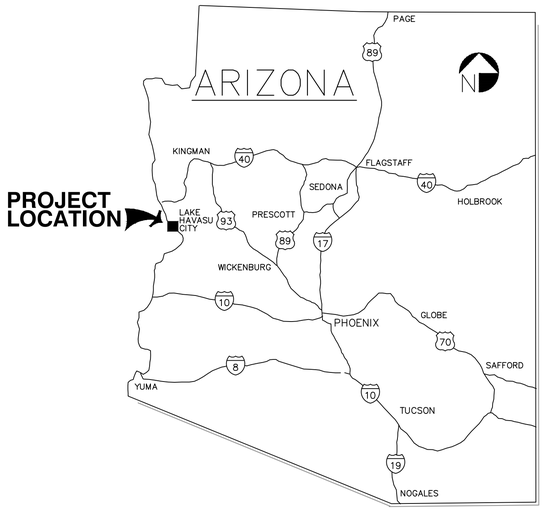
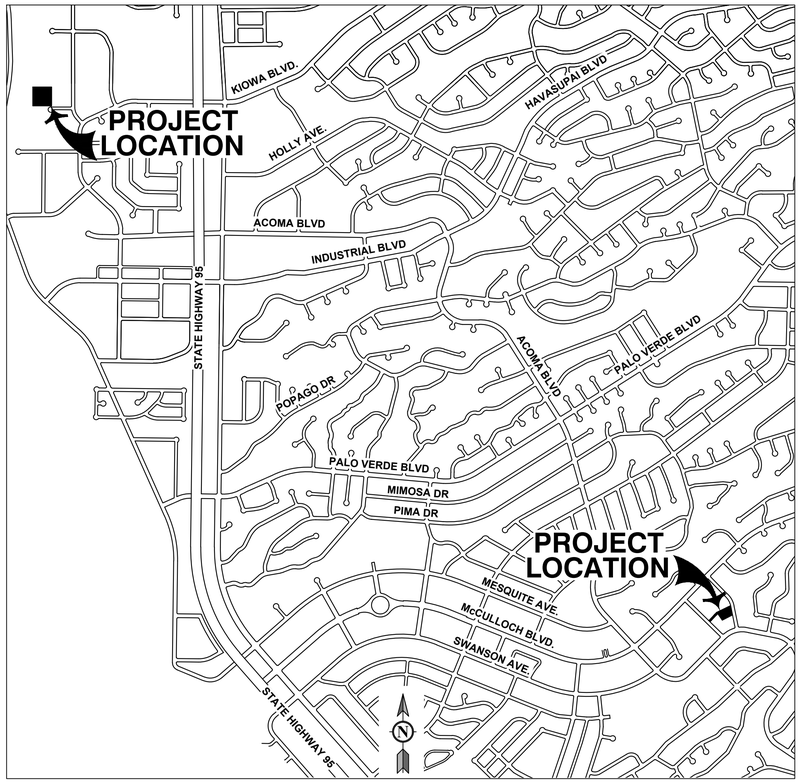
CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NUMBER: 101010

PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY

DRAWING INDEX



VICINITY MAP
SCALE: N.T.S.



LOCATION MAP
SCALE: N.T.S.

PROJECT CONTROL:

PROJECT SETTINGS:

DATUM:	NAD83
PROJECTION:	ARIZONA STATE PLANE (WEST)
LINEAR UNIT:	US FEET
COORDINATE:	GRID
GEOID:	GEOID 2003, UNIT 05

PROJECT CONTROL AND BENCHMARK DATA:

CITY BASE STATION:
N=1265542.33 --- E=528326.69 --- ELEV=773.83

US HARN POINT – HAVASU:
NGS ORDER A: STAINLESS STEEL ROD IN HANDHOLE MARKED HAVASU 92
N=1298017.10 --- E=515892.32 --- ELEV=696.75

LAKE HAVASU CITY SURVEY MONUMENT – SARA:
2005 AERIAL CONTROL CAP
N=1254812.07 --- E=550796.23 --- ELEV=1060.40

LAKE HAVASU CITY SURVEY MONUMENT – CP1:
G.P.S. CONTROL MONUMENT 1997 IN HANDHOLE
N=1267052.09 --- E=544522.51 --- ELEV=1209.68

CITY COUNCIL

MAYOR:	CAL SHEEHY
VICE MAYOR:	DAVID LANE
CITY COUNCIL:	NANCY CAMPBELL
	JIM DOLAN
	MICHELE LIN
	CAMERON MOSES
	JENI COKE
CITY MANAGER:	JESS KNUDSON
CITY ENGINEER:	GREG FROSLIE, PE
PROJECT MANAGER:	JASON HART

UTILITY CONTACTS:

CITY OF LAKE HAVASU CITY (WASTEWATER)	(928) 855-3999
CITY OF LAKE HAVASU CITY (WATER)	(928) 855-2618
SUDDENLINK (CABLE)	(928) 855-7815
UNISOURCE ENERGY SERVICES (GAS)	(928) 505-7025
UNISOURCE ENERGY SERVICES (ELECTRIC)	(928) 505-7031

Contact Arizona 811 at least two full working days before you begin excavation
ARIZONA811 BLUE STAKE, INC.
Call 811 or click Arizona811.com

STATE OF ARIZONA — SEAN D. PERROTTO — 51510 — REGISTERED PROFESSIONAL ENGINEER — CIVIL
EXPIRES 12-31-2025

NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN	S. PERROTTO	E. PERROTTO	R. EDWARDS			S. PERROTTO	

TRICO ENGINEERING, LLC
231 SWANSON AVENUE, STE. 204
LAKE HAVASU CITY, AZ 86403
PHONE: 928-230-4569
WWW.TRICOENGINEERING.LLC.COM

CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY
2359 MCCULLOCH BLVD N.
LAKE HAVASU CITY, AZ 86403
(928) 855-2116

Jacobs

BID SET
COVER SHEET
CIVIL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	C-1
SHEET	1 of 26

FILENAME: 23-028_01_Cover Sheet.dwg PLOT DATE: 10/3/23 PLOT TIME: 2:08 PM

GENERAL NOTES

1. ALL WATER UTILITY CONSTRUCTION TO CONFORM TO AAC R18-5-502 AND AAC R18-4-119 WATER SYSTEM STANDARDS, ADEQ BULLETIN 10, LAKE HAVASU CITY STANDARDS AND SPECIFICATIONS, MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) STANDARD SPECIFICATIONS AND DETAILS UNLESS SPECIFICALLY MODIFIED ON THE PLANS.
2. THE OWNER SHALL BE NOTIFIED A MINIMUM OF 24 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION.
3. ANY WORK PERFORMED WITHOUT THE KNOWLEDGE AND APPROVAL BY THE OWNER OR ENGINEER AND/OR ALL WORK MATERIAL NOT IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS IS SUBJECT TO REMOVAL AT THE CONTRACTOR'S EXPENSE.
4. NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL CURBS, PAVEMENT AND SIDEWALKS (NEW AND EXISTING) HAVE BEEN SWEPT CLEAN OF ALL DIRT AND DEBRIS.
5. THE CONTRACTOR SHALL KEEP SUITABLE EQUIPMENT ON HAND AT THE JOBSITE FOR MAINTENANCE DUST CONTROL, AND SHALL CONTROL DUST IN ACCORDANCE WITH CITY SPECIFICATIONS.
6. ASPHALT CONCRETE SHALL NOT BE PLACED ON SUBGRADE UNTIL SUBGRADE REQUIREMENTS HAVE BEEN COMPLETED PER THE PROJECT SPECIFICATIONS BY THE CONTRACTOR.
7. BACKFILL COMPACTION SHALL BE TYPE 1 (MAG 601) UNLESS OTHERWISE NOTED PER LHC STD DETAILS.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING TRAFFIC CONTROL PLANS AS PART OF THE SUBMITTAL REVIEW REQUEST TO THE ENGINEER FOR APPROVAL NO LATER THAN 30 CALENDAR DAYS PRIOR TO THE PLANNED CONSTRUCTION IN THE AREA OF THE WORK, EXCEPT IN EMERGENCIES. ALL TRAFFIC CONTROL DEVICES SHALL BE WELL MAINTAINED AND COMPLY WITH ALL PERFORMANCE REQUIREMENTS WITHIN THE MUTCD AND THE LATEST REVISIONS THEREOF. NO STREET IS TO BE CLOSED, RESTRICTED, OR CONSTRUCTED UPON UNTIL A TRAFFIC PLAN IS APPROVED. CONTRACTOR SHALL MAINTAIN A MINIMUM ONE LANE OF TRAFFIC IN EACH DIRECTION AT ALL TIMES OR AS NOTED IN THE SPECIFICATIONS.
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN COPIES OF MAG AND THE CITY OF LAKE HAVASU STANDARDS, SPECIFICATIONS, AND DETAILS AS WELL AS ALL OTHER STANDARDS AND SPECIFICATIONS NECESSARY TO COMPLETELY AND ACCURATELY INTERPRET THESE PLANS.
10. REMOVAL OF STRUCTURES AND OBSTRUCTIONS AS NECESSARY TO COMPLETE THE WORK, OTHER THAN OR NOT OF SPECIFICALLY SCHEDULED IN THE BID, IS INCIDENTAL TO THE CONTRACT. NO SEPARATE MEASUREMENT OF PAYMENT FOR UNSCHEDULED REMOVAL ITEMS WILL BE MADE.
11. CONSTRUCTION STAKING SHALL BE BY THE CONTRACTOR'S SURVEYOR WITH CONTROL PROVIDED WITHIN THE CONTRACT DOCUMENTS.
12. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW THE MINIMUM COVER SHOWN WITH EXCEPTION TO THE LOCATIONS WHERE CONNECTING TO EXISTING MAIN LINE. ANY CHANGES MUST BE APPROVED BY ENGINEER.
13. THE OWNER RESERVES THE RIGHT TO ORDER ANY OR ALL WORKMANSHIP AND MATERIALS TO BE TESTED ACCORDING TO APPLICABLE STANDARDS.
14. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL REWORK AND/OR REMOVAL AND REPLACEMENT OF ALL MATERIALS AND/OR WORKMANSHIP REPRESENTED BY A FAILING TEST.
15. IN ACCORDANCE WITH SPECIFICATION 00800, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS OF TESTING AND QUALITY CONTROL AS DELINEATED IN THE CITY'S PROJECT SPECIFICATIONS. THE COST OF TESTING IS INCIDENTAL TO EACH ITEM OF WORK. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE COST OF ANY CITY INSPECTION, AND TIME ASSOCIATED WITH, IF THE CONTRACTOR'S WORK IS BEING PERFORMED IN OVERTIME, AT NIGHT, OR ON WEEKENDS.
16. APPROVAL OF A PORTION OF THE WORK IN PROGRESS DOES NOT GUARANTEE ITS FINAL ACCEPTANCE. TESTING AND EVALUATION MAY CONTINUE UNTIL WRITTEN FINAL ACCEPTANCE OF A COMPLETE AND WORKABLE UNIT.
17. IN ACCORDANCE WITH SPECIFICATION 00700, THE OWNER MAY SUSPEND THE WORK BY WRITTEN NOTICE WHEN, IN ITS JUDGEMENT, PROGRESS IS UNSATISFACTORY, WORK BEING DONE IS UNAUTHORIZED OR DEFECTIVE, WEATHER CONDITIONS ARE UNSUITABLE, OR THERE IS A DANGER TO THE PUBLIC HEALTH OR SAFETY.
18. CLEARING AND GRUBBING IS CONSIDERED INCIDENTAL TO THE WORK UNLESS SEPARATELY IDENTIFIED IN THE BID SCHEDULE. NO SEPARATE MEASUREMENT OF OR PAYMENT FOR CLEARING, GRUBBING, AND TREE REMOVAL WILL BE MADE. THE SITE OF ALL EXCAVATION, EMBANKMENTS, AND FILLS SHALL FIRST BE CLEARED OF STUMPS, TRASH, WEEDS, RUBBISH, AND LOOSE BOULDERS WHICH SHALL BE REMOVED AND DISPOSED OF.
19. ALL FINISHED EDGES OF CONCRETE SHALL HAVE A ¾" CHAMFER UNLESS OTHERWISE SPECIFIED ON PLANS.
20. IF AC PAVEMENT IS DAMAGED OR CRACKED DURING REMOVAL OF EXISTING CONCRETE DRIVEWAY, THE CONTRACTOR SHALL SAWCUT 12" FROM EDGE OF PAVEMENT. REMOVAL AND REPLACEMENT OF DAMAGED AC PAVEMENT SHALL BE IN KIND AT CONTRACTORS EXPENSE.
21. IF A SECTION OF CONCRETE NOT ADJACENT TO AC PAVEMENT IS REMOVED AND SURROUNDING CONCRETE IS CRACKED OR DAMAGED, CONTRACTOR SHALL REMOVE AND REPLACE IN KIND AT CONTRACTORS EXPENSE.
22. CONCRETE SURFACES TO HAVE A BROOM FINISH UNLESS OTHERWISE NOTED ON THE PLANS.
23. ALL CONCRETE TO BE AT LEAST 4,000 P.S.I. CLASS 'A' PORTLAND CEMENT CONCRETE UNLESS OTHERWISE SPECIFIED ON PLANS.
24. ALL EXPANSION JOINTS SHALL BE FILLED PER MAG STANDARDS.
25. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE AND ARE BASED ON VISIBLE FIELD DATA AND AVAILABLE MAP RECORDS. THE CONTRACTOR SHALL CONTACT ARIZONA 811 PRIOR TO ANY EXCAVATION ACTIVITY TO LOCATE THE ACTUAL LOCATION OF ALL UTILITIES. THE CONTRACTOR SHALL BEAR THE COST TO PROTECT ANY AND ALL UTILITIES LOCATED BY BLUESTAKE AND/OR SHOWN ON THE PLANS. ADDITIONALLY, THE CONTRACTOR SHALL TAKE ALL REASONABLE EFFORT AND ACTION TO SATISFY HIMSELF ON THE HORIZONTAL AND VERTICAL LOCATION OF THE EXISTING UTILITIES PRIOR TO TRENCHING. ANY DAMAGE TO EXISTING UTILITIES CAUSED BY CONTRACTOR'S OPERATION SHALL BE REPORTED TO THE UTILITY OWNER IMMEDIATELY AND REPAIRED OR REPLACED AT NO COST TO THE OWNER.
26. IN ACCORDANCE WITH ARIZONA ADMINISTRATIVE CODE, SECTION R18-5-502, "MINIMUM DESIGN CRITERIA", WATER AND SEWER MAINS SHALL BE SEPARATED IN ORDER TO PROTECT PUBLIC WATER SYSTEMS FROM POSSIBLE CONTAMINATION. ALL DISTANCES ARE MEASURED PERPENDICULARLY FROM THE OUTSIDE OF THE SEWER MAIN TO THE OUTSIDE OF THE WATER MAIN. SEPARATION REQUIREMENTS ARE AS FOLLOWS:
    - 26.1. A WATER MAIN SHALL NOT BE PLACED:
        - 26.1.1. WITHIN 6 FEET, HORIZONTAL DISTANCE, AND BELOW 2 FEET, VERTICAL DISTANCE, ABOVE THE TOP OF A SEWER MAIN UNLESS EXTRA PROTECTION IS PROVIDED. EXTRA PROTECTION SHALL CONSIST OF CONSTRUCTING THE SEWER MAIN WITH MECHANICAL JOINT DUCTILE IRON PIPE WITH SLIP-JOINT DUCTILE IRON PIPE IF JOINT RESTRAINT IS PROVIDED. ALTERNATE EXTRA PROTECTION SHALL CONSIST OF ENCASING BOTH THE WATER AND SEWER MAINS IN AT LEAST 6 INCHES OF CONCRETE FOR AT LEAST 10 FEET BEYOND THE AREA OF COVERED BY THE SUBSECTION (C)(1)(a).
        - 26.1.2. WITHIN 2 FEET HORIZONTALLY AND 2 FEET BELOW THE SEWER MAIN.
        - 26.1.3. NO WATER PIPE SHALL PASS THROUGH OR COME INTO CONTACT WITH ANY PART OF A SEWER MANHOLE. THE MINIMUM HORIZONTAL SEPARATION BETWEEN WATER MAINS AND MANHOLES SHALL BE 6 FEET, MEASURED FROM THE CENTER OF THE MANHOLE.
    - 26.2. THE MINIMUM SEPARATION BETWEEN FORCE MAINS OR PRESSURE SEWER AND WATER MAINS SHALL BE 2 FEET VERTICALLY AND 6 FEET HORIZONTALLY UNDER ALL CONDITIONS. WHERE A SEWER FORCE MAIN CROSSES ABOVE OR LESS THAN 6 FEET BELOW A WATER LINE, THE SEWER MAIN SHALL BE ENCASED IN A T LEAST 6 INCHES OF CONCRETE OR CONSTRUCTED USING MECHANICAL JOINT DUCTILE IRON PIPE FOR 10 FEET ON EITHER SIDE OF THE WATER MAIN.
27. HORIZONTAL DATUM IS BASED ON THE PUBLISHED 2005 LAKE HAVASU AERIAL MAPPING DATUM. COORDINATES ARE NAD83 (1992 ADJUSTMENT) GEODE 03 MODEL, ARIZONA STATE PLANE WEST ZONE, U.S. FOOT (39.37 DIVIDED BY 12), WITH ADDITIONAL INFORMATION LOCATED IN THE PROJECT CONTROL SECTION.
28. THE CONTRACTOR SHALL LIMIT THE WORK AREA TO PUBLIC RIGHT-OF-WAY AND PERMANENT EASEMENTS AS SHOWN FOR CONSTRUCTION OF THE PROJECT.
29. CONTRACTOR SHALL OBTAIN ANY ADDITIONAL TEMPORARY EASEMENTS OR USE AGREEMENTS THAT ARE DEEMED NECESSARY FOR CONSTRUCTION AT NO ADDITIONAL COST TO THE CITY. COPIES OF ALL CONTRACTOR OBTAINED EASEMENTS AND USE AGREEMENTS SHALL BE PROVIDED TO THE CITY'S REPRESENTATIVE PRIOR TO THE UTILIZATION OF THE SITE.
30. THE CONTRACTOR SHALL GRADE AND RESURFACE ALL AREAS DISTURBED BY CONSTRUCTION. IN ACCORDANCE WITH THE SPECIFICATIONS AND TO A CONDITION EQUAL TO, OR BETTER THAN, THE PRE-CONSTRUCTION CONDITION.
31. THE CONTRACTOR SHALL PROVIDE PROTECTION TO PREVENT UNDERMINING OR DAMAGING THE STRUCTURAL INTEGRITY OF ALL POWER POLES, FENCES, BLOCK WALLS, SCREEN WALLS, RETAINING WALLS, HIGHWAY AND STREET SIGNS, OTHER UTILITY POLES, OR OTHER PRIVATE OR PUBLIC IMPROVEMENTS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OWNING UTILITY AS NECESSARY TO PROVIDE TEMPORARY SUPPORT OR PROTECTION DURING CONSTRUCTION WORK, AND SHALL NEATLY REMOVE AND PROMPTLY REPLACE NON UTILITY IMPROVEMENTS WITHOUT UNDUE DISRUPTION. THE COST OF ALL SUCH PROTECTION, REMOVAL, AND REPLACEMENT REQUIRED TO COMPLETE THE PROJECT SHALL BE SUBSIDIARY TO OTHER BID ITEMS.
32. THE CONTRACTOR SHALL TAKE ALL APPROPRIATE STEPS TO MAINTAIN CONTINUOUS UTILITY SERVICE TO RESIDENTS AND BUSINESSES WITHIN THE PROJECT AREA. MANY EXISTING WATER AND GAS LINES ARE MORE THAN 30 YEARS OLD. PROPOSED METHOD OF CROSSING AND/OR SUPPORT OF UTILITIES SHALL BE APPROVED BY UTILITY OWNER IN ADVANCE OF WORK. MANY LOCAL WATER LINES ARE CONSTRUCTED OF ASBESTOS CEMENT. GAS LINES ARE REPORTED TO BE BRITTLE, SO CLOSE COORDINATION WITH THE UTILITY OWNER'S WILL BE NECESSARY TO AVOID DAMAGE. PROTECTION OF ALL UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.

GENERAL NOTES (CONT):

33. ALL GRAVEL DRIVES AND GRAVEL ROADS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED WITH A MINIMUM OF SIX INCHES (6") OF GRANULAR BACKFILL AS SPECIFIED IN SECTION 02300 AND SHALL BE CONSIDERED SUBSIDIARY TO OTHER PAY ITEMS.
34. THE CONTRACTOR SHALL REMOVE ALL FENCING, ASPHALT AND CONCRETE ROADS AND DRIVEWAYS, CURB AND GUTTER, RIP-RAP, LANDSCAPING, DRAINAGE CULVERTS, MAILBOXES, LANDSCAPING AND ASSOCIATED APPURTENANCES AS REQUIRED FOR CONSTRUCTION PURPOSES. ALL ITEMS DAMAGED, REMOVED, OR DISTURBED SHALL BE RESTORED IN ACCORDANCE WITH THE SPECIFICATION TO A CONDITION EQUAL TO, OR BETTER THAN, THEIR CONDITION PRIOR TO THE START OF THE PROJECT. ITEMS OF WORK NOT SPECIFICALLY INCLUDED IN THE MEASUREMENTS AND PAYMENT SECTION OF THE SPECIFICATIONS SHALL BE CONSIDERED SUBSIDIARY AND INCIDENTAL TO OTHER BID ITEMS AND SHALL NOT BE PAID FOR SEPARATELY.
35. IN ACCORDANCE WITH SPECIFICATION 00800, THE CONTRACTOR SHALL TAKE APPROPRIATE STEPS TO PREVENT EROSION OF MATERIAL FROM THE WORK AREA AND DEPOSITION OF SEDIMENTS INTO WATER COURSES OR DRAINAGE SWALES, THE CONTRACTOR SHALL SUBMIT AN EROSION CONTROL PLAN PRIOR TO THE START OF ANY EXCAVATION. ALL EROSION AND SEDIMENT CONTROL WORK SHALL BE INCIDENTAL TO THE OTHER PAY ITEMS.
36. AERIAL TOPOGRAPHY PERFORMED BY:

