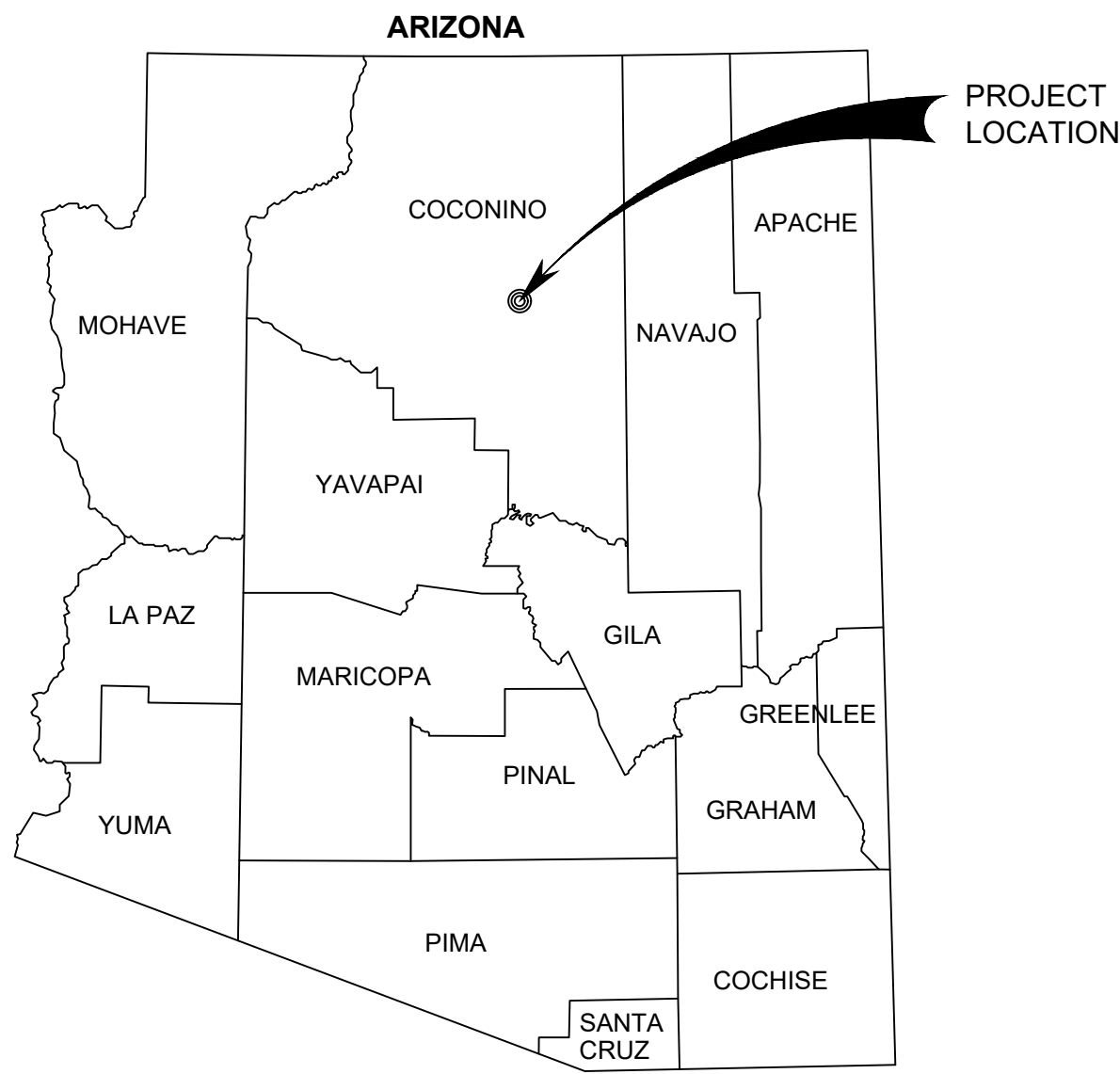




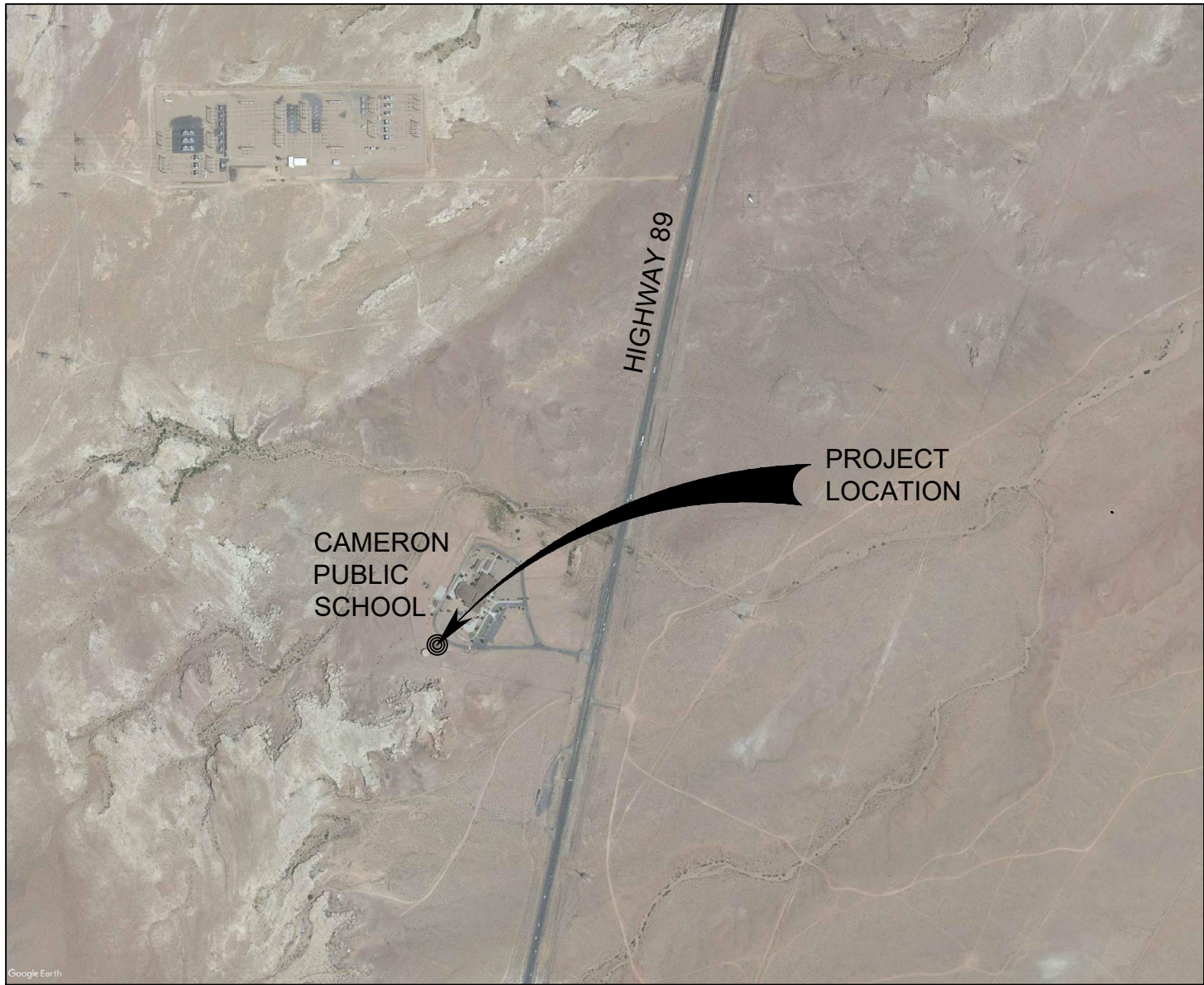
# NAVAJO TRIBAL UTILITY AUTHORITY

## CAMERON SCHOOL WATER INTER-TIE

CAMERON, ARIZONA



LOCATION MAP  
NTS



VICINITY MAP  
SCALE= 1"=1000"

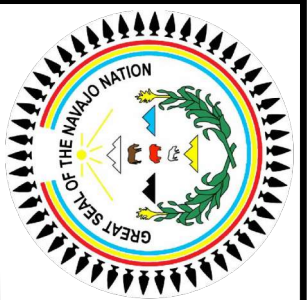
### INDEX OF DRAWINGS

SHEET NO.	SHEET TITLE
1	COVER SHEET AND INDEX OF DRAWINGS
2	GENERAL NOTES
3	WATER DISTRIBUTION LAYOUT
4	PUMP STATION PIPING ABANDONMENT PLAN
5	DETAILS
6	DETAILS
7	DETAILS

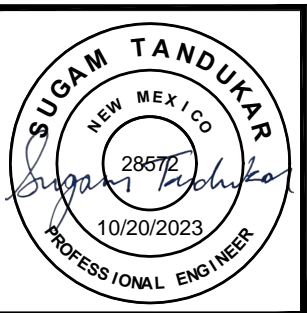
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DRAWN BY:	AO. MS
CHECKED BY:	ST
DATE:	OCT. 2023



NAVAJO TRIBAL UTILITY AUTHORITY  
CAMERON SCHOOL WATER INTER-TIE  
CAMERON, ARIZONA  
COVER SHEET AND INDEX OF DRAWINGS



JOB NO.  
2251700012

SHEET 1 OF 7



GENERAL NOTES:

QUALITY CONTROL

- 1.0
- UNLESS OTHERWISE STATED, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE MARICOPA ASSOCIATION OF GOVERNMENTS (MAG) UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 2020 EDITION (REFERRED TO HERIN BY STD SPEC SECTION NUMBER AND STD. DWG NUMBER).

