STD 123-335-03

MILITARY SERVICE STATION AND FACTORY FABRICATED TANK ENGINEERING STANDARD

AIR FORCE CIVIL ENGINEER CENTER

CONTRACT NO. FA8903-08-D-8794 / 4C02

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E. International Tower,
Suite 2000, Atlanta, Georgia, U.S.A. 30303
PH:404 577-4000 FAX:404 577-7119

FINAL SUBMITTAL
OCTOBER 2, 2015

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E. International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MHF | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO. 14018-20

DRAWING TITLE: COVER SHEET

DRAWING NO. **cov**

SHEET 1 OF 72

RAC # 1401800

M:\2014\14018000\0000\1401800-COV.dwg 10/5/2015 1:29:24 PM Ralph Aldridge

DRAWING INDEX

SHEET NO.	SHEET TITLE	REVISION
COV	COVER SHEET	
G-101	DRAWING INDEX	
C-001	CIVIL ABBREVIATIONS, LEGEND AND NOTES	
C-401	ABOVEGROUND FUEL STORAGE TANKS PLAN	
C-401A	ABOVEGROUND FUEL STORAGE TANKS AND CO-LOCATED OFFLOAD/FILLSTAND PLAN	
C-402	UNDERGROUND FUEL STORAGE TANKS PLAN	
C-402A	UNDERGROUND FUEL STORAGE TANKS AND CO-LOCATED OFFLOAD/FILLSTAND PLAN	
C-501	PAVEMENT DETAILS	
C-502	CIVIL SITE DETAILS	
C-503	CONTAINMENT BASIN DETAILS	
C-504	FENCE DETAILS	
S-001	STRUCTURAL GENERAL NOTES (1 OF 2)	
S-002	STRUCTURAL GENERAL NOTES (2 OF 2)	
S-101	CONTROL BUILDING FOUNDATION AND ROOF PLANS	
S-102	TANK PAD FOUNDATION PLAN	
S-103	DISPENSER ISLAND CANOPY FOUNDATION PLAN	
S-104	OFFLOAD EQUIPMENT CANOPY ROOF BOUNDARY AND FOUNDATION PLAN	
S-105	UNDERGROUND STORAGE TANK FOUNDATIONPLAN	
S-106	FILLSTAND CANOPY OPTION ROOF BOUNDARY AND FOUNDATION PLAN	
S-301	CONTROL BUILDING ROOF SELECTION	
S-302	TANK ACCESS PLATFORM SECTIONS	
S-303	MISCELLANEOUS SECTIONS	
S-501	TYPICAL DETAILS	
S-502	TYPICAL MASONRY DETAILS	
S-503	TYPICAL MASONRY DETAILS	
S-504	TYPICAL EXTERIOR PIPE SHOE AND ANCHOR DETAILS	
A-001	GENERAL INFORMATION	
A-101	CONTROL BUILDING PLANS	
A-102	DISPENSER ISLAND CANOPY PLAN AND ELEVATIONS	
A-201	CONTROL BUILDING ELEVATIONS	
A-301	WALL SECTIONS AND DETAILS	
A-601	OPENING AND FINISH SCHEDULES	
M-001	FUEL SYSTEM LEGEND, ABBREVIATIONS AND GENERAL NOTES	
M-002A	ABOVEGROUND STORAGE TANKS FUEL SYSTEM FLOW DIAGRAM	
M-002B	UNDERGROUND STORAGE TANKS FUEL SYSTEM FLOW DIAGRAM	
M-003	FUEL SYSTEM DISPENSERS FLOW DIAGRAM	
M-101A	ABOVEGROUND STORAGE TANKS PIPING PLAN	
M-101B	UNDERGROUND STORAGE TANKS PIPING PLAN	

SHEET NO.	SHEET TITLE	REVISION
M-102A	ABOVEGROUND STORAGE TANKS OFFLOAD PAD PIPING PLAN	
M-103	TRUCK FILLSTAND PIPING PLAN	
M-301A	ABOVEGROUND STORAGE TANKS PIPING SECTION	
M-301B	UNDERGROUND STORAGE TANKS PIPING SECTION	
M-501	FUEL DISPENSER DETAILS (1 OF 2)	
M-502	FUEL DISPENSER DETAILS (2 OF 2)	
M-503	HOSE SUPPORT STRUCTURE DETAILS	
M-504A	ABOVEGROUND STORAGE TANKS FUEL SYSTEM DETAILS (1 OF 2)	
M-504B	UNDERGROUND STORAGE TANKS FUEL SYSTEM DETAILS	
M-505A	ABOVEGROUND STORAGE TANKS FUEL SYSTEM DETAILS (2 OF 2)	
M-601	FUEL SYSTEM SCHEDULES	
MHP-101	CONTROL BUILDING PLANS AND GENERAL NOTES	
MHP-501	CONTROL BUILDING DETAILS (1 OF 2)	
MHP-502	CONTROL BUILDING DETAILS (2 OF 2)	
E-001	ELECTRICAL LEGEND AND GENERAL NOTES	
EG-101	CONTROL BUILDING GROUNDING PLAN	
EG-102	DISPENSER SHELTER GROUNDING AND LIGHTNING PROTECTION PLAN	
EG-103	OFFLOAD SHELTER GROUNDING AND LIGHTNING PROTECTION PLAN	
EG-104	ABOVEGROUND TANKS OPTION GROUNDING PLAN	
EL-101	CONTROL BUILDING AND OFFLOAD CANOPY LIGHTING PLAN	
EL-102	FUELING STATION DISPENSER SHELTER LIGHTING PLAN	
EP-101	CONTROL BUILDING POWER PLAN AND SCHEMATICS	
EP-102	OFFLOAD SHELTER ELECTRICAL PLAN AND SCHEMATICS	
EP-103	ABOVEGROUND TANKS OPTION ELECTRICAL PLAN AND SCHEMATICS	
EP-104	UNDERGROUND TANKS OPTION ELECTRICAL PLAN AND SCHEMATICS	
EP-105	OPTIONAL FILLSTAND POWER AND GROUNDING PLANS	
EP-501	FUELING CONTROLS DETAILS	
EP-502	ELECTRICAL DETAILS (1 OF 2)	
EP-503	ELECTRICAL DETAILS (2 OF 2)	
EP-601	PANEL SCHEDULES	
EP-602	ELECTRICAL SCHEDULES	
ES-101	ELECTRICAL SITE PLAN	
ES-501	ELECTRICAL DETAILS	
TP-501	TELECOMMUNICATIONS DETAILS	

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL

PRELIMINARY
NOT FOR
CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: BEG
DRAWN: BEG
CHECKED: MHF
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
PROJECT NO.: 14018-20
DRAWING TITLE: DRAWING INDEX

DRAWING NO.

G-101

SHEET 2 OF 72

RAC # 1401800

ABBREVIATIONS

ABI	ADDITIVE BID ITEM
ACM	ASBESTOS CEMENT
AD	AREA DRAIN
AFFF	AQUEOUS FILM FORMING FOAM
A/G	ABOVEGROUND
AVT	ANTI-VEHICLE TRENCH
BBL	BARREL
B	BOLLARD
BM	BENCHMARK
BOP	BOTTOM OF PIPE
BYO	BY OTHERS
CB	CATCH BASIN
CBR	CALIFORNIA BEARING RATIO
CC	CENTER TO CENTER
℄	CENTERLINE
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
COC	CENTER OF CURVE
COE	CORPS OF ENGINEERS
CONC	CONCRETE
COR	CORNER
DI	DROP INLET
DIA	DIAMETER
Ø	DIAMETER
DIP	DUCTILE IRON PIPE
DV	DIVERSION VALVE
EFSO	EMERGENCY FUEL SHUTOFF
EHH	ELECTRICAL HANDHOLE
EL	ELEVATION
EMH	ELECTRICAL MANHOLE
FFEL	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE ELEVATION
FH	FIRE HYDRANT
FML	FLEXIBLE MEMBRANE LINER
FOC	FIBER OPTICS CABLE
FOD	FOREIGN OBJECT DAMAGE
FRP	FIBERGLASS REINFORCED PIPE
GPMH	GRINDER PUMP MANHOLE
GPS	GLOBAL POSITIONING SYSTEM
GWL	GREY WATER LINE
HH	HANDHOLE
HORZ.	HORIZONTAL
HPV	HIGH POINT VENT
HPVP	HIGH POINT VENT PIT
HSV	HYDRANT SERVICE VEHICLE
HW	HEADWALL
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCH
INTER	INTERSECTION
INV	INVERT
IVV	ISOLATION VALVE VAULT
KL	KILOLITER
LCP	LATERAL CONTROL PIT
LP	LIGHT POLE
LPD	LOW POINT DRAIN
LPDP	LOW POINT DRAIN PIT
LT	LEFT
M	METER
MH	MANHOLE
MW	MANWAY
mm	MILLIMETER
MAX	MAXIMUM
MIN	MINIMUM
NO.	NUMBER
NSW	NATIVE STONE WALL
NTS	NOT TO SCALE
OC	ON CENTER
O.C.E.W.	ON CENTER EACH WAY
OA	OUTLET APRON
OSHA	OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
OFF	OFFSET
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PCCP	PORTLAND CEMENT CONCRETE PAVEMENT
PI	POINT OF INTERSECTION
PIV	POST INDICATOR VALVE
PRC	POINT OF REVERSE CURVE
PRT	PRODUCT RECOVERY TANK
PSI	POUND PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVE
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
R	RADIUS
Ⓡ	REINFORCED SLAB
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RT	RIGHT
SAN.	SANITARY
SB	SLUDGE BED
SC#	POWER SWITCH
SD	STORM DRAIN
SS	SANITARY SEWER
SSFM	SANITARY SEWER FORCE MAIN
SSMH	SANITARY SEWER MANHOLE
SS	STAINLESS STEEL
STA	STATION
SW	SIDEWALK
SY	SQUARE YARD
T##	TRANSFORMER
TBM	TEMPORARY BENCH MARK
TCMH	TELECOMMUNICATION MANHOLE
T/C	TOP OF CURB
TD	TIE DOWN
TEL	TELEPHONE
T/G	TOP OF GRATE
TOC	TOP OF COVER
TYP	TYPICAL
UE	UNDERGROUND ELECTRICAL LINE
U/G	UNDERGROUND
USCS &GS	UNITED STATES COASTAL AND GEOLOGICAL SURVEY
VC	VERTICAL CURVE
W	WATER
WWF	WELDED WIRE FABRIC
WV	WATER VALVE
YI	YARD INLET
YH	YARD HYDRANT

LEGEND

DESCRIPTION	EXISTING	NEW
BUILDINGS		
ROADS		
CURB & GUTTER		
WALKS		
RAILROAD		
CONTOURS	12	12
SPOT GRADE ELEVATIONS	+ 77.2	+ 77.2
DIRECTION OF DRAINAGE		
CULVERT		
STORM DRAIN	SD	SD
SUBDRAIN		
SUBDRAIN OUTLET LINE		
WATER LINE	W	W
FIRE WATER LINE	FW	FW
SANITARY SEWER	S	S
FORCE MAIN	FM	FM
FIRE PROTECTION WATER LINE	FW	FW
WASTE DRAIN	WD	WD
SUBDRAIN FLUSHING & OBSERVATION RISER	△OR	▲OR
MANHOLE SELF EXPLANATORY DEPENDING ON TYPE OF UTILITY LINE	○	◉
CURB INLET		
AREA INLET		
FIRE HYDRANT		
GATE VALVE & VALVE BOX OR SERVICE STOP & BOX		
DRILL HOLE	⊕DH-2	◍DH-2
MONITORING WELL	⬡MW-1	⬢MW-2
CONTROL POINT	△	
SECURITY FENCE	X	X
WOVEN WIRE	○	●
WOOD	□	■

SPECIFICATIONS THAT MAY BE USED AS PART OF THIS STANDARD:

(TO BE EDITED BY FINAL DESIGNER)

02 41 00 DEMOLITION
09 90 00 PAINTS AND COATINGS
31 00 00 EARTHWORK
31 05 20 GEOSYNTHETIC DRAINAGE LAYER
31 32 11 SOIL SURFACE EROSION CONTROL
32 01 19 FIELD MOLDED SEALANT FOR SEALING JOINTS IN RIGID PAVEMENTS
32 11 16 SUBBASES FOR FLEXIBLE PAVING AND BASE COURSE FOR RIGID.
32 11 23 GRADED-CRUSHED AGGREGATE BASE COURSE
32 12 10 BITUMINOUS TACK AND PRIME COATS
32 12 16 HOT-MIX ASPHALT (HMA) FOR AIRFIELDS AND ROADS
32 13 13.06 PORTLAND CEMENT FOR ROADS AND SITE FACILITIES
32 15 00 AGGREGATE SURFACE COURSE
32 16 13 CONCRETE SIDEWALKS AND CURBS AND GUTTERS
32 17 24.00 10 PAVEMENT MARKINGS
32 31 13.53 CHAIN LINK FENCES AND GATES
32 92 19 SEEDING
33 11 00 WATER DISTRIBUTION
33 40 01 STORM DRAINAGE
33 56 63 FUEL IMPERMEABLE LINER SYSTEM

NOTE:

THE ENGINEER OF RECORD IS REQUIRED TO PROVIDE COMPLETE DESIGN FOR ALL WORK. THESE STANDARDS ARE TO BE USED ONLY AS A GUIDE. OTHER UFGS SPECIFICATIONS MAY BE REQUIRED DEPENDING ON LOCAL REQUIREMENTS AND CONDITIONS.

DESIGNER NOTES:

1. THIS MILITARY SERVICE STATION STANDARD IS BASED ON TYPICAL 12,000 GALLON TANK SIZES FOR GASOLINE, E-85, DIESEL AND BIODIESEL FUELS. SUGGESTED SITE LAYOUTS ARE PROVIDED FOR ABOVEGROUND AND UNDERGROUND STORAGE TANKS. AN OPTIONAL HIGH-FLOW TRUCK FILLSTAND FACILITY IS ALSO INCLUDED. THE FINAL DESIGNER SHOULD FOLLOW THE SPECIFIC PROJECT PROGRAMMING / SCOPING DOCUMENTS TO INCLUDE THE REQUIRED FUEL PRODUCTS, TANK SIZING, TANK TYPE, AND ALL ASSOCIATED FEATURES, MODIFIED TO SUIT THE ACTUAL PROJECT SITE CONDITIONS. THE SITE LAYOUT SHOWN ON THIS PLAN IS PROVIDED TO SHOW THE TYPICAL COMPONENTS AND GENERAL LAYOUT FOR AN INSTALLATION. THE DESIGNER WILL DESIGN THE SERVICE STATION BASED ON LOCAL CONDITIONS AND SITE CONSTRAINTS.
2. STANDARD SYSTEM COMPONENTS AND FEATURES ARE INCLUDED HEREIN, SUITABLE FOR A TYPICAL "CONUS" PROJECT LOCATION. FINAL DESIGNER SHALL INVESTIGATE AND INCLUDE ALL REQUIRED PROJECT FEATURES TO MEET LOCAL / STATE / HOST NATION CODES AND REGULATIONS (INCLUDING ANY STAGE II VAPOR RECOVERY REQUIREMENTS).
3. TRUCK FILLSTAND FUNCTION MAY BE DELETED PER PROGRAMMING / SCOPING DOCUMENTS. IN THIS CASE DELETE THE APPROPRIATE ISSUE PUMP, PIPING, LOADING EQUIPMENT, TRUCK SPILL CONTAINMENT, EYEWASH STATION / PIPING, AND ALL ASSOCIATED COMPONENTS AND CONTROLS.
4. IF THE PROJECT PROGRAMMING DOCUMENTS REQUIRE SMALL, STAND-ALONE TYPE PACKAGED STORAGE TANK SYSTEMS, THESE SHALL INCLUDE A UL 2085 “PROTECTED” TYPE TANK AND TANK-MOUNTED DISPENSING UNIT, WITH TRUCK OFFLOADING AND FILLSTAND SERVICING AREAS SEPARATED FROM THE TANK BY AT LEAST 25 FEET (15 FEET FOR SYSTEMS STORING CLASS II OR CLASS III LIQUIDS), FOLLOWING NFPA 30A GUIDELINES. FOLLOW SIMILAR DESIGN CONCEPTS AS PRESENTED HEREIN FOR OTHER SITE LAYOUT FEATURES, SYSTEM COMPONENTS AND FUNCTIONAL REQUIREMENTS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MAS | DRAWN: MLV | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

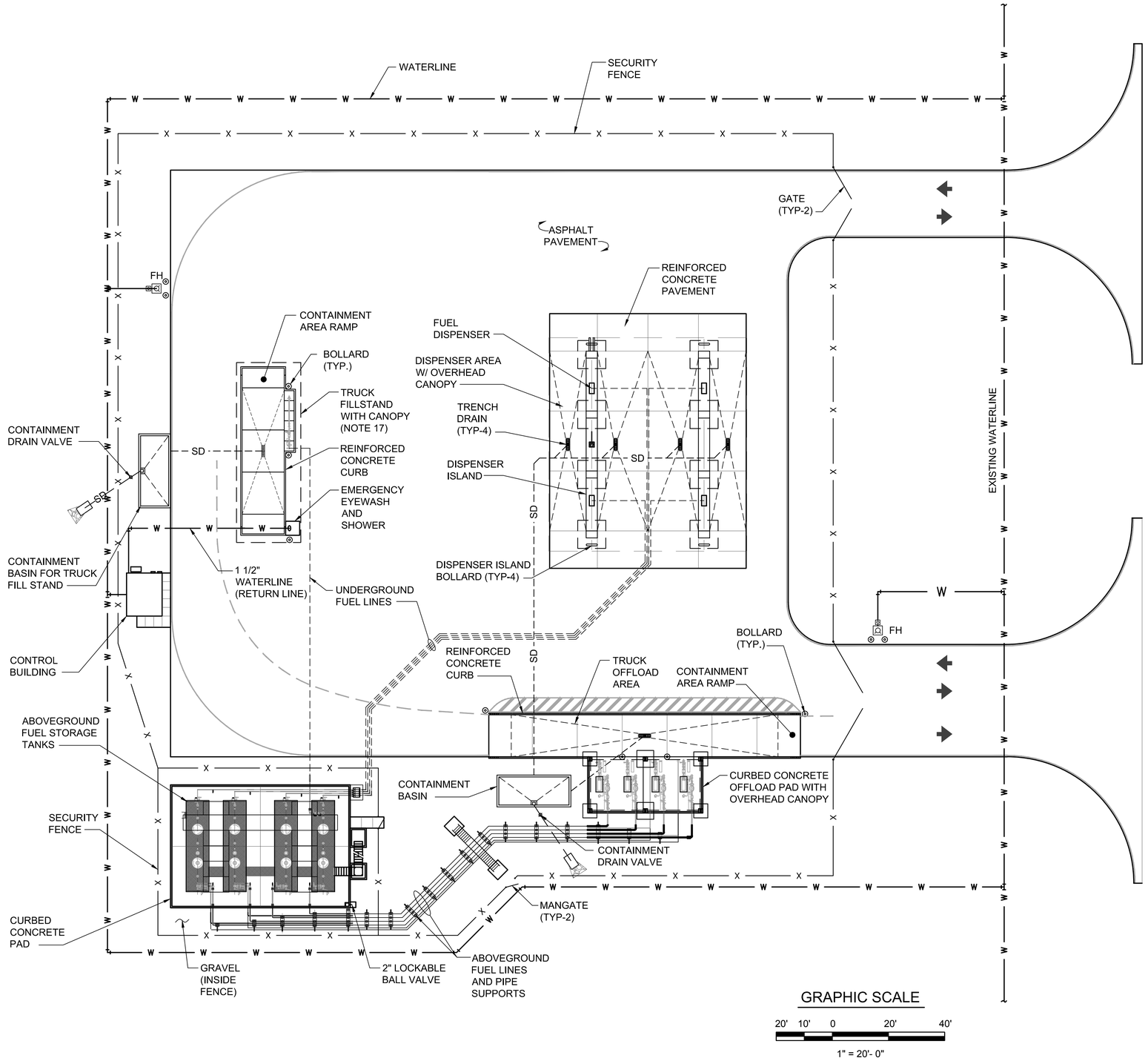
PROJECT NO. 14018-20

DRAWING TITLE: CIVIL ABBREVIATIONS, LEGEND AND NOTES

DRAWING NO. C-001

SHEET 3 OF 72

RAC # 1401800



GRAPHIC SCALE

20' 10' 0 20' 40'

1" = 20'- 0"

DESIGNER NOTES:

1. THE SITE LAYOUT SHOWN ON THIS PLAN IS PROVIDED TO SHOW THE TYPICAL COMPONENTS AND GENERAL LAYOUT FOR AN INSTALLATION. THE DESIGNER WILL DESIGN THE SERVICE STATION BASED ON LOCAL CONDITIONS AND SITE CONSTRAINTS.
2. DESIGN SHALL ADHERE TO ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
3. TANKS SHALL BE "PROTECTED" UL2085 UNLESS OTHERWISE DIRECTED BY SERVICE HEADQUARTERS. REFER TO DRAWING M-001, DESIGNER NOTES FOR TANK REQUIREMENTS. DESIGNER SHALL ADHERE TO REQUIREMENTS IN NFPA 30/30A, UFC 3-460-01 FOR SEPARATION/SPACING BETWEEN TANKS, OFFLOAD POSITIONS, FILL STANDS, DISPENSERS AND SITE FEATURES SUCH AS BUILDINGS, PROPERTY LINES, ROADS, POWER LINES THAT MAY AFFECT THE DESIGN OF THE FACILITY.
4. ARRANGE HORIZONTAL ABOVEGROUND TANKS IN PAIRS WITH A MINIMUM OF 5 FEET BETWEEN EACH TANK IN EACH PAIR AND 10 FEET BETWEEN ADJACENT TANKS OF TWO PAIRS IN THE SAME ROW. SEE UFC 3-460-01 FOR FURTHER DETAILS AND REQUIREMENTS.
5. ARRANGE HORIZONTAL ABOVEGROUND TANKS IN COMPLIANCE WITH NFPA 30/30A AS APPLICABLE. AST CAPACITY LIMITS AND SETBACKS FROM OFFLOADING AND FILLING VEHICLES SHALL CONFORM TO NFPA 30A.
6. THE DESIGNER SHALL INVESTIGATE THE MAXIMUM VOLUME OF THE FUEL TANKERS THAT WILL UTILIZE THE FACILITY FOR SECONDARY CONTAINMENT BASIN VOLUME DESIGN FOR FILLSTAND OPTION
7. DESIGNER SHALL COORDINATE WITH THE CONTRACTING OFFICER TO DEVELOP THE LEVEL OF SECURITY AND TYPE OF FENCING AND GATES REQUIRED FOR THE FACILITY. DEPENDING ON THE LOCATION OF THE FACILITY, THE GOVERNMENT MAY REQUIRE THE DESIGNER TO INCORPORATE THE ANTITERRORISM CONSTRUCTION STANDARDS.
8. THE CONTAINMENT BASIN FOR THE TRUCK OFFLOAD AND DISPENSER PAD AREAS SHALL BE DESIGNED FOR GENERAL SPILL CONTAINMENT AND/OR PRECIPITATION IN ACCORDANCE WITH 40 CFR 112, UFC 3-460-01, STATE AND LOCAL REGULATIONS.
9. A REMOTE CONTAINMENT BASIN FOR THE TRUCK FILL STAND SHALL BE DESIGNED TO CONTAIN THE MAXIMUM POTENTIAL FUEL SPILL AND/OR PRECIPITATION IN ACCORDANCE WITH UFC 3-460-01, STATE AND LOCAL REGULATIONS.
10. A SINGLE REMOTE CONTAINMENT BASIN MAY BE UTILIZED FOR PART OR ALL OF THE REQUIRED SPILL VOLUME FROM ONE OR MORE POSITIONS. DESIGNER SHALL ADHERE TO THE REQUIREMENTS OF UFC 3-460-01.
11. STORM DRAIN MATERIAL THAT HAS THE POTENTIAL OF BEING EXPOSED TO FUEL SHALL BE DUCTILE IRON PIPE (ASTM A746) WITH PETROLEUM-RESISTANT JOINT GASKETS.
12. THE TRUCK OFFLOAD PAD AND FILLSTAND PAD LAYOUT AND DESIGN WILL SUPPORT THE TYPE OF TRUCKS AVAILABLE TO THE SITE. THE PADS DESIGN SHALL BE SIZED TO FULLY ENCLOSE THE TRUCK ON A FLAT SURFACE AND ALLOW PROPER ALIGNMENT FROM THE TRUCK TO THE LOADING/UNLOADING EQUIPMENT.
13. THE EGRESS/ENTRANCE ROUTES FOR THE TRUCKS MUST BE LARGE ENOUGH TO ALLOW THE FLOW OF TRAFFIC IN A CONTINUOUS FORWARD MOVEMENT. ADDITIONAL PAVEMENT AREAS MAY BE REQUIRED DUE TO MISSION REQUIREMENTS. DURING THE DESIGN PROCESS, COORDINATE THE EXTENT OF THE PAVEMENT LIMITS WITH THE CONTRACTING OFFICER.
14. BASED ON LOCAL TOPOGRAPHIC CONDITIONS, THE DESIGNER SHALL GRADE THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE CONTAINMENT PADS FOR THE DISPENSER AREA, TRUCK OFFLOAD AND TRUCK FILL STAND AREAS. OUTFLOW FROM THE CANOPY DOWNSPOUTS SHALL OUTLET OUTSIDE THE CONTAINMENT PADS.
15. STORM WATER MANAGEMENT SHALL ADDRESS STORM WATER QUALITY AND QUANTITY IN ACCORDANCE WITH UFC 3-210-10, LOW IMPACT DEVELOPMENT, ALL FEDERAL, STATE AND LOCAL REGULATIONS.
16. THE DESIGNER SHALL PREPARE AN EROSION AND SEDIMENT CONTROL PLAN FOR THE SITE THAT ADHERES TO ALL FEDERAL, STATE AND LOCAL REGULATIONS.
17. THE INSTALLATION OF THE TRUCK FILL STAND IS OPTIONAL BASED ON THE NEEDS AND OPERATIONS OF THE FACILITY. THIS WOULD INCLUDE ALL APPURTENANCES THAT SERVICE THE TRUCK FILL STAND SUCH AS CONTAINMENT BASIN, FUEL PUMPS, CANOPY, FUEL LINES, EMERGENCY EYEWASH, ETC.

FIRE PROTECTION DESIGNER NOTES:

1. PER UFC 3-600-01 3-7.3.3, AND UFC 3-460-01 2-15.2.1, ALL PARTS OF THE STORAGE TANKS AND THE FUELING STATION CONTROL BUILDING MUST BE WITHIN 300 FEET , HOSE-LAY DISTANCE OF TWO FIRE HYDRANTS, WITH CONSIDERATION GIVEN TO ACCESSIBILITY AND OBSTRUCTIONS.
2. AVAILABLE WATER FLOW SHALL BE NOT LESS THAN THAT SPECIFIED IN UFC 3-460-01 3-2.2.3.
3. PER NFPA 291 4.1.3, A MINIMUM RESIDUAL PRESSURE OF 20 PSI SHOULD BE MAINTAINED AT HYDRANTS WHEN DELIVERING FIRE FLOW. USE DRY BARREL HYDRANTS IN AREAS SUBJECT TO FREEZING CONDITIONS.
4. VERIFY WATER FOR FIRE PROTECTION AROUND THE TANKS AND FUELING EQUIPMENT MEET THE REQUIREMENTS AS LISTED IN UFC 3-600-01.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

CHECKED: MHF | DRAWN: MLV | DESIGNED: MAS | PROJECT NO.: 14018-20

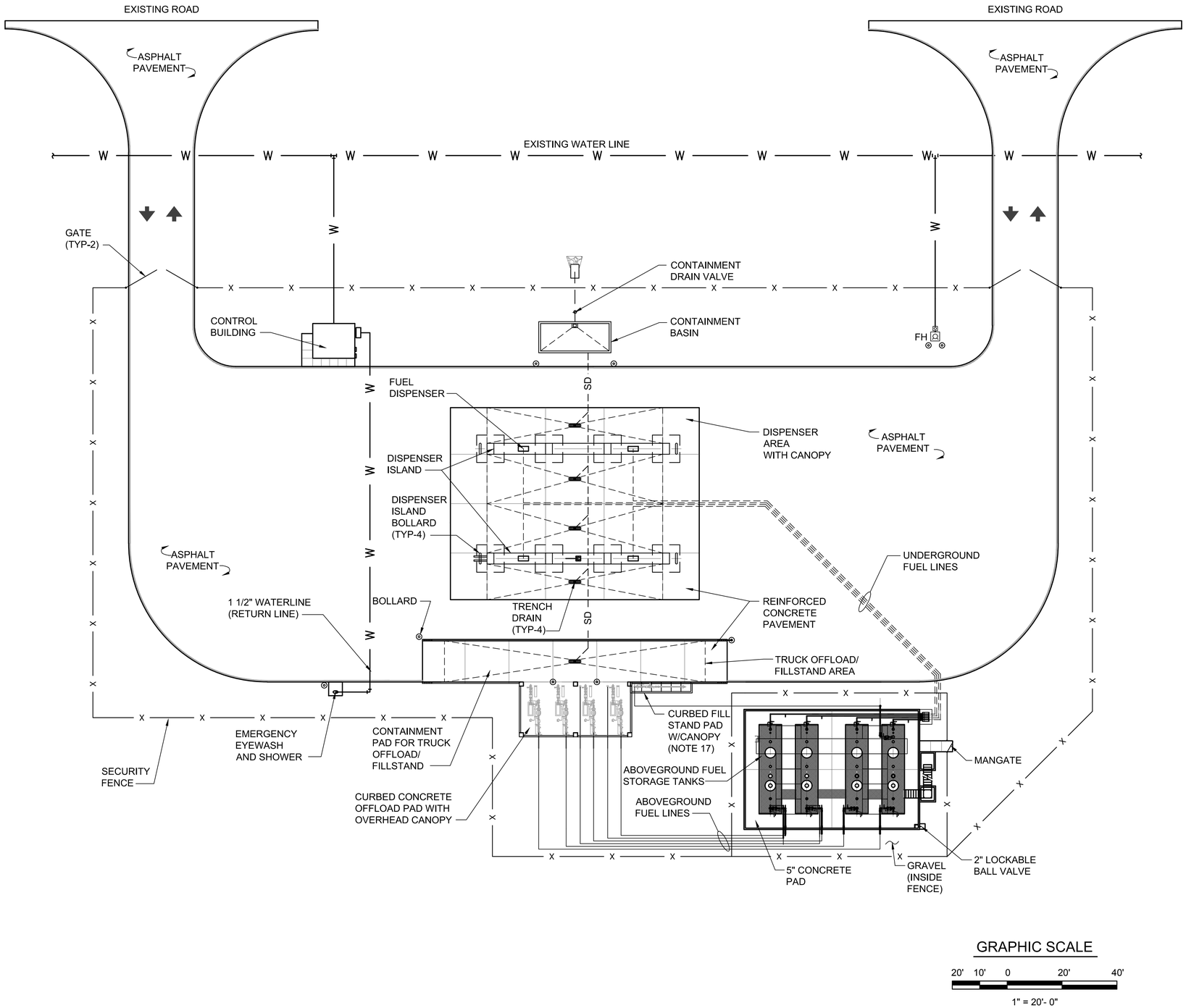
DRAWING TITLE: ABOVEGROUND FUEL STORAGE TANKS PLAN

DRAWING NO.: **C-401**

SHEET 4 OF 72

RAC # 1401800

M:\2014\1401800\civil\1401800C-401.dwg 10/1/2015 11:33:57 AM Ralph Aldridge



GRAPHIC SCALE

20' 10' 0 20' 40'

1" = 20'- 0"

DESIGNER NOTES:

1. THE SITE LAYOUT SHOWN ON THIS PLAN IS PROVIDED TO SHOW THE TYPICAL COMPONENTS AND GENERAL LAYOUT FOR AN INSTALLATION. THE DESIGNER WILL DESIGN THE SERVICE STATION BASED ON LOCAL CONDITIONS AND SITE CONSTRAINTS.
2. DESIGN SHALL ADHERE TO ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
3. TANKS SHALL BE "PROTECTED" UL2085 UNLESS OTHERWISE DIRECTED BY SERVICE HEADQUARTERS. REFER TO DRAWING M-001, DESIGNER NOTES FOR TANK REQUIREMENTS. DESIGNER SHALL ADHERE TO REQUIREMENTS IN NFPA 30/30A, UFC 3-460-01 FOR SEPARATION/SPACING BETWEEN TANKS, OFFLOAD POSITIONS, FILL STANDS, DISPENSERS AND SITE FEATURES SUCH AS BUILDINGS, PROPERTY LINES, ROADS, POWER LINES THAT MAY AFFECT THE DESIGN OF THE FACILITY.
4. ARRANGE HORIZONTAL ABOVEGROUND TANKS IN PAIRS WITH A MINIMUM OF 5 FEET BETWEEN EACH TANK IN EACH PAIR AND 10 FEET BETWEEN ADJACENT TANKS OF TWO PAIRS IN THE SAME ROW. SEE UFC 3-460-01 FOR FURTHER DETAILS AND REQUIREMENTS.
5. ARRANGE HORIZONTAL ABOVEGROUND TANKS IN COMPLIANCE WITH NFPA 30 AND NFPA 30A AS APPLICABLE. AST CAPACITY LIMITS AND SETBACKS FROM OFFLOADING AND FILLING VEHICLES SHALL CONFORM TO NFPA 30A.
6. THE DESIGNER SHALL INVESTIGATE THE MAXIMUM VOLUME OF THE FUEL TANKERS THAT WILL UTILIZE THE FACILITY FOR SECONDARY CONTAINMENT BASIN VOLUME DESIGN FOR FILLSTAND OPTION.
7. DESIGNER SHALL COORDINATE WITH THE CONTRACTING OFFICER TO DEVELOP THE LEVEL OF SECURITY AND TYPE OF FENCING AND GATES REQUIRED FOR THE FACILITY. DEPENDING ON THE LOCATION OF THE FACILITY, THE GOVERNMENT MAY REQUIRE THE DESIGNER TO INCORPORATE THE ANTITERRORISM CONSTRUCTION STANDARDS.
8. THE CONTAINMENT BASIN FOR THE TRUCK OFFLOAD AND DISPENSER PAD AREAS SHALL BE DESIGNED FOR GENERAL SPILL CONTAINMENT AND/OR PRECIPITATION IN ACCORDANCE WITH 40 CFR 112, UFC 3-460-01, STATE AND LOCAL REGULATIONS.
9. A REMOTE CONTAINMENT BASIN FOR THE TRUCK FILL STAND SHALL BE DESIGNED TO CONTAIN THE MAXIMUM POTENTIAL FUEL SPILL AND/OR PRECIPITATION IN ACCORDANCE WITH UFC 3-460-01, STATE AND LOCAL REGULATIONS.
10. A SINGLE REMOTE CONTAINMENT BASIN MAY BE UTILIZED FOR PART OR ALL OF THE REQUIRED SPILL VOLUME FROM ONE OR MORE POSITIONS. DESIGNER SHALL ADHERE TO THE REQUIREMENTS OF UFC 3-460-01.
11. STORM DRAIN MATERIAL THAT HAS THE POTENTIAL OF BEING EXPOSED TO FUEL SHALL BE DUCTILE IRON PIPE (ASTM A746) WITH PETROLEUM-RESISTANT JOINT GASKETS.
12. THE TRUCK OFFLOAD PAD AND FILLSTAND PAD LAYOUT AND DESIGN WILL SUPPORT THE TYPE OF TRUCKS AVAILABLE TO THE SITE. THE PADS DESIGN SHALL BE SIZED TO FULLY ENCLOSE THE TRUCK ON A FLAT SURFACE AND ALLOW PROPER ALIGNMENT FROM THE TRUCK TO THE LOADING/UNLOADING EQUIPMENT.
13. THE EGRESS/ENTRANCE ROUTES FOR THE TRUCKS MUST BE LARGE ENOUGH TO ALLOW THE FLOW OF TRAFFIC IN A CONTINUOUS FORWARD MOVEMENT. ADDITIONAL PAVEMENT AREAS MAY BE REQUIRED DUE TO MISSION REQUIREMENTS. DURING THE DESIGN PROCESS, COORDINATE THE EXTENT OF THE PAVEMENT LIMITS WITH THE CONTRACTING OFFICER.
14. BASED ON LOCAL TOPOGRAPHIC CONDITIONS, THE DESIGNER SHALL GRADE THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE CONTAINMENT PADS FOR THE DISPENSER AREA, TRUCK OFFLOAD AND TRUCK FILL STAND AREAS. OUTFLOW FROM THE CANOPY DOWNSPOUTS SHALL OUTLET OUTSIDE THE CONTAINMENT PADS.
15. STORM WATER MANAGEMENT SHALL ADDRESS STORM WATER QUALITY AND QUANTITY IN ACCORDANCE WITH UFC 3-210-10, LOW IMPACT DEVELOPMENT, ALL FEDERAL, STATE AND LOCAL REGULATIONS.
16. THE DESIGNER SHALL PREPARE AN EROSION AND SEDIMENT CONTROL PLAN FOR THE SITE THAT ADHERES TO ALL FEDERAL, STATE AND LOCAL REGULATIONS.
17. THE INSTALLATION OF THE TRUCK FILL STAND IS OPTIONAL BASED ON THE NEEDS AND OPERATIONS OF THE FACILITY. THIS WOULD INCLUDE ALL APPURTENANCES THAT SERVICE THE TRUCK FILL STAND SUCH AS CONTAINMENT BASIN, FUEL PUMPS, CANOPY, FUEL LINES, EMERGENCY EYEWASH, ETC.

FIRE PROTECTION DESIGNER NOTES:

1. PER UFC 3-600-01 3-7.3.3, AND UFC 3-460-01 2-15.2.1, ALL PARTS OF THE STORAGE TANKS AND THE FUELING STATION CONTROL BUILDING MUST BE WITHIN 300 FEET , HOSE-LAY DISTANCE OF TWO FIRE HYDRANTS, WITH CONSIDERATION GIVEN TO ACCESSIBILITY AND OBSTRUCTIONS.
2. AVAILABLE WATER FLOW SHALL BE NOT LESS THAN THAT SPECIFIED IN UFC 3-460-01 3-2.2.3.
3. PER NFPA 291 4.1.3, A MINIMUM RESIDUAL PRESSURE OF 20 PSI SHOULD BE MAINTAINED AT HYDRANTS WHEN DELIVERING FIRE FLOW. USE DRY BARREL HYDRANTS IN AREAS SUBJECT TO FREEZING CONDITIONS.
4. VERIFY WATER FOR FIRE PROTECTION AROUND THE TANKS AND FUELING EQUIPMENT MEET THE REQUIREMENTS AS LISTED IN UFC 3-600-01.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

PRELIMINARY NOT FOR CONSTRUCTION

SEAL

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MAS | DRAWN: MLV | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

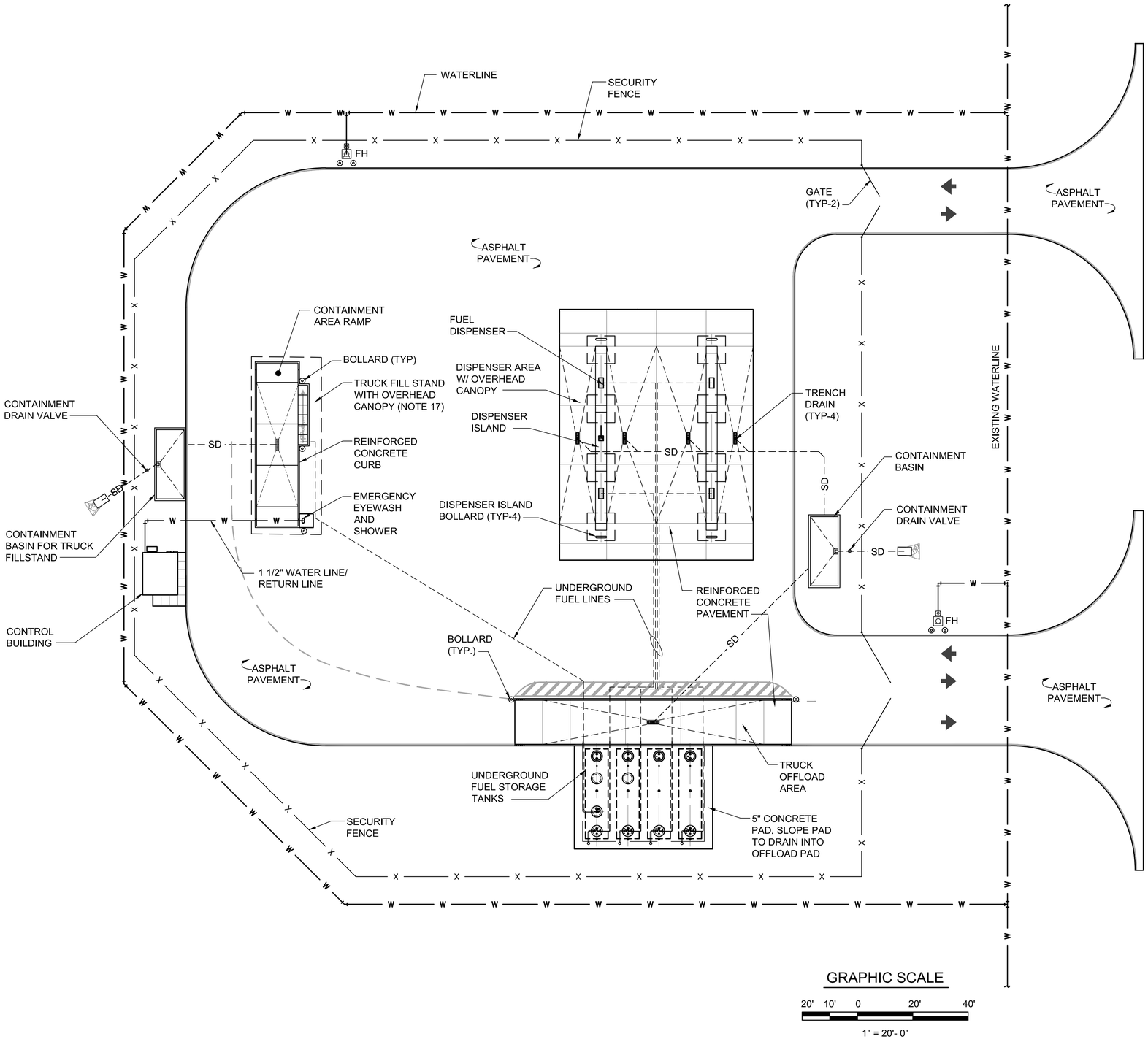
DRAWING TITLE: ABOVEGROUND STORAGE TANKS AND CO-LOCATED OFFLOAD/FILLSTAND PLAN

DRAWING NO.: **C-401A**

SHEET 5 OF 72

RAC # 1401800

M:\2014\1401800\civil\1401800C-401A.dwg 10/1/2015 11:34:23 AM Ralph Aldridge



DESIGNER NOTES:

1. THE SITE LAYOUT SHOWN ON THIS PLAN IS PROVIDED TO SHOW THE TYPICAL COMPONENTS AND GENERAL LAYOUT FOR AN INSTALLATION. THE DESIGNER WILL DESIGN THE SERVICE STATION BASED ON LOCAL CONDITIONS AND SITE CONSTRAINTS.
2. DESIGN SHALL ADHERE TO ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
3. TANKS SHALL BE DOUBLE WALL STEEL OR FRP UNLESS OTHERWISE DIRECTED BY SERVICE HEADQUARTERS. REFER TO DRAWING M-001, DESIGNER NOTES FOR TANK REQUIREMENTS. DESIGNER SHALL ADHERE TO REQUIREMENTS IN NFPA 30A, UFC 3-460-01 FOR SEPARATION/SPACING BETWEEN TANKS, OFFLOAD POSITIONS, FILL STANDS, DISPENSERS AND SITE FEATURES SUCH AS BUILDINGS, PROPERTY LINES, ROADS, POWER LINES THAT MAY AFFECT THE DESIGN OF THE FACILITY.
4. ARRANGE HORIZONTAL UNDERGROUND TANKS IN PAIRS WITH A MINIMUM OF 5 FEET BETWEEN EACH TANK IN EACH PAIR AND 10 FEET BETWEEN ADJACENT TANKS OF TWO PAIRS IN THE SAME ROW. SEE UFC 3-460-01 FOR FURTHER DETAILS AND REQUIREMENTS.
5. ARRANGE HORIZONTAL ABOVEGROUND TANKS IN COMPLIANCE WITH NFPA 30/30A AS APPLICABLE. AST CAPACITY LIMITS AND SETBACKS FROM OFFLOADING AND FILLING VEHICLES SHALL CONFORM TO NFPA 30A.
6. THE DESIGNER SHALL INVESTIGATE THE MAXIMUM VOLUME OF THE FUEL TANKERS THAT WILL UTILIZE THE FACILITY FOR SECONDARY CONTAINMENT BASIN VOLUME DESIGN FOR FILLSTAND OPTION.
7. DESIGNER SHALL COORDINATE WITH THE CONTRACTING OFFICER TO DEVELOP THE LEVEL OF SECURITY AND TYPE OF FENCING AND GATES REQUIRED FOR THE FACILITY. DEPENDING ON THE LOCATION OF THE FACILITY, THE GOVERNMENT MAY REQUIRE THE DESIGNER TO INCORPORATE THE ANTITERRORISM CONSTRUCTION STANDARDS.
8. THE CONTAINMENT BASIN FOR THE TRUCK OFFLOAD AND DISPENSER PAD AREAS SHALL BE DESIGNED FOR GENERAL SPILL CONTAINMENT AND/OR PRECIPITATION IN ACCORDANCE WITH 40 CFR 112, UFC 3-460-01, STATE AND LOCAL REGULATIONS.
9. A REMOTE CONTAINMENT BASIN FOR THE TRUCK FILL STAND SHALL BE DESIGNED TO CONTAIN THE MAXIMUM POTENTIAL FUEL SPILL AND/OR PRECIPITATION IN ACCORDANCE WITH UFC 3-460-01, STATE AND LOCAL REGULATIONS.
10. A SINGLE REMOTE CONTAINMENT BASIN MAY BE UTILIZED FOR PART OR ALL OF THE REQUIRED SPILL VOLUME FROM ONE OR MORE POSITIONS. DESIGNER SHALL ADHERE TO THE REQUIREMENTS OF UFC 3-460-01.
11. STORM DRAIN MATERIAL THAT HAS THE POTENTIAL OF BEING EXPOSED TO FUEL SHALL BE DUCTILE IRON PIPE (ASTM A746) WITH PETROLEUM-RESISTANT JOINT GASKETS.
12. THE TRUCK OFFLOAD PAD AND FILLSTAND PAD LAYOUT AND DESIGN WILL SUPPORT THE TYPE OF TRUCKS AVAILABLE TO THE SITE. THE PADS DESIGN SHALL BE SIZED TO FULLY ENCLOSE THE TRUCK ON A FLAT SURFACE AND ALLOW PROPER ALIGNMENT FROM THE TRUCK TO THE LOADING/UNLOADING EQUIPMENT.
13. THE EGRESS/ENTRANCE ROUTES FOR THE TRUCKS MUST BE LARGE ENOUGH TO ALLOW THE FLOW OF TRAFFIC IN A CONTINUOUS FORWARD MOVEMENT. ADDITIONAL PAVEMENT AREAS MAY BE REQUIRED DUE TO MISSION REQUIREMENTS. DURING THE DESIGN PROCESS, COORDINATE THE EXTENT OF THE PAVEMENT LIMITS WITH THE CONTRACTING OFFICER.
14. BASED ON LOCAL TOPOGRAPHIC CONDITIONS, THE DESIGNER SHALL GRADE THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE CONTAINMENT PADS FOR THE DISPENSER AREA, TRUCK OFFLOAD AND TRUCK FILL STAND AREAS. OUTFLOW FROM THE CANOPY DOWNSPOUTS SHALL OUTLET OUTSIDE THE CONTAINMENT PADS.
15. STORM WATER MANAGEMENT SHALL ADDRESS STORM WATER QUALITY AND QUANTITY IN ACCORDANCE WITH UFC 3-210-10, LOW IMPACT DEVELOPMENT, ALL FEDERAL, STATE AND LOCAL REGULATIONS.
16. THE DESIGNER SHALL PREPARE AN EROSION AND SEDIMENT CONTROL PLAN FOR THE SITE THAT ADHERES TO ALL FEDERAL, STATE AND LOCAL REGULATIONS.
17. THE INSTALLATION OF THE TRUCK FILL STAND IS OPTIONAL BASED ON THE NEEDS AND OPERATIONS OF THE FACILITY. THIS WOULD INCLUDE ALL APPURTENANCES THAT SERVICE THE TRUCK FILL STAND SUCH AS CONTAINMENT BASIN, FUEL PUMPS, CANOPY, FUEL LINES, EMERGENCY EYEWASH, ETC.

FIRE PROTECTION DESIGNER NOTES:

1. PER UFC 3-600-01 3-7.3.3, AND UFC 3-460-01 2-15.2.1, ALL PARTS OF THE STORAGE TANKS AND THE FUELING STATION CONTROL BUILDING MUST BE WITHIN 300 FEET , HOSE-LAY DISTANCE OF TWO FIRE HYDRANTS, WITH CONSIDERATION GIVEN TO ACCESSIBILITY AND OBSTRUCTIONS.
2. AVAILABLE WATER FLOW SHALL BE NOT LESS THAN THAT SPECIFIED IN UFC 3-460-01 3-2.2.3.
3. PER NFPA 291 4.1.3, A MINIMUM RESIDUAL PRESSURE OF 20 PSI SHOULD BE MAINTAINED AT HYDRANTS WHEN DELIVERING FIRE FLOW. USE DRY BARREL HYDRANTS IN AREAS SUBJECT TO FREEZING CONDITIONS.
4. VERIFY WATER FOR FIRE PROTECTION AROUND THE TANKS AND FUELING EQUIPMENT MEET THE REQUIREMENTS AS LISTED IN UFC 3-600-01.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

DESIGNED: MVB | DRAWN: MLV | CHECKED: MHF | PROJECT NO.: 14018-20

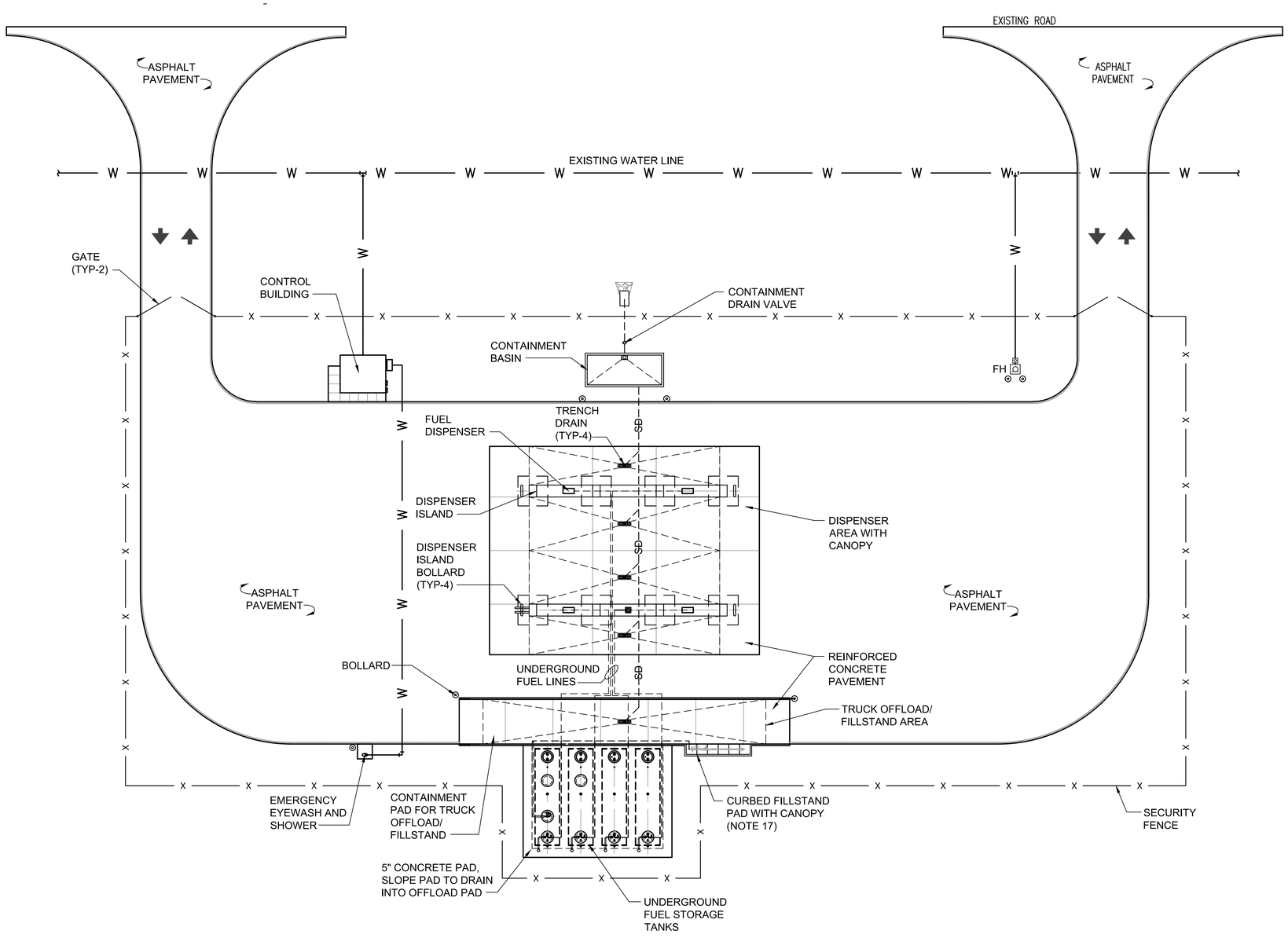
DRAWING TITLE: UNDERGROUND FUEL STORAGE TANKS PLAN

DRAWING NO.: C-402

SHEET 6 OF 72

RAC # 1401800

M:\2014\1401800\civil\1401800C-402.dwg 10/1/2015 11:34:47 AM Ralph Aldridge



GRAPHIC SCALE

20' 10' 0 20' 40'

1" = 20'- 0"

DESIGNER NOTES:

1. THE SITE LAYOUT SHOWN ON THIS PLAN IS PROVIDED TO SHOW THE TYPICAL COMPONENTS AND GENERAL LAYOUT FOR AN INSTALLATION. THE DESIGNER WILL DESIGN THE SERVICE STATION BASED ON LOCAL CONDITIONS AND SITE CONSTRAINTS.
2. DESIGN SHALL ADHERE TO ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
3. TANKS SHALL BE DOUBLE WALL STEEL OR FRP UNLESS OTHERWISE DIRECTED BY SERVICE HEADQUARTERS. REFER TO DRAWING M-001, DESIGNER NOTES FOR TANK REQUIREMENTS. DESIGNER SHALL ADHERE TO REQUIREMENTS IN NFPA 30A, UFC 3-460-01 FOR SEPARATION/SPACING BETWEEN TANKS, OFFLOAD POSITIONS, FILL STANDS, DISPENSERS AND SITE FEATURES SUCH AS BUILDINGS, PROPERTY LINES, ROADS, POWER LINES THAT MAY AFFECT THE DESIGN OF THE FACILITY.
4. ARRANGE HORIZONTAL UNDERGROUND TANKS IN PAIRS WITH A MINIMUM OF 5 FEET BETWEEN EACH TANK IN EACH PAIR AND 10 FEET BETWEEN ADJACENT TANKS OF TWO PAIRS IN THE SAME ROW. SEE UFC 3-460-01 FOR FURTHER DETAILS AND REQUIREMENTS.
5. ARRANGE HORIZONTAL ABOVEGROUND TANKS IN COMPLIANCE WITH NFPA 30/30A AS APPLICABLE. AST CAPACITY LIMITS AND SETBACKS FROM OFFLOADING AND FILLING VEHICLES SHALL CONFORM TO NFPA 30A.
6. THE DESIGNER SHALL INVESTIGATE THE MAXIMUM VOLUME OF THE FUEL TANKERS THAT WILL UTILIZE THE FACILITY FOR SECONDARY CONTAINMENT BASIN VOLUME DESIGN FOR FILLSTAND OPTION.
7. DESIGNER SHALL COORDINATE WITH THE CONTRACTING OFFICER TO DEVELOP THE LEVEL OF SECURITY AND TYPE OF FENCING AND GATES REQUIRED FOR THE FACILITY. DEPENDING ON THE LOCATION OF THE FACILITY, THE GOVERNMENT MAY REQUIRE THE DESIGNER TO INCORPORATE THE ANTITERRORISM CONSTRUCTION STANDARDS.
8. THE CONTAINMENT BASIN FOR THE TRUCK OFFLOAD AND DISPENSER PAD AREAS SHALL BE DESIGNED FOR GENERAL SPILL CONTAINMENT AND/OR PRECIPITATION IN ACCORDANCE WITH 40 CFR 112, UFC 3-460-01, STATE AND LOCAL REGULATIONS.
9. A REMOTE CONTAINMENT BASIN FOR THE TRUCK FILL STAND SHALL BE DESIGNED TO CONTAIN THE MAXIMUM POTENTIAL FUEL SPILL AND/OR PRECIPITATION IN ACCORDANCE WITH UFC 3-460-01, STATE AND LOCAL REGULATIONS.
10. A SINGLE REMOTE CONTAINMENT BASIN MAY BE UTILIZED FOR PART OR ALL OF THE REQUIRED SPILL VOLUME FROM ONE OR MORE POSITIONS. DESIGNER SHALL ADHERE TO THE REQUIREMENTS OF UFC 3-460-01.
11. STORM DRAIN MATERIAL THAT HAS THE POTENTIAL OF BEING EXPOSED TO FUEL SHALL BE DUCTILE IRON PIPE (ASTM A746) WITH PETROLEUM-RESISTANT JOINT GASKETS.
12. THE TRUCK OFFLOAD PAD AND FILLSTAND PAD LAYOUT AND DESIGN WILL SUPPORT THE TYPE OF TRUCKS AVAILABLE TO THE SITE. THE PADS DESIGN SHALL BE SIZED TO FULLY ENCLOSE THE TRUCK ON A FLAT SURFACE AND ALLOW PROPER ALIGNMENT FROM THE TRUCK TO THE LOADING/UNLOADING EQUIPMENT.
13. THE EGRESS/ENTRANCE ROUTES FOR THE TRUCKS MUST BE LARGE ENOUGH TO ALLOW THE FLOW OF TRAFFIC IN A CONTINUOUS FORWARD MOVEMENT. ADDITIONAL PAVEMENT AREAS MAY BE REQUIRED DUE TO MISSION REQUIREMENTS. DURING THE DESIGN PROCESS, COORDINATE THE EXTENT OF THE PAVEMENT LIMITS WITH THE CONTRACTING OFFICER.
14. BASED ON LOCAL TOPOGRAPHIC CONDITIONS, THE DESIGNER SHALL GRADE THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE CONTAINMENT PADS FOR THE DISPENSER AREA, TRUCK OFFLOAD AND TRUCK FILL STAND AREAS. OUTFLOW FROM THE CANOPY DOWNSPOUTS SHALL OUTLET OUTSIDE THE CONTAINMENT PADS.
15. STORM WATER MANAGEMENT SHALL ADDRESS STORM WATER QUALITY AND QUANTITY IN ACCORDANCE WITH UFC 3-210-10, LOW IMPACT DEVELOPMENT, ALL FEDERAL, STATE AND LOCAL REGULATIONS.
16. THE DESIGNER SHALL PREPARE AN EROSION AND SEDIMENT CONTROL PLAN FOR THE SITE THAT ADHERES TO ALL FEDERAL, STATE AND LOCAL REGULATIONS.
17. THE INSTALLATION OF THE TRUCK FILL STAND IS OPTIONAL BASED ON THE NEEDS AND OPERATIONS OF THE FACILITY. THIS WOULD INCLUDE ALL APPURTENANCES THAT SERVICE THE TRUCK FILL STAND SUCH AS CONTAINMENT BASIN, FUEL PUMPS, CANOPY, FUEL LINES, EMERGENCY EYEWASH, ETC.

FIRE PROTECTION DESIGNER NOTES:

1. PER UFC 3-600-01 3-7.3.3, AND UFC 3-460-01 2-15.2.1, ALL PARTS OF THE STORAGE TANKS AND THE FUELING STATION CONTROL BUILDING MUST BE WITHIN 300 FEET , HOSE-LAY DISTANCE OF TWO FIRE HYDRANTS, WITH CONSIDERATION GIVEN TO ACCESSIBILITY AND OBSTRUCTIONS.
2. AVAILABLE WATER FLOW SHALL BE NOT LESS THAN THAT SPECIFIED IN UFC 3-460-01 3-2.2.3.
3. PER NFPA 291 4.1.3, A MINIMUM RESIDUAL PRESSURE OF 20 PSI SHOULD BE MAINTAINED AT HYDRANTS WHEN DELIVERING FIRE FLOW. USE DRY BARREL HYDRANTS IN AREAS SUBJECT TO FREEZING CONDITIONS.
4. VERIFY WATER FOR FIRE PROTECTION AROUND THE TANKS AND FUELING EQUIPMENT MEET THE REQUIREMENTS AS LISTED IN UFC 3-600-01.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

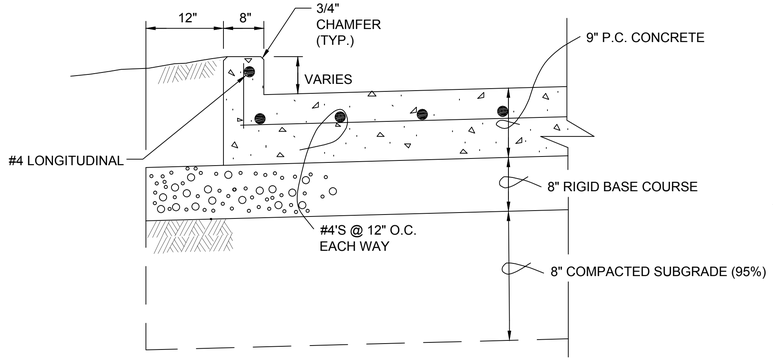
DESIGNED: MVB | DRAWN: MLV | CHECKED: MHF | PROJECT NO.: 14018-20 | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

DRAWING TITLE: UNDERGROUND STORAGE TANKS AND CO-LOCATED OFFLOAD/FILLSTAND PLAN

DRAWING NO.: **C-402A**

SHEET 7 OF 72

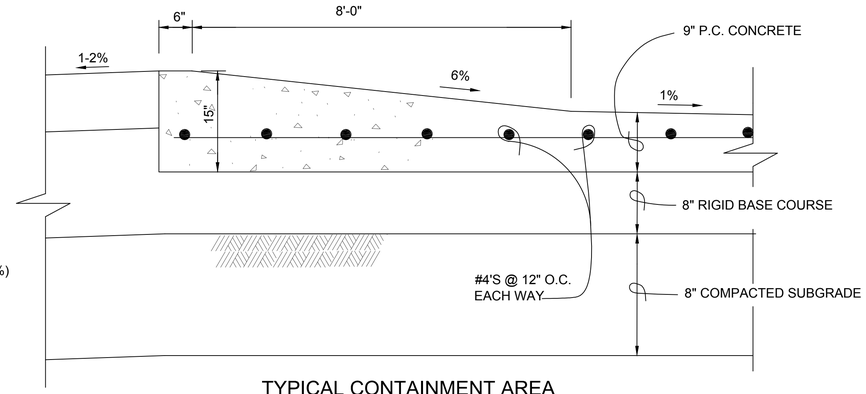
RAC # 1401800



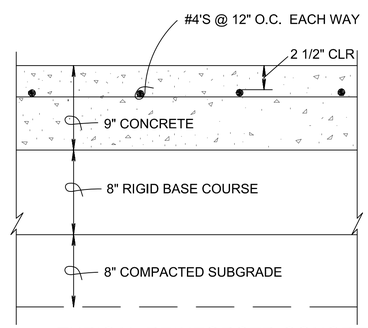
CONTAINMENT AREAS

NOTE:
1. PAINT ALL CURBS YELLOW (TYP.)

