

STORM WATER DRAIN #192 PHASE 3 - TARA FALLS ADDITION

**Lots 43-64, Block A; Lots 33-35, Block C; Lots 1-15, Block D;
Lots 1-42, Block E
PROJECT NO. 468-83527
O.C.A. NO. 751328**

GENERAL NOTES

Contractor will be required to provide a minimum advance notice of forty-eight (48) hours to utility companies prior to starting any excavation as follows:

Kansas One-Call 687-2470

The Contractor must notify the following in case of an emergency:

Cox Communication 262-0661
Kansas Gas Service 383-8600
Westar Energy 383-8600
Aquila Net 1-800-303-0357
Southwestern Bell Telephone Company 1-800-286-8313
City of Wichita Water Department 262-6000
City of Wichita Sewer Maintenance 262-6000

Underground utility service lines and overhead utility pole lines are to be adjusted as necessary by others prior to construction unless the plans specifically call for their adjustment by the Contractor or unless the plans specifically identify a utility to be adjusted by its owner during construction. Existing utilities and their location, as shown on the plans, represent the best information obtainable for design. Location information has been obtained from the various utility companies and is either from company record drawings or company-provided field locations. The Contractor will be required to work around existing utilities within the right-of-way which do not conflict with proposed construction.

Rubble from the removal of miscellaneous structures and excess excavation which is to be wasted shall be disposed of on sites to be provided by the Contractor. These sites shall be approved by the Engineer as to suitability, appearance and site location. Locations that, in the opinion of the Engineer, will leave an unsightly appearance will not be approved.

All disposal sites must be approved by the Kansas Department of Health and Environment. Material either stockpiled or disposed of in a flood plain would require a Kansas State Board of Agriculture permit. Any material dumped in waters of the United States or wetlands is subject to U.S. Corps permitting regulations. Any material buried or stockpiled beyond approved of Engineers construction limits would require additional archeological investigations unless buried in a previously approved borrow location.

The Engineer shall take field ties to all quarter section corners. The Contractor shall set a City survey monument in the required location where such quarter section corners fall within the limits of pavement construction. Survey monuments will be furnished by the City. The Engineer will accurately locate and install the iron at the quarter section corner. This work will not be paid for directly, but shall be considered subsidiary to the other pay items of work in the contract.

The Contractor shall notify pipeline companies at least 24 hours in advance of any work being performed across and/or adjacent to pipelines.

The Contractor shall give all property owners and/or tenants of developed property directly abutting the construction of this project a minimum of ten (10) days advance notice prior to start of construction.

The Contractor shall seed, fertilize and mulch or sod all disturbed areas upon completion of construction. Contractor shall seed Fescue around ponds and areas that are not lots or street R/W. Contractor shall seed Rye on all other disturbed areas. Seeding shall be in compliance with City of Wichita Standard Specifications.

PROJECT SUMMARY

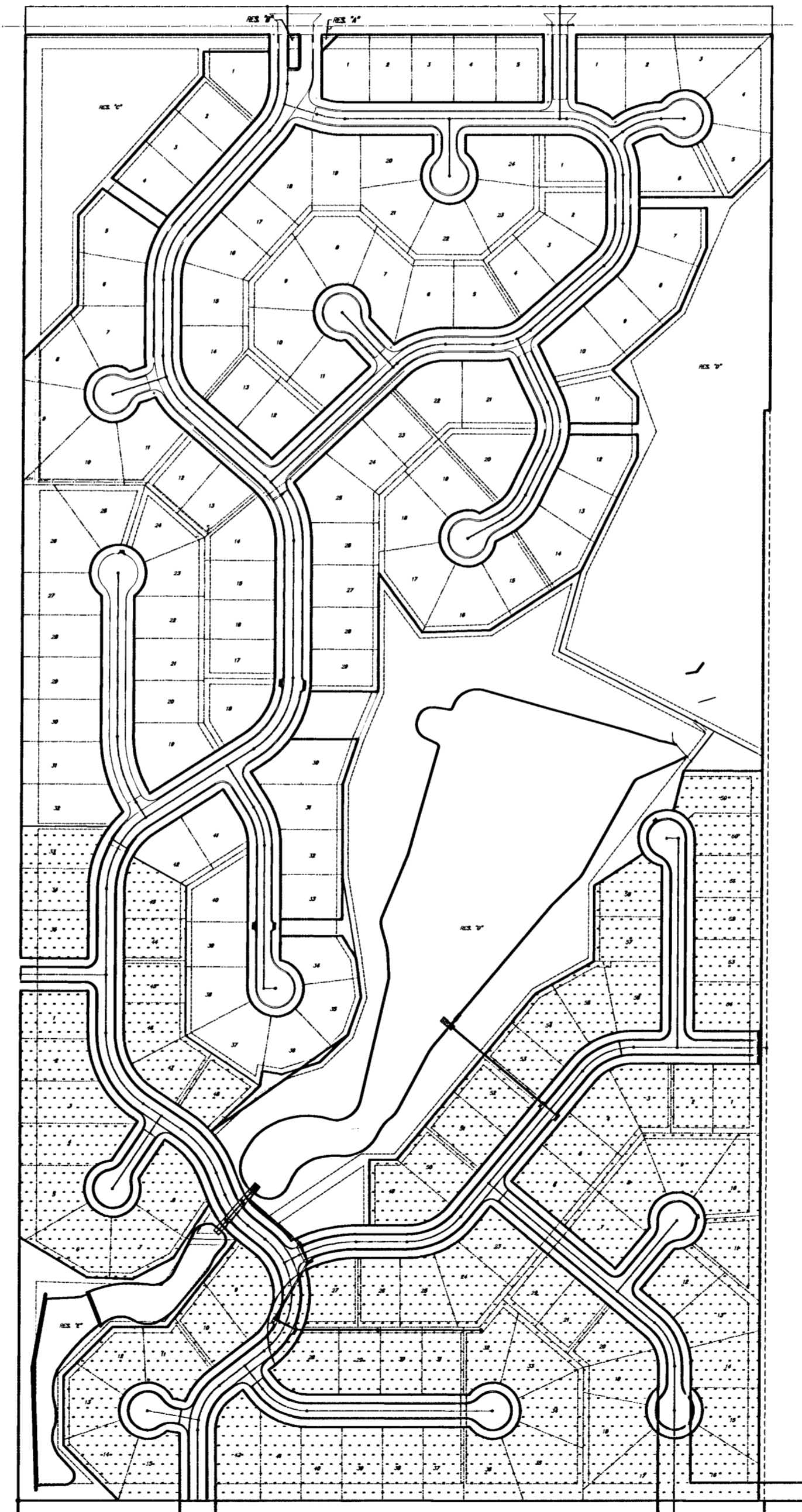
Site Earthwork (Including Ponds):
Cut: 39,422 cu. yds.
Fill: 38,337 cu. yds.
Excess: 1,085 cu. yds.

BENCH MARKS

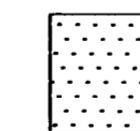
No.	Street and Station	From CL	Description	Elevation
1	Tara Falls, Sta. 17+40	17.50' Rt	N. End of NE Corner of Tara Falls & Tara Falls Ct. (1802-1842). In front of Fire Hydrant.	1341.05
2	Tara Falls, Sta. 22+42	17.50' Rt	S. End of SE Corner of Tara Falls & Michelle. 5' +/- South of Fire Hydrant	1341.92
3	Tara Falls Ct. (S), Sta. 1+64	14.50' Rt	N. End of East Cul-de-sac Return. 350' +/- S. of Int. of C.L. of Tara Falls & Tara Falls Ct. (S) (1802-1842)	1337.39
4	Tara Falls Ct. (N), Sta. 3+95	14.50' Rt	S. End of East Cul-de-sac Return. 397' +/- N. of Int. of C.L. of Tara Falls & Tara Falls Ct. (N) (1731-1779)	1340.87

INDEX

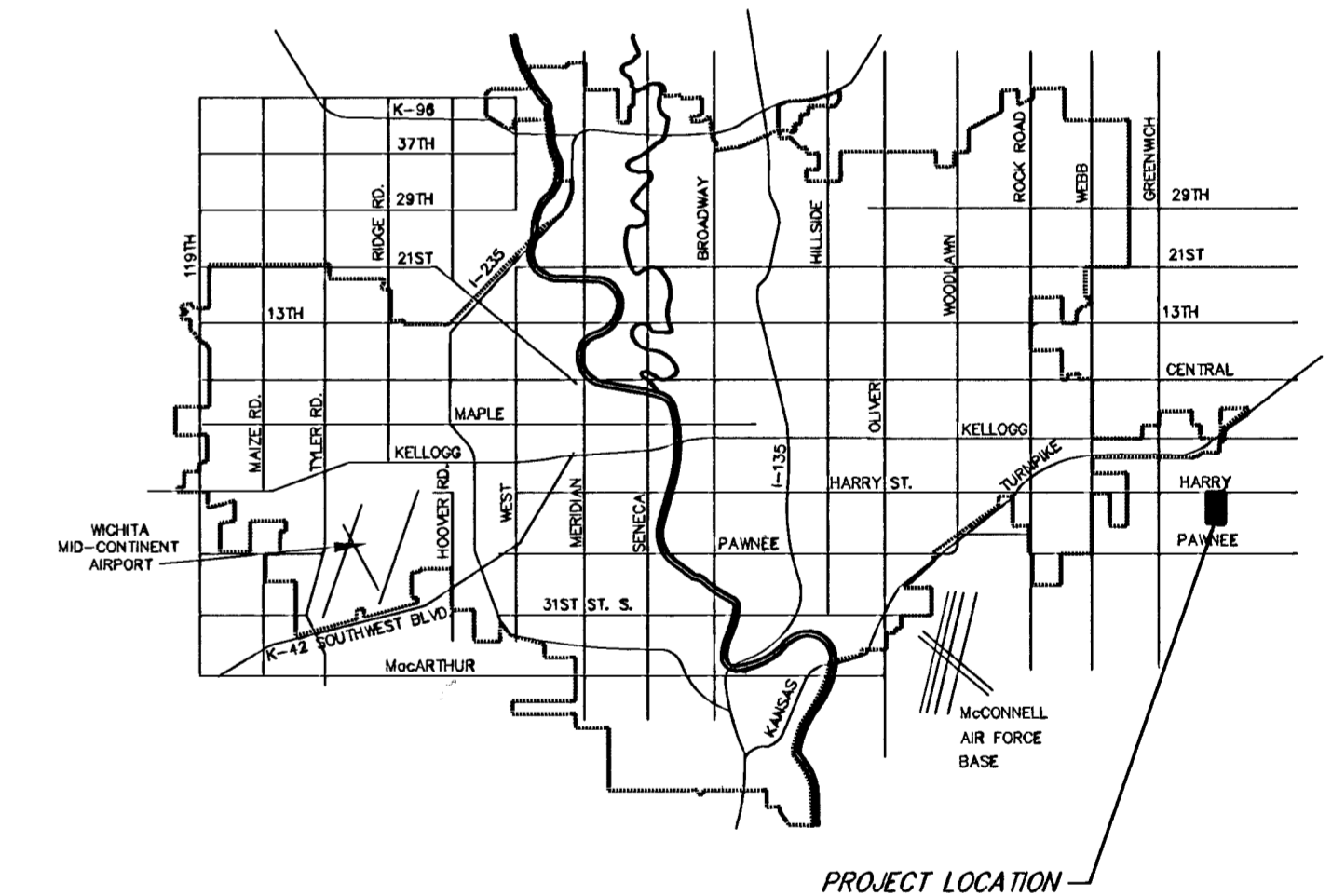
1. TITLE SHEET
- 2-4. SITE GRADING PLAN
5. DETENTION POND PLAN NO. 1
6. DETENTION POND PLAN NO. 2
7. DETENTION PONDS COORDINATES
8. RCB PLAN/PROFILE
9. HANDRAIL DETAILS
10. DRY-STACKED RETAINING WALL DETAILS
11. WEIR WALL DETAILS
12. EROSION CONTROL PLAN
- 13-15. SOIL EROSION BMP'S
16. PLAT COPY



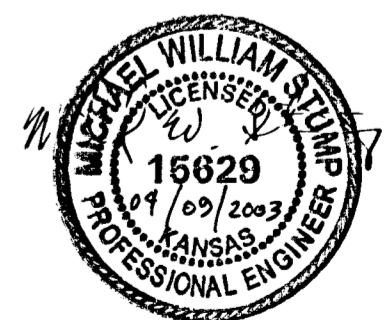
Scale: 1" = 200'



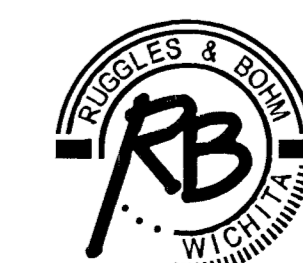
IMPROVEMENT DISTRICT



VICINITY MAP



**CITY OF WICHITA, KANSAS
NEIL D. CABLE, P.E. - CITY ENGINEER**



Ruggles & Bohm, P.A.
Engineering, Surveying, Land Planning
924 North Main (316) 264-8008
Wichita, Kansas 67203 (316) 264-4621 fax
www.rbkansas.com E-mail: info@rbkansas.com



