



# ARCO

## FUELING CANOPY W/6 MPDs

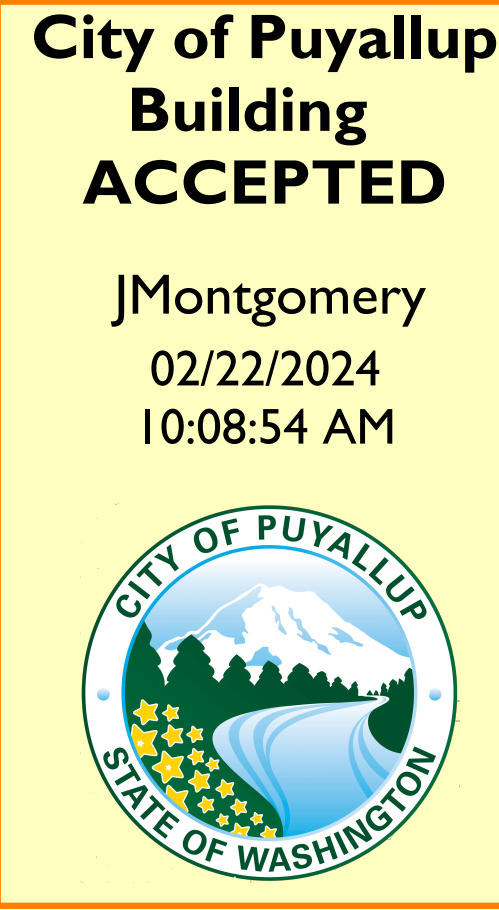
### SWC S MERIDIAN

@ HIGHWAY 512  
PUYALLUP, WASHINGTON

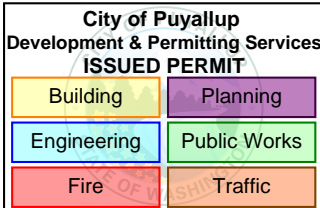


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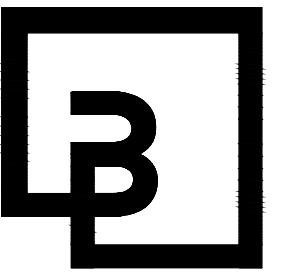

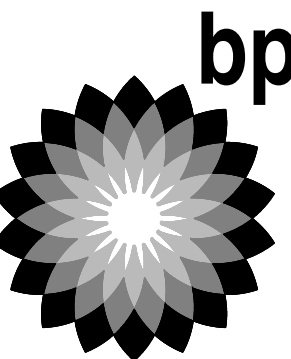
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FULL SIZED LEDGIBLE **COLOR**  
PLANS ARE REQUIRED TO BE  
PROVIDED BY THE PERMITTEE  
ON  
SITE FOR ALL INSPECTIONS  
**(MIN. PLAN SIZE 24" X 36")**

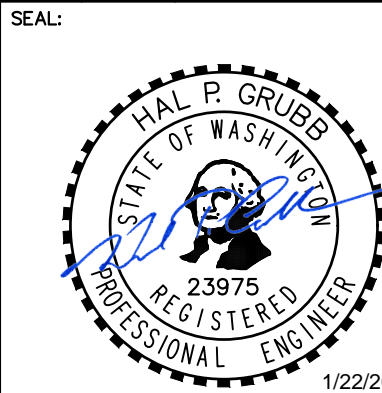


CLIENT:



**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
△1	10/04/23	PERMIT RELEASE
△2	01/22/24	PERMIT RELEASE
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PRFI20240124

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
**3400 am/pm**  
**FUEL CANOPY w/ 6 MPD's**

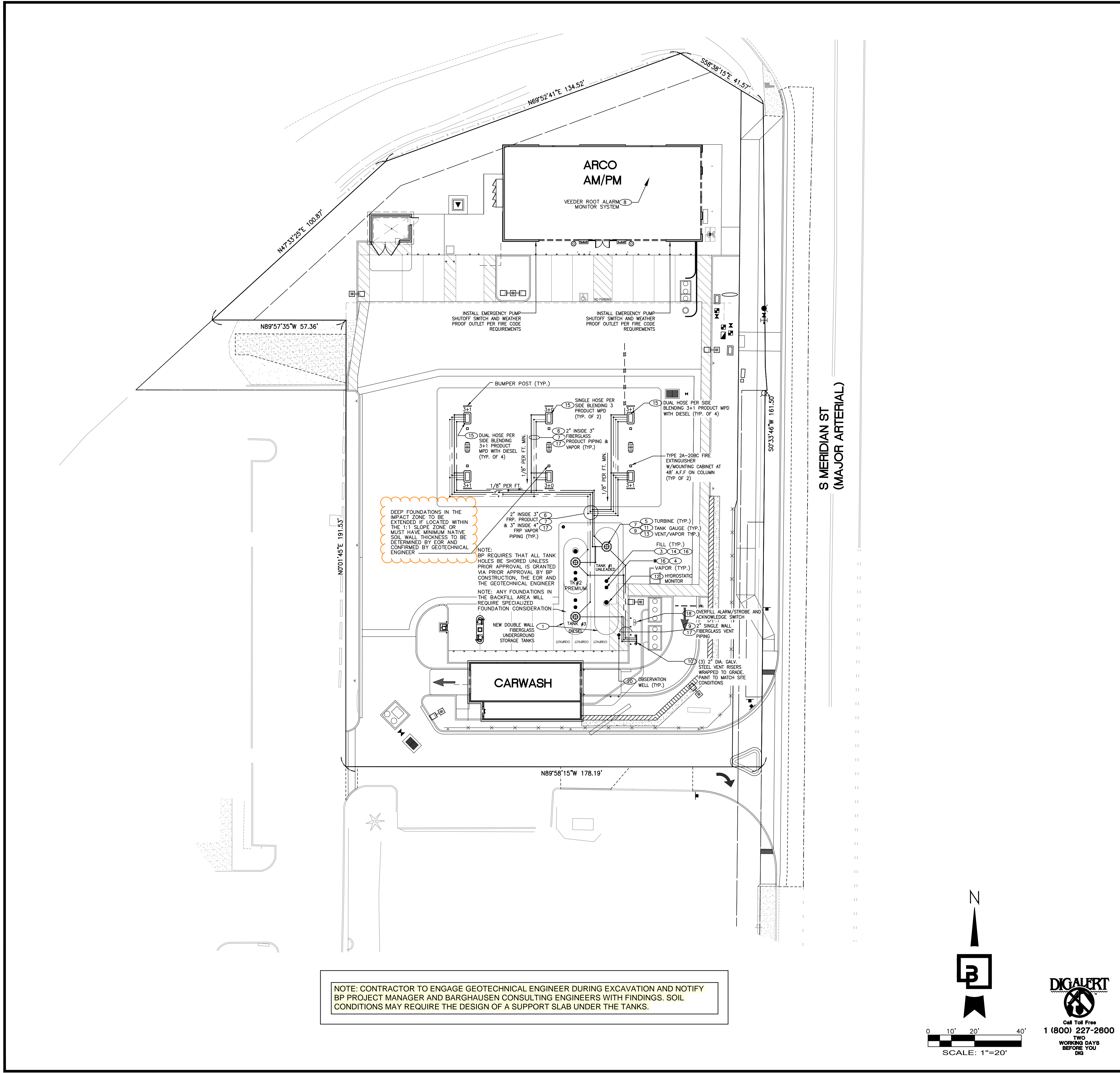
SITE ADDRESS:  
**SWC S MERIDIAN**  
**@ HIGHWAY 512**  
**PUYALLUP, WASHINGTON**

**FACILITY #TBD**

DESIGNED BY: NP/RF	ALLIANCE ZADN:
CHECKED BY: OV	BP REPM:
DRAWN BY: NP/RF	ALLIANCE PM:
VERSION: V-15.0	PROJECT NO. 21730
01/01/2023	

DRAWING TITLE:  
**TITLE SHEET & DRAWING INDEX**

SHEET NO:  
**G.0.0**



- PIPING LEGEND
- FIBERGLASS PRODUCT PIPING
  - FIBERGLASS VAPOR RECOVERY PIPING
  - FIBERGLASS VENT PIPING

NOTE:  
CONTRACTOR ASSUMES RESPONSIBILITY TO ASSURE THAT THE OPERABLE SYSTEM MEETS THE DESIGN INTENT AND THE CONTRACTOR IS PERMITTED TO ADJUST PIPING LOCATIONS BASED ON ACTUAL FIELD CONDITIONS AND INSTALLATION TECHNIQUES.

- PRODUCT, VAPOR AND VENT PIPING IS TO SLOPE TOWARD TANK 1/8" PER FOOT MINIMUM, 1/4" PER FOOT PREFERRED. IF INSTALLED, SIPHON PIPING TO SLOPE 1/4" PER FOOT.
- SECONDARY CONTAINMENT PIPING IS SHOWN BY NOTE ONLY, NOT GRAPHICALLY. ALL PRODUCT PIPING TO BE DOUBLE CONTAINMENT PIPE. VENT AND VAPOR RECOVERY SHALL BE SINGLE WALL.

GENERAL NOTES

- INSTALL (1) 25K REGULAR UNLEADED, ONE (1) 12K/10K PREMIUM UNLEADED/DIESEL DUAL COMPARTMENT "CONTAINMENT SOLUTIONS" DOUBLE WALL FIBERGLASS TANKS WITH CONTINUOUS MONITORING OF HYDROSTATIC ANNULAR SPACES BY "VEEDER ROOT" TLS-450 PLUS TANK AND PIPING MONITORING ALARM SYSTEM. ALL TANK Sumps SHALL BE INDIVIDUALLY CONTINUOUSLY MONITORED BY "VEEDER ROOT" LIQUID SENSORS TIED INTO THE TLS-450 PLUS TANK & PIPING MONITOR SYSTEM. TANKS TO BE SET MIN. 2" BELOW FINISH GRADE. CONTRACTOR TO FOLLOW THE DEPTH AND BACKFILL REQUIREMENTS OF THE GEOTECHNICAL ENGINEER ALONG WITH THE REQUIREMENTS IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- INSTALL A CONCRETE SLAB OVER TANKS. SURFACE WATER SHALL BE DIVERTED AWAY FROM EACH MANHOLE BY FORMING A CONCRETE CROWN WITH A 1-1/2" DROP IN 18" FROM THE EDGE OF THE MANHOLE RING TO THE SURROUNDING SLAB ELEVATION. CONSTRUCT SLAB PER CIVIL SLAB INSTALLATION DETAILS AND SPECIAL REQUIREMENTS SHOWN ON DETAILS.
- INSTALL DIRECT BURY FILL SPILL BUCKET 5 GALLON WITH ADAPTERS AND CAPS.
- INSTALL DIRECT BURY VAPOR SPILL BUCKET 5 GALLON WITH ADAPTERS AND CAPS.
- INSTALL ONE (1) 2HP VARIABLE SPEED TURBINES IN UNLEADED TANK, ONE (1) 2HP IN PREMIUM TANK & ONE (1) 2HP IN DIESEL TANK. TURBINE SYSTEMS TO BE EQUIPPED WITH 3 GPH ELECTRONIC LINE LEAK DETECTION. LEAK DETECTORS ARE TO BE TESTED FOR THE 3 GPH LEAK DETECTION PRIOR TO START UP. CONTRACTOR TO PROVIDE TEST DATA AT THE TIME OF PUNCH LIST AS WELL AS INCLUDE IN CLOSE OUT BINDER. SET TURBINE INTAKES AT 5" FROM BOTTOM OF TANKS. TURBINES TO BE EQUIPPED WITH INTAKE FILTER SCREENS. CONTRACTOR TO FOLLOW THE DEPTH AND BACKFILL REQUIREMENTS OF THE GEOTECHNICAL ENGINEER ALONG WITH THE REQUIREMENTS IN THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- INSTALL 2" INSIDE 3" DOUBLE WALL FIBERGLAS PRODUCT SUPPLY LINES TO DISPENSERS. PIPING SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS. PIPING SHALL BE INSTALLED WITH A MINIMUM SLOPE OF 1/8" PER FOOT FROM THE FURTHEST DISPENSER SUMP DOWN TO THE TURBINE Sumps. CONTRACTOR TO INSTALL TRACER TAPE WITH PRODUCT PIPING. TESTING OF PRODUCT LINES SHALL BE PERFORMED PRIOR TO BACKFILL, PRIOR TO PAVING AND BEFORE STATION OPERATION.
- INSTALL 3" FIBERGLASS STAGE II VAPOR RECOVERY HEADER FOR VAPOR RECOVERY SYSTEM. SLOPE 1/8" PER FOOT MINIMUM TO TANKS. INSTALL 3" TO 2" REDUCING TEES TO DISPENSERS. CONTRACTOR TO INSTALL TRACER TAPE WITH VAPOR PIPING. TESTING OF VAPOR LINES SHALL BE PERFORMED PRIOR TO BACKFILL, PRIOR TO PAVING AND BEFORE STATION OPERATION. VERIFY LOCAL REGULATIONS FOR ADDITIONAL EQUIPMENT OR INSTALLATION ONLY. SEE DETAILS AND SCOPE OF WORK ON SHEETS G.O.2.1 & G.O.2.2 FOR PIPE SIZING AT UNDERGROUND STORAGE TANKS.
- INSTALL "VEEDER ROOT" TANK AND LINE ALARM CONTROL PANEL MODEL # TLS-450PLUS IN BUILDING AT NORMALLY OCCUPIED LOCATION IN FRP. SEE ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR EXACT LOCATION.
- INSTALL A SINGLE 2" FRP VENT LINE FOR EACH UNDERGROUND STORAGE TANK. SLOPE 1/4" PER FOOT (1/8" PER FOOT MINIMUM) TO TANKS AS SHOWN. CONTRACTOR TO INSTALL TRACER TAPE WITH VENT PIPING.
- TERMINATION POINT OF TANK VENTS TO BE A MINIMUM OF 12' ABOVE GRADE AND NOT WITHIN 5' FROM ANY BUILDING OPENING OR PROPERTY LINE THAT CAN BE BUILT UPON. VENT RISERS SHALL BE INSTALLED IN ACCORDANCE WITH UNIFORM FIRE CODE REQUIREMENTS. VERIFY LOCAL REGULATIONS FOR ADDITIONAL EQUIPMENT OR INSTALLATION REQUIREMENTS.
- INSTALL A SINGLE 1" RIGID GALVANIZED CONDUIT FOR EACH NEWLY INSTALLED TURBINE PUMP.
- INSTALL DUAL FLOAT TANK ANNULAR SPACE HYDROSTATIC MONITORING SENSORS. SEE DETAILS FOR CONDUIT LOOPING.
- INSTALL .1 GPM MAG PROBE TANK LEVEL GAUGES AT TURBINE SUMP AS SHOWN.
- TANKS SHALL BE PROPERLY MARKED AND TAGGED WITH STANDARD API IDENTIFICATION MARKINGS AT FILL MANHOLES.
- INSTALL (4) FOUR WAYNE OVATION SERIES 3+1 & (2) TWO 3+0 DISPENSERS TO BE FITTED WITH STAGE II HOSES, NOZZLES AND BREAKAWAY VALVES PER LOCAL REQUIREMENTS. CONTRACTOR IS RESPONSIBLE FOR INSTALLING HOSES, NOZZLES AND BREAKAWAYS. INSTALL DISPENSER CONTAINMENT INCLUDING SHUT OFF VALVES AND MONITORING SENSORS. START UP BY MANUFACTURER REPRESENTATIVE. GENERAL CONTRACTOR TO PURGE LINES WITH A MINIMUM OF 200 GALLONS THROUGH EACH HOSE/NOZZLE. ANY AIR POCKETS OR PARTIAL PURGE INSTALLATION OR INCORRECT WIRING THAT DESTROYS ELECTRONICS WILL BE BILLED BACK TO THE CONTRACTOR. AFTER PURGING THE PRODUCT LINES OF AIR AND BEFORE VAPOR RECOVERY TESTING, CONTRACTOR IS TO REPLACE THE FACTORY INSTALLED GASOLINE FILTERS WITH NEW FILTERS.
- FILL AND STAGE I VAPOR RECOVERY RISERS & ANNULAR RISER SHALL BE GROUNDED TO PREVENT STATIC DISCHARGE DURING FILLING OPERATIONS. SEE DWS, G.O.2.1 STANDARD DETAILS.
- ALL NEW PIPING AND TANKS TO BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS.
- INSTALL OVERFILL ALARM & ACKNOWLEDGMENT SWITCH, AND ESD IN LOCATION SHOWN. ALARM AND SWITCH TO BE LOCATED TO PROVIDE AN UNOBSTRUCTED VIEW TO TRUCK DRIVER. PROVIDE BOLLARD PROTECTION OF FREE STANDING POLE. SEE WIRING DIAGRAM AND DETAIL FOR MOUNTING REQUIREMENTS.
- FINAL FACILITY EQUIPMENT LOCATIONS TO BE APPROVED BY DISTRIBUTION TERMINAL MANAGER PRIOR TO SUBMITTAL FOR PERMITS TO ENSURE CLEAR AND SAFE ACCESS TO THE UNDERGROUND TANKS FOR UNLOADING OPERATIONS.
- INSTALL (2) TWO OBSERVATION WELL.

GENERAL COMPLIANCE NOTES

- ARCHITECTURAL AND CIVIL DRAWINGS SHALL TAKE PRECEDENCE FOR REFERENCING ALL DIMENSIONS, PROPERTY LINES, ELEVATIONS AND EQUIPMENT LOCATIONS.
- ALL DIMENSIONS AND CONDITIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BEFORE STARTING ANY WORK. ANY DISCREPANCY SHALL BE CALLED TO THE ATTENTION OF THE OWNERS ENGINEER FOR HIS DECISION BEFORE PROCEEDING WITH THE WORK.
- GENERAL CONTRACTOR SHALL OBTAIN NECESSARY PERMIT FROM APPLICABLE AGENCIES FOR EXCAVATIONS OF TRENCHES 5'-0" OR MORE IN DEPTH INTO WHICH A PERSON IS REQUIRED TO DESCEND.
- AN UNAUTHORIZED RELEASE RESPONSE PLAN MUST BE SUBMITTED AND APPROVED BY GOVERNING AGENCY PRIOR TO TANK OPERATIONS.
- ALL MATERIALS SHALL BE COMPATIBLE WITH USE FOR THE INTENDED PURPOSE AS PER NATIONALLY RECOGNIZED CODES, LOCAL CODES AND GOVERNING AUTHORITIES.
- THE UNDERGROUND STORAGE TANK SYSTEM SHALL BE COMPATIBLE WITH THE PRODUCT STORED.
- ALL MONITORING DEVICES SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
- GENERAL CONTRACTOR IS REQUIRED TO PROVIDE 72 HOUR (TYPICAL) NOTIFICATION TO GOVERNING AGENCY PRIOR TO TANK INSTALLATION.
- TANK AND PIPING SYSTEM TO BE INSPECTED BY OWNER'S THIRD PARTY INSPECTOR & GOVERNING AGENCY AT FOUR (4) SEPARATE CONSTRUCTION PHASES (SEE SPECIFICATIONS):
  - TANK AIR TEST BEFORE SETTING IN HOLE AND SOAP TEST.
  - TANKS AND PRIMARY PIPING HYDROSTATICALLY OR PNEUMATICALLY TESTED FOR 30 MINUTES.
  - INSPECTION OF ALL SECONDARY CONTAINMENT, INCLUDING TESTING, IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES.
  - FINAL INSPECTION INCLUDING ALL PORTIONS OF THE LEAK DETECTION SYSTEM.
- ALL TANK Sumps AND UNDER DISPENSER CONTAINMENT Sumps SHALL BE HYDROSTATICALLY TESTED (LAKE TEST) WITH STANDING WATER TO TOP OF REDUCING COLLAR FOR A PERIOD OF 24 HOURS TO INSURE THAT THE Sumps ARE WATERTIGHT. RECORD THE TEST RESULTS AND SUBMIT TO OWNER.
- TANK SYSTEM, LEAK DETECTORS AND MONITORING SYSTEM INTEGRITY TESTS FORWARDED AND APPROVED BY GOVERNING AGENCY PRIOR TO TANK SYSTEM BEING PLACED IN OPERATION.
- PRIOR TO FUEL BEING PUMPED, STATION MUST HAVE VEEDER ROOT FUNCTIONAL AND MONITORING ANNULAR SPACES OF TANK AND DISPENSER Sumps.
- PAYMENT OF ALL APPLICABLE UST OPERATING FEES SHALL BE SUBMITTED TO THE GOVERNING JURISDICTION WITHIN 30 DAYS OF THE FINAL INSPECTION.
- EVIDENCE OF FINANCIAL RESPONSIBILITY SHALL BE SUBMITTED TO GOVERNING AGENCY (BY BP).
- MEASUREMENTS OF BRINE LEVELS IN TANKS SHALL BE TAKEN BY BP REPRESENTATIVE DURING THREE SEPARATE VISITS TO SITE AND PRIOR TO FUELING OPERATIONS. REFER TO TANK MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR REQUIREMENTS.

UTILITY CONFLICT NOTE:

CAUTION:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POT HOLEING THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE @ 1 (800) 227-2600 AND THEN POT HOLEING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT THE OWNERS CIVIL ENGINEER TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

CAUTION:

POTENTIAL UTILITY CONFLICT. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND NEW UTILITIES PRIOR TO CONSTRUCTION. SEE UTILITY CONFLICT NOTE. THE EXISTING WATER, STORM, AND SANITARY SEWER SERVICE SHOWN IS APPROXIMATE, BASED ON FIELD SURVEYS AND "AS-BUILT" RECORDS. THE GENERAL CONTRACTOR SHALL "POTHOLE" THE EXISTING UTILITIES TO VERIFY THE DIAMETER AND LOCATION (INCL. ELEVATIONS) PRIOR TO CONSTRUCTION. ANY DISCREPANCIES IN THE LOCATION OF THE EXISTING PIPE OR INCOMPATIBILITY OF THE DESIGN SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNERS REPRESENTATIVE, AND OWNERS CIVIL ENGINEER.

TANK EXCAVATION NOTE:

TANK EXCAVATIONS SHALL BE PER OSHA REQUIREMENTS AND BE PERFORMED FOLLOWING THE RECOMMENDATIONS OF THE SOILS REPORT. TANKS EXCAVATIONS THAT REQUIRE SHORING SHALL BE ENGINEERED AND PERMITTED SEPARATELY AND SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR. HIGH WATER TABLE IS ANTICIPATED. CONTRACTOR TO SHORE AND DEWATER TANK HOLE EXCAVATION. FOLLOW TANK MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR WET HOLE TANK INSTALLATION.

DEWATERING NOTE

THE GENERAL CONTRACTOR SHALL REVIEW PLANS, NOTES, AND GEOTECHNICAL ENGINEER RECOMMENDATIONS FOR IF DEWATERING MEASURES REQUIRED FOR EXCAVATIONS. COSTS FOR PROVIDING AND IMPLEMENTING THESE MEASURES ON THIS PROJECT SHALL BE SPECIFICALLY INCLUDED IN THE CONTRACTOR'S BID PROPOSALS.

GEOTECHNICAL ENGINEER:

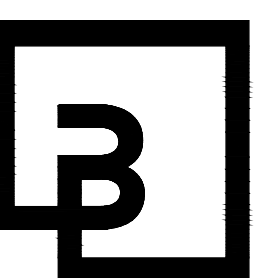
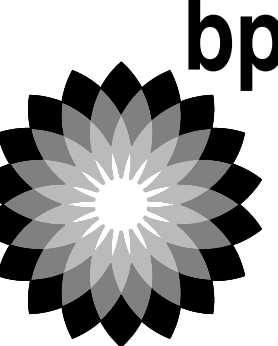
KRAZAN & ASSOCIATES, INC.  
825 CENTER STREET, STE A  
TACOMA, WASHINGTON 98409  
PHONE: (253) 939-2500  
CONTACT: THERESA R. NUNAN

GROUND WATER LEVEL NOTE:

A SOILS REPORT OF THIS SITE LOCATION HAS REVEALED THAT GROUNDWATER WAS ENCOUNTERED BETWEEN 1.2 AND 3.7 FEET BELOW THE GROUND SURFACE WITH A MAXIMUM EXPOSURE OF 2.1 FEET. TANKS SHALL BE INSTALLED WITH A MINIMUM OF 2 FEET BELOW FINISH GRADE. CONTRACTOR TO PROVIDE DEADMAN AND FILTER FABRIC PER ISSUED PERMITS GUIDELINES.



CLIENT:



**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
1	10/04/23	PERMIT RELEASE
2	01/22/24	PERMIT RELEASE
3		
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11		
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SEAL:



PRFI20240124

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
**3400 am/pm**  
**FUEL CANOPY w/ 6 MPD's**

SITE ADDRESS:  
**SWC S MERIDIAN**  
**@ HIGHWAY 512**  
**PUTALLUP, WASHINGTON**

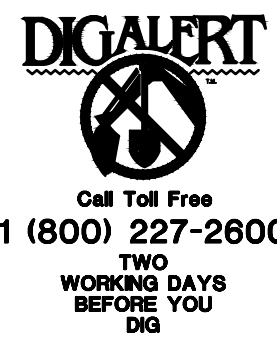
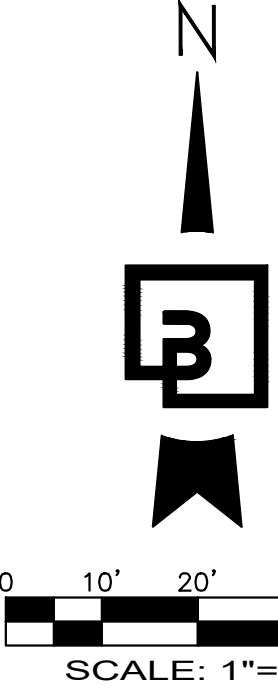
**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZONE:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

DRAWING TITLE:  
**UNDERGROUND TANK AND PIPING**  
**SITE PLAN**  
**AND INSTALLATION NOTES**

SHEET NO:

**G.O.2.0**



# TANK AND PIPING INSTALLATION SCOPE OF WORK:

## GENERAL:

SCOPE OF WORK: UNLESS SPECIFIED OTHERWISE ON THESE DRAWINGS, THE GENERAL CONTRACTOR SHALL FURNISH ALL WORK AND MATERIALS TO COMPLETE THE INSTALLATION OF THE SYSTEMS AND EQUIPMENT SHOWN IN THESE DRAWINGS AND AS REQUIRED BY PROJECT DOCUMENTS PROVIDED TO THE CONTRACTOR.

WHERE THESE DRAWINGS DIFFER FROM LOCAL REGULATIONS, LOCAL REGULATIONS WILL SUPERSEDE THESE DRAWINGS IF THEY ARE MORE STRINGENT.

## NOTE:

THESE GUIDELINES APPLY ONLY TO UNDERGROUND STORAGE TANKS AND PRODUCT PIPING. REFER TO BALANCE OF SITE SPECIFIC DOCUMENTS/ DRAWINGS FOR SPECIFICATIONS REGARDING CONCRETE/ASPHALT INSTALLATION, ELECTRICAL REQUIREMENTS, AND SANITARY & STORM SEWERS INSTALLATION.

ARCHITECTURAL AND CIVIL DRAWINGS SHALL TAKE PRECEDENCE FOR REFERENCING ALL DIMENSIONS, PROPERTY LINES, ELEVATIONS AND EQUIPMENT LOCATIONS.

ALL DIMENSIONS AND CONDITIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BEFORE STARTING ANY WORK. ANY DISCREPANCY SHALL BE CALLED TO THE ATTENTION OF THE OWNERS ENGINEER FOR HIS DECISION BEFORE PROCEEDING WITH THE WORK.

ALL REQUESTS TO ADD, DELETE, OR SUBSTITUTE MATERIAL AND EQUIPMENT SHOWN ON THESE DRAWINGS MUST BE REVIEWED AND APPROVED BY THE OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER, IN CHARGE OF THE PROJECT. ALL CHANGES MUST BE REVIEWED WITH THE MARKETING FUELS MANAGER.

THE CONTRACTOR IS REQUIRED TO FURNISH AS-BUILT DRAWINGS TO LOCATE TANKS AND PIPING AS INSTALLED AFTER THE COMPLETION OF THE PROJECT.

## (1) TANK INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL DOUBLE WALL FIBERGLASS TANKS WITH COMPLETE "VEEDER ROOT PANEL" TANK AND PIPING MONITORING AND ALARM SYSTEM. TANKS TO BE SET MIN. 60" BELOW FINISH GRADE. SEE SITE SPECIFIC INSTALLATION DETAILS FOR TANK SIZES AND LOCATIONS.

## TANK SIZING GUIDELINES:

SPECIFIC BUSINESS UNIT TANK SIZE REQUIREMENTS ARE RECOMMENDED. TANK SIZING MODELS CAN BE RUN BY CONTACTING FUEL SYSTEM DESIGN MANAGER - AMERICAS.

LOCATION OF TANKS AND ASSOCIATED EQUIPMENT ON PROPERTY: FINAL FACILITY EQUIPMENT LOCATIONS INCLUDING PLACEMENT AND ORIENTATION OF TANKS, EMERGENCY SHUTOFF SWITCHES, OVERFILL ALARMS (IF PRESENT) TO BE APPROVED BY BP DISTRIBUTION PRIOR TO SUBMITTAL FOR PERMITS TO ENSURE CLEAR AND SAFE ACCESS TO THE UNDERGROUND TANKS FOR UNLOADING OPERATIONS. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR CONFIRMING APPROVED TANK AND EQUIPMENT LOCATIONS HAS BEEN DOCUMENTED W/ BP DISTRIBUTION, THE SITE ENGINEER AND/OR OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.

"TANK EXCLUSION ZONE NOTE" THE UST STRUCTURAL EXCLUSION ZONE SHALL BE ESTABLISHED AS 16'-0" AS MEASURED FROM THE EXTERIOR FACE OF ANY UNDERGROUND STORAGE TANKS LOCATED WITHIN THE SITE PLAN. THE PURPOSE OF THIS ZONE IS TO ACT AS AN ENGINEERING BARRIER TO PREVENT THE RISK OF DAMAGE TO OUR UST'S FROM STRUCTURAL ELEMENTS THAT ARE TOO CLOSE TO THE EXCAVATION WALLS, RESULTING IN LATERAL INSTABILITY AND TRANSFER OF LOADS INTO THE TANK HOLE AND POTENTIALLY DAMAGING OUR TANKS

## TANKS:

SHALL BE UNDERWRITERS LABORATORY APPROVED LISTED FOR THE UNDERGROUND STORAGE OF ALL FLAMMABLE AND COMBUSTIBLE MOTOR FUELS AS CALLED FOR ON THE SITE SPECIFIC DRAWING OR AS DESIGNATED ON THE SUPPLEMENTAL CONDITIONS AND SHALL BE DOUBLE WALL WITH FIBERGLASS REINFORCED PLASTIC (FRP). INSTALLATION OF TANKS AND PIPING SHALL BE IN ACCORDANCE WITH U.L. LISTED MANUFACTURER'S INSTRUCTIONS. INSTALLATION SHALL CONFORM TO NFPA-30/30A AND ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. TANKS SHALL ONLY BE INSTALLED BY QUALIFIED INSTALLERS CERTIFIED BY THE STATE IN WHICH THE TANKS ARE TO BE INSTALLED AND BY THE TANK MANUFACTURER.

THE UNDERGROUND STORAGE TANK SYSTEM SHALL BE COMPATIBLE WITH THE PRODUCT STORED. ALL CONTINUOUS MONITORING DEVICES SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

ALL MATERIALS USED IN THE INSTALLATION SHALL BE COMPATIBLE WITH USE FOR THE INTENDED PURPOSE AS PER NATIONALLY RECOGNIZED CODES, LOCAL CODES AND GOVERNING AUTHORITIES.

METHANOL COMPATIBILITY: FOR ALL METHANOL COMPATIBLE STORAGE SYSTEMS, ALL READILY ACCESSIBLE COMPONENTS SHALL BE METHANOL COMPATIBLE FOR THE IMMEDIATE INTENDED SERVICE.

BIO-DIESEL COMPATIBILITY: CURRENTLY AT THIS TIME, NO TANKS ARE LISTED FOR BIO-DIESEL SERVICE APPLICATIONS.

## INITIAL TANK TESTING:

NEW TANKS SHALL BE INSPECTED UPON ARRIVAL AT SITE, AFTER UNLOADING FROM THE TRUCK, FOR VISUAL DAMAGE PRIOR TO INSTALLATION.

- FOR DRY ANNULAR SPACE TANKS AIR/SOAP TESTS MUST BE PERFORMED AT THE JOB SITE PRIOR TO INSTALLATION TO VERIFY THE ABSENCE OF DAMAGE.
- FOR LIQUID FILLED ANNULAR SPACE TANKS - AIR/SOAP TESTS ON ACCESSORIES AND FITTINGS CAN BE PERFORMED AFTER THE TANK IS IN THE EXCAVATION BEFORE OR AFTER BACKFILLING.

CONTRACTOR SHALL COMPLETE ALL TESTING ACCORDING TO MANUFACTURER'S INSTRUCTIONS FOR THE TANKS. CONTRACTOR SHALL COMPLETE ALL WARRANTY VALIDATION TESTING AND PROVIDE DOCUMENTATION TO OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER.

HYDROSTATICALLY MONITORED DOUBLE WALL TANKS SHALL BE TESTED ACCORDING TO MANUFACTURER'S INSTRUCTIONS BY:

- INSPECT AND ADJUST RESERVOIR LEVEL OF THE MONITORING FLUID (TO COVER THE RISE INSIDE THE RESERVOIR).
- REMOVE ENOUGH TANK FITTING PLUGS TO SEE INSIDE THE PRIMARY TANK. VISUALLY INSPECT THE TANK INTERIOR FOR COLORED MONITORING FLUID TRACES.
- CONNECT TANK TEST MANIFOLD AND PRESSURIZE THE PRIMARY TANK TO 5 PSIG MAX. (3 PSIG MAX. FOR 12' TANKS). MONITOR THE PRESSURE FOR 30 MINUTES FOR ANY LOSS IN PRESSURE THAT MAY INDICATE A LEAK.
- DO NOT PRESSURIZE THE ANNULAR SPACE. DOING SO MAY DAMAGE THE PRIMARY TANK OR CAUSE TANK FAILURE.
- WHILE UNDER PRESSURE, COVER FITTINGS AND MANWAY(S) WITH SOAP SOLUTION AND INSPECT.
- AFTER COMPLETING AIR TEST, RELEASE PRESSURE; REMOVE ALL GAUGES, VALVES, AND HOSE ASSEMBLIES; REPLACE AND TIGHTEN FITTING PLUGS; AND REPLACE THE PLASTIC VENT PLUG IN THE OPEN FITTINGS.

\*\*\*NOTE\*\*\* HYDROSTATIC FLUID RESERVOIR LEVEL MUST BE RECHECKED TO VERIFY TANK INTEGRITY PRIOR TO INTRODUCING BALLAST INTO TANKS.

**FIELD REPAIR OF TANKS:** IT IS ALLOWABLE TO FIELD REPAIR DAMAGED TANKS AFTER APPROVAL BY BP FIELD ENGINEER. ALL TANKS DAMAGED IN TRANSPORT OR OFF LOADING OPERATIONS SHALL BE FIELD REPAIRED BY A TANK MANUFACTURER'S CERTIFIED FIELD SERVICE REPRESENTATIVE. TANK MANUFACTURER SHALL RE-CERTIFY REPAIRED TANKS FOR USE. ALL FIELD SERVICE WORK SHALL BE DOCUMENTED. COPIES OF ANY AND ALL FIELD SERVICE DOCUMENTATION SHALL BE PLACED IN THE PROJECT FILE AND INTO OWNERS OPERATING FILE.

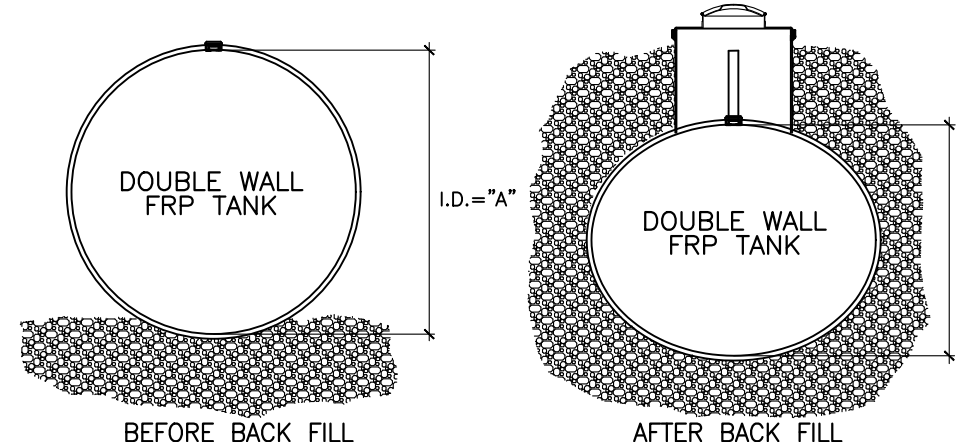
## TANK MEASUREMENTS:

THE GENERAL CONTRACTOR IS RESPONSIBLE FOR THE COMPLETION OF THE FOLLOWING TANK MEASUREMENT ACTIVITIES:

- VERIFY THE EXTERNAL SIZE OF THE TANK TO MATCH WITH MANUFACTURER SUPPLIED SHOP MEASUREMENTS.
- TRANSFER THE SIZE, SERIAL NUMBER, AND PRODUCT INSTALLED, AND POSITION OF TANK TO THE AS-BUILT PLAN.
- TRANSFER TANK DIMENSIONAL AND PRODUCT INFORMATION TO THE DATA SHEET IN THE TANK GAUGE CONSOLE.
- PROVIDE THE TOP OF TANK ELEVATION READING AT BOTH ENDS OF EACH TANK.

## TANK DEFLECTION MEASUREMENT PROCEDURE:

DEFLECTION MEASUREMENT BEFORE AND AFTER TANK INSTALLATION SHALL BE ACCORDING TO MANUFACTURER'S REQUIREMENTS AND SHALL BE WITHIN MANUFACTURER'S TOLERANCES. ALL INFORMATION SHALL BE COMPLETED AS PER THE MANUFACTURER'S WARRANTY DOCUMENTATION.



## TANK INSPECTION AND INSTALLATION - DEFLECTION MEASUREMENT

### DIPSTICK PREPARATION

DRIVE A SMALL HEADED, NON-SPARKING (E.G. BRASS) NAIL HALFWAY INTO A WOODEN DIPSTICK, 1 INCH ABOVE ITS BASE.

### FIRST DIAMETER READING (PRIOR TO BACK FILL)

- PLACE THE DIPSTICK INTO A SERVICE FITTING.
- MEASURE AND RECORD THE DISTANCE FROM THE TANK BOTTOM TO THE TOP OF THE FITTING.
- PULL THE DIPSTICK UP UNTIL THE EXPOSED NAIL CATCHES ON THE INSIDE TOP OF TANK.
- MEASURE THE DISTANCE FROM THE TANK TOP (INSIDE) TO THE TOP OF THE FITTING. SUBTRACT 1 INCH FROM THIS MEASUREMENT AND RECORD THE DISTANCE.
- SUBTRACT THE SECOND DISTANCE FROM THE FIRST AND RECORD THIS VALUE AS READING "A" ON THE INSTALLATION CHECKLIST.

### SECOND DIAMETER READING (AFTER BACKFILL)

- PLACE THE DIPSTICK INTO A SERVICE FITTING WITH A STANDPIPE INSTALLED TO SUBGRADE.
- MEASURE AND RECORD THE DISTANCE FROM THE TANK BOTTOM TO THE TOP OF THE STANDPIPE.
- PULL THE DIPSTICK UP UNTIL THE EXPOSED NAIL CATCHES ON THE INSIDE TOP OF TANK.
- MEASURE THE DISTANCE FROM THE TANK TOP (INSIDE) TO THE TOP OF THE STANDPIPE. SUBTRACT 1 INCH FROM THIS MEASUREMENT AND RECORD THE DISTANCE.
- SUBTRACT THE SECOND DISTANCE FROM THE FIRST AND RECORD THIS VALUE AS READING "B" ON THE INSTALLATION CHECKLIST.

### CALCULATION AND COMPARISON

- SUBTRACT READING "B" FROM READING "A".
- COMPARE THIS VALUE TO THE TABLE OF MAXIMUM ALLOWABLE DEFLECTIONS SHOWN ON THE "INSTALLATION CHECKLIST".
- VERTICAL DEFLECTION IN EXCESS OF THESE VALUES INDICATES IMPROPER INSTALLATION AND Voids THE TANK WARRANTY.

MAXIMUM DEFLECTION FOR 8'-0" TANKS = 1-1/4"  
MAXIMUM DEFLECTION FOR 10'-0" TANKS = 1-1/2"

## TOP OF TANK ELEVATION:

CONTRACTOR TO CALCULATE TOP OF TANK ELEVATION. START WITH 18" MINIMUM DEPTH OF VAPOR RECOVERY LINE AT THE FARTHEST DISPENSER AND SLOPE 1/4" PER FOOT MAXIMUM TO 1/8" PER FOOT MINIMUM. ADD 12" AT THE TANK. ADD 13" (FOR 3" PIPE) OR 8" (FOR 2") FOR A CHANGE IN PIPING DIRECTION OTHER THAN 90 OR 45 DEGREES. SET TANKS 6" DEEPER THAN CALCULATED AS PRECAUTION. IN NO EVENT SHALL THE TANK BE BURIED LESS THAN 4'-0" BELOW FINISHED GRADE OR DEEPER THAN 7'-0" BELOW FINISHED GRADE. SEE MANUFACTURERS INSTALLATION INSTRUCTIONS FOR MINIMAL TANK BURY WHEN DEADMAN ANCHORING IS NOT PROVIDED. ANY VARIATIONS IN SLOPE FROM 1/4" PER FOOT SHALL BE REPORTED TO OWNER'S ENGINEER.

## TANK EXCAVATION:

CONTRACTOR TO EXCAVATE TANK HOLE. CONTRACTOR SHALL ADHERE TO O.S.H.A. STANDARDS ON EXCAVATIONS. CONTRACTOR MAY SELECT ANY OF THE RECOMMENDED PRACTICES FOR TANK EXCAVATION AND MUST PROVIDE ALL NECESSARY PROTECTIVE BARRICADES.

SLOPE SIDES OF TANK HOLE (USE OF SLOPING MUST BE RECEIVE PRIOR APPROVAL ON INDIVIDUAL SITE BASIC FROM "BP") OR USE SHORING FOR ALL TANK EXCAVATIONS IN ACCORDANCE WITH OSHA 1926 SUBPART P, OSHA STANDARDS - EXCAVATIONS; FINAL RULE OCTOBER 1, 1989. WHEN ENGINEERED SHORING IS REQUIRED DUE TO SITE CONDITIONS AN ENGINEERED SHORING PLAN UTILIZING INTERLOCKING STEEL SHEET PILING SHALL BE PROVIDED AND SHALL INCLUDE SUPPORTING ENGINEERING CALCULATIONS BY A STATE CERTIFIED ENGINEER AND SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.

GENERAL CONTRACTOR SHALL OBTAIN NECESSARY PERMIT FROM APPLICABLE AGENCIES FOR EXCAVATIONS OF TRENCHES 5'-0" OR MORE IN DEPTH INTO WHICH A PERSON IS REQUIRED TO DESCEND.

TANK EXCAVATIONS SHALL BE THE MINIMUM SIZE REQUIRED TO PROVIDE FOR BEDDING AND CLEARANCES INDICATED IN THESE DRAWINGS. TANK BURIAL DEPTH FIELD DETERMINED TO PROVIDE FOR 1/4" (1/8" PER FOOT MIN.) PER FOOT FOR STAGE II VAPOR RECOVERY PIPING & 1/8" MINIMUM PER FOOT FOR PRODUCT PIPING SLOPE BACK FROM DISPENSERS TO TANK.

## TANK STABILITY BUOYANCY CALCULATIONS:

TANK STABILITY SHALL BE RE-CHECKED AGAINST FLOATION BY INSTALLING CONTRACTOR. SEE BUOYANCY CALCULATIONS ON TANK DETAILING SHEETS.

## TANK ANCHORING:

CONTRACTOR TO INSTALL MANUFACTURER SUPPLIED TANK HOLD DOWN STRAPS & ANCHORS WHEN REQUIRED DUE TO HIGH WATER TABLE, LOCAL REGULATIONS, OR SPECIFIED BY SITE ENGINEER/DESIGNER AND/OR OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER. WHEN REQUIRED, THE ANCHORING SYSTEM SHALL BE IN COMPLIANCE WITH AUTHORITY HAVING JURISDICTION. ANCHOR & STRAPS TO BE INSTALLED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

\*\* ALTERNATE ANCHORING BY USE OF A CONCRETE ANCHORING SLAB IS PERMITTED. WHEN GROUNDWATER LEVEL IS ANTICIPATED TO BE WITHIN 5 FT. OF GRADE CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE FOR DIRECTION ON ANCHORING METHOD TO BE USED (DEADMAN OR ANCHORING SLAB) AND SUCH SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATION.

**FILTER FABRIC:** IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE FOR THE INSTALLATION OF FILTER FABRIC (DUPONT TYPAR OR MIRAFI 6900X ) WHICH IS REQUIRED FOR WET HOLE INSTALLATIONS IN UNSUITABLE SOILS. (NOTE: A WET HOLE/ UNSUITABLE AREA REQUIRING FILTER FABRIC: ANY TANK EXCAVATION IN WHICH THE AREA IS SUBJECT TO TIDAL INFLUENCES, OR AREAS SUBJECT TO FREQUENTLY CHANGING GROUND WATER LEVELS, OR WATER CONDITIONS WITH SILTY SOIL, OR MUCK, BOG, PEAT, SWAMP, LANDFILL TYPE AREAS OR ANY OTHER SITUATION WHERE THE SOIL IS INHERENTLY UNSTABLE, OR SOILS WITH LESS THAN 250 LBS./SQ. FT. COHESION, OR WITH ULTIMATE BEARING CAPACITY OF LESS THAN 500 LBS./SQ. FT., OR AT THE REQUEST OF THE TANK OWNER. ALL WET HOLE BALLAST INSTALLS (AS DESCRIBED IN SECTION BELOW) SHALL USE FILTER FABRIC.

FILTER FABRIC SHALL EXTEND 1 FOOT ABOVE MAX HIGH WATER TABLE AND SEAMS SHALL BE OVERLAPPED BY 1 FOOT. MATERIAL SHALL BE PINNED OR OTHERWISE SECURED ALLOW BACKFILL WITHOUT DISTURBANCE. USE OF PLASTIC, OR ANY OTHER MATERIAL THAT MAY TEAR, OR DEGRADE OVERTIME IS PROHIBITED.

## WET HOLE BALLAST METHOD:

WATER IS THE SUITABLE MEDIUM FOR BALLAST DURING WET HOLE TANK INSTALLATIONS. A PROPERLY INSTALLED 12 FOOT HIGH TEMPORARY VENT PIPE MUST BE INSTALLED BY THE CONTRACTOR. IF WATER IS USED TO BALLAST TANKS, THE WATER IS TO BE COMPLETELY PUMPED OUT & MOPPED DRY IN ORDER TO PROTECT FUEL INTEGRITY. CONTRACTOR IS REQUIRED TO COORDINATE BALLASTING OPERATIONS WITH OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER. IT IS THE INSTALLING CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE JURISDICTIONAL REQUIREMENTS AND ACCEPTANCE FOR BALLASTING THE TANKS AND TO PROVIDE FOR PROPER DISPOSAL OF THE BALLASTING MEDIUM UNDER THE REGULATIONS OF THE GOVERNING AUTHORITY.

## BACK FILL:

CONTRACTOR TO PROVIDE ALL BACK FILL REQUIRED FOR THE PROJECT SCOPE. PEA GRAVEL SHALL CONSIST OF NATURALLY ROUNDED AGGREGATE, MINIMUM 1/8" AND MAXIMUM 3/4" SIZE. FREE OF CLAY, SLAG, CINDERS, OR DEBRIS. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER AND OWNERS FIELD REPRESENTATIVE.

NO MORE THAN 5% (BY WEIGHT) MAY PASS THE #8 SIEVE FOR BACK FILLING NONMETALLIC TANKS WITH A 96% TO 98% FREE FALL COMPACTION. DRY PEA GRAVEL DENSITY MINIMUM OF 95 POUNDS PER CUBIC FOOT IS REQUIRED. SUPPLY QUARRY CERTIFICATION MEETING ASTM C-33, PARAGRAPH 9.1 REQUIREMENTS.

BACK FILLING OF TANK EXCAVATIONS SHALL BE PROVIDED IN LIFTS AS PER TANK MANUFACTURER'S INSTALLATION INSTRUCTIONS.

PRODUCT, VENT, AND VAPOR PIPING SHALL BE LAID AND CONTINUOUSLY SUPPORTED ON A 6" BED OF COMPACTED PEA GRAVEL. BLOCKS, PLANKS, OR OTHER DEBRIS SHALL NOT BE USED TO SUPPORT PIPING IN FINAL INSTALLATION.

NOTE: UNDER NO CIRCUMSTANCES SHALL DIRT, PAVING MATERIALS, WOOD, OR OTHER CONSTRUCTION DEBRIS BE ALLOWED TO REMAIN IN TANK AND PIPE EXCAVATIONS.

## (2) ANNULAR SPACE HYDROSTATIC MONITOR AND RISER INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL 4" FIBERGLASS RISER AND VEEDER ROOT HYDROSTATIC SENSOR AT TANK ANNULAR SPACE LOCATION NOTED ON THE PLANS PER MANUFACTURERS INSTRUCTIONS.

## (3) TANK SUMP INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL 42" OR 48" DIAMETER TURBINE SIDE FIBERGLASS POLYSIDED SUMPS ON TANKS PER MANUFACTURER'S INSTRUCTIONS. NOTE THAT THE ORIENTATION OF THE TANK SUMPS MUST BE CORRECT IN ORDER TO FACILITATE CORRECT PIPING INSTALLATION INTO THE SUMPS. SEE ACCOMPANYING DETAILS IN PLAN SET AND NOTE SIZES OF SUMPS PER PROJECT DEMOGRAPHICS.

NYC VARIANT: 42" DIAMETER TURBINE SUMPS ARE INSTALLED.

LONG ISLAND/NY VARIANT: ON TANKS INSTALLED IN LONG ISLAND, FILL SUMPS ARE REQUIRED. SEE ENCLOSED DRAWINGS FOR DETAILS

ARCO BRANDED VARIANT: 48" DIAMETER TURBINE SUMPS ARE INSTALLED.

CALIFORNIA VARIANT: 42" DIAMETER FILL SUMPS TO BE DOUBLE WALLED AND INSTALLED WITH CONTINUOUS HYDROSTATIC MONITORING DEVICE PER AB-2481 REQUIREMENTS.

## (4) TANK LEVEL GAUGE / OVERFLOW PROTECTION:

STANDARD: CONTRACTOR TO INSTALL VEEDER ROOT MAGNETOSTRICTIVE PROBE LEVEL GAUGE AT LOCATION NOTED ON PLANS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

OVERFLOW PROTECTION: UST OVERFLOW COMPLIANCE IS ACHIEVED BY USE OF OVERFLOW PREVENTION DROP TUBE FLAPPER VALVE SET AT 95% AND IS IN ACCORDANCE WITH FEDERAL AND STATE GUIDELINES FOR UST OVERFILL REQUIREMENTS.

AN OVERFILL ALARM AND ACKNOWLEDGE SWITCH TIED INTO THE VEEDER ROOT AUTOMATIC TANK GAUGE SYSTEM. THE MONITORING SYSTEM PROVIDES AN AUDIBLE AND VISUAL ALARM WHEN THE TANK(S) ARE FILLED TO THE 90% LEVEL.

## (5) FILL AND STAGE I VAPOR RECOVERY INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL 4" GALVANIZED FILL AND STAGE I VAPOR RECOVERY RISERS. CONTRACTOR TO INSTALL DROP TUBE ASSEMBLY. WITH OVERFILL PREVENTION DROP TUBE. CONTRACTOR TO INSTALL VENT AND STAGE II FLEX CONNECTORS AND FRP ADAPTERS. LOCATE AND CUT PENETRATIONS INTO SUMPS FOR THE ROUTING OF VENT AND STAGE II VAPOR PIPING INTO TURBINE SUMPS AND MAKE CONNECTIONS TO VENT AND VAPOR PIPING FIBERGLASS PIPING. CONTRACTOR TO INSTALL DOUBLE SIDED PENETRATION ENTRY BOOTS FOR ALL ENTRIES INTO SUMPS. CONTRACTOR TO INSTALL STATIC GROUNDING SYSTEM AT ALL FILL AND VAPOR RISERS PER INSTALLATION DETAILS SHOWN ON SHEET G.0.7.

CONTRACTOR TO INSTALL CARB APPROVED STAGE I MANHOLES WITH 5 GALLON SPILL COLLECTION BUCKETS. INSTALL PRODUCT AND FILL ADAPTERS AND CAPS. SEE ACCOMPANYING DETAILS IN SITE SPECIFIC PLAN SET FOR MANUFACTURER AND INSTALLATION REQUIREMENTS.

NYC VARIANT: CONTRACTOR TO PROVIDE THE INSTALLATIONS OF A SEPARATE UNOBSERVED VENT CONNECTION AT EACH TANK AT THE TURBINE SIDE OF THE TANK AS PER PLANS AND PER NYC CODE REQUIREMENTS. A 15 GALLON PRODUCT SPILL COLLECTION BUCKET IS REQUIRED BY NYC FIRE CODE. FILL SPILL BUCKETS MUST HAVE A NYC CERTIFICATE OF APPROVAL FROM FIRE DEPARTMENT.

## (6) TURBINE INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL FE PETRO IST 2 HP VARIABLE SPEED TURBINES AND PIPING CONNECTION VALVES AND FITTINGS IN TANK SUMPS AS SHOWN ON SITE SPECIFIC DETAIL DRAWINGS. ALL PRODUCT LINES TO TURBINES TO BE EQUIPPED WITH 3 GPH ELECTRONIC LINE LEAK DETECTION. LEAK DETECTORS ARE TO BE TESTED FOR THE 3 GPH LEAK DETECTION PRIOR TO START UP. CONTRACTOR TO PROVIDE TEST DATA AT THE TIME OF PUNCH LIST AS WELL AS INCLUDE IN CLOSE OUT BINDER. ALL TURBINES ARE EQUIPPED WITH STANDARD "R" CHECK VALVE AS A STANDARD FROM FACTORY. SET TURBINE INTAKES AT 5" FROM BOTTOM OF TANKS. TURBINES TO BE EQUIPPED WITH INTAKE FILTER SCREENS. CONTRACTOR TO INSTALL 1" RIGID STEEL CONDUITS FOR SUBMERSIBLE PUMP POWER. (ONE FOR EACH TURBINE). CONTRACTOR IS TO LABEL TURBINES AND CONTROLLERS AS TO WHICH PRODUCT THEY SERVE. GREEN CONTROLLER LIGHTS ARE TO GO OUT WHEN TURBINES ARE OFF OR LOSE POWER. IST PUMP CONTROLS ARE TIED TO VEEDER ROOT CONTROL PANEL. SEE APPROPRIATE TURBINE CONFIGURATION AND PROGRAMMING SHEETS.

SINGLE MASTER TURBINE CONFIGURATIONS - EQUIPPED AS NOTED ABOVE. SEE APPROPRIATE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

MASTER-SATELLITE TURBINE CONFIGURATIONS - EQUIPPED AS NOTED ABOVE EXCEPT: ONLY THE MASTER TURBINE SHALL HAVE THE PLLD LEAK DETECTOR INSTALLED. CONTRACTOR TO REMOVE THE STANDARD "R" CHECK VALVE OUT OF THE SATELLITE TURBINE. THE BALL VALVE ON MANIFOLD LINE BETWEEN TURBINES SHALL BE SET IN THE "OPEN" POSITION AND A SINGLE PLD PART #848-480-001 (TLS350) OR DPLD PART #859080-001 (TSL450) IS TO BE INSTALLED ON THE MASTER IST WITH AN FE. PETRO NON-VENTED PRECISION CHECK VALVE (PART #65 PS) INSTALLED ON THE SATELLITE IST PREVENTING BACKFILLING OF USTERS. SEE APPROPRIATE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

MASTER-MASTER TURBINE CONFIGURATIONS - EQUIPPED AS NOTED ABOVE EXCEPT: THE BALL VALVE ON MANIFOLD LINE BETWEEN TURBINES SHALL BE SET IN THE "CLOSED" POSITION DURING NORMAL OPERATION. SEPARATE LINES & (2) PLD PART #848-480-001 (TSL350) OR (2) DPLD PART #859080-001 (TSL450) SHALL BE INSTALLED. IN CASE OF FAILURE OF AN INDIVIDUAL IST, THE PRODUCT CROSS-OVER LINE CAN BE PLACED INTO OPERATION BY OPENING THE CROSS CONNECTING VALVE. THE FAILED IST MUST HAVE ITS PLD DISABLED & DISPENSER SIGNAL WIRES NEED TO BE MODIFIED FOR THIS TEMPORARY SET-UP. SEE APPROPRIATE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

ARCO LARGE SITE VARIANT - IF SITE HAS 9 OR MORE MPD'S, TWO (2) 2 HP VARIABLE SPEED TURBINES ARE TO BE INSTALLED IN THE PRIMARY ANNULAR UNLEADED TANK. THE REGULAR UNLEADED TURBINES SHALL BE SET UP AS "MASTER/SATELLITE/SATELLITE" AND THE CROSS CONNECTION MANIFOLD BETWEEN TANKS SHALL BE OPENED ALLOWING ALL THREE TURBINES TO SERVE THE ENTIRE SITE.

NYC VARIANT: MASTER-MASTER TURBINE CONFIGURATION W/ ROTATING STARTS - EQUIPPED AS NOTED ABOVE FOR MASTER-SATELLITE CONFIGURATION EXCEPT WITHOUT SIPHON LINE BETWEEN TANKS: THE UST PRODUCT LEVEL BALANCING IS ACHIEVED BY ROTATING THE STARTING OF INDIVIDUAL IST'S WITH CONTROL LOGIC LINKED TO THE VEEDER ROOT ATG. THE PRODUCT LINES ARE CONNECTED BY A CROSS OVER MANIFOLD BETWEEN TURBINES. ONE IST, THE MASTER, SHALL HAVE A PLD LEAK DETECTION DEVICE INSTALLED PLD's PART #848-480-001 (TSL350) OR (2) DPLD's PART #859080-001 (TSL450) AND THE SATELLITE SHALL HAVE AN FE PETRO NON-VENTED PRECISION CHECK VALVE (PART #65 PS) INSTALLED. THE BALL VALVE ON MANIFOLD LINE BETWEEN TURBINES SHALL BE SET IN THE "OPEN" POSITION DURING NORMAL OPERATION. IN CASE OF FAILURE OF AN INDIVIDUAL IST, NO ADJUSTMENT TO THE DISPENSER SIGNAL WIRES WILL BE REQUIRED AS THE IST CONTROLLERS WILL ACCOMMODATE THE IST STARTING VIA THE VEEDER ROOT ATG LINK. THE PRODUCT IN THE UST WITH THE FAILED IST WILL HAVE THE PRODUCT LEFT IN A STATIC STATE AND NOT AVAILABLE FOR DISPENSING UNTIL A REPAIR IS MADE. SEE APPROPRIATE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

## (7) SIPHON LINE INSTALLATION:

STANDARD: WHEN SITE SPECIFIC TANK CONFIGURATION SHOWS MULTIPLE TANKS FOR IDENTICAL PRODUCTS, CONTRACTOR TO INSTALL 4" OVER 3" DOUBLE WALL FIBERGLASS SIPHON LINES AND PIPING CONNECTION VALVES AND FITTINGS BETWEEN TANKS. INSTALL SIPHON PIPING AS LOW AS POSSIBLE IN SUMP. NOTE LIMITATION ON MAXIMUM SIPHON PIPING SYSTEM HEIGHT ON DETAILS. ADJUST HEIGHT DOWN FOR SMALLER DIAMETER TANKS. CONTRACTOR TO INSTALL VEEDER ROOT SIPHON BREAK, IF APPROPRIATE FOR MARKET CONDITIONS. SEE APPROPRIATE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

NYC VARIANT: SIPHON PIPING IS NOT INSTALLED. SEE TURBINE INSTALLATION NOTE ABOVE. SEE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

ARCO BRANDED VARIANT: CONTRACTOR TO INSTALL 4" OVER 3" DOUBLE WALL FIBERGLASS SIPHON PIPING. SIPHON BREAK IS NOT INSTALLED. INSTALL SIPHON PIPING AS LOW AS POSSIBLE IN SUMP. NOTE LIMITATION ON MAXIMUM SIPHON PIPING SYSTEM HEIGHT ON DETAILS. ADJUST HEIGHT DOWN FOR SMALLER DIAMETER TANKS. SEE APPROPRIATE SITE SPECIFIC DRAWINGS FOR INSTALLATION DETAILS.

CALIFORNIA VARIANT: SIPHON PIPING TO BE INSTALLED WITH CONTINUOUS VACUUM MONITORING DEVICE PER AB-2481 REQUIREMENTS

## (8) PRODUCT PIPING INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL DOUBLE WALL FIBERGLASS PRODUCT PIPING, CONNECTORS, VALVES AND FITTINGS IN TANK AND DISPENSER SUMPS AS SHOWN ON SITE SPECIFIC DETAIL DRAWINGS TO SUPPLY DISPENSERS. PRODUCT PIPING TO BE N.O.V. RED THREAD IIA, 2" INSIDE 3" DIAMETER AS INDICATED ON SITE SPECIFIC FUELING PLAN. ALL PIPING AND FITTINGS SHALL BE UL-971 LISTED IN COMPLIANCE WITH THE JULY 2005 PERFORMANCE STANDARDS, AND SHALL BE COMPATIBLE WITH ETHANOL, INCLUDING BUT NOT LIMITED TO "E25/E20" (25% ETHANOL 75% GASOLINE). PRODUCTS LINES TO BE EQUIPPED 3 GPH PRESSURE LINE LEAK DETECTORS (PLLD) ON TURBINES AND WITH LIQUID LEAK MONITORING SENSORS LOCATED IN TURBINE PIPING SUMPS ATTACHED TO TANKS WIRED FOR TURBINE SHUT DOWN. PRODUCT PIPING IN TURBINE SUMPS, PRODUCT PIPING CROSS CONNECTION MANIFOLDS BETWEEN SUMPS AND SIPHON PIPING PENETRATIONS ARE TO ENTER THE SAME SIDE OF THE SUMP IF POSSIBLE. IF PRODUCT PENETRATION ENTERS ON BOTH SIDES OF SUMP DUE TO FIELD CONDITIONS, THEN DUAL SENSORS AT TURBINE SUMP MAY BE REQUIRED TO BE INSTALLED BY LOCAL REGULATIONS. IF THE BP PROJECT MANAGER DETERMINES THAT THE ALL THE PIPING ENTRIES NOTED ABOVE COULD HAVE BEEN MADE TO THE SAME SIDE OF THE SUMP, THEN ANY COSTS ASSOCIATED WITH EXTRA SENSORS SHALL BE BORNE BY THE INSTALLING CONTRACTOR. PIPING TO BE INSTALLED WITH A SLOPE OF 1/8" PER FOOT MINIMUM TO TANKS UNLESS APPROVED BY OWNER. CONTRACTOR TO INSTALL TRACER TAPE WITH PRODUCT PIPING PER TRENCHING DETAILS. PENETRATIONS INTO ALL SUMPS SHALL BE MADE WITH DOUBLE WALL FRP ENTRY FITTINGS. TESTING OF PRODUCT LINES SHALL BE PERFORMED PRIOR TO BACK FILL, PRIOR TO PAVING AND BEFORE STATION OPERATION. SEE SITE SPECIFIC DETAIL SHEETS FOR INSTALLATION DETAILS.

\*\*\*NOTE\*\*\* "FIBERCAST SYSTEMS" PIPING TO BE INSTALLED PER MANUFACTURER'S INSTALLATION MANUAL AND SHALL ONLY BE INSTALLED BY QUALIFIED INSTALLERS CERTIFIED BY THE MANUFACTURER.

