



CITY OF SURPRISE PUBLIC WORKS DEPARTMENT

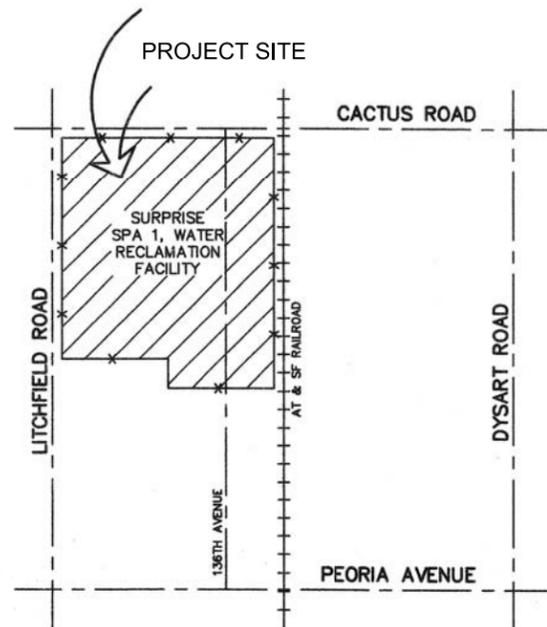
COS 11-011 TTHM REDUCTION PROJECT SPA-1 AMMONIA STORAGE AND FEED FACILITY VOLUME 3 OF 3

NOVEMBER 2013

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CONTRACT FORMS, AND
CONDITIONS OF CONTRACT
VOLUME 2: SPECIFICATIONS
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VICINITY MAP
NTS

PROJECT ADDRESS: 11401 N 136th AVENUE, SURPRISE AZ
TOWNSHIP 3N, RANGE 1W, SECTION 22

THESE PLANS ARE FOR OFFICIAL USE ONLY AND MAY NOT BE SHARED WITH OTHERS EXCEPT AS REQUIRED TO FULFILL THE OBLIGATIONS OF YOUR CONTRACT WITH THE CITY OF SURPRISE.

IN ACCORDANCE WITH AAC R18-119, ALL MATERIALS INSTALLED AFTER JANUARY 1, 1993, WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATIONS STANDARDS 60 & 61.

APPROVALS

CITY OF SURPRISE SIGNATURE BLOCK

THIS SET OF PLANS HAS BEEN REVIEWED FOR COMPLIANCE WITH CITY REQUIREMENTS PRIOR TO ISSUANCE OF PERMITS. THE CITY NEITHER ACCEPTS NOR ASSUMES ANY LIABILITY FOR ERRORS OR OMISSIONS. THIS COMPLIANCE APPROVAL SHALL NOT PREVENT THE CITY ENGINEER FROM REQUIRING CORRECTIONS OF ERRORS OR OMISSIONS IN PLANS FOUND TO BE IN VIOLATION OF LAW OR ORDINANCES.

APPROVED: _____ DATE _____
CITY OF SURPRISE ENGINEER

APPROVED: _____ DATE _____
CITY OF SURPRISE UTILITIES ASSISTANT DIRECTOR

APPROVED: _____ DATE _____
MARICOPA COUNTY ENVIRONMENTAL SERVICES DEPARTMENT MCESD#

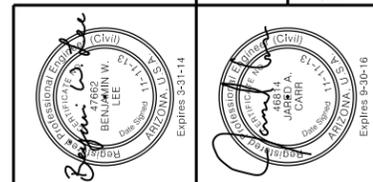
AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE AS-BUILT MEASUREMENTS AS SHOWN OR NOTED HEREON WERE MADE BY MYSELF OR BY THOSE UNDER MY SUPERVISION AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

REGISTERED LAND SURVEYOR/ENGINEER

REGISTRATION NUMBER

CALL TWO WORKING DAYS
BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(OUTSIDE MARICOPA COUNTY)



GENERAL
COVER

DRAWN
MP
DESIGN
JC

DATE
NOVEMBER 2013
PROJECT NUMBER
11-023
DRAWING NUMBER
G-001

SHEET - OF -

GENERAL ENGINEERING NOTES:

- THE ENGINEER WILL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES OR FOR SAFETY PRECAUTIONS OR PROGRAMS UTILIZED IN CONNECTION WITH THE WORK, AND THEY WILL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- EXISTING UTILITIES SHOWN ON THESE PLANS HAVE BEEN LOCATED ACCORDING TO INFORMATION PROVIDED BY THE AGENCY OPERATING EACH UTILITY. LOCATIONS SHOWN ARE APPROXIMATE ONLY, AND ARE NOT RELIABLE FOR CONSTRUCTION PURPOSES. CALL BLUE STAKE FOR FIELD LOCATION AT 602-263-1100.
- THE ENGINEER AND APPLICABLE AGENCY MUST APPROVE, PRIOR TO CONSTRUCTION, ANY ALTERATION OR VARIANCE FROM THESE PLANS. ANY VARIATION FROM THESE PLANS SHALL BE PROPOSED AND RESUBMITTED FOR REVIEW AND APPROVAL.
- THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING UTILITIES ON THE SITE. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN OR NOT ON THE DRAWING, SHALL BE REPAIRED/REPLACED AT THE CONTRACTOR'S EXPENSE. EXISTING SURFACE FEATURES AND FENCING SHALL BE REPLACED IN KIND.
- ANY INSPECTION BY THE CITY, COUNTY, OR THE ENGINEER, SHALL NOT IN ANY WAY RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN STRICT COMPLIANCE WITH THE APPLICABLE CODES AND AGENCY REQUIREMENTS.
- CONTRACTOR IS TO LOCATE ALL EXISTING PROPERTY MONUMENTS PRIOR TO CONSTRUCTION. A REGISTERED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE SHALL REPLACE ANY MONUMENTS DISTURBED DURING THE CONSTRUCTION OF THIS PROJECT PER THE REQUIREMENTS OF ARS 33-106.
- NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL CREATE, NOR SHALL BE CONSTRUED TO CREATE, ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR ANY SUBCONTRACTOR.
- ALL CONSTRUCTION WATER USED WITHIN THE CITY OF SURPRISE WATER SERVICE AREA REQUIRES APPROVAL BY THE CITY OF SURPRISE PUBLIC WORKS DEPARTMENT AND MAY BE SUBJECT TO VOLUME AND TIME RESTRICTIONS. PLEASE SEE THE CITY OF SURPRISE CONSTRUCTION WATER GUIDELINES FOR ADDITIONAL INFORMATION. THE GUIDELINES CAN BE OBTAINED FROM THE PUBLIC WORKS DEPARTMENT AT 623-222-7000.
- THE CONTRACTOR SHALL MAKE NO CLAIM AGAINST THE OWNER OR THE ENGINEER REGARDING THE ALLEGED INACCURACY OF CONSTRUCTION STAKES SET BY THE ENGINEER UNLESS ALL SURVEY STAKES SET BY THE ENGINEER ARE MAINTAINED INTACT AND CAN BE VERIFIED AS TO THEIR ORIGIN. IF, IN THE OPINION OF THE ENGINEER, THE STAKES ARE NOT MAINTAINED INTACT AND CANNOT BE VERIFIED AS TO THEIR ORIGIN, ANY REMEDIAL WORK REQUIRED TO CORRECT ANY ITEM OR IMPROPER CONSTRUCTION WORK IN THIS DEVELOPMENT SHALL BE PERFORMED AT THE SOLE EXPENSE OF THE RESPONSIBLE CONTRACTOR OR SUBCONTRACTOR.
- PRIOR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK, THE DEVELOPER/CONTRACTOR WILL BE REQUIRED TO CLEAN AND REPAIR ADJACENT (OFF-PROJECT) ROADWAYS USED OR DAMAGED DURING THE COURSE OF CONSTRUCTION.
- EMERGENCY VEHICLE ACCESS (E.V.A.) MUST BE PROVIDED BY THE CONTRACTOR THROUGHOUT THE PROJECT SITE. E.V.A. ROADS AND SIGNAGE SHALL BE MAINTAINED BY THE CONTRACTOR AT ALL TIMES. SIGNAGE SHALL BE POSTED AT THE POINT OF ENTRY TO THE SITE AND AT ALL LOCATIONS WHERE A CHANGE IN DIRECTION OCCURS.
- THE PLANS SHALL COMPLY WITH THE AMERICANS WITH DISABILITIES ACT'S ACCESSIBILITIES GUIDELINES, AS PUBLISHED IN THE FEDERAL REGISTER ON SEPTEMBER 15, 2010, AS PERTAINS TO CURB AND RAMP, RAMP, CROSS WALK, SLOPE AND CROSS SLOPE OF SIDEWALK, AND PARKING REQUIREMENTS.

PAVING NOTES:

- CONSTRUCTION WITHIN THE RIGHT-OF-WAY SHALL CONFORM TO THE LATEST APPLICABLE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS AND DETAILS UNLESS OTHERWISE STATED ON PLANS.
- THE CITY OF SURPRISE ENGINEERING SERVICES OF PUBLIC WORKS SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION WORK AT 623-222-6150.
- THE ACTUAL POINT OF PAVEMENT MATCHING AND/OR TERMINATION, SHALL BE DETERMINED IN THE FIELD BY A CITY OF SURPRISE FIELD INSPECTOR.
- ALL FRAMES, COVERS, VALVE BOXES, AND MANHOLE COVERS SHALL BE ADJUSTED TO FINISH GRADE AFTER COMPLETION OF PAVING OR RELATED CONSTRUCTION.
- CONSTRUCTION OF SURFACE IMPROVEMENTS SHALL NOT BEGIN UNTIL CONFLICTING UNDERGROUND UTILITY CONSTRUCTION IS COMPLETED AND SERVICE CONNECTIONS TO ALL PLATTED LOTS HAVE BEEN ADEQUATELY EXTENDED TO THE RIGHT-OF-WAY OR PUBLIC UTILITY EASEMENT.
- THE PERMITTEE SHALL ARRANGE FOR THE RELOCATION COSTS OF ALL UTILITIES, INCLUDING ANY STREET LIGHTS, AND SUBMIT A UTILITY RELOCATION SCHEDULE PRIOR TO THE ISSUANCE OF A CONSTRUCTION PERMIT.
- TREES AND SHRUBBERY IN THE RIGHT-OF-WAY THAT CONFLICT WITH PROPOSED IMPROVEMENTS SHALL NOT BE REMOVED WITHOUT APPROVAL FROM THE CITY. THE PERMITTEE SHALL BE RESPONSIBLE FOR OBTAINING AUTHORIZATION FROM CITY OF SURPRISE COMMUNITY DEVELOPMENT AT 623-222-3000 TO REMOVE AND/OR RELOCATE SAID TREES AND SHRUBBERY.
- DAMAGED AND/OR DISPLACED CONCRETE CURB, GUTTER, SIDEWALK, OR DRIVEWAY SLAB THAT IS WITHIN THE RIGHT-OF-WAY SHALL BE REPAIRED OR REPLACED BEFORE FINAL ACCEPTANCE OF THE WORK.
- GRADING BETWEEN BACK OF CURB AND PROPERTY LINE SHALL BE LIMITED TO 4:1 SLOPE. PROTECT SLOPES FROM EROSION AND/OR TRANSPORTING SILT ONTO STREETS OR ADJACENT PRIVATE PROPERTY.
- ALL INLET GRATES ARE TO BE BICYCLE SAFE GRATES.
- ALL FIRE HYDRANTS SHALL HAVE A TWO-WAY BLUE REFLECTOR INSTALLED PER CITY OF SURPRISE STANDARD DETAIL 4-23.
- STREET SIGNS SHALL BE FURNISHED AND INSTALLED BY THE DEVELOPER AT THE LOCATIONS SHOWN ON THE SIGNAGE, STRIPING, OR PAVING PLAN. ALL STREET SIGNS SHALL BE INSTALLED PER CITY OF SURPRISE STREET SIGN AND STREET SIGN BASE DETAILS IN CHAPTER 4 OF THE CITY OF SURPRISE STANDARD DETAILS.
- ASPHALT MIX DESIGN SHALL BE SUBMITTED TO THE CITY OF SURPRISE ENGINEERING DEVELOPMENT SERVICES DIVISION PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- THE PLANS SHALL COMPLY WITH THE AMERICANS WITH DISABILITIES ACT'S ACCESSIBILITIES GUIDELINES, AS PUBLISHED IN FEDERAL REGISTER ON JULY 26, 1991, AS PERTAINS TO CURB AND RAMP, RAMP, CROSS WALK, SLOPE AND CROSS SLOPE OF SIDEWALK, AND PARKING REQUIREMENTS.

GENERAL POTABLE WATER NOTES:

- ALL CONSTRUCTION MUST CONFORM TO MARICOPA ASSOCIATION OF GOVERNMENT (MAG) SPECIFICATIONS AND DETAILS AND LATEST REVISIONS UNLESS OTHERWISE STATED ON PLANS.
- THE CITY OF SURPRISE PUBLIC WORKS DEPARTMENT SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION WORK; CONTACT ENGINEERING SERVICES AT 623-222-6150 AND UTILITIES SERVICES AT 623-222-6000.
- ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE CITY ENGINEER AND/OR ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THE SPECIFICATION IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL UNCOVER ALL EXISTING LINES BEING TIED TO AND VERIFY THEIR LOCATION PRIOR TO TRENCHING. THE CONTRACTOR SHALL LOCATE OR HAVE LOCATED ALL EXISTING UNDERGROUND PIPELINES, TELEPHONE AND ELECTRICAL CONDUIT AND STRUCTURES IN ADVANCE OF CONSTRUCTION AND SHALL OBSERVE ALL POSSIBLE PRECAUTIONS TO AVOID DAMAGE TO THE SAME. CALL BLUE STAKE AT 602-263-1100 AND NOTIFY ALL INTERESTED UTILITIES.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD BEFORE THE WATER FITTINGS ARE COVERED. FITTINGS SHALL NOT BE COVERED UNTIL SURVEYS HAVE BEEN COMPLETED. THE ENGINEER SHALL MAKE FIELD AS-BUILT MEASUREMENTS OF THE WATER WORK UPON NOTIFICATION BY THE WATER CONTRACTOR THAT THE PIPE WORK IS COMPLETE AND READY FOR AS-BUILT SURVEY.
- AS-BUILT PLANS CERTIFIED FOR CORRECTNESS BY A PROFESSIONAL CIVIL ENGINEER ACTIVELY REGISTERED TO PRACTICE IN THE STATE OF ARIZONA SHALL BE REQUIRED PRIOR TO FINAL APPROVAL OF ALL WATER, SEWER, RECLAIMED WATER AND STORM WATER CONSTRUCTION.
- ANY CHANGES FROM APPROVED PLANS SHALL BE SUBMITTED TO THE CITY OF SURPRISE FOR WRITTEN APPROVAL PRIOR TO INSTALLATION.
- THE CITY OF SURPRISE ENGINEERING SERVICES SHALL INSPECT AND APPROVE ALL TRENCHING, BEDDING, PIPE INSTALLATION, BACKFILL, AND COMPACTION. THE CITY OF SURPRISE SHALL INSPECT AND APPROVE ALL PRESSURE TESTING, DISINFECTIONS, AND ALL OPERATIONAL SYSTEMS TESTS. AFTER COMPLETION OF EACH PHASE OF THE WATER SYSTEM, BUT BEFORE ACCEPTANCE BY THE CITY OF SURPRISE INTO THE WARRANTY PERIOD, ALL PUNCH LIST ITEMS MUST BE ONE HUNDRED (100) PERCENT COMPLETED, AS DETERMINED BY THE CITY OF SURPRISE.
- WATER LINES SHALL BE DISINFECTED AND TESTED IN ACCORDANCE WITH ADEQ BULLETIN #8.
- WATER SERVICES TWO (2) INCHES OR SMALLER SHALL BE IN ACCORDANCE WITH CITY OF SURPRISE DETAIL 6-05.
- IN A WATER PIPE ZONE WHERE CITY OF SURPRISE IS THE PROVIDER, THE BEDDING SHALL BE ONE HUNDRED (100) PERCENT ABC MATERIAL PER MAG SPECIFICATIONS, PLACED AND COMPACTED FROM FOUR (4) INCHES BELOW FOR PIPES THAT ARE SIXTEEN (16) INCHES AND LARGER OR WHEN ROCK OR UNSTABLE SOIL IS ENCOUNTERED TO TWELVE (12) INCHES ABOVE PIPE. BEDDING FOR PIPES TWELVE (12) INCHES AND SMALLER MAY BE UNDISTURBED NATIVE MATERIAL OR BACKFILL COMPACTED TO NINETY-FIVE (95) PERCENT. THE PIPE ZONE FROM BOTTOM OF PIPE TO TWELVE (12) INCHES ABOVE TOP OF PIPE SHALL BE ABC COMPACTED TO NINETY-FIVE (95) PERCENT FOR ALL SIZES. IN A WATER PIPE ZONE WHERE AAWC IS THE PROVIDER, REFER TO THEIR REQUIREMENTS.
- SHUTDOWN OF EXISTING FACILITIES SHALL BE SCHEDULED BY CONTRACTOR WITH CITY UTILITIES DIVISION FORTY-EIGHT (48) HOURS IN ADVANCE. VALVES ARE TO BE OPERATED ONLY BY A UTILITIES DIVISION CERTIFIED OPERATOR OR UNDER THE DIRECTION OF A UTILITIES DIVISION CERTIFIED OPERATOR. SHUTDOWN OF THE EXISTING SYSTEM IS LIMITED TO TWO FOUR (4) HOUR DURATIONS (12:00 AM THROUGH 4:00 AM AND 10:00 AM THROUGH 2:00 PM). NORMAL PRESSURE AND FLOW MUST BE RETURNED BY THE SCHEDULED TIME.

POTABLE WATER SYSTEM MATERIAL SPECIFICATION NOTES:

- WATER SERVICE:** TAPS, PIPES AND FITTINGS FOR WATER SERVICES UP TO A TWO (2) INCH SIZE SHALL BE IN ACCORDANCE WITH CITY OF SURPRISE STANDARD DETAIL 6-05. LARGER SIZES ARE TO BE SUBMITTED FOR APPROVAL.
- ALL OTHER ITEMS:** IN ACCORDANCE WITH MAG SPECIFICATIONS.
- IN ACCORDANCE WITH AAC R18-4-213 ALL MATERIALS ADDED AFTER JANUARY 1, 1993, WHICH MAY COME INTO CONTACT WITH DRINKING WATER SHALL CONFORM TO NATIONAL SANITATION FOUNDATION STANDARDS 60 AND 61, INCLUDING CHEMICALS USED FOR DISINFECTION.

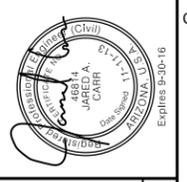
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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

7080 N. Dobson Rd., Suite 200 • Scottsdale, AZ • 480-661-1792



| | | |
|--------------------------|-------------|---------------|
| DESIGN JC | DRAWN AA | CHECKED JM |
| GENERAL NOTES | | |
| DATE NOVEMBER 2013 | | |
| PROJECT NUMBER 11-023 | | |
| DRAWING NUMBER G-002 | | |
| SHEET - OF - | | |

ABBREVIATIONS

| | | | | | | | | | |
|------------|--|------------|---|-----------|--|----------|--|--------|-------------------------------------|
| @ | AT | CLSM | CONTROLLED LOW STRENGTH MATERIAL | FCA | FLANGED COUPLING ADAPTER | PSI | POUNDS PER SQUARE INCH | SW | SOUTHWEST OR |
| AB | ANCHOR BOLT, AGGREGATE BASE | CL | CENTERLINE | FCO | FLOOR CLEAN OUT | PSIG | POUNDS PER SQUARE INCH, GAUGE | SYMM | SERVICE WATER |
| AC | ASPHALTIC CONCRETE | CML, CSP | CONCRETE MORTAR LINED AND COATED STEEL P PE | FD | FLOOR DRAIN | PT | POINT OF TANGENCY | | SYMMETRICAL |
| ACI | AMERICAN CONCRETE INSTITUTE | | | FDA | FLOOR DRAIN W/INTEGRAL TRAP | P.U.E. | PUBLIC UTILITY EASEMENT | | |
| ADD | ADDITIONAL | CMLSP | CEMENT MORTAR LINED STEEL PIPE | FDN | FOUNDATION | PV | PLUG VALVE | T | TANGENT, TELEPHONE LINE, TOP |
| ADH AB | ADHESIVE ANCHOR BOLT | CMP | CORRUGATED METAL PIPE | FES | FLARED END SECTION | PVC | POLYVINYL CHLORIDE PLASTIC \ POINT OF VERTICAL CURVE | T&B | TOP AND BOTTOM |
| ADJ | ADJACENT, ADJUSTABLE | CMU | CONCRETE MASONRY UNIT | FEXT | FIRE EXTINGUISHER | | | T&G | TONGUE AND GROOVE |
| AFF | ABOVE FINISH FLOOR | CO | CLEANOUT | FF | FINISH FLOOR | LAB | LABORATORY | t, T | THICKNESS |
| AFG | ABOVE FINISH GRADE | COL | COLUMN | FG | FINISH GRADE OR | LAT'L | LATERAL | TBG | TUBING |
| AHP | AIR: HIGH PRESSURE | COM | COMMUNICATION | | FUEL GAS | LB | POUNDS | TCE | TEMPORARY CONSTRUCTION EASEMENT |
| AIR | COMPRESSED AIR | COMB | COMBINED | FHY | FIRE HYDRANT | LB/CU FT | POUNDS PER CUBIC FOOT | PVMT | WATER DISTRIBUTION SERVICE TYPE |
| AISC | AMERICAN INSTITUTE OF STEEL CONSTRUCTION | CONC | CONCRETE | FIL | FILTRATE | LF | LINEAR FEET | | PAVEMENT |
| AL, ALUM | ALUMINUM | CONN | CONNECTION | FIG | FIGURE | LG | LONG | PVI | POINT OF VERTICAL INTERSECTION |
| ALP | AIR LOW PRESSURE | CONT | CONTINUOUS, CONTINUATION | FI | FLOW INDICATOR | LONG | LONGITUDINAL | PVT | POINT OF VERTICAL TANGENCY, PRIVATE |
| ALTN | ALTERNATE | COORD | COORDINATE | FL | FLOOR, FLOW LINE | LP | LOW POINT | PW | POTABLE WATER |
| AMH | AMMONIUM HYDROXIDE | CJ | COPPER | FLG | FLANGE | LR | LONG RADIUS | | |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE | CPLG | COUPLING | FLH | FLAT HEAD | LS | LOW PRESSURE STREAM | R, RAD | RADIUS |
| APPROX | APPROXIMATE | CTR, CTD | CENTERED | FLL | FLOW LINE | | | RC | REINFORCED CONCRETE |
| APVD | APPROVED | CTR | CENTER | FLTR | FILTER | MAX | MAXIMUM | RCP | REINFORCED CONCRETE PIPE |
| APWA | AMERICAN PUBLIC WORKS ASSOCIATION | CJ FT | CUBIC FOOT | FNSH | FINISH | MCC | MOTOR CONTROL CENTER | RD | ROAD, ROOF DRAIN |
| AR | AERATION | CJ IN | CUBIC INCH | FO | FUEL OIL | MCJ | MASONRY CONTROL JOINT | RDCR | REDUCER |
| ARCH, A | ARCHITECTURAL | CJ YD | CUBIC YARD | FOC | FACE OF CONCRETE | MECH | MECHANICAL | REF | REFER OR REFERENCE |
| ARV | AIR RELEASE VALVE | CULV | CULVERT | FRP | FIBERGLASS REINFORCED PLASTIC | MFR | MANUFACTURER | REINF | REINFORCED, REINFORCING, REINFORCE |
| ASTM | AMERICAN SOCIETY FOR TESTING AND MATERIALS | CWTP | CIRCULATING WATER | FT | FOOT OR FEET | MGD | MILLION GALLONS PER DAY | REQD | REQUIRED |
| AUTO | AUTOMATIC | CWTP | CHAPARRAL WATER TREATMENT PLANT | FTG | FOOTING | MH | MANHOLE | RJ | RESTRAINED JOINT |
| AUX | AUXILIARY | CV | CHECK VALVE | FWD | FORWARD | MIN | MINIMUM, MINUTE | RLS | RUBBER LINED STEEL |
| AV | AIR/VACUUM ASSEMBLY | °C | CELSIUS | *F | DEGREE FAHRENHEIT | MISC | MISCELLANEOUS | RM | ROOM |
| AVE | AVENUE | d | PENNY | G | GAS | MJ | MECHANICAL JOINT | RMJ | RESTRAINED MECHANICAL JOINT |
| AWG | AMERICAN WIRE GAGE | DBA | DEFORMED BAR ANCHOR | GA | GAGE | MPH | MILES PER HOUR | RO | ROUGH OPENING OR |
| AWWA | AMERICAN WATER WORKS ASSOCIATION | DR | DRAIN | GAL | GALLON | MSNRY | MASONRY | RP | REVERSE OSMOSIS |
| AX | ANOXIC | DBL | DOUBLE | GALV | GALVANIZED | MSP | MILL STEEL PIPE, MANUAL OF STANDARD PRACTICE | R/R | REMOVE AND REPLACE |
| B | BORING | DEC | DECANT | GB | GRADE BREAK | MTL | MATERIAL | RST | REINFORCING STEEL |
| BC | BEGIN CURVE, BOTTOM OF CURB | DET | DETAIL | GC | GROOVED COUPLING | MW | MAKE UP WATER | RT | RIGHT |
| BD | BLOW DOWN | DF | DOUGLAS FIR/LARCH | GCO | GRADE CLEAN OUT | MWS | MAXIMUM WATER SURFACE | RTN | RETURN WATER |
| BF | BLIND FLANGE, BOTTOM FACE | DI | DROP INLET, DUCTILE IRON | GCF | GROOVED COUPLING FITTING | | | RV | ROOF VENT |
| BFD | BUTTERFLY VALVE DAMPER | DIA | DIAMETER | GD | GENERAL DRAINAGE | N | NORTH | RW | RAW WATER |
| BFP | BACKFLOW PREVENTER ASSEMBLY | DIAG | DIAGONAL | GE | GROOVED END | NC | NORMALLY CLOSED | R/W | RIGHT-OF-WAY |
| BFV | BUTTERFLY VALVE | DIL | DILUTE | GL | GLASS | NE | NORTHEAST | S | I-BEAM, SOUTH, S.OPE |
| BLDG | BUILDING | DIM | DIMENSION | GPD | GALLONS PER DAY | NH | AMMONIA | S = | SLOPE EQUALS |
| BLM | BUREAU OF LAND MANAGEMENT | DIMJ | DUCTILE IRON MECHANICAL JOINT | GPH | GALLONS PER HOUR | NIC | NOT IN CONTRACT | SA | SERVICE AIR |
| BM | BENCH MARK, BEAM | DIP | DUCTILE IRON PIPE | GPM | GALLONS PER MINUTE | NO | NUMBER, NUMBERING | SAT | SUSPENDED ACOUSTIC TILE |
| BO | BLOW OFF | DIPPL | DUCTILE IRON PIPE, POLYETHYLENE LINED | GRTG | GRATING | NPT | NATIONAL PIPE THREAD | SC | SCUM |
| BOO | BOTTOM OF OPENING | DIR | DIRECTION | GSP | GALVANIZED STEEL PIPE | NPW | NON POTABLE WATER | SCFH | STANDARD CUBIC FEET PER HOUR |
| BOC | BACK OF CURB | DIST | DISTANCE | GT | GAS TURBINE | NTS | NOT TO SCALE | SCFM | STANDARD CUBIC FEET PER MINUTE |
| BOG | BACK OF GUTTER | DN | DOWN | GV | GATE VALVE | NW | NORTHWEST | SCH | SCHEDULE |
| BOT | BOTTOM | do | DITTO | GVL | GRAVEL | OC | ON CENTER | SD | STORM DRAIN |
| BRG | BEARING | DWG | DRAWING | GW | GROUND WATER | OD | OUTSIDE DIAMETER, OVERFLOW DRAIN | SE | SOUTHEAST |
| BV | BALL VALVE | E | EAST, ELECTRIC, ELECTRICAL | HB | HOSE BIB | OF | OUTSIDE FACE, OVERFLOW | SEC | SECONDARY |
| BWI | BACKWASH IN | EA | EACH | HD | HUB DRAIN | OFR | OVERFLOW RETURN | SECT | SECTION |
| BWO | BACKWASH OUT | EA | EACH | HDP | HIGH DENSITY POLYETHYLENE PIPE | OG | ORIGINAL GROUND | SHC | SODIUM HYPOCHLORITE |
| BVC | BEGINNING OF VERTICAL CURVE | EC | END CURVE | HDR | HEADER | OHE | OVERHEAD ELECTRIC | SH | SHEET |
| BYP | BYPASS | ECC | ECCENTRIC | HDW | HARDWARE | OMRF | ORDINARY MOMENT RESISTING FRAME | SHC | SODIUM HYPOCHLORITE |
| C to C, CC | CENTER TO CENTER | EE | ELECTRICAL | HF | HIGH PRESSURE FEEDWATER | O TO O | OUT TO OUT | SIM | SIMILAR |
| C | CHANNEL (BEAM) | E'F | EACH FACE, EXHAUST FAN | HGT | HEIGHT | OPNG | OPENING | SLD | SLUDGE |
| CAA/ARV | COMBINATION AIR ADMISSION/ AIR RELEASE VALVE | E'FL | EFFLUENT | HM | HOLLOW METAL | OPP | OPPOSITE | SLP | SLOPE |
| CARV | AIR RELEASE VALVE | EG | EXHAUST GAS | HORIZ | HORIZONTAL | OZ | OUNCE | SMP | SAMPLE |
| CATH | COMBINATION AIR RELEASE VALVE | EJ | EXPANSION JOINT | HP | HORSEPOWER | PA | PROCESS AIR | SOLN | SOLUTION |
| CATHD | CATHODIC PROTECTION | EL | ELEVATION | HPT | HIGH POINT | PC | POINT OF CURVE | SP | SPACE OR SPACES |
| CATV | CABLE TELEVISION | E.L.B, ELL | ELBOW | HR | HANDRAIL | PE | PLAIN END, POLYETHYLENE AND PERMANENT EASEMENT | SPD | SUMP PUMP DRAIN |
| CB | CATCH BASIN | E.L.C | ELECTRICAL LOAD CENTER | HSS | HOLLOW STRUCTURE STEEL | | | SPEC | SPECIFICATIONS |
| CCP | CONCRETE CYLINDER PIPE | ELEC | ELECTRIC, ELECTRICAL | HV | HOSE VALVE | PENT | PENETRATION | SPLY | SUPPLY |
| CCS | CENTRAL CONTROL SYSTEM | EM | EMISSION MEASUREMENT | HWY | HIGHWAY | PI | POINT OF INTERSECTION | SRP | SALT RIVER PROJECT |
| CE | CONDENSATE | ENGR | ENGINEER | HYD | HYDRANT | PJF | PREMOLDED JOINT FILLER | SQ | SQUARE |
| CF | EQUIPMENT | EO | EMERGENCY OVERFLOW | IA | INSTRUMENT AIR | PL | PLATE, PROPERTY LINE | SQ FT | SQUARE FOOT |
| CFM | CUBIC FEET PER MINUTE | EP | EDGE OF PAVEMENT | I&C | INSTRUMENTATION & CONTROL | PLYWD | PLYWOOD | SQ IN | SQUARE INCH |
| CFS | CUBIC FEET PER SECOND | EQL SP | EQUALLY SPACED | ID | INSIDE DIAMETER | POB | POINT OF BEGINNING | SS | SANITARY SEWER OR SAMPLING SYSTEM |
| CHEM | CHEMICAL | EQPT | EQUIPMENT | IF | INSIDE FACE OR INTERMEDIATE PRESSURE FEEDWATER | POC | POINT OF CONNECTION | SSH | SAFETY SHOWER |
| CI | CAST IRON | ESC | EROSION SEDIMENT CONTROL | IMLR | INTERNAL MIXED LIQUOR RETURN | POE | POINT OF ENDING | ST | SAMPLE TAP |
| CIGC | CAST IRON GROOVED COUPLING | ERW | EFFLUENT REUSE WATER | IN | INCH | PP, P&P | PLAN AND PROFILE, POWER POLE | SST | STAINLESS STEEL |
| CIMJ | CAST IRON MECHANICAL JOINT | ESA | ENVIRONMENTALLY SENSITIVE AREA | INFL | INFLUENT | PPM | PARTS PER MILLION | ST | STREAM TURBINE |
| CIP | CAST IRON PIPE | ESEW | EMERGENCY SHOWER/EYE WASH | INSTM | INSTRUMENTATION | PRC | POINT OF REVERSE CURVE | STA | STATION |
| CIRJ | CAST IRON RESTRAINED JOINT | EVC | END OF VERTICAL CURVE | INSUL | INSULATE, INSULATION | PRCST | PRECAST | STD | STANDARD |
| CISP | CAST IRON SOIL PIPE | EW | EACH WAY | INV | INVERT | PREFAB | PREFABRICATED | STIF | STIFFENER |
| CJ | CONSTRUCTION JOINT, CONTRACTION JOINT | E/EF | EACH WAY, EACH FACE | INVERT EL | INVERT ELEVATION | PRESS | PRESSURE | STL | STEEL, STEEL PIPE |
| CLDIP | CEMENT-LINED DUCTILE IRON PIPE | EXC | EXCAVATE | IP | IRON PIPE | PRC | POINT OF REVERSE CURVE | STLS | STEEL PIPE (SPECIAL) |
| CLG | CEILING | EXP | EXPOSED, EXPANSION | IR | IRON ROD | PRI | PRIMARY | STR | STRAIGHT |
| CLR | CLEAR, CLEARANCE | EXP JT | EXPANSION JOINT | IS | INTERMEDIATE PRESSURE STREAM | PROP | PROPERTY | STRL | STRUCTURAL |
| | | EXST | EXISTING | IW | INJECTION WATER | PRV | PRESSURE RELEASE VALVE | STRUCT | STRUCTURE |
| | | FB | FLAT BAR | | | PSF | POUNDS PER SQUARE FOOT | SUBFL | SUBFLOOR |
| | | FC | FLEXIBLE COUPLING | | | PS | PUMP STATION | SUSP | SUSPEND |

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| <b style="font-size: 2em; font-weight: bold;">SURPRISE ARIZONA | | | | | | | | | |
| <b style="font-size: 1.5em; font-weight: bold;">WATERWORKS ENGINEERS <small>7081 N. Dobson Rd. Suite 200 - Scottsdale, AZ - 85261-1792</small> | | | | | | | | | |
| CITY OF SURPRISE PUBLIC WORKS DEPARTMENT TTHM REDUCTION PROJECT | | | | | | | | | |
| JARED A. CARR No. 10000 State of Arizona Expires 9-30-16 | | | | | | | | | |
| <b style="font-size: 1.5em; font-weight: bold;">ABBREVIATIONS | | | | | | | | | |
| GENERAL | | | | | | | | | |
| DESIGN: JC DRAWN: MP CHECKED: JM | | | | | | | | | |
| DATE: NOVEMBER 2013 PROJECT NUMBER: 11-023 DRAWING NUMBER: G-003 SHEET: - OF - | | | | | | | | | |

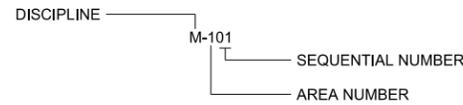
DISCIPLINE

| LETTER | DISCIPLINE |
|--------|----------------------------------|
| G | GENERAL |
| D | DEMOLITION |
| C | CIVIL YARD |
| A | ARCHITECTURAL |
| S | STRUCTURAL |
| M | MECHANICAL |
| H | HEATING, VENTILATION AND COOLING |
| P | PLUMBING |
| E | ELECTRICAL |
| N | INSTRUMENTATION |

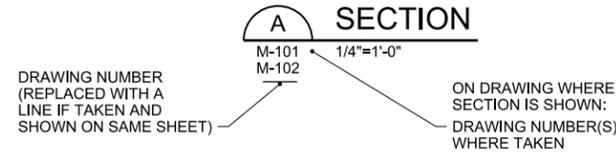
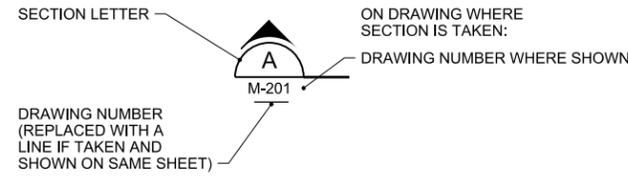
DRAWING NUMBERING

| AREA NUMBER | AREA DESCRIPTION |
|-------------|-------------------|
| 000 | GENERAL / OVERALL |
| 100 | PLANS |
| 200 | SECTIONS |
| 300 | DETAILS |
| 400 | ELEVATIONS |
| 500 | SCHEDULES |

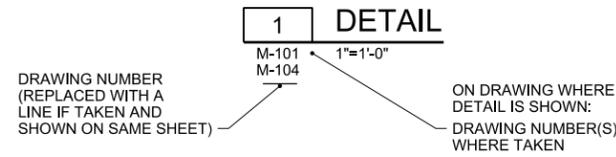
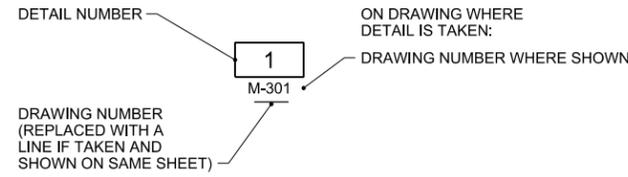
DRAWING NUMBER



SECTION



DETAIL



STANDARD DETAIL



NOTES:

- STANDARD DETAIL CALLOUTS ARE SHOWN TO INDICATE DETAIL REQUIRED AT SPECIFIC LOCATIONS. DETAILS ARE NOT CALLED OUT AT ALL LOCATIONS. WHERE A STANDARD DETAIL CALLOUT IS NOT SHOWN, THE CONTRACTOR SHALL USE THE STANDARD DETAIL MOST APPLICABLE AND CONSISTENT WITH OTHER WORK UNDER THIS CONTRACT.

