

ROCKERY WALL GENERAL NOTES:  
 1. TYPE, DENSITY AND VOID SPACE: THE TYPE AND DENSITY OF THE ROCK SHALL BE CONSISTENT WITH THE DESIGN OF THE ENGINEER. IF, FOR EXAMPLE, GRANITE IS SPECIFIED IN THE STRUCTURAL CALCULATIONS AND DETAILS, GRANITE SHALL BE USED AT THE SITE. THE TYPE OF ROCK USED SHALL BE SOUND (I.E. NO FISSURES) AND BE RESISTANT TO WEATHERING. IF THE ROCK OR BOULDER DENSITY DOES NOT AGREE WITH THE CALCULATIONS, THE ENGINEER OF RECORD MUST BE NOTIFIED AND THE CALCULATIONS MAY REQUIRE REVISIONS. ADDITIONALLY, THE INTERNAL VOID SPACE IN THE ROCK SHALL BE KEPT TO A MINIMUM VALUE AS SPECIFIED BY THE ENGINEER OF RECORD AND AS LOCATED IN THE STRUCTURAL CALCULATIONS.

2. SIZE OF ROCK: FOR ROCK WALLS 5 FEET OR LESS IN HEIGHT: WALLS UP TO THIS HEIGHT ARE TYPICALLY ONE ROCK (OR BOULDER) WIDE. FOR THESE WALLS THE DIMENSIONS OF EACH ROCK ABOVE THE NEXT SHALL BE SPECIFIED. IN THIS MANNER ALL ROCK SIZES WILL BE CALLED OUT.

FOR ROCK WALLS OVER 5 FEET: WALLS OVER 5 FEET IN HEIGHT MAY REQUIRE MORE THAN ONE ROCK PER LAYER. A GOOD ROCK SIZE IS USUALLY 1/4 TO 1/3 THE WIDTH OF THE BASE LAYER (IF NOT SPECIFIED IN THE CONSTRUCTION DOCUMENTS). ROCKS PLACED AT THE TOP OF THE WALL FOR AESTHETIC PURPOSES SHALL BE HEAVY ENOUGH, OR OTHERWISE PLACED IN SUCH A WAY THAT THEY CANNOT BE EASILY DISLODGED FROM THEIR POSITION. WITHIN THE BOTTOM HALF OF THE WALL, NO MORE THAN TWO ROCKS SHALL BE PLACED ADJACENT (HORIZONTALLY) TO ONE ANOTHER IN ANY PARTICULAR WAY.

3. SHAPE OF THE ROCK: IN ADDITION TO THE ABOVE-MENTIONED CRITERIA, THE LONGEST DIMENSION OF ANY INDIVIDUAL ROCK SHOULD NOT EXCEED THREE TIMES ITS SHORTEST DIMENSION. ROCKS SHOULD BE ROUGHLY CUBOIDAL IN SHAPE. ROCKS WHICH ARE VERY ROUND (ONES WHICH COULD BE ROLLED EASILY BY PUSHING) SHALL EITHER NOT BE USED OR SHALL BE RESHAPED UNTIL SUFFICIENTLY "CUBIC". ROCKS PLACED AT THE TOP OF THE WALL FOR AESTHETIC PURPOSES SHALL BE HEAVY ENOUGH, OR OTHERWISE PLACED IN SUCH A WAY THAT THEY CANNOT BE EASILY DISLODGED FROM THEIR POSITION. THE SHAPE OF THESE ROCKS IS ARBITRARY.

4. DRAINAGE LAYER: ROCK WALLS SHALL HAVE A MINIMUM DRAINAGE LAYER THICKNESS OF 12" SEPARATING THE BACK OF THE WALL AND THE CUT SLOPE OR COMPACTED BACKFILL. THE DRAINAGE MATERIAL SHALL BE 3 INCH TO 3/4" DIAMETER CLEAN GRAVEL AND COBBLES. THE DRAINAGE MATERIAL SHALL BE CLEAN OF ORGANIC MATERIALS AND CONTAIN LESS THAN 5% FINE MATERIAL (I.E. SILTS AND CLAYS WHICH PASS THE NO. 200 SIEVE). IF A RANDOM WALL ROCK EXTENDS BACK TO THE EXPOSED SOIL FACE, IT IS NOT NECESSARY THAT THE FILTER ROCK LAYER EXTEND BETWEEN IT AND THE SOIL FACE.

