

PRE-FINAL PLANS  
FOR  
LUKACHUKAI COMMUNITY SCHOOL  
WATERLINE SUPPLY  
LUKACHUKAI, ARIZONA  
OCTOBER 2021

INDEX

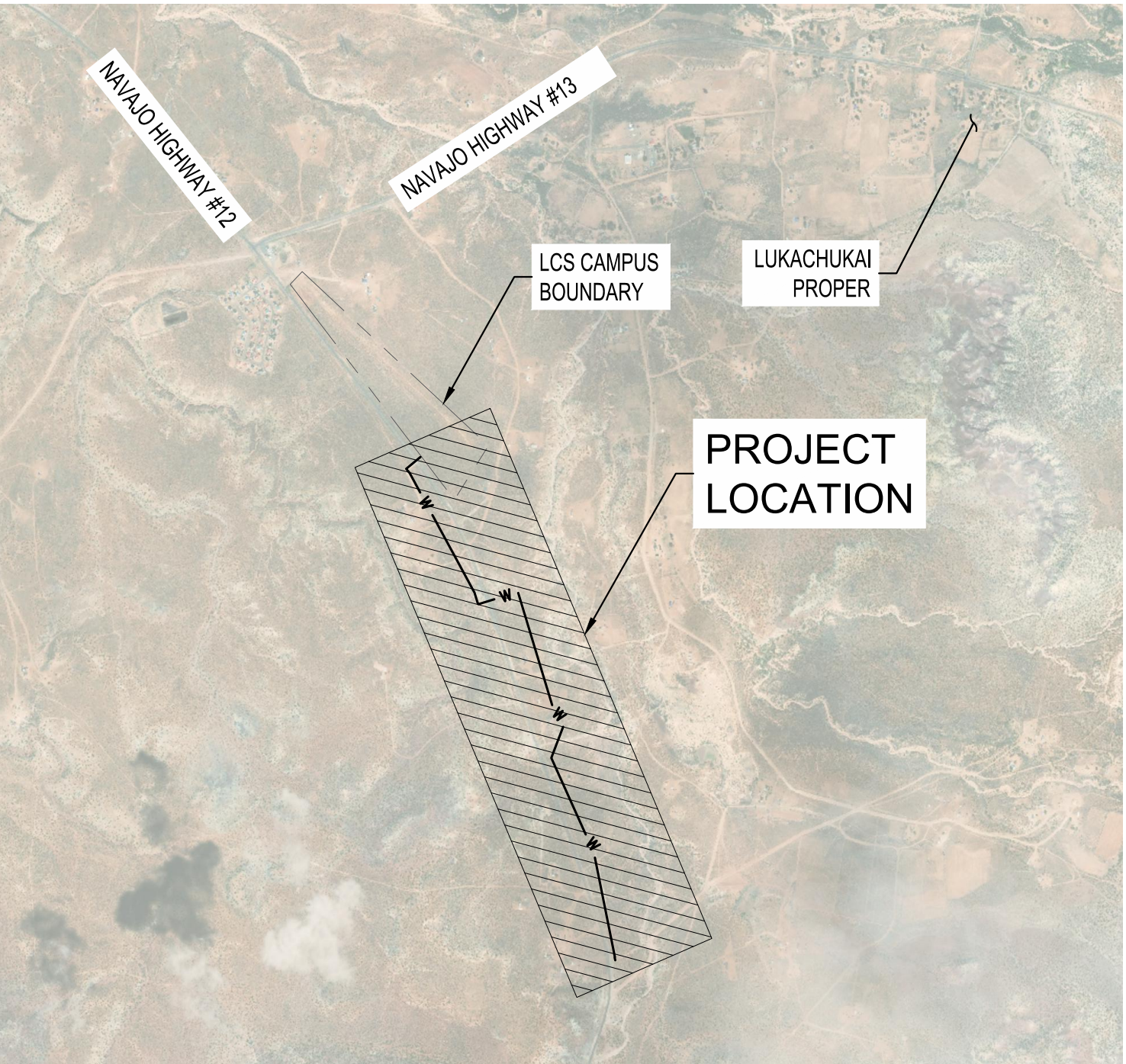
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3	G-03	SURVEY CONTROL SHEET
4	G-04	HYDRAULIC PROFILE

CIVIL SHEETS

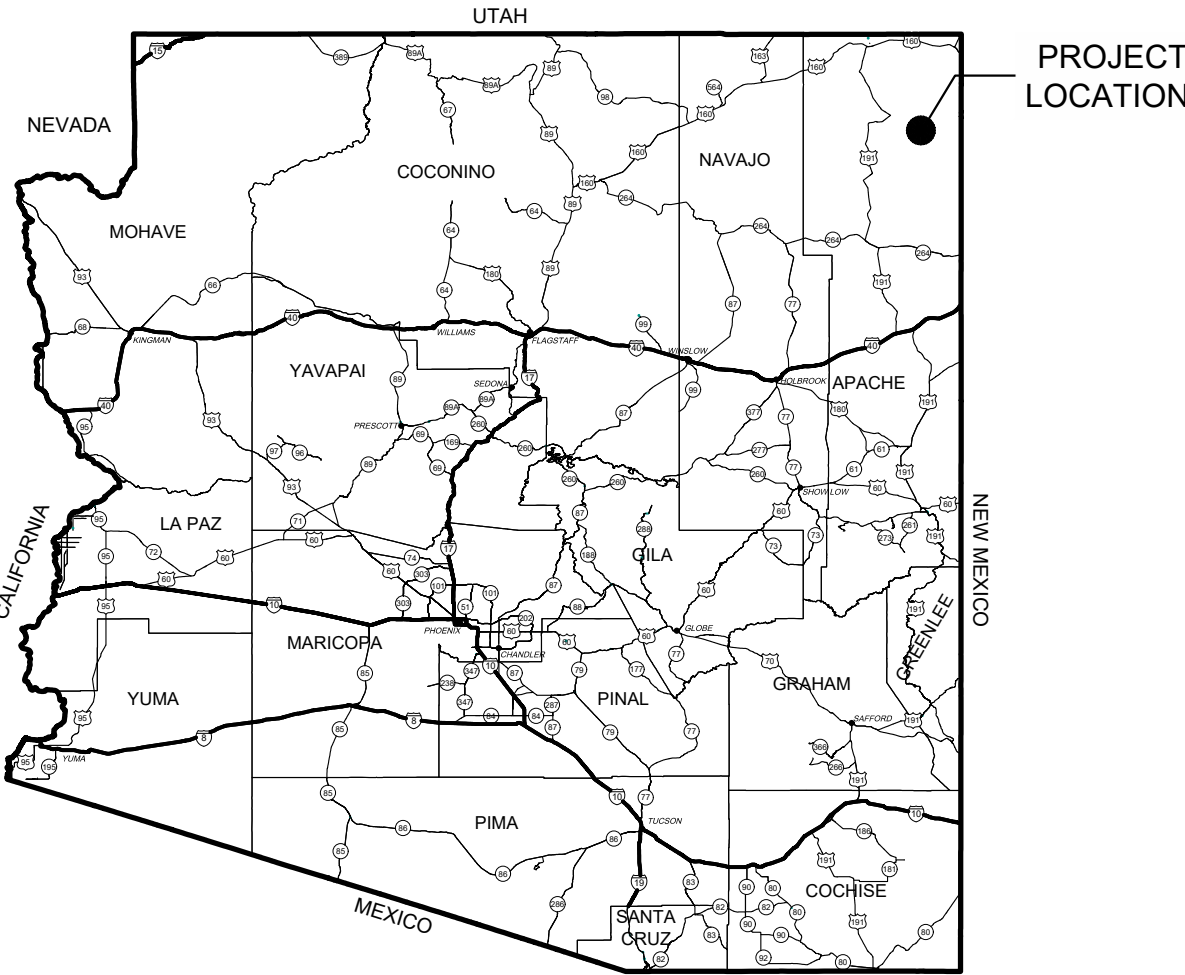
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LOCATION MAP  
SCALE: 1"=2000'  
(ZONE ATLAS MAP NO. D-16)



VICINITY MAP  
SCALE: 1"=80 MILES

ARCHITECTURE / DESIGN / INSPIRATION

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7601 JEFFERSON NE, SUITE 100  
ALBUQUERQUE, NM 87109  
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ARCHITECT

ENGINEER

PROJECT

K-8 Academics  
Lukachukai Community Schools  
Waterline Supply  
Lukachukai, AZ 86507

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SUBMITTAL

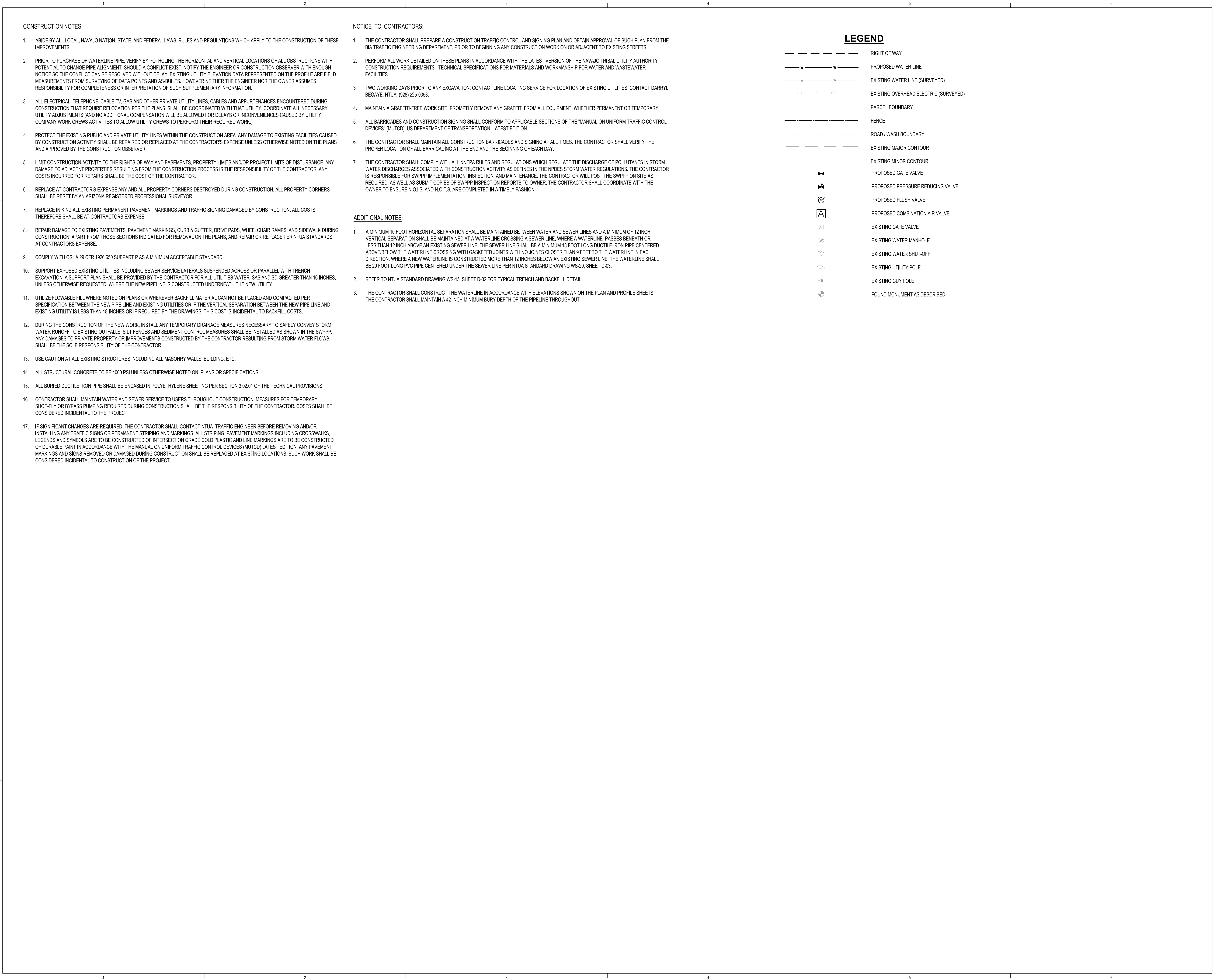
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DRAWN BY	JTL
REVIEWED BY	NDR
DATE	09/03/2021
PROJECT NO.	20-7002.001
DRAWING NAME	

LCS WATERLINE  
SUPPLY  
COVER SHEET

SHEET NO.  
G-01  
OF







**Lukachukai Waterline Control Report**

Control is for Lukachukai Waterline Project. Based on GPS RTK measurements and an OPUS solution using Trimble R8 receivers. The intended use for the control is engineering design and construction for a waterline.

Coordinate System Definition:

Arizona State Plane East 0201 - Modified to ground  
Geodetic Coordinates: NAD83 (2011)  
Vertical Datum: NAVD 88 - Geoid18  
Project Origin: Point #400  
Project Origin Northing: 1965112.095  
Project Origin Easting: 967758.249  
Project Origin Latitude: N 36°23'49.88062"  
Project Origin Longitude: W 109°15'24.63001"  
Ground Scale Factor: 1.000220724  
Basis of Bearings: Grid Bearings  
Units: International Feet

Point Number	Latitude	Longitude	Ellipsoid Height	Orthometric Elevation	Modified Northing	Modified Easting	Description
102	36.400093	-109.255364	6346.88	6404.86	1967630.14	968109.64	3IN AC 3/8 S30 S31 S32 BLM
200	36.400024	-109.251931	6351.08	6417.07	1965165.37	966250.57	1IN YPC - NO 4 REBAR L93818
201	36.40034	-109.261958	6354.77	6418.76	1966245.38	966241.55	1.5IN YPC L336700
203	36.393408	-109.259605	6471.00	6538.78	1960113.96	969912.68	NO 4 REBAR NO CAP
400	36.397189	-109.256842	6384.55	6448.49	1965112.10	967758.25	CP Waterline
10301	36.375097	-109.246365	6504.54	6568.24	1957097.04	970919.03	3IN AC 1/4 S5 S8 2000 BLM
10302	36.375097	-109.255329	6551.12	6615.27	1957071.96	968579.42	3IN AC 25 S6 S7 S8 2000 BLM
10306	36.379795	-109.248821	6489.30	6553.05	1958800.75	970179.57	3IN AC IN CONC B/LA ROADS 19
10307	36.382346	-109.255336	6491.64	6555.45	1959711.46	968251.83	3IN AC 1/4 S6 S5 2000 BLM
10308	36.380995	-109.255347	6486.49	6470.35	1962260.52	968224.24	3IN AC S31 S32 S36 S5 2000 BLM

**SURVEYOR'S CERTIFICATE:**

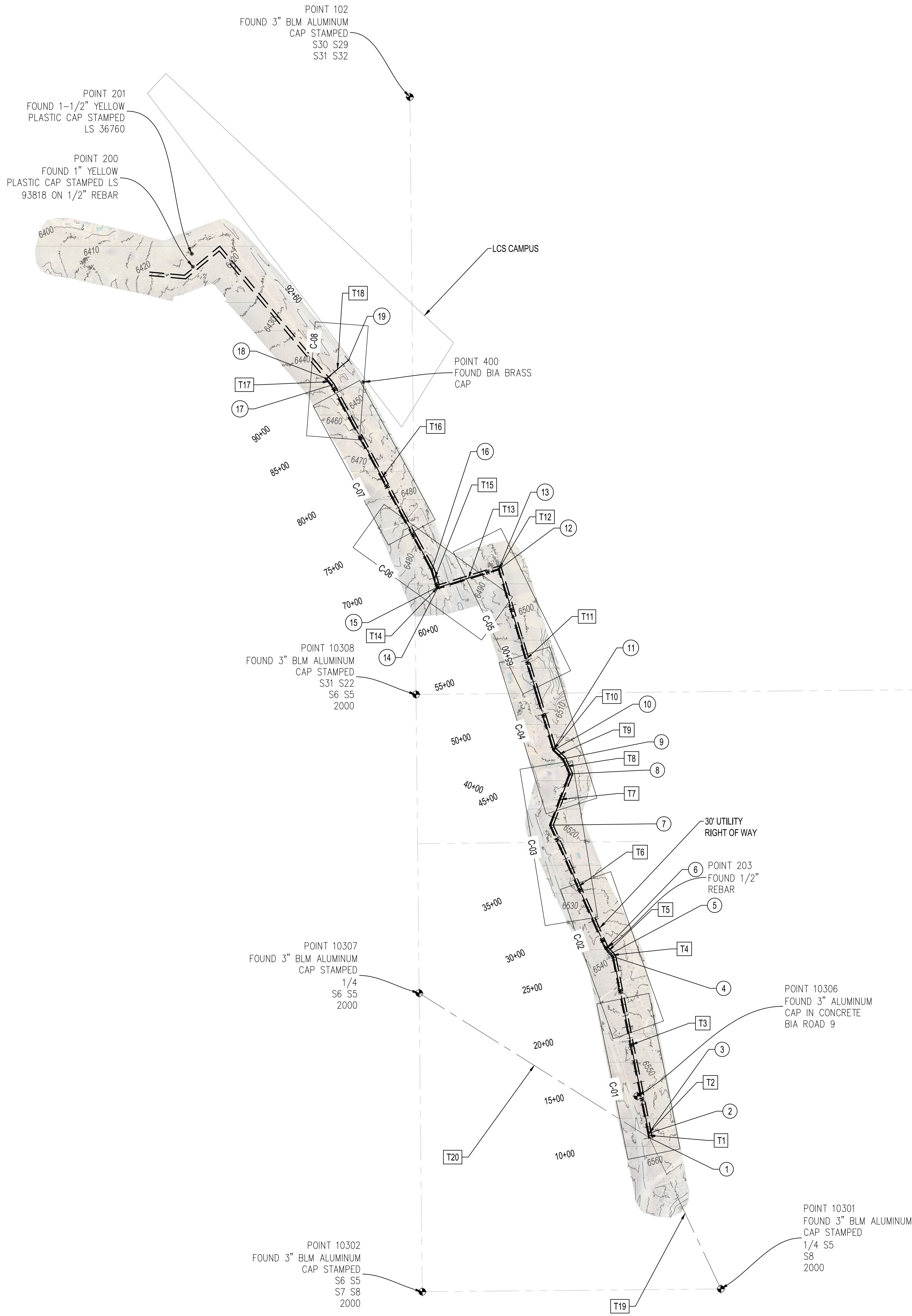
I, Timothy A. Barnett, being a Registered Professional Land Surveyor, licensed in the State of Colorado, do hereby certify that this Control Report was prepared on September 24<sup>th</sup>, 2021, from a survey performed in July and August, 2021 under my direct supervision and checking, and that this Control Report is true and accurate to the best of my knowledge and belief.