    MAPCON DATED: DECEMBER 2019

    ORIGINAL DOCUMENT BOOK ON FILE AT THE OFFICE OF THE CITY ENGINEER.
37. ALL STREET CENTERLINES HAVE EXISTING PINS AT THE INTERSECTION OF THE STREET CENTERLINES AND SHALL BE PROTECTED IN PLACED. IF A PIN IS DISTURBED OR REMOVED, THE CONTRACTOR SHALL ARRANGE AND PAY FOR AN ARIZONA REGISTERED LAND SURVEYOR TO DETERMINE THE COORDINATES FOR EACH PIN PRIOR TO CONSTRUCTION AND TO REPLACE THE PINS WITH 4½" X ⅜" MAG NAIL WITH WASHER AND SURVEYOR INFORMATION STAMPED ON WASHER TO THE SAME LOCATION AFTER RESURFACING. ALL REQUIRED SURVEY WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE SUBSIDIARY TO OTHER PAY ITEMS.
38. EXISTING WATER VALVES AND MANHOLES HAVE AN 8-INCH THICK CONCRETE COLLAR AT THE PAVEMENT SURFACE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL NEW CONCRETE COLLARS ON NEW MANHOLES AND VALVE BOXES, ALL EXISTING VALVE BOXES AND MANHOLES THAT ARE DISTURBED DURING CONSTRUCTION, AND WHERE THE NEW ASPHALT SURFACE IS PLACED TO AN ELEVATION HIGHER THAN EXISTING VALVE BOX OR MANHOLE COVER. THIS ITEM OF WORK IS SUBSIDIARY TO OTHER PAY ITEMS. ALL VALVE BOXES WITHIN THE DISTURBED PROJECT AREA SHALL BE ADJUSTED IN ACCORDANCE WITH MAG DETAIL 391-1A.
39. ANY AND ALL SOILS, INCLUDING ROCK, ENCOUNTERED DURING EXCAVATION SHALL BE CONSIDERED UNCLASSIFIED AND SHALL BE INCIDENTAL TO OTHER ITEMS OF WORK.
40. ANY SHORING REQUIRED SHALL BE CONSIDERED MEANS AND METHODS INCIDENTAL TO OTHER ITEMS OF WORK.
41. CONTRACTOR SHALL SCHEDULE WATER SHUTDOWNS AND SEWER WORK SO AS TO NOT DISRUPT SERVICE TO SCHOOLS, HOSPITALS, DAY CARE FACILITIES, ETC. IN ACCORDANCE WITH ARIZONA STATE LAW.
42. RIGHT-OF-WAY AND PROPERTY LINES SHOWN ON DRAWINGS ARE APPROXIMATE. CONTRACTOR WILL NEED TO FIELD VERIFY LINES PERTAINING TO SCOPED WORK PRIOR TO CONSTRUCTION.
43. ALL RESTRAINED PIPE SHALL BE PER SPECIFICATION 02550 2.7. JOINT RESTRAINTS SHALL BE EBAA IRON SERIES 15PF00 OR EQUAL. ALL JOINT RESTRAINTS SHALL BE DOUBLE POLY WRAPPED & TAPED. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTRAINING ANY NECESSARY BENDS USED WITHIN THE PROJECT LIMITS. CONTRACTOR TO PROVIDE JOINT RESTRAINT PLAN.
44. ALL LANDSCAPING DISTURBED SHALL BE REPLACED AT EQUAL OR BETTER CONDITION THAN EXISTING.
45. CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY ALIGNMENT AND DEPTH. THIS WORK SHALL BE INCIDENTAL TO INSTALLATION OF THE WATERLINE.
46. IN ACCORDANCE WITH ADEQ REQUIREMENTS, CONTRACTOR IS RESPONSIBLE FOR PIPE PROTECTION WHERE MINIMUM SEPARATION CANNOT BE MAINTAINED.
47. CONTRACTOR SHALL PERFORM ALL TESTING AND DISINFECTING OF THE WATER LINES PER THE CITY OF LAKE HAVASU SPECIFICATION 02550, PROJECT SPECIFICATION 02666, AND THE ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY (ADEQ) REGULATIONS IN BULLETIN NO. 8.
48. ALL WATER MAINS SHALL BE BURIED WITH 14 GAUGE DIRECT BURY TRACE WIRE.
49. EXACT SLOPES FOR EXISTING PIPES ARE UNKNOWN. CONTRACTOR SHALL ADJUST PIPE ACCORDINGLY TO MATCH EXACT FIELD CONDITIONS. IF THE USE OF FLEX COUPLINGS IS NECESSARY, THIS SHALL BE INCIDENTAL TO THE WATERLINE INSTALLATION BID ITEM.
50. ALL DUCTILE IRON FITTINGS, VALVES, AND PIPE ARE TO BE WRAPPED WITH POLY-ETHYLENE ENCASEMENT.
51. ALL PIPE, FITTINGS, FIRE HYDRANTS & OTHER APPURTENANCES IN DIRECT CONTACT WITH POTABLE WATER SHALL BE NATIONAL SANITATION FOUNDATION (NSF) 61 CERTIFIED. PLASTIC PIPE SHALL BEAR THE NSF SEAL FOR POTABLE WATER USE (NSF-PW).
52. ALL PROJECT LOCATIONS LIE WITHIN FEMA ZONE X.
53. THE CONTRACTOR SHALL TAKE ALL REASONABLE EFFORT AND ACTION TO SATISFY HIMSELF ON THE HORIZONTAL AND VERTICAL LOCATION OF THE EXISTING SEWER LATERALS PRIOR TO TRENCHING MAINLINE.
54. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AND SATISFY HIMSELF OF THE EXISTING CONDITIONS AS SHOWN IN THE PLANS PRIOR TO FIRE HYDRANT ASSEMBLY SUBMITTALS. THE CONTRACTOR SHALL INCLUDE SUPPORTING DOCUMENTATION IN A SCHEDULE TYPE FORMAT CONFIRMING THE APPROPRIATE BARREL LENGTH TO MATCH THE FIELD CONDITION. APPROVAL BY OWNER/ENGINEER SHALL BE OBTAINED PRIOR TO THE ORDERING OF MATERIALS. CONTRACTOR IS RESPONSIBLE FOR APPROPRIATE BARREL LENGTH TO ACCOMMODATE ANY CHANGE IN GRADE OR PIPE ELEVATION THAT OCCURS DURING CONSTRUCTION DUE TO AN EXISTING CONDITION. THE CONTRACTOR SHALL BEAR COST OF ANY NECESSARY FITTING TO ACCOMMODATE FIRE LINE ADJUSTMENTS OR ADJUSTED BARREL LENGTHS TO MEET APPROPRIATE GRADE. OWNER SHALL BEAR NO ADDITIONAL COSTS FOR CHANGES IN BARREL AND/OR LINE LENGTH.
55. ENGINEER ASSUMES THAT EACH DEVELOPED LOT ADJACENT TO THE PUBLIC RIGHT-OF-WAY REFLECTED IN THESE PLANS WILL HAVE AT LEAST ONE (1) SANITARY SEWER LATERAL EXTENDING TO THE EXISTING PUBLIC SANITARY SEWER MAIN. A REVIEW OF PUBLIC RECORDS WAS UNABLE TO ASCERTAIN THE EXISTING LATERAL LOCATIONS TO A DEGREE OF CERTAINTY. CONTRACTOR IS ADVISED TO FOLLOW GENERAL NOTE NUMBER 7 ON SHEET 2 OF 24 PRIOR TO CONSTRUCTION. ANCILLARY TO THE REPLACEMENT OF THE EXISTING WATER MAINS, AND SHALL BE PROMPTLY REPAIRED IN KIND BY THE CONTRACTOR AT NO ADDITIONAL COST OR SCHEDULE ESCALATION TO THE OWNER.
56. ALL ASBESTOS CONCRETE PIPE SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH PROJECT SPECIFICATION SECTION 02050.
57. ALL PIPE THAT IS TO BE ABANDONED IN PLACE SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATION SECTION 02550.
58. THE CONTRACTOR IS TO VERIFY DIMENSIONS AND ELEVATIONS PRIOR TO WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
59. THE CONTRACTOR IS TO VERIFY LOCATIONS OF ALL UTILITIES PRIOR TO STARTING WORK.
60. THE CONTRACTOR SHALL EXERCISE EXTREME CARE DURING EXCAVATION OF EXISTING STRUCTURES TO AVOID DAMAGE TO ADJACENT STRUCTURES AND EXISTING UTILITIES. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MEANS AND METHODS REQUIRED TO FACILITATE CONSTRUCTION OF WORK AND ENSURING SAFETY, STABILITY, AND INTEGRITY OF ADJACENT STRUCTURES AND FACILITIES.
61. THE ENGINEER SHALL BE NOTIFIED A MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION.
62. ANY WORK PERFORMED WITHOUT THE KNOWLEDGE AND APPROVAL BY THE ENGINEER AND/OR WORK NOT IN COMFORMANCE WITH THE PLANS AND SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
63. NO JOB WILL BE CONSIDERED COMPLETE UNTIL ALL CURBS, PAVEMENT, AND SIDEWALKS HAVE BEEN SWEPT CLEAN.
64. BACKFILL COMPACTION SHALL BE PER MAG 301, UNLESS OTHERWISE NOTED. SUBGRADE PREPARATION SHALL MEET THE LHC STANDARD SPECIFICATION SECTION 2600.
65. REMOVAL OF STRUCTURES AND OBSTRUCTIONS AS NECESSARY TO COMPLETE THE WORK, OTHER THAN SPECIFICALLY SCHEDULED IN THE BID ITEMS ARE TO BE INCIDENTAL TO THE CONTRACT.
66. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS OF TESTING AND QUALITY ASSURANCE / CONTROL AS DELINEATED IN THE CITY'S PROJECT SPECIFICATIONS. THE COST OF TESTING IS INCIDENTAL TO EACH ITEM OF WORK.
67. THE APPROVAL OF A PORTION OF THE WORK IN PROGRESS DOES NOT GUARANTEE IT'S FINAL ACCEPTANCE. TESTING AND EVALUATION MAY CONTINUE UNTIL WRITTEN FINAL ACCEPTANCE OF A COMPLETE AND WORKABLE UNIT.
68. LAKE HAVASU CITY MAY SUSPEND THE WORK BY WRITTEN NOTICE WHEN IN ITS JUDGEMENT PROGRESS IS UNSATISFACTORY, WORK BEING DONE IS UNAUTHORIEZED OR DEFECTIVE, WEATHER CONDITIONS ARE UNSUITABLE OR THERE IS A DANGER TO THE PUBLIC HEALTH OR SAFETY.
69. THE CONTRACTOR SHALL OBTAIN ANY ADDITIONAL TEMPORARY EASEMENTS OR USE AGREEMENTS THAT ARE DEEMED UNNECESSARY FOR CONSTRUCTION AT NO ADDITIONAL COST TO THE CITY. COPIES OF ALL CONTRACTORS OBTAINED EASEMENTS AND USE AGREEMENTS SHALL BE PROVIDED TO THE CITY'S REPRESENTATIVE PRIOR TO THE UTILIZATION OF THE SITE.
70. THE CONTRACTOR SHALL GRADE AND RESURFACE ALL AREAS DISTURBED BY CONSTRUCTION INCLUDING LANDSCAPE ROCK IN ACCORDANCE WITH THE SPECIFICATIONS AND TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITION.
71. THE CONTRACTOR SHALL PROTECT ALL CONCRETE STRUCTURES TO REMAIN. ALL CONCRETE PLACEMENT SHALL BE JOINT TO JOINT (WALLS, SIDEWALKS) AND SHALL BE REPLACED WITH 4000 PSI CONCRETE. ALL DAMAGED CONCRETE PANELS MUST BE REPLACED AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
72. THE CONTRACTOR SHALL PROVIDE PROTECTION TO PREVENT UNDERMINING OR DAMAGEING TO THE STRUCTURAL INTEGRITY OF ALL FENCES, RETAINING WALLS, STREET SIGNS, OTHER UTILITIES, OR OTHER PRIVATE OR PUBLIC IMPROVEMENTS WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OWNING UTILITY AS NECESSARY TO PROVIDE TEMPORARY IMPROVEMENTS WITHOUT UNDUE DISRUPTION. THE COST OF ALL SUCH PROTECTION, REMOVAL, AND REPLACEMENT REQUIRED TO COMPLETE THE PROJECT SHALL BE SUBSIDIARY TO OTHER BID ITEMS.
73. IT IS NOT THE INTENT OF THE SPECIFICATIONS TO SUPERSEDE ANY FEDERAL, STATE, OR LOCAL LAWS, REGULATIONS AND / OR ORDINANCES. THEY SHALL GOVERN IN ALL INSTANCES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SHOW GOOD FAITH EFFORT AND TO PROTECT ALL EXISTING UTILITIES AND STRUCTURES AND TO ABIDE BY ALL FEDERAL, STATE, LOCAL LAWS AND ORDINANCES IN THE RESPECT.
74. THE CONTRACTOR SHALL PROTECT ALL EXISTING IMPROVEMENTS ON PRIVATE PROPERTY. ALL ITEMS DAMAGED OR REMOVED SHALL BE RESTORED IN ACCORDANCE WITH THE SPECIFICATION TO A CONDITION EQUAL TO OR BETTER THAN THEIR CONDITION PRIOR TO THE START OF THE PROJECT.

LEGEND:

LINE / SYMBOL	DESCRIPTION
T	EXISTING TELEPHONE
S	EXISTING SANITARY SEWER
W	EXISTING WATER MAIN
G	EXISTING GAS MAIN
OH	EXISTING OVERHEAD UTILITY
FM	EXISTING FORCE MAIN
714	EXISTING CONTOURS
	EXISTING PIPE TO BE ABANDONED
R/W	RIGHT-OF-WAY
P/L	ADJACENT PROPERTY LINE
W	PROPOSED WATER MAIN
	PROPOSED POURED CONCRETE CEMENT
	PROPOSED AC PAVEMENT
BO	EXISTING BLOW OFF IN METER BOX
W	EXISTING WATER SERVICE METER BOX
MB	EXISTING DECORATIVE MAILBOX
	EXISTING WATER VALVE
	EXISTING FIRE HYDRANT
S	EXISTING MANHOLE (SANITARY)
	EXISTING CLEANOUT (SANITARY)
	PROPOSED WATER VALVE
	PROPOSED FIRE HYDRANT

FLOOD INFORMATION:

SAID DESCRIBED AREA ARE LOCATED WITHIN AN AREA HAVING A ZONE DESIGNATION "ZONE X" AS SHOWN ON FLOOD INSURANCE RATE MAP NO. 04015C6176G, WITH A DATE OF IDENTIFICATION OF NOVEMBER 18, 2009, WHICH IS THE CURRENT FLOOD INSURANCE RATE MAP FOR THE COMMUNITY IN WHICH SAID PROPERTY IS SITUATED.

ABBREVIATIONS:

A	ABANDONED
ACP	ASBESTOS CEMENT PIPE
AGGR	AGGREGATE
APVD	APPROVED
ARCH	ARCHITECTURAL
AUX	AUXILLARY
AVG	AVERAGE
@	AT
BLDG	BUILDING
BOP	BOTTOM OF PIPE
BVCE	BEGINNING OF VERTICAL CURB ELEVATION
BVCS	BEGINNING OF VERTICAL CURB STATION
B/C	BACK OF CURB
CONC	CONCRETE
CONN	CONNECTION
CR	CURB RETURN
CF	CUBIC FOOT, FEET
CY	CUBIC YARD
DDC	DOUBLE-DETECTOR-CHECK VALVE
DI	DUCTILE IRON
DIA	DIAMETER
DWG	DRAWING
EOP	EDGE OF PAVEMENT
EVC	END OF VERTICAL CURB
E	EAST
ESMT	EASEMENT
EXST	EXISTING
EXT	EXTERIOR
FF	FINISH FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FIG	FIGURE
FS	FINISH SURFACE
GV	GATE VALVE
GFI	GROUND FAULT INTERRUPTER
HDPE	HIGH DENSITY POLYETHYLENE PIPE
LT	LEFT
LF	LINEAR FEET
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
N	NORTH
NTS	NOT TO SCALE
OHP	OVERHEAD POWER
P	PRESSURIZED
PIV	POST INDICATOR VALVE
PRCE	POINT OF REVERSE CURVATURE ELEVATION
PRCS	POINT OF REVERSE CURVATURE STATION
PROP	PROPOSED
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
RT	RIGHT
R	RADIUS
RW / ROW	RIGHT OF WAY
S	SOUTH
SAN	SANITARY SEWER
SF	SQUARE FOOT, FEET
SY	SQUARE YARDS
STA	STATION
STD	STANDARD
TAN	TANGENT
TH#	TESTHOLE (NUMBER)
THRU	THROUGH
TOP	TOP-OF-PIPE
TOW	TOP-OF-WALL
TYP	TYPICAL
W	WEST

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NO.	DATE	DR	REVISION	CHK	APVD	BY	APVD
DSGN	S. PERROTTO	E. PERROTTO		R. EDWARDS		S. PERROTTO	

EXPIRES 12-31-2025

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CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY

LAKE HAVASU CITY
2330 MCCULLOCH BLVD N.
LAKE HAVASU CITY, AZ 86403
(928) 855-2116

Jacobs

BID SET

GENERAL NOTES
CIVIL

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	C-2
SHEET	2 of 26

STORAGE COMPLEX MULTIPLE OWNERS
PARCEL 115-39-001 – 115-39-189
(NOT A PART)

N72° 24' 55.94"E
613.411'

EXISTING KEYPAD TO BE PROTECTED IN PLACE

EXISTING FENCE TO BE PROTECTED IN PLACE

EXISTING FENCE & CURB TO BE PROTECTED IN PLACE

EXISTING FENCE TO BE PROTECTED IN PLACE

EXISTING CURB TO BE PROTECTED IN PLACE

N89° 35' 58.36"E
60.142'

EXISTING GATE TO BE PROTECTED IN PLACE

82 LF (1)

30 LF (1)

EXISTING ISLAND TO BE PROTECTED IN PLACE

EXISTING CURB TO BE PROTECTED IN PLACE

N0° 16' 40.24"E
203.471'

EXISTING GENERATOR
277/480V 3PH TO REMAIN

36 LF (1)

EXISTING ISLAND TO BE PROTECTED IN PLACE

LAKE HAVASU CITY
PARCEL 115-22-001B

6 LF (1)

EXISTING WALL TO REMAIN IN PLACE

EXISTING CURB TO BE PROTECTED IN PLACE

LAKE HAVASU CITY
PARCEL 115-28-008

AUTOMATIC TRANSFER EXISTING SWITCH
277/480V 3PH TO REMAIN

EXISTING ELECTRICAL SES
277/480V 3PH TO REMAIN

EXISTING MAIN PANEL
277/480V 3PH TO REMAIN

35 LF (1)

EXISTING CURB TO BE PROTECTED IN PLACE

EXISTING 3' WALL TO REMAIN IN PLACE

EXISTING LIGHT POLE TO BE PROTECTED IN PLACE

EXISTING LIGHT POLE TO BE PROTECTED IN PLACE

EXISTING LIGHT POLE TO BE PROTECTED IN PLACE

EXISTING CURB TO BE PROTECTED IN PLACE

EXISTING CURB TO BE PROTECTED IN PLACE

640.320'
S89° 32' 29.57"W

28 LF (1)

EXISTING PUBLIC WORKS
PARCEL 115-07-045

(INTERNET ACCESS PROPOSED FROM
EXISTING PUBLIC WORKS FACILITY)

DEMOLITION KEY NOTES:

1. SAWCUT AC PAVEMENT. LF PER PLAN.
2. REMOVE 6-INCH CURBING AND ISLAND.
3. REMOVE LIGHT POLE. COORDINATE WITH UNI-SOURCE ELECTRIC BEFORE REMOVING.
4. SAWCUT AND REMOVE CURB.
5. REMOVE AC PAVEMENT WITHIN HATCHED AREA.
6. ITEM TO REMAIN IN PLACE.

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N

0 20 40 60
1"=20'-0"

Brett Stewart Perrotto
51510
SEAN D. PERROTTO
Date Signed
REGISTERED PROFESSIONAL ENGINEER (CIVIL)
EXPIRES 12-31-2025

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		S. PERROTTO	E. PERROTTO	R. EDWARDS	APVD	S. PERROTTO	

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DATE	OCTOBER 2023
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DWG	C-3
SHEET	3 of 26

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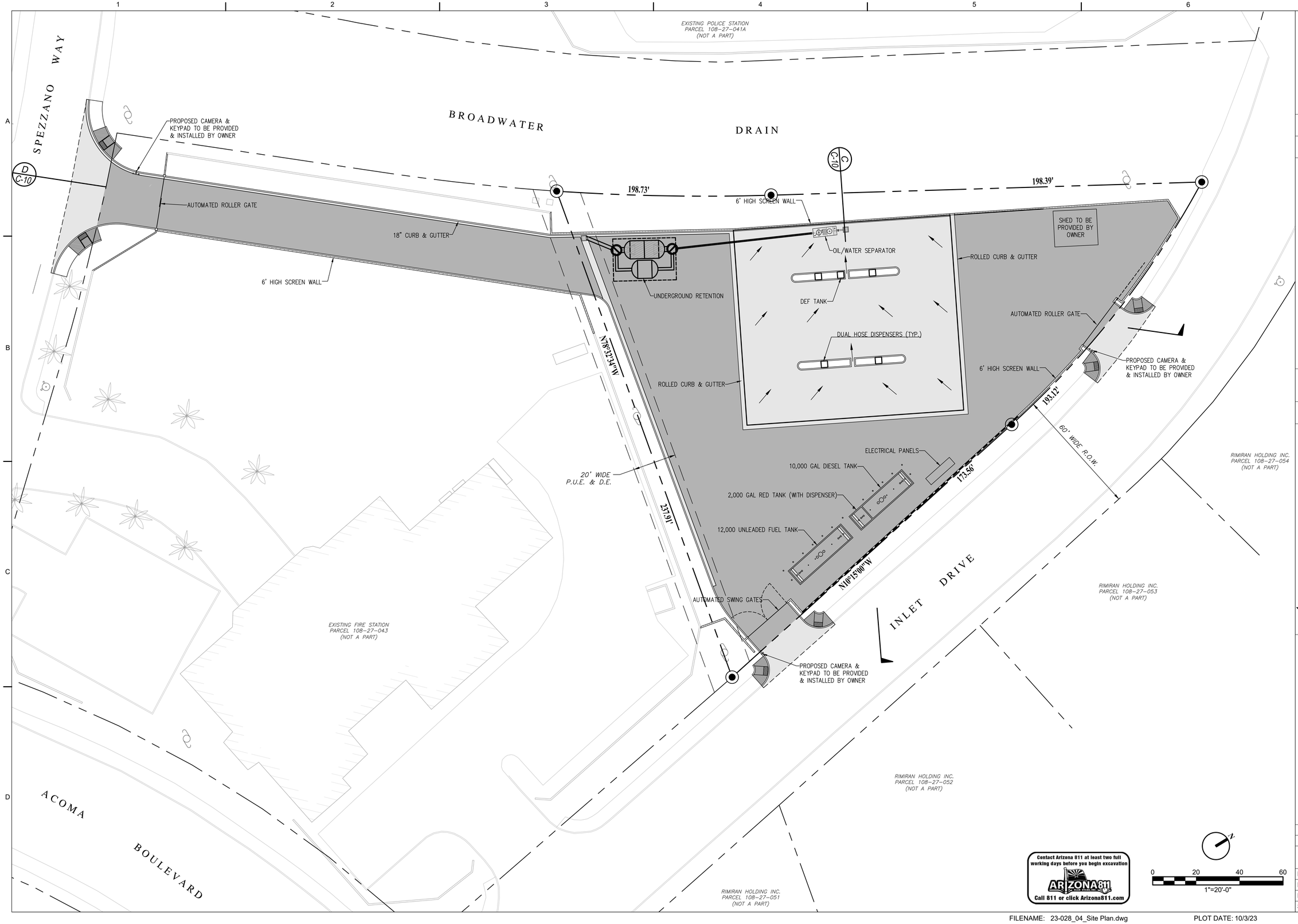
PLOT TIME: 2:14 PM



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0 20 40 60
1"=20'-0"

FILENAME: 23-028_04_Site Plan.dwg PLOT DATE: 10/3/23 PLOT TIME: 10:57 AM

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NO.	DATE	REVISION	BY	APVD
DSGN	S. PERROTTO	DR E. PERROTTO CHK R. EDWARDS	APVD	S. PERROTTO

REGISTERED PROFESSIONAL ENGINEER (CIVIL) 51510 SEAN D. PERROTTO Date Signed 12-31-25 ARIZONA U.S.A.
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CIVIL

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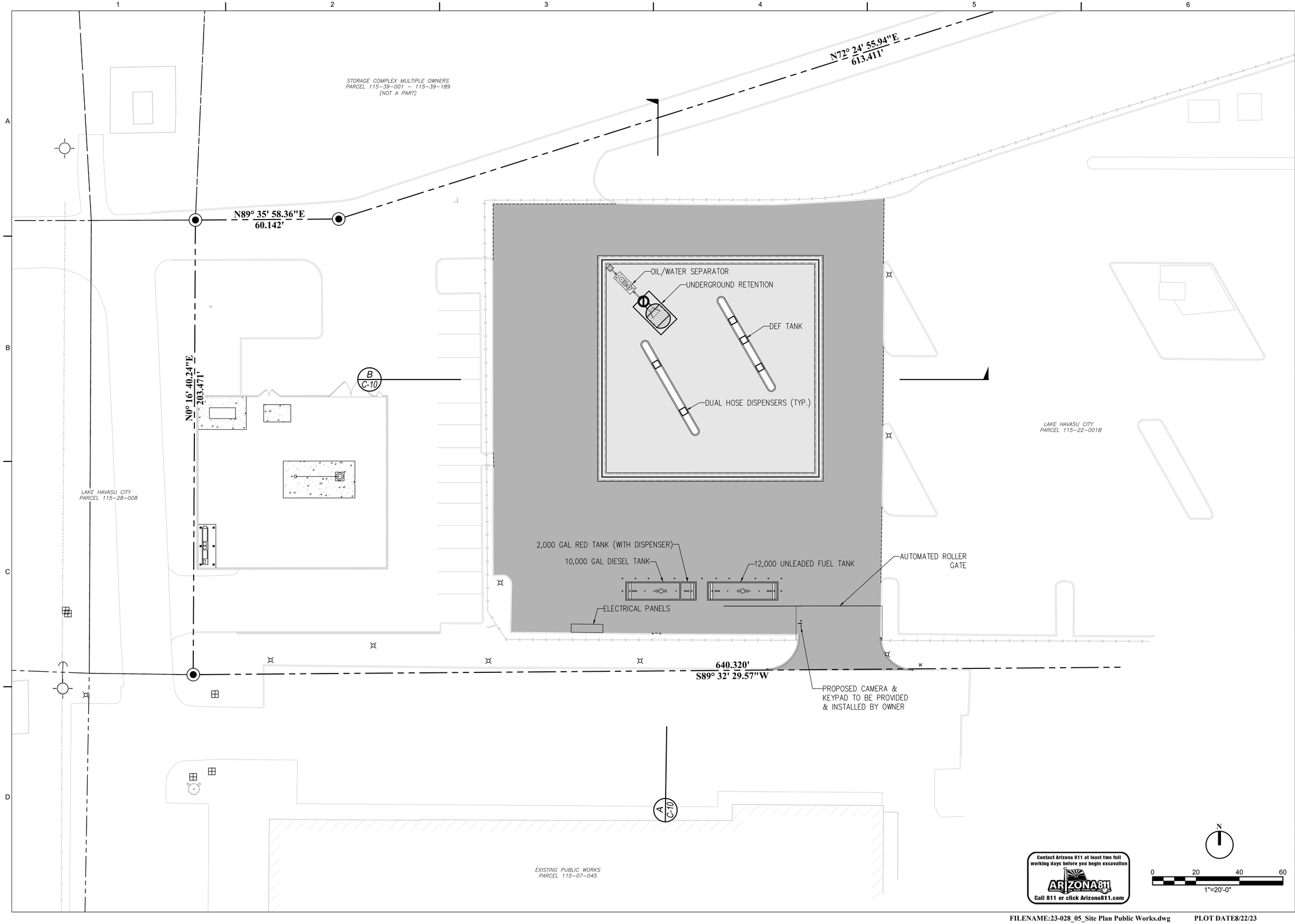
DATE	OCTOBER 2023
PROJ	
DWG	C-4
SHEET	4 of 26



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FILENAME:23-028_05_Site Plan Public Works.dwg PLOT DATE8/22/23 PLOT TIME2:17 PM

Registered Professional Engineer (Civil)
SEAN D. PERROTTO
Date Signed 12-31-2023
EXPIRES 12-31-2025

NO.	DATE	REVISION	BY
DSGN	S. PERROTTO	DR E. PERROTTO CHK R. EDWARDS	APVD S. PERROTTO

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SITE PLAN
CIVIL

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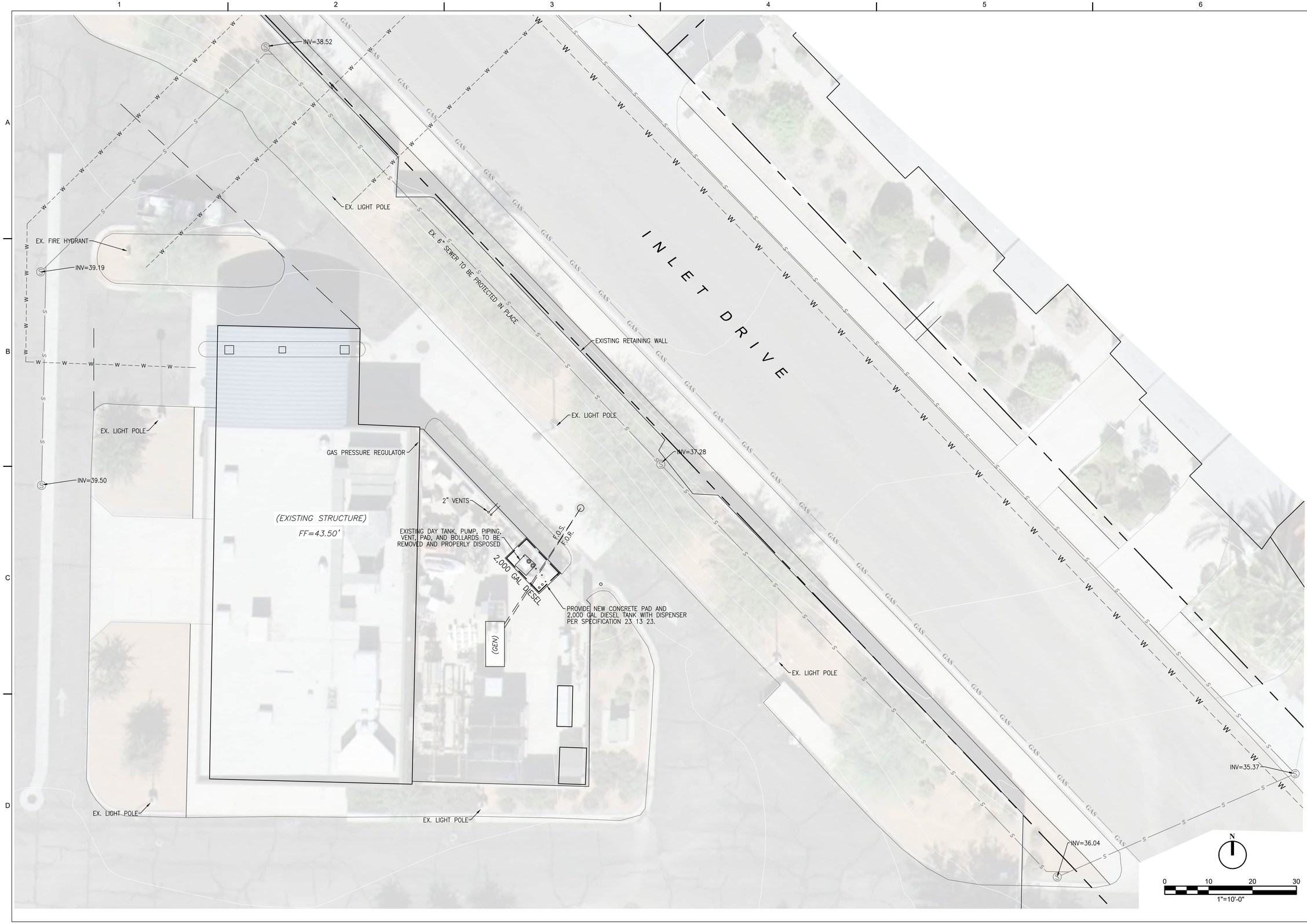
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	C-5
SHEET	5 of 26



1 2 3 4 5 6

A B C D

Brett Stetson Perrotto (Civil) 51510 SEAN D. PERROTTO Date Signed 12-31-2025 Arizona U.S.A.