CALIFORNIA VARIANT: IN ADDITION TO THE ABOVE, PIPING TO BE INSTALLED WITH CONTINUOUS VACUUM MONITORING DEVICE PER AB-2481 REQUIREMENTS

## (9) VENT PIPING INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL 2" INDIVIDUAL SINGLE WALL FIBERGLASS VENT PIPING, CONNECTORS, VALVES AND FITTINGS ON TANKS AS INDICATED ON SITE SPECIFIC FUELING PLAN AND ACCOMPANYING DETAILS. CONTRACTOR TO PROVIDE AT LEAST 4 FEET OF PIPING RUN BEFORE A CHANGE OF DIRECTION OF 30 DEGREES OR MORE IN ORDER TO PROVIDE MECHANICAL FLEXIBILITY PER CODE REQUIREMENTS. CONTRACTOR TO INSTALL TRACER TAPE WITH VENT PIPING PER TRENCHING DETAILS. PENETRATIONS INTO ALL SUMPS SHALL BE MADE WITH SINGLE WALL ENTRY FITTINGS. VENT PIPING SHALL BE DESIGNED AND INSTALLED FOR SLOPE 1/4" PER FOOT MINIMUM BACK TO TANKS. FOR LONG PIPING RUNS 1/8" PER FOOT IS ACCEPTABLE.

CONTRACTOR TO INSTALL ABOVE GROUND RISERS AND MOUNTING RACK AS DETAILED ON THESE PLANS. TERMINATION POINT OF TANK VENTS TO BE A MINIMUM OF 12' ABOVE GRADE AND NOT WITHIN 5' FROM ANY BUILDING OPENING OR PROPERTY LINE THAT CAN BE BUILT UPON. VENT RISERS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA-30, INTERNATIONAL AND UNIFORM FIRE CODE REQUIREMENTS AND CARB EVR REQUIREMENTS.

CONTRACTOR TESTING OF VENT LINES SHALL BE PERFORMED PRIOR TO BACK FILL, PRIOR TO PAVING AND BEFORE STATION OPERATION. SEE SITE SPECIFIC DETAIL SHEETS FOR INSTALLATION DETAILS. SEE FIBERGLASS PIPING MANUFACTURER SPECIFICATION BELOW.

## VENT PIPING SPECIFICATION:

FIBERCAST SYSTEMS: RED THREAD II PIPE AND FITTINGS (USED FOR SINGLE WALL). WHERE DOUBLE WALL SYSTEMS ARE REQUIRED FOR ALL VENT AND VAPOR PIPING, USE SIZE OVER SIZE RED THREAD II PIPING AND FITTINGS. USE ONLY FIBERCAST SYSTEMS ALCOHOL COMPATIBLE ADHESIVES. ALL PIPING AND FITTINGS SHALL BE UL-971 LISTED IN COMPLIANCE WITH THE JULY 2005 PERFORMANCE STANDARDS.

PIPING TO BE INSTALLED PER MANUFACTURER'S LISTED INSTRUCTIONS AND SHALL ONLY BE INSTALLED BY QUALIFIED INSTALLERS CERTIFIED BY THE MANUFACTURER. PROVIDE AT LEAST 4' OF STRAIGHT PIPING RUN BEFORE A CHANGE OF DIRECTION OF MORE THAN 30 DEGREES AND INSTALL FLEXIBLE CONNECTORS AT THE VENT AND VAPOR CONNECTION AT THE TANK SUMPS, AND DISPENSER SUMPS.

NYC VARIANT: SAME AS ABOVE EXCEPT: VENT CONNECTIONS ARE ROUTED TO A SEPARATE UNOBSERVED EXTRACTOR FITTING LOCATED IN THE TURBINE SIDE. VENT TERMINATION TO BE A MINIMUM OF 15' ABOVE GRADE.

JURISDICTIONAL VARIANT: INSTALL DOUBLE WALL SIZE OVER SIZE FIBERGLASS PIPING WHEN REQUIRED BY AUTHORITY HAVING JURISDICTION.

CALIFORNIA VARIANT: VENT PIPING TO BE DOUBLE WALLED AND INSTALLED WITH CONTINUOUS VACUUM MONITORING DEVICE PER AB-2481 REQUIREMENTS

## (10) STAGE II VAPOR RECOVERY PIPING INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL 3" SINGLE WALL FIBERGLASS STAGE II VAPOR RECOVERY HEADER, CONNECTORS, VALVES AND FITTINGS TO THE LOWEST OCTANE GRADE AS INDICATED ON SITE SPECIFIC FUELING PLAN AND ACCOMPANYING DETAILS. NOTE THAT THE 1ST CONNECTION FROM STAGE II VAPOR RECOVERY HEADER TO LOWEST OCTANE TANK SHALL BE 3". ALL OTHER CONNECTIONS TO ADDITIONAL TANKS SHALL BE MADE WITH 2".

CONTRACTOR TO PROVIDE AT LEAST 4 FEET OF STRAIGHT PIPING RUN BEFORE A CHANGE OF DIRECTION OF 30 DEGREES OR MORE IN ORDER TO PROVIDE MECHANICAL FLEXIBILITY PER CODE REQUIREMENTS. CONTRACTOR TO INSTALL TRACER TAPE WITH VAPOR PIPING PER TRENCHING DETAILS. PENETRATIONS INTO ALL SUMPS SHALL BE MADE WITH DOUBLE WALL ENTRY FITTINGS. STAGE II VAPOR RECOVERY PIPING SHALL BE DESIGNED AND INSTALLED FOR 1/4" PER FOOT MINIMUM SLOPE BACK TO TANKS. AT LARGE SITE LAYOUTS, 1/8" PER FOOT MINIMUM IS ACCEPTABLE IF IT AVOIDS USING A KNOCK OUT SUMP (VAPOR POT) OR HAVING EXCESSIVE TANK DEPTH. CONSULT OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER, WHERE DISCREPANCIES OCCUR.

CONTRACTOR TESTING OF STAGE II VAPOR LINES SHALL BE PERFORMED PRIOR TO BACK FILL, PRIOR TO PAVING AND BEFORE STATION OPERATION. SEE SITE SPECIFIC DETAIL SHEETS FOR INSTALLATION DETAILS. SEE FIBERGLASS PIPING MANUFACTURER SPECIFICATION BELOW.

## STAGE II PIPING SPECIFICATION:

FIBERCAST SYSTEMS: RED THREAD II PIPE AND FITTINGS (USED FOR SINGLE WALL). WHERE DOUBLE WALL SYSTEMS ARE REQUIRED FOR ALL VENT AND VAPOR PIPING, USE SIZE OVER SIZE RED THREAD II PIPING AND FITTINGS. USE ONLY FIBERCAST SYSTEMS ALCOHOL COMPATIBLE ADHESIVES. ALL PIPING AND FITTINGS SHALL BE UL-971 LISTED IN COMPLIANCE WITH THE JULY 2005 PERFORMANCE STANDARDS.

PIPING TO BE INSTALLED PER MANUFACTURER'S LISTED INSTRUCTIONS AND SHALL ONLY BE INSTALLED BY QUALIFIED INSTALLERS CERTIFIED BY THE MANUFACTURER. PROVIDE AT LEAST 4' OF STRAIGHT PIPING RUN BEFORE A CHANGE OF DIRECTION OF MORE THAN 30 DEGREES AND INSTALL FLEXIBLE CONNECTORS AT THE VENT AND VAPOR CONNECTION AT THE TANK SUMPS, AND DISPENSER SUMPS.

JURISDICTIONAL VARIANT: INSTALL DOUBLE WALL SIZE OVER SIZE FIBERGLASS PIPING WHEN REQUIRED BY AUTHORITY HAVING JURISDICTION.

CLIENT:

TANK AND PIPING INSTALLATION SCOPE OF WORK:

(11) METAL PIPE AND FITTINGS:

STANDARD: STEEL PIPE SHOWN ON THESE DRAWINGS TO BE MINIMUM SCHEDULE 40. METAL PRODUCT LINE FITTINGS TO BE MALLEABLE IRON CLASS 150, GALVANIZED. ALL MALLEABLE IRON FITTINGS SHALL BE SUPPLIED BY "ANVIL" (FORMERLY "GRINNELL") OR EQUAL SPECIFICATIONS AS FOLLOWS:

	DIMENSIONS	MATERIAL	GALVANIZING	THREAD	PRESSURE RATING
M.I. FITTINGS (TEES, ELBOWS) CLASS 150/PN 20	ASME B16.3	ASTM A-197	ASTM A-153	ASME B.1 20.1	ASME B16.3
M.I. UNIONS CLASS 150/PN 20	ASME B16.39	ASTM A-197	ASTM A-153	ASME B.1 20.1	ASME B16.3
STEEL PIPE NIPPLES CLASS 150/PN 20	ASTM A733	ASTM A-53 (F OR E)	ASTM A-153	ASME B.1 20.1	ASME B16.3
STEEL PIPE CLASS 150/PN 20 SCHEDULE 40	N/A	ASTM A-53 (F OR E)	ASTM A-153	ASME B.1 20.1	ASME B16.3

GASOLINE/ALCOHOL COMPATIBLE THREAD SEALANT LIKE LOCITTE 567 SHALL BE USED ON ALL THREADED PIPE CONNECTIONS. ANY METAL PIPE OR FITTING USED FOR PRODUCT, VENT, OR VAPOR RECOVERY WHICH CONTACTS SOIL OR BACK FILL MUST BE 100% COVERED WITH A 3M SCOTCHRAP PRIMER AND 3M TEMFLEX 10 MIL. OR 10 MIL. SELF-PRIME PROSELECT PIPE TAPE.

(12) PIPING SUMP PENETRATION INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL SUMP PENETRATION FITTINGS. ALL PENETRATIONS OF THE SUMPS TO BE ON A LINE TOWARD THE CENTER OF THE SUMP, NOT TO EXCEED MANUFACTURERS' RECOMMENDED ANGLE IN ANY DIRECTION, TO ENSURE THE PROPER INSTALLATION OF ALL BULKHEAD AND COMPRESSION FITTINGS AND RESULTANT WATER TIGHTNESS. ALL PIPING, CONDUIT AND GROUNDS THAT PENETRATE THE SUMP SIDE WALLS MUST BE SEALED WITH DOUBLE SIDED BULKHEAD FITTINGS IN SUMPS. SUMPS SHALL BE HYDROSTATICALLY TESTED WITH STANDING WATER FOR A PERIOD OF 24 HOURS OR CERTIFIED USING SUMP MANUFACTURERS' APPROVED TESTING PROCEDURE TO INSURE THAT SUMPS ARE WATERTIGHT. THE OWNER'S ENGINEER, THE BP PROJECT MANAGER MUST SIGN OFF ON THIS TESTING ON THE TANK INSTALLATION CHECK LIST.

MANUFACTURER ENTRY BOOT TYPE VARIANT: THE MAKE AND MODEL NUMBERS OF THE PIPING PENETRATION FITTINGS SHOWN IN THE DETAILS ARE NOT SUBJECT TO CHANGE. N.O.V. FRP BONDED ENTRY FITTINGS ARE REQUIRED FOR ALL PIPING PENETRATIONS. CONDUIT PENETRATIONS INTO SUMPS SHALL BE AS SPECIFIED ON THE PLANS.

CALIFORNIA VARIANT: CONTRACTOR TO INSTALL SUMP PENETRATION FITTINGS THAT MEET THE ADDITIONAL CRITERIA REQUIREMENT FOR CONTINUOUS HYDROSTATIC AND VACUUM MONITORING.

(13) DISPENSER INSTALLATION:

STANDARD: CONTRACTOR TO INSTALL "WAYNE OVATION" STYLE DISPENSERS WITH INTEGRATED CARD READERS AND INTERCOM SYSTEM AS SHOWN ON SITE SPECIFIC DESIGN DETAIL SHEETS. DISPENSERS TO BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. INSTALLATION TO INCLUDE DISPENSER ISLANDS, SINGLE WALL DISPENSER CONTAINMENT SUMPS, AND THE INSTALLATION OF ALL SHEAR VALVES, RISERS, PIPING CONNECTIONS AND ALL PENETRATIONS INTO THE SUMPS. SEE TANK ELECTRICAL DRAWINGS FOR CONDUIT AND WIRING REQUIREMENTS.

DISPENSER START-UP: - START UP BY MANUFACTURERS REPRESENTATIVE. CONTRACTOR TO PURGE LINES WITH 200 GALLONS PER HOSE MINIMUM. ANY AIR POCKETS OR START UP PROBLEMS DUE TO IMPROPER INSTALLATION OR INCORRECT WIRING THAT DESTROYS ELECTRONICS WILL BE BILLED BACK TO THE CONTRACTOR

NYC VARIANT: DISPENSER SUMPS SHALL BE BACK FILLED WITH PEA GRAVEL PER NYC CODE. DISPENSER ISLAND SHALL BE EQUIPPED WITH A FIRE SUPPRESSION SYSTEM. SEE FIRE SUPPRESSION DETAILS FOR INSTALLATION REQUIREMENTS.

ARCO BRANDED VARIANT: DISPENSERS INSTALLED WITHOUT CARD READERS IN DISPENSERS. CONTRACTOR TO INSTALL TWO (2) DOUBLE SIDED PAYMENT ISLAND CASHIERS (PIC UNITS) AS SHOWN ON SITE SPECIFIC PLANS. START UP BY MANUFACTURERS REPRESENTATIVE. START UP PROBLEMS DUE TO IMPROPER INSTALLATION OR INCORRECT WIRING THAT DESTROYS ELECTRONICS WILL BE BILLED BACK TO THE CONTRACTOR. REFER TO ARCHITECTURAL CANOPY DRAWINGS FOR ADDITIONAL SITE PREP AND CONDUIT REQUIREMENTS.

CALIFORNIA VARIANT: DISPENSER SUMPS TO BE DOUBLE WALL AND INSTALLED WITH CONTINUOUS HYDROSTATIC MONITORING DEVICE PER AB-2481 REQUIREMENTS

INSTALLATION OF HANGING HARDWARE:

STANDARD: - CONTRACTOR TO INSTALL VAPOR ASSIST HOSES, NOZZLES, SWIVELS AND BREAK AWAY VALVES PER '96" CARB EXECUTIVE ORDER G-70-153-AD. SITES WHERE ORVR COMPATIBLE SYSTEMS ARE NOT REQUIRED

ARCO BRAND VARIANT - CONTRACTOR TO INSTALL ORVR COMPATIBLE BALANCE HOSES, NOZZLES, SWIVELS AND BREAK AWAY VALVES PER CARB EXECUTIVE ORDER G-70-52-AM PER LOCAL STATUES.

CALIFORNIA VARIANT - CONTRACTOR TO INSTALL ORVR/PHASE II EVR COMPATIBLE HOSES, NOZZLES, SWIVELS AND BREAK AWAY VALVES PER APPLICABLE CARB EXECUTIVE ORDER WITH IN SYSTEM DIAGNOSTICS (ISD) PER LOCAL JURISDICTIONAL REQUIREMENTS.

NEW JERSEY VARIANT - CONTRACTOR TO INSTALL LOW PERMEATION HOSE AND COMPATIBLE HARDWARE. SEE SHEET G.0.6.15

(14) SUMP SENSOR INSTALLATION:

CONTRACTOR TO INSTALL ALL FILL SUMP, TURBINE SUMP AND DISPENSER SUMP SENSORS PER VEEDER ROOT INSTALLATION INSTRUCTIONS. SUMP SENSORS TO BE INSTALLED IN SUMP HOLDERS MOUNTED TO SIDE OF SUMP WALLS SEE TANK DETAIL SHEETS FOR LIQUID SENSOR DETAILS. TURBINE SIDE SUMP SENSORS TO BE MOUNTED AT SIDE OF TANK WHERE PRODUCT PENETRATION INTO SUMP IS MADE AND BELOW LOWEST PENETRATION FITTING WITHIN SUMP AREA AT BOTTOM OF SUMP. SEE TANK ELECTRICAL DRAWINGS FOR MONITORING CONDUIT DETAILS AND SENSOR AND PROBE WIRING DETAILS.

(15) OVERFILL ALARM AND ACKNOWLEDGE SWITCH INSTALLATION:

CONTRACTOR TO INSTALL OVERFILL ALARM & ACKNOWLEDGMENT AS SHOWN. ALARM AND SWITCH TO BE LOCATED TO PROVIDE AN UNOBSTRUCTED VIEW TO TRUCK DRIVER. PROVIDE BALLARD PROTECTION OF FREE STANDING POLE. SEE SITE SPECIFIC WIRING DIAGRAM AND DETAILS FOR MOUNTING REQUIREMENTS.

(16) VEEDER ROOT CONSOLE INSTALLATION:

CONTRACTOR TO INSTALL "VEEDER ROOT TLS-450 PLUS" TANK AND LINE ALARM CONTROL PANEL IN BUILDING. INSTALL PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. SEE ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR EXACT LOCATION IN BUILDING.

CALIFORNIA VARIANT: TLS-350 PLUS CONSOLE TO BE EQUIPPED WITH ADDITIONAL SENSOR MODULES TO ADDRESS AB-2481 AND CARB ISD REQUIREMENTS. TLS-450 PLUS WILL BE REQUIRED ONCE APPROVED BY CALIFORNIA

NYC VARIANT: CONSOLE TO BE PROGRAMMED FOR MASTER/MASTER ALTERNATE START

(17) CONCRETE SLAB INSTALLATION:

REFER TO PROJECT GENERAL SPECIFICATIONS FOR ADDITIONAL CONCRETE REQUIREMENTS NOT INDICATED ON THESE DRAWINGS.

STANDARD:

- CONCRETE SLAB OVER TANKS WITH A MINIMUM 8" THICK FIBER REINFORCEMENT TO BE USED. REINFORCE CONCRETE SLAB AROUND MANHOLES WITH (4) #4 REBAR, 60" IN LENGTH FOR THE LARGE MANHOLES AND 30" FOR SMALL MANHOLES. PLACE REBAR 6" FROM SIDES OF BOX. SEE RECIPE BELOW.
- CONCRETE DRIVE SLAB AT CANOPY FUELING AREA WITH A MINIMUM 6" THICK FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.
- CONCRETE FORMLESS ISLAND WITH A 6" HEIGHT ABOVE FINISHED GRADE FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.

NYC VARIANT:

- CONCRETE SLAB OVER TANKS WITH A MINIMUM 10" THICKNESS REINFORCED WITH C#5 REBARS @ 12" O.C. EACH WAY TOP & BOTTOM. REINFORCE CONCRETE SLAB AROUND MANHOLES WITH (4) #4 REBAR, 60" IN LENGTH FOR THE LARGE MANHOLES AND 30" FOR SMALL MANHOLES. PLACE REBAR 6" FROM SIDES OF BOX. SEE RECIPE BELOW.
- CONCRETE SLAB BELOW TANKS WITH A MINIMUM 12" THICKNESS, REINFORCED WITH TWO LAYERS OF 6X6-W7.4.XW7.4 ON 2" STEEL CHAIRS TOP & BOTTOM. SEE RECIPE BELOW.
- LOAD BEARING 12"x16" CONCRETE BLOCK PIERS FILLED WITH TYPE "M" MORTAR SPACED NO MORE THAN 3'-2" APART. FOR ALTERNATE SONOTUBE PIER CONFIGURATION A MINIMUM 16" DIAMETER CONCRETE PIER WITH #3 REBAR HORIZONTAL TIES SPACED EVERY 2' VERTICALLY AND (5) #5 VERTICAL REBARS SPACE EQUALLY
- CONCRETE DRIVE SLAB AT CANOPY FUELING AREA WITH A MINIMUM 6" THICK, REINFORCED WITH TWO LAYERS OF 6X6-W5.5XW5.5 ON 2" STEEL CHAIRS TOP & BOTTOM.
- CONCRETE FORMLESS ISLAND WITH A 6" HEIGHT ABOVE FINISHED GRADE FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.
- CONCRETE WALKWAY WITH A MINIMUM 4" THICK FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.
- CONCRETE DRIVEWAY WITH A MINIMUM 7" THICK FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.

CALIFORNIA VARIANT:

- CONCRETE SLAB OVER TANKS WITH A MINIMUM 8" THICK FIBER REINFORCEMENT TO BE USED. REINFORCE CONCRETE SLAB AROUND MANHOLES WITH (4) #4 REBAR, 60" IN LENGTH FOR THE LARGE MANHOLES AND 30" FOR SMALL MANHOLES. PLACE REBAR 6" FROM SIDES OF BOX. SEE RECIPE BELOW.
- THICKEN CONCRETE SLAB AT DISPENSER SUMPS AND TANK FILL AND TURBINE SUMPS SUCH THAT THE BOTTOM OF CONCRETE IS BELOW THE TOP OF THE TERMINATION OF THE SECONDARY CONTAINMENT OF THE SUMPS PER AB-2481 REQUIREMENTS.
- CONCRETE DRIVE SLAB AT CANOPY FUELING AREA WITH A MINIMUM 6" THICK FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.
- CONCRETE FORMLESS ISLAND WITH A 6" HEIGHT ABOVE FINISHED GRADE FIBER REINFORCED CONCRETE TO BE USED. SEE RECIPE BELOW.

CONCRETE MIX RECIPE. PREMIX UNIFORMLY THROUGHOUT CONCRETE. REINFORCEMENT BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.

UNLESS OTHERWISE NOTED ON THESE DRAWINGS:

- CONCRETE - REGULAR WEIGHT HARD ROCK CONCRETE (150 LBS/CU FT)
- CEMENT - TYPE I/II, SULFATE RESISTANT
- AGGREGATES - ASTM C33, (MAXIMUM SIZE 3/4 INCHES)
- 28 DAY CONCRETE STRENGTH (f'c):
  - 4,000 PSI - SLAB (DESIGN BASED ON 2,000 PSI NO SPECIAL INSPECTION REQUIRED)
  - SLUMP - 3" + 1" - 4" MAXIMUM AT POINT OF PLACEMENT
  - SHRINKAGE - 0.05% MAXIMUM
  - ENTRAINED AIR RANGE - 2% TO 4%

CONCRETE SHALL BE NORMAL WEIGHT WITH A MIX OF 1 : 2 1/2 : 3 1/2, WITH A MAXIMUM 7 1/2 GALLONS OF WATER PER SACK. ADD 3.0 LB MACRO (STRUCTURAL) FIBER PER CU. YD. REINFORCING CONCRETE.

REINFORCING STEEL FOR TANK SUMP CAGES SHALL BE #4 REBAR.

MAINTAIN CONCRETE IN A MOIST CONDITION FOR AT LEAST 7 DAYS AFTER PLACEMENT.

PLACE CONCRETE DIRECTLY FROM TRUCK INTO FORMS. DO NOT PUMP CONCRETE UNLESS SPECIAL INSPECTION, IN ACCORDANCE WITH CHAPTER 3 OF THE IBC, IS PROVIDED.

SUBMIT MIX DESIGNS, WITH STRENGTH AND SHRINKAGE TEST RESULTS, TO OWNER'S ENGINEER AT LEAST 7 DAYS BEFORE PLACING CONCRETE. CONSOLIDATE CONCRETE IN PLACE USING A MECHANICAL VIBRATOR.

BEFORE PLACING CONCRETE, SECURE REINFORCING STEEL, ANCHOR BOLTS, DOWELS, AND OTHER INSERTS IN POSITION TO PREVENT MOVEMENT.

MATERIALS AND WORKMANSHIP SHALL CONFORM TO A.C.I. - 318 (SPECIFICATIONS OF THE DESIGN AND PLACEMENT OF CONCRETE).

MANHOLE CROWNS:

ALL MANHOLE OPENINGS ON THE TANK SLAB SHALL BE INSTALLED WITH A 1-1/2" CROWN (1" RISE OVER 12" RUN) OF CONCRETE TO PREVENT WATER INTRUSION INTO THE MANHOLE. THE OWNER'S ENGINEER, THE BP PROJECT MANAGER WILL BE REQUIRED TO SIGN OFF ON THIS ITEM ON THE TANK INSTALLATION CHECKLIST.

PRODUCT IDENTIFICATION MARKINGS:

CONTRACTOR TO INSTALL PRODUCT IDENTIFICATION TAGS AT ALL MANHOLE OPENING PER SITE SPECIFIC DETAIL DRAWINGS.

(18) TESTING:

CONTRACTOR SHALL COMPLETE ALL TESTING ACCORDING TO MANUFACTURER'S INSTRUCTIONS FOR TANKS AND PIPING AND PER INDUSTRY RECOMMENDED PRACTICES (API & PE). CONTRACTOR SHALL COMPLETE ALL WARRANTY VALIDATION TESTING AND PROVIDE DOCUMENTATION TO OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER.

PIPE TESTING:

ISOLATE THE PRODUCT TANKS AND DISPENSERS DURING PRESSURE TESTING OF LINES IN ORDER TO PREVENT DAMAGE.

THE DESIGN, ASSEMBLY, AND TESTING OF THE PIPING SYSTEM SHALL BE IN CONFORMANCE WITH THE APPLICABLE SECTION OF ANSI-B31, AMERICAN NATIONAL STANDARD CODE FOR PRESSURE PIPING, NFPA 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE, AND AMERICAN PETROLEUM INSTITUTES RECOMMENDED PRACTICE 1615.

DURING CONSTRUCTION, BEFORE BACK FILLING, PIPING SHOULD BE ISOLATED FROM THE TANKS AND SUBJECTED TO A PIPE TIGHTNESS TEST. OTHER TESTING METHODS MAY ALSO BE ACCEPTABLE IF APPROVED BY THE AUTHORITY HAVING JURISDICTION. A CONSTRUCTION PIPE TEST IS CONDUCTED AS FOLLOWS:

A. THE PRODUCT PIPING TO BE TESTED IS ISOLATED AND PRESSURIZED WITH COMPRESSED AIR TO 150 PERCENT OF THE MAXIMUM SYSTEM OPERATING PRESSURE (OR A MINIMUM OF 50 POUNDS PER SQUARE INCH GAUGE; MAXIMUM AS RECOMMENDED BY COMPONENT MANUFACTURER) FOR AT LEAST 30 MINUTES AND NOT MORE THAN 1 HOUR.

B. ALL PIPING SURFACES INCLUDING VALVES, FITTINGS, JOINTS, AND SO FORTH ARE WETTED WITH A SOAP SOLUTION AND INSPECTED FOR BUBBLES.

C. LEAKS, AS INDICATED BY BUBBLES, ARE REPAIRED OR REPLACED, AND THE PIPING RE-TESTED AS NECESSARY.

D. THE INNER PIPE WALLS SHALL BE TESTED FOR TIGHTNESS BEFORE CLOSING THE OUTER PIPE. THE OUTER PIPE MUST BE TESTED AT A 5 POUNDS PER SQUARE INCH GAUGE MAXIMUM BEFORE BACKFILLING. CARE SHOULD BE TAKEN TO PREVENT OVER PRESSURIZATION OF THE INTERSTICE. IT IS IMPORTANT THAT THE MANUFACTURER'S INSTRUCTIONS BE FOLLOWED. REPEAT BOTH TESTS AFTER BACKFILLING.

WHEN THE PIPING IS INSTALLED AND OPERATIONAL, A HYDROSTATIC TEST OF THE PIPING, AS SPECIFIED IN NFPA 329, MAY BE REQUIRED BY CODES.

CAUTION: EXTREME CARE SHOULD BE EXERCISED IN CONDUCTING PIPE TIGHTNESS TEST. PRESSURIZED PIPING IS POTENTIALLY DANGEROUS. BECAUSE OF THE POSSIBILITY OF VIOLENT RUPTURE, THIS TEST SHOULD BE CONDUCTED WITH MINIMUM EXPOSURE OF PERSONNEL AND WITHOUT MOVING OR DISTURBING THE PIPING BEING TESTED. WHEN THE TEST IS COMPLETED, THE PIPING PRESSURE CAN BE REDUCED OR RELEASED COMPLETELY FOR THE REMAINDER OF CONSTRUCTION. REFER TO THE PIPING MANUFACTURER'S RECOMMENDATIONS.

N.O.V. PIPING SHALL BE TESTED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

VAPOR RECOVER PIPING MUST PASS ALL CARB BLOCKAGE TESTING RELATIVE TO TIGHTNESS, PRESSURE DECAY, & BLOCKAGE RATES. A/L TESTING IS REQUIRED FOR "ASSISTED" STAGE II SYSTEMS (IF INSTALLED). NOTIFY THE BP PROJECT MANAGER TO COORDINATE.

CONTAINMENT SUMP TESTING:

ALL TANK SUMPS AND UNDER DISPENSER CONTAINMENT SUMPS SHALL BE HYDROSTATICALLY TESTED (LAKE TEST) WITH STANDING WATER ABOVE THE LEVEL OF THE HIGHEST PIPE OR CONDUIT PENETRATION FOR A PERIOD OF 24 HOURS AFTER ALL WORK IS COMPLETED TO INSURE THAT THE SUMPS ARE WATERTIGHT OR CERTIFIED USING SUMP MANUFACTURER'S APPROVED TEST PROCEDURE TO INSURE THAT SUMPS ARE WATERTIGHT PER UT REGULATIONS. THE OWNER'S ENGINEER MUST SIGN OFF ON THIS TESTING ON THE TANK INSTALLATION CHECKLIST.

CALIFORNIA VARIANT: ALL DOUBLE WALL SUMPS SHALL BE BRINE FILLED AND INSPECTED FOR TIGHTNESS THROUGHOUT THE INSTALLATION PROCESS ONCE SUMPS HAVE BEEN FILLED WITH BRINE SOLUTION.

FINAL SYSTEM TESTING:

AFTER COMPLETE INSTALLATION OF THE ENTIRE FUEL SYSTEM AND ALL PAVING, THE OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER, SHALL ARRANGE FOR A PRECISION TANK AND LINE TEST TO BE PERFORMED ON THE COMPLETE SYSTEM. SUCCESSFUL COMPLETION OF THIS TEST WILL BE REQUIRED FOR FINAL APPROVAL. THIS TEST SHALL ENSURE THAT ALL NEW TANK & PIPING SHALL MEET ALL FEDERAL, STATE, & LOCAL REQUIREMENTS FOR TIGHTNESS INTEGRITY. PRIOR TO START-UP OF SYSTEM, OPERATIONALLY TEST ALL OTHER EQUIPMENT, INCLUDING IMPACT (SHEAR) VALVES, LINK LEAK DETECTORS, LEAK DETECTOR ALARMS, AND EMERGENCY SHUTDOWN SWITCHES IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. CONTRACTOR SHALL PROVIDE (3) COPIES OF ALL CERTIFICATIONS & TEST RESULTS TO OWNER'S REPRESENTATIVE OR HIS AGENT, THE BP PROJECT MANAGER.

TANK SYSTEM TEST METHOD CALIFORNIA ONLY AB-2481:

BEFORE THE UNDERGROUND STORAGE TANK IS PLACED INTO USE, THE UNDERGROUND STORAGE TANK SHALL BE TESTED AFTER INSTALLATION USING ONE OF THE FOLLOWING METHODS TO DEMONSTRATE THAT THE TANK IS PRODUCT TIGHT:

- ENHANCED LEAK DETECTION (ELD) BY TRACER CORPORATION.
- AN INERT GAS PRESSURE TEST THAT HAS BEEN CERTIFIED BY A THIRD PARTY AND APPROVED BY THE BOARD.
- A TEST METHOD DEEMED EQUIVALENT TO ENHANCED LEAK DETECTION OR AN INERT GAS PRESSURE TEST BY THE BOARD IN REGULATIONS ADOPTED PURSUANT TO THE APPLICABLE CHAPTER IN THE CODE. AN UNDERGROUND STORAGE TANK INSTALLED AND TESTED IN ACCORDANCE WITH THIS SECTION IS EXEMPT FROM THE REQUIREMENTS OF SECTION 25292.5.

(19) CHECKING FOR PRODUCT QUALITY: INITIAL SITE COMMISSIONING RECOMMENDED PRACTICES

BEFORE OPENING YOUR STORE, IT IS APPROPRIATE AND PROPER PROCEDURE TO CHECK YOUR FUELING EQUIPMENT TO MINIMIZE POSSIBLE PRODUCT QUALITY ISSUES. THIS GUIDANCE MUST BE FOLLOWED TO ENSURE THAT PRODUCT QUALITY HAS BEEN MAINTAINED, AND IS ACCEPTABLE FOR OUR CUSTOMERS.

THE UNDERLYING ASSUMPTION IS THAT THE GENERAL CONTRACTOR, WHO WAS RESPONSIBLE FOR BUILDING YOUR STATION, HAS PROPERLY PERFORMED THEIR JOB AND CHECKED THAT TANKS AND PIPING HAVE BEEN PROPERLY INSTALLED, TESTED, CLEANED, AND LABELED AT A MINIMUM. ANY BP AREA MAINTENANCE MANAGER, OR BP PROJECT MANAGER, HAS A CHECKLIST SHOWING KEY POINTS TO LOOK FOR BEFORE ACCEPTING A SITE AS "COMPLETE" FROM THE CONTRACTOR. SOME KEY AREAS ARE AS FOLLOWS:

1. CONFIRM THAT APPROPRIATE PRODUCT TAGS HAVE BEEN INSTALLED AT THE FILL RISERS.

2. PERFORM A FINAL INSPECTION FOR THE PRESENCE OF WATER IN THE PIPING TO THE DISPENSERS BY OPENING THE TURBINE DISCHARGE CONNECTION AT EACH TURBINE SUMP, AND OPENING/REMOVING THE BLEEDER/TEST PLUG ON IMPACT VALVE. ANY TRAPPED LIQUIDS SHOULD DRAIN BACK TO THE TURBINE SUMP FOR REMOVAL.

3. CONFIRM THAT BOTH GASOLINE AND DIESEL DISPENSERS ARE INSTALLED WITH A MINIMUM (MEANING A MESH SIZE NOT GREATER THAN) 10 MICRON FILTER. ANY FACTORY INSTALLED FILTER AFTER STARTUP MUST BE DISCARDED IN ACCORDANCE WITH USED FUEL FILTER WASTE MANAGEMENT ENVIRONMENTAL GUIDELINES.

4. CONFIRM THAT PROPER DECALS, TAX NUMBERS, AND OTHER SIGNAGE REQUIRED PER PLANS, REGULATORY REQUIREMENTS, AND CONTRACTUAL AGREEMENTS ARE INSTALLED.

5. PERFORM A FINAL INSPECTION FOR THE PRESENCE OF WATER WITHIN THE UNDERGROUND STORAGE TANKS, OR IN THE PIPING GOING TO THE DISPENSERS. INSPECTION FOR WATER IN THE TANK SHALL BE PERFORMED USING SARGEL'S WATER FINDING PASTE (OR EQUAL), AND CONDUCTED AT BOTH ENDS OF THE TANK. IF LEVELS OF WATER GREATER THAN 1/4" ARE DETECTED, PROCEED WITH WATER ELIMINATION PROCEDURES, AND REQUEST THAT THE CONTRACTOR DO THIS AS PART OF THEIR SCOPE OF WORK.

6. THE BP REPRESENTATIVE (REGIONAL ACCOUNT EXECUTIVE OR FRANCHISE CONSULTANT) SHALL BE INFORMED OF ALL MAJOR MILESTONES LEADING UP TO SITE START-UP. BP RESERVES THE RIGHT TO REQUEST COPIES OF INSPECTION REPORTS BEFORE INITIAL SITE START-UP.

7. AFTER DELIVERY OF THE FIRST LOAD OF PRODUCTS, EACH PRODUCT MUST BE TESTED AND THE RESULTS PROVIDED TO THE BP AREA MAINTENANCE MANAGER AND TO THE BP PROJECT MANAGER, PRIOR TO ANY SALE.

COSTS OF THE SAMPLING AND ANALYSIS ARE TO BE INCLUDED IN THE CONTRACTOR'S SCOPE OF WORK. A LABORATORY CERTIFIED TO CONDUCT FUELS SAMPLING AND TESTING MUST BE USED.

(20) TANK ELECTRICAL SPECIFICATIONS:

GENERAL:

ALL MATERIALS AND WORKMANSHIP WILL CONFORM TO THE MOST RECENT EDITIONS OF THE NATIONAL ELECTRICAL CODE, N.E.T.A., B.I.C.S.I., U.S.C. & NFPA AS REQUIRED BY THE ENGINEER, LOCAL AND STATE CODES AND ORDINANCES, AMERICANS WITH DISABILITIES ACT, E.P.A., AND UTILITY COMPANY REQUIREMENTS.

THE CONTRACTOR WILL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS WHICH MAY AFFECT HIS BID OR WORK. NO ALLOWANCES WILL BE MADE AFTER THE BID FOR EXISTING CONDITIONS OR THE CONTRACTORS FAILURE TO VERIFY EXISTING CONDITIONS.

FURNISH AND INSTALL A COMPLETE ELECTRICAL SYSTEM AS DEPICTED FROM THE PLANS AND SPECIFICATIONS HEREIN - AS NOTED OR IMPLIED - NOT LIMITED TO WHAT IS SHOWN.

ALL DRAWINGS ARE SCHEMATIC IN NATURE AND ALL APPURTENANCES NOT INDICATED TO MAKE A WORKING SYSTEM MUST BE INCLUDED IN CONTRACTOR'S BID.

IF THERE APPEARS TO BE ANY ITEMS IN CONFLICT WITH THE DRAWINGS, INCONSISTENCIES WITH DESIGN OR INTENT, OR NEED FOR CLARIFICATION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLARIFY THESE ITEMS PRIOR TO BID IN WRITING WITH THE ENGINEER. IF THE CONTRACTOR FAILS TO CLARIFY ANY QUESTIONS OR INCONSISTENCY, THEY ACCEPT RESPONSIBILITY TO CORRECT AT THEIR COST ANY SUCH ITEM SO AS TO MEET INTENT AS DEFINED BY ENGINEER.

UTILITIES:

CONTRACTOR WILL SUPPLY INFORMATION AS REQUIRED TO ALL SERVING UTILITIES IN A TIMELY MANNER TO PROVIDE SERVICE REQUIRED.

RSG FITTINGS & CONDUIT:

RGS FITTINGS MUST BE STEEL COMPRESSION TYPE; EACH WITH CODE SIZED COPPER BOND WIRE. MINIMUM CONDUIT 1" C. EXCEPT AS NOTED. ALL WORK WILL BE IN CONDUIT; COMPLETED SYSTEM REAMED, AND SWABBED PRIOR TO CONDUCTOR INSTALL.

ALL CONDUITS TO BE CONCEALED EXCEPT TO SURFACE MOUNTED PANELS. TIE WIRE, PERFORATED STRAPS, OR OTHER PIPING OR CONDUIT ARE NOT ACCEPTABLE SUPPORTS. NO TIE WIRE WILL BE ALLOWED ON PROJECT.

CALIFORNIA VARIANT - THE LAST 2 FEET (MINIMUM) OF ALL CONDUITS THAT ARE ROUTED TO AND PENETRATE TANK SUMPS, DISPENSER SUMPS AND VENT TENSION SUMPS SHALL BE PVC COATED RIGID STEEL GALVANIZED WHERE PENETRATIONS TO THE BRINE FILLED SUMPS ARE MADE. ROBROY CONDUIT MUST BE USED WITH THE BRAVO PENETRATION FITTING - NO SUBSTITUTE PERMITTED.

CONDUCTORS:

CONDUCTORS TO BE 600V., COPPER (98% CONDUCTIVITY). BRANCH CIRCUITS TO HAVE THHN/THWN GAS & OIL RESISTANT INSULATION.

CONDUCTORS WILL BE STRANDED, HYDRAULIC CRIMP ALL CONNECTIONS. CONDUCTOR INSULATION WILL BE CONTINUOUSLY COLOR COATED. ALL GROUNDING/BUILDING CONDUCTORS WILL BE MULTI-CONDUCTOR TYPE (U.L. LABELED - ROPE STRAND BUILDING WIRE CLASS "M") BARE OR INSULATED AS NOTED OR REQUIRED.

MINIMUM LINE VOLTAGE WIRE SIZE IS #12 AWG (STRANDED) FOR LINE VOLTAGE WIRING DEVICES TO BE SPECIFICATION GRADE, MINIMUM 20 AMPS FOR RECEPTACLES, HUBBELL OR ENGINEER APPROVED. ALL SPECIAL RECEPTACLES AND GROUND FAULT PROTECTED DEVICES MUST BE PERMANENTLY MARKED WITH ENGRAVED COVER PLATES.

FILL RISER GROUNDING:

ALL RISERS IN THE FILL SUMP SHALL BE GROUNDED AND BONDED.

INSTALL 1/2" x 10'-0" LONG CONTINUOUS COPPER CLAD GROUND ROD IN NATIVE SOIL FOR TANK SYSTEM GROUNDING. PROVIDE MANHOLE ACCESS TO GROUND ROD AND COPPER GROUND WIRE, SEE DETAILS ON SHEET G.0.7

EMERGENCY SHUTDOWN:

ENSURE THAT THE E-STOP DISCONNECTS THE HOT AND NEUTRAL WIRES TO THE DISPENSERS  
ENSURE THAT THE E-STOP DISCONNECTS THE HOT AND NEUTRAL WIRES TO THE TURBINES  
ENSURE THAT THE TURBINE PUMPS ARE ISOLATED TO AVOID FEEDBACK VOLTAGE  
ENSURE THAT THE E-STOP DISCONNECTS THE LOW VOLTAGE WIRES TO THE DISPENSER (I.E. DATA, INTERCOM, MEDIA)  
ENSURE THAT THE TURBINE AND DISPENSER BREAKERS ARE CLEARLY IDENTIFIED / LABELED  
ENSURE THAT EACH DISPENSER HAS ITS OWN DEDICATED CIRCUIT  
ENSURE THAT EACH PUMP HAS ITS OWN DEDICATED CIRCUIT  
ENSURE THAT THE DISPENSING EQUIPMENT IS GROUNDED PER NEC  
ENSURE THAT ALL OF THE DISPENSING EQUIPMENT MEETS NEC LOCK OUT/TAG OUT CODES.

CONTRACTOR PERFORMANCE:

THE CONTRACTOR WILL GUARANTEE ALL MATERIALS AND WORKMANSHIP FURNISHED BY HIM UNDER THIS CONTRACTOR FOR A PERIOD OF TWO YEARS FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK OF THIS CONTRACT BY THE OWNER AND THE ENGINEER AND PROVIDE A BOND TO VALIDATE THIS GUARANTEE. ANY DEFECTS DEVELOPING WITHIN THE PERIOD TRACEABLE TO MATERIALS OR WORKMANSHIP PERFORMED HERE UNDER, WILL BE MADE GOOD AT THE EXPENSE OF THE CONTRACTOR NOT THE OWNER OR ENGINEER. THE CONTRACTOR WILL ACCEPT AND FULLY UNDERSTAND THIS PROVISION PRIOR TO CONTRACT BEING AWARDED. AS NO CLAIM FOR EXTRA COMPENSATION WILL BE ALLOWED FOR CORRECTION OF FAULTY WORK OR DEFECTIVE MATERIALS. ANYTIME DURING THE CONSTRUCTION PERIOD, THE OWNERS REPRESENTATIVES AND THE ENGINEER RETAIN THE RIGHT TO REQUIRE THE CONTRACTOR TO REMOVE AND REINSTALL ANY EQUIPMENT OR MATERIALS NOT FOLLOWING THE STANDARDS AS PRESENTED HEREIN OR ON THE DRAWINGS WITHOUT COST TO THE OWNER OR ENGINEER.

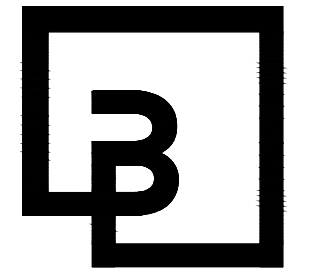
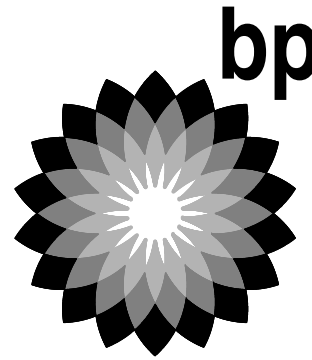
CONTRACTOR WILL PROVIDE PROOF OF PERFORMANCE BOND WITH SHOP DRAWINGS

PROVIDE 3 SETS OF SHOP DRAWINGS & SAMPLES FOR ALL EQUIPMENT, PRIOR TO ORDERING AND IN A TIMELY MANNER (AS DETERMINED BY THE ENGINEER) SO NOT TO DELAY WORK, TO THE ENGINEER FOR APPROVAL. (CONDUIT, SWITCHES, CONDUCTORS, ECT.) WHERE SUBSTITUTIONS ARE MADE. CONTRACTOR WILL INCLUDE COMPARISON DATA & SAMPLES FOR BOTH THE SUBSTITUTE AND SPECIFIED ITEMS FOR REFERENCE PURPOSES.

CONTRACTOR WILL PROVIDE LETTER TO ENGINEER CONFIRMING ALL EQUIPMENT AND TERMINATIONS ARE PROPERLY TORQUED - SIGNED BY LICENSED CONTRACTOR.

CONTRACTOR WILL PROVIDE ACCURATE AND COMPLETE "AS BUILT" DRAWINGS TO OWNER AND ENGINEER AT TIME OF OWNER ACCEPTANCE. ALL "AS BUILT" DRAWINGS TO BE 4 SETS OF "BLUELINES" OR PHOTO COPY PRINTS 24" x 36" AND TWO SETS (OWNER/ENGINEER) ON MAGNETIC MEDIA & AUTOCAD 2010 (BY AUTODESK) COMPATIBLE. FAILURE TO DO SO WILL CONSTITUTE FORFEITURE OF ALL PAYMENTS DUE AND HOURLY RATES OR \$99.00/HOUR/MAN MINIMUM TO ENGINEER PAID BY CONTRACTOR FOR "AS BUILT" DEVELOPMENT.

CLIENT:



Barghausen Consulting Engineers, Inc.

18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

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SEAL:



PRF120240124

DEVELOPMENT INFORMATION:

ARCO NTI  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:

SWC S MERIDIAN  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

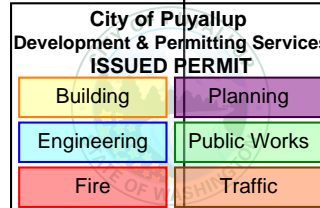
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DESIGNED BY: NP/RF	ALLIANCE ZADNO:
CHECKED BY: OV	BP REPM:
DRAWN BY: NP/RF	ALLIANCE PM:
VERSION: V-15.0	PROJECT NO:
01/01/2023	21730
DRAWING TITLE:	

TANK AND PIPING  
SCOPE OF WORK  
AND GENERAL NOTES  
(FRP 2 OF 2) TLS-450

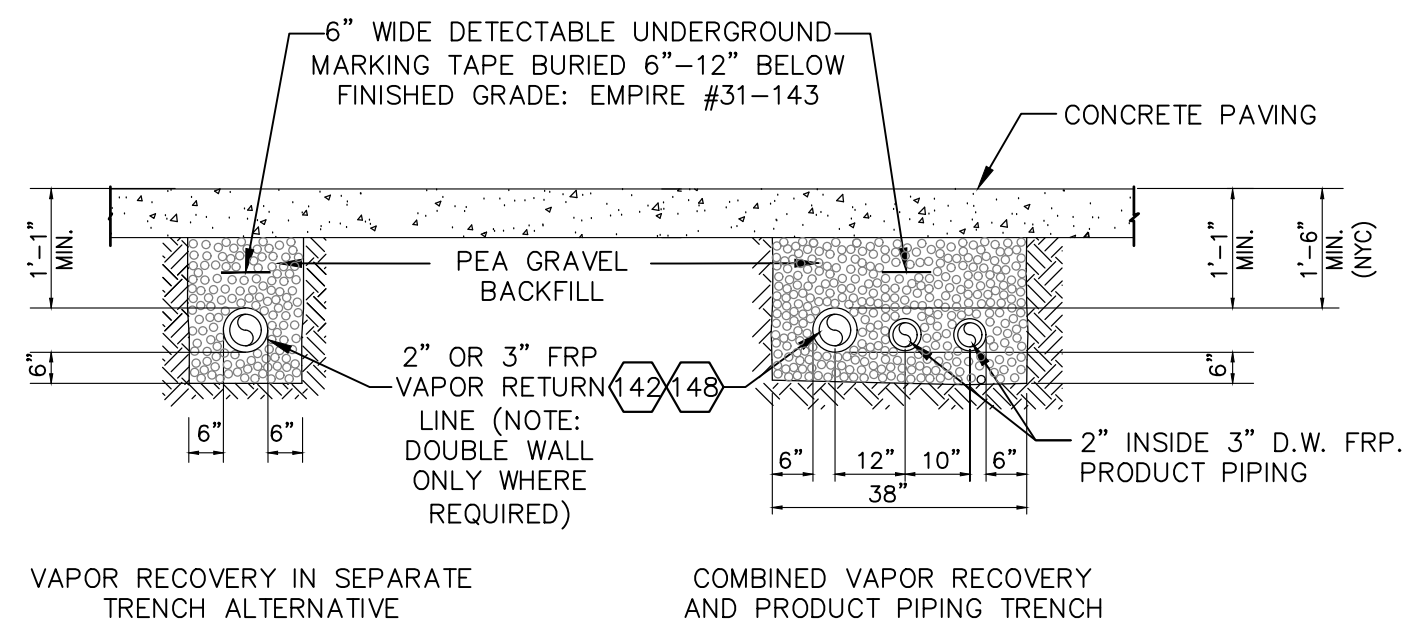
SHEET NO:

G.0.2.2



PIPE TRENCH DETAIL

SCALE: NTS



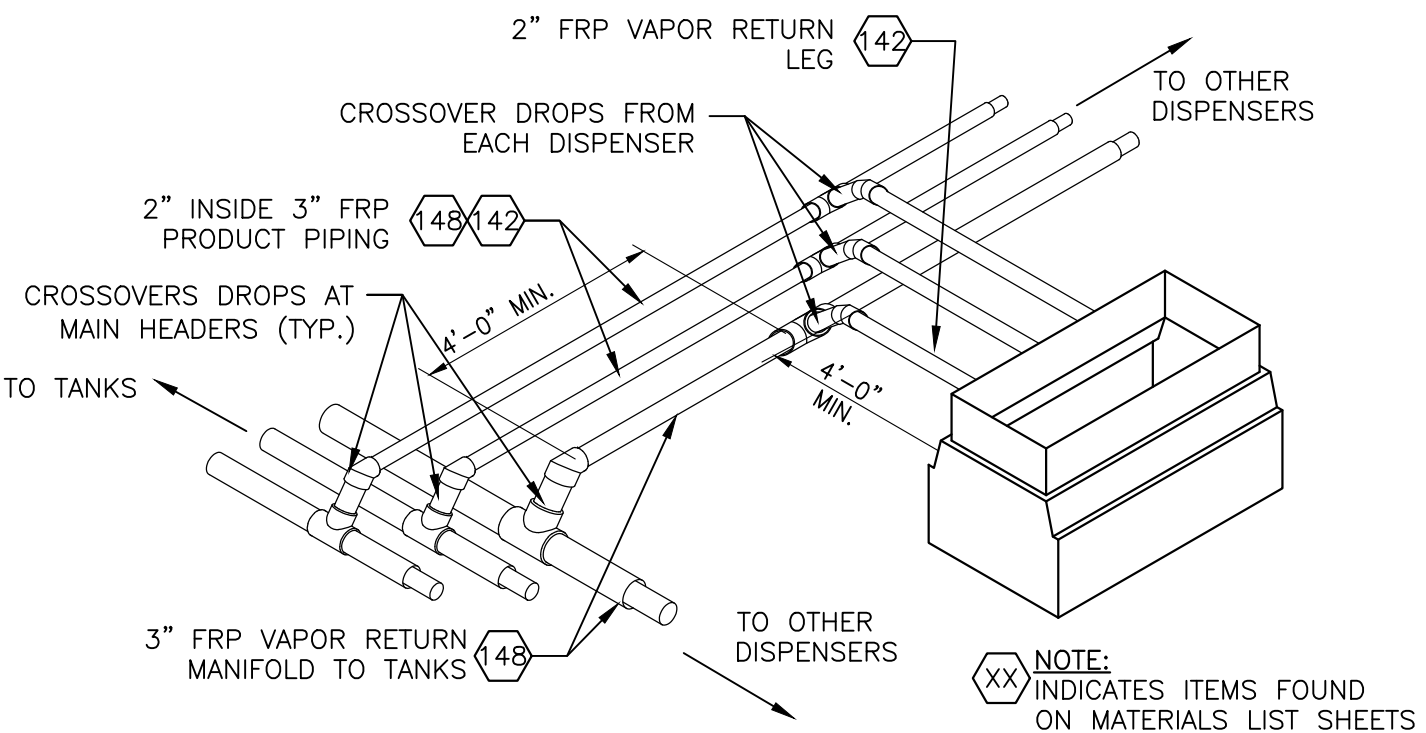
NOTE:  
FOR ILLUSTRATION PURPOSES, A BLENDING GASOLINE OPTION IS SHOWN. FOR A COMBINED DIESEL OPTION, ADDITIONAL PIPING IS REQUIRED.

NOTE:  
IN COMBINED TRENCH, MIN. 12" BETWEEN STAGE II & PRODUCT PIPING (C.L.)

XX NOTE:  
INDICATES ITEMS FOUND ON MATERIALS LIST SHEETS

DISPENSER SUMP CROSSOVER PIPING DETAIL FOR FRP

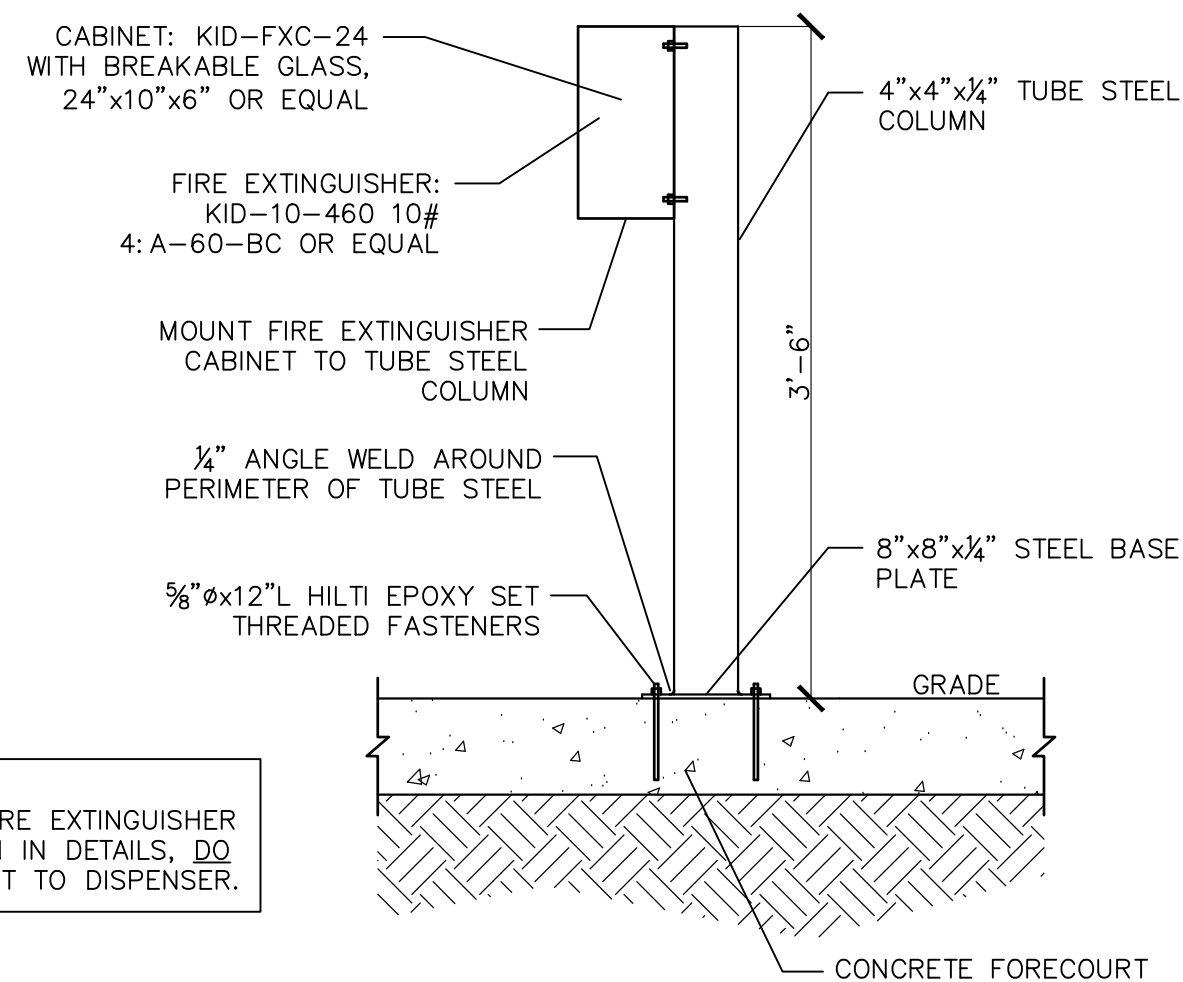
SCALE: NTS



XX NOTE:  
INDICATES ITEMS FOUND ON MATERIALS LIST SHEETS

ALTERNATE FIRE EXTINGUISHER FOR DISPENSER AREA INSTALLATION DETAILS

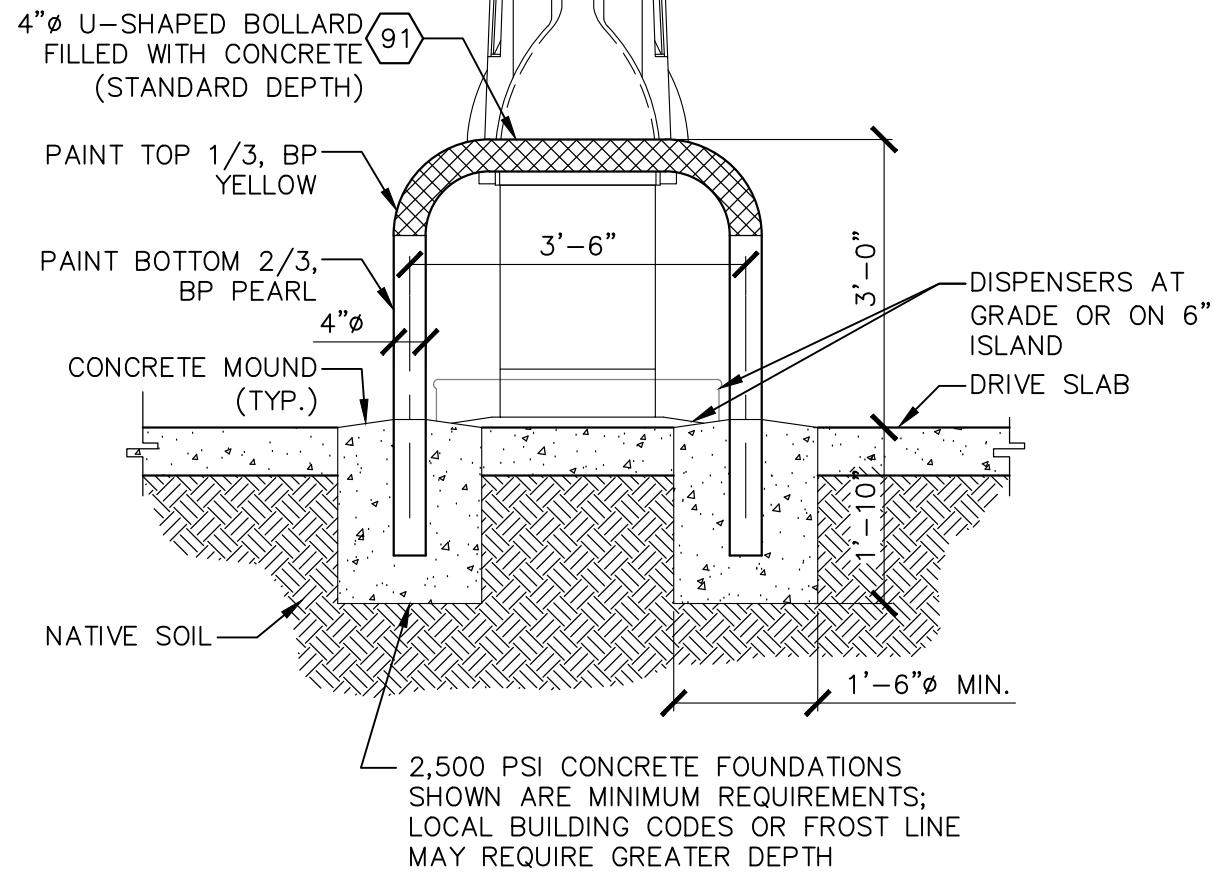
SCALE: 1" = 1'-0"



NOTE:  
INSTALL FIRE EXTINGUISHER AS SHOWN IN DETAILS, DO NOT MOUNT TO DISPENSER.

STANDARD PIPE BOLLARD DETAIL - NFPA 30/30A

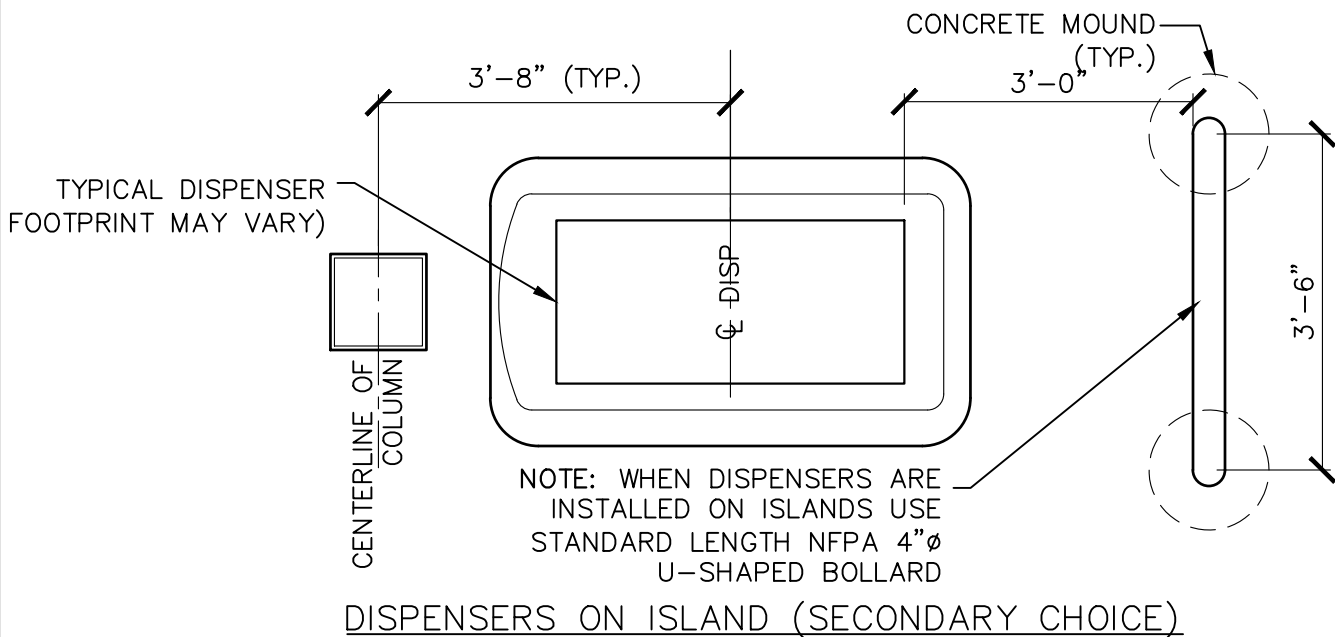
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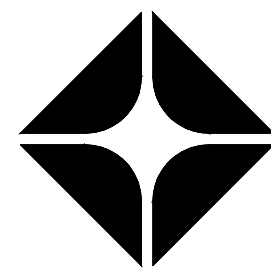
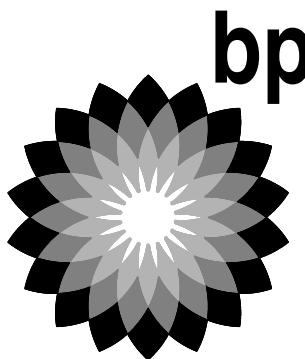
2012 NFPA 30A FIRE CODE SECTION 6.3.4 REQUIREMENTS FOR DISPENSING DEVICES:  
DISPENSING DEVICES SHALL BE MOUNTED ON A CONCRETE ISLAND OR SHALL BE OTHERWISE BE PROTECTED AGAINST COLLISION BY MEANS ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.....