- 2.0
- IF DURING THE COURSE OF WORK THE CONTRACTOR BECOMES AWARE OF A CONTRADICTION IN THE REQUIREMENTS BETWEEN THE STANDARD SPECIFICATIONS AND DRAWINGS AND THESE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

SAFETY

- 3.0
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOBSITE SAFETY AND FOR KNOWLEDGE AND COMPLIANCE WITH APPLICABLE O.S.H.A. STANDARDS AND OTHER FEDERAL, STATE, TRIBAL AND LOCAL SAFETY AND WORKPLACE COMPLIANCE REQUIREMENTS.

EXISTING CONDITIONS

- 4.0
- THE LOCATION OF EXISTING UTILITIES, AS SHOWN ON THE DRAWINGS, ARE APPROXIMATE. THE CONTRACTOR IS RESPONSIBLE FOR THE ACCURATE LOCATION IN THE FIELD.
- 5.0
- CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF EXISTING WATERLINE.
- 6.0
- IF EVIDENCE OF SUBSURFACE ARCHAEOLOGICAL OR HISTORIC FEATURES ARE OBSERVED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY HALT CONSTRUCTION IN THE AREA, PROTECT THE SITE, AND NOTIFY THE ENGINEER. NO CONSTRUCTION ACTIVITY SHALL OCCUR WITHIN THE 50 FOOT BUFFER AROUND THE EXISTING ARCHAEOLOGICAL SITE UNTIL APPROVED.

WORK AREA

- 7.0
- THE CONTRACTOR SHALL CONFINE WORK TO WITHIN THE PRESCRIBED CONSTRUCTION LIMITS.
- 8.0
- THE CONTRACTOR SHALL COORDINATE ACTIVITIES WITH THE OWNER AND ENGINEER TO MINIMIZE DISRUPTIONS TO ADJACENT PROPERTIES AND TRAFFIC.
- 9.0
- THE CONTRACTOR SHALL ACQUIRE THE NECESSARY LICENSES OR PERMITS WHEN WORKING WITHIN OR NEAR A RIGHT-OF-WAY, STREET, ROAD OR HIGHWAY, SIDEWALK, TRAIL, OR OTHER PUBLIC THOROUGHFARE AND SHALL INCORPORATE THE REQUIREMENTS OF SAID LICENSE/PERMIT.
- 10.0
- WHEN WORKING IN OR NEAR TRAFFIC, THE CONTRACTOR SHALL (AT A MINIMUM) PROVIDE ADEQUATE SIGNS, BARRICADES, WARNING LIGHTS, AND FLAGGERS TO ENSURE THE SAFETY/PROTECTION OF THE PUBLIC, EMPLOYEES, AND THE WORK IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), LATEST EDITION.
- 11.0
- IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ACCESS TO EXISTING RESIDENCES, BUSINESSES, TURNOUTS AND INTERSECTING ROADS AT ALL TIMES DURING CONSTRUCTION.
- 12.0
- IF A FENCED/SECURE STORAGE AREA FOR MATERIALS AND EQUIPMENT IS DESIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AN AREA OFF THE PROJECT SITE. USING THE AREA FOR STORAGE SHALL COMPLY WITH LOCAL ZONING OR OTHER ORDINANCES AND SHALL BE PERMITTED, IF REQUIRED.
- 13.0
- OVERNIGHT PARKING OF CONTRACTOR'S EQUIPMENT SHALL NOT OBSTRUCT ACCESS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL PARK OR STORE EQUIPMENT AT SAFE DISTANCES FROM THE TRAVELED WAY.
- 14.0
- THE CONTRACTOR IS RESPONSIBLE FOR SOIL EROSION, DRAINAGE CONTROL AND DUST DURING CONSTRUCTION AND MUST, WHEN APPLICABLE, PREPARE AND ADHERE TO A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED ACCORDING TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY'S CONSTRUCTION GENERAL PERMIT (CGP).

OTHER UTILITIES

- 15.0
- THE CARE AND PROTECTION OF OTHER UTILITIES, STREET APPURTENANCES, DRAINAGE STRUCTURES AND OTHER INFRASTRUCTURE, WHETHER PUBLIC OR PRIVATE, THAT ARE NOT PART OF THE INTENDED WORK IS THE RESPONSIBILITY OF THE CONTRACTOR.
- 16.0
- WHERE TRENCHING AROUND OR BENEATH EXISTING UTILITY LINES OCCURS, THE CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING WITH THE UTILITY OWNER AND FOR SUPPORTING THE UTILITY LINE, AS REQUIRED BY THE UTILITY OWNER, DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASSURING THE UTILITY IS ADEQUATELY SUPPORTED BY COMPACTED BACKFILL OR OTHER MEANS AT THE COMPLETION OF CONSTRUCTION AS REQUIRED BY THE UTILITY OWNER. IF THE TECHNIQUES REQUIRED FOR STABILIZING OTHER UTILITIES CONFLICT WITH THE REQUIREMENTS OF THIS PROJECT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

EXCESS MATERIAL & DEBRIS

- 17.0
- ANY EXTRA NATURAL SOIL (CLEAN OF OIL AND CHEMICALS) REMAINING AFTER BACKFILL AND COMPACTION MAY BE DISPOSED AT A SITE APPROVED BY THE OWNER. CONTRACTOR SHALL HAUL DEBRIS AND NON-NATURAL SOILS TO A CERTIFIED LANDFILL.

WATERLINE CONSTRUCTION

- 18.0
- ALL TEES, BENDS, FITTINGS, ETC. SHALL BE RESTRAINED WITH MECHANICAL JOINT RESTRAINTS AND THRUST BLOCKS PER STD DWG 303-1, 303-2, DETAIL 5, AND MODIFIED SPECIFICATION 610.4.3.
- 19.0
- WATERLINE SHALL HAVE FLANGED FITTINGS ABOVE GRADE AND MECHANICAL JOINT FITTINGS BELOW GRADE. HORIZONTAL SEPARATION SHALL BE MINIMUM 6-FEET OD TO OD FROM EXISTING 8-INCH PVC C-900 WATERLINE.
- 20.0
- PIPES AND FITTINGS SHALL BE INSULATED ABOVE GRADE AND UP TO 24-INCH BELOW GRADE WITH 1.5-INCH CLOSED CELL FOAM INSULATION WITH A R-FACTOR OF 4 PER INCH, MOLDED TO FIT THE 4-INCH PIPE FITTINGS. INSULATIONS SHALL BE COVERED BY AN ALUMINUM JACKET THAT IS FORMED TO FIT THE PIPE INSULATION.
- 21.0
- PVC WATER SERVICE LINE SHALL BE 4" C900 PVC WITH A MINIMUM PRESSURE RATING OF 200 PSI.
- 22.0
- DUCTILE IRON WATER SERVICE LINE SHALL HAVE A MINIMUM PRESSURE RATING OF 200 PSI. WHEN BURIED, DUCTILE IRON PIPE SHALL BE WRAPPED IN A POLYETHYLENE PROTECTIVE WRAPPING PER STD SPEC SECTION 610.6.

RECORD DRAWINGS

- 23.0
- THE CONTRACTOR SHALL PREPARE AND MAINTAIN AN UP-TO-DATE SET OF RECORD DRAWINGS FOR THE PROJECT. THESE PLANS SHALL BE KEPT CURRENT DAILY AND SHALL BE MADE AVAILABLE FOR REVIEW AS REQUESTED BY THE ENGINEER. THE COST OF PREPARING AND MAINTAINING A RECORD DRAWING SET SHALL BE INCIDENTAL TO THE PROJECT.

CONTACTS:

WSP ENVIRONMENT & INFRASTRUCTURE INC.

SUGAM TANDUKAR, P.E.  
(505) 821-1801  
sugam.tandukar@wsp.com

NAVAJO TRIBAL UTILITY AUTHORITY

ADRIAN TOLEDO, HQ W/WW PROJECT MANAGER  
(928) 729-6191  
adriant@ntua.com

CAMERON ELEMENTARY SCHOOL

ALEX WOODY, MAINTENANCE FOREMAN  
TUBA CITY UNIFIED SCHOOL DISTRICT #15  
(928) 283-1146  
awoody@tcusd.org

REVISION MADE		BY		DATE	
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2					
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DESIGNED BY:	ST. MS
DRAWN BY:	AD. MS
CHECKED BY:	ST
DATE:	OCT. 2023

