

# CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL

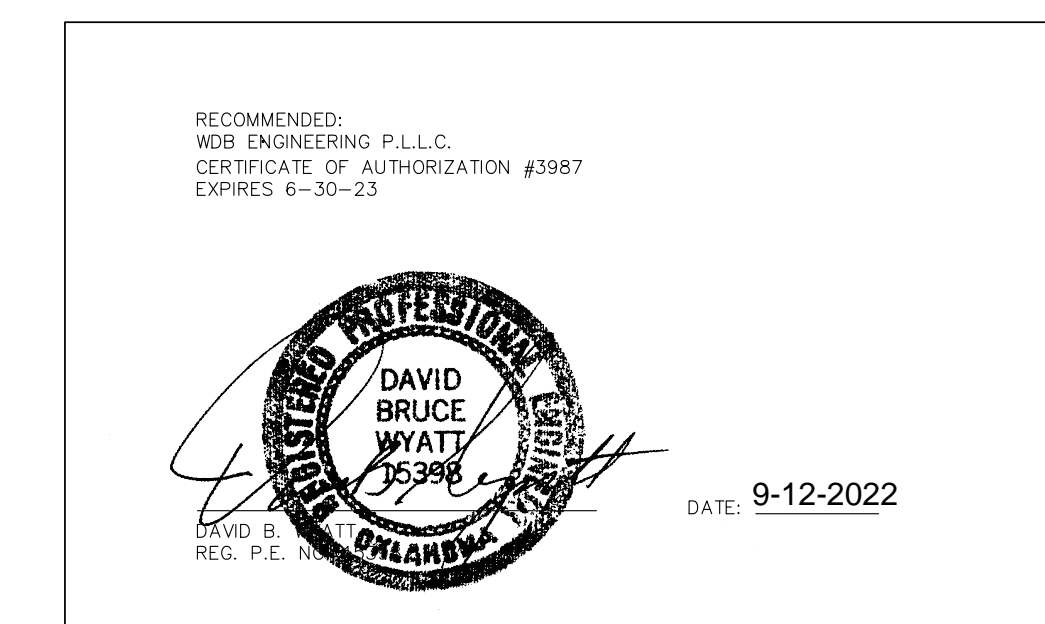
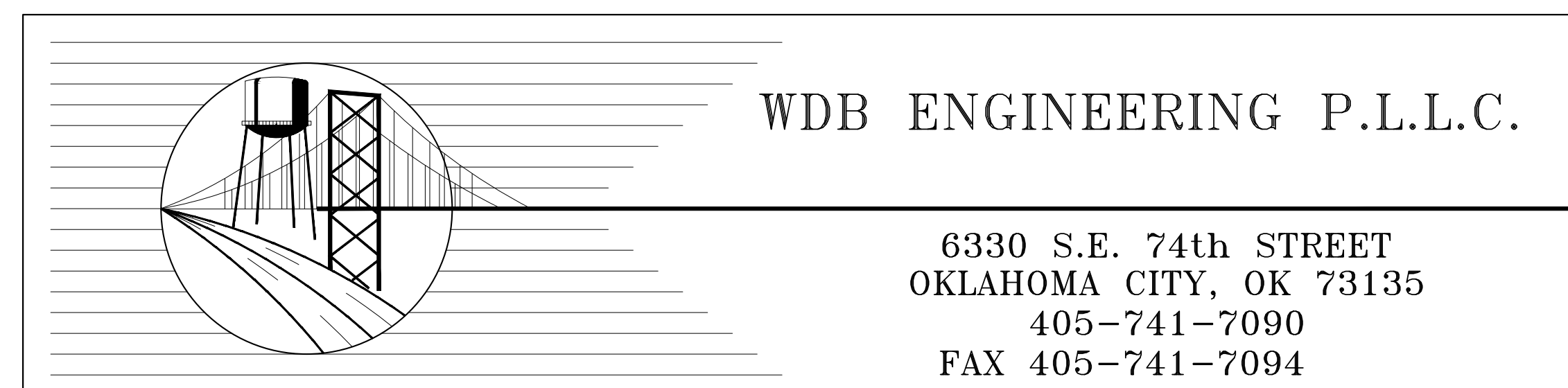
LOCATED AT

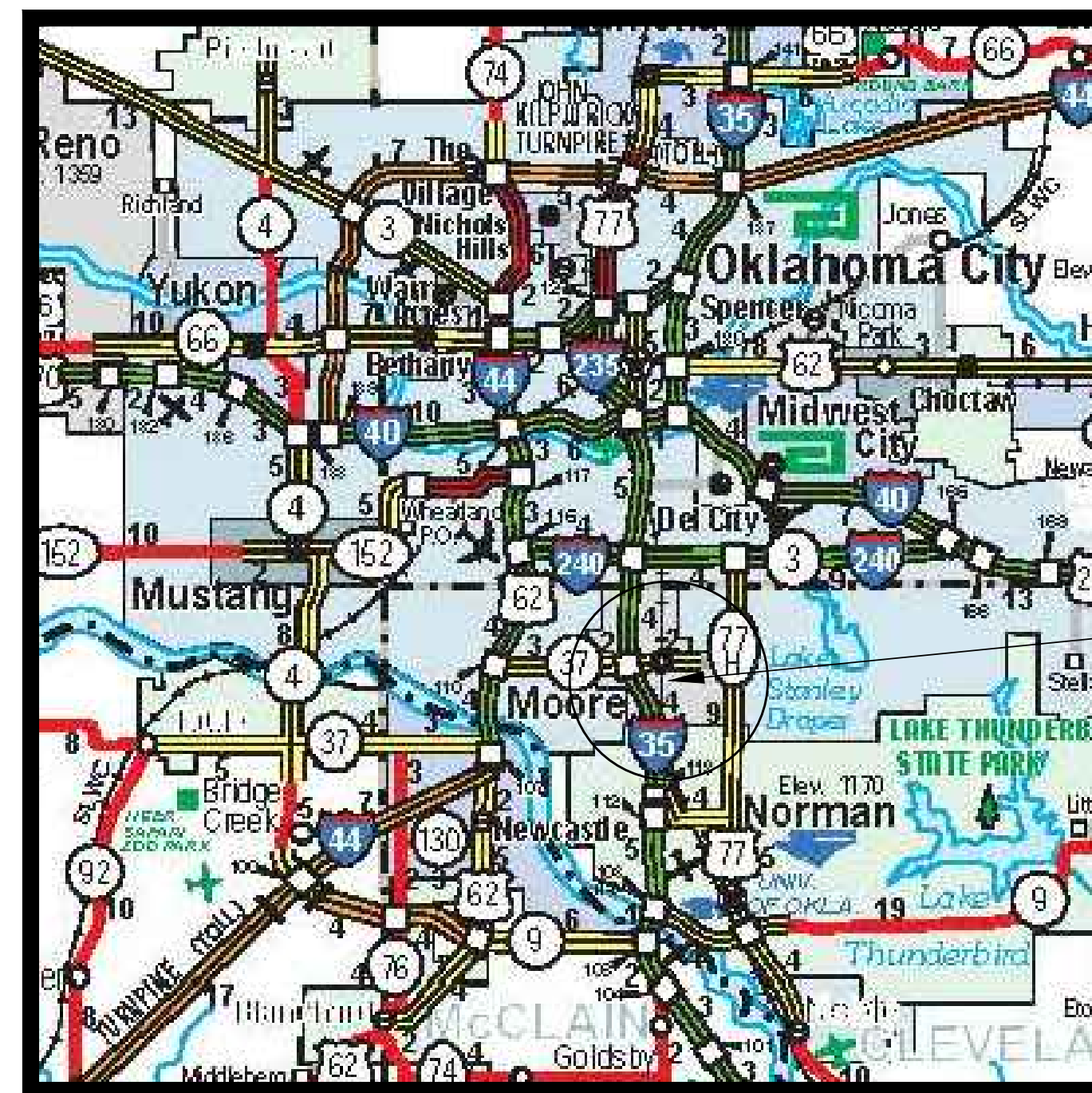
1200 SE 4TH STREET, MOORE, OK 73160

E/2, NE/4, NW/4, SEC. 24, T10N, R3W  
CLEVELAND COUNTY

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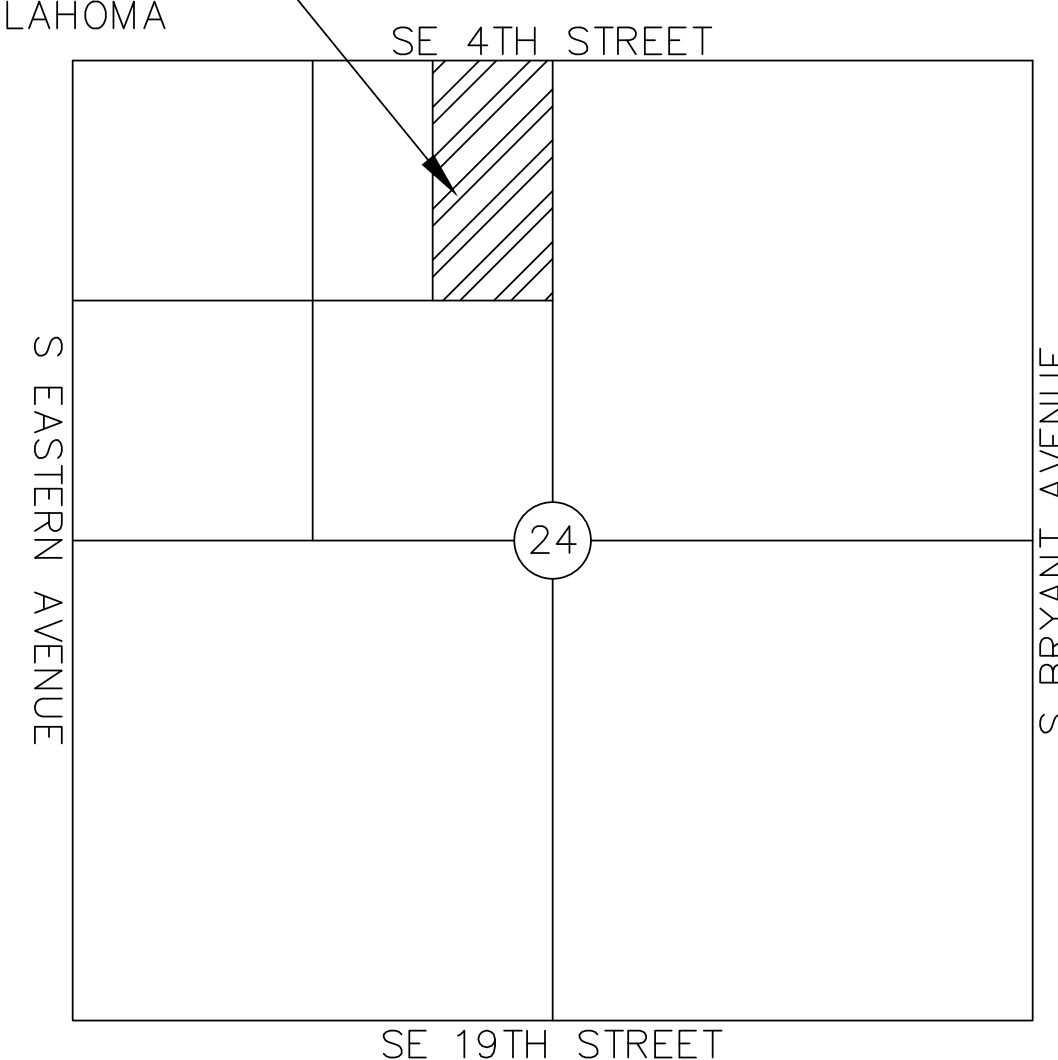
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VICINITY

PROJECT LOCATION  
 HIGHLAND EAST JUNIOR HIGH  
 E/2, NE/4, NW/4, SEC. 24, T10N, R3W  
 CLEVELAND COUNTY, OKLAHOMA



PROJECT LOCATION

### SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	AS BUILT
1	12" ADS DRAINAGE PIPE	L.F.	475	
2	STANDARD 4' DIA. MANHOLE (STORM SEWER)	EA.	4	
3	12" x 12" TEE (ADS)	EA.	4	
4	12" x 12" CROSS (ADS)	EA.	1	
5	12" CAP (ADS)	EA.	1	
6	12" CONCRETE END SECTION	EA.	2	
7	24" ADS DRAINAGE PIPE	L.F.	60	
8	DUAL 24" CONCRETE ENDWALL	EA.	2	
9	STANDARD 3' CUT OFF WALL	EA.	2	
10	3' WIDE EMERGENCY SPILLWAY CONCRETE FLUME	EA.	1	
11	CUT & REPAIR EXISTING CONCRETE SIDEWALK	S.F.	20	
12	4' WIDE CONCRETE TRICKLE CHANNEL	L.F.	325	
13	8" SURGE ROCK w/18" DEPTH	C.Y.	20	
14	1" #57 ROCK BEDDING	TON	35	
15	NEW ROOF DRAINS	EA.	5	
16	STANDARD 4' DIA. MANHOLE (SANITARY SEWER)	EA.	1	
17	TIE IN TO EXISTING SANITARY SEWER MANHOLE	EA.	1	
18	6" SDR-35 SANITARY SEWER SERVICE LINE	L.F.	113	
19	8" WATERLINE C900 DR-18	L.F.	403	
20	12" x 8" TAPPING SLEEVE	EA.	1	
21	8" TAPPING VALVE	EA.	1	
22	8" SOLID SLEEVE	EA.	1	
23	8" GATE VALVE	EA.	1	
24	8" x 90° BEND	EA.	1	
25	8" x 6" TEE	EA.	1	
26	6" GATE VALVE	EA.	1	
27	FIRE HYDRANT WITH ALL APPURTENANCES	EA.	1	
28	ANCHOR	EA.	4	
29	6" CLASS A CONCRETE PAVEMENT (FIRE ACCESS ROAD)	S.Y.	1,266	
30	COMPACTED SUBGRADE	C.Y.	215	
31	6" CONCRETE CURB & GUTTER	L.F.	613	

### GENERAL CONSTRUCTION NOTES

- ALL WORK NOT CLASSIFIED AS A CONTRACT "PAY ITEM", SHALL BE CONSIDERED INCIDENTAL AND THE COST THEREOF AND INCLUDED IN ITEMS CLASSIFIED FOR PAYMENT.
- BEFORE ANY SIDEWALK OR DRIVE IS CUT, THE RESIDENT ON PROPERTY AFFECTED SHALL BE NOTIFIED BY THE CONTRACTOR. NO DRIVE OR SIDEWALK SHALL BE LEFT UNCOVERED OVERNIGHT.
- THE CLEAN-UP OF RIGHT-OF-WAY SHALL NOT BE DELAYED UNTIL FINAL ESTIMATE. THE CLEAN-UP WORK ON SECTIONS OF COMPLETED LINE SHALL BE BROUGHT UP TO DATE AT LEAST EVERY 10 WORKING DAYS. IF CLEAN UP GETS BEHIND TIME, PRODUCTION SHALL BE SUSPENDED TO GIVE MORE MEN AND EQUIPMENT ATTENTION TO CLEAN UP UNTIL IT IS DONE. ALL RUBBISH AND DISCARDED MATERIALS SHALL BE REMOVED FROM THE SITE AND ADJACENT WILL NOT BE CONSIDERED AS HAVING BEEN DISPOSED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL UTILITIES EITHER PUBLIC OR PRIVATE. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE APPROPRIATE OWNER TO DETERMINE THEIR EXACT LOCATION BEFORE CONSTRUCTION BEGINS.
- THE CONTRACTOR SHALL NOTIFY THE UTILITY OWNER AND ALL PARTIES AFFECTED BEFORE ANY WATER LINE IS TAKEN OUT OF SERVICE.
- ALL CONCRETE SHALL HAVE 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
- THE CONTRACTOR SHALL VERIFY THE DEPTH OF THE EXISTING UTILITIES AND/OR WATER LINES BEFORE STARTING ANY EXCAVATION BEGINS.
- THE LOCATION OF OTHER UTILITIES AS SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE OF ALL UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT. CALL 1-800-840-5032 48 HOURS PRIOR TO ANY EXCAVATION.
- FILL MATERIAL SHALL BE COMPACTED IN LIFTS NOT TO EXCEED 12" TO 95% STANDARD PROCTOR DENSITY.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE, FEDERAL AND LOCAL REGULATIONS.
- ANY CONSTRUCTION PROCEDURES NOT COVERED IN PLANS AND SPECIFICATIONS, WILL BE EXECUTED IN ACCORDANCE WITH PROPER CONSTRUCTION TECHNIQUES AND SHALL BE APPROVED BY THE ENGINEER.
- IF DITCHES SUBSIDE LATER, THE CONTRACTOR SHALL REFILL DITCHES AS SOON AS WEATHER PERMITS, AND SHALL NOT LET DITCHES WITH SUBSIDENCE EXIST DURING CONSTRUCTION OR THEREAFTER.
- ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE FINISHED TO A SMOOTH UNIFORM SURFACE PERMITTING DRAINAGE AND SLOPED IN SUCH CONDITION THAT ALL AREAS MAY BE MOWED WITH ROTARY TYPE MOWING EQUIPMENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FENCES DISTURBED DURING CONSTRUCTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING FOR THE PROJECT.
- THE CONTRACTOR SHALL REFERENCE CITY OF MOORE STANDARDS.