5. KEYWAY: THE KEYWAY SHALL HAVE A MINIMUM DEPTH AT THE TOE OF THE ROCK GRAVITY WALL OF 12" (12" EMBEDMENT). THIS CAN BE ACCOMPLISHED BY EITHER EXCAVATING 12" INTO EXISTING GRADE OR BRINGING THE FINISH GRADE UP 12" OR ANY COMBINATION OF BOTH (I.E. EXCAVATE 4" INTO EXISTING GRADE AND BRING THE FINISH GRADE UP 8" FOR A TOTAL OF A 12" TOE). ALL FILL MUST BE COMPACTED TO 90% OF THE LABORATORY STANDARD (ASTM D 1557). THE COMPETENCY OF THE KEYWAY SUB GRADE TO SUPPORT THE ROCK WALL SHALL BE VERIFIED BY PROBING WITH A SMALL DIAMETER STEEL ROD. THE ROD SHALL HAVE A DIAMETER OF BETWEEN THREE-EIGHTHS AND ONE-HALF INCH, AND SHALL BE PUSHED INTO THE SUB GRADE IN A SMOOTH, UNAIDED MANNER UNDER THE BODY WEIGHT OF THE PROBE OPERATOR ONLY. PENETRATION OF UP TO SIX INCHES, WITH SOME DIFFICULTY, SHALL INDICATE A "COMPETENT" KEYWAY SUB GRADE, UNLESS OTHER FACTORS IN THE GEOTECHNICAL ENGINEER'S OPINION SHALL INDICATE OTHERWISE.

6. WALL FACE OF SLOPE: THE FACE SLOPE OR BATTER SHALL BE BETWEEN 4 TO 1 TO 6 TO 1.

7. WORKMANSHIP: ROCK WALL CONSTRUCTION IS A CRAFT WHICH DEPENDS LARGELY ON THE SKILL AND EXPERIENCE OF THE BUILDER. THE FIRST COURSE OF ROCK SHOULD BE PLACED ON FIRM, UNYIELDING SOIL. THERE SHOULD BE FULL CONTACT BETWEEN THE ROCK AND THE SOIL, WHICH MAY REQUIRE SHAPING OF THE GROUND SURFACE OR SLAMMING OR DROPPING THE ROCKS INTO PLACE SO THAT THE SOIL FOUNDATION CONFORMS TO THE ROCK FACE BEARING ON IT. AS THE ROCK WALL IS CONSTRUCTED, THE ROCKS SHOULD BE PLACED SO THAT THERE ARE NO CONTINUOUS JOINT PLANES IN EITHER THE VERTICAL OR LATERAL DIRECTION. WHEREVER POSSIBLE, EACH ROCK SHOULD BEAR AT LEAST TWO ROCKS BELOW IT. EACH ROCK SHALL BE SUPPORTED IN SUCH A WAY AS TO PREVENT INSTABILITIES (I.E. THE ROCK BEING POSITIONED SHOULD NOT "WOBBLE" IN PLACE). IF THIS OCCURS THE ROCK NEEDS TO BE REPOSITIONED. CARE SHOULD BE TAKEN TO KEEP EXCESSIVE AMOUNTS OF GRAVEL OFF OF BEARING SURFACES BEFORE THE NEXT ROCK IS PUT IN PLACE. THESE SMALL PIECES OF GRAVEL COULD ACT LIKE "BALL BEARINGS" EFFECTIVELY REDUCING THE COEFFICIENT OF FRICTION. ROCKS SHALL NOT BE SUPPORTED SUCH THAT THEY SHOW EVIDENCE OF SIGNIFICANT CANTILEVER IN THE OPINION OF THE INSPECTOR OR ENGINEER OF RECORD.

