

SANITARY SEWER AND WATER LINE IMPROVEMENTS FOR USD 320 - SPORTS COMPLEX

SEPTEMBER 2017

NOTES:

- ALL CONSTRUCTION ACTIVITIES SHALL BE COORDINATED WITH USD 320 AND CITY OF WAMEGO.
- ALL CONSTRUCTION WORK AND UTILITY WORK OUTSIDE OF THE PROPERTY BOUNDARIES SHALL BE PERFORMED IN COOPERATION WITH AND IN ACCORDANCE WITH REGULATIONS OF THE AUTHORITIES CONCERNED.
- EXISTING UTILITIES AND THEIR LOCATION, AS SHOWN ON THE PLANS, REPRESENT THE BEST INFORMATION OBTAINABLE FOR DESIGN. LOCATION INFORMATION HAS BEEN OBTAINED FROM THE VARIOUS UTILITY COMPANIES AND IS EITHER FROM COMPANY RECORD DRAWINGS OR COMPANY PROVIDED FIELD LOCATIONS. THE PLAN LOCATIONS SHOWN ARE NOT GUARANTEED. ADDITIONAL EXISTING UTILITIES MAY ALSO BE ENCOUNTERED. THE CONTRACTOR SHALL BE REQUIRED TO WORK AROUND EXISTING UTILITIES WITHIN THE RIGHT-OF-WAY WHICH DO NOT CONFLICT WITH PROPOSED CONSTRUCTION. THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION OF EACH PHASE OF THE PROJECT, THE CONTRACTOR SHALL BE REQUIRED TO FIELD VERIFY THE LOCATION AND ELEVATIONS OF EXISTING UTILITIES. ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING PROPERTY PINS, BENCH MARKS, REFERENCE POINTS, STAKES, AND SECTION CORNERS. THE CONTRACTOR SHALL BE REQUIRED TO RE-ESTABLISH ANY WHICH ARE DAMAGED OR DESTROYED BY HIS CONSTRUCTION OPERATIONS. SUCH IRONS SHALL BE RE-ESTABLISHED BY A LICENSED LAND SURVEYOR IN ACCORDANCE WITH STATE LAWS. NO SEPARATE MEASUREMENT OR PAYMENT WILL BE MADE FOR THIS WORK AS IT SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS IN THE CONTRACT.
- TREES & SHRUBS IN PUBLIC RIGHT-OF-WAY WHICH ARE IN DIRECT CONFLICT WITH PROPOSED NEW CONSTRUCTION SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR WITH THE ENGINEER'S APPROVAL. TREES AND SHRUBS WHICH ARE NOT IN CONFLICT WITH PROPOSED NEW CONSTRUCTION AND NOT SHOWN TO BE REMOVED SHALL BE SAVED AND PROTECTED FROM DAMAGE.
- CONTRACTOR TO COMPLY WITH CITY OF WAMEGO STORM WATER MANAGEMENT REQUIREMENTS AS WELL AS THE PROVIDED STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
- TEMPORARY SEEDING SHALL INCLUDE ALL DISTURBED SOIL UNLESS OTHERWISE NOTED AS PERMANENT SEEDING.
- ALL INLETS SHALL BE ADEQUATELY PROTECTED DOWNSTREAM FROM CONSTRUCTION AREA
- EXISTING VEGETATION SHALL BE MAINTAINED IN ALL AREAS AS STORM WATER POLLUTION PREVENTION WITH THE EXCEPTION OF THOSE AREAS NOTED TO BE DISTURBED ON THIS PLAN SHEET.
- CONTRACTOR SHALL DESIGNATE TRUCK WASHOUT AREA.
- EROSION CONTROL INFORMATION IS LOCATED ON INDIVIDUAL PLAN & PROFILE SHEETS. FOR ADDITIONAL EROSION CONTROL INFORMATION, REFER TO PLANS FOR THE USD 320 SPORTS COMPLEX LOCKER & CONCESSIONS AND THE USD 320 DISTRICT KITCHEN.
- CONSTRUCTION METHODS AND MATERIALS SHALL MEET OR EXCEED THE USD 320 SPORTS COMPLEX WATER & SANITARY SEWER SPECIFICATIONS.



PROJECT LOCATION

INDEX TO SHEETS

- TITLE SHEET
- QUANTITIES
- SITE PLAN
- 4-7. SANITARY SEWER PLAN & PROFILE
8. SERVICE LINE A PLAN & PROFILE
9. SERVICE LINE B PLAN & PROFILE
10. SANITARY SEWER DETAILS
- 11-13. WATER LINE A PLAN & PROFILE
- 14-15. WATER LINE B PLAN & PROFILE
16. WATER LINE DETAILS

PROJECT ENGINEER BRETT M. LOUK, P.E.
SMH CONSULTANTS, P.A.
2017 VANESTA DRIVE, SUITE 110
MANHATTAN, KS 66503
(785) 776-0541
blouk@smhconsultants.com

USD 320 TIM WINTER, SUPERINTENDENT
1008 8TH STREET
WAMEGO, KS 66547
(785) 456-7643
winter@usd320.com

**SITE MAP
(NOT TO SCALE)**

CAUTION - NOTICE TO CONTRACTOR:

THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST THE EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS. THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

SAFETY NOTICE TO CONTRACTOR:

IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

WARRANTY / DISCLAIMER:

THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER SMH CONSULTANTS NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE SMH CONSULTANTS INSPECTS AND CONTROLS THE PHYSICAL CONSTRUCTION ON THE SITE.



CALL BEFORE YOU DIG - DRILL - BLAST
800-344-7233
(DIG-SAFE)
(316) 687-3753
(FAX)

KANSAS ONE CALL SYSTEM, INC.

The utilities as shown on this drawing were developed from the information available. This is not implied nor intended to be the complete inventory of utilities in this area. It is the clients/contractors responsibility to verify the location of all utilities (whether shown or not) and protect said utilities from any damage. Confirmation Numbers 17093029, 1729016, 17295974.

WATER & SEWER CITY OF WAMEGO
430 LINCOLN AVENUE
WAMEGO, KS 66547
(785) 456-9119

ELECTRIC CITY OF WAMEGO
430 LINCOLN AVENUE
WAMEGO, KS 66547
(785) 456-9119

WESTAR ENERGY
DAN LUTHI
225 SETH CHILD ROAD
MANHATTAN, KS 66502
(785) 587-2325

TELEPHONE WTC TELEPHONE SERVICE
ANDY BOECKMAN
1009 LINCOLN AVENUE
WAMEGO, KS 66547
(785) 456-1000

CABLE COX COMMUNICATIONS
GLENN CALHOON
931 SW HENDERSON
TOPEKA, KS 66615
(785) 215-6705

GAS KANSAS GAS SERVICE
JULIE ROBLER
225 SETH CHILD ROAD
MANHATTAN, KS 66502
(785) 587-2339



REVISION DESCRIPTION
PE STAMP & SPECIFICATION REFERENCE ADDED

REVISION DATE
9/27/2017

NORTH



NOT TO SCALE

PROJECT # 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

DATE: 9.7.2017

SHEET # 1

TOTAL SHEETS 16

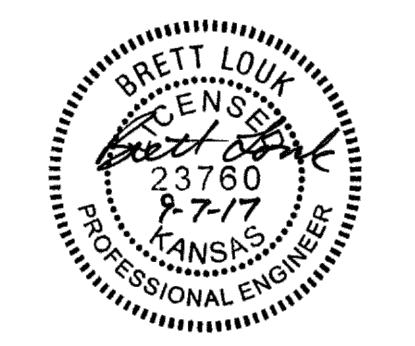
PLANS APPROVED BY:

Merle Page, City Manager

MERLE PAGE
CITY MANAGER

SANITARY SEWER QUANTITIES		
ITEM	QUANTITY	UNIT
MOBILIZATION	1	LS
CONSTRUCTION STAKING	1	LS
CLEARING & GRUBBING	1	LS
4'-0" STANDARD MANHOLE	6	EA
EXTRA DEPTH MANHOLE	14.8	VF
SANITARY SEWER PIPE (8" SDR 26)	1961	LF
SERVICE LINE (4" PVC)	39	LF
SERVICE LINE (6" PVC)	1036	LF
6" PVC TEE	2	EA
6" PVC WYE	2	EA
CLEANOUT RISER	11	EA
CONNECTION TO EXISTING SANITARY SEWER	1	LS
SEDIMENT & EROSION CONTROL	1	LS

WATER QUANTITIES		
ITEM	QUANTITY	UNIT
MOBILIZATION	1	LS
CONSTRUCTION STAKING	1	LS
CLEARING & GRUBBING	1	LS
WATER MAIN (12" C900)	1706	LF
WATER MAIN (6" C900)	610	LF
VALVES & FITTINGS		
12"X6"X12" MJ TEE	1	EA
12" 22.5" MJ BEND	2	EA
12" 45" MJ BEND	2	EA
12" GATE VALVE	3	EA
12" CAP/PLUG	1	EA
VALVES & FITTINGS		
6" 11.25" MJ BEND	2	EA
6" 45" MJ BEND	2	EA
6" 90" MJ BEND	2	EA
6" GATE VALVE	1	EA
3" MIP FIRE HYDRANT SETTING	2	EA
CONNECT TO EXISTING 12" WATER MAIN	1	EA
SEDIMENT & EROSION CONTROL	1	LS



REVISION DATE	REVISION DESCRIPTION	QUANTITIES
09/22/2017	1 C900 WATERLINE	

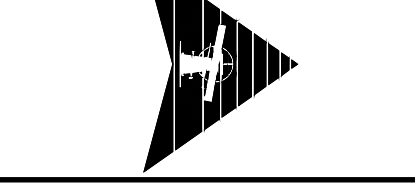
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DATE: 9.7.2017
SHEET # 2
TOTAL SHEETS 16



REVISION DESCRIPTION
1 LABELED RIGHT OF WAY

REVISION DATE
9/27/2017

NORTH



SCALE: 1" = 100'

PROJECT #: 1702MN4004
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DRAWN BY: KMM

DATE: 9.7.2017

SHEET #

3

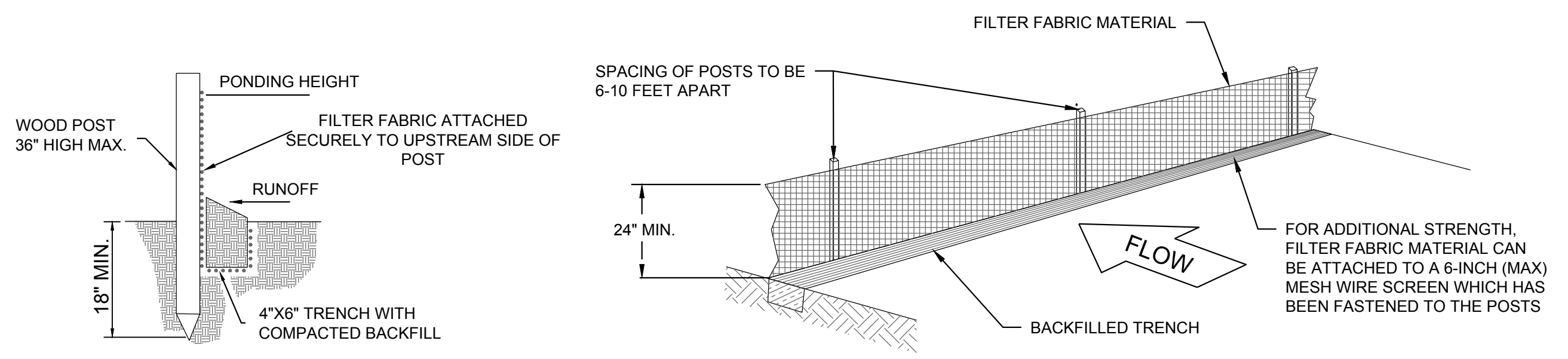
TOTAL SHEETS
16

LEGEND

- EXISTING FENCE
- EXISTING FENCE
- EXISTING FIBER OPTIC LINE
- EXISTING GAS LINE
- PROPOSED GAS SERVICE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING UNDERGROUND ELECTRIC LINE
- PROPOSED WATER LINE
- PROPOSED WATER SERVICE
- EXISTING SANITARY SEWER LINE
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY SEWER SERVICE
- 5' EXISTING CONTOUR
- 1' EXISTING CONTOUR
- 5' PROPOSED CONTOUR
- 1' PROPOSED CONTOUR
- SILT FENCE
- FIRE HYDRANT
- EXISTING POWER POLE
- EXISTING PINE TREE
- EXISTING DECIDUOUS TREE

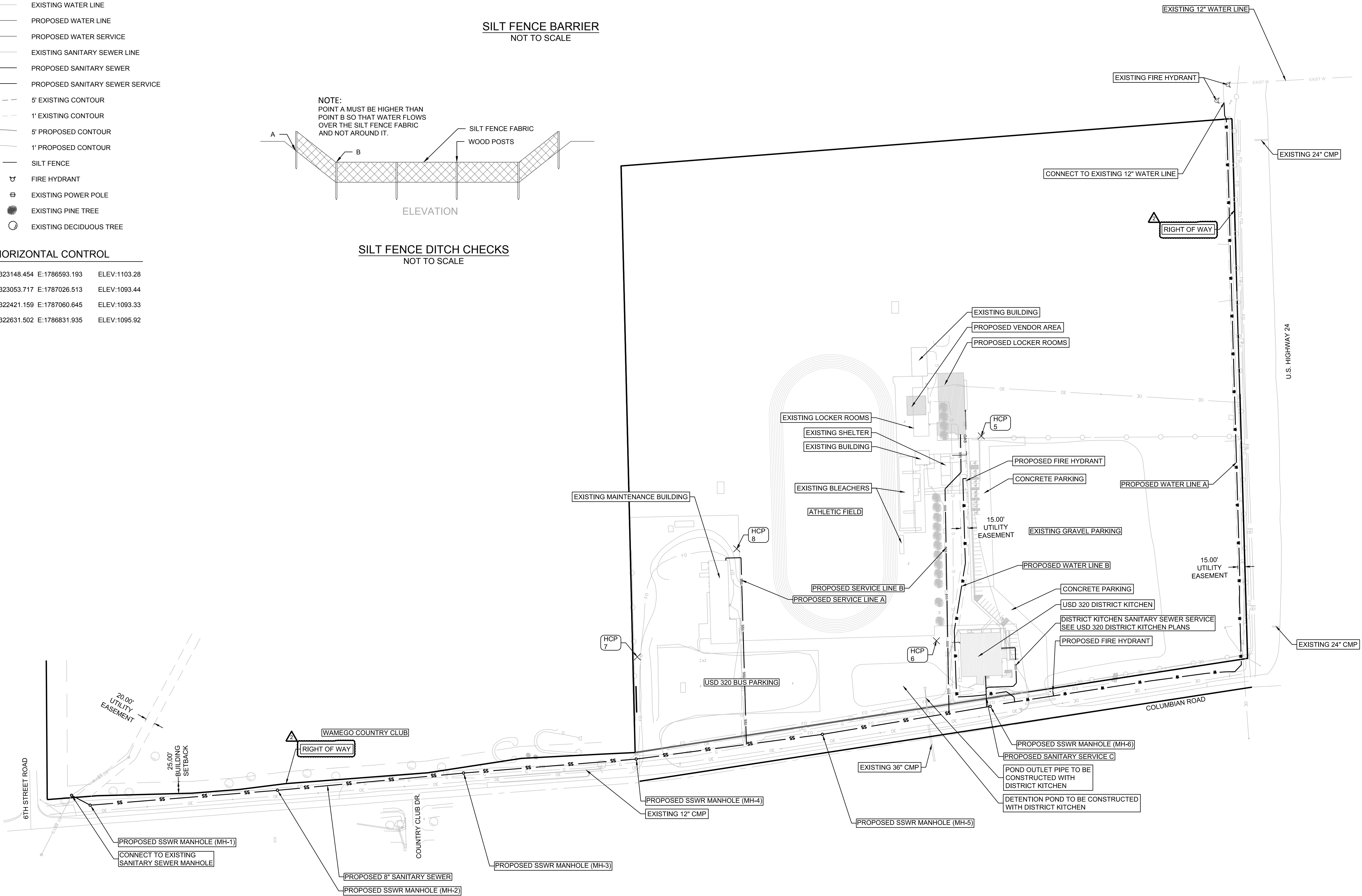
HORIZONTAL CONTROL

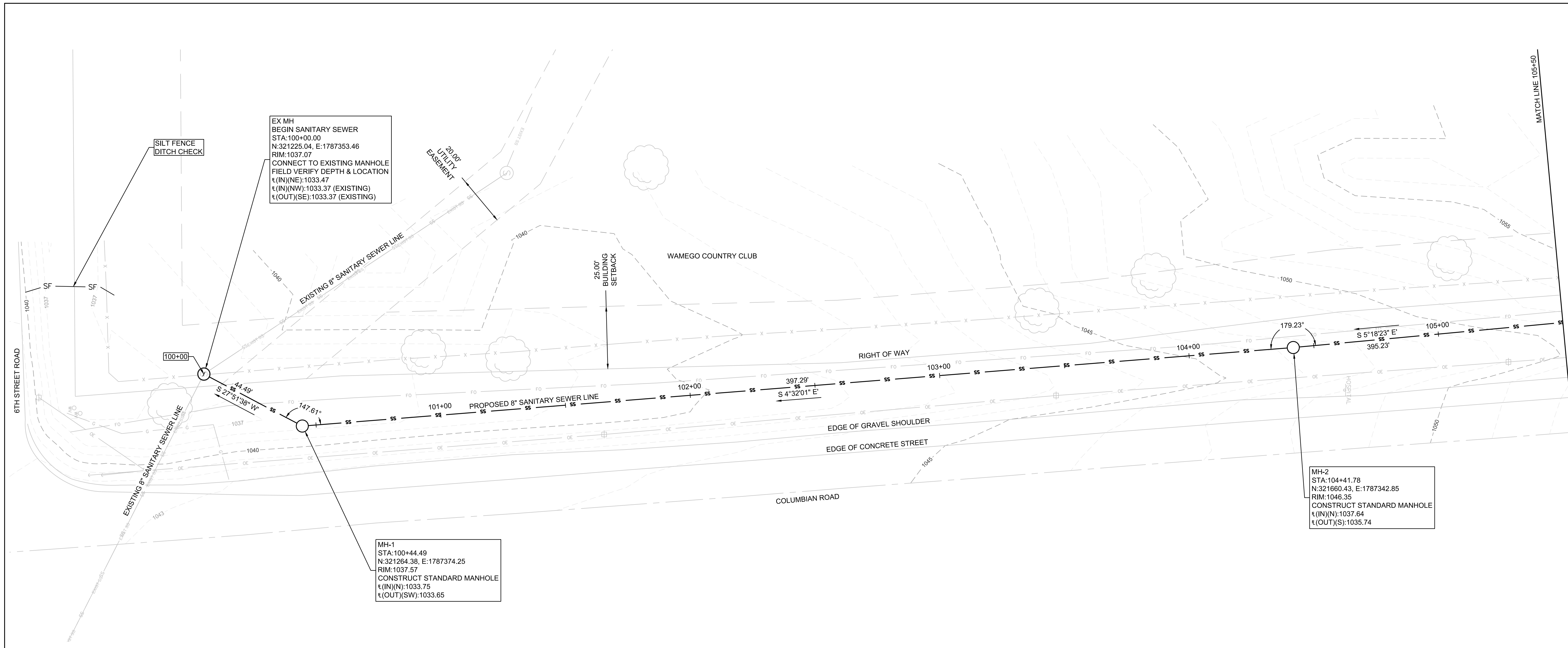
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HCP #6:	N:323053.717	E:1787026.513	ELEV:1093.44
HCP #7:	N:322421.159	E:1787060.645	ELEV:1093.33
HCP #8:	N:322631.502	E:1786831.935	ELEV:1095.92