WDB ENGINEERING PLLC  
 6330 S.E. 74TH STREET  
 OKC, OK 73135 PH: 405-741-7090  
 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023

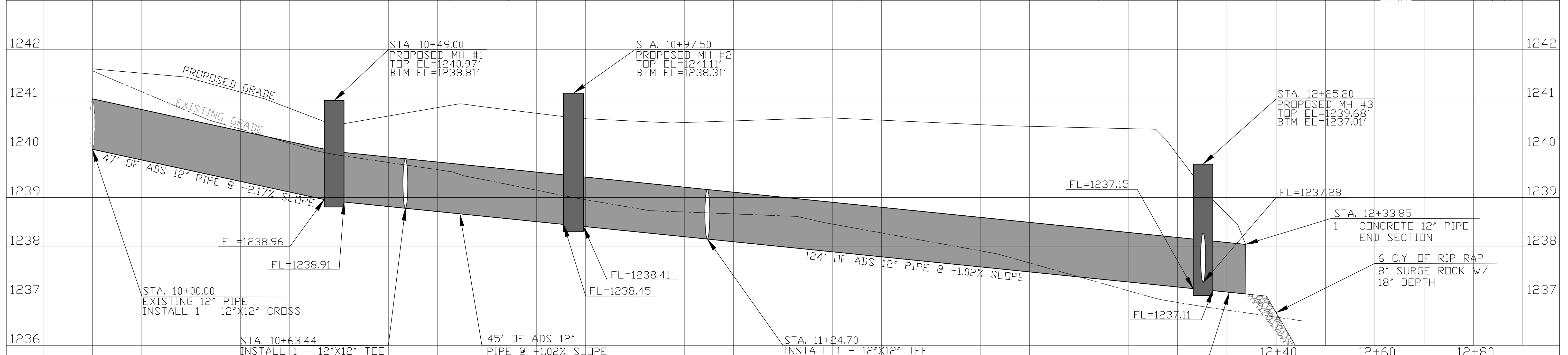
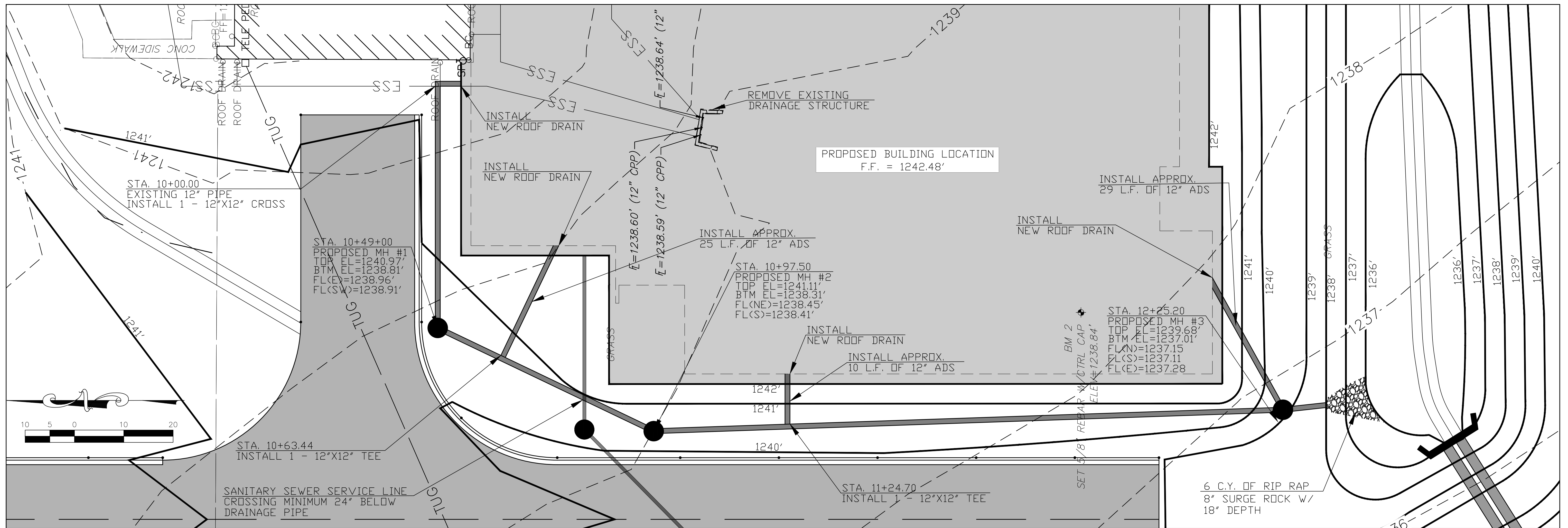
CLASSROOM ADDITION  
 HIGHLAND EAST JUNIOR HIGH SCHOOL

DATE: 6-25-2022 APPROVED BY: DRAWN BY: MW

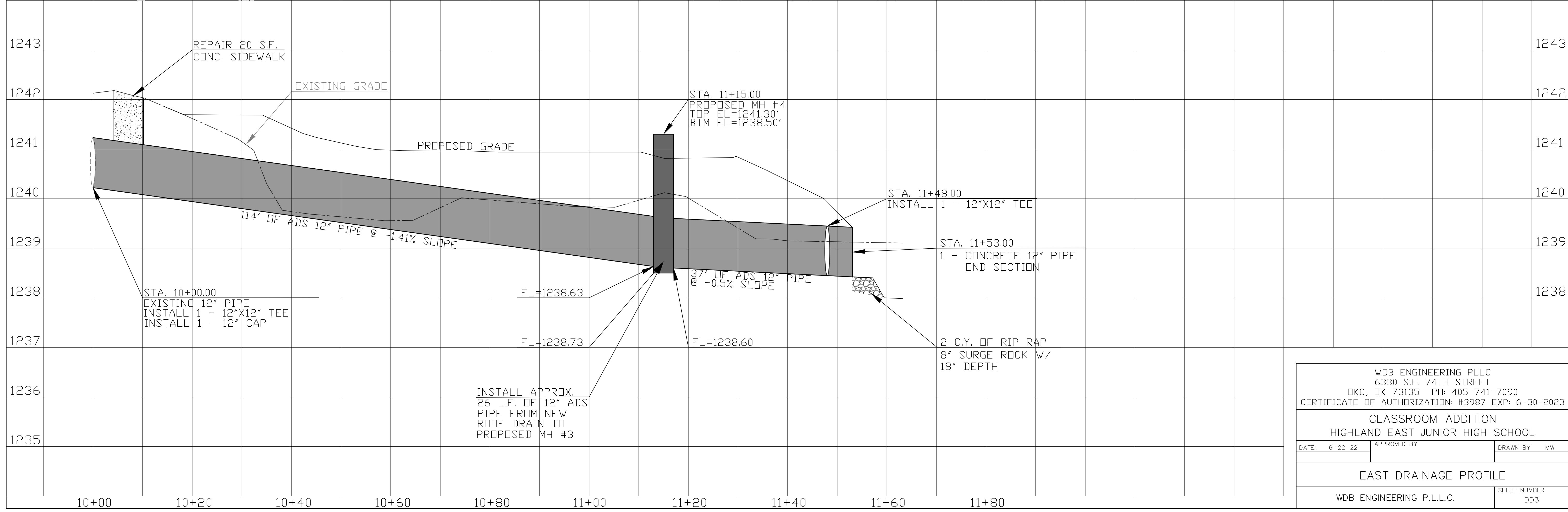
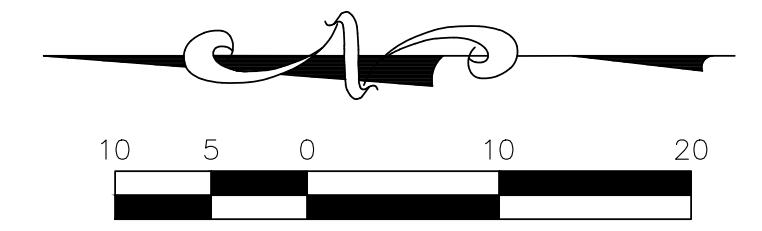
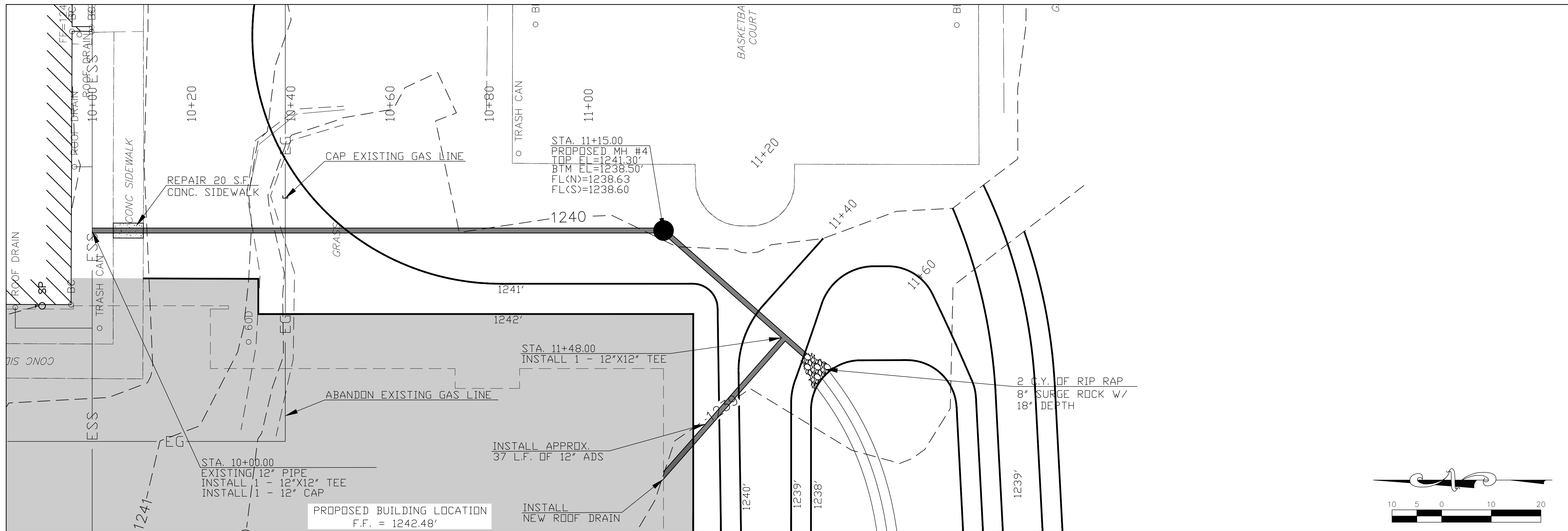
LOCATION MAP &  
 GENERAL NOTES

WDB ENGINEERING P.L.L.C. SHEET NUMBER 2

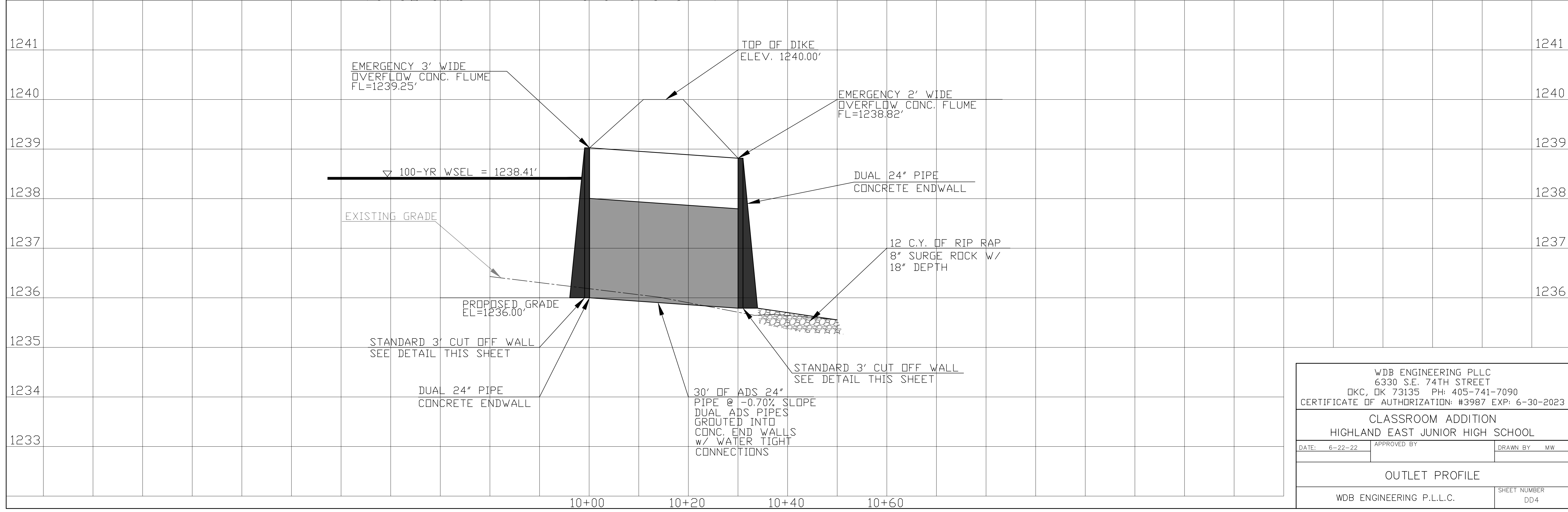
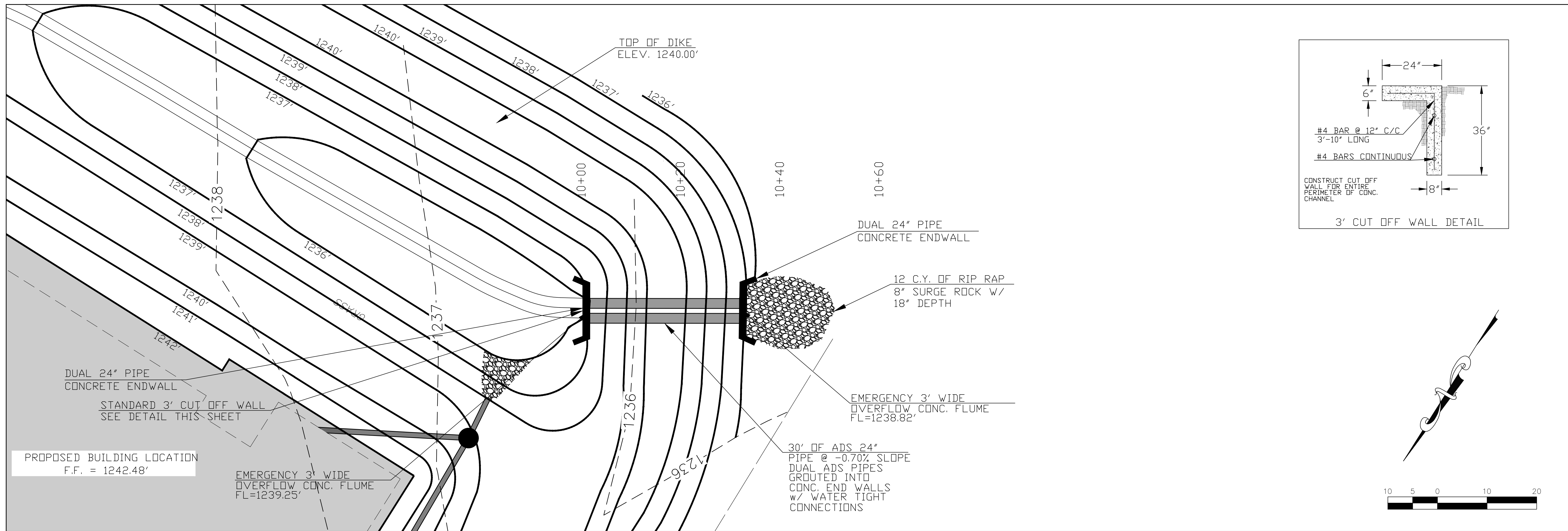




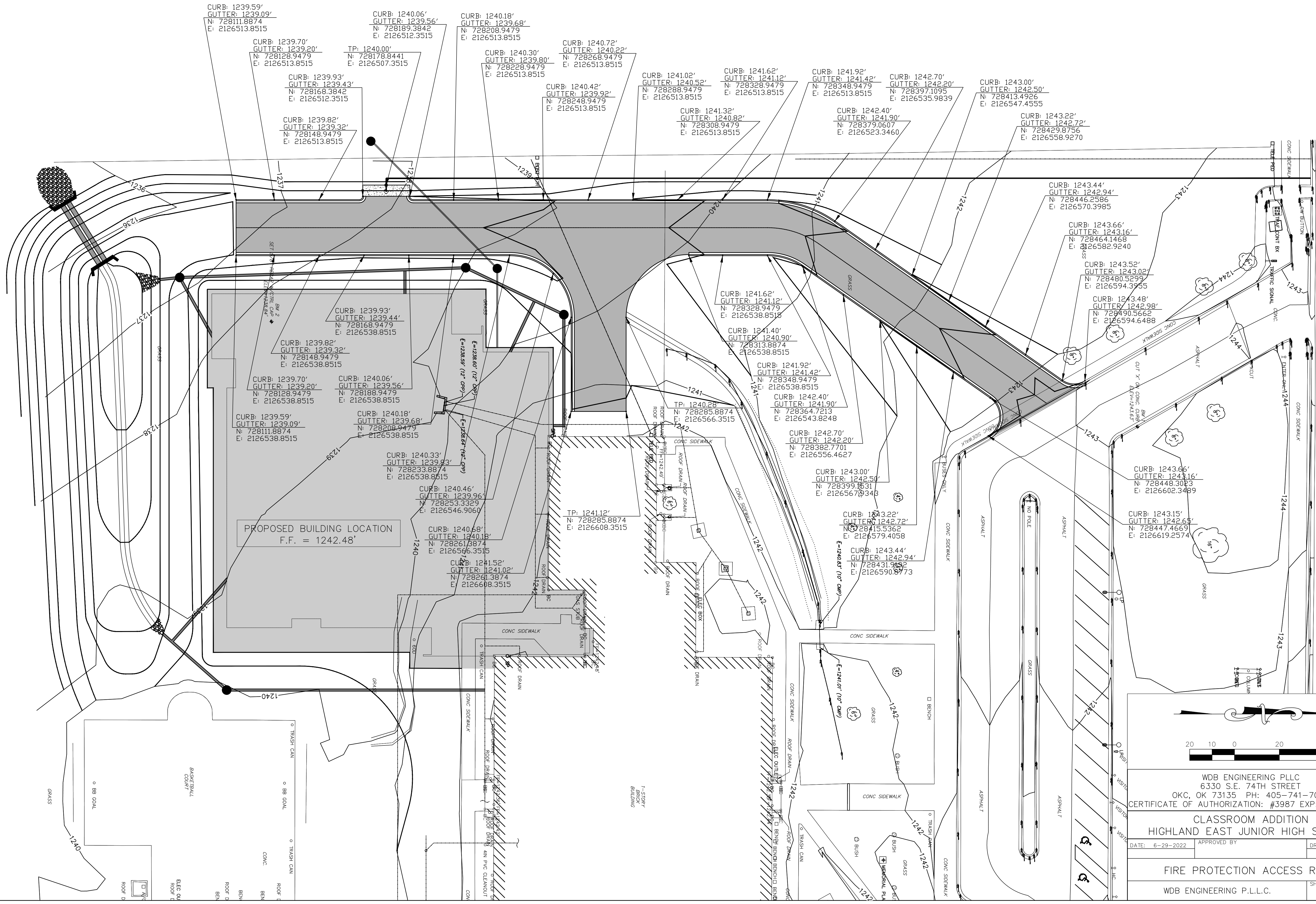
WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OLC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 06-22-22	APPROVED BY:	DRAWN BY: MW
WEST DRAINAGE PROFILE		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER DD2




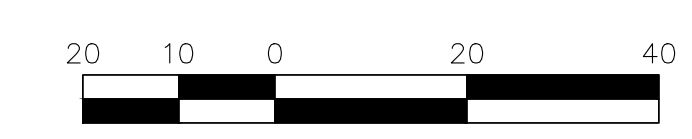
WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 6-22-22	APPROVED BY:	DRAWN BY: MW
EAST DRAINAGE PROFILE		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER DD3



WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 6-22-22	APPROVED BY:	DRAWN BY: MW
<b>OUTLET PROFILE</b>		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER DD4



PROPOSED BUILDING LOCATION  
F.F. = 1242.48'

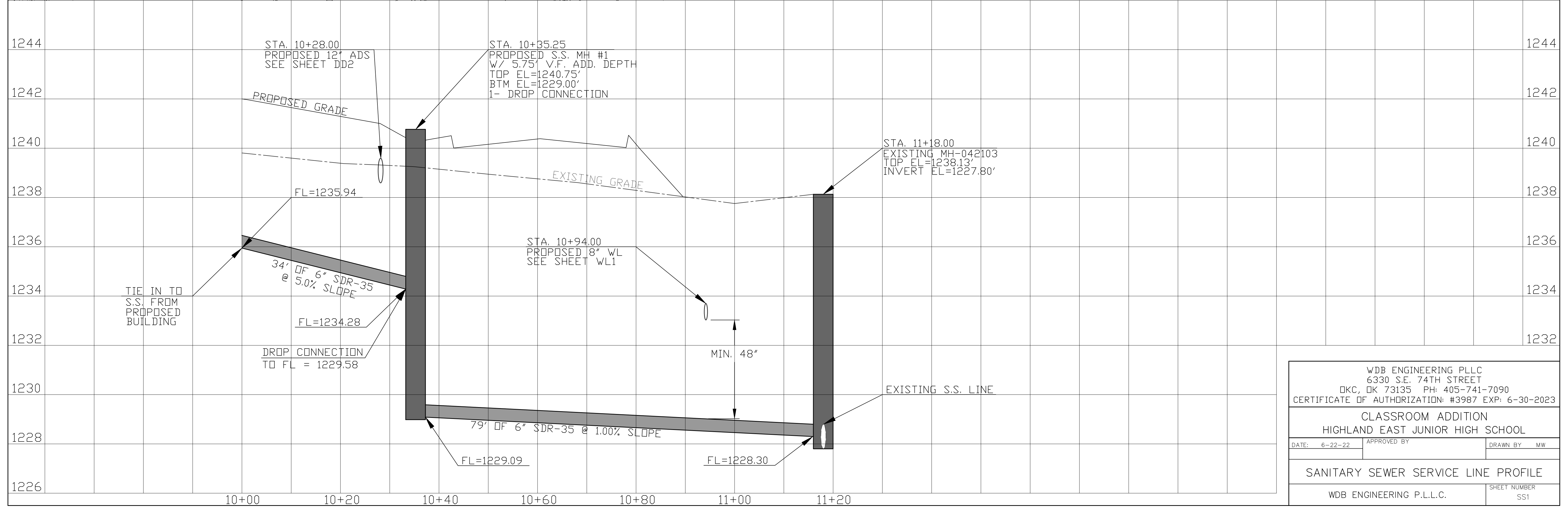
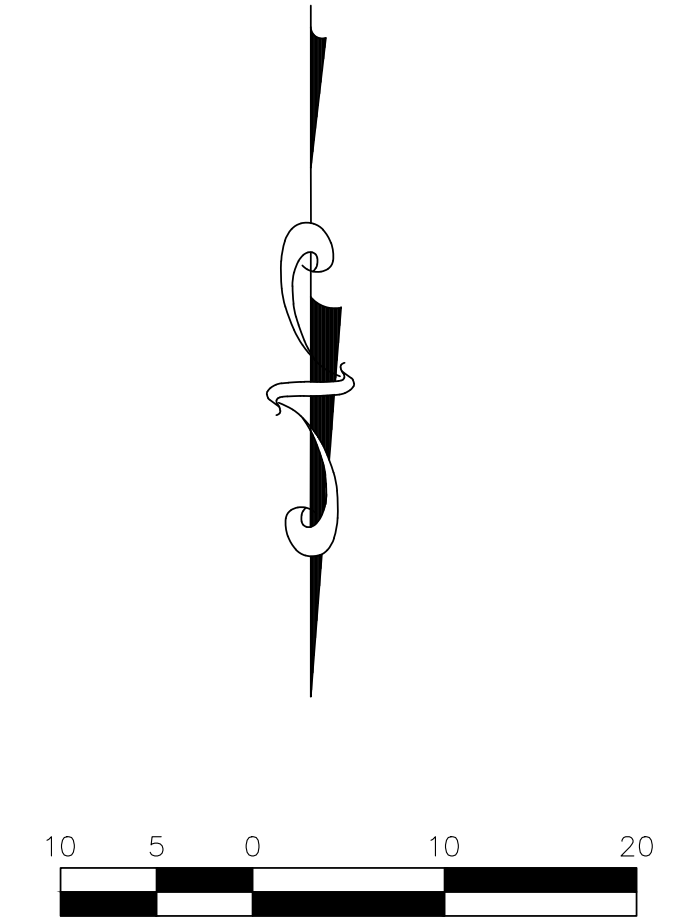
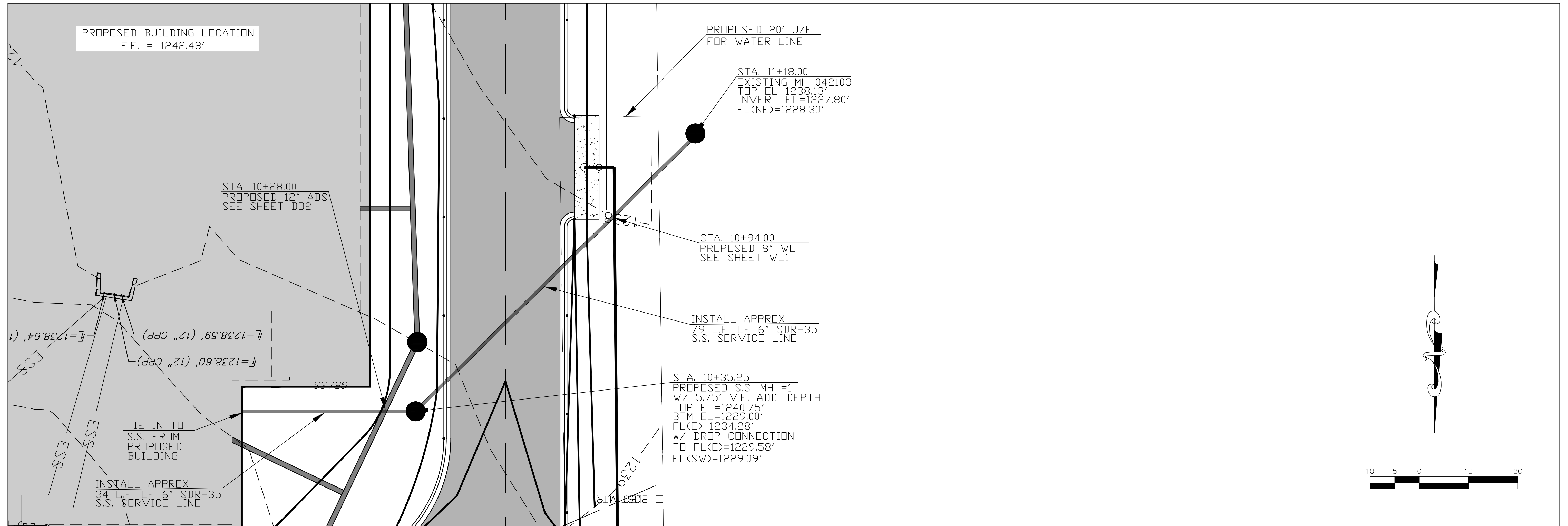
**WDB ENGINEERING PLLC**  
 6330 S.E. 74TH STREET  
 OKC, OK 73135 PH: 405-741-7090  
 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023

**CLASSROOM ADDITION**  
**HIGHLAND EAST JUNIOR HIGH SCHOOL**

DATE: 6-29-2022	APPROVED BY:	DRAWN BY: MW
<b>FIRE PROTECTION ACCESS ROAD</b>		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER FA1

SEE PLAN 317

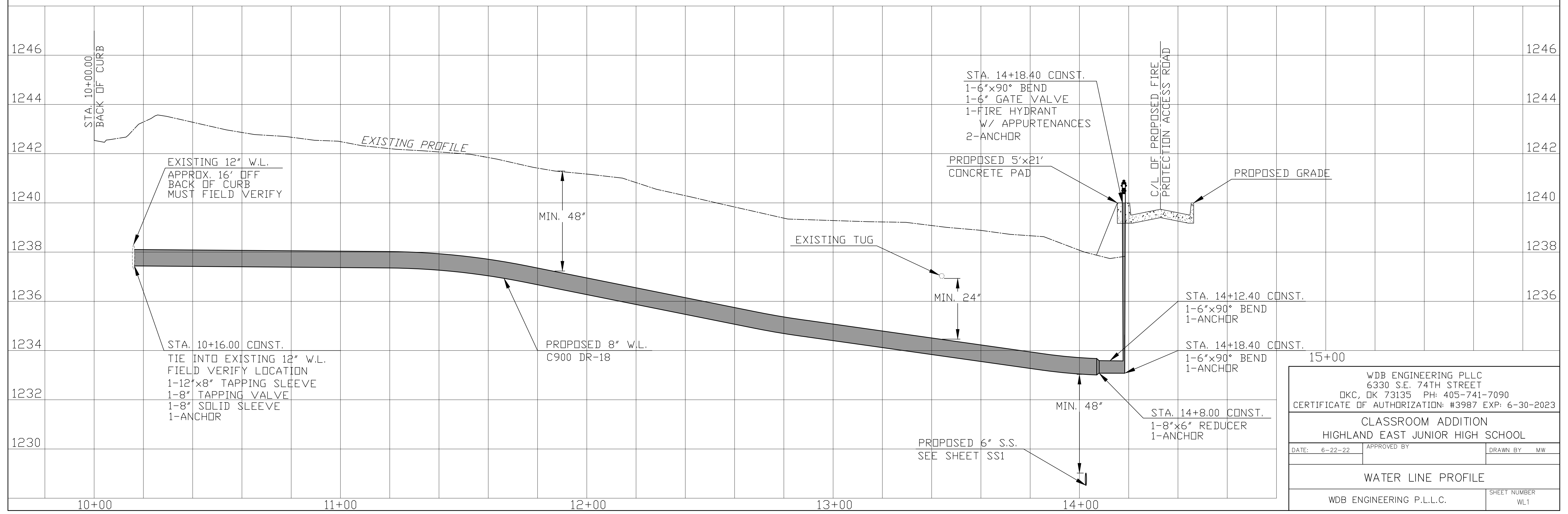
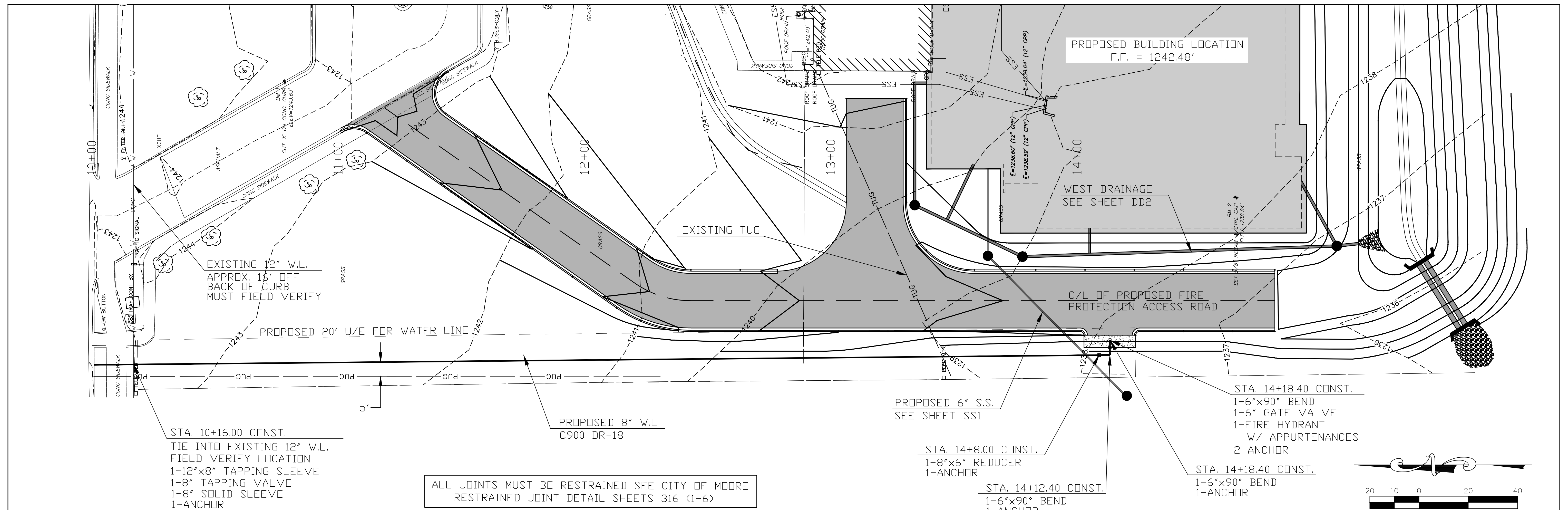
REVISED 8-15-22



WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 6-22-22	APPROVED BY:	DRAWN BY: MW
SANITARY SEWER SERVICE LINE PROFILE		SHEET NUMBER SS1
WDB ENGINEERING P.L.L.C.		



REVISED 8-15-22



WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 6-22-22	APPROVED BY:	DRAWN BY: MW
WATER LINE PROFILE		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER WL1

# STORM WATER MANAGEMENT PLAN

H: /JOBS/2959/PAVING/2959SW3P.DWG

## SITE DESCRIPTION

PROJECT LIMITS: E1/2, NE1/4, NW1/4 SECTION 24, T-10-N, R-3-W,  
CLEVELAND COUNTY

PROJECT DESCRIPTION: SITE GRADING, BUILDING CONSTRUCTION AND  
DRAINAGE

SUGGESTED SEQUENCE OF EROSION CONTROL ACTIVITIES:  
SOUTH TO NORTH

SOIL TYPE: SILT LOAM

AREA TO BE DISTURBED: 1.67 ACRES

OFFSITE AREA TO BE DISTURBED:  
(FOR CONTRACTOR USE) \_\_\_\_\_

MAXIMUM ACRES TO BE  
DISTURBED AT ANY ONE TIME:  
(FOR CONTRACTOR USE) \_\_\_\_\_

LATITUDE & LONGITUDE  
OF CENTER OF PROJECT: 35°19'58.7504"N, 97°28'11.6473"W

### PROJECT WILL DISCHARGE TO:

NAME OF RECEIVING WATERS: LITTLE RIVER

SENSITIVE WATERS OR WATERSHEDS:      YES       NO

303(d) IMPAIRED WATERS:              YES               NO

NOTE: THIS SHEET SHOULD BE USED IN CONJUNCTION WITH A DRAINAGE MAP THAT ILLUSTRATES THE DRAINAGE PATTERNS/PATHWAYS AND RECEIVING WATERS FOR THIS PROJECT. THIS SHEET SHOULD ALSO BE USED WITH THE EROSION CONTROL SUMMARIES, PAY ITEMS, & NOTES.

## EROSION AND SEDIMENT CONTROLS

### SOIL STABILIZATION PRACTICES:

- TEMPORARY SEEDING
- PERMANENT SODDING, SPRIGGING OR SEEDING
- VEGETATIVE MULCHING
- SOIL RETENTION BLANKET
- PRESERVATION OF EXISTING VEGETATION

NOTE: TEMPORARY EROSION CONTROL METHODS MUST BE USED ON ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITIES HAVE CEASED FOR OVER 14 DAYS. METHODS USED WILL BE AS SHOWN ON PLANS, OR AS DIRECTED BY THE ENGINEER.

### STRUCTURAL PRACTICES:

- STABILIZED CONSTRUCTION EXIT
- TEMPORARY SILT FENCE
- TEMPORARY SILT DIKES
- TEMPORARY FIBER LOG
- DIVERSION, INTERCEPTOR OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR OR PERIMETER SWALES
- ROCK FILTER DAMS
- TEMPORARY SLOPE DRAIN
- PAVED DITCH W/ DITCH LINER PROTECTION
- TEMPORARY DIVERSION CHANNELS
- TEMPORARY SEDIMENT BASINS
- TEMPORARY SEDIMENT TRAPS
- TEMPORARY SEDIMENT FILTERS
- TEMPORARY SEDIMENT REMOVAL
- RIP RAP
- INLET SEDIMENT FILTER
- TEMPORARY BRUSH SEDIMENT BARRIERS
- SANDBAG BERMS
- TEMPORARY STREAM CROSSINGS

### OFFSITE VEHICLE TRACKING:

- HAUL ROADS DAMPENED FOR DUST CONTROL
- LOADED HAUL TRUCKS TO BE COVERED W/ TARPAULIN
- EXCESS DIRT ON ROAD REMOVED DAILY

### NOTES:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE FOLLOWING:

### MAINTENANCE AND INSPECTION:

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 AND ANY NECESSARY REPAIRS SHALL BE PERFORMED ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCH AS RECORDED BY A NON-FREEZING RAIN GAUGE TO BE LOCATED ON SITE. POTENTIALLY ERODIBLE AREAS, DRAINAGE WAYS, MATERIAL STORAGE, STRUCTURAL DEVICES, CONSTRUCTION ENTRANCES AND EXITS ALONG WITH EROSION AND SEDIMENT CONTROL LOCATIONS ARE EXAMPLES OF SITES THAT NEED TO BE INSPECTED.

### WASTE MATERIAL:

PROPER MANAGEMENT AND DISPOSAL OF CONSTRUCTION WASTE MATERIAL IS REQUIRED BY THE CONTRACTOR. MATERIALS INCLUDE STOCKPILES, SURPLUS, DEBRIS AND ALL OTHER BY-PRODUCTS FROM THE CONSTRUCTION PROCESS. PRACTICES INCLUDE DISPOSAL, PROPER MATERIALS HANDLING, SPILL PREVENTION AND CLEANUP MEASURES. CONTROLS AND PRACTICES SHALL MEET THE REQUIREMENTS OF ALL FEDERAL, STATE AND LOCAL AGENCIES.

### HAZARDOUS MATERIALS:

PROPER MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE MATERIALS IS REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING MANUFACTURER'S RECOMMENDATIONS, STATE AND FEDERAL REGULATIONS TO ENSURE CORRECT HANDLING, DISPOSAL, SPILL PREVENTION AND CLEANUP MEASURES. EXAMPLES INCLUDE BUT ARE NOT LIMITED TO: PAINTS, ACIDS, CLEANING SOLVENTS, CHEMICAL ADDITIVES, CONCRETE CURING COMPOUNDS AND CONTAMINATED SOILS.

