

# City of Broken Arrow

Drainage Advisory Committee



## PROJECT REPORT

DATE:	2/17/2021
NAME	Pembroke Park HOA
ADDRESS / LOCATION	In vicinity of 3704 West Boston Street, Pembroke Park Subdivision
WATERSHEAD	Haikey Creek – East Branch
ESTIMATE	\$0.00
CASE NO.	21-002

### DESCRIPTION

Erosion has occurred on the west bank of the E Branch of Haikey Creek at Pembroke Park pond. This may have been caused by undermining of a large tree that fell into the creek and forced high waters into the west bank at this section. The pond existed prior to the construction of the subdivision.

On October 28, 2019, the Drainage Advisory Committee approved \$10,000.00 for tree removal and riprap. City Council approved these funds on November 18, 2019.

Tree removal has been completed at a cost of \$3,000.00, leaving \$7,000.00 remaining for riprap. The Pembroke Park Homeowners Association hired Keithline Engineering Group, PLLC, (Keithline) to design a set of construction documents for erosion control at the pond. Keithline opened the bids for this project on February 15, 2021.

Keithline's construction cost estimate is \$31,355.00. The portion of the project associated with the riprap is estimated at \$15,770.00. Pembroke Park is requesting additional funds for the construction of the erosion control.

The stormwater utility fees mentioned in the application are a Broken Arrow Municipal Authority revenue source used for funding the stormwater utility function of the City, examples include storm sewer maintenance, equipment for maintenance, and the Streets & Stormwater Department as well as the Stormwater Division of Engineering and Construction.

### BENEFIT

Addressing the erosion control on the private pond does not have a benefit to the City of Broken Arrow.

### RECOMMENDATION

Reject Pembroke Park's request for additional funds for construction of erosion control items on a private pond.

COMPLETED BY: *Patrick P. Wilson*

DATE: 2/17/21

# City of Broken Arrow

Drainage Advisory Committee



## APPLICATION

**DATE:** 1/22/2021

**OWNER NAME:** PEMBROOKE PARKHOA (HOMEOWNER REPRESENTATIVE: JIM C. JONES)

**PHONE NUMBER:** 918-231-5029

**EMAIL ADDRESS:** dem3bars@windstream.net

**OWNER MAILING ADDRESS:** P.O. BOX 3031 B.A. OKLA. 74013

**ADDRESS OF PROPERTY WITH DRAINAGE PROBLEM:** IN THE VICINITY OF 3704 WEST BOSTON STREET (NOT A LISTED ADDRESS)

**LOCATION OF DRAINAGE ISSUE ON PROPERTY:** NE CORNER POND IN PEMBROOKE PARK'S PARK. ENTER PEMBROOKE PARK FROM OLIVE AVE.; WEST ON W. BOSTON ST. PARK ON NORTH SIDE OF W. BOSTON ST. ISSUE IS EAST SIDE OF POND'S PERIMETER FENCE.

**DESCRIPTION OF PROBLEM:** (\*PHOTOS SHOULD ACCOMPANY APPLICATION)

MASSIVE EROSION TO STRUCTURE EAST OF PEMBROOKE PARK'S POND EAST FENCE. FROM THE CITY OF BROKEN ARROW ITEM OF CONSENT DOC REFERENCING FILE # 19-1364; UPON REQUEST OF ASSISTANT CITY MANAGER KENNETH SCHWAB IN THE LAST BADAC MEETING ON 10/28/2019; PEMBROOKE PARK HAS MET THE BURDEN OF OBTAINING OUR OWN PERSONAL ENGINEERING FIRM; KEATHLINE ENGINEERING GROUP, PLLC. KEATHLINE ENGINEERING WORKING IN CONJUNCTION WITH STAFF AT BA STORMWATER; HAS SUBMITTED A REPAIR PLAN TO BA STORMWATER STAFF. PEMBROOKE PARK HOA IS RE-SUBMITTING THIS APPLICATION TO ONCE AGAIN APPEAR BEFORE BADAC FOR ADDITIONAL FUNDS. AFTER CONFERRING WITH DAN KEATHLINE OF KEATHLINE ENGINEERING HE HAS OFFERED THE SUGGESTION THAT PEMBROOKE PARK SHOULD ASK BA STAFF CONSIDER PAST SORMWATER UTILITY FEES THE PEMBROOKE PARK HAVE PAID OVER THE YEARS SINCE INCEPTION OF SUCH FEES UPON THE RESIDENCE OF PEMBROOKE PARK. THANK YOU!

Signature:

RETURN TO CITY MANAGER'S OFFICE, 220 S. 1<sup>ST</sup> St. Broken Arrow, OK 74012



**BEFORE TREE REMOVAL**



**AFTER TREE REMOVAL**



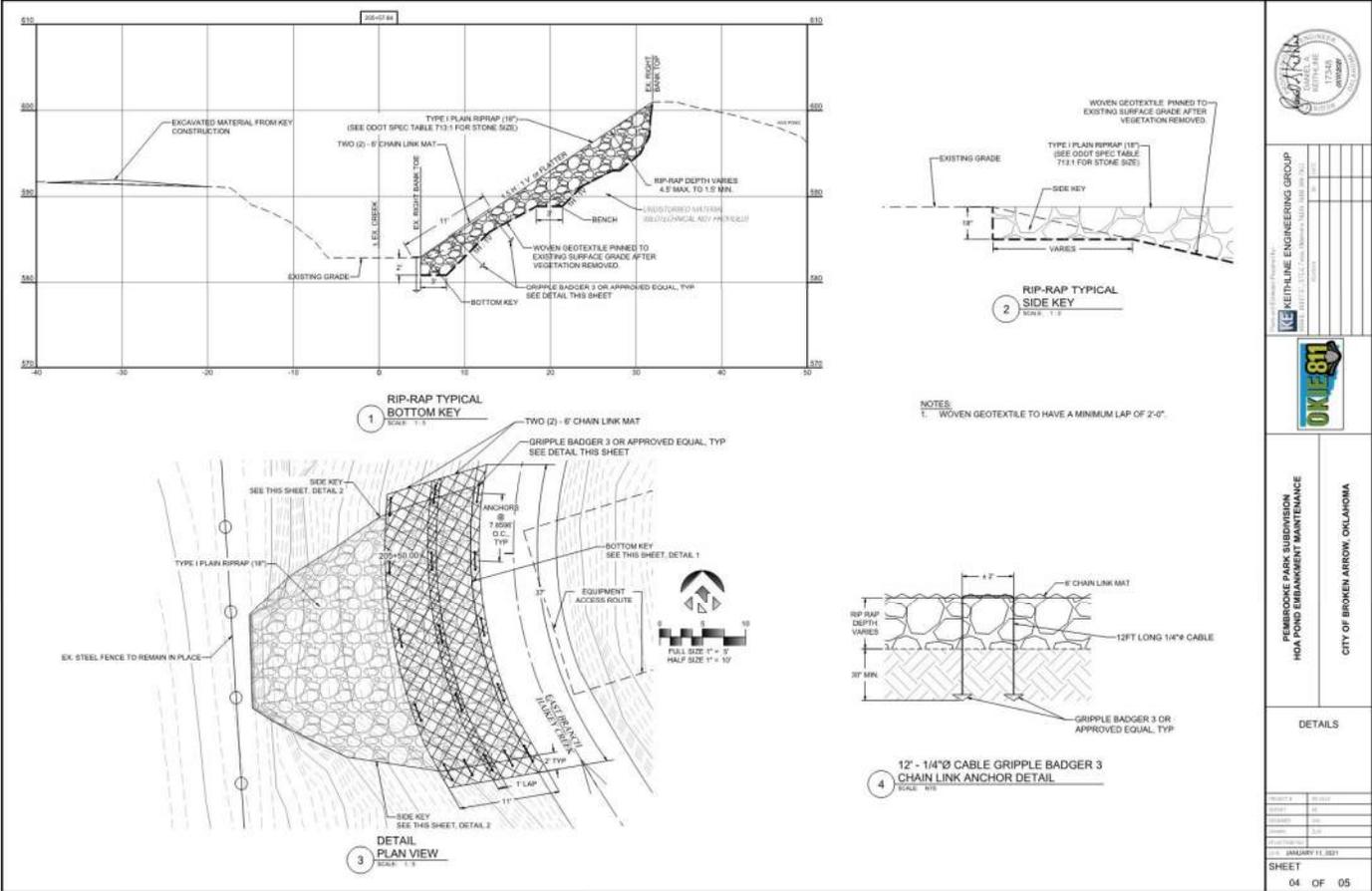
# LOOKING DOWNSTREAM AT POND AND CHANNEL



# POND AND CHANNEL CONTOURS



# PROPOSED PROJECT



1/22/2021 4:13:19 PM



W. J. WILSON  
 PROFESSIONAL ENGINEER  
 LICENSE NO. 17343  
 STATE OF OKLAHOMA



PERMISSIBLE BANK SUBSTITUTION  
 HIGH POND EMBANKMENT MAINTENANCE  
 CITY OF BROKEN ARROW, OKLAHOMA

**DETAILS**

PROJECT NO.	20-07-84
DATE	01/11/2021
DESIGNED BY	W. J. WILSON
CHECKED BY	W. J. WILSON
DATE OF SHEET	01/11/2021
SHEET	04 OF 05

# PEMBROOKE PARK

## BLOCKS THROUGH

5120

A SUBDIVISION OF PART OF THE S/2 NE/4,  
 SECTION 20, TOWNSHIP 18 NORTH, RANGE 14 EAST,  
 CITY OF BROKEN ARROW, TULSA COUNTY, OKLAHOMA

**OWNER:**

C & I DEVELOPMENT COMPANY L.L.C.  
 4032 East 11th  
 Tulsa, Oklahoma 74137  
 Tel. (918) 299-1661

**LEGEND**

BL - DENOTES BUILDING LINE  
 U/E - DENOTES UTILITY EASEMENT  
 F/U/E - DENOTES FENCE & UTILITY EASE.  
 D/E - DENOTES DRAINAGE EASEMENT  
 L.A. - DENOTES LIMITS OF ACCESS  
 L.N.A. - DENOTES LIMITS OF NO ACCESS

**ENGINEER:**

COX & ASSOCIATES, INC.  
 7935 East 57th Street South  
 Tulsa, Oklahoma 74145  
 Tel. (918) 664-3357

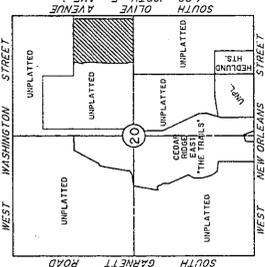
**NOTES:**

NOTES: LINES WITHOUT BEARINGS  
 ARE N/S OR E/W



SCALE: 1" = 100'  
 81 LOTS  
 29.4056 ACRES

STATE OF OKLAHOMA }  
 COUNTY OF TULSA }  
 I, Joan Hastings, Tulsa County Clerk, in and  
 before me, on this 1st day of April, 1996,  
 did appear *Joan Hastings*, Tulsa County Clerk,  
 and she acknowledged to me that she is a true  
 and correct copy of the foregoing as a true  
 and correct copy of the instrument now  
 on file in my office.