DURANGO 555 RiverGate Lane, Suite B4-82 | Durango, CO 81301 | 970.385.2340

POINT TABLE				
POINT #	DESCRIPTION	NORTHING	EASTING	ELEVATION
1	BOP	1958433.22	970286.67	6552.07
2	45° BEND	1958471.75	970278.92	6551.45
3	45° BEND	1958476.46	970282.06	6551.29
4	22.5° BEND	1960032.48	969969.44	6534.65
5	11.25° BEND	1960061.87	969949.72	6534.33
6	22.5° BEND	1960108.76	969902.66	6533.71
7	45° BEND	1961195.92	969414.39	6519.21
8	45° BEND	1961649.04	969586.65	6515.10
9	22.5° BEND	1961781.57	969527.13	6515.26
10	22.5° BEND	1961859.99	969443.96	6513.29
11	11.25° BEND	1961868.91	969439.95	6513.11
12	45° BEND	1963459.62	968959.31	6495.17
13	45° BEND	1963461.95	968954.89	6495.22
14	45° BEND	1963296.13	968419.40	6472.37
15	45° BEND	1963299.38	968413.24	6472.24
16	11.25° BEND	1963452.46	968365.83	6476.19
17	11.25° BEND	1965085.35	967480.73	6439.85
18	6° CROSS	1965143.54	967432.41	6437.76
19	EOP	1965304.98	967626.80	6438.79

TANGENT TABLE		
ID	LENGTH	BEARING
T1	39.30	N11° 21' 36"W
T2	5.66	N33° 38' 24"E
T3	1587.12	N11° 21' 36"W
T4	35.39	N33° 51' 36"W
T5	66.43	N45° 06' 34"W
T6	1191.77	N24° 11' 09"W
T7	484.76	N20° 48' 51"E
T8	145.28	N24° 11' 09"W
T9	114.31	N46° 41' 10"W
T10	9.78	N24° 11' 09"W
T11	1661.74	N16° 48' 44"W
T12	5.00	N62° 12' 24"W
T13	560.57	S72° 47' 37"W
T14	6.97	N62° 12' 24"W
T15	160.25	N17° 12' 33"W
T16	1857.35	N28° 27' 34"W
T17	75.63	N39° 42' 34"W
T18	252.69	N50° 17' 26"E



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Lukachukai Community Schools  
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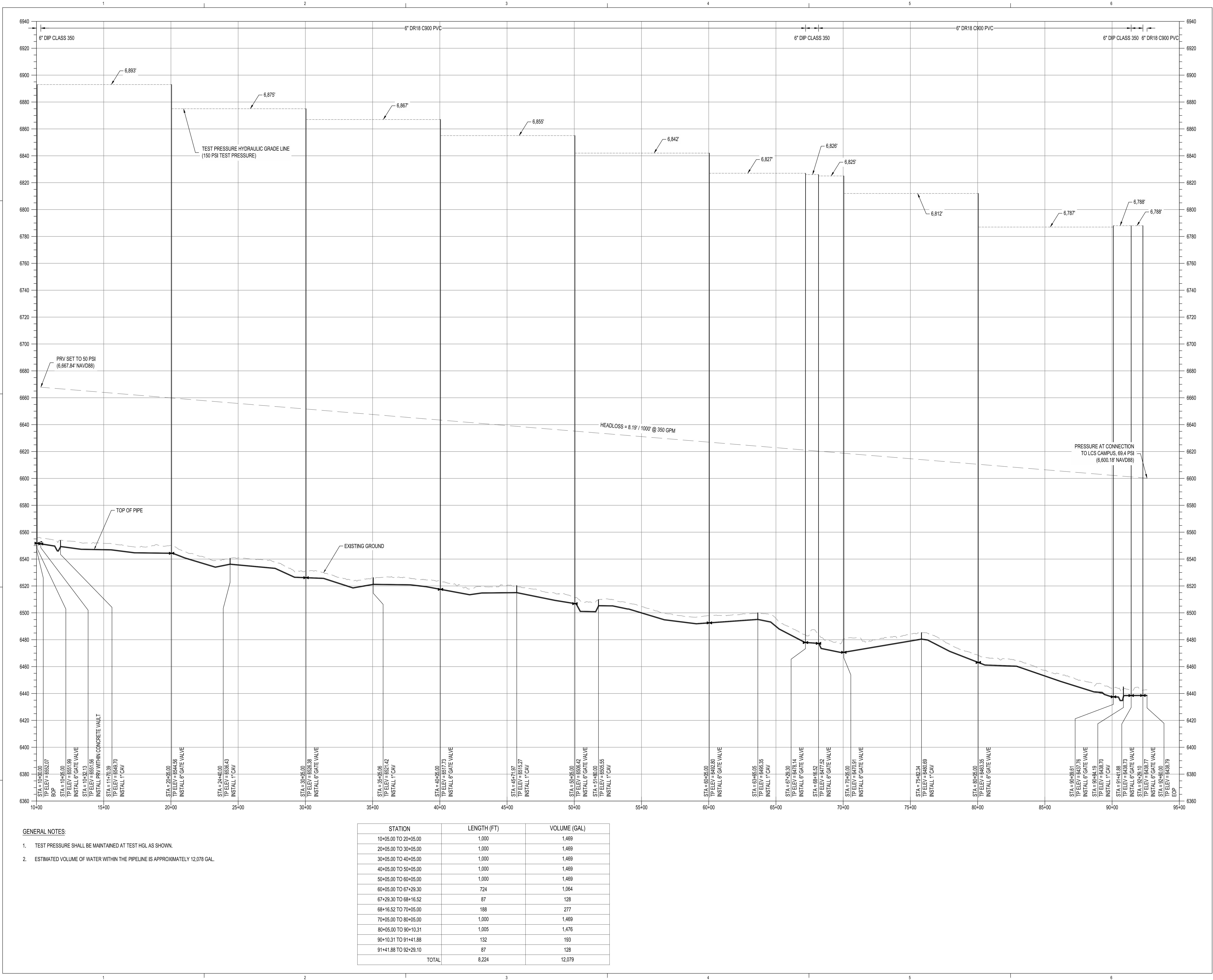
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LCS WATERLINE  
SUPPLY  
SURVEY CONTROL  
SHEET

SHEET NO.  
G-03  
OF





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LCS WATERLINE  
SUPPLY  
HYDRAULIC  
PROFILE

SHEET NO.  
**G-04**  
OF



**K-8 Academics**  
Lukachukai Community Schools  
Waterline Supply  
Lukachukai, AZ 86507

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DATE 09/03/2021

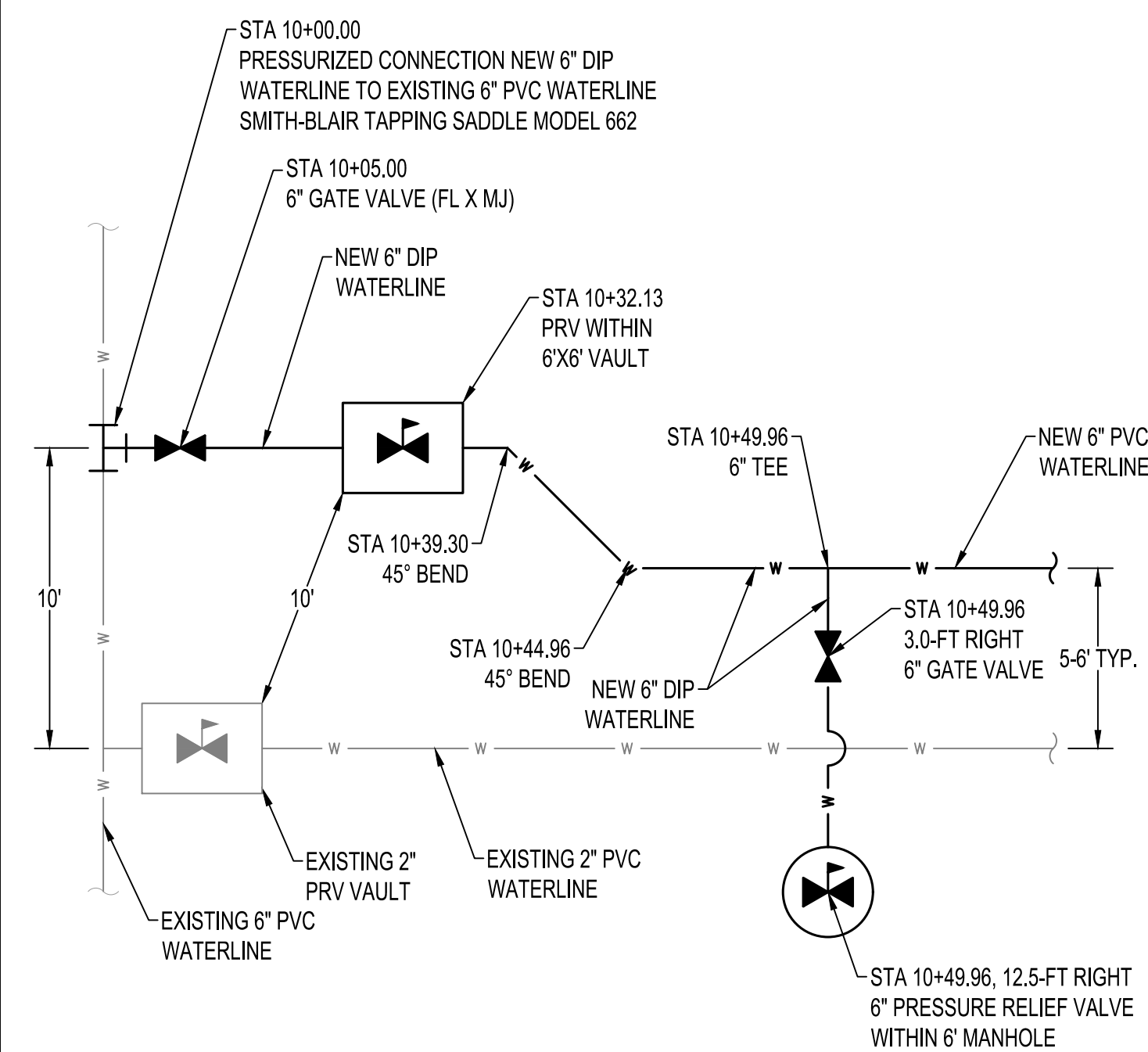
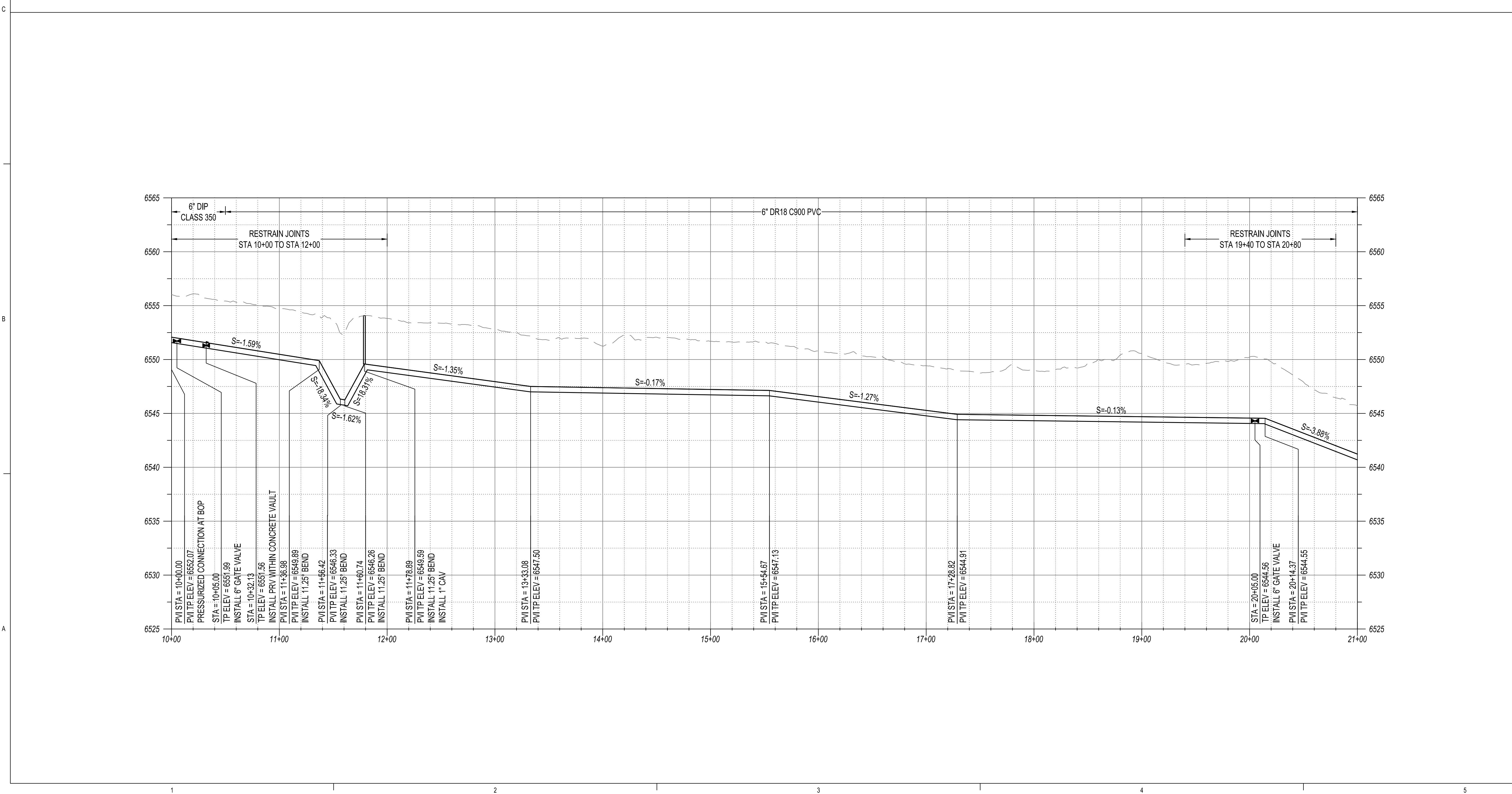
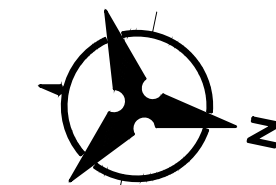
PROJECT NO. 20-7002.001

LCS WATERLINE  
SUPPLY

# PLAN & PROFILE STA 10+00 TO STA 21+00

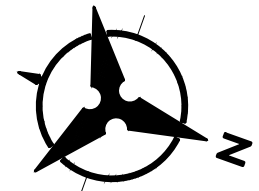
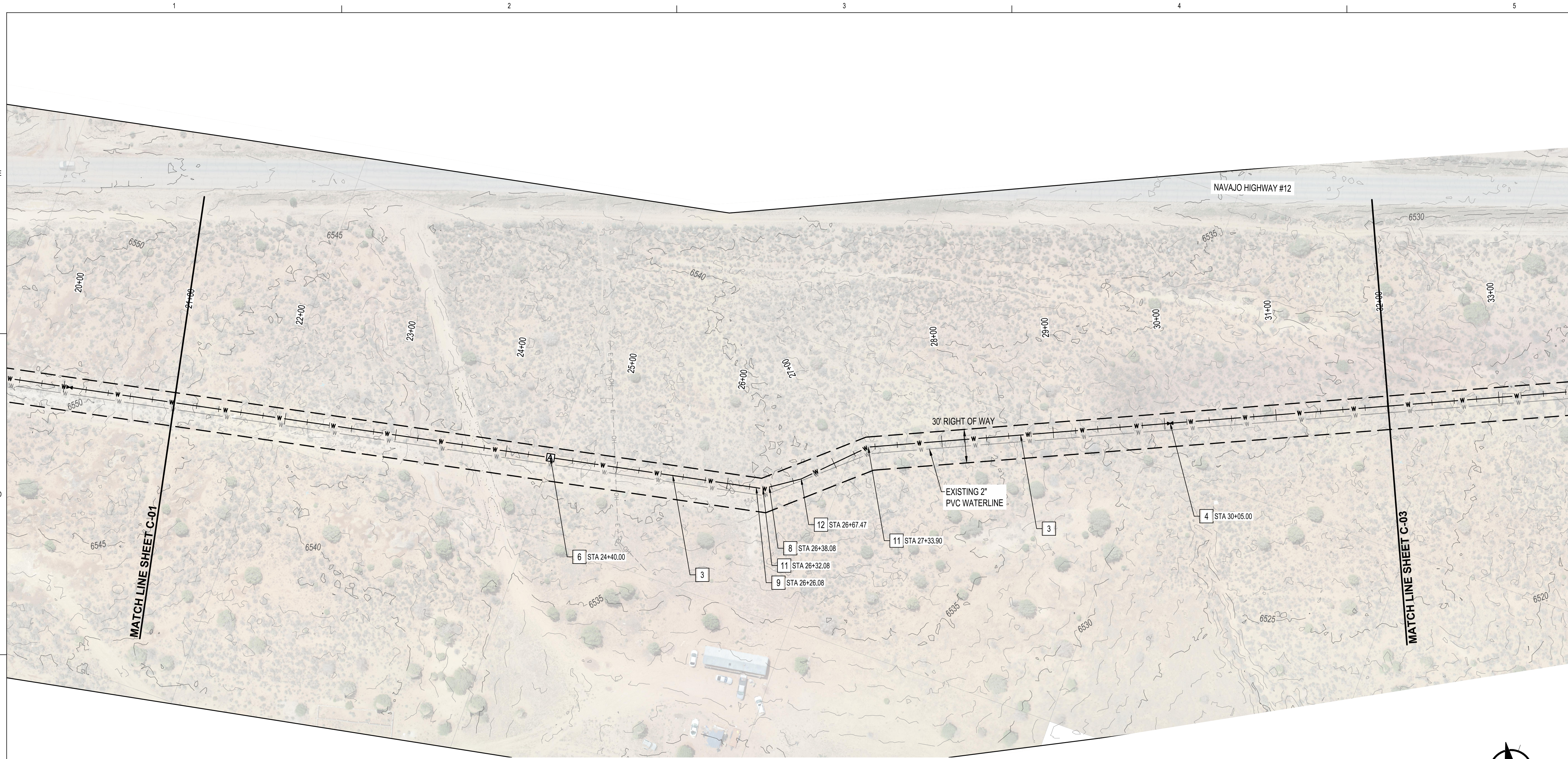
SHEET NO. \_\_\_\_\_

C-01



**1 WATERLINE CONNECTION DETAIL**  
SCALE: NOT TO SCALE



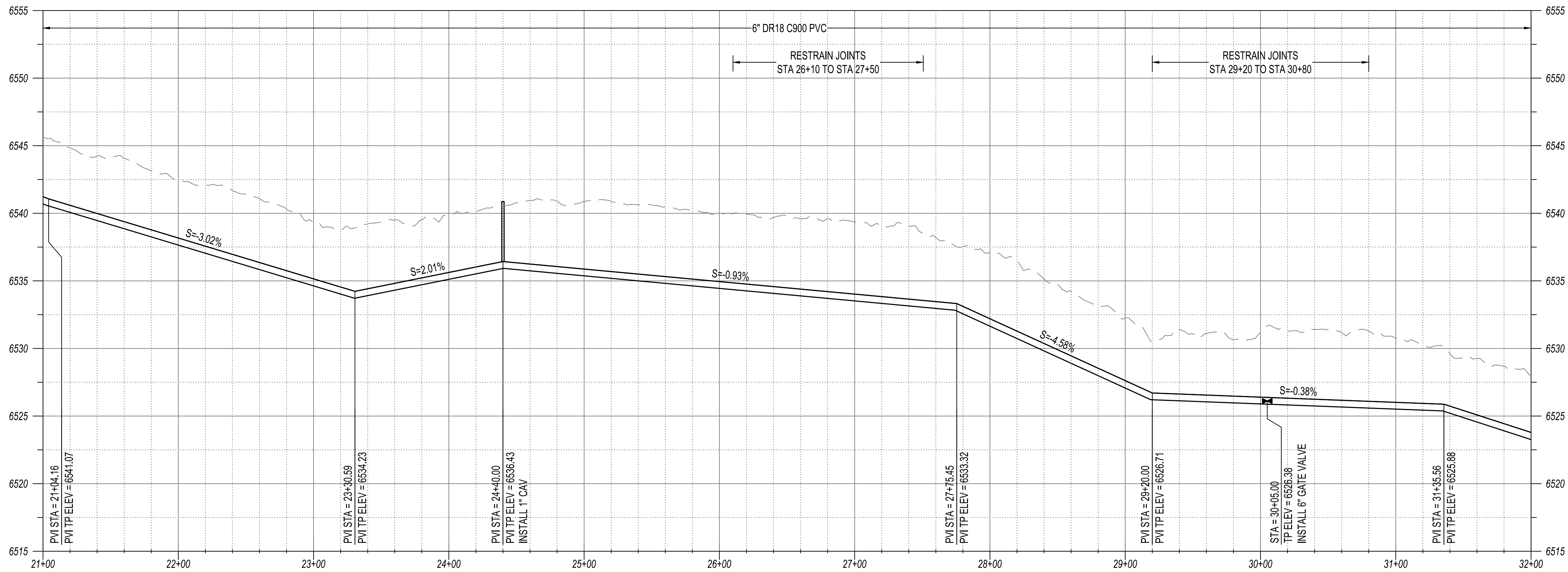


GENERAL NOTES:

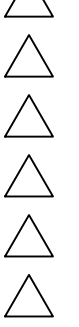
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3. STATIONS SHOWN ARE ALONG CENTERLINE OF PIPE AND ELEVATIONS SHOWN ARE ALONG TOP OF PIPE.
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5. TRENCHING SHALL BE DONE IN ACCORDANCE WITH NTUA STANDARD DRAWING WS-15, SHEET D-02.