LEGEND

- +0.5 FILL TABLE
- 2.0 CUT TABLE

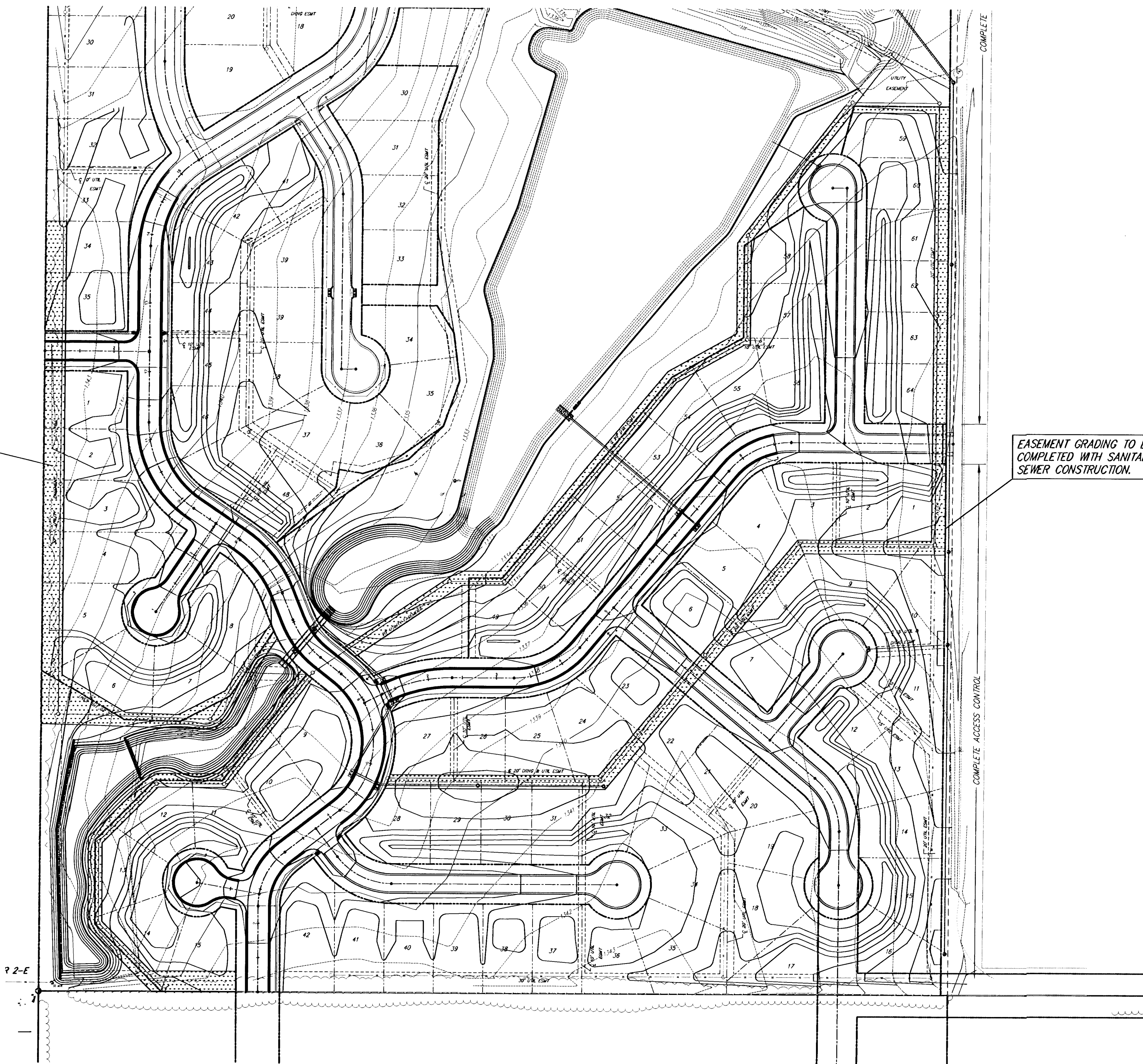


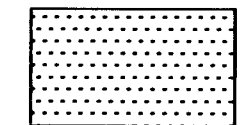
SCALE 1" = 100'
IRON = ●

<p>Tara Falls - Phase 3 SITE GRADING PLAN WICHITA, KANSAS</p>			
	<p>Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning</p>		<p>DESIGN MWS</p>
	<p>924 North Main Wichita, Kansas 67203 www.rbkansas.com</p>		<p>DRAWN TEB</p>
<p>(316) 264-8009 (316) 264-4621 fax E-mail: info@rbkansas.com</p>		<p>REVIEW</p>	<p>PROJECT NUMBER 468-83527</p>
<p>DRAWING FILE pond [Site Grade]</p>		<p>DATE Mar. 5, 2003</p>	<p>SHEET 2 OF 16</p>

EASEMENT GRADING TO BE COMPLETED WITH SANITARY SEWER CONSTRUCTION.

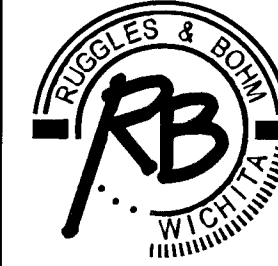
EASEMENT GRADING TO BE COMPLETED WITH SANITARY SEWER CONSTRUCTION.

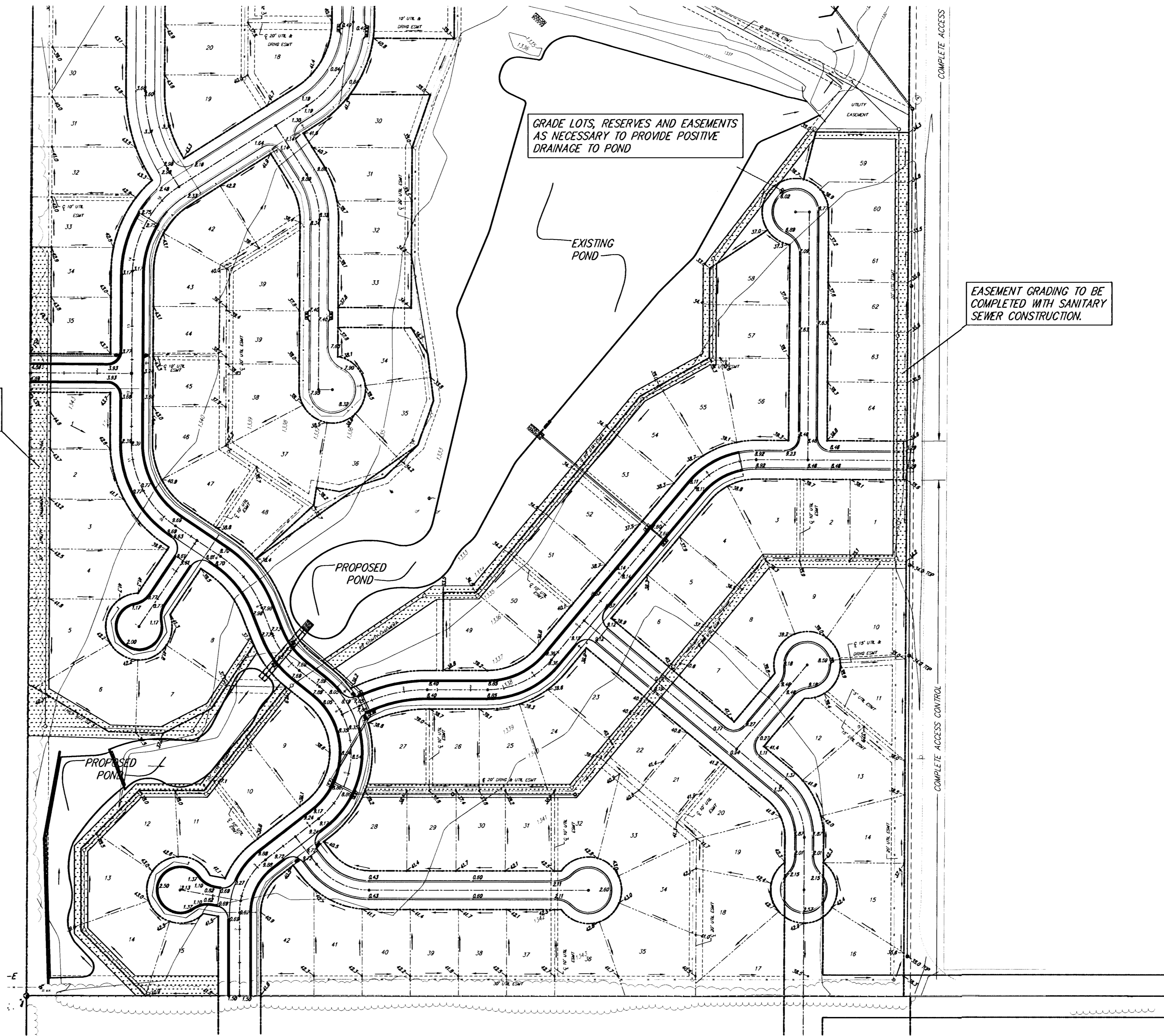


 EASEMENT GRADING



SCALE 1" = 100'
IRON = •

<p>Tara Falls - Phase 3 SITE GRADING PLAN WICHITA, KANSAS</p>			
	<p>Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning</p>		<p>DESIGN MWS</p>
	<p>924 North Main Wichita, Kansas 67203 www.rbkansas.com</p>		<p>(316) 264-8008 (316) 264-4621 fax E-mail: info@rbkansas.com</p>
<p>DRAWING FILE pond {Site Grade 2}</p>	<p>PROJECT NUMBER 468-83527</p>	<p>DATE Mar. 5, 2003</p>	<p>DESIGN MWS DRAWN TEB REVIEW UTILITY</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">SHEET 3 OF 16</p>



EASEMENT GRADING TO BE COMPLETED WITH SANITARY SEWER CONSTRUCTION.

GRADE LOTS, RESERVES AND EASEMENTS AS NECESSARY TO PROVIDE POSITIVE DRAINAGE TO POND

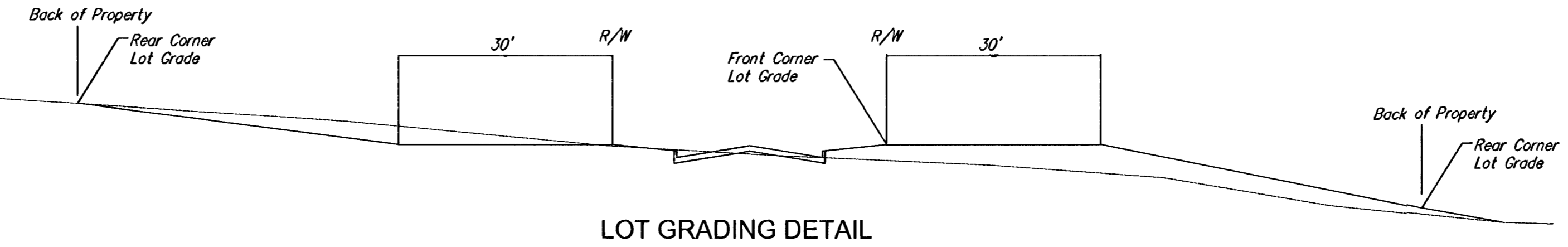
EASEMENT GRADING TO BE COMPLETED WITH SANITARY SEWER CONSTRUCTION.

 EASEMENT GRADING

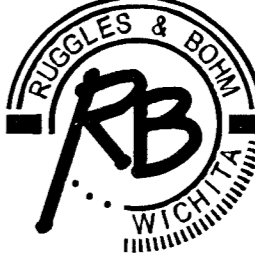


SCALE 1" = 100'
IRON = ●

TREES SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION UNLESS OTHERWISE NOTED ON PLANS.



LOT GRADING DETAIL

Tarra Falls - Phase 3 SITE GRADING PLAN WICHITA, KANSAS		DESIGN MWS	SHEET 4 OF 16
 Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning 924 North Main Wichita, Kansas 67203 www.rbkansas.com		DRAWN TEB	
(316) 284-8008 (316) 284-4621 fax E-mail: info@rbkansas.com		REVIEW UTILITY	DATE Mar. 5, 2003
DRAWING FILE pond [Site Grade 3]		PROJECT NUMBER 468-83527	

POND DATA
 Pond Bottom Elev. = 1331.00
 Static Pool Elev. = 1335.00
 100yr Water Surface = 1336.40
 Qin (100yr) = 200 c.f.s.
 Qout (100yr) = 200 c.f.s.

INSTALL 350.0 L.F.
 RETAINING WALL
 INSTALL 112 S.Y
 LIGHT STONE RIPRAP.
 SEE SHEET NO. 10.
 (WALL SHALL BE BID AS
 ADD ALTERNATE.)