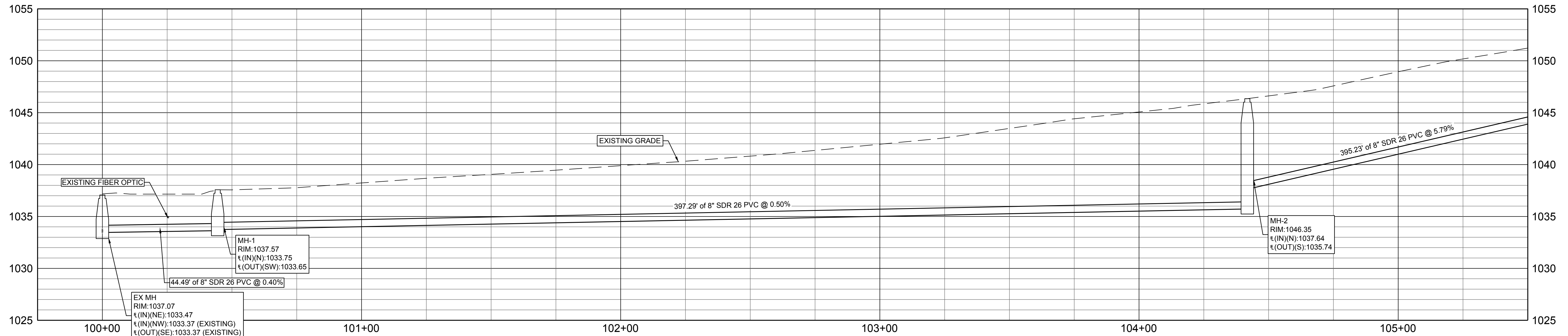
SILT FENCE BARRIER
NOT TO SCALE

SILT FENCE DITCH CHECKS
NOT TO SCALE

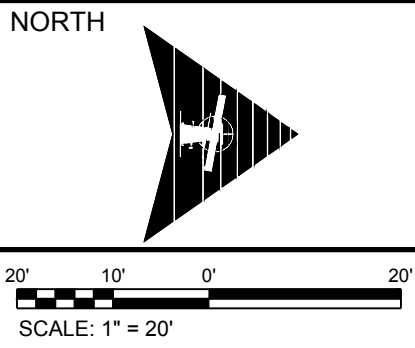




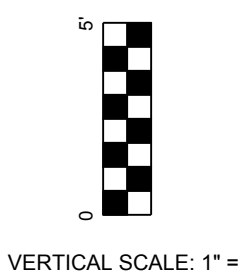
SANITARY SEWER PROFILE



REVISION DATE	REVISION DESCRIPTION
00/00/00	(DESCRIPTION)



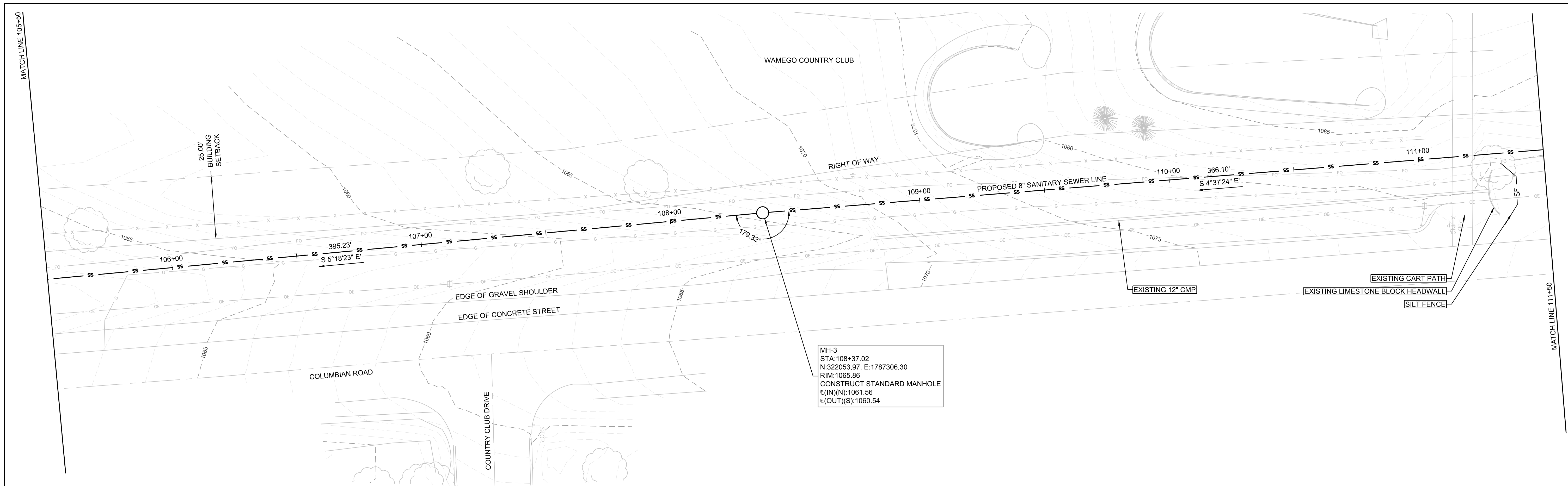
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DATE: 9.7.2017
SHEET # 4
TOTAL SHEETS 16



USD 320 - SPORTS COMPLEX

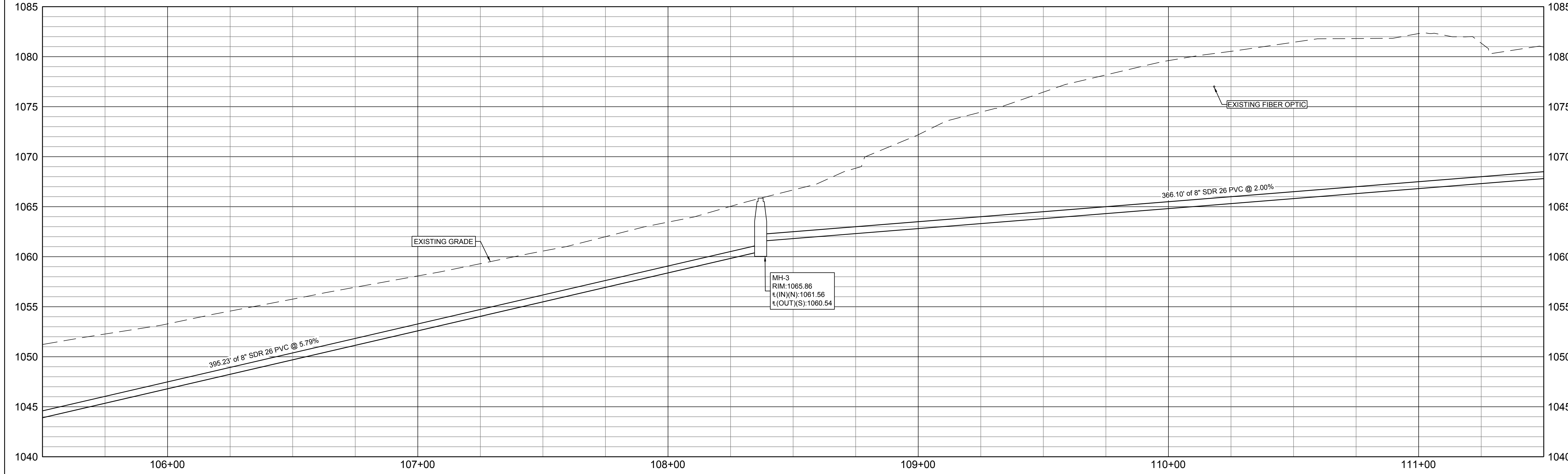
CONSTRUCTION DOCUMENTS

WAMEGO, KANSAS

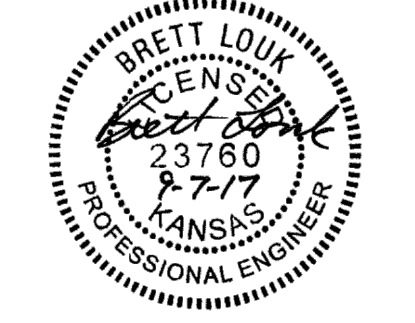


MH-3
STA:108+37.02
N:322053.97, E:1787306.30
RIM:1065.86
CONSTRUCT STANDARD MANHOLE
I(IN)(N):1061.56
I(OUT)(S):1060.54

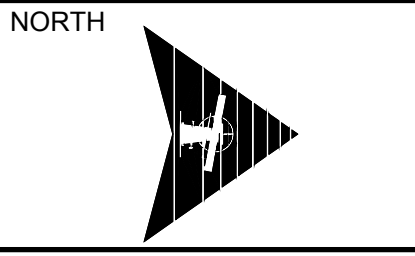
SANITARY SEWER PROFILE



MH-3
RIM:1065.86
I(IN)(N):1061.56
I(OUT)(S):1060.54



REVISION DATE	REVISION DESCRIPTION (DESCRIPTION)
00/00/00	



SCALE: 1" = 20'

PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

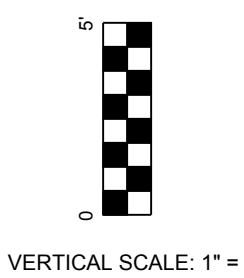
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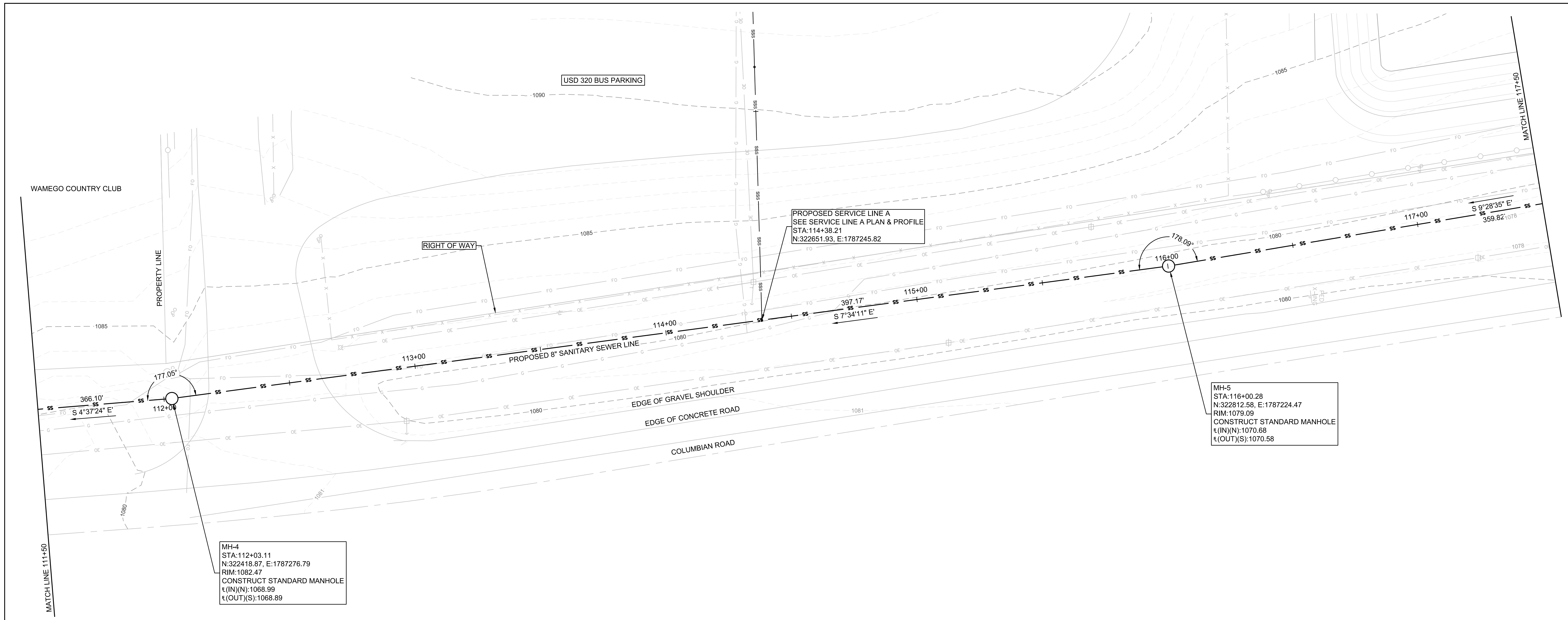
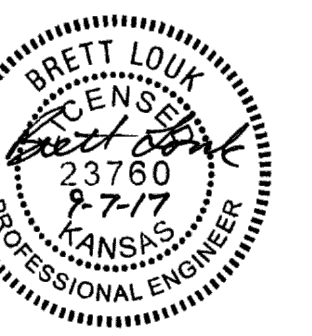
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TOTAL SHEETS

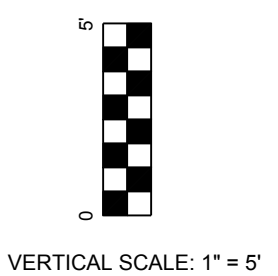
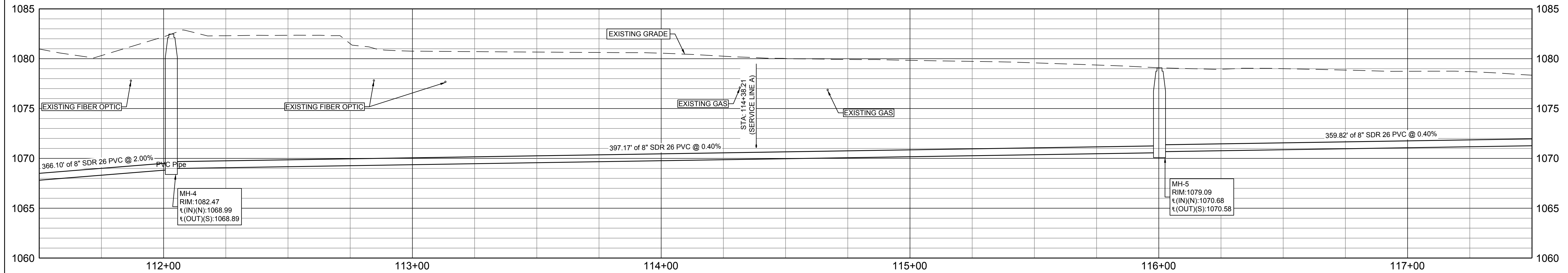
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VERTICAL SCALE: 1" = 5'



SANITARY SEWER PROFILE



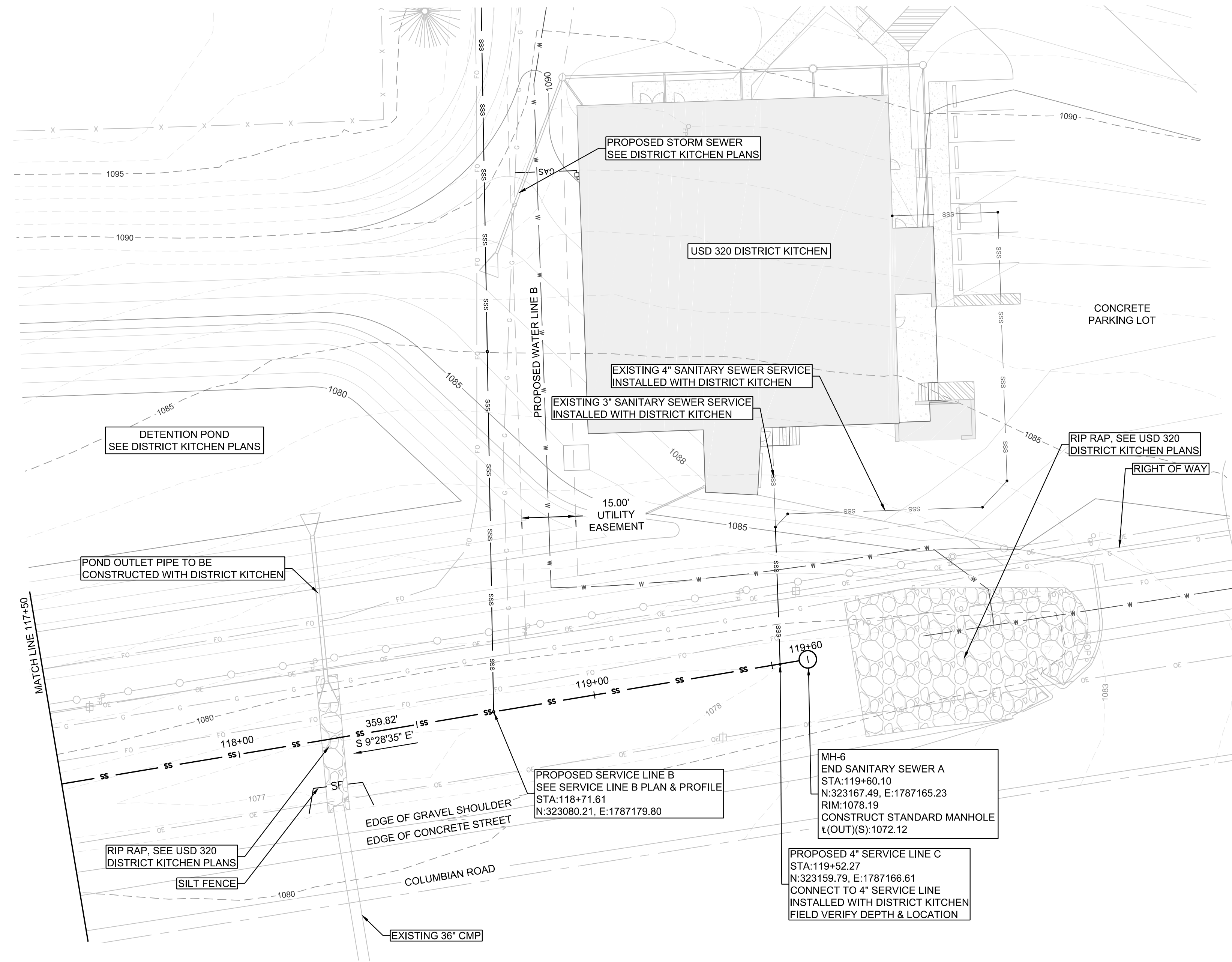
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PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM
DATE: 9.7.2017
SHEET #
6
TOTAL SHEETS
16