### GENERAL NOTES:

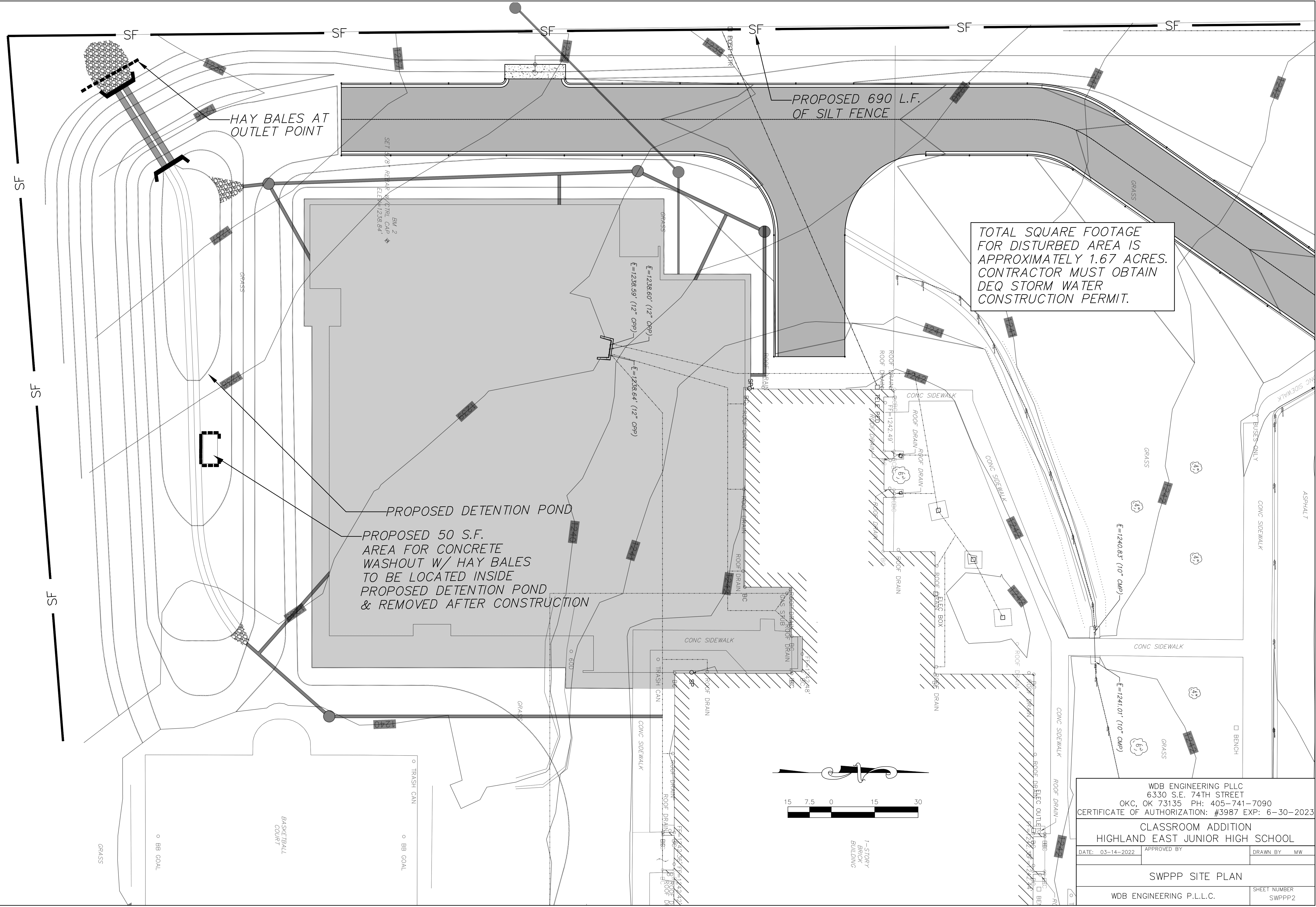
PROPER MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE MATERIALS IS REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING MANUFACTURER'S RECOMMENDATIONS, STATE AND FEDERAL REGULATIONS TO ENSURE CORRECT HANDLING, DISPOSAL, SPILL PREVENTION AND CLEANUP MEASURES. EXAMPLES INCLUDE BUT ARE NOT LIMITED TO: PAINTS, ACIDS, CLEANING SOLVENTS, CHEMICAL ADDITIVES, CONCRETE CURING COMPOUNDS AND CONTAMINATED SOILS.

THE FOLLOWING SECTIONS OF THE 2009 ODOT STANDARD SPECIFICATIONS SHOULD BE NOTED:

- 103.05 BONDING REQUIREMENTS
- 104.10 FINAL CLEANING UP
- 104.12 CONTRACTOR'S RESPONSIBILITY FOR WORK
- 104.13 ENVIRONMENTAL PROTECTION
- 106.08 STORAGE AND HANDLING MATERIAL
- 107.01 LAWS, RULES AND REGULATIONS TO BE OBSERVED
- 107.20 STORM WATER MANGEMENT
  - 220 MANAGEMENT OF EROSION, SEDIMENTATION AND STORM WATER POLLUTION PREVENTION AND CONTROL
  - 221 TEMPORARY SEDIMENT CONTROL

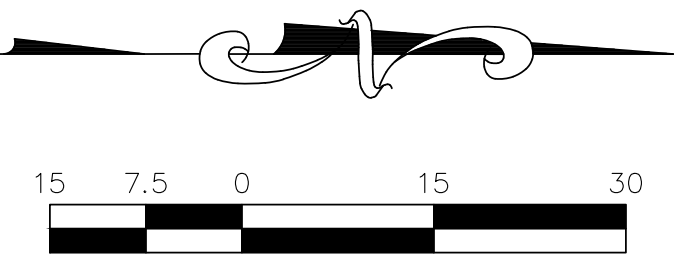
WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 03-14-2022	APPROVED BY	DRAWN BY MW
STORM WATER MANAGEMENT PLAN		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER SWPPP1

H:\AOBS\73264



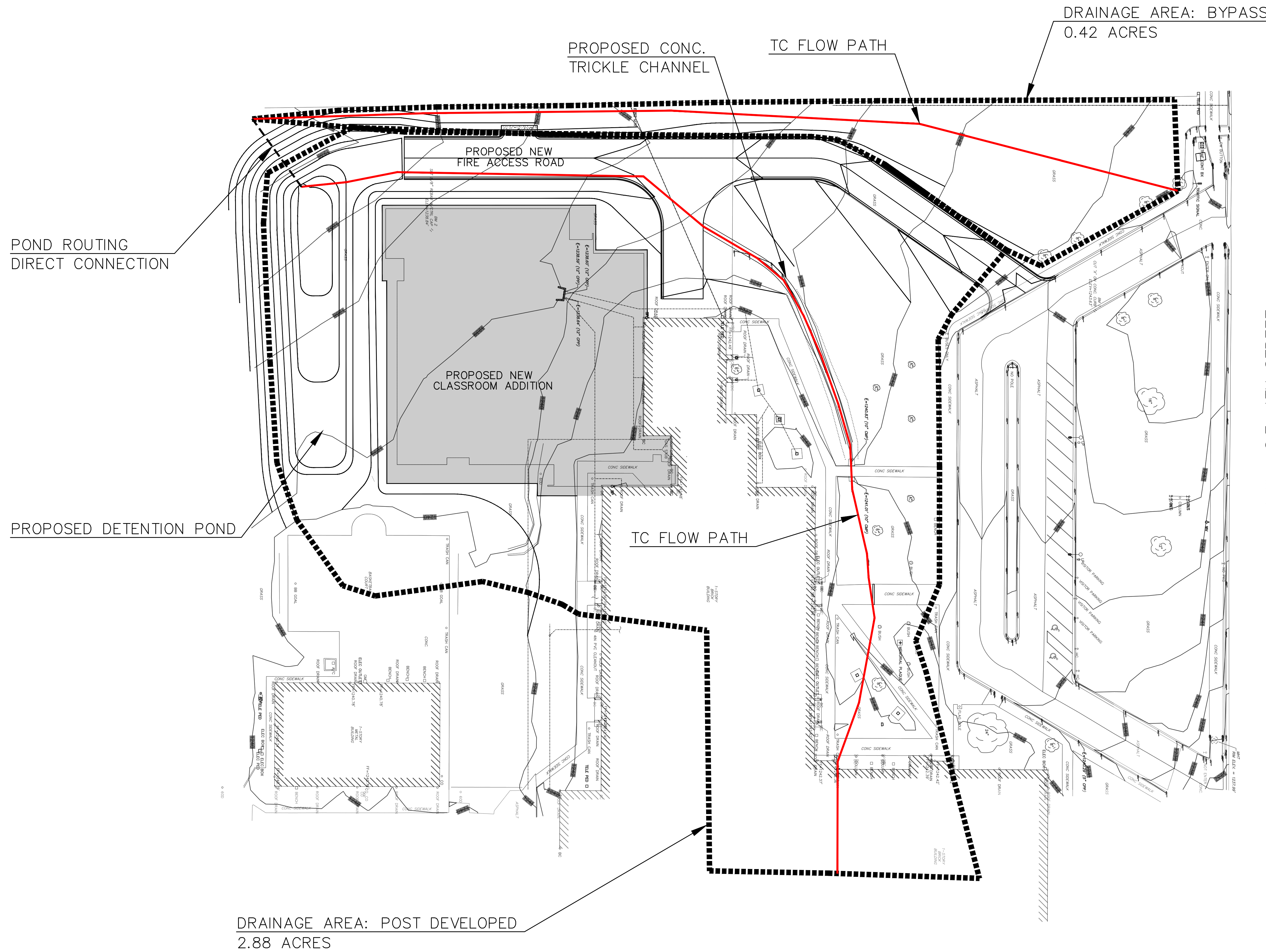
TOTAL SQUARE FOOTAGE FOR DISTURBED AREA IS APPROXIMATELY 1.67 ACRES. CONTRACTOR MUST OBTAIN DEQ STORM WATER CONSTRUCTION PERMIT.

PROPOSED DETENTION POND  
 PROPOSED 50 S.F. AREA FOR CONCRETE WASHOUT W/ HAY BALES TO BE LOCATED INSIDE PROPOSED DETENTION POND & REMOVED AFTER CONSTRUCTION



WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
<b>CLASSROOM ADDITION          HIGHLAND EAST JUNIOR HIGH SCHOOL</b>		
DATE: 03-14-2022	APPROVED BY:	DRAWN BY: MW
<b>SWPPP SITE PLAN</b>		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER SWPPP2





POND ROUTING  
DIRECT CONNECTION

PROPOSED DETENTION POND

DRAINAGE AREA: POST DEVELOPED  
2.88 ACRES

DRAINAGE AREA: BYPASS  
0.42 ACRES

PROPOSED CONC.  
TRICKLE CHANNEL

TC FLOW PATH

PROPOSED NEW  
FIRE ACCESS ROAD

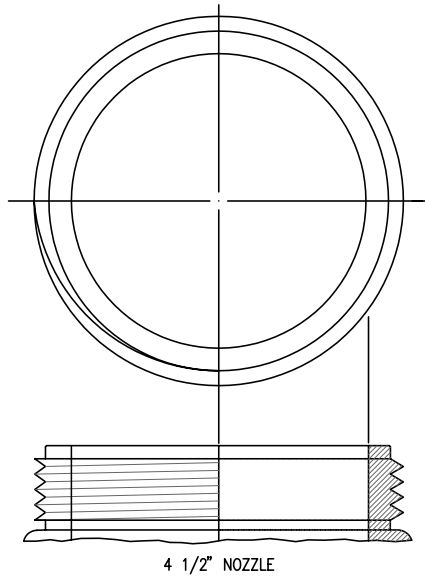
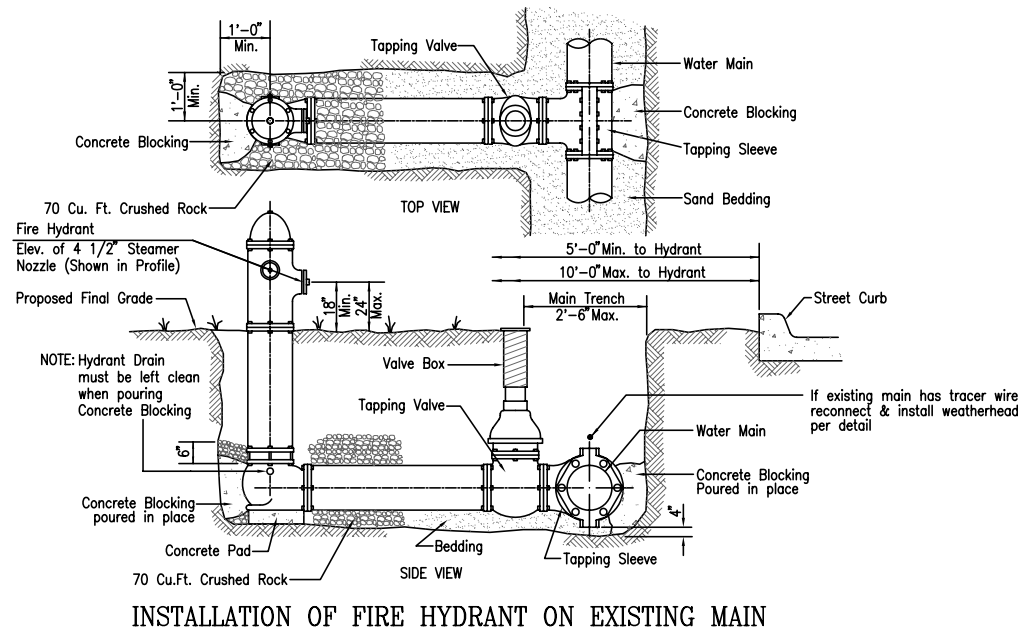
PROPOSED NEW  
CLASSROOM ADDITION

TC FLOW PATH

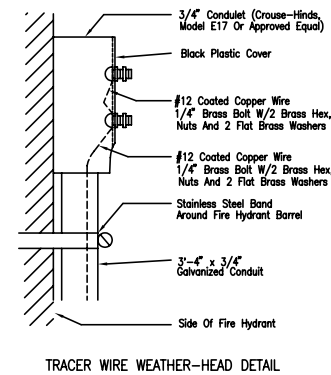
S.E. 4TH STREET

WDB ENGINEERING PLLC 6330 S.E. 74TH STREET OKC, OK 73135 PH: 405-741-7090 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023		
CLASSROOM ADDITION HIGHLAND EAST JUNIOR HIGH SCHOOL		
DATE: 6-25-2022	APPROVED BY:	DRAWN BY: MW
DRAINAGE MAP POST DEVELOPED		
WDB ENGINEERING P.L.L.C.		SHEET NUMBER DA2

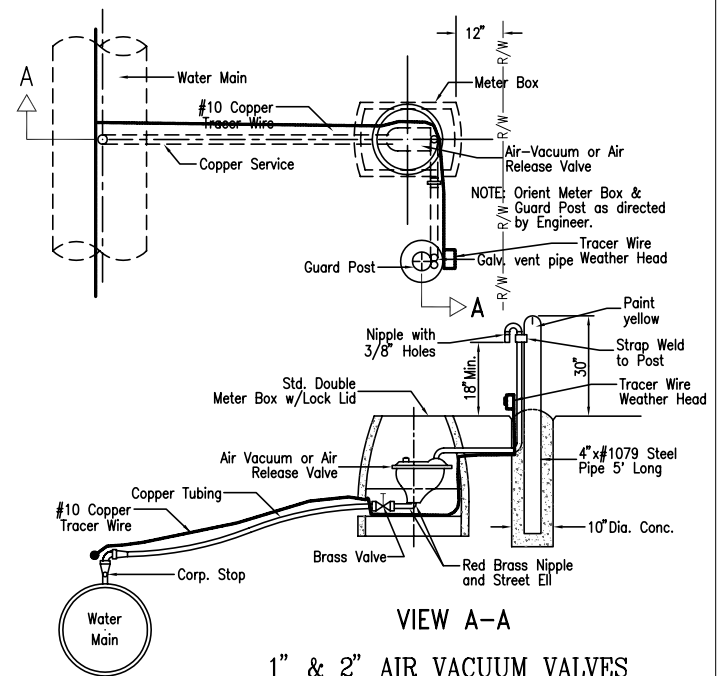
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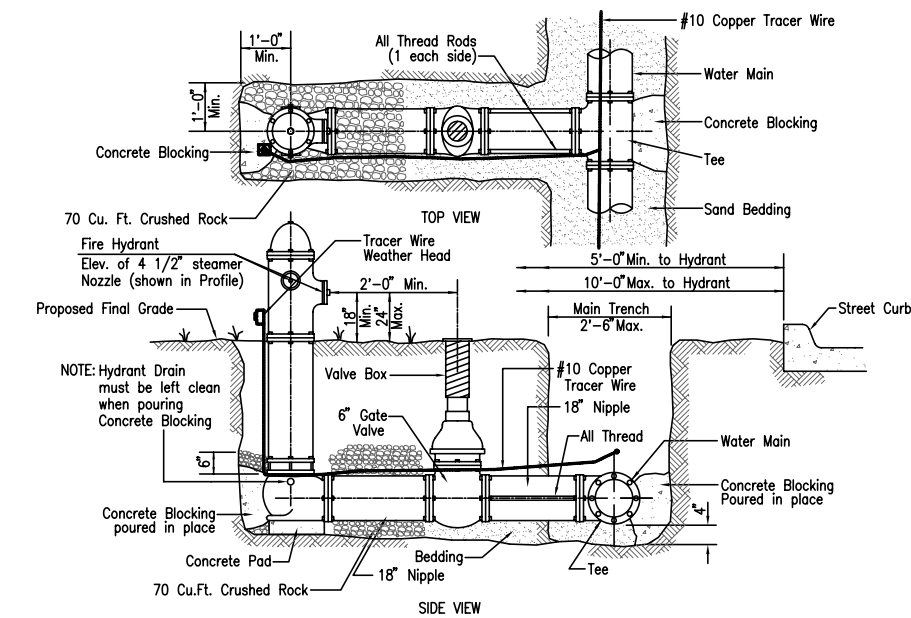
Threads Shall be National Standard Threads  
**FIRE HYDRANT NOZZLE THREADS**