CONSTRUCT CONCRETE
 WEIR WALL. SEE SHEET 11.

EASEMENT GRADING TO BE
 COMPLETED WITH SANITARY
 SEWER CONSTRUCTION.

EXISTING
 SANITARY
 SEWER

EASEMENT GRADES TO BE
 COMPLETED BY SANITARY
 SEWER CONSTRUCTION.

EXISTING
 SANITARY
 SEWER

Pond #1
 RES. "E"

TARA
 FALLS
 CT.

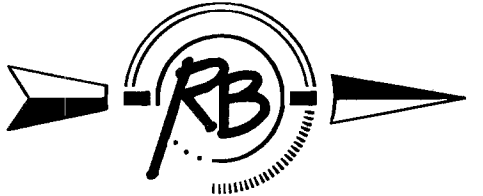
TARA
 FALLS
 CT.

TARA
 FALLS

TARA
 FALLS

POND DATA
 Pond Bottom Elev. = 1330.00
 Static Pool Elev. = 1334.00
 100yr Water Surface = 1336.20
 Qin (100yr) = 200 c.f.s.
 Qout (100yr) = 200 c.f.s.

PROPOSED RCB'S
 SEE SHEET NO. 8.

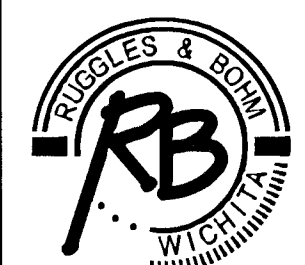


Scale : 1" = 40'

NOTE: THE POND BOTTOM AND SIDES ARE TO BE SCARIFIED A MINIMUM OF 8 INCHES, MOISTURE CONDITIONED AND RECOMPACTED TO A MINIMUM OF 95 PERCENT OF STANDARD PROCTOR DENSITY (ASTM D-698) FROM MINUS 3 TO PLUS 3 PERCENT OF OPTIMUM MOISTURE CONTENT. ADDITIONALLY, ALL GYPSUM/CALICHE SEAMS, SANDY CLAY AND CLAY SHALE ENCOUNTERED SHOULD BE OVER-EXCAVATED A MINIMUM OF 1 FOOT AND REPLACED WITH CLAY.

POND EARTHWORK CALCULATED IN MASS EARTHWORK QUANTITIES

TARA FALLS - PHASE 3
 DETENTION POND NO. 1
 WICHITA, KANSAS

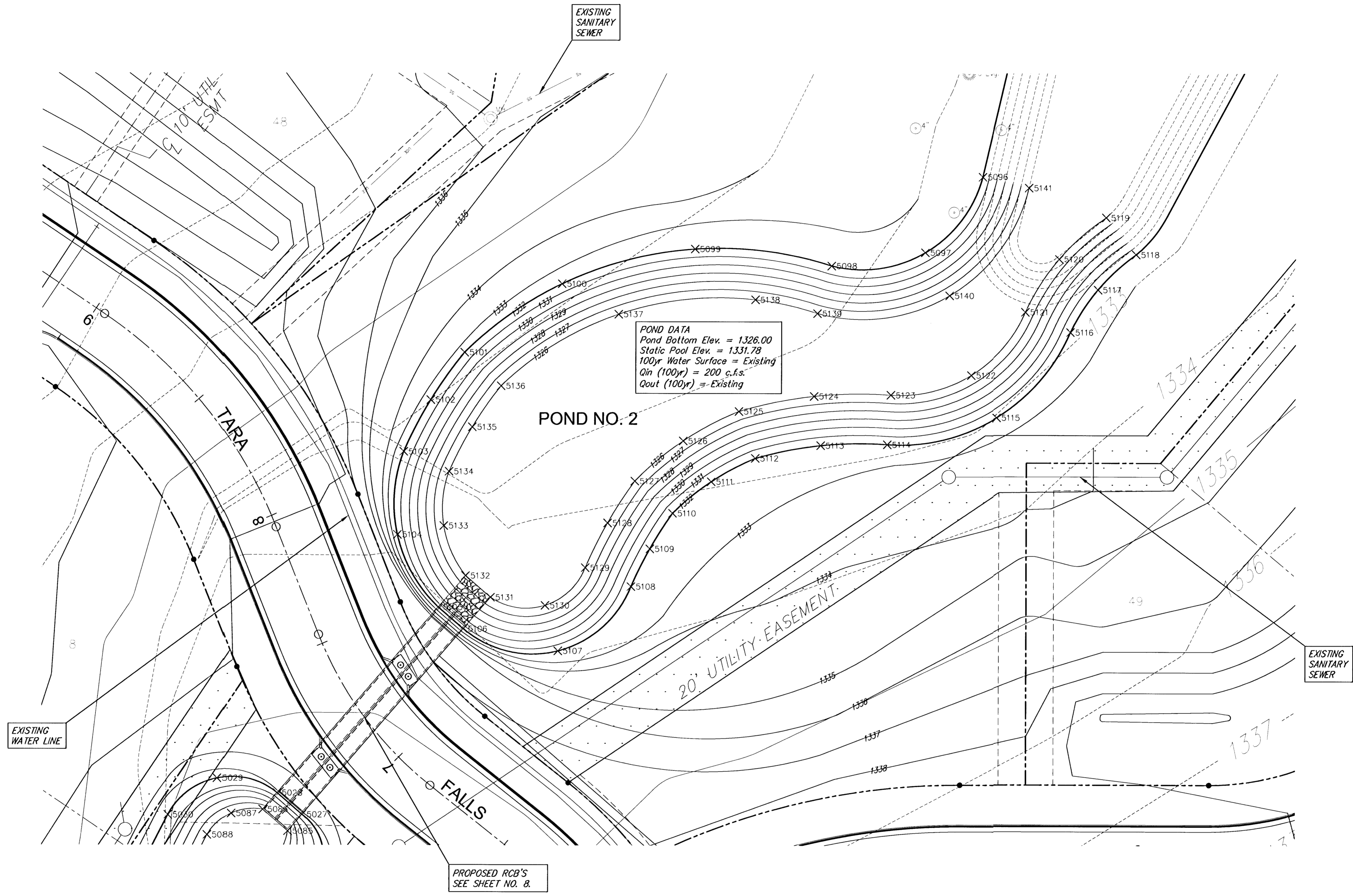


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 www.rbkansas.com E-mail: info@rbkansas.com

DRAWING FILE: pond {Pond Plan 1}
 PROJECT NUMBER: 468-83527
 DATE: Mar. 5, 2003

DESIGN	MWS	SHEET 5 OF 16
DRAWN	TEB	
REVIEW		
UTILITY		



POND DATA
 Pond Bottom Elev. = 1326.00
 Static Pool Elev. = 1331.78
 100yr Water Surface = Existing
 Qin (100yr) = 200 c.f.s.
 Qout (100yr) = Existing

POND NO. 2

EXISTING WATER LINE

PROPOSED RCB'S
 SEE SHEET NO. 8.



Scale : 1" = 20'

POND EARTHWORK CALCULATED IN MASS EARTHWORK QUANTITIES

**TARA FALLS - PHASE 3
 DETENTION POND NO. 2
 WICHITA, KANSAS**



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NOTE: THE POND BOTTOM AND SIDES ARE TO BE SCARIFIED A MINIMUM OF 8 INCHES, MOISTURE CONDITIONED AND RECOMPACTED TO A MINIMUM OF 95 PERCENT OF STANDARD PROCTOR DENSITY (ASTM D-698) FROM MINUS 3 TO PLUS 3 PERCENT OF OPTIMUM MOISTURE CONTENT. ADDITIONALLY, ALL GYPSUM/CALICHE SEAMS, SANDY CLAY AND CLAY SHALE ENCOUNTERED SHOULD BE OVER-EXCAVATED A MINIMUM OF 1 FOOT AND REPLACED WITH CLAY.

DRAWING FILE: pond {Pond Plan 2}
 PROJECT NUMBER: 468-83527
 DATE: Mar. 4, 2003

DESIGN	MWS	SHEET 6 OF 16
DRAWN	TEB	
REVIEW		
UTILITY		

DETENTION POND NO. 1

Point No.	Northing	Easting	Elevation
5000	17372.96	17359.04	1335.00
5001	17374.47	17410.30	1335.00
5002	17385.41	17426.58	1335.00
5003	17400.09	17423.27	1335.00
5004	17413.61	17410.74	1335.00
5005	17427.13	17398.22	1335.00
5006	17438.87	17392.16	1335.00
5007	17451.54	17388.41	1335.00
5008	17465.63	17388.73	1335.00
5009	17479.21	17392.51	1335.00
5010	17496.25	17394.79	1335.00
5011	17513.36	17393.03	1335.00
5012	17545.63	17389.27	1335.00
5013	17577.24	17396.82	1335.00
5014	17617.01	17427.13	1335.00
5015	17651.87	17462.97	1335.00
5016	17659.39	17472.27	1335.00
5017	17656.04	17474.69	1335.00
5018	17671.99	17502.04	1335.00
5019	17665.94	17532.19	1335.00
5020	17659.68	17552.58	1335.00
5021	17662.97	17573.65	1335.00
5022	17689.40	17609.92	1335.00
5023	17719.99	17635.89	1335.00
5024	17750.58	17661.87	1335.00
5025	17765.49	17671.10	1335.00
5026	17794.33	17690.46	1335.00
5027	17823.96	17689.71	1335.00
5028	17831.82	17680.64	1335.00
5029	17837.18	17659.02	1335.00
5030	17823.87	17641.16	1335.00
5031	17788.83	17623.28	1335.00
5032	17753.79	17605.41	1335.00
5033	17733.40	17584.46	1335.00
5034	17730.25	17555.39	1335.00
5035	17730.43	17502.46	1335.00
5036	17715.61	17449.78	1335.00
5037	17711.91	17451.26	1335.00
5038	17706.79	17427.32	1335.00
5039	17705.55	17401.18	1335.00
5040	17704.31	17375.03	1335.00
5041	17655.12	17366.07	1335.00
5042	17605.93	17357.10	1335.00
5043	17582.57	17352.90	1335.00
5044	17532.57	17354.32	1335.00
5045	17482.59	17355.79	1335.00
5046	17432.61	17357.27	1335.00
5047	17382.63	17358.75	1335.00
5048	17693.05	17390.73	1331.00
5049	17687.32	17384.20	1331.00
5050	17638.13	17375.23	1331.00
5051	17588.94	17366.26	1331.00
5052	17581.66	17364.94	1331.00
5053	17531.68	17366.41	1331.00
5054	17481.70	17367.89	1331.00
5055	17431.72	17369.37	1331.00
5056	17392.31	17370.54	1331.00
5057	17385.52	17377.74	1331.00
5058	17386.36	17406.40	1331.00
5059	17391.94	17414.47	1331.00
5060	17405.83	17401.59	1331.00
5061	17419.72	17388.72	1331.00
5062	17434.14	17381.13	1331.00
5063	17449.77	17376.53	1331.00
5064	17466.64	17376.76	1331.00
5065	17482.95	17381.08	1331.00
5066	17496.68	17382.80	1331.00
5067	17510.45	17381.39	1331.00
5068	17546.78	17377.31	1331.00
5069	17582.27	17386.11	1331.00
5070	17622.41	17415.93	1331.00
5071	17657.55	17451.49	1331.00
5072	17670.53	17467.82	1331.00
5073	17670.90	17468.74	1330.00

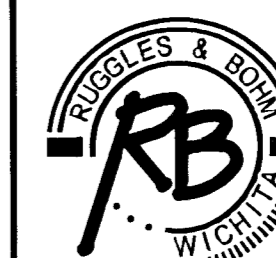
DETENTION POND NO. 1 (CONT.)