NOTE:  
THIS BOLLARD AND FOUNDATION SATISFIES BOTH CONSTRAINED & NON-CONSTRAINED SOIL CONDITIONS. USE THIS DESIGN IN JURISDICTIONS THAT FOLLOW NFPA 30/30A.

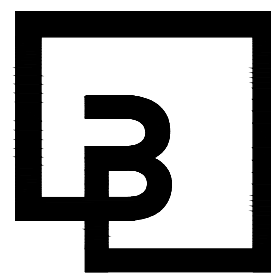
NOTE: THIS DETAIL TO BE USED WHEN DISPENSERS ARE MOUNTED ON ISLANDS AND WHEN THE DISPENSER ISLANDS ARE 6 INCHES OR MORE IN HEIGHT



CLIENT:



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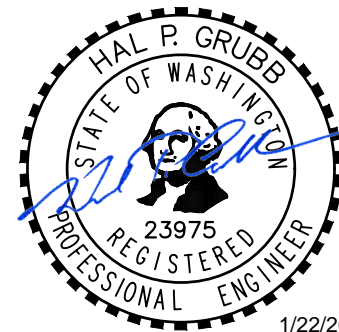


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SEAL:



PRFI20240124

DEVELOPMENT INFORMATION:

ARCO NTI  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:

SWC S MERIDIAN  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

FACILITY #TBD

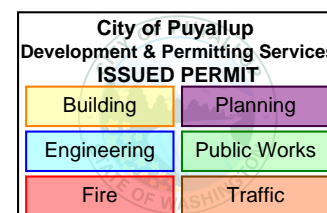
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VERSION: V-15.0	PROJECT NO:
01/01/2023	21730

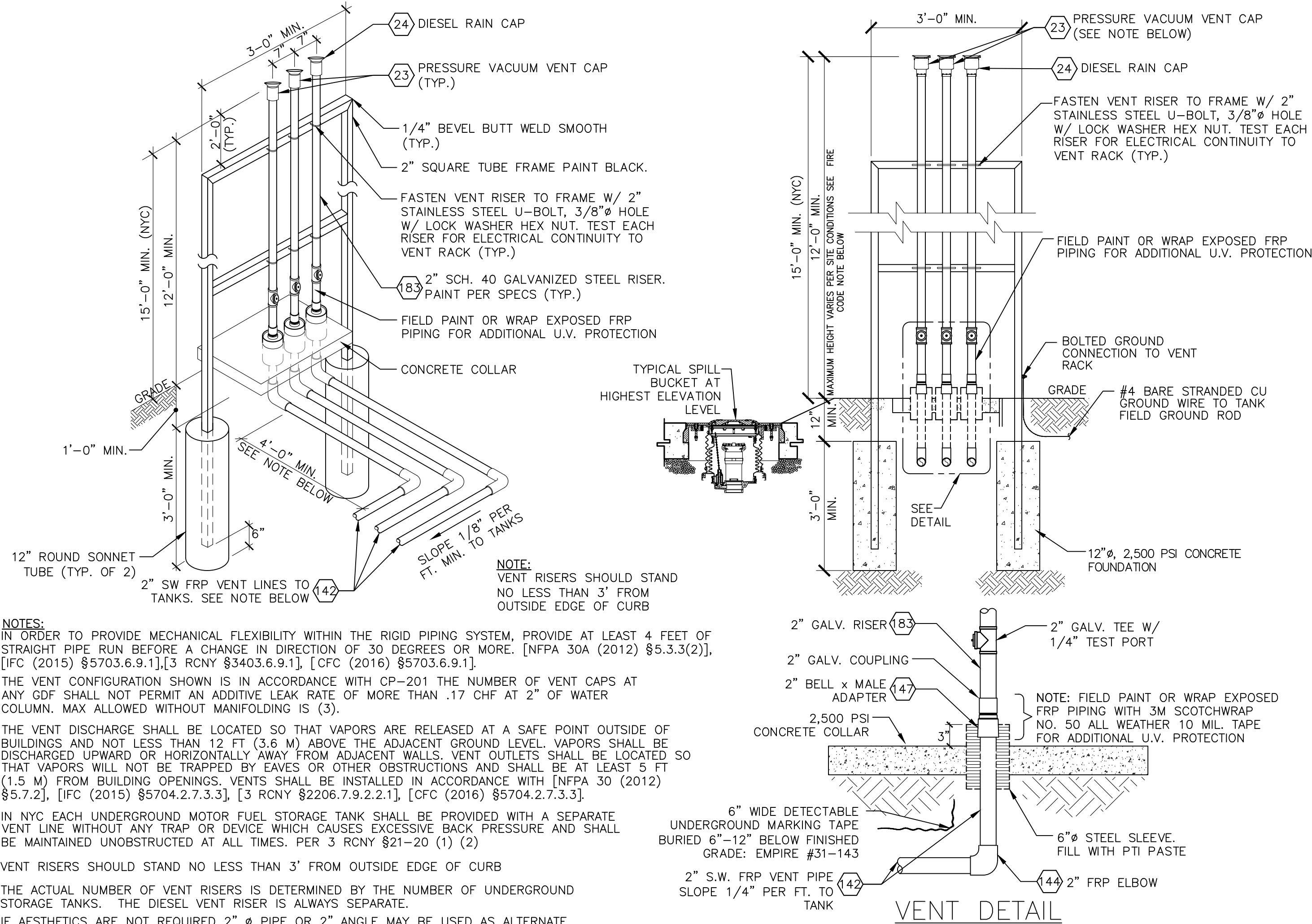
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DESIGN INTENT  
MISCELLANEOUS DETAILS

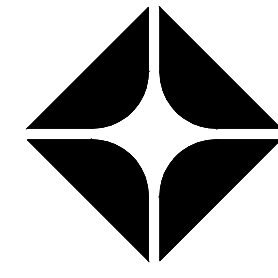
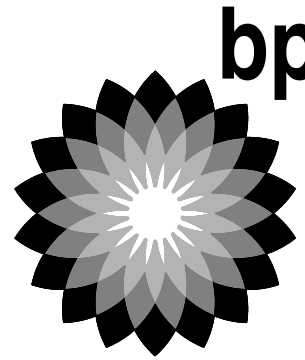
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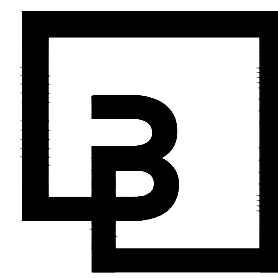




CLIENT:



BP WEST COAST PRODUCTS, LLC

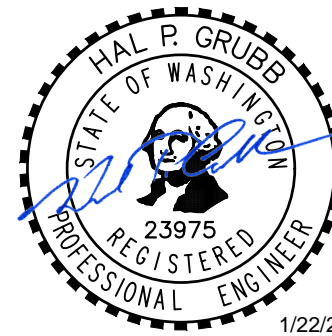


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DEVELOPMENT INFORMATION:

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**3400 am/pm**

**FUEL CANOPY w/ 6 MPD's**

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**SWC S MERIDIAN**

**@ HIGHWAY 512**

**PUYALLUP, WASHINGTON**

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DRAWN BY: NP/RF	ALLIANCE PM:
VERSION: V-15.0	PROJECT NO:
01/01/2023	21730

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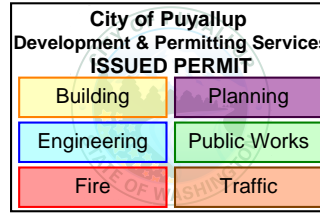
**DESIGN INTENT**

**VENT STACK**

**INSTALLATION DETAILS**

**(STANDARD)**

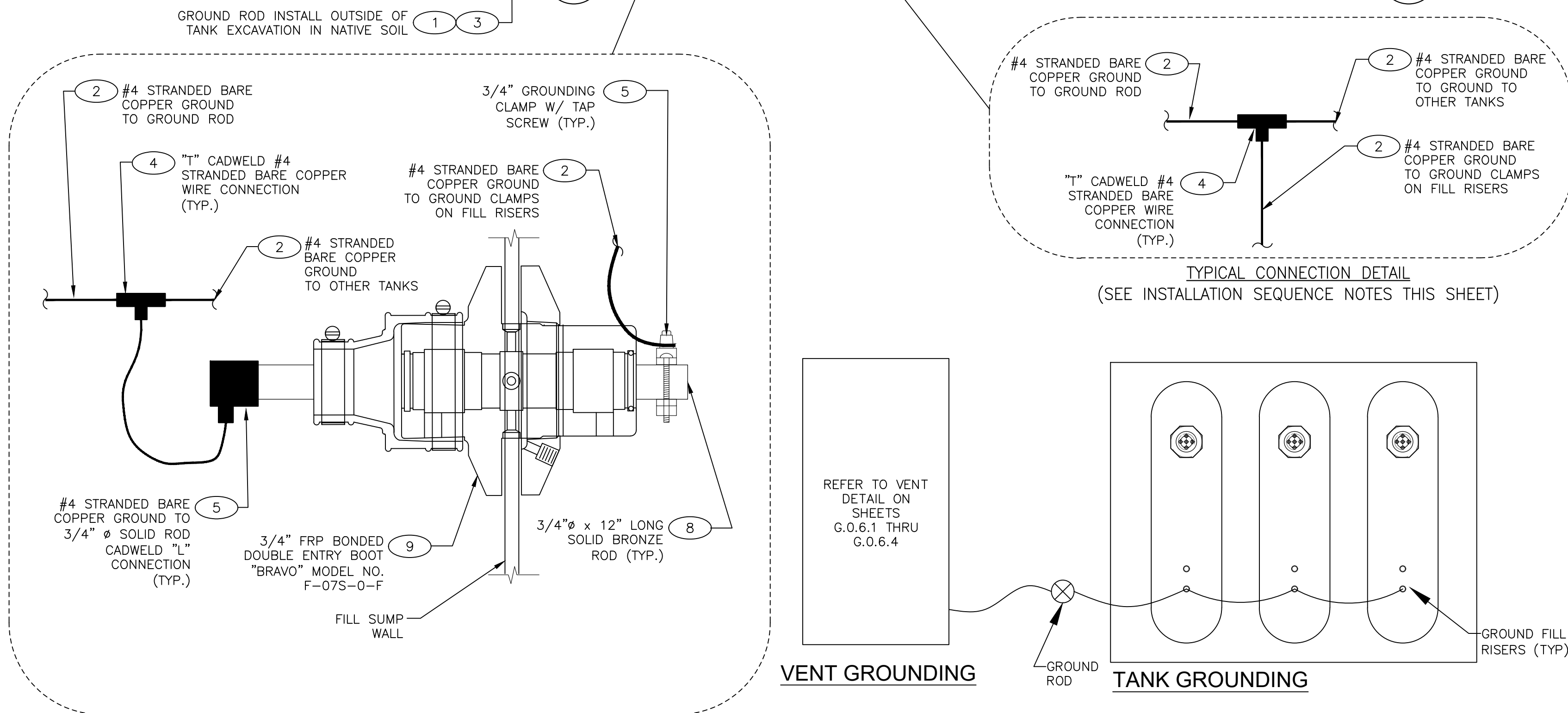
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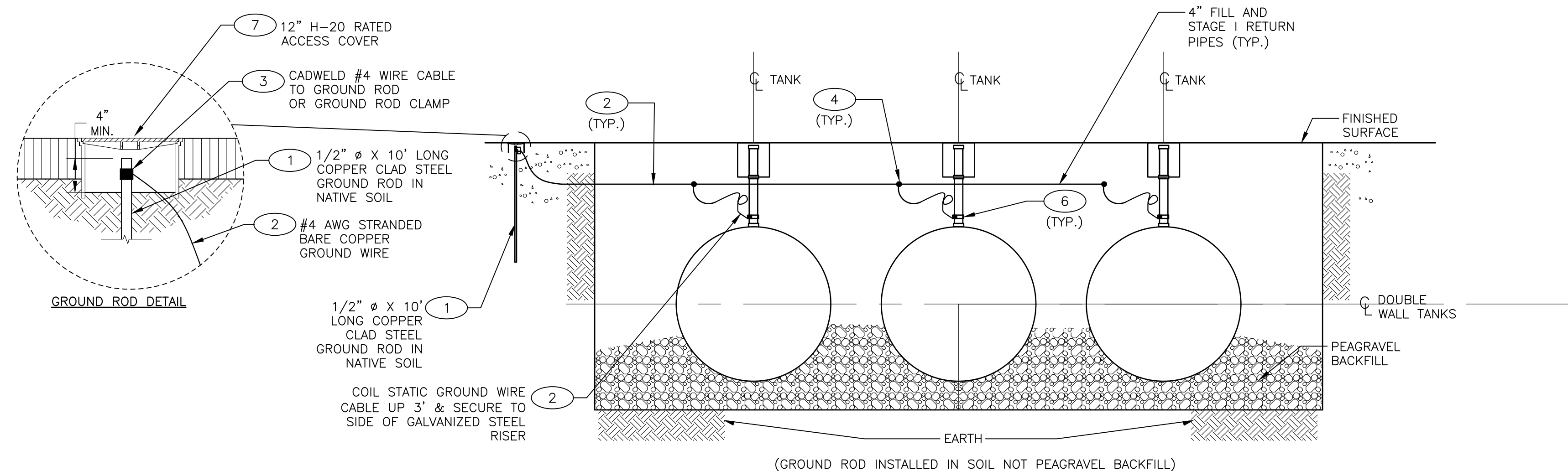
## EQUIPMENT SCHEDULE

ITEM NO.	DESCRIPTION
1	5/8" Ø X 10' LONG COPPERBONDED GROUND ROD: "ERITECH" PART NO. 615800 (UL LISTED) OR EQUIVALENT
2	#4 AWG STRANDED BARE COPPER GROUND WIRE, "ERITECH" PART NO. A809A01F100 OR EQUIVALENT
3	CADWELD #4 WIRE CABLE TO GROUND ROD CONNECTION "THERMOWELD" PART NO. M-2109 (4 WIRE CONNECTION), USE WELD METAL #65
4	CADWELD "T" CONNECTION FOR #4 BARE STRANDED WIRE CABLES. "THERMOWELD" PART NO. M-221, USE #32 WELD METAL.
5	CADWELD "CABLE TO VERTICAL STEEL" CONNECTION FOR #4 BARE STRANDED WIRE CABLES TO 4" RISER PIPE. "THERMOWELD" PART NO. M-190, USE #25CP WELD METAL.
6	4" NPT ADJUSTABLE COPPER GROUND CLAMPS, BURNDY GAR224C 4AWG GROUND CONNECTOR
7	OPW 104A-1200WT 12" H-20 RATED, BOLT DOWN WATER TIGHT ACCESS COVER (USED IN DRIVE AREAS) OPW 104A-1200 12" H-20 RATED, DRIVE LID ACCESS COVER (USED IN PLANTER AREAS)
8	3/4" DIAMETER X 12" LONG SOLID BRONZE ROD.
9	3/4" SINGLE WALL ENTRY FITTING "BRAVO" MODEL NO. F-07S-0-F ADHESIVE- EP100 2 NEEDED PER PENETRATION



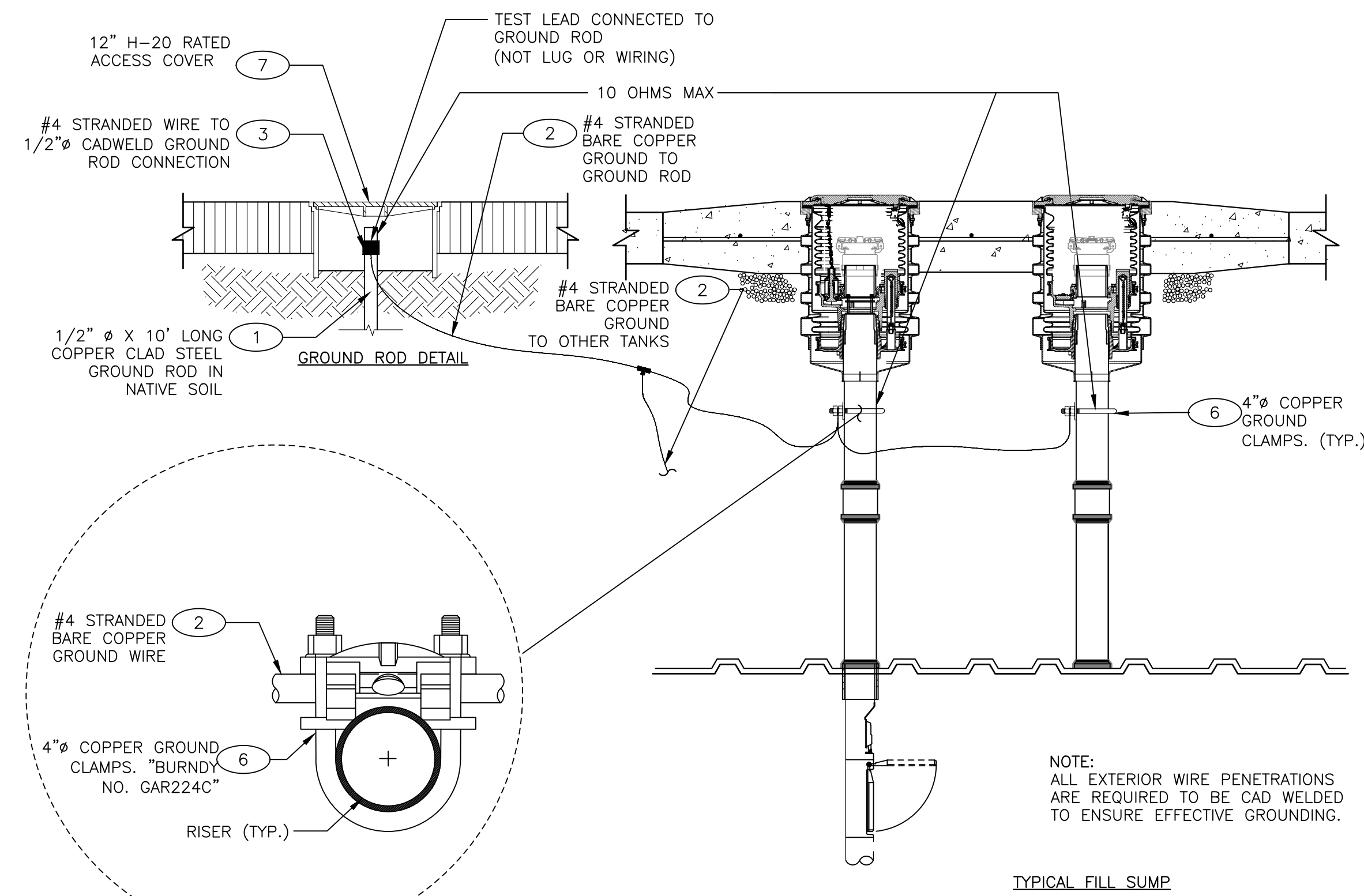
## A: STATIC GROUNDING PLAN VIEW &amp; BONDING DETAILS

SCALE: NONE



## B: STATIC GROUNDING SECTION &amp; BONDING DETAILS

SCALE: NONE



## C: TESTING EXPOSED GROUND SYSTEM &amp; BONDING DETAILS

SCALE: NONE

## GENERAL SHEET NOTES

## NOTES:

ALL STAGE I FILL AND VAPOR RISER ADAPTERS SHALL BE ELECTRICALLY GROUNDING TO PROMOTE THE RELAXATION OF STATIC CHARGE.

THE BONDING AND GROUNDING FOR STATIC ELECTRICITY PROTECTION SHALL BE IN COMPLIANCE PER ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES INCLUDING NFPA 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE, NFPA 77, RECOMMENDED PRACTICE ON STATIC ELECTRICITY, NFPA 70, NATIONAL ELECTRIC CODE, AND THE CALIFORNIA CODE OF REGULATIONS, SUBCHAPTER 15, PETROLEUM SAFETY ORDERS-REFINING, TRANSPORTATION AND HANDLING, ARTICLE 5, FIRE AND EXPLOSIONS.

PER SECTION 6.4.1.3 OF NFPA 77, THE MEASURED TOTAL RESISTANCE IN THE GROUND PATH TO EARTH SHALL BE LESS THAN 1 MEGAOHM WHICH IS CONSIDERED ADEQUATE FOR RELAXATION OF STATIC CHARGE. THE MAXIMUM ALLOWABLE GROUND PATH TO EARTH RESISTANCE FOR STATIC ELECTRICITY GROUNDING APPLICATIONS SHALL NOT EXCEED 100,000 OHMS.

PER SECTION 6.4.1.3 OF NFPA 77, THE RESISTANCE IN METALLIC BONDING AND OR GROUNDING SYSTEMS SHALL BE LESS THAN 10 OHMS. RESISTANCE HIGHER THAN 10 OHMS INDICATES INADEQUATE CONNECTIONS.

A GROUNDING SYSTEM PER NEC CODE FOR CURRENT CARRYING CONDUCTORS SHALL BE CONSIDERED MORE THAN ADEQUATE FOR A STATIC ELECTRICITY GROUNDING SYSTEM.

PER THE NFPA 30, SECTION 5-6.3.4 ALL PARTS OF THE FILL PIPE ASSEMBLY, INCLUDING THE DROP TUBE, SHALL FORM A CONTINUOUS ELECTRICALLY CONDUCTIVE PATH.

THE MINIMUM WIRE SIZE FOR BONDING AND GROUNDING SHALL BE COPPER AWG #4

A 1/2" Ø BY 10' LONG COPPER CLAD STEEL GROUND ROD SHALL BE DRIVEN INTO NATIVE SOIL ONLY. PLACING THE GROUND ROD INTO TANK PIT PEA GRAVEL SHALL NOT BE PERMITTED UNDER ANY CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR CLEARING ANY UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF THE GROUND.

THE GROUND ROD TO GROUND WIRE CONNECTION SHALL BE ACCESSIBLE THROUGH A H-20 RATED 12" DIAMETER MINIMUM ACCESS COVER TO ASSIST INSPECTION, MAINTENANCE AND TESTING. THE SCREW TYPE GROUND ROD CLAMP SHALL BE UL LISTED FOR DIRECT BURIAL.

ONE MAIN STRANDED #4 THHN CONDUCTOR SHALL BE RUN PAST EACH FILL RISER. ONE STRANDED #4 THHN CONDUCTOR SHALL BE ROUTED FROM EACH FILL AND STAGE I RISER. INSTALLATION SHALL BE AS FOLLOWS AND MUST BE COMPLETED IN ORDER NOTED AS FOLLOWS:

## OUT OF HOLE INSTALLATION SEQUENCE:

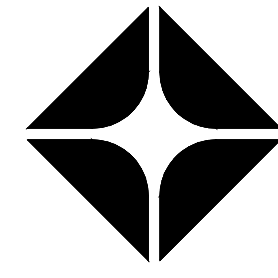
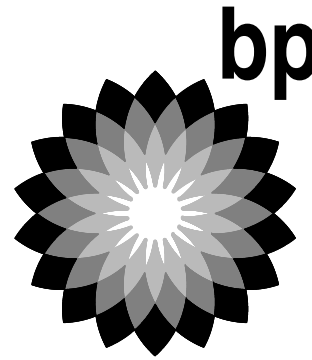
## NOTE:

ALL CAD WELDS W/ EXCEPTION OF "T" CONNECTIONS AT EACH TANK AND FINAL CAD WELD @ GROUND ROD NOTED IN SCHEDULE ON THIS SHEET MAY BE PREFABRICATED OUTSIDE THE TANK AREA AND BROUGHT TO SITE.

1. MAKE "CABLE TO PIPING STEEL SURFACE" CADWELD CONNECTION CONNECTION WITH #4 STRANDED WIRE TO EACH FILL AND STAGE I RISER OUTSIDE THE SUMP AREA. TO ASSURE A COMPLETE CONNECTION, ANY PAINT OR COATING ON THE RISER SHALL BE REMOVED PRIOR TO INSTALLATION OF THE CADWELD CONNECTION.
2. APPLY "THERMOCAP" CATHODIC PROTECTION TO EACH OF THE CADWELDS ON RISERS.
3. FOR EACH TANK RISER MAKE #4 STRANDED "T" CADWELD CONNECTIONS TO MAIN GROUND WIRE BACK TO GROUND ROD. THE CONDUCTORS SHALL HAVE 18" MINIMUM COVER. EACH TANK SHALL HAVE SEPARATE GROUND WIRE TO GROUND ROD
3. MAKE #4 STRANDED WIRE TO GROUND ROD CADWELD CONNECTION. CADWELD CONNECTION MODEL NUMBER PER NUMBER OF TANKS.

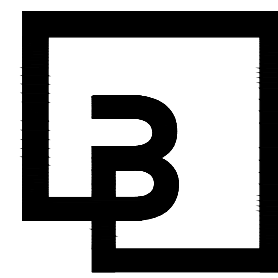
NOTE:  
ELECTRICAL CONDUIT, FUELING SYSTEM HARDWARE OR THE STATION ELECTRICAL GROUNDING SYSTEM SHALL NOT BE USED FOR GROUNDING OR BONDING FILL AND VAPOR RISERS.

CLIENT:



ARCO

BP WEST COAST PRODUCTS, LLC



Barghausen  
Consulting Engineers, Inc.

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PRFI20240124

## DEVELOPMENT INFORMATION:

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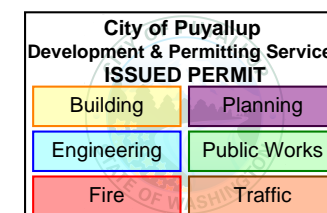
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CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

## DRAWING TITLE:

TANK FILL AND VAPOR RISER  
STATIC GROUNDING DETAIL  
(STANDARD)

## SHEET NO:

G.0.7.1

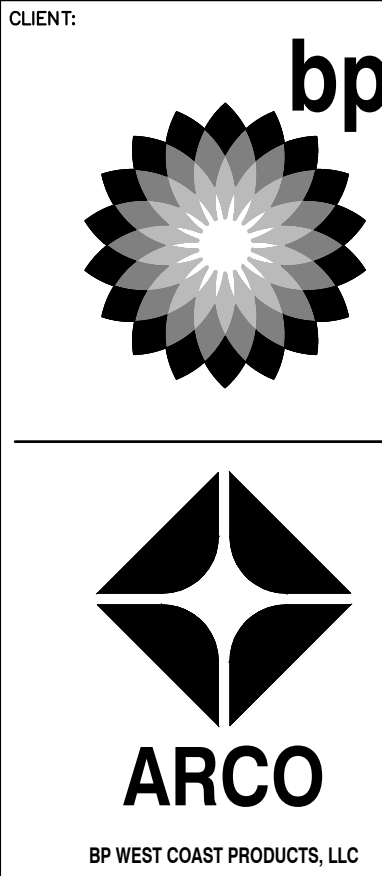


TANKS			
ITEM	BY	DESCRIPTION (BP CORE CONFIGURATIONS)	MANUFACTURER
11	BP	TANK: 12,000,10,000 GALLON, 10' DIA. NOMINAL DOUBLE WALL FIBERGLASS TANK, (w/ (2) 42" 8-SIDED TURBINE SUMPS SINGLE STP DESIGN, STEEL STRIKE PLATES AND TIE DOWN GUIDES. TANK SHALL BE UL 1316 APPROVED AND METHANOL APPROVED. (CORE DESIGN)	"CONTAINMENT SOLUTIONS" MODEL NO. DWT-6 TYPE II: (10) 12,000/10,000 GAL. w/ HYDROSTATIC RESERVOIR, w/ SINGLE WALL SUMP PKG. AS REQUIRED, w/ DEADMEN PKG. AS REQUIRED CSI-PRODUCT CODE XWDCSD303
13	BP	TANK: 25,000 GALLON, 10' DIA. NOMINAL DOUBLE WALL FIBERGLASS TANK, (w/42" 8-SIDED TURBINE SUMPS SINGLE STP DESIGN, OR 48" 8-SIDED TURBINE SUMP WITH 2 STP DESIGN w/ 22" MW), STEEL STRIKE PLATES AND TIE DOWN GUIDES. TANK SHALL BE UL 1316 APPROVED AND METHANOL APPROVED. (CORE DESIGN SIDE BY SIDE FILL)	"CONTAINMENT SOLUTIONS" MODEL NO. DWT-6 TYPE II: (10) 25,000 GALLON w/ HYDROSTATIC RESERVOIR, w/ SINGLE WALL SUMP PKG. AS REQUIRED, w/ DEADMEN PKG. AS REQUIRED CSI-PRODUCT CODE XW25SD131(42" SUMP) CSI-PRODUCT CODE XW25SD144(48" SUMP)
STAGE I EQUIPMENT - (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
19	BP	4"x4"x3"x2" EXTRACTOR CROSS FITTING W/ CAGE.	"OPW" MODEL NO. 233-4432
20	BP	4"x4"x2" EXTRACTOR TEE FITTING W/ CAGE	"OPW" MODEL NO. 233-4420
21			"OPW" MODEL NO. 723V-2203
22	BP	4" GALVANIZED RISER - LENGTH AS REQUIRED	"ANVIL" OR EQUAL
23	BP	2" PRESSURE VACUUM VENT-(GASOLINE)	"OPW" MODEL NO. 723V-2203
24	BP	DIESEL VENT CAP	"OPW" MODEL NO. 23-0033
25	G.C.	PRODUCT IDENTIFICATION MARKERS	"OPW" MODEL NO. 1TAG-1000 & 1TAG-1010 (UNLEADED) 1TAG-3000 & 1TAG-3010 (PREMIUM) 1TAG-4200 & 1TAG-4210 (ULTRA LOW DIESEL)

STAGE I EQUIPMENT - (STANDARD OPW SOLUTION)			
ITEM	BY	DESCRIPTION	MANUFACTURER
28	BP	"EDGE" DIRECT-BURY 5-GALLON REPLACEABLE DOUBLE WALL FILL SIDE SPILL BUCKET CAST IRON BASE WITH SEALABLE COVER WITH PLUG & INSTALLATION TOOL	"OPW" MODEL NO. 1C-3112P "OPW" MODEL NO. 61SA-TOOL
31	BP	FILL SWIVEL ADAPTOR - PER CARB EVR EXEC ORDER VR-102	"OPW" MODEL NO. 61SALP-1020-EVR
32	BP	PRODUCT TOP SEAL FILL CAP - PER CARB EVR EXEC ORDER VR-102	"OPW" MODEL NO. 634TT-7085-EVR
33	BP	VAPOR RECOVERY SWIVEL ADAPTOR - PER CARB EVR EXEC ORDER VR-102	"OPW" MODEL NO. 61VSA-1020-EVR
34	BP	VAPOR TOP SEAL CAP - PER CARB EVR EXEC ORDER VR-102	"OPW" MODEL NO. 1711T-7085-EVR
35	BP	4"x13' DROP TUBE W/ OVERFILL PREVENTION VALVE 4"x19.5' DROP TUBE W/ OVERFILL PREVENTION VALVE W/ JACK SCREW LOCK DOWN DEVICE W/ FACE SEAL ADAPTER (NOT NEEDED FOR "EDGE 1" SPILL BUCKETS) W/ TANK BOTTOM PROTECTOR W/ INSTALLATION TOOL - PER CARB EVR EXEC ORDER VR-102	"OPW" MODEL NO. OPW-71SQ-400C-EVR "OPW" MODEL NO. OPW-71SQ-410C-EVR "OPW" MODEL NO. 61JSK-44CB-EVR "OPW" MODEL NO. FSA-400 "OPW" MODEL NO. 6111-1400 "OPW" MODEL NO. 71SA-TOOLC
DISPENSERS			
CONTACT DRESSER WAYNE AGENT TO ENSURE THAT DISPENSERS ARE ORDERED WITH THE CORRECT PCI/TRIPLE DES POS EQUIPMENT FOR MARKET			
ITEM	BY	DESCRIPTION (BLENDEERS)	MANUFACTURER
51	BP	"OVATION" H-FRAME BLENDING MULTI-PRODUCT DISPENSER: 3-GRADE, 2-SIDED, 1 HOSE PER SIDE, w/ CARD READER. CONFIGURED AS REQUIRED FOR SITE SPECIFIC CONDITIONS AND MARKETS. FOR GASOLINE ONLY	"WAYNE" OVATION SERIES MODEL NO. B12/322XD6/K/N (3+0 GASOLINE ONLY) "X"=1 BALANCE
52	BP	"OVATION" H-FRAME BLENDING MULTI-PRODUCT DISPENSER: 4-GRADE, 2-SIDED, 2 HOSE PER SIDE, w/ CARD READER. CONFIGURED AS REQUIRED FOR SITE SPECIFIC CONDITIONS AND MARKETS. FOR GASOLINE & AUTO DIESEL	"WAYNE" OVATION SERIES MODEL NO. B23/422XD6/K/N (3+1 GASOLINE/DIESEL) "X"=1 BALANCE
EQUIPMENT SOLUTION FOR CARB LISTED ORVR "BALANCE" AREAS			
ITEM	BY	DESCRIPTION	MANUFACTURER
61	BP	G2 BLACK EVR BALANCE SYSTEM NOZZLE	"VST" MODEL # VST-EVR-NB-2
62	BP	SWIVEL (INCORPORATED INTO VST HOSE DESIGN)	
63	BP	8 FOOT ENVIRO-LOC EVR BALANCE VAPOR RECOVERY HOSE WITH VENTURI	"VST" MODEL NO. VDV-EVR-096
64	BP	BALANCE COAXIAL FUEL WHIP HOSE 12" LONG BALANCE COAXIAL FUEL WHIP HOSE 5' LONG FOR SITE USING RETRACTORS/LAZY "J" STYLE	"VST"MODEL NO. VSTA-EVR-012 "VST"MODEL NO. VSTA-EVR-060
65	BP	COAXIAL BREAKAWAY VALVE - NON REUSABLE	"VST" MODEL # VSTA-EVR-SBK
66	BP	INCLUDE SAFETY BREAKAWAY SCUFF GUARD	"VST" MODEL # VSTA-BBSG-100

EQUIPMENT SOLUTION FOR DIESEL DISPENSING (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
70	BP	DIESEL PRESSURE-SENSING AUTOMATIC PREPAY NOZZLE WITH 3/4 INCH NPT INLET 2-PIECE HAND INSULATOR ALUMINUM SPOUT AND 2-POSITION HOLD-OPEN RACK. UL 2586 LISTED. WITH NOZZLE FILLGARD SPLASH GUARD	"OPW" MODEL NO. 11B-0400-BLACK "OPW" MODEL NO. 8BL-0400-BLACK (BP/AMOCO) "OPW" MODEL NO.11B-0100-GREEN "OPW" MODEL NO. 8G-0100-GREEN (THORNTONS/ARCO)
71	BP	DIESEL 3/4 INCH MALE X 3/4 INCH FEMALE TWO PLANE SWIVEL	"OPW" MODEL NO. 241TPS-0241 (BP/AMOCO/ARCO)
72	BP	DIESEL FUEL HOSE 5/8 INCH X 8 FOOT BLACK HARDWALL HOSE 3/4 INCH MALE SWIVEL X MALE SWIVEL ENDS. UL330 AND ULC LISTED.	"SOURCE" MODEL NO. GY5/8X8MSXMS (BP/AMOCO/ARCO)
73	BP	DIESEL 5/8 INCH X 12 INCH BLACK HARDWALL WHIP HOSE 3/4 INCH MALE X MALE SWIVEL ENDS. UL330 AND ULC LISTED.	"SOURCE" MODEL NO. GY5/8X1MXMSWHIP (BP/AMOCO/ARCO)
74	BP	DIESEL 3/4 INCH RECONNECTABLE BREAKAWAY	"OPW" MODEL # 66REC-1000 (BP/AMOCO/ARCO)
75	BP	DIESEL FILTER	"CIMTEK" MODEL NO. 260-HS-10 (BP/ARCO)

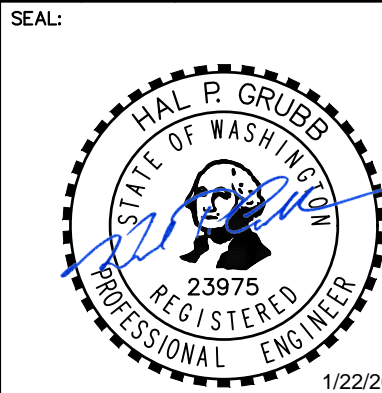
NOTE: THIS MATERIALS EQUIPMENT SCHEDULE IS NOT A COMPLETE LIST OF MATERIALS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MISCELLANEOUS EQUIPMENT, FITTINGS, MATERIALS AND DEVICES NECESSARY TO PROVIDE A COMPLETE AND OPERABLE SYSTEM. CONTRACTOR TO COORDINATE MATERIALS DELIVERY SCHEDULE AND VERIFY EQUIPMENT COUNTS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT ALL EQUIPMENT ARRIVES AT SITE IN UNDAMAGED CONDITION.





**Barghausen Consulting Engineers, Inc.**  
  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
1	10/04/23	PERMIT RELEASE
2	01/22/24	PERMIT RELEASE
3		
4		
5		
6		
7		
8		
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10		
11		
12		



PRFI20240124

DEVELOPMENT INFORMATION:

ARCO NTI

3400 am/pm

FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:

SWC S MERIDIAN

@ HIGHWAY 512

PUYALLUP, WASHINGTON

FACILITY #TBD

DESIGNED BY: NP/RF

ALLIANCE ZONE:

CHECKED BY: OV

BP REPM:

DRAWN BY: NP/RF

ALLIANCE PM:

VERSION: V-15.0

PROJECT NO: 21730

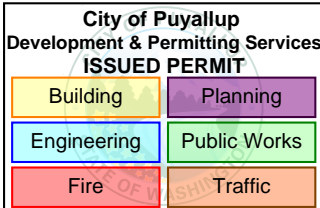
01/01/2023

DRAWING TITLE:

TANK AND PIPING MATERIALS LIST

(1 OF 2)

SHEET NO:



M.5.1.01


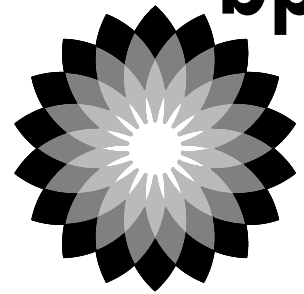
OTHER EQUIPMENT AT DISPENSERS (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
81	BP	1-1/2" PRODUCT IMPACT VALVE DOUBLE POPPET W/ FUSIBLE LINK W/ U-BOLT INSTALLATION KIT	"OPW" MODEL NO. OPW-10P-0152 "OPW" MODEL NO. OPW-10P-0152EB5
82	BP	VAPOR RECOVERY IMPACT VALVE (TOP ENTRY)	"OPW" MODEL NO. 60 VSP-1001
83		(NOT USED)	
84	BP	UNDER DISPENSER SPILL CONTAINMENT SUMP FOR "WAYNE OVATION" GASOLINE DISPENSERS (SINGLE WALL FRP) (CONTRACTOR TO PLUMB ALL FITTINGS) – SHEAR VALVE PLATES INCLUDED AND STABILIZER BRACKET	"BRAVO" MODEL # B9250-S36 "BRAVO" MODEL # BK-8000
85		(NOT USED)	
86		(NOT USED)	
87		(NOT USED)	
88		(NOT USED)	
89		(NOT USED)	
90		ISLAND FORM FOR H-FRAME DISPENSERS (NOTE ISLAND FORMS USED ONLY WHERE REQUIRED BY LOCAL JURISDICTION) 5'-0"x3'-0" (STANDARD) 7'-6"x3'-0" (FOR COLUMN WRAP) (REFER TO SPECIFIC MARKET REQUIREMENTS W/ BP PM BEFORE ORDERING)	"OPW" OR EQUAL BP ISLAND FORM
91	BP	42"x84"x4" SCH. 40 DISPENSER ISLAND TRAFFIC BOLLARD W/SIGN MOUNTS (OR) 42"x104"x4" SCH. 40 DISPENSER ISLAND TRAFFIC BOLLARD W/SIGN MOUNTS (OR) 72"x6" SCH. 40 STRAIGHT PIPE BOLLARD (CA ISLANDLESS SOLUTION ONLY)	"RIVERSIDE STEEL" OR EQUAL BP TRAFFIC BOLLARD
MANHOLES (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
101	BP	12" DIA. ROUND MONITORING MANHOLE, WATER TIGHT AND TRAFFIC RATED WITH IDENTIFICATION TRIANGLE	"OPW" MODEL NO. 104AOW-1200 (BOLT DOWN & WATER TIGHT)
102	BP	18" DIA. ROUND MANHOLE, BOLT DOWN, WATER TIGHT AND TRAFFIC RATED	"OPW" 104A-1800WT (BOLT DOWN & WATER TIGHT)
103	BP	42"/45" DIA. ROUND COMPOSITE MANHOLE, WATER TIGHT GASKET, TRAFFIC RATED W/ STICK LIFT KEY PLATE & STICK LIFT ASSEMBLY (AT DUAL TURBINES ONLY)	"EBW" MODEL NO. 78144313GRY W/ SLIDE ACTION HANDLE (1 ONLY PER SITE)
104	BP	40" COMPOSITE MANHOLEWATER TIGHT GASKET, TRAFFIC RATED W/ STICK LIFT KEY PLATE & STICK LIFT ASSEMBLY (AT TURBINES)	"FIBRELITE" 40" HEAVY DUTY FLAT SEALED COMPOSITE COVER WITH COMPOSITE FRAME MODEL # FL100GRAY-HD-SK12 W/LIFTING HANDLE MODEL # FL7A (1 ONLY PER SITE) OR "EBW" MODEL # 781-485-12GRY W/ SLIDE ACTION HANDLE (1 ONLY PER SITE)
TURBINES (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
105	BP	VARIABLE SPEED SUBMERSIBLE TURBINE PUMPS -2 H.P. W/O PISTON LEAK DETECTION, W/ MAGVFC CONTROLLER PANEL 208/230V, W/ 26" RISER, W/ "R" CHECK VALVE  ADVANCED PROTECTION E-COATED FINISHED 2 H.P. VARIABLE SPEED "AG" PUMPS, SUITABLE FOR ALL DIESEL BLENDS AND ALL ETHANOL BLENDS 3/4 H.P. VARIABLE SPEED SUBMERSIBLE TURBINE FOR SINGLE DISPENSER USE	GASOLINE MODELS "FE PETRO" MODEL NO. FE-IST-2R (89" TO 151") "FE PETRO" MODEL NO. FE-IST-3R (121" TO 214") DIESEL AND FLEXFUEL MODELS "FE PETRO" MODEL NO. FE-IST-AP-2R (89" TO 151") "FE PETRO" MODEL NO. FE-IST-AP-3R (121" TO 214") "FE PETRO" MODEL NO. FE-STP-AP-75-W2-R (89" TO 151")
106		(NOT USED)	
107	BP	SIPHON CHECK VALVE FOR TURBINE PUMP (ALL TURBINES)	"FE PETRO" MODEL NO. 400137908
108	BP	65 PSI CHECK VALVE (FOR SLAVE TURBINE ONLY)	"FE PETRO" MODEL NO. 402459931
109		(NOT USED)	
MISCELLANEOUS TRANSITION SUMPS			
ITEM	BY	DESCRIPTION	MANUFACTURER
111		(NOT USED)	
112	BP	VENT TRANSITION CONTAINMENT SUMP AND VENT RACK (SINGLE WALL FRP) (CONTRACTOR TO PLUMB ALL FITTINGS)	"BRAVO" MODEL NO. B501-S-222 (3 RISERS) "BRAVO" MODEL NO. B501-S-22220(4 RISERS) ORDER W/ RS-501 SUPPORT RACK (3 RISER) ORDER W/ RS-503 SUPPORT RACK (4 RISER)
PENETRATION FITTINGS (ALL AREAS - DESIGNER TO CONFIRM WITH BP PM FITTINGS TO BE USED)			
120	BP	1" CONDUIT ENTRY FITTING	"BRAVO" MODEL NO. F-10S-0-F WITH EP100 ADHESIVE AS NEEDED
121	BP	2" SINGLE WALL FRP BONDED PENETRATION FITTING (SW FRP PIPING)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL NO. 012020-622-0
122	BP	3" SINGLE WALL FRP BONDED PENETRATION FITTING (SW FRP PIPING)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL NO. 012030-622-0
123	BP	4" SINGLE WALL FRP BONDED PENETRATION FITTING (SW FRP PIPING ONLY WHEN REQUIRED)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL NO. 012040-622-0
124			
125	BP	3/4" ENTRY FITTING – STANDARD VERSION FOR GROUNDING PENETRATION	"BRAVO" MODEL NO. F-07S-0-F WITH EP100 ADHESIVE AS NEEDED
126	BP	3" DOUBLE WALL FRP BONDED FITTING (USED FOR 3" OVER 2" DW PIPING)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL NO. 012030-622-0
127	BP	4"x3" CONCENTRIC REDUCER (SECONDARY) (USED FOR 3" OVER 2" DW PIPING)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL NO. #012040-238-3
128	BP	4" DOUBLE WALL FRP BONDED PENETRATION FITTING (USED FOR 4" OVER 3" DW PIPING)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL NO. 012040-626-0
129	BP	5"x4" CENCENTRIC REDUCER (SECONDARY) (USED FOR 4" OVER 3" DW PIPING)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012050-238-3
FIBERGLASS PIPING AND FITTINGS (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
130		(NOT USED)	
131		(NOT USED)	
132		(NOT USED)	
133		(NOT USED)	

135		(NOT USED)	
136	G.C.	6" (SECONDARY) FIBERGLASS PIPE, 22'-25' LENGTH & GLUE KITS	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #011060-120-4
137	G.C.	6" COUPLING (SECONDARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012060-101-9
138	G.C.	6" 90 DEGREE ELBOW (SECONDARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012060-360-9
139	G.C.	6" 45 DEGREE ELBOW (SECONDARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012060-310-9
140	G.C.	4" BELL X MALE THREADED ADAPTER	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #002040-191-7
141	G.C.	4" X 6" CONCENTRIC REDUCER 4" X 6" CONCENTRIC REDUCER (WITH TEST PORT)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012060-235-9 #012060-234-7
142	G.C.	2" (PRIMARY) FIBERGLASS PIPE, 22'-25' LENGTH & GLUE KITS	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #011020-069-2
143	G.C.	2" COUPLING (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012020-101-8
144	G.C.	2" 90 DEGREE ELBOW (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012020-360-4
145	G.C.	2" 45 DEGREE ELBOW (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012020-310-4
146	G.C.	2" TEE (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #120020-410-4
147	G.C.	2" THREADED ADAPTER BELL x MALE FRP	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012020-191-4
148	G.C.	3" (PRIMARY) FIBERGLASS PIPE, 22'-25' LENGTH & GLUE KITS 3" (SECONDARY) FIBERGLASS PIPE, 22'-25' LENGTH & GLUE KITS	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A PRIMARY MODEL #011030-069-2 SECONDARY MODEL #011030-069-5
149	G.C.	3" COUPLING (PRIMARY) 3" COUPLING (SECONDARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A PRIMARY MODEL #012030-101-8 SECONDARY MODEL #012030-101-9
150	G.C.	3" 90 DEGREE ELBOW (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012030-360-4
151	G.C.	3" 45 DEGREE ELBOW (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012030-310-4
152	G.C.	3" TEE (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #120030-410-4
153	G.C.	3" THREADED ADAPTER BELL x MALE FRP	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012030-191-4
154	G.C.	3" 90 DEGREE ELBOW (SECONDARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012030-360-3
155	G.C.	3" 45 DEGREE ELBOW (SECONDARY FLAT) 3" 45 DEGREE ELBOW (SECONDARY CROSSOVER)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A FLAT MODEL #012030-310-3 CROSSOVER MODEL #012030-311-3
156	G.C.	3" TEE (SECONDARY FLAT) 3" TEE (SECONDARY CROSSOVER)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A FLAT MODEL #120030-410-3 CROSSOVER MODEL #120030-411-3
157	G.C.	4" (SECONDARY) FIBERGLASS PIPE, 22'-25' LENGTH & GLUE KITS 4" (PRIMARY) FIBERGLASS PIPE, 22'-25' LENGTH & GLUE KITS	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #011040-069-5 MODEL #011040-069-2
158	G.C.	4" COUPLING (SECONDARY) 4" COUPLING (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012040-101-3 MODEL #012040-101-4
159	G.C.	4" 90 DEGREE ELBOW (SECONDARY) 4" 90 DEGREE ELBOW (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012040-360-3 MODEL #012040-360-4
160	G.C.	4" 45 DEGREE ELBOW (SECONDARY FLAT) 4" 45 DEGREE ELBOW (SECONDARY CROSSOVER)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A FLAT MODEL #012040-310-3 CROSSOVER MODEL #012040-311-3 MODEL #012040-301-4
161	G.C.	4" TEE (SECONDARY FLAT) 4" TEE (SECONDARY CROSSOVER)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A FLAT MODEL #120040-410-3 CROSSOVER MODEL #120040-411-3
162	G.C.	4"x3" CONCENTRIC REDUCER (SECONDARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012040-238-3
163	G.C.	2" CAP	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A MODEL #012020-180-4
164	G.C.	3"x2" REDUCER BUSHING (PRIMARY) 2"x1-1/2" FEMALE NPT REDUCER BUSHING (PRIMARY)	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A 3x2 MODEL #012030-231-4 2x1.5 MODEL #012020-231-4
165	G.C.	ADDITIONAL SIMILAR FRP FITTING TYPES MAY BE REQUIRED AND SHALL BE PROVIDED BY THE CONTRACTOR.	"NOV FIBERGLASS SYSTEMS" RED THREAD 11A
MISCELLANEOUS EQUIPMENT (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
166	GC	4" DIA. PIPE 7'-0" LG. MAX. WITH 4" NPT BELL X MALE ADAPTER (FOR HYDROSTATIC TANK MONITOR)	4" SINGLE WALL FRP "NOV FIBERGLASS SYSTEMS" RED THREAD 11A
167	BP	1-1/2" BALL VALVE-FULL PORT (IF REQUIRED)	"JOMAR" MODEL NO. 100-707
168	BP	2" BALL VALVE-FULL PORT (FOR TURBINE PRODUCT LINES) 2" STAINLESS STEEL BALL VALVE FOR E-85 FUEL, FULL PORT (FOR TURBINE PRODUCT LINES E-85 APPLICATIONS ONLY)	"JOMAR" MODEL NO. 100-708 "JOMAR" MODEL NO. 100-968
169	BP	3" BALL VALVE-FULL PORT (FOR SIPHON LINE IF USED)	"JOMAR" MODEL NO. 100-710
171	BP	1-1/2"x12" LONG FLEX CONNECTOR – MALE x MALE SWIVEL	"HOSE MASTER" MODEL # FSMS120150 (U.L. LISTED)
172	BP	1-1/2"x18" LONG FLEX CONNECTOR – MALE x MALE SWIVEL	"HOSE MASTER" MODEL # FSMS180150 (U.L. LISTED)
173	BP	2"x12" LONG FLEX CONNECTOR – 2" FEMALE x MALE SWIVEL	"HOSE MASTER" MODEL # FSFS120200 (U.L. LISTED)
174	BP	2"x18" LONG FLEX CONNECTOR – 2" FEMALE x MALE SWIVEL	"HOSE MASTER" MODEL # FSFS180200 (U.L. LISTED)
175	BP	2"x24" LONG FLEX CONNECTOR – 2" FEMALE x MALE SWIVEL	"HOSE MASTER" MODEL # FSFS240200 (U.L. LISTED)
176	BP	3"x18" LONG FLEX CONNECTOR – 3" MALE x 3" UNION (AT STAGE II VAPOR)	"HOSE MASTER" MODEL # FSMU180300 (U.L. LISTED)
177		(NOT USED)	
178	BP	6" LOCKING TEST WELL PLUG	"EBW" MODEL NO. 772-109-01
179	BP	6" FACTORY SLOTTED PVC-1 PIPE, 0.02 SLOTS OR AS REQUIRED FOR LOCAL REGULATIONS W/ CAPPED BOTTOM (LENGTH AS REQUIRED)	"ATLANTIC SCREEN" OR EQUAL
180	G.C.	6" PVC COUPLER. PRESS FIT WITH NO SOLVENT GLUES	BY G.C.
181	G.C.	6" SCH 40 SOLID PVC PIPING	BY G.C.
182	G.C.	4" NPT x 3" NPT DOUBLE TAP BUSHING-PLATED CAST IRON (SIPHON STINGERS)	"OPW" MODEL NO. 53-0038
183	G.C.	1-1/2" OR 2" OR 3" GALVANIZED STEEL PIPE	"ANVIL" OR EQUAL
184	G.C.	1-1/2" OR 2" OR 3" 90° OR 45° GALVANIZED STEEL ELBOW	"ANVIL" OR EQUAL
185	G.C.	1-1/2" OR 2" OR 3" GALVANIZED STEEL PIPE TEE	"ANVIL" OR EQUAL

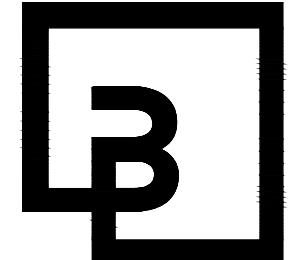
186	G.C.	1-1/2" OR 2" OR 3" GALVANIZED STEEL PIPE UNION	"ANVIL" OR EQUAL
187	G.C.	1" RIGID CONDUIT	BY G.C.
188	G.C.	J-BOX "NEMA" 3R 4X4 OR 16" SQ.	"CROUSE HINDS" GUP215
189	G.C.	J-BOX EXP. PROOF	"CROUSE HINDS" 1" GUA SERIES
190	G.C.	(NOT USED)	
191	G.C.	SEAL OFF W/ DRAIN	"CROUSE HINDS" 1" EYS3 (VERTICAL) OR EYS31 (VERTICAL OR HORIZONTAL) W/ ECD15 UNIVERSAL DRAIN
192	G.C.	SEAL OFF	"CROUSE HINDS" 1" EYS3 (VERTICAL) OR EYS31 (VERTICAL OR HORIZONTAL)
VEEDER ROOT EQUIPMENT (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
200	BP	TLS-450 PLUS ENVIRONMENTAL & INVENTORY MANAGEMENT SYSTEM WITH INTEGRAL PRINTER (W/ ALL REQUIRED SENSOR MODULES REQUIREMENTS, DIM MODULE, RS232 PORT, V-27 SOFTWARE)	"VEEDER-ROOT" MODEL NO. 860091-302
201	BP	MAG SUMP LIQUID SENSOR, 12" MODEL, DISCRIMINATING, POSITION SENSITIVE (FOR ALL CORE AND NYC EAST OF ROCKIES – ALL SUMPS)	"VEEDER-ROOT" MODEL NO. 857080-111
202	BP	SUMP LIQUID SENSOR, POSITION SENSITIVE (FOR ALL CORE AND CA LOCATIONS WEST OF ROCKIES – ALL SUMPS)	"VEEDER-ROOT" MODEL NO. 794380-208 (PREFERRED) "VEEDER-ROOT" MODEL NO. 794380-323
203	BP	HYDROSTATIC SENSOR-DUAL FLOAT (ALL LOCATIONS) (INCLUDES 4" RISER PIPE CAP MODEL 329892-002)	"VEEDER-ROOT" MODEL NO. 794380-303
204	BP	TANK LEVEL 8" MAGNETOISTRICTIVE PROBE-0.1 GPH (USE 4" FLOAT IN KIT) TANK LEVEL 10" MAGNETOISTRICTIVE PROBE-0.1 GPH (USE 4" FLOAT IN KIT) TANK LEVEL 11" MAGNETOISTRICTIVE PROBE-0.1 GPH (USE WITH 10" W/ MANWAY) (ALCOHOL COMPATIBLE)	"VEEDER-ROOT" MODEL NO. VR-846397-107 "VEEDER-ROOT" MODEL NO. VR-846397-109 "VEEDER-ROOT" MODEL NO. VR-846397-111 "VEEDER-ROOT" MODEL NO. VR-846397-407 "VEEDER-ROOT" MODEL NO. VR-846397-409 "VEEDER-ROOT" MODEL NO. VR-846397-410
205	BP	2" FLOAT PROBE KIT (GASOLINE) (ONLY WHEN ATG BUNG NOT ON CENTER OF TANK) 4" FLOAT PROBE KIT W/ WATER/PHASE DETECTION FOR TANK LEVEL PROBE (GASOLINE)	"VEEDER-ROOT" MODEL NO. VR-846400-100 "VEEDER-ROOT" MODEL NO. VR-886100-011
206	BP	2" FLOAT PROBE KIT (DIESEL) (ONLY WHEN ATG BUNG NOT ON CENTER OF TANK) 4" FLOAT PROBE INSTALL KIT FOR TANK LEVEL PROBE (DIESEL)	"VEEDER-ROOT" MODEL NO. VR-846400-111 "VEEDER-ROOT" MODEL NO. VR-846400-011
207	BP	4" FLOAT PROBE INSTALL KIT FOR TANK LEVEL PROBE (ALCOHOL COMPATIBLE) TANK GAUGE PORT CAP AND RING KIT PER CARB EVR EXEC ORDER VR-101 & VR-102	"VEEDER-ROOT" MODEL NO. VR-846400-004 "VEEDER ROOT" MODEL NO. VR-312020-952
208	BP	DIGITAL 3 GPH PRESSURE LINE LEAK DETECTION AT TURBINES	"VEEDER-ROOT" MODEL NO. 859080-001
209	BP	OVERFILL ALARM WITH HORN/STROBE 120VAC	"VEEDER-ROOT" MODEL NO. 790091-001
210	BP	ACKNOWLEDGEMENT SWITCH	"VEEDER-ROOT" MODEL NO. 790095-001
211	BP	MANIFOLD SIPHON BREAK VALVE KIT	"VEEDER-ROOT" MODEL NO. 330020-031
212			
213			
214		(NOT USED)	
215		(NOT USED)	
216		(NOT USED)	
217		(NOT USED)	
MATERIAL LIST AT BUILDING (ALL AREAS)			
ITEM	BY	DESCRIPTION	MANUFACTURER
220	BP	ELECTRICAL POWER AND CONTROL CABINET "EPC" PREFABRICATED WITH ALL ELECTRICAL PANELS, BREAKERS, TURBINE CONTROLLERS, ISOLATION RELAYS, DISPENSER LOW VOLTAGE DISCONNECT (DATA/CRIND/INTERCOM/ETHERNET) AND FIELD WIRING TERMINAL BLOCKS. SITE SPECIFIC CONFIGURATION PROVIDED AND U.L. LISTED FOR THIS APPLICATION.	"PER BP REQUIREMENTS" (SUPPLIED DIRECTLY TO SITE)
221	BP	POWER CONDITIONER	"ONEAC" MODEL NO. CB1115 OR EQUAL W/ HARD WIRE PART #011-002
223	BP	VERIFONE SITE COMMANDER SITE CONTROLLER	"VERIFONE" COMMANDER SITE CONTROLLER
224	BP	TOKHEIM INTERCONNECT/ISOLATION MODULE FOR PIC UNITS (ARCO BRANDED SITES ONLY)	"TOKHEIM" SAM PIC INTERFACE UNIT (SUPPLIED DIRECTLY FROM TOKHEIM)
225	BP	TOKHEIM SAM CONTROLLER BOX FOR PIC UNITS (ARCO BRANDED SITES ONLY)	"TOKHEIM" SAM CONTROLLER BOX (SUPPLIED DIRECTLY FROM TOKHEIM)
228	BP	POS MODULE (POINT OF SALE)	POS SYSTEM BP CONFIGURATION (SOFTWARE SUPPLIED DIRECTLY FROM MANUFACTURER)
229	BP	INTERCOM TO DISPENSERS (CONSOLE MOUNTED AT SALES COUNTER)	"3M" INTERCOM MASTER MODEL # 3M-D-120 (12 CHANNEL) DISPENSER MOUNTED SPEAKERS BY DISP. MANF.
230	BP	EMERGENCY PUMP SHUT OFF SWITCH (INDOOR/OUTDOOR)	"SQUARE D" CLASS 9001 KR3RH6 PUSH-BUTTON N.C. WITH BOX AND COVER. (FOR OUTDOOR NEMA 3R ENCLOSURE REQUIRED) (OR EQUAL)
231	BP	EMERGENCY PUMP SHUT OFF RESET SWITCH (INDOOR AT SALES COUNTER)	"SQUARE D" CLASS 9001 KR3RH5 PUSH-BUTTON N.C. WITH BOX AND COVER. (FOR OUTDOOR NEMA 3R ENCLOSURE REQUIRED) (OR EQUAL)
232	G.C.	MAINTENANCE RECEPTACLE	"HUBBELL" SPECIFICATION GRADE RECEPTACLE GFCI IN WEATHERPROOF COVER

NOTE: THIS MATERIALS EQUIPMENT SCHEDULE IS NOT A COMPLETE LIST OF MATERIALS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MISCELLANEOUS EQUIPMENT, FITTINGS, MATERIALS AND DEVICES NECESSARY TO PROVIDE A COMPLETE AND OPERABLE SYSTEM. CONTRACTOR TO COORDINATE MATERIALS DELIVERY SCHEDULE AND VERIFY EQUIPMENT COUNTS. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT ALL EQUIPMENT ARRIVES AT SITE IN UNDAMAGED CONDITION.

