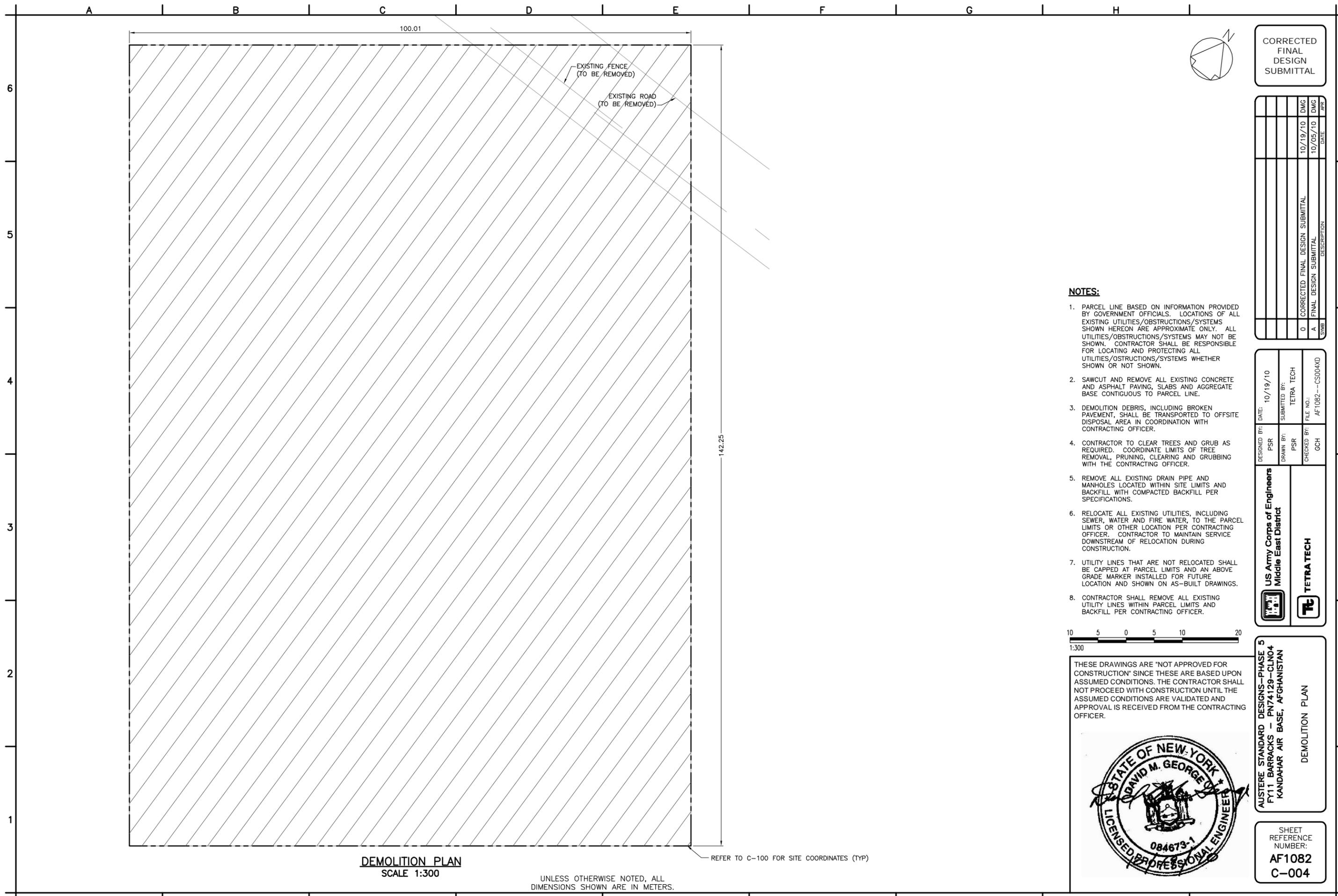


**AUSTERE STANDARD DESIGNS - PHASE 5**  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

OVERALL SITE LOCATION PLAN

SHEET REFERENCE NUMBER:  
**AF1082**  
**C-003**

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**DEMOLITION PLAN**  
SCALE 1:300

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN METERS.

REFER TO C-100 FOR SITE COORDINATES (TYP)

**NOTES:**

1. PARCEL LINE BASED ON INFORMATION PROVIDED BY GOVERNMENT OFFICIALS. LOCATIONS OF ALL EXISTING UTILITIES/OBSTRUCTIONS/SYSTEMS SHOWN HEREON ARE APPROXIMATE ONLY. ALL UTILITIES/OBSTRUCTIONS/SYSTEMS MAY NOT BE SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES/OBSTRUCTIONS/SYSTEMS WHETHER SHOWN OR NOT SHOWN.
2. SAWCUT AND REMOVE ALL EXISTING CONCRETE AND ASPHALT PAVING, SLABS AND AGGREGATE BASE CONTIGUOUS TO PARCEL LINE.
3. DEMOLITION DEBRIS, INCLUDING BROKEN PAVEMENT, SHALL BE TRANSPORTED TO OFFSITE DISPOSAL AREA IN COORDINATION WITH CONTRACTING OFFICER.
4. CONTRACTOR TO CLEAR TREES AND GRUB AS REQUIRED. COORDINATE LIMITS OF TREE REMOVAL, PRUNING, CLEARING AND GRUBBING WITH THE CONTRACTING OFFICER.
5. REMOVE ALL EXISTING DRAIN PIPE AND MANHOLES LOCATED WITHIN SITE LIMITS AND BACKFILL WITH COMPACTED BACKFILL PER SPECIFICATIONS.
6. RELOCATE ALL EXISTING UTILITIES, INCLUDING SEWER, WATER AND FIRE WATER, TO THE PARCEL LIMITS OR OTHER LOCATION PER CONTRACTING OFFICER. CONTRACTOR TO MAINTAIN SERVICE DOWNSTREAM OF RELOCATION DURING CONSTRUCTION.
7. UTILITY LINES THAT ARE NOT RELOCATED SHALL BE CAPPED AT PARCEL LIMITS AND AN ABOVE GRADE MARKER INSTALLED FOR FUTURE LOCATION AND SHOWN ON AS-BUILT DRAWINGS.
8. CONTRACTOR SHALL REMOVE ALL EXISTING UTILITY LINES WITHIN PARCEL LIMITS AND BACKFILL PER CONTRACTING OFFICER.



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A	FINAL DESIGN SUBMITTAL	10/05/10	DMG

DESIGNED BY: PSR	DATE: 10/19/10
DRAWN BY: PSR	SUBMITTED BY: TETRA TECH
CHECKED BY: GCH	FILE NO.: AF1082--CS004XD

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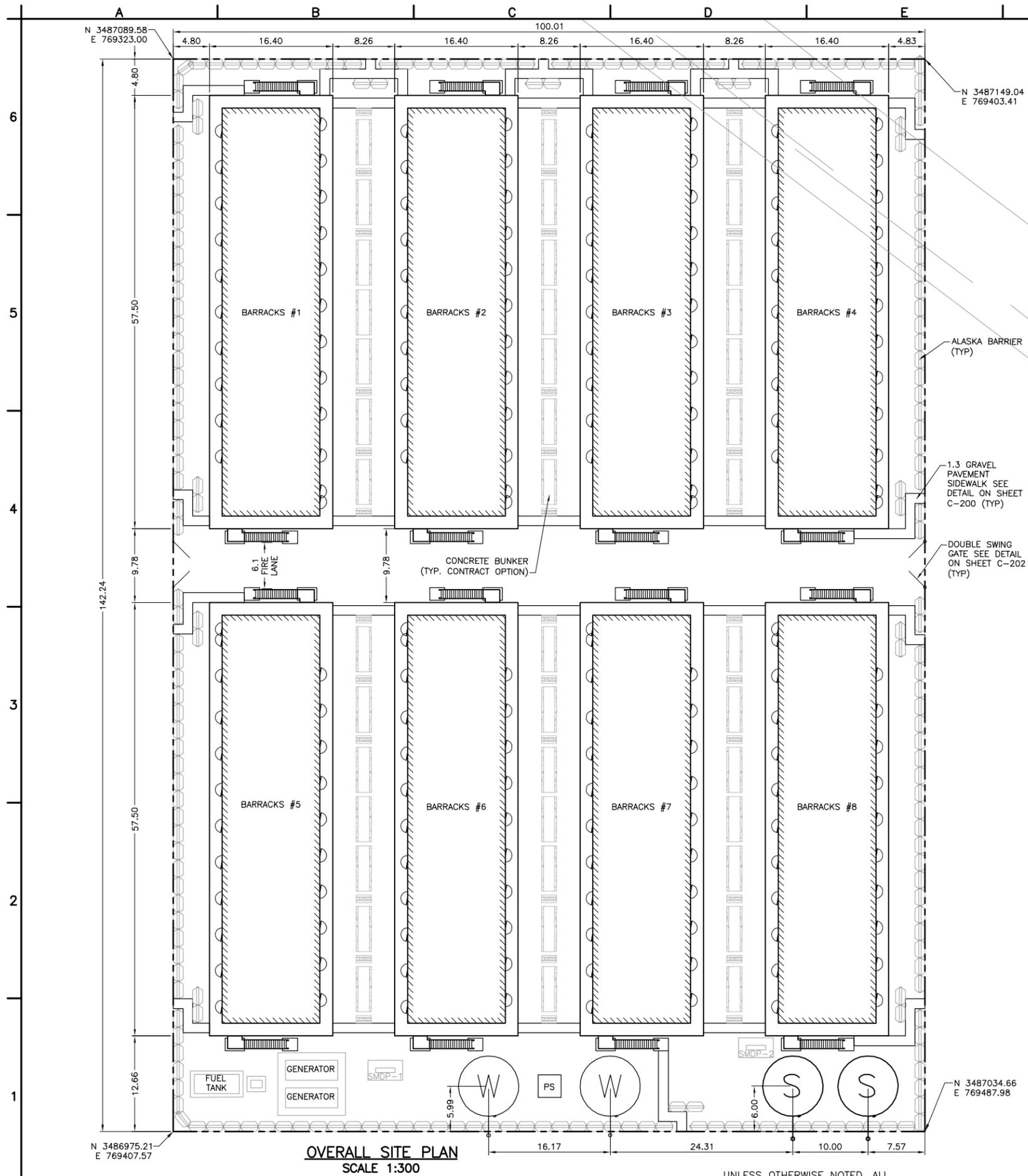
**TETRA TECH**

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

DEMOLITION PLAN

SHEET REFERENCE NUMBER:  
**AF1082 C-004**

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PSR	SUBMITTED BY:	TETRA TECH
DRAWN BY:	PSR	FILE NO.:
GCH	AFT082--CS100PN	

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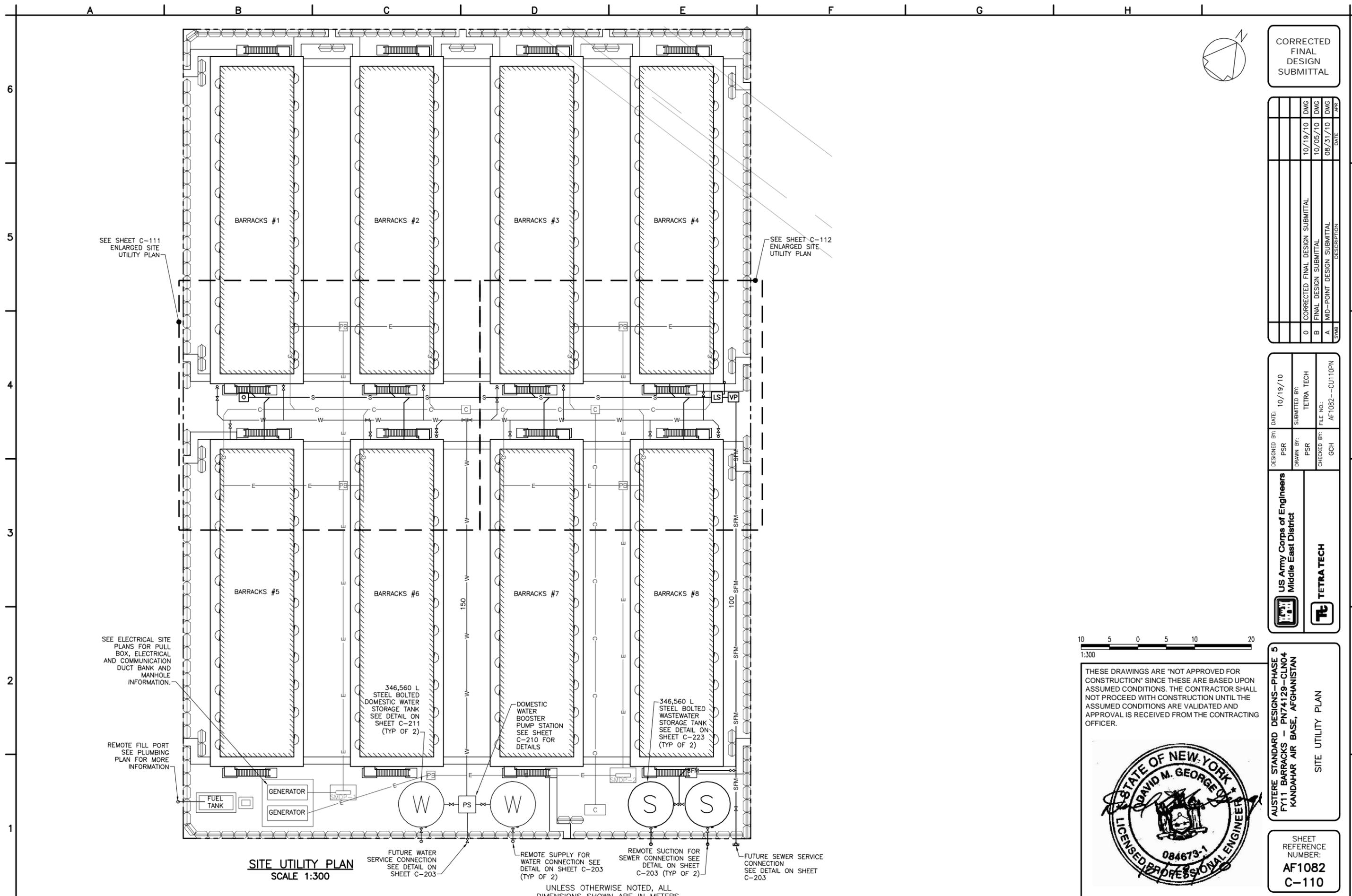


AUSTERE STANDARD DESIGNS--PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

OVERALL SITE PLAN

SHEET REFERENCE NUMBER:  
**AF1082**  
**C-100**

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**SITE UTILITY PLAN**  
SCALE 1:300

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SHEET REFERENCE NUMBER:  
**AF1082**  
**C-110**

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN  
SITE UTILITY PLAN

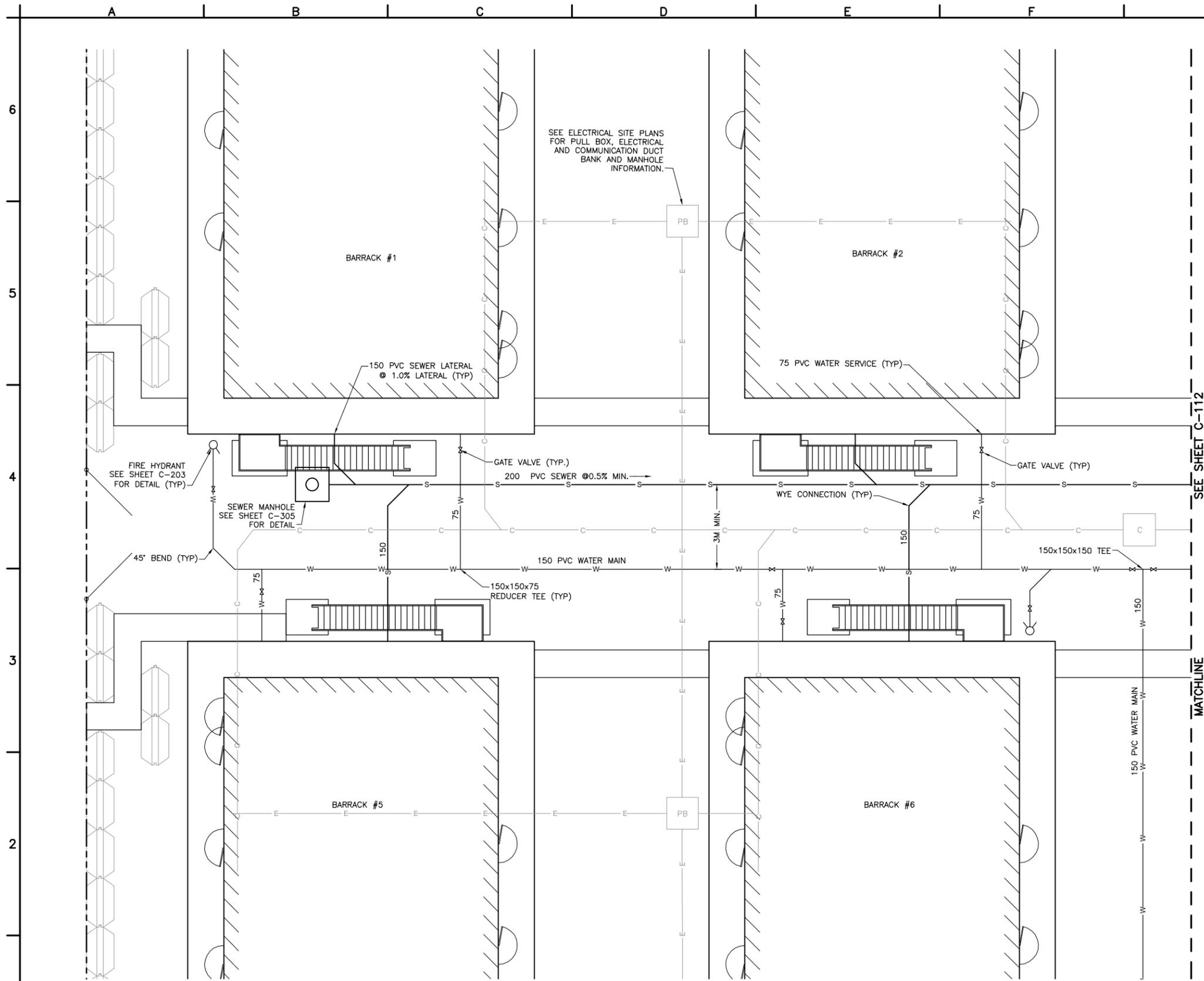
**US Army Corps of Engineers**  
Middle East District  
**TETRA TECH**

DESIGNED BY: PSR  
DRAWN BY: PSR  
CHECKED BY: GCH  
DATE: 10/19/10  
SUBMITTED BY: TETRA TECH  
FILE NO.: AF1082--CU110PN

SYMBOL	DESCRIPTION	DATE	PREPARED BY
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A	MID-POINT DESIGN SUBMITTAL	08/31/10	DMG

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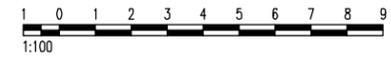
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ENLARGED SITE UTILITY PLAN  
SCALE 1:100

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SEE SHEET C-112  
MATCHLINE



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DESIGNED BY:	PSR	DATE:	10/19/10
DRAWN BY:	PSR	SUBMITTED BY:	TETRA TECH
CHECKED BY:	GCH	FILE NO.:	AF1082--CU111LS

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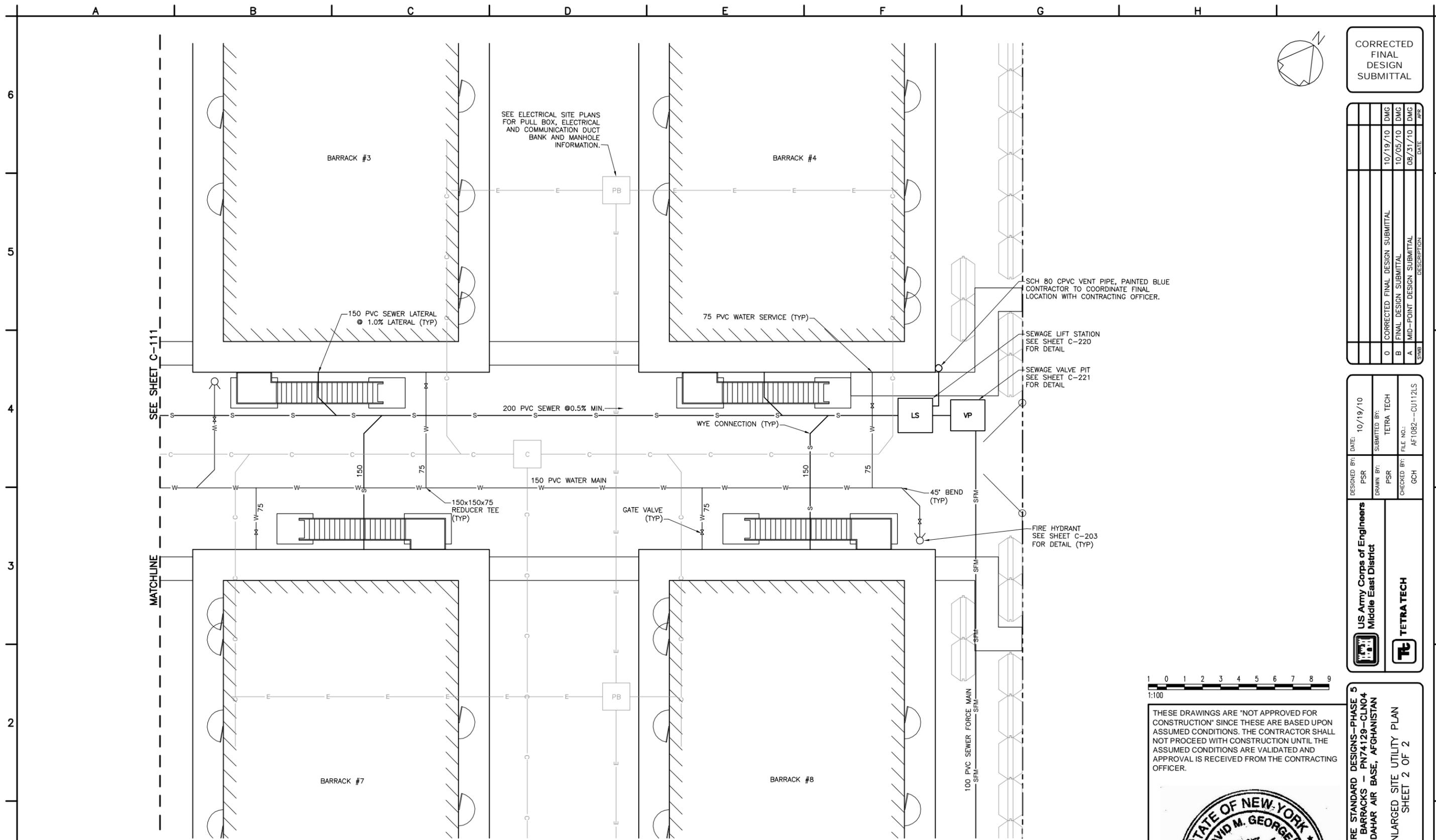
TETRA TECH

AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ENLARGED SITE UTILITY PLAN  
SHEET 1 OF 2

SHEET REFERENCE NUMBER:  
AF1082  
C-111

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ENLARGED SITE UTILITY PLAN  
SCALE 1:100

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CHECKED BY:	GCH	
	FILE NO.:	AF1082--CU112LS

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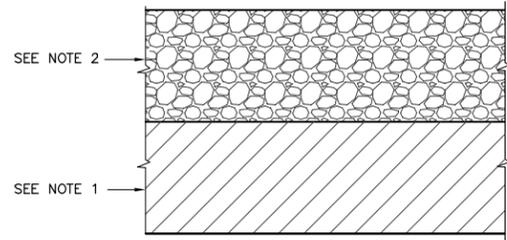


AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ENLARGED SITE UTILITY PLAN  
SHEET 2 OF 2

SHEET REFERENCE NUMBER:  
AF1082  
C-112

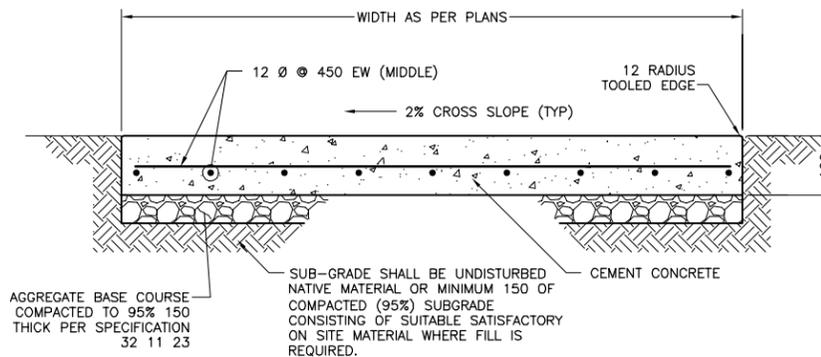
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**NOTES:**

1. SUB-GRADE SHALL BE UNDISTURBED NATIVE MATERIAL OR MINIMUM 150 OF COMPACTED (95%) SUBGRADE CONSISTING OF NATIVE MATERIAL WHERE FILL IS REQUIRED. PROOF ROLL PER GEOTECH REPORT.
2. 150 SURFACE COURSE FOR TRAFFICKED AREAS, 100 FOR NON-TRAFFICKED AREAS, TO BE COARSE AGGREGATE PER SPECIFICATION SECTION 32 15 00.
3. SIDEWALKS SHALL BE INSTALLED BETWEEN BUILDINGS AND EXISTING WALKWAYS AS SHOWN ON PLAN. SIDEWALK MATERIAL FOR BASE BID SHALL BE 150mm THICK COMPACTED GRAVEL; BID OPTION SHALL BE CONCRETE PER DETAIL.

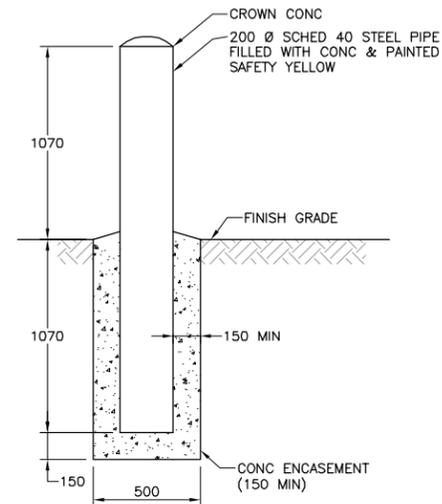
**GRAVEL PAVEMENT SIDEWALK SECTION**  
N.T.S.



**NOTES:**

1. CONTROL JOINTS ARE TO BE AT 1800 INTERVALS, EXPANSION JOINTS EVERY 5400.
2. REINFORCING SHALL BE CONTINUOUS THROUGH CONSTRUCTION AND CONTROL JOINTS ONLY.
3. REFER TO C-300 FOR CONCRETE AND REINFORCING NOTES.

**CONCRETE SIDEWALK DETAIL (BID OPTION)**  
N.T.S.



**NOTE:**

REFER TO C-300 FOR CONCRETE NOTES.

**BOLLARD DETAIL**  
N.T.S.

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SYMB	DESCRIPTION	DATE	PR
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	DMG
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DRAWN BY:	FILE NO.:	AF1082--CS2000T
PSR	GCH	

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AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TYPICAL SITE LAYOUT DETAILS  
SHEET 1 OF 3

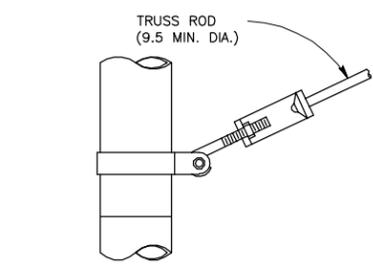
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NUMBER:  
**AF1082**  
**C-200**

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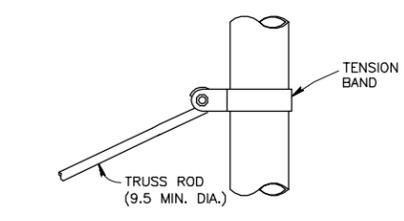
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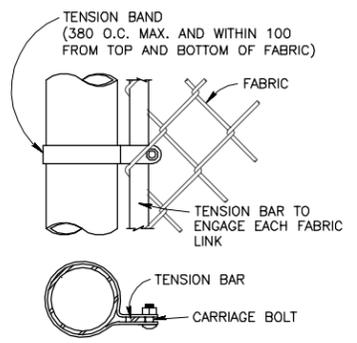
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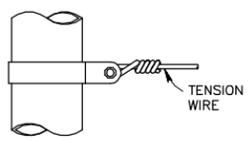
**TRUSS ROD AND BAND**



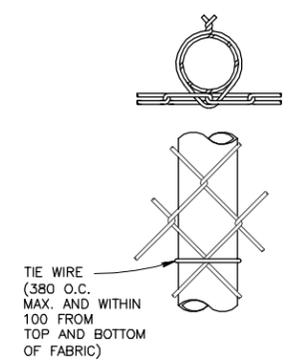
**ROUND POST  
TRUSS ROD CONNECTION DETAIL**



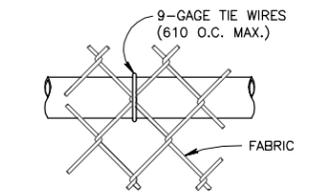
**END OR GATE POST DETAIL**



**TENSION BAND DETAIL**



**ROUND POST ATTACHMENT**



**TOP OR BRACE RAIL ATTACHMENT**

**FABRIC CONNECTION DETAILS  
N.T.S.**

**NOTES:**

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION.
2. WIRE TIES, RAILS, POSTS AND BRACES SHALL BE CONSTRUCTED ON THE ENCLOSED SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE OPPOSITE SIDE OF THE ENCLOSED AREA.
3. CHAIN LINK FENCE AND MATERIALS SHALL BE GALVANIZED STEEL.
4. THE FENCE SHALL BE IN ACCORDANCE WITH ASTM F567, F626 AND F1043.

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DRAWN BY:	PSR	FILE NO.:
GCH	GCH	AF1082--CS201DT

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Middle East District

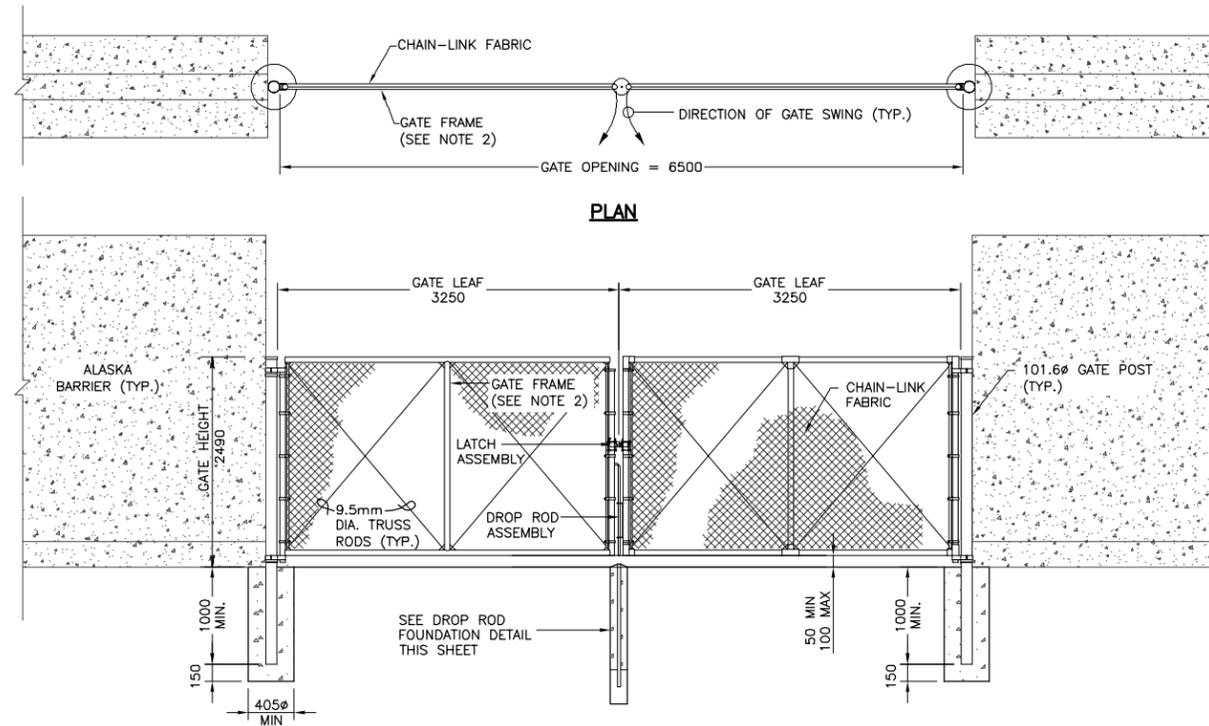
AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TYPICAL SITE LAYOUT DETAILS  
SHEET 2 OF 3

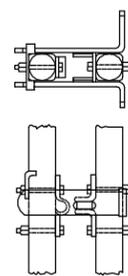
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NUMBER:  
**AF1082  
C-201**

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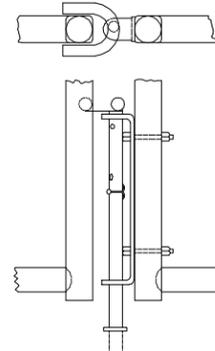
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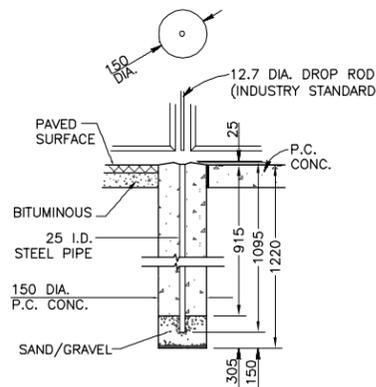
**ELEVATION**  
**DOUBLE SWING GATE**  
N.T.S.



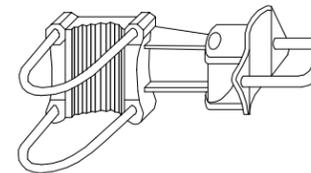
**LATCH ASSEMBLY**



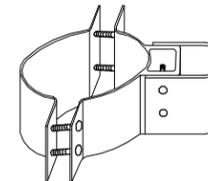
**DROP ROD ASSEMBLY**



**DROP ROD FOUNDATION**



**OFFSET HINGE**



**STANDARD HINGE**

**SWING GATE DETAILS**  
N.T.S.

**NOTES:**

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION.
2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY, AND GATE KEEPERS EXCEPT AS NOTED.
3. ALL GATE FRAMES SHALL BE A MINIMUM 48.2 NOMINAL (ROUND) OR 50.8 NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT THE CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.
4. CHAIN-LINK FABRIC AND MATERIALS SHALL BE PER THE SPECIFICATION.
5. REFER TO SHEET C-201 FOR FABRIC CONNECTION DETAILS.
6. REFER TO C-300 FOR CONCRETE NOTES.
7. CONTRACTOR SHALL VERIFY FOUNDATION DESIGN BASED ON GEOTECHNICAL INVESTIGATION AND ACTUAL FENCE SELECTED.

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DRAWN BY:	PSR	SUBMITTED BY:	TETRA TECH
CHECKED BY:	GCH	FILE NO.:	AF1082--CS2020T

US Army Corps of Engineers  
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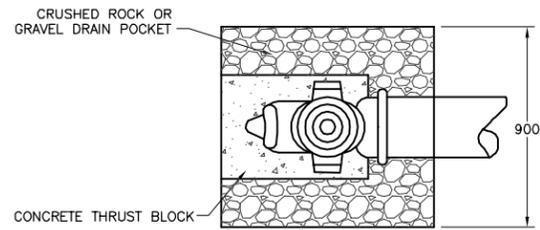
AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TYPICAL SITE LAYOUT DETAILS  
SHEET 3 OF 3

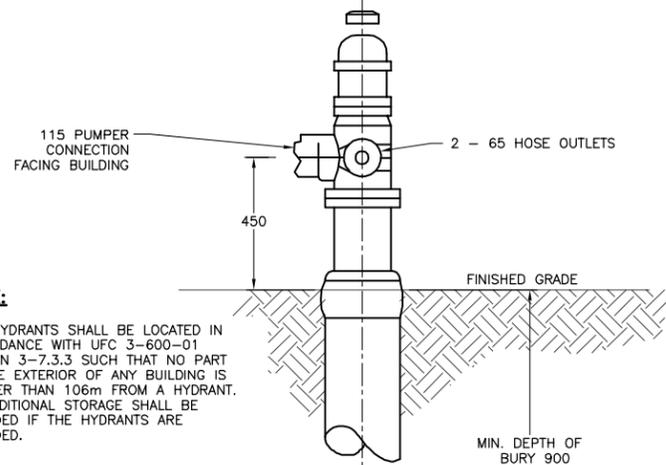
SHEET  
REFERENCE  
NUMBER:  
**AF1082  
C-202**

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DIMENSIONS SHOWN ARE IN MILLIMETERS.

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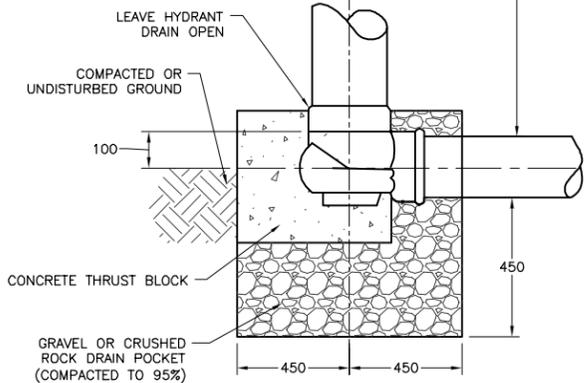


PLAN

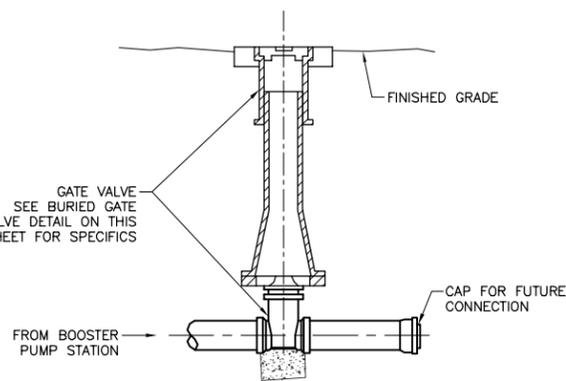


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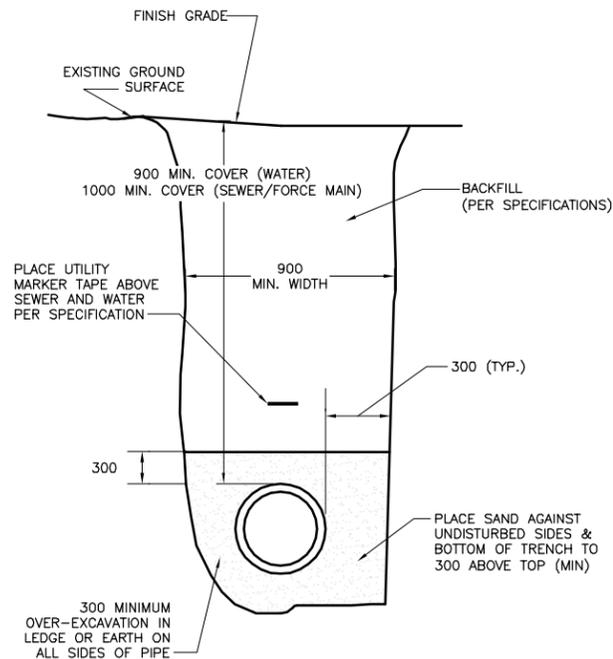
FIRE HYDRANTS SHALL BE LOCATED IN ACCORDANCE WITH UFC 3-600-01 SECTION 3-7.3.3 SUCH THAT NO PART OF THE EXTERIOR OF ANY BUILDING IS GREATER THAN 106m FROM A HYDRANT. NO ADDITIONAL STORAGE SHALL BE PROVIDED IF THE HYDRANTS ARE INCLUDED.



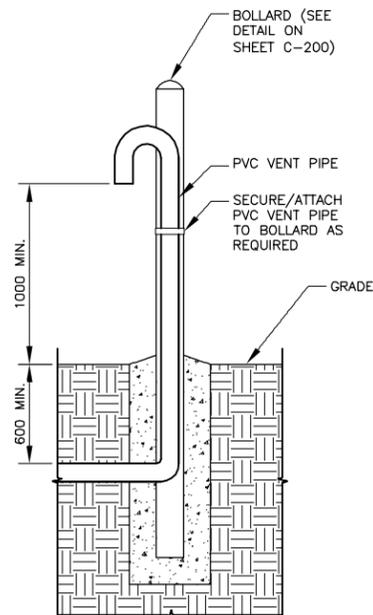
**FIRE HYDRANT**  
N.T.S.



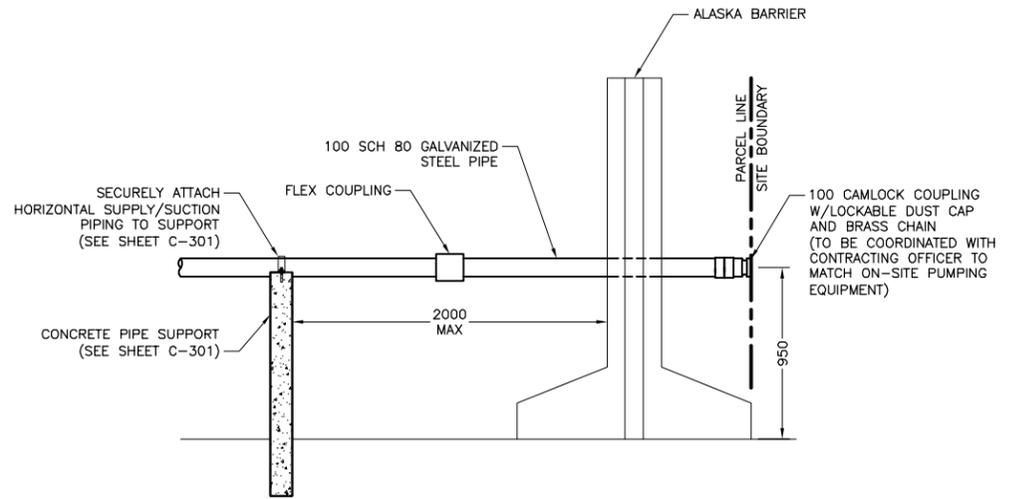
**FUTURE WATER SERVICE CONNECTION**  
N.T.S.



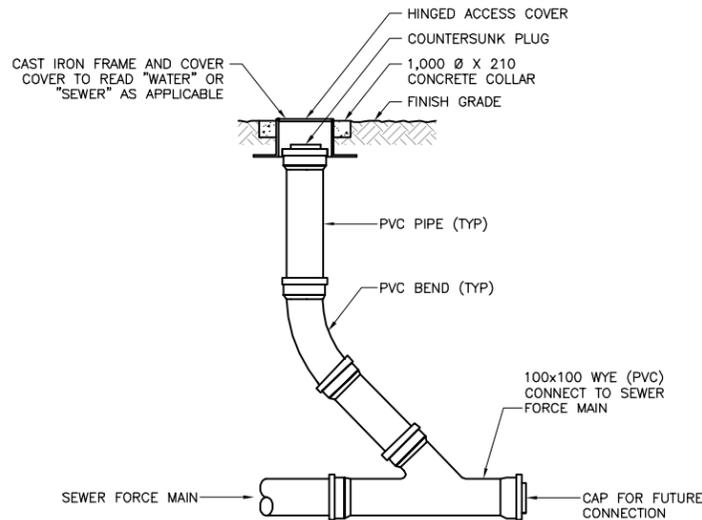
**PIPE TRENCH DETAIL**  
N.T.S.



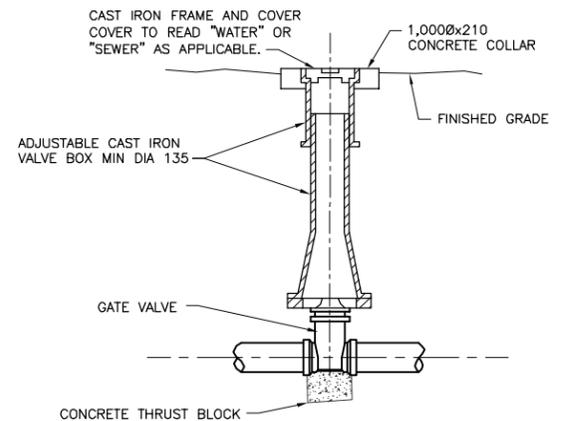
**VENT PIPE DETAIL ATTACHED TO BOLLARD**  
N.T.S.