LINE TYPE APPEARANCE

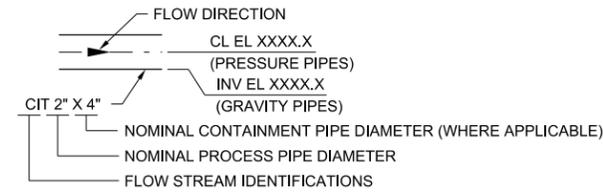
| | | |
|-----------------------------------|----------------------------------|-----------------------------------|
| — (Solid Black) | BLACK | NEW 'ON' DISCIPLINE |
| — (Light/Medium Gray or Screened) | LIGHT OR MEDIUM GRAY OR SCREENED | EXISTING 'ON' OR 'OFF' DISCIPLINE |
| — (Dark Gray) | DARK GRAY | NEW 'OFF' DISCIPLINE |

GENERAL SYMBOLOGY

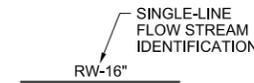


PIPING DESIGNATION

DOUBLE LINE



SINGLE LINE



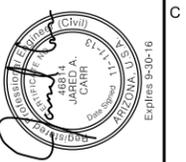
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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

7060 N. Dobson Rd., Suite 200 • Scottsdale, AZ • 480-461-1792



GENERAL

STANDARD DESIGNATIONS

DESIGN: JC
DRAWN: MP
CHECKED: JM

DATE: NOVEMBER 2013
PROJECT NUMBER: 11-023
DRAWING NUMBER: G-004
SHEET: - OF -

CIVIL LEGEND

| | |
|--|--|
| | SPOT ELEVATION |
| | CONTOUR LINE |
| | CUT SLOPE (HORIZ:VERT) |
| | EMBANKMENT - FILL SLOPE (HORIZ:VERT) |
| | DRAINAGEWAY OR DITCH |
| | DIRECTION OF FLOW |
| | CENTER LINE, BUILDING, ROAD |
| | PROPERTY LINE |
| | RIGHT OF WAY, EASEMENT OR SETBACK |
| | STAGING OR WORK AREA LIMITS |
| | STRUCTURE, BUILDING OR FACILITY LOCATION POINT COORDINATES |
| | STRUCTURE, BUILDING OR FACILITY |
| | RETAINING WALL |
| | CONCRETE CURB |
| | ARCHITECTURAL FENCE |
| | GUARD RAIL/BARRICADE |
| | CHAIN LINK FENCE WITH 3 STRAND BARBED WIRE TOPPING |
| | ARCHITECTURAL FENCE |
| | WIRE FENCE |
| | BARBED WIRE |
| | SINGLE SWING GATE |
| | DOUBLE SWING GATE |
| | SLIDING GATE |
| | CULVERT |
| | WALL |
| | BRUSH/TREE LINE |
| | TREE |
| | DEMOLITION |
| | AUTOMATIC AIR RELEASE VALVE |
| | MANUAL AIR RELEASE VALVE |
| | WATER SURFACE ELEVATION |

| | |
|--|---|
| | BEDROCK |
| | ROCKS OR RIPRAP |
| | SAND |
| | AGGREGATE BASE |
| | NATURAL SOIL |
| | COMPACTED SOIL |
| | CONCRETE |
| | GROUT |
| | CONTROLLED LOW STRENGTH MATERIAL (CLSM) |
| | AC PAVEMENT |
| | GRATING |
| | ASPHALT MILLINGS |

MAPPING LEGEND

| | | | |
|--|--|--|---|
| | AIR RELEASE VALVE | | REBAR |
| | ASPHALT PAVEMENT | | RIGHT-OF-WAY |
| | BOLLARD | | SEWER CLEANOUT |
| | CABLE TELEVISION | | SEWER MANHOLE |
| | CATCH BASIN | | SOLAR PANEL |
| | ELECTRIC METER | | STORM DRAIN MANHOLE |
| | ELECTRIC PULLBOX | | STREET SIGN |
| | ELECTRIC RISER | | SURVEY CONTROL POINT OR POINT OF INTERSECTION |
| | ELECTRIC SWITCHBOX | | TELEPHONE BOX |
| | ELECTRIC TRANSFORMER | | TRAFFIC CONTROL BOX |
| | FIRE HYDRANT | | TRAFFIC SIGNAL BOX |
| | GAS VALVE | | TRAFFIC SIGNAL WITH ARM |
| | GRAY PVC CONDUIT PIPES | | TRAFFIC SIGNAL WITH NO ARM |
| | GUARD POST | | TRAFFIC WALK SWITCH |
| | GUY WIRE | | UTILITY POLE |
| | IRRIGATION BOX | | WATER VALVE |
| | IRRIGATION VALVE | | WATER MANHOLE |
| | LIGHT POLE WITH NO ARM | | WATER METER |
| | LIGHT POLE WITH ARM ATTACHED TO UTILITY POLE | | WELL |

NOTES:
 1. EXISTING PIPING, EQUIPMENT, AND TOPOGRAPHY IS SHOWN SCREENED AND/OR LIGHT-LINED. NEW PIPING, EQUIPMENT, STRUCTURE, AND FINISHED GRADE IS SHOWN HEAVY-LINED.
 2. THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS MAY APPEAR ON THIS SHEET AND NOT BE USED ON THE PLANS.

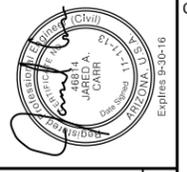
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CITY OF SURPRISE
 PUBLIC WORKS DEPARTMENT
 TTHM REDUCTION PROJECT

WATERWORKS
 ENGINEERS

708 N. Dobson Rd, Suite 200 • Scottsdale, AZ • 480-661-1792



| | | | |
|-------|--------|---------|----|
| CIVIL | LEGEND | DESIGN | JC |
| | | DRAWN | MP |
| | | CHECKED | JM |

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| DATE | NOVEMBER 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | C-001 |
| SHEET | - OF - |



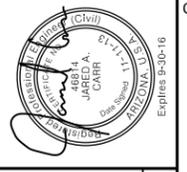
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CITY OF SURPRISE
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TTHM REDUCTION PROJECT

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ENGINEERS

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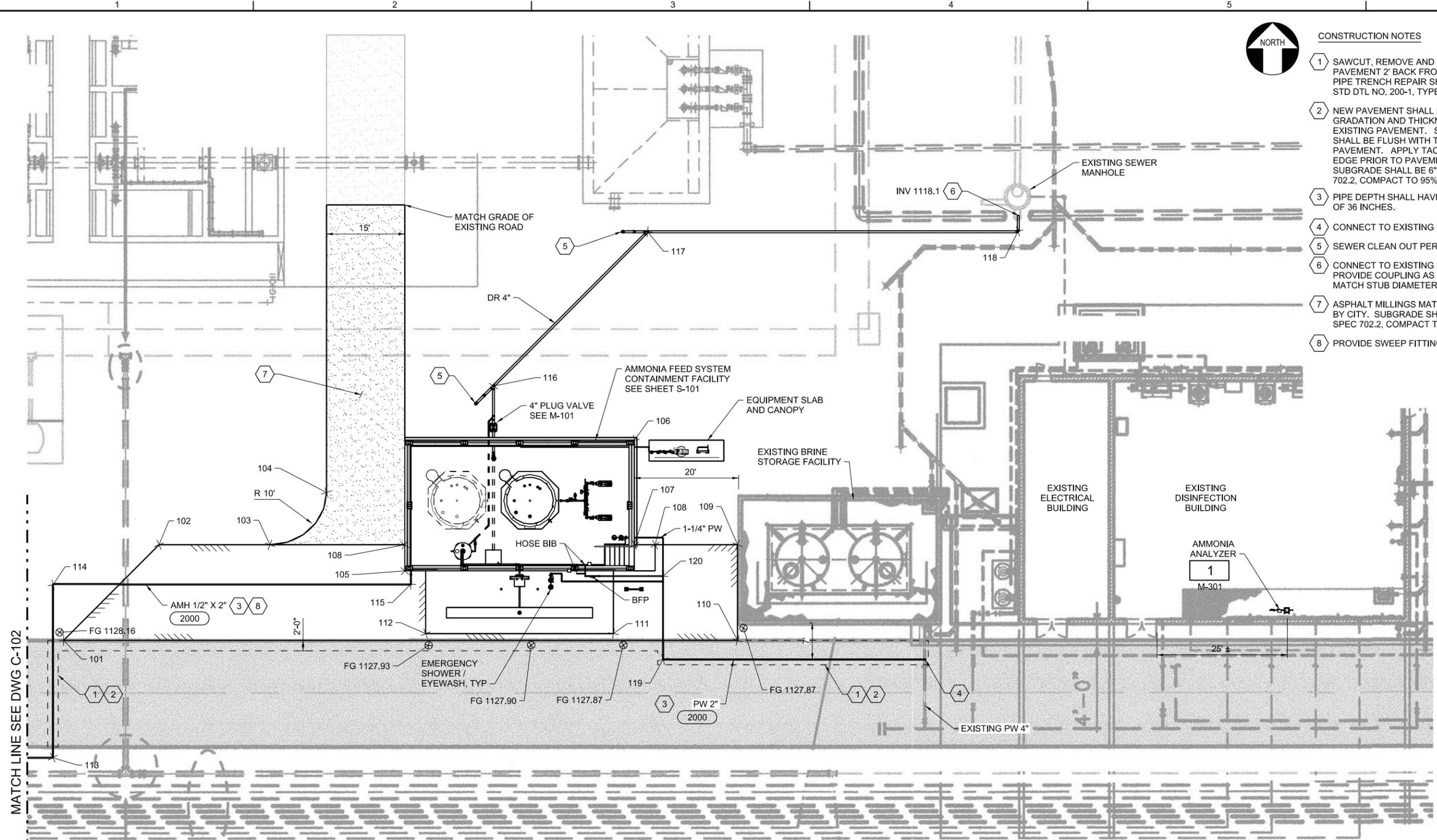


CIVIL

**HORIZONTAL CONTROL AND
KEY PLAN**

DESIGN: J.C.
DRAWN: M.P.
CHECKED: J.M.

DATE: NOVEMBER 2013
PROJECT NUMBER: 11-023
DRAWING NUMBER: C-100
SHEET: - OF -



- CONSTRUCTION NOTES**
- 1 SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT 2' BACK FROM EXISTING EDGE. PIPE TRENCH REPAIR SHALL BE PER MAG STD DTL NO. 200-1, TYPE "A".
 - 2 NEW PAVEMENT SHALL MATCH THE GRADATION AND THICKNESS OF THE EXISTING PAVEMENT. SURFACE COURSE SHALL BE FLUSH WITH THE EXISTING PAVEMENT. APPLY TACK COAT TO SAW CUT EDGE PRIOR TO PAVEMENT REPLACEMENT. SUBGRADE SHALL BE 6" AB PER MAG SPEC 702.2, COMPACT TO 95% DENSITY.
 - 3 PIPE DEPTH SHALL HAVE A MINIMUM COVER OF 36 INCHES.
 - 4 CONNECT TO EXISTING 1-1/4" PW SUPPLY LINE
 - 5 SEWER CLEAN OUT PER MAG STD DLT NO. 441
 - 6 CONNECT TO EXISTING SEWER STUB. PROVIDE COUPLING AS NECESSARY TO MATCH STUB DIAMETER AND INVERT.
 - 7 ASPHALT MILLINGS MATERIAL TO BE PROVIDED BY CITY. SUBGRADE SHALL BE 6" AB PER MAG SPEC 702.2, COMPACT TO 95% DENSITY.
 - 8 PROVIDE SWEEP FITTING AT ALL BENDS

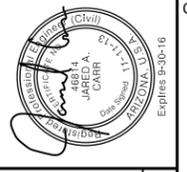
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CIVIL

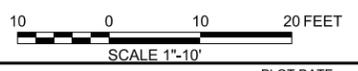
SITE GRADING AND YARD PIPING PLAN 1

DRAWN: MP
CHECKED: JM
DESIGN: JC

| | |
|----------------|---------------|
| DATE | NOVEMBER 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | C-101 |
| SHEET | - OF - |

| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|-----------|-----------|-----------|--------------------------|
| 101 | 941714.57 | 566864.48 | 1128.16 | BEGIN EDGE OF PAVEMENT |
| 102 | 941732.87 | 566882.77 | 1128.10 | EDGE OF PAVEMENT |
| 103 | 941732.87 | 566904.03 | 1128.08 | BEGIN CURVE GRAVEL DRIVE |
| 104 | 941742.87 | 566914.89 | 1128.08 | END CURVE GRAVEL DRIVE |
| 105 | 941732.87 | 566977.89 | 1128.00 | FG AT CORNER |
| 106 | 941752.87 | 566973.89 | 1128.20 | FG AT CORNER |
| 107 | 941732.87 | 566973.89 | 1128.50 | TOP OF CONCRETE SLAB |
| 108 | 941732.87 | 566929.89 | 1128.08 | END DIRT ROAD |
| 109 | 941732.87 | 566993.68 | 1127.90 | EDGE OF PAVEMENT |
| 110 | 941714.57 | 566993.68 | 1127.72 | EDGE OF PAVEMENT |
| 111 | 941715.87 | 566969.89 | 1128.00 | TOP OF CONCRETE |

| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
|---------|-----------|-----------|-----------|-----------------------------|
| 112 | 941715.87 | 566933.89 | 1128.00 | TOP OF CONCRETE CL |
| 113 | 941692.15 | 566862.39 | 1122.50 | 1/2" X 2" AMH 90° ELBOW CL |
| 114 | 941725.22 | 566862.46 | 1122.50 | 1/2" X 2" AMH 90° ELBOW CL |
| 115 | 941725.29 | 566931.02 | 1122.50 | 1/2" X 2" AMH 90° ELBOW |
| 116 | 941763.22 | 566946.90 | 1122.38 | 4" DR WYE CONNECTION |
| 117 | 941792.73 | 566976.43 | 1121.50 | 4" DR WYE CONNECTION INVERT |
| 118 | 941792.80 | 567047.45 | 1118.50 | 4" DR 90° ELBOW INVERT |
| 119 | 941710.94 | 566979.41 | 1124.75 | 2" WTR 90° ELBOW CL |
| 120 | 941726.87 | 566979.39 | 1124.75 | 2" WTR TEE CL |

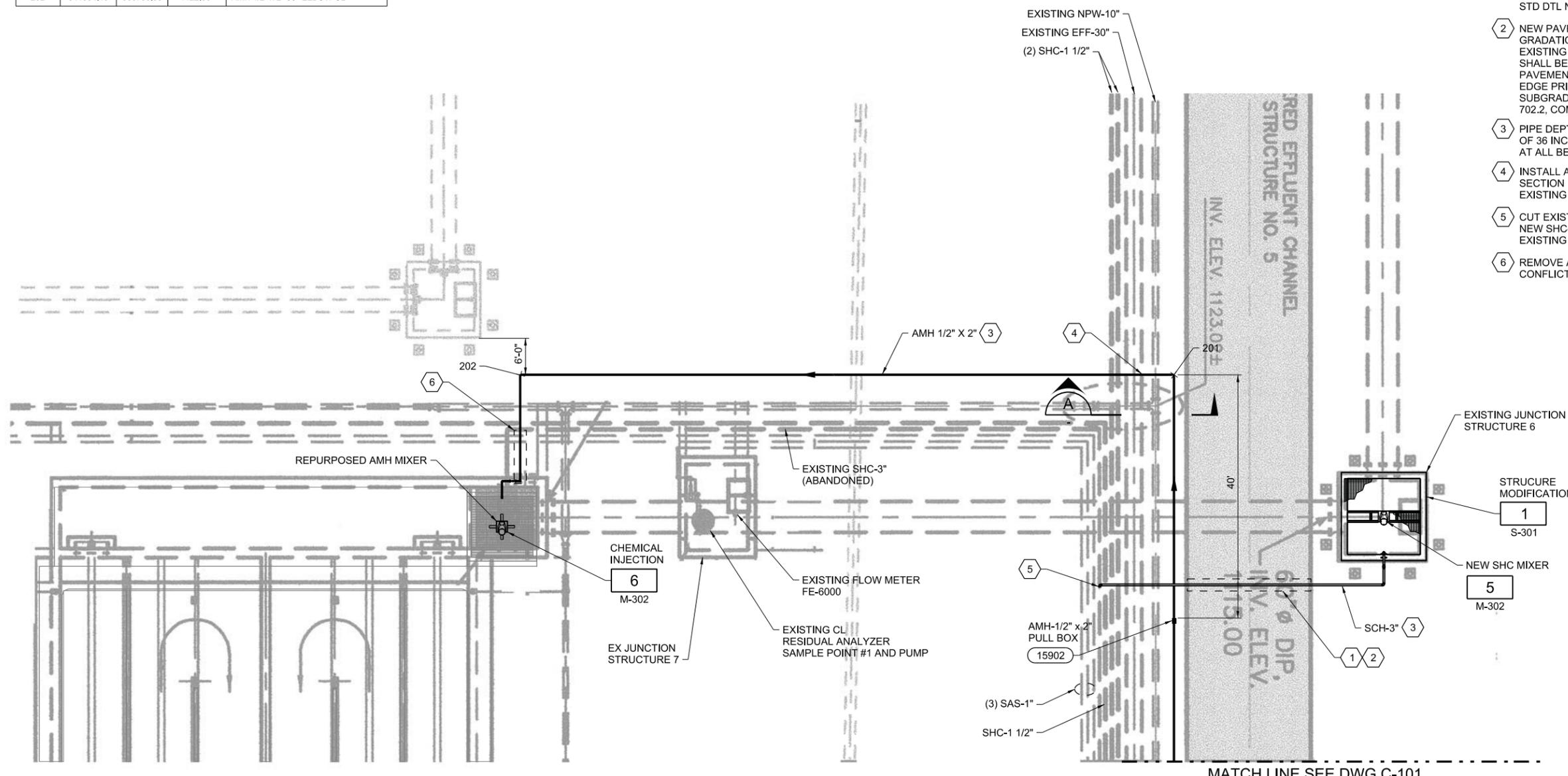


| POINT TABLE | | | | |
|-------------|-----------|-----------|-----------|----------------------------|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 201 | 941692.10 | 566793.91 | 1122.50 | AMH 1/2" x 2" 90° ELBOW CL |
| 202 | 941584.43 | 566793.98 | 1122.50 | AMH 1/2" x 2" 90° ELBOW CL |

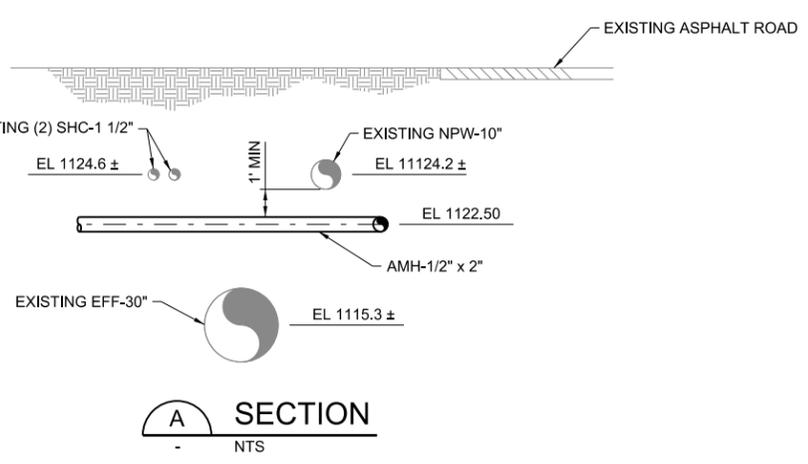


CONSTRUCTION NOTES

- 1 SAWCUT, REMOVE AND REPLACE EXISTING PAVEMENT 2' BACK FROM EXISTING EDGE. PIPE TRENCH REPAIR SHALL BE PER MAG STD DTL NO. 200-1, TYPE "A".
- 2 NEW PAVEMENT SHALL MATCH THE GRADATION AND THICKNESS OF THE EXISTING PAVEMENT. SURFACE COURSE SHALL BE FLUSH WITH THE EXISTING PAVEMENT. APPLY TACK COAT TO SAW CUT EDGE PRIOR TO PAVEMENT REPLACEMENT. SUBGRADE SHALL BE 6" AB PER MAG SPEC 702.2, COMPACT TO 95% DENSITY.
- 3 PIPE DEPTH SHALL HAVE A MINIMUM COVER OF 36 INCHES, PROVIDE SWEEP FITTINGS AT ALL BENDS FOR AMH PIPING.
- 4 INSTALL AMH-1/2" x 2" PIPING AS SHOWN IN SECTION 1 ON THIS SHEET. PROTECT EXISTING PIPING IN PLACE.
- 5 CUT EXISTING SHC-3" LINE AND CONNECT NEW SHC-3" PIPING. CAP AND ABANDON EXISTING PIPE BEYOND CONNECTION.
- 6 REMOVE ABANDONED SHC-3" PIPING IN CONFLICT WITH AMH-1/2" x 2" PIPING.



MATCH LINE SEE DWG C-101



SECTION A
NTS



| | | | | |
|---|--|--|----------------|-------------|
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| REV BY | CHK BY | | | |
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| CITY OF SURPRISE PUBLIC WORKS DEPARTMENT TTHM REDUCTION PROJECT | | | | |
| | | | | |
| CIVIL | SITE GRADING AND YARD PIPING PLAN 2 | | CHECKED JHM | DRAWN MP |
| DATE NOVEMBER 2013 PROJECT NUMBER 11-023 DRAWING NUMBER C-102 | | | | |
| SHEET - OF - | | | | |

STRUCTURAL ABBREVIATIONS

| | | | |
|-------------|--|-----------|----------------------------|
| AB | ANCHOR BOLT | IN | INCHES |
| ACI | AMERICAN CONCRETE INSTITUTE | JT | JOINT |
| ADDL | ADDITIONAL | L | LOW / ANGLE |
| AFF | ABOVE FINISH FLOOR | LONG | LONGITUDINAL |
| AISC | AMERICAN INSTITUTE OF STEEL CONSTRUCTION | LLH | LONG LEG HORIZONTAL |
| AL | ALUMINUM | LLV | LONG LEG VERTICAL |
| ALT | ALTERNATE | LSH | LONG SLOTTED HOLE |
| ANC | ANCHOR | MFR | MANUFACTURER |
| ANSI | AMERICAN NATIONAL STANDARDS INSTITUTE | MAX | MAXIMUM |
| APVD | APPROVED | MB | MACHINE BOLT |
| ARCH | ARCHITECT, ARCHITECTURAL | MECH | MECHANICAL |
| BC | BOTTOM CHORD | MIN | MINIMUM |
| BLK | BLOCK | MTL | METAL |
| BOC | BOTTOM OF CONCRETE | NDT | NON-DESTRUCTIVE TESTING |
| BOS | BOTTOM OF STEEL | NIC | NOT IN CONTRACT |
| BOT | BOTTOM, BOTTOM OF TRENCH | NS | NEAR SIDE |
| BM | BEAM | NTS | NOT TO SCALE |
| BRG | BEARING | OC | ON CENTER |
| BTWN | BETWEEN | OD | OUTSIDE DIAMETER |
| C | CAMBER | OF | OUTSIDE FACE |
| CC | CENTER TO CENTER | O/O | OUT TO OUT |
| CHKD | CHECKERED | OPNG | OPENING |
| CIP | CAST IN PLACE | OPP | OPPOSITE |
| CJ | CONSTRUCTION JOINT | OSH | OVERSIZED HOLE |
| CL | CENTERLINE | OWJ | OPEN WEB JOIST |
| CLG | CEILING | PC | PRECAST |
| CLR | CLEARANCE | PLCS | PLACES |
| CO | CLEANOUT | PJF | PREMOLDED JOINT FILLER |
| COL | COLUMN | PL | PLATE |
| CONC | CONCRETE | PLYWD | PLYWOOD |
| CONN | CONNECTION | PP | PARTIAL PENETRATION |
| CONT | CONTINUOUS | PROJ | PROJECTION |
| CP | COMPLETE PENETRATION | PT | PRESSURE TREATED |
| CTR | CENTER | PVC | POLYVINYL CHLORIDE |
| DBA | DEFORMED BAR ANCHOR | REINF | REINFORCE, REINFORCING |
| DBL | DOUBLE | REQD | REQUIRED |
| DIA Ø | DIAMETER | RTN | RETURN |
| DWG | DRAWING | SC | SLIP CRITICAL |
| EA | EACH | SHT | SHEET |
| ECS | EPOXY COATED STEEL | SIB | STRUCTURAL ISOLATION BREAK |
| EE | EACH END | SIM | SIMILAR |
| EF | EACH FACE | SJ | SAWN JOINT |
| EL, ELEV | ELEVATION | SLV | SHORT LEG VERTICAL |
| EMBED | EMBEDMENT | SPCG, SPA | SPACING |
| EN | EDGE NAIL | SPCS | SPACES |
| EQ, EQL, SP | EQUALLY SPACED | SPECS | SPECIFICATIONS |
| ES | EASH SIDE | SQ | SQUARE |
| EW | EACH WAY | SS | STAINLESS STEEL |
| EXP | EXPANSION | SSH | SHORT SLOTTED HOLE |
| EXST, (E) | EXISTING | STD | STANDARD |
| FD | FLOOR DRAIN | STIFF | STIFFENER |
| FON | FOUNDATION | STL | STEEL |
| FIN | FINISH | SMS | SHEET METAL SCREW |
| FF | FINISHED FLOOR | SW | STUD WELD |
| FLG | FLANGE | SYM | SYMMETRICAL |
| FLR | FLOOR | T&B | TOP & BOTTOM |
| FOB | FACE OF BLOCK | TC | TOP CHORD |
| FOC | FACE OF CONCRETE | TD | TRUSS DIAGONAL |
| FOS | FACE OF STUD / STEEL | THK | THICK |
| FP | FULL PENETRATION | TN | TOE NAIL |
| FRMG | FRAMING | TO | TOP OF |
| FRP | FIBER REINFORCED PLASTIC | TOC | TOP OF CONCRETE |
| FS | FAR SIDE | TOF | TOP OF FOOTING |
| FTG | FOOTING | TOG | TOP OF GRATING |
| GA | GAUGE, GAGE | TOS | TOP OF STEEL |
| GALV | GALVANIZED | TOT | TOTAL |
| GLB | GLULAM BEAM | TOW | TOP OF WALL |
| GRD | GRADE | TRANS | TRANSVERSE |
| GRT | GROUT | TYP | TYPICAL |
| GRTG | GRATING | UN | UNLESS NOTED |
| H | HIGH | UT | ULTRASONIC TESTING |
| H.A.S. | HEADED ANCHOR STUD | VERT | VERTICAL |
| HCA | HEADED CONCRETE ANCHOR | W/ | WITH |
| HD | HOLDOWN | W/O | WITH OUT |
| HORIZ | HORIZONTAL | WP | WORK POINT |
| HSB | HIGH STRENGTH BOLT | WS | WATERSTOP |
| IF | INSIDE FACE | WWF | WELDED WIRE FABRIC |

DESIGN CRITERIA:

1. APPLICABLE CODE: 2006 INTERNATIONAL BUILDING CODE (IBC)
2. REFER TO THE SPECIFICATIONS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.
3. ROOF LOADS:
0 PSF MINIMUM LIVE LOAD
4. GRATING LOADS:
100 PSF LIVE LOAD
5. WIND LOAD:
ASCE 7-05 METHOD 1 (SIMPLIFIED PROCEDURE)
NOT IN CONTRACT
BASIC WIND SPEED: 90 MPH, EXPOSURE CATEGORY: C
Iw: 1.15
6. SEISMIC LOAD:
SEISMIC OCCUPANCY CATEGORY: IV
SEISMIC IMPORTANCE FACTOR Ie: 1.5
SEISMIC DESIGN CATEGORY: C
Ss: 0.176g
Sds: 0.188g
SITE CLASS: D
CANTILEVERED COLUMN SYSTEM R=1.25
DESIGN BASE SHEAR: 0.205W (ASD)
EQUIVALENT LATERAL FORCE PROCEDURE
S1= 0.060g
Sd1: 0.096g

GENERAL INFORMATION:

1. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE BUILDING CODE.
2. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS" PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
3. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO ALL SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE KEYED IN EACH LOCATION. CONSULT THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.
4. VERIFY ALL OPENING DIMENSIONS IN WALLS, SLABS, AND DECKS WITH THE ARCHITECTURAL, MECHANICAL, HVAC AND ELECTRICAL DRAWINGS.
5. FOR NUMBER, TYPE, SIZE ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, HVAC AND PLUMBING DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS, WALLS AND FOUNDATIONS. COORDINATE ALL MECHANICAL, ELECTRICAL, AND HVAC PIPING OPENINGS WITH MECHANICAL, ELECTRICAL AND HVAC DRAWINGS.
6. NO STRUCTURAL MEMBERS SHALL BE CUT FOR PIPES, DUCTS, ETC UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.