Point No.	Northing	Easting	Elevation
5074	17687.96	17502.45	1330.00
5075	17680.30	17539.44	1330.00
5076	17675.68	17553.29	1330.00
5077	17677.83	17567.73	1330.00
5078	17686.83	17584.02	1330.00
5079	17699.59	17597.58	1330.00
5080	17730.46	17623.76	1330.00
5081	17761.32	17649.93	1330.00
5082	17770.12	17655.79	1330.00
5083	17790.37	17665.85	1330.00
5084	17808.08	17679.92	1330.00
5085	17817.95	17684.50	1330.00
5086	17825.82	17675.43	1330.00
5087	17824.35	17663.98	1330.00
5088	17816.60	17655.41	1330.00
5089	17781.57	17637.54	1330.00
5090	17746.55	17619.68	1330.00
5091	17719.07	17591.59	1330.00
5092	17714.49	17552.56	1330.00
5093	17714.45	17503.68	1330.00
5094	17701.12	17456.65	1330.00
5095	17700.78	17455.71	1331.00

DETENTION POND NO. 2

Point No.	Northing	Easting	Elevation
5096	18055.55	17936.89	1332.00
5097	18028.13	17916.05	1332.00
5098	18023.23	17881.97	1332.00
5099	18029.36	17832.34	1332.00
5100	18016.63	17783.99	1332.00
5101	17991.79	17748.58	1332.00
5102	17974.53	17736.32	1332.00
5103	17955.77	17726.52	1332.00
5104	17925.61	17724.27	1332.00
5105	17899.30	17739.17	1332.00
5106	17891.44	17748.23	1332.00
5107	17883.46	17782.72	1332.00
5108	17906.88	17809.25	1332.00
5109	17920.56	17816.08	1332.00
5110	17933.43	17824.34	1332.00
5111	17944.91	17838.35	1332.00
5112	17953.44	17854.33	1332.00
5113	17958.11	17878.10	1332.00
5114	17958.46	17902.31	1332.00
5115	17968.18	17942.08	1332.00
5116	17999.10	17968.93	1332.00
5117	18014.53	17978.97	1332.00
5118	18027.34	17992.84	1332.00
5119	18040.80	17981.91	1326.00
5120	18025.66	17964.80	1326.00
5121	18006.42	17952.48	1326.00
5122	17983.62	17932.82	1326.00
5123	17976.41	17903.59	1326.00
5124	17975.96	17875.71	1326.00
5125	17970.45	17848.37	1326.00
5126	17959.75	17828.15	1326.00
5127	17945.11	17810.57	1326.00
5128	17929.92	17800.70	1326.00
5129	17913.71	17792.59	1326.00
5130	17899.97	17778.00	1326.00
5131	17902.90	17758.17	1326.00
5132	17910.76	17749.11	1326.00
5133	17928.86	17741.14	1326.00
5134	17948.54	17743.00	1326.00
5135	17964.71	17751.41	1326.00
5136	17979.62	17761.89	1326.00
5137	18005.63	17804.59	1326.00
5138	18010.91	17854.31	1326.00
5139	18005.96	17876.85	1326.00
5140	18012.47	17924.92	1326.00
5141	18051.48	17953.75	1326.00

TARA FALLS - PHASE 3
DETENTION POND COORDINATES
WICHITA, KANSAS



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Wichita, Kansas 67203
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DRAWING FILE
pond {Pond Plan 1}

PROJECT NUMBER
468-83527

DESIGN	MWS	SHEET 7 OF 16
DRAWN	TEB	
REVIEW		
UTILITY		
DATE	Feb. 27, 2003	

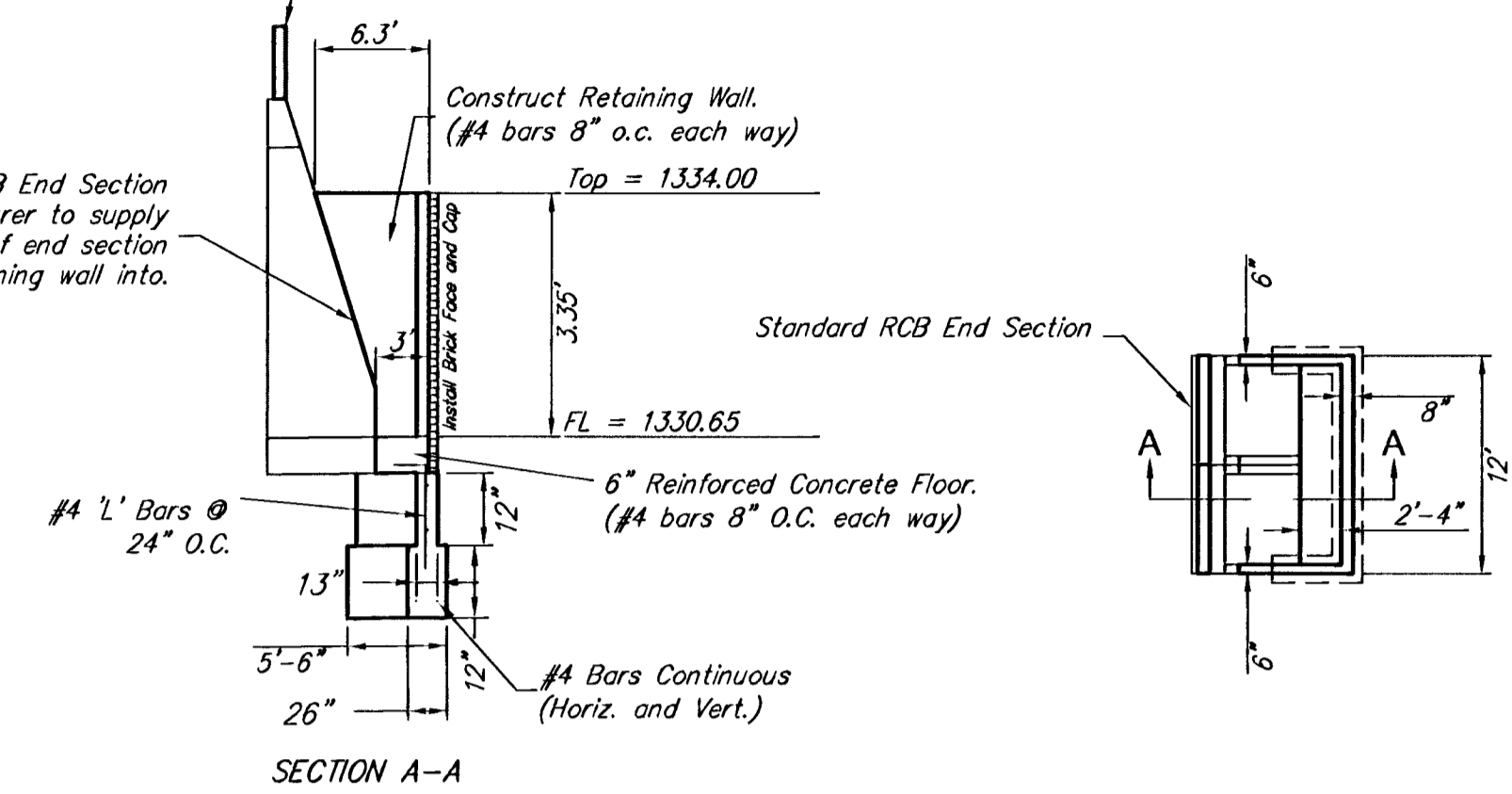
STA. 1+00
STA. 7+35.77, 47.62' RT. (TARA FALLS)
END RIPRAP
BEGIN (2) 5'x4' RCBC WITH END SECTIONS.

STA. 1+27.59
STA. 7+24.70, 21.25' RT. (TARA FALLS)
CONSTRUCT TYPE 1A CURB INLET OVER RCBC
L = 11'-4" W = 5'-4"
TOP ELEV. 1337.62

STA. 1+98.95
STA. 6+84.64, 32.00' LT. (TARA FALLS)
END (2) 5'x4' RCBC

Construct Headwall on end of RCBC End Section (12" High x 8" Wide). Precast Manufacturer to supply reinforcing in end section to tie headwall into. Typical both ends. Headwall to be constructed from brick.

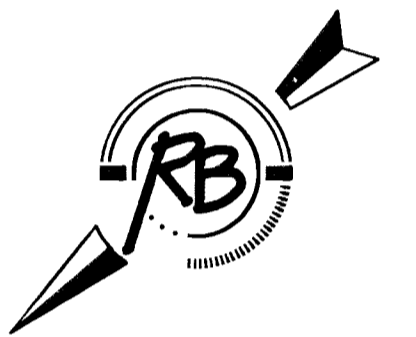
Standard RCBC End Section
Precast Manufacturer to supply reinforcing in edge of end section to tie retaining wall into.



EASEMENT GRADING TO BE COMPLETED WITH SANITARY SEWER CONSTRUCTION.

EXISTING SANITARY SEWER

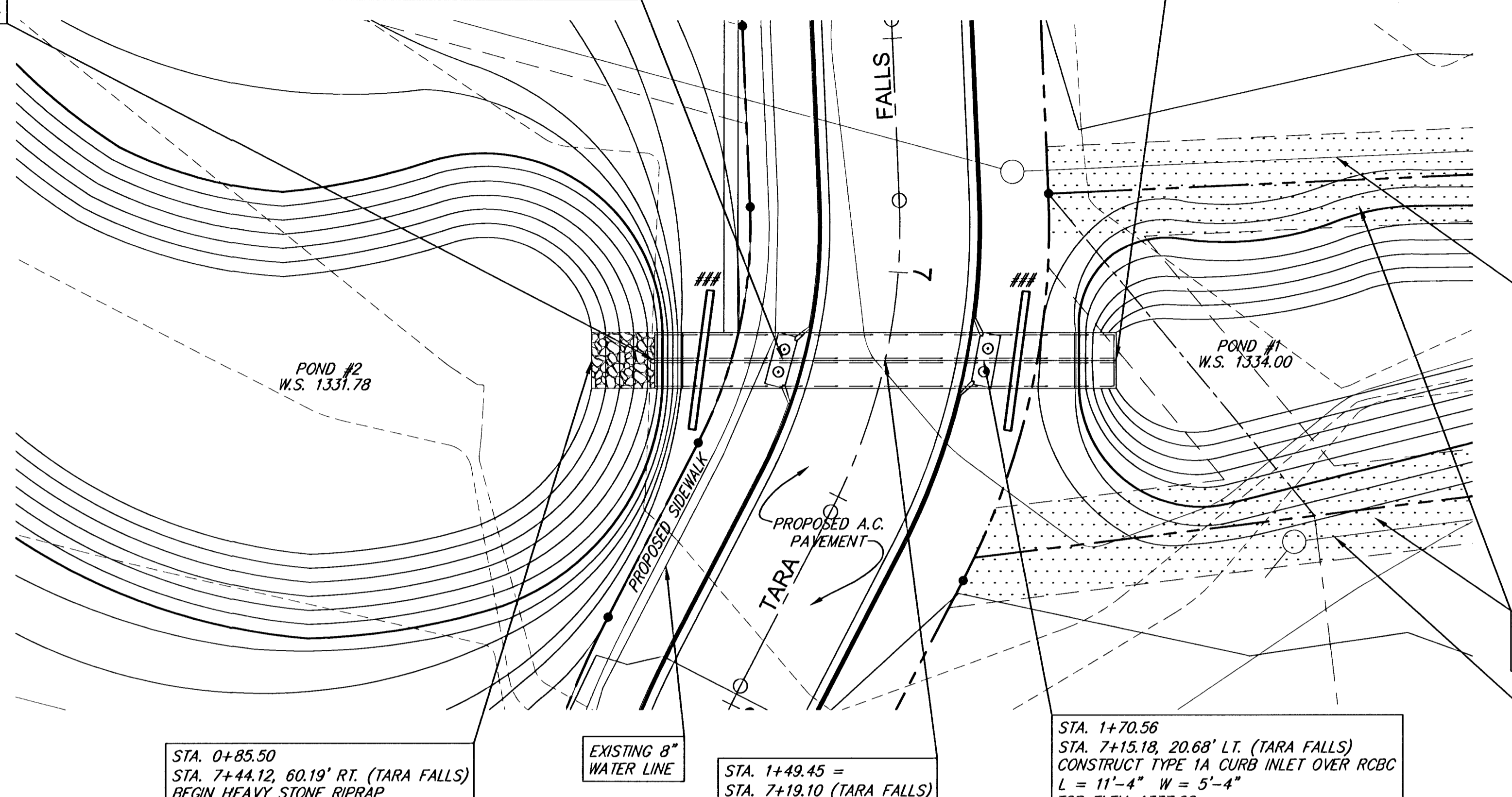
ALL WORK AND MATERIAL ON THIS SHEET SHALL BE BID UNDER 'LUMP SUM' FOR RCBC CONSTRUCTION.



Scale: PLAN
1" = 20'
PROFILE
1" = 20' Horiz.
1" = 5' Vert.

PRECAST MANUFACTURER TO SUPPLY OPENINGS IN RCBC'S TO ALLOW TYPE 1A CURB INLET TOPS TO BE CONSTRUCTED OVER THEM.