EXPIRES 12-31-2025

NO.	DATE	REVISION	BY	APVD
DSGN	S. PERROTTO	DR E. PERROTTO CHK R. EDWARDS	APVD	S. PERROTTO

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POLICE DEPARTMENT GENERATOR SITE PLAN CIVIL

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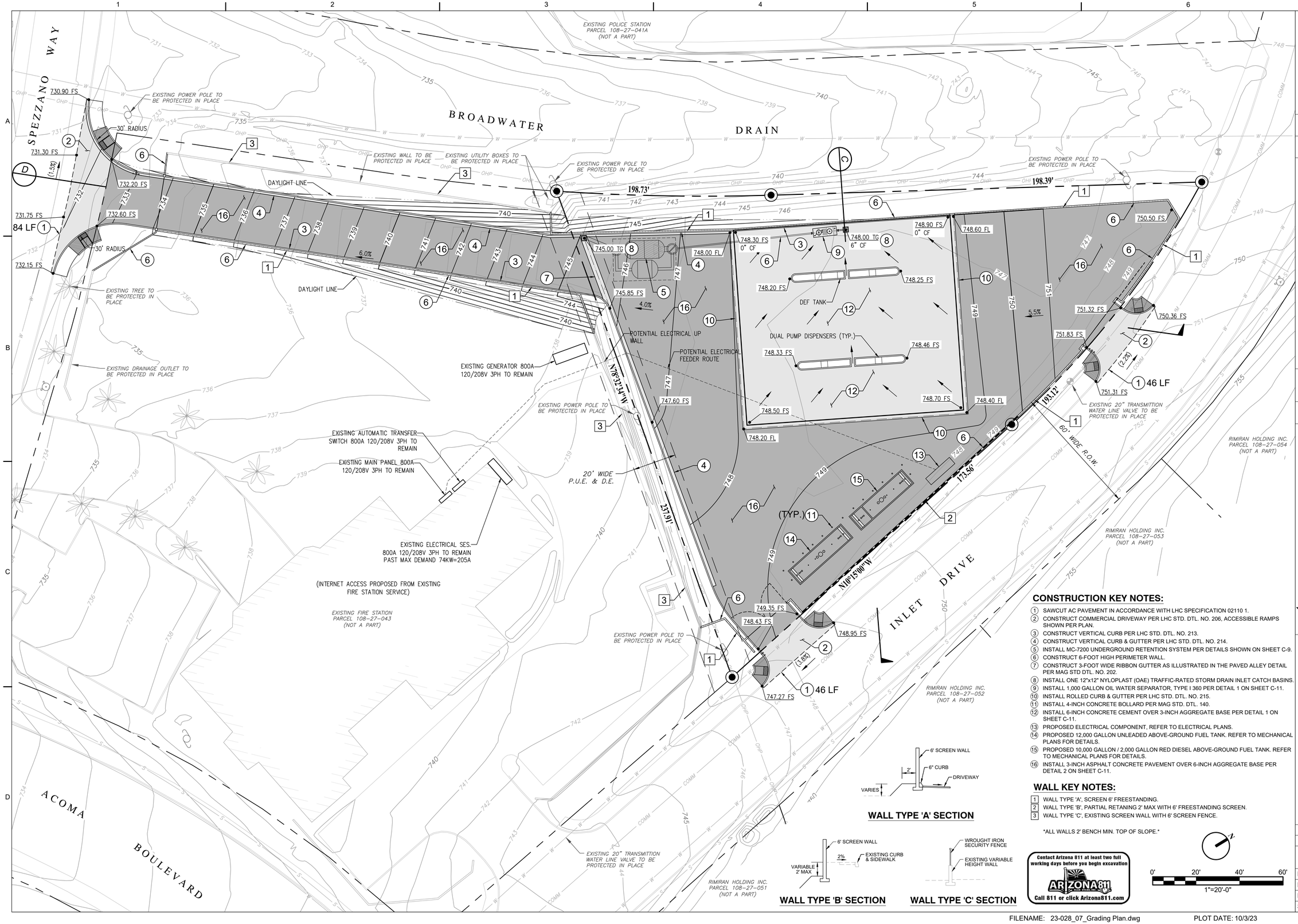
DATE	OCTOBER 2023
PROJ	
DWG	C-6
SHEET	6 of 26



CONSTRUCTION KEY NOTES:

1. SAWCUT AC PAVEMENT IN ACCORDANCE WITH LHC SPECIFICATION 02110 1.
2. CONSTRUCT COMMERCIAL DRIVEWAY PER LHC STD. DTL. NO. 206, ACCESSIBLE RAMPS SHOWN PER PLAN.
3. CONSTRUCT VERTICAL CURB PER LHC STD. DTL. NO. 213.
4. CONSTRUCT VERTICAL CURB & GUTTER PER LHC STD. DTL. NO. 214.
5. INSTALL MC-7200 UNDERGROUND RETENTION SYSTEM PER DETAILS SHOWN ON SHEET C-9.
6. CONSTRUCT 6-FOOT HIGH PERIMETER WALL.
7. CONSTRUCT 3-FOOT WIDE RIBBON GUTTER AS ILLUSTRATED IN THE PAVED ALLEY DETAIL PER MAG STD DTL. NO. 202.
8. INSTALL ONE 12"x12" NYLOPLAST (OAE) TRAFFIC-RATED STORM DRAIN INLET CATCH BASINS.
9. INSTALL 1,000 GALLON OIL WATER SEPARATOR, TYPE I 360 PER DETAIL 1 ON SHEET C-11.
10. INSTALL ROLLED CURB & GUTTER PER LHC STD. DTL. NO. 215.
11. INSTALL 4-INCH CONCRETE BOLLARD PER MAG STD. DTL. 140.
12. INSTALL 6-INCH CONCRETE CEMENT OVER 3-INCH AGGREGATE BASE PER DETAIL 1 ON SHEET C-11.
13. PROPOSED ELECTRICAL COMPONENT, REFER TO ELECTRICAL PLANS.
14. PROPOSED 12,000 GALLON UNLEADED ABOVE-GROUND FUEL TANK. REFER TO MECHANICAL PLANS FOR DETAILS.
15. PROPOSED 10,000 GALLON / 2,000 GALLON RED DIESEL ABOVE-GROUND FUEL TANK. REFER TO MECHANICAL PLANS FOR DETAILS.
16. INSTALL 3-INCH ASPHALT CONCRETE PAVEMENT OVER 6-INCH AGGREGATE BASE PER DETAIL 2 ON SHEET C-11.

WALL KEY NOTES:

1. WALL TYPE 'A', SCREEN 6' FREESTANDING.
2. WALL TYPE 'B', PARTIAL RETANING 2' MAX WITH 6' FREESTANDING SCREEN.
3. WALL TYPE 'C', EXISTING SCREEN WALL WITH 6' SCREEN FENCE.

ALL WALLS 2' BENCH MIN. TOP OF SLOPE.

WALL TYPE 'A' SECTION

WALL TYPE 'B' SECTION

WALL TYPE 'C' SECTION

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N

0' 20' 40' 60'
1"=20'-0"

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NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
	S. PERROTTO	S. PERROTTO	E. PERROTTO	R. EDWARDS	S. PERROTTO	APVD	

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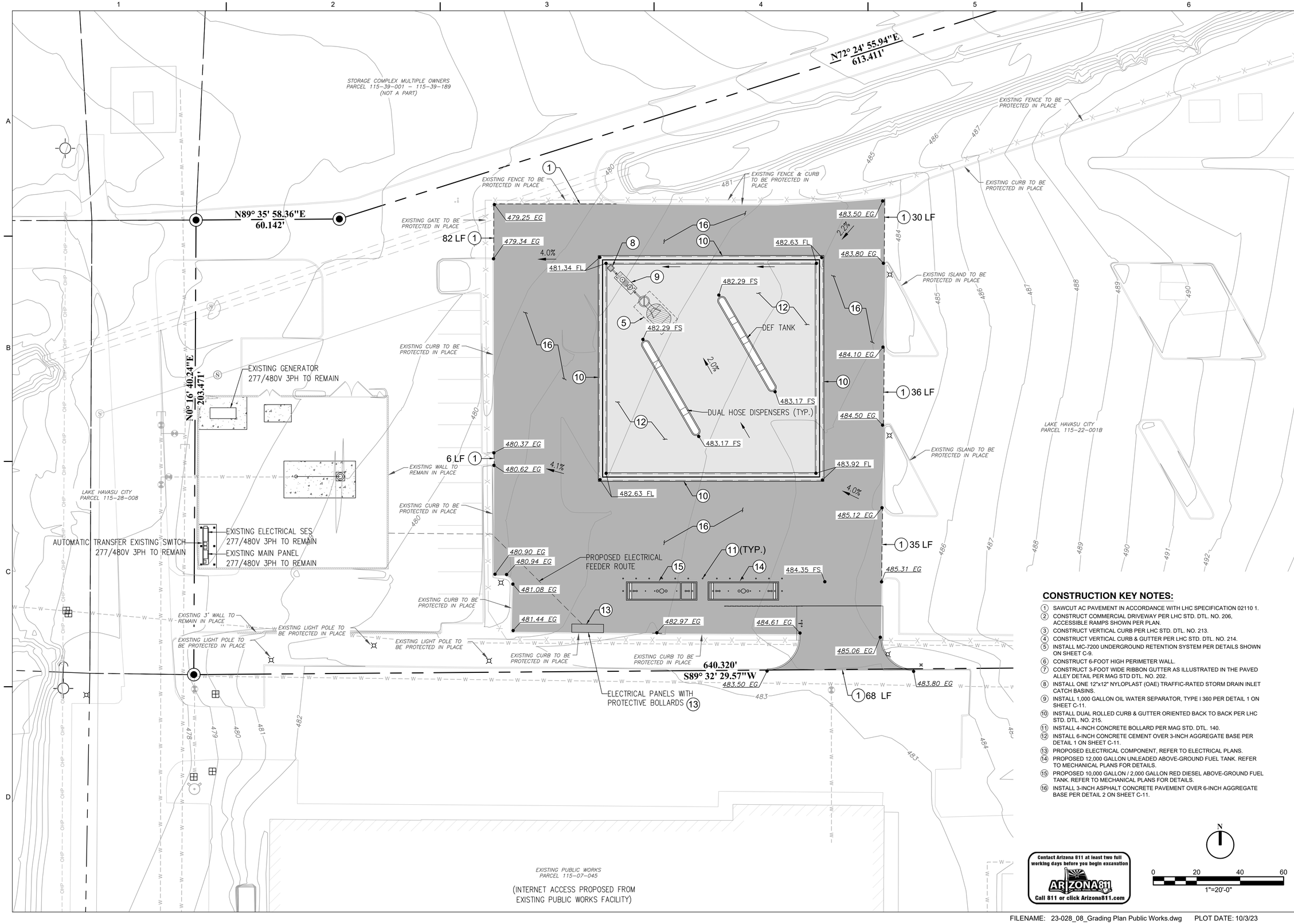
DWG	C-7
SHEET	7 of 26

FILENAME: 23-028_07_Grading Plan.dwg PLOT DATE: 10/3/23 PLOT TIME: 10:56 AM



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4. CONSTRUCT VERTICAL CURB & GUTTER PER LHC STD. DTL. NO. 214.
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9. INSTALL 1,000 GALLON OIL WATER SEPARATOR, TYPE I 360 PER DETAIL 1 ON SHEET C-11.
10. INSTALL DUAL ROLLED CURB & GUTTER ORIENTED BACK TO BACK PER LHC STD. DTL. NO. 215.
11. INSTALL 4-INCH CONCRETE BOLLARD PER MAG STD. DTL. 140.
12. INSTALL 6-INCH CONCRETE CEMENT OVER 3-INCH AGGREGATE BASE PER DETAIL 1 ON SHEET C-11.
13. PROPOSED ELECTRICAL COMPONENT, REFER TO ELECTRICAL PLANS.
14. PROPOSED 12,000 GALLON UNLEADED ABOVE-GROUND FUEL TANK. REFER TO MECHANICAL PLANS FOR DETAILS.
15. PROPOSED 10,000 GALLON / 2,000 GALLON RED DIESEL ABOVE-GROUND FUEL TANK. REFER TO MECHANICAL PLANS FOR DETAILS.
16. INSTALL 3-INCH ASPHALT CONCRETE PAVEMENT OVER 6-INCH AGGREGATE BASE PER DETAIL 2 ON SHEET C-11.

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0 20 40 60
1"=20'-0"

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		S. PERROTTO	E. PERROTTO	R. EDWARDS	APVD	S. PERROTTO	

Registered Professional Engineer (Civil)
STEVEN D. PERROTTO
Date Signed 12-31-25
ARIZONA U.S.A.
EXPIRES 12-31-2025

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DATE	OCTOBER 2023
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DWG	C-8
SHEET	8 of 26

MC-7200 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-7200.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3”.
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-7200 CHAMBER SYSTEM

1. STORMTECH MC-7200 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE SHALL BE BROUGHT UP EVENLY AROUND CHAMBERS SO AS NOT TO DISTORT THE CHAMBER SHAPE. STONE DEPTHS SHOULD NEVER DIFFER BY MORE THAN 12" (300 mm) BETWEEN ADJACENT CHAMBER ROWS.
10. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
11. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIAL BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
12. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-7200 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-7200 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-7200 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

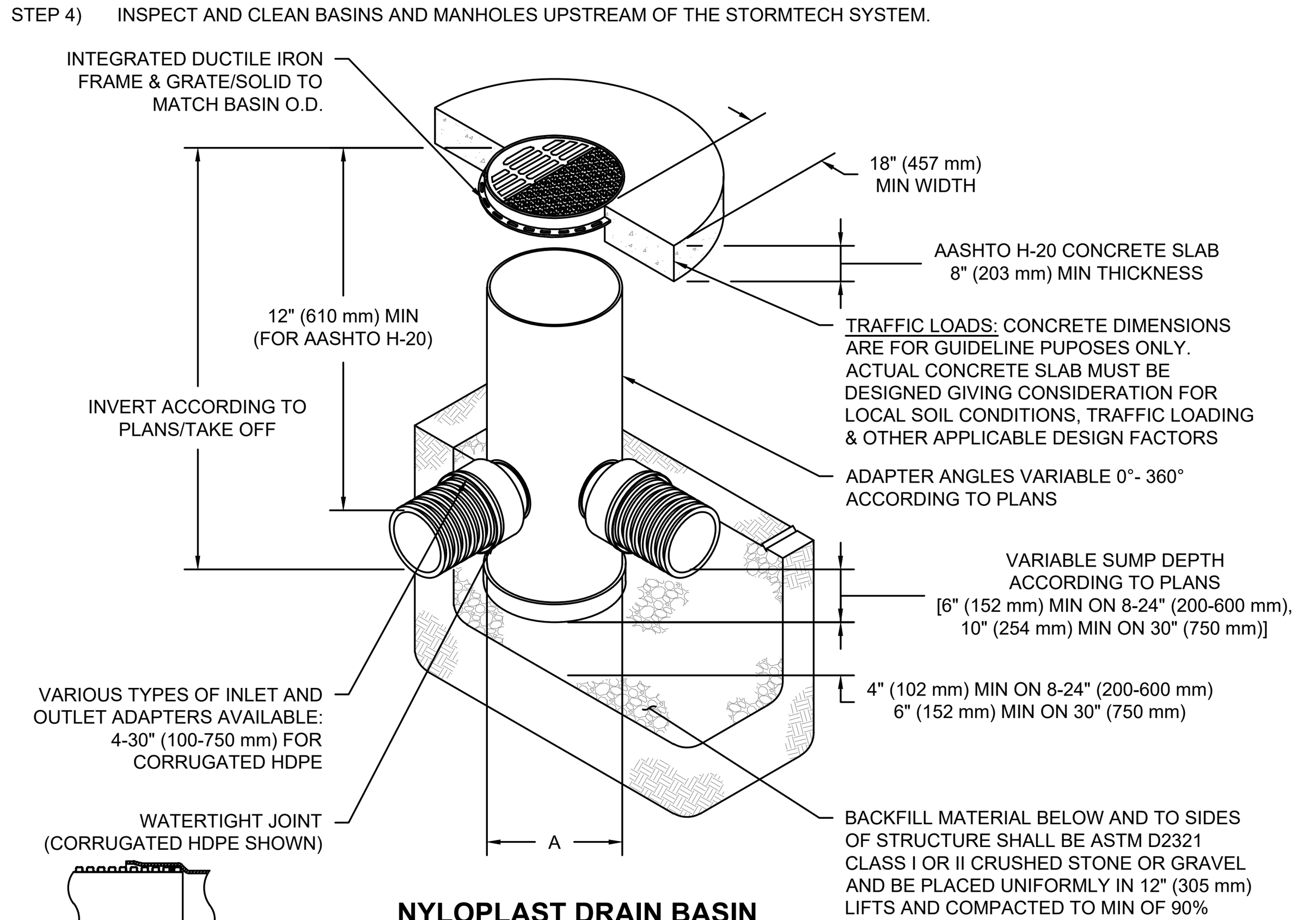
INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

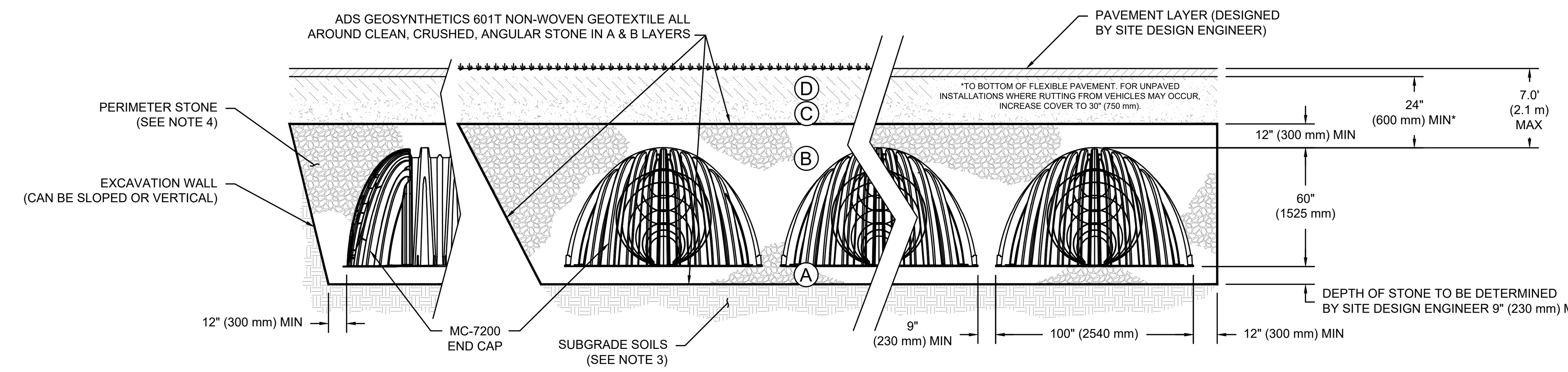


NYLOPLAST DRAIN BASIN
NTS

ACCEPTABLE FILL MATERIALS: STORMTECH MC-7200 CHAMBER SYSTEMS

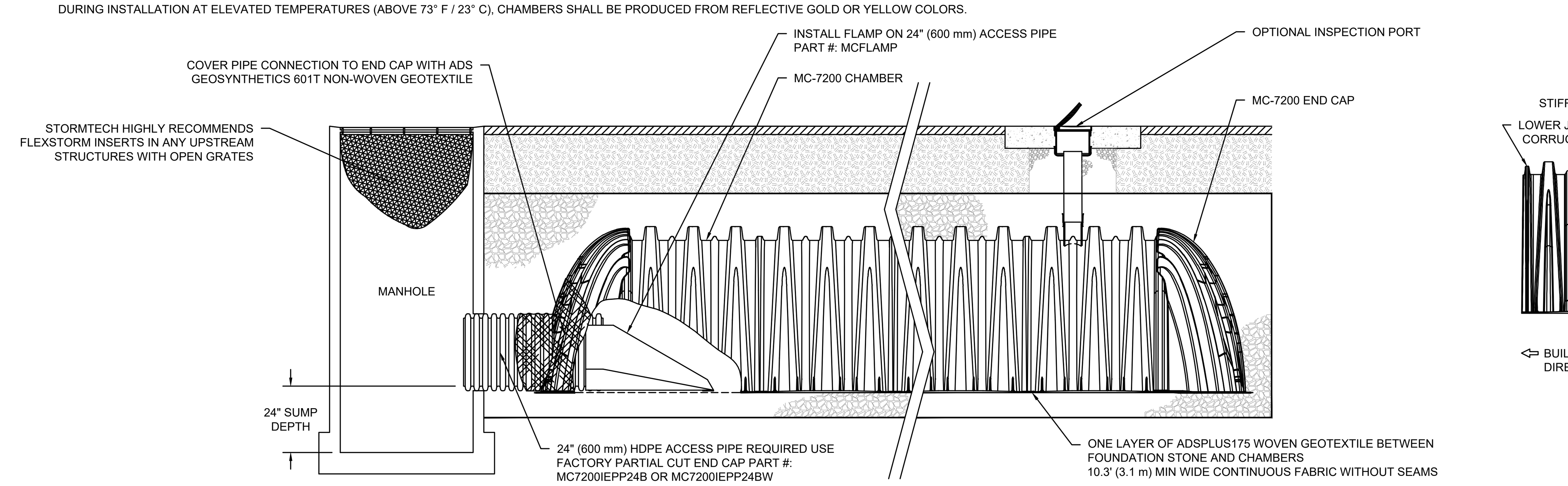
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

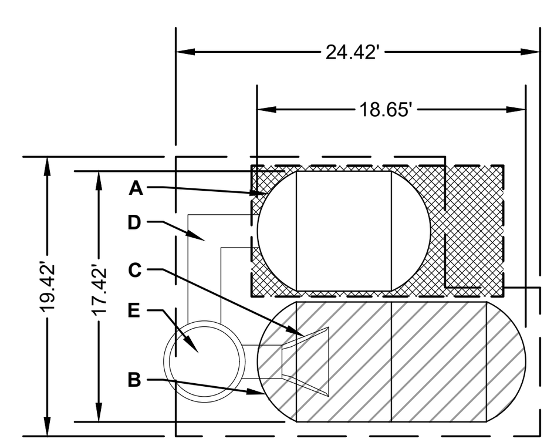
1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-7200 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 450 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.



MC-7200 ISOLATOR ROW PLUS DETAIL
NTS

PUBLIC SAFETY UNDERGROUND RETENTION SYSTEM			
PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS	
3	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.75
4	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.25
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	7.75
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	7.75
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	7.75
1530	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	6.75
		TOP OF MC-7200 CHAMBER:	5.75
		12" x 12" BOTTOM MANIFOLD INVERT:	3.72
		24" ISOLATOR ROW PLUS INVERT:	0.94
414	SYSTEM AREA (SF)	BOTTOM OF MC-7200 CHAMBER:	0.75
87.7	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00

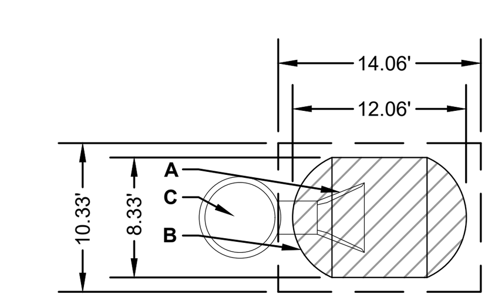
PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	12" TOP PARTIAL CUT END CAP, PART # MC7200IEPP12T / TYP OF ALL 12" TOP CONNECTIONS	35.69"	
PREFABRICATED END CAP	B	24" BOTTOM PARTIAL CUT END CAP, PART # MC7200IEPP24B /TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
FLAMP	C	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
MANIFOLD	D	12" x 12" BOTTOM MANIFOLD, ADS N-12	35.69"	
CONCRETE STRUCTURE W/WEIR	E	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		2.5 CFS IN



PUBLIC SAFETY UNDERGROUND RETENTION SYSTEM
NTS

PUBLIC WORKS UNDERGROUND RETENTION SYSTEM			
PROPOSED LAYOUT		CONCEPTUAL ELEVATIONS	
1	STORMTECH MC-7200 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	12.75
2	STORMTECH MC-7200 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	8.25
12	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	7.75
9	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	7.75
40	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	7.75
545	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	6.75
		TOP OF MC-7200 CHAMBER:	5.75
		12" x 12" BOTTOM MANIFOLD INVERT:	3.72
		24" ISOLATOR ROW PLUS INVERT:	0.94
145	SYSTEM AREA (SF)	BOTTOM OF MC-7200 CHAMBER:	0.75
48.8	SYSTEM PERIMETER (ft)	BOTTOM OF STONE:	0.00

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED END CAP	A	24" BOTTOM PARTIAL CUT END CAP, PART # MC7200IEPP24B /TYP OF ALL 24" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	2.26"	
FLAMP	B	INSTALL FLAMP ON 24" ACCESS PIPE / PART#: MCFLAMP		
CONCRETE STRUCTURE	C	(DESIGN BY ENGINEER / PROVIDED BY OTHERS)		