KEYED NOTES:

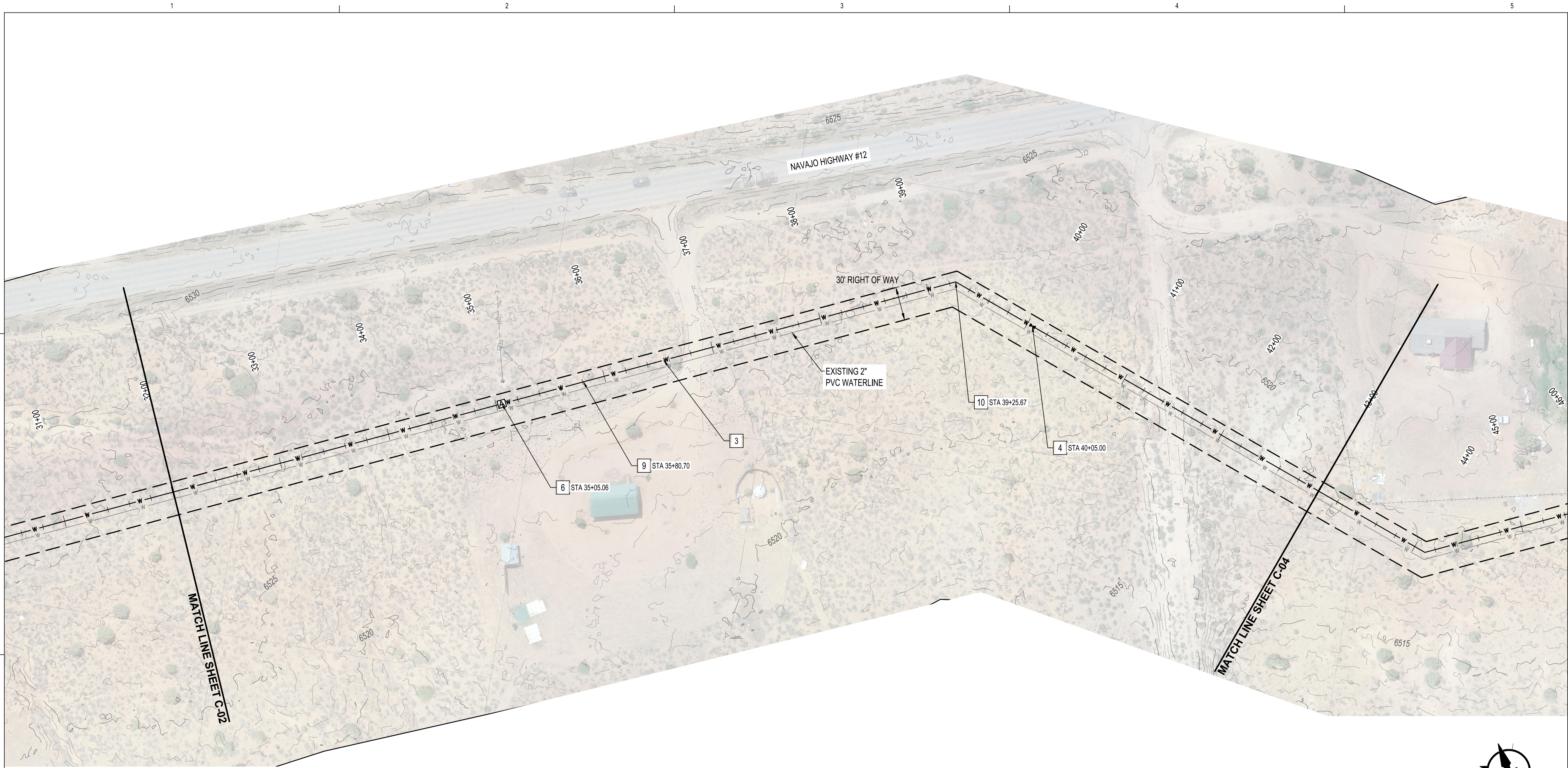
- 3 INSTALL 6" DR18 C900 PVC WATERLINE.
- 4 INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14. SEE SHEET D-02
- 6 INSTALL 1" CAV PER NTUA STD DWG WS-10. SEE SHEET D-02
- 8 INSTALL SERVICE SADDLE FOR FUTURE SERVICE EXTENSION TO RESIDENT GREATER THAN 200' AWAY PER NTUA STD DWGS WS-3 & WS-3A. SEE SHEET D-01. CAP 2" LATERAL.
- 9 INSTALL SERVICE SADDLE FOR CUSTOMER CONNECTION PER NTUA STD DWGS WS-2 & WS-2A. SEE SHEET D-01.
- 11 INSTALL 22.5° BEND (MJ X MJ).
- 12 INSTALL 11.25° BEND (MJ X MJ).



REVISIONS





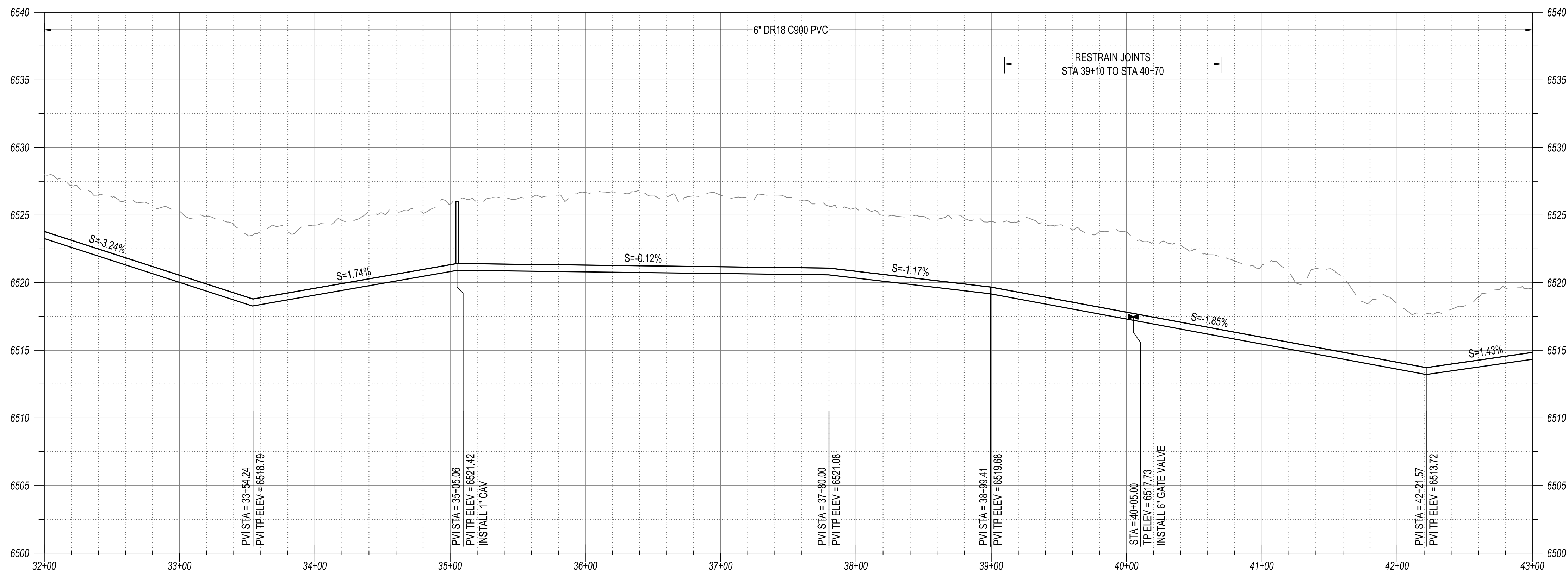
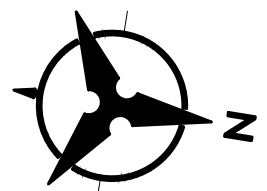


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KEYED NOTES:

- 3 INSTALL 6" DR18 C900 PVC WATERLINE.
- 4 INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14. SEE SHEET D-02.
- 6 INSTALL 1" CAV PER NTUA STD DWG WS-10. SEE SHEET D-02.
- 9 INSTALL SERVICE SADDLE FOR CUSTOMER CONNECTION PER NTUA STD DWGS WS-2 & WS-2A. SEE SHEET D-01.
- 10 INSTALL 45" BEND (MJ X MJ).



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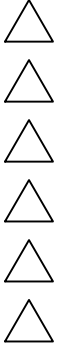
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LCS WATERLINE  
SUPPLY

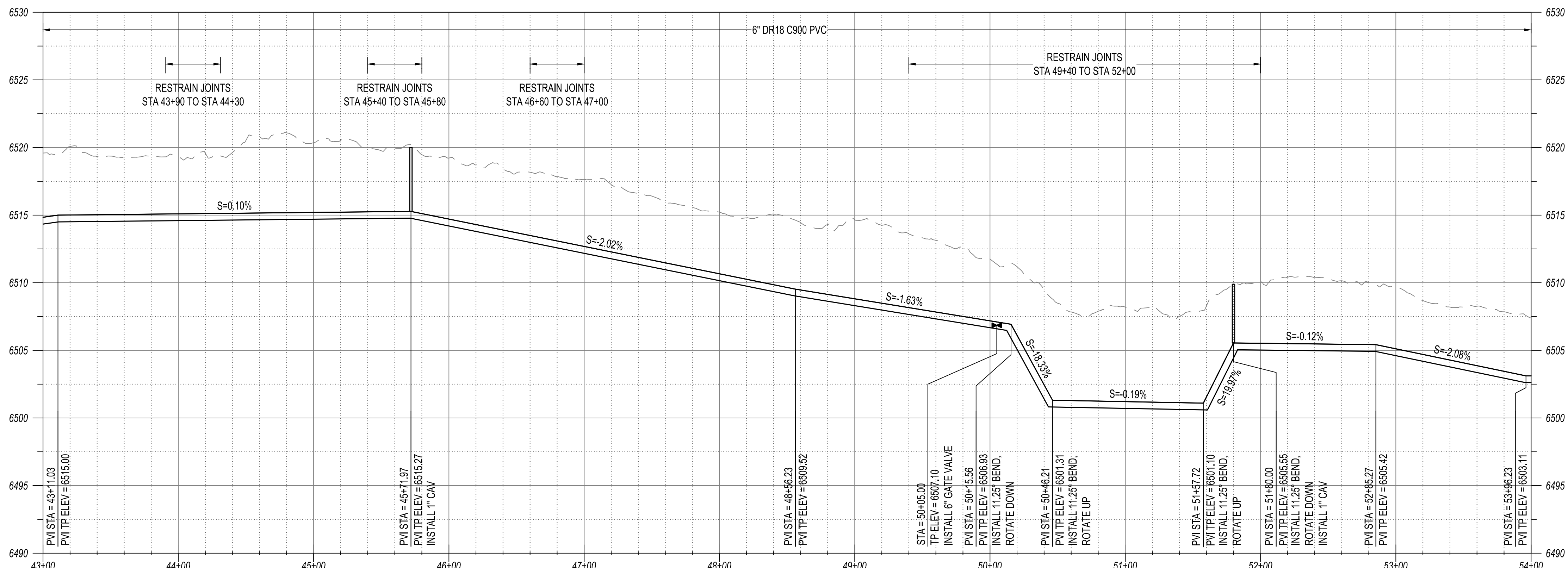
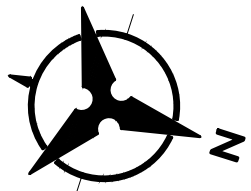
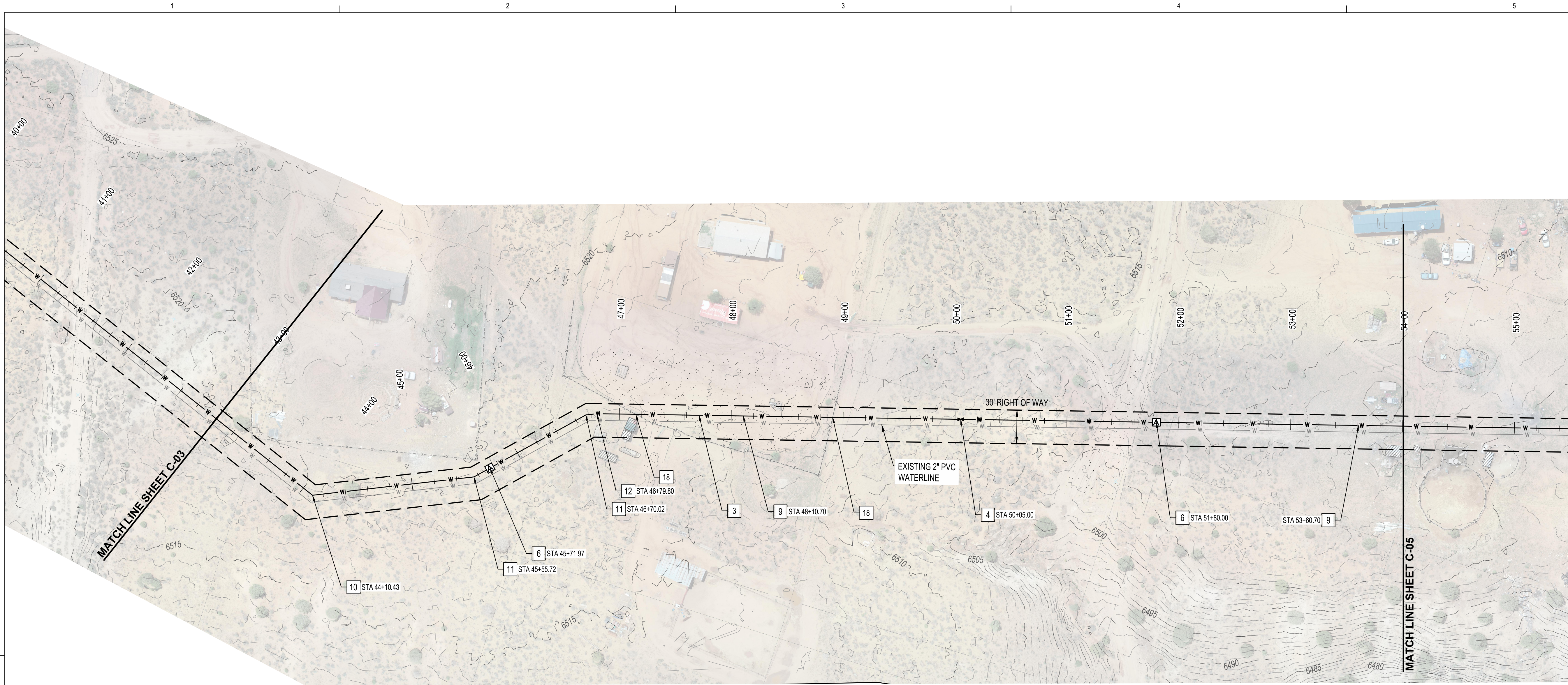
PLAN & PROFILE  
STA 32+00 TO STA  
43+00

SHEET NO.

C-03

OF





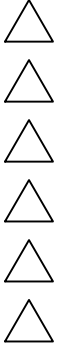
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5. TRENCHING SHALL BE DONE IN ACCORDANCE WITH NTUA STANDARD DRAWING WS-15, SHEET D-02.

KEYED NOTES:

3. INSTALL 6" DR18 C900 PVC WATERLINE.
4. INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14. SEE SHEET D-04.
6. INSTALL 1" CAV PER NTUA STD DWG WS-10. SEE SHEET D-04.
9. INSTALL SERVICE SADDLE FOR CUSTOMER CONNECTION PER NTUA STD DWGS WS-2 & WS-2A. SEE SHEET D-01.
10. INSTALL 45° BEND (MJ X MJ).
11. INSTALL 22.5° BEND (MJ X MJ).
12. INSTALL 11.25° BEND (MJ X MJ).
18. REMOVE AND REPLACE EXISTING FENCE IN KIND.