**REMOTE SUPPLY/SUCTION FOR WATER AND SEWER CONNECTIONS DETAIL**  
N.T.S.



**IN-LINE FUTURE SEWER SERVICE CONNECTION**  
N.T.S.



**BURIED GATE VALVE**  
N.T.S.

**NOTE:**

1. REFER TO C-300 FOR CONCRETE NOTES.

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SYMB	DESCRIPTION	DATE	PRP
0	CORRECTED FINAL DESIGN RE-ISSUED	12/02/10	DMG
B	FINAL DESIGN SUBMITTAL	10/19/10	DMG
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		08/31/10	DMG

DESIGNED BY:	DATE:	12/02/10
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CHECKED BY:	PSR	
FILE NO.:	AF1082--CU2030T	
TECH:	TETRA TECH	
GCH:	GCH	

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TETRA TECH

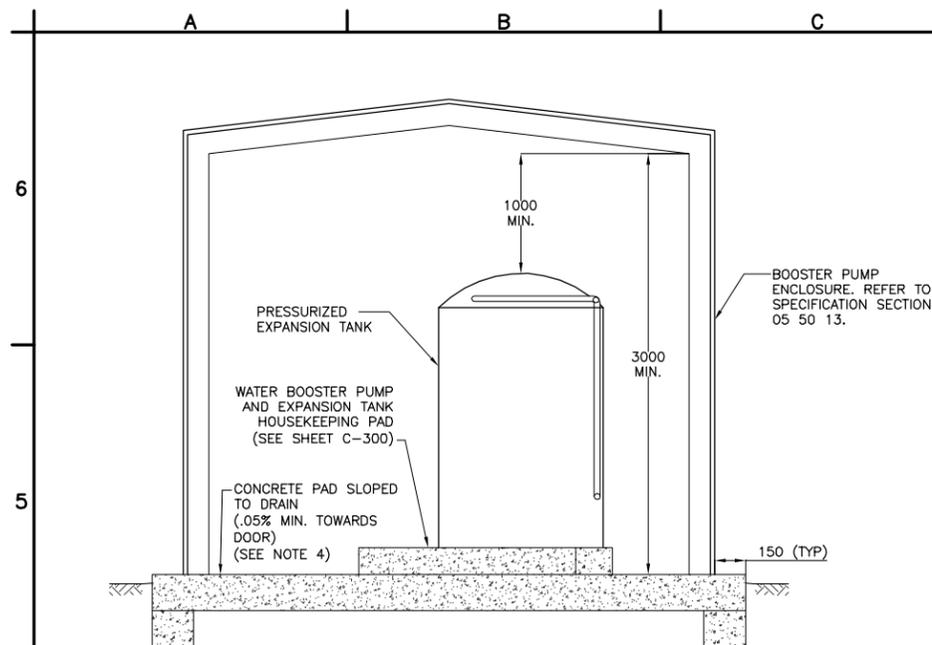
AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TYPICAL SITE UTILITY DETAILS

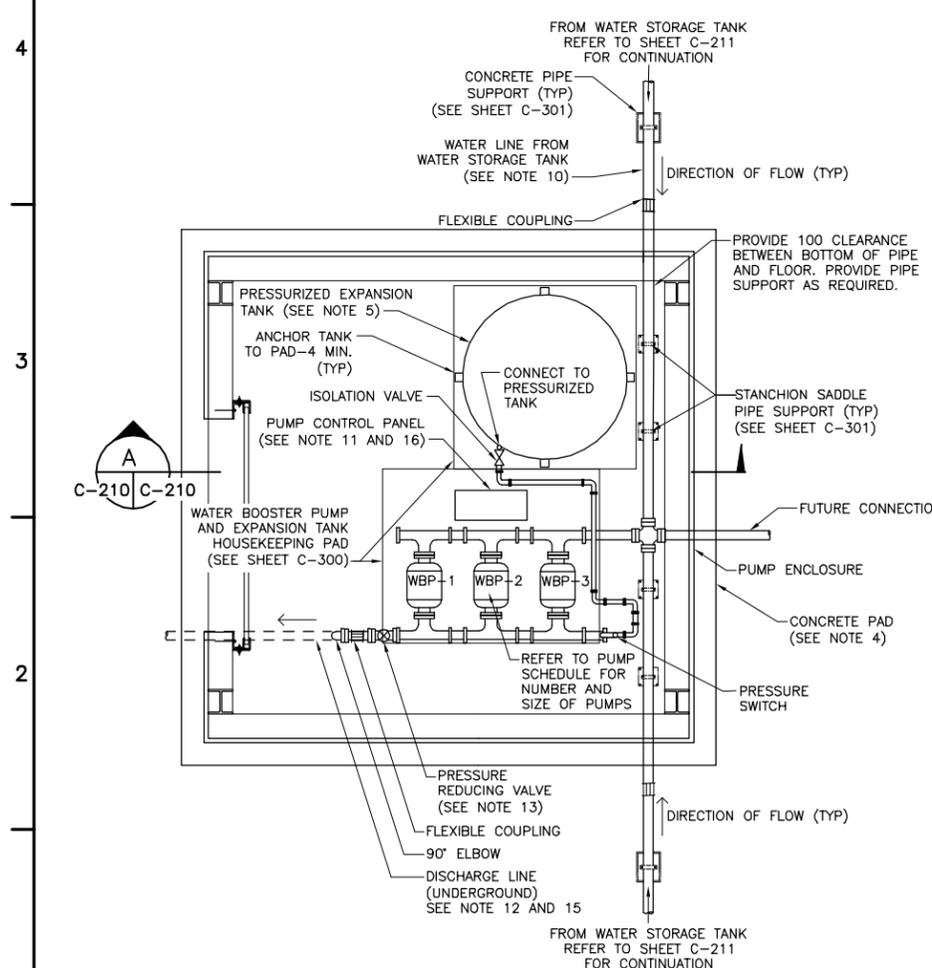
SHEET REFERENCE NUMBER:  
**AF1082 C-203**

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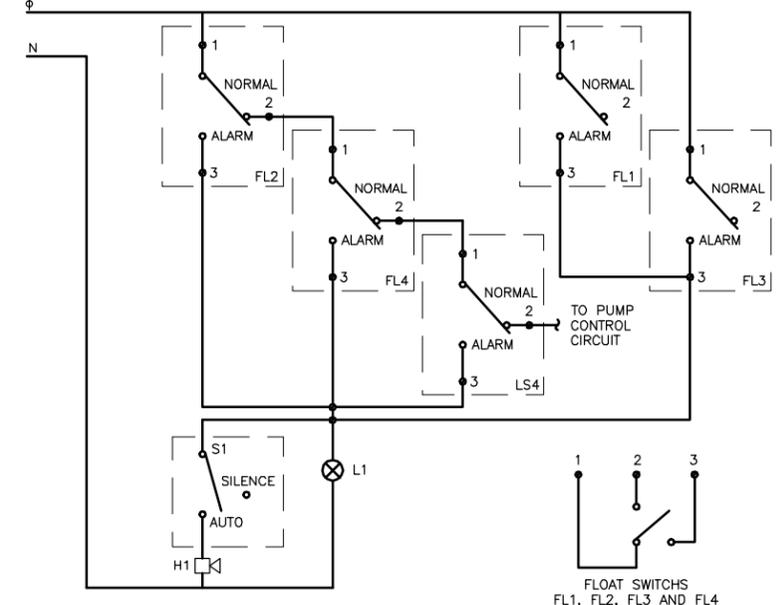
**SECTION A**  
N.T.S. C-210 C-210



**BOOSTER PUMP STATION PLAN**  
N.T.S.

**CONTROL PANEL ALARM REPORTING**

- FL1 - LOW LEVEL ALARM FLOAT SWITCH IN WATER STORAGE TANK
- FL2 - LOW LEVEL DOMESTIC SHUT OFF FLOAT SWITCH IN WATER STORAGE TANK
- FL3 - HIGH LEVEL ALARM FLOAT SWITCH IN WASTEWATER STORAGE TANK
- FL4 - HIGH LEVEL DOMESTIC PUMP SHUT OFF FLOAT SWITCH IN WASTEWATER STORAGE TANK
- LS4 - HIGH WATER ALARM/LAG PUMP ON FLOAT SWITCH IN SEWAGE LIFT STATION
- L1 - HIGH SEWAGE LEVEL/LOW WATER LEVEL INDICATOR LAMP (⊗) (MOUNTED TO EXTERIOR WALL OF BOOSTER PUMP STATION)
- H1 - HIGH SEWAGE LEVEL/LOW WATER LEVEL AUDIBLE ALARM (⊠) (MOUNTED TO EXTERIOR WALL OF BOOSTER PUMP STATION)
- S1 - AUTO/SILENCE SWITCH



**ALARM FLOAT/SIGNALING SCHEMATIC DIAGRAM**  
N.T.S.

DOMESTIC WATER BOOSTER PUMP SCHEDULE								
NUMBER OF PUMPS	TYPE	RATING POINT PER PUMP				DISCH. SIZE	SUCT. SIZE	TYPE SEAL
		CAP. FLOW		MIN. HEAD M.	MIN. HEAD FT.			
		L/M	G/M					
3	VER/CENT OR APPROVED EQUAL	946	250	36.1	118.5	150mm	SEE NOTE 10	MECH.

**BOOSTER PUMP SYSTEM SEQUENCE OF OPERATIONS**

- A. THE HAND/OFF/AUTO (HOA) SWITCHES FOR ALL PUMPS SHOULD BE MAINTAINED IN THE "AUTO" POSITION.
- B. WHEN THE WATER PRESSURE IN THE PRESSURIZED EXPANSION TANK DROPS BELOW THE "CUT-IN" SET POINT OF PRESSURE SWITCH PS-1, IT CLOSSES AND LOAD SHARING RELAY MCR CAUSES THE FIRST BOOSTER PUMP TO RUN AND THE "PUMP RUN" INDICATION LAMP FOR THAT PUMP TO ILLUMINATE.
- C. WHEN PRESSURE SWITCH PS-1 SENSES THAT THE PRESSURE IN THE TANK HAS REACHED ITS "CUT-OUT" PRESSURE, THE SWITCH OPENS AND LOAD SHARING RELAY MCR SHUTS DOWN THE PUMP AND THE "PUMP RUN" LAMP EXTINGUISHES.
- D. FOR EACH CLOSURE OF PRESSURE SWITCH PS-1, THE LOAD SHARING RELAY WILL ELECTRONICALLY ALTERNATE WHICH PUMP STARTS FIRST (LEAD PUMP).
- E. IF THE WATER PRESSURE IN THE PRESSURIZED TANK CONTINUES TO DROPS BELOW THE "CUT-IN" SET POINT OF PS-1, PRESSURE SWITCH PS-2 CLOSSES AT ITS "CUT-IN" SET POINT AND LOAD SHARING RELAY MCR CAUSES THE SECOND BOOSTER PUMP TO ALSO RUN AND THE "PUMP RUN" INDICATION LAMP FOR THAT PUMP TO ILLUMINATE.
- F. WHEN PRESSURE SWITCH PS-2 SENSES THAT THE PRESSURE IN THE TANK HAS REACHED ITS "CUT-OUT" PRESSURE, THE SWITCH OPENS AND LOAD SHARING RELAY MCR SHUTS DOWN THE PUMP AND THE "PUMP RUN" LAMP EXTINGUISHES, WHILE THE FIRST PUMP CONTINUES TO RUN UNTIL PS-1 IS SATISFIED.
- G. IF THE FLOAT SWITCH FL1 IN THE WATER STORAGE TANK SENSES A LOW WATER LEVEL CONDITION, IT SHUTS DOWN BOTH BOOSTER PUMPS BY INTERRUPTING THE CONTROL CIRCUIT AND CAUSES THE "LOW LEVEL" INDICATION LAMP TO ILLUMINATE AND AUDIBLE ALARM TO SOUND. WHEN THE WATER LEVEL RISES TO A SAFE LEVEL, FLOAT SWITCH FL1 CLOSSES THE CONTROL CIRCUIT, ALLOWING NORMAL OPERATION TO RESUME.
- H. IF THE FLOAT SWITCH FL2 IN THE WASTEWATER STORAGE TANK SENSES A HIGH LEVEL CONDITION, IT SHUTS DOWN BOTH BOOSTER PUMPS BY INTERRUPTING THE CONTROL CIRCUIT AND CAUSES THE "HIGH SEWAGE LEVEL" INDICATION LAMP TO ILLUMINATE AND THE AUDIBLE ALARM TO SOUND. WHEN THE LEVEL IN THE WASTEWATER STORAGE TANK RETURNS TO A SAFE LEVEL, FLOAT SWITCH FL2 CLOSSES THE CONTROL CIRCUIT, ALLOWING NORMAL OPERATION TO RESUME.
- I. IF EITHER PUMP OVERLOAD RELAY, OL-1 OR OL-2 SENSES AN OVERLOAD CONDITION IN THE PUMP IT PROTECTS, IT WILL OPEN THE APPROPRIATE CONTROL CIRCUIT CAUSING THAT PUMP TO SHUT DOWN. THE "PUMP TRIP" INDICATION LAMP WILL ILLUMINATE. THE PUMP WILL REMAIN OFF UNTIL THE OVERLOAD RELAY IS MANUALLY RESET, RESTORING THE CONTROL CIRCUIT AND EXTINGUISHING THE INDICATION LAMP.
- J. IF FLOAT SWITCH FL1 SENSES A LOW WATER LEVEL CONDITION IT SOUNDS THE REMOTE ALARM LOCATED IN THE BOOSTER PUMP STATION. SWITCH S1 ALLOWS THE ALARM TO BE SILENCED.
- K. PROVIDE REMOTE HORN IN LINE TO REPORT FL1 AND FL2 ALARM CONDITION.

**NOTES:**

1. DELIVERY AT BUILDING REQUIRES A FLOW OF 15.8 LPS (250 GPM) AT A PRESSURE OF 345 kPa (50 PSI).
2. PUMPS, PUMP CONTROLS, ETC. SHALL BE DESIGNED TO ACCOMMODATE ANY ENVIRONMENTAL CONDITIONS THAT THE SITE WILL BE EXPECTED TO EXPERIENCE. THIS INCLUDES PROVIDING A HEATED ENCLOSURE WITH VENTILATION IF NECESSARY. CONTRACTOR TO PROVIDE HEATING AND VENTILATION AS PER CLIMATIC DATA AND INTERIOR DESIGN CONDITIONS DESCRIBED IN GENERAL NOTES ON SHEET M-001.
3. CONTRACTOR SHALL PROVIDE CERTIFICATION FROM THE PUMP MANUFACTURER THAT THE PUMP AND MOTOR SELECTED WILL OPERATE AS DESIGNED UNDER THE EXTREMES OF THE ENVIRONMENTAL CONDITIONS (POTENTIAL TEMPERATURES EXCEEDING 50°C AT THE SITE).
4. CONTRACTOR TO PROVIDE FINAL DESIGN OF CONCRETE SUPPORT SLAB BASED ON PROVIDED PUMP SKID, EXPANSION TANK, ENCLOSURE DIMENSIONS, SUPPORT REQUIREMENTS AND SITE SPECIFIC GEOTECHNICAL REPORT. CONCRETE SLAB IS TO BE SLOPED IN THE DIRECTION OF THE DOOR OPENING TO ENSURE POSITIVE DRAINAGE. FOR APPROXIMATE PAD SIZE AND REINFORCEMENT, SEE SHEET C-300.
5. THE VOLUME OF THE PRESSURIZED EXPANSION TANK AND OPERATING PRESSURE RANGE WILL BE SIZED BY THE PACKAGED WATER BOOSTER PUMP MANUFACTURER TO BE CONSISTENT WITH THE PUMP OPERATIONAL CONTROL SETTINGS.
6. ALL COMPONENTS OF WATER BOOSTER PUMP SYSTEM, INCLUDING PUMPS, PRESSURE EXPANSION TANK AND CONTROL PANEL, SHALL BE COMPATIBLE WITH ONE ANOTHER. ISOLATION VALVES SHALL BE PROVIDED TO FACILITATE PUMP MAINTENANCE.
7. CONTRACTOR SHALL COORDINATE THE BOOSTER PUMP MOTOR DESIGN WITH THE AVAILABLE ELECTRIC POWER SUPPLY.
8. FOR ALL ELECTRICAL SYSTEMS SEE ELECTRICAL DRAWINGS.
9. COORDINATE ALL SLAB PENETRATIONS PRIOR TO POURING SLAB.
10. CONTRACTOR TO ENSURE SUCTION LINE SIZE IS CAPABLE OF SUPPLYING WATER USAGE AS REQUIRED FOR PUMPS AS STIPULATED IN THE DOMESTIC WATER BOOSTER PUMP SCHEDULE.
11. DOMESTIC WATER PUMPS TO TERMINATE WHEN EITHER WASTEWATER STORAGE TANK OR SEWER LIFT STATION HIGH LEVEL FLOAT IS ACTIVATED OR WHEN DOMESTIC WATER STORAGE TANK LOW LEVEL ALARM IS ACTIVATED.
12. ALL PIPING ABOVE GRADE SHALL BE GALVANIZED STEEL OR DUCTILE IRON AND ALL PIPE JOINTS ABOVE GRADE TO BE PER SPECIFICATIONS. ALL PIPE JOINTS BELOW GRADE TO BE MECHANICALLY RESTRAINED OR THRUST BLOCKS WILL BE PROVIDED.
13. A PRESSURE REDUCING VALVE SHALL BE PROVIDED BY THE CONTRACTOR BASED ON THE RECOMMENDATIONS OF THE PUMP MANUFACTURER AND THE SERVICE PRESSURE REQUIREMENTS OF THE RECEIVING FACILITY. REFER TO SPECIFICATIONS SECTION 33 11 00 FOR ADDITIONAL INFORMATION.
14. ALL VALVES ABOVE GRADE SHALL BE DUCTILE IRON, FLANGED JOINT.
15. CONTRACTOR SHALL ENSURE THAT TOP OF FOOTING IS A MINIMUM OF 150 BELOW BOTTOM OF PIPE. CONTRACTOR SHALL STEP FOOTING IF REQUIRED.
16. MAINTAIN 1000mm CLEARANCE IN FRONT OF CONTROL PANEL.

CORRECTED FINAL DESIGN RE-ISSUED

REV	DATE	DESCRIPTION
0	12/02/10	DMG CORRECTED FINAL DESIGN RE-ISSUED
1	10/19/10	DMG CORRECTED FINAL DESIGN SUBMITTAL
2	10/05/10	DMG FINAL DESIGN SUBMITTAL
3	08/31/10	DMG MID-POINT DESIGN SUBMITTAL

DESIGNED BY: PSR	DATE: 12/02/10
DRAWN BY: PSR	SUBMITTED BY: TETRA TECH
CHECKED BY: GCH	FILE NO.: AF1082--CU210D1

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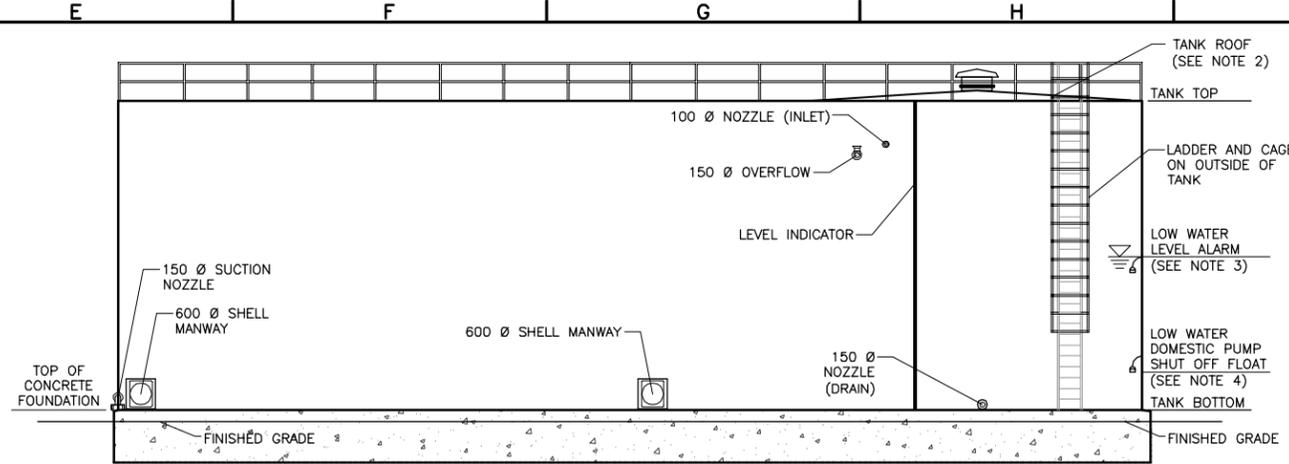
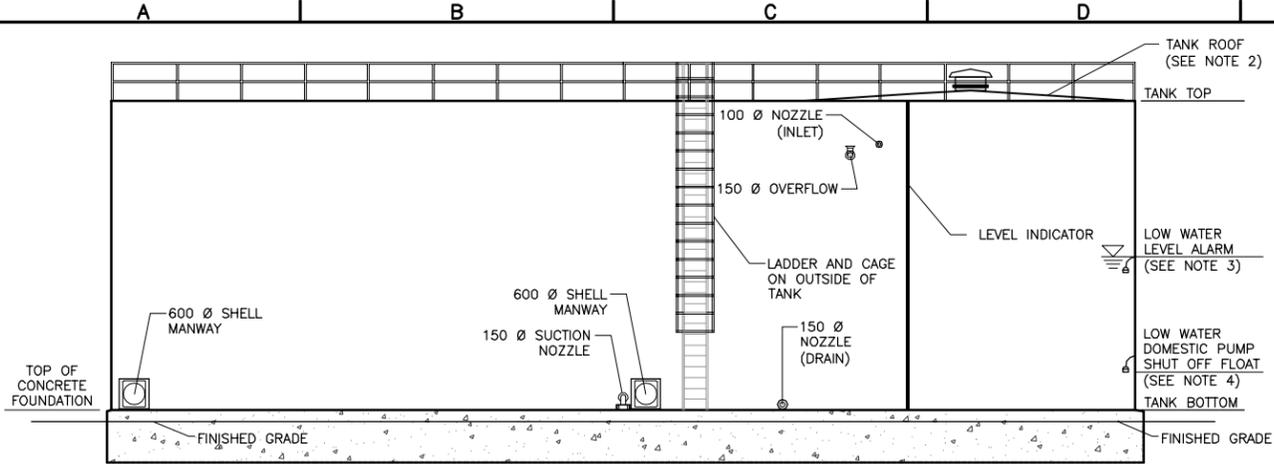
AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

WATER BOOSTER PUMP STATION PLAN, SECTION AND DETAILS

SHEET REFERENCE NUMBER:  
**AF1082 C-210**

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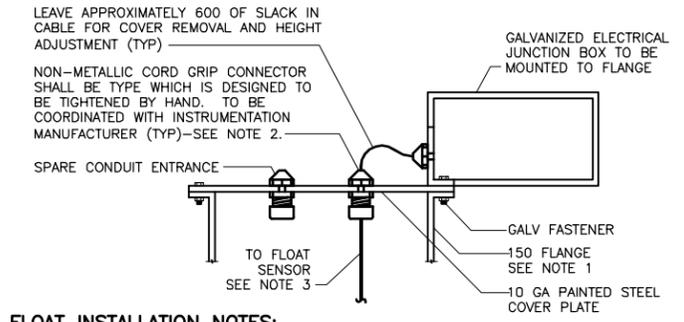
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- NOTES:**
- CONTRACTOR TO ENSURE SUCTION LINE SIZE IS CAPABLE OF SUPPLYING WATER USAGE AS REQUIRED FOR PUMPS AS STIPULATED IN THE DOMESTIC WATER BOOSTER PUMP SCHEDULE.
  - ALL EXPOSED PIPE SURFACES TO BE PROTECTED WITH PAINT. FINISH COAT TO BE BLUE.
  - CONTRACTOR SHALL SET LOW WATER LEVEL ALARM TO PROVIDE 2 HOURS OF USABLE VOLUME (28,880 LITERS).
  - CONTRACTOR SHALL SET LOW WATER DOMESTIC PUMP SHUT OFF FLOAT 150 ABOVE SUCTION PIPE.
  - TANK SIZES ARE BASED ON PERSON USAGE NOT FIRE PROTECTION.

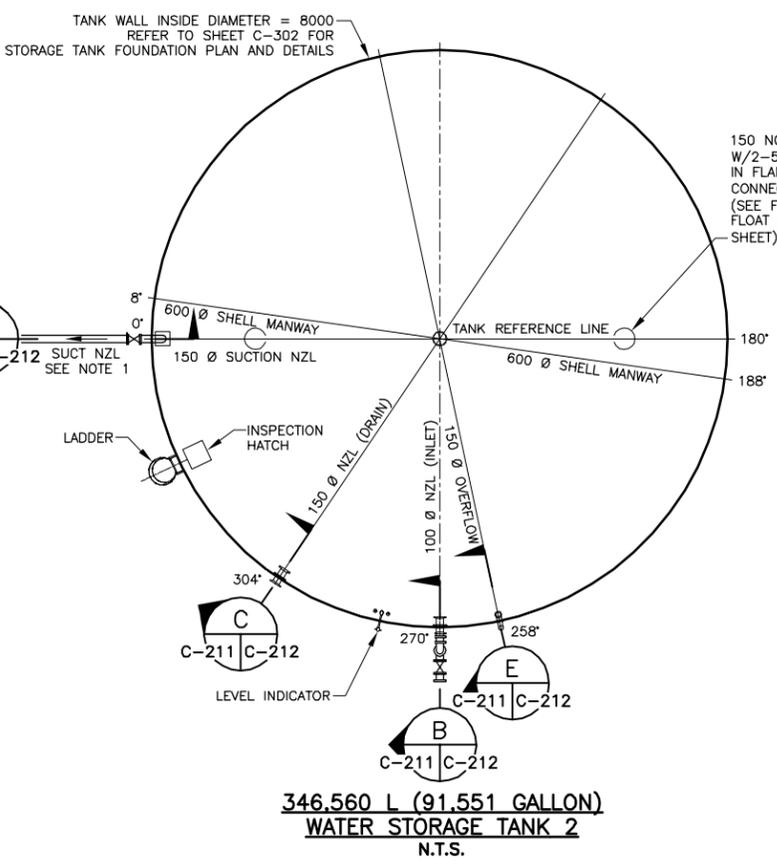
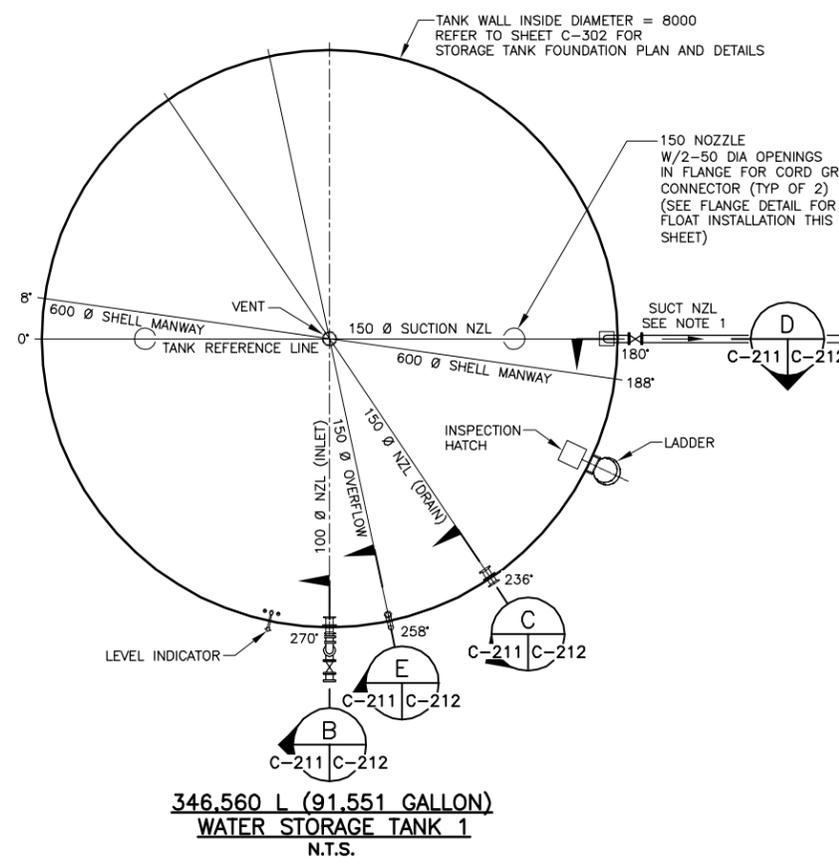
**TANK 1 TYPICAL ROLLOUT (SHOWN FROM INSIDE OF TANK LOOKING OUT) N.T.S.**

**TANK 2 TYPICAL ROLLOUT (SHOWN FROM INSIDE OF TANK LOOKING OUT) N.T.S.**



**FLOAT INSTALLATION NOTES:**

- COORDINATE MOUNTING REQUIREMENTS WITH TANK MANUFACTURERS RECOMMENDATIONS.
- LAYOUT SHOWN IS REPRESENTATIVE OF A SUBMERSIBLE PRESSURE SENSOR CONFIGURATION. INSTALLATION OF AN ULTRA SONIC PRESSURE SENSOR CONFIGURATION IS ALSO ACCEPTABLE.
- PROVIDE SUFFICIENT CABLE LENGTH TO ACCOMMODATE FLOAT ADJUSTMENT TO THE BOTTOM OF TANKS IF NECESSARY.



UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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NO.	DESCRIPTION	DATE	BY
0	CORRECTED FINAL DESIGN RE-ISSUED	12/02/10	DMG
1	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	DMG
2	FINAL DESIGN SUBMITTAL	10/05/10	DMG
3	MID-POINT DESIGN SUBMITTAL	08/31/10	DMG

DESIGNED BY:	DATE:	12/02/10
PSR	SUBMITTED BY:	TETRA TECH
DRAWN BY:	PSR	
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AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

WATER STORAGE TANK  
PLAN AND DETAILS

SHEET REFERENCE NUMBER:  
**AF1082 C-211**

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FINAL  
DESIGN  
RE-ISSUED

DATE	DESCRIPTION
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10/05/10	DMG
08/31/10	DMG
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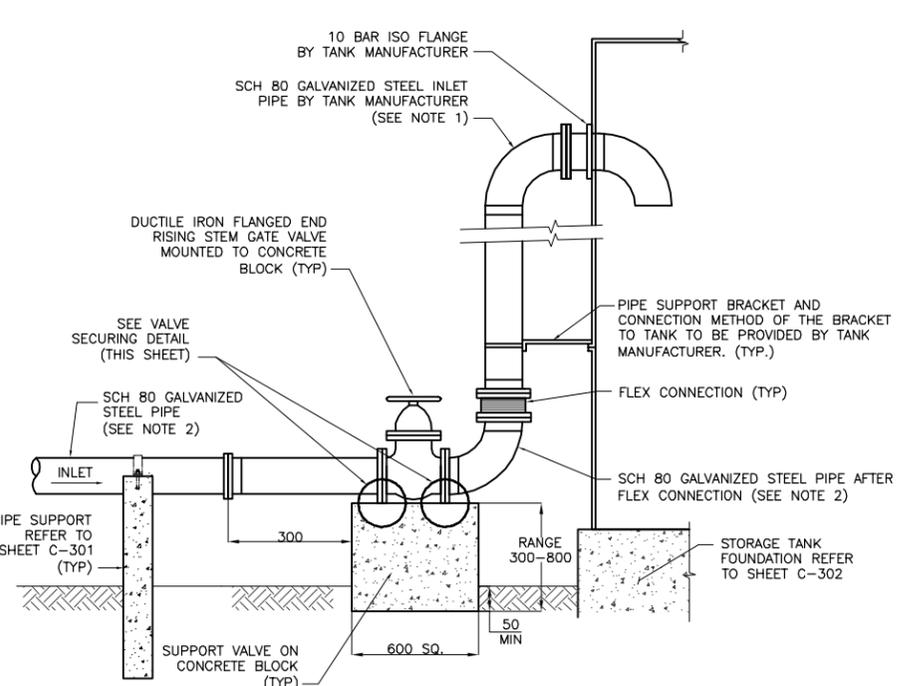
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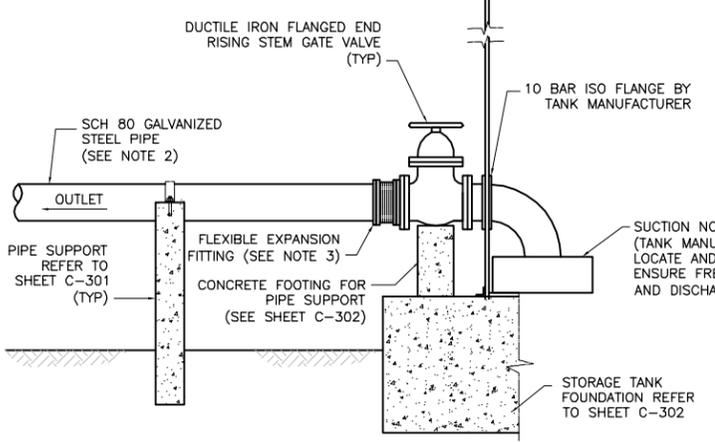
AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

WATER AND WASTEWATER  
STORAGE TANK PIPE DETAILS

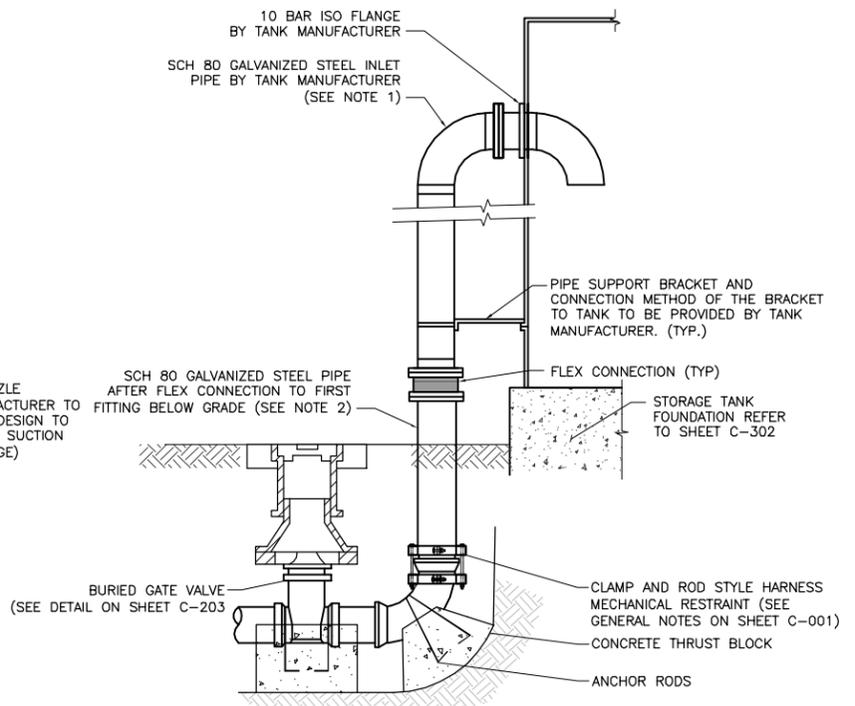
SHEET  
REFERENCE  
NUMBER:  
**AF1082  
C-212**



**WATER TANK INLET DETAIL** (B)  
N.T.S. C-211, C-212

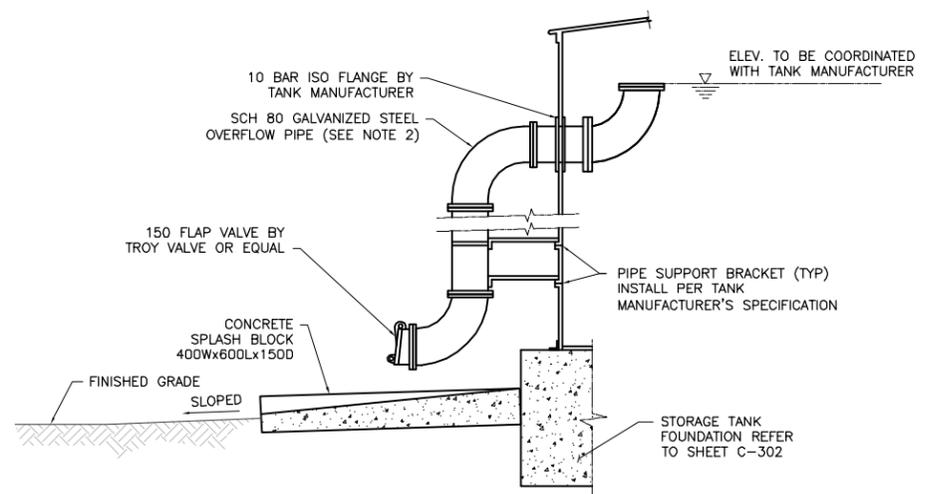


**TANK SUCTION DETAIL** (D)  
N.T.S. C-211, 223, C-212

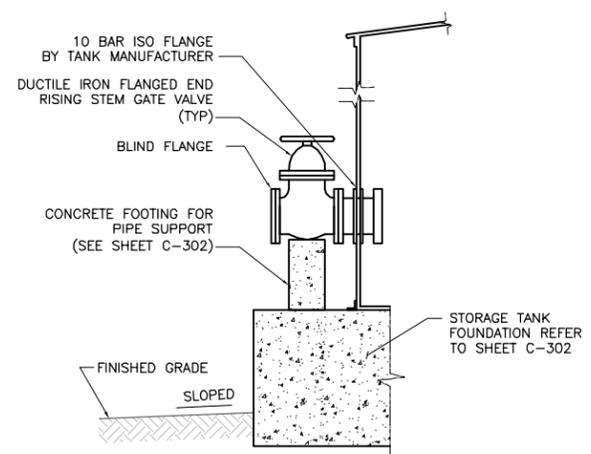


**WASTEWATER TANK INLET DETAIL** (A)  
N.T.S. C-223, C-212

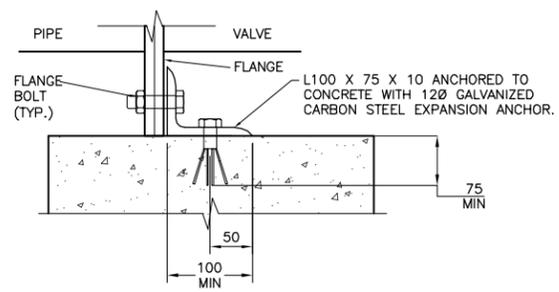
- NOTES:**
- ELEVATION OF TANK PENETRATIONS AND TANK FILL AND OUTLET PIPES TO BE COORDINATED WITH TANK MANUFACTURER'S REQUIREMENTS.
  - ALL EXPOSED PIPE TO BE PROTECTED WITH PAINT. FINISH COAT TO BE BLUE.
  - PROVIDE FLEXIBLE EXPANSION FITTING TO ACCOMMODATE APPROXIMATELY 38 TO 50 OF SETTLEMENT. FITTING TO BE RESISTANT TO UV EXPOSURE AND COMPLY WITH PIPE TESTING REQUIREMENTS AS STATED IN SPECIFICATIONS.
  - VICTAULIC TYPE FITTINGS MAY BE SUBSTITUTED FOR FLANGED CONNECTIONS.
  - ELEVATIONS OF ALL TANK APPURTENANCES ARE CENTERLINE OF FIXTURE. LOCATIONS TO BE COORDINATED WITH THE TANK MANUFACTURER.
  - REFER TO SHEETS C-110, C-111, AND C-112 FOR PIPING LAYOUT.



**TANK OVERFLOW DETAIL** (E)  
N.T.S. C-211, 223, C-212



**TANK DRAIN DETAIL** (C)  
N.T.S. C-211, 223, C-212



**VALVE SECURING DETAIL**  
N.T.S.

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FINAL  
DESIGN  
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B	10/05/10	FINAL DESIGN SUBMITTAL
A	08/31/10	MID-POINT DESIGN SUBMITTAL
SYMB		

DESIGNED BY:	PSR	DATE:	12/02/10
DRAWN BY:	PSR	SUBMITTED BY:	TETRA TECH
CHECKED BY:	GCH	FILE NO.:	AF1082--CU220SE

**US Army Corps of Engineers**  
Middle East District

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AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

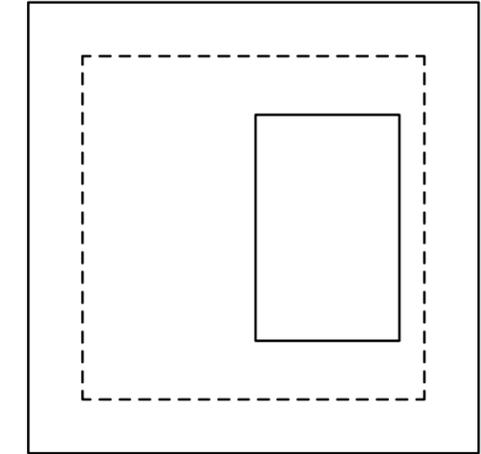
SEWAGE LIFT STATION  
PLAN AND SECTIONS

SHEET  
REFERENCE  
NUMBER:  
**AF1082  
C-220**

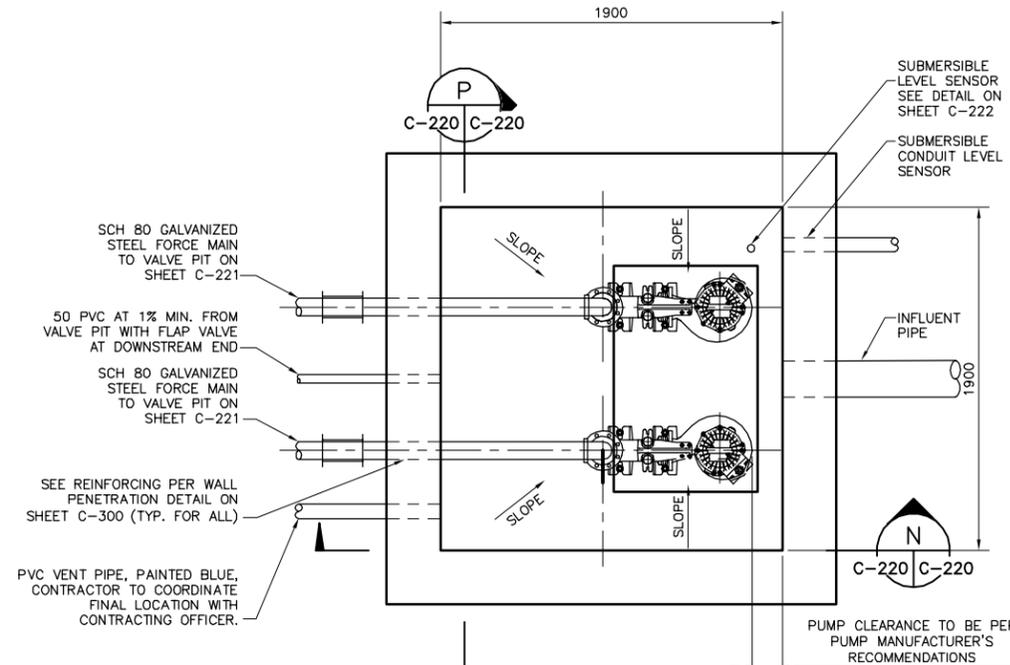
NO. REQ.D	TYPE	RATING POINT		MIN. DISCH SIZE	TYPE SEAL
		CAP. l/s (GPM)	MIN. HEAD m (FT.)		
2	GRINDER	16.2 (257)	20.5 (67.25)	100	TANDEM MECH.

- NOTES:**
- SEE SHEET C-303 FOR STRUCTURAL DETAILS.
  - ALL PIPES AND FITTINGS INSIDE STATION TO BE SCH 80 GALVANIZED STEEL WITH THREADED JOINTS.
  - CONTRACTOR SHALL INSTALL PUMPS AND PIPING TO ALLOW SUFFICIENT CLEARANCE FOR REMOVAL OF PUMPS THROUGH ACCESS HATCH.
  - PIPE HANGERS, SUPPORTS, CLAMPS OR OTHER MISCELLANEOUS METAL COMPONENTS INSTALLED WITHIN THE PUMP STATION SHALL BE MANUFACTURED OF CORROSIVE RESISTANT METAL AND PER MANUFACTURERS RECOMMENDATIONS.
  - CONTRACTOR TO PERFORM BUOYANCY CALCULATIONS ON ALL UNDERGROUND TANKS BASED ON GEOTECHNICAL REPORT RECOMMENDED HIGH GROUND WATER ELEVATION.
  - PUMP STATION DEPTH AND CONTROL SETTINGS TO BE DETERMINED BY CONTRACTOR.