PUBLIC WORKS UNDERGROUND RETENTION SYSTEM
NTS

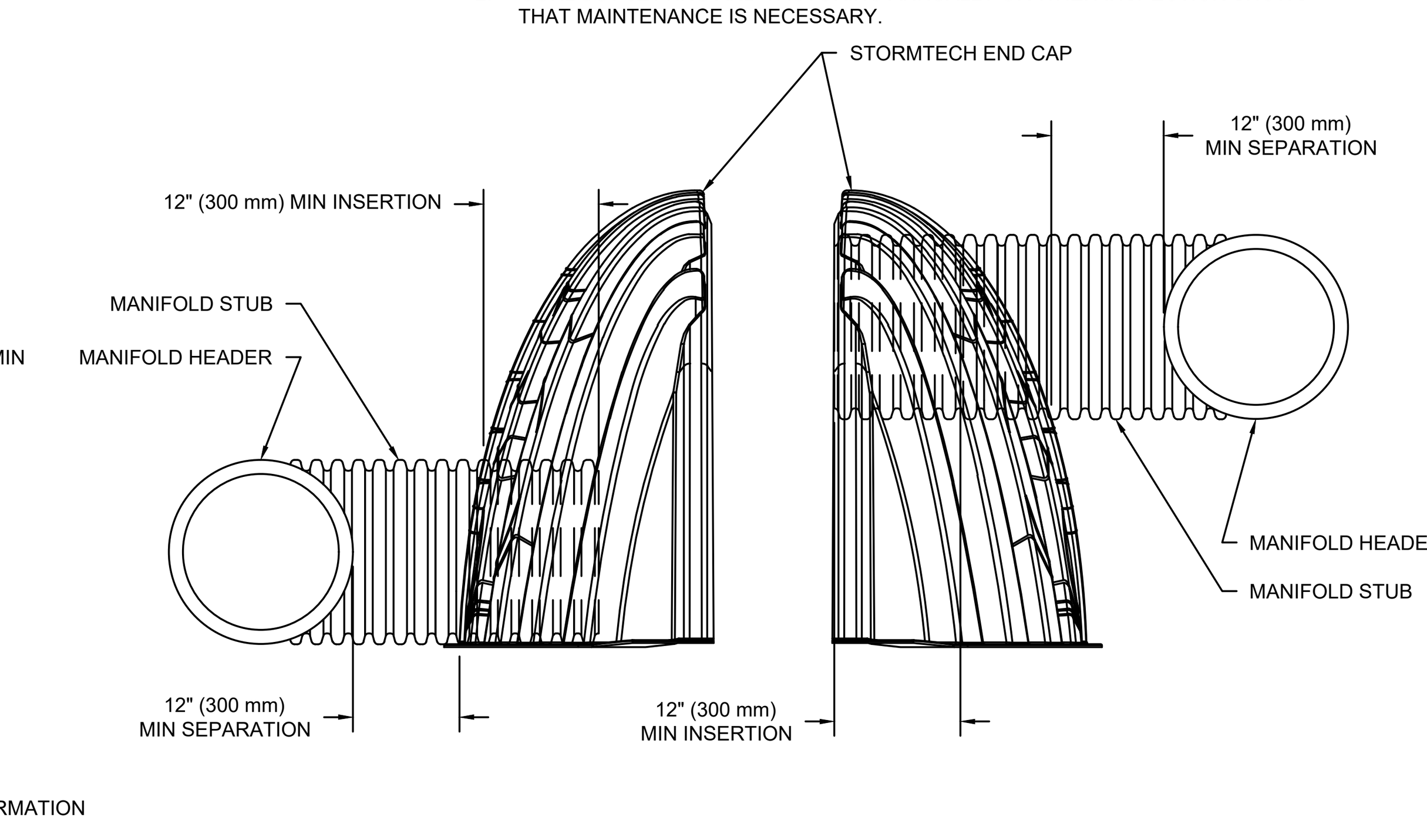
NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

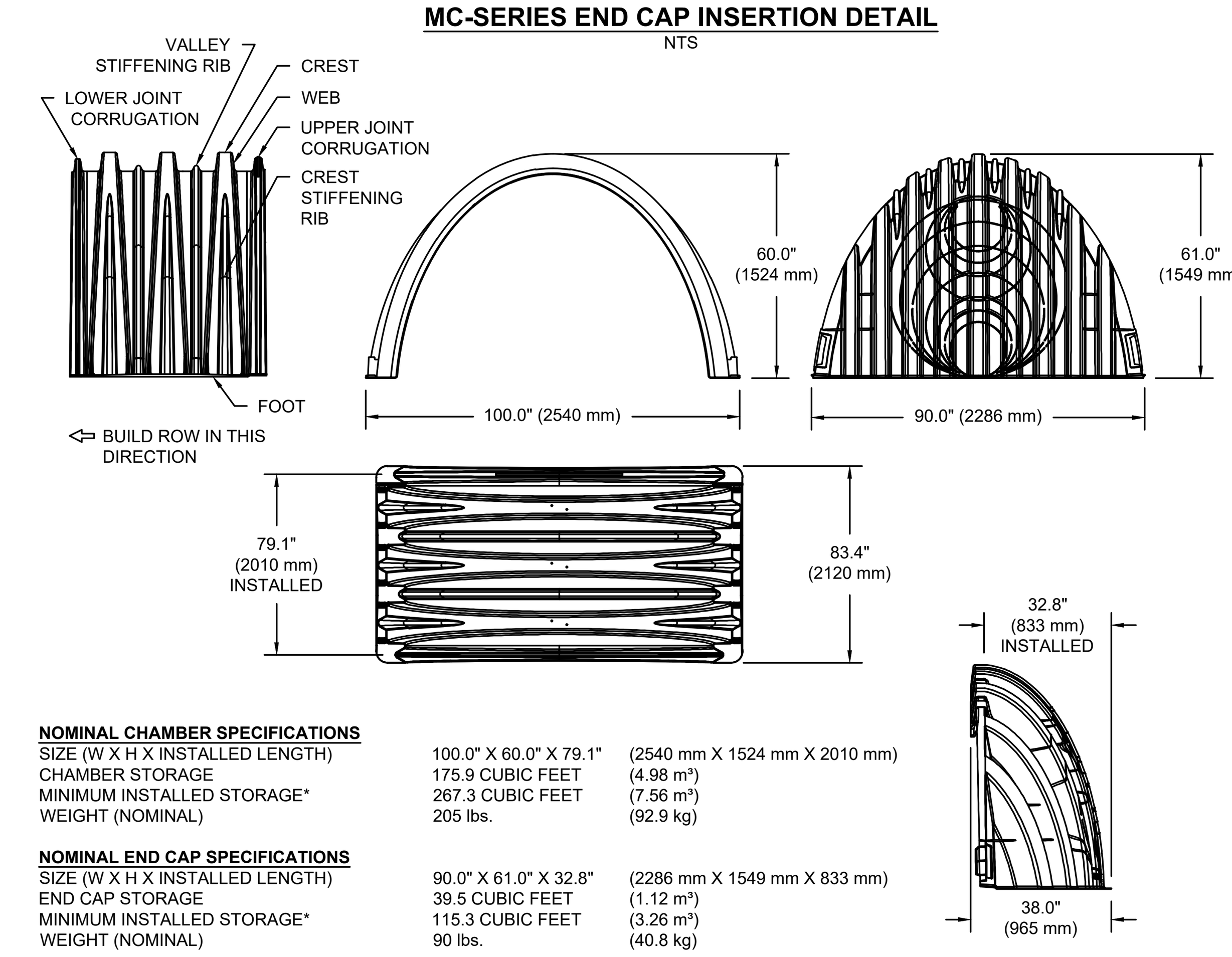
NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-SERIES END CAP INSERTION DETAIL
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	100.0" X 60.0" X 79.1"	(2540 mm X 1524 mm X 2010 mm)
CHAMBER STORAGE	175.9 CUBIC FEET	(4.98 m³)
MINIMUM INSTALLED STORAGE*	267.3 CUBIC FEET	(7.56 m³)
WEIGHT (NOMINAL)	205 lbs.	(92.9 kg)

NOMINAL END CAP SPECIFICATIONS

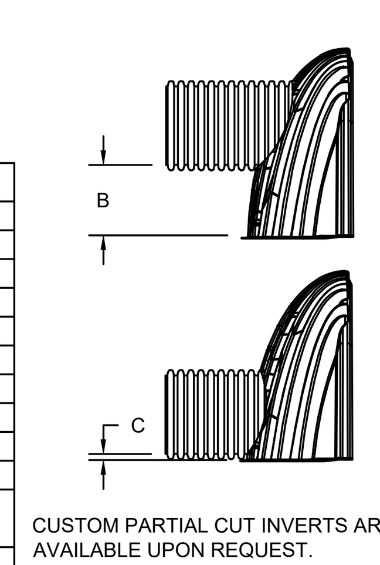
SIZE (W X H X INSTALLED LENGTH)	90.0" X 61.0" X 32.8"	(2286 mm X 1549 mm X 833 mm)
END CAP STORAGE	39.5 CUBIC FEET	(1.12 m³)
MINIMUM INSTALLED STORAGE*	115.3 CUBIC FEET	(3.26 m³)
WEIGHT (NOMINAL)	90 lbs.	(40.8 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS, 12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"

PART #	STUB	B	C
MC7200IEPP06T	6" (150 mm)	42.54" (1081 mm)	---
MC7200IEPP06B		---	0.86" (22 mm)
MC7200IEPP08T	8" (200 mm)	40.50" (1029 mm)	---
MC7200IEPP08B		---	1.01" (26 mm)
MC7200IEPP10T	10" (250 mm)	38.37" (975 mm)	---
MC7200IEPP10B		---	1.33" (34 mm)
MC7200IEPP12T	12" (300 mm)	35.69" (907 mm)	---
MC7200IEPP12B		---	1.55" (39 mm)
MC7200IEPP15T	15" (375 mm)	32.72" (831 mm)	---
MC7200IEPP15B		---	1.70" (43 mm)
MC7200IEPP18T	18" (450 mm)	29.36" (746 mm)	---
MC7200IEPP18TW			
MC7200IEPP18B		---	1.97" (50 mm)
MC7200IEPP18BW			
MC7200IEPP24T	24" (600 mm)	23.05" (585 mm)	---
MC7200IEPP24TW			
MC7200IEPP24B		---	2.26" (57 mm)
MC7200IEPP24BW			
MC7200IEPP30BW	30" (750 mm)	---	2.95" (75 mm)
MC7200IEPP36BW	36" (900 mm)	---	3.25" (83 mm)
MC7200IEPP42BW	42" (1050 mm)	---	3.55" (90 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-4500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN							
S. PERROTTO			E. PERROTTO	R. EDWARDS		S. PERROTTO	

TRICO ENGINEERING, LLC
231 SWANSON AVENUE, STE. 204
LAKE HAVASU CITY, AZ 86403
PHONE: 928-230-4969
WWW.TRICOENGINEERINGLLC.COM

CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY
LAKE HAVASU CITY
2330 MCCULLOCH BLVD N.
LAKE HAVASU CITY, AZ 86403
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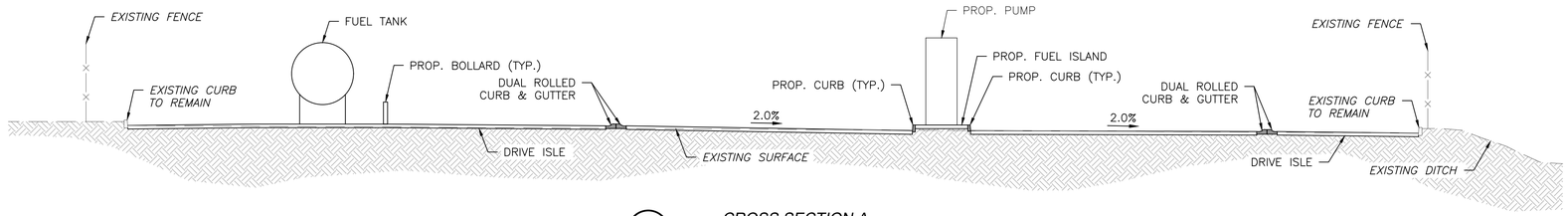
BID SET
PUBLIC FUEL STATIONS ADS STORMTECH SYSTEM DETAILS
CIVIL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

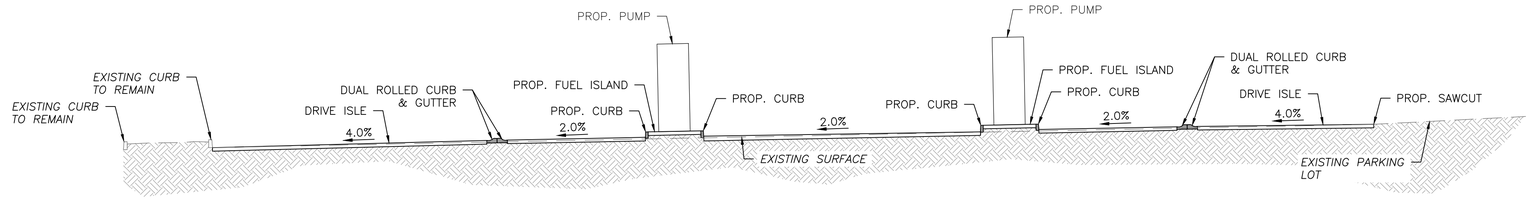
DATE	OCTOBER 2023
PROJ	
DWG	C-9
SHEET	9 of 26

Registered Professional Engineer (Civil) 51810 SEAN D. PERROTTO ARIZONA, U.S.A. EXPIRES 12-31-2025



A CROSS SECTION A

NOT TO SCALE



B CROSS SECTION B

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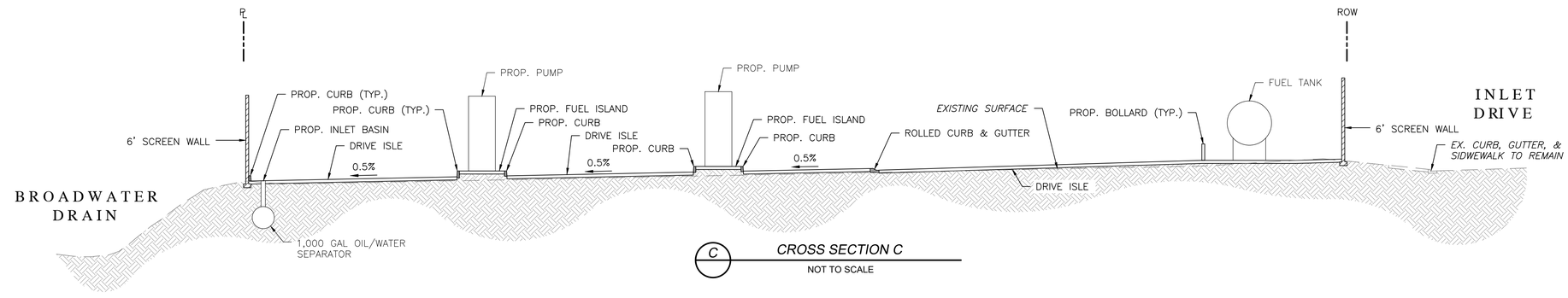

C CROSS SECTION C

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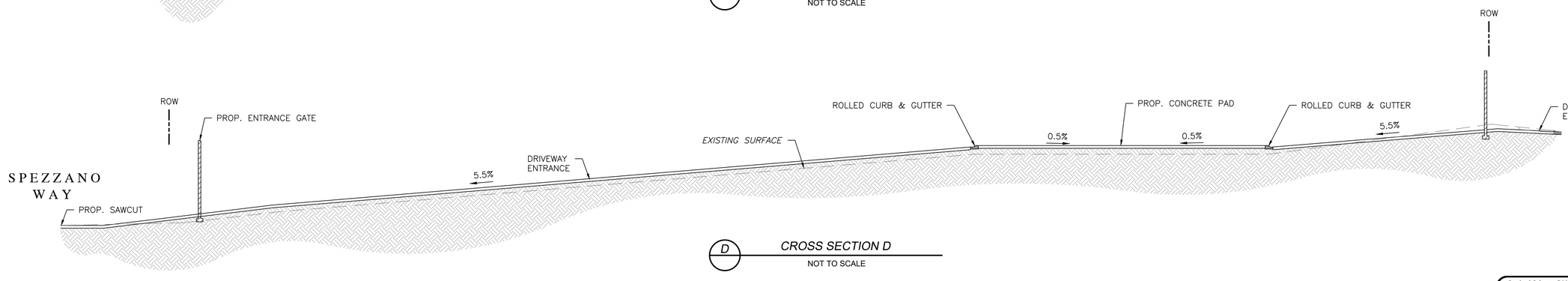

D CROSS SECTION D

NOT TO SCALE

Contact Arizona 811 at least two full working days before you begin excavation

ARIZONA811 BLUE STAKE, INC.

Call 811 or click Arizona811.com

TRICO ENGINEERING, LLC
231 SWANSON AVENUE, STE. 204
LAKE HAVASU CITY, AZ 86403
PHONE: 928-230-4969
WWW.TRICOENGINEERINGLLC.COM

CITY FUELING FACILITIES IMPROVEMENTS
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PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY

239 MCCULLOCH BLVD N.
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NO.	DATE	DR	REVISION	CHK	BY	APVD
DSGN	S. PERROTTO	E. PERROTTO	R. EDWARDS	APVD	S. PERROTTO	

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BID SET

CROSS SECTIONS
CIVIL

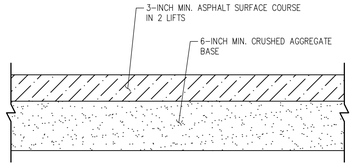
VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

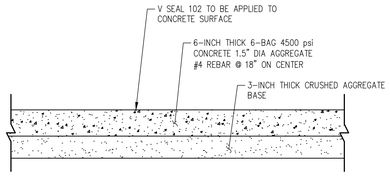
DATE	OCTOBER 2023
PROJ	
DWG	C-10
SHEET	10 of 26

EXPIRES 12-31-2025

FILENAME: 23-028_10_Cross Sections.dwg PLOT DATE: 10/3/23 PLOT TIME: 10:31 AM



1 / C-11 A.C. PAVEMENT DRIVEWAY SECTION
NOT TO SCALE



2 / C-11 CONCRETE DRIVEWAY SECTION
NOT TO SCALE

GENERAL SPECIFICATIONS

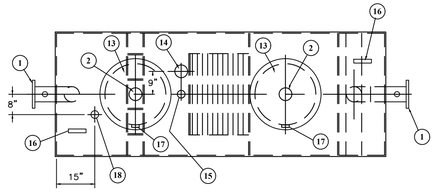
NO. REQ'D: (1)
CAPACITY: 1000 GALLONS
TYPE: HTC, HIGHGUARD, DW TYPE I 360
MATERIAL: MILD CARBON STEEL
FLOW RATE: 100 GPM
GAUGE: BASED ON 60" MAX BURIAL

	INNER	OUTER
SHELL–	7 GA.	10 GA.
HEADS–	7 GA.	10 GA.

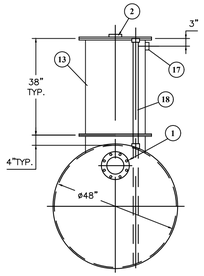
SURFACE PREP:
SSPC NO.6 BLAST ALL EXTERIOR SURFACES
SSPC NO.10 BLAST ALL INTERIOR SURFACES

COATING:	MATERIAL	THICKNESS
EXTERIOR–	HIGHGUARD	(75 MILS)
INTERIOR–	CHEMLINE 4200 PW	(15 MILS)

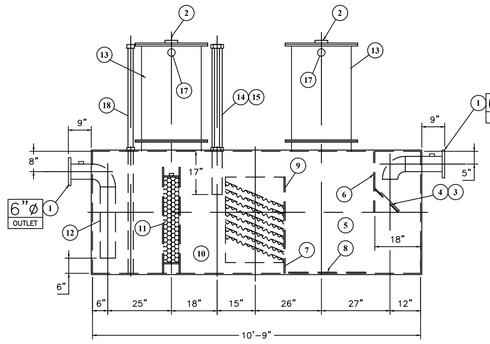
CONSTRUCTION :
LAP FIT & WELD ALL EXTERIOR SEAMS
OPERATING PRESSURE : ATMOSPHERIC



PLAN



END VIEW



ELEVATION

PROVIDED EQUIPMENT

1. 150# R.F.S.O. FLANGE W/ 2" FNPT FOR VENT
2. 4"ø FNPT FOR GAUGE WITH PLUG
3. VELOCITY HEAD DIFFUSION BAFFLE
4. WEAR PLATE
5. SEDIMENT CHAMBER
6. UNDERFLOW BAFFLE (REMOVABLE)
7. SLUDGE BAFFLE
8. STRIKER PLATES
9. PARALLEL CORRUGATED PLATE COALESCER. CORELLA PVC PLATES (3" PLATE SPACING)
10. OIL/WATER SEPARATOR CHAMBER
11. 6" THICK PETROSCREEN COALESCER MATERIAL INSTALLED W/ PULL ROD SHIPPED LOOSE
12. STEEL OUTLET DOWNCOMER
13. 24"ø MANWAY WITH BOLT–ON EXTENSION SHIPPED LOOSE
14. 4"ø FNPT FOR OIL PUMP–OUT WITH INTERNAL PVC PIPE INSTALLED & RISER PIPE SHIPPED LOOSE
15. 2"ø FNPT FOR LEVEL SENSOR WITH RISER PIPE SHIPPED LOOSE
16. LIFTING LUG
17. 2"ø FNPT FOR VENT
18. 2"ø FNPT FOR LEAK SENSOR WITH RISER PIPE SHIPPED LOOSE

ANCILLARY PROVIDED EQUIPMENT

(4) 24" FIBREFLEX MANWAY GASKETS
(4) SETS OF NUTS/BOLTS/WASHERS FOR 24" MANWAY

NOTES

1. POLYURETHANE HIGHGUARD TANK IS NOT APPROVED FOR THE STORAGE OF HEATED PRODUCTS
2. ALL VENT PIPING BY INSTALLER
3. 15000 VOLT SPARK TEST PROVIDED AT FACTORY

REVISIONS

Highland Tank
U.S. Patent #4,722,800 Canadian Patent # 1,296,263

1000 GALLON OIL WATER SEPARATOR
HTC, HIGHGUARD, DW TYPE I 360

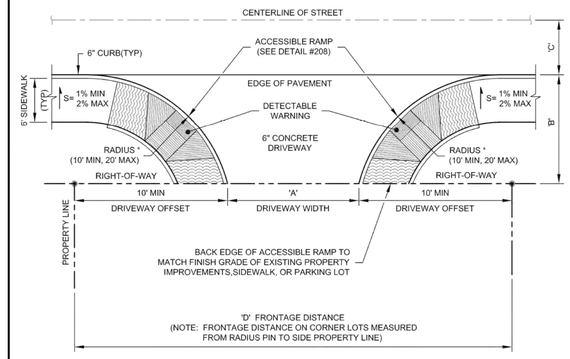
CUSTOMER:
PROJECT:
QUOTE NO:
CHK'D BY:

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: ± OR – 1"

SCALE:	DATE:	DWG. BY:	DWG. NO.:
1/2"=1'-0"			01000HGDWHTCHDS

1,000 GALLON OIL WATER SEPARATOR DETAIL
NTS

Issued: 02/01/2019



STREET WIDTH DATA		
STREET	'B'	'C'
BOULEVARD	15 FEET	27 FEET
AVENUE	13 FEET	22 FEET
DRIVE	9 FEET	21 FEET
CUL-DE-SAC	7 FEET	18 FEET

DRIVEWAY WIDTH SPECIFICATIONS 'A' ★		
USE	MINIMUM WIDTHS	
	MULTI-FAMILY	COMMERCIAL-INDUSTRIAL
ONE-WAY	12 FEET	15 FEET
TWO-WAY	18 FEET	24 FEET

MAXIMUM DRIVEWAY WIDTH IS 40 FEET
★ TOTAL OF DRIVEWAY WIDTHS MAY NOT EXCEED 60% OF FRONTAGE 'D'
★ 10' (MIN), 20' (MAX) DRIVEWAY RADIUS

★ UNLESS RECOMMENDED IN A TRAFFIC REPORT APPROVED BY LAKE HAVASU CITY.

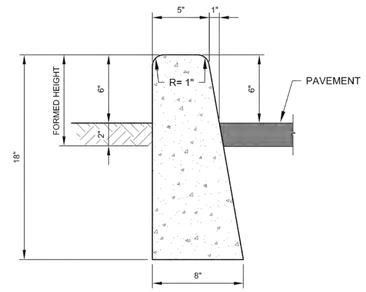
NOTES:

1. ALL SIDEWALKS TO BE 4" THICK CONCRETE.
2. ALL DRIVEWAYS TO BE 6" THICK CONCRETE.
3. NO REBAR OR WIRE MESH IN RIGHT-OF-WAY.
4. NO COLORED CONCRETE IN RIGHT-OF-WAY UNLESS APPROVED BY LAKE HAVASU CITY.
5. CONCRETE FOR STRUCTURES IN RIGHT-OF-WAY SHALL BE A 6 SACK PER CUBIC YARD MIX WITH A 4" MAXIMUM SLUMP AND BE ABLE TO PASS A 3000 PSI COMPRESSIVE STRENGTH TEST AT 28 DAYS.
6. SIDEWALK CROSS-SLOPE (BACK OF SIDEWALK TO CURB) TO BE 1% MIN / 2% MAX.

LAKE HAVASU CITY	Standard Details / Roadway Improvements	Street & Driveway Intersection (Zone R-3 or Greater)	Scale: N.T.S. Detail No. 206

\\Lhcdata\engineering\Programs\Standards\Developing Public Works Standards\LHC Standard Details\LHC Series 200 Roadway\DWG\DETAIL 206.dwg

Issued: 02/01/2019



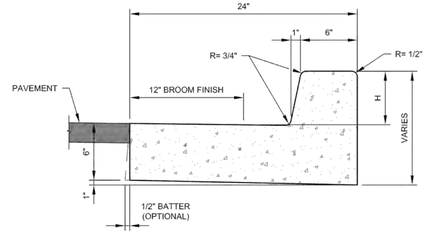
NOTES:

1. ALL VERTICAL SURFACES TO BE FORMED.
2. CLASS 'B' CONCRETE 2500 PSI.
3. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN.
4. CONTRACTION JOINT SPACING 10' MAX.
5. H=6" OR AS SPECIFIED ON PLANS.
6. EXPANSION JOINTS PLACED AT INTERVALS NOT TO EXCEED 100 FEET.

LAKE HAVASU CITY	Standard Details / Roadway Improvements	Vertical Curb	Scale: N.T.S. Detail No. 213

A:\City Operations and Development\Engineering\Programs\Standards\Developing Public Works Standards\LHC Standard Details\LHC Series 200 Roadway\DWG\DETAIL 213.dwg

Issued: 02/01/2019



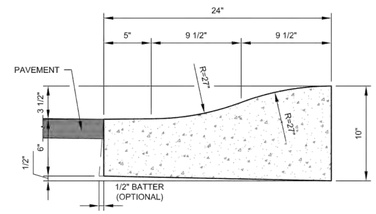
NOTES:

1. CLASS 'B' CONCRETE 2500 PSI.
2. ALL EXPOSED SURFACES TO BE TROWEL FINISHED EXCEPT AS SHOWN.
3. CONTRACTION JOINT SPACING 10' MAX.
4. H=6" OR AS SPECIFIED ON PLANS.
5. EXPANSION JOINTS PLACED AT INTERVALS NOT TO EXCEED 100 FEET.

LAKE HAVASU CITY	Standard Details / Roadway Improvements	Vertical Curb and Gutter	Scale: N.T.S. Detail No. 214

A:\City Operations and Development\Engineering\Programs\Standards\Developing Public Works Standards\LHC Standard Details\LHC Series 200 Roadway\DWG\DETAIL 214.dwg

Issued: 02/01/2019



NOTES:

1. MODIFIED MAG 220 (TYPE D).
2. PRIOR APPROVAL FROM ENGINEERING DIVISION REQUIRED.
3. CLASS 'B' CONCRETE 2500 PSI.
4. PLACE 3/4" EXPANSION JOINTS WITH TWO-FOOT DOWELS AT RADIUS POINTS. THESE DOWELS SHALL BE GREASED AND WRAPPED ON ONE END WITH EXPANSION TUBES.
5. INSTALL 1 1/2"-DEEP CONTRACTION JOINTS AT APPROXIMATELY 15' INTERVALS.