REVISIONS



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LCS WATERLINE  
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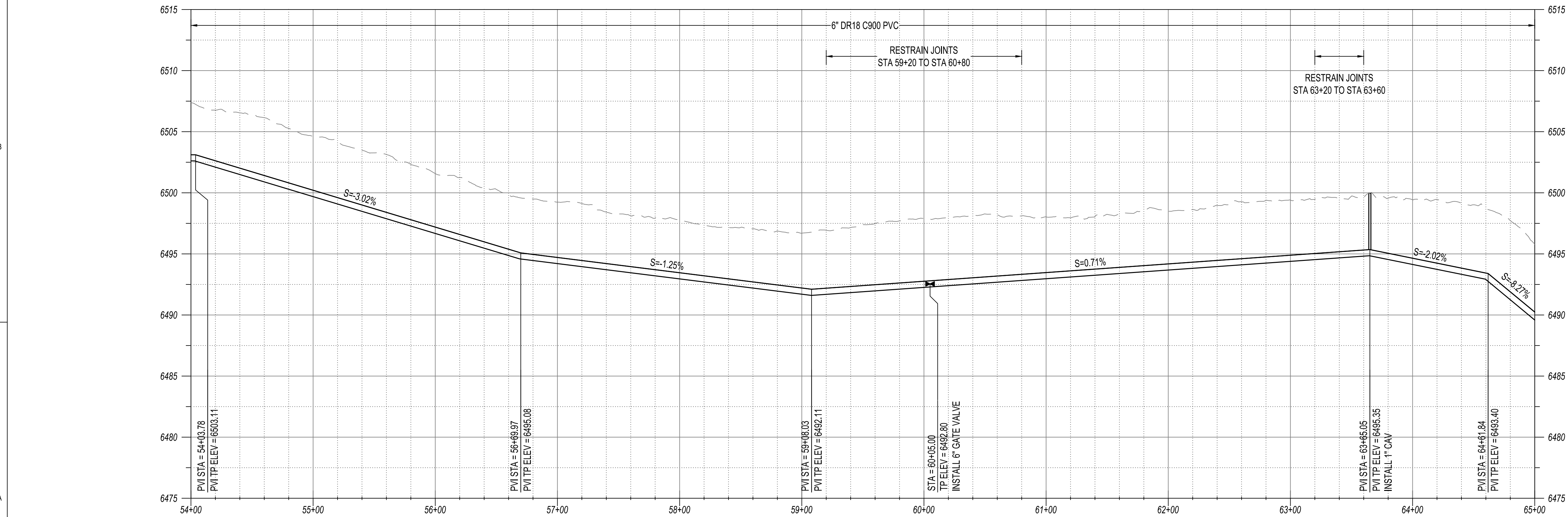
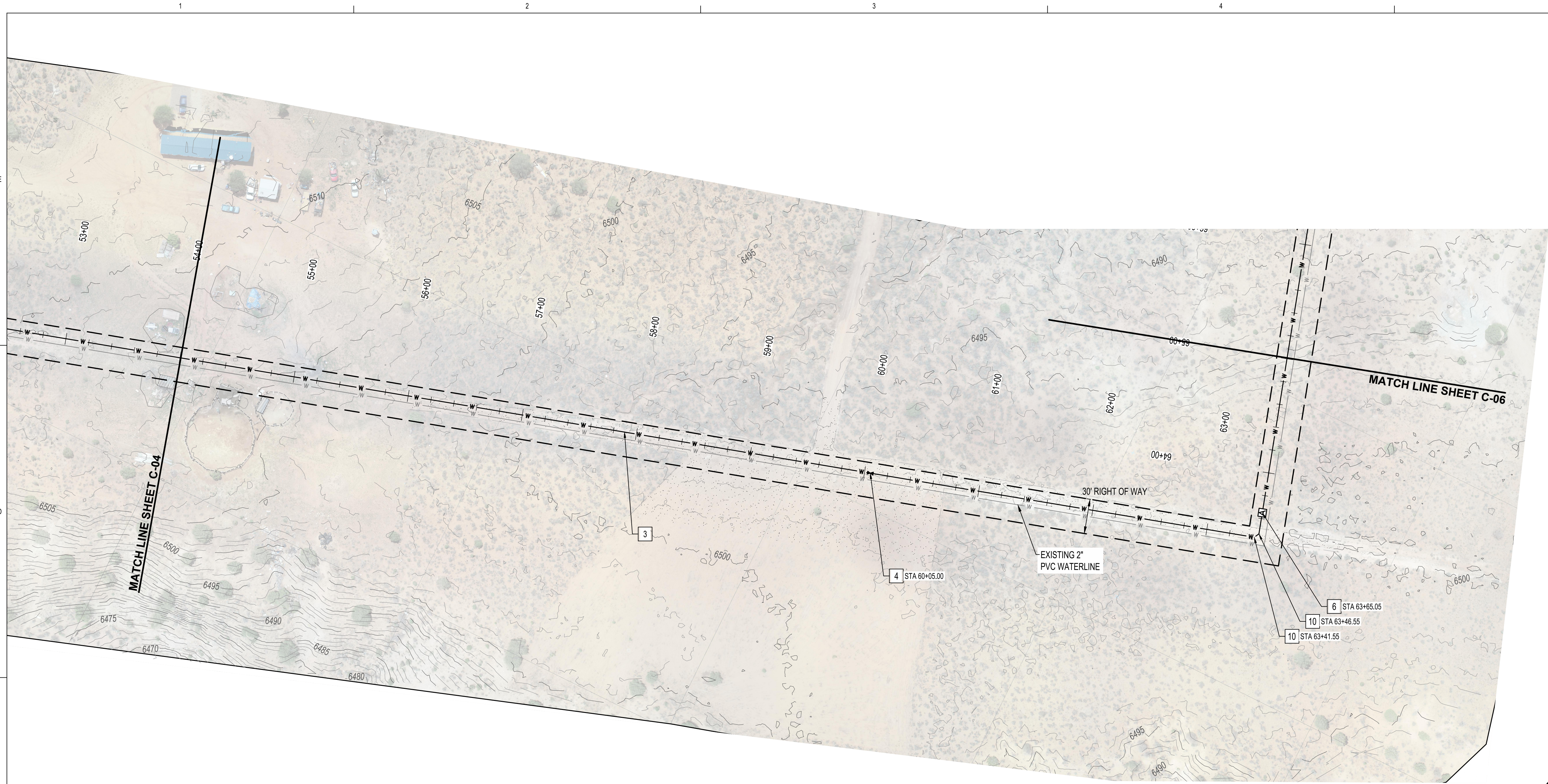
PLAN & PROFILE  
STA 43+00 TO STA  
54+00

SHEET NO.

C-04

OF





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KEYED NOTES:

- 3 INSTALL 6" DR18 C900 PVC WATERLINE.
- 4 INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14, SEE SHEET D-02.
- 6 INSTALL 1" CAV PER NTUA STD DWG WS-10, SEE SHEET D-02.
- 10 INSTALL 45° BEND (MJ X MJ).

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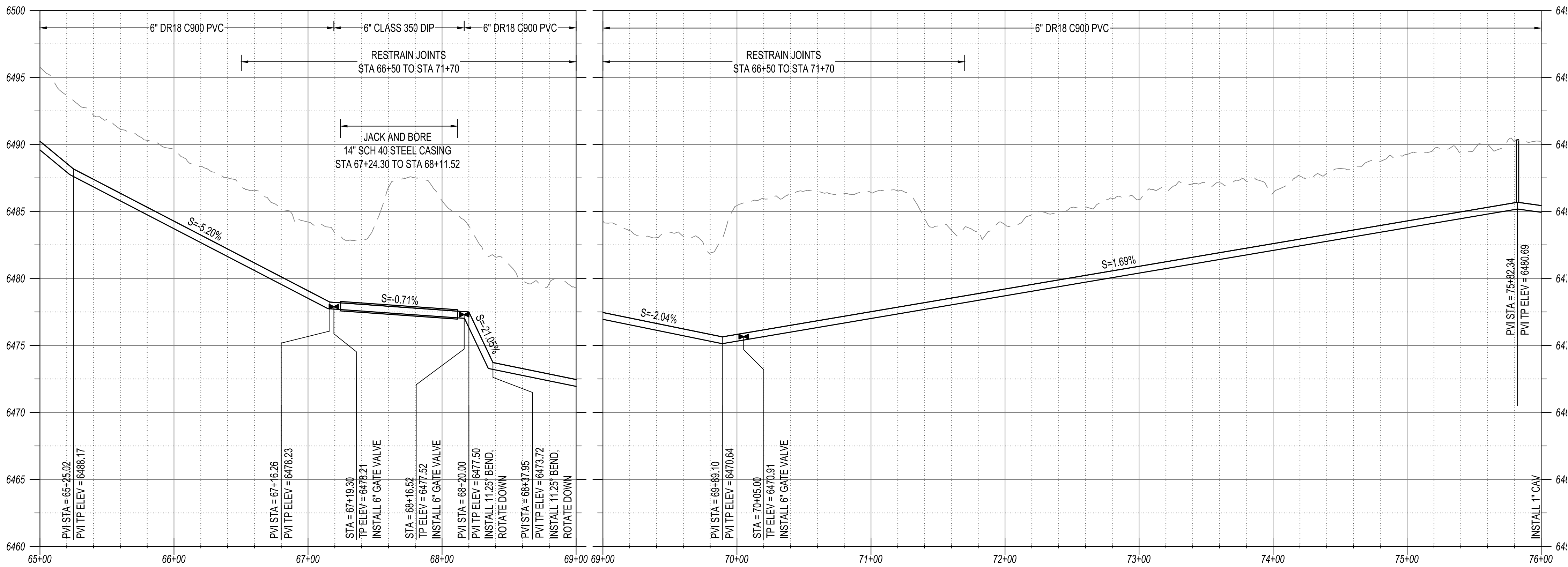
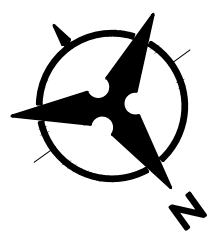
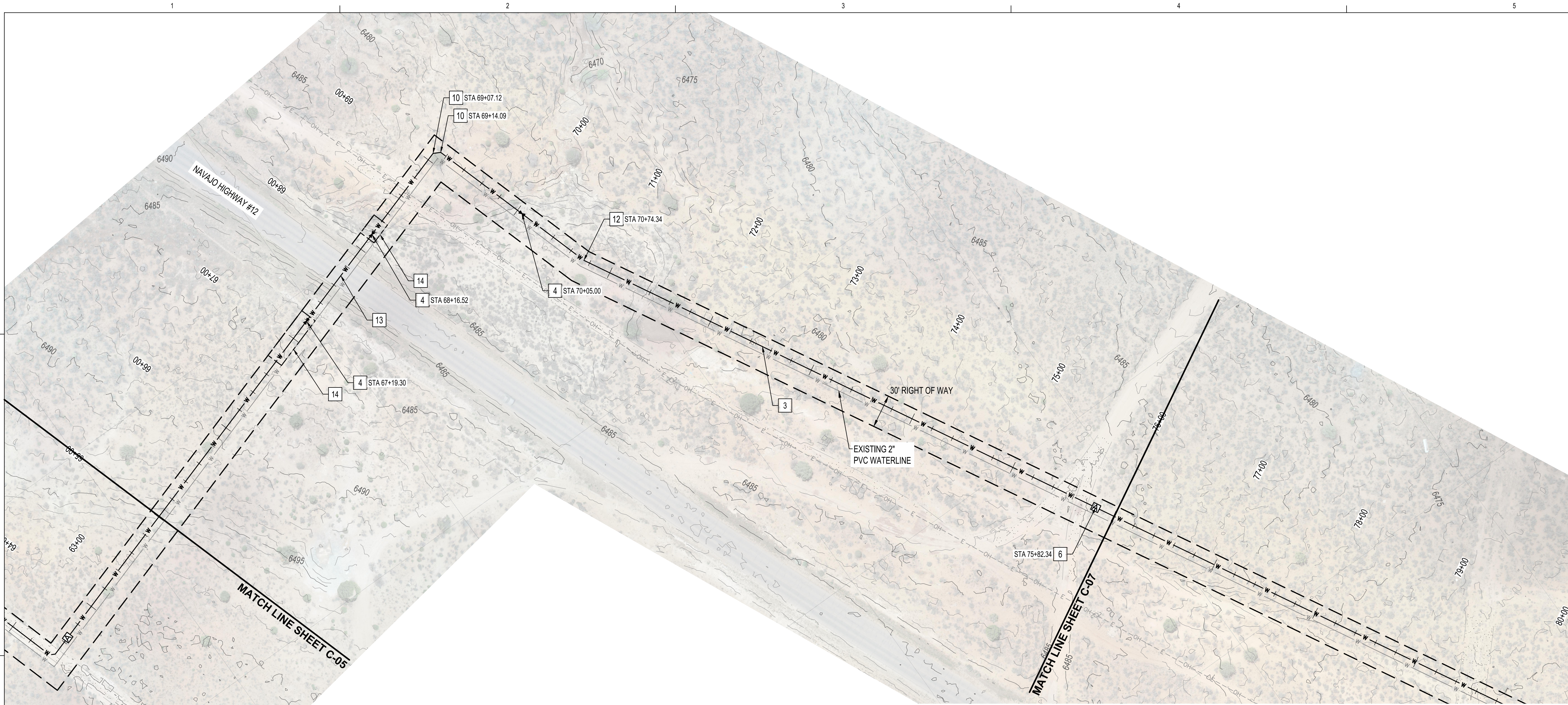
PLAN & PROFILE  
STA 54+00 TO STA  
65+00

SHEET NO.

C-05

OF





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KEYED NOTES:

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- 4 INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14, SEE SHEET D-02.
- 6 INSTALL 1" CAV PER NTUA STD DWG WS-10, SEE SHEET D-02.
- 10 INSTALL 45° BEND (MJ X MJ).
- 12 INSTALL 11.25° BEND (MJ X MJ).
- 13 JACK AND BORE BENEATH ROADWAY PER NTUA STD DWG WS-17A, SEE SHEET D-03.
- 14 BORE PIT.



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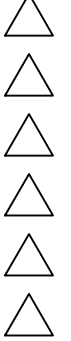
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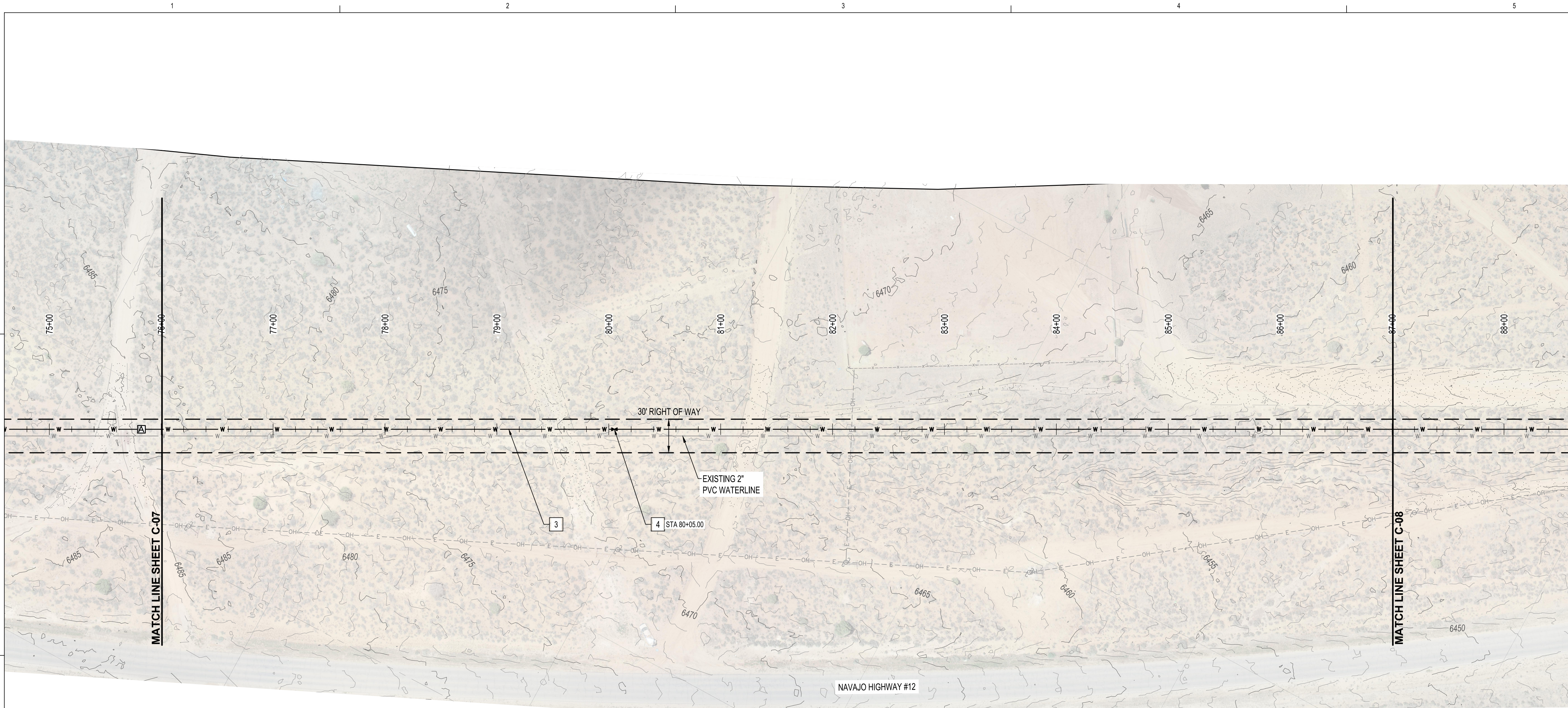
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SUPPLY  
PLAN & PROFILE  
STA 65+00 TO STA  
76+00

SHEET NO.