**CURVE DATA TABLE**

CURVE NO.	RADIUS	DELTA	LENGTH
1	375'	129°15'0"	78.60'
2	150'	185°55'0"	95.17'
3	100'	185°55'0"	49.54'
4	100'	185°55'0"	33.03'
5	338.01'	5°12'4"	30.62'
6	2056.25'	2°57'0"	105.96'
7	50'	4°24'35"	36.14'
8	50'	4°24'35"	36.14'
9	50'	2°57'0"	105.96'
10	2056.25'	2°57'0"	105.96'
11	2066.95'	5°24'0"	104.08'
12	2056.25'	2°57'0"	105.96'
13	50'	4°24'35"	36.14'
14	50'	4°24'35"	36.14'
15	50'	2°57'0"	105.96'
16	50'	2°57'0"	105.96'
17	50'	13°34'16"	134.02'
18	50'	3°47'18"	27.74'
19	540'	7°48'11"	73.54'
20	4464.99'	3°47'52"	285.95'
21	4514.99'	3°47'52"	282.99'
22	4514.99'	3°47'52"	282.99'
23	4514.99'	3°47'52"	282.99'
24	50'	3°47'18"	27.74'
25	50'	13°34'16"	134.02'
26	50'	3°47'18"	27.74'
27	50'	3°47'18"	27.74'

**CERTIFICATE**

I hereby certify that all real estate taxes involved in this plat have been paid as reflected by the current tax rolls. Security as required has been provided in the amount of \$20,000 per lot. Taxes to be applied to 1996 taxes.

This certificate is NOT to be construed as payment of 1996 taxes in full but is given in order that this plat may be filed of record.

19 *Joan Hastings* could exceed the amount of the security deposit.

Dated 4/1 19 96  
 Dennis Seidler  
 Tulsa County Treasurer  
 by *Joan Hastings*  
 Deputy

BENCHMARK:  
 TOP OF CAP AT THE INTERSECTION  
 OF S 20 N AND W 100 E ST. (E)  
 AVENUE (S 20 N AND W 100 E)  
 ELEVATION 651.53 U.S.C.S.

NOTE:  
 3/8" IRON PINS, 18" LONG, HAVE  
 BEEN SET IN THE GROUND AT ALL  
 CORNERS AND INTERSECTIONS OF  
 PLAT LINES AND FRGS. OF THE LOT LINES.

**DEED OF DEDICATION  
 RESTRICTIVE COVENANTS**

**KNOW ALL MEN BY THESE PRESENTS:**

THAT: C & I DEVELOPMENT COMPANY L.L.C., hereinafter referred to as the "Owner", is the Owner of the following described land:  
 Part of the S/2 NE/4 of Section 20, Township 18 North, Range 14 East of the Indian Base and Meridian, according to the U.S. Government Survey thereof in the City of Broken Arrow, Tulsa County, Oklahoma, more particularly described as follows, to-wit:

Beginning at a point in the South boundary of said S/2 NE/4, a distance of 65.00 feet West of the Southeast corner thereof; thence N69°59'54"W along said South boundary a distance of 958.59 feet; thence Due North a distance of 114.94 feet; thence Due West a distance of 24.00 feet; thence Due North a distance of 420.15 feet; thence N3°48'58"E a distance of 300.50 feet; thence Due North a distance of 287.84 feet; thence N71°03'36"W a distance of 181.76 feet to a point of 278.00 feet Northwesterly on said curve to the NE corner of said S/2 NE/4; thence N13°45'00"E a distance of 181.76 feet; thence N69°59'54"W a distance of 93.08 feet to a point on the North boundary of said S/2 NE/4; thence S89°57'26"E along said North boundary a distance of 1032.82 feet to a point lying 65.00 feet West of the Northeast corner of said S/2 NE/4; thence S0°05'28"E a distance of 1318.18 feet to the point of Beginning, containing 29.4056 acres more or less.

and has caused the same to be surveyed, staked and platted into blocks, lots and streets and has designated the same as PEMBROKE PARK BLOCKS, THRU 6, a subdivision in the City of Broken Arrow, Tulsa County, State of Oklahoma (the "Subdivision").

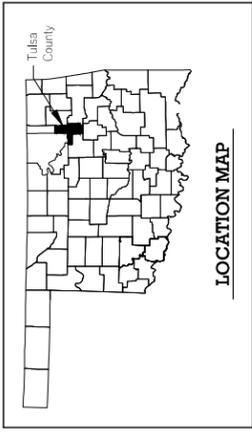
**SECTION 1  
 STREETS, EASEMENTS AND UTILITIES**

- A. Public Streets and General Utility Easements:
- The undersigned OWNER does hereby dedicate for public use all of the streets as shown on the accompanying plat.
  - The undersigned OWNER does hereby dedicate for public use the easements and right-of-way shown on the accompanying plat for the several purposes of constructing, maintaining, operating, repairing, any and all public utilities including storm sewers, sanitary sewers, water mains, gas lines, water lines, electric power lines, and transformers, together with all fittings, including the poles, wires, conduits, pipes, valves, meters and equipment for each of such facilities and any other appurtenances thereto with the rights of ingress and egress to and upon the utility easements and right-of-ways for the uses and purposes aforesaid. PROVIDED, HOWEVER, that the easements and right-of-ways shall be reserved to the Owner for the operation, laying and relaying over, across and along the public street and utility easements shown on the plat for the purpose of furnishing water and sewer services to the area included in the plat.
  - No building structure, or other above or below ground obstruction that will interfere with the purposes aforesaid, shall be placed, erected, installed or permitted upon the easements or right-of-ways as shown.
  - The foregoing covenants concerning streets and easements shall be agreed to be bound hereby.

**B. Underground Electric and Communication Service:**

- Overhead lines for the supply of electric and communication service may be located along the East and South perimeters. Electric underground easements shall be reserved for general utility services and in the easement-ways reserved for general utility services and in the street rights-of-way shown on the attached plat. Service pedestals and transformers, as sources of supply at secondary voltages, may also be located in the easement-ways. Street light poles or standards may be served by underground cable.
- Underground service cables to all structures which may be located on all lots in the Subdivision may be run from the nearest service pedestal or transformer to the point of usage determined by the location and construction of such structure as may be located upon each lot; PROVIDED, that upon the installation of such a service cable to a particular structure, the supplier of electric service shall have a permanent and exclusive right-of-way easement on the lot, covering a five (5) foot strip extending 2.5 feet on each side of such service cable, extending from the service pedestal or transformer to the service entrance on the structure.
- The supplier of electric or communication service, through its proper agents and employees, shall at all times have right of access to all such easements shown on the plat, or provided for

APPROVED: 3/14/96 By the City  
 Council of the City of Broken Arrow,  
 Oklahoma.  
*James C. Reynolds*  
 Mayor  
*Andrea S. Rinehart*  
 Attest: City Clerk



**LOCATION MAP**

Broken Arrow, Oklahoma

This entire project is located within the corporate and urban city limits of Broken Arrow.

**LEGEND**

These standard symbols will be found in the drawing.

	WATER VALVE		HANDICAP RAMP
	WATER MANHOLE		RETAINING WALL
	FIRE HYDRANT		LANDSCAPE HATCH
	SHRUB		STORM GRATE
	DECIDUOUS TREE		BUILDING
	DECIDUOUS TREE		ASPHALT
	POWER POLE		CONCRETE
	GUY WIRE		GRAVEL
	TELEPHONE UNDERGROUND MARKER		DIRT
	TELEPHONE PEDESTAL		UNDERGROUND PETROLEUM LINE
	TELEPHONE MANHOLE		UNDERGROUND TELEPHONE
	60D SPIKE		UNDERGROUND SANITARY SEWER
	MAIL BOX		UNDERGROUND GAS
	GAS METER		UNDERGROUND CABLE
	FIBER OPTIC PEDESTAL		UNDERGROUND WATER
	TRAFFIC SIGNAL POLE		UNDERGROUND STORM SEWER
	LIGHT POLE		OVERHEAD ELECTRIC
	TRAFFIC JUNCTION BOX		FENCE
	FLOOD LIGHT		CENTER LINE OF ROAD or GR L
	CABLE TV UNDERGROUND MARKER		PROPERTY LINE
	ELECTRIC OUTLET		SECTION LINE
	SANITARY SEWER MANHOLE		1/4 SECTION LINE
	STORM SEWER MANHOLE		PROPOSED / NEW RIGHT OF WAY
	FOUND MONUMENTS		EX. RIGHT OF WAY
	UTILITY MARKER		UTILITY EASMENT
	VENT		
	FIBER OPTICS		
	NOT FIELD VERIFIED (NFV)		

**NOTE:** This Design is Specifically prepared for use at the location shown. Use in any other manner exceeds the intended purpose of these drawings and any accompanying specifications.