FOUNDATIONS:

1. IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATION REPORT #6-117-001061 BY AMEC EARTH & ENVIRONMENTAL, INC. FOUNDATIONS HAVE BEEN DESIGNED FOR ALLOWABLE BEARING VALUES OF:
DEAD + LIVE LOADS 2,750 PSF
2. FOOTINGS SHALL EXTEND 1'-6" INTO FIRM, UNDISTURBED, NATURAL SOIL. AS STATED IN THE GEOTECHNICAL INVESTIGATION REPORT.
3. NO BACKFILL SHALL BE PLACED BEHIND WALLS UNTIL THE CONCRETE HAS ATTAINED 100% OF ITS SPECIFIED COMPRESSIVE STRENGTH.
4. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AT LEAST 48 HOURS NOTICE FOLLOWING EXCAVATION FOR FOUNDATIONS AND PRIOR TO THE PLACEMENT OF FORMWORK, REINFORCING STEEL AND CONCRETE.

FORMWORK, SHORING AND BRACING:

1. THE STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. THE DESIGN SHOWN DOES NOT INCLUDE THE NECESSARY COMPONENTS OR EQUIPMENT FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN

CONCRETE:

1. STRUCTURAL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS AND A SLUMP AS SPECIFIED IN SECTION 03300.
2. THE CONTRACTOR SHALL SUBMIT THE CONCRETE MIX DESIGNS TO THE ENGINEER FOR REVIEW PRIOR TO USE.
3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO THE PLACEMENT OF CONCRETE.
4. HORIZONTAL CONSTRUCTION JOINTS SHALL BE PREPARED TO EXPOSE CLEAN, SOLIDLY EMBEDDED AGGREGATE OVER THE ENTIRE JOINT INTERFACE.
5. PLACEMENT OF PIPES, CONDUITS OR OTHER EMBEDDED ITEMS IN THE CONCRETE SHALL BE IN ACCORDANCE WITH THESE DRAWINGS OR SHALL BE APPROVED BY THE ENGINEER.
6. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.
7. CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH ASTM C94.
8. THE REQUIREMENTS FOR CONCRETE MIXES, PLACING, TESTING AND CURING ARE CONTAINED IN IBC SECTIONS 1905 - 1906 AND THE PROJECT SPECIFICATIONS.
9. PORTLAND CEMENT SHALL CONFORM TO ASTM C150 TYPE II, AGGREGATE SHALL CONFORM TO ASTM C33.
10. CONTINUOUS WATERSTOP AS SPECIFIED SHALL BE INSTALLED IN ALL CONSTRUCTION JOINTS IN WALLS OF WATER HOLDING BASINS, CHANNELS, AND BELOW GRADE STRUCTURES, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.

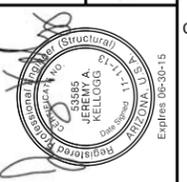
CONCRETE REINFORCING:

1. PROVIDE LARGER SIZES AND MORE REINFORCING IN ALL SECTIONS OF CONCRETE WHERE REQUIRED BY THE DETAILS ON THE DRAWINGS OR BY THE SPECIFICATIONS.
2. CLEARANCE FOR REINFORCEMENT BARS, UNLESS SHOWN OTHERWISE, SHALL BE: CAST AGAINST EARTH = 3", CONCRETE SURFACES OF CONTAINMENT STRUCTURES = 2", ALL OTHER CONCRETE SURFACES: #5 BAR OR SMALLER = 1 1/2", #6 BAR OR LARGER = 2".
3. REFER TO WALL CORNER AND WALL INTERSECTION REINFORCING DETAIL 3303. WALL CORNER REINFORCING SIZES AND SPACINGS SHALL BE AS SHOWN ON THE DRAWINGS AND REFERENCED TO THIS DETAIL. TYPICAL HORIZONTAL WALL REINFORCING SHALL LAP WITH THE CORNER HORIZONTAL REINFORCING.
4. ALL BENDS, UNLESS OTHERWISE SHOWN, SHALL BE 90 DEGREE ACI 318 STANDARD HOOKS.
5. PROVIDE A MINIMUM OF TWO VERTICAL DOWELS AT WALL ENDS, CORNERS AND INTERSECTIONS WITH SIZE TO MATCH TYPICAL VERTICAL REINFORCING STEEL SHOWN.
6. ALL REINFORCING BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

| CONCRETE DESIGN STRENGTH = 4,000 PSI | | GRADE 60 REINF STEEL | | | | |
|--------------------------------------|-----------|----------------------|-------|-------|-------|--------|
| BAR SIZE | | #3 | #4 | #5 | #6 | #7 |
| LAP SPLICE LENGTH | | | | | | |
| | TOP BAR * | 2'-0" | 2'-8" | 3'-4" | 4'-0" | 5'-10" |
| | OTHER BAR | 1'-6" | 2'-1" | 2'-7" | 3'-1" | 4'-6" |

* TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

* * WHERE 3000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16%.

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| STRUCTURAL | STRUCTURAL NOTES 1 | | | | CHECKED JM |
| | | DRAWN MP | | | |
| | | DESIGN JC | | | |
| DATE NOVEMBER 2013 | | | | | |
| PROJECT NUMBER 11-023 | | | | | |
| DRAWING NUMBER S-001 | | | | | |
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STRUCTURAL STEEL:

- STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE.
- STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATION:
 - HOLLOW STRUCTURAL SECTIONS: A500 GRADE B MINIMUM Fy = 46 ksi
 - PIPE: A53 GRADE B MINIMUM Fy = 35 ksi
 - WIDE FLANGE SECTIONS: A992 MINIMUM Fy = 50 ksi
 - PLATES, ANGLES, AND CHANNELS: A36 MINIMUM Fy = 36 ksi
- ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS AND SHALL CONFORM TO THE REQUIREMENTS OF ANS/AWS D1.1-2008 AND IBC SECTION 2204.
- WELDING ELECTRODES SHALL BE THE FOLLOWING TYPES: E70XX.
- ALL BOLTS SHALL BE ASTM A325X UNLESS NOTED OTHERWISE.
- STRUCTURAL STEEL SHALL BE FREE OF EXCESSIVE RUST, MILL SCALE OR GREASE.
- ALL FILLET WELDS SHALL BE AISC MINIMUM AND BUTT WELDS SHALL BE FULL PENETRATION.
- OPENINGS SHALL NOT BE PLACED IN STEEL MEMBERS UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL PLANS.
- DISTANCE FROM EDGE OF PLATE TO CENTER OF BOLT SHALL BE 1 1/2" UNO.
- THE STRUCTURAL STEEL FABRICATOR/CONTRACTOR SHALL FURNISH SHOP DRAWINGS OF ALL STRUCTURAL STEEL FOR ENGINEERS REVIEW PRIOR TO FABRICATION.

FRP GRATING AND PLATFORMS:

- PROVIDE FRP GRATING WITH NON-SKID SURFACE OVER AREAS INDICATED ON DRAWINGS. MATERIAL SHALL BE PREMIUM GRADE, FIRE RESISTANT VINYLESTER RESIN WITH GLASS REINFORCEMENT CONSTRUCTED BY THE PULTRUSION METHOD.
- DESIGN CRITERIA:
 - UNIFORMLY DISTRIBUTED LOAD OF 100 PSF.
 - CONCENTRATED LOAD OF 400 POUNDS ON 2'x2' AREA WITHOUT ANY OTHER SUPERIMPOSED LOAD.
 - MAXIMUM GRATING DEFLECTION UNDER UNIFORMLY DISTRIBUTED LOAD OF 100 PSF = 1/4" OR SPAN/180, WHICHEVER IS LESS.
 - DESIGN BEAMS SUPPORTING GRATING FOR NON-REDUCIBLE SUPERIMPOSED LOAD OF 300 PSF. MAXIMUM BEAM DEFLECTION = SPAN/180.
- GRATING SHALL BE BANDED ON ALL EDGES.
- UNLESS OTHERWISE NOTED ALL GRATING SHALL BE REMOVABLE.
- PROVIDE AND INSTALL EMBEDDED FRP EDGE ANGLES AND THEIR ANCHORAGE AT SUPPORTING CONCRETE OR MASONRY WALLS. GRATING ATTACHMENT HARDWARE SHALL BE OF TYPE 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.
- SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR GRATING AND SUPPORTING FRAMING TO THE ENGINEER FOR REVIEW. THE DRAWINGS AND CALCULATIONS SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF A CIVIL OR STRUCTURAL ENGINEER REGISTERED IN THE SAME STATE AS THE PROJECT.

EPOXY ANCHORS:

- EPOXY ANCHORS AND EPOXY DOWELS SHALL BE HILTI HIT-RE 500-SD UNLESS NOTED OTHERWISE. INSTALL ANCHORS IN CONFORMANCE WITH THE MANUFACTURER'S REQUIREMENTS AND ICC REPORT ESR-2322.
- SPECIAL INSPECTION IS REQUIRED PER IBC SECTION 1704 AND THE REQUIREMENTS OF THE ICC REPORT.
- THREADED RODS TO BE STAINLESS STEEL 316. REBAR TO BE ASTM A615.
- CONTRACTOR SHALL VERIFY MINIMUM EDGE DISTANCES, SPACING AND THICKNESSES ARE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS PRIOR TO INSTALLING ANCHORS.
- WHEN DRILLING HOLES IN EXISTING CONCRETE, USE CARE AND CAUTION TO AVOID CUTTING OR DAMAGING THE EXISTING REINFORCING BARS. MAINTAIN A REASONABLE CLEARANCE BETWEEN REINFORCEMENT AND THE DRILLED-IN ANCHOR. CORE DRILLED HOLES ARE NOT PERMITTED.
- THE SPECIAL INSPECTOR MUST BE PRESENT ON THE JOB SITE DURING ANCHOR INSTALLATION TO VERIFY ANCHOR TYPE, ANCHOR DIMENSIONS, HOLE CLEANLINESS, EMBEDMENT DEPTH, CONCRETE TYPE, CONCRETE COMPRESSIVE STRENGTH, DRILL BIT DIAMETER, HOLE DEPTH, EDGE DISTANCE, ANCHOR SPACING, CONCRETE THICKNESS, AND ADHESIVE INJECTION.

SPECIAL INSPECTION:

- SPECIAL INSPECTION IS IN ADDITION TO THE INSPECTIONS REQUIRED BY SECTION 110 OF THE IBC, THE OWNER SHALL EMPLOY A SPECIAL INSPECTOR DURING CONSTRUCTION ON THE TYPES OF WORK INDICATED BELOW.
- SPECIAL INSPECTIONS SHALL BE PERFORMED BY A QUALIFIED PERSON WHO IS ACCEPTABLE TO THE ENGINEER AND BUILDING DEPARTMENT. THE SPECIAL INSPECTOR SHALL OBSERVE THE INDICATED WORK FOR COMPLIANCE WITH THE APPROVED CONTRACT DOCUMENTS AND SUBMIT RECORDS OF INSPECTION.
- INSPECTION RECORDS AND TESTING REPORTS SHALL BE SUBMITTED TO THE ENGINEER, OWNER, AND BUILDING OFFICIAL WITHIN ONE WEEK OF INSPECTION OR WITHIN ONE WEEK OF TEST COMPLETION.
- AT THE CONCLUSION OF CONSTRUCTION, A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF DISCREPANCIES SHALL BE SUBMITTED.
- SPECIAL INSPECTION IS REQUIRED PER CHAPTER 17 OF THE IBC FOR THE FOLLOWING ITEMS:
 - REINF CONCRETE CONSTRUCTION
 - STEEL CONSTRUCTION

| REQUIRED STRUCTURAL INSPECTION (CONCRETE) | | | | | |
|---|---|---|----------|-----------------------------------|--------------------------|
| | VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | REFERENCED STANDARD | 2006 IBC REFERENCE |
| 1 | INSPECTION OF REINF STEEL AND PLACEMENT | - | X | ACI 318: 3.5, 7.1-7.7 | 1913.4 |
| 2 | INSPECTION OF REINF STEEL WELDING | SEE WELDING SPECIAL INSPECTION REQUIREMENTS | | AWS D1.4, ACI 318: 3.5.2 | - |
| 3 | INSPECTION OF AB TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE | X | - | - | 1911.5 |
| 4 | INSPECTION OF ANCHORS INSTALLED IN HARDENED CONCRETE | - | X | - | - |
| 5 | VERIFYING USE OF REQUIRED DESIGN MIX | - | X | ACI 318: Ch. 4, 5.2-5.4 | 1904.2.2, 1913.2, 1913.3 |
| 6 | AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE | X | - | ASTM: C172, C31 ACI 318: 5.6, 5.8 | 1913.10 |
| 8 | INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES | - | X | ACI 318: 5.11-5.13 | 1913.9 |
| 12 | INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED | - | X | ACI 318: 6.1.1 | - |

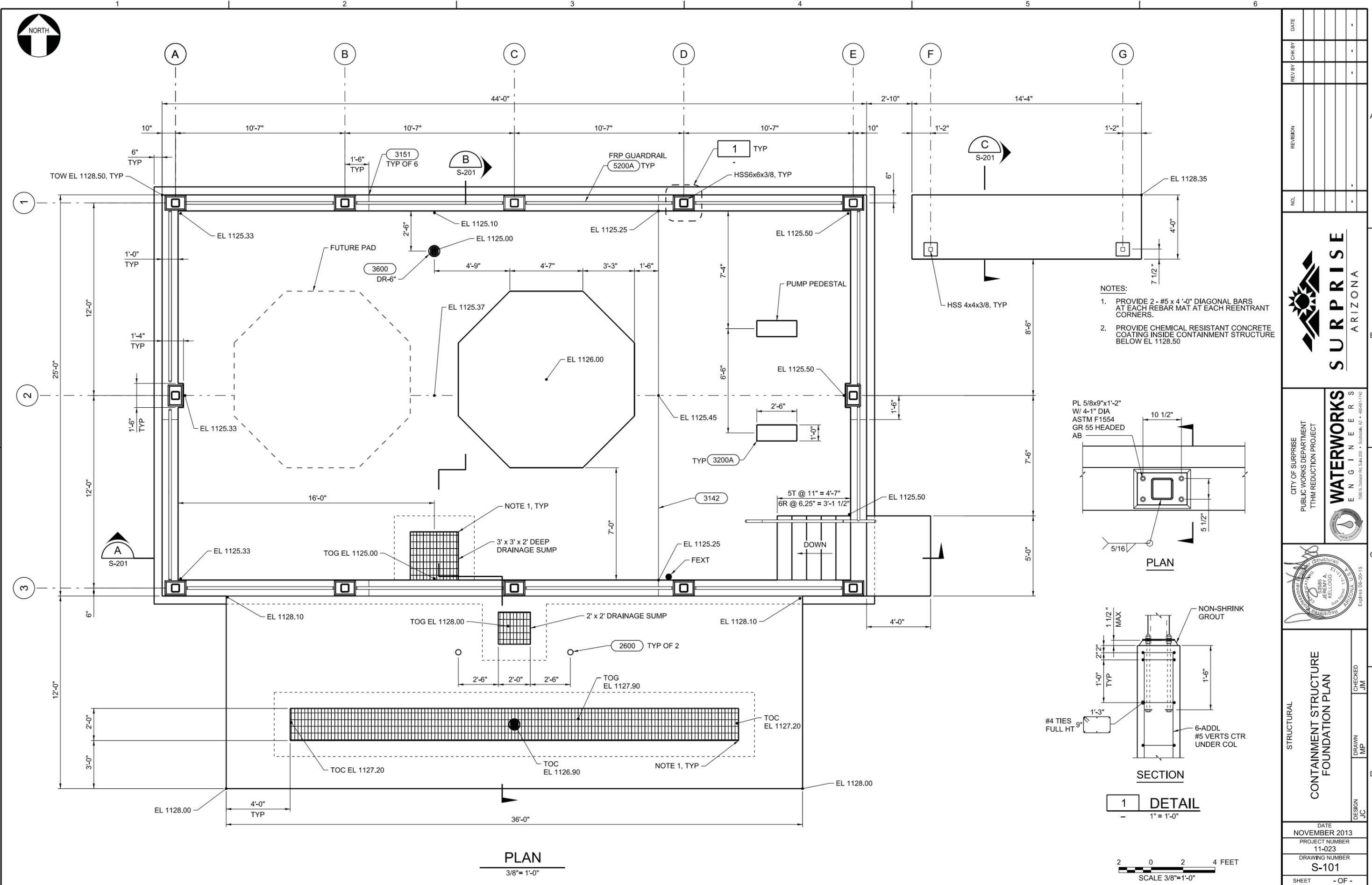
| REQUIRED STRUCTURAL INSPECTION (STEEL) | | | | | |
|--|---|------------|----------|------------------------|--------------------|
| | VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | REFERENCED STANDARD | 2006 IBC REFERENCE |
| 1 | MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS: | | | | |
| 1a | IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS | - | X | AISC 360, SECTION A3.3 | - |
| 1b | MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED | - | X | - | - |
| 2 | INSPECTION OF HIGH-STRENGTH BOLTING: | | | | |
| 2a | SNUG-TIGHT JOINTS | - | X | AISC 360, Section M2.5 | 1704.3.3 |
| 5 | INSPECTION OF WELDING: | | | | |
| 5a | STRUCTURAL STEEL AND COLD-FORMED STEEL DECK: | | | | |
| | 1) COMPLETE AND PARTIAL JOINT PENETRATION GROOVE WELDS | X | - | AWS D1.1 | 1704.3.1 |
| | 3) SINGLE-PASS FILLET WELDS > 5/16" | X | - | | |
| | 5) SINGLE-PASS FILLET WELDS ≤ 5/16" | - | X | | |
| 6 | INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE: | | | | |
| 6a | DETAILS SUCH AS BRACING AND STIFFENING | - | X | - | 1704.3.2 |
| 6b | MEMBER LOCATIONS | - | X | | |
| 6c | APPLICATION OF JOINT DETAILS AT EACH CONNECTION | - | X | | |

DEFERRED SUBMITTALS:

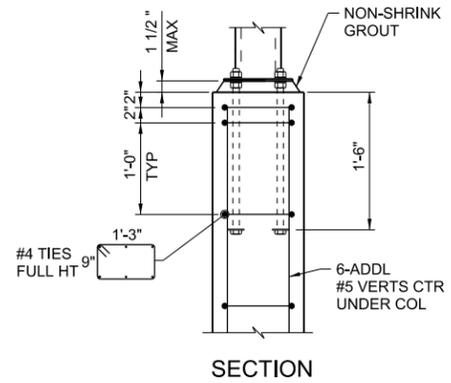
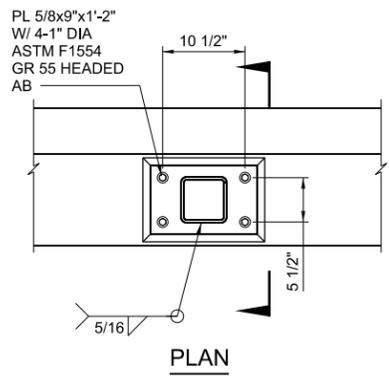
- PER 2006 IBC 106.3.4.2 THE FOLLOWING ITEMS SHALL BE STAMPED BY AN ENGINEER REGISTERED IN THE STATE OF THE PROJECT. ITEMS SHALL BE SUBMITTED TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE FOR REVIEW AND APPROVAL. FOLLOWING APPROVAL BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE THE CONTRACTOR SHALL SUBMIT THE ITEMS TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN GENERAL CONFORMANCE TO THE DESIGN OF THE STRUCTURE. THE CONTRACTOR SHALL NOT START FABRICATION OR ERECTION PRIOR TO REVIEW AND APPROVAL BY THE BUILDING OFFICIAL. THE CONTRACTOR SHALL INCLUDE IN HIS BID ALL TIME AND EFFORT REQUIRED TO OBTAIN A BUILDING OFFICIAL REVIEW/PERMIT FOR THE FOLLOWING PREFABRICATED STRUCTURAL COMPONENTS:
 - CHEMICAL STORAGE TANK DRAWINGS AND CALCULATIONS
 - HANDRAIL DRAWINGS AND CALCULATIONS OR TEST DATA

| BUILDING CODE DATA | |
|---------------------------------|--------------------------------------|
| BUILDING CODE | 2006 IBC |
| OCCUPANCY CLASSIFICATION | H-4 |
| HAZARDOUS MATERIALS | AMMONIUM HYDROXIDE, 19% |
| ACTUAL STORAGE VOLUME | 9,400 GALLONS |
| MAXIMUM ALLOWABLE QUANTITY | 500 GALLONS (CORROSIVE LIQUID) |
| OCCUPANCY SEPARATION | NOT REQUIRED |
| TYPE OF CONSTRUCTION | V-B |
| ACTUAL NUMBER OF STORIES | 1 |
| ALLOWABLE NUMBER OF STORIES | 2 |
| ACTUAL HEIGHT | 15'-0" |
| ALLOWABLE HEIGHT | 40'-0" |
| ACTUAL FLOOR AREA | 966 SF |
| ALLOWABLE FLOOR AREA | 6,500 SF, WITHOUT AREA MODIFICATIONS |
| FIRE SUPPRESSION | FIRE EXTINGUISHERS |
| ACTUAL FIRE SEPARATION DISTANCE | OVER 30 FEET |
| WALLS | N.A. |
| ACTUAL OCCUPANT LOAD | 9.7 PERSONS |
| ALLOWABLE OCCUPANT LOAD | 10 PERSONS FOR SPACES WITH 1 EXIT |
| ACTUAL COMMON PATH OF TRAVEL | 56'-6" |
| ALLOWABLE COMMON PATH OF TRAVEL | 75'-0" |
| ACTUAL TRAVEL DISTANCE | 56'-6" |
| ALLOWABLE TRAVEL DISTANCE | 175'-0" |

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| STRUCTURAL NOTES 2 | | | | | |
| DESIGN | JC | DRAWN | MP | CHECKED | JM |
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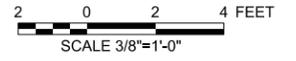


- NOTES:**
1. PROVIDE 2 - #5 x 4'-0" DIAGONAL BARS AT EACH REBAR MAT AT EACH REENTRANT CORNERS.
 2. PROVIDE CHEMICAL RESISTANT CONCRETE COATING INSIDE CONTAINMENT STRUCTURE BELOW EL 1128.50



1 DETAIL
1" = 1'-0"

PLAN
3/8" = 1'-0"



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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

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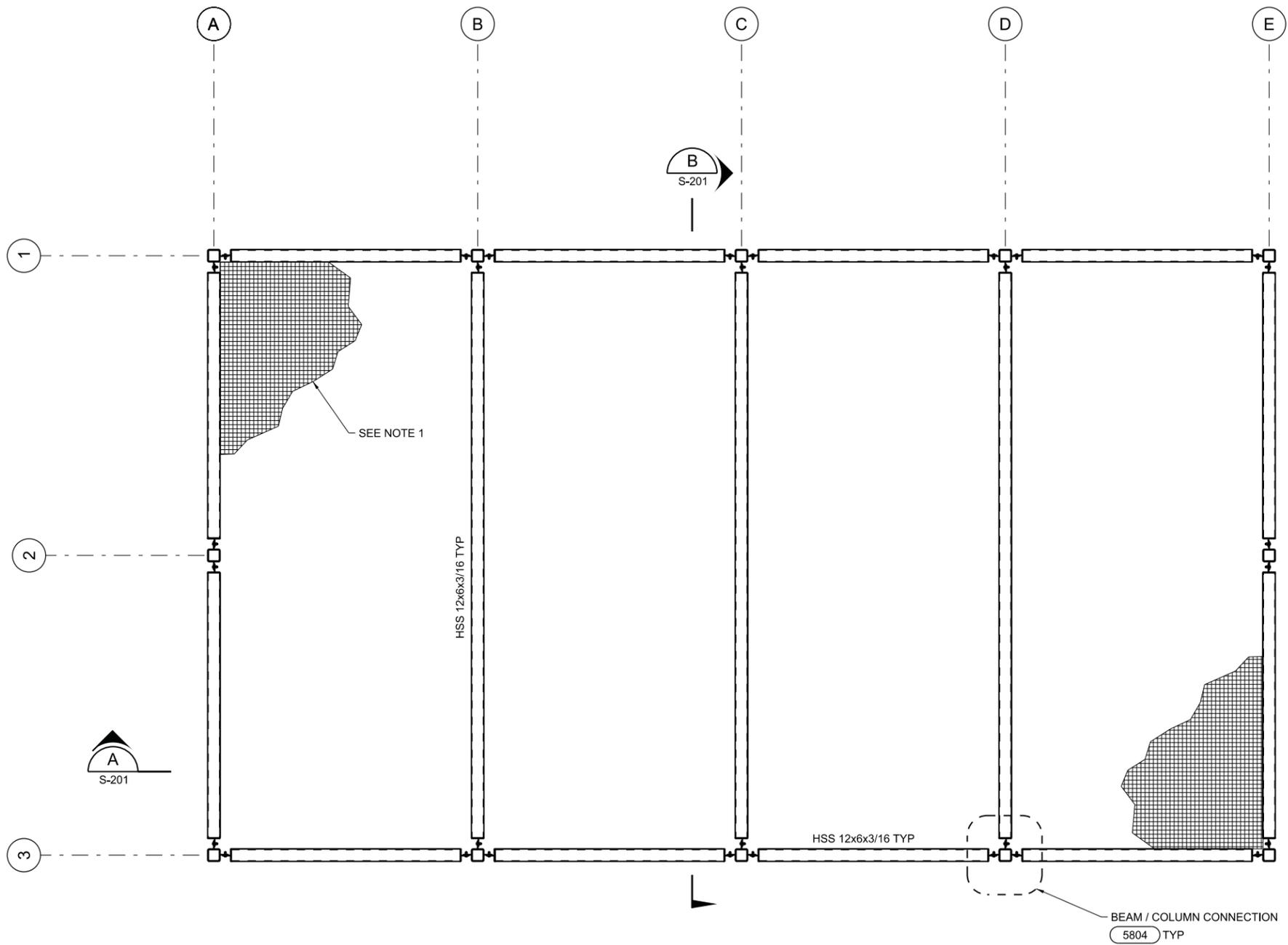


STRUCTURAL

**CONTAINMENT STRUCTURE
FOUNDATION PLAN**

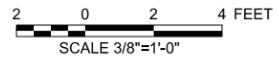
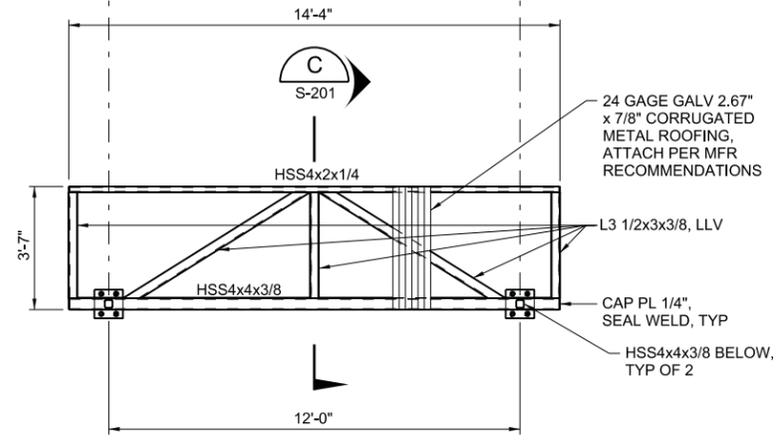
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| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | S-101 |
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ROOF FRAMING PLAN
3/8" = 1'-0"

NOTES:
1. SHADE COVER MANUFACTURED FROM HIGH-DENSITY POLYETHYLENE KNITTED FABRIC, 90% MINIMUM SHADING SPECIFICALLY MANUFACTURED FOR SHADE STRUCTURES WITH A 10 YEAR MINIMUM MANUFACTURER'S WARRANTY. ATTACH IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. SUBMIT, FOR APPROVAL PRIOR TO MANUFACTURING, SHOP DRAWINGS OF FABRIC PANELS AND ATTACHMENT AND PRODUCT DATA OF FABRIC AND HARDWARE.



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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

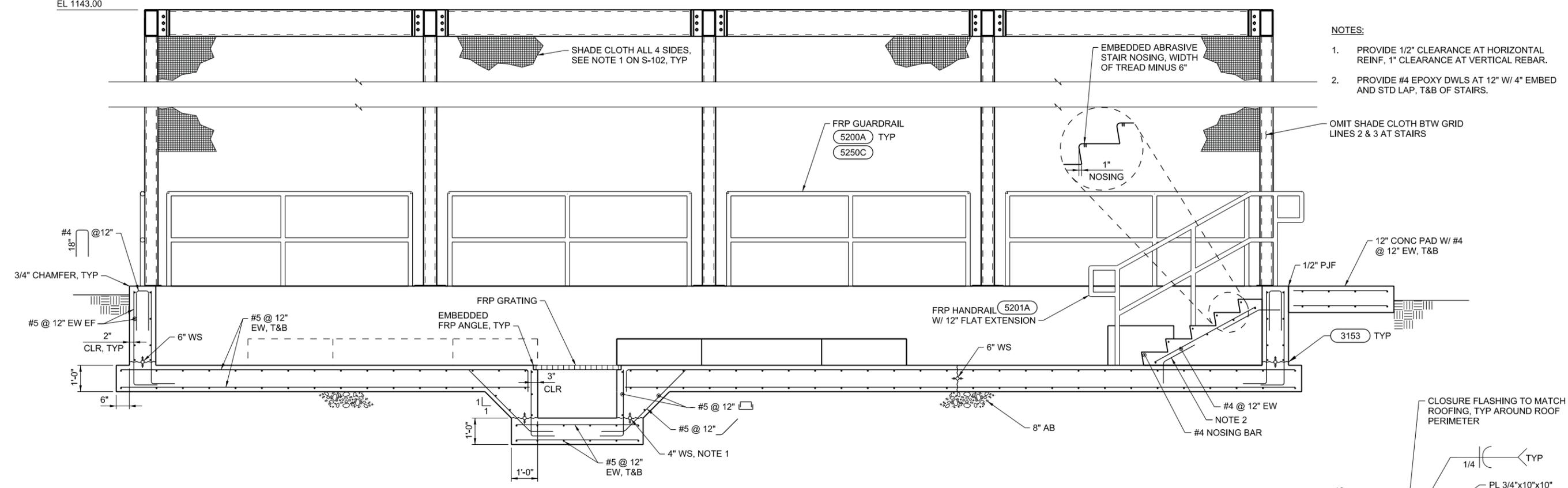
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| STRUCTURAL | DESIGN | DATE |
| CONTAINMENT STRUCTURE FRAMING PLAN | JC | NOVEMBER 2013 |
| | DRAWN | PROJECT NUMBER |
| | MP | 11-023 |
| | CHECKED | DRAWING NUMBER |
| | JM | S-102 |
| | | SHEET - OF - |

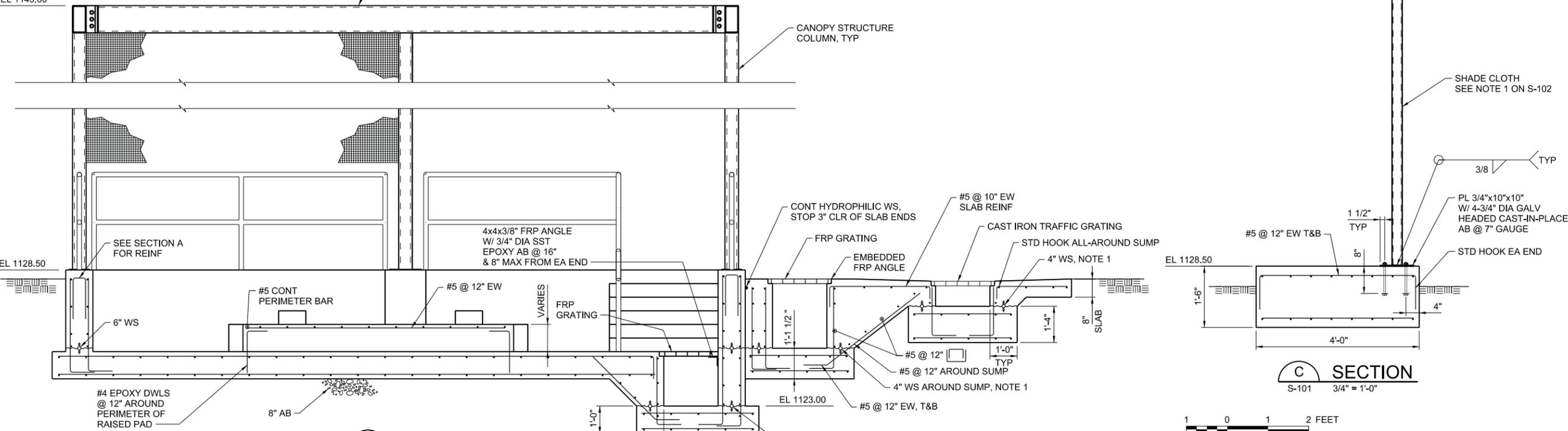
EL 1143.00

- NOTES:
1. PROVIDE 1/2" CLEARANCE AT HORIZONTAL REINF, 1" CLEARANCE AT VERTICAL REBAR.
 2. PROVIDE #4 EPOXY DWLS AT 12" W/ 4" EMBED AND STD LAP, T&B OF STAIRS.