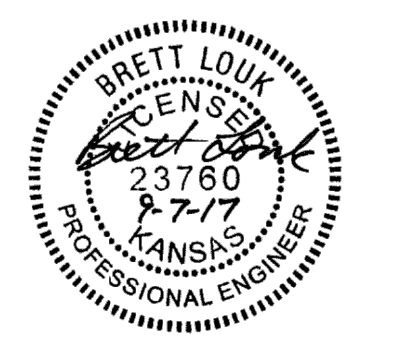
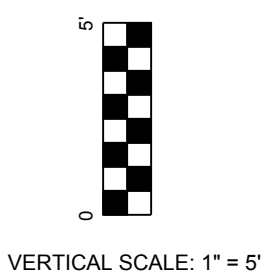
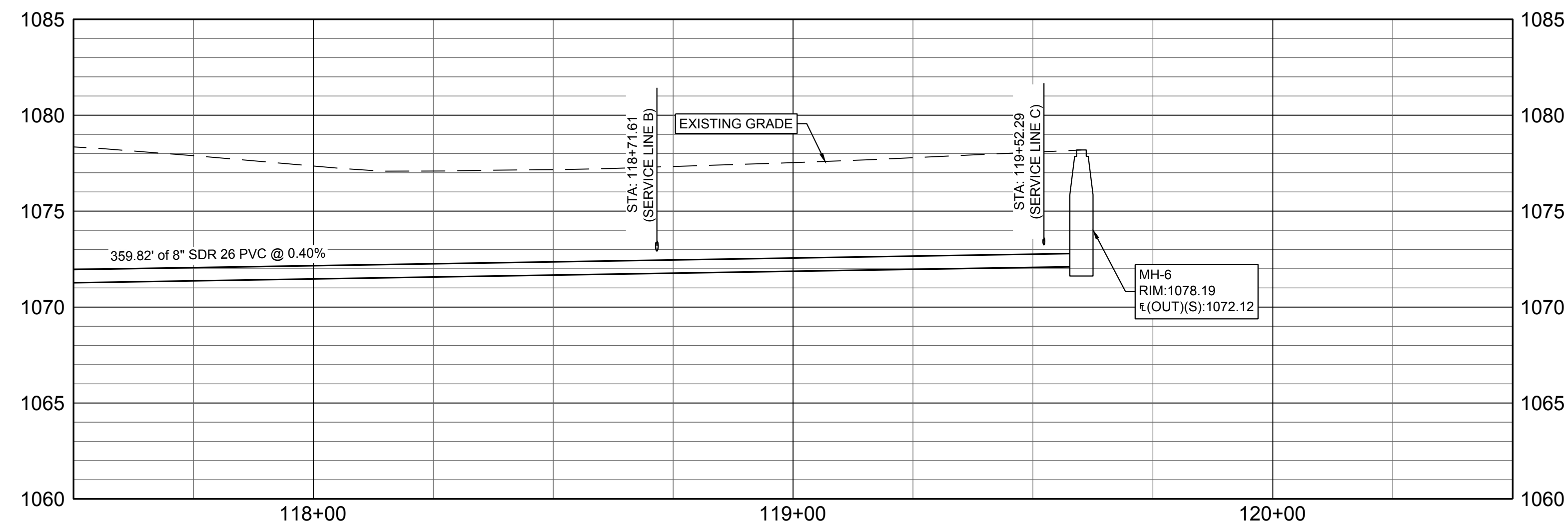
USD 320 - SPORTS COMPLEX

CONSTRUCTION DOCUMENTS

WAMEGO, KANSAS

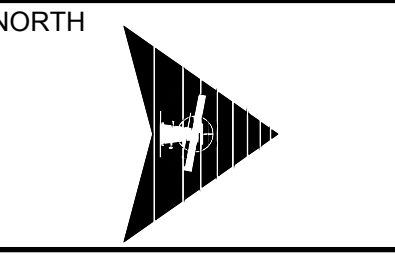


SANITARY SEWER PROFILE



REVISION DATE	REVISION DESCRIPTION
00/00/00	(DESCRIPTION)

NORTH



SCALE: 1" = 20'

PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

DATE: 9.7.2017

SHEET #
7

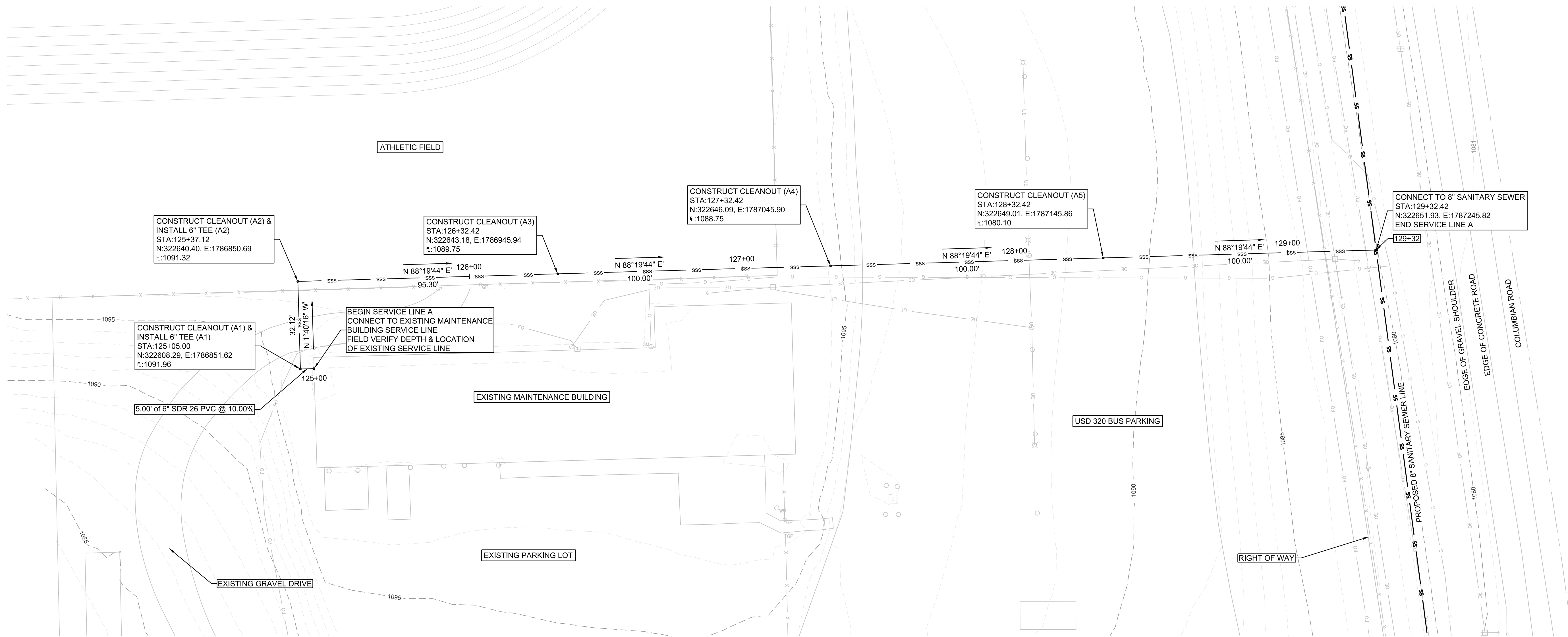
TOTAL SHEETS
16

SANITARY SEWER PLAN & PROFILE

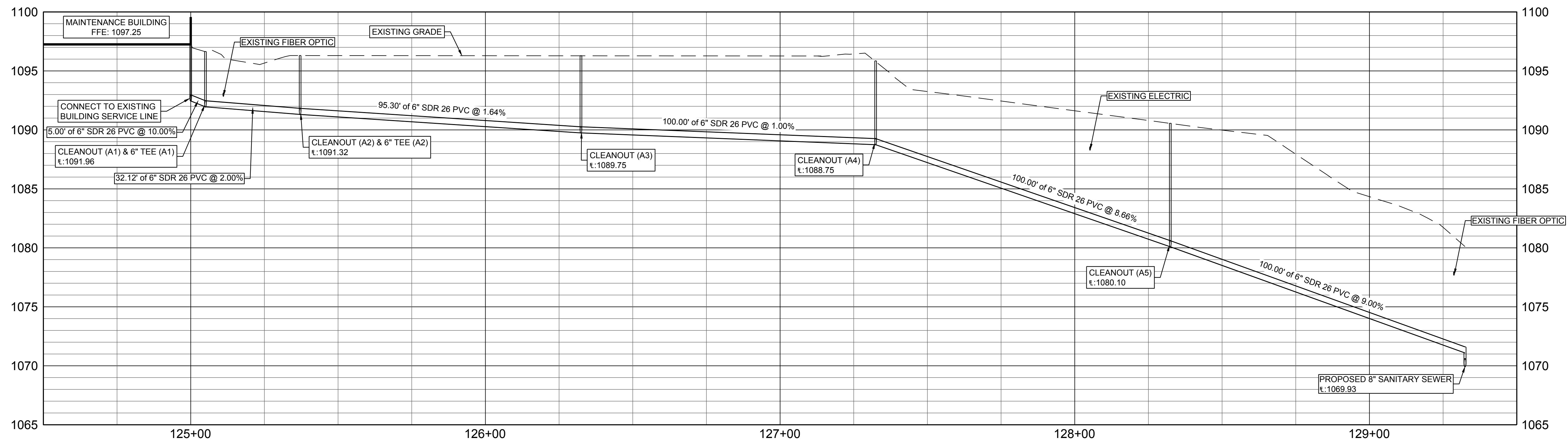
USD 320 - SPORTS COMPLEX

CONSTRUCTION DOCUMENTS

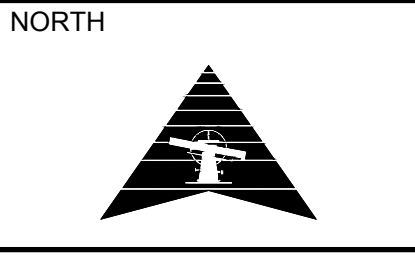
WAMEGO, KANSAS



SERVICE LINE A PROFILE



REVISION	DATE	DESCRIPTION
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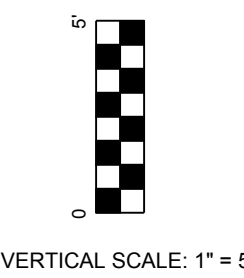
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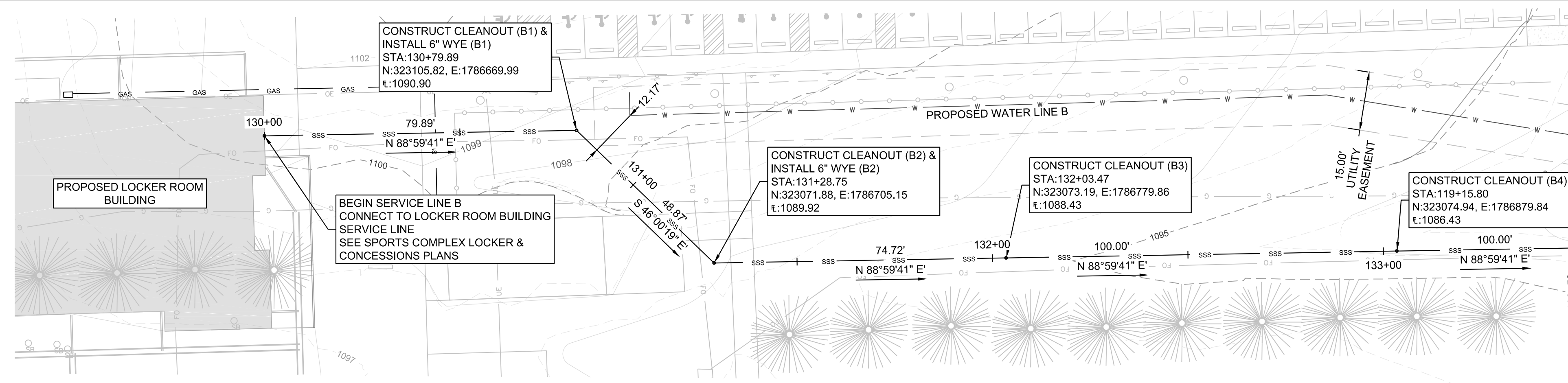
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DRAWN BY: KMM

DATE: 9.7.2017

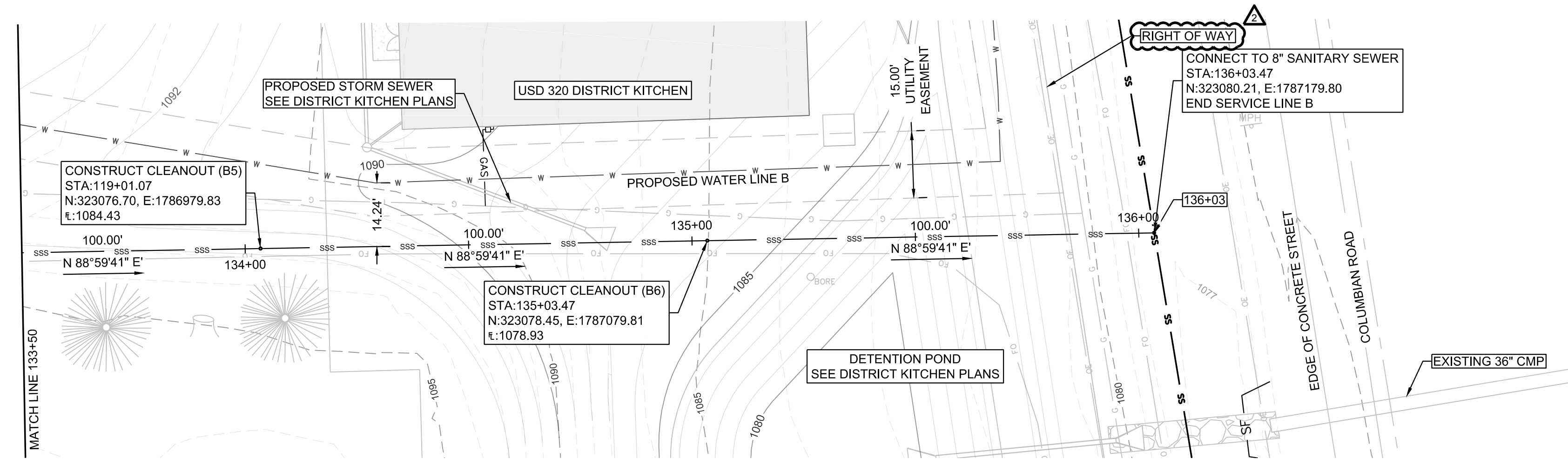
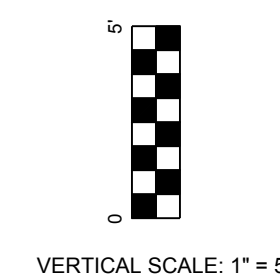
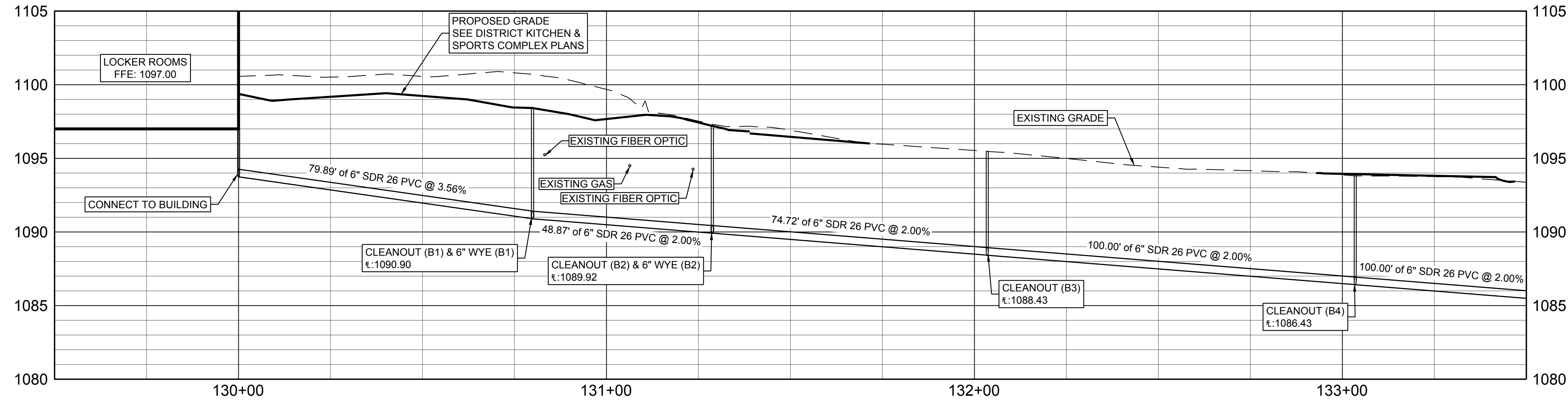
SHEET # **8**

TOTAL SHEETS 16

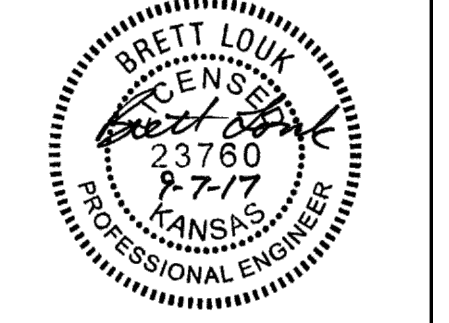
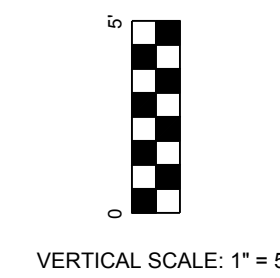
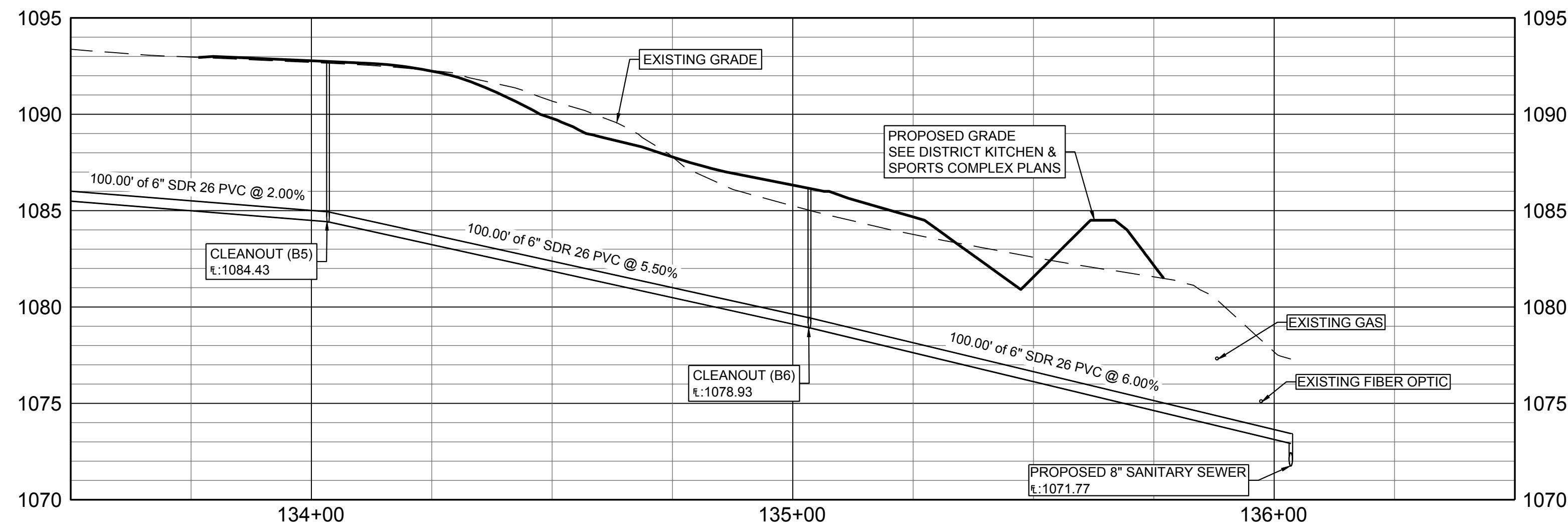