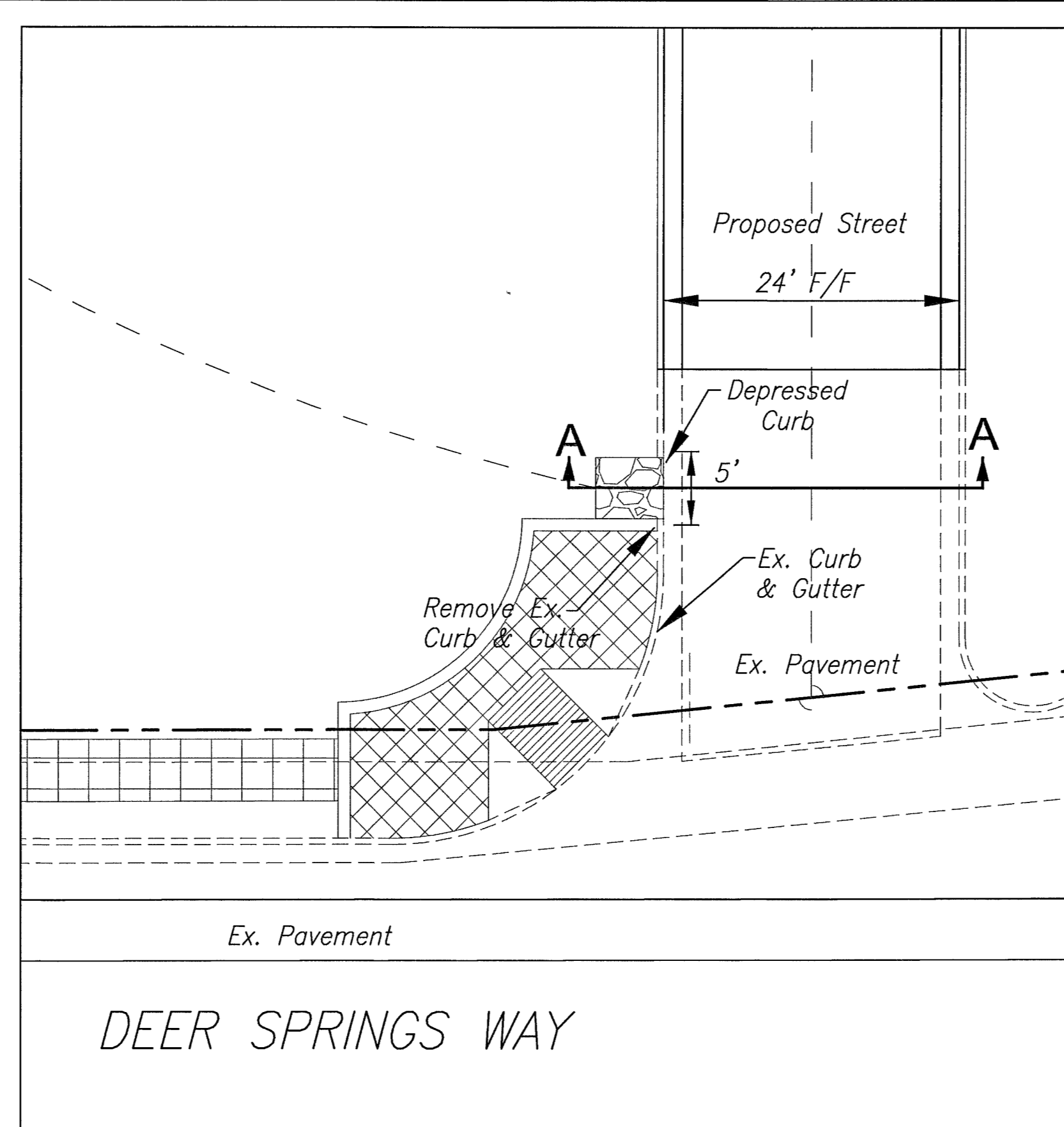
8. UPON COMPLETION: UPON COMPLETION OF CONSTRUCTION THE CONTRACTOR SHALL INSPECT THE FINAL CONDITION OF THE WALL. CONTRACTOR SHALL CLEAN VOIDS OF LOOSE GRAVEL DRAINAGE ROCK. CHECK THE WALL FOR ANY LOOSE OR UNSTABLE BOULDERS. IF ANY UNSTABLE WALL ELEMENTS ARE FOUND THEY SHALL BE REMOVED OR PLACED SO THAT THE ROCK OR BOULDER CAN NOT BE DISLODGED BY HAND. WHERE VOIDS OF GREATER THAN SIX INCHES IN DIMENSION EXIST IN THE FACE OF A ROCK WALL THEY SHOULD BE VISUALLY EXAMINED TO DETERMINE IF CONTACT BETWEEN THE ROCKS EXISTS WITHIN THE THICKNESS OF THE ROCK WALL. IF CONTACT DOES EXIST, NO FURTHER ACTION IS REQUIRED. HOWEVER, IF THERE IS NO ROCK CONTACT WITHIN THE ROCK WALL THICKNESS THE VOID SHOULD BE "CHINKED" WITH A SMALLER PIECE OF ROCK.

9. ROCK QUALITY: ROCKS DELIVERED TO AND INCORPORATED IN THE PROJECT SHALL MEET THE FOLLOWING MINIMUM SPECIFICATIONS: A. ABSORPTION ASTM C 127 AASHTO T-85 B. ACCELERATED EXPANSION (15 DAYS) CRD-C-148 \*1,2 C. SOUNDNESS (MSS04 AT 5 CYCLES) ASTM C88 CRD-C-13 D. UNCONFINED COMPRESSIVE STRENGTH ASTM D 2938 E. BULK SPECIFIC GRAVITY (SEE CALCULATIONS) ASTM C127 AASHTO T-85 NOT MORE THAN 2.0% FOR IGNEOUS AND METAMORPHIC ROCK TYPES AND 3.0% FOR SEDIMENTARY ROCK TYPES. NOT MORE THAN 15% BREAKDOWN. NOT GREATER THAN 5% LOSS. INTACT STRENGTH OF 3000 PSI, OR GREATER. NOT LESS THAN 2.40 (MIN).