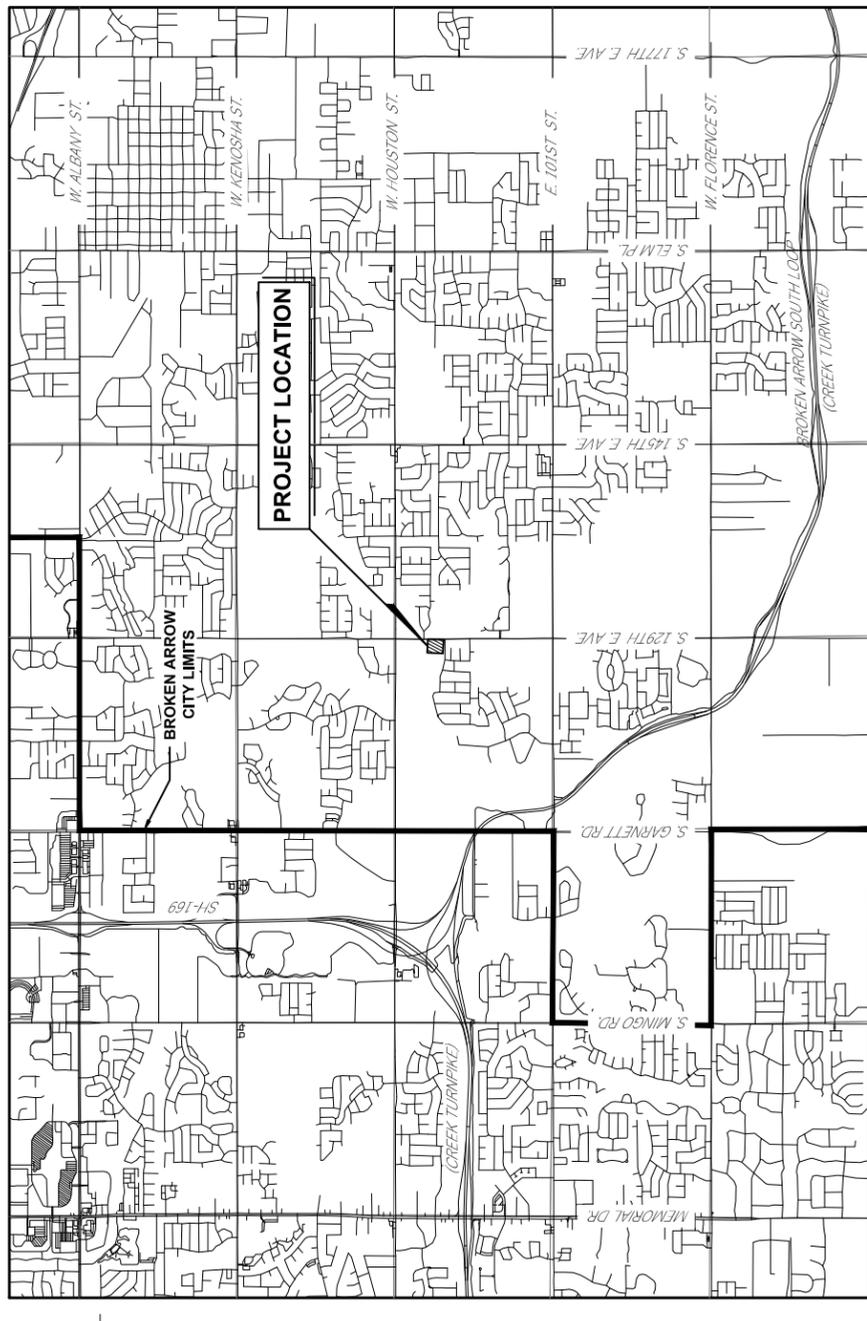
UTILITY COORDINATION			
UTILITY COORDINATION	CONTACT	PHONE NO.	EMAIL
SBC	Brian Smith	(918) 596-4283	bryans@sbco.com
AEP/PSO	Tren Pham	(918) 250-6261	typham@aep.com
Oklahoma Natural Gas - Tulsa	DeVayne Hillman	(918) 631-8521	DeVayne.Hillman@omegas.com
ONG/Gas Transmission	Jonathan Meadows	(918) 631-8215	Jonathan.Meadows@omegas.com
Cox Communications	John Vanscoy	(918) 286-4542	John.Vanscoy@cox.com
AT&T Communications	Roger Hurst	(918) 596-0321	rh7687@att.com
Broken Arrow - Water			

Note: Names and Numbers could Change.

**PEMBROOKE PARK SUBDIVISION**

**PROPOSED PLANS**

**HOME OWNERS ASSOCIATION (HOA)  
CREEK EMBANKMENT PROTECTION  
AT PLAYGROUND**



**ODOT STANDARDS**

R-5 TSC2-4	TEMPORARY SEDIMENT CONTROLS
T-506 TCS6-1	TRAFFIC CONTROL STANDARD CHANNELIZING DEVICES

**DRAWING INDEX**

SHEET NUMBER	TITLE SHEET
01	TITLE SHEET
02	PAY ITEMS & NOTES
03	PROJECT OVERVIEW
04	DETAILS
05	SWMP

**GOVERNMENT SPECIFICATIONS:**

- CURRENT 2009 OKLAHOMA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION - ENGLISH GOVERN. APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, JAN. 4TH, 2010.
- CITY OF BROKEN ARROW ENGINEERING DESIGN CRITERIA AND STANDARD SPECIFICATIONS.
- PROJECT SPECIFICATIONS
- ODOT CONSTRUCTION DIRECTIVES
- LASTEST EDITION OF MUTCD FOR TRAFFIC CONTROL

**PLANS PREPARED BY:**  
**KEITHLINE ENGINEERING GROUP, PLLC KE**  
 8556 East 101st Street, Suite C  
 Tulsa, OK 74133  
 (918) 520-0069

CERTIFICATE OF AUTHORIZATION NO. 5736  
 RENEWAL DATE - June 30, 2021

*Daniel A. Keithline*  
 Daniel A. Keithline, P.E.  
 OKLA. REG. P. E. No. 17348



ENTIRE PROJECT IS WITHIN CORPORATE LIMITS OF BROKEN ARROW  
 THIS PROJECT COMPLES WITH ALL OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ) REQUIREMENTS



**BID PLANS (FINAL)**

DATE: JANUARY 11, 2021

**GENERAL NOTES:**

- ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST 2009 OKLAHOMA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION AND THE CURRENT CITY OF BROKEN ARROW STANDARD SPECIFICATIONS AND STANDARD DETAILS AND STANDARD DRAWINGS AND CITY OF BROKEN ARROW SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS GOVERNING SAFETY, HEALTH AND SANITATION. THE CONTRACTOR SHALL PROVIDE ALL SAFEGUARDS, SAFETY DEVICES AND PROTECTIVE EQUIPMENT, AND TAKE ANY OTHER NEEDED ACTION ON AS HIS OWN RESPONSIBILITY OR AS THE ENGINEER MAY DETERMINE REASONABLY NECESSARY TO PROTECT PROPERTY DURING PERFORMANCE OF WORK UNDER THIS CONTRACT.
- THE 11" X 17" PLANS ARE CONSIDERED HALF SIZE PLANS AND 22" X 34" IS FULL SIZE PLANS
- THE CONTRACTOR WILL HAVE 20 CALENDAR DAYS FOR MATERIALS PROCUREMENT AND 10 CALENDAR DAYS FOR CONSTRUCTION, FOR A TOTAL OF 30 CALENDAR DAYS. TO COMPLETE THE WORK IN THE PROJECT. LIQUIDATED DAMAGES OF \$100.00 PER DAY WILL BE ASSESSED AGAINST THE CONTRACT AMOUNT UNTIL THE WORK IS COMPLETE IF THE PROJECT IS NOT COMPLETED IN THE AGREED TIME.
- THE CONTRACTOR SHALL EXECUTE THE **NOI** AND EXECUTE ALL WORK ACCORDANTLY.
- THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL **EXISTING UTILITIES** BEFORE COMMENCING WORK IN EACH AREA. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ALL DAMAGES WHICH MIGHT RESULT FROM HIS FAILURE TO LOCATE AND PRESERVE ALL UTILITIES AND PROPERTIES.
- THE LOCATIONS OF THE UTILITIES ARE SHOWN ACCORDING TO ALL AVAILABLE INFORMATION. THE CONTRACTOR SHALL **NOTIFY EACH UTILITY OWNER** PRIOR TO COMMENCEMENT OF WORK TO VERIFY BOTH HORIZONTAL AND VERTICAL LOCATIONS. THE FOLLOWING IS A LIST OF UTILITY OWNERS:  
 A. SOUTHWESTERN BELL 918-495-2200  
 B. PUBLIC SERVICE COMPANY OF OKLAHOMA (AEP) 918-599-2217  
 C. OKLAHOMA NATURAL GAS (ONG) 918-588-7000 EXT. 676  
 D. COX COMMUNICATIONS 918-628-3635  
 E. MCI 918-590-2160  
 F. WELLSCO VALLOR TELECOM 918-451-3441
- THE CONTRACTOR SHALL GIVE THE NOTIFICATION CENTER OF OKLAHOMA **ONE-CALL SYSTEM, INC.** NOTICE OF ANY EXCAVATION NO SOONER THAN TEN DAYS NOR LATER THAN 48 HOURS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, PRIOR TO THE COMMENCEMENT OF WORK. THE PHONE NUMBER IS 1-800-522-6543.
- APPLICABLE **ODOT STANDARDS** ARE LISTED ON THE TITLE SHEET.
- SOIL INVESTIGATION** WAS NOT PERFORMED ON THIS SITE.