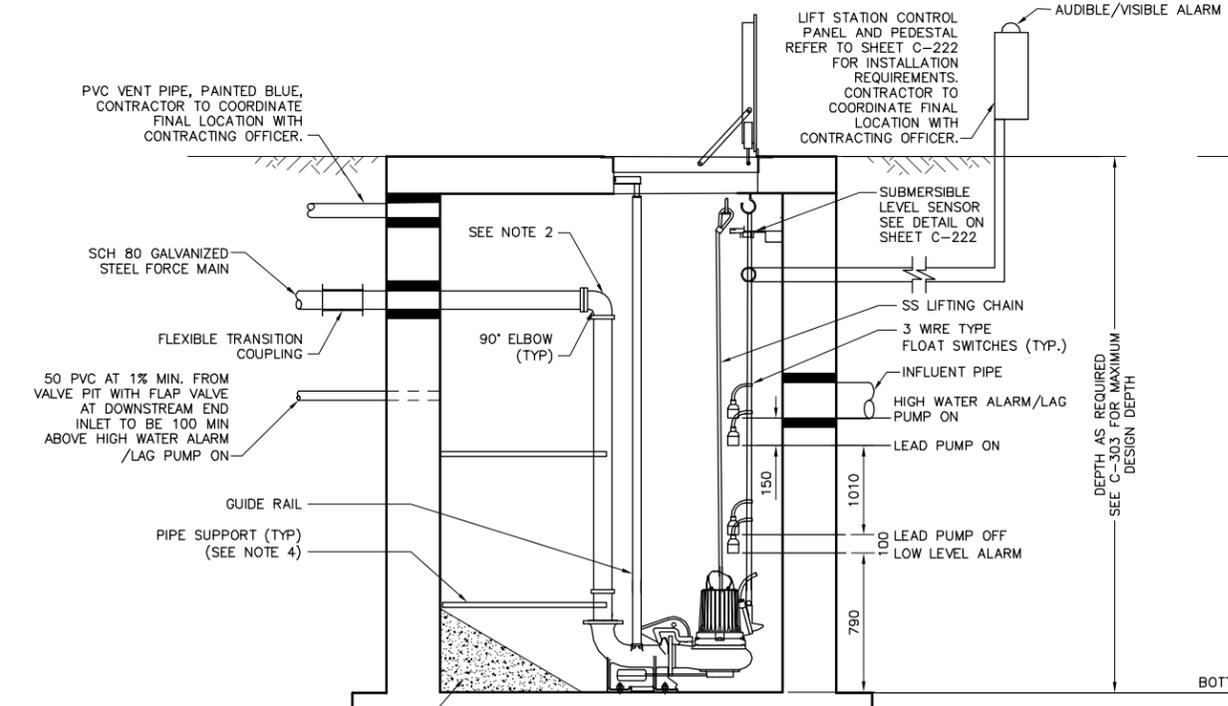
THESE DRAWINGS ARE "NOT APPROVED FOR CONSTRUCTION" SINCE THESE ARE BASED UPON ASSUMED CONDITIONS. THE CONTRACTOR SHALL NOT PROCEED WITH CONSTRUCTION UNTIL THE ASSUMED CONDITIONS ARE VALIDATED AND APPROVAL IS RECEIVED FROM THE CONTRACTING OFFICER.



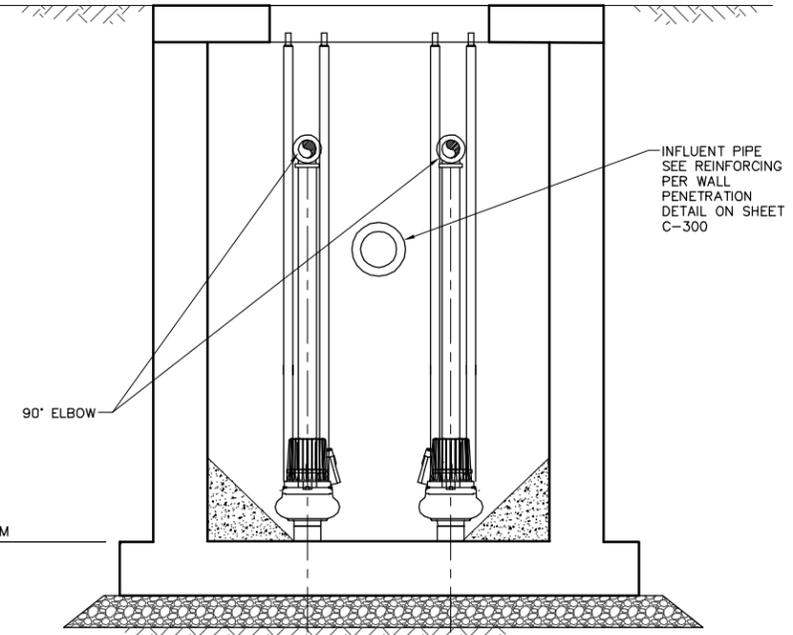
TOP SLAB PLAN  
N.T.S.



SEWAGE LIFT STATION PLAN  
N.T.S.



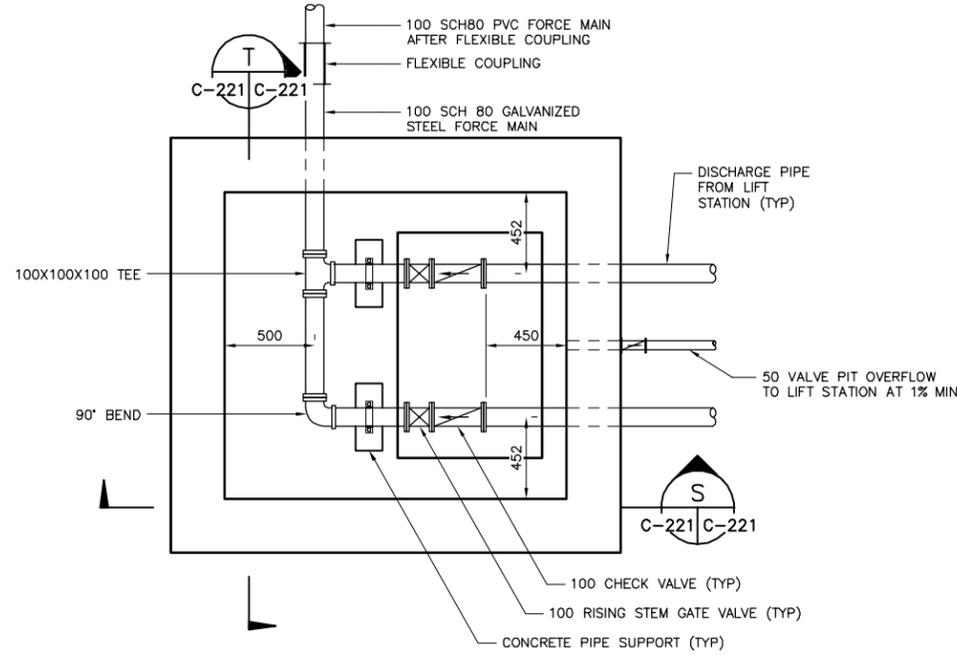
SECTION N.T.S.  
C-220 C-220



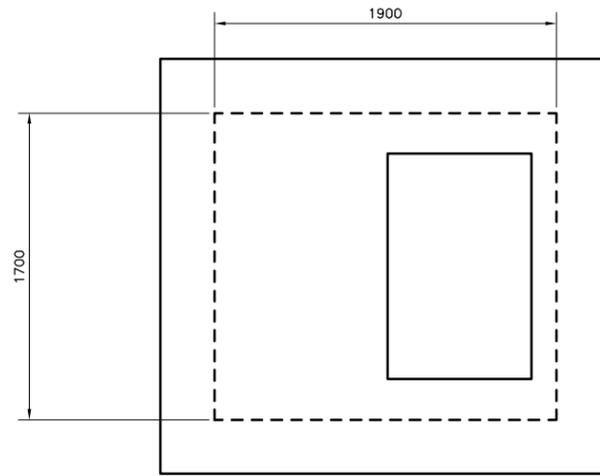
SECTION P N.T.S.  
C-220 C-220

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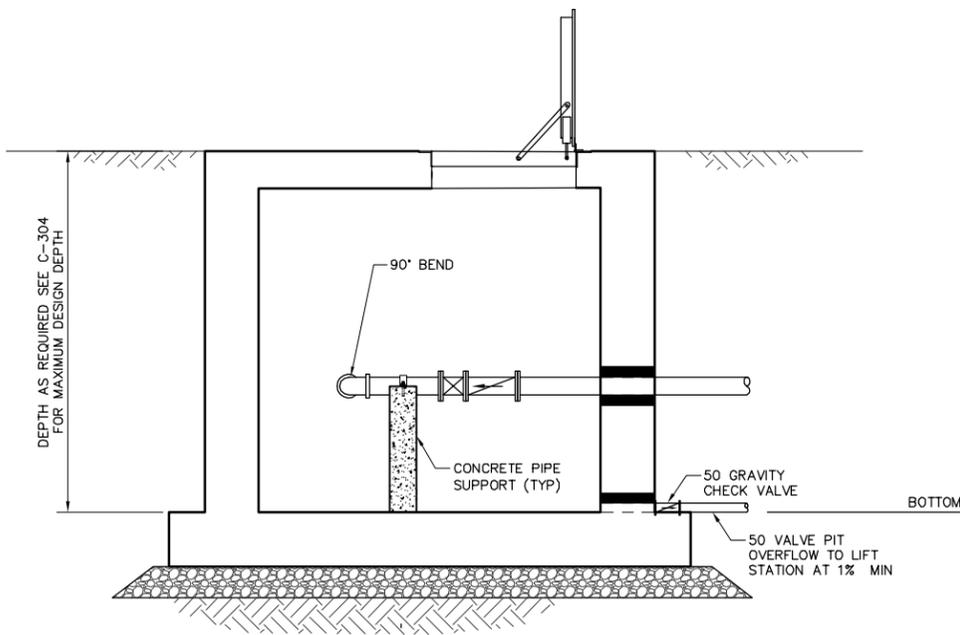
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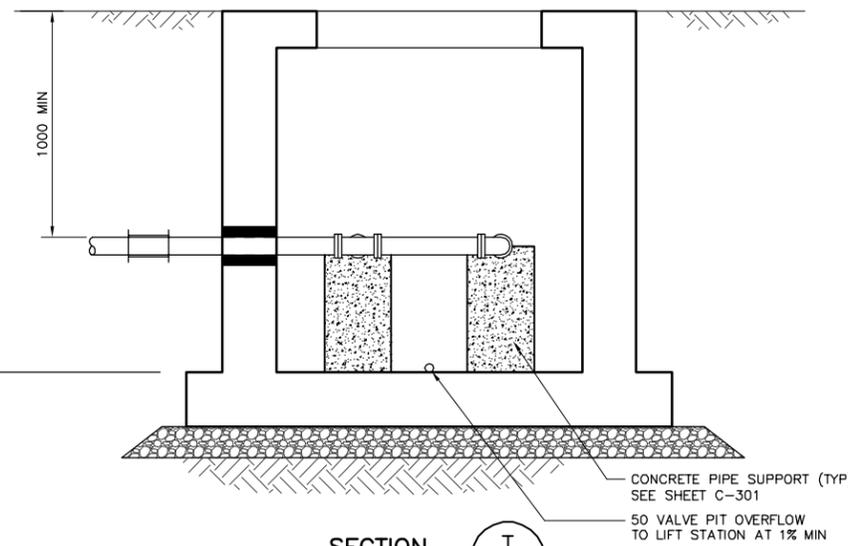
VALVE PIT PLAN  
N.T.S.



TOP SLAB PLAN  
N.T.S.



SECTION S  
N.T.S. C-221 C-221



SECTION T  
N.T.S. C-221 C-221

NOTES:

- REFER TO C-300 FOR CONCRETE NOTES.
- SEE C-304 FOR CONCRETE VALVE PIT AND STEEL REINFORCEMENT DETAILS.

CORRECTED  
FINAL  
DESIGN  
RE-ISSUED

SYMB	DESCRIPTION	DATE	PR
0	CORRECTED FINAL DESIGN RE-ISSUED	12/02/10	DMG
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	DMG
B	FINAL DESIGN SUBMITTAL	10/05/10	DMG
A	MID-POINT DESIGN SUBMITTAL	08/31/10	DMG

DESIGNED BY:	DATE:	12/02/10
PSR	SUBMITTED BY:	TETRA TECH
DRAWN BY:	PSR	FILE NO.:
PSR	GCH	AF1082--CU221SE

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TETRA TECH

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

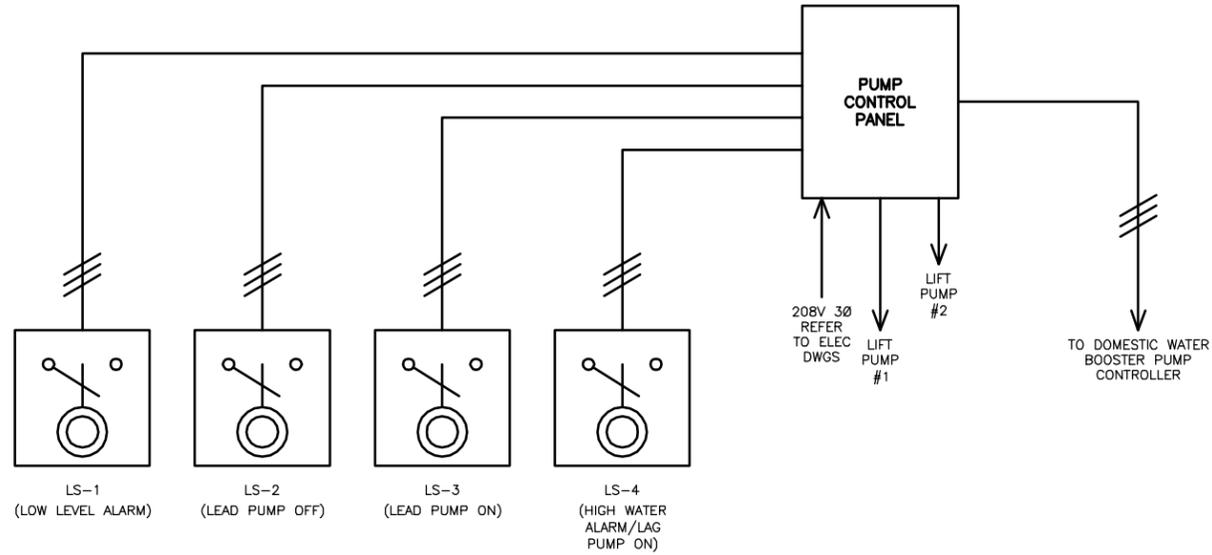
SEWAGE LIFT STATION  
VALVE PIT PLAN AND SECTIONS

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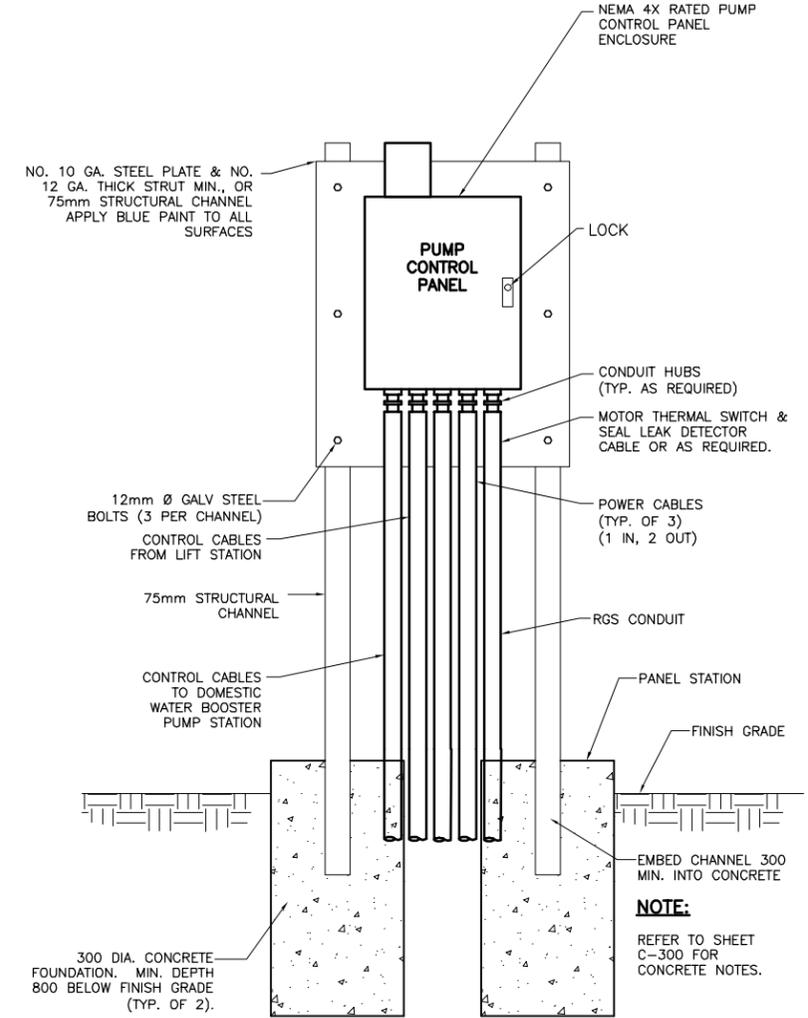
SHEET  
REFERENCE  
NUMBER:  
AF1082  
C-221

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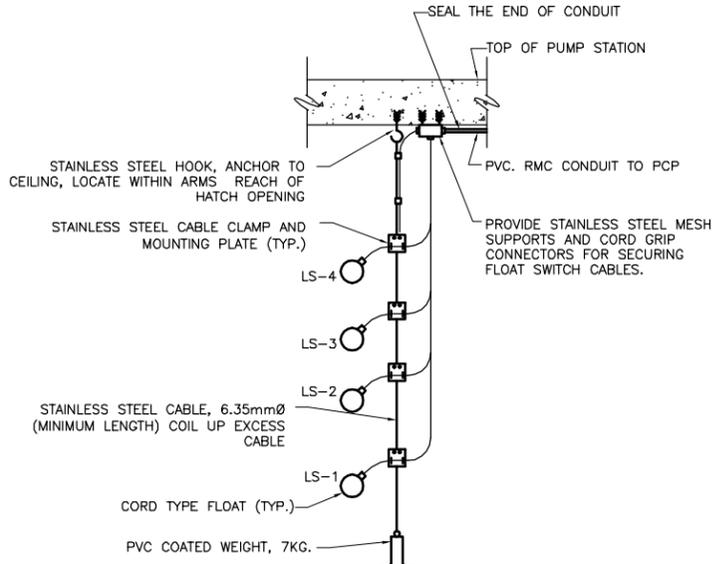
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**LIFT STATION SCHEMATIC WIRING DIAGRAM**  
N.T.S.



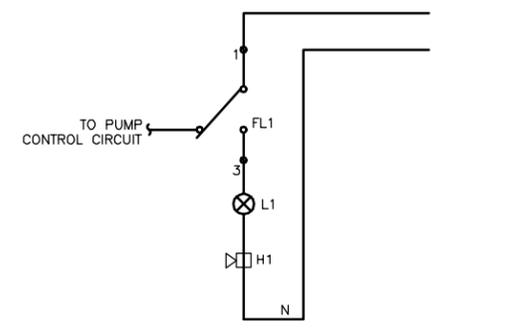
**LIFT STATION CONTROL PANEL MOUNTING DETAIL**  
N.T.S.



**SUBMERSIBLE LEVEL SENSOR DETAIL**  
N.T.S.

**LIFT STATION SYSTEM SEQUENCE OF OPERATIONS**

- THE HAND/OFF/AUTO (HOA) SWITCHES FOR BOTH PUMPS SHOULD BE MAINTAINED IN THE "AUTO" POSITION.
- WHEN THE LIQUID LEVEL RISES ABOVE THE SET POINT OF THE FLOAT LS-3, THE LEAD PUMP WILL START AND RUN UNTIL THE LEVEL DROPS BELOW THE SET POINT FOR LS-2.
- IF THE LIQUID LEVEL CONTINUES TO RISE TO THE LEVEL OF THE SET POINT FOR LS-4, THE LAG PUMP WILL ALSO START, THE LOCAL ALARM WILL SOUND AND A SIGNAL WILL BE SENT TO THE DOMESTIC WATER BOOSTER PUMP CONTROL STATION INDICATING "HIGH LEVEL" AND THE DOMESTIC WATER BOOSTER PUMPS WILL SHUT DOWN. SEE DRAWING C-210 FOR CONNECTION TO DOMESTIC WATER BOOSTER PUMP CONTROL.
- WHEN THE LIQUID LEVEL DROPS BELOW THE SET POINT FOR LS-2, BOTH PUMPS WILL STOP.
- IF THE LIQUID LEVEL DROPS BELOW THE SET POINT OF LS-1, BOTH PUMPS WILL AGAIN STOP AND THE LOCAL ALARM WILL SOUND INDICATING "LOW LEVEL".
- IF EITHER PUMP OVERLOAD RELAY SENSES AN OVERLOAD CONDITION IN THE PUMP IT PROTECTS, IT WILL OPEN THE APPROPRIATE CONTROL CIRCUIT CAUSING THAT PUMP TO SHUT DOWN. THE "PUMP TRIP" INDICATOR LAMP WILL ILLUMINATE. THE PUMP WILL REMAIN OFF UNTIL THE OVERLOAD RELAY IS MANUALLY RESET, RESTORING THE CONTROL CIRCUIT AND EXTINGUISHING THE INDICATION LAMP.
- PUMP CONTROL PANEL SHALL BE A STEEL CABINET, IP54, CONTAINING MAIN SWITCH, ALL REQUIRED FUSES, SWITCHING EQUIPMENT, AND MICROPROCESSOR CONTROLLER.



- FL1 - HIGH LEVEL FLOAT SWITCH IN SEWAGE TANK
- L1 - HIGH SEWAGE LEVEL INDICATOR LAMP (⊗)
- H1 - HIGH SEWAGE LEVEL AUDIBLE ALARM

IF FL1 REACHES "HIGH LEVEL" IT OPENS PUMP CONTROL POWER AND ILLUMINATES L1 AND SOUNDS H1.

**LEVEL ALARM SCHEMATIC DIAGRAM**  
N.T.S.

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NO.	DESCRIPTION	DATE	BY
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	DMG
B	FINAL DESIGN SUBMITTAL	10/05/10	DMG
A	MID-POINT DESIGN SUBMITTAL	08/31/10	DMG

DESIGNED BY:	DATE:	10/19/10
PSR	SUBMITTED BY:	TETRA TECH
PSR	FILE NO.:	AF1082--CU222D
GCH	CHECKED BY:	

US Army Corps of Engineers  
Middle East District

TETRA TECH

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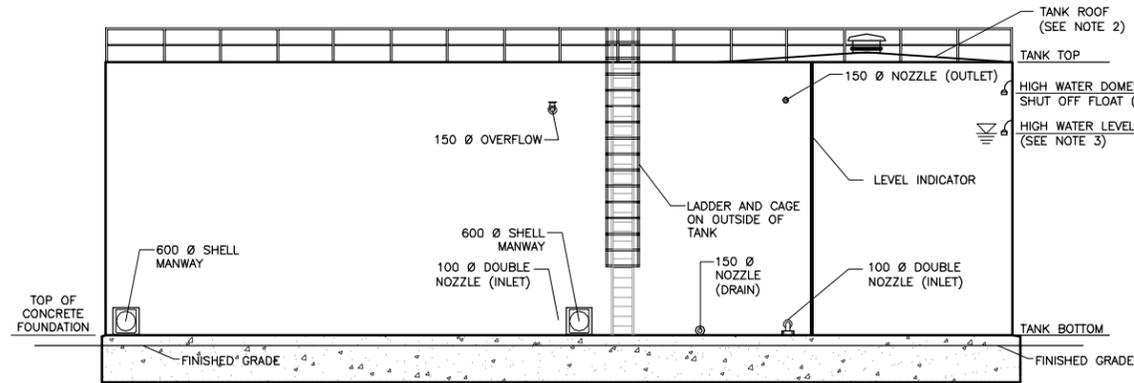
AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

SEWAGE LIFT STATION CONTROL PANEL DIAGRAMS AND DETAILS

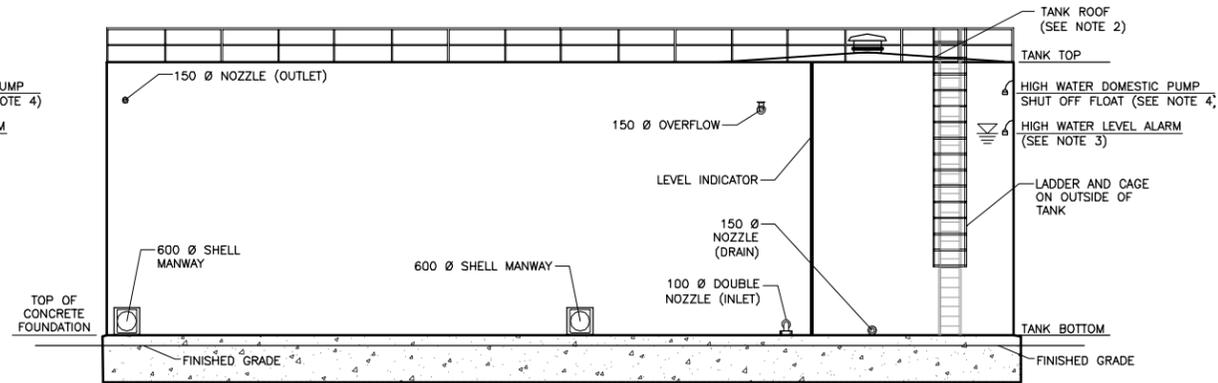
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**AF1082 C-222**

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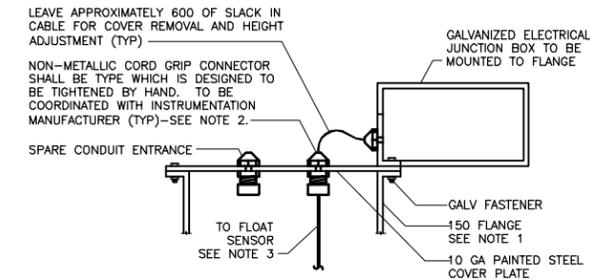
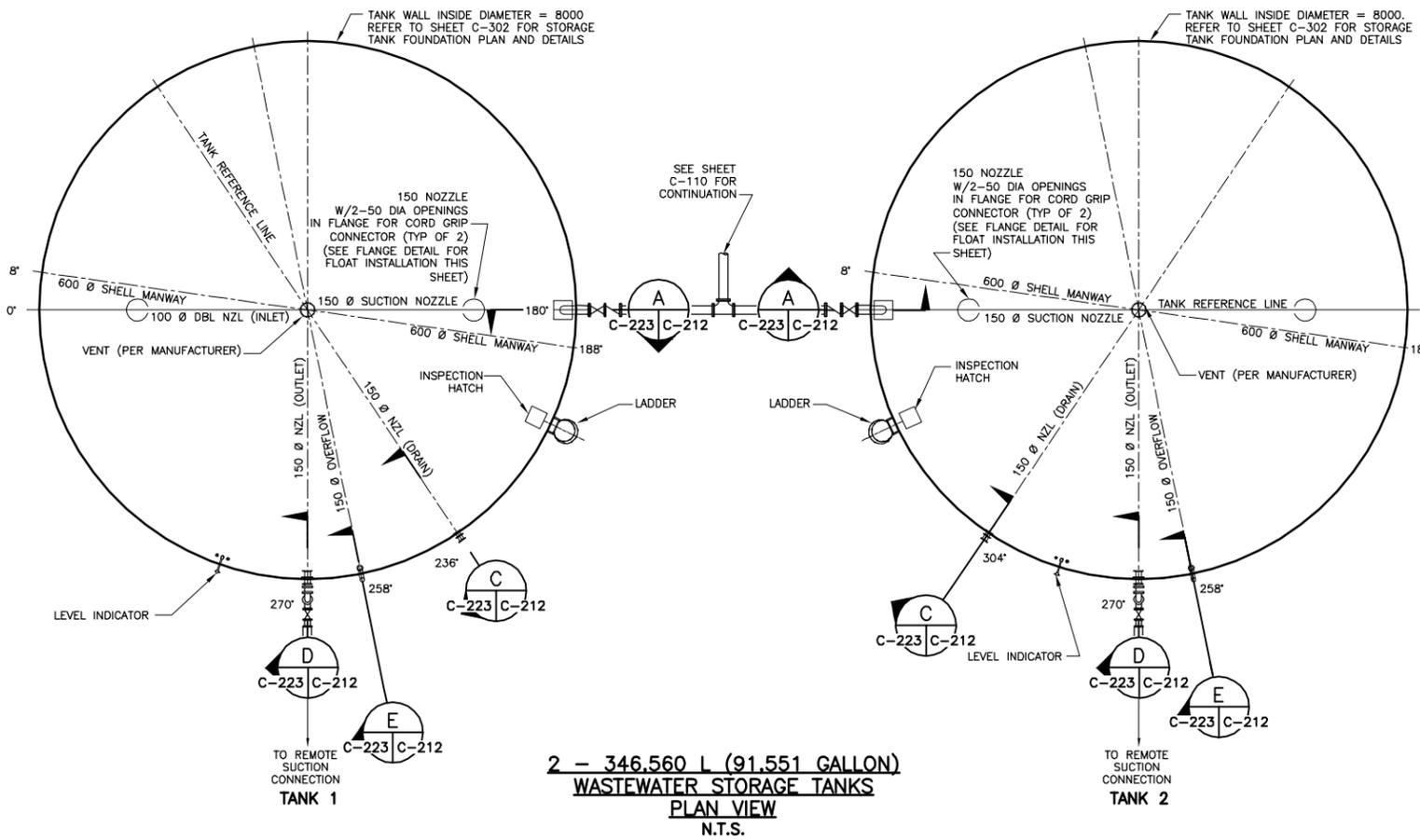
**TANK 1 TYPICAL ROLL OUT**  
SHOWN FROM INSIDE OF TANK LOOKING OUT



**TANK 2 TYPICAL ROLL OUT**  
SHOWN FROM INSIDE OF TANK LOOKING OUT

**NOTES:**

- CONTRACTOR TO ENSURE SUCTION LINE SIZE IS COMPATIBLE WITH BASE COLLECTION TRUCKS.
- ALL EXPOSED PIPE SURFACES TO BE PROTECTED WITH PAINT. FINISH COAT TO BE BLUE.
- CONTRACTOR SHALL SET HIGH WATER LEVEL ALARM TO PROVIDE 2 HOURS OF ADDITIONAL STORAGE VOLUME (28,800 LITERS).
- CONTRACTOR SHALL SET HIGH WATER SANITARY PUMP SHUT OFF FLOAT 150 BELOW OVERFLOW PIPE.



**FLANGE DETAIL FOR FLOAT INSTALLATION**  
N.T.S.

- FLOAT INSTALLATION NOTES:**
- COORDINATE MOUNTING REQUIREMENTS WITH TANK MANUFACTURERS RECOMMENDATIONS.
  - LAYOUT SHOWN IS REPRESENTATIVE OF A SUBMERSIBLE PRESSURE SENSOR CONFIGURATION. INSTALLATION OF AN ULTRA SONIC PRESSURE SENSOR CONFIGURATION IS ALSO ACCEPTABLE.
  - PROVIDE SUFFICIENT CABLE LENGTH TO ACCOMMODATE FLOAT ADJUSTMENT TO THE BOTTOM OF TANKS IF NECESSARY.

CORRECTED FINAL DESIGN RE-ISSUED

NO.	DATE	DESCRIPTION
0	12/02/10	DWG CORRECTED FINAL DESIGN RE-ISSUED
1	10/19/10	DWG CORRECTED FINAL DESIGN SUBMITTAL
2	10/05/10	DWG FINAL DESIGN SUBMITTAL
3	08/31/10	DWG MID-POINT DESIGN SUBMITTAL

DESIGNED BY:	DATE:	12/02/10
DRAWN BY:	PSR	
CHECKED BY:	GCH	
FILE NO.:	AF1082--CU223DT	

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AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

WASTEWATER STORAGE TANK  
PLAN AND DETAILS

SHEET REFERENCE NUMBER:  
**AF1082 C-223**

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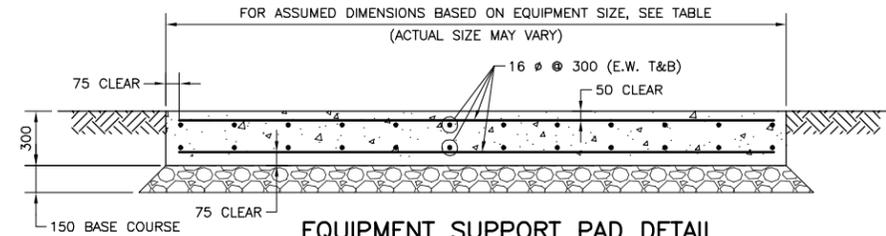
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**NOTES:**

- STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS.
- THE SITE INFRASTRUCTURE STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH:
  - INTERNATIONAL BUILDING CODE (IBC), 2009.
  - ACI318-08 SPECIFICATION
  - ACI350-06 SPECIFICATION
  - SEISMIC DESIGN AND HS-20 LOADING PER 2002 SPECIFICATIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS WITH CURRENT INTERIM SPECIFICATIONS (AASHTO).
  - PCA RECTANGULAR CONCRETE TANK, REVISED 5th EDITION.
  - ASCE 7-05, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
- ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
- LOADING:
  - SEE DETAIL SHEETS FOR ADDITIONAL LOADING INFORMATION.
  - LIVE LOAD: (AS APPLICABLE BASED ON STRUCTURE TYPE)
    - UNIFORM: 100 PSF
    - VEHICULAR: HS-20 AASHTO TRUCK
    - EQUIPMENT LOADS: AS NOTED ON THE DRAWINGS
  - WIND LOAD: CALCULATED AS PER ASCE 7-05 USING A "3-SECOND GUST" WIND SPEED OF 125 km/hr (78 mph), EXPOSURE C, IMPORTANCE FACTOR 1.5
  - SEISMIC:  $S_p = 1.65G$   
 $S_s = 0.75G$   
OCCUPANCY CATEGORY I  
SITE CLASS D  
IMPORTANCE FACTOR  $I = 1.0$
- THE FOLLOWING GEOTECHNICAL PROPERTIES WERE ASSUMED FOR DESIGN. THE CONTRACTOR SHALL VERIFY THE GEOTECHNICAL PROPERTIES LISTED BELOW AND FOR CONSTRUCTING FOUNDATIONS, PAVEMENTS, MATERIALS, EARTHWORK AND OTHER GEOTECHNICAL RELATED ITEMS CONTAINED IN THIS PROJECT.
  - UNIT WEIGHT OF SOIL 1922 kg/m<sup>3</sup> [120PCF]
  - NET ALLOWABLE BEARING PRESSURE:
    - TYPICAL (U.N.O.) 72 kPa [1500 PSF]
    - WATER / WASTEWATER STORAGE TANKS: 96 kPa [2000 PSF] (SEE NOTE 6)
  - SUBGRADE MODULUS  $k: 27.145 \text{ Mpa/m}$  [100 PSI/IN]
  - ACTIVE EARTH PRESSURE COEFFICIENT:  $K_a=0.33$
  - PASSIVE EARTH PRESSURE COEFFICIENT:  $K_p=3.0$
  - AT REST EARTH PRESSURE COEFFICIENT:  $K_0=0.55$
  - FRICTION ANGLE OF BACKFILL: 30 DEGREES
  - MAXIMUM GROUND WATER IS ASSUMED TO BE 1.5m BELOW GRADE. CONTRACTOR SHALL VERIFY THAT THE WATER TABLE IS NOT ABOVE THIS LEVEL.
- THE STORAGE TANK RING FOUNDATION NET ALLOWABLE BEARING PRESSURE REQUIRES THAT THE CONTRACTOR SCARIFIES THE TOP 150mm [6"] OF NATIVE MATERIAL AND RE-COMPACTS IT TO 100% OF MODIFIED PROCTOR DENSITY. IF CONSTRUCTION REPRESENTATIVE IDENTIFIES THE SCARIFIED MATERIAL TO BE INADEQUATE, IT WILL BE REQUIRED TO BE MOVED AND REPLACED WITH GOOD MATERIAL.
- THE FOUNDATIONS SHALL BE PLACED ON SCARIFIED EARTH AND 150mm COMPACTED SELECT FILL PREPARED AS FOLLOWS:
  - REMOVE UNSATISFACTORY MATERIAL BELOW THE BOTTOM SLAB AND REPLACE WITH COMPACTED SELECT FILL TO A DEPTH WHERE NATURAL SOIL AND OR COMPACT FILL IS ENCOUNTERED.
  - FILL MATERIAL MUST BE PLACED IN LIFTS UP TO A MAXIMUM OF 150mm IN THICKNESS. EACH LIFT COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.
- SUBGRADE PREPARATION SHALL BE PERFORMED IN THE DRY. DEWATERING MAY BE REQUIRED FOR CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT A DEWATERING PLAN TO THE ENGINEER FOR REVIEW.
- ALL UNSATISFACTORY MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE STRUCTURE. REMOVAL OF UNSATISFACTORY MATERIAL REQUIRED TO A MINIMUM DEPTH OF 1/2 THE WIDTH OF THE STRUCTURE OR UNTIL SATISFACTORY MATERIAL IS REACHED WITHIN A PLAN AREA OF 1.5m BEYOND THE EDGE OF FOUNDATIONS.
- MAINTAIN LEVEL OF BACKFILL WITHIN 300mm ON THE OPPOSITE SIDE OF THE TANK WHILE BACKFILLING.
- ALL PVC WATERSTOPS TO BE 150mm PVC TIP, TYPE 0, 5mm THICK (3 RIBS). SEE DETAIL THIS SHEET. THE WATERSTOPS FOR THE FUEL STORAGE CONTAINMENT SHALL BE FUEL RESISTANT MATERIAL.

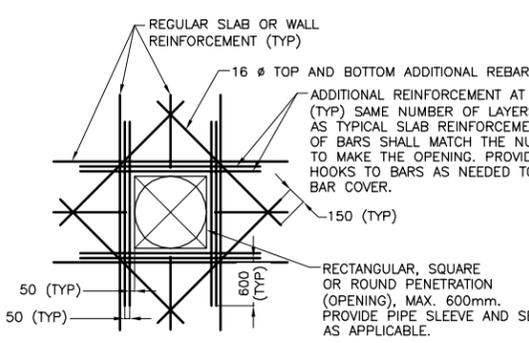
**CONCRETE NOTES:**

- STRUCTURAL CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 27.5 MPa (4000 PSI) AT 28 DAYS. TYPE II OR TYPE V PORTLAND CEMENT SHALL BE USED.
- CONCRETE SHALL BE CONTROLLED NORMAL WEIGHT CONCRETE, PROPORTIONED, MIXED AND PLACED UNDER THE SUPERVISION OF AN APPROVED QUALITY CONTROL ENGINEER.
- ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60. SEE SPLICE TABLE FOR LAP LENGTHS. MINIMUM YIELD STRENGTH  $F_y = 4218 \text{ kg/cm}^2$ .
- STANDARD REINFORCEMENT BENDING DETAILS SHALL BE IN ACCORDANCE WITH ACI STANDARDS.
- ALL EXPOSED CONCRETE EDGES SHALL HAVE A 25mm CHAMFER.
- MINIMUM PROTECTIVE CONCRETE COVER FOR REINFORCEMENT:
  - CONCRETE PLACED AGAINST EARTH, 75mm.
  - ALL OTHERS = 50mm MINIMUM
- DO NOT WELD OR BEND REINFORCEMENT IN FIELD UNLESS SPECIFICALLY SHOWN OR APPROVED BY ENGINEER.
- REINFORCING BARS EXTEND 12 BAR DIAMETERS BUT NOT LESS THAN 300mm BEYOND BEND U.N.O.
- NO BARS SHALL BE CUT OR OMITTED IN THE FIELD BECAUSE OF PIPE PENETRATIONS, SLAB OPENINGS, ETC. BARS MAY BE MOVED ASIDE WITHOUT CHANGE IN LEVEL WITH THE APPROVAL OF THE QUALITY CONTROL ENGINEER.
- REINFORCEMENT STEEL SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS. ALL CONSTRUCTION JOINTS SHALL BE KEYS U.N.O. PER DETAILS. ALL KEYS SHALL BE 50mm BY 100mm NOMINAL U.N.O.
- DETAILING, FABRICATION AND ERECTION OF REINFORCEMENT SHALL CONFORM TO ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL, CONCRETE, ACI 318 DETAILS AND DETAILING OF CONCRETE REINFORCEMENT, AND CRSI MANUAL OF STANDARD PRACTICE.
- CONTRACTOR SHALL COORDINATE LOCATIONS OF PIPING, CONDUITS, SLEEVES, INSERTS, ETC. WITH CONCRETE CONSTRUCTION. NO PIPES SHALL PASS THROUGH CONCRETE WITHOUT THE PERMISSION OF THE CONTRACTING OFFICER. STEEL PIPE SLEEVES SHALL BE PROVIDED AND SPACED A MINIMUM OF THREE PIPE DIAMETERS ON CENTER. CONDUIT AND OTHER EMBEDDED ITEMS SHALL BE CLEAN AND FREE OF OIL AND OTHER FOREIGN MATTER SUCH AS LOOSE COATING OR RUST, PAINT AND SCALE.
- ALL EMBEDDED ITEMS TO BE PLACED AND SECURED BEFORE CONCRETE PLACEMENT. NO "WET SETTING" OF EMBEDDED ITEMS WILL BE ALLOWED.
- PROVIDE ALL NECESSARY CHAIRS, CHAIR BARS, SPACERS, ETC., WIRED SECURELY TO HOLD REINFORCEMENT IN POSITION.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWING SHOWING REINFORCING STEEL PLACEMENT, SCHEDULES, SIZES, GRADES AND SPLICING AND BENDING DETAILS. DRAWINGS SHALL SHOW SUPPORT DETAILS INCLUDING TYPES, SIZES AND SPACING.
- REINFORCEMENT SHALL BE STORED OFF THE GROUND ON PLATFORMS, SKIDS OR OTHER SUPPORTS.
- SEE SPECIFICATIONS FOR TRANSPORTING, PLACING AND CURING CAST-IN-PLACE CONCRETE.

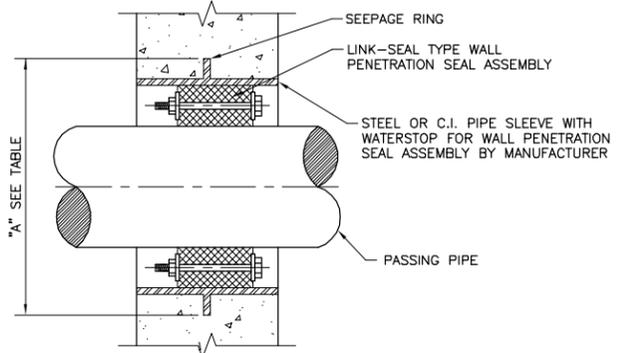


EQUIPMENT SUPPORT PAD GEOMETRY TABLE		
LOCATION	APPROX. GEOMETRY (W x L)	APPROX. WEIGHT (kg)
GENERATOR	2950 x 9650	16,012
BOOSTER PUMP	3000 x 3000	363
TRANSFER PUMP	1100 x 900	68

**NOTE:** PAD GEOMETRY BASED ON ASSUMED EQUIPMENT SIZE. FOR BOOSTER PUMP, PAD SIZE TO LIMITS OF SUNSHADE. SUNSHADE FOUNDATION TO BE DESIGNED BY CONTRACTOR. ACTUAL PAD SIZE MAY VARY.

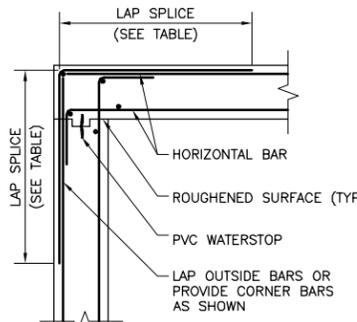


**SLAB OR WALL PENETRATION DETAIL**  
N.T.S.

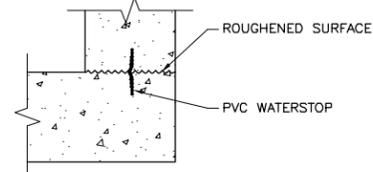


**PIPE PENETRATION DETAIL**  
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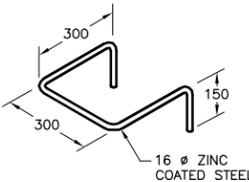
PIPE SIZE	NOMINAL SLEEVE DIAMETER	"A"
50	100	150
65	100	200
80	150	200
100	150	250
150	250	350
200	300	400
250	350	450
300	400	500
350	450	550
400	500	600
450	600	650
500	600	700
600	750	800



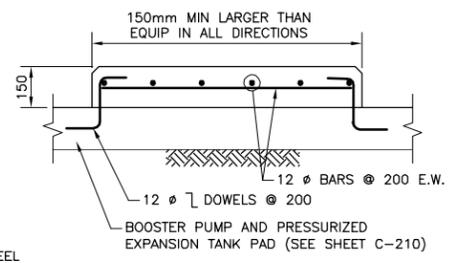
**TYPICAL WALL HORIZONTAL REINFORCING DETAIL AT CORNER**  
SCALE 1:20



**TYPICAL CONNECTION DETAIL**  
SCALE 1:10



**LADDER RUNG**  
N.T.S.



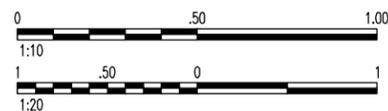
**WATER BOOSTER PUMP AND EXPANSION TANK HOUSEKEEPING PAD**  
N.T.S.

