

SUMMARY OF PUBLIC QUANTITIES - SOUTHWEST				
ITEM #	ITEM	UNIT	QUANTITY	AS-BUILT
1	TRENCH EXCAVATION AND BACKFILL (10'-15')	LF	1,688	
2	TRENCH EXCAVATION AND BACKFILL (15'-20')	LF	1,457	
3	TRENCH EXCAVATION AND BACKFILL (20'-25')	LF	420	
4	BORING - 12-INCH CARRIER PIPE	LF	140	
5	BORING - CASING FOR 12-INCH CARRIER PIPE	LF	140	
6	POLYVINYL CHLORIDE (PVC) (12-INCH, SDR-35)	LF	3,565	
7	STEEL CASING PIPE (12-INCH CARRIER PIPE)	LF	140	
8	SANITARY SEWER MANHOLE (4' DIA.) (0'-6')	EA	14	
9	EXTRA DEPTH MANHOLE WALL (4'-DIA.)	VF	135	
10	SOLID SLAB SODDING	SY	3,961	
11	DEFLECTION TEST (<24-INCH)	LS	1	
12	POST-CONSTRUCTION TELEVISION INSPECTION (CCTV)	LF	3,565	
13	SEWER LEAK TEST (<24-INCH)	LS	1	
14	MANHOLE TESTING	EA	14	
15	CONSTRUCTION STAKING	LS	1	
16	GPS "AS-BUILT" SURVEY	LS	1	
17	CONSTRUCTION TRAFFIC CONTROL	LS	1	
18	MOBILIZATION	LS	1	
19	CLEARING AND GRUBBING	LS	1	
20	COLOR VIDEO/AUDIO RECORDING, PRE AND POST CONSTRUCTION	LS	1	
21	STRUCTURE REMOVAL (SANITARY MANHOLE)	EA	1	
22	REMOVE SANITARY SEWER (12-INCH)	LF	190	
23	REMOVE AND REPLACE DRIVEWAY (CONCRETE)	SY	61	

SWQ/ML-2/9/24

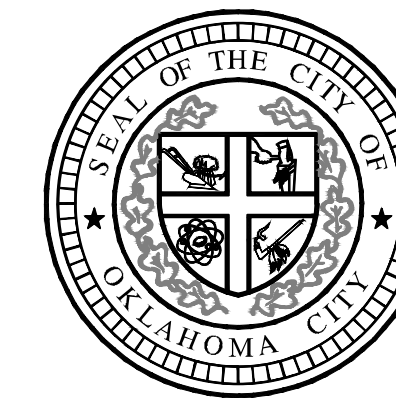
PROJECT NO. SD-2023-00083

SANITARY SEWER PLANS

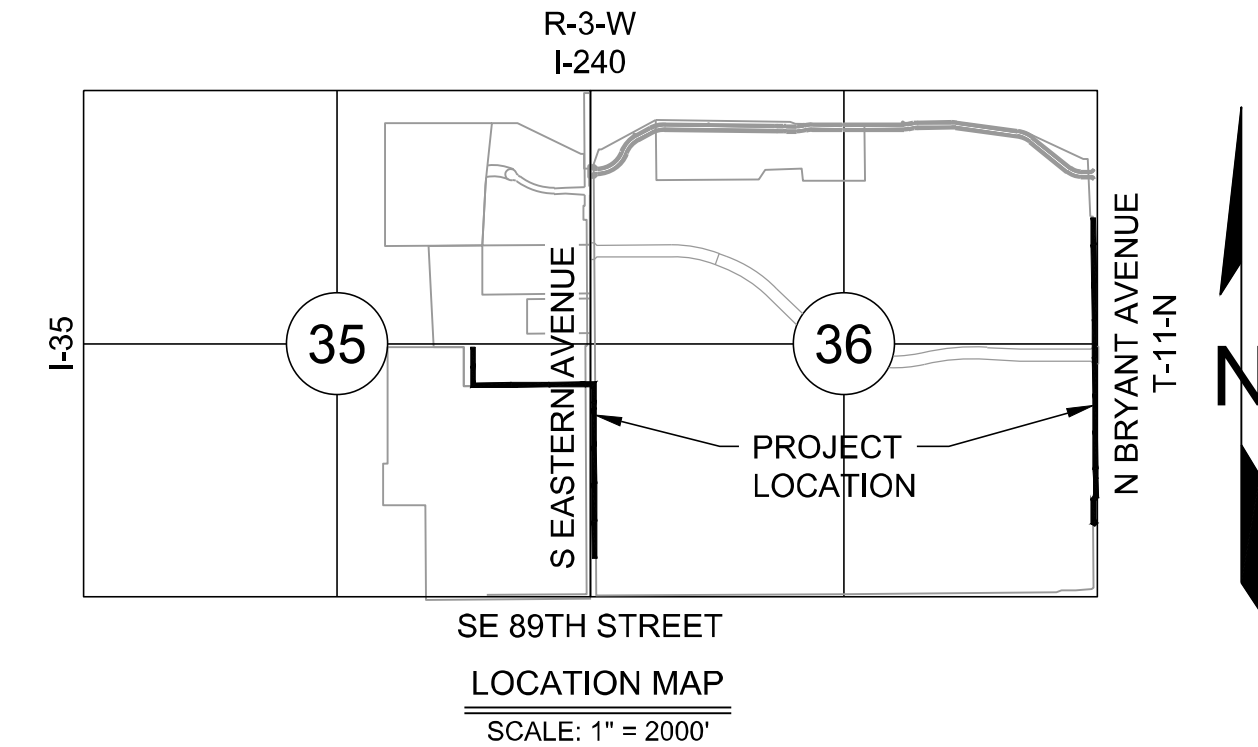
TO SERVE

OKC 577 ACRES DEVELOPMENT

BEING A PART OF THE NW/4 OF SEC. 36, T11N, R3W, I.M., AN ADDITION TO OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA



The City of
OKLAHOMA CITY
Utilities Engineering
Private Development Division



SUMMARY OF PUBLIC QUANTITIES - EAST				
ITEM #	ITEM	UNIT	QUANTITY	AS-BUILT
1	TRENCH EXCAVATION AND BACKFILL (10'-15')	LF	1,531	
2	TRENCH EXCAVATION AND BACKFILL (15'-20')	LF	937	
3	TRENCH EXCAVATION AND BACKFILL (20'-25')	LF	538	
4	BORING - 12-INCH CARRIER PIPE	LF	80	
5	BORING - CASING FOR 12-INCH CARRIER PIPE	LF	80	
6	POLYVINYL CHLORIDE (PVC) (12-INCH, SDR-35)	LF	3,006	
7	POLYVINYL CHLORIDE (PVC) (8-INCH, SDR-35)	LF	7	
8	STEEL CASING PIPE (12-INCH CARRIER PIPE)	LF	80	
9	SANITARY SEWER MANHOLE (4' DIA.) (0'-6')	EA	11	
10	SANITARY SEWER DROP MANHOLE (4' DIA.) (0'-6')	EA	1	
11	EXTRA DEPTH MANHOLE WALL (4'-DIA.)	VF	123	
12	SOLID SLAB SODDING	SY	3,340	
13	DEFLECTION TEST (<24-INCH)	LS	1	
14	POST-CONSTRUCTION TELEVISION INSPECTION (CCTV)	LF	3,006	
15	SEWER LEAK TEST (<24-INCH)	LS	1	
16	MANHOLE TESTING	EA	11	
17	ABANDONING SEWER	CY	13	
18	CONSTRUCTION STAKING	LS	1	
19	GPS "AS-BUILT" SURVEY	LS	1	
20	CONSTRUCTION TRAFFIC CONTROL	LS	1	
21	MOBILIZATION	LS	1	
22	CLEARING AND GRUBBING	LS	1	
23	COLOR VIDEO/AUDIO RECORDING, PRE AND POST CONSTRUCTION	LS	1	
24	REMOVE AND REPLACE DRIVEWAY (CONCRETE)	SY	106	
25	ABANDONING MANHOLE (4')	EA	3	
26	REMOVE AND REPLACE CURB AND GUTTER	LF	60	

SANITARY SEWER GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE MOST RECENT VERSION OF THE CITY OF OKLAHOMA CITY STANDARD SPECIFICATIONS AND TITLE 252 OKLAHOMA ADMINISTRATIVE CODES.
- SEPARATION OF WATER MAINS AND SEWER MAINS SHALL BE IN ACCORDANCE TO ODEQ 252-626-5-4(C).
- LEAKAGE TEST SHALL BE IN ACCORDANCE TO ODEQ 252-626-5-5-(b).
- MANHOLES AND WYE SERVICES MUST SIT OUTSIDE OF PAVING FOR SIDEWALKS AND DRIVEWAYS.
- CONTRACTOR SHALL "CALL OKIE" AT 811 STATEWIDE OR 1-800-654-8249 OUT-OF-STATE FOR INFORMATION ON UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATION.
- THE CONTRACTOR MAY REQUEST SUBSTITUTION OF ALTERNATE METHODS OF CONSTRUCTION FROM THAT CALLED FOR, SUBJECT TO APPROVAL BY THE ENGINEER. THE CONTRACTOR SHALL THEN BE PAID THE LESSOR OF THE SUM OF THE ASSOCIATED BID ITEMS FOR THE RESPECTIVE ALTERNATIVE METHODS.
- WORK THAT DOES NOT HAVE A PAY ITEM WILL BE CONSIDERED INCIDENTAL WITH THE COST INCLUDED IN OTHER PAY ITEMS. NO ADDITIONAL COMPENSATION WILL BE PROVIDED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE GPS "AS-BUILT" SURVEY, FOLLOWING THE COMPLETION OF CONSTRUCTION. FOR EVERY 100 FEET ALONG THE ALIGNMENT OF THE PROJECT, LOCATION OF MANHOLES, RIM ELEVATIONS, INVERTS, CASINGS, VALVES, METERS, PUMPS, AND SIMILAR APPURTENANCES SHALL BE LOCATED. AN AUTOCAD DRAWING AND COORDINATE DATA SHEET SHALL BE SUBMITTED TO THE PRIVATE DEVELOPMENT DIVISION FOR APPROVAL. ALL DRAWINGS MUST BE SIGN AND CERTIFIED BY A REGISTERED PROFESSIONAL LAND SURVEYOR. DATA SUBMITTED SHALL BE TIED TO THE OKLAHOMA STATE PLANE COORDINATE SYSTEM.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING STRUCTURES, FENCES, AND LANDSCAPING NOT SHOWN TO BE REMOVED AND SHALL BE RESPONSIBLE FOR THE COST OF ANY REPAIRS TO THESE ITEMS UPON COMPLETION OF CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MANAGING ALL SANITARY SEWER FLOW AND WATERLINE SERVICE DURING CONSTRUCTION IN A MANNER APPROVED BY THE CITY OF OKLAHOMA CITY, AND ALL COSTS SHALL BE INCLUDED IN PRICE BID FOR "SEWER FLOW CONTROL".
- ON APRIL 30, 2013, THE CITY OF OKLAHOMA CITY ADOPTED A RESOLUTION ESTABLISHING A PERMANENT MANDATORY WATER CONSERVATION PROGRAM RESTRICTING WATERING TO EVERY OTHER DAY WITH PROPERTIES WITH ODD NUMBERED ADDRESSES BEING PERMITTED TO WATER ONLY ON ODD NUMBERED DAYS AND PROPERTIES WITH EVEN NUMBERED ADDRESSES BEING PERMITTED TO WATER ONLY ON EVEN NUMBERED DAYS. SHOULD CONDITIONS INCLUDING BUT NOT LIMITED TO DECREASED WATER SUPPLY STORAGE LEVELS OR DROUGHT CAUSE CONDITIONS TO DETERIORATE INCREASED WATER RESTRICTIONS MAY COME INTO EFFECT. THESE CURRENT AND FUTURE CONSERVATION REQUIREMENTS AND WATER AND WATERING RESTRICTIONS ARE APPLICABLE TO ALL PROJECTS AND CONTRACTORS JUST AS THEY ARE APPLICABLE TO OKLAHOMA CITY CITIZENS. SEE DETAILS AT: <http://www.squeezeeverndrop.com/> THE CITY OF OKLAHOMA CITY HAS ALSO ESTABLISHED A VARIANCE PROGRAM FOR IRRIGATION OF NEW LANDSCAPING. CONTRACTOR WILL BE RESPONSIBLE FOR TIMELY OBTAINING AND, IF AND AS GRANTED, FOR COMPLIANCE WITH THE VARIANCE PROGRAM REQUIREMENTS. SEE DETAILS AT: <http://www.squeezeeverndrop.com/WaterConservationProgram/VarianceProgram.aspx> FAILURE TO COMPLY WITH THE CURRENT AND FUTURE RESTRICTIONS AND REQUIREMENTS OF THE MANDATORY WATER CONSERVATION PROGRAM OR THE VARIANCE, IF AND AS GRANTED, MAY RESULT IN THE RECEIPT OF A CITATION AND/OR THE REVOCATION FOR THE VARIANCE.
- TYPE 'A' AGGREGATE BACKFILL SHALL BE PLACED IN ALL DITCHES UP TO GROUND LEVEL WHERE LINES CROSS UNDER PROPOSED OR EXISTING PAVING. TYPE 'A' AGGREGATE BACKFILL SHALL BE COMPACTED IN ACCORDANCE WITH THE CITY OF OKLAHOMA CITY STANDARD SPECIFICATIONS. THE MAXIMUM PAY QUANTITY FOR TYPE 'A' AGGREGATE BACKFILL IS THAT QUANTITY REQUIRED TO FILL A NEAT MINIMUM WIDTH DITCH, LISTED IN THE TRENCH WIDTH DETAIL, FROM THE FLOWLINE OF THE PIPE TO THE PAVEMENT SUBGRADE ELEVATION TO 5' BACK OF CURB ON EACH SIDE OF THE STREET. ANY ADDITIONAL TYPE 'A' AGGREGATE REQUIREMENTS ARE CONSIDERED INCIDENTAL.
- ANY SUBDIVISION ENTRY SIGN, MARQUEE, SIGN, FENCE, STRUCTURE, ETC. THAT WILL BE OVER ANY PROPOSED WATER AND/OR WASTEWATER MAIN. THE MAIN MUST BE STEEL ENCASED A MINIMUM OF 20 FEET AND EXTEND 5 FEET BEYOND THE EDGE OR FOOTING OF SIGN. FOR ANY EXISTING MAINS, CONCRETE ENCASE EXISTING MAINS AS REQUIRED. A REVOCABLE PERMIT IS REQUIRED TO ALLOW THESE TO BE IN THE ROW AND/OR UTILITY EASEMENT.

EROSION CONTROL NOTES

- CONSTRUCTION ACTIVITIES THAT RESULT IN LAND DISTURBANCE OF EQUAL TO OR GREATER THAN ONE (1) ACRE, OR LESS THAN ONE (1) ACRE IF THE ACTIVITIES ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE THAT TOTALS AT LEAST ONE (1) ACRE MUST OBTAIN A STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) PRIOR TO THE INITIAL DISTURBANCE OF SOILS. ADDITIONALLY, CONSTRUCTION ACTIVITIES THAT RESULT IN LAND DISTURBANCE OF EQUAL TO OR GREATER THAN ONE (1) ACRE, OR LESS THAN ONE (1) ACRE IF THE ACTIVITIES ARE PART OF A LARGER COMMON PLAN OF DEVELOPMENT OR SALE THAT TOTALS AT LEAST ONE (1) ACRE MUST OBTAIN AUTHORIZATION TO DISCHARGE STORMWATER UNDER THE OPDES CONSTRUCTION GENERAL PERMIT OKR10.
- THE USGS 7.5 MINUTES QUADRANGLE SHEETS ARE USED TO INDICATE THE "WATERS OF THE UNITED STATES" AND "WETLANDS" EXIST WITHIN THIS PROJECT AREAS. THE ISSUE OF "WATERS OF THE UNITED STATES" AND "WETLANDS" FALLS UNDER THE CORP OF ENGINEERS (COE) TULSA DISTRICT REGULATORY DIVISION, BUT THE CITY IS OBLIGATED TO ENSURE THAT ALL NECESSARY STATE AND FEDERAL PERMITS HAVE BEEN OBTAINED, PURSUANT TO 40 CFR 122.21 THEREFORE, THE APPLICANT IS REQUIRED TO SUBMIT DOCUMENTATION FROM THE COE SHOWING COE APPROVAL FOR PROPOSED WORK.
- LIST EROSION CONTROL QUANTITIES AND WHO WILL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF THE EROSION CONTROLS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ALL EROSION CONTROL DEVICES DAMAGED DUE TO CONSTRUCTION.
- A COPY OF THE EROSION CONTROL SITE PLAN MUST ALWAYS BE ON SITE AND MADE AVAILABLE TO THE INSPECTOR UPON REQUEST.
- BLOCK OFF ACCESS OR ADD CONSTRUCTION ENTRANCE.
- ALL SANITARY SEWER BYPASS LINES SHALL BE FREE FROM ANY LEAKS AS TO ELIMINATE CONTAMINATION DURING BYPASS OPERATIONS.
- A MINIMUM OF 18" OF SOD IS REQUIRED ALONG ALL CURBS & FLUMES.
- IF A FLOODPLAIN ACTIVITY (FPA) PERMIT IS REQUIRED FOR THIS PROJECT, THIS PERMIT MUST BE OBTAINED BEFORE A STORM WATER QUALITY (SWQ) PERMIT WILL BE ISSUED.
- A NOTICE OF INTENT (NOI) AND STORM WATER POLLUTION PREVENTION PLAN (SWPPP) SHOULD BE SUBMITTED 30 DAYS PRIOR TO THE INITIAL DISTURBANCE OF SOILS.
- A WORK ZONE PERMIT MUST BE OBTAINED FROM THE TRAFFIC MANAGEMENT DIVISION AT LEAST TWO (2) WORKING DAYS PRIOR TO THE START OF WORK AND/OR PLACING OR REMOVING ANY BARRICADES OR MODIFYING EXISTING TRAFFIC CONTROL DEVICES. APPLICATION FOR WORK ZONE PERMIT CAN BE LOCATED AT <https://access.okc.gov/laca/Default.aspx>
- THE CONTRACTOR IS RESPONSIBLE FOR THE PROMPT REPLACEMENT AND/OR REPAIR OF ALL TRAFFIC CONTROL DEVICES AND APPURTENANCES DAMAGED OR DISTURBED DUE TO CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF ALL PAVEMENT MARKINGS THAT WILL BE IN CONFLICT WITH THE PROPOSED WORK.
- THE CONTRACTOR SHALL CONTACT OKLAHOMA CITY TRAFFIC OPERATIONS AT (405) 297-2085 FOR THE MARKING OF TRAFFIC SIGNAL CONDUIT AND APPURTENANCES AT LEAST TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION AND/OR PLACING OR REMOVING ANY BARRICADES OR MODIFYING EXISTING TRAFFIC CONTROL DEVICES.
- ALL TRAFFIC CONTROL DEVICES SHALL BE PLACED, RELOCATED, OR REMOVED BY THE CONTRACTOR WHEN REQUIRED. THE COST OF SAID WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "TRAFFIC CONTROL".

SUMMARY OF EROSION CONTROL - SOUTHWEST				
ITEM #	ITEM	UNIT	QUANTITY	AS-BUILT
1	SILT FENCE	LF	3,359	
2	TEMPORARY CURB INLET SEDIMENT BARRIER	EA	5	

SUMMARY OF EROSION CONTROL - EAST				
ITEM #	ITEM	UNIT	QUANTITY	AS-BUILT
1	SILT FENCE	LF	2,783	
2	TEMPORARY DROP INLET SEDIMENT BARRIER	EA	1	

Will be issued prior to construction
SWQ permit needed. The permit listed
has not been issued

SWQ PERMIT: SWL-2023-00738	BILLING ADDRESS
BLDC-202X-XXXXX	
BELOW FOR CITY USE ONLY	BUILDING ADDRESS
<input checked="" type="checkbox"/> DEQ REQUIRED	
<input checked="" type="checkbox"/> EASEMENT REQUIRED	
REFERENCED SEWER STANDARD DETAILS	
S-STD-01 - 3/14/14 S-STD-02 - 3/14/14 S-STD-03 - 3/14/14 S-STD-04 - 3/14/14 S-STD-05 - 3/14/14 (IF REQ'D)	

SHEET INDEX	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SEWER GENERAL LAYOUT
3-6	PLAN AND PROFILE - SEWER LINE A
7-9	PLAN AND PROFILE - SEWER LINE B
10-12	EROSION CONTROL PLAN
13	EROSION CONTROL SHEET
14	BORE LOG SHEET
15-19	OKC SANITARY SEWER STANDARD DETAILS

ONE CALL UTILITY LOCATION NUMBER

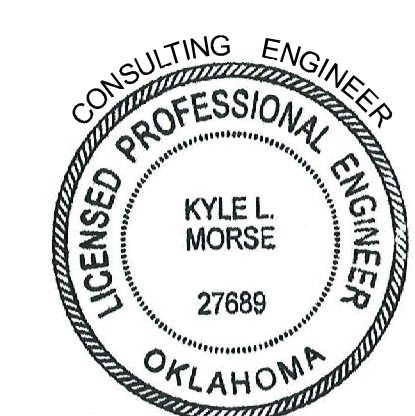
840-5032
1-800-522-6543

This number is to be used for information on the location of all underground utilities. Contact this number and other numbers specified in the plans prior to any excavation.

CEC CORPORATION
4555 WEST MEMORIAL ROAD
OKLAHOMA CITY, OKLAHOMA 73142
T: 405-753-4200 & F: 405-260-9504

PREPARED BY:
Kyle Morse
KYLE MORSE, P.E.
CA #32 EXPIRATION 06-30-2024
Date: 2-5-2024

REGISTERED PROFESSIONAL ENGINEER
DATE: 12-22-2014



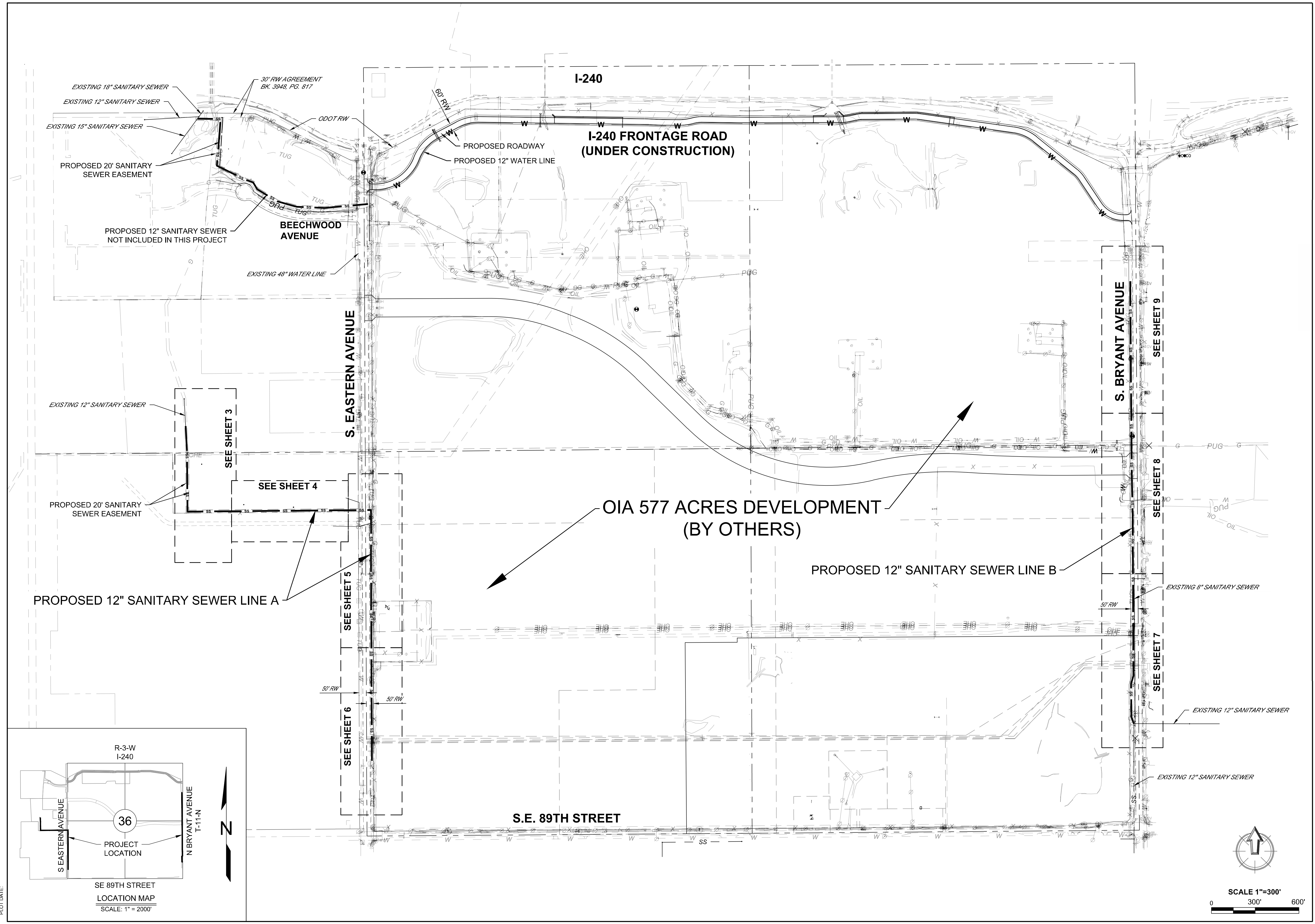
CONSTRUCTION MUST BEGIN WITHIN ONE (1) YEAR FROM THE DATE OF APPROVAL, OR THAT APPROVAL IS WITHDRAWN.