C-06

OF



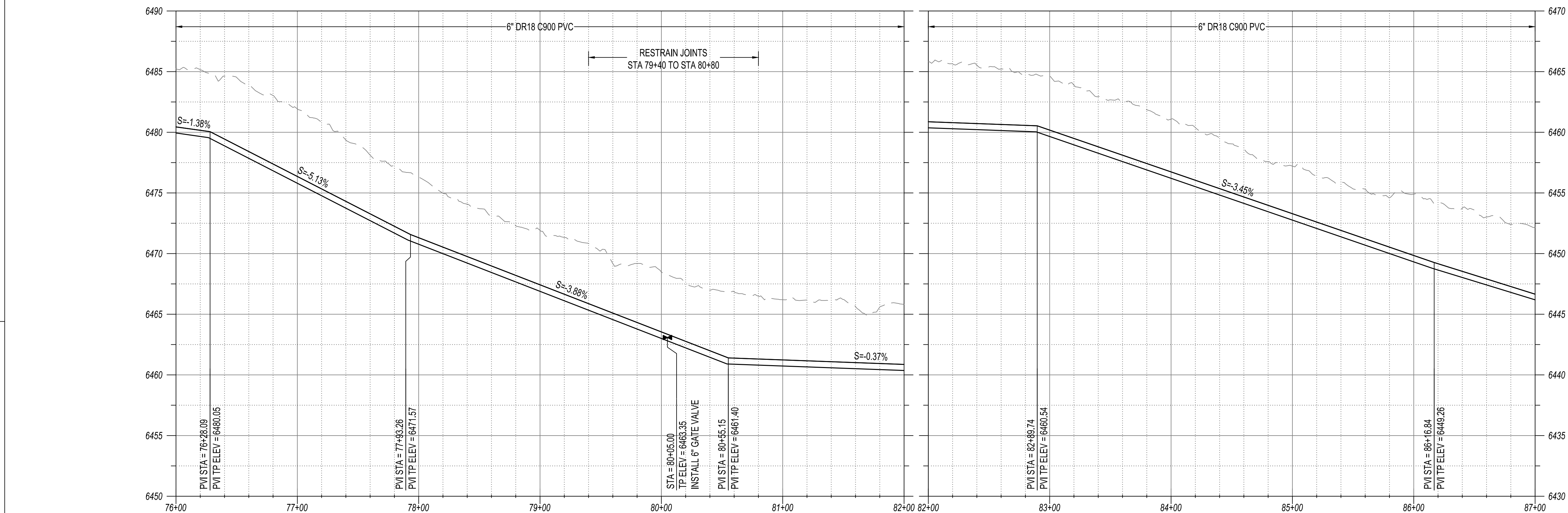


GENERAL NOTES:

1. FIELD VERIFY ALL EXISTING UTILITIES AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. DAMAGE TO UTILITIES OR FACILITIES WITHIN THE PROJECT RIGHT-OF-WAY SHALL BE RESTORED TO EXISTING CONDITIONS UNLESS OTHERWISE DENOTES IN PLANS.
3. STATIONS SHOWN ARE ALONG CENTERLINE OF PIPE AND ELEVATIONS SHOWN ARE ALONG TOP OF PIPE.
4. JOINTS TO BE RESTRAINED AS SHOWN ON PLANS. IF PIPE CANNOT BE RESTRAINED AT JOINTS, INSTALL THRUST BLOCKS PER NTUA STANDARD DRAWINGS WS-19 & WS-19A, SHEET D-03.
5. TRENCHING SHALL BE DONE IN ACCORDANCE WITH NTUA STANDARD DRAWING WS-15, SHEET D-02.

KEYED NOTES:

- 3 INSTALL 6" DR18 C900 PVC WATERLINE.
- 4 INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14. SEE SHEET D-02.



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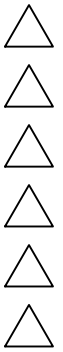
ENGINEER

PROJECT

K-8 Academics  
Lukachukai Community Schools  
Waterline Supply  
Lukachukai, AZ 86507

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REVIEWED BY	NDR
DATE	09/03/2021
PROJECT NO.	20-7002.001
DRAWING NAME	

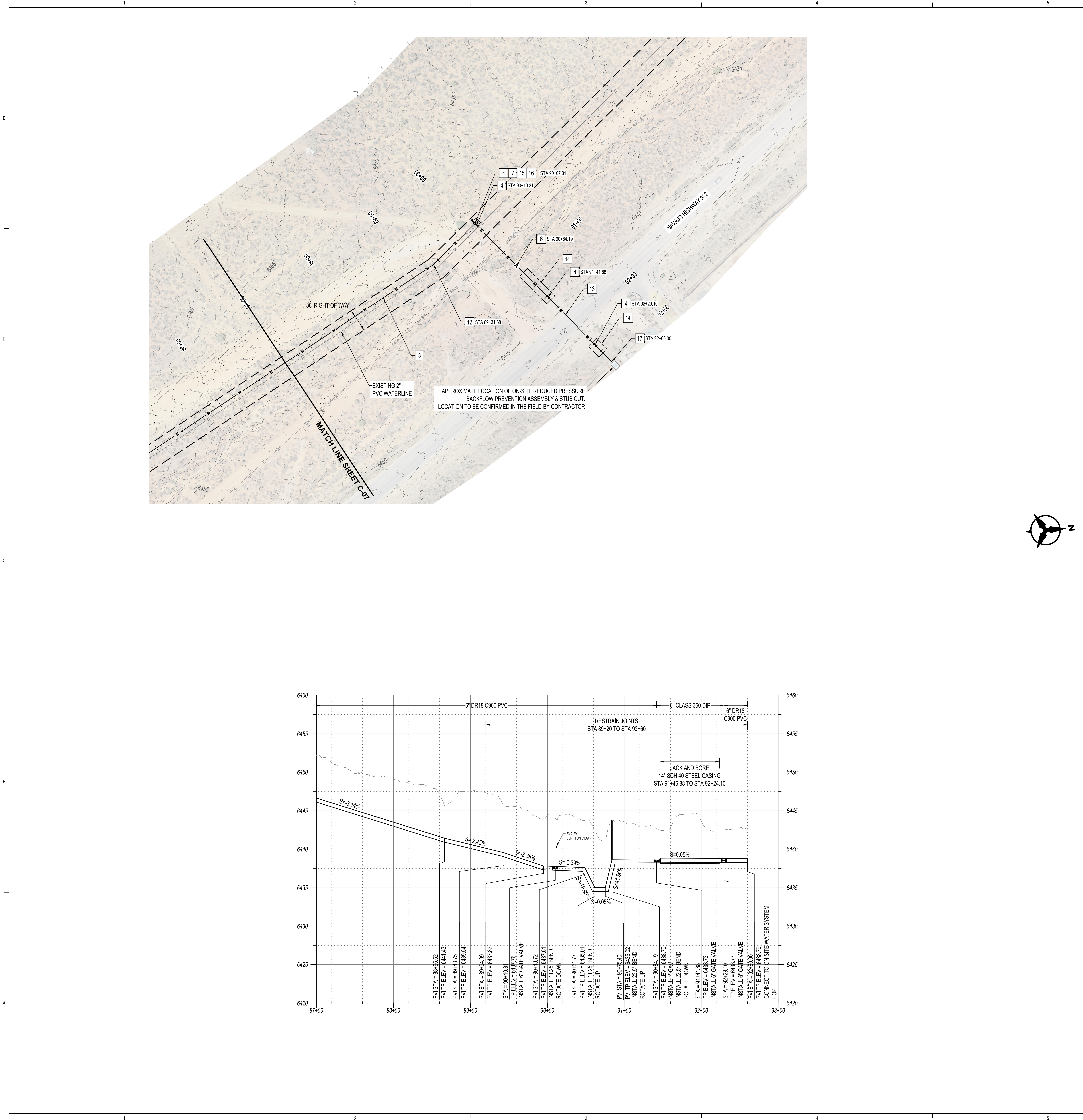
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SUPPLY  
PLAN & PROFILE  
STA 76+00 TO STA  
87+00

SHEET NO.

C-07

OF



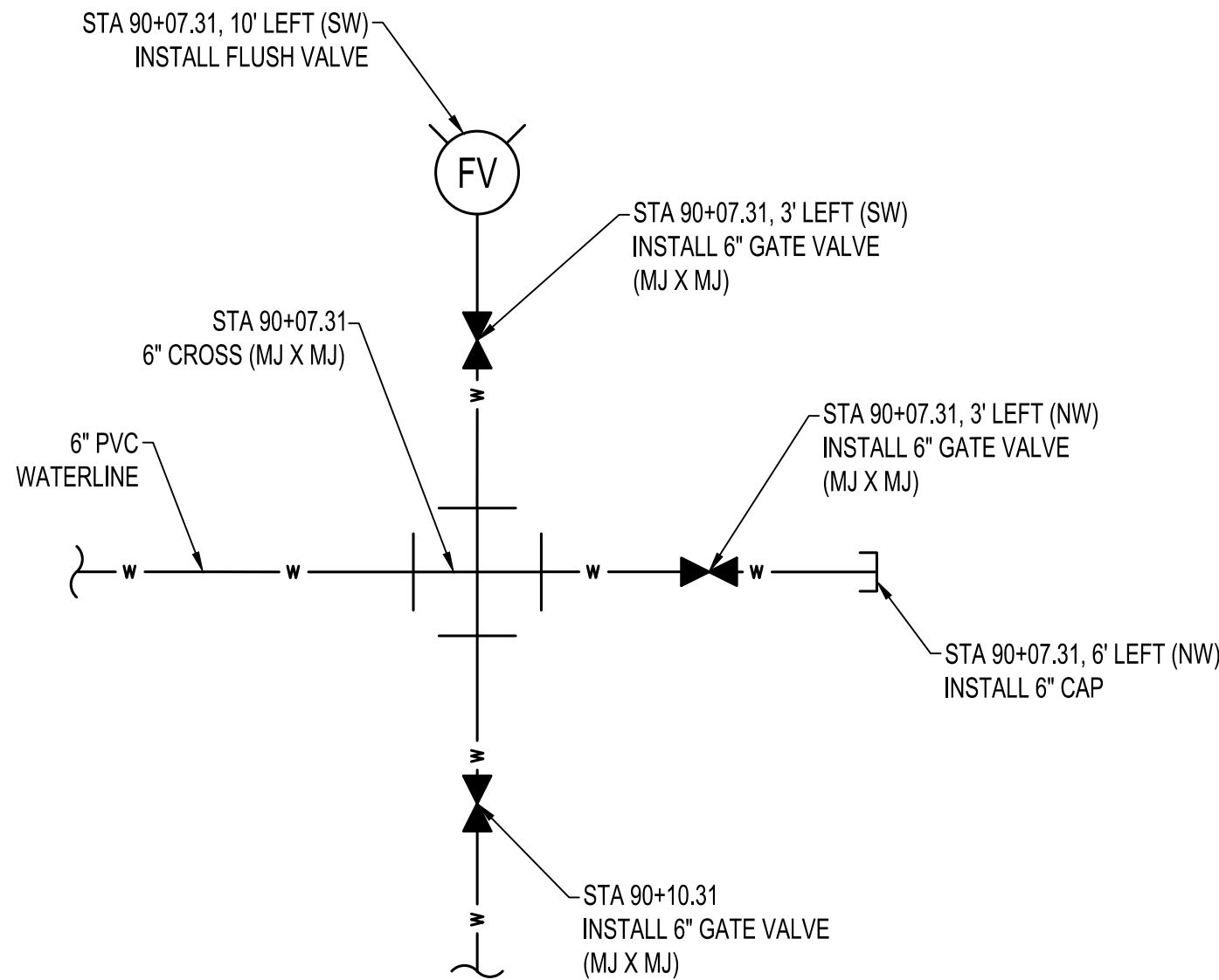
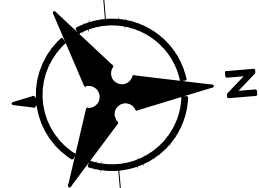


GENERAL NOTES:

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KEYED NOTES:

3. INSTALL 6" DR18 C900 PVC WATERLINE.
4. INSTALL 6" GATE VALVE (MJ X MJ) AND VALVE CAN PER NTUA STD DWG WS-14. SEE SHEET D-02.
6. INSTALL 1" CAV PER NTUA STD DWG WS-10. SEE SHEET D-02.
7. INSTALL FLUSH VALVE PER NTUA STD DWG WS-11. SEE SHEET D-02.
12. INSTALL 11.25" BEND (MJ X MJ).
13. JACK AND BORE BENEATH ROADWAY PER NTUA STD DWG WS-17A. SEE SHEET D-03.
14. BORE PIT.
15. INSTALL 6" CROSS (MJ X MJ). REFER TO DETAIL 01, THIS SHEET.
16. INSTALL 6" CAP.
17. REMOVE CAP, CONNECT TO 6" ON-SITE WATERLINE.



1 WATERLINE CROSS DETAIL  
SCALE: NOT TO SCALE

- NOTES:
1. RESTRAIN ALL JOINTS.