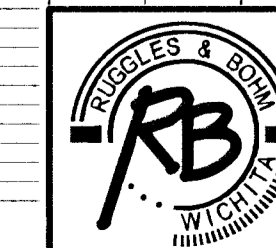
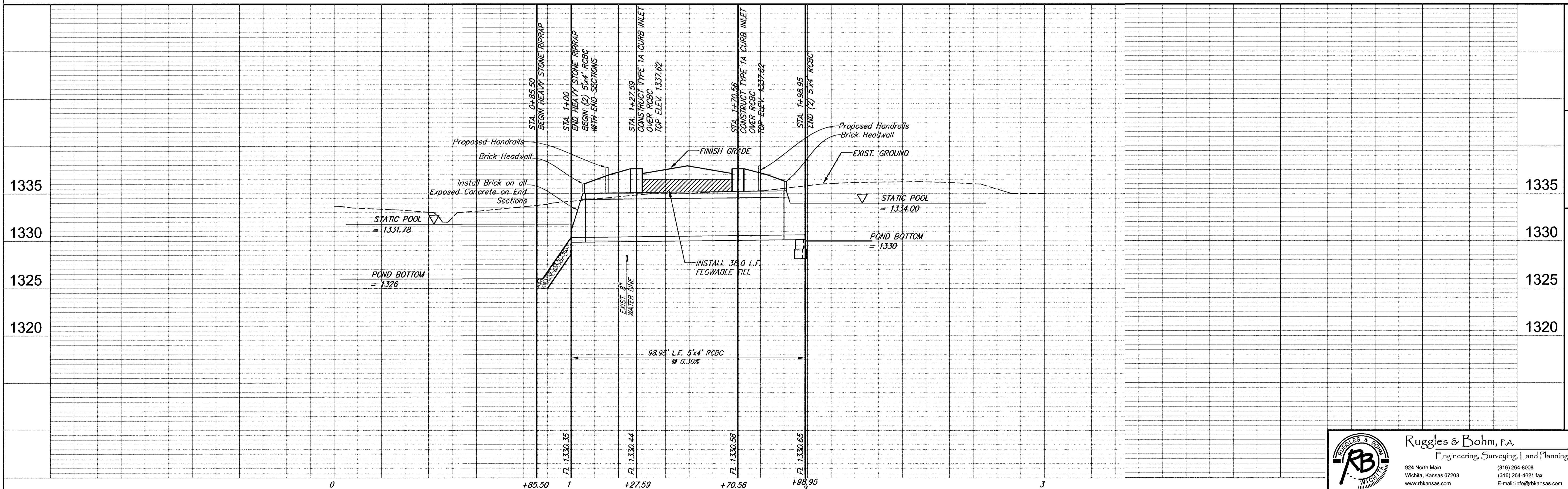
Future Walls with Handrails and Lighting.
Precast Manufacturer to design RCBC's with capacity to hold future brick/block or concrete walls. Walls will have handrail and post with lights attached.



STA. 0+85.50
STA. 7+44.12, 60.19' RT. (TARA FALLS)
BEGIN HEAVY STONE RIPRAP

STA. 1+49.45 =
STA. 7+19.10 (TARA FALLS)

STA. 1+70.56
STA. 7+15.18, 20.68' LT. (TARA FALLS)
CONSTRUCT TYPE 1A CURB INLET OVER RCBC
L = 11'-4" W = 5'-4"
TOP ELEV. 1337.62



Ruggles & Bohm, P.A.
Engineering, Surveying, Land Planning
924 North Main (316) 264-8008
Wichita, Kansas 67203 (316) 264-4621 fax
www.rbkansas.com E-mail: info@rbkansas.com

REVISION REVIEW
DRAWN TEB DATE Mar. 4, 2003
DESIGN MMS UTILITY
PROJECT NUMBER DRAWING FILE Pond {RCB}
Tara Falls - Phase 3 RCB Plan/Profile WICHITA, KANSAS
RB JOB # 211E
SHEET 8 OF 16

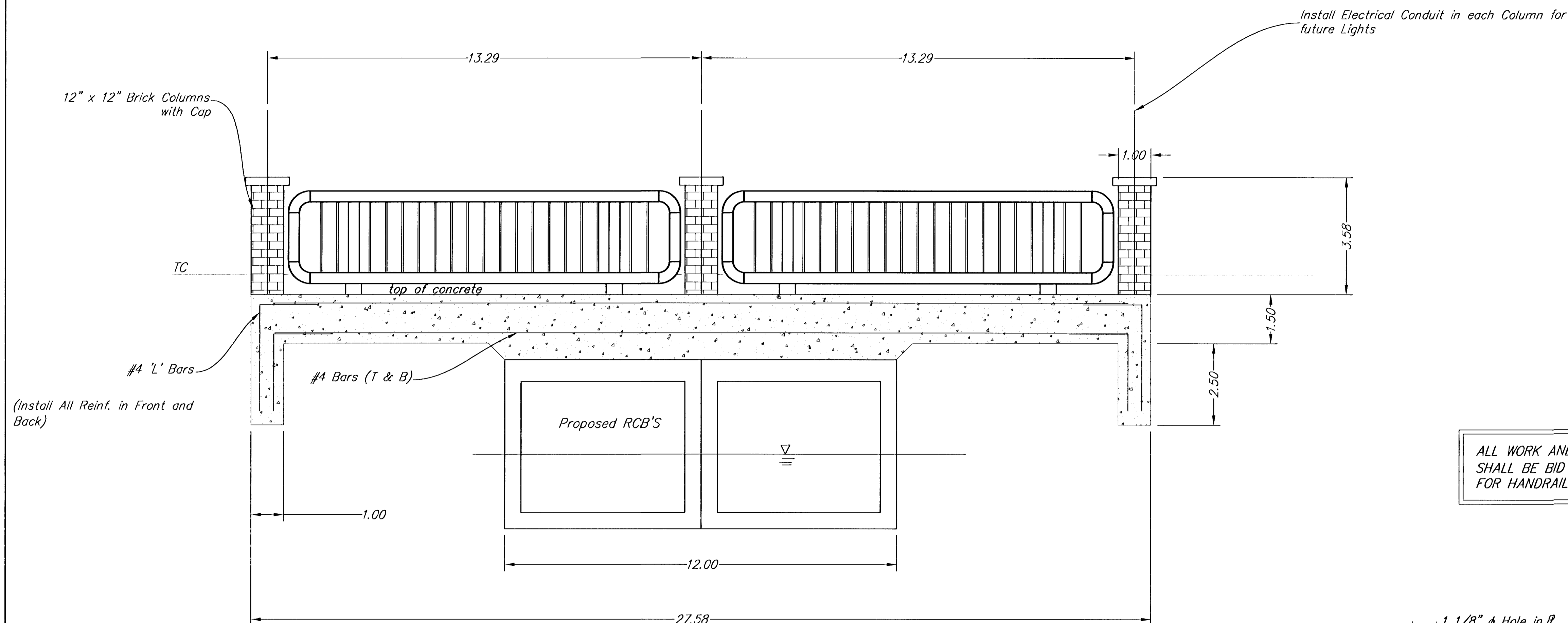
BRIDGE HANDRAIL NOTES:

The rail members shall conform to ASTM Designation A36 or equivalent.
 Rail shall be fabricated in lengths to include a minimum of two and a maximum of three panels. Posts shall be set vertical. Shims may be used between concrete and base plates of posts.

All parts of Bridge Handrail shall be painted. Shop and field coats shall conform to organic or inorganic Zinc for primer and "High-Build Polyurethane Finish Coat" at the Standard Specifications for State Road and Bridge Construction, 1990 Edition, Kansas Department of Transportation. All materials, equipment and labor necessary for the installation of the Handrail on the bridge shall be *subsidiary* to the bid item, "Handrail".

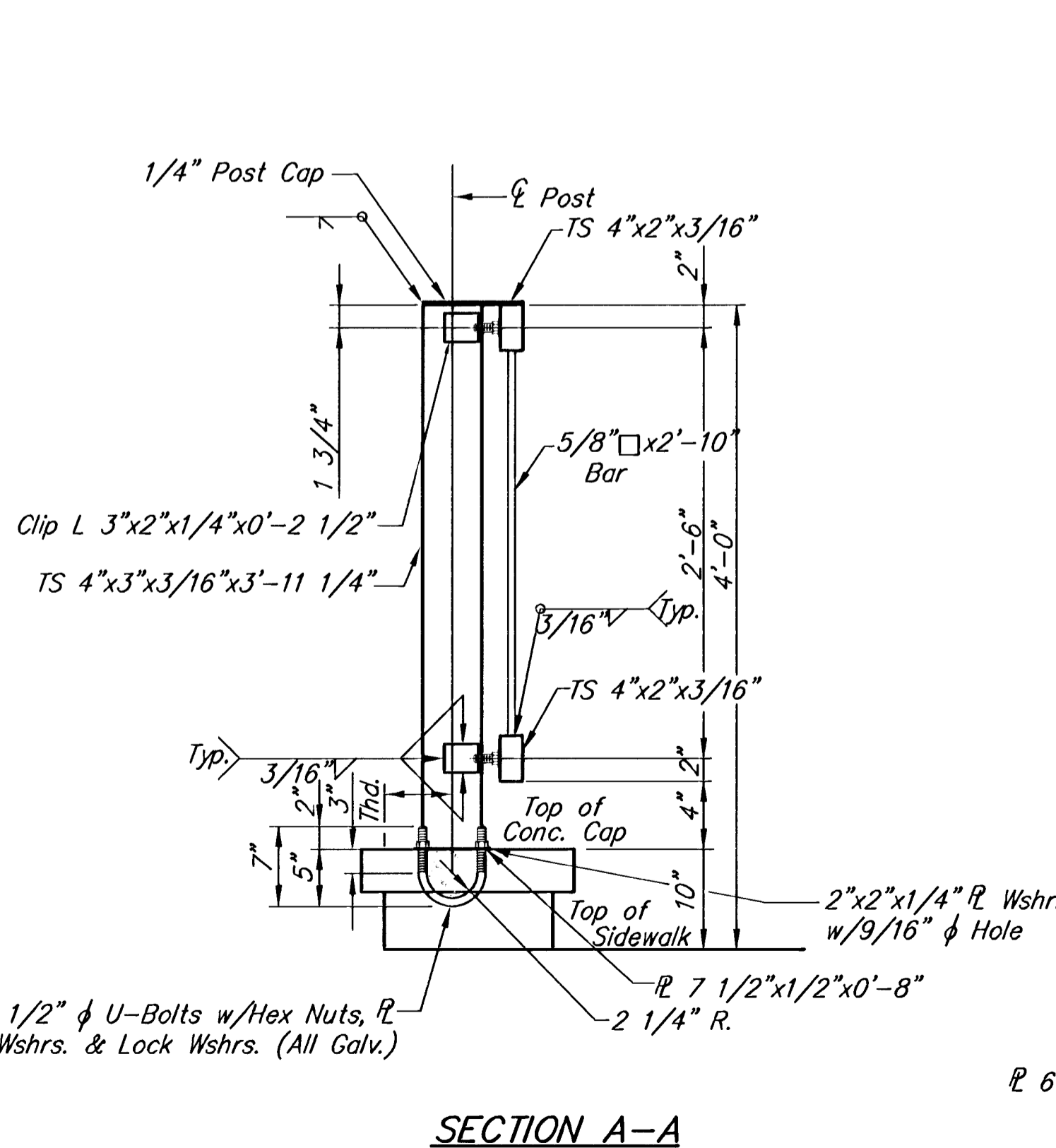
Handrail shall be hunter Green in color. Contractor to submit color chart to Engineer for approval.

Touch Up: All bolts, nuts and studs and other small areas of damaged paint (10 S.F. or less) requiring touch up will be prepared and painted w/approved aluminum epoxy mastic primer.

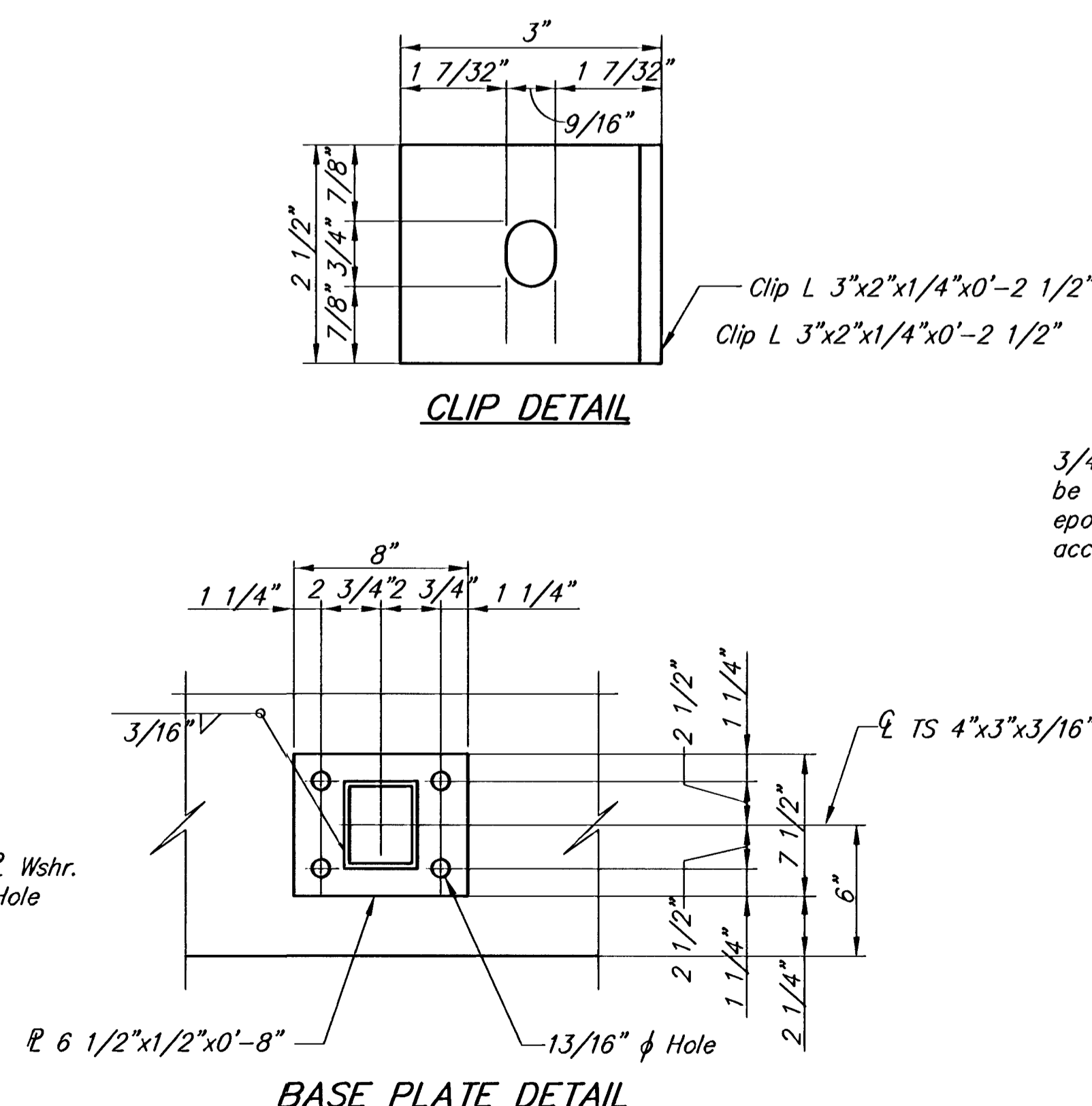


ALL WORK AND MATERIAL ON THIS SHEET SHALL BE BID UNDER 'LUMP SUM' FOR HANDRAIL CONSTRUCTION.