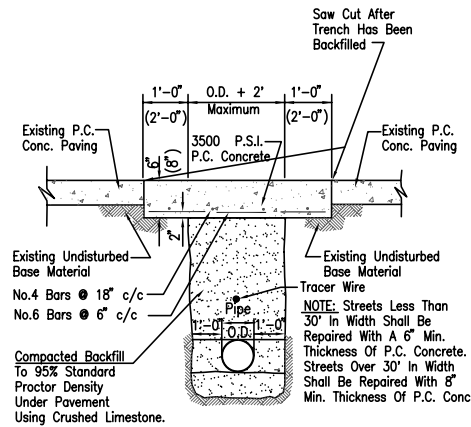
**TRACER WIRE WEATHER-HEAD DETAIL**



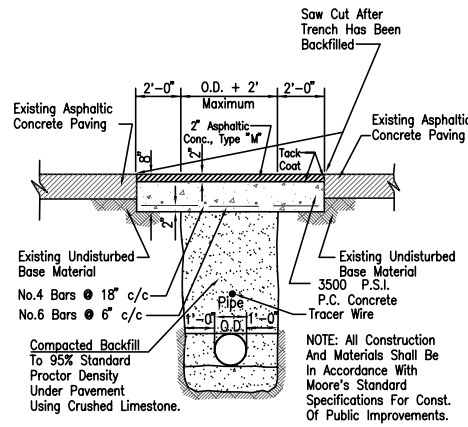
**1" & 2" AIR VACUUM VALVES**  
**3/4" AIR RELEASE VALVES**



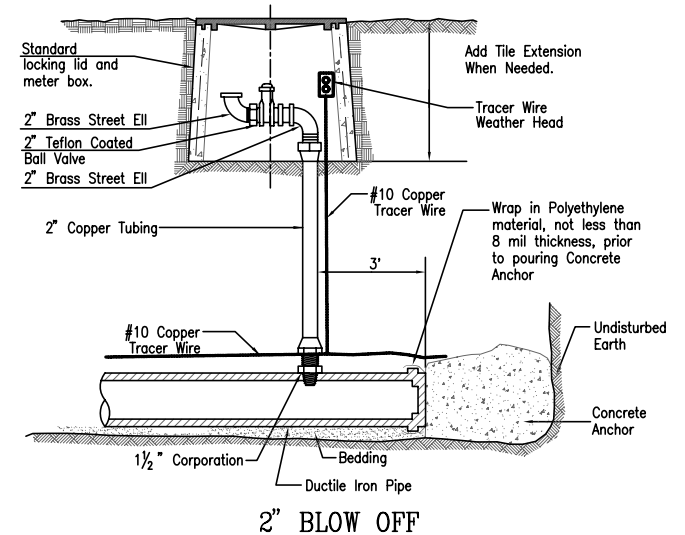
**INSTALLATION OF FIRE HYDRANT ON NEW MAIN**



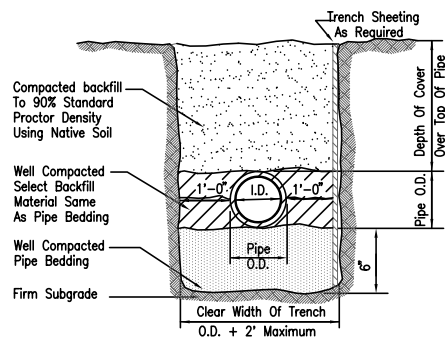
**TYPICAL PERMANENT REPAIR FOR P.C. CONCRETE PAVING**



**TYPICAL PERMANENT REPAIR FOR ASPHALTIC CONCRETE PAVING**



**2" BLOW OFF**



- 1) Pipe Bedding And Select Backfill Shall Be Well Graded Crushed Stone Or Crushed Gravel 1/4" To 1/2".
- 2) The Pipe Bedding And Select Backfill Shall Be Compacted To 90% Standard Proctor Density. Compaction Shall Be Done By Power Tamping.

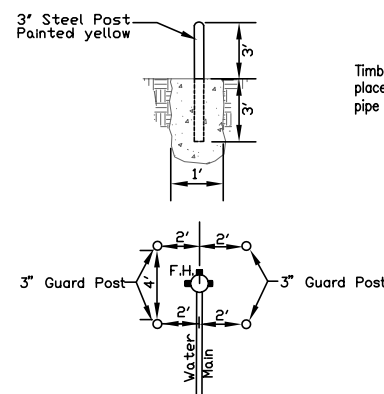
**TYPICAL BEDDING & TRENCH DETAILS**

- Standard Notes Water**
- Note 1 All Fire Hydrants & Valve Boxes to be set to proposed final grade with 4 1/2" steamer nozzle a minimum at 18" & a Maximum of 24" above ground level. All fire hydrants to have ductile iron leads.
  - Note 2 All existing water mains being abandoned by this project are to remain the property of the City of Moore and shall be salvaged by the Water/Wastewater Department at their discretion. However, items in the way of construction may be removed and delivered to the Water Department Warehouse.
  - Note 3 Concrete encase Sanitary Sewer or install Cast Iron Pipe 10 feet either side of water main, to be measured at right angles, in accordance with Oklahoma Department of Environmental Quality Standards.
  - Note 4 When crossing streets, driveways subject to heavy traffic, alleys and structures, etc., pipe shall be installed with special backfill, see detail this sheet. All other pipe to be installed in accordance with manufacturers recommendations or City specification.

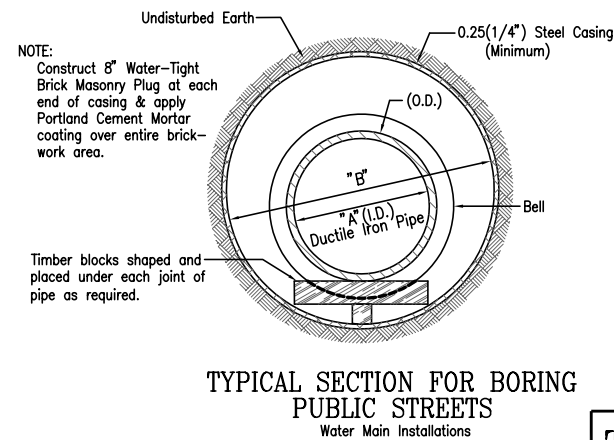
**General Note**

All construction to be in accordance with current City Standards and Specifications

- Note 5 Set end of main stubs in Cul-de-sacs at a point 5.0' off property line. This point being in line with side property line.
- Note 6 In instances where flow lines are not indicated on the drawings, main shall be constructed with a minimum of 4' cover or as directed by the Field Engineer.
- Note 7 All staking for alignment and grade will be done under the supervision of a Registered Professional Engineer or a Registered Land Surveyor. Grade stakes will be marked and cut sheets will be furnished to the City Inspector on the project prior to construction.
- Note 8 Unless specifically authorized, all Gate Valves are to be located at P.C. or P.T. of street curb. When Fire Hydrants are required they shall be located within 5' of Gate Valves.
- Note 9 Poly wrap all cast or ductile steel fittings prior to backfilling or placing concrete blocking.



**GUARD POST DETAIL**  
TYPICAL ALL HYDRANTS LOCATED IN TRAFFIC AREAS



**TYPICAL SECTION FOR BORING PUBLIC STREETS**  
Water Main Installations

PIPE & STEEL CASING SCHEDULE	
PIPE DIAMETER "A"	CASING DIAMETER "B"
4	10"
6	12"
8	14" or 16"
10	18"
12	20"
16	24"
18	26"
20	30"
24	33"

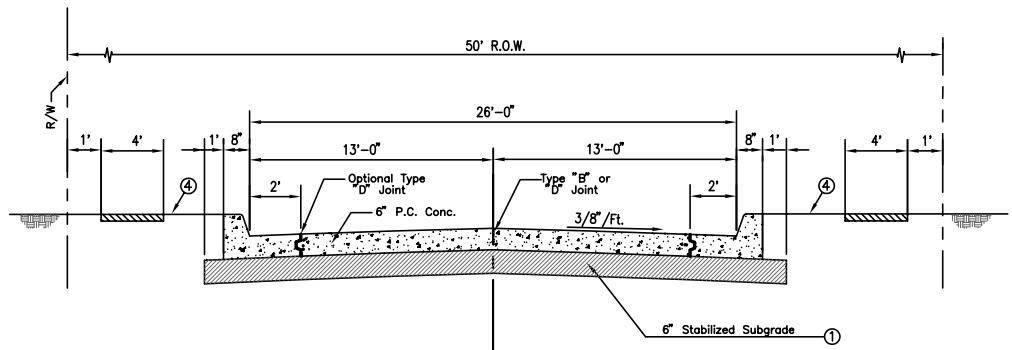
**The City of MOORE Oklahoma**



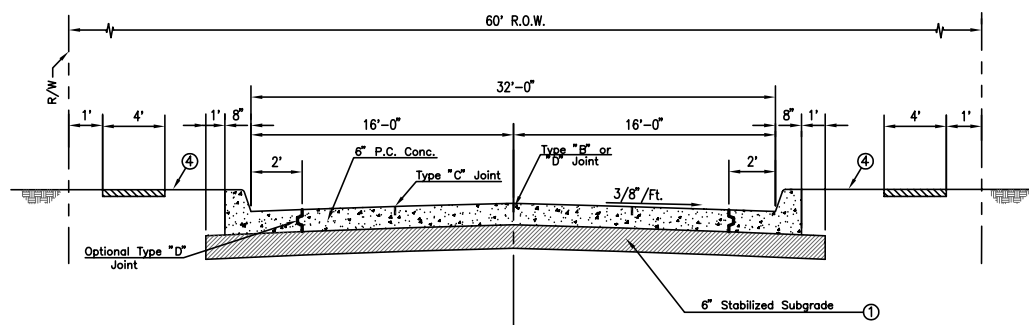
**Water Standard Details No. 101**

APPROVED BY: *Donald Vick* DATE: 03/06/2008  
DONALD VICK, P.E. CITY ENGINEER  
REVISOR: 03/05/2008

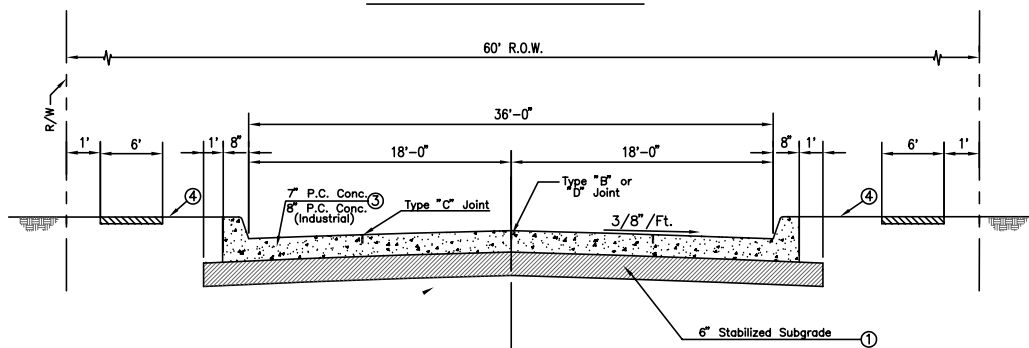




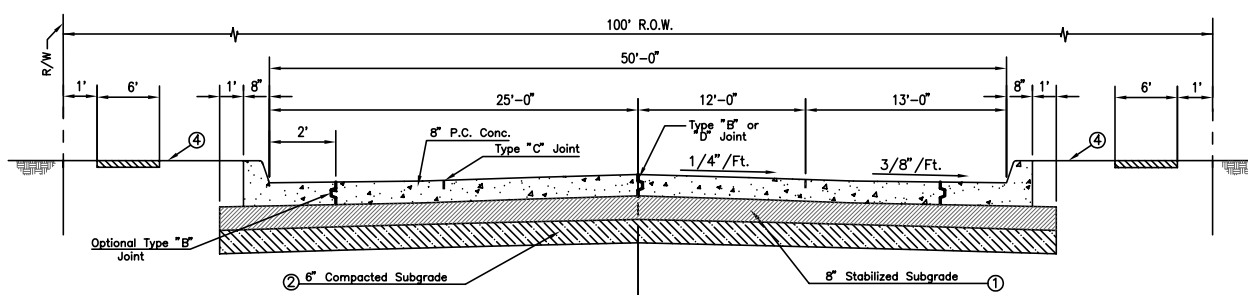
RESIDENTIAL LOCAL



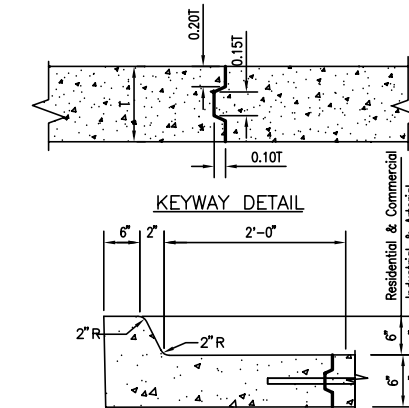
RESIDENTIAL COLLECTOR



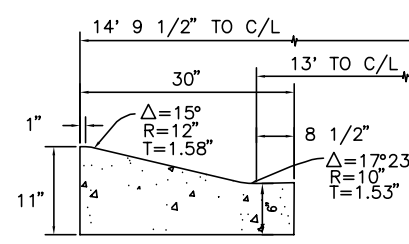
COMMERCIAL or INDUSTRIAL



ARTERIAL



KEYWAY DETAIL  
RESIDENTIAL & Commercial  
Industrial & Arterial

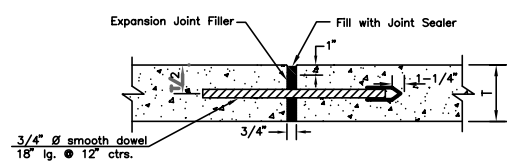


STANDARD MOUNTABLE CURB  
RESIDENTIAL STREET ONLY

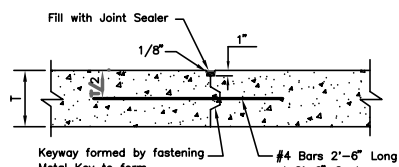
NOTE: Where Type 'D' Joint is used 2' from face of Curb, Eliminate Type 'C' Joint Shown.

- ① Base additive per geotechnical recommendation
- ② Compacted to 95% Standard Proctor Density
- ③ Industrial Zones shall be 8" Thick
- ④ Slope down to top of curb from edge of sidewalk at 1/2" /ft. minimum, 3' ft./ft. maximum.

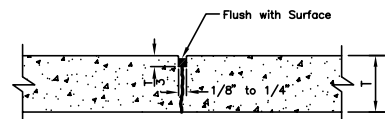
PORTLAND CEMENT CONCRETE STREET SECTIONS



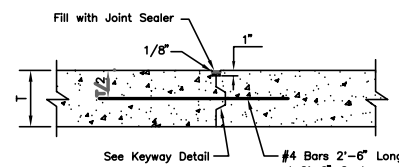
EXPANSION JOINT  
TYPE 'A'



TIED LONGITUDINAL JOINT  
TYPE 'B'



SAWED CONTRACTION JOINT  
TYPE 'C'



CONSTRUCTION JOINT  
TYPE 'D'

BASE TREATMENTS

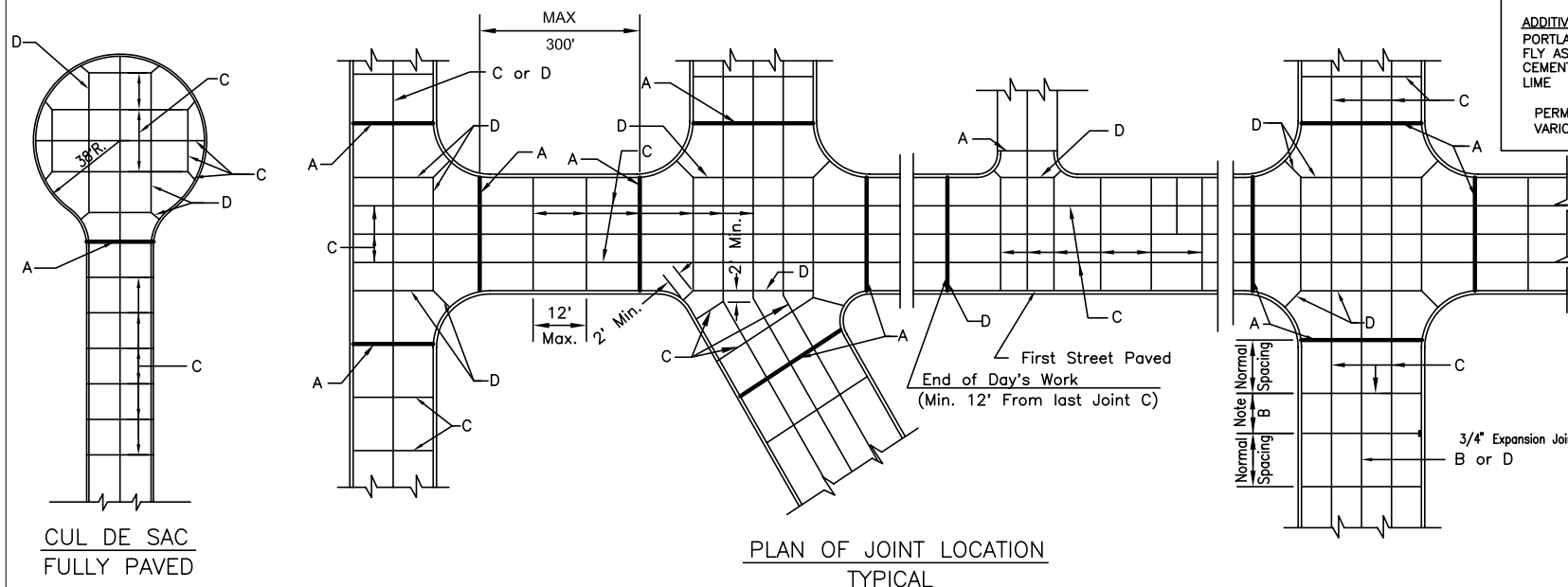
ADDITIVE	SOIL TYPE - AASHTO M145						
	A-1	A-2	A-3	A-4	A-5	A-6	A-7
PORTLAND CEMENT	X	X	X	X	X	X	X
FLY ASH	X	X	X	X	X	X	X
CEMENT KILN DUST	X	X	X	X	X	X	X
LIME						X	X

PERMITTED SOIL STABILIZATION MATERIALS FOR VARIOUS SOIL GROUPS

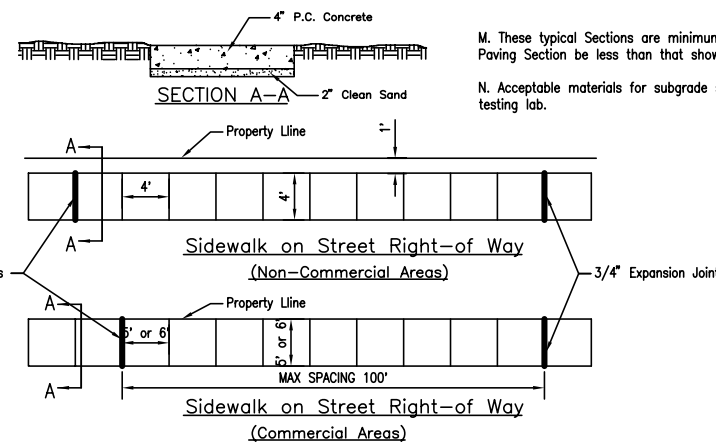
- GENERAL NOTES**
- A. Expansion joint material shall be placed between the paving and any structure within or adjacent to the paving. Expansion joint material shall extend completely through the curb and slab.
  - B. When a joint falls within 5 ft. of, or contacts basins, manholes, or other structures, shorten one or more panels either side of the opening to permit joint to fall on the round structures and at corners of rectangular structures.
  - C. All transverse joints shall extend through curbs and shall be continuous across pavement. Expansion joints will not be required except at structures and as shown on the joint layout plan.
  - D. Maximum transverse joint spacing shall be 12'.
  - E. The subgrade shall be thoroughly compacted to 95% Standard Density with suitable equipment so as to have uniform density at moisture contents of not less than 2% above standard optimum (AASHTO T98)
  - F. Unless otherwise noted or shown, P.C. Concrete Paving, Plant Mix Asphalt Concrete Paving, and Curb and Gutter (materials, construction methods and testing requirements) shall conform to the Most Current Oklahoma Standard Department of Transportation Standard Specifications for Highway Construction.
  - G. Transverse grooving will not be required except on arterial streets.
  - H. Joint sealer shall conform to the requirements of ASTM D1190, "Concrete Joint Sealant, Hot Poured Elastic Type".
  - I. Prefomed expansion joint filler shall conform to the requirements of AASHTO M 213 for bituminous joint filler.
  - J. The percentage of Base additive used for Treated subgrade shall be determined by laboratory tests submitted to the City for approval. Construction methods and materials shall conform to the Most Current Oklahoma Standard Specifications for Highway Construction.
  - K. Aggregate base (materials and construction methods) shall conform to the Most Current Oklahoma Standard Specifications for Highway Construction except that the gradation shall be as follows:
 

Sieve Size	Percent Passing
1 1/2"	100
3/4"	90-100
No. 4	30-85
No. 200	10-20
  - L. Trenches under the proposed paving shall be backfilled to the top of the trench with granular material meeting the following gradation:
 

Sieve Size	Percent Passing
1 1/2"	100
No. 4	60-100
No. 40	10-40
No. 200	5-25
  - M. These typical Sections are minimum designs. Actual paving sections shall be determined by a qualified testing lab. In no case shall the Paving Section be less than that shown on this standard.
  - N. Acceptable materials for subgrade stabilization are Lime, Fly Ash, Portland Cement, or CKD. The determination shall be by a qualified testing lab.