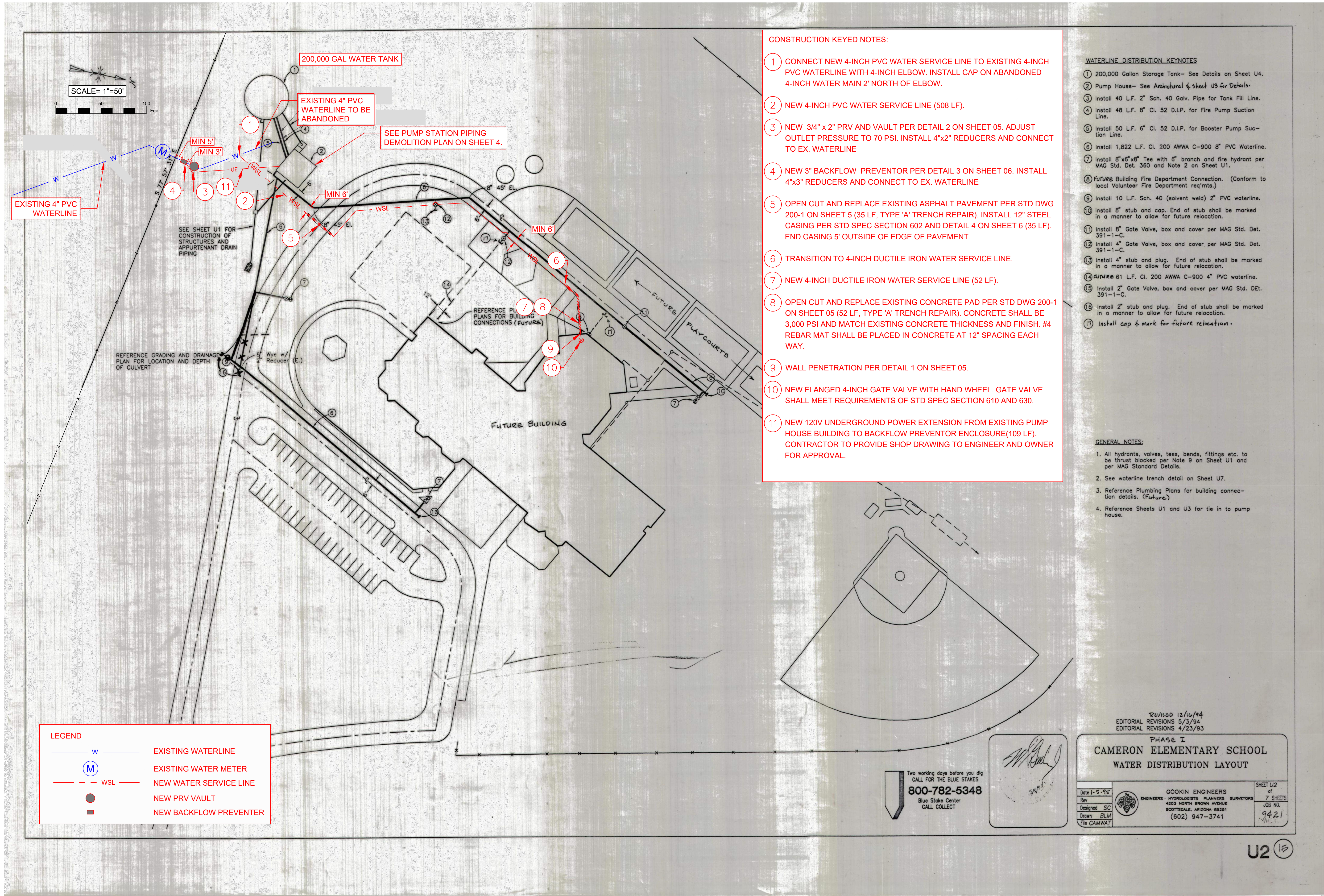


NAVAJO TRIBAL UTILITY AUTHORITY  
CAMERON SCHOOL WATER INTER-TIE  
CAMERON, ARIZONA  
GENERAL NOTES



JOB NO.  
2251700012





CONSTRUCTION KEYED NOTES:

- 1 CONNECT NEW 4-INCH PVC WATER SERVICE LINE TO EXISTING 4-INCH PVC WATERLINE WITH 4-INCH ELBOW. INSTALL CAP ON ABANDONED 4-INCH WATER MAIN 2' NORTH OF ELBOW.
- 2 NEW 4-INCH PVC WATER SERVICE LINE (508 LF).
- 3 NEW 3/4" x 2" PRV AND VAULT PER DETAIL 2 ON SHEET 05. ADJUST OUTLET PRESSURE TO 70 PSI. INSTALL 4"x2" REDUCERS AND CONNECT TO EX. WATERLINE
- 4 NEW 3" BACKFLOW PREVENTOR PER DETAIL 3 ON SHEET 06. INSTALL 4"x3" REDUCERS AND CONNECT TO EX. WATERLINE
- 5 OPEN CUT AND REPLACE EXISTING ASPHALT PAVEMENT PER STD DWG 200-1 ON SHEET 5 (35 LF, TYPE 'A' TRENCH REPAIR). INSTALL 12" STEEL CASING PER STD SPEC SECTION 602 AND DETAIL 4 ON SHEET 6 (35 LF). END CASING 5' OUTSIDE OF EDGE OF PAVEMENT.
- 6 TRANSITION TO 4-INCH DUCTILE IRON WATER SERVICE LINE.
- 7 NEW 4-INCH DUCTILE IRON WATER SERVICE LINE (52 LF).
- 8 OPEN CUT AND REPLACE EXISTING CONCRETE PAD PER STD DWG 200-1 ON SHEET 05 (52 LF, TYPE 'A' TRENCH REPAIR). CONCRETE SHALL BE 3,000 PSI AND MATCH EXISTING CONCRETE THICKNESS AND FINISH. #4 REBAR MAT SHALL BE PLACED IN CONCRETE AT 12" SPACING EACH WAY.
- 9 WALL PENETRATION PER DETAIL 1 ON SHEET 05.
- 10 NEW FLANGED 4-INCH GATE VALVE WITH HAND WHEEL. GATE VALVE SHALL MEET REQUIREMENTS OF STD SPEC SECTION 610 AND 630.
- 11 NEW 120V UNDERGROUND POWER EXTENSION FROM EXISTING PUMP HOUSE BUILDING TO BACKFLOW PREVENTOR ENCLOSURE(109 LF). CONTRACTOR TO PROVIDE SHOP DRAWING TO ENGINEER AND OWNER FOR APPROVAL.

WATERLINE DISTRIBUTION KEYNOTES

- 1 200,000 Gallon Storage Tank- See Details on Sheet U4.
- 2 Pump House- See Architectural & Sheet U3 for Details.
- 3 Install 40 L.F. 2" Sch. 40 Galv. Pipe for Tank Fill Line.
- 4 Install 48 L.F. 8" Cl. 52 D.I.P. for Fire Pump Suction Line.
- 5 Install 50 L.F. 6" Cl. 52 D.I.P. for Booster Pump Suction Line.
- 6 Install 1,822 L.F. Cl. 200 AWWA C-900 8" PVC Waterline.
- 7 Install 8"x6"x8" Tee with 6" branch and fire hydrant per MAG Std. Det. 360 and Note 2 on Sheet U1.
- 8 FUTURE Building Fire Department Connection. (Conform to local Volunteer Fire Department req'mts.)
- 9 Install 10 L.F. Sch. 40 (solvent weld) 2" PVC waterline.
- 10 Install 8" stub and cap. End of stub shall be marked in a manner to allow for future relocation.
- 11 Install 8" Gate Valve, box and cover per MAG Std. Det. 391-1-C.
- 12 Install 4" Gate Valve, box and cover per MAG Std. Det. 391-1-C.
- 13 Install 4" stub and plug. End of stub shall be marked in a manner to allow for future relocation.
- 14 FUTURE 61 L.F. Cl. 200 AWWA C-900 4" PVC waterline.
- 15 Install 2" Gate Valve, box and cover per MAG Std. Det. 391-1-C.
- 16 Install 2" stub and plug. End of stub shall be marked in a manner to allow for future relocation.
- 17 Install cap & mark for future relocation.

GENERAL NOTES:

1. All hydrants, valves, tees, bends, fittings etc. to be thrust blocked per Note 9 on Sheet U1 and per MAG Standard Details.
2. See waterline trench detail on Sheet U7.
3. Reference Plumbing Plans for building connection details. (Future)
4. Reference Sheets U1 and U3 for tie in to pump house.

Two working days before you dig  
CALL FOR THE BLUE STAKES  
**800-782-5348**  
Blue Stake Center  
CALL COLLECT

Revised 12/16/94  
EDITORIAL REVISIONS 5/3/94  
EDITORIAL REVISIONS 4/23/93

PHASE I  
**CAMERON ELEMENTARY SCHOOL**  
WATER DISTRIBUTION LAYOUT

Date 1-5-95  
Rev  
Designed SC  
Drawn BLM  
File CAMWAT  
GOOKIN ENGINEERS  
ENGINEERS HYDROLOGISTS PLANNERS SURVEYORS  
4003 NORTH BROWN AVENUE  
SCOTTSDALE, ARIZONA 85251  
(602) 947-3741  
SHEET U2  
of  
7 SHEETS  
JOB NO.  
9421