CLIENT:

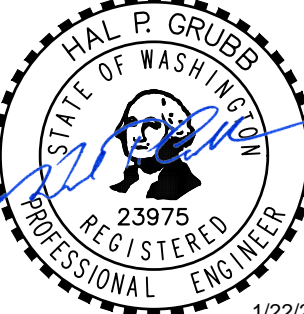


BP WEST COAST PRODUCTS, LLC



**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION	DESCRIPTION
△	10/04/23	PERMIT	RELEASE
△	01/22/24	PERMIT	RELEASE
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SEAL:  


PRFI20240124

DEVELOPMENT INFORMATION:

**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:

**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

FACILITY #TBD

DESIGNED BY: **NP/RF** ALLIANCE ZADME:  
CHECKED BY: **OV** BP REPM:  
DRAWN BY: **NP/RF** ALLIANCE PM:  
VERSION: **V-15.0** PROJECT NO.:  
**01/01/2023** **21730**

DRAWING TITLE:  
**TANK AND PIPING MATERIALS LIST (2 OF 2)**  
**TLS-450**

SHEET NO:

**M.5.1.02**

City of Puyallup  
Development & Permitting Services  
ISSUED PERMIT

Building

Planning

Engineering

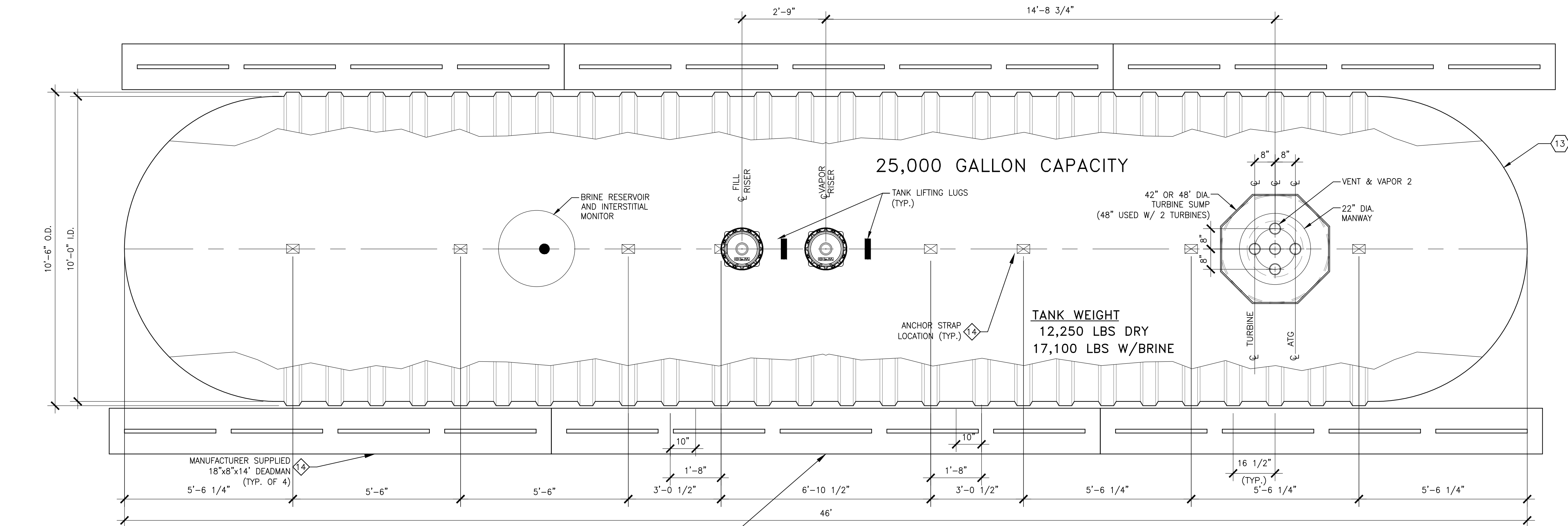
Public Works

Fire

Traffic

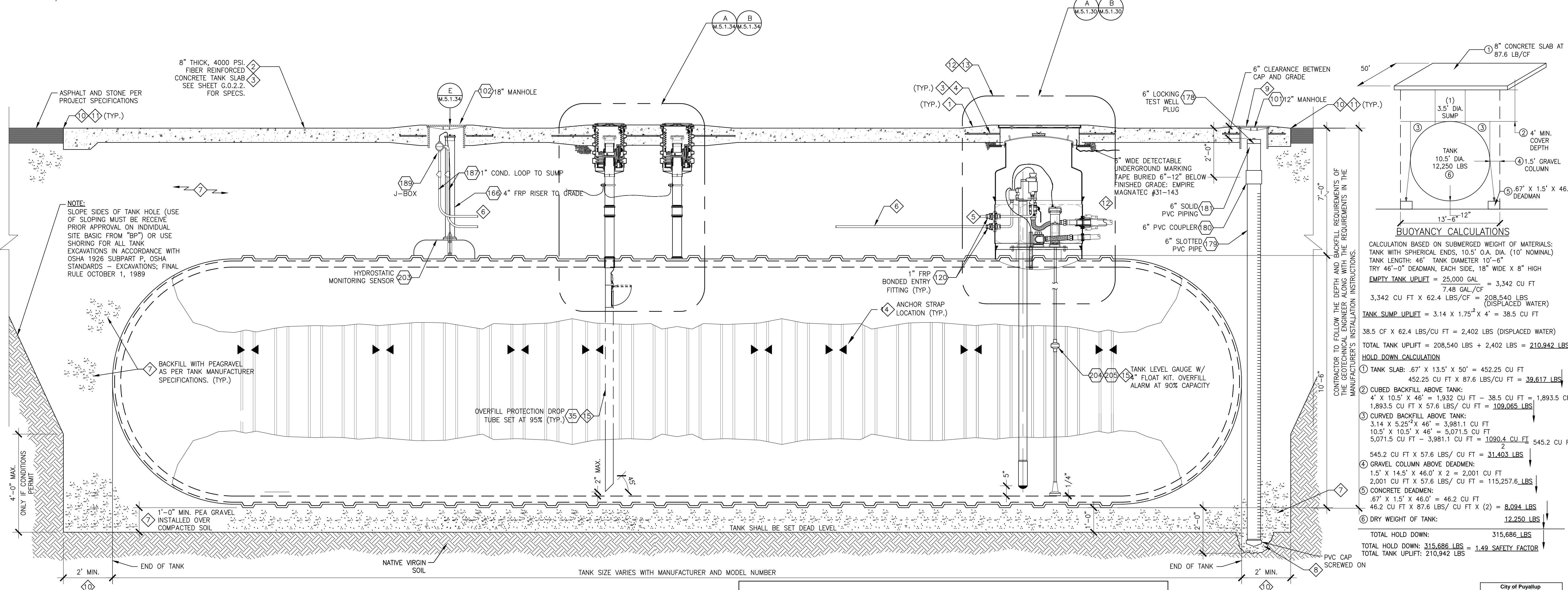
NOTE: SEE SECTION 12 ON THE TANK AND PIPING INSTALLATION SCOPE OF WORK FOR THE USE OF ALTERNATE PENETRATION FITTINGS.

PA:21000a 21730 Mechanical Notes 21730 M.5.1.01 and M.5.1.02.dwg 10/2/2023 3:49 PM NPHAN



## UNDERGROUND TANK PLAN VIEW

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



## A: UNDERGROUND TANK SECTION DETAIL

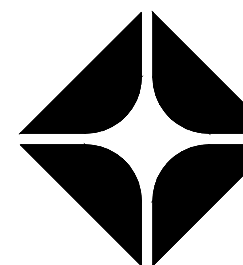
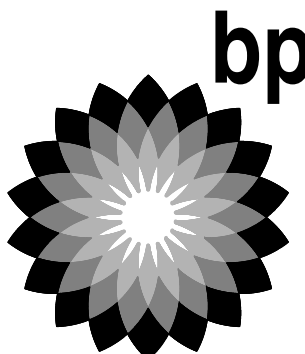
SCALE: 1/2" = 1'-0"

NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEETS M.5.1.01 & M.5.1.02

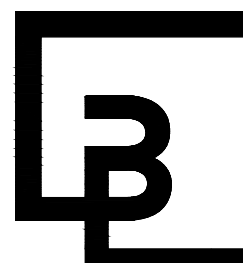
NOTE: CONTRACTOR TO ENGAGE GEOTECHNICAL ENGINEER DURING EXCAVATION AND NOTIFY BP PROJECT MANAGER AND BARGHAUSEN CONSULTING ENGINEERS WITH FINDINGS. SOIL CONDITIONS MAY REQUIRE THE DESIGN OF A SUPPORT SLAB UNDER THE TANKS.

NOTES: UST INSTALLATION
1 SLOPE CONCRETE AWAY FROM ALL MANHOLES 1" RISE OVER 12" RUN.
2 FIBER REINFORCEMENT TO BE USED. PREMIX UNIFORMLY THROUGHOUT CONCRETE.
3 REINFORCING BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.
4 REINFORCE CONCRETE SLAB AROUND MANHOLE WITH (4) #4 REBAR 60" IN LENGTH. PLACE REBAR 6" FROM SIDES OF BOX.
5 SINGLE 1" CONDUIT TO EACH SUBMERSIBLE PUMP. PROVIDE SEAL-OFF AT SUMP & BUILDING WIRING TROUGH. CONTAINS LINE VOLTAGE WIRING. ALL CONDUIT PENETRATIONS MUST BE MADE WITH ROBROY PVC COATED CONDUIT ONLY.
6 SINGLE 1" CONDUIT TO EACH TANK. LOOP HOME RUN FROM INTERSTITIAL SENSOR LOCATION TO CONTAINMENT SUMP SENSORS & TANK GAUGES. PROVIDE SEAL-OFF IN BUILDING & AT TANK. ROUTE TO INTRINSICALLY SAFE TROUGH IN BUILDING. CONTAINS ONLY LOW VOLTAGE WIRING FOR SENSORS. ALL CONDUIT PENETRATIONS MUST BE MADE WITH ROBROY PVC COATED CONDUIT ONLY.
7 USE PEA GRAVEL CONSISTING OF NATURALLY ROUNDED AGGREGATE, MIN 1/2" & MAX OF 1/2" IN SIZE, FREE OF CLAY, SLAG, CINDERS, OR DEBRIS. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER'S & OWNER'S FIELD REPRESENTATIVE.
8 6" OBSERVATION SUMP DEPTH SHALL BE 24" BELOW TANK. DO NOT PENETRATE SOIL. DO NOT USE PVC CEMENT ON BOTTOM CAP OR OTHER COUPLINGS OR FITTINGS.
9 TANK EXCAVATION OBSERVATION SUMP (2). INSTALLED WITH TANKS, DO NOT DRILL AFTER INSTALLATION.
10 TANK PAD MINIMUM 2'-0" OFF OUTSIDE WALLS OF TANKS, AND MUST COVER THE FOOTPRINT OF THE TANKS, REQUIRED TO PROVIDE FOR PROPER TANK HOLD DOWN, AND TO PREVENT ACCIDENTAL DRILLING INTO TANK.
11 CUT CORNER WHERE MEETING ASPHALT PAVING ONLY. SQUARE CORNERS WHERE MEETING CONCRETE.
12 REFER TO SITE SPECIFIC PLANS FOR ACTUAL PIPE RUNS & NUMBER OF PRODUCT LINES (1 OR 2 PER UST SUMP).
13 TURBINE SUMP CONFIGURATION SHOWN IS TYPICAL. FOR SPECIFIC DESIGN CRITERIA AT THESE SUMPS SEE ACCOMPANYING TANK INSTALLATION SITE PLAN & SUMP DETAIL DRAWINGS NOTED ABOVE.
14 TANK ANCHORING. CONSULT LOCAL REGULATION; VERIFY WITH OWNER'S REPRESENTATIVE.
15 OVERFLOW PROTECTION: UST OVERFLOW COMPLIANCE IS ACHIEVED BY USE OF OVERFLOW PREVENTION DROP TUBE FLAPPER VALVE SET AT 95% AND IN ACCORDANCE WITH FEDERAL AND STATE GUIDELINES FOR UST OVERFILL REQUIREMENTS.
AN OVERFILL ALARM AND ACKNOWLEDGE SWITCH TIED INTO THE VEEDER ROOT AUTOMATIC TANK GAUGE SYSTEM. THE MONITORING SYSTEM PROVIDES AN AUDIBLE AND VISUAL ALARM WHEN THE TANK(S) ARE FILLED TO THE 90% LEVEL.

CLIENT:



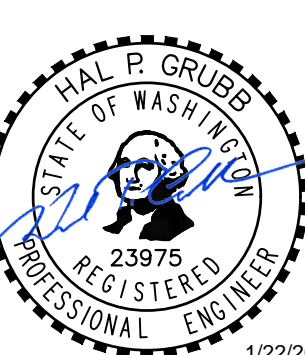
BP WEST COAST PRODUCTS, LLC



**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
1	10/04/23	PERMIT RELEASE
2	01/22/24	PERMIT RELEASE
3		
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11		
12		

SEAL:



PRFI20240124

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:  
**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

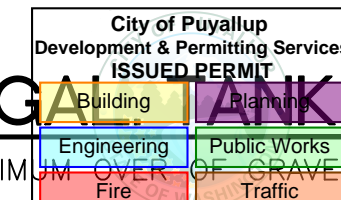
DRAWING TITLE:  
**TYPICAL 10" DIA. 25,000 GALLON DOUBLE WALL FIBERGLASS TANK INSTALLATION DETAILS (MID FILL)**

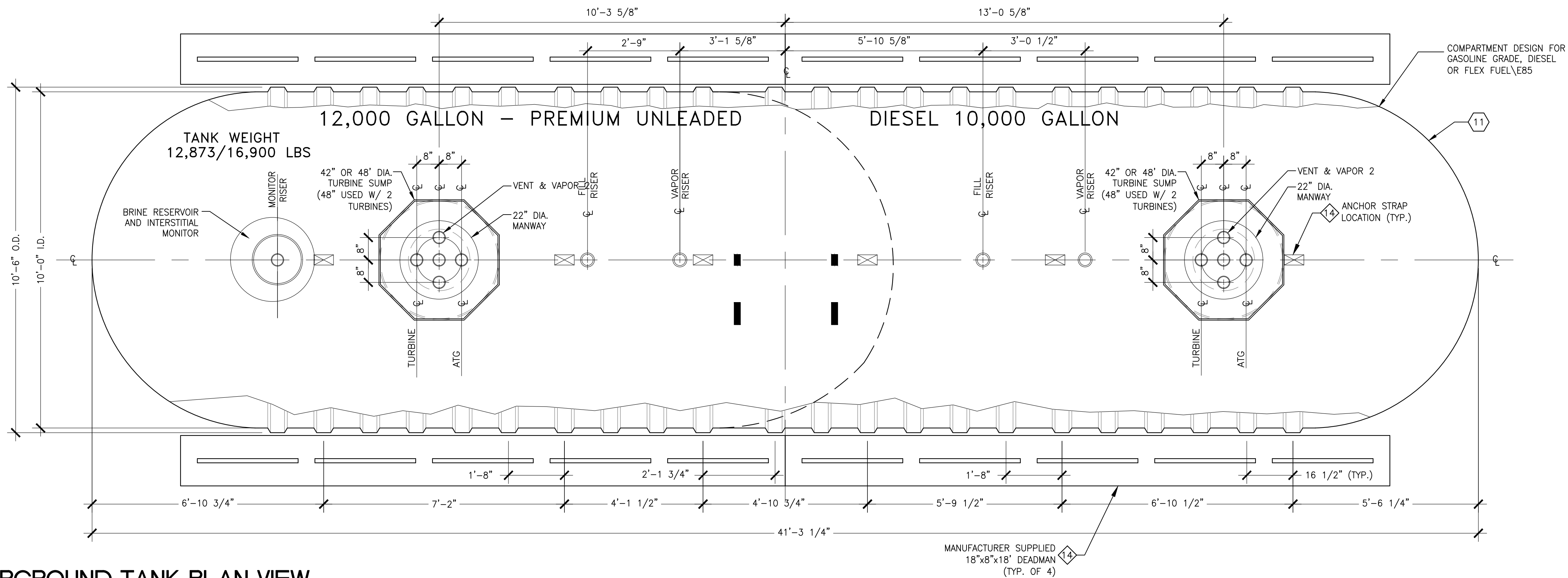
SHEET NO:

**M.5.1.04**

**BUOYANCY CALC. 25,000 G**

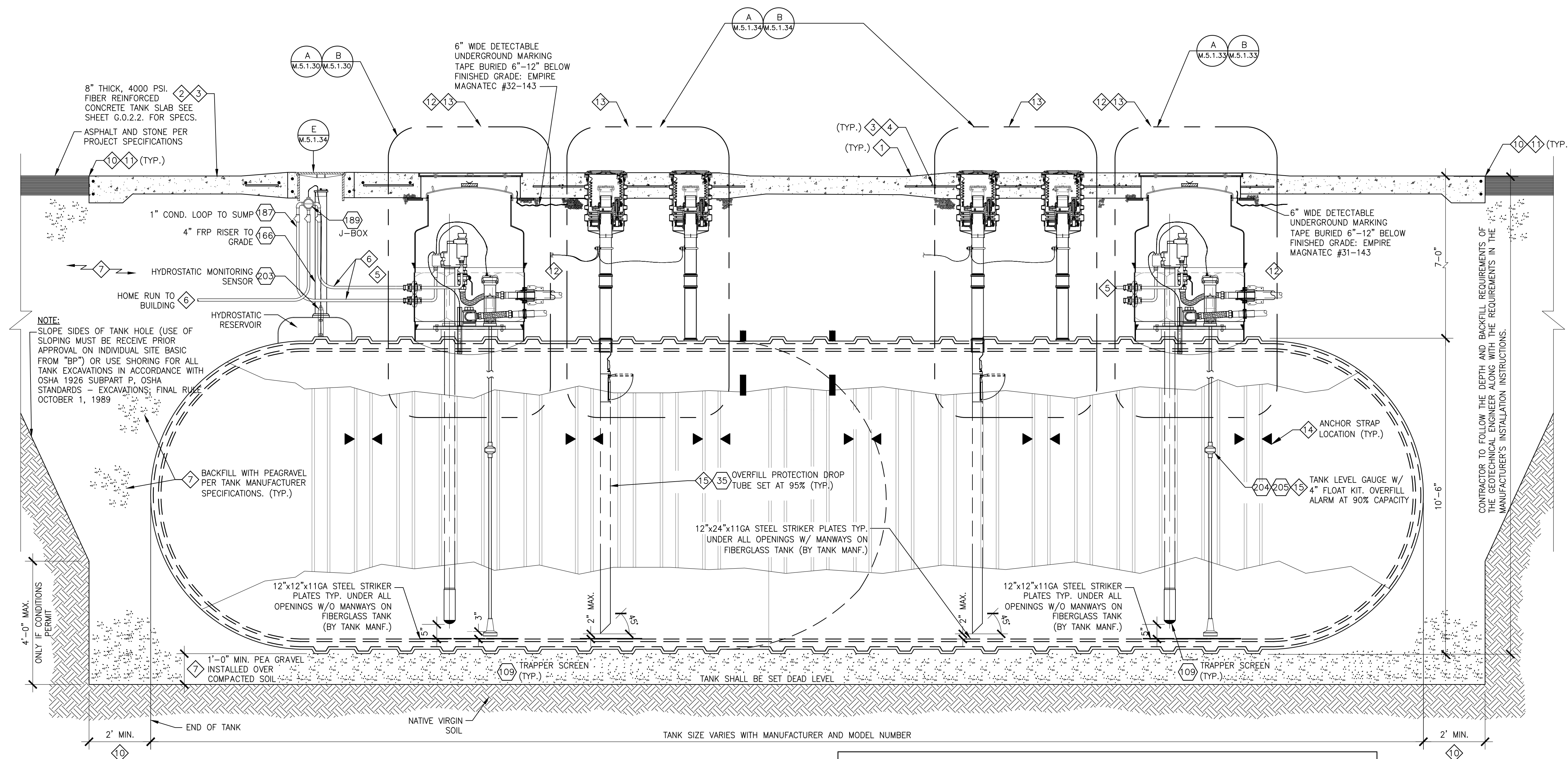
SCALE: NTS (TYPICAL CALCULATION ASSUMING 4" MINIMUM COVER)





## UNDERGROUND TANK PLAN VIEW

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



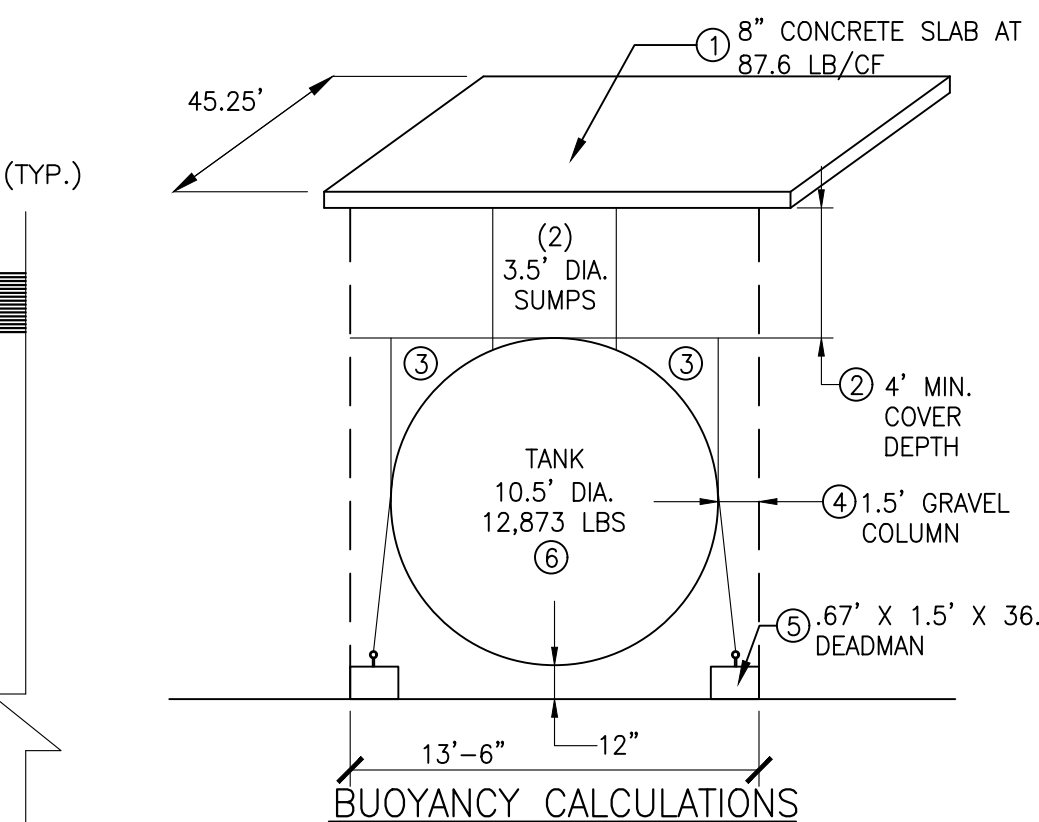
## A: UNDERGROUND TANK SECTION DETAIL

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

NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEETS M.5.1.01 & M.5.1.02

NOTE: CONTRACTOR TO ENGAGE GEOTECHNICAL ENGINEER DURING EXCAVATION AND NOTIFY BP PROJECT MANAGER AND BARGHAUSEN CONSULTING ENGINEERS WITH FINDINGS. SOIL CONDITIONS MAY REQUIRE THE DESIGN OF A SUPPORT SLAB UNDER THE TANKS.

NOTES: UST INSTALLATION
1. SLOPE CONCRETE AWAY FROM ALL MANHOLES 1" RISE OVER 12" RUN.
2. FIBER REINFORCEMENT TO BE USED. PREMIX UNIFORMLY THROUGHOUT CONCRETE.
3. REINFORCING BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.
4. REINFORCE CONCRETE SLAB AROUND MANHOLE WITH (4) #4 REBAR 60" IN LENGTH. PLACE REBAR 6" FROM SIDES OF BOX.
5. SINGLE 1" CONDUIT TO EACH SUBMERSIBLE PUMP. PROVIDE SEAL-OFF AT SUMP & BUILDING WIRING TROUGH. CONTAINS LINE VOLTAGE WIRING. ALL CONDUIT PENETRATIONS MUST BE MADE WITH ROBROY PVC COATED CONDUIT ONLY.
6. SINGLE 1" CONDUIT TO EACH TANK. LOOP HOME RUN FROM INTERSTITIAL SENSOR LOCATION TO CONTAINMENT SUMP SENSORS & TANK GAUGES. PROVIDE SEAL-OFF IN BUILDING & AT TANK. ROUTE TO INTRINSICALLY SAFE TROUGH IN BUILDING. CONTAINS ONLY LOW VOLTAGE WIRING FOR SENSORS. ALL CONDUIT PENETRATIONS MUST BE MADE WITH ROBROY PVC COATED CONDUIT ONLY.
7. USE PEA GRAVEL CONSISTING OF NATURALLY ROUNDED AGGREGATE, MIN 1/2" & MAX OF 1/2" IN SIZE, FREE OF CLAY, SLAG, CINDERS, OR DEBRIS. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER'S & OWNER'S FIELD REPRESENTATIVE.
8. NOT USED
9. NOT USED
10. TANK PAD MINIMUM 2'-0" OFF OUTSIDE WALLS OF TANKS, AND MUST COVER THE FOOTPRINT OF THE TANKS. REQUIRED TO PROVIDE FOR PROPER TANK HOLD DOWN, AND TO PREVENT ACCIDENTAL DRILLING INTO TANK.
11. CUT CORNER WHERE MEETING ASPHALT PAVING ONLY. SQUARE CORNERS WHERE MEETING CONCRETE.
12. REFER TO SITE SPECIFIC PLANS FOR ACTUAL PIPE RUNS & NUMBER OF PRODUCT LINES (1 OR 2 PER UST SUMP).
13. TURBINE SUMP CONFIGURATION SHOWN IS TYPICAL FOR SPECIFIC DESIGN CRITERIA AT THESE SUMPS SEE ACCOMPANYING TANK INSTALLATION SITE PLAN & SUMP DETAIL DRAWINGS NOTED ABOVE.
14. TANK ANCHORING. CONSULT LOCAL REGULATION; VERIFY WITH OWNER'S REPRESENTATIVE.
15. OVERFLOW PROTECTION: UST OVERFLOW COMPLIANCE IS ACHIEVED BY USE OF OVERFLOW PREVENTION DROP TUBE FLAPPER VALVE SET AT 95% AND IS IN ACCORDANCE WITH FEDERAL AND STATE GUIDELINES FOR UST OVERFILL REQUIREMENTS.



BUOYANCY CALCULATIONS
CALCULATION BASED ON SUBMERGED WEIGHT OF ALL MATERIALS: TANK WITH SPHERICAL ENDS, 10.5' O.A. DIA. (10' NOMINAL) TANK LENGTH: 41' 3-1/4" TANK DIAMETER 10'-6" TRY 36'-0" DEADMAN, EACH SIDE, 18" WIDE X 8" HIGH EMPTY TANK UPLIFT = 22,000 GAL = 2941 CU FT 2941 CU FT X 62.4 LBS/CF = 183,518 LBS (DISPLACED WATER) TANK SUMP UPLIFT = (2) X 3.14 X 1.75 <sup>2</sup> X 4' = 76.9 CU FT 76.9 CF X 62.4 LBS/CF = 4,798 LBS (DISPLACED WATER) TOTAL TANK UPLIFT = 183,518 LBS + 4,804 LBS = 188,322 LBS HOLD DOWN CALCULATION 1. TANK SLAB: .67' X 13.5' X 45.25' = 409.2 CU FT 409.2 CU FT X 87.6 LBS/CF = 35,846 LBS 2. CUBED BACKFILL ABOVE TANK: 4' X 10.5' X 41.25' = 1,732.5 CU FT = 76.9 CU FT = 1655 CF 1655 CU FT X 57.6 LBS/CF = 95,328 LBS 3. CURVED BACKFILL ABOVE TANK: 3.14 X 5.25 <sup>2</sup> X 41.25' = 3,570.0 CU FT 10.5' X 10.5' X 41.25' = 4,547.8 CU FT 4,547.8 CU FT - 3,570.0 CU FT = 977.8 CU FT = 488.9 CU FT 488.9 CU FT X 57.6 LBS/CF = 28,161 LBS 4. GRAVEL COLUMN ABOVE DEADMAN: 1.5' X 14.5' X 36.0' X 2 = 1,566 CU FT 1,566 CU FT X 57.6 LBS/CF = 90,202 LBS 5. CONCRETE DEADMEN: .67' X 1.5' X 36.0' = 36.2 CU FT 36.2 CU FT X 87.6 LBS/CF X (2) = 6,342 LBS 6. DRY WEIGHT OF TANK: 12,873 LBS TOTAL HOLD DOWN: 268,752 LBS TOTAL TANK UPLIFT: 188,322 LBS TOTAL HOLD DOWN: 268,752 LBS = 1.42 SAFETY FACTOR OF PUYALLUP DEVELOPMENT & PERMITTING SERVICES

## BUOYANCY CALC. 22,000 GAL. ST

SCALE: NTS (TYPICAL CALCULATION ASSUMING 4' MINIMUM OVER OF GRAVEL)

CLIENT: **bp**

**ARCO**  
BP WEST COAST PRODUCTS, LLC

**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
1	10/04/23	PERMIT RELEASE
2	01/22/24	PERMIT RELEASE
3		
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11		
12		



PRFI20240124

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:  
**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON


**FACILITY #TBD**

DESIGNED BY: NP/RP ALLIANCE ZADNE:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RP ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

DRAWING TITLE:  
TYP. 10' DIA. 12,000/10,000 GALLON  
DOUBLE WALL FIBERGLASS  
TANK INSTALLATION DETAILS

SHEET NO:

**M.5.1.15**



8215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
**arghausen.com**

NO.	DATE	REVISION DESCRIPTION
1		
2	10/04/23	PERMIT RELEASE
3	01/22/24	PERMIT RELEASE
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12		

PRFI20240124

ARCO NTI  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

TE ADDRESS:

**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

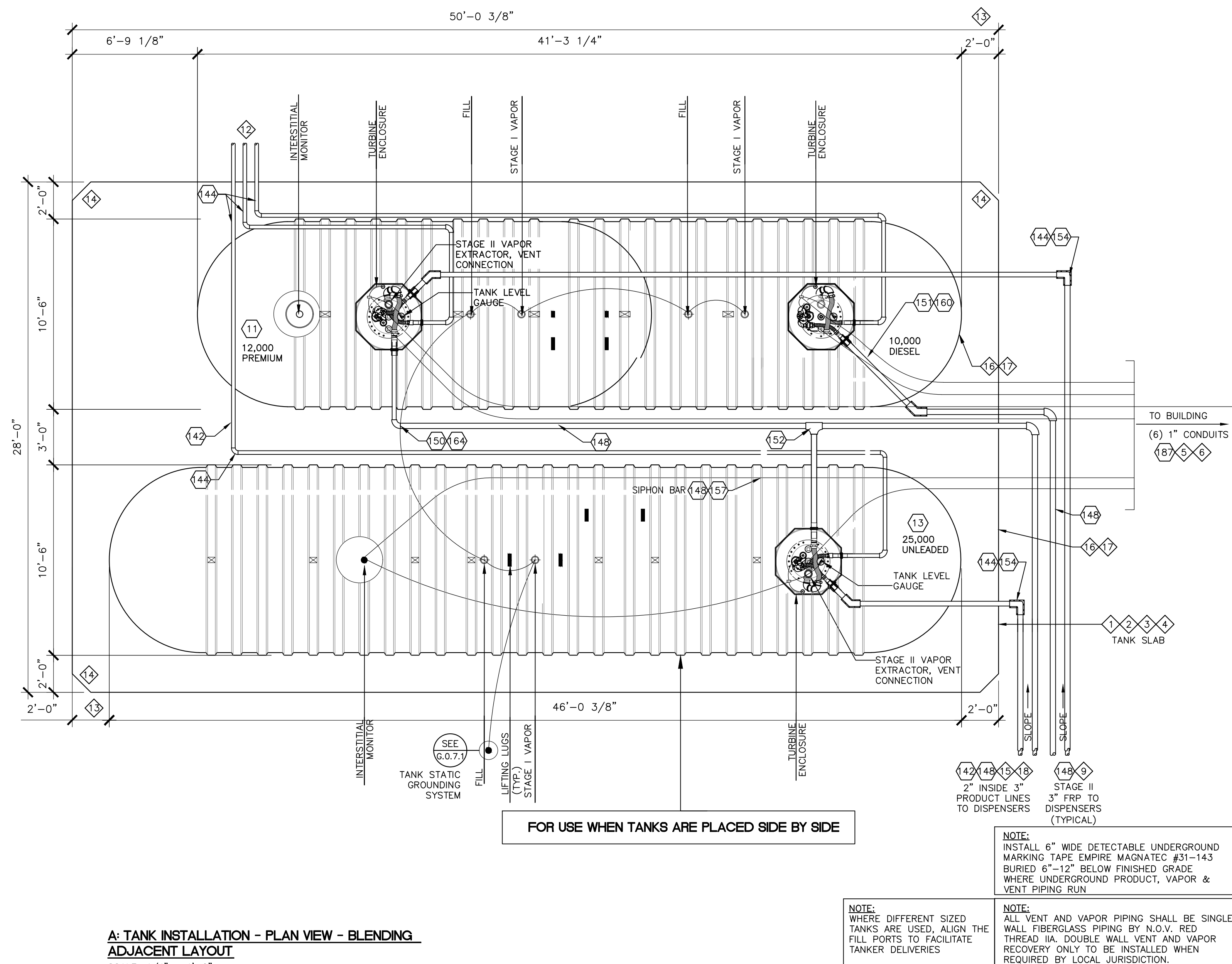
SIGNED BY: NP/RF	ALLIANCE Z&DM:
CHECKED BY: OV	BP REPM:
DRAWN BY: NP/RF	ALLIANCE PM:
VERSION: V-15.0	PROJECT NO:
01/01/2023	21730

DRAWING TITLE:

**UST INSTALLATION**  
**(2) 10' DIA. 25K/22K BLENDING**

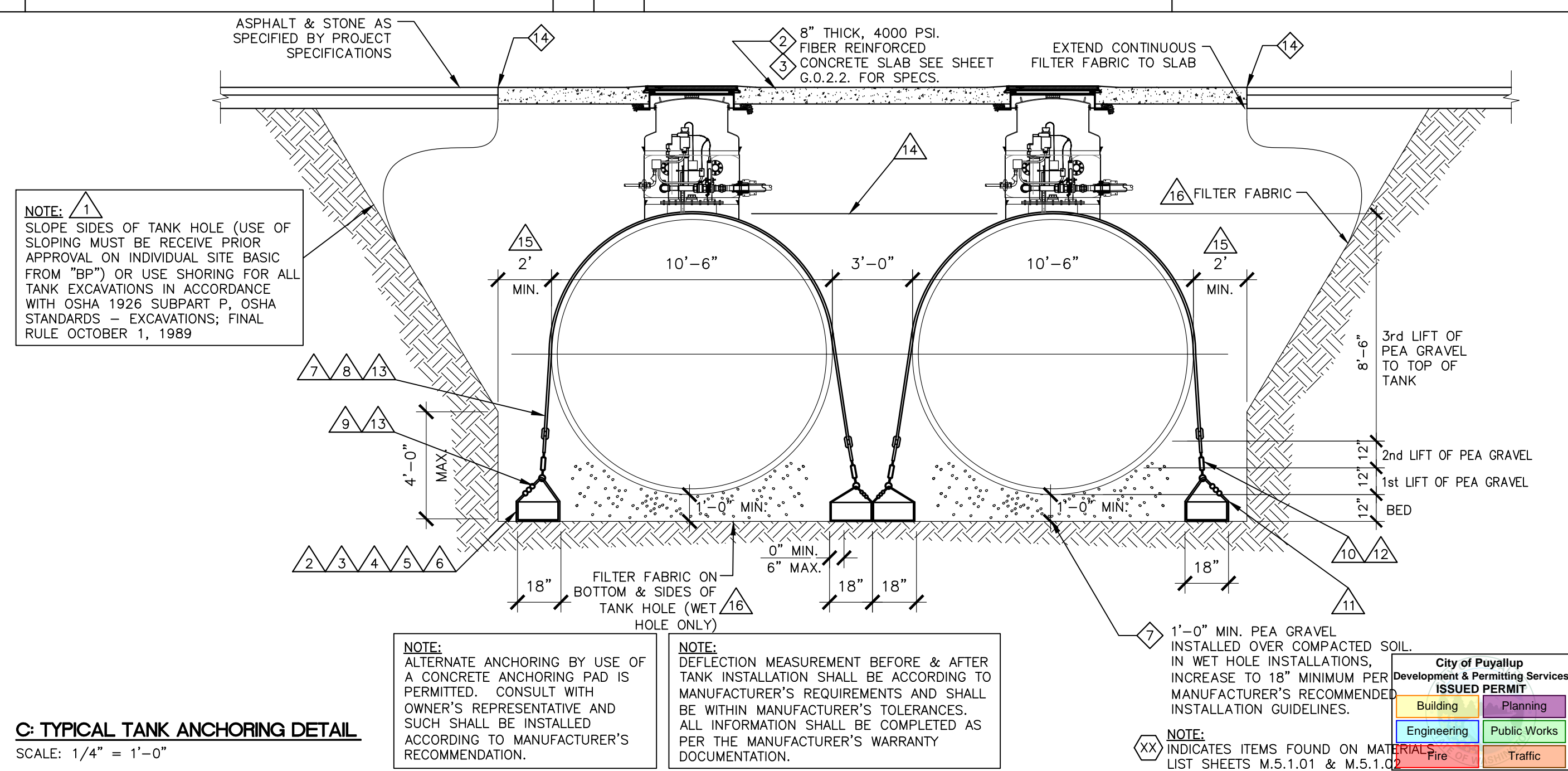
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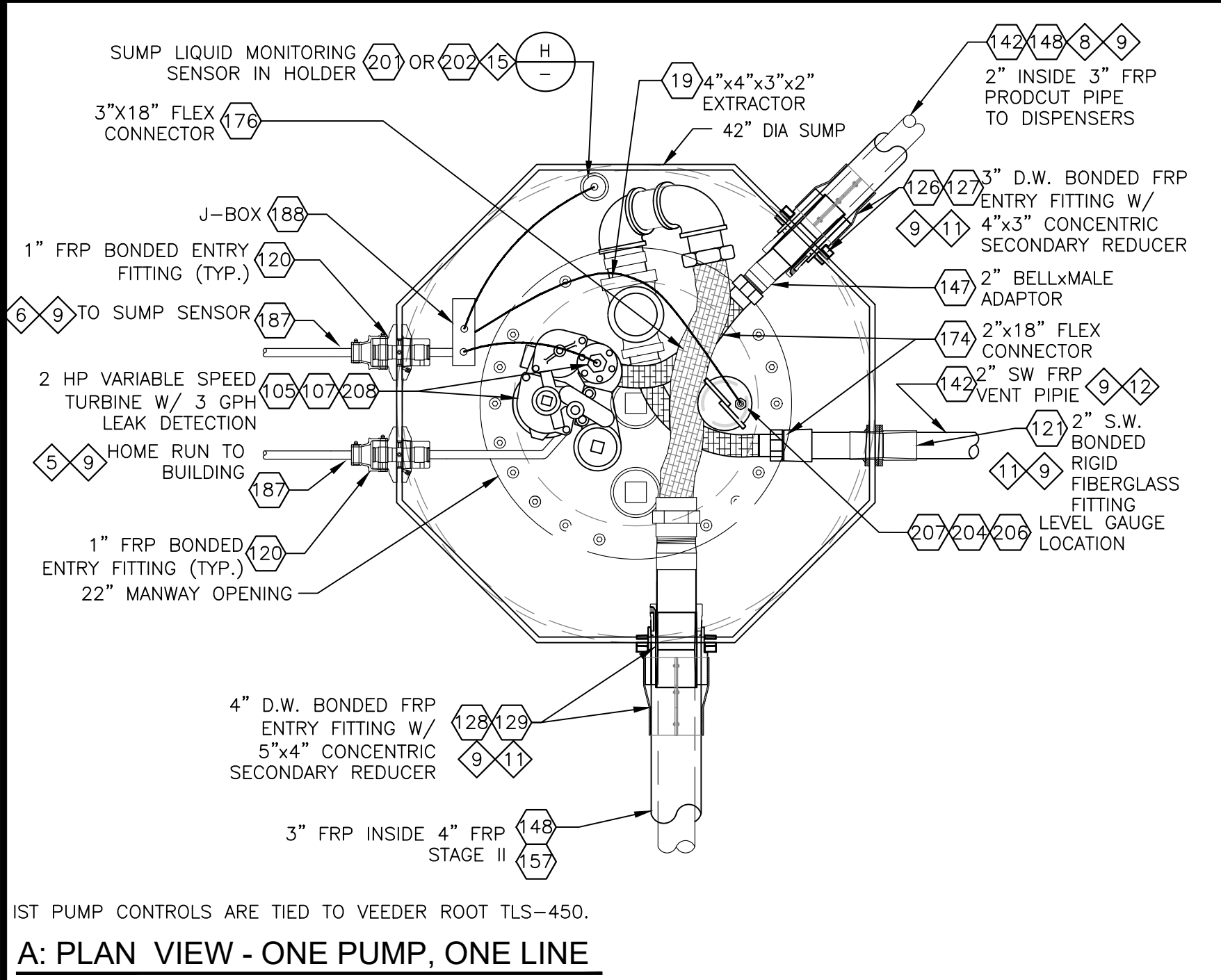
**NOTE: CONTRACTOR TO ENGAGE GEOTECHNICAL ENGINEER DURING EXCAVATION AND NOTIFY BP PROJECT MANAGER AND BARGHAUSEN CONSULTING ENGINEERS WITH FINDINGS. SOIL CONDITIONS MAY REQUIRE THE DESIGN OF A SUPPORT SLAB UNDER THE TANKS.**



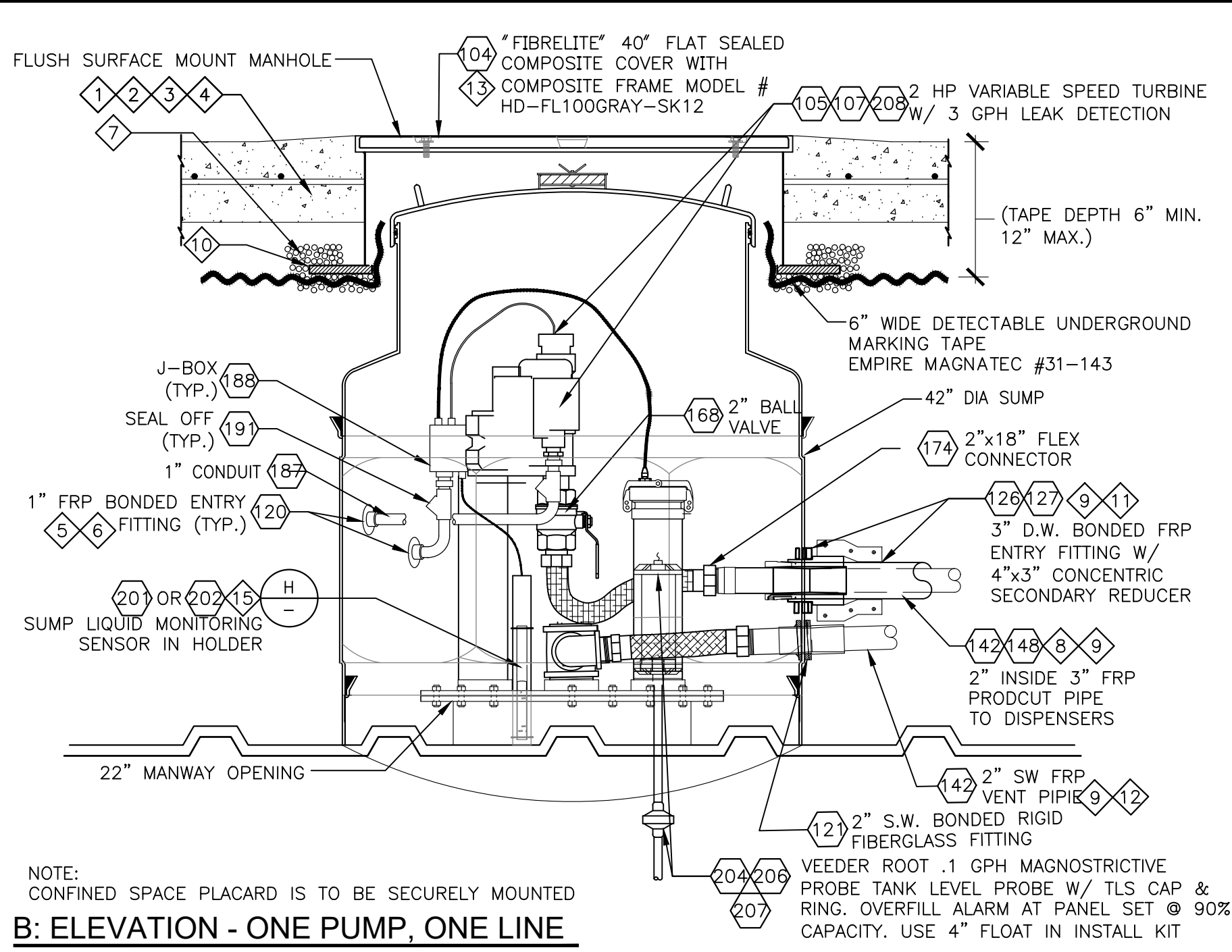
## NOTES: UST INSTALLATION

- |   |   |    |   |
|---|---|----|---|
| 1 | SLOPE CONCRETE AWAY FROM ALL MANHOLES 1" RISE OVER 12" RUN.   | 10 | NOT USED.   |
| 2 | FIBER REINFORCEMENT TO BE USED. PREMIX UNIFORMLY THROUGHOUT CONCRETE.   | 11 | TANK EXCAVATION OBSERVATION SUMP (2). INSTALLED WITH TANKS, DO NOT DRILL AFTER INSTALLATION.  |
| 3 | REINFORCING BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.  | 12 | TO ABOVE GROUND VENT RISERS, SEE DETAIL ON SHEET G.O.6.1.   |
| 4 | REINFORCE CONCRETE SLAB AROUND MANHOLE WITH (4) #4 REBAR 60" IN LENGTH. PLACE REBAR 6" FROM SIDES OF BOX.   | 13 | TANK PAD MINIMUM 2'-0" OFF OUTSIDE WALLS OF TANKS, AND MUST COVER THE FOOTPRINT OF THE TANKS. REQUIRED TO PROVIDE FOR PROPER TANK HOLD DOWN, AND TO PREVENT ACCIDENTAL DRILLING INTO TANK.  |
| 5 | SINGLE 1" CONDUIT TO EACH SUBMERSIBLE PUMP. PROVIDE SEAL-OFF AT SUMP & BUILDING WIRING TROUGH. CONTAINS LINE VOLTAGE WIRING. ALL CONDUIT PENETRATIONS MUST BE MADE WITH ROBROY PVC COATED CONDUIT ONLY.   | 14 | CUT CORNER WHERE MEETING ASPHALT PAVING ONLY. SQUARE CORNERS WHERE MEETING CONCRETE.  |
| 6 | SINGLE 1" CONDUIT TO EACH TANK. LOOP HOME RUN FROM INTERSTITIAL SENSOR LOCATION TO CONTAINMENT SUMP SENSORS & TANK GAUGES. SEE SUMP OFF IN BUILDING & AT TANK. ROUTE TO INTRINSICALLY SAFE TROUGH IN BUILDING. CONTAINS ONLY LOW VOLTAGE WIRING FOR SENSORS. ALL CONDUIT PENETRATIONS MUST BE MADE WITH ROBROY PVC COATED CONDUIT ONLY. | 15 | DIESEL DESIGN USES JUST ONE PRODUCT LINE TO DIESEL DISPENSER.   |
| 7 | USE PEA GRAVEL CONSISTING OF NATURALLY ROUNDED AGGREGATE, MIN 1/8" & MAX OF 3/4" IN SIZE, FREE OF CLAY, SLAG, CINDERS, OR DEBRIS. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER'S & OWNER'S FIELD REPRESENTATIVE.  | 16 | REFER TO DIESEL UST INSTALLATION DRAWING FOR STAND-ALONE UST OR AS AN EXTENSION TO THIS UST DESIGN.   |
| 8 | 6" OBSERVATION SUMP DEPTH SHALL BE 24" BELOW TANK. DO NOT PENETRATE SOIL. DO NOT USE PVC CEMENT ON BOTTOM CAP OR OTHER COUPLINGS OR FITTINGS.   | 17 | SEE SITE SPECIFIC PLANS FOR ACTUAL TANK SIZES, PLACEMENT, AND ORIENTATION. FINAL SITE SPECIFIC TANK LOCATIONS SHALL BE APPROVED BY THE LOCAL DISTRIBUTION TERMINAL MANAGER OR HIS AGENT. FINAL LOCATION SIGN-OFF SHALL BE DOCUMENTED.   |
| 9 | LAYOUT TANKS & STAGE II VAPOR RECOVERY PIPING SUCH THAT THE STAGE II PIPING DRAINS & ENTERS INTO REGULAR UNLEADED TANK FIRST W/ 3" CONNECTIONS. ALL OTHER CONNECTIONS MADE W/ 2".   | 18 | REFER TO SITE SPECIFIC PLANS FOR ACTUAL PIPE RUNS & NUMBER OF PRODUCT LINES (1 OR 2 PER UST SUMP).  |
|   |   | 19 | ANY STRUCTURE THAT ENCLOSES WITHIN THE UST STRUCTURAL EXCLUSION ZONE, WHERE NOT OTHERWISE AVOIDABLE, SHALL BE IDENTIFIED ON THE PLANS. IT WILL BE THE ARCHITECT OF RECORD'S OBLIGATION TO IDENTIFY AND COORDINATE WITH THE STRUCTURAL ENGINEER OF THE NEED TO DESIGN THE ENCLOSED STRUCTURAL ELEMENT(S) TO MITIGATE ANY LATERAL LOAD TRANSMISSION TO THE UNDERGROUND STORAGE TANKS. |

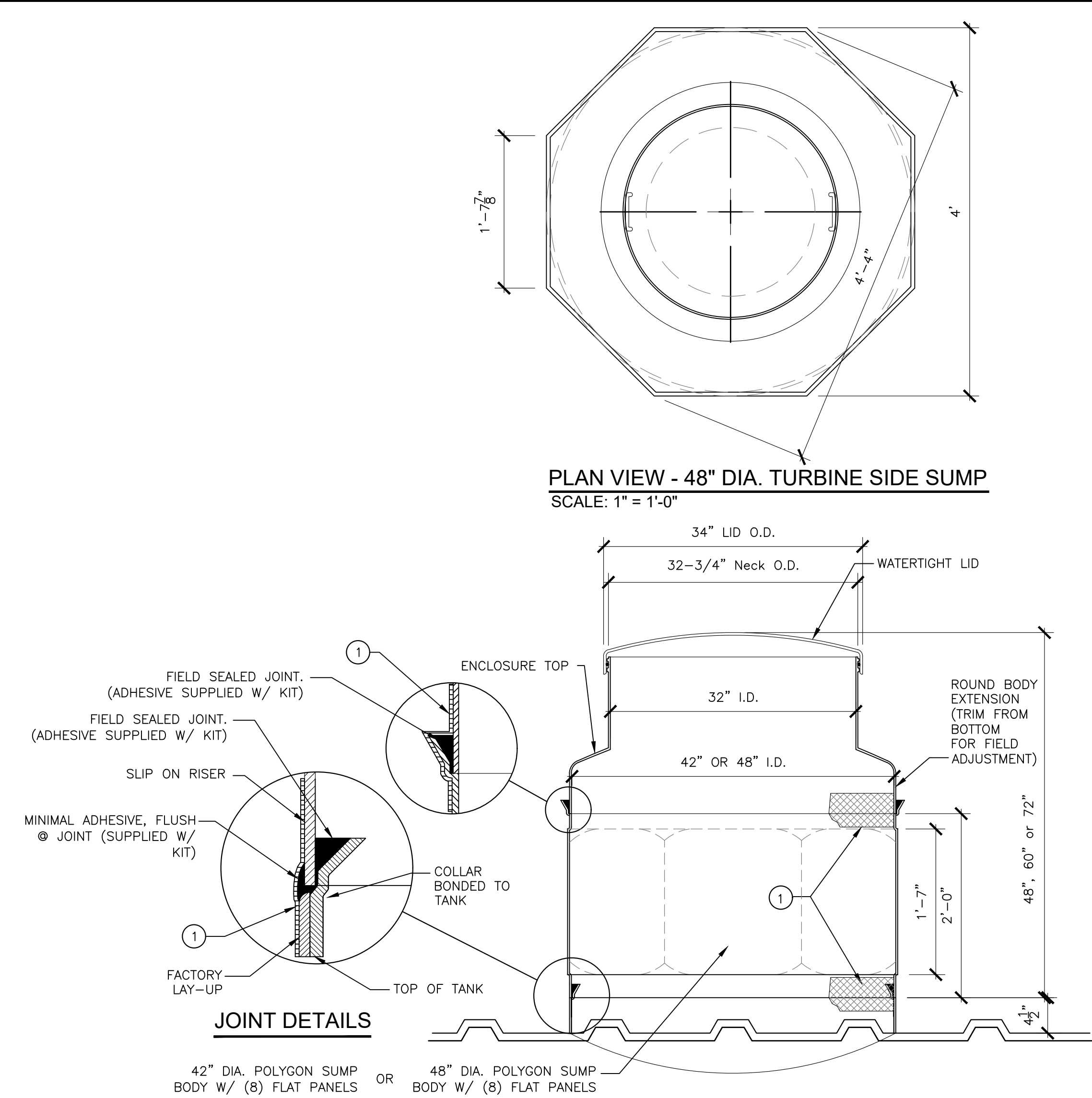




IST PUMP CONTROLS ARE TIED TO VEEDEER ROOT TLS-450.  
**A: PLAN VIEW - ONE PUMP, ONE LINE**



NOTE: CONFINED SPACE PLACARD IS TO BE SECURELY MOUNTED  
**B: ELEVATION - ONE PUMP, ONE LINE**



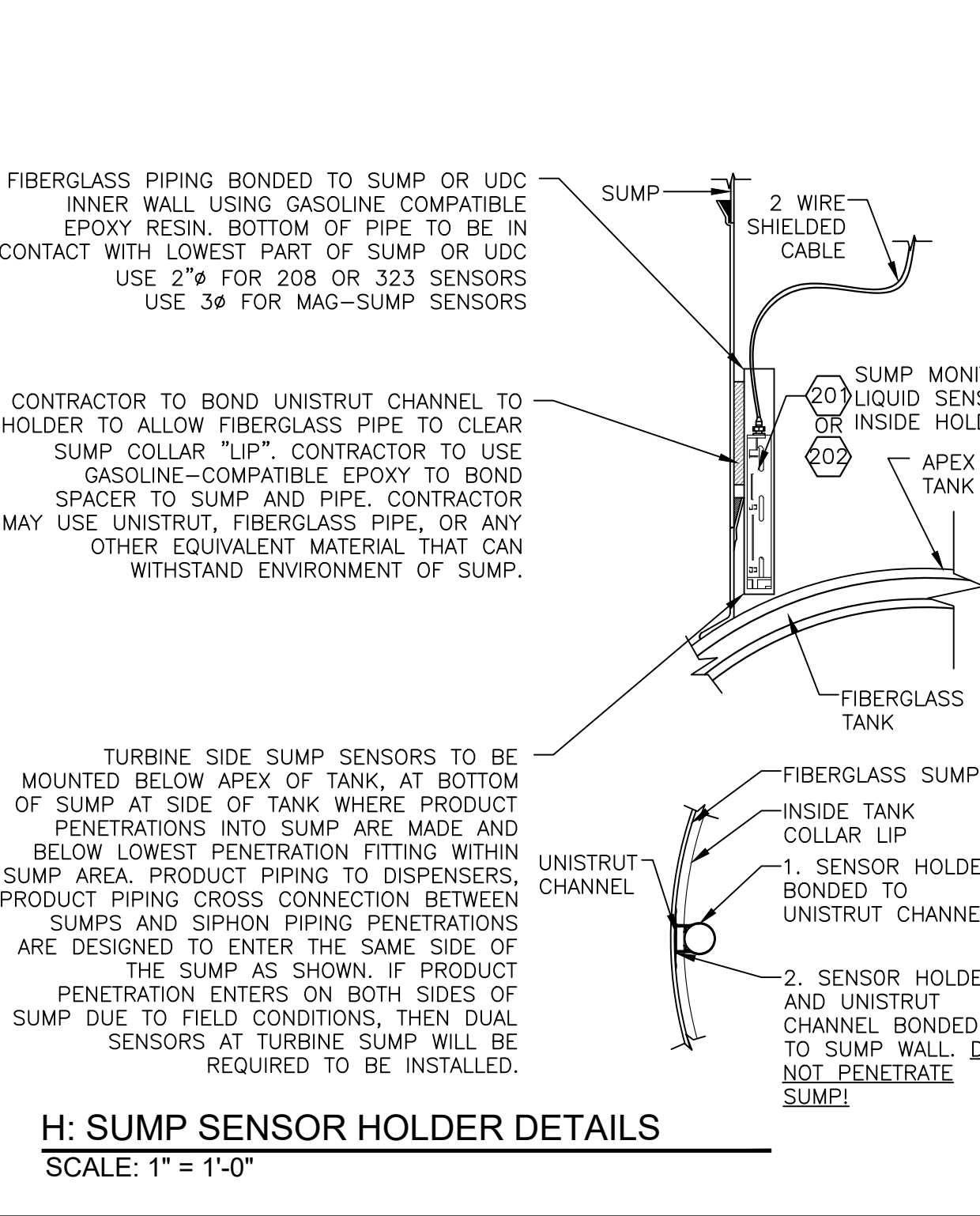
**G: ELEVATION & PLAN VIEW - TURBINE SIDE SUMP**  
SCALE: 1" = 1'-0"

① CONTRACTOR TO ADDITIONALLY GLASS WRAP & LAMINATE AT CONNECTION FOLLOWING CURING OF ADHESIVE. SPECIFIC ATTENTION MUST BE GIVEN TO SURFACE PREP AS TESTING REQUIREMENTS WILL DETECT THE SMALLEST OF FLAWS. ALL MATERIALS MUST BE COMPATIBLE WITH GASOLINE, GASOLINE WITH 15% MTBE (METHYL TERTIARY-BUTYL ETHER), OR GASOLINE WITH 10% ETOH (ETHANOL). FIBERGLASS AND RESIN MUST EXTEND 1/2" BEYOND COVERAGE OF ADHESIVE.

\*NOTE: CONTRACTOR SHALL BE HELD RESPONSIBLE FOR PROPER INSTALLATION & PREPARATION PER MANUFACTURERS INSTRUCTIONS AND SHALL REINSTALL SUMPS IF HYDROSTATIC TESTING SHOWS LEAKING IN THIS AREA OF THE SUMP.

\*\*NOTE THE REQUIRED ORIENTATION OF THE SUMPS PRIOR TO BONDING SUMPS TO COLLARS\*\*

SUMPS MUST BE ORIENTED SUCH THAT THE FACE OF THE SUMP PANEL IS PARALLEL WITH ADJACENT TANK SUMP PANEL IN ORDER TO ACHIEVE THE 45° ANGLES REQUIRED TO ROUTE THE PIPING WHILE MAINTAINING THE DESIRED PERPENDICULAR ANGLE INTO THE SUMP.