**MINIMUM RE-BAR SPLICE LENGTHS mm**  
 $f_y = 4218 \text{ kg/cm}^2$   $f'_c = 27.5 \text{ MPa}$

BAR SIZE $\phi$ mm	TOP BARS	OTHER BARS
10	650	500
12	815	635
16	1016	788
20	1590	1220
22	1755	1350
25	2032	1550

**SPLICE NOTES:**

- BASED ON NORMAL WEIGHT CONCRETE, UNCOATED BARS, CLEAR SPACING NOT LESS THAN FOUR BAR DIAMETERS, AND CLEAR COVER NOT LESS THAN 40mm.
- WHERE SPACING BETWEEN BARS IS LESS THAN FOUR BAR DIAMETERS, OR CLEAR COVER IS LESS THAN TWO BAR DIAMETERS, INCREASE SPLICE LENGTHS SHOWN BY 50%.
- BARS ARE CONSIDERED TO BE TOP BARS WHERE MORE THAN 300mm [12"] OF CONCRETE IS CAST BELOW THE BAR. WALL HORIZONTAL BARS UNIFORMLY SPACED IN A VERTICAL PLANE AT 300mm [12"] MAXIMUM SPACING ARE NOT CONSIDERED TOP BARS.
- BAR SPLICE LOCATION INDICATED MAY BE ADJUSTED TO MEET FIELD CONDITIONS.



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A	MID-POINT DESIGN SUBMITTAL	08/31/10

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DRAWN BY: RM  
CHECKED BY: APL  
DATE: 10/19/10  
SUBMITTED BY: TETRA TECH  
FILE NO.: AF1082--CU300GN

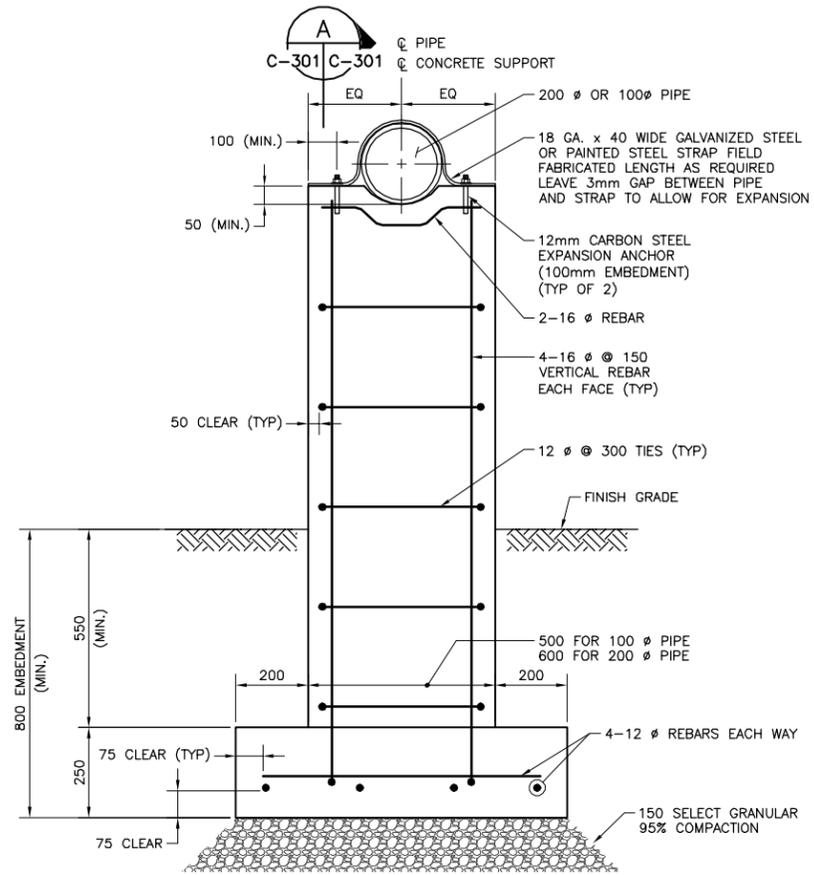
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AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN  
SITE INFRASTRUCTURE  
GENERAL NOTES AND  
TYPICAL DETAILS

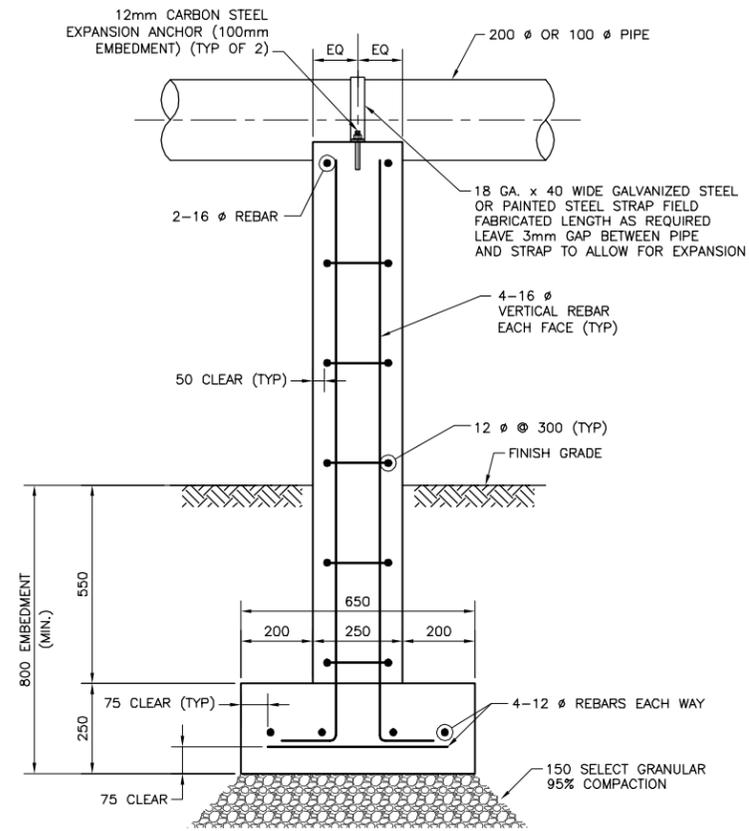
SHEET REFERENCE NUMBER:  
**AF1082 C-300**

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

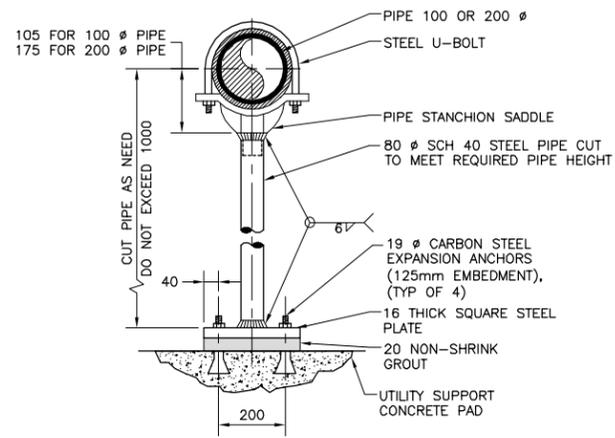
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**TYPICAL CAST-IN-PLACE  
CONCRETE PIPE SUPPORT**  
SCALE 1:10



**SECTION A**  
SCALE 1:10 C-301 C-301

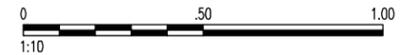


**PIPE SUPPORT - STANCHION SADDLE**  
N.T.S.

UNLESS OTHERWISE NOTED, ALL  
DIMENSIONS SHOWN ARE IN MILLIMETERS.

**NOTES:**

- SEE CONCRETE NOTES ON SHEET C-300.
- INSTALL PIPE SUPPORTS AT ALL LOCATIONS WHERE PIPING IS ABOVE GROUND WITH MINIMUM SPACING OF 2.75 METERS ON CENTER WITH FLEXIBLE COUPLING INSTALLED BETWEEN EVERY PIPE SUPPORT.



THESE DRAWINGS ARE "NOT APPROVED FOR CONSTRUCTION" SINCE THESE ARE BASED UPON ASSUMED CONDITIONS. THE CONTRACTOR SHALL NOT PROCEED WITH CONSTRUCTION UNTIL THE ASSUMED CONDITIONS ARE VALIDATED AND APPROVAL IS RECEIVED FROM THE CONTRACTING OFFICER.



CORRECTED  
FINAL  
DESIGN  
SUBMITTAL

SYMB	DESCRIPTION	DATE	PREP
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	SGW
B	FINAL DESIGN SUBMITTAL	10/05/10	SGW
A	MID-POINT DESIGN SUBMITTAL	08/31/10	SGW

DESIGNED BY:	DATE:	10/19/10
AHL	SUBMITTED BY:	TETRA TECH
GPV	CHECKED BY:	APL
FILE NO.:	AF1082--CU30101D	

US Army Corps of Engineers  
Middle East District



AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

PIPE SUPPORT DETAILS

SHEET  
REFERENCE  
NUMBER:  
**AF1082  
C-301**

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SUBMITTAL

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B	FINAL DESIGN SUBMITTAL	10/05/10	SGW
A	MID-POINT DESIGN SUBMITTAL	08/31/10	SGW

DESIGNED BY:	DATE:	10/19/10
NAV	SUBMITTED BY:	TETRA TECH
DRAWN BY:	AC	FILE NO.:
AF1082	AF1082--CU302PN	APL

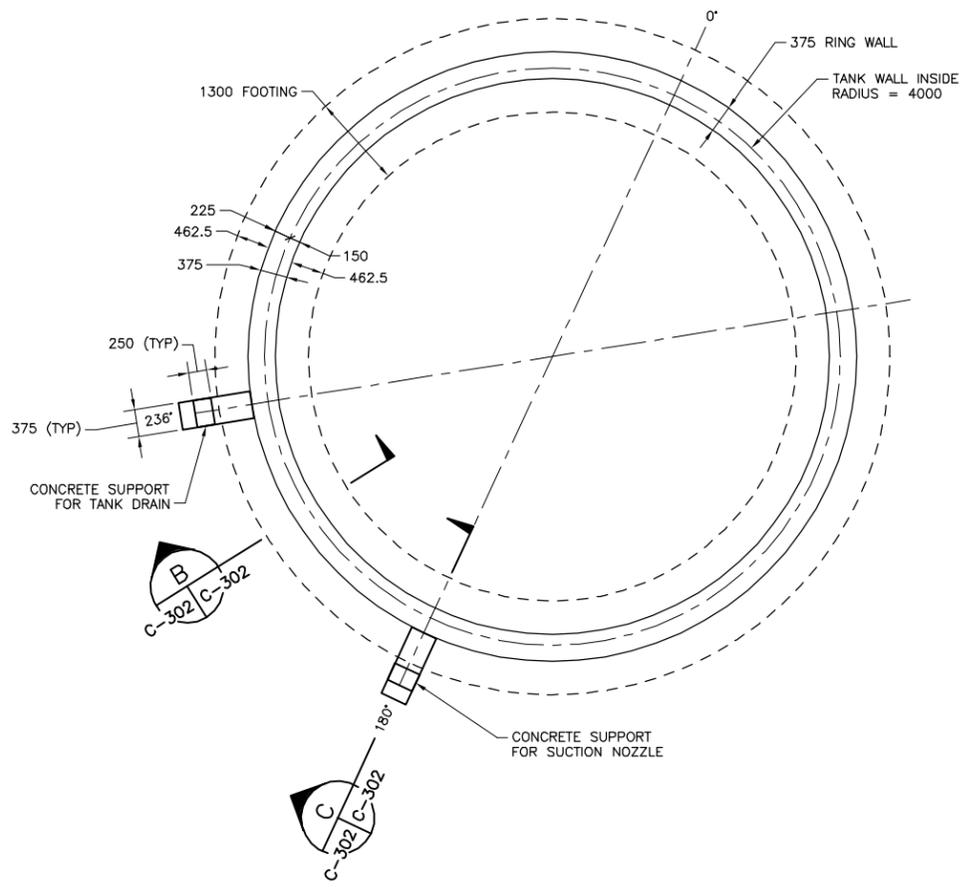
AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

US Army Corps of Engineers  
Middle East District

TETRA TECH

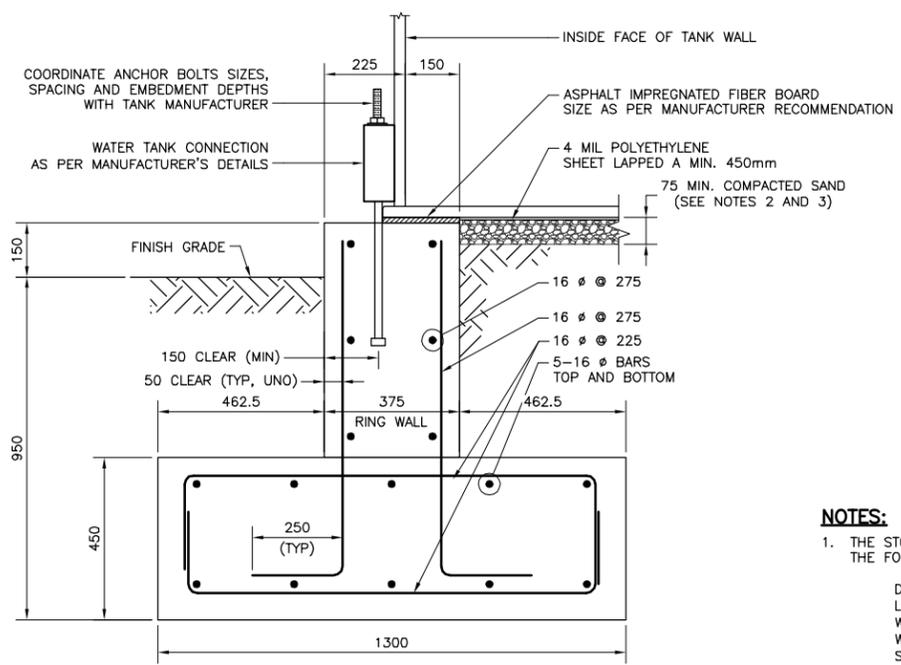
STORAGE TANK  
FOUNDATION PLAN AND SECTIONS

SHEET  
REFERENCE  
NUMBER:  
AF1082  
C-302



NOTE: TANK DRAIN SUPPORT CONFIGURATION SHOWN FOR TANK 1 ON C-211. TANK 2 ON C-211 SIMILAR.

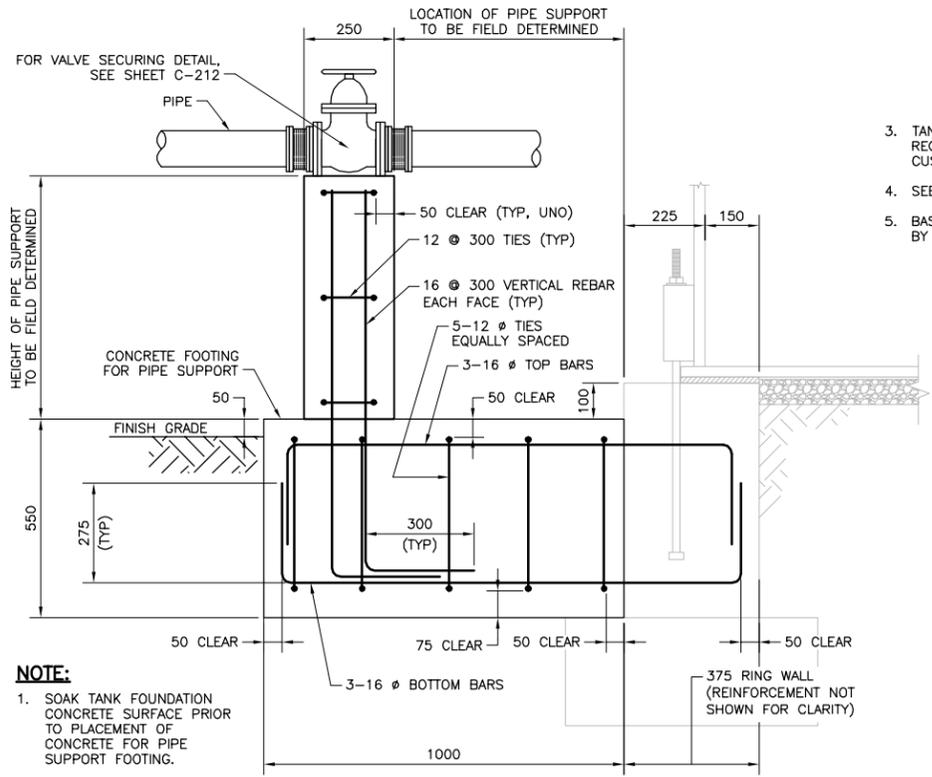
**346,560 LITER WATER/WASTEWATER STORAGE TANK FOUNDATION PLAN**  
SCALE 1:50



**DESIGN BEARING PRESSURE**  
SEISMIC/WIND: 45.50 kPa [0.95 ksf]

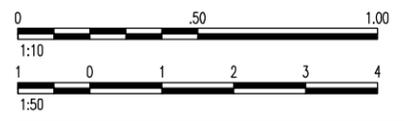
**STORAGE TANK FOUNDATION SECTION**  
SCALE 1:10

- NOTES:**
- THE STORAGE TANK RING FOUNDATION HAS BEEN DESIGNED FOR THE FOLLOWING TANK REACTIONS:
    - DL = 207 kg/m [139 LB/FT]
    - LL = 260 kg/m [175 LB/FT]
    - WS = 2958 kg [6522 LB]
    - WM = 10561 kg-m [76386 FT-LB]
    - SS = 80765 kg [178056 LB]
    - SM = 198049 kg-m [1432494 FT-LB]
    - UPLIFT = 3467 kg/m [2330 LB/FT]
  - FOOTINGS AND THE 75mm COMPACTED SAND UNDER THE TANK SHALL BE PLACED ON NATURAL UNDISTURBED SOIL OR ON COMPACTED SELECT GRANULAR MATERIAL FILL PREPARED AS FOLLOWS:
    - REMOVE UNSUITABLE MATERIAL BELOW THE FOOTING AND REPLACE WITH COMPACTED SELECT GRANULAR MATERIAL FILL TO A DEPTH WHERE NATURAL SOIL AND/OR COMPACT FILL IS ENCOUNTERED.
    - FILL MATERIAL MUST BE PLACED IN LIFTS UP TO A MAXIMUM OF 150mm IN THICKNESS. EACH LIFT COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 AT MOISTURE CONTENT WITHIN MINUS 1% TO PLUS 2% OF THE OPTIMUM.
  - TANK'S SUBGRADE SHALL BE SLOPED AS PER MANUFACTURER'S RECOMMENDATION WITH A MINIMUM 75mm COMPACTED SAND CUSHION.
  - SEE GEOTECHNICAL & CONCRETE NOTES ON SHEET C-300.
  - BASE PLATE AND CONNECTIONS SHALL BE SIZED AND DETAILED BY THE TANK MANUFACTURER.



**CONCRETE FOOTING FOR PIPE SUPPORT SECTION**  
SCALE 1:10

NOTE:  
1. SOAK TANK FOUNDATION CONCRETE SURFACE PRIOR TO PLACEMENT OF CONCRETE FOR PIPE SUPPORT FOOTING.

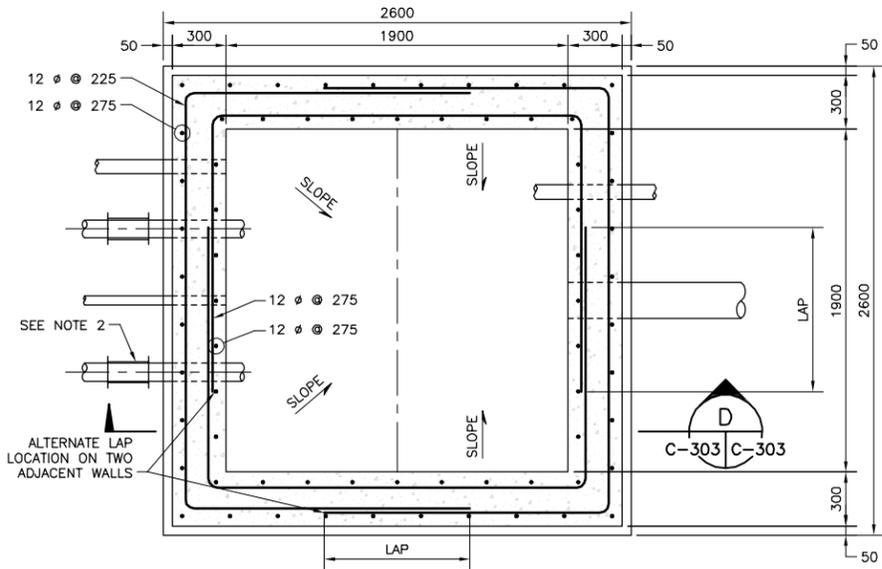


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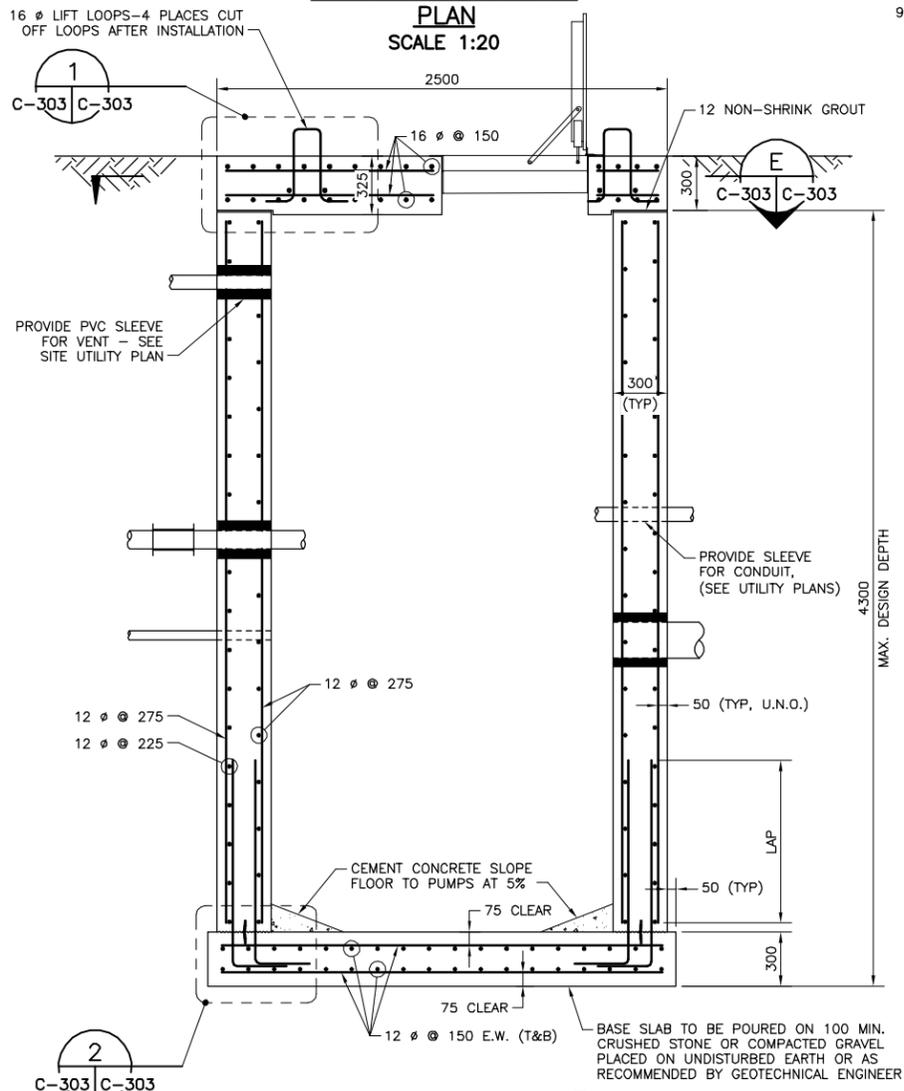


UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

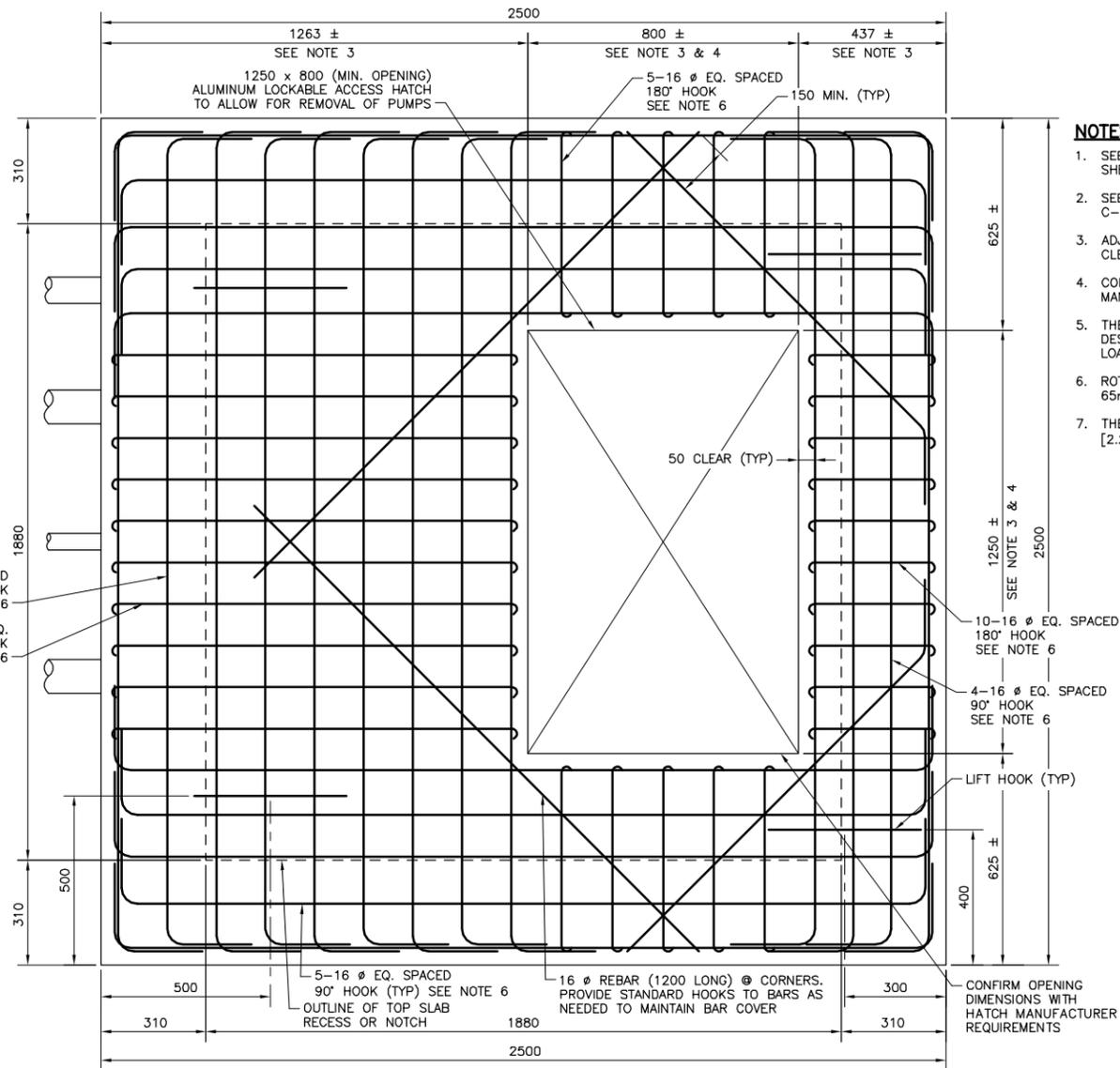
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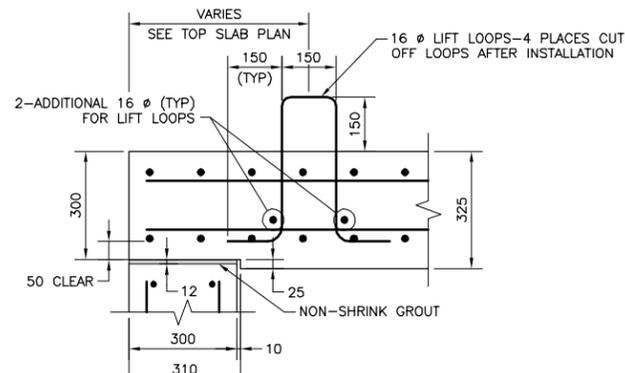
**SEWAGE LIFT STATION PLAN**  
SCALE 1:20



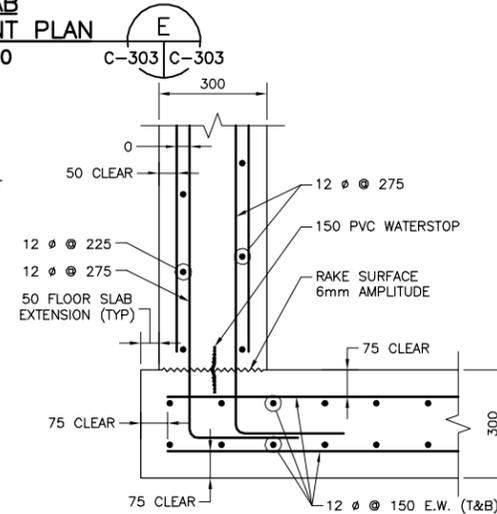
**SECTION**  
SCALE 1:20



**TOP SLAB REINFORCEMENT PLAN**  
SCALE 1:10



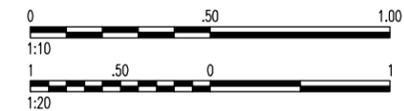
**DETAIL 1**  
SCALE 1:10



**DETAIL 2**  
SCALE 1:10

**NOTES:**

- SEE GENERAL AND CONCRETE NOTES ON SHEET C-300.
- SEE SHEETS C-110, C-111, C-112 AND C-220 FOR PIPE SIZES & LOCATION.
- ADJUST OPENING AS REQUIRED TO PROVIDE CLEAR ACCESS TO PUMPS.
- CONFIRM OPENING DIMENSIONS WITH HATCH MANUFACTURER REQUIREMENTS.
- THE SEWAGE LIFT STATION HAS BEEN DESIGNED FOR AASHTO HS20 VEHICULAR LOADING.
- ROTATE ALL HOOKS AS NEEDED TO PROVIDE 65mm MIN COVER.
- THE DESIGN BEARING PRESSURE IS 106.3 kPa [2.22 ksf] (NON-WIND OR SEISMIC).



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DESIGNED BY:	DATE:	10/19/10
NAV	SUBMITTED BY:	TETRA TECH
DRAWN BY:	RM	
CHECKED BY:	APL	
FILE NO.:	AF1082--CU3030T	

US Army Corps of Engineers  
Middle East District

TETRA TECH

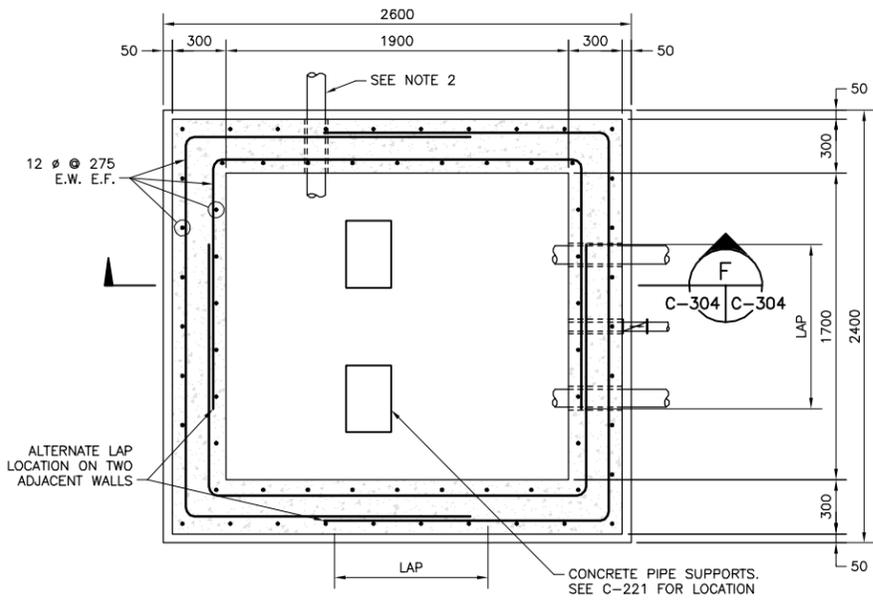
AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

SEWAGE LIFT STATION DETAILS

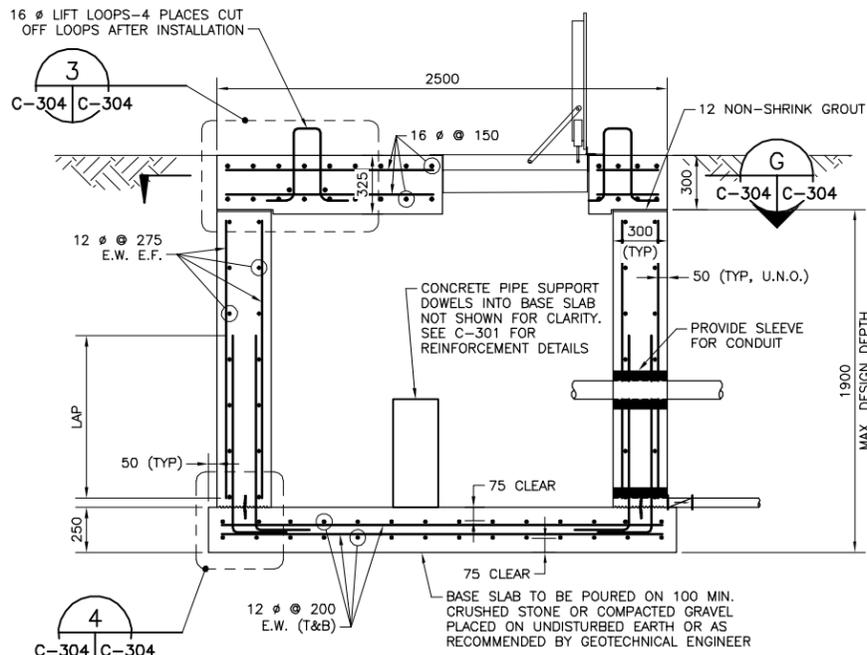
SHEET REFERENCE NUMBER:  
AF1082  
C-303

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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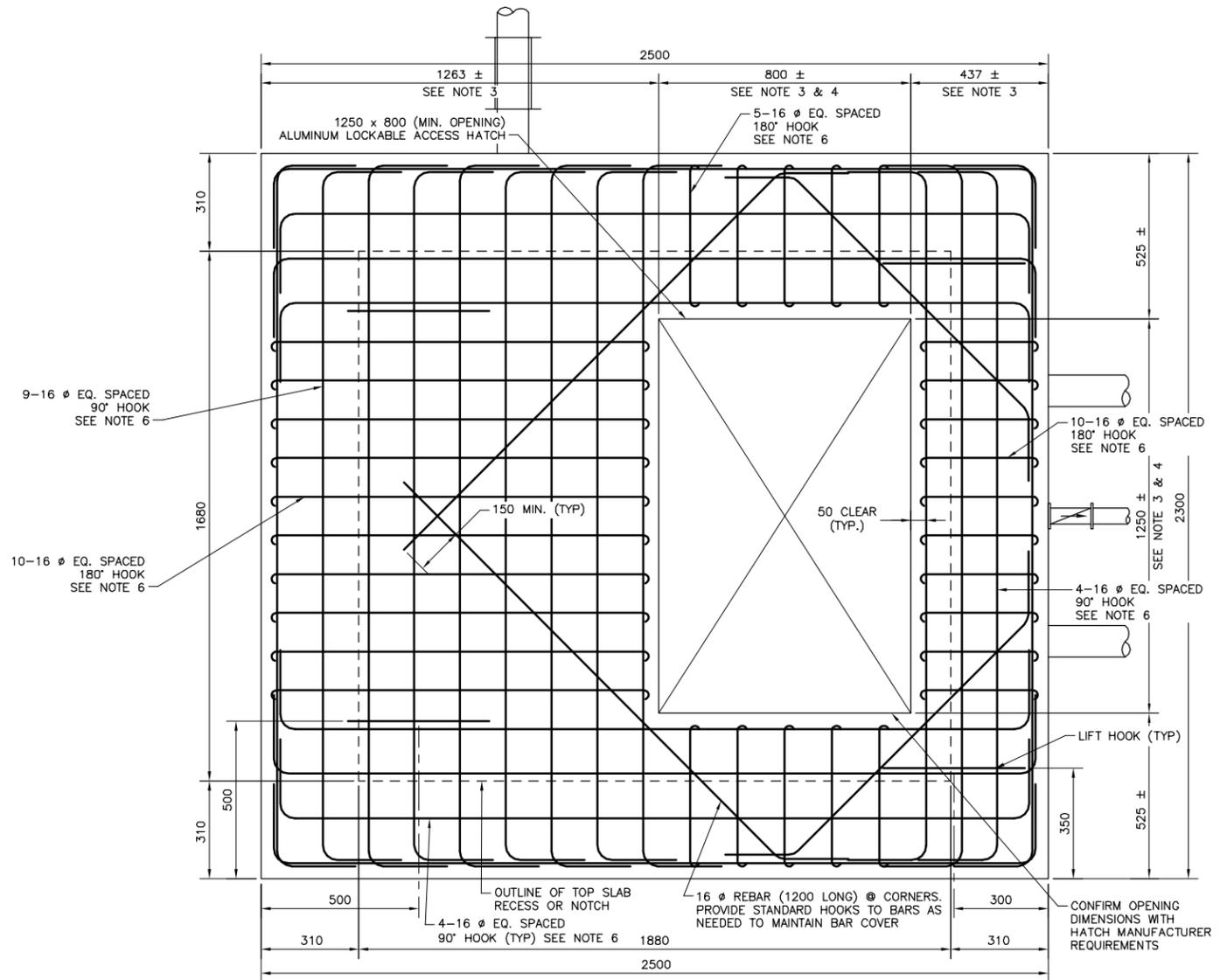
**VALVE PIT PLAN**  
SCALE 1:20



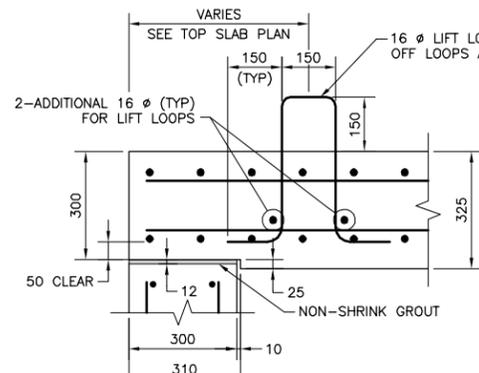
**SECTION F**  
SCALE 1:20 C-304 C-304

**NOTES:**

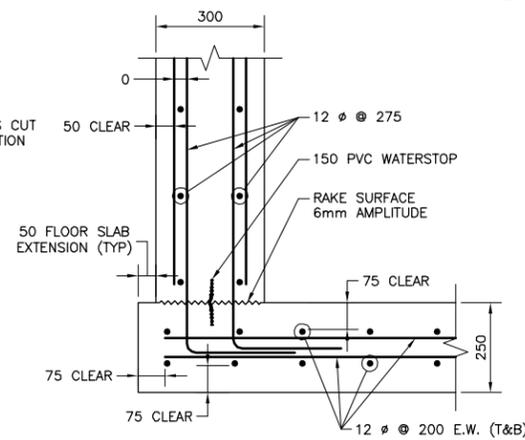
1. SEE GENERAL AND CONCRETE NOTES ON SHEET C-300.
2. SEE SHEETS C-110, C-111, C-112 AND C-221 FOR PIPE SIZES & LOCATION.
3. ADJUST OPENING AS REQUIRED TO PROVIDE CLEAR ACCESS TO PUMPS.
4. CONFIRM OPENING DIMENSIONS WITH HATCH MANUFACTURER REQUIREMENTS.
5. THE SEWAGE LIFT STATION HAS BEEN DESIGNED FOR AASHTO HS20 VEHICULAR LOADING.
6. ROTATE ALL HOOKS AS NEEDED TO PROVIDE 65mm MIN COVER.
7. THE DESIGN BEARING PRESSURE IS 63.20 kPa [1.32 ksf] (NON-WIND OR SEISMIC).