PLAN OF JOINT LOCATION  
TYPICAL



SECTION A-A  
Sidewalk on Street Right-of Way  
(Non-Commercial Areas)

Property Line

3/4" Expansion Joints

MAX SPACING 100'

Sidewalk on Street Right-of Way  
(Commercial Areas)

The City of MOORE Oklahoma

Standard Typical Sections  
P.C. Concrete Paving  
Std. 201

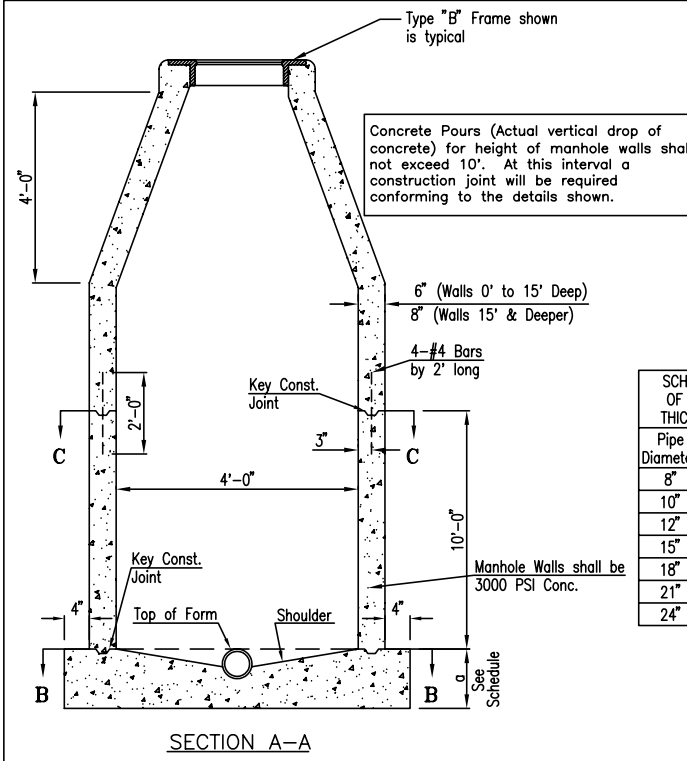
APPROVED BY: *Donald Vick* DATE: 03/06/2008  
DONALD VICK, P.E. CITY ENGINEER

REVISED: 03/05/2008

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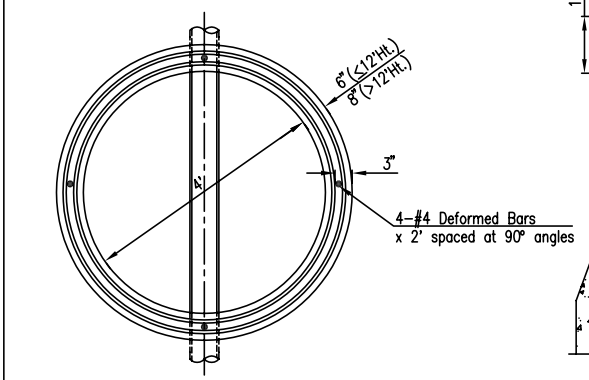
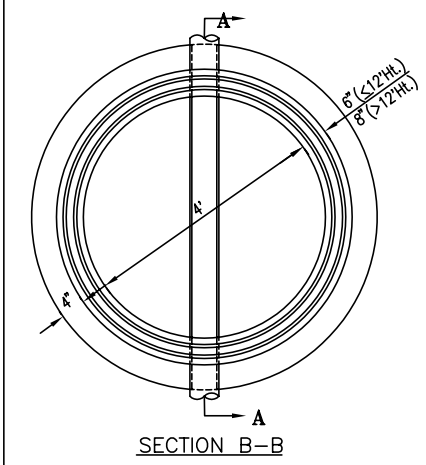


SCHEDULE OF BASE THICKNESS

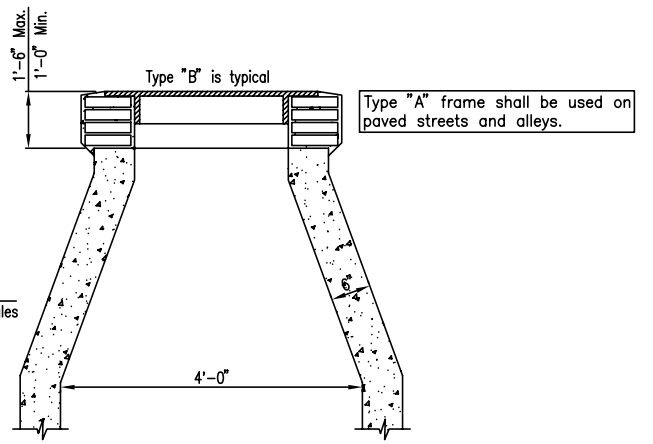
Pipe Diameter	a
8"	1'-6"
10"	1'-8"
12"	1'-11"
15"	2'-2"
18"	2'-6"
21"	2'-10"
24"	3'-1"

**KEY CONSTRUCTION JOINT FOR BOTTOM & WALLS DETAIL**  
N.T.S.

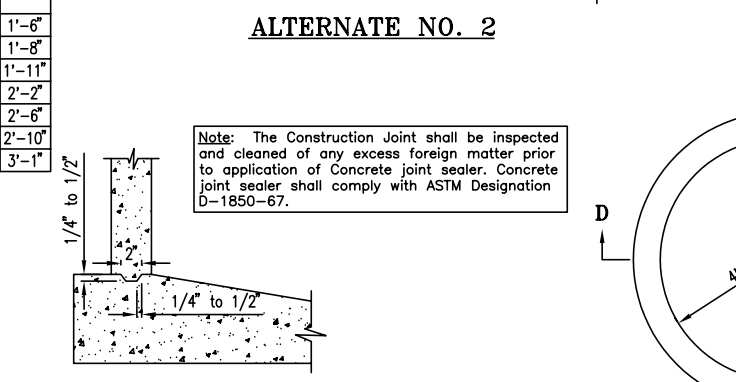
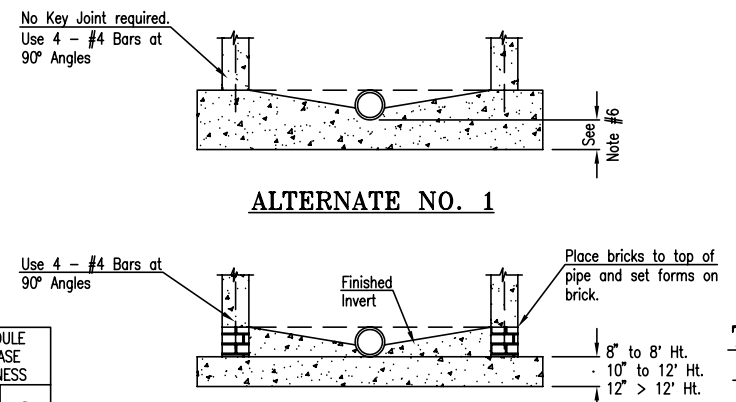
Note: The following Alternate Concrete Mix may be permitted:  
Mix design: 3000 lb. pump mix, 1416 lb. of rock, 1700 lb. of sand, 5 1/2 bags of cement, or 517 lbs., and sufficient water to produce a 4" slump. No vibration required when placing this mix.



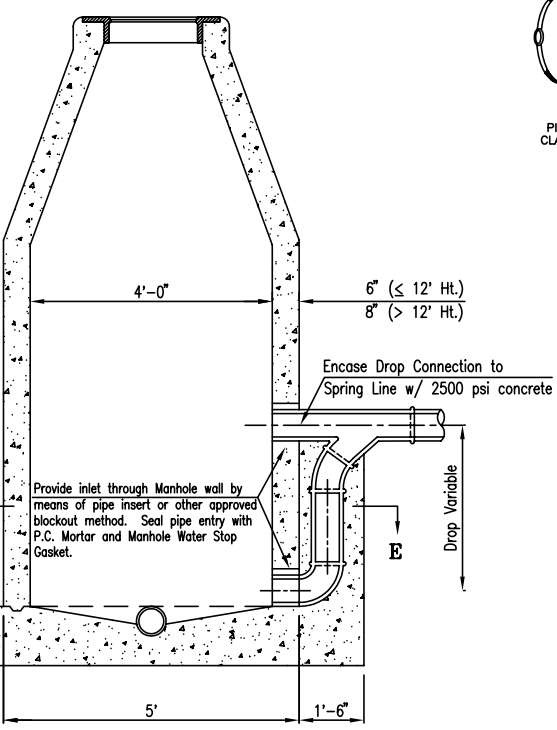
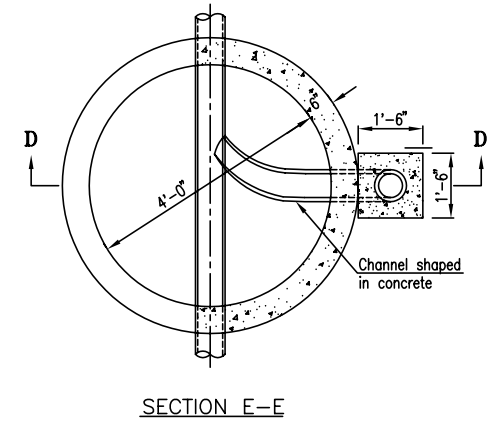
**POURED-IN-PLACE STANDARD MANHOLE**  
N.T.S.



**TYPICAL SECTION TO BE USED WITHIN STREET RIGHT-OF-WAY**  
N.T.S.

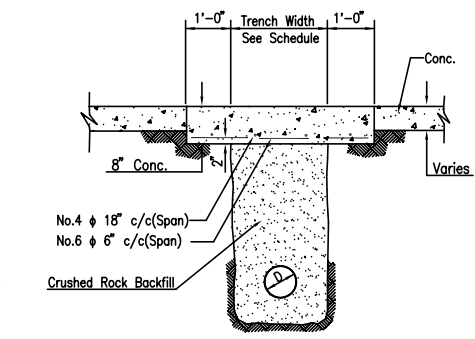


Note: The Construction Joint shall be inspected and cleaned of any excess foreign matter prior to application of Concrete joint sealer. Concrete joint sealer shall comply with ASTM Designation D-1850-67.

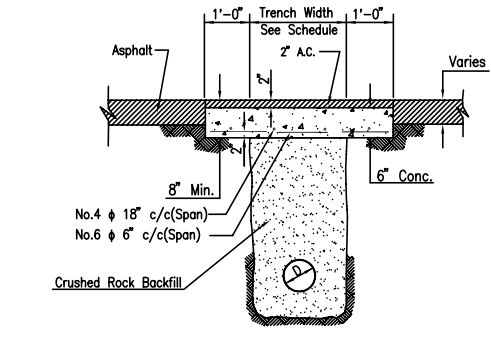


**POURED-IN-PLACE DROP MANHOLE**  
N.T.S.

**TYPICAL PERMANENT REPAIR FOR P.C. CONCRETE PAVING**

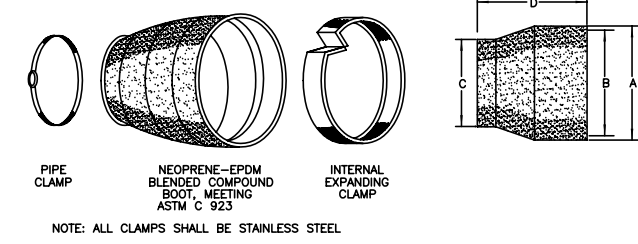
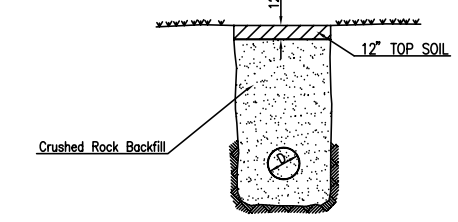


**TYPICAL PERMANENT REPAIR FOR ASPHALTIC CONCRETE PAVING**



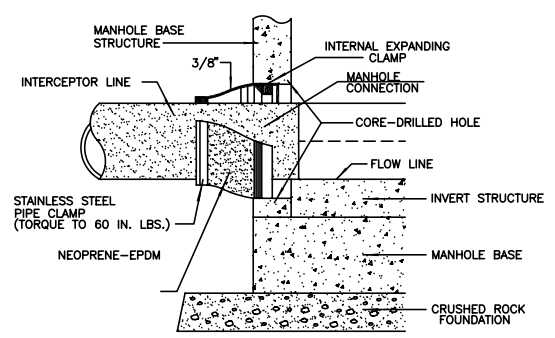
NOTE: IF SANITARY SEWER IS INSTALLED IN FRONT YARD OR STREET R/W THE DITCH SHALL BE BACKFILLED WITH ROCK TO WITHIN 12" OF FINAL GRADE.

**TYPICAL SECTION FOR FRONT YARD SEWERS**



SUGGESTED HOLE & BOOT DIAMETER DIMENSIONS

PIPE O.D. RANGE	A	B	C	D
3 1/2" - 4 1/2"	7"	6 1/8"	4 1/4"	6"
5 3/8" - 7"	12"	10 7/8"	6 1/2"	8"
7" - 8 1/2"	12"	10 7/8"	8"	8"
8 3/16" - 9 3/4"	12"	10 7/8"	9 1/4"	8"
9 1/4" - 11"	16"	14 7/8"	10 1/2"	8"
10 3/4" - 12 1/2"	16"	14 7/8"	12"	8"
12" - 13 3/4"	16"	14 7/8"	13 1/4"	8"
14 1/2" - 16 1/4"	20"	18 7/8"	15 3/4"	8"
15 3/4" - 17 1/2"	20"	18 7/8"	17"	8"
19 1/2" - 21 1/4"	24"	22 7/8"	20 3/4"	8"

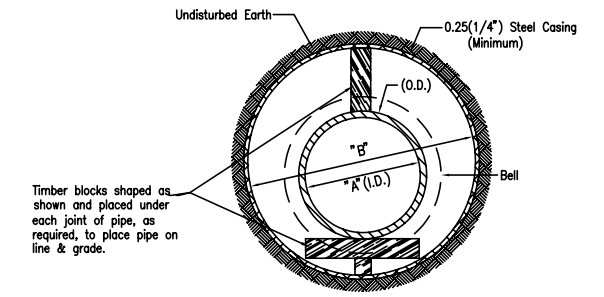


**STANDARD DETAIL FOR MANHOLE-PIPE CONNECTION**

**GENERAL NOTES FOR POURED-IN-PLACE MANHOLES**

- Materials for concrete shall conform, as a minimum to the following current specifications:  
Portland Cement: ASTM C 150  
Aggregate for Mortar: ASTM C 144  
Fine & Coarse Aggregate: ASTM C 33  
Water: Clean and free from deleterious substances. Total water content of concrete shall not exceed 6.5 gallons (54.2 liters) of water per 100 pounds (100 kg) of cement in the mix.
- The base shall be constructed of concrete having a minimum 3500 PSI compressive strength at 28 days (20,684 kn/cm) and with a maximum slump of 4 inches (10 cm), vibrated or tamped. The base shall have a minimum diameter of 8 inches (20 cm) greater than the outside diameter of the manhole.
- The invert flow channel shall be formed during or immediately after the pouring of the manhole base and brush finished as soon as the concrete has sufficiently set. The flow channel through manholes shall be made to conform in shape and in slope to that of the sewers. Sewer pipe, with the top half removed, shall be laid through the manhole whenever possible.  
The inside bottom of the manhole shall rise a minimum of 1 inch per foot (8.3 cm/m) from the side of the pipe or the flow channel to the wall of the manhole. Dips or projections capable of holding water or solid materials will not be permitted. The concrete shall set for 24 hours before any pipe inside the manhole is trimmed.
- All sewers constructed of rigid or semi-rigid pipe extending from all manholes shall be encased with concrete with a distance of 3 feet (0.9 m) from the outside wall of the manhole. This support may be deleted if a flexible watertight gasket is used to connect the sewer to the manhole. No support is required for sewers constructed of flexible pipe.
- Wall thickness uniformity shall be obtained through the use of spacers located at the top and bottom of the manhole. For deep manholes, spacers located at a depth of one-half the manhole depth shall also be utilized. Wall thickness shall be 6" for manholes 0' to 12' deep and wall thickness shall be 8" for manholes greater than 12' deep.
- The base may be poured monolithically with the rest of the manhole. The base shall have a minimum thickness under the pipe as follows:  
0 ft. to 8 ft. (0 - 2.4 m) manhole heights: 8 inches  
8 ft. to 12 ft. (2.4 - 3.7 m) manhole heights: 10 inches  
12 ft. (3.7 m) and above manhole heights: 12 inches
- The construction joint shall be inspected and cleaned of any excess foreign matter prior to application of concrete joint sealer. Concrete joint sealer shall comply with ASTM Designation D 1850-67.
- Forms shall be provided for the shaping and finishing of the manhole bottoms. A minimum interval of 24 hours shall elapse prior to pouring of manhole walls. Construction of manhole bottoms shall comply with the standard specifications for the construction of sanitary sewers and appurtenances.
- Mortar for finishing and sealing shall be Class "C". Any honeycombing of concrete less than 2" deep in 6" manhole walls may be repaired using Class "D" Mortar.
- This manhole is standard only for sewers 36" in diameter or less provided that at junction points, special manholes may be required for sewers smaller than 36" in diameter.
- Interior surfaces of all manhole walls shall receive two (2) coats of an approved sealer. A minimum interval of 24 hours shall elapse between applications of coating.
- Manholes shall conform to the requirements of Oklahoma State Department of Environmental Quality. The more restrictive requirement between The City of Moore and The ODEQ shall govern in cases where there are discrepancies.