**H: SUMP SENSOR HOLDER DETAILS**  
SCALE: 1" = 1'-0"

# - NOTES	
1	SLOPE CONCRETE AWAY FROM ALL MANHOLES 1" RISE OVER 12" RUN
2	FIBER REINFORCEMENT TO BE USED. PRE-MIX UNIFORMLY THROUGHOUT CONCRETE.
3	REINFORCING BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.
4	REINFORCE CONCRETE SLAB AROUND MANHOLE WITH 4-#4 REBAR TOP AND BOTTOM, 60" IN LENGTH. PLACE REBAR 6" FROM SIDES OF BOX.
5	SINGLE 1" CONDUIT TO EACH SUBMERSIBLE PUMP. PROVIDE SEAL OFF AT SUMP & BUILDING WIRING TROUGH SUMP. CONTAINS LINE VOLTAGE WIRING.
6	SINGLE 1" CONDUIT TO EACH TANK. LOOP FROM INTERSTITIAL SENSOR TO CONTAINMENT SUMPS & TANK GAUGE. PROVIDE SEAL-OFF IN BUILDING & TANK AREA. ROUTE TO INTRINSICALLY SAFE TROUGH IN BUILDING. CONTAINS ONLY LOW VOLTAGE WIRING FOR SENSORS.
7	PEA GRAVEL BACKFILL. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER AND OWNER'S FIELD REPRESENTATIVE.
8	PIPING SHALL BE LAID AND CONTINUOUSLY SUPPORTED ON A 6" COMPACTED PEA GRAVEL BEDDING. PIPING SHALL NOT BE SUPPORTED BY BLOCKS, PLANKS, OR OTHER DEBRIS.
9	ALL ENTRIES TO BE PERPENDICULAR TO CONTAINMENT SUMP. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR MAXIMUM ANGLE ALLOWANCE.
10	PLYWOOD 48" X 48" X 3/4" PLACED TO ASSURE 2" CLEARANCE BETWEEN CONCRETE AND CONTAINMENT SUMP.
11	N.O.V. RED THREAD PENETRATION FITTINGS SHOWN. ALTERNATE FITTINGS MAY NOT BE USED.
12	NOT USED
13	FIBRELITE MANHOLE LID SHOWN ALTERNATE OPW CONQUISTADOR ONLY IF APPROVED BY BP ENGINEER.
14	NOT USED
15	NO SECURITY PIN IS REQUIRED IN MOUNTING
NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEETS M.5.1.01 & M.5.1.02	

CLIENT:

BP WEST COAST PRODUCTS, LLC

**Barghausen Consulting Engineers, Inc.**

18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

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SEAL:

**PRFI20240124**

DEVELOPMENT INFORMATION:

**ARCO NTI**

**3400 am/pm**

**FUEL CANOPY w/ 6 MPD's**

SITE ADDRESS:

**SWC S MERIDIAN**

@ HIGHWAY 512  
PUTALLUP, WASHINGTON

**FACILITY #TBD**

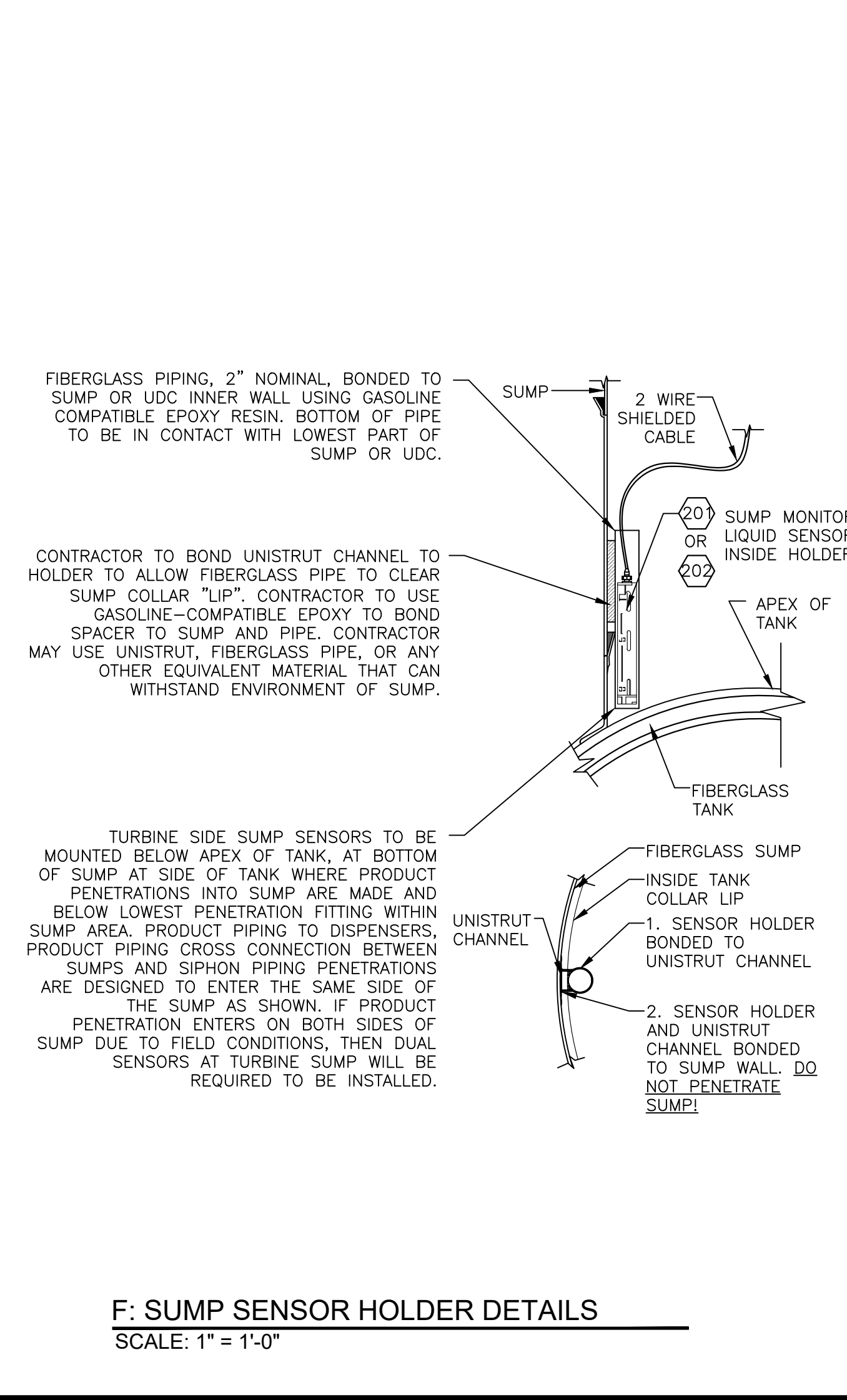
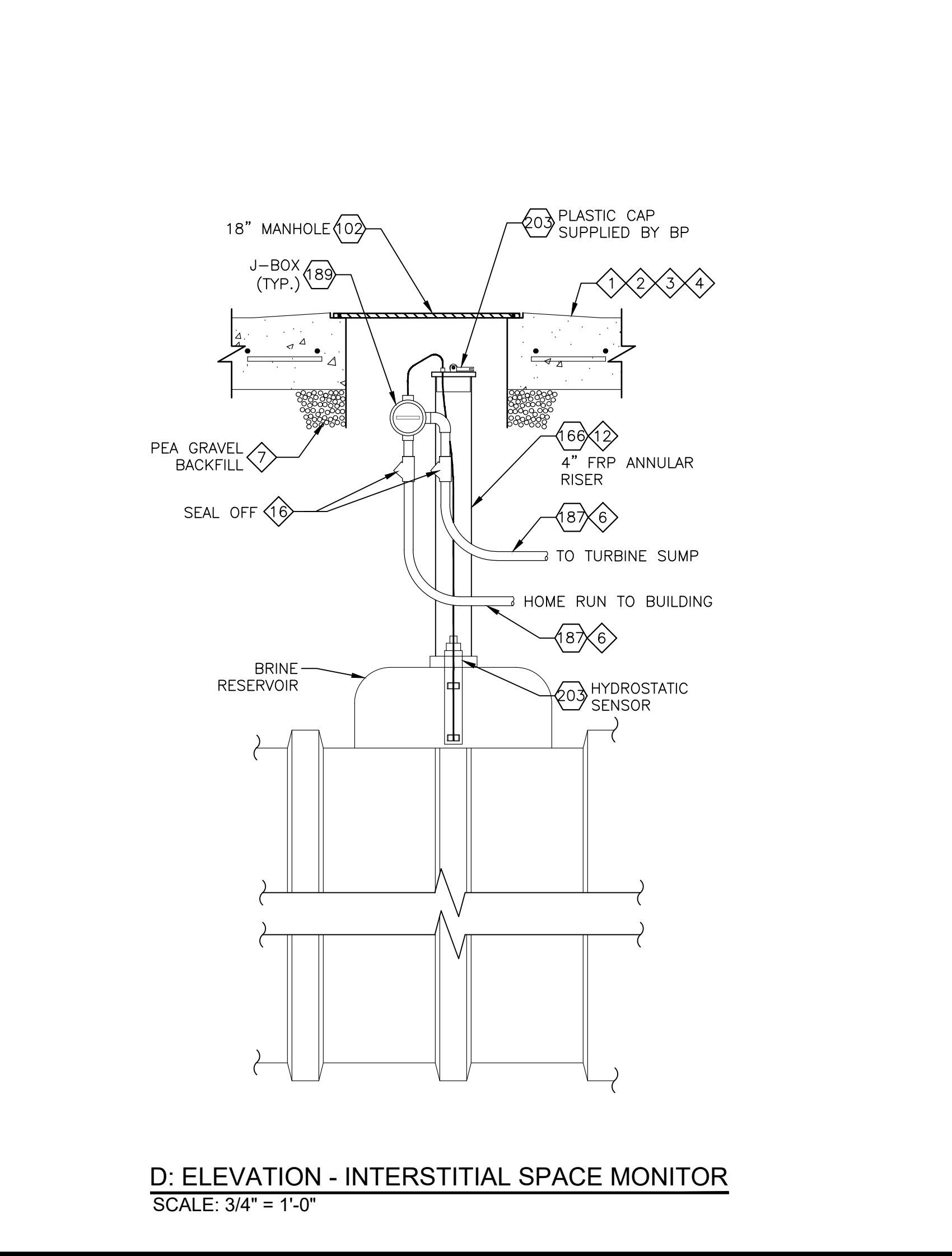
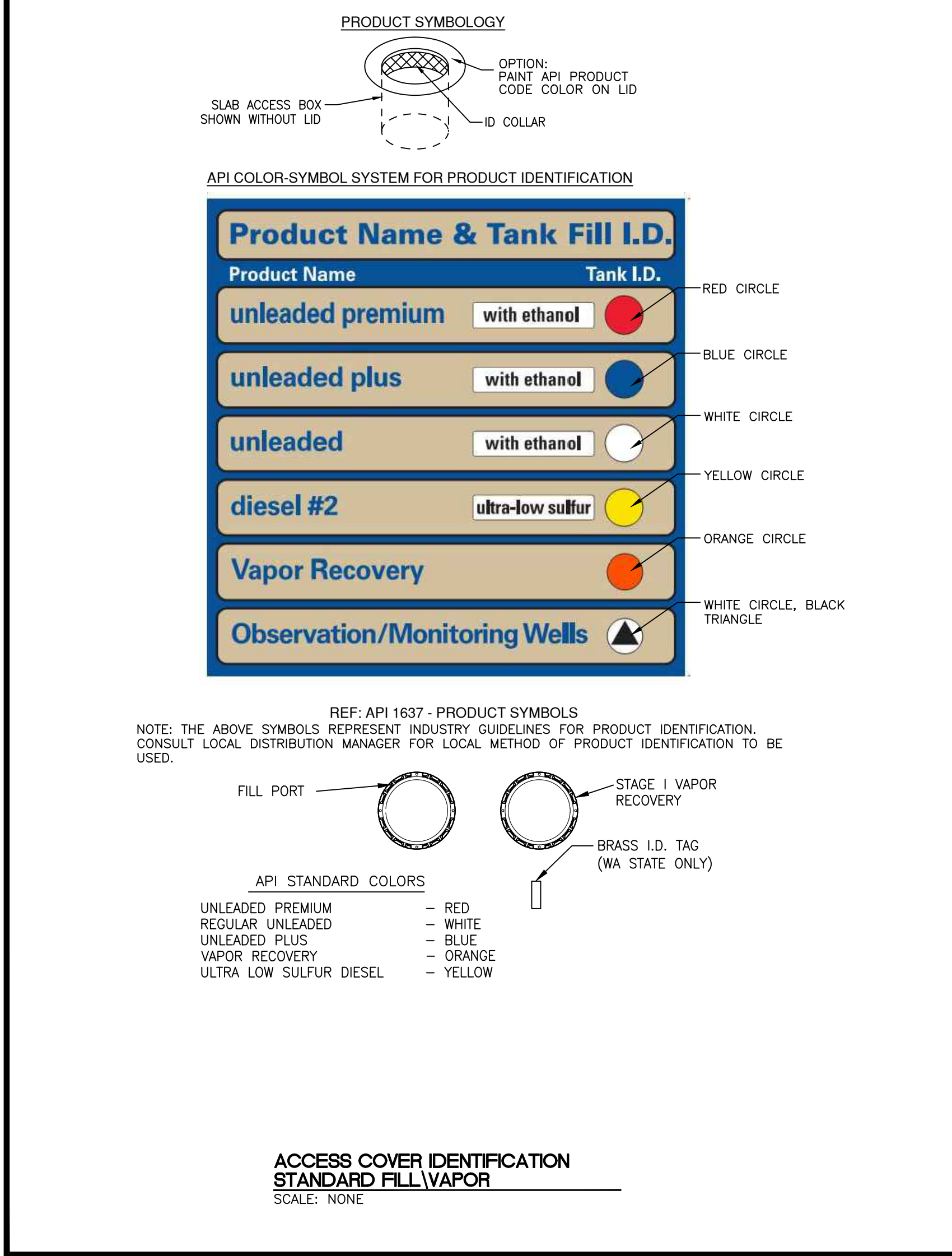
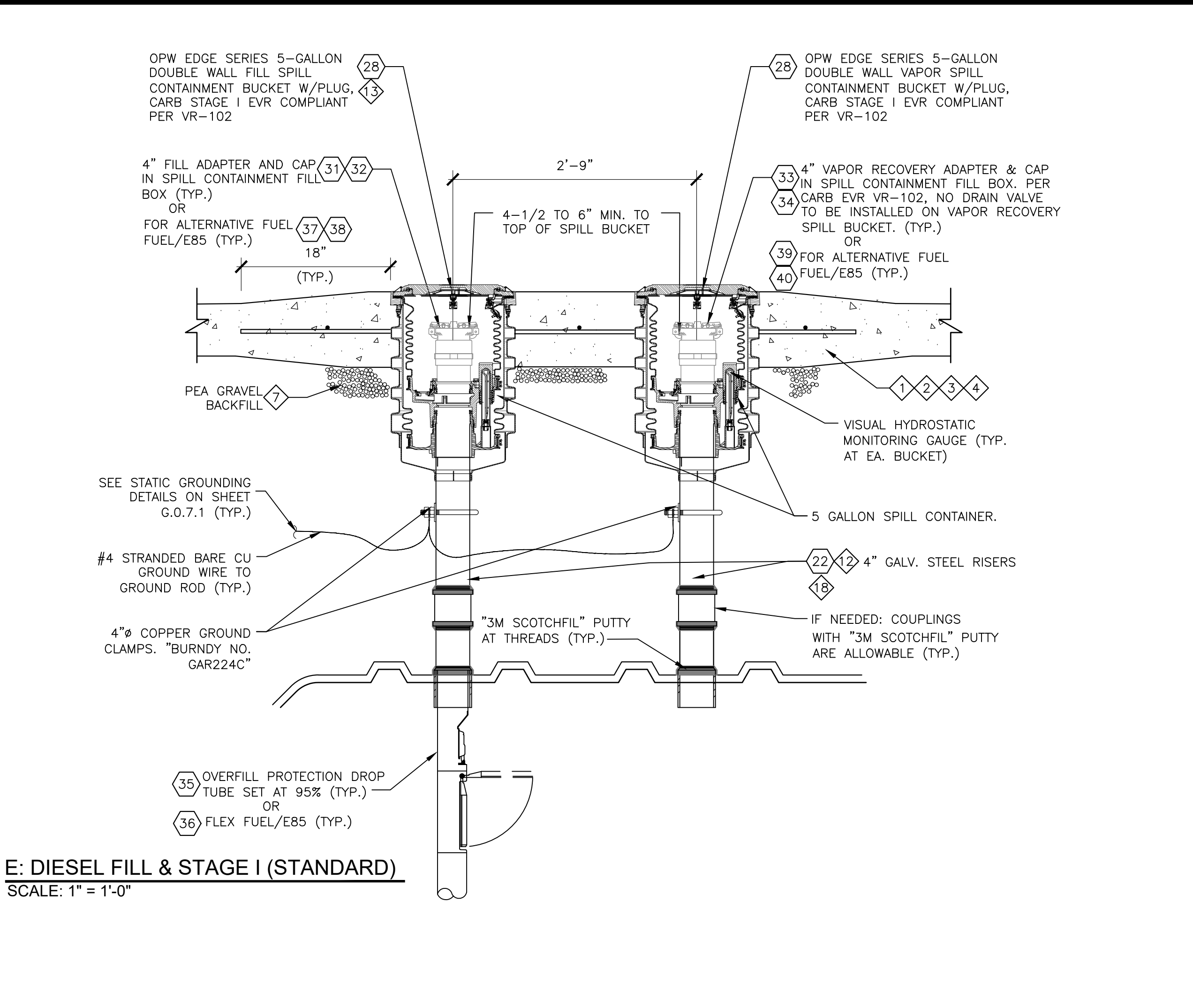
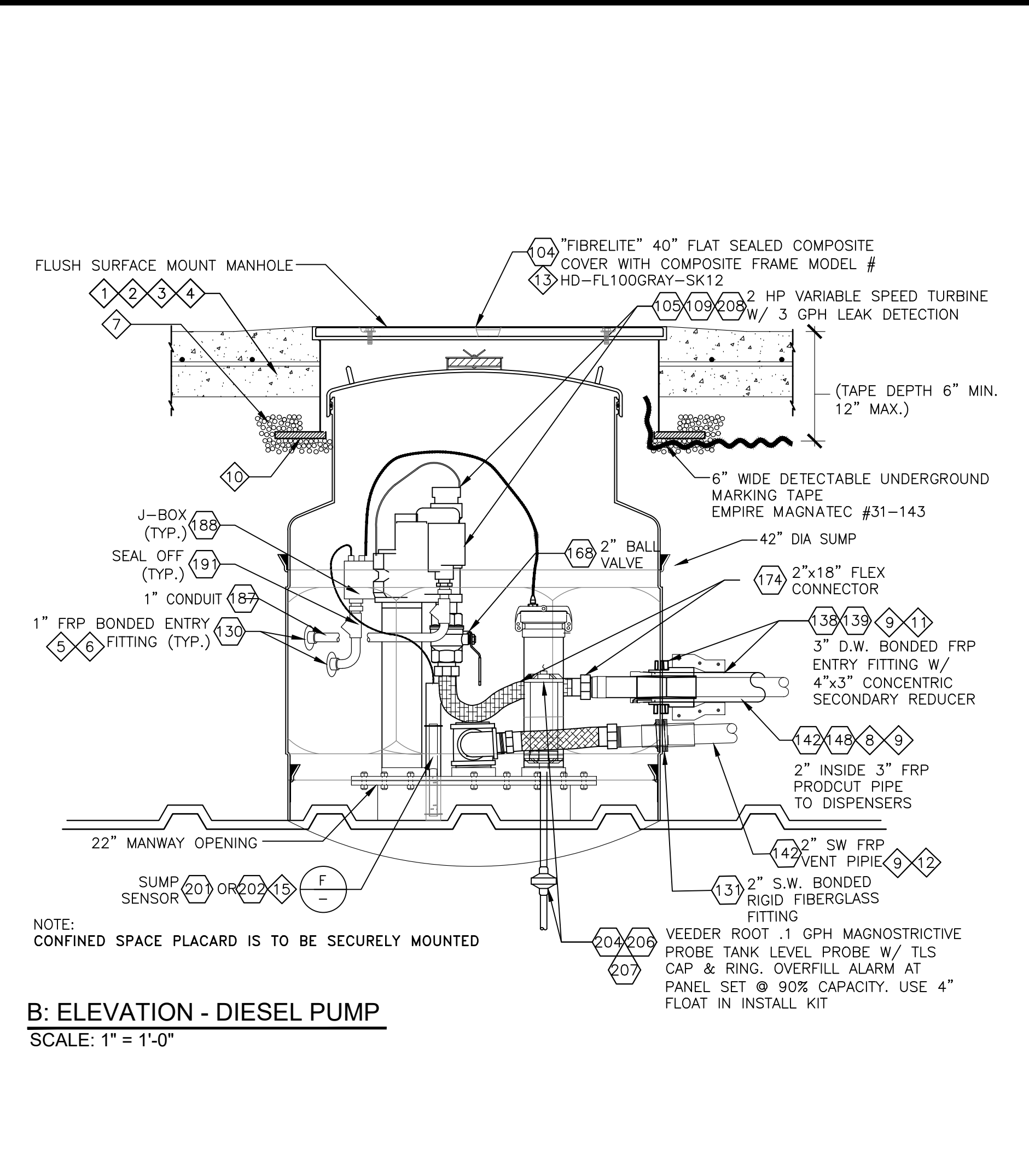
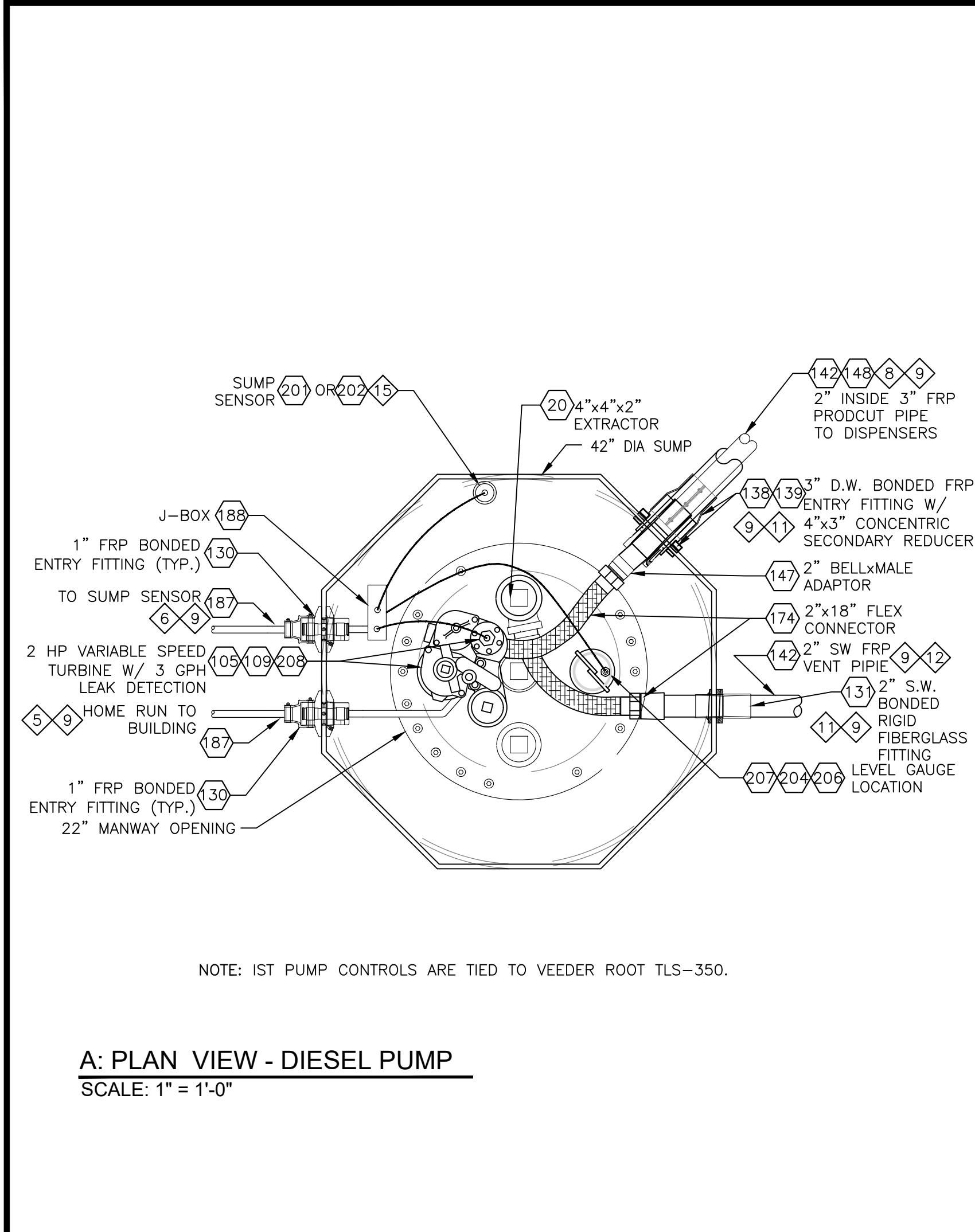
DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO.:  
01/01/2023 21730

DRAWING TITLE:

**SINGLE UST GASOLINE TANK SUMP FITTING DETAILS**

SHEET NO:

**M.5.1.30**



# - NOTES	
1	SLOPE CONCRETE AWAY FROM ALL MANHOLES 1" RISE OVER 12" RUN
2	FIBER REINFORCEMENT TO BE USED. PRE-MIX UNIFORMLY THROUGHOUT CONCRETE.
3	REINFORCING BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.
4	REINFORCE CONCRETE SLAB AROUND MANHOLE WITH 4-#4 REBAR 60" IN LENGTH. PLACE REBAR 6" FROM SIDES OF BOX.
5	SINGLE 1" CONDUIT TO EACH SUBMERSIBLE PUMP. PROVIDE SEAL OFF AT BUILDING WIRING TROUGH SUMP. CONTAINS LINE VOLTAGE WIRING.
6	SINGLE 1" CONDUIT TO EACH TANK. LOOP HOME RUN FROM INTERSTITIAL SENSOR LOCATION TO CONTAINMENT SUMP SENSORS & TANK GAUGES. PROVIDE SEAL-OFF IN BUILDING & AT TANK. ROUTE TO INTRINSICALLY SAFE TROUGH IN BUILDING. CONTAINS ONLY LOW VOLTAGE WIRING FOR SENSORS.
7	PEA GRAVEL BACKFILL. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER AND OWNER'S FIELD REPRESENTATIVE.
8	PIPING SHALL BE LAID AND CONTINUOUSLY SUPPORTED ON A 6" COMPACTED PEA GRAVEL BEDDING. PIPING SHALL NOT BE SUPPORTED BY BLOCKS, PLANKS, OR OTHER DEBRIS.
9	ALL ENTRIES TO BE PERPENDICULAR TO CONTAINMENT SUMP. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR MAXIMUM ANGLE ALLOWANCE.
10	PLYWOOD 48" X 48" X 3/4" PLACED TO ASSURE 2" CLEARANCE BETWEEN CONCRETE AND CONTAINMENT SUMP.
11	N.O.V. RED THREAD IIA PENETRATION FITTINGS SHOWN. ALTERNATE FITTINGS MAY NOT BE USED.
12	REAM ALL RISERS FOR FULL PIPE BORE IF REQUIRED.
13	INSTALL TANK ID MARKERS IN THE SPILL CONTAINMENT MANHOLES. COVERS SHALL BE PRIMED AND PAINTED ACCORDING TO SPECIFICATIONS.
14	SECONDARY CONTAINMENT FOR ALL VENT AND STAGE II VAPOR RECOVERY PIPING ONLY WHEN REQUIRED BY LOCAL JURISDICTION.
15	COAT ALL BURIED GALVANIZED STEEL PIPING WITH COAL TAR EPOXY.
16	SEAL OFF REQUIRED ONLY AT FIRST SUMP HOME RUN FROM VEEDER ROOT PANEL.
17	OVERFLOW PROTECTION: UST OVERFLOW COMPLIANCE IS ACHIEVED BY USE OF OVERFLOW PREVENTION DROP TUBE FLAPPER VALVE SET AT 95% AND IS IN ACCORDANCE WITH FEDERAL AND STATE GUIDELINES FOR UST OVERFILL REQUIREMENTS.  AN OVERFILL ALARM AND ACKNOWLEDGE SWITCH TIED INTO THE VEEDER ROOT AUTOMATIC TANK GAUGE SYSTEM. THE MONITORING SYSTEM PROVIDES AN AUDIBLE AND VISUAL ALARM WHEN THE TANK(S) ARE FILLED TO THE 90% LEVEL.
18	FIELD COATING AND WRAPPING ALL RISERS AND STATIC GROUND CONNECTIONS WITH 3M SCOTCHTAPE PIPE PRIMER & 3M TEMFLEX 10 MIL TAPE OR USE 10 MIL SELF-PRIME PROSELECT PIPE WRAP TAPE.
NOTE: XX INDICATES ITEMS FOUND ON MATERIALS LIST SHEETS M.5.1.01 & M.5.1.02	

CLIENT:

**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

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SEAL:

**PRFI20240124**

DEVELOPMENT INFORMATION:

**ARCO NTI**  
**3400 am/pm**  
**FUEL CANOPY w/ 6 MPD's**

SITE ADDRESS:

**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

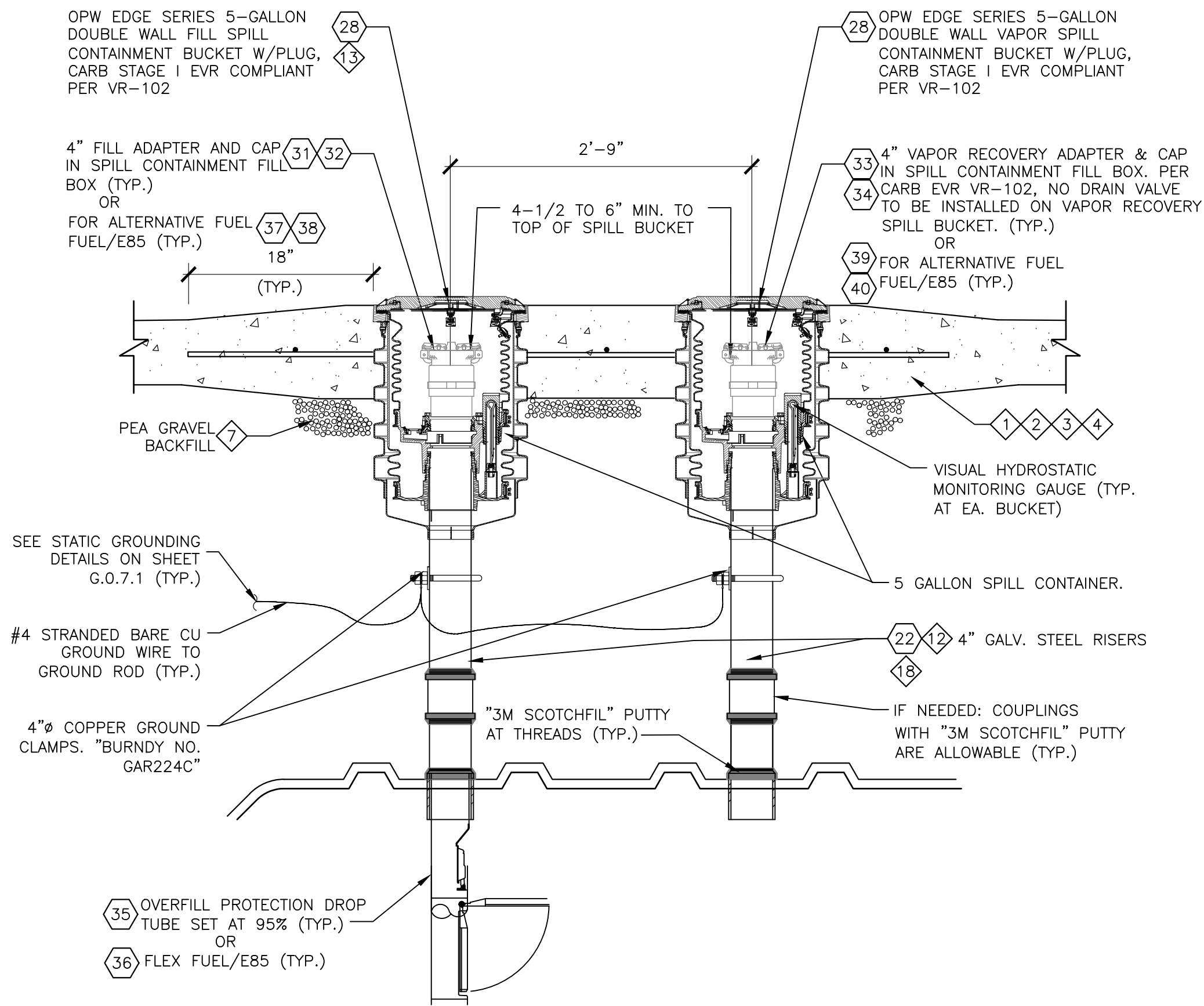
**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: **V-15.0** PROJECT NO.: **21730**  
DATE: **01/01/2023**  
DRAWING TITLE:

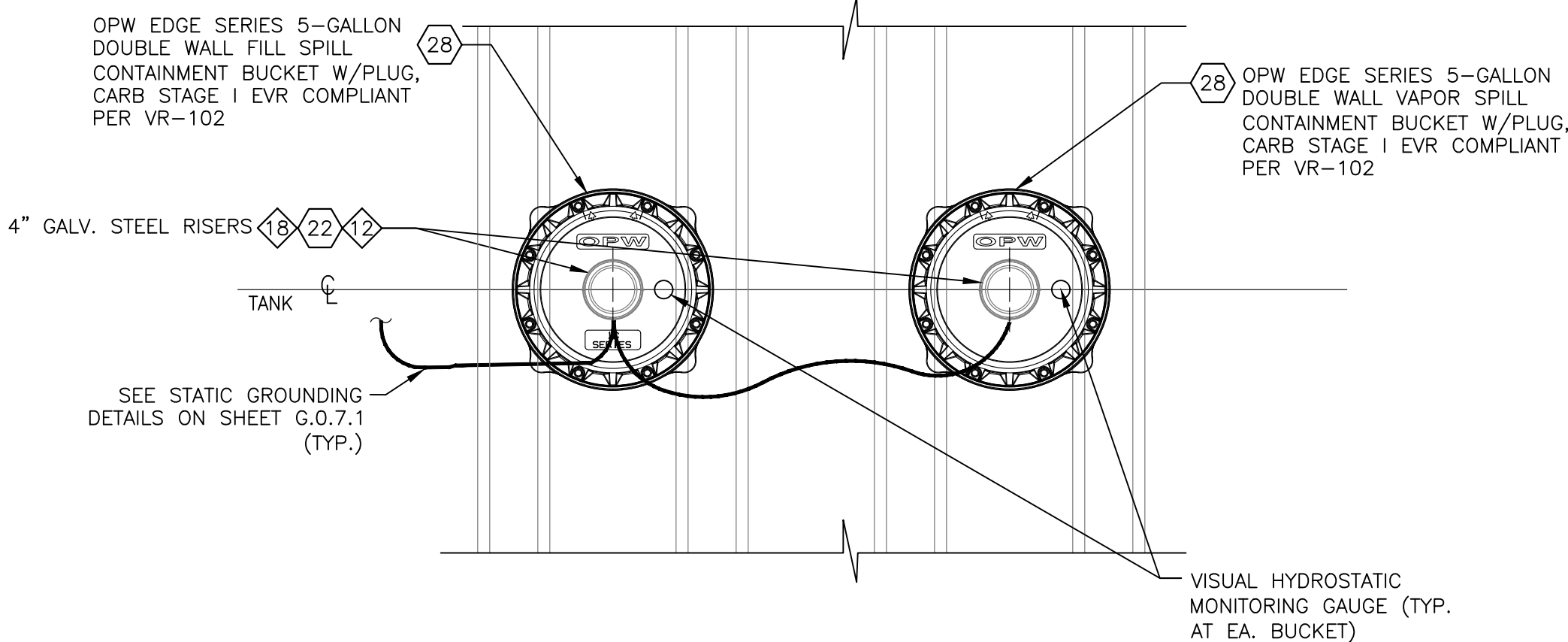
**DIESEL TANK SUMP AND FITTING INSTALLATION DETAILS (STANDARD OPW)**

SHEET NO:

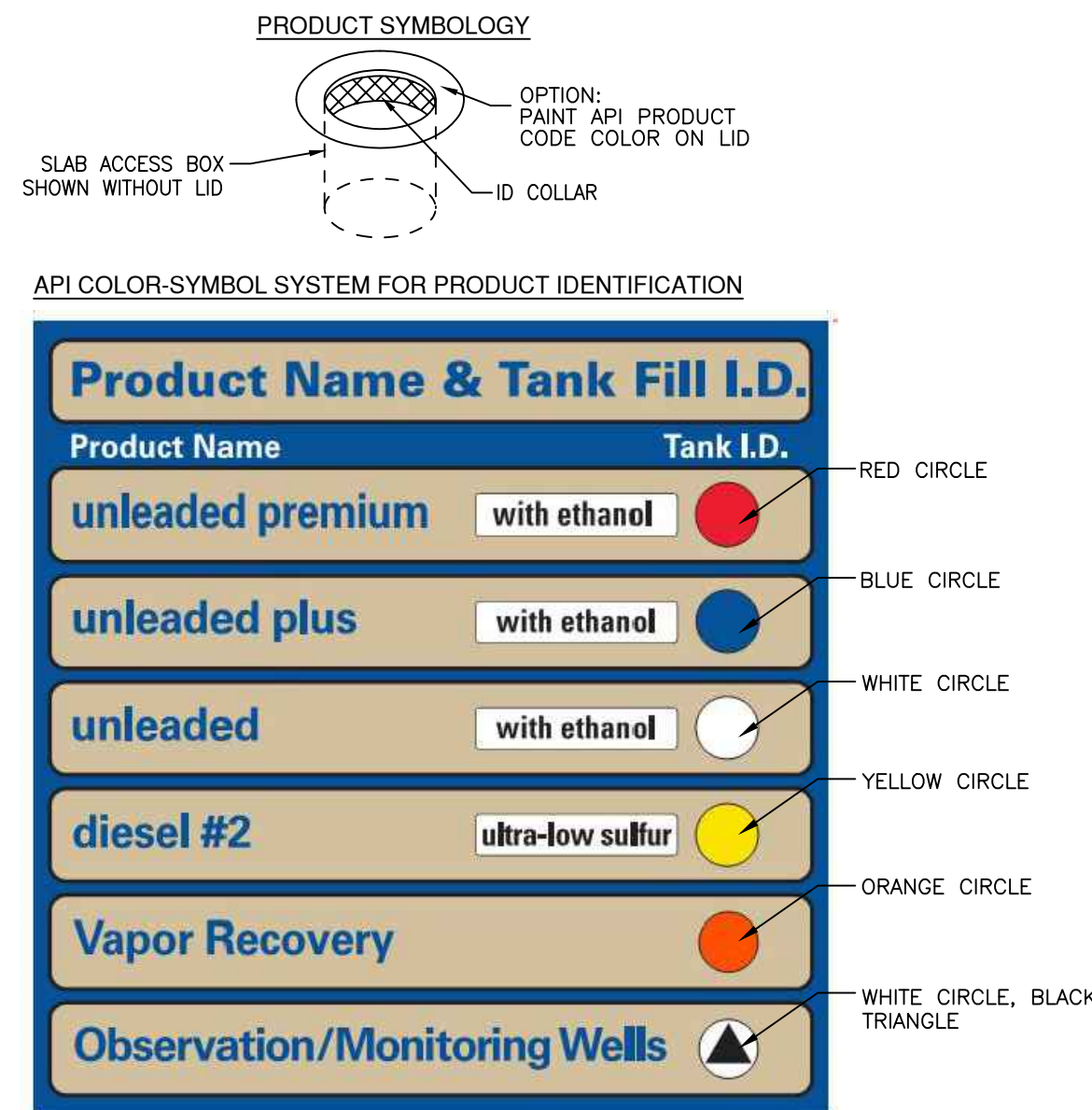
**M.5.1.33**



**A: ELEVATION - GASOLINE FILL & STAGE I RISERS (STANDARD)**  
SCALE: 1" = 1'-0"

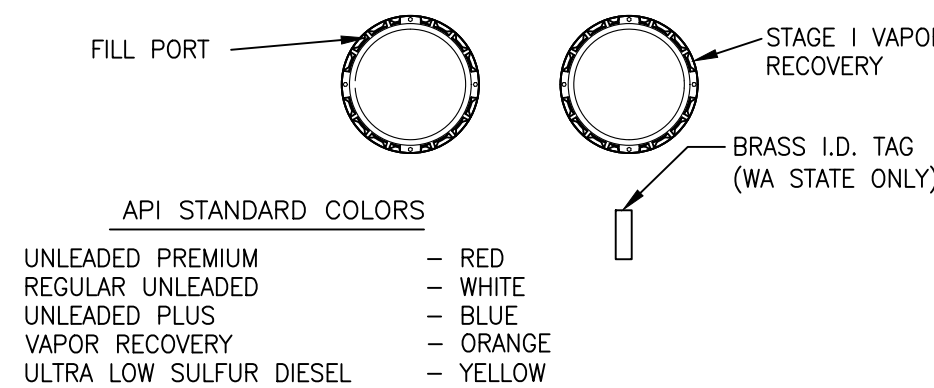


**B: TYPICAL TANK TOP DETAIL AT FILL & STAGE I RISERS**  
SCALE: 1" = 1'-0"

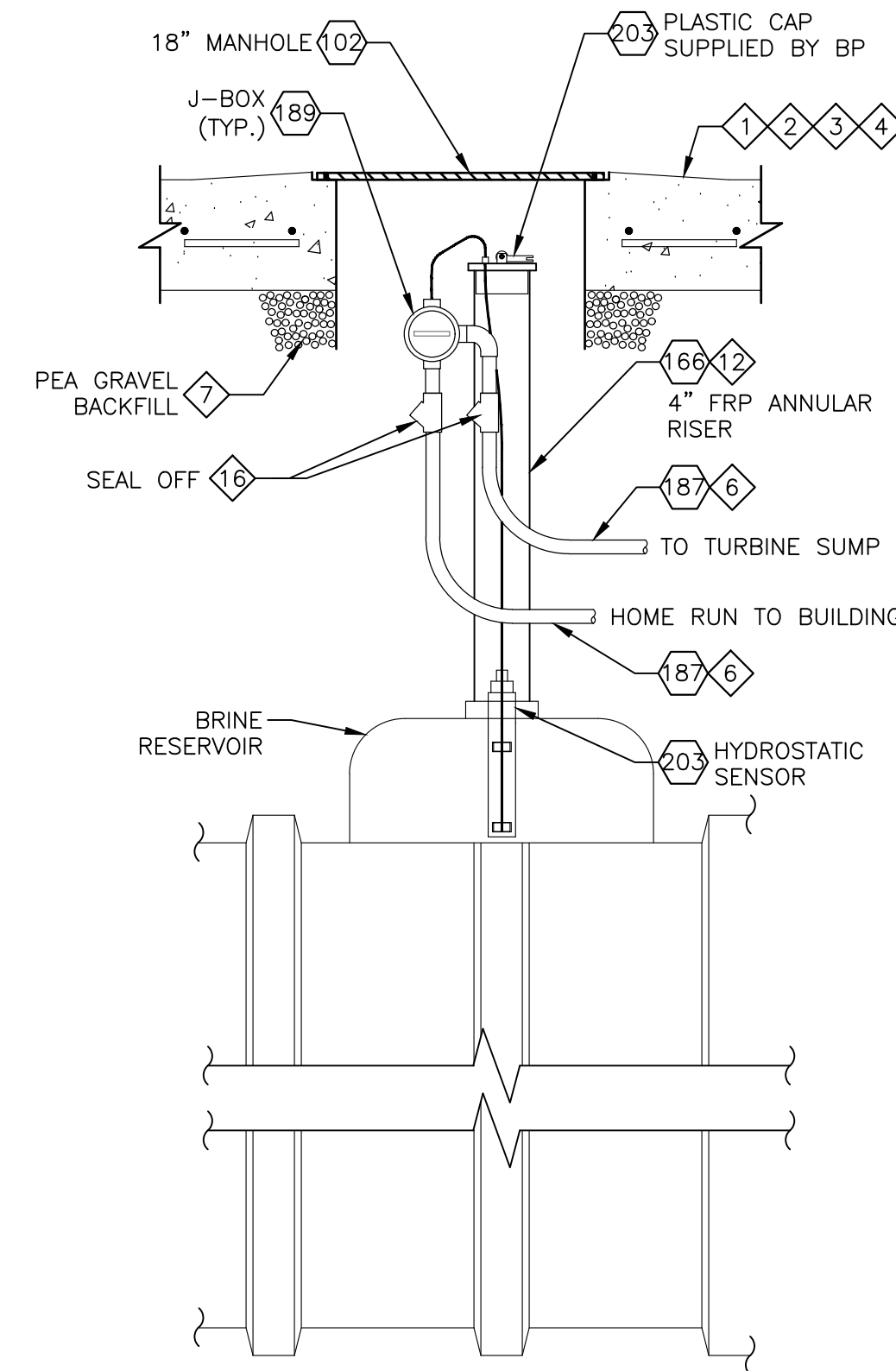


REF: API 1637 - PRODUCT SYMBOLS

NOTE: THE ABOVE SYMBOLS REPRESENT INDUSTRY GUIDELINES FOR PRODUCT IDENTIFICATION. CONSULT LOCAL DISTRIBUTION MANAGER FOR LOCAL METHOD OF PRODUCT IDENTIFICATION TO BE USED.



**ACCESS COVER IDENTIFICATION  
STANDARD FILL/VAPOR**  
SCALE: NONE

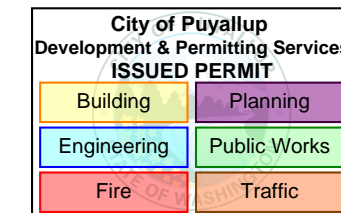


**E: ELEVATION - INTERSTITIAL SPACE MONITOR**  
SCALE: 3/4" = 1'-0"

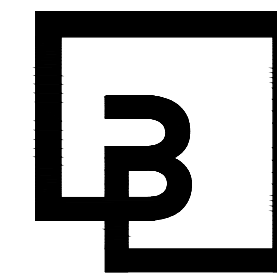
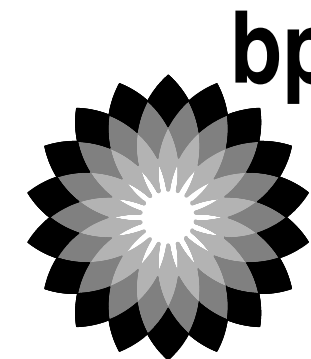
# - NOTES

- SLOPE CONCRETE AWAY FROM ALL MANHOLES 1" RISE OVER 12" RUN
- FIBER REINFORCEMENT TO BE USED. PRE-MIX UNIFORMLY THROUGHOUT CONCRETE.
- REINFORCING BARS TO BE NO LESS THAN 2" AND NO MORE THAN 4" FROM SURFACE.
- REINFORCE CONCRETE SLAB AROUND MANHOLE WITH 4-#4 REBAR 60" IN LENGTH. PLACE REBAR 6" FROM SIDES OF BOX.
- SINGLE 1" CONDUIT TO EACH SUBMERSIBLE PUMP. PROVIDE SEAL OFF AT BUILDING WIRING TROUGH SUMP. CONTAINS LINE VOLTAGE WIRING.
- SINGLE 1" CONDUIT TO EACH TANK. LOOP HOME RUN FROM INTERSTITIAL SENSOR LOCATION TO CONTAINMENT SUMP SENSORS & TANK GAUGES. PROVIDE SEAL-OFF IN BUILDING & AT TANK. ROUTE TO INTRINSICALLY SAFE TROUGH IN BUILDING. CONTAINS ONLY LOW VOLTAGE WIRING FOR SENSORS.
- PEA GRAVEL BACKFILL. ALL SUBSTITUTES MUST BE APPROVED BY MANUFACTURER AND OWNER'S FIELD REPRESENTATIVE.
- PIPING SHALL BE LAID AND CONTINUOUSLY SUPPORTED ON A 6" COMPACTED PEA GRAVEL BEDDING. PIPING SHALL NOT BE SUPPORTED BY BLOCKS, PLANKS, OR OTHER DEBRIS.
- ALL ENTRIES TO BE PERPENDICULAR TO CONTAINMENT SUMP. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR MAXIMUM ANGLE ALLOWANCE.
- PLYWOOD 48" X 48" X 3/4" PLACED TO ASSURE 2" CLEARANCE BETWEEN CONCRETE AND CONTAINMENT SUMP.
- SMITH FIBERCAST PENETRATION FITTINGS SHOWN. ALTERNATE FITTINGS MAY NOT BE USED.
- REAM ALL RISERS FOR FULL PIPE BORE IF REQUIRED.
- INSTALL TANK ID MARKERS IN THE SPILL CONTAINMENT MANHOLES. COVERS SHALL BE PRIMED AND PAINTED ACCORDING TO SPECIFICATIONS.
- SECONDARY CONTAINMENT FOR ALL VENT AND STAGE II VAPOR RECOVERY PIPING ONLY WHEN REQUIRED BY LOCAL JURISDICTION.
- COAT ALL BURIED GALVANIZED STEEL PIPING WITH COAL TAR EPOXY.
- SEAL OFF REQUIRED ONLY AT FIRST SUMP HOME RUN FROM VEEDER ROOT PANEL.
- OVERFLOW PROTECTION: UST OVERFLOW COMPLIANCE IS ACHIEVED BY USE OF OVERFLOW PREVENTION DROP TUBE FLAPPER VALVE SET AT 95% AND IS IN ACCORDANCE WITH FEDERAL AND STATE GUIDELINES FOR UST OVERFILL REQUIREMENTS.  
AN OVERFILL ALARM AND ACKNOWLEDGE SWITCH TIED INTO THE VEEDER ROOT AUTOMATIC TANK GAUGE SYSTEM. THE MONITORING SYSTEM PROVIDES AN AUDIBLE AND VISUAL ALARM WHEN THE TANK(S) ARE FILLED TO THE 90% LEVEL.
- FIELD COATING AND WRAPPING ALL RISERS AND STATIC GROUND CONNECTIONS WITH 3M SCOTCHRAPE PRIMER & 3M TEMFLEX 10 MIL TAPE OR CONTRACTOR MAY USE 10 MIL SELF-PRIME PROSELECT PIPE WRAP TAPE.

NOTE:  
INDICATES ITEMS FOUND ON MATERIALS  
LIST SHEETS M.5.1.01 & M.5.1.02



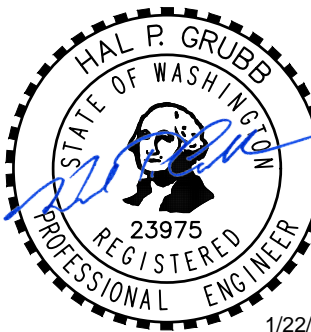
CLIENT:



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Consulting Engineers, Inc.**  
18215 72nd Avenue South  
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SEAL:



**PRFI20240124**

DEVELOPMENT INFORMATION:

**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:

**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

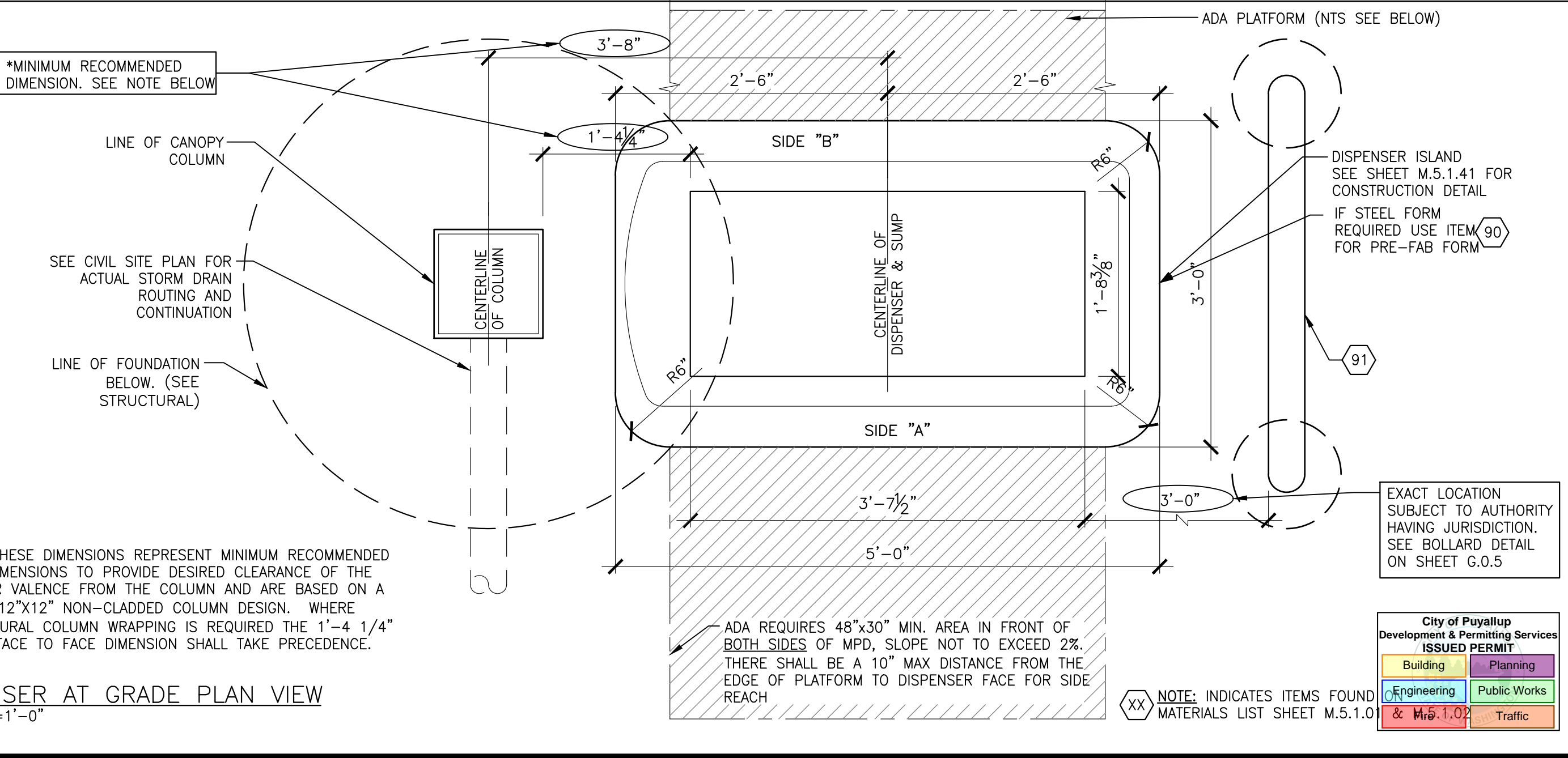
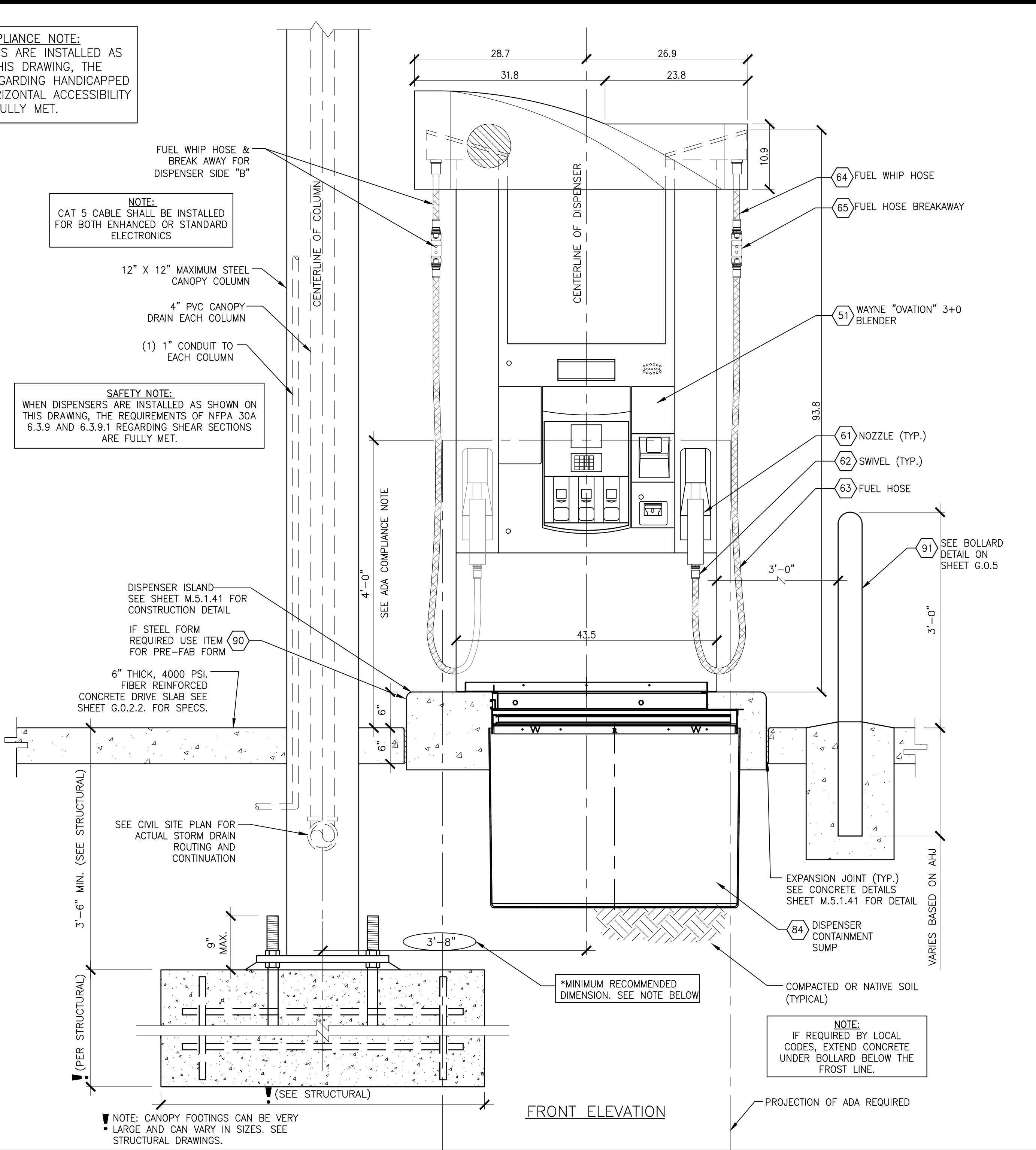
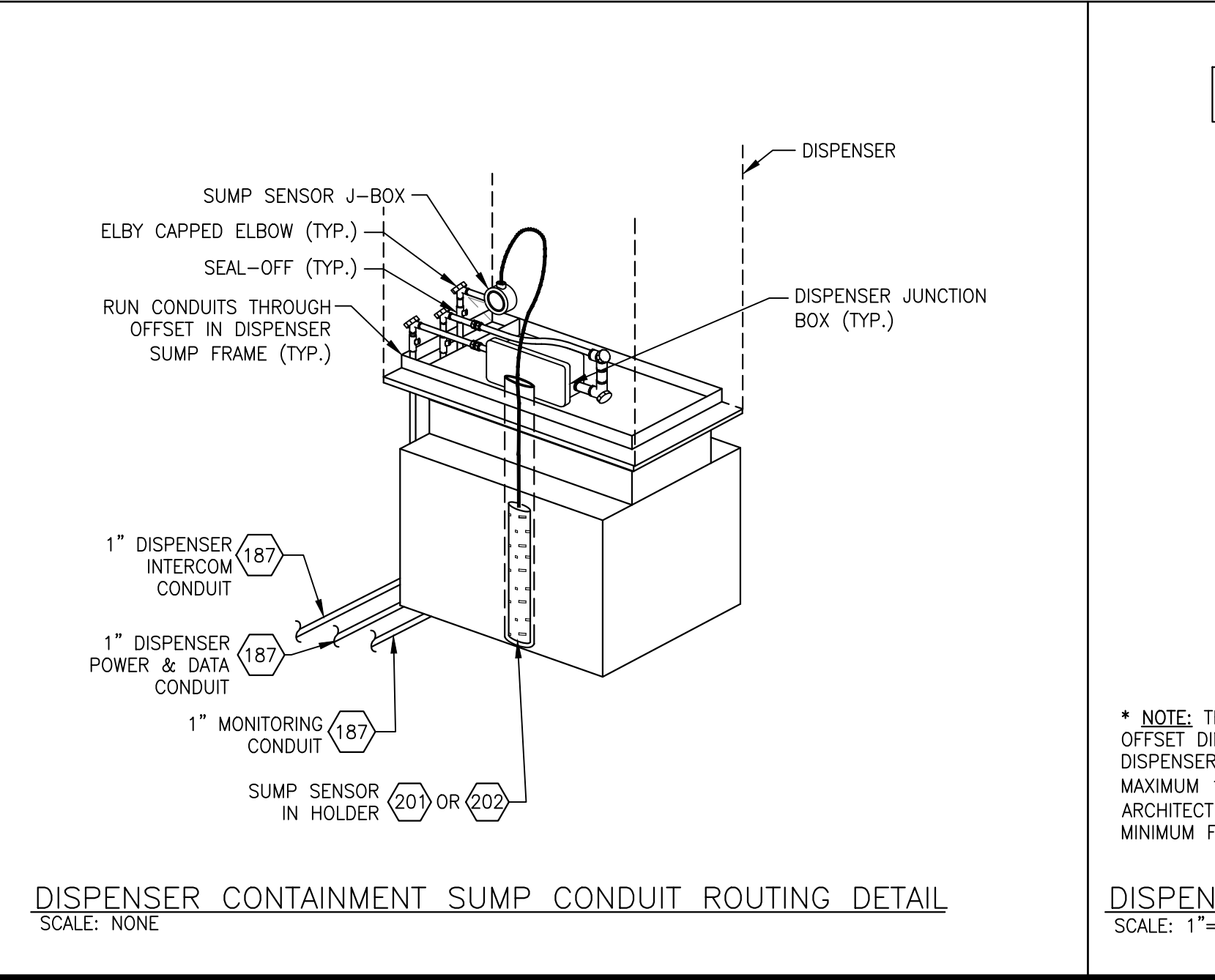
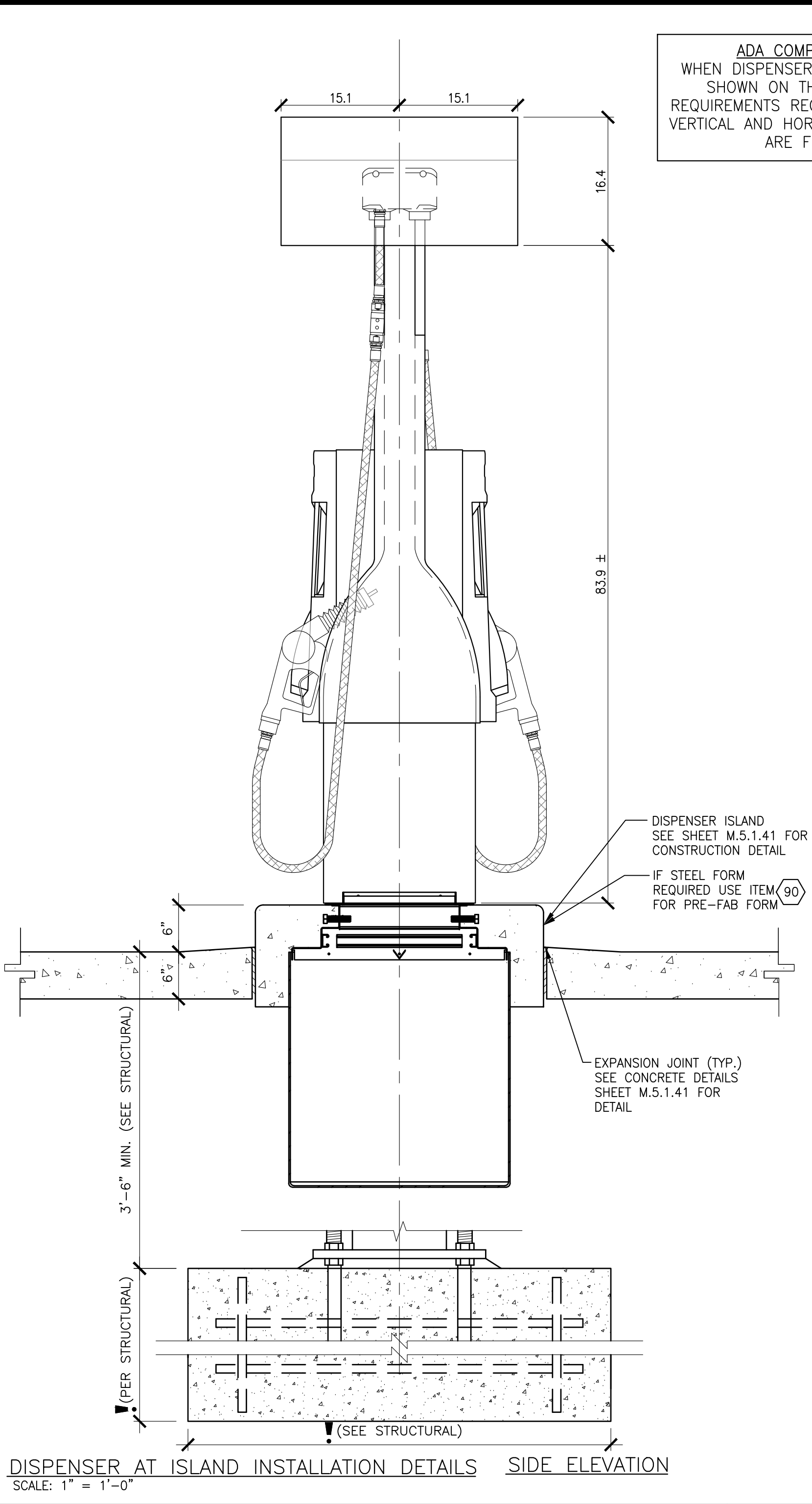
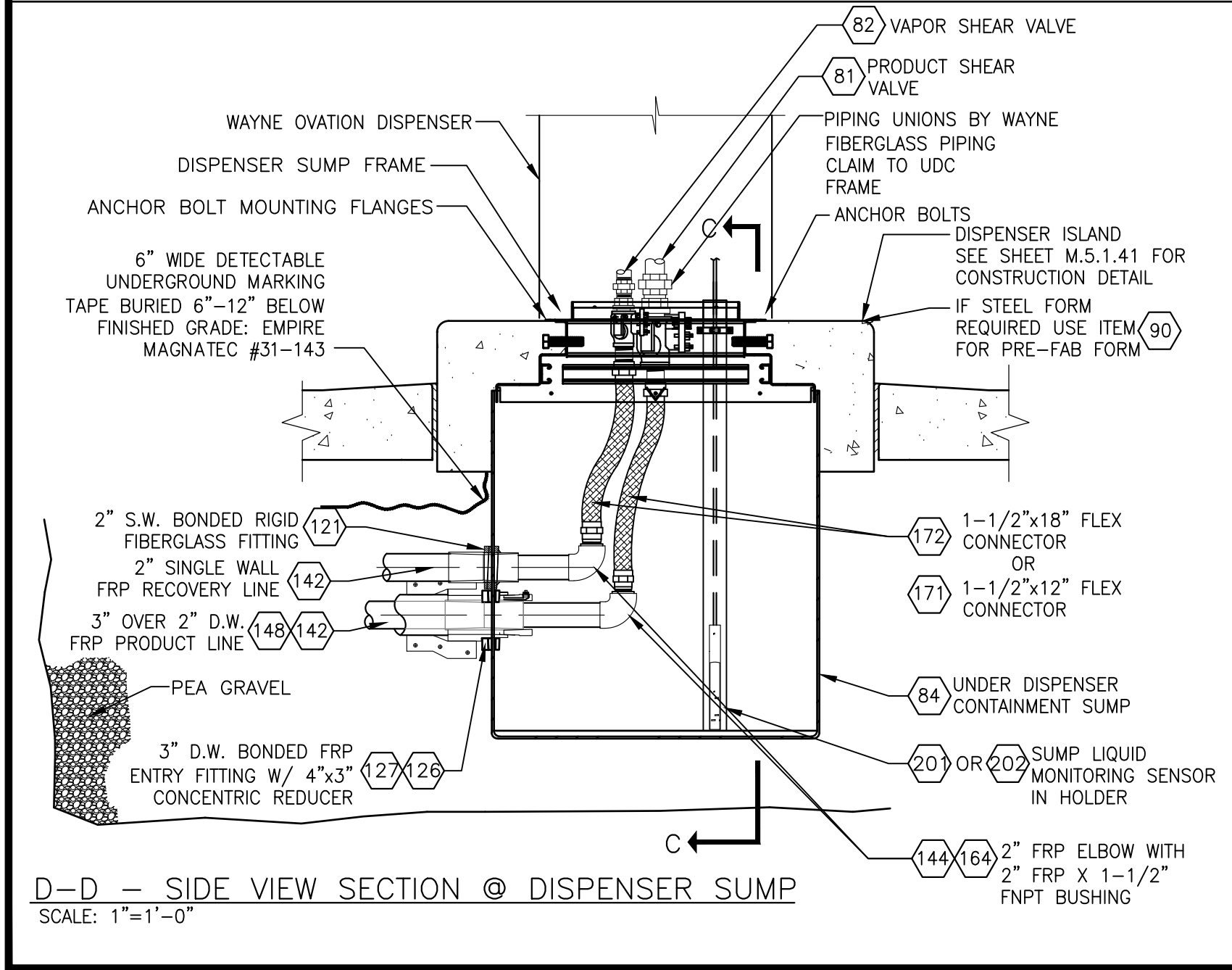
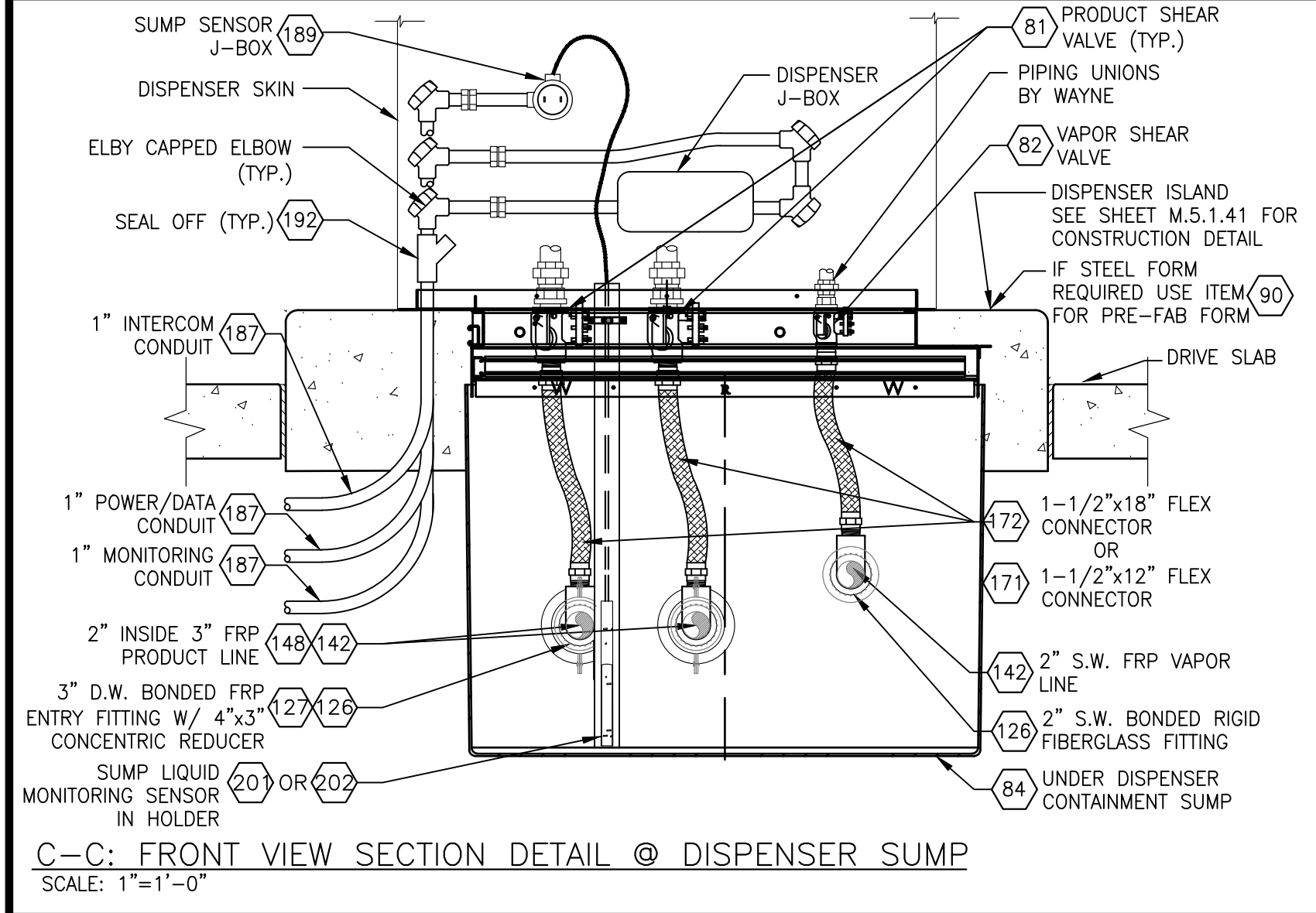
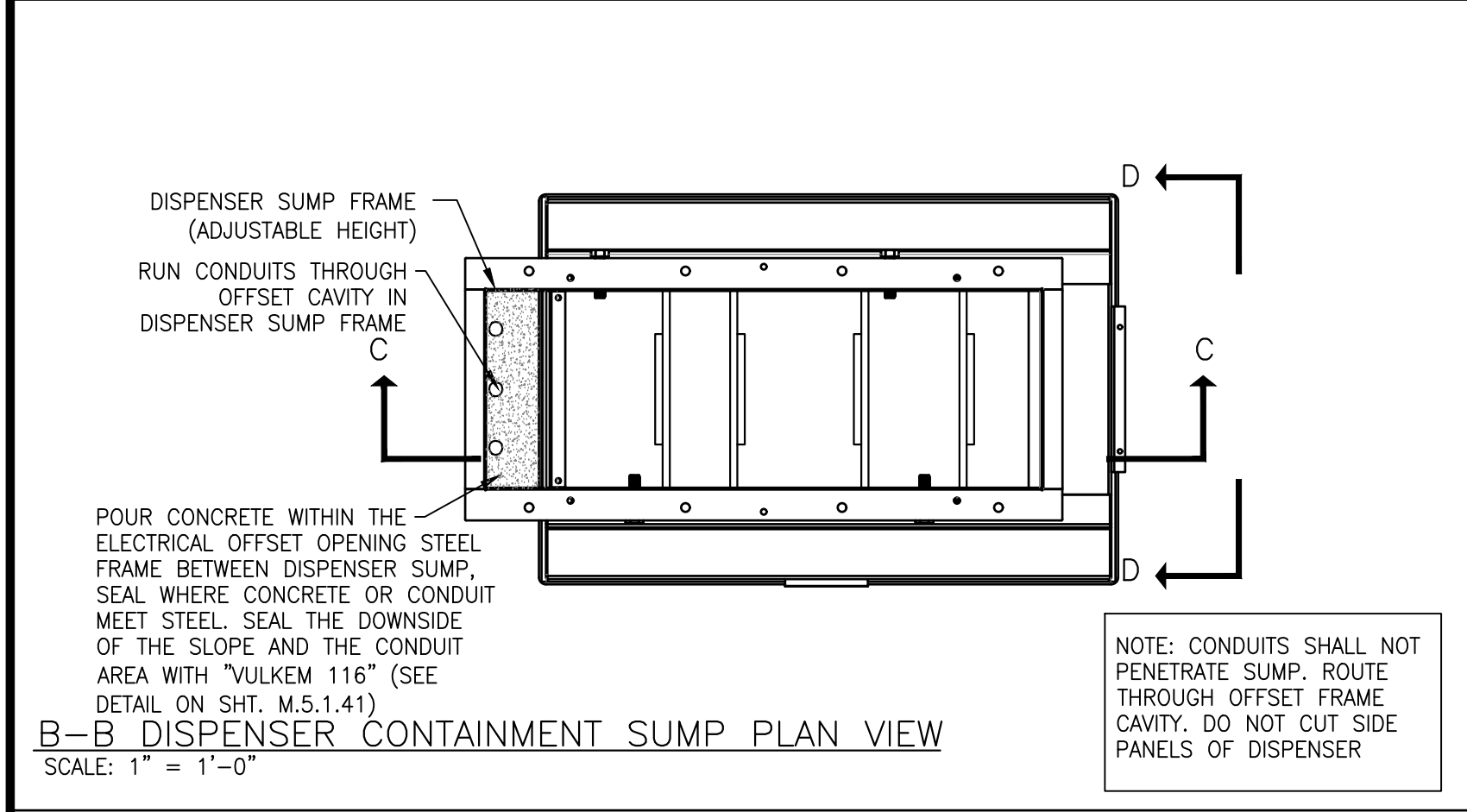
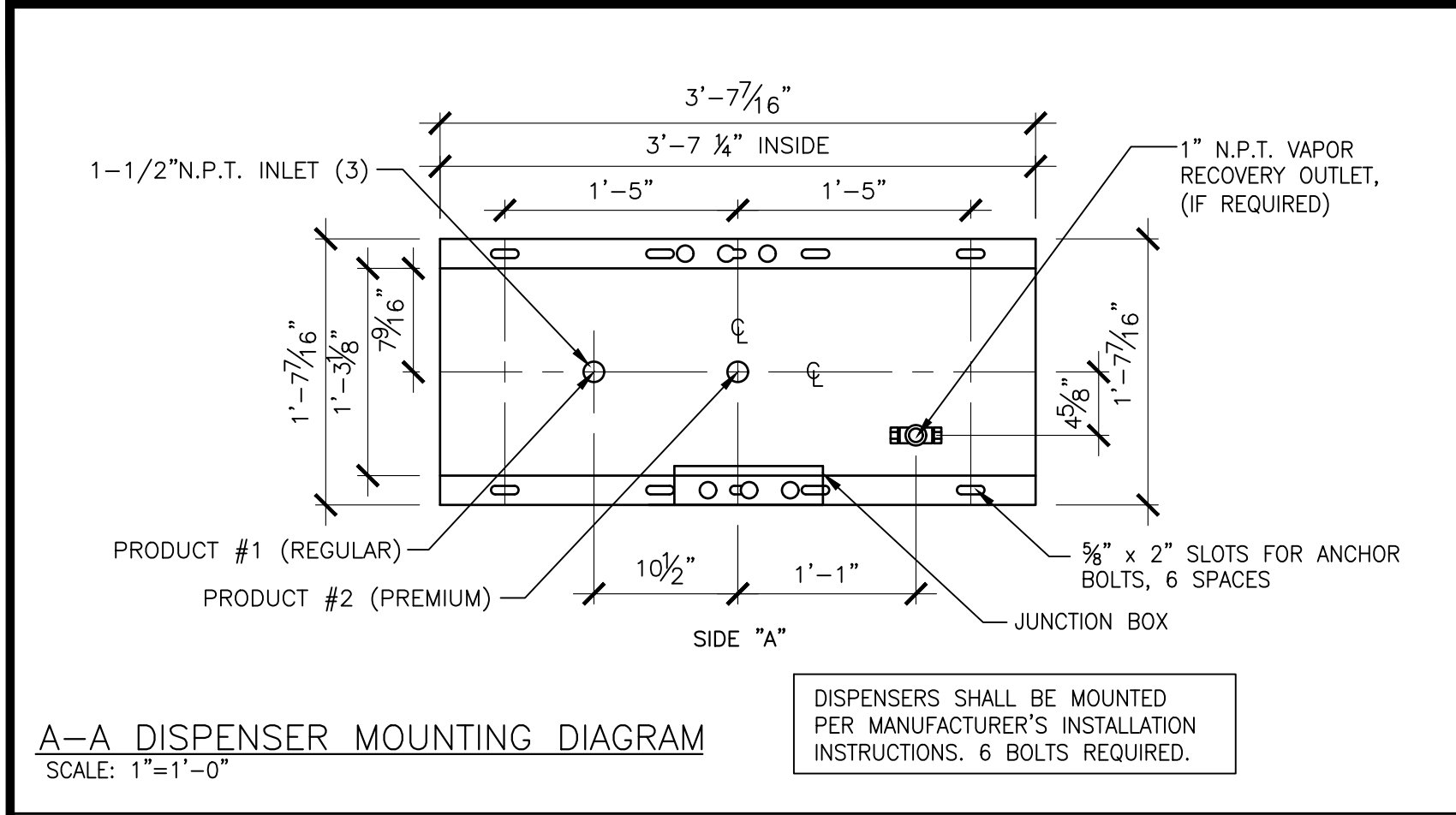
**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO.:  
01/01/2023 21730