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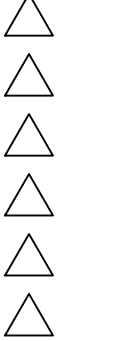
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Lukachukai Community Schools  
Waterline Supply  
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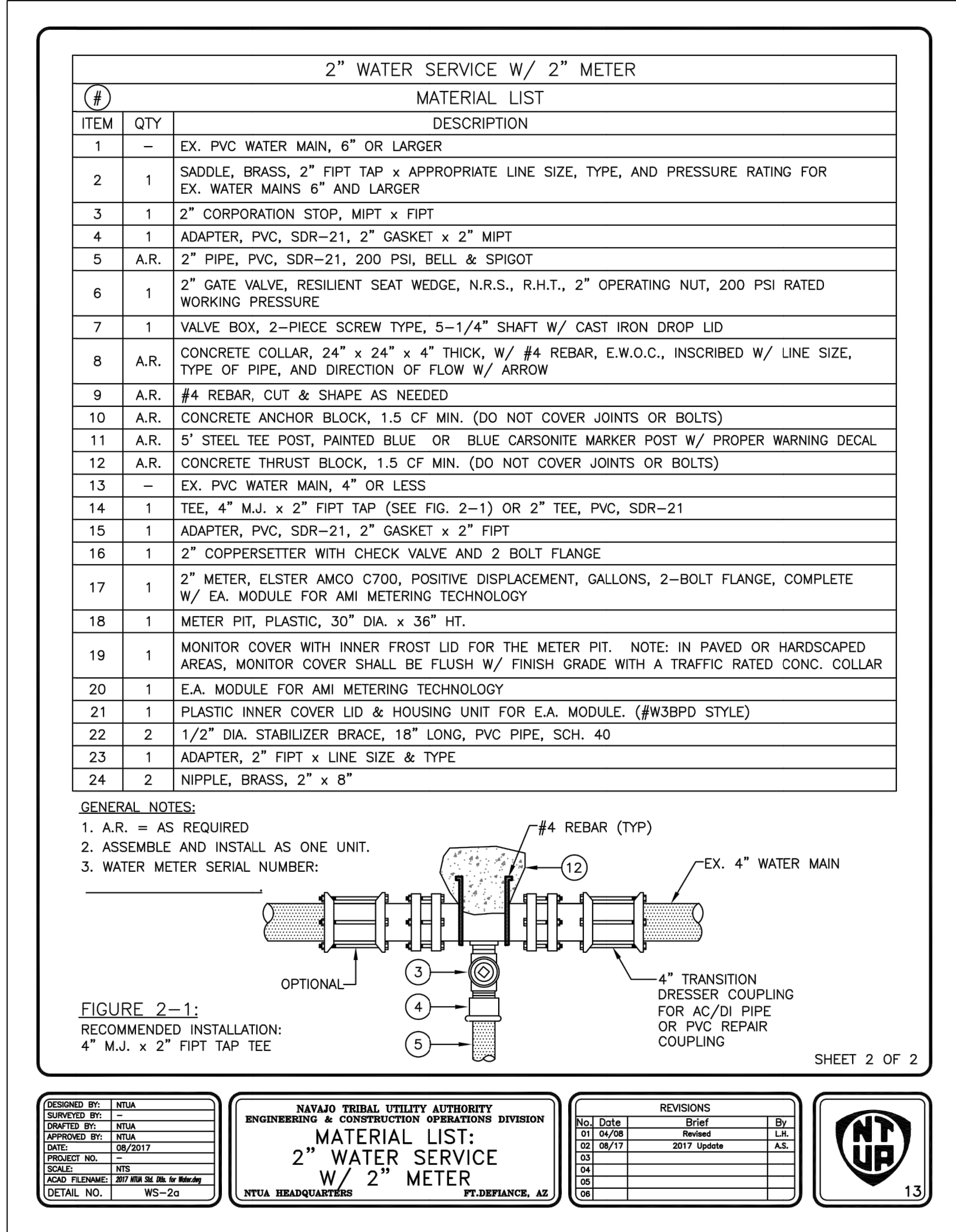
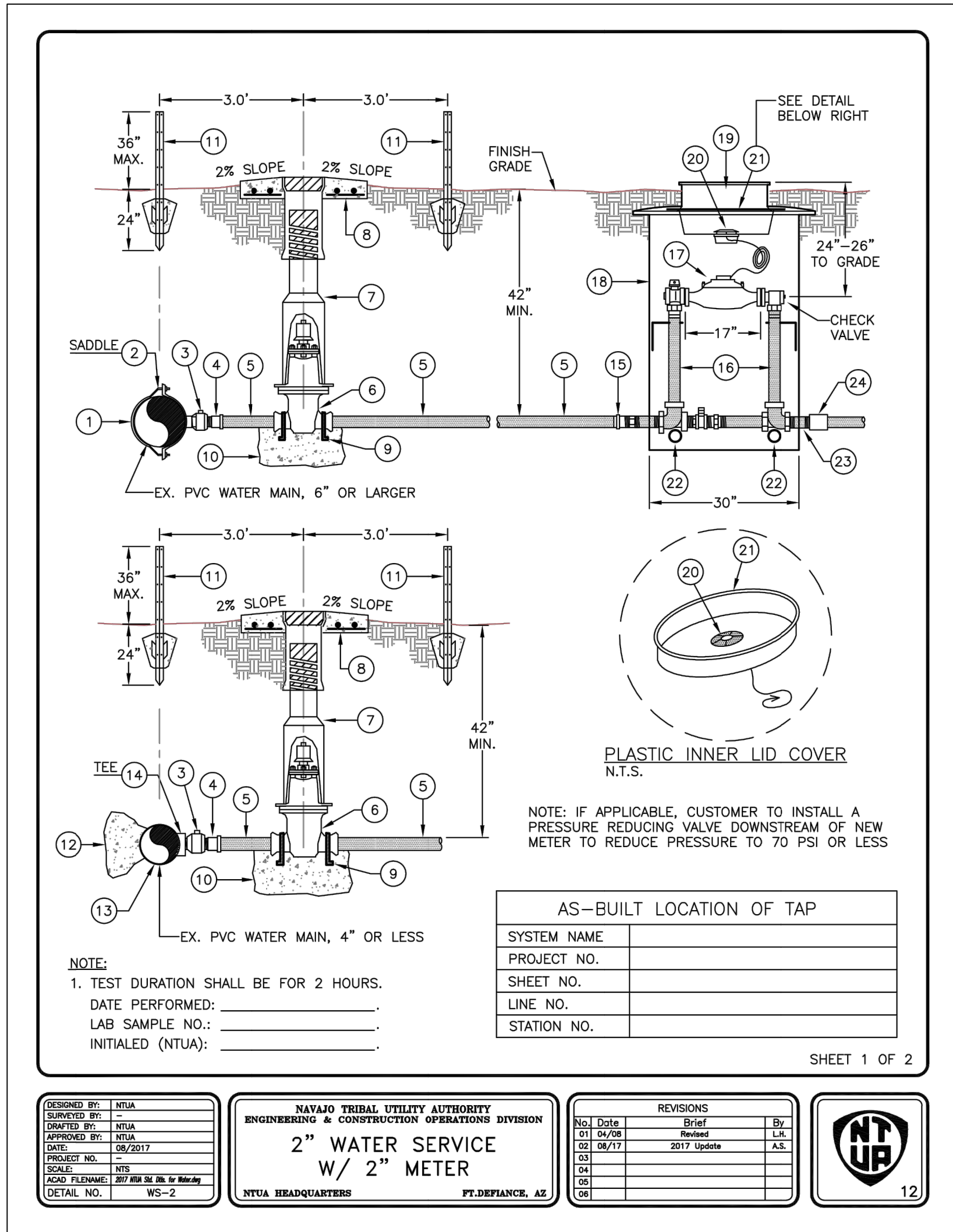
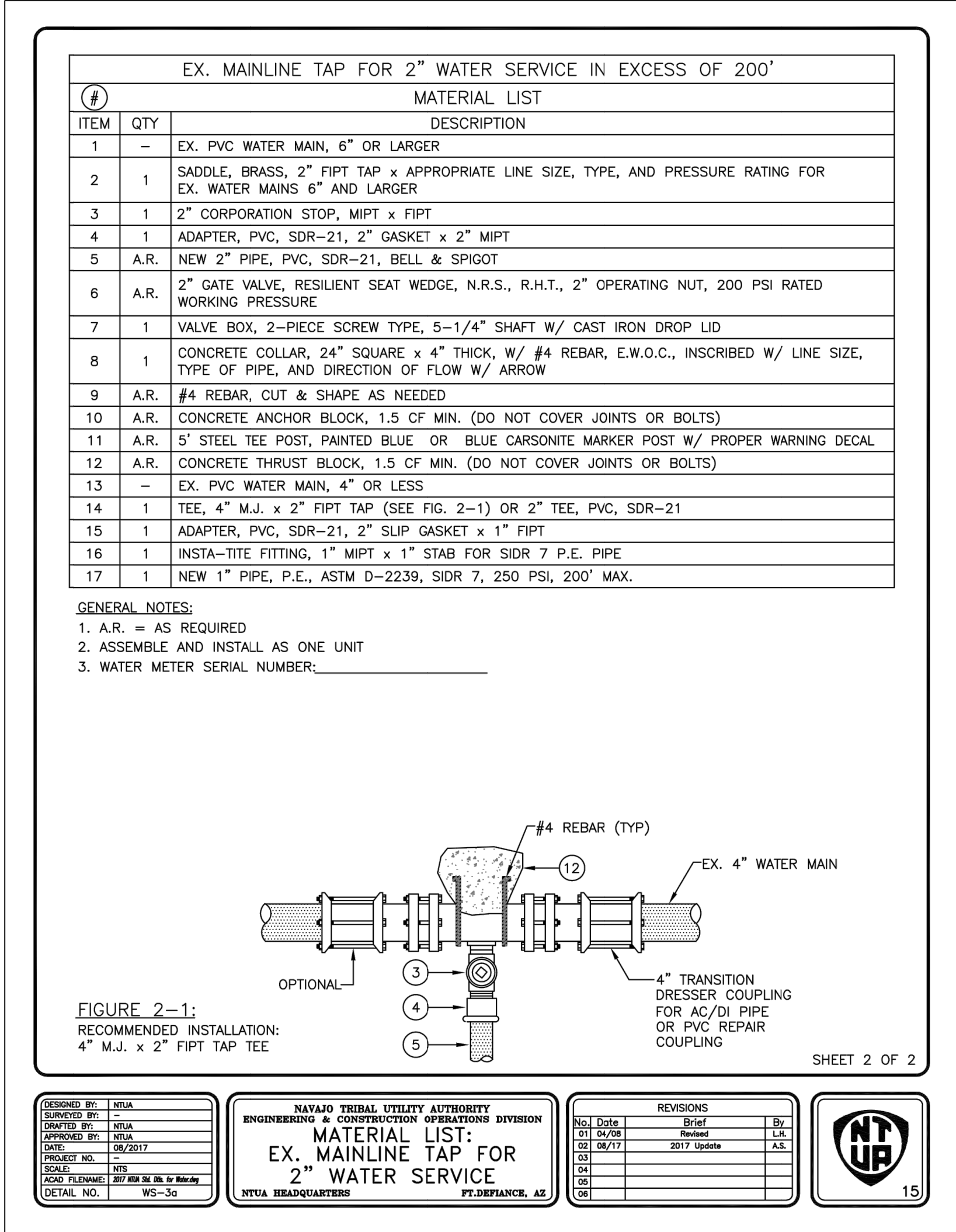
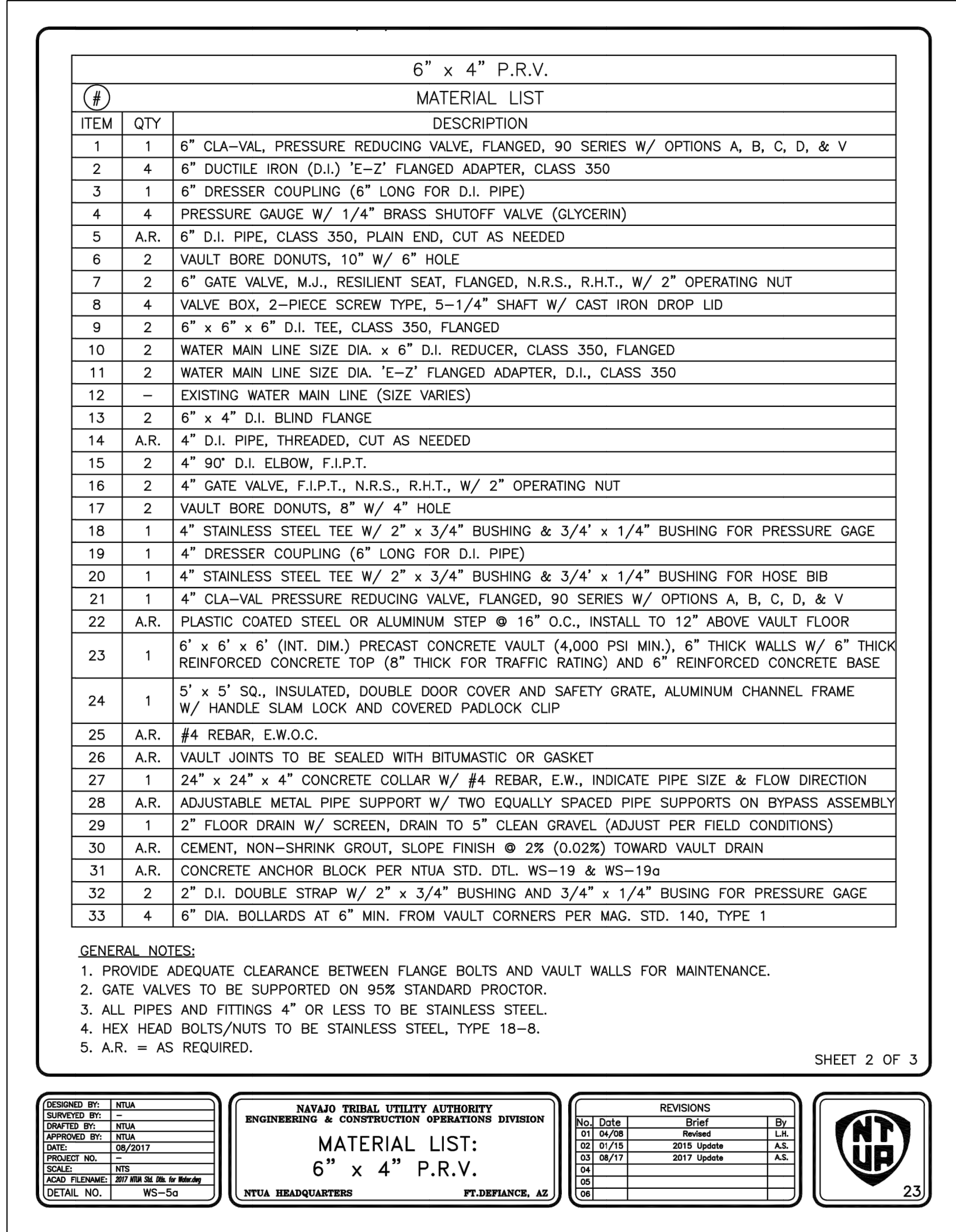
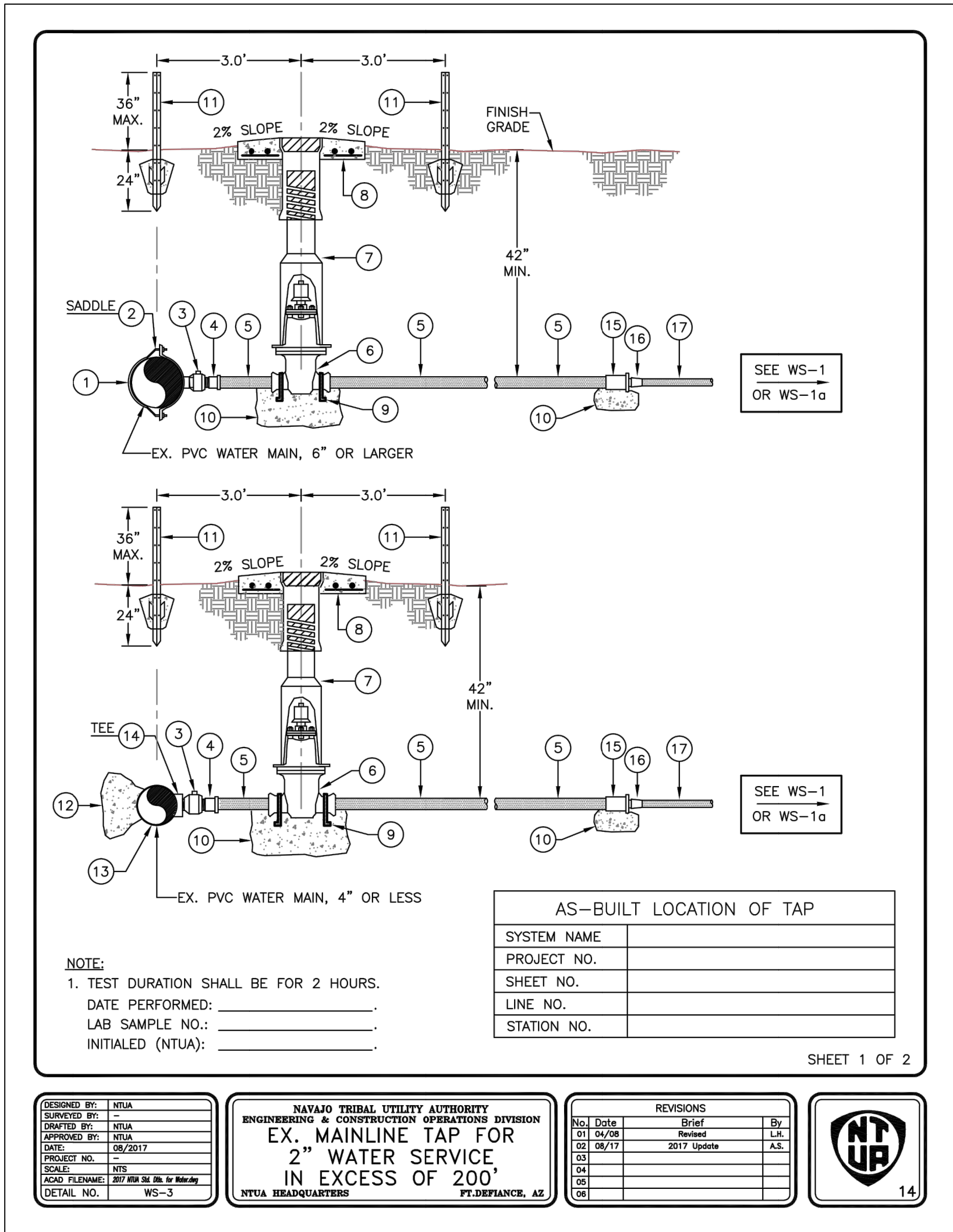
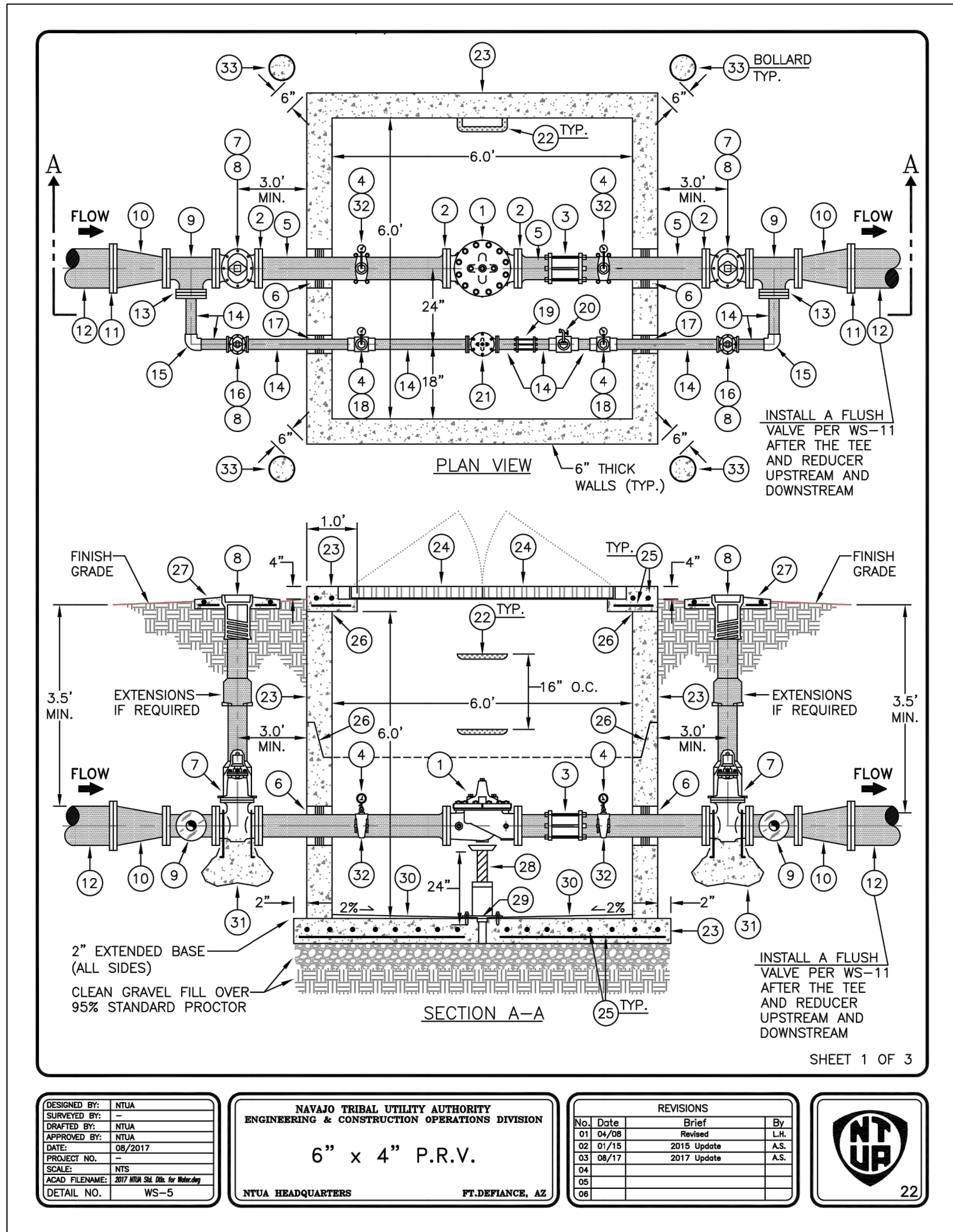
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SUPPLY  
PLAN & PROFILE  
STA 87+00 TO STA  
92+60

SHEET NO.

