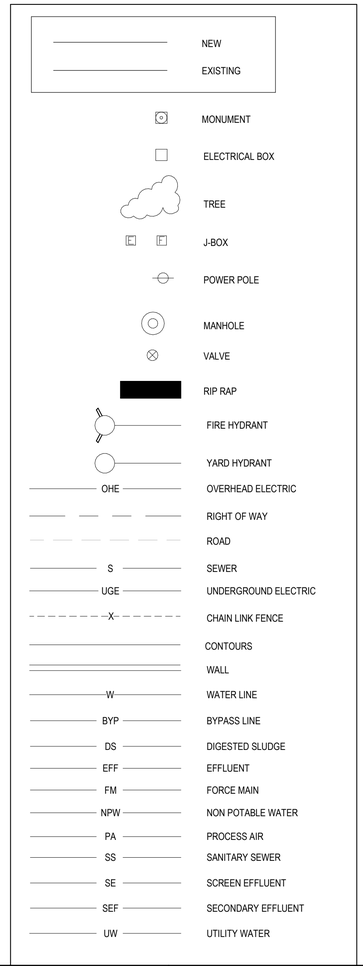
STANDARD ABBREVIATIONS

@	AT
ABC	AGGREGATE BASE COURSE
ACP	ASBESTOS CEMENT PIPE
ALT	ALTERNATE
ALUM	ALUMINUM
AM	AIR METER
APPROX	APPROXIMATELY
AR	AIR RELEASE VALVE
ARVR	AIR AND VACUUM RELEASE VALVE
AVG	AVERAGE
ARV	AIR VACUUM RELEASE
BA	BALL VALVE
BC	BALL CHECK VALVE
BEFP	BELT FILTER PRESS
BF	BLIND FLANGE or BACKFLUSH or BUTTERFLY VALVE
BFP	BACKFLOW PREVENTER
BLDG	BUILDING
BOT	BOTTOM
BP	BACK PRESSURE REGULATING VALVE
BYP	BYPASS
CC	CENTER-TO-CENTER
CEN	CENTRATE
CFM	CUBIC FEET (OF STANDARD AIR) PER MINUTE
CIP	CLEAN IN PLACE
CIT	CITRIC ACID SOLUTION
CK	CHECK VALVE
CL	CENTERLINE
CL2	CHLORINE
CLDI	CEMENT LINED DUCTILE IRON
CMU	CEMENT MASONRY UNIT
C/O	CLEAN OUT
CONC	CONCRETE
CONN	CONNECTION
CONV	CONVEYOR
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
CSP	CORRUGATED STEEL PIPE
CW	CHAIN WHEEL
C/W	COMPLETE WITH
CWSD	CHEMICAL WET SCRUBBER DRAIN
CWS	CHEMICAL WET SCRUBBER
D	DRAIN or DEEP or DEPTH
DC	DOUBLE CONTAINED
DE	DISINFECTED EFFLUENT
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DP	DAMPER
DS	DIGESTED SLUDGE
DTL	DETAIL
DWG	DRAWING
DWS	DEWATERED SLUDGE
E	EAST or ELECTRIC
EA	EACH OR ELECTRIC ACTUATOR
EAS	EXTENDED AERATION SYSTEM
ECC	ECCENTRIC
EDB	ELECTRICAL DUCT BANK
EFF	EFFLUENT
EL	ELEVATION
ELEC	ELECTRIC
EMH	ELECTRICAL MANHOLE
EPA	ENVIRONMENTAL PROTECTION AGENCY
EPDM	ETHYLENE PROPYLENE DIENE MONOMER
EQUIP	EQUIPMENT
EXIST	EXISTING
FA	FOUL AIR
FBW	FILTER BACKWASH WASTE
FC	FLEXIBLE CONNECTOR
FCA	FLANGED COUPLING ADAPTER
FD	FLOOR DRAIN
FE	FILTER EFFLUENT
FH	FIRE HYDRANT
FI	FILTER INFLUENT
FLG	FLANGE
FLGD	FLANGED
FM	FORCE MAIN
FPM	FEET PER MINUTE
FR	FILTRATE REJECT
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FOOT or FEET
G	GRIT
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GE	GRIT EFFLUENT
GLDI	GLASS LINED DUCTILE IRON
GV	GLOBE VALVE
GPM	GALLONS PER MINUTE
GRV	GROOVED
GV	GATE VALVE
GW	GROUNDWATER
H	HIGH or HEIGHT
HDPE	HIGH DENSITY POLYETHYLENE
HDWKS	HEADWORKS
HORIZ	HORIZONTAL
HP	HORSEPOWER
HO	HAND OPERATED
INF	INFLUENT
INV	INVERT
IWBW	INJECTION WELL BACKWASH
IWI	INJECTION WELL INFLUENT
IW	IRRIGATION WATER
KG	KNIFE GATE VALVE
L	LONG or LENGTH
LF	LINEAR FEET
LT	LEFT
M	METER
MAG	MARICOPA ASSOCIATION OF GOVERNMENTS
MAX	MAXIMUM
MECH	MECHANICAL
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
ML	MIXED LIQUOR
MLR	MIXED LIQUOR RETURN
N	NORTH
NA	NOT APPLICABLE
NaHSO3	SODIUM BISULFITE
NaOCl	SODIUM HYPOCHLORITE
NaOH	SODIUM HYDROXIDE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN or NUMBER
NOM	NOMINAL
NPT	NATIONAL PIPE THREAD
NPW	NON-POTABLE WATER
OA	OUTSIDE AIR
OCD	ODOR CONTROL DUCT
OF	OVERFLOW
OHE	OVERHEAD ELECTRIC POWER LINES
OPP	OPPOSITE
PA	PROCESS AIR
PD	PLAIN DRAIN
PE	PLAIN END
PEF	PRIMARY EFFLUENT
PI	PLANT INFLUENT
P.I.P	PROTECT IN PLACE
PL	PROPERTY LINE
PG	PLUG VALVE
PM	PERMEATE
PR	PRESSURE RELIEF VALVE
PRV	PRESSURE REDUCING VALVE
PVC	POLYVINYL CHLORIDE
PW	POTABLE WATER
PN	PNEUMATIC
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
RED	REDUCER or REDUCING
REQ'D	REQUIRED
RH	RELATIVE HUMIDITY
RI	RAW INFLUENT
ROW	RIGHT-OF-WAY
RPM	REVOLUTIONS PER MINUTE
RS	RAW SEWAGE
RT	RIGHT
S	SOUTH or SLUDGE
SB	SCREEN BYPASS
SBR	SEQUENCING BATCH REACTOR
SBRE	SBR EFFLUENT
SBRI	SBR INFLUENT
SBS	SODIUM BISULFITE
SBW	SCREEN BACKWASH
SCR	SCREEN
SE	SCREEN EFFLUENT
SEC	SECTION
SEF	SECONDARY EFFLUENT
SER	SECONDARY EFFLUENT RECYCLE
SG	SLUICE GATE
SI	SCREEN INFLUENT
SIM	SIMILAR
SLG	SLIDE GATE
SMP	SAMPLE
SN	SUPERNATANT
SP IN WG	STATIC PRESSURE INCHES OF WATER GAUGE
SPECS	SPECIFICATIONS
SQ	SQUARE
SS	SANITARY SEWER
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SV	SOLENOID VALVE
T	TELEPHONE
TEMP	TEMPERATURE or TEMPORARY
TMH	TELEPHONE MANHOLE
TS&V	TAPPING SLEEVE AND VALVE
TYP	TYPICAL
UGE	UNDERGROUND ELECTRICAL
UV	ULTRA-VIOLET
UW	UTILITY WATER
V	VOLTS
VAC	VOLTS ALTERNATING CURRENT
VB	VALVE BOX
VCP	VITRIFIED CLAY PIPE
VEL	VELOCITY
VERT	VERTICAL
W	WEST or WIDE or WIDTH
W/	WITH
WAS	WASTE ACTIVATED SLUDGE
WD	WIDE
WS	WATER SURFACE

LEGEND



GENERAL NOTES

1. UNLESS OTHERWISE SPECIFICIED IN THE CONTRACT DOCUMENTS, ALL MATERIAL AND WORKMANSHIP OF THIS PROJECT SHALL BE IN ACCORDANCE WITH THE FOLLOWING ORDER OF PRECENDENCE:
A.THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2020 EDITION (REFERRED TO HERERIN BY MAG SPEC/SECTION, STD SPEC/SECTION, MAG AND STD DETAIL).
B.THE NAVAJO NATION AREA INDIAN HEALTH SERVICE (IHS) STANDARD DETAILS FOR WATER [REV 3.2] AND SEWER [REV 1.9].

2. IF DURING THE COURSE OF THE WORK THE CONTRACTOR BECOMES AWARE OF A CONTRADICTION IN THE REQUIREMENTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.

3. SUBMISSION OF A PRICE WILL CONSTITUTE AN INCONTROVERTIBLE REPRESENTATION BY CONTRACTOR THAT CONTRACTOR HAS COMPLIED WITH ALL CONTRACT REQUIREMENTS AND THAT WITHOUT EXCEPTION THE PRICE IS PREMISED UPON PERFORMING AND FURNISHING THE WORK REQUIRED BY THE CONTRACT DOCUMENTS AND APPLYING ANY SPECIFIC MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION THAT MAY BE SHOWN OR INDICATED OR EXPRESSLY REQUIRED BY THE CONTRACT DOCUMENTS, THAT CONTRACTOR HAS GIVEN ENGINEER WRITTEN NOTICE OF ALL CONFLICTS, ERRORS, AMBIGUITIES, AND DISCREPANCIES THAT CONTRACTOR HAS DISCOVERED IN THE CONTRACT DOCUMENTS AND THE WRITTEN RESOLUTIONS THEREOF BY ENGINEER ARE ACCEPTABLE TO CONTRACTOR, AND THAT THE CONTRACT DOCUMENTS ARE GENERALLY SUFFICIENT TO INDICATE AND CONVEY UNDERSTANDING OF ALL TERMS AND CONDITIONS FOR PERFORMING AND FURNISHING THE WORK.

4. BEFORE UNDERTAKING EACH PART OF THE WORK, CONTRACTOR SHALL CAREFULLY STUDY AND COMPARE THE CONTRACT DOCUMENTS AND CHECK AND VERIFY PERTINENT FIGURES THEREIN AND ALL APPLICABLE FIELD MEASUREMENTS. CONTRACTOR SHALL PROMPTLY REPORT IN WRITING TO ENGINEER ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WHICH CONTRACTOR DISCOVERS, OR HAS ACTUAL KNOWLEDGE OF, AND SHALL OBTAIN A WRITTEN INTERPRETATION OR CLARIFICATION FROM ENGINEER BEFORE PROCEEDING WITH ANY WORK AFFECTED THEREBY. IF, DURING THE PERFORMANCE OF THE WORK, CONTRACTOR DISCOVERS ANY CONFLICT, ERROR, AMBIGUITY, OR DISCREPANCY WITHIN THE CONTRACT DOCUMENTS, OR BETWEEN THE CONTRACT DOCUMENTS AND (A) ANY APPLICABLE LAW OR REGULATION, (B) ANY STANDARD, SPECIFICATION, MANUAL, OR CODE, OR (C) ANY INSTRUCTION OF ANY SUPPLIER, THEN CONTRACTOR SHALL PROMPTLY REPORT IT TO ENGINEER IN WRITING. CONTRACTOR SHALL NOT PROCEED WITH THE WORK AFFECTED THEREBY (EXCEPT IN AN EMERGENCY) UNTIL AN AMENDMENT OR SUPPLEMENT TO THE CONTRACT DOCUMENTS HAS BEEN ISSUED.

5. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE OF APPLICABLE PORTIONS OF THE EPA STORM WATER DISCHARGE REGULATIONS.

6. THE CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS AND PERMIT COMPLIANCE REQUIRED FOR CONSTRUCTION OF THE PROJECT.

7. THE WORK DESCRIBED IN THESE PLANS WILL BE DONE IN EXISTING WASTEWATER TREATMENT FACILITIES THAT CONTAIN NUMEROUS EXISTING PIPES, ELECTRIC LINES, AND OTHER STRUCTURES. THE EXISTING WASTEWATER TREATMENT PLANT SHALL REMAIN IN OPERATION AT ALL TIMES AND SHALL NOT BE TAKEN OFF LINE UNTIL THE NEW SYSTEM IS IN FULL OPERATION AND ACCEPTED BY THE OWNER. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ALL ITEMS DESCRIBED IN THESE PLANS IN A MANNER THAT PROTECTS THE EXISTING FACILITY. THE CONTRACTOR MUST CONTACT THE ENGINEER IMMEDIATELY IF THE CONTRACTOR CANNOT PERFORM THE WORK WITHOUT DAMAGE TO THE EXISTING FACILITY. THE CONTRACTOR MUST VERIFY ALL EXISTING INFORMATION SHOWN ON THESE PLANS. CHANGES IN ALIGNMENT CAUSED BY UNKNOWN OR UNANTICIPATED SITE CONDITIONS SHALL BE MEASURED AND PAID FOR BASED ON THE APPROVED SCHEDULE OF VALUES SUBMITTED BY THE CONTRACTOR.

8. THE LOCATION, SIZE, AND CONDITION OF UNDERGROUND UTILITIES AND STRUCTURES SHOWN IN THESE PLANS ARE BASED ON AVAILABLE RECORDS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR LOCATING, PROTECTION OF, OR ANY DAMAGE TO THESE LINES OR STRUCTURES. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING ALL UTILITY COMPANIES AND OBTAINING LINE SPOTS.

9. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SO THE CONFLICT CAN BE RESOLVED WITH MINIMUM AMOUNT OF DELAY. THE CONTRACTOR SHALL IDENTIFY UTILITY LINES FAR ENOUGH IN ADVANCE OF CONSTRUCTION WORK SO THAT THE OWNER OF SUCH LINES CAN RAISE, LOWER, REALIGN OR REMOVE LINES AND STRUCTURES (IF NECESSARY), AND THE ENGINEER CAN MAKE NECESSARY LINE AND GRADE CHANGES (SHOULD THE EXISTING UTILITY LINES CONFLICT WITH THE WORK UNDER CONSTRUCTION), PROVIDING SUCH ADJUSTMENTS DO NOT MATERIALLY AFFECT THE WORK.

10. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR COSTS OF REPAIR OF ANY AND ALL DAMAGE TO ANY UTILITY (WHICH IS PREVIOUSLY KNOWN, DISCLOSED, OR SHOWN ON THESE PLANS) CAUSED BY THE CONTRACTORS OPERATIONS.

11. FIVE (5) WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NTUA FOR LOCATION OF EXISTING UTILITIES.

12. THE CONTRACTOR SHALL GIVE ALL PUBLIC AND PRIVATE UTILITY COMPANIES NOTICE AS SOON AS POSSIBLE, IN NO EVENT LESS THAN FORTY EIGHT (48) HOURS, FOR ANY WORK THAT IS UNDERSTOOD TO INTERFERE WITH THE SERVICE OF ANY EXISTING PUBLIC OR PRIVATE UTILITY. IF SUCH PUBLIC OR PRIVATE UTILITY DOES NOT COOPERATE FOR THE PROTECTION OF ITS SERVICES, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

13. UTILITY CONTACTS: GAS, SEWER, WATER, ELECTRIC: NTUA SAFETY DEPARTMENT 928-729-5721, TELEPHONE: FRONTIER COMMUNICATION 928-871-3748.

14. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL FACILITIES ADJACENT TO THE CONSTRUCTION AREA.

15. THE CONTRACTOR IS RESPONSIBLE FOR RECORDING EXISTING CONDITIONS BEFORE CONSTRUCTION BEGINS. THE RECORD OF EXISTING CONDITIONS SHALL BE USED AS THE "EQUAL CONDITION BEFORE DAMAGE" IN THE EVENT OF DAMAGE TO PUBLIC OR PRIVATE PROPERTY.

16. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DAMAGES TO PUBLIC OR PRIVATE PROPERTY TO THE OWNER OF THE PROPERTY INVOLVED AND TO THE ENGINEER. THE CONTRACTOR SHALL REPAIR OR RESTORE AT THE CONTRACTOR'S EXPENSE ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY, FOR WHICH THE CONTRACTOR IS DIRECTLY OR INDIRECTLY RESPONSIBLE, TO A CONDITION EQUAL TO THAT EXISTING BEFORE DAMAGE. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE CONTRACTORS INSURANCE CARRIER OF SUCH DAMAGE. IF THE CONTRACTOR FAILS TO GIVE SUCH NOTICE TO THE INSURANCE CARRIER OR REFUSES TO MAKE SUCH REPAIRS OR RESTORATION UPON RECEIPT OF NOTICE, THE OWNER MAY DEDUCT THE COST OF SUCH REPAIRS OR RESTORATION FROM MONEYS DUE, OR WHICH MAY BECOME DUE, TO THE CONTRACTOR.

17. THE LANDS WITHIN THE FENCE LINE OF THE WASTEWATER TREATMENT PLANT BELONG TO THE NAVAJO TRIBAL UTILITY AUTHORITY (NTUA). THE CONTRACTOR MAY USE THESE LANDS TO FACILITATE CONSTRUCTION WITH APPROVAL OF THE NTUA. A PREAPPROVED STAGING/STORAGE AREA IS SHOWN IN THE PLANS. THE CONTRACTOR SHALL AVOID ANY ACTIVITY IN AREAS THAT WOULD BE A POTENTIALLY SIGNIFICANT DISTURBANCE TO OPERATION AND MAINTENANCE OF THE WASTEWATER PLANT.

18. DEBRIS GENERATED BY CONSTRUCTION ACTIVITIES MAY BE STORED AT THE CONSTRUCTION SITE AT AN AREA IDENTIFIED BY THE WASTEWATER TREATMENT PLANT PERSONNEL. DEBRIS MAY BE STORED DURING CONSTRUCTION UPON STAGING AND STORAGE AREAS SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING SAFETY ISSUES ASSOCIATED WITH STORED DEBRIS AND SHALL PROVIDE FENCING AND/OR BARRICADING AROUND DEBRIS IF NECESSARY. PRIOR TO COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL DISPOSE OF DEBRIS AT A PERMITTED LANDFILL OR OTHER DULY CERTIFIED REFUSE FACILITY (INCIDENTAL TO THE PROJECT).

19. THE CONTRACTOR SHALL STOCK PILE ANY EXCESS EARTH ON-SITE AT A LOCATION DETERMINED.

20. THE CONTRACTOR SHALL PHASE AND SCHEDULE WORK IN SUCH A WAY AS TO PROVIDE FOR CONTINUOUS WASTEWATER TREATMENT DURING CONSTRUCTION. THE CONTRACTOR'S SCHEDULE SHALL INCLUDE FLOW SCHEMATICS AND PROCESS DIAGRAMS TO ILLUSTRATE FLOW ROUTING AND TREATMENT.

21. CONTRACTOR SHALL NOT LOAD NOR PERMIT ANY PART OF ANY STRUCTURE TO BE LOADED IN ANY MANNER THAT WILL ENDANGER THE STRUCTURE, NOR SHALL THE CONTRACTOR SUBJECT ANY PART OF THE WORK OR ADJACENT PROPERTY TO STRESSES OR PRESSURES THAT WILL ENDANGER IT.

22. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. SUCH RESPONSIBILITY DOES NOT RELIEVE SUBCONTRACTORS OF THEIR RESPONSIBILITY FOR THE SAFETY OF PERSONS OR PROPERTY IN THE PERFORMANCE OF THEIR WORK, NOR FOR COMPLIANCE WITH APPLICABLE SAFETY LAWS AND REGULATIONS. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE SAFETY OF, AND SHALL PROVIDE THE NECESSARY PROTECTION TO PREVENT DAMAGE, INJURY OR LOSS TO:

22.1. ALL PERSONS ON THE SITE OR WHO MAY BE AFFECTED BY THE WORK;
22.2. ALL THE WORK AND MATERIALS AND EQUIPMENT TO BE INCORPORATED THEREIN, WHETHER IN STORAGE ON OR OFF THE SITE; AND
22.3. OTHER PROPERTY AT THE SITE OR ADJACENT THERETO, INCLUDING, BUT NOT LIMITED TO, TREES, SHRUBS, LAWNS, WALKS, PAVEMENTS, ROADWAYS, STRUCTURES, UTILITIES, AND UNDERGROUND FACILITIES NOT DESIGNATED FOR REMOVAL, RELOCATION, OR REPLACEMENT IN THE COURSE OF CONSTRUCTION.
22.4. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS RELATING TO THE SAFETY OF PERSONS OR PROPERTY, OR TO THE PROTECTION OF PERSONS OR PROPERTY FROM DAMAGE, INJURY, OR LOSS; AND SHALL ERECT AND MAINTAIN ALL NECESSARY SAFEGUARDS FOR SUCH SAFETY AND PROTECTION. CONTRACTOR SHALL NOTIFY OWNERS OF ADJACENT PROPERTY AND OF UNDERGROUND FACILITIES AND OTHER UTILITY OWNERS WHEN PROSECUTION OF THE WORK MAY AFFECT THEM, AND SHALL COOPERATE WITH THEM IN THE PROTECTION, REMOVAL, RELOCATION, AND REPLACEMENT OF THEIR PROPERTY.
22.5. CONTRACTOR SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF OWNER'S SAFETY PROGRAMS, IF ANY. THE SUPPLEMENTARY CONDITIONS IDENTIFY ANY OWNER'S SAFETY PROGRAMS THAT ARE APPLICABLE TO THE WORK.
22.6. CONTRACTOR SHALL INFORM OWNER AND ENGINEER OF THE SPECIFIC REQUIREMENTS OF CONTRACTOR'S SAFETY PROGRAM WITH WHICH OWNER'S AND ENGINEER'S EMPLOYEES AND REPRESENTATIVES MUST COMPLY WHILE AT THE SITE.
22.7. CONTRACTOR'S DUTIES AND RESPONSIBILITIES FOR SAFETY AND FOR PROTECTION OF THE WORK SHALL CONTINUE UNTIL SUCH TIME AS ALL THE WORK IS COMPLETED AND ENGINEER HAS ISSUED A NOTICE TO OWNER AND CONTRACTOR IN ACCORDANCE WITH THAT THE WORK IS ACCEPTABLE (EXCEPT AS OTHERWISE EXPRESSLY PROVIDED IN CONNECTION WITH SUBSTANTIAL COMPLETION).

23. IF THIS DRAWING IS OTHER THAN FULL SIZE (22"X34"), UTILIZE BAR SCALE IN LIEU OF NUMERIC SCALE.

24. ALL UTILITY MANHOLES, METERS CLEANOUTS, AND VALVES IMPACTED BY CONSTRUCTION TO BE FIELD LOCATED AND ADJUSTED TO GRADE, THIS SHALL BE INCIDENTAL TO THE PROJECT.

25. PERTINENT RELOCATION AND ADJUSTMENT OF THE EXISTING UTILITIES TO PERFORM THE WORK IS CONSIDERED INCIDENTAL AND SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.

26. CONTRACTOR SHALL PROTECT THE EXISTING UNDERGROUND AND OVERHEAD UTILITIES INCLUDING, BUT NOT LIMITED TO, POWER, TELEPHONE, CABLE, WATER, GAS, AND SEWER DURING THE CONSTRUCTION, UNLESS SPECIFIED, ALL UTILITIES SHALL REMAIN IN SERVICE DURING CONSTRUCTION TO SUPPORT THE EXISTING TREATMENT PLANT. CONTRACTOR IS RESPONSIBLE TO PLAN CONSTRUCTION ACTIVITIES AND SEQUENCE SUCH THAT THERE IS MINIMUM UTILITY SHUTDOWN REQUIRED. CONTRACTOR SHALL COORDINATE ANY POTENTIAL SHUTDOWNS WITH THE OWNER AND OPERATORS AT MINIMUM 48 HOURS PRIOR TO PROCEDURE.

27. CONTRACTOR SHALL NOT OPEN/CLOSE VALVES OR GATES, OR SHUTDOWN EQUIPMENT THAT MAY IMPACT THE OPERATION WITHOUT THE OWNER AND THE OPERATOR APPROVAL.

28. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING UTILITIES. LOCATIONS SHOWN IN THESE PLANS ARE BASED ON HISTORIC AS BUILTS AND MIGHT BE DIFFERENT FROM ACTUAL CONDITIONS. CONTRACTOR SHALL FIELD VERIFY ALL UTILITIES WITHN THE CONSTRUCTION BOUNDARIES. SHOULD ANY DAMAGE OCCUR TO ANY EXISITNG UTILITY DURING THE PROGRSS OF WORK, CONTRACTOR SHALL REPAIR THE DAMAGE AT NO ADDITIONAL COST TO THE OWNER.

29. CONTRACTOR IS RESPONSIBLE FOR RELOCATION OF THE EXISTING UTILITIES REQUIRED TO MINIMIZE DOWNTIME OF EXISTING TREATMENT FACILITIES.

30. ALL AREAS WHERE GROUND IS DISTURBED OR REGRADED BY CONSTRUCTION ACTIVITIES SHALL BE SEEDED WITH NATIVE SEEDING PER SPECIFATION SECTION 329219.

YARD PIPING

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.

2. P.I.P. = PROTECT IN PLACE
CONTRACTOR TO PROTECT ALL UTILITY CROSSINGS IN PLACE, SEE SPECIFICATION SECTION 601.

3. CONTRACTOR TO FOLLOW SITE RESTORATION PER REQUIREMENTS OF STD SECTION 601 AND SPECIFICATION SECTION 329219.

4. POTABLE UTILITY, AND NON-POTABLE WATER LINES TO BE INSTALLED WITH MIN 3 FT COVER.

5. CONTRACTOR SHALL PROVIDE JOINT RESTRAINTS FOR REQUIRED LENGTH OF PIPES PER STD DWG 303 AND THRUST BLOCK PER STD DWG 380. CONTRACTOR SHALL PROVIDE APPROPRIATE THRUST BLOCK WHEN TYING INTO EXISTING WATER AND SEWER LINES. ANY DAMAGE TO EXISTING UTILITIES DUE TO FAILURE OF MEETING THIS REQUIREMENT SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.

6. ANY PIPE CROSSING LESS THAN 16" SHALL BE BACKFILLED WITH CLSM, PER STD SECTION 604.

7. SEPARATION OF WATER AND SEWER LINES SHALL BE PER IHS/NE CA TECHNICAL PROVISIONS - 3.10.

8. PIPE INSTALLATION SHALL INCLUDE MATERIALS, LABOR, EQUIPMENT, AND ALL INCIDENTAL ITEMS FOR COMPLETE INSTALLATION AND OPERATION OF THE WORK, INCLUDING BUT NOT LIMITED TO, PIPE, FITTINGS, JOINT RESTRAINTS, TRENCHING, COATING, WRAPPING, THRUST BLOCK, BACKFILLING, CLSM, COMPACTION, TESTING, UTILITY MARKERS, ELECTRIC MARKERS, AND DEVICES IN ACCORDANCE WITH STD REQUIREMENTS OF MAG PART 600. COMPLETE IN PLACE.

9. CONTRACTOR SHALL MAINTAIN MINIMUM OF 10 FT, HORIZONTAL CLEARANCE WITH EXISTING UTILITY POLES DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH NTUA, WHEN WORKING CLOSER THAN 10 FT TO EXISTIN POLES.