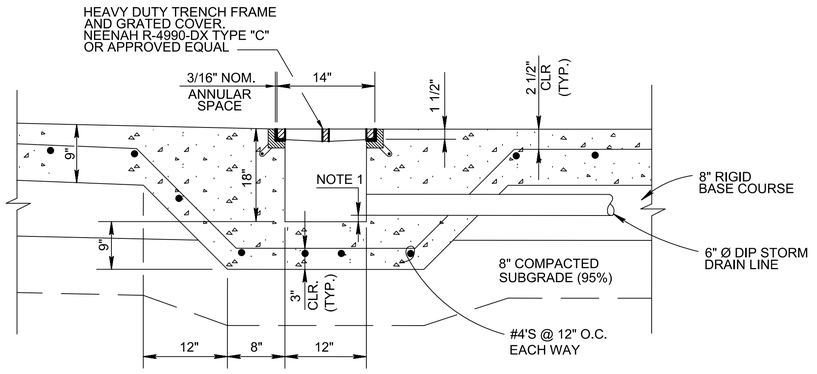
1 REINFORCED CONCRETE CURB SECTION
NTS



2 TYPICAL CONTAINMENT AREA RAMP SECTION
NTS

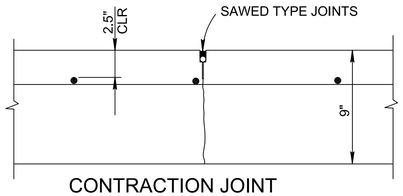


3 TYPICAL REINFORCED CONCRETE PAVEMENT SECTION
NTS

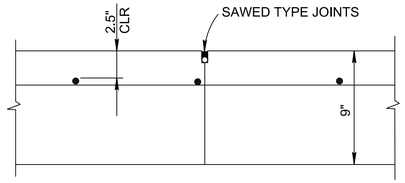


NOTE:
1. THE 6"Ø D.I.P. STORM DRAIN LINE SHALL BE CONSTRUCTED 1" ABOVE BOTTOM OF TRENCH DRAIN TO CATCH SEDIMENT AND TRASH.

4 TRENCH DRAIN DETAIL
NTS

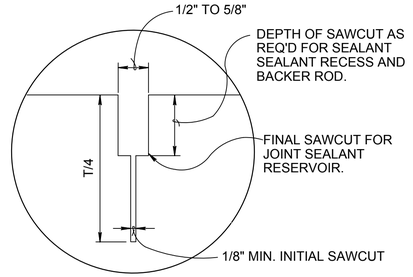


CONTRACTION JOINT



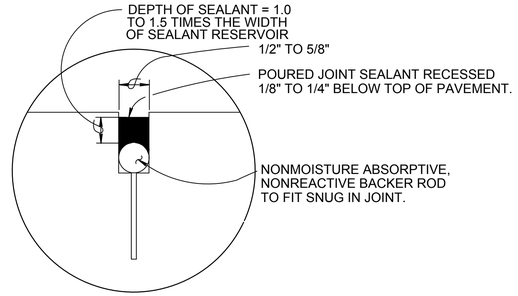
CONSTRUCTION JOINT

5 JOINT DETAILS
NTS



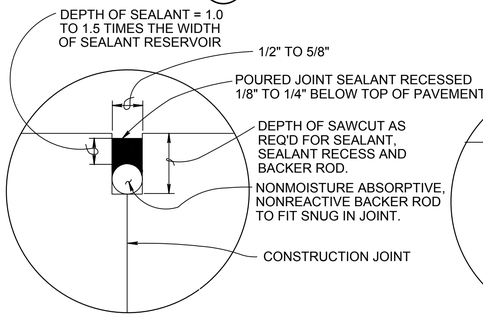
SAWCUT

T = PAVEMENT THICKNESS



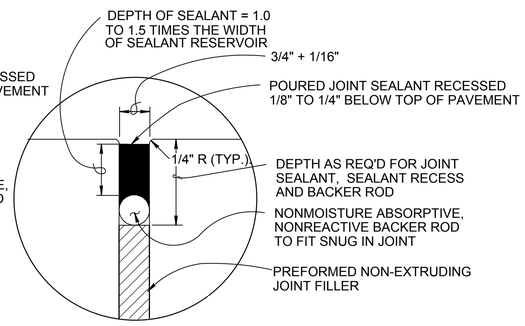
COMPLETED SAWCUT JOINT

6 CONTRACTION JOINT SEALANT DETAILS (SAWED TYPE)
NTS



COMPLETED CONSTRUCTION JOINT

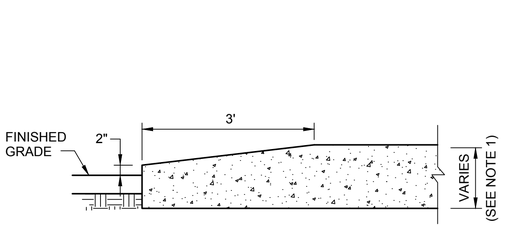
SEALANT DETAIL



COMPLETED EXPANSION JOINT

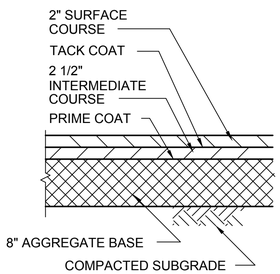
SEALANT DETAIL

7 POURED JOINT SEALANT DETAILS
NTS

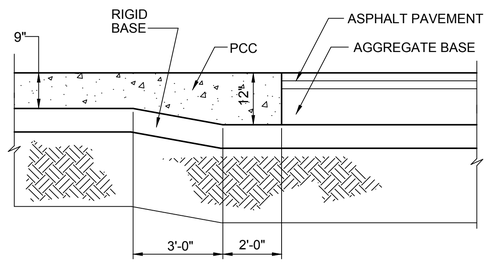


NOTE:
1. SEE GRADING PLANS TO DETERMINE CURB HEIGHT.

8 HEADER CURB TRANSITION DETAIL
NTS



9 TYPICAL ASPHALT PAVEMENT SECTION
NTS



10 RIGID TO FLEXIBLE PAVEMENT CONNECTION
NTS Ⓒ

DESIGNER NOTES:

1. PAVEMENT SECTIONS PROVIDED ARE MINIMUMS. DESIGNER SHALL PERFORM CALCULATIONS AND PROVIDE A PAVEMENT SECTION SUITED FOR EACH LOCATION.
2. 3/4" EXPANSION JOINTS SHALL BE INSTALLED AROUND ANY STRUCTURE THROUGH THE PAVEMENT.
3. ALL NEW PORTLAND CEMENT CONCRETE JOINTS SHALL BE SEALED IN ACCORDANCE WITH UFGS SECTION 32 01 19, FIELD MOLDED SEALANTS, FOR SEALING JOINTS IN RIGID PAVEMENTS USING ELASTOMERIC MATERIAL MEETING ASTM C 920, ELASTOMERIC JOINT SEALANTS. BASE MATERIAL SHALL BE POLYURETHANE OR POLYSULFIDE. JOINT SEALANT SHALL BE GRADE P (SELF LEVELING) OR NS (NON-SAG), AS REQUIRED; CLASS 25 OR BETTER; USE T (TRAFFIC) AND USE I (CONTINUOUS IMMERSION). SEALANT SHALL BE RECOMMENDED BY THE MANUFACTURER FOR EXPOSURE TO FUEL. PRIMER SHALL BE USED WHERE RECOMMENDED BY THE SEALANT MANUFACTURER FOR THE INTENDED APPLICATION.
4. DESIGNER MUST PROVIDE A JOINT LAYOUT PLAN FOR ALL CONCRETE PAVEMENTS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MAS | DRAWN: MLV | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

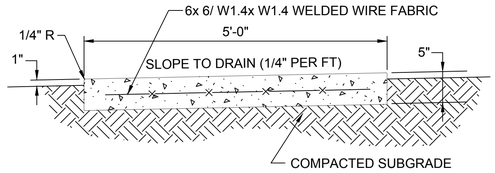
DRAWING TITLE: PAVEMENT DETAILS

DRAWING NO.: C-501

SHEET 8 OF 72

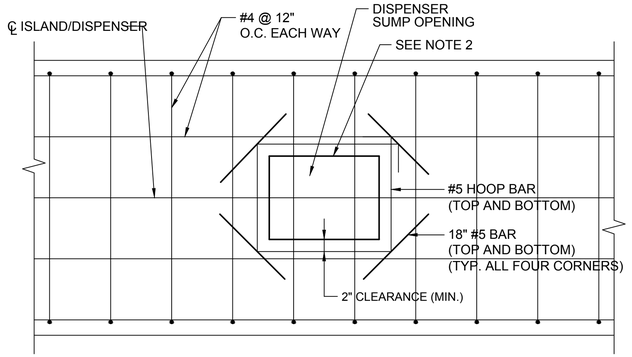
RAC # 1401800

M:\2014\1401800\civil\1401800C-501.dwg 10/1/2015 11:35:48 AM Ralph Aldridge



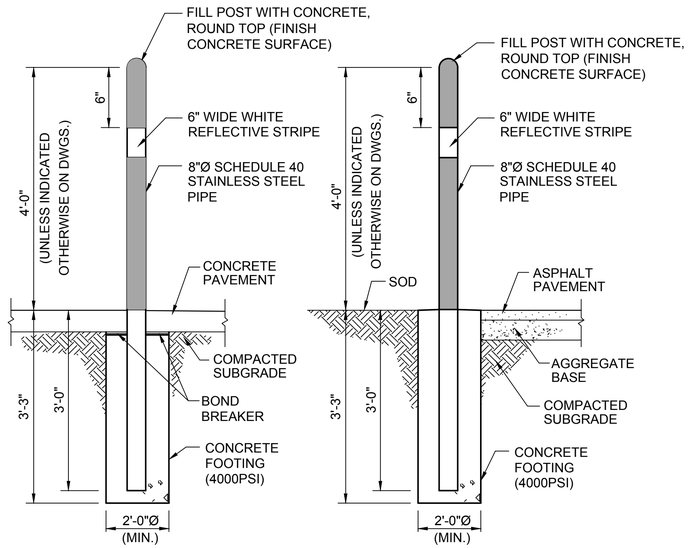
NOTES:
1. PROVIDE CONTROL JOINTS SPACED AT A MINIMUM OF 5 FEET.
2. PROVIDE EXPANSION JOINTS WHERE SIDEWALK MEETS PADS OR STRUCTURES.

1 SIDEWALK DETAIL
NTS



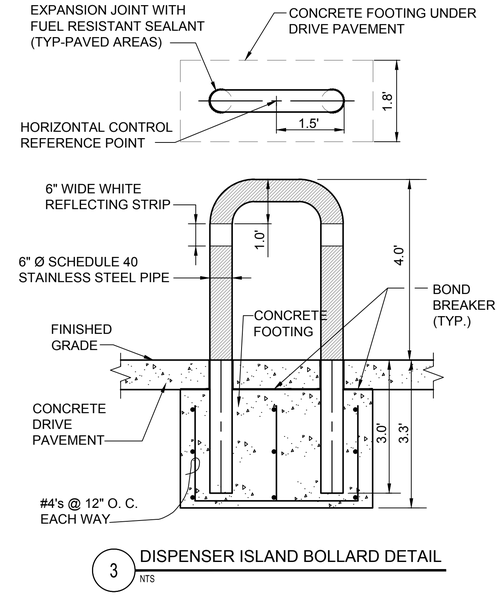
NOTES:
1. COORDINATE LOCATION AND SITE OF DISPENSER SUMP OPENINGS WITH DISPENSER MANUFACTURER PRIOR TO CONSTRUCTION OF ISLANDS.
2. PROVIDE FUEL RESISTANT SEALANT AROUND DISPENSER AFTER INSTALLATION.

4 CONCRETE ISLAND DISPENSER SUMP OPENING DETAIL
NTS

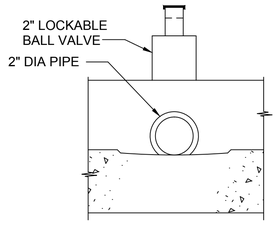


CONCRETE ASPHALT/SOD

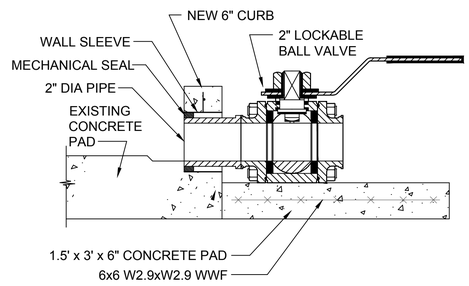
2 BOLLARD DETAIL
NTS



3 DISPENSER ISLAND BOLLARD DETAIL
NTS



ELEVATION

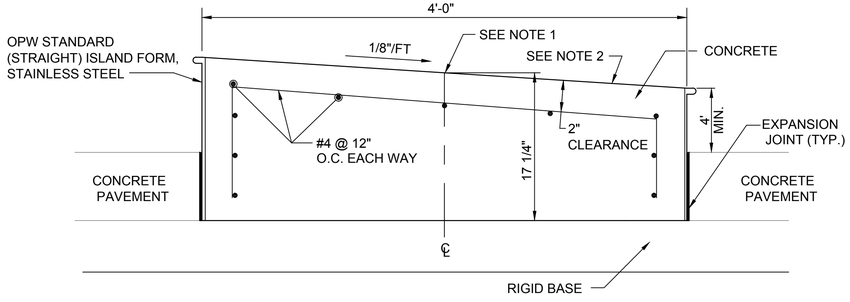


SECTION

NOTE:
1. THE 2" LOCKABLE BALL VALVE SHALL BE IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION SPEC C-500.

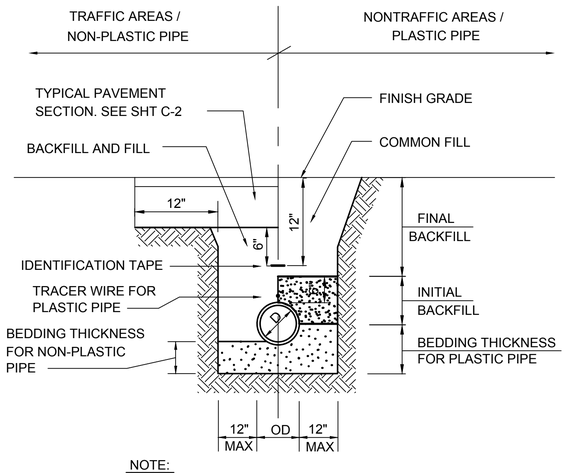
7 2" LOCKABLE BALL VALVE DETAIL
NTS

DESIGNER NOTE:
1. IF THE SITE TOPOGRAPHY AND LAYOUT ALLOWS, THE DESIGNER MAY USE AN AREA DRAIN AND PIPE TO THE SITE'S CONTAINMENT BASIN IN LIEU OF INSTALLING A 2" LOCKABLE BALL VALVE.



NOTES:
1. ANY PENETRATIONS THROUGH CONCRETE SHALL BE COMPLETELY ENCLOSED WITH SLEEVE AND FUEL RESISTANT SEALANT.
2. ELEVATION/HEIGHT OF ISLAND VARIES, SEE GRADING PLAN.

6 FUELING ISLAND SECTION
NTS



NOTE:
1. PROVIDE BEDDING IN ACCORDANCE WITH THE SPECIFICATIONS.

5 TRENCH CROSS SECTION PLASTIC/NON-PLASTIC PIPE
NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

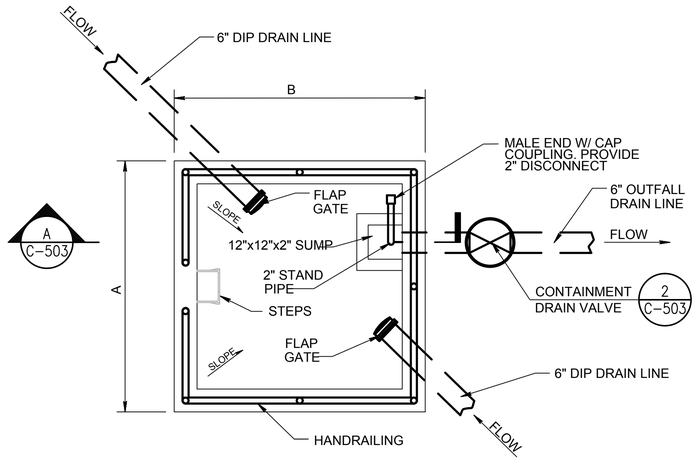
DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | CHECKED: MHF | DRAWN: MLV | PROJECT NO.: 14018-20 | DESIGNED: MAS

DRAWING TITLE: CIVIL SITE DETAILS

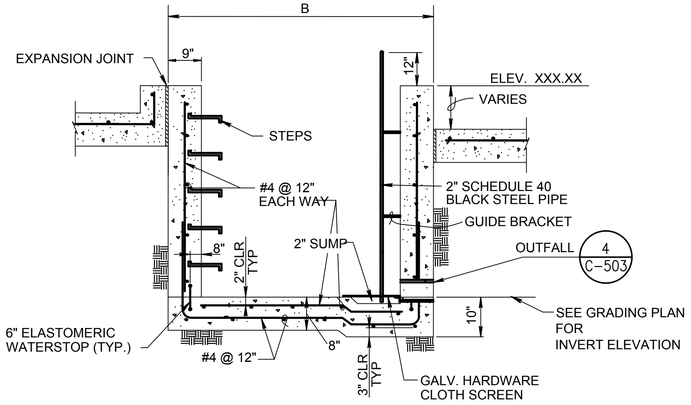
DRAWING NO.: C-502

SHEET 9 OF 72

RAC # 1401800

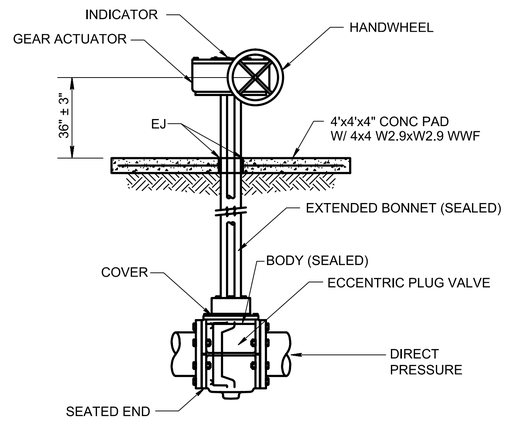


1 CONTAINMENT BASIN PLAN
NTS



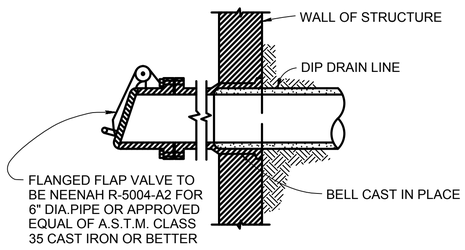
NOTE: HARDWARE CLOTH SCREEN SHALL BE SLOTTED FOR THE STAND PIPE TO ALLOW FOR EASY REMOVAL. A 1.5" x 1/4" GALV. STEEL ANGLE SHALL BE PROVIDED TO SUPPORT THE WIRE CLOTH AT THE VERTICAL WALL.

A SECTION
NTS

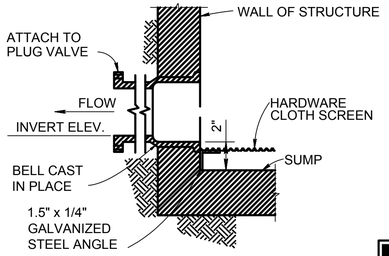


NOTE: 100% PORT ECCENTRIC PLUG VALVE SHALL CONFORM TO AWWA C517 AND BE RESISTANT TO HYDROCARBONS (NITRILE RUBBER SEALS). GEAR ACTUATOR BOX WITH HANDWHEEL SHALL BE LOCKABLE.

2 CONTAINMENT DRAIN VALVE DETAIL
NTS



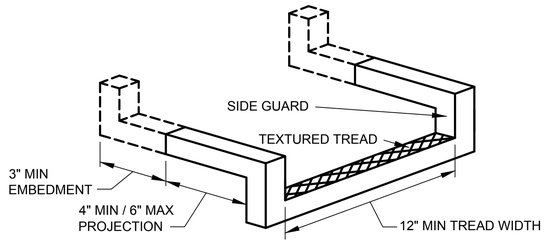
3 FLAP GATE DETAIL
NTS



4 OUTFALL DETAIL
NTS

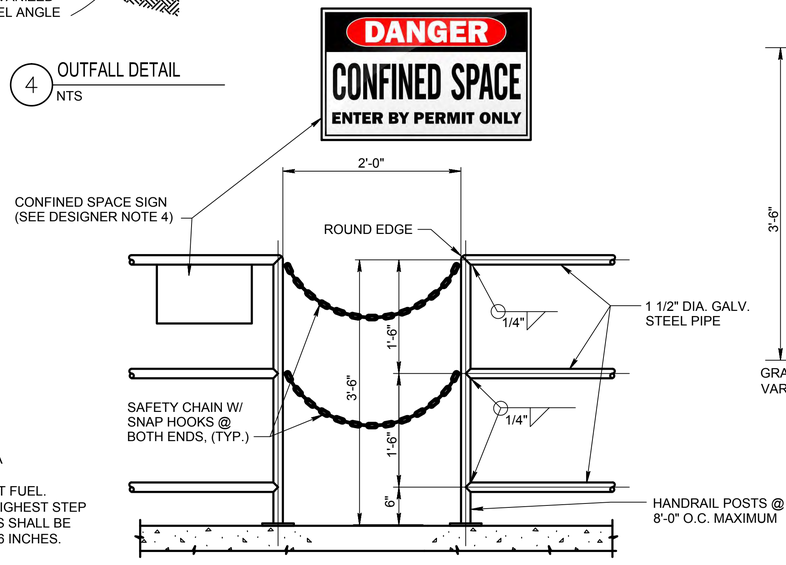
DESIGNER NOTES:

1. FLAP GATES SHALL BE PROVIDED (AS SHOWN) WHEN MULTIPLE CONTAINMENT AREAS DRAIN TO A SINGLE CONTAINMENT BASIN TO PREVENT THE POSSIBILITY OF A SPILL FROM ONE AREA BACKING-UP INTO ANOTHER AREA.
2. THE TOP OF CONTAINMENT BASIN ELEVATION MUST BE SET AT LEAST AS HIGH AS THE HIGHEST TOP OF CURB CONTAINMENT AREA ELEVATION.
3. CONTAINMENT BASINS EXCEEDING 5-FT IN DEPTH MUST BE DESIGNED BY A STRUCTURAL ENGINEER.
4. PROVIDE CONFINED SPACE SIGNAGE IN ACCORDANCE WITH OSHA 29 CFR 910.146 WHEN DEPTH OF CONTAINMENT BASIN IS GREATER THAN 6 FT.

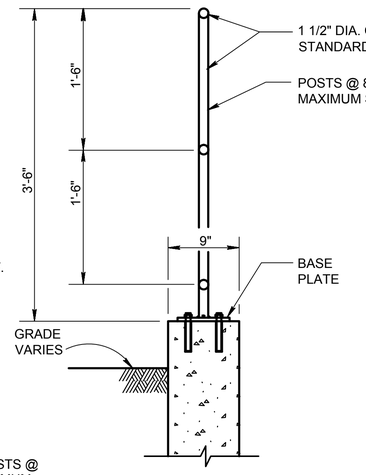


NOTES:
1. STEPS SHALL BE A STANDARD MANUFACTURER'S PRODUCT MEETING ASTM C 478 AND OSHA REQUIREMENTS FOR MANHOLE STEPS, AS WELL AS THE REQUIREMENTS INDICATED ABOVE.
2. POLYPROPYLENE COMPOSITE STEPS SHALL NOT BE USED DUE POSSIBLE EXPOSURE TO JET FUEL.
3. LOWEST STEP SHALL BE LOCATED NOT MORE THAN 12 INCHES ABOVE THE BASIN FLOOR. HIGHEST STEP SHALL BE LOCATED NOT MORE THAN 12 INCHES BELOW THE TOP OF THE BASIN WALL. STEPS SHALL BE ALIGNED VERTICALLY AND EVENLY SPACED AT A MINIMUM OF 12 INCHES AND MAXIMUM OF 16 INCHES.

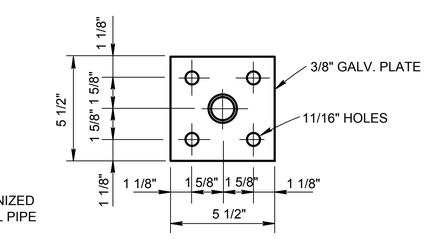
5 STEP DETAIL
NTS



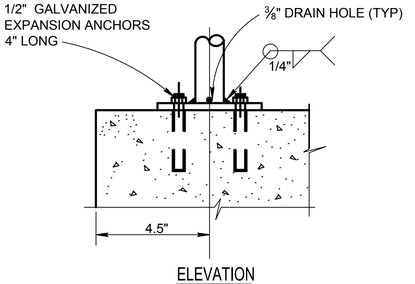
HANDRAIL ELEVATION @
OPENING FOR STEPS
6 NTS



HANDRAIL SECTION



PLAN



ELEVATION

BASE PLATE

NOTE:
1. PIPE HANDRAIL, POSTS AND BASE PLATE SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.

7 HANDRAIL DETAILS
NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

CHECKED: MHF | DRAWN: MLV | DESIGNED: MAS | PROJECT NO.: 14018-20

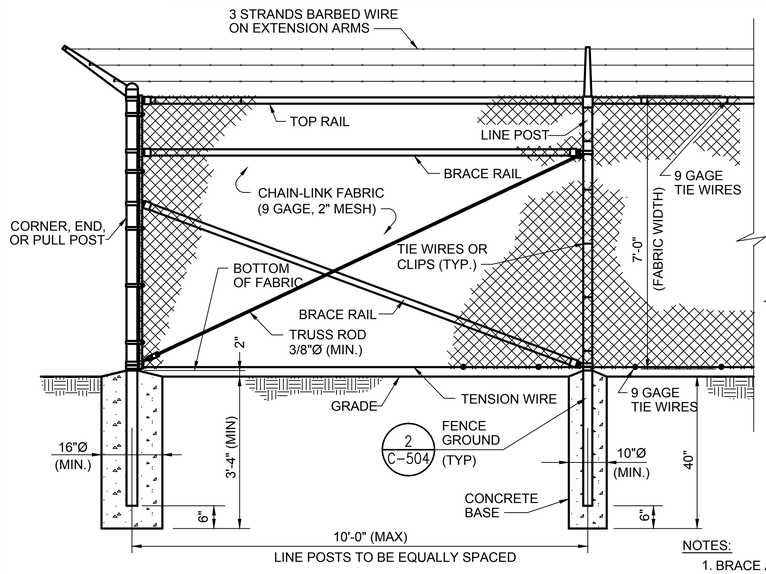
DRAWING TITLE: CONTAINMENT BASIN DETAILS

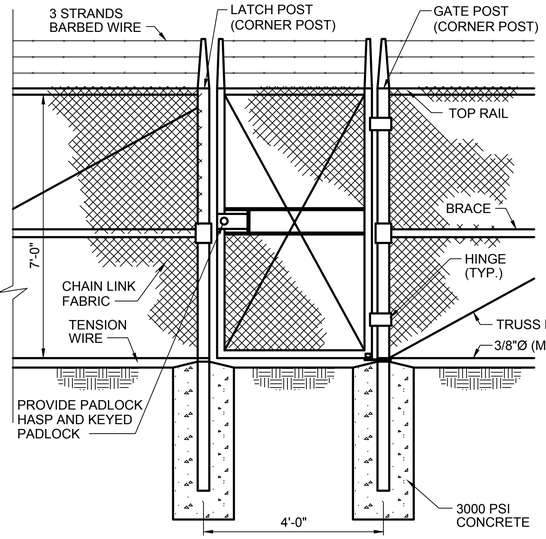
DRAWING NO.: C-503

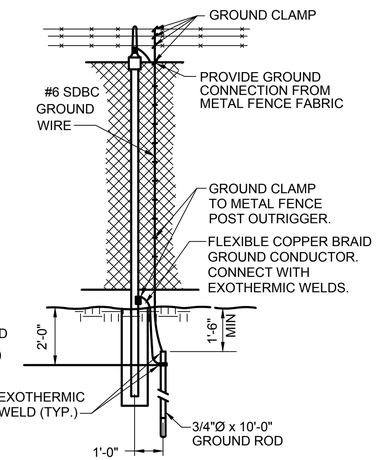
SHEET 10 OF 72

RAC # 1401800

M:\2014\1401800\civil\1401800C-503.dwg 10/1/2015 11:32:34 AM Ralph Aldridge

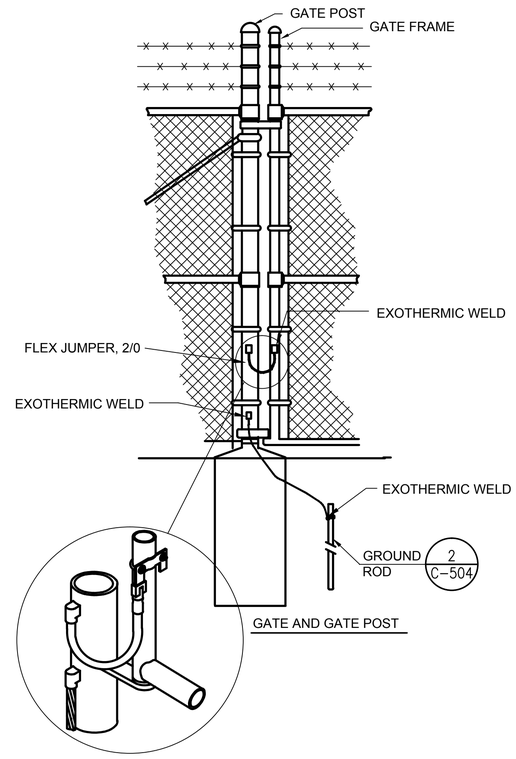






TYPICAL FENCE GROUNDING DETAIL

2 NTS



GATE AND GATE POST

3 GATE POST GROUNDING DETAIL

NTS

NOTES:

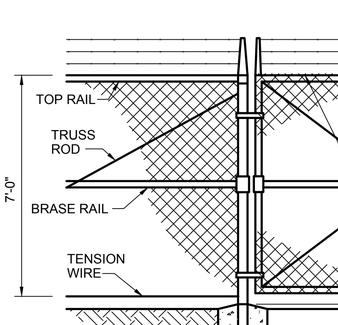
1. BRACE AND TRUSS RODS ON BOTH SIDES OF GATE.
2. CONTRACTORS TO PROVIDE FOUR SETS OF KEYS FOR PADLOCKS PER GATE.
3. ALL LOCKS FOR GATES SHALL BE KEYED THE SAME.

CHAIN LINK SECURITY FENCE AND MANGATE DETAIL

1 NTS

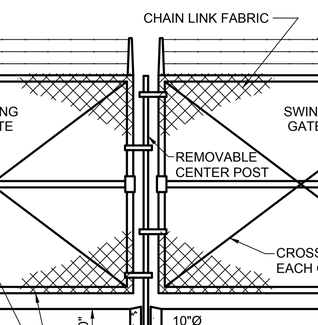
STEEL POST SCHEDULE

USE AND SECTION	MINIMUM OUTSIDE DIMENSIONS (NOMINAL)		
	FABRIC WIDTH 72" OR LESS	FABRIC WIDTH 84" TO 96"	FABRIC WIDTH 108" AND OVER
CORNER, END & PULL POSTS			
TUBULAR - ROUND	2.375" O.D.	2.875" O.D.	4.00" O.D.
TUBULAR - SQUARE	2.00" SQ.	2.50" SQ.	3.00" SQ.
C-SECTION (ROLL-FORMED)	3.50" X 3.50"	3.50" X 3.50"	
LINE POSTS			
TUBULAR - ROUND	1.90" O.D.	2.375" O.D.	2.875" O.D.
H-SECTION	2.25" X 1.70"	2.25" X 1.70"	2.25" X 1.70"
C-SECTION (ROLL-FORMED)	1.875" X 1.625"	2.25" X 1.70"	
TOP, BOTTOM & BRACE RAILS			
TUBULAR - ROUND		1.66" O.D.	
TUBULAR - SQUARE		1.50" SQ.	
H-SECTION		1.625" X 1.50"	
C-SECTION (ROLL-FORMED)		1.625" X 1.25"	



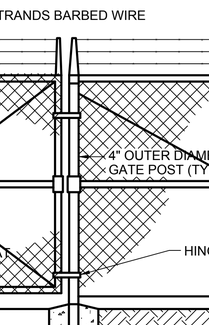
TRUSS ROD AND BAND DETAIL

4 NTS



BRACE RAIL CLAMP DETAIL

5 NTS



STANDARD HINGE DETAIL

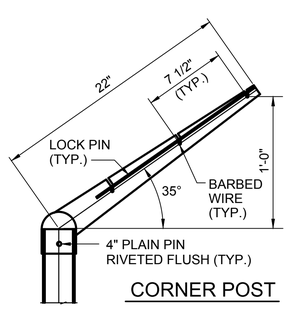
6 NTS

NOTE:

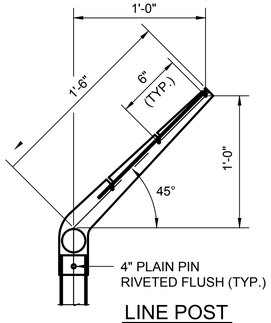
1. BRACE AND TRUSS ROD ON BOTH SIDES OF GATES, CORNER POSTS AND END POSTS. TIE WIRES FOR TYING FABRIC TO TENSION WIRE SHALL BE 9 GA., 1'-0" O.C.

DOUBLE SWING GATE DETAIL

7 NTS



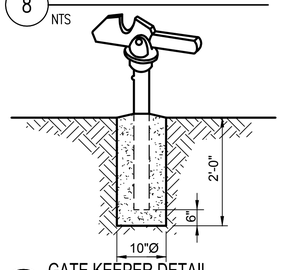
CORNER POST



LINE POST

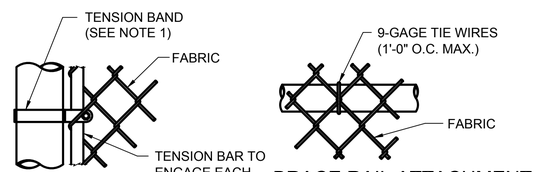
EXTENSION ARM DETAILS

8 NTS



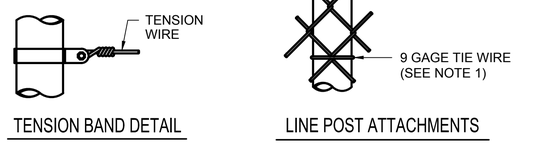
GATE KEEPER DETAIL

9 NTS (TO HOLD GATE OPEN)



BRACE RAIL ATTACHMENT

END OR GATE POST DETAIL



TENSION BAND DETAIL

LINE POST ATTACHMENTS

NOTES:

1. 15" MAX. AND WITHIN 4" FROM BOTTOM OF FABRIC.
2. FITTINGS SHOWN ARE SUGGESTED ONLY. SIMILAR DESIGNS MEETING THE APPROVAL OF THE CONTRACTING OFFICER'S DESIGNATED REPRESENTATIVE MAY BE USED.

FASTENING DETAILS

10 NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL

PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MAS | DRAWN: MLV | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

DRAWING TITLE: FENCE DETAILS

DRAWING NO.: **C-504**

SHEET 11 OF 72

RAC # 1401800

M:\2014\1401800\civil\1401800C-504.dwg 10/1/2015 11:31:27 AM Ralph Aldridge

GENERAL NOTES:

1. REFERENCE ELEVATION 0'-0" FOR CIVIL FLOOR/TOP OF SLAB ELEVATION:
   ELEVATION SHALL BE AS DESIGNED BY CONTRACTOR FOR THE ACTUAL SITE LOCATION. SEE CIVIL DRAWINGS FOR ANTICIPATED CIVIL LAYOUT.

2. COORDINATION:
   A. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND THE CONTRACTING OFFICER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCY.

   B. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE BRACING AND SHORING AT ALL TIMES DURING CONSTRUCTION.

   C. THE STRUCTURAL DRAWINGS SHALL BE COORDINATED WITH ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL OPENINGS, SLEEVES, ETC. NOT SHOWN ON STRUCTURAL DRAWINGS. COORDINATE LOCATION, SIZE, AND REINFORCING OF ALL OPENINGS WITH RESPECTIVE TRADES BEFORE FABRICATION.

3. VERIFY SITE SPECIFIC ELEVATIONS AND DIMENSIONS AT SITE BEFORE COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

4. FOR ADDITIONAL TANK NOTES AND INFORMATION SEE T-SERIES DRAWINGS.

5. ALL STRUCTURAL MATERIALS SHALL BE PROTECTED AGAINST CORROSION.

SOILS & FOUNDATION NOTES:

1. THE DESIGN FOUNDATION DEPTH (BELOW FINISHED GRADE) SHALL BE AS STATED ON DRAWINGS OR BELOW THE LOCATION'S FROST DEPTH (WHICHEVER IS GREATER).

MATERIAL NOTES: (STEEL)

STRUCTURAL STEEL: SHALL CONFORM TO AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS.

1. STRUCTURAL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992, Fy= 50 KSI

2. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B, Fy = 42 FSI

3. OTHER ROLLED PLATES AND SHAPES SHALL CONFORM TO ASTM A36, Fy= 36 KSI

4. HIGH STRENGTH BOLTS SHALL BE ASTM A325-N (U.N.O.), 3/4" DIA. U.N.O.

5. ANCHOR BOLTS AND OTHER UNFINISHED BOLTS SHALL CONFORM TO ASTM F1554 GRADE 36 OR ASTM A-307.

6. WELDING ELECTRODES SHALL CONFORM TO E70XX.

7. WELDING SHALL CONFORM TO AWS D1.1

8. WELDING WILL BE DONE AT WORKSHOP. THERE ARE TO BE NO FIELD WELDING OF STRUCTURAL STEEL MEMBERS.

9. UNLESS NOTED OTHERWISE (U.N.O.) MINIMUM BOLT SPACING SHALL BE 3". THE MINIMUM EDGE DISTANCE SHALL BE 1.5".

10. ALL CONNECTIONS NOT DETAILED OR OTHERWISE NOTED SHALL BE STANDARD AISC WELDED OR AISC BOLTED CONNECTIONS. CONNECTIONS FOR BEAMS SHALL BE DESIGNED (UNLESS DESIGN LOADS OR DETAILS ARE SHOWN IN THE PLANS) FOR ONE-HALF THE TOTAL ALLOWABLE UNIFORM LOAD CAPACITY FOR A GIVEN MEMBER. WHERE REACTIONS ARE SUBJECT TO ECCENTRICITY, SUCH ECCENTRICITY SHALL BE TAKEN INTO ACCOUNT WHEN DETAILING THE CONNECTION.

11. BOLTED CONNECTIONS SHALL BE MADE USING ASTM A325 HIGH-STRENGTH BOLTS AS SHOWN ON THE DRAWINGS OR AS SPECIFIED. ALL BOLTS SHALL BE 3/4" DIA UNLESS OTHERWISE SPECIFIED. PROVIDE A MINIMUM OF TWO BOLTS PER CONNECTION. WASHERS SHALL BE INSTALLED UNDER NUTS OF FASTENERS.

12. A325 BOLT CONNECTIONS SHALL BE BEARING TYPE UNLESS OTHERWISE SPECIFICALLY NOTED OR PERMITTED. TIGHTEN BOLTS TO "SNUG TIGHT" CONDITION.

13. UNLESS NOTED OTHERWISE, DOUBLE ANGLE MEMBERS SHALL BE PROVIDED WITH INTERMEDIATE CONNECTORS TO PREVENT LOCAL BUCKLING PER AISC CRITERIA. MINIMUM THICKNESS OF CLIP ANGLES OR CONNECTOR PLATES SHALL BE 1/4".

14. BOLTS GRAPHICALLY SHOWN IN DETAILS ARE NOT INTENDED TO QUANTIFY THE SPECIFIC BOLT DESIGN UNLESS THE TYPE AND NUMBER OF BOLTS ARE SPECIFICALLY INDICATED. USE GRAPHICAL REPRESENTATION FOR DESIGN CONCEPT ONLY.

15. GALVANIZED NUTS AND WASHERS SHALL BE USED WITH GALVANIZED BOLTS AND ANCHORS.

16. SEE ARCHITECTURAL DRAWINGS FOR GUIDELINES ON COATINGS AND ANY OTHER APPLICABLE ARCHITECTURAL FEATURES.

MATERIAL NOTES: (CONCRETE)

CONCRETE AND REINFORCEMENT: SHALL CONFORM TO ACI 318

1. SPECIFIED COMPRESSIVE STRENGTH, f'c = 4,500 PSI AT 28 DAYS TYP. W/C RATIO 0.45.

2. REINFORCING STEEL: SPECIFIED YIELD STRENGTH, Fy = 60 KSI (ASTM A615).

3. LAP SPLICES AND CONCRETE COVER OF REINFORCEMENT SHALL CONFORM TO ACI 318 USING CLASS B TENSION SPLICES UNLESS OTHERWISE NOTED. (SEE TABLE, THIS SHEET).

4. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-497.

5. ALL ISOLATION JOINTS SHALL BE SEALED WITH SINGLE COMPONENT SILICON JOINT SEALANT.

MATERIAL NOTES: (CONCRETE)

6. SEE DETAIL 2/S-501 FOR TYPICAL REINFORCING AT OPENINGS.

7. FOR OPENINGS WITH SIDES AND DIAMETERS LESS THAN 10", SPREAD THE SLAB REINFORCING TO CLEAR THE OPENING.

8. CLEAR COVER FOR CAST-IN-PLACE CONCRETE REINFORCEMENT U.N.O. SHALL BE AS FOLLOWS:
   A) CONCRETE CAST AGAINST & PERMANENTLY EXPOSED TO EARTH = 3.00"
   B) FORMED SURFACES OF CONCRETE EXPOSED TO EARTH OR WEATHER:
      ≤ #5 BAR = 1.50"
      ≥ #6 BAR = 2.00"
   C) CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
      SLABS, WALLS, JOISTS:
      #11 BAR AND SMALLER = 0.75"
      BEAMS, COLUMNS:
      PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS = 1.50"

LAP SPLICE LENGTH		
BAR SIZE NO.	TOP BAR	OTHER
#3	24"	18"
#4	32"	25"
#5	40"	31"
#6	48"	37"
#7	70"	54"
#8	80"	62"

TABLE NOTES:
1. LAP SPLICE LENGTH FOR REINFORCED CONCRETE.
2. MINIMUM UNLESS NOTED OTHERWISE.
3. NOT ALL BAR SIZES ARE INCLUDED IN PROJECT.
4. TOP BARS ARE HORIZONTAL BARS PLACED SO THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE SPLICE

STRUCTURAL ABBREVIATIONS

#	NUMBER
&	AND
@	AT
AB	ANCHOR BOLT
ADDL, ADD'L	ADDITIONAL
AL	ALUMINUM
ALT	ALTERNATE (ING)
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
BLK	BLOCKING
BO, B.O.	BOTTOM OF
BOT, BOTT	BOTTOM
BOW	BOTTOM OF WALL
CCJ	CONSTRUCTION JOINT
CJ	CONTROL JOINT
CL	CENTERLINE/CLEAR
CLR	CLEAR
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
CTR	CENTERED
DBL	DOUBLE
DEG	DEGREES
DET	DETAIL
DIA	DIAMETER
DWG	DRAWING
DWL	DOWEL
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL, ELE, ELEV	ELEVATION
EMBED	EMBEDMENT
EQ	EQUAL (LY)
EQPT	EQUIPMENT
ES	EACH SIDE
EW	EACH WAY
EXST	EXISTING
EXT	EXTERIOR
f'c	CONCRETE COMPRESSION STRESS
f'm	MASONRY PRISM STRESS
FDN	FOUNDATION
FL, FLR	FLOOR
FTG	FOOTING
GALV	GALVANIZED
HORIZ	HORIZONTAL
IJ	ISOLATION JOINT
INT	INTERIOR
JT	JOINT
LLV	LONG LEG VERTICAL
LONG.	LONGITUDINAL
MANUF	MANUFACTURER
MAX	MAXIMUM
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MIN	MINIMUM
NFS	NON–FROST SUSCEPTIBLE SOIL (SUCH AS GRAVEL, CRUSHED STONE, OR ROCK WITH A VOID RATIO OF 0.25 OR GREATER MINIMAL AMOUNT OF FINES IN THE GRADATION [0 TO 3% PASSING THE 0.02MM SIEVE] AND CLASSIFIED AS SOIL TYPES GW OR GP.
NTS	NOT TO SCALE
OC	ON CENTER
OH	OPPOSITE HAND (MIRRORED)
OPNG	OPENING
RAD	RADIUS
REINF	REINFORCING
REQD, REQ'D	REQUIRED
SEC	SECTION
SHT	SHEET
SIM	SIMILAR
SLV	SHORT LEG VERTICAL
STD	STANDARD
T&B	TOP AND BOTTOM
TO, T.O.	TOP OF
TOW	TOP OF WALL
TRNSV	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/	WITH
W/O	WITHOUT
WCJ	WALL PARTIAL CONTRACTION JOINT
WS	WATERSTOP
WWF	WELDED WIRE FABRIC

NOTES TO DESIGNERS

1. THESE STANDARD DRAWINGS ARE USED TO ILLUSTRATE THE INTENDED REQUIREMENTS OF THE STRUCTURES. THE ACTUAL DESIGN OF THE STRUCTURES (MEMBER SIZES, THICKNESS, REINFORCING, AND ETC) SHALL BE BY THE DESIGNER. THE DESIGNER SHALL SUBMIT SIGNED AND SEALED CALCULATIONS ILLUSTRATING THE STRUCTURAL ACCEPTABILITY OF THE REQUIRED STRUCTURES.

2. DESIGN LOADS AND CONDITIONS:
   THE BUILDING AND FOUNDATION SHALL BE DESIGNED BASED ON THE FOLLOWING LOADS AND CONDITIONS.

   ROOF LIVE LOAD ..... 20PSF (NOT REDUCIBLE)
   STAIR AND PLATFORM LIVE LOAD 100PSF
   SNOW LOAD ..... AS REQUIRED PER PROJECT'S LOCATION

   RISK CATEGORY ..... III (UNLESS SPECIFIED OTHERWISE BY OWNER)

   WIND LOAD (CALCULATED IN ACCORDANCE WITH ASCE 7)
   BASIC WIND SPEED (3 SECOND GUST) ..... AS REQUIRED PER PROJECT'S SITE & APPLICABLE UFC REQUIREMENTS.

   SEISMIC LOAD - CALCULATED IN ACCORDANCE WITH ASCE-7 AND APPLICABLE UFC REQUIREMENTS.
   Ss ..... AS REQUIRED PER PROJECT'S SITE & APPLICABLE UFC REQUIREMENTS.
   S1 ..... AS REQUIRED PER PROJECT'S SITE & APPLICABLE UFC REQUIREMENTS.
   SITE CLASSIFICATION ..... AS REQUIRED PER PROJECT'S SITE & APPLICABLE UFC REQUIREMENTS.
   SDS ..... AS DETERMINED PER PROJECT'S SITE & APPLICABLE UFC REQUIREMENTS.
   SDC ..... AS DETERMINED PER PROJECT'S SITE & APPLICABLE UFC REQUIREMENTS.

3. SOILS & FOUNDATION DATA
   A GEOTECHNICAL INVESTIGATION SHALL BE PROVIDED TO VERIFY THE ACCEPTABLE ALLOWABLE SOIL BEARING PRESSURE. THE GEOTECHNICAL INVESTIGATION SHALL (AT A MINIMUM) INCLUDE ALL THE REQUIREMENTS STATED IN THE CURRENT INTERNATIONAL BUILDING CODE.

4. APPLICABLE CODES TO BE USED AS (BUT NOT LIMITED TO) PART OF THIS STANDARD:

   AMERICAN CONCRETE INSTITUTE (ACI)
   ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY
   ACI 530 BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES

   AMERICAN INSTITUTE OF STEEL CONSTRUCTION
   AISC 341 SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS
   AISC 360 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

   AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
   ASCE-7 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES

   INTERNATIONAL BUILDING CODE:
   IBC (CURRENT VERSION)

   UNIFIED FACILITIES CRITERIA (UFC) CODES:
   UFC 1-200-01 GENERAL BUILDING REQUIREMENTS
   UFC 3-220-01 GEOTECHNICAL ENGINEERING
   UFC 3-301-01 STRUCTURAL ENGINEERING
   UFC 3-301-04 SEISMIC DESIGN FOR BUILDINGS
   UFC 3-320-06A CONCRETE FLOOR SLABS ON GRADE SUBJECT TO HEAVY LOADS

5. SPECIFICATIONS TO BE PREPARED AND USED AS (BUT NOT LIMITED TO) PART OF THIS STANDARD:

   03 11 13.00 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING
   03 15 00.00 CONCRETE ACCESSORIES
   03 20 00.00 CONCRETE REINFORCING
   03 30 00 CAST-IN-PLACE CONCRETE
   05 05 23 WELDING, STRUCTURAL
   05 12 00 STRUCTURAL STEEL
   05 50 13 MISCELLANEOUS METAL FABRICATIONS
   05 51 00 METAL STAIRS
   05 51 33 METAL LADDERS
   05 52 00 METAL RAILINGS
   07 92 00 JOINT SEALANTS
   13 34 19 METAL BUILDING SYSTEM
   31 00 00 EARTHWORK

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

PRELIMINARY NOT FOR CONSTRUCTION

SEAL

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

DRAWING TITLE: STRUCTURAL GENERAL NOTES (1 OF 2)

DRAWING NO.: S-001

SHEET 12 OF 72

RAC # 1401800

M:\2014\1401800\stru\14018005-001.dwg 10/5/2015 1:14:58 PM Ralph Aldridge

MASONRY NOTES:

1. MASONRY AND REINFORCEMENT: (SHALL CONFORM TO ACI 530)

2. VERTICAL REINFORCING IN GROUTED CELLS AND PILASTERS SHALL BE LAPPED PER ACI 530 AND WIRED TIED AT SPLICES UNLESS NOTED OTHERWISE.

3. PROVIDE VERTICAL CONTROL JOINTS IN ALL MASONRY WALLS AT NOT MORE THAN 24'-0" ON CENTER. COORDINATE LOCATION OF CONTROL JOINTS WITH THE ENGINEER PRIOR TO CONSTRUCTION.

4. ALL REINFORCING SHOWN IS FOR ILLUSTRATION ONLY AND IS NOT TO SCALE. ACTUAL SIZE, SPACING, AND QUANTITIES ARE AS WRITTEN ON DRAWINGS.

5. CELLS WHICH CONTAIN REINFORCING STEEL SHALL BE FILLED SOLIDLY WITH GROUT, INCLUDING BOND BEAMS, LINTELS AND PILASTERS. GROUT SHALL MEET ASTM C 476 WITH A MINIMUM COMPRESSIVE STRENGTH OF 14MPa (2000 PSI).

6. VERTICAL CELLS TO BE FILLED SHALL HAVE VERTICAL ALIGNMENT SUFFICIENT TO MAINTAIN A CLEAR UNOBSTRUCTED CONTINUOUS VERTICAL CELL NOT LESS THAN 2"x3" IN PLAN DIMENSIONS.

7. FOUNDATION DOWELS SHALL EXTEND INTO THE FOUNDATION CONCRETE AND INTO THE MASONRY WALL AS REQUIRED BY ACI 530. THERE SHALL BE A FOUNDATION DOWEL FOR EACH VERTICAL REINFORCING BAR.

8. VERTICAL WALL REINFORCING SHALL EXTEND CONTINUOUSLY FROM THE TOP OF FOUNDATION TO 2" BELOW TOP OF WALL.

9. CONTROL JOINTS SHALL NOT EXTEND THROUGH CONTINUOUS BOND BEAMS. INSTEAD, THE JOINT SHALL EXTEND TO THE BOTTOM OF THE BOND BEAM AND THEN RESUME ABOVE THE BOND BEAM. WHERE BOND BEAMS ARE EXPOSED TO VIEW, SAWCUT A VERTICAL GROOVE APPROXIMATELY 1/3" DEEP AND THE SAME WIDTH AS THE CONTROL JOINT INTO THE CONTINUOUS BOND BEAM TO RESEMBLE THE CONTROL JOINT. FILL CONTROL JOINTS AND SAWCUT JOINTS WITH SEALANT.

10. UNLESS NOTED OTHERWISE, BOND BEAMS SHALL BE CONTINUOUS AT ALL CORNERS. USE CORNER BARS SAME SIZE AND NUMBER AS BOND BEAM REINFORCING.

11. CONCRETE MASONRY UNITS SHALL MEET ASTM C 90 TYPE I NORMAL WEIGHT. THE NET AREA COMPRESSIVE STRENGTH OF THE CMU BLOCK SHALL EQUAL 1,900 PSI. THE NET COMPRESSIVE STRENGTH OF THE BLOCK MORTAR ASSEMBLY SHALL BE 1,500 PSI. ONLY TYPE S MORTAR (ASTM C 476) SHALL BE USED.

12. THE VEHICLE FUELING STATION CONTROL BUILDING EXTERIOR CONCRETE MASONRY SHALL BE FULLY GROUTED (ALL CELLS GROUTED) WITH #5 BARS SPACED A MAXIMUM OF 32" OC. MASONRY JOINT REINFORCING SHALL OCCUR @ A MAXIMUM OF 16" OC. MASONRY JOINT REINFORCING SHALL BE GALVANIZED, LADDER TYPE (MIN 0.148" DIA SIDE WIRES). SEE SHEET S-502 FOR TYPICAL MASONRY DETAILS AND LINEL REQUIREMENTS.

PRE-ENGINEERED METAL CANOPY SYSTEMS

1. NEW CANOPIES SHALL BE A MANUFACTURER'S STANDARD OR CUSTOM DESIGNED PRE-ENGINEERED METAL STRUCTURE.

2. UNLESS JUSTIFIED OTHERWISE, PROVIDE RIGID FRAMES (WHERE REQUIRED) WITH PINNED COLUMN BASE CONNECTIONS.

3. PRE-ENGINEERED METAL CANOPIES SHALL BE DESIGN AND CONSTRUCTED ACCORDING TO THE FOLLOWING STANDARDS AND CODES (IF APPLICABLE).
   A. METAL BUILDING MANUFACTURERS ASSOCIATION (MBMA)
   B. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)
   C. AMERICAN IRON AND STEEL INSTITUTE (AISI)
   D. AMERICAN WELDING SOCIETY (AWS)
   E. INTERNATIONAL BUILDING CODE (IBC)

4. INCLUDE STRUCTURAL STEEL FRAMING, SUPPORTS, BRACING AND ACCESSORIES FOR ROOF TOP HVAC UNITS, EXHAUST SYSTEM, PIPING, PROCESS EQUIPMENT AND OTHER SUCH DEVICES SHOWN ON THE PLANS AND AS SPECIFIED.

5. AS APPLICABLE THE CANOPY SHALL BE DESIGNED TO INCLUDE LOADS INDUCED BY THE MECHANICAL, PROCESS EQUIPMENT, PIPING SPRINKLERS, EXHAUST SYSTEM, AND OTHER SUCH DEVICES SHOWN ON THE PLANS AND AS SPECIFIED. ADDITIONAL GIRTS OR PURLINS SHALL BE DESIGNED AND PLACED IN CONVENIENT LOCATIONS FOR ATTACHMENT OF ALL DEVICES OR EQUIPMENT. CONTRACTOR SHALL PROVIDE THE CANOPY MANUFACTURER WITH THE EQUIPMENT LOADS AND OTHER INFORMATION AS NEEDED FOR THE CANOPY DESIGN.

6. PERMANENT CANOPY BRACING MAY BE INSUFFICIENT DURING ERECTION. DESIGN AND PROVIDE TEMPORARY LATERAL BRACING DURING CONSTRUCTION.

7. COMPONENTS MUST BE FABRICATED IN THE SHOP TO THE FURTHEST EXTENT BEFORE DELIVERY TO THE SITE.

8. CARE MUST ME MAINTAINED DURING DELIVERY AND STORAGE TO ENSURE MEMBERS ARE NOT DAMAGED.

9. FOUNDATION SHALL BE DESIGNED BY DESIGNER BASED ON THE FOOTPRINT LOADS FROM THE PRE-ENGINEERED CANOPY MANUFACTURER AND THE RECOMMENDATIONS FROM SITE SPECIFIC GEOTECHNICAL REPORT. DRAWINGS PICTORIALLY SHOW SHALLOW TYPE FOOTINGS HOWEVER IF GEOTECHNICAL REPORT RECOMMENDS DEEP (PILE) FOUNDATION DESIGNER SHALL DESIGN THE PILE FOUNDATION.

10. REFER TO ARCHITECTURAL DRAWINGS FOR ADDITIONAL INFORMATION.

SPECIAL INSPECTION

1. PER UFC 1-200-01, SECTION 2-17 THE CONTRACTOR SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTIONS ON THE TYPES OF WORK LISTED UNDER SECTION 1705 "REQUIRED VERIFICATION" AND INSPECTION. THESE INSPECTIONS ARE IN ADDITION TO THE INSPECTION SECTION 110 OF IBC.
2. TO DETERMINE REQUIRED SPECIAL INSPECTION ITEMS, DESIGNER AND CONTRACTORS SHALL REFER TO SECTION 17 OF IBC BASED ON SEISMIC DESIGN CATEGORY AND BASIC WIND SPEED SHOWN ON DWG S-001.
3. SPECIAL INSPECTION REQUIRED ON ITEMS/COMPONENTS SHALL BE IDENTIFIED BY DESIGNER ON DRAWINGS OR ON SPECIFICATIONS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

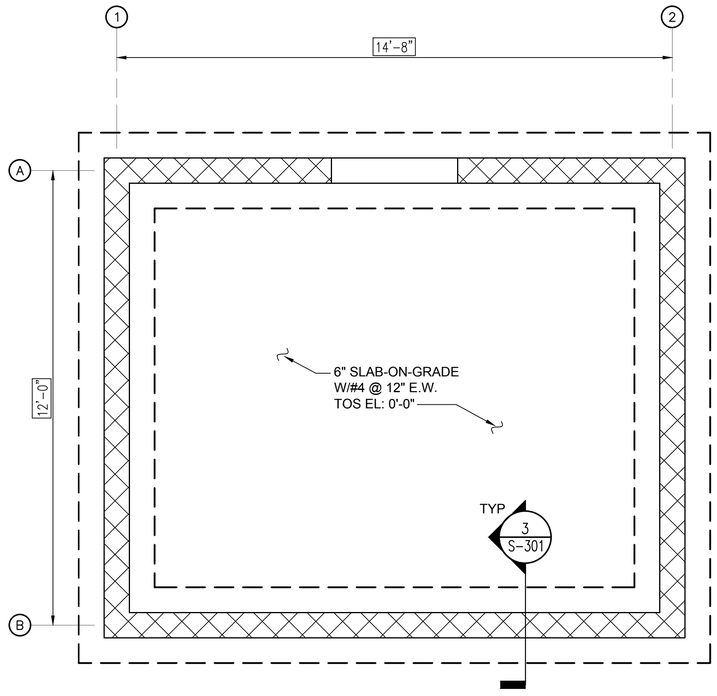
DRAWING TITLE: STRUCTURAL GENERAL NOTES (2 OF 2)

DRAWING NO.: S-002

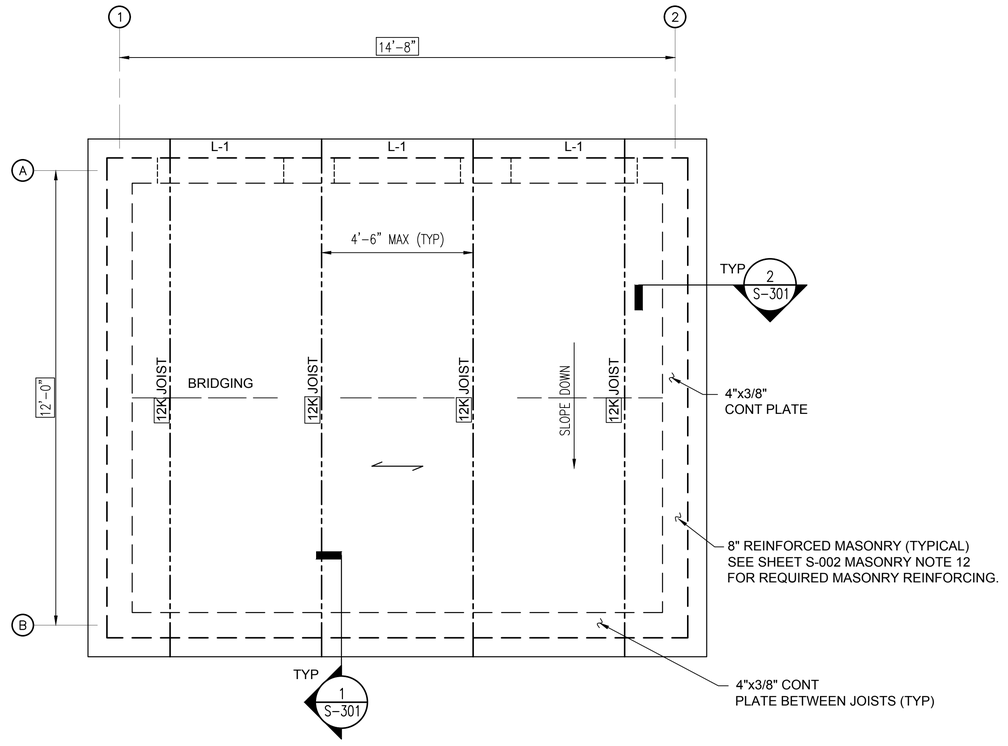
SHEET 13 OF 72

RAC # 1401800

M:\2014\1401800\stru\1401800S-002.dwg 10/5/2015 1:17:17 PM Ralph Aldridge



1 CONTROL BLDG FOUNDATION PLAN
Scale: 1/2"=1'-0"



2 CONTROL BLDG ROOF PLAN
Scale: 1/2"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. SEE ARCHITECTURAL DWGS. FOR BUILDING ELEVATIONS.
4. SEE DWGS S-501 THRU S-504 FOR TYPICAL DETAILS.
5. SEE CIVIL DRAWINGS FOR LOCATION.

GRAPHIC SCALE

2 0 2 4

SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

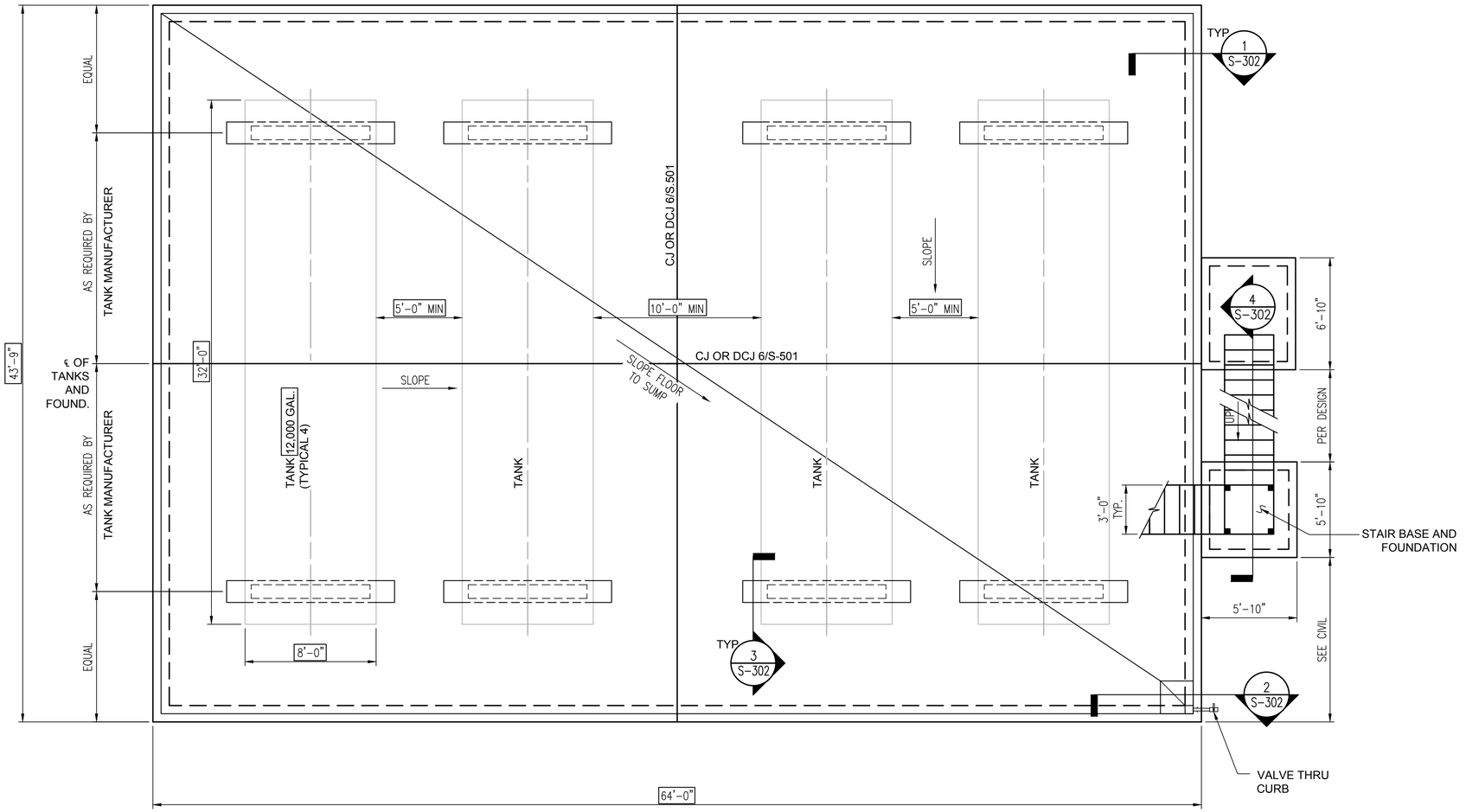
DRAWING TITLE: CONTROL BUILDING FOUNDATION AND ROOF PLANS

DRAWING NO.: **S-101**

SHEET 14 OF 72

RAC # 1401800

M:\2014\1401800\stru\1401800S-101.dwg 10/5/2015 1:17:33 PM Ralph Aldridge



1 TANK PAD FOUNDATION PLAN
Scale: 1/4"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. UNLESS JUSTIFIED OTHERWISE AND APPROVED BY OWNER, TANKS PAD FOUNDATION SHALL BE DESIGNED AS MAT FOUNDATION. SITE SPECIFIC SOIL PARAMETERS SHALL BE USED BY DESIGNER TO DETERMINE THE MAT THICKNESS AND REINFORCING STEEL DETAILS.
4. TOP OF SLAB SHALL BE SLOPED TO DRAIN. COORDINATE WITH CIVIL AND MECHANICAL DRAWINGS.
5. EACH STEEL TANK WILL BE SUPPLIED WITH ITS SPECIAL STEEL BASE-SUPPORT THAT WILL BE ANCHORED TO THE CONCRETE PEDESTALS WITH CAST-IN-PLACE ANCHORS PER MANUFACTURERS RECOMMENDATIONS. HEIGHT OF EACH STEEL BASE-SUPPORT SHALL BE SUCH THAT EACH TANK SHALL HAVE SLOPE AS INDICATED IN MECHANICAL DRAWINGS.