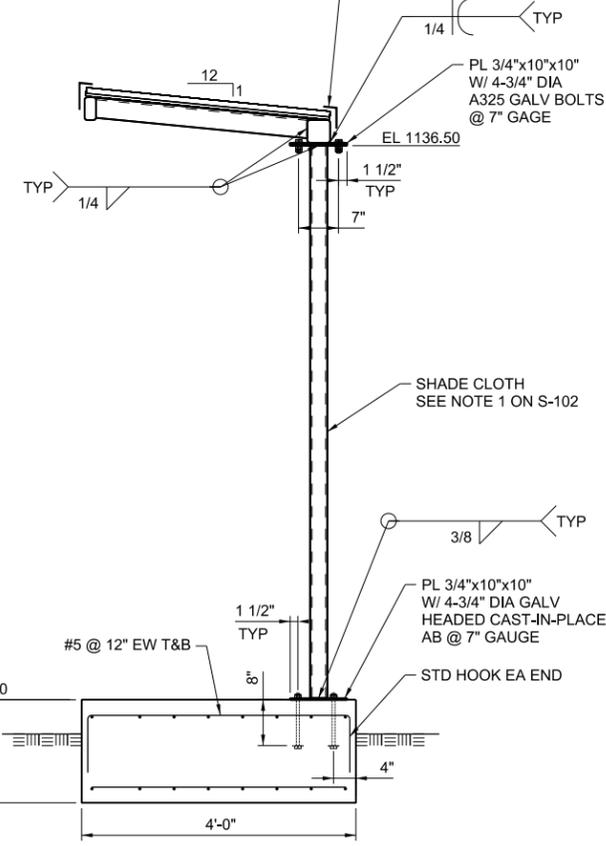


A SECTION
S-101 1/2" = 1'-0"

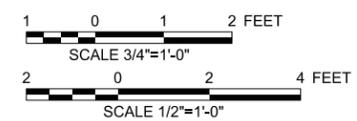
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B SECTION
S-101 1/2" = 1'-0"



C SECTION
S-101 3/4" = 1'-0"



| NO. | REVISION | REV BY | CHK BY | DATE |
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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

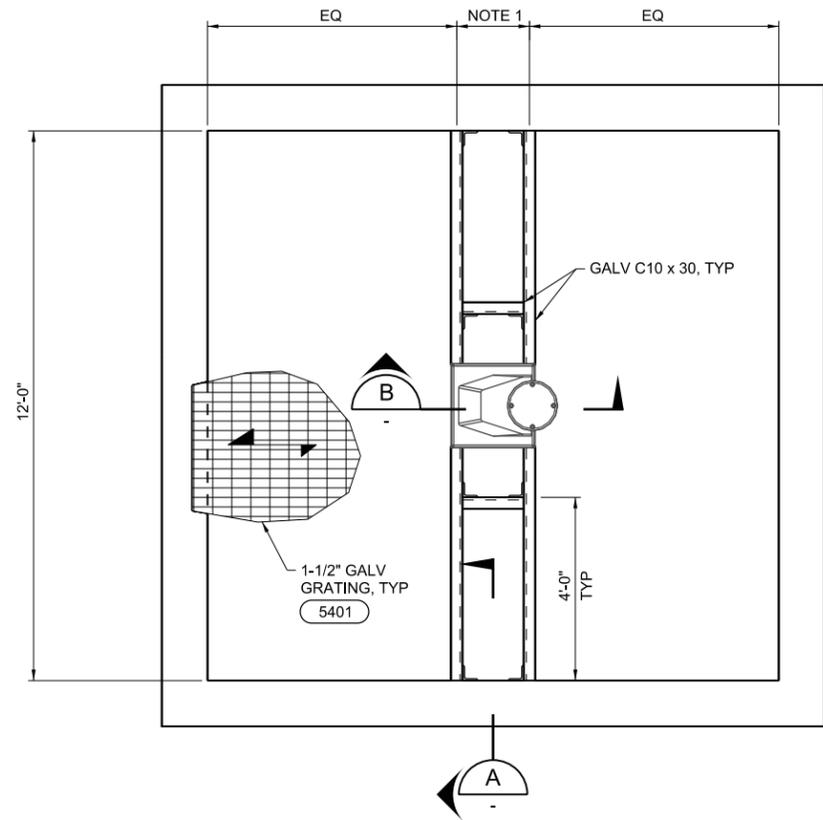
708 N. Dobson Rd. Suite 200 • Scottsdale, AZ • 480-461-1792



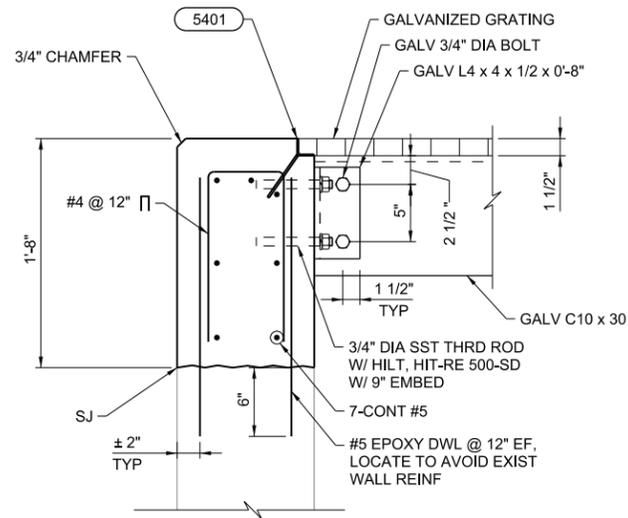
STRUCTURAL
CONTAINMENT STRUCTURE SECTIONS

DESIGN JK
DRAWN MP
CHECKED JM

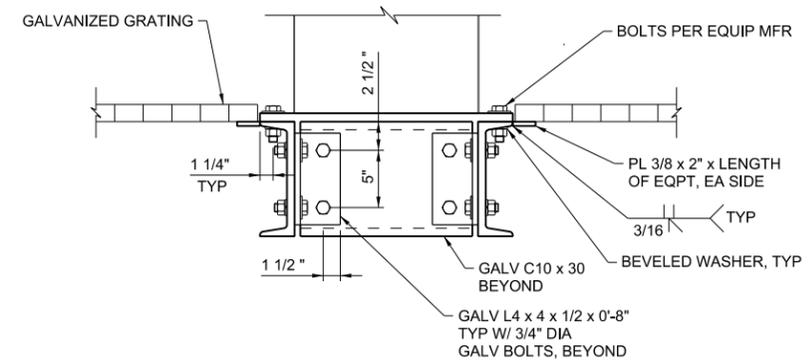
DATE NOVEMBER 2013
PROJECT NUMBER 11-023
DRAWING NUMBER S-201
SHEET - OF -



1 PLAN VIEW
M-302
C-102 1/2" = 1'-0"



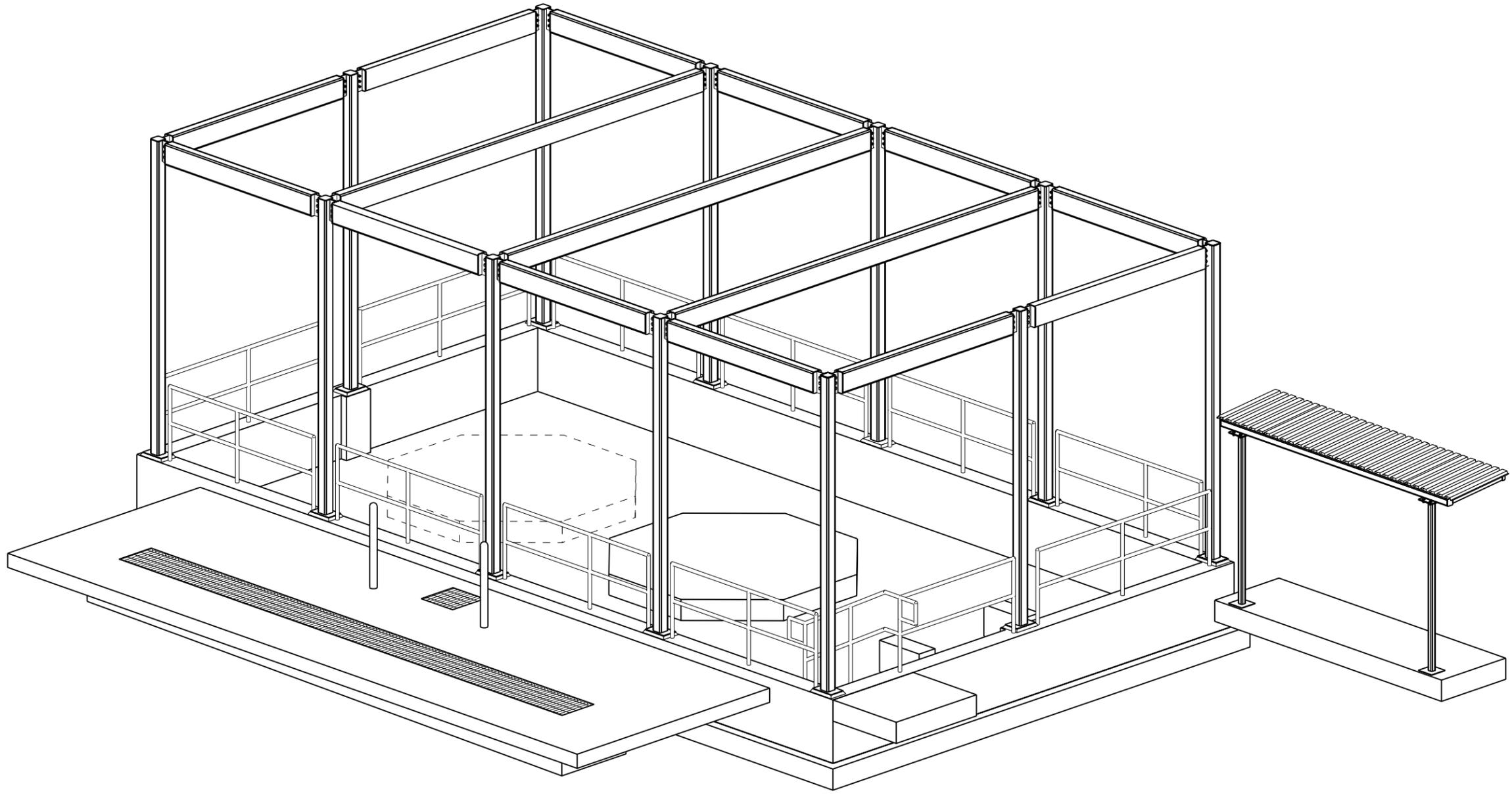
A SECTION
1-1/2" = 1'-0"



B SECTION
1-1/2" = 1'-0"

- NOTES**
- DIMENSIONS TO BE COORDINATED WITH CONNECTION REQUIREMENTS OF EQUIPMENT MANUFACTURER.
 - HOT DIP GALVANIZE ALL STRUCTURAL STEEL AFTER FABRICATION.
- DEMOLITION NOTES**
- DEMOLISH EXISTING 14'-4" SQ VAULT COVER AND HATCH. CUT CONCRETE AND REBAR 1'-8" FROM TOP FACE.

| | |
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| DATE | |
| REV BY | |
| REVISION | |
| NO. | |
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| CITY OF SURPRISE PUBLIC WORKS DEPARTMENT TTHM REDUCTION PROJECT WATERWORKS ENGINEERS 7080 N. Dobson Rd, Suite 200 • Scottsdale, AZ • 480-461-1792 | |
| | |
| STRUCTURAL | JUNCTION STRUCTURE NO. 6 MODIFICATIONS |
| DESIGN JK | DRAWN MP |
| CHECKED JK | DATE NOVEMBER 2013 |
| PROJECT NUMBER 11-023 | DRAWING NUMBER S-301 |
| SHEET | SCALE: |



ISOMETRIC
3/8" = 1'-0"

| NO. | REVISION | REV BY | CHK BY | DATE |
|-----|----------|--------|--------|------|
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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

7081 N. Dobson Rd., Suite 200 • Scottsdale, AZ • 480-468-1792



STRUCTURAL

**CONTAINMENT STRUCTURE
ISOMETRIC RENDERING**

DESIGN: JC
DRAWN: MP
CHECKED: JM

| | |
|----------------|---------------|
| DATE | NOVEMBER 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | S-401 |
| SHEET | - OF - |

PIPE AND FITTING SYMBOLS

| DOUBLE LINE | SINGLE LINE | |
|-------------|-------------|--|
| | | EXISTING PIPE (SCREENED) |
| | | NEW PIPE |
| | | EXISTING PIPE TO BE ABANDONED |
| | | EXISTING PIPE TO BE REMOVED |
| | | WELDED JOINT |
| | | GROOVED END JOINT - FLEXIBLE |
| | | GROOVED END JOINT - RIGID |
| | | FLANGED JOINT |
| | | MECHANICAL JOINT |
| | | HUB & SPIGOT JOINT (RUBBER GASKET PUSH-ON) |
| | | BALL JOINT |
| | | FLANGE COUPLING ADAPTER |
| | | FLEXIBLE COUPLING |
| | | FLEXIBLE COUPLING WITH THRUST TIES |
| | | DISMANTLING JOINT |
| | | STEEL BELLOWS EXPANSION JOINT |
| | | ELASTOMER BELLOWS EXPANSION JOINT |
| | | ELBOW - 90 DEGREE |
| | | ELBOW UP - 90 DEGREE |
| | | ELBOW DOWN - 90 DEGREE |
| | | ELBOW - 45 DEGREE |
| | | ELBOW UP - 45 DEGREE |
| | | ELBOW DOWN - 45 DEGREE |
| | | TEE |
| | | TEE UP |
| | | TEE DOWN |
| | | CROSS |
| | | LATERAL |
| | | LATERAL UP |
| | | LATERAL DOWN |
| | | REDUCER - CONCENTRIC |

PIPE AND FITTING SYMBOLS

| DOUBLE LINE | SINGLE LINE | |
|-------------|-------------|---------------------|
| | | REDUCER - ECCENTRIC |
| | | UNION |
| | | BLIND FLANGE |
| | | PLUG |
| | | CAP |

VALVE SYMBOLS

| DOUBLE LINE | SINGLE LINE | |
|-------------|-------------|---|
| | | GATE |
| | | KNIFE GATE |
| | | BUTTERFLY |
| | | GLOBE |
| | | BALL |
| | | VEE BALL |
| | | PLUG OR COCK |
| | | ECCENTRIC PLUG WITH SEAT PORT REQUIRED SEAT LOCATION |
| | | FULL PORT PLUG |
| | | NEEDLE |
| | | DIAPHRAGM |
| | | PINCH VALVE |
| | | SWING CHECK |
| | | DOUBLE DISK OR SILENT CHECK |
| | | BALL CHECK |
| | | HOSE VALVE |
| | | NON FREEZE HOSE VALVE X=NUMBER IN SPECIFICATIONS |
| | | NON FREEZE HOSE VALVE WITH HOSE RACK X=NUMBER IN SPECIFICATIONS |
| | | SAMPLE |
| | | MUD |
| | | PRESSURE RELIEF |
| | | AIR AND OR VACUUM RELEASE |
| | | REGULATED SIDE PRESSURE CONTROL |
| | | MULTI-PORT VALVE ARROWS INDICATE FLOW PATTERN. SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN. BALL VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN. |
| | | FIRE HYDRANT |
| | | CATHODIC PROTECTION TEST STATION |
| | | CATHODIC PROTECTION ANODE |

FLOW METERS

| DOUBLE LINE | SINGLE LINE | |
|-------------|-------------|-----------------|
| | | MAGMETER |
| | | PROPELLER METER |
| | | INSERTION METER |

PUMPS

| | |
|--|-------------|
| | METERING |
| | DIAPHRAGM |
| | CENTRIFUGAL |
| | PERISTALTIC |

MIXERS

| | |
|--|--------------|
| | STATIC MIXER |
|--|--------------|

ACTUATORS

| | |
|--|-----------|
| | PNEUMATIC |
| | MOTORIZED |
| | SOLENOID |

MISCELLANEOUS PIPING SYMBOLS

| | |
|--|--|
| | STRAINER |
| | SIGHT GLASS |
| | FLEXIBLE (ELASTOMER) PIPE CONNECTION |
| | GAUGE WITH COCK |
| | THERMOMETER |
| | ROTAMETER |
| | GALVANIC ANODE |
| | AIR SET XX = SUPPLY PRESSURE - PSIG |
| | TYPICAL INSTRUMENT SYMBOL (SEE I&C LEGEND) |
| | DRAIN |
| | DOUBLE CONTAINMENT PIPE |

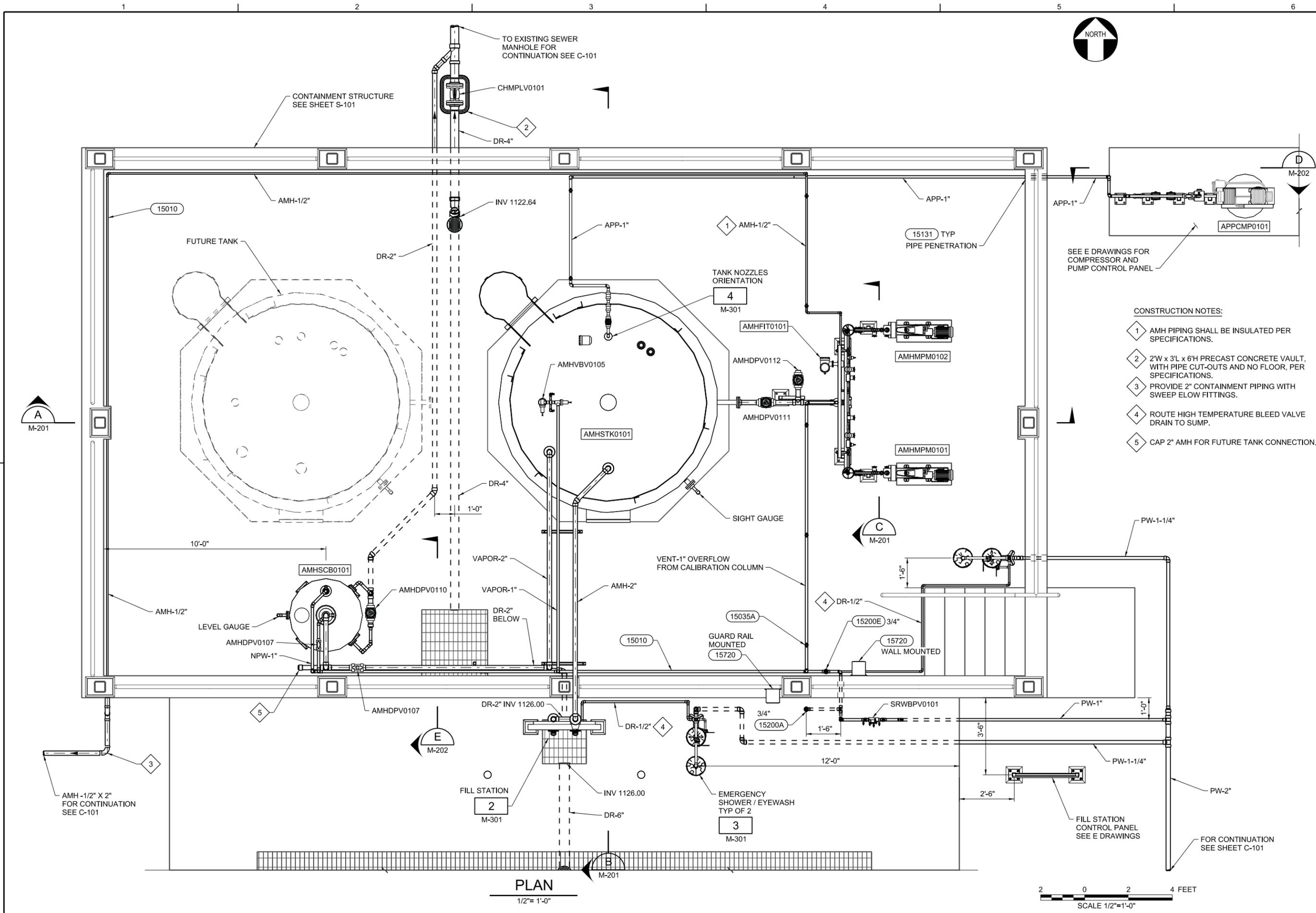
NOTES

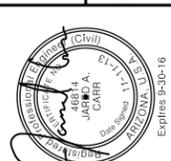
- ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS AND THE PIPING SCHEDULE.
- SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.

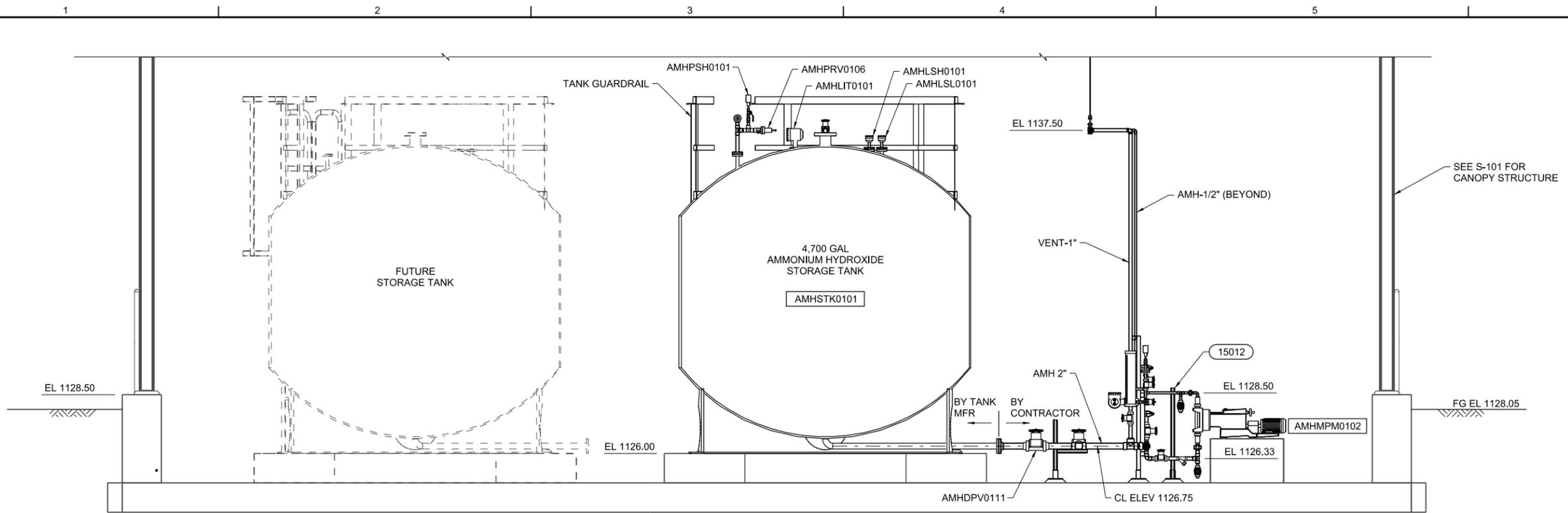
GENERAL PIPING NOTES

- LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. MINIMUM COVER SHALL BE 36 INCHES UNLESS OTHERWISE SHOWN.
- SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
- LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. FINAL SUPPORT REQUIREMENTS SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. MAXIMUM SPACING SHALL BE AS SPECIFIED.
- APPROPRIATE STANDARD WALL PIPE DETAIL SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
- ALL FLEXIBLE CONNECTORS OR FLANGED COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST TIES, BLOCKS, OR ANCHORS, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
- SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. ALL OF THE VARIOUS APPLICATIONS ARE NOT NECESSARILY USED IN THE PROJECT.
- NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS ARE ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
- THE CONTRACTOR FOR THIS PROJECT IS RESPONSIBLE FOR COORDINATING AND PERFORMING THE CONNECTION OF THE PIPING AND ASSOCIATED APPURTENANCES INSTALLED UNDER THIS CONTRACT TO BOTH THE EXISTING PIPING AND FACILITIES.
- PRIOR TO SUBMITTING PIPING DRAWINGS FOR ANY NEW PIPE THAT IS TO CONNECT TO OR CROSS AN EXISTING PIPE OR STRUCTURE, THE CONTRACTOR SHALL EXPOSE THE EXISTING PIPE OR STRUCTURE TO VERIFY ITS EXACT LOCATION, SIZE, MATERIALS, AND INVERT ELEVATIONS.
- COMPONENTS SHOWN WITH A DOUBLE ASTERISK (**) ARE PART OF A PACKAGE SYSTEM. SEE EQUIPMENT SPECIFICATIONS.

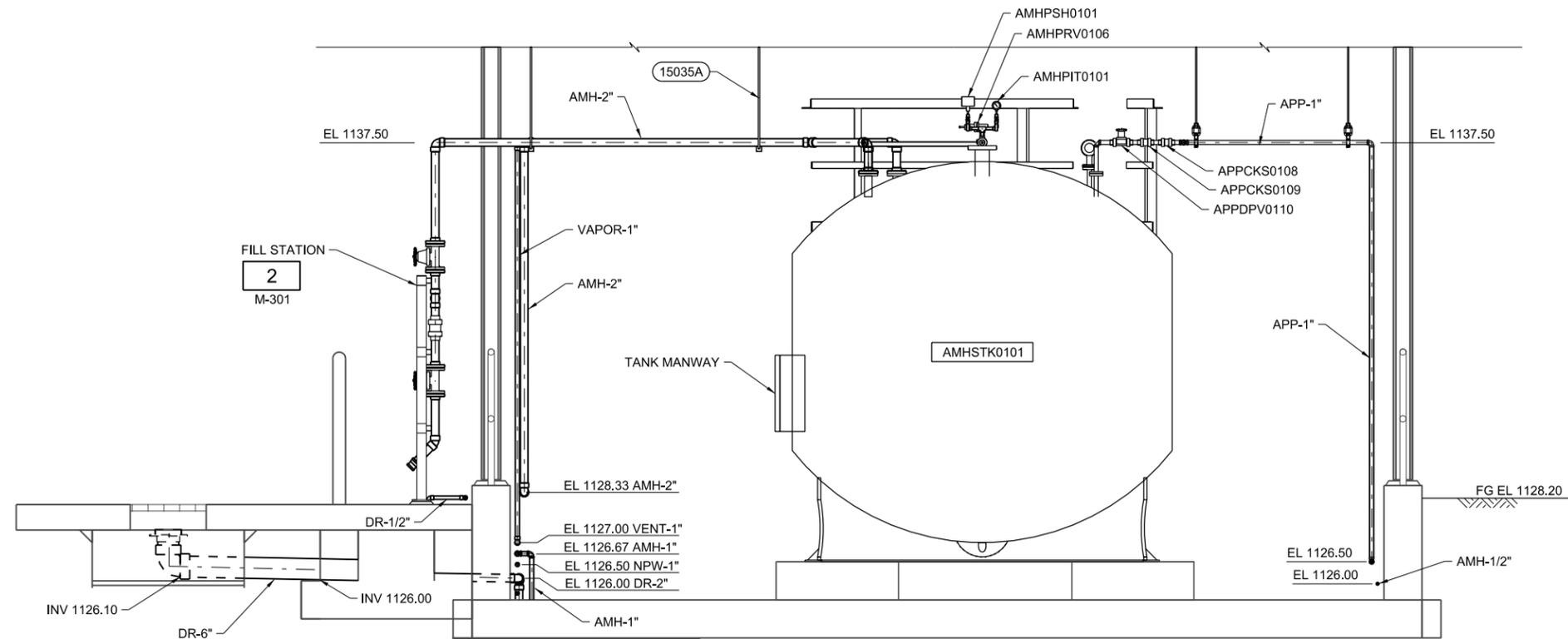
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| REV BY | | | | | |
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| CITY OF SURPRISE PUBLIC WORKS DEPARTMENT TTHM REDUCTION PROJECT WATERWORKS ENGINEERS 708 N. Dobson Rd., Suite 200 - Scottsdale, AZ - 85261-1792 | | | | | |
| | | | | | |
| MECHANICAL LEGEND | | | | | |
| DRAWN: MP CHECKED: JM | | | | | |
| DESIGN: JC | | | | | |
| DATE: NOVEMBER 2013 PROJECT NUMBER: 11-023 DRAWING NUMBER: M-001 SHEET: | | | | | |



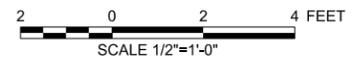
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| NO. | REVISION | REV BY | CHK BY | DATE |
| | | | | |
|  WATERWORKS ARIZONA ENGINEERS | | | | |
| CITY OF SURPRISE PUBLIC WORKS DEPARTMENT TTHM REDUCTION PROJECT | | | | |
|  JAMES A. CARR PROFESSIONAL ENGINEER No. 10000 State of Arizona Expires 9-30-16 | | | | |
| MECHANICAL AMMONIA FACILITY PLAN | | | | |
| DESIGN | JC | DRAWN | MP | CHECKED |
| DATE | NOVEMBER 2013 | PROJECT NUMBER | 11-023 | DRAWING NUMBER |
| | | | | M-101 |
| SHEET | - OF - | | | |



A SECTION
M-101 1/2" = 1'-0"



B SECTION
M-101 1/2" = 1'-0"



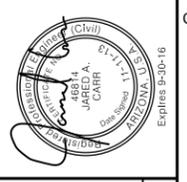
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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

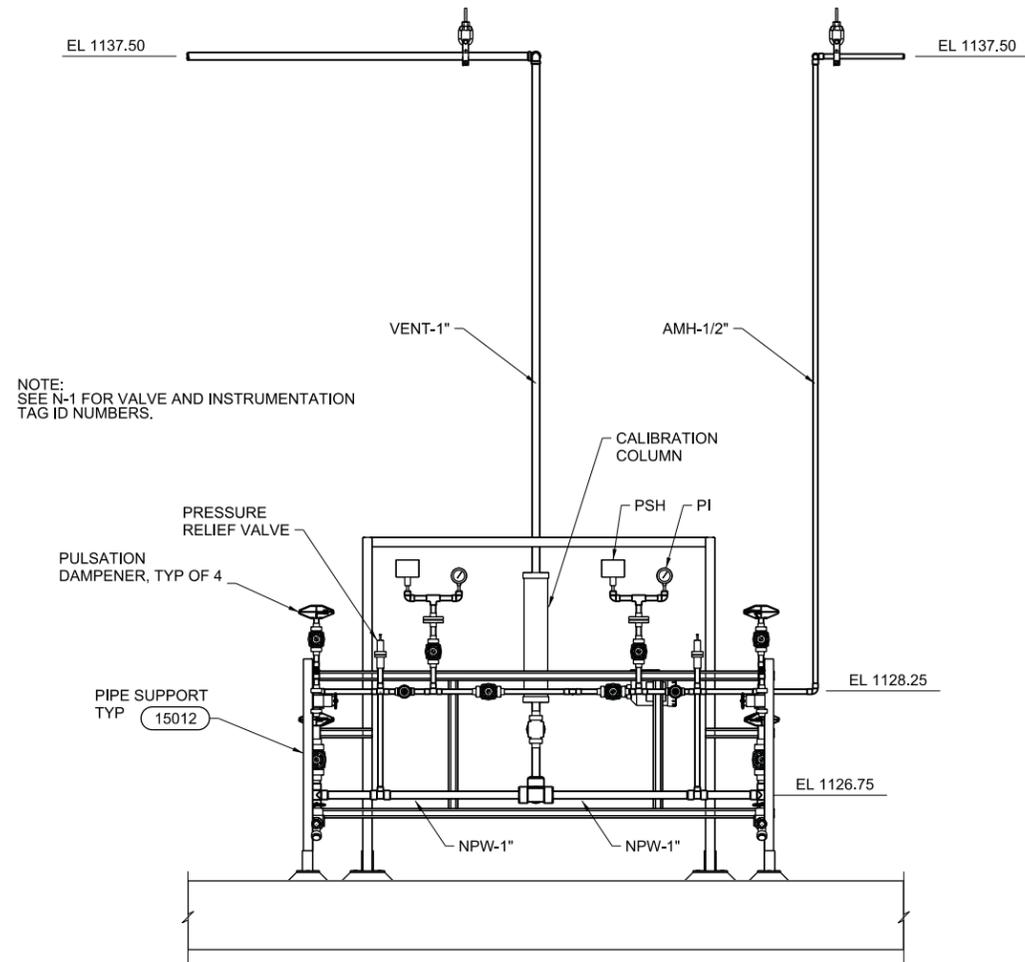
WATERWORKS
ENGINEERS

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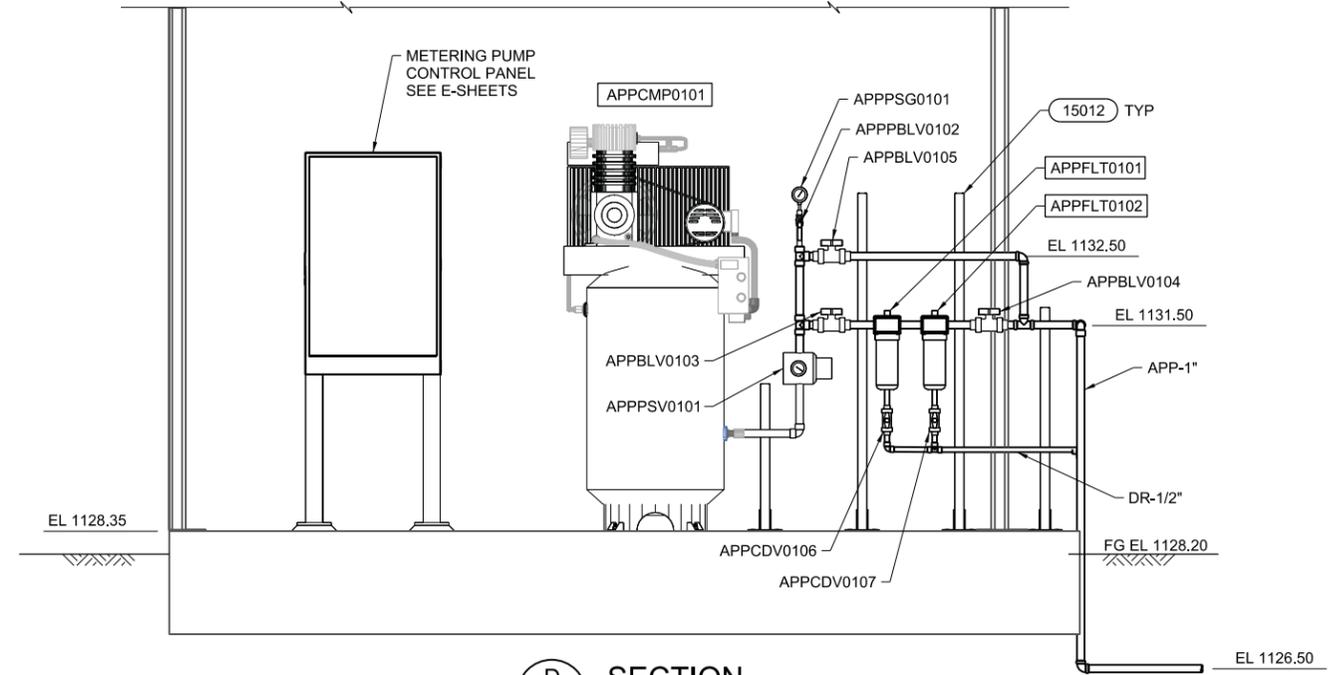
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|------------|-----------------------------|------------|
| MECHANICAL | AMMONIA FACILITY SECTIONS 1 | CHECKED JM |
| DESIGN JC | DRAWN MP | |

| | |
|----------------|---------------|
| DATE | NOVEMBER 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | M-201 |
| SHEET | - OF - |