10. NO JOINT OR FITTING SHALL BE PLACED WITHIN 2 FT. (EITHER DIRECTION) OF ANY PIPE CROSSING.

11. PROVIDE MARKERS AND ELECTRIC TRACING DEVICES AT PIPE BENDS, VALVES, FITTINGS, CONNECTIONS, AND MANHOLES, TYP.

wsp
4221 BALLOON PARK RD NE,
ALBUQUERQUE, NM 87109

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No:
2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	MK
DRAWN BY:	TMO
CHECKED BY:	JCB
DATE:	02SEP2022

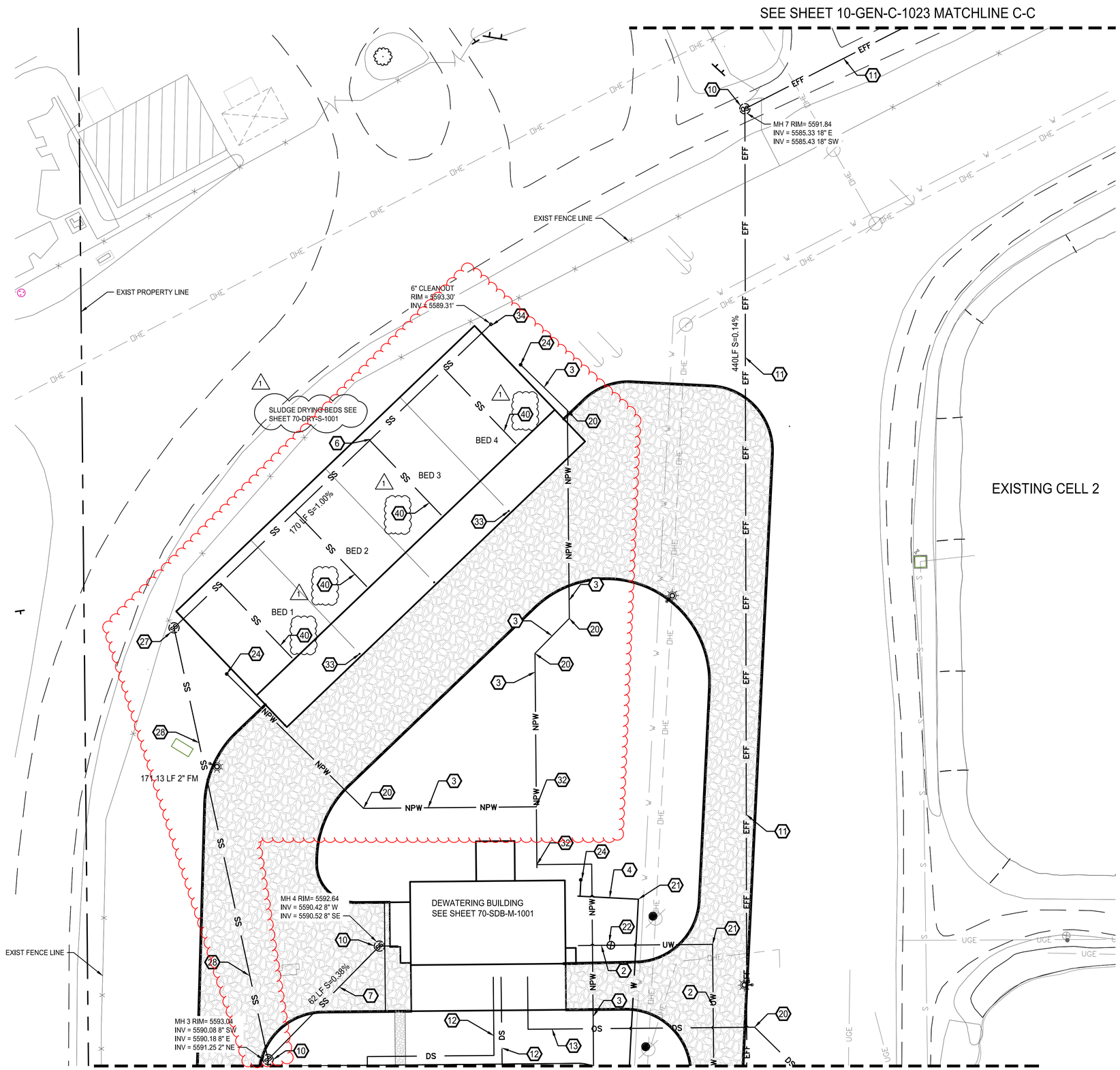
SHEET TITLE:

GENERAL

NOTES, LEGENDS AND ABBREVIATIONS

SHEET NUMBER:	REV. #
DWG- 10-GEN-G-0002	0

SHEET 3 OF 223



GENERAL SHEET NOTES

1. CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION.
2. P.I.P. = PROTECT IN PLACE CONTRACTOR TO PROTECT ALL UTILITY CROSSINGS IN PLACE.
3. CONTRACTOR TO ENSURE PROPER SEPARATION BETWEEN SEWER AND WATER LINES.
4. IN NON-PAVED AREAS, TRENCH REPLACEMENT PER STD DTL 4 ON SHEET 10-GEN-C-3001.
5. POTABLE, UTILITY, AND NON-POTABLE WATER LINES TO BE INSTALLED AT MIN 3' BELOW GRADE.
6. CONTRACTOR TO FOLLOW SPECS AND PIPE SCHEDULE FOR ALL PIPE FURNISHING AND INSTALLING.

CONSTRUCTION NOTES

- (2) INSTALL 2" SCH 80 PVC UTILITY WATER LINE PER SPECS
- (3) INSTALL 2" SCH 80 PVC NON POTABLE WATER LINE PER SPECS
- (4) INSTALL 4" SCH 80 PVC POTABLE WATER LINE PER SPECS
- (5) INSTALL 4" SDR35 PVC SEWER LINE PER SPECS
- (6) INSTALL 6" SDR35 PVC SEWER LINE PER SPECS
- (7) INSTALL 8" SDR35 PVC SEWER LINE PER SPECS
- (10) CONSTRUCT NEW 48" MANHOLE PER STD DWG 420-1
- (11) INSTALL 18" SDR35 PVC EFFLUENT LINE PER SPECS
- (12) INSTALL 4" CL350 DIP SLUDGE FEED LINE PER SPECS
- (13) INSTALL 4" CL350 DIP DIGESTED SLUDGE LINE PER SPECS
- (20) INSTALL 45 DEGREE BEND PER SPECS, TYP
- (21) INSTALL 90 DEGREE BEND PER SPECS, TYP
- (22) INSTALL 2" BALL VALVE PER STD DWG 391-1
- (24) INSTALL YARD HYDRANT PER STD DTL 1 ON SHEET 10-GEN-C-3001
- (27) INSTALL WETWELL AND SLUDGE PUMP FOR LEACHATE SYSTEM PER STD DTL 3 ON SHEET 10-GEN-C-3002
- (28) INSTALL 2" SCH 80 PVC FORCE MAIN PER PIPE SCHEDULE
- (32) FURNISH AND INSTALL TEE IN PLACE
- (33) INSTALL TYPE 1 PERMANENT BOLLARDS PER STD DWG-140, TYP
- (34) INSTALL 6" SEWER CLEAN OUT PER STD DWG-441
- (1) (40) INSTALL 4" PERFORATED, FULL LENGTH SDR35 PVC BELL END PIPE WITH END CAP PER SPECS

0 10' 20' 40'

SCALE: 1"=20'

wsp

4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No: 2151700032

REVISIONS

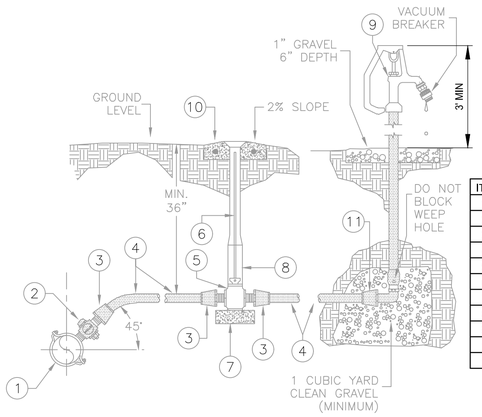
NO.	DATE	DESCRIPTION
1	01SEP2023	GENERAL REVISIONS

DESIGNED BY:	DDM
DRAWN BY:	DDM
CHECKED BY:	JCB
DATE:	04NOV2022

SHEET TITLE:

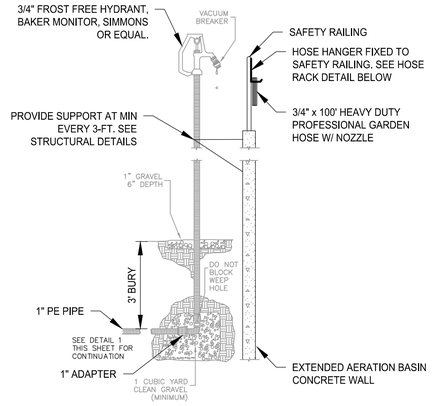
YARD PIPING SITE LAYOUT 3

SHEET NUMBER:	REV. #
10-GEN-C-1022	1
SHEET 18 OF 223	

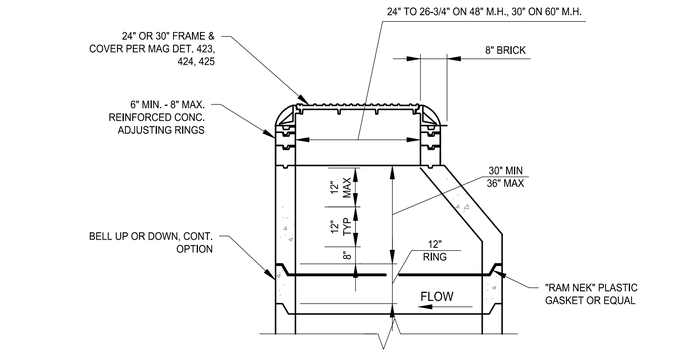


ITEM	DESCRIPTION
1	SERVICE SADDLE, DOUBLE STRAP IRON, SMITH-BLAIR, DRESSER, OR EQUAL
2	CORPORATION STOP, 1" MIPT x 1" FIPT, MUELLER H-10046, OAE
3	INSTA-TITE FITTING, 1" MIPT x 1" STAB FOR SIDR 7 P.E. PIPE, MUELLER H15426 OR APPROVED EQUAL
4	PIPE, 1" P.E., ASTM D-2239, SIDR 7, 200 PSI, 3/4" FIPT
5	CURB STOP, 1" FIPT x 1" FIPT, MINNEAPOLIS PATTERN W/O RING, MUELLER H-10287 OR APPROVED EQUAL
6	STATIONARY ROD 36" LONG, MUELLER PART #84338 OAE, SECURED TO THE CURB STOP W/COTTER PIN
7	CONCRETE BLOCK OR BRICK
8	CURB VALVE BOX, EXTENSION TYPE, MUELLER H-10302, W/2" x 1 x 1/2" BUSHING
9	HYDRANT, FROST FREE, 3/5" x 3' BURY, MERRIL MFG., ORDER NO. E7503, OR APPROVED EQUAL
10	CONCRETE COLLAR, 18" SQUAREX 4" THICK, W/ #4 REBAR, E.W.O.C
11	CONNECTOR/ADAPTER, 1" MIPT x APPRORIATE PIPE TYPE AND O.D.

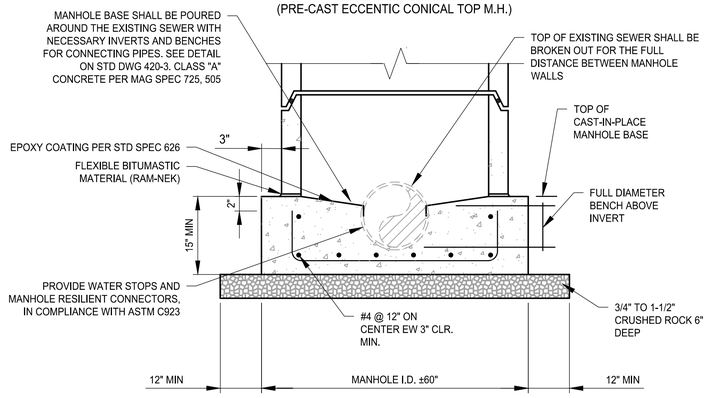
1 TYPICAL YARD HYDRANT
NOT TO SCALE



2 AERATION BASIN YARD HYDRANT
NOT TO SCALE

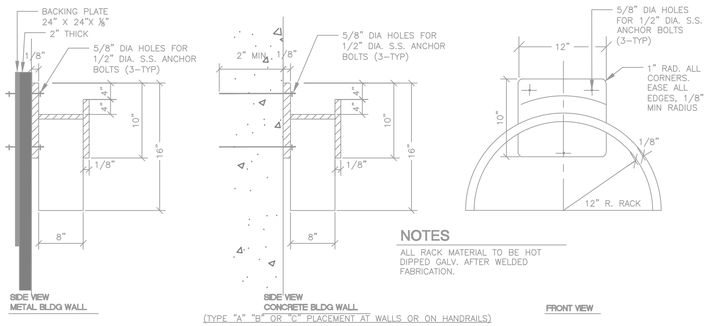


TYPE 'A' TOP
(PRE-CAST ECCENTIC CONICAL TOP M.H.)

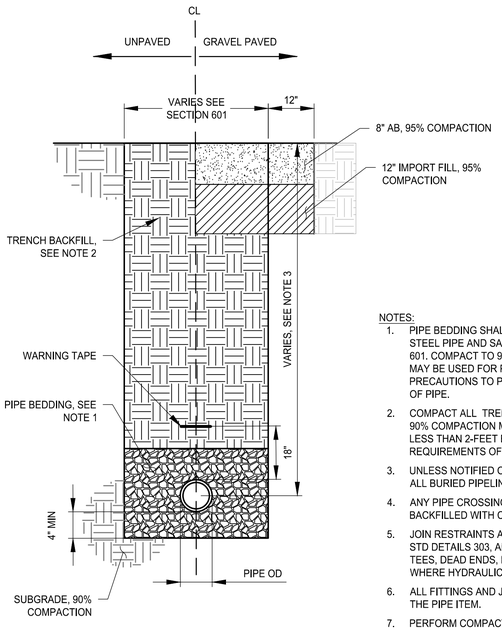


NOTE:
CONSTRUCT INVERT TO MATCH USING 3500 PSI MINIMUM CONCRETE "OR" BRICK AND NON-SHRINK GROUT IF CONNECTING TO EXISTING LIVE SEWER

3 NEW SEWER MANHOLE ON EXISTING SEWER LINE MODIFIED MAG DTL 420-1
N.T.S.

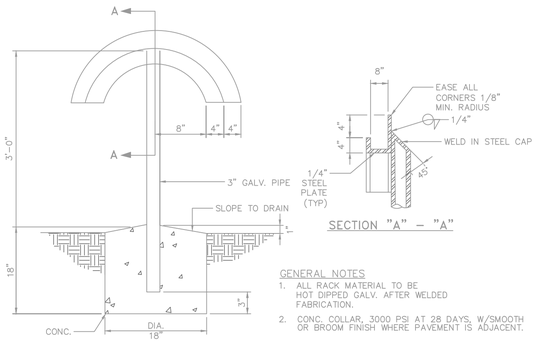


5 HOSE RACK DETAIL - WALL MOUNTED
NOT TO SCALE

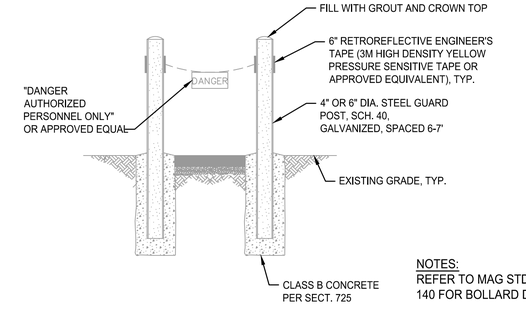


NOTES:
1. PIPE BEDDING SHALL BE GRANULAR BEDDING FOR ALL DUCTILE IRON OR STEEL PIPE AND SAND FOR ALL OTHER PIPE MATERIAL AND PER STD SPEC 601. COMPACT TO 90% RELATIVE COMPACTION. ALTERNATIVELY, SLURRY FILL MAY BE USED FOR PIPE BEDDING. IF SLURRY FILL IS USED, TAKE PRECAUTIONS TO PREVENT PIPE FLOATING. BACKFILL TO MIN 4" ABOVE TOP OF PIPE.
2. COMPACT ALL TRENCH BACKFILL (COMMON FILL AND SELECT GRADE) TO 90% COMPACTION MORE THAN 2-FEET BELOW GRADE AND 95% COMPACTION LESS THAN 2-FEET BELOW GRADE. BACKFILL MATERIAL SHALL MEET REQUIREMENTS OF STD SECTION 601.
3. UNLESS NOTIFIED OTHERWISE, PROVIDE MINIMUM 3-FEET OF COVER OVER ALL BURIED PIPELINES. SEE SECTION 601.
4. ANY PIPE CROSSING LESS THAN 16" OF VERTICAL CLEARANCE MUST BE BACKFILLED WITH CLSM, UP TO SPRING LINE AND 1-FT BEYOND PIPE OD.
5. JOIN RESTRAINTS AND THRUST BLOCKING COMPLYING WITH SECTION 610, STD DETAILS 303, AND STD DETAIL 308 SHALL BE USED AT ALL ALL BENDS, TEES, DEAD ENDS, REDUCERS, VALVES, HYDRANTS, AND OTHER LOCATIONS WHERE HYDRAULIC FORCE MAY CAUSE DAMAGE TO NEW OR EXISTING PIPES.
6. ALL FITTINGS AND JOINT RESTRAINTS SHALL BE CONSIDERED INCIDENTAL TO THE PIPE ITEM.
7. PERFORM COMPACTION TEST FOR EA 2 FT DEPTH AT 200 FT INTERVALS OR LESS, IN ACCORDANCE WITH ASTM D2922 AND D3017. TESTING IS INCIDENTAL TO WORK. NON-COMPLIANT AREAS SHALL BE COMPACTED AND TESTED AGAIN AT NO ADDITIONAL COST.
8. ALL BURIED CON-PLASTIC PIPES AND FITTING SHALL HAVE CORROSION PROTECTION WRAPPING PER SECTION 404616.

4 TYPICAL TRENCH DETAIL
N.T.S.



6 HOSE RACK DETAIL - PEDESTAL MOUNTED
NOT TO SCALE



NOTES:
REFER TO MAG STD DTL 140 FOR BOLLARD DETAILS

7 BOLLARDS WITH CHAIN AND SIGN
N.T.S.

wsp
4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

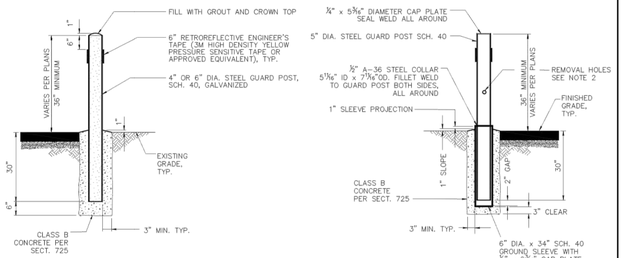
WSP PROJECT No:
2151700032

REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	DDM
DRAWN BY:	DDM
CHECKED BY:	JCB
DATE:	04NOV2022

SHEET TITLE:
CIVIL DETAILS 1

SHEET NUMBER:	REV. #
10-GEN-C-3001	0
SHEET 23 OF 223	



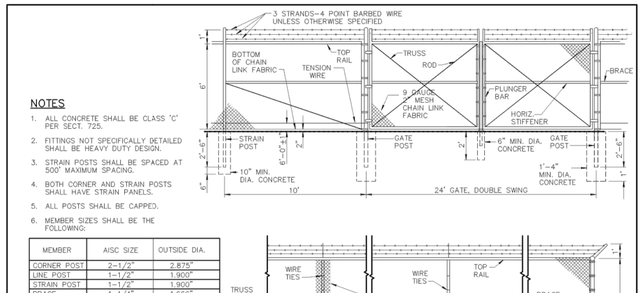
TYPE 1 PERMANENT

TYPE 2 REMOVABLE

NOTES

1. BOLLARDS SHALL HAVE A HEIGHT OF 3 FEET OR BE EQUAL TO THE HEIGHT OF THE BACK SCREEN WALL OF BIN ENCLOSURES. POSTS SHALL BE PLACED A MINIMUM OF 4" FROM THE WALL.
2. REMOVABLE POSTS SHALL HAVE 1" DIA. HOLES DRILLED THROUGH AT A DISTANCE ⅞ THE OVERALL POST LENGTH FROM TOP.
3. REMOVABLE POST – GRIND SMOOTH ALL SHARP EDGES PRIOR TO GALVANIZATION. GALVANIZE PER ASTM A54 AFTER FABRICATION.

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
140	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	BOLLARD	01-01-2009	140



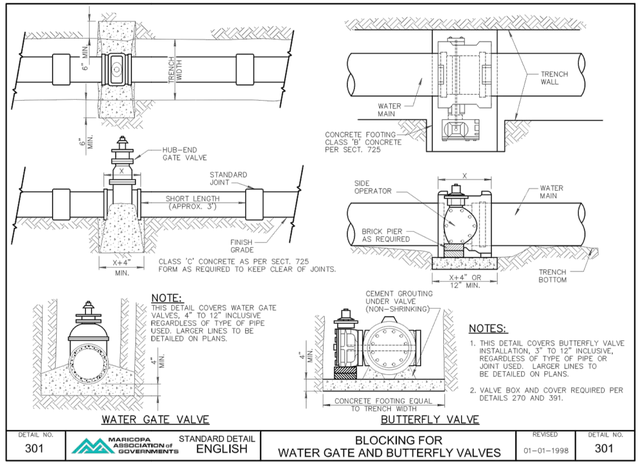
NOTES

1. ALL CONCRETE SHALL BE CLASS 'C' PER SECT. 725.
2. FITTINGS NOT SPECIFICALLY DETAILED SHALL BE HEAVY DUTY DESIGN.
3. STRAIN POSTS SHALL BE SPACED AT 500' MAXIMUM SPACING.
4. BOTH CORNER AND STRAIN POSTS SHALL HAVE STRAIN PANELS.
5. ALL POSTS SHALL BE CAPPED.
6. MEMBER SIZES SHALL BE THE FOLLOWING:

MEMBER	AISC SIZE	OUTSIDE DIA.
CORNER POST	2–1/2"	2.875"
LINE POST	1–1/2"	1.900"
STRAIN POST	1–1/2"	1.900"
BRACE	1–1/4"	1.666"
STRETCH BAR	3/16"x3/4" FLAT	3/16"x3/4" FLAT
GATE POST	3–1/2"	4.000"
TOP RAIL	1–1/4"	1.666"

7. CONSTRUCTION AND MATERIALS SHALL CONFORM TO SECT. 420 AND 772, RESPECTIVELY. SEE TABLE 772–1 FOR WEIGHTS OF MEMBERS.

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
160	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	6' CHAIN LINK FENCE AND GATE	01-01-2013	160



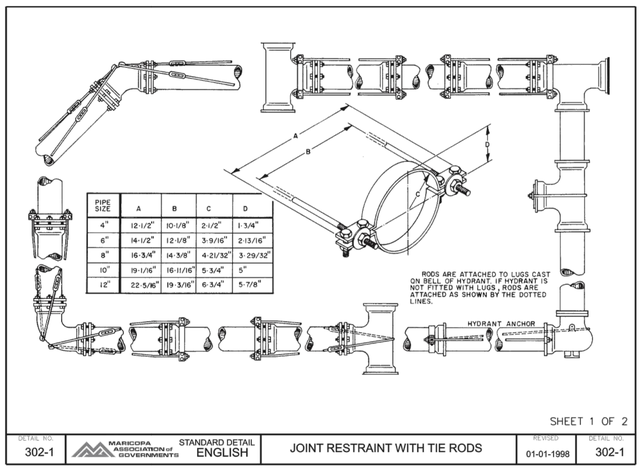
NOTE:
THIS DETAIL COVERS WATER GATE VALVES, 4" TO 12" INCLUSIVE, REGARDLESS OF TYPE OF PIPE USED. LARGER LINES TO BE DETAILED ON PLANS.

WATER GATE VALVE

NOTES:
1. THIS DETAIL COVERS BUTTERFLY VALVE INSTALLATION, 3" TO 12" INCLUSIVE, REGARDLESS OF TYPE OF PIPE OR JOINT USED. LARGER LINES TO BE DETAILED ON PLANS.
2. VALVE BOX AND COVER REQUIRED PER DETAILS 270 AND 391.

BUTTERFLY VALVE

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
301	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	BLOCKING FOR WATER GATE AND BUTTERFLY VALVES	01-01-1998	301



SHEET 1 OF 2

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
302-1	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	JOINT RESTRAINT WITH TIE RODS	01-01-1998	302-1

THIS DETAIL IS FOR USE ONLY ON UNDERGROUND INSTALLATIONS WHERE THE USE OF CONCRETE THRUST BLOCKING PER DETAIL 380 CANNOT BE USED BECAUSE OF OBSTRUCTIONS, OR REQUIREMENTS OF THE SPECIFICATIONS...

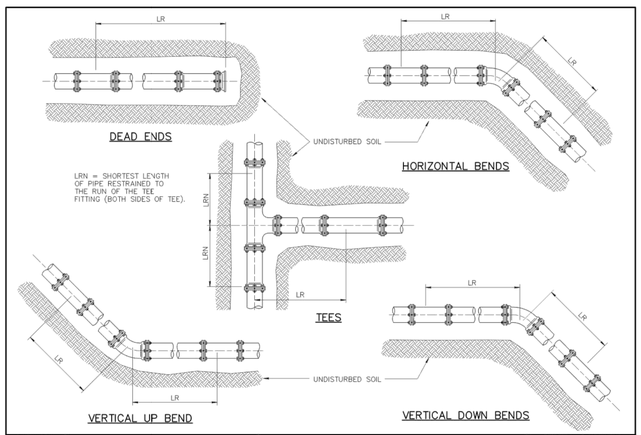
- CLAMPS SHALL BE 1/2 BY 2 INCHES FOR PIPE 4 AND 6 INCHES IN DIAMETER; 5/8 BY 2–1/2 INCHES FOR PIPE 8 AND 10 INCHES; 5/8 BY 3 INCHES FOR PIPE 12 INCHES. BOLT HOLES SHALL BE 1/16 INCH IN DIAMETER LARGER THAN BOLTS.
- RODS SHALL BE 3/4 INCHES IN DIAMETER FOR PIPES 4,6 AND 8 INCHES IN DIAMETER; 7/8 INCHES FOR PIPE 10 INCHES AND 1 INCH IN DIAMETER FOR PIPE 12 INCHES.
- BOLTS SHALL BE 5/8 INCHES IN DIAMTER FOR PIPE 4, 6 AND 8 INCHES IN DIAMETER; 3/4 INCHES FOR PIPE 10 INCHES AND 7/8 INCHES IN DIAMETER FOR PIPE 12 INCHES
- WASHERS MAY BE CAST IRON OR STEEL, ROUND OR SQUARE. DIMENSIONS FOR CAST IRON WASHERS ARE 5/8 BY 3 INCHES FOR PIPE 4, 6, 8 AND 10 INCHES IN DIAMETER AND 3/4 BY 3–1/2 INCHES FOR PIPE 12 INCHES. DIMENSIONS FOR STEEL WASHERS ARE 1/2 BY 3 INCHES FOR PIPE 4, 6, 8 AND 10 INCHES IN DIAMETER AND 1/2 BY 3–1/2 INCHES FOR PIPE 12 INCHES IN DIAMTER. HOLES SHALL BE 1/8 INCH LARGER THAN THE RODS.

FOR PIPE LARGER THAN 12 INCHES IN DIAMETER, RESTRAINT DETAILS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO INSTALLATION.