GRAPHIC SCALE
4 0 4 8
SCALE: 1/4" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED HD | DRAWN JHN | CHECKED HD | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

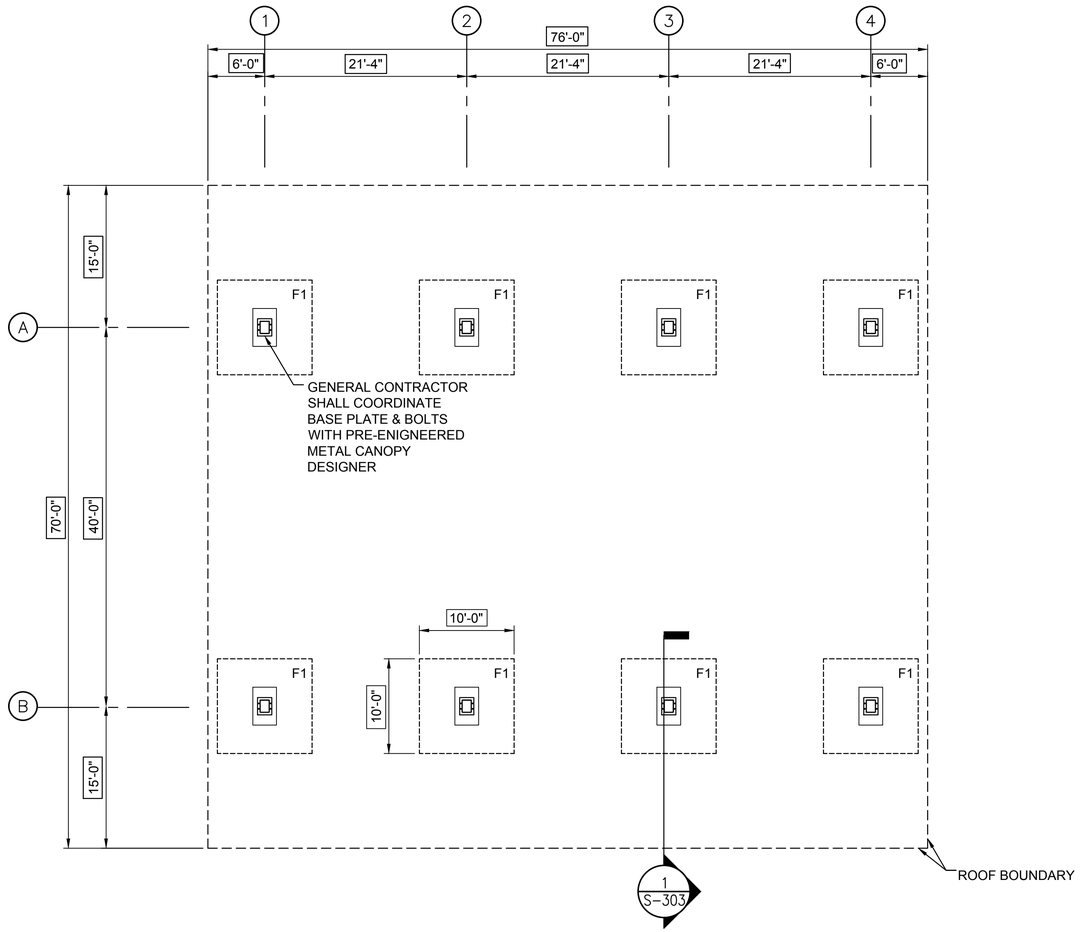
DRAWING TITLE: TANK PAD FOUNDATION PLAN

DRAWING NO.
S-102

SHEET 15 OF 72

RAC # 1401800

M:\2014\1401800\stru\1401800S-102.dwg 10/5/2015 1:18:25 PM Ralph Aldridge



1 PRE-ENGINEERED CANOPY OVER DISPENSER ISLANDS ROOF BOUNDARY AND FOUNDATION PLAN

Scale: 1/8"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. COORDINATE SHAPE AND SLOPE OF ROOF WITH ARCH. DRWGS AND OR OWNER REQ'M.
4. GENERAL CONTRACTOR SHALL COORDINATE COLUMN TO FOOTING ANCHOR REQUIREMENTS WITH PRE-ENGINEERED METAL CANOPY MANUFACTURER.
5. FOUNDATION SHALL BE DESIGNED BY DESIGNER BASED ON THE FOOTPRINT LOADS FROM THE PRE-ENGINEERED CANOPY MANUFACTURER AND THE RECOMMENDATIONS FROM SITE SPECIFIC GEOTECHNICAL REPORT. DRAWINGS PICTORIALLY SHOW SHALLOW TYPE FOOTINGS HOWEVER IF GEOTECHNICAL REPORT RECOMMENDS DEEP (PILE) FOUNDATION DESIGNER SHALL DESIGN THE PILE FOUNDATION.

GRAPHIC SCALE

8 0 8 16

SCALE: 1/8" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

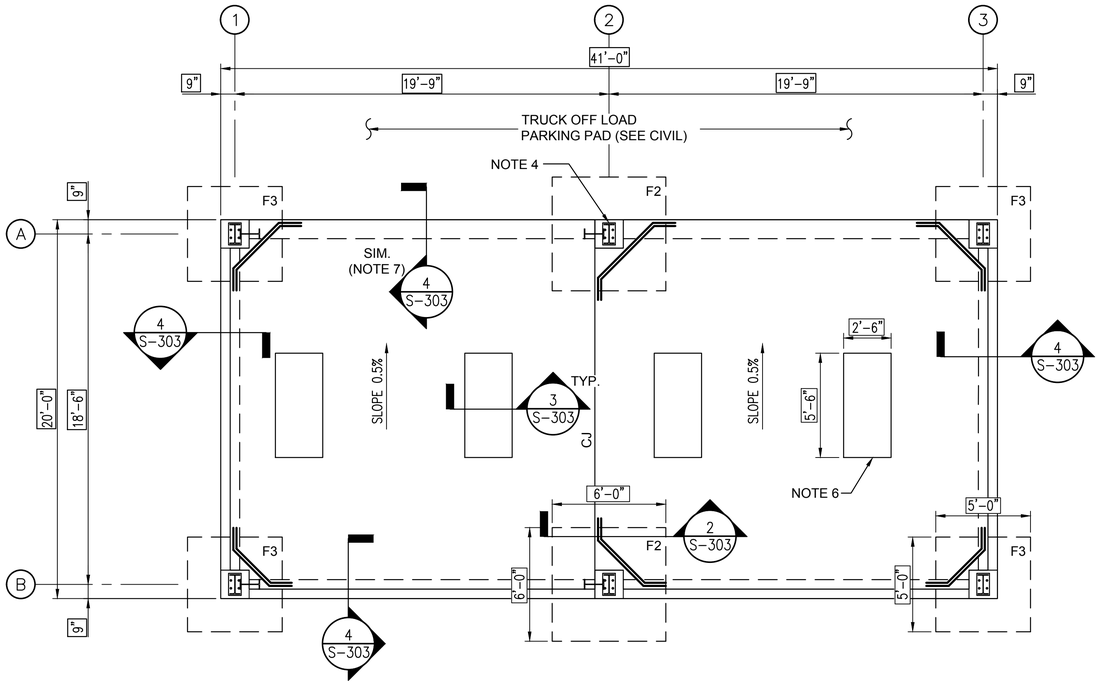
DRAWING TITLE: DISPENSER ISLAND CANOPY FOUNDATION PLAN

DRAWING NO. **S-103**

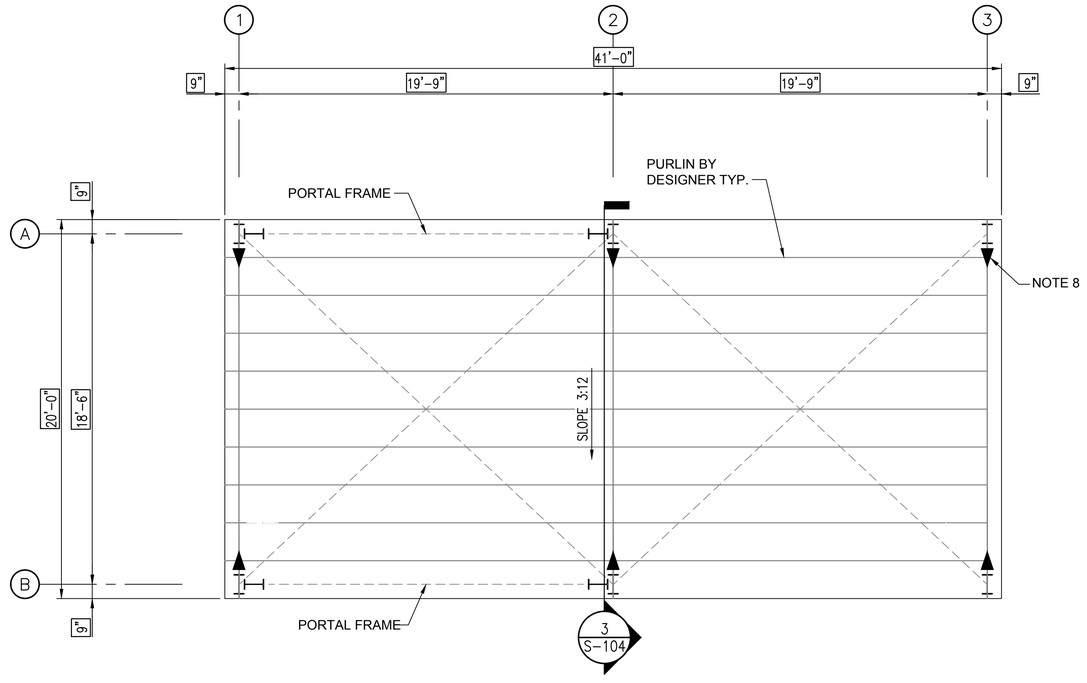
SHEET 16 OF 72

RAC # 1401800

M:\2014\1401800\stru\1401800S-103.dwg 10/5/2015 11:45:13 AM Ralph Aldridge



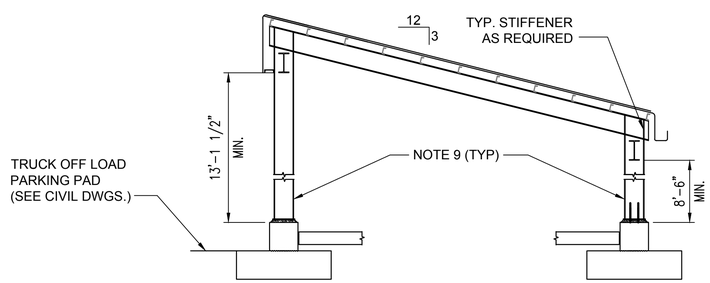
1 OFFLOAD EQUIPMENT CANOPY ROOF BOUNDARY AND FOUNDATION PLAN
Scale: 1/4"=1'-0"



2 OFFLOAD EQUIPMENT CANOPY ROOF BOUNDARY
Scale: 1/4"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. COORDINATE SHAPE AND SLOPE OF ROOF WITH SITE SPECIFIC AND OR OWNER REQUIREMENTS.
4. COORDINATE COLUMN TO FOOTING ANCHOR REQUIREMENTS WITH PRE-ENGINEERED METAL CANOPY MANUFACTURER.
5. FOUNDATION SHALL BE DESIGNED BY DESIGNER BASED ON THE FOOTPRINT LOADS FROM THE PRE-ENGINEERED CANOPY MANUFACTURER AND THE RECOMMENDATIONS FROM SITE SPECIFIC GEOTECHNICAL REPORT. DRAWINGS PICTORIALLY SHOW SHALLOW TYPE FOOTINGS HOWEVER IF GEOTECHNICAL REPORT RECOMMENDS DEEP (PILE) FOUNDATION DESIGNER SHALL DESIGN THE PILE FOUNDATION.
6. LOCATION AND ELEVATION OF PUMP PADS SHALL BE COORDINATED WITH MECHANICAL DRAWINGS.
7. THE SECTION IS SIMILAR TO 4/S-303 BUT HAS NO CURB.
8. ▲ DENOTES MOMENT CONNECTIONS.
9. CANOPY STRUCTURE COLUMN SHAPES SHOWN ON THIS DRAWING CAN BE REPLACED (AS AN OPTION) BY HOLLOW STRUCTURAL STEEL (HSS) SHAPES; THIS MAY EVEN BE PREFERRED IN SOME PROJECT LOCATIONS WHERE MAINTENANCE AGAINST CORROSION IS A REAL CONCERN. DESIGNER SHALL CONSULT WITH OWNER AND SHALL COORDINATE WITH THE SITE SPECIFIC DESIGN CRITERIA.



3 SECTION
Scale: N.T.S.

GRAPHIC SCALE
4 0 4 8
SCALE: 1/4" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

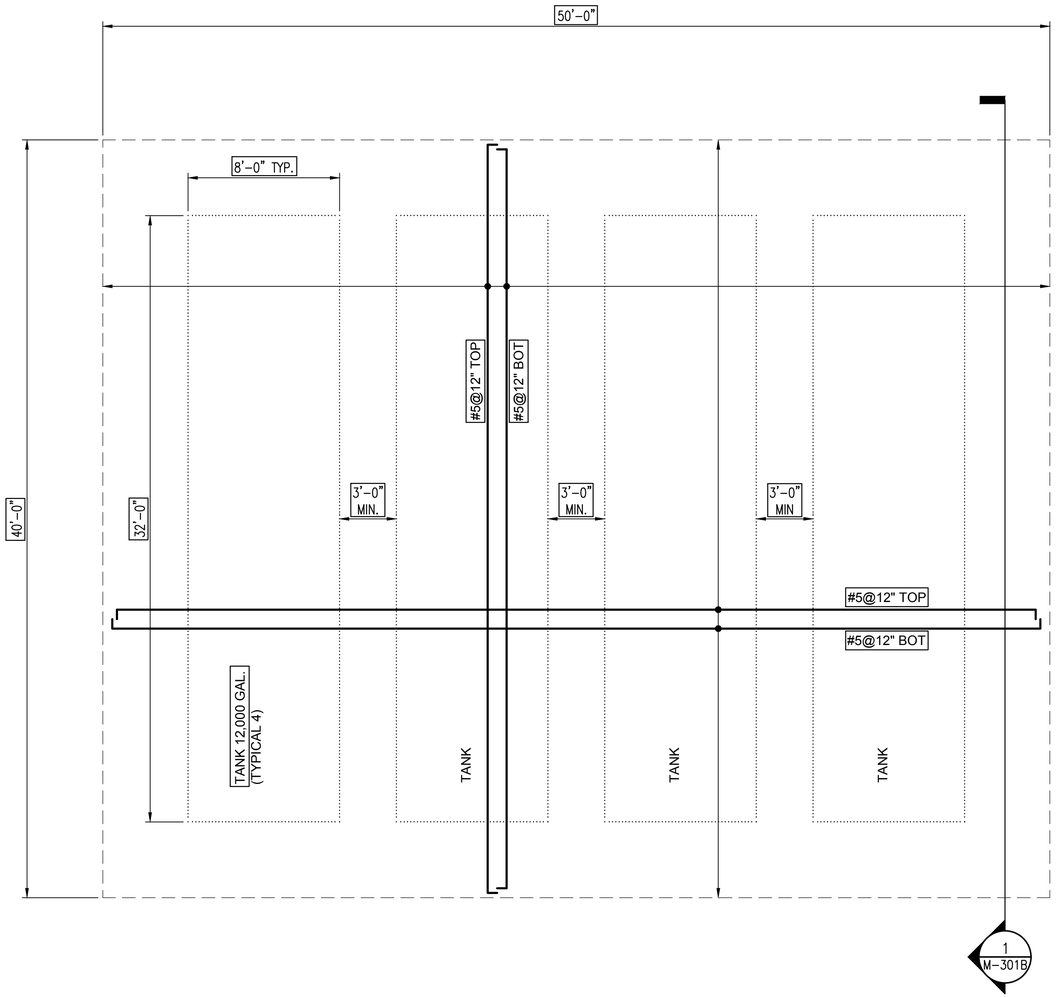
DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN
CHECKED: HD | DRAWN: JHN | DESIGNED: HD
PROJECT NO. 14018-20

DRAWING TITLE: OFFLOAD EQUIPMENT CANOPY ROOF BOUNDARY AND FOUNDATION PLAN

DRAWING NO. **S-104**

SHEET 17 OF 72

RAC # 1401800



1 UNDERGROUND STORAGE TANK FOUNDATION
Scale: 1/4"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. DESIGN CONCRETE FOUNDATION THICKNESS AND REINFORCING STEEL. PAD THICKNESS SHALL NOT BE LESS THAN 15".
4. COORDINATE ANCHORS FOR STRAPS WITH TANK MANUFACTURES REQUIREMENT AND MECHANICAL DRAWINGS.

GRAPHIC SCALE
4 0 4 8
SCALE: 1/4" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL
PRELIMINARY
NOT FOR
CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO. 14018-20

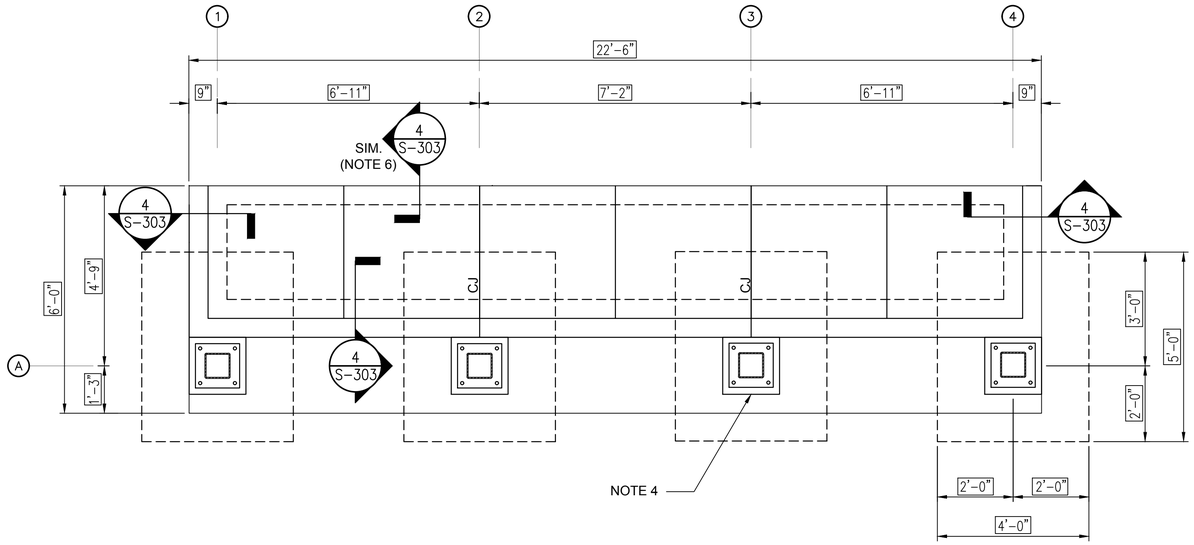
DRAWING TITLE: UNDERGROUND STORAGE TANK FOUNDATION PLAN

DRAWING NO.
S-105

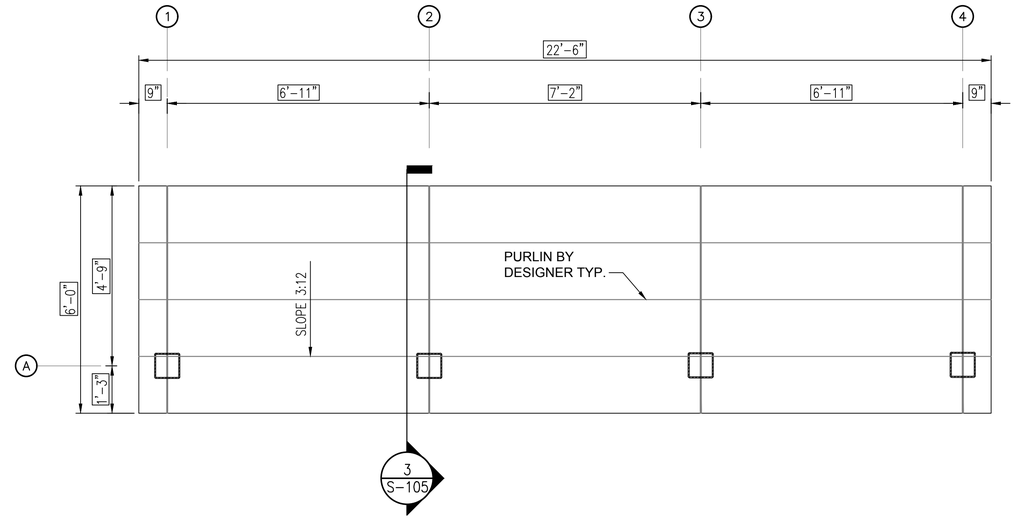
SHEET 18 OF 72

RAC # 1401800

M:\2014\1401800\struct\1401800S-105.dwg 10/5/2015 11:44:43 AM Ralph Aldridge



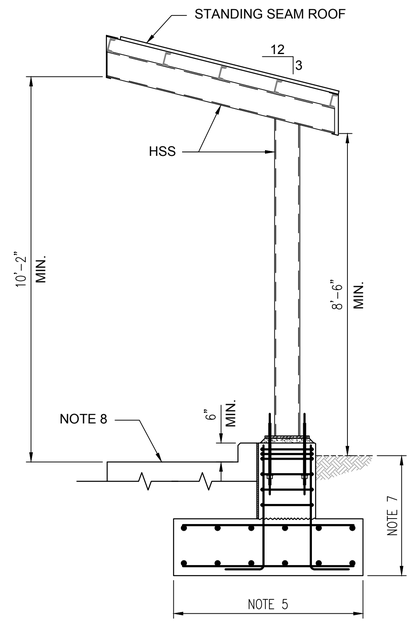
1 FILLSTAND CANOPY ROOF BOUNDARY AND FOUNDATION PLAN (OPTION)
Scale: 1/2"=1'-0"



2 FILLSTAND CANOPY ROOF BOUNDARY (OPTION)
Scale: 1/2"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. COORDINATE SHAPE AND SLOPE OF ROOF WITH SITE SPECIFIC AND OR OWNER REQUIREMENTS.
4. COORDINATE COLUMN TO FOOTING ANCHOR REQUIREMENTS WITH PRE-ENGINEERED METAL CANOPY MANUFACTURER.
5. FOUNDATION SHALL BE DESIGNED BY DESIGNER BASED ON THE FOOTPRINT LOADS FROM THE PRE-ENGINEERED CANOPY MANUFACTURER AND THE RECOMMENDATIONS FROM SITE SPECIFIC GEOTECHNICAL REPORT. DRAWINGS PICTORIALLY SHOW SHALLOW TYPE FOOTINGS HOWEVER IF GEOTECHNICAL REPORT RECOMMENDS DEEP (PILE) FOUNDATION DESIGNER SHALL DESIGN THE PILE FOUNDATION.
6. THE SECTION IS SIMILAR TO 4/S-303 BUT HAS NO CURB.
7. DEPTH AS REQUIRED BY DESIGN BUT NOT LESS THAN MINIMUM FROST DEPTH.
8. SLAB-ON-GRADE SHALL BE COORDINATED WITH CIVIL DRAWINGS.



3 SECTION
Scale: 1/2"=1'-0"

GRAPHIC SCALE
2 0 2 4
SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

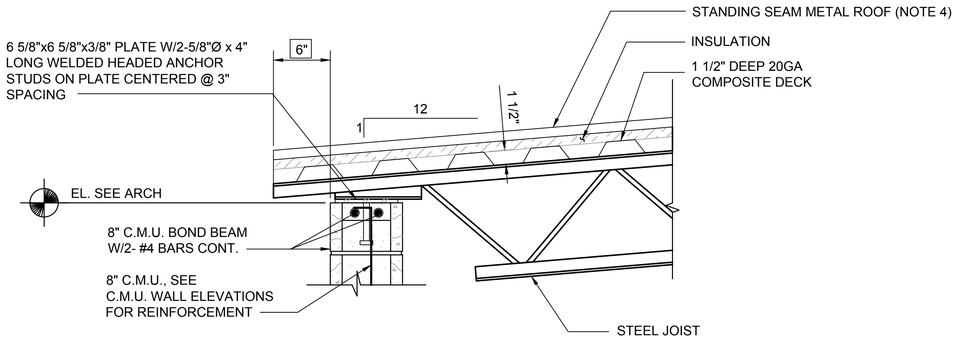
PROJECT NO.: 14018-20

DRAWING TITLE: FILLSTAND CANOPY OPTION ROOF BOUNDARY AND FOUNDATION PLAN

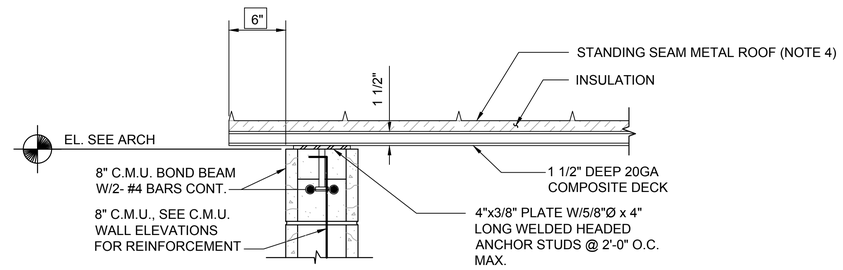
DRAWING NO.: **S-106**

RAC # 1401800

M:\2014\1401800\stru\1401800S-106.dwg 10/5/2015 11:44:29 AM Ralph Aldridge



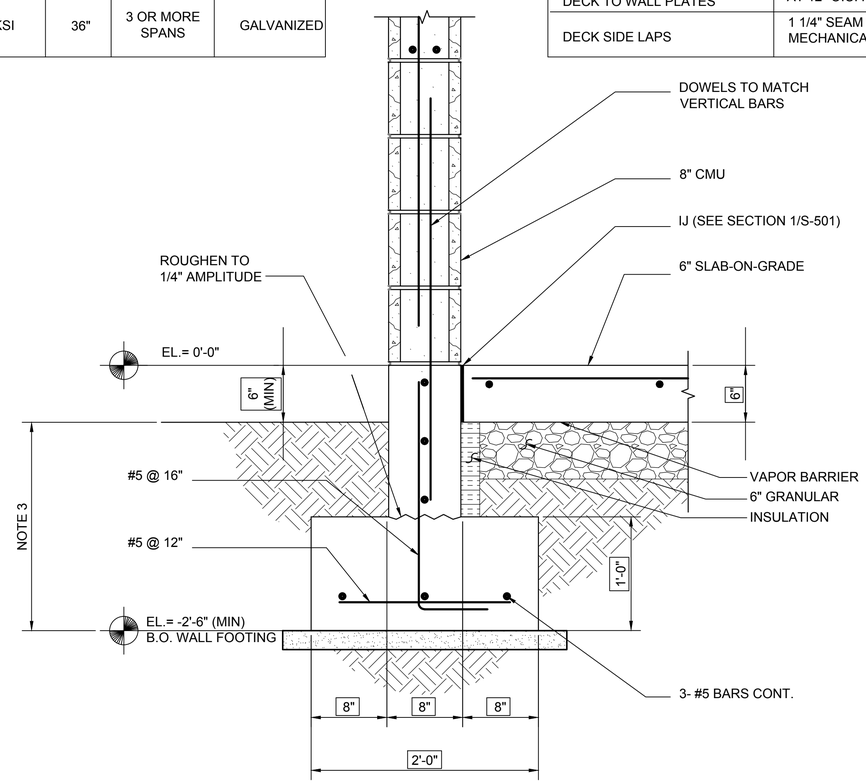
1 SECTION @ JOIST END
Scale: 1 1/2"=1'-0"



2 SECTION @ DECK PERPENDICULAR TO WALL
Scale: 1 1/2"=1'-0"

COMPOSITE STEEL DECK MATERIAL SCHEDULE					
DECK TYPE	MINIMUM THICKNESS	MIN. YIELD STRENGTH.	MIN. SHEET WIDTH	MIN. SHEET LENGTH	DECK FINISH
1 1/2" DEEP COMPOSITE	0.0358 IN.	33 KSI	36"	3 OR MORE SPANS	GALVANIZED

COMPOSITE STEEL DECK FASTENER SCHEDULE	
FASTENER LOCATION	FASTENER REQUIREMENT
DECK TO JOISTS DECK TO WALL PLATES	5/8" MINIMUM DIAMETER PUDDLE WELD AT 12" O.C. MAXIMUM (36/4 PATTERN)
DECK SIDE LAPS	1 1/4" SEAM WELD OR EQUIVALENT MECHANICAL FASTENER PER DECK SPAN



3 SECTION
Scale: 1 1/2"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. DEPTH AS REQUIRED BY DESIGN BUT NOT LESS THAN MINIMUM FROST DEPTH.
4. GUTTERS AND FLUSHING ARE NOT SHOWN AND SHALL BE COORDINATED WITH ARCHITECTURE.

GRAPHIC SCALE
1 0 1
SCALE: 1 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

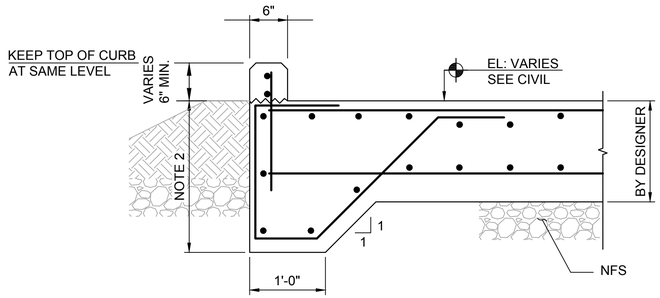
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
CHECKED: HD
DRAWN: JHN
DESIGNED: HD
PROJECT NO.: 14018-20
DRAWING TITLE: CONTROL BUILDING ROOF SELECTION

DRAWING NO.: **S-301**

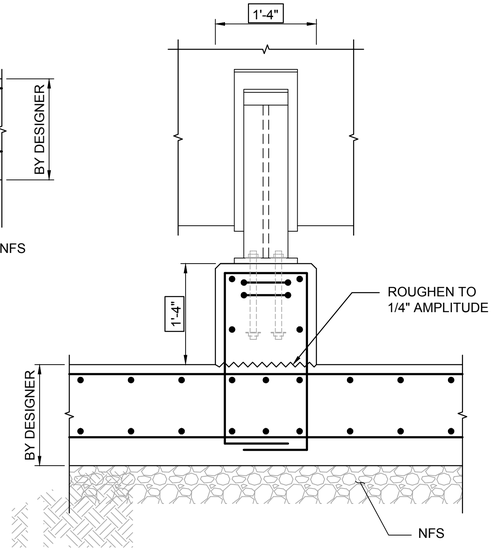
SHEET 20 OF 72

RAC # 1401800

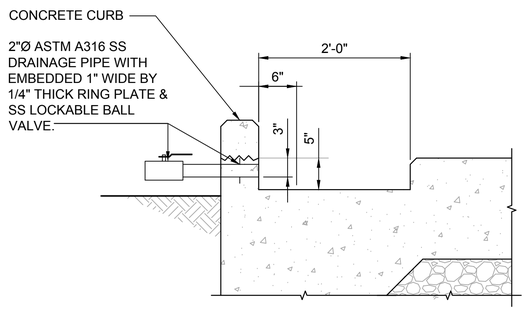
M:\2014\1401800\stru\1401800S-301.dwg 10/5/2015 11:44:14 AM Ralph Aldridge



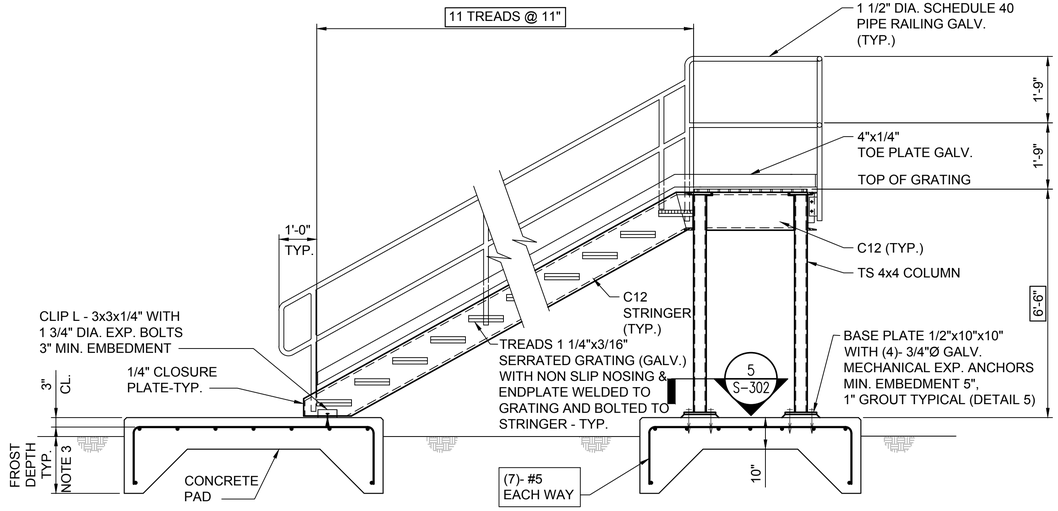
1 SECTION
Scale: 1"=1'-0"



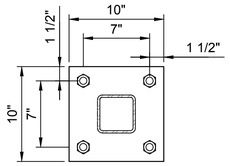
3 SECTION
Scale: 1"=1'-0"



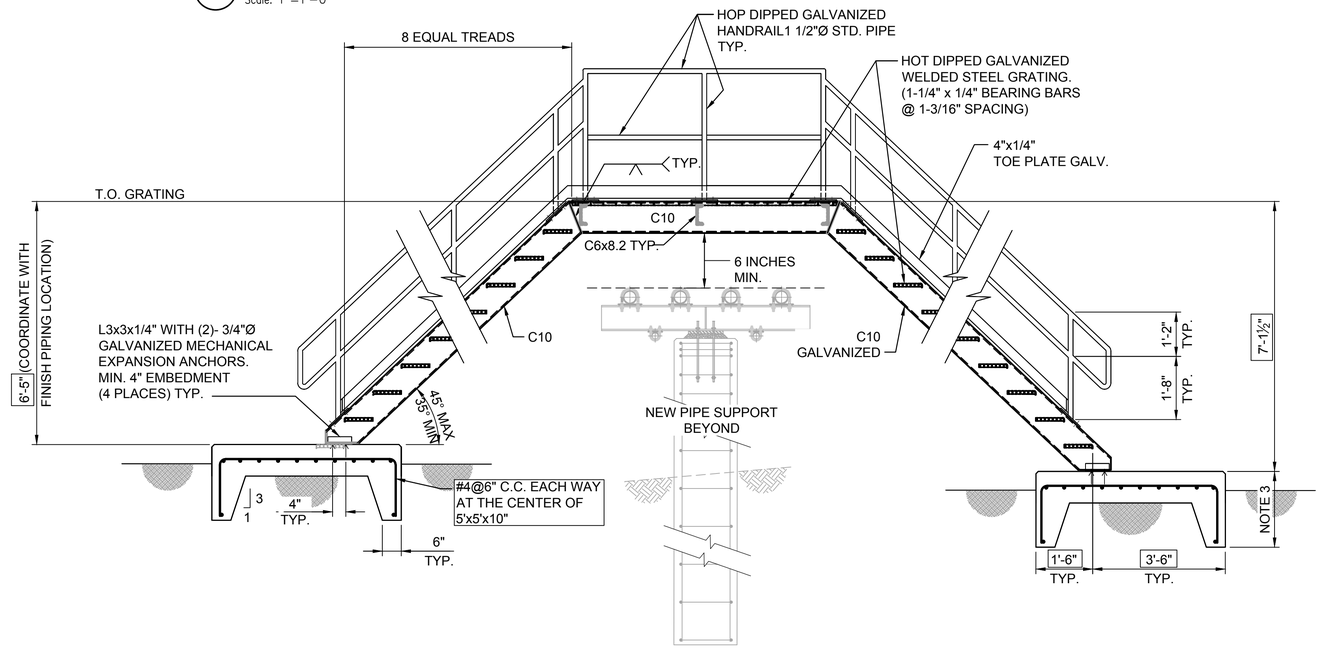
2 SECTION
Scale: 1"=1'-0"



4 STAIR SECTION
Scale: N.T.S.



5 SECTION
Scale: 1 1/2"=1'-0"



6 SECTION
Scale: 1"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS SHEET S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. DEPTH AS REQUIRED BY DESIGN BUT NOT LESS THAN MINIMUM FROST DEPTH
4. THE GRATING SHALL BE A MINIMUM OF 1 1/4" DEEP WITH THICKNESS AS DESIGNED BY GRATING DESIGNER TO MEET THE REQUIRED LOADING OF 100 POUNDS PER FT^2.
5. REFER TO ELECTRICAL DRAWINGS FOR GROUNDING REQUIREMENTS/DETAILS.
6. THE STEEL MANUFACTURER SHALL PROVIDE AN IBC AND OSHA ACCEPTABLE 3'-0" WIDE STAIR WITH GUARDRAIL AND HANDRAIL. THE STAIR ORIENTATION SHALL BE AS APPROXIMATELY SHOWN ON THE ACCESS PLATFORM PLAN.
7. APPROXIMATE TOP OF GRATING (T.O.G.) FROM TOP OF CONCRETE. CONTRACTOR TO COORDINATE FINAL ELEVATION WITH MECHANICAL, PURCHASED EQUIPMENT AND PIPING SYSTEM REQUIREMENTS.
8. ALL STAIR PARTS SHALL BE HOT DIPPED GAVANIZED

GRAPHIC SCALE

2 0 2 4
SCALE: 1/2" = 1'-0"

1 0 1 2
SCALE: 1" = 1'-0"

1 0 1
SCALE: 1 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

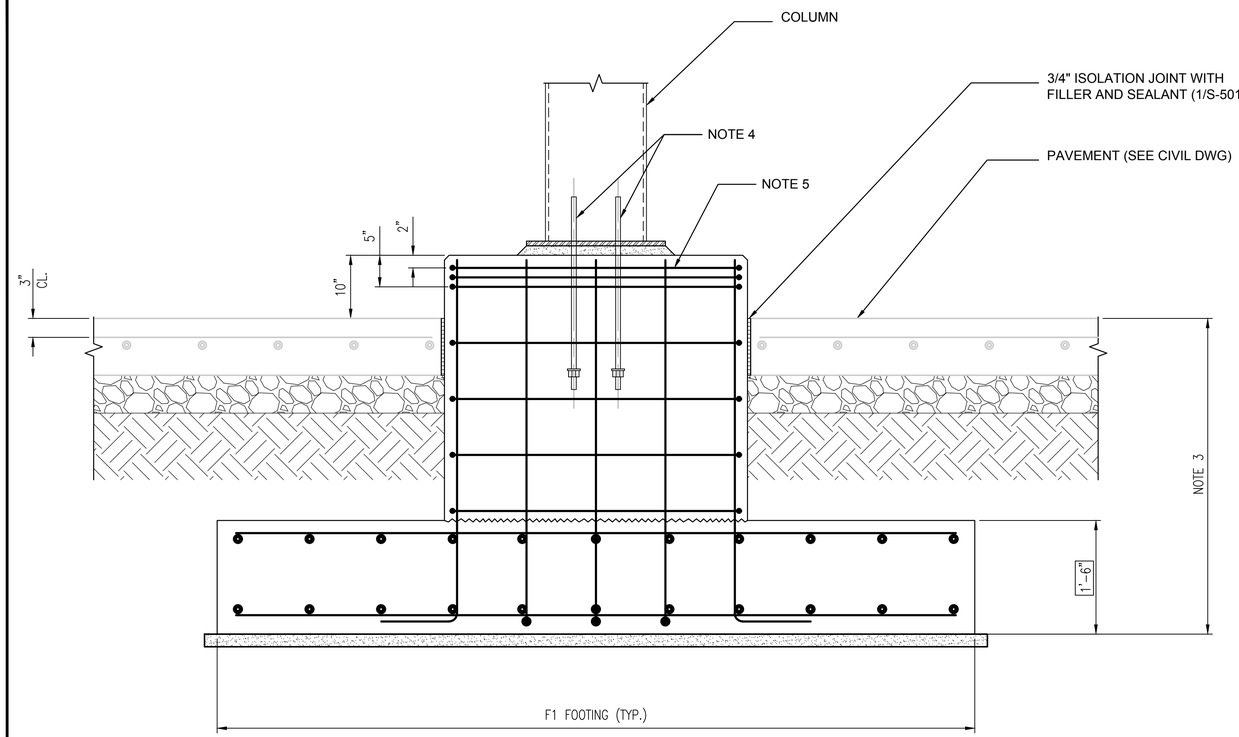
PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
CHECKED: HD
DRAWN: JHN
DESIGNED: HD
PROJECT NO.: 14018-20
DRAWING TITLE: TANK ACCESS PLATFORM SECTIONS

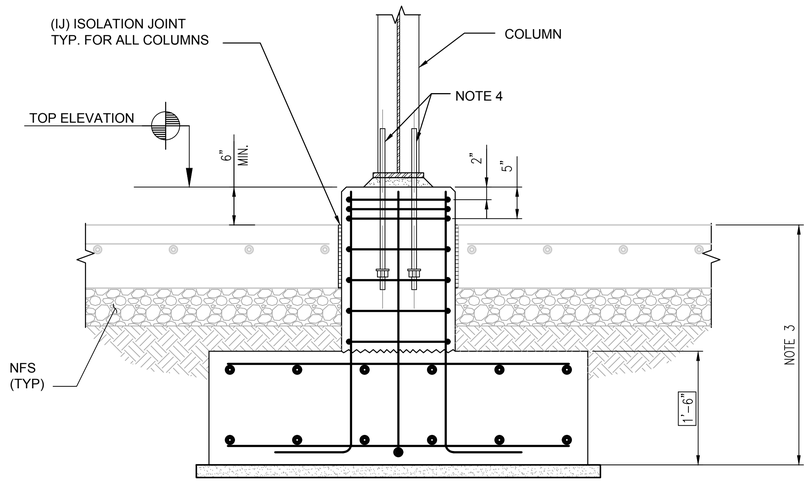
DRAWING NO.: S-302

SHEET 21 OF 72

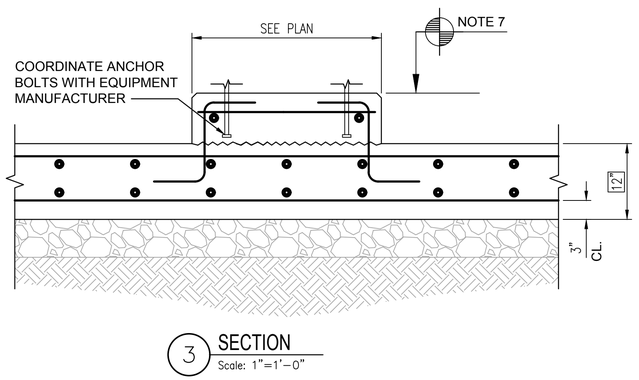
RAC # 1401800



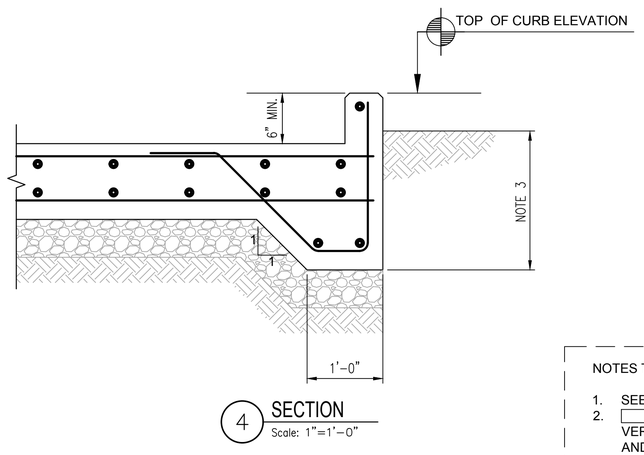
1 SECTION
Scale: 1"=1'-0"



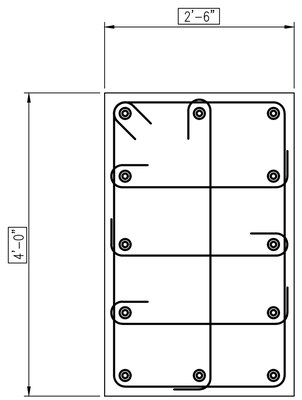
2 SECTION
Scale: 1"=1'-0"



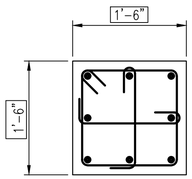
3 SECTION
Scale: 1"=1'-0"



4 SECTION
Scale: 1"=1'-0"



5 SECTION
Scale: 1"=1'-0"



6 SECTION
Scale: 1"=1'-0"

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DRAWINGS S-001 & S-002.
2. [ ] DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. DEPTH AS REQUIRED BY DESIGN BUT NOT LESS THAN MINIMUM FROST DEPTH.
4. ANCHORS SHALL BE CAST-IN-PLACE. ASTM F1554 GRADE 35, POST-INSTALLED ANCHORS SHALL NOT BE USED UNLESS APPROVED BY OWNER. EMBEDMENT DEPOTS SHALL BE DETERMINED BY DESIGNER BASED ON COLUMN LOADS AND ACI-318.
5. PROVIDE 3-#3 OR 2-#4 TIES WITHIN 5" FROM THE TOP OF CONCRETE.
6. REINFORCING STEEL SHALL BE DESIGNED BY THE DESIGNER.
7. TOP OF CONCRETE ELEVATION TO BE HIGHER OR EQUAL TO THE TOP OF CURB ELEVATION. COORDINATE WITH MECHANICAL.

GRAPHIC SCALE

2 0 2 4
SCALE: 1/2" = 1'-0"

1 0 1 2
SCALE: 1" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE/ACE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED HD | DRAWN JHN | CHECKED HD | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

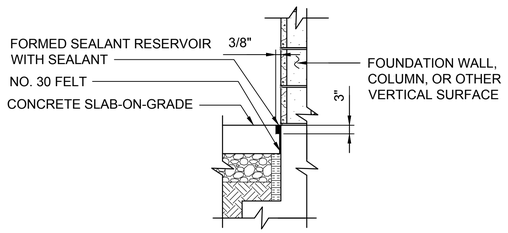
PROJECT NO. 14018-20

DRAWING TITLE: MISCELLANEOUS SECTIONS

DRAWING NO. S-303

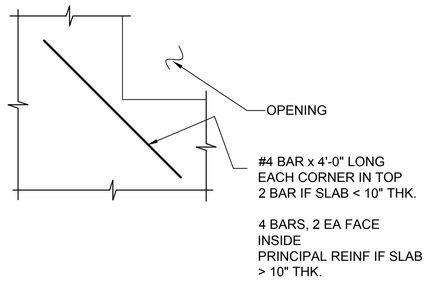
SHEET 22 OF 72

RAC # 1401800



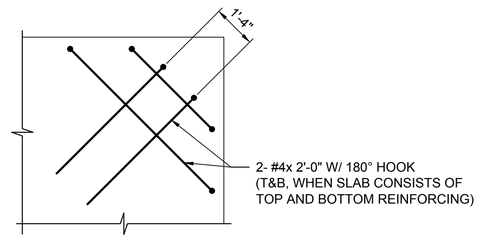
ISOLATION JOINT (IJ)

1 SECTION
Scale: N.T.S.



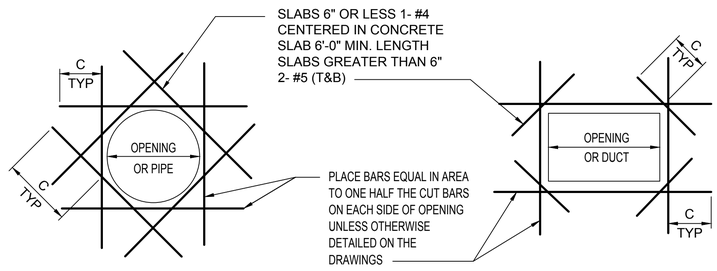
ADD'L RE-ENTRANT BARS

2 PLAN
Scale: N.T.S.

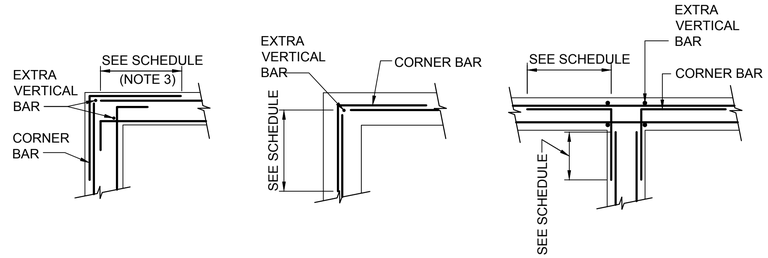


ADD'L CORNER BARS

3 PLAN
Scale: N.T.S.



ADD'L REINFORCING AROUND OPENINGS



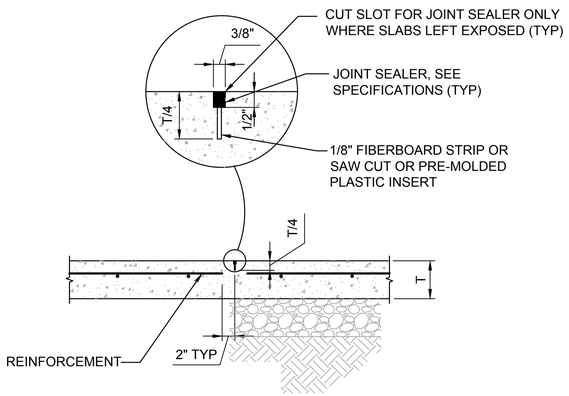
ADD'L REINFORCING AT WALL JOINTS

SECTION NOTES:
1. C = TENSION DEVELOPMENT LENGTH: PROVIDE STD HOOK IF FULL DEVELOPMENT LENGTH IS NOT POSSIBLE.
2. REINFORCING STEEL IS TO BE CARRIED ACROSS ALL CONSTRUCTION JOINTS.
3. DETAIL IS TYP FOR ALL OPENINGS GREATER THAN 10" IN SLABS (WHERE ADDL REINF IS NOT EXPLICITLY STATED ON PLANS). FOR OPENINGS LESS THAN 10" SPREAD THE REINFORCING TO CLEAR THE OPENING.
4. EXTRA BARS ARE NOT REQUIRED AT AN OPENING EDGE PARALLEL TO AND WITHIN 4" OF A WALL OR BEAM.
5. PROVIDE 2" MIN CLEARANCE FROM REINF. TO EDGE OF OPENING (TYP; UNO)

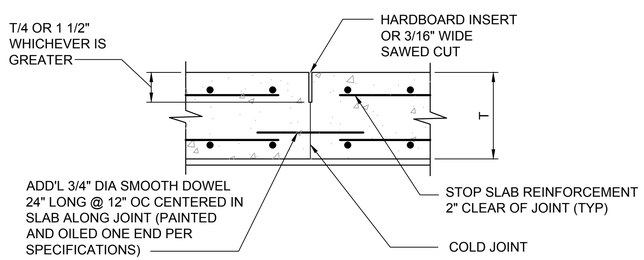
SECTION NOTES:
1. DETAILS APPLY TO FOOTINGS & WALLS.
2. CORNER BARS TO MATCH SIZE & SPACING OF HORIZONTAL BARS.
3. SEE SPLICE LENGTH TABLE S-001.

4 SECTION/PLAN
Scale: N.T.S.

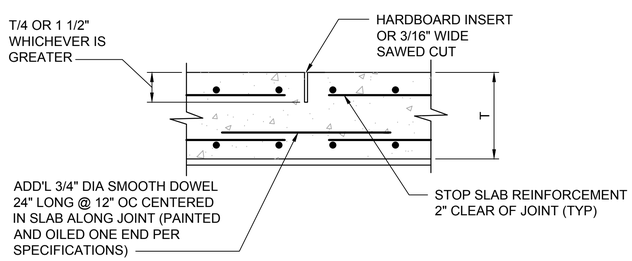
5 PLAN
Scale: N.T.S.



SJ SAW-CUT JOINT T ≤ 6"



DCJ DOWELED CONSTRUCTION JOINT T > 6"



CJ CONSTRUCTION JOINT T > 6"

TYPICAL SLAB CONTROL JOINTS

SECTION NOTES:
1. DCJ AND CJ ARE INTERCHANGEABLE

6 SECTION
Scale: N.T.S.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION	BY	DATE	SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

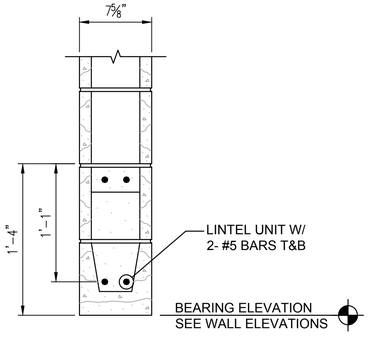
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
CHECKED: HD
DRAWN: JHN
PROJECT NO.: 14018-20
DESIGNED: HD
DRAWING TITLE: TYPICAL DETAILS

DRAWING NO.: **S-501**

SHEET 23 OF 72

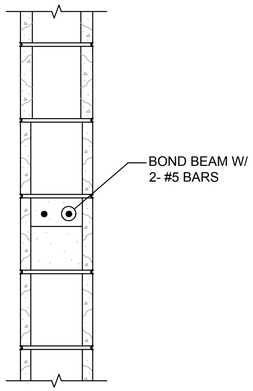
RAC # 1401800

M:\2014\1401800\stru\1401800S-501.dwg 10/5/2015 11:43:13 AM Ralph Aldridge



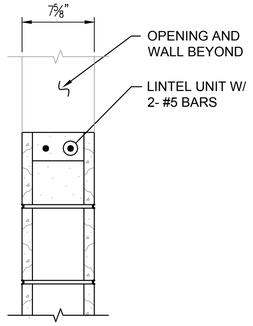
LINTEL L-1

1 SECTION
Scale: N.T.S.



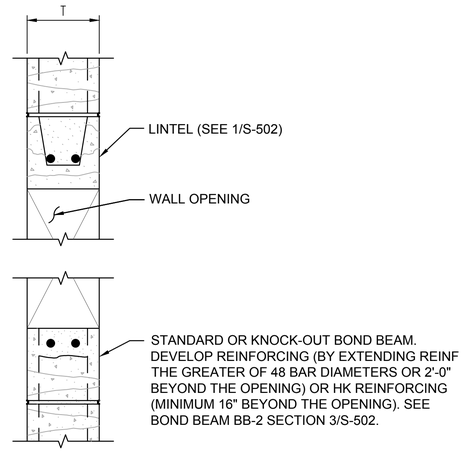
BOND BEAM BB-1

2 SECTION
Scale: N.T.S.

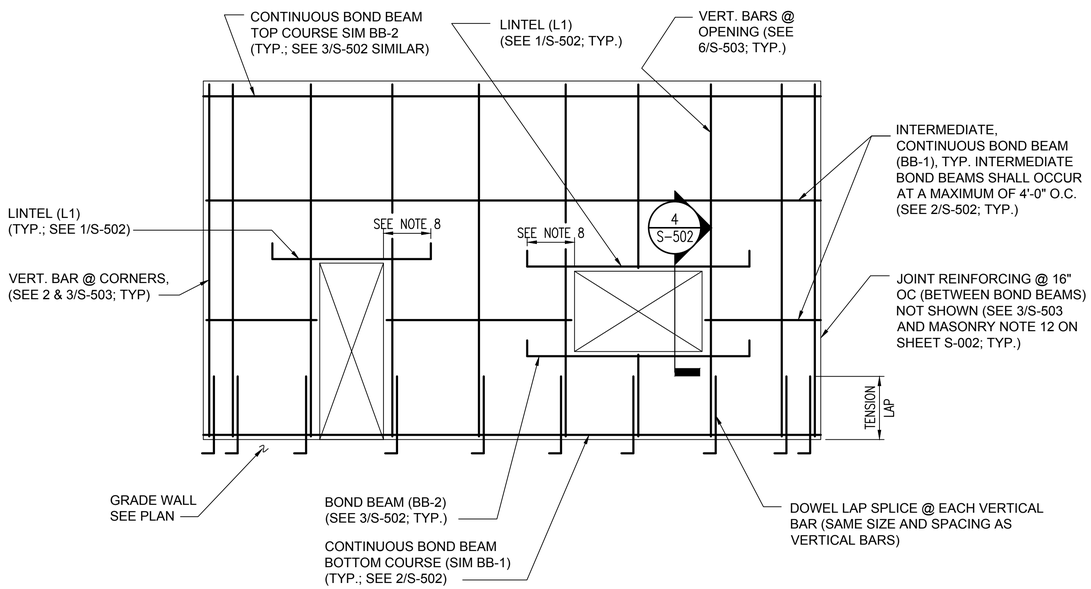


BOND BEAM BB-2

3 SECTION
Scale: N.T.S.



4 TYPICAL OPENING SECTION
Scale: N.T.S.



5 TYPICAL MASONRY WALL REINFORCING DETAIL
Scale: N.T.S.

NOTES:

1. FOR STRUCTURAL GENERAL NOTES SEE SHEET S-001 & S-002.
2. STRUCTURAL GENERAL DETAILS APPLY TO AREAS WHERE CONDITIONS ARE SIMILAR UNLESS NOTED OTHERWISE ON DRAWINGS.
3. IN STRUCTURAL GENERAL DETAILS, ORIENTATION OF WALL OR SLAB BARS IN EACH DIRECTION IS ARBITRARY. SEE DRAWINGS OF EACH STRUCTURE FOR ORIENTATION REQUIRED AT THAT STRUCTURE.
4. JOINT REINFORCING SHALL OCCUR @ 16" OC VERTICAL BETWEEN CONTINUOUS BOND BEAMS.
5. ALL EXTERIOR CMU WALLS SHALL BE FULLY GROUTED (UNO) SEE MASONRY NOTE 12 ON SHEET S-002 FOR CMU REINFORCING.
6. CONTINUOUS BOND BEAMS SHALL HAVE CORNER BARS AND INTERSECTIONS HOOKED PER DETAIL 2/S-503. NON-CONTINUOUS BOND BEAMS SHALL HAVE REINFORCING HOOKED AT ENDS.
7. FOR MASONRY CONTROL JOINTS (SEE ARCH FOR LOCATIONS AND SECTION 4/S-503 FOR SECTION).
8. LINTEL EXTENSION SHALL BE 24" TYPICAL. IF 24" EXTENSION CAN NOT BE ACHIEVED, REINFORCING SHALL BE HOOKED @ LINTEL ENDS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

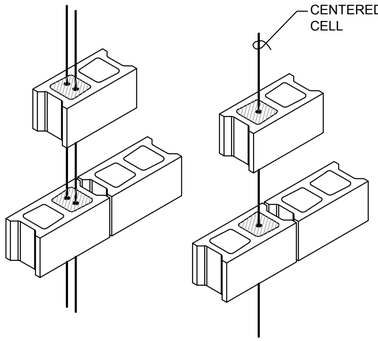
DRAWING TITLE: TYPICAL MASONRY DETAILS

DRAWING NO.: **S-502**

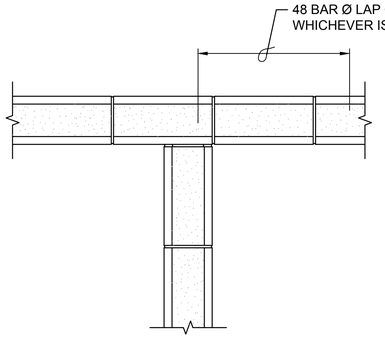
SHEET 24 OF 72

RAC # 1401800

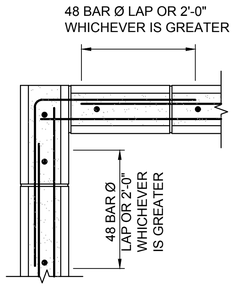
M:\2014\1401800\stru\1401800S-502.dwg 10/5/2015 11:42:57 AM Ralph Aldridge



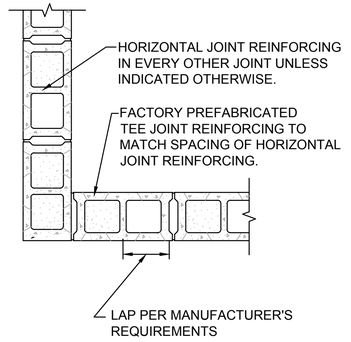
TYPICAL VERTICAL REINFORCING
FOR SINGLE AND DOUBLE STIFFENERS



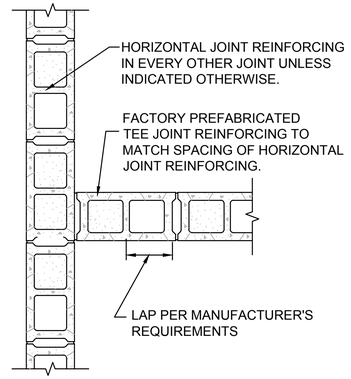
INTERSECTION OF BOND BEAM



CORNER OF BOND BEAM



CORNER OF
JOINT REINFORCING

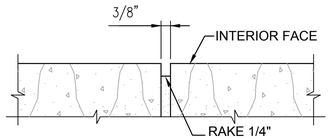


INTERSECTION OF
JOINT REINFORCING

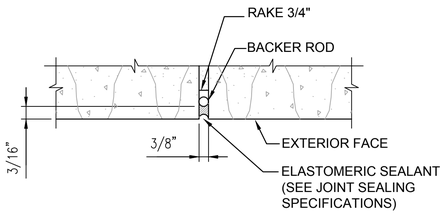
1 SECTION
Scale: N.T.S.

2 SECTION
Scale: N.T.S.

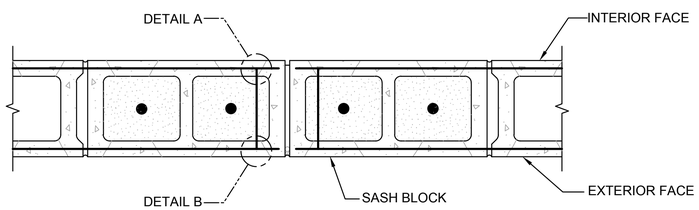
3 SECTION
Scale: N.T.S.



DETAIL A

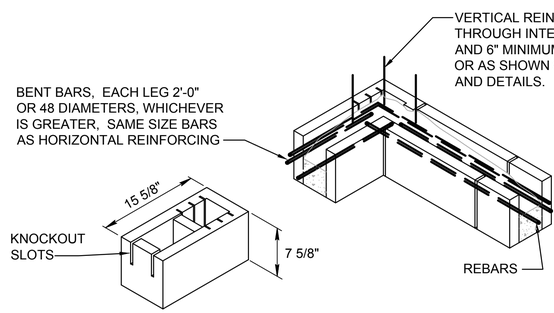


DETAIL B



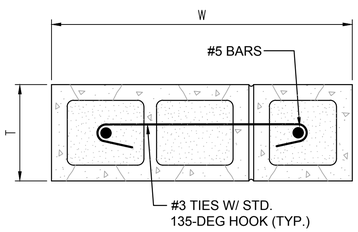
CMU CONTROL JOINT (M.C.J.)

4 SECTION
Scale: N.T.S.



BOND BEAM UNIT AT CORNER

5 SECTION
Scale: N.T.S.

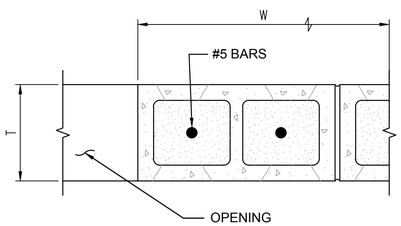


DETAIL C

REINFORCING DETAIL FOR CMU ADJACENT TO OPENINGS		
CMU WALL THICKNESS ("t")	SEE DETAIL C IF:	SEE DETAIL D IF:
8"	2'-0" ≤ w ≤ 3'-4"	w > 3'-4"

NOTE:

"W" = WIDTH OF CMU BETWEEN ADJACENT OPENINGS.
"H" = HEIGHT OF ADJACENT CMU OPENING.