LAKE HAVASU CITY	Standard Details / Roadway Improvements	Rolled Curb and Gutter	Scale: N.T.S. Detail No. 215

A:\City Operations and Development\Engineering\Programs\Standards\Developing Public Works Standards\LHC Standard Details\LHC Series 200 Roadway\DWG\DETAIL 215.dwg

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(928) 855-2116

CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
	S. PERROTTO	E. PERROTTO	R. EDWARDS		S. PERROTTO		

REVISION

Jacobs

BID SET

GENERAL DETAILS
CIVIL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	C-11
SHEET	11 of 26

Professional Civil Engineer
STEVEN D. PERROTTO
Date 9 March 25
EXPIRES 12-31-2025

FILENAME: 23-028_11_General Details.dwg PLOT DATE: 10/3/23 PLOT TIME: 2:23 PM

MECHANICAL SYMBOL LEGEND (ALL SYMBOLS SHOWN ARE NOT NECESSARILY USED ON THE DRAWINGS)

PIPING SYMBOLS

- PITCH DOWN IN DIRECTION OF ARROW
- DIRECTION OF FLOW
- PIPE ANCHOR
- PIPE GUIDE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- BRANCH - SIDE CONNECTION
- BRANCH - TOP CONNECTION
- BRANCH - BOTTOM CONNECTION
- RISE OR DROP IN PIPE
- RISER DOWN (ELBOW)
- RISER UP (ELBOW)
- CAPPED PIPE
- BLIND FLANGE
- UNION (SCREWED)
- ORIFICE UNION
- FLANGED CONNECTION
- TEMPERATURE & PRESSURE PORT
- STRAINER WITH BLOWDOWN VALVE
- FLEX PIPE
- FLEX CONNECTION
- BELLOWS CONNECTION (DOUBLE SPHERE NEOPRENE TYPE)
- THERMOMETER
- PRESSURE GAGE WITH COCK
- FS — FLOW SWITCH
- PS — PRESSURE SWITCH
- MANUAL AIR VENT
- AUTOMATIC AIR VENT
- PUMP
- WELDED CONNECTION
- FLANGED CONNECTION
- SOLDERED CONNECTION
- THREADED OR "PRESS" CONNECTION
- BELL & SPIGOT CONNECTION
- SOLVENT CONNECTION
- 1" ET — INSULATION WITH ELECTRIC HEAT TRACE

VALVE SYMBOLS

- GATE VALVE
- GLOBE VALVE
- CHECK VALVE (NON SLAM)
- PLUG VALVE
- PRESSURE REDUCING VALVE (PRV)
- BUTTERFLY VALVE
- GLOBE VALVE
- NEEDLE VALVE
- VENTURI FLOW METER
- VALVE IN DROP
- VALVE IN CENTER DROP
- VALVE IN RISE
- GATE VALVE W/ 3/4" HOSE THREAD ADAPTER
- SOLENOID VALVE
- TWO-WAY CONTROL VALVE
- THREE-WAY CONTROL VALVE
- SAFETY VALVE OR PRESSURE RELIEF VALVE
- MANUAL BALANCING VALVE
- AUTOMATIC BALANCING VALVE
- TEMPERATURE WELL
- HOSE BIBB
- ANGLE GATE VALVE
- ANGLE GLOBE VALVE
- AIR VENT
- DIAPHRAGM VALVE
- QUICK ACTION VALVE
- OS&Y VALVE
- OS&Y VALVE WITH SUPERVISORY SWITCH
- FLANGED VALVE (GATE VALVE SHOWN)
- FLOAT VALVE
- ORIFICE FLOW PLATE

CONTROLS SYMBOLS

NORMAL OPEN	NORMAL CLOSED	
		GATE VALVE
		VALVE W/ REDUCERS (GATE VALVE SHOWN)
		GLOBE VALVE
		BUTTERFLY VALVE
		NEEDLE VALVE/INSTRUMENT VALVE
		3-WAY VALVE
		BALL VALVE
		PLUG VALVE
		ANGLE VALVE

CONTROL VALVE SYMBOLS:

- M — ELECTRIC ACTUATOR
- P — PNEUMATIC ACTUATOR
- S — SOLENOID ACTUATOR

ABBREVIATIONS

DEF - DIESEL EXHAUST FLUID
DF - DIESEL FUEL
GAS - GASOLINE
HS - HAND SWITCH
LI - LEVEL INDICATOR
LSH - LEVEL SWITCH HIGH, ALARM
LSHH - LEVEL SWITCH HIGH HIGH, SHUTDOWN
LSL - LEVEL SWITCH LOW, ALARM
LT - LEVEL TRANSMITER
PSV - PRESSURE SAFETY VALVE
PW - POTABLE WATER
TI - TEMPERATURE INDICATOR

EQUIPMENT SYMBOLS

- NEW EQUIPMENT

PLAN LEGEND

- EXISTING CONSTRUCTION
- NEW CONSTRUCTION
- EXISTING CONSTRUCTION TO DEMOLISH
- POINT OF CONNECTION
- POINT OF DISCONNECTION

MECHANICAL GENERAL NOTES

A. ALL WORK SHALL COMPLY WITH THE CURRENT LAKE HAVASU CITY CODES AND SPECIFICATIONS UNLESS NOTED OTHERWISE IN NFPA, IMC, IFC, NEC, AND ALL APPLICABLE CODES.

B. WHERE CODES HAVE BEEN ESTABLISHED BY OSHA, UNDERWRITERS LABORATORY, AMERICAN CODES, ANSI, ASME, ASA, ASHRAE, ASTM, ARI, NEC, NFPA, SMACNA, OR THE STATE FIRE INSURANCE REGULATORY BODY, FOLLOW THESE STANDARDS WHETHER OR NOT INDICATED ON THE DRAWINGS.

C. PERFORM WORK IN ACCORDANCE WITH THE LATEST EDITIONS, REVISIONS, AMENDMENTS OR SUPPLEMENTS OF APPLICABLE STATUTES, ORDINANCES, CODES, OR REGULATIONS OF FEDERAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION IN EFFECT ON THE DATE BIDS ARE RECEIVED.

D. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR SITE INVESTIGATION PRIOR TO START OF WORK TO REVIEW EXISTING CONDITIONS.

E. THE CONTRACTOR SHALL COORDINATE WITH AND NOTIFY THE OWNER'S REPRESENTATIVE FOR APPROVAL AND SCHEDULING OF ANY BUILDING SYSTEM INTERRUPTIONS OF ADJACENT CITY BUILDINGS.

F. COORDINATE ALL POWER AND SYSTEM SHUTOFFS WITH BUILDING FACILITY AND OPERATIONS MANAGERS. ADVANCE NOTICE OF AT LEAST 48 HOURS IS REQUIRED FOR ANY INTERRUPTIONS.

G. PROVIDE AT LEAST 24 HOURS ADVANCED NOTICE TO FACILITY MANAGER FOR ANY CORE DRILLING OR OTHER DISRUPTIVE NOISES.

H. THE CONTRACTOR SHALL EXECUTE ALL WORK HEREINAFTER SPECIFIED OR INDICATED ON ACCOMPANYING DRAWINGS. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT NECESSARY AND USUALLY FURNISHED IN CONNECTION WITH SUCH WORK AND SYSTEMS WHETHER OR NOT MENTIONED SPECIFICALLY HEREIN OR ON THE DRAWINGS.

I. THE TERM "PROVIDE" ON THESE DRAWINGS MEANS; FURNISH, TRANSPORT, INSTALL, CONNECT, WARRANT AND START UP, INCLUSIVELY.

J. MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE NEW AND SHALL BEAR THE U.L. LABEL WHERE APPLICABLE UNLESS NOTED OTHERWISE.

K. CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL BY THE ENGINEER ALL MAJOR ITEMS OF MATERIALS AND EQUIPMENT.

L. THE CONTRACTOR SHALL CAREFULLY LAY OUT HIS WORK AT THE SITE TO CONFORM TO THE STRUCTURAL CONDITIONS, TO AVOID ALL OBSTRUCTIONS, TO CONFORM TO THE DETAILS OF THE INSTALLATION AND THEREBY TO PROVIDE AN INTEGRATED SATISFACTORY OPERATING INSTALLATION.

M. THE MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS ARE NECESSARILY DIAGRAMMATIC BY THEIR NATURE, AND ARE NOT INTENDED TO SHOW EVERY CONNECTION IN DETAIL OR EVERY PIPE OR CONDUIT IN ITS EXACT LOCATION. THESE DETAILS ARE SUBJECT TO THE REQUIREMENTS OF STANDARDS REFERENCED ELSEWHERE IN THESE SPECIFICATIONS, AND STRUCTURAL AND ARCHITECTURAL CONDITIONS.

N. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE STRUCTURAL AND FINISH CONDITIONS AND SHALL COORDINATE THE SEPARATE TRADES IN ORDER TO AVOID INTERFERENCE BETWEEN THE VARIOUS PHASES OF WORK.

O. WHEN THE MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS DO NOT GIVE EXACT DETAILS AS TO THE ELEVATION OF PIPE, CONDUIT AND DUCTS, THE CONTRACTOR SHALL PHYSICALLY ARRANGE THE SYSTEMS TO FIT IN THE SPACE AVAILABLE AT THE ELEVATIONS INTENDED WITH PROPER GRADES FOR THE FUNCTIONING OF THE SYSTEM INVOLVED.

P. THE CONTRACTOR SHALL TAKE PROPER PRECAUTIONS TO PROTECT EXISTING CONSTRUCTION AND ADJACENT PROPERTY, WITH WHICH WORK COMES IN CONTACT, AND OVER TO TRANSPORT, HOIST OR MOVE MATERIALS, EQUIPMENT, DEBRIS, ETC., AND SHALL REPAIR SATISFACTORILY ALL DAMAGES CAUSED DURING CONSTRUCTION.

Registered Professional Engineer (Retired) CERTIFICATE NO. 46287 SCOTT HINTE Date Signed 12/15/22 ARIZONA U.S.A.

Scott Hinte

NO.	DATE	REVISION	DR	CHK	BY	APVD
DSGN	S. GOODELL		S. GOODELL	R. EDWARDS	G.S.HINTE	APVD

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CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO:101010
PUBLIC WORKS MAINTENANCE FACILITY
CITY HALL FACILITY
LAKE HAVASU CITY
2330 MCCULLOCH BLVD N.
LAKE HAVASU CITY, AZ 86403
(928) 855-2116

LAKE HAVASU CITY, ARIZONA • 1978 • INCORPORATED

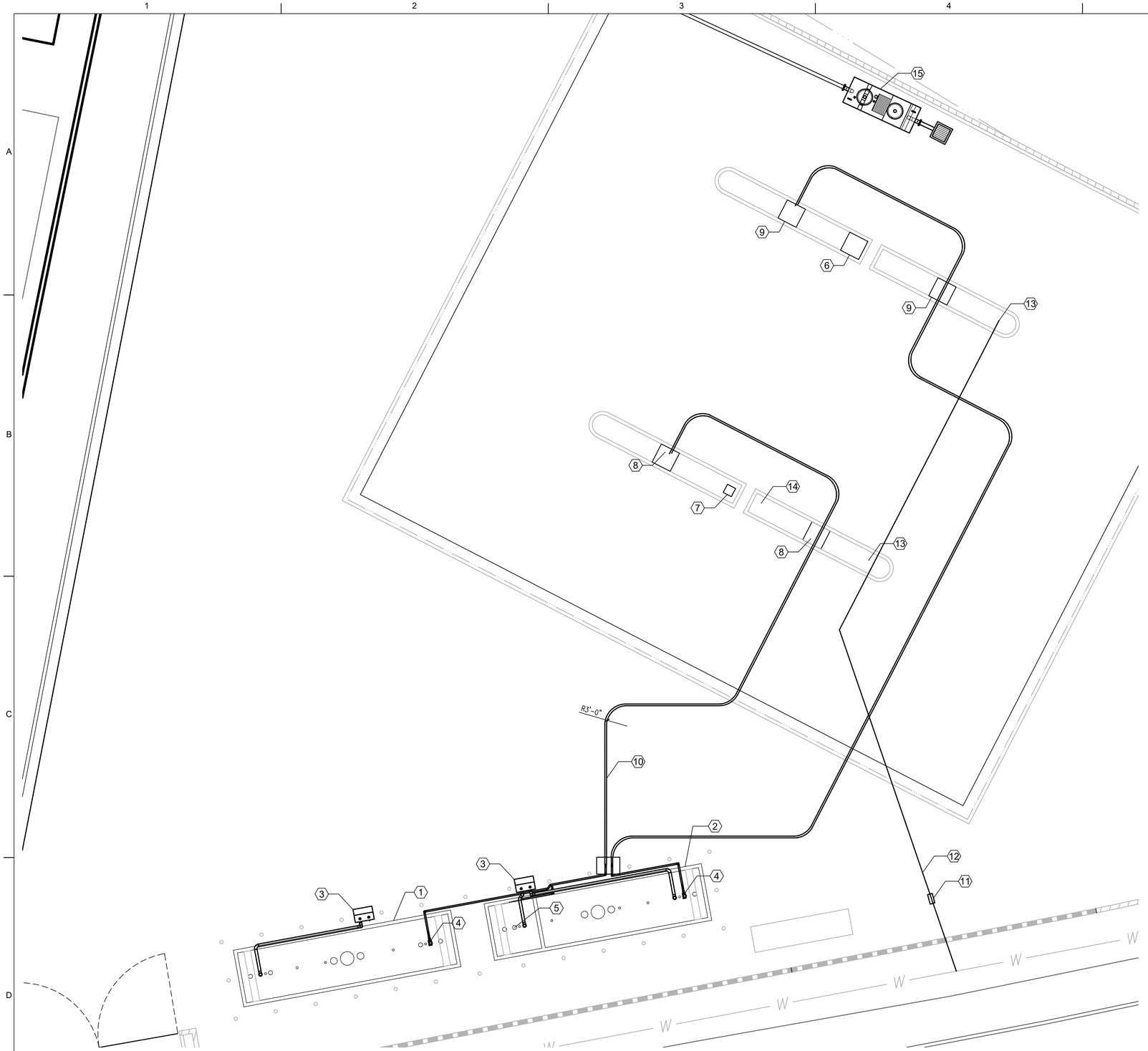
Jacobs

MECHANICAL ABBREVIATION AND SYMBOLS
MECHANICAL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	LHCFUE00
DWG	M-1
SHEET	12 of 26

FILENAME: LHCFUE00 - Mechanical.dwg PLOT DATE: 4/5/22 PLOT TIME: 8:34 AM



A1 MECHANICAL PIPING PLAN - PUBLIC SAFETY
1/8" = 1'-0"

PLAN NOTES:

A. VERIFY ALL EXISTING CONDITIONS. INFORM OWNER'S PROJECT MANAGER AND ENGINEER OF ANY DISCREPANCIES BETWEEN THE DRAWINGS AND THE ACTUAL CONDITIONS.

B. THE PIPING AND EQUIPMENT LAYOUT HAS BEEN UTILIZED FOR SCHEMATIC REPRESENTATION. ACTUAL CONDITION MAY VARY.

C. OTHER EXISTING EQUIPMENT AND PIPING IS NOT SHOWN.

KEYED NOTES:

1. 12,000 GALLON DOUBLE WALL GASOLINE STORAGE TANK
2. 12,000 GALLON DOUBLE WALL DIESEL STORAGE TANK. (10,000 ROAD DIESEL/2,000 RED DIESEL)
3. REMOTE FILL CABINET WITH SPILL CONTAINMENT
4. SUBMERSIBLE PUMP, 3/4 HP.
5. TANK MOUNTED RED DIESEL DISPENSER, 1/3 HP.
6. 400 GALLON DEF TANK WITH DISPENSER
7. FUEL KIOSK
8. GASOLINE DISPENSER, TWO HOSE
9. DIESEL DISPENSER, TWO HOSE
10. 2" DOUBLE WALL, UNDERGROUND FUEL PIPING
11. DOUBLE CHECK VALVE BACKFLOW PREVENTER, WATTS SERIES 007, OR EQUAL.
12. 1" POTABLE WATER LINE
13. YARD HYDRANT, 3/4", SIMMONS MODEL 802SB, OR EQUAL.
14. CLASS BC FIRE EXTINGUISHER
15. OIL-WATER SEPARATOR. SEE DETAIL DWG. C-11

Registered Professional Engineer (Retired) CERTIFICATE NO. 46287 SCOTT HINTE Date Signed 10/5/23 ARIZONA U.S.A.

Scott Hinte

NO.	DATE	REVISION	BY	APVD
DSGN	S. GOODELL	DR S. GOODELL CHK R. EDWARDS	APVD	G.S.HINTE

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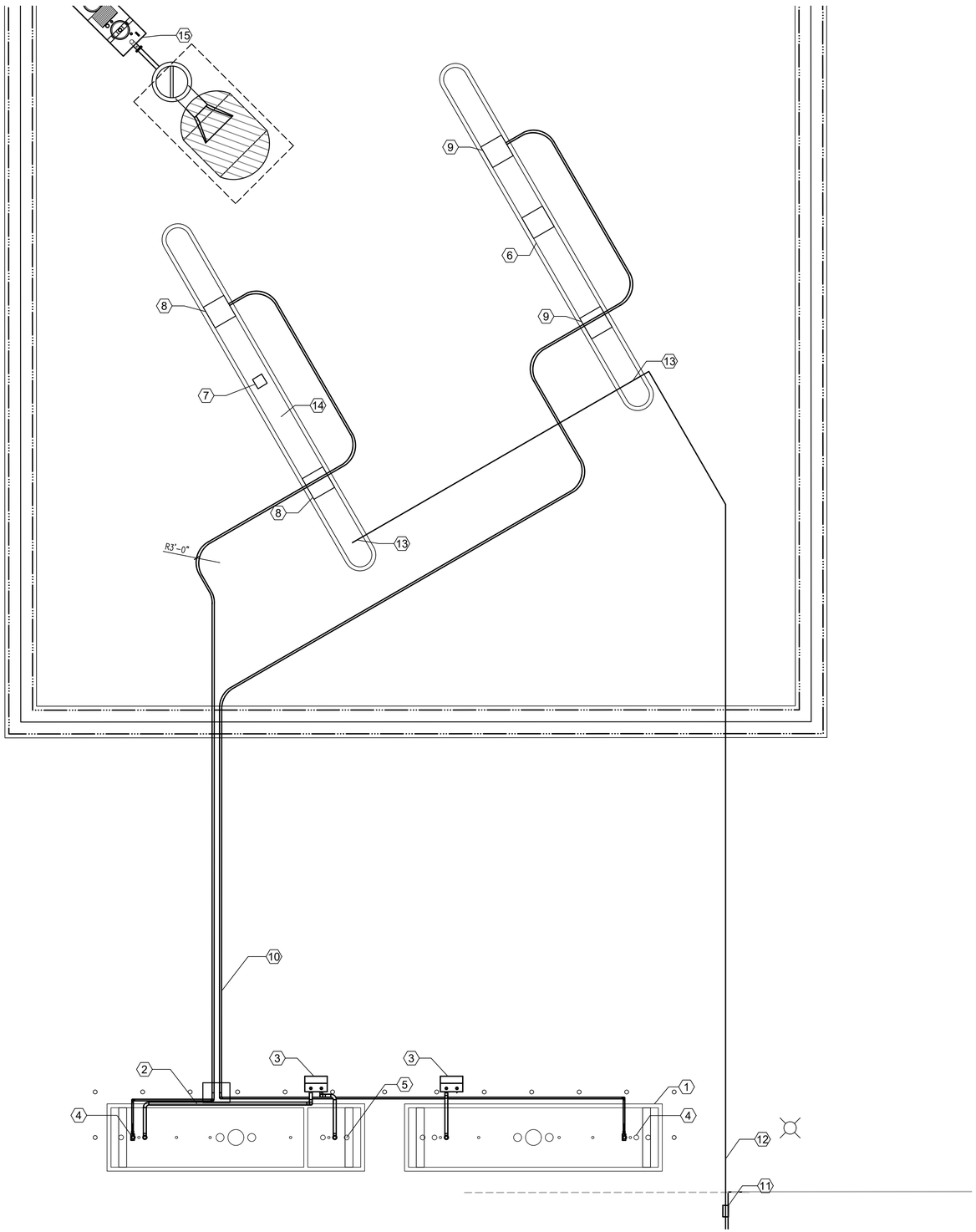
Jacobs

MECHANICAL PIPING PLAN
PUBLIC SAFETY
MECHANICAL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	LHCFUE00
DWG	M-2
SHEET	13 of 26

FILENAME: LHCFUE00 - Mechanical.dwg PLOT DATE: 4/5/22 PLOT TIME: 8:36 AM



A1 MECHANICAL PIPING PLAN - PUBLIC WORKS
1/8" = 1'-0"

PLAN NOTES:

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14. CLASS BC FIRE EXTINGUISHER
15. OIL-WATER SEPARATOR. SEE DETAIL DWG. C-11

Registered Professional Engineer (Retired) CERTIFICATE NO. 46287 SCOTT HINTE Date Signed 10/5/23 ARIZONA U.S.A.

Scott Hinte

NO.	DATE	REVISION	BY	APVD
DSGN	S. GOODELL	DR S. GOODELL CHK R. EDWARDS	APVD	G.S.HINTE

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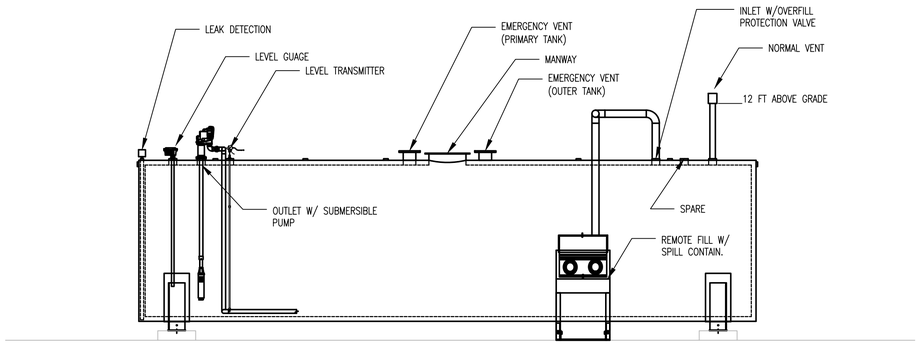
Jacobs

MECHANICAL PIPING PLAN
PUBLIC WORKS
MECHANICAL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	LHCFUE00
DWG	M-3
SHEET	14 of 26

FILENAME: LHCFUE00 - Mechanical.dwg PLOT DATE: 4/5/22 PLOT TIME: 8:38 AM



A1 FUEL STORAGE TANK ELEVATION
NOT TO SCALE

EMERGENCY INSTRUCTIONS

IN CASE OF FIRE OR SPILL:

(1) USE EMERGENCY STOP BUTTON.

(2) REPORT ACCIDENT BY CALLING 911.

A2 EMERGENCY SIGNAGE
NOT TO SCALE

WARNING

NO SMOKING
STOP MOTOR

IT IS UNLAWFUL AND DANGEROUS TO DISPENSE GASOLINE INTO UNAPPROVED CONTAINERS.

NO FILLING OF PORTABLE CONTAINERS IN OR ON A MOTOR VEHICLE.

PLACE CONTAINER ON GROUND BEFORE FILLING.

DISCHARGE YOUR STATIC ELECTRICITY BEFORE FUELING BY TOUCHING A METAL SURFACE AWAY FROM THE NOZZLE.

DO NOT RE-ENTER YOUR VEHICLE WHILE GASOLINE IS PUMPING.

IF A FIRE STARTS DO NOT REMOVE NOZZLE- BACK AWAY IMMEDIATELY.

DO NOT ALLOW INDIVIDUALS UNDER LICENSED AGE TO USE THE PUMP.

A3 WARNING SIGN
NOT TO SCALE

Registered Professional Engineer (Electrical) CERTIFICATE NO. 46287 SCOTT HINTE Date Signed 10/5/23 ARIZONA U.S.A.

Scott Hinte

NO.	DATE	DR	REVISION	CHK	APVD	BY	APVD
DSGN	S. GOODELL	S. GOODELL		R. EDWARDS		G.S.HINTE	

TRICO ENGINEERING, LLC
231 SWANSON AVENUE, STE. 204
LAKE HAVASU CITY, AZ 86403
PHONE: 928-230-4869
WWW.TRICOENGINEERINGLLC.COM

CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO:101010
PUBLIC WORKS MAINTENANCE FACILITY
CITY HALL FACILITY
LAKE HAVASU CITY
2330 MCCULLOCH BLVD N.
LAKE HAVASU CITY, AZ 86403
(928) 855-2116

Jacobs

MECHANICAL PIPING PLAN
PUBLIC WORKS
MECHANICAL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	LHCFUE00
DWG	M-4
SHEET	15 of 26

FILENAME: LHCFUE00 - Mechanical.dwg PLOT DATE: 4/5/22 PLOT TIME: 8:35 AM

KEYED NOTES:

1. SHEAR VALVE WITH FUSIBLE LINK.
2. SUMP UNDER DISPENSER
3. 3/4 HP SUBMERSIBLE PUMP WITH LINE LEAK DETECTOR.
4. 1/3 HP SUBMERSIBLE PUMP WITH LINE LEAK DETECTOR.
5. RED DIESEL DISPENSER.
6. DOUBLE CONTAINMENT PIPING
7. TRANSITION SUMP

TANK INVENTORY MANAGEMENT SYSTEM

VENT

VENT

RETURN TO TANK

PSV 101

LEAK DET

LT 102

LSHH 101

LI 101

LT 101

LI 102

RETURN TO TANK

PSV 102

4"ø

E-STOP

HS 104

E-STOP

HS 106

FUEL MANAGEMENT KIOSK

DIESEL PUMP

DIESEL PUMP

REMOTE FILL WITH SPILL CONTAINMENT

AST - 1
10,000 GALLON DIESEL/2,000 GALLON RED DIESEL TANK

2"ø

2"ø

ABOVE GROUND

UNDER GROUND

STEEL PIPE

PVDF PIPE

PSV 103

RETURN TO TANK

E-STOP

HS 105

GASOLINE PUMP

GASOLINE PUMP

PRESSURE/VACUUM VENT

LEAK DET

LI 103

LT 103

LSHH 103

4"ø

REMOTE FILL WITH SPILL CONTAINMENT

AST - 2
12,000 GALLON GASOLINE TANK

VENT

INSULATION

AST - 3
400 GALLON DEF TANK

VENT

LSHH 108

LSH 108

LSL 108

LEAK DET

LSHH 107

6"ø

6"ø

SEE CIVIL FOR CONTINUATION

OIL/WATER SEPARATOR
1000 GALLON TANK

Registered Professional Engineer (Electrical) CERTIFICATE NO. 46287 SCOTT HINTE Date Signed 10/05/23 ARIZONA U.S.A.