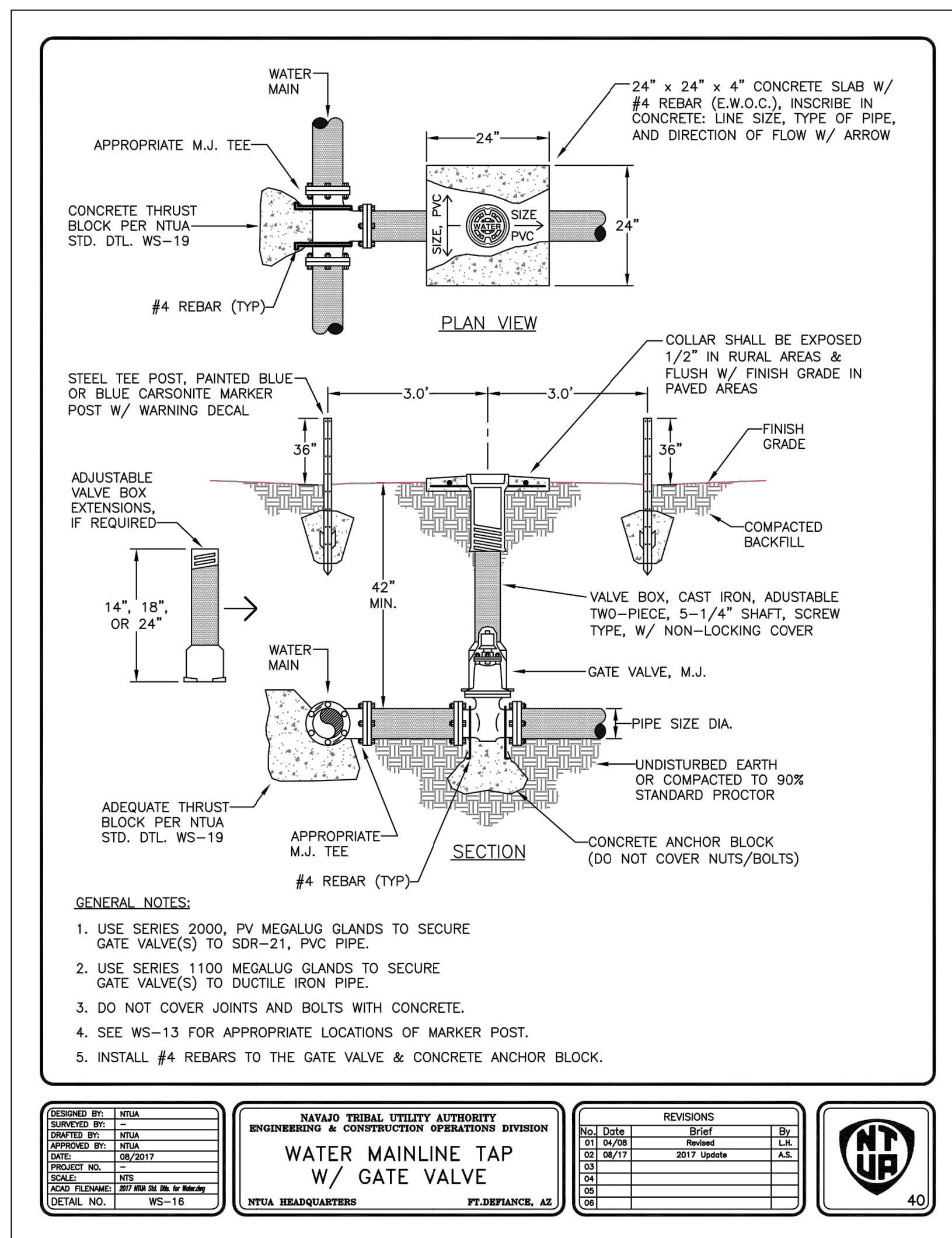
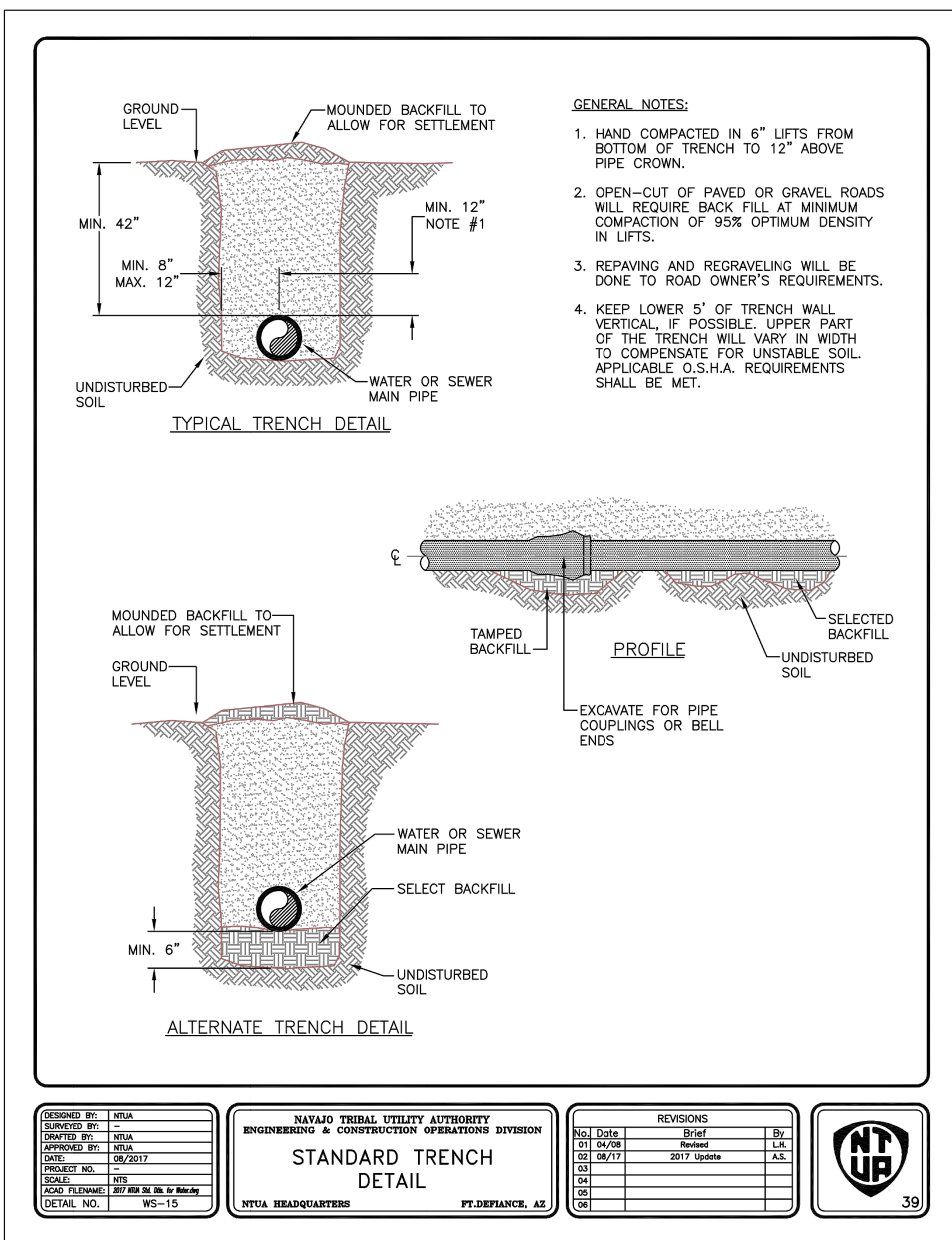
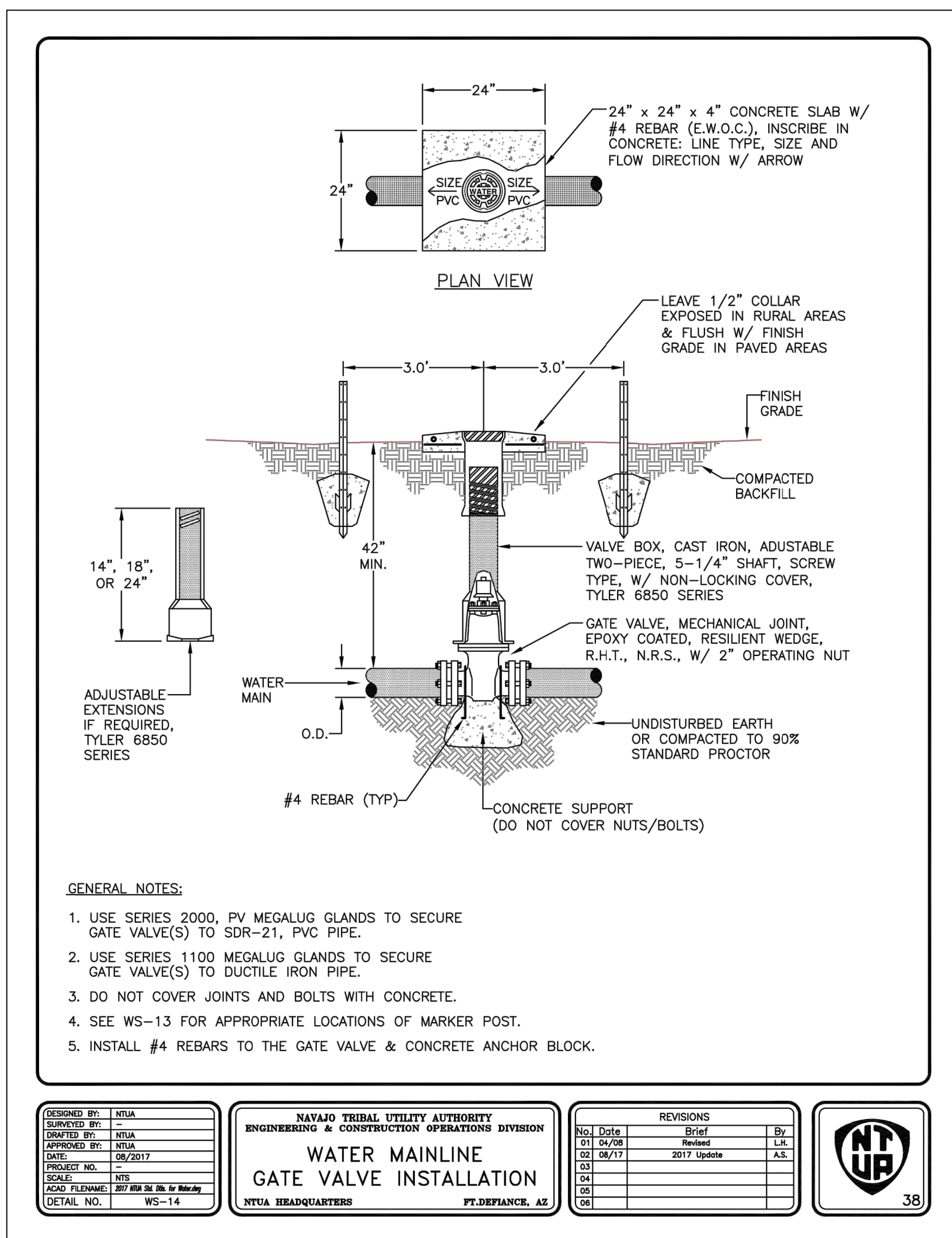
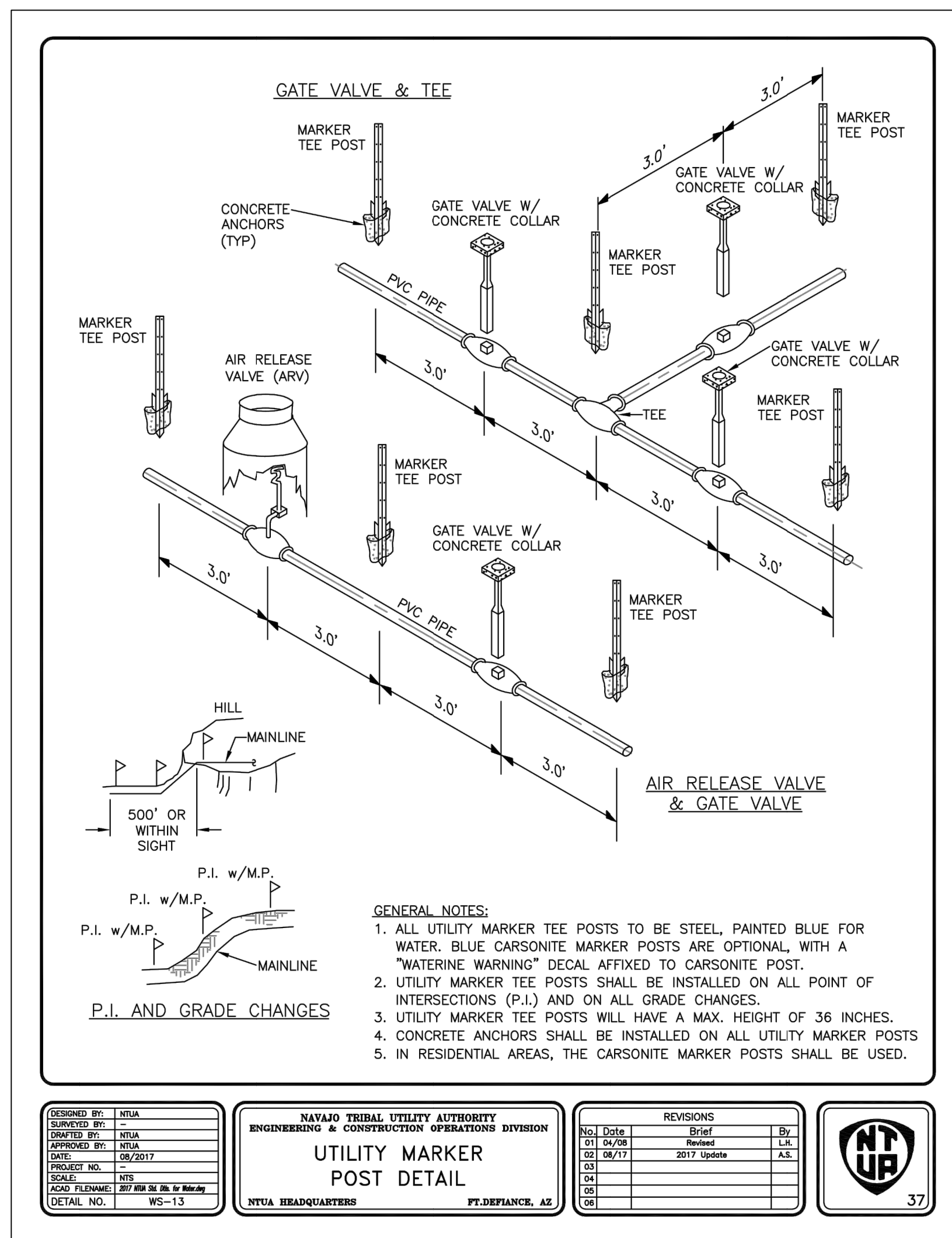
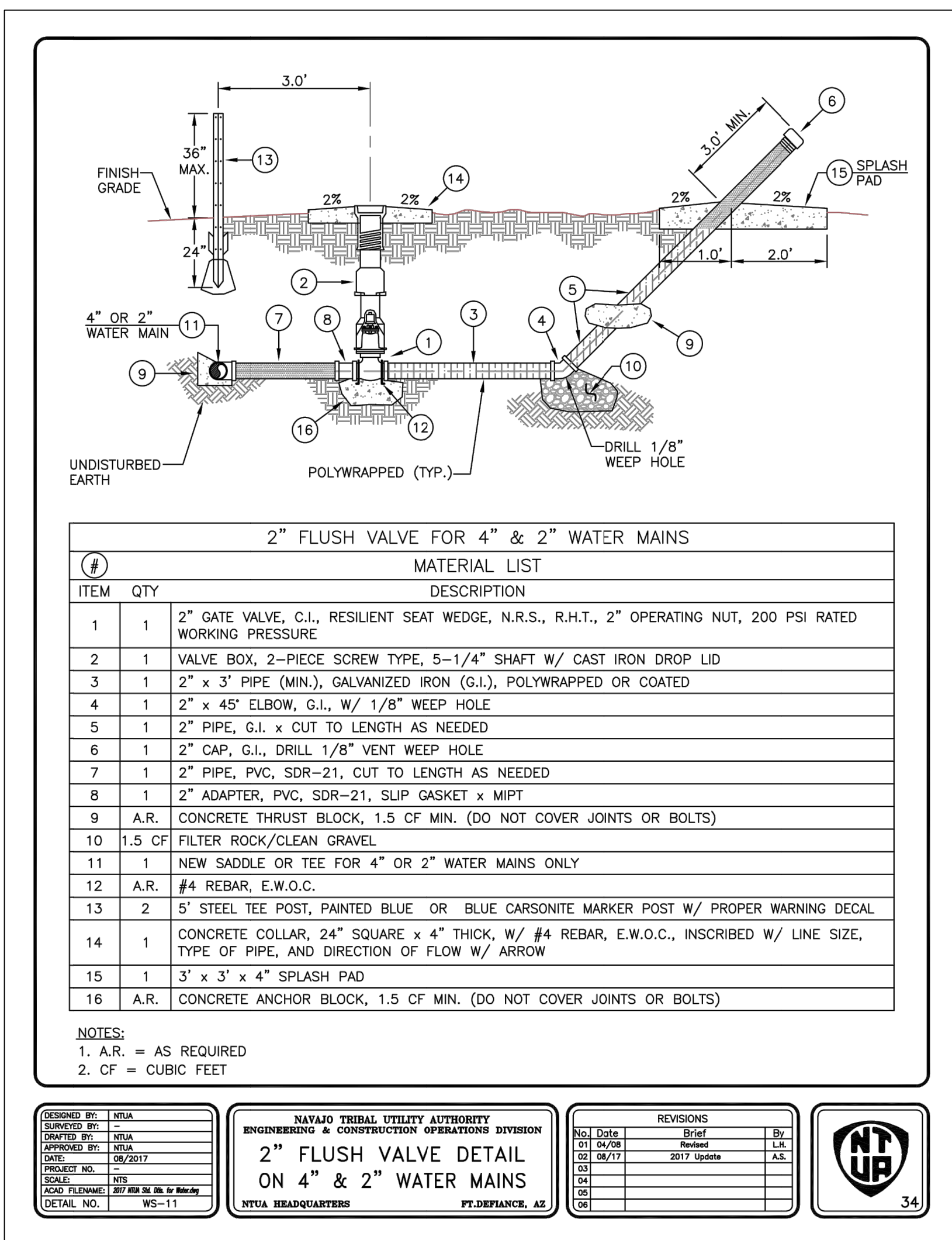
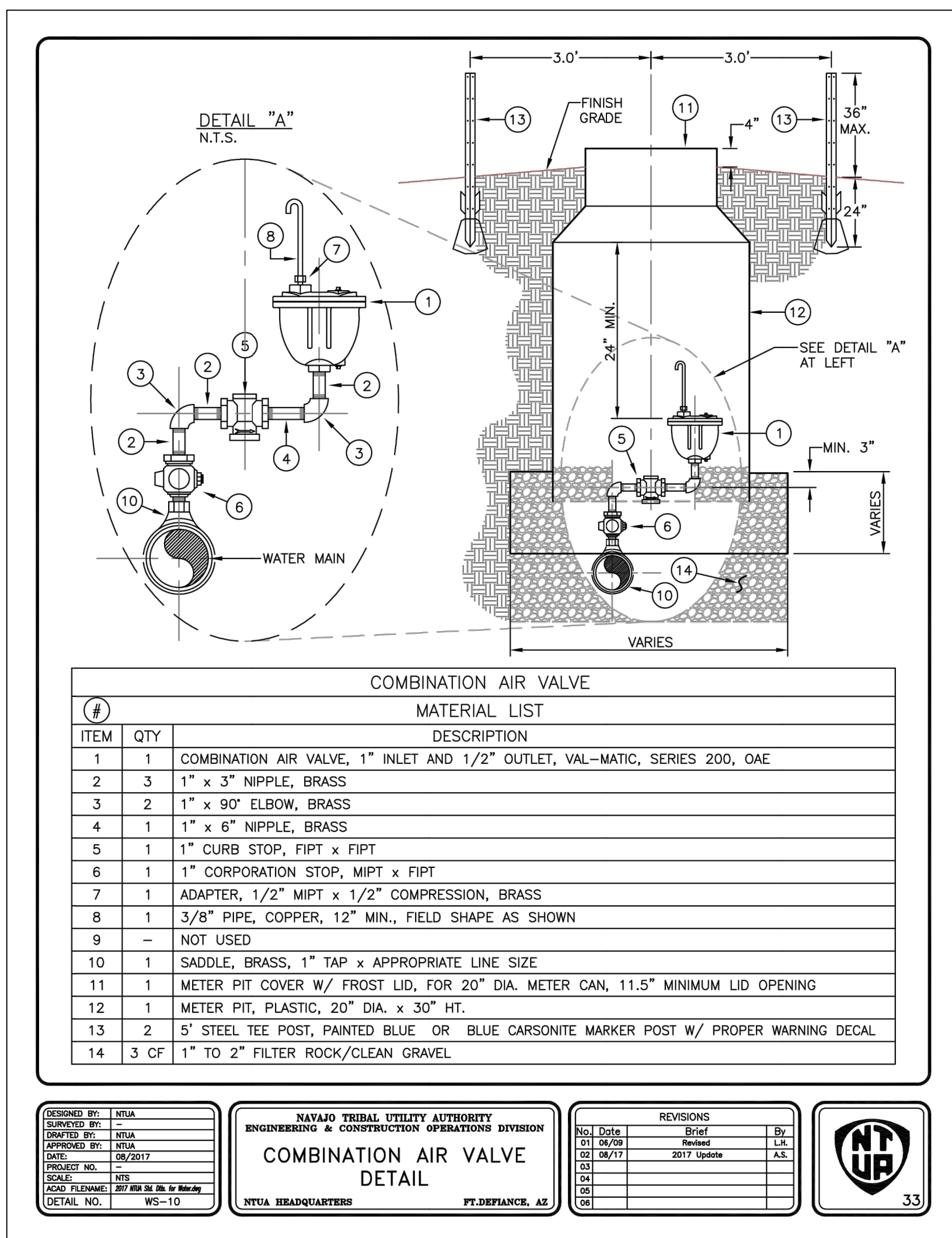
C-08

OF











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Lukachukai Community Schools  
Waterline Supply  
Lukachukai, AZ 86507