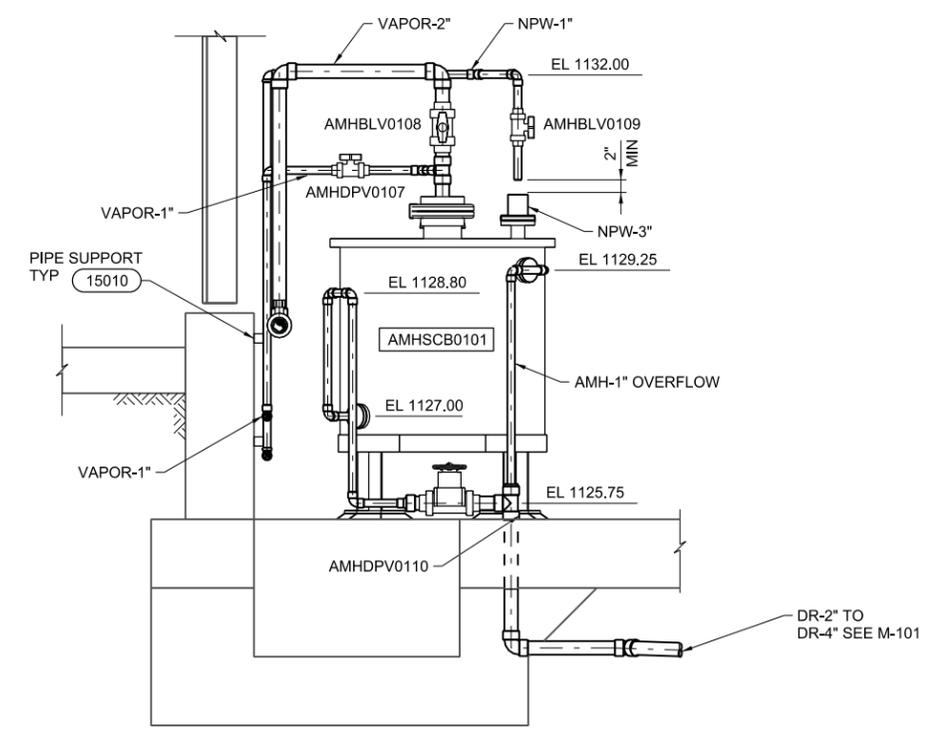


C SECTION
M-101 3/4" = 1'-0"

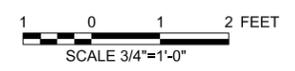
NOTE:
SEE N-1 FOR VALVE AND INSTRUMENTATION
TAG ID NUMBERS.



D SECTION
M-101 3/4" = 1'-0"



E SECTION
M-101 3/4" = 1'-0"



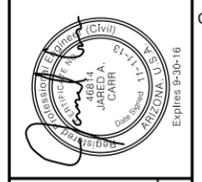
| NO. | REVISION | REV BY | CHK BY | DATE |
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CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS

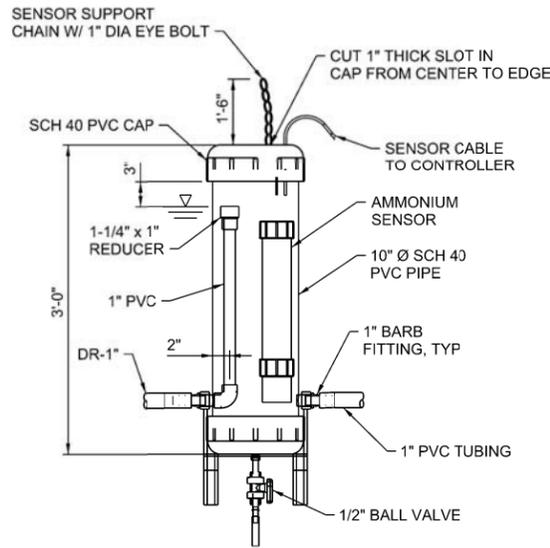
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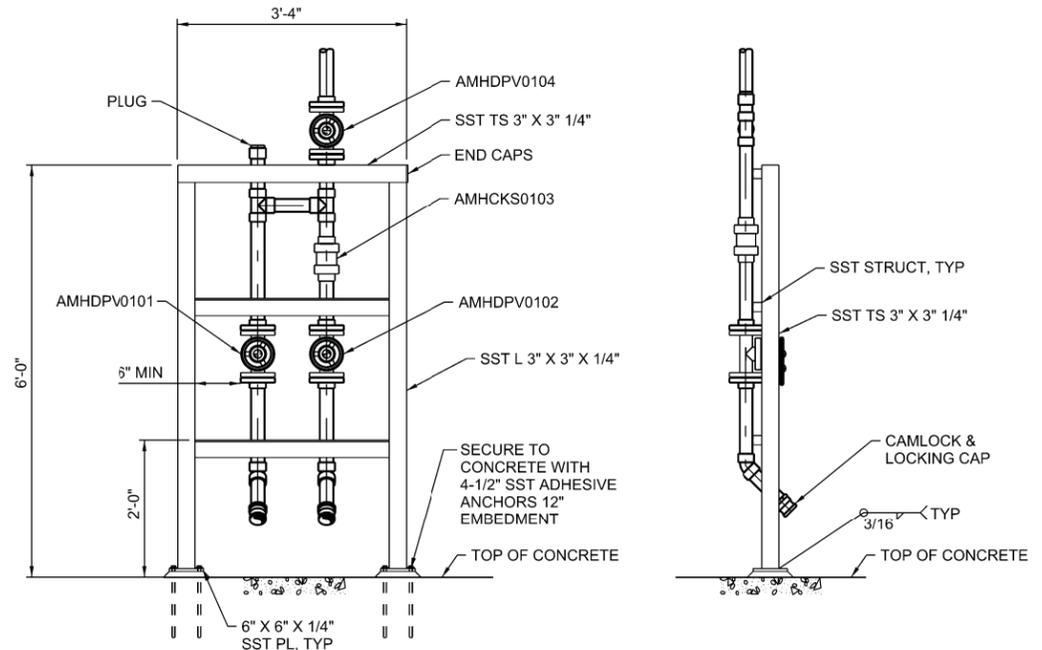
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|--------------------------------|---------------|----|
| MECHANICAL | DESIGN | JC |
| AMMONIA FACILITY SECTIONS 2 | DRAWN | MP |
| | CHECKED | JM |
| DATE | NOVEMBER 2013 | |
| PROJECT NUMBER | 11-023 | |
| DRAWING NUMBER | M-202 | |
| SHEET | - OF - | |



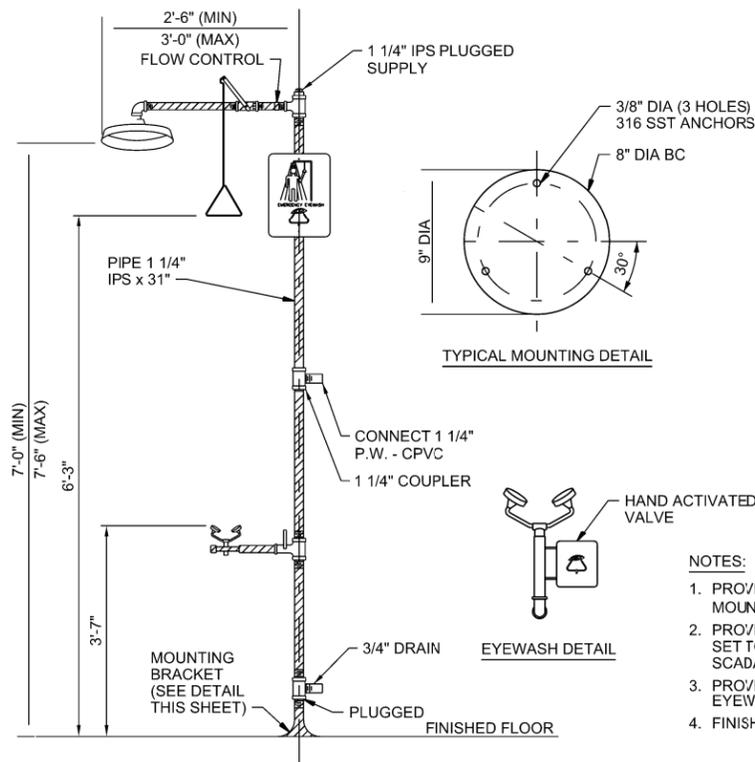
1 ANALYZER DETAIL
M-101 NTS



1A AMMONIUM SENSOR HOUSING DETAIL
NTS

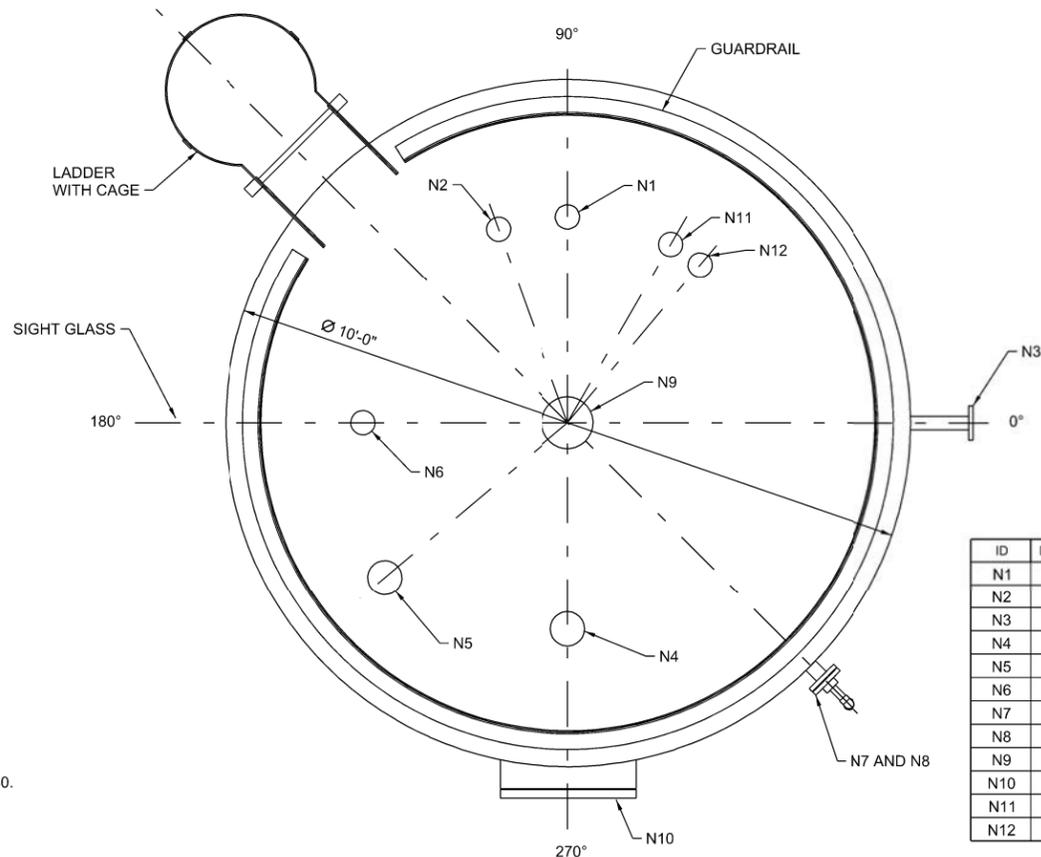


2 FILL STATION DETAIL
M-101 NTS



- NOTES:**
1. PROVIDE ANTI-SCALDING DEVICE WHEN MOUNTED OUTSIDE.
 2. PROVIDE FLOW SWITCH ALARM WITH (INITIALLY SET TO 20 SECONDS) DELAY TIMER AT PLANT SCADA PRIOR TO SOUNDING ALARM.
 3. PROVIDE STAINLESS STEEL SHOWER HEAD AND EYEWASH BOWL.
 4. FINISH PER SECTION 15400, INSULATE PER SECTION 15080.

3 EMERGENCY SHOWER / EYEWASH
M-101 NTS



| ID | DEGREE | SIZE | RADIUS | CONNECTION | DESCRIPTION |
|-----|--------|------|--------|------------|-------------------|
| N1 | 90° | 1" | 3'-0" | FLG | AIR |
| N2 | 110° | 3" | 3'-0" | FLG | LIT |
| N3 | 0° | 2" | - | FLG | OUTLET |
| N4 | 270° | 2" | 3'-0" | FLG | FILL |
| N5 | 220° | 2" | 3'-6" | FLG | VAPOR TO SCRUBBER |
| N6 | 180° | 1" | 3'-0" | FLG | VAPOR TO SCRUBBER |
| N7 | 45° | 1" | - | FLG | SIGHT GAUGE |
| N8 | 45° | 1" | - | FLG | SIGHT GAUGE |
| N9 | CTR | 4" | 0 | FLG | BLIND FLANGE |
| N10 | 270° | 24" | - | - | MANWAY |
| N11 | 60° | 2" | 3'-0" | FLG | LSL |
| N12 | 50° | 2" | 3'-0" | FLG | LSH |

4 TANK NOZZLE DETAIL
M-101 3/4" = 1'-0"

DATE: _____
REV BY: _____
REVISION: _____
NO. _____

CITY OF SURPRISE
PUBLIC WORKS DEPARTMENT
TTHM REDUCTION PROJECT

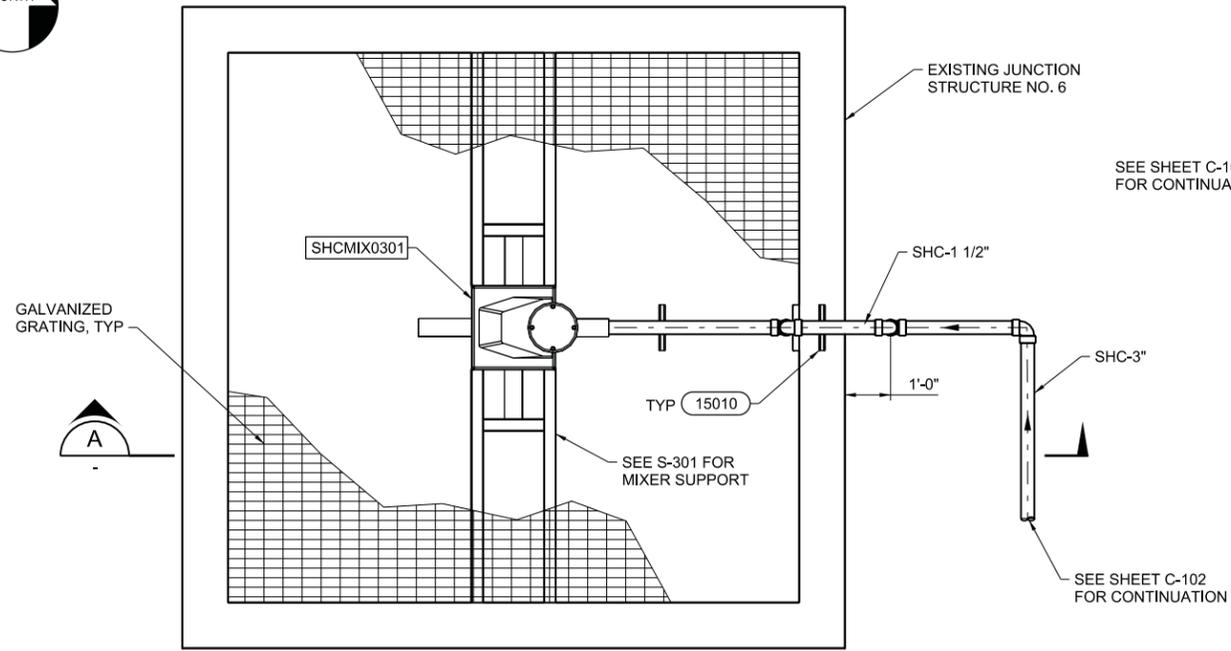
WATERWORKS
ENGINEERS

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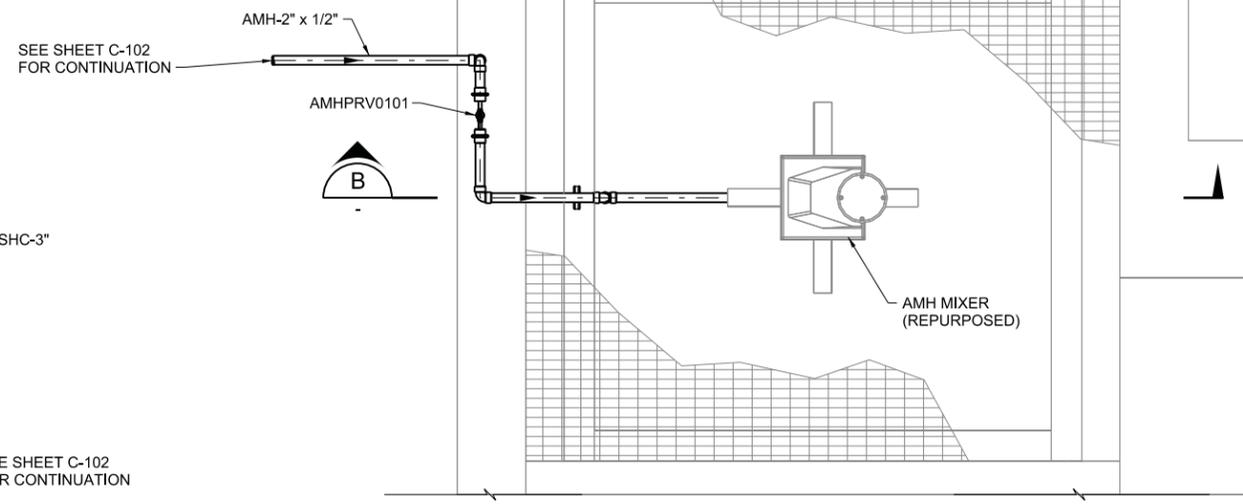
MECHANICAL
DETAILS

CHECKED: JM
DRAWN: MP
DESIGN: JC

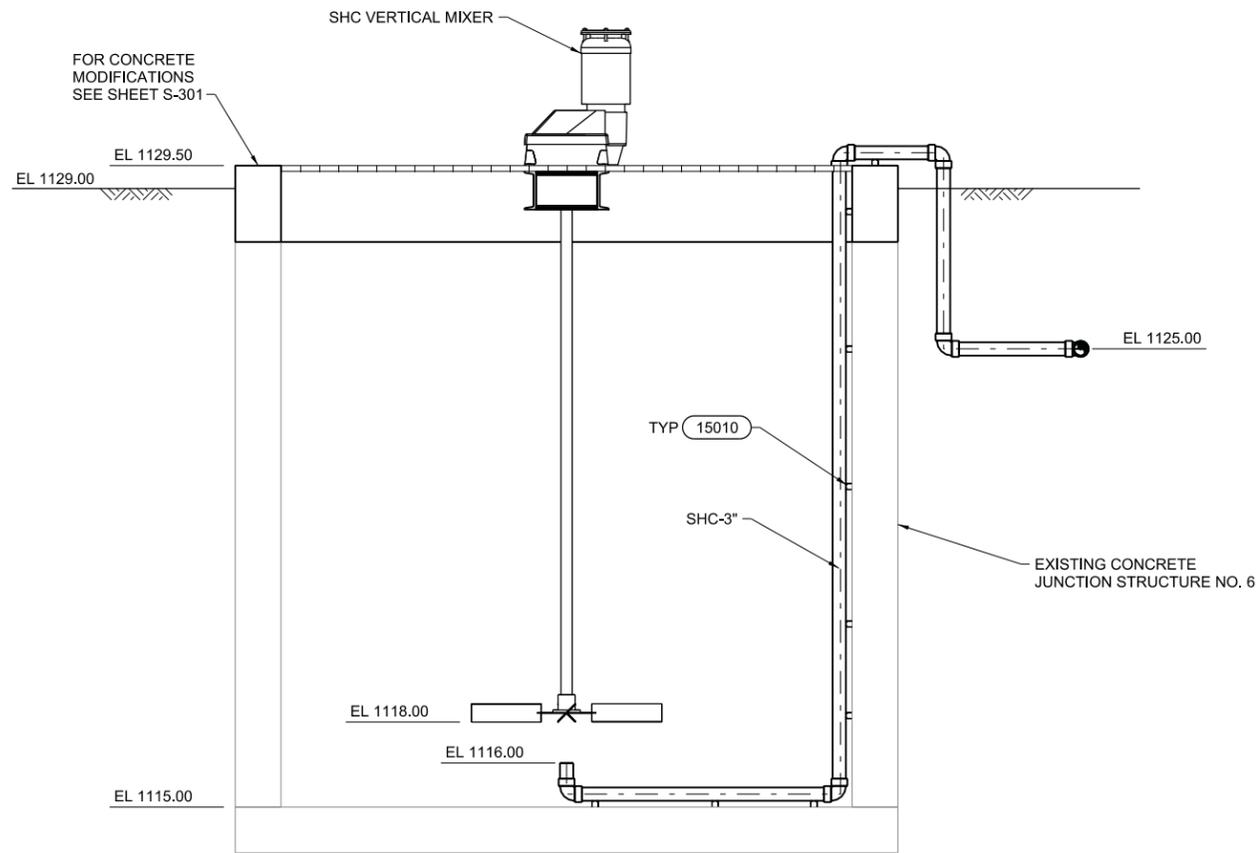
DATE: NOVEMBER 2013
PROJECT NUMBER: 11-023
DRAWING NUMBER: M-301
SHEET: - OF -



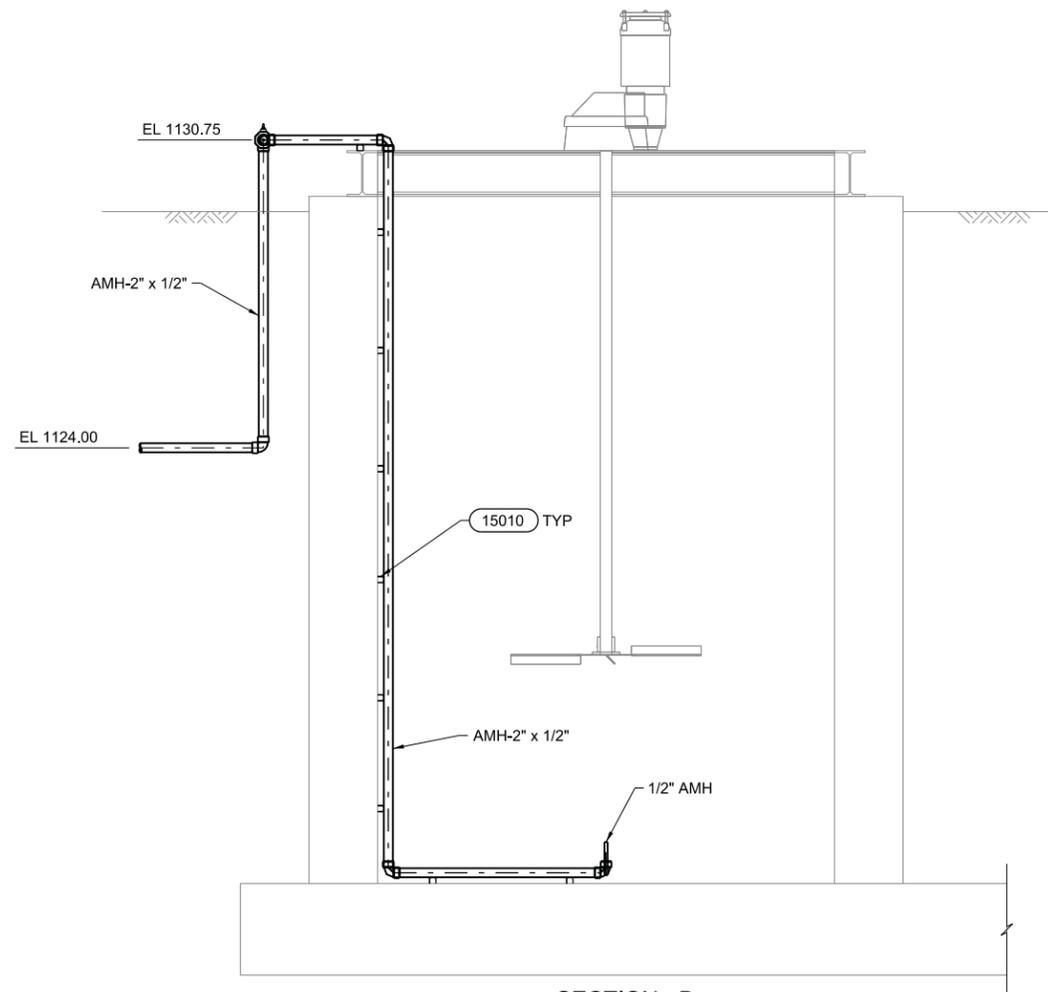
PLAN



PLAN



SECTION - A



SECTION - B

5
C-102 1/2"= 1'-0"

6
C-102 1/2"= 1'-0"

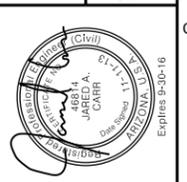
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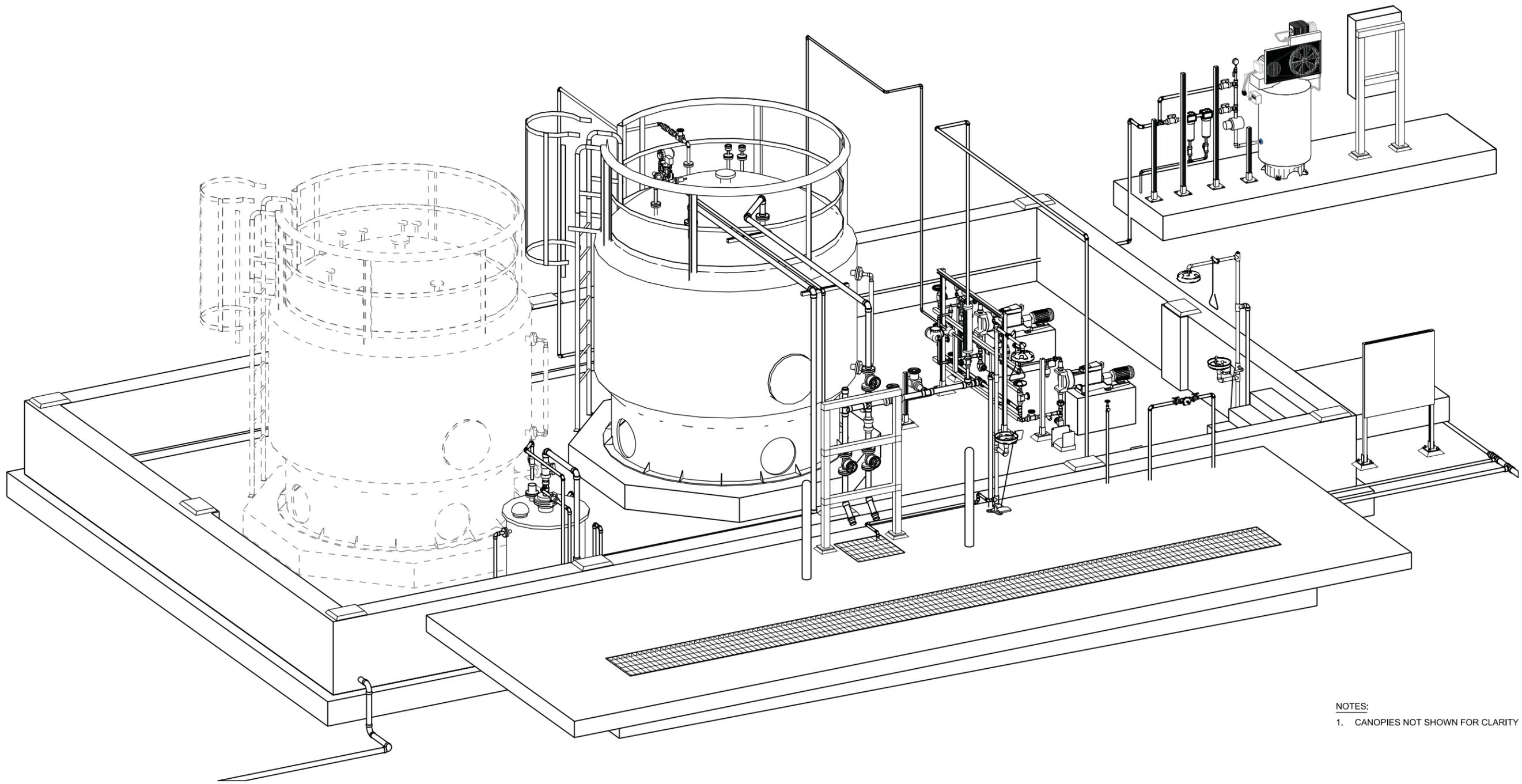