U2

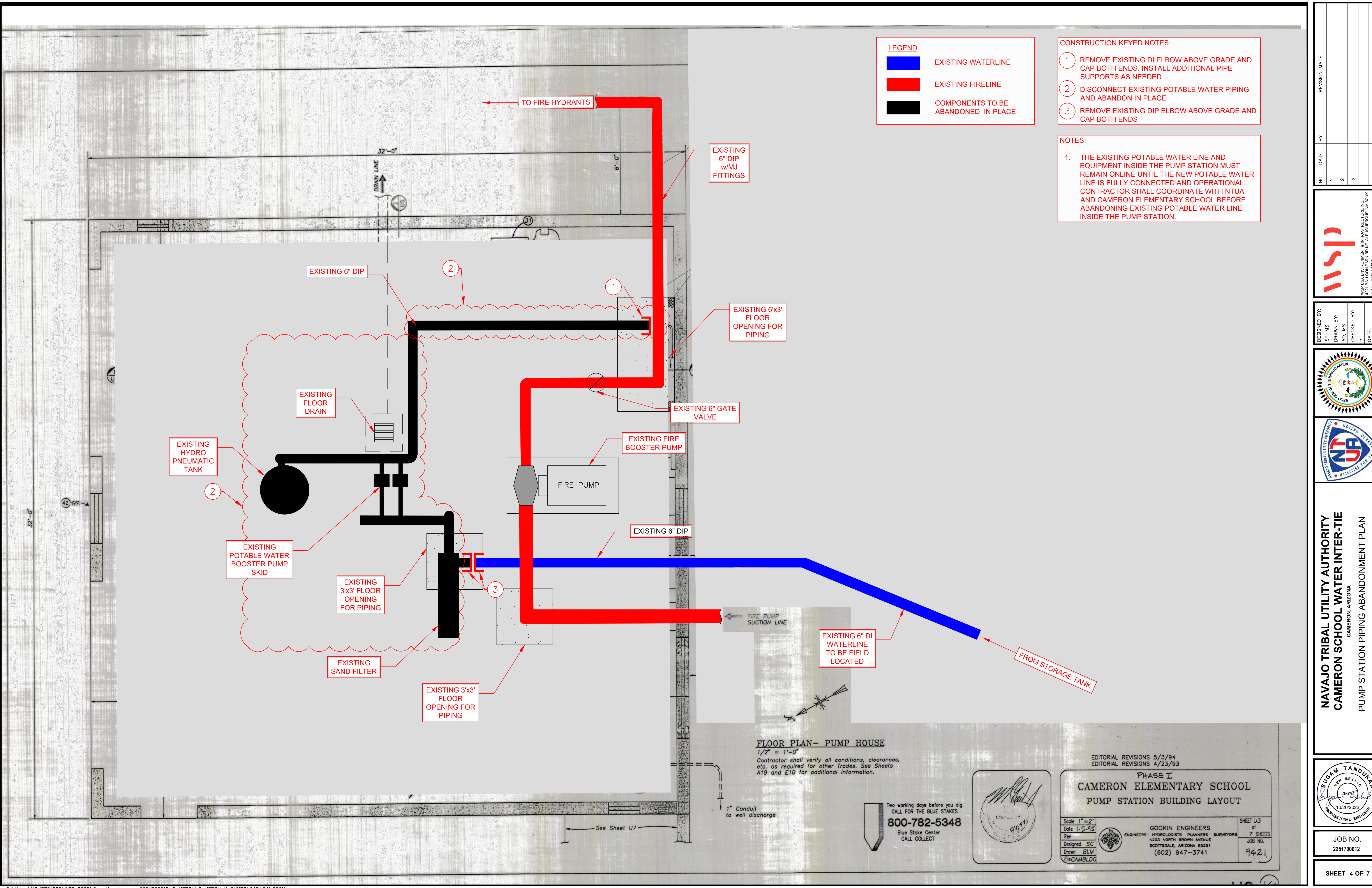
NAVAJO TRIBAL UTILITY AUTHORITY  
**CAMERON SCHOOL WATER INTER-TIE**  
CAMERON, ARIZONA  
WATER DISTRIBUTION LAYOUT

SUGAM TANDUKER  
NEW MEXICO  
28672  
10/20/2023  
PROFESSIONAL ENGINEER

JOB NO.  
2251700012

SHEET 3 OF 7





**LEGEND**

- EXISTING WATERLINE
- EXISTING FIRELINE
- COMPONENTS TO BE ABANDONED IN PLACE

**CONSTRUCTION KEYED NOTES:**

- REMOVE EXISTING DI ELBOW ABOVE GRADE AND CAP BOTH ENDS. INSTALL ADDITIONAL PIPE SUPPORTS AS NEEDED
- DISCONNECT EXISTING POTABLE WATER PIPING AND ABANDON IN PLACE
- REMOVE EXISTING DIP ELBOW ABOVE GRADE AND CAP BOTH ENDS

**NOTES:**

- THE EXISTING POTABLE WATER LINE AND EQUIPMENT INSIDE THE PUMP STATION MUST REMAIN ONLINE UNTIL THE NEW POTABLE WATER LINE IS FULLY CONNECTED AND OPERATIONAL. CONTRACTOR SHALL COORDINATE WITH NTUA AND CAMERON ELEMENTARY SCHOOL BEFORE ABANDONING EXISTING POTABLE WATER LINE INSIDE THE PUMP STATION.

**FLOOR PLAN- PUMP HOUSE**

1/2" = 1'-0"  
Contractor shall verify all conditions, clearances, etc. as required for other Trades. See Sheets A19 and E10 for additional information.

Two working days before you dig  
CALL FOR THE BLUE STAKES  
**800-782-5348**  
Blue Stake Center  
CALL COLLECT



EDITORIAL REVISIONS 5/3/94  
EDITORIAL REVISIONS 4/23/93

**PHASE I**  
**CAMERON ELEMENTARY SCHOOL**  
**PUMP STATION BUILDING LAYOUT**

Scale 1"=2'		GOOKIN ENGINEERS ENGINEERS · HYDROLOGISTS · PLANNERS · SURVEYORS 4203 NORTH BROWN AVENUE SCOTTSDALE, ARIZONA 85251 (602) 947-3741	SHEET U3 of 7 SHEETS
Date 1-5-95			JOB NO. 9421
Rev			
Designed SC			
Drawn BLM			
File CAMBLDG			

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**WSP**  
WSP USA ENVIRONMENT & INFRASTRUCTURE INC.  
4221 BALLOON PARK RD NE ALBUQUERQUE NM 87109  
TEL: (505) 921-1180