HANDRAIL TABLE	
EACH	RAIL LENGTH
4	12.0'
TOTALS	48.0'

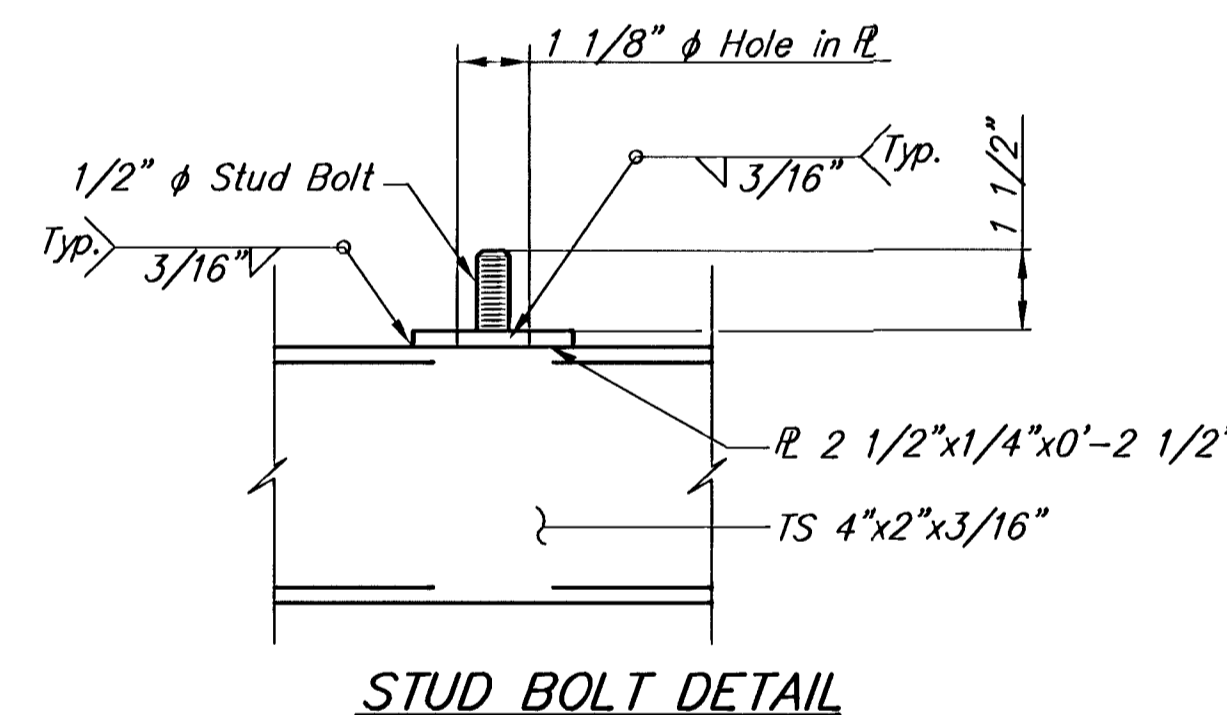


SECTION A-A



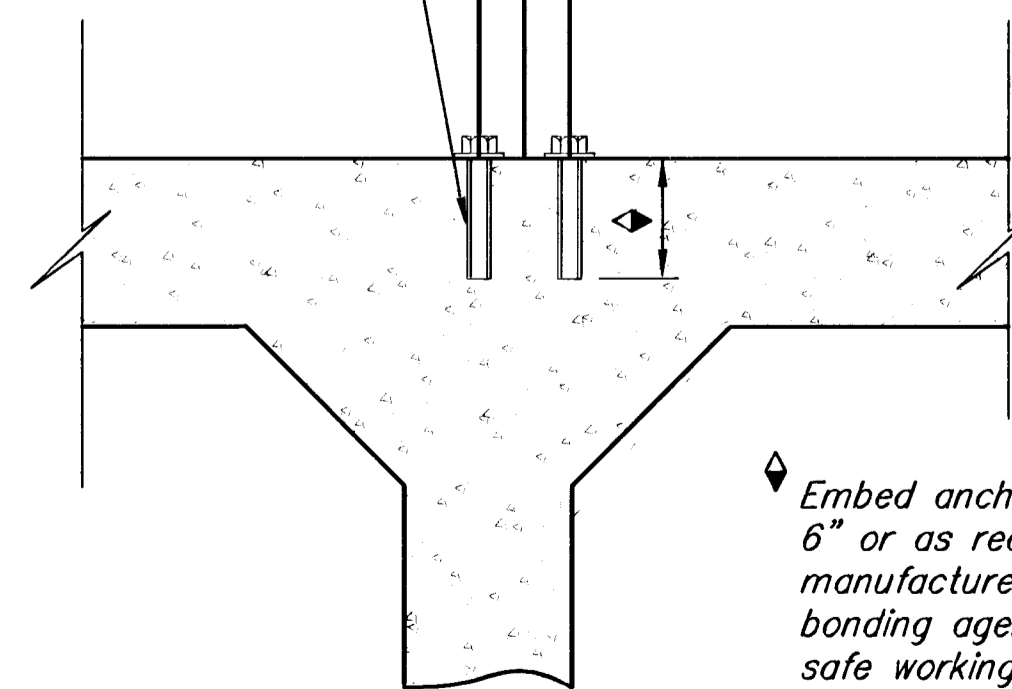
CLIP DETAIL

BASE PLATE DETAIL

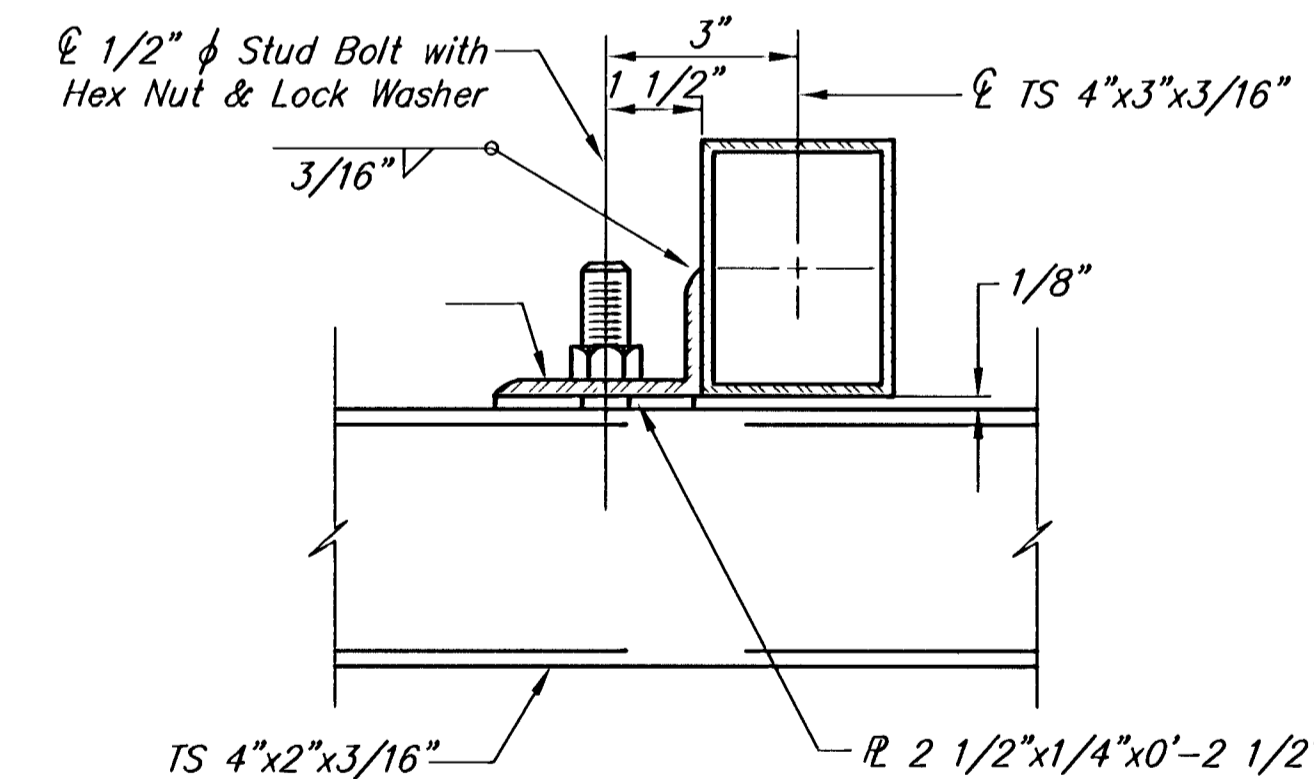


STUD BOLT DETAIL

3/4" Dia. A36 Threaded Rod to be grouted with an approved epoxy or polyester resin in accordance with KDOT Specifications

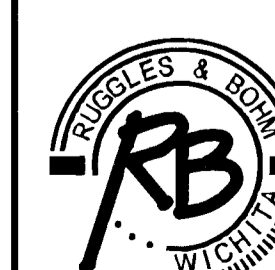


ANCHOR ROD DETAIL



RAIL CONNECTION DETAIL

**TARA FALLS - PHASE 3
HANDRAIL DETAILS
WICHITA, KANSAS**



Ruggles & Bohm, P.A.
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 (316) 264-8008
 (316) 264-4621 fax
 E-mail: info@rbkansas.com

DRAWING FILE: HDRAIL1
 PROJECT NUMBER: .
 DATE: Feb. 20, 2002

DESIGN	KWL	SHEET	15
DRAWN	RA		
REVIEW		9	OF
UTILITY			

SPECIFICATION: RETAINING WALL WITH GEOGRID REINFORCED SOILS

PART 1 GENERAL

1.04 Delivery, Storage, and Handling

A. Retaining Wall Units:

1. Contractor shall check the units upon delivery to ensure that proper materials have been received.
2. Contractor shall prevent excessive mud, wet cement, epoxy, and like materials from coming in contact with and affixing to the units.
3. Contractor shall protect the units from damage (i.e. cracks, chips, spalls). Damaged units shall be evaluated for usage in the wall according to ASTM: C-145-75 (1981 Rev.).

B. Geogrid:

1. Contractor shall check the geogrid upon delivery to ensure that the proper material has been received.
2. Geogrids shall be stored as recommended by manufacturer.
3. Contractor shall prevent excessive mud, wet cement, epoxy, and like materials from coming in contact with and affixing to the geogrid material.
4. Rolled geogrid material may be laid flat or stood on end for storage.

PART 2 PRODUCTS

2.01 Definitions

- A. Retaining wall units - Rockwood of approved equal classic masonry units.
- B. Geogrid - a geosynthetic formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
- C. Reinforced fill - compacted soil which is within the reinforced soil mass.
- D. Drainage fill - compacted granular fill directly behind the masonry units.
- E. Backfill - compacted or in-situ soil located behind the reinforced soil mass.
- F. Foundation soil - compacted or in-situ soil beneath the entire wall.
- G. Leveling Pad - a smooth flat surface upon which the first course of masonry units is placed.

2.02 Modular Concrete Retaining Wall Units

- A. Concrete wall units shall have a minimum 28 day compressive strength of 3000 psi. The concrete shall have adequate freeze/thaw protection with a maximum moisture absorption rate of 6%.
- B. Exterior dimensions may vary. The unit must also be capable of concave and convex alignment curves with a minimum radius of 3 feet and 90 degree inside and outside corners.
- C. Exterior face shall be textured and colored as specified by the Owner.
- D. Units shall be free from all cracks and be resistant to flexural cracking.