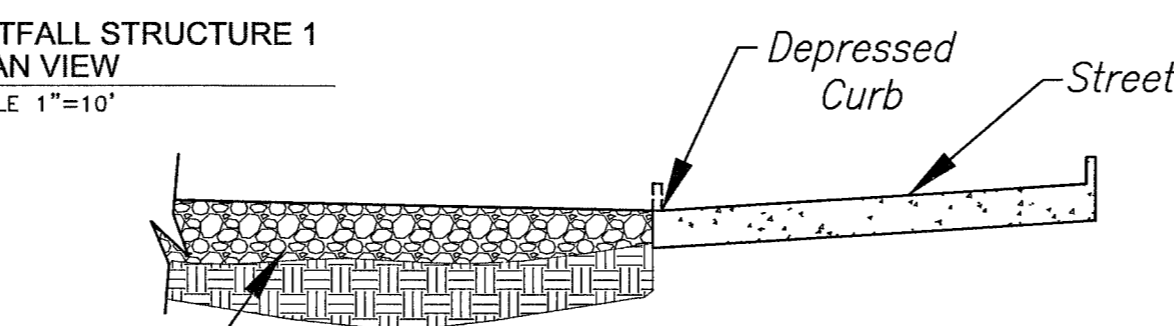
\*1. THE TEST SAMPLE WILL BE PREPARED AND TESTED IN ACCORDANCE WITH CORPUS OF ENGINEERS TESTING PROCEDURE CRC-C-148, "METHOD OF TESTING STONE FOR EXPANSIVE BREAKDOWN ON SOAKING IN ETHYLENE GLYCOL".

\*2. ACCELERATED EXPANSION TESTS SHOULD ALSO INCLUDE ANALYSES OF THE FRACTURES AND VEINS FOUND IN THE ROCK.

10. FREQUENCY OF TESTING: QUARRY SOURCES SHALL BE TESTED WHEN EITHER BECOMING A SUPPLIER OR WHEN A NEW AREA OF THE SOURCE PIT IS OPENED. THE TEST DESCRIBED IN THE PREVIOUS SECTION SHALL BE PERFORMED ONCE EVERY YEAR THE SOURCE PIT IS IN USE AS A SUPPLIER.

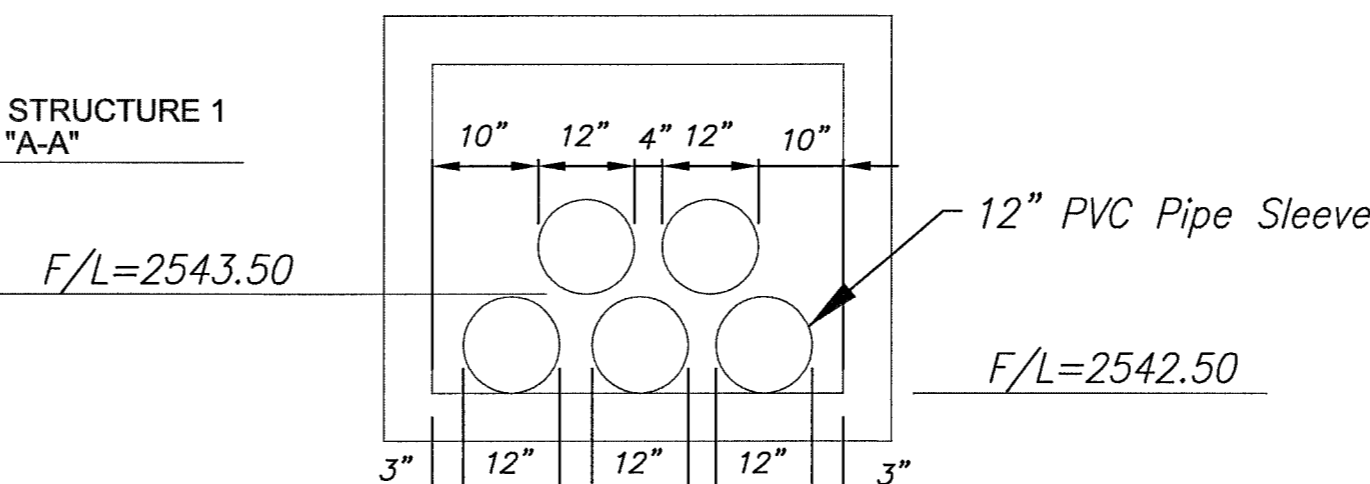


OUTFALL STRUCTURE 1  
 PLAN VIEW  
 SCALE 1"=10'