1. ALL TIE RODS, ROD COUPLINGS, TURNBUCKLES, BOLTS AND NUTS FOR THESE JOINTS SHALL BE OF CARBON STEEL EQUIVALENT TO A.S.T.M. A–307, GRADE B, WITH CADMIUM PLATING IN ACCORDANCE WITH A.S.T.M. A–165. EXCEPT THAT THE MIN. THICKNESS OF THE PLATING SHALL BE .0002 OF AN INCH. CADMIUM PLATED BOLTS SHALL HAVE CLASS 2A THREADS AND THE NUTS, ROD COUPLINGS AND TURNBUCKLES SHALL HAVE 2B THREADS.
2. HIGH STRENGTH, HEAT TREATED CAST IRON TEE–HEAD BOLTS WITH HEXAGON NUTS, ALL IN ACCORDANCE WITH THE STRENGTH REQUIREMENTS OF A.W.W.A. C–111, MAY BE USED IN LIEU OF THE CADMIUM PLATED BOLTS AND NUTS.
3. THE SKETCHES IN THIS SERIES OF FIGURES SHOW ACCEPTABLE METHODS OF PROVIDING ANCHORAGE. THERE IS NO PARTICULAR SIGNIFICANCE TO BE ATTACHED TO WHETHER THE SKETCH SHOWS A BELL AND SPIGOT JOINT OR A STANDARD MECHANICAL JOINT. THE ANCHORING PROCEDURE ILLUSTRATED APPLIES IN MOST CASES TO EITHER TYPE OF JOINT. IN SOME CASES, DIMENSIONS OF THE PARTICULAR PIPE OR HUB AND SPACE AVAILABLE FOR WORKING AROUND THE PARTICULAR JOINT WILL INFLUENCE THE CHOICE OF METHODS USED.
4. IN CERTAIN ASSEMBLIES OF RODS AND CLAMPS SHOWN, RODS RUN FROM A LUG ON THE FITTING (OR A CLAMP BEHIND THE HUB OF A BELL) TO A CLAMP AGAINST A FACE OF A BELL. NOTE THAT THIS ARRANGEMENT ANCHORS ONLY ONE JOINT. THE STABILITY OF THE JOINT WHERE THE CLAMP IS AGAINST THE FACE OF THE BELL DEPENDS ON HAVING SOIL ABOVE A RELATIVELY LONG PIECE OF PIPE ON BOTH SIDES OF THE JOINT. CONSEQUENTLY, IF THE DISTANCE BETWEEN THE FIRST AND SECOND JOINTS IS LESS THAN 12 FEET, THE SECOND JOINT SHOWN SHALL BE ANCHORED BY A CLAMP BEHIND THE HUB OF THE BELL AND RODS TO A CLAMP AT THE FACE OF THE NEXT BELL.
5. COATING TYPE: A.H.D. ASPHALTIC PRIMER 719(A). – ALL EXPOSED METAL.

SHEET 2 OF 2

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
302-2	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	JOINT RESTRAINT WITH TIE RODS	01-01-1998	302-2



DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
303–1	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	JOINT RESTRAINT FOR DUCTILE IRON, POLYETHYLENE WRAPPED DUCTILE IRON AND PVC WATER PIPES	01-01-2019	303–1

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE

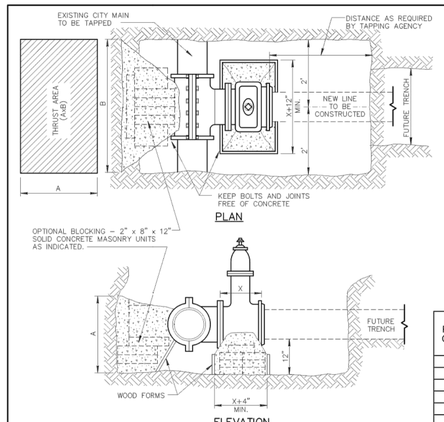
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS 90° BEND FITTINGS		45° BEND FITTINGS		22–1/2° BEND FITTINGS		DEAD ENDS
	90°	45°	22–1/2°	LRN=0°	LRN=10°	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	18	7	4	30	8	31	18	13	7	6	3	31
6	25	10	5	43	20	44	25	18	10	9	5	44
8	32	13	6	56	34	58	32	24	13	11	6	58
10	38	16	8	68	45	69	38	29	16	14	8	69
12	45	19	9	80	57	81	45	34	19	16	9	81
14	51	21	10	91	68	92	51	38	21	18	10	92
16	57	24	11	103	79	104	57	43	24	21	11	104
18	62	26	12	113	90	115	62	48	26	23	12	115
20	68	28	14	125	100	126	68	52	28	25	14	126
24	79	33	16	145	121	147	79	61	33	29	16	147

RESTRAINED LENGTHS, LR, FOR DUCTILE IRON WITH POLYETHYLENE WRAP AND PVC PIPE

NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS 90° BEND FITTINGS		45° BEND FITTINGS		22–1/2° BEND FITTINGS		DEAD ENDS
	90°	45°	22–1/2°	LRN=0°	LRN=10°	DOWN BEND	UP BEND	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	26	11	5	69	18	72	26	30	11	14	5	72
6	36	15	7	99	47	102	36	42	15	20	7	102
8	47	19	9	130	78	133	47	55	19	26	9	133
10	56	23	11	157	103	159	56	66	23	32	11	159
12	65	27	13	185	131	187	65	77	27	37	13	187
14	74	31	15	211	156	214	74	89	31	42	15	214
16	82	34	16	238	183	241	82	100	34	48	16	241
18	90	37	18	263	207	266	90	110	38	53	18	266
20	98	41	20	289	233	292	98	121	41	58	20	292
24	113	47	22	337	280	340	113	141	47	68	22	340

NOTES:
1. ALL JOINTS WITHIN THE SPECIFIED LENGTH LR MUST BE RESTRAINED. ALL LENGTHS ARE GIVEN IN FEET.
2. THE MAXIMUM TEST PRESSURE SHALL NOT EXCEED 200 PSI
3. THE MINIMUM DEPTH OF BURY SHALL BE 3' TO TOP OF PIPE.
4. RESTRAINED LENGTHS MAY BE REDUCED WHEN SUPPORTED BY ENGINEERING CALCULATIONS.

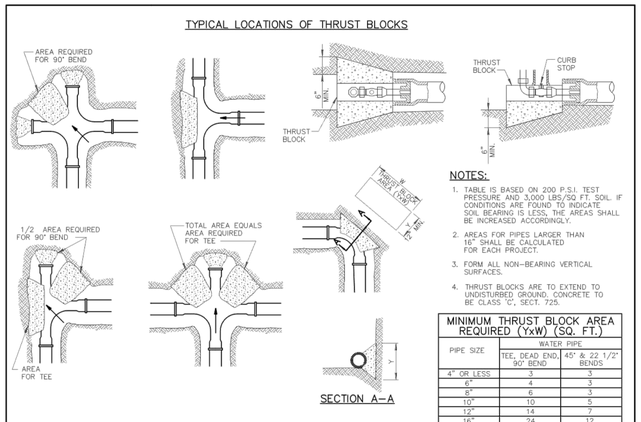
DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
303–2	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	JOINT RESTRAINT FOR DUCTILE IRON, POLYETHYLENE WRAPPED DUCTILE IRON AND PVC WATER PIPES	01-01-2019	303–2



NOTES:
1. TAPPING SLEEVE TO BE PLACED A MINIMUM OF 18" FROM ANY BELL COUPLING, VALVE, FITTING OR OTHER OBSTRUCTION
2. CONTRACTOR SHALL EXCAVATE AS SHOWN AND SHALL SET TAPPING SLEEVE AND VALVE AND TIGHTEN ALL BOLTS PRIOR TO THE PRESSURE TEST.
3. ALL TAPPING SLEEVES AND VALVES MUST BE PRESSURE TESTED PRIOR TO BLOCKING OR TAPPING. THE TEST MUST BE WITNESSED AND APPROVED BY THE INSPECTOR.
4. BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND AND BE INSTALLED BEFORE THE TAP IS MADE. ALL FLANGE BOLTS SHALL BE FREE AND CLEAR OF CONCRETE.
5. CONCRETE THRUST BLOCKS SHALL BE CLASS 'B' PER SECT. 725. NORMALLY, CURE TIME FOR CONCRETE IS 24 HOURS BEFORE BACKFILLING.
6. TAPS SHALL BE MADE BY CITY CREWS AT PREVAILING RATES OR BY APPROVED CONTRACTORS WHEN ALLOWED BY AGENCY.
7. THIS DETAIL COVERS TAPPING SLEEVES 4" THROUGH 16" IN SIZE ON DUCTILE IRON, CAST IRON AND ASBESTOS CEMENT PIPE. ANY OTHER SIZE OR TYPE OF PIPE WILL REQUIRE A SEPARATE SUBMITTAL AND APPROVAL BY THE ENGINEER.

SIZE OF PIPE BEING CONNECTED	MINIMUM THRUST AREA REQUIRED EQUALS (AxB) (SQUARE FEET)
4" AND LESS	3
6"	4
8"	6
10"	9
12"	13
16"	23

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
340	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	INSTALLING TAPPING SLEEVES AND VALVES	01-03-2002	340



NOTES:
1. TABLE IS BASED ON 200 P.S.I. TEST PRESSURE AND 3,000 LBS/SQ FT. SOIL. IF CONDITIONS ARE FOUND TO INDICATE SOIL BEARING IS LESS, THE AREAS SHALL BE INCREASED ACCORDINGLY.
2. AREAS FOR PIPES LARGER THAN 16" SHALL BE CALCULATED FOR EACH PROJECT.
3. FORM ALL NON–BEARING VERTICAL SURFACES.
4. THRUST BLOCKS ARE TO EXTEND TO UNDISTURBED GROUND. CONCRETE TO BE CLASS 'C', SECT. 725.

MINIMUM THRUST BLOCK AREA REQUIRED (YxW) (SQ. FT.)

PIPE SIZE	WATER PIPE	
	TEE, DEAD END, 90° BEND	45° & 22 1/2° BENDS
4" OR LESS	3	3
6"	4	3
8"	6	3
10"	10	5
12"	14	7
16"	24	12

DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
380	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	THRUST BLOCKS FOR WATER LINES	01-01-1998	380

wsp
4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY
WSP PROJECT No: 2151700032

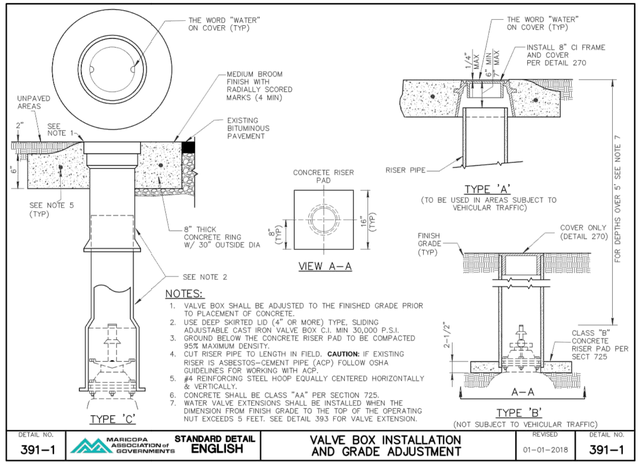
REVISIONS

NO.	DATE	DESCRIPTION

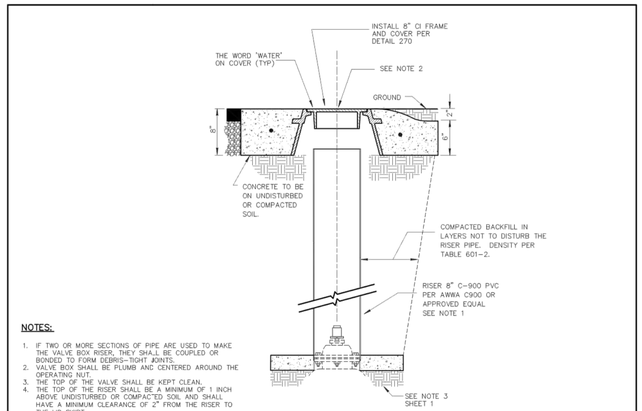
DESIGNED BY:	DDM
DRAWN BY:	DDM
CHECKED BY:	JCB
DATE:	04NOV2022

SHEET TITLE:
CIVIL DETAILS 3

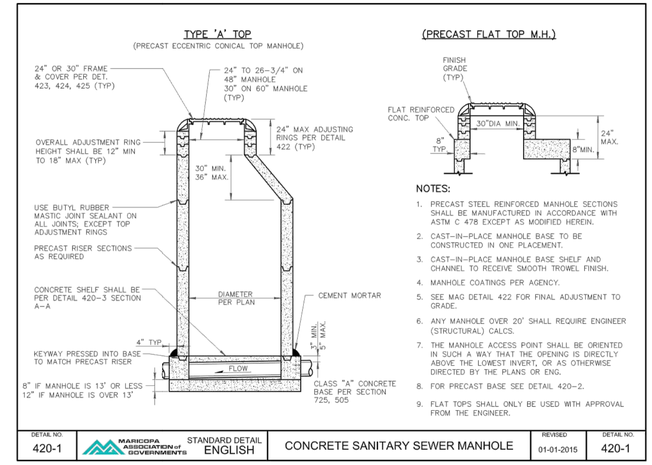
SHEET NUMBER:	REV. #
10–GEN–C–3003	0
SHEET 25 OF 223	



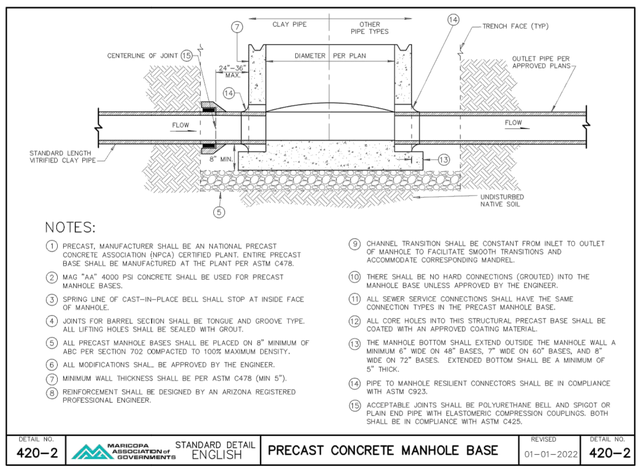
DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
391–1	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	VALVE BOX INSTALLATION AND GRADE ADJUSTMENT	01–01–2018	391–1



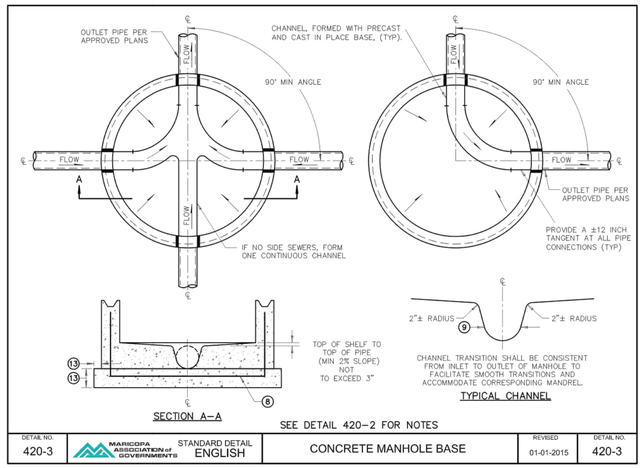
DRAFT	STANDARD DETAIL		REVISED	DETAIL NO.
391–2	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	VALVE BOX INSTALLATION AND GRADE ADJUSTMENT	01–01–2017	391–2



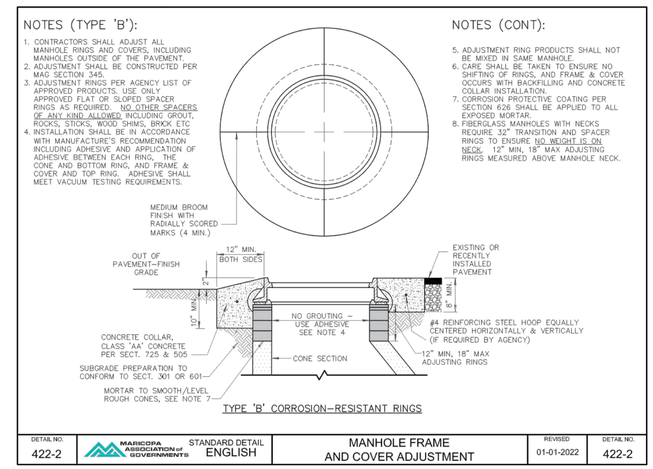
DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
420-1	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	CONCRETE SANITARY SEWER MANHOLE	01-01-2015	420-1



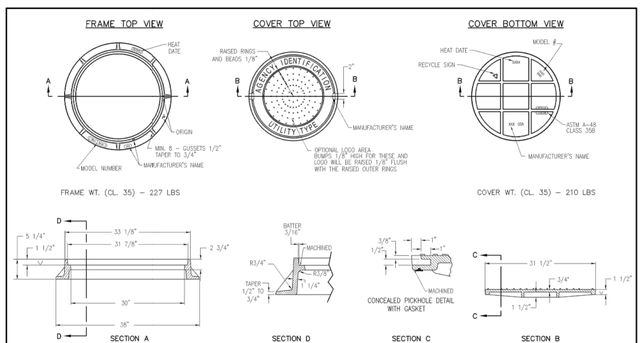
DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
420–2	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	PRECAST CONCRETE MANHOLE BASE	01–01–2022	420–2



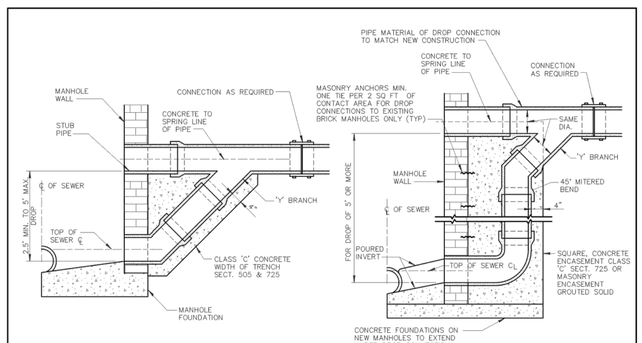
DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
420-3	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	CONCRETE MANHOLE BASE	01-01-2015	420-3



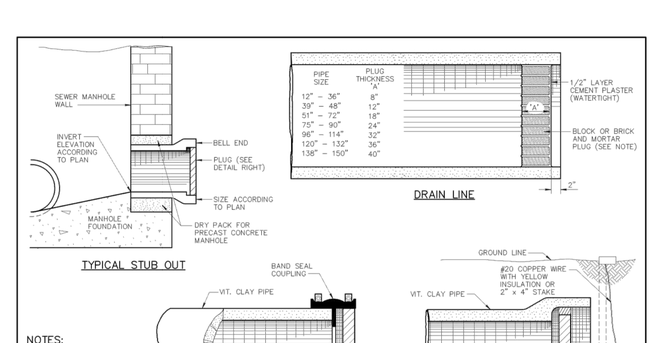
DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
422-2	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	MANHOLE FRAME AND COVER ADJUSTMENT	01-01-2022	422-2



DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
424–2	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	30" CAST IRON WATERTIGHT MANHOLE FRAME AND COVER	01–01–2020	424–2



DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
426	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	DROP SEWER CONNECTIONS	01–01–2007	426



DETAIL NO.	STANDARD DETAIL		REVISED	DETAIL NO.
427	MARICOPA ASSOCIATION of GOVERNMENTS ENGLISH	STUB OUT AND PLUGS	01–01–1998	427

wsp
4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

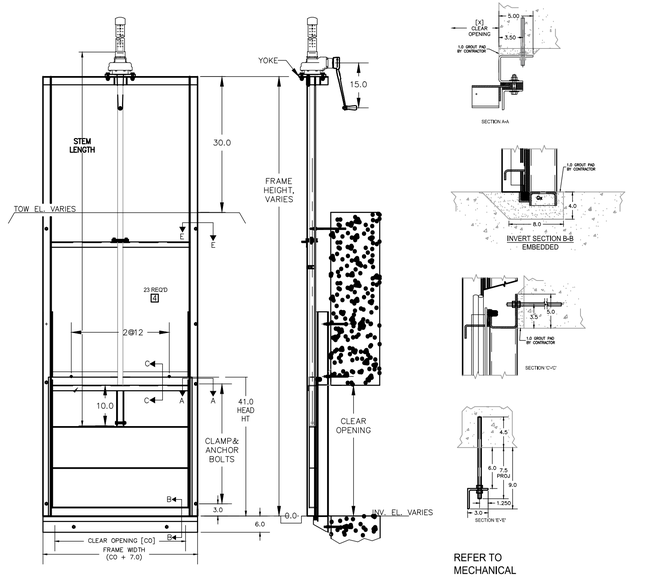
WSP PROJECT No:
2151700032

REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	DDM
DRAWN BY:	DDM
CHECKED BY:	JCB
DATE:	04NOV2022

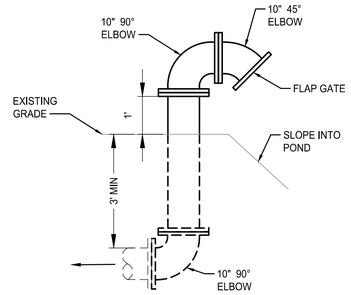
SHEET TITLE:
CIVIL DETAILS 4

SHEET NUMBER:	REV. #
10–GEN–C–3004	0
SHEET 26 OF 223	

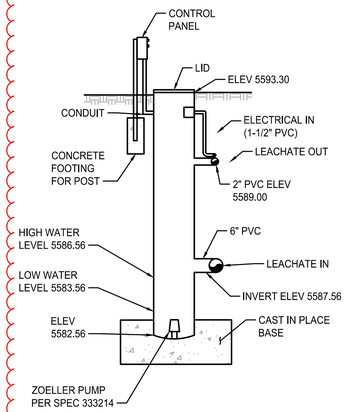


REFER TO MECHANICAL DETAILS

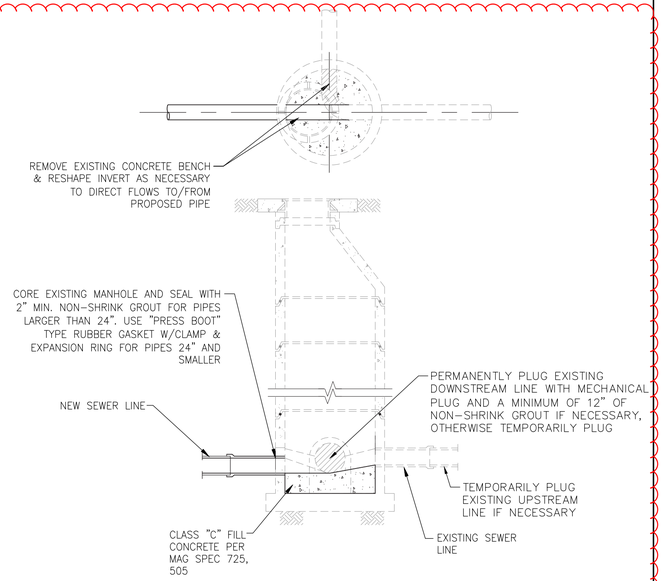
1 SLUICE GATE DETAIL
NOT TO SCALE



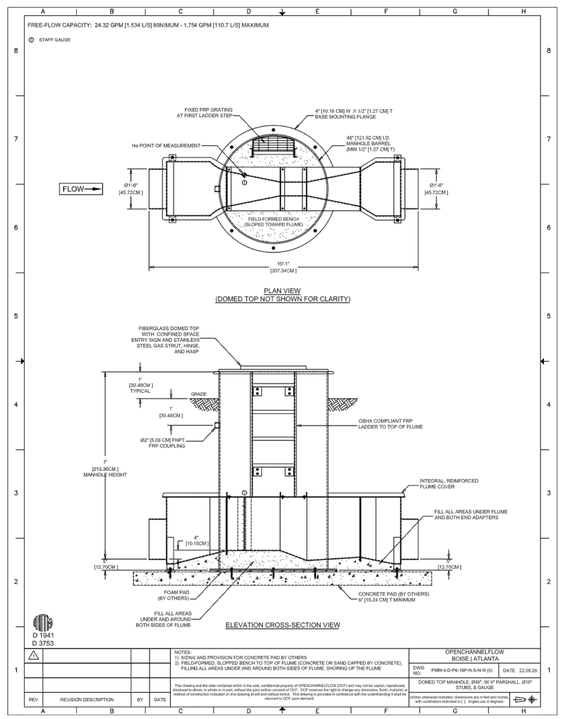
2 DISCHARGE INTO CELL 4
1" = 2'



3 LEACHATE RETURN SYSTEM
NOT TO SCALE



4 SEWER CONNECTION TO EXISTING MANHOLE
NOT TO SCALE



6 METERING MANHOLE
NOT TO SCALE

wsp
4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No: 2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	DDM
DRAWN BY:	DDM
CHECKED BY:	JCB
DATE:	04NOV2022

SHEET TITLE:
CIVIL DETAILS 2

SHEET NUMBER:	REV. #
10-GEN-C-3002	0

SHEET 24 OF 223

A. GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN ON CONTRACT DRAWINGS FOR EXISTING STRUCTURES. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
2. UNLESS DETAILED, SPECIFIED, OR INDICATED OTHERWISE, CONSTRUCTION SHALL BE AS INDICATED IN THE APPLICABLE TYPICAL DETAILS AND GENERAL NOTES. TYPICAL DETAILS APPLY EVEN THOUGH NOT REFERENCED AT SPECIFIC LOCATIONS OR IN SPECIFIED CONTRACT DRAWINGS. WHERE SPECIFIC DETAILS OR NOTES DIFFER FROM TYPICAL DETAILS AND THESE GENERAL NOTES, THE SPECIFIC REQUIREMENTS GOVERN.
3. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS FROM ALL OTHER DISCIPLINES AND COORDINATE ALL OPENINGS, PENETRATIONS AND EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUITS, ETC. THAT WILL BE INCORPORATED INTO THE STRUCTURAL WORK.
4. MECHANICAL AND ELECTRICAL SUPPORTS, ANCHORAGES, OPENINGS, AND RECESSES NOT SHOWN ON THE STRUCTURAL DRAWINGS, BUT REQUIRED TO COMPLETE OTHER PORTIONS OF THE WORK, SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL AND SHALL BE PROVIDED PRIOR TO PLACING CONCRETE.
5. THE STRUCTURES HEREIN HAVE BEEN DESIGNED TO THE CODES AND STANDARDS SPECIFIED BELOW. ANY ITEMS TO BE DESIGNED BY THE CONTRACTOR SHALL MEET THESE SAME REQUIREMENTS. SUCH DESIGNS SHALL BE PREPARED AND SEALED BY AN ENGINEER REGISTERED TO PRACTICE IN THE STATE OF ARIZONA.
6. ANY CHANGES TO THE DESIGN WHICH ARE PROPOSED BY THE CONTRACTOR SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION AND COST OF CHANGES TO ANY COMPONENTS OCCASIONED BY SUCH CHANGE. THE COST OF ANY DESIGN WORK NECESSITATED BY SUCH PROPOSAL SHALL BE BORNE BY THE CONTRACTOR.
7. UNLESS OTHERWISE SHOWN OR SPECIFIED, FINISHED GRADE AROUND STRUCTURES, SHOWN GENERICALLY, MAY INDICATE GROUND SURFACE, TOP OF CONCRETE SLABS ON GRADE, OR PAVEMENT. FOR TYPES OF FINISHED SURFACES, REFER TO CIVIL OR ARCHITECTURAL DRAWINGS.
8. PROVIDE CONCRETE ENCASEMENT FOR ALL UNDERGROUND PIPE BENEATH STRUCTURES (EXCEPT FOR SMALL-DIAMETER BUILDING SERVICE PIPING).
9. GUARDRAILS, HANDRAILS, LADDERS, STAIRS, CATWALKS, ELEVATORS, AND SIMILAR SAFETY DEVICES SHALL CONFORM TO THE LATEST FEDERAL AND STATE OSHA REQUIREMENTS, AND TO THE GOVERNING BUILDING CODE OF THE PROJECT'S JURISDICTION.
10. FIELD MEASUREMENTS SHALL BE TAKEN BY THE GENERAL CONTRACTOR PRIOR TO PREPARATION OF SHOP DRAWINGS. THE CONTRACTOR SHALL USE A REGISTERED LAND SURVEYOR FOR THIS PURPOSE, IF NECESSARY, TO OBTAIN ACCURATE MEASUREMENTS.
11. TEMPORARILY BRACE ALL NEW CONSTRUCTION AS REQUIRED UNTIL ALL PERMANENT BRACING, SUPPORTING ELEMENTS AND DIAPHRAGMS HAVE BEEN INSTALLED, AND ALL CONNECTIONS BETWEEN THESE ELEMENTS HAVE BEEN MADE. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL LOADS ON THE COMPLETED STRUCTURES ONLY, UNLESS OTHERWISE INDICATED. DURING CONSTRUCTION, ALL OTHER CONSTRUCTION LOADS SHALL BE ACCOMMODATED BY SHORING, BRACING, OR OTHER PROTECTION, BY THE CONTRACTOR.
12. CONSTRUCTION SHORING AND BRACING OF FORMWORK SHALL BE IN ACCORDANCE WITH ACI 301 AND ACI 347.
13. TEMPRORY SHORING SHALL REMAIN IN PLACE UNTIL CONCRETE HAS REACHED 28 DAY DESIGN STRENGTH AS DETERMINED BY CYLINDER BREAK TESTS.
14. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED PRIOR TO FABRICATION.
15. COORDINATE ALL ACTIVITIES, INCLUDING THOSE OF SUBCONTRACTORS, WITH CLIENT'S OPERATIONS AND ACTIVITIES ON THE PROJECT SITE.
16. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT THEY ARE GUARANTORS OF THE CONSTRUCTION WORK, OR RESPONSIBLE FOR COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.
17. A GEOTECHNICAL INVESTIGATION REPORT SHALL BE PROVIDED FOR THE SITE, IN ACCORDANCE WITH ASCE 7 FOR SEISMIC DESIGN CATEGORY B STRUCTURES (SEE LOADING CRITERIA SECTION IN THE GENERAL NOTES HEREIN). THE REPORT SHALL CONTAIN RECOMMENDATIONS FOR FOUNDATION DESIGNS OR OTHER MEASURES TO MITIGATE THE EFFECTS OF THE MENTIONED HAZARDS.