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Jacobs

FUEL SYSTEM
PIPING & INSTRUMENT DIAGRAM
MECHANICAL

VERIFY SCALE

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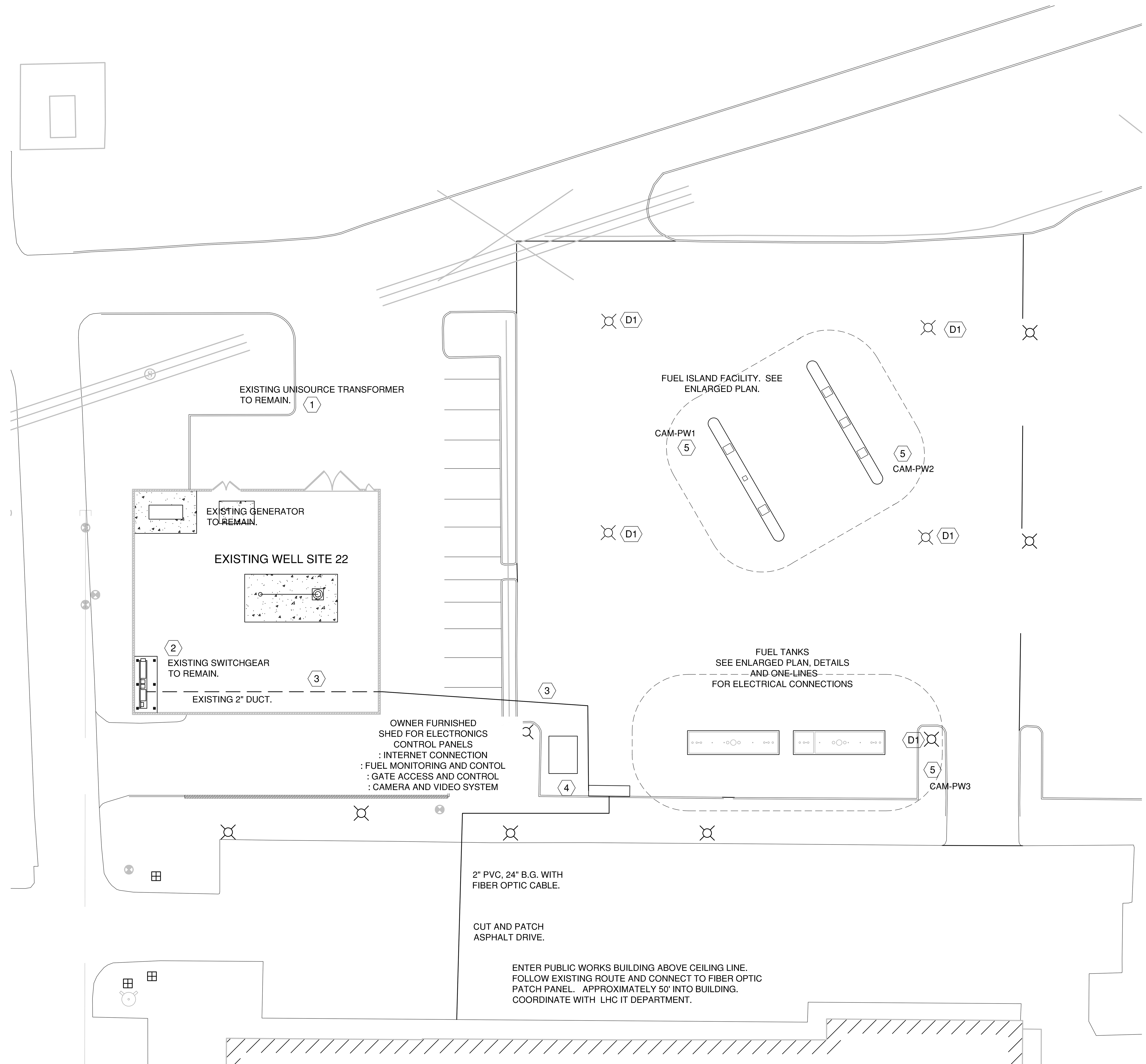
0 1"

DATE	OCTOBER 2023
PROJ	LHCFUE00
DWG	M-5
SHEET	16 of 26

FILENAME: LHCFUE00 - Mechanical.dwg PLOT DATE: 4/5/22 PLOT TIME: 8:37 AM



GENERAL NOTES

REFER TO ONE-LINE DIAGRAMS FOR FEEDER AND CONDUCTOR SIZES AND QUANTITIES.

PLAN VIEWS DO NOT INDICATE ALL CONDUITS. REFER TO ONE-LINE DIAGRAMS, EQUIPMENT SPECIFICATIONS, AND EQUIPMENT SHOP DRAWINGS FOR BRANCH CIRCUITRY, CONTROL, INSTRUMENTATION, POWER, AND COMMUNICATION CONDUIT AND CONDUCTORS. COORDINATE FIELD PLACEMENT OF INSTRUMENTATION CONDUIT AND CONDUCTORS WITH SYSTEMS VENDOR FABRICATION DRAWINGS.

SEE TYPICAL DETAILS FOR CONDUIT ROUTING, PANEL SUPPORTS AND CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

ELECTRICAL PLAN NOTES

1. EXISTING UNISOURCE 277/480V TRANSFORMER AND SERVICE TO REMAIN.
2. EXISTING SES, METER AND SERVICE TO REMAIN. SEE ONE-LINE DIAGRAM FOR MODIFICATIONS. CONNECT TO EXISTING DISTRIBUTION PANEL FOR POWER SOURCE FOR NEW FUEL FACILITY.
3. EXISTING 2" PVC CONDUIT FROM EXISTING DISTRIBUTION PANEL AND STUBBED BEYOND PERIMETER WALL OF WELL FACILITY. APPROXIMATELY 6' DEEP, (BELOW EXISTING WALL AND FOOTING.) CONTRACTOR RESPONSIBLE TO TRACE AND LOCATE CONDUIT. APPROXIMATELY 10' FROM SOUTHERLY WALL. INTERCEPT EXISTING DUCT AND UTILIZE FOR SERVICE SOURCE FOR NEW FUEL FACILITY.
4. NEW ELECTRICAL SERVICE PANELS FOR PUBLIC WORKS FUELING FACILITY. AND ELECTRICAL EQUIPMENT ENCLOSURE FOR FUEL FACILITY. SEE ONE-LINE DIAGRAMS AND ELEVATION DETAILS.
5. CAMERA LOCATION TO BE MOUNTED ON LIGHT POLE. CONTRACTOR TO PROVIDE EMPTY CONDUIT SYSTEM. SEE CAMERA SYSTEM ONE-LINE DIAGRAM
6. PROVIDE INGROUND PULLBOX LOCATED ADJACENT TO OPERATOR. PROVIDE POWER AND COMMUNICATION DUCTS AND HOMERUN TO POWER PANEL PS1 AND TO ACCESS CONTROL PANEL ACP. SEE ONE-LINE DIAGRAM FOR CONDUIT AND CONDUCTORS AND DETAILS.
7. INSTALL FIBER OPTIC CABLE TO PUBLIC WORKS FACILITY. CONNECT AT EXISTING SYSTEM COMMUNICATION CLOSET. SEE FIBER OPTIC ONE-LINE DIAGRAM

ELECTRICAL DEMOLITION NOTES

D1 EXISTING LIGHT POLE TO BE REMOVED BY UNISOURCE. RESTORATION OF EXISTING LIGHTING CIRCUITS TO BE BY UNISOURCE. CITY TO CONTRACT WITH UNISOURCE SEPARATE FROM THIS CONTRACT.

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NO.	DATE	REVISION	BY	APVD

DSGN JAK | DR JAK | CHK JAK | APVD JAK

CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY
LAKE HAVASU CITY

Jacobs

PUBLIC WORK PLAN
ELECTRICAL

VERIFY SCALE
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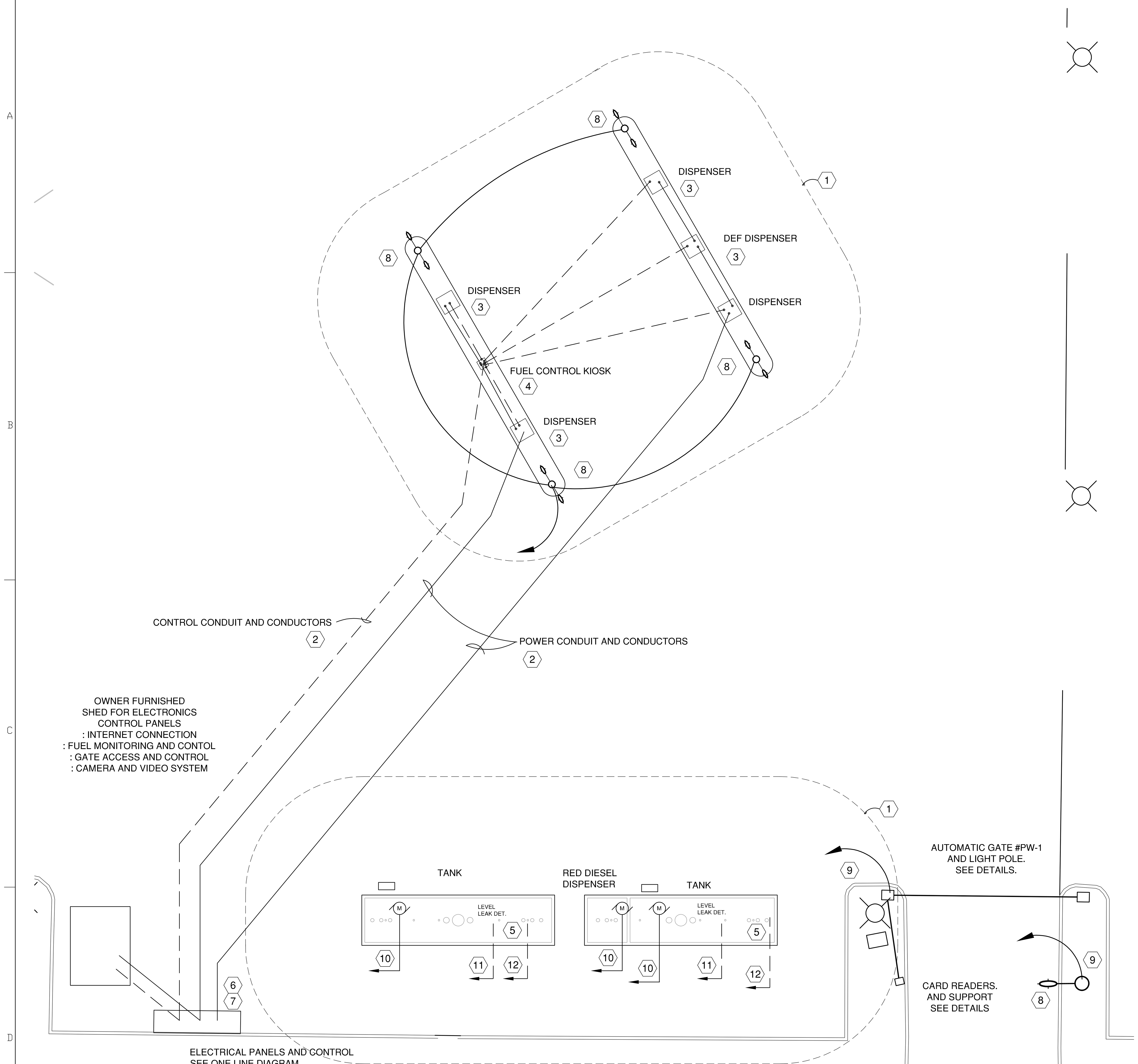
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	E-1
SHEET	17 of 26



GENERAL NOTES

REFER TO ONE-LINE DIAGRAMS FOR FEEDER AND CONDUCTOR SIZES AND QUANTITIES.

SEE TYPICAL DETAILS FOR CONDUIT ROUTING, PANEL SUPPORTS AND CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

PLAN VIEWS DO NOT INDICATE ALL CONDUITS. REFER TO ONE-LINE DIAGRAMS, EQUIPMENT SPECIFICATIONS, AND EQUIPMENT SHOP DRAWINGS FOR BRANCH CIRCUITRY, CONTROL, INSTRUMENTATION, POWER, AND COMMUNICATION CONDUIT AND CONDUCTORS. COORDINATE FIELD PLACEMENT OF INSTRUMENTATION CONDUIT AND CONDUCTORS WITH SYSTEMS VENDOR FABRICATION DRAWINGS.

ALL INSTALLATION SHALL BE IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE. FUEL ISLAND AND FUEL TANK INSTALLATION IS AS REQUIED BY ARTICLE 514. PROVIDE EXPLOSION PROOF SEALS AS REQUIRED. NEATLY ORGANIZE SEALS WHEN IN MULTIPLE LOCATIONS.

ALL CONDUIT CONNECTIONS TO FUEL DISPENSING AND FUEL TANKS SHALL BE RIGID STEEL CONDUIT. BELOW GRADE INSTALLATION SHALL UTILIZE PVC COATED RIGID STEEL CONDUIT AS A CORROSION PROTECTION FOR DIRECT CONTACT WITH SOIL.

ANY BELOW GRADE CONDUIT THAT CROSSES WITHIN THE BOUNDRY AS DEFINED IN NEC ARTICAL 514 SHALL UTILIZE PVC COATED RIGID STEEL CONDUIT FROM SOURCE TO DEVICE.

CONDUIT ROUTING, CONDUCTORS AND CONDUIT IS BASED ON TYPICAL MANUFACTURER/VENDOR OF FUEL DISPENSING AND LEAK DETECTION SYSTEMS. COORDINATE AND ALTER ROUTES AND METHODS TO MEET REQUIREMENTS OF THE INSTALLING MANUFACTURER.

SUBMIT CONDUIT AND CONDUCTOR LAYOUT PLAN TO ENGINEER AND FUEL SYSTEMS VENDOR PRIOR TO START OF CONSTRUCTION.

INSPECTION OF TRENCHED AND INSTALLED CONDUIT SHALL BE APPROVED BY ENGINEER AND FUEL SYSTEM VENDOR PRIOR TO BACKFILL OF ANY CONDUIT TRENCH.

ELECTRICAL NOTES: OWNER PROVIDED SHED

AT COMPLETION OF THE CONSTRUCTION, THE OWNER WILL INSTALL A SHED TO ENCLOSE THE ELECTRONIC CONTROLLERS FOR THE STATION.
- INTERNET MODEM AND WAN
- FUEL CONTROL AMD MANAGEMENT SYSTEM
- CAMERA SYSTEM
- INTERFACE WITH LEAK DETECTION SYSTEM
- GATE ACCESS CONTROL.

CONTRACTOR TO COORDINATE CONDUIT STUBS FOR THESE SYSTEMS WITH ENGINEER AND OWNER PRIOR TO INSTALLATION OF CONDUIT.

SEE SHEMATIC OF OWNER FURNISHED SHED FOR APPROVXIMATE LOCATIONS

ELECTRICAL PLAN NOTES

1. 20' PERIMETER LINE DESIGNATION FROM THE FUEL EQUIPMENT AS NOTED IN NEC 514.
2. REFER TO FUEL SYSTEM ELECTRICAL ONE-LINE DIAGRAMS FOR BRANCH CIRCUIT CONDUCTOR SIZES AND QUANTITIES.
3. STUB CONDUIT INTO SUMP OF DISPENSERS. PROVIDE SEALS AS PER ARTICLE 514.
4. STUB CONDUIT INTO FUEL KIOSK. PROVIDE SEALS AS PER ARTICLE 514.
5. PROVIDE CONNECTION TO TANK LEAK DETECTION AND FUEL LEVEL MONITORING SYSTEM. PROVIDE CONNECTION TO INTERNAL TANK PUMP MOTOR. TYPICAL EACH TANK. SEE ONE-LINE DIAGRAM AND DETAILS.
6. PROVIDE CONNECTION TO EMERGENCY STOP PUSH BUTTON. LOCATED ON SEPARATE PEDESTAL ADJACENT TO POWER PANEL.
7. PROVIDE CONTACTOR PANEL FOR EMERGENCY FUEL SHUTOFF.
8. PROVIDE TWIN HEAD LIGHT AND POLE ON 30" TALL CONCRETE BASE ON FUEL ISLAND. MOTION SENSOR ACTIVATED.
9. 3#12, 3/4"C TO SITE PANEL FOR LIGHTING CIRCUIT.
10. PROVIDE CONNECTION TO TANK SUMP MOTOR PER MANUFACTURER REQUIREMENTS. PROVIDE 3#12, 3/4"C TO SITE PANEL VIA EMERGENCY SHUTDOWN COTACTOR. MOTOR AND CIRCUIT TO BE 208V 2P.
11. PROVIDE CONNECTION TO TANK LEAK DETECTION AND FUEL LEVEL MONITORING SYSTEMS PER MANUFACTURER REQUIREMENTS. PROVIDE 3/4"C TO FUEL CONTROL SYSTEM PANEL.
12. PROVIDE POWER AND CONTROL CONDUIT AND CONDUCTOR PER MANUFACTURERS REQUIREMENTS. PROVIDE 3/4"C POWER TO SITE PANEL VIA EMERGENCY SHUTDOWN CONTACTOR. PROVIDE 3/4"C CONTROL CONDUIT TO FUEL CONTROL PANEL.

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CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
PUBLIC SAFETY FACILITY
PUBLIC WORKS MAINTENANCE FACILITY

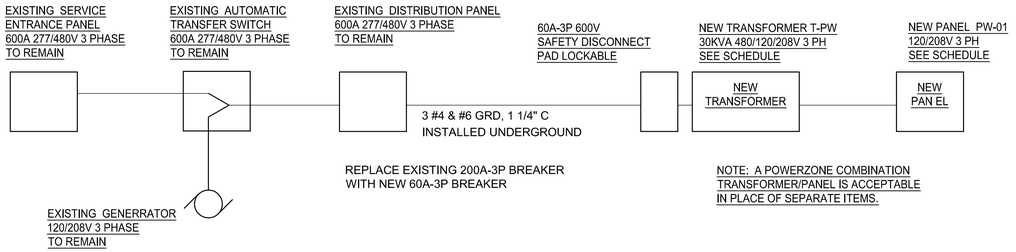
Jacobs

PUBLIC WORK ENLARGED PLAN ELECTRICAL

NO.	DATE	REVISION	BY	APVD
DSGN	JAK	DR JAK	CHK JAK	APVD JAK

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.

DATE	OCTOBER
PROJ	
DWG	E-2
SHEET	18 of 26



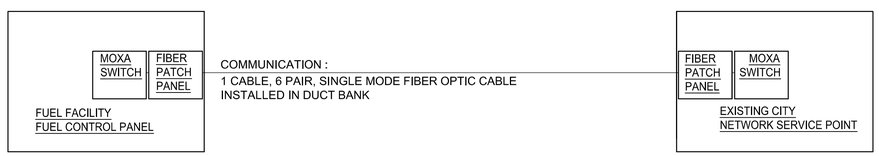
1 / E-3 PUBLIC WORKS POWER ONE-LINE DIAGRAM

NO SCALE

POWER SUPPLY: 120/208 VAC, 1PH, 3W
BUS RATING: 100A, 10K A.I.C.
MAIN BREAKER 100A-3P

LOCATION: EXTERIOR WP NEMA 4
MOUNTING: SURFACE
NAME: PW-P1

DESCRIPTION	CCT BKR AMP	CCT No	PHASE A B C	CCT No	CCT BKR AMP	DESCRIPTION
AST-1 GAS PUMP CONTROLLED VIA E-STOP CONTACTOR PS-ESC	20/2 GFI	1		2	20/1	CONVENIENCE OUTLETS - MODEMS
		3		4	20/1	FUEL CONTROL SYSYTEM
AST-2 DIESEL PUMP CONTROLLED VIA E-STOP CONTACTOR PS-ESC	20/2 GFI	5		6	20/1	LIGHTS
		7		8	20/2	GATE #1 POWER
AST-2 RED DIESEL PUMP CONTROLLED VIA E-STOP CONTACTOR PS-ESC	20/2 GFI	9		10		
		11		12	20/2	GATE #2 POWER
DEF PUMP	20/2 GFI	13		14		
		15		16	20/2	SPARE
DEF PUMP	20/2 GFI	17		18		
		19		20	20/1	EQUIPMENT ENCLOSURE AC
SPARE	20/2 GFI	21		22	20/1	AREA LIGHTS
		23		24	20/1	LEAK DETECTION SYSTEM
SPARE	20/1	25		26	20/1	SPARE
SPARE	20/1	27		28	20/1	SPARE
SPARE	20/1	29		30	20/1	SPARE
SPARE	20/1	31		32	20/1	SPARE



FIBER OPTIC PATCH PANEL TERMINATION ENCLOSURE
48 FIBER CAPACITY. EQUAL TO FS:FHD-FWME2

INTERCONNECT TO FIBER NETWORK WITH FIBER CONVERTERS
MOXA SWITCH MODEL #SFP-1GLXLC

3 / E-3 FIBER OPTIC CONNECTION ONE-LINE DIAGRAM

NO SCALE

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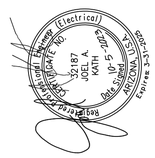

NO.	DSGN	DATE	REVISION	CHK	APV'D
	JAK		DR	JAK	BY	APV'D
					JAK	JAK

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PUBLIC WORKS MAINTENANCE FACILITY
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(928) 854-2136

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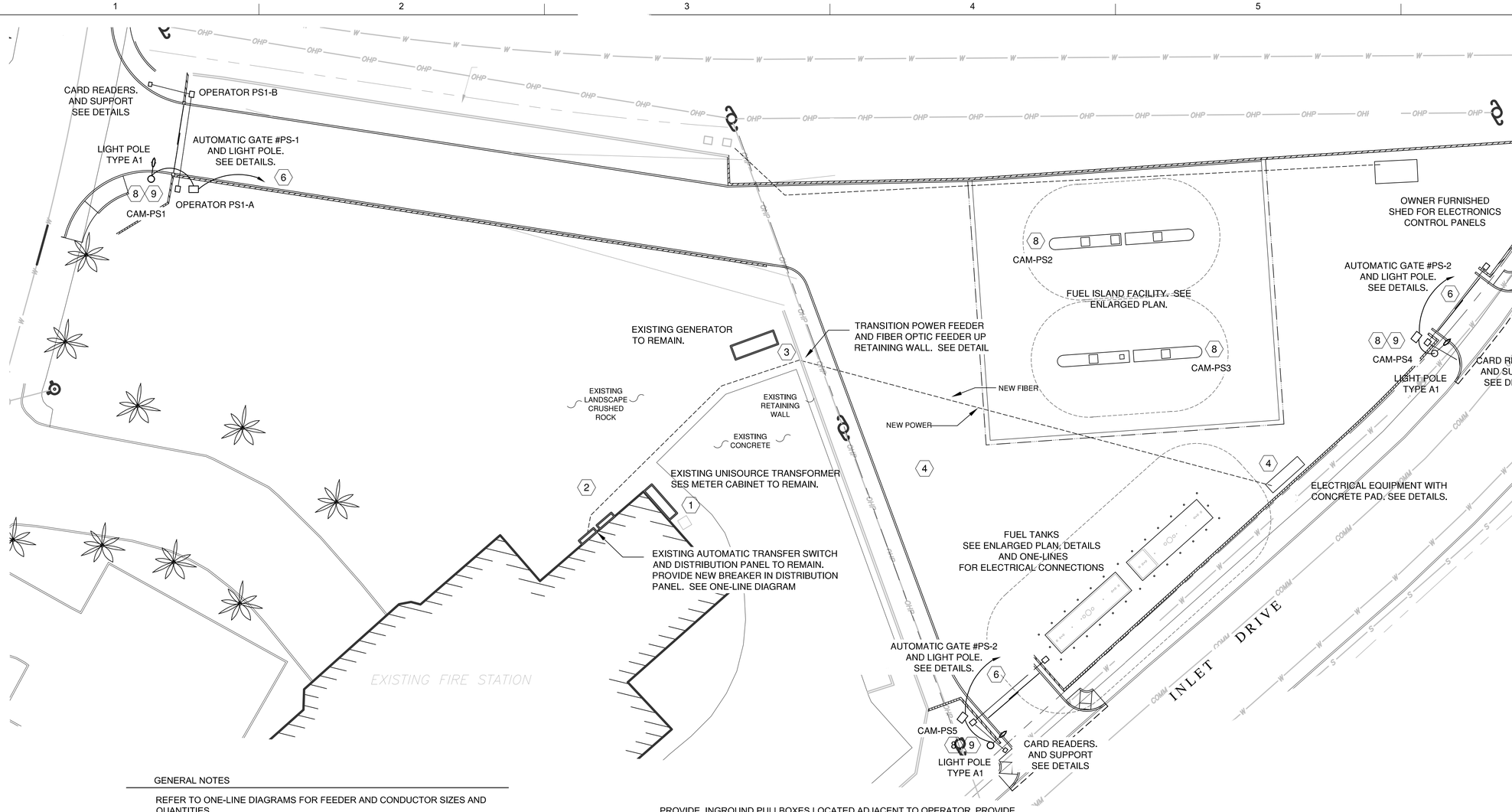
Jacobs

PUBLIC WORKS
ONE-LINES, DETAILS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	E-3
SHEET	19 of 26



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SEE TYPICAL DETAILS FOR CONDUIT ROUTING, PANEL SUPPORTS AND CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

ELECTRICAL PLAN NOTES

1. EXISTING UNISOURCE 120/208V TRANSFORMER AND SES METER CABINET TO REMAIN.
2. EXISTING AUTOMATIC TRANSFER SWITCH AND DISTRIBUTION PANEL TO REMAIN. SEE ONE-LINE DIAGRAM FOR MODIFICATIONS. CONNECT TO EXISTING DISTRIBUTION PANEL FOR POWER SOURCE FOR NEW FUEL FACILITY.
3. NEW ELECTRICAL SERVICE FEEDER AND FIBER OPTIC FEEDER FOR FUEL FACILITY. SEE ONE-LINE DIAGRAM. TRENCH FEEDER IN LANDSCAPE ROCK AT APPROXIMATE ROUTE AS SHOWN. MINIMUM DEPTH 24". PROVIDE INGROUND PULLBOXES NEAR RETAINING WALL. MAINTAIN MINIMUM 12" LATERAL SEPARATION. TRANSITION TO RIGID STEEL CONDUIT AND SURFACE ROUTE CONDUIT VERTICAL UP WALL TO CONTINUE. SEE DETAIL. PROVIDE STRUT SUPPORT SEPARATE FROM RETAINING BLOCKS. PROVIDE EXPANSION FLEXIBLE FITTINSS TO ALLOW A MINIMUM 6" DISPLACEMENT.
SEE DETAIL.
4. NEW ELECTRICAL SERVICE PANELS FOR PUBLIC SAFETY FUELING FACILITY. AND ELECTRICAL EQUIPMENT ENCLOSURE FOR FUEL FACILITY. SEE ONE-LINE DIAGRAMS AND ELEVATION DETAILS.
5. NEW ELECTRICAL OPERATED GATE WITH ACCESS CONTROL CONNECTION. SEE DETAILS AND DIAGRAMS.
6. PROVIDE INGROUND PULLBOXES LOCATED ADJACENT TO OPERATOR. PROVIDE POWER AND COMMUNICATION DUCTS AND HOMERUN TO POWER PANEL PS1 AND TO ACCESS CONTROL PANEL ACP. SEE ONE-LINE DIAGRAM FOR CONDUIT AND CONDUCTORS AND DETAILS.
7. INSTALL 1" CONDUIT FOR INTERNET SERVICE TO LOCATION AS INDICATED. COORDINATE WITH PROVIDER. STUB UP INTO OWNER PROVIDED SHED.
8. CAMERA LOCATION TO BE MOUNTED ON LIGHT POLE. CONTRACTOR TO PROVIDE EMPTY CONDUIT SYSTEM. SEE CAMERA SYSTEM ONE-LINE DIAGRAM.
9. PROVIDE 3#12, 3/4"C AND HOMERUN TO PANEL FOR LIGHT POLE POWER CIRCUIT. THIS MAY BE COMBINED WITH CONDUIT FOR THE GATE OPERATOR.