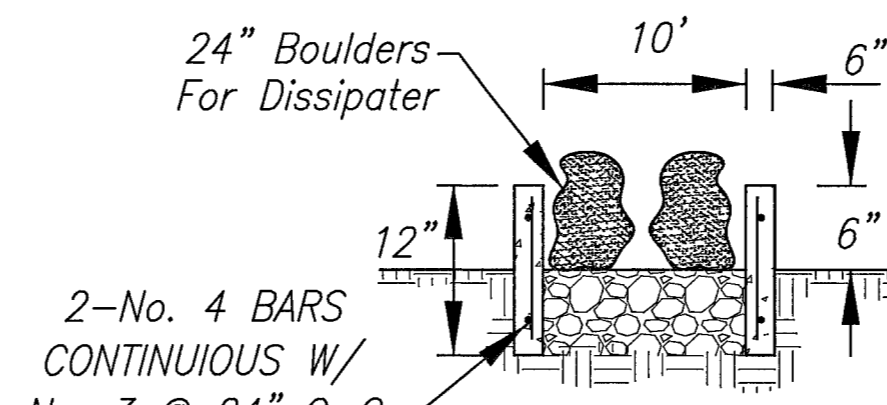
OUTFALL STRUCTURE 1  
 SECTION "A-A"  
 N.T.S.

HEIGHT	WIDTH AT BOTTOM
3'	1'-10"
5'	2'-10"
7'	3'-10"
9'	4'-9"
11'	5'-9"
13'	6'-7"



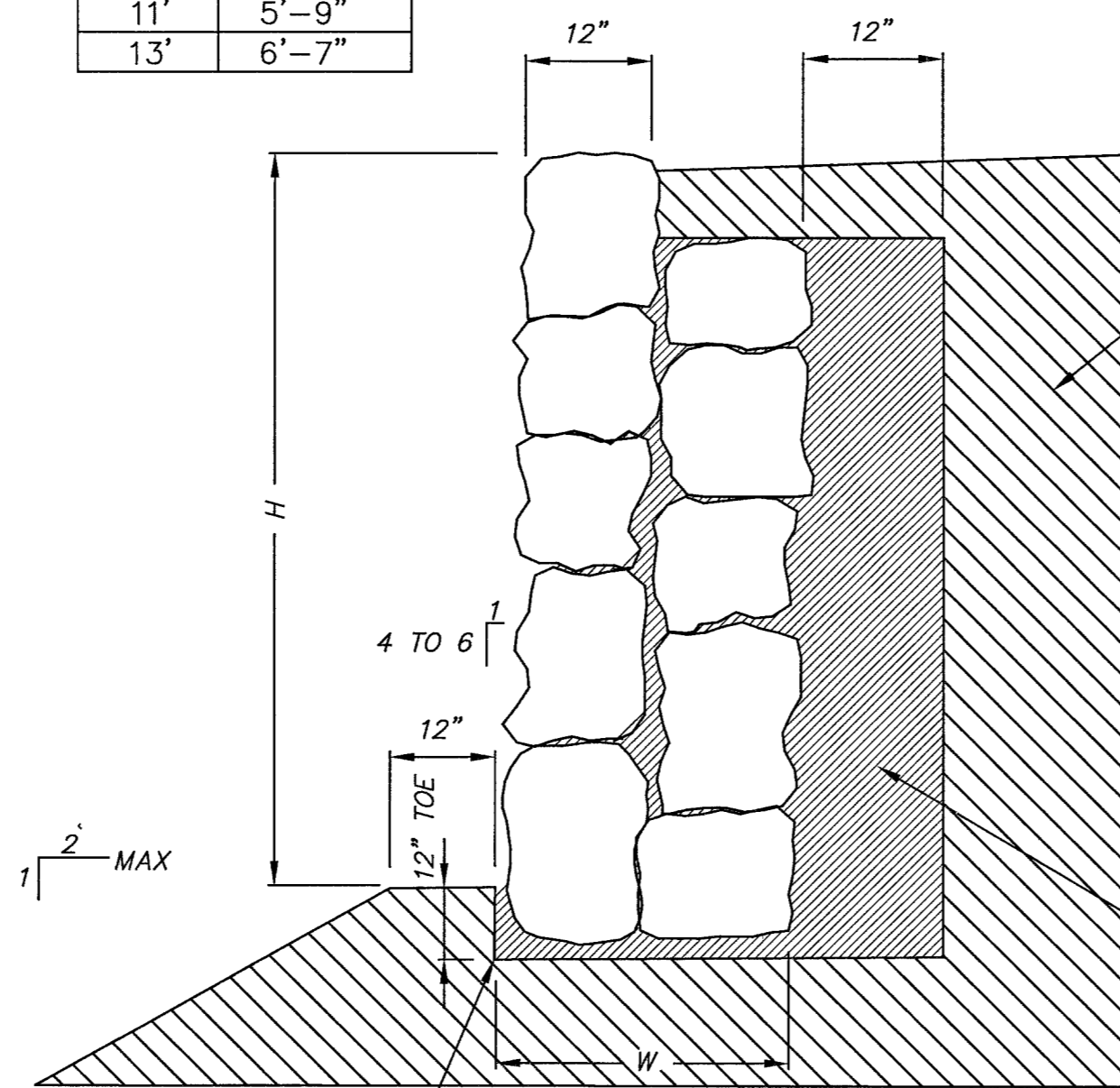
SECTION "E-E"  
 N.T.S.