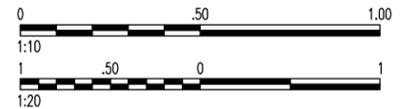
**TOP SLAB REINFORCEMENT PLAN**  
SCALE 1:10 C-304 C-304



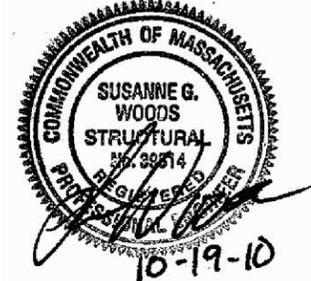
**DETAIL 3**  
SCALE 1:10 C-304 C-304



**DETAIL 4**  
SCALE 1:10 C-304 C-304



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NAV	SUBMITTED BY:	TETRA TECH
RM	CHECKED BY:	FILE NO.: AF1082--CU304DT
APL		

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Middle East District



TETRA TECH



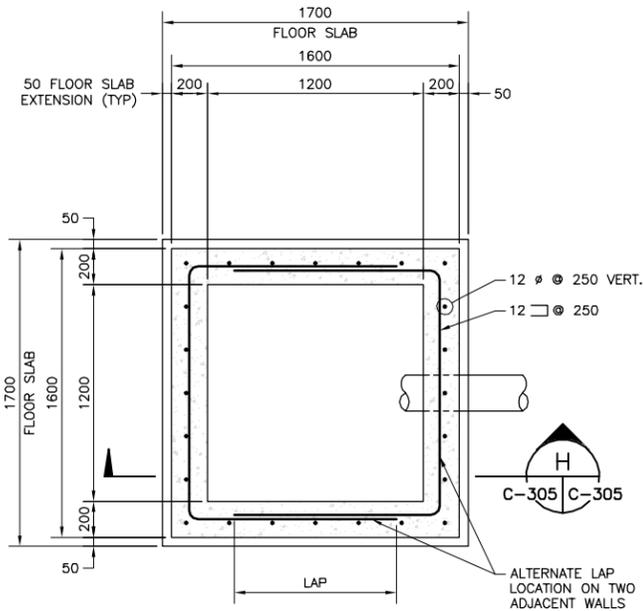
AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

SEWAGE LIFT STATION  
VALVE PIT DETAILS

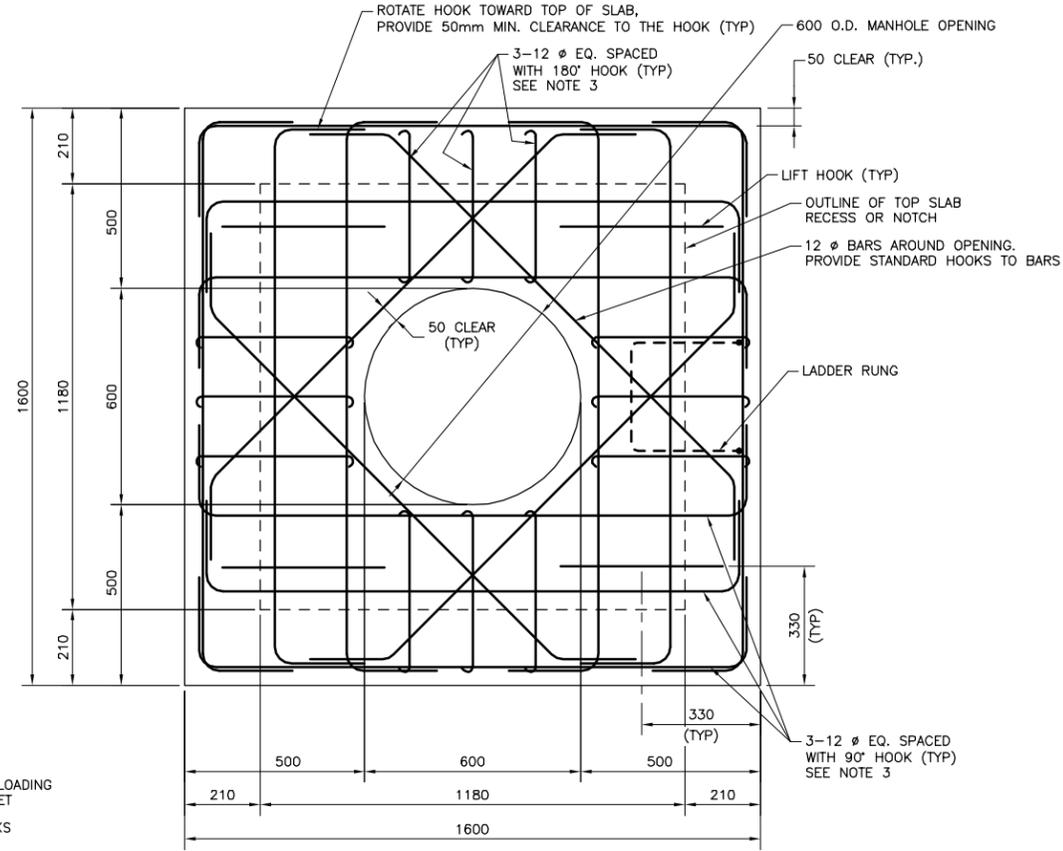
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AF1082  
C-304

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

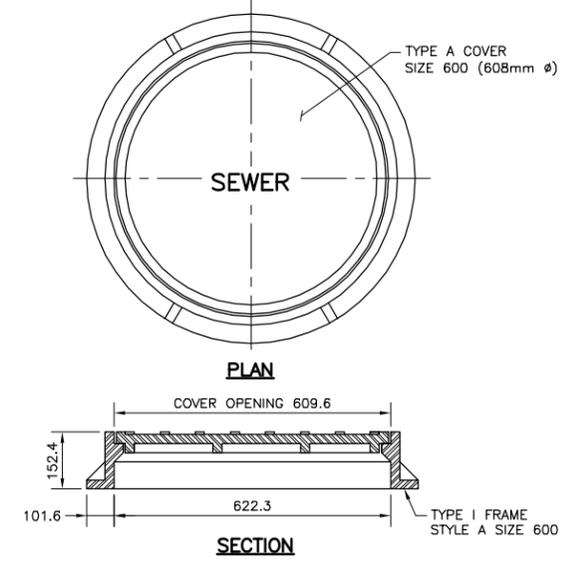
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PLAN VIEW  
SCALE 1:20  
C-305 C-305

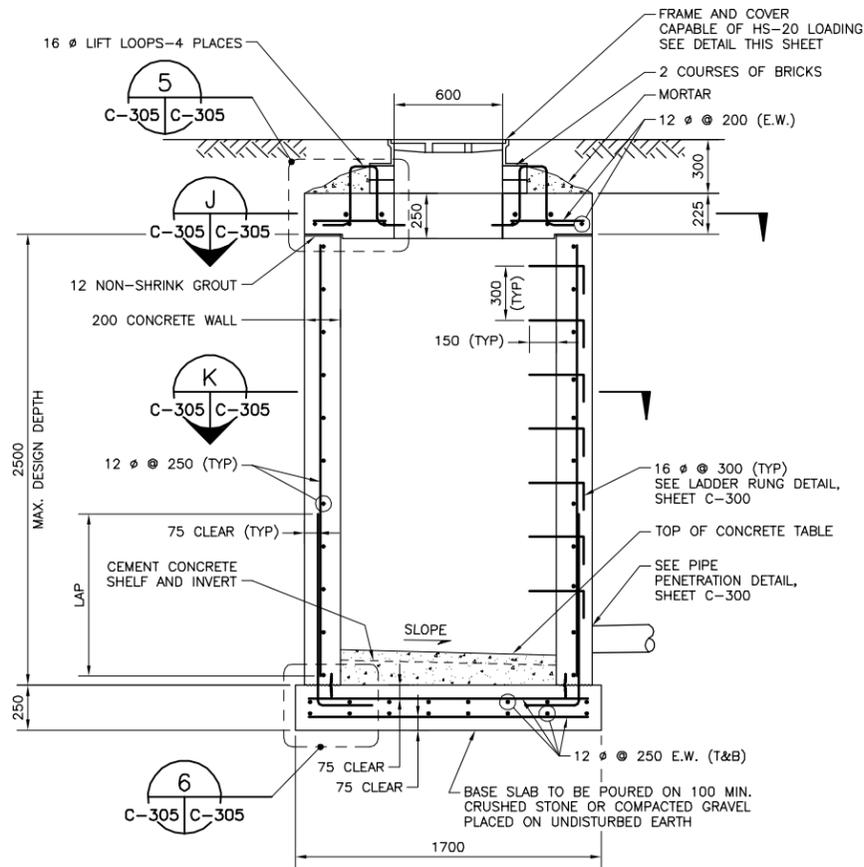


TOP SLAB REINFORCEMENT PLAN  
SCALE 1:10  
C-305 C-305

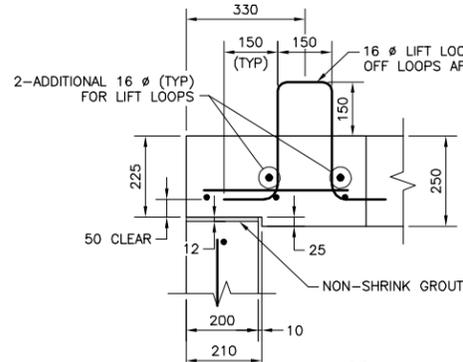


NOTE: FRAME INSTALLED BY SEATING IN A 1:2 GROUT MIX. JOINT SHALL NOT BE LESS THAN 20mm IN THICKNESS.

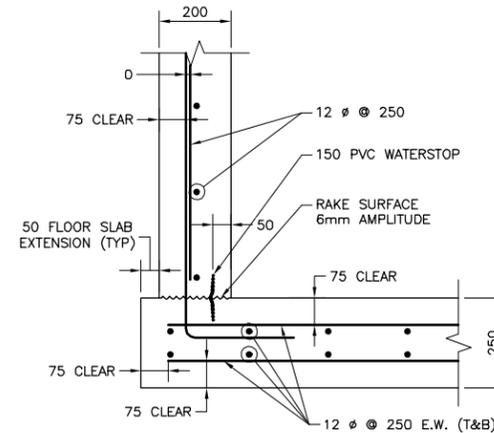
FRAME & COVER DETAIL  
N.T.S.



SECTION  
SCALE 1:20  
C-305 C-305



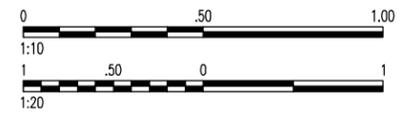
DETAIL 5  
SCALE 1:10  
C-305 C-305



DETAIL 6  
SCALE 1:10  
C-305 C-305

NOTES:

1. SEE GENERAL AND CONCRETE NOTES ON SHEET C-300.
2. THE MANHOLE HAS BEEN DESIGNED FOR HS-20 VEHICULAR LOADING.
3. ROTATE ALL HOOKS AS NEEDED TO PROVIDE 65mm MIN COVER.
4. THE DESIGN BEARING PRESSURE IS 87.60 kPa [1.83 ksf] (NON-WIND OR SEISMIC).



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SYMBOL	DESCRIPTION	DATE	PREP
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A	MID-POINT DESIGN SUBMITTAL	08/31/10	SGW

DESIGNED BY:	DATE:	10/19/10
NAV	SUBMITTED BY:	TETRA TECH
DRAWN BY:	GRN	TETRA TECH
CHECKED BY:	FILE NO.:	AF1082--CU30505T
APL	APL	

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Middle East District

TETRA TECH

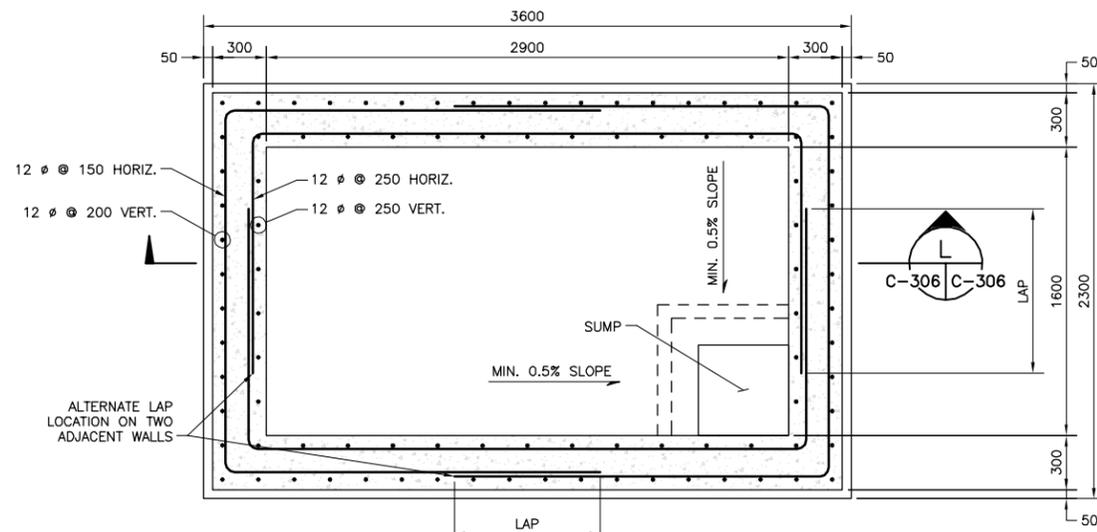
AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

SEWER MANHOLE DETAILS

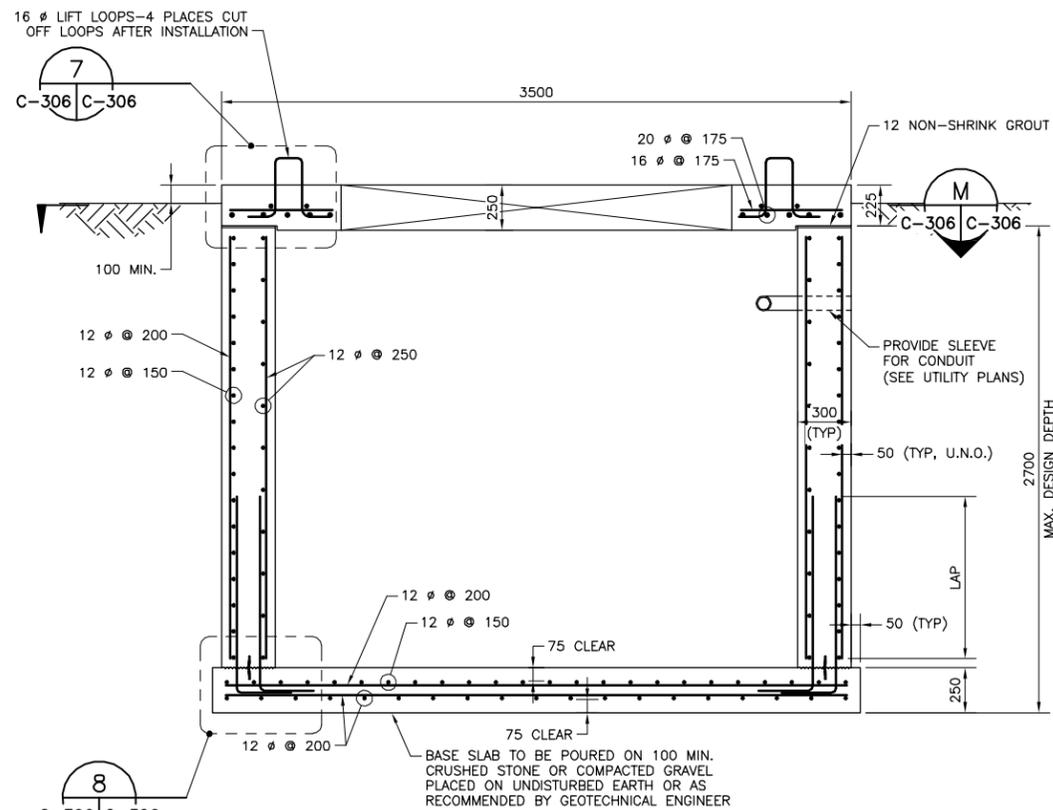
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AF1082  
C-305

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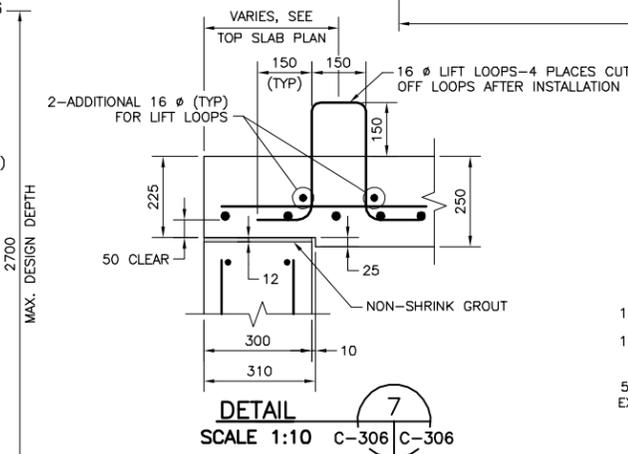
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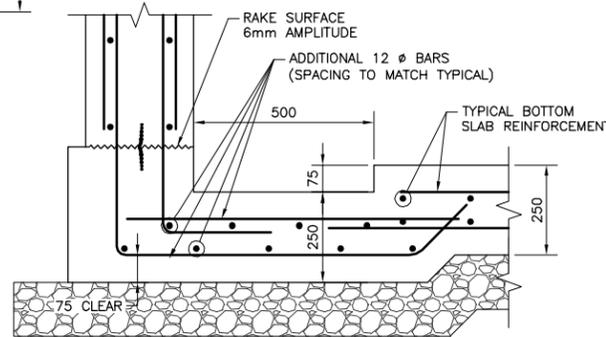
**ELECTRIC VAULT PLAN**  
SCALE 1:20



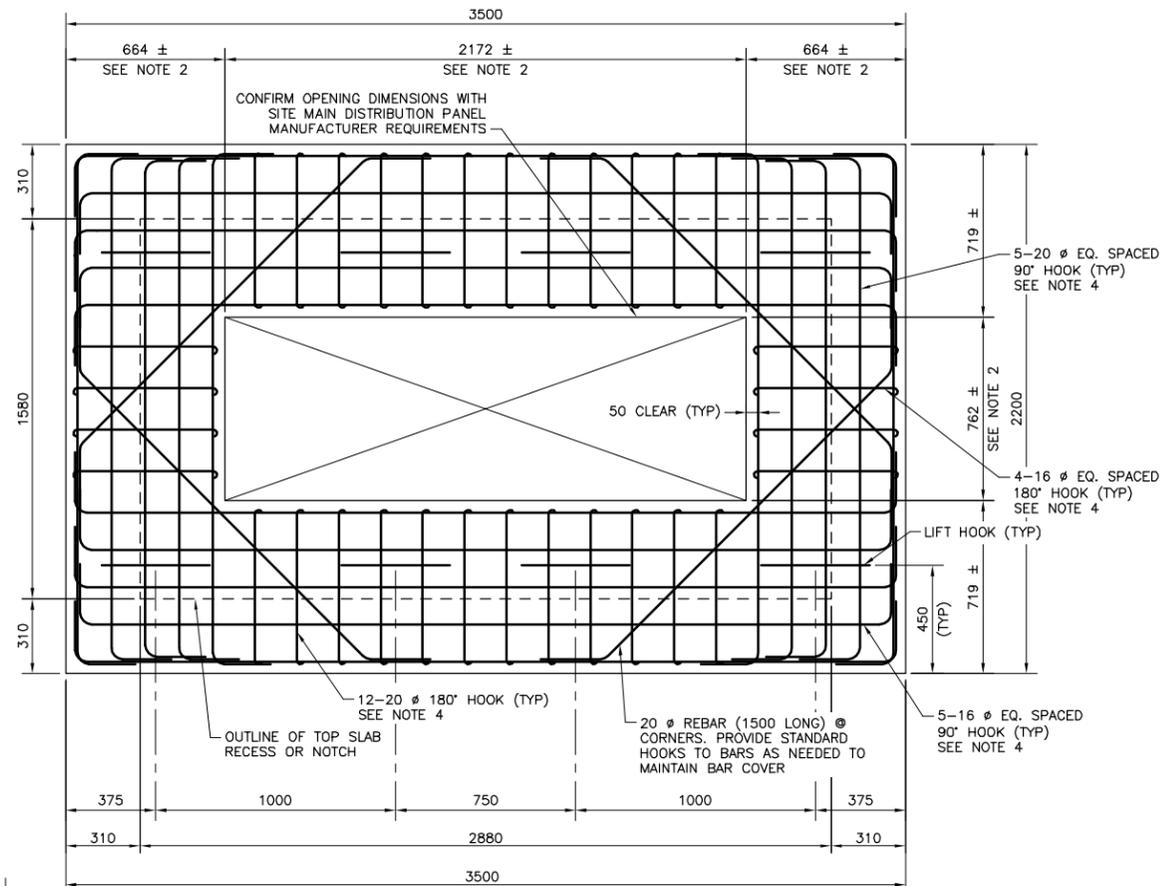
**SECTION**  
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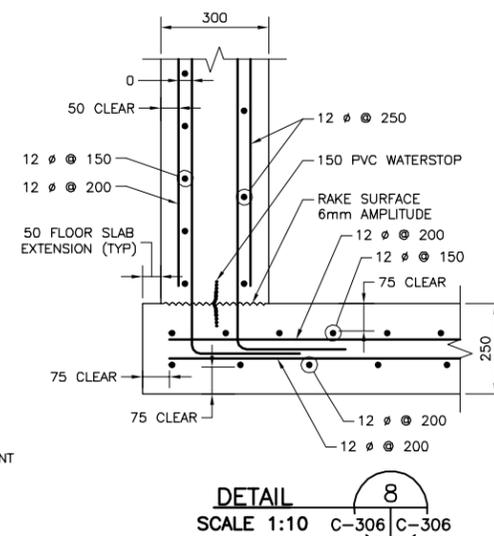
**DETAIL**  
SCALE 1:10



**SUMP REINFORCEMENT DETAIL**  
SCALE 1:10



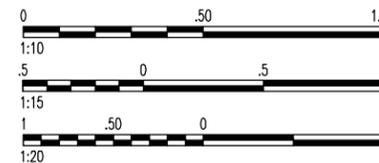
**TOP SLAB REINFORCEMENT PLAN**  
SCALE 1:15



**DETAIL**  
SCALE 1:10

**NOTES:**

1. SEE GENERAL AND CONCRETE NOTES ON SHEET C-300.
2. CONFIRM OPENING DIMENSIONS WITH SITE MAIN DISTRIBUTION PANEL MANUFACTURER REQUIREMENTS.
3. FOR THE PURPOSE OF DESIGN, THE ASSUMED WEIGHT OF THE SITE MAIN DISTRIBUTION PANEL IS 1000 KG (2205 LBS).
4. ROTATE ALL HOOKS AS NEEDED TO PROVIDE 65mm MIN COVER.
5. THE DESIGN BEARING PRESSURE IS 47.90 kPa [1.00 ksf] (NON-WIND OR SEISMIC).



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CORRECTED FINAL DESIGN SUBMITTAL

REV	DATE	DESCRIPTION
0	10/19/10	SGW CORRECTED FINAL DESIGN SUBMITTAL
B	10/05/10	SGW FINAL DESIGN SUBMITTAL
A	08/31/10	SGW MID-POINT DESIGN SUBMITTAL

DESIGNED BY:	DATE:	10/19/10
BRO:	SUBMITTED BY:	TETRA TECH
DRAWN BY:	GPV	
CHECKED BY:	APL	AF1082--CU3060T

US Army Corps of Engineers  
Middle East District

TETRA TECH

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ELECTRIC VAULT DETAILS

SHEET REFERENCE NUMBER:  
**AF1082 C-306**

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FINAL  
DESIGN  
SUBMITTAL

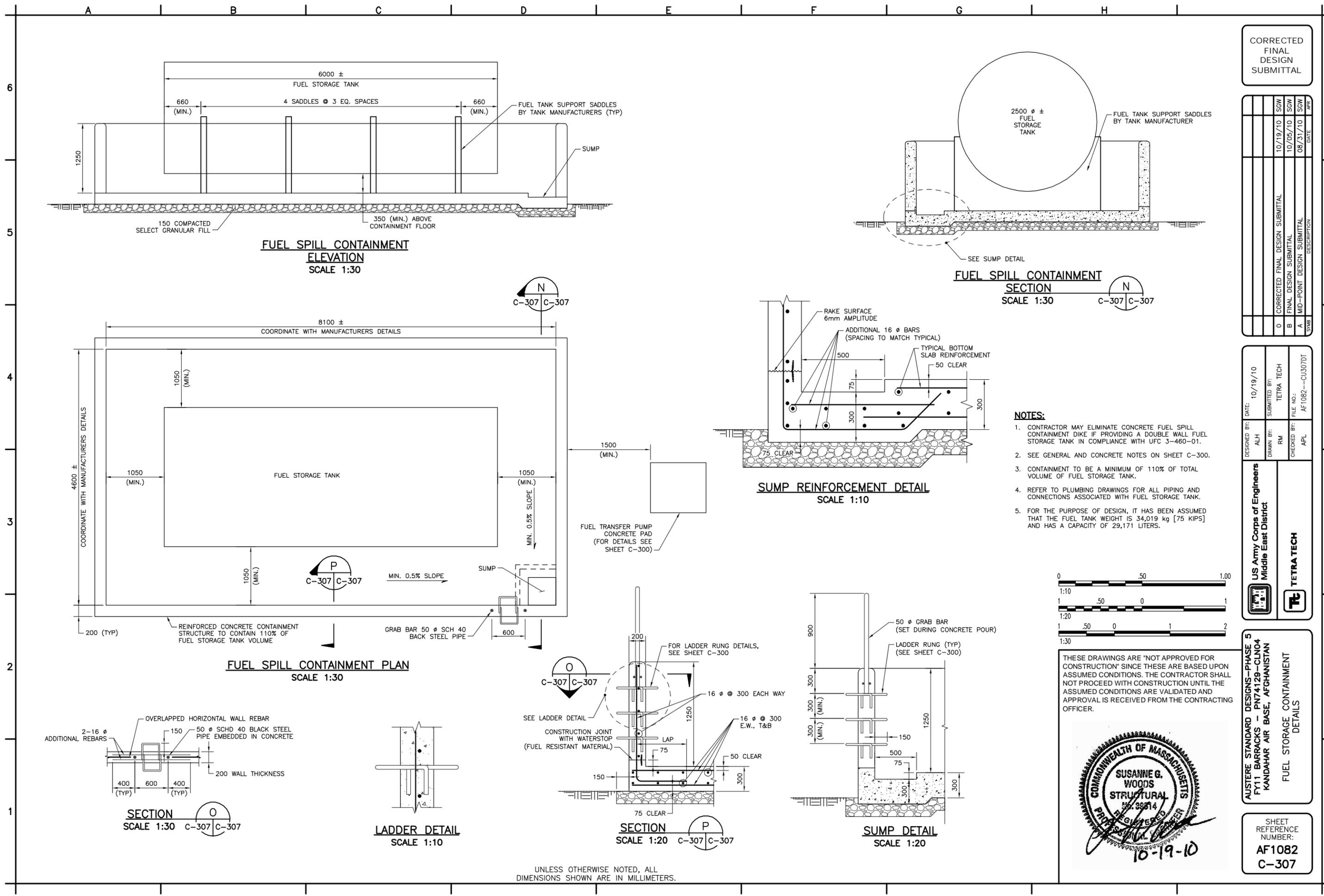
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B	FINAL DESIGN SUBMITTAL	10/05/10	ISGW
A	MID-POINT DESIGN SUBMITTAL	08/31/10	ISGW

DESIGNED BY:	DATE:	10/19/10
ALH	10/19/10	
DRAWN BY: <td>RM</td> <td></td>	RM	
CHECKED BY: <td>APL</td> <td></td>	APL	
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<b>TETRA TECH</b>		

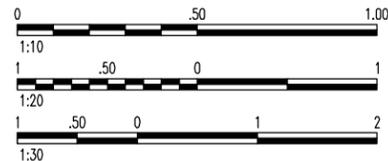
AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129--CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

FUEL STORAGE CONTAINMENT  
DETAILS

SHEET  
REFERENCE  
NUMBER:  
**AF1082  
C-307**



- NOTES:**
- CONTRACTOR MAY ELIMINATE CONCRETE FUEL SPILL CONTAINMENT DIKE IF PROVIDING A DOUBLE WALL FUEL STORAGE TANK IN COMPLIANCE WITH UFC 3-460-01.
  - SEE GENERAL AND CONCRETE NOTES ON SHEET C-300.
  - CONTAINMENT TO BE A MINIMUM OF 110% OF TOTAL VOLUME OF FUEL STORAGE TANK.
  - REFER TO PLUMBING DRAWINGS FOR ALL PIPING AND CONNECTIONS ASSOCIATED WITH FUEL STORAGE TANK.
  - FOR THE PURPOSE OF DESIGN, IT HAS BEEN ASSUMED THAT THE FUEL TANK WEIGHT IS 34,019 kg [75 KIPS] AND HAS A CAPACITY OF 29,171 LITERS.



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### PLAN LEGEND (LIGHTING)

FOR LIGHT FIXTURE SYMBOLS  
REFER TO LIGHT FIXTURE SCHEDULE  
ON DRAWING E-200

SWITCH  
 3-WAY SWITCH  
 4-WAY SWITCH  
 HOMERUN TO PANELBOARD. SYMBOL SHOWN INDICATES CIRCUIT NO. 2 PANEL LPB1. REFER TO PANELBOARD SCHEDULE FOR FURTHER INFORMATION.

### PLAN LEGEND (POWER)

PANELBOARD  
 MOTOR XXXX-## = PANEL AND CIRCUIT NUMBER. ## = MOTOR NUMBER IN MOTOR CONNECTION SCHEDULE.  
 20A, 120V, 60 Hz DUPLEX RECEPTACLE GFI SUBSCRIPT INDICATES GROUND FAULT INTERRUPTER. LABEL RECEPTACLE WITH VOLTAGE, FREQUENCY & BRANCH CIRCUIT CONNECTED.  
 20A, 120V, 60 Hz DOUBLE DUPLEX RECEPTACLE LABEL RECEPTACLE WITH VOLTAGE, FREQUENCY & BRANCH CIRCUIT CONNECTED.  
 TRANSFORMER - # DENOTES DESIGNATION  
 DISCONNECT SWITCH  
 EQUIPMENT CONNECTION - TYPE AS INDICATED.  
 MDP  
 LIGHTNING PROTECTION AIR TERMINAL

### ONE-LINE AND CONTROL SCHEMATIC LEGEND

GENERATOR  
 CIRCUIT BREAKER  
 TRANSFORMER  
 HIGH VOLTAGE FUSE  
 HIGH VOLTAGE SWITCH  
 FUSED DISCONNECT SWITCH

### PLAN LEGEND (SITE)

SITE MAIN DISTRIBUTION PANEL # DENOTES DESIGNATION (PAD MOUNTED)  
 TRANSFORMER (PAD MOUNTED)  
 PULLBOX  
 ELECTRIC MANHOLE  
 NEW UNDERGROUND ELECTRIC

ALLOWABLE AMPACITIES OF CONDUCTORS		
NOT MORE THAN 3 CURRENT-CARRYING CONDUCTORS IN RACEWAY/CABLE/EARTH (30°C)		
SIZE		
AWG (CU)	mm <sup>2</sup>	AMPACITY
12	4	20*
10	6	30*
8	10	40*
6	16	55*
4	25	70*
3	35	85*
2	35	89**
1	50	108**
1/0	70	136**
2/0	70	136**
3/0	95	164**
4/0	120	188**
250	150	216**
300	150	216**
350	185	245**
400	240	286**
500	300	328**
600	300	328**

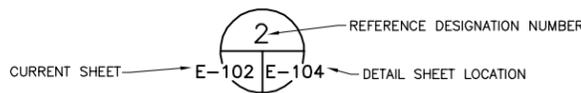
MINIMUM INSIDE DIAMETER EQUIVALENT CONDUIT SIZE	
mm	INCH
20	3/4
25	1
32	1 1/4
38	1 1/2
50	2
64	2 1/2
76	3
90	3 1/2
100	4

\*BASED ON NEC TABLE 310.16  
\*\*BASED ON IEC 60364-5-52 TABLE A.52-4

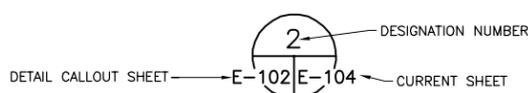
UNLESS NOTED ELSEWHERE ON THE CONTRACT DOCUMENTS, THE FOLLOWING LIST REPRESENTS THE TYPICAL MOUNTING HEIGHTS FOR THE DEVICES SHOWN:

- a. SWITCHES 1,220 mm (TO TOP)
- b. RECEPTACLES 500 mm (TO BOTTOM)
- c. POWER PANELS 1,830 mm (TO TOP)
- d. DISCONNECT SWITCHES 1,520 mm (TO TOP)
- e. MOTOR STARTERS 1,520 mm (TO TOP)

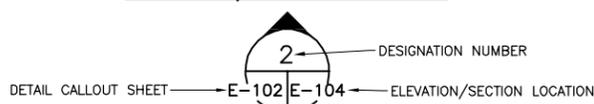
#### DETAIL CALLOUT



#### DETAIL TITLE



#### ELEVATION/SECTION CALLOUT



UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

#### GENERAL NOTES:

- ALL CIRCUITS SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR SIZED PER N.E.C.
- ALL SERVICE ENTRANCE CONDUITS/DUCTS WITH CABLES SHALL BE SEALED AT BOTH ENDS WITH APPROPRIATE SEALER. EMPTY CONDUITS SHALL BE CLEANED AND CAPPED.
- ALL PANELBOARD DIRECTORIES SHALL BE TYPEWRITTEN AND COMPLETE IN ENGLISH.
- ALL CONDUIT PENETRATIONS THRU 1 HOUR FIRE RATED WALLS SHALL BE SEALED/FIRESTOPPED. SEE SHEET E-204 FOR DETAILS.
- ALL LIGHT SWITCHES SHALL BE RATED 20 AMPERES UNLESS OTHERWISE NOTED.
- FOR ELECTRICAL INSTALLATION SEISMIC REQUIREMENTS, SEE SPECIFICATION SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT, SECTIONS 26 05 48. 0010.
- FOR ABOVE GRADE FLOOR/WALL PENETRATION DETAILS REFER TO APPROPRIATE DETAILS.
- ALL RACEWAYS CONTAINING CONDUCTORS 25mm<sup>2</sup> OR LARGER SHALL HAVE AN INSULATED BUSHING INSTALLED ON EACH END WHERE ENTERING A CABINET, BOX OR ENCLOSURE, PER NEC 300.4(G) AND 312.16(C).
- ALL ABOVE GRADE RACEWAYS SHALL BE SURFACED MOUNTED.

#### ABBREVIATIONS

- AFG ABOVE FINISHED GRADE
- AFF ABOVE FINISHED FLOOR
- ACCU AIR COOLED CONDENSING UNIT
- A AMPERE
- AHU AIR HANDLING UNIT
- AIC AMPERE INTERRUPTING CAPACITY
- BFG BELOW FINISHED GRADE
- BLDG BUILDING
- CATV CABLE TELEVISION
- CC COMMUNICATIONS CABINET
- CKT CIRCUIT
- C CONDUIT
- CE CONCRETE ENCASED
- CND CONDUCTOR
- COR CONTRACTING OFFICERS REPRESENTATIVE
- DC DIRECT CURRENT
- ECP ENTRY CONTROL POINT
- EDC ELECTRIC DUCT HEATER
- EF EXHAUST FAN
- EP EXPLOSION PROOF
- EPO EMERGENCY POWER OFF
- ESS ELECTRONIC SECURITY SYSTEM
- EWH ELECTRIC WATER HEATER
- FACP FIRE ALARM CONTROL PANEL
- FO FIBER OPTIC
- FPP FIRE PUMP PANEL
- GFI GROUND FAULT INTERRUPTING
- GFE GOVERNMENT FURNISHED CONTRACTOR INSTALLED
- GND GROUND
- GR GROUND ROD
- GRS GALVANIZED RIGID STEEL CONDUIT
- HH HANDHOLE
- HP HORSEPOWER
- HPS HIGH PRESSURE SODIUM
- HZ HERTZ
- IDS INTRUSION DETECTION SYSTEM
- KV KILOVOLT
- KW KILOWATT
- KVA KILOVOLT-AMPERE
- M METERS
- MM MULTIMODE
- mm MILLIMETER
- MH MANHOLE
- MDP MAIN DISTRIBUTION PANEL
- MTD MOUNTED
- NL NIGHT LIGHT
- OSP OUTSIDE PLANT
- PH, φ PHASE
- P POLE
- PVC POLYVINYL CHLORIDE
- RM ROOM
- SM SINGLEMODE
- SN SOLID NEUTRAL
- TBB TELEPHONE BACKBOARD
- TTC TELEPHONE TERMINAL CABINET
- TYP. TYPICAL
- UNO UNLESS NOTED OTHERWISE
- V VOLT
- W WIRE
- WP WEATHERPROOF
- W/ WITH
- W/O WITHOUT
- XFMR, T TRANSFORMER

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FINAL  
DESIGN  
SUBMITTAL

DATE	DESCRIPTION
10/19/10	KCT
0	CORRECTED FINAL DESIGN SUBMITTAL

DESIGNED BY: JAS DATE: 10/19/10  
 DRAWN BY: SES SUBMITTED BY: TETRA TECH  
 CHECKED BY: KCT FILE NO.: AF1082--ES001GN

**US Army Corps of Engineers**  
Middle East District

**TETRA TECH**

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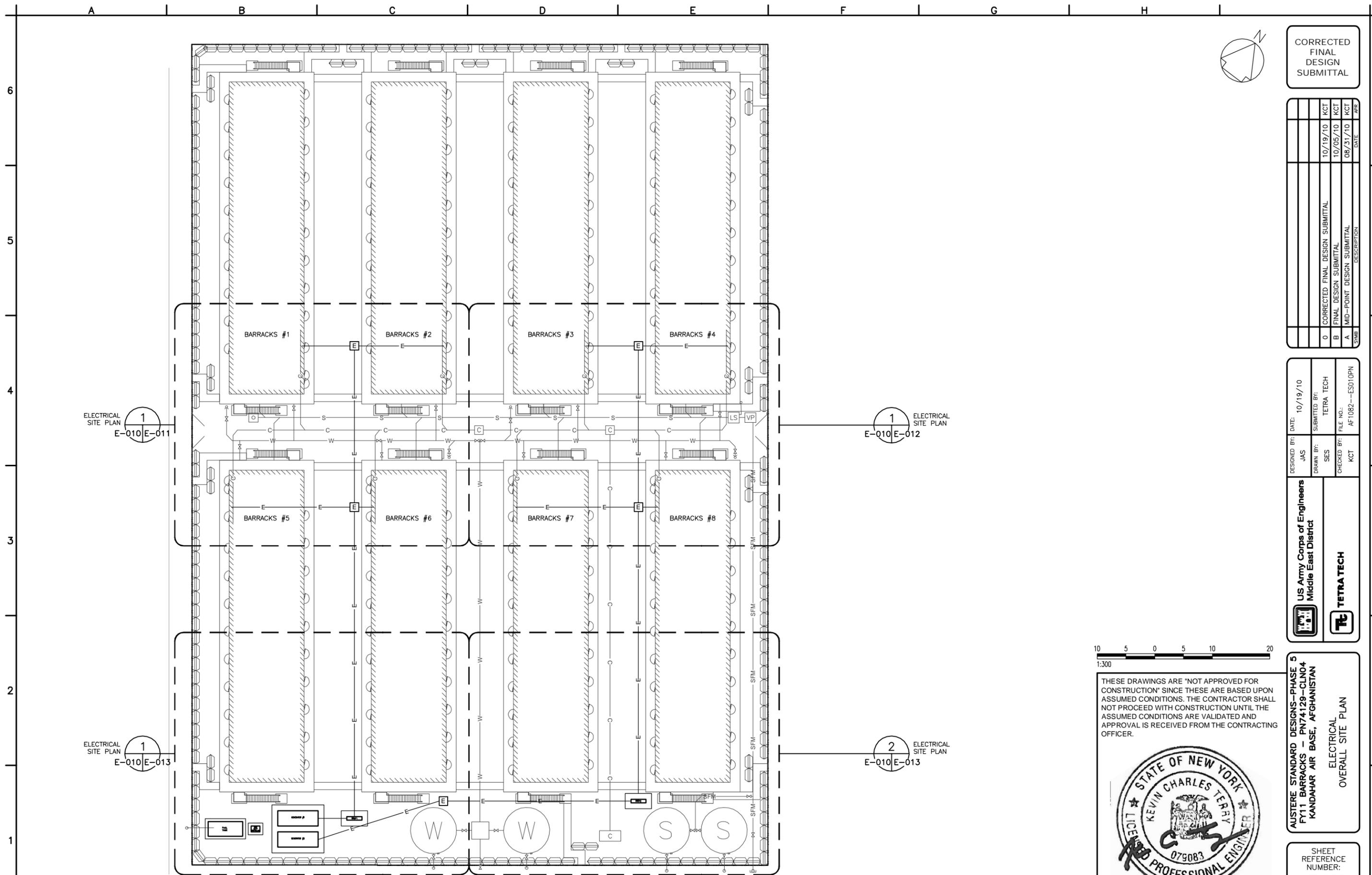


AUSTERE STANDARD DESIGNS-PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

ELECTRICAL  
 LEGEND, ABBREVIATIONS,  
 SYMBOLS AND GENERAL NOTES

SHEET  
REFERENCE  
NUMBER:  
**AF1082**  
**E-001**

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**ELECTRICAL OVERALL SITE PLAN**  
 SCALE = 1:300  
 E-010 E-010

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN METERS.



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0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	KCT
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DESIGNED BY:	JAS	DATE:	10/19/10
DRAWN BY:	SES	SUBMITTED BY:	TETRA TECH
CHECKED BY:	KCT	FILE NO.:	AF1082--ES010PN

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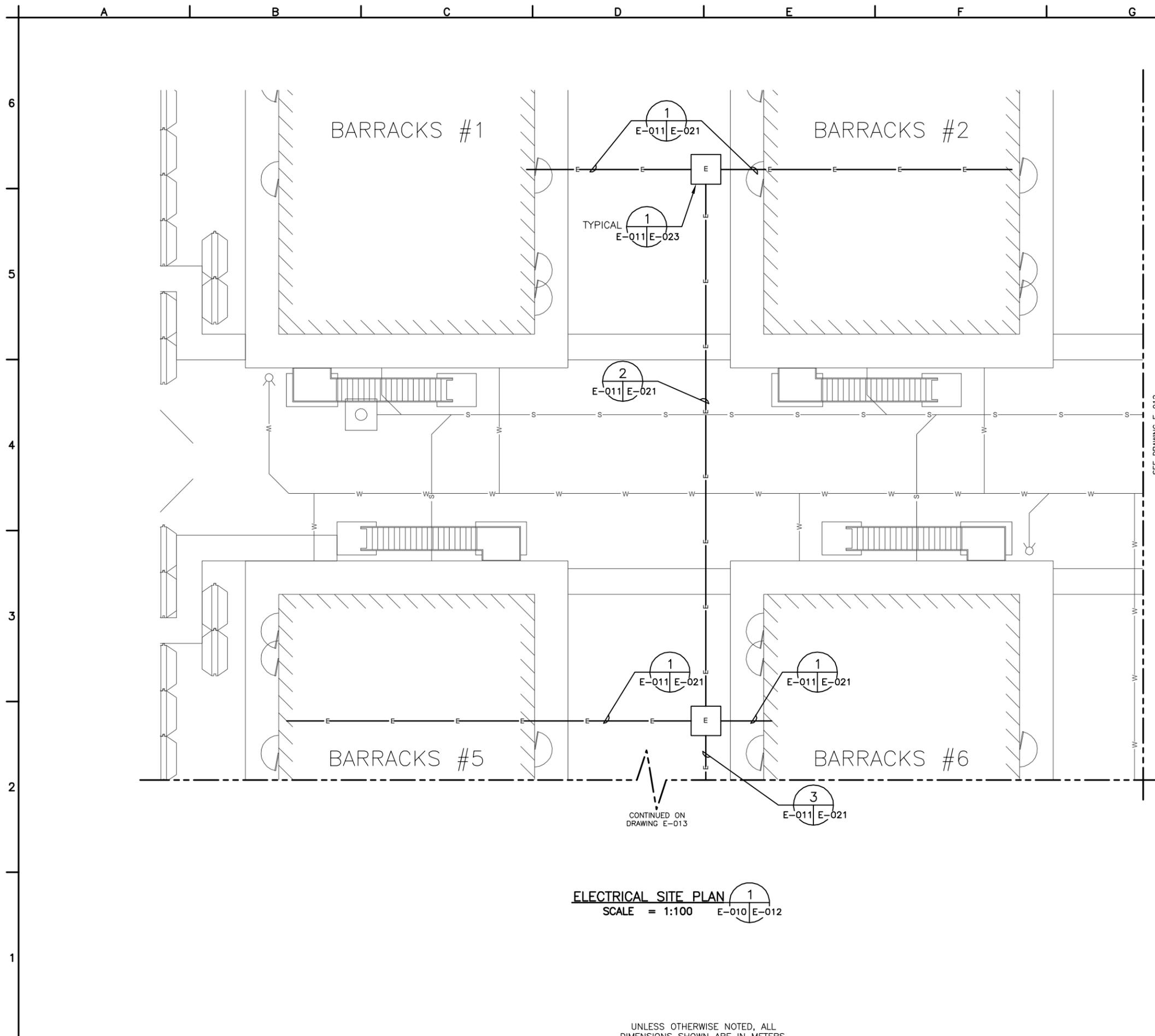
10/19/10

AUSTERE STANDARD DESIGNS - PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

ELECTRICAL  
 OVERALL SITE PLAN

SHEET  
 REFERENCE  
 NUMBER:  
**AF1082**  
**E-010**

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**ELECTRICAL SITE PLAN** 1  
SCALE = 1:100 E-010 E-012

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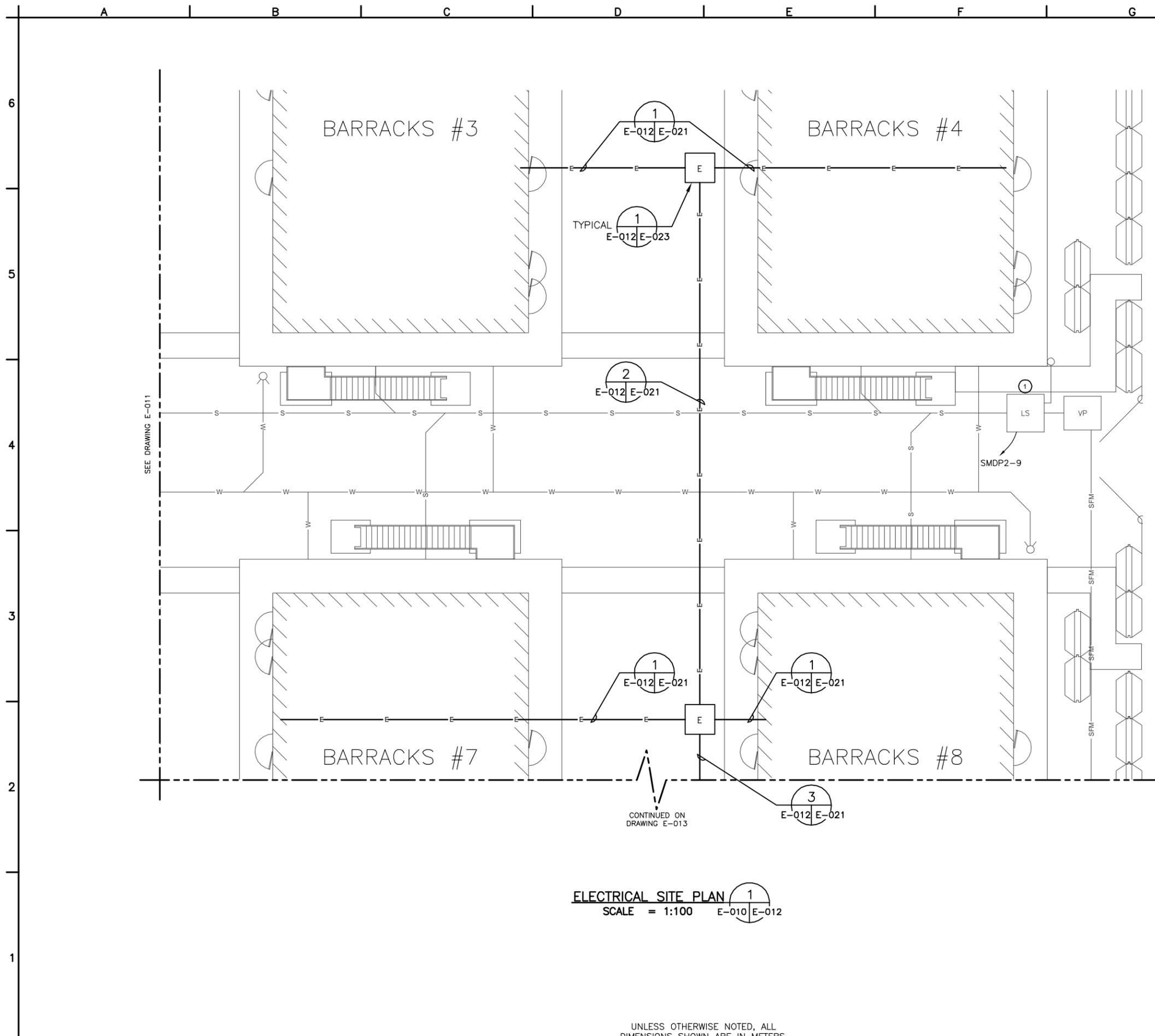


AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ELECTRICAL SITE PLAN  
SHEET 1 OF 3

SHEET REFERENCE NUMBER:  
**AF1082**  
**E-011**

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NOTE:  
PROVIDE APPROPRIATE SEALING FITTING IN ALL CONDUITS LEAVING THE LIFT STATION CONTROL PANEL AND ENTERING THE LIFT STATION PIT.