**CONSTRUCTION NOTES:**

- PRIOR TO CONSTRUCTION, A **WORK PLAN** SHALL BE SUBMITTED ON EACH SIGNIFICANT TASK, MANUFACTURES LIFTING, STORAGE AND INSTALLATION PROTOCOLS AND PROCEDURES SHALL BE INCLUDED ALONG WITH EQUIPMENT, MANPOWER, INSTALLATION PARAMETERS.
- ALL **CONSTRUCTION AND MATERIALS** SHALL BE IN ACCORDANCE WITH CURRENT STANDARD SPECIFICATIONS AND STANDARD DETAILS; CITY OF BROKEN ARROW ENGINEERING SERVICES DEPARTMENT.
- CONTRACTOR SHALL GIVE THE NOTIFICATION CENTER OF THE OKLAHOMA **ONE-CALL SYSTEM, INC.** NOTICE OF ANY EXCAVATION NO SOONER THAN 48 HOURS OR LATER THAN 10 DAYS, EXCLUDING SATURDAYS, SUNDAYS, LEGAL HOLIDAYS PRIOR TO COMMENCEMENT OF WORK. PHONE 1-800-522-6543.
- CONSTRUCTION FOR ALL ENGINEERING SERVICES FACILITIES SHALL BE IN **COMPLIANCE WITH THE LATEST EDITION OF TITLE 252, DEPARTMENT OF ENVIRONMENTAL QUALITY, CHAPTER 626, PUBLIC WATER SUPPLY CONSTRUCTION STANDARDS, OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ).**
- ANY **CHANGES FROM APPROVED PLANS** SHALL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL NOT WASTE ANY **EXCESS SPOILS** UNTIL ALL PLANNED EMBANKMENTS AND BACKFILLS ARE COMPLETE.
- STOCKPILES** ON SITE SHALL BE PROTECTED WITH SILT FENCE.
- PHYSICAL TESTING FOR QUALITY ASSURANCE SHALL BE FURNISHED BY CITY.
- ALL WORK AND/OR MATERIALS NOT CLASSIFIED AS A "CONTRACT PAY ITEM" SHALL BE CONSIDERED **INCIDENTAL** AND THE COST THEREOF SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEMS WHICH ARE CLASSIFIED FOR PAYMENT.
- CONTRACTOR SHALL **NOTIFY ENGINEER, CITY OF BROKEN ARROW** FIELD ENGINEERING AND CITY SECURITY A MINIMUM OF 48 HRS PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL **DAMAGE TO EXISTING PUBLIC AND PRIVATE PROPERTY** AFFECTED BY HIS CONSTRUCTION OPERATIONS. RESTORATION OF ALL DAMAGED PROPERTY, BOTH PUBLIC AND PRIVATE, TO ITS ORIGINAL CONDITION SHALL BE PERFORMED BY AND AT THE EXPENSE OF THE CONTRACTOR.
- BLASTING** SHALL NOT BE ALLOWED.
- CONTRACTOR SHALL **DOCUMENT PRE-CONSTRUCTION SITE CONDITIONS** BY MEANS OF PHOTOGRAPHS AND VIDEO WITH CITY REPRESENTATIVES BEFORE START OF CONSTRUCTION. COST SHALL BE CONSIDERED PART OF MOBILIZATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ANY **EXISTING UTILITIES DAMAGES** WITHIN THE PROJECT AREA AS A RESULT OF HIS TRENCHING, DIGGING, ETC.
- ALL ADJACENT **PUBLIC, PRIVATE STREETS AND DRIVES** SHALL BE ACCESSABLE AT ALL TIMES.
- ALL MATTERS NECESSARY TO ENSURE THAT CONSTRUCTION IS ACCOMPLISHED IN A RESPONSIBLE MANNER WILL BE ESTABLISHED AS REQUIRED BY LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS. IN ADDITION, **OWRB RULES, CHAPTER 25 SECTION 786.25-7-2** SHALL BE OBSERVED TO ENSURE CONSTRUCTION OF A SAFE STRUCTURE.
- AREA OUTSIDE THE **PROJECT LIMITS** SHALL NOT BE DISTURBED.
- CONSTRUCT TEMPORARY **SILT FENCE BARRIERS** AROUND EARTHWORK STOCKPILES AND DOWNSTREAM OF DISTURBED AREAS
- THE CONTRACTOR SHALL MAINTAIN **POSITIVE DRAINAGE** IN ALL OPEN EXCAVATION AREAS OVERNIGHT. COST SHALL BE INCLUDED IN OTHER ITEMS OF WORK.
- 0.25-INCH DIA. **10-FOOT LONG CABLE**

PART 'A'					
NO.	PAY NOTE	ODOT ITEM NO.	DESCRIPTION OF WORK (FURNISH AND INSTALL)	UNIT	QTY
1	4	201	SELECTIVE CLEARING (FOR ACCESS)	LSUM	1
2	1	201 (A)	CLEARING AND GRUBBING (RIPRAP AREA)	LSUM	1
3	5	220	SWPPP DOCUMENTATION & MANAGEMENT	LSUM	1
4	6,10	221 (C)	TEMPORARY SILT FENCE	LF	100
5	9	326 (A)	GEOTEXTILE REINFORCEMENT (WOVEN)	SY	139
6	7	641	MOBILIZATION	LSUM	1
7	8	860 (J)	CONSTRUCTION TRAFFIC CONTROL (IF REQUIRED)	LSUM	1
8			VINYL COATED CHAIN LINK FENCE (2" MESH, 11 GAUGE)	SY	160
9	11		SOIL ANCHORS CLAMPED TO 1/2" FT CABLE (1/4" Dia)	EA	30
PART 'B'				UNIT	QTY
10	2,3	601 (A)	TYPE I PLAIN RIPRAP (18")	TON	166

**PAY NOTES:**

- CLEARING AND GRUBBING** INCLUDES COSTS OF LABOR, MATERIALS, PLANT, AND EQUIPMENT TO CLEAR AND GRUB AREAS INSIDE EQUIPMENT ACCESS ROUTE.
  - THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE EXISTING CONDITION. ANY DISTURBANCE OUTSIDE OF THIS AREA SHALL BE RESTORED AT THE CONTRACTORS EXPENSE AND SHALL BE PAID FOR UNDER CLEARING AND GRUBBING.
  - COST INCLUDES REMOVAL AND OFFSITE DISPOSAL OF ALL TREES WITHIN THE AREA DESIGNATED.
  - DEBRIS BURNS WILL NOT BE PERMITTED.
  - ALL CONSTRUCTION WASTE SHALL NOT BE USED AS RIP-RAP CONTRACTOR AND SHALL BE DISPOSED OF BY THE CONTRACTOR IN A MANNER ACCEPTABLE TO THE ENGINEER WITHOUT COST TO THE OWNER. THE CONTRACTOR SHALL BE REQUIRED TO OBTAIN AN EARTH CHANGE PERMIT IF ANY EXCESS MATERIAL IS TO BE DISPOSED OF WITHIN THE CITY LIMITS OF BROKEN ARROW.
  - COST INCLUDES SEASONAL SEEDING OF DISTURBED AREAS OF SAME TYPE AND VARIETY OR AS NOTED ON PLANS.
- TYPE I PLAIN RIPRAP (18")** INCLUDES COSTS OF LABOR, MATERIALS, PLANT, AND EQUIPMENT TO PLACE RIPRAP BY HAND OR MACHINE TO ACHIEVE THE LINES AND THICKNESS SHOWN ON THE PLANS.
- 2,000 LBS PER TON. RIPRAP TON IS MEASURED AT 150 LBS/CF. SEE ODOT SPEC BOOK, TABLE 713:1 FOR STONE SIZING.
- SELECTIVE CLEARING** INCLUDES ALL COSTS OF LABOR, MATERIALS, PLANT, AND EQUIPMENT TO COMPLETE WORK ON THE HOA POND EMBANKMENT AS SHOWN ON PLANS.
  - COST INCLUDES REMOVAL AND DISPOSAL OFF SITE OF ALL TREES WITHIN THE AREA DESIGNATED.
  - DEBRIS BURNS WILL NOT BE PERMITTED.
  - COST INCLUDES SIDE AND BOTTOM KEYWAY EXCAVATION
  - COST INCLUDES MINOR GRADING OF EMBANKMENT SURFACE AFTER VEGETATION IS REMOVED. USE KEYWAY SPOILS TO FILL IN DIVOTS.
  - COST EXCESS EMBANKMENT SPOILS TO BE SPREAD OUT OF EQUIPMENT ACCESS ROUTE.
- SWPPP DOCUMENTATION / MANAGEMENT, SAFETY PLAN, AND WORK PLAN** INCLUDES ALL COSTS OF LABOR, MATERIALS, AND EQUIPMENT TO COMPLETE SWPPP DOCUMENTATION / MANAGEMENT, SAFETY PLAN, AND WORK PLAN FOR DURATION OF PROJECT. SAFETY PLAN SHALL ADDRESS BUT NOT BE LIMITED TO ISSUES AS TRAFFIC CONTROL, WORK SITE SAFETY, WORKER EQUIPMENT, FIRST AID, HYGIENE, ETC. CONTRACTOR IS EXPECTED TO PERFORM WORK IN A MANNER THAT BEST PROTECTS SAFETY OF WORKERS, INSPECTORS, BYSTANDERS, AND OTHERS WHO MAY BE IN THE VICINITY OF WORK. SAFETY PLAN SHALL INCLUDE SEQUENCE OF CONSTRUCTION, PROVISIONS TO PROTECT INTEGRITY OF PROPERTIES, FAILURE TO PERFORM WORK, AND MAINTAIN SITE IN A SAFE MANNER. WORK PLAN SHALL ADDRESS SEQUENCE OF CONSTRUCTION PLUS MEANS AND METHODS TO PERFORM EACH TASK. WORK AND SAFETY PLANS TO BE APPROVED PRIOR TO CONSTRUCTION.
- SILT FENCE** SHALL BE INSTALLED PER STANDARD.
- MOBILIZATION** INCLUDES COSTS OF ALL LABOR, MATERIALS, PLANT AND EQUIPMENT TO:
  - INSURE ALL POWER POLES WHICH ARE AFFECTED BY CONSTRUCTION ARE BRACED BY OWNERS.
  - REPAIR ANY FENCE DAMAGED IN THE ZONE OF CONSTRUCTION DURING THE COURSE OF CONSTRUCTION TO SATISFACTION OF THE PROPERTY OWNER.
  - PROTECT PAVEMENT, CURB, OR DRIVEWAY. DAMAGE SHALL BE PAID UNDER THIS BID ITEM.
- TRAFFIC CONTROL AND CONSTRUCTION SIGNING** INCLUDES COSTS TO WORK IN COOPERATION WITH THE CERTIFIED TRAFFIC CONTROL. INSTALLER TO ESTABLISH, INSTALL, MAINTAIN, AND OPERATE COMPLETE, ADEQUATE, AND SAFE TRAFFIC CONTROLS DURING THE ENTIRE CONSTRUCTION PERIOD IN ACCORDANCE WITH THE CURRENT EDITION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. ALL FLAGMEN, BARRICADES, AND TRAFFIC CONTROL DEVICES SHALL BE INSTALLED AND MAINTAINED BY A CERTIFIED SUBCONTRACTOR.
- GEOTEXTILE REINFORCEMENT (WOVEN)** INCLUDES COSTS OF ALL LABOR, MATERIALS, PLANT AND EQUIPMENT TO INSTALL WOVEN TENGATE MIRAFI FW404, OR APPROVED EQUAL, UNDER RIPRAP. INCLUDES PINNING TO RESTRICT MOVEMENT DURING RIPRAP PLACEMENT.
- TEMPORARY SILT FENCE** INCLUDES COSTS OF ALL LABOR, MATERIALS, PLANT AND EQUIPMENT TO INSTALL PER PLANS. INCLUDES COST TO DISPOSE OF SILT ACCUMULATION.
- 10-ft LONG x 1/4" CABLE WITH SOIL HOOK ANCHOR ON EACH END**