B. FOUNDATIONS AND SLABS-ON-GROUND

1. FOUNDATIONS SHALL BE DESIGNED BASED ON THE PRELIMINARY GEOTECHNICAL REPORT TO BEAR ON AN ENGINEERED FILL CAPABLE OF SUPPORTING A NET ALLOWABLE DESIGN BEARING PRESSURE OF 1,500 PSF WITH ONE-THIRD INCREASE FOR SEISMIC OR OTHER TRANSIENT LIVE LOADING.
2. PERFORM CLEARING, GRUBBING, AND ROUGH GRADING.
3. MINIMUM DEPTH BELOW GRADE FOR FOUNDATIONS FOR FROST PROTECTION IS 24 INCHES.
4. STRUCTURES BEARING ON WEATHERED OR INTACT BEDROCK SHALL HAVE A MINIMUM 1-FOOT-THICK CRUSHED ROCK COMPACTED LAYER ACROSS THE BEDROCK SURFACE, TO PROVIDE A LEVELLING COURSE AND A UNIFORM BEARING CONDITION.
5. PLACE A LAYER OF 15 MIL VAPOR BARRIER AND A 6" CAPILLARY/WATER BARRIER UNDER ALL INTERIOR SLABS ON GROUND AND 6" LAYER OF OPEN COARSE AGGREGATE FOR ALL EXTERIOR SLABS ON GROUND. ALL EXCAVATIONS SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER BEFORE PLACING ANY CONCRETE OR AGGREGATE.
6. FOR WORK TO BE INCORPORATED IN FOUNDATION WORK, SEE DRAWINGS FROM OTHER DISCIPLINES IN THIS CONTRACT SET.

C. EARTHWORK

1. THE CONTRACTOR SHALL HIRE AN INDEPENDENT PROFESSIONAL GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF ARIZONA TO INSPECT ALL EARTHWORK OPERATIONS AND FOUNDATION CONSTRUCTION. THE GEOTECHNICAL ENGINEER SHALL INSPECT EARTHWORK PROCEDURES AND VERIFY BEARING CAPACITY AT FOUNDATION BEARING ELEVATIONS.
2. BACKFILL FOR ALL FOUNDATION EXCAVATIONS SHALL MEET THE REQUIREMENTS FOR SATISFACTORY MATERIALS PLACED IN ACCORDANCE WITH THE EARTHWORK SPECIFICATION.
3. TEMPORARY DEWATERING SHALL BE REQUIRED TO ACCOMPLISH EXCAVATIONS BELOW THE GROUNDWATER TABLE. KEEP ALL EXCAVATIONS DRY. STANDING WATER IN EXCAVATIONS IS NOT ALLOWED.
4. PRIOR TO PLACEMENT OF FILL OR FORMING FOR ANY STRUCTURE, FOOTING, SLAB ON GRADE, OR TANK, REMOVE AND DISPOSE OF ANY VEGITATION OR TOPSOIL AND EXCAVATE TO SUBGRADE INDICATED AND SCARIFY TO 12" DEPTH THEN RECOMPACT TO 95% MAXIMUM DENSITY WITHIN +/- 2% OF OPTIMUM MOISTURE CONTENT. ENGINEER'S APPROVAL SHALL BE OBTAINED FOR SUBGRADE PREPARATION.
5. TEMPORARY OPEN CUTS CAN BE MADE WHERE ADEQUATE LATERAL SPACE IS AVAILABLE. ALL EXCAVATION SIDEWALLS SHOULD BE ADEQUATELY SLOPED BACK TO MINIMIZE SLOUGHING AND EROSION. ALL TEMPORARY SLOPING AND TEMPORARY SHORING ARE REQUIRED TO ADHERE TO THE OSHA REQUIREMENTS AS FOLLOWS: SOIL TYPE B, 1H:1V; SOIL TYPE C 1.5H:1V ; SOIL TYPE A 0.75H:1V
6. BACKFILL SHALL BE CARRIED OUT IN LIFTS OF A MAXIMUM OF 8" AND COMPACTED USING SMALL, HAND OPERATED COMPACTION EQUIPMENT WITHIN 3 FT OF A BACKFILLED WALL.
7. FILL SHALL BE CARRIED OUT IN LIFTS OF A MAXIMUM OF 8" AND COMPACTED USING MECHANICAL VIBRATORY COMPACTOR.
8. TESTING SHALL BE PERFORMED AT LEAST EVERY SECOND LIFT, 1 TEST PER 2000 SY, OR PORTION THEREOF.
9. GRADE TO DRAIN AWAY FROM STRUCTURES, A MINIMUM GRADE OF 2% FOR A MINIMUM OF 10'-0" FROM STRUCTURE PERIMETER, EXCEPT THAT GRADING AWAY FROM BURIED FOOTERS SHALL BE FOR 4'-0" FROM PIERS FOUNDED ON THESE.
10. NO BACKFILL SHALL BE PLACED BEHIND FREE TOP WALLS UNTIL THE CONCRETE HAS ATTAINED 100% OF ITS SPECIFIED COMPRESSIVE STRENGTH.
11. EXCAVATIONS SHALL BE SHORED AS REQUIRED TO PREVENT SUBSIDENCE OR DAMAGE TO ADJACENT EXISTING STRUCTURES.

D. CONCRETE

1. ALL CONCRETE TANKS AND CONTAINMENT STRUCTURES ARE WATER BEARING STRUCTURES. WATER BEARING STRUCTURES, INCLUDING REINFORCEMENT, SHALL COMPLY WITH ACI "CODE REQUIREMENTS FOR ENVIRINOMENTAL ENGINEERING CONCRETE STRUCTURES" (ACI 350-06).
2. ALL OTHER CONCRETE CONSTRUCTION, INCLUDING REINFORCING, SHALL COMPLY WITH ACI "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" (ACI 318-11).
3. NON-STRUCTURAL CONCRETE IS CONCRETE FOR PIPE SUPPORTS, EQUIPMENT PADS, THRUST BLOCKS, ENCASEMENTS, FILL, CURBS AND SIDEWALKS. STRUCTURAL CONCRETE IS ALL OTHER CONCRETE.
4. STRUCTURAL CONCRETE:
    - A. ASTM C150 TYPE II PORTLAND CEMENT
    - B. MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI IN 28 DAYS
    - C. WATER-CEMENT RATIO SHALL NOT EXCEED 0.42
    - D. MINIMUM CEMENT CONTENT: 650 lb/yd^3
    - E. SLUMP AT POINT OF PLACEMENT SHALL NOT EXCEED 3" ±1". IF SUPERPLASTICIZER IS USED, IT SHALL BE ADDED AT THE JOB SITE, AFTER VERIFYING THAT THE SLUMP (BEFORE PLASTICIZING) DOES NOT EXCEED 3" ±1". SUPERPLASTICIZED CONCRETE SLUMP SHALL NOT EXCEED 7" ±1"
    - F. MAXIMUM AGGREGATE SIZE: 1½"
    - G. SHRINKAGE, TESTED PER ASTM C157, MODIFIED TO 7-DAYS MOIST CURING, SHALL NOT EXCEED 0.030% AT 28 DAYS OF DRYING
5. NON-STRUCTURAL CONCRETE:
    - A. MINIMUM COMPRESSIVE STRENGTH OF 2500 PSI IN 28 DAYS
    - B. WATER-CEMENT RATIO NOT TO EXCEED 0.55
    - C. MINIMUM CEMENT CONTENT: 470 lb/cy
    - D. SLUMP AT POINT OF PLACEMENT NOT TO EXCEED 5" ±1"
    - E. MAXIMUM AGGREGATE SIZE: 1½"
6. CONTROLLED LOW-STRENGTH MATERIAL (CLSM) BACKFILL:
    - A. 85 PSI TO 175 PSI, FLOWABLE FILL
    - B. ASTM C33 SIZE #7 COARSE AGGREGATE
    - C. AIR CONTENT (APPROXIMATE): 10 PERCENT.
7. POZZOLANS SHALL BE USED IN WATER-BEARING STRUCTURES AND MAY BE USED IN OTHER CONCRETE: FLY ASH, PER ASTM C618 CLASS F, 10%-20% REPLACEMENT OF CEMENT (BY WEIGHT).
8. SUBMIT MIX DESIGNS, INCLUDING STRENGTH HISTORY, AS SHOP DRAWINGS TO ENGINEER AND RECEIVE APPROVAL PRIOR TO PLACING CONCRETE.
9. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:
    - A. OUTER BARS IN FOOTINGS, WALL OR SLABS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3".
    - B. BEAMS, SLABS, COLUMNS AND WALL EXPOSED TO GROUND, LIQUID AND/OR WEATHER: 2".
    - C. ALL OTHER CONCRETE SURFACES NOT EXPOSED TO GROUND, LIQUID, WEATHER OR VEHICLE TRAFFIC: 1-1/2".
10. LOCATION OF ALL CONSTRUCTION, CONTRACTION, AND EXPANSION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER. PLACE CONSTRUCTION JOINTS IN SLABS AND BEAMS AT THE SAME TIME. CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND INTENTIONALLY ROUGHENED FOR BOND.
11. PROVIDE WATER STOPS IN ALL CONSTRUCTION JOINTS IN WATER BEARING SLABS AND WALLS.
12. EXPANSION JOINTS SHALL HAVE EDGES ROUNDED TO 1/4" RADIUS, USE 1/2" CORK OR CANE-FIBER FORM BOARD, EXCAVATED TO 1/2" DEPTH AND FILLED WITH AN APPROVED POLY-SULFIDE CAULK.
13. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" UNLESS OTHERWISE NOTED.
14. DO NOT PLACE ANY CONCRETE WHOSE TEMPERATURE IS ABOVE 90°F.
15. DO NOT PLACE ANY CONCRETE WHICH IS OLDER THAN 90 MINUTES FROM TIME OF WATER ADDITION.
16. PROVIDE A MINIMUM OF 7 DAYS MOIST CURING OF ALL CONCRETE. IF DAYTIME HIGHS ARE ABOVE 95°F, USE WATER CURE ONLY (NOT MEMBRANE CURE OR MOISTURE-RETAINING COVERS).
17. POUR CONCRETE SLABS AND WALLS BETWEEN INDICATED JOINTS, ALLOWING A MINIMUM ELAPSED PERIOD OF 3 DAYS BETWEEN ADJACENT POURS.
18. PROVIDE BONDING COMPOUND AT ALL LOCATIONS IN WHICH FRESH CONCRETE COMES IN CONTACT WITH CURED CONCRETE.
19. FORMS & SHORES SHALL NOT BE REMOVED FROM SUSPENDED SLABS AND BEAMS UNTIL THEY HAVE ATTAINED AT LEAST 75% OF SPECIFIED STRENGTH.
20. SIZE AND LOCATE ANCHOR BOLTS AND EQUIPMENT PADS OR PEDESTALS TO SUIT EQUIPMENT FURNISHED, UNLESS OTHERWISE NOTED.
21. REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS AND EMBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUIT, ETC. THAT WILL BE INCORPORATED INTO CONCRETE WORK.

E. REINFORCING STEEL

1. DETAIL AND CONSTRUCT REINFORCED CONCRETE IN ACCORDANCE WITH ACI "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" (ACI 318-11) AND ACI "SPECIFICATIONS FOR STRUCTURAL CONCRETE" (ACI 301-10).
2. DETAIL REINFORCING STEEL IN ACCORDANCE WITH ACI SP-66, "ACI DETAIL MANUAL", WHICH INCLUDES ACI 315, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT".
3. PROVIDE REINFORCEMENT CONFORMING TO ASTM A615, GRADE 60, DEFORMED BARS. WELDED REINFORCING STEEL SHALL BE LOW-ALLOY ASTM A706.
4. PROVIDE WELDED WIRED FABRIC CONFORMING TO ASTM A1064.
5. WHERE A SLAB IS SLOPED (TOP AND/OR BOTTOM), PROVIDE SLOPED REINFORCING STEEL PARALLEL TO THE CONCRETE SURFACE.
6. DETAIL ALL SPLICES FOR REINFORCING STEEL BARS NOT DIMENSIONED ON THE DRAWINGS AS TABULATED IN THE LAP SPLICE AND HOOK DEVELOPMENT SCHEDULE ON DRAWING S-3001.
7. ALL REINFORCEMENT AT CORNERS OR JUNCTIONS OF WALLS, CURBS AND/OR SLABS SHALL BE CONTINUOUS, LAPPED AS SPECIFIED BELOW, OR TERMINATED IN A STANDARD HOOK.
8. AT CONSTRUCTION JOINTS, COLUMNS, AND MASONARY GROUT LIFTS, REINFORCEMENT SHALL BE DOWELED. DOWELS SHALL NOT BE WET STABBED INTO FRESHLY PLACED CONCRETE OR GROUT.
9. PROVIDE ADDITIONAL REINFORCEMENT AT OPENINGS AND PIPE PENETRATIONS PER DETAIL 2, DRAWING S-3001.
10. SUBMIT REINFORCING STEEL DETAILS, AS SHOP DRAWINGS TO ENGINEER AND RECEIVE APPROVAL BEFORE PROCEEDING WITH FABRICATION.
11. SUBMIT MANUFACTURER'S DATA ON ALL COUPLERS, MECHANICAL SPLICES, REBAR POSITIONERS, CHAIRS, AND OTHER REINFORCEMENT ACCESSORIES IF USED FOR APPROVAL PRIOR TO PLACEMENT.

F. MASONRY

1. CONSTRUCT MASONRY IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI-530/ ASCE 5/ TMS 402, (IBC 2018) "BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES".
2. PROVIDE HOLLOW LIGHTWEIGHT LOAD-BEARING CONCRETE MASONRY UNITS MEETING THE REQUIREMENTS OF ASTM C90, WITH A MINIMUM NET AREA COMPRESSIVE STRENGTH (F'_m) OF 2,000 PSI AT 28 DAYS.
3. PROVIDE MORTAR CONFORMING TO THE REQUIREMENTS OF ASTM C270, TYPE S. CEMENT USED FOR MORTAR SHALL BE PORTLAND CEMENT.
4. PROVIDE GROUT CONFORMING TO THE REQUIREMENTS OF ASTM C476 COARSE GROUT, WITH A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI AT 28 DAYS.
5. PROVIDE REINFORCING BARS CONFORMING TO ASTM A 615, GRADE 60.
6. IN ADDITION TO THE MASONRY WALL REINFORCEMENT SHOWN ON THE DRAWINGS:
    - A. #6 VERTICAL REINFORCEMENT SHALL BE PROVIDED AT CORNERS, WITHIN 16 INCHES OF EACH SIDE OF OPENINGS, WITHIN 8 INCHES OF EACH SIDE OF MOVEMENT JOINTS AND WITHIN 8 INCHES OF THE ENDS OF THE WALLS.
7. LAP SPLICE FOR #6 BAR IN CMU SHALL BE 38" MINIMUM. LEGS FOR #6 BAR STANDARD HOOK SHALL BE 9" MINIMUM.
8. PROVIDE DOWEL AT BOTTOM OF CMU MATCHING SIZE AND SPACING AT WALL REINFORCING. LAP DOWEL BARS WITH VERTICAL BARS AND PROVIDE DOWEL STANDARD HOOK INTO SUPPORTING CONCRETE BELOW.

G. STRUCTURAL STEEL

1. STEEL CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS CONTAINED IN THE AISC STEEL CONSTRUCTION MANUAL. BOLTING SHALL CONFORM TO THE AISC SPECIFICATION FOR BOLTING USING A325 BOLTS. WELDING SHALL CONFORM TO AWS STRUCTURAL WELDING CODE, D1.1.
2. UNLESS OTHERWISE SPECIFIED, ALL STEEL SHALL BE STAINLESS STEEL PER ASTM A240 OR A276 TYPE 316L. WHERE CARBON STEEL IS SPECIFIED IT SHALL CONFORM TO:
    - A. SHAPES, PLATES, & BARS ASTM A36
    - B. WIDE FLANGES AND WT ASTM A992
    - C. PIPE ASTM A53, GRADE B
    - D. STRUCTURAL TUBING ASTM A500, GRADE B
    - E. ANCHOR BOLTS ASTM A307, 3/4" DIA. MINIMUM
    - F. BOLTS ASTM F3125, GRADE A325, GALV, 3/4" DIA. MINIMUM
    - G. WELDING E70XX, 3/16" MINIMUM
3. WHERE SIZE AND NUMBER OF BOLTS ARE NOT SHOWN ON THE DRAWINGS, ALL CONNECTIONS SHALL DEVELOP THE CAPACITY EQUIVALENT TO THE MAXIMUM UNIFORM LOAD IN BENDING FOR A BEAM OR GIRDER OF THE SAME SPAN.
4. HARDENED, HEAVY-DUTY WASHERS OR PLATE WASHERS SHALL BE USED AT ALL OVERSIZED OR SLOTTED HOLES. WASHERS SHALL NOT BE USED AT STANDARD HOLES, UNLESS PREVIOUSLY APPROVED BY THE ENGINEER.
5. ALL WELDS SHALL BE SLAGGED AND SHALL REMAIN UNPAINTED UNTIL INSPECTION HAS BEEN COMPLETED AND APPROVED.
6. WELDING SHALL BE IN ACCORDANCE WITH PRE-QUALIFIED PROCEDURES, BY WELDERS CERTIFIED FOR THE MATERIAL, WELD, POSITION, AND PROCEDURES EMPLOYED.
7. TUBE WELDING OF T-, Y-, AND K- CONNECTIONS (DESIGNATED "TUBE") SHALL BE PER AWS D1.1, FIGURE 3.4, 3.5, OR 3.6, AS APPLICABLE.
8. MILL BOTTOM OF ALL COLUMNS AND FINISH TOP OF ALL BASE PLATES IN ACCORDANCE WITH AISC SPECIFICATIONS. WELD BASE PLATES TO BOTTOM OF COLUMNS.
9. OTHER WELDING SHALL BE PER AWS D1.1, FIGURE 3.3, OR AWS D1.6, FOR STAINLESS STEEL. EACH WELD SHALL BE FULLY DETAILED ON SHOP DRAWINGS PER AWS A2.4.
10. FIELD WELDING SHALL NOT BE PERFORMED UNLESS SPECIFICALLY SHOWN AS SUCH IN THESE DRAWINGS, OR ON APPROVED SUBMITTALS.
11. STEEL ENCASED IN CONCRETE SHALL NOT BE PAINTED, AND SHALL, AT TIME OF CONCRETE PLACEMENT, BE CLEAN AND FREE OF DELETERIOUS SUBSTANCES.
12. SUBMIT SHOP DRAWINGS, FOR APPROVAL, PRIOR TO FABRICATION.
13. IF FABRICATION, MEASUREMENT, OR INSTALLATION ERRORS NECESSITATE FIELD MODIFICATION OF STRUCTURAL STEEL, THE ENGINEER SHALL BE CONSULTED PRIOR TO THE MODIFICATION, AND HIS/HER INSTRUCTIONS SHALL BE FOLLOWED. THIS SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.

H. MECHANICAL/ELECTRICAL SUPPORT

1. EQUIPMENT, PIPE, CONDUIT, AND SIMILAR ITEMS SHALL BE SUPPORTED IN ACCORDANCE WITH THE MECHANICAL/ELECTRICAL SPECIFICATIONS AND DRAWINGS AND THE ADDITIONAL REQUIREMENTS IN THE STRUCTURAL DRAWINGS AND SPECIFICATIONS.
2. ALL EQUIPMENT, PIPES, CONDUITS, AND CABLE TRAYS SHALL BE ANCHORED AND/OR BRACED PER SMACNA SEISMIC RESTRAINT MANUAL.

I. COLD-FORMED STEEL

1. COLD-FORMED STEEL DESIGN AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE (AISI) "COLD-FORMED STEEL DESIGN MANUAL", 2008 EDITION, AND THE NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, 2007 EDITION.
2. ALL MATERIAL 18 GAGE OR LESS IN THICKNESS SHALL HAVE A MINIMUM YIELD STRENGTH OF 33 KSI.
3. ALL MATERIAL 16 GAGE OR GREATER IN THICKNESS SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KSI.
4. ALL COLD-FORMED STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A924.
5. ALL CONNECTION SCREWS SHALL BE ZINC COATED.
6. WELDING SHALL BE IN ACCORDANCE WITH AWS D1.3, "STRUCTURAL WELDING CODE-SHEET STEEL".
7. SAW CUT STUDS AND JOISTS SQUARE AND SET WITH FIRM BEARING AGAINST THE CONNECTING MEMBER.
8. THE CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND GUYING OF COLD-FORMED STEEL FRAMING TO PROVIDE FOR THE SAFETY OF THE STRUCTURE AND WORK PERSONNEL. BRACING SHALL REMAIN UNTIL NO LONGER REQUIRED FOR SAFE SUPPORT OF FRAMING.
9. FIELD MODIFICATIONS OF COLD-FORMED STEEL SYSTEMS SHALL NOT BE ALLOWED WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER OF RECORD.
10. MAINTAIN ¾" MINIMUM DISTANCE BETWEEN CENTERS OF CONNECTION SCREWS AND ¾" MINIMUM DISTANCE FROM THE CENTER OF SCREW TO EDGE OF CONNECTED PART. INSTALL FASTENERS FROM THINNER THROUGH THICKER MATERIAL.
11. SUBMIT SHOP DRAWINGS TO THE DESIGN PROFESSIONAL FOR APPROVAL INDICATING ALL COLD-FORMED STEEL MEMBERS, CONNECTIONS, FASTENERS, OPENINGS, AND OTHER COLD-FORMED STEEL RELATED ITEMS.
12. STUD MATERIAL INDICATED ON THE DRAWINGS SHALL HAVE A MINIMUM OF 1 5/8" FLANGES AND ½" STIFFENING RETURN LIPS. TRACK MATERIAL SHALL HAVE A MINIMUM OF 1 ¼" FLANGES (NO STIFFENING RETURN LIP).
13. MECHANICAL BRIDGING AT INTERVALS NOT EXCEEDING 4'-0" ON CENTER SHALL BRACE ALL LOAD-BEARING AND CURTAIN-TYPE COLD-FORMED STEEL WALLS. BRIDGING SHALL BE IN PLACE PRIOR TO PLACING ANY LOADS ON THE STUD WALL.

J. FASTENERS

1. IN WET OR CORROSIVE AREAS, AND FOR ALL FRP CONSTRUCTION, FASTENERS SHALL BE TYPE 316 STAINLESS STEEL PER ASTM F593. IN OTHER LOCATIONS FASTENERS SHALL BE PLATED OR GALVANIZED STEEL AS NOTED BELOW.
2. ANCHOR BOLTS SHALL BE HEADED BOLTS, A307 GALVANIZED, UNLESS OTHERWISE NOTED. ANCHOR BOLTS SHALL BE INSTALLED WITH LEVELING NUTS AND WITH TYPE A PLAIN WASHERS OR 3" x 3" x 1/4" PLATE WASHERS. POST-CONSTRUCTION ANCHORS SHALL NOT BE SUBSTITUTED FOR CAST-IN ANCHOR BOLTS, UNLESS PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.
3. ADHESIVE FOR ADHESIVE ANCHORS (EPOXY ANCHORS) AND EPOXY DOWELS SHALL BE HILTI HIT RE-500, OR APPROVED EQUAL. ANCHOR MATERIAL SHALL BE GALVANIZED STEEL UNLESS OTHERWISE NOTED. HOLES IN CONCRETE AND MASONRY SHALL BE 1/16"-1/8" LARGER THAN THE ANCHOR/BAR DIAMETER. UNLESS OTHERWISE NOTED, EMBEDMENT SHALL BE 12 TIMES THE ANCHOR DIAMETER, OR FOR REINFORCING, 20 TIMES THE DIAMETER. HOLES IN METAL OR PLASTIC PARTS SHALL BE OVERSIZED, PER AISC TABLE J3.1.
4. WEDGE ANCHORS SHALL BE HILTI KWIK BOLT TZ, HILTI HIT-HY, OR APPROVED EQUAL. MATERIALS SHALL BE GALVANIZED STEEL, UNLESS OTHERWISE NOTED. UNLESS OTHERWISE NOTED, DEPTH OF HOLE SHALL BE 8 TIMES THE ANCHOR DIAMETER (EMBEDMENT SHALL BE 7 TIMES THE ANCHOR DIAMETER). WEDGE ANCHORS SHALL NOT BE SUBSTITUTED FOR ADHESIVE ANCHORS UNLESS PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.
5. POST-INSTALLED ANCHORS SHALL NOT BE USED IN OVERHEAD APPLICATIONS, NOR IN ANY APPLICATION WHERE RESISTANCE TO GRAVITY LOADS IS PRIMARILY IN TENSION ON THE ANCHOR. IN THESE APPLICATIONS, CAST-IN EMBEDMENTS OR ANCHORS, OR THROUGH-BOLTING SHALL BE USED.
6. WEDGE ANCHORS OR OTHER FRICTION ANCHORS SHALL NOT BE USED IN SUBMERGED APPLICATIONS OR AREAS SUBJECT TO ANY CHEMICAL INUNDATION OR VIBRATION. IN THESE APPLICATIONS, ONLY CAST-IN-PLACE OR ADHESIVE ANCHORS MAY BE USED.
7. POST-INSTALLED ANCHORS GREATER THAN 3/8" DIAMETER ARE SUBJECT TO SPECIAL INSPECTION. DRILLING FOR SUCH ANCHORS SHALL BE PERPENDICULAR TO THE CONCRETE OR MASONRY SURFACE, WITHIN ±5°.
8. THE FOLLOWING TYPES OF ANCHORS ARE NOT ACCEPTABLE IN ANY APPLICATION UNLESS SPECIFICALLY SHOWN ON THESE DRAWINGS: POWDER-ACTUATED FASTENERS, TOGGLE BOLTS, PLASTIC OR LEAD EXPANSION SHIELDS, "TAP-CON" SCREWS AND SIMILAR ANCHORS, POLYESTER RESIN (CAPSULE) ANCHORS.
9. BOLTS FOR STEEL SHALL BE ASTM F3125, GRADE A325 N, GALVANIZED. BOLTS FOR ALUMINUM SHALL BE A307 GALVANIZED. BOLTS FOR STAINLESS STEEL OR FIBERGLASS-REINFORCED PLASTIC (FRP) SHALL BE TYPE 316 STAINLESS STEEL. HOLES FOR BOLTS SHALL BE OVERSIZED HOLES PER ASIC TABLE J3.1, UON.
10. WASHERS, TYPE A SHALL BE PROVIDED AT ALL OVERSIZED AND SLOTTED HOLES.
11. SHEET METAL SCREWS SHALL BE GALVANIZED OR STAINLESS STEEL, SELF-DRILLING TYPE. SCREWS FOR ROOFING AND EXTERIOR CLADDING SHALL BE PROVIDED WITH AN INTEGRAL NEOPRENE WASHER.
12. ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL OF THEIR ANCHORING PRODUCTS SPECIFIED TO PERSONNEL WHO WILL INSTALL THE CONCRETE ANCHORS PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS. ALTERNATIVELY, PROVIDE CERTIFICATION TO THE ENGINEER CERTIFYING THAT PERSONNEL WHO INSTALL CONCRETE ANCHORS HAVE BEEN TRAINED. THE STRUCTURAL ENGINEER OF RECORD MUST RECEIVE DOCUMENTED CONFIRMATION THAT ALL OF THE CONTRACTOR'S PERSONNEL WHO INSTALL ANCHORS ARE TRAINED PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.
13. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
14. EXISTING REINFORCING BARS IN THE CONCRETE STRUCTURE MAY CONFLICT WITH SPECIFIC ANCHOR LOCATIONS. UNLESS NOTED ON THE DRAWINGS THAT THE BARS CAN BE CUT, THE CONTRACTOR SHALL REVIEW THE EXISTING STRUCTURAL DRAWINGS AND SHALL UNDERTAKE TO LOCATE THE POSITION OF THE REINFORCING BARS AT THE LOCATIONS OF THE CONCRETE ANCHORS, BY HILTI FERROSCAN, GPR, X-RAY, CHIPPING OR OTHER MEANS. IF A CONFLICT BETWEEN CONCRETE ANCHORS AND EXISTING REINFORCING BARS IS DISCOVERED, NOTIFY THE ENGINEER.