**DEPARTMENT OF UTILITIES
ENGINEERING PRIVATE
DEVELOPMENT DIVISION**

Checked by: *[Signature]* Date: 2/19/24
Checked by: _____ Date: _____
Checked by: _____ Date: _____

**DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION**

APPROVED:
[Signature] for 02/20/2024
City Engineer Date:



CEC



CEC CORPORATION
 OKLAHOMA CITY, OKLAHOMA 73142
 WWW.CONNEXCEC.COM
 STATE OF OKLAHOMA CERTIFICATE OF AUTHORIZATION
 CASE NO. 2019-0000000
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NO.	DESCRIPTION

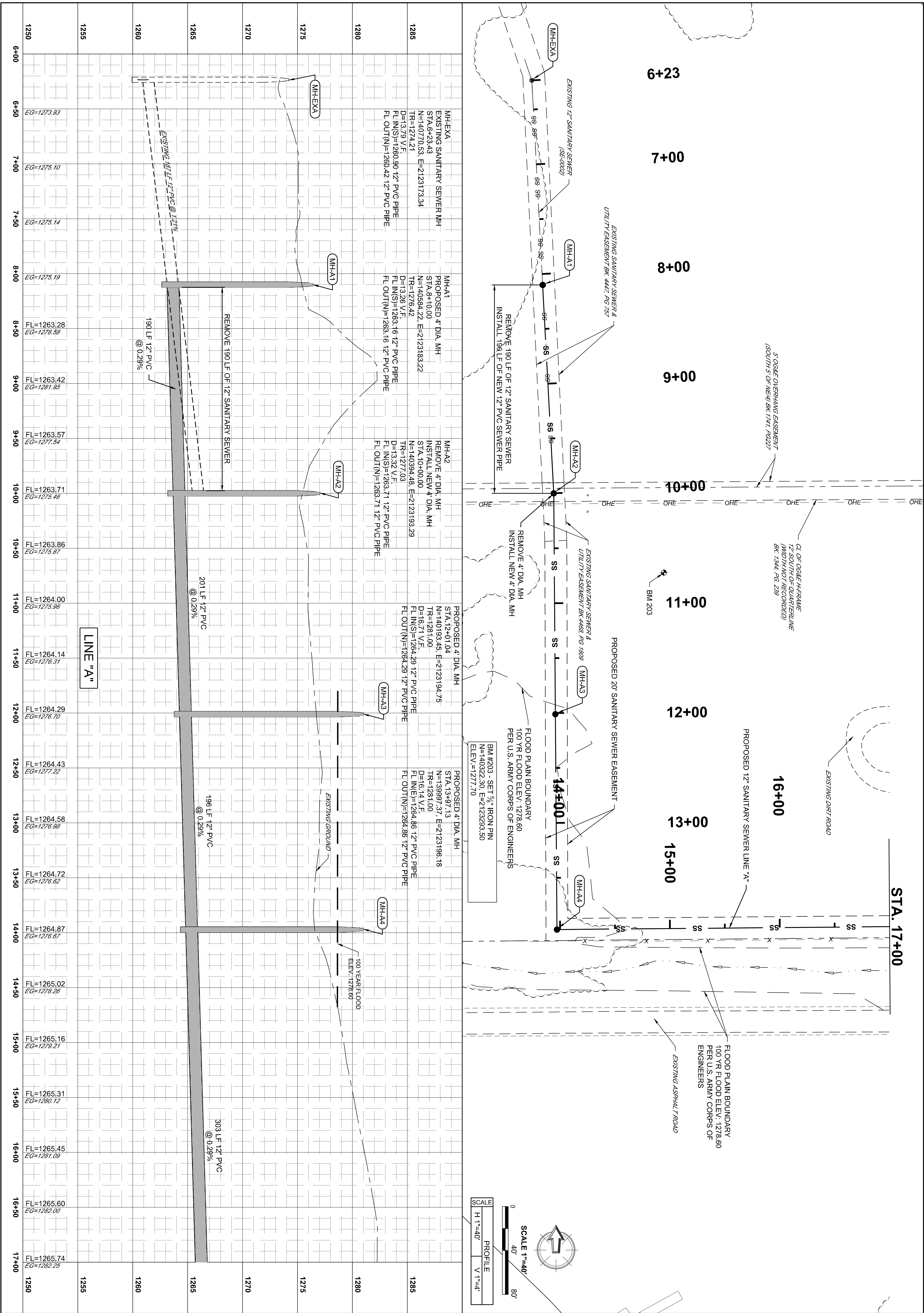
DATE:	02-05-2024	DATE:	
PROJECT NO.:	SD-2022-00083	DESIGNED BY:	KLM
DESIGNED BY:	KLM	DRAWN BY:	MTD
DRAWN BY:	MTD	APPROVED BY:	KLM
APPROVED BY:	KLM	SCALE:	AS SHOWN

OKC 577 ACRES DEVELOPMENT
 OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
SEWER GENERAL LAYOUT

SHEET
2

PLOT DATE:



SHEET NAME
OKC 577 ACRES DEVELOPMENT
 OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

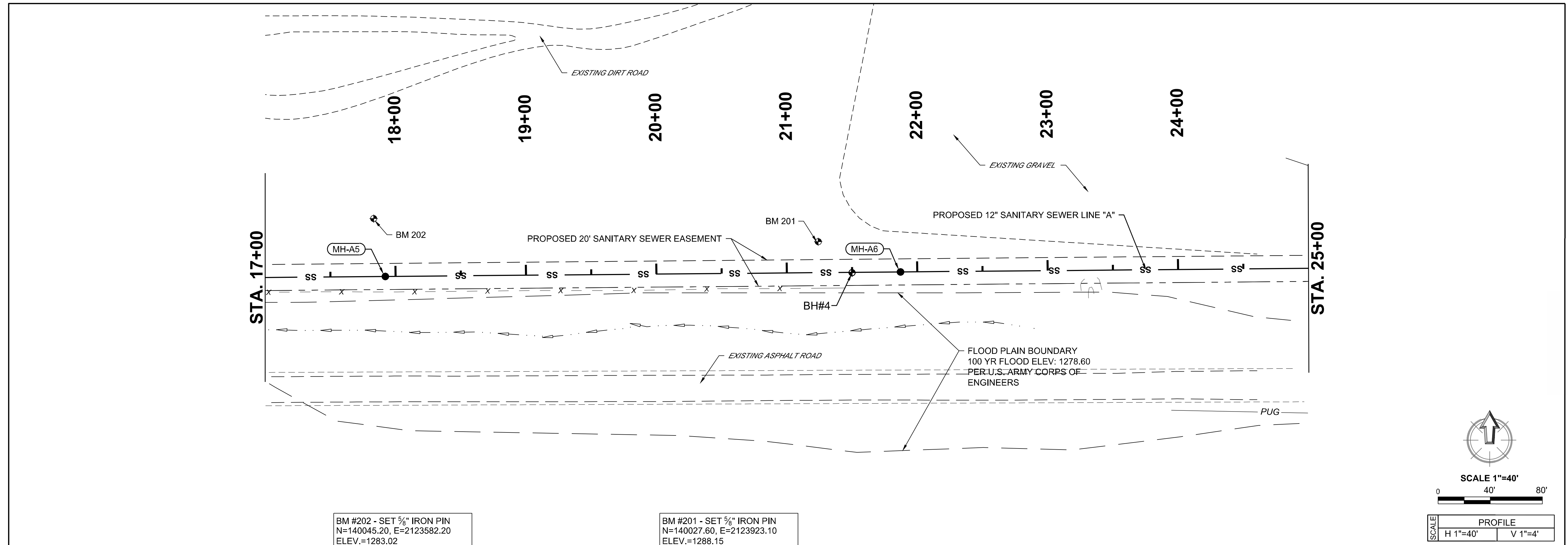
DATE	DESCRIPTION	DATE
02-05-2024	FINAL	

NO.	DESCRIPTION	DATE
SD-2023-00083	DESIGNED BY: KLM	
MTD	DRAWN BY: MTD	
KLM	APPROVED BY: KLM	

SCALE: AS SHOWN

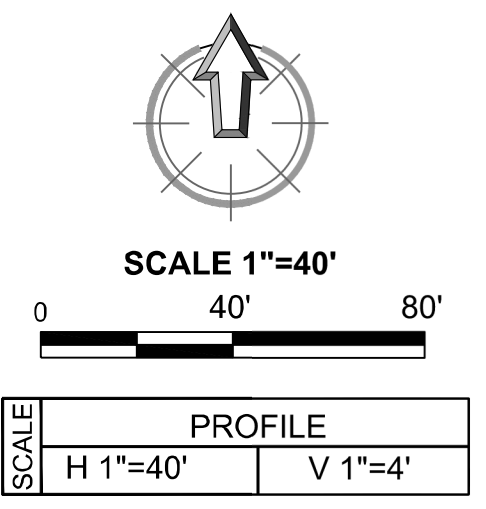
REVISION HISTORY

CEC CORPORATION
 4556 W. HENRIETTA ROAD
 OKLAHOMA CITY, OKLAHOMA 73142
 P: 405.753.6500
 WWW.CONNECTCEC.COM
 STATE OF OK CERTIFICATE OF AUTHORIZATION
 CAR 32 EXPIRES: 2024-05-30
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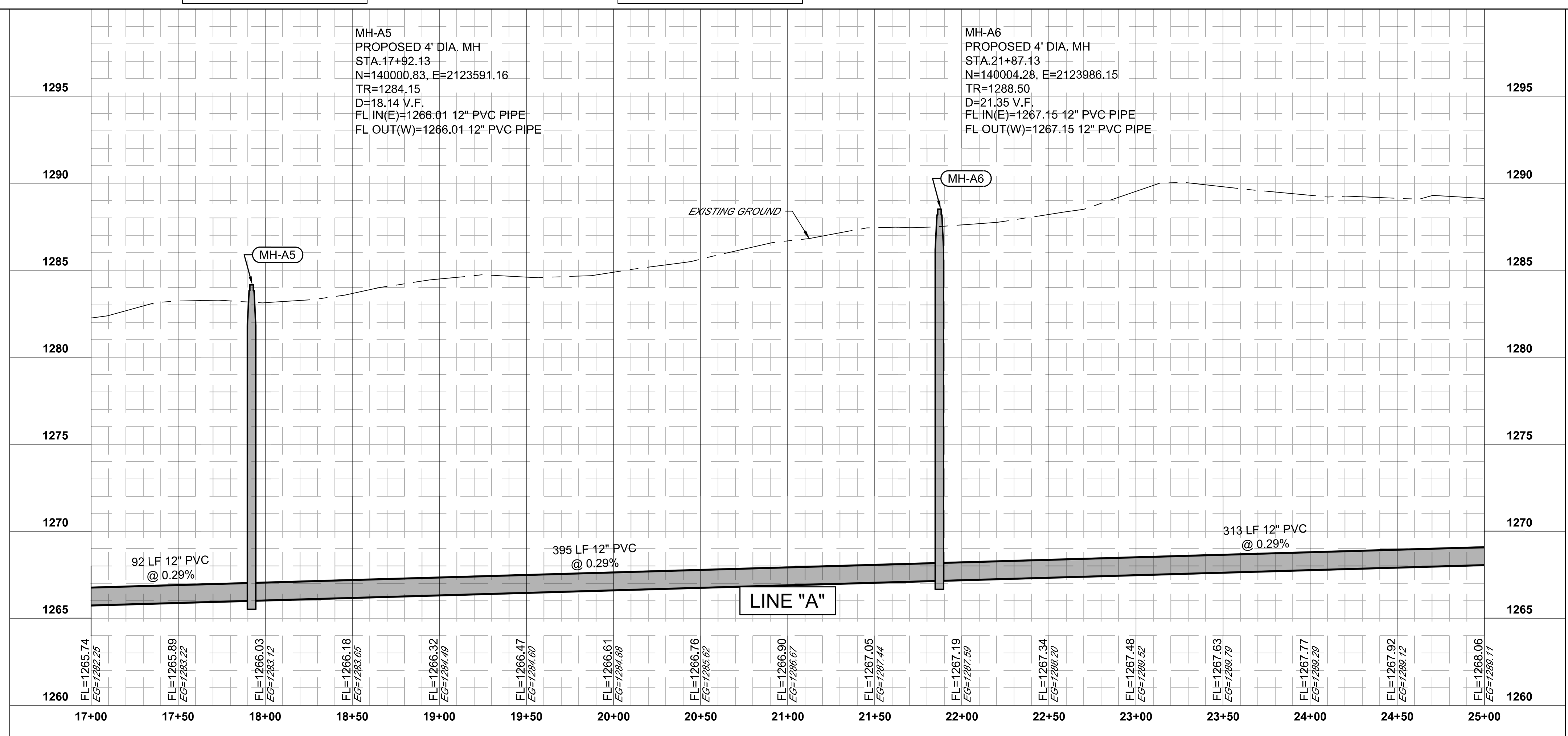



BM #202 - SET 5/8" IRON PIN
N=140045.20, E=2123582.20
ELEV.=1283.02

BM #201 - SET 5/8" IRON PIN
N=140027.60, E=2123923.10
ELEV.=1288.15



PLOT DATE:






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OKLAHOMA CITY, OKLAHOMA 73142
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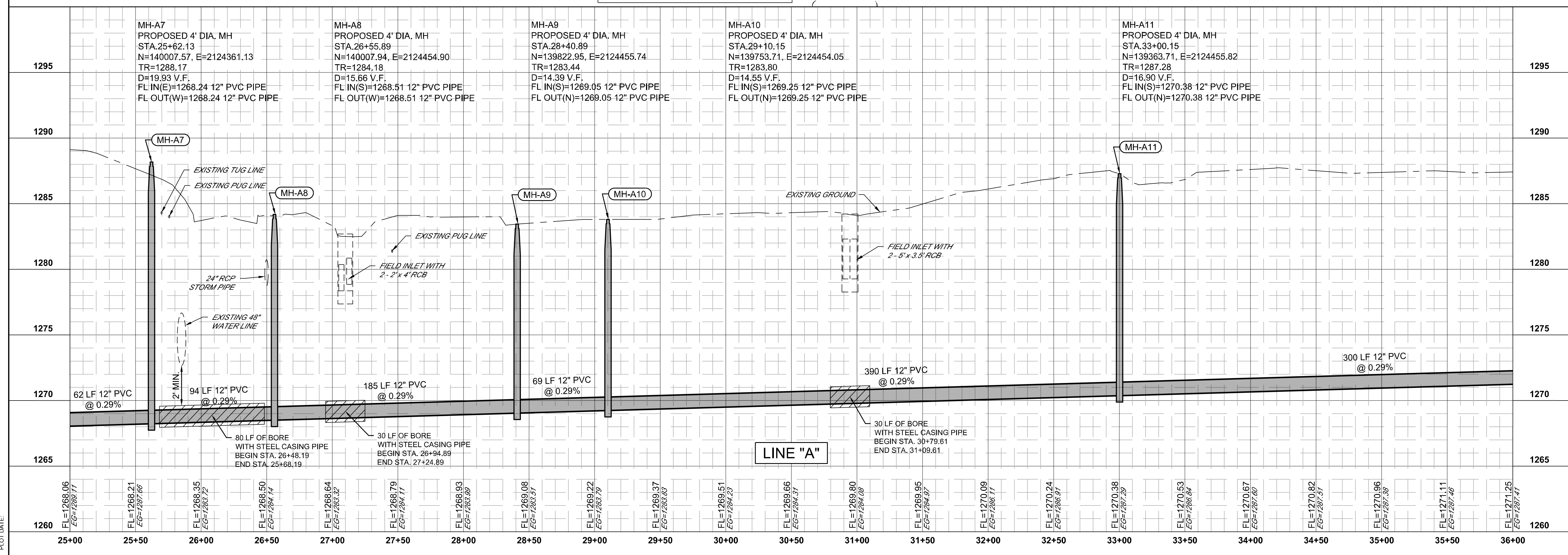
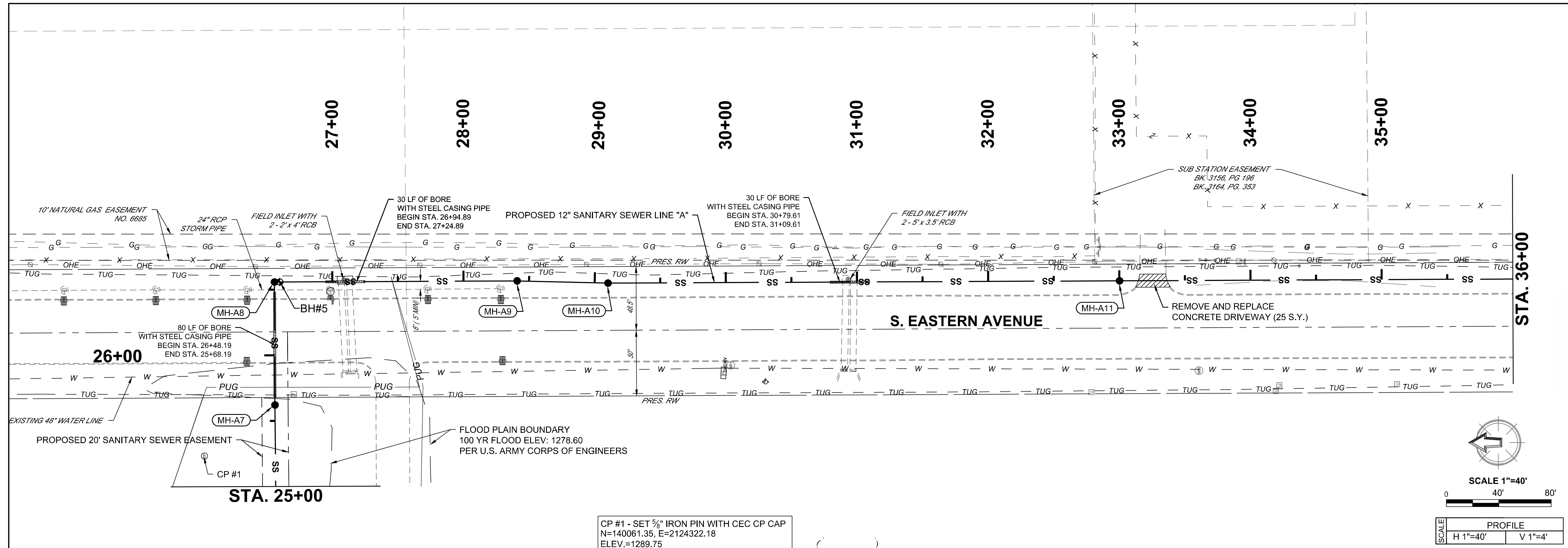
DATE:	02-05-2024	DATE:	
PROJECT NO.:	SD-2022-00083	NO.:	
DESIGNED BY:	KLM	DESCRIPTION:	
DRAWN BY:	MTD	FINAL:	
APPROVED BY:	KLM	SCALE:	AS SHOWN

OKC 577 ACRES DEVELOPMENT

OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
**PLAN & PROFILE
SEWER LINE A**

SHEET
4



CEC CORPORATION
OKLAHOMA CITY, OKLAHOMA 73142
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STATE OF OKLAHOMA CERTIFICATE OF AUTHORIZATION
CASE # 22-EMBE-2024-030

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KYLE L. MORSE
27698
OKLAHOMA

REVISION HISTORY	
NO.	DESCRIPTION

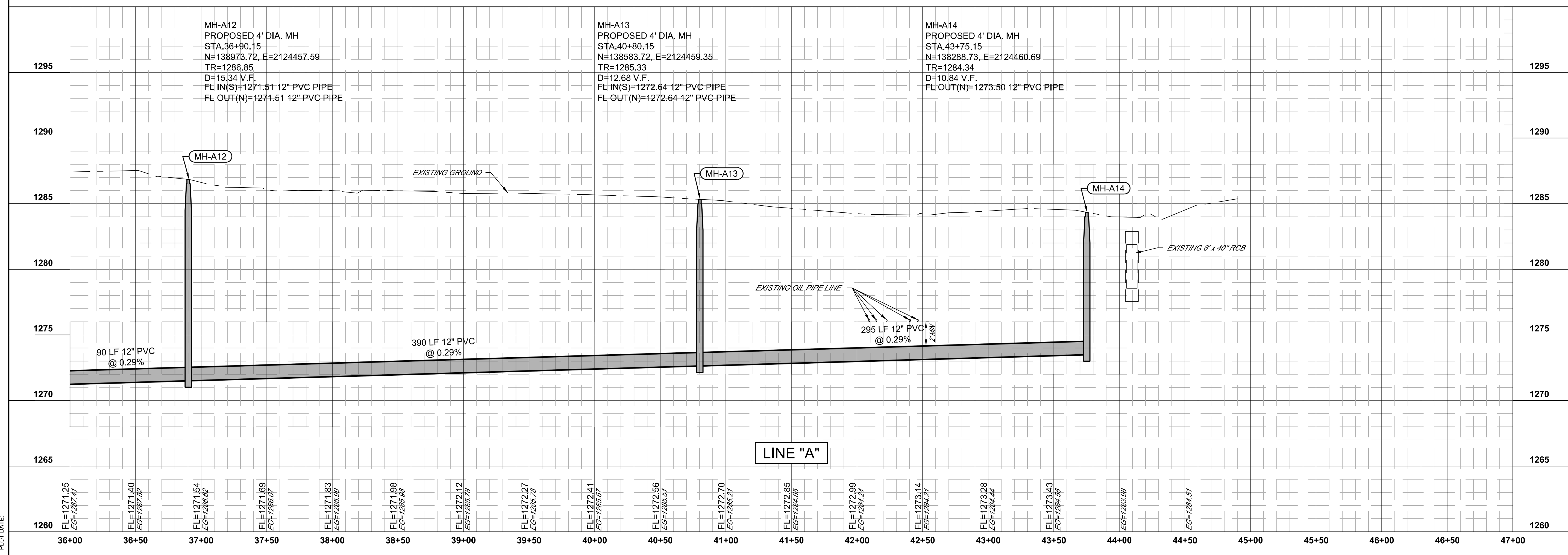
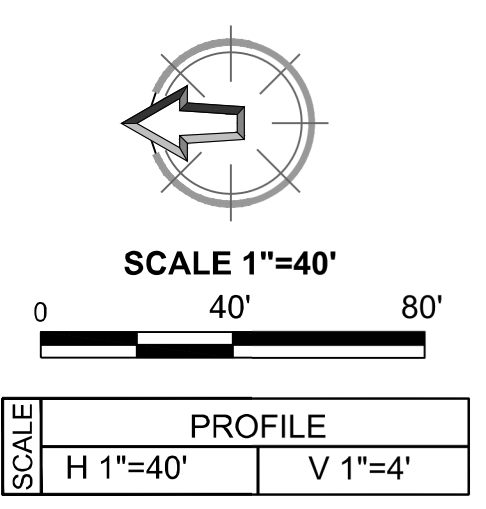
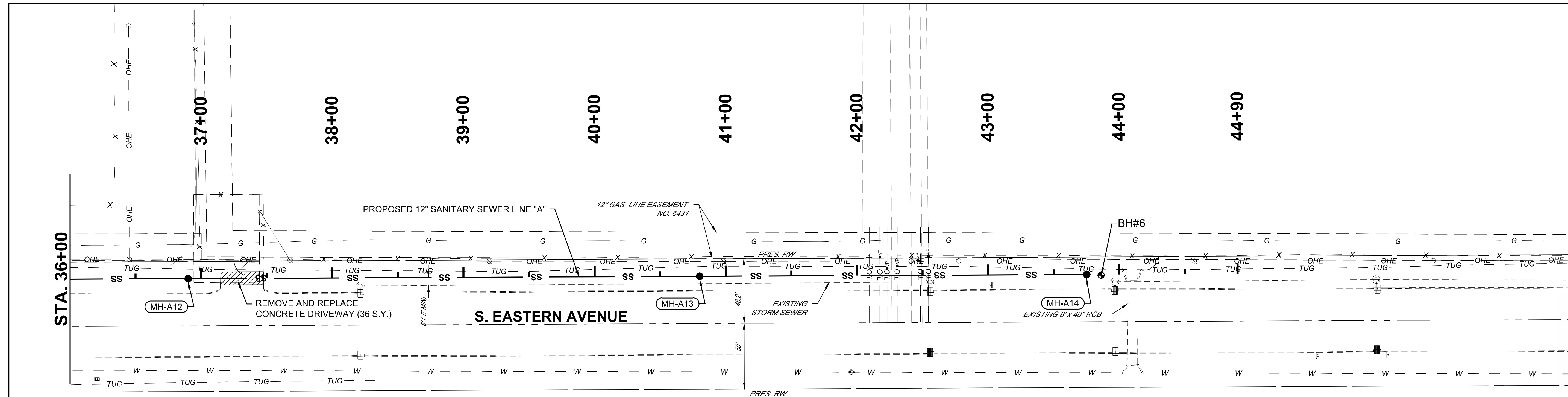
SUBMITTAL:	FINAL	DATE: 02-05-2024	PROJECT NO.: SD-2022-00083	DESIGNED BY: KLM	DRAWN BY: JMD	APPROVED BY: KLM	SCALE:	AS SHOWN
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OKC 577 ACRES DEVELOPMENT

OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
**PLAN & PROFILE
SEWER LINE A**

SHEET
5



CEC

OKLAHOMA CITY, OKLAHOMA 73142
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CASE NO. 2024-030

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KYLE L MORSE
27898
2/13/24
OKLAHOMA

NO.	DESCRIPTION	DATE

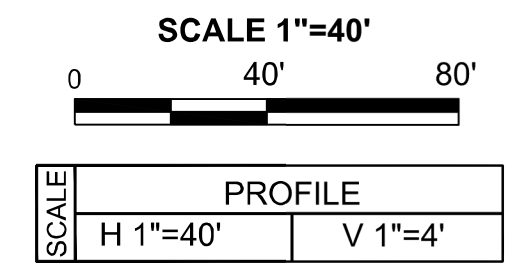
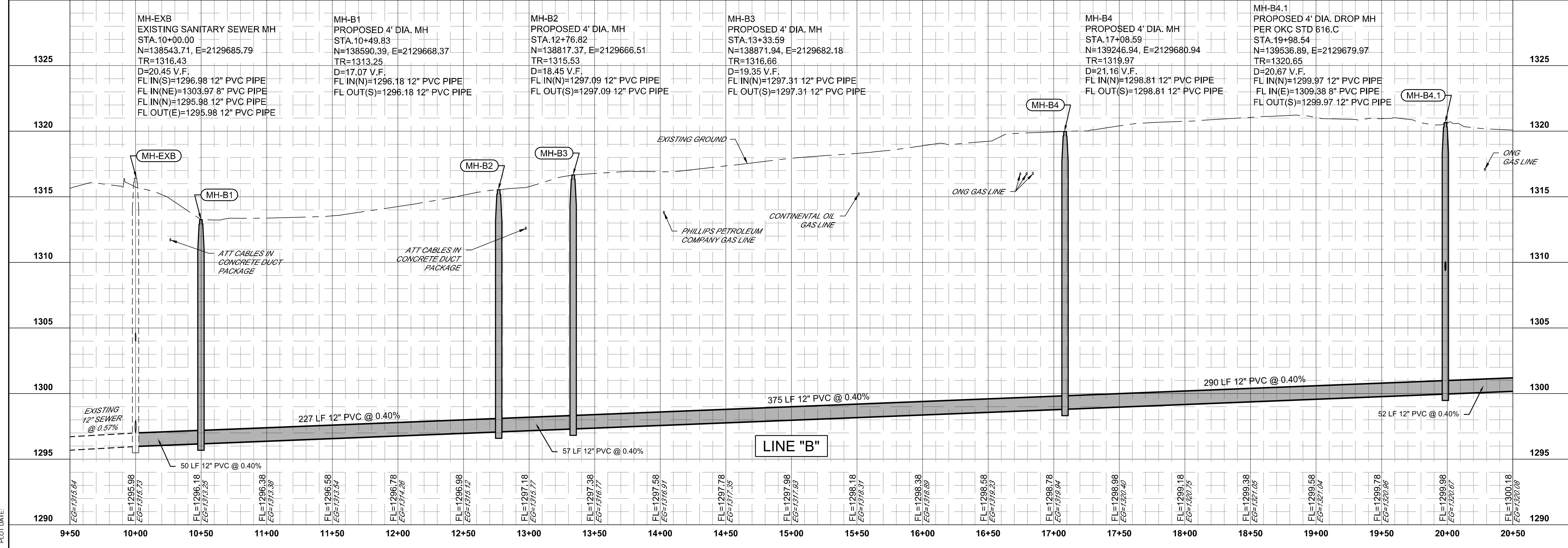
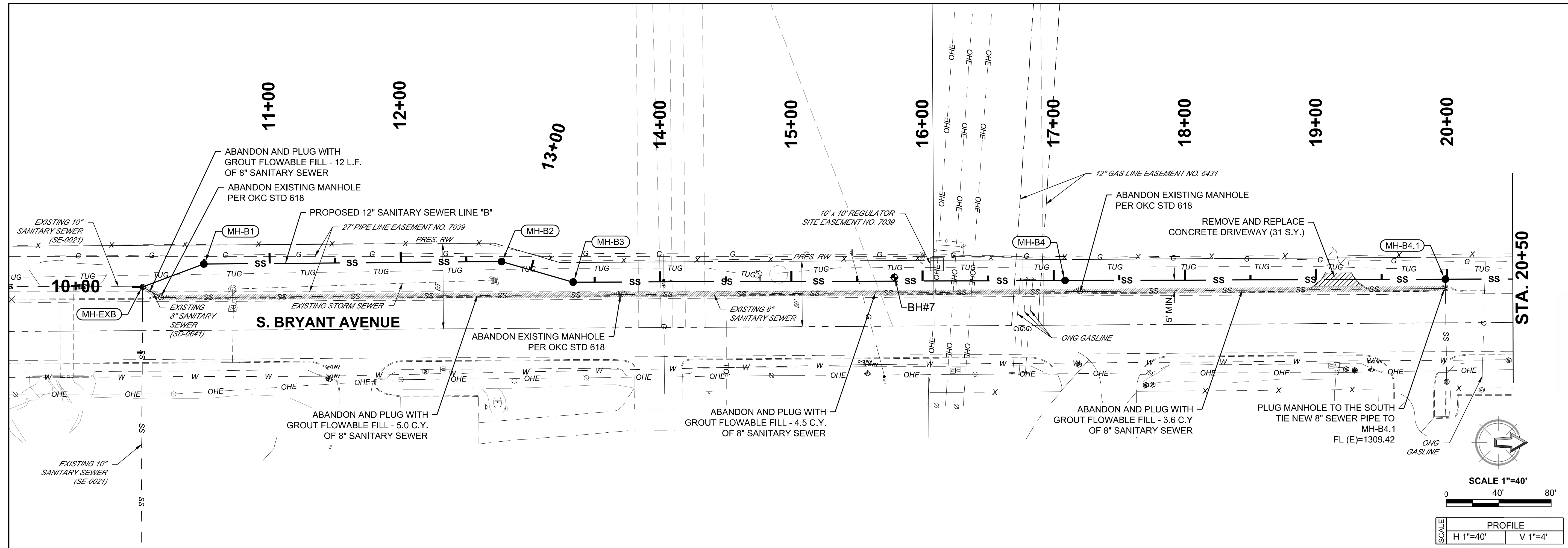
REVISION HISTORY

FINAL	02-05-2024	
DATE:	SD-2022-00083	
DESIGNED BY:	KLM	
DRAWN BY:	MTD	
APPROVED BY:	KLM	
SCALE:	AS SHOWN	

OKC 577 ACRES DEVELOPMENT
OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA


SHEET NAME
**PLAN & PROFILE
SEWER LINE A**

SHEET
6



1325	MH-EXB EXISTING SANITARY SEWER MH STA. 10+00.00 N=138543.71, E=2129685.79 TR=1316.43 D=20.45 V.F. FL IN(S)=1296.98 12" PVC PIPE FL IN(NE)=1303.97 8" PVC PIPE FL IN(N)=1295.98 12" PVC PIPE FL OUT(E)=1295.98 12" PVC PIPE	MH-B1 PROPOSED 4' DIA. MH STA. 10+49.83 N=138590.39, E=2129668.37 TR=1313.25 D=17.07 V.F. FL IN(N)=1296.18 12" PVC PIPE FL OUT(S)=1296.18 12" PVC PIPE	MH-B2 PROPOSED 4' DIA. MH STA. 12+76.82 N=138817.37, E=2129666.51 TR=1315.53 D=18.45 V.F. FL IN(N)=1297.09 12" PVC PIPE FL OUT(S)=1297.09 12" PVC PIPE	MH-B3 PROPOSED 4' DIA. MH STA. 13+33.59 N=138871.94, E=2129682.18 TR=1316.66 D=19.35 V.F. FL IN(N)=1297.31 12" PVC PIPE FL OUT(S)=1297.31 12" PVC PIPE	MH-B4 PROPOSED 4' DIA. MH STA. 17+08.59 N=139246.94, E=2129680.94 TR=1319.97 D=21.16 V.F. FL IN(N)=1298.81 12" PVC PIPE FL OUT(S)=1298.81 12" PVC PIPE	MH-B4.1 PROPOSED 4' DIA. DROP MH PER OKC STD 516.C STA. 19+98.54 N=139536.89, E=2129679.97 TR=1320.65 D=20.67 V.F. FL IN(N)=1299.97 12" PVC PIPE FL IN(E)=1309.38 8" PVC PIPE FL OUT(S)=1299.97 12" PVC PIPE	1325
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PLOT DATE:




CEC

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OKLAHOMA CITY, OKLAHOMA 73142
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CASE NO. 2004-030

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KYLE L. MORSE
LICENSED PROFESSIONAL ENGINEER
OKLAHOMA

REVISION HISTORY	
NO.	DESCRIPTION

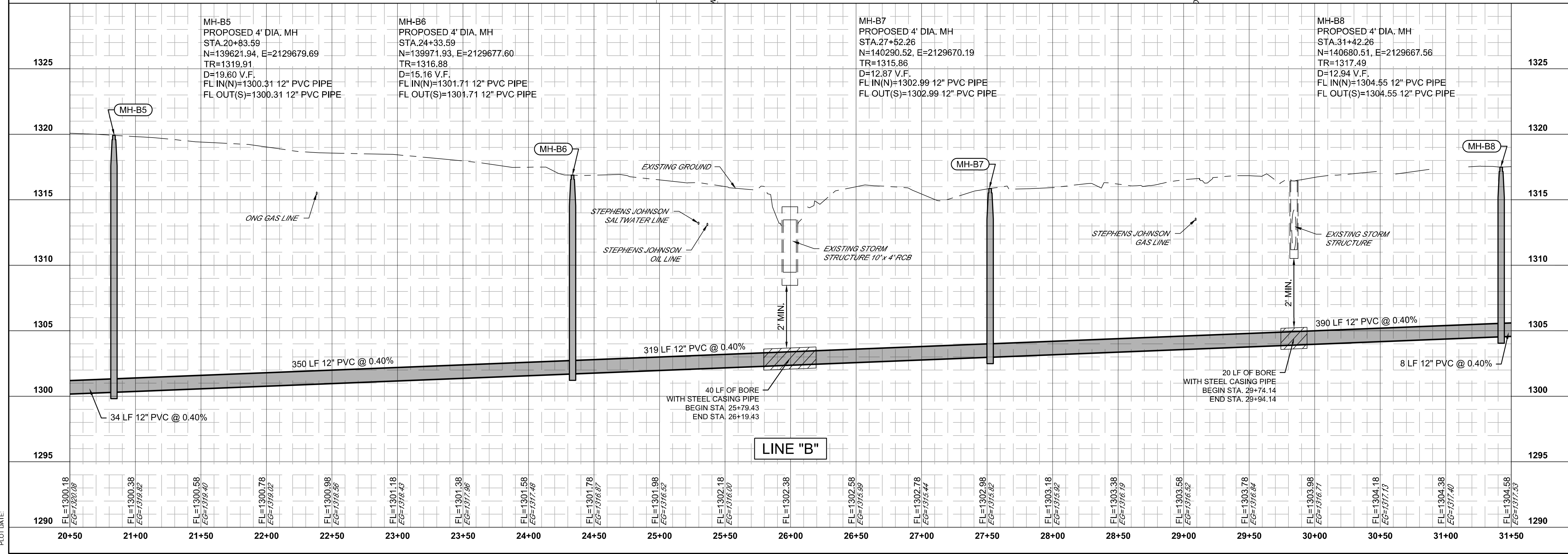
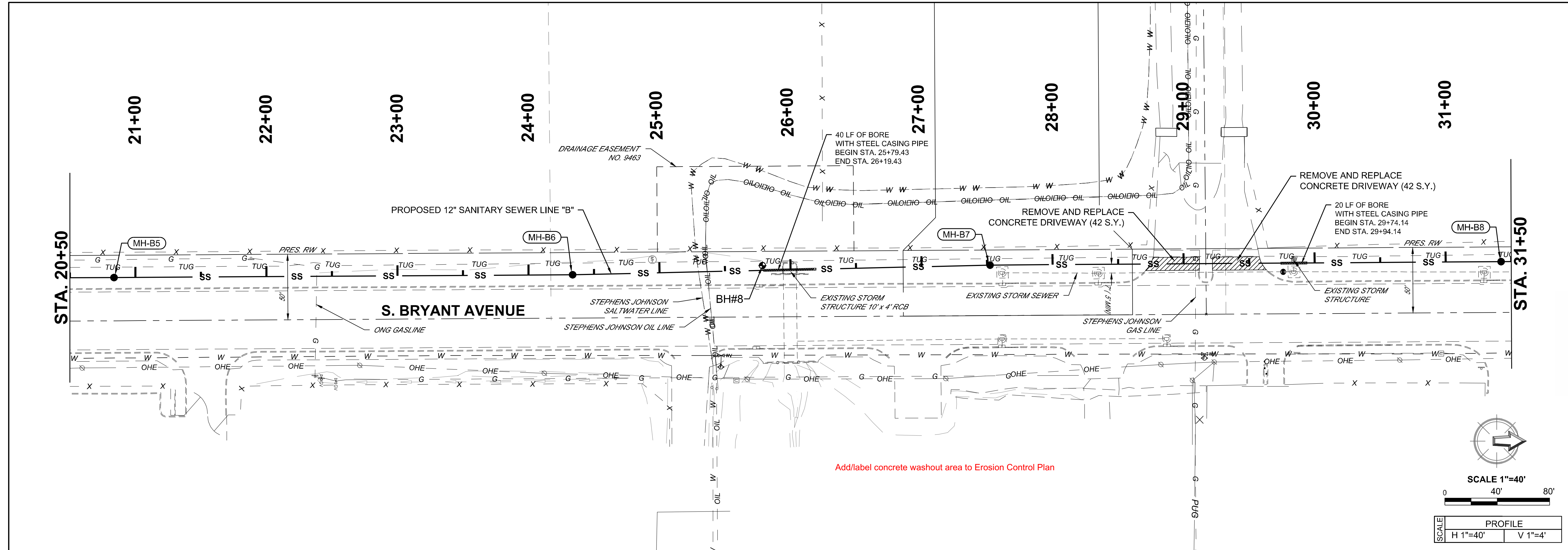
DATE:	02-05-2024
PROJECT NO.:	SD-2022-00083
DESIGNED BY:	KLM
DRAWN BY:	MTD
APPROVED BY:	KLM
SCALE:	AS SHOWN

OKC 577 ACRES DEVELOPMENT

OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
**PLAN & PROFILE
SEWER LINE B**

SHEET
7



PLOT DATE:

CEC

CEC CORPORATION
OKLAHOMA CITY, OKLAHOMA 73142
WWW.CONNEXIONCEC.COM

STATE OF OKLAHOMA CERTIFICATE OF AUTHORIZATION
CASE NO. 2019-0000000
EXPIRES 2024-06-30

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KYLE L. MORSE
LICENSED PROFESSIONAL ENGINEER
OKLAHOMA

REVISION HISTORY	
NO.	DESCRIPTION

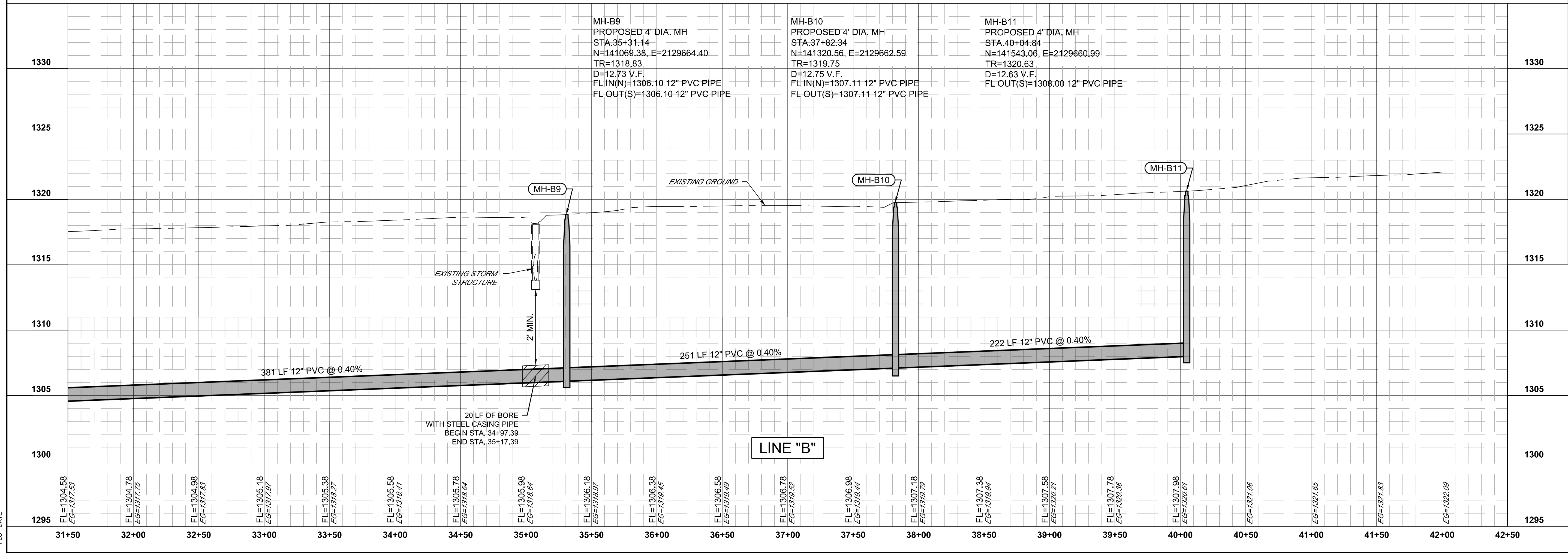
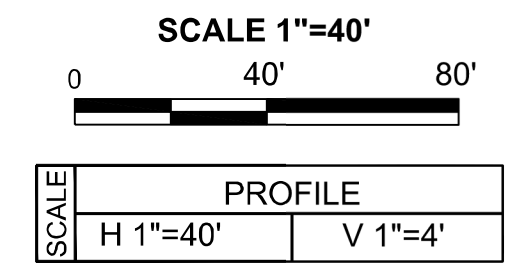
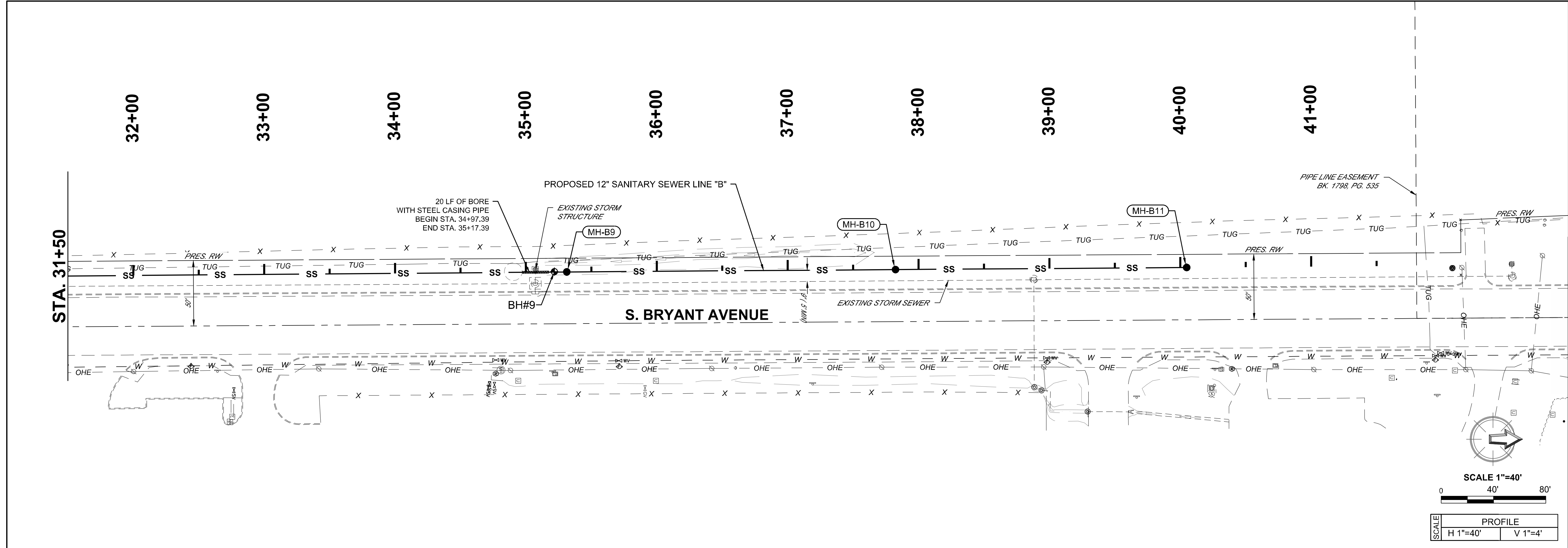
SUBMITTAL:	FINAL	DATE: 02-05-2024	PROJECT NO.: SD-2022-00083	DESIGNED BY: KLM	DRAWN BY: JMD	APPROVED BY: KLM	SCALE: AS SHOWN
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OKC 577 ACRES DEVELOPMENT


OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
PLAN & PROFILE SEWER LINE B

SHEET
8



PLOT DATE:




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KYLE L. MORSE
 LICENSED PROFESSIONAL ENGINEER
 OKLAHOMA

REVISION HISTORY	
NO.	DESCRIPTION

DATE	DESCRIPTION

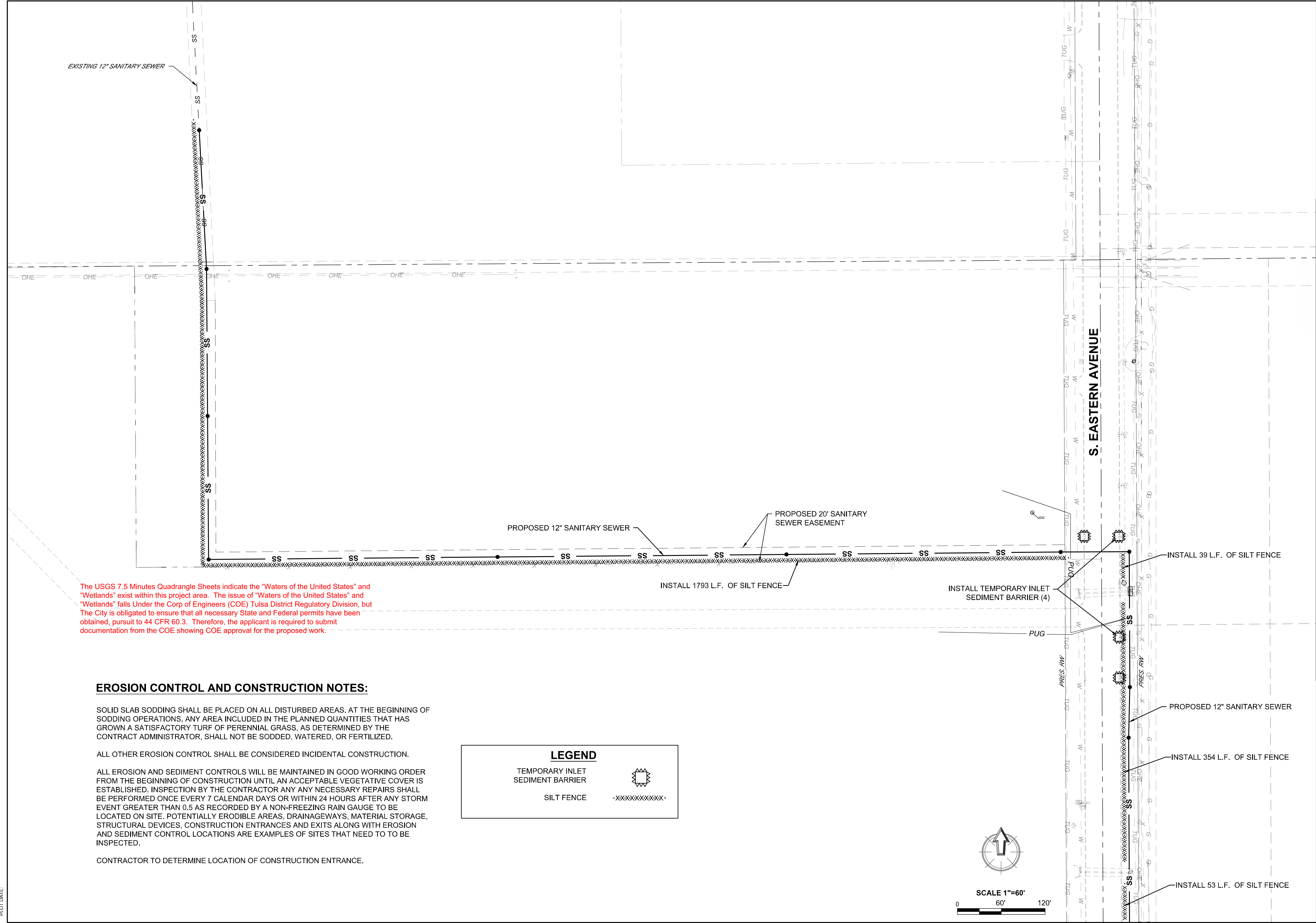
SUBMITTAL:	FINAL	NO. 02-05-2024	DATE	DESCRIPTION	SCALE	AS SHOWN

OKC 577 ACRES DEVELOPMENT

OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
**PLAN & PROFILE
SEWER LINE B**

SHEET
9



EXISTING 12" SANITARY SEWER

PROPOSED 12" SANITARY SEWER

PROPOSED 20" SANITARY SEWER EASEMENT

INSTALL 1793 L.F. OF SILT FENCE

INSTALL TEMPORARY INLET SEDIMENT BARRIER (4)

INSTALL 39 L.F. OF SILT FENCE

PROPOSED 12" SANITARY SEWER

INSTALL 354 L.F. OF SILT FENCE

INSTALL 53 L.F. OF SILT FENCE

S. EASTERN AVENUE

The USGS 7.5 Minutes Quadrangle Sheets indicate the "Waters of the United States" and "Wetlands" exist within this project area. The issue of "Waters of the United States" and "Wetlands" falls Under the Corp of Engineers (COE) Tulsa District Regulatory Division, but The City is obligated to ensure that all necessary State and Federal permits have been obtained, pursuant to 44 CFR 60.3. Therefore, the applicant is required to submit documentation from the COE showing COE approval for the proposed work.

EROSION CONTROL AND CONSTRUCTION NOTES:

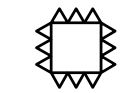
SOLID SLAB SODDING SHALL BE PLACED ON ALL DISTURBED AREAS. AT THE BEGINNING OF SODDING OPERATIONS, ANY AREA INCLUDED IN THE PLANNED QUANTITIES THAT HAS GROWN A SATISFACTORY TURF OF PERENNIAL GRASS, AS DETERMINED BY THE CONTRACT ADMINISTRATOR, SHALL NOT BE SODDED, WATERED, OR FERTILIZED.


ALL OTHER EROSION CONTROL SHALL BE CONSIDERED INCIDENTAL CONSTRUCTION.

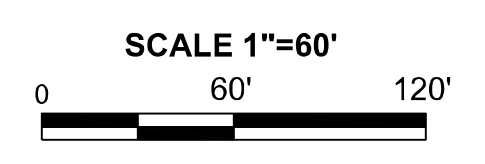
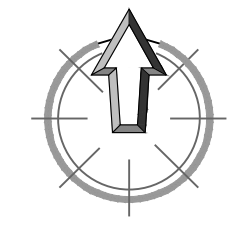
ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER FROM THE BEGINNING OF CONSTRUCTION UNTIL AN ACCEPTABLE VEGETATIVE COVER IS ESTABLISHED. INSPECTION BY THE CONTRACTOR ANY ANY NECESSARY REPAIRS SHALL BE PERFORMED ONCE EVERY 7 CALENDAR DAYS OR WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 AS RECORDED BY A NON-FREEZING RAIN GAUGE TO BE LOCATED ON SITE. POTENTIALLY ERODIBLE AREAS, DRAINAGEWAYS, MATERIAL STORAGE, STRUCTURAL DEVICES, CONSTRUCTION ENTRANCES AND EXITS ALONG WITH EROSION AND SEDIMENT CONTROL LOCATIONS ARE EXAMPLES OF SITES THAT NEED TO TO BE INSPECTED.


CONTRACTOR TO DETERMINE LOCATION OF CONSTRUCTION ENTRANCE.

LEGEND

TEMPORARY INLET SEDIMENT BARRIER 


SILT FENCE 





CEC CORPORATION
OKLAHOMA CITY, OKLAHOMA 73142
WWW.CONNEXCEC.COM
STATE OF OK CERTIFICATE OF AUTHORIZATION
CASE NO. 2024-030

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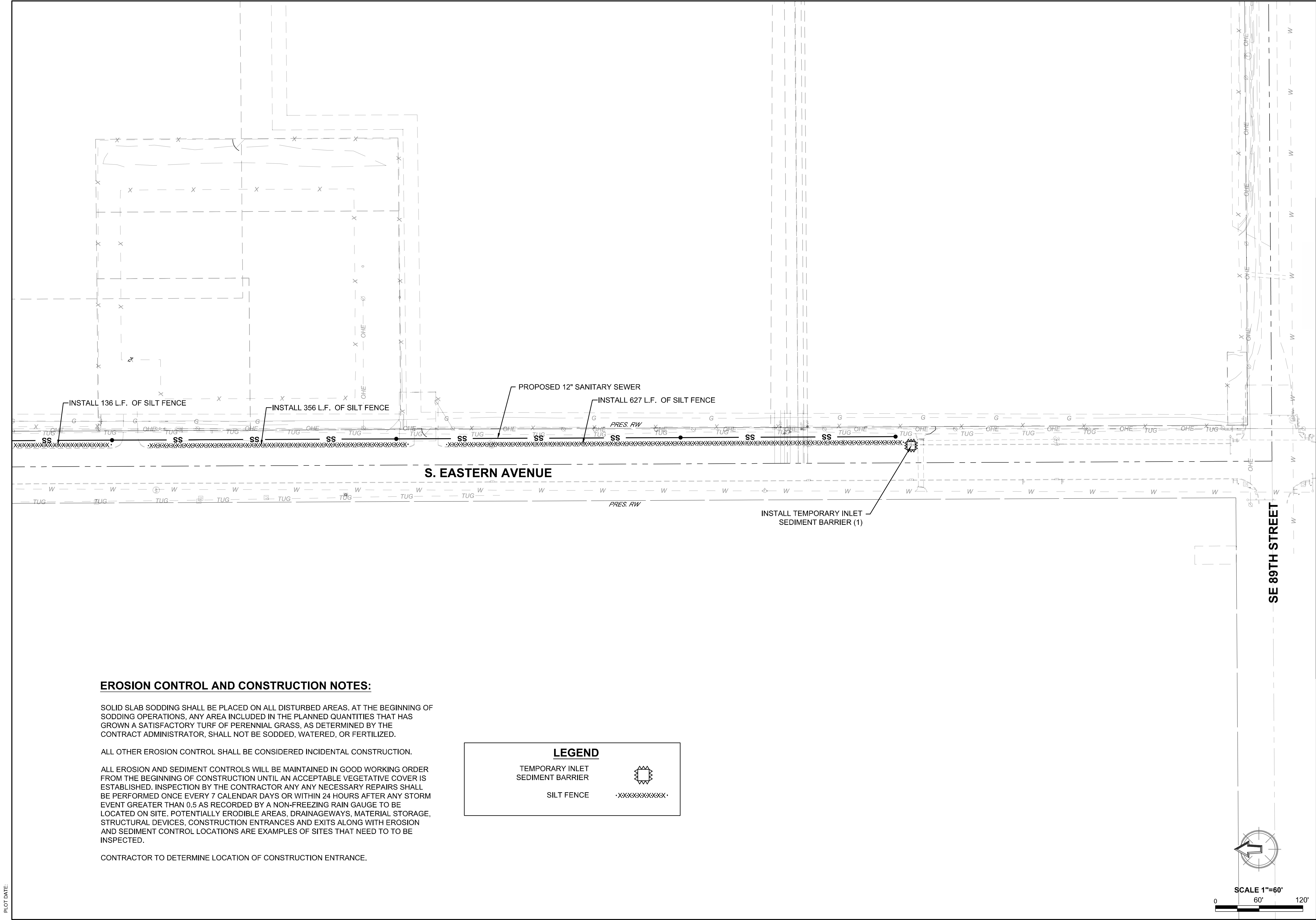


SUBMITTAL:		REVISION HISTORY	
DATE:	PROJECT NO.:	NO.:	DESCRIPTION:
02-05-2024	SD-2022-00083		
DESIGNED BY: KLM			
DRAWN BY: INTD			
APPROVED BY: KLM			
SCALE:	FINAL		
AS SHOWN			

OKC 577 ACRES DEVELOPMENT

OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME	EROSION CONTROL PLAN
SHEET	
10	



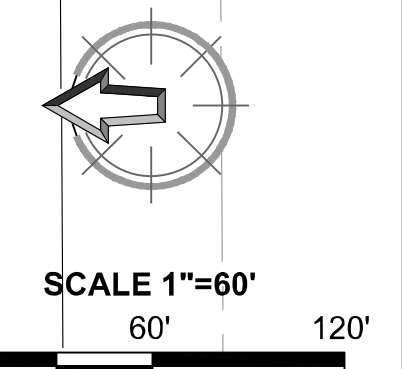
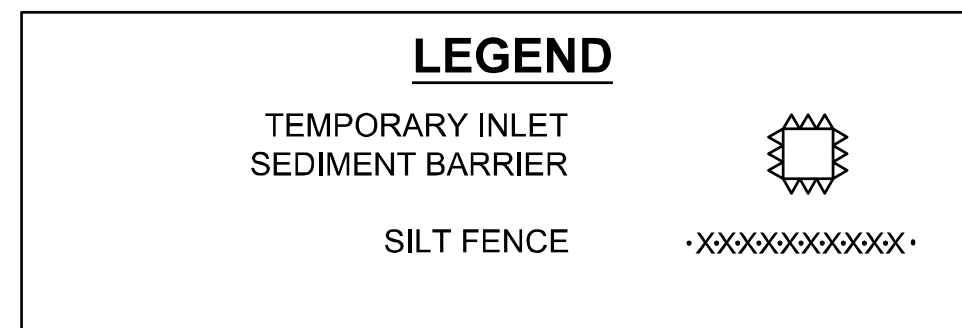
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SOLID SLAB SODDING SHALL BE PLACED ON ALL DISTURBED AREAS. AT THE BEGINNING OF SODDING OPERATIONS, ANY AREA INCLUDED IN THE PLANNED QUANTITIES THAT HAS GROWN A SATISFACTORY TURF OF PERENNIAL GRASS, AS DETERMINED BY THE CONTRACT ADMINISTRATOR, SHALL NOT BE SODDED, WATERED, OR FERTILIZED.

ALL OTHER EROSION CONTROL SHALL BE CONSIDERED INCIDENTAL CONSTRUCTION.

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CONTRACTOR TO DETERMINE LOCATION OF CONSTRUCTION ENTRANCE.






CEC

CEC CORPORATION
OKLAHOMA CITY, OKLAHOMA 73142
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CASE NO. 2024-030

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PROJECT NO.:	SD-2022-00083				
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DRAWN BY:	MTD				
APPROVED BY:	KLM				
SCALE:	AS SHOWN				

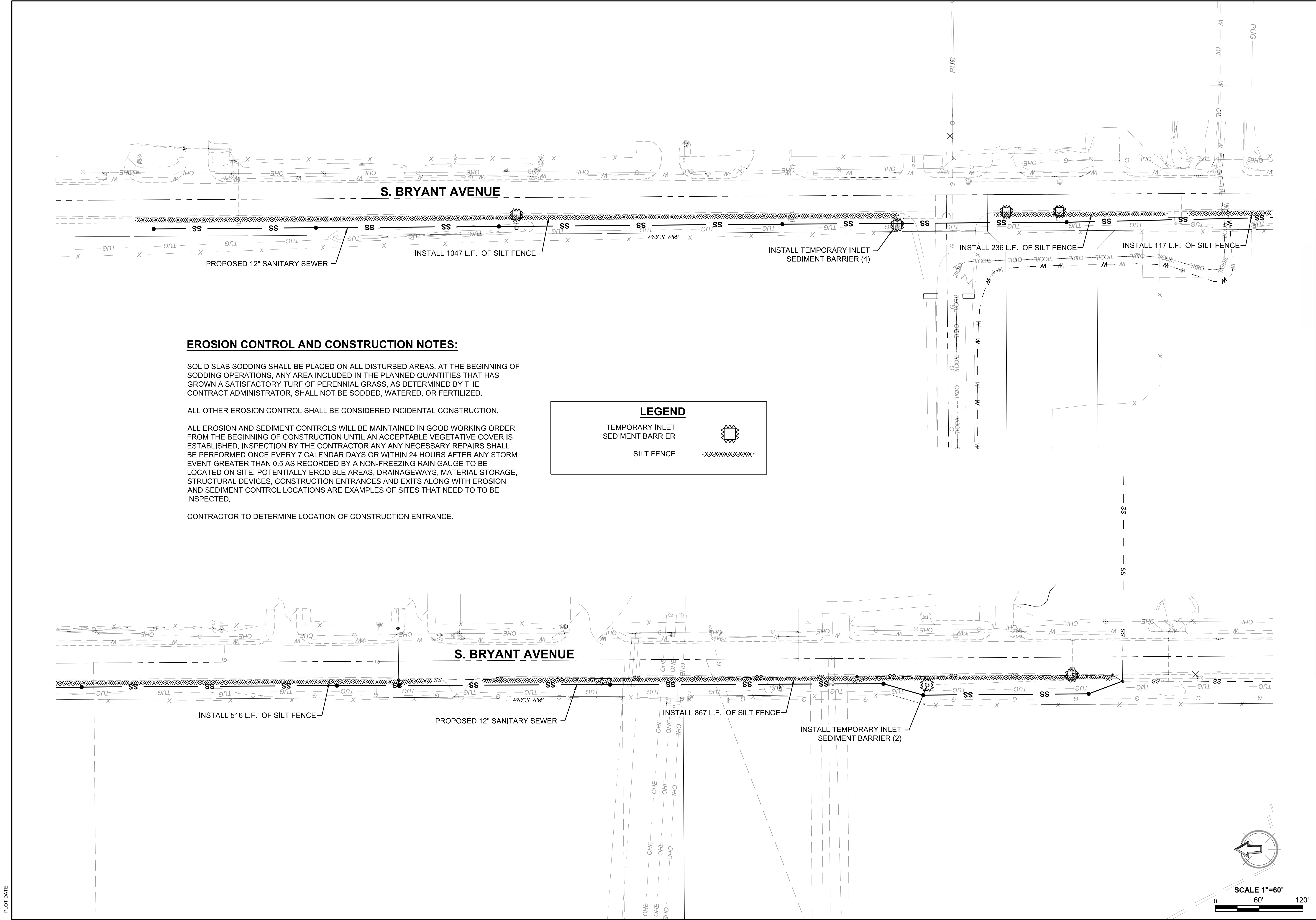
OKC 577 ACRES DEVELOPMENT

OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
EROSION CONTROL PLAN

SHEET
11

PLOT DATE:



EROSION CONTROL AND CONSTRUCTION NOTES:

SOLID SLAB SODDING SHALL BE PLACED ON ALL DISTURBED AREAS. AT THE BEGINNING OF SODDING OPERATIONS, ANY AREA INCLUDED IN THE PLANNED QUANTITIES THAT HAS GROWN A SATISFACTORY TURF OF PERENNIAL GRASS, AS DETERMINED BY THE CONTRACT ADMINISTRATOR, SHALL NOT BE SODDED, WATERED, OR FERTILIZED.


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CONTRACTOR TO DETERMINE LOCATION OF CONSTRUCTION ENTRANCE.

LEGEND

TEMPORARY INLET SEDIMENT BARRIER	
SILT FENCE	·XXXXXXXXXXXX·




CEC

CEC CORPORATION
 1000 N. UNIVERSITY AVENUE, SUITE 100
 OKLAHOMA CITY, OKLAHOMA 73102
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STATE OF OKLAHOMA CERTIFICATE OF AUTHORIZATION
 CASE NO. 2020-00000000
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DESIGNED BY: KLM	DRAWN BY: MTD				
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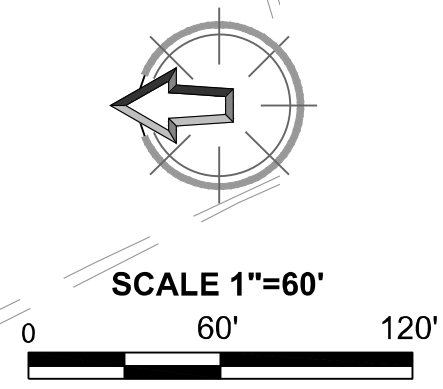
OKC 577 ACRES DEVELOPMENT

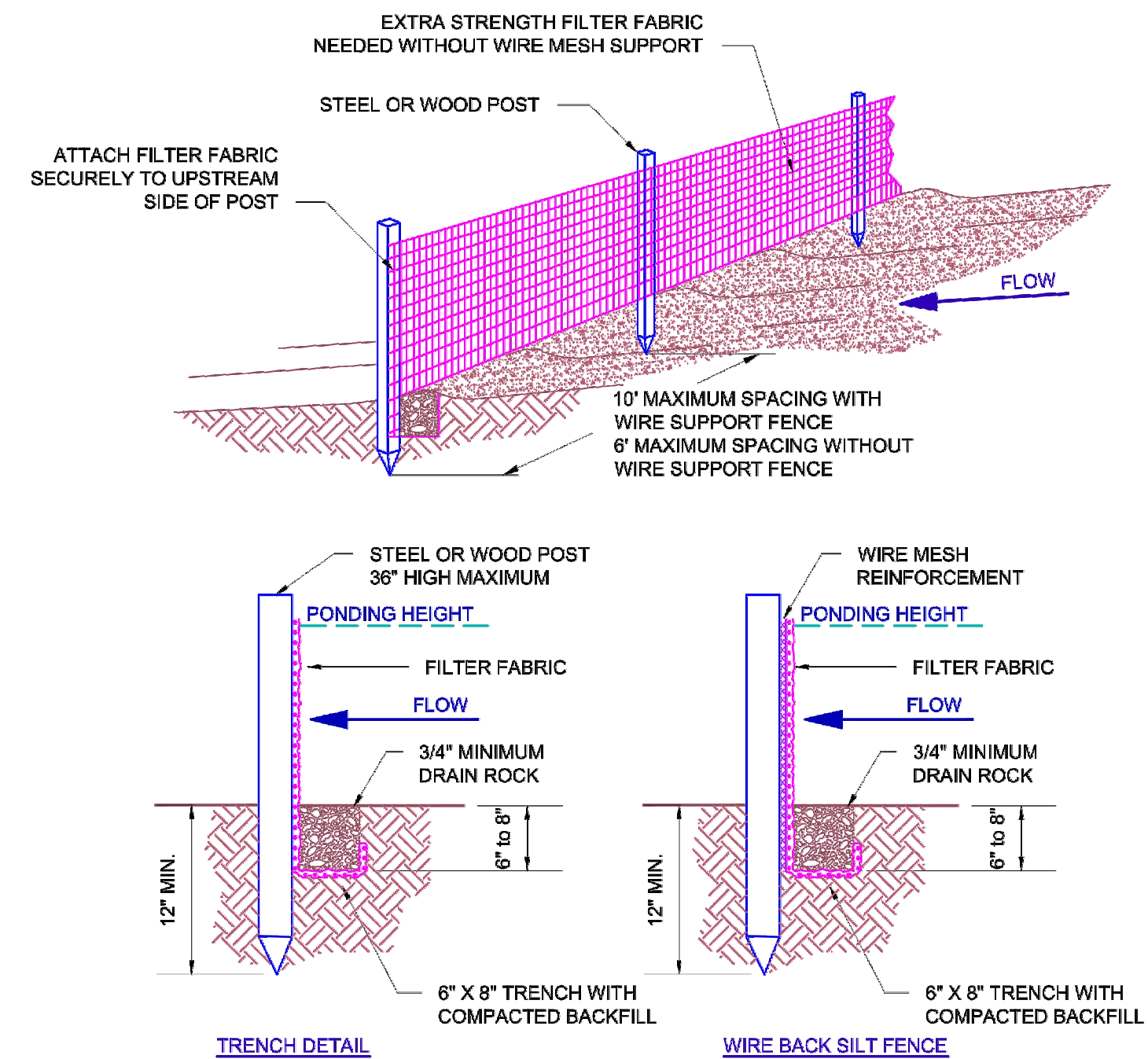
OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
EROSION CONTROL PLAN

SHEET
12

PLOT DATE:





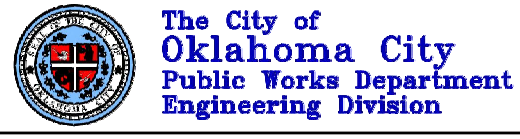
NOTES:

- MUST BE INSTALLED PROPERLY TO AVOID NOTICE OF VIOLATION.
- SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE POUNDING EFFICIENCY.
- INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. ACCUMULATED SEDIMENT SHOULD BE REMOVED FROM THE FENCE BASE WHEN THE SEDIMENT REACHES ONE-THIRD TO ONE-HALF THE FENCE HEIGHT.
- REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE TO SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