2.03 Geogrids

- A. The geogrid shall be a regular grid structure of high density polyethylene (HDPE) or polyester. Geogrid shall be a horizontal layer of high strength high modulus grid capable of creating a composite soil/geogrid mass that acts as a monolithic gravity structure.

PART 3 FILL AND FOUNDATION MATERIALS

3.01 Foundation Base Material

- A. Material for the leveling pad shall consist of concrete as shown on the construction drawings. A minimum of 6 inches of compacted base is required.

3.02 Drainage Fill

- A. Fill placed behind the units shall consist of free-draining 3/4" crushed stone or granular fill. Gradation shall include material with fines limited to 5% passing the #200 sieve and less than 50% passing the #40 sieve. Maximum size 1".
- B. Provide a drainage zone behind the wall units to within 1 foot of final grade. Drainage tile may be required. Cap backfill with 1 foot of impervious material.

3.03 Reinforced Fill

- A. Reinforced fill shall be native material unless otherwise specified. Unsuitable soil for backfill shall not be used within the reinforced soil mass when using geogrid for tiebacks. Unsuitable soil shall be those classified as organics or specified by the engineer.
- B. Where additional fill is required, contractor shall submit sample and specifications to the Engineer to determine if acceptable.

PART 4 CONSTRUCTION

4.01 Excavation

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. Over-excavation shall not be paid for and replacement with compacted fill and/or wall system components will be required at the contractor's expense. Contractor shall be careful not to disturb base beyond the lines shown.

4.02 Foundation Soil Preparation

- A. Foundation soil shall be excavated as required for footing dimensions and degree of tilt-back shown on the construction drawings, or as directed by the Engineer.
- B. Foundation soil shall be examined by the Engineer to insure that the actual soil strength meets or exceeds assumed design strength. Soil not meeting the required strength shall be removed and replaced with acceptable material.
- C. Over-excavated areas shall be filled with compacted backfill material.
- D. As a minimum, soil shall be rolled before construction proceeds.

4.03 Base Preparation

- A. Place base material in excavated trench and compact.
- B. Base material shall be compacted to insure no gaps between the base and the retaining wall units.

4.04 Unit Installation (see Manufacturer's specs for additional details)

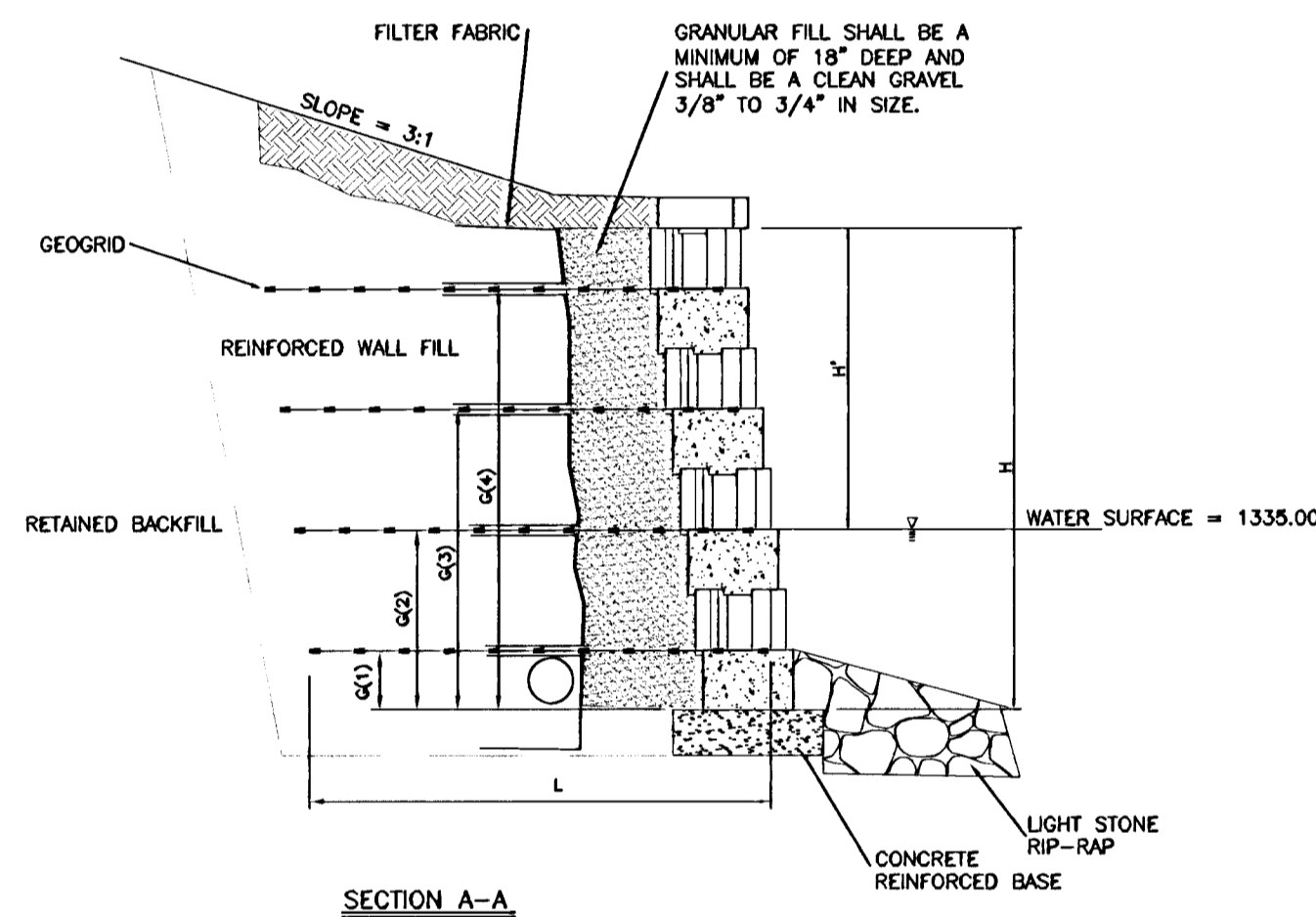
- A. Place the first course of masonry units end to end on the prepared base so they are touching. Proper alignment may be achieved with the aid of a string line or offset from a baseline.
- B. Masonry units shall be placed side by side for the full length of the wall.
- C. Install the units of the second row, set squarely with no rocking on the first row. Backfill units with drainage fill.
- D. All excess material shall be swept from the top of units prior to installing the next course. Each course shall be completely backfilled prior to proceeding to the next course.
- E. Make sure the material is compacted behind the units. Backfill and compact every course.

4.05 Geogrid Installation

- A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
- B. Geogrid reinforcement shall be placed at the elevation and to the extent shown on the construction drawings or as directed by the Engineer.
- C. The geogrid soil reinforcement shall be laid horizontally on compacted reinforced fill. Place geogrid to the front faces of the wall, install next course of units. Place drainage fill and pull geogrid taut. Anchor geogrid prior to placing backfill.
- D. Slack in the geogrid will not be allowed and shall be removed in a manner and to such a degree as approved by the Engineer.
- E. Geogrid reinforcements shall be continuous throughout full embedment length. Spliced connections between shorter pieces of geogrid will not be allowed unless pre-approved by the engineer prior to construction.

4.06 Back Fill Placement

- A. Reinforced fill shall be placed and compacted in lifts not to exceed 8 inches.
- B. Reinforced fill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid.
- C. Only lightweight hand-operated compaction equipment shall be allowed within 3 feet of the wall units.
- D. Tracked construction equipment shall not be operated directly upon the geogrid. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to minimum to prevent tracks from displacing the fill and damaging the geogrid.
- E. Rubber tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.



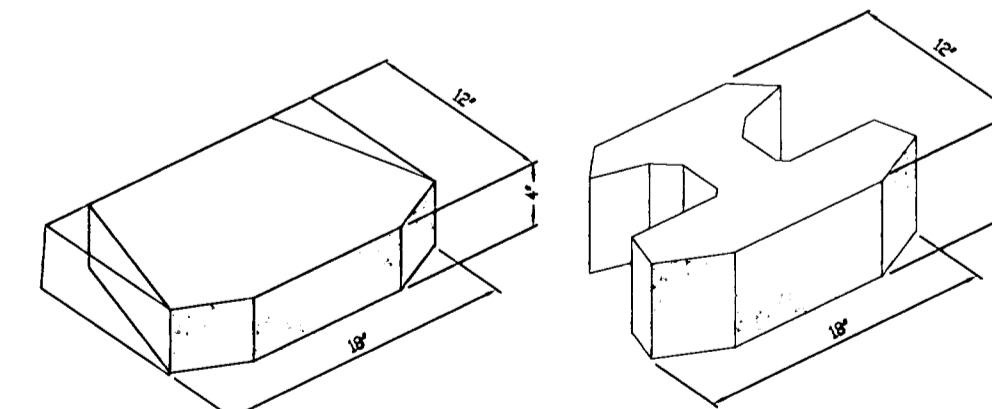
TOTAL HEIGHT		EXPOSED HEIGHT		GEOGRID		GEOGRID LEVEL-PLACEMENT HEIGHT ABOVE LEVELING PAD						GRID	
H	H'	NO. LAYERS	L	TYPE	1	2	3	4	5	6	TYPE	LONG TERM ALLOWABLE DESIGN STRENGTH	
4'-0"	2'-6"	4	6'-0"	B	0'-8"	1'-8"	2'-8"	3'-8"	-	-	B	1200	
-	-	-	-	-	-	-	-	-	-	-	-	-	

GENERAL INFORMATION

- APPROXIMATE WEIGHT: MEETS OR EXCEEDS ASTM 1902-78 STANDARDS
- COMPRESSIVE STRENGTH: 3000 PSI APPROXIMATE, UNLESS OTHERWISE SPECIFIED
- COMPOSITION: HIGH STRENGTH, HIGH DENSITY, 100% SLUMP CONCRETE

UNIT INFORMATION

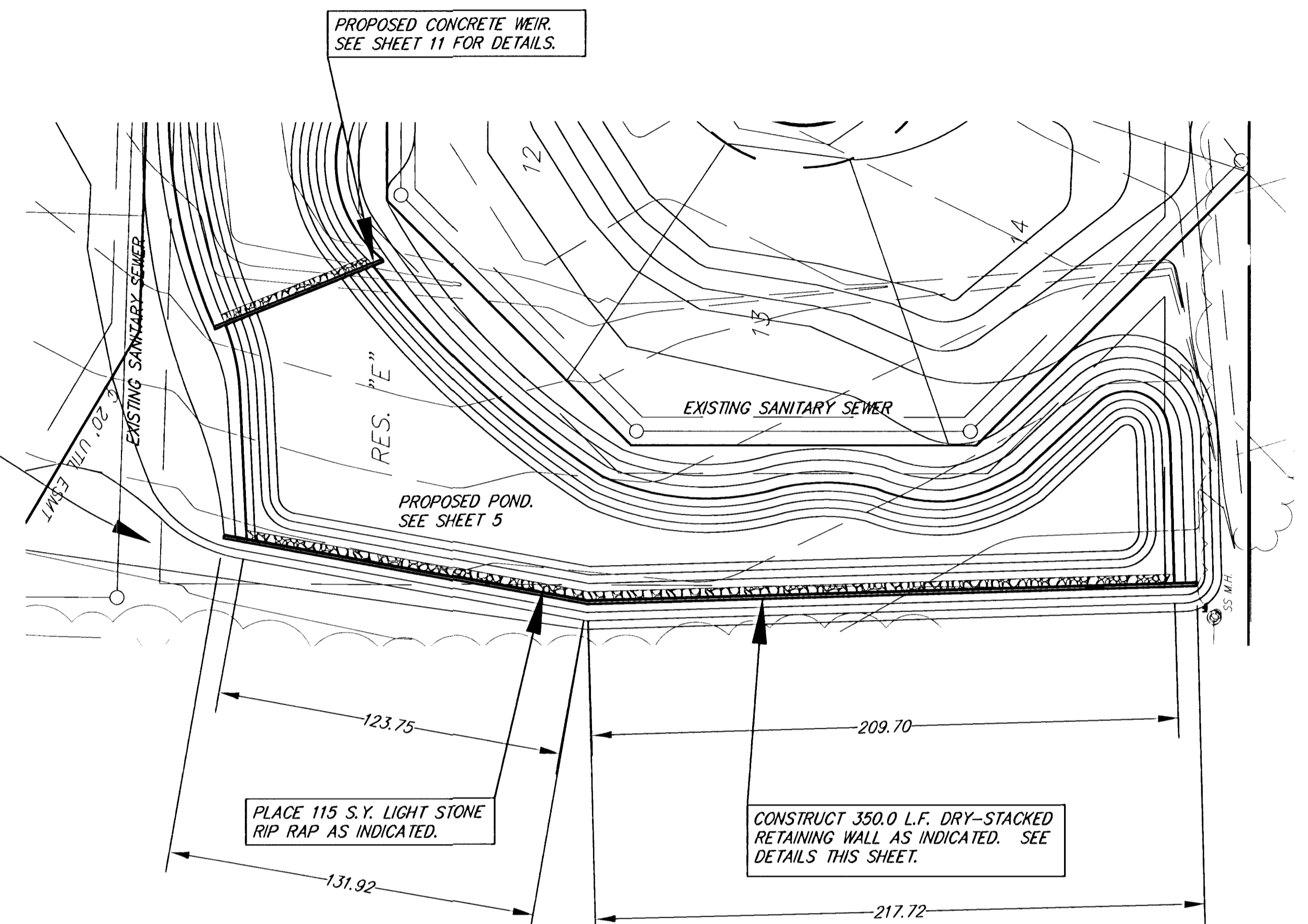
- BEVELED CLASSIC UNIT
- 1'-4" BEVELED SPILT FACE: 6" x 12" x 16" 50 LBS APPROX. 0.75 SQ FT FACE
- 1'-4" RAP BEVELED SPILT FACE: 4" x 12" x 16" 50 LBS APPROX. 0.50 SQ FT FACE