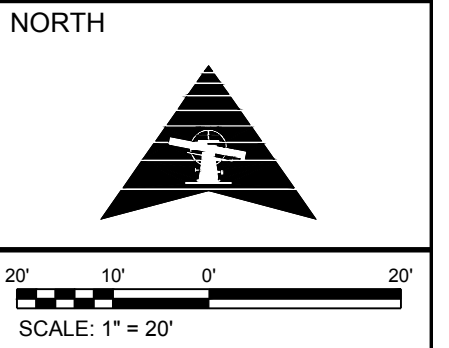
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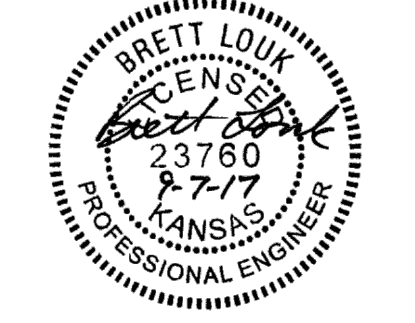


SERVICE LINE B PROFILE



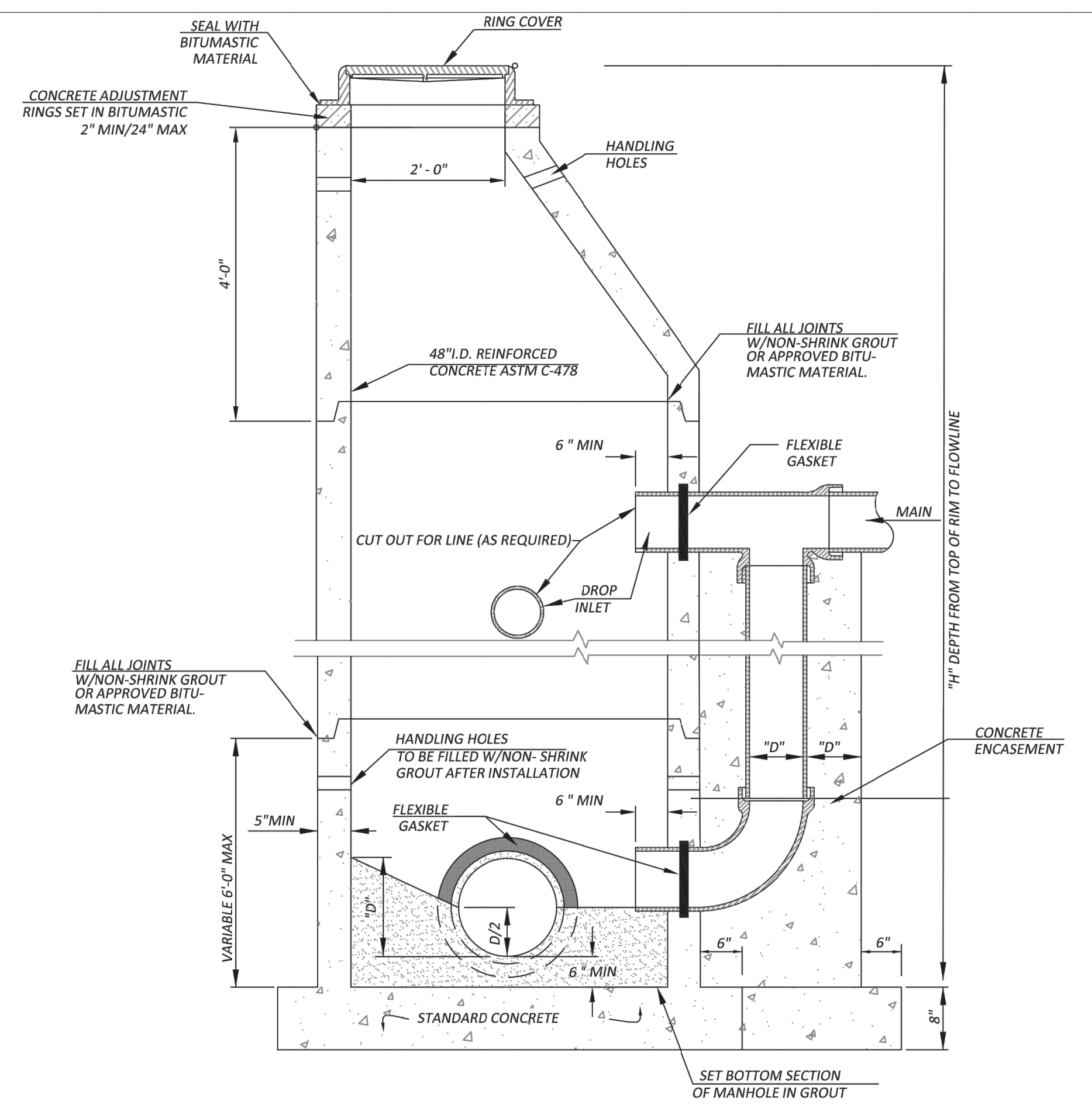
REVISION	DATE	DESCRIPTION
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2		



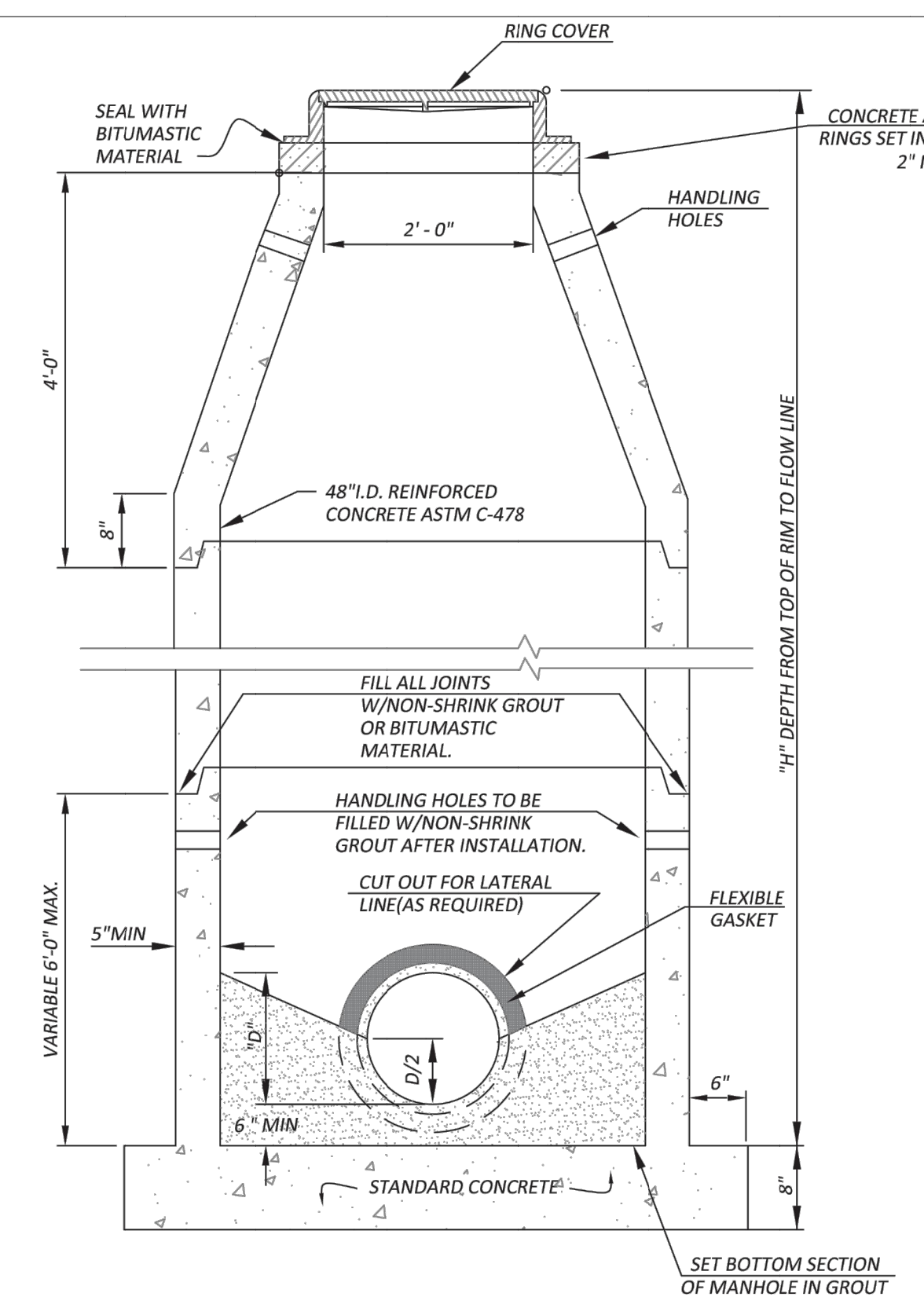


REVISION DATE	REVISION DESCRIPTION (DESCRIPTION)
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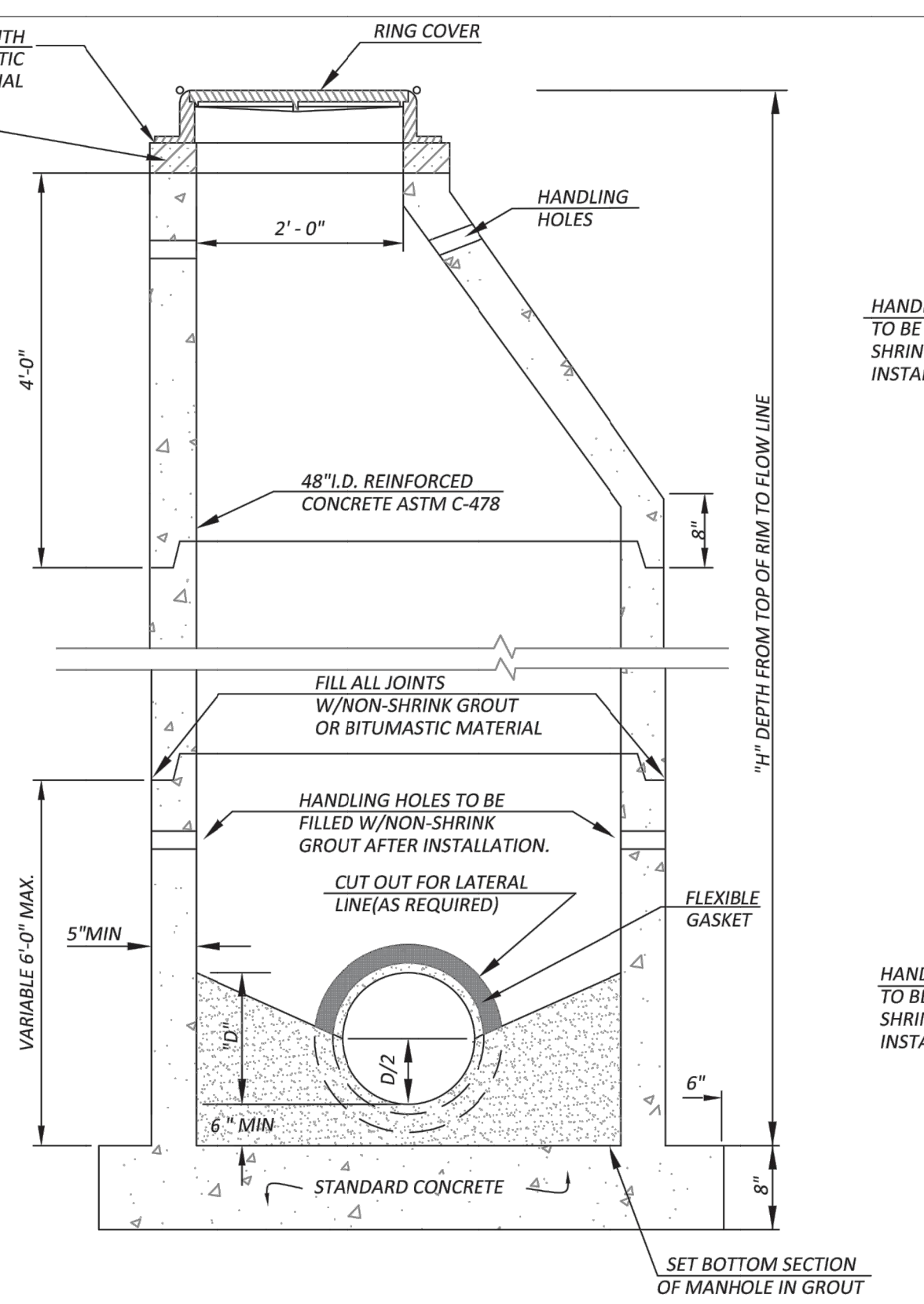
SANITARY SEWER DETAILS



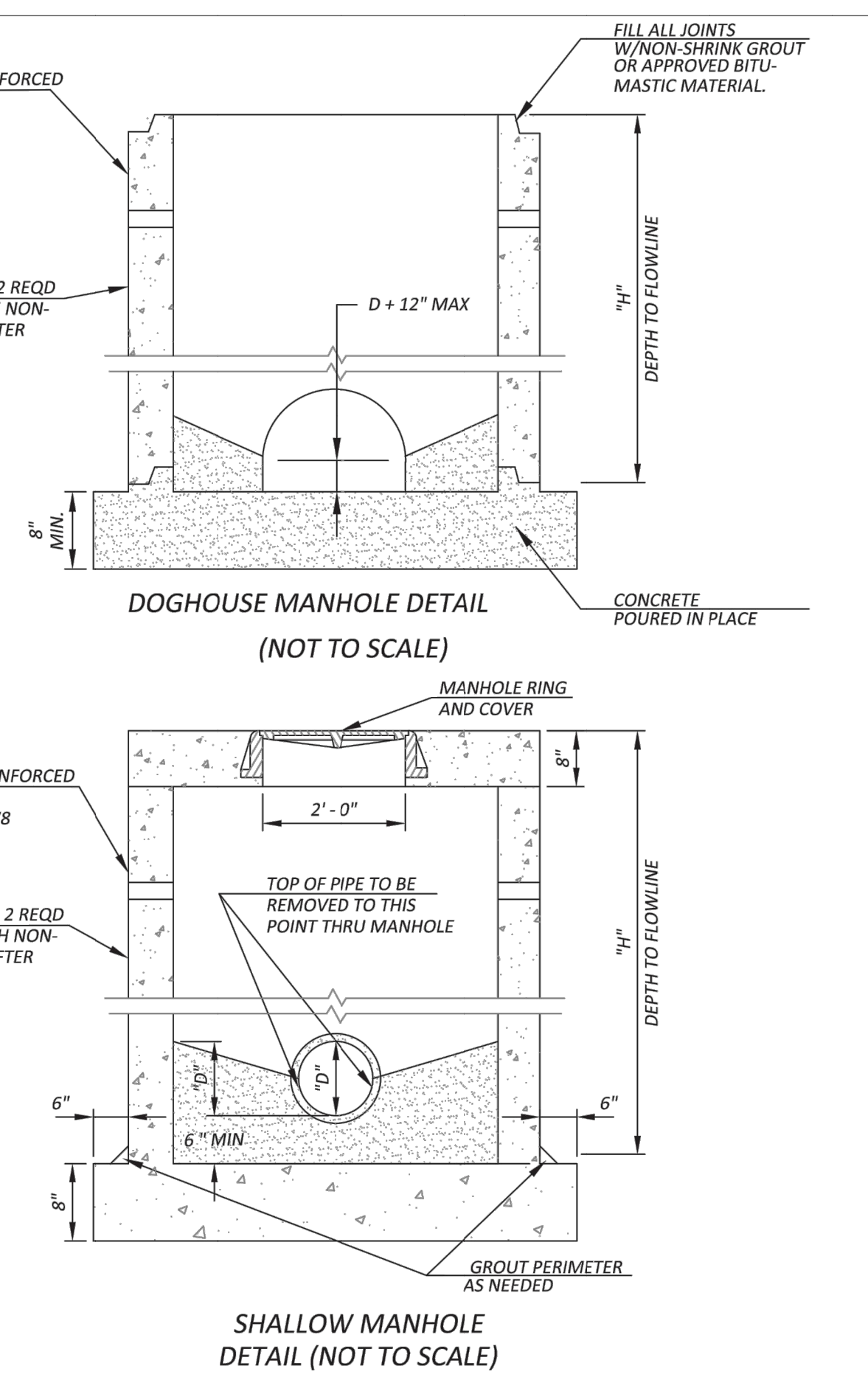
PRECAST OUTSIDE DROP MANHOLE DETAIL (NOT TO SCALE)