DRAWING TITLE:  
**FILL VAPOR II  
INSTALLATION DETAILS  
(STANDARD OPW)**

SHEET NO:

**M.5.1.34**



CLIENT: **bp**

**ARCO**  
BP WEST COAST PRODUCTS, LLC

**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

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12		

SEAL: **HAL P. GRUBB**  
STATE OF WASHINGTON  
REGISTERED PROFESSIONAL ENGINEER  
23975  
1/22/2024

**PRFI20240124**

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

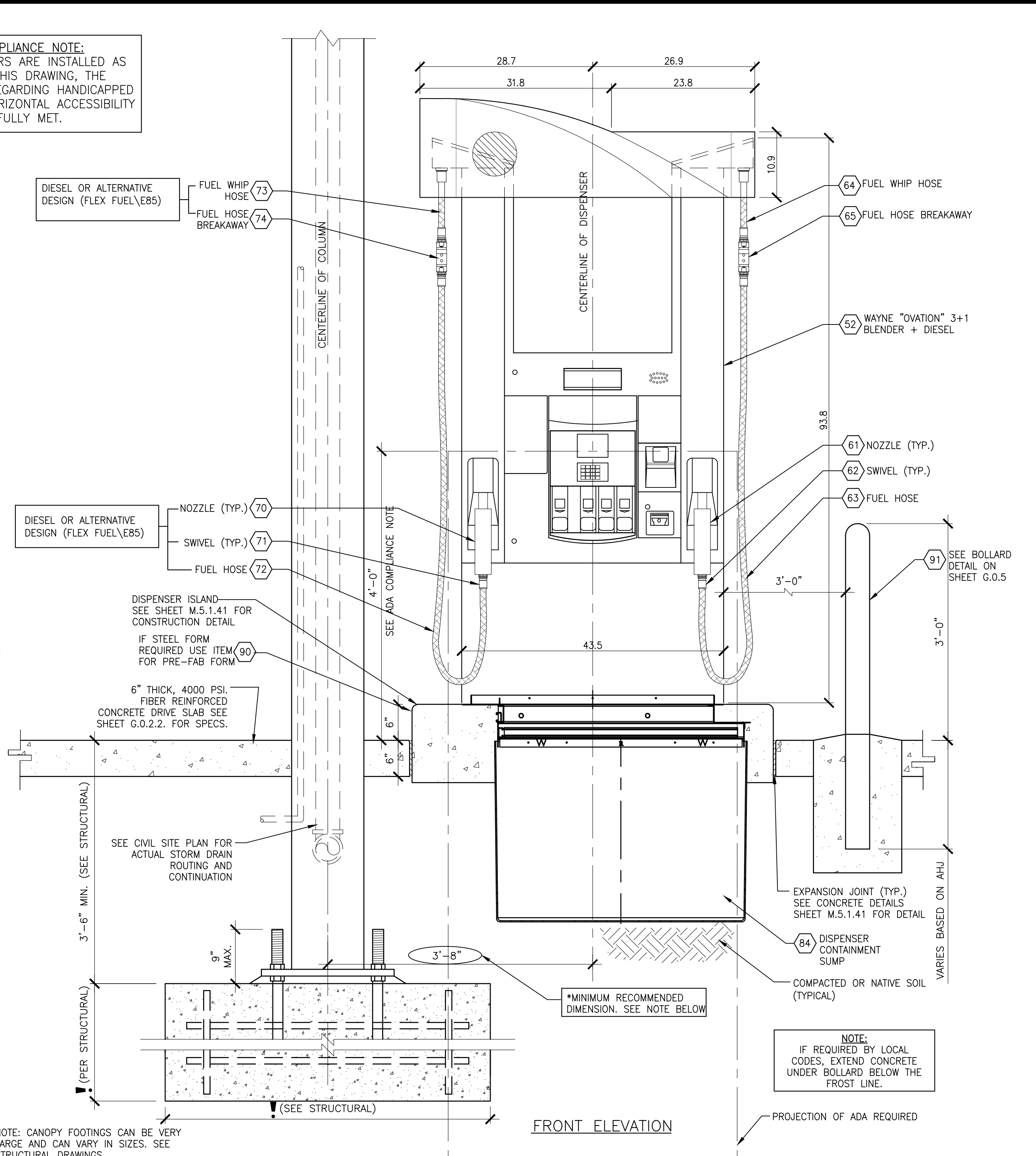
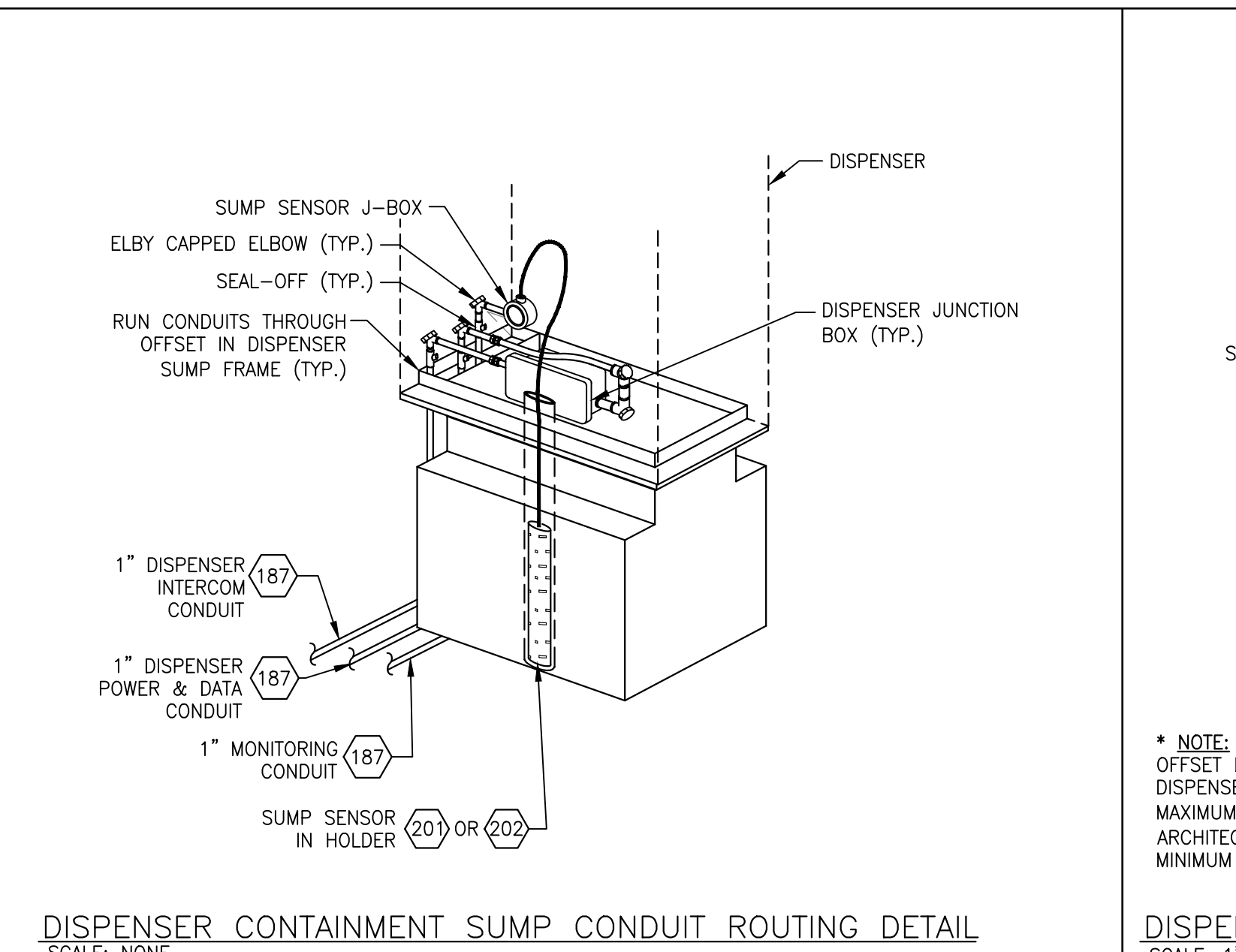
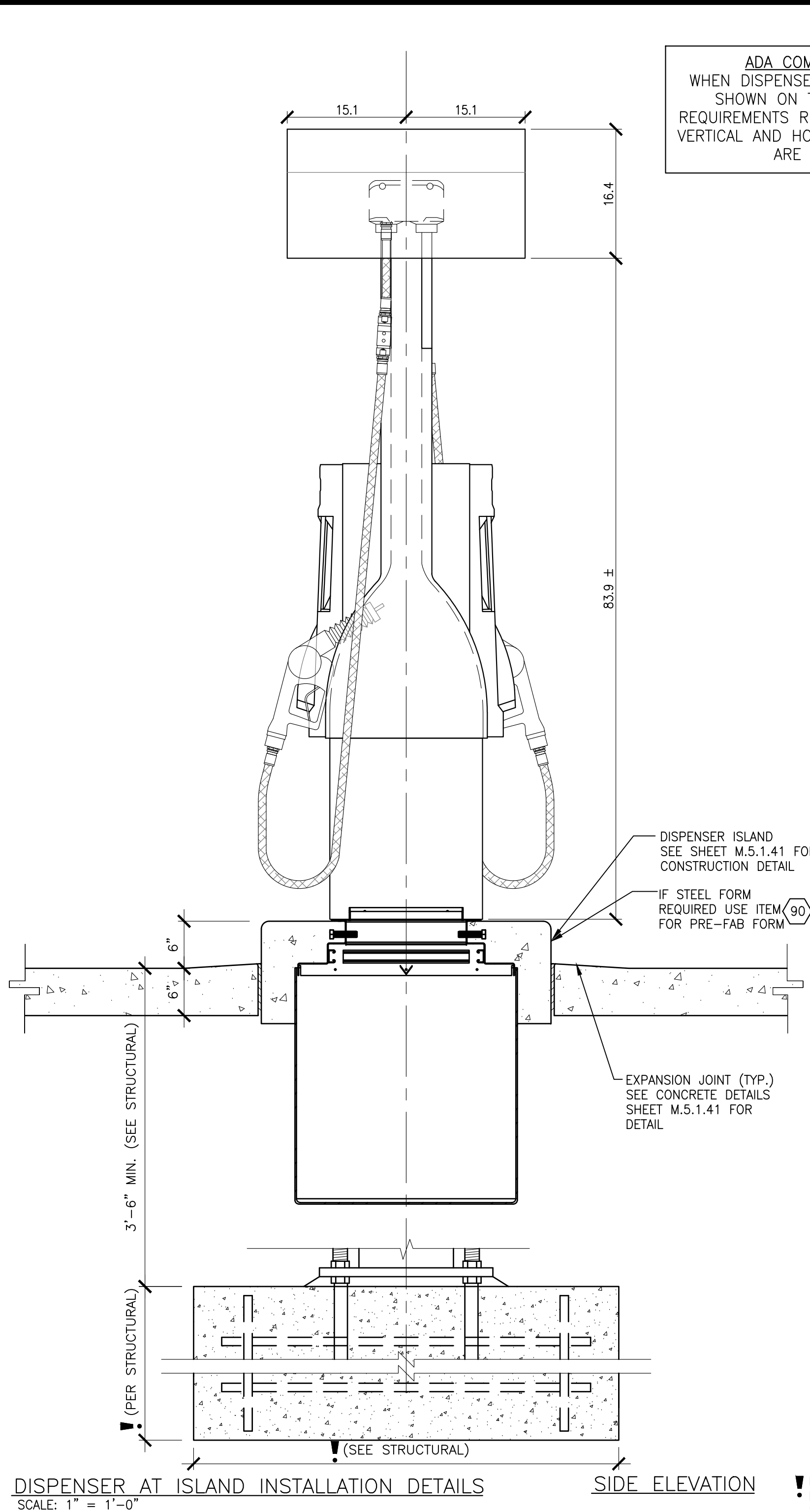
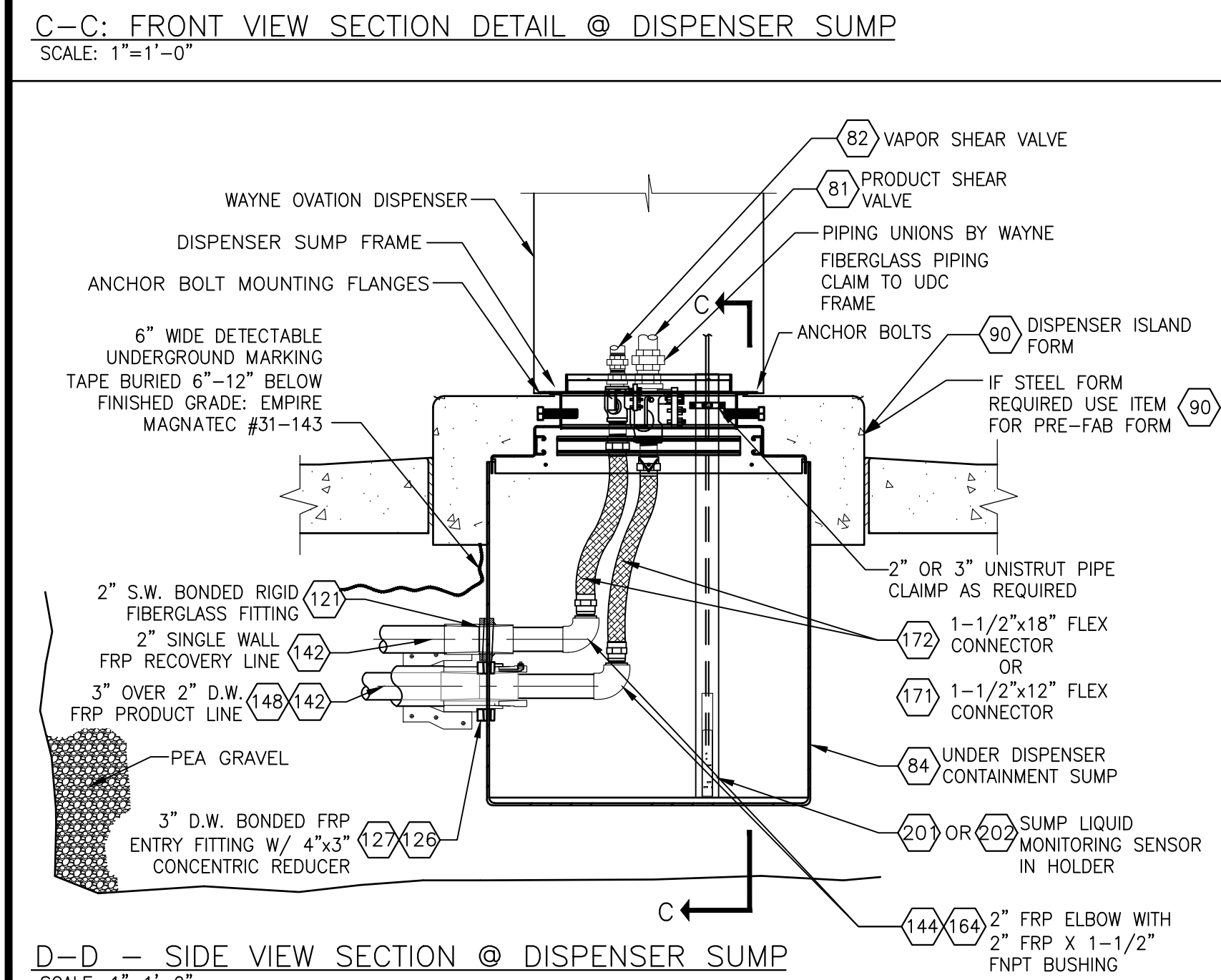
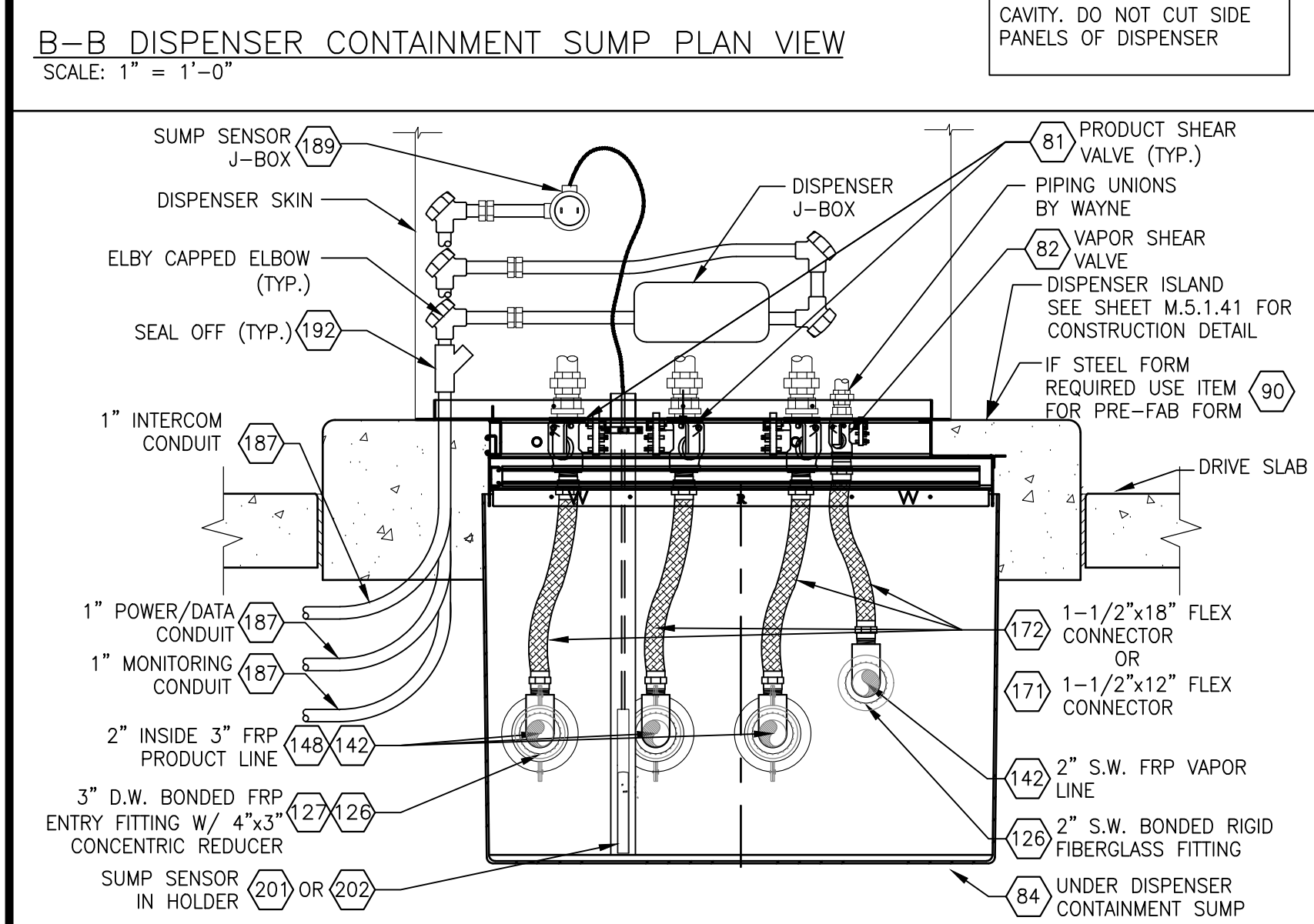
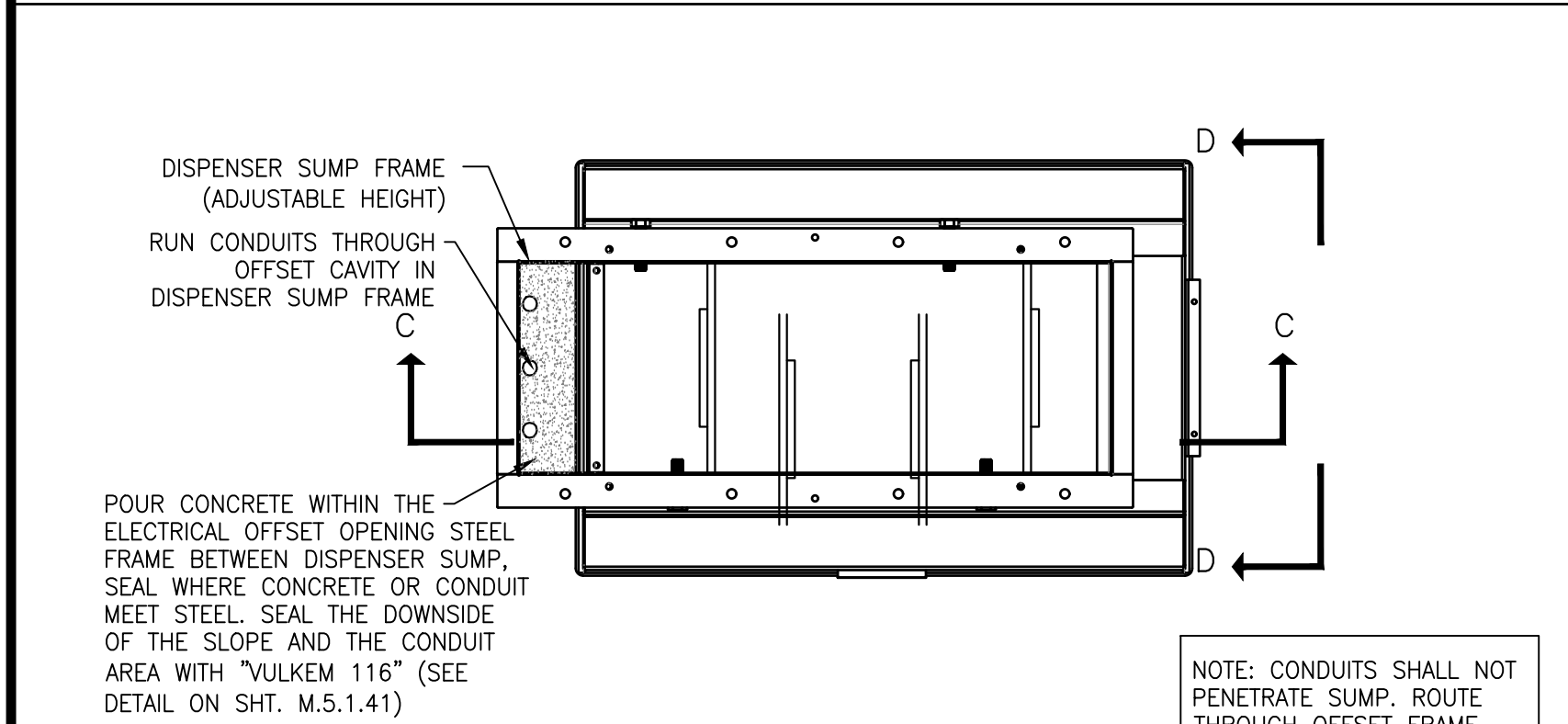
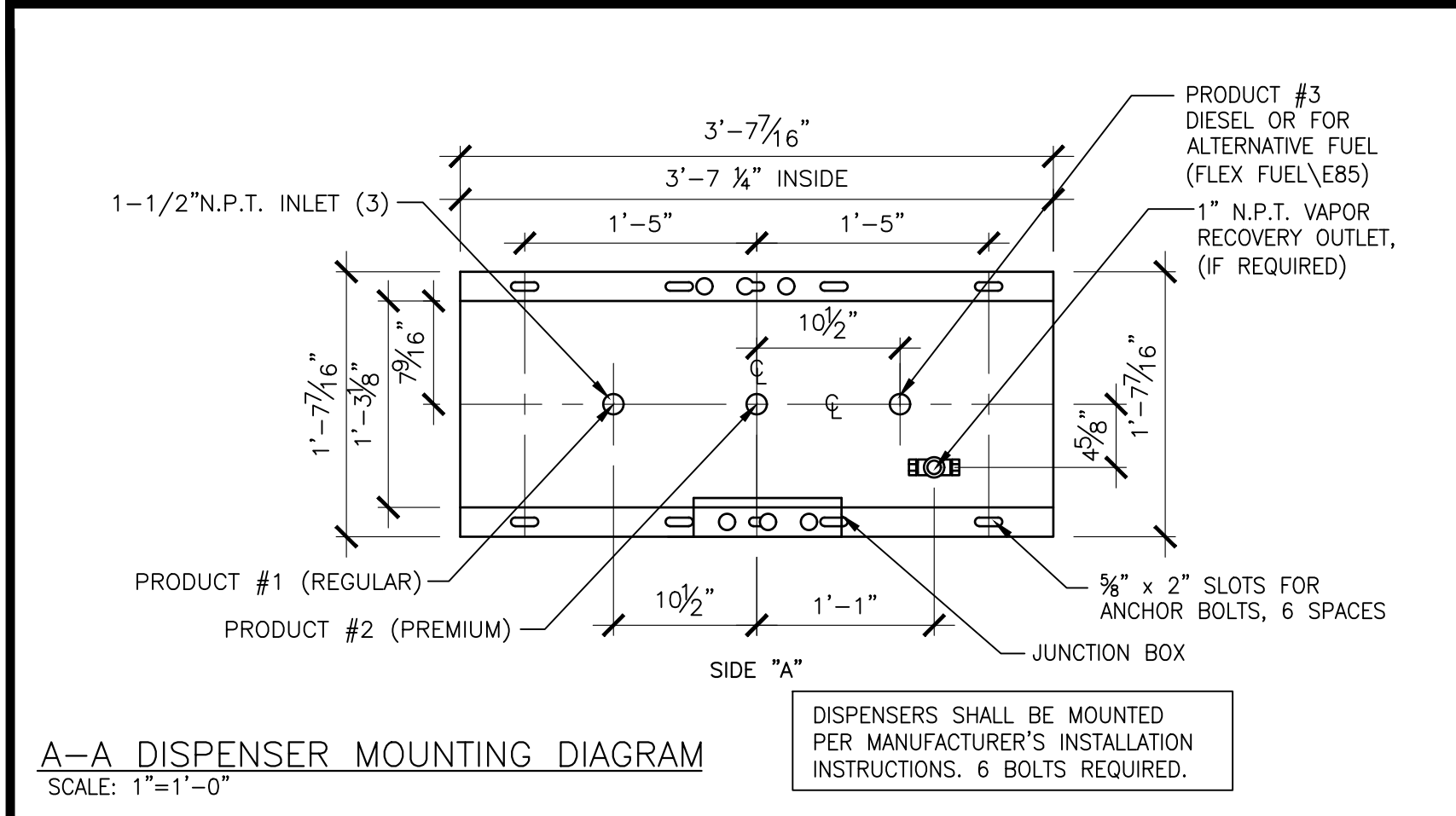
SITE ADDRESS:  
**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADNE:  
CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO.:  
01/01/2023 21730

DRAWING TITLE:  
**DISPENSER DETAILS:**  
WAYNE OVATION (3+0) BLEND  
DISPENSER INSTALLATION DETAILS  
ON ISLANDS (S.W. VAPOR)

SHEET NO:  
**M.5.1.38**



ADA COMPLIANCE NOTE:  
WHEN DISPENSERS ARE INSTALLED AS SHOWN ON THIS DRAWING, THE REQUIREMENTS REGARDING HANDICAPPED VERTICAL AND HORIZONTAL ACCESSIBILITY ARE FULLY MET.

CLIENT: **bp**

**ARCO**  
BP WEST COAST PRODUCTS, LLC

**Barghausen Consulting Engineers, Inc.**  
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Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
1	10/04/23	PERMIT RELEASE
2	01/22/24	PERMIT RELEASE
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12		

SEAL: **HAL P. GRUBB**  
STATE OF WASHINGTON  
REGISTERED PROFESSIONAL ENGINEER  
1/22/2024

**PRFI20240124**

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:  
**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADNE:  
CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730  
DRAWING TITLE:  
DISPENSER DETAILS:  
WAYNE OVATION (3+1) BLENDING  
DISPENSER INSTALLATION DETAILS  
ON ISLAND (S.W. VAPOR)

SHEET NO: **M.5.1.40**

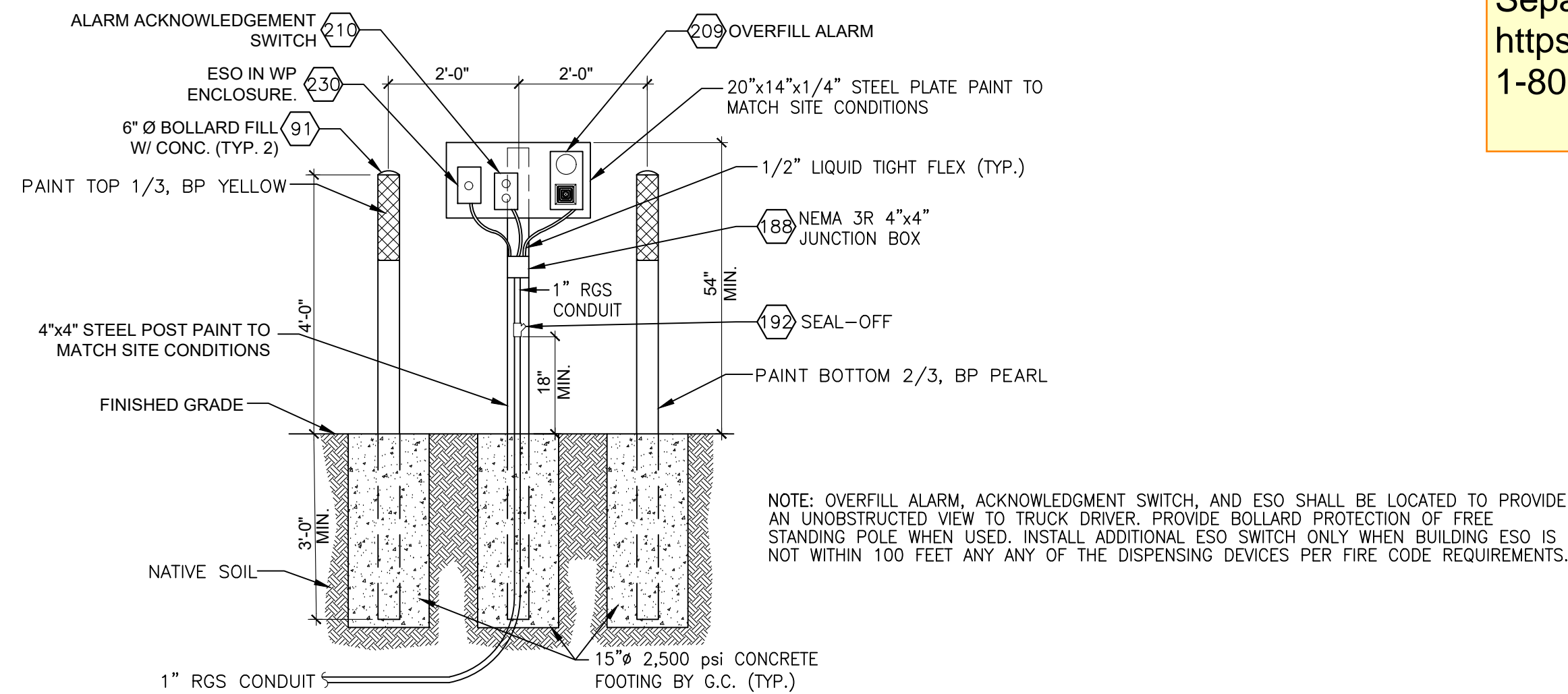
City of Puyallup  
Development & Permitting Services  
ISSUED PERMIT  
Building Planning  
Engineering Public Works

EXACT LOCATION  
SUBJECT TO AUTHORITY  
HAVING JURISDICTION.  
SEE BOLLARD DETAIL  
ON SHEET G.O.5

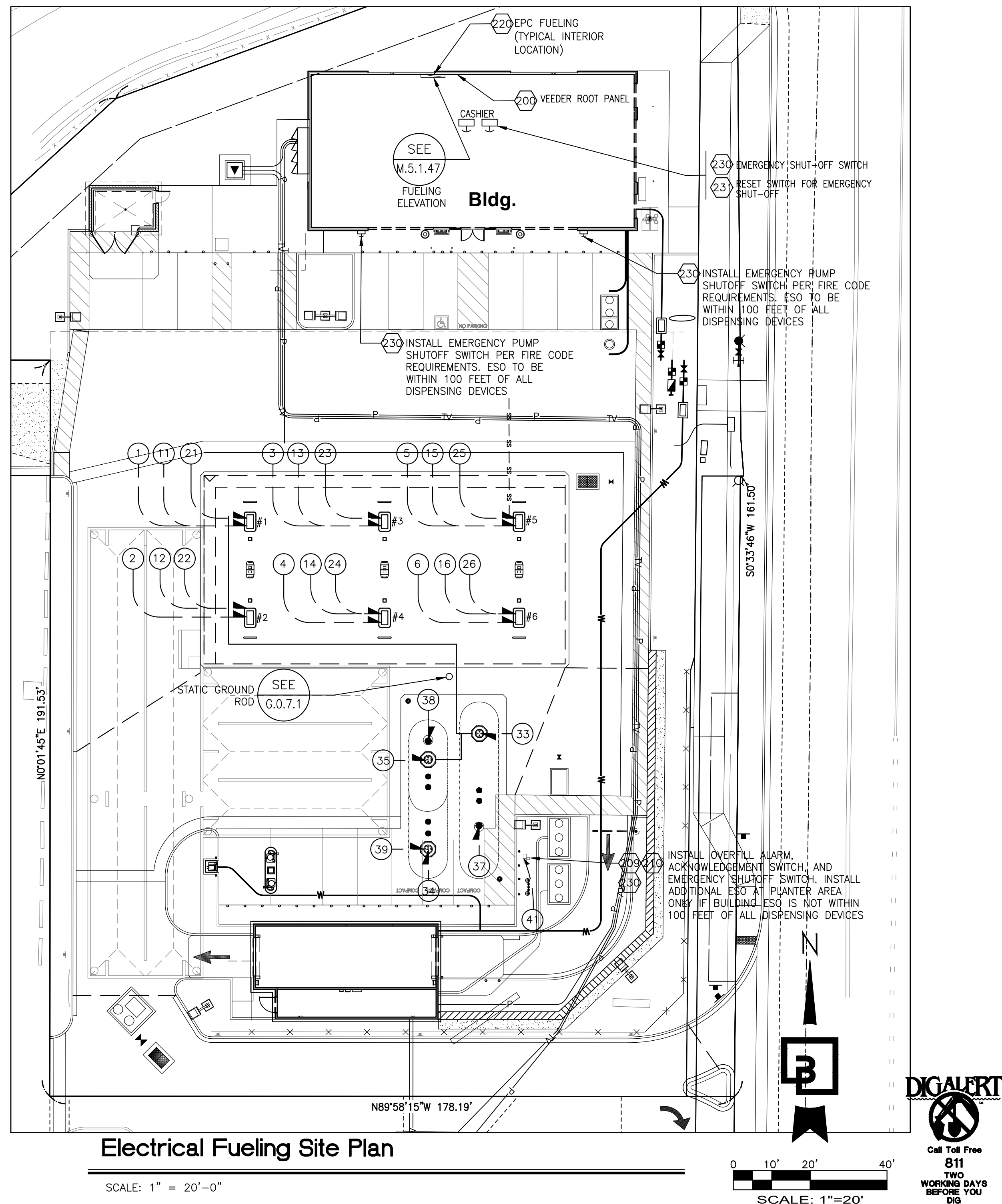
ADA REQUIRES 48"x30" MIN. AREA IN FRONT OF BOTH SIDES OF MPD, SLOPE NOT TO EXCEED 2%. THERE SHALL BE A 10" MAX DISTANCE FROM THE EDGE OF PLATFORM TO DISPENSER FACE FOR SIDE REACH

NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEET M.5.1.01





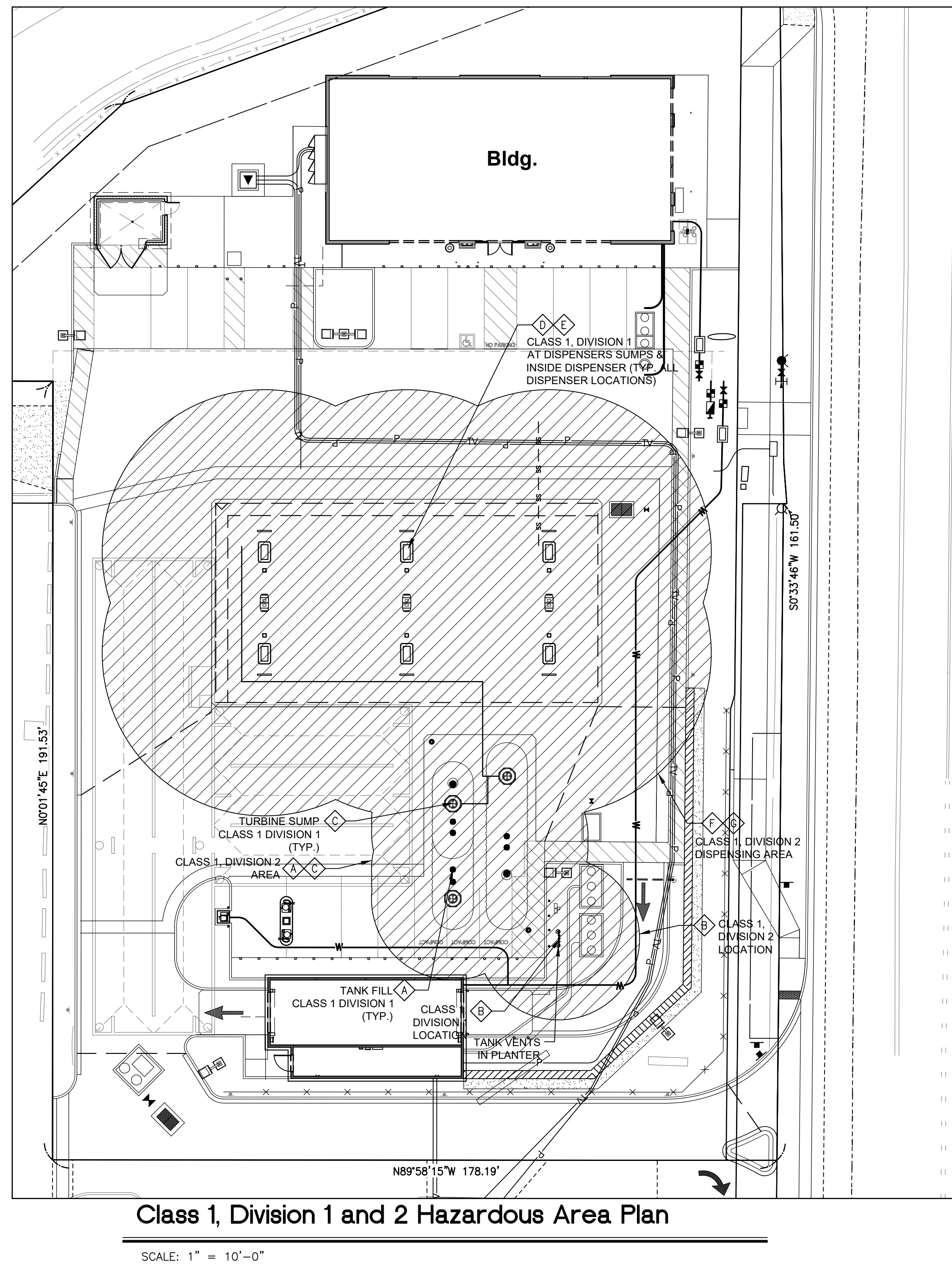
1 Overfill Alarm, Acknowledgment Switch and ESO  
SCALE: 1/2" = 1'-0"



Separate electrical permit is required with Washington State Department of Labor & Industries.  
<https://lni.wa.gov/licensing-permits/electrical/electrical-permits-fees-and-inspections> or Licensing information: Call 1-800-647-0982

### N.E.C. HAZARDOUS AREA NOTES

- A** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (UNDERGROUND TANK - FILL OPENING)  
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:  
ANY PIT, BOX, OR SPACE BELOW GRADE LEVEL, ANY PART OF WHICH IS WITHIN THE DIVISION 1 OR 2 CLASSIFIED LOCATION.  
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:  
UP TO 18 INCHES ABOVE GRADE LEVEL WITHIN A HORIZONTAL RADIUS OF 10 FEET FROM A LOOSE FILL CONNECTION AND WITHIN A HORIZONTAL RADIUS OF 5 FEET FROM A TIGHT FILL CONNECTION.
- B** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (UNDERGROUND TANK - VENT-DISCHARGING UPWARD)  
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:  
WITHIN 5 FEET OF OPEN END OF VENT, EXTENDING IN ALL DIRECTIONS.  
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:  
SPACE BETWEEN 5 FEET AND 10 FEET OF OPEN END OF VENT, EXTENDING IN ALL DIRECTIONS.
- C** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (REMOTE PUMP - OUTDOOR)  
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:  
ANY PIT, BOX, OR SPACE BELOW GRADE LEVEL IF ANY PART IS WITHIN A HORIZONTAL DISTANCE OF 10 FT. FROM ANY EDGE OF PUMP.  
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:  
WITHIN 3 FEET OF ANY EDGE OF PUMP, EXTENDING IN ALL DIRECTIONS. ALSO UP TO 18 INCHES ABOVE GRADE LEVEL WITHIN 10 FEET HORIZONTALLY FROM ANY EDGE OF PUMP.
- D** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - PITS)  
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:  
ANY PIT, BOX, OR SPACE BELOW GRADE LEVEL, ANY PART OF WHICH IS WITHIN THE DIVISION 1 OR 2 CLASSIFIED LOCATION.
- E** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - DISPENSER)  
EXTENT OF CLASS 1, GROUP D, DIVISION 1 LOCATION:  
SPACE CLASSIFICATION INSIDE THE DISPENSER ENCLOSURE IS COVERED IN ANSIUL 87, "POWER OPERATED DISPENSING DEVICES FOR PETROLEUM PRODUCTS".
- F** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - DISPENSER)  
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:  
WITHIN 18 INCHES HORIZONTALLY IN ALL DIRECTIONS EXTENDING TO GRADE FROM (1) THE DISPENSER ENCLOSURE OR (2) THAT PORTION OF THE DISPENSER ENCLOSURE CONTAINING LIQUID HANDLING COMPONENTS.
- G** TYPICAL N.E.C. ARTICLE 514 CLASS 1 LOCATION (DISPENSING DEVICE - OUTDOOR)  
EXTENT OF CLASS 1, GROUP D, DIVISION 2 LOCATION:  
UP TO 18 INCHES ABOVE GRADE LEVEL WITHIN 20 FEET HORIZONTALLY OF ANY EDGE OF ENCLOSURE.



CLIENT:

**bp**

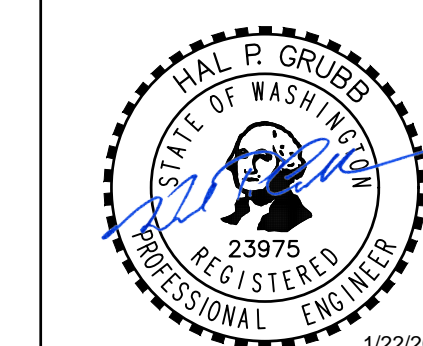
**ARCO**  
BP WEST COAST PRODUCTS, LLC

**B**

**Barghausen Consulting Engineers, Inc.**

18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
[barghausen.com](http://barghausen.com)

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PRFI20240124

DEVELOPMENT INFORMATION:

**ARCO NTI**

**3400 am/pm**  
**FUEL CANOPY w/ 6 MPD's**

SITE ADDRESS:

**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

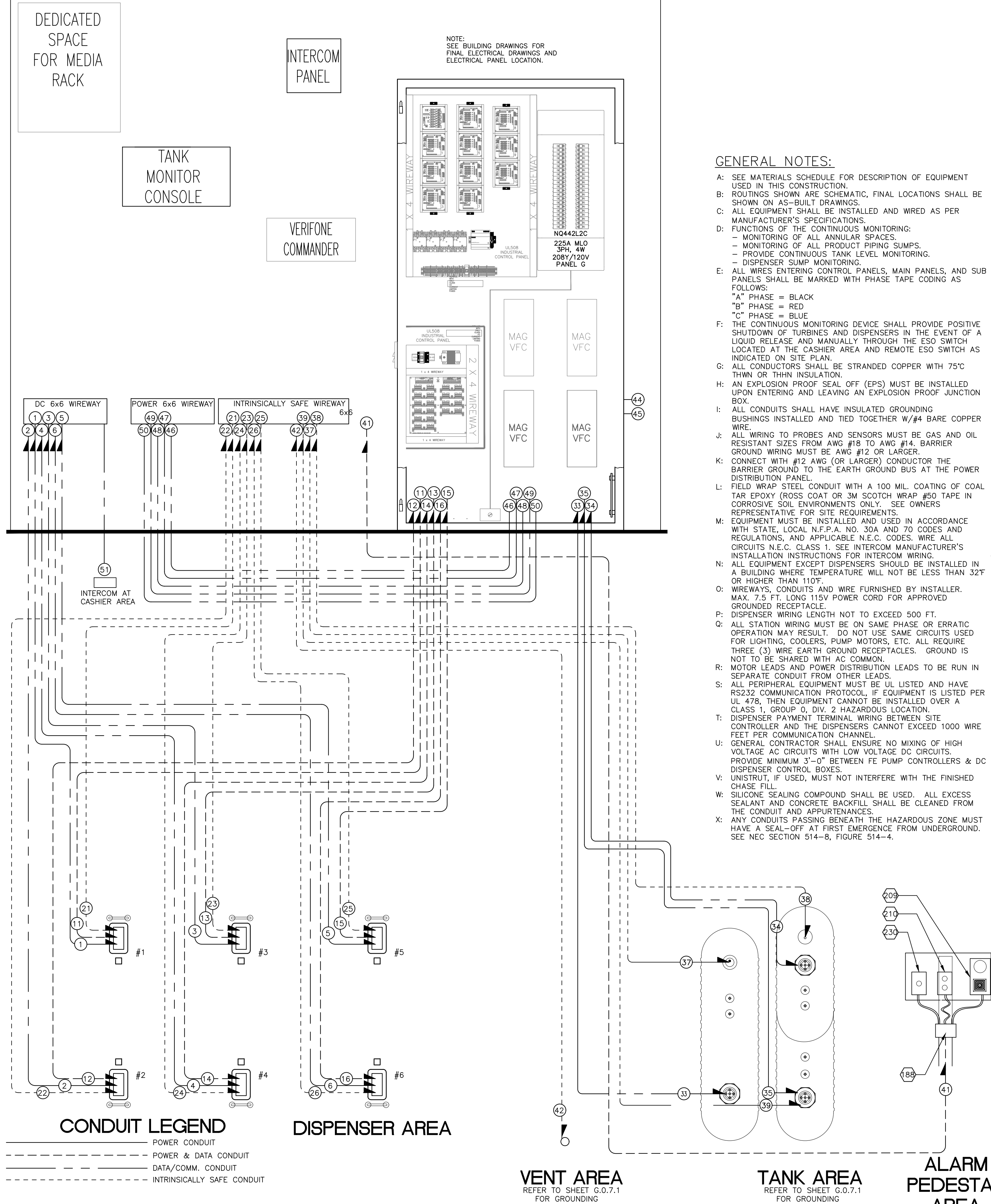
**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADNE:  
CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO.:  
01/01/2023 21730  
DRAWING TITLE:

**FUEL SYSTEM ELECTRICAL SITE PLAN**

SHEET NO:

**M.5.1.42**



CONDUIT SCHEDULE					
CONDUIT NUMBER	CONDUIT SIZE & TYPE	CONDUIT FILL	CONDUIT START	CONDUIT END	CONDUIT DESCRIPTION
1	1" RGS	(2) BELDEN CABLE 88760* + CAT 5 BELDEN CABLE #7928A FOR MEDIA	DISPENSER #1	INTERCOM PANEL AT MANAGER'S OFFICE	INTERCOM (SPEAKER & CALL BUTTON) ON DISPENSER
2	1" RGS	(2) BELDEN CABLE 88760* + CAT 5 BELDEN CABLE #7928A FOR MEDIA	DISPENSER #2	INTERCOM PANEL AT MANAGER'S OFFICE	INTERCOM (SPEAKER & CALL BUTTON) ON DISPENSER
3	1" RGS	(2) BELDEN CABLE 88760* + CAT 5 BELDEN CABLE #7928A FOR MEDIA	DISPENSER #3	INTERCOM PANEL AT MANAGER'S OFFICE	INTERCOM (SPEAKER & CALL BUTTON) ON DISPENSER
4	1" RGS	(2) BELDEN CABLE 88760* + CAT 5 BELDEN CABLE #7928A FOR MEDIA	DISPENSER #4	INTERCOM PANEL AT MANAGER'S OFFICE	INTERCOM (SPEAKER & CALL BUTTON) ON DISPENSER
5	1" RGS	(2) BELDEN CABLE 88760* + CAT 5 BELDEN CABLE #7928A FOR MEDIA	DISPENSER #5	INTERCOM PANEL AT MANAGER'S OFFICE	INTERCOM (SPEAKER & CALL BUTTON) ON DISPENSER
6	1" RGS	(2) BELDEN CABLE 88760* + CAT 5 BELDEN CABLE #7928A FOR MEDIA	DISPENSER #6	INTERCOM PANEL AT MANAGER'S OFFICE	INTERCOM (SPEAKER & CALL BUTTON) ON DISPENSER
7	NOT USED				
8	NOT USED				
9	NOT USED				
10	NOT USED				
11	1" RGS	5 #12 THWN & 1 #12 GRD. (POWER) (2) BELDEN CABLE #88760* - (DATA & CRIND)	DISPENSER #1	EPC PANEL AT ELECTRICAL CLOSET	POWER & DATA FOR DISPENSER
12	1" RGS	5 #12 THWN & 1 #12 GRD. (POWER) (2) BELDEN CABLE #88760* - (DATA & CRIND)	DISPENSER #2	EPC PANEL AT ELECTRICAL CLOSET	POWER & DATA FOR DISPENSER
13	1" RGS	5 #12 THWN & 1 #12 GRD. (POWER) (2) BELDEN CABLE #88760* - (DATA & CRIND)	DISPENSER #3	EPC PANEL AT ELECTRICAL CLOSET	POWER & DATA FOR DISPENSER
14	1" RGS	5 #12 THWN & 1 #12 GRD. (POWER) (2) BELDEN CABLE #88760* - (DATA & CRIND)	DISPENSER #4	EPC PANEL AT ELECTRICAL CLOSET	POWER & DATA FOR DISPENSER
15	1" RGS	5 #12 THWN & 1 #12 GRD. (POWER) (2) BELDEN CABLE #88760* - (DATA & CRIND)	DISPENSER #5	EPC PANEL AT ELECTRICAL CLOSET	POWER & DATA FOR DISPENSER
16	1" RGS	5 #12 THWN & 1 #12 GRD. (POWER) (2) BELDEN CABLE #88760* - (DATA & CRIND)	DISPENSER #6	EPC PANEL AT ELECTRICAL CLOSET	POWER & DATA FOR DISPENSER
17	NOT USED				
18	NOT USED				
19	NOT USED				
20	NOT USED				
21	1" RGS	(1) BELDEN CABLE 88760*	DISPENSER #1	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	DISPENSER SUMP MONITORING
22	1" RGS	(1) BELDEN CABLE 88760*	DISPENSER #2	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	DISPENSER SUMP MONITORING
23	1" RGS	(1) BELDEN CABLE 88760*	DISPENSER #3	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	DISPENSER SUMP MONITORING
24	1" RGS	(1) BELDEN CABLE 88760*	DISPENSER #4	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	DISPENSER SUMP MONITORING
25	1" RGS	(1) BELDEN CABLE 88760*	DISPENSER #5	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	DISPENSER SUMP MONITORING
26	1" RGS	(1) BELDEN CABLE 88760*	DISPENSER #6	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	DISPENSER SUMP MONITORING
27	NOT USED				
28	NOT USED				
29	NOT USED				
30	NOT USED				
31	NOT USED				
32	NOT USED				
33	1" RGS	3 #10 THWN & 1 #10 GRD.	TANK AREA - TURBINE	EPC PANEL AT ELECTRICAL CLOSET	TURBINE POWER
34	1" RGS	3 #10 THWN & 1 #10 GRD.	TANK AREA - TURBINE	EPC PANEL AT ELECTRICAL CLOSET	TURBINE POWER
35	1" RGS	3 #10 THWN & 1 #10 GRD.	TANK AREA - TURBINE	EPC PANEL AT ELECTRICAL CLOSET	TURBINE POWER
36	NOT USED				
37	1" RGS	(4) BELDEN CABLE 88760*	TANK AREA - ANNULAR	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	TANK MONITORING (TYP.) (VARIES BASED ON PLLD REQUIREMENTS)
38	1" RGS	(4) BELDEN CABLE 88760*	TANK AREA - ANNULAR	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	TANK MONITORING (TYP.) (VARIES BASED ON PLLD REQUIREMENTS)
39	1" RGS	(3) BELDEN CABLE 88760*	TANK AREA - TURBINE	INTRINSICALLY SAFE WIREWAY AT MANAGER'S OFFICE	TANK MONITORING (TYP.) (VARIES BASED ON PLLD REQUIREMENTS)
40	NOT USED				
41	1" RGS	6 #12 THWN & 1 #12 GRD.	TANK AREA OVERFILL ALARM	EPC PANEL AT ELECTRICAL CLOSET	POWER FOR OVERFILL ALARM AND ESO
42	NOT USED				
43	NOT USED				
44	1" RGS	4 #12 THWN & 1 #12 GRD	EPC PANEL AT ELECTRICAL CLOSET	CASHIER AREA	EMERGENCY SHUT OFF SWITCH AND RESET SWITCH
45	1" RGS	2 #12 THWN & 1 #12 GRD	EPC PANEL AT ELECTRICAL CLOSET	EXTERIOR BUILDING WALL	EMERGENCY SHUT OFF SWITCH
46	1" RGS	(6) BELDEN CABLE #88760* - (DATA)	EPC PANEL AT ELECTRICAL CLOSET	WAYNE DATA DISTRIBUTION AT MANAGER'S OFFICE	DATA & CRIND WIRES FOR DISPENSER COMM.
47	1" RGS	(6) BELDEN CABLE #88760* - (DATA)	EPC PANEL AT ELECTRICAL CLOSET	WAYNE DATA DISTRIBUTION AT MANAGER'S OFFICE	DATA & CRIND WIRES FOR DISPENSER COMM.
48	1" RGS	(4) BELDEN CABLE #88760* - (DATA)	EPC PANEL AT ELECTRICAL CLOSET	WAYNE DATA DISTRIBUTION AT MANAGER'S OFFICE	DATA & CRIND WIRES FOR DISPENSER COMM.
49	2" RGS	28 #12 THWN & 2 #12 GRD	EPC PANEL AT ELECTRICAL CLOSET	VEEDER ROOT PANEL AT MANAGER'S OFFICE	CONTROL FOR OVERFILL ALARM; PLLD WIRES AND CONTROL FROM DM-EX MODULES
50	1" RGS	SPARE W/ PULL ROPE	EPC PANEL AT ELECTRICAL CLOSET	MANAGER'S OFFICE	FUTURE
51	2" RGS	(32) #18 TW TWISTED PAIR SHIELDED INDIVIDUALLY	MANAGER'S OFFICE	INTERCOM AT CASHIER AREA	INTERCOM (SPEAKER & CALL BUTTON)