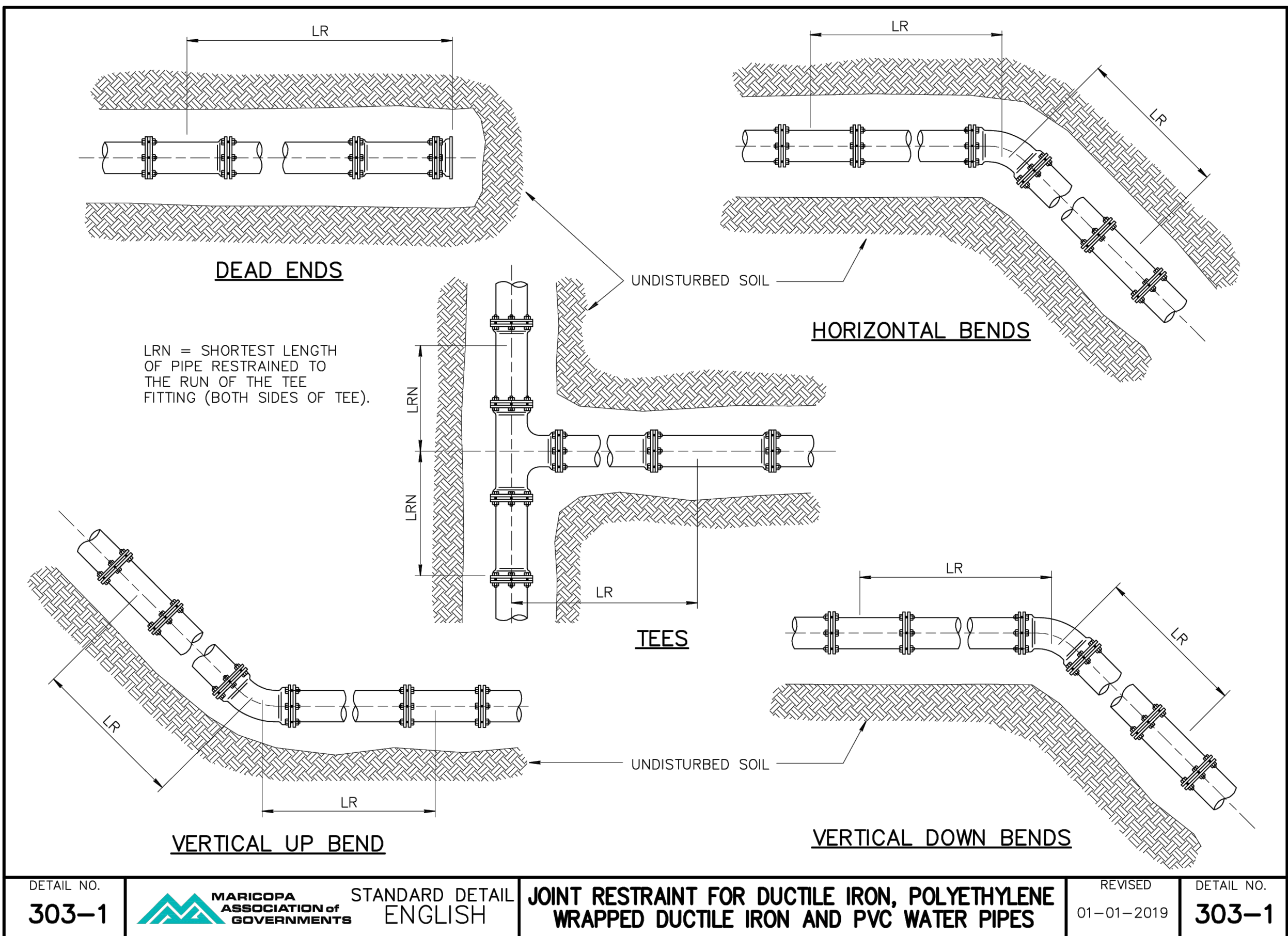
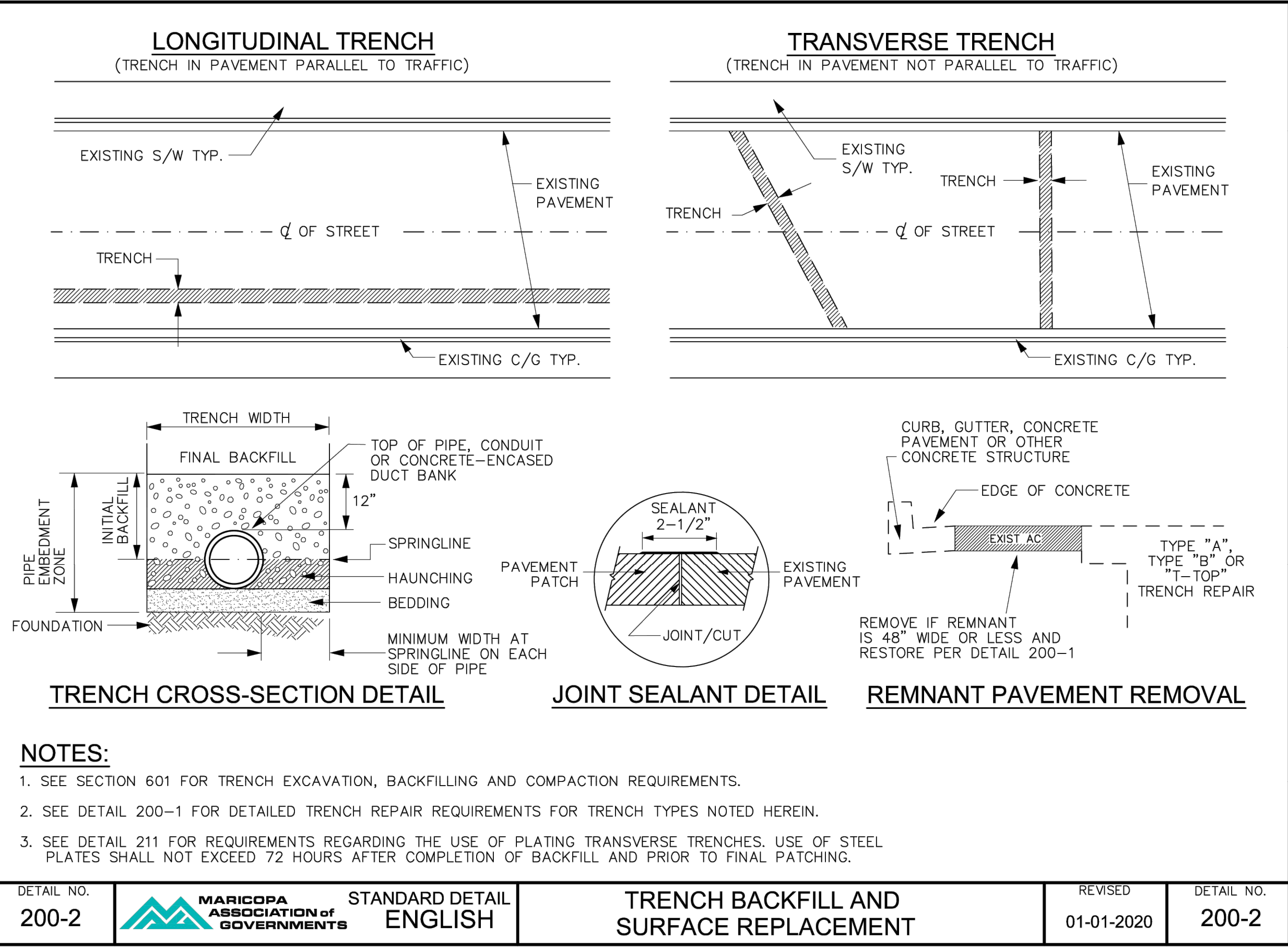
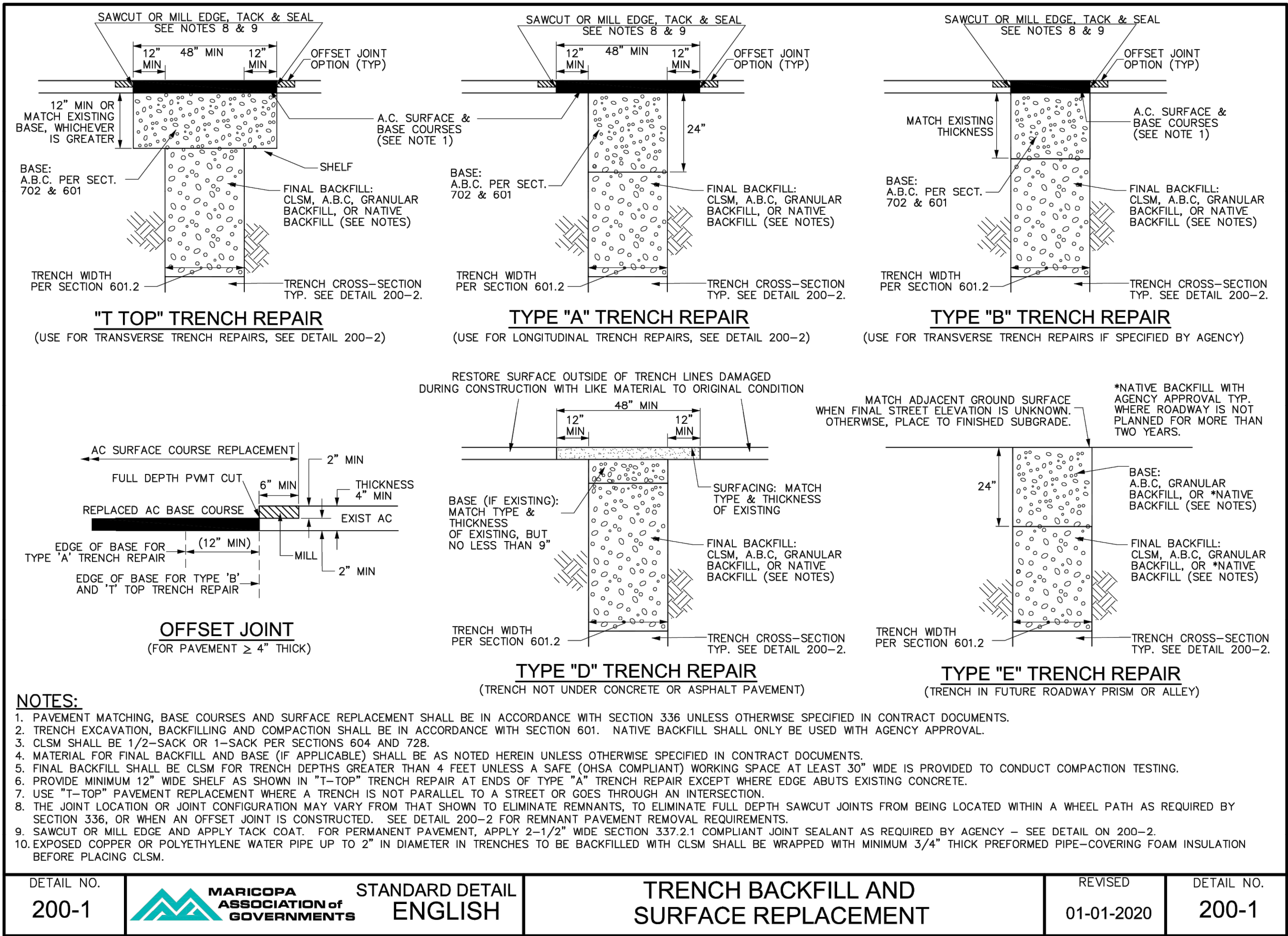
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DRAWN BY: AO. MS  
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DATE: OCT. 2023

**NAVAJO TRIBAL UTILITY AUTHORITY**  
CAMERON SCHOOL WATER INTER-TIE  
CAMERON, ARIZONA  
PUMP STATION PIPING ABANDONMENT PLAN

JOB NO.  
2251700012

SHEET 4 OF 7





RESTRAINED LENGTHS, LR, FOR DUCTILE IRON PIPE										
NOMINAL PIPE SIZE INCHES	HORIZONTAL BENDS			TEES		VERTICAL OFFSETS				
						90° BEND FITTINGS		45° BEND FITTINGS		DEAD ENDS
	90°	45°	22-1/2°	LRN=0°	LRN=10°	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	18	7	4	30	8	31	18	13	7	31
6	25	10	5	43	20	44	25	18	10	44
8	32	13	6	56	34	58	32	24	13	58
10	38	16	8	68	45	69	38	29	16	69
12	45	19	9	80	57	81	45	34	19	81
14	51	21	10	91	68	92	51	38	21	92
16	57	24	11	103	79	104	57	43	24	104
18	62	26	12	113	90	115	62	48	26	115
20	68	28	14	125	100	126	68	52	28	126
24	79	33	16	145	121	147	79	61	33	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		DEAD ENDS
	90°	45°	22-1/2°	LRN=0°	LRN=10°	DOWN BEND	UP BEND	DOWN BEND	UP BEND	
4	26	11	5	69	18	72	26	30	11	72
6	36	15	7	99	47	102	36	42	15	102
8	47	19	9	130	78	133	47	55	19	133
10	56	23	11	157	103	159	56	66	23	159
12	65	27	13	185	131	187	65	77	27	187
14	74	31	15	211	156	214	74	89	31	214
16	82	34	16	238	183	241	82	100	34	241
18	90	37	18	263	207	266	90	110	38	266
20	98	41	20	289	233	292	98	121	41	292
24	113	47	22	337	280	340	113	141	47	340