**TYPICAL SECTION FOR BORING PUBLIC STREETS**



The City of MOORE Oklahoma

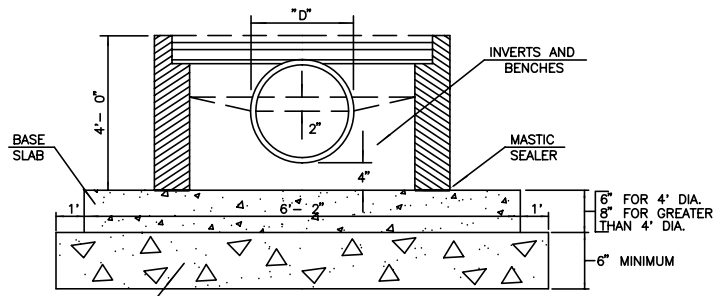
Poured-in-Place Manhole Sanitary Sewer Standard Details No. 301

APPROVED BY: *Donald Wick* DATE: 03/06/2008  
DONALD WICK, P.E. CITY ENGINEER

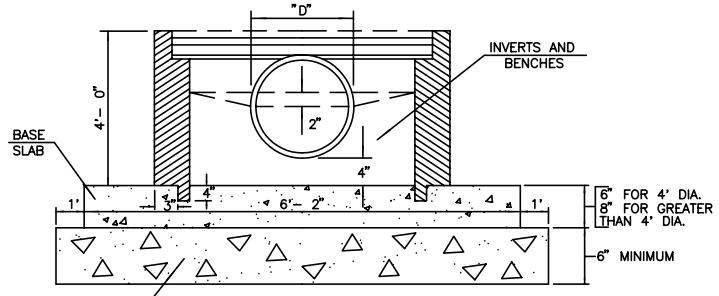
REVISED: 03/05/2008

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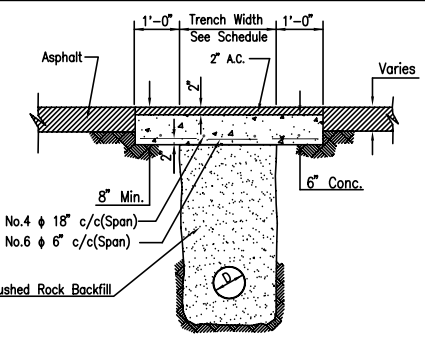
### STANDARD DETAIL FOR BASE SECTIONS



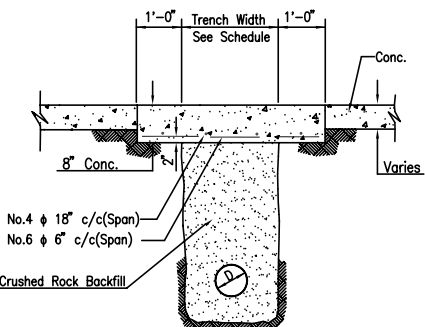
**BASE RISER SECTION  
WITH MASTIC SEALER  
OPTION "A"**



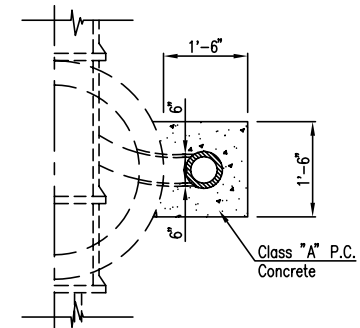
**BASE RISER SECTION  
WITH PREFORMED SOCKET  
OPTION "B"**



**TYPICAL PERMANENT REPAIR  
FOR ASPHALTIC CONCRETE PAVING**



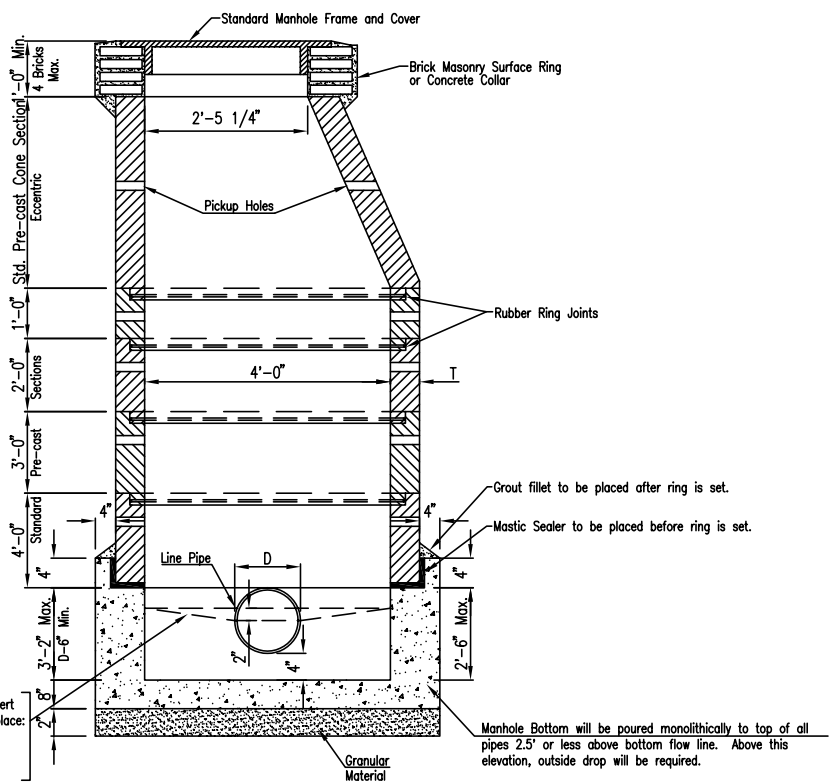
**TYPICAL PERMANENT REPAIR  
FOR P.C. CONCRETE PAVING**



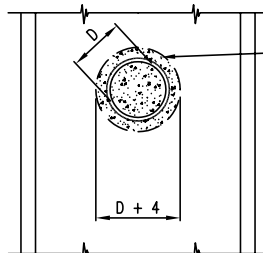
**SECTION A-A**

### GENERAL NOTES FOR PRECAST MANHOLES

- All pre-cast components shall be reinforced per their respective ASTM specifications.
- All joints shall have approved rubber rings.
- All lifting holes shall be repaired with a mixture of cement and sand grout firmly packed.
- The interior surfaces of manhole and cone sections shall be coated with two (2) coats of approved sealer.
- The minimum compressive strength of the concrete in manhole and cone sections shall be 4000 PSI.
- Cement used in the construction of pre-cast reinforced concrete manholes shall conform to the requirements of the standard specifications for portland cement (ASTM designation: C 150).
- The minimum shell thickness for pre-cast concrete reinforced manholes shall be:  
At a depth of 0 to 16 feet One-twelfth internal shell diameter or 4 inches (10cm), whichever is greater.  
At a depth greater than 16 feet One-twelfth internal shell diameter or 5 inches (13cm), whichever is greater.
- Any pre-cast reinforced concrete section which has been damaged in transit or on site such that the water tightness of the section has been affected adversely shall not be utilized in the construction of the manholes.
- Materials for concrete used for manhole bases shall conform, as a minimum, to the following current specifications:  
Portland Cement ASTM C 150  
Aggregate for Mortar ASTM C 144  
Fine & Coarse Aggregate ASTM C 33  
Water: Clean and free from deleterious substances. Total water content of concrete shall not exceed 6.5 gallons (54.2) of water per 100 pounds (100kg) of cement in the mix.
- The base shall be poured of a minimum 3500 PSI (20,684kn/sm) concrete with a maximum slump of 4 inches (10cm), vibrated or tamped. The base shall have a minimum diameter of 8 inches (20cm) greater than the outside diameter of the manhole. The base shall have a minimum of 8 inch (20cm) thickness beneath the manhole wall.
- The invert flow channel shall be formed during or immediately after the pouring of the manhole base and brush finished as soon as the concrete has sufficiently set. The flow channel through manholes shall be made to conform to shape and in slope to that of the sewers. Sewer pipe, with the top half removed, shall be laid through the manhole whenever possible. The inside bottom of the manhole shall rise a minimum of 1 inch per foot (8.3 cm/m) from the side of the pipe or the flow channel to the wall of the manhole. Dips or projections capable of holding water or solid materials will not be permitted. The concrete shall set for 24 hours before any pipe inside the manhole is trimmed.
- All sewer constructed of rigid or semi-rigid pipe extending from all manholes shall be encased with concrete for a distance of 3 feet (0.9m) from the outside wall of the manhole. This support may be deleted if a flexible, watertight gasket is used to connect the sewer to the manhole. No support is required for sewers constructed of flexible pipe.
- The interior surface of all manhole walls shall receive two (2) coats of an approved sealer. A minimum 24 hours shall elapse between coats.
- Manholes shall conform to the requirements of Oklahoma Department of Environmental Quality. The more restrictive requirement between The City of Moore and The ODEQ shall govern in cases where there are discrepancies.

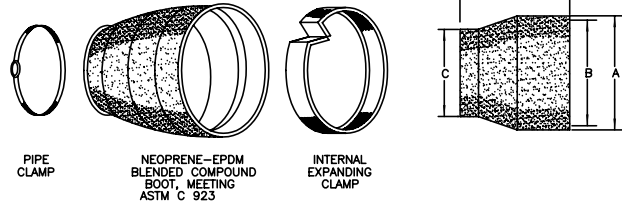


**TYPICAL BASE DETAILS  
4'-0" DIAMETER MANHOLE  
(Eccentric Cone)**  
N.T.S.



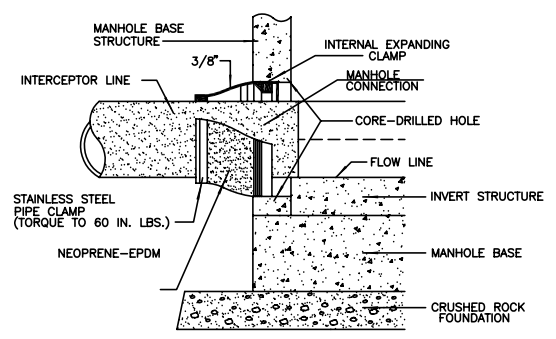
### PIPE CONNECTION DETAILS

Shop shall score concrete walls to dimensions shown. Reinforcing to be cut on job site.

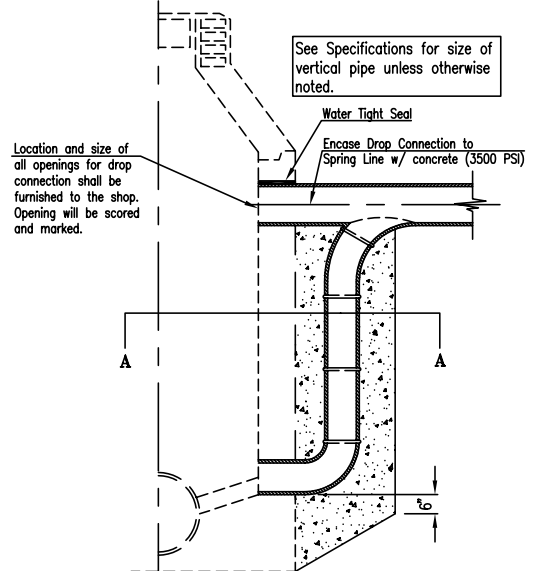


NOTE: ALL CLAMPS SHALL BE STAINLESS STEEL

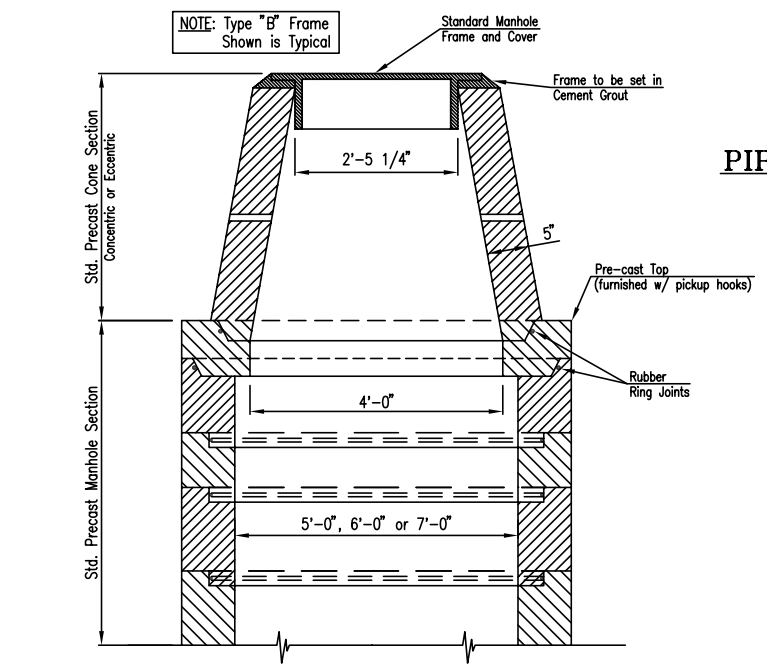
SUGGESTED PIPE O.D. RANGE	HOLE & BOOT DIAMETER DIMENSIONS			
	A	B	C	D
3 1/2" - 4 1/2"	7"	6 1/8"	4 1/4"	6"
5 3/8" - 7"	12"	10 7/8"	6 1/2"	8"
7" - 8 1/2"	12"	10 7/8"	8"	8"
8 3/16" - 9 3/4"	12"	10 7/8"	9 1/4"	8"
9 1/4" - 11"	16"	14 7/8"	10 1/2"	8"
10 3/4" - 12 1/2"	16"	14 7/8"	12"	8"
12" - 13 3/4"	16"	14 7/8"	13 1/4"	8"
14 1/2" - 16 1/4"	20"	18 7/8"	15 3/4"	8"
15 3/4" - 17 1/2"	20"	18 7/8"	17"	8"
19 1/2" - 21 1/4"	24"	22 7/8"	20 3/4"	8"



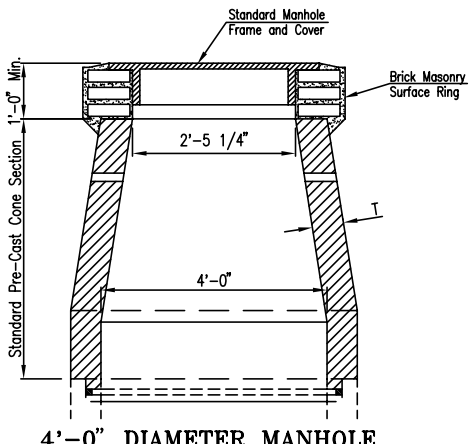
**STANDARD DETAIL FOR  
MANHOLE-PIPE CONNECTION**  
N.T.S.



**DROP MANHOLE CONNECTION**  
N.T.S.




**5'-0", 6'-0" & 7'-0" DIAMETER MANHOLE**  
N.T.S.



**4'-0" DIAMETER MANHOLE  
(Concentric Cone)**  
N.T.S.  
BUILT IN STREET R/W

### TYPICAL SECTION FOR BORING PUBLIC STREETS



**The City of MOORE Oklahoma**

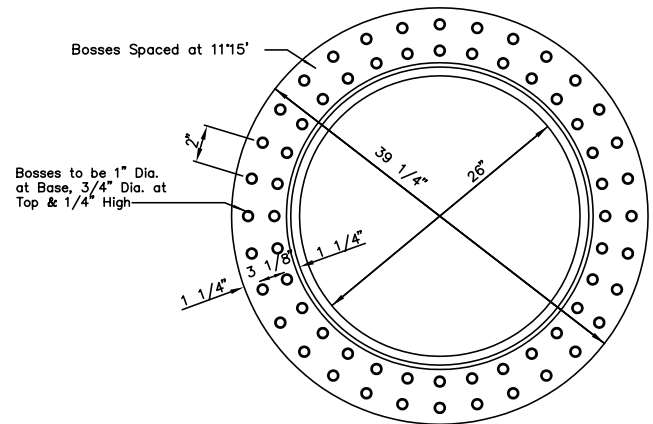
Precast Manhole  
Sanitary Sewer  
Standard Details  
No. 302

APPROVED BY: *Donald Wick*  
DONALD WICK, P.E.  
CITY ENGINEER

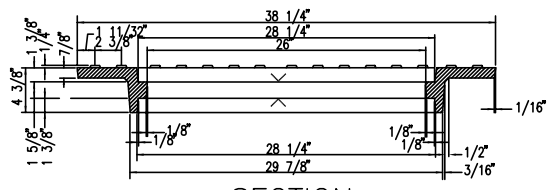
DATE: 03/06/2008

REVISED:  
03/05/2008

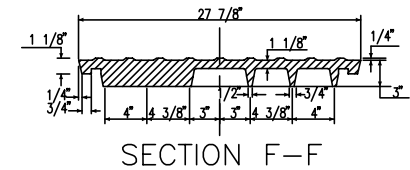
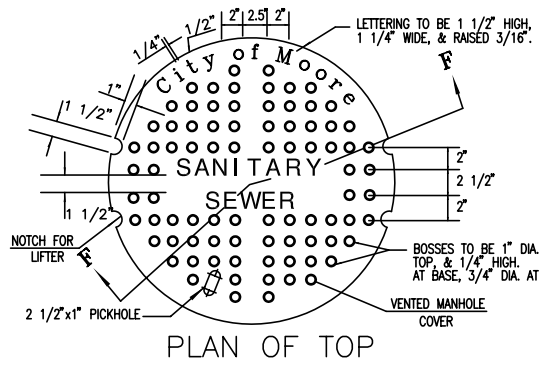
R:\DRAFTING LIBRARY\Standards\Moore\2008 revised\SEWER\_303.dwg, 5/16/2008 1:57:22 PM, Adobe PDF.pc3, 1:2.04651



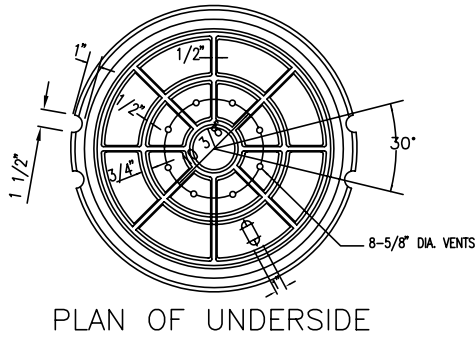
**REVERSIBLE FRAME FOR TYPE "A" OR TYPE "B" INSTALLATION**  
N.T.S.