DETAIL D

6 SECTION
Scale: N.T.S.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | CHECKED: HD | DRAWN: JHN | DESIGNED: HD | PROJECT NO.: 14018-20

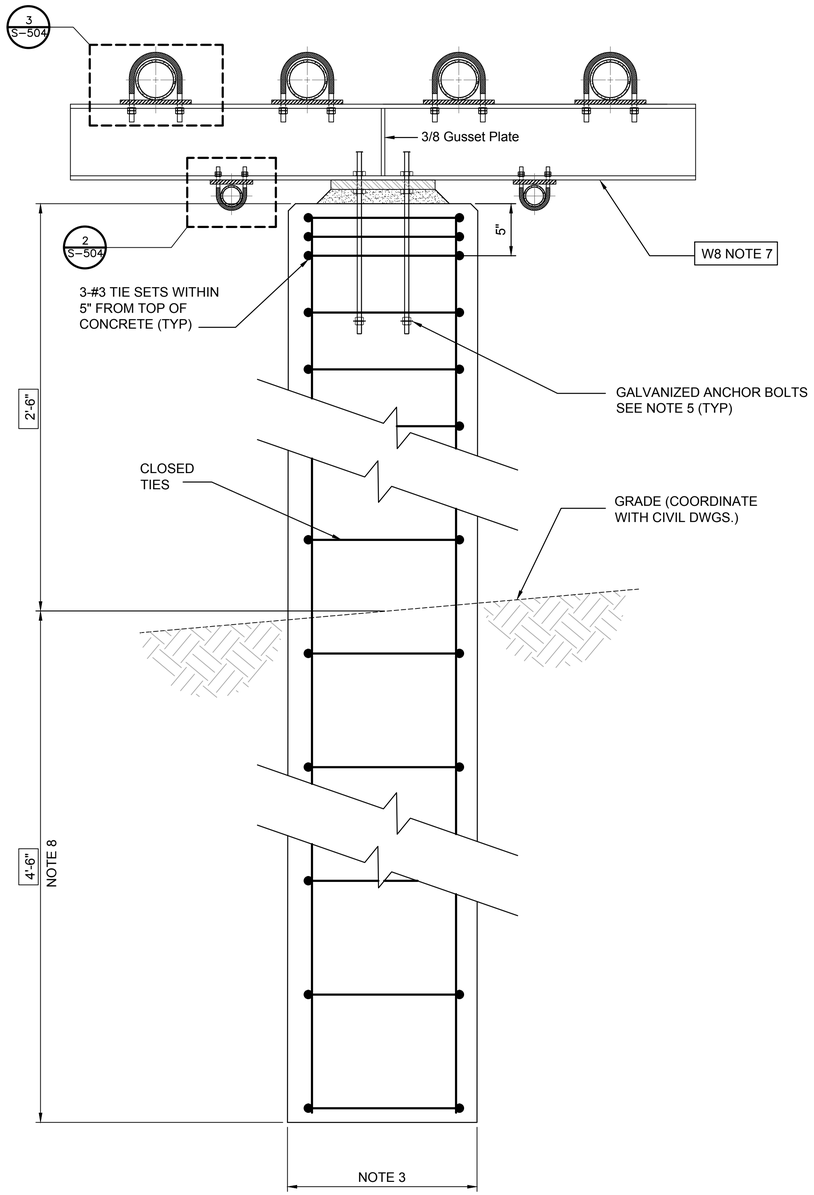
DRAWING TITLE: TYPICAL MASONRY DETAILS

DRAWING NO.: **S-503**

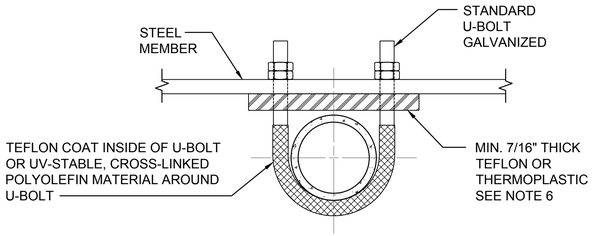
SHEET 25 OF 72

RAC # 1401800

M:\2014\1401800\stru\1401800S-503.dwg 10/5/2015 11:42:36 AM Ralph Aldridge



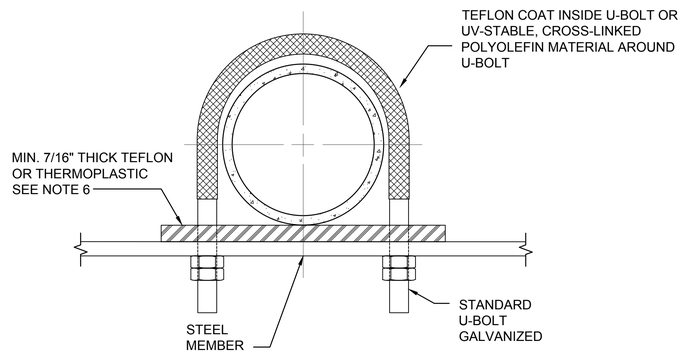
1 TYPICAL CONCRETE PIPE SUPPORT
Scale: N.T.S



2 TYPICAL 2"Ø PIPE SUPPORT
Scale: N.T.S.

NOTES TO DESIGNERS:

1. SEE GENERAL NOTES ON DWG. S-001 & s-002.
2. ▭ DENOTES APPROXIMATE DIMENSIONS AND MUST BE DESIGNED AND VERIFIED BASED ON SITE CONDITIONS, WITH MANUFACTURER, MECHANICAL, AND CIVIL DRAWING REQUIREMENTS.
3. DESIGN CIRCULAR OR SQUARE CONCRETE PIPE SUPPORT WITH REINFORCING STEEL.
4. ALL STEEL PLATES SHALL BE ASTM A36. ALL PLATES SHALL BE GALVANIZED, UON.
5. ANCHORS SHALL BE CAST-IN-PLACE. ASTM F1554 GRADE 36, POST-INSTALLED ANCHORS SHALL NOT BE USED UNLESS APPROVED BY OWNER. EMBEDMENT DEPOTS SHALL BE DETERMINED BY DESIGNER BASED ON COLUMN LOADS AND ACI-318
6. THERMOPLASTIC SIMILAR TO DEEPWATER CORROSION SERVICE INC.'S I-ROD OR EQUAL.
7. W8 I-BEAM SHALL BE DESIGNED AND HOT DIPPED GALVANIZED AFTER BOLT HOLES ARE DRILLED AND FINAL WELDING IS COMPLETED. BOLTS, WASHERS, AND NUTS SHALL ALSO BE GALVANIZED.
8. DEPTH AS REQUIRED BY DESIGN BUT NOT LESS THAN MINIMUM FROST DEPTH.
9. U-BOLTS SHALL NOT BE TIGHTENED SUCH THAT IT RESTRICTS PIPE MOVEMENT OR DAMAGES THE TEFLON COATING.



3 TYPICAL 2"-6"Ø PIPE SUPPORT
Scale: N.T.S.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | SYMBOL | DATE | BY

SEAL
PRELIMINARY
NOT FOR
CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: HD | DRAWN: JHN | CHECKED: HD | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

DRAWING TITLE: TYPICAL EXTERIOR PIPE SHOE AND ANCHOR DETAILS

DRAWING NO.: **S-504**

SHEET 26 OF 72

RAC # 1401800

M:\2014\1401800\struct\1401800S-504.dwg 10/5/2015 1:14:43 PM Ralph Aldridge

ABBREVIATIONS

-A-	
AB	ANCHOR BOLT
AC	AIR CONDITIONING
ACT	SUSPENDED ACOUSTICAL CEILING TILE
AD	AREA DRAIN OR ACCESS DOOR
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ANOD	ANODIZED
AP	ACCESS PANEL
APPAR	APPARATUS
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
ASPH	ASPHALT
-B-	
BC	BOTTOM OF CURB
BD	BOARD
BF	BOTTOM FLAT
BL	BASE LINE
BLDG	BUILDING
BLK	BLOCK
BM	BEAM OR BENCH MARK
BOD	BOTTOM OF DUCT
BOT	BOTTOM
BRG	BEARING
BRK	BRICK
BRKT	BRACKET
-C-	
C TO C	CENTER TO CENTER
C/EPOXY	CONCRETE WITH EPOXY COATING
CEM	CEMENT
CER	CERAMIC
CFCI	CONTRACTOR FURNISH, CONTRACTOR INSTALL
CH	CLEAR HEIGHT
CI	CAST IRON
CIP	CAST-IN-PLACE
CIRC	CIRCULAR
CJ	CONSTRUCTION/CONTROL JOINT
CL	CENTERLINE
CLR	CLEAR
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
COMP	COMPACT
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
CU	CONDENSING UNIT
-D-	
D	DEPTH
DBL	DOUBLE
DEMO	DEMOLISH / DEMOLITION
DF	DRINKING FOUNTAIN
DI	DRAIN INLET
DIA	DIAMETER
DIM	DIMENSION
DIR	DIRECTION
DISP	DISPENSER
DN	DOWN
DW	DRINKING WATER
DWG	DRAWING
-E-	
E	EAST
EA	EACH
EF	EACH FACE OR EXHAUST FAN
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC(AL)
ENCL	ENCLOSURE
ENGR	ENGINEER

-E- CONTINUED	
ENT	ENTRANCE
EPDM	ELASTOMETRIC ROOFING
EPX	EPOXY COATING
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
ETC	ETCETERA
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPOSED
EXPD	EXPANDED
EXT	EXTERIOR
-F-	
FACP	FIRE ALARM CONTROL PANEL
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FH	FIRE HYDRANT
FIN	FINISH
FIX	FIXTURE
FL	FLOOR
FLUOR	FLUORESCENT
FTG	FOOTING
-G-	
G	GRILLE
GA	GAGE
GALV	GALVANIZED
GB	GRADE BEAM
GEN	GENERAL
GLV	GALVANIZED
GR	GRADE
GRD	GROUND
GRTG	GRATING
GT	GATE (FENCE)
GYP	GYPSUM
GYPWB	GYPSUM WALLBOARD
-H-	
HB	HOSE BIBB
HC	HANDICAPPED
HDW	HARDWARE
HGT	HEIGHT
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
- I -	
ID	INSIDE DIAMETER
IDENT	IDENTIFICATION
INS	INSULATION
INST	INSTRUMENT
INT	INTERIOR
-J-	
JAN	JANITOR
JT	JOINT
-K-	
KP	KICKPLATE
KS	KITCHEN SINK
-L-	
LAV	LAVATORY
LNTL	LINTEL
LTG	LIGHTING
LVR	LOUVER

-M-	
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MOIST	MOISTURE
MON	MONUMENT
MOS	MOSAIC
MR	MIRROR
MS	MOP SINK
MTD	MOUNTED
MTL	METAL
-N-	
N	NORTH
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
-O-	
OC	ON CENTER
OCV	ON CENTER VERTICALLY
OD	OUTSIDE DIAMETER
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
-P-	
PASS	PASSAGE
PCB	POLYCHLORINATED BIPHENYL
PERF	PERFORATED
PH	PENTHOUSE
PKG	PARKING
PL	PLATE
PLBG	PLUMBING
PR	PAIR
PRCST	PRECAST
PREFIN	REFINISHED
PREP	PREPARATION
PRESS	PRESSURE
PROP	PROPERTY
PRST	PRESTRESSED
PT	PAINT
PVC	PROPYLENE-VINYL CHLORIDE
PVMT	PAVEMENT
PW	PASS WINDOW
-Q-	
QTY	QUANTITY
-R-	
R	RADIUS OR RISER
RD	ROOF DRAIN
REC	RECESSED
RECT	RECTANGULAR
REF	REFERENCE
REINF	REINFORCED
REQD	REQUIRED
REV	REVISION, REVISED
RGH	ROUGH
RH	RIGHT HAND
RIF	RUBBER INTERLOCKING FLOOR TILES
RLG	RAILING
RM	ROOM
RO	ROUGH OPENING
RT	RIGHT
RVS	REVERSE
-S-	
S	SOUTH
SC	SEALED CONCRETE
SCHED	SCHEDULE
SECT	SECTION
S.F.	SQUARE FOOT (FEET)
SHT	SHEET
SIM	SIMILAR
SJ	SAW-CUT JOINT
SK	SINK
SPEC	SPECIFICATIONS
SPL	SPECIAL

-S- CONTINUED	
SQ	SQUARE
SS	SERVICE SINK
SST	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUC	STRUCTURAL
SUSP	SUSPENDED
-T-	
T/	TOP
TC	TOP OF CURB
TEL	TELEPHONE
TEMP	TEMPERATURE
TER	TERRAZZO
THK	THICK / THICKNESS
THR	THRESHOLD
TOC	TOP OF CONCRETE
TOIL	TOILET
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TSW	TOP OF SIDEWALK
TTD	TOILET TISSUE DISPENSER
TYP	TYPICAL
-U-	
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UT	UTILITY
-V-	
VCT	VINYL COMPOSITION TILE
VEH	VEHICLE
VERT	VERTICAL
VEST	VESTIBULE
VTR	VENT THRU ROOF
-W-	
W	WEST
W/	WITH
W/H	WATER HEATER
W/O	WITHOUT
WC	WATER CLOSET
WD	WOOD
WDW	WINDOW
WGL	WIRE GLASS
WOM	WOMEN
WP	WEATHERPROOF
WT	WEIGHT
WWF	WELDED WIRE FABRIC

NOTE: ABBREVIATIONS LISTED ARE STANDARD ABBREVIATIONS. ALL ABBREVIATIONS LISTED MAY NOT APPEAR THROUGHOUT THE DRAWINGS.

GENERAL NOTES

1. ALL WORK DESCRIBED IN THE DOCUMENTS SHALL BE PERFORMED IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND CONSTRUCTED IN COMPLIANCE WITH THE CURRENT EDITION OF ALL APPLICABLE BUILDING CODES.
2. CONTRACTOR SHALL VERIFY EXISTING DIMENSIONS, ELEVATIONS AND SITE CONDITIONS PRIOR TO START OF WORK. FOR ANY DISCREPANCIES FOUND OR CLARIFICATIONS REQUIRED, NOTIFY THE ARCHITECT/ENGINEER PRIOR TO COMMENCING WORK.
3. ANY DISTURBANCES OF EXISTING APPURTENANCES ARE TO BE COORDINATED WITH THE RESPECTIVE UTILITY COMPANY.
4. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS THAT ARE PERTINENT TO THE PROJECT.

STANDARD GRAPHICS AND SYMBOLS

(101) DOOR NUMBER

ELECTRICAL ROOM 105 — SPACE LABEL AND NUMBER

(W01) WINDOW SYMBOL

CODES, RELATED DESIGN CRITERIA, OR TECHNICAL GUIDES TO BE USED AS PART OF THIS STANDARD:

THE FOLLOWING IS A PARTIAL LIST OF APPLICABLE DESIGN GUIDES, STANDARD CRITERIA OR CODES THAT MAY APPLY TO ONE OR MORE AREAS OF THE SERVICE STATION DESIGN STANDARD DOCUMENTS. DESIGNER IS TO REVIEW THE MOST RECENT VERSION OF STANDARDS, AND APPLY AS APPLICABLE. THIS LIST IS NOT INTENDED TO BE EXHAUSTIVE, DESIGNER IS TO REVIEW AND APPLY ALL APPLICABLE CODES AND STANDARDS.

BUILDING:	INTERNATIONAL BUILDING CODE (IBC)
LIFE SAFETY:	LIFE SAFETY CODE (LSC)
ENERGY:	ASHRAE 90.1
ACCESSIBILITY:	ARCHITECTURAL BARRIERS ACT (ABA) ACCESSIBILITY STANDARD FOR DEPARTMENT OF DEFENSE FACILITIES
UFC 1-200-01	GENERAL BUILDING REQUIREMENTS
UFC 3-101-01	ARCHITECTURE

BASE/FACILITY ARCHITECTURE DESIGN GUIDE

GENERAL NOTES TO DESIGNER:

1. THE ARCHITECT OF RECORDED SHALL PROVIDE A COMPLETE DESIGN FOR ALL WORK. THE STANDARDS PROVIDED IN THESE DOCUMENTS SHALL BE USED ONLY AS A GUIDE.

SPECIFICATIONS TO BE USED AS PART OF THIS STANDARD:

SPECIFICATIONS TO BE EDITED BY FINAL DESIGNER, AND ALL SECTIONS MAY NOT BE APPLICABLE TO EACH PROJECT. APPLY AND EDIT SPECS AS APPROPRIATE FOR EACH PROJECT. OTHER SECTIONS OF UFGS GUIDE SPECIFICATIONS MAY BE REQUIRED FOR INDIVIDUAL PROJECTS. PROVIDE AND EDIT THOSE SPECIFICATIONS AS NECESSARY.

04 20 00	MASONRY
06 10 00	ROUGH CARPENTRY
07 21 13	BOARD AND BLOCK INSULATION
07 21 16	MINERAL FIBER BLANKET INSULATION
07 22 00	ROOF AND DECK INSULATION
07 60 00	FLASHING AND SHEET METAL
07 61 14.00 20	STEEL STANDING SEAM ROOFING
07 92 00	JOINT SEALANTS
08 11 13	STEEL DOORS AND FRAMES
08 51 13	ALUMINUM WINDOWS
08 71 00	DOOR HARDWARE
08 81 00	GLAZING
09 22 00	SUPPORTS FOR PLASTER AND GYPSUM BOARD
09 29 00	GYPSUM BOARD
09 65 00	RESILIENT FLOORING
09 90 00	PAINTS AND COATINGS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: AQF | DRAWN: RLA | CHECKED: JBF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

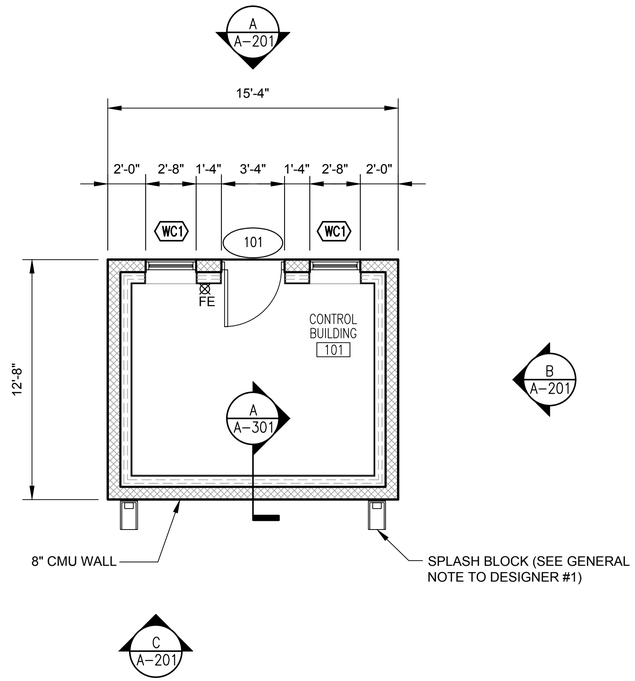
PROJECT NO.: 14018-20

DRAWING TITLE: GENERAL INFORMATION

DRAWING NO.: **A-001**

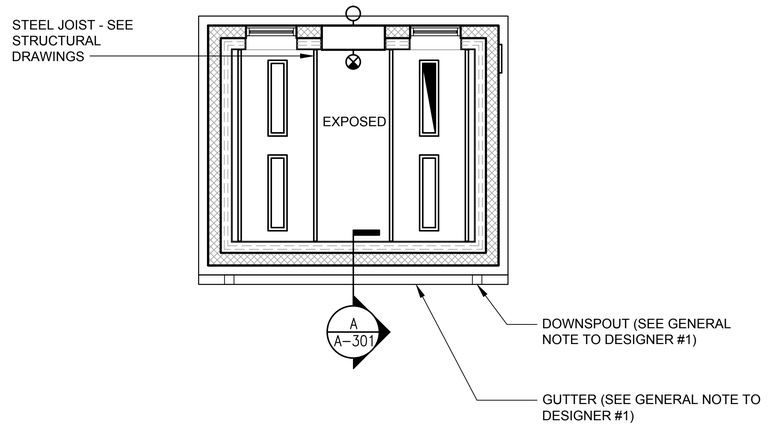
SHEET 27 OF 72

RAC # 1401800



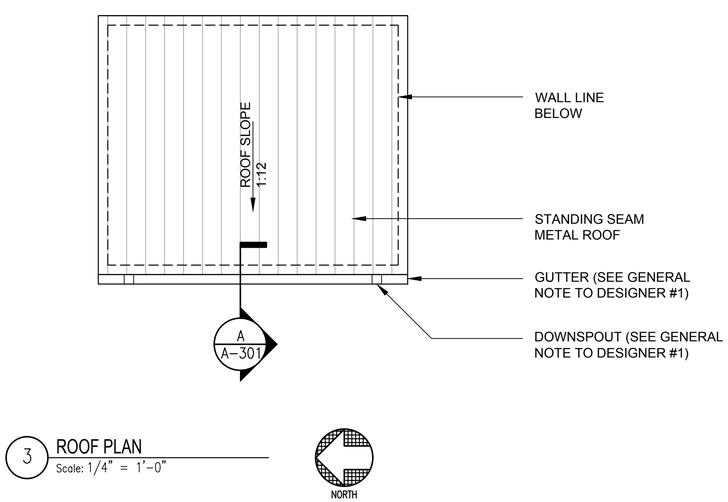
1 FLOOR PLAN
Scale: 1/4" = 1'-0"

NORTH



2 REFLECTED CEILING PLAN
Scale: 1/4" = 1'-0"

NORTH



3 ROOF PLAN
Scale: 1/4" = 1'-0"

NORTH

FLOOR PLAN LEGEND:

- CMU WALL
- GYPSUM WALL BOARD FURRING

REFLECTED CEILING KEY PLAN:

ELECTRICAL:

- LED LIGHT FIXTURE - 1'-0" X 4'-0"
- LED LIGHT FIXTURE (EMERGENCY) - 1'-0" X 4'-0"
- EXTERIOR LIGHT FIXTURE
- EXIT LIGHT FIXTURE

GENERAL NOTE TO DESIGNER:

1. DESIGNER SHALL REFER TO BASE / FACILITY ARCHITECTURAL DESIGN GUIDE TO DETERMINE IF GUTTERS AND DOWNSPOUTS ARE INSTALLED ON BUILDINGS.

SCALE

4' 2' 0 4' 8'

1/4" = 1'- 0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: AQF | DRAWN: RLA | CHECKED: JBF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO. 14018-20

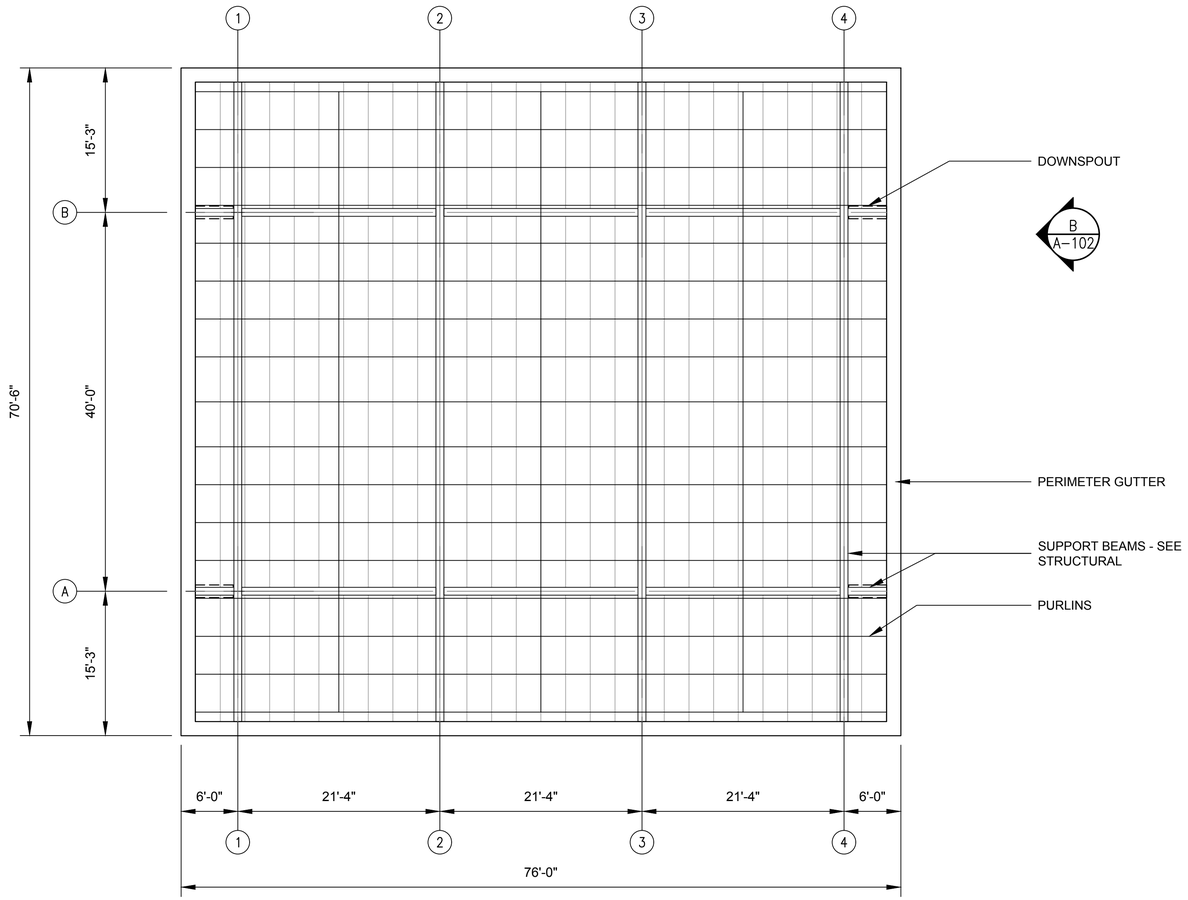
DRAWING TITLE: CONTROL BUILDING PLANS

DRAWING NO. A-101

SHEET 28 OF 72

RAC # 1401800

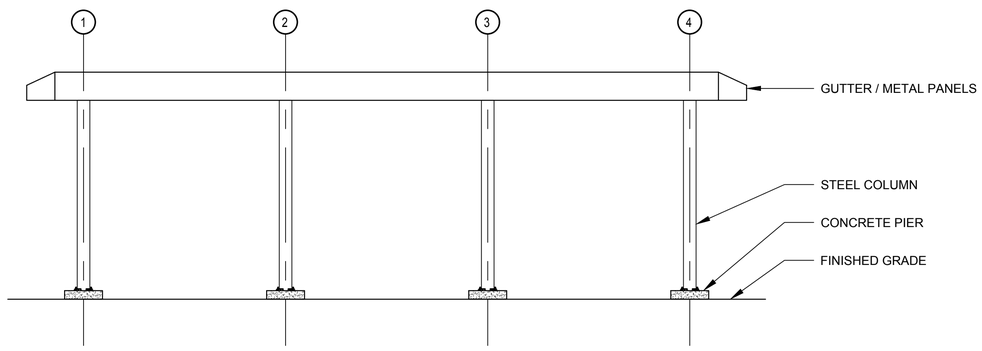
M:\2014\1401800\arch\1401800A-101.dwg 10/5/2015 11:32:09 AM Ralph Aldridge



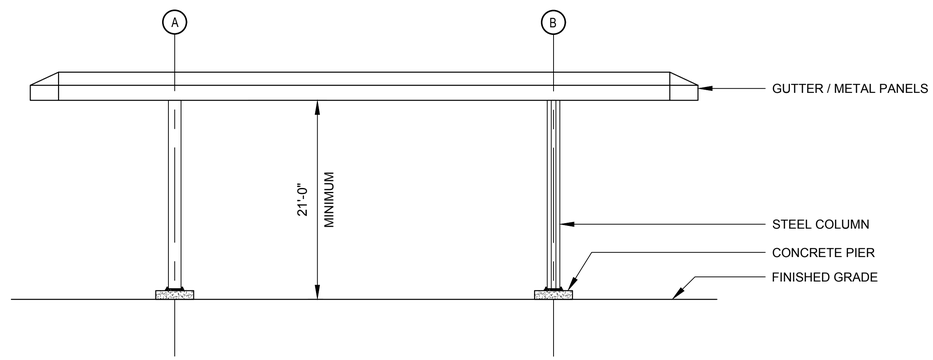
1 ROOF PLAN
Scale: 1/8" = 1'-0"

NORTH

A
A-102



A SIDE ELEVATION
Scale: 1/8" = 1'-0"



B FRONT ELEVATION
Scale: 1/8" = 1'-0"

GENERAL NOTE TO DESIGNER:

1. CANOPY PLAN AND ELEVATION PROVIDED FOR GENERAL DESIGN PURPOSES ONLY. THE FULL CANOPY DESIGN AND INSTALLATION SHALL BE PROVIDED BY CANOPY MANUFACTURER.
2. DESIGNER SHALL REFER TO BASE / FACILITY ARCHITECTURAL DESIGN GUIDE TO DETERMINE IF GUTTERS AND DOWNSPOUTS ARE INSTALLED ON BUILDINGS AND OTHER STRUCTURES

SCALE
8' 4' 0 8' 16'
1/8" = 1'- 0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

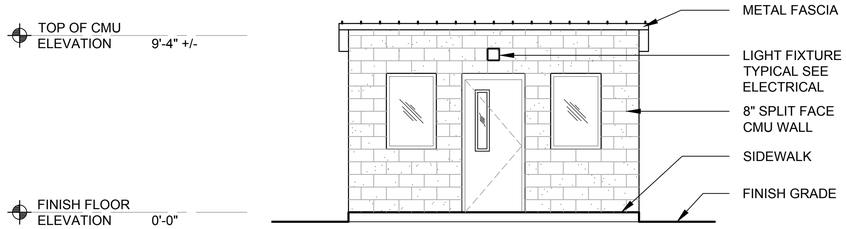
DESIGNED: AQF
DRAWN: RLA
CHECKED: JBF
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
PROJECT NO.: 14018-20
DRAWING TITLE: DISPENSER ISLAND CANOPY PLAN AND ELEVATIONS

DRAWING NO.
A-102

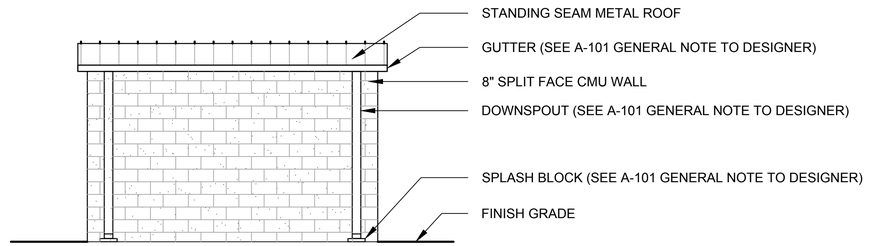
SHEET 29 OF 72

RAC # 1401800

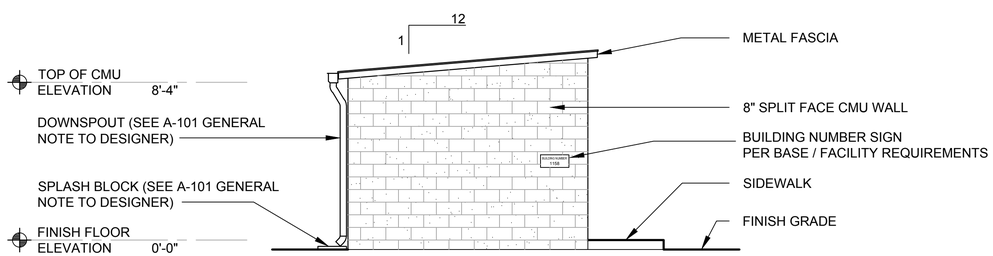
M:\2014\1401800\arch\1401800A-102.dwg 10/5/2015 11:32:25 AM Ralph Aldridge



A EAST - ELEVATION
Scale: 1/4" = 1'-0"



C WEST - ELEVATION
Scale: 1/4" = 1'-0"



B SOUTH - ELEVATION (NORTH ELEVATION SIMILAR)
Scale: 1/4" = 1'-0"

SCALE

1/4" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

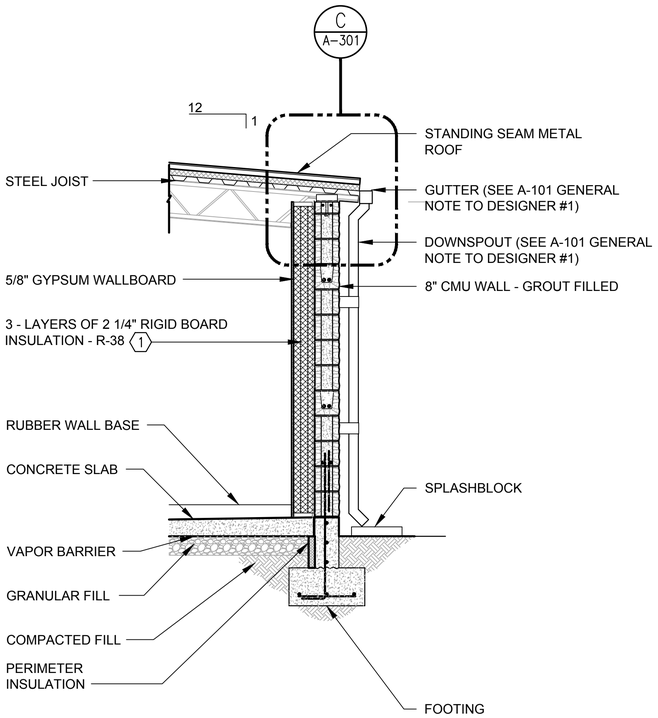
PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: AOF
DRAWN: RLA
CHECKED: JBF
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
PROJECT NO.: 14018-20
DRAWING TITLE: CONTROL BUILDING ELEVATIONS

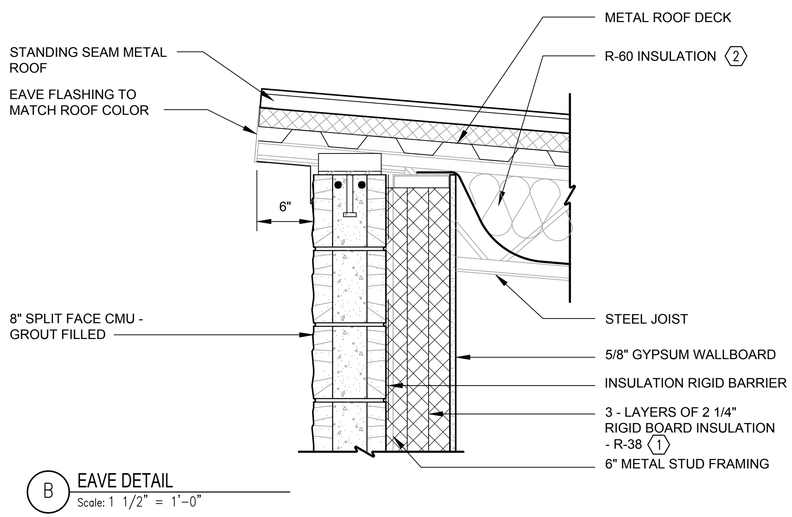
DRAWING NO.: **A-201**

SHEET 30 OF 72

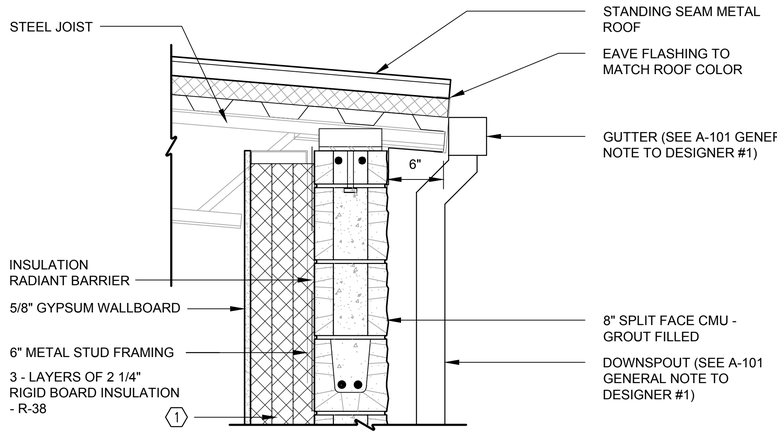
RAC # 1401800



A WALL SECTION
Scale: 1/2" = 1'-0"



B EAVE DETAIL
Scale: 1 1/2" = 1'-0"



C EAVE DETAIL
Scale: 1 1/2" = 1'-0"

WALL SECTION AND DETAILS KEYNOTES:

1 R-38 IS DETERMINED BASED ON THE TOTAL WALL ASSEMBLY.;
- 8" CMU, FULL GROUTED, 2 1/4" RIGID INSULATION = R-13
- 2 - LAYERS 2 1/4" RIGID INSULATION = R-26 (R-13 EACH LAYER).

2 PROVIDE COMBINATION OF RIGID AND BATT INSULATION FOR TOTAL R-60 INSULATION VALUE.

GENERAL NOTE TO DESIGNER:

1. DESIGNER SHALL PROVIDE DESIGN OF WALL AND ROOF R-VALUES ON AN INDIVIDUAL PROJECT BASIS. AT A MINIMUM. DESIGNER SHALL REFER TO DLA ENERGY DESIGN REQUIREMENTS.

SCALE

12" 9" 6" 3" 0 1'
1 1/2" = 1'- 0"

12" 6" 0 1' 2' 3' 4' 5'
1/2" = 1'- 0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED AQF | DRAWN RLA | CHECKED JBF | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

DRAWING TITLE: WALL SECTIONS AND DETAILS

DRAWING NO. **A-301**

SHEET 31 OF 72

RAC # 1401800

M:\2014\1401800\arch\1401800A-301.dwg 10/5/2015 11:33:04 AM Ralph Aldridge

DOOR SCHEDULE

101 OPENING	DOOR DATA						FRAME DATA			DETAIL			MISCELLANEOUS		REMARKES
	TYPE	WIDTH	HEIGHT	MATERIAL	FINISH	GLASS	TYPE	MATERIAL	FINISH	HEAD	JAMB	SILL	FIRE LABEL	HDWR SET	
101	SL	3'-0"	7'-0"	HM	PT	GL - 1	1	HM	PT	-	-	-		-	-

DOOR TYPE DESIGNATION:

SL SIDE LIGHT

ABBREVIATIONS:

HM HOLLOW METAL
PT PAINT

FINISH SCHEDULE

ROOM NUMBER	SPACE NAME	FLOOR		BASE	NORTH WALL		SOUTH WALL		EAST WALL		WEST WALL		CEILING			REMARKES
		MATERIAL	FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	HEIGHT	
101	CONTROL BUILDING	CONC	VCT	RB	GWB	PT	GWB	PT	GWB	PT	GWB	PT	EXP	PT	VARIES	-

SCHEDULE ABBREVIATIONS:

CONC	CONCRETE	MATL	MATERIAL
EXP	EXPOSED	MMF	MANUFACTURE'S FINISH
GWB	GYPSUM WALLBOARD	MTL	METAL
PT	PAINT		
RB	RUBBER BASE		
VCT	VINYL COMPOSITE TILE		

WINDOW SCHEDULE

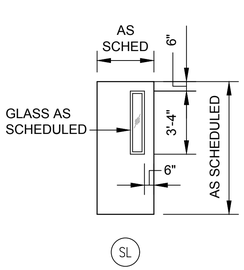
W01 WINDOW NUMBER	WINDOW			FRAME DATE		DETAIL			REMARKES
	WIDTH	HEIGHT	GLASS	MATERIAL	FINISH	HEAD	SILL	JAMB	
WP1	2'-8"	4'-8"	GL - 1	ALUM	MMF	-	-	-	

SCHEDULE ABBREVIATIONS:

ALUM ALUMINUM MMF MANUFACTURER FINISH

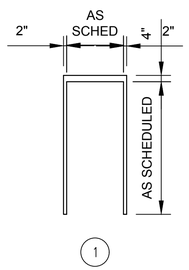
GLASS SCHEDULE

FUELING STATION CONTROL BUILDING	
GL-1	1" INSULATING GLASS



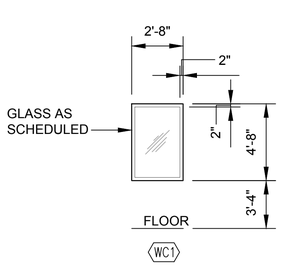
DOOR TYPE

NOT TO SCALE



DOOR FRAME TYPE

NOT TO SCALE



WINDOW TYPE

NOT TO SCALE

FINISH MATERIALS AND COLOR SELECTION:

1. FINISH MATERIALS. ALL FINISH MATERIALS SHALL BE SELECTED IN ACCORDANCE WITH BASE / FACILITY ARCHITECTURAL DESIGN GUIDE.
2. COLORS. ALL COLORS SHALL BE SELECTED IN ACCORDANCE WITH BASE / FACILITY ARCHITECTURAL DESIGN GUIDE.

DOOR HARDWARE:

1. 3 BUTT HINGES (HEAVY DUTY)
2. STOREROOM LOCK
3. CLOSURE
4. THRESHOLD
5. WEATHER - STRIPPING
6. DRIP CAP

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: AQF | DRAWN: RLA | CHECKED: JBF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

DRAWING TITLE: OPENING AND FINISH SCHEDULES

DRAWING NO.: **A-601**

SHEET 32 OF 72

RAC # 1401800

MECHANICAL ABBREVIATIONS

AAV	AUTOMATIC AIR VENT
AE	AIR ELIMINATOR
AFF	ABOVE FINISHED FLOOR
AG	ABOVEGROUND
ATG	AUTOMATIC TANK GAUGE
BS	BASKET STRAINER
BV	BYPASS VALVE
CL OR C/L	CENTERLINE
CS	CARBON STEEL
CV	NON-SURGE CHECK VALVE W/ RATE OF FLOW CONTROLLER
DP	DISPENSER PUMP
DP GAUGE	DIFFERENTIAL PRESSURE GAUGE
ESO	EMERGENCY SHUT-OFF
FCV	FLOW CONTROL VALVE
FT	FEET
GPM	GALLONS PER MINUTE
HHLA	HIGH-HIGH LEVEL ALARM
HLA	HIGH LEVEL ALARM
HLV	HIGH LIQUID LEVEL SHUT-OFF VALVE
HPV	HIGH POINT VENT
IF	INSULATING FLANGE
IP	ISSUE PUMP
LLA	LOW LEVEL ALARM
LLLA	LOW-LOW LEVEL ALARM
LPD	LOW POINT DRAIN
MAV	MANUAL AIR VENT
MIN	MINIMUM
NO	NORMALLY OPEN
NC	NORMALLY CLOSED
NTS	NOT TO SCALE
OP	OFFLOAD PUMP
PDCV	PUMP DISCHARGE CONTROL VALVE
PDMO	POSITIVE DISPLACEMENT METER OFFLOAD
PDML	POSITIVE DISPLACEMENT METER LOADING
PRT	PRODUCT RECOVERY TANK
PS	PIPE SUPPORT
PV	PRESSURE-VACUUM
RTB	RETURN TO BULK
SFI	SIGHT FLOW INDICATOR
SS	STAINLESS STEEL
TLCV	TRUCK LOADING CONTROL VALVE
TRV	THERMAL RELIEF VALVE
TYP	TYPICAL
UG	UNDERGROUND
W/	WITH
WC	WATER COLUMN

MECHANICAL LEGEND

- NEW ABOVEGROUND PIPING
- NEW UNDERGROUND PIPING
- EXISTING ABOVEGROUND PIPING
- EXISTING UNDERGROUND PIPING
- CAP
- CONNECTOR
- BALL VALVE
- BALL VALVE, FULL PORT
- GLOBE VALVE
- PLUG VALVE (DBB VALVE)
- CHECK VALVE
- NEEDLE VALVE
- LIMIT SWITCH
- DIAPHRAGM STYLE CONTROL VALVE
- SOLENOID-CONTROLLED ANTI-SIPHON VALVE
- FIRE-SAFE BALL VALVE W/ FUSIBLE LINK CLOSURE
- FLEXIBLE CONNECTION
- SAMPLE CONNECTION
- INSULATING FLANGE
- SIGHT FLOW INDICATOR
- THERMAL RELIEF VALVE
- LINE SIZE REDUCER
- MANUAL AIR VENT
- WYE STRAINER
- PRESSURE GAUGE
- FLOW SWITCH
- CLEAN OUT
- CONNECTION TO EXISTING
- LIQUID LEVEL INDICATOR
- METER
- AG TO UG PIPING TRANSITION

SPECIFICATIONS TO BE USED AS PART OF THIS STANDARD:

(TO BE EDITED BY FINAL DESIGNER)

09 97 13.15	EPOXY / FLUOROPOLYURETHANE INTERIOR COATING OF WELDED STEEL PETROLEUM FUEL TANKS
09 97 13.27	EXTERIOR COATING OF STEEL STRUCTURES
22 00 00	PLUMBING, GENERAL PURPOSE
23 82 02.00 10	UNITARY HEATING AND COOLING EQUIPMENT
23 05 93	TESTING, ADJUSTING, AND BALANCING FOR HVAC
33 08 55	COMMISSIONING OF FUEL FACILITY SYSTEMS
33 52 10	SERVICE PIPING, FUEL SYSTEMS
33 52 43	AVIATION FUEL DISTRIBUTION (NON-HYDRANT)
33 52 43.14	AVIATION FUEL CONTROL VALVES
33 52 80	LIQUID FUELS PIPELINE COATING SYSTEMS
33 52 90.00 20	WELDING FOR POL SERVICE PIPING
33 56 10	FACTORY-FABRICATED FUEL STORAGE TANKS
33 57 00	BULK FUEL RECEIVING/DISPENSING EQUIPMENT
33 58 00	LEAK DETECTION FOR FUELING SYSTEMS

GENERAL NOTES:

1. ALL NEW ABOVEGROUND FUEL PIPING SHALL BE UNLINED SINGLE WALL CARBON STEEL MATERIAL WITH EXTERIOR COATINGS. PROVIDE PIPE PROTECTION FROM ACCIDENTAL DAMAGE, VANDALISM, ETC.
2. UNDERGROUND PIPING TO DISPENSERS SHALL BE FUEL-RESISTANT, FLEXIBLE DOUBLE WALL HDPE / PLASTIC MATERIAL.
3. UNDERGROUND PIPING TO TRUCK FILLSTAND SHALL BE DOUBLE WALL CARBON STEEL MATERIAL. CARRIER PIPING SHALL BE EXTERIOR COATED AND CONTAINMENT PIPING SHALL BE EXTERIOR COATED AND CATHODICALLY PROTECTED.
4. ENSURE ALL E-85 SYSTEM COMPONENTS (INCLUDING DISPENSERS) ARE FULLY COMPATIBLE WITH E-85 FUEL.
5. ALL ABOVEGROUND PIPELINES AND TANKS SHALL BE IDENTIFIED AS TO PRODUCT SERVICE BY COLOR CODING, BANDING, PRODUCT NAMES, NATO DESIGNATION AND DIRECTION OF FLOW IN ACCORDANCE WITH MIL-STD-161.
6. PROVIDE COMPLETE EXTERIOR TANK COATINGS PER SPECIFICATION SECTION 09 97 13.27.
7. PROVIDE INTERIOR COATINGS FOR ALL TANKS EXCEPT THE E-85 TANK PER SPECIFICATION SECTION 09 97 13.15. DO NOT COAT E-85 TANK INTERIOR SURFACE.

CONTROLS SUMMARY (ABOVEGROUND STORAGE TANKS):

1. EACH TANK WILL HAVE A COMBINATION GAUGING / LEVEL ALARM / LEAK DETECTION SYSTEM (VEEDER ROOT OR RONAN TYPE, OR PER CURRENT DLA DIRECTION). ATG SIGNALS FOR ALL TANKS WILL GO TO THE MAIN CONTROL PANEL IN THE CONTROL BUILDING.
2. EACH TANK'S GAUGING UNIT WILL HAVE FOUR LEVEL ALARM SETPONITS, WIRED TO THE MAIN CONTROL PANEL IN THE CONTROL BUILDING. ALL FOUR SETPOINTS WILL ACTIVATE AN AUDIBLE AND VISUAL ALARM AT THE PANEL AND ON THE EXTERIOR OF THE CONTROL BUILDING TO NOTIFY OPERATORS OF A PROBLEM. IN ADDITION, THE LOW-LOW ALARM WILL STOP THE DISPENSER PUMP IN THE ASSOCIATED TANK, AND THE HIGH-HIGH ALARM WILL STOP THE ASSOCIATED OFFLOAD PUMP.
3. EACH TANK WILL HAVE AN INTERSTITIAL LEAK DETECTION SENSOR, WIRED TO THE MAIN CONTROL PANEL. THERE WILL ALSO BE LEAK DETECTION SENSORS IN THE SUMPS OF EACH OF FOUR DISPENSERS AND IN THE TRANSITION SUMP. ACTIVATION OF ANY OF THESE LEAK DETECTION SENSORS WILL ACTIVATE AN AUDIBLE AND VISUAL ALARM AT THE PANEL AND ON THE EXTERIOR OF THE CONTROL BUILDING.
4. THE MAIN CONTROL PANEL WILL BE CAPABLE OF IDENTIFYING DISTINCT ALARMS FROM VARIOUS TANK AND SUMP DEVICES.
5. EACH DISPENSER PUMP WILL INCLUDE A NORMALLY-CLOSED SOLENOID VALVE AT ITS OUTLET (ONLY OPENS WHEN THE ASSOCIATED PUMP IS OPERATING).
6. EACH OFFLOAD PUMP WILL INCLUDE STANDARD START/STOP CONTROLS AND ALSO A FLOW SWITCH (WITH ADJUSTABLE TIME-DELAY RELAY) TO STOP THE PUMP UPON A NO-FLOW CONDITION.
7. THE CONTRACTOR WILL PROVIDE THE REQUIRED CONDUIT AND PULL WIRES ASSOCIATED WITH THE DISPENSER INTERFACE UNIT (TYPICALLY INSTALLED / FUNDED BY OTHERS).
8. THE CONTRACTOR SHALL PROVIDE 10-WEEK NOTICE TO GOVERNMENT PERSONNEL PRIOR TO COMPLETION TO ALLOW SCHEDULING OF THE INSTALLATION OF THE DISPENSER CONTROL UNITS AT THE END OF THE PROJECT.

CONTROLS SUMMARY (UNDERGROUND STORAGE TANKS):

1. EACH TANK WILL HAVE A COMBINATION GAUGING / LEVEL ALARM / LEAK DETECTION SYSTEM (VEEDER ROOT OR RONAN TYPE, OR PER CURRENT DLA DIRECTION). ATG SIGNALS FOR ALL TANKS WILL GO TO THE MAIN CONTROL PANEL IN THE CONTROL BUILDING.
2. EACH TANK'S GAUGING UNIT WILL HAVE FOUR LEVEL ALARM SETPOINTS, WIRED TO THE MAIN CONTROL PANEL IN THE CONTROL BUILDING. ALL FOUR SETPOINTS WILL ACTIVATE AN AUDIBLE AND VISUAL ALARM AT THE PANEL AND ON THE EXTERIOR OF THE CONTROL BUILDING TO NOTIFY OPERATORS OF A PROBLEM. IN ADDITION, THE LOW-LOW ALARM WILL STOP THE DISPENSER PUMP IN THE ASSOCIATED TANK.
3. EACH TANK WILL HAVE AN INTERSTITIAL LEAK DETECTION SENSOR, WIRED TO THE MAIN CONTROL PANEL. THERE WILL ALSO BE LEAK DETECTION SENSORS IN THE SUMPS OF EACH OF FOUR DISPENSERS AND IN THE TANK SUMPS. ACTIVATION OF ANY OF THESE LEAK DETECTION SENSORS WILL ACTIVATE AN AUDIBLE AND VISUAL ALARM AT THE PANEL AND ON THE EXTERIOR OF THE CONTROL BUILDING.
4. THE MAIN CONTROL PANEL WILL BE CAPABLE OF IDENTIFYING DISTINCT ALARMS FROM VARIOUS TANK AND SUMP DEVICES.
5. THE CONTRACTOR WILL PROVIDE THE REQUIRED CONDUIT AND PULL WIRES ASSOCIATED WITH THE DISPENSER INTERFACE UNIT (TYPICALLY INSTALLED / FUNDED BY OTHERS).
6. THE CONTRACTOR SHALL PROVIDE 10-WEEK NOTICE TO GOVERNMENT PERSONNEL PRIOR TO COMPLETION TO ALLOW SCHEDULING OF THE INSTALLATION OF THE DISPENSER CONTROL UNITS AT THE END OF THE PROJECT.

DESIGNER NOTES:

GENERAL:

1. THIS MILITARY SERVICE STATION STANDARD IS BASED ON TYPICAL 12,000 GALLON TANK SIZES FOR GASOLINE, E-85, DIESEL AND BIODIESEL FUELS. SUGGESTED SITE LAYOUTS ARE PROVIDED FOR ABOVEGROUND AND UNDERGROUND STORAGE TANKS. AN OPTIONAL HIGH-FLOW TRUCK FILLSTAND FACILITY IS ALSO INCLUDED. THE FINAL DESIGNER SHOULD FOLLOW THE SPECIFIC PROJECT PROGRAMMING / SCOPING DOCUMENTS TO INCLUDE THE REQUIRED FUEL PRODUCTS, TANK SIZING, TANK TYPE, AND ALL ASSOCIATED FEATURES, MODIFIED TO SUIT THE ACTUAL PROJECT SITE CONDITIONS.
2. STANDARD SYSTEM COMPONENTS AND FEATURES ARE INCLUDED HEREIN, SUITABLE FOR A TYPICAL "CONUS" PROJECT LOCATION. FINAL DESIGNER SHALL INVESTIGATE AND INCLUDE ALL REQUIRED PROJECT FEATURES TO MEET LOCAL / STATE / HOST NATION CODES AND REGULATIONS (INCLUDING ANY STAGE II VAPOR RECOVERY REQUIREMENTS).
3. FOR AVIATION-GRADE FUEL PROVIDE API 1581 TYPE FILTER / SEPARATORS FOR FUEL RECEIPT AT THE OFFLOAD PAD AND ALSO AT THE TRUCK FILLSTANDS WITH DOWNSTREAM STAINLESS STEEL / INTERIOR EPOXY COATED CARBON STEEL PIPING AS PART OF THE FILLSTAND EQUIPMENT.
4. TRUCK FILLSTAND FUNCTION MAY BE DELETED PER PROGRAMMING / SCOPING DOCUMENTS. IN THIS CASE DELETE THE APPROPROATE ISSUE PUMP, PIPING, LOADING EQUIPMENT, TRUCK SPILL CONTAINMENT, EYEWASH STATION / PIPING, AND ALL ASSOCIATED COMPONENTS AND CONTROLS.

STORAGE TANKS:

1. ABOVEGROUND STORAGE TANKS SHALL BE THE "PROTECTED" UL 2085 TYPE, UNLESS OTHERWISE DIRECTED BY SERVICE HEADQUARTERS. IF SINGLE WALL TANKS (OR DOUBLE WALL TANKS LARGER THAN ALLOWED BY NFPA 30) ARE PROGRAMMED, ENSURE ALL REQUIRED TANK SPILL CONTAINMENT IS PROVIDED.
2. UNDERGROUND STORAGE TANKS MAY BE DOUBLE WALL STEEL PER UL 58 OR DOUBLE WALL FRP PER UL 1316, UNLESS OTHERWISE DIRECTED BY SERVICE HEADQUARTERS.
3. ENSURE COMPLETE EXTERIOR AND INTERIOR COATINGS ARE PROVIDED FOR ALL STEEL TANKS (DO NOT INTERIOR COAT E-85 TANKS).
4. FINAL DESIGNERS SHALL INCLUDE UFGS 09 97 13.15 AND 09 97 13.27 FOR TANK INTERIOR AND EXTERIOR COATINGS, RESPECTIVELY. THESE SPECS SHOULD BE EDITED / SIMPLIFIED TO ALLOW IN-SHOP COATING OPERATIONS, WITH ASSOCIATED RELAXATION OF APPLICATION, INSPECTION AND ABRASIVE BLASTING QUALIFICATIONS.
5. COORDINATE WITH LOCAL PERSONNEL IN CHARGE OF FACILITY NUMBERING FOR PROPER TANK NUMBERING AND IDENTIFICATION. SEE THE TANK MARKING DETAIL INCLUDED HEREIN.
6. PROVIDE INDEPENDENT TANK LEVEL ALARM AND ATG SYSTEMS FOR TANKS LARGER THAN 30,000 GALLONS, INSTEAD OF THE COMBINATION TYPE SHOWN HEREIN.
7. PROVIDE ADEQUATE GROUNDING OF ALL ABOVEGROUND TANKS PER DETAILS AND REQUIREMENTS ON ELECTRICAL DRAWINGS.

PIPING:

1. ENSURE DOUBLE WALL STEEL UNDERGROUND PIPING IS PROVIDED WITH EXTERIOR COATINGS AND CATHODIC PROTECTION.
2. IN AREAS OF HIGH CORROSION POTENTIAL, STAINLESS STEEL MATERIAL SHOULD BE CONSIDERED FOR ALL SMALL-BORE PIPING. FINAL DESIGNERS SHOULD MODIFY THE PIPING NOTES AND DETAILS ACCORDINGLY TO INDICATE THIS PIPE MATERIAL.
3. ENSURE UFGS 33 52 10 INCLUDES THE DISPENSER ISSUE PIPING (FUEL RESISTANT, FLEXIBLE DOUBLE WALL HDPE / PLASTIC MATERIAL).
4. RELIEF VALVES SHALL BE PROVIDED AT EACH LOCATION WHERE SEGMENTS OF PIPE CAN BE ISOLATED BY VALVING OR BLINDING. UTILIZE BALANCED TYPE RELIEF VALVES AS REQUIRED TO PREVENT EXCESSIVE "CASCADING" PRESSURES.
5. PROVIDE MANUAL AIR VENTS AND LOW POINT DRAINS AS REQUIRED TO ENSURE COMPLETE DRAINAGE AND COMPLETE AIR VENTING OF FUEL PIPING.
6. PIPE STRESS ANALYSIS: BASED ON FINAL ABOVEGROUND PIPING CONFIGURATIONS, ENSURE THAT NO EXCESSIVE PIPE STRESSES WILL BE CREATED DUE TO THERMAL EXPANSION. PROVIDE PIPE OFFSETS, EXPANSION LOOPS OR OTHER FEATURES AS REQUIRED. BELLOWS ARE NOT ACCEPTABLE.
7. PROVIDE ADEQUATE PIPE SUPPORTS FOR ALL ABOVEGROUND PIPING RUNS PER DETAILS ON DRAWING M-504A.
8. PROVIDE ADEQUATE GROUNDING OF ALL ABOVEGROUND PIPING AND EQUIPMENT PER DETAILS AND REQUIREMENTS ON ELECTRICAL DRAWINGS.

EQUIPMENT:

1. ENSURE UFGS 33 52 10 INCLUDES SELF-PRIMING CENTRIFUGAL PUMPS FOR TRUCK OFFLOADING OPERATIONS.
2. ENSURE UFGS 33 52 10 INCLUDES A TANK OVERFILL VALVE WHICH IS SUITABLE FOR PUMPED FUEL RECEIPT.
3. ENSURE UFGS 33 52 10 INCLUDES A SOLENOID-CONTROLLED ANTI-SIPHON VALVE FOR ABOVEGROUND TANK SYSTEMS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED MLS | DRAWN MLS | CHECKED MHF | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

DRAWING TITLE: FUEL SYSTEM LEGEND, ABBREVIATIONS AND GENERAL NOTES

DRAWING NO. M-001

SHEET 33 OF 72

RAC # 1401800

OFFLOAD EQUIPMENT PAD AREA
(SIMILAR EQUIPMENT FOR EACH PRODUCT)

FOR OFFLOAD EQUIPMENT PAD PIPING PLAN SEE DETAIL 1 / M-102A

STAGE I VAPOR RECOVERY CONNECTION (E-85 AND GASOLINE ONLY)

2" METER PROVING CONNECTION (N.C. BALL VALVE W/ SS CAMLOCK AND CAP) (TYP 8)

E-85 — OP-4 300 GPM — NC — AE — S — PDMO 4 — FCV 4 — LPD — SIGHT FLOW INDICATOR — BASKET STRAINER W/ DRAIN & DP GAUGE — DRAIN (TYP) — 2" VAPOR RECOVERY PIPING

PADDLE TYPE FLOW SWITCH (TYP) SEE DETAIL 7 / M-504A

SAMPLE CONNECTION (TYP) SEE DETAIL 8 / M-504A

GASOLINE — OP-3 300 GPM — NC — AE — S — PDMO 3 — FCV 3 — LPD — 4" ABOVEGROUND RECEIPT PIPING (TYP) — FLEXIBLE CONNECTION (TYP) — LOW POINT DRAIN (TYP) SEE DETAIL 9 / M-504A

4" SS CAMLOCK OFFLOAD ADAPTER WITH CAP AND 6" OUTLET FLANGE

5 GALLON SS DRAIN TANK (TYP). SEE DETAIL 3 / M-505A

4" FLOW CONTROL VALVE SHALL PREVENT ANY AIR FROM MOVING TO DOWNSTREAM PIPING (TYP)

NOZZLE ADAPTER FOR DIRECT PUMPED OFFLOAD (TYP)

BIODIESEL — OP-2 300 GPM — NC — AE — S — PDMO 2 — FCV 2 — LPD — THERMAL RELIEF VALVE (TYP) SEE DETAIL 2 / M-504A — SIGHT FLOW INDICATOR — 300 GPM SELF PRIMING CENTRIFUGAL OFFLOAD PUMP — 2" VAPOR RECOVERY PIPING

AIR ELIMINATOR/ STRAINER (TYP) — SS TUBING TO FLOW CONTROL VALVE (TYP) — PRESSURE GAUGE (TYP) SEE DETAIL 4 / M-504A

DIESEL — OP-1 300 GPM — NC — AE — S — PDMO 1 — FCV 1 — LPD

4" PD METER WITH INLET-SIDE STRAINER AND AIR ELIMINATOR ACCESSORIES (METER SHALL HAVE MECHANICAL TEMPERATURE COMPENSATION)

SEE M-003 FOR CONTINUATION TO DISPENSERS

SEE DESIGNER NOTES

½" PRESSURE TEST CONNECTION (TYP 4)

½" CHECK VALVE / BALL VALVE FOR THERMAL RELIEF (TYP FOR ALL 4 LINES)

IP-1 150 GPM — MAV — PUMP DISCHARGE CONTROL VALVE — DP-1 10 GPM

3" PRODUCT PIPE W/ 6" CONTAINMENT PIPE

CLOCK GAUGE READOUT

INSULATED PIPE TRANSITION (TYP)

FIBERGLASS TRANSITION SUMP. SEE DETAIL 1 / M-505A

UNDERGROUND FLEXIBLE DOUBLE WALL 1 ½" SUPPLY PIPING W/ CRUSH-RESISTANT ACCESS PIPE (TYP 4)

3" OVERFILL VALVE W/ ANTI-SIPHON FEATURE. SET TO ACTUATE AT 96.5% TANK VOLUME

DIESEL STORAGE TANK (12,000 GALLON CAPACITY)

HAND PUMP LOCATED AT GROUND LEVEL

SLOPE DOWN @ 1.0%

PRIMARY TANK

SECONDARY TANK

ABOVEGROUND STORAGE TANKS
(SIMILAR EQUIPMENT FOR EACH PRODUCT)

FOR ABOVEGROUND STORAGE TANK PLAN SEE DETAIL 1 / M-101A

1/2" CHECK VALVE / BALL VALVE FOR THERMAL RELIEF (TYP)

DP-2 10 GPM — MAV — ANTI-SIPHON VALVE (TYP)

BIODIESEL STORAGE TANK (12,000 GALLON CAPACITY)

SLOPE DOWN @ 1.0%

1 ½" BALL VALVE/CAMLOCK/CAP TO ALLOW TANK RECIRCULATION VIA HOSES (HOSES PROVIDED BY OTHERS) (ONE AT EACH ISSUE LINE, ONE AT EACH FILL LINE, TOTAL OF 8)

4" PV VENT (TYP)

DP-3 10 GPM — MAV

GASOLINE STORAGE TANK (12,000 GALLON CAPACITY)

SLOPE DOWN @ 1.0%

SOLENOID CONTROLLED ANTI-SIPHON BALL VALVE (TYP)

DP-4 10 GPM — MAV

E-85 STORAGE TANK (12,000 GALLON CAPACITY)

SLOPE DOWN @ 1.0%

ABOVEGROUND PIPING TO TANKS (TYP)

SEE M-003 FOR CONTINUATION TO TRUCK FILLSTAND

STORAGE TANK NOZZLE SCHEDULE
(ALL 4 TANKS SIMILAR)

A. 4" NOZZLE FOR DISPENSER ISSUE PUMP
B. 2" NOZZLE FOR MECHANICAL CLOCK TYPE GAUGE
C. 6" NOZZLE FOR ISSUE PUMP (FOR OPTIONAL HIGH-FLOW LOADING)
D. 4" NOZZLE FOR ATG SYSTEM W/ LEVEL ALARMS (VEEDER-ROOT OR RONAN TYPE)
E. 36" ACCESS MANWAY WITH OPTIONAL LADDER
F. 4" MANUAL GAUGING/SAMPLING
G. 10" EMERGENCY VENT (SECONDARY TANK)
H. 36" MANWAY W/ 10" EMERGENCY VENT (PRIMARY TANK)
I. 4" PV TANK VENT (PRIMARY TANK)
J. 2" VAPOR RECOVERY NOZZLE (GASOLINE AND E-85 ONLY)
K. 6" NOZZLE FOR 4" RECEIPT PIPING W/ 3" FLOAT-TYPE OVERFILL PREVENTION VALVE. VALVE SHALL BE SUITABLE FOR PUMPED FUEL RECEIPT
L. 2" TANK NOZZLE FOR 1" DRAIN PIPE WITH ANTI-SIPHON VALVE
M. 2" LEAK DETECTION

DESIGNER NOTES:

1. EQUIPMENT FOR OPTIONAL DIESEL TRUCK FILLSTAND. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.
3. TYPICAL FILLSTAND FLOWRATE IS 150 GPM. OBTAIN SERVICE HEADQUARTERS APPROVAL IF 300 GPM IS REQUIRED. ADJUST SUPPLY PIPE SIZE AS REQUIRED.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

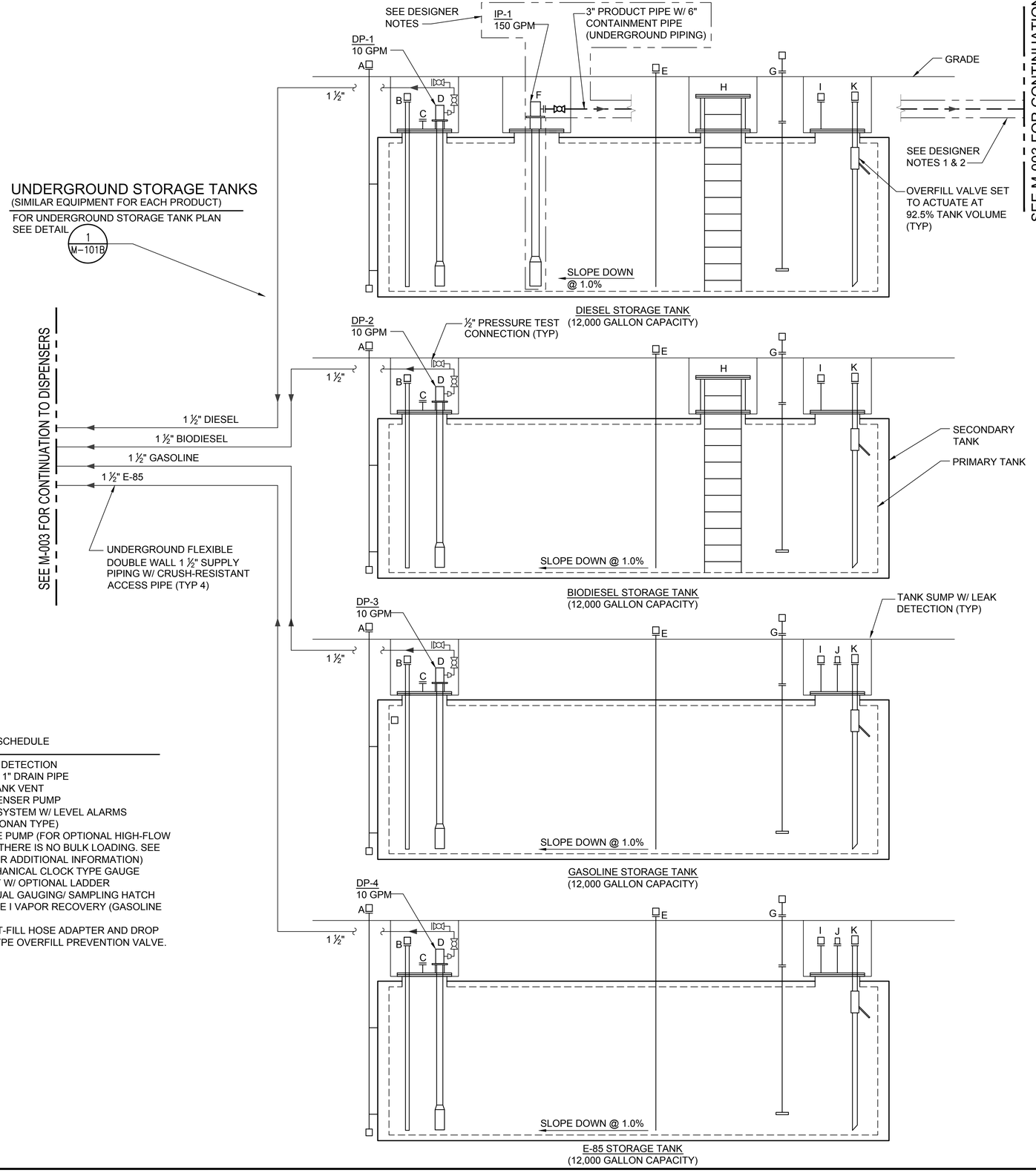
DRAWING TITLE: ABOVEGROUND STORAGE TANKS FUEL SYSTEM FLOW DIAGRAM

DRAWING NO.: **M-002A**

SHEET 34 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-002A.dwg 10/1/2015 11:17:49 AM Ralph Aldridge



DESIGNER NOTES:

1. DEDICATED PUMP ACCESS MANHOLE AND HIGH-FLOW PUMP FOR OPTIONAL DIESEL TRUCK FILLSTAND. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.
3. TYPICAL FILLSTAND FLOWRATE IS 150 GPM. OBTAIN SERVICE HEADQUARTERS APPROVAL IF 300 GPM IS REQUIRED.