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



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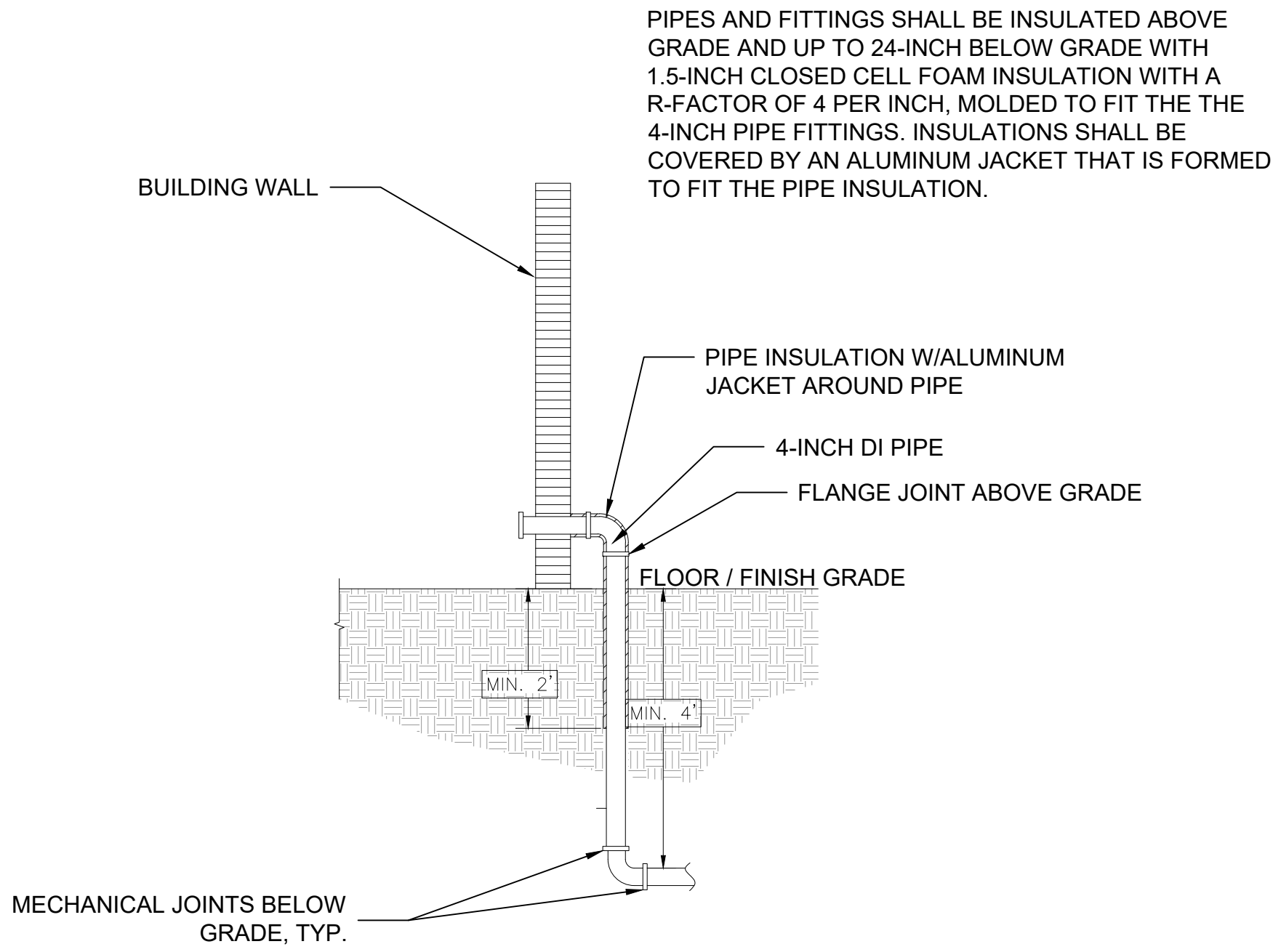


NAVAJO TRIBAL UTILITY AUTHORITY  
CAMERON SCHOOL WATER INTER-TIE  
CAMERON, ARIZONA  
DETAILS



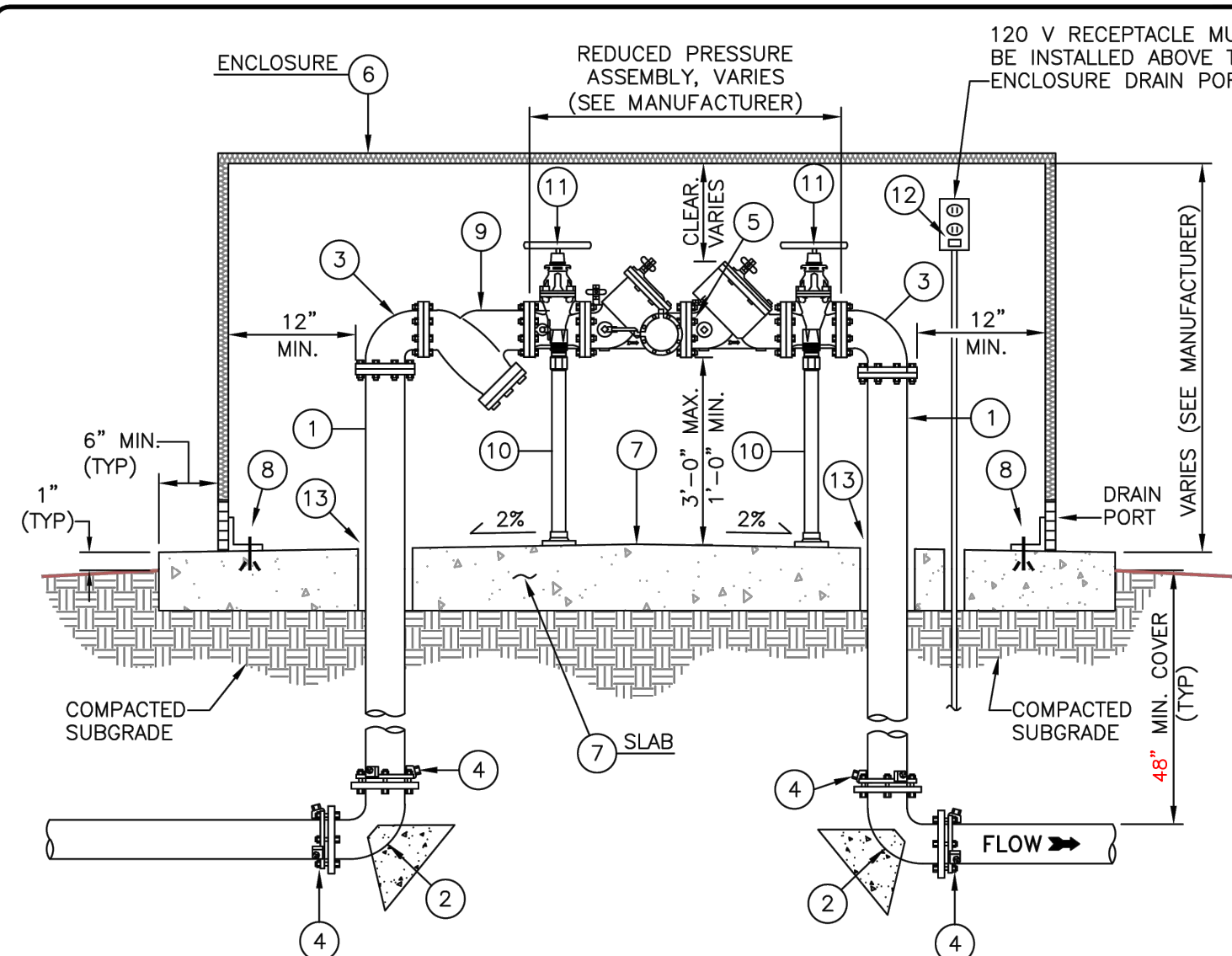
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## TYPICAL WALL PENETRATION

1 N.T.S



### GENERAL NOTES:

- REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY SHALL COMPLY WITH ASSE 1013, AWWA C511 & USC-FCCCHR.
- NO WATERLINE CONNECTIONS ARE ALLOWED BETWEEN THE METER AND BACKFLOW PREVENTION ASSEMBLY.
- BACKFLOW PREVENTION ASSEMBLY SHALL BE INSTALLED WITHIN 5-FT OF THE METER BOX.
- BACKFLOW PREVENTION ASSEMBLY SHALL BE CENTERED ON CONCRETE PAD AND COVERED WITH AN ENCLOSURE.
- MINIMUM HEATED & INSULATED CLASS I, ASSE 1030 WEATHERPROOF ENCLOSURE REQUIRED.
- PROTECT PIPES & BACKFLOW PREVENTION ASSEMBLY FROM FREEZING WITH INSULATION AND HEATING SOURCE.
- STANDARD 120V GFCI ELECTRICAL RECEPTACLE TO BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE FOR OUTDOOR AND DAMP ENCLOSURE OPERATION.
- PIPE MATERIAL SHALL BE CLASS 150 DIP OR BETTER.
- INSTALLATION SHALL BE IN COMPLIANCE WITH ALL APPLICABLE SPECIFICATIONS.
- PROPERTY OWNER SHALL BE RESPONSIBLE FOR MAINTENANCE AND OPERATION OF BACKFLOW PREVENTION ASSEMBLY AND COMPLIANCE WITH REPORTING AND TESTING REQUIREMENTS.
- MINIMUM 24" CLEARANCE FROM WALL ON THE TEST PORTS SIDE OF THE ASSEMBLY FOR TESTING.
- CLEARANCE FOR TOP OF ENCLOSURE TO ASSEMBLY VARIES PER ASSEMBLY MODEL AND ENCLOSURE MANUFACTURER.