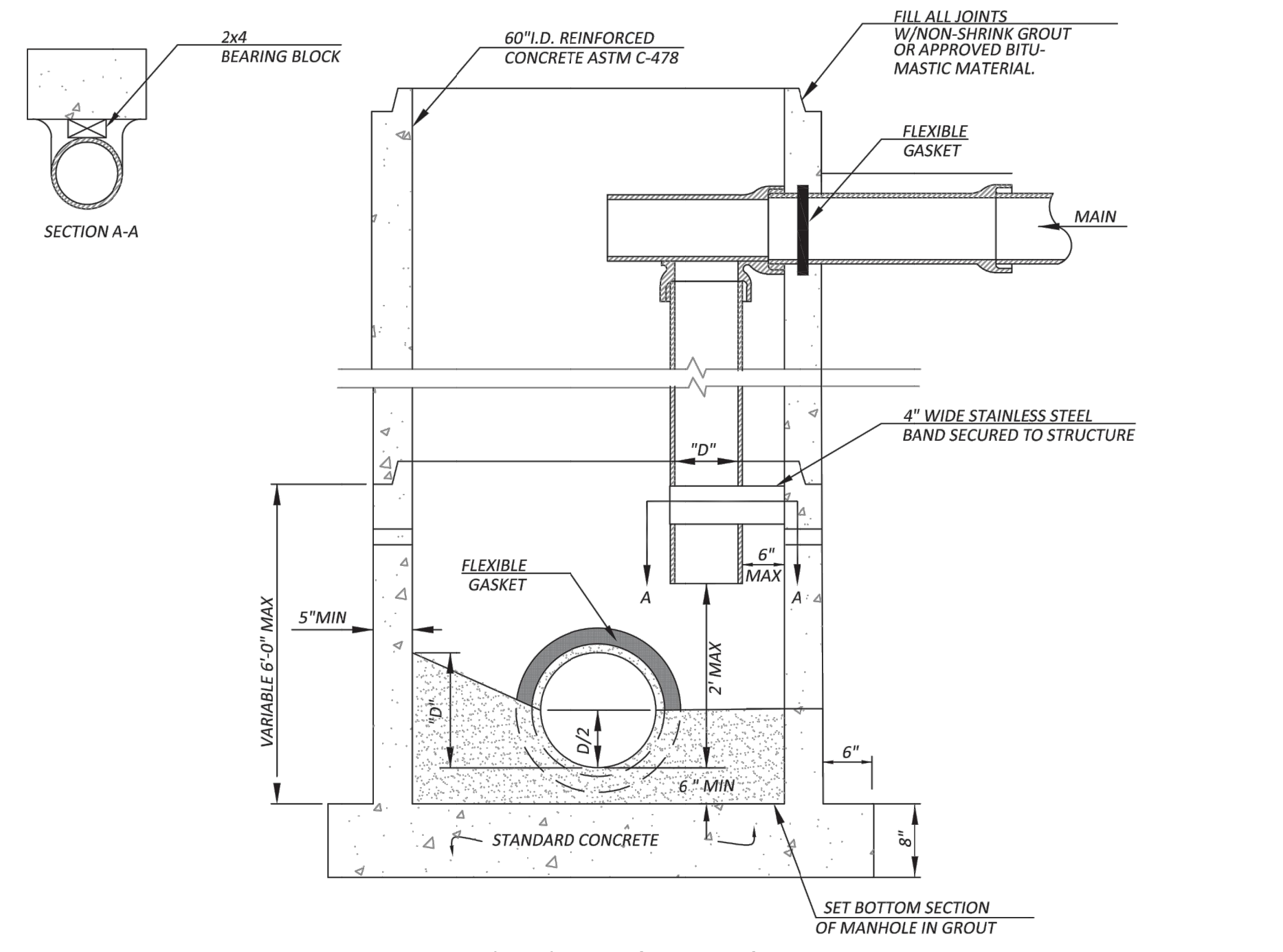
PRECAST MANHOLE DETAIL (NOT TO SCALE)



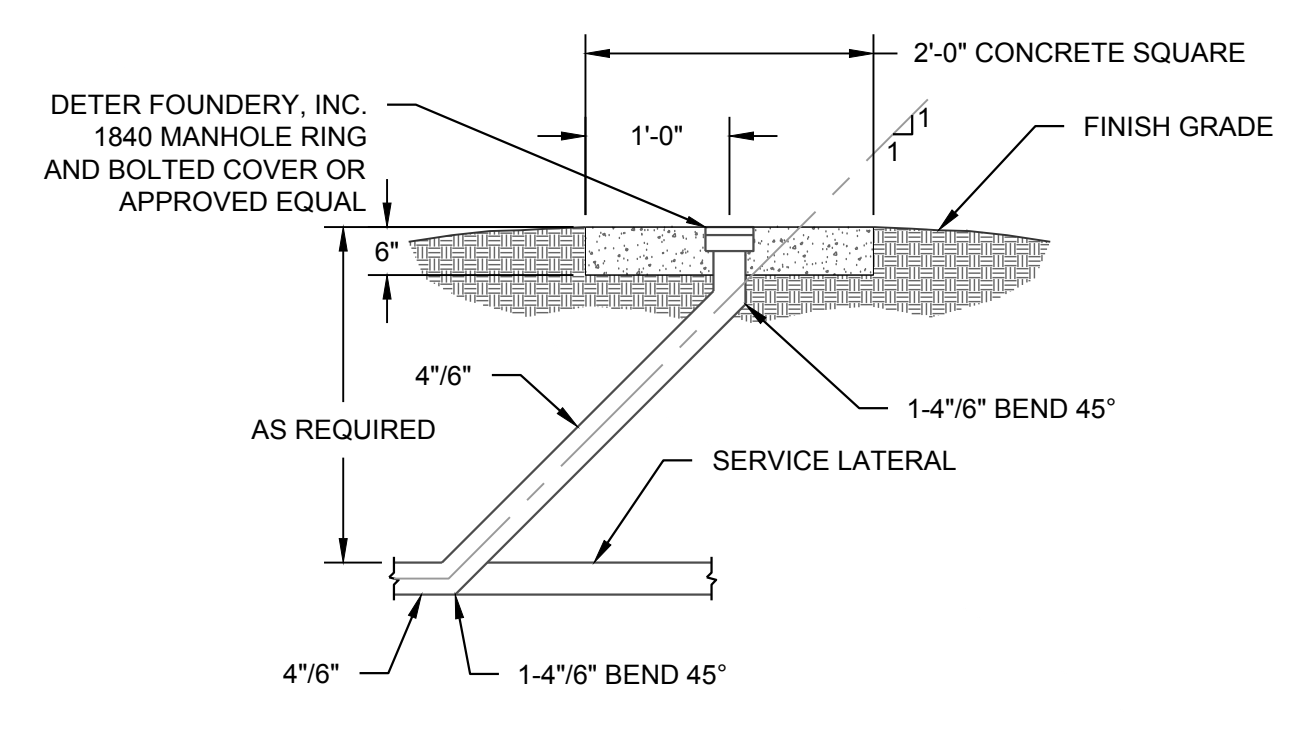
ECCENTRIC PRECAST MANHOLE DETAIL (NOT TO SCALE)



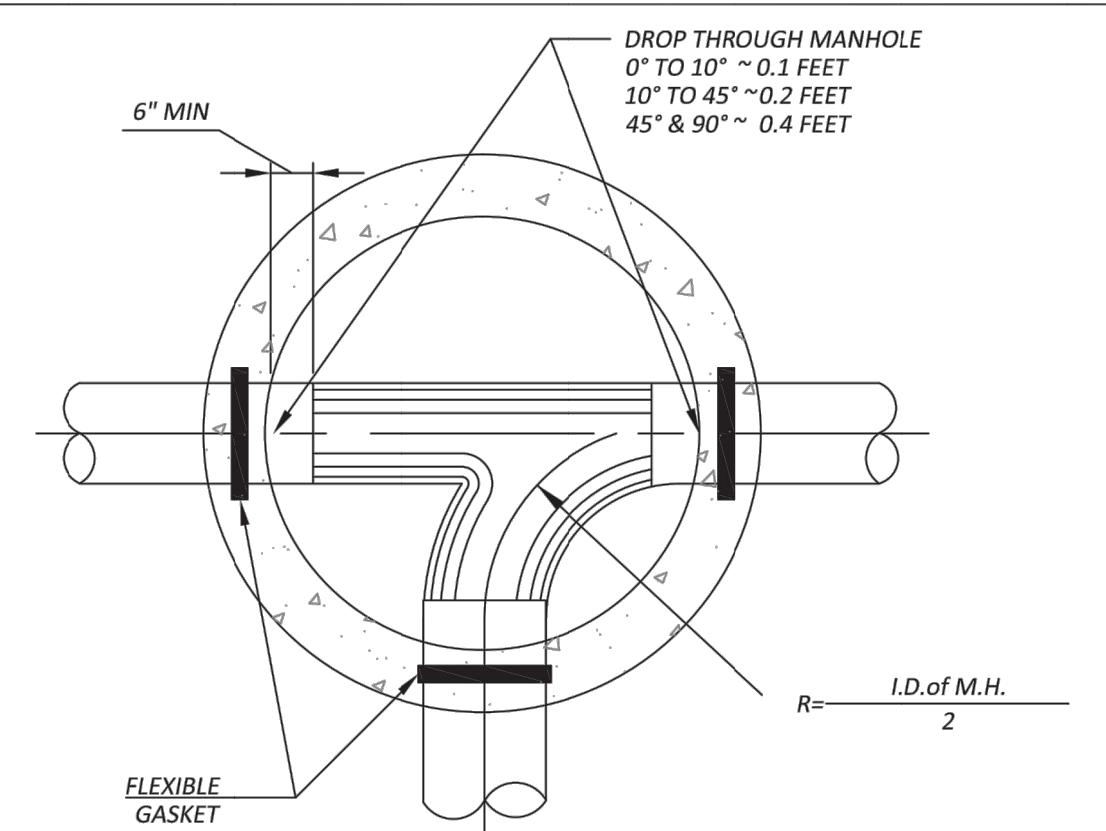
SHALLOW MANHOLE DETAIL (NOT TO SCALE)



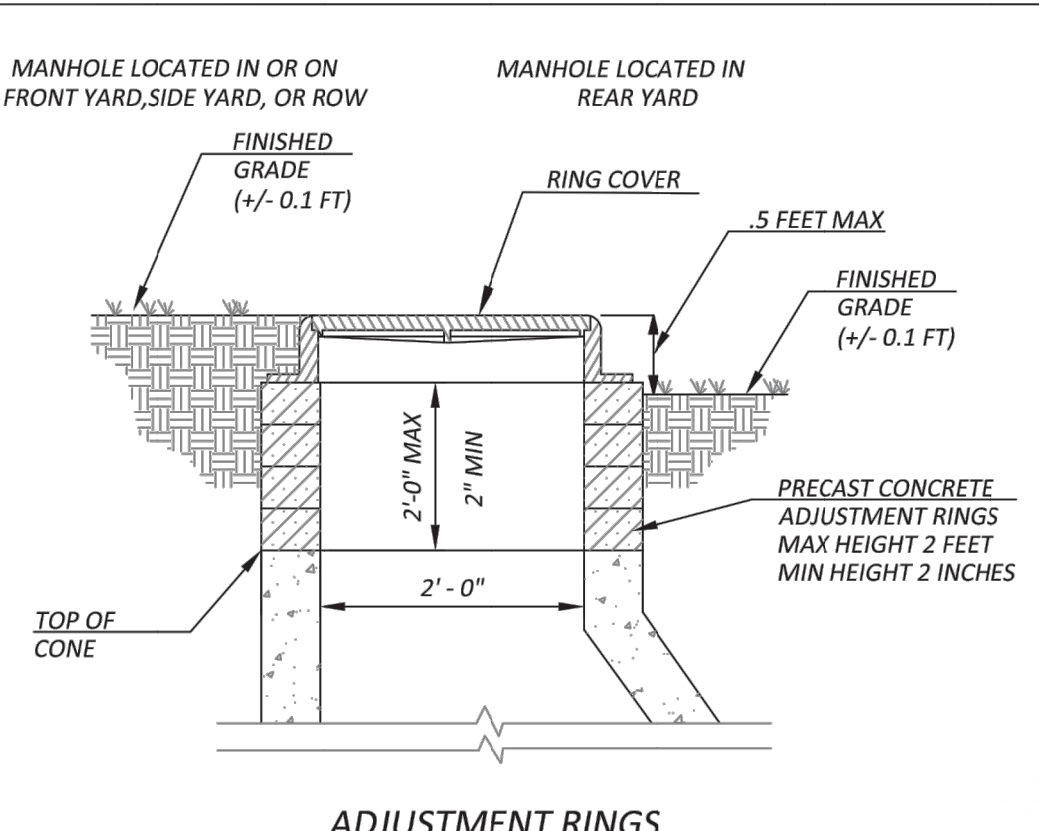
PRECAST INSIDE DROP MANHOLE DETAIL REQUIRES SPECIAL APPROVAL FROM CITY ENGINEER (NOT TO SCALE)



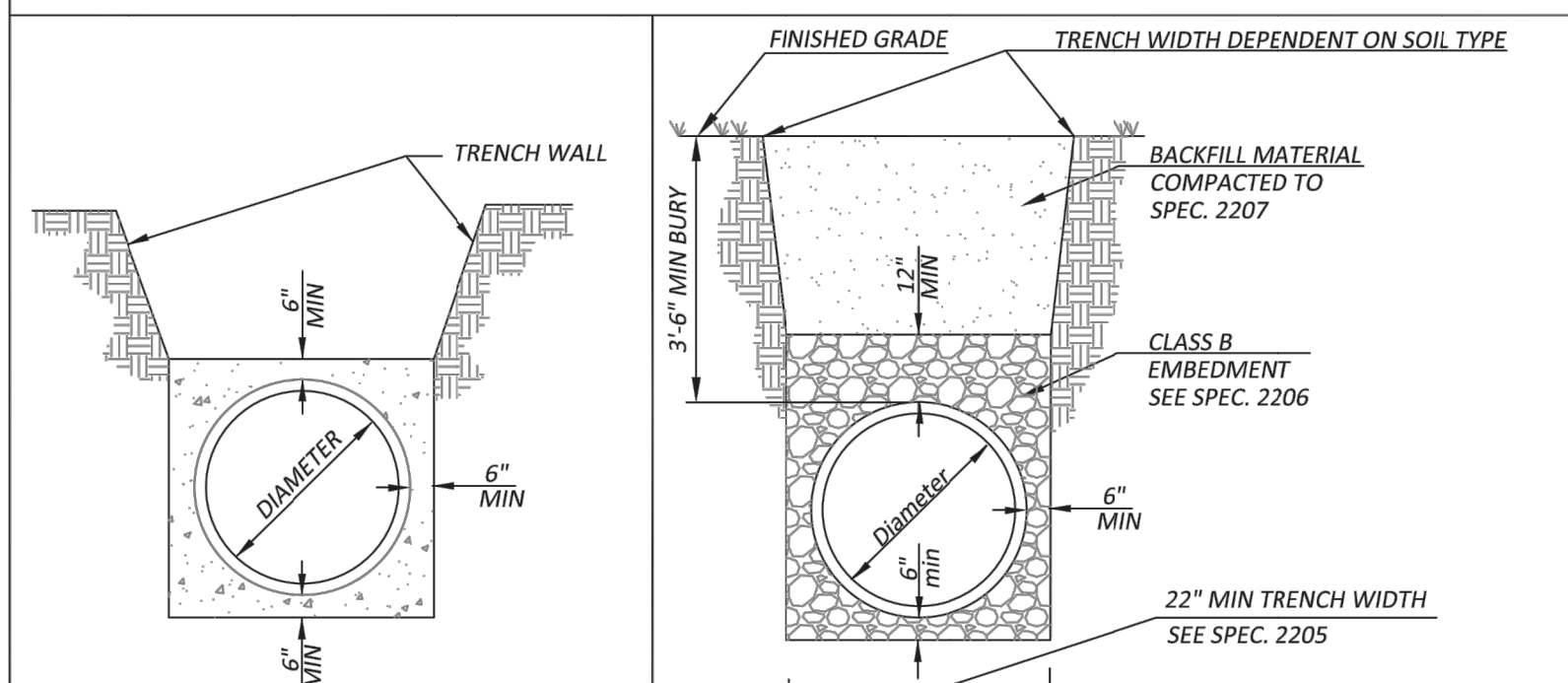
CLEANOUT DETAIL (NOT TO SCALE)



TYPICAL INVERT (NOT TO SCALE)



ADJUSTMENT RINGS (NOT TO SCALE)



CONCRETE ENCASUREMENT (NOT TO SCALE)

TRENCH BACKFILL AND EMBEDMENT (NOT TO SCALE)

- NOTES:
1. PRECAST MANHOLE SECTIONS SHALL BE USED UNLESS PRIOR APPROVAL HAS BEEN GIVEN BY THE CITY ENGINEER
 2. STANDARD RING AND COVER SHALL BE DEETER 1256 FOR IN STREET AND OUT OF STREET LOCATIONS
 3. BOLT DOWN RING AND COVER SHALL BE CLAY & BAILEY 2014
 4. A DROP MANHOLE SHALL BE CONSTRUCTED WHEN THE FLOWLINE OF THE INCOMING LINE IS EQUAL TO OR GREATER THAN 24 INCHES ABOVE THE FLOWLINE OF THE MANHOLE INVERT
 5. STAIRS SHALL NOT BE INSTALLED IN MANHOLE SECTIONS
 6. MANHOLE SPACING SHALL NOT EXCEED 400 FEET WITH OUT APPROVAL OF CITY ENGINEER
 7. ALL SPEC. NUMBERS REFER TO THE MANHATTAN CITY STANDARD SPECIFICATIONS
 8. NO LATERALS SHALL BE PERMITTED INTO MANHOLES
 9. WATERPROOFING WILL BE REQUIRED ON THE OUTSIDE OF MANHOLES. THE BITUMEN SHALL CONSIST OF TWO (2) SIX (6) MILL COATS OF ASPHALT, COAL TAR PITCH, OR A COATING MEETING ASTM D-41. ASPHALT SHALL CONFORM TO THE REQUIREMENTS OF ASTM D-449. COAL-TAR PITCH SHALL CONFORM TO THE REQUIREMENTS OF ASTM C450.
 10. FOR PIPE DIAMETERS OF 8"-12", THE DROP PIPE SHALL HAVE THE SAME NOMINAL DIAMETER AS THAT OF THE INCOMING SEWER. FOR LARGER PIPE SIZES, A MINIMUM 12" DIAMETER DROP PIPE SHALL BE PROVIDED.
 11. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY KDHE MINIMUM DESIGN STANDARDS, CHAPTER IV SECTION F.9.
 12. PRECAST CONCRETE CEMENT SHALL CONFORM TO ASTM C150.
 13. ANY PRECAST CONCRETE SECTION WHICH HAS BEEN DAMAGED IN TRANSIT OR ON SITE SHALL THAT THE WATER TIGHTNESS OF THE SECTION HAS BEEN ADVERSELY AFFECTED SHALL NOT BE UTILIZED IN THE CONSTRUCTION OF THE MANHOLE.