K. TESTING AND INSPECTION

1. BUILDING INSPECTION PER THE BUILDING CODE SHALL BE PERFORMED BY THE JURISDICTION.
2. SPECIAL INSPECTION AND TESTING SHALL BE FURNISHED BY OWNER AND SHALL BE PERFORMED PER INSTRUCTIONS IN SHEET SXXX. THE CONTRACTOR SHALL PROVIDE 24 HOURS' PRIOR NOTICE AND SAFE ACCESS FOR THESE INSPECTIONS AND SHALL ENSURE THAT WORK IS READY FOR INSPECTION AS SCHEDULED.
3. PERIODIC (HOLD-POINT) INSPECTION IS REQUIRED FOR THE FOLLOWING WORK:
    - A. COMPLETION OF SUBGRADE PREPARATION, PRIOR TO REBAR INSTALLATION, FOR FOOTINGS & MATS.
    - B. INSTALLATION OF REBAR AND EMBEDS FOR CONCRETE FOOTINGS, WALLS, ELEVATED SLABS, AND FOUNDATION SLABS. PERFORMED AT LEAST TWO HOURS BEFORE CONCRETE PLACEMENT.
    - C. WELDING FOR ALL FILLET WELDS 5/16" AND SMALLER AND PARTIAL-PENETRATION GROOVE WELDS, PERFORMED AT COMPLETION OF ALL WELDING, AFTER WELDS ARE SLAGGED, AND BEFORE PAINTING OR COVERING WORK.
    - D. BEARING-TYPE CONNECTIONS USING A325, A490, GRADE 8, OR OTHER HIGH-STRENGTH BOLTS, AND SLIP-CRITICAL CONNECTIONS USING THESE BOLTS AND LOAD-INDICATING DEVICES; PERFORMED AFTER ALL BOLTING IS COMPLETE, AND BEFORE PAINTING OR COVERING WORK.
    - E. ANY WEDGE ANCHOR EXCEEDING 3/8" IN DIAMETER, PERFORMED AFTER ALL SUCH ANCHORS FOR A GIVEN STRUCTURE ARE INSTALLED.
4. CONTINUOUS SPECIAL INSPECTION IS REQUIRED DURING ALL ASPECTS OF THE FOLLOWING WORK:
    - A. DURING CONCRETE PLACEMENT FOR CONCRETE FOOTINGS, WALLS, ELEVATED SLABS, AND FOUNDATION SLABS.
    - B. DURING WELDING FOR ALL FILLET WELDS LARGER THAN 5/16" AND FOR ALL COMPLETE-PENETRATION GROOVE WELDING.
    - C. SLIP-CRITICAL CONNECTIONS USING A325, A490, GRADE 8, OR OTHER HIGH-STRENGTH BOLTS, AND NOT UTILIZING LOAD-INDICATING DEVICES.
    - D. AT FIRST USE OF WEDGE ANCHORS AND ALL INSTALLATIONS OF ADHESIVE ANCHORS AND EPOXY DOWELS.
5. WELDS NEED NOT HAVE SPECIAL INSPECTION WHEN THE WELDING IS DONE IN AN APPROVED FABRICATOR'S SHOP. HOWEVER, THE APPROVED FABRICATOR MUST SUBMIT A CERTIFICATE OF COMPLIANCE IN ACCORDANCE WITH IBC SECTION 1704.2.2. NO FABRICATION WORK SHALL BE PERFORMED OFF OF THE PROJECT SITE, EXCEPT IN AN APPROVED FABRICATOR'S SHOP.
6. HYDRAULIC TESTING FOR CONCRETE WATER RETAINING STRUCTURES (INCLUDING CHEMICAL CONTAINMENT STRUCTURES) SHALL BE PERFORMED PER ACI "TIGHTNESS TESTING OF ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES" (ACI 350.1-10). THE TYPE OF CONTAINMENT STRUCTURE CONSIDERED FOR THE TESTING WILL BE "CONCRETE-PAVED RESERVOIRS AND CHANNELS" AND THE DEFAULT HYDROSTATIC TEST QUANTITATIVE CRITERION WILL BE 0.100% OF VOLUME LOSS PER DAY. THE INSPECTOR SHALL WITNESS ALL SUCH TESTING AND APPROVE THE WATERTIGHTNESS OF THE TANK PRIOR TO BACKFILLING.

L. LOADING CRITERIA

1. DEAD LOADS:
ACTUAL LOADS. IN THE ABSENCE OF DEFINITE INFORMATION, THE VALUES FOR MATERIALS PROVIDED IN ASCE 7-10, TABLE C3-1 SHALL BE USED. LOADS FOR EQUIPMENT PROVIDED BY THE CONTRACTOR SHALL BE THE ACTUAL LOADS, AS PROVIDED BY THE MANUFACTURER OF THE EQUIPMENT.
2. LIVE LOADS:

ADMINISTRATIVE ROOMS	125 PSF,
PROCESS FLOOR	250 PSF,
ELEVATED ACCESS PLATFORMS & WALKWAYS	125 PSF,
ELECTRICAL ROOM AREAS	200 PSF,
ROOF	20 PSF OR 500 LBS CONCENTRATED
ALL OTHER AREAS	150 PSF

3. WIND LOADING:

RISK CATEGORY:	III
BASIC WIND SPEED (3-SECOND GUST):	108 MPH,
EXPOSURE:	C
MINIMUM DESIGN PRESSURE:	8 PSF

4. SEISMIC LOADING:

RISK CATEGORY:	III
SEISMIC IMPORTANCE FACTOR:	1.25
SITE CLASS:	D
DESIGN SPECTRAL RESPONSE ACC.:	S_{DS}=0.242g, S_{D1}=0.099g
SEISMIC DESIGN CATEGORY:	D
ANALYSIS PROCEDURE:	EQUIVALENT LATERAL FORCE

M. DEFERRED SUBMITTAL

1. THESE ITEMS SHALL BE DESIGNED AND MANUFACTURED BY AN APPROVED FABRICATOR. DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH THE CODES AND STANDARDS CITED IN THESE GENERAL STRUCTURAL NOTES, DRAWINGS, AND/OR SPECIFICATIONS. CONTRACTOR SHALL SUBMIT CALCULATIONS, DRAWINGS, AND MANUFACTURER'S DATA SUFFICIENT TO DEMONSTRATE COMPLIANCE TO THE ENGINEER FOR REVIEW.
2. CALCULATIONS AND DRAWINGS SHALL BE PREPARED AND SEALED BY AN ENGINEER REGISTERED IN THE STATE OF NEW MEXICO.

N. CODES AND STANDARDS

1. DESIGN OF STRUCTURAL ENGINEERING SYSTEMS FOR THE PROJECT SHALL BE IN ACCORDANCE WITH THE LAWS AND REGULATIONS OF THE STATE OF ARIZONA, THE NAVAJO COUNTY, AND INDUSTRY STANDARDS. THE CURRENT ISSUE OR EDITION OF THE DOCUMENTS AT THE TIME OF DESIGN COMMENCEMENT WILL APPLY, UNLESS OTHERWISE NOTED. IN CASES WHERE CONFLICTS BETWEEN THE CITED DOCUMENTS EXIST, REQUIREMENTS OF THE MORE CONSERVATIVE DOCUMENT WILL BE USED. THE STRENGTH, SERVICEABILITY, AND QUALITY FOR MATERIALS AND DESIGN PROCEDURES WILL MEET THE REQUIREMENTS OF THE 2018 INTERNATIONAL BUILDING CODE (IBC) AND ITS REFERENCED STANDARDS.
2. THE EDITIONS SHOWN BELOW ARE THE STANDARDS REFERENCED BY THE 2018 EDITION OF THE IBC AND OTHER CORRESPONDING STANDARDS:
    - A. THE INTERNATIONAL BUILDING CODE, 2018 EDITION (IBC), INCLUDING OTHER CODES & STANDARDS REFERENCED THEREIN, PROVIDES MINIMUM REQUIREMENTS. IN ADDITION, OTHER CODES AND STANDARDS REFERENCED IN THESE DRAWINGS APPLY TO THE SPECIFIED PARTS OF THE WORK.
    - B. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE), ASCE 7-16 (2016), "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".
    - C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), AISC 325-17 (2017), "STEEL CONSTRUCTION MANUAL, 15TH EDITION".
    - D. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), AISC 341-16 (2016), "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS".
    - E. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), AISC 360-16 (2016), "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".
    - F. AMERICAN CONCRETE INSTITUTE (ACI), ACI 318-14 (2014), "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE".
    - G. AMERICAN CONCRETE INSTITUTE (ACI), ACI 350-06 (2006), "BUILDING CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES".
    - H. AMERICAN CONCRETE INSTITUTE (ACI), ACI 530-11 (2013), "BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES".
    - I. AMERICAN CONCRETE INSTITUTE (ACI), ACI 301-10 (2010), "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
    - J. AMERICAN CONCRETE INSTITUTE (ACI), ACI 347-04 (2004), "GUIDE TO FORMWORK FOR CONCRETE".
    - K. AMERICAN CONCRETE INSTITUTE (ACI), ACI SP-66 (2004), "ACI DETAIL MANUAL".
    - L. AMERICAN CONCRETE INSTITUTE (ACI), ACI 350.1-10 (2011), "TIGHTNESS TESTING OF ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES".
    - M. AMERICAN CONCRETE INSTITUTE (ACI), ACI 350.3-06 (2006), "SEISMIC DESIGN OF LIQUID CONTAINING CONCRETE STRUCTURES".
    - N. AMERICAN CONCRETE INSTITUTE (ACI), ACI 543R-12 (2012), "GUIDE TO DESIGN, MANUFACTURE, AND INSTALLATION OF CONCRETE PILES".
    - O. ALUMINUM ASSOCIATION (AA), 2015, "ALUMINUM DESIGN MANUAL".
    - P. AMERICAN IRON AND STEEL INSTITUTE (AISI), AISI S100-16, "NORTH AMERICAN SPECIFICATION FOR DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS".
    - Q. AMERICAN IRON AND STEEL INSTITUTE (AISI), AISI S240-15, "NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL STRUCTURAL FRAMING".
    - R. AMERICAN IRON AND STEEL INSTITUTE (AISI), AISI S400-15, "NORTH AMERICAN STANDARD FOR SEISMIC DESIGN OF COLD-FORMED STEEL STRUCTURAL SYSTEMS".
    - S. NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM), MBG 531-09, "METAL BAR GRATING MANUAL".
    - T. AMERICAN WELDING SOCIETY (AWS), AWS D1.1:2020 (2020), "STRUCTURAL WELDING CODE-STEEL".
    - U. AMERICAN WELDING SOCIETY (AWS), AWS D1.3:2018 (2018), "STRUCTURAL WELDING CODE-SHEET STEEL".
    - V. AMERICAN WELDING SOCIETY (AWS), AWS D1.6:2017 (2017), "STRUCTURAL WELDING CODE -STAINLESS STEEL".
    - W. AMERICAN WELDING SOCIETY (AWS), AWS D2.4:2012 (2012), "STANDARD SYMBOLS FOR WELDING, BRAZING, AND NONDESTRUCTIVE EXAMINATION".
    - X. ANSI/AMERICAN WATER WORKS ASSOCIATION (AWWA) D100, "WELDED STEEL TANKS FOR WATER STORAGE"

ABBREVIATIONS

BLDG	BUILDING
CJ	CONTRACTION JOINT CONSTRUCTION JOINT
CLR	CLEAR
CNR	CORNER
CONT	CONTINUOUS
CTR	CENTER
do	DITTO
(E)	EXISTING
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
EQUIP	EQUIPMENT
EW	EACH WAY
FAB	FABRICATED, FABRICATOR
FB	FLAT BAR
FJ	FORMED JOINT
GL	GRID LINE
GB	GRADE BREAK
HP	HIGH POINT
H1E	(STD) HOOK ONE END
H2E	(STD) HOOK TWO ENDS
HCA	HEADED CONCRETE ANCHOR
HK, HKS	HOOK OR HOOKS
HORIZ	HORIZONTAL
IF	INSIDE FACE
LP	LOW POINT
LONG	LONGITUDINAL
MFR	MANUFACTURER
MJ	MECHANICAL JOINT
(N)	NEW
OC	ON CENTER
OF	OUTSIDE FACE
OH	OTHER HAND
PC	PIECE
PL	PLATE
SJ	SAWN JOINT
STD	STANDARD
T&B	TOP & BOTTOM
TOC	TOP OF CONCRETE (CURB)
TOG	TOP OF GRADE/GRATING
TOM	TOP OF MASONRY
TOS	TOP OF STEEL
TOW	TOP OF WALL
TRANSV.	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
U/S	UNDERSIDE OF STEEL
VERT	VERTICAL
WP	WORK POINT

wsp

4221 BALLOON PARK RD NE,
ALBUQUERQUE, NM 87109

SEISMIC REQUIREMENTS IN CONFORMITY TO: **CFR 1792**, HAVE BEEN IMPLEMENTED IN THE ENGINEERING AND DESIGN OF THE STRUCTURAL ELEMENTS SHOWN ON THIS DRAWING, AS WELL AS ON THE STRUCTURAL SYSTEM WHERE THEY BELONG.

Ivan G. Soto, P.E.
Structural Engineer
Arizona License 75678
Engineer of Record

75678
IVAN G. SOTO
Date Signed 11/08/2022

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No:
2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	IGS
DRAWN BY:	JRW
CHECKED BY:	IGS
PLOTTED DATE:	02SEP2022

SHEET TITLE:
STRUCTURAL
GENERAL NOTES

SHEET NUMBER:	REV. #
DWG- 10-GEN-S-0401	0

SHEET 35 OF 223

AISC 360-16: TABLE N5.4-1
INSPECTION TASK PRIOR TO WELDING

INSPECTION TASK PRIOR TO WELDING	QC	QC
WELDING QUALIFICATION RECORDS AND CONTINUITY RECORDS	P	O
WPS AVAILABLE	P	P
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVIALABLE	P	P
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O
WELDER IDENTIFICATION SYSTEM [a]	O	O
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY)		
• JOINT PREPARATION		
• DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL)	O	O
• CLEANLINESS (CONDITION OF STEEL SURFACES)		
• TACKING (TACK WELD QUALITY AND LOCATION)		
• BACKING TYPE AND FIT (IF APPLICABLE)		
FIT-UP OF CJP GROOVE WELDS OF HSS T-, Y- AND K-JOINTS WITHOUT BACKING		
JOINT PREPARATIONS	P	O
• DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE BEVEL)		
• CLEANLINESS (CONDITION OF STEEL SURFACES)		
• TACKING (TACK WELD QUALITY AND LOCATION)		
CONFIGURATION AND FINISH OF ACCESS HOLES	O	O
FIT-UP OF FILLET WELDS		
• DIMENSIONS (ALIGNMENT, GAPS AT ROOT)	O	O
• CLEANLINESS (CONDITION OF STEEL SURFACES)		
• TACKING (TACK WELD QUALITY AND LOCATION)		
CHECK WELDING EQUIPMENT	O	-

[a] THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE LOW STRESS TYPE .

AISC 360-16: TABLE N5.4-2
INSPECTION TASK DURING WELDING

INSPECTION TASK DURING WELDING	QC	QA
CONTROL AND HANDLING OF WELDING CONSUMABLES		
• PACKING	O	O
• EXPOSURE CONTROL		
NO WELDING OVER CRACKED TACK WELDS	O	O
ENVIRONMENTAL CONDITIONS	O	O
• WIND SPEED WITHIN LIMITS		
• PRECIPITATION AND TEMPERATURE		
WPS FOLLOWED		
• SETTINGS ON WELDING EQUIPMENT		
• TRAVEL SPEED		
• SELECTED WELDING MATERIALS		
• SHIELDED GAS TYPE/FLOW RATE	O	O
• PREHEAT APPLIED		
• INTERPASS TEMPERATURE MAINTAINED (MIN/MAX)		
• PROPER POSITION (F, V, H, OH)		
WELDING TECHNIQUES		
• INTER PASS AND FINAL CLEANING	O	O
• EACH PASS WITHIN PROFILE LIMITATIONS		
• EACH PASS MEETS QUALITY REQUIREMENTS		
PLACEMENT AND INSTALLATION OF STEEL HEADED STUDS	P	P

AISC 360-16: TABLE N5.4-3
INSPECTION TASK AFTER WELDING

INSPECTION TASK AFTER WELDING	QC	QA
WELDING CLEANED	O	O
SIZE, LENGTH AND LOCATION OF WELDS	P	P
WELDS MEET VISUAL ACCEPTANCE CRITERIA		
• CRACK PROHIBITION		
• WELD BASE METAL FUSION		
• CRATER CROSS SECTION	P	P
• WELD PROFILER		
• WELD SIZE		
• UNDERCUT		
• POROSITY		
ARC STRIKERS	P	P
k-AREA	P	P
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P
REPAIR ACTIVITIES	P	P
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P
WHEN WELDING OF DOUBLE PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PREFORMED IN THE k-AREA, VISUALLY INSPECT THE WEB k-AREA FOR CRACKS WITHIN 3 IN (75mm) OF THE WELD.		

AISC 360-16: TABLE N5.6-1
INSPECTION TASK PRIOR TO BOLTING

INSPECTION TASK PRIOR TO BOLTING	QC	QA
MANUFACTURER'S CERTIFICATION AVAILABLE FOR FASTENER MATERIALS	P	O
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O
CORRECT FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE,	O	O
BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE) CORRECT BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	O	O
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE LAYING SURFACE		
CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL	O	O
OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHOD USED	P	O
PROPER STORAGE PROVIDE BOLTS, NUTS WASHERS AND OTHER	O	O
FASTENER COMPONENTS		

AISC 360-16: TABLE N5.6-2
INSPECTION TASK DURING BOLTING

INSPECTION TASK DURING BOLTING	QC	QA
FASTENER ASSEMBLIES PLACED IN ALL HOLES AND WASHERS ARE	O	O
POSITIONED AS REQUIRED JOINT BROUGHT TO SNUG-TIGHT CONDITION		
PRIOR TO THE PRETENSIONING OPERATIONS	O	O
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH RCSC	O	O
SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM POST RIGID POINT TOWARD THE FREE EDGES		

AISC 360-16: TABLE N5.6-3 INSPECTION TASK
AFTER BOLTING INSPECTION TASK

AFTER BOLTING	QC	QA
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P	P

IBC 2018: TABLE 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

	TYPE	2018 CODE REFERENCE	REFERENCE STANDARDS	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1.	INSPECTION OF REINFORCEMENT INCLUDING PRESTRESSING TENDONS AND VERIFY PLACEMENT.	1908.4	ACI 318: CH. 20, 25.2 25.3, 26.6.1-26.6.3	-	X
2.	REINFORCING BAR WELDING: a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706 b. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"; AND c. INSPECT ALL OTHER WELDS.	-	AWS D1.4 ACI 318:26.6.4	- X	X X
3.	INSPECT ANCHORS CAST IN CONCRETE.	-	ACI 318: 17.8.2	-	X
4.	INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS. [b] a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINE ORIENTATIONS TO RESIST SUBSTAINED TENSION LOADS. b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4 (a)	-	ACI 318: 17.8.2.4 ACI 318: 17.8.2	X	 X
5.	VERIFY USE OF REQUIRED DESIGN MIX.	1908.4 1904.2 1908.2 1908.3	ACI 318: CH. 20 25.2 25.3, 26.6.1-26.6.3	-	X
6.	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGHT TESTS , PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	1908.10	ASTM C 172 ASTM C 31 ACI 318: 26.5, 26.12	X	-
7.	INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	1910.6 1910.7 1910.8	ACI 318: 26.5	-	X
8.	VERIFY MAINTANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	1910.9	ACI 318: 26.5.3-26.5.5	-	X
9.	INSPECT PRESTRESSED CONCRETE FOR: a. APPLICATION OF PRESTRESSING FORCES AND b. GROUTING OF BONDED PRESTRESSED TENDONS.	-	 ACI 318: 26.10	- -	X X
10.	INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	ACI 318: 26.9	-	X
11.	VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	ACI 318: 26.11.2	-	X
12.	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	ACI 318: 26.11.1.2(b)	-	X

FOR SI: 1 INCH = 25.4 mm

a. WHERE APPLICABLE, SEE SECTION 1702.12, SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE.
b. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR ISSUED BY AN APPROVED SOURGE IN ACCORDANCE WITH 17.8.2 IN ACI 318, OR OTHER QUALIFICATION PROCEEDURES. WHERE SPECIFIC REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO COMMENCEMENT OF WORK.

IBC 2018: TABLE 1705.6
ADDITIONAL REQUIRED VERIFICATION AND INSPECTION OF SOILS

	SYSTEM OR MATERIAL	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1.	VERIFY MATERIAL BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X
2.	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X
3.	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X
4.	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-
5.	PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X

GENERAL SHEET NOTES

1. THE STATE OF SPECIAL INSPECTION PLAN SHEET PROVIDES PROJECT AND BUILDING SPECIFIC COMPLIANCE WITH THE PROVISIONS OF THE INTERNATIONAL BUILDING CODE (IBC 2018) CHAPTER 17 SPECIAL INSPECTIONS.
2. THE SPECIAL INSPECTIONS OUTLINED ON THIS DRAWING ARE SEPARATE TO ANY ITEMS SPECIFIED TO BE INCLUDED BY SECTION 014000 QUALITY CONTROL.
3. REFER TO THE TABLES AND NOTES CONTAINED ON THIS DRAWING FOR BUILDING SPECIFIC SPECIAL INSPECTION TYPE AND FREQUENCIES.
4. PROVIDE AN APPROVED, ACCREDITED AND INDEPENDENT SPECIAL INSPECTOR AND TESTING AGENCY/LABORATORY FOR SPECIAL INSPECTIONS AND ASSOCIATED TESTING OF SHOP FABRICATION AND FIELD CONSTRUCTION. THE SPECIAL INSPECTOR AND TESTING AGENCY/LABORATORY MUST BE INDEPENDENT FROM THE CONTRACTOR QUALITY CONTROL PERSONNEL.
5. THE APPROVED, ACCREDITED AND INDEPENDENT SPECIAL INSPECTOR AND TESTING AGENCY/LABORATORY MUST INSPECT THE INDICATED WORK FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS AND SUBMIT RECORDS OF THE INSPECTION. ALL DISCREPANCIES MUST TO BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTING OFFICER AND CONTRACTOR FOR CORRECTION.

STRUCTURAL STEEL AND STEEL CONSTRUCTION INSPECTION NOTES

1. THE SPECIAL INSPECTION REQUIREMENTS FOR STRUCTURAL STEEL ARE TAKEN FROM AISC 360-16 CHAPTER N. COMPLY WITH AISC 360-16 CHAPTER N FOR ADDITIONAL MINIMUM QUALITY CONTROL AND QUALITY ASSURANCE REQUIREMENTS, INCLUDING BUT NOT LIMITED TO FABRICATOR AND ERECTOR QUALITY CONTROL PROGRAM, FABRICATOR AND ERECTOR DOCUMENTS, INSPECTION AND NONDESTRUCTIVE TESTING PERSONNEL, MINIMUM REQUIREMENTS FOR INSPECTION OF STRUCTURAL STEEL BUILDINGS AND SUBMITTAL REQUIREMENTS.
2. THE QUALITY CONTROL (QC) AS OUTLINED IN AISC 360-16 CHAPTER N MUST BE PROVIDED BY THE STRUCTURAL STEEL FABRICATOR AND ERECTOR. PROVIDE THE QUALITY ASSURANCE (QA) AS OUTLINED IN AISC 360-16 CHAPTER N.
3. THE SPECIAL INSPECTION REQUIREMENTS FOR STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL ARE IN ACCORDANCE WITH IBC 2018 TABLE 1705 2.2.
4. PROVIDE STRUCTURAL STEEL SPECIAL INSPECTION TASK IN ACCORDANCE WITH AISC 360-16 TABLE N5.4-1, TABLE N5.4-2, TABLE N5.4-3, TABLE N5.6-1, TABLE N5.6-2 TABLE N5.6-3 AND THE AISC 360-16.
5. PROVIDE STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL SPECIAL INSPECTION TASK SHALL BE IN ACCORDANCE WITH IBC 2018 1705.2.

CONCRETE SPECIAL INSPECTION NOTES

1. IN ACCORDANCE WITH IBC 2018 1705.3 SPECIAL INSPECTIONS ARE NOT REQUIRED FOR ISOLATED SPREAD FOOTINGS, CONTINUOUS CONCRETE FOOTINGS, CONCRETE FOUNDATION WALLS, CONCRETE SLABS ON GROUND, CONCRETE DRIVEWAYS OR CONCRETE SIDEWALKS ON GROUND.
2. PROVIDE SPECIAL INSPECTION TASK IN ACCORDANCE WITH IBC 2018 TABLE 1705.3 ON COMBINED FOUNDATIONS AND FOUNDATIONS WHERE STEEL BRACING CONNECTS TO FOUNDATION ELEMENTS.
3. PROVIDE CONTINUOUS SPECIAL INSPECTION DURING ATTACHMENT TO EXISTING STRUCTURAL ELEMENTS.
4. PROVIDE PERIODIC SPECIAL INSPECTION ON FRAMEWORK SHAPE, LOCATION AND DIMENSIONS FOR ANY FOUNDATIONS IN THE PROXIMITY OR INTERFACING WITH EXISTING FOUNDATION ELEMENTS.
5. PROVIDE CONTINUOUS SPECIAL INSPECTION FOR GROUTING OF ALL BASE PLATES.
6. PROVIDE CONTINUOUS SPECIAL INSPECTION FOR ALL ADHESIVE ANCHORS.