MECHANICAL

**SODIUM HYPOCHLORITE MIXER
& REPURPOSED AMMONIA MIXER
DETAILS**

DESIGN: JC
DRAWN: MP
CHECKED: JM

DATE: NOVEMBER 2013
PROJECT NUMBER: 11-023
DRAWING NUMBER: M-302
SHEET



NOTES:
 1. CANOPIES NOT SHOWN FOR CLARITY

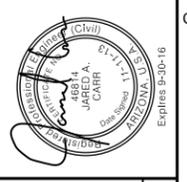
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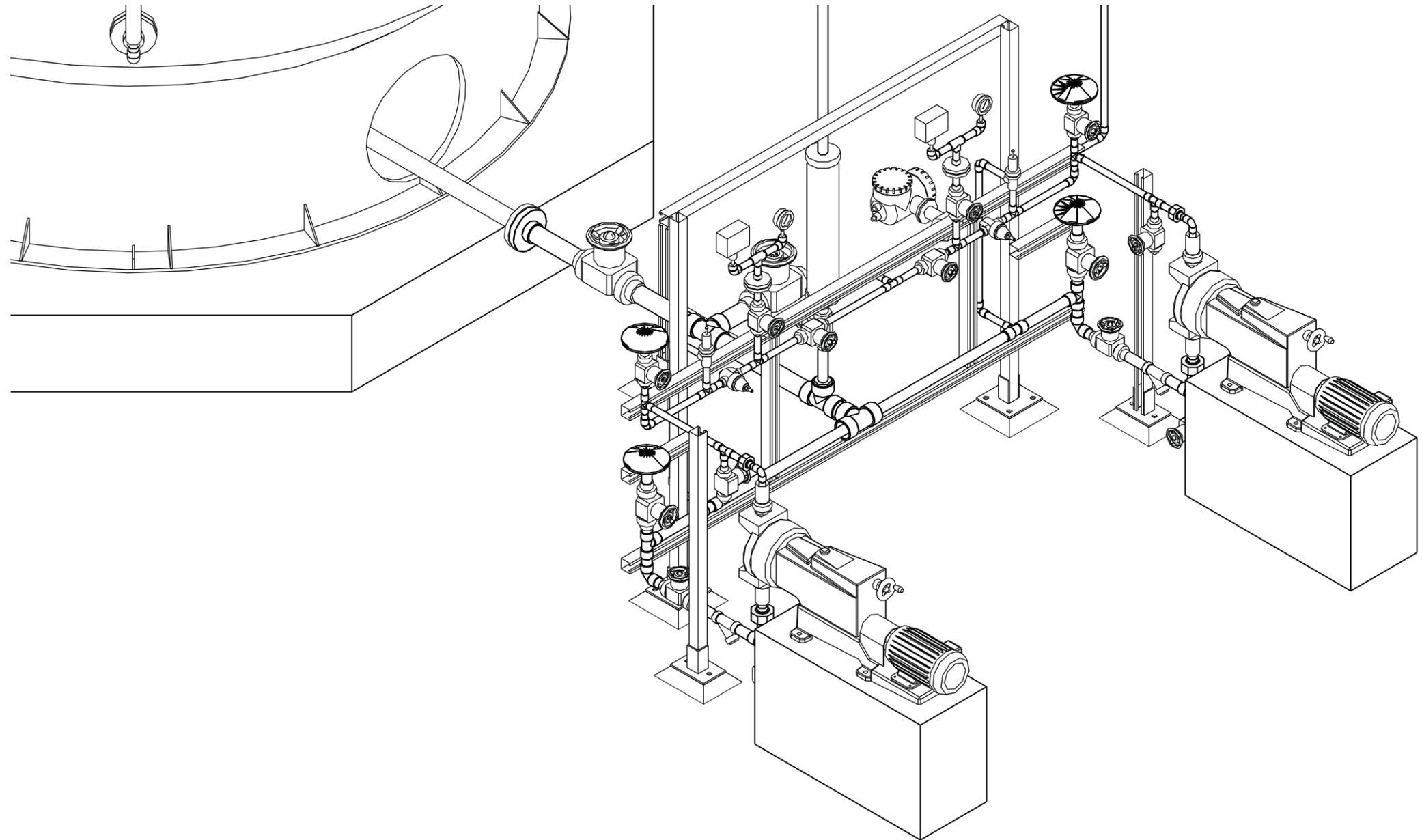


MECHANICAL

**AMMONIA FACILITY
 ISOMETRIC**

DESIGN: JC
 DRAWN: MP
 CHECKED: JM

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| DATE | NOVEMBER 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | M-401 |
| SHEET | |



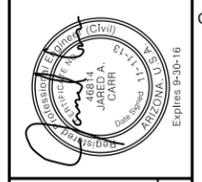
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CITY OF SURPRISE
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WATERWORKS
ENGINEERS

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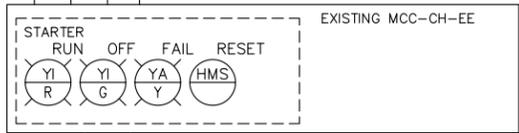


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|--------------------------|---------|----|
| MECHANICAL | DESIGN | JC |
| PUMP SYSTEM ISOMETRIC | DRAWN | MP |
| | CHECKED | JM |
| DATE NOVEMBER 2013 | | |
| PROJECT NUMBER 11-023 | | |
| DRAWING NUMBER M-402 | | |
| SHEET | | |

ALLEN BRADLEY CONTROL LOGIX PLC [AMHPLC0101]

PLC

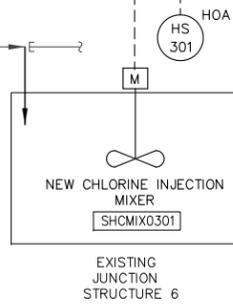
MIXER 301
 AUTO
 MIXER 301
 RUNNING
 MIXER 301
 FAULT
 MIXER 301
 START/STOP



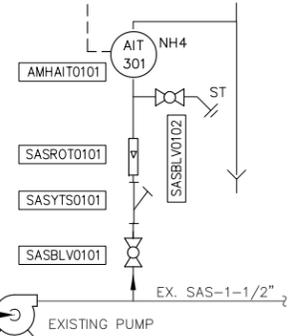
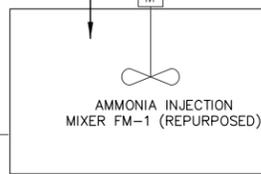
FROM AMMONIA FACILITY

N-1 A AMH-1/2" X 2"

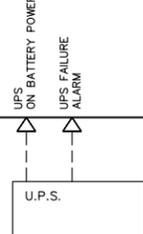
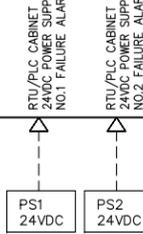
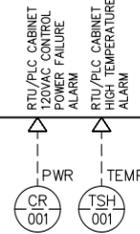
EX. SHC-3"



EFF-60"



4-20mA
 AMMONIA
 RESIDUAL



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 Est. 1988
 Casa Creek, Arizona

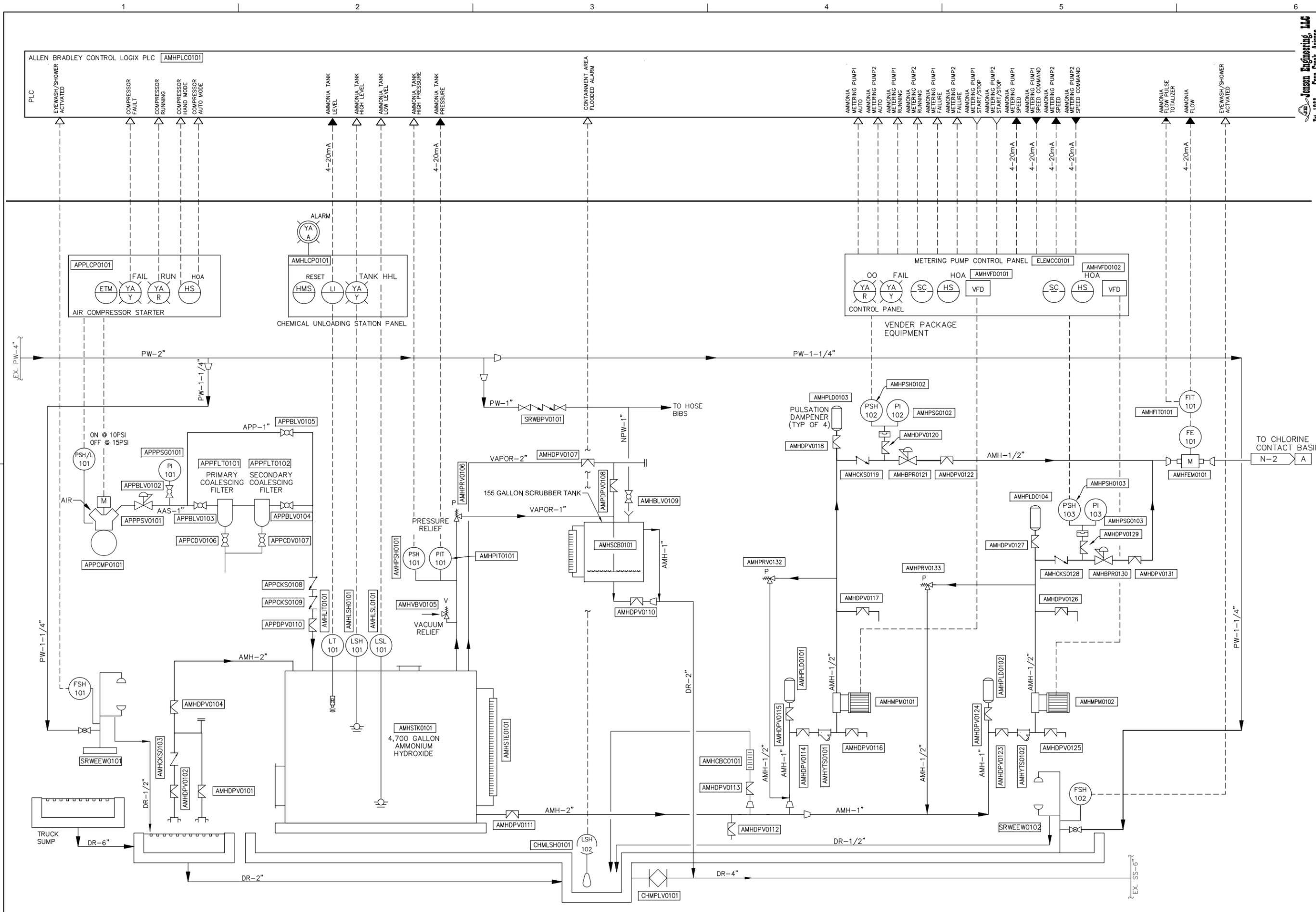
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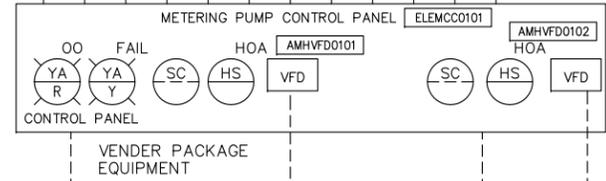
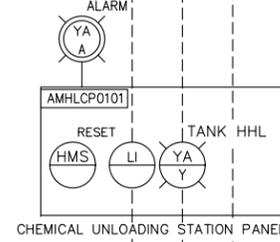
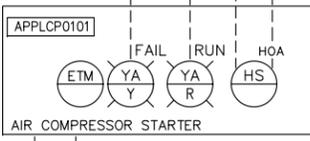
CITY OF SURPRISE
 WATER SERVICES DEPARTMENT
 TTHM REDUCTION PROJECT
WATERWORKS
 ENGINEERS
 7500 N. Dobson Rd Suite 200 - Scottsdale, AZ - 4804611702



| | | |
|--|-----------------------|--------------------------|
| INSTRUMENTATION AMMONIA MIXING P&ID NO.2 | DESIGN D. JENSEN | CHECKED |
| | DRAWN D. JENSEN | CHECKED |
| | DATE NOV 2013 | PROJECT NUMBER 11-023 |
| | DRAWING NUMBER N-2 | SHEET - OF - |



| | | | | | | | | | | | |
|---|--------------------|--------------------------------|-----------------------------|------------------------|---------------------------------|---------------------------------|--------------------------------------|--------------------------------------|------------------------|--------------|---------------------------|
| ALLEN BRADLEY CONTROL LOGIX PLC AMHPLC0101 | AMMONIA TANK LEVEL | CONTAINMENT AREA FLOODED ALARM | AMMONIA METERING PUMP1 AUTO | AMMONIA METERING PUMP2 | AMMONIA METERING PUMP1 RUN/STOP | AMMONIA METERING PUMP2 RUN/STOP | AMMONIA METERING PUMP1 SPEED COMMAND | AMMONIA METERING PUMP2 SPEED COMMAND | AMMONIA FLOW TOTALIZER | AMMONIA FLOW | EYE WASH/SHOWER ACTIVATED |
| PLC | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA | 4-20mA |



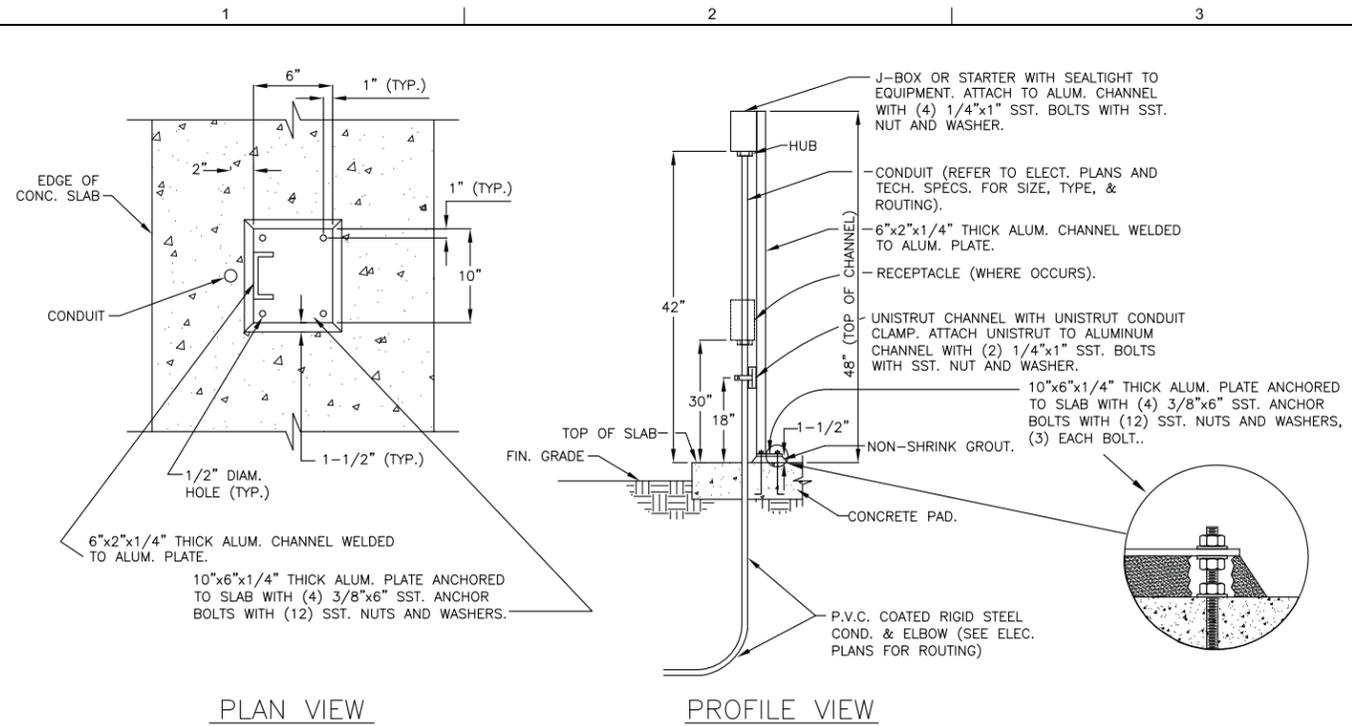
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WATERWORKS
ENGINEERS
7500 N. Dobson Rd. Suite 200 • Surprise, AZ • 480-661-7102



| | |
|----------------------------------|--------------------|
| INSTRUMENTATION | CHECKED |
| AMMONIA FEED SYSTEM P&ID NO.1 | DRAWN D. JENSEN |
| DESIGN D. JENSEN | |

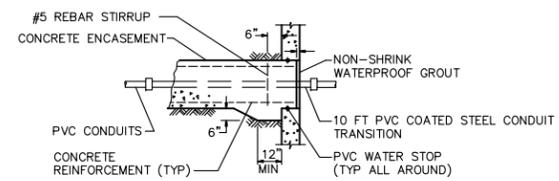
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| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | N-1 |
| SHEET | - OF - |



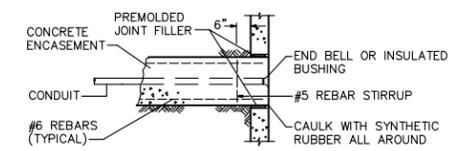
PLAN VIEW

PROFILE VIEW

1 ELECTRICAL EQUIPMENT MOUNTING
NTS

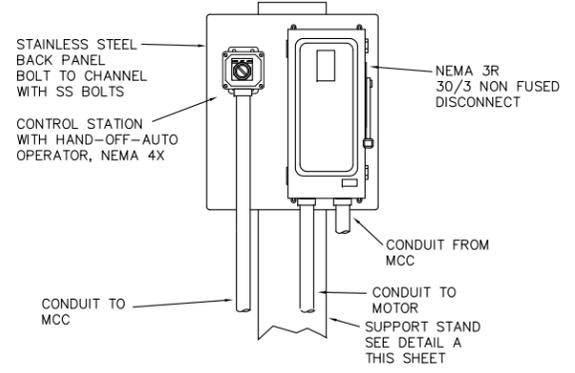


STRUCTURE PENETRATION

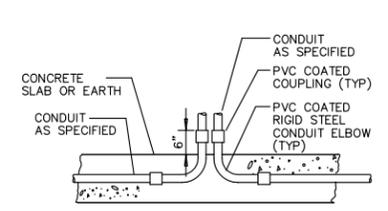


MANHOLE PENETRATION

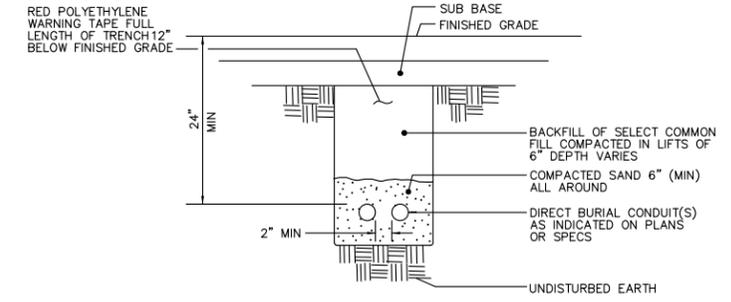
4 CONDUIT PENETRATIONS
NTS



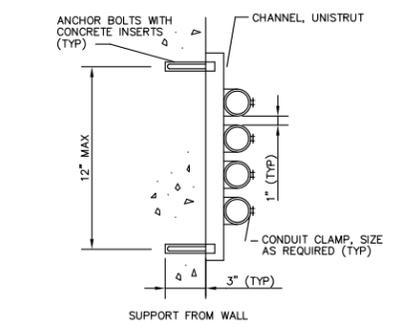
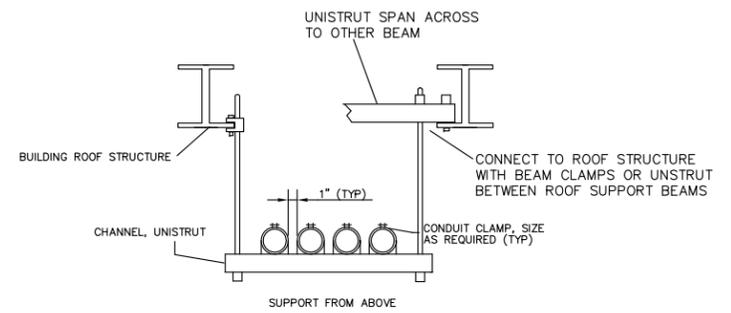
5 DISCONNECT AND CONTROL STATION
NTS



2 CONDUIT STUB UP
NTS



3 CONDUIT STUB UP
NTS



6 CONDUIT RACK SUPPORTS
NTS

Jensen Engineering, LLC
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Care Creek, Arizona

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TTHM REDUCTION PROJECT
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ENGINEERS
7950 N. DeWain Rd Suite 200 • Surprise, AZ • 480-661-1702



| | | |
|------------------------------|---------------------|---------|
| ELECTRICAL DETAILS | DESIGN D. JENSEN | CHECKED |
| | DRAWN D. JENSEN | |

| |
|-------------------------------|
| DATE NOV 2013 |
| PROJECT NUMBER 11-023 |
| DRAWING NUMBER E-13 |
| SHEET - OF - |

| I.D.: EML9 | | PANEL SCHEDULE | | | | | | AIC RATING: 10,000A | |
|---|------|----------------|---------|-------------|---------|---------|------|---------------------------------|---|
| VOLTAGE: 120/208 | | MAINS: | | 225 AMP C/B | | AMP MLO | | LOCATION: DISINFECTION BLDG | |
| MOUNTING: SURFACE | | LOADS VA | | | | | | BKR TYPE: BOLT ON | |
| CIRCUIT DESCRIPTION | BKR | CKT | PHASE A | PHASE B | PHASE C | CKT | BKR | CIRCUIT DESCRIPTION | |
| EXHAUST FAN WEST | 20/1 | 1 | 800 | | | 2 | 20/1 | NEW PLC CONTROL PANEL | |
| EXHAUST FAN EAST | 20/1 | 3 | 700 | 800 | | 4 | 20/1 | FILTER DRAIN VALVES | |
| RECEPS ELECT ROOM EXTERIOR | 20/1 | 5 | | | 720 | 6 | 20/1 | FA CONTROL PANEL | |
| RECEPS | 20/1 | 7 | | | 500 | 8 | 20/1 | COOLER PUMPS | |
| RECEPS | 20/1 | 9 | | | 1000 | 10 | 20/1 | COOLER PUMPS | |
| RECEPS GFC DISINF BASIN | 20/1 | 11 | | | 720 | 12 | 20/1 | METER CABINETS | |
| RECEPS GFC DISINF BASIN | 20/1 | 13 | | | 1000 | 14 | 20/1 | ANALYZERS | |
| HP-1 | 40 | 15 | | | 900 | 16 | 20/1 | TURBIDITY ANALYZER | |
| | / | 17 | | | 3002 | 18 | 20/1 | DISINFECTION BLDG PLC | |
| | 3 | 19 | | | 100 | 20 | 20/1 | P5218 LIT | |
| NH4OH METERING PUMP PANEL | 30 | 21 | | | 3002 | 22 | 20/1 | AMMONIA FACILITY LIGHTS | |
| | / | 23 | | | 250 | 24 | 20/1 | CHEMICAL UNLOADING PANEL | |
| | 3 | 25 | | | 1200 | 26 | 20/1 | FLOW TRANSMITTER (EXIST) | |
| RECEPS | 20/1 | 27 | | | 700 | 28 | 15/ | FLOW TRANSMITTER FIT-101 | CONNECT NEW FLOW TRANSMITTER TO SAME CIRCUIT AS EXISTING FLOW TRANSMITTER |
| RECEPS | 20/1 | 29 | | | 915 | 30 | 2 | RESIDUAL ANALYZER SUPPLY PUMP 1 | |
| SPARE | 15/ | 31 | | | 720 | 32 | 15/ | RESIDUAL ANALYZER SUPPLY PUMP 2 | |
| | 2 | 33 | | | 915 | 34 | 2 | RESIDUAL ANALYZER SUPPLY PUMP 3 | |
| AMMONIA ANALYZER AIT-101 | 15/1 | 35 | | | 915 | 36 | 15/ | RESIDUAL ANALYZER SUPPLY PUMP 4 | |
| SPARE | 15/1 | 37 | | | 250 | 38 | 2 | | |
| SPARE | 15/ | 39 | | | 916 | 40 | 15/ | | |
| | 2 | 41 | | | 915 | 42 | 2 | | |
| CONNECTED KVA PER PHASE | | | 11.002 | 11.337 | 11.987 | NOTES: | | | |
| CONNECTED AMPS PER PHASE | | | 91.7 | 94.5 | 99.9 | | | | |
| 25% OF CONTINUOUS & LIGHTING LOAD (KVA) | | | 0.000 | 0.000 | 0.000 | | | | |
| LARGEST MOTOR (25%) | | | 0.200 | 0.200 | 0.000 | | | | |
| CODE KVA PER PHASE | | | 11.202 | 11.537 | 11.987 | | | | |
| CODE AMPS PER PHASE | | | 93.350 | 96.142 | 99.892 | | | | |

THIS PANEL IS EXISTING. MODIFICATIONS AND NEW LOADS ARE SHOWN IN BOLD.

CONDUIT SCHEDULE

| CONDUIT | SIZE | CONDUCTORS | BOND | FROM | TO | REMARKS |
|---------|--------|-------------------|------|---|--|------------------------------------|
| P300 | 1" | 3#10 | 1#10 | MCC-CH-EE | SHC INJECTION MIXER SHCMIX0301 DISCONNECT | CONT TO MIXER MOTOR |
| P301 | 3/4" | 3#12 | 1#12 | MCC-CH-EE | AIR COMPRESSOR APPCMP0101 CONTROL PANEL | |
| P302 | 1" | 3#10,1#10 NEUT | 1#10 | PANEL EML9 | METERING PUMP CONTROL PANEL ELEMCC0101 | |
| P303 | 3/4" | 3#12 | 1#12 | METERING PUMP CONTROL PANEL ELEMCC0101 | NH4OH METERING PUMP NO.1 AMHMPM0101 | |
| P304 | 3/4" | 3#12 | 1#12 | METERING PUMP CONTROL PANEL ELEMCC0101 | NH4OH METERING PUMP NO.2 AMHMPM0102 | |
| P305 | 3/4" | 2#12 | 1#12 | PANEL EML9 | AMMONIA ANALYZER AIT-101 AMHAI0101 | |
| P306 | 3/4" | 2#12 | 1#12 | PANEL EML9 | NEW PLC CONTROL PANEL AMHPLC0101 | |
| P307 | 3/4" | 2#12 | 1#12 | PANEL EML9 | FILTER DRAIN VALVES | |
| P308 | 3/4" | 2#12 | 1#12 | PANEL EML9 | FLOW TRANSMITTER FIT-101 AMHFIT0101 | |
| P309 | 3/4" | 2#12 | 1#12 | PANEL EML9 | CHEMICAL UNLOADING PANEL AMHLCPO101 | |
| P310 | 3/4" | 2#12 | 1#12 | PANEL EML9 | AMMONIA AREA LIGHTS | |
| C400 | 3/4" | 8#14 | 1#14 | MCC-CH-EE | NEW PLC CONTROL PANEL AMHPLC0101 | |
| C401 | 1" | 1 ETHERNET CABLE | 1#14 | EXIST DISINFECTION PLC PANEL | NEW PLC CONTROL PANEL AMHPLC0101 | |
| C402 | 1" | 16#14 | 1#14 | PLC PANEL AMHPLC0101 | METERING PUMP CONTROL PANEL ELEMCC0101 | |
| C403 | 1-1/2" | (4) PRTWSH CABLES | 1#14 | PLC PANEL AMHPLC0101 | METERING PUMP CONTROL PANEL ELEMCC0101 | |
| C404 | 3/4" | 4#14 | 1#14 | PLC PANEL AMHPLC0101 | AIR COMPRESSOR APPCMP0101 CONTROL PANEL | |
| C405 | 3/4" | 8#14 | 1#14 | PLC PANEL AMHPLC0101 | CHEMICAL UNLOADING PANEL AMHLCPO101 | |
| C406 | 1" | (2) PRTWSH CABLES | 1#14 | PLC PANEL AMHPLC0101 | CHEMICAL UNLOADING PANEL AMHLCPO101 | |
| C407 | 3/4" | (1) PRTWSH CABLE | 1#14 | PLC PANEL AMHPLC0101 | AMMONIA ANALYZER AIT-101 AMHAI0101 | |
| C408 | 1" | (2) PRTWSH CABLES | 1#14 | PLC PANEL AMHPLC0101 | FLOW TRANSMITTER FIT-101 AMHFIT0101 | |
| C409 | 1" | (1) PRTWSH CABLE | 1#14 | PLC PANEL AMHPLC0101 | PRESSURE TRANSMITTER PIT-101 AMHPIT0101 | |
| C410 | 1" | 8#14 | 1#14 | PLC PANEL AMHPLC0101 | AMHPSH0101, CHMLSH0101, SRWEEW0101, SRWEEW0102 | PSH-101, LSH-102, FSH-101, FSH-102 |
| C411 | 3/4" | 4#14 | 1#14 | METERING PUMP CONTROL PANEL ELEMCC0101 | PRESSURE SWITCHES AMHPSH0102, AMHPSH0103 | |
| C412 | 3/4" | 4#14 | 1#14 | AIR COMPRESSOR APPCMP0101 CONTROL PANEL | PRESSURE SWITCH PSHL-301 | |
| C413 | 3/4" | (1) PRTWSH CABLE | 1#14 | CHEMICAL UNLOADING PANEL AMHLCPO101 | LEVEL TRANSMITTER LIT-101 AMBLIT0101 | |
| C414 | 3/4" | 4#14 | 1#14 | CHEMICAL UNLOADING PANEL AMHLCPO101 | LEVEL SWITCHES AMHLSH0101, AMHLSL0101 | |
| C415 | 1" | 6#14 | 1#14 | MCC-CH-EE | HOA SWITCH FOR MIXER SHCMIX0301 | |

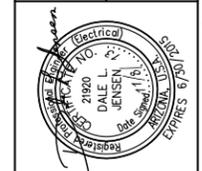
Jensen Engineering, LLC
Est. 1988
Care Creek, Arizona



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WATER SERVICES DEPARTMENT
TTHM REDUCTION PROJECT

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ENGINEERS

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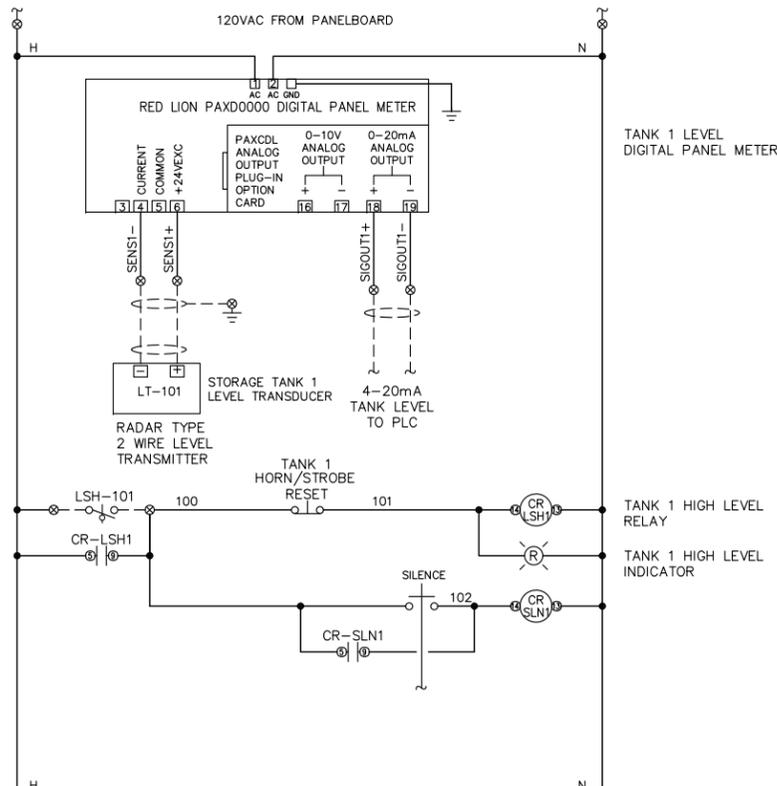


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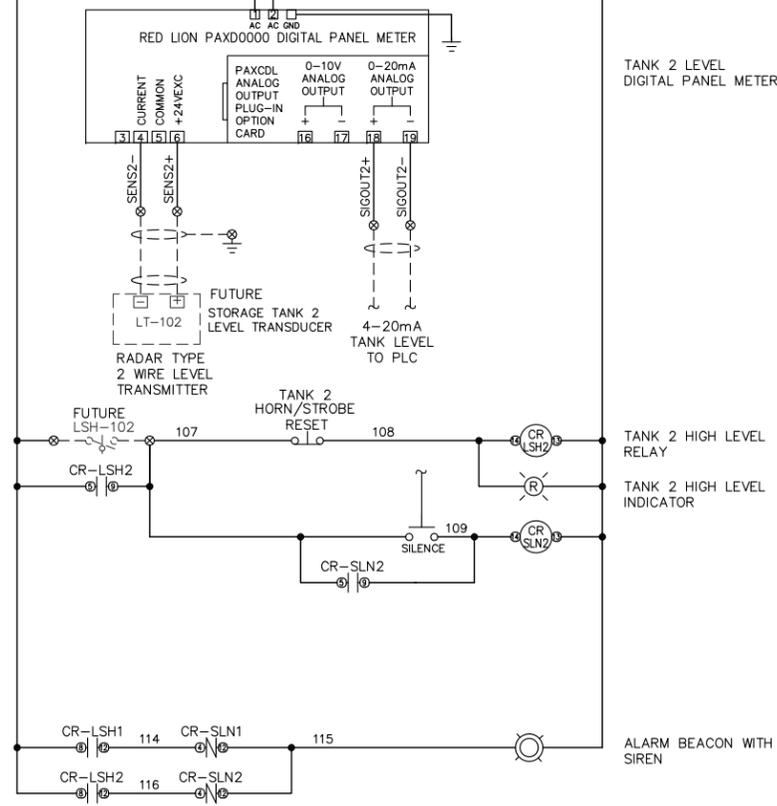
PANEL SCHEDULES & CONDUIT SCHEDULES

DESIGN: D. JENSEN
DRAWN: D. JENSEN
CHECKED: _____

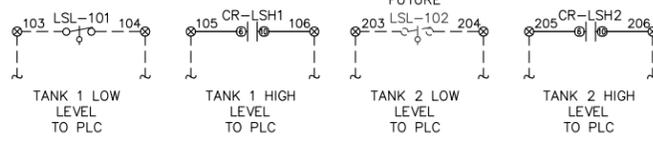
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PROJECT NUMBER: 11-023
DRAWING NUMBER: E-12
SHEET: - OF -



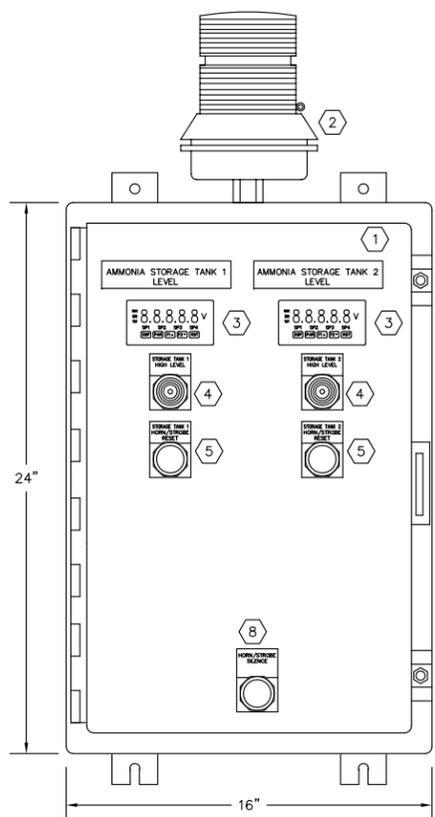
TANK 1 LEVEL DIGITAL PANEL METER



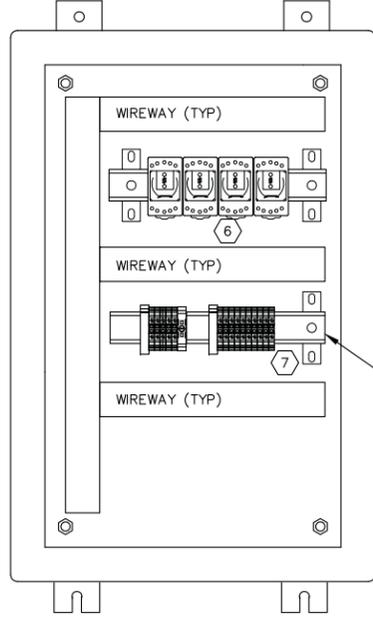
TANK 2 LEVEL DIGITAL PANEL METER



CHEMICAL TANK UNLOADING STATION PANEL - SCHEMATIC



PANEL EXTERIOR DOOR ELEVATION



PANEL INTERIOR ELEVATION

CHEMICAL TANK UNLOADING STATION PANEL - DETAILS
SCALE: 1/4" = 1"

- BILL OF MATERIAL**
- ① HOFFMAN A24H1608SSLP NEMA 4X 316 STAINLESS STEEL ENCLOSURE WITH #A24P16 PANEL.
 - ② EDWARDS 51R-N5-40W ADAPTABEACON 120VAC INCANDESCENT BEACON WITH INTEGRAL HORN. RED.
 - ③ RED LION PAXD0000 DIGITAL PANEL METER WITH OPTIONAL ANALOG OUTPUT CARD PAXCDL. 120VAC.
 - ④ NEMA 4X 30mm RED PILOT LIGHT 120VAC.
 - ⑤ NEMA 4X 30mm RESET PUSH BUTTON.
 - ⑥ CONTROL RELAY, 3PDT IDEC 120VAC COIL
 - ⑦ DIN RAIL MOUNT TERMINAL BLOCKS.
 - ⑧ NEMA 4X 30mm MOMENTARY PUSHBUTTON. NAMEPLATE "HORN/STROBE SILENCE".