STORAGE TANK NOZZLE SCHEDULE

A. 2" NOZZLE FOR LEAK DETECTION
B. 2" TANK NOZZLE FOR 1" DRAIN PIPE
C. 4" NOZZLE FOR PV TANK VENT
D. 4" NOZZLE FOR DISPENSER PUMP
E. 4" NOZZLE FOR ATG SYSTEM W/ LEVEL ALARMS (VEEDER-ROOT OR RONAN TYPE)
F. 6" NOZZLE FOR ISSUE PUMP (FOR OPTIONAL HIGH-FLOW LOADING, DELETE IF THERE IS NO BULK LOADING. SEE DESIGNER NOTES FOR ADDITIONAL INFORMATION)
G. 2" NOZZLE FOR MECHANICAL CLOCK TYPE GAUGE
H. 32" ACCESS MANWAY W/ OPTIONAL LADDER
I. 4" NOZZLE FOR MANUAL GAUGING/ SAMPLING HATCH
J. 2" NOZZLE FOR STAGE I VAPOR RECOVERY (GASOLINE AND E-85)
K. 4" NOZZLE FOR TIGHT-FILL HOSE ADAPTER AND DROP TUBE WITH FLOAT-TYPE OVERFILL PREVENTION VALVE.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

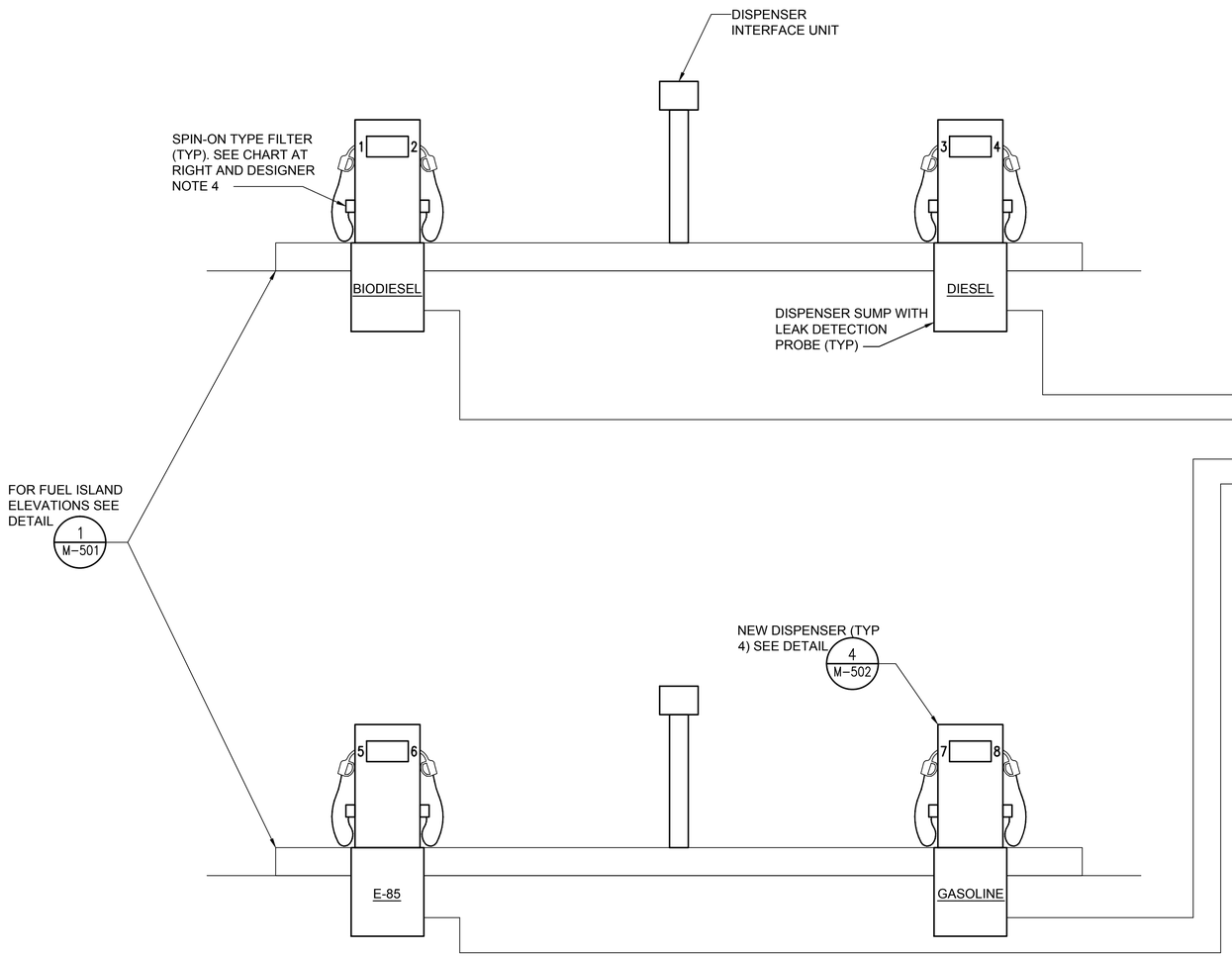
DRAWING TITLE: UNDERGROUND STORAGE TANKS FUEL SYSTEM FLOW DIAGRAM

DRAWING NO.: **M-002B**

SHEET 35 OF 72

RAC # 1401800

M:\2014\14018\00\mech\14018M-002B.dwg 10/1/2015 11:17:30 AM Ralph Aldridge



DESIGNER NOTES:

1. EQUIPMENT FOR OPTIONAL DIESEL TRUCK FILLSTAND SHOWN. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.
3. WHERE TRUCK FILLSTANDS ARE DISPENSING AVIATION FUEL, PROVIDE API 1581 TYPE FILTER/SEPARATORS WITH DOWNSTREAM STAINLESS STEEL OR INTERIOR EPOXY COATED CARBON STEEL PIPING.
4. FILTER AND FILTER ADAPTER SHALL BE FUEL-COMPATIBLE AND CORROSION RESISTANT. PROVIDE ADDITIONAL FILTRATION / WATER REMOVAL CAPABILITIES AS DIRECTED BY SERVICE HEADQUARTERS, AS APPROPRIATE FOR PRODUCT TYPE.

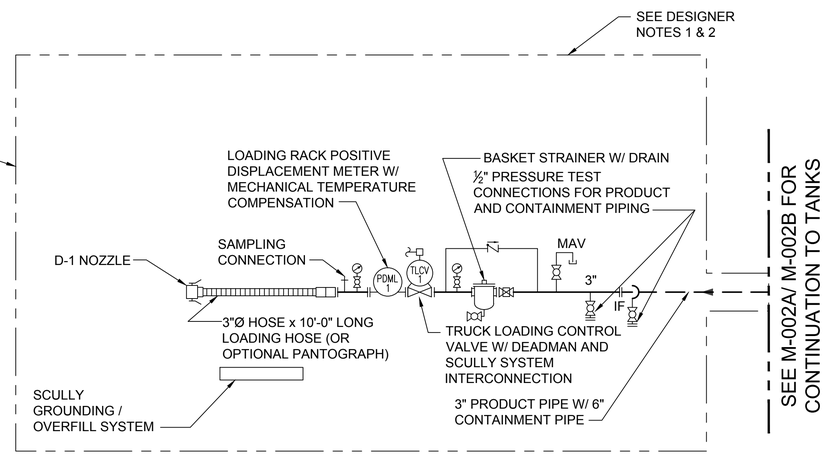
DISPENSER FILTRATION SCHEDULE

PRODUCT	PARTICULATE FILTRATION EFFICIENCY	EFFLUENT WATER
GASOLINE	5 MICRON	--
E-85	5 MICRON	--
DIESEL	25 MICRON	50 PPM MAXIMUM
BIODIESEL	25 MICRON	50 PPM MAXIMUM

NOTES:
1. CONFIRM SPECIFIC REQUIREMENTS WITH SERVICE HEADQUARTERS.

TRUCK FILLSTAND EQUIPMENT PAD
(SIMILAR EQUIPMENT FOR EACH PRODUCT)

FOR TRUCK FILLSTAND PIPING PLAN SEE DETAIL 1 M-103



Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

DRAWING TITLE: FUEL SYSTEM DISPENSERS FLOW DIAGRAM

DRAWING NO.: **M-003**

SHEET 36 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-003.dwg 10/1/2015 11:18:05 AM Ralph Aldridge

PROVIDE TANK MARKING AND NAMEPLATE FOR ALL TANKS. SEE DETAILS 4/M-505A 5/M-505A

PIPING TO TRUCK FILLSTAND (3" PRODUCT PIPING WITH 6" CONTAINMENT PIPING)

SEE DESIGNER NOTES 1 & 2

UNDERGROUND FLEXIBLE DOUBLE WALL PIPING W/ CRUSH-RESISTANT ACCESS PIPING TO DISPENSERS (1 ½" SUPPLY PIPING)

TANK PLATFORM, LADDER AND RAILING (SEE TANK PLATFORM NOTES)

2" NOZZLE FOR STAGE I VAPOR RECOVERY PIPING (GASOLINE AND E-85 ONLY)

6" INLET NOZZLE FOR 4" FILL PIPING WITH 3" FLOAT-TYPE OVERFILL PREVENTION VALVE

SECONDARY TANK

PRIMARY TANK 8'-0" DIAMETER AND 32'-0" LONG

1 ½"

MAV

2" SOLENOID CONTROLLED BALL VALVE (TYP)

1 ½" BALL VALVE WITH SS CAMLOCK/ CAP TO ALLOW RECIRCULATION HOSE CONNECTION (TYP-8)

7'-3" (PLATFORM WIDTH)

31'-7" (PLATFROM LENGTH)

4" DISPENSER PUMP NOZZLE

2" NOZZLE FOR MECHANICAL TANK GAUGE

4" NOZZLE FOR ATG SYSTEM W/ LEVEL ALARMS

36" ACCESS MANWAY

4" NOZZLE FOR MANUAL GAUGING/SAMPLING HATCH

10" EMERGENCY VENT FOR SECONDARY TANK

36" MANWAY WITH 10" EMERGENCY VENT FOR PRIMARY TANK

4" PV VENT FOR PRIMARY TANK

2" NOZZLE FOR TANK DRAIN

2" NOZZLE FOR LEAK DETECTION

SEE M-301A FOR TANK SECTION (APPROX.)

3" PUMP DISCHARGE CONTROL VALVE

6" NOZZLE FOR HIGH-FLOW ISSUE PUMP

TRANSITION SUMP SEE DETAIL 1/M-505A

FOR STAIRS SEE DETAIL 4/S-302

E-85

GASOLINE

BIODIESEL

DIESEL

HAND PUMP FOR TANK DRAINAGE (2' ABOVE SLAB)

PROVIDE MARKINGS ON EACH END OF THE TANKS

4" E-85 PIPING

4" GASOLINE PIPING

4" BIODIESEL PIPING

4" DIESEL PIPING

2" STAGE I VAPOR RECOVERY PIPING

PIPING FROM OFFLOAD EQUIPMENT PAD

PROVIDE PIPE SUPPORTS PER DETAIL 1/S-504

1 ABOVEGROUND STORAGE TANKS PIPING PLAN
Scale: 1/4" = 1'-0"

NOTES:

1. TANK FEATURES ARE IDENTICAL FOR ALL FOUR TANKS EXCEPT THAT GASOLINE AND E-85 REQUIRE VAPOR RECOVERY PIPING.

TANK PLATFORM NOTES:

1. PLATFORM SHALL PROVIDE ACCESS TO ALL APPURTENANCES ON TOP OF THE TANKS.
2. TANK PLATFORM, INTER-CONNECTING PLATFORMS, RAILINGS AND LADDER SHALL BE DESIGNED, COORDINATED AND PROVIDED BY THE TANK MANUFACTURER, UTLIIZING APPROXIMATE COVERAGE DIMENSIONS SHOWN.
3. PLATFORM GRATING SHALL BE UV RESISTANT FRP MATERIAL.
4. PLATFORM FRAME & HANDRAILS SHALL BE GALVANIZED STEEL.
5. PROVIDE CUT-OUTS IN PLATFORM GRATING FOR TANK NOZZLES AND APPURTENANCES ON TOP OF TANK.
6. PLATFORMS AND GRATING SHALL BE DESIGNED FOR A MIMNIMUM OF 100 PSF LIVE LOADS.

DESIGNER NOTES:

1. EQUIPMENT SHOWN FOR OPTIONAL DIESEL TRUCK FILLSTAND. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.

GRAPHIC SCALE

4 0 4 8

SCALE: 1/4" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED MLS | DRAWN MLS | CHECKED MHF | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

DRAWING TITLE: ABOVEGROUND STORAGE TANKS PIPING PLAN

DRAWING NO. M-101A

SHEET 37 OF 72

RAC # 1401800

NOTES:

1. TANK FEATURES ARE IDENTICAL FOR ALL FOUR TANKS EXCEPT THAT GASOLINE AND E-85 REQUIRE STAGE I VAPOR RECOVERY PIPING.
2. UNDERGROUND ISSUE PIPING TO THE DISPENSERS SHALL BE FLEXIBLE DOUBLE WALL PIPING WITH CRUSH-RESISTANT OUTER ACCESS PIPE.

DESIGNER NOTES:

1. EQUIPMENT FOR OPTIONAL DIESEL TRUCK FILLSTAND. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.
3. DOUBLE WALL STEEL TYPE TANK IS SHOWN. ADJUST AS REQUIRED FOR FRP TYPE TANK.

SECONDARY TANK
PRIMARY TANK 8'-0" DIAMETER AND 32'-0" LONG (TYP)
2" NOZZLE FOR STAGE I VAPOR RECOVERY PIPING (GASOLINE AND E-85 TANKS ONLY)
4" NOZZLE FOR 4" HOSE ADAPTER AND DROP TUBE (TYP)
FLEXIBLE DOUBLE WALL PIPING TO GASOLINE DISPENSER (1 ½" SUPPLY)
FLEXIBLE DOUBLE WALL PIPING TO BIODIESEL DISPENSER (1 ½" SUPPLY)
FLEXIBLE DOUBLE WALL PIPING TO E-85 DISPENSER (1 ½" SUPPLY)
3" PRODUCT PIPING W/ 6" CONTAINMENT PIPING TO TRUCK FILLSTAND
FLEXIBLE DOUBLE WALL PIPING TO DIESEL DISPENSER (1 ½" SUPPLY)
4" NOZZLE MANUAL GAUGING/ SAMPLING HATCH (TYP)
EDGE OF TRUCK ROADWAY AREA
EDGE OF TRUCK ROADWAY AREA
32" ACCESS MANWAY (DIESEL AND BIODIESEL ONLY)
36" MANWAY (TYP)
TANK SUMP WITH LEAK DETECTION (TYP ALL SUMPS)
SEE DESIGNER NOTES 1 & 2
2" NOZZLE FOR TANK LEVEL READOUT (TYP)
3" PRODUCT PIPING W/ 6" CONTAINMENT PIPING TO HIGH-FLOW TRUCK FILLSTAND
4" NOZZLE FOR ATG SYSTEM W/ LEVEL ALARMS (TYP)
12,000 GALLON UNDERGROUND DIESEL TANK
12,000 GALLON UNDERGROUND BIODIESEL TANK
12,000 GALLON UNDERGROUND GASOLINE TANK
12,000 GALLON UNDERGROUND E-85 TANK
SEE M-301B FOR TANK SECTION (APPROX.)
6" NOZZLE FOR HIGH-FLOW ISSUE PUMP
½" PRESSURE TEST CONNECTION (TYP)
4" NOZZLE FOR PRIMARY TANK PV VENT (TYP)
4" NOZZLE FOR DISPENSER PUMP
36" MANWAY (TYP)
5 / M-502 SUMP PENETRATION DETAIL (TYP)
4" TANK PV VENT (TYP)
2" NOZZLE FOR TANK DRAIN (TYP)
2" NOZZLE FOR LEAK DETECTION (TYP)

1 UNDERGROUND STORAGE TANKS PIPING PLAN
Scale: 3/8" = 1'-0"

GRAPHIC SCALE
2 0 2 4 6
SCALE: 3/8" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO. 14018-20

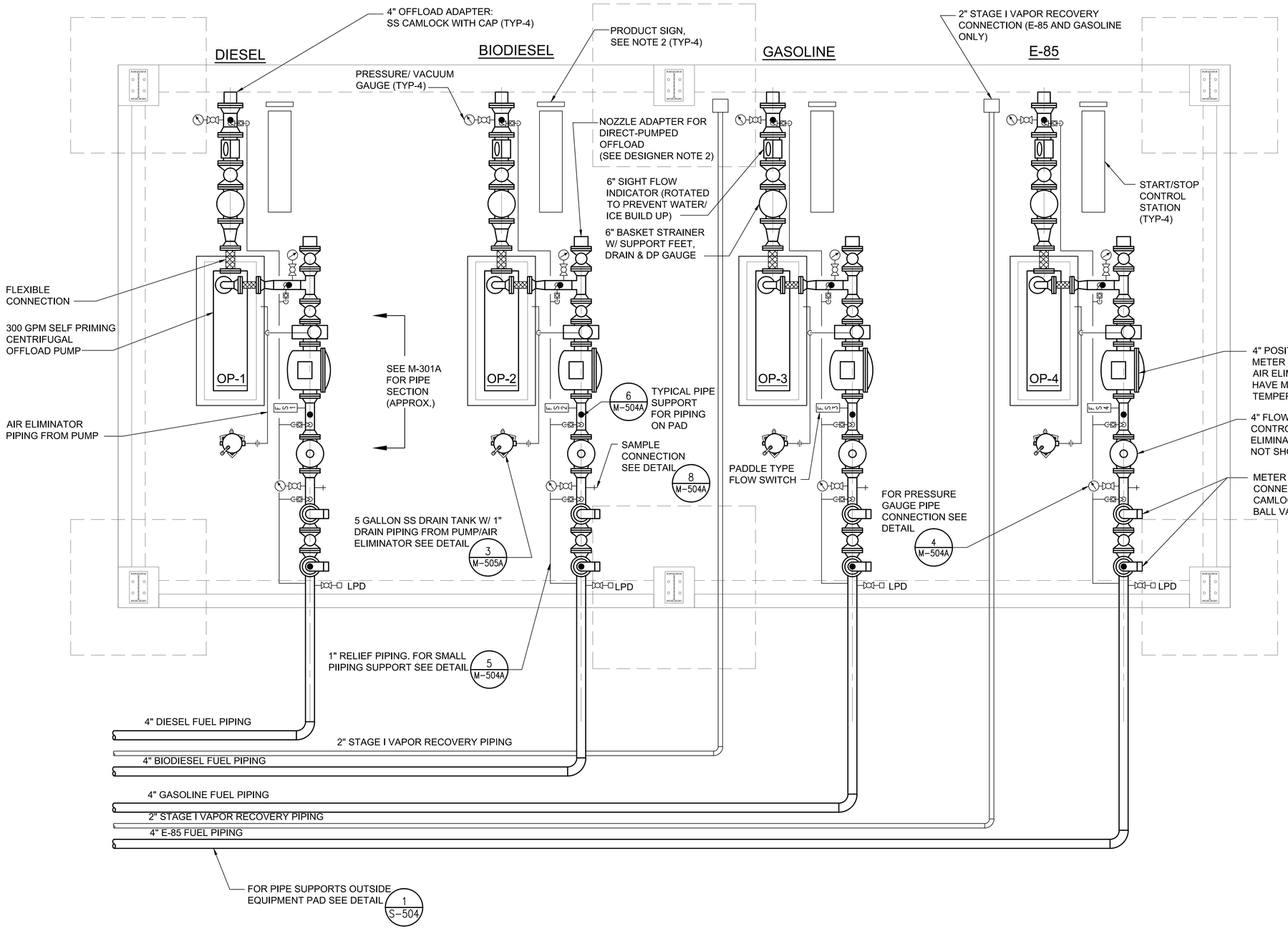
DRAWING TITLE: UNDERGROUND STORAGE TANKS PIPING PLAN

DRAWING NO. M-101B

SHEET 38 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-101B.dwg 10/1/2015 11:12:37 AM Ralph Aldridge



1 OFFLOAD EQUIPMENT PAD PIPING PLAN
Scale: 1/2" = 1'-0"

NOTES:

1. THE OFFLOAD POSITIONS ARE IDENTICAL EXCEPT FOR THE STAGE I VAPOR RECOVERY PIPING AND CONNECTION ASSOCIATED WITH E-85 AND GASOLINE SYSTEMS.
2. PROVIDE 12"x12" PRODUCT IDENTIFICATION SIGNS AT EACH OFFLOAD POINT, SIMILAR TO THE DISPENSER IDENTIFICATION SIGNS.

DESIGNER NOTES:

1. BASED ON SITE CONSTRAINTS, OPTIONAL FILLSTAND EQUIPMENT CAN BE CO-LOCATED WITH OFFLOAD EQUIPMENT TO REDUCE FOOTPRINT. SEE CIVIL DRAWINGS FOR COMBINED SITE PLAN LAYOUTS.
2. VERIFY CONNECTION TYPE (NOZZLE ADAPTER VS. CAM-TYPE) WITH LOCAL FUELS PERSONNEL.

GRAPHIC SCALE

2 0 2 4

SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION	BY	DATE	SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

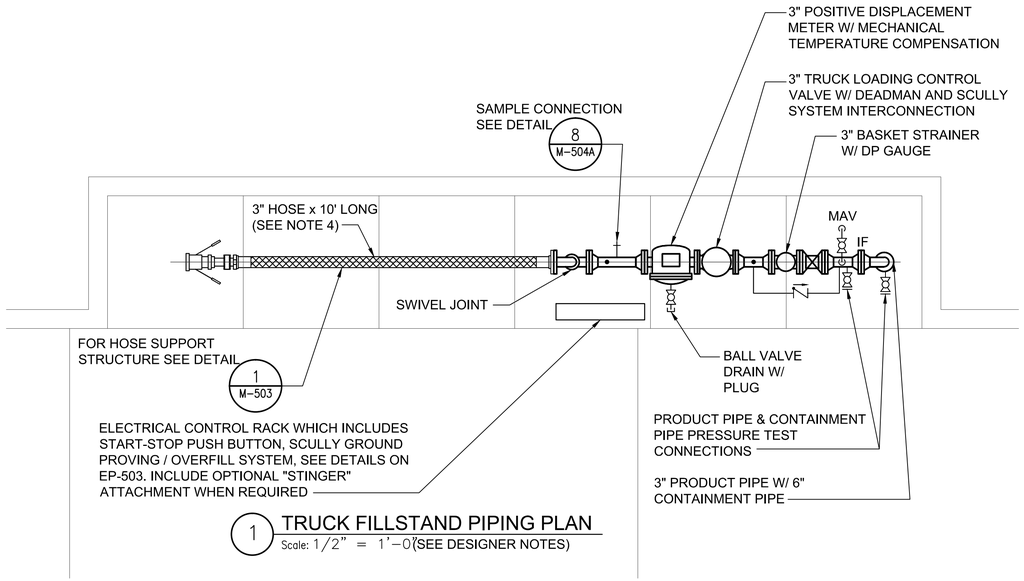
DESIGNED: MLS
DRAWN: MLS
CHECKED: MHF
PROJECT NO.: 14018-20
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN

DRAWING TITLE: ABOVEGROUND STORAGE TANKS OFFLOAD PAD PIPING PLAN

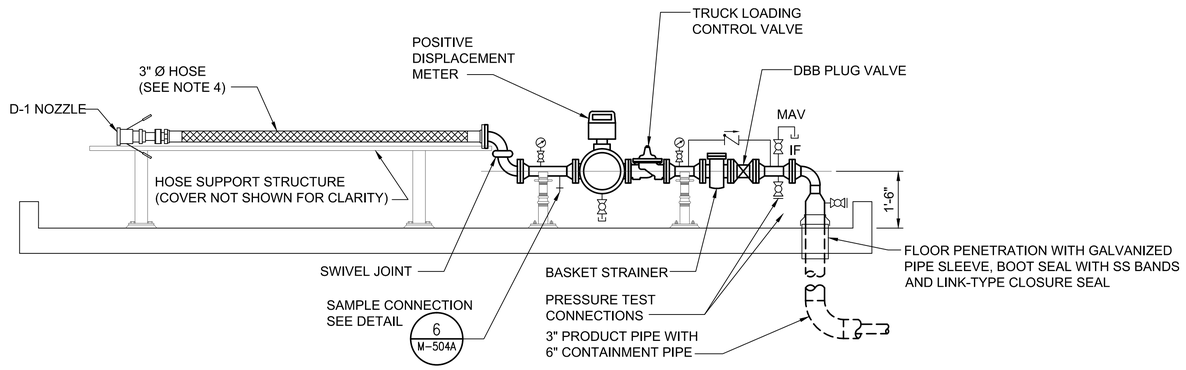
DRAWING NO.: M-102A

SHEET 39 OF 72

RAC # 1401800



1 TRUCK FILLSTAND PIPING PLAN
Scale: 1/2" = 1'-0" (SEE DESIGNER NOTES)



A TRUCK FILLSTAND PIPING SECTION
Scale: 1/2" = 1'-0"

DESIGNER NOTES:

1. EQUIPMENT FOR OPTIONAL HIGH-FLOW DIESEL LOADING. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE THIS ENTIRE SHEET IF THERE IS NO HIGH-FLOW TRUCK FILLSTAND.
3. FOR AVIATION TURBINE FUELS PROVIDE FILTER/ SEPARATORS DESIGNED AND CONSTRUCTED PER EI SPECIFICATION 1581, WITH STAINLESS STEEL OR EPOXY LINED CARBON STEEL PIPING DOWNSTREAM.
4. INSTEAD OF LOADING HOSE AND RACK, PROVIDE OPTIONAL PANTOGRAPH PER DOD PRESSURIZED HYDRANT FUELING SYSTEM TYPE III STANDARDS IN AREAS OF HIGH UV RAYS OR IF THERE IS NO CANOPY, AS DIRECTED BY SERVICE HEADQUARTERS.

GRAPHIC SCALE

2 0 2 4

SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

PRELIMINARY NOT FOR CONSTRUCTION

SEAL

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED	DRAWN	CHECKED	DATE	SCALE
MLS	MLS	MHF	OCTOBER 2, 2015	AS SHOWN

PROJECT NO. 14018-20

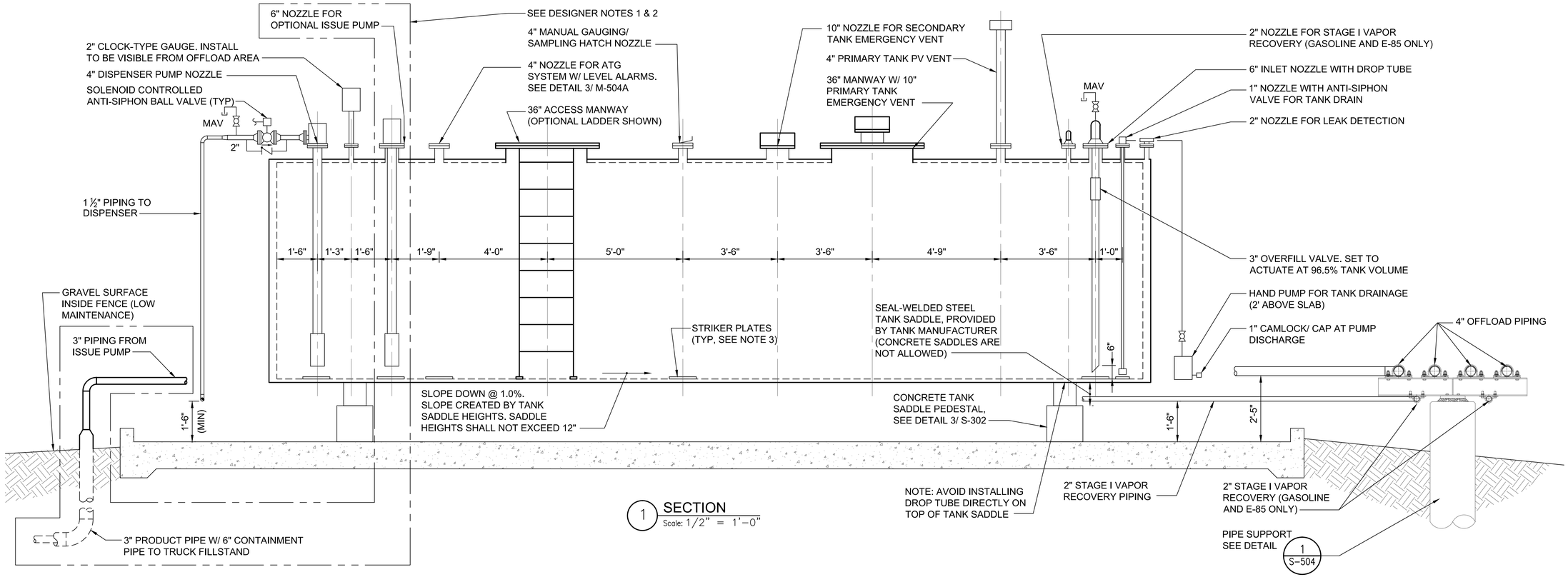
DRAWING TITLE: TRUCK FILLSTAND PIPING PLAN

DRAWING NO. M-103

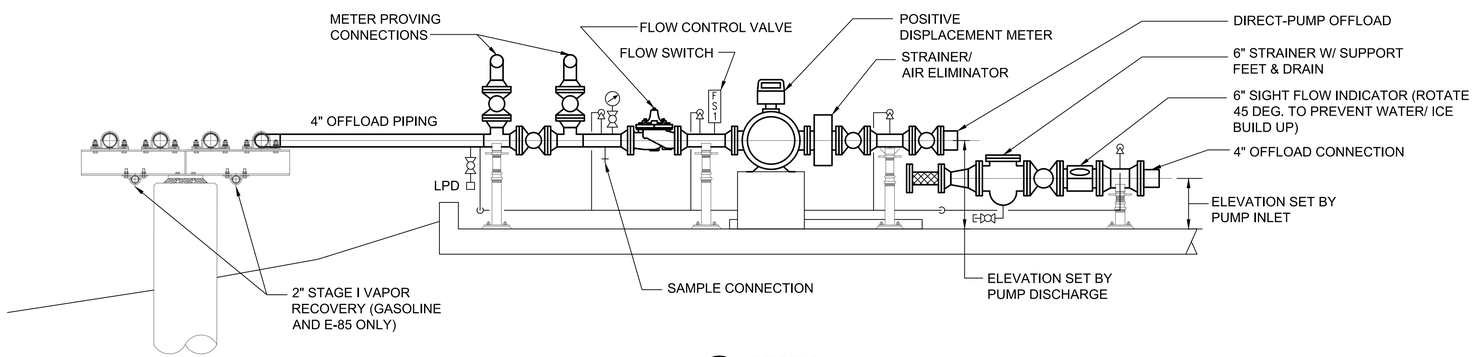
SHEET 40 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-103.dwg 10/1/2015 11:11:21 AM Ralph Aldridge



1 SECTION
Scale: 1/2" = 1'-0"



A SECTION
Scale: 1/2" = 1'-0"

NOTES:

1. TANKS SHALL HAVE PLATFORM W/ RAILING FOR ACCESS TO APPURTENANCES ON TO OF TANK. SEE SHEET M-101A FOR ADDITIONAL PLATFORM INFORMATION.
2. PROVIDE BONDING / GROUNDING OF ALL PIPING AND EQUPIMENT AS INDICATED ON THE ELECTRICAL DRAWINGS.
3. STRIKER PLATES UNDER THE ATG & GAUGING HATCH SHALL BE FLAT. ALL OTHER STRIKER PLATES CAN BE CURVED TO MATCH THE TANK GEOMETRY. THE FLAT PLATES SHALL BE SEALED TO PREVENT MATERIAL BUILD UP UNDER THE PLATE.

DESIGNER NOTES:

1. EQUIPMENT FOR OPTIONAL DIESEL TRUCK FILLSTAND. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.

GRAPHIC SCALE
2 0 2 4
SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED MLS | DRAWN MLS | CHECKED MHF | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

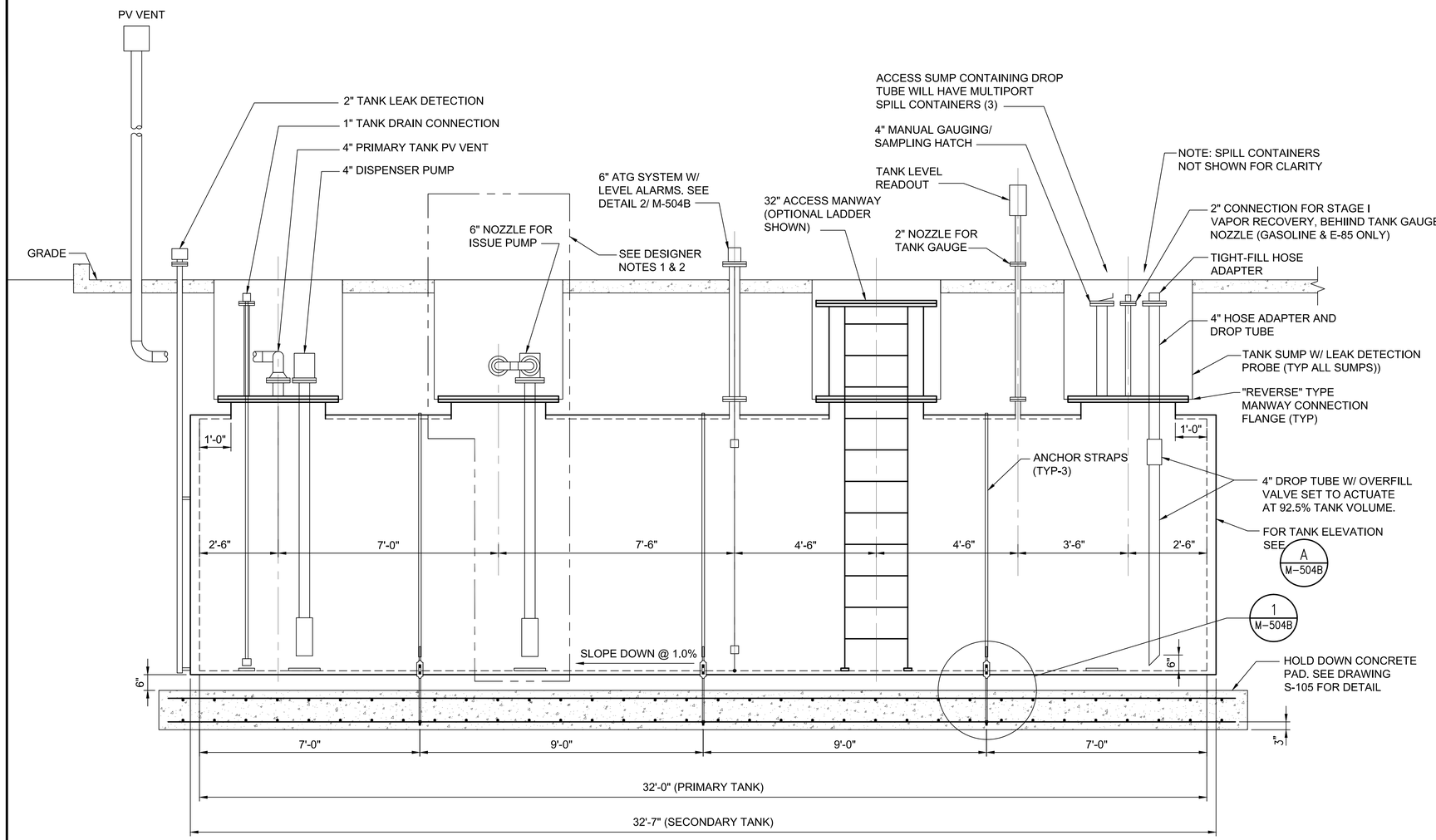
DRAWING TITLE: ABOVEGROUND STORAGE TANKS PIPING SECTIONS

DRAWING NO. **M-301A**

SHEET 41 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-301A.dwg 10/2/2015 8:35:25 AM Ralph Aldridge



1 TYPICAL UNDERGROUND TANK ELEVATION
Scale: 1/2" = 1'-0"

DESIGNER NOTES:

1. EQUIPMENT FOR OPTIONAL DIESEL TRUCK FILLSTAND, INCLUDING MANWAY W/ SUMP. ADD SIMILAR EQUIPMENT FOR BIODIESEL, GASOLINE AND/ OR E-85 IF NEEDED.
2. DELETE IF THERE IS NO TRUCK FILLSTAND.
3. DOUBLE WALL STEEL TYPE TANK IS SHOWN. ADJUST AS REQUIRED FOR FRP TYPE TANK
4. FOR SUMPS LOCATED IN THE TRAFFIC AREA SEE DETAIL 3/M-504B

GRAPHIC SCALE
2 0 2 4
SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED MLS | DRAWN MLS | CHECKED MHF | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

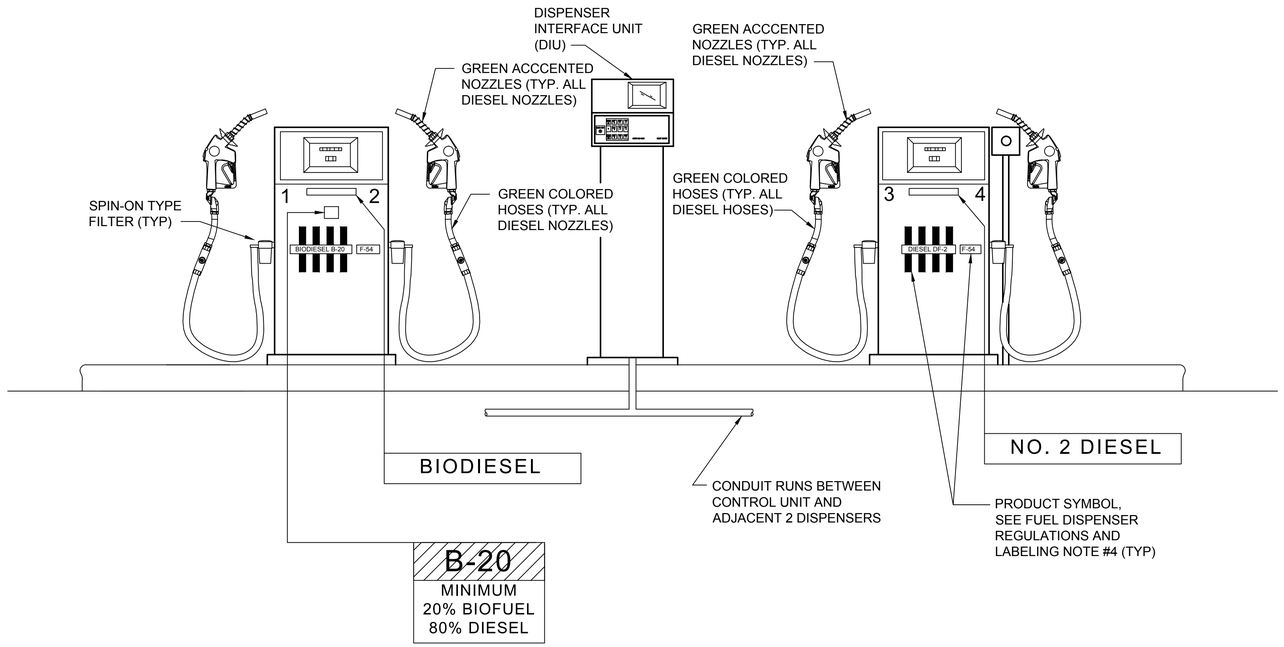
DRAWING TITLE: UNDERGROUND STORAGE TANKS PIPING SECTION

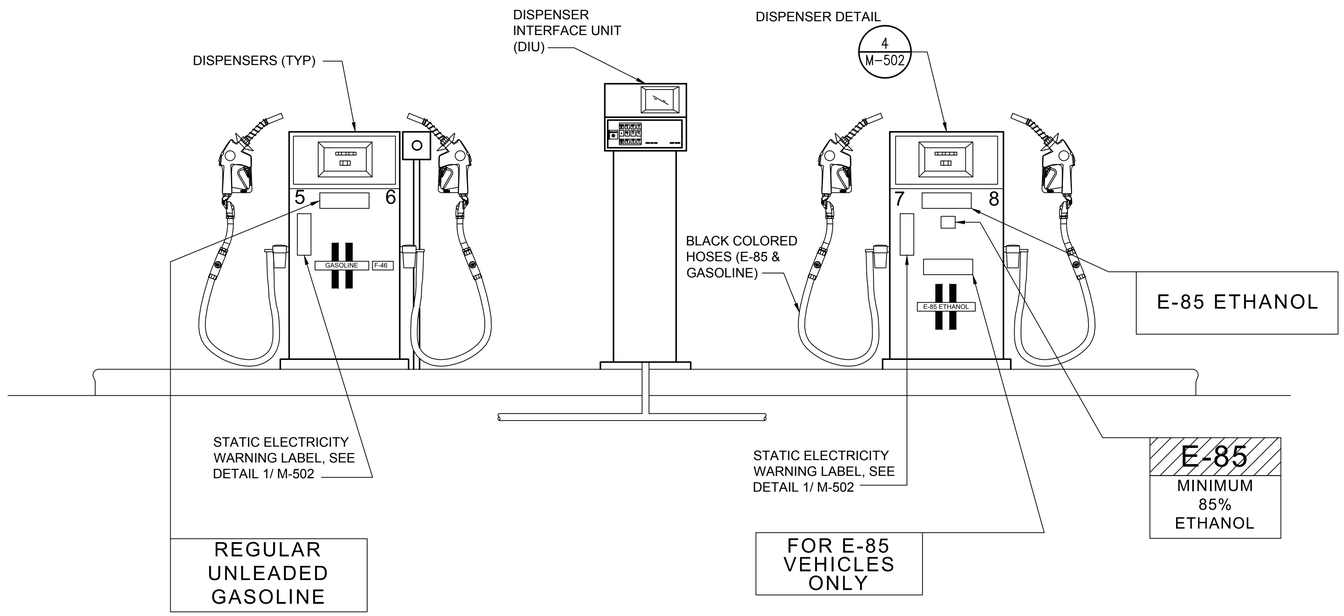
DRAWING NO. M-301B

SHEET 42 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-301B.dwg 10/1/2015 1:08:25 PM Ralph Aldridge





1 FUEL DISPENSERS ISLAND ELEVATION
Scale: NTS

FUEL DISPENSER REGULATIONS AND LABELING

1. THE FOLLOWING REGULATIONS SHALL TAKE PRECEDENCE OVER ALL INDICATED DATA ON THIS DRAWING. EXCEPT THAT DIESEL FUEL IS EXEMPTED.
   16 CFR PART 306 -- AUTOMOTIVE FUEL RATINGS, CERTIFICATION, AND POSTING
   16 CFR PART 309 -- LABELING REQUIREMENTS FOR ALTERNATIVE FUELS AND ALTERNATIVE FUELED VEHICLES.
2. DISPENSERS SHALL BE INSTALLED IN ACCORDANCE WITH THE STATE AND LOCAL CODES.
3. ALL LABELS MUST BE ABLE TO WITHSTAND EXTREME WEATHER CONDITIONS FOR AT LEAST ONE YEAR, AND MUST BE RESISTANT TO VEHICLE FUEL, OIL, GREASE, SOLVENTS, DETERGENTS, AND WATER
4. LABELS STANDARD TO THE INDUSTRY AND APPROVED BY THE CONTRACTING OFFICER WILL BE ACCEPTABLE.
5. PROVIDE UNIT LABELS IN ACCORDANCE WITH MIL-STD-161 AND NATO LABELING, INCLUDING YELLOW BANDS, FUEL GRADE DESIGNATION AND SYMBOLS. COORDINATE WITH CONTRACTING OFFICER/ SYSTEM OPERATORS.
6. SEE ADDITIONAL MARKING DETAILS ON DRAWING M-502.

SEQUENCE OF OPERATION, DISPENSERS

1. A CARD IS SWIPED THROUGH THE DISPENSER INTERFACE UNIT (DIU), ENERGIZING THE REQUESTED DISPENSER NOZZLE. (ALTERNATIVELY, THE "AUTOMOTIVE INFORMATION MODULE" WILL RECOGNIZE AND VERIFY THE CORRECT DISPENSER AND FUEL TYPE.)
2. THE DISPENSER NOZZLE, WHEN REMOVED FROM THE DISPENSER, SHALL OPEN THE DISPENSER VALVE, OPEN THE ASSOCIATED TANK DISPENSING SOLENOID VALVE AND ENERGIZE THE ASSOCIATED PUMP.
3. FUEL FLOW S STARTED BY SQUEEZING THE NOZZLE HANDLE . FUEL FLOW IS STOPPED BY RELEASING THE HANDLE OR BY AUTOMATIC SENSOR OF THE VEHICLE FUEL TANK BEING FULL.
4. PLACING THE NOZZLE BACK INTO THE DISPENSER SHALL CLOSE THE DISPENSER VALVE, CLOSE THE ASSOCIATED TANK DISPENSING SOLENOID VALVE WITH 5 SECOND TIME DELAY, AND DE-ENERGIZE THE ASSOCIATED PUMP.
5. REMOVING THE NOZZLE FROM THE DISPENSER WILL DO NOTHING UNTIL STEP 1 IS REDONE.
6. A CARD IS SWIPED THROUGH THE DIU FOR A PRODUCT ALREADY BEING DISPENSED.
   a. THE DIU ENERGIZES THE REQUESTED DISPENSER NOZZLE.
   b. THE DISPENSER NOZZLE, WHEN REMOVED FROM THE DISPENSER, SHALL OPEN THE DISPENSER VALVE.
   c. FUELING, SEE STEP 4.
   d. THE FIRST NOZZLE RETURNED TO THE DISPENSER SHALL CLOSE THE ASSOCIATED DISPENSER VALVE.
   e. THE LAST NOZZLE RETURNED TO THE DISPENSER SHALL CLOSE THE ASSOCIATED DISPENSER VALVE, CLOSE THE ASSOCIATED TANK DISPENSING SOLENOID VALVE, AND DE-ENERGIZE THE ASSOCIATED PUMP.
   f. REMOVING THE NOZZLE FROM THE DISPENSER WILL DO NOTHING UNTIL STEP 1 IS REDONE.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED MLS | DRAWN MLS | CHECKED MHF | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

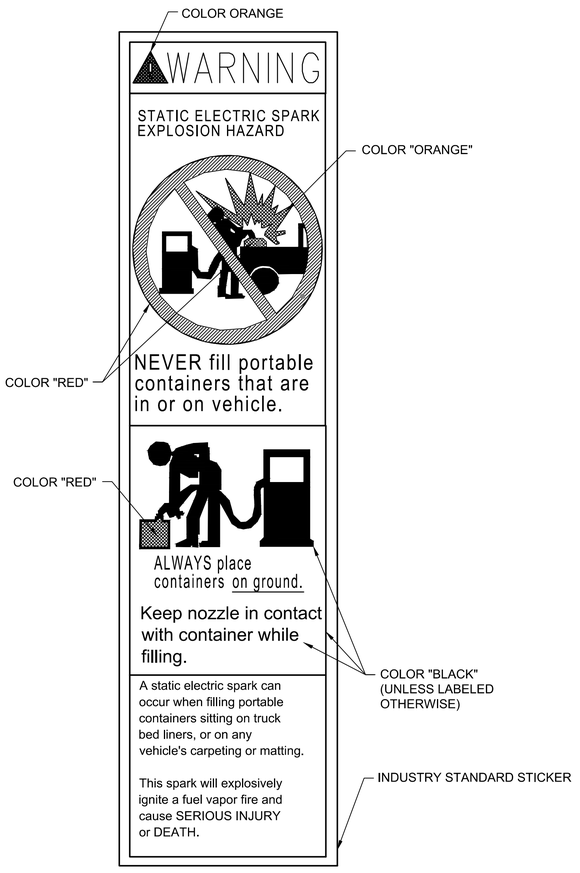
DRAWING TITLE: FUEL DISPENSER DETAILS (1 OF 2)

DRAWING NO. M-501

SHEET 43 OF 72

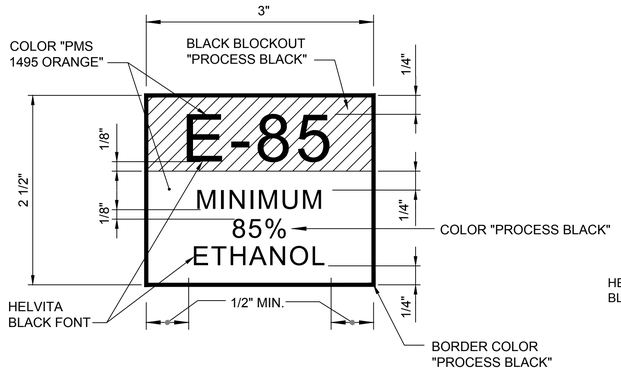
RAC # 1401800

M:\2014\1401800\mech\1401800M-501.dwg 10/1/2015 11:10:00 AM Ralph Aldridge

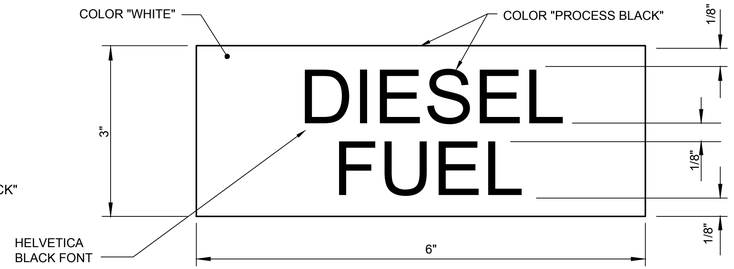


PLACE ONE ON EACH SIDE OF EACH FUEL DISPENSER (PLACE IN A CONSPICUOUS AREA)

1 STATIC ELECTRICITY WARNING
Scale: NTS



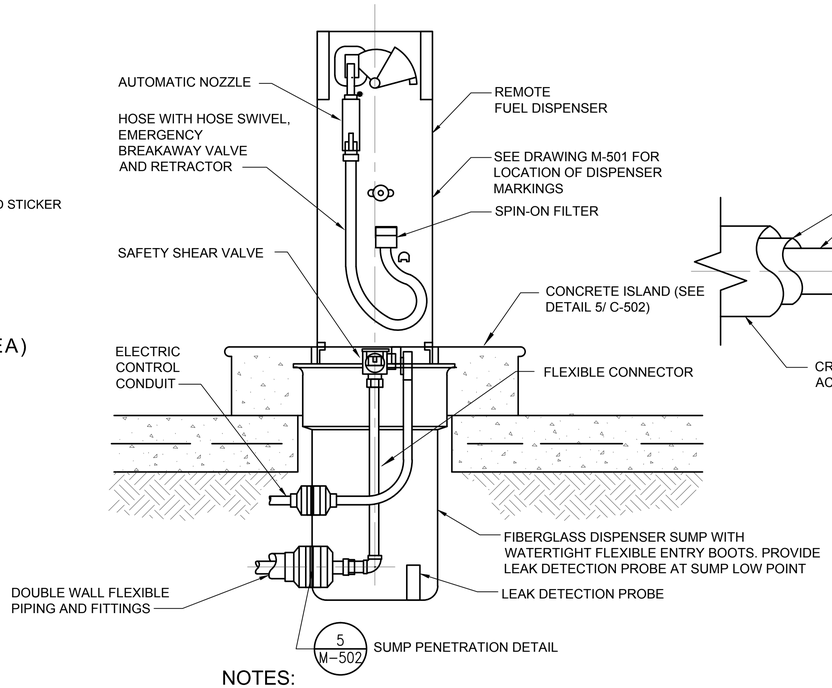
2 ALTERNATIVE FUELS DISPENSER LABEL
Scale: NTS



3 TYPICAL DISPENSER LABEL
Scale: NTS
NOTE: MARKINGS SHOWN FOR DIESEL FUEL. ADJUST MARKINGS FOR OTHER FUELS ACCORDINGLY

LABELING NOTES:

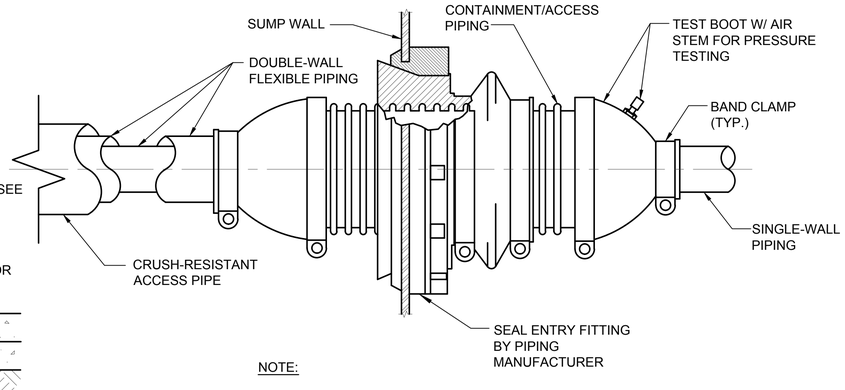
1. SEE FUEL DISPENSER REGULATIONS AND LABELING NOTES ON SHEET M-501 FOR ADDITIONAL INFORMATION.



NOTES:

1. DISPENSER SHALL BE COMPATIBLE WITH AUTOMATED FUELS SERVICE STATION EQUIPMENT / SOFTWARE PROVIDED BY DLA ENERGY.
2. ENSURE DISPENSERS / NOZZLES ARE COMPATIBLE WITH ANY LOCAL VEHICLE-MOUNTED "AUTOMOTIVE INFORMATION MODULES".

4 DISPENSER DETAIL
Scale: NTS



NOTE:

1. AFTER PRESSURE TEST, LOOSEN SECONDARY CONTAINMENT BOOT SEAL INSIDE CONTAINMENT SUMP AND ALLOW ACCUMULATED FLUID LEAKAGE TO FLOW BACK INTO SUMP.

5 SUMP PENETRATION DETAIL
Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

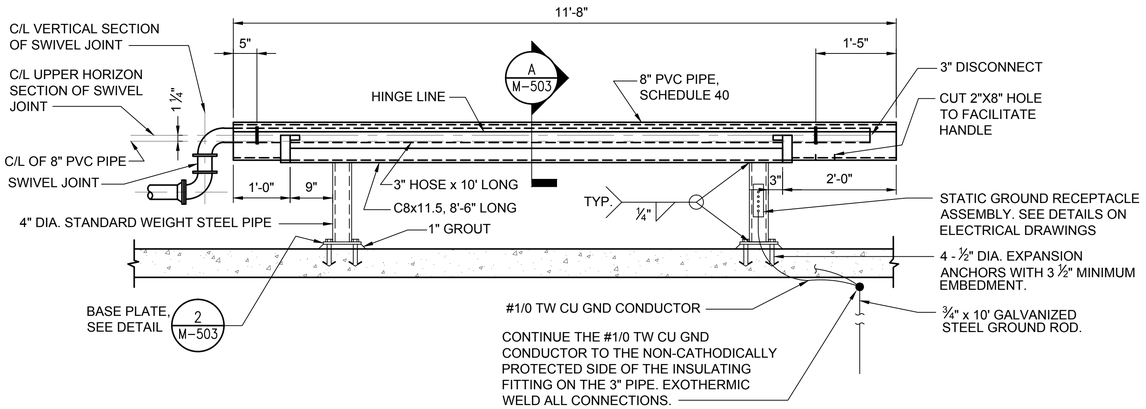
DRAWING TITLE: FUEL DISPENSER DETAILS (2 OF 2)

DRAWING NO.: M-502

SHEET 44 OF 72

RAC # 1401800

M:\2014\14018001\mech\14018001M-502.dwg 10/1/2015 11:07:01 AM Ralph Aldridge



1 HOSE SUPPORT STRUCTURE ELEVATION
Scale: 3/4" = 1'-0"

HOSE SUPPORT STRUCTURE NOTES:

1. THE 3" HOSE AND DISCONNECT ARE SHOWN HERE AS THEY WOULD APPEAR RIGIDLY EXTENDED FROM THE FLANGED SWIVEL JOINT. THE FLEXIBLE HOSE WILL ACTUALLY LAY IN THE BOTTOM OF THE PVC PIPE.
2. HANDLES: PROVIDE TWO HANDLES

   HANDLES SHALL BE STAINLESS STEEL ⅜" MINIMUM IN DIAMETER AND PROVIDED WITH A BACK PLATE OF 0.08" THICK STAINLESS STEEL TO OVER THE ENTIRE ARE BETWEEN THE SCREWS, WITH HOLES DRILLED TO ALLOW FOR MOUNTING OF THE HANDLES WITH THE SCREWS.

   HANDLES SHALL BE MOUNTED A MINIMUM OF 15" FROM CENTERLINE OF THE PVC LID WITH A MAXIMUM OF 30" APART.
3. HINGES:

   PROVIDE A MINIMUM OF 2, 6'-0" CONTINUOUS HINGES

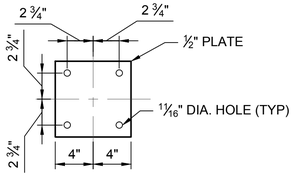
   HINGES SHALL BE ALUMINUM OR STAINLESS STEEL WITH A MINIMUM THICKNESS OF 0.06" A MINIMUM PIN DIAMETER OF 0.12" AND OPEN WIDTH OF 2".

   HINGES SHALL BE DRILLED AT 4" ON CENTER FOR BOTH LEAFS AND THROUGH BOLTED WITH WASHERS ON BACKSIDE OF THE PVC PIPE.

DESIGNER NOTES:

1. DETAILS ON THIS SHEET NEEDED FOR OPTIONAL TRUCK FILLSTAND. DELETE SHEET IF THERE IS NO TRUCK FILLSTAND.
2. INSTEAD OF LOADING HOSE AND RACK, PROVIDE OPTIONAL PANTOGRAPH PER DOD PRESSURIZED HYDRANT FUELING SYSTEM TYPE III STANDARDS IN AREAS OF HIGH UV RAYS OR IF THERE IS NO CANOPY, AS DIRECTED BY SERVICE HEADQUARTERS.

A SECTION
Scale: 1" = 1'-0"



2 BASE PLATE DETAIL
Scale: 1 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

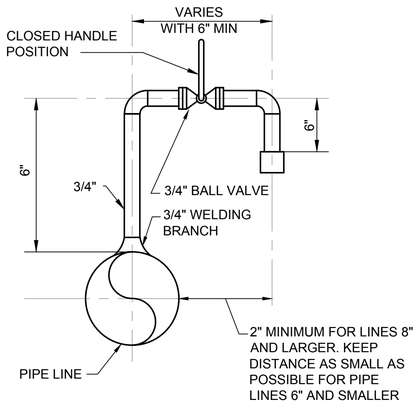
DRAWING TITLE: HOSE SUPPORT STRUCTURE DETAILS

DRAWING NO.: M-503

SHEET 45 OF 72

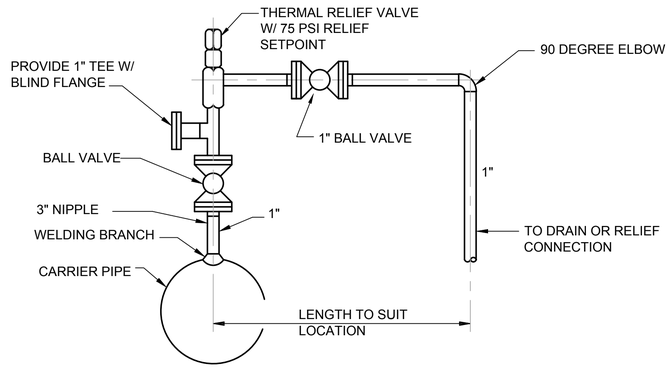
RAC # 1401800

M:\2014\1401800\mech\1401800M-503.dwg 10/1/2015 11:06:35 AM Ralph Aldridge



NOTE: PIPING MATERIALS TO MATCH CARRIER PIPE

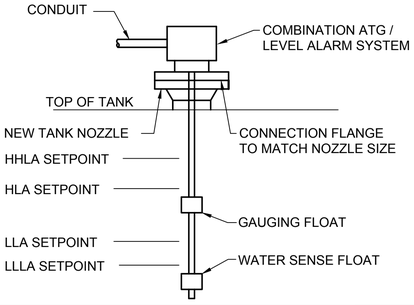
1 MANUAL AIR VENT
Scale: NTS



2 THERMAL RELIEF VALVE ASSEMBLY
Scale: NTS

NOTES:

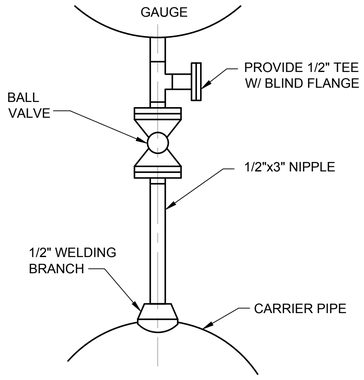
1. ALL PIPING JOINTS SHALL BE WELDED. BALL VALVES AND RELIEF VALVE SHALL BE FLANGED.
2. TRV PIPING AND COMPONENT MATERIAL SHALL MATCH CARRIER PIPE MATERIAL.
3. VALVES SHALL BE SECURED IN THE OPEN POSITION.
4. INSTALL THERMAL RELIEVE VALVE IN VERTICAL POSITION.