SHEET 1 OF 2

DESIGNED BY: NTUA	
DRAWN BY: NTUA	
APPROVED BY: NTUA	
DATE: 05/2017	
PROJECT NO. 105	
SCALE: 1/8" = 1'-0"	
FILE NAME: 2017 05 20 105 105 105 105	
DETAIL NO. WS-26	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION 3" & LARGER OUTDOOR, REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY NTUA HEADQUARTERS FT. DEFENCE, AZ	
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No.	Date	Revised By	By
01	01/10	2010 Addition	A.S.
02	08/17	2017 Update	A.S.
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DESIGNED BY: NTUA	
DRAWN BY: NTUA	
APPROVED BY: NTUA	
DATE: 05/2017	
PROJECT NO. 105	
SCALE: 1/8" = 1'-0"	
FILE NAME: 2017 05 20 105 105 105 105	
DETAIL NO. WS-26a	

NAVAJO TRIBAL UTILITY AUTHORITY ENGINEERING & CONSTRUCTION OPERATIONS DIVISION MATERIAL LIST: 3" & LARGER OUTDOOR, REDUCED PRESSURE PRINCIPLE NTUA HEADQUARTERS FT. DEFENCE, AZ	
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No.	Date	Revised By	By
01	01/10	2010 Addition	A.S.
02	08/17	2017 Update	A.S.
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05			
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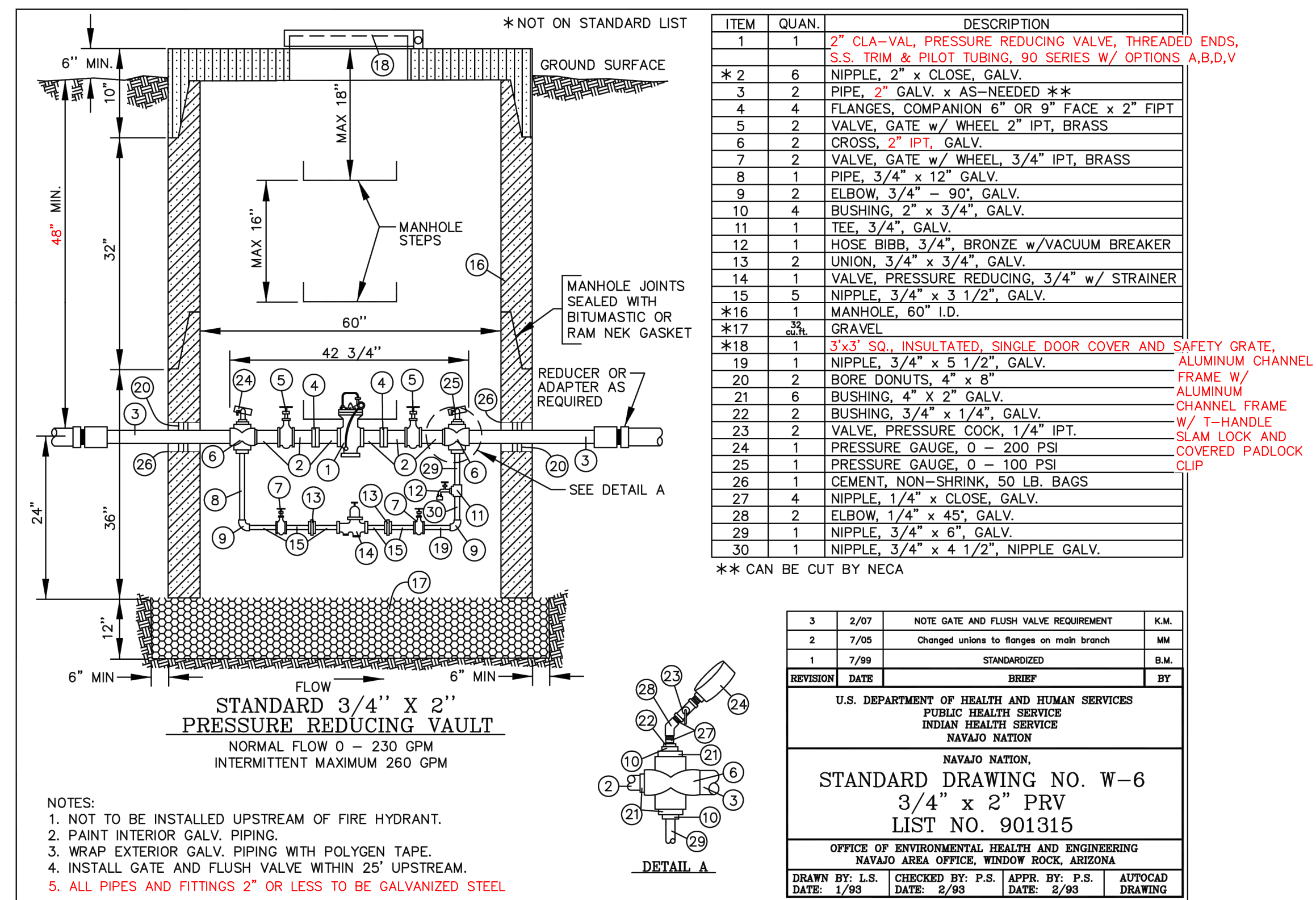
### 3" & LARGER OUTDOOR, REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY

#	QTY	DESCRIPTION
1	A.R.	3" CLASS 350 DIP
2	2	3" CLASS 350 DIP MJ 90 DEGREE ELBOWS
3	2	3" CLASS 350 DIP MJ 90 DEGREE ELBOWS
4	A.R.	LOCKING TYPE RETAINER GLAND / MEGA LUGS
5	1	3" BACKFLOW PREVENTION ASSEMBLY, REDUCED PRESSURE PRINCIPLE, ZURN WILKINS 375A, OAE
6	1	CLASS I, ASSE 1060 HEATED & INSULATED WEATHERPROOF ENCLOSURE W/ DRAIN OUTLETS, ANCHORED TO CONCRETE MOUNTING PAD, HUBBELL HB3E OAE
7	1	6" - 3,000 PSI CONCRETE MOUNTING PAD, DIMENSIONS PER ENCLOSURE MANUFACTURER SPECIFICATION
8	A.R.	ANCHOR SYSTEM FOR ENCLOSURE (HARDWARE)
9	1	3" CAST IRON WYE STRAINER (FLANGED), WILKINS MODEL 'FS' SERIES, OAE
10	2	ADJUSTABLE PIPE SUPPORT
11	2	APPROVED 3" NRS GATE VALVE, NON-RISING STEM
12	1	GFCI ELECTRICAL RECEPTACLE
13	A.R.	MINIMUM 1" ANNULAR AREA AROUND PIPE & ELECTRICAL CONDUIT W/ PIPE SLEEVE

### GENERAL NOTES:

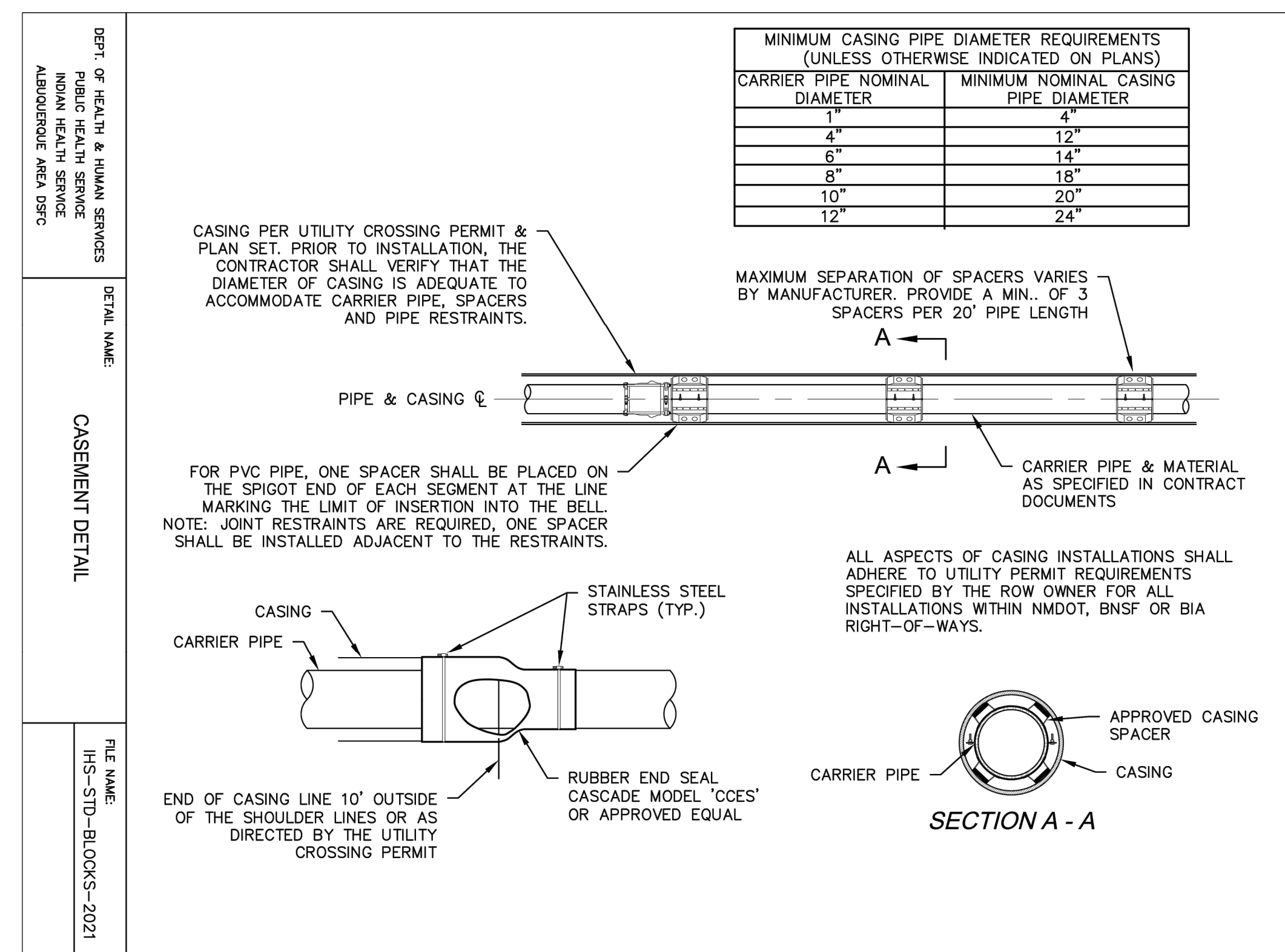
- A.R. = AS REQUIRED
- OAE = OR APPROVED EQUAL