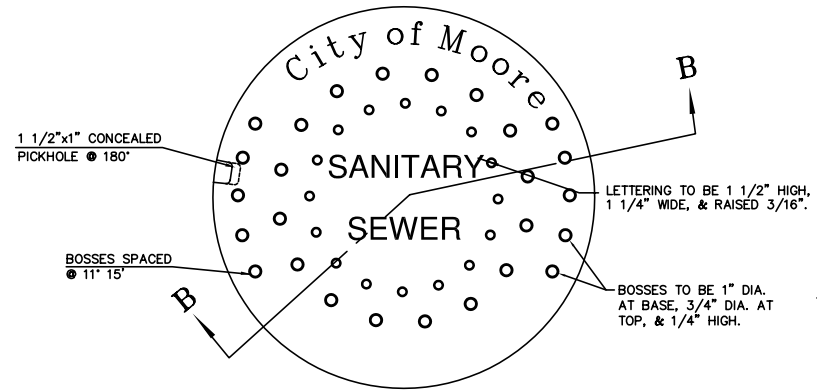
As Shown for "Out of Paving" Installation Type "B"  
Reversed for "In Paving" Installation Type "A"



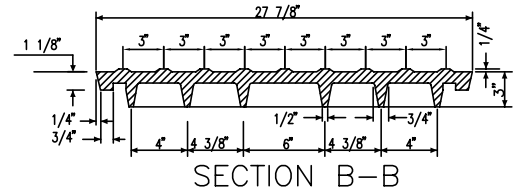
**STANDARD COVER FOR TYPE "B" INSTALLATION**  
N.T.S.



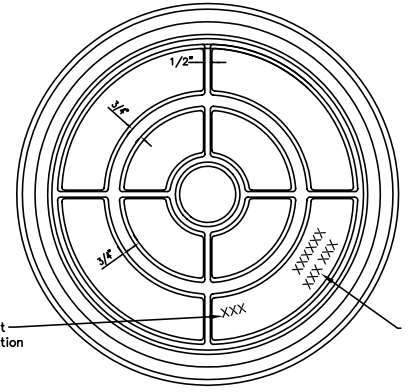
PLAN OF UNDERSIDE



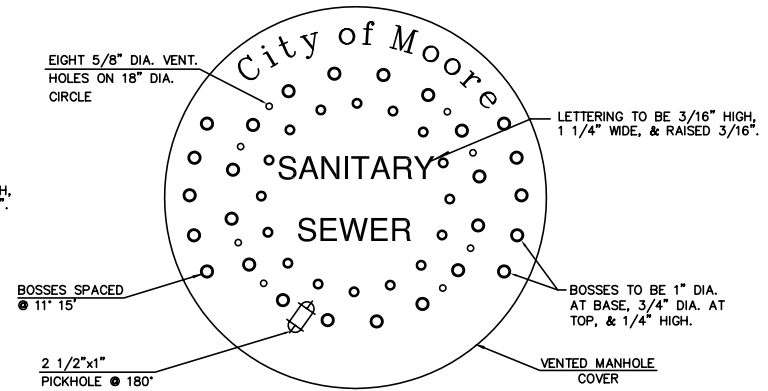
PLAN OF TOP



SECTION B-B

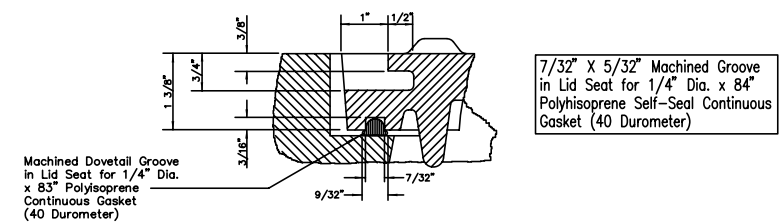


**STANDARD COVER FOR TYPE "A" INSTALLATION**  
N.T.S.



PLAN OF TOP

**OPTIONAL COVER FOR TYPE "B" INSTALLATION**  
N.T.S.




**SELF-SEAL DETAIL FOR TYPE "A" INSTALLATION**  
N.T.S.

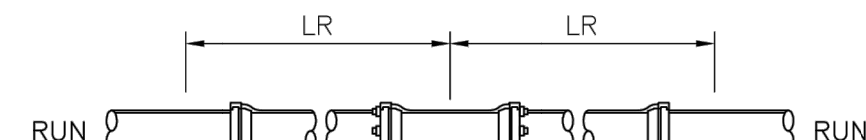
**GENERAL NOTES**

- All construction and materials shall be in accordance with the current specifications.
- Sharp edges resulting from fabrication shall be dulled by any acceptable method for safety in handling.
- Covers shall be gray iron conforming to the requirements of AASHTO M-105, class 45B or ASTM A-48-76, Class 35B. Frame shall be gray iron conforming to the requirements of AASHTO M-105, Class 30B or ASTM 4-48-76, Class 30B Ferrous Castings shall be of uniform quality, free of blowholes, porosity, hard spots, shrinkage, distortion or other defects. They shall be smooth and well cleaned by shot blasting or other approved cleaning method.
- All castings shall be manufactured true to pattern, component parts shall fit together in a satisfactory manner. Where indicated, machined surfaces shall be furnished.
- Weights are approximate and average deviation from the weights shown shall not exceed 5% plus or minus.
- Castings shall be unpainted.
- No wording or markings of any kind, other than those shown on the plan will be permitted on these castings.
- All Type "A" Installations shall have self-sealing feature as shown.

**CASTING WEIGHTS**

Reversible Frame \_\_\_\_ 235 lb. Standard  
Type "B" Frame \_\_\_\_ 300 lb.  
Covers for Reversible Frame \_\_\_\_ 195 lb.  
Standard Type "B" Cover \_\_\_\_ 251 lb.

<b>The City of MOORE Oklahoma</b>	
	Manhole Ring and Cover Sanitary Sewer Standard Details No. 303
APPROVED BY: <i>Donald Wick</i> DONALD WICK, P.E. CITY ENGINEER	DATE: <u>03/06/2008</u> REVISED: <u>03/05/2008</u>




- CALCULATION ASSUMPTIONS:**
1. PVC PIPE BEDDED IN COMPACTED GRANULAR BACKFILL EXTENDING TO THE TOP OF PIPE.
  2. SOIL TYPE CH (INORGANIC CLAY, HIGH PLASTICITY).
  3. MAX. PIPE PRESSURE.
  4. DEPTH OF BURY OF 4 FEET.
  5. FACTOR OF SAFETY (FS) EQUALS 1.5 FOR 12" DIA. AND LESS AND 2.0 FOR 16" DIA.

LR = LENGTH OF PIPE ALONG THE RUN FREE OF JOINTS.  
L = LENGTH TO BE RESTRAINED.

- NOTES:**
1. IF DISTANCE BETWEEN FITTINGS IS LESS THAN OR EQUAL TO RESTRAINED LENGTH, ALL JOINTS BETWEEN FITTINGS MUST BE RESTRAINED.

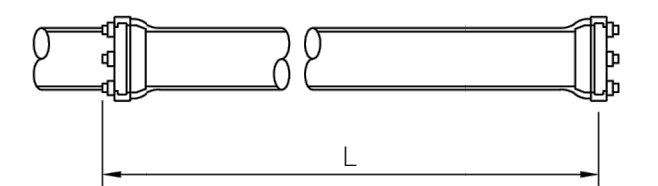
PIPE SIZE (IN.)	BRANCH SIZE (IN.)	LR (FT.)	RESTRAINED LENGTH, L (FT.)
6	6	0	90
6	6	5	64
6	6	10	38
6	6	15	12
6	6	20	1
8	6	0	90
8	6	5	56
8	6	10	22
8	6	15	1
8	8	0	118
8	8	5	92
8	8	10	66
8	8	15	40
8	8	20	14
12	6	0	90
12	6	5	38
12	6	10	1
12	8	0	118
12	8	5	78
12	8	10	38

PIPE SIZE (IN.)	BRANCH SIZE (IN.)	LR (FT.)	RESTRAINED LENGTH, L (FT.)
12	8	15	1
12	12	0	167
12	12	10	114
12	12	15	88
12	12	20	61
16	6	0	92
16	6	5	1
16	12	0	172
16	12	5	123
16	12	10	75
16	12	15	26
16	12	20	1
16	16	0	222
16	16	5	186
16	16	10	150
16	16	15	114
16	16	20	78




 DETAIL NO. **316-1**  
 REVISIONS  
 9/1/2021

**RESTRAINED JOINT DETAILS (1 OF 5)**



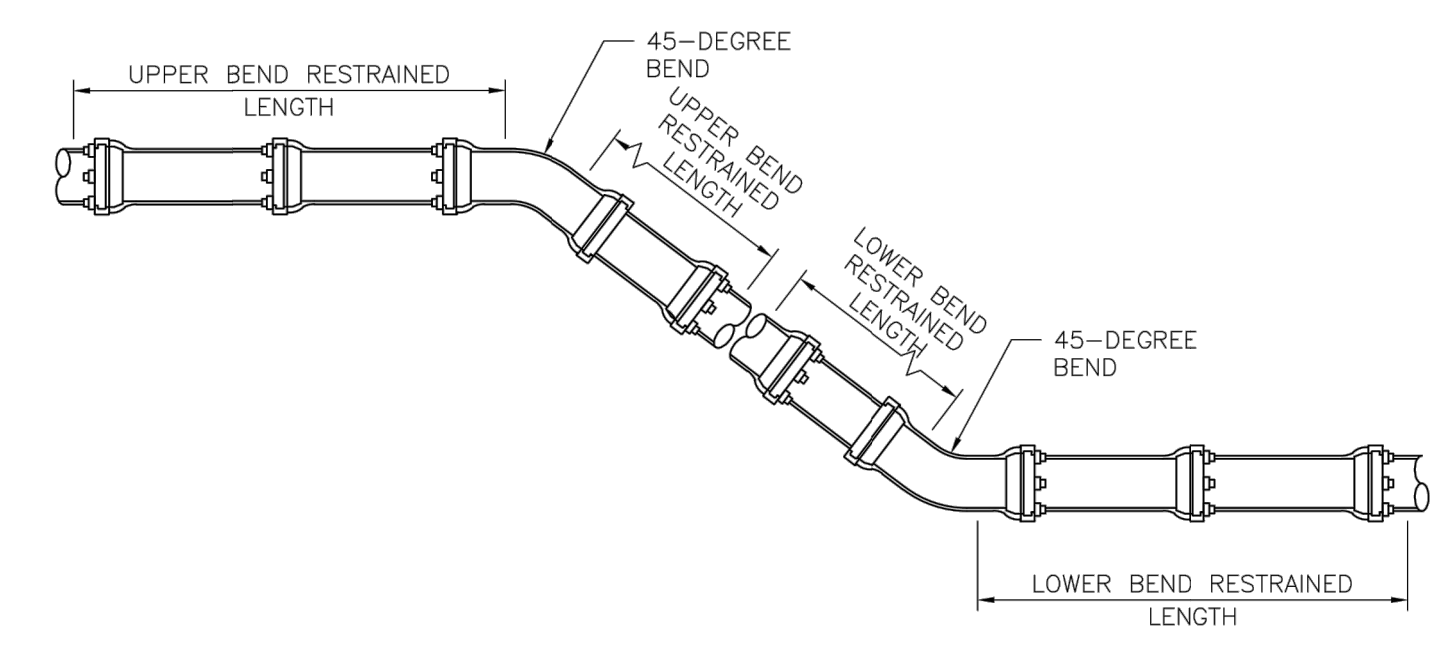
L = LENGTH TO BE RESTRAINED.

PIPE SIZE (INCH)	RESTRAINED LENGTH (FT)
6	90
8	118
12	167
16	222



 DETAIL NO. **316-3**  
 REVISIONS  
 9/1/2021


**RESTRAINED JOINT DETAILS (2 OF 5)**



- NOTES:**
1. IF DISTANCE BETWEEN FITTINGS IS LESS THAN OR EQUAL TO RESTRAINED LENGTH, ALL JOINTS BETWEEN FITTINGS MUST BE RESTRAINED.

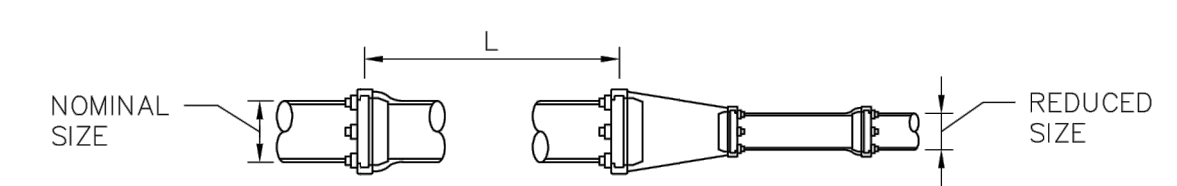
PIPE SIZE (INCH)	UPPER BEND RESTRAINED LENGTH (FT)	LOWER BEND RESTRAINED LENGTH (FT)
6	38	10
8	49	13
12	70	18
16	92	23

- CALCULATION ASSUMPTIONS:**
1. PVC PIPE BEDDED IN COMPACTED GRANULAR BACKFILL EXTENDING TO THE TOP OF PIPE.
  2. SOIL TYPE CH (INORGANIC CLAY, HIGH PLASTICITY).
  3. MAX. PIPE PRESSURE.
  4. DEPTH OF BURY FOR UPPER BEND IS 4 FEET. LOWER DEPTH OF 6 FEET.
  5. FACTOR OF SAFETY (FS) EQUALS 1.5 FOR 12" DIA. AND LESS AND 2.0 FOR 16" DIA.



 DETAIL NO. **316-4**  
 REVISIONS  
 9/1/2021

**RESTRAINED JOINT DETAILS (3 OF 5)**




L = LENGTH TO BE RESTRAINED.

NOMINAL SIZE (INCH)	REDUCED SIZE (INCH)	RESTRAINED LENGTH (FT)
8	6	50
12	6	122
16	6	187
12	8	89
16	6	187
16	8	162
16	12	94

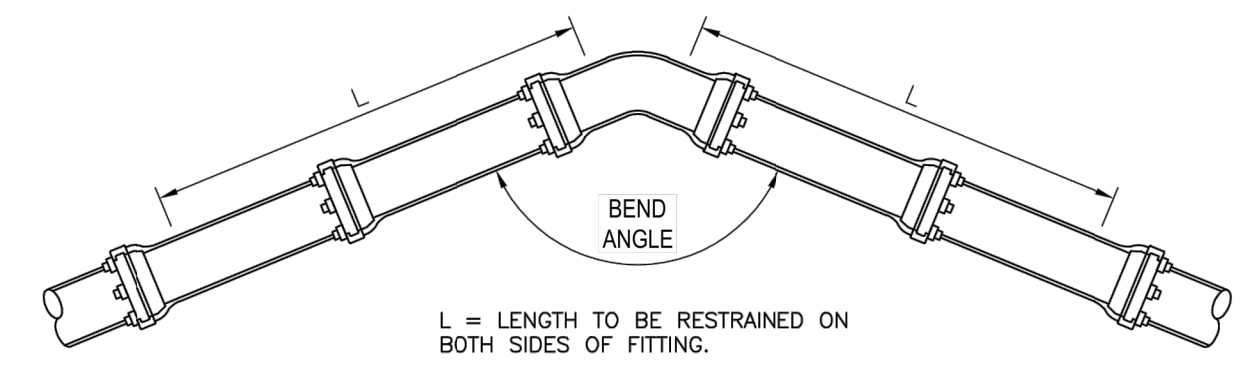
- NOTES:**
1. IF DISTANCE BETWEEN FITTINGS IS LESS THAN OR EQUAL TO RESTRAINED LENGTH, ALL JOINTS BETWEEN FITTINGS MUST BE RESTRAINED.

- CALCULATION ASSUMPTIONS:**
1. PVC PIPE BEDDED IN COMPACTED GRANULAR BACKFILL EXTENDING TO THE TOP OF PIPE.
  2. SOIL TYPE CH (INORGANIC CLAY, HIGH PLASTICITY).
  3. MAX. PIPE PRESSURE.
  4. DEPTH OF BURY OF 4 FEET.
  5. FACTOR OF SAFETY (FS) EQUALS 1.5 FOR 12" DIA. AND LESS AND 2.0 FOR 16" DIA.



 DETAIL NO. **316-5**  
 REVISIONS  
 9/1/2021


**RESTRAINED JOINT DETAILS (4 OF 5)**



PIPE SIZE (INCH)	BEND ANGLE (DEG)	RESTRAINED LENGTH (FT)
6	45	14
8	45	18
12	45	25
16	45	33
6	22.5	7
8	22.5	9
12	22.5	12
16	22.5	16
6	11.25	4
8	11.25	5
12	11.25	6
16	11.25	8
6	90	44
8	90	58
12	90	81
16	90	80

- NOTES:**
1. IF DISTANCE BETWEEN FITTINGS IS LESS THAN OR EQUAL TO RESTRAINED LENGTH, ALL JOINTS BETWEEN FITTINGS MUST BE RESTRAINED.

- CALCULATION ASSUMPTIONS:**
1. PVC PIPE BEDDED IN COMPACTED GRANULAR BACKFILL EXTENDING TO THE TOP OF PIPE.
  2. SOIL TYPE CH (INORGANIC CLAY, HIGH PLASTICITY).
  3. MAX. PIPE PRESSURE.
  4. DEPTH OF BURY OF 4 FEET.
  5. FACTOR OF SAFETY (FS) EQUALS 1.5 FOR 12" DIA. AND LESS AND 2.0 FOR 16" DIA.



 DETAIL NO. **316-6**  
 REVISIONS  
 9/1/2021

**RESTRAINED JOINT DETAILS (5 OF 5)**

WDB ENGINEERING PLLC  
 6330 S.E. 74TH STREET  
 OKC, OK 73135 PH: 405-741-7090  
 CERTIFICATE OF AUTHORIZATION: #3987 EXP: 6-30-2023

**CLASSROOM ADDITION**  
**HIGHLAND EAST JUNIOR HIGH SCHOOL**

DATE: 9-12-22	APPROVED BY:	DRAWN BY: MW
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**RESTRAINED JOINT DETAILS**

WDB ENGINEERING P.L.L.C.	SHEET NUMBER STD 316
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