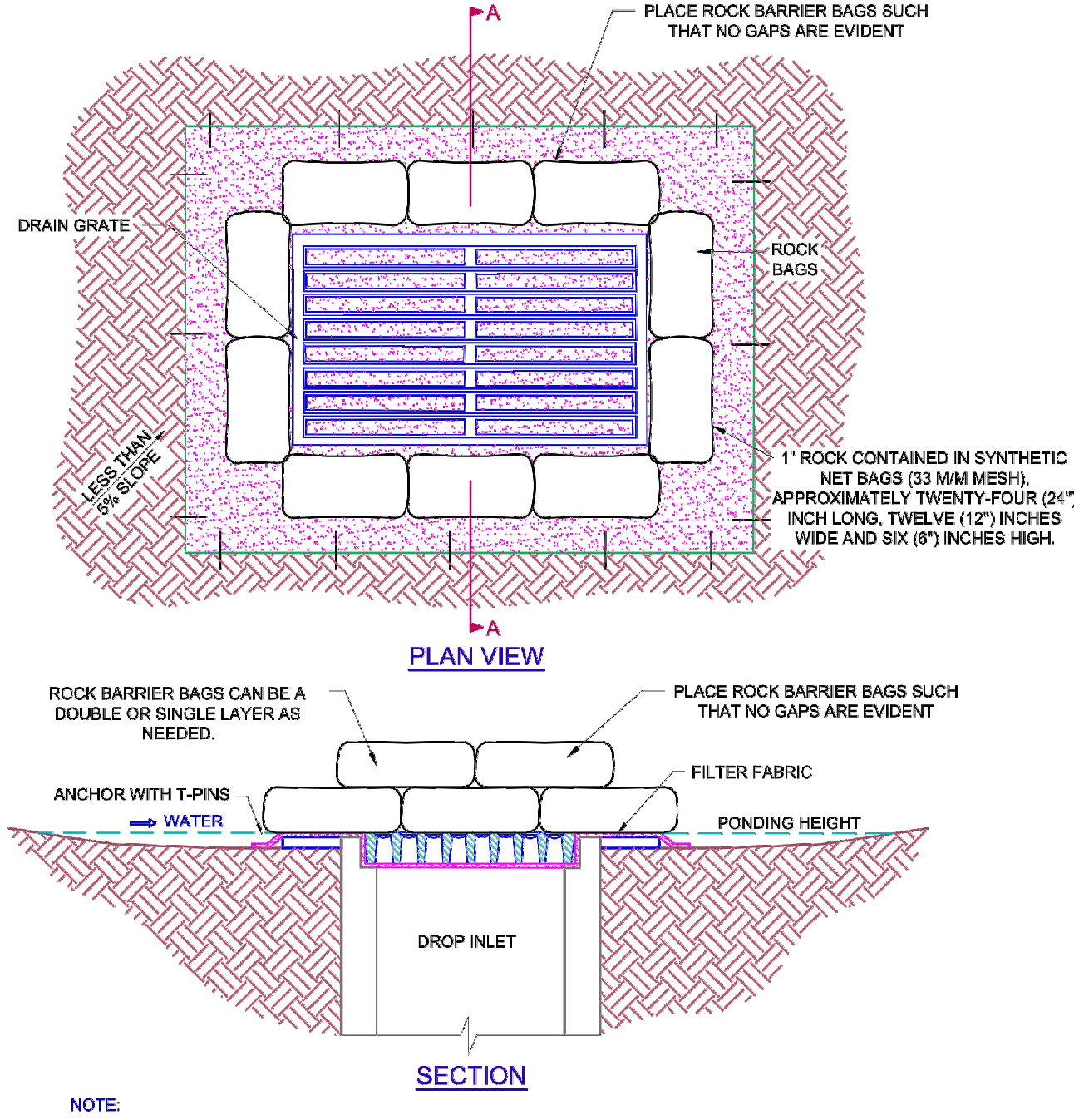
SILT FENCE

STORM WATER QUALITY MANAGEMENT DIVISION

DATE: 05/23/24
 DESIGNED BY: MTD
 DRAWN BY: MTD
 CHECKED BY: MTD
 DATE: 05/23/24



FORM 7.1



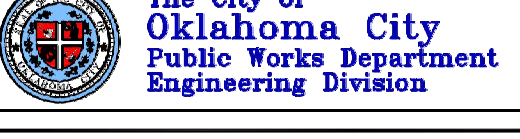
NOTE:

- DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS, (LESS THAN 5%).
- USE T-PINS TO ANCHOR FIBER MAT INTO THE SOIL.
- A "REASONABLE" DESIGN SIZE PARTICLE TO CAPTURE MUST BE SELECTED.
- SIZE DISTRIBUTION OF UPSTREAM SOIL PARTICLES MUST BE EVALUATED.
- INFLOW AND OUTFLOW FROM THE SYSTEM FOR A SPECIFIC FREQUENCY STORM MUST BE KNOWN.
- POND VOLUME IS DIRECTLY PROPORTIONAL TO THE DISCHARGE RATE OF WATER FROM THE SYSTEM.
- POND VOLUME IS INVERSELY PROPORTIONAL TO THE MASS OF THE DESIGN SIZE SUSPENDED PARTICLE.
- A SYSTEM MUST PROVIDE SUFFICIENT FLOW TO ALLOW FOR DEPOSITION OF DESIGN SIZE PARTICLES.
- THE PONDING HEIGHT MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWNSLOPE SIDE OF THE STRUCTURE.

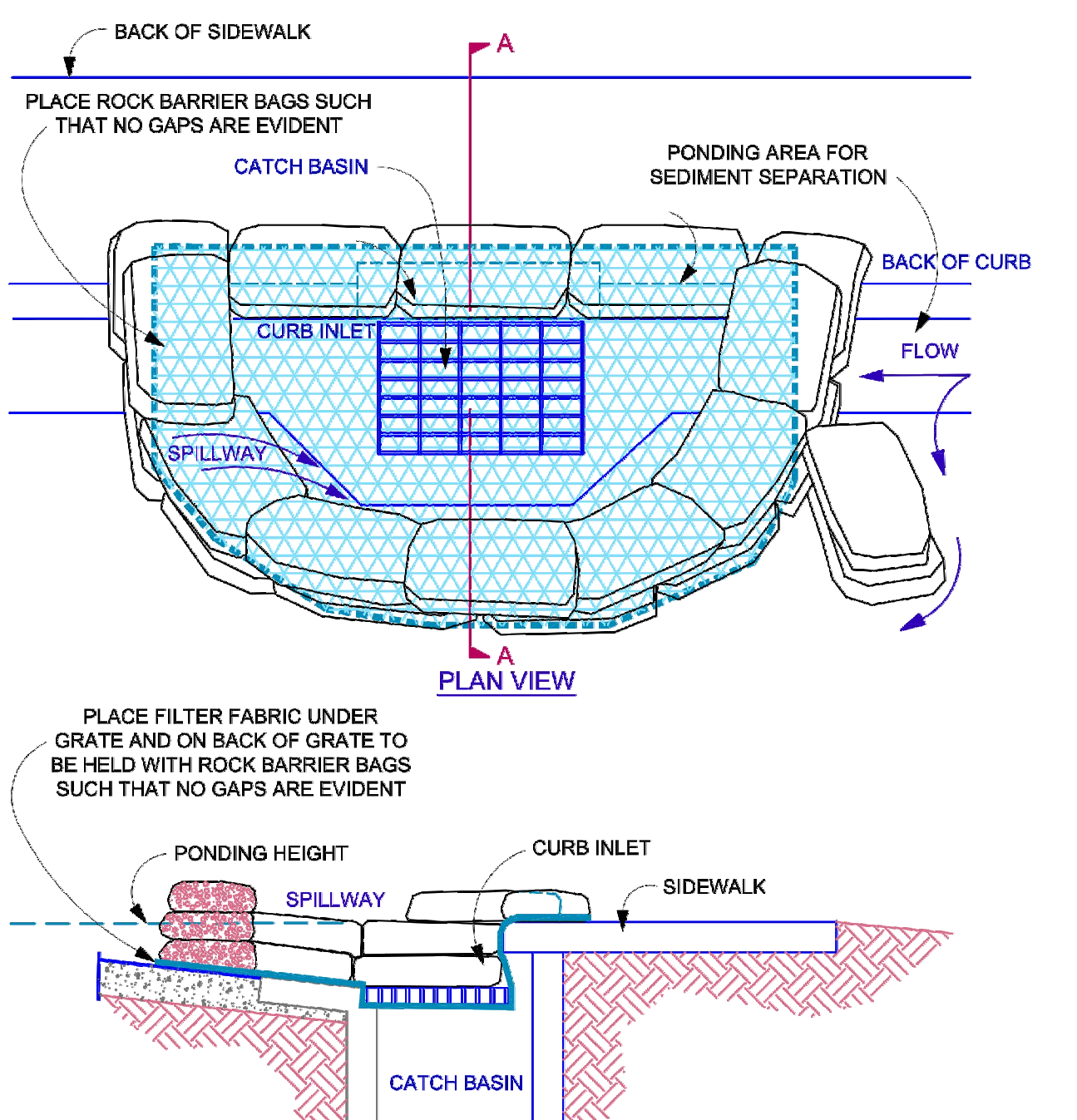
ROCK BAG / FILTER MAT DROP INLET SEDIMENT BARRIER

STORM WATER QUALITY MANAGEMENT DIVISION

DATE: 05/23/24
 DESIGNED BY: MTD
 DRAWN BY: MTD
 CHECKED BY: MTD
 DATE: 05/23/24



FORM 7.10



NOTES:

- PLACE CURB TYPE ROCK BAG BARRIER ON GENTLY SLOPING STREET, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
- BAGS OF WOVEN GEOTEXTILE FABRIC, FILLED WITH GRAVEL MUST BE LAYERED SUCH THAT NO GAPS ARE EVIDENT.
- LEAVE ONE SANDBAG GAP IN THE TOP ROW ON THE SIDE AWAY FROM FLOW, TO PROVIDE A SPILLWAY; OR IN THE CENTER IF PONDING IS NEEDED ON BOTH SIDES.
- INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

ROCK BAG CURB INLET BARRIER

STORM WATER QUALITY MANAGEMENT DIVISION

DATE: 05/23/24
 DESIGNED BY: MTD
 DRAWN BY: MTD
 CHECKED BY: MTD
 DATE: 05/23/24



FORM 7.9



CEC CORPORATION
 OKLAHOMA CITY, OKLAHOMA 73142
 WWW.CONNEXIONCEC.COM
 STATE OF OKLAHOMA CERTIFICATE OF AUTHORIZATION
 OKLAHOMA ENGINEERING BOARD
 CASE NO. 2014-050



REVISION HISTORY	NO.	DESCRIPTION	DATE

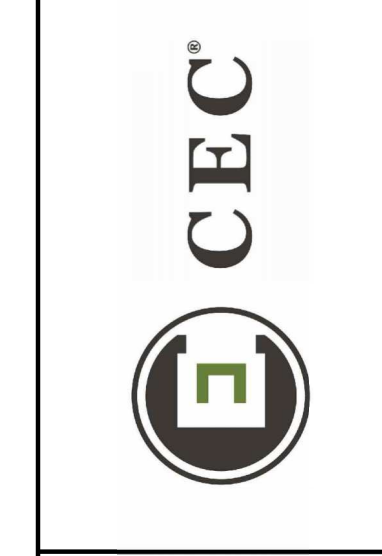
OKC 577 ACRES DEVELOPMENT
 OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
 EROSION CONTROL SHEET
 SHEET
 13

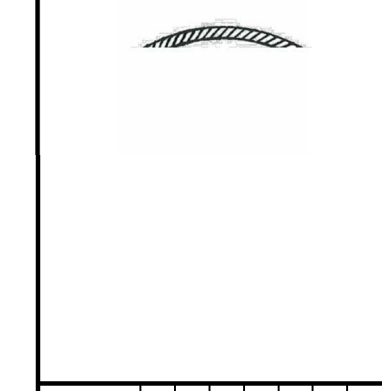
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	DRAWN BY: MTD			
	APPROVED BY: KLM			
SCALE:	AS SHOWN			

OKC 577 ACRES DEVELOPMENT
OKLAHOMA CITY, OKLAHOMA COUNTY, OKLAHOMA

SHEET NAME
BORE LOG SHEET

SHEET
14

FILE PATH: Z:\STANDARD DETAILS & WATER METER SPECIFICATIONS\UPDATED STANDARD DETAILS 2014\SEWERWORKING\SAN-SEW-STDNS-2014-SIGNED.DWG

PLOTTED: Friday, March 28, 2014

SANITARY SEWER STANDARD DETAIL

DRAWING INDEX ISSUE DATE:

S.01	GENERAL CONSTRUCTION NOTES - PAGE 1 OF 2	3/13/2014
S.02	GENERAL CONSTRUCTION NOTES - PAGE 2 OF 2	3/13/2014
S.03	REINFORCED CONCRETE PIPE MINIMUM DESIGN	3/13/2014
S.04	VITRIFIED CLAY PIPE DESIGN	3/13/2014
S.05	MANHOLE TESTING	3/13/2014
S.06	EMBEDMENT MATERIAL & TRENCH WIDTH TABLE	3/13/2014
S.07	BACKFILLING REQUIREMENTS - PAGE 1 OF 2	3/13/2014
S.08	BACKFILLING REQUIREMENTS - PAGE 2 OF 2	3/13/2014
S.09	PIPE INSTALLATION DETAILS	3/13/2014
S.10	REBUILDING MANHOLES STANDARD DETAIL	3/13/2014
S.11	ABANDONING MANHOLES STANDARD DETAIL	3/13/2014
S.12	EMBEDMENT PLUGS	3/13/2014
S.13	PRECAST REINFORCED CONCRETE MANHOLE TRANSITION SECTION	3/13/2014
S.14	REINFORCED CONCRETE PRECAST MANHOLE BASE SECTION	3/13/2014
S.15	REINFORCED CONCRETE PRECAST 4 FT DIAMETER MANHOLE CONE	3/13/2014
S.16	PRECAST MANHOLE WALL DETAIL	3/13/2014
S.17	PRECAST REINFORCED CONCRETE FLAT SLAB MANHOLE TOP	3/13/2014
S.18	CAST-IN-PLACE CONCRETE MANHOLE BASE SECTION	3/13/2014
S.19	MANHOLE PIPE CONNECTION FOR CAST IN PLACE MANHOLES	3/13/2014
S.20	MANHOLE LID / RING GENERAL NOTES	3/13/2014
S.21	REVERSIBLE MANHOLE RING	3/13/2014
S.22	VENTED MANHOLE COVER - PAGE 1 OF 2	3/13/2014
S.23	VENTED MANHOLE COVER - PAGE 2 OF 2	3/13/2014
S.24	NON-VENTED MANHOLE COVER - PAGE 1 OF 2	3/13/2014
S.25	NON-VENTED MANHOLE COVER - PAGE 2 OF 2	3/13/2014
S.26	SERVICE CONNECTION INSTALLATION	3/13/2014
S.27	SERVICE CONNECTION TYPES	3/13/2014
S.28	BORE AND ENCASEMENT DETAIL - PAGE 1 OF 2	3/13/2014
S.29	BORE AND ENCASEMENT DETAIL - PAGE 2 OF 2	3/13/2014
S.30	CONCRETE COLLAR WITH SPREAD FOOTING - PAGE 1 OF 2	3/13/2014
S.31	CONCRETE COLLAR WITH SPREAD FOOTING - PAGE 2 OF 2	3/13/2014
S.32	TYPE I PIER - TYPE 1 OF 2	3/13/2014
S.33	TYPE II PIER - TYPE 2 OF 2	3/13/2014
S.34	TYPE I PIER	3/13/2014
S.35	STEEL CARRIER PIPE SIZES MAXIMUM SPAN LENGTH	3/13/2014

SANITARY SEWER DETAILS INDEX OF DRAWINGS

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-00
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

VITRIFIED CLAY PIPE (VCP) MINIMUM PIPE DESIGN ASTM C-700

PIPE NOMINAL SIZE (INCHES)	MINIMUM THREE-EDGE BEARING STRENGTH (LB/FT)	MAXIMUM DEPTH OF COVER (FT)
4	2000	25
6	2000	25
8	2200	20
10	2400	18
12	2600	16
15	2900	15
18	3300	14
21	3850	14
24	4400	14
27	4700	13
30	5000	13
33	5500	13
36	6000	13
39	6500	13
42	7000	12

VITRIFIED CLAY PIPE DESIGN

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-04
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF OKLAHOMA CITY STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS.
- ALL WORK NOT CLASSIFIED AS A CONTRACT PAY ITEM SHALL BE CONSIDERED AS AN INCIDENTAL AND NOT PAID FOR DIRECTLY.
- ALL EXCAVATION UNDER EXISTING PAVEMENT SHALL BE BACKFILLED WITH CRUSHER RUN ROCK. ALL EXCAVATION UNDER FUTURE PAVEMENT SHALL BE BACKFILLED WITH SAND.
- PIPE LEAKAGE TESTS SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH THE OKLAHOMA CITY SEWER REQUIREMENTS. LEAKAGE SHALL NOT EXCEED 50 GALLONS PER INCH OF NORMAL PIPE PER MILE PER DAY FOR ANY SECTION OF THE SYSTEM.
- DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE PIPE. THE TEST SHALL BE CONDUCTED AFTER THE FINAL BACKFILL HAS BEEN IN PLACE FOR AT LEAST THIRTY (30) DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF MORE THAN FIVE (5%) PERCENT. IF THE DEFLECTION TEST IS TO BE RUN USING A RIGID BALL AND MANDREL, IT SHALL HAVE A DIAMETER EQUAL TO NINETY-FIVE (95%) PERCENT OF THE INSIDE DIAMETER OF THE PIPE. THE TEST SHALL BE PERFORMED WITHOUT MECHANICAL PULLING DEVICES.
- POLYVINYL CHLORIDE (PVC) PIPES SHALL CONFORM TO ASTM F-794 FOR OPEN PROFILE PIPE AND ASTM F-1003 FOR CLOSED PROFILE PIPE. REGARDLESS OF SIZE, OPEN PROFILE WALL PIPE WILL BE ALLOWED ONLY ON SECTIONS OF PIPE WHERE THERE ARE NO APPARENT SERVICE CONNECTIONS.
- SPECIAL SANITARY SEWER PIPE SHALL BE REQUIRED TO SATISFY MINIMUM HORIZONTAL AND VERTICAL CLEARANCE REQUIREMENTS FROM WATERLINES, WELLS AND PETROLEUM STORAGE TANKS, AS ESTABLISHED BY THE OKLAHOMA STATE DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ).
- SPECIAL PVC PIPE SHALL CONFORM TO ASTM D-2241 AND SDR 32.5 FOR SIZES FOUR (4") INCHES TO THIRTY-SIX (36") INCHES, OR AWWA C-900 AND AWWA C-905, WITH A MINIMUM DR RATING OF DR18 FOR PIPE SIZES FOUR (4") INCHES TO TWELVE (12") INCHES AND A MINIMUM DR RATING OF DR32.5 FOR PIPE SIZES GREATER THAN TWELVE (12") INCHES.
- DUCTILE IRON PIPE (DIP) SHALL CONFORM TO THE REQUIREMENTS OF AWWA C-151.
 - EXTERIOR COATING -- THE EXTERIOR SURFACES OF DUCTILE IRON PIPE SPECIFICATIONS AND FITTINGS SHALL BE COATED WITH AN ASPHALTIC COATING IN ACCORDANCE WITH ASTM A746, SECTION 6.1, OF AWWA E-151. THE COATING SHALL HAVE A MINIMUM THICKNESS OF ONE (1) MIL.
 - INTERIOR COATING -- INTERIOR SURFACES OF PIPE AND FITTINGS SHALL BE LINED WITH FORTY (40) MILS OF VIRGIN POLYETHYLENE COMPLYING WITH ASTM D-1248 OR MADISON POLYETHYLENE LINING, CORPORATE II TX-5 MINUTE NUMBER 1715, MANUFACTURED BY MADISON CHEMICALS, INC., CANADA, OR APPROVED EQUAL. THE LINING MATERIALS SHALL BE COMPOUNDED WITH A MINIMUM OF TWO (2%) PERCENT CARBON BLACK TO RESIST ULTRA VIOLET RAYS.
 - THICKNESS -- UNLESS OTHERWISE SPECIFIED, DUCTILE IRON PIPE SHALL MEET THE REQUIREMENTS IN THE FOLLOWING TABLE AS SHOWN IN DETAIL S-02.

GENERAL CONSTRUCTION NOTES 1 of 2

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-01
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

- GENERAL -- WHEN CALLED FOR ON THE PLANS OR SPECIFIED, MANHOLES SHALL BE TESTED, BEFORE ACCEPTANCE, BY EITHER PERFORMING EXFILTRATION OR VACUUM TEST. THE ENGINEER SHALL DETERMINE WHICH TEST SHALL BE PERFORMED.
- EXFILTRATION TEST -- ALL INCOMING AND OUTGOING LINES (INCLUDING SERVICES) SHALL BE PLUGGED AND THE MANHOLE FILLED WITH WATER UP TO THE BOTTOM OF THE MANHOLE RING. IF THE WATER LOSS EXCEEDS THE MAXIMUM ALLOWABLE AS SHOWN, THE MANHOLE SHALL BE CONSIDERED TO HAVE FAILED THE TEST. THE CONTRACTOR SHALL DRAIN, PERFORM THE NECESSARY REPAIRS AS DIRECTED BY THE ENGINEER, AND THEN RESET THE MANHOLE UNTIL IT PASSES, ALL AT NO ADDITIONAL COST TO THE CITY.

Manhole Depth (feet)	Maximum Allowable Water Loss
≤ 8	One (1") inch over Five (5) minutes
≥ 8	One-eighth (1/8") inch per vertical foot of depth over five (5) minutes
- VACUUM TESTING -- ALL INCOMING AND OUTGOING SEWER AND SERVICE LINES SHALL BE PLUGGED. THE PLUGS RESTRAINED AND THE VACUUM TESTER HEAD PLACED ON THE MANHOLE RING AND SEALED. A VACUUM OF TEN (10") INCHES Hg (MERCURY) SHALL THEN BE DRAWN ON THE MANHOLE AND THE TIME MEASURES FOR THE VACUUM TO DROP TO NINE (9") INCHES Hg. THE TIME MEASURED SHALL BE NOT LESS THAN THAT SHOWN ON THE FOLLOWING TABLE.

Manhole Internal Diameter (feet)	Time Measured (seconds)
4	60
5	60
6	60
7	70

MANHOLE TESTING

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-05
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

DIP PIPE THICKNESS REQUIREMENTS

Pipe Nominal Thickness (inches)	DEPTH OF COVER (feet)	
	>15 or ≥20'	>20 or ≥25'
3	0.25	0.25
4	0.25	0.25
6	0.25	0.25
8	0.25	0.25
10	0.25	0.25
12	0.25	0.25
14	0.25	0.25
16	0.25	0.25
18	0.25	0.25
20	0.25	0.25
22	0.25	0.25
24	0.25	0.25
26	0.25	0.25
28	0.25	0.25
30	0.25	0.25
32	0.25	0.25
34	0.25	0.25
36	0.25	0.25
38	0.25	0.25
40	0.25	0.25
42	0.25	0.25
44	0.25	0.25
46	0.25	0.25
48	0.25	0.25
50	0.25	0.25
52	0.25	0.25
54	0.25	0.25
56	0.25	0.25
58	0.25	0.25
60	0.25	0.25
62	0.25	0.25
64	0.25	0.25

GENERAL CONSTRUCTION NOTES 2 of 2

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-02
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

EMBEDMENT MATERIAL

EMBEDMENT MATERIAL IS THE MATERIAL TO BE PLACED FROM A MINIMUM OF SIX-INCHES (6") BELOW THE BOTTOM OF THE PIPE TO THE SPRINGLINE (HALF THE PIPE DIAMETER) OR TO A MINIMUM OF SIX-INCHES (6") ABOVE THE TOP OF THE PIPE FOR RIGID AND FLEXIBLE PIPES, RESPECTIVELY. THE REMAINING TO BE PLACED OVER THE EMBEDMENT MATERIAL WILL BE CONSIDERED BACKFILL.

MINIMUM MATERIAL REQUIREMENTS

- GENERAL
EMBEDMENT MATERIAL FOR ALL RIGID AND FLEXIBLE PIPES SHALL BE CRUSHED ROCK MEETING THE REQUIREMENTS EITHER OF ASTM D-2321, CLASS 1A, OR ASTM C-33, NO. 57 OR 67 IN GRADATIONS SHOWN BELOW.