LEVEL ALARM HEIGHT				
	RISING LEVEL ACTUATOR POINT		FALLING LEVEL ACTUATOR POINT	
	HLA	HHLA	LLA	LLLA
ALL TANKS	95% VOLUME	98% VOLUME	15% VOLUME	AT MINIMUM PUMP SUBMERGENCE LEVEL
SYSTEM RESPONSE	ACTIVATES AUDIBLE AND VISUAL ALARM	SHUTS DOWN OFFLOAD PUMP	ACTIVATES AUDIBLE AND VISUAL ALARM	SHUTS DOWN DISPENSER PUMP AND TRUCK FILLSTAND PUMP (SEE NOTE *)

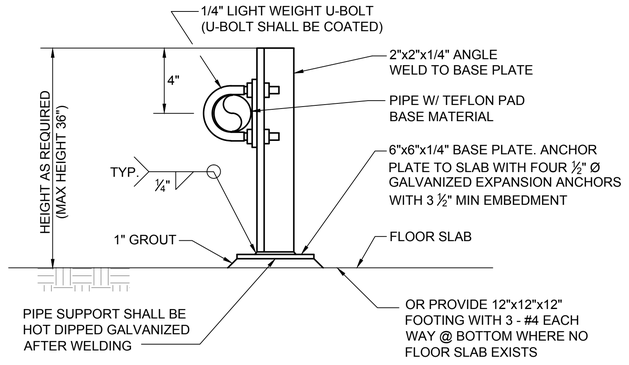
* NOTE: DISPENSER PUMP ONLY IF THERE IS NO FILLSTAND

3 TANK LEVEL ALARM
Scale: NTS



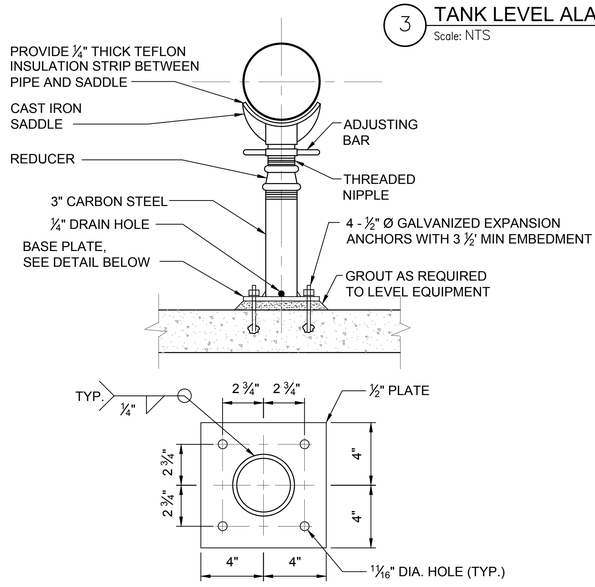
4 PRESSURE GAUGE PIPE CONNECTION
Scale: NTS

NOTE:
1. GAUGE PIPING AND COMPONENT MATERIAL SHALL MATCH CARRIER PIPE MATERIAL.



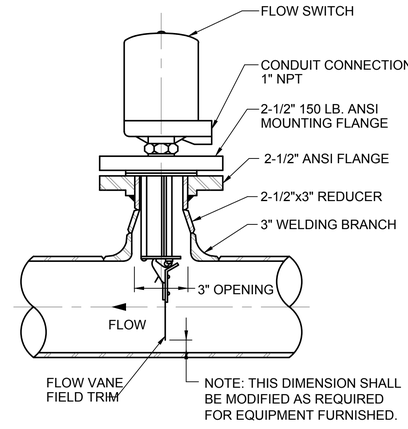
5 PIPE SUPPORT FOR 3/4" TO 2" PIPE
Scale: NTS

MAXIMUM PIPE SUPPORT SPACING:
3/4" PIPE - 6'; 1" PIPE - 7'; 1-1/2" PIPE - 9';
2" PIPE - 10'

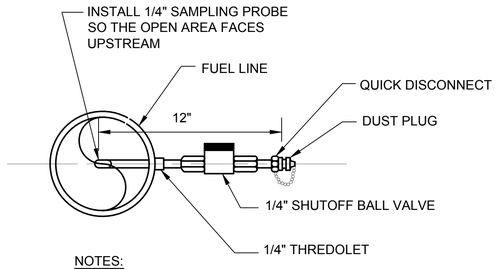


6 ADJUSTABLE PIPE SUPPORT
Scale: NTS

MAXIMUM PIPE SUPPORT
SPACING: 3" PIPE - 12'; 4" PIPE - 14';
OR AS SHOWN



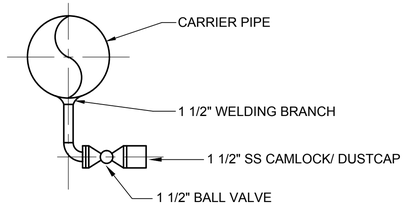
7 PADDLE TYPE FLOW SWITCH
Scale: NTS



NOTES:

1. INSTALLER TO PAY CLOSE ATTENTION TO DIRECTIONAL ARROW TO AVOID INCORRECT INSTALLATION OF SAMPLE PROBE

8 SAMPLE CONNECTION
Scale: NTS



9 LOW POINT DRAIN
Scale: NTS

NOTES:

1. LPD PIPING AND COMPONENT MATERIAL SHALL MATCH CARRIER PIPE MATERIAL.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

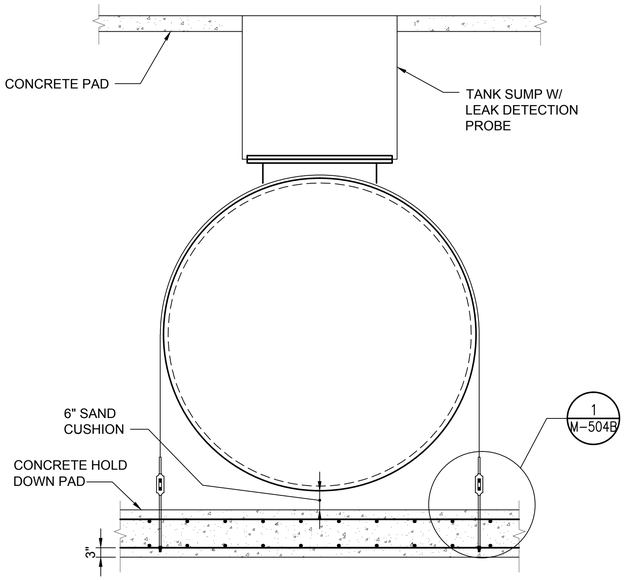
DRAWING TITLE: ABOVEGROUND STORAGE TANKS FUEL SYSTEM DETAILS (1 OF 2)

DRAWING NO.: **M-504A**

SHEET 46 OF 72

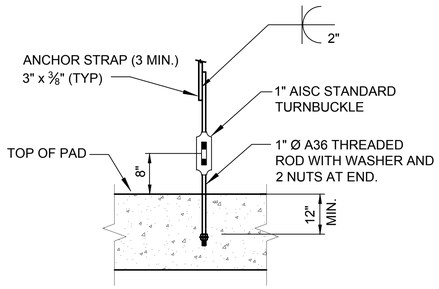
RAC # 1401800

M:\2014\14018001\mech\14018001M-504A.dwg 10/1/2015 11:06:09 AM Ralph Aldridge

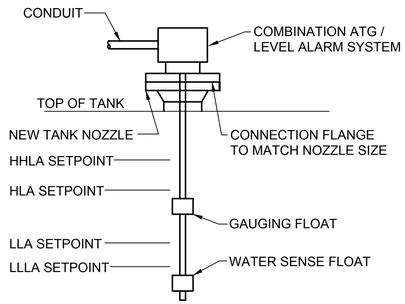


A SECTION
Scale: 1/2" = 1'-0"

NOTE: HOLD-DOWN STRAP, TURN BUCKLE AND ANCHOR ROD SHALL BE NON-CORROSIVE OR COATED FOR CORROSION PROTECTION.



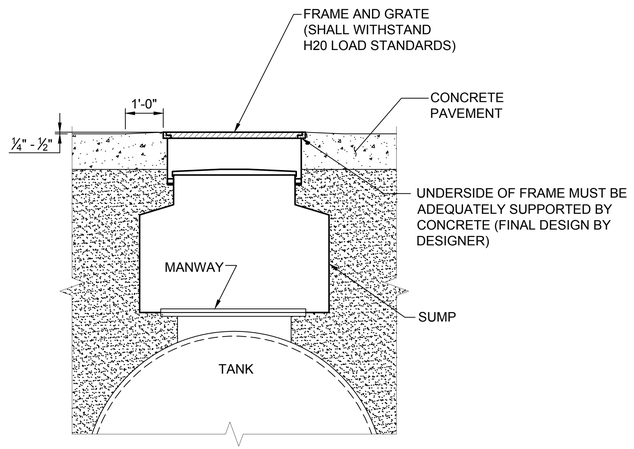
1 DETAIL
Scale: NTS



LEVEL ALARM HEIGHT				
	RISING LEVEL ACTUATOR POINT		FALLING LEVEL ACTUATOR POINT	
	HLA	HHLA	LLA	LLLA
ALL TANKS	90% VOLUME	95% VOLUME	15% VOLUME	AT MINIMUM PUMP SUBMERGENCE LEVEL
SYSTEM RESPONSE	ACTIVATES AUDIBLE AND VISUAL ALARM	ACTIVATES AUDIBLE AND VISUAL ALARM	ACTIVATES AUDIBLE AND VISUAL ALARM	SHUTS DOWN DISPENSER PUMP AND THE TRUCK FILLSTAND PUMP (SEE NOTE *)

* NOTE: DISPENSER PUMP ONLY IF THERE IS NO FILLSTAND

2 TANK LEVEL ALARM
Scale: NTS



3 SUMP INSTALLATION IN TRAFFIC AREA
Scale: 1/2" = 1'-0"

GRAPHIC SCALES

2 0 2 4

SCALE: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

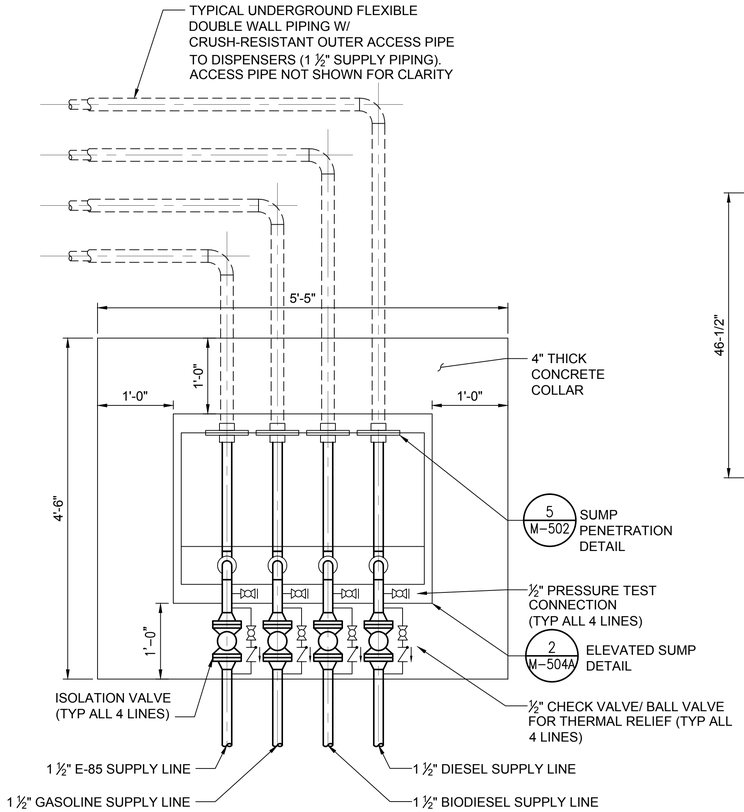
DRAWING TITLE: UNDERGROUND STORAGE TANKS FUEL SYSTEM DETAILS

DRAWING NO.: M-504B

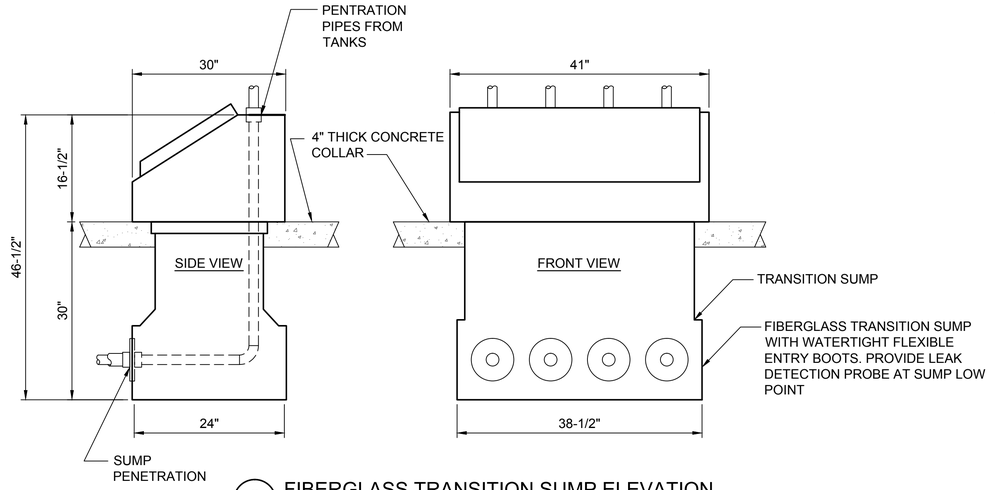
SHEET 47 OF 72

RAC # 1401800

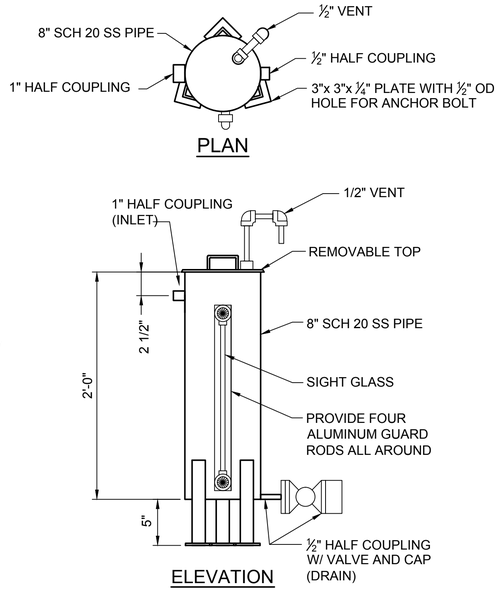
M:\2014\1401800\mech\1401800M-504B.dwg 10/1/2015 11:05:44 AM Ralph Aldridge



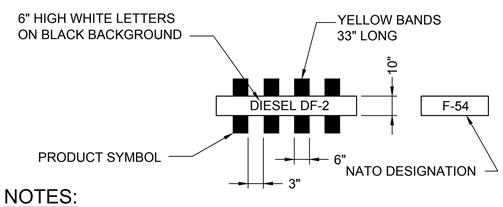
1 FIBERGLASS TRANSITION SUMP PLAN
Scale: 1" = 1'–0"



2 FIBERGLASS TRANSITION SUMP ELEVATION
Scale: NTS



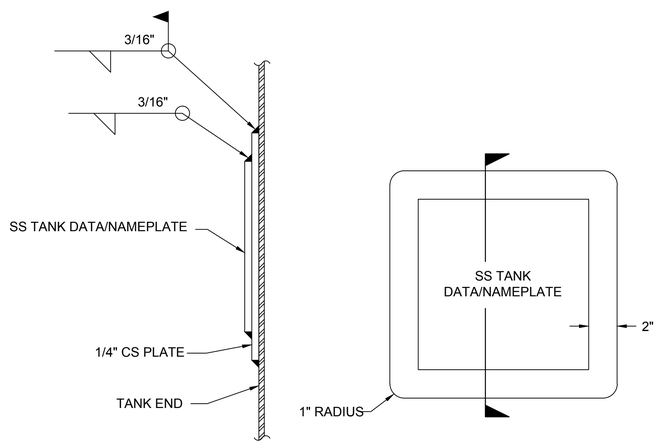
3 5 GALLON DRAIN TANK DETAIL
Scale: 1 1/2" = 1' – 0"



NOTES:

1. IDENTIFY TANKS AS TO PRODUCT SERVICE BY COLOR CODING, BANDING, PRODUCT NAMES, AND NATO DESIGNATION IN ACCORDANCE WITH MIL-STD-161G.
2. SAMPLE TANK LABELING SHOWN IS FOR DIESEL FUEL. FOR OTHER FUELS REFER TO MIL-STD-161G. DIMENSIONS VARY BASED ON TANK SIZE.
3. MARK TANKS WITH EASILY DISCERNIBLE PAINTED NUMBERS AND LETTERS INDICATING THE FOLLOWING IN ADDITION TO THE REQUIREMENTS STATED IN MIL-STD-161: TANK NUMBER, FACILITY NUMBER, "NO SMOKING" ON CLASS 1 TANKS, AND "CONFINED SPACE" ON ROOF MANHOLE/LADDER HATCH.
4. PROVIDE HAZARD IDENTIFICATION SYSTEM LABELING IN ACCORDANCE WITH NFPA 704.

4 TANK PRODUCT SYMBOL DETAIL
Scale: NTS



NOTE:
1. TANK DATA/NAMEPLATE SHALL INDICATE THE TANK CAPACITY IN GALLONS, UL LISTINGS, YEAR OF MANUFACTURE AND TANK MANUFACTURER'S NAME, ADDRESS AND TELEPHONE NUMBER.
2. LOCATE ON TANK END ON MOST USED APPROACH SIDE AND AT EYE LEVEL.
3. NAMEPLATE DATA SHALL BE ENGRAVED OR CHEMICALLY ETCHED.

5 TANK DATA PLATE
Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

DRAWING TITLE: ABOVEGROUND STORAGE TANKS FUEL SYSTEM DETAILS (2 OF 2)

DRAWING NO.: **M-505A**

SHEET 48 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401800M-505A.dwg 10/1/2015 11:05:13 AM Ralph Aldridge

PUMP SCHEDULE (ABOVEGROUND STORAGE TANKS FUEL SYSTEM)

TAG	SERVICE	TYPE	FLUID	GPM	INLET SIZE	OUTLET SIZE	HEAD (NOTE 2)	MOTOR DATA			LOCATION
								HP	V/PH/HZ	RPM	
OP-1	OFFLOAD PUMP	SELF PRIMING CENT.	DIESEL	300	4"	3"	-	25	208/3/60	-	OFFLOAD PAD AREA
OP-2	OFFLOAD PUMP	SELF PRIMING CENT.	BIODIESEL	300	4"	3"	-	25	208/3/60	-	OFFLOAD PAD AREA
OP-3	OFFLOAD PUMP	SELF PRIMING CENT.	GASOLINE	300	4"	3"	-	25	208/3/60	-	OFFLOAD PAD AREA
OP-4	OFFLOAD PUMP	SELF PRIMING CENT.	E-85	300	4"	3"	-	25	208/3/60	-	OFFLOAD PAD AREA
DP-1	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	DIESEL	10	N/A	1"	-	1	208/3/60	-	DIESEL STORAGE TANK
DP-2	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	BIODIESEL	10	N/A	1"	-	1	208/3/60	-	GASOLINE STORAGE TANK
DP-3	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	GASOLINE	10	N/A	1"	-	1	208/3/60	-	BIODIESEL STORAGE TANK
DP-4	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	E-85	10	N/A	1"	-	1	208/3/60	-	E-85 STORAGE TANK
IP-1	FILLSTAND ISSUE PUMP	SUBMERSIBLE TURBINE	DIESEL	150	N/A	3"	-	5	208/3/60	-	DIESEL STORAGE TANK

NOTES:
1. PUMPS SHALL MEET ALL MATERIAL, CONSTRUCTION AND PERFORMANCE REQUIREMENTS OF UFGS 33 52 10.
2. FINAL DESIGNER SHALL PERFORM FINAL PUMP SIZING BASED ON ACTUAL PIPING AND COMPONENT CONFIGURATIONS USED. ENSURE ALL OPERATIONAL PERFORMANCE REQUIREMENTS ARE MET.
3. ASSUMED PUMP MOTOR SIZES ARE SHOWN; VERIFY WITH FINAL PUMP SIZING.
4. IP-1 MAY BE A VERTICAL TURBINE TYPE PUMP IF 300 GPM ISSUE FLOWRATE TO FILLSTAND IS REQUIRED.
5. PER SERVICE HEADQUARTERS DIRECTION, DP-1 / DP-2 FLOWRATE MAY BE INCREASED TO 15 GPM FOR "HIGH-FLOW" DISPENSER CAPABILITY.
6. GUIDELINES FOR FILLSTAND PUMP SIZING BY FINAL DESIGNER: IN ADDITION TO SITE-SPECIFIC ELEVATION CHANGES AND FRICTION LOSSES DUE TO LENGTHS / QUANTITIES / SIZING OF PIPING / FITTING / MANUAL VALVES, ENSURE CALCULATIONS ACCOUNT FOR: 15 PSI DROP ACROSS PDCV; 15 PSI DROP ACROSS FILTER/SEPARATOR (IF APPLICABLE); 3 PSI DROP THROUGH BASKET STRAINER; 15 PSI DROP ACROSS TLCV; 3 PSI DROP THROUGH METER; 35 PSI BACKPRESSURE AT INLET TO LOADING NOZZLE.

PUMP SCHEDULE (UNDERGROUND STORAGE TANKS FUEL SYSTEM)

TAG	SERVICE	TYPE	FLUID	GPM	INLET SIZE	OUTLET SIZE	HEAD (NOTE 2)	MOTOR DATA			LOCATION
								HP	V/PH/HZ	RPM	
DP-1	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	DIESEL	10	N/A	1"	-	1	208/3/60	-	DIESEL STORAGE TANK
DP-2	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	BIODIESEL	10	N/A	1"	-	1	208/3/60	-	GASOLINE STORAGE TANK
DP-3	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	GASOLINE	10	N/A	1"	-	1	208/3/60	-	BIODIESEL STORAGE TANK
DP-4	DISPENSER ISSUE PUMP	SUBMERSIBLE TURBINE	E-85	10	N/A	1"	-	1	208/3/60	-	E-85 STORAGE TANK
IP-1	FILLSTAND ISSUE PUMP	SUBMERSIBLE TURBINE	DIESEL	150	N/A	3"	-	5	208/3/60	-	DIESEL STORAGE TANK

NOTES:
1. PUMPS SHALL MEET ALL MATERIAL, CONSTRUCTION AND PERFORMANCE REQUIREMENTS OF UFGS 33 52 10.
2. TANK MANUFACTURER SHALL PERFORM FINAL PUMP SIZING BASED ON ACTUAL PIPING AND COMPONENT CONFIGURATIONS USED. ENSURE ALL OPERATIONAL PERFORMANCE REQUIREMENTS ARE MET.
3. ASSUMED PUMP MOTOR SIZES ARE SHOWN; VERIFY WITH FINAL PUMP SIZING.
4. PER SERVICE HEADQUARTERS DIRECTION, DP-1 / DP-2 FLOWRATE MAY BE INCREASED TO 15 GPM FOR "HIGH-FLOW" DISPENSER CAPABILITY.
5. GUIDELINES FOR FILLSTAND PUMP SIZING BY FINAL DESIGNER: IN ADDITION TO SITE-SPECIFIC ELEVATION CHANGES AND FRICTION LOSSES DUE TO LENGTHS / QUANTITIES / SIZING OF PIPING / FITTING / MANUAL VALVES, ENSURE CALCULATIONS ACCOUNT FOR: 15 PSI DROP ACROSS PDCV; 15 PSI DROP ACROSS FILTER/SEPARATOR (IF APPLICABLE); 3 PSI DROP THROUGH BASKET STRAINER; 15 PSI DROP ACROSS TLCV; 3 PSI DROP THROUGH METER; 35 PSI BACKPRESSURE AT INLET TO LOADING NOZZLE.

CONTROL VALVE SCHEDULE

TAG	SIZE	DESCRIPTION	LOCATION	FEATURES (SEE NOTE 2)
FCV	4"	FLOW CONTROL VALVE	OFFLOAD PAD	INCLUDES "AIR BLOCK" INTERCONNECTION TO UPSTREAM METER
PDCV	3"	PUMP DISCHARGE CONTROL VALVE	STORAGE TANK NOZZLE	
TLCV	3"	TRUCK LOADING CONTROL VALVE	TRUCK FILLSTAND EQUIPMENT PAD	INCLUDES DEADMAN CONTROL, THERMAL RELIEF TO INLET SIDE; SCULLY INTERCONNECTION

NOTES:
1. CONTROL VALVES SHALL MEET ALL MATERIAL, CONSTRUCTION AND PERFORMANCE REQUIREMENTS OF UFGS 33 52 43.14.
2. PROVIDE ALL VALVE FUNCTIONS PER UFGS SPECIFIATION, EXCEPT AS MODIFIED OR AMENDED ABOVE.
3. FCV ARE NOT REQUIRED FOR UNDERGROUND STORAGE TANK SYSTEMS.
4. PDCV AND TLCV ARE NOT REQUIRED UNLESS THE OPTIONAL FILLSTAND IS INCLUDED.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

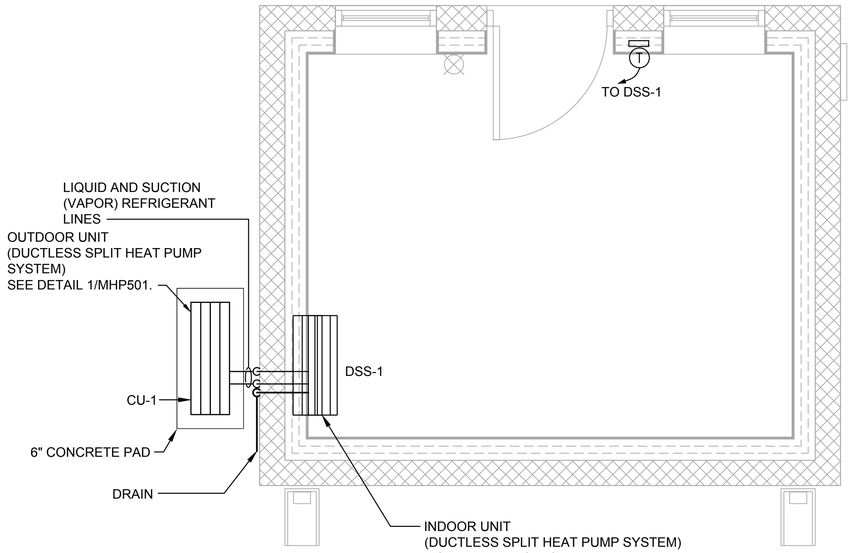
DESIGNED: MLS | DRAWN: MLS | CHECKED: MHF | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

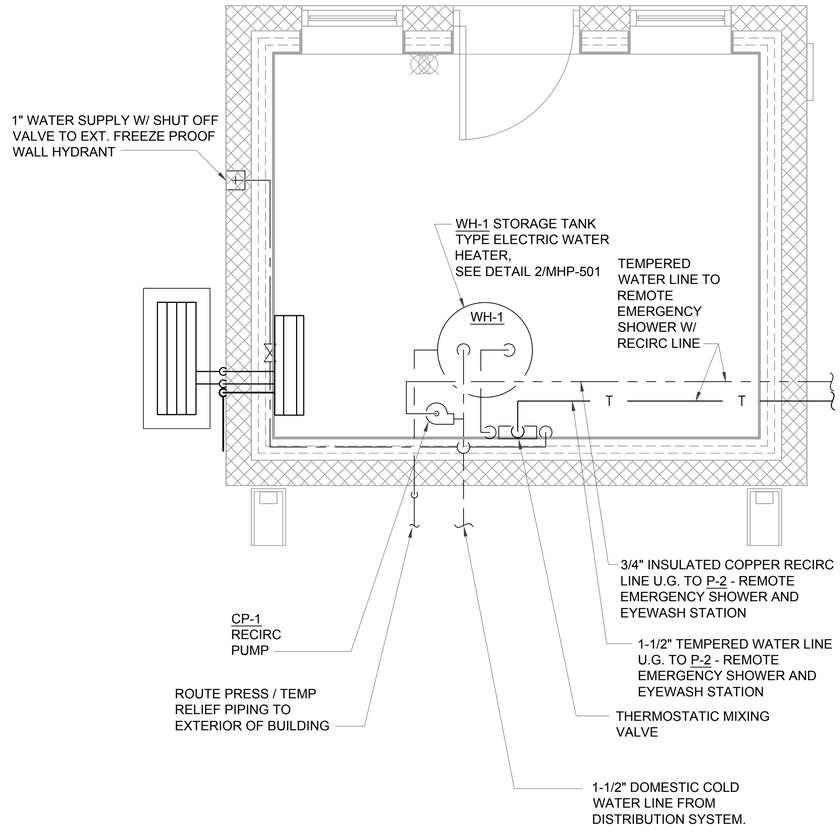
DRAWING TITLE: FUEL SYSTEM SCHEDULES

DRAWING NO.: **M-601**

RAC # 1401800



1 HVAC FLOOR PLAN
Scale: 1/4" = 1'-0"



2 PLUMBING FLOOR PLAN
Scale: 1/4" = 1'-0"

GENERAL NOTES:

1. FIXED SAFETY SHOWERS AND EYEWASH FACILITIES, OR PORTABLE EYEWASH UNITS, SHALL BE INSTALLED IN ACCORDANCE WITH UFC 3-460-01 2-11.1 AT LOCATIONS WITH HIGH-FLOW FILLSTANDS ONLY. FIXED SAFETY SHOWERS AND EYEWASH FACILITIES ARE NOT TO BE PROVIDED AT OTHER LOCATIONS. INSTALLATION OF SAFETY SHOWER AND EYEWASH (SSEW) FACILITIES SHALL FOLLOW UFC 3-420-01 APPENDIX D. UNITS MUST MEET REQUIREMENTS OF ANSI/ISEA Z358.1. PORTABLE EYEWASH UNITS SHALL BE PROVIDED WHEN COST OF EXTENDING POTABLE WATER SUPPLY IS PROHIBITIVE.
2. SSEW MUST BE LOCATED CLOSE TO THE FUEL TRANSFER HOSE CONNECTION POINTS, IDEALLY ABOUT 20 TO 30 FT AWAY, BUT NOT MORE THAN 10 SECONDS OR 100 FEET (30 M) OF UNOBSTRUCTED TRAVEL AWAY, WHICHEVER IS LESS.
3. A WATERFLOW INITIATED ALARM MUST BE PROVIDED FOR EACH SSEW, WHERE REQUIRED BY THE INSTALLATION. FOR LOCATIONS WHERE POTABLE WATER IS NOT AVAILABLE, PROVIDE PERSONAL EYEWASH PROTECTION AND A MANUALLY INITIATED ALARM. PROVIDE A LOCAL AUDIBLE SIGNAL DEVICE, A SILENCING SWITCH, AND A FLASHING STROBE LIGHT FOR EACH SSEW AND FOR EACH MANUAL ALARM, AND OPTIONALLY PROVIDE CENTRAL REPORTING OF THE ALARM TO A 24 HOUR PER DAY MANNED LOCATION (THIS MAY BE ACCOMPLISHED USING A FIRE ALARM SUPERVISORY SIGNAL IF BASE FIRE DEPARTMENT ALLOWS). ALARM AUDIBLE SIGNAL DEVICES SHOULD HAVE A DISTINCT SOUND, DIFFERENT FROM OTHER ALARMS IN THIS AND ADJACENT FACILITIES. MOUNT ALARM AUDIBLE SIGNAL DEVICE, SILENCING SWITCH, AND STROBE LIGHT ON WALL OR SSEW COLUMN, IMMEDIATELY ABOVE THE LEVEL OF THE SHOWERHEAD.
4. FLOOR DRAINS ARE NOT REQUIRED FOR SSEW FACILITIES, IN ACCORDANCE WITH INTERNATIONAL PLUMBING CODE (IPC) SECTION 411. HOWEVER, IF A HOT WATER HEATER IS USED TO PROVIDE TEMPERED WATER TO THE EMERGENCY EYEWASH AND SHOWER STATIONS AND WATER HEATER IS LOCATED IN THE CONTROL ROOM, THEN A DRAIN PAN IS REQUIRED UNDER THE WATER HEATER AND THE DRAIN PAN DRAIN MUST BE TERMINATED IN ACCORDANCE WITH IPC 504.7.
5. WATER SUPPLY FOR SSEW MUST PROVIDE 20 GPM OF TEMPERED WATER AT 30 PSIG FOR NOT LESS THAN 15 MINUTES, AS REQUIRED BY ANSI Z358.1, "STANDARD FOR EYE WASH AND SHOWER EQUIPMENT". TEMPERED WATER SHALL BE DELIVERED AT A TEMPERATURE BETWEEN 60°F AND 100°F, WITH 90°F TO 95°F BEING IDEAL (PER AFI 91-203, AIR FORCE CONSOLIDATED OCCUPATIONAL SAFETY INSTRUCTION, PARA 19.6.1) .
6. WHEN SUFFICIENT ELECTRICAL POWER IS AVAILABLE, DESIGNER SHOULD CONSIDER THE USE OF INSTANTANEOUS WATER HEATERS SUCH AS PRODUCTS MANUFACTURED BY KELTECH AND EEMAX. CAPACITY OF INSTANTANEOUS WATER HEATER SHALL BE CALCULATED BASED ON DIFFERENCE BETWEEN DELIVERY TEMPERATURE AND PUBLISHED MINIMUM GROUND WATER TEMPERATURE FOR LOCALE. LOCATIONS WITH PUBLISHED MINIMUM GROUND WATER TEMPERATURES ABOVE 65°F SHOULD NOT NORMALLY REQUIRE HEAT FOR TEMPERING.
7. IF AN INSTANTANEOUS WATER HEATER IS NOT USED, USE A STANDARD STORAGE TYPE WATER HEATER CONFIGURED AS SHOWN IN THE DETAIL.
8. WATER HEATERS MUST BE MOUNTED INSIDE A BUILDING OR IN A SUITABLE WEATHERPROOF ENCLOSURE, SUCH AS PRODUCTS MANUFACTURED BY AQUASHIELD AND HOT-BOX.
9. SSEW FACILITIES REQUIRE ELECTRIC HEAT TRACING AND INSULATION FOR FREEZE PROTECTION IN AREAS SUBJECT TO FREEZING TEMPERATURES. IN HOT CLIMATES, PROVIDE INSULATION OR SHADE TO PREVENT SCALDING WATER TEMPERATURES.
10. IF THE SSEW IS LOCATED MORE THAN FIFTY FEET FROM THE TEMPERED WATER SOURCE IN AREAS SUBJECT TO FREEZING TEMPERATURES, A CIRCULATING LINE AND PUMP MUST BE PROVIDED TO MAINTAIN THE TEMPERATURE OF THE WATER IN THE SUPPLY LINE, TO AVOID THERMAL SHOCK TO THE USER. CIRCULATING PUMP WILL BE 1/2 HP, 5 GPM CIRCULATION PUMP ASSEMBLY WITH ISOLATION VALVES, CHECK VALVE, AND UNIONS. PUMP WILL CIRCULATE THE TEMPERED WATER FROM THE SSEW BACK TO THE WATER HEATER FROM THE FURTHEST POINT. A SYSTEM SHUT-OFF WILL BE INSTALLED TO SHUT OFF PUMP WHEN THE FACILITY IS NOT IN USE.

SCALE
4' 2' 0 4' 8'
1/4" = 1'- 0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED WBH | DRAWN JAB | CHECKED WBH | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

DRAWING TITLE: CONTROL BUILDING PLANS AND GENERAL NOTES

DRAWING NO. **MHP-101**

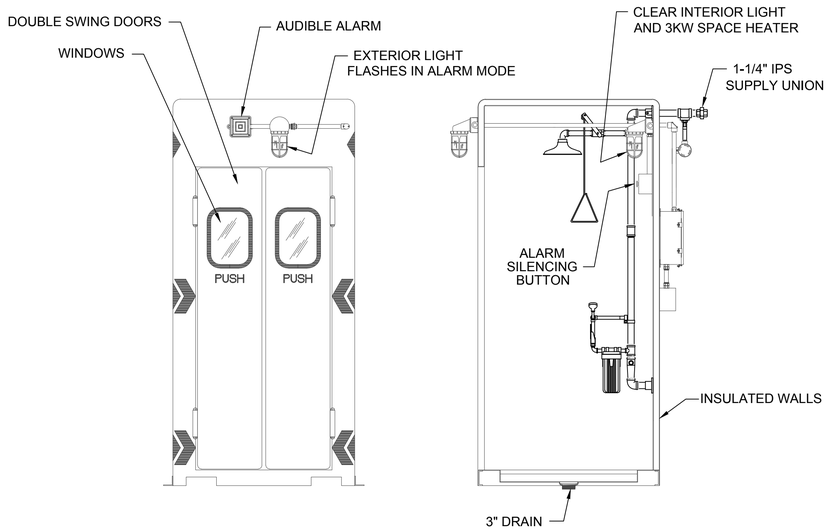
SHEET 51 OF 72

RAC # 1401800

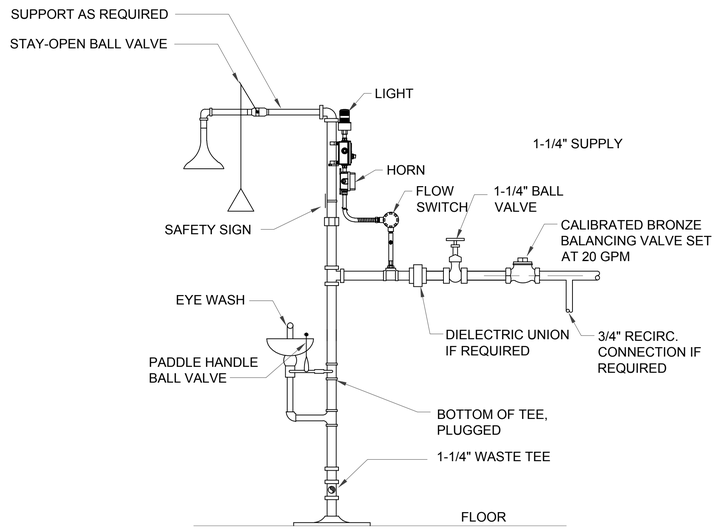
M:\2014\1401800\mech\1401820MHP-101.dwg 10/1/2015 11:03:57 AM Ralph Aldridge

GENERAL NOTES:

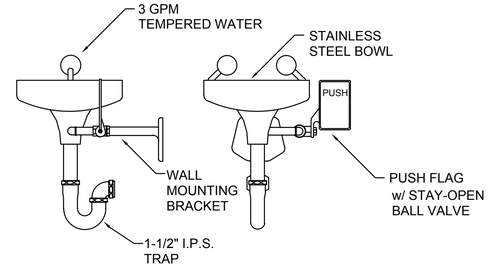
1. SEE SHEET MHP-101 FOR SAFETY SHOWER / EYEWASH SELECTION NOTES.



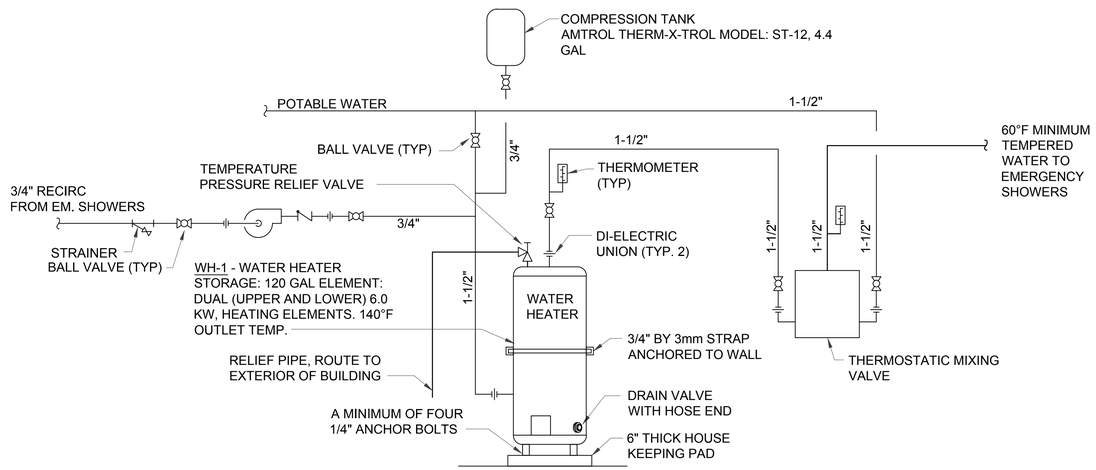
1 ENCLOSED EMERGENCY FACE/EYE WASH AND SHOWER DETAIL
SCALE: N.T.S.



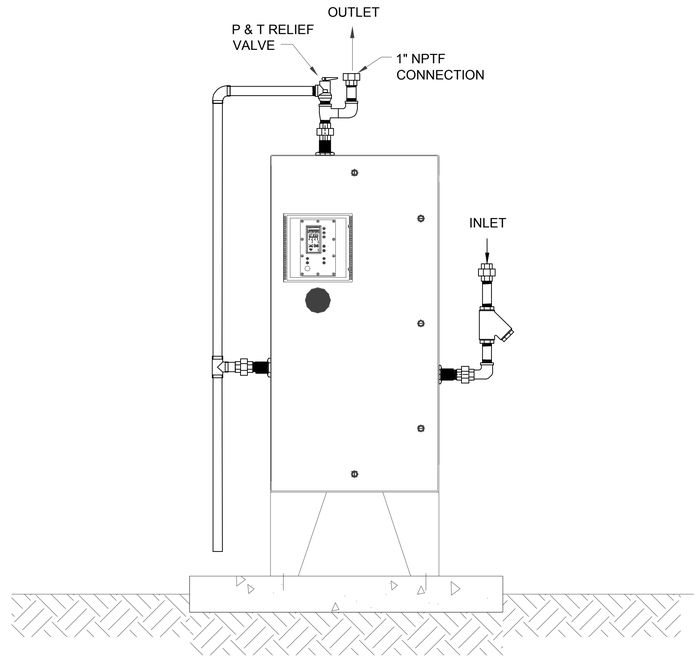
2 EMERGENCY FACE/EYE WASH AND SHOWER DETAIL
SCALE: N.T.S.



3 EMERGENCY EYE WASH DETAIL
SCALE: N.T.S.



4 STORAGE WATER HEATER WITH RECIRC LINE AND THERMOSTATIC MIXING VALVE
SCALE: N.T.S.



5 OUTDOOR MOUNTED INSTANTANEOUS WATER HEATER
SCALE: N.T.S.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: WBH | DRAWN: JAB | CHECKED: WBH | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

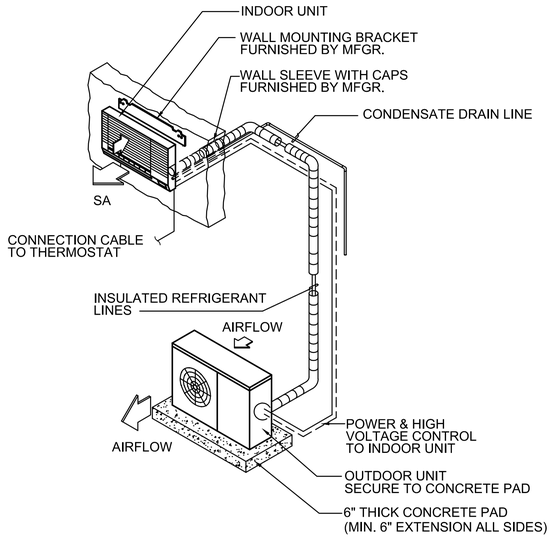
DRAWING TITLE: CONTROL BUILDING DETAILS (1 OF 2)

DRAWING NO.: **MHP-501**

SHEET 51 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401820MHP-501.dwg 10/1/2015 11:03:35 AM Ralph Aldridge

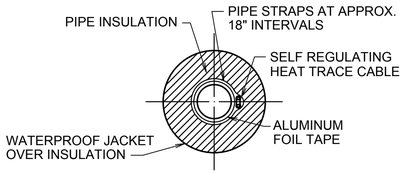


1 WALL-MOUNT DUCTLESS SPLIT (HEAT PUMP) UNIT DETAIL

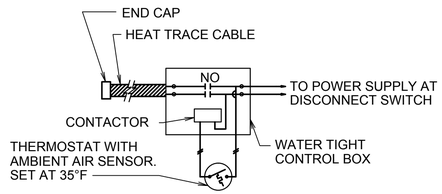
SCALE: N.T.S.

GENERAL NOTES:

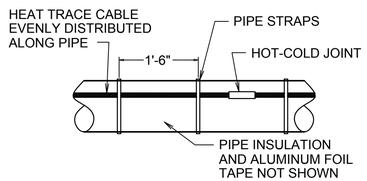
1. THE CONTROL BUILDING FOR THE VEHICLE FUELING STATION WILL REQUIRE COOLING BECAUSE OF THE ELECTRONIC SYSTEMS MOUNTED THERE, INCLUDING THE ATG/LEVEL ALARM/FUEL CUSTODY MANAGEMENT SYSTEM, AND THE TELECOMMUNICATIONS SYSTEM.
2. SUMMER AND WINTER OUTDOOR DESIGN CONDITIONS MUST BE OBTAINED FOR THE LOCALE FROM UFC 3-400-02, ENGINEERING WEATHER DATA.
3. THE CONTROL BUILDING SHOULD BE PROVIDED WITH A WALL-MOUNT DUCTLESS SPLIT HEAT PUMP DIRECT EXPANSION UNIT UTILIZING REFRIGERANT R-410A.
4. INDOOR COOLING DESIGN CRITERIA WILL BE 78°F DB AND 50% RH. INDOOR HEATING DESIGN CRITERIA WILL BE 68°F.
5. NO OUTDOOR AIR IS REQUIRED TO BE CONDITIONED BECAUSE THE SPACE IS NOT NORMALLY OCCUPIED. SUFFICIENT OUTDOOR AIR WILL BE INTRODUCED THROUGH INFILTRATION.



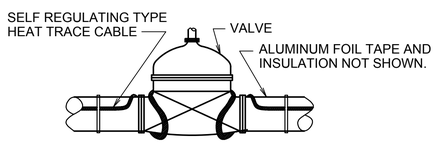
SECTION THRU PIPE



HEAT TRACE CONTROL BOX DIAGRAM



INSTALLATION DETAIL



INSTALLATION AT VALVES

NOTES: (1) PROVIDE WEATHER RESISTANT LABELING ON EXTERIOR OF JACKET IDENTIFYING PIPES AS BEING "ELECTRIC TRACED" WITH VOLTAGE INDICATED.

2 ELECTRIC RESISTANCE HEAT TRACING DETAIL

SCALE: N.T.S.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

PRELIMINARY NOT FOR CONSTRUCTION

SEAL

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: WBH
DRAWN: JAB
CHECKED: WBH
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
PROJECT NO.: 14018-20
DRAWING TITLE: CONTROL BUILDING DETAILS (2 OF 2)

DRAWING NO.: **MHP-502**

SHEET 52 OF 72

RAC # 1401800

M:\2014\1401800\mech\1401820MHP-502.dwg 10/1/2015 11:16:53 AM Ralph Aldridge

EXTERIOR ELECTRICAL LEGEND

PE — PHOTOELECTRIC CONTROL RELAY

#4/0 — GROUNDING SYSTEM. ELECTRODE AND CONDUCTOR (COUNTERPOISE) (BARE COPPER) AS INDICATED

LIGHTNING PROTECTION AIR TERMINAL

ELECTRICAL POWER DIAGRAM LEGEND

3P / 20 A — MOLDED CASE CIRCUIT BREAKER, FIXED TRIP. THREE POLE UNLESS DESIGNATED '1P' OR '2P'.

1600AF / 1200AT — MOLDED CASE CIRCUIT BREAKER OF A GIVEN FRAME SIZE WITH ADJUSTABLE TRIP SETTINGS.

FUSE-POWER AND CONTROL APPLICATIONS RESPECTIVELY, SIZE AS INDICATED

SS — GROUND CONNECTION - TO STANDARD ROD TYPE ELECTRODE, TO NEAREST STRUCTURAL STEEL (#6 MIN. CONDUCTOR IF NOT SHOWN)

POWER & DISTRIBUTION TRANSFORMER, RATED kVA, VOLTAGE, CONNECTIONS, COOLING CLASS AND TYPE AS INDICATED.

TRANSFORMER DELTA CONNECTION DESIGNATION WHEN USED BY A TRANSFORMER SYMBOL.

TRANSFORMER GROUNDED-WYE CONNECTION DESIGNATION WHEN USED BY A TRANSFORMER SYMBOL, DIRECT GROUNDED AND RESISTOR GROUNDED RESPECTIVELY. IF THE GROUND SYMBOL IS MISSING, THEN IT IS AN UNGROUNDED WYE CONNECTION.

M ID — MOTOR - USE AND SIZE AS INDICATED

HP ID — MOTOR, THREE PHASE - USE AND SIZE AS INDICATED

#3 / 2S — MOTOR CONTROLLER - TYPE AS SPECIFIED, UPPER NUMERAL DESIGNATES NEMA SIZE; LOWER LETTER, IF USED, INDICATES: 'R' - REVERSING TYPE, '2S' - TWO SPEED TYPE, 'FV'- FULL VOLTAGE TYPE (DEFAULT IF NOT INDICATED), 'RV' - REDUCED VOLTAGE TYPE, 'AT' - AUTO TRANSFORMER TYPE, 'PW" - PART WINDING TYPE.

COMBINATION STARTER W/EXTERNALLY OPERATED DISCONNECT

DISCONNECT SWITCH, SIZE AND TYPE AS INDICATED (OR 3P, 480V, 30A MIN)

EPDS-# — PUSHBUTTON CONTROL STATION - "EPDS" = EMERGENCY FUEL SHUTOFF / EMERGENCY POWER DOWN SWITCH.

$S_{HOA\ 2P}$ SS — SELECTOR SWITCH (SEPARATE FROM STARTER)- 2 POSITION OR 3 POSITION AS INDICATED. IF NOT SPECIFIED ELSEWHERE, LEGEND PLATE DESIGNATIONS WILL BE 'ON-OFF' AND 'MAN-OFF-AUTO' (OR 'H.O.A.)

LP2 B — LIGHTING AND APPLIANCE TYPE PANELBOARD - FLUSH MOUNTED AND SURFACE MOUNTED TYPES, SEE CORRESPONDING PANEL SCHEDULE. OPEN SYMBOL INDICATES EXISTING

DISTRIBUTION TYPE PANEL

MSB MSG — MAIN SWITCH BOARD OR MAIN SWITCH GEAR (ABBREVIATED OR SPELLED OUT), SEE FLOOR PLANS AND DIAGRAMS FOR DIMENSIONS, CLEARANCES, AND ELECTRICAL RATINGS

LP-2,4,6 — BRANCH CIRCUIT AND FEEDER WIRING. LONG, SHORT, SINGLE DOT AND DOUBLE DOT HASH MARKS REPRESENT PHASE CONDUCTOR, NEUTRAL, EQUIPMENT GROUND, AND ISOLATED EQUIPMENT GROUND RESPECTIVELY ARROWS AND LETTER/NUMERALS IDENTIFY HOME-RUN CIRCUITS. IF HASH MARKS ARE OMITTED BETWEEN HOME-RUNS, TRANSITION SEGMENTS, AND END-OF-LINE DEVICES, REQUIRED QUANITY IS UNDERSTOOD TO APPLY TO ALL UNMARKED INTERVENING SEGMENTS. A CIRCUIT WITHOUT ANY DESIGNATION INDICATES THE CIRCUIT IS THREE-WIRE

CO — CONDUIT ONLY - NO CONDUCTORS, PULL WIRE IF OVER 50'

UF — COMM OR POWER FEEDER INSTALLED UNDER FLOOR SLAB IN COATED R.S. CONDUIT UNLESS INDICATED OTHERWISE

LIGHT LINE - EXISTING, OR BY OTHER TRADES

HEAVY LINE - NEW ELECTRICAL WORK

G — BARE COPPER GROUND CONDUCTOR, #4/0 FOR COUNTERPOISE, #2/0 FOR BONDING CONDUCTOR, UNLESS NOTED OTHERWISE (UON)

CONTROL INTERFACE OR OPERATING RELATIONSHIP BETWEEN 2 OR MORE DEVICES (KEY INTERLOCK BETWEEN BREAKERS, RELAY/CONTACTOR, ETC.)

INTERIOR ELECTRICAL LEGEND

G — GENERATOR WITH FUEL TANK

A — INCANDESCENT OR H.I.D. LUMINAIRE LESS THEN 2' X 2' IN SIZE - LETTER IDENTIFIES CORRESPONDING SWITCH

+7' — WALL FIXTURE - MOUNTING HEIGHT INDICATED (TO FIXTURE C)

CEILING EXIT LIGHT. ARROWS IDENTIFY DIRECTION OF EGRESS

WALL EXIT LIGHT - MOUNTING HEIGHT INDICATED ARROWS IDENTIFY DIRECTION OF EGRESS

LC — LIGHTING CONTACTOR - NO. OF POLES, CURRENT AND VOLTAGE RATINGS AS INDICATED

EPS — EMERGENCY POWER SYSTEM FOR EGRESS LIGHTING - BATTERY INVERTER SET RATINGS AND PHYSICAL SIZE AS INDICATED

BATTERY OPERATED EMERGENCY LIGHT SET, NO. OF LUMINAIRE HEADS AS INDICATED

E / OR / E — LIGHTING FIXTURE SYMBOLS, AND FIXTURE TYPE DESIGNATION. THE SHADED PORTION OF THE FLUORESCENT SYMBOL INDICATES SUPPLIED WITH BATTERY BACKUP FOR EMERGENCY EGRESS REQUIREMENTS.

J J — JUNCTION BOX, 4" SQUARE UNLESS NOTED OTHERWISE. CEILING AND WALL MOUNT TYPES INDICATED.

S_{TO} — MANUAL STARTER WITH THERMAL OVERLOADS (MOTOR RATED SWITCH)
S — SINGLE POLE SWITCH
S_2 — DOUBLE POLE SINGLE THROW SWITCH
S_3 — THREE WAY SWITCH
S_4 — FOUR WAY SWITCH
S_P — SINGLE POLE SWITCH WITH PILOT LIGHT
S_K — KEY OPERATED SWITCH
S_{MC} — MOMENTARY CONTACT SWITCH
S_O — OCCUPANCY SENSOR SWITCH, 120/277V DUAL TECHNOLOGY

48" AFF, LETTERS A, B, C, ETC. WHERE USED, IDENTIFY SWITCHED FIXTURES

20A — 125V, CONVENTIONAL DUPLEX & SIMPLEX, IG= ISOLATED GROUND TYPE OUTLETS, NEMA 5-20 SERIES. DEFAULT SIZE IS 20A.

WP — GFI TYPE DUPLEX OUTLET, WP= WITH WEATHERPROOF COVER PER SPECS

FCP — FIRE ALARM CONTROL PANEL, (SEE SPECS)

610mm LIGHTNING AIR TERMINAL

LIGHTNING PROTECTION MAIN CONDUCTOR

TELEPHONE OUTLET WITH SINGLE JACK. MOUNT AT 1210mm TO BOTTOM OF BOX, UNLESS INDICATED OTHERWISE.

TELEPHONE/DATA OUTLET WITH FOUR JACKS - SEE SPECIFICATIONS AND DETAILS FOR JACK INFORMATION.

ATG — AUTOMATIC TANK GAUGING

LA — LEVEL ALARM

FS — FLOW SWITCH

SV — SOLENOID VALVE

PCP — PUMP CONTROL PANEL

LS — LIMIT SWITCH

RES WP — HORN, RESONATING, WEATHERPROOF

VIB WP — HORN, VIBRATING, WEATHERPROOF

LD — LEAK DETECTION SENSOR

WEATHER-PROOF LIGHTING CONTROL MOTION SENSOR

CODES, RELATED DESIGN CRITERIA, OR TECHNICAL GUIDES TO BE USED AS PART OF THIS STANDARD:

THE FOLLOWING IS A PARTIAL LIST OF APPLICABLE DESIGN GUIDES, STANDARD CRITERIA OR CODES THAT MAY APPLY TO ONE OR MORE AREAS OF THE SERVICE STATION DESIGN STANDARD DOCUMENTS. DESIGNER IS TO REVIEW THE MOST RECENT VERSION OF STANDARDS, AND APPLY AS APPLICABLE. THIS LIST IS NOT INTENDED TO BE EXHAUSTIVE, DESIGNER IS TO REVIEW AND APPLY ALL APPLICABLE CODES AND STANDARDS.

NFPA 30	FLAMMABLE AND COMBUSTIBLE LIQUID CODE
NFPA 70	NATIONAL ELECTRICAL CODE
NFPA 77	RECOMMENDED PRACTICE ON STATIC ELECTRICITY
NFPA 101	LIFE SAFETY CODE
NFPA 110	EMERGENCY AND STANDBY POWER SYSTEMS
NFPA 780	INSTALLATION OF LIGHTNING PROTECTION SYSTEMS
UFC 3-460-01	DESIGN OF PETROLEUM FUEL FACILITIES
UFC 3-501-01	ELECTRICAL ENGINEERING
UFC 3-520-01	INTERIOR ELECTRICAL SYSTEMS
UFC 3-530-01	INTERIOR AND EXTERION LIGHTING SYSTEMS AND CONTROLS
UFC 3-550-01	EXTERIOR ELECTRICAL POWER DISTRIBUTION
UFC 3-575-01	LIGHTNING AND STATIC ELECTRICITY PROTECTION SYSTEMS
UFC 3-580-01	TELECOMM BUILDING CABLING SYSTEMS PLANNING AND DESIGN
UFC 4-022-03	SECURITY FENCES AND GATES
MIL-HDBK-1022	PETROLEUM FACILITIES
MIL-HDBK-419	GROUNDING BONDING AND SHIELDING FOR ELECTRONIC EQUIPMENT AND FACILITIES
API RP-540	ELECTRICAL INSTALLATIONS IN PETROLEUM PROCESSING FACILITIES
IESNA RP-8-00	ROADWAY LIGHTING
IESNA RP-33-14	LIGHTING FOR EXTERIOR ENVIRONMENTS
I3A	TECHNICAL CRITERIA FOR THE INSTALLATION OF INFORMATION INFRASTRUCTURE ARCHITECTURE
EIA/TIA 568	COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD
EIA/TIA 569	COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATIONS PATHWAYS AND SPACES.

SPECIFICATIONS TO BE USED AS PART OF THIS STANDARD:

SPECIFICATIONS TO BE EDITED BY FINAL DESIGNER, AND ALL SECTIONS MAY NOT BE APPLICABLE TO EACH PROJECT. APPLY AND EDIT SPECS AS APPROPRIATE FOR EACH PROJECT. OTHER SECTIONS OF UFGS GUIDE SPECIFICATIONS MAY BE REQUIRED FOR INDIVIDUAL PROJECTS. PROVIDE AND EDIT THOSE SPECIFICATIONS AS NECESSARY.

26 00 00.00 20	BASIC ELECTRICAL MATERIALS AND METHODS
26 05 48.00 10	SEISMIC PROTECTION FOR ELECTRICAL EQUIPMENT
26 20 00	INTERIOR DISTRIBUTION SYSTEM
26 28 01.00 10	COORDINATED POWER SYSTEM PROTECTION
26 41 00	LIGHTNING PROTECTION SYSTEM
26 51 00	INTERIOR LIGHTING (EDIT TO INCLUDE LED LIGHTING)
26 56 00	EXTERIOR LIGHTING
27 10 00	BUILDING TELECOMMUNICATIONS CABLING SYSTEM
33 71 02	UNDERGROUND ELECTRICAL DISTRIBUTION
33 82 00	TELECOMMUNICATIONS OUTSIDE PLANT (OSP)

GENERAL NOTES TO DESIGNER:

1. THE ENGINEER OF RECORD IS REQUIRED TO PROVIDE COMPLETE DESIGN FOR ALL WORK. THESE STANDARDS ARE TO BE USED ONLY AS A GUIDE.
2. COORDINATE ENVIRONMENTAL DESIGN PARAMETERS WITH ALL DISCIPLINES. ADJUST DESIGN ACCORDINGLY FOR HIGH AMBIENT LOCATIONS, HIGH SALT OR CORROSIVE ENVIRONMENTS, AREAS OF HIGH SNOW OR WIND LOADING, OR OTHER ENVIRONMENTAL CONCERNS, AS NECESSARY.
3. COORDINATE SEISMIC DESIGN PARAMETERS WITH STRUCTURAL REQUIREMENTS FOR A GIVEN AREA OR BASE. ADJUST ALL MOUNTING AND BRACING METHODS, OR PRODUCTS, TO COMPLY WITH THE SITE SPECIFIC PARAMETERS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | CHECKED: MKK | DRAWN: SS | DESIGNED: SS | PROJECT NO.: 14018-20

DRAWING TITLE: ELECTRICAL LEGEND AND GENERAL NOTES

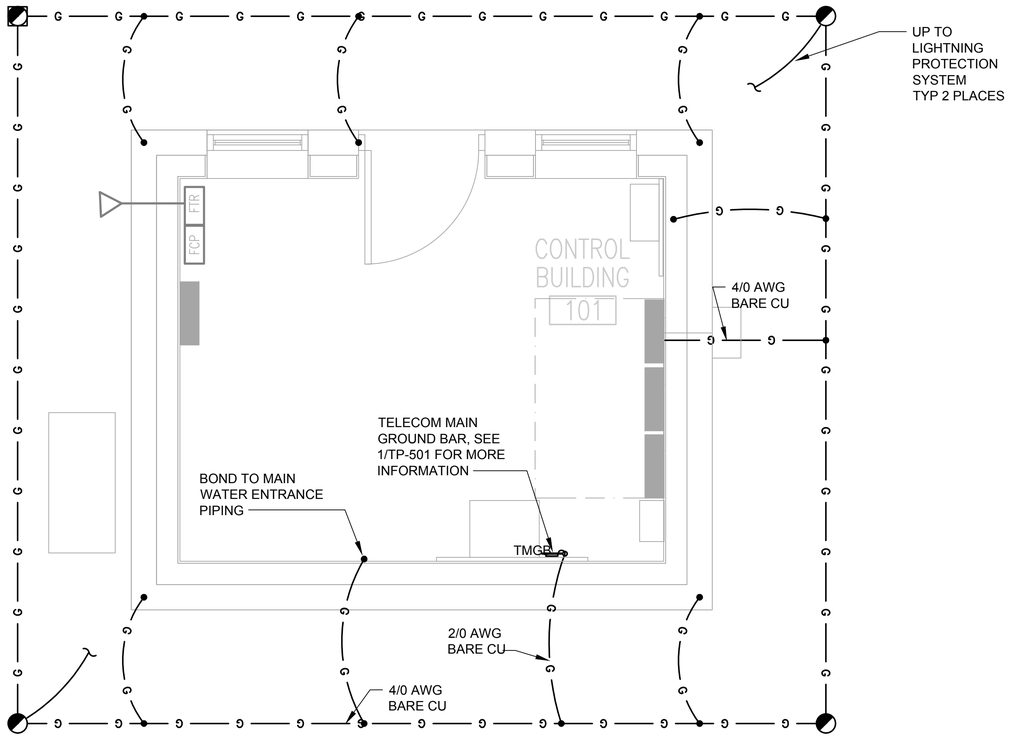
DRAWING NO.: E-001

SHEET 53 OF 72

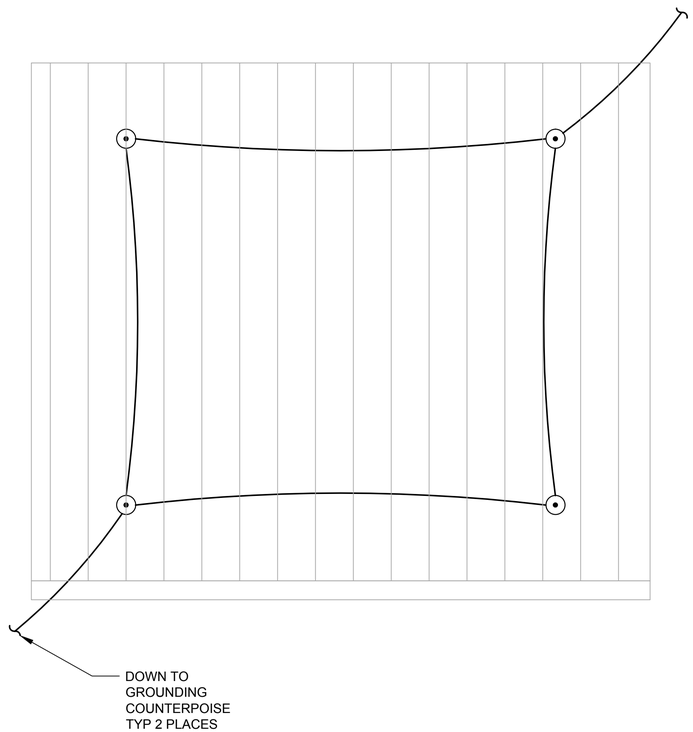
RAC # 1401800

NOTES TO DESIGNER:

1. ALL GROUND CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELD, UNLESS SPECIFICALLY NOTED, DETAILED, OR REQUIRED BY SPECIFICATIONS, ELSEWHERE.
2. ALL GROUND CONDUCTORS SHALL BE ALL BE COPPER, AND SHALL BE #4/0 FOR COUNTERPOISE, AND #2/0 FOR GROUND BONDING CONDUCTORS FROM COUNTERPOISE TO EQUIPMENT.
3. LIGHTNING PROTECTION AIR TERMINALS, ROOF CONDUCTORS, AND DOWN CONDUCTORS SHALL BE AS REQUIRED TO MEET CRITERIA OF NFPA 780, AND UL 96. WHERE DOWN CONDUCTORS ARE ALLOWED TO BE REMOVED, AND ELECTRICALLY CONTINUOUS STEEL STRUCTURE DOCUMENTATION CAN BE PROVIDED, COMPLY WITH UFC 3-575-01 FOR GROUND POTENTIAL LIMITATIONS.