KEYED NOTES:  
① RUN (4) 2.5mm<sup>2</sup> AND (1) 2.5mm<sup>2</sup> GROUND TO BOOSTER PUMP CONTROL PANEL IN 25mm PVC CONDUIT. SEE TRENCH DETAIL 5 ON E-021 AND PULL BOX DETAIL 2 ON E-023.



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FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

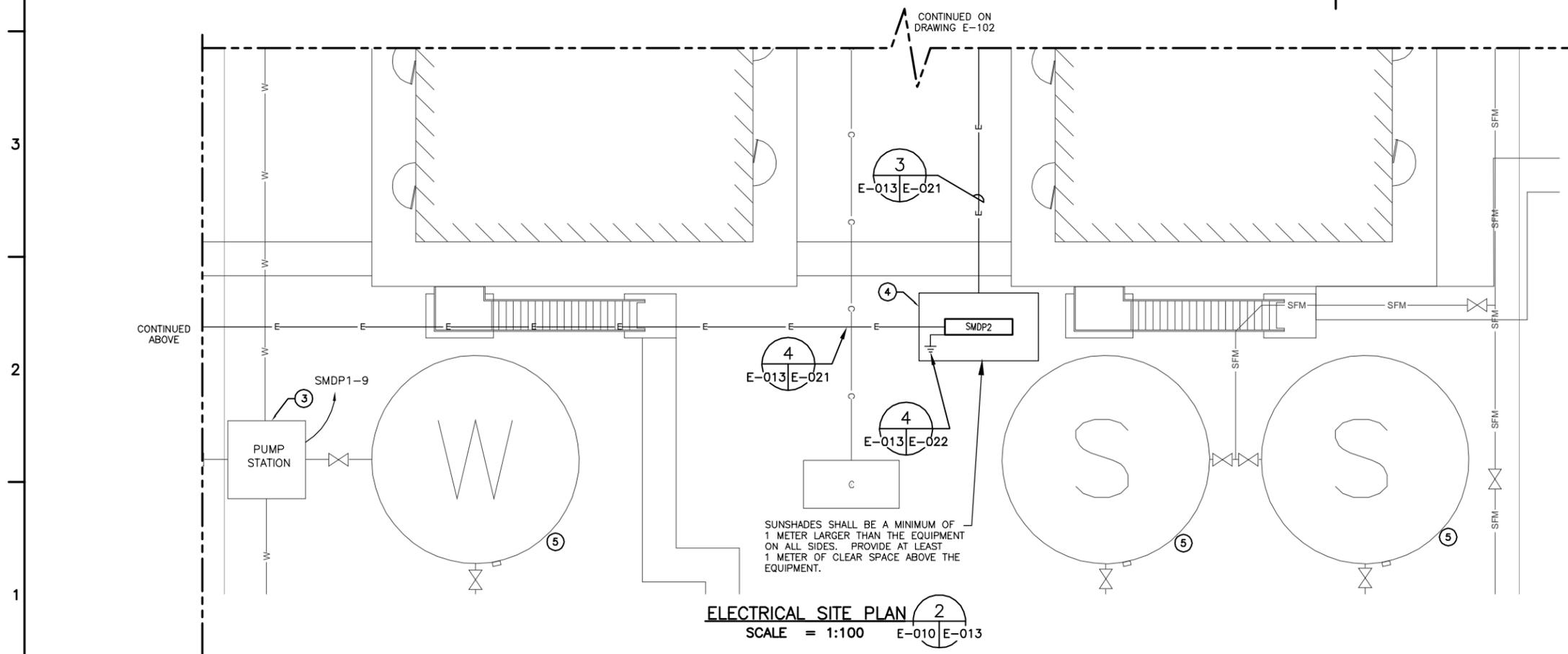
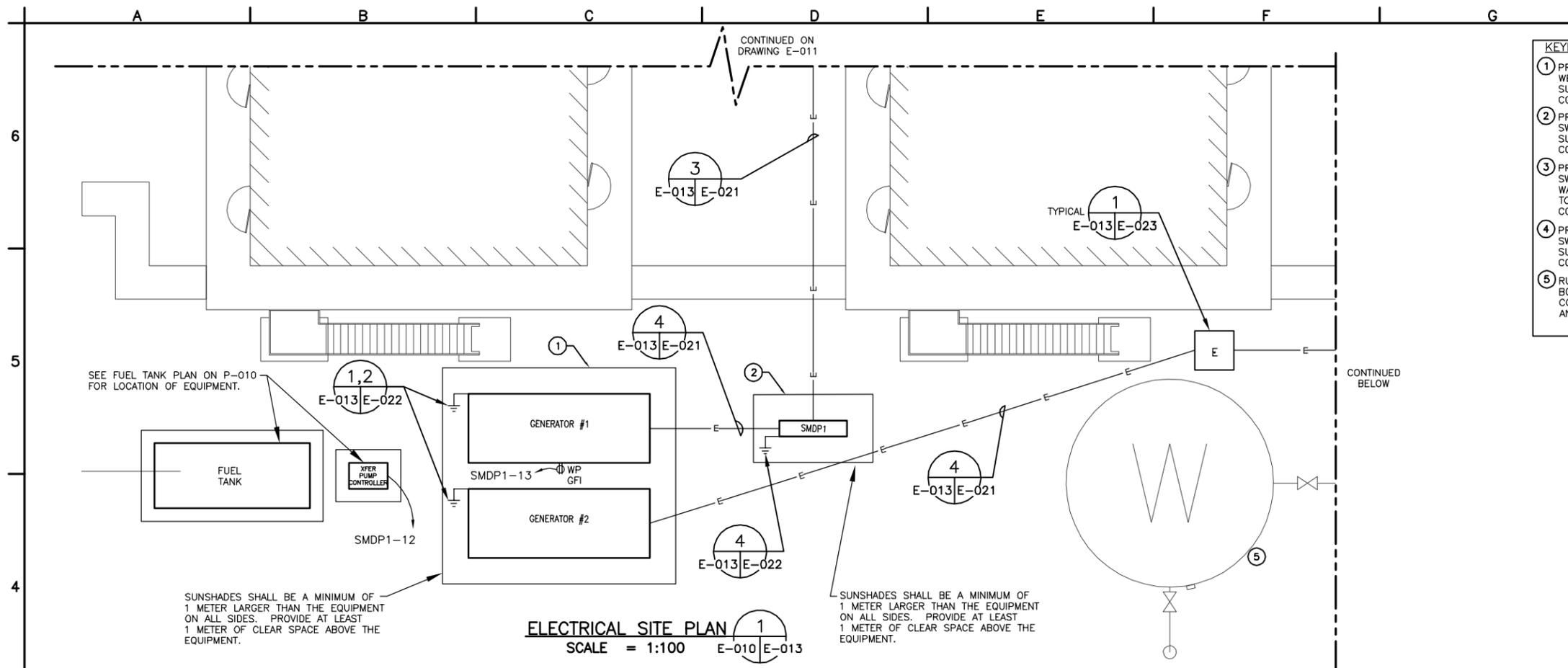
ELECTRICAL SITE PLAN  
SHEET 2 OF 3

SHEET REFERENCE NUMBER:  
**AF1082 E-012**

**ELECTRICAL SITE PLAN** ①  
SCALE = 1:100 E-010 E-012

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- KEYED NOTES:**
- PROVIDE (4) TYPE 2 FIXTURES AND WEATHERPROOF SWITCH UNDER GENERATOR SUNSHADE. CIRCUIT TO SMDP1-13. REFER TO CONDUIT TRENCH DETAIL 5 ON DRAWING E-021.
  - PROVIDE (2) TYPE 2 FIXTURES, WEATHERPROOF SWITCH AND GFI RECEPTACLE UNDER SMDP1 SUNSHADE. CIRCUIT TO SMDP1-13. REFER TO CONDUIT TRENCH DETAIL 5 ON DRAWING E-021.
  - PROVIDE (1) TYPE 2 FIXTURE, WEATHERPROOF SWITCH AND GFI RECEPTACLE IN DOMESTIC WATER BOOSTER PUMP ENCLOSURE. CIRCUIT TO SMDP1-13. REFER TO CONDUIT TRENCH DETAIL 5 ON DRAWING E-021.
  - PROVIDE (2) TYPE 2 FIXTURES, WEATHERPROOF SWITCH AND GFI RECEPTACLE UNDER SMDP2 SUNSHADE. CIRCUIT TO SMDP2-13. REFER TO CONDUIT TRENCH DETAIL 5 ON DRAWING E-021.
  - RUN (4) 2.5mm<sup>2</sup> AND (1) 2.5mm<sup>2</sup> GROUND TO BOOSTER PUMP CONTROL PANEL IN 25mm PVC CONDUIT. SEE TRENCH DETAIL 5 ON E-021 AND PULL BOX DETAIL 2 ON E-023.



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DESIGNED BY:	JAS	DATE:	10/19/10
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CHECKED BY:	KCT	FILE NO.:	AF1082--ES013LS

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10/19/10

AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ELECTRICAL SITE PLAN  
SHEET 3 OF 3

SHEET REFERENCE NUMBER:  
**AF1082 E-013**

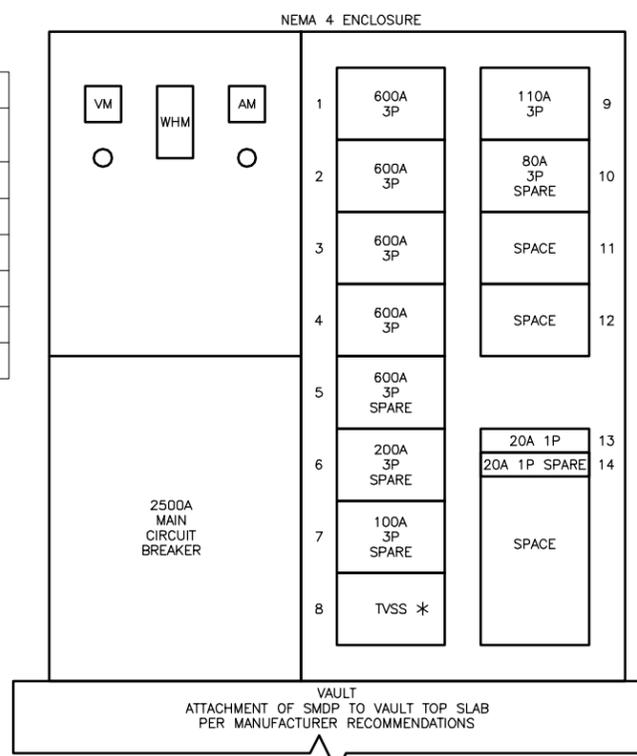
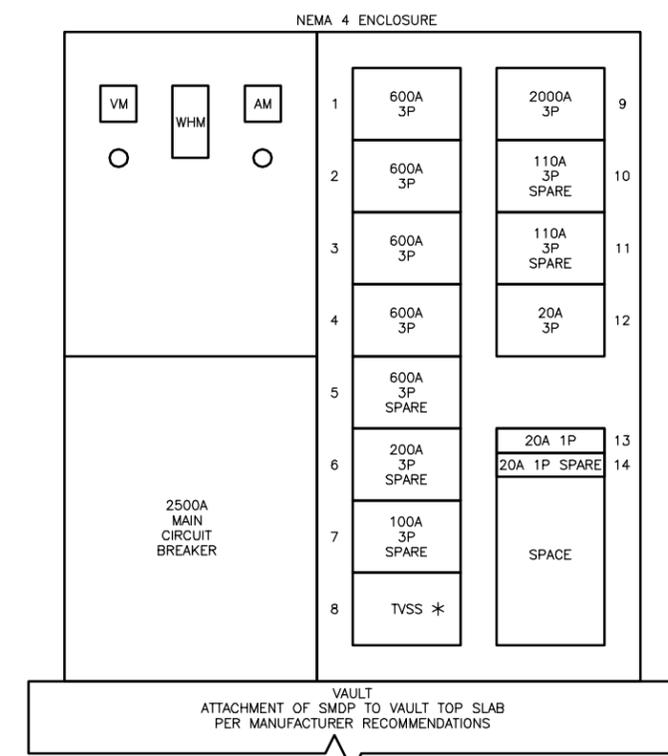
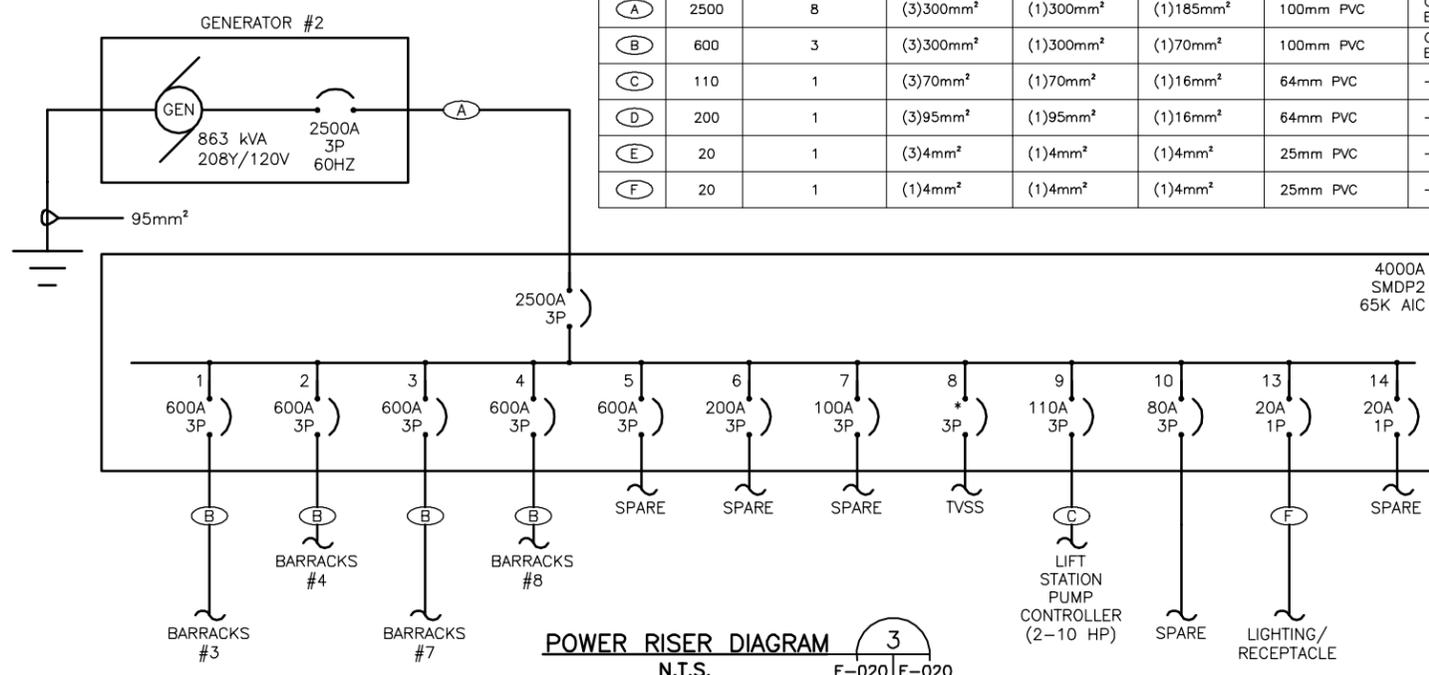
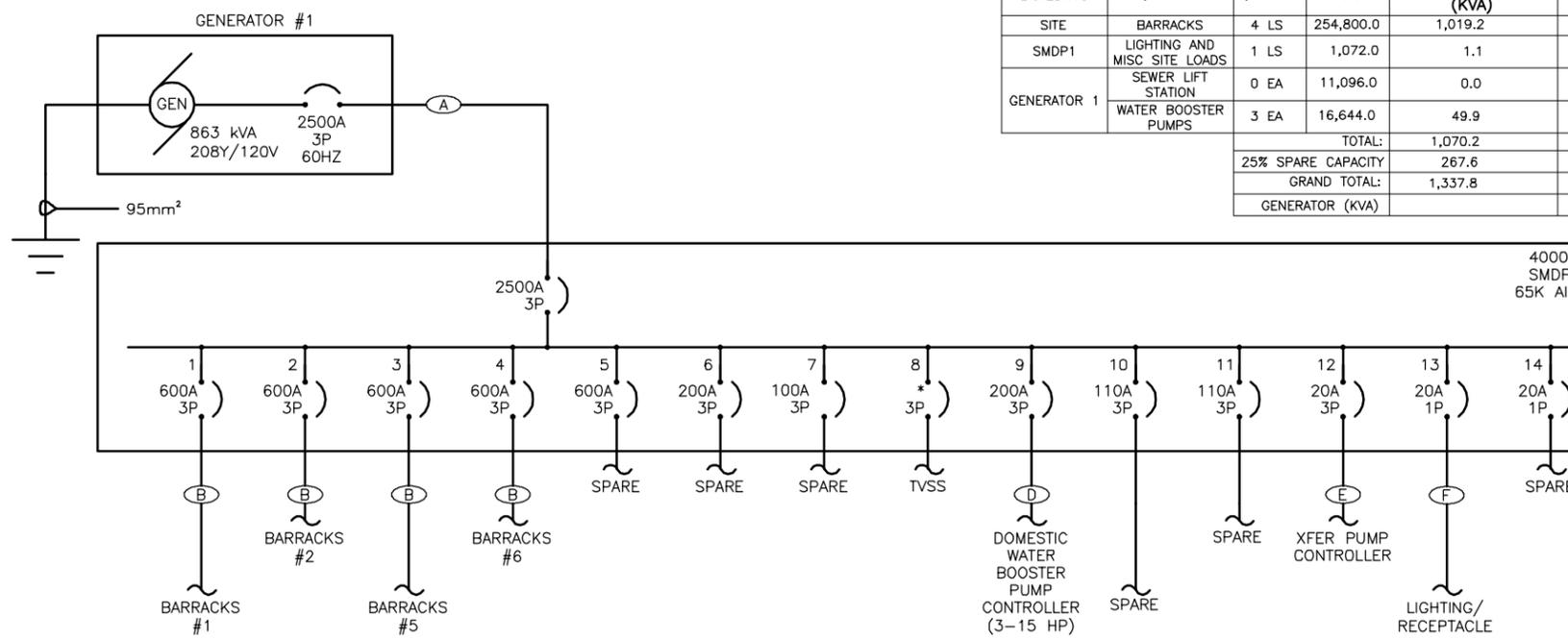
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LOAD SUMMARY					
BUILDING	EQUIPMENT	QUANTITY	VA	CONNECTED LOAD (KVA)	ESTIMATED DEMAND (KVA)
SITE	BARRACKS	4 LS	254,800.0	1,019.2	691.0
SMDP1	LIGHTING AND MISC SITE LOADS	1 LS	1,072.0	1.1	0.6
GENERATOR 1	SEWER LIFT STATION	0 EA	11,096.0	0.0	0.0
	WATER BOOSTER PUMPS	3 EA	16,644.0	49.9	25.0
	TOTAL:			1,070.2	716.6
	25% SPARE CAPACITY			267.6	179.2
	GRAND TOTAL:			1,337.8	895.8
	GENERATOR (KVA)				863

LOAD SUMMARY					
BUILDING	EQUIPMENT	QUANTITY	VA	CONNECTED LOAD (KVA)	ESTIMATED DEMAND (KVA)
SITE	BARRACKS	4 LS	254,800.0	1,019.2	691.0
SMDP2	LIGHTING AND MISC SITE LOADS	1 LS	1,072.0	1.1	0.6
GENERATOR 2	SEWER LIFT STATION	2 EA	11,096.0	22.2	11.1
	WATER BOOSTER PUMPS	0 EA	16,644.0	0.0	0.0
	TOTAL:			1,042.5	702.7
	25% SPARE CAPACITY			260.6	175.7
	GRAND TOTAL:			1,303.1	878.4
	GENERATOR (KVA)				863

FEEDER SIZE TABLE							
FEEDER ID	AMPS	SETS PARALLEL CONDUCTORS AND RACEWAYS	PHASE CONDUCTOR	NEUTRAL	GROUND	RACEWAY SIZE	NOTES
(A)	2500	8	(3)300mm <sup>2</sup>	(1)300mm <sup>2</sup>	(1)185mm <sup>2</sup>	100mm PVC	CONCRETE ENCASED
(B)	600	3	(3)300mm <sup>2</sup>	(1)300mm <sup>2</sup>	(1)70mm <sup>2</sup>	100mm PVC	CONCRETE ENCASED
(C)	110	1	(3)70mm <sup>2</sup>	(1)70mm <sup>2</sup>	(1)16mm <sup>2</sup>	64mm PVC	--
(D)	200	1	(3)95mm <sup>2</sup>	(1)95mm <sup>2</sup>	(1)16mm <sup>2</sup>	64mm PVC	--
(E)	20	1	(3)4mm <sup>2</sup>	(1)4mm <sup>2</sup>	(1)4mm <sup>2</sup>	25mm PVC	--
(F)	20	1	(1)4mm <sup>2</sup>	(1)4mm <sup>2</sup>	(1)4mm <sup>2</sup>	25mm PVC	--



CORRECTED FINAL DESIGN SUBMITTAL

SYMB	DESCRIPTION	DATE	BY
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DESIGNED BY:	JAS	DATE:	10/19/10
DRAWN BY:	SES	SUBMITTED BY:	TETRA TECH
CHECKED BY:	KCT	FILE NO.:	AF1082--ES020DI

US Army Corps of Engineers  
Middle East District

TETRA TECH

SMDP 1 1  
N.T.S. E-020 E-020

NOTE:  
\*SIZE TVSS PER MANUFACTURER'S RECOMMENDATION

SMDP 2 2  
N.T.S. E-020 E-020

NOTE:  
\*SIZE TVSS PER MANUFACTURER'S RECOMMENDATION

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AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

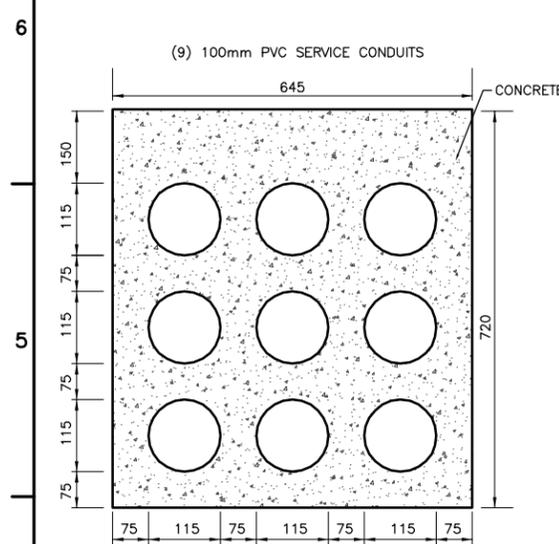
ELECTRICAL SITE ONE-LINE DIAGRAM

SHEET REFERENCE NUMBER:  
AF1082  
E-020

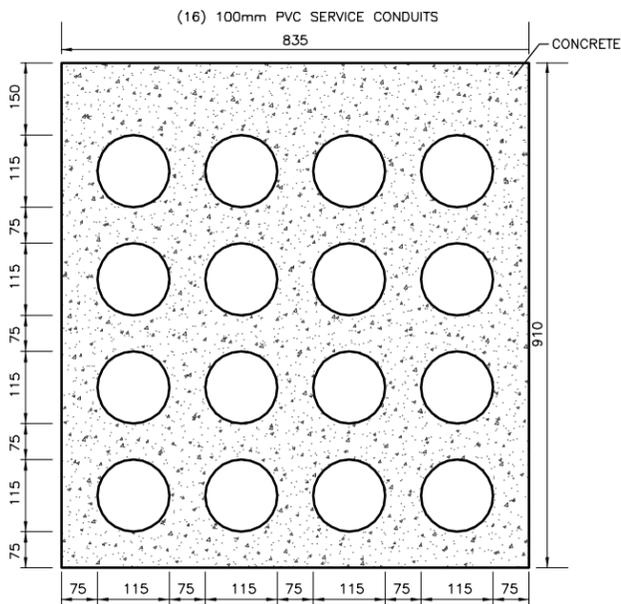
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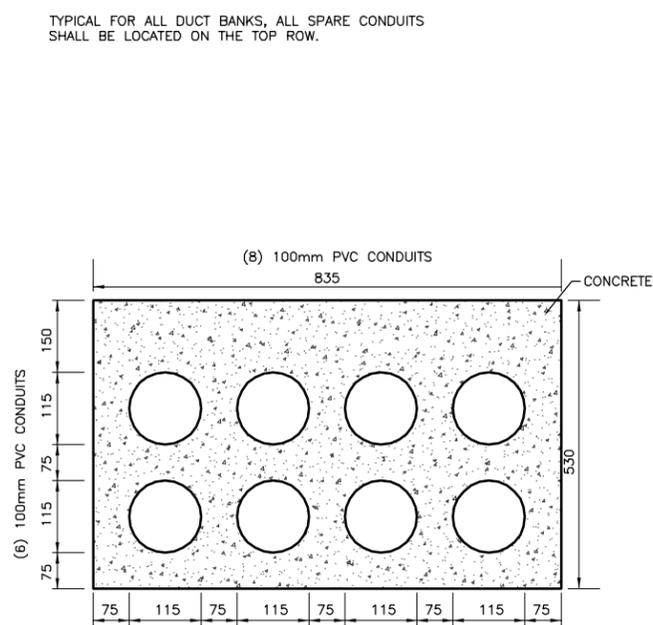
A | B | C | D | E | F | G | H



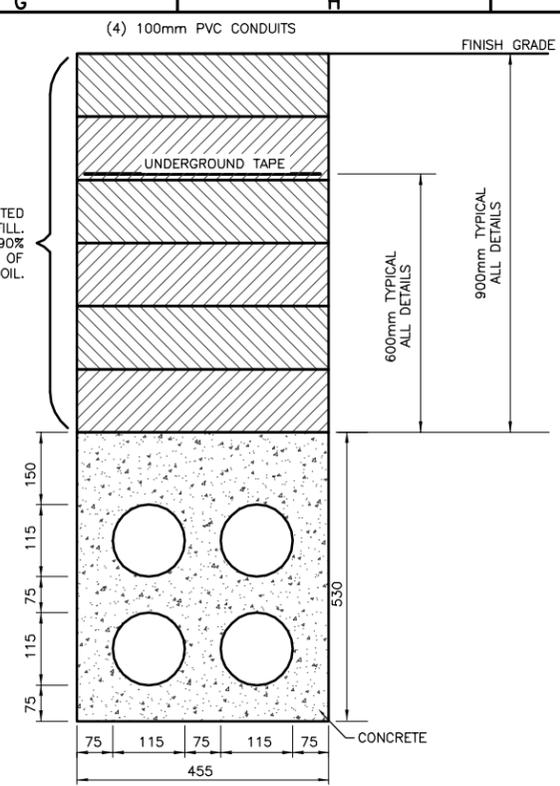
**DUCT BANK DETAIL 4**  
N.T.S. E-013 E-021



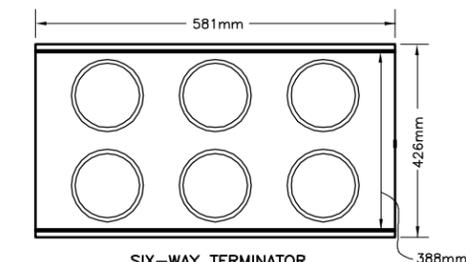
**DUCT BANK DETAIL 3**  
N.T.S. E-011,E-012,E-013 E-021



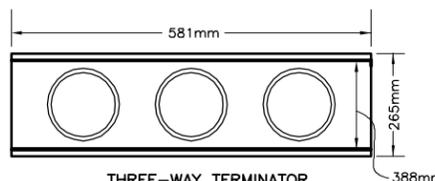
**DUCT BANK DETAIL 2**  
N.T.S. E-011,E-012 E-021



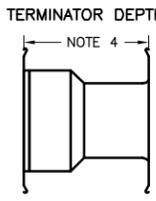
**DUCT BANK DETAIL 1**  
N.T.S. E-011,E-012,E-013 E-021



**SIX-WAY TERMINATOR**  
388mm

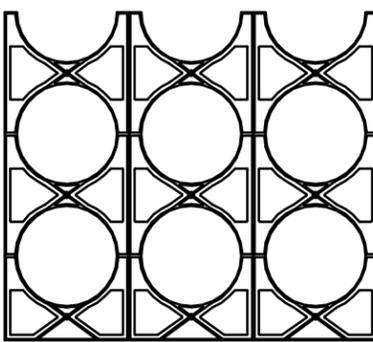


**THREE-WAY TERMINATOR**  
388mm



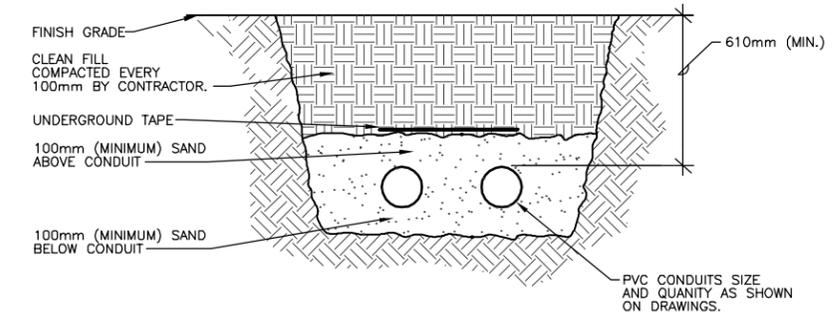
- GENERAL NOTES:**
1. TERMINATORS SHALL BE CONNECTED ("INTERLOCKED") TO FORM PANELS AS REQUIRED BY DUCT CONFIGURATION.
  2. REINFORCING BARS SHALL BE INSTALLED BETWEEN THE TERMINATORS.
  3. DUCT TERMINATORS SHALL BE SIZED FOR 114mm OUTER DIAMETER (4.5 INCH OD).
  4. TERMINATOR DEPTH VARIES DEPENDENT ON MH/HH WALL THICKNESS.

**DUCT TERMINATORS**  
N.T.S.



**NOTE:**  
DUCT SPACERS SHALL BE SIZED AND CONFIGURED TO MATCH DUCT DETAIL.

**DUCT SPACERS**  
N.T.S.



**CONDUIT TRENCH DETAIL 5**  
N.T.S. E-011,E-012 E-021

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**CORRECTED FINAL DESIGN SUBMITTAL**

SYMB	DESCRIPTION	DATE	APP
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	KCT
B	FINAL DESIGN SUBMITTAL	10/05/10	KCT
A	MID-POINT DESIGN SUBMITTAL	08/31/10	KCT

DESIGNED BY:	JAS	DATE:	10/19/10
DRAWN BY:	SES	SUBMITTED BY:	TETRA TECH
CHECKED BY:	KCT	FILE NO.:	AF1082--ES021DT

**US Army Corps of Engineers**  
Middle East District

**TETRA TECH**

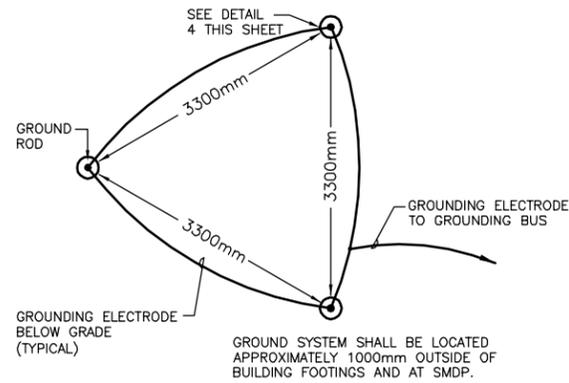
**AUSTERE STANDARD DESIGNS-PHASE 5**  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ELECTRICAL DETAILS  
SHEET 1 OF 4

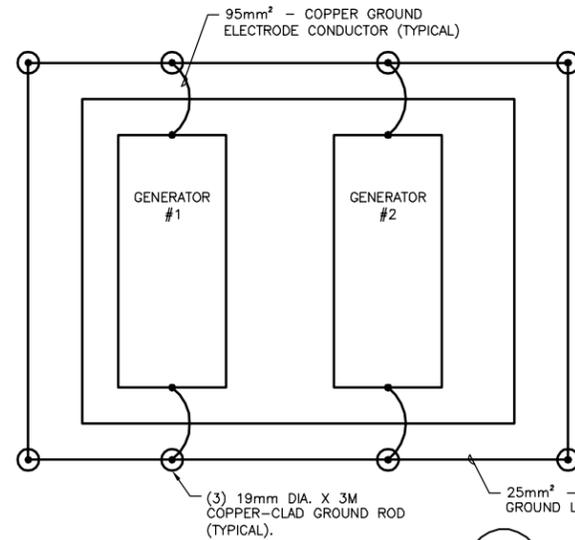
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**AF1082 E-021**

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

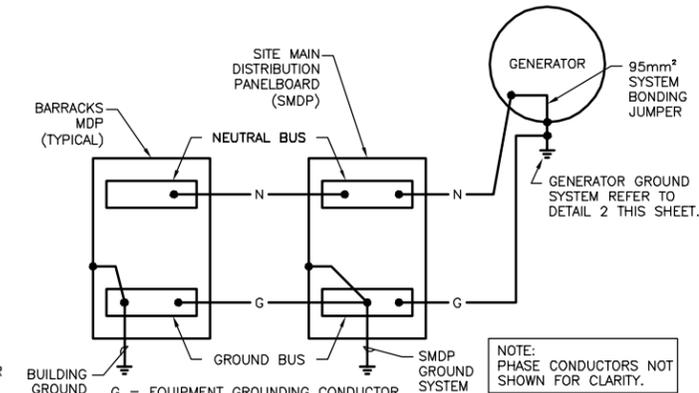
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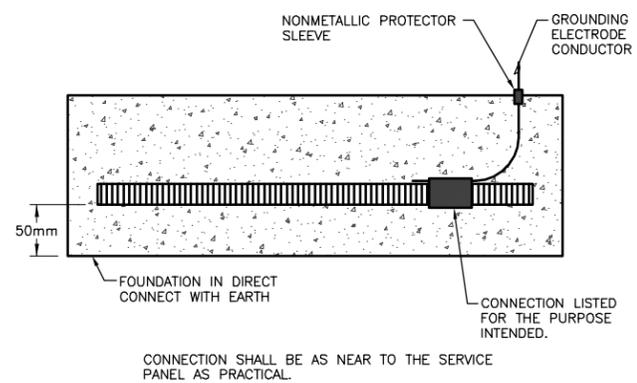
**GROUND SYSTEM** (3)  
N.T.S. E-022 E-022



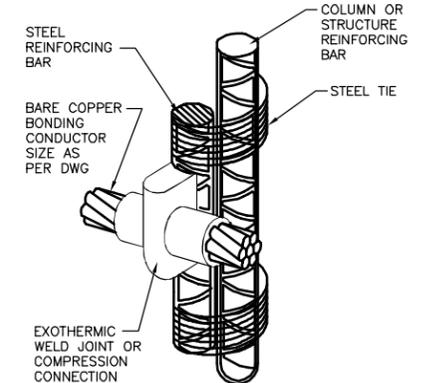
**GENERATOR GROUND SYSTEM** (2)  
N.T.S. E-013 E-022



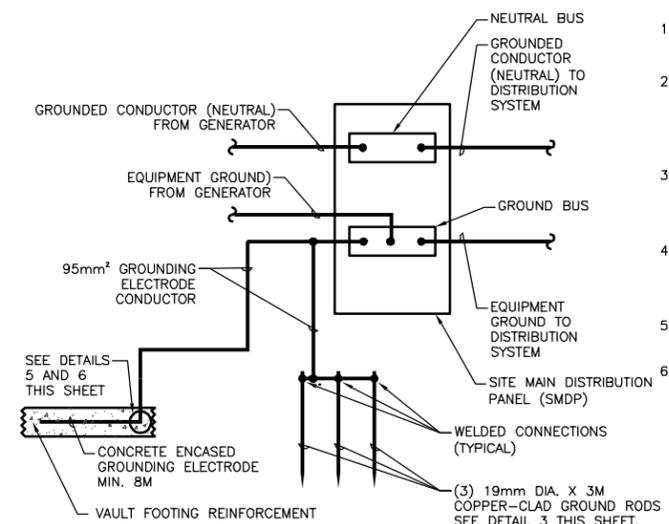
**DISTRIBUTION SYSTEM GROUNDING** (1)  
N.T.S. E-013 E-022



**CONCRETE-ENCASED ELECTRODE** (6)  
N.T.S. E-022 E-022



**WELDING TO STEEL REINFORCING BAR DETAIL** (5)  
N.T.S. E-022 E-022



**SMDP GROUNDING ELECTRODE CONNECTION** (4)  
N.T.S. E-013 E-022

- NOTES:**
- BOND OTHER METAL PIPING GROUND TERMINALS TO THE SERVICE GROUNDING ELECTRODE SYSTEM.
  - THE GROUNDING ELECTRODE CONDUCTOR SHALL ONLY BE CONNECTED TO GROUNDING ELECTRODES THAT ARE AVAILABLE ON THE PREMISES.
  - PROTECT GROUNDING ELECTRODE CONDUCTOR WITH NONMETALLIC RACEWAY WHEN CONDUCTOR PENETRATES FLOOR SLABS AND WALLS.
  - ALL GROUNDING ELECTRODE CONDUCTORS, BONDING JUMPERS AND GROUNDING CONDUCTORS SHALL BE COPPER.
  - BOND SUNSHADE STEEL TO THE GROUND BUS.
  - DO NOT BOND THE NEUTRAL AND GROUND BUSES AT THE SMDP.