COMPACTED STRUCTURAL FILL  
 (REFER TO SOILS REPORT,  
 PROVIDED BY CONVERSE  
 CONSULTANTS, PROJECT No.  
 D3-33414-02)

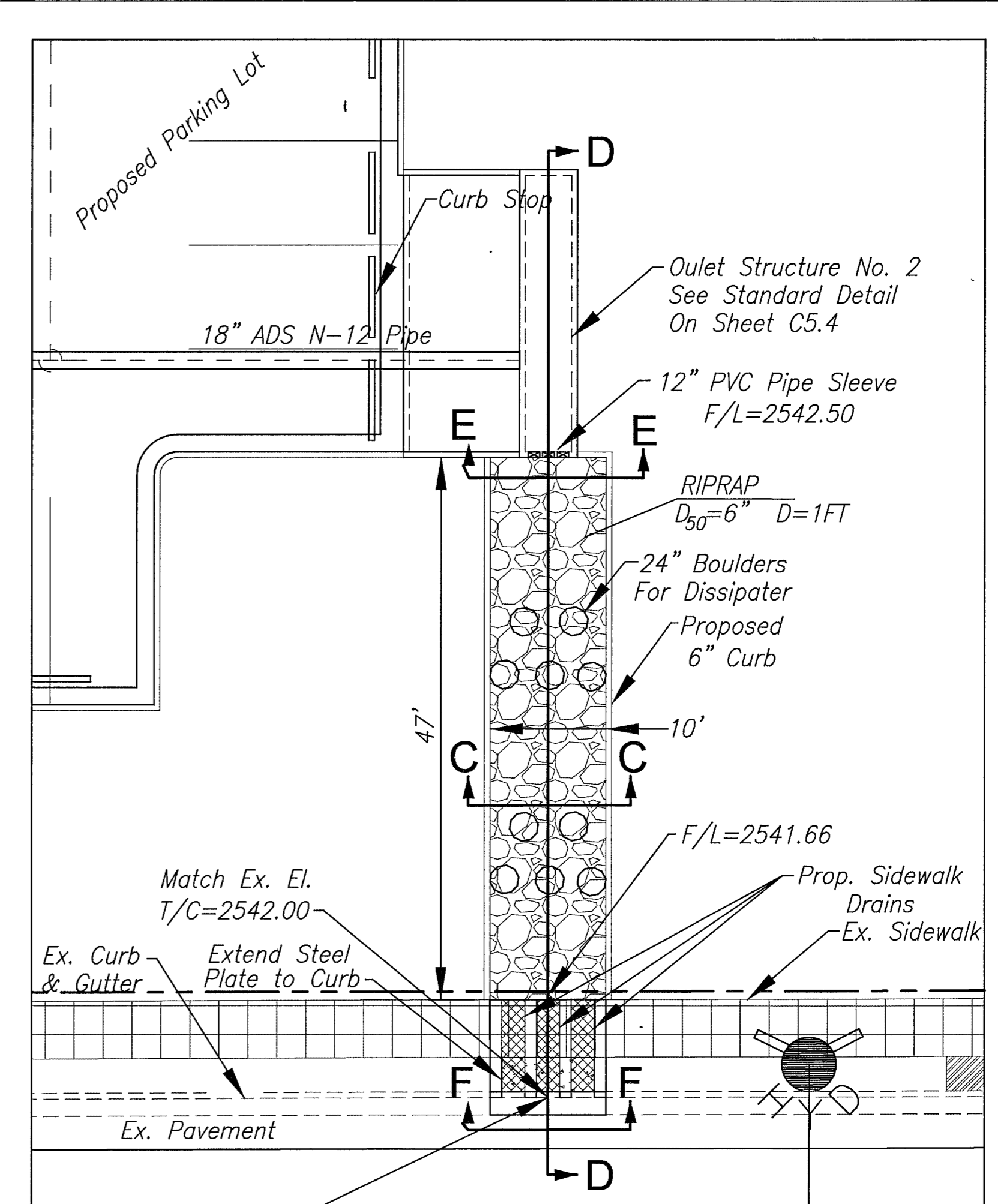


OUTFALL STRUCTURE 2  
 SECTION "C-C"  
 N.T.S.