SOIL SPECIAL INSPECTION NOTES

1. SPECIAL INSPECTION OF SOIL IS IN ACCORDANCE WITH IBC 2018 TABLE 1705.6.
2. PROVIDE SPECIAL INSPECTION TASK IN ACCORDANCE WITH IBC 2018 TABLE 1705.6.

LEGEND

- = INSPECTION IS NOT REQUIRED.

X = INSPECTION IS REQUIRED.

O = OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATION NEED NOT BE DELAYED PENDING THESE INSPECTION.

P = PERFORM THESE TASK FOR EACH WELD JOINT OR MEMBER.

wsp

4221 BALLOON PARK RD NE,
ALBUQUERQUE, NM 87109

SEISMIC REQUIREMENTS IN CONFORMITY TO: **CFR 1792**, HAVE BEEN IMPLEMENTED IN THE ENGINEERING AND DESIGN OF THE STRUCTURAL ELEMENTS SHOWN ON THIS DRAWING, AS WELL AS ON THE STRUCTURAL SYSTEM WHERE THEY BELONG.

Ivan G. Soto, P.E.
Structural Engineer
Arizona License 75678
Engineer of Record

Registered Professional Engineer (Civil)
CERTIFICATE NO.
75678
IVAN G. SOTO
Date Signed
11/08/2022
ARIZONA, U.S.A.

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No:
2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	IGS
DRAWN BY:	JRW
CHECKED BY:	IGS
PLOTTED DATE:	02SEP2022

SHEET TITLE:

STRUCTURAL

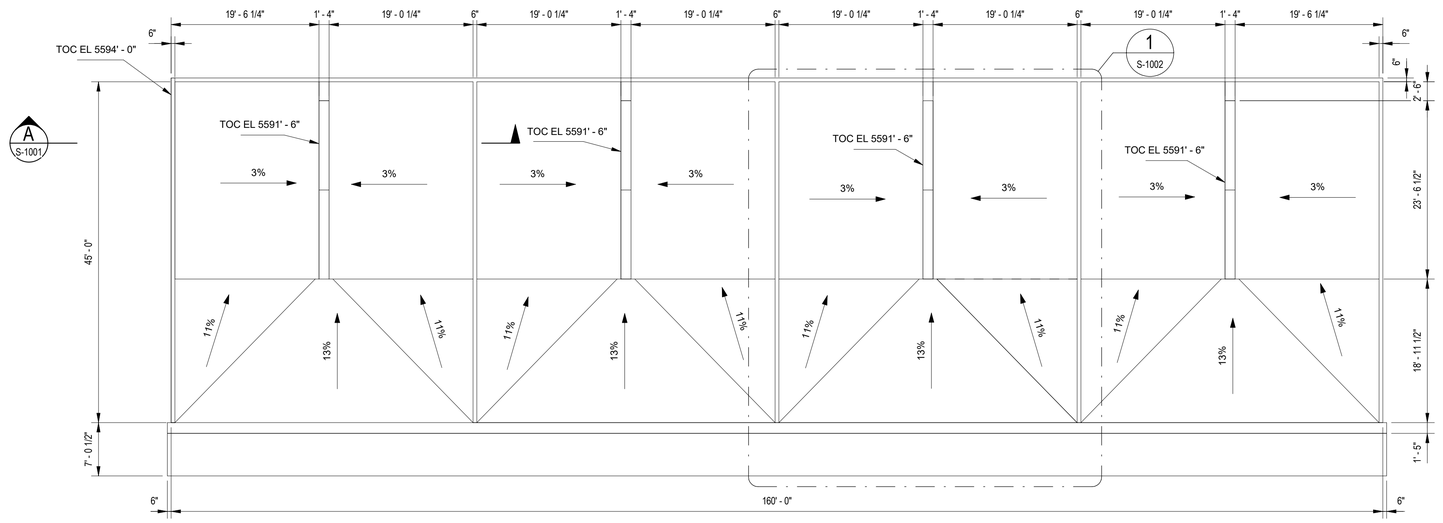
STATEMENT OF SPECIAL INSPECTION

SHEET NUMBER:	REV. #
DWG- 10-GEN-S-0402	0

SHEET 36 OF 223

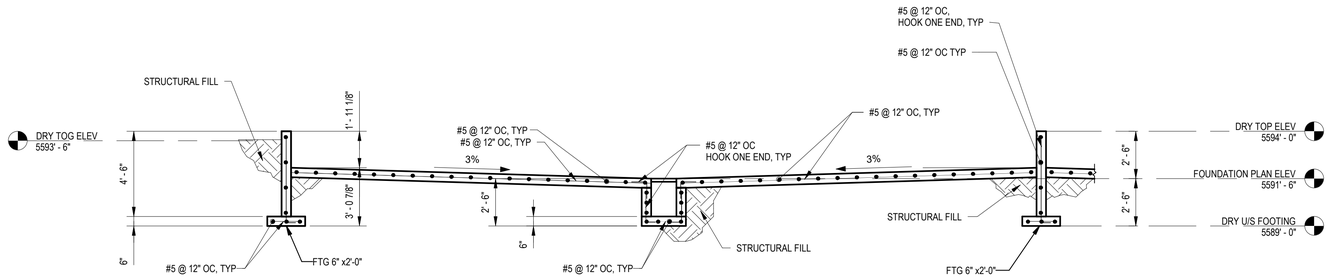
GENERAL NOTES:

1. FOR GENERAL NOTES SEE DRAWINGS DWG-10-GEN-S-0401 AND 0402.
2. FOR STANDARD CONCRETE DETAILS SEE DRAWINGS DWG-10-GEN-S-3001, S-3002.
3. FOR FILL REQUIREMENTS SEE SPECIFICATION SECTION 312300.



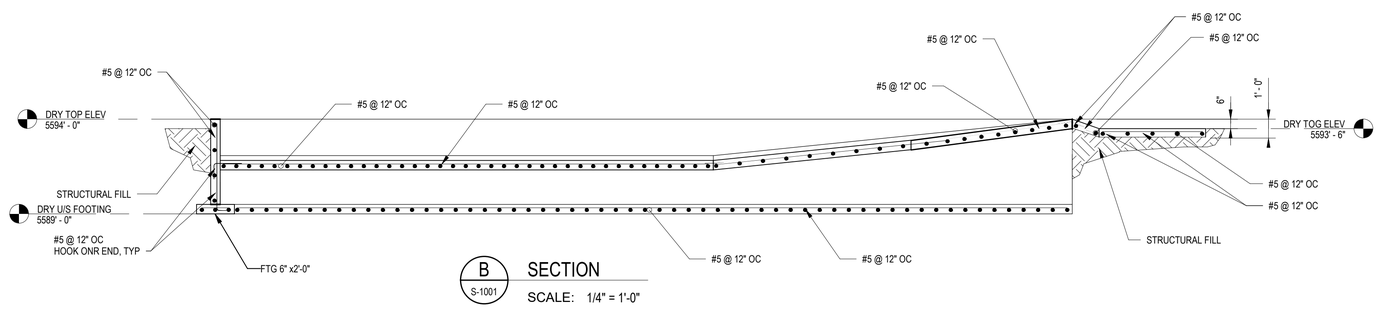
1 S-1001 SLUDGE DRYING BEDS OVERALL PLAN

SCALE: 1" = 10'-0" (0, 5', 10', 20')



A S-1001 SECTION

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



B S-1001 SECTION

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

WSP

4221 BALLOON PARK RD NE,
ALBUQUERQUE, NM 87109

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Ivan G. Soto, P.E.
Structural Engineer
Arizona License 75678
Engineer of Record

Registered Professional Engineer (Civil)
CERTIFICATE NO.
75678
IVAN G. SOTO
Date Signed
12/19/2022
ARIZONA, U.S.A.

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No:
2151700032

REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	IGS
DRAWN BY:	JRW
CHECKED BY:	IGS
PLOTTED DATE:	04NOV2022

SHEET TITLE:

STRUCTURAL

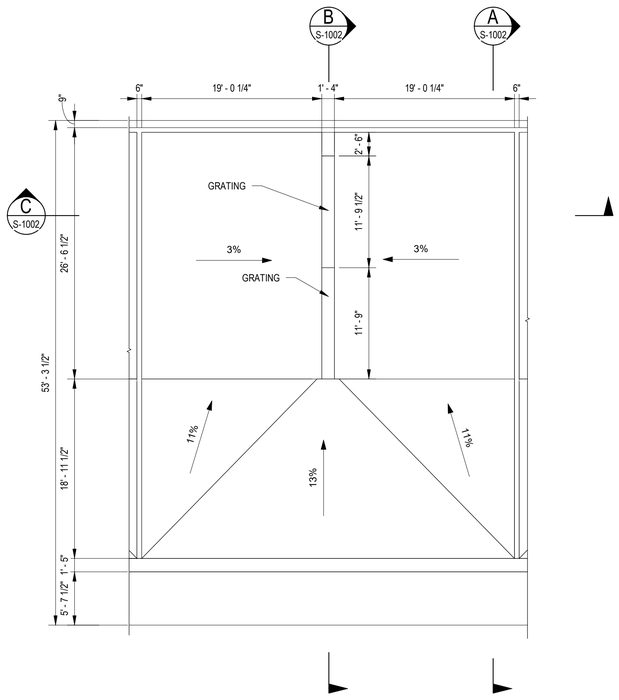
SLUDGE DRYING BEDS OVERALL PLAN AND SECTIONS

SHEET NUMBER:	REV. #
DWG- 10-DRY-S-1001	

SHEET 70 OF 223

GENERAL NOTES:

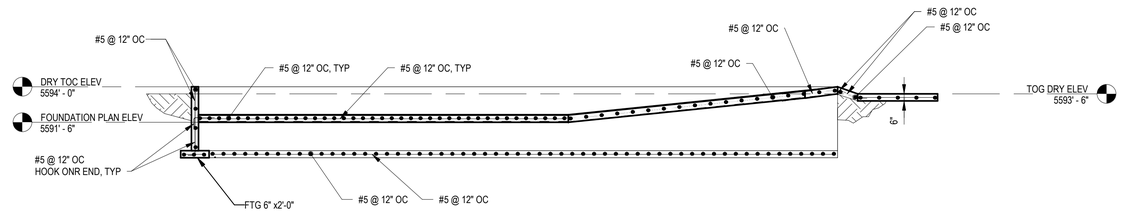
1. FOR GENERAL NOTES SEE DRAWINGS DWG-10-GEN-S-0401 AND 0402.
2. FOR STANDARD CONCRETE DETAILS SEE DRAWINGS DWG-10-GEN-S-3001, S-3002.
3. FOR FILL REQUIREMENTS SEE SPECIFICATION SECTION 312300.



1 S-1001 ENLARGED DRYING BED PLAN

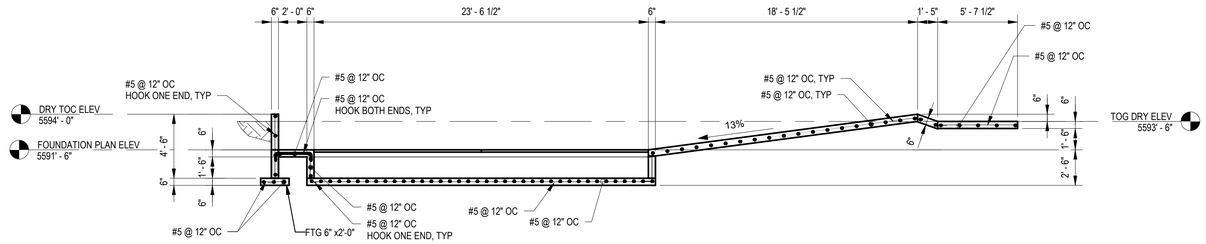
SCALE: 1/8" = 1'-0"

0 4' 8' 16'



A S-1002 SECTION

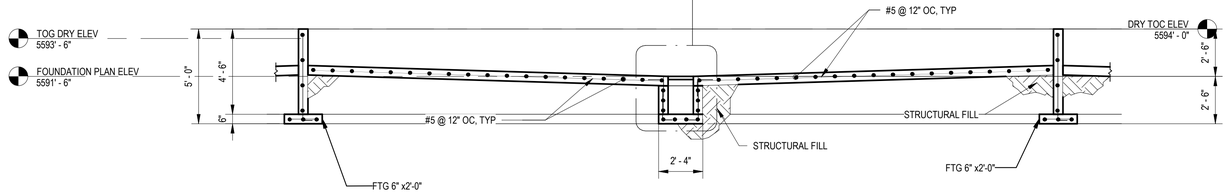
SCALE: 3/16" = 1'-0"



B S-1002 SECTION

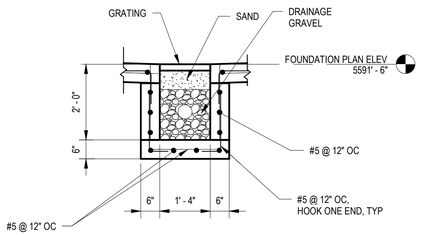
SCALE: 3/16" = 1'-0"

2 S-1002



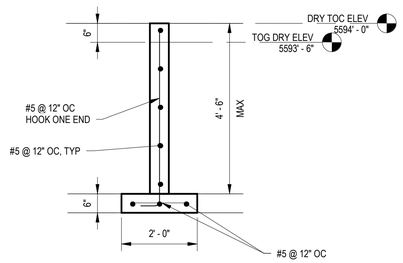
C S-1002 SECTION

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



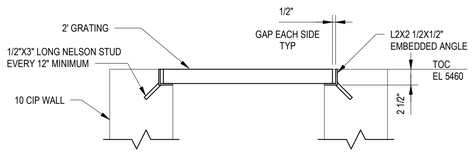
2 S-1002 DETAIL

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



TYPICAL FOOTING

1/2" = 1'-0"



TYPICAL GRATING SUPPORT

1" = 1'-0"

wsp

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ALBUQUERQUE, NM 87109

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Registered Professional Engineer (Civil)
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12/19/2022
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PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No:
2151700032

REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	IGS
DRAWN BY:	JRW
CHECKED BY:	IGS
PLOTTED DATE:	04NOV2022

SHEET TITLE:

STRUCTURAL

SLUDGE DRYING BEDS PLAN AND SECTIONS

SHEET NUMBER:	REV. #
DWG- 10-DRY-S-1002	0

SHEET 71 OF 223

ELECTRICAL SYMBOLS LEGEND

SYMBOL	DESCRIPTION
	EXISTING
X X X	REMOVE
	NEW WORK
	HIDDEN OR BURIED
	HOMERUN CONDUIT
	GROUND
	PHASE
	SWITCHED
	NEUTRAL
	ISOLATED GROUND
	FLEXIBLE CONDUIT
	CONDUIT TURNING DOWN
	CONDUIT TURNING UP
	CONDUIT UP AND DOWN
	CONDUIT SEAL
	CONDUIT CAP
480V 600A	BUSWAY WITH DESCRIPTION
G	GROUNDING CONDUCTOR
6 X 24	CABLE TRAY WITH DESCRIPTION
J	CEILING JUNCTION BOX
J	WALL JUNCTION BOX
	DUPLEX RECEPTACLE OUTLET
	SINGLE RECEPTACLE OUTLET
	DOUBLE DUPLEX RECEPTACLE OUTLET
GFCI WP	GROUND FAULT CIRCUIT INTERRUPTER DUPLEX OUTLET WITH WEATHERPROOF COVER
	SPLIT WIRED DUPLEX RECEPTACLE
IG	DUPLEX ISOLATED GROUND
A	SPECIAL PURPOSE OUTLET – USE SUBSCRIPT TO IDENTIFY TYPE IN SPECS
A	FLOOR RECEPTACLE OUTLET USE SUBSCRIPT TO IDENTIFY TYPE IN SPECS
	RECEPTACLE RACEWAY
$a	SINGLE POLE SWITCH – USE SUBSCRIPT TO DESIGNATE CONTROL OF PARTICULAR OUTLETS
$2	DOUBLE POLE SWITCH
$3	THREE–WAY SWITCH
$4	FOUR–WAY SWITCH
$WP	WEATHERPROOF SWITCH
$K	KEY OPERATED SWITCH
600	DIMMER SWITCH – NUMBER INDICATES WATTAGE
M	OCCUPANCY SENSING SWITCH
P	PHOTOCELL
6 30	REMOTE CONTROL SWITCH 6 POLE, 30 AMPS
A 1, b	FLUORESCENT LUMINAIRE A=FIXTURE TYPE 1=CIRCUIT NUMBER b=SWITCH CONTROLLING FIXTURE
	FLUORESCENT STRIP LUMINAIRE
	WALL MOUNTED FLUORESCENT LUMINAIRE
	CEILING MOUNTED LUMINAIRE
	WALL MOUNTED LUMINAIRE
	EMERGENCY LUMINAIRE
	LIGHT POLE WITH LUMINAIRE

SYMBOL	DESCRIPTION
	EMERGENCY LIGHTING UNIT
	CEILING MOUNTED EXIT SIGN – ARROW AS INDICATED
	TWO FACED EXIT SIGN
	WALL MOUNTED EXIT SIGN
	SWITCHBOARD, POWER PANELBOARD
LP–XX	LIGHTING PANELBOARD
T	TRANSFORMER
30	NON–FUSIBLE SAFETY SWITCH (NUMBER INDICATES SWITCH SIZE)
F 40/60	FUSED SAFETY SWITCH (NUMBERS INDICATE FUSE/SWITCH SIZES)
20	COMBINATION MAGNETIC STARTER AND CIRCUIT BREAKER 2 – INDICATES NEMA STARTER SIZE 20 – INDICATES CIRCUIT BREAKER TRIP
	MAGNETIC STARTER
ASD	ADJUSTABLE SPEED DRIVE
3	MOTOR (NUMBER INDICATES HP)
	BELL
H	HORN "H" OR SIREN "S"
	BUZZER
	PUSHBUTTON
F	MANUAL PULL STATION
V	FIRE ALARM HORN (V=VISUAL SIGNAL)
P	PHOTOELECTRIC SMOKE DETECTOR
I	IONIZATION SMOKE DETECTOR
T	THERMAL DETECTOR
P D DH	DUCT SMOKE DETECTOR (PHOTOELECTRIC)
	MAGNETIC DOOR HOLDER
PS	PRESSURE SWITCH
FS	FLOW SWITCH
S	VALVE SUPERVISORY SWITCH
FACP	FIRE ALARM CONTROL PANEL
F	FIRE ALARM RACEWAY
S	CEILING SPEAKER
S	WALL SPEAKER
	TELECOMMUNICATIONS OUTLET
	FLOOR MOUNTED TELECOMMUNICATIONS OUTLET
	INTERCOM OUTLET
T	TELECOMMUNICATIONS RACEWAY
D	PROTECTED TRANSMISSION SYSTEM (PTS) DATA TERMINAL CONNECTION
TV	TELEVISION OUTLET
CR	CARD READER
ES	ELECTRIC DOOR STRIKE
DC	DOOR CONTACTS
RAP	REMOTE ACCESS PANEL
HG	HAND GEOMETRY UNIT
MD	MOTION DETECTOR
C	CLOSED CIRCUIT TV CAMERA

SYMBOL	DESCRIPTION
100/3	MEDIUM VOLTAGE DISCONNECT SWITCH
600	MEDIUM VOLTAGE DRAWOUT CIRCUIT BREAKER
480V 208Y/120V 500 KVA	TRANSFORMER (DELTA–WYE CONN.)
	SHIELDED TRANSFORMER
1000 1600	DRAWOUT CIRCUIT BREAKER (TRIP / FRAME)
300 400 GFI	CIRCUIT BREAKER (TRIP / FRAME) WITH GROUND FAULT INTERRUPTER
7 MCP	MOTOR CIRCUIT PROTECTOR
30 MCP	MOTOR CONTROL CENTER STARTER UNIT
	FUSE
	GROUND
G	GENERATOR
3000/5 3	CURRENT TRANSFORMER (NUMBERS INDICATE RATIO AND QUANTITY)
3	POTENTIAL TRANSFORMER (NUMBER INDICATES QUANTITY)
AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
V	VOLTMETER
A	AMMETER
KW	KILOWATT METER
N E L	TRANSFER SWITCH
K 1	KEY INTERLOCK #1
	BATTERY
	NORMALLY CLOSED CONTACT
	NORMALLY OPEN CONTACT
	PROTECTIVE RELAY, SOLENOID COIL
	THERMAL OVERLOAD
	CONNECTION
	CROSS, NO CONNECTION
	SURGE ARRESTOR
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
	CAPACITOR
CR 1	CONTROL RELAY #1
	BUS PLUG CIRCUIT BREAKER
T	THERMOSTAT
1	KEYED NOTE DESIGNATION
3	ELECTRICAL EQUIPMENT DESIGNATION (SEE SCHEDULE)
5	MECHANICAL EQUIPMENT DESIGNATION (SEE SCHEDULE)
7	NAMEPLATE DESIGNATION (SEE SCHEDULE)
WP	WEATHERPROOF
AFF	ABOVE FINISH FLOOR

GENERAL ELECTRICAL NOTES

(NOT ALL SYMBOLS & NOTES WILL APPLY TO THIS PROJECT)

1. PERFORM INSTALLATION IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA), AND APPLICABLE DOE ORDERS. EQUIPMENT SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).
2. PROVIDE AND MAINTAIN A CLEAR WORKING SPACE ABOUT ELECTRIC EQUIPMENT (SWITCHBOARDS,PANELBOARDS, ETC.) IN ACCORDANCE WITH NEC ARTICLES 110.26 AND 110.34.
3. USE 600 VAC CIRCUIT BREAKERS IN 480V AND 480Y/277V SWITCHBOARDS, PANELBOARDS AND MOTOR CONTROL CENTERS.
4. PROVIDE CIRCUIT BREAKERS WITH UL LISTED INTERRUPTING RATING (RMS SYMMETRICAL AMPERES) GREATER THAN THE AVAILABLE FAULT CURRENT SHOWN ON THE ELECTRICAL ONE–LINE DIAGRAM.
5. PROVIDE PADLOCKING PROVISIONS FOR EACH TWO– AND THREE–POLE CIRCUIT BREAKER.
6. BOND RACEWAYS AND THE FRAMES AND ENCLOSURES OF MOTORS, BREAKERS, SWITCHES, AND OTHER ELECTRICAL EQUIPMENT TO THE BUILDING GROUNDING SYSTEM. INSTALL AN INSULATED EQUIPMENT GROUND CONDUCTOR IN EACH RACEWAY OR CONDUIT. SIZE EQUIPMENT GROUND CONDUCTOR IN ACCORDANCE WITH NEC TABLE 250.122.
7. IDENTIFY NEW BRANCH CIRCUITS AT THE PANEL AND AT THE LOAD OUTLET, RECEPTACLE AND SWITCH. IDENTIFY THE PURPOSE OF INDIVIDUAL CIRCUIT BREAKERS, SAFETY SWITCHES AND MOTOR STARTERS BY MEANS OF NAMEPLATES AS INDICATED.
8. ROUTE CONDUITS TO SUIT EQUIPMENT AND BUILDING STRUCTURE. LIMIT THE USE OF ELECTRICAL METALLIC TUBING (EMT) TO AREAS WHERE IT WILL NOT BE SUBJECT TO PHYSICAL DAMAGE OR CORROSION. USE INTERMEDIATE METAL CONDUIT (IMC) OR RIGID GALVANIZED STEEL CONDUIT (RGS) FOR WORK EMBEDDED IN CONCRETE OR EXPOSED TO PHYSICAL DAMAGE. USE MINIMUM 3/4 INCH CONDUIT EXCEPT AS FOLLOWS: 1/2" CONDUIT MAY BE USED FOR 20 AMP GENERAL LIGHT AND POWER CIRCUITS AND FOR CONTROL CIRCUITS; 3/8" FLEXIBLE METAL CONDUIT MAY BE USED TO CONNECT LIGHT FIXTURES IN SUSPENDED CEILINGS. USE LIQUID–TIGHT FLEXIBLE METAL CONDUIT FOR FLEXIBLE CONNECTIONS TO EQUIPMENT IN MECHANICAL ROOMS OR OUTDOORS.
9. SEAL AROUND CONDUIT PENETRATIONS THROUGH INTERIOR WALLS AND FLOORS SEPARATING AREAS TO RESTORE ORIGINAL FIRE RATING; USE A UL CLASSIFIED FIRE SEALANT. SEAL PENETRATIONS THROUGH ROOF AND EXTERIOR WALLS TO MAKE WATERPROOF. REQUEST INSPECTION OF FIRE SEALS BY ELECTRICAL INSPECTOR FROM AUTHORITY HAVING JURISDICTION BEFORE AND AFTER PLACEMENT OF FIRE SEAL MATERIALS.
10. USE 12 AWG OR LARGER CONDUCTORS FOR POWER WIRING. USE 14 AWG STRANDED CONDUCTORS FOR CONTROL WIRING UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS.
11. USE ONLY COPPER CONDUCTORS ON CIRCUITS 600V AND LESS. CONDUCTORS 10 AWG AND SMALLER SHALL BE SOLID AND 8 AWG AND LARGER AWG SHALL BE STRANDED. PROVIDE TYPE THHN/THWN WIRE INSULATION; XHHW INSULATION MAY BE USED FOR 1 AWG AND LARGER.
12. USE THE FOLLOWING CONDUCTOR COLOR CODES:

	208Y/120 VOLT	480Y/277 VOLT
PHASE A	BLACK	BROWN
PHASE B	RED	ORANGE
PHASE C	BLUE	YELLOW
NEUTRAL	WHITE	GRAY
EQUIP. GROUND	GREEN	GREEN

ISOLATED GROUND SHALL BE GREEN WITH YELLOW TRACER.

13. ARRANGE CONNECTIONS FOR SINGLE PHASE CIRCUITS TO ACHIEVE THREE PHASE LOAD BALANCE WITHIN 20% OF THE AVERAGE PHASE LOAD CURRENT. UNGROUNDED CONDUCTORS USING A COMMON NEUTRAL MUST ORIGINATE FROM DIFFERENT PHASES.
14. INSTALL OUTDOOR EQUIPMENT TO BE WEATHERPROOF AND TO EXCLUDE BIRDS AND RODENTS WITH MAXIMUM 1/2" DIAMETER UNPROTECTED OPENINGS IN ENCLOSURES.
15. PROVIDE LIGHTNING PROTECTION IN ACCORDANCE WITH NFPA 780. PROVIDE MATERIAL THAT IS UL LABELED FOR LIGHTNING PROTECTION SERVICE. THE LIGHTNING PROTECTION SYSTEM DESIGN AND INSTALLATION SHALL FOLLOW THAT SHOWN ON THE DRAWINGS.
16. TEST CONDUCTORS FOR CONTINUITY AND FREEDOM FROM SHORTS AND UNINTENTIONAL GROUNDS.
17. ELECTRICAL EQUIPMENT SPECIFIED IN THIS DOCUMENT SHALL BE ACCEPTANCE TESTED AND INSPECTED IN ACCORDANCE WITH UL.
18. ELECTRICAL MATERIALS AND CONSTRUCTION SHALL CONFORM TO OWNERS/PROJECT MANAGERS STANDARD CONSTRUCTION SPECIFICATIONS WHERE APPLICABLE.
19. DISPOSE OF ITEMS REMOVED AS DIRECTED BY THE OWNER/PROJECT CONSTRUCTION INSPECTOR.
20. REPAIR AREAS DAMAGED DURING CONSTRUCTION TO MATCH ADJACENT AREAS WITH RESPECT TO BOTH COLOR AND FINISH.
21. KEEP JOB SITE IN AN ORDERLY CONDITION AND AT PROJECT COMPLETION, REMOVE ALL WASTE. LEAVE THE JOB SITE IN A CONDITION ACCEPTABLE TO THE OWNER/PROJECT CONSTRUCTION INSPECTOR.
22. IF A CONFLICT ARISES BETWEEN THE FIELD CONDITIONS AND THESE GENERAL ELECTRICAL REQUIREMENTS, CONTACT THE OWNER/PROJECT LEADER FOR DIRECTIONS.
23. TIE–INS TO EXISTING POWER SYSTEMS WILL BE PERFORMED BY THE PROJECT SUPPORT SERVICES SUB–CONTRACTOR.