NOT TO SCALE

PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

DATE: 9.7.2017

SHEET #

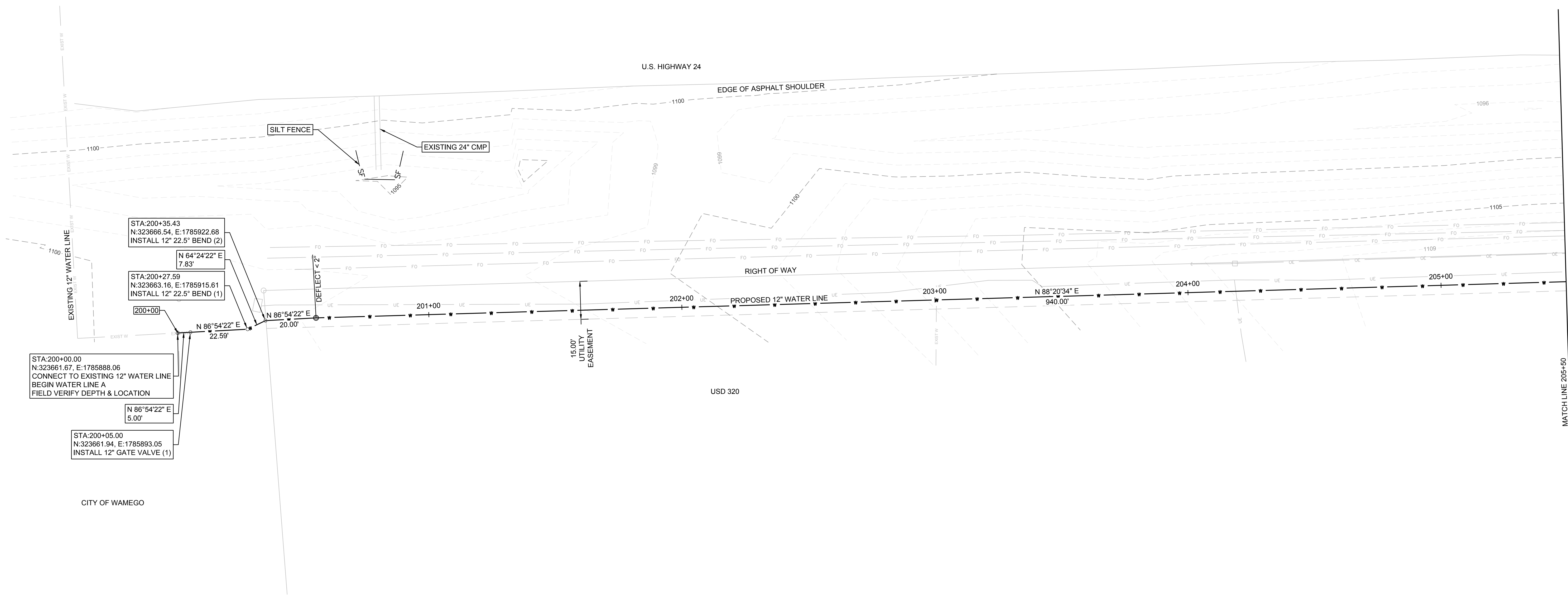
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TOTAL SHEETS 16

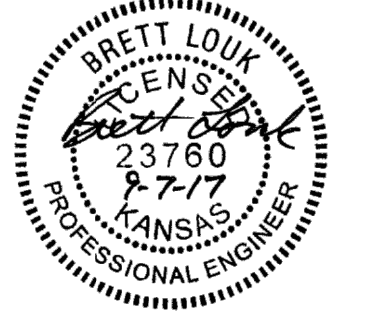
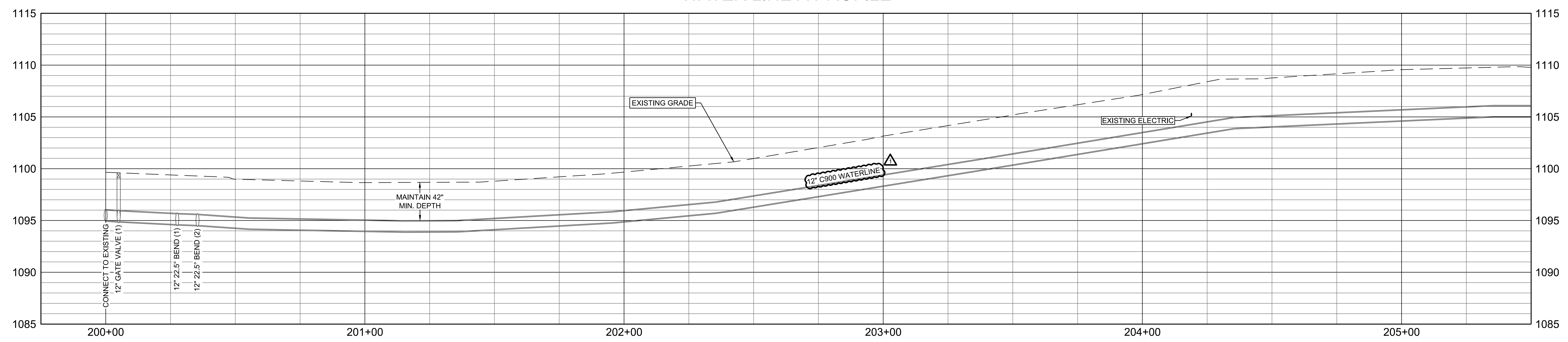
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CONSTRUCTION DOCUMENTS

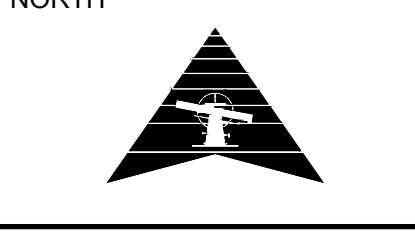
WAMEGO, KANSAS



WATER LINE A PROFILE



REVISION	DATE	DESCRIPTION
1	09/22/2017	C900 WATERLINE



SCALE: 1" = 20'

PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

DATE: 9.7.2017

SHEET #

11

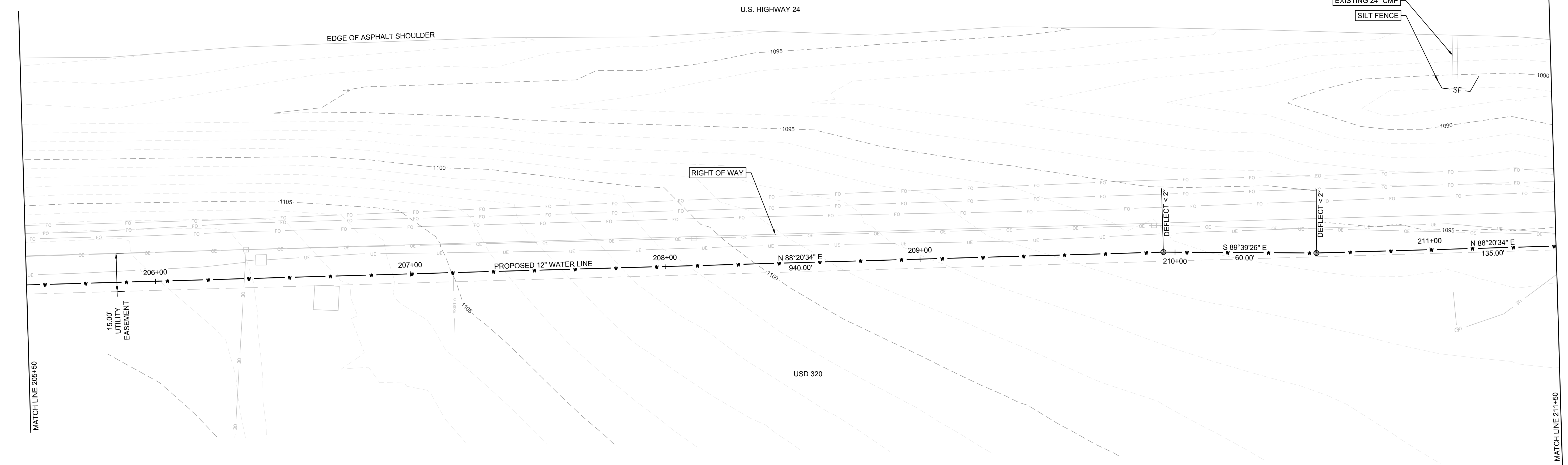
TOTAL SHEETS
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WATER LINE A PLAN & PROFILE

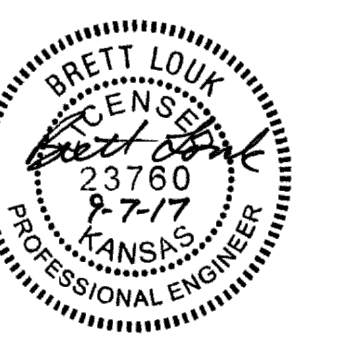
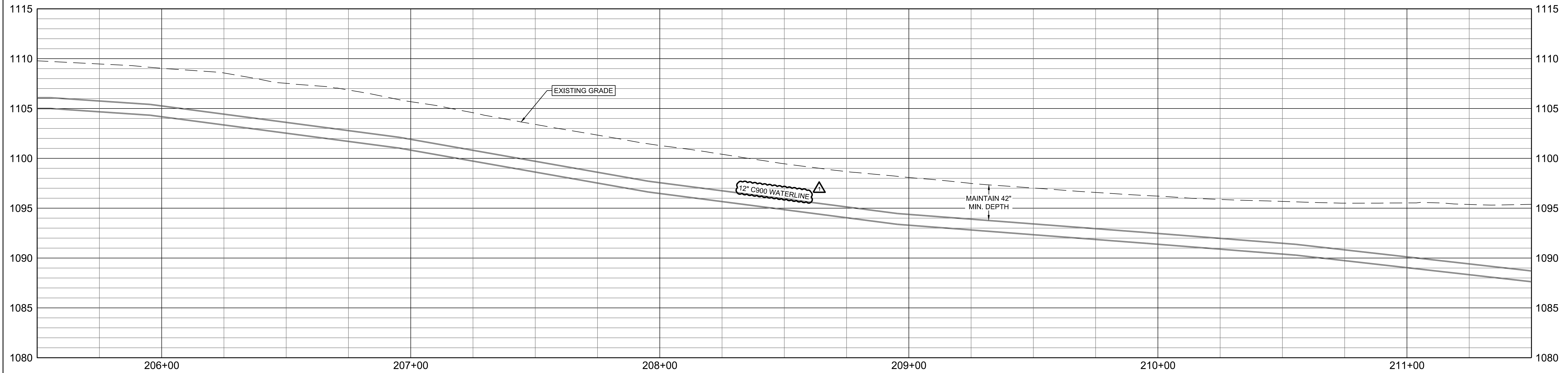
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CONSTRUCTION DOCUMENTS

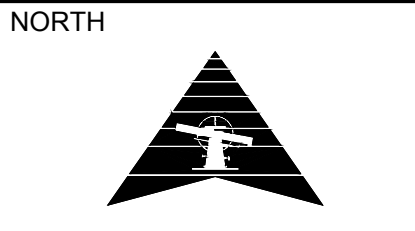
WAMEGO, KANSAS



WATER LINE A PROFILE



REVISION DATE	REVISION DESCRIPTION
09/22/2017	1 C900 WATERLINE



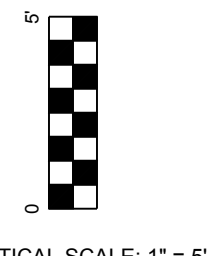
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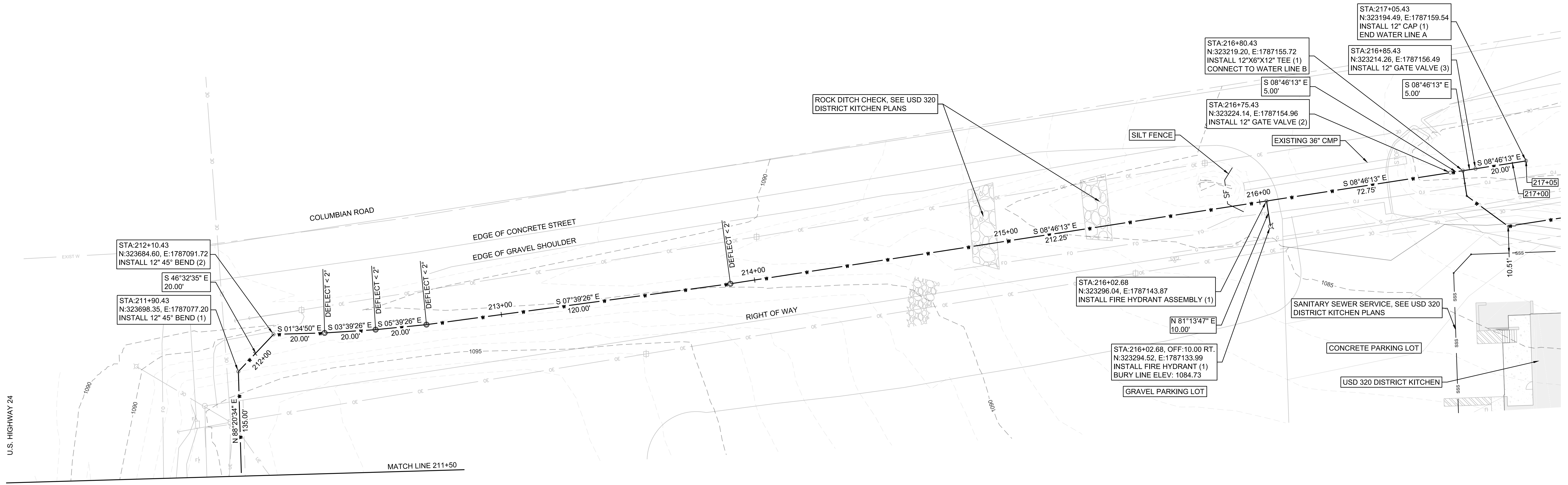
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CHECKED BY: BML
DRAWN BY: KMM

DATE: 9.7.2017

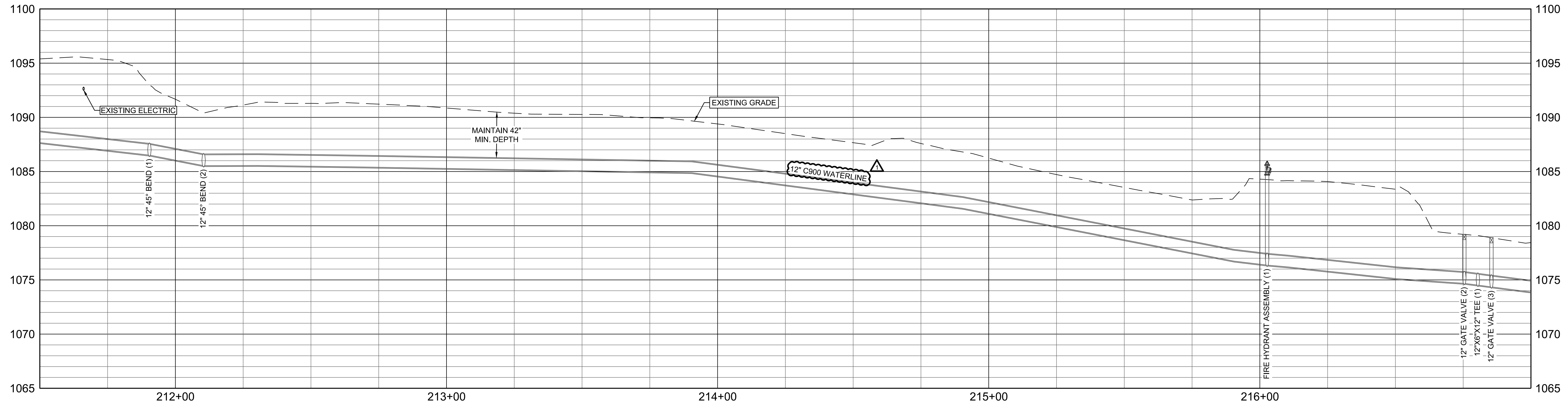
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TOTAL SHEETS
16