DRAINAGE LAYER  
 (REFER TO NOTE No. 4)



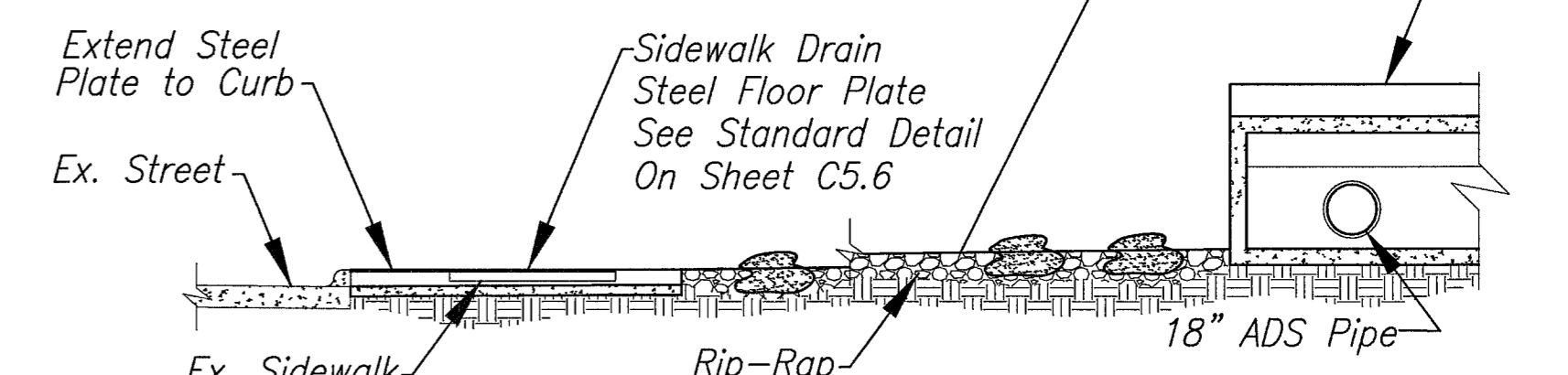
KEYWAY (REFER TO NOTE No. 5)  
 ROCKERY WALL TYPICAL SECTION  
 N.T.S.



Prop. (3) 24"  
 Curb Opening

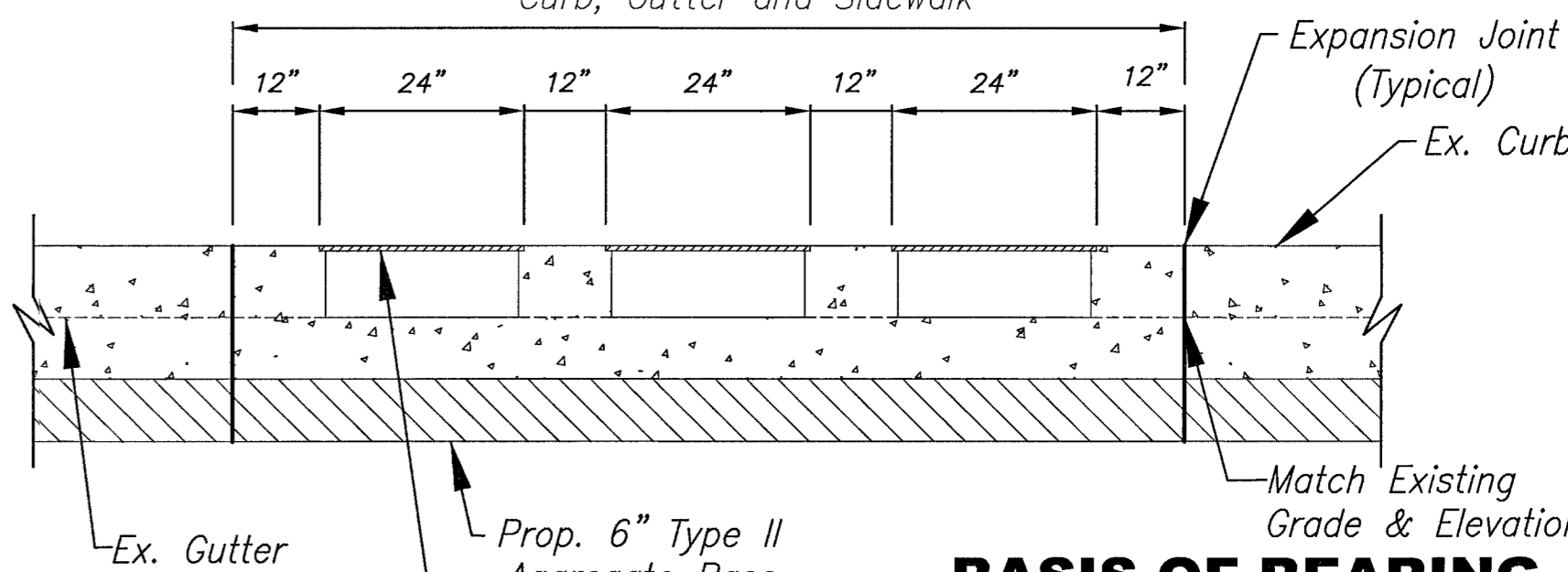
DEER SPRINGS WAY

OUTFALL STRUCTURE 2  
 PLAN VIEW  
 SCALE 1"=10'



OUTFALL STRUCTURE 2  
 SECTION "D-D"  
 N.T.S.