NOMINAL SIEVE REQUIREMENT	PERCENT PASSING	
	ASTM D-2321 CLASS 1A	ASTM C-33 NO. 57
1 1/2" IN.	100%	100%
1 INCH	-	95 TO 100%
3/4 INCH	-	90 TO 100%
1/2 INCH	-	25 TO 60%
3/8 INCH	-	20 TO 55%
NO. 4	≤ 10%	0 TO 10%
NO. 8	0 TO 5%	0 TO 5%
NO. 200	≤ 5%	-

- COMPACTION REQUIREMENTS
ALL EMBEDMENT MATERIAL SHALL BE COMPACTED IN SIX INCH (6") LIFTS TO THE FOLLOWING MINIMUM PERCENT OF STANDARD PROCTOR DENSITY AS DETERMINED BY ASTM D-698. TESTS FOR MOISTURE DENSITY RELATIONS OF SOIL-AGGREGATE MIXTURES AND ASTM D-2049. TEST FOR RELATED DENSITY OF COHESIONLESS SOILS, RESPECTIVELY.

COMPACTION TEST	COMPACTION REQUIREMENT
STANDARD PROCTOR DENSITY	95%
RELATIVE DENSITY	75%

- COMPACTION METHODS
ALL EMBEDMENT MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH THE METHODS DESCRIBED IN PART "3" OF "BACKFILLING REQUIREMENTS"

PIPE ENCASEMENT AND COLLAR DETAIL

NOTE: For Collars the concrete encasement shall be placed to a minimum of twelve (12") inches on either side of the joint.

EMBEDMENT MATERIAL & TRENCH WIDTH TABLE

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-06
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

- HIGHWAYS
MINIMUM PIPE CLASSES FOR DIAMETER TWENTY FOUR INCHES (24") TO ONE HUNDRED TWO INCHES (102") MEETING THE REQUIREMENTS OF ASTM C-76 SHALL BE AS FOLLOWS:

MAXIMUM DEPTH OF COVER (FT)	MINIMUM CLASS
10	III
15	IV
25	V

FOR MAXIMUM DEPTH OF COVER THIRTY FEET (30') PIPES RANGING FROM TWENTY FOUR INCHES (24") TO FIFTY FOUR INCHES (54") IN DIAMETER SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH ASTM C-655 AND SHALL HAVE THE FOLLOWING MINIMUM THREE-EDGE BEARING STRENGTH FOR 0.01 INCH CRACK (D0.01) IN POUNDS PER LINEAL FOOT PER FOOT OF INSIDE DIAMETER.

PIPE NOMINAL SIZE (INCHES)	D _{0.01} (LB./LINEAL FT./FT. OF INSIDE Ø)
24	3200
27	3050
30	3050
33	3475
36	3475
42	3450
48	3300
54	3125

PIPES RANGING IN DIA. FROM SIXTY INCHES (60") TO ONE HUNDRED TWO INCHES (102") SHALL BE CLASS V FOR A MINIMUM DEPTH OF COVER OF THIRTY FEET (30') WHEN MANUFACTURED IN ACCORDANCE WITH ASTM C-76.

- RAILROADS
MINIMUM PIPE CLASSES FOR E-80 RAILROAD LIVE LOAD FOR PIPE SIZE TWENTY FOUR INCHES (24") TO ONE HUNDRED TWO INCHES (102") IN DIA. MEETING THE REQUIREMENTS OF ASTM C-76, OR ASTM C-655 SHALL BE AS FOLLOWS:

PIPE NOMINAL SIZE (INCHES)	D _{0.01} (LB./LINEAL FT./FT. OF INSIDE Ø)
24	3300
27	3125
30	3150
33	3575
36	3575
42	3550
48	3400
54	3225
60	3100

DIAMETERS TWENTY FOUR INCHES (24") TO ONE HUNDRED TWO INCHES (102") SHALL BE CLASS V.

REINFORCED CONCRETE PIPE MINIMUM DESIGN

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-03
OKLAHOMA CITY UTILITIES DEPARTMENT			

SANITARY SEWER STANDARD DETAIL

- DESCRIPTION
BACKFILL IS THAT PORTION OF THE TOTAL TRENCH BACKFILL DOWN TO BUT NOT INCLUDING THE PIPE EMBEDMENT MATERIAL. THE BACKFILL SHALL BE ONLY MATERIAL APPROVED BY THE ENGINEER CONSISTING OF LOOSE EARTH FREE OF CLODS, STONES, ORGANIC MATTER, DEBRIS OR OTHER OBJECTIONABLE MATERIAL. ALL BACKFILLING SHALL BE DONE IN SUCH A MANNER AS NOT TO DISTURB OR DAMAGE THE PIPE OR STRUCTURES OVER OR AGAINST WHICH IT IS BEING PLACED. ANY PIPE OR STRUCTURE DAMAGED OR MOVED FROM ITS PROPER LINE OR GRADE DURING BACKFILLING OPERATIONS SHALL BE OPENED UP AND REPAIRED AND THEN REBACKFILLED AS HEREIN SPECIFIED. THE PLACING OF BACKFILL MATERIAL SHALL NOT BEGIN UNTIL APPROVAL FOR SO DOING HAS BEEN GIVEN BY THE ENGINEER, BUT BACKFILLING ABOUT STRUCTURES OR PORTIONS OF STRUCTURES SHALL BE DONE IMMEDIATELY WHEN SO ORDERED BY THE ENGINEER. THE TOP SURFACE OR OTHER MATERIAL IS REMOVED AND PILED SEPARATELY. SUCH MATERIAL SHALL BE CAREFULLY REPLACED IN A MANNER APPROVED BY THE ENGINEER. THE TOP TWELVE INCHES (12") OF BACKFILL MATERIAL SHALL BE OF AS GOOD OR BETTER QUALITY AS THE ORIGINAL TOP SOIL WHICH WAS REMOVED.
- COMPACTION REQUIREMENTS
ALL BACKFILL SHALL BE PLACED AND COMPACTED IN SIX INCH (6") LIFTS OR HAND-TAMPED EQUIPMENT AND THIRTY INCH (30") LIFTS FOR SELF-PROPELLED OR POWER DRIVEN EQUIPMENT TO THE FOLLOWING MINIMUM PERCENT OF STANDARD PROCTOR DENSITY OR RELATED DENSITY AS DETERMINED BY ASTM D-698. TESTS FOR MOISTURE-DENSITY RELATIONS OF SOILS AND SOIL-AGGREGATE MIXTURES, AND ASTM D-2049. TEST FOR RELATED DENSITY OF COHESIONLESS SOILS, RESPECTIVELY. ASTM D-2049 SHALL BE PERFORMED ON COHESIONLESS (GRANULAR) SOILS. COHESIVE BACKFILL MATERIAL SHALL REACH THE INDICATED COMPACTION LEVELS AT PLUS OR MINUS THREE PERCENT (3%) OF OPTIMUM MOISTURE CONTENT. THE LIFT THICKNESS SHALL BE REDUCED, IF NECESSARY, TO MEET THE COMPACTION REQUIREMENTS SPECIFIED HEREIN:

GENERAL LOCATION	PERCENT COMPACTION	
	STANDARD PROCTOR DENSITY ASTM D-698	RELATIVE DENSITY TEST ASTM - 2049
UNDER TRAFFIC AREA OR IMPROVED EXISTING SURFACES	95	75
URBAN & RESIDENTIAL AREAS	90	70
UNDEVELOPED & OTHER AREAS	85	70

BACKFILLING REQUIREMENTS

03/13/14 DATE	APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER	DATE: <i>3/14/14</i>	S-07
OKLAHOMA CITY UTILITIES DEPARTMENT			

The City of
Oklahoma City
Utilities Department
Engineering Division

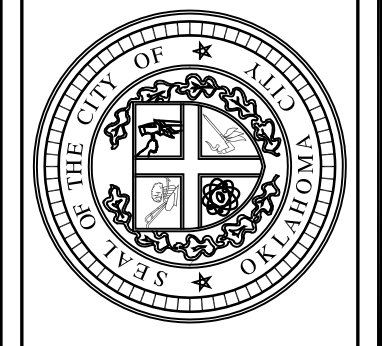
NO.	DATE	DESCRIPTION

SANITARY SEWER STANDARD DETAILS

DATE: 03/14/14
DRAWN BY: JDS
CHECKED BY: MWS/EJW

SCALE:
AS SHOWN

SHEET NUMBER
S-STD-01



NO. DATE DESCRIPTION

**SANITARY SEWER
STANDARD DETAILS**

DATE: 03/14/14
DRAWN BY: JDS
CHECKED BY: MWS/EJW

SCALE:
AS SHOWN

SHEET NUMBER
S-STD-02

SANITARY SEWER STANDARD DETAIL

3. COMPACTION METHODS

COMPACTION METHODS MAY VARY DEPENDING ON THE MATERIAL OR AS APPROVED BY THE ENGINEER

A. COHESIVE MATERIALS
COMPACTION OF COHESIVE MATERIALS MAY BE OBTAINED BY USE OF IMPACT TYPE EQUIPMENT IN CONFINED AREAS, PNEUMATIC TAMPERS AND ENGINE DRIVEN RAMMERS MAY ALSO BE USED. IN RELATIVELY NARROW TRENCHES, SELF-PROPELLED RAMMERS MAY BE USED. IN WIDE TRENCHES, SHEEPSFOOT ROLLERS MAY BE USED.

B. COHESIONLESS MATERIALS
COHESIONLESS MATERIALS ARE GRANULAR MATERIALS CLASSIFIED AS NON-PLASTIC. IN GENERAL, VIBRATORY EQUIPMENT MAY BE USED FOR PROPER COMPACTION. IN CONFINED AREAS, VIBRATORY PLATES MAY BE USED. FOR WIDER TRENCHES, VIBRATORY ROLLERS MAY BE USED.

C. FLOODING OR JETTING
WHEN APPROVED BY THE ENGINEER, MATERIALS MAY ALSO BE COMPACTED OR SETTLED BY FLOODING WHERE ADEQUATE QUANTITIES OF WATER ARE AVAILABLE FROM THE CITY'S WATER SYSTEM, PRIVATELY OWNED PONDS, CREEKS OR OTHER SOURCES LOCATED WITHIN THREE HUNDRED FEET (300') OF THE TRENCH. WATER SHALL BE USED TO PRODUCE A SEMI-FLUID MASS ALONG AND OUT OF THE TRENCH AT STREAM CROSSINGS OR OTHER PLACES OF ABRUPT CHANGES IN GROUND PROFILE. THE CONTRACTOR SHALL MAKE NECESSARY ARRANGEMENTS WITH THE CITY FOR THE PURCHASE OF WATER FROM THE CITY WATER MAINS, AND WITH OWNERS OF WATER PROCURED FROM PRIVATELY OWNED WATER SOURCES. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED TO THE CONTRACTOR FOR SETTling THE BACKFILL BY JETTING. THE COST OF SUCH WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR TRENCH EXCAVATION AND BACKFILL OR OTHER PAY ITEMS THE CONTRACTOR MAY ELECT.

4. COMPACTION REQUIREMENTS

ALL BACKFILL SHALL BE TESTED BY AN APPROVED LABORATORY FOR COMPLIANCE OF THE COMPACTION REQUIREMENTS.

5. SURFACE RESTORATION

UPON COMPLETION OF BACKFILLING PROCEDURES, THE CONTRACTOR SHALL REPLACE ALL SURFACE MATERIALS AND SHALL RESTORE PAVING, CURBING, SIDEWALKS, GUTTERS, SHRUBBERY, FENCES, SOD AND OTHER SURFACES DISTURBED TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITION BEFORE WORK BEGAN.

SANITARY SEWER STANDARD DETAIL

FLEXIBLE PIPE INSTALLATION DETAIL (DIP, HDPE, PVC & RFP)

RIGID PIPE INSTALLATION DETAIL (RCP & VCP)

OD=PIPE OUTSIDE DIAMETER (N) BEDDING CLASS="B" LOAD FACTOR=1.8

SANITARY SEWER STANDARD DETAIL

MINIMUM 1'-0"

BRICK MASONRY OR PRECAST RING (MORTARED)

CONCENTRIC OR ECCENTRIC CONE

CONCRETE PAD

VARIABLE (4" MIN.)

6" MIN. CRUSHED ROCK

NOTES:

- CAST-IN-PLACE NON-REINFORCED CONCRETE AND BRICK MANHOLES
 - THE EXISTING CONE AND WALL, IF NECESSARY, SHALL BE REMOVED TO A LEVEL WHICH WILL ALLOW INSTALLATION OF NEW CONE TO THE PROPER GRADE. THE EXPOSED CUT-OFF SURFACES OF THE EXISTING MANHOLE WALL SHALL BE CLEANED BY REMOVING LOOSE MATERIAL AND WETTED, PRIOR TO CONSTRUCTION OF CONCRETE PAD. ALL LOOSE BACKFILL AROUND THE MANHOLE WALL SHALL BE REMOVED AND REPLACED WITH COMPACTED CRUSHED ROCK. THE NEW CONCRETE PAD SHALL BE CONSTRUCTED, AND A NEW CONE SHALL BE FORMED OR PLACED TO THE PROPER GRADE USING FIFTEEN THOUSAND (15000 PSI) POUNDS PER SQUARE INCH MORTAR.
- PRECAST REINFORCED CONCRETE MANHOLES
 - PRECAST SECTIONS SHALL BE REMOVED TO A LEVEL WHERE THE NEW CONE CAN BE INSTALLED TO THE DESIRED GRADE. INSTALLATION SHALL BE IN ACCORDANCE WITH THE APPROPRIATE STANDARD DETAIL FOR PRECAST MANHOLE CONES. A NEW RUBBER GASKET SHALL BE USED TO SEAL EACH SECTION.

SANITARY SEWER STANDARD DETAIL

ABANDONED MANHOLE

REMOVE EXIST. TOP 2'-0" OF MANHOLE

PLUG

EX. SAN. SEWER

COMPACTED SAND BACKFILL

CONC. FILL BOTTOM OF M.H. TO TOP OF PIPE

PLUG

NOTE: SALVAGED MATERIALS, INCLUDING RING AND COVER SHALL BE DELIVERED TO THE LINE MAINTENANCE DIVISION OF THE WATER AND WASTEWATER UTILITIES DEPARTMENT.

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-08

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-09

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-10

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-11

SANITARY SEWER STANDARD DETAIL

TRENCH WIDTH

BACKFILL

EMBEDMENT PLUG

6" MIN.

NOTES:

TWO TYPES OF EMBEDMENT PLUGS MAY BE USED, AT THE CONTRACTORS OPTION, AS FOLLOWS:

- CLAY PLUGS
 - THE EMBEDMENT AND BACKFILL MATERIAL SHALL BE SELECT CLAY SEPARATED FROM EXCAVATED MATERIAL AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT. THIS MATERIAL SHALL BE FREE OF CLODS, CLUMPS, DEBRIS, ORGANIC MATERIAL AND STONES. ALL CLAY PLUG MATERIAL SHALL BE COMPACTED TO A MINIMUM OF NINETY (90%) PERCENT OF STANDARD PROCTOR DENSITY (ASTM D-698) AT PLUS OR MINUS THREE (3%) PERCENT OF OPTIMUM MOISTURE CONTENT.
- FLOWABLE FILL PLUGS
 - FLOWABLE FILL PLUGS SHALL CONSIST OF A PORTLAND CEMENT GROUT HAVING A MINIMUM TWENTY-EIGHT (28) DAY COMPRESSIVE STRENGTH OF FIVE HUNDRED (500 PSI) POUNDS PER SQUARE INCH.

SANITARY SEWER STANDARD DETAIL

- MANHOLES SHALL BE CONSTRUCTED AS SPECIFIED IN ASTM C-478.
- THE MINIMUM WALL THICKNESS IS SPECIFIED IN THE FOLLOWING TABLE AND SHALL NOT BE LESS THAN ONE-TWELFTH (1/12) OF THE INTERNAL DIAMETER OF THE LARGEST CONE OR RISER OR FIVE-INCHES (5") WHICHEVER IS GREATER.
- MINIMUM DEPTH OF MANHOLE TO BE 6'-0".
- ALL LIFTING HOLES PROVIDED IN EACH SECTION SHALL BE REPAIRED WITH A MIXTURE OF CEMENT & SAND GROUT FIRMLY PACKED INTO ENTIRE ORIFICE.
- ALL INSIDE SURFACES OF PRECAST MANHOLES SHALL BE COATED WITH A DRY FILM THICKNESS OF NOT LESS THAN EIGHT (8) MILS OF TNEPEC SERIES 69 HI-BUILD EPOXOLINE II, OR APPROVED EQUAL.
- WHEN DIRECTED BY THE ENGINEER, A SET OF THREE (3) CYLINDERS, THREE-INCHES (3") IN DIAMETER SHALL BE CUT FROM RANDOMLY SELECTED MANHOLES AND TESTED FOR COMPRESSIVE STRENGTH.
- ACCEPTANCE OF THE MANHOLE STRUCTURE SHALL BE BASED ON THE CONFORMANCE AND PERFORMANCE OF MATERIALS REQUIRED IN ASTM C-478 AND THE ENGINEER'S INSPECTION OF THE INSTALLED PRODUCT.

MANHOLE INTERNAL DIAMETER (FEET)	MINIMUM WALL THICKNESS (INCHES)
4	5
5	5
6	6
7	7
8	8

4 FT. - 5 FT. - or 6 FT.

LIFTING HOLES

REINFORCING WIRE PER ASTM C-478

8 FT. - 7 FT. - or 6 FT.

SANITARY SEWER STANDARD DETAIL

NOTE:

- ALL CONCRETE FOR MANHOLE STRUCTURE AND BASE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI
- PRECAST MANHOLES SHALL BE CONSTRUCTED AS PER ASTM C-478
- ALL INSIDE SURFACES OF PRECAST MANHOLES SHALL BE COATED WITH A DRY FILM THICKNESS OF NOT LESS THAN EIGHT (8) MILS OF TNEPEC SERIES 69 HI-BUILD EPOXOLINE II, OR APPROVED EQUAL.
- MINIMUM DEPTH OF MANHOLE TO BE 6'-0".

MH WALL SECTION

O-RING SEAL

PIPE OD

REINFORCING WIRE PER ASTM C-478

#4 BARS 8" O.C. BOTH WAYS

2" SLOPE TO TROUGH

INVERT AND BENCH

2 FT MIN. BASE HEIGHT SECTION

6" CRUSHED ROCK FOUNDATION

UNDISTURBED EARTH

"ALOK" GASKET SYSTEM FOR PIPE PENETRATION

SANITARY SEWER STANDARD DETAIL

- MANHOLES SHALL BE CONSTRUCTED AS SPECIFIED IN ASTM C-478
- THE MINIMUM WALL THICKNESS IS SPECIFIED IN THE FOLLOWING TABLE AND SHALL NOT BE LESS THAN ONE-TWELFTH (1/12) OF THE INTERNAL DIAMETER OF THE LARGEST CONE OR RISER OF FIVE-INCHES (5") WHICHEVER IS GREATER.
- MINIMUM DEPTH OF MANHOLE TO BE 6'-0".
- ALL LIFTING HOLES PROVIDED IN EACH SECTION SHALL BE REPAIRED WITH A MIXTURE OF CEMENT & SAND GROUT FIRMLY PACKED INTO ENTIRE ORIFICE.
- ALL INSIDE SURFACES OF PRECAST MANHOLES SHALL BE COATED WITH A DRY FILM THICKNESS OF NOT LESS THAN EIGHT (8) MILS OF TNEPEC SERIES 69 HI-BUILD EPOXOLINE II, OR APPROVED EQUAL.
- WHEN DIRECTED BY THE ENGINEER, A SET OF THREE (3) CYLINDERS, THREE-INCHES (3") IN DIAMETER SHALL BE CUT FROM RANDOMLY SELECTED MANHOLES AND TESTED FOR COMPRESSIVE STRENGTH.
- ACCEPTANCE OF THE MANHOLE STRUCTURE SHALL BE BASED ON THE CONFORMANCE AND PERFORMANCE OF MATERIALS REQUIRED IN ASTM C-478 AND THE ENGINEER'S INSPECTION OF THE INSTALLED PRODUCT.

MANHOLE INTERNAL DIAMETER (FEET)	MINIMUM WALL THICKNESS (INCHES)
4	5
5	5
6	6
7	7
8	8

BRICK MASONRY OR PRECAST RING (MORTARED)

STANDARD RING & LID

1'-6" MAX. CONE SECTION 3'-0"

2 FT. - 6"

LIFTING HOLES

4'-0"

REINFORCING WIRE PER ASTM C-478

RUBBER O-RING GASKET MATERIAL

CONCENTRIC CONE

ECCENTRIC CONE

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-12

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-13

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-14

03/13/14 DATE APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR DATE: 3/14/14 S-15

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SANITARY SEWER STANDARD DETAIL

1. MANHOLES SHALL BE CONSTRUCTED AS SPECIFIED IN ASTM C-478
 2. THE MINIMUM WALL THICKNESS IS SPECIFIED IN THE FOLLOWING TABLE AND SHALL NOT BE LESS THAN ONE-TWELTH (1/12) OF THE INTERNAL DIAMETER OF THE LARGEST CONE OR RISER OR FIVE-INCHES (5") WHICHEVER IS GREATER.

MANHOLE INTERNAL DIAMETER (FEET)	MINIMUM WALL THICKNESS (INCHES)
4	5
5	5
6	6
7	7
8	8

3. ALL LIFTING HOLES PROVIDED IN EACH SECTION SHALL BE REPAIRED WITH A MIXTURE OF CEMENT AND SAND GROUT FIRMLY PACKED INTO ENTIRE ORIFICE.
 4. ALL INSIDE SURFACES OF PRECAST MANHOLES SHALL BE COATED WITH A DRY FILM THICKNESS OF NOT LESS THAN EIGHT (8) MILS OF TNE MEC SERIES 69 HI-BUILD EPOXOLINE II, OR APPROVED EQUAL.
 5. WHEN DIRECTED BY THE ENGINEER, A SET OF THREE (3) CYLINDERS, THREE-INCHES (3") IN DIAMETER SHALL BE CUT FROM RANDOMLY SELECTED MANHOLES AND TESTED FOR COMPRESSIVE STRENGTH.
 6. ACCEPTANCE OF THE MANHOLE STRUCTURE SHALL BE BASED ON THE CONFORMANCE AND PERFORMANCE OF MATERIALS REQUIRED IN ASTM C-478 AND THE ENGINEER'S INSPECTION OF THE INSTALLED PRODUCT.

PRECAST MANHOLE WALL DETAIL

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-16
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

1. MANHOLE TOPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-478 LIFTING HOOKS SHALL BE CONSTRUCTED AS PER MANUFACTURERS RECOMMENDATION.
 2. ALL INSIDE SURFACES OF PRECAST FLAT TOP SHALL BE COATED WITH A DRY FILM THICKNESS OF NOT LESS THAN EIGHT (8) MILS OF TNE MEC 69 HI-BUILD EPOXOLINE II, OR APPROVED EQUAL.
 3. WHEN DIRECTED BY THE ENGINEER, A SET OF THREE (3) CYLINDERS, THREE-INCHES (3") IN DIAMETER SHALL BE CUT FROM RANDOMLY SELECTED MANHOLE TOPS AND TESTED FOR A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI.
 4. ACCEPTANCE OF THE MANHOLE TOP STRUCTURE SHALL BE BASED ON THE CONFORMANCE AND PERFORMANCE OF MATERIALS REQUIRED IN ASTM C-478 AND THE ENGINEER'S INSPECTION OF THE INSTALLED PRODUCT.