CORRECTED FINAL DESIGN SUBMITTAL

SYMB	DESCRIPTION	DATE	APP
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	KCT
A	FINAL DESIGN SUBMITTAL	10/05/10	KCT

DESIGNED BY:	JAS	DATE:	10/19/10
DRAWN BY:	SES	SUBMITTED BY:	TETRA TECH
CHECKED BY:	KCT	FILE NO.:	AF1082--ES022DT

**US Army Corps of Engineers**  
Middle East District

**TETRA TECH**

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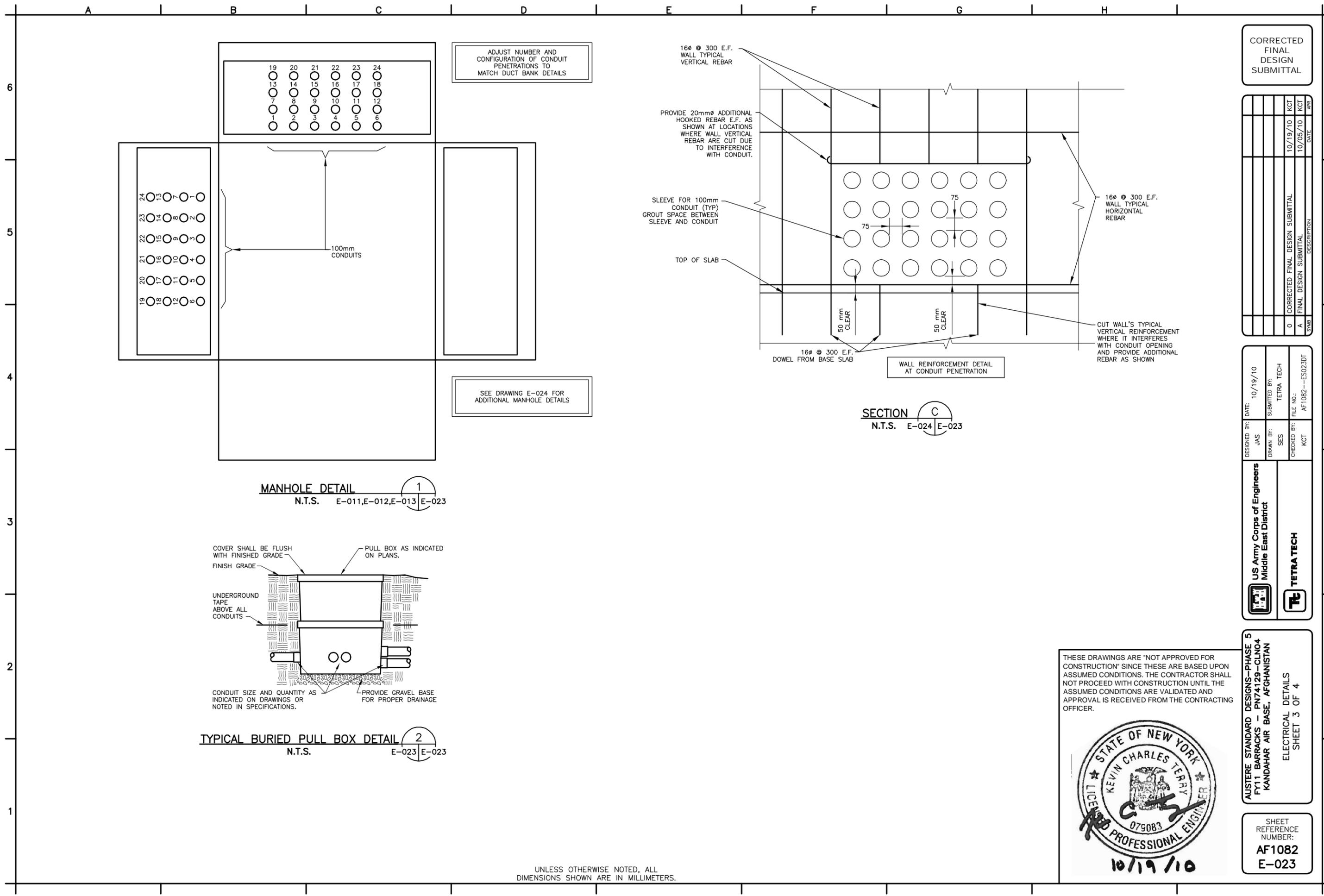
**AUSTERE STANDARD DESIGNS-PHASE 5**  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

ELECTRICAL DETAILS  
SHEET 2 OF 4

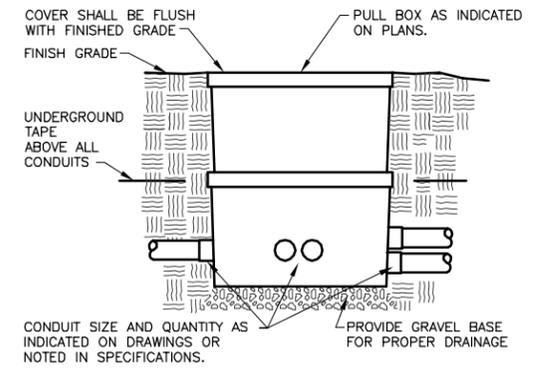
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**AF1082 E-022**

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**MANHOLE DETAIL**  
N.T.S. E-011,E-012,E-013 | E-023



**TYPICAL BURIED PULL BOX DETAIL**  
N.T.S. E-023 | E-023

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

CORRECTED FINAL DESIGN SUBMITTAL

SYMB	DESCRIPTION	DATE	APP
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	KCT
A	FINAL DESIGN SUBMITTAL	10/05/10	KCT

DESIGNED BY:	JAS	DATE:	10/19/10
DRAWN BY:	SES	SUBMITTED BY:	TETRA TECH
CHECKED BY:	KCT	FILE NO.:	AF1082--ES023DT

US Army Corps of Engineers  
Middle East District

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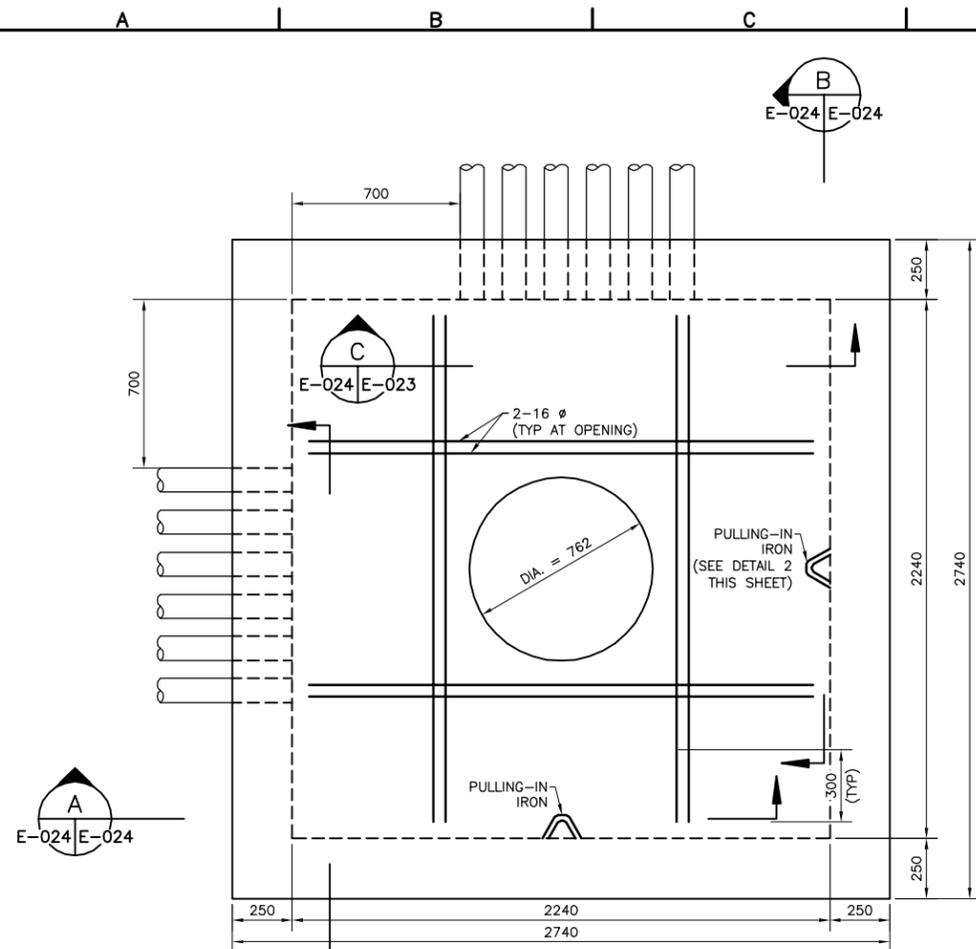


AUSTERE STANDARD DESIGNS--PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

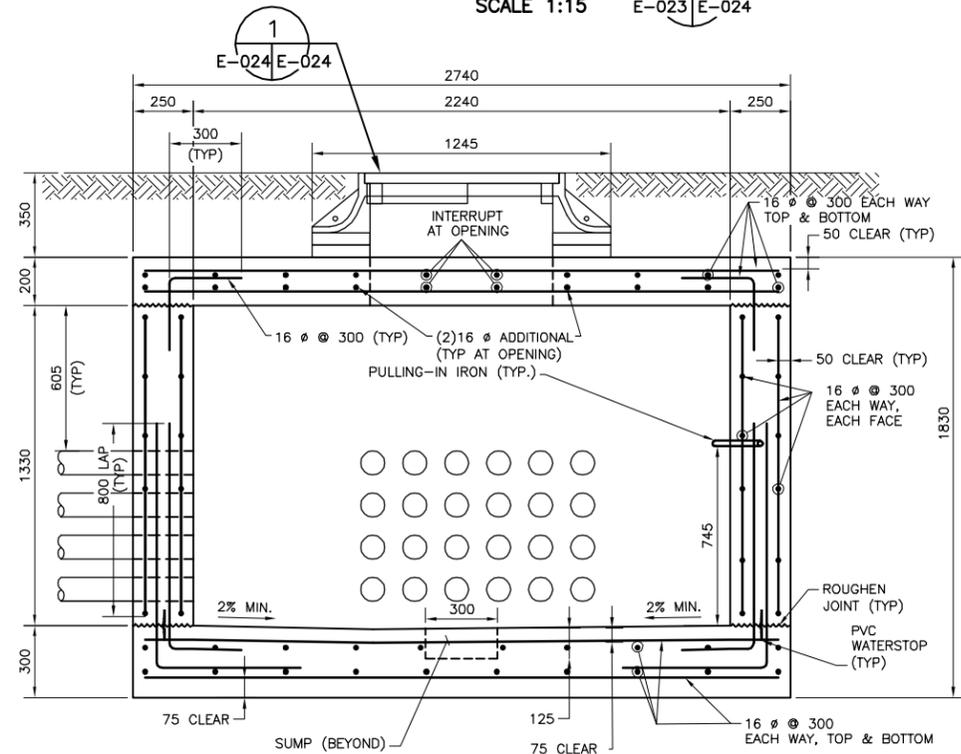
ELECTRICAL DETAILS  
SHEET 3 OF 4

SHEET REFERENCE NUMBER:  
AF1082  
E-023

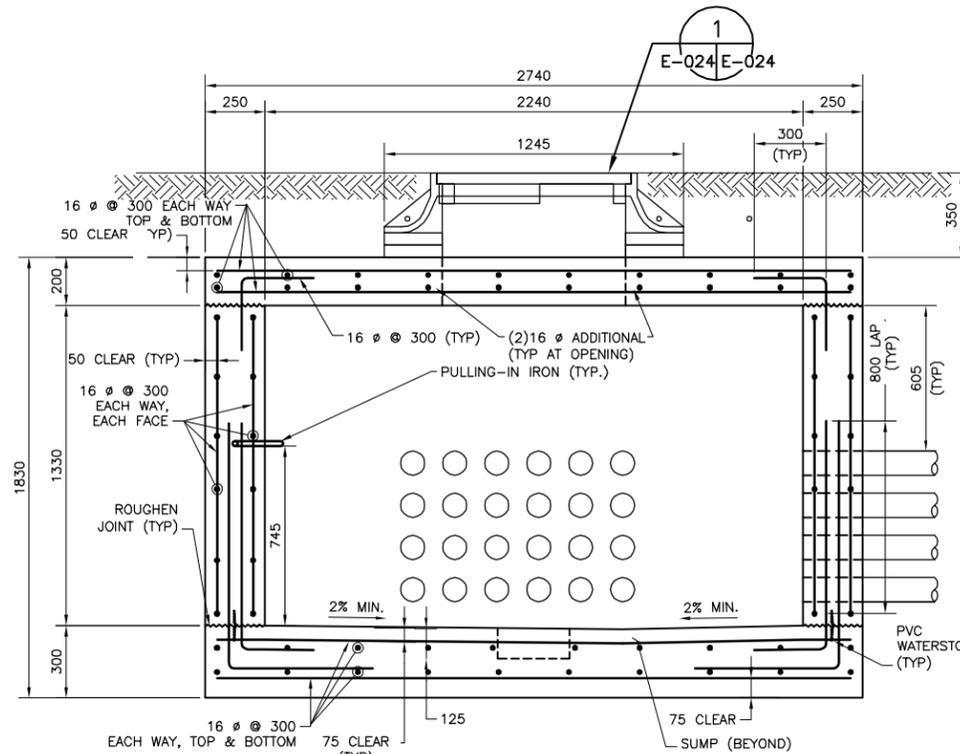
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**PLAN - TOP SLAB 3**  
SCALE 1:15 E-023 E-024

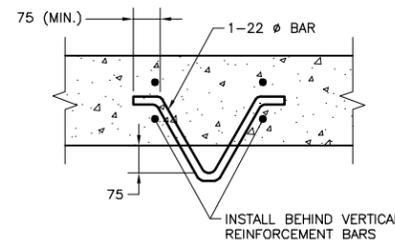


**SECTION A**  
SCALE 1:15 E-024 E-024



**SECTION B**  
SCALE 1:15 E-024 E-024

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

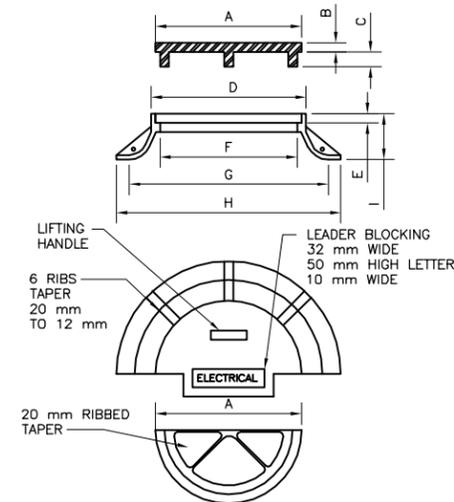


**NOTE:** ACTUAL EMBEDMENT WILL BE IN ACCORDANCE WITH THE PULLING IRON MANUFACTURERS REQUIREMENTS.

**TYPICAL PULLING-IN IRON DETAIL 2**  
N.T.S E-024 E-024

**NOTES:**  
**GENERAL**

- ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED BY THE CONTRACTOR IN THE FIELD AND ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.
- THE ELECTRICAL MANHOLE BASE FLOOR SLAB SHALL BE PLACED ON NATURAL UNDISTURBED SOIL OR ON COMPACTED SELECT FILL PREPARED AS FOLLOWS:
  - REMOVE UNSUITABLE MATERIAL BELOW THE SLAB AND REPLACE WITH COMPACTED SELECT FILL TO A DEPTH WHERE NATURAL SOIL AND OR COMPACT FILL IS ENCOUNTERED.
  - FILL MATERIAL MUST BE PLACED IN LIFTS UP TO A MAXIMUM OF 150mm IN THICKNESS. EACH LIFT COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.
- ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE STRUCTURE.
- ALL PVC WATERSTOPS TO BE 150mm PVC TYP. TYPE 5mm THICK (3 RIBS)
- BACKFILL OF EXCAVATION SHALL START AFTER BOTTOM OF THE SLAB IS IN PLACE AND CURED FOR 7 DAYS.
- CONTRACTOR SHALL PROVIDE A SUITABLE RACK SYSTEM TO SUPPORT AND SEPERATE CABLES PASSING THROUGH MANHOLES. A RACK SHALL BE PROVIDED FOR EACH LEVEL OF CONDUIT ENTERING OR LEAVING THE MANHOLE. THE RACK SHALL BE CONSTRUCTED FROM A GALVANIZED STEEL STRUCTURAL FRAMING SYSTEM AND BE CAPABLE OF CARRYING THE WEIGHT OF ALL CONDUCTORS PASSING THROUGH THE MANHOLE AT ITS GIVEN LEVEL.



**TYPE III MANHOLE FRAME AND TYPE B COVER DETAIL 1**  
SCALE: 1:20 E-024 E-024

	A	B	C	D	E
MANHOLE	810mm	51mm	83mm	813mm	51mm
	F	G	H	I	
MANHOLE	762mm	1041mm	1245mm	245mm	

**CONCRETE**

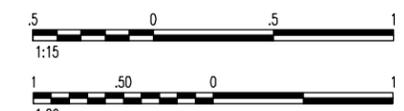
- REFER TO SPECIFICATIONS FOR COMPLETE CONCRETE AND REINFORCING STEEL. SPECIFICATION REQUIREMENTS.
  - STRUCTURAL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE HAVING A MINIMUM STRENGTH OF 280 kg/cm<sup>2</sup> (4000 PSI) AT 28 DAYS.
  - REINFORCING BARS, IN SLABS, SHALL BE LAPPED IN ACCORDANCE WITH ACI CODE REQUIREMENT OR AS DETAILED ON THE DRAWING. REINFORCING BARS LAP SPLICES SHALL BE AS FOLLOWS:
    - 16 # BARS LAP 790mm, UNO.
    - PROTECTIVE CONCRETE COVER FOR REINFORCEMENT:
      - CONCRETE PLACED AGAINST EARTH, 75mm.
      - PROVIDE 50mm CONCRETE COVER UNLESS NOTED OTHERWISE.
- ALL EMBEDDED ITEMS TO BE PLACED AND SECURED BEFORE CONCRETE PLACEMENT. NO "WET SETTING" OF EMBEDDED ITEMS WILL BE ALLOWED.

CORRECTED FINAL DESIGN SUBMITTAL

NO.	DESCRIPTION	DATE	BY
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	KCT
1	FINAL DESIGN SUBMITTAL	10/05/10	KCT

DESIGNED BY: JAS  
DRAWN BY: SES  
CHECKED BY: KCT  
DATE: 10/19/10  
SUBMITTED BY: TETRA TECH  
FILE NO.: AF1082--ES024DT

US Army Corps of Engineers  
Middle East District  
TETRA TECH



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AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN  
ELECTRICAL DETAILS  
SHEET 4 OF 4

SHEET REFERENCE NUMBER:  
AF1082  
E-024

10/19/10



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### MATERIAL SPECIFICATIONS

FUEL STORAGE TANK: UL 142 STEEL PRIMARY TANK WITH MINIMUM OF 3 FACTORY SUPPLIED TANK SADDLES, INTERNAL AND EXTERNAL LADDERS, IMPACT PLATES LOCATED UNDER ALL OPENINGS, 29,171 LITER CAPACITY.

MANHOLE: UL LISTED STEEL COVER WITH GASKET. SEE PLANS FOR SIZES

TANK VENT: ALUMINUM BODY WITH BRASS SCREEN UPDRAFT VENT

TANK EMERGENCY VENT: UL LISTED ALUMINUM EMERGENCY VENT TESTED WITH ASME PTC25.3-1988 SETTINGS. CAPACITY TO MATCH TANK SIZE

FILL BOX: 75mm FILL BOX AND SPILL CONTAINER WITH 18.9 LITER LIQUID CAPACITY, QUICK OPENING COVER, HIGH SPEED INTERNAL DRAIN, INNER CAP AND CAST ALUMINUM COVER, QUICK DETACHABLE COUPLING WITH CHECK VALVE AND SHUTOFF BALL VALVE.

FUEL TRANSFER PUMPS: DUPLEX PUMP SET WITH EACH PUMP DELIVERING 200 LPH AT 345KPA. PUMP TO BE ENCLOSED IN WEATHER PROOF ENCLOSURE.

OVERFILL PREVENTION VALVE: UL LISTED VALVE WITH CAST ALUMINUM BODY AND POPPET, NITRILE FLOAT DESIGNED TO CLOSE OFF FILL PORT AS TANK NEARS FULL CAPACITY.

ALL ABOVE GROUND FUEL PIPING SHALL BE SCHEDULE 40 BLACK STEEL WITH THREADED FITTINGS WITH INSULATION AND ALUMINUM JACKETING.

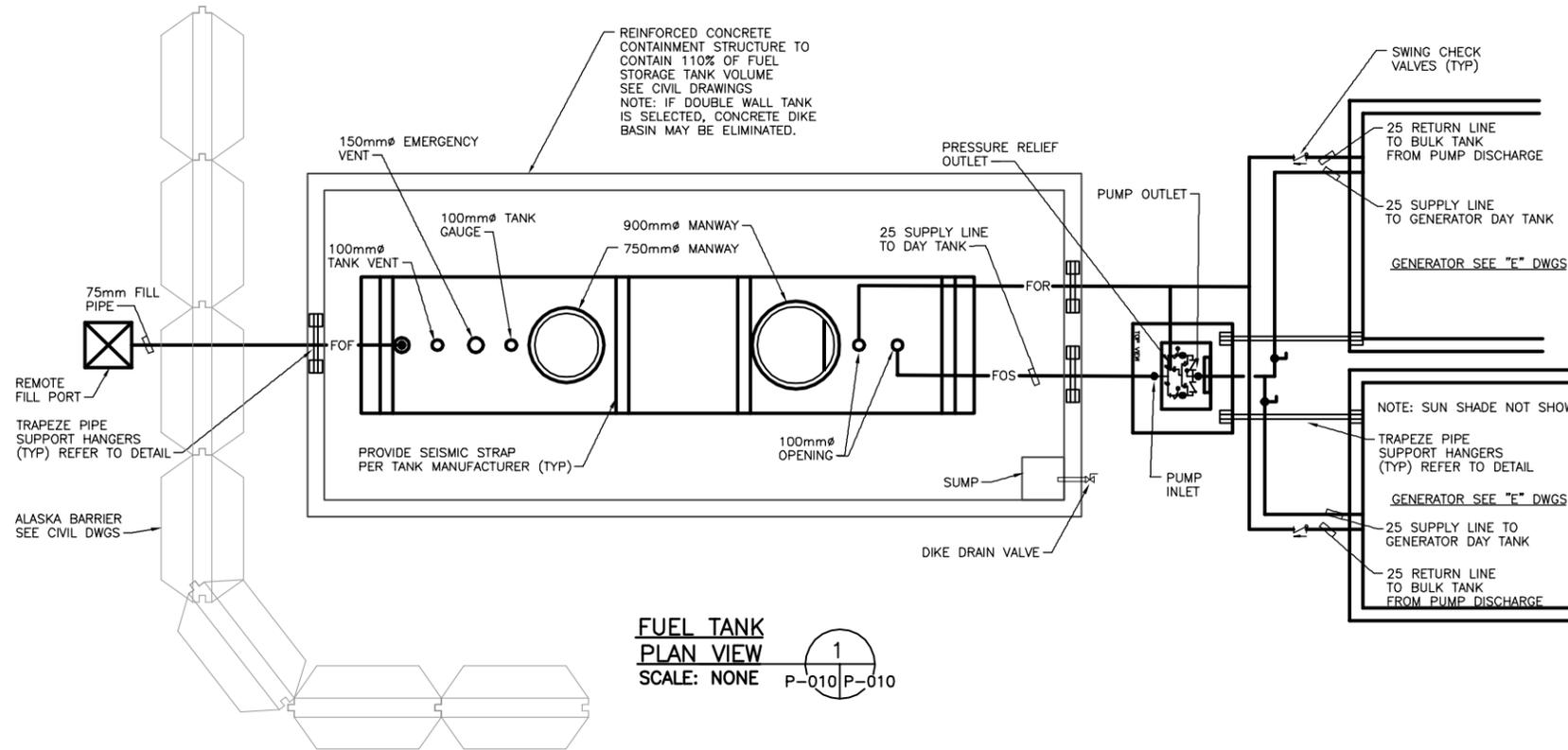
CONTRACTOR SHALL PROVIDE A FULL SUPPLY OF FUEL TO EACH DAY TANK AND BULK STORAGE TANK AT THE TIME OF TURNOVER TO THE OWNER.

### ABBREVIATIONS

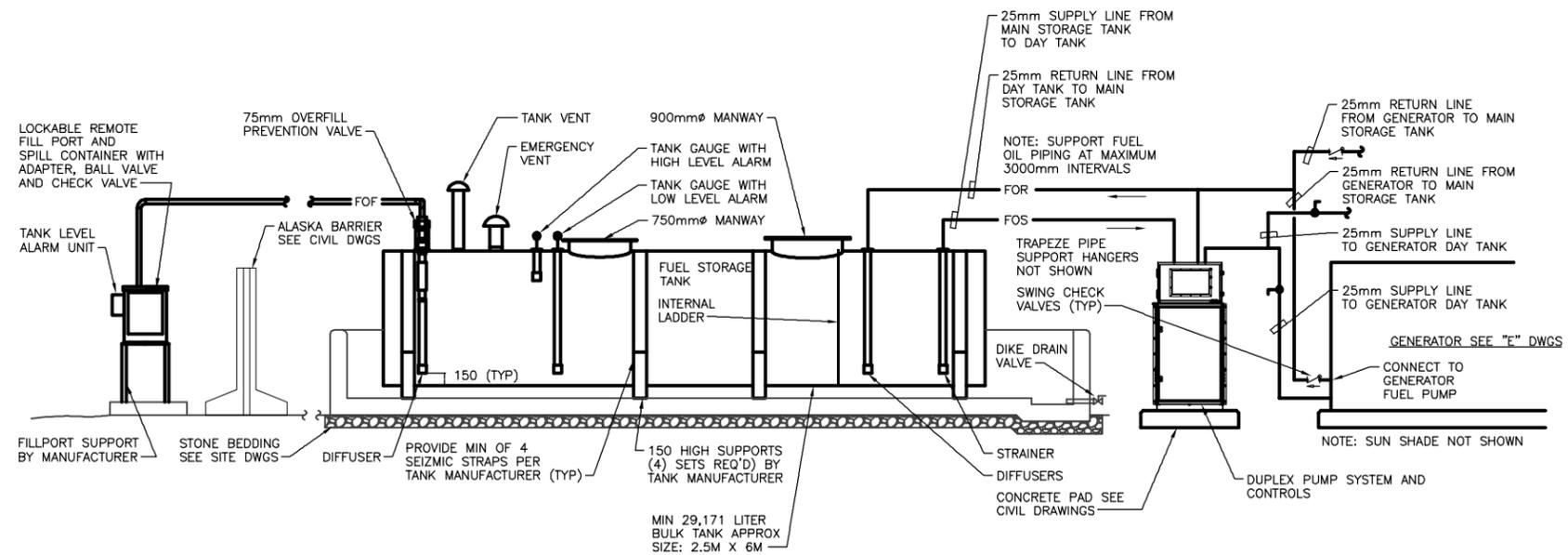
APPROX ASME	APPROXIMATELY AMERICAN SOCIETY OF MECHANICAL ENGINEERS
CONC CONN DWGS	CONCRETE CONNECTION DRAWINGS
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOV	FUEL OIL VENT
HP	HORSEPOWER
KPa	KILO PASCALS
LPH	LITERS PER HOUR
MIN	MINIMUM
MM	MILLIMETER
NO	NORMALLY OPEN/NUMBER
Ø	DIAMETER
PSI	POUNDS PER SQUARE INCH
%	PERCENT
RPM	REVOLUTIONS PER MINUTE
TYP	TYPICAL
UL	UNDERWRITER'S LABORATORIES

### LEGEND

	BALL VALVE
	BUTTERFLY VALVE
	GATE VALVE
	SOLENOID VALVE
	EMERGENCY VALVE
	CHECK VALVE
	CIRC PUMP
	D.V. DRAIN VALVE
	UNION
	CAPPED / PLUGGED CONNECTION
	REDUCER - INCREASER
	PIPE TURNING DOWN
	PIPE TURNING DOWN WITH SHUT-OFF
	PIPE TURNING UP
	SUPPORT LOCATION



**FUEL TANK PLAN VIEW**  
SCALE: NONE P-010 P-010



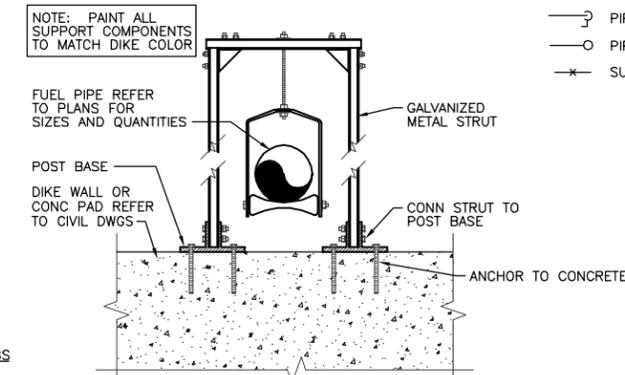
**FUEL TANK SCHEMATIC VIEW**  
SCALE: NONE P-010 P-010

### GENERAL NOTES:

- ALL DIMENSIONS HERE ON PLANS ARE IN mm UNLESS OTHERWISE INDICATED.
- MANUFACTURER BRAND NAMES AND MODEL NUMBERS GIVEN ON PLANS ARE FOR INFORMATION PURPOSES ONLY. THESE AND SIMILAR PRODUCTS FROM OTHER MANUFACTURERS THAT MEET THE SPECIFICATIONS WILL BE APPROVED AS AN ACCEPTABLE ALTERNATIVE.
- SEE CIVIL DRAWINGS FOR EXACT LOCATIONS OF TANK AND EQUIPMENT.

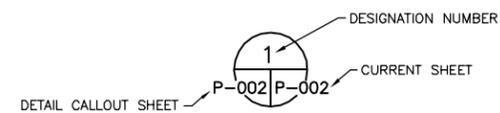
— FOS —	FUEL OIL SUPPLY
— FOR —	FUEL OIL RETURN
— FOF —	FUEL OIL FILL

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

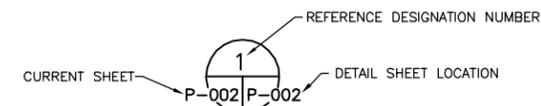


**TRAPEZE SUPPORT HANGER**  
SCALE: NONE P-010 P-010

### DETAIL TITLE



### DETAIL CALLOUT



### FUEL PUMP SCHEDULE

DESIGNATION	NO. REQUIRED	FLOW RATE (LPH) EACH PUMP	PRESSURE KPa (PSI) EACH PUMP	ELECTRIC LOAD (H-P)	VOLTS	PHASE	HERTZ	RPM	LOCATION	DRAWING NO.
FUEL PUMP	2	200	345 (50)	1/3	208	3	60	1725	FUEL TANK	P-010

NOTE: EACH PUMP IS TO OPERATE 100% LOAD. PUMP SET TO OPERATE AS A LEAD-LEG ARRANGEMENT.

CORRECTED FINAL DESIGN SUBMITTAL

NO.	DATE	DESCRIPTION
0	10/19/10	KCT CORRECTED FINAL DESIGN SUBMITTAL
B	10/05/10	KCT FINAL DESIGN SUBMITTAL
A	08/31/10	KCT MID-POINT DESIGN SUBMITTAL

DESIGNED BY:	DATE:	10/19/10
DRAWN BY:	DCG	
CHECKED BY:	BCL	
FILE NO.:	AF1082--PS010PN	
TECH:	TETRA TECH	

US Army Corps of Engineers  
Middle East District

TETRA TECH

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AUSTERE STANDARD DESIGNS-PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

FUEL TANK PLAN AND SCHEMATIC

SHEET REFERENCE NUMBER:  
**AF1082 P-010**

10/19/10

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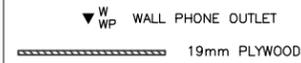
METRIC COPPER CONDUCTOR CONVERSION CHART		
AWG KCMIL	COMPUTER CONVERSION mm <sup>2</sup>	ADVISED CROSS SECTION mm <sup>2</sup>
24	.2	0.25
20	.5	0.75
18	.8	1
16	1.3	1.5
14	2.1	2.5
12	3.3	4
10	5.27	6
8	8.4	10
6	13.3	16
4	21.2	25
3	26.7	25
2	33.6	35
1	42.4	50
1/0	53.4	50
2/0	67.5	70
3/0	85.0	95
4/0	107.2	120

EQUIVALENT CONDUIT SIZE	
mm	INCH
20	3/4
25	1
32	1 1/4
38	1 1/2
50	2
64	2 1/2
76	3
90	3 1/2
100	4

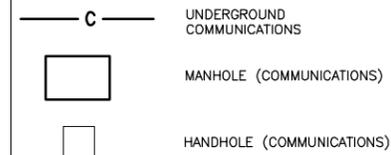
**GENERAL NOTES:**

- ALL CONDUIT PENETRATIONS THRU WALLS OR CEILINGS SHALL BE SEALED/FIRESTOPPED.
- FOR ELECTRICAL INSTALLATION SEISMIC REQUIREMENTS, SEE SPECIFICATION 26 05 48 00.10.

**PLAN LEGEND (TELECOM)**



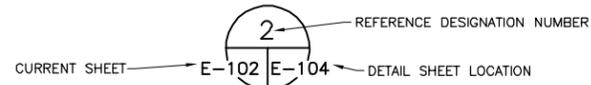
**PLAN LEGEND (SITE)**



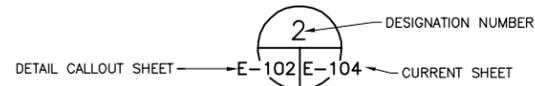
**ABBREVIATIONS**

- AFG ABOVE FINISHED GRADE
- AFF ABOVE FINISHED FLOOR
- A AMPERE
- AIC AMPERE INTERRUPTING CAPACITY
- BFG BELOW FINISHED GRADE
- BLDG BUILDING
- CKT CIRCUIT
- C CONDUIT
- CND CONDUCTOR
- EC CONTRACTOR RESPONSIBLE FOR ELECTRICAL WORK
- FOC FIBER OPTIC CABLE
- GFE GOVERNMENT FURNISHED CONTRACTOR INSTALLED
- GFGI GOVERNMENT FURNISHED GOVERNMENT INSTALLED
- GFI GROUND FAULT INTERRUPTING
- GRS GALVANIZED RIGID STEEL CONDUIT
- HZ HERTZ
- M METERS
- mm MILLIMETERS
- MH MANHOLE
- MTD MOUNTED
- OSP OUTSIDE PLANT
- PET PROTECTED ENTRANCE TERMINATION
- PP PATCH PANEL
- RM ROOM
- SM SINGLEMODE
- TC CONTRACTOR RESPONSIBLE FOR TELECOMMUNICATIONS WORK
- TMGB TELECOMMUNICATIONS MAIN GROUNDING BUS
- TR TELECOMMUNICATIONS ROOM
- UTP UNSHIELDED TWISTED PAIR
- WM WALL MOUNTED
- WP WEATHER-PROOF

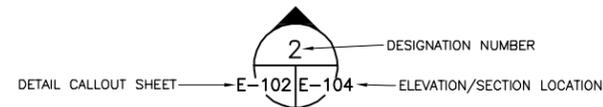
**DETAIL CALLOUT**



**DETAIL TITLE**



**ELEVATION/SECTION CALLOUT**



UNLESS NOTED ELSEWHERE ON THE CONTRACT DOCUMENTS, THE FOLLOWING LIST REPRESENTS THE TYPICAL MOUNTING HEIGHTS FOR THE DEVICES SHOWN:  
 a. WALL(W) TELE. AND/OR CALL SWITCHES 1,219mm (TO TOP)

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

CORRECTED  
FINAL  
DESIGN  
SUBMITTAL

REV	DATE	DESCRIPTION
0	10/19/10	CORRECTED FINAL DESIGN SUBMITTAL

DESIGNED BY: JLB	DATE: 10/19/10
DRAWN BY: SES	SUBMITTED BY: TETRA TECH
CHECKED BY: RSM	FILE NO.: AF1082--XT001GN

US Army Corps of Engineers  
Middle East District

TETRA TECH

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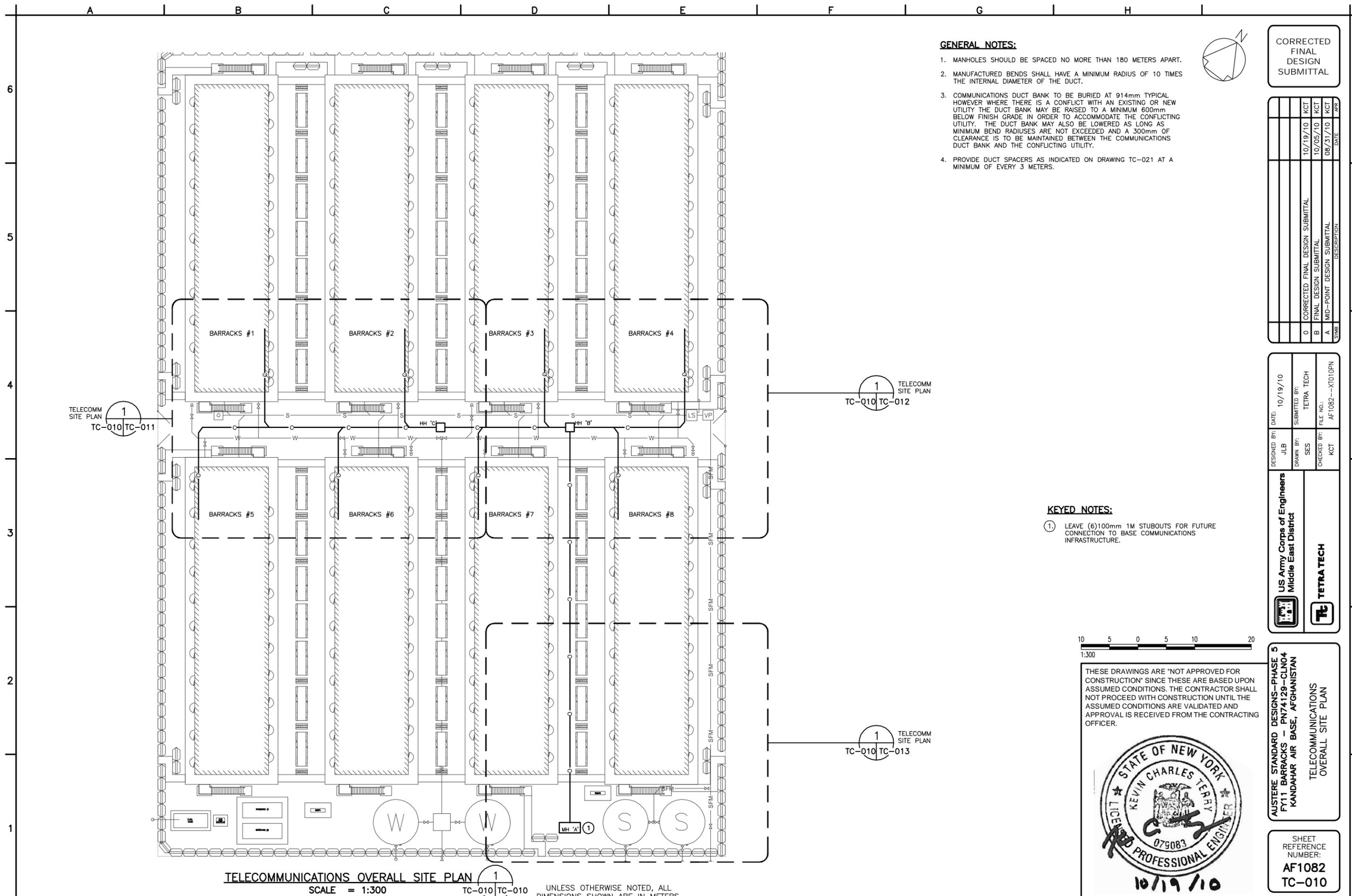


AUSTERE STANDARD DESIGNS - PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS  
 LEGEND, ABBREVIATIONS,  
 SYMBOLS AND GENERAL NOTES

SHEET  
REFERENCE  
NUMBER:  
**AF1082**  
**TC-001**

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**TELECOMMUNICATIONS OVERALL SITE PLAN**  
 SCALE = 1:300  
 TC-010 TC-011 TC-012 TC-013

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN METERS.

**GENERAL NOTES:**

1. MANHOLES SHOULD BE SPACED NO MORE THAN 180 METERS APART.
2. MANUFACTURED BENDS SHALL HAVE A MINIMUM RADIUS OF 10 TIMES THE INTERNAL DIAMETER OF THE DUCT.
3. COMMUNICATIONS DUCT BANK TO BE BURIED AT 914mm TYPICAL HOWEVER WHERE THERE IS A CONFLICT WITH AN EXISTING OR NEW UTILITY THE DUCT BANK MAY BE RAISED TO A MINIMUM 600mm BELOW FINISH GRADE IN ORDER TO ACCOMMODATE THE CONFLICTING UTILITY. THE DUCT BANK MAY ALSO BE LOWERED AS LONG AS MINIMUM BEND RADIUS ARE NOT EXCEEDED AND A 300mm OF CLEARANCE IS TO BE MAINTAINED BETWEEN THE COMMUNICATIONS DUCT BANK AND THE CONFLICTING UTILITY.
4. PROVIDE DUCT SPACERS AS INDICATED ON DRAWING TC-021 AT A MINIMUM OF EVERY 3 METERS.



CORRECTED  
 FINAL  
 DESIGN  
 SUBMITTAL

SYMB	DESCRIPTION	DATE	APP
0	CORRECTED FINAL DESIGN SUBMITTAL	10/19/10	KCT
B	FINAL DESIGN SUBMITTAL	10/05/10	KCT
A	MID-POINT DESIGN SUBMITTAL	08/31/10	KCT

DESIGNED BY:	JLB	DATE:	10/19/10
DRAWN BY:	SES	SUBMITTED BY:	TETRA TECH
CHECKED BY:	KCT	FILE NO.:	AF1082--XT010PN

**US Army Corps of Engineers**  
 Middle East District

**TETRA TECH**

**KEYED NOTES:**

1. LEAVE (6)100mm 1M STUBOUTS FOR FUTURE CONNECTION TO BASE COMMUNICATIONS INFRASTRUCTURE.



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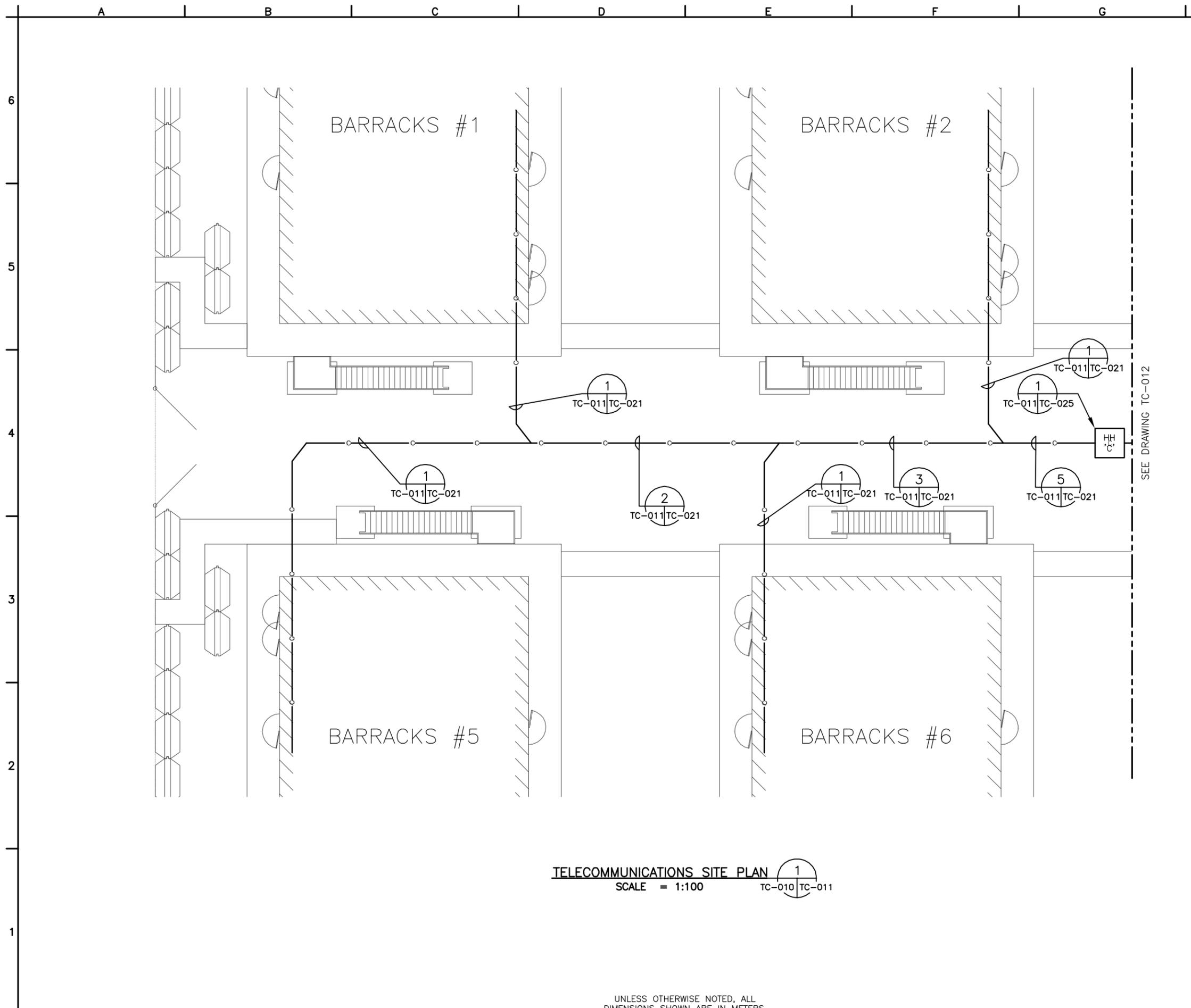


AUSTER STANDARD DESIGNS-PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS  
 OVERALL SITE PLAN

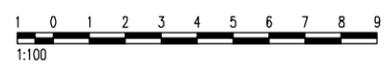
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**AF1082**  
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**TELECOMMUNICATIONS SITE PLAN**  
SCALE = 1:100

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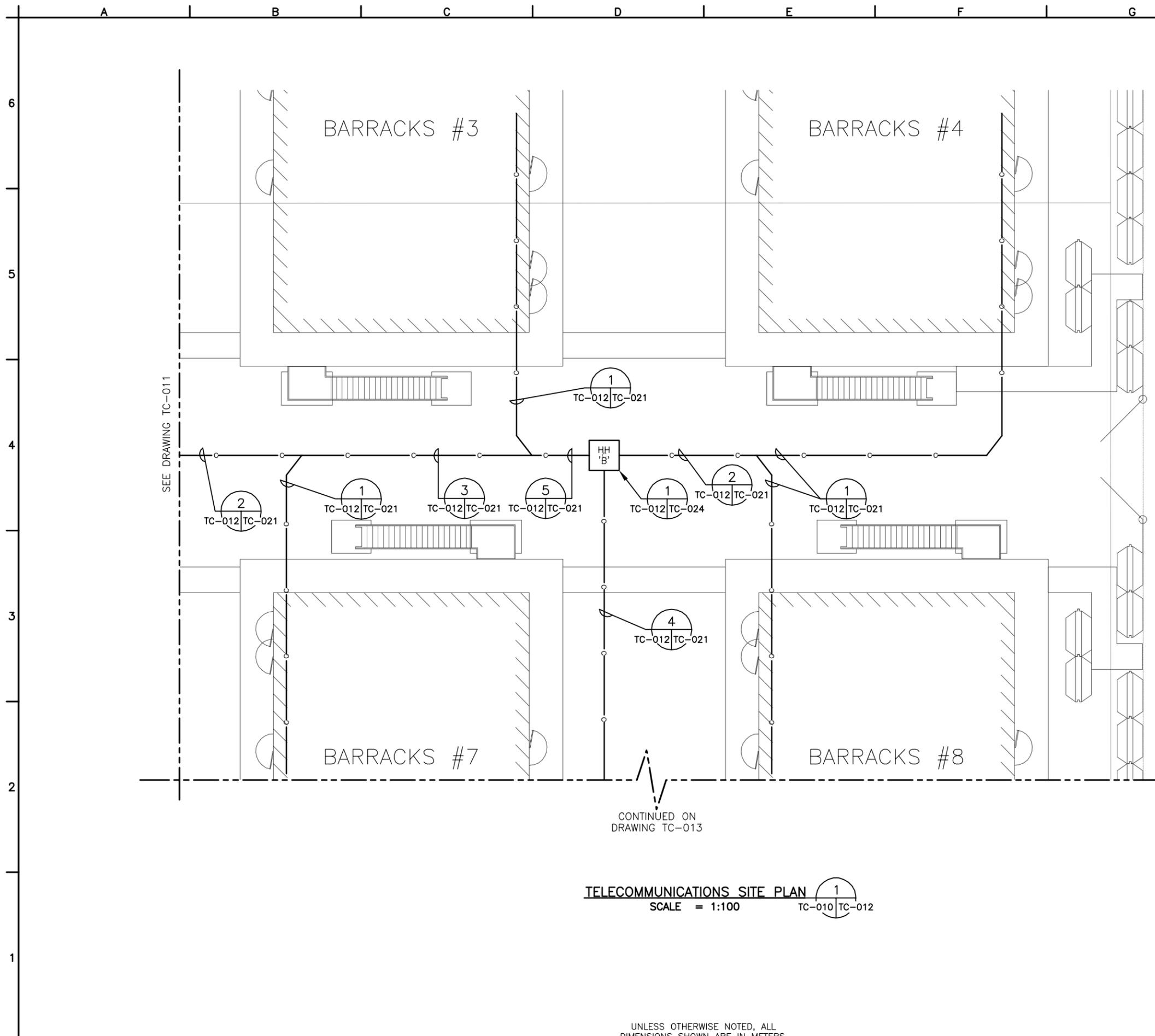
**TETRA TECH**

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS SITE PLAN  
SHEET 1 OF 3

SHEET REFERENCE NUMBER:  
**AF1082**  
**TC-011**

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**TELECOMMUNICATIONS SITE PLAN** 1  
 SCALE = 1:100 TC-010 TC-012