Saw-Cut and Remove Exist.  
 Curb, Gutter and Sidewalk



SECTION "F-F"  
 N.T.S.

**BASIS OF BEARING**

THE BASIS OF BEARING IS A LINE BETWEEN THE N1/4 COR. OF SEC. 20, T. 19 S., R. 60 E., M.D.M., AND THE E1/16 COR. OF SAID SEC. 20, AS SHOWN ON EXHIBIT B OF DOC. 20030131-03151, WHICH IS THE DEDICATION OF ELKHORN ROAD, WHICH BEARS S 89°42'15" E.

CLV BENCHMARK #8LV90-20N6  
 RIVET & PLATE IN CONCRETE CYLINDER NE CORNER OF EL CAPITAN & DORRELL  
 ELEVATION: 788.9015 METERS, 2588.25 FEET

Call before you UnderGround  
 1-702-455-7511  
 CLARK COUNTY TRAFFIC OPERATORS AND  
 1-702-229-6611

REV.	DESCRIPTION:	DATE:	BY:

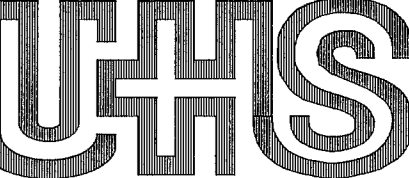
**ROCKERY WALL DETAIL**

NOTE: DETAIL PROVIDED BY PARSON BROS. ROCK RETAILING WALLS, DESIGN BY KUBOTA AND ASSOCIATES ENGINEERS, LTD. DETAILS SHOWN ARE FOR INFORMATION ONLY. CONTRACTOR SHALL HAVE WALLS DESIGNED BY A QUALIFIED STRUCTURAL ENGINEER.

86335

Call before you Dig  
 1-800-227-2800

Call before you OVERHEAD  
 1-702-593-6111



CLIENT  
 UHS OF DELAWARE, INC.  
 367 SOUTH GULPH ROAD  
 KING OF PRUSSIA, PA 19406  
 610-768-3300

ARCHITECT  
 HKS INC. OF NEVADA  
 1919 MCKINNEY AVE.  
 DALLAS, TX 75201  
 214-969-5599

STRUCTURAL ENGINEER  
 HKS STRUCTURES  
 1919 MCKINNEY AVE.  
 DALLAS, TX 75201

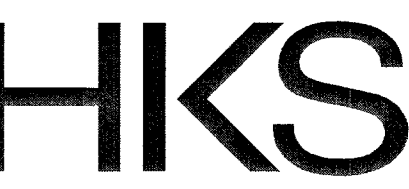
MEP ENGINEER  
 CRD PARTNERS  
 3525 N. HALL ST., SUITE 1300 LB 139  
 DALLAS, TX 75219

INTERIORS CONSULTANT  
 DESIGN STUDIO, INC.  
 161 LEVERINGTON AVE.  
 PHILADELPHIA, PA 19127

CIVIL ENGINEER  
 LOPEZGARCIA GROUP  
 1825 MARKET CENTER, SUITE 500  
 DALLAS, TX 75207

FOOD SERVICE CONSULTANT  
 SDI, INC.  
 5200 DTC PARKWAY, SUITE 500  
 GREENWOOD VILLAGE, CO 80111

LANDSCAPE ARCHITECT  
 JW ZUNINO AND ASSOCIATES  
 3191 S. JONES BLVD.  
 LAS VEGAS, TN 89146



Centennial Hills Hospital  
 Medical Center

Centennial Hills Hospital

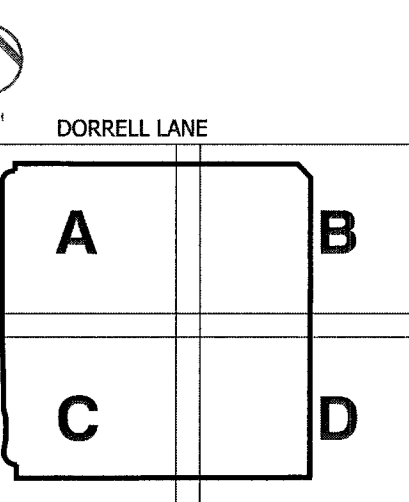
Las Vegas, NV

Professional Engineer Seal for Richard Carson, Jr., State of Nevada, License No. 14870, expires 12-31-06.

DATE:

HKS JOB NO. 8849

KEY PLAN



DATE

20 Jun 05

BID/PERMIT ISSUE 20 JUN 05

CITY OF LAS VEGAS - CIVIL REVIEW

15 SEPT 05

FINAL SUBMITTAL

31 OCT 05

SHEET TITLE

**OUTFALL STRUCTURE DETAILS**

SHEET NO.

**C5.3**

SHEET NO. 25 OF 43

107V4516