Plans and Estimates Prepared by:  
**KEITHLINE ENGINEERING GROUP**  
 8556 E. 101ST ST., S.T.C. Tulsa, Oklahoma 74133 (918) 369-7911  
 REVISION: \_\_\_\_\_ BY: \_\_\_\_\_ DATE: \_\_\_\_\_

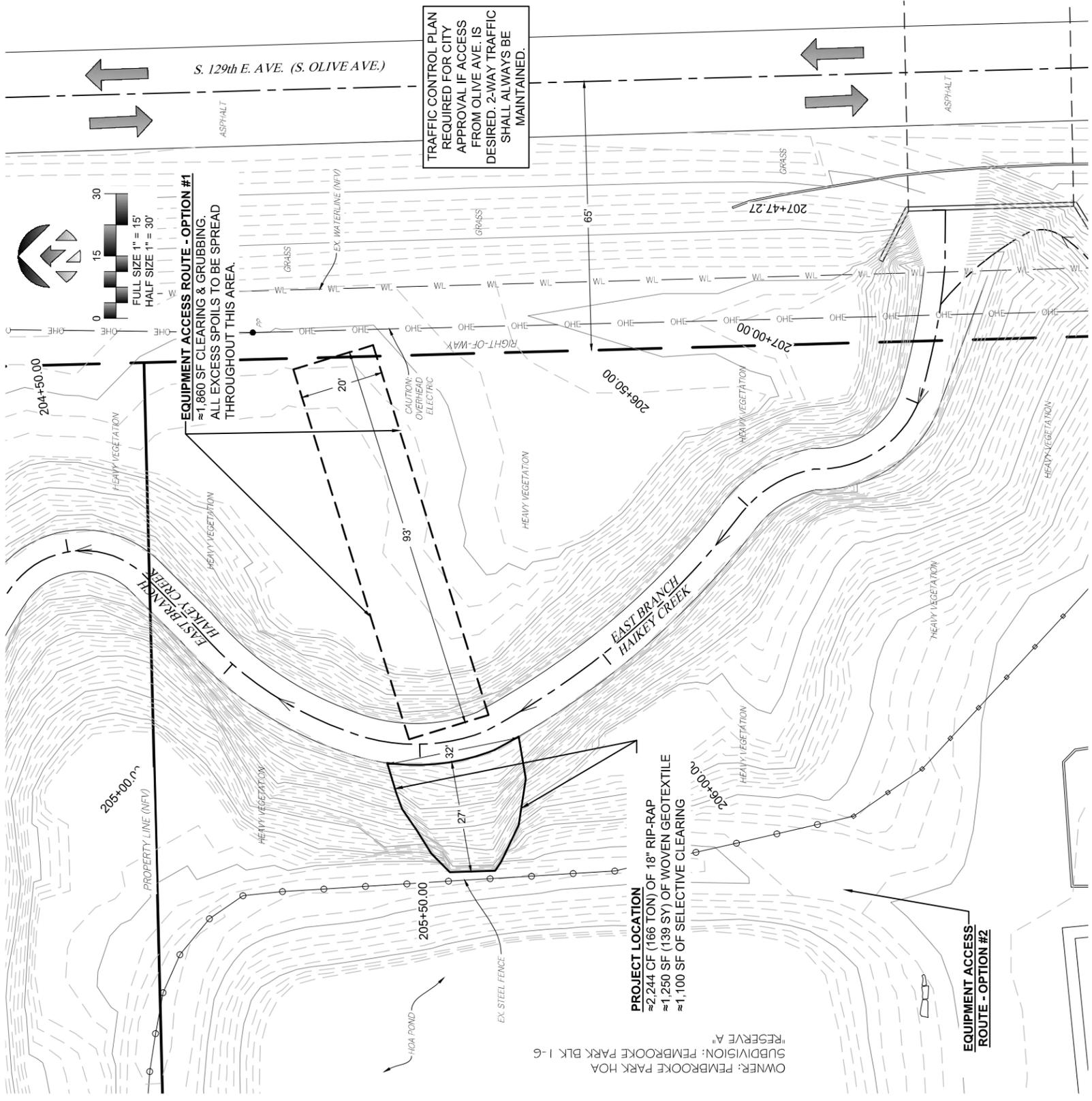


**PEMBROOKE PARK SUBDIVISION**  
**HOA POND EMBANKMENT MAINTENANCE**  
 CITY OF BROKEN ARROW, OKLAHOMA

**PAY ITEMS & NOTES**

PROJECT #	KE-2014
SURVEY	KE
DESIGNED	DMK
DRAWN	ZJM
ATLAS PAGE NO.	
DATE	JANUARY 11, 2021

1 PROJECT OVERVIEW  
SCALE: 1"=15'



Plans and Estimates Prepared by:  
**KE KEITHLINE ENGINEERING GROUP**  
 8556 E. 101ST ST., STE.C Tulsa, Oklahoma 74133 (918) 369-7911  
 REMSON  
 BY DATE

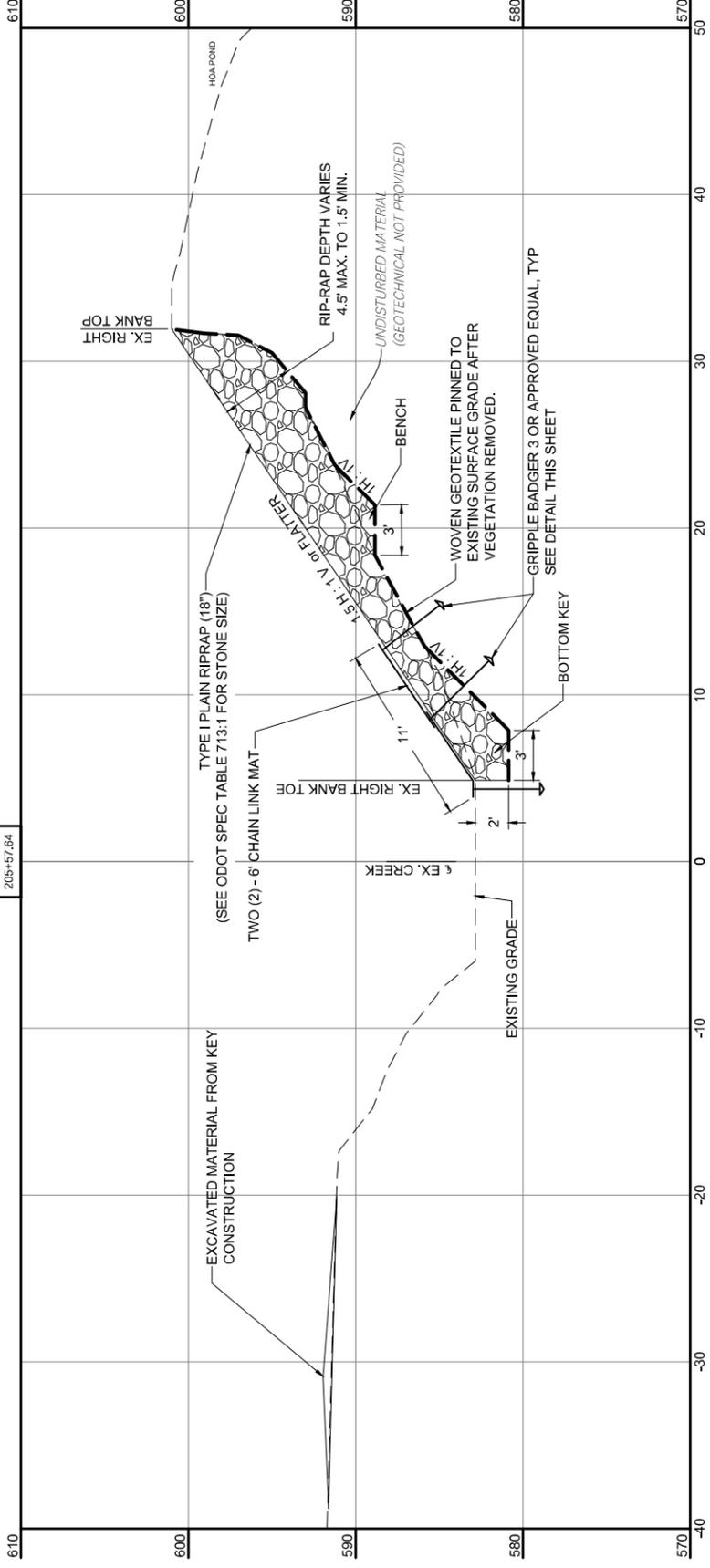


**PEMBROOKE PARK SUBDIVISION**  
**HOA POND EMBANKMENT MAINTENANCE**  
 CITY OF BROKEN ARROW, OKLAHOMA

**PROJECT OVERVIEW**

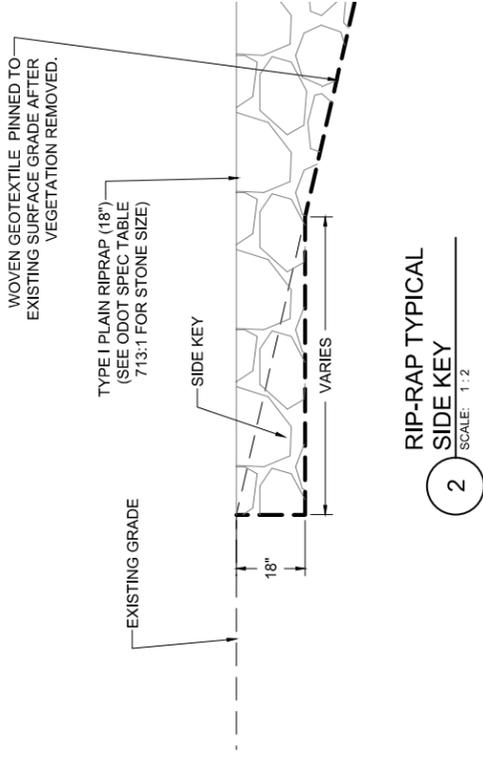
PROJECT #	KE 2014
SURVEY	KE
DESIGNED	DMK
DRAWN	ZLM
ATLAS PAGE NO.	
DATE	JANUARY 11, 2021