PRECAST REINFORCED CONCRETE FLAT SLAB MANHOLE TOP

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-17
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

CAST-IN-PLACE CONCRETE MANHOLE BASE SECTION

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-18
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

NOTE:
 1. ALL PIPE CLAMPS SHALL BE STAINLESS STEEL
 2. NEOPRENE EPDM BLENDED COMPOUND BOOT SHALL MEET ASTM C-923

SUGGESTED PIPE O.D. RANGE (IN.)	HOLE & BOOT DIAMETER DIMENSIONS			
	A	B	C	D
3 1/2" - 4 1/2"	7"	6 1/2"	4 1/2"	6"
5 1/4" - 7"	12"	10 1/4"	6 1/2"	8"
7" - 8 1/2"	12"	10 1/4"	8"	8"
8 1/2" - 9 1/2"	12"	10 1/4"	8 1/2"	8"
9 1/2" - 11"	16"	14 1/4"	10 1/2"	8"
10 1/2" - 12"	16"	14 1/4"	12"	8"
12" - 13 1/2"	16"	14 1/4"	13 1/2"	8"
14 1/2" - 16 1/2"	20"	18 1/4"	15 1/2"	8"
15 1/2" - 17 1/2"	20"	18 1/4"	17"	8"
18 1/2" - 21 1/2"	24"	22 1/4"	20 1/2"	8"

MANHOLE PIPE CONNECTION FOR CAST IN PLACE MANHOLES

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-19
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

1. GENERAL -- Cast iron rings, tops, covers, grating and all cast iron fitting shall be sound, true to form and thickness, and neatly finished and shall fit together in a satisfactory manner. Castings shall be clean, uniform and whole without blow or sand holes, deposit, hard spots, shrinkage distortion or any other surface defects which would impair serviceability. Casting surfaces shall be smooth and well-cleaned by shot blasting or other approved cleaning method. Plugging or filling holes or other defects shall not be permitted. Parting fins and pouring gates shall be removed. Sharp edges resulting from fabrication shall be dulled by acceptable method to ensure safety in handling. Casting shall conform to the requirements of the Standard Specification for Grey Iron Fittings ASTM A-48, Class "30 B" for rings and "35 B" for covers and the approved Standard Details for Manhole Rings and Covers.
 All rings and covers shall be accurately and carefully placed. All rings shall be beaded in a substantial layer of mortar, shall have a full bearing and shall be set to the exact grade. Unless other wise shown, top of covers shall be flush with or slightly above the surrounding surface. When each cover is placed in any position on the ring, the side play shall not exceed one-eighth (1/8") inch in any direction.
 2. RINGS -- Rings may be manufactured in accordance with the Standard Detail for Reversible Manhole Rings.
 3. COVERS --
 A GENERAL -- Manhole covers may be manufactured in accordance with the appropriate Standard Details for Vented or Non-Vented Covers.
 B COATING -- When called for on the plans or specified, the underside of all manhole covers shall be given one (1) coat of asphalt varnish after visual inspection and approval on the job site.
 C APPLICATION -- All lids (covers) in street right-of-way shall be non-vented and include rainguard in/low protectors.
 4. CASTING WEIGHTS -- The minimum weight of casting will be not less than shown below:

Ring Only	200 LBS
Cover Only	150 LBS
Totals	350 LBS

MANHOLE LID / RING GENERAL NOTES

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-20
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

REVERSIBLE MANHOLE RING

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-21
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

VENTED MANHOLE COVER

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-22
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

VENTED MANHOLE COVER

APPROVED BY: *Eric J. Wenger* DATE: 3/14/14 S-23
 APPROVED BY: *Marsha W. Slaughter* DATE: 3/14/14
 OKLAHOMA CITY UTILITIES DEPARTMENT

The City of
Oklahoma City
 Utilities Department
 Engineering Division

NO.	DATE	DESCRIPTION

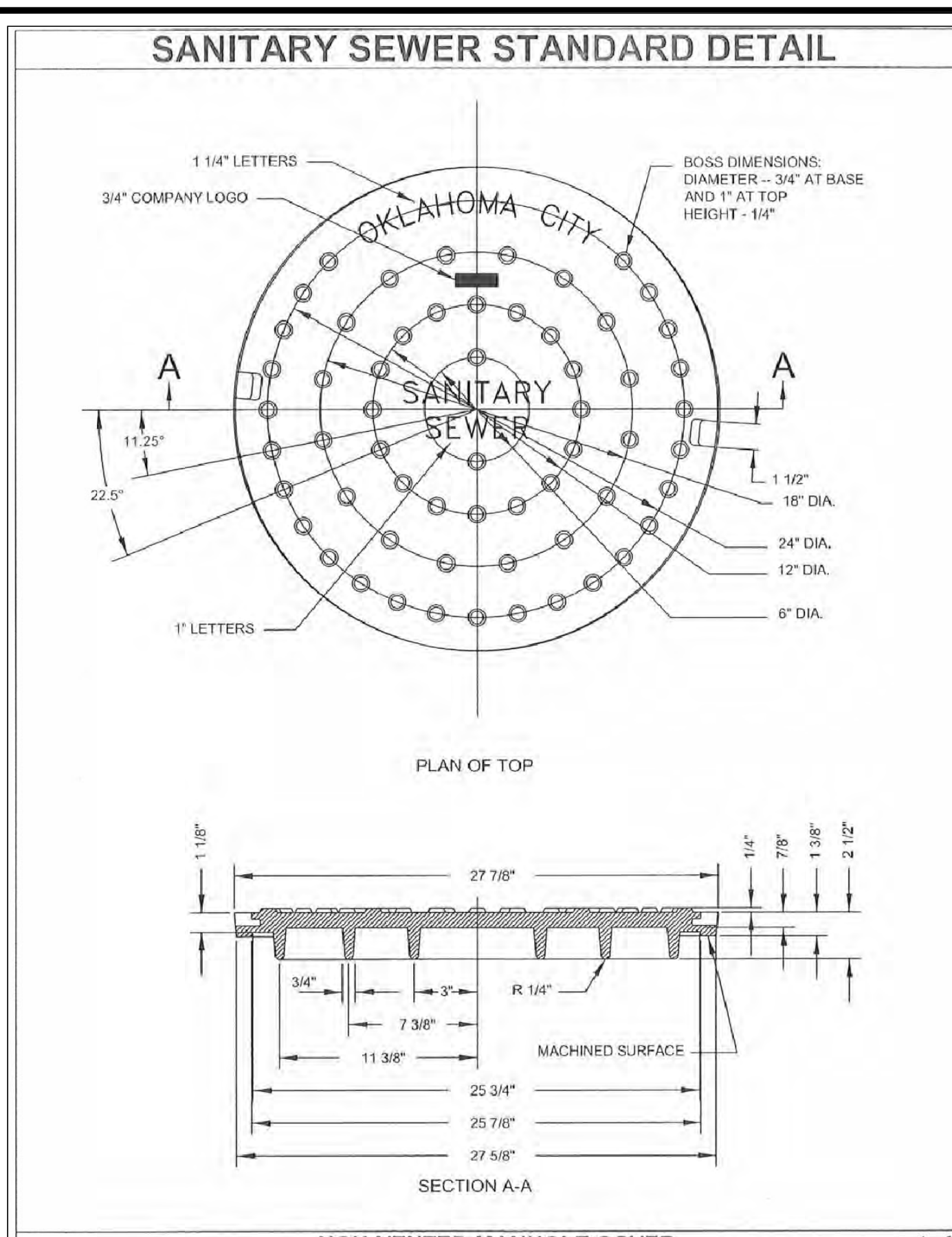
SANITARY SEWER STANDARD DETAILS

DATE: 03/14/14
 DRAWN BY: JDS
 CHECKED BY: MWS/EJW

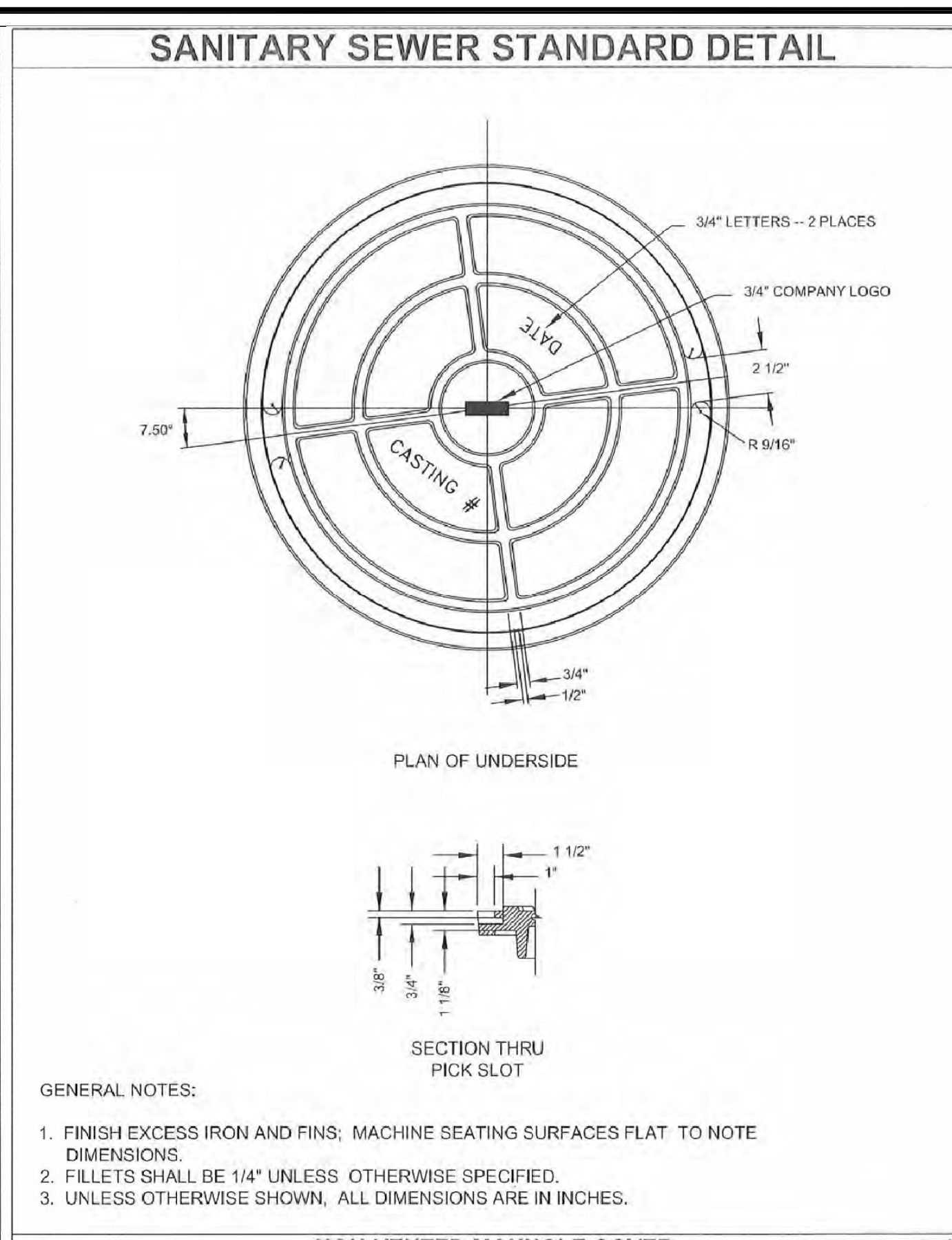
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SHEET NUMBER
S-STD-03

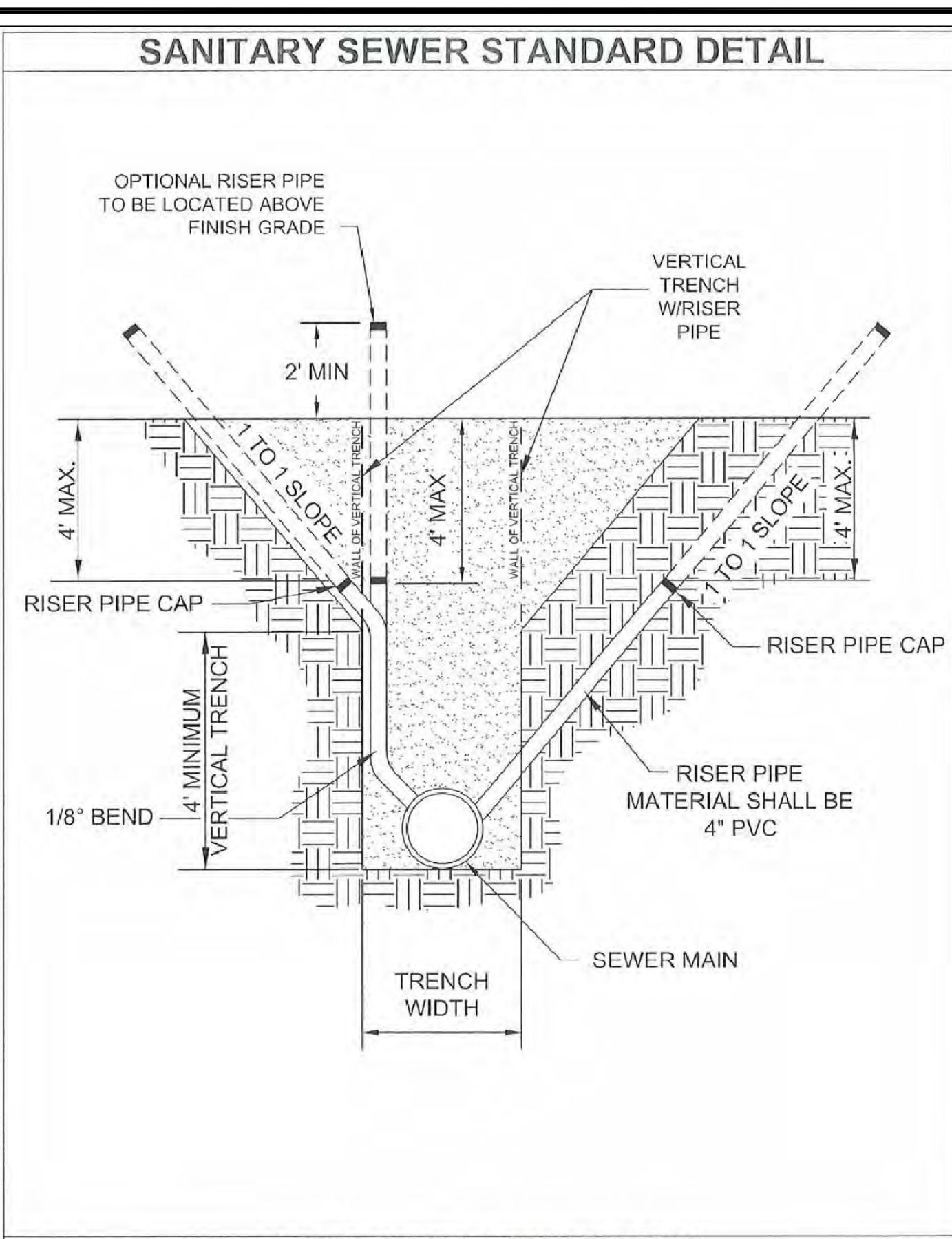
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NON-VENTED MANHOLE COVER 1 of 2
 03/13/14 DATE: APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 S-24
 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR



NON-VENTED MANHOLE COVER 2 of 2
 03/13/14 DATE: APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 S-25
 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR

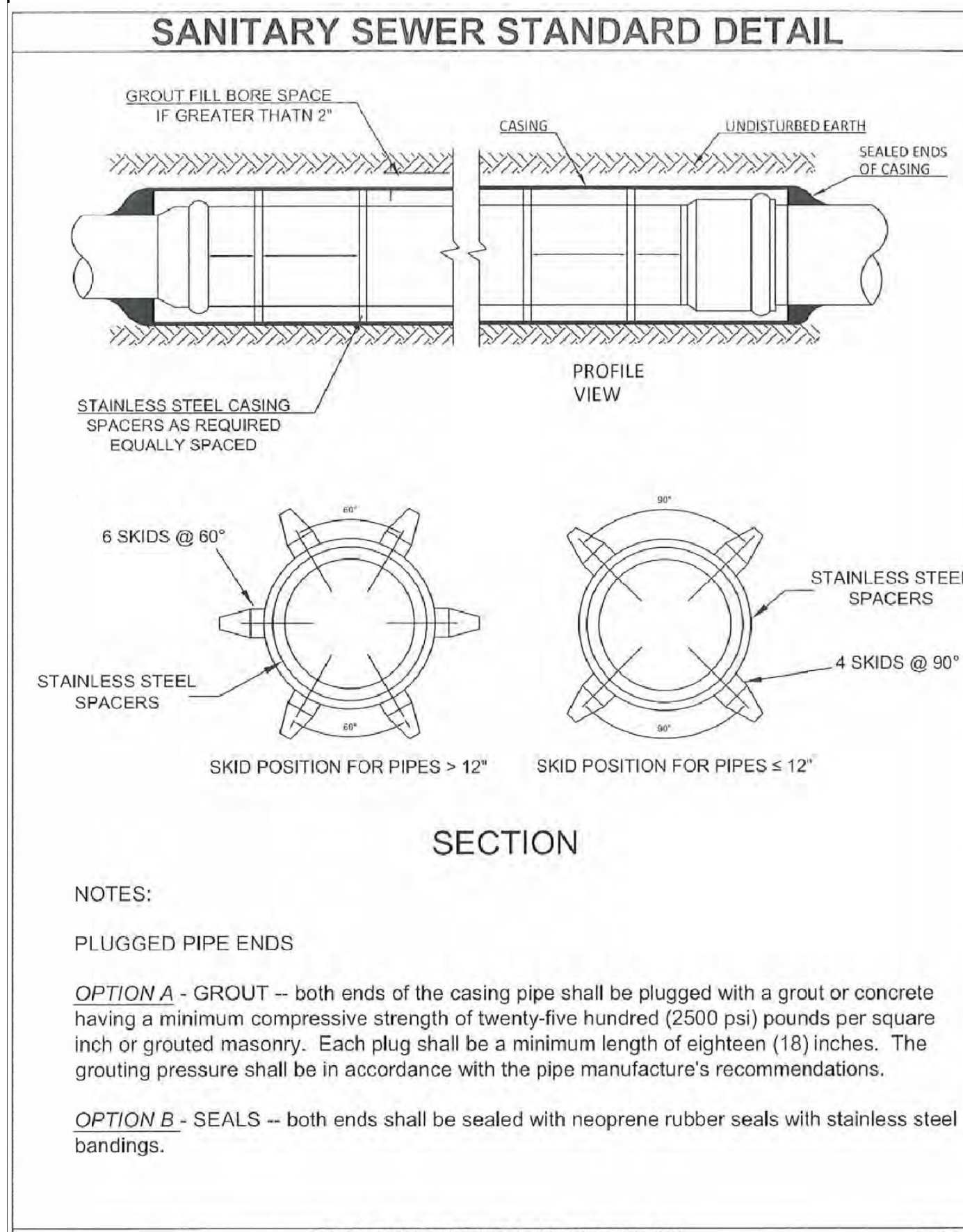


SERVICE CONNECTION INSTALLATION S-26
 03/13/14 DATE: APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14
 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR

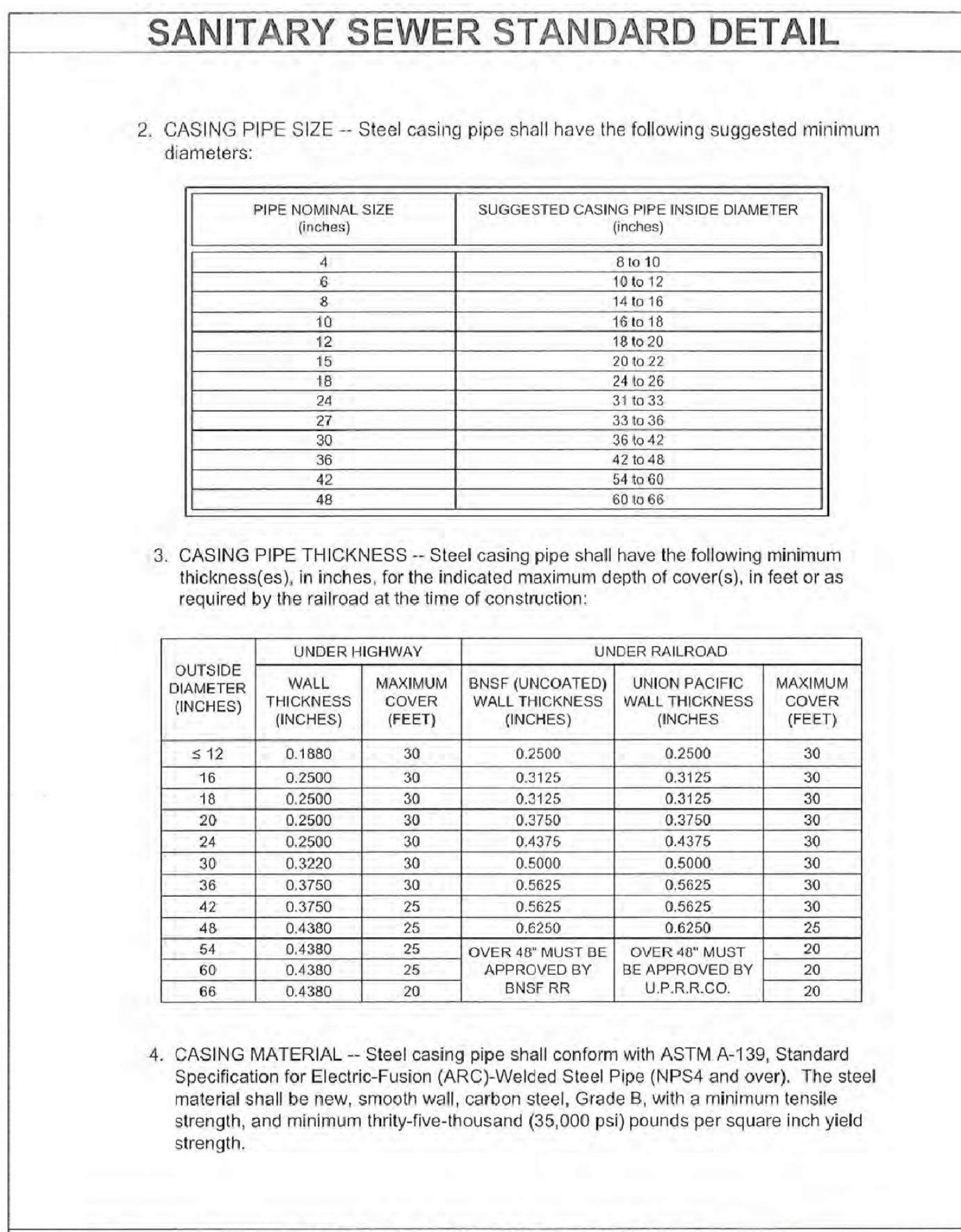
SANITARY SEWER STANDARD DETAIL

- EXTERNAL CONNECTIONS FOR NEW CONSTRUCTION
 - WYE BRANCHES -- For new construction there shall be installed wye branches of size and type shown on the plans with six (6") inch openings at locations shown on the plans or as described by the Engineer.
 - ELECTRO FUSION BONDED SADDLES -- For new construction using "Trenchless Construction" technology with HDPE pipe, service connections shall be installed with an electro fusion bonded saddle.
- EXTERNAL CONNECTION TO EXISTING MAIN -- Connections to existing main may be accomplished as follows:
 - SADDLES -- Connections may be made by excavating the existing main and cutting a hole using approved equipment and installing a saddle. Sewer service connections constructed with saddles shall include straps, a one-eighth (1/8") degree bend, and a closure piece. When existing main has been rehabilitated by trenchless method of construction, the saddle connection shall be made to the pipe/or liner.
 - TEES -- Connections may be made by removing a section of existing pipe and installing a wye branch. Fittings and closure assembly shall be used to make the connection and shall be supplied in a normal diameter or six (6") inches. The external connection shall be considered complete when backfilling and surface restoration is complete. Service connections constructed with wye branches shall include a one-eighth (1/8") degree bend, elbow, and when required, a closure piece.
- RISER
 - INSTALLATION -- The pipe may be installed in one of four ways shown on "Service Connection Details." Vertical installation is only approved if approved by the City Engineer.
 - SIZE AND MATERIAL -- The riser pipe shall be four inch (4") PVC.
- LOCATOR TAPE -- A locator tape, green in color stating "CAUTION -- SANITARY SEWER RISER BURIED BELOW" shall be attached to the sanitary sewer riser and extended to a minimum of two (2') feet above the ground, the tape shall be three (3") inch wide DuraTac as manufactured by THOR Enterprises, Inc., of Sun Prairie, Wisconsin or approved equal.