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Est. 1988
Casa Grande, Arizona

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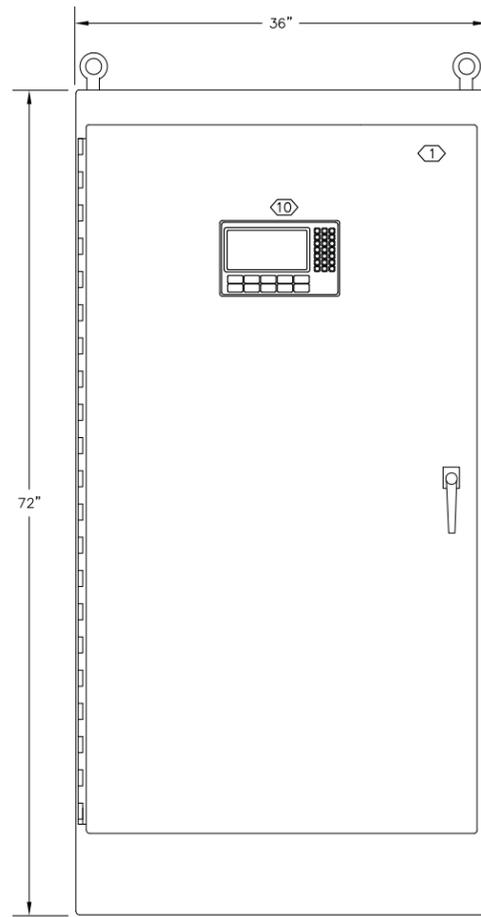


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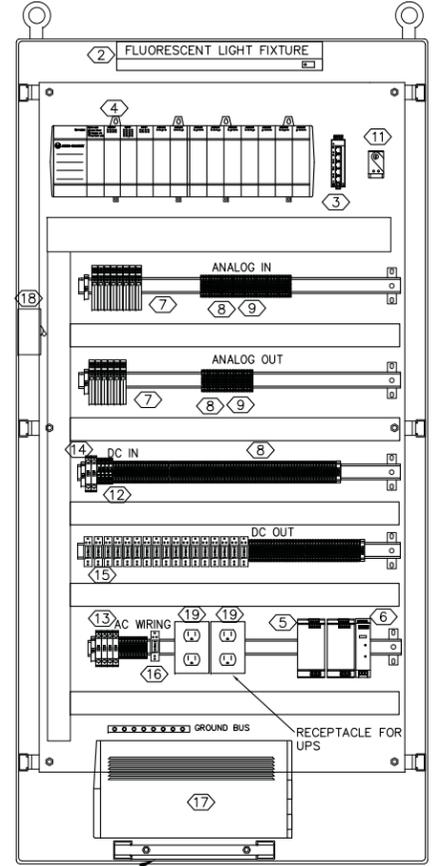
CHEMICAL UNLOADING PANEL
AMHLCPO101
SCHEMATIC AND DETAILS

DESIGN: D. JENSEN
DRAWN: D. JENSEN
CHECKED: D. JENSEN

| | |
|----------------|----------|
| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-11 |
| SHEET | - OF - |



DOOR ELEVATION



PROVIDE SUPPORT BASE FOR UPS TO MOUNT UPS AT THIS LOCATION.

INTERIOR ELEVATION

BILL OF MATERIAL

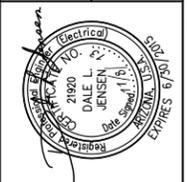
| ITEM | QUAN | DESCRIPTION |
|------|------|--|
| 1 | 1 | HOFFMAN A-723618FS NEMA 12 ENCLOSURE WITH A-72P36F1 PANEL. |
| 2 | 1 | HOFFMAN ALF16M18R FLUORESCENT LIGHT 120VAC. |
| 3 | 1 | HIRSCHMANN SPIDER 5TX EHTERNET SWITCH. 24VDC. |
| 4 | 1 | PLC RACK WITH: ALLEN BRADLEY #1756-PA72/C POWER SUPPLY, 1756-A13 RACK, 1756-L61 PROCESSOR, 1756-ENBT ETHERNET COMM MODULE, (1) 1756-IF16 ANALOG INPUT MODULE, (1) 1756-OF6GI ANALOG CURRENT OUTPUT MODULE, (2) 1756-IB16 24VDC DISCRETE INPUT MODULES, (1) 1756-OB16I 24VDC OUTPUT MODULES. |
| 5 | 2 | PHOENIX CONTACT QUINT-PS/ 1AC/24DC/10 ORDER NO. 2866763 POWER SUPPLY. |
| 6 | 1 | PHOENIX CONTACT QUINT-ORING/24DC/2X10/1X20 ORDER NO. 2320173 REDUNDANCY MODULE. |
| 7 | 14 | PHOENIX CONTACT ISOLATOR MCR-1CLP-I-I-00 2814016 |
| 8 | 166 | PHOENIX CONTACT #UT4 #3044102 TERMINAL BLOCKS WITH PHOENIX CONTACT #D-UT 4/10 END BARRIERS #3047028 AND PHOENIX CONTACT E/NS 35 N #0800886 END ANCHORS AS NEEDED. |
| 9 | 14 | PHOENIX CONTACT UT4 PE GROUNDING BLOCK GREEN/YELLOW PART #3044128. |
| 10 | 1 | ALLEN BRADLEY PANELVIEW PLUS MODEL 600 COLOR KEYPAD/TOUCH HMI SCREEN 24VDC WITH ETHERNET COMMUNICATIONS. |
| 11 | 1 | HOFFMAN ATEMNO TEMPERATURE SWITCH N.O. 0-140° F. |
| 12 | 4 | PHOENIX CONTACT FUSE BLOCK UT6 HESILED 24. #3046414 FUSE SIZES 1 AMP. |
| 13 | 4 | PHOENIX CONTACT TMC 1-F1 100 SERIES 16 AMP THERMAL MAGNETIC CIRCUIT BREAKERS PART #0914183. |
| 14 | 2 | PHOENIX CONTACT TMC 1-F1 100 SERIES 10 AMP THERMAL MAGNETIC CIRCUIT BREAKERS PART #0914167. |
| 15 | 16 | SPDT 24VDC RELAYS. |
| 16 | 1 | SPDT 120VAC RELAY. |
| 17 | 1 | APC UPS MODEL SMT1500 WITH RELAY I/O SMART SLOT CARD 120VAC/120VAC 1500VA. |
| 18 | 1 | GENERAL PURPOSE LIGHT SWITCH 15A 120VAC. MOUNT ON PANEL SIDE. |
| 19 | 2 | GENERAL PURPOSE DUPLEX RECEPTACLE 15A 120VAC |
| AR | | ALLEN BRADLEY #1492-DR6 RAISED DIN RAIL AS REQUIRED. |

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 Est. 1988
 Care Creek, Arizona

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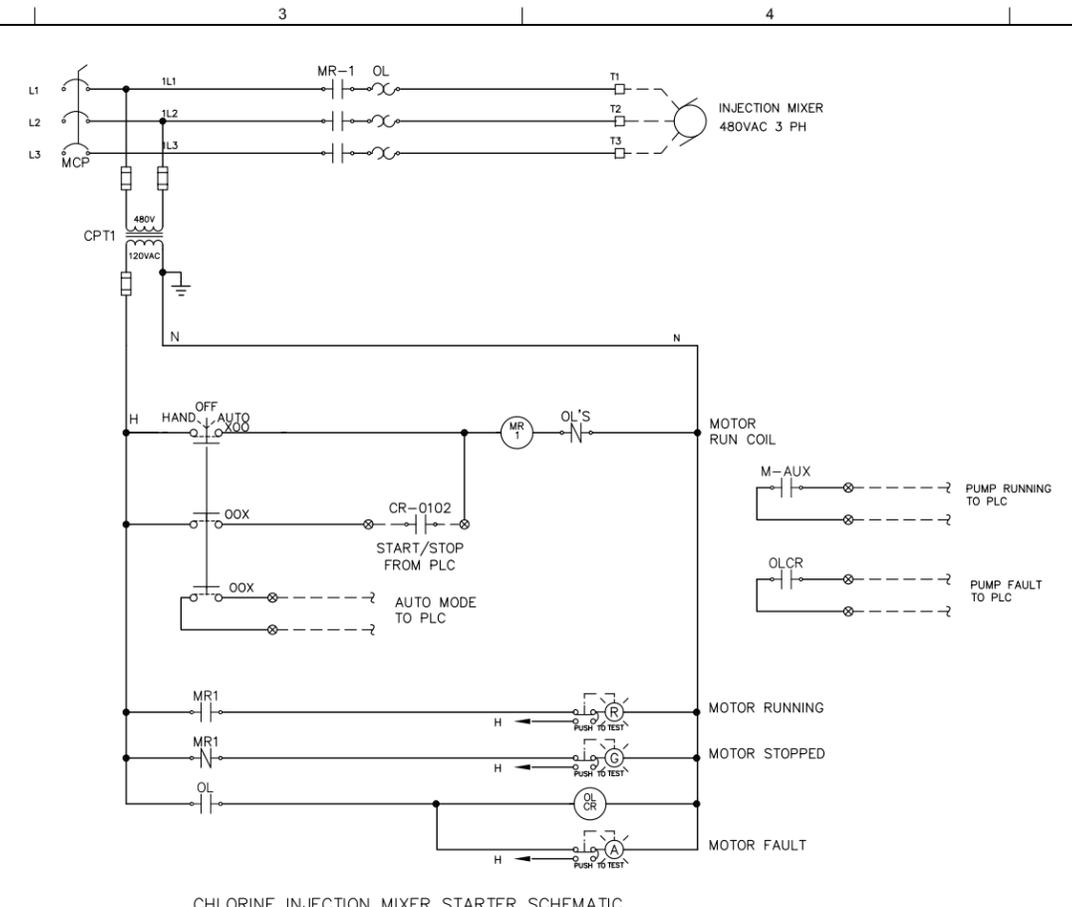
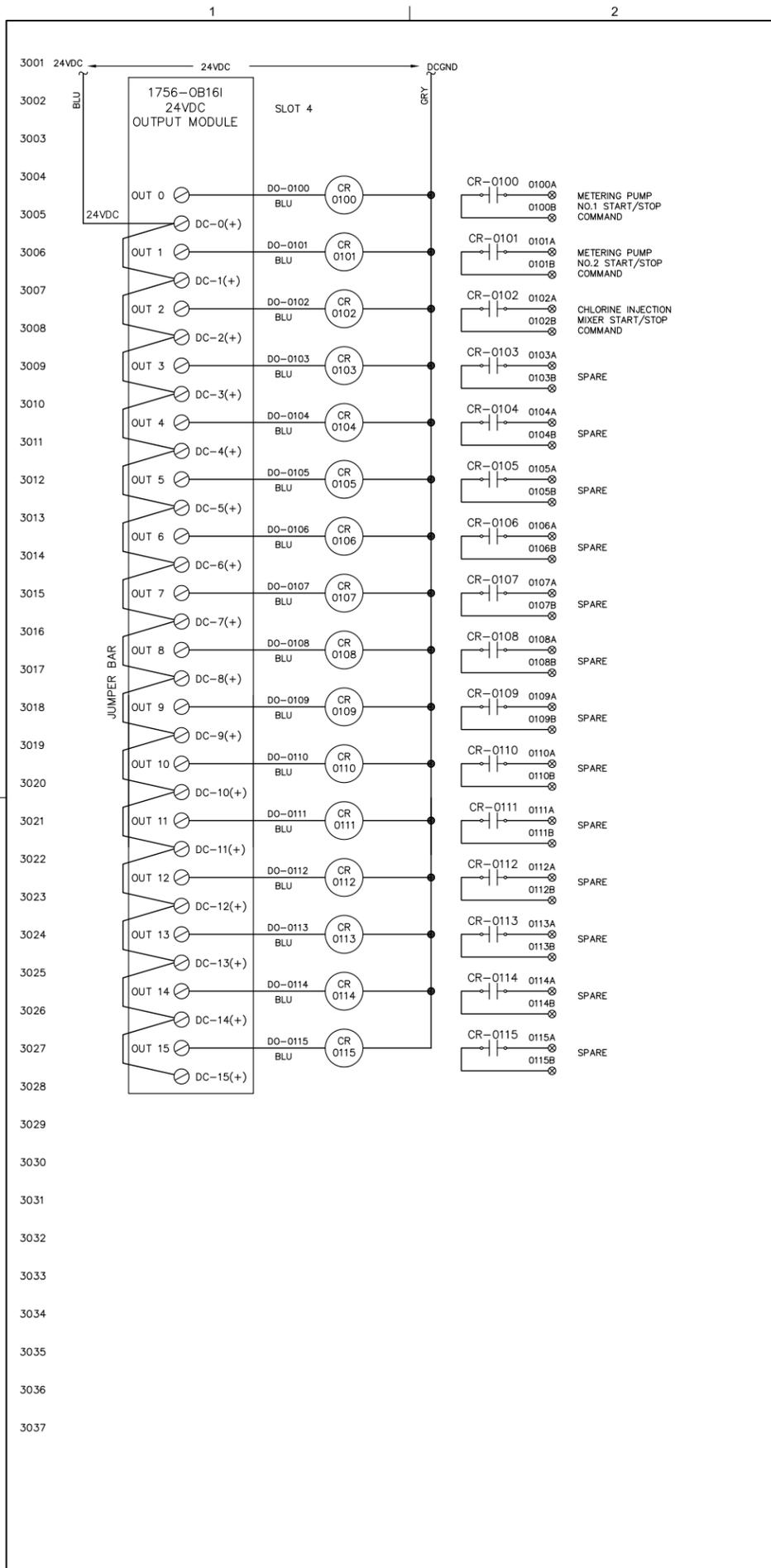


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 ENGINEERS
 7500 N. DeWain Rd Suite 200 - Surprise, AZ - 4804611702



ELECTRICAL
PLC PANEL AMHPLC0101
 PANEL DETAILS
 DESIGN: D. JENSEN
 DRAWN: D. JENSEN
 CHECKED:

DATE: NOV 2013
 PROJECT NUMBER: 11-023
 DRAWING NUMBER: E-10
 SHEET: - OF -



CHLORINE INJECTION MIXER STARTER SCHEMATIC

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Est. 1988
Casa Grande, Arizona

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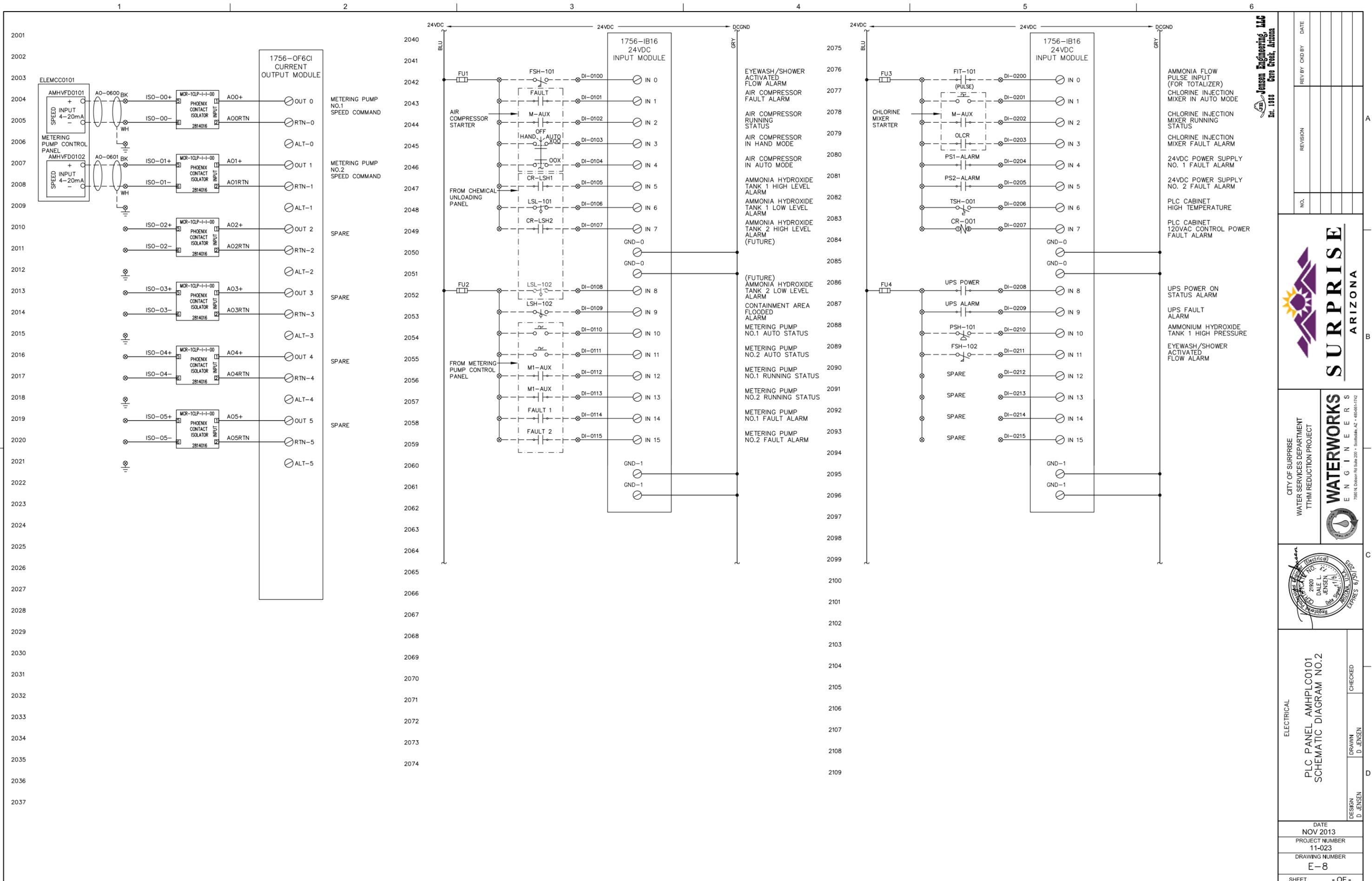


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| | | | |
|----------------|---|----------------|-----------|
| ELECTRICAL | PLC PANEL AMHPLC0101 SCHEMATIC DIAGRAM NO.3 & MISC SCHEMATICS | DESIGN | CHECKED |
| | | DRAWN | D. JENSEN |
| | | DATE | NOV 2013 |
| | | PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | | E-9 | |
| SHEET | | - OF - | |



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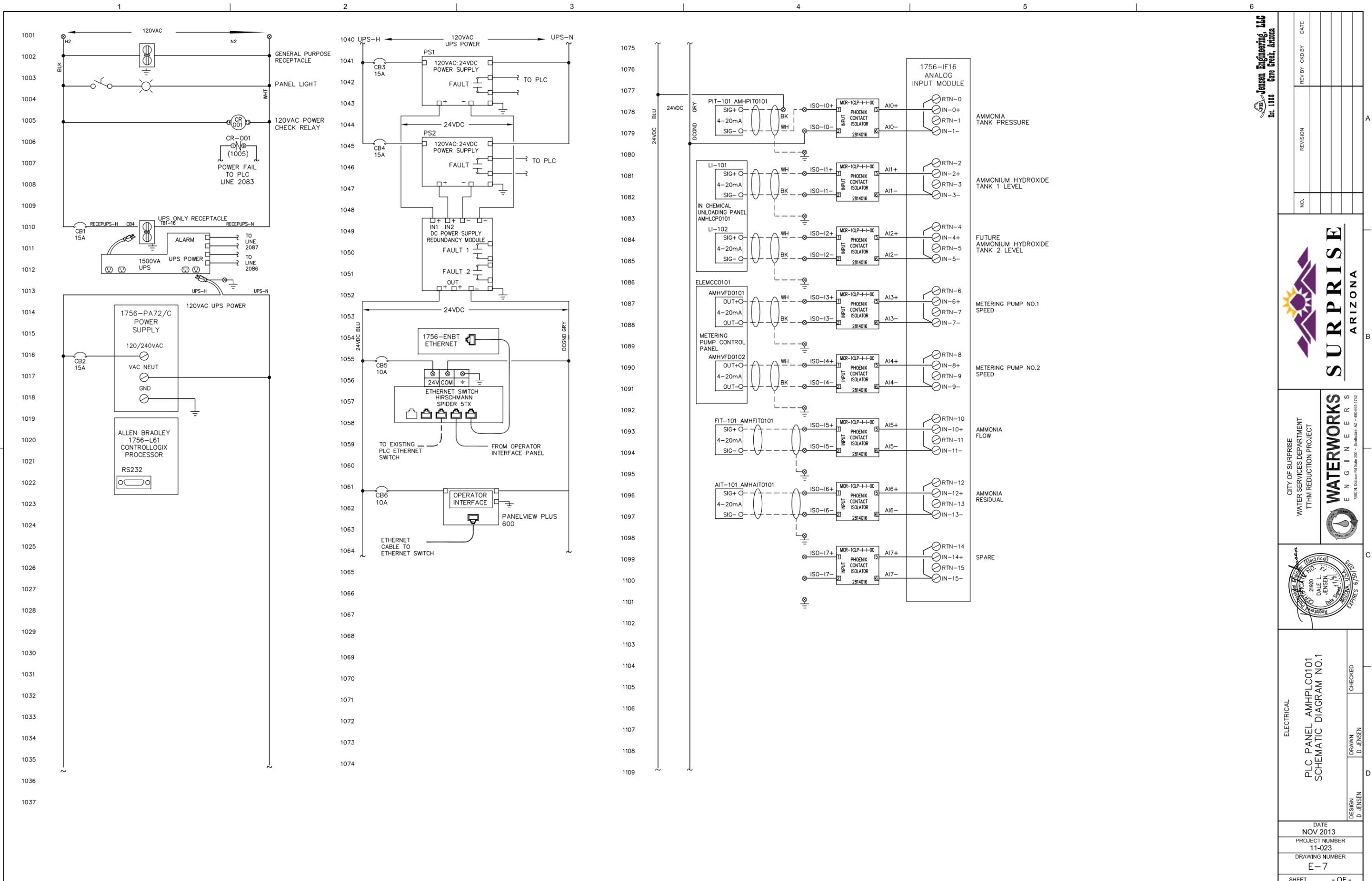


ELECTRICAL

PLC PANEL AMHPLC0101
 SCHEMATIC DIAGRAM NO.2

DESIGN: D. JENSEN
 DRAWN: D. JENSEN
 CHECKED: []

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|----------------|----------|
| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-8 |
| SHEET | - OF - |



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 Casa Creek, Arizona

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|-----|----------|--------|--------|------|
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CITY OF SURPRISE
 WATER SERVICES DEPARTMENT
 TTHM REDUCTION PROJECT

WATERWORKS
 ENGINEERS
 7500 N. DeWain Rd Suite 200 • Scottsdale, AZ • 480-661-1702



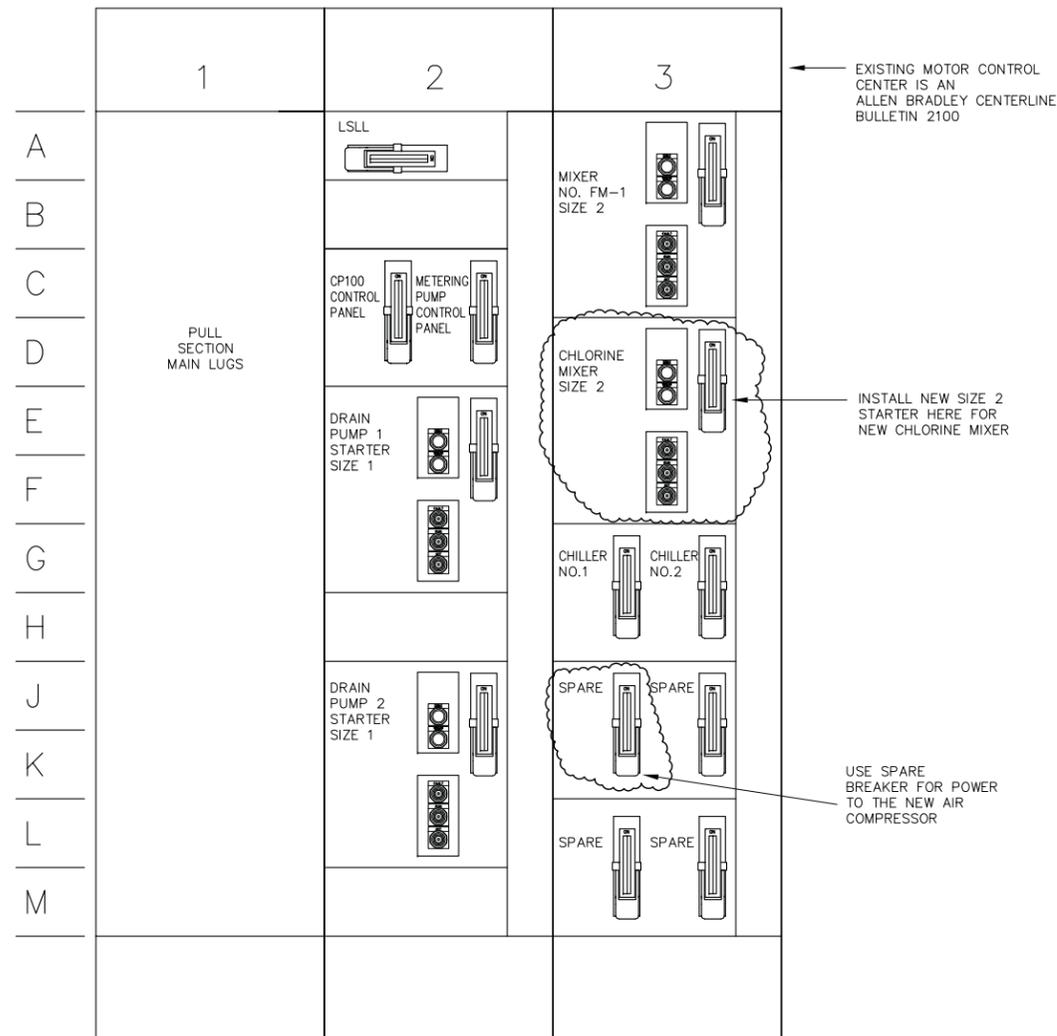
ELECTRICAL

PLC PANEL AMHPLC0101
 SCHEMATIC DIAGRAM NO.1

DESIGN: D. JENSEN
 DRAWN: D. JENSEN
 CHECKED: _____

| | |
|----------------|----------|
| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-7 |
| SHEET | - OF - |

MCC -600A 3 PHASE 3 WIRE 480 VAC 60 HZ BRACED FOR 65,000 AMPS



EXISTING MOTOR CONTROL CENTER MCC-CH-EE FRONT ELEVATION
SCALE: 1/8" = 1"

Jensen Engineering, LLC
Est. 1988
Casa Grande, Arizona

| NO. | REVISION | REV BY | CHK BY | DATE |
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WATER SERVICES DEPARTMENT
TTHM REDUCTION PROJECT

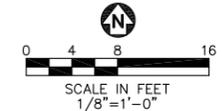
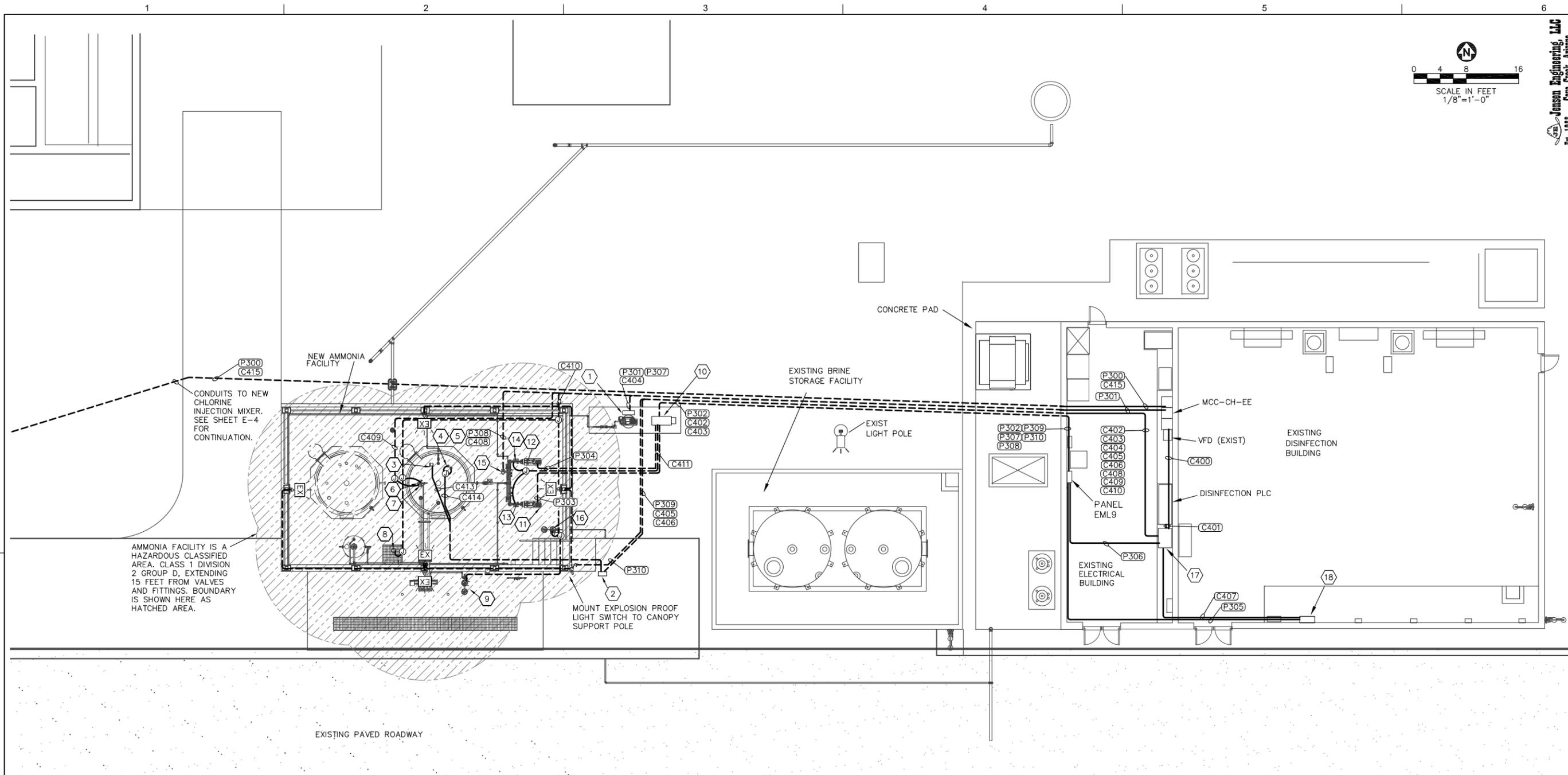
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ENGINEERS
7580 N. DeSoto Rd Suite 200 • Scottsdale, AZ • 480-661-1722