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REVIEWED BY NDR

DATE 09/03/2021

PROJECT NO. 20-7002.001

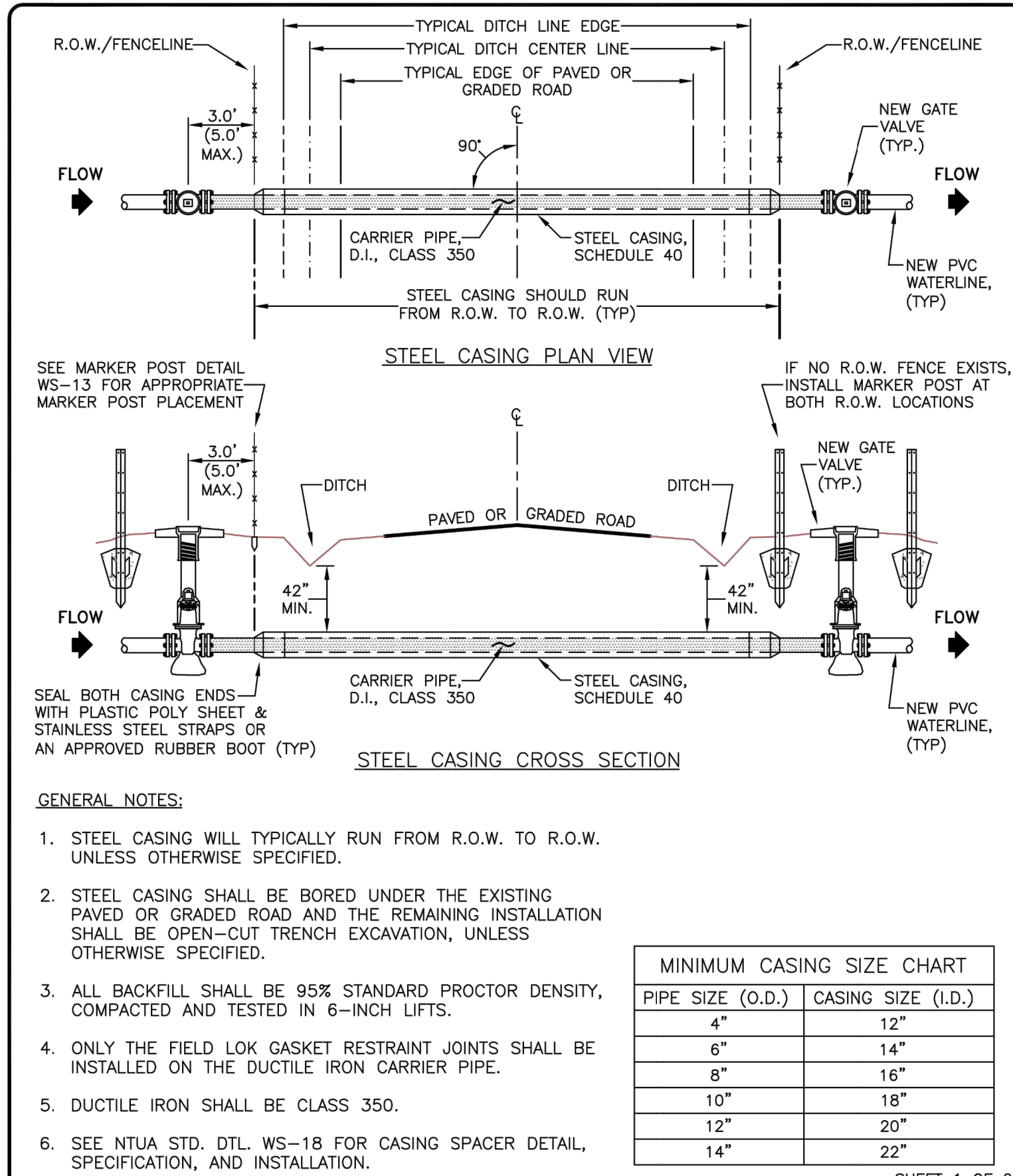
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LCS WATERLINE  
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NTUA STANDARD  
DRAWINGS (3)

SHEET NO.

**D-03**

OF

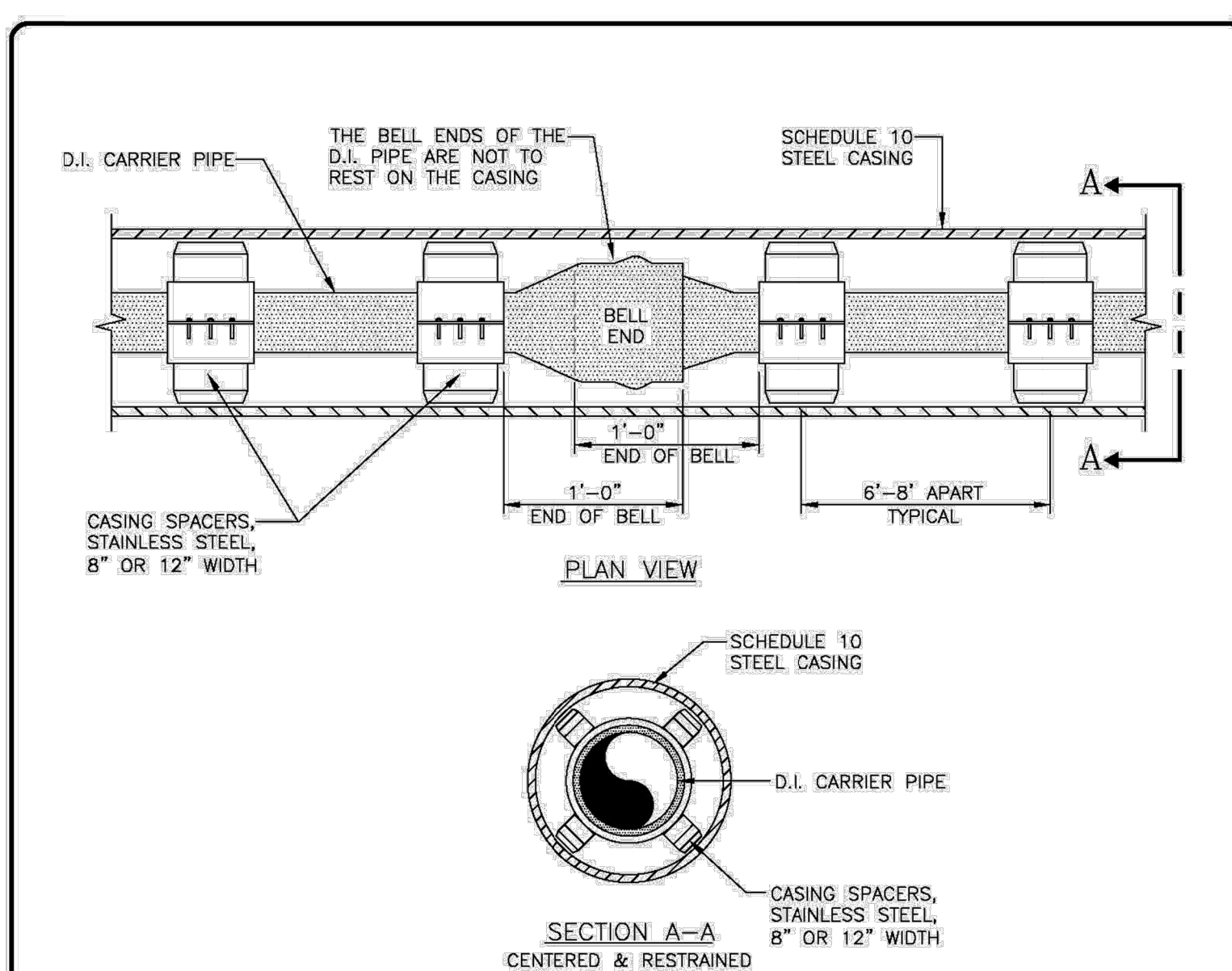


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APPROVED BY: JTL	DATE: 09/20/21	DATE: 09/20/21
PROJECT NO. 20-7002	DATE: 09/20/21	DATE: 09/20/21
PROJECT NAME: K-8 Academics	DATE: 09/20/21	DATE: 09/20/21
DETAIL NO. WS-17a	DATE: 09/20/21	DATE: 09/20/21

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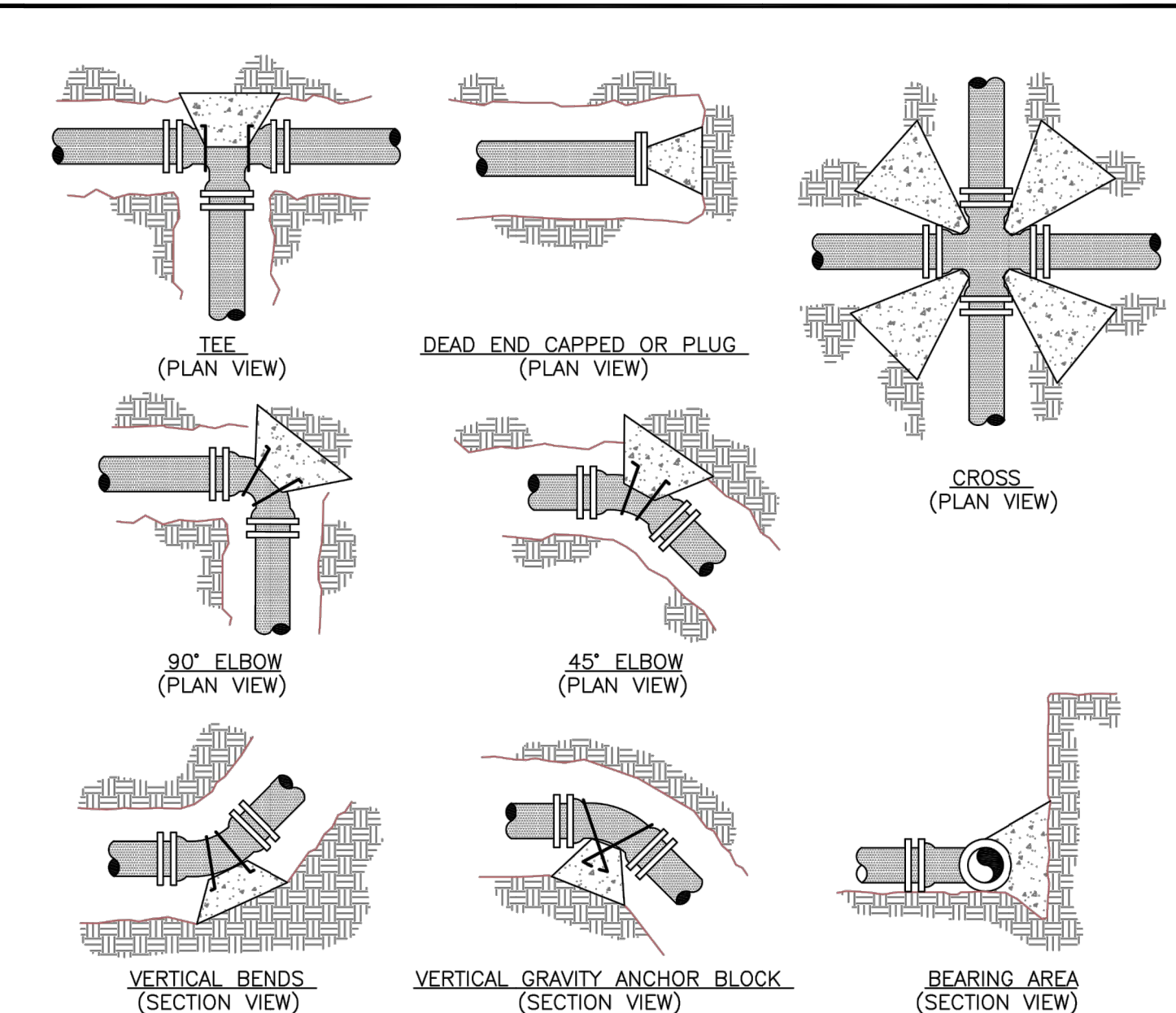


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PROJECT NO. 20-7002	DATE: 09/20/21	DATE: 09/20/21
PROJECT NAME: K-8 Academics	DATE: 09/20/21	DATE: 09/20/21
DETAIL NO. WS-18	DATE: 09/20/21	DATE: 09/20/21

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MINIMUM BEARING AREAS IN SQUARE FEET					
PIPE SIZE	TEE & PLUG	90° ELBOW	45° OR 22 1/2° ELBOW	CROSS	
2"	0.5	0.5	0.5	0.5	
4"	1.5	2.0	1.5	1.0	
6"	3.0	4.5	2.5	2.0	
8"	5.0	7.5	4.0	4.0	
10"	8.0	11.0	6.5	5.5	
12"	11.0	15.5	9.0	8.0	
14"	15.0	21.0	12.0	10.5	
16"	19.0	27.0	15.5	13.5	
18"	24.0	34.0	19.0	17.0	

- NOTES:**
- DO NOT COVER GASKETED JOINTS AND NUTS/BOLTS.
  - PRESSURE TESTING SHALL NOT COMMENCE UNTIL THE CONCRETE HAS SET A MINIMUM OF 48 HRS., UNLESS OTHERWISE SPECIFIED.
  - #4 REBARS AS SHOWN.

SHEET 1 OF 2

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PROJECT NO. 20-7002	DATE: 09/20/21	DATE: 09/20/21
PROJECT NAME: K-8 Academics	DATE: 09/20/21	DATE: 09/20/21
DETAIL NO. WS-19	DATE: 09/20/21	DATE: 09/20/21

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CONCRETE THRUST BLOCK CHART (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	61,854	31,380	15,766
36"	115,209	162,931	89,177	44,952	22,585
42"	155,528	219,950	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

- GENERAL NOTES:**
- 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./FTS.
  - TO OBTAIN VOLUME OF CONCRETE REQUIRED, USE:  
VOLUME OF CONCRETE (CF)= THRUST (LBS.) x SYSTEM PRESSURE (PSI)/100 PSI /// 150 LBS./CF  
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 FT OR 2 CUBIC YARDS.

SHEET 2 OF 2

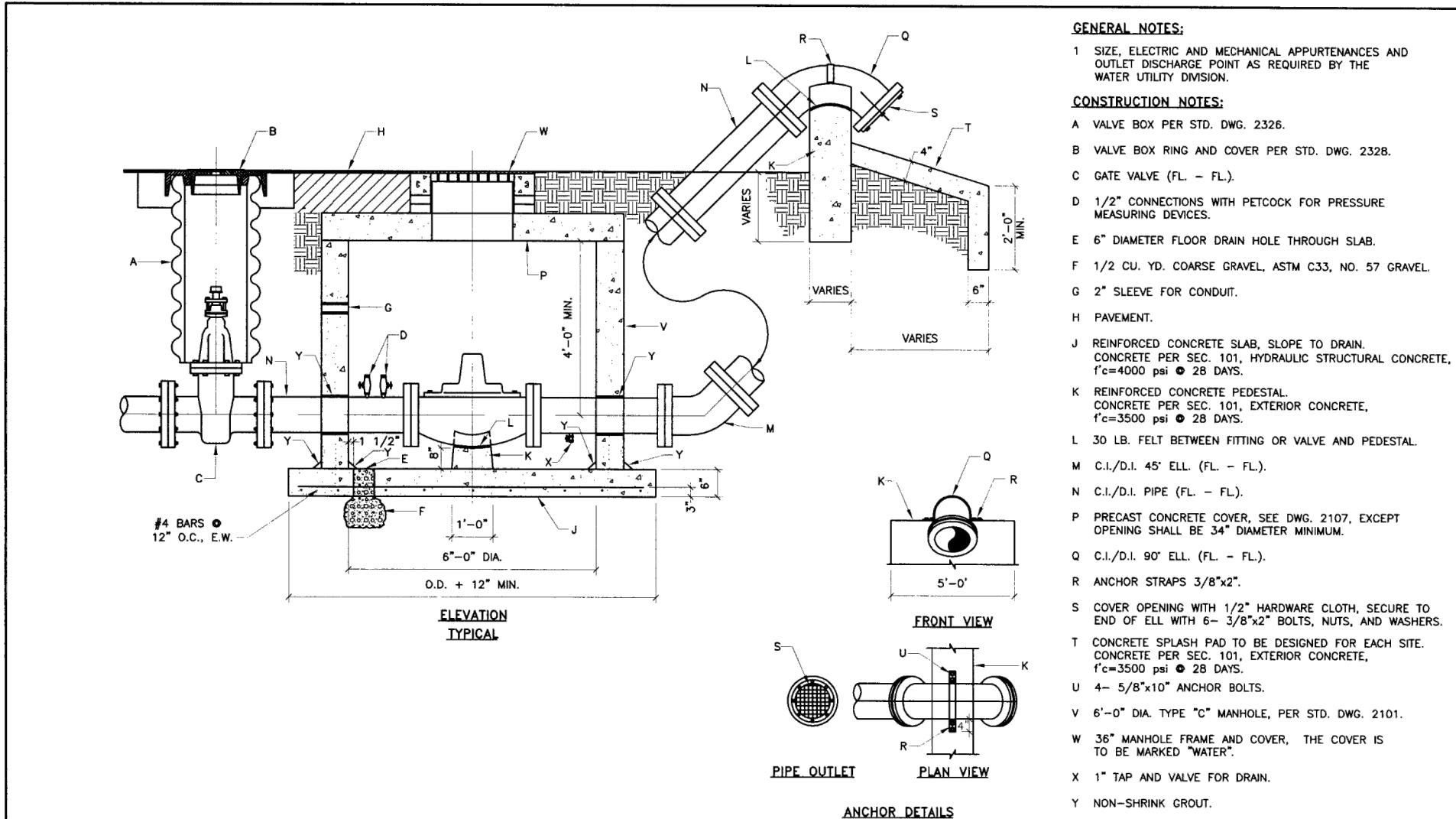
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PROJECT NO. 20-7002	DATE: 09/20/21	DATE: 09/20/21
PROJECT NAME: K-8 Academics	DATE: 09/20/21	DATE: 09/20/21
DETAIL NO. WS-19a	DATE: 09/20/21	DATE: 09/20/21

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NOTES:

1. CONSTRUCTION NOTES A AND B DO NOT APPLY TO THIS PROJECT. GATE VALVE, VALVE BOX, AND VALVE BOX COLLAR TO BE INSTALLED IN ACCORDANCE WITH NTUA STANDARD DETAIL WS-14. DO NOT REFERENCE APWA STANDARD DETAILS 2326 OR 2328.
2. CONSTRUCTION NOTE C DOES NOT APPLY TO THIS PROJECT. GATE VALVE SHALL BE MJ X MJ.
3. LOCATION OF GATE VALVE SHALL BE CONSISTENT WITH PLACEMENT IDENTIFIED ON SHEET C-01.
4. PRESSURE RELIEF VALVE SHALL BE GA INDUSTRIES 6" FIGURE 5670 PILOT OPERATED PRESSURE RELIEF / PRESSURE SUSTAINING VALVE, FLANGED, CLASS 150.
5. INCLUDE EBAA IRON SERIES 2000 MEGAFRANGE ADAPTER DOWNSTREAM OF THE PRESSURE RELIEF VALVE.