0' 20' 40' 60'
1"=20'-0"

ENGINEERS INC
FARGO, ND 58102
WWW.JACOBS.COM

Professional Engineer (Electrical) JOEL A. KATH 55187 Date Signed 10-5-2023 ARIZONA, U.S.A. Expires 3-31-2025

NO.	DATE	REVISION	CHK	APVD	BY
DSGN	JAK	DR	JAK	JAK	JAK

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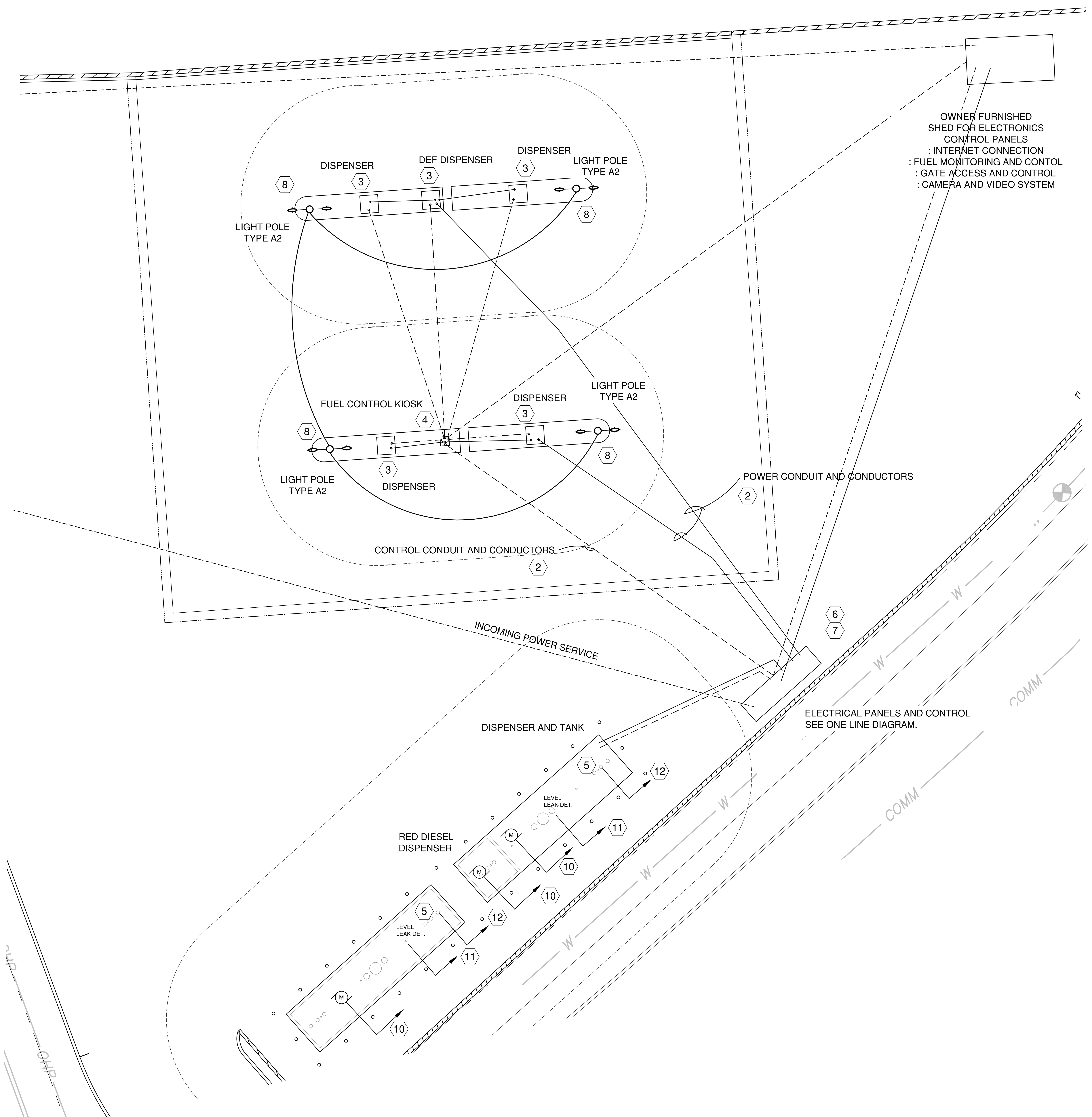
PROGRESS SET

PUBLIC SAFETY PLAN
CIVIL

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCTOBER 2023
PROJ	
DWG	E-4
SHEET	20 of 26



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ELECTRICAL NOTES: OWNER PROVIDED SHED

AT COMPLETION OF THE CONSTRUCTION, THE OWNER WILL INSTALL A SHED TO ENCLOSE THE ELECTRONIC CONTROLLERS FOR THE STATION.
- INTERNET MODEM AND WAN
- FUEL CONTROL AMD MANAGEMENT SYSTEM
- CAMERA SYSTEM
- INTERFACE WITH LEAK DETECTION SYSTEM
- GATE ACCESS CONTROL.

CONTRACTOR TO COORDINATE CONDUIT STUBS FOR THESE SYSTEMS WITH ENGINEER AND OWNER PRIOR TO INSTALLATION OF CONDUIT.

SEE SHEMATIC OF OWNER FURNISHED SHED FOR APPROVXIMATE LOCATIONS

ELECTRICAL PLAN NOTES

1. 20' PERIMETER LINE DESIGNATION FROM THE FUEL EQUIPMENT AS NOTED IN NEC 514.
2. REFER TO FUEL SYSTEM ELECTRICAL ONE-LINE DIAGRAMS FOR BRANCH CIRCUIT CONDUCTOR SIZES AND QUANTITIES.
3. STUB CONDUIT INTO SUMP OF DISPENSERS. PROVIDE SEALS AS PER ARTICLE 514.
4. STUB CONDUIT INTO FUEL KIOSK. PROVIDE SEALS AS PER ARTICLE 514.
5. PROVIDE CONNECTION TO TANK LEAK DETECTION AND MONITORING SYSTEM. TYPICAL EACH TANK. SEE ONE-LINE DIAGRAM AND DETAILS.
6. PPROVIDE CONNECTION TO EMERGENCY STOP PUSH BUTTON. LOCATED ON SEPARATE PEDESTAL ADJACENT TO POWER PANEL.
7. PROVIDE CONTACTOR PANEL FOR EMERGENCY FUEL SHUTOFF.
8. PROVIDE TWIN HEAD LIGHT AND POLE ON 30" TALL CONCRETE BASE ON FUEL ISLAND. MOTION SENSOR ACTIVATED
9. 3#12, 3/4"C TO SITE PANEL FOR LIGHTING CIRCUIT.
10. PROVIDE CONNECTION TO TANK SUMP MOTOR PER MANUFACTURER REQUIREMENTS. PROVIDE 3#12, 3/4"C TO SITE PANEL VIA EMERGENCY SHUTDOWN COTACTOR. MOTOR AND CIRCUIT TO BE 208V 2P.
11. PROVIDE CONNECTION TO TANK LEAK DETECTION AND FUEL LEVEL MONITORING SYSTEMS PER MANUFACTURER REQUIREMENTS. PROVIDE 3/4"C TO FUEL CONTROL SYSTEM PANEL.
12. PROVIDE POWER AND CONTROL CONDUIT AND CONDUCTOR PER MANUFACTURERS REQUIREMENTS. PROVIDE 3/4"C POWER TO SITE PANEL VIA EMERGENCY SHUTDOWN CONTACTOR. PROVIDE 3/4"C CONTROL CONDUIT TO FUEL CONTROL PANEL.

0' 20' 40' 60'
1"=20'-0"

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CITY FUELING FACILITIES IMPROVEMENTS
PROJECT NO: 101010
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PUBLIC WORKS MAINTENANCE FACILITY

Jacobs

PROGRESS SET
PUBLIC SAFETY ENLARGED PLAN
ELECTRICAL

VERIFY SCALE
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0 1"

DATE	OCTOBER 2023
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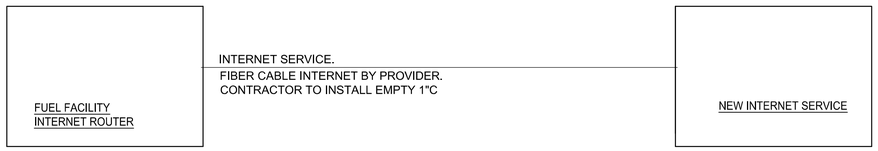
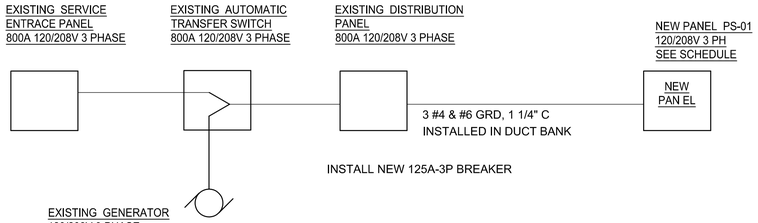
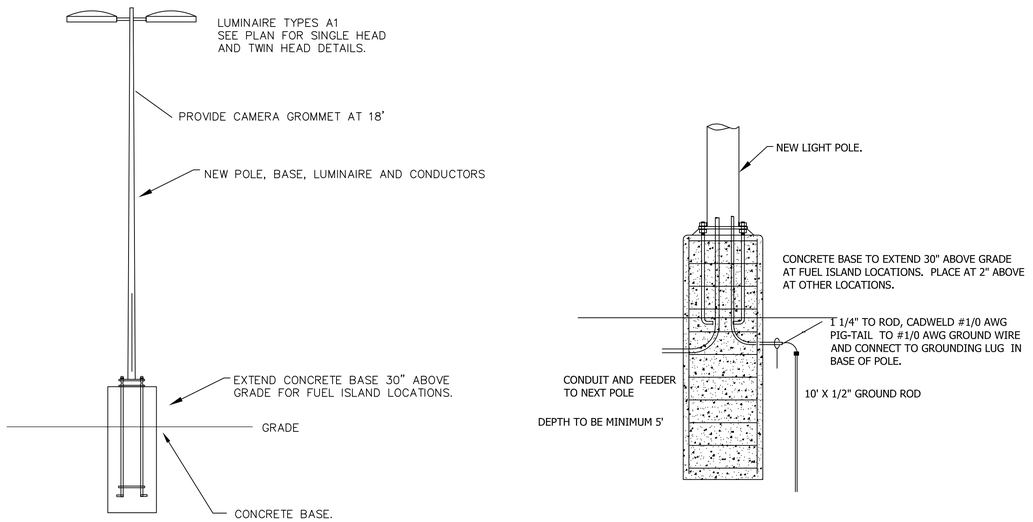


3 / E-3 PUBLIC SAFETY INTERNET ONE-LINE DIAGRAM

NO SCALE





1 / E-6 LIGHT POLE AND BASE DETAILS

NO SCALE

POWER SUPPLY: 120/208 VAC, 1PH, 3W BUS RATING: 100A, 10K A.I.C. MAIN BREAKER 100A-3P							LOCATION: EXTERIOR WP NEMA 4 MOUNTING: SURFACE NAME: PS-P1
DESCRIPTION	CCT BKR AMP	CCT No	PHASE A	PHASE B	PHASE C	CCT No	CCT BKR AMP	DESCRIPTION
AST-1 GAS PUMP CONTROLLED VIA E-STOP CONTACTOR PS-ESC	20/2 GFI	1				2	20/1	CONVENIENCE OUTLETS - MODEMS
		3				4	20/1	FUEL CONTROL SYSYTEM
AST-2 DIESEL PUMP CONTROLLED VIA E-STOP CONTACTOR PS-ESC	20/2 GFI	5				6	20/1	LIGHTS
		7				8	20/2	GATE #1 POWER
AST-2 RED DIESEL PUMP CONTROLLED VIA E-STOP CONTACTOR PS-ESC	20/2 GFI	9				10		
		11				12	20/2	GATE #2 POWER
DEF PUMP	20/2 GFI	13				14		
		15				16	20/2	GATE #3 POWER
DEF PUMP	20/2 GFI	17				18		
		19				20	20/1	EQUIPMENT ENCLOSURE AC
SPARE	20/2 GFI	21				22	20/1	AREA LIGHTS
		23				24	20/1	LEAK DETECTION SYSTEM
SPARE	20/1	25				26	20/1	SPARE
SPARE	20/1	27				28	20/1	SPARE
SPARE	20/1	29				30	20/1	SPARE
SPARE	20/1	31				32	20/1	SPARE

1 / E-6 PUBLIC SAFETY POWER ONE-LINE DIAGRAM

NO SCALE

LIGHT POLE SCHEDULE

TYPE	MANUFACTURER	DESCRIPTION	FINISH COLOR	POLE HEIGHT	REMARKS
P1	LITHONIA	ROUND SMOOTH TAPERED STEEL POLE WITH SINGLE LIMUNAIRE ARM, ANCHOR BASE.. WITH VIBRATION DAMPENER.	NATURAL ALUMINUM	20	MOUNT ON CONCRETE BASE 2" ABOVE GRADE
P2	LITHONIA	ROUND SMOOTH TAPERED STEEL POLE WITH DOUBLE LUMINAIRE, ANCHOR BASE. WITH VIBRATION DAMPENER.	NATURAL ALUMINUM	20	MOUNT ON 36" RAISED CONCRETE BASE.

LUMINAIRE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	FINISH COLOR	MOUNTING HEIGHT	VOLTAGE	LUMINAIRE WATTAGE	COLOR TEMPURATURE	DISTRIBUTION	REMARKS
A1	LITHONIA	RSX1 P2 30K R4 MVOLT WITH NLTAIR2PIRHN nLIGHT AIR GEN 2 NETWORKED BI-LEVEL MOTION/AMBIENT SENSOR	AREA LUMINAIRE	DARK BRONZE	20 - 23	MVOLT	72 WATTS	3000K	TYPE IV	

ENGINEERS INC
FARGO, ND 58102
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Professional Engineer (Electrical) JOSEPH A. KATH 32187 DATE 10-5-2023 Arizona, U.S.A. Expires 3-31-2024

NO.	DSGN	DATE	REVISION	CHK	BY	APVD
	JAK			JAK		JAK

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PUBLIC SAFETY
ONE-LINES, DETAILS

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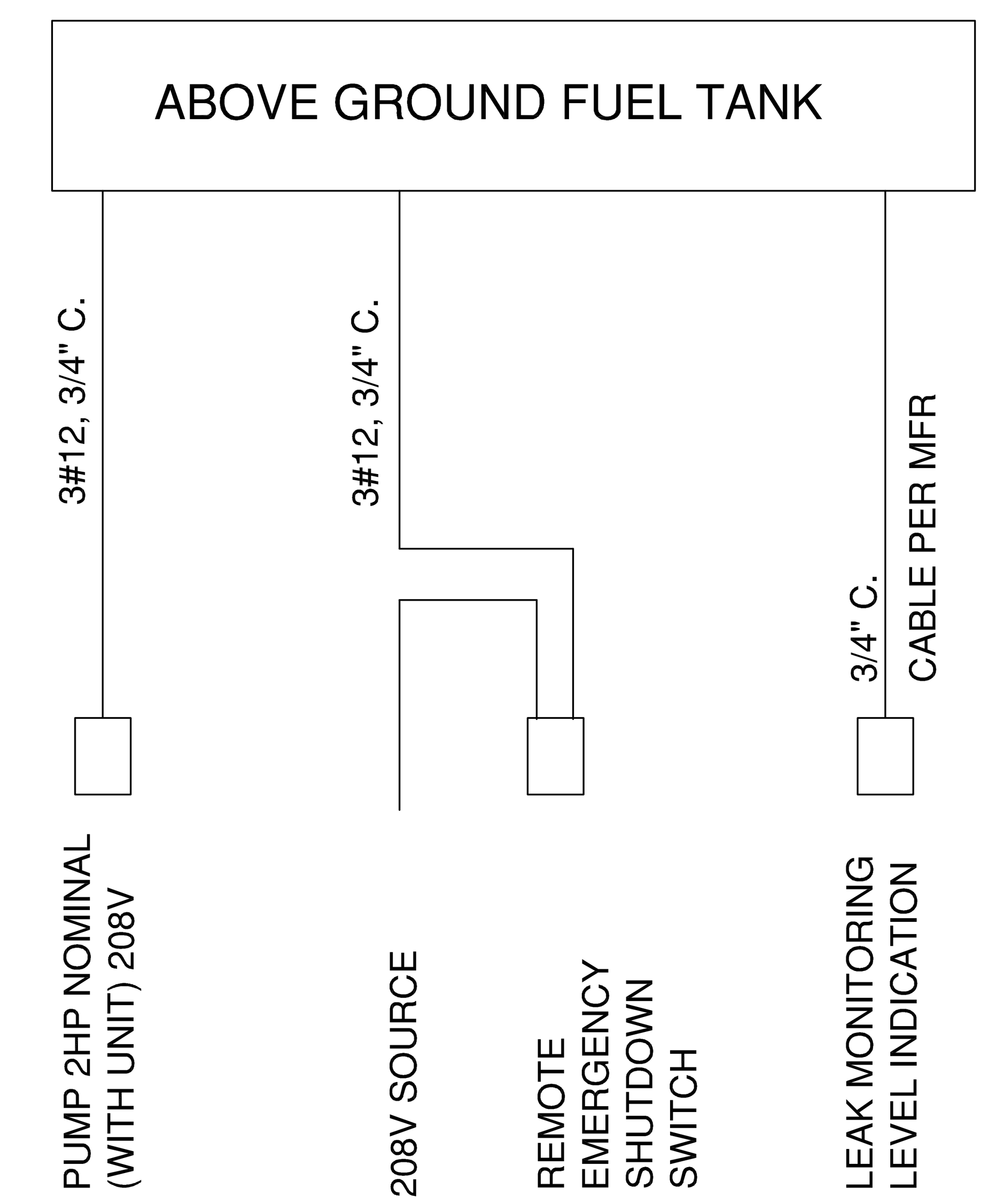
CONSTRUCTION NOTES:

GENERAL:

PROVIDE ELECTRICAL INSTALLATION IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC) FOR FUEL TANK STORAGE AND DISPENSING EQUIPMENT AND FACILITIES. PROVIDE WIRING METHODS AND SEALING REQUIREMENTS PER NEC. REPLACE/RESTORE ALL SEALS IN ANY EXISTING CONDUIT THAT MAY BE RETAINED AND REUSED FOR REPLACEMENT EQUIPMENT.

ELECTRICAL CONSTRUCTION NOTES:

1. EXISTING POWER SOURCE PANELBOARD 120/208V 3 PHASE. LOCATED IN INTERIOR ELECTRICAL CLOSET. ROUTE NEW POWER CIRCUITS FROM THIS LOCATION TO EXTERIOR OF BUILDING. SURFACE MOUNT CONDUIT IN EXPOSED OPEN CEILING AREA BETWEEN CLOSET AND EXTERIOR COURTYARD. SURFACE MOUNT CONDUIT TO EXTERIOR OF BUILDING AS NECESSARY WITHIN COURTYARD AREA.
2. POWER CIRCUIT FOR DIESEL TANK. 3#12, 3/4" EMT POWER. 1-3/4" EMT CONTROL-MONITORING. SURFACE MOUNTED AT 8' A.G. ALONG COURTYARD WALL OF BUILDING AND COURTYARD PERIMETER WALL. TRANSITION TO RSC WITH SEAL-OFFS BEFORE TANK. CONNECT TO DIESEL FUEL PUMP AND HOSE DISPENSER. PROVIDE 20A-2P BREAKER IN EXISTING PANEL.
3. PROVIDE EXPLOSION PROOF DISCONNECT SWITCH AND CONNECTION TO DIESEL PUMP. COORDINATE CONNECTION POINT OF TANK WITH TANK MANUFACTURER.
4. PROVIDE NEW EMERGENCY SHUT DOWN SWITCH FOR DIESEL FUEL PUMP MOTOR. SURFACE MOUNT TO EXTERIOR WALL.
5. NEW ABOVE GROUND DIESEL TANK. PROVIDE NEW ELECTRICAL CONNECTION TO PUMP, EMERGENCY DISPENSER SHUT DOWN SWITCH, LEVEL GAUGE AND LEAK DETECTION MONITORING SYSTEMS. SEE DETAILS AND DIAGRAMS.



ABOVE GROUND TANK DIAGRAM

SCALE: NONE

TYPICAL EACH TANK.

PROVIDE ELECTRICAL INSTALLATION IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC) FOR FUEL TANK STORAGE AND DISPENSING EQUIPMENT AND FACILITIES. PROVIDE WIRING METHODS AND SEALING REQUIREMENTS PER NEC. PROVIDE INSTALLATION AND CABLE TYPES PER MANUFACTURER RECOMMENDATIONS.

N

0 10 20 30

1"=10'-0"

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POLICE DEPARTMENT
ELECTRICAL PLAN AND DETAILS

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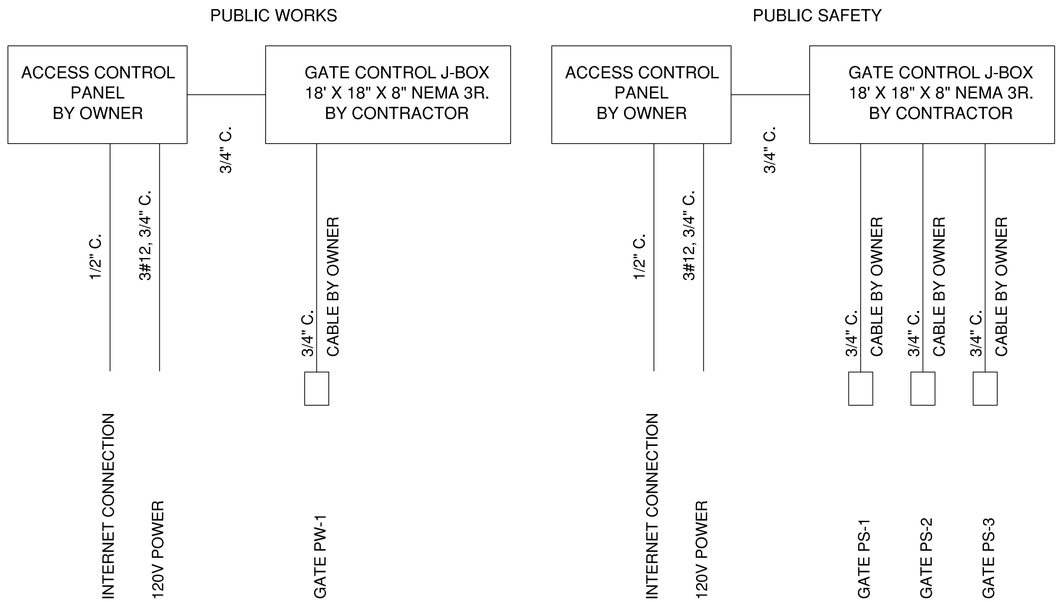


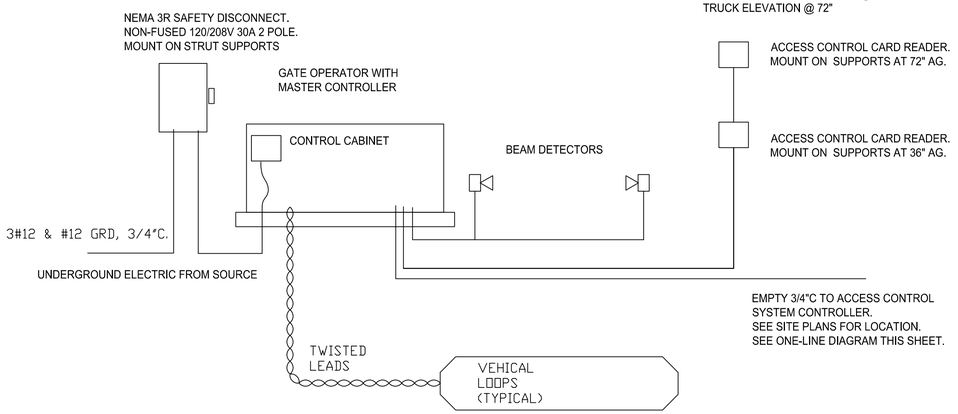
3 E-8 ACCESS CONTROL ONE-LINE DIAGRAM
NO SCALE

NOTES:

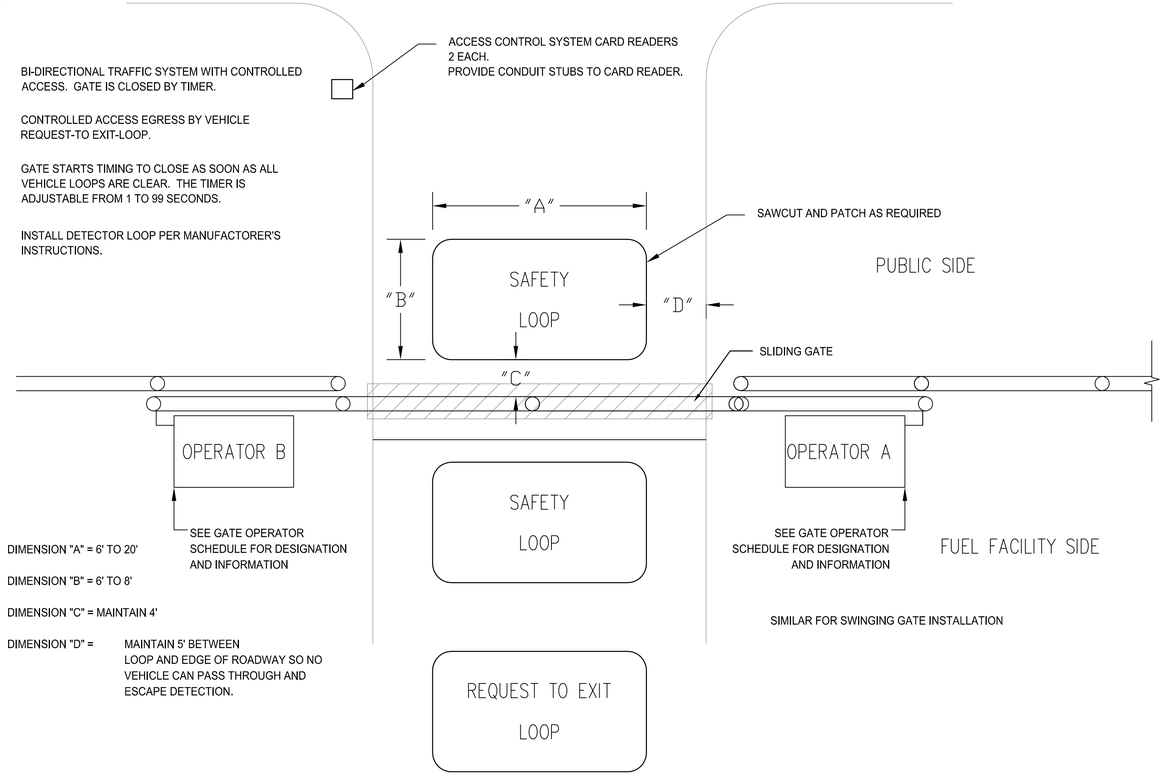
CONTRACTOR TO PROVIDE ONLY EMPTY CONDUIT WITH PULL STRING FOR ACCESS CONTROL CONTROL SYSTEM.