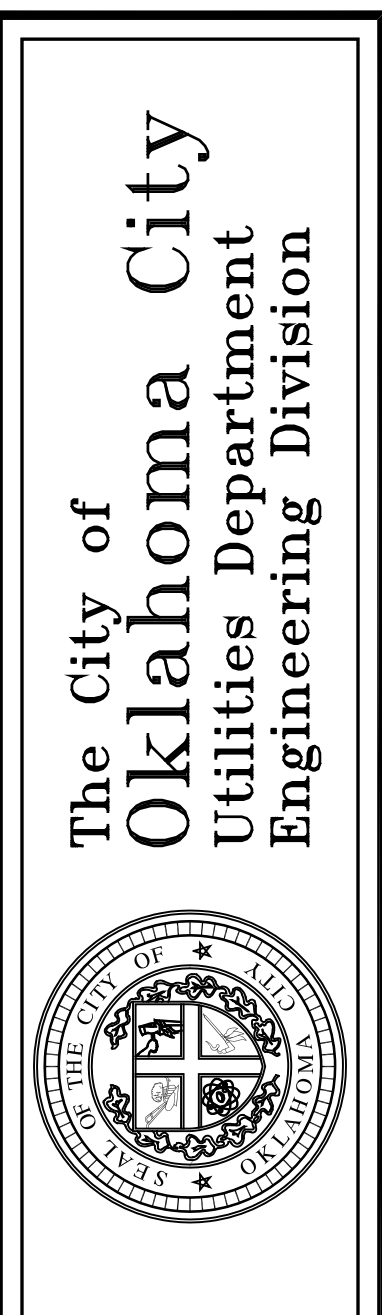
SERVICE CONNECTION INSTALLATION S-27
 03/13/14 DATE: APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14
 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR



BORE AND ENCASEMENT DETAIL 1 of 2
 03/13/14 DATE: APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 S-28
 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR



BORE AND ENCASEMENT DETAIL 2 of 2
 03/13/14 DATE: APPROVED BY: ERIC J. WENGER, P.E., CITY ENGINEER DATE: 3/14/14 S-29
 MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR

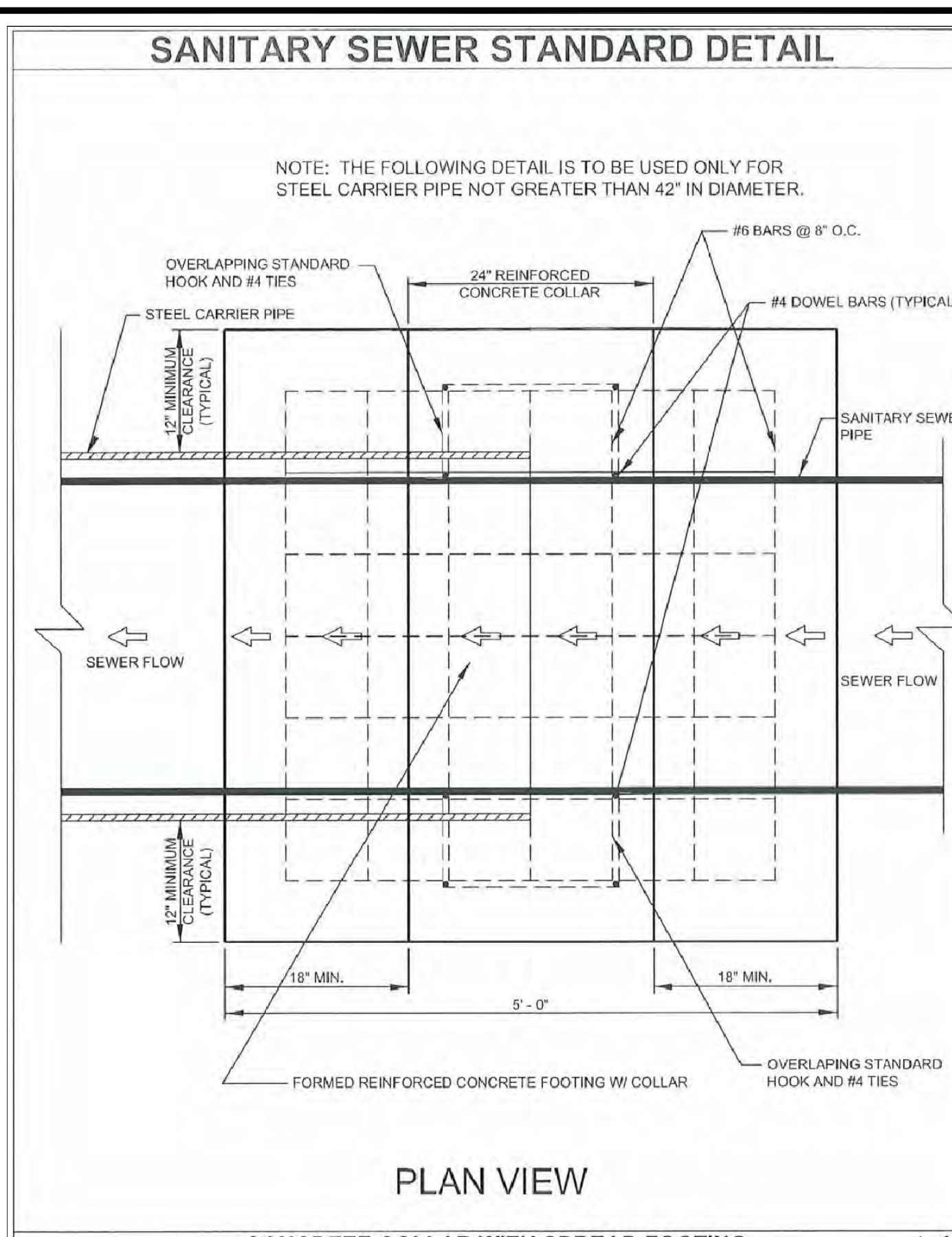


NO.	DATE	DESCRIPTION

SANITARY SEWER STANDARD DETAILS

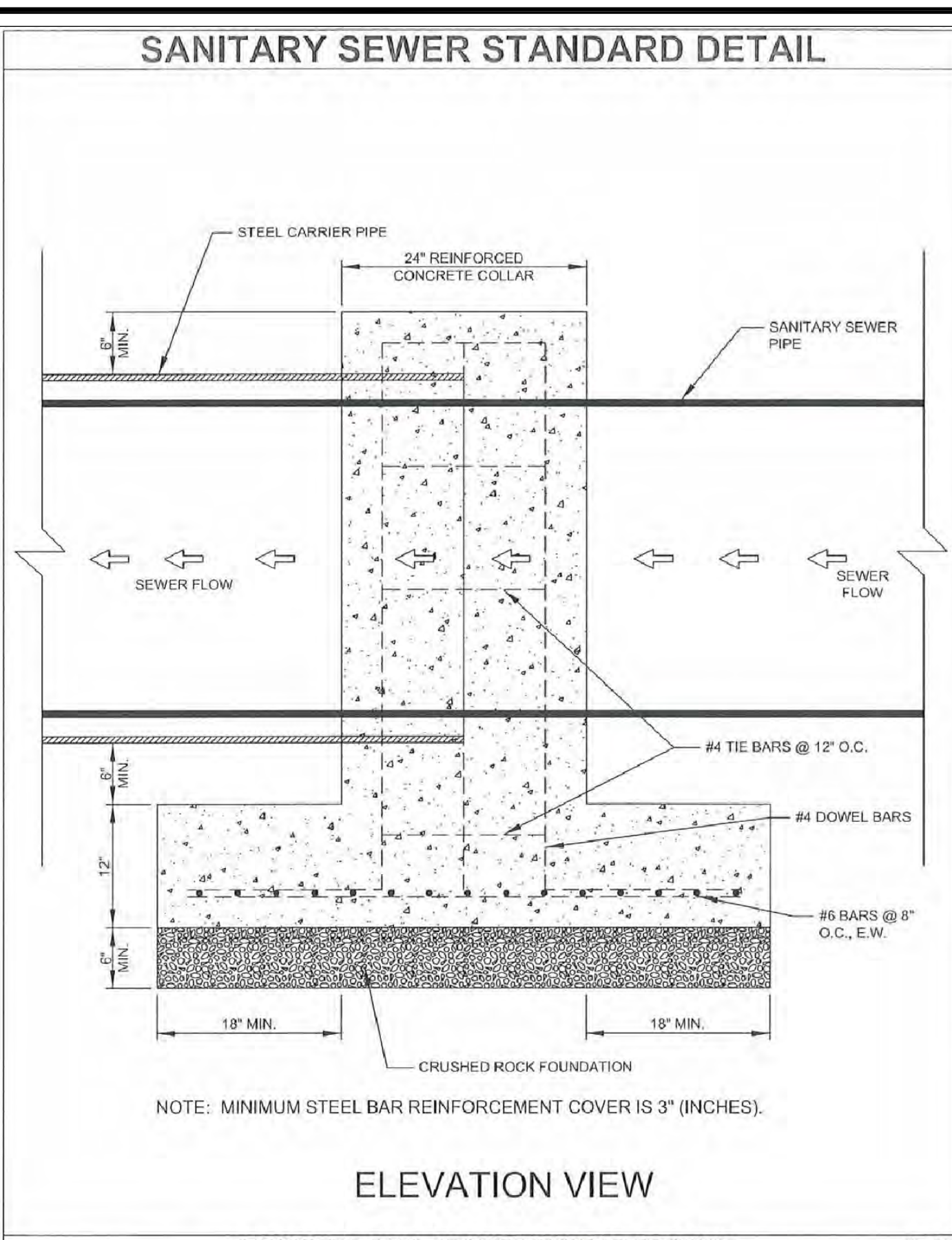
DATE: 03/14/14
 DRAWN BY: JDS
 CHECKED BY: MWS/EJW
 SCALE: AS SHOWN
 SHEET NUMBER: S-STD-04

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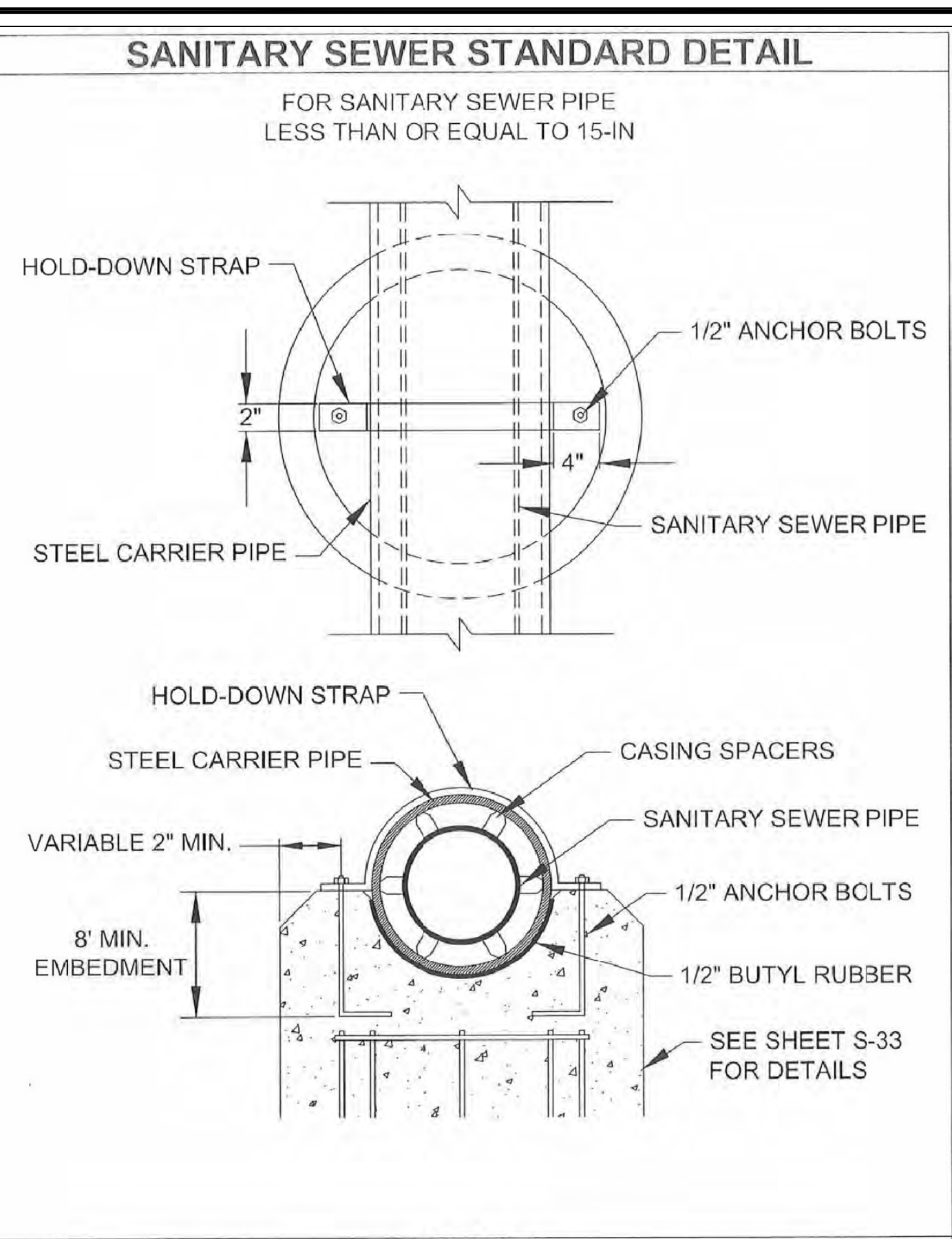
CONCRETE COLLAR WITH SPREAD FOOTING 1 of 2

03/13/14 APPROVED BY: *[Signature]* DATE: 3/14/14 S-30
 ERIC J. WENGER, P.E., CITY ENGINEER MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR
 OKLAHOMA CITY UTILITIES DEPARTMENT



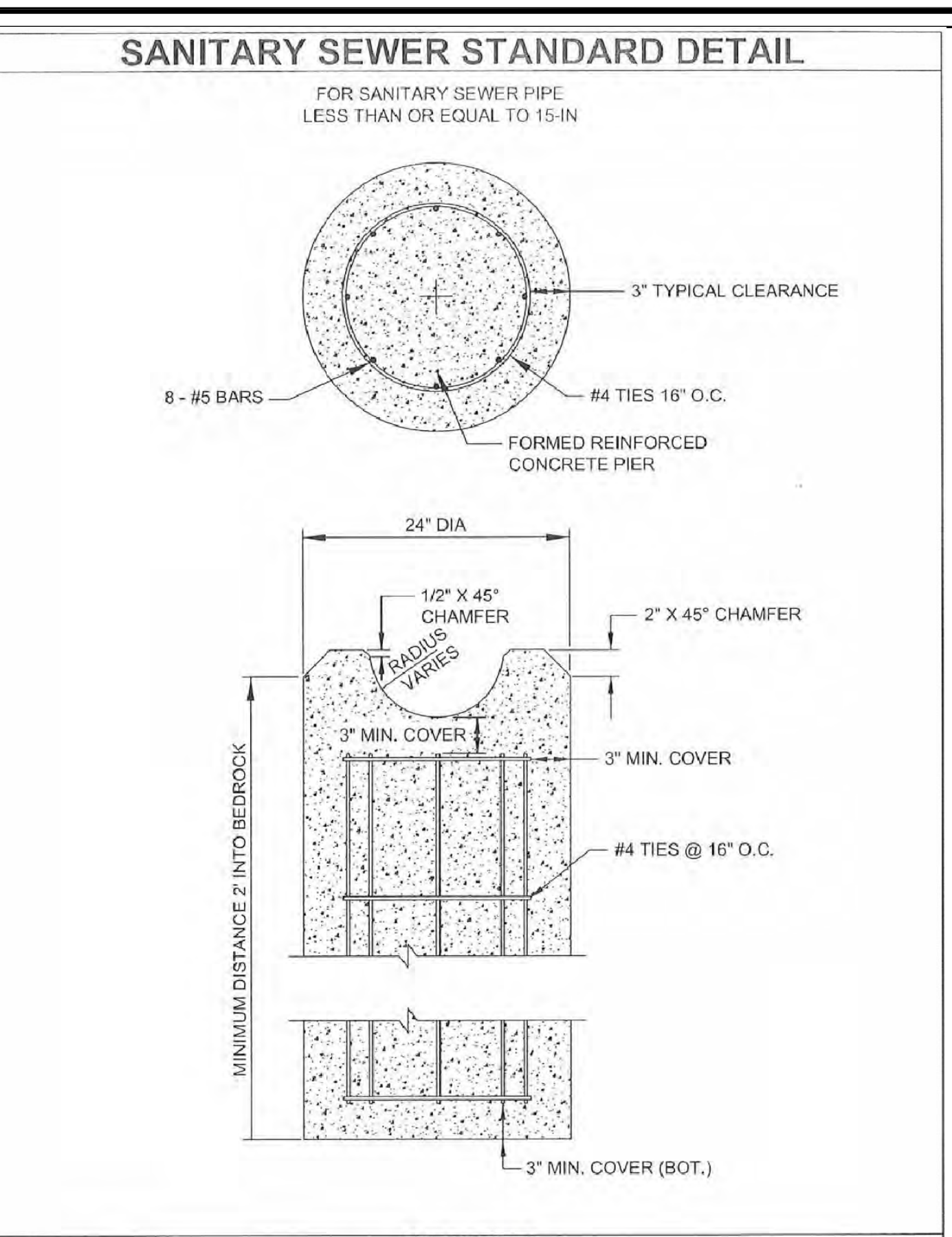
CONCRETE COLLAR WITH SPREAD FOOTING 2 of 2

03/13/14 APPROVED BY: *[Signature]* DATE: 3/14/14 S-31
 ERIC J. WENGER, P.E., CITY ENGINEER MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR
 OKLAHOMA CITY UTILITIES DEPARTMENT



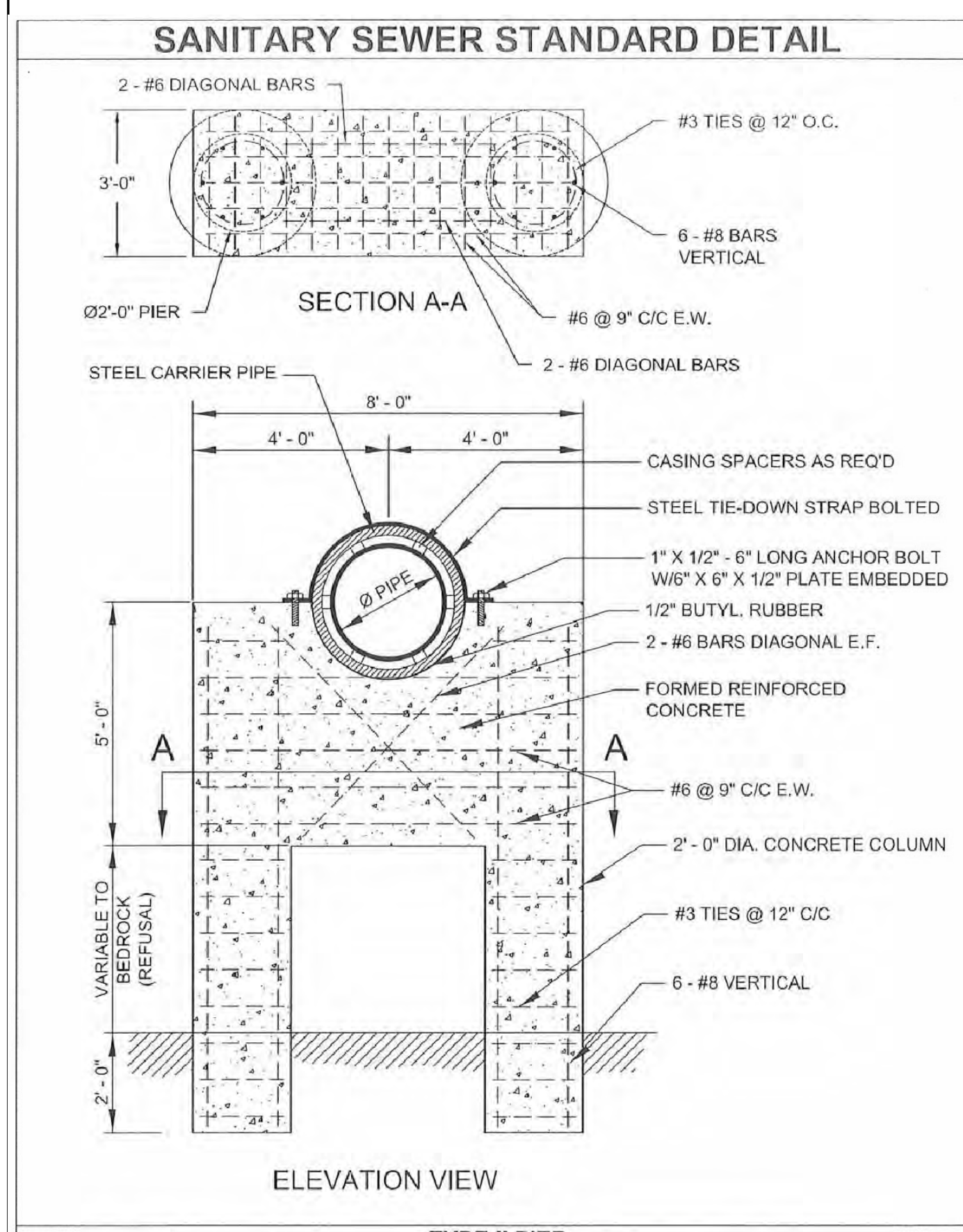
TYPE I PIER 1 of 2

03/13/14 APPROVED BY: *[Signature]* DATE: 3/14/14 S-32
 ERIC J. WENGER, P.E., CITY ENGINEER MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR
 OKLAHOMA CITY UTILITIES DEPARTMENT



TYPE I PIER 2 of 2

03/13/14 APPROVED BY: *[Signature]* DATE: 3/14/14 S-33
 ERIC J. WENGER, P.E., CITY ENGINEER MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR
 OKLAHOMA CITY UTILITIES DEPARTMENT



TYPE II PIER

03/13/14 APPROVED BY: *[Signature]* DATE: 3/14/14 S-34
 ERIC J. WENGER, P.E., CITY ENGINEER MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR
 OKLAHOMA CITY UTILITIES DEPARTMENT

SANITARY SEWER STANDARD DETAIL

TABLE OF STEEL CARRIER PIPE SIZES

Nominal Size [in]	Wall Thickness [in]									
	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
Span Length - [ft]										
6	36	40	44							
8	38	42	45							
10	39	43	46							
12	40	44	47							
14	40	44	47							
16	41	45	48							
18	41	46	49	52						
20	42	46	50	53						
22	42	46	51	54						
24	42	48	52	55	58	60				
26	43	48	52	56	59	61				
28	43	48	53	56	59	62				
30	43	49	53	57	60	63				
32	44	49	54	57	61	64				
34	44	49	54	58	61	64				
36	44	50	54	58	62	65	70			
38	44	50	55	59	62	65	70			
40	44	50	55	59	63	66	71			
42	44	50	55	59	63	66	72			
45		51	55	60	63	67	72			
48		51	56	60	64	67	73	78		
51		51	56	60	64	68	74	79		
54		51	56	61	65	68	74	79		
57		51	57	61	65	69	75	80		
60		51	57	61	65	69	75	80		
63		52	57	62	66	69	76	81		
66		52	57	62	66	70	76	81	86	90
72		52	58	62	66	70	77	82	87	92

Reference: AWWA M11, 4th Edition, 2004, "Steel Pipe - A Guide for Design and Installation." - Table 7-1.

STEEL CARRIER PIPE SIZES MAXIMUM SPAN LENGTH

TYPE II PIER

03/13/14 APPROVED BY: *[Signature]* DATE: 3/14/14 S-35
 ERIC J. WENGER, P.E., CITY ENGINEER MARSHA W. SLAUGHTER, P.E., UTILITIES DIRECTOR
 OKLAHOMA CITY UTILITIES DEPARTMENT

The City of
Oklahoma City
 Utilities Department
 Engineering Division

NO.	DATE	DESCRIPTION

SANITARY SEWER STANDARD DETAILS

DATE: 03/14/14
 DRAWN BY: JDS
 CHECKED BY: MWS/EJW
 SCALE: AS SHOWN
 SHEET NUMBER: **S-STD-05**