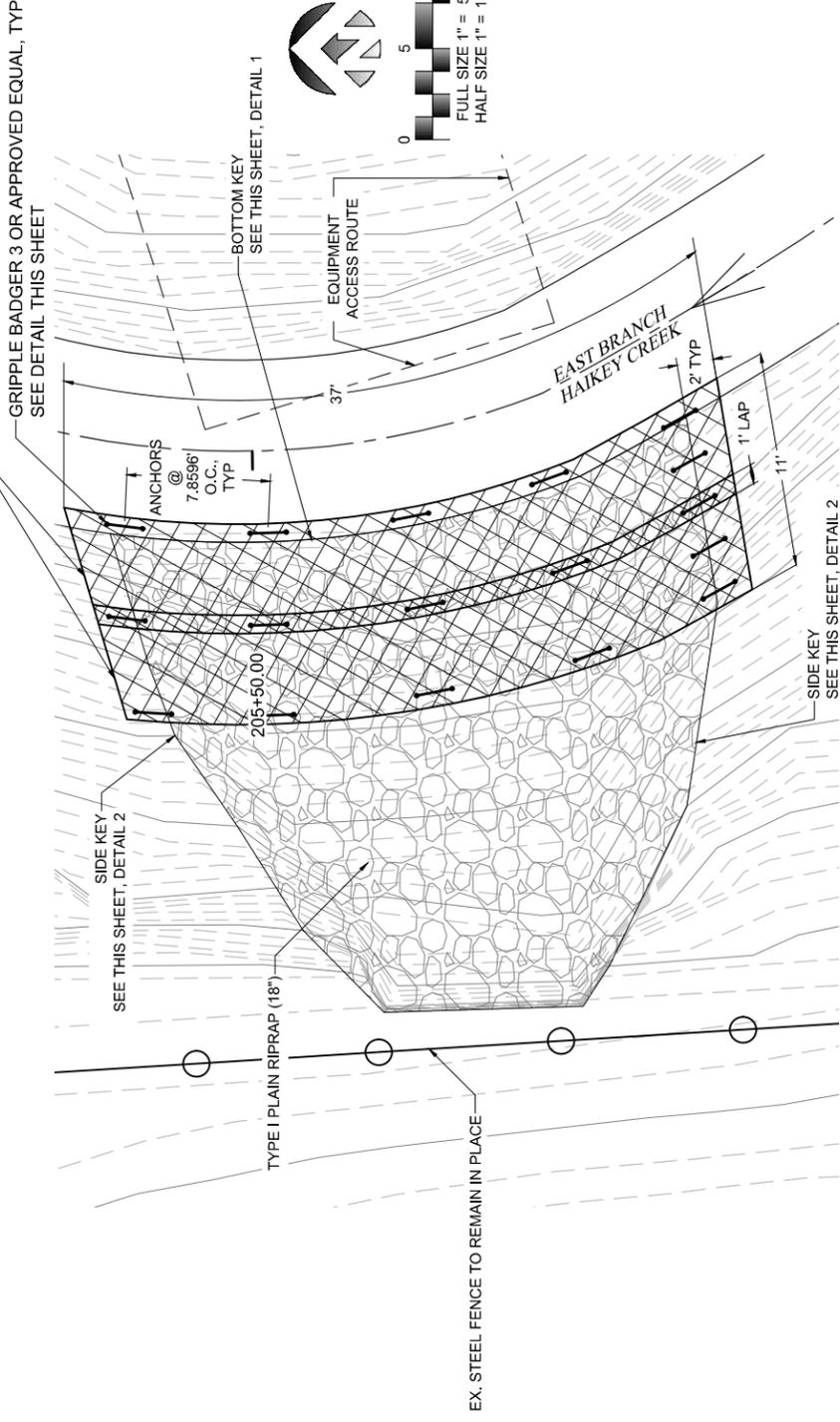


1 RIP-RAP TYPICAL  
BOTTOM KEY  
SCALE: 1:5

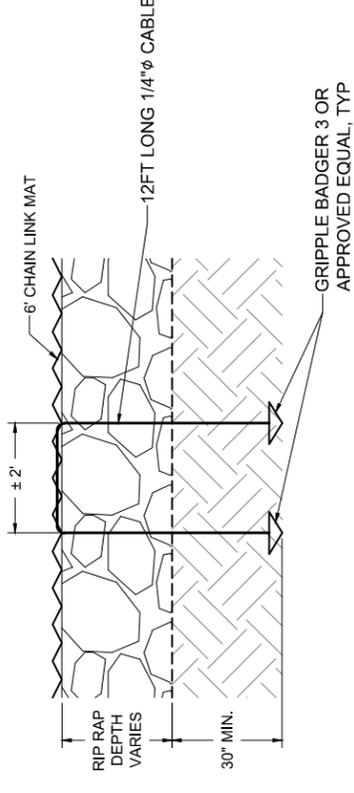
NOTES:  
1. WOVEN GEOTEXTILE TO HAVE A MINIMUM LAP OF 2'-0".



2 RIP-RAP TYPICAL  
SIDE KEY  
SCALE: 1:2



3 DETAIL  
PLAN VIEW  
SCALE: 1:5



4 12" - 1/4"Ø CABLE GRIPPLE BADGER 3  
CHAIN LINK ANCHOR DETAIL  
SCALE: NTS

DETAILS

PEMBROOKE PARK SUBDIVISION  
HOA POND EMBANKMENT MAINTENANCE  
CITY OF BROKEN ARROW, OKLAHOMA



Plans and Estimates Prepared by:  
**KE KEITHLINE ENGINEERING GROUP**  
8556 E. 101ST ST., STE C Tulsa, Oklahoma 74133 (918) 369-7911  
REVISION  
BY  
DATE



PROJECT #	KE 2014
SURVEY	KE
DESIGNED	DMK
DRAWN	ZLM
ATLAS PAGE NO.	
DATE	JANUARY 11, 2021

SHEET 04 OF 05

# STORM WATER MANAGEMENT PLAN

## SITE DESCRIPTION

PROJECT LIMITS: \_\_\_\_\_  
 APPROX. 60FT WIDE AND 125FT LONG BETWEEN THE RIGHT-OF-WAY AND HOA POND.

PROJECT DESCRIPTION: \_\_\_\_\_  
 A MAINTENANCE CONTRACT TO INSTALL 18-INCH RIPRAP ALONG THE HOA POND EMBANKMENT TO PREVENT SLOPE EROSION.

SUGGESTED SEQUENCE OF EROSION CONTROL ACTIVITIES: \_\_\_\_\_  
 1. CLEAR EQUIPMENT ACCESS ROUTE THROUGH HEAVY VEGETATION  
 2. INSTALL TEMPORARY SILT FENCE DOWNSTREAM OF DISTURBED AREAS.  
 3. REMOVE TREE/VEGETATION ON THE HOA POND EMBANKMENT.  
 4. INSTALL PERMANENT GEOTEXTILE FABRIC AND 18-INCH RIPRAP ON EMBANKMENT.  
 5. GRADE EQUIPMENT ACCESS ROUTE AND PLACE SEASONAL SEEDING.  
 6. REMOVE TEMPORARY SILT FENCE AFTER GRASS GROWTH.

SOIL TYPE: RADLEY & DENNIS SILT

TOTAL AREA OF THE CONSTRUCTION SITE: APPROX. 0.17 ACRES

ESTIMATED AREA TO BE DISTURBED: APPROX. 0.07 ACRES (3,000 SF)

OFFSITE AREA TO BE DISTURBED: N/A  
 (FOR CONTRACTOR USE)

TOTAL IMPERVIOUS AREA PRE-CONSTRUCTION: N/A

TOTAL IMPERVIOUS AREA POST-CONSTRUCTION: N/A

POST-CONSTRUCTION RUNOFF COEFFICIENT OF THE SITE: NO CHANGE

LATITUDE & LONGITUDE OF CENTER OF PROJECT: LAT 36.028033, LONG -95.833792

PROJECT WILL DISCHARGE TO: \_\_\_\_\_

NAME OF RECEIVING WATERS: EAST BRANCH OF HAIKEY CREEK

SENSITIVE WATERS OR WATERSHEDS: YES  NO

303(d) IMPAIRED WATERS: YES  NO

IF YES, LIST IMPAIRMENT: \_\_\_\_\_

LOCATED IN A TMDL: YES  NO

LAKE THUNDERBIRD TMDL: YES  NO

MS4 ENTITY: YES  NO

IF YES, LOCATION: \_\_\_\_\_

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

THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE FOLLOWING:

- 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 WITH TARPAULIN
- EXCESS DIRT ON ROAD REMOVED DAILY

### NOTES:

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

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, DRAINAGEWAYS, 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 MATERIALS:  
 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:  
 A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED TO COMPLY WITH THE OKLAHOMA POLLUTION DISCHARGE ELIMINATION SYSTEM (OPDES) REGULATIONS. THIS PLAN IS INITIATED DURING THE DESIGN PHASE, CONFIRMED IN THE PRE-WORK MEETINGS AND AVAILABLE ON THE JOB SITE ALONG WITH COPIES OF THE NOTICE OF INTENT (NOI) FORM AND PERMIT CERTIFICATE THAT HAVE BEEN FILED WITH THE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ). THE PLAN MUST BE KEPT CURRENT WITH UP-TO-DATE AMENDMENTS DURING THE PROGRESSION OF THE PROJECT. ALL CONTRACTOR OFF-SITE OPERATIONS ASSOCIATED WITH THE PROJECT MUST BE DOCUMENTED IN THE SWPPP, I.E., BORROW PITS, WORK ROADS, DISPOSAL SITES, ASPHALT/CONCRETE PLANTS, ETC. THE BASIC GOAL OF STORM WATER MANAGEMENT IS TO IMPROVE WATER QUALITY BY REDUCING POLLUTANTS IN STORM WATER DISCHARGES. RUNOFF FROM CONSTRUCTION SITES HAS A POTENTIAL FOR POLLUTION DUE TO EXPOSED SOILS AND THE PRESENCE OF HAZARDOUS MATERIALS USED IN THE CONSTRUCTION PROCESS. THE PREVENTION OF SOIL EROSION, CONTAINMENT OF HAZARDOUS MATERIALS AND/OR THE INTERCEPTION OF THESE POLLUTANTS BEFORE LEAVING THE CONSTRUCTION SITE ARE THE BEST PRACTICES FOR CONTROLLING STORM WATER POLLUTION.

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 OF MATERIAL
- 107.01 LAWS, RULES AND REGULATIONS TO BE OBSERVED
- 107.20 STORM WATER MANAGEMENT
- 220 MANAGEMENT OF EROSION, SEDIMENTATION AND STORM WATER POLLUTION PREVENTION AND CONTROL
- 221 TEMPORARY SEDIMENT CONTROL

IN ADDITION:  
 "ODEQ GENERAL PERMIT (OKR10) FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES WITHIN THE STATE OF OKLAHOMA." ODEQ, WATER QUALITY DIVISION, SEPTEMBER 13, 2017.