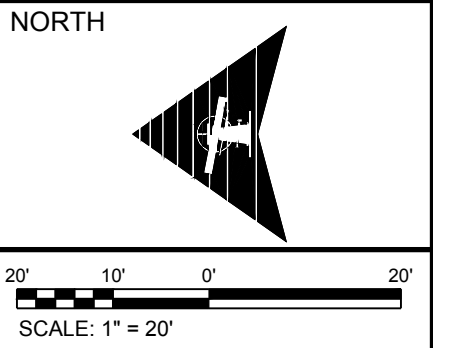




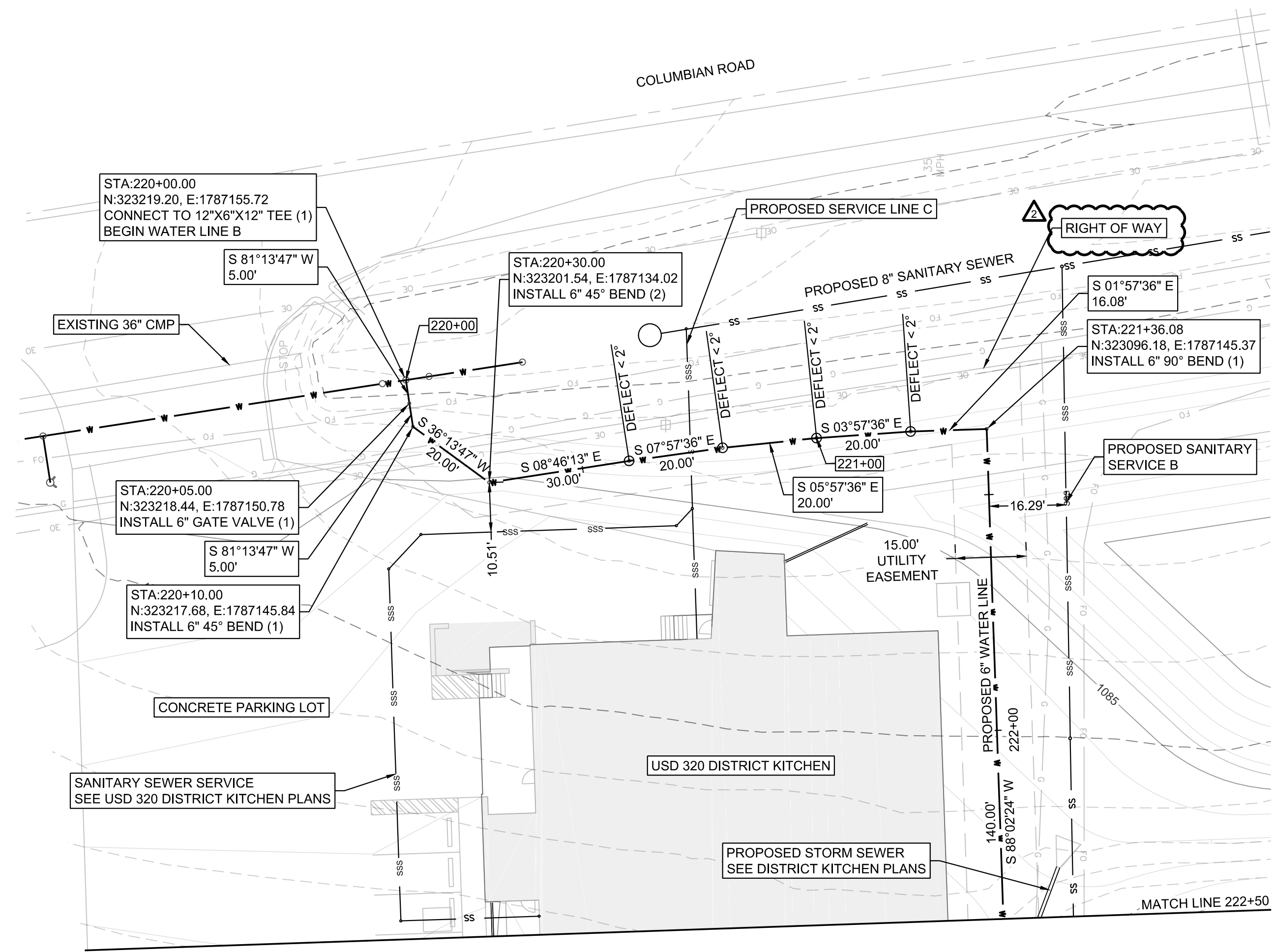
WATER LINE A PROFILE



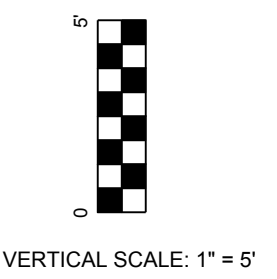
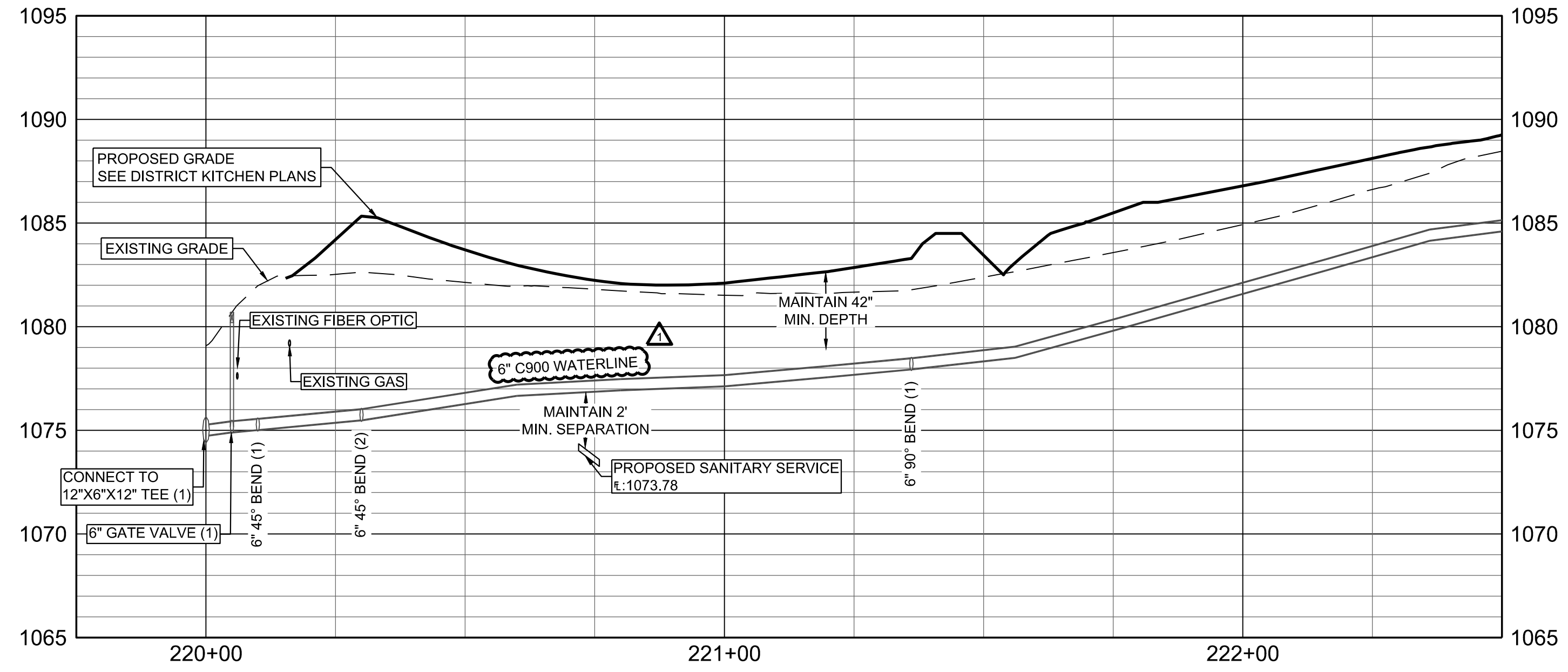
REVISION DATE	REVISION DESCRIPTION
09/22/2017	C900 WATERLINE



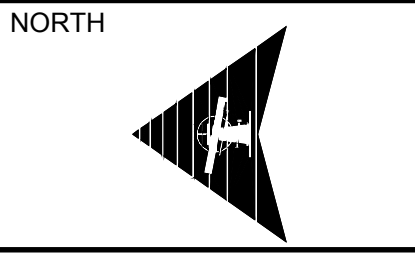
PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM
DATE: 9.7.2017
SHEET #
13
TOTAL SHEETS
16



WATER LINE B PROFILE



REVISION DATE	REVISION DESCRIPTION
09/22/2017	1 C900 WATERLINE
09/27/2017	2 LABELED RIGHT OF WAY



SCALE: 1" = 20'

PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

DATE: 9.7.2017

SHEET #
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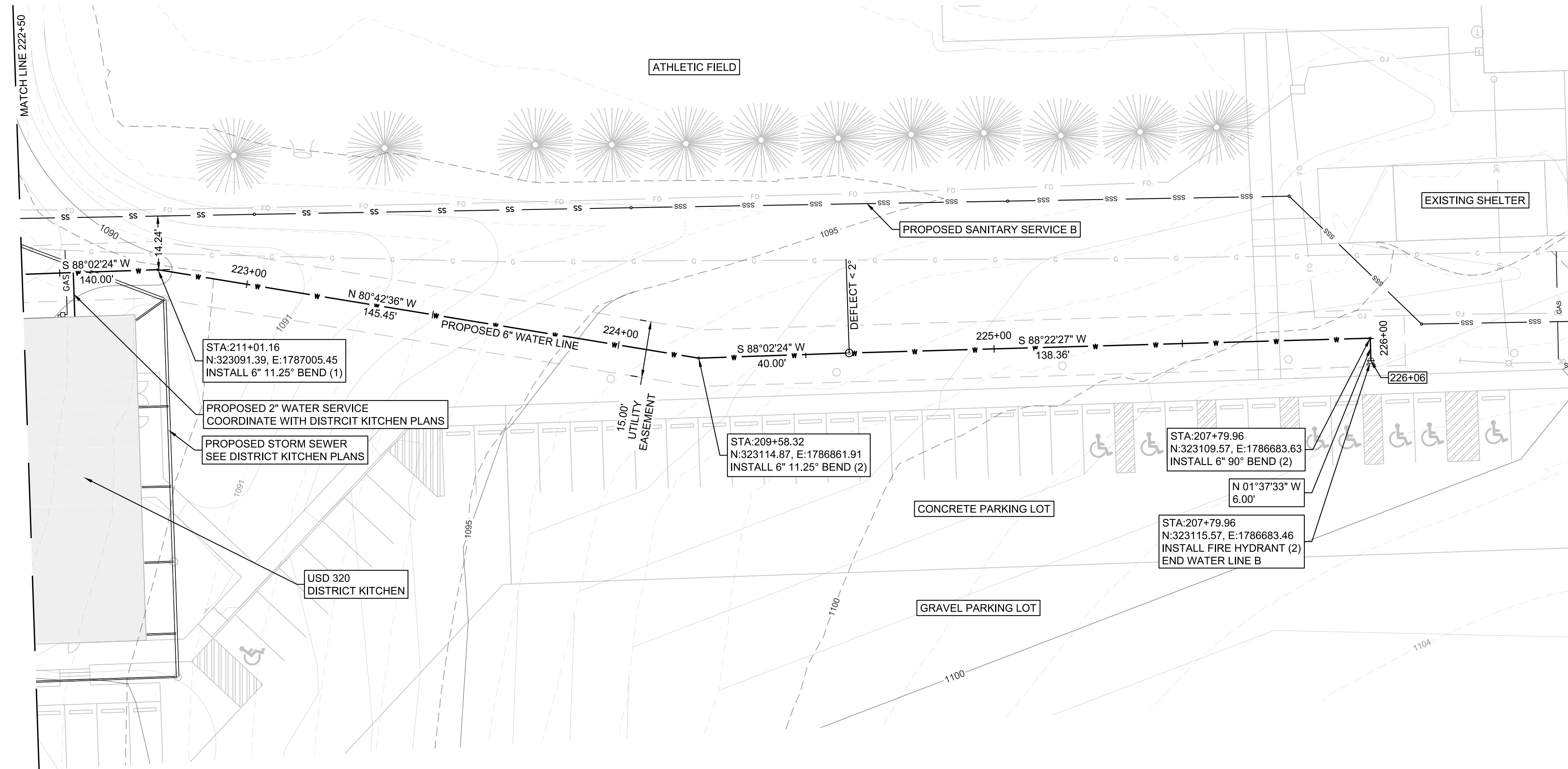
TOTAL SHEETS
16

WATER LINE B PLAN & PROFILE

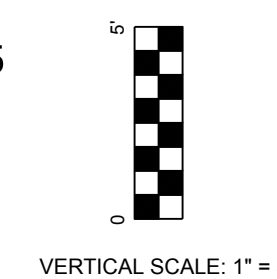
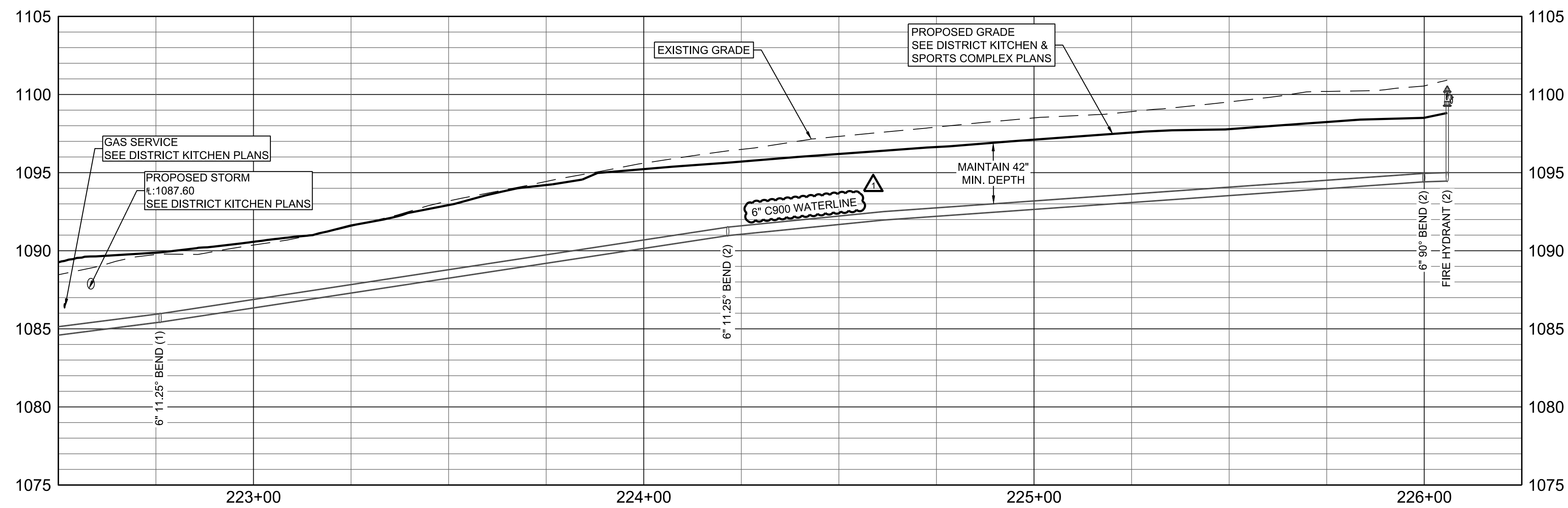
USD 320 - SPORTS COMPLEX

CONSTRUCTION DOCUMENTS

WAMEGO, KANSAS

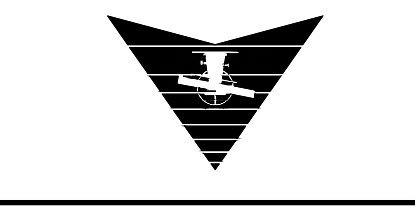


WATER LINE B PROFILE



REVISION DATE	REVISION DESCRIPTION
09/22/2017	C900 WATERLINE

NORTH



SCALE: 1" = 20'