OORDINATE CONDUIT LOCATIONS WITH OWNER. SUBMIT SKETCH OF FINAL CONDUIT LAYOUT TO ENGINEER AFTER COORDINATION AND PRIOR TO INSTALLATION OF CONDUIT.

ALL UNDERGROUND CONDUIT THAT CROSSES NEC 514 CLASSIFIED BOUNDARIES SHALL BE OVC COATED RIGID STEEL WITH APPROPRIATE SEALS. INSTALL SEAL MATERIAL AFTER CABLE INSTALLATION (BY OTHERS.)



1 E-8 TYPICAL GATE ONE-LINE DIAGRAM
NO SCALE



2 E-8 DETECTOR LOOP TYPICAL LAYOUT
NO SCALE

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DETAILS AND DIAGRAMS ELECTRICAL

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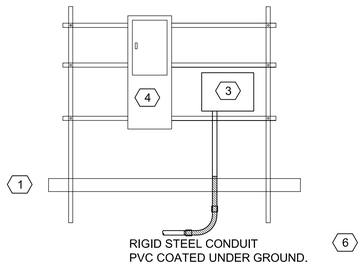
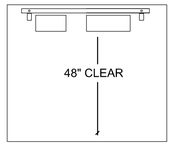


RIGID STEEL CONDUIT
PVC COATED UNDER GROUND.

EQUIPMENT ELEVATION DETAIL NOTES

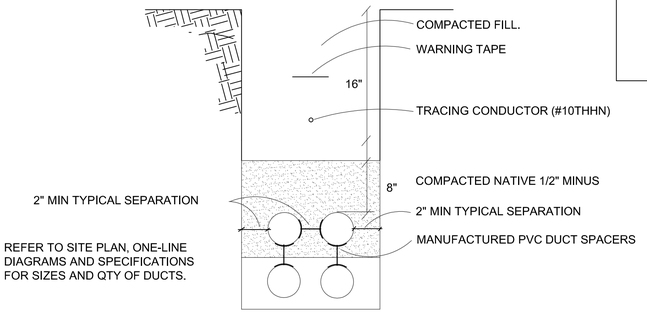
1. 4" CONCRETE HOUSEKEEPING PAD FOR EQUIPMENT. EXTEND 24" BEYOND WIDTH OF LINEUP.
2. STRUT RACK SUPPORT FOR PANELS
3. FUEL EMERGENCY SHUT DOWN CONTACTOR.
4. ELECTRICAL POWER PANEL. SEE ONE-LINE DIAGRAMS FOR EACH STATION.
5. CONDUIT TO ENTER ONLY BOTTOM OF PANELS.
6. SEAL OFF AS REQUIRED NEC 514.



WIDTH AS REQUIRED FOR EQUIPMENT

1 E-9 ELECTRICAL EQUIPMENT PANEL ELEVATIONS

NO SCALE



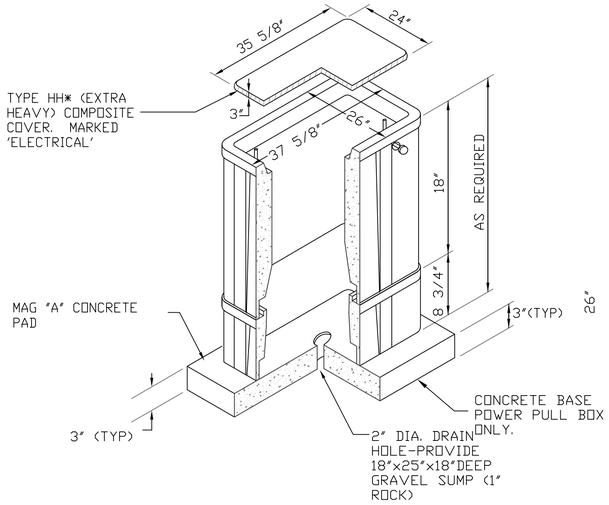
REFER TO SITE PLAN, ONE-LINE DIAGRAMS AND SPECIFICATIONS FOR SIZES AND QTY OF DUCTS.

2 E-9 ELECTRICAL EQUIPMENT CONCRETE PAD

NO SCALE

3 E-9 TRENCH DETAIL

NO SCALE

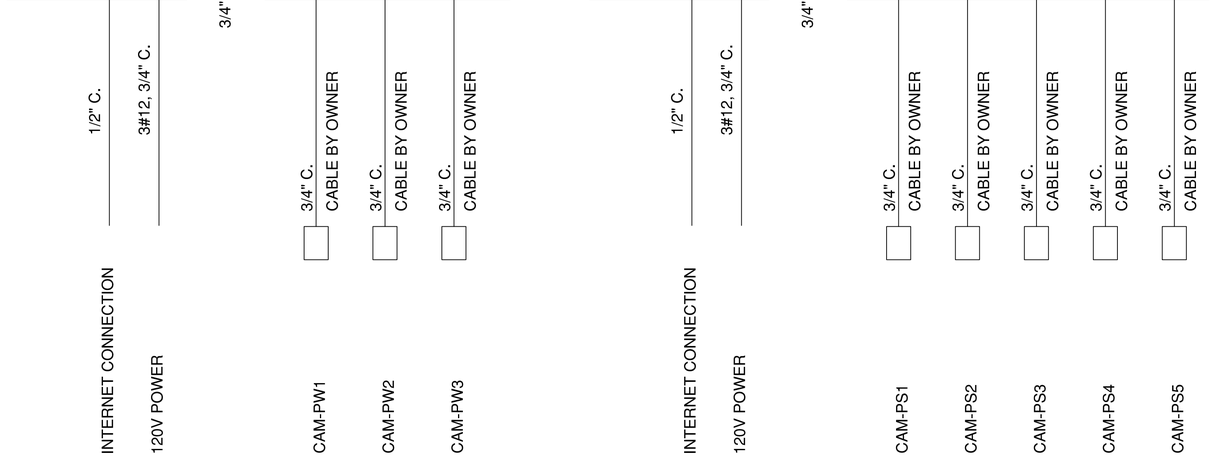


4 E-9 IN-GROUND PULLBOX DETAIL

NO SCALE

PULL BOXES TO BE POLYMERE CONCRETE TYPE WITH EXTRA* HEAVY DUTY COVERS. HH RATED.

POWER PULLBOX NOTES: 11' X 17' NOMINAL
PROVIDE CONCRETE SOLID BASE.
ALL CONDUIT ENTRIES SHALL TERMINATE IN THE SIDES OF THE BOX WITH END BELLS INSTALLED FLUSH WITH INSIDE WALL OF BOX OR HANDHOLE. SAW CUT KNOCKOUTS.



2 E-10 CAMERA CONDUIT SYSTEM

SCALE: NONE

NOTES:

CONTRACTOR TO PROVIDE ONLY EMPTY CONDUIT WITH PULL STRING. CAMERA SYSTEM INCLUDING CAMERA'S CABLING, MOUNTING, CONFIGURATION AND STARTUP IS FURNISHED BY OTHERS.

OORDINATE CONDUIT LOCATIONS WITH OWNER. SUBMIT SKETCH OF FINAL CONDUIT LAYOUT TO ENGINEER AFTER COORDINATION AND PRIOR TO INSTALLATION OF CONDUIT.

STUB UP CONDUIT AT CAMERA CONTROL SYSTEM J-BOX ADACENT TO CAMERA CONTROLLER. NEATLY ARRANGE CONDUIT AND ALIGN SEAL-OFFS AS REQUIRED.

ALL UNDERGROUND CONDUIT THAT CROSSES NEC 514 CLASSIFIED BOUNDARIES SHALL BE OVC COATED RIGID STEEL WITH APPROPRIATE SEALS. INSTALL SEAL MATERIAL AFTER CABLE INSTALLATION (BY OTHERS.)

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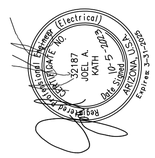

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DETAILS AND DIAGRAMS ELECTRICAL

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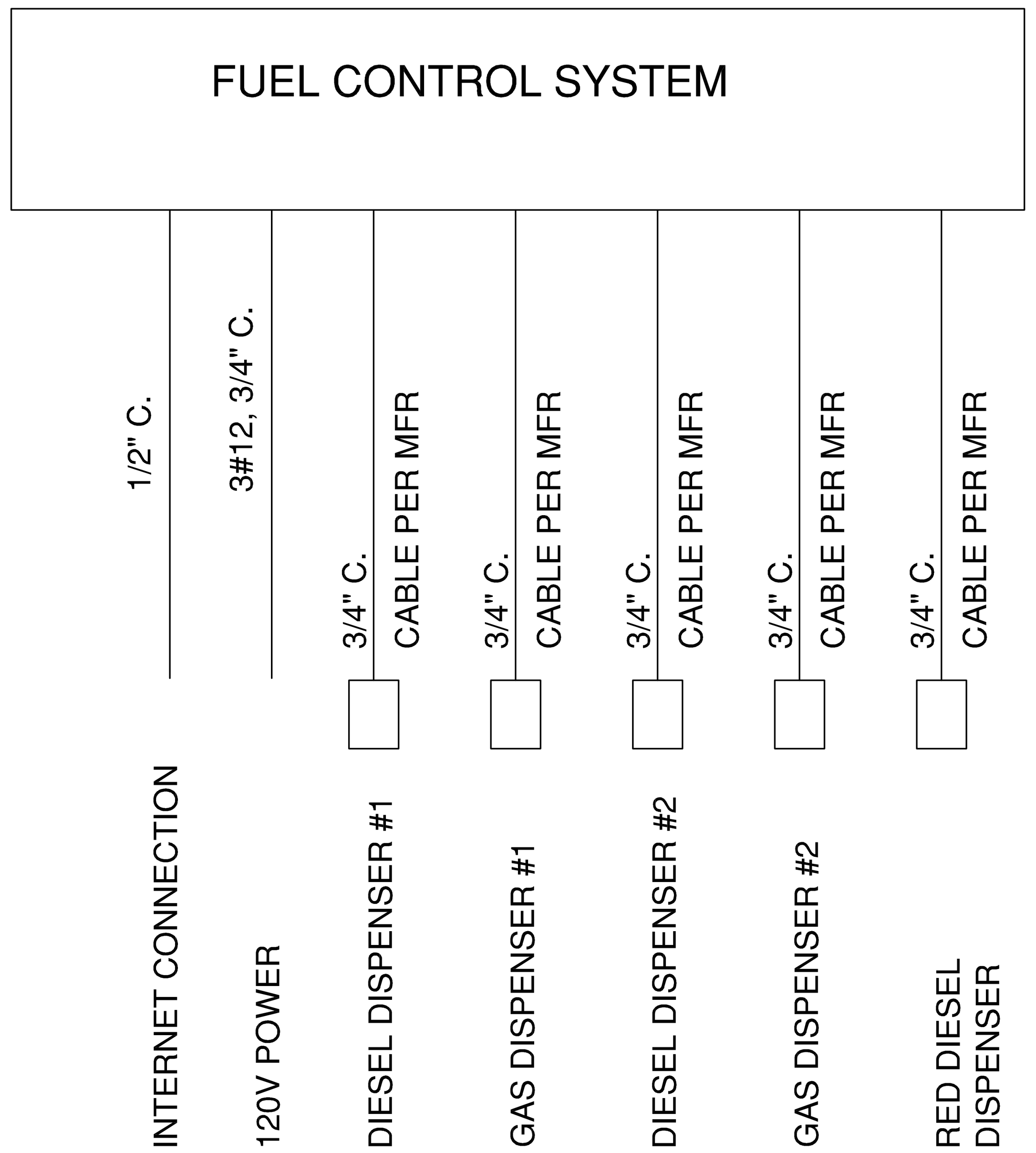
FUEL CONTROL SYSTEM

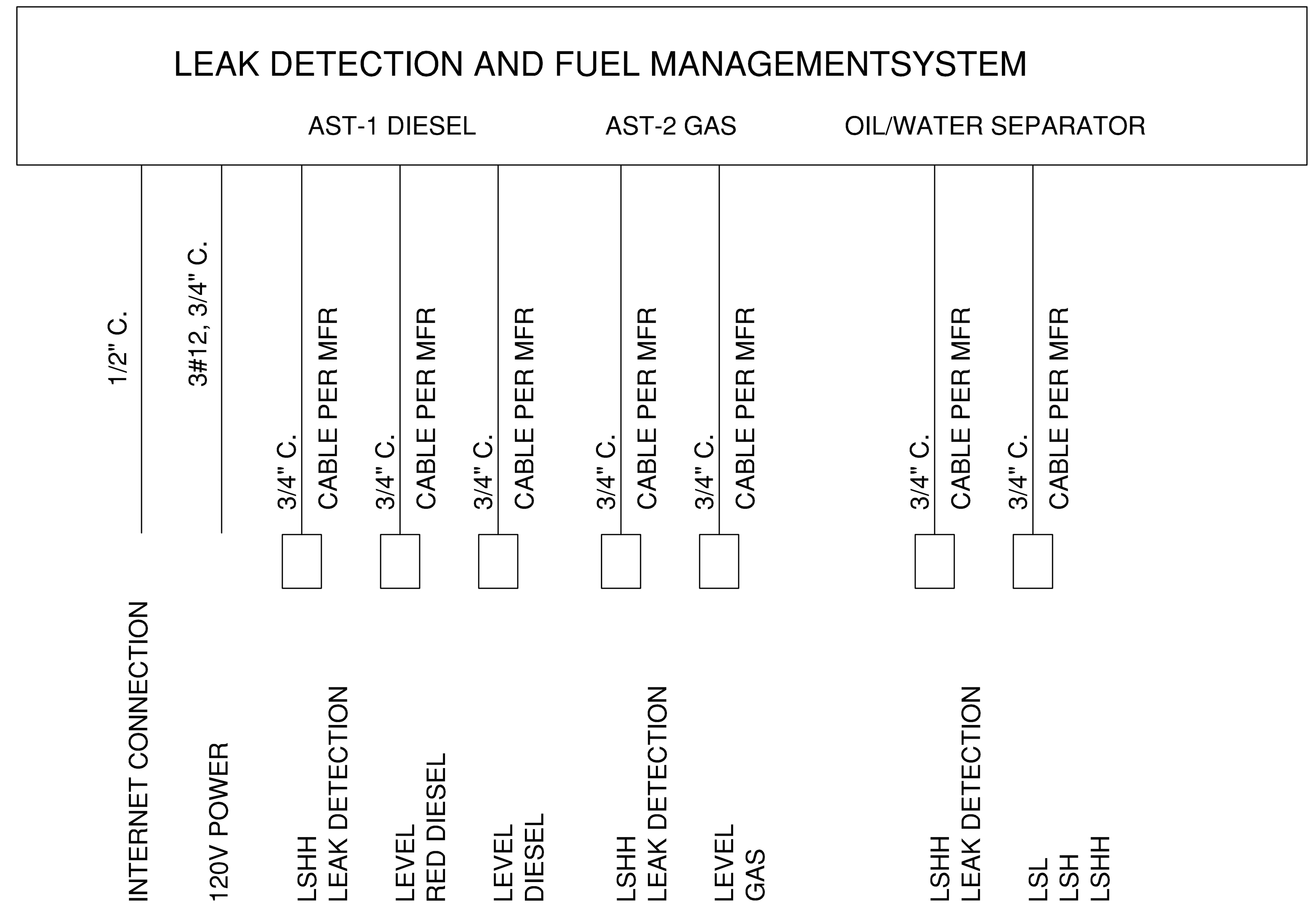


2 / E-10 FUEL CONTROL SYSTEM ONE-LINE DIAGRAM

SCALE: NONE

COORDINATE CABLE AND CONDUIT CONFIGURATION WITH MANUFACTURER. CONTRACTOR TO PROVIDE CONDUIT AND CABLE ONLY. CONTROL SYSTEM INCLUDING CONFIGURATION AND STARTUP IS FURNISHED BY CITY.

LEAK DETECTION AND FUEL MANAGEMENTSYSTEM

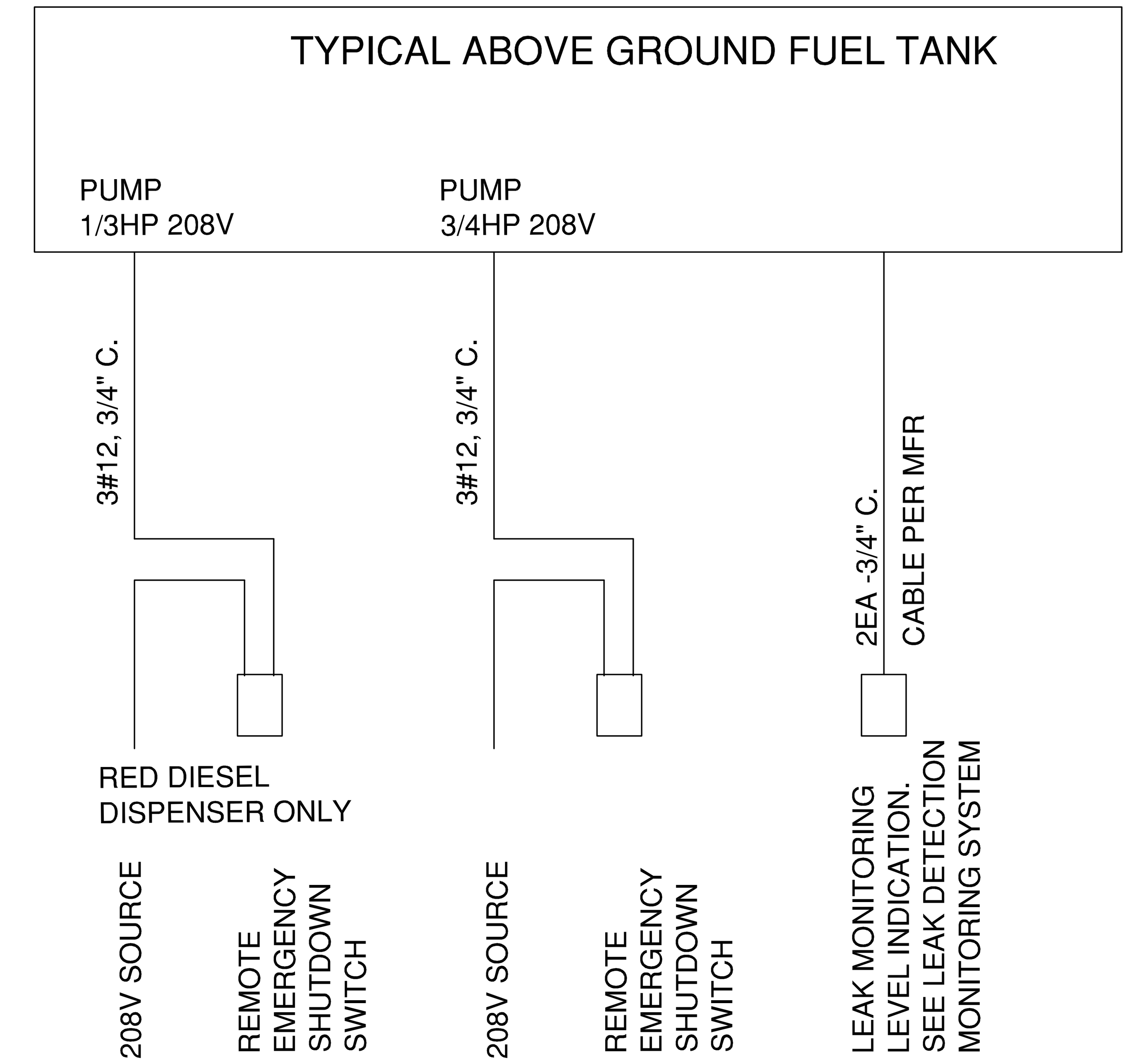


2 / E-10 LEAK DETECTION SYSTEM ONE-LINE DIAGRAM

SCALE: NONE

COORDINATE CABLE AND CONDUIT CONFIGURATION WITH MANUFACTURER.

TYPICAL ABOVE GROUND FUEL TANK



2 / E-10 ABOVE GROUND TANK DIAGRAM

SCALE: NONE

TYPICAL EACH TANK.

PROVIDE ELECTRICAL INSTALLATION IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE (NEC) FOR FUEL TANK STORAGE AND DISPENSING EQUIPMENT AND FACILITIES. PROVIDE WIRING METHODS AND SEALING REQUIREMENTS PER NEC. PROVIDE INSTALLATION AND CABLE TYPES PER MANUFACTURER RECOMMENDATIONS.

STANDARD SYMBOLS AND DESIGNATIONS

FIELD MOUNTED

MOUNTED ON FACE OF PANEL

MOUNTED ON INSIDE OF PANEL

INSTRUMENTS SHARING COMMON HOUSING

AL # / YL # / UL # — ALARM OR PILOT LIGHT

HS # XX — HAND SELECTOR SWITCH OR PUSHBUTTON XX DENOTES FUNCTION

AE # XX — ANALYZING ELEMENT XX DENOTES MEASURED SUBSTANCE/CONCENTRATION

FY # XX — INSTRUMENT RELAY MOUNTED IN REAR OF PANEL (BROKEN LINE) ACTIVATES AND DEACTIVATES CONTROL AND/OR ALARM SWITCHES AT PRESET SIGNAL VALUES. SEE BELOW FOR FUNCTIONS (X).

>	HIGH SELECTOR
<	LOW SELECTOR
I/I	CURRENT/CURRENT CONVERTER
R/I	RESISTANCE/CURRENT CONVERTER
AV	AVERAGE
%	RATIO
ACK	ACKNOWLEDGE
E-STP	EMERGENCY STOP
FSR	FORWARD-STOP-REVERSE
H	ALARM HORN
HOR	HAND-OFF-REMOTE
JOG	JOG OR PULSE
LOR	LOCAL-OFF-REMOTE
MAN	MANUAL
OC	OPEN-CLOSE
OO	OFF-ON
OSC	OPEN-STOP-CLOSE
POT	POTENTIOMETER
RS	RESET
SS	START PUSHBUTTON AND STOP PUSHBUTTON (SHOWN AS ONE DEVICE FOR CLARITY)
STP	STOP
STA	START

A — ALARM BEACON LETTER INDICATES COLOR

FIT # / M — MAGNETIC FLOW METER FLOWTUBE TYPE

PI ## / PS ## — PRESSURE GAUGE / SWITCH (WITH ANNULAR DIAPHRAM SEAL)

HAND SWITCH DESIGNATIONS

HS 1 SS — DESIGNATION TYPE

OA	ON-AUTO
OOA	ON-OFF-AUTO
LR	LOCAL REMOTE
OC	OPEN-CLOSE
OO	ON-OFF
OOR	ON-OFF-REMOTE
LOR	LOCAL-OFF-REMOTE
FR	FORWARD-REVERSE
SS	START/STOP

EQUIPMENT ABBREVIATION LIST

ADDITIONAL DESIGNATIONS MAY ACCOMPANY VALVE OR GATE SYMBOLS:

NC	NORMALLY CLOSED
FC	FAILS CLOSED
FO	FAILS OPEN
FIP	FAILS IN LAST POSITION

TAG NUMBERS AND DESIGNATIONS

PIT 1-1 SD2
- FIRST LETTER
- SUCEEDING LETTERS
- NUMBER AFTER DASH DENOTES MULTIPLE DEVICES IN IDENTICAL DUPLICATE SYSTEMS. LETTER AFTER THE LOOP NUMBER IS USED TO DISTINGUISH MULTIPLE SIMILAR DEVICES IN THE SAME INSTRUMENT LOOP.
- LOOP DESIGNATION
- SEE INSTRUMENTATION ABBREVIATIONS

STANDARD ONE LINE DIAGRAM LEGEND

500KVA 4.16KV Δ-480Y/277V — TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, AND KVA RATING AS NOTED.

20 — 22: 3#8,#10G,2" — CIRCUIT NO.22 WITH 3#8 INSULATED CONDUCTORS, 1#10, GROUND WIRE ALL IN 2" CONDUIT TO 20 HP MOTOR.

AUX. ITEMS MAY NOT BE SHOWN COMPLETELY. — ONE-LINE SHOWING POWER AND CONTROL TO A PACKAGE UNIT, AS FOR EXAMPLE A RESIDUAL ANALYZER OR A PUMP CONTROL DIRECTOR, SHALL IMPLY THAT ANY AND ALL ASSOCIATED EQUIPMENT SHALL ALSO BE INSTALLED AND WIRED AS REQUIRED BY THE EQUIPMENT FURNISHED.

3P-20 — LOW VOLTAGE AIR CIRCUIT BREAKER, 3 POLE, 20 AMPERE

S4 — SIZE 4 COMBINATION MAGNETIC MOTOR STARTER

CONDUIT & WIRING INSTALLATION LEGEND

CONDUIT EXPOSED

CONDUIT CONCEALED

SHORT DASH FOR EACH PHASE CONDUCTOR. LONG DASH FOR NEUTRAL CONDUCTOR. CIRCULAR DASH FOR GROUND WIRE.

PPHS1-5 — TYPICAL HOME RUN TO BE ROUTED TO PANEL PPHS1 & CONNECTED TO CIRCUIT #5

STANDARD SCHEMATIC DRAWINGS

- WIRE INTERSECTION POINT
- EXTERNAL CONNECTION POINT
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- STARTER, CONTACTOR OR RELAY COIL
- NORMALLY OPEN PUSH BUTTON
- NORMALLY CLOSED PUSH BUTTON
- INDICATING LIGHT
- FUSE
- CONTROL TRANSFORMER
- SWITCH
- MANUAL STARTER
- OVERLOAD
- TEMPERATURE SWITCH (CLOSING ON RISING TEMPERATURE)
- LIMIT SWITCH (NORMALLY OPEN)
- PRESSURE SWITCH (OPENS ON INCREASING VACUUM)

STANDARD CONTROL SYSTEM LEGEND

LINE SYMBOLS

- MAJOR PROCESS PIPING OR FLOW CHANNEL. ARROW INDICATES FLOW.
- ARROW INDICATES EMERGENCY OR OPTIONAL FLOW.
- ELECTRICAL SIGNAL
- C — PROCESS OR SIGNAL LINE CONTINUED ON ANOTHER SHEET OR OTHER LOCATION.
- A — PROCESS OR SIGNAL LINE CONTINUED FROM ANOTHER SHEET OR OTHER LOCATION.

- GATE VALVE
- GLOBE VALVE
- PLUG VALVE
- DIAPHRAM VALVE
- BUTTERFLY VALVE
- BALL VALVE
- PINCH VALVE
- NEEDLE VALVE
- CHECK VALVE

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Registered Professional Engineer (Electrical) CERTIFICATE NO. 32187 JOEL A. KATH Date Signed 10-5-2023 ARIZONA, U.S.A. Expires 3-31-2025

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DETAILS AND DIAGRAMS
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