DRAWING NOTES

1. DRAWINGS ARE MEANT TO BE A REPRESENTATION ONLY, DEVICES MAY LOOK DIFFERENT THAN WHAT WE HAVE SHOWN.
2. REFER TO PRODUCT SPECIFICATIONS FOR EXACT DIMENSIONS OF ENCLOSURE, BACK PANEL & ALL DEVICES DRAWN IN THESE DRAWINGS.

NOTING SYMBOLS & DESIGNATIONS

(#) CORRESPONDS TO A BILL OF MATERIALS #

(55) CORRESPONDS TO A KEYED NOTE #

X (INDICATES DETAIL DESIGNATION)
X–X TITLE NOTATION & SEE DETAIL SYMBOL
(INDICATES SHEET NUMBER)

wsp
4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

Professional Engineer (Electrical) CERTIFICATE No. 43358 JEFFREY L. JORGENSEN Date Signed 11/15/22 ARIZONA, U.S.A.

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No: 2151700032

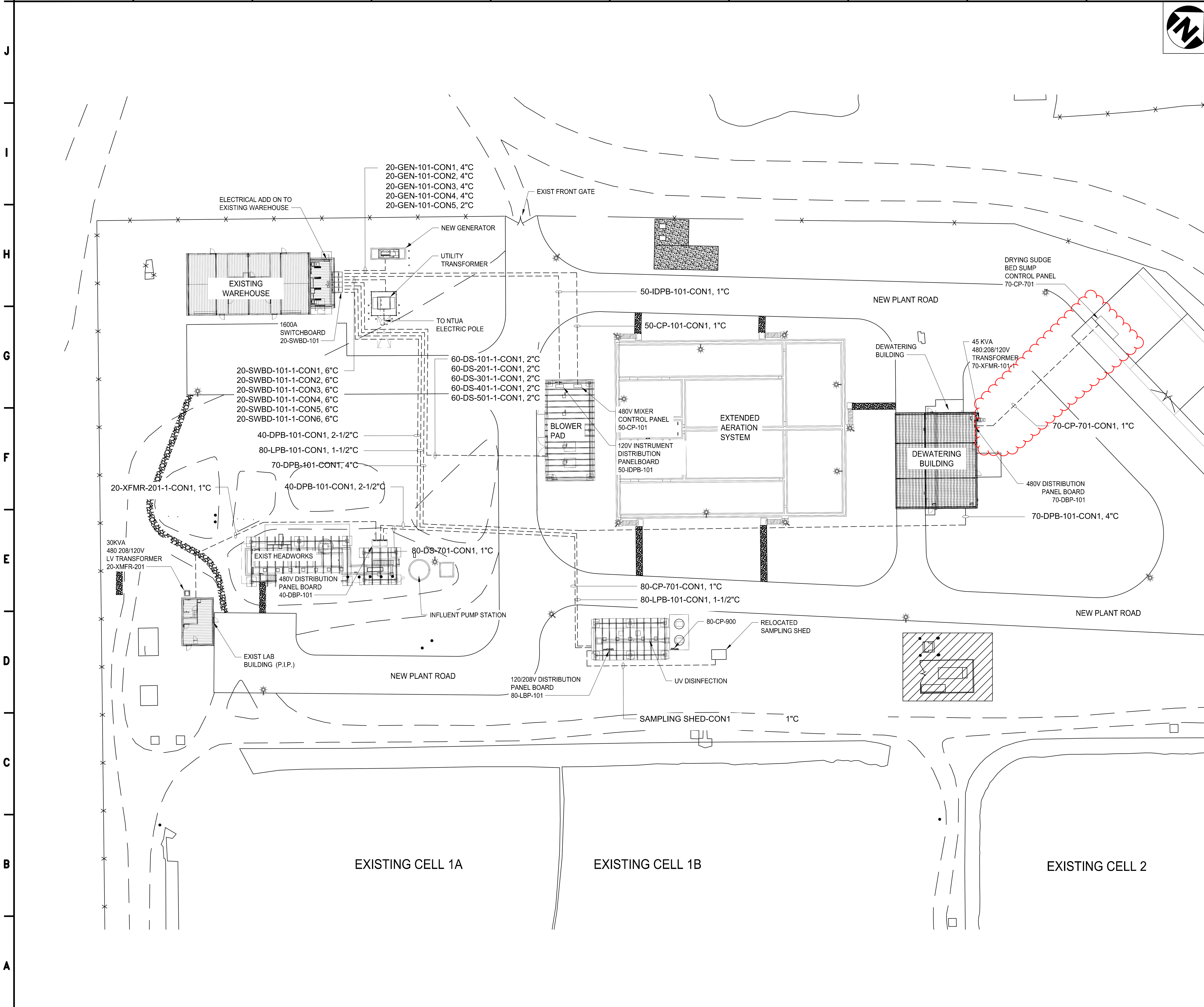
REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	PP
APPROVED BY:	PP
DATE:	08NOV2022

SHEET TITLE:
PROCESS FLOW SYMBOLS & NOTES PG.1 - P & ID

SHEET NUMBER:	REV. #
N-A02	0

SHEET 186 OF 223



GENERAL SHEET NOTES

1. ALL DATA SHOWN HEREIN CONCERNING EXISTING PRIVATELY AND PUBLICLY OWNED UTILITIES AND FROM FIELD OBSERVATIONS. THESE MAY OR MAY NOT BE ACCURATE. THE CONTRACTOR IS CAUTIONED THAT HE IS RESPONSIBLE FOR FOR THE EXACT LOCATION AND PROTECTION OF ALL LINES DURING CONSTRUCTION.
2. THE UNDERGROUND CONDUIT ROUTING IS DIAGRAMMATICALLY SHOWN. CONTRACTOR IS RESPONSIBLE TO LOCATE AND ROUTE THE CONDUITS TO THE MOST EFFICIENT WAY PER FIELD VERIFICATION. PROVIDE PULL BOXES AS REQUIRED TO LIMIT CONDUIT BENDS TO NO MORE THAN 360 DEGREES.
3. ALL UNDERGROUND CONDUITS ARE PVC SCHEDULE 40 FOR NON HEAVY TRAFFIC AREAS AND SCHEDULE 80 FOR HEAVY TRAFFIC AREAS, WITH PVC COATED STEEL RISERS HALF LAP WRAPPED WITH SCOTCHRAP-50 CORROSION INHIBITING TAPE.
4. ALL ABOVE GROUND CONDUITS SHALL BE PVC COATED RIGID GALVANIZED STEEL UNLESS NOTED OTHERWISE
5. REFER TO DRAWING NUMBER 10-GEN-C-1004 FOR DEMOLITION OF EXISTING UTILITY OVERHEAD LINES AND ABANDONED UNDERGROUND ELECTRIC CONDUITS.
6. CONTRACTOR TO COORDINATE WITH NTUA ELECTRIC FOR INSTALLATION OF PRIMARY CONDUCTOR AND CONDUIT SIZING.

wsp

4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

Registered Professional Engineer (Electrical) CERTIFICATE No. 43356 JEFFREY L. JORGENSEN Date Signed: 11/15/22 ARIZONA, U.S.A.

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No: 2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	SA
DRAWN BY:	SA
CHECKED BY:	JJ
DATE:	09NOV2022

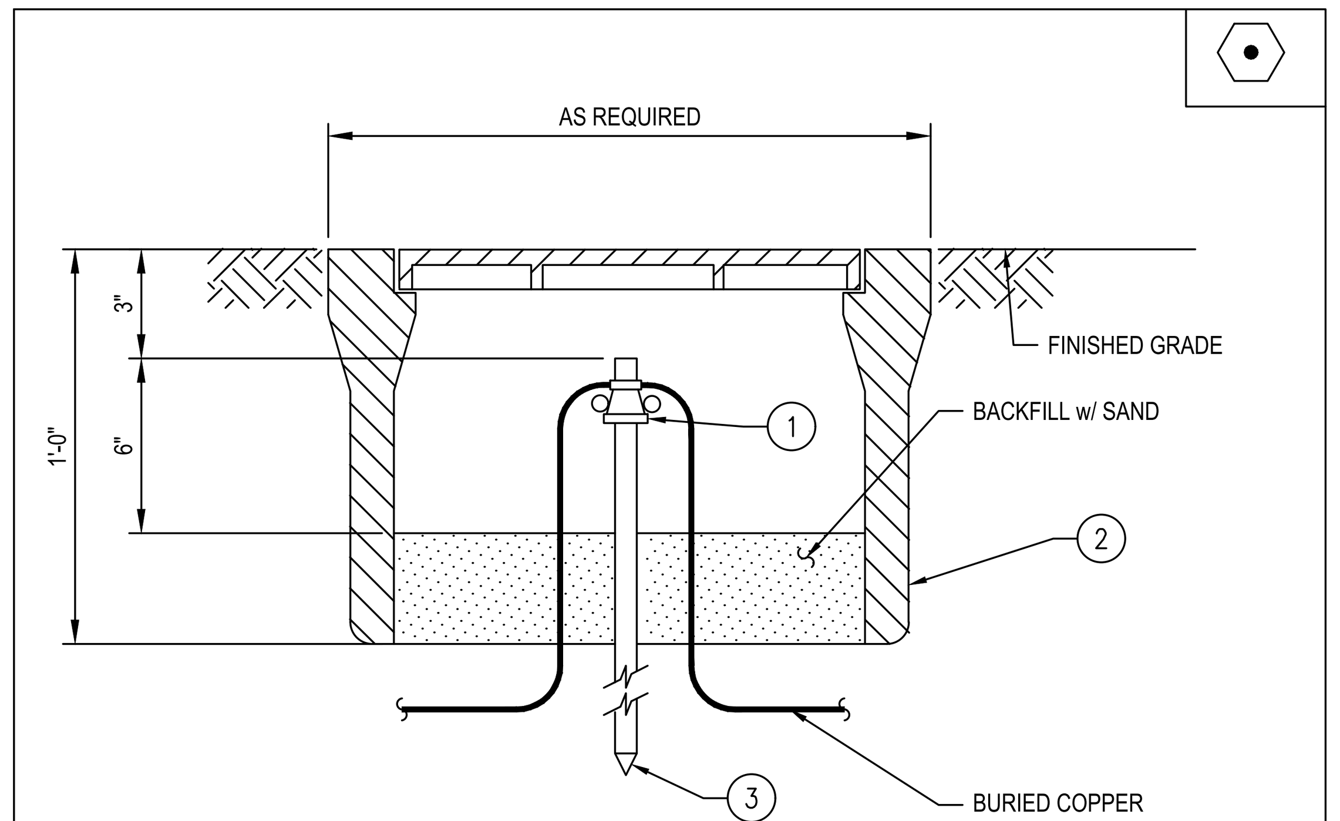
SHEET TITLE:

ELECTRICAL CONDUIT LAYOUT SITE PLAN

SHEET NUMBER:	REV. #
10-GEN-E-1006	0

SHEET 151 OF 223

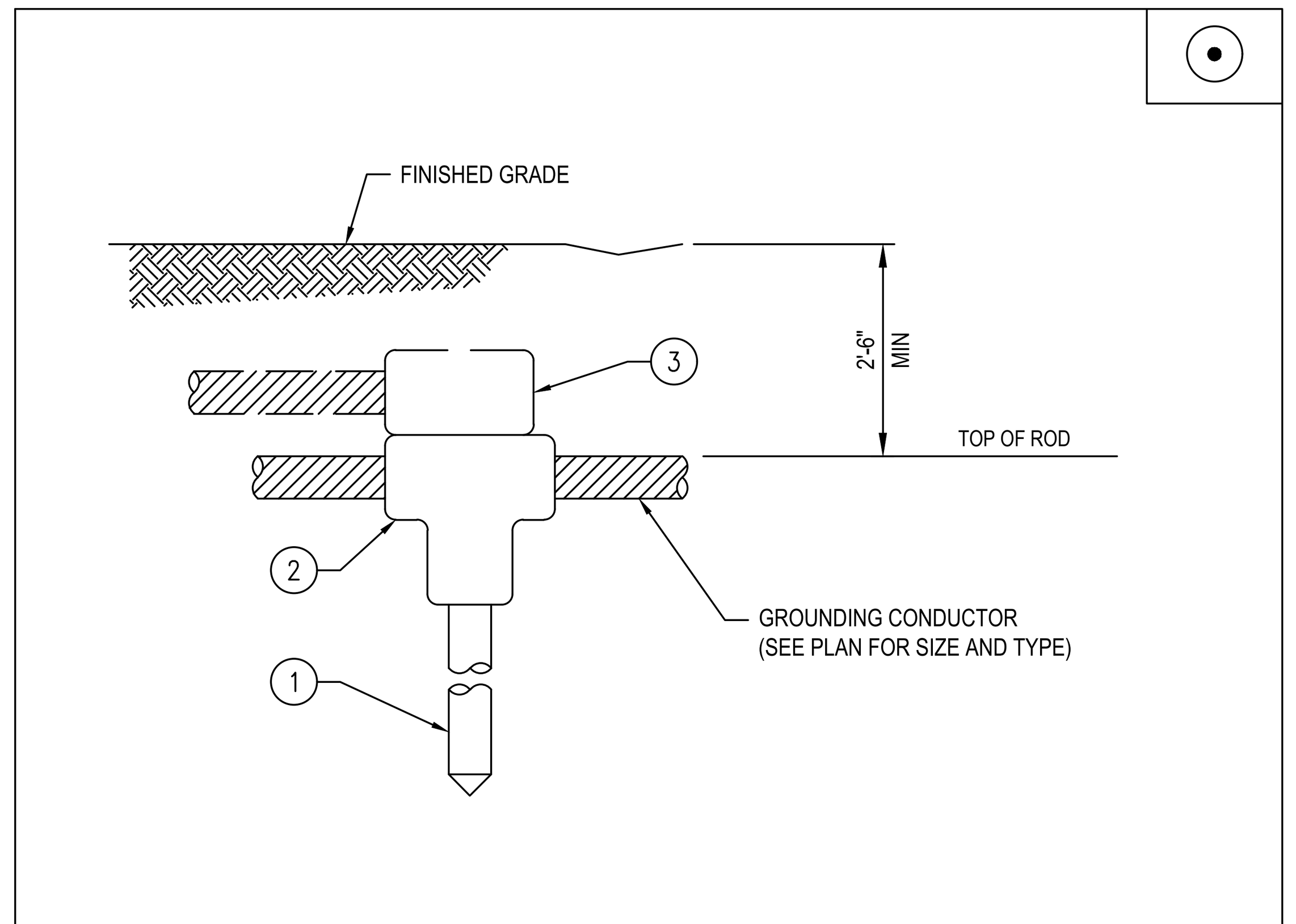
1 2 3 4 5 6 7 8 9 10 11 12



NOTE:
1. TOP OF GROUND TEST WELLS SHALL BE INSTALLED EVEN WITH FINISHED GRADE.

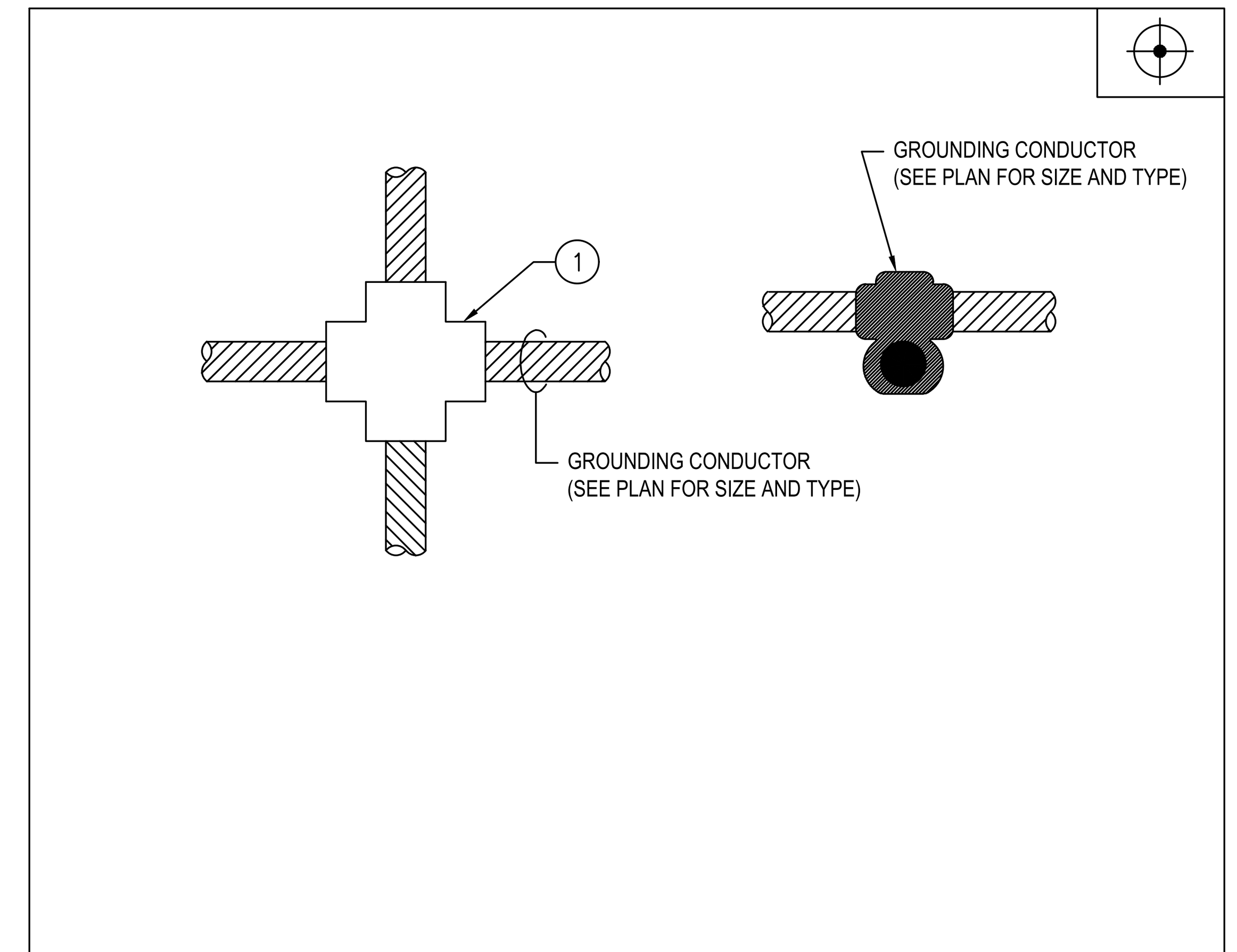
ITEM	MATERIAL DESCRIPTION: CONDUCTOR SIZE	MATERIAL DESCRIPTION: GROUND CONNECTION CATALOG NUMBER		QTY.	REMARKS
1	#2/0 TO 250 kcmil	BURNDY GAR6429 OR EQUAL		1	
2	METER BOX			1	
3	COPPER CLAD GROUND ROD, 3/4" X 10'-0"			1	

1 TYPICAL TEST WELL



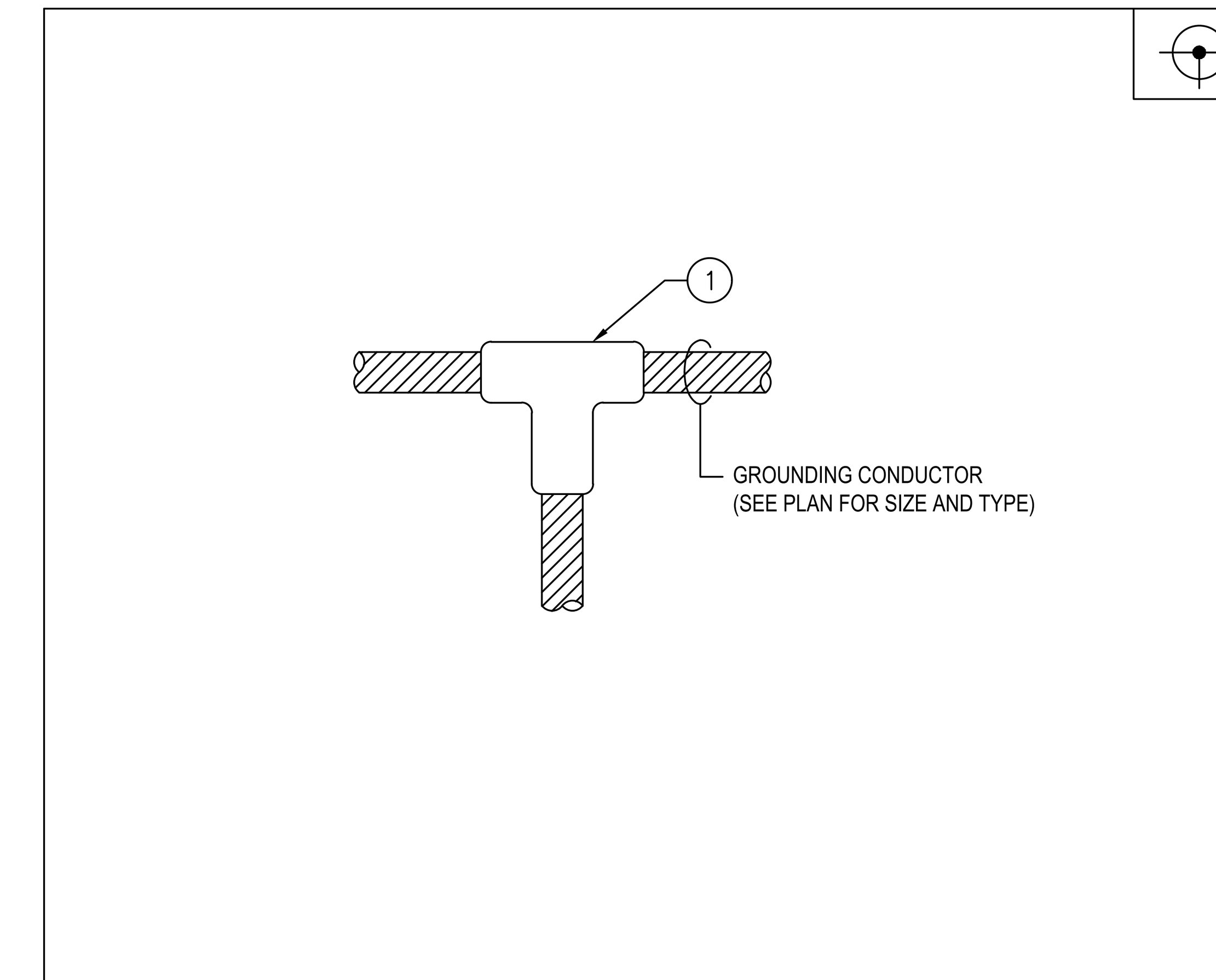
ITEM	MATERIAL DESCRIPTION	QTY.	REMARKS
1	COPPER CLAD GROUND ROD, 3/4" X 10'-0"	1	
2	USE MOLD CADWELD MOLD FAMILY "GT" WITH CORRECT WELD MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.	A/R	OR EQUAL
3	USE MOLD CADWELD MOLD FAMILY "NC" WITH CORRECT WELD MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.	A/R	OR EQUAL

2 TYPICAL GROUND ROD



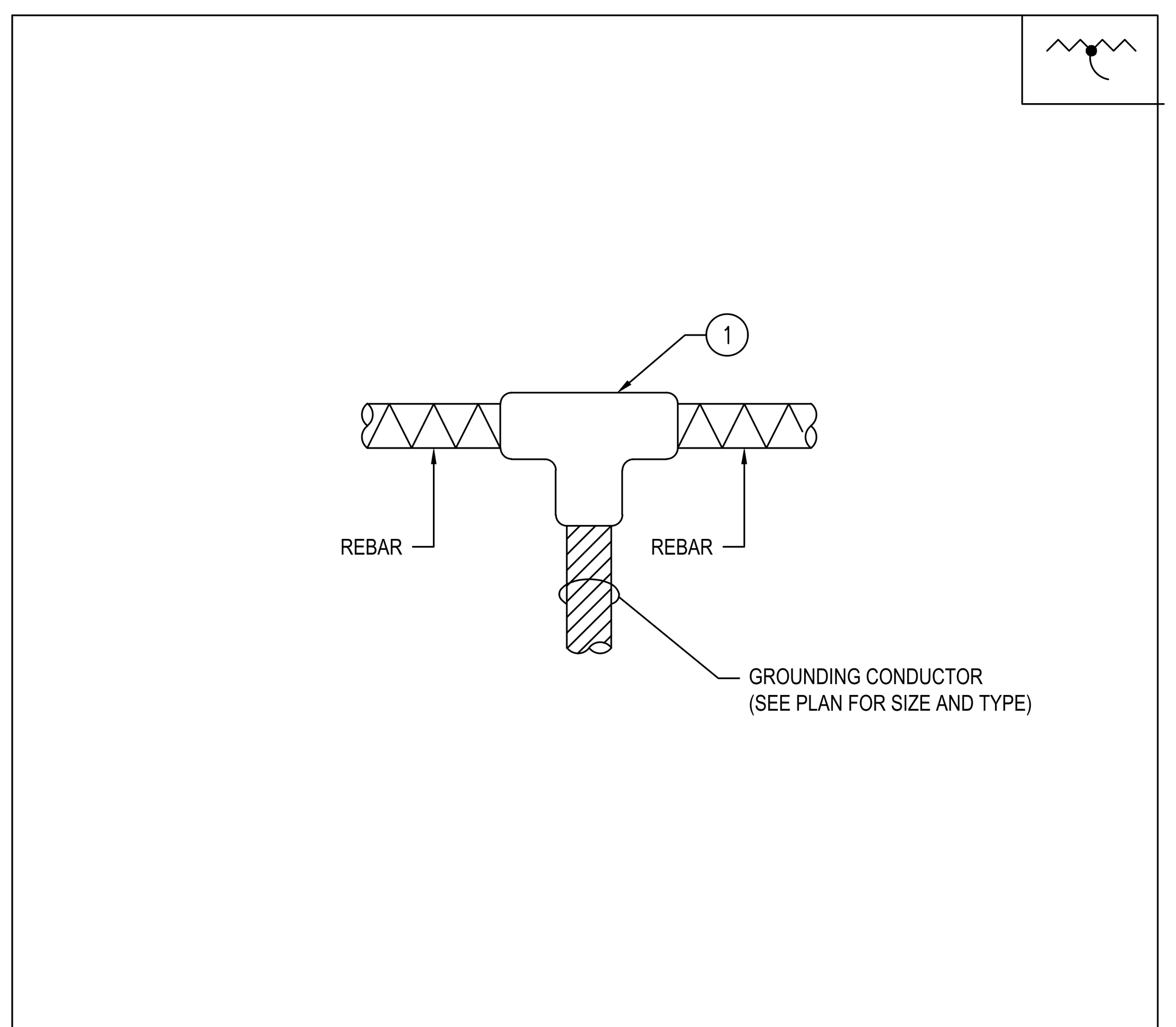
ITEM	MATERIAL DESCRIPTION	QTY.	REMARKS
1	USE MOLD CADWELD MOLD FAMILY "XB" WITH CORRECT WELD MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.	A/R	OR EQUAL