PROJECT #: 1702MN4004
CHECKED BY: BML
DRAWN BY: KMM

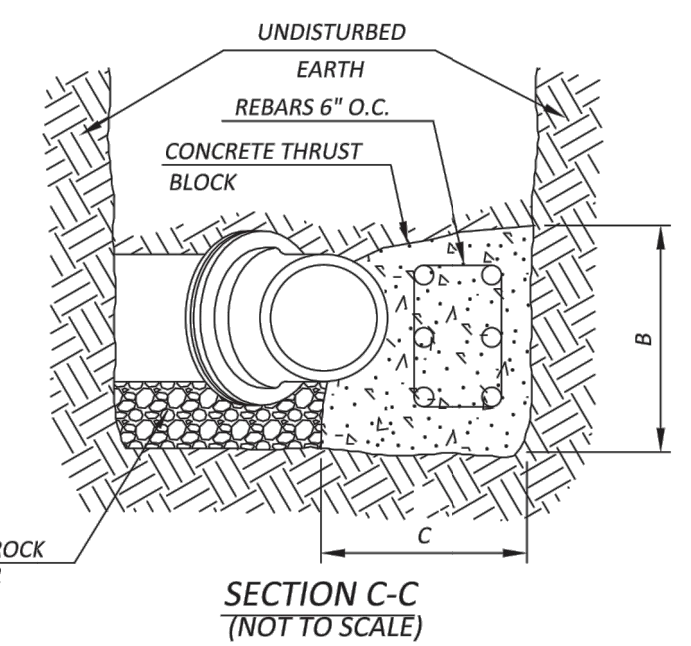
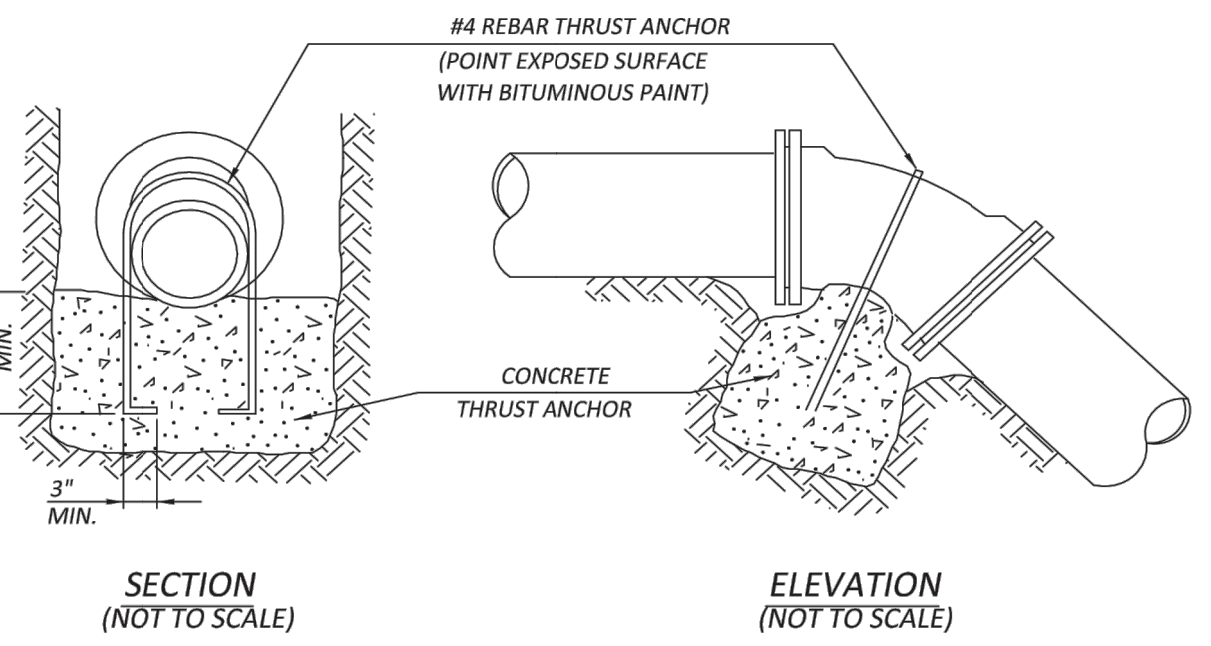
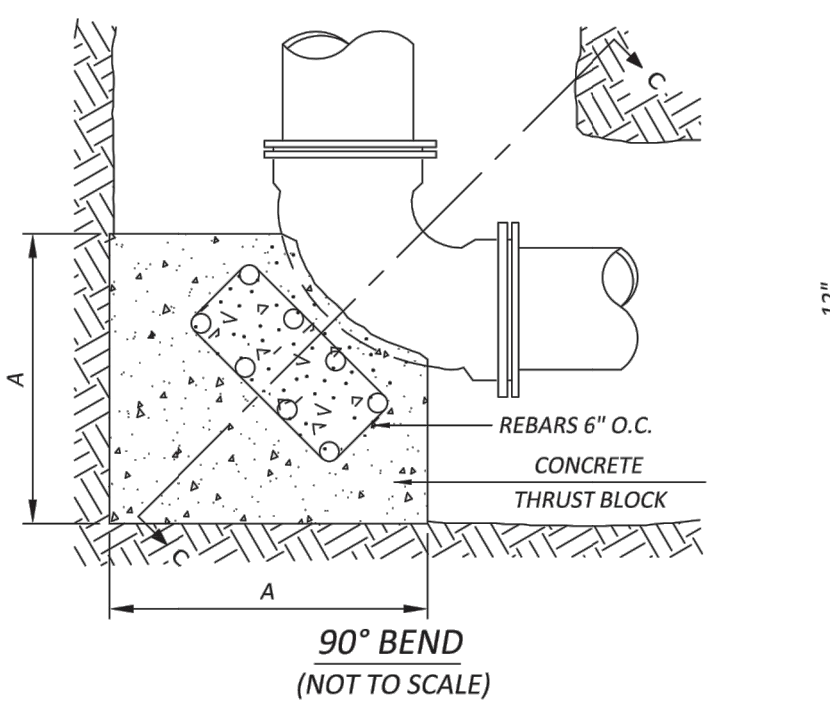
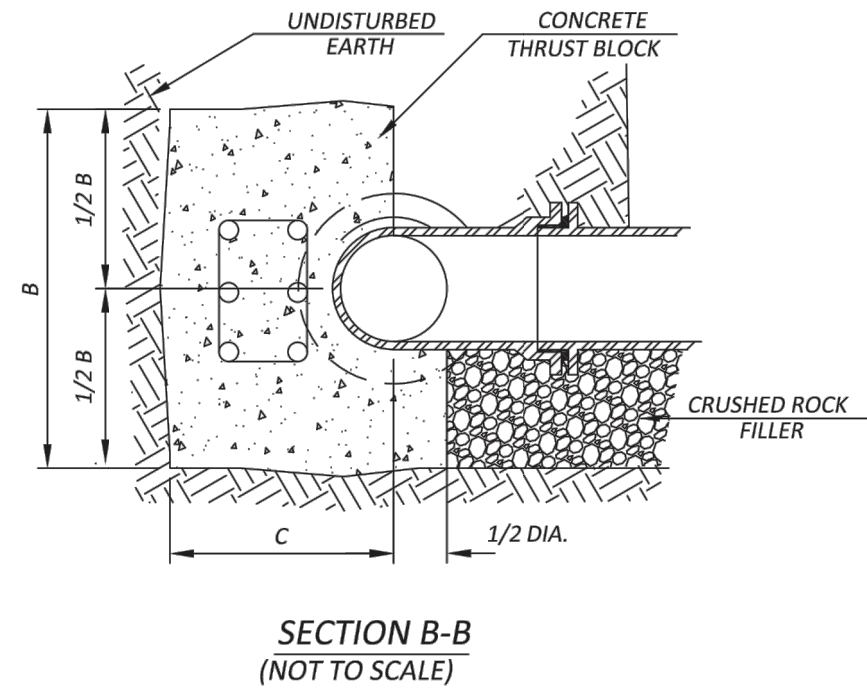
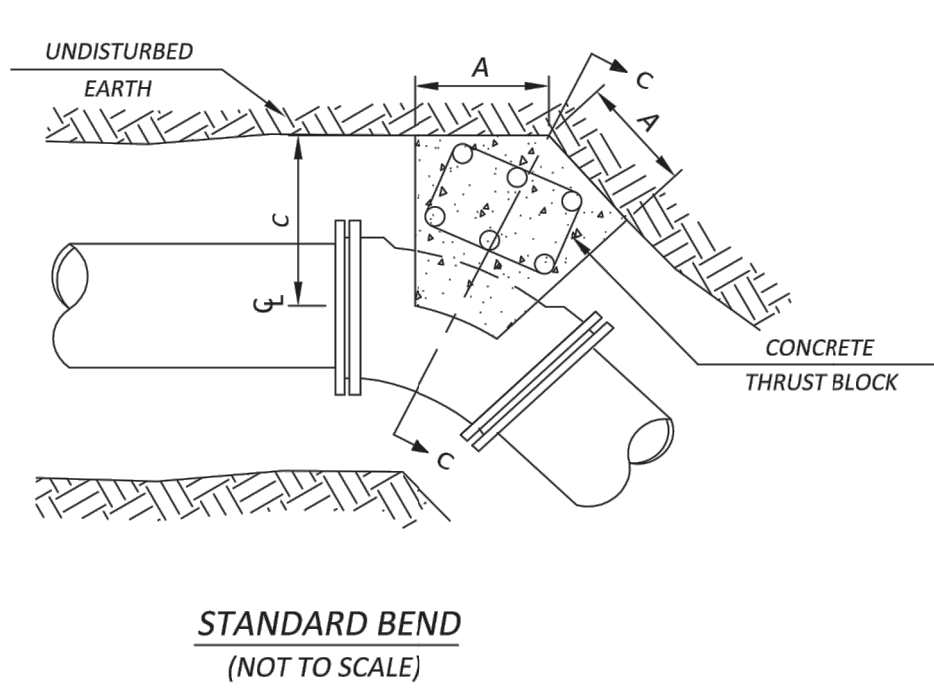
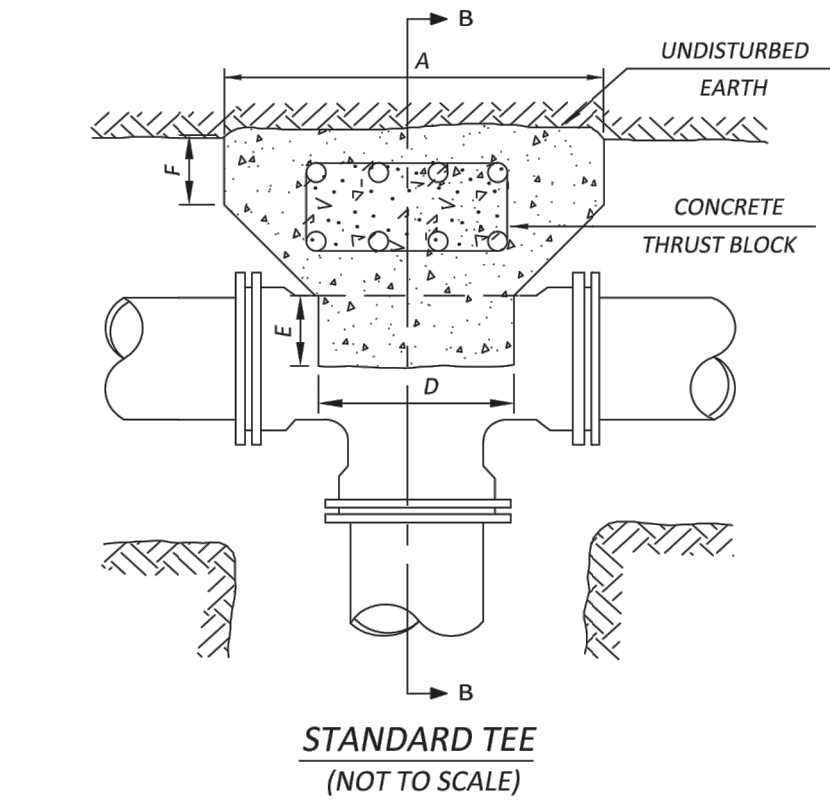
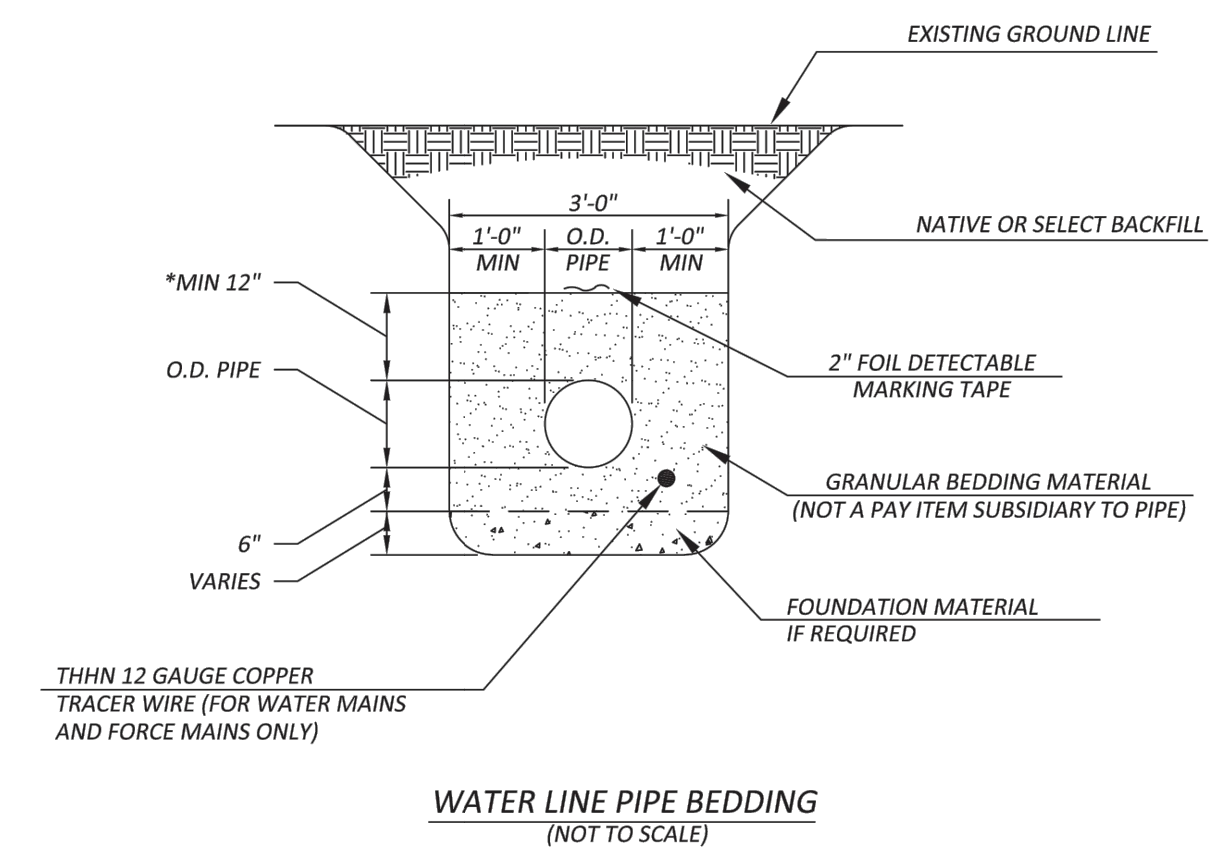
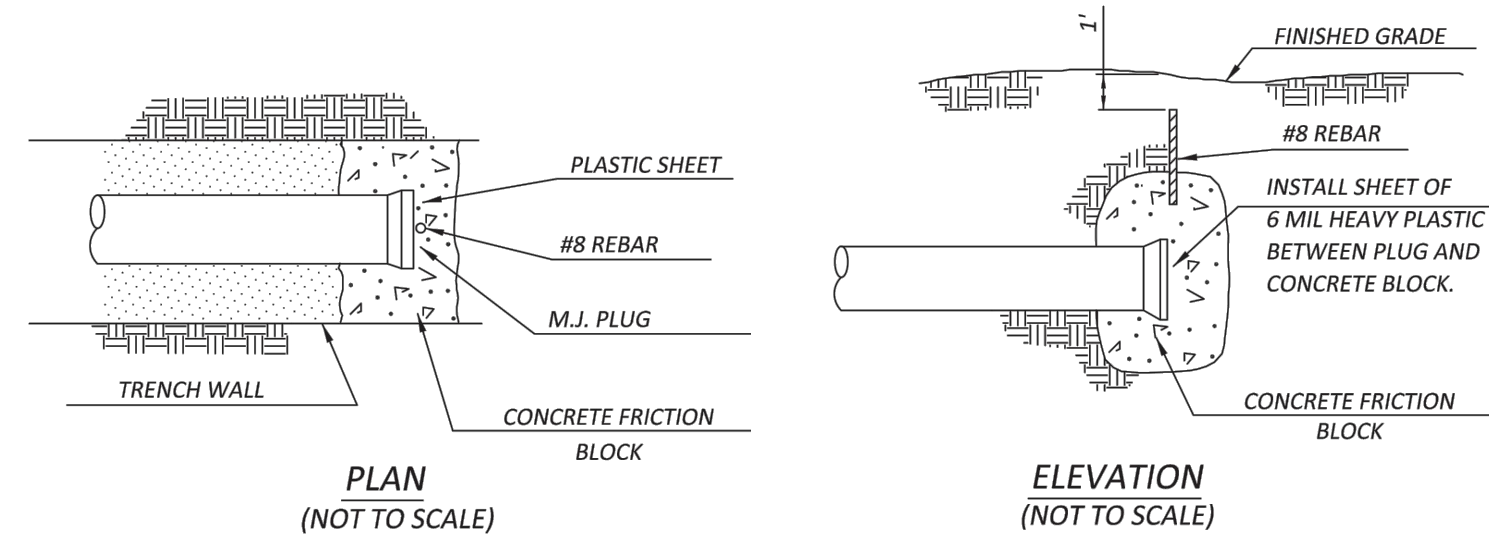
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SHEET #

15

TOTAL SHEETS
16

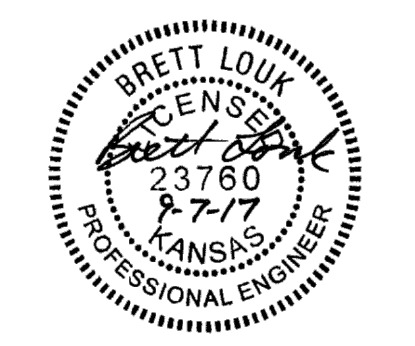
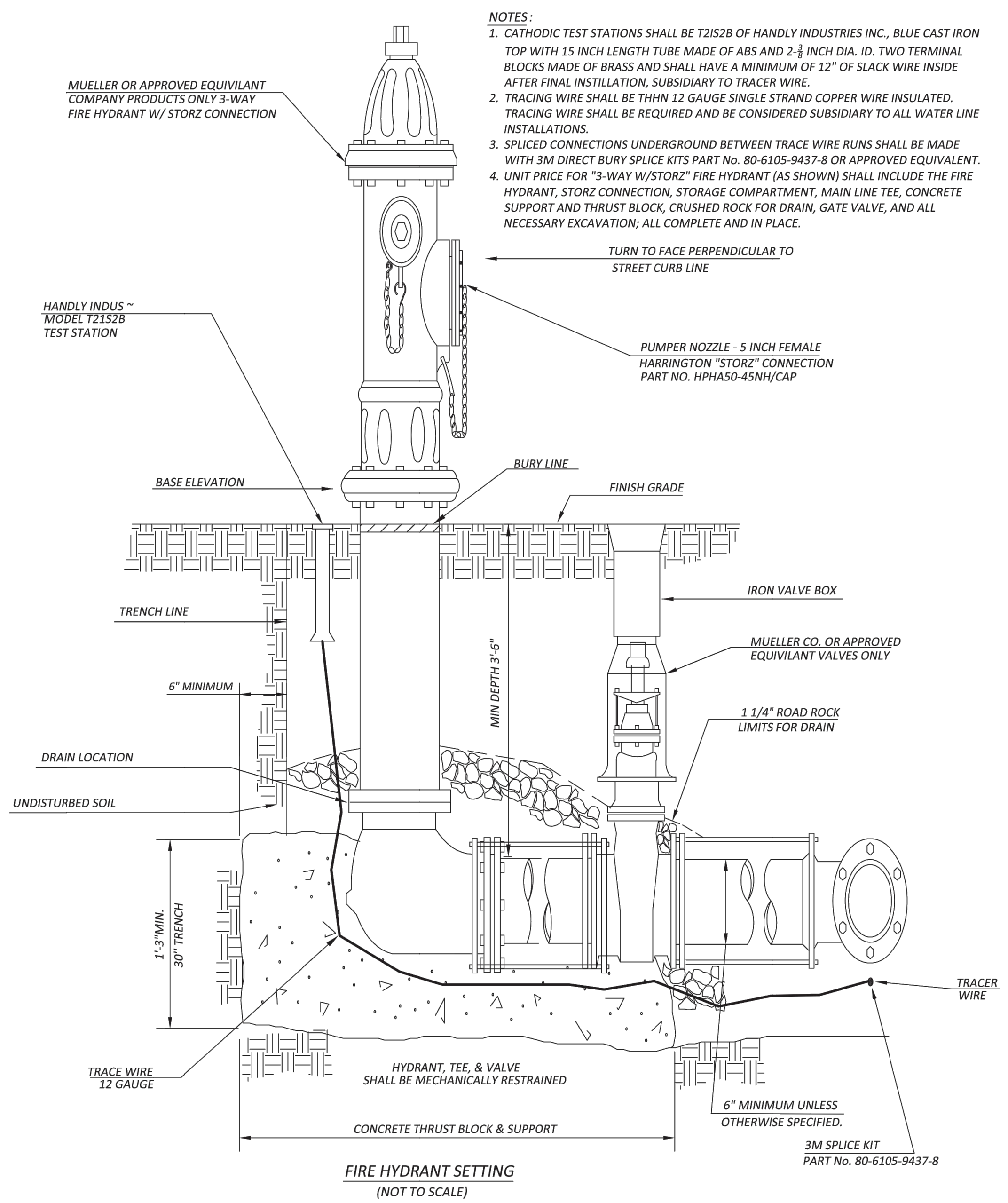
WATER LINE B PLAN & PROFILE



1. THE CONCRETE AND STEEL REQUIRED FOR ALL FITTINGS NOT LISTED SHALL BE THE SAME AMOUNT AS REQUIRED FOR THE 22 1/2" BENDS, CONCRETE AND STEEL ARE SUBSIDIARY TO OTHER ITEMS OF WORK. THE SPACING FOR MULTIPLE REBAR ANCHORS SHALL BE 2" C.C.
2. ALL BENDS ARE TO HAVE MEGALUG OR APPROVED EQUIVALENT JOINT RESTRAINTS.
3. ALL FITTINGS SHALL BE WRAPPED IN 6 MIL HEAVY PLASTIC.
4. BLOCKING OF TEES IS TO BE PLACED OPPOSITE THE BRANCH & AREA IS BASED ON BRANCH SIZE. ALL MATERIAL, LABOR, AND EQUIPMENT REQUIRED TO CONSTRUCT CONCRETE THRUST BLOCKS SHALL BE CONSIDERED SUBSIDIARY TO OTHER ITEMS OF WORK.
5. 12 GAUGE TRACER WIRE SHALL BE INSTALLED AND CONSIDERED SUBSIDIARY TO ALL WATER LINE INSTALLATIONS.
6. 2" DETECTABLE FOIL WARNING TAPE READING WITH THE WORDS "CAUTION" AND "WATER LINE" ON A BLUE BACKGROUND SHALL BE INSTALLED 12" ABOVE THE PIPE AND IS SUBSIDIARY TO ALL WATER LINE INSTALLATIONS.

THRUST BLOCK BEARING AREA																		
PIPE DIA	TEES				90° BEND			45° BEND			22.5° BEND			11.25° BEND				
	A	B	C	D	E	F	A	B	C	A	B	C	A	B	C			
4"	13"	22"	9"	13"	-	-	18"	12"	9"	9"	12"	12"	6"	12"	12"	-	-	-
6"	24"	30"	16"	16"	6"	6"	24"	18"	16"	10"	24"	12"	7"	18"	12"	-	-	-
8"	34"	32"	21"	18"	7"	6"	30"	26"	21"	13"	36"	18"	9"	24"	18"	9"	24"	18"
10"	40"	42"	23"	22"	8"	6"	35"	34"	24"	18"	38"	27"	12"	30"	27"	12"	30"	27"
12"	48"	52"	27"	24"	9"	6"	42"	42"	30"	21"	48"	33"	14"	36"	30"	10"	42"	24"
16"	54"	54"	32"	30"	12"	6"	50"	42"	36"	24"	48"	40"	15"	42"	34"	10"	42"	24"
18"	60"	60"	34"	32"	12"	6"	54"	48"	38"	27"	54"	44"	17"	46"	37"	10"	42"	24"
20"	72"	66"	36"	36"	24"	10"	72"	66"	54"	36"	66"	48"	18"	66"	42"	15"	48"	30"
24"	96"	72"	36"	44"	19"	8"	82"	60"	60"	44"	60"	72"	22"	60"	54"	15"	48"	36"
30"	108"	96"	60"	50"	20"	12"	108"	72"	84"	54"	72"	84"	28"	72"	64"	17"	60"	36"
36"	108"	108"	60"	56"	23"	12"	108"	108"	80"	68"	84"	96"	34"	84"	69"	20"	72"	36"

VERTICAL CHANGE ANCHORS								
PIPE SIZE	90° BEND		45° BEND		22.5° BEND		11.25° BEND	
	CONCRETE	NO.	CONCRETE	NO.	CONCRETE	NO.	CONCRETE	NO.
	C.Y.	BAR	C.Y.	BAR	C.Y.	BAR	C.Y.	BAR
6"	2.0	2	1.0	1	1.0	1	1.0	1
8"	3.5	4	2.0	2	1.0	1	1.0	1
10"	5.5	6	3.0	3	1.5	2	1.0	1
12"	8.0	8	4.5	5	2.5	3	2.0	2



REVISION DATE	REVISION DESCRIPTION
00/00/00	(DESCRIPTION)