PROJECT #	KE 2014
SURVEY	KE
DESIGNED	DAK
DRAWN	ZTM
ATLAS PAGE NO.	
DATE	JANUARY 11, 2021

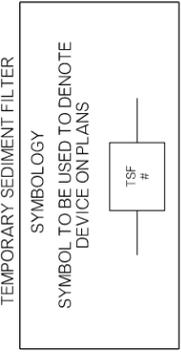
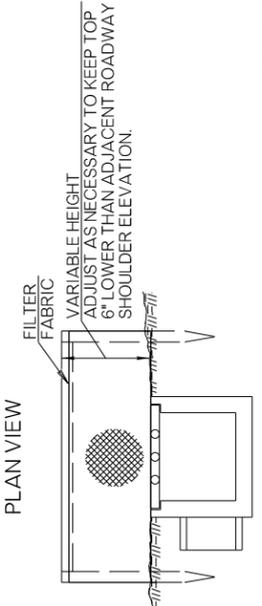
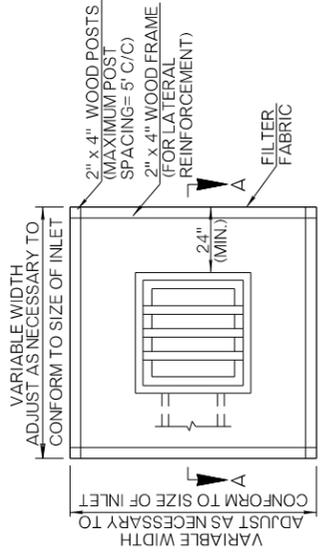


Plans and Estimates Prepared by:  
**KE** KEITHLINE ENGINEERING GROUP  
 8556 E. 101ST ST., STE.C Tulsa, Oklahoma 74133 (918) 369-7911

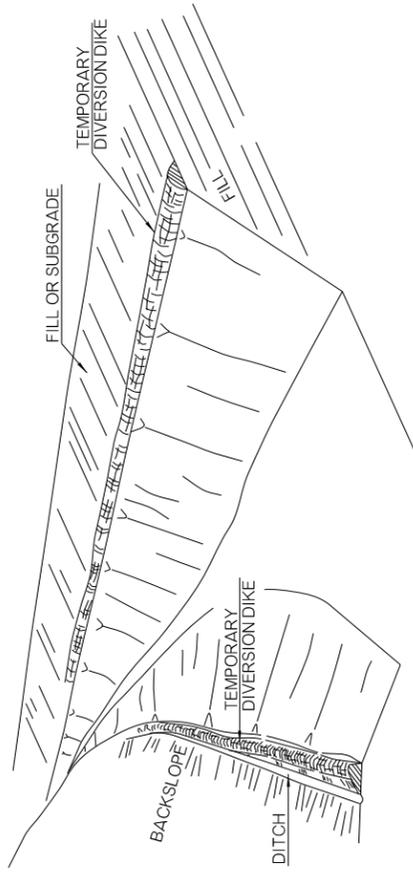
PEMBROOKE PARK SUBDIVISION  
 HOA POND EMBANKMENT MAINTENANCE  
 CITY OF BROKEN ARROW, OKLAHOMA

STORMWATER  
 MANAGEMENT  
 PLAN

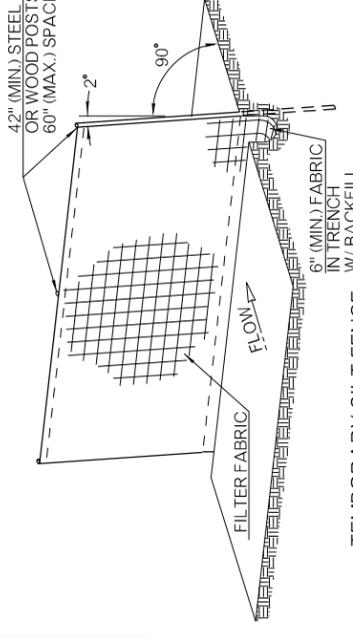
OKLAHOMA DEPARTMENT OF TRANSPORTATION	
STANDARD REVISIONS	DATE



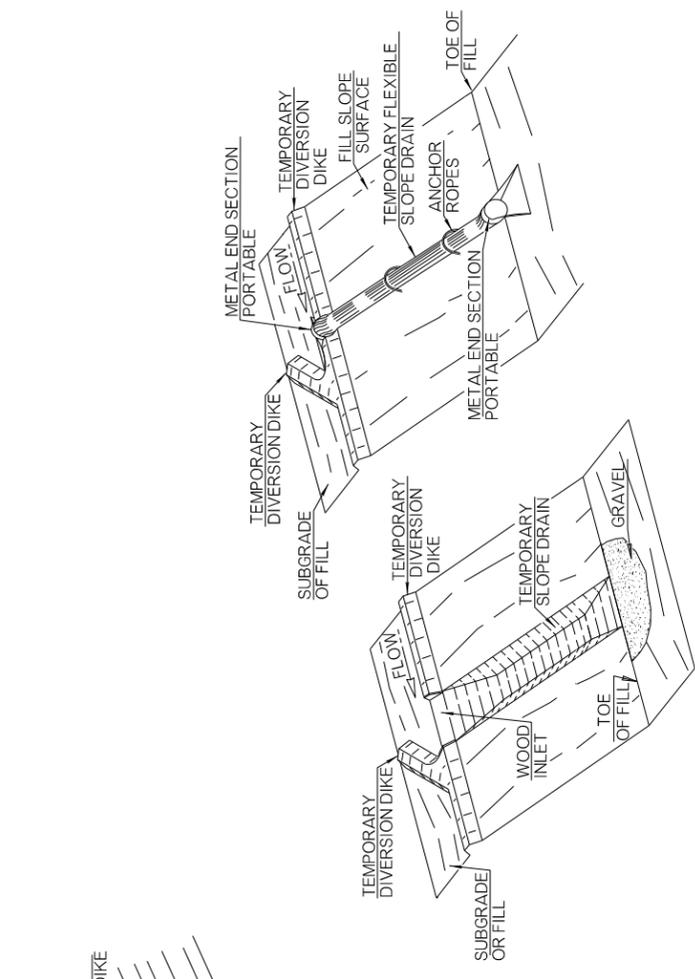
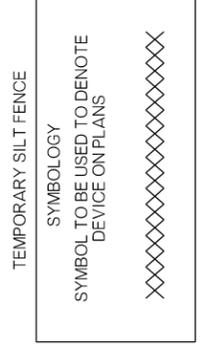
SECTION A - A  
SEDIMENT FILTER  
(TYPE I)



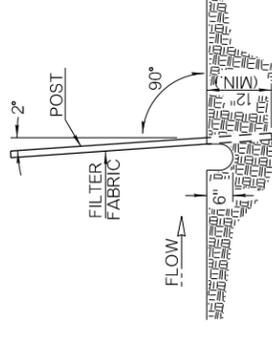
DIVERSION DIKES



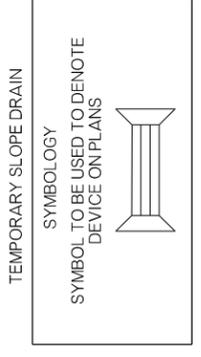
TEMPORARY SILT FENCE  
RECOMMENDED TOE-IN METHOD



SLOPE DRAINS



TEMPORARY SILT FENCE  
SECTION

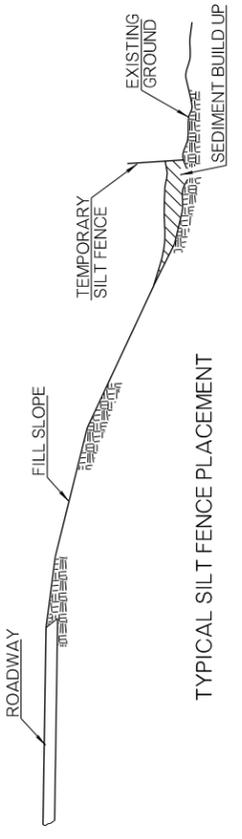


GENERAL NOTES

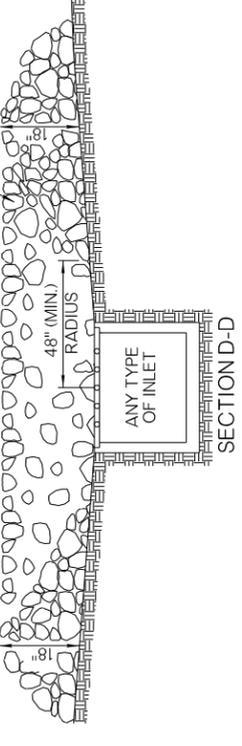
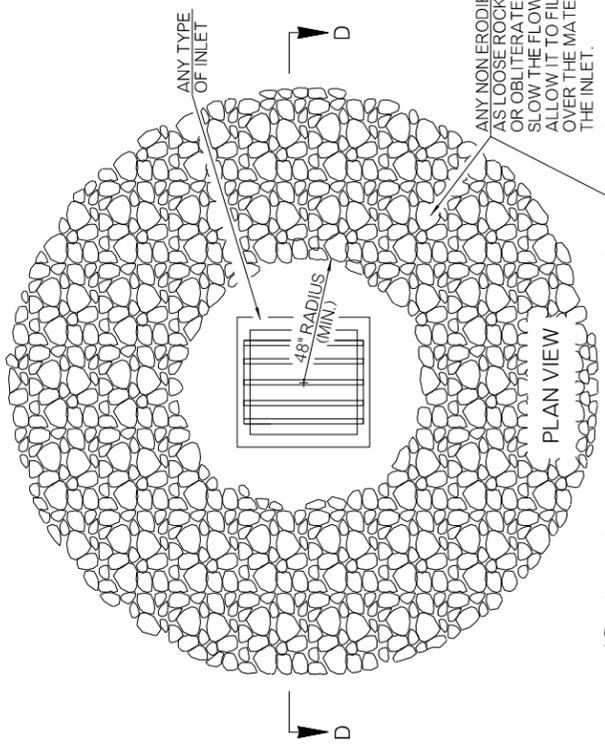
1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
2. COST OF TEMPORARY DIVERSION DIKES TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS OF WORK.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
221 (A)	TEMPORARY SLOPE DRAINS	LF
221 (B)	TEMPORARY SILT FENCE	LF
221 (C)	TEMPORARY SEDIMENT FILTER	EA