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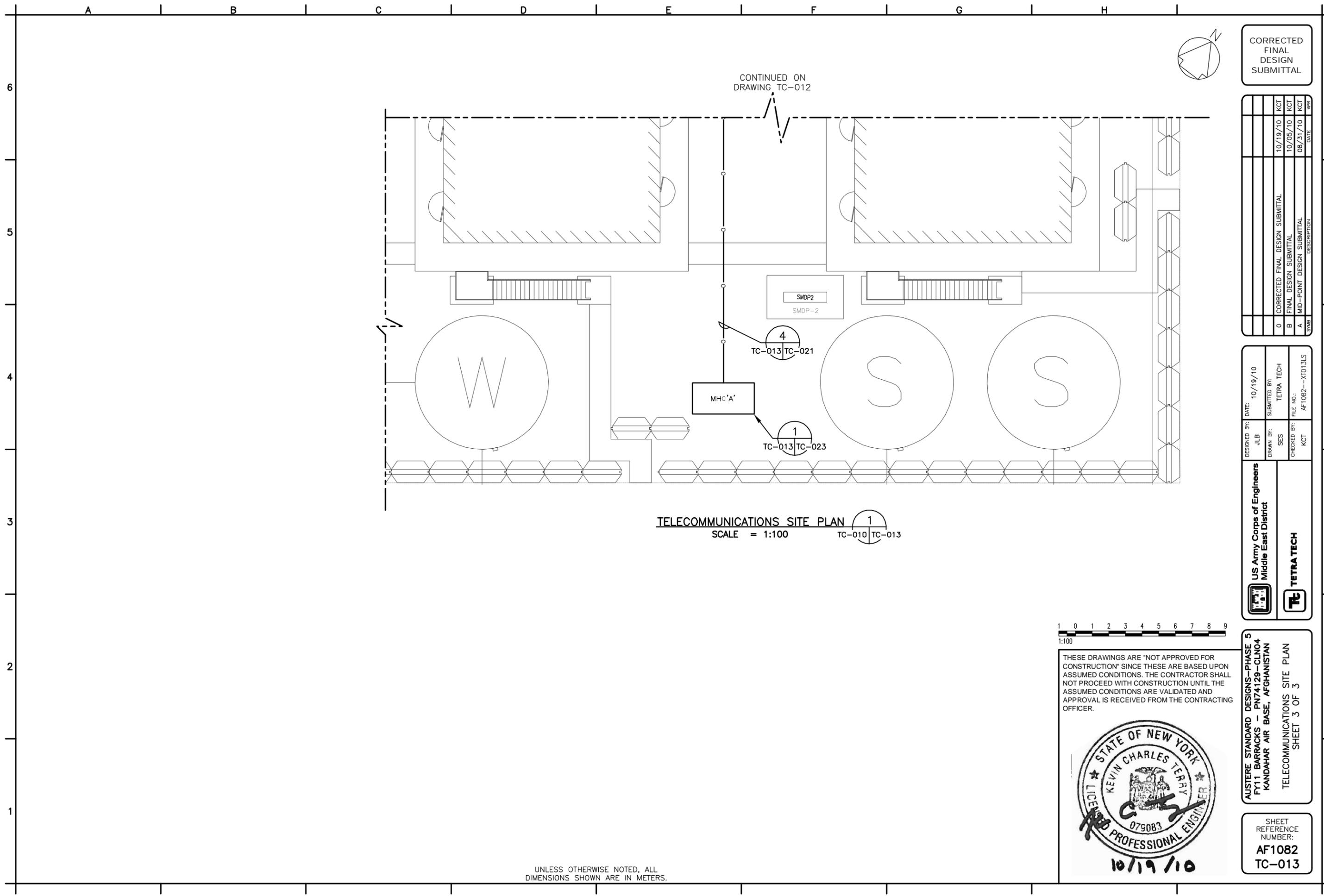
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 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN  
 TELECOMMUNICATIONS SITE PLAN  
 SHEET 2 OF 3

SHEET REFERENCE NUMBER:  
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**TELECOMMUNICATIONS SITE PLAN**  
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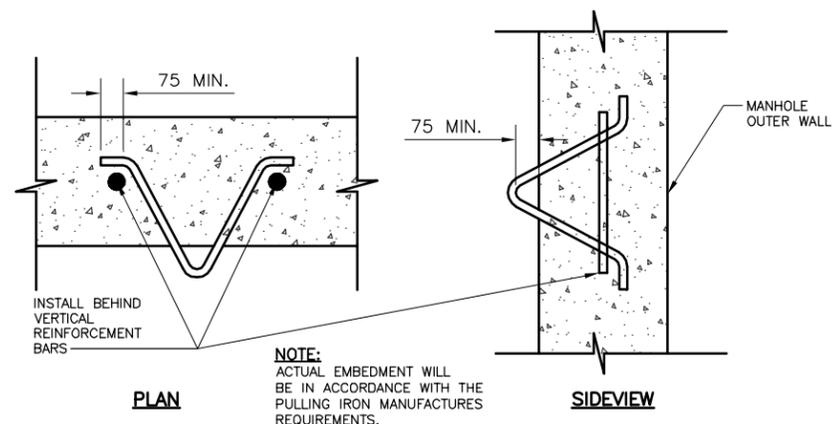
**TETRA TECH**

AUSTERE STANDARD DESIGNS - PHASE 5  
 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

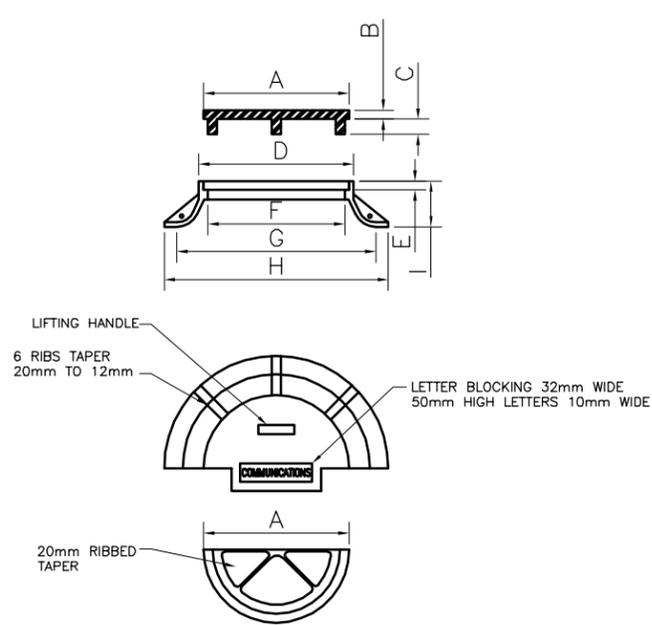
TELECOMMUNICATIONS SITE PLAN  
 SHEET 3 OF 3

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**AF1082**  
**TC-013**

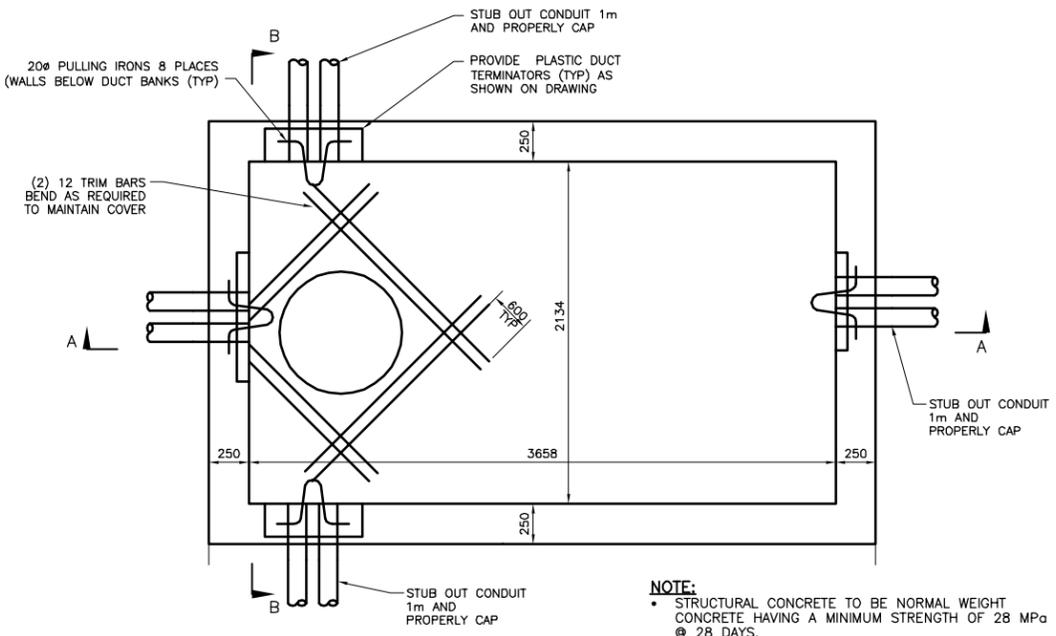
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**TYPICAL PULLING-IN IRON  
DETAIL A**  
N.T.S.



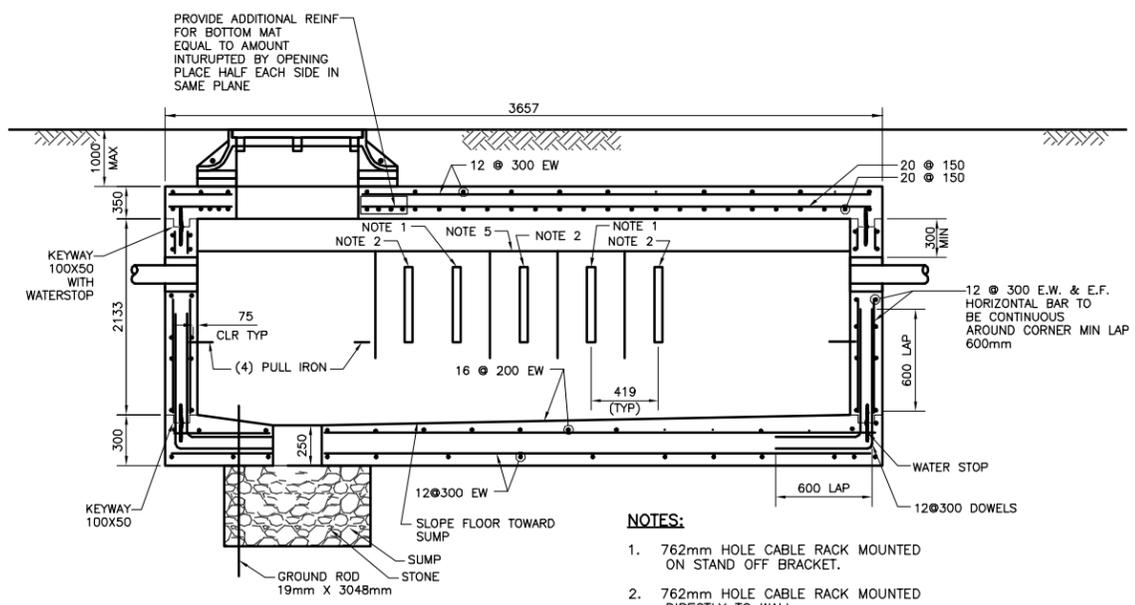
	A	B	C	D	E	F	G	H	I
MANHOLE	810mm	51mm	83mm	813mm	51mm	762mm	1041mm	1245mm	245mm



**COMMUNICATIONS MANHOLE - TRAFFIC RATED**  
N.T.S.

**NOTE:**

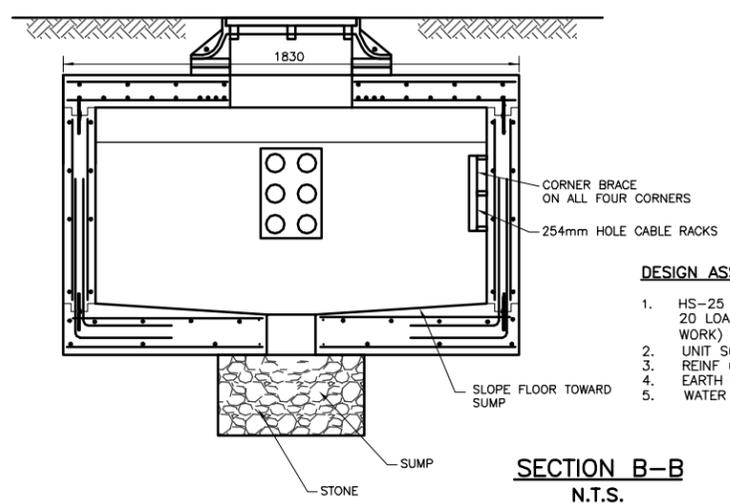
- STRUCTURAL CONCRETE TO BE NORMAL WEIGHT CONCRETE HAVING A MINIMUM STRENGTH OF 28 MPa @ 28 DAYS.
- REINFORCING STEEL ASTM A615 GR. 60 YIELD STRENGTH = 4218 kg/cm<sup>2</sup>
- ALLOW CONCRETE TO CURE 3 DAYS PRIOR TO BACKFILL
- CONCRETE MUST REACH FULL 28 DAY COMPRESSIVE STRENGTH PRIOR TO TRAFFIC LOADING



**SECTION A-A**  
N.T.S.

- NOTES:**
- 762mm HOLE CABLE RACK MOUNTED ON STAND OFF BRACKET.
  - 762mm HOLE CABLE RACK MOUNTED DIRECTLY TO WALL.
  - PROVIDE 42 EACH 254mm CABLE HOOK
  - PROVIDE 42 INSULATORS
  - GROUND WIRE BOND
  - PROVIDE 20 GROUND WIRE FARGO CONNECTERS

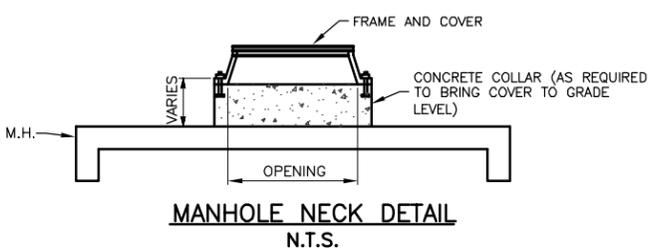
**NOTE:**  
REFER TO SITE DRAWINGS FOR LOCATIONS OF MANHOLES.



**SECTION B-B**  
N.T.S.

- DESIGN ASSUMPTIONS:**
- HS-25 LOADING (THIS EXCEEDS THE HS 20 LOAD RATING REQUIRED BY THE SCOPE OF WORK)
  - UNIT SOIL WEIGHT = 1920kg/m<sup>3</sup>
  - REINF COVER = 75mm TYP UNO
  - EARTH COVER = 0.0m TO 1.0m
  - WATER TABLE - AT GRADE

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.



**MANHOLE NECK DETAIL**  
N.T.S.

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**TETRA TECH**

AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS DETAILS  
SHEET 1 OF 6

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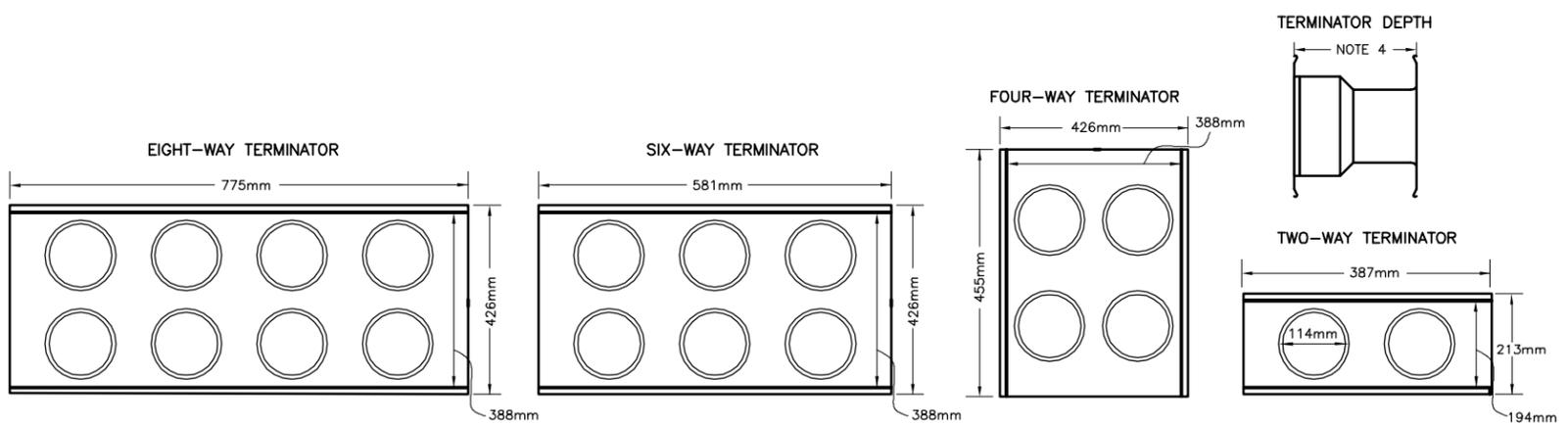
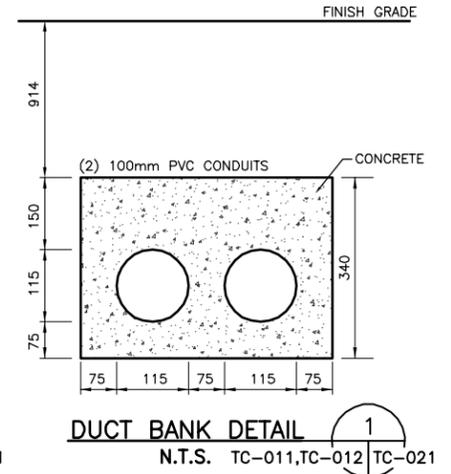
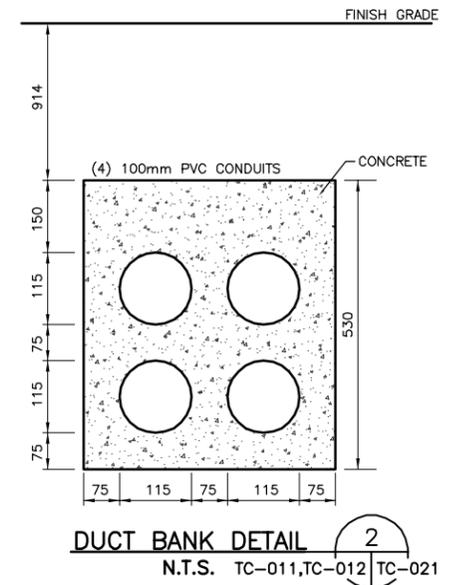
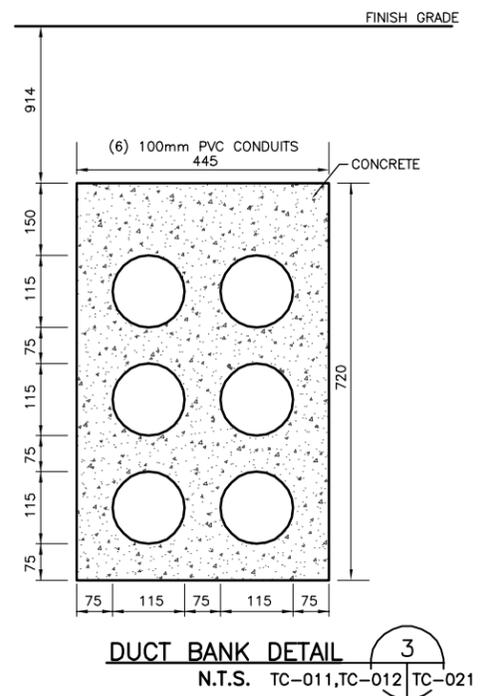
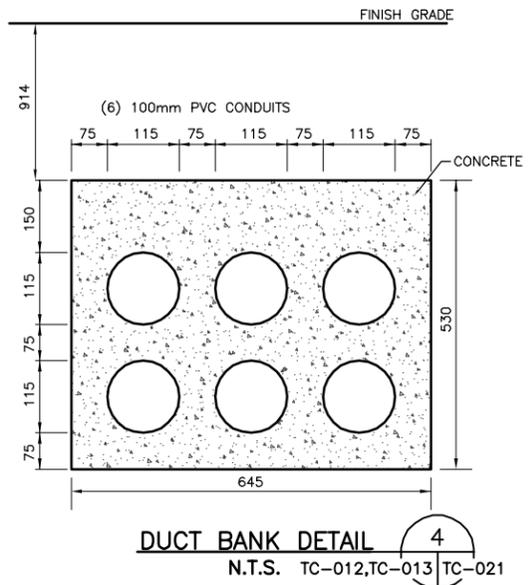
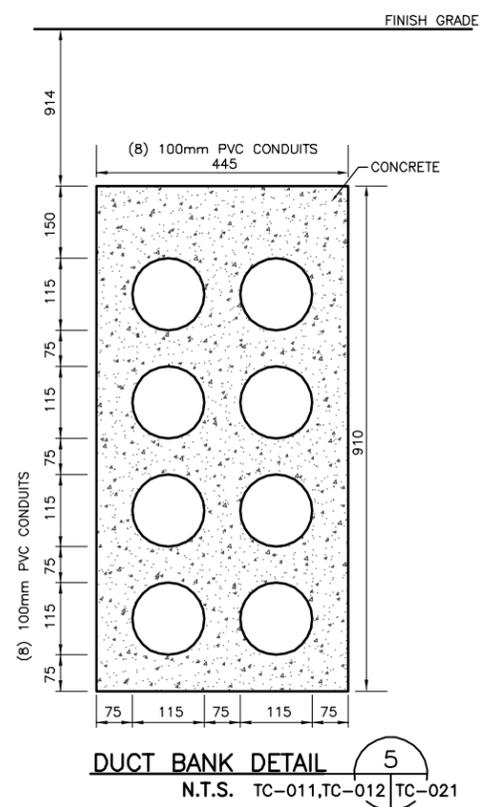
10/19/10

SHEET REFERENCE NUMBER:  
**AF1082  
TC-020**

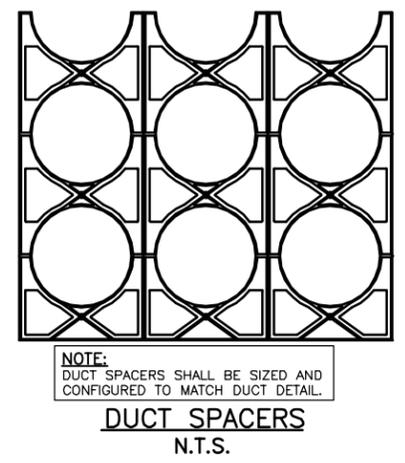
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A B C D E F G H

6  
5  
4  
3  
2  
1



- GENERAL NOTES:**
1. TERMINATORS SHALL BE CONNECTED ("INTERLOCKED") TO FORM PANELS AS REQUIRED BY DUCT CONFIGURATION.
  2. REINFORCING BARS WILL BE INSTALLED BETWEEN THE TERMINATORS.
  3. DUCT TERMINATORS WILL BE SIZED FOR 114mm OUTER DIAMETER (4.5 INCH OD).
  4. TERMINATOR DEPTH VARIES DEPENDENT ON MH/HH WALL THICKNESS.



**NOTE:**  
DUCT SPACERS SHALL BE SIZED AND CONFIGURED TO MATCH DUCT DETAIL.

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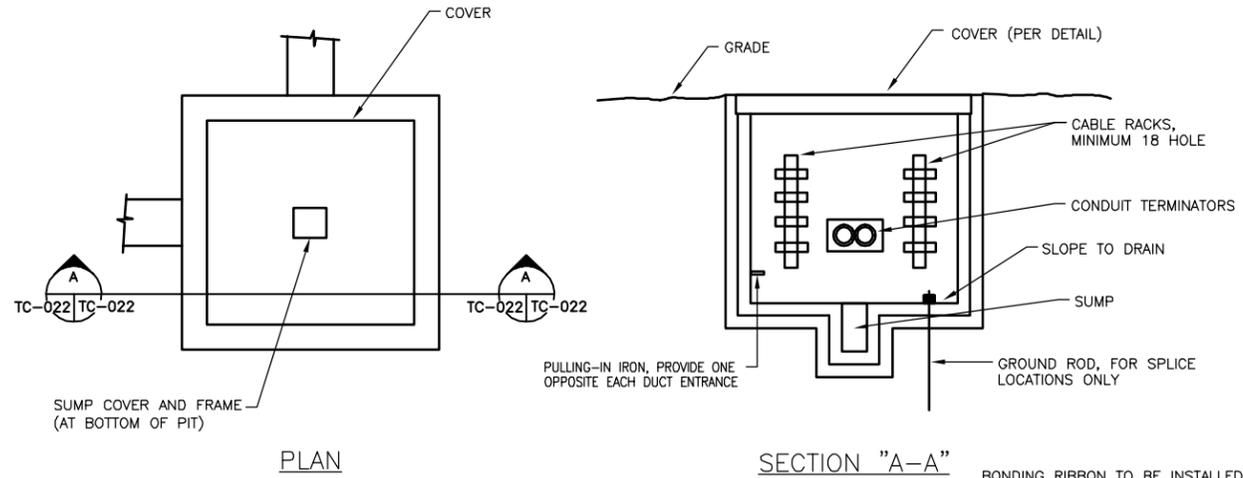


AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS DETAILS  
SHEET 2 OF 6

SHEET REFERENCE NUMBER:  
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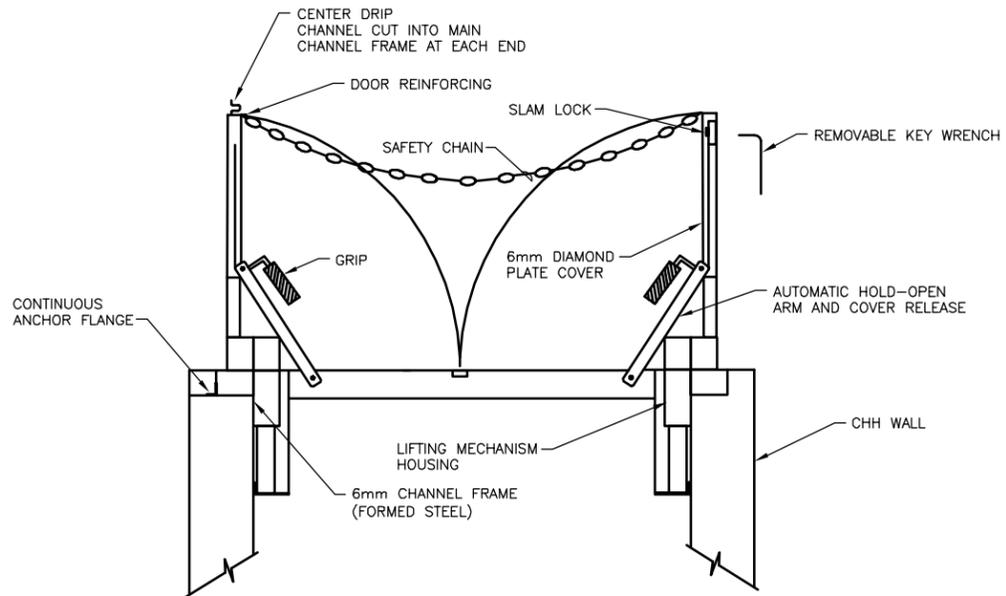
MINIMUM CONCRETE THICKNESS	
HANDHOLE WALLS AND FLOOR	203mm

CONSTRUCTION REQUIREMENTS				
MINIMUM REQUIREMENTS				
TYPE	HEIGHT	LENGTH	WIDTH	SUMP DEPTH
THH	NOTE 1	1.2m	1.2m	.25m

**NOTE:**  
1. HEIGHT REQUIRED FOR MINIMUM CONDUIT DEPTHS INDICATED

MINIMUM REINFORCING
1. BARS WILL BE A MINIMUM OF 13 Ø ROUND DEFORMED.
2. WALLS AND FLOOR WILL HAVE BARS AT 200mm MAXIMUM ON CENTERS WITH A MINIMUM 300 mm HOOK AT CORNERS AND INTERSECTIONS.
3. THE TOP SHALL HAVE BARS INSTALLED AS SHOWN AT A MINIMUM OF 50mm FROM THE OPENING AND WITH A MINIMUM 100mm SPACING BETWEEN BARS.

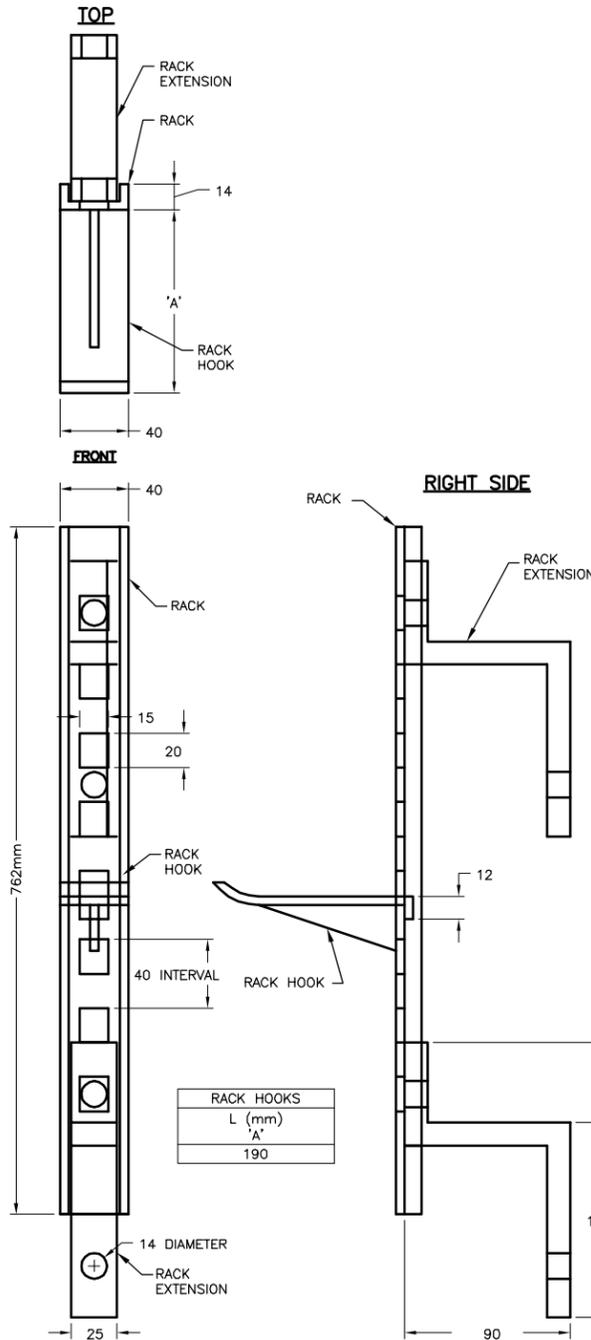
**HANDHOLE DETAIL**  
N.T.S.



**HANDHOLE COVER**  
N.T.S.

COVER DESIGNED TO WITHSTAND H2O WHEEL LOADING SUITABLE FOR USE IN OFF STREET LOCATIONS WHERE NOT SUBJECTED TO HIGH DENSITY TRAFFIC.

UNLESS OTHERWISE NOTED, ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.



**MANHOLE CABLE RACKS**  
N.T.S.

CORRECTED FINAL DESIGN SUBMITTAL

REV	DATE	DESCRIPTION
0	10/19/10	KCT CORRECTED FINAL DESIGN SUBMITTAL
B	10/05/10	KCT FINAL DESIGN SUBMITTAL
A	08/31/10	KCT MID-POINT DESIGN SUBMITTAL

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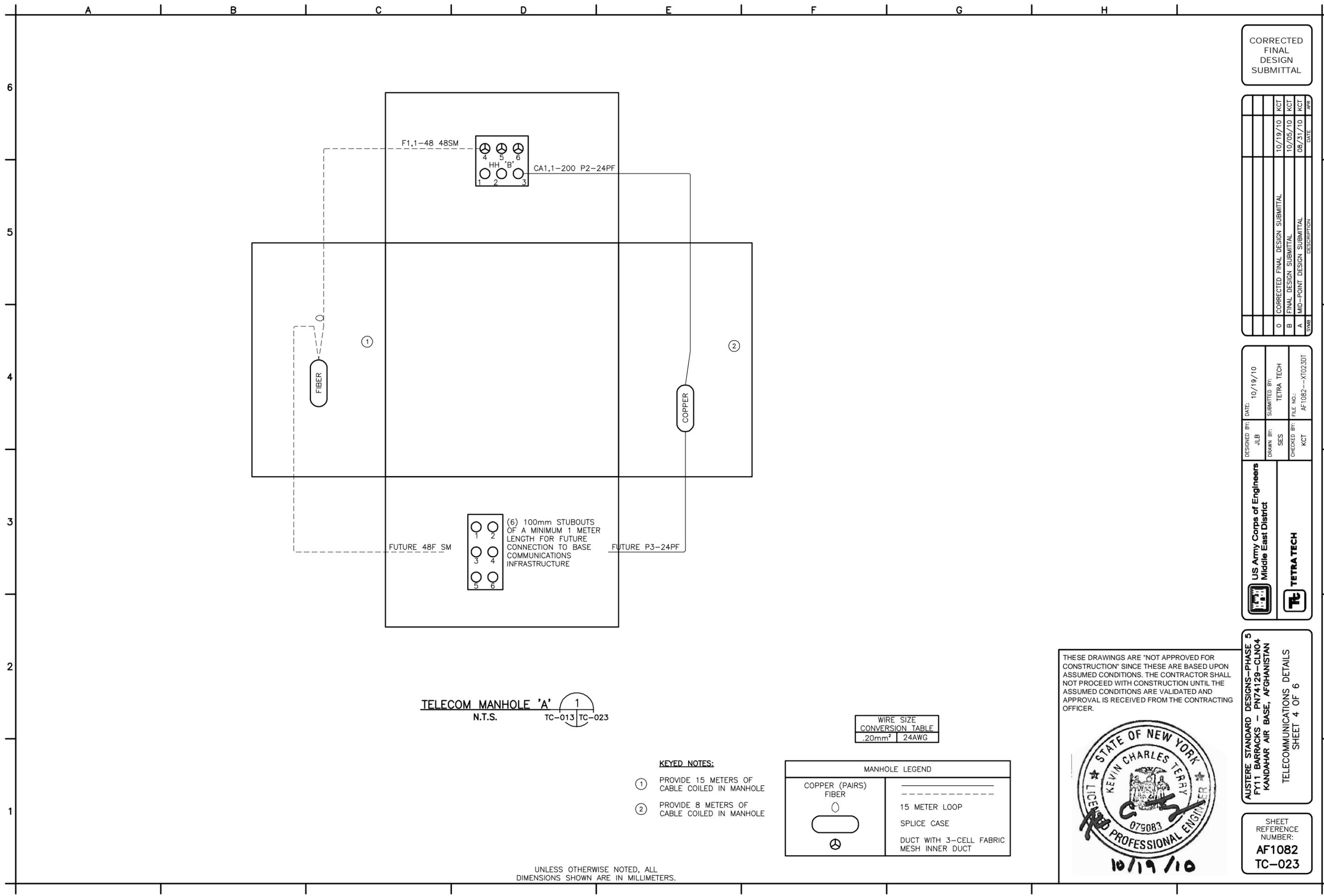


AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS DETAILS  
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SHEET REFERENCE NUMBER:  
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**TELECOM MANHOLE 'A'**  
N.T.S. TC-013 TC-023

- KEYED NOTES:**
- ① PROVIDE 15 METERS OF CABLE COILED IN MANHOLE
  - ② PROVIDE 8 METERS OF CABLE COILED IN MANHOLE

**WIRE SIZE CONVERSION TABLE**

.20mm <sup>2</sup>	24AWG
--------------------	-------

**MANHOLE LEGEND**

COPPER (PAIRS)	-----
FIBER	-----
○	15 METER LOOP
⊖	SPLICE CASE
⊕	DUCT WITH 3-CELL FABRIC MESH INNER DUCT

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AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN  
TELECOMMUNICATIONS DETAILS  
SHEET 4 OF 6

SHEET REFERENCE NUMBER:  
**AF1082 TC-023**

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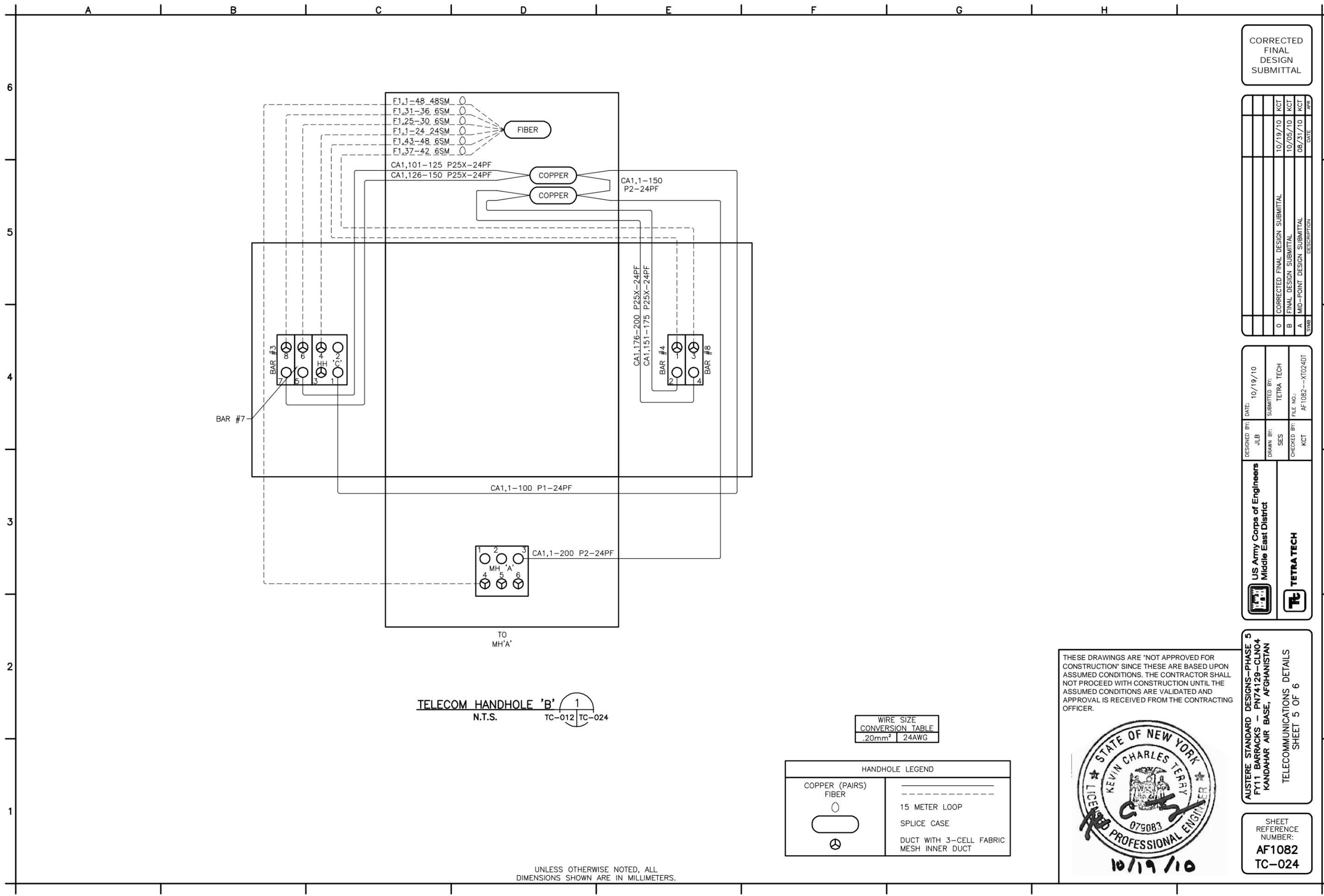
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CHECKED BY:	KCT	FILE NO.:	AF1082--XT023DT

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TELECOM HANDHOLE 'B' 1  
N.T.S. TC-012 TC-024

WIRE SIZE CONVERSION TABLE	
.20mm <sup>2</sup>	24AWG

HANDHOLE LEGEND	
COPPER (PAIRS)	-----
FIBER	-----
	15 METER LOOP
	SPLICE CASE
	DUCT WITH 3-CELL FABRIC MESH INNER DUCT

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CHECKED BY:	KCT	FILE NO.:	AF1082--XT024DT

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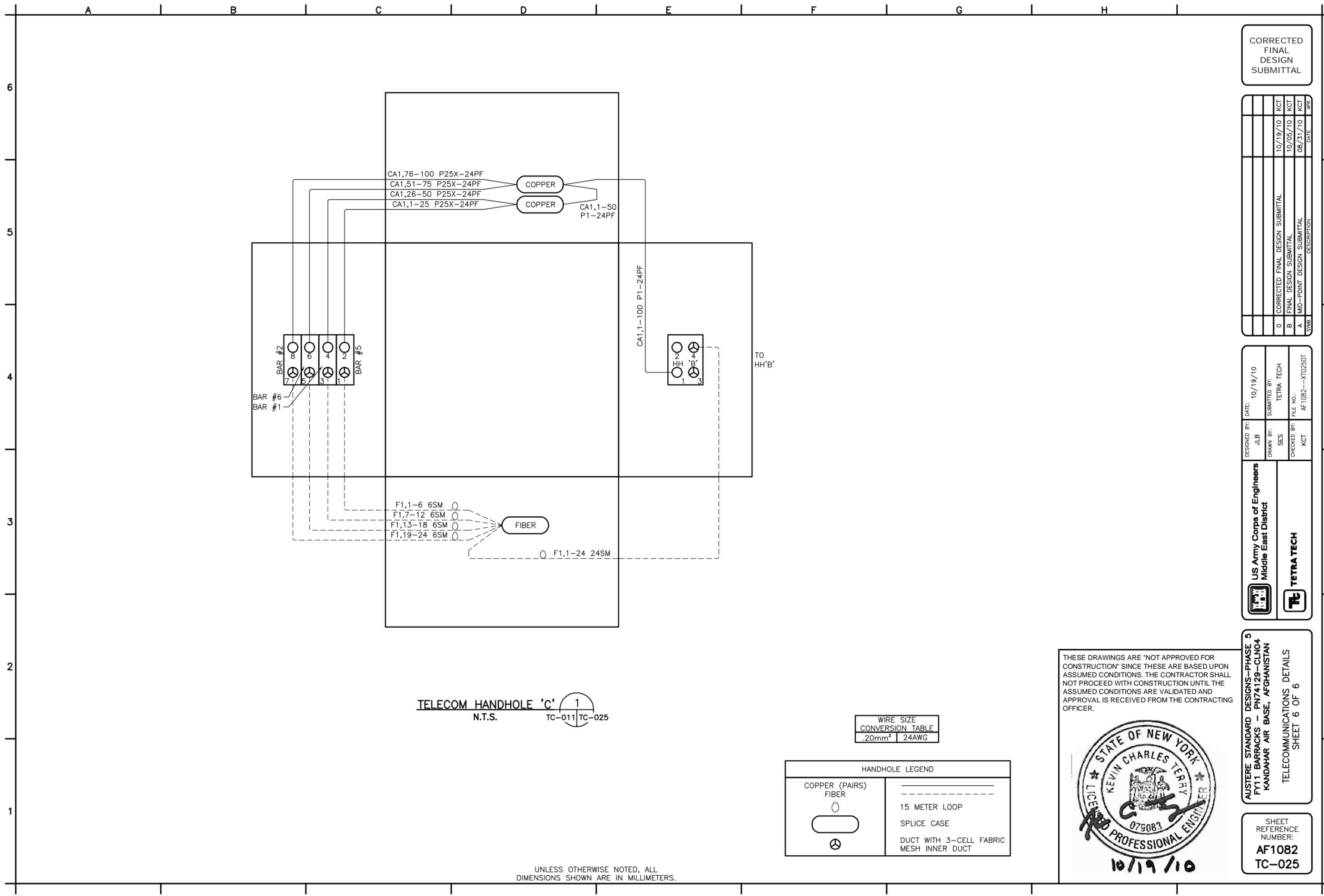
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AUSTERE STANDARD DESIGNS - PHASE 5  
FY11 BARRACKS - PN74129-CLN04  
KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS DETAILS  
SHEET 5 OF 6

SHEET REFERENCE NUMBER:  
AF1082  
TC-024

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TELECOM HANDHOLE 'C' 1  
 N.T.S. TC-011 TC-025

WIRE SIZE CONVERSION TABLE	
.20mm <sup>2</sup>	24AWG

HANDHOLE LEGEND	
COPPER (PAIRS)	-----
FIBER	-----
	15 METER LOOP
	SPLICE CASE
	DUCT WITH 3-CELL FABRIC MESH INNER DUCT

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 FY11 BARRACKS - PN74129-CLN04  
 KANDAHAR AIR BASE, AFGHANISTAN

TELECOMMUNICATIONS DETAILS  
 SHEET 6 OF 6

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 AF1082  
 TC-025