SHEET 2 OF 2



## MODIFIED 3/4" x 2" PRV

N.T.S



## CASING DETAIL

N.T.S

3

## MODIFIED 3" REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY

N.T.S

4

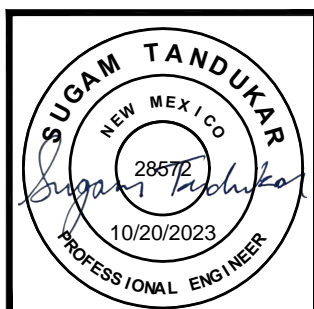
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DESIGNED BY: ST. MS	DRAWN BY: AC. MS	CHECKED BY: ST. MS	DATE: OCT 2023
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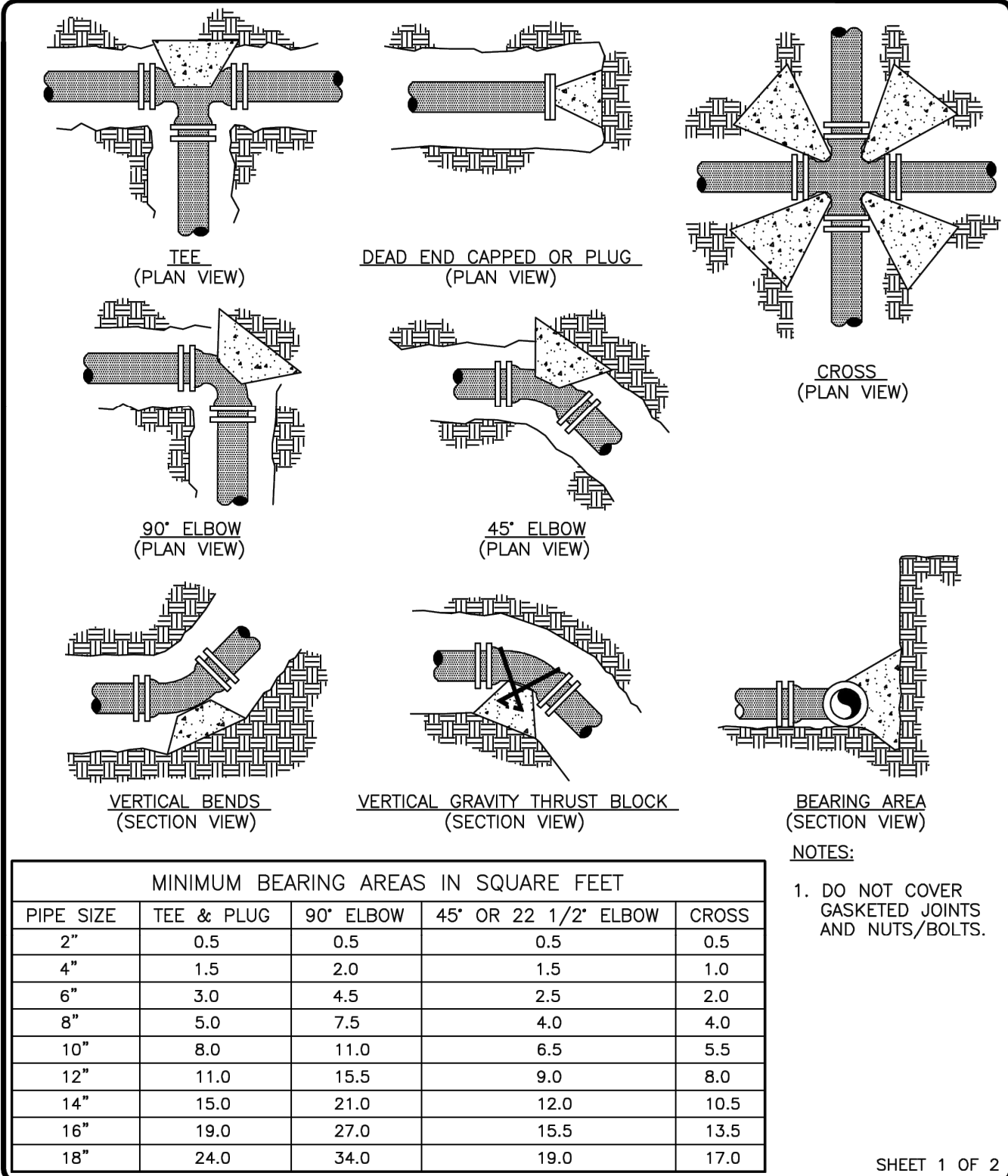
NAVAJO TRIBAL UTILITY AUTHORITY  
CAMERON SCHOOL WATER INTER-TIE  
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DETAILS



JOB NO.  
2251700012

SHEET 6 OF 7





SHEET 1 OF 2

GRAVITY THRUST BLOCK  
(ALSO TO BE USED IN UNSTABLE TRENCH CONDITIONS)  
RESULTANT THRUST IN POUNDS OF FITTINGS AT 100 PSI WATER PRESSURE

TOTAL POUNDS					
PIPE SIZE	DEAD END	90° ELBOW	45° ELBOW	22 1/2° ELBOW	11 1/4° ELBOW
3"	1,232	1,742	943	481	241
4"	1,810	2,559	1,385	706	355
6"	3,739	5,288	2,862	1,459	733
8"	6,433	9,097	4,923	2,510	1,261
10"	9,677	13,685	7,406	3,776	1,897
12"	13,685	19,353	10,474	5,340	2,683
14"	18,385	26,001	14,072	7,174	3,604
16"	23,799	33,628	18,199	9,278	4,661
18"	29,865	42,235	22,858	11,653	5,855
20"	36,644	51,822	28,046	14,298	7,183
24"	52,279	73,934	40,013	20,398	10,249
30"	80,425	113,738	61,554	31,380	15,766
36"	115,209	162,931	88,177	44,952	22,585
42"	155,528	219,850	119,036	60,684	30,489
48"	202,683	286,637	155,127	79,083	39,733
54"	260,214	367,999	199,160	101,531	51,011
60"	298,121	421,606	228,172	116,321	58,442
64"	338,707	479,004	259,235	132,157	66,398

NOTES:

1. THE THRUST (IN TOTAL POUNDS) IN THE CHART IS BASED ON DUCTILE IRON OUTSIDE DIAMETER PIPE DIMENSION. SURGES SHOULD BE CONSIDERED AT TWICE THE NORMAL OPERATING PRESSURE. THE VOLUME OF THE GRAVITY THRUST BLOCK IS BASED ON CONCRETE AT 150 LBS./FT<sup>3</sup>.

2. TO OBTAIN VOLUME OF CONCRETE REQUIRED, USE:  
VOLUME OF CONCRETE(FT<sup>3</sup>)= THRUST(LBS.) x SYSTEM PRESSURE(Psi)/100 PSI // 150 LBS./FT<sup>3</sup>.

E.G.: CALCULATE THE VOLUME OF THE GRAVITY THRUST BLOCK FOR AN 8" x 45° BEND AT AN OPERATING PRESSURE OF 80 PSI.

ANSWER: 4923 LBS. x 160 PSI/100 PSI DIVIDED BY 150 LBS./CUBIC FT. = 52.5 CUBIC FEET OR 2 CUBIC YARDS.

SHEET 2 OF 2

DESIGNED BY:	NTUA
DRAWN BY:	NTUA
CHECKED BY:	NTUA
DATE:	04/08
PROJECT NO.:	
SCALE:	N/A
ROAD FILENAME:	Water Standard
DWG. NO.:	VS-19.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
GRAVITY/THRUST BLOCK DETAILS
NS-0000000000
PT-0000000000

REV. DATE	BY	REVISIONS
01	04/08	Initial
02		
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DESIGNED BY:	NTUA
DRAWN BY:	NTUA
CHECKED BY:	NTUA
DATE:	04/08
PROJECT NO.:	
SCALE:	N/A
ROAD FILENAME:	Water Standard
DWG. NO.:	VS-19a.DWG

NAVAJO TRIBAL UTILITY AUTHORITY
GRAVITY/THRUST BLOCK CHART
NS-0000000000
PT-0000000000

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5 THRUST BLOCK DETAIL  
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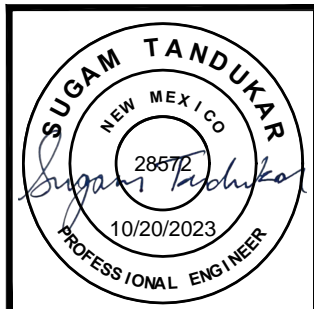
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DATE:	OCT. 2023



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