COLOR AND FACE OPTIONS

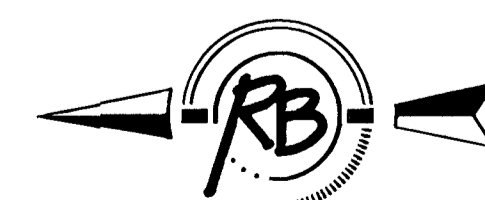
- FACTORY COLORS: GRAY AND BUFF
- CUSTOM COLORS: SPECIAL ORDERS ONLY
- FACE PATTERNS: BEVELED SPILT FACE, STRAIGHT SPILT FACE

Proposed Area for Electrical Meter for Lights



SPECIAL NOTES:

- ALL WORK AND MATERIAL ON THIS SHEET SHALL BE BID UNDER 'LUMP SUM' FOR SEGMENTAL RETAINING WALL - ADD ALTERNATE
1. Contractor to install wall lights in Dry-stacked retaining wall every 10 feet (10'). Wall lights shall be constructed in a manner that they look like the dry-stacked retaining wall. Contact the developer during all phases of construction for proper design approval of lights, light spacing and block face.
2. Contractor to install electrical conduit to wall as needed.



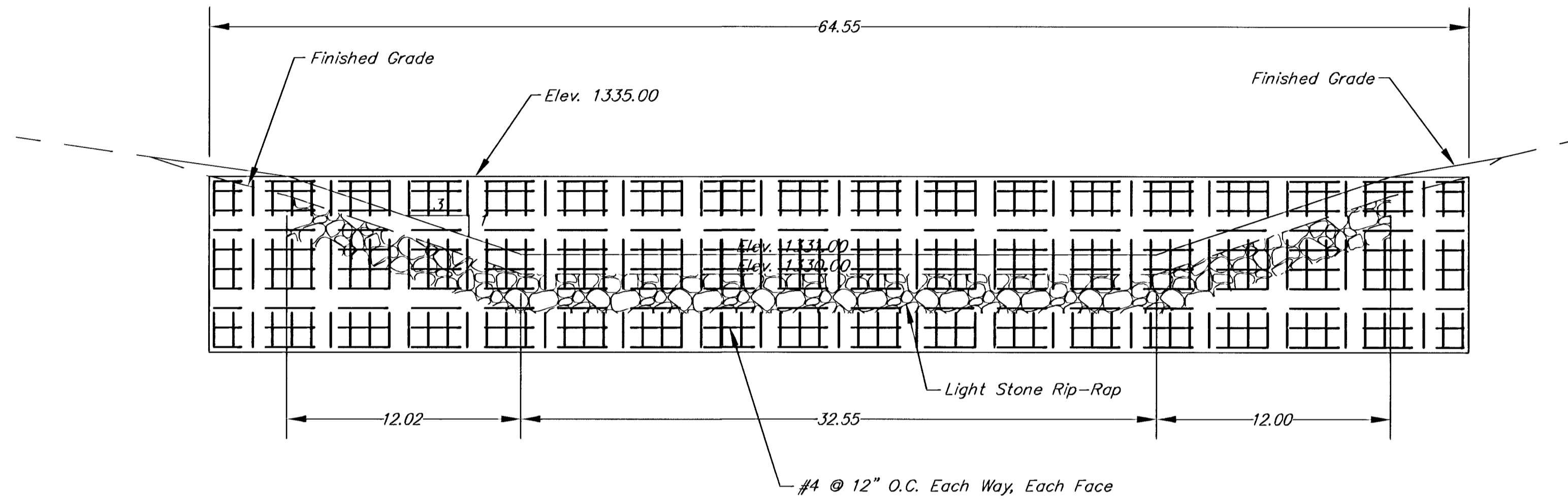
Scale: 1" = 5'

**TARA FALLS - PHASE 3, DETENTION POND
DRY-STACKED RETAINING WALL DETAILS
WICHITA, KANSAS**

<p>Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning</p> <p>924 North Main Wichita, Kansas 67203 www.rbkansas.com</p> <p>(316) 264-8008 (316) 264-4621 fax E-mail: info@rbkansas.com</p>	DESIGN: MWS	SHEET 10 OF 16
	DRAWN: TEB	
REVIEW:	UTILITY:	DATE: Mar. 3, 2003
DRAWING FILE: pond {weir wall}	PROJECT NUMBER: 468-83527	

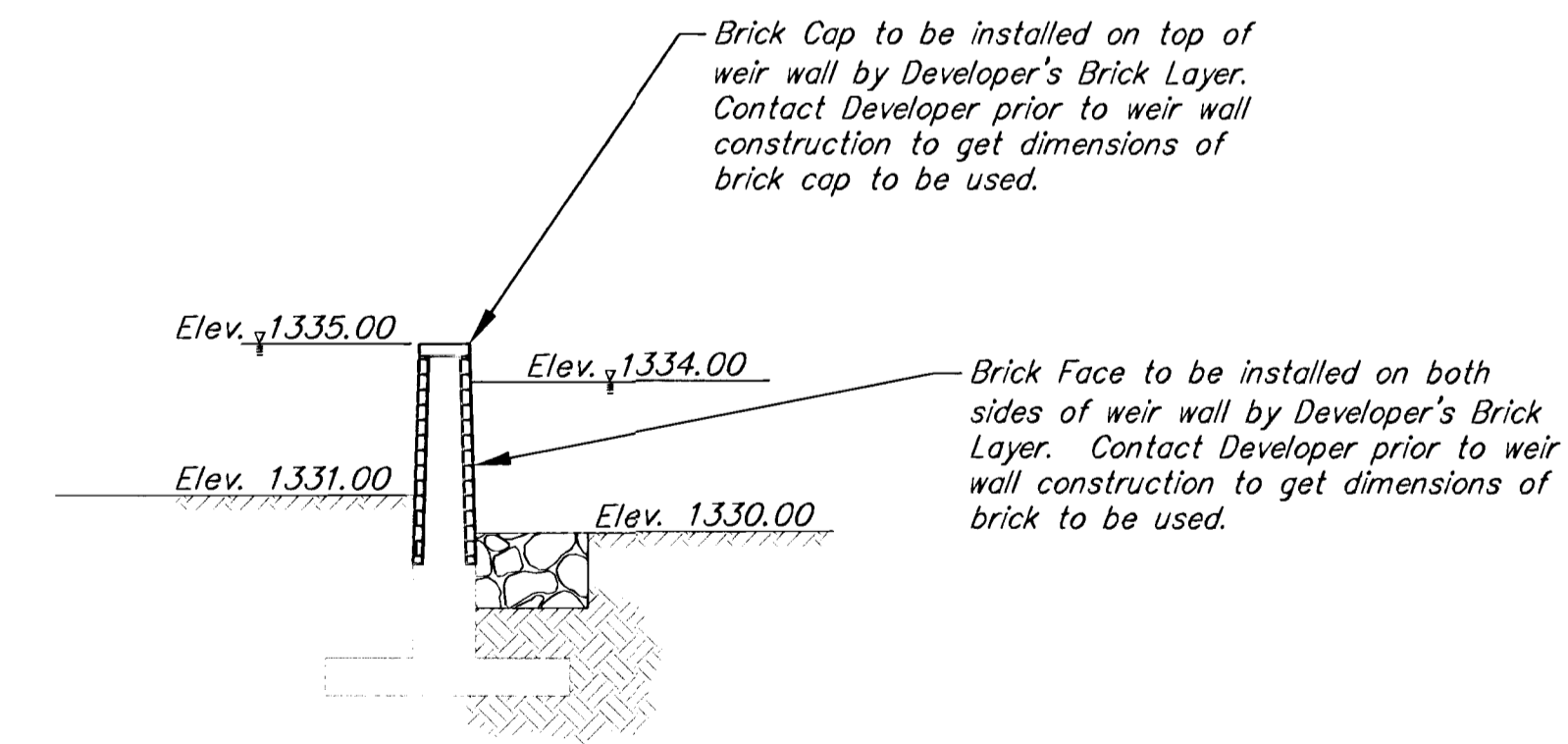
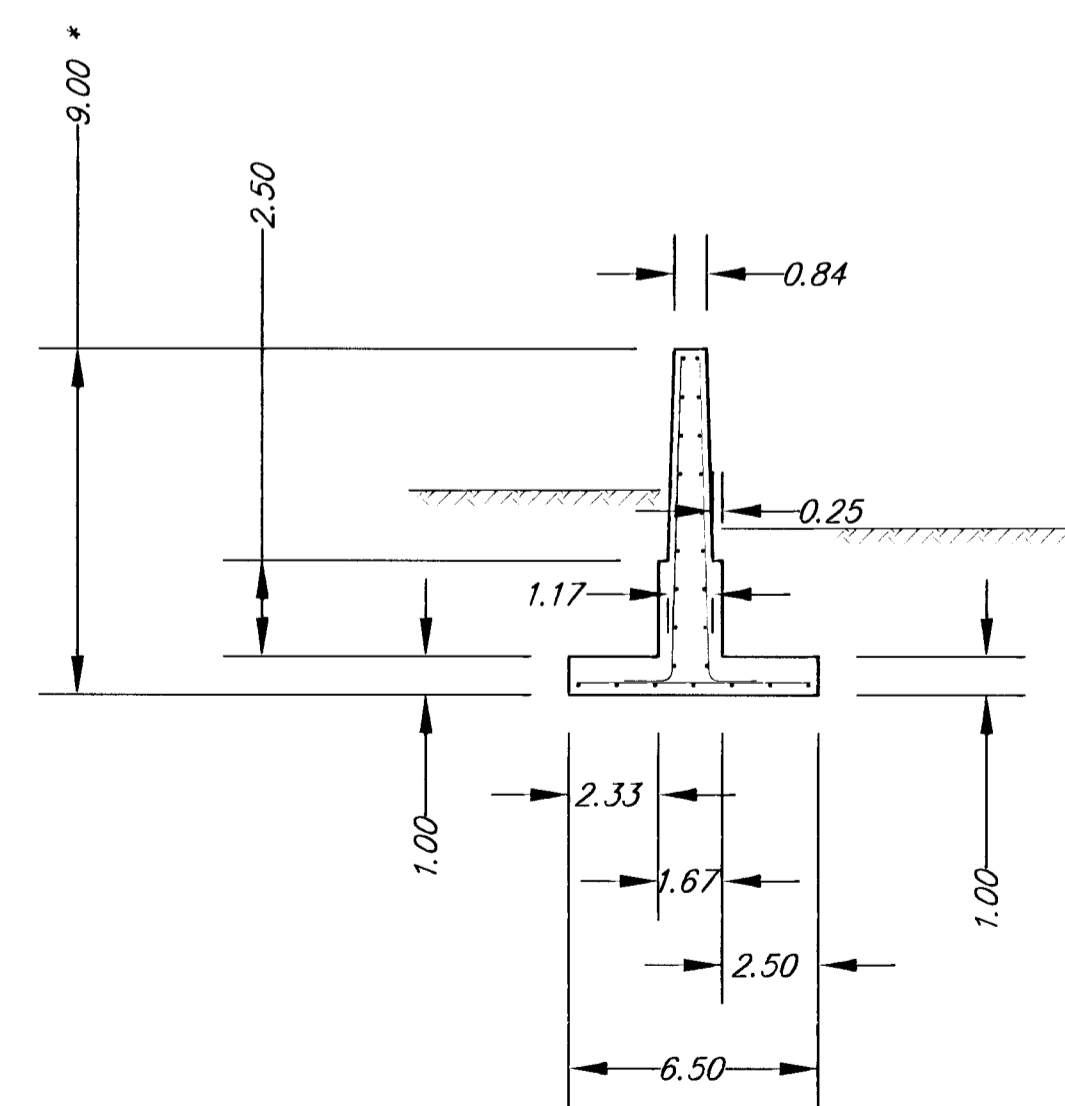