\* SUBSTITUTE ALTERNATE SPEC FOR WASHINGTON STATE AND WHERE REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION . BELDEN CABLE # 1032A



CLIENT:

**bp**

**ARCO**

BP WEST COAST PRODUCTS, LLC

**Barghausen Consulting Engineers, Inc.**

18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

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SEAL:

**HAL P. GRUBB**  
STATE OF WASH. REG.  
25975  
REGISTERED PROFESSIONAL ENGINEER  
1/22/2024

**PRFI20240124**

DEVELOPMENT INFORMATION:

**ARCO NTI**

**3400 am/pm**

**FUEL CANOPY w/ 6 MPD's**

SITE ADDRESS:

**SWC S MERIDIAN**

@ HIGHWAY 512  
PUYALLUP, WASHINGTON

**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO.:  
**01/01/2023 21730**

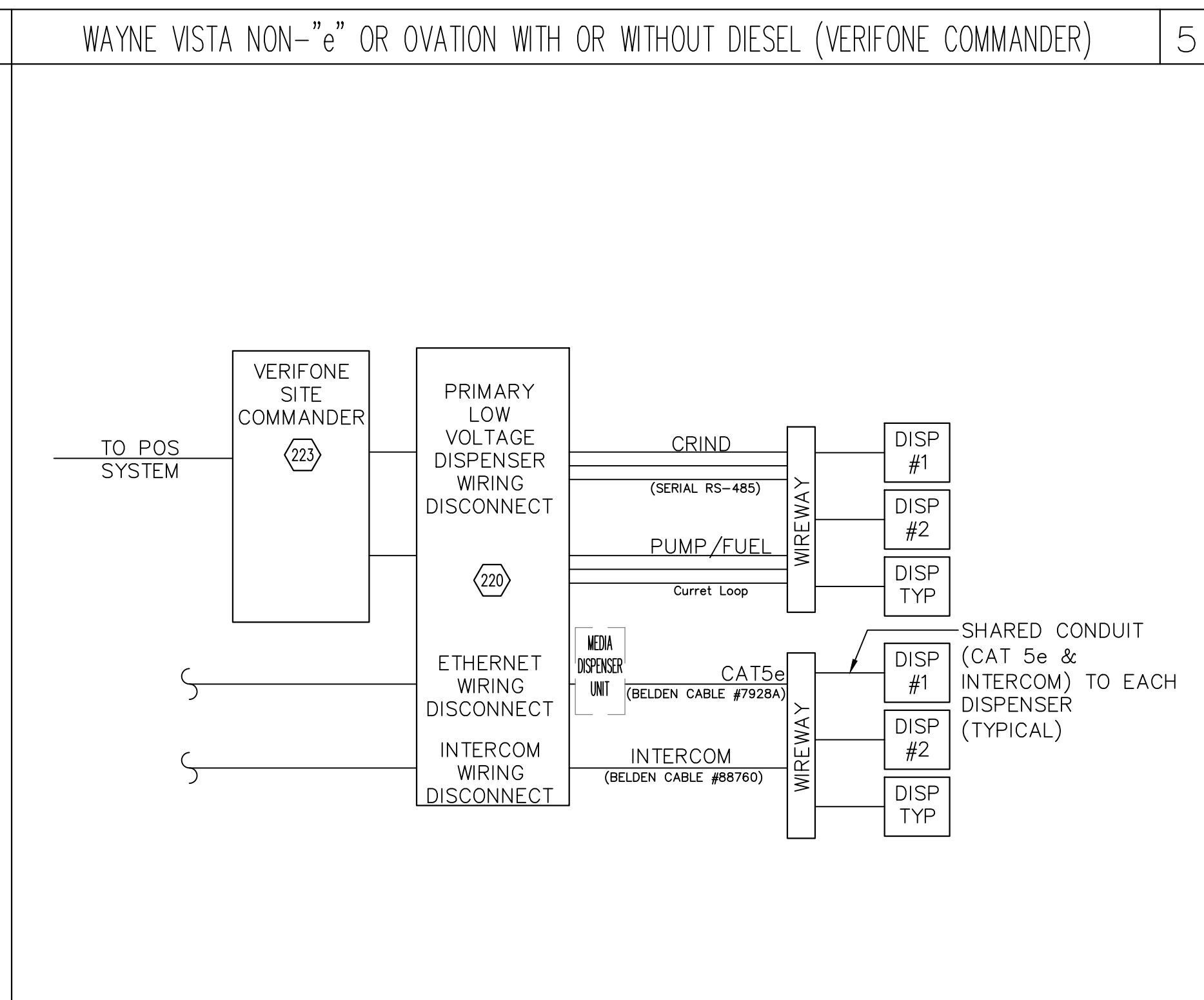
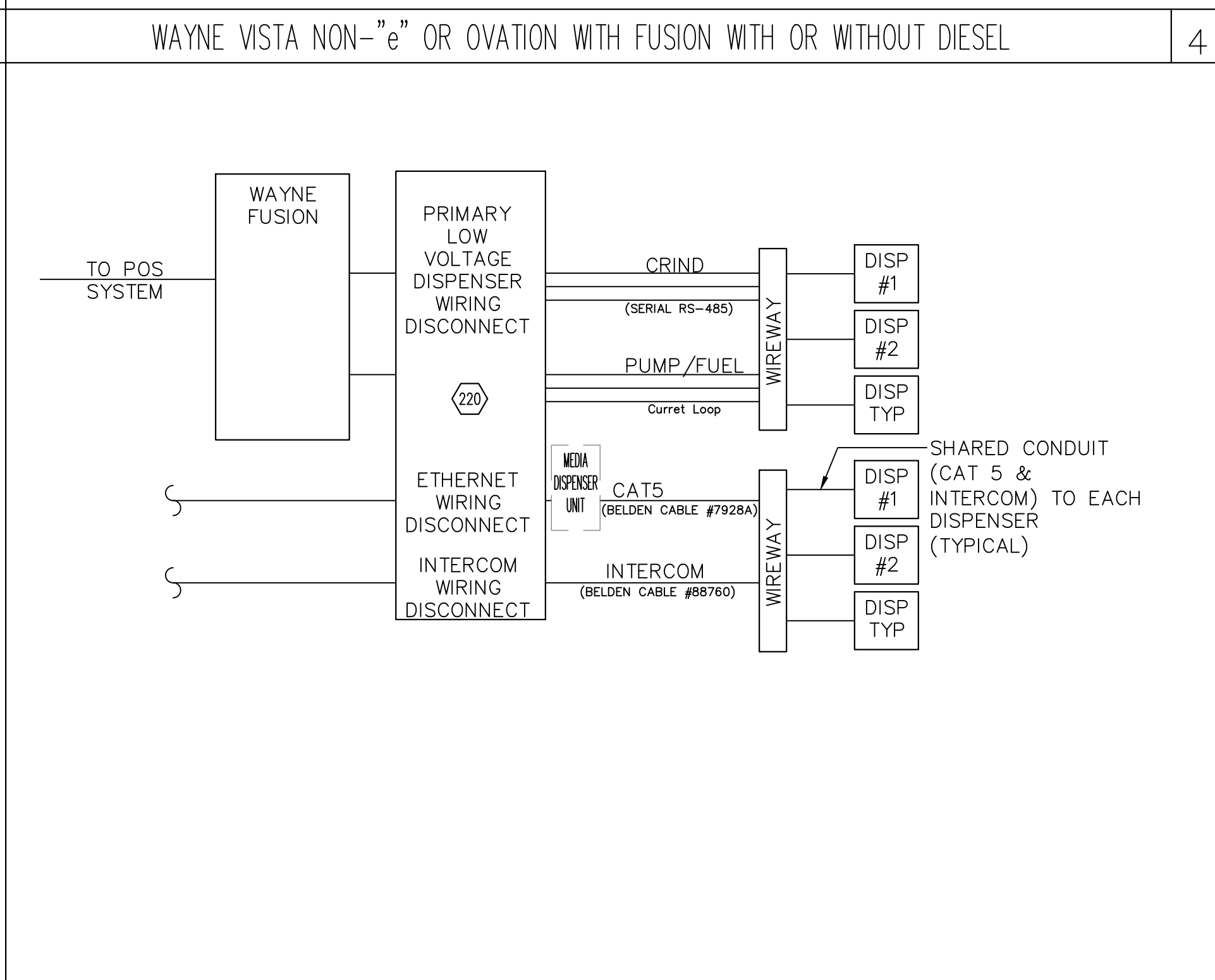
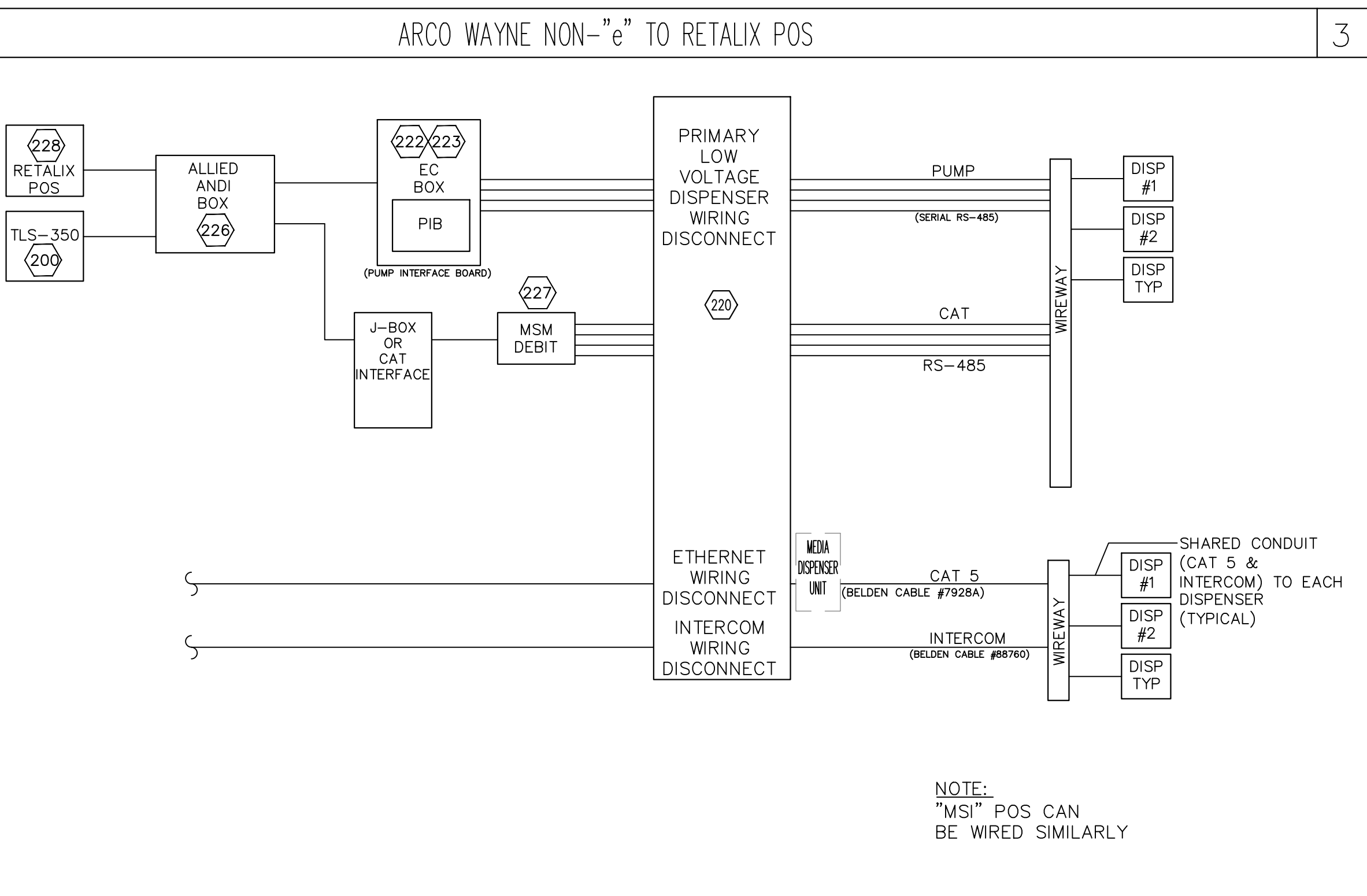
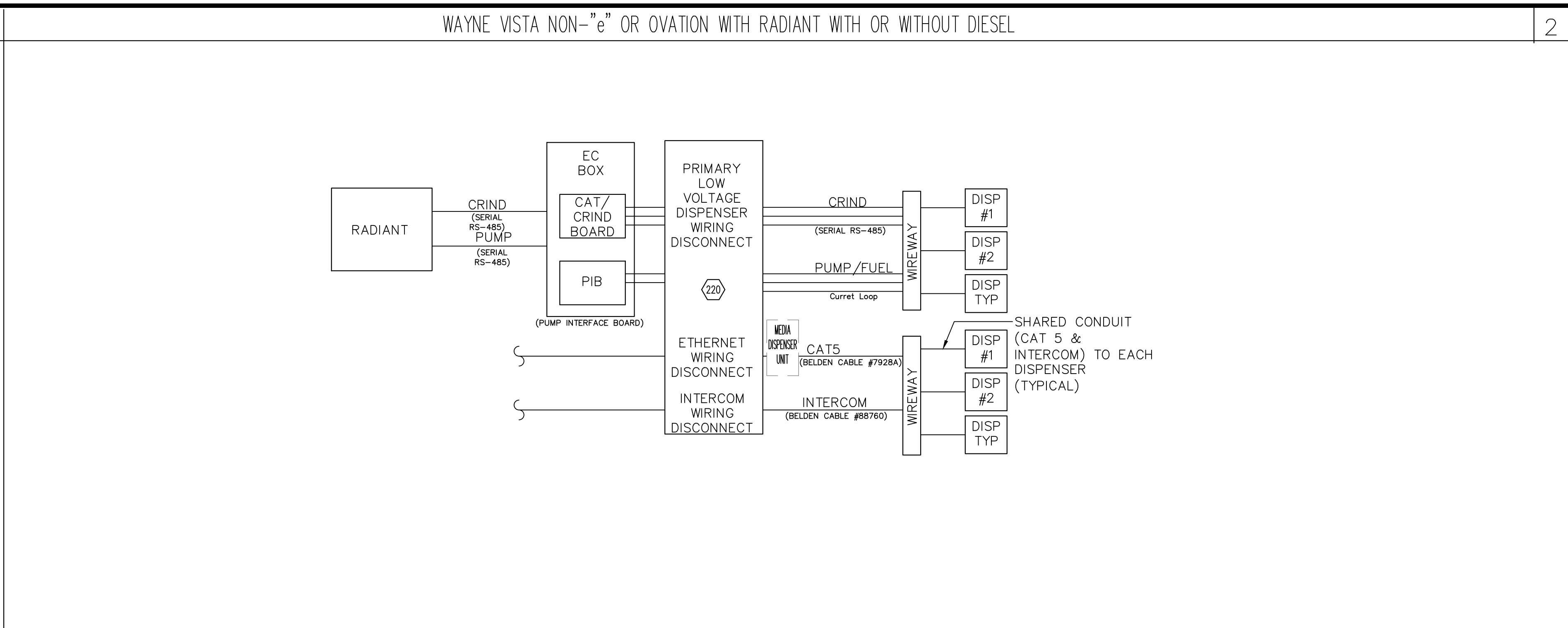
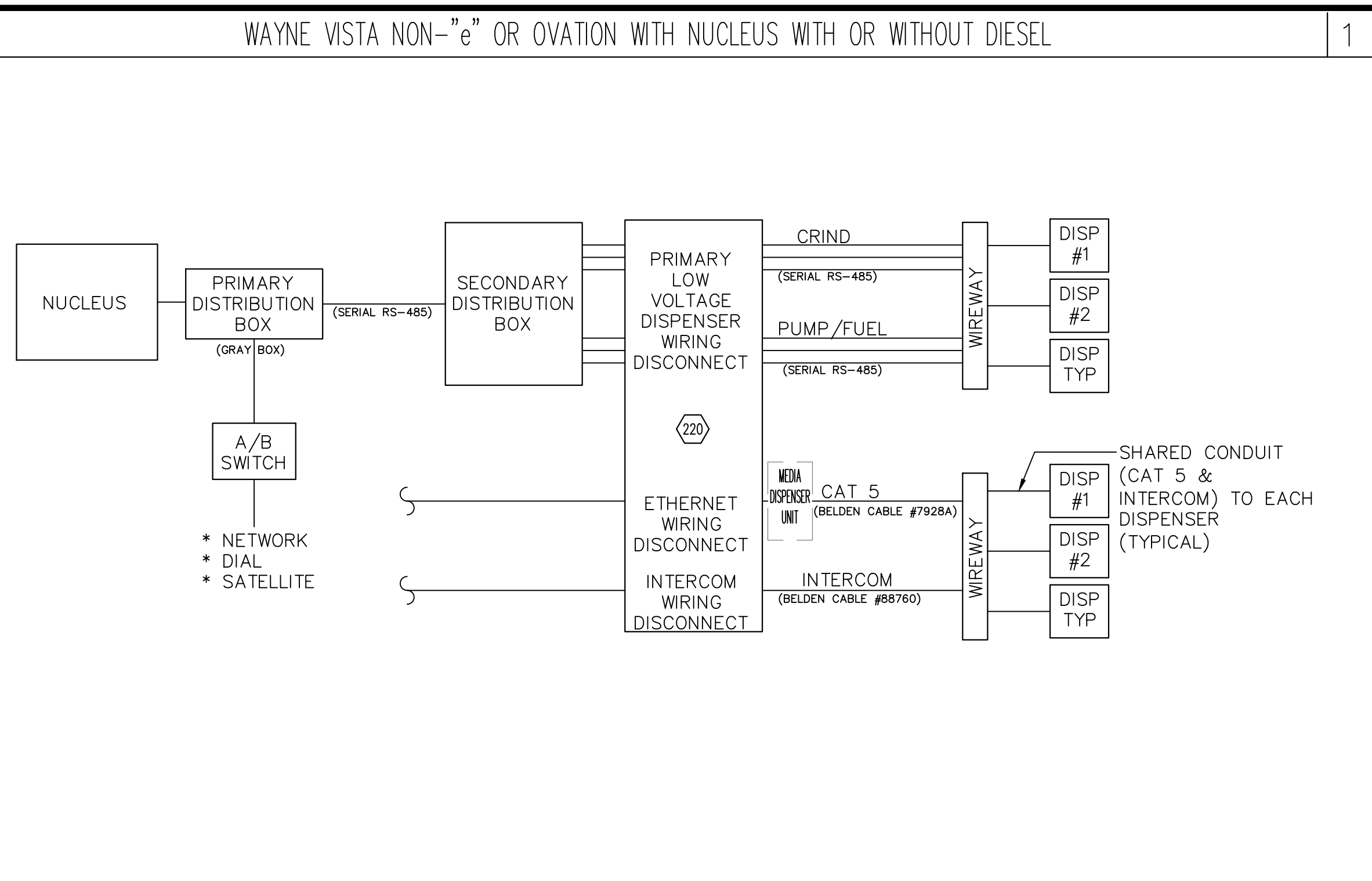
DRAWING TITLE:

**FUEL SYSTEM ELECTRICAL CONDUIT POINT TO POINT PLAN (SPLIT TANK VERSION)**

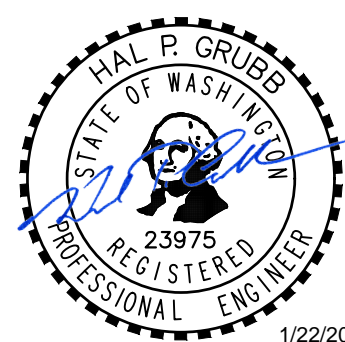
SHEET NO:

**M.5.1.43**

XX NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEET M.5.1.01 & M.5.1.02



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PRFI20240124

DEVELOPMENT INFORMATION:

LEAK DETECTION SYSTEM NOTES	6
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## Leak Detection System Notes

1. **WARNING:**  
MONITOR SENSOR & PROBE WIRING IS INTRINSICALLY SAFE WIRING AND MUST BE SEPARATE FROM ALL OTHER WIRING AND INSTALLED IN SEPARATE CONDUIT. MAXIMUM CABLE LENGTH BETWEEN MONITOR CONSOLE AND SENSORS IS 1,000 FEET.
2. **CAUTION:**  
120 VAC WIRING MUST NOT BE CONNECTED TO LOW VOLTAGE CONNECTIONS. DAMAGE FROM MISWIRING IS NOT COVERED BY WARRANTY. INSTALLING CONTRACTOR TO BE HELD RESPONSIBLE.
3. INSTALL TANK MONITOR SYSTEM PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. USE BELDEN CABLE # 88760 OR APPROVED EQUAL FOR ALL SENSOR AND PROBE WIRING.
5. RUN RIGID METAL CONDUIT FOR PROBE AND SENSOR WIRING FROM THE MONITOR CONSOLE TO THE INTRINSICALLY SAFE WIREWAY. CONDUIT MUST ENTER THE MONITOR WHERE KNOCKOUTS ARE PROVIDED. NO OTHER CONDUIT ENTRY IS PERMITTED.
6. **SPECIAL NOTE:** IT IS THE INTENT OF THIS DESIGN THAT ANY DETECTED LEAK OR ANY FAILURE OF THE LEAK DETECTION SYSTEM, WILL RESULT IN THE INTERRUPTION OF ALL POWER TO THE PRODUCT PUMPS.
7. **CERTIFIED INSTALLERS-** ALL MANUFACTURERS TRAINING REQUIREMENTS SHALL BE MET BY CONTRACTOR INSTALLING SENSORS/PROBES AND WIRING TO MONITORING SYSTEM.
8. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO NOTIFY THE VEEDER ROOT DISTRIBUTOR FOR STARTUP.
9. **SEE MANUFACTURERS WIRING DIAGRAM FOR SPECIFIC WIRING AND FURTHER INFORMATION.**
10. EACH TURBINE RELAY IS TO BE WIRED INTO THE MONITOR CONTROL SO THAT AN ACTIVATION OF TURBINE SIDE SUMP SENSOR OR ANNULAR SPACE SENSOR OR LLD WILL SHUT DOWN THE TURBINE FOR THAT TANK.

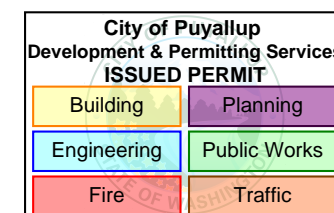
CAT 5 CABLE INSTALLATION GUIDE	7
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# CAT 5 Cable Installation Guide

1. EXCESSIVE FORCE SHOULD NOT BE USED TO PULL IN NEW CABLE. PULL FORCE SHOULD NOT EXCEED 25 LBS.
2. CABLE SHALL NOT BE KINKED, KNOTTED, OR OTHERWISE DEFORMED DURING INSTALLATION.
3. PROPER CABLE SUPPORT HARDWARE SUCH AS J-HOOKS SHALL BE USED TO PREVENT RIPPING OR FRAYING OF CABLE. WHERE USED, STAPLES SHALL BE NON-METALLIC PLASTIC. STAPLE SHOULD BE LOOSE ENOUGH SUCH THAT CABLE JACKET IS NOT CRIMPED.
4. CABLE BUNDLES MAY BE SECURED WITH LOOSE FITTING WIRE TIE OR VELCRO TIE WRAPS. CABLES SHALL NOT BE OVER TIGHTENED SUCH THAT CRUSH STRESS IS EVIDENT.
5. CABLE SHALL BE ROUTED TO PERMIT SWEEPING BENDS, NOT RIGHT ANGLES OR SHARP BENDS. CABLE RUNS SHALL BE INDIVIDUALLY SUPPORTED.
6. A MINIMUM OF CABLE JACKET SHALL BE REMOVED WHEN TERMINATING. CABLE JACKET SHALL EXTEND AS CLOSE AS PRACTICAL TO THE TERMINATION POINT, LEAVING NO MORE THAN 3/4 INCH OF WIRE EXPOSED.
7. MAINTAIN TWISTED CONFIGURATION OF WIRE PAIRS TO WITHIN 1/2 INCH OF THE TERMINATION POINT.
8. WIRES SHALL NOT BE SPLICED. DAMAGED CABLE SHALL BE REPLACED, NOT REPAIRED.
9. LEAVE APPROXIMATELY 18 INCHES OF SPARE WIRE AT OUTLET AND CONNECTION POINT.
10. ENSURE ADEQUATE SEPARATION WHEN RUNNING CAT 5 CABLE PARALLEL TO POWER WIRING. CABLE SHALL NOT BE ROUTED THROUGH SAME BOX OR HOLES AS POWER WIRING. WHEN POSSIBLE CAT 5 CABLES SHOULD CROSS POWER WIRES AT 90 DEGREE ANGLES. MAINTAIN SEPARATION BETWEEN CABLE AND OTHER WIRING AS FOLLOWS:

PURPOSE	TYPE OF WIRE	MIN. SEPARATION
POWER SUPPLY	OPEN WIRING LESS THAN 300 VOLTS	2 INCHES
	WIRE IN CONDUIT OR ARMORED OR NON-METALLIC SHEATH CABLE/POWER GROUND WIRES	NONE
RADIO & TELEVISION	ANTENNA LEAD & GROUND WIRES WITHOUT GROUNDED SHIELD	4 INCHES
SIGNAL & CONTROL WIRE	OPEN WIRING NOT OVER 300 VOLTS	NONE
CATV CABLES	COMMUNITY TELEVISION SYSTEMS COAXIAL CABLES WITH GROUNDED SHIELD	NONE
TELEPHONE SERVICE DROP WIRE	AERIAL OR BURIED	2 INCHES
SIGN	NEON SIGNS AND ASSOCIATED WIRING FROM TRANSFORMER	6 INCHES
FLUORESCENT LIGHTING	FLUORESCENT LIGHTING WIRE	5 INCHES
LIGHTNING SYSTEM	LIGHTNING RODS AND WIRES	6 FEET

**XX** NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEET M.5.1.01 & M.5.1.02



**ARCO NTI**  
**3400 am/pm**  
**FUEL CANOPY w/ 6 MPD's**

**SITE ADDRESS:**

**SWC S MERIDIAN**  
**@ HIGHWAY 512**  
**PUYALLUP, WASHINGTON**

FACILITY #TBD

DESIGNED BY: NP/RF	ALLIANCE Z&DM:
CHECKED BY: OV	BP REPM:
DRAWN BY: NP/RF	ALLIANCE PM:
VERSION: V-15.0 01/01/2023	PROJECT NO: 21730

DRAWING TITLE:  
**WAYNE DISPENSER SCHEMATICS  
LEAK DETECTION AND  
CAT 5 NOTES**

SHEET NO:

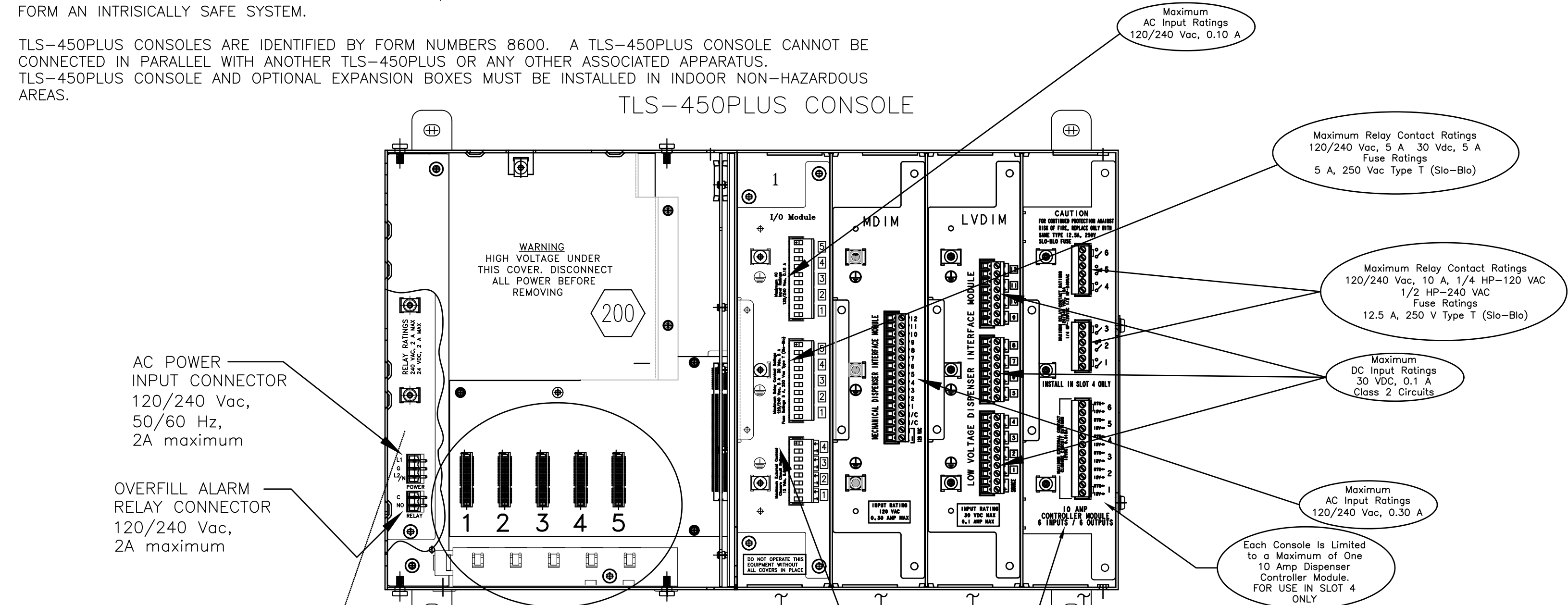
## M.5.1.44

DESCRIPTION

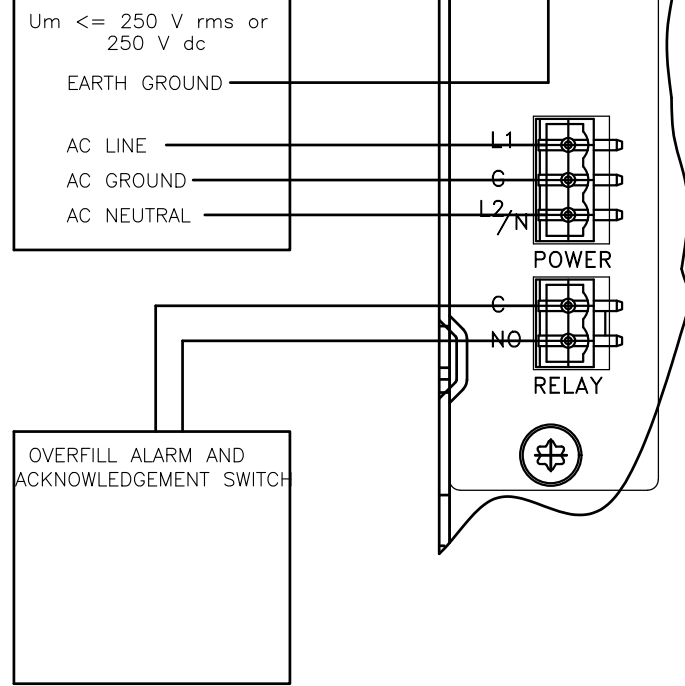
THIS DRAWING DESCRIBES THE INTRINSICALLY SAFE EQUIPMENT AND ASSOCIATED APPARATUS THAT TOGETHER FORM AN INTRINSICALLY SAFE SYSTEM.

TLS-450PLUS CONSOLES ARE IDENTIFIED BY FORM NUMBERS 8600. A TLS-450PLUS CONSOLE CANNOT BE CONNECTED IN PARALLEL WITH ANOTHER TLS-450PLUS OR ANY OTHER ASSOCIATED APPARATUS. TLS-450PLUS CONSOLE AND OPTIONAL EXPANSION BOXES MUST BE INSTALLED IN INDOOR NON-HAZARDOUS AREAS.

TLS-450PLUS CONSOLE



CIRCUIT BREAKER PANEL



COMM MODULES	PERMISSABLE SLOT(S)
SITEFAX MODEM MODULE	1, 2 OR 3
USB/WIRELESS MODULE	5 ONLY
ETHERNET INTERFACE MODULE	4 ONLY
SINGLE SERIAL PORT MODULE	1, 2 OR 3
DUAL SERIAL PORT MODULE	1, 2 OR 3
ELECTRONIC DISPENSER INTERFACE MODULE (EDIM)	1, 2 OR 3
CURRENT LOOP DISPENSER INTERFACE MODULE (CDIM)	1, 2 OR 4
NOTE: Limited single port capability in slot 3.	

INTRINSICALLY-SAFE AREA

BAY 1

BAY 2

BAY 3

BAY 4

5 SPARE
4 SPARE
3 DIESEL #1 HOOK IN
2 PREMIUM HOOK IN
1 UNLEADED HOOK IN
5 SPARE
4 SPARE
3 DIESEL #1 HOOK OUT
2 PREMIUM HOOK OUT
1 UNLEADED HOOK OUT
4 NOT USED
3 NOT USED
2 NOT USED
1 NOT USED
MODULE TYPE: US 1/0

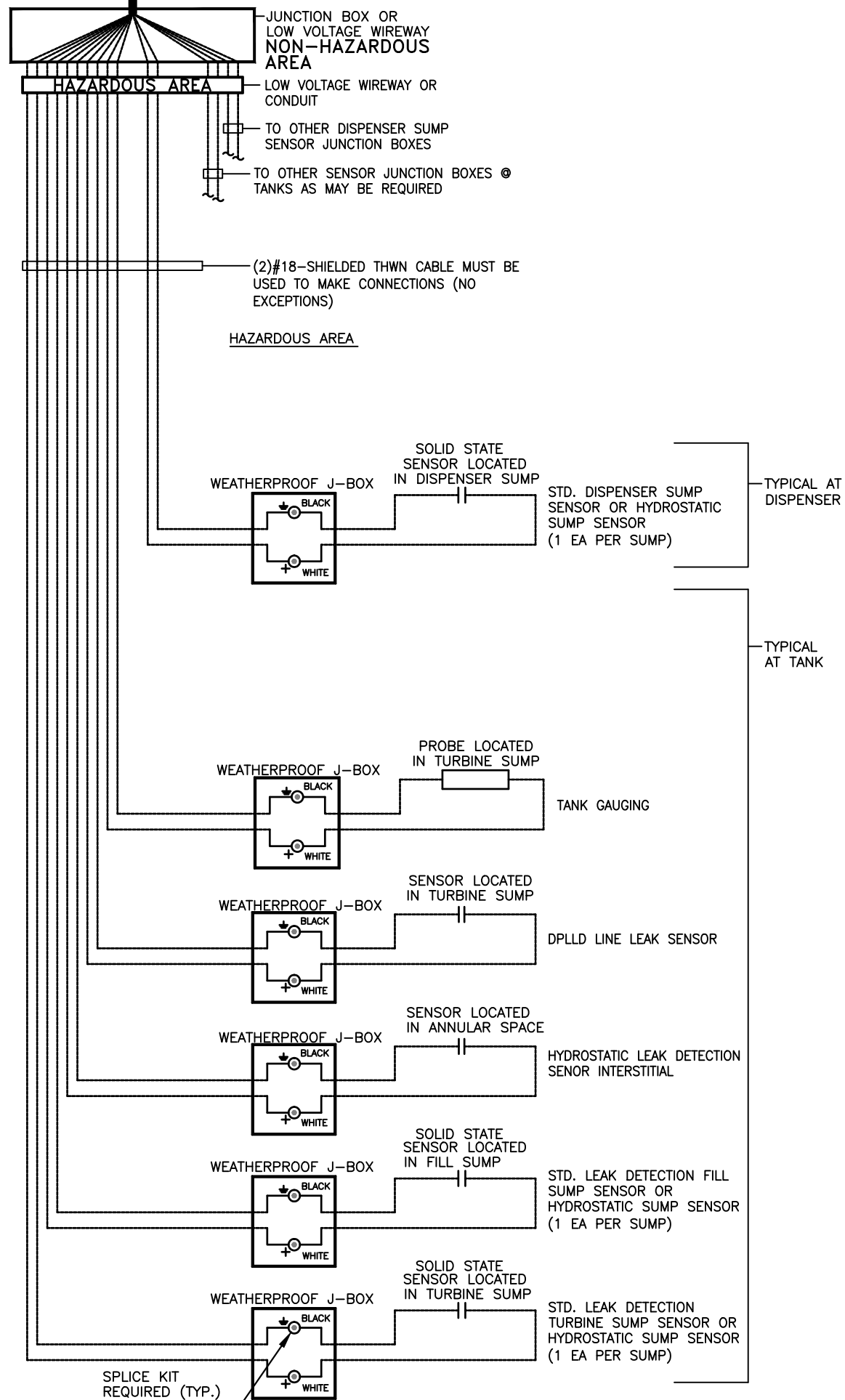
15 DISPENSER 5/6
14 DISPENSER 3/4
13 DISPENSER 1/2
12 ANNULAR - DIESEL
11 ANNULAR - ULP
10 ANNULAR - ULR
9 TURBINE SUMP - DIESEL
8 TURBINE SUMP - ULP
7 TURBINE SUMP - ULR
6 ATG - DIESEL
5 ATG - ULP
4 ATG - ULR
3 DPLLD - DIESEL
2 DPLLD - ULP
1 DPLLD - ULR
MODULE TYPE: USM

15
14
13
12
11
10
9
8
7
6
5
4
3 DISPENSER 11/12
2 DISPENSER 9/10
1 DISPENSER 7/8
MODULE TYPE: USM

15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
MODULE TYPE: USM

Module Configuration

Veeder Root Console



IST-VFC NOTES

REQUIREMENTS FOR THIS SYSTEM:

- VFC CONTROL BOXES WITH LATEST SOFTWARE. PLEASE CONTACT FE PETRO FOR AVAILABILITY.
- VEEDER-ROOT TLS-450PLUS WITH LATEST VERSION OF TLS SOFTWARE. PLEASE CONTACT VEEDER-ROOT FOR AVAILABILITY.
- SET ALL THE VFC'S WITH DPLLD TRANSDUCER INSTALLED IN ITS PUMP TO BE THE MASTER VFC.
- 18 AWG 3-WIRE SHIELDED COMMUNICATION CABLE (300 V MINIMUM) CONNECTING VFC'S.
- INSTALLATION MANUALS FOR BOTH VEEDER-ROOT TLS-450PLUS & FE PETRO VFC WILL BE AVAILABLE DURING INSTALLATION.

BASIC OPERATION FOR THIS CONFIGURATION:

- THE VEEDER-ROOT TLS-450PLUS SYSTEM MONITOR THE TANK PRODUCT LEVELS.
- WHEN DEMAND FOR PRODUCT IS CALLED FOR, A 120 VAC HOOK SIGNAL FROM DISPENSER IS PRESENT, THE VEEDER-ROOT TLS-450PLUS SYSTEM WILL TURN ON A PUMP, DICTATED BY CONSOLE CONFIGURATION.
- WHEN DEMAND FOR PRODUCT RISES, MORE PEOPLE DISPENSING PRODUCT, WHICHEVER VFC IS IN THE LEAD POSITION CAN CALL FOR ADDITIONAL VFC TO TURN ON.
- WHEN THE DEMAND FOR PRODUCT GOES AWAY, THE VEEDER-ROOT SYSTEM WILL PERFORM A LINE LEAK TEST ACCORDING TO VEEDER-ROOT'S LINE TEST PROTOCOL.
- IN THIS CONFIGURATION, IF THERE ARE ANY FAULTS IN THE SYSTEM THE WHOLE SYSTEM WILL BE SHUT DOWN.

THE WIRING DIAGRAM IN FIGURE 1 SHOWS THE CONNECTIONS BETWEEN THE VEEDER-ROOT POWER BAY CONSOLE AND THE MASTER VFC'S.

- FOLLOW ALL SAFETY AND INSTALLATION INSTRUCTIONS IN THE LATEST VEEDER-ROOT SITE PREP AND INSTALLATION INSTRUCTIONS FOR THE VEEDER-ROOT TLS-450PLUS.
- FOLLOW ALL SAFETY AND INSTALLATION INSTRUCTIONS IN THE LATEST IST-VFC INSTALLATION AND OWNERS MANUAL FOR WIRING NOT SHOWN IN FIGURE 1.
- SET SW3 SWITCHES ACCORDING TO MASTER CONFIGURATION.
- CALIBRATE CONTROLLERS ACCORDING TO CALIBRATION INSTRUCTIONS IN IST-VFC INSTALLATION AND OWNERS MANUAL.

ADDITIONAL NOTES:

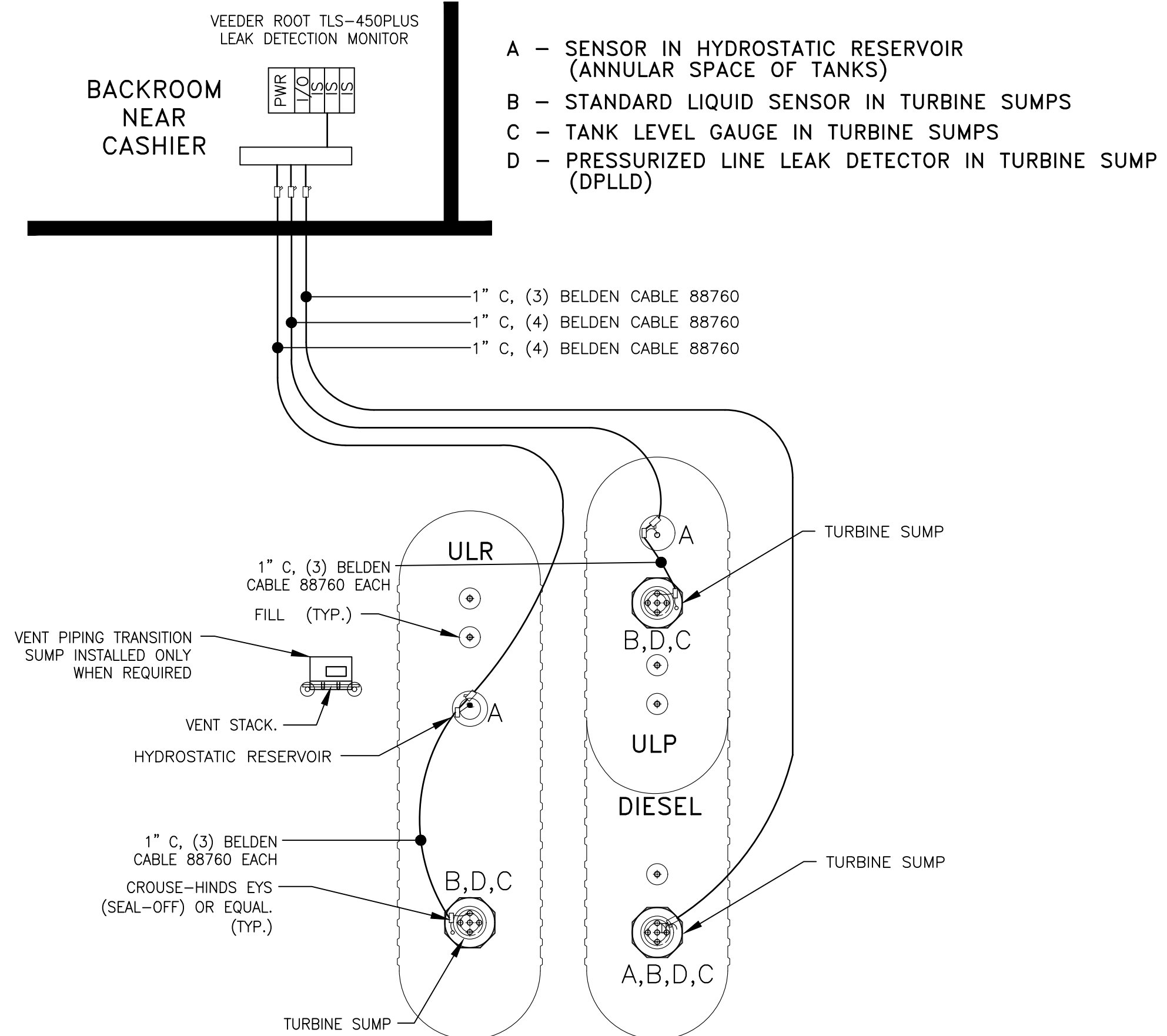
- FOR ADDITIONAL INFORMATION, REFERENCE THE LATEST VEEDER-ROOT SITE PREPARATION AND INSTALLATION MANUAL FOR INSTALLATION INSTRUCTIONS OF DPLLD USING A MASTER CONFIGURATION.
- THE VEEDER-ROOT TLS-450PLUS SYSTEM MUST BE PROGRAMMED USING THE CORRECT DISPENSER MODE. SEE THE LATEST VEEDER-ROOT SYSTEM SET-UP MANUAL FOR SPECIFIC PROGRAMMING INSTRUCTIONS.
- THE VEEDER-ROOT TLS-450PLUS MUST BE PROGRAMMED USING THE CORRECT TANK SET-UP. THE PROGRAMMER MUST ASSIGN THE FIRST MASTER TANK T-1 TO LINE LEAK DETECTOR Q-1. THE SECOND MASTER TANK T-2 TO LINE LEAK DETECTOR Q-2. SPECIFIC PROGRAMMING QUESTIONS SHOULD BE DIRECTED TO VEEDER-ROOT TECHNICAL SUPPORT DEPARTMENT.

VEEDER-ROOT TLS-450PLUS NOTES

- WARNING:** IN INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH THE NATIONAL ELECTRICAL CODE: FEDERAL, STATE AND LOCAL CODES. IN ADDITION, TURN OFF POWER AND TAKE OTHER NECESSARY PRECAUTIONS DURING INSTALLATION, SERVICE AND REPAIR TO PREVENT PERSONAL INJURY, PROPERTY LOSS AND EQUIPMENT DAMAGE.
- WARNING:** DISCONNECT ALL POWER BEFORE MAKING ANY CONNECTIONS TO PREVENT DEATH, SERIOUS INJURY, EXPLOSION OR ELECTRICAL SHOCK. MONITOR MUST NEVER BE OPERATED UNLESS THE FRONT COVER IS CLOSED OVER THE BARRIER TERMINALS IN THE INTRINSICALLY SAFE AREA.

NOTES:

- WIRING TO PROBES, SENSORS, & DPLLD MUST BE SHIELDED MULTI-STRAND, GAS AND OIL RESISTANT SIZES FROM AWG #18 TO AWG #14. BARRIER GROUND WIRING MUST BE AWG #12 OR LARGER.
- CONNECT WITH #12 AWG (OR LARGER) CONDUCTOR THE BARRIER GROUND TO THE EARTH GROUND BUS AT THE POWER DISTRIBUTION PANEL.
- ⊙ DENOTES FIELD WIRING CONNECTION USING WATERPROOF CONNECTORS SUPPLIED WITH THE PROBE(S) AND SENSOR(S).
- INTRINSICALLY SAFE WIRING SHALL BE INSTALLED IN ACCORDANCE WITH ARTICLE 504-20 OF THE NEC AND NFPA 70 (CURRENT VERSIONS).
- TO MAINTAIN INTRINSIC SAFETY AND PROPER SYSTEM OPERATION, PROBE AND SENSOR WIRING MUST BE INSTALLED WITHIN SEALED CONDUIT.
- ELECTRICAL RATING POWER INPUT - 120VAC, 50/60 HZ, 600 WATTS MAX.
- REFER TO THE LATEST "SITE PREPARATION AND INSTALLATION INSTRUCTIONS," MANUAL FOR ACTUAL LOCATION OF CONDUIT ENTRY INTO TLS-450PLUS MONITOR.
- REFER TO LINE LEAK DETECTOR IN THE LATEST "SITE PREPARATION AND INSTALLATION."
- RS-232 MODULE IS LOCATED IN THE COMMUNICATIONS COMPARTMENT AND MUST BE ORDERED SEPARATELY.
- BONDING LOCKNUTS OR BONDING BUSHINGS SHALL BE USED AT ALL CONDUIT ENTRANCES TO THE TLS-450PLUS ENCLOSURE AND AT ANY JUNCTION BOX/WIREWAYS IN THE NON-HAZARDOUS AREA TO ENSURE POSITIVE CONDUIT GROUNDING.
- FOR 2 PUMPS IN SINGLE TANK OPERATION, AN ADDITIONAL I/O MODULE REQUIRED AND MUST BE ORDERED SEPARATELY.
- NO SPLICING OF PROBE/SENSOR WIRE EXCEPT AT THE DEVICE ITSELF.
- CONTRACTOR MUST COMPLY WITH ALL THE TRAINING REQUIREMENTS OF VEEDER-ROOT.
- SPECIFIC PROGRAMMING FOR VEEDER ROOT TLS-450PLUS CONSOLE SHALL BE OBTAINED FROM THE LOCAL ENVIRONMENTAL COMPLIANCE MANAGER.

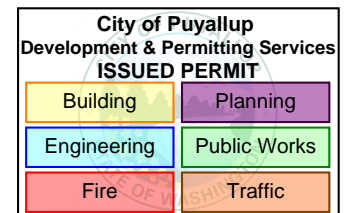


SEE TANK FUELING SITE PLAN FOR SPECIFIC TANK LAYOUT

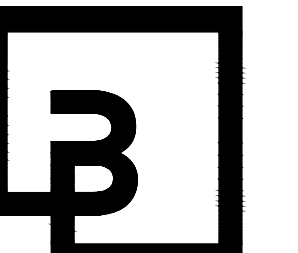
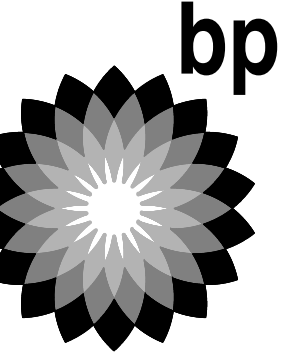
Tank Monitoring Conduit Schematic

SCALE: N.T.S.

NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEET M.5.1.01 & M.5.1.02



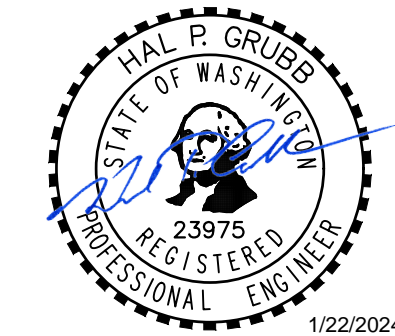
CLIENT:



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18215 72nd Avenue South  
Kent, WA 98032  
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SEAL:



PRFI20240124

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:  
**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

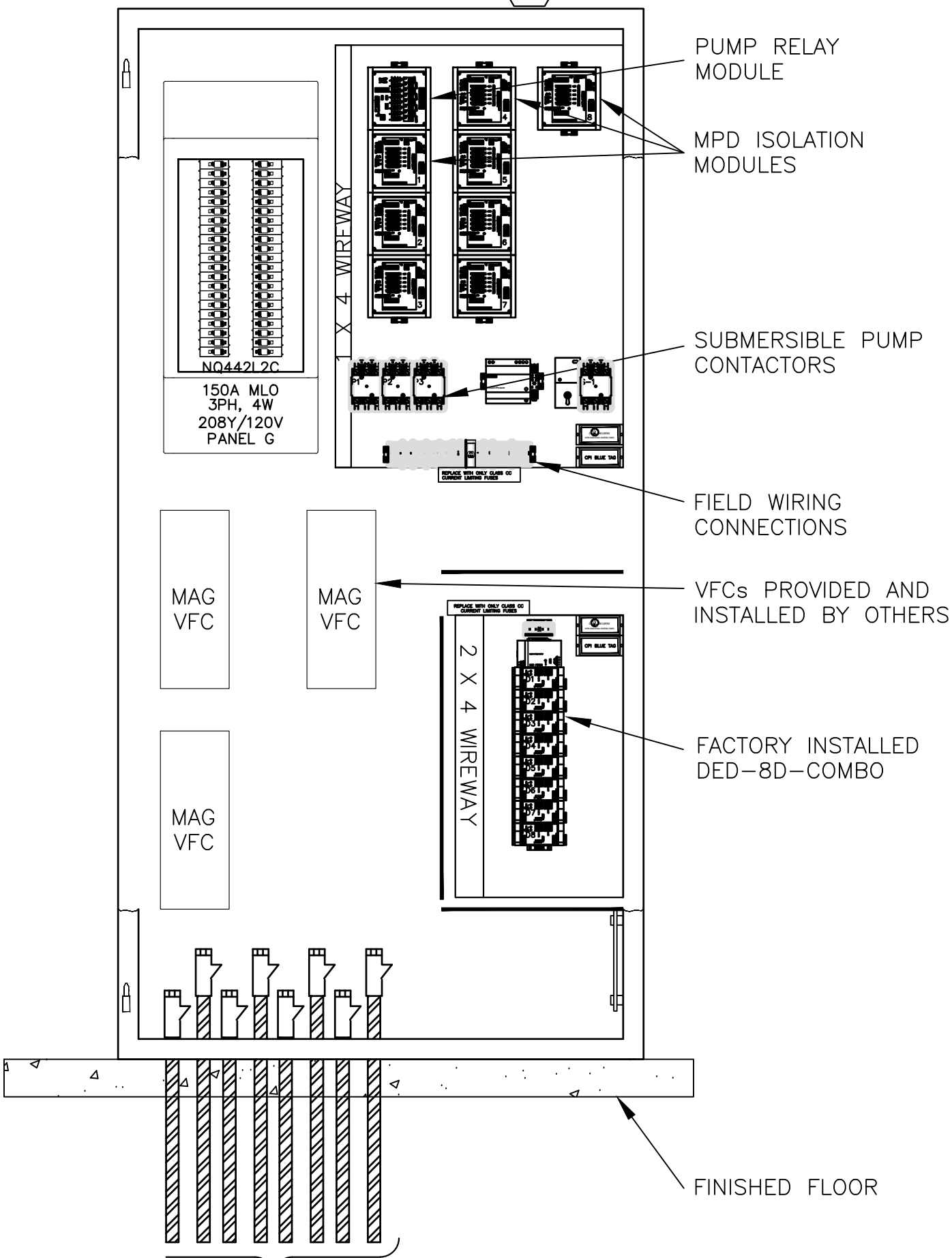
DRAWING TITLE:  
VEEDER ROOT 450 AND FE PETRO  
INTERFACE FIELD WIRING DIAGRAM  
(SINGLE MASTER)  
(SPLIT TANK VERSION)

SHEET NO:

M.5.1.45

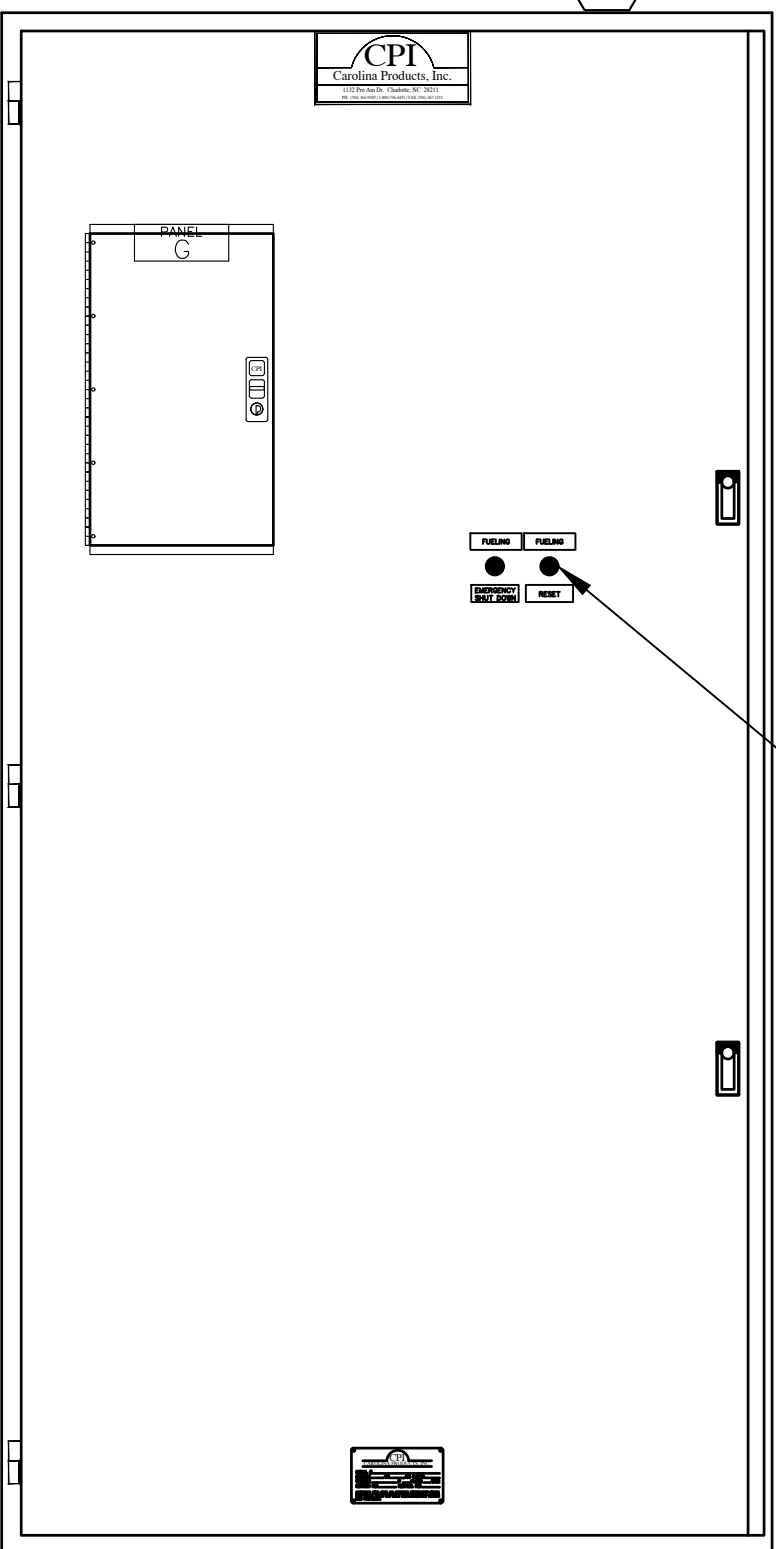
INTERIOR VIEW

SECTION 3 (220)



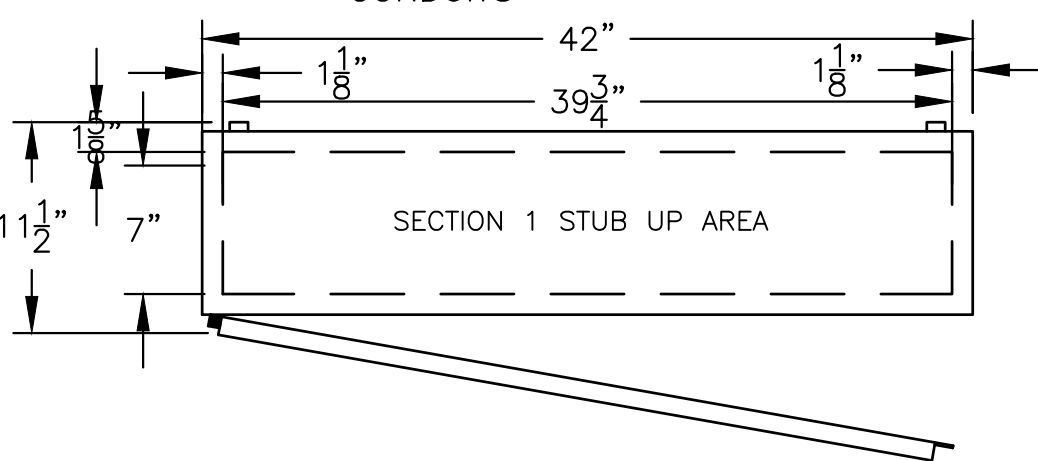
EXTERIOR VIEW

SECTION 3 (220)

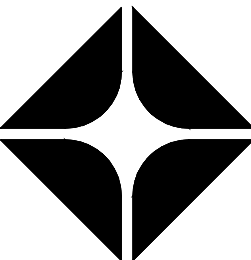


EMERGENCY STOP AND RESET PUSHBUTTONS

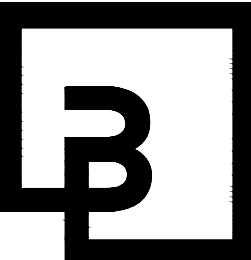
STUB UP DETAIL



NOTE:  
SEE BUILDING DRAWINGS FOR  
FINAL ELECTRICAL DRAWINGS AND  
ELECTRICAL PANEL LOCATION.  
CONTACT:  
BRYAN STRYKER  
CAROLINA PRODUCTS INCORPORATED  
(704) 441-4048  
BRYANS@CPIPANELS.COM

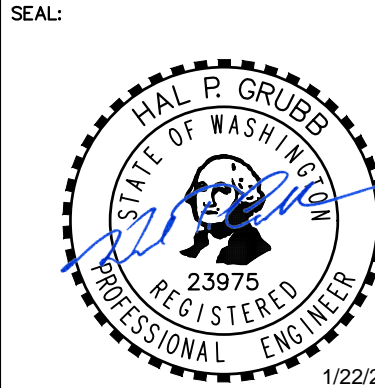


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PRFI20240124

DEVELOPMENT INFORMATION:  
ARCO NTI  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

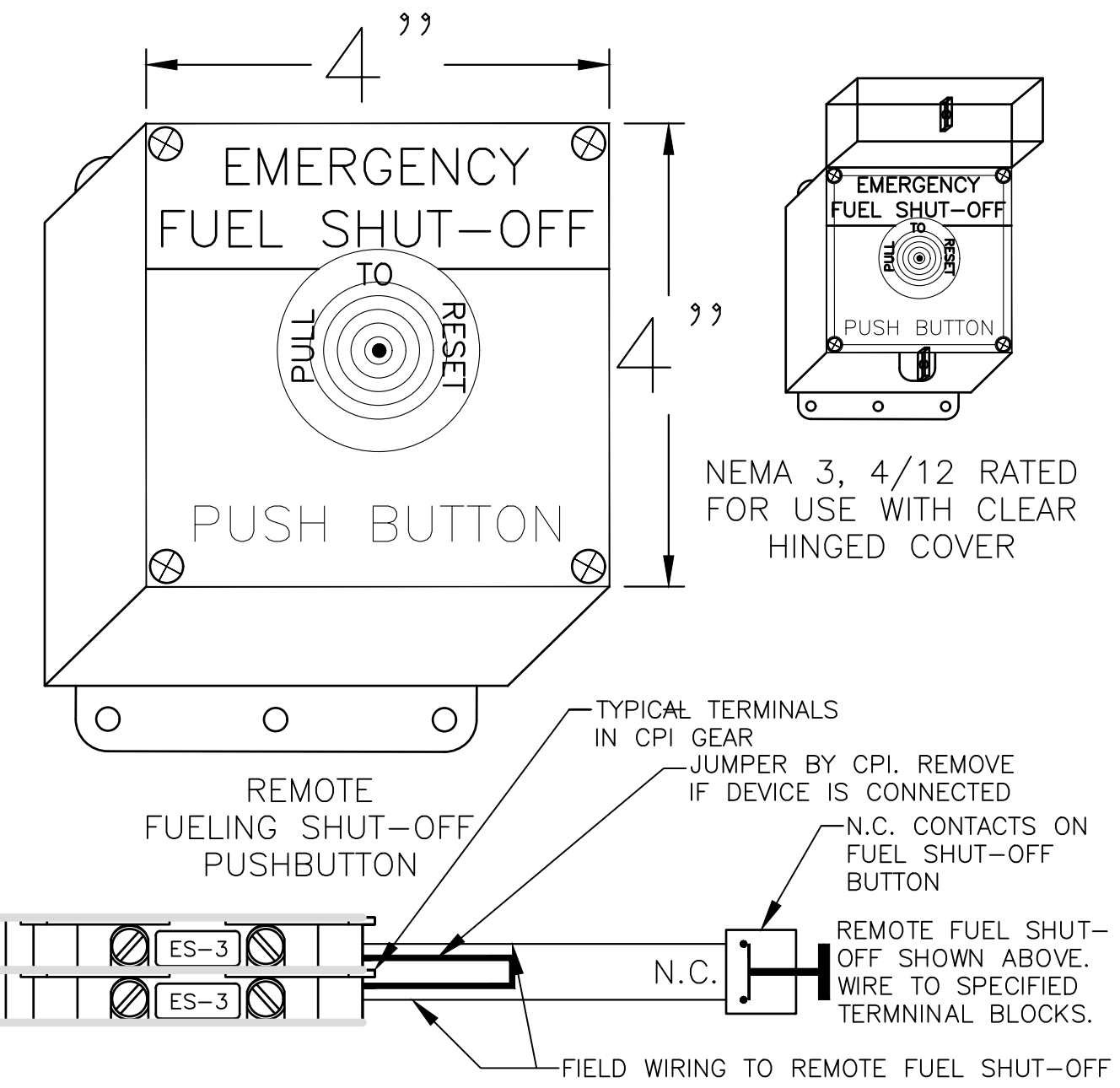
SITE ADDRESS:  
SWC S MERIDIAN  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