1 FUELING STATION CONTROL BUILDING GROUNDING PLAN
Scale: 1/2" = 1'-0"



2 FUELING STATION CONTROL BUILDING LIGHTNING PROTECTION PLAN
Scale: 1/2" = 1'-0"

1/2"=1'-0" 1' 0' 1' 2' 3' 4' 5'

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS
DRAWN: SS
CHECKED: MKK
PROJECT NO.: 14018-20
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN

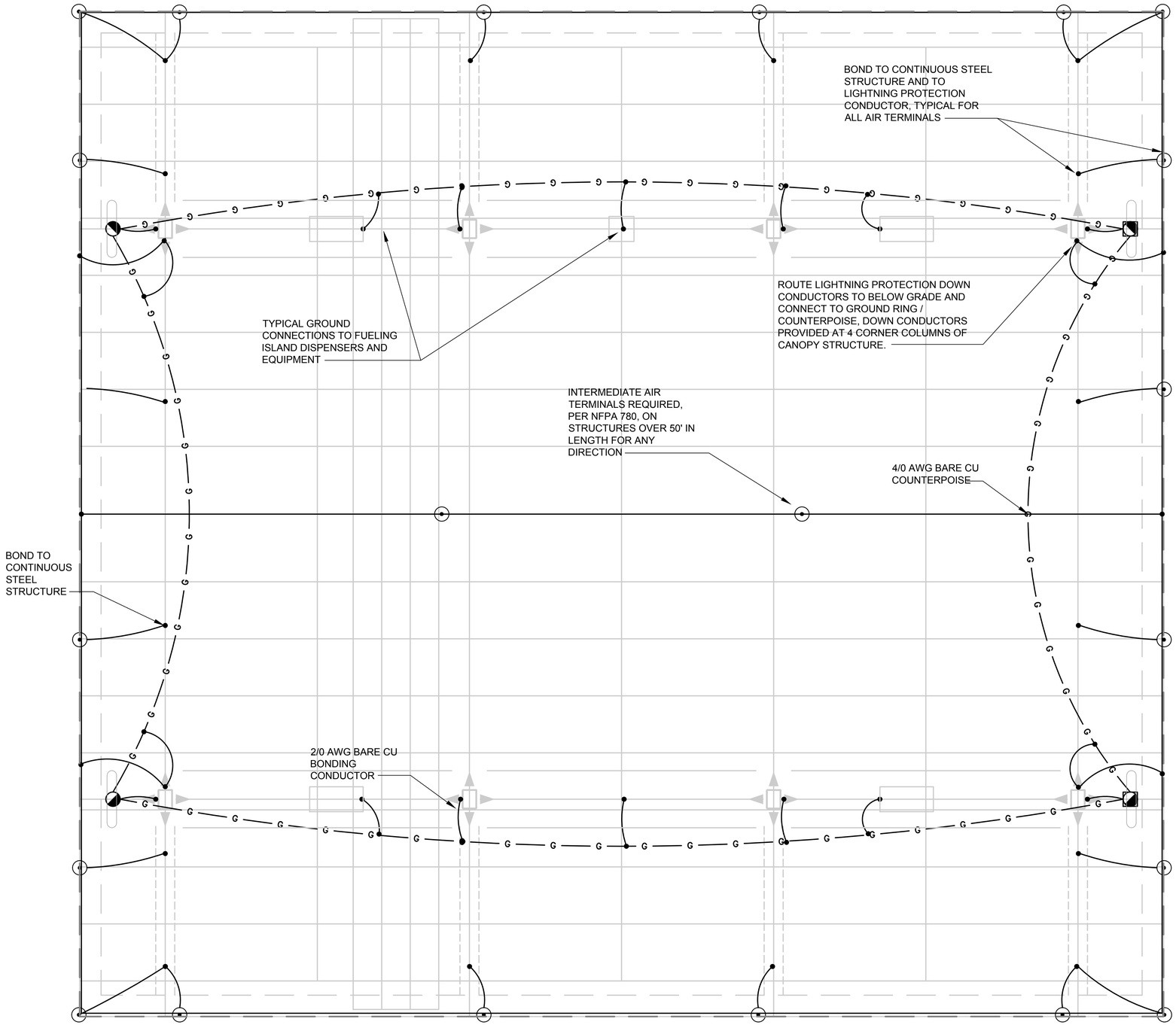
DRAWING TITLE: CONTROL BUILDING GROUNDING PLAN

DRAWING NO.: **EG-101**

SHEET 54 OF 72

RAC # 1401800

M:\2014\1401800\elec\1401800-EG101.dwg 10/1/2015 10:37:34 AM Ralph Aldridge



1 DISPENSER SHELTER GROUNDING AND LIGHTNING PROTECTION PLAN
Scale: 1/4"=1'-0"

NOTES TO DESIGNER:

1. ALL GROUND CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELD, UNLESS SPECIFICALLY NOTED, DETAILED, OR REQUIRED BY SPECIFICATIONS, ELSEWHERE.
2. ALL GROUND CONDUCTORS SHALL BE ALL BE COPPER, AND SHALL BE #4/0 FOR COUNTERPOISE, AND #2/0 FOR GROUND BONDING CONDUCTORS FROM COUNTERPOISE TO EQUIPMENT.
3. LIGHTNING PROTECTION AIR TERMINALS, ROOF CONDUCTORS, AND DOWN CONDUCTORS SHALL BE AS REQUIRED TO MEET CRITERIA OF NFPA 780, AND UL 96. WHERE DOWN CONDUCTORS ARE ALLOWED TO BE REMOVED, AND ELECTRICALLY CONTINUOUS STEEL STRUCTURE DOCUMENTATION CAN BE PROVIDED, COMPLY WITH UFC 3-575-01 FOR GROUND POTENTIAL LIMITATIONS.
4. WHERE A SINGLE ISLAND CANOPY IS PROVIDED, OR WHERE A DIFFERENT STRUCTURE TYPE FOR CANOPY IS PROVIDED, ADJUST DESIGN, FOR LIGHTNING PROTECTION AND GROUNDING, TO ACCOMMODATE FIELD DESIGN REQUIREMENTS.

1/4"=1'-0" 1' 0' 1' 5' 10' 15'

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED SS | DRAWN SS | CHECKED MKK | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

PROJECT NO. 14018-20

DRAWING TITLE: DISPENSER SHELTER GROUNDING AND LIGHTNING PROTECTION PLAN

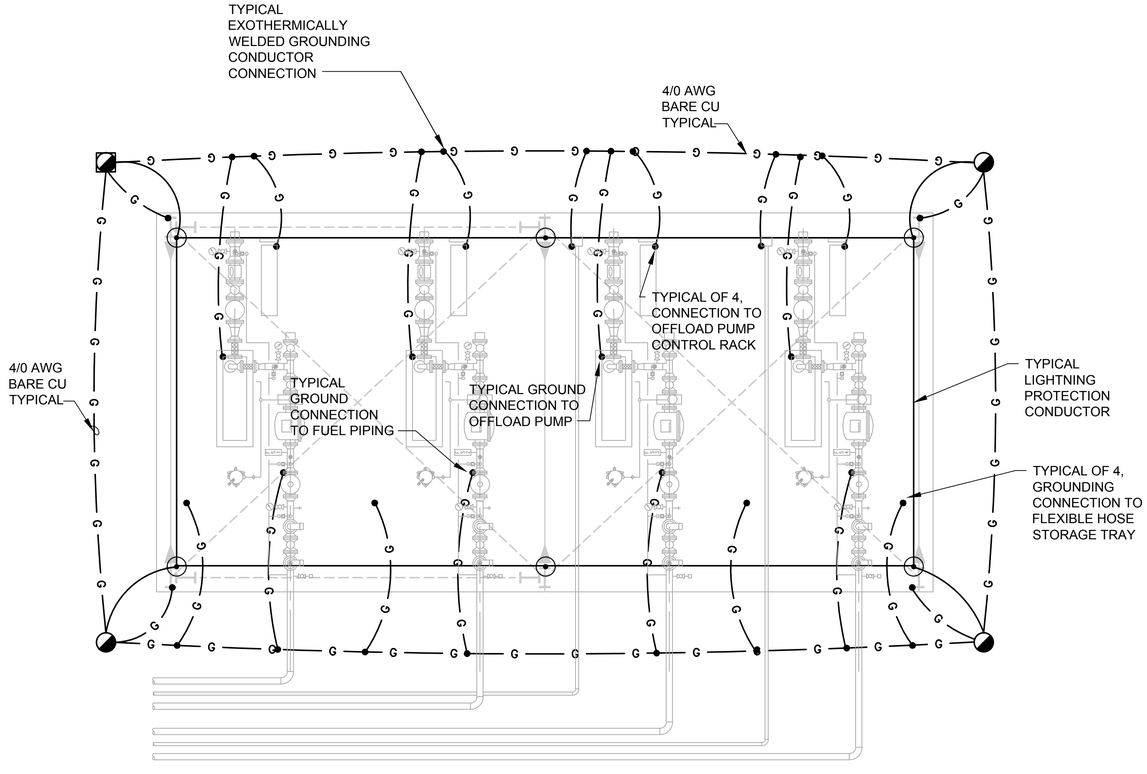
DRAWING NO. EG-102

SHEET 55 OF 72

RAC # 1401800

NOTES TO DESIGNER:

1. ALL GROUND CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELD, UNLESS SPECIFICALLY NOTED, DETAILED, OR REQUIRED BY SPECIFICATIONS, ELSEWHERE.
2. ALL GROUND CONDUCTORS SHALL BE ALL BE COPPER, AND SHALL BE #4/0 FOR COUNTERPOISE, AND #2/0 FOR GROUND BONDING CONDUCTORS FROM COUNTERPOISE TO EQUIPMENT.
3. LIGHTNING PROTECTION AIR TERMINALS, ROOF CONDUCTORS, AND DOWN CONDUCTORS SHALL BE AS REQUIRED TO MEET CRITERIA OF NFPA 780, AND UL 96. WHERE DOWN CONDUCTORS ARE ALLOWED TO BE REMOVED, AND ELECTRICALLY CONTINUOUS STEEL STRUCTURE DOCUMENTATION CAN BE PROVIDED, COMPLY WITH UFC 3-575-01 FOR GROUND POTENTIAL LIMITATIONS.
4. ADJUST LAYOUT AND CONFIGURATION OF SYSTEM TO MEET SITE DESIGN PARAMETERS.
5. WHERE THE OPTION TO PROVIDE A HIGH FLOW FILLSTAND IS EXERCISED, THE CONSTRUCTION OF THE CANOPY OVER THAT EQUIPMENT SHALL BE SIMILAR IS STYLE AND DESIGN TO THE THAT OF THE OFFLOAD SHELTER. SEE SHEET EP-105 FOR ADDITIONAL INFORMATION



1 OFFLOAD SHELTER GROUNDING AND LIGHTNING PROTECTION PLAN
Scale: 1/4"=1'-0"

1/4"=1'-0" 1' 0' 1' 5' 10' 15'

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

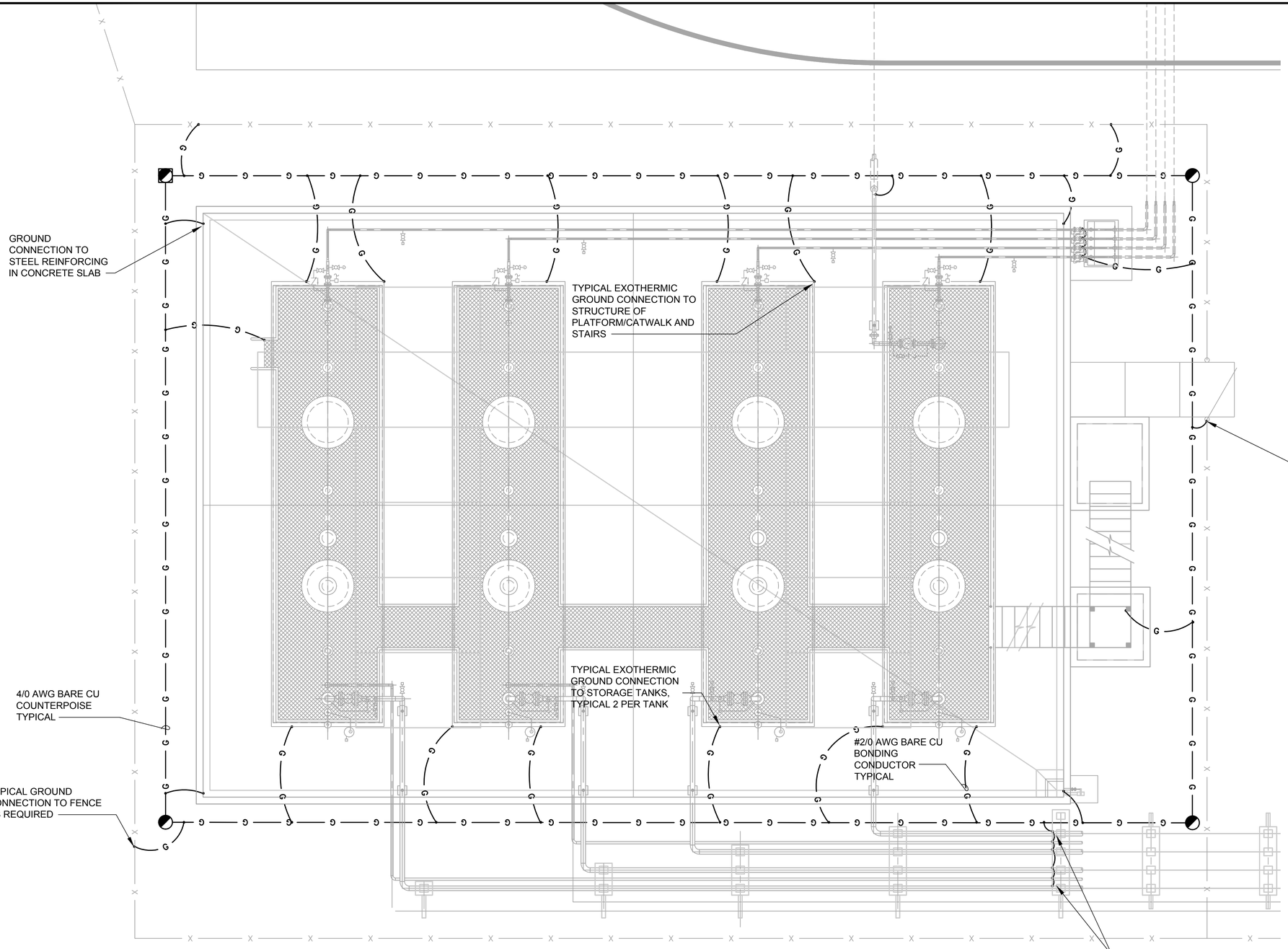
PROJECT NO.: 14018-20

DRAWING TITLE: OFFLOAD SHELTER GROUNDING AND LIGHTNING PROTECTION PLAN

DRAWING NO.: **EG-103**

SHEET 56 OF 72

RAC # 1401800



1 TANK AND PLATFORM GROUNDING PLAN
Scale: 1/4"=1'-0"

NOTES TO DESIGNER:

1. ALL GROUND CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELD, UNLESS SPECIFICALLY NOTED, DETAILED, OR REQUIRED BY SPECIFICATIONS, ELSEWHERE.
2. ALL GROUND CONDUCTORS SHALL BE ALL BE COPPER, AND SHALL BE #4/0 FOR COUNTERPOISE, AND #2/0 FOR GROUND BONDING CONDUCTORS FROM COUNTERPOISE TO EQUIPMENT.
3. BOND ALL NON-CURRENT CARRYING METAL STRUCTURES PER UFC 3-460-01 REQUIREMENTS.
4. ADJUST SITE LAYOUT AND CONFIGURATION TO MEET SITE DESIGN PARAMETERS.
5. SEE UFC 4-022-03 FOR FENCE GROUND REQUIREMENTS.

1/4"=1'-0" 1' 0' 1' 5' 10' 15'

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

DRAWING TITLE: ABOVE GROUND TANKS OPTION GROUNDING PLAN

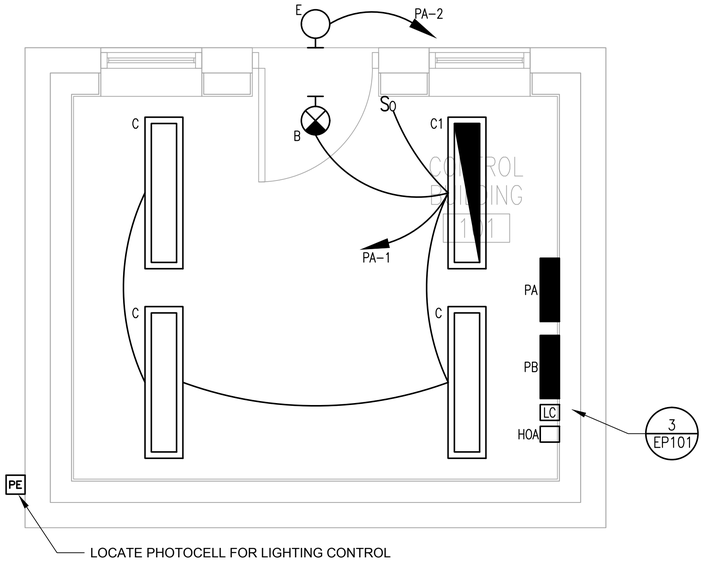
DRAWING NO.: EG-104

SHEET 57 OF 72

RAC # 1401800

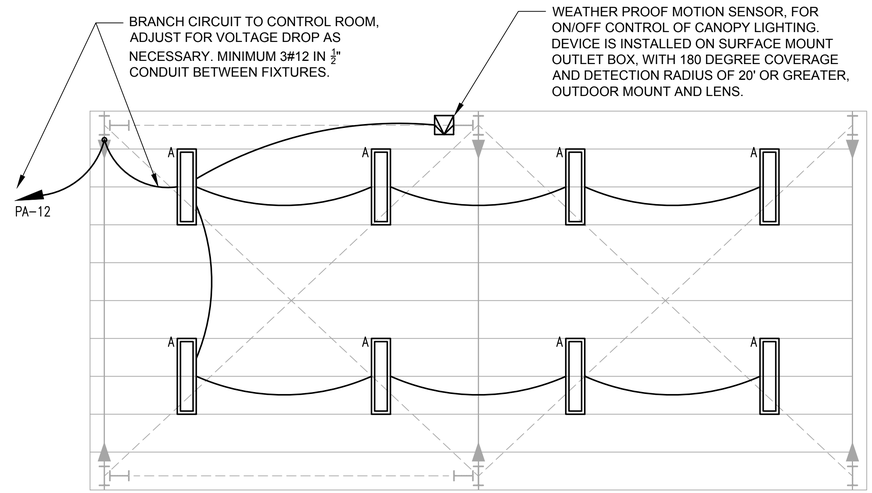
NOTES TO DESIGNER:

1. LIGHTING SHALL COMPLY WITH LOCAL BASE REQUIREMENTS, AND MEET GENERAL LIGHTING LEVELS OF RELATED IESNA RECOMMENDED PRACTICES, AND API RP-540.
2. ADJUST LAYOUT AND CONFIGURATION OF SYSTEM TO ACCOMMODATE SITE DESIGN PARAMETERS.
3. WHERE THE HIGH FLOW FILLSTAND OPTION IS EXERCISED, THE CONSTRUCTION AND FEATURES OF THE CANOPY OVER THAT EQUIPMENT SHALL BE SIMILAR IN STYLE AND DESIGN TO THAT OF THE OFFLOAD SHELTER.



LOCATE PHOTOCELL FOR LIGHTING CONTROL AS RECOMMENDED BY MANUFACTURER TO AVOID FALSE ACTIVATION OF LIGHTING SYSTEM TYPICAL LOCATION TO BE NORTH SIDE OF BUILDING AND OUT SITE LIGHTING COVERAGE.

1 FUELING STATION CONTROL BUILDING LIGHTING PLAN
Scale: 1/2" = 1'–0"



2 OFFLOAD SHELTER LIGHTING PLAN
Scale: 1/4" = 1'–0"

LIGHTING FIXTURE SCHEDULE

DEVICE ID	LAMP TYPE / NOMINAL MIN LUMENS	COLOR TEMP (NOM)	NOMINAL WATTS PER FIXTURE	FIXTURE VOLTAGE	MOUNTING HEIGHT AFF	MOUNTING STYLE	REFERENCE NOTES
A	LED/4700 LUMEN	4000 K	55	120	SURFACE MOUNT TO CANOPY	SURFACE MOUNT TO CANOPY	LINEAR LED VAPORTIGHT, HIGH AMBIENT TEMP DRIVER PER LOCATION AND GENERAL BASE AREA, IP66 RATED OR BETTER, WITH IMPACT RESISTANT LINEAR RIBBED PRISMATIC CLEAR LENS, COORDINATE LOCATION AND PROVIDE CLASSIFIED FIXTURES AS REQUIRED, RATED FOR CLASSIFIED AREAS WHERE REQUIRED
B	LED EXIT	-	10±	120	ABV DOOR	WALL	LED EXIT, WITH UNIVERSAL MOUNTING AND BATTERY BACKUP
C	LED/4700 LUMEN	4000 K	55	120	CEILING	SURFACE	LINEAR LED WRAP, FOR INDOOR MOUNTING WITH IMPACT RESISTANT PRISMATIC LENS.
C1	LED/4700 LUMEN	4000 K	55	120	CEILING	SURFACE	SAME AS C ABOVE, WITH BATTERY BACKUP, BATTERY BACKUP TO BE WIRED IN PARALLEL WITH NORMAL POWER SOURCE TO ACTIVATE ONLY ON LOSS OF NORMAL POWER.
E	LED/2000 LUMEN	4000 K	24	120	COORD WITH ARCH ELEVATION	WALL	LED WALL PACK, MOUNT ABOVE DOOR, PROVIDE INTEGRAL BATTERY BACKUP, IES TYPE 3 OR 4 DISTRIBUTION WITH FULL CUTOFF OPTICS

1/2"=1'–0" 1' 0' 1' 2' 3' 4' 5'

1/4"=1'–0" 1' 0' 1' 5' 10' 15'

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED SS | DRAWN SS | CHECKED MKK | DATE OCTOBER 2, 2015 | SCALE AS SHOWN

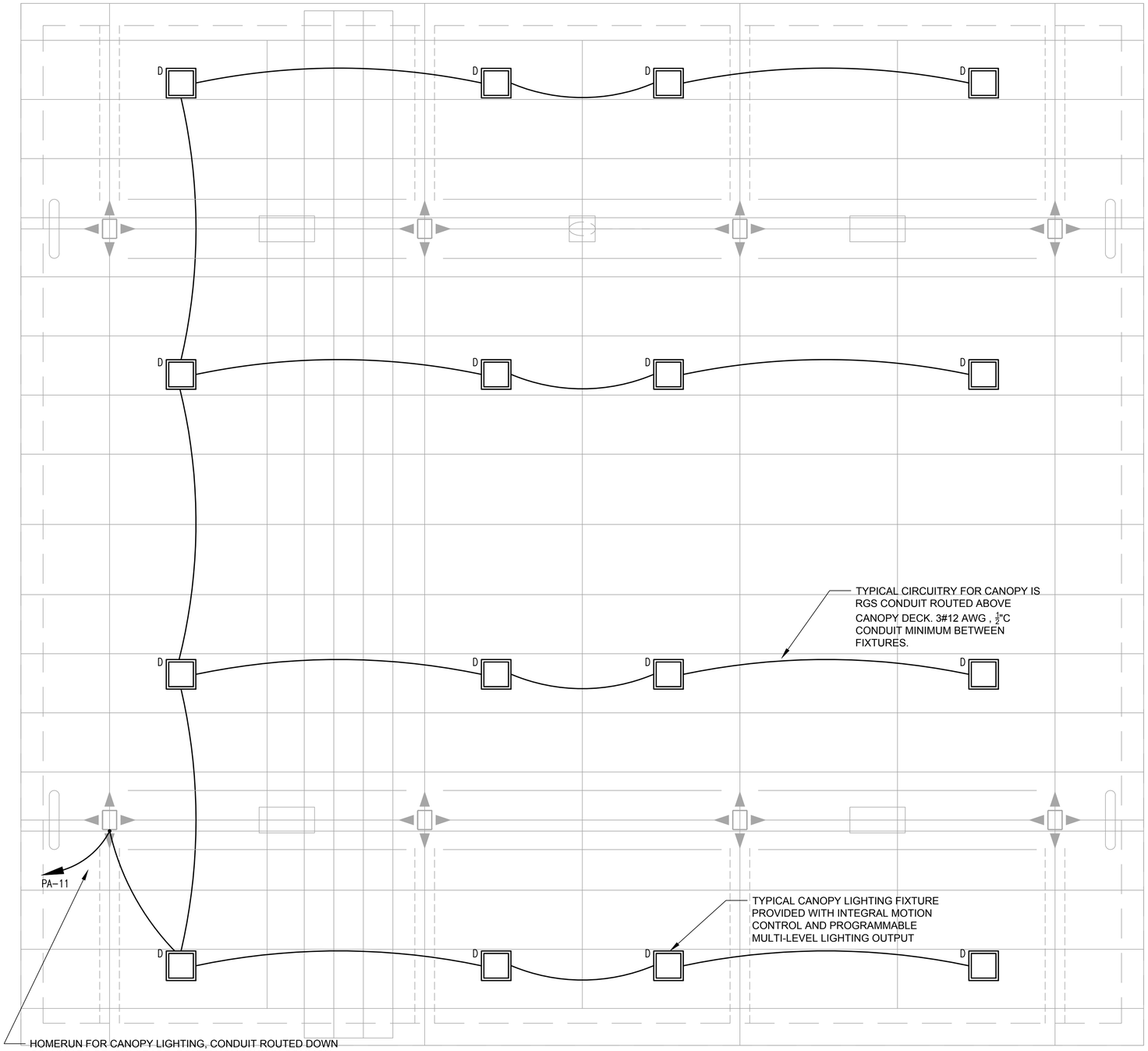
PROJECT NO. 14018-20

DRAWING TITLE: CONTROL BUILDING AND OFFLOAD CANOPY LIGHTING PLAND

DRAWING NO. **EL-101**

SHEET 58 OF 72

RAC # 1401800



1 DISPENSER SHELTER LIGHTING PLAN
Scale: 1/4"=1'–0"

NOTES TO DESIGNER:

1. LIGHTING SHALL COMPLY WITH LOCAL BASE REQUIREMENTS, AND MEET GENERAL LIGHTING LEVELS OF RELATED IESNA RECOMMENDED PRACTICES, AND API RP-540.
2. ADJUST LAYOUT AND CONFIGURATION OF SYSTEM TO ACCOMMODATE SPECIFIC LAYOUT SITE CONDITIONS, INCLUDING ADJUSTMENTS TO STRUCTURE TYPE OR STYLE, AND NUMBER OF FUELING ISLANDS TO BE PROVIDED.

LIGHTING FIXTURE SCHEDULE

DEVICE ID	LAMP ORDERING DESIGNATION OR CODE	COLOR TEMP (NOM)	TOTAL WATTS PER FIXTURE	FIXTURE VOLTAGE	MOUNTING HEIGHT AFF	MOUNTING STYLE	REFERENCE NOTES
D	LED/8100 LUMEN	4000	95 MAX	120	RECESSED IN CANOPY	RECESSED IN CANOPY	RATED FOR SINGLE OR DUAL SKIN CANOPIES, 8100 LUMENS MIN, INTEGRAL MOTION CONTROL AND PROGRAMMABLE LIGHTING LEVEL CONTROL, LIGHTING DISTRIBUTION AS REQUIRED.

4 0 4 8
SCALE: 1/4" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

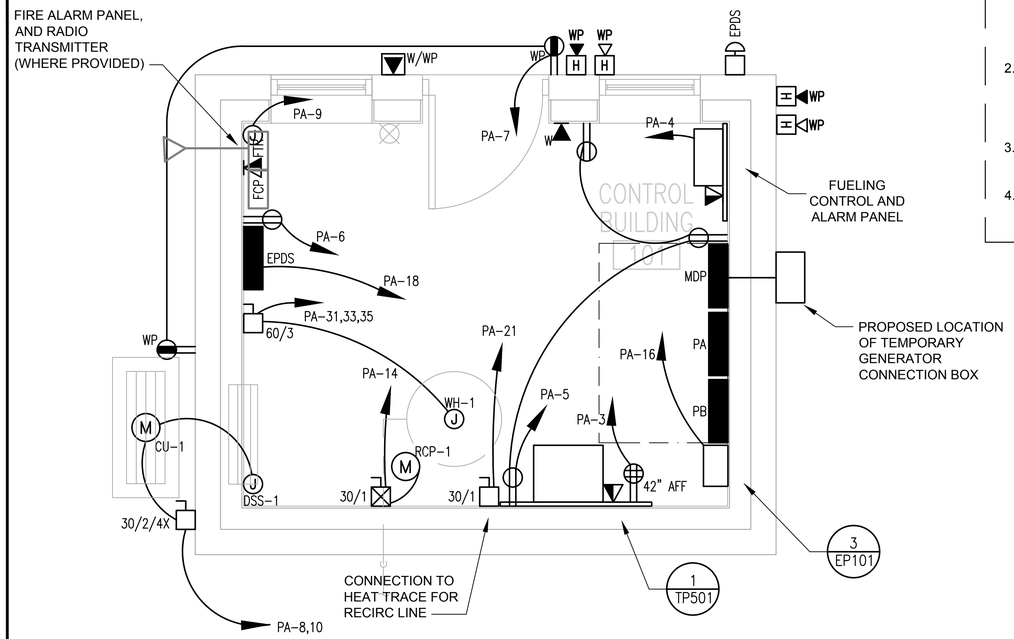
DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

DRAWING TITLE: FUELING STATION DISPENSER SHELTER LIGHTING PLAN

DRAWING NO.: **EL-102**

SHEET 59 OF 72

RAC # 1401800



1 FUELING STATION CONTROL BUILDING POWER/TELECOMM PLAN

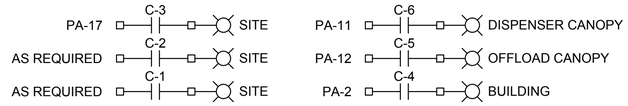
Scale: 1/2" = 1'-0"

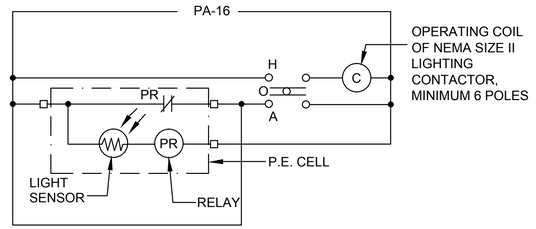
NOTES TO DESIGNER:

1. MDP IS TO BE A DUAL BREAKER INPUT PANEL, WITH KEY INTERLOCK SELECTION BETWEEN INPUTS, AND TWO OUTPUT BREAKERS TO SERVE THE BRANCH PANELS. FINAL AMPERAGE RATINGS TO BE BASED ON ACTUAL DESIGN LOADS, SEE EP-601 FOR LOAD CALCULATIONS FOR VARYING SERVICE OPTIONS.
2. ADJUST RATINGS FOR PANELS MDP, PA AND PB BASED ON SPECIFIC SITE DESIGN PARAMETERS. ADJUST PANEL RATINGS, AS WELL AS POLE SPACE, SPARE BREAKERS, SPACE PROVISIONS IN PANEL, AND RATINGS OF BREAKERS TO COMPLY WITH UFC AND NEC CRITERIA
3. CONTACTOR AHEAD OF MAIN BREAKER IN PANEL PB IS USED AS PART OF EFSO REQUIREMENT TO CONTROL EMERGENCY SHUTOFF OF ALL FUELING RELATED LOADS.
4. 100% RATED MAIN OR BRANCH BREAKERS ARE ALLOWED FOR USE IN MDP ONLY, IN ORDER TO MINIMIZE PANEL RATINGS, PROVIDED THAT NEC REQUIREMENTS FOR 90C CABLE, 90C TERMINATIONS AND 100% RATED ENCLOSURES ARE MET.

GENERAL NOTES:

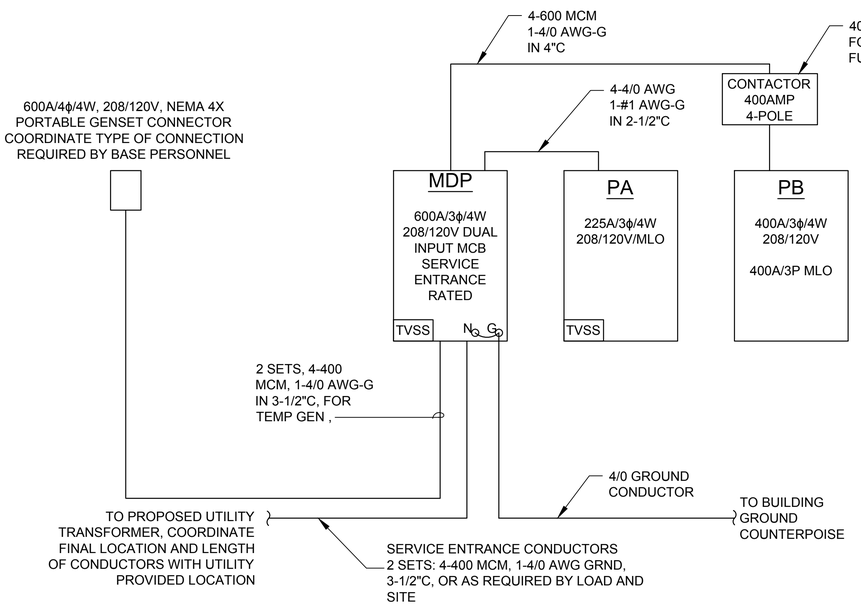
1. EACH CONDUIT ORIGINATING IN OR PASSING THROUGH OR UNDER A HAZARDOUS AREA AND PENETRATING CONTROL ROOM WALLS, ROOF, OR FLOOR SHALL HAVE EXPLOSION PROOF SEALING FITTINGS INSTALLED IN THE INTERIOR OF THE CONTROL ROOM, PRIOR TO CONNECTION WITH ANY EQUIPMENT OR PANELS, PER NEC 501.15. THIS INCLUDES ALL CONDUITS ROUTED TO AND FROM OFFLOAD POSITIONS, TANKS, AND FUELING ISLANDS.
2. ALL METALLIC CONDUITS THAT ARE NOT ATTACHED TO A GROUNDED PANEL OR ENCLOSURE SHALL BE GROUNDED USING A GROUNDING BUSHING.
3. REFER TO SHEET EP-602 FOR FEEDER TYPE AND DISCONNECT INFORMATION INCLUDED ON MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE
4. PROVIDE CALCULATIONS FOR ARC FLASH HAZARD, AD PROVIDE ARC FLASH WARNING SIGNS ON THE PANELBOARDS, INDUSTRIAL CONTROL PANELS, METER SOCKET ENCLOSURES, AND MOTOR STARTERS AS REQUIRED BY NFPA 70 (NEC) ARTICLE 110.16, AND PER NFPA 70E ARTICLE 130.3, AND UFC 3-560-01 ELECTRICAL SAFETY, O&M.





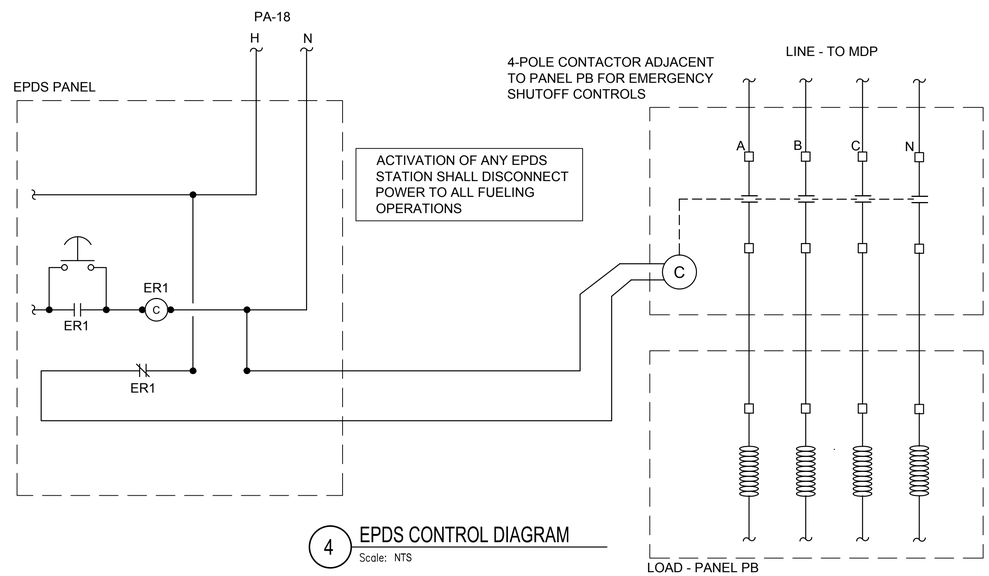
3 LIGHTING CONTROL DIAGRAM

Scale: NTS



2 FUELING STATION CONTROL BUILDING RISER DIAGRAM

Scale: NTS



4 EPDS CONTROL DIAGRAM

Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

DRAWING TITLE: CONTROL BUILDING POWER PLAN AND SCHEMATICS

DRAWING NO.: **EP-101**

SHEET 60 OF 72

RAC # 1401800

ELECTRICAL EQUIPMENT RACK (TYP 4) WITH EFSO, MOTOR STARTER / DISCONNECT, HOA, CONTROLS AND GROUND REEL, SEE DETAIL 1/EP-502

EPDS

200/3/EP

25

OP-1

OP-2

OP-3

OP-4

FS

1

2

1 OFFLOAD POWER & CONTROLS PLAN
Scale: 1/2" = 1'-0"

GENERAL NOTES:

1. THE AREAS AROUND THE PUMPS AND OFFLOAD PIPING AND INSIDE CONTAINMENT WALLS, SHALL BE CONSIDERED A CLASS 1, DIVISION 1 GROUP D (T3), OR CLASS 1, DIVISION 2 HAZARDOUS LOCATION, PER DEFINITIONS AND DESCRIPTIONS GIVEN IN ARTICLE 500 OF THE NEC. ALL ELECTRICAL EQUIPMENT INSTALLED WITHIN THE HAZARDOUS AREA SHALL BE SPECIFICALLY UL LISTED FOR THE AREA CLASSIFICATION.
2. EACH CONDUIT ORIGINATING IN OR PASSING THROUGH OR UNDER A HAZARDOUS AREA AND PENETRATING CONTROL ROOM WALLS, ROOF, OR FLOOR SHALL HAVE EXPLOSION PROOF SEALING FITTINGS INSTALLED IN THE INTERIOR OF THE CONTROL ROOM PER NEC 501.15.
3. SEE THE MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE ON SHEET EP-602 FOR CONDUIT AND CABLE REQUIREMENTS, AND FURTHER INFORMATION ON DISCONNECT AND CIRCUITRY.
4. ALL METALLIC CONDUITS THAT ARE NOT ATTACHED TO A GROUNDED PANEL OR ENCLOSURE SHALL BE GROUNDED USING A GROUNDED BUSHING.

KEYED NOTES:

1. FLOW SWITCH WITH TIME DELAY FUNCTION, INTERCONNECTED WITH LOCAL START STOP CONTROLS, PER MECHANICAL SEQUENCE OF OPERATION. PROVIDE CONDUIT AND CONDUCTORS AS REQUIRED BY EQUIPMENT MANUFACTURER, AND PER THE REQUIREMENTS OF NEC ARTICLE 500.
2. ROUTE POWER AND CONTROLS CIRCUITS FROM EACH OFFLOAD POSITION TO RESPECTIVE POWER OR CONTROLS SOURCE IN CONTROLS BUILDING. COORDINATE ROUTE WITH OTHER EQUIPMENT ON SITE, AND PROVIDE A COMBINED DUCTBANK WHERE POSSIBLE.

NOTES TO DESIGNER:

1. ADJUST CONFIGURATION AND RATINGS OF ELECTRICAL EQUIPMENT AND CIRCUITS TO ACCOMMODATE SITE SPECIFIC DESIGN REQUIREMENTS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS
DRAWN: SS
CHECKED: MKK
PROJECT NO.: 14018-20
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN

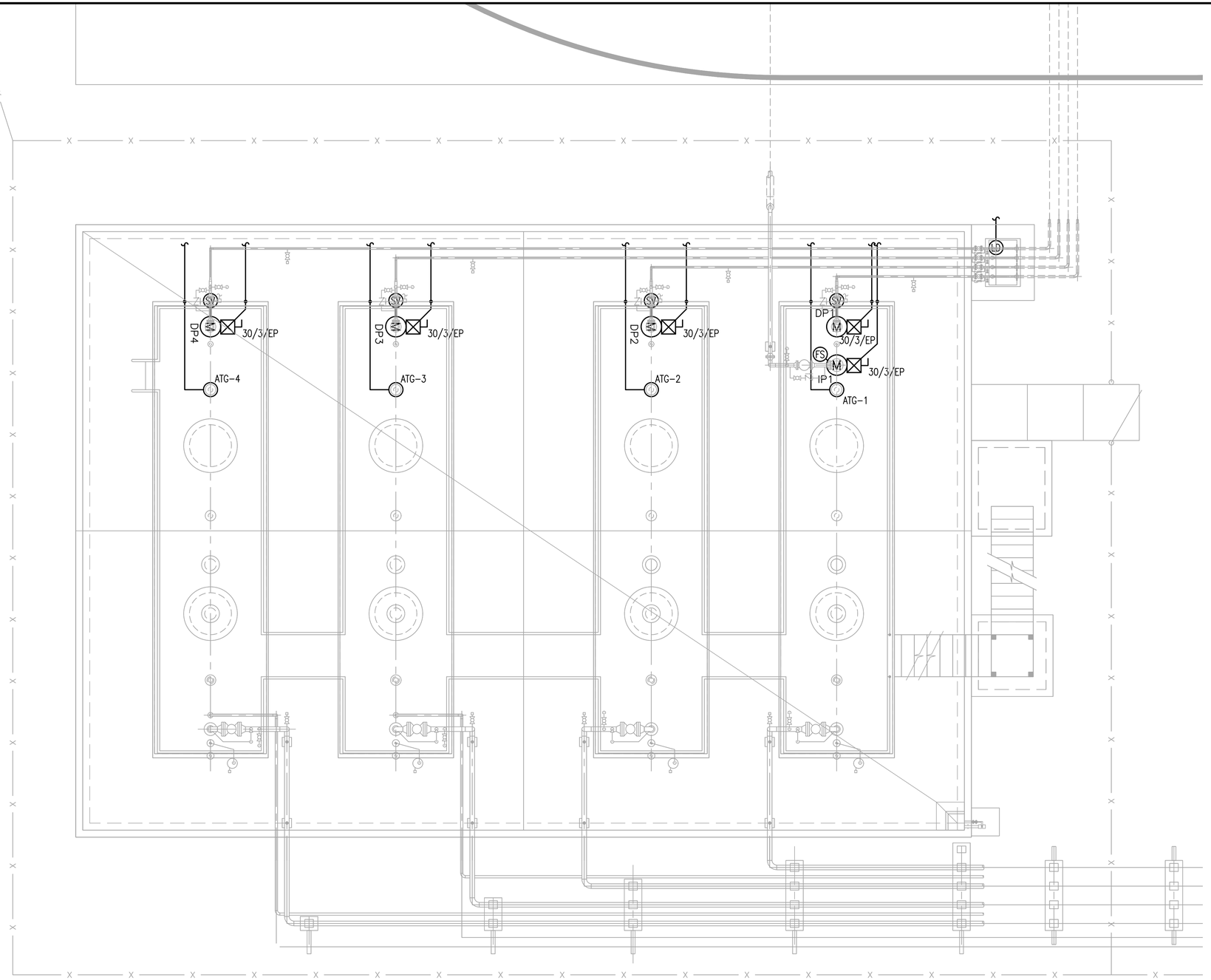
DRAWING TITLE: OFFLOAD SHELTER ELECTRICAL PLAN AND SCHEMATICS

DRAWING NO.: **EP-102**

SHEET 61 OF 72

RAC # 1401800

M:\2014\1401800\elec\1401800-EP102.dwg 10/1/2015 10:28:28 AM Ralph Aldridge



GENERAL NOTES:

1. THE AREAS AROUND THE TANKS AND INSIDE CONTAINMENT WALLS, SHALL BE CONSIDERED A CLASS 1, DIVISION 1 GROUP D (T3), OR CLASS 1, DIVISION 2 HAZARDOUS LOCATION, PER DEFINITIONS AND DESCRIPTIONS GIVEN IN ARTICLE 500 OF THE NEC. ALL ELECTRICAL EQUIPMENT INSTALLED WITHIN THE HAZARDOUS AREA SHALL BE SPECIFICALLY UL LISTED FOR THE AREA CLASSIFICATION.

2. EACH CONDUIT ORIGINATING IN OR PASSING THROUGH OR UNDER A HAZARDOUS AREA AND PENETRATING CONTROL ROOM WALLS, ROOF, OR FLOOR SHALL HAVE EXPLOSION PROOF SEALING FITTINGS INSTALLED IN THE INTERIOR OF THE CONTROL ROOM PER NEC 501.15.

3. ALL METALLIC CONDUITS THAT ARE NOT ATTACHED TO A GROUNDED PANEL OR ENCLOSURE SHALL BE GROUNDED USING A GROUNDED BUSHING.

KEYED NOTES:

1. PROVIDE INTERLOCK WIRING BETWEEN DISPENSER PUMP AND SOLENOID VALVE AND DISPENSER PUMP AND FLOW SWITCH AS REQUIRED, VERIFY FUNCTION WITH SEQUENCE OF OPERATION ON MECHANICAL PLANS

2. SEE SITE PLAN, ES-101, FOR PROPOSED ROUTING OF POWER AND CONTROLS CONDUITS TO CONTROL BUILDING, INCLUDING DUCTBANK AND PROPOSED HANDHOLE LOCATIONS. PROVIDE FEEDERS FOR MOTORS AND CONTROL DEVICES AS SHOWN ON EP-602.

1 ABOVE GROUND OPTION-FUEL TANKS POWER/CONTROLS PLAN
Scale: 1/2" = 1'-0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL
PRELIMINARY
NOT FOR
CONSTRUCTION

CLIENT
AIR FORCE CIVIL ENGINEERING
SUPPORT FACILITY

PROJECT
MILITARY SERVICE STATION (MSS) /
FABRICATED STORAGE TANK STANDARDS

DESIGNED	DRAWN	CHECKED	DATE
SS	SS	MKK	OCTOBER 2, 2015

PROJECT NO. 14018-20
SCALE AS SHOWN

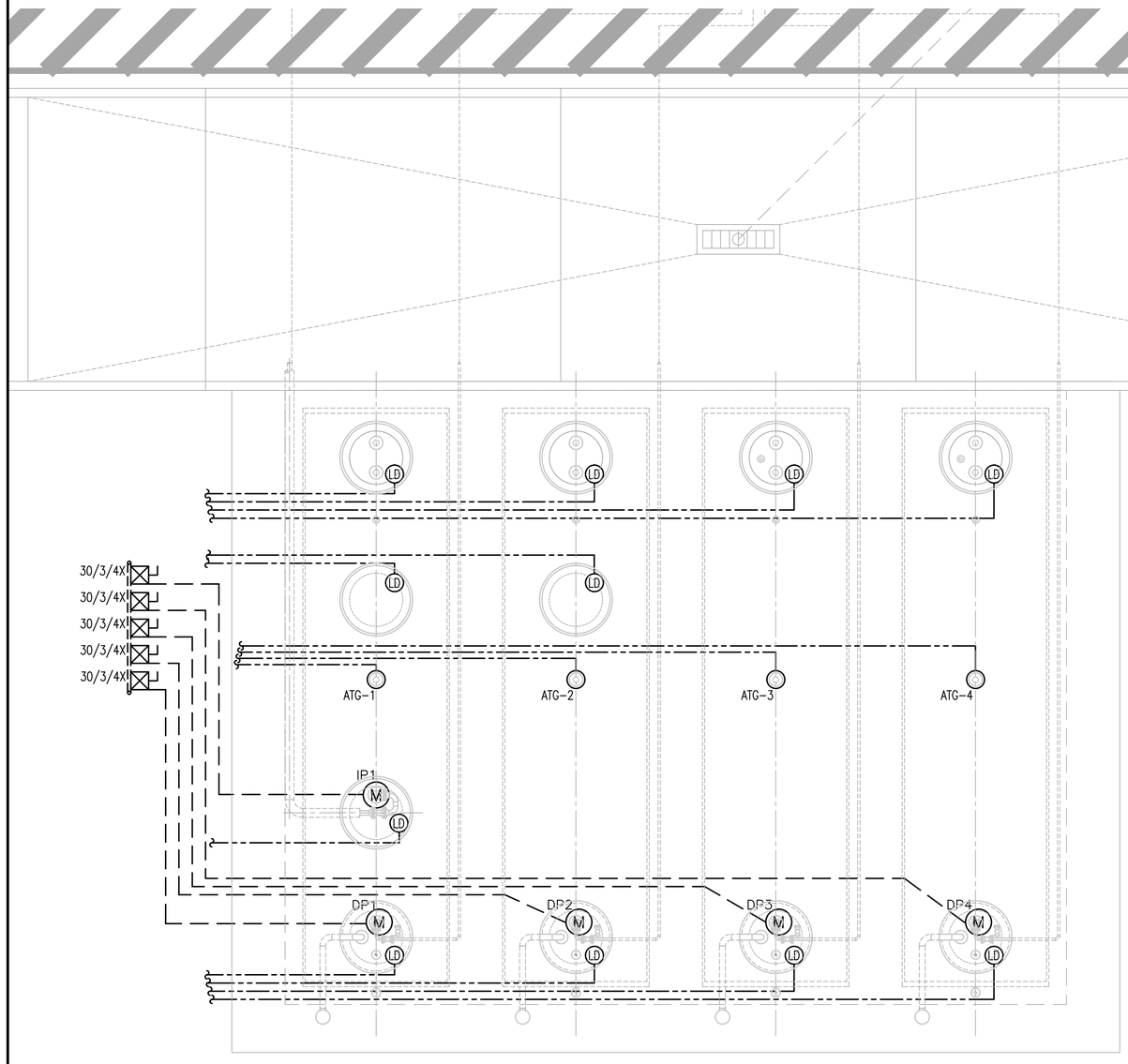
DRAWING TITLE
ABOVE GROUND TANKS OPTION
ELECTRICAL PLANS AND SCHEMATICS

DRAWING NO.
EP-103

SHEET 62 OF 72

RAC # 1401800

M:\2014\1401800\elec\1401800-EP103.dwg 10/1/2015 10:27:26 AM Ralph Aldridge



1 BELOW GROUND OPTION-FUEL TANKS POWER/CONTROLS PLAN
Scale: 1/2" = 1'-0"

GENERAL NOTES:

1. THE AREAS AROUND THE TANKS AND INSIDE CONTAINMENT WALLS, SHALL BE CONSIDERED A CLASS 1, DIVISION 1 GROUP D (T3), OR CLASS 1, DIVISION 2 HAZARDOUS LOCATION, PER DEFINITIONS AND DESCRIPTIONS GIVEN IN ARTICLE 500 OF THE NEC. ALL ELECTRICAL EQUIPMENT INSTALLED WITHIN THE HAZARDOUS AREA SHALL BE SPECIFICALLY UL LISTED FOR THE AREA CLASSIFICATION.
2. EACH CONDUIT ORIGINATING IN OR PASSING THROUGH OR UNDER A HAZARDOUS AREA AND PENETRATING CONTROL ROOM WALLS, ROOF, OR FLOOR SHALL HAVE EXPLOSION PROOF SEALING FITTINGS INSTALLED IN THE INTERIOR OF THE CONTROL ROOM PER NEC 501.15.
3. ALL METALLIC CONDUITS THAT ARE NOT ATTACHED TO A GROUNDED PANEL OR ENCLOSURE SHALL BE GROUNDED USING A GROUNDED BUSHING.

NOTES TO DESIGNER:

1. PROVIDE INTERLOCK WIRING BETWEEN DISPENSER PUMP AND FLOW SWITCH AS REQUIRED, VERIFY FUNCTION WITH SEQUENCE OF OPERATION ON MECHANICAL PLANS
2. UNDERGROUND TANK OPTION SHOWN, INCLUDES LEAK DETECTION DEVICES FOR INTERSTITIAL SPACE OF DOUBLE WALL TANK, AND FOR LOW POINT TYPE SENSORS IN THE SUMPS FOR EQUIPMENT OR MANWAYS.
3. PROVIDE ABOVE GROUND RACK MOUNT LOCAL DISCONNECTS FOR DISPENSER AND ISSUE PUMPS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

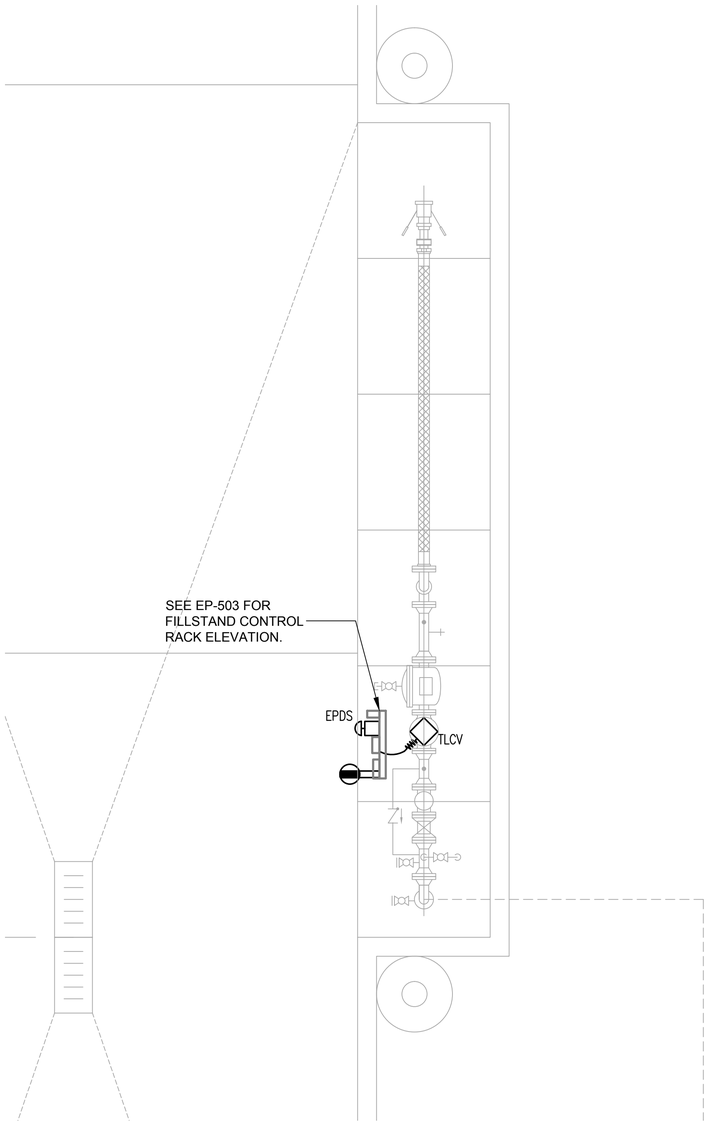
DRAWING TITLE: BELOW GROUND TANKS OPTION ELECTRICAL PLANS AND SCHEMATICS

DRAWING NO.: **EP-104**

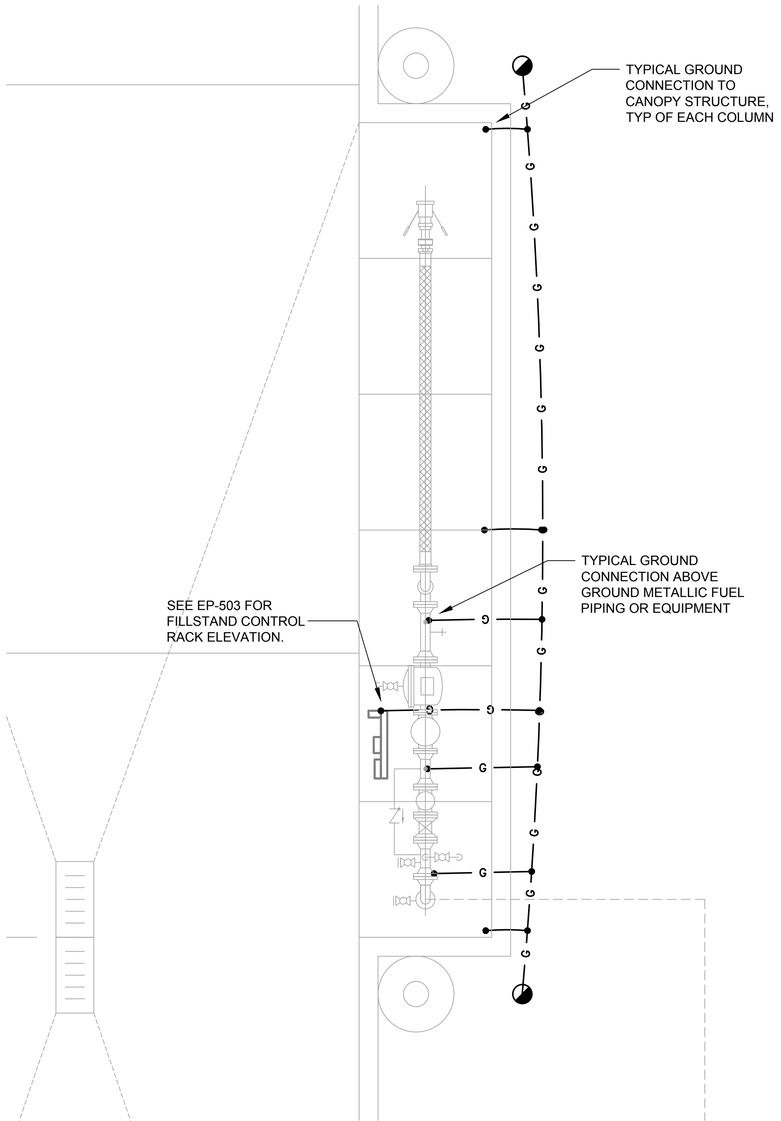
SHEET 63 OF 72

RAC # 1401800

M:\2014\1401800\elec\1401800-EP104.dwg 10/1/2015 10:26:28 AM Ralph Aldridge



1 OPTIONAL FILLSTAND POWER/CONTROLS
Scale: 1/2" = 1'-0"



1 OPTIONAL FILLSTAND GROUNDING
Scale: 1/2" = 1'-0"

GENERAL NOTES:

1. THE AREAS AROUND THE FILLSTAND PIPING, EQUIPMENT AND CONNECTIONS, SHALL BE CONSIDERED A CLASS 1, DIVISION 1 GROUP D (T3), OR CLASS 1, DIVISION 2 HAZARDOUS LOCATION, PER DEFINITIONS AND DESCRIPTIONS GIVEN IN ARTICLE 500 OF THE NEC. ALL ELECTRICAL EQUIPMENT INSTALLED WITHIN THE HAZARDOUS AREA SHALL BE SPECIFICALLY UL LISTED FOR THE AREA CLASSIFICATION.
2. EACH CONDUIT ORIGINATING IN OR PASSING THROUGH OR UNDER A HAZARDOUS AREA AND PENETRATING CONTROL ROOM WALLS, ROOF, OR FLOOR SHALL HAVE EXPLOSION PROOF SEALING FITTINGS INSTALLED IN THE INTERIOR OF THE CONTROL ROOM PER NEC 501.15.
3. ALL METALLIC CONDUITS THAT ARE NOT ATTACHED TO A GROUNDED PANEL OR ENCLOSURE SHALL BE GROUNDED USING A GROUNDED BUSHING.