APPROVED BY ROADWAY ENGINEER: *[Signature]* DATE: 5/27/20  
ROADWAY DESIGN DIVISION STANDARD



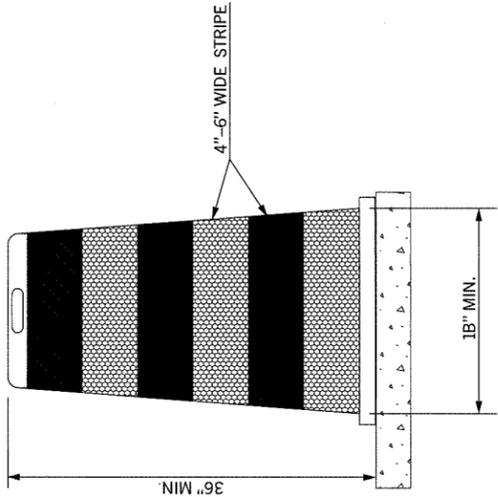
TYPICAL SILT FENCE PLACEMENT



SECTION D-D  
SEDIMENT FILTER  
(TYPE II)

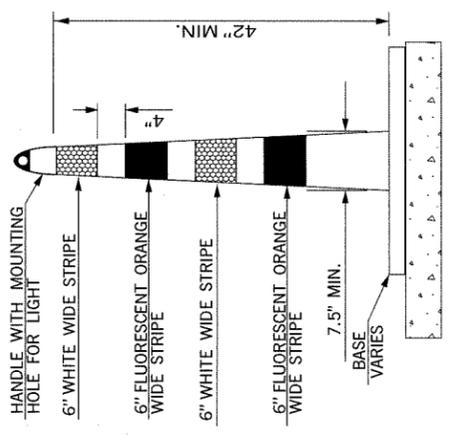
ANY NON-ERODIBLE MATERIAL SUCH AS LOOSE ROCK, BROKEN CONCRETE OR OBLITERATED PAVING, THAT WILL SLOW THE FLOW OF WATER AND ALLOW IT TO FILTER THROUGH AND OVER THE MATERIAL BEFORE ENTERING THE INLET.

REVISIONS	DATE
DESCRIPTION	
ADD NOTE TO VERTICAL PANEL	07/29/05
CHANGED TYPE 'C' LIGHT TO OPTIONAL	3/12/2011



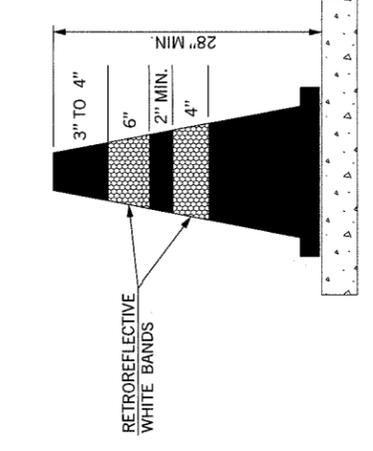
### DRUM

NOTES:  
 METAL DRUMS SHALL NOT BE USED.  
 EACH DRUM SHALL HAVE A MINIMUM OF TWO (2) FLUORESCENT ORANGE STRIPES ALTERNATING WITH A MINIMUM OF TWO (2) WHITE STRIPES. THESE STRIPES SHALL CONSIST OF RETROREFLECTIVE SHEETING.  
 BALLAST SHALL NOT BE PLACED ON TOP OF A DRUM.  
 DRUMS SHALL NOT BE USED TO DELINEATE AN EDGE DROP OFF IF THEY MUST BE PLACED IN THE DROP OFF AREA BELOW THE LEVEL OF THE DRIVING SURFACE.



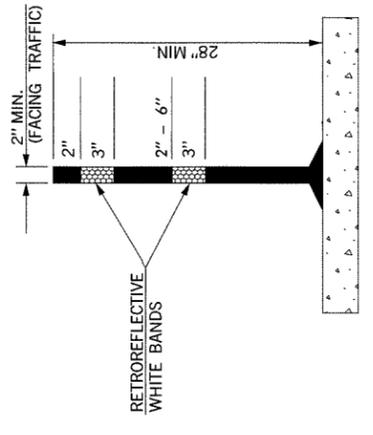
### CHANNELIZER CONE

NOTES:  
 CHANNELIZER CONES USED ON HIGH SPEED ROADWAYS ON ALL HIGHWAYS DURING NIGHTTIME OR WHENEVER MORE CONSPICUOUS GUIDANCE IS NEEDED SHALL BE A MINIMUM OF 42 INCHES HIGH. EACH CHANNELIZER CONES SHALL HAVE A MINIMUM OF TWO (2) FLUORESCENT ORANGE STRIPES ALTERNATING WITH A MINIMUM OF TWO (2) WHITE STRIPES. THESE STRIPES SHALL CONSIST OF RETROREFLECTIVE SHEETING.  
 BASE SHALL WEIGH 30 LBS. OR MORE.



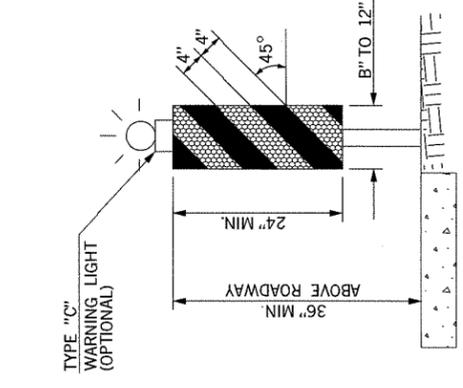
### CONE

NOTES:  
 CONES USED ON HIGH SPEED ROADWAYS ON ALL HIGHWAYS DURING NIGHTTIME OR WHENEVER MORE CONSPICUOUS GUIDANCE IS NEEDED SHALL BE A MINIMUM OF 28 INCHES HIGH. CONES SHALL BE PREDOMINANTLY ORANGE, WITH WHITE RETROREFLECTIVE SHEETING.



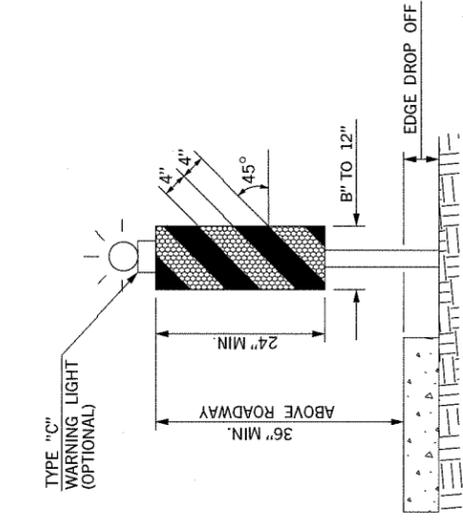
### TUBE CHANNELIZER

NOTES:  
 TUBE CHANNELIZERS USED ON HIGH SPEED ROADWAYS ON ALL HIGHWAYS DURING NIGHTTIME OR WHENEVER MORE CONSPICUOUS GUIDANCE IS NEEDED SHALL BE A MINIMUM OF 28 INCHES HIGH. TUBE CHANNELIZERS SHALL BE PREDOMINANTLY ORANGE, WITH WHITE RETROREFLECTIVE SHEETING.



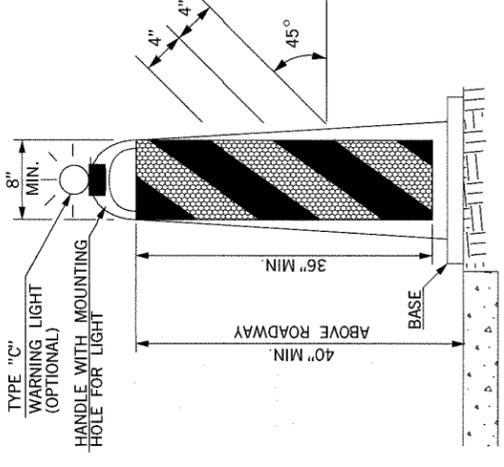
### VERTICAL PANEL W/O DROP OFF

NOTES:  
 PANEL STRIPE WIDTHS SHALL BE 6 INCHES EXCEPT WHERE PANELS LENGTHS ARE LESS THAN 36 INCHES, THEN 4 INCH WIDE STRIPES MAY BE USED. MARKINGS FOR VERTICAL PANELS SHALL BE ALTERNATING FLUORESCENT ORANGE AND WHITE RETROREFLECTORIZED STRIPES (SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS). SHALL HAVE A MINIMUM OF TWO (2) FULL FLUORESCENT ORANGE STRIPES.



### VERTICAL PANEL W/DROP OFF

ON UNDIVIDED HIGHWAYS, VERTICAL PANELS SHALL HAVE A MINIMUM OF 192 SQUARE INCHES OF RETROREFLECTIVE SHEETING ON EACH PANEL (FRONT AND BACK). WHEN USED ON HIGH SPEED ROADWAYS, VERTICAL PANELS SHALL HAVE MINIMUM OF 270 SQUARE INCHES OF RETROREFLECTIVE SHEETING ON EACH PANEL (FRONT AND BACK). THIS SHALL CONSTITUTE ONE (1) COMPLETE VERTICAL PANEL.  
 ON DIVIDED HIGHWAYS A VERTICAL PANEL MAY HAVE SHEETING ON ONLY ONE SIDE.



### STACKABLE VERTICAL PANEL

NOTES:  
 (1) VERTICAL PANEL SIGNS SHALL BE MOUNTED BACK TO BACK WHEN USED FOR TWO-WAY TRAFFIC.  
 (2) BASE SHALL BE NO LARGER THAN 28" LONG BY 20" WIDE, AND 2" THICK.  
 (3) BASE SHALL WEIGHT 30 LBS. OR MORE.  
 (4) THESE DEVICES SHALL BE CONSTRUCTED OF A MATERIAL THAT CAN BE STRUCK WITHOUT DAMAGING VEHICLES ON IMPACT.



BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
880(D)	VERTICAL PANEL	SD
880(E)	WARNING LIGHTS	SD
880(F)	DRUMS	SD
880(G)	TUBE CHANNELIZERS	SD
880(H)	CONES	SD
880(I)	CHANNELIZER CONES	SD



APPROVED BY: *[Signature]* DATE: 3/21/11  
 TRAFFIC ENGINEER  
 TRAFFIC STANDARD  
 CHANNELIZING DEVICES