3 TYPICAL "X" SHAPE THERMOWELD



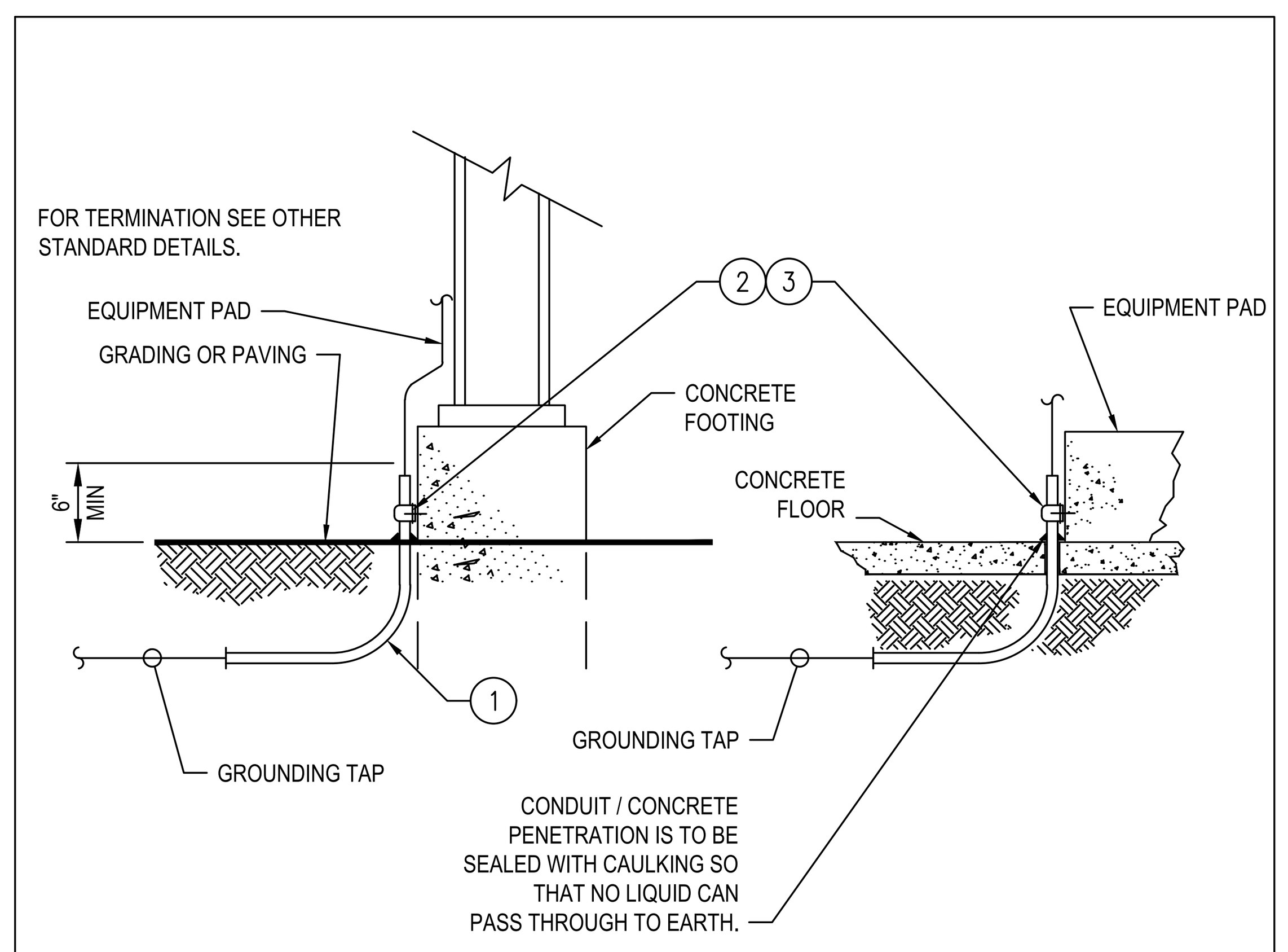
ITEM	MATERIAL DESCRIPTION	QTY.	REMARKS
1	USE MOLD CADWELD MOLD FAMILY "TA" WITH CORRECT WELD MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.	A/R	OR EQUAL

4 TYPICAL TEE THERMOWELD



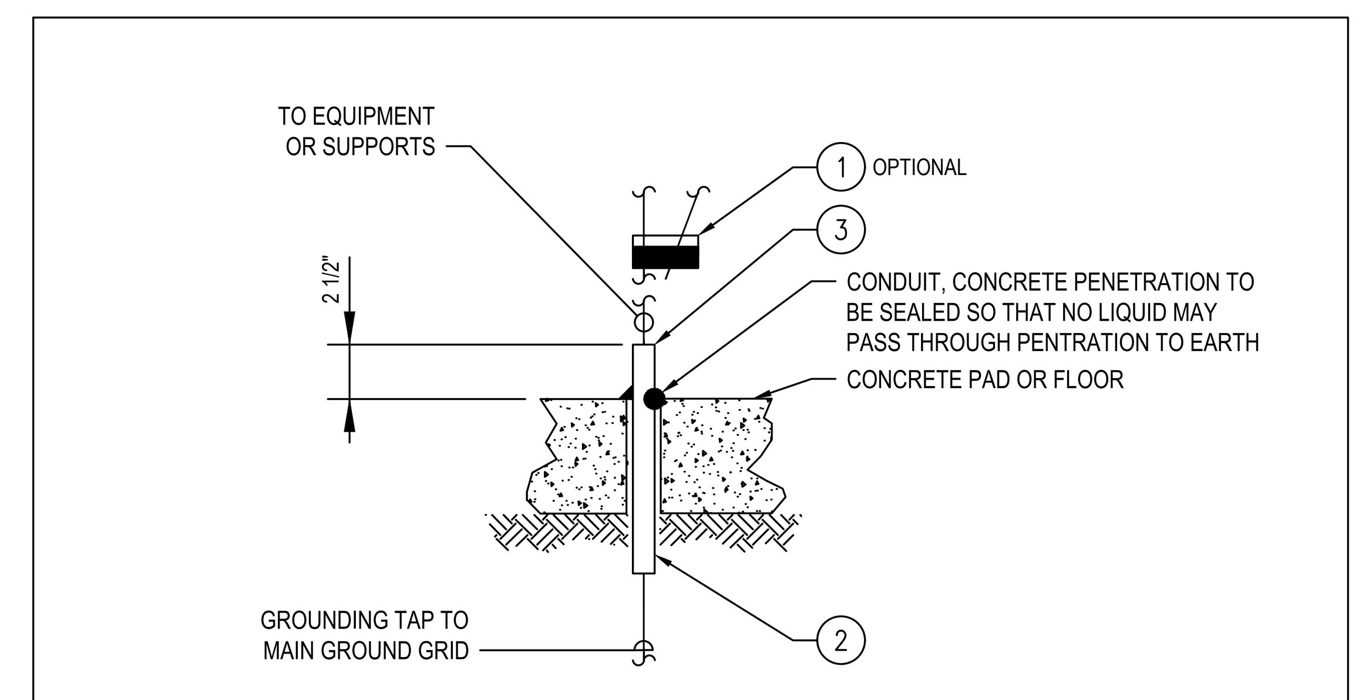
ITEM	MATERIAL DESCRIPTION	QTY.	REMARKS
1	USE MOLD CADWELD MOLD FAMILY "RH" WITH CORRECT WELD MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.	A/R	OR EQUAL

5 TGROUND CONDUCTOR TO REBAR (THERMOWELD)



ITEM	MATERIAL DESCRIPTION	QTY.	REMARKS
1	1" PVC CONDUIT (SCHED 40 OR GREATER)		AR
2	1" CONDUIT CLAMP, 1-HOLE		1
3	1/4" ANCHOR		1

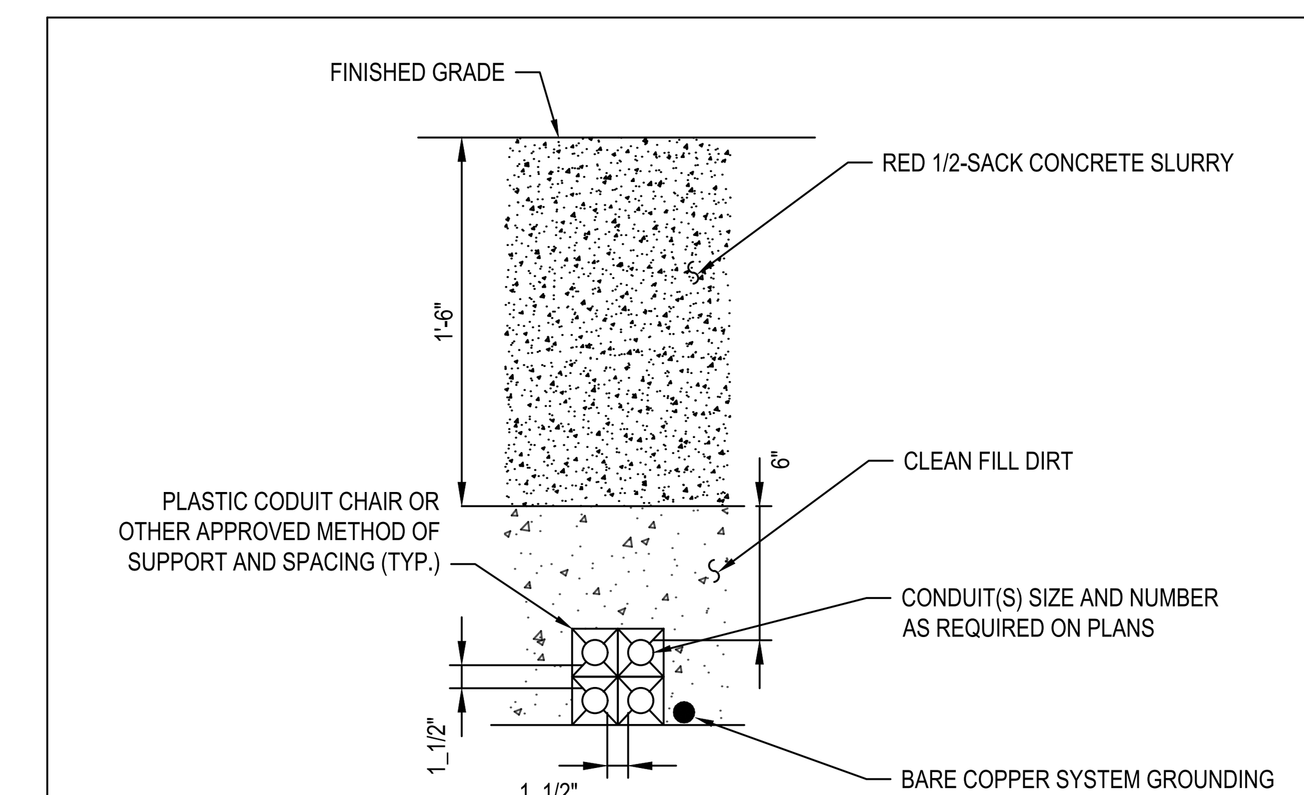
6 TYPICAL STRUCTURAL GROUNDING



NOTE:
FOR EACH ELEC EQUIP STUB-UP, COIL 6'-0"(1829) OF GROUNDING CONDUCTOR FOR LATER CONNECTION TO EQUIPMENT, UNLESS NOTED OTHERWISE ON PLAN DRAWINGS.

ITEM	DESCRIPTION	QTY	REMARKS
1	GROUND TAP CONNECTOR	1	
2	SCHEDUAL 40 OR 80 PVC CONDUIT	AR	
3	GROUND CONDUCTOR PER PLAN VIEW	AR	SEE NOTE

7 TYPICAL GROUNDING STUB-UP THROUGH CONCRETE



NOTES:
1.- ALL DIMENSIONS INDICATED ABOVE ARE MINIMUM.
2.- SPARE CONDUITS MUST BE LOCATED ON TOP OF DUCTBANKS.
3.- THIS DETAIL APPLIES IN ALL CASES WHETHER SPECIFICALLY REFERRED TO OR NOT.
4.- THIS DETAIL DOES NOT APPLY TO UTILITY DUCTBANKS.

ITEM	DESCRIPTION	QTY	REMARKS

8 TYPICAL UNDERGROUND CONDUIT DUCTBABK DETAIL

NOTE:
1. THIS IS A RECOMMENDED INSTALLATION DETAIL. THE CONTRACTOR MAY DEVIATE BUT MUST MEET (IN ORDER OF PRECEDENCE) THE NEC (NATION ELECTRIC CODE), LOCAL CODES, PROJECT SPECIFICATIONS AND PROJECT CONSTRUCTION DRAWINGS.

WSP
4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No: 2151700032

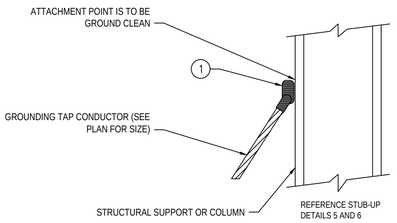
REVISIONS		
NO.	DATE	DESCRIPTION

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	JJ
DATE:	09NOV2022

SHEET TITLE:
ELECTRICAL TYPICAL DETAILS

SHEET NUMBER:	REV. #
10-GEN-E-3001	0

SHEET 154 OF 223

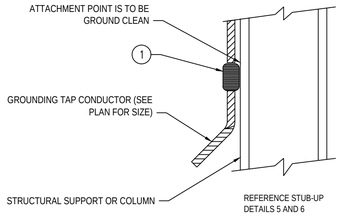


NOTES

1. GROUNDING CONNECTIONS SHALL BE INSTALLED ON VESSEL SUPPORTS. DO NOT ATTACH TO SHELL OF VESSEL.
2. REPAIR DAMAGED GALVANIZED SURFACES WITH ZINC RICH PAINT.
3. REPAIR DAMAGED FIRE-PROOFING OF COLUMNS AND BEAMS.

ITEM	MATERIAL DESCRIPTION		QTY.	REMARKS
1	USE MOLD CADWELD MOLD FAMILY "VS" WITH CORRECT WELD		A/R	OR EQUAL
	MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.			

9 TYPICAL GROUNDING CONDUCTOR TO STRUCTURAL

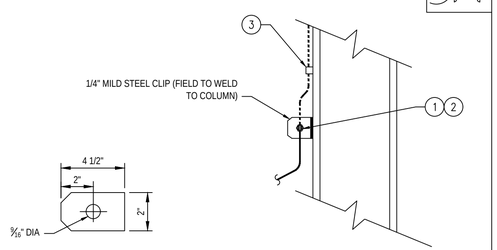


NOTES

1. GROUNDING CONNECTIONS SHALL BE INSTALLED ON VESSEL SUPPORTS. DO NOT ATTACH TO SHELL OF VESSEL.
2. REPAIR DAMAGED GALVANIZED SURFACES WITH ZINC RICH PAINT.
3. REPAIR DAMAGED FIRE-PROOFING OF COLUMNS AND BEAMS.

ITEM	MATERIAL DESCRIPTION		QTY.	REMARKS
1	USE MOLD CADWELD MOLD FAMILY "V" WITH CORRECT WELD		A/R	OR EQUAL
	MATERIAL PER VENDOR REQUIREMENTS FOR CONDUCTOR SIZE.			

10 TYPICAL THROUGH GROUND CONDUCTOR TO STRUCTURAL STEEL (THERMOWELD)

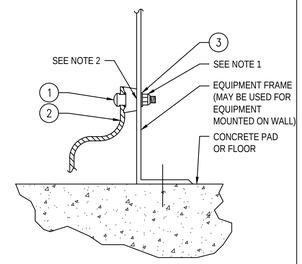


NOTES:

1. REFERENCE DETAILS E-SD-610, E-SD-611 AND E-SD-612.

ITEM	MATERIAL DESCRIPTION		QTY.	REMARKS
1	BURNDY TYPE QGFL CONNECTOR OR EQUAL		1	
2	LOCK WASHER, 1/2" INT. TOOTH, BURNDY #50NWBOX		1	
3	CABLE STRAP, 1-HOLE, MALLEABLE IRON		AR	IF CONDUCTOR IS RUN THRU

11 GROUND CONDUCTOR TO STRUCTURAL (MECHANICAL CONNECTION)

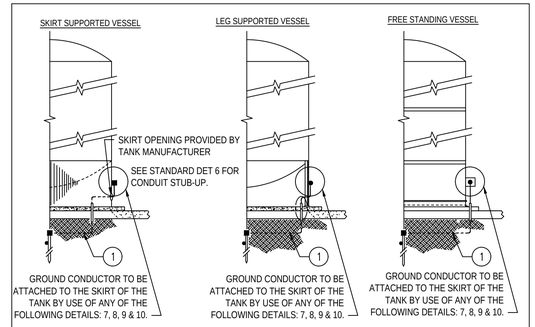


NOTES:

1. CONTRACTOR IS TO DRILL HOLE IN THE EQUIP FRAME OR SUPPORT LEG & USE A STAR WASHER IN CONJUNCTION WITH THE WASHER THAT COMES WITH THE GROUND CONNECTOR. THE HOLE IS TO BE SIZED ACCORDING TO THE CONNECTOR BEING USED.
2. THE EQUIPMENT SURFACE MUST BE CLEANED TO BARE METAL & THE CROUSE-HINDS TYPE STL (OR EQUAL) CONDUCTING GREASE APPLIED PRIOR TO THE LUG ATTACHMENT.
3. REFERENCE DETAILS E-SD-610, E-SD-611 AND E-SD-612.

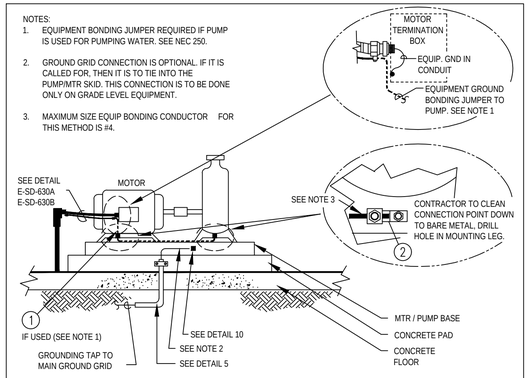
ITEM	DESCRIPTION		QTY.	REMARKS
1	BURNDY TYPE QGFL BARTAP GROUND CONNECTOR		1	OR EQUAL
2	GROUND CONNDUCTOR		AR	
3	STAR WASHER, 1/2"		1	

12 EQUIPMENT FRAME GROUND



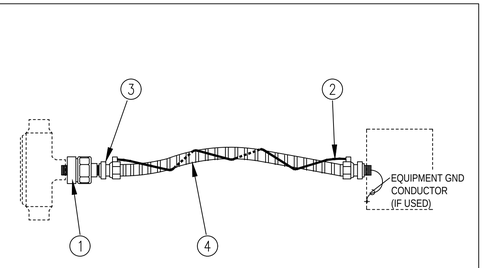
ITEM	DESCRIPTION		QTY	REMARKS
1	GROUNDING CONDUCTOR		AR	

13 TANK GROUNDING



ITEM	DESCRIPTION		QTY	REMARKS
1	GREEN INSULATED STRANDED EQUIPMENT GND BOND		AR	
2	BURNDY TYPE QA GROUND CONNECTOR OR EQUAL		1	

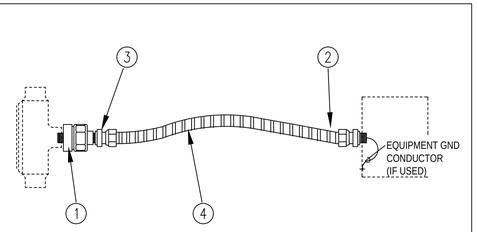
14 PUMP GROUNDING



THIS DETAIL IS INTENDED TO BE USED FOR ALL METALIC\NON-METALIC LIQUID-TIGHT OR NON LIQUID-TIGHT FLEXIBLE CONDUIT. THE EXCEPTION IS FLEXIBLE CONDUIT WITH A BUILT IN EQUIPMENT GROUND.

ITEM	DESCRIPTION		QTY	REMARKS
1	CONDUIT UNION		1	
2	#6 STRANDED, GREEN INSULATED GROUND CONDUCTOR		AR	
3	APPLETON TYPE STB CONNECTOR W/ GND LUG OR EQUAL		2	
4	LIQUIDTIGHT FLEXIBLE METAL CONDUIT		AR	

15 GND BONDING CONDUCTOR



THIS DETAIL IS INTENDED TO BE USED FOR ALL METALIC LIQUID-TIGHT OR NON LIQUID-TIGHT FLEXIBLE CONDUIT.

ITEM	DESCRIPTION		QTY	REMARKS
1	CONDUIT UNION		1	
2	LIQUIDTIGHT CONNECTOR (LISTED FOR GROUNDING)		2	
3	LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LISTED FOR GROUNDING)		AR	

16 GND BONDING CONDUCTOR

NOTE:

1. THIS IS A RECOMMENDED INSTALLATION DETAIL. THE CONTRACTOR MAY DEVIATE BUT MUST MEET (IN ORDER OF PRECEDENCE) THE NEC (NATION ELECTRIC CODE), LOCAL CODES, PROJECT SPECIFICATIONS AND PROJECT CONSTRUCTION DRAWINGS.

wsp

4221 BALLOON PARK RD NE
ALBUQUERQUE, NM 87109

Registered Professional Engineer (Electrical) CERTIFICATE NO. 43358 JEFFREY L. JORGENSEN 11/15/22 Date Signed ARIZONA, U.S.A.

PROJECT:

KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No: 2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	JJ
DATE:	09NOV2022

SHEET TITLE:

ELECTRICAL TYPICAL DETAILS

SHEET NUMBER:	REV. #
10-GEN-E-3002	0
SHEET 155 OF 223	

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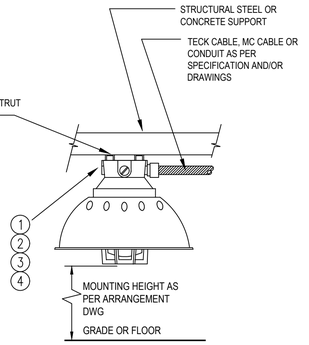
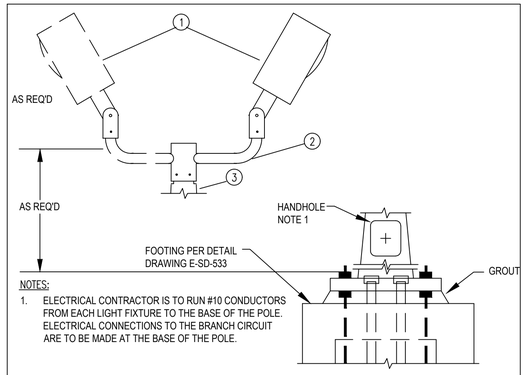


ITEM	DESCRIPTION	QTY	REMARKS
1	UNISTRUT	A/R	
2	UNISTRUT 1/4" SPRING NUT	A/R	
3	BOLT, 1/4" x 20 HEX HEAD	A/R	
4	FLAT WASHER, 1/4", (CADMIUM)	A/R	

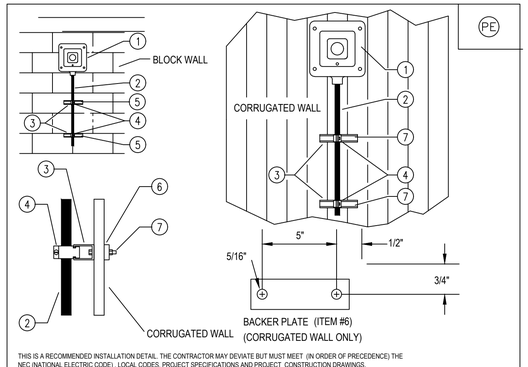
20 TYPICAL LIGHT FIXTURE - CEILING MOUNT



NOTES:
1. ELECTRICAL CONTRACTOR IS TO RUN #10 CONDUCTORS FROM EACH LIGHT FIXTURE TO THE BASE OF THE POLE. ELECTRICAL CONNECTIONS TO THE BRANCH CIRCUIT ARE TO BE MADE AT THE BASE OF THE POLE.

ITEM	DESCRIPTION	QTY	REMARKS
1	LIGHTS PER PLAN DRAWING	A/R	
2	TENNON MOUNTING BRACKET	A/R	
3	TAPERED STEEL POLE (LENGTH AS REQUIRED)	1	

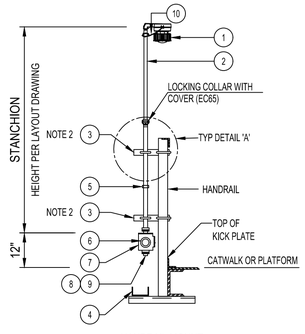
21 TYPICAL MULTI UNIT FLOOD LIGHT POLE



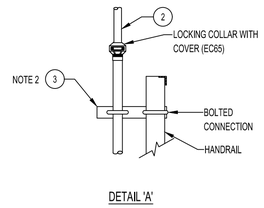
THIS IS A RECOMMENDED INSTALLATION DETAIL. THE CONTRACTOR MAY DEVIATE BUT MUST MEET (IN ORDER OF PRECEDENCE) THE NEC (NATIONAL ELECTRIC CODE) , LOCAL CODES, PROJECT SPECIFICATIONS AND PROJECT CONSTRUCTION DRAWINGS.

ITEM	DESCRIPTION	QTY	REMARKS
1	PHOTOELECTRIC CONTROL PER PLAN DWG.	1	
2	3/4" RGS CONDUIT	A/R	
3	UNISTRUT, GALVANIZED	2	
4	UNISTRUT CONDUIT CLAMP	2	
5	1/4" CINCH ANCHOR FOR BLOCK	4	
6	1 1/2" X 1/4" X 6" LONG PLATE	2	SEE BACK PLATE DETAIL
7	1/4"-20 X 3" BOLT, WASHER, LOCK WASHER & NUT 316SS	4	

22 TYPICAL PHOTOELECTRIC CONTROL MOUNTING



HANDRAIL MOUNT



DETAIL 'A'

ITEM	DESCRIPTION*	QTY
1	FIXTURE AS PER LIGHTING LAYOUT & FIXTURE SCHEDULE	1
2	V-SPRING TELESCOPING SAFETY LIGHT POLE C/W LOCKING COLLAR WITH COVER (CROUSE-HINDS V65-H-GC)	1
3	ANGLE IRON MOUNTING BRACKET KIT (CROUSE-HINDS MHK-RAG)	1 SET
4	AS PER TRAY / LIGHTING LAYOUT DRAWING OR 4" CHANNEL TRAY	AS REQ'D
5	LAMACOID CALLOUT LABEL, C/W PANEL AND CIRCUIT NUMBER ATTACHED TO POLE	1
6	TECK90 CABLE CONNECTOR (TO SUIT HAZARDOUS AREA CLASSIFICATION)	2
7	CONDULET BOX C/W FLOATING TERMINAL BLOCK (CROUSE-HINDS GUAX59SA AND 3 X BURNDY BIBD42FX)	1
8	COMBINATION DRAIN & BREATHER (CROUSE-HINDS ECD16)	1
9	1 1/2" TO 1/2" (CROUSE-HINDS RE51SA)	3
10	SAFETY CABLE (nVENT SLK2L3)	1

NOTES
1. ELEVATE FITTING ABOVE PLATFORM KICK PLATE & FACE COVER TOWARDS CATWALK FOR EASY ACCESS.
2. PROVIDE MAXIMUM SPACING BETWEEN BOLTED SUPPORTS FOR STABILITY.

23 TYPICAL LIGHT FIXTURE - TELESCOPING POLE MOUNT

NOTE:
1. THIS IS A RECOMMENDED INSTALLATION DETAIL. THE CONTRACTOR MAY DEVIATE BUT MUST MEET (IN ORDER OF PRECEDENCE) THE NEC (NATION ELECTRIC CODE), LOCAL CODES, PROJECT SPECIFICATIONS AND PROJECT CONSTRUCTION DRAWINGS.

wsp
4221 BALLOON PARK RD NE
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Registered Professional Engineer (Qualified)
CERTIFICATE No.
43358
JEFFREY L. JORGENSEN
Date Signed 11/15/22
ARIZONA, U.S.A.

PROJECT:
KAYENTA WWTP IMPROVEMENTS PROJECT

NAVAJO TRIBAL UTILITY AUTHORITY

WSP PROJECT No:
2151700032

REVISIONS

NO.	DATE	DESCRIPTION

DESIGNED BY:	RSB
DRAWN BY:	RSB
CHECKED BY:	JE
DATE:	09NOV2022

SHEET TITLE:
ELECTRICAL
TYPICAL DETAILS

SHEET NUMBER:	REV. #
10-GEN-E-3003	0
SHEET 156 OF 223	