NOTES TO DESIGNER FOR OPTIONAL HIGH FLOW FILLSTAND:

1. COORDINATE LOCATION AND EQUIPMENT REQUIREMENTS FOR FILLSTAND WITH MECHANICAL REQUIREMENTS AND CIVIL OR SITE LAYOUT CRITERIA.
2. WHERE THE OPTIONAL FILLSTAND IS INCLUDED, IT SHALL BE PROVIDED WITH A CANOPY, AS REQUIRED BY UFC CRITERIA. THE CANOPY IS INTENDED TO BE OF SIMILAR CONSTRUCTION AS THE OFFLOAD, OR DISPENSER ISLAND CANOPY.
3. THE CANOPY SHALL BE PROVIDED WITH APPROPRIATE, AND CODE OR STANDARD REQUIRED, GROUNDING AND BONDING, AS WELL AS LIGHTNING PROTECTION SYSTEM PER NFPA 780.
4. THE FILLSTAND CANOPY SHALL BE PROVIDED WITH LIGHTING TO COMPLY WITH IESNA AND API CRITERIA AND RECOMMENDED PRACTICES. FIXTURES SHALL BE COORDINATED WITH STRUCTURE TYPE, AND ANY NECESSARY SITE SPECIFIC ENVIRONMENTAL REQUIREMENTS. COORDINATE FIXTURE AND LAMP TYPES WITH OFFLOAD AND DISPENSER AREA CANOPIES.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

DRAWING TITLE: OPTIONAL FILLSTAND POWER AND GROUNDING PLANS

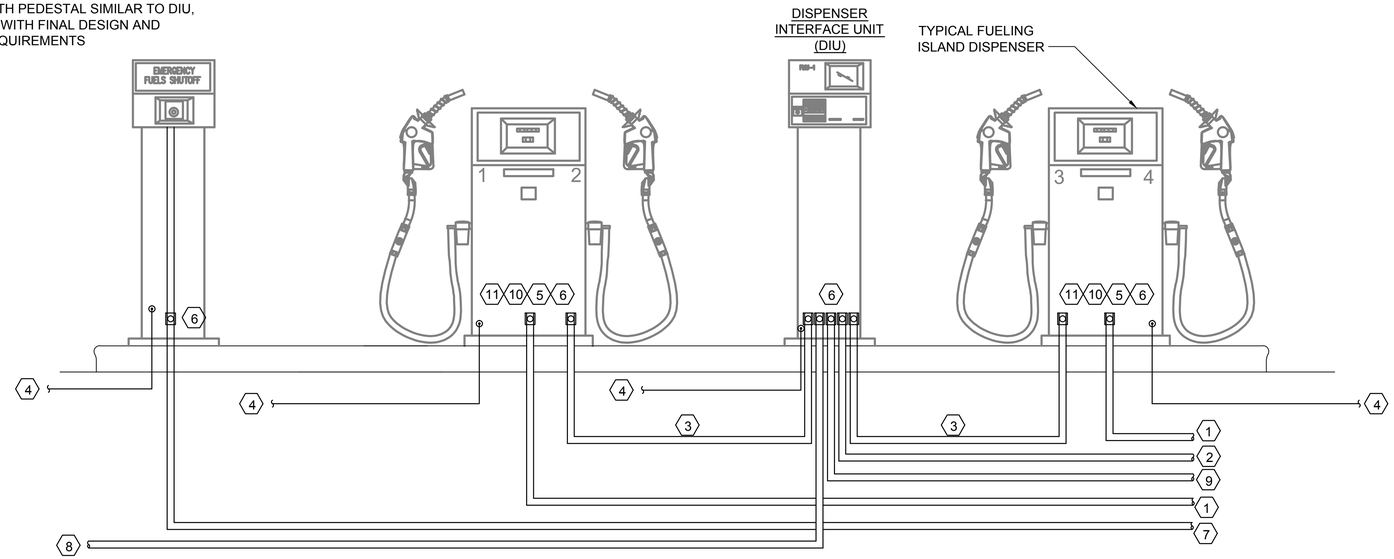
DRAWING NO.: **EP-105**

SHEET 64 OF 72

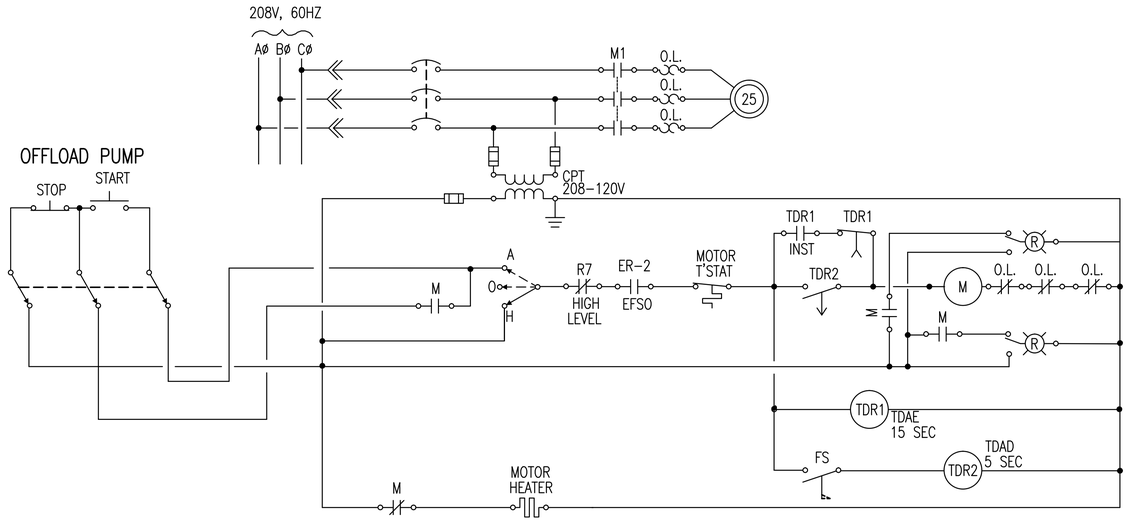
RAC # 1401800

M:\2014\1401800\elec\1401800-EP105.dwg 10/1/2015 10:25:28 AM Ralph Aldridge

NOTE:
EPDS/EFSO SHUTOFF STATION CAN BE MOUNTED TO EXPOSED COLUMN, OR FREE STANDING WITH PEDESTAL SIMILAR TO DIU, COORDINATE WITH FINAL DESIGN AND LOCATION REQUIREMENTS



1 TYPICAL FUELING ISLAND DETAIL/ELEVATION
Scale: NTS



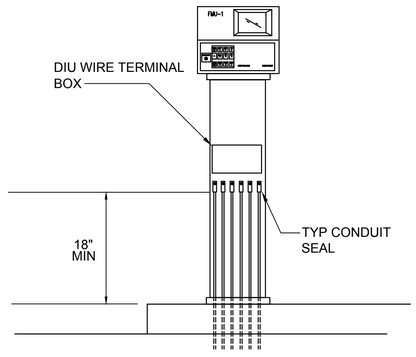
2 OFFLOAD PUMP CONTROL DIAGRAM
Scale: NTS

GENERAL NOTES:

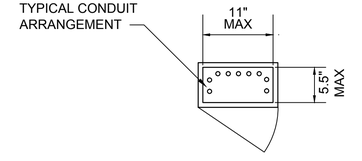
1. THE AREAS AROUND THE DISPENSERS ARE CLASSIFIED AS CLASS 1 DIVISION 2, PER NEC ARTICLE 500 REQUIREMENTS, AND THE AREA INSIDE CONTAINMENT SUMP/PIT AND INSIDE THE DISPENSER ENCLOSURE SHALL BE CONSIDERED A CLASS 1, DIVISION 1 GROUP D (T3), HAZARDOUS LOCATION, PER DEFINITIONS AND DESCRIPTIONS GIVEN IN ARTICLE 500 OF THE NEC. ALL ELECTRICAL EQUIPMENT INSTALLED WITHIN THE HAZARDOUS AREA SHALL BE SPECIFICALLY UL LISTED FOR THE AREA CLASSIFICATION.
2. EACH CONDUIT ORIGINATING IN OR PASSING THROUGH OR UNDER A HAZARDOUS AREA AND PENETRATING CONTROL ROOM WALLS, ROOF, OR FLOOR SHALL HAVE EXPLOSION PROOF SEALING FITTINGS INSTALLED IN THE INTERIOR OF THE CONTROL ROOM PER NEC 501.15.
3. REFER TO SHEET EP-602 FOR FEEDER TYPE AND DISCONNECT INFORMATION INCLUDED ON MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE
4. ALL METALLIC CONDUITS THAT ARE NOT ATTACHED TO A GROUNDED PANEL OR ENCLOSURE SHALL BE GROUNDED USING A GROUNDED BUSHING.

SHEET NOTES:

1. 120 VOLT POWER TO PANEL PB IN CONTROL BUILDING, SEE EP-602 FOR CONDUIT AND CONDUCTOR REQUIREMENTS.
2. CONTROLS - 2" CONDUIT TO FUEL SYSTEM CONTROL PANEL IN CONTROL BUILDING FROM PEDESTAL, FOR FUTURE CONTROLS CABLING.
3. CONTROLS 1" CONDUIT, ROUTED FROM FUELING CONTROLS PEDESTAL TO DISPENSER, FOR FUTURE CONTROLS CABLING
4. #4/0 BARE COPPER FROM GROUNDING LUG ON DISPENSER OR EFSO TO GROUND RING AT DISPENSER ISLAND/CANOPY.
5. PROVIDE EXPLOSION PROOF 30 AMP / 1 POLE MOTOR RATED SWITCH INSIDE DISPENSER BASE FOR LOCAL DISCONNECT.
6. PROVIDE CONDUIT SEALS FOR ALL CONDUITS ENTERING OR LEAVING DISPENSER, CONTROLS PEDESTAL, OR EFSO PEDESTAL.
7. PROVIDE CONDUIT AND CONDUCTORS FOR EPDS, 1" CONDUIT AND #12 CONDUCTORS AS REQUIRED
8. 1" CONDUIT, BELOW GRADE, TO FUTURE CONTROL PEDESTALS ON SECOND FUELING ISLAND. CONDUIT IS FOR FUTURE CONNECTION BETWEEN CONTROL PEDESTALS, CABLING AND CONDUCTORS BY OTHERS.
9. SEE SHEET EP-602 FOR FEEDER REQUIREMENTS FROM CONTROL PEDESTALS TO PANEL PA IN CONTROL BUILDING.
10. PROVIDE LEAK DETECTION SENSOR IN DISPENSER SUMP PIT, WITH ALL ASSOCIATED CONTROLS CONNECTIONS TO PANEL IN CONTROL BUILDING.
11. ALL CONDUITS SHALL ENTER DISPENSERS THROUGH THE SUMP. CONDUIT PENETRATIONS INTO THE SUMP SHALL BE IN THE SIDE, AND ABOVE THE LEVEL OF FUEL PIPING PENETRATION, BUT BELOW THE LEVEL OF CONCRETE OR ASPHALT PAVING. COORDINATE WITH FINAL CIVIL AND FUELING PLANS.



3 DIU PEDESTAL DETAIL
Scale: NTS



4 DIU MOUNTING FOOTPRINT
Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

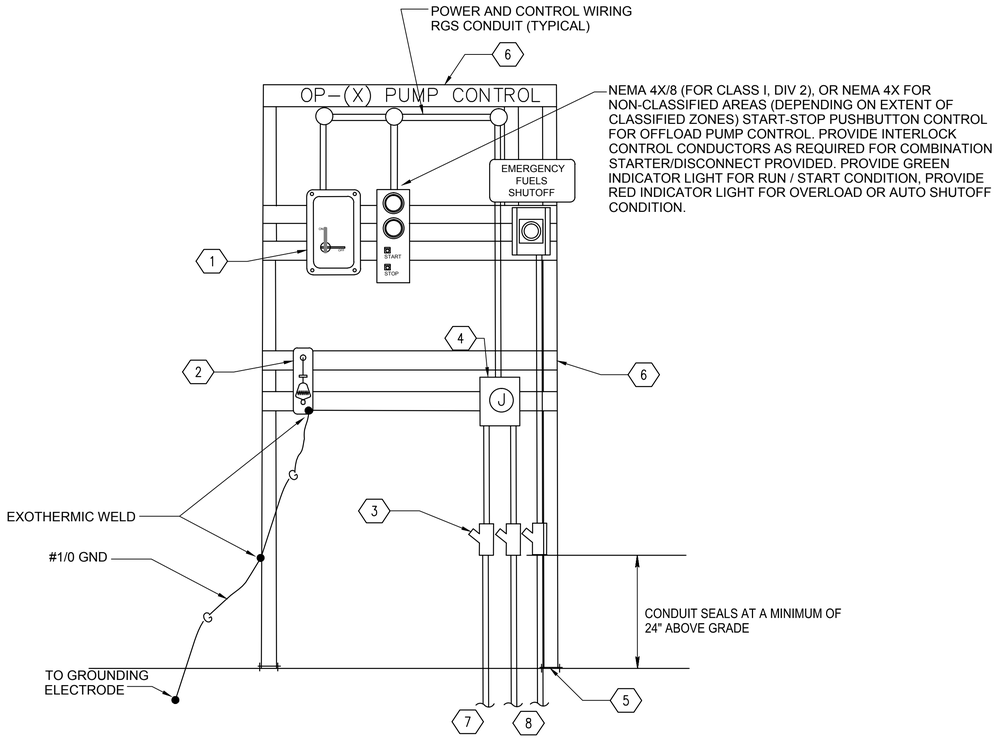
CHECKED: MKK | DRAWN: SS | DESIGNED: SS | PROJECT NO.: 14018-20

DRAWING TITLE: FUELING CONTROLS DETAILS

DRAWING NO.: **EP-501**

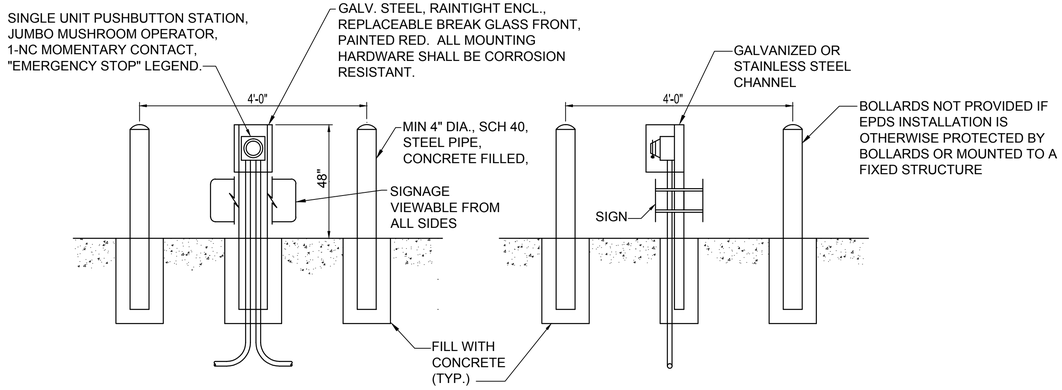
SHEET 65 OF 72

RAC # 1401800

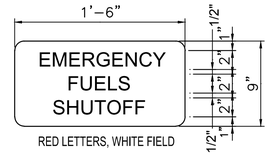


1. NEMA 4X/8 COMBINATION STARTER/DISCONNECT FOR OFFLOAD PUMP CONTROL, HP/AMPACITY/FUSE RATINGS PER MANUFACTURER AND CODE REQUIREMENTS.
2. GROUNDING REEL WITH SPRING OPERATED AUTOMATIC RETRIEVE REEL, NOMINAL 50' STRANDED CABLE, INSTANT-ACTING LOCKING MECHANISM, AND 100 AMP ALLIGATOR TYPE GROUND CLAMP.
3. CONDUIT SEAL FITTING. (TYPICAL)
4. JUNCTION BOX - NEMA 8 / 4X OR NEMA 4X, DEPENDING ON EXTENT OF CLASSIFIED AREA
5. CONCRETE ANCHOR BOLTS AND BASEPLATE W/ 1" (MIN.) NON-SHRINK GROUT, OR ANCHOR BOLTS AND FOUNDATION, AS REQUIRED BY SITE CONDITIONS.
6. STRUCTURAL STEEL CHANNEL OR TUBE SUPPORT STRUCTURE. PRIME AND FINISH PAINT.
7. FEEDER TO PANEL PB IN CONTROL ROOM,
8. TO OFFLOAD PUMP

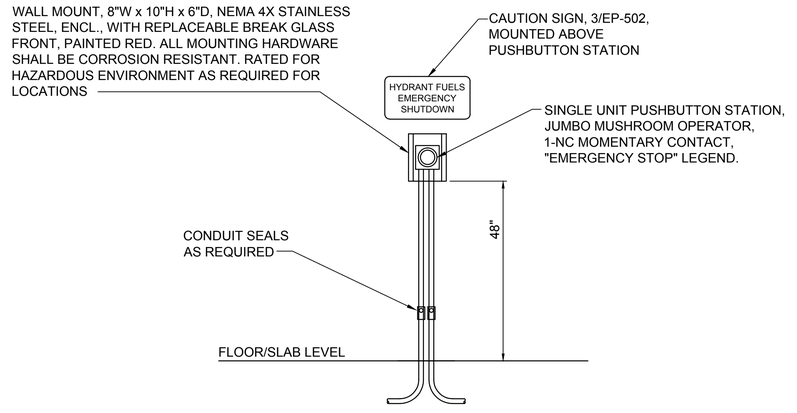
1 OFFLOAD PUMPS EPDS AND GROUNDING STATION
Scale: NTS



2 EMERGENCY FUELS SHUTOFF STATION (EFSO) DETAIL
Scale: NTS



3 CAUTION SIGN DETAIL
Scale: NTS



4 WALL MOUNT EMERGENCY POWER DOWN STATION (EPDS) DETAIL
Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

DRAWING TITLE: ELECTRICAL DETAILS (1 OF 2)

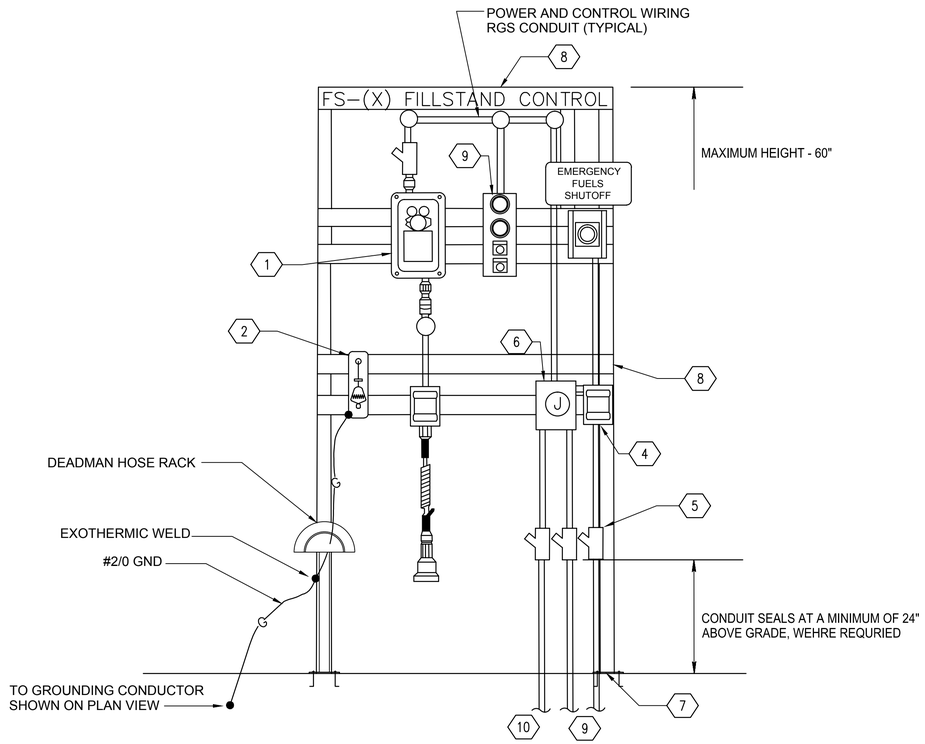
DRAWING NO.: **EP-502**

SHEET 66 OF 72

RAC # 1401800

GENERAL NOTES:

1. COORDINATE LOCATION AND HAZARDOUS RATINGS WITH FILL STAND PIPING AND EQUIPMENT. ADJUST LOCATION AND RATINGS AS REQUIRED.



1. SCULLY GROUND PROVING STATION.
2. PROVIDE NEW STATIC DISCHARGE AND GROUNDING REEL WITH SPRING OPERATED AUTOMATIC RETRIEVE REEL. THE REEL SHALL CONTAIN A STRANDED CABLE WHICH IS USED TO GROUND STATIC CHARGES ON SERVICE EQUIPMENT. THE REEL SHALL BE HEAVY DUTY STEEL CONSTRUCTION AND HAVE AN INSTANT-ACTING LOCK AND RELEASE FOR OPERATOR CONVENIENCE. IT SHALL COME WITH A 100 AMP GROUND CLAMP (ALLIGATOR CLIP) AND RUBBER COVERED BUMPER. CABLE LENGTH SHALL BE 50 FEET.
3. 3 # 12, 1" C TO DUPLEX OUTLET
4. WEATHER PROOF DUPLEX OUTLET BODY, NEMA 4X OUTLET BOX, NEMA 5-20 OUTLET WITH HINGED COVER. (DELETE DUPLEX OUTLET WHERE INSIDE A HAZARDOUS AREA)
5. CONDUIT SEAL FITTING. (TYPICAL)
6. JUNCTION BOX - NEMA 8/NEMA 4X
7. 6" CONCRETE ANCHORS AND½"x5"x10" BASEPLATE W/ 1" (MIN.) NON-SHRINK GROUT. (TYPICAL) PRIME AND FINISH PAINT BASEPLATE.
8. C4x7.5 CHANNEL. PRIME AND FINISH PAINT.
9. NEMA 4X/8 START-STOP PUSHBUTTON CONTROL FOR HIGH-FLOW FILLSTAND PUMP CONTROL. PROVIDE INTERLOCK CONTROL CONDUCTORS AS REQUIRED FOR STARTER AND PUMP SUPPLIED, PROVIDE GREEN INDICATOR LIGHT FOR RUN/START CONDITION, RED FOR TROUBLE/ALARM.

1 OPTIONAL FILLSTAND CONTROLS RACK
Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN

PROJECT NO.: 14018-20

DRAWING TITLE: ELECTRICAL DETAILS (2 OF 2)

DRAWING NO.: **EP-503**

SHEET 67 OF 72

RAC # 1401800

PANEL: PA			VOLTAGE	208/120		PHASE/WIRE		3/4			LOCATION	FUELING STATION CONTROL BUILDING					
MAIN BUS 225			MAIN	225A / 3P MLO		NEUTRAL		100%		BUS:	COPPER	GND:	COPPER		FAULT DUTY: 30,000 AIC		
LOAD INFORMATION			KVA			BREAKER RATING/POLES						KVA			LOAD INFORMATION		
LOAD	NOTE	TYPE	PH-A	PH-B	PH-C	CKT	P	CB	PH	CB	P	CKT	PH-A	PH-B	PH-C	TYPE	NOTE	LOAD
INTERIOR LIGHTING			320			1	1	20	A	20	1	2	200					EXTERIOR BLDG LIGHTING
TELECOM RECEPTACLE				1000		3	1	20	B	20	1	4		360				CONTROL PANEL
RECEPTACLES					540	5	1	20	C	20	1	6			360			RECEPTACLES
EXTERIOR RECEPTACLES			360			7	1	20	A	40	2	8	3000					DSS-1/CU-1
FACP-WHERE NEEDED	2			1200		9	1	20	B			10		3000				
CANOPY LIGHTING					700	11	1	20	C	20	1	12			700			CANOPY LIGHTING
EMERGENCY SHOWER (WHERE PROVIDED)			2500			13	2	40	A	20	1	14	500					RECIRC PUMP
				2500		15			B	20	1	16		500				LIGHTING CONTROLS
SITE LIGHTING					1200	17	1	20	C	20	1	18			600			EPDS
SITE LIGHTING			1200			19	1	20	A	20	1	20	1000					SPARE
HEAT TRACE				1200		21	1	20	B	20	1	22		1000				SPARE
SHUNT TRIP					100	23	1	20	C	20	1	24			1000			SPARE
SPARE						25	1	20	A	30	3	26	0					SPACE
SPARE						27	1	20	B			28		0				
SPARE						29	1	20	C			30			0			
WATER HEATER (COORDINATE TYPE AND RATING WITH PLUMBING DESIGN)			4000			31	3	60	A	20	3	32	0					SPARE
				4000		33			B			34		0				
					4000	35			C			36			0			
AIR COMPRESSOR (IF REQUIRED)			2250			37	3	30	A	30	3	38	0					SPACE
				2250		39			B			40		0				
					2250	41			C			42			0			
SPACE						43	1	20	A	30	3	44						SPARE
SPACE						45	1	20	B			46						
SPACE						47	1	20	C			48						
MOUNTING: SURFACE			10630	12150	8790			A	B	C			4700	4860	2660			
ENCLOSURE: NEMA 1			CONNECTED PHASE (KVA):					15330	17010	11450								
			CONNECTED CURRENT (A):					127.8	141.8	95.4								

NOTES:

1. PROVIDE BUILT IN TVSS / SPD SURGE PROTECTION PER SPECS
2. PROVIDE HANDLE LOCK OFF FOR CIRCUIT 9, FACP, PER NEC/NFPA AND UFC CRITERIA.
3. PROVIDE CONDUIT SEALS FOR ALL CIRCUITS ROUTED AROUND SITE, TO TANKS, OFFLOADS, OR FUELING ISLANDS, PRIOR TO ENTERING PANEL, PER N.E.C. ARTICLE 500.

TYPE	KVA	DF	KVAxDF
L	4.1000	1.	4.1
LM	6.7500	1.25	8
M	6.0000	1.0	6
O	20	1.00	20
R	2.6	1.00	3
R	0	0.50	0
S	25	1	25
CND	64	EMD	66
		EMD (Amps)	183.58

LOAD TYPES:

- L – LIGHTING
- LM – LARGEST MOTOR
- M – MOTOR LOAD
- O – MISC OR OTHER TYPE LOADS
- R – RECEPTACLE (First 10,000 VA per NEC)
- R – RECEPTACLE (over 10,000 VA per NEC)
- S – SPARE

PANEL: MDP – LOAD CALCULATIONS W/ HIGH FLOW FILLSTAND AND PUMPED OFFLOAD

TYPE	KVA	DF	KVAxDF
L	4.1000	1.	4.1
LM	27.0000	1.25	34
M	86.2500	1.0	86
O	25	1.00	25
R	2.6	1.00	3
R	0	0.50	0
S	50	1	50
CND	195	EMD	202
		EMD (Amps)	559.88

LOAD TYPES:

- L – LIGHTING
- LM – LARGEST MOTOR
- M – MOTOR LOAD
- O – MISC OR OTHER TYPE LOADS
- R – RECEPTACLE (First 10,000 VA per NEC)
- R – RECEPTACLE (over 10,000 VA per NEC)
- S – SPARE

PANEL: MDP – LOAD CALCULATIONS W/O HIGH FLOW, AND USING GRAVITY OFFLOAD

TYPE	KVA	DF	KVAxDF
L	4.1000	1.	4.1
LM	6.7500	1.25	8
M	26.8000	1.0	27
O	25	1.00	25
R	2.6	1.00	3
R	0	0.50	0
S	50	1	50
CND	115	EMD	117
		EMD (Amps)	324.60

LOAD TYPES:

- L – LIGHTING
- LM – LARGEST MOTOR
- M – MOTOR LOAD
- O – MISC OR OTHER TYPE LOADS
- R – RECEPTACLE (First 10,000 VA per NEC)
- R – RECEPTACLE (over 10,000 VA per NEC)
- S – SPARE

PANEL: MDP – LOAD CALCULATIONS W/O HIGH FLOW, AND W/ PUMPED OFFLOAD

TYPE	KVA	DF	KVAxDF
L	4.1000	1.	4.1
LM	27.0000	1.25	34
M	65.2500	1.0	65
O	25	1.00	25
R	2.6	1.00	3
R	0	0.50	0
S	50	1	50
CND	174	EMD	181
		EMD (Amps)	501.59

LOAD TYPES:

- L – LIGHTING
- LM – LARGEST MOTOR
- M – MOTOR LOAD
- O – MISC OR OTHER TYPE LOADS
- R – RECEPTACLE (First 10,000 VA per NEC)
- R – RECEPTACLE (over 10,000 VA per NEC)
- S – SPARE

PANEL: PB			VOLTAGE	208/120		PHASE/WIRE		3/4			LOCATION	FUELING STATION CONTROL BUILDING					
MAIN BUS 400			MAIN	400A / 3P MLO		NEUTRAL		100%		BUS:	COPPER	GND:	COPPER		FAULT DUTY: 30,000 AIC		
LOAD INFORMATION			KVA			BREAKER RATING/POLES						KVA			LOAD INFORMATION		
LOAD	NOTE	TYPE	PH-A	PH-B	PH-C	CKT	P	CB	PH	CB	P	CKT	PH-A	PH-B	PH-C	TYPE	NOTE	LOAD
TANK 1 / DP-1			1200			1	3	20	A	20	1	2	1200					OFFLOAD 1 / OP-1
				1200		3			B	20	1	4		1200				OFFLOAD 2 / OP-2
					1200	5			C	20	1	6			1200			OFFLOAD 3 / OP-3
TANK 2 / DP-2			1200			7	3	20	A	20	1	8	1200					OFFLOAD 4 / OP-4
				1200		9			B	20	1	10		1600				PRODUCT SVC PMP 1
					1200	11			C	20	1	12			1600			PRODUCT SVC PMP 2
TANK 3 / DP-3			1200			13	3	20	A	20	1	14	1600					PRODUCT SVC PMP 3
				1200		15			B	20	1	16		1600				PRODUCT SVC PMP 4
					1200	17			C	20	1	18			800			OFFLOAD RECEPT
TANK 4 / DP-4			1200			19	3	20	A	20	1	20						SPARE
				1200		21			B	20	1	22						SPARE
					1200	23			C	20	1	24						SPARE
FILLSTAND PUMP HIGH FLOW (WHERE PROVIDED)			3500			25	3	60	A	60	3	26	3500					FILLSTAND PUMP HIGH FLOW (WHERE PROVIDED)
				3500		27			B			28		3500				
					3500	29			C			30			3500			
OFFLOAD 1			9000			31	3	125	A	125	3	32	9000					OFFLOAD 3
				9000		33			B			34		9000				
					9000	35			C			36			9000			
OFFLOAD 2			9000			37	3	125	A	125	3	38	9000					OFFLOAD 4
				9000		39			B			40		9000				
					9000	41			C			42			9000			
SPARE			0			43	3	30	A	30	3	44	0					SPACE
				0		45			B			46		0				
					0	47			C			48			0			
SPARE			0			49	1	20	A	20	1	50	0					SPACE
SPARE				0		51	1	20	B	20	1	52		0				SPACE
SPARE					0	53	1	20	C	20	1	54			0			SPACE
MOUNTING: SURFACE			26300	26300	26300			A	B	C			25500	25900	25100			
ENCLOSURE: NEMA 1			CONNECTED PHASE (KVA):					51800	52200	51400								
			CONNECTED CURRENT (A):					431.7	435	428.3								

NOTES:

1. PROVIDE CONDUIT SEALS FOR ALL CIRCUITS ROUTED AROUND SITE, TO TANKS, OFFLOADS, OR FUELING ISLANDS, PRIOR TO ENTERING PANEL, PER N.E.C. ARTICLE 500.

TYPE	KVA	DF	KVAxDF
L	0.0000	1.	0
LM	27.0000	1.25	34
M	73.6000	1.0	74
O	5	1.00	5
R	0	1.00	0
R	0	0.50	0
S	25	1.0	25
CND	131	EMD	137
		EMD (Amps)	381.26

LOAD TYPES:

- L – LIGHTING
- LM – LARGEST MOTOR
- M – MOTOR LOAD
- O – MISC OR OTHER TYPE LOADS
- R – RECEPTACLE (First 10,000 VA per NEC)
- R – RECEPTACLE (over 10,000 VA per NEC)
- S – SPARE

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | CHECKED: MKK | DRAWN: SS | DESIGNED: SS | PROJECT NO.: 14018-20

DRAWING TITLE: PANEL SCHEDULES

DRAWING NO.: **EP-601**

SHEET 68 OF 72

RAC # 1401800

10/1/2015 10:21:20 AM Ralph Aldridge

M:\2014\1401800\elec\1401800-EP601.dwg

MECHANICAL EQUIPMENT ELECTRICAL CONNECTION SCHEDULE

TAG	EQUIPMENT	VOLT/PH	HP/KW/MCA/FLA	PANEL CIRCUIT	WIRING	DISCONNECT	NOTES
CMP-1	AIR COMPRESSOR	208/3	5 HP	PA-37,39,41	4#10 AWG, 1#12 AWG GND, 1" C	30/3/3R MOTOR RATED FUSED DISCONECT	WHERE REQUIRED AND PROVIDED PER PROGRAM REQUIREMENTS.
RCP-1	RECIRC PUMP	120/1	1/5 HP	PA-14	3#12 AWG, 1/2 C	30/1/3R MOTOR RATED SWITCH W/TO	WHERE REQUIRED AND PROVIDED PER PROGRAM REQUIREMENTS.
CU-1/DSS-1	DUCTLESS SPLIT SYSTEM (HVAC)	208/1	MOCP 15A	PA-8,10	4#10 AWG, 1#12 AWG GND, 1" C	30/2/4X MOTOR RATED FUSED DISCONNECT	SINGLE POINT DISCONNECT, INTERIOR DSS INTERLOCKED AND FED FROM EXTERIOR CU
WH-1	WATER HEATER	208/3	12 KW	PA-31,33,35	4#4 AWG, 1#8 AWG GND, 1.5" C	60/3/3R FUSED DISCONNECT	COORDINATE TYPE AND SIZE, OR RATING, OF WATER HEATER WITH FINAL SITE DESIGN PLUMBING PLANS AND SPECIFICATIONS.
OP-1	OFFLOAD 1	208/3	25 HP	PB-31,33,35 PB-18	4# 1/0AWG, 1#6 AWGGND 2" C, 3# 8AWG FOR DUPLEX 1" C, 6#12 1"C FOR CONTROLS	200/3/4X/EP FUSED STARTER/DISCONNECT	EXPLOSION PROOF / CLASSIFIED AREA AT OFFLOAD SKID PROVIDE HOA SWITCH FOR LOCAL CONTROL, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEM CONTROL PANEL
OP-2	OFFLOAD 2	208/3	25 HP	PB-37,39,41 PB-18	4# 1/0AWG, 1#6 AWGGND 2" C, 3# 8AWG FOR DUPLEX 1" C, 6#12 1"C FOR CONTROLS	200/3/4X/EP FUSED STARTER/DISCONNECT	EXPLOSION PROOF / CLASSIFIED AREA AT OFFLOAD SKID PROVIDE HOA SWITCH FOR LOCAL CONTROL, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEM CONTROL PANEL
OP-3	OFFLOAD 3	208/3	25 HP	PB-32,34,36 PB-18	4# 1/0AWG, 1#6 AWGGND 2" C, 3# 8AWG FOR DUPLEX 1" C, 6#12 1"C FOR CONTROLS	200/3/4X/EP FUSED STARTER/DISCONNECT	EXPLOSION PROOF / CLASSIFIED AREA AT OFFLOAD SKID PROVIDE HOA SWITCH FOR LOCAL CONTROL, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEM CONTROL PANEL
OP-4	OFFLOAD 4	208/3	25 HP	PB-38,40,42 PB-18	4# 1/0AWG, 1#6 AWGGND 2" C, 3# 8AWG FOR DUPLEX 1" C, 6#12 1"C FOR CONTROLS	200/3/4X/EP FUSED STARTER/DISCONNECT	EXPLOSION PROOF / CLASSIFIED AREA AT OFFLOAD SKID PROVIDE HOA SWITCH FOR LOCAL CONTROL, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEM CONTROL PANEL
DP-1	DISPENSER PUMP 1	208/3	1 HP	PD-1,3,5	4#10, #12 GND, 1" C, AND 6#12 1"C FOR CONTROLS	30/3 FUSED STARTER/DISCONNECT EXPLOSION PROOF	EXPLOSION PROOF / CLASSIFIED AREA AT PRODUCT STORAGE TANKS, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEMS CONTROL PANEL
DP-2	DISPENSER PUMP 2	208/3	1 HP	PB-7,9,11	4#10, #12 GND, 1" C, AND 6#12 1"C FOR CONTROLS	30/3 FUSED STARTER/DISCONNECT EXPLOSION PROOF	EXPLOSION PROOF / CLASSIFIED AREA AT PRODUCT STORAGE TANKS, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEMS CONTROL PANEL
DP-3	DISPENSER PUMP 3	208/3	1 HP	PB-13,15,17	4#10, #12 GND, 1" C, AND 6#12 1"C FOR CONTROLS	30/3 FUSED STARTER/DISCONNECT EXPLOSION PROOF	EXPLOSION PROOF / CLASSIFIED AREA AT PRODUCT STORAGE TANKS, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEMS CONTROL PANEL
DP-4	DISPENSER PUMP 4	208/3	1 HP	PB-19,21,23	4#10, #12 GND, 1" C, AND 6#12 1"C FOR CONTROLS	30/3 FUSED STARTER/DISCONNECT EXPLOSION PROOF	EXPLOSION PROOF / CLASSIFIED AREA AT PRODUCT STORAGE TANKS, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEMS CONTROL PANEL
D-1	DISPENSER 1	120/1	2 KW MAX	PB-10	3#6 AWG, 1" C	30/1/EP MOTOR RATED SWITCH W/TO	EXPLOSION PROOF MOTOR RATED SWITCH IN BASE OF DISPENSER
D-2	DISPENSER 2	120/1	2 KW MAX	PB-12	3#6 AWG, 1" C	30/1/EP MOTOR RATED SWITCH W/TO	EXPLOSION PROOF MOTOR RATED SWITCH IN BASE OF DISPENSER
D-3	DISPENSER 3	120/1	2 KW MAX	PB-14	3#6 AWG, 1" C	30/1/EP MOTOR RATED SWITCH W/TO	EXPLOSION PROOF MOTOR RATED SWITCH IN BASE OF DISPENSER
D-4	DISPENSER 4	120/1	2 KW MAX	PB-16	3#6 AWG, 1" C	30/1/EP MOTOR RATED SWITCH W/TO	EXPLOSION PROOF MOTOR RATED SWITCH IN BASE OF DISPENSER
EM SHOWER	EMERGENCY SHOWER CABINET	208/1	5 KW MAX	PA-13,15	4#10 AWG, 1#12 AWG GND, 1" C	30/2 FUSED DISCONNECT , PROVIDE CONDUIT SEALS AS REQUIRED	EMERGENCY SHOWER LOCATED ADJACENT TO HIGH FLOW FILLSTAND, PROVIDE EXPLOSION PROOF DISCONNECT WHERE REQUIRED BY LOCATION AND CLASSIFICATION, COORDINATE WATER HEATER LOCATION AND REQUIREMENTS WITH PLUMBING PLANS AND SPECIFICATIONS.
HEAT TRACE	HEAT TRACE FOR EMERGENCY SHOWER RECIRC LINE	120/1	1 KW MAX	PA-21	2#12 AWG, 1#12 AWG GND, 1/2" C	30/1/3R MOTOR RATED SWITCH FOR DISCONNECT	DISCONNECT AND CIRCUIT FROM PANEL PC TO HEAT TRACE SERVING RECIRC LINE
ATG (1-4)	ATG AND LEVEL ALARM CONNECTIONS ON TANKS 1-4, TO ATG PANEL IN CONTROL BUILDING	CONTROLS	---	CONTROL PANEL	4#12 AWG, 1#12 AWG GND, 4 - 2C#14 SHIELDED TWISTED CABLES, 1" C, EACH	PROVIDE CONDUIT SEALS AS REQUIRED	EXPLOSION PROOF CONNECTION TO AUTOMATIC TANK GAUGING PORT
FMU (1-2)	FUELS MANAGEMENT UNIT PEDESTAL, ON FUELING ISLANDS	120/1	1 KW MAX, EACH	PA-22, PA-24	2#10 AWG, 1#12 AWG GND, 3/4" C	PROVIDE CONDUIT SEALS AS REQUIRED	EXPLOSION PROOF POWER CONNECTION TO FUELS MANAGEMENT UNIT (FMU) ON FUELING ISLAND.
FS-1	HIGH FLOW FILLSTAND PUMP	208/3	10 HP	PB-25,27,29	4#4, #6 GND, 2" C, AND 6#12 1"C FOR CONTROLS	60/3 FUSED STARTER/DISCONNECT EXPLOSION PROOF	EXPLOSION PROOF / CLASSIFIED AREA AT PRODUCT STORAGE TANKS, ROUTE CONTROLS CONDUCTORS TO FUEL SYSTEMS CONTROL PANEL, WHERE REQUIRED AND PROVIDED PER THE PROGRAM REQUIREMENTS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL

PRELIMINARY
NOT FOR
CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS
DRAWN: SS
CHECKED: MKK
PROJECT NO.: 14018-20
DATE: OCTOBER 2, 2015
SCALE: AS SHOWN

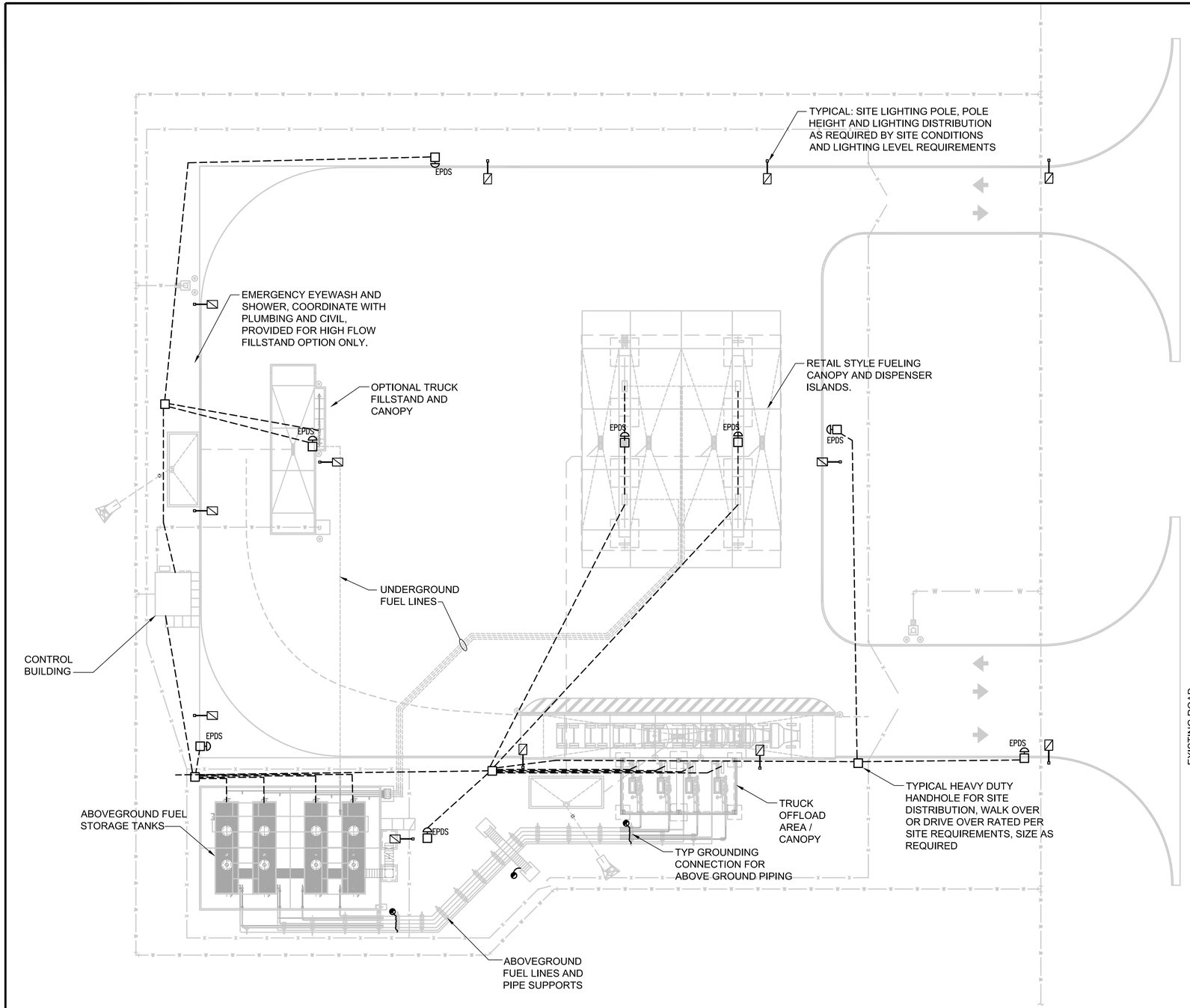
DRAWING TITLE: ELECTRICAL SCHEDULES

DRAWING NO.: **EP-602**

SHEET 69 OF 72

RAC # 1401800

M:\2014\1401800\elec\1401800-EP602.dwg 10/1/2015 10:19:21 AM Ralph Aldridge



1 OVERALL ELECTRICAL SITE PLAN
Scale: 1" = 20'

DESIGNER NOTES:

1. SITE LIGHTING IS TO BE DESIGNED PER APPLICABLE IESNA RECOMMENDED PRACTICES, INCLUDING BUT NOT LIMITED TO IESNA RP-8-00, AND IESNA RP-33-14, AS WELL AS API RP-540, AND DLA ENERGY POLICY GUIDELINES.
2. IN GENERAL SITE LIGHTING IS ANTICIPATED TO BE MINIMUM OF 1 F.C., WITH AN AVG/MIN UNIFORMITY OF NOT GREATER THAN 4:1. LIGHTING LEVELS ARE EXPECTED TO BE HIGHER IN AREAS OF FUELING OPERATIONS, WHETHER AT OFFLOAD, FUELING ISLAND, OR AT THE OPTIONAL HIGH FLOW FILLSTAND, COORDINATE THESE REQUIREMENTS WITH APPLICABLE STANDARDS REFERENCED ABOVE.
3. ALL SITE LIGHTING IS TO BE BASED ON FULL CUT-OFF DISTRIBUTION, LED BASED LUMINAIRES, UNLESS OTHERWISE REQUIRED BY BASE SPECIFIC STANDARDS. LIGHTING DISTRIBUTION OF FIXTURES MAY INCLUDE A COMBINATION OF IES TYPE II, III, IV, V, AND FORWARD THROW OPTICS TO ACHIEVE THE APPROPRIATE LIGHTING LEVELS AND UNIFORMITY.
4. WHERE REQUIRED, OR REQUESTED BY BASE, MOTION CONTROL IS TO BE PROVIDED AS APPLICABLE FOR LIGHTING IN AREAS OF LOW NIGHT TIME USE.
5. COORDINATE WITH BASE, AND SPECIFIC SITE SELECTED, TO DETERMINE THE APPLICABILITY AND APPLICATION REQUIREMENTS OF FIXTURES WITH HOUSE-SIDE SHIELDS, OR SIMILAR LIGHTING CONTROL DEVICES OR DISTRIBUTIONS.
6. FOR PROJECT LOCATIONS IN CLOSE PROXIMITY TO BEACHES OR SHORELINE, COORDINATE SPECIAL SITE LIGHTING REQUIREMENTS WITH BASE, ADJUST COLOR TEMPERATURE, AND/OR LAMP SOURCE TO PROVIDE TURTLE FRIENDLY LIGHTING, OR OTHER SPECIAL SITE LIGHTING REQUIREMENTS DUE TO ENVIRONMENTAL CONCERNS, AS NECESSARY.
7. COORDINATE SITE LIGHTING POLE AND FOUNDATION REQUIREMENTS WITH BASE STANDARDS. ADJUST LAYOUT IN RELATION TO POLE HEIGHT AND FIXTURE WATTAGE REQUIREMENTS. FOUNDATIONS SHALL BE DESIGNED TO MEET LOCAL SOILS CONDITION.
8. LOCATIONS SHOWN FOR EPDS (EFSO) STATIONS ARE APPROXIMATE AND BASED ON LAYOUT SHOWN. COORDINATE FINAL LOCATIONS AND REQUIRED DISTANCES BASED ON SPECIFIC SITE REQUIREMENTS, COMPLYING WITH THE REQUIREMENTS OF UFC 3-460-01 AND NEC ARTICLE 514. ADDITIONAL EPDS STATIONS ARE SHOWN ON PLANS FOR OFFLOAD AREA, AND CONTROL BUILDING.
9. GROUND ALL NON-CURRENT CARRYING METAL STRUCTURES PER THE REQUIREMENTS OF UFC 3-460-01, INCLUDING STAIRS OVER PIPING, ABOVE GROUND PIPING, CANOPIES, AND FENCES.
10. COORDINATE SITE ELECTRICAL UTILITY CONNECTION POINT AND TYPE OF SERVICE REQUIRED WITH BASE. SERVICE IS ANTICIPATED TO BE 208/120 VOLT, THREE PHASE, FOUR WIRE. PROVIDE OVERHEAD OR UNDERGROUND UTILITY LATERAL AND TRANSFORMERS AS REQUIRED.
11. COORDINATE SITE TELECOM CONNECTION POINT, AS WELL AS OSP CABLE TYPE REQUIREMENTS FROM BASE INFRASTRUCTURE TO CONTROLS BUILDING.
12. FOR FILLSTAND OPTION, IF EXERCISED, PROVIDE CANOPY OVER EQUIPMENT AS REQUIRED BY UFC 3-460-01. CANOPY IS TO BE PROVIDED WITH LIGHTING, GROUNDING AND LIGHTNING PROTECTION SYSTEMS SIMILAR TO THOSE PROVIDED FOR THE OFFLOAD CANOPY, AS WELL GROUND PROVING / SCULLY, AND INTERCONNECTION OF FLOW SWITCH WITH CONTROL VALVES AS REQUIRED.
13. TYPICAL ABOVEGROUND TANK CONFIGURATION, WITH OPTIONAL FILLSTAND, IS SHOWN. ADJUST DEVICES AS REQUIRED FOR ACTUAL SITE CONDITIONS AND FEATURES REQUIRED.
14. COORDINATE EMERGENCY SHOWER/EYEWASH REQUIREMENTS WITH MECHANICAL AND FUELING REQUIREMENTS. COORDINATE LOCATION WITH CIVIL PLANS.

NOTES TO DESIGNER:

1. CONDUITS UNDER ROADWAYS OR PARKING AND DRIVE AREAS SHALL BE CONCRETE ENCASED.
2. CONDUITS ROUTED WITHIN 5 FEET OF ROADWAY OR PARKING AND DRIVE AREAS, OR ARE SUBJECT TO VEHICLE TRAFFIC, SHALL BE CONCRETE ENCASED
3. CONDUITS ROUTED BEYOND 5 FEET FROM EDGE OF PAVEMENT AND NOT SUBJECT TO VEHICLE TRAFFIC MAY BE DIRECT BURIED, EXCEPT AS REQUIRED OTHERWISE BY BASE OR PROJECT SPECIFIC REQUIREMENTS.
4. COORDINATE REQUIREMENTS FOR SITE CONDUITS TO SERVE PRIMARY POWER, AND/OR TELECOMMUNICATIONS INFRASTRUCTURE, WITH UTILITY PROVIDER. PROVIDE CONCRETE ENCASEMENT AS REQUIRED.

GRAPHIC SCALES

20' 10' 0 20' 40'

1" = 20'- 0"

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

SYMBOL	DATE	BY	REVISION

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN | PROJECT NO.: 14018-20

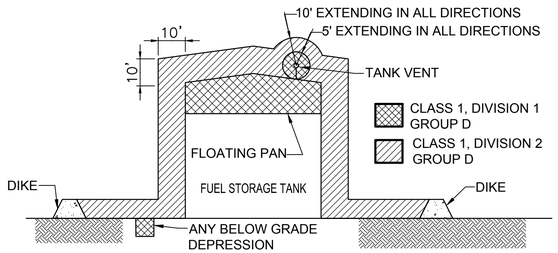
DRAWING TITLE: ELECTRICAL SITE PLAN

DRAWING NO.: **ES-101**

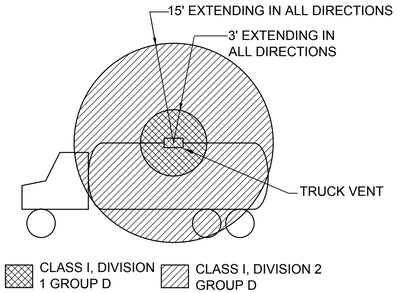
SHEET 70 OF 72

RAC # 1401800

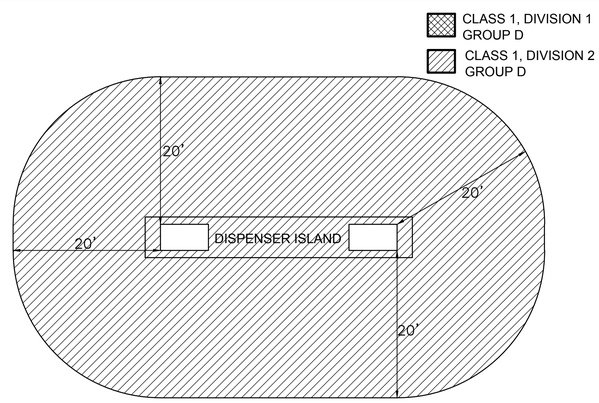
M:\2014\1401800\elec\1401800-ES101.dwg 10/1/2015 10:18:46 AM Ralph Aldridge



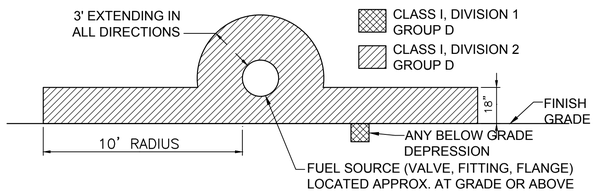
1 FUEL STORAGE TANK HAZARDOUS AREA DETAIL
Scale: NTS



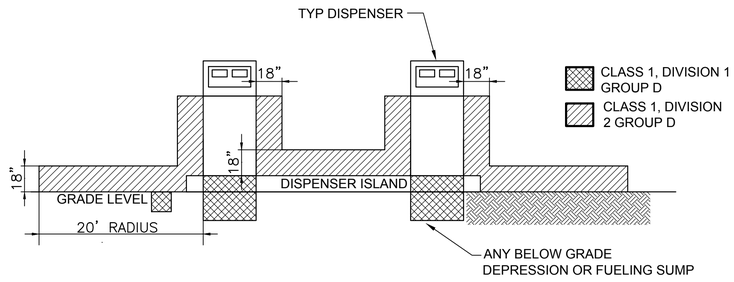
3 FUEL TRUCK HAZARDOUS AREA DETAIL
Scale: NTS



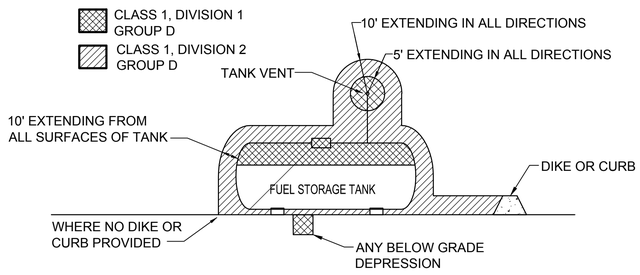
5 FUELING ISLAND HAZARDOUS AREA PLAN
Scale: NTS



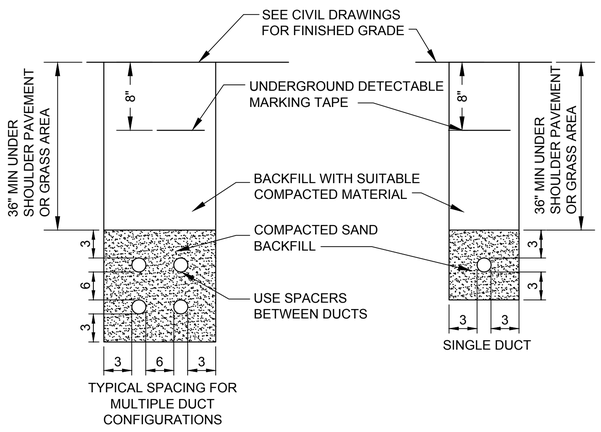
2 EXTERIOR FUEL PIPING HAZARDOUS AREA DETAIL
Scale: NTS



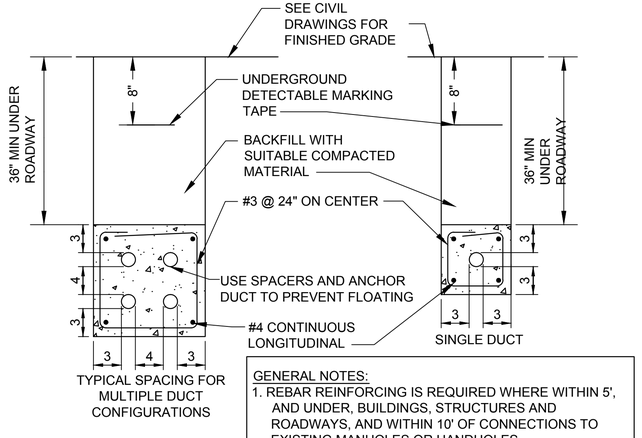
4 FUELING ISLAND HAZARDOUS AREA ELEVATION
Scale: NTS



6 FUEL STORAGE TANK HAZARDOUS AREA DETAIL
Scale: NTS



7 TYPICAL DIRECT BURY DUCTBANK
Scale: NTS



GENERAL NOTES:
1. REBAR REINFORCING IS REQUIRED WHERE WITHIN 5', AND UNDER, BUILDINGS, STRUCTURES AND ROADWAYS, AND WITHIN 10' OF CONNECTIONS TO EXISTING MANHOLES OR HANDHOLES.
2. PROVIDE COLORED CONCRETE, RED, OR AS REQUIRED BY BASE STANDARDS.

8 TYPICAL CONCRETE ENCASED DUCTBANK
Scale: NTS

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL
PRELIMINARY
NOT FOR
CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY
PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

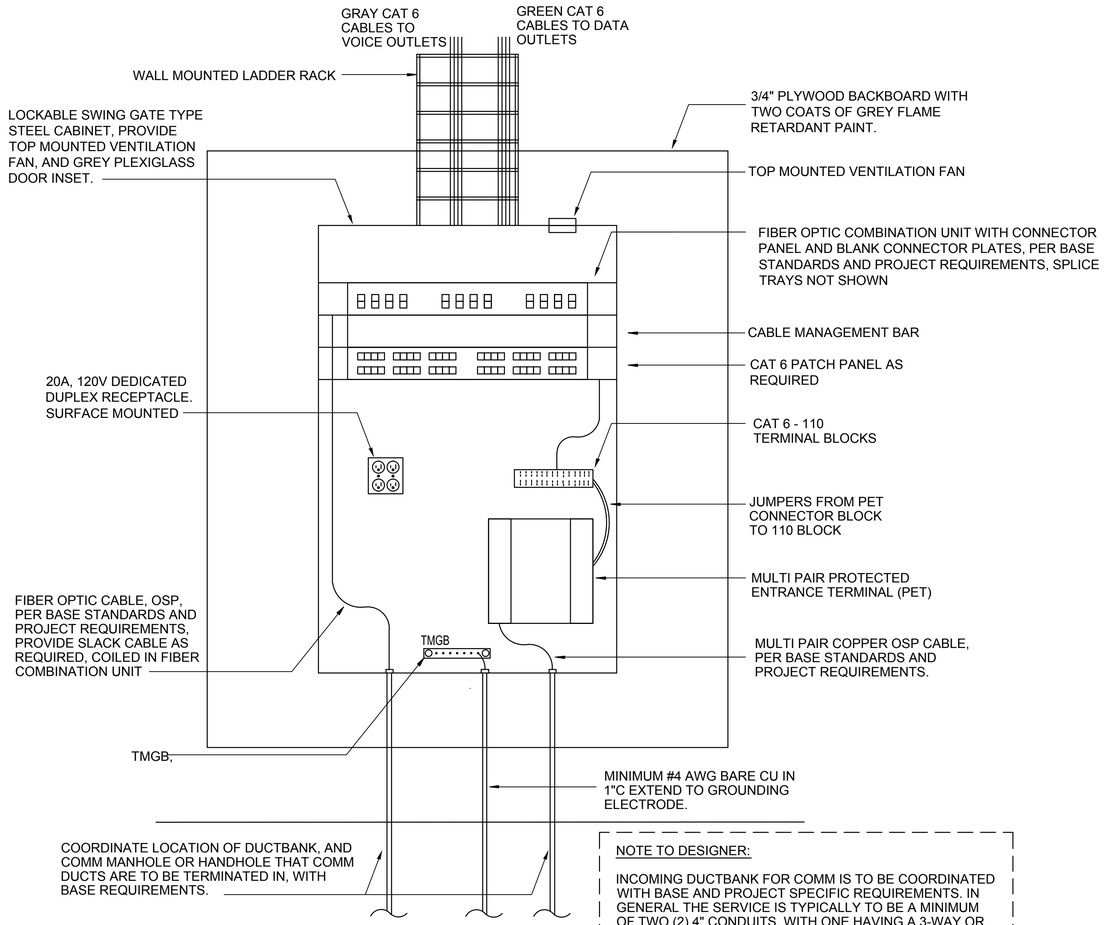
DESIGNED: SS | DRAWN: SS | CHECKED: MKK | DATE: OCTOBER 2, 2015 | SCALE: AS SHOWN
PROJECT NO.: 14018-20
DRAWING TITLE: ELECTRICAL DETAILS

DRAWING NO.
ES-501

SHEET 71 OF 72

RAC # 1401800

M:\2014\14018\elec\1401800-ES501.dwg 10/1/2015 10:18:12 AM Ralph Aldridge

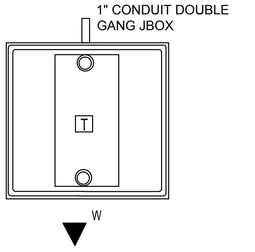


NOTE TO DESIGNER:

INCOMING DUCTBANK FOR COMM IS TO BE COORDINATED WITH BASE AND PROJECT SPECIFIC REQUIREMENTS. IN GENERAL THE SERVICE IS TYPICALLY TO BE A MINIMUM OF TWO (2) 4" CONDUITS, WITH ONE HAVING A 3-WAY OR 4-WAY INNDERDUCT, PER BASE REQUIREMENTS.

1 TELECOM BACKBOARD DETAIL

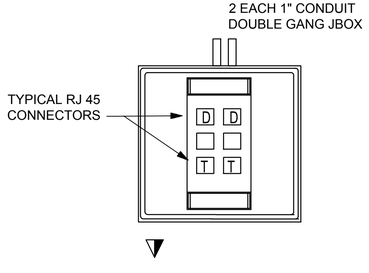
Scale: NTS



WALL TELEPHONE: MOUNTED 48" AFF, 119mm SQ BOX W/SINGLE GANG MUD RING

2 TELEPHONE OUTLET

Scale: NTS

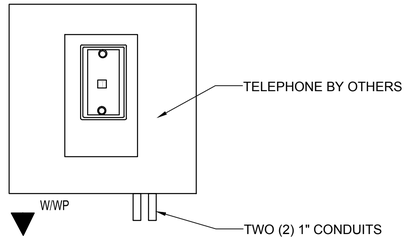


DATA/TELEPHONE; MOUNTED 18" AFF, UNO 119MM SQ BOX W/SINGLE GANG MUD RING.

3 COMBINATION TELEPHONE/DATA OUTLET

Scale: NTS

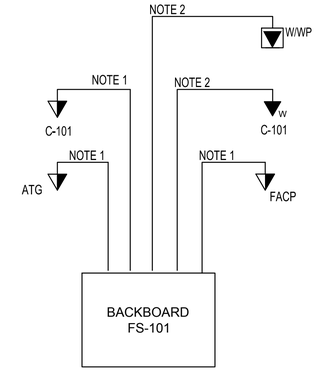
WEATHERIZED NEMA 4X BOX, 11" X 15" X 10.5", HINGED DOOR WITH LOCK DOOR OPTION, EQUIPPED WITH WALL MOUNT, POST MOUNTING PLATE, WITH CAT 6 RJ45 OUTLET TO ACCOMMODATE STANDARD WALL TELEPHONE WITH FACTORY INSTALLED MODULAR WALL TELEPHONE JACK.



WEATHERIZED EXTERIOR WALL TELEPHONE: MOUNTED 60" AFF

4 WEATHERPROOF TELEPHONE OUTLET

Scale: NTS



NOTES:
1. FOUR (4) CAT6, UTP CABLES IN 1"C.
2. TWO (2) CAT6, UTP CABLES IN 1"C.

5 TELECOM RISER DIAGRAM

Scale: NTS

CODES, RELATED DESIGN CRITERIA, OR TECHNICAL GUIDES TO BE USED AS PART OF THIS STANDARD:

THE FOLLOWING IS A PARTIAL LIST OF APPLICABLE DESIGN GUIDES, STANDARD CRITERIA OR CODES THAT MAY APPLY TO ONE OR MORE AREAS OF THE SERVICE STATION DESIGN STANDARD DOCUMENTS TELECOMMUNICATIONS REQUIREMENTS. DESIGNER IS TO REVIEW THE MOST RECENT VERSION OF STANDARDS, AND APPLY AS APPLICABLE. THIS LIST IS NOT INTENDED TO BE EXHAUSTIVE, DESIGNER IS TO REVIEW AND APPLY ALL APPLICABLE CODES AND STANDARDS.

UFC 3-501-01	ELECTRICAL ENGINEERING
UFC 3-520-01	INTERIOR ELECTRICAL SYSTEMS
UFC 3-575-01	LIGHTNING AND STATIC ELECTRICITY PROTECTION SYSTEMS
UFC 3-580-01	TELECOMM BUILDING CABLING SYSTEMS PLANNING AND DESIGN
MIL-HDBK-419	GROUNDING BONDING AND SHIELDING FOR ELECTRONIC EQUIPMENT AND FACILITIES
I3A	TECHNICAL CRITERIA FOR THE INSTALLATION OF INFORMATION INFRASTRUCTURE ARCHITECTURE
EIA/TIA 568	COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING STANDARD
EIA/TIA 569	COMMERCIAL BUILDING STANDARD FOR TELECOMMUNICATIONS PATHWAYS AND SPACES.

DESIGNER NOTES:

1. COORDINATE CABLE TYPE AND REQUIREMENTS WITH BASE, TO INCLUDE BUT NOT LIMITED TO, TYPE OF CABLE REQUIRED, NUMBER OF STRANDS OF FIBER OR PAIRS OF COPPER, CONNECTION POINT, CONNECTION METHOD, AND THE PARTY REQUIRED TO MAKE ALL FINAL TERMINATIONS.
2. PROVIDE MANHOLES, OR HANDHOLES, AT DISTANCES THAT DO NOT EXCEED APPLICABLE STANDARDS.
3. PROVIDE BUTTERFLY DIAGRAMS FOR MANHOLES AND HANDHOLES PER APPLICABLE STANDARDS.

Robert and Company
Engineers, Architects, Planners
229 Peachtree Street, N.E., International Tower, Suite 2000
Atlanta, Georgia 30303-1629
404 577-4000 FAX: 404 577-7119

REVISION | BY | DATE | SYMBOL

SEAL: PRELIMINARY NOT FOR CONSTRUCTION

CLIENT: AIR FORCE CIVIL ENGINEERING SUPPORT FACILITY

PROJECT: MILITARY SERVICE STATION (MSS) / FABRICATED STORAGE TANK STANDARDS

DATE: OCTOBER 2, 2015
SCALE: AS SHOWN
CHECKED: MKK
DRAWN: SS
DESIGNED: SS
PROJECT NO.: 14018-20

DRAWING TITLE: TELECOMMUNICATIONS DETAILS

DRAWING NO.: **TP-501**

SHEET 72 OF 72

RAC # 1401800