FACILITY #TBD  
DESIGNED BY: NP/RF ALLIANCE ZADN:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

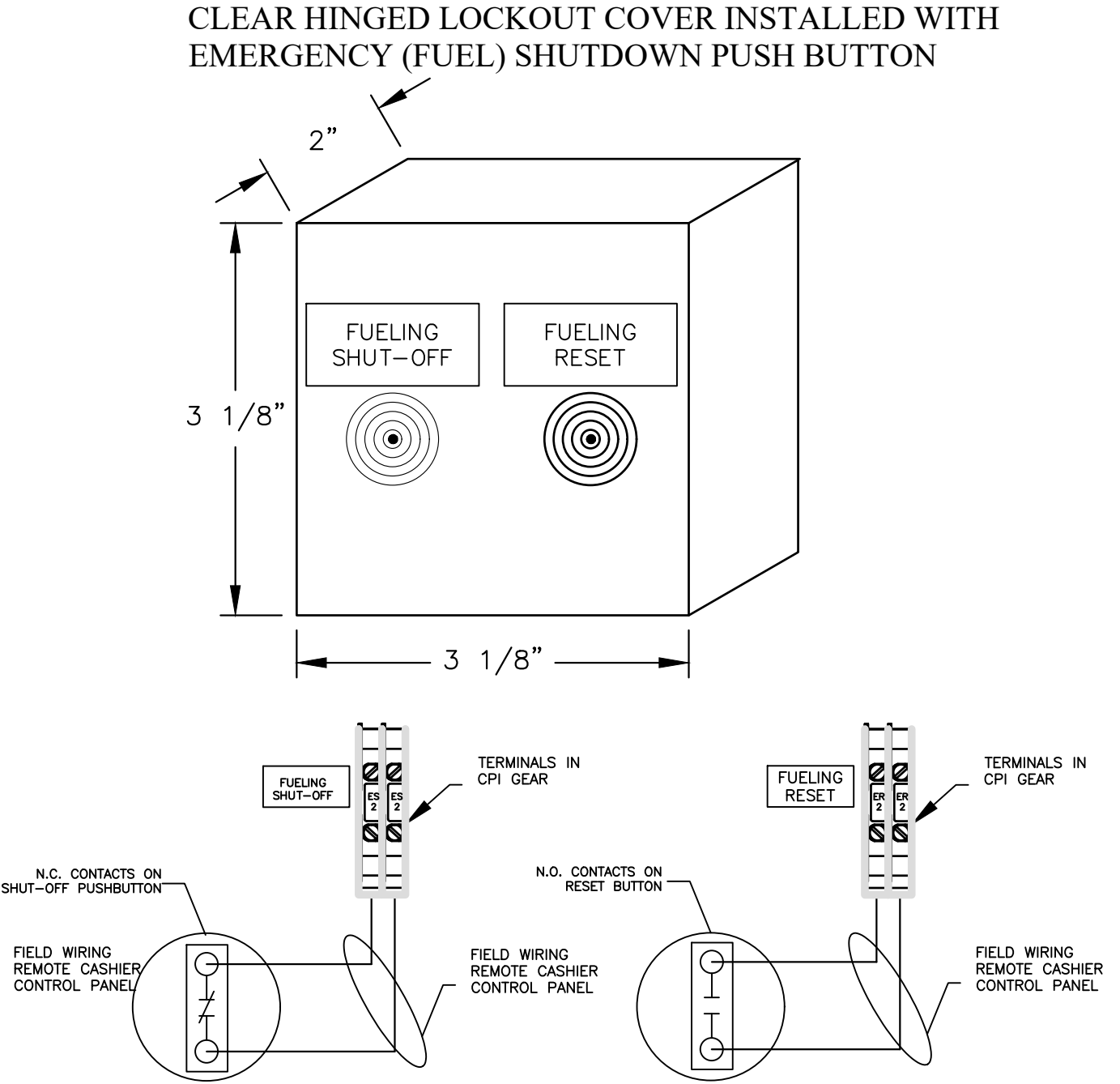
DRAWING TITLE:  
ELECTRICAL UNITIZED FUELING  
MANAGER CABINET ELEVATIONS  
AND DETAILS

SHEET NO:

M.5.1.47

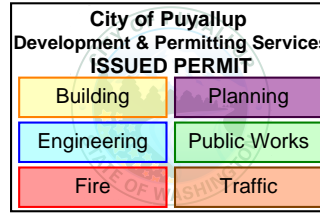


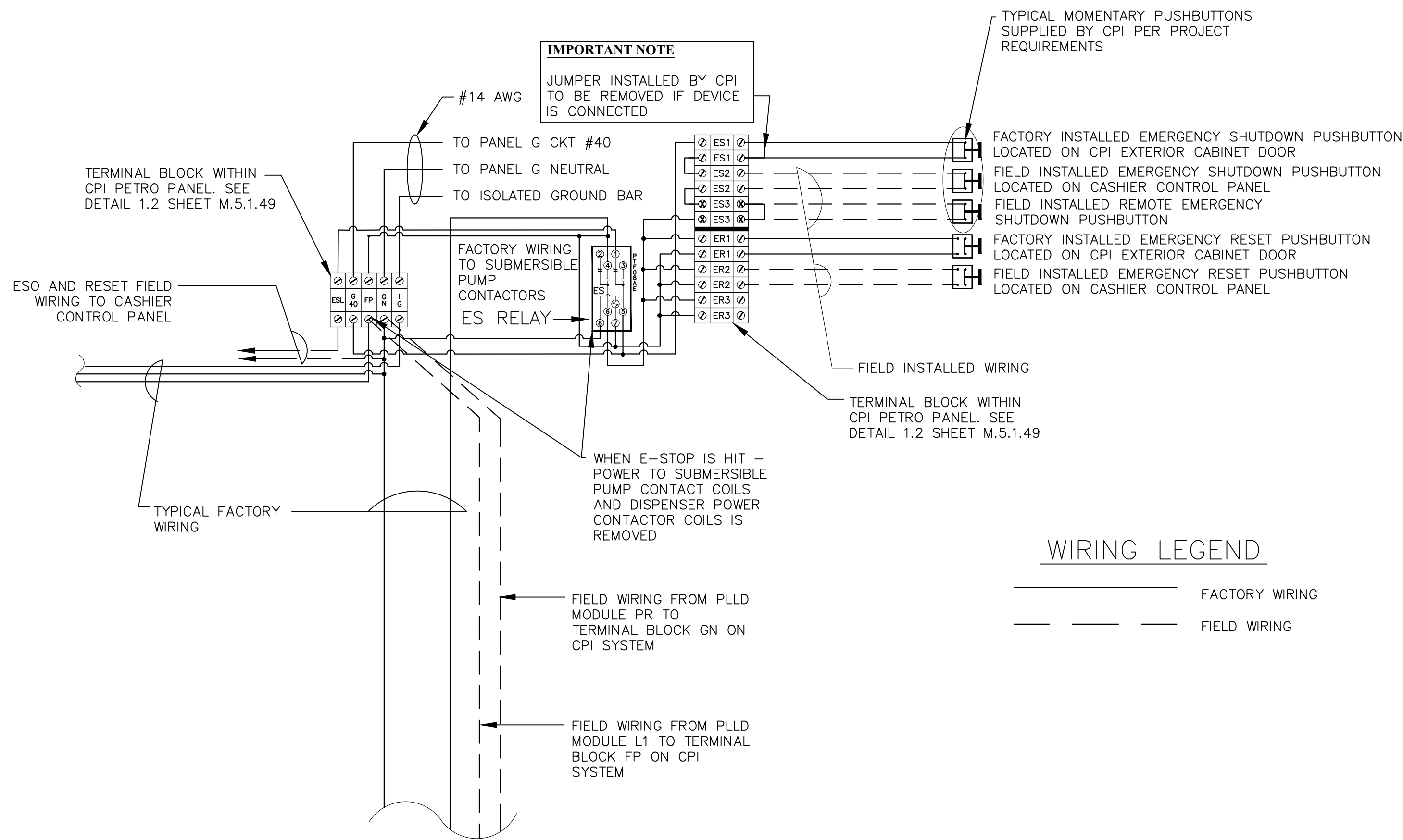
1.1 FUELING EMERGENCY STOP PUSHBUTTON  
INSTALLATION DETAILS



1.2 CASHIER CONTROL PANEL  
INSTALLATION DETAILS

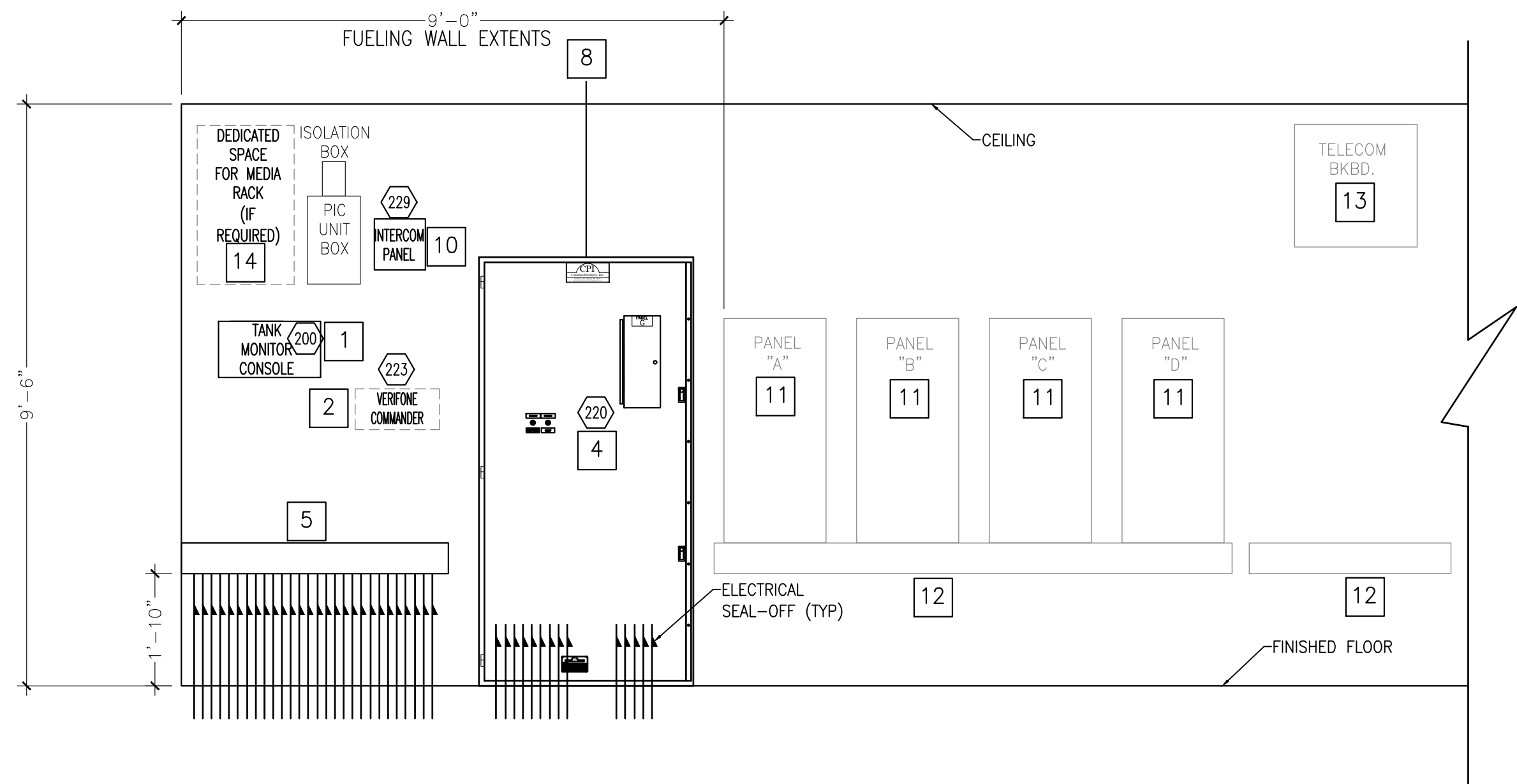
NOTE: INDICATES ITEMS FOUND  
ON MATERIALS LIST SHEET  
M.5.1.01 & M.5.1.02





## F: EMERGENCY STOP WIRING SCHEMATIC DETAIL

NOT TO SCALE:



## G: TYPICAL BACKROOM ELEVATION IN C-STORE

NOT TO SCALE:

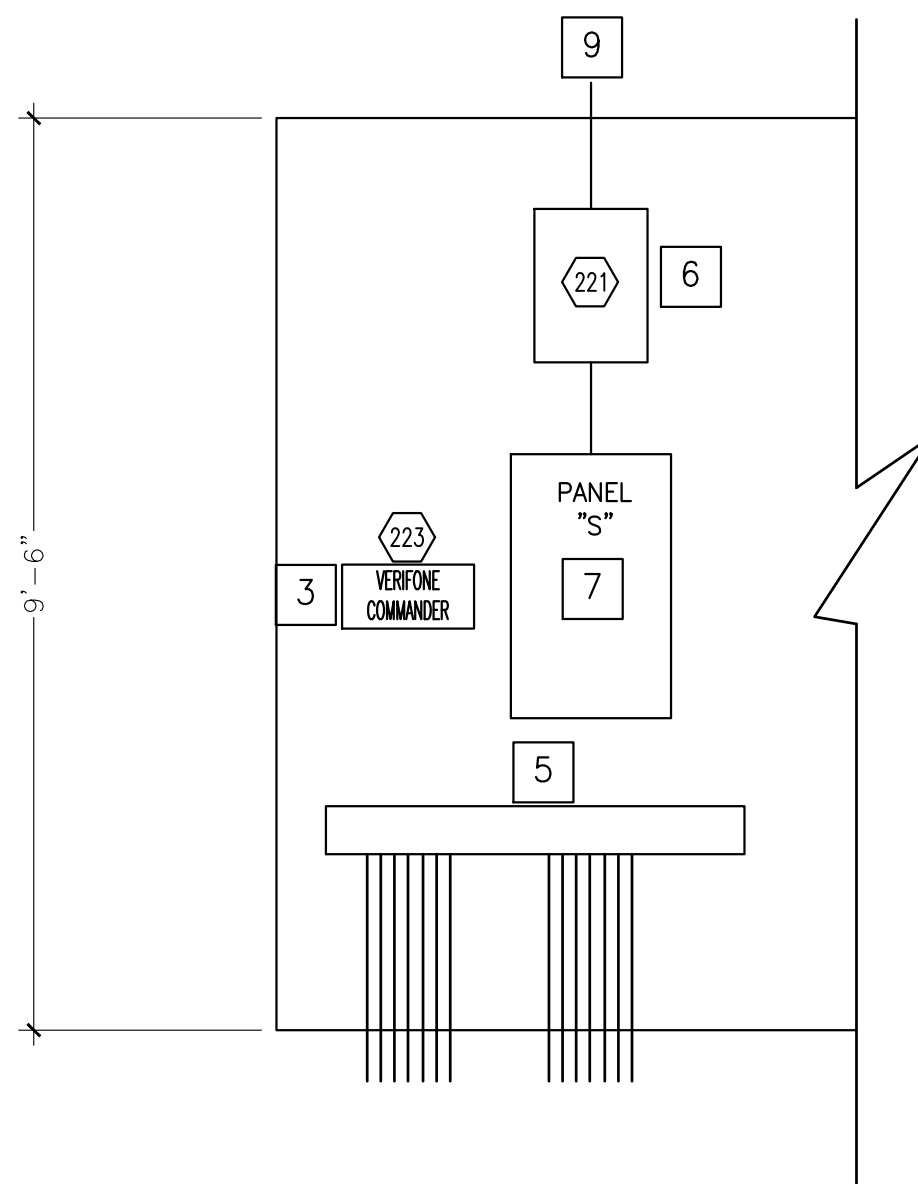
- 1 TANK/DISPENSER MONITORING CONSOLE
- 2 VERIFONE SITE COMMANDER UNIT (OPTIONAL LOCATION)
- 3 VERIFONE SITE COMMANDER UNIT (PREFERRED LOCATION)
- 4 FUELING DISPENSER MANAGER CABINET (42"Wx84"H - FLOOR MOUNTED):
  - 1) FUELING ELECTRICAL PANEL "G"
  - 2) DISPENSER RELAYS/MAINTENANCE SWITCH
  - 3) DISPENSER DATA/CRIND/INTERCOM/ETHERNET DISCONNECT
  - 4) TURBINE CONTROLS AND VFC UNITS
  - 5) EMERGENCY SHUT-OFF SYSTEM
- 5 6X6 WIREWAY WITH DIVIDERS
- 6 3KVA SURGE SUPPRESSOR

NOTE:  
SEE BUILDING DRAWINGS FOR FINAL ELECTRICAL DRAWINGS AND ELECTRICAL PANEL LOCATION.

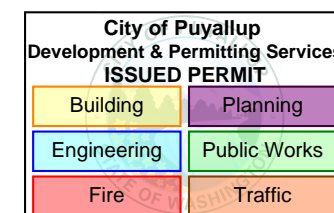
- 7 ELECTRICAL FUELING PANEL "S" (SECURE)
- 8 CONDUIT ROUTED ABOVE CEILING TO POWER CONDITIONER
- 9 CONDUIT ROUTED ABOVE CEILING TO PANEL "G"
- 10 INTERCOM PANEL
- 11 C-STORE ELECTRICAL PANELS (LOCATION TO BE DETERMINED)
- 12 C-STORE WIREWAY (LOCATION TO BE DETERMINED)
- 13 C-STORE COMMUNICATION BACKBOARD (LOCATION TO BE DETERMINED)
- 14 DEDICATED AREA FOR DISPENSER MEDIA RACK/CABINET, IF REQUIRED. CHECK WITH BP CONSTRUCTION AND MAINTENANCE COORDINATOR

## H: TYPICAL MANAGER OFFICE ELEVATION

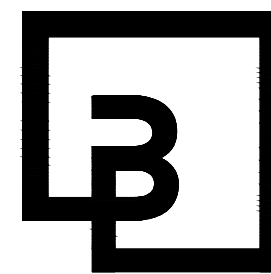
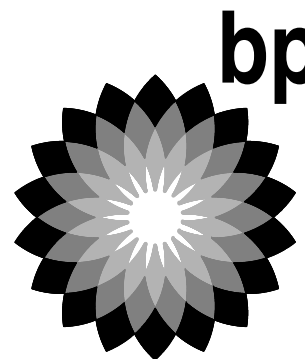
NOT TO SCALE:



NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEET M.5.1.01 & M.5.1.02



CLIENT:

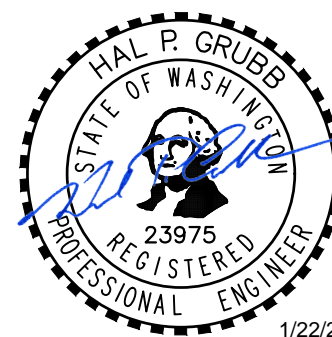


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DEVELOPMENT INFORMATION:

ARCO NTI  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:

SWC S MERIDIAN  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

FACILITY #TBD

DESIGNED BY: NP/RF ALLIANCE ZADN:

CHECKED BY: OV BP REPM:

DRAWN BY: NP/RF ALLIANCE PM:

VERSION: V-15.0 PROJECT NO:

01/01/2023 21730

DRAWING TITLE:

ELECTRICAL PANEL E-STOP  
CONTROL WIRING SCHEMATIC  
AND TYPICAL FUELING ELEVATION

SHEET NO:

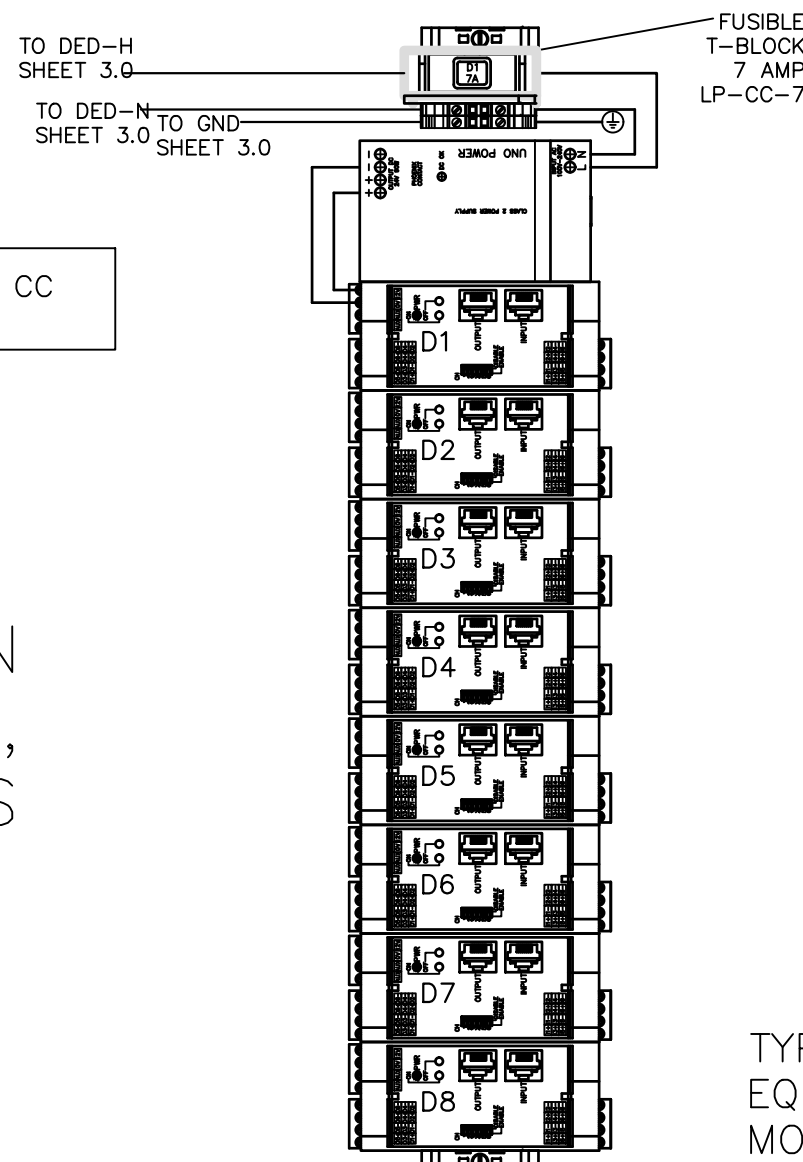
M.5.1.48

RED LABEL  
WHITE LETTER  
PLACE NEXT TO  
FUSE HOLDER

REPLACE WITH ONLY CLASS CC  
CURRENT LIMITING FUSES

DED BOARDS MOUNTED IN  
CPI CONTROL CABINET,  
PROTECTED BY BARRIERS

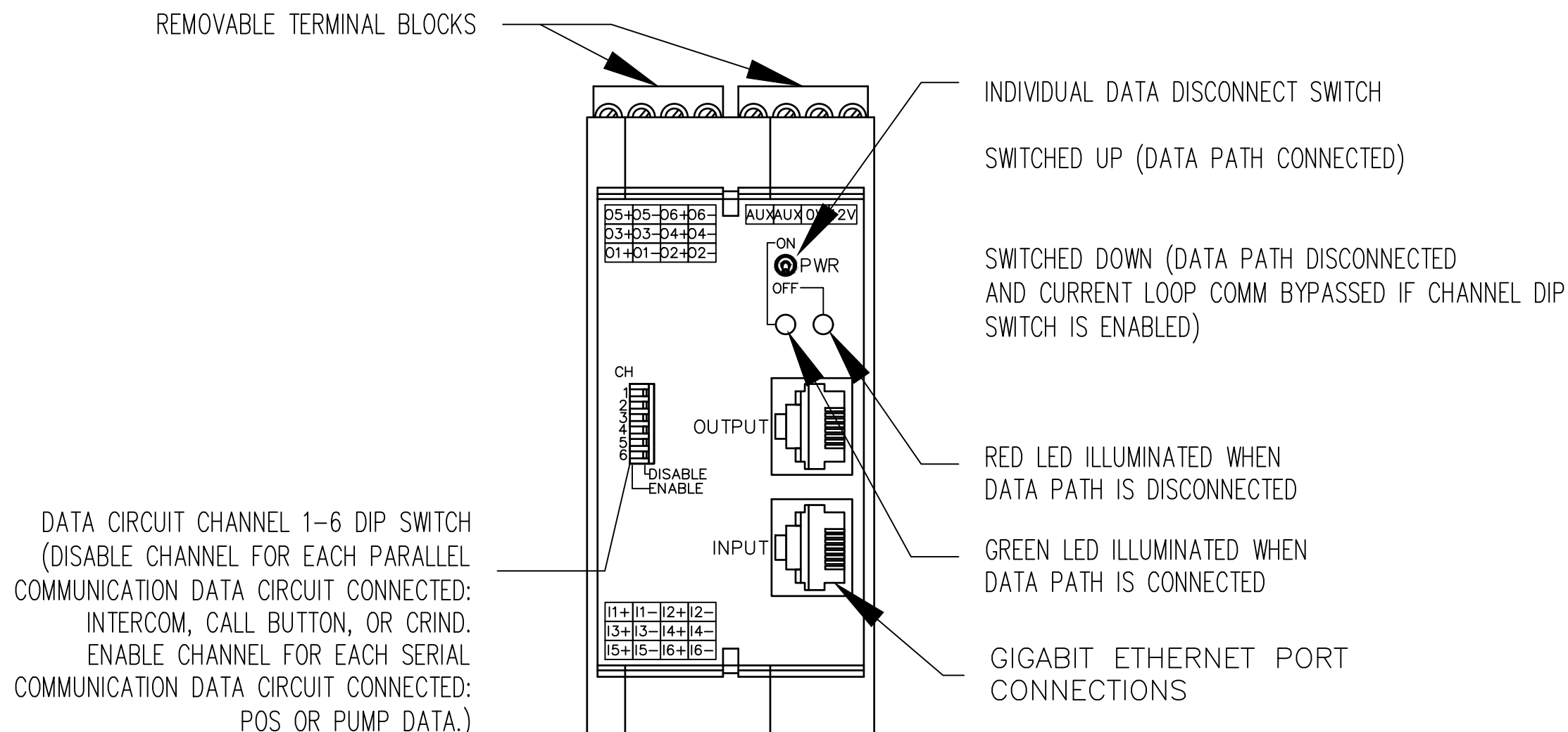
WIRE LEGEND	
14 AWG WIRING:	
18 AWG WIRING:	
FIELD WIRING:	



TYPICAL DISPENSING  
EQUIPMENT DISCONNECT  
MODULES

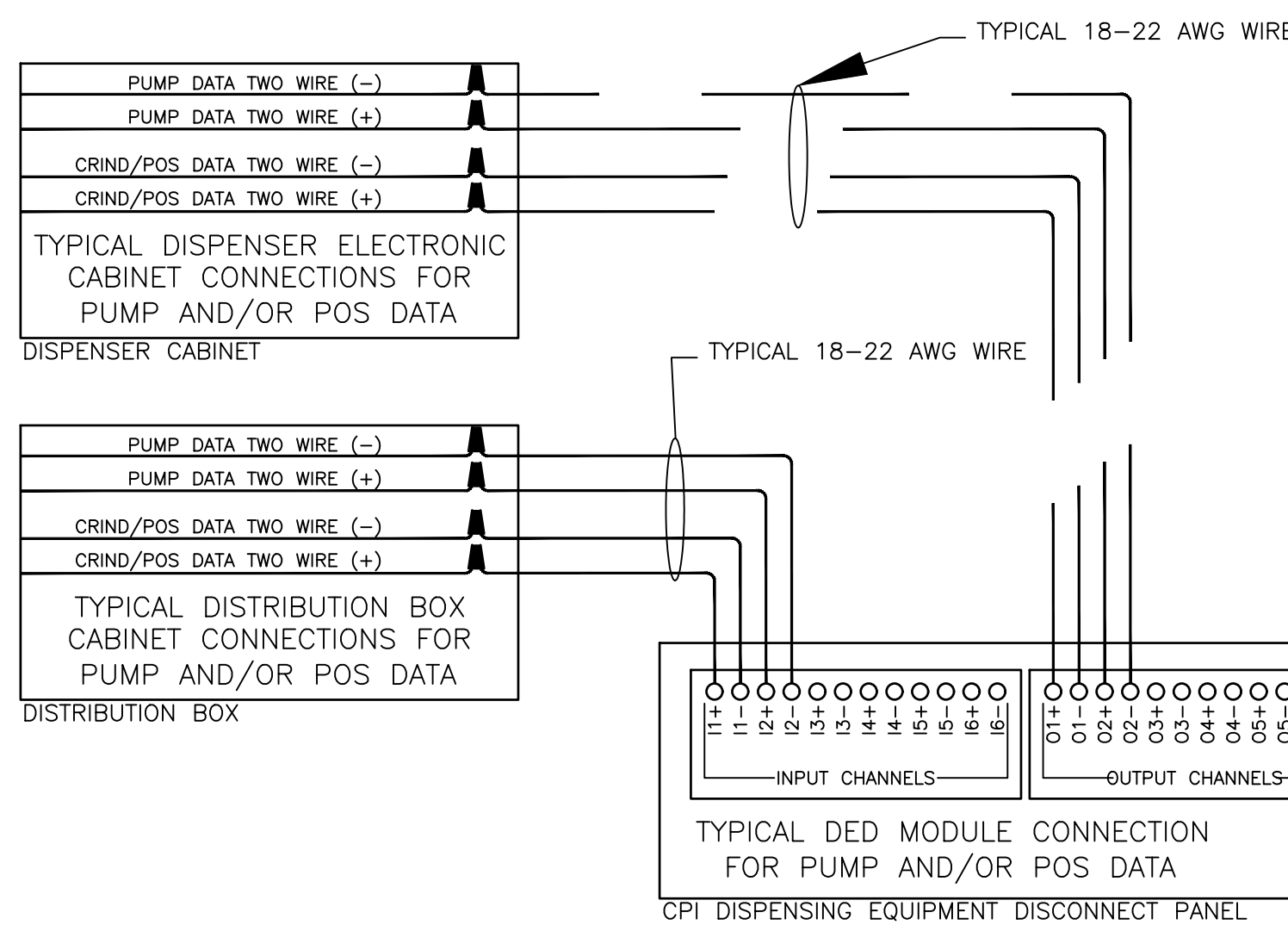
### 1.0 CPI DED SYSTEM

FACTORY INSTALLED



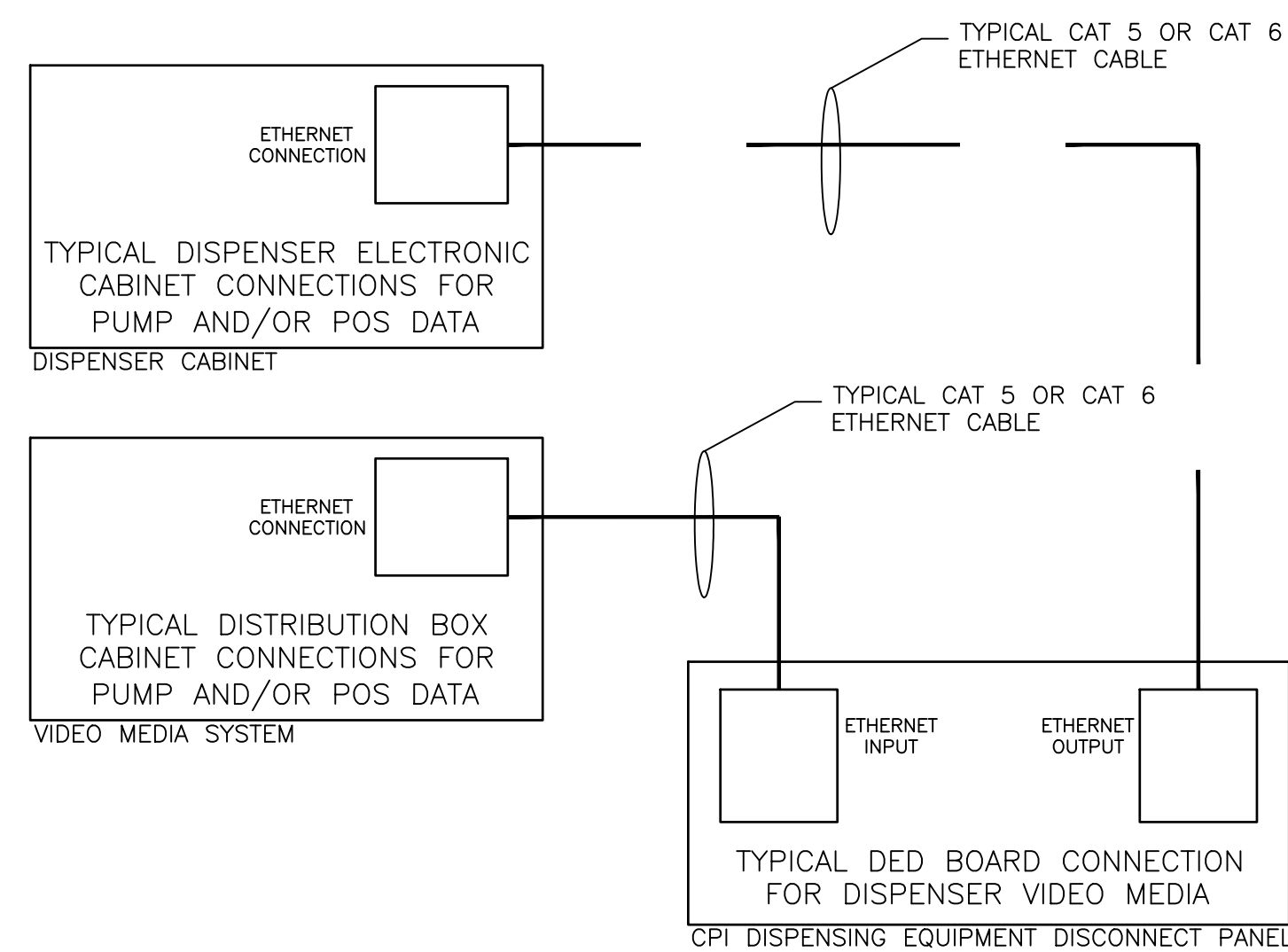
### 1.6 DED BOARD DESCRIPTION

TYPICAL BOARD



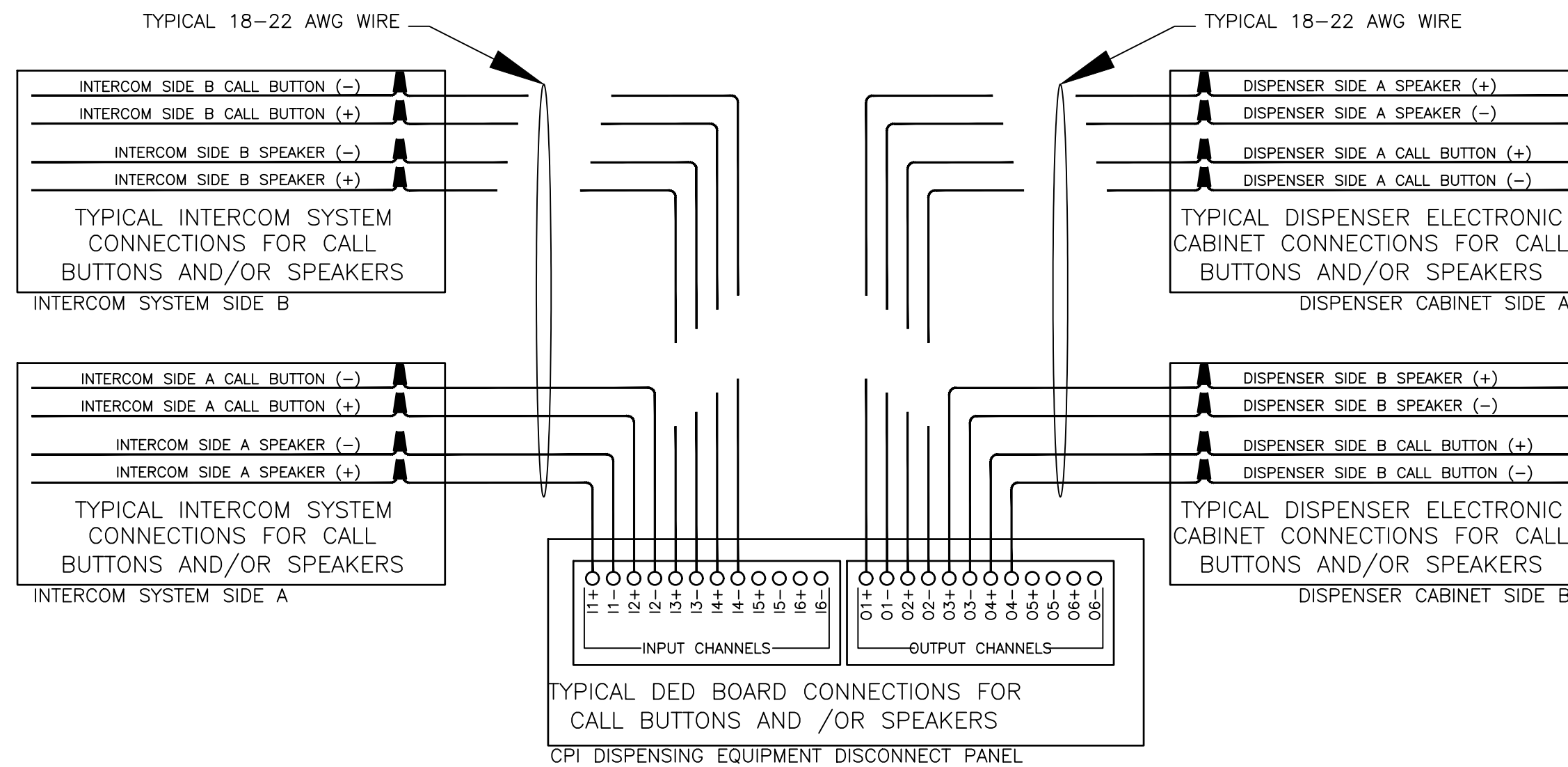
### 1.1 CPI PUMP DATA DISCONNECT

TYPICAL FIELD WIRING CONNECTION



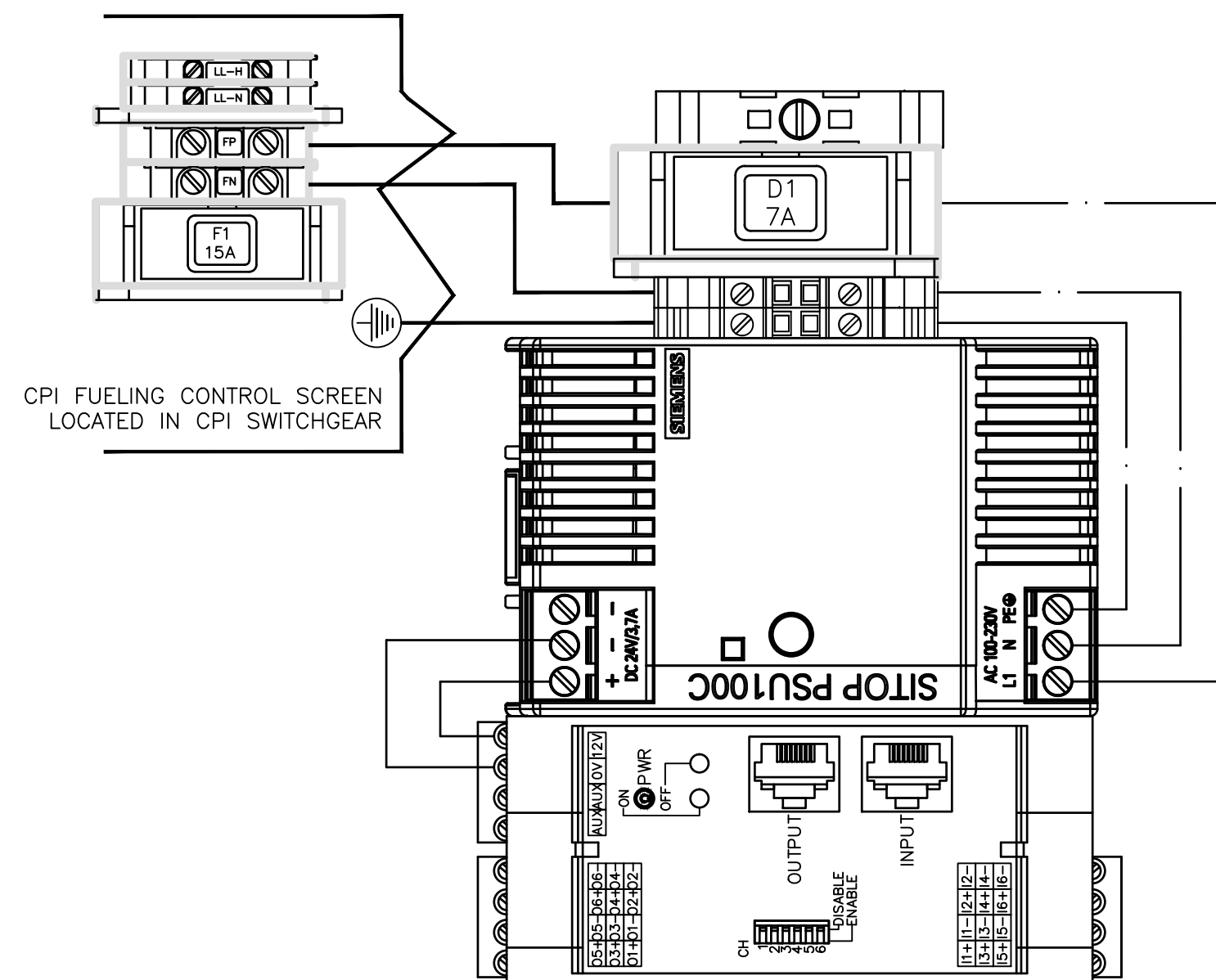
### 1.2 CPI VIDEO MEDIA DISCONNECT

TYPICAL FIELD WIRING CONNECTION



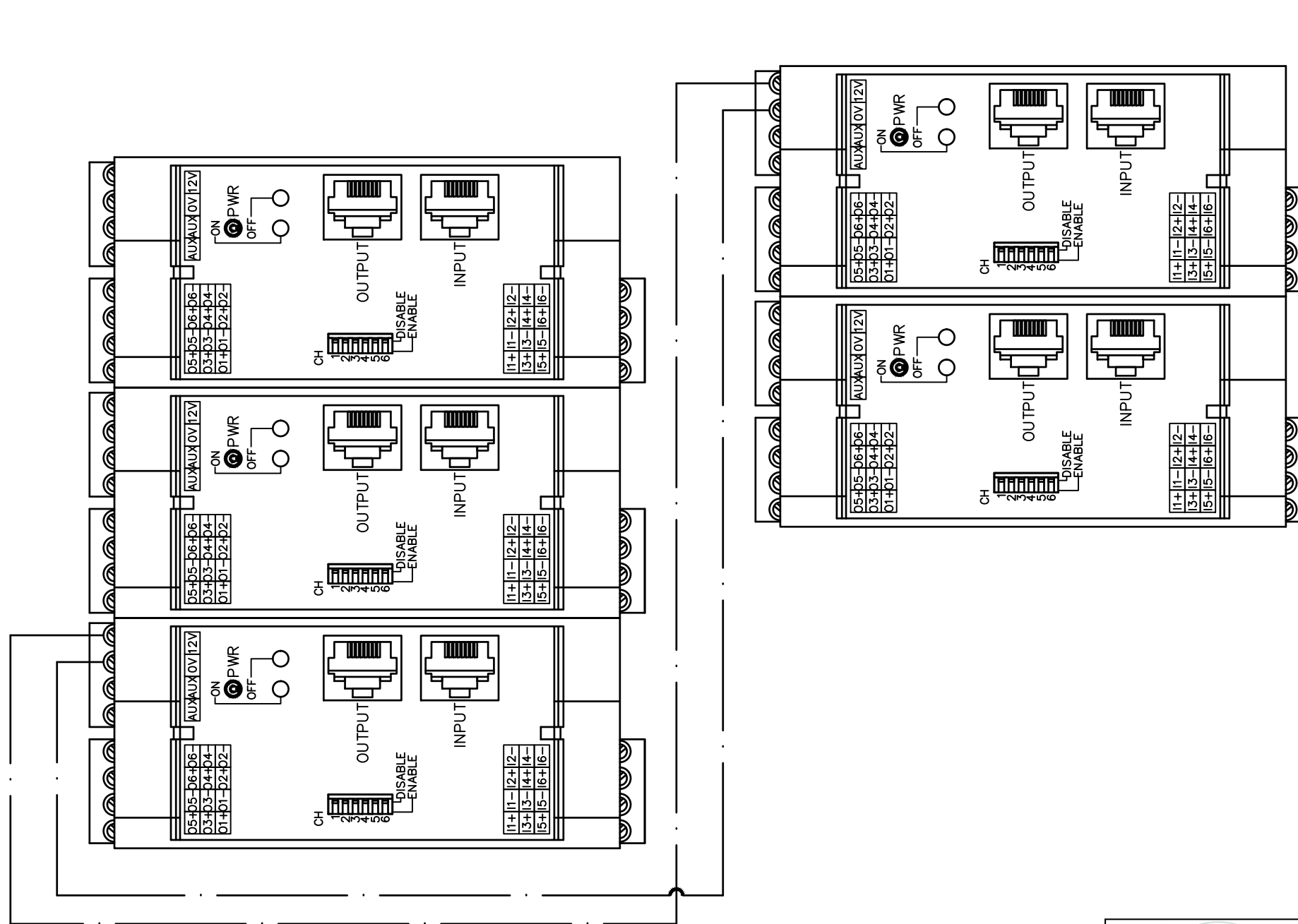
### 1.3 CPI INTERCOM DATA DISCONNECT

TYPICAL FIELD WIRING CONNECTION



### 1.4 DED WIRING DIAGRAM

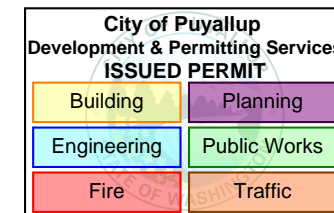
120VAC TO 24VDC



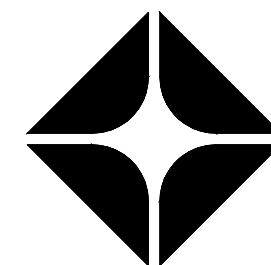
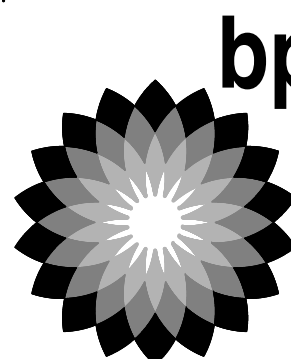
### 1.5 DED WIRING DIAGRAM

SAMPLE WIRING BETWEEN 2 LINES OF DED UNITS

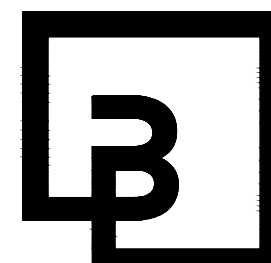
NOTE: INDICATES ITEMS FOUND  
ON MATERIALS LIST SHEET  
M.5.1.01 & M.5.1.02



CLIENT:



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SEAL:



PRFI20240124

DEVELOPMENT INFORMATION:

ARCO NTI  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:  
SWC S MERIDIAN  
@ HIGHWAY 512  
PUYALLUP, WASHINGTON

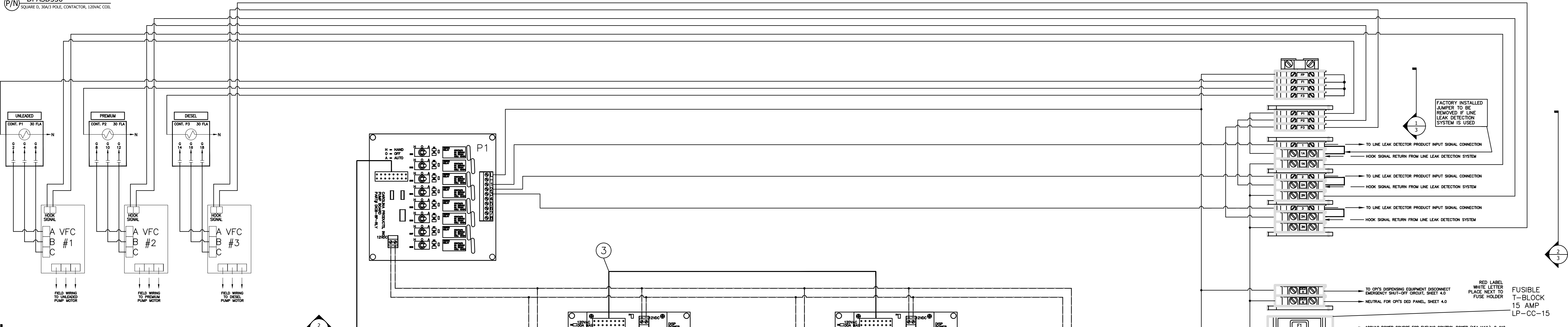
FACILITY #TBD

DESIGNED BY: NP/RF ALLIANCE ZADNE:  
CHECKED BY: OV BP REP:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO:  
01/01/2023 21730

DRAWING TITLE:  
ELECTRICAL LOW VOLTAGE  
DISCONNECT FOR  
DATA/INTERCOM/ETHERNET  
WIRING DIAGRAMS

SHEET NO:

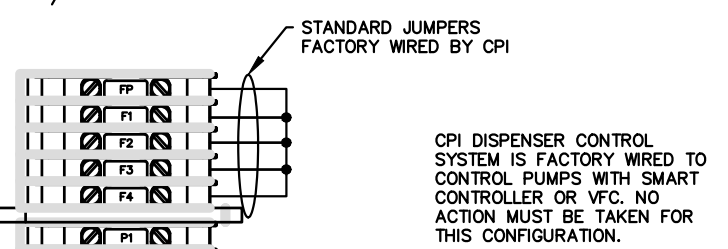
M.5.1.49



### CONFIGURING PRODUCT PUMP CONTROLS IN THE CFI DISPENSER CONTROL SYSTEM FOR

- VFC/SMART CONTROLLER OR
- FIXED SPEED PRODUCT PUMPS.

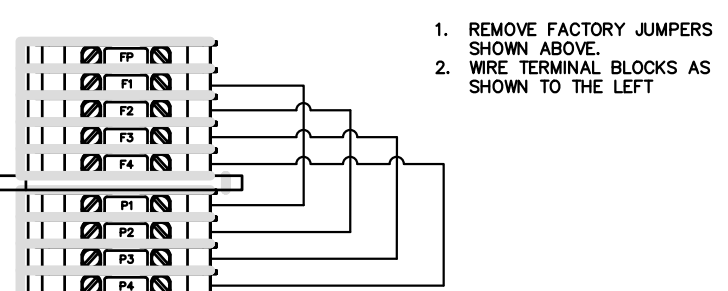
#### VFC/SMART CONTROLLER PRODUCT PUMP



#### 1 VFC/SMART CONTROLLER

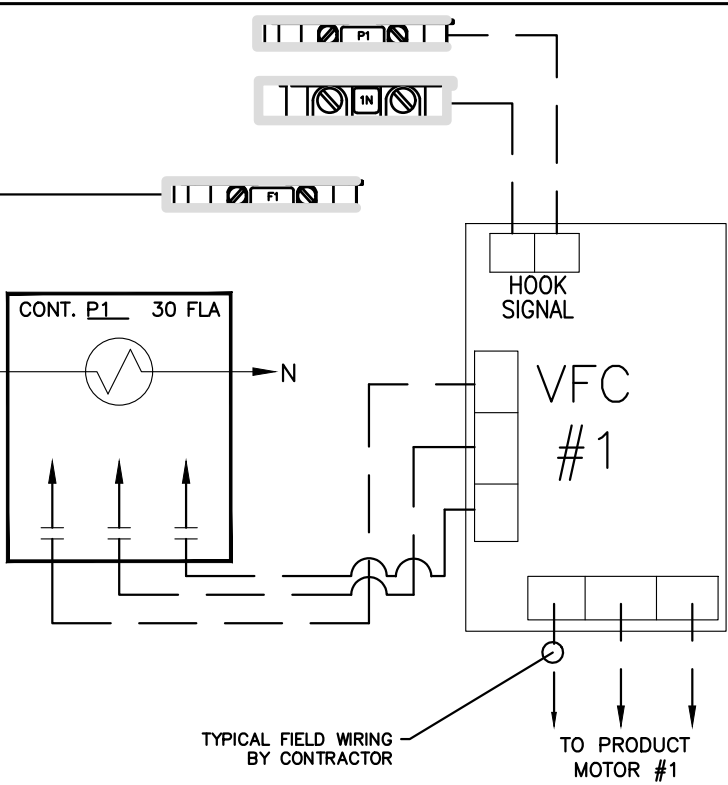
TERMINAL BLOCK DETAIL

#### FIXED SPEED PRODUCT PUMP (NO SMART CONTROLLER OR VFC)



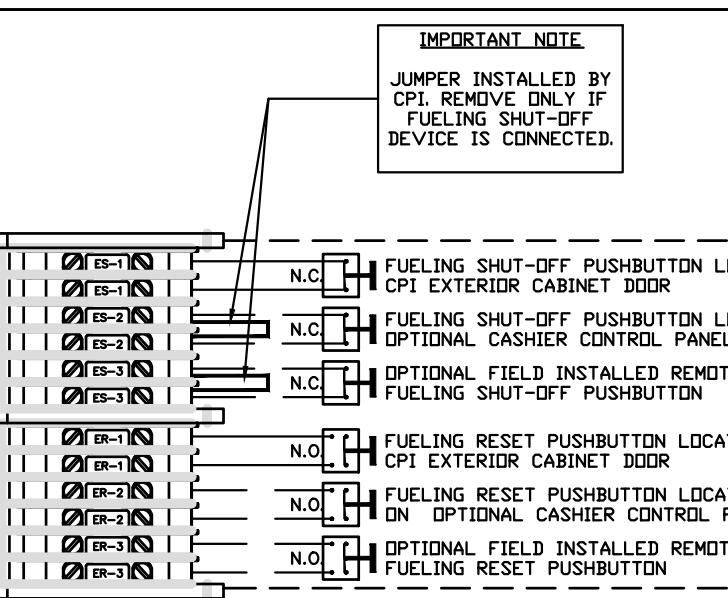
#### 1 FIXED SPEED PRODUCT CONTROLLER

TERMINAL BLOCK DETAIL



#### 2 VFC CONTROLLER (TYPICAL)

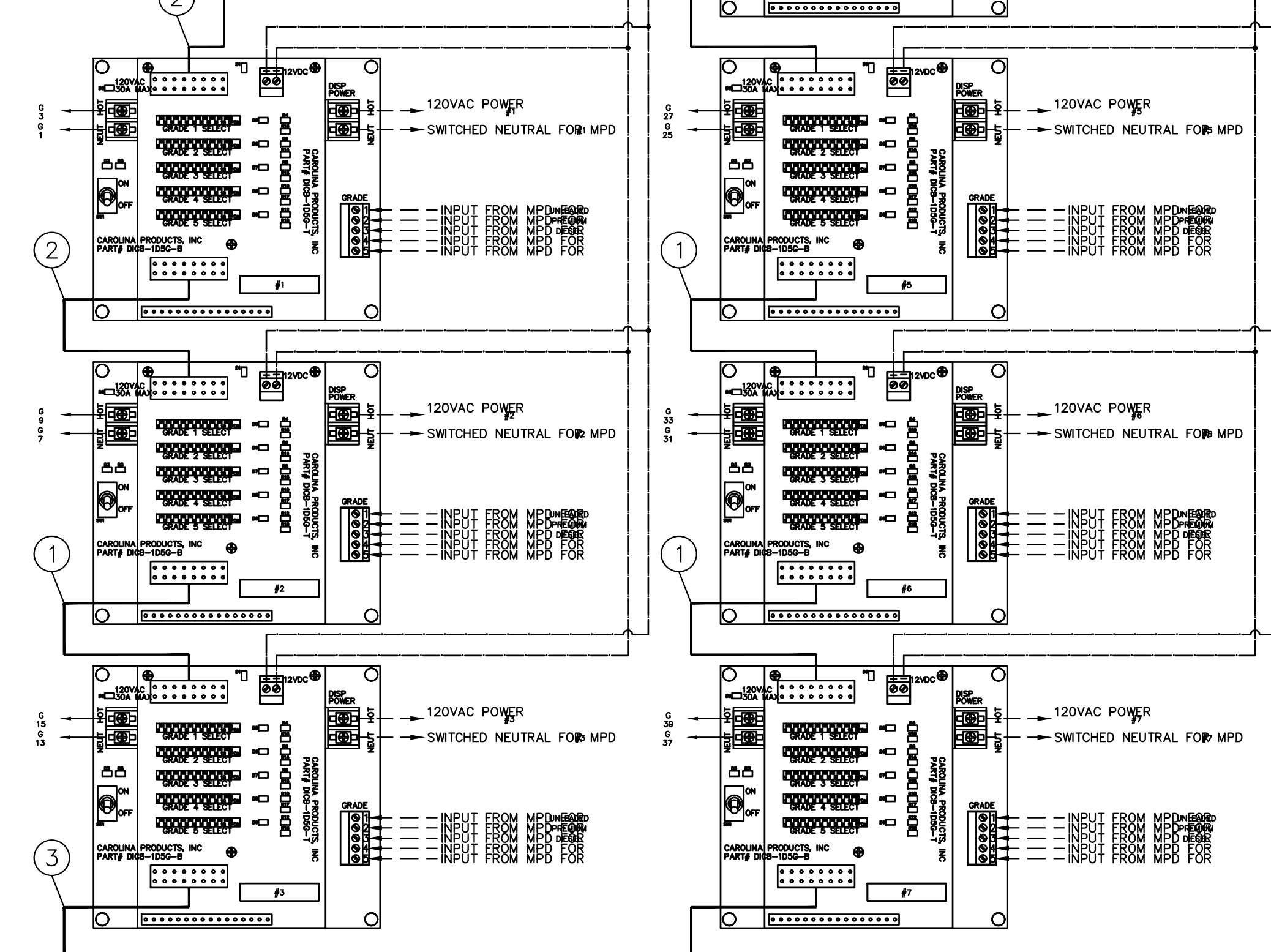
FACTORY WIRING DETAIL



#### 3 PUSHBUTTON CONNECTIONS

WIRING DETAIL

IMPORTANT NOTE:  
ALL GROUNDS FROM PUMP CONTROLLERS GO TO ISOLATED GROUND BAR



### FUELING CONTROLS BYPASS OPERATION

THE FOLLOWING DESCRIPTION OUTLINES THE PROCEDURE FOR BYPASSING THE AUTOMATIC FUELING CONTROLS IN THE EVENT OF A FAILURE IN THE AUTOMATIC CONTROLS. REFER TO THE MANUAL INSIDE THE CFI SYSTEM FOR A MORE DETAILED PROCEDURE DESCRIPTION.

- REFER TO MANUAL LOCATED IN BINDER INSIDE CFI SYSTEM.
- TURN PRODUCT SWITCHES FOR SUBMERSIBLE PUMPS OFF.
- TURN OFF POWER TO VFC.
- LOCATE DIP SWITCH BANK SW6 (ON VFC CONTROLLER) AND SWITCH POLE 1 TO THE ON POSITION.
- RESTORE POWER TO VFC.
- PLACE PRODUCT SWITCHES INTO THE MANUAL POSITION. (LOCATED ON CFI CONTROL SCREEN)
- CALL STORE MAINTENANCE AND CFI IMMEDIATELY TO REPORT PROBLEM AND GET REPLACEMENT PARTS SHIPPED.

IMPORTANT NOTE:  
ONCE THE AUTOMATIC FUELING CONTROL FAILURE HAS BEEN REPAIRED, SWITCH POLE 1 ON BANK SW6 (VFC CONTROLLER) MUST BE RETURNED TO THE DEF POSITION.

WIRE LEGEND:

DASHED	---	FIELD
SOLID	—	14AWG
DASHED-DOT	-.-	18AWG

CONTACTOR NAME	CONTACTS	AMPERE RATING	COIL VOLTAGE
P1	3 POLE	30 A	120 VAC
P2	3 POLE	30 A	120 VAC
P3	3 POLE	30 A	120 VAC
S-1	3 POLE	30 A	120 VAC

DESIGNATION	SIZE	P/N
F1	15A	LP-CC-15

DIP SWITCH #	FUNCTION
1	INPUT FROM MPD FOR UNLEADED
2	INPUT FROM MPD FOR PREMIUM
3	INPUT FROM MPD FOR DIESEL

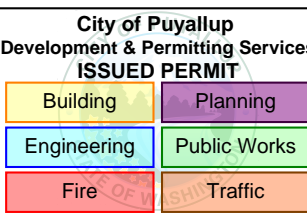
#	LENGTH
1	4"
2	12"
3	24"

SYMBOL	DESCRIPTION
	RELAY COIL
	NORMALLY OPEN RELAY CONTACT
	NORMALLY CLOSED RELAY CONTACT

RELAY NAME	CONTACTS	COIL VOLTAGE
ES	2 POLE	120 VAC

NOTE: INDICATES ITEMS FOUND ON MATERIALS LIST SHEET M.S.1.01 & M.S.1.02



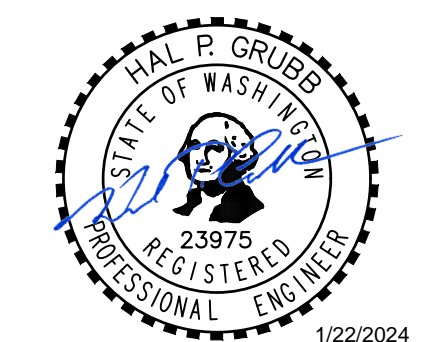
CLIENT:

**bp**

**ARCO**  
BP WEST COAST PRODUCTS, LLC

**Barghausen Consulting Engineers, Inc.**  
18215 72nd Avenue South  
Kent, WA 98032  
425.251.6222  
barghausen.com

NO.	DATE	REVISION DESCRIPTION
1	10/04/23	PERMIT RELEASE
2	01/22/24	PERMIT RELEASE
3		
4		
5		
6		
7		
8		
9		
10		



PRFI20240124

DEVELOPMENT INFORMATION:  
**ARCO NTI**  
3400 am/pm  
FUEL CANOPY w/ 6 MPD's

SITE ADDRESS:  
**SWC S MERIDIAN**  
@ HIGHWAY 512  
PUTALLUP, WASHINGTON

**FACILITY #TBD**

DESIGNED BY: NP/RF ALLIANCE ZADME:  
CHECKED BY: OV BP REPM:  
DRAWN BY: NP/RF ALLIANCE PM:  
VERSION: V-15.0 PROJECT NO.:  
01/01/2023 21730

EMERGENCY SHUTDOWN SCHEMATIC  
FUELING CONTROLS W/ VFC's

SHEET NO:

**M.5.1.50**