ELECTRICAL
EXISTING MCC-CH-EE
PANEL DETAILS

DESIGN: D. JENSEN
DRAWN: D. JENSEN
CHECKED: _____

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| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-6 |
| SHEET | - OF - |

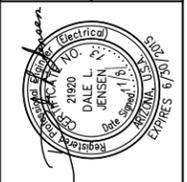


Jensen Engineering, LLC
 Est. 1988
 Casa Creek, Arizona

| NO. | REVISION | REV BY | CHK BY | DATE |
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CITY OF SURPRISE
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 TTHM REDUCTION PROJECT
WATERWORKS
 ENGINEERS
 7500 N. Dobson Rd Suite 200 - Surprise, AZ - 4606611702



ELECTRICAL
AMMONIA FEED SYSTEM PLAN
 DESIGN: D. JENSEN
 DRAWN: D. JENSEN
 CHECKED: D. JENSEN

| | |
|----------------|----------|
| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-5 |
| SHEET | - OF - |

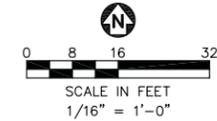
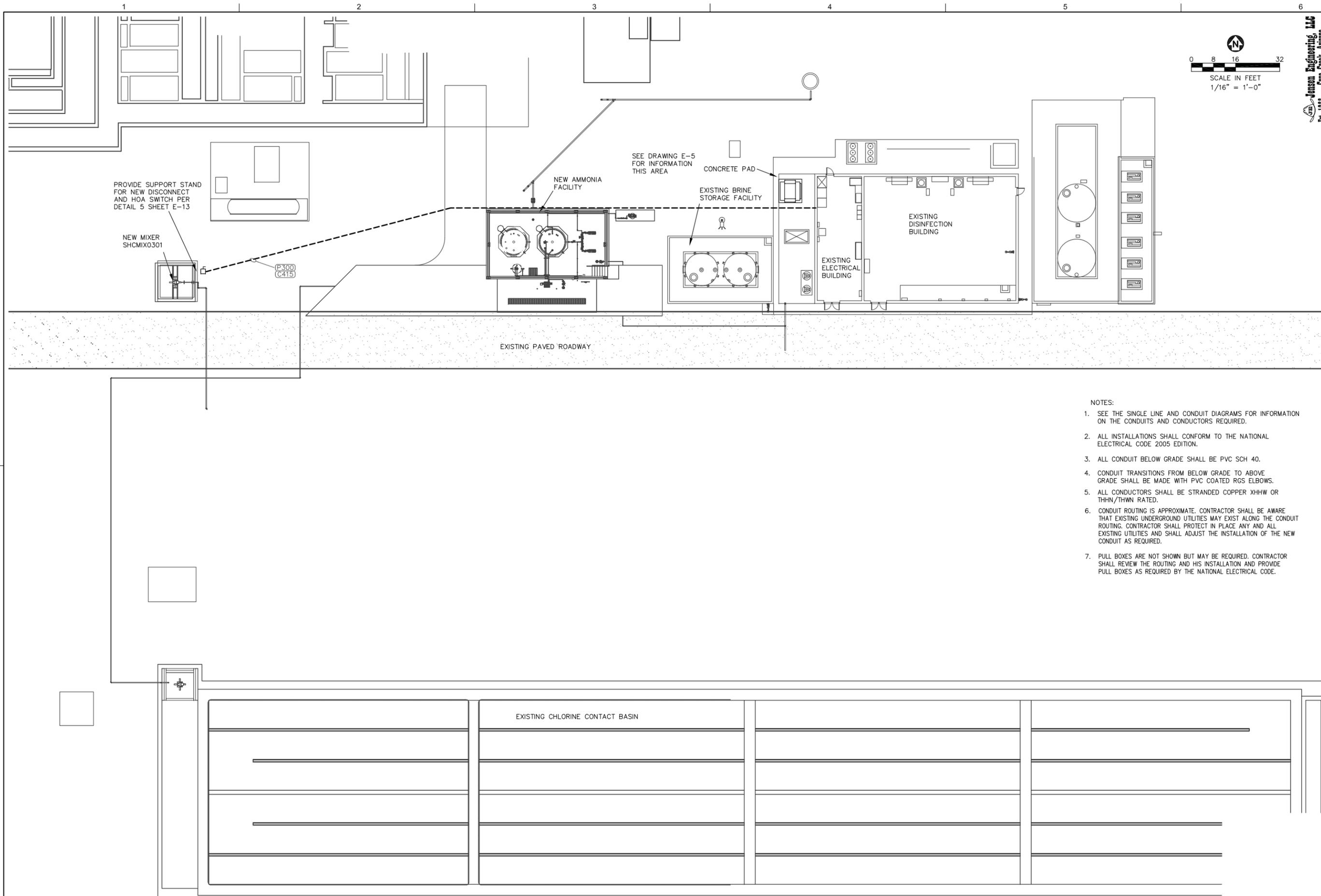
IDENTIFIER NOTES:

| | | |
|----|------------|--|
| 1 | APPLCP0101 | AIR COMPRESSOR CONTROL PANEL |
| 2 | AMHLCPO101 | CHEMICAL UNLOADING PANEL |
| 3 | AMBLITO101 | TANK 1 LEVEL TRANSMITTER LT-101 |
| 4 | AMHLSHO101 | TANK 1 HIGH LEVEL SWITCH LSH-101 |
| 5 | AMHLSLO101 | TANK 1 LOW LEVEL SWITCH LSL-101 |
| 6 | AMHPSHO101 | TANK 1 HIGH PRESSURE SWITCH PSH-101 |
| 7 | AMHPITO101 | TANK 1 PRESSURE PIT-101 |
| 8 | CHMLSHO101 | CONTAINMENT AREA HIGH LEVEL SWITCH LSH-102 |
| 9 | SRWEWO101 | EYEWASH/SHOWER FLOW SWITCH FSH-301 |
| 10 | ELEMCCO101 | METERING PUMP CONTROL PANEL |
| 11 | AMHMPO101 | METERING PUMP NO.1 |
| 12 | AMHMPO102 | METERING PUMP NO.2 |
| 13 | AMHPSHO102 | METERING PUMP 1 DISCHARGE PRESSURE PSH-102 |
| 14 | AMHPSHO103 | METERING PUMP 2 DISCHARGE PRESSURE PSH-103 |
| 15 | AMHFITO101 | AMH FLOW TO CHLORINE CONTACT BASING FLOW METER FIT-101 |
| 16 | SRWEWO102 | EYEWASH/SHOWER FLOW SWITCH FSH-302 |

| | | |
|----|------------|----------------------------------|
| 17 | AMHPLCO101 | AMMONIA SYSTEM PLC CONTROL PANEL |
| 18 | AMHAITO101 | AMMONIA RESIDUAL ANALYZER |

- NOTES:**
- PROVIDE 3/0 COPPER UFER TYPE GROUND IN NEW AMMONIA CONTAINMENT BASIN SLAB. CONNECT AMMONIA TANK(S) TO GROUND WITH 1/0 BARE COPPER CABLES. CONNECT EACH CANOPY SUPPORT POLE TO UFER GROUND WITH #1 BARE COPPER WIRES.
 - ALL CONDUITS EXPOSED OUTDOORS SHALL BE PVC COATED RIGID GALVANIZED STEEL. ALL JUNCTION BOXES, FITTINGS AND CONDUIT SEALOFFS SHALL MATCH THE CONDUIT SYSTEM AND SHALL BE PVC COATED RGS.
 - SEE THE SINGLE LINE/CONDUIT DIAGRAM FOR INFORMATION ON THE CONDUITS AND CONDUCTORS REQUIRED.
 - ALL INSTALLATIONS SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE 2005 EDITION.
 - ALL CONDUIT BELOW GRADE SHALL BE PVC SCH 40.
 - CONDUIT TRANSITIONS FROM BELOW GRADE TO ABOVE GRADE SHALL BE MADE WITH PVC COATED RGS ELBOWS.
 - ALL CONDUCTORS SHALL BE STRANDED COPPER XHHW OR THHN/THWN RATED.
 - CONDUIT ROUTING IS APPROXIMATE. CONTRACTOR SHALL BE AWARE THAT EXISTING UNDERGROUND UTILITIES MAY EXIST ALONG THE CONDUIT ROUTING. CONTRACTOR SHALL PROTECT IN PLACE ANY AND ALL EXISTING UTILITIES AND SHALL ADJUST THE INSTALLATION OF THE NEW CONDUIT AS REQUIRED.
 - PULL BOXES ARE NOT SHOWN BUT MAY BE REQUIRED. CONTRACTOR SHALL REVIEW THE ROUTING AND HIS INSTALLATION AND PROVIDE PULL BOXES AS REQUIRED BY THE NATIONAL ELECTRICAL CODE.


 HPS 150 WATT 120VAC LIGHT FIXTURE RATED FOR USE IN CLASS 1 DIVISION 2 GROUP D OUTDOOR AREAS. MOUNT TO CANOPY SUPPORT POLES AT LOCATIONS SHOWN ON THE PLAN. KILLARK WMLB-2-91GG OR EQUAL.



- NOTES:
- SEE THE SINGLE LINE AND CONDUIT DIAGRAMS FOR INFORMATION ON THE CONDUITS AND CONDUCTORS REQUIRED.
 - ALL INSTALLATIONS SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE 2005 EDITION.
 - ALL CONDUIT BELOW GRADE SHALL BE PVC SCH 40.
 - CONDUIT TRANSITIONS FROM BELOW GRADE TO ABOVE GRADE SHALL BE MADE WITH PVC COATED RGS ELBOWS.
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Jensen Engineering, LLC
Est. 1988
Care Creek, Arizona

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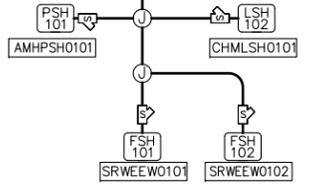
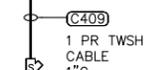
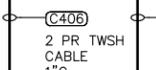
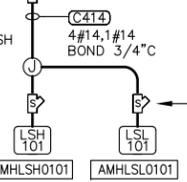
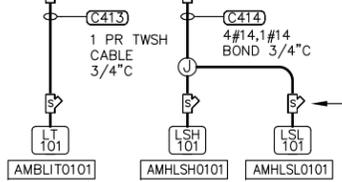
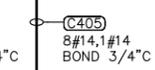
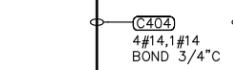
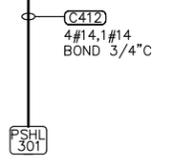
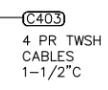
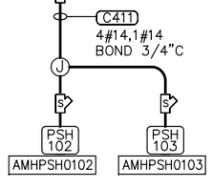
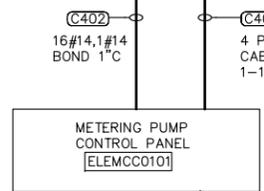
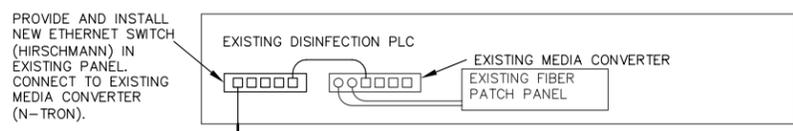
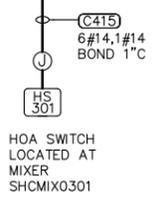


CITY OF SURPRISE
WATER SERVICES DEPARTMENT
TTHM REDUCTION PROJECT

WATERWORKS
ENGINEERS
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| | | | | |
|------------|----------------------------------|----------|---------------------|---------|
| ELECTRICAL | AMMONIA FEED SYSTEM SITE PLAN | | DESIGN D. JENSEN | CHECKED |
| | DATE | NOV 2013 | DRAWN D. JENSEN | |
| | PROJECT NUMBER | 11-023 | | |
| | DRAWING NUMBER | E-4 | | |
| SHEET | - OF - | | | |



NOTES

1. ALL INSTALLATIONS SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE, CITY OF SURPRISE STANDARDS AND ANY OTHER LOCAL CODES.
2. ALL CONDUIT BELOW GRADE SHALL BE SCHEDULE 40 PVC.
3. ALL CONDUIT ABOVE GRADE SHALL BE PVC COATED RIGID GALVANIZED STEEL INCLUDING ELBOWS FROM BELOW GRADE TURNED UP TO ABOVE GRADE CONDUITS.
4. ALL CONDUIT SHALL BE INSTALLED WITH A GREEN INSULATED COPPER CODE SIZED BOND WIRE AS SHOWN.
5. "PR-TWSH" CABLE DENOTES BELDEN 9318 SHIELDED TWISTED PAIR CABLE.
6. ALL EQUIPMENT, CONDUIT AND CONDUCTORS SHOWN ON THIS DRAWING ARE TO BE PROVIDED NEW WITH EXCEPTION OF THE NOTED EXISTING MOTOR CONTROL CENTER AND THE EXISTING PLC CABINET. PROVIDE WORK WITHIN THE EXISTING EQUIPMENT AS INDICATED.

Jensen Engineering, LLC
Est. 1988
Care Creek, Arizona

| NO. | REVISION | REV BY | CHK BY | DATE |
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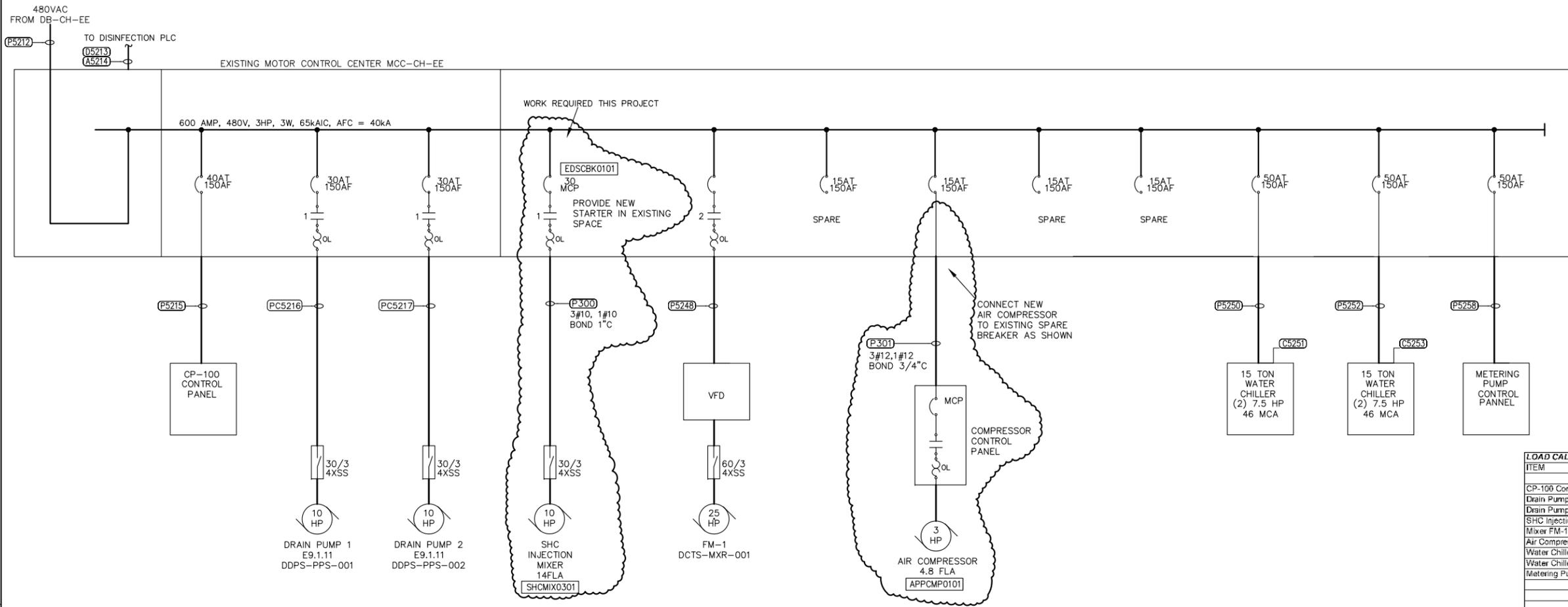


CITY OF SURPRISE
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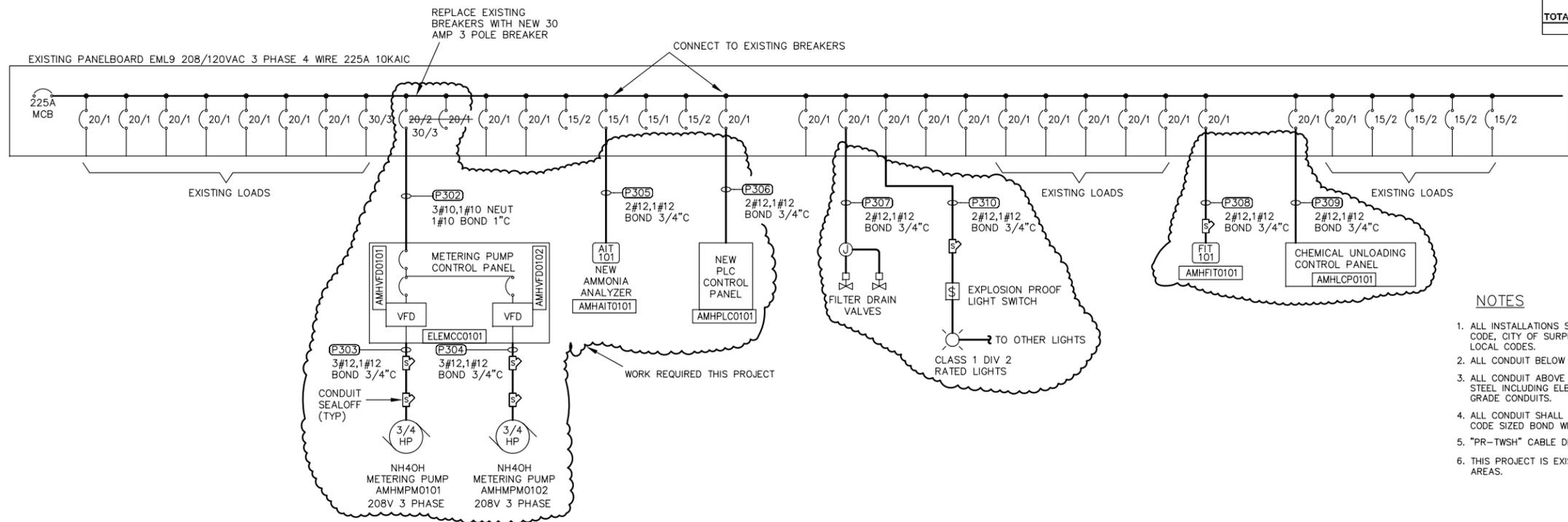
ELECTRICAL
CONDUIT DIAGRAM
INSTRUMENTS AND SIGNALS
DESIGN: D. JENSEN
DRAWN: D. JENSEN
CHECKED: _____

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|----------------|----------|
| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-3 |
| SHEET | - OF - |



LOAD CALCULATIONS MCC-CH-EE

| ITEM | FLA @ 480V |
|-----------------------------|--------------|
| CP-100 Control Panel | 28.0 |
| Drain Pump 1 | 14.0 |
| Drain Pump 2 | 14.0 |
| SHC Injection Mixer | 14.0 |
| Mixer FM-1 | 34.0 |
| Air Compressor | 4.8 |
| Water Chiller No. 1 | 25.0 |
| Water Chiller No. 2 | 25.0 |
| Metering Pump Control Panel | 26.0 |
| 25% LARGEST MOTOR | 8.6 |
| TOTAL LOAD (AMPS) | 193.3 |



- NOTES**
1. ALL INSTALLATIONS SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE, CITY OF SURPRISE STANDARDS AND ANY OTHER LOCAL CODES.
 2. ALL CONDUIT BELOW GRADE SHALL BE SCHEDULE 40 PVC.
 3. ALL CONDUIT ABOVE GRADE SHALL BE PVC COATED RIGID GALVANIZED STEEL INCLUDING ELBOWS FROM BELOW GRADE TURNED UP TO ABOVE GRADE CONDUITS.
 4. ALL CONDUIT SHALL BE INSTALLED WITH A GREEN INSULATED COPPER CODE SIZED BOND WIRE AS SHOWN.
 5. "PR-TW5H" CABLE DENOTES BELDEN 9318 SHIELDED TWISTED PAIR CABLE.
 6. THIS PROJECT IS EXISTING. WORK REQUIRED IS SHOWN WITHIN THE CLOUDED AREAS.

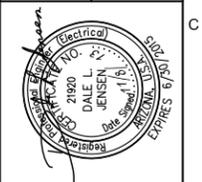
Jensen Engineering, LLC
Est. 1988
Casa Creek, Arizona

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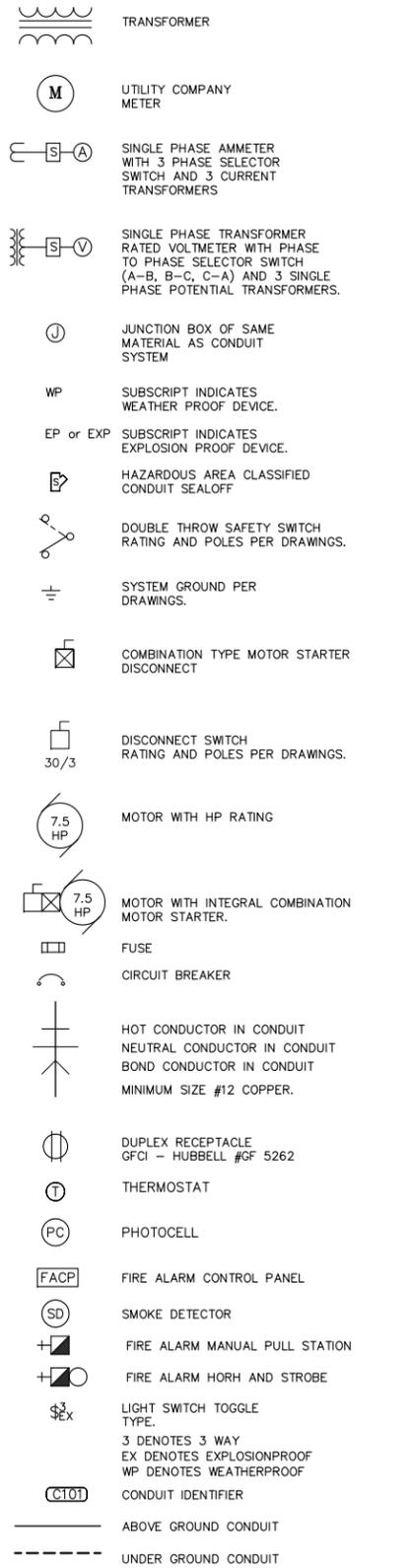
ELECTRICAL

EXISTING MCC-CH-EE & PANEL EML9
SINGLE LINE DIAGRAM REVISIONS

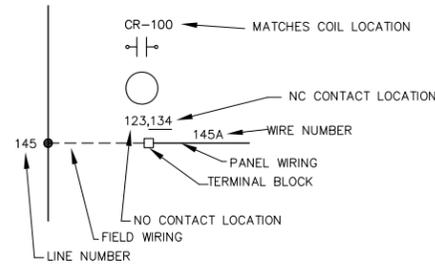
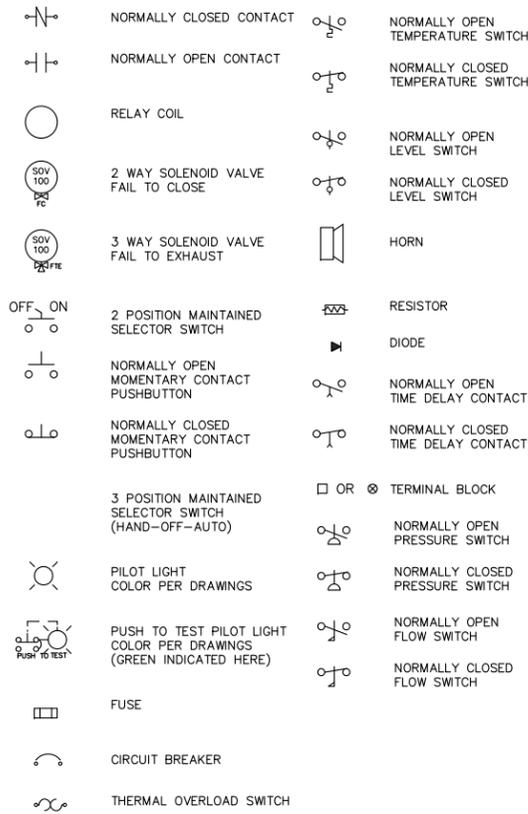
DESIGN: D. JENSEN
DRAWN: D. JENSEN
CHECKED: []

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| DATE | NOV 2013 |
| PROJECT NUMBER | 11-023 |
| DRAWING NUMBER | E-2 |
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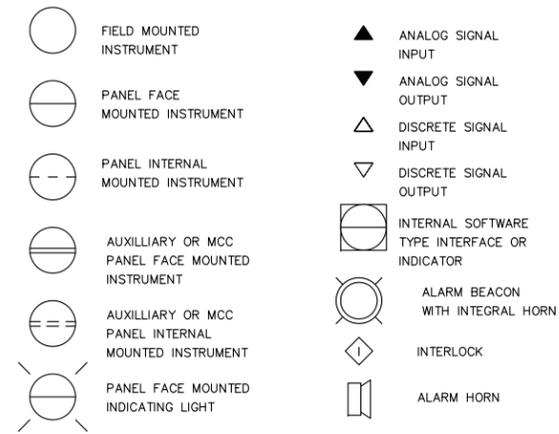
SINGLE LINE AND CONDUIT DIAGRAM SYMBOLS



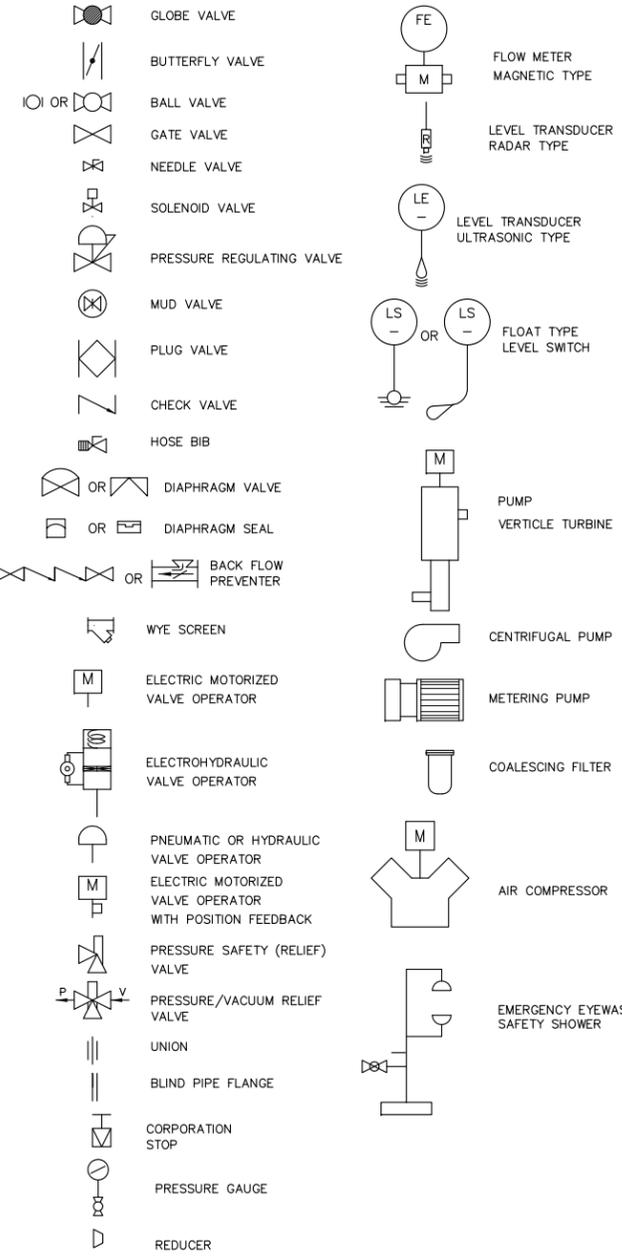
SCHEMATIC DIAGRAM SYMBOLS



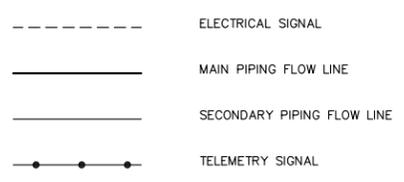
INSTRUMENT SYMBOLS



PIPING SYMBOLS



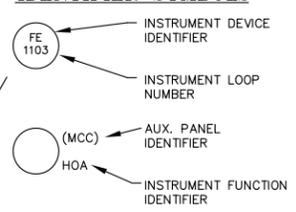
INSTRUMENT LINE SYMBOLS



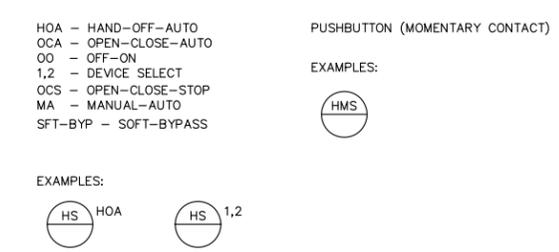
INSTRUMENT & DEVICE LETTERING TABLE
IDENTIFICATION LETTERS

| FIRST LETTER | SUCCEEDING LETTERS | | | |
|--------------|---------------------------------|-----------------------|-----------------------------|--|
| | MEASURED OR INITIATING VARIABLE | MODIFIER | READOUT OR PASSIVE FUNCTION | OUTPUT FUNCTION |
| A | ANALYSIS | | ALARM | |
| B | BURNER, COMBUSTION | | USER'S CHOICE | USER'S CHOICE |
| C | CONDUCTIVITY | | | CONTROL |
| D | DENSITY (MASS) | DIFFERENTIAL | | |
| E | VOLTAGE | | SENSOR (PRIMARY ELEMENT) | |
| F | FLOW RATE | RATIO (FRACTION) | | |
| G | GAGING | | GLASS OR VIEWING DEVICE | |
| H | HAND | | | HIGH |
| I | CURRENT (ELECTRICAL) | | INDICATE | |
| J | POWER | SCAN | | |
| K | TIME OR TIME SCHEDULE | TIME RATE OF CHANGE | | CONTROL STATION |
| L | LEVEL | | LIGHT | LOW |
| M | MOTOR | MOMENTARY | | MIDDLE OR INTERMEDIATE |
| N | USER'S CHOICE | | STATUS | USER'S CHOICE |
| O | USER'S CHOICE | | ORFICE RESTRICTION | |
| P | PRESSURE OR VACUUM | | POINT (TEST CONNECTION) | |
| Q | QUANTITY | INTEGRATE OR TOTALIZE | | |
| R | RADIATION | SAFETY | RECORD | |
| S | SPEED OR FREQUENCY | | | SWITCH |
| T | TEMPERATURE | | | TRANSMIT |
| U | MULTIVARIABLE | | MULTIFUNCTION | MULTIFUNCTION |
| V | VIBRATION | | | VALVE, DAMPER, LOUVER |
| W | WEIGHT OR FORCE | | WELL | |
| X | UNCLASSIFIED | | UNCLASSIFIED | UNCLASSIFIED |
| Y | EVENT, STATE OR PRESENCE | | | RELAY, COMPUTE, CONVERT |
| Z | POSITION OR DIMENSION | | | DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT |

IDENTIFIER SYMBOLS



HAND SWITCH FUNCTIONS



GENERAL NOTES

- ALL CONDUIT SHALL BE INSTALLED WITH A GREEN CODE SIZED BOND WIRE.
 - ALL ELECTRICAL INSTALLATIONS SHALL CONFORM WITH ALL LOCAL AND NATIONAL CODES.
 - DIFFERENT SIGNAL AND POWER WIRING SHALL BE SEGREGATED INTO DIFFERENT CONDUITS. FOR EXAMPLE, THE FOLLOWING SHALL BE SEGREGATED FROM EACH OTHER:
 - A. 4-20mA ANALOG SIGNALS
 - B. 24VDC DIGITAL SIGNALS
 - C. 240/120VAC 1 PHASE WIRING
 - D. RADIO COAX CABLE
 - E. TELEPHONE CABLE
 - F. SPECIALTY CABLES FOR INSTRUMENTATION
 - G. 480VAC 3 PHASE.
- NOTE: 4-20mA WIRING AND 24VDC WIRING MAY BE RUN IN SAME CONDUIT ONLY WHERE SHOWN TOGETHER ON DRAWINGS.

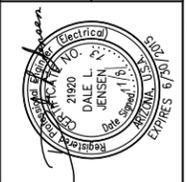
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|-------------------|---|
| ELECTRICAL LEGEND | CHECKED |
| | DRAWN D. JENSEN |
| | DESIGN D. JENSEN |
| | DATE NOV 2013 PROJECT NUMBER 11-023 DRAWING NUMBER E-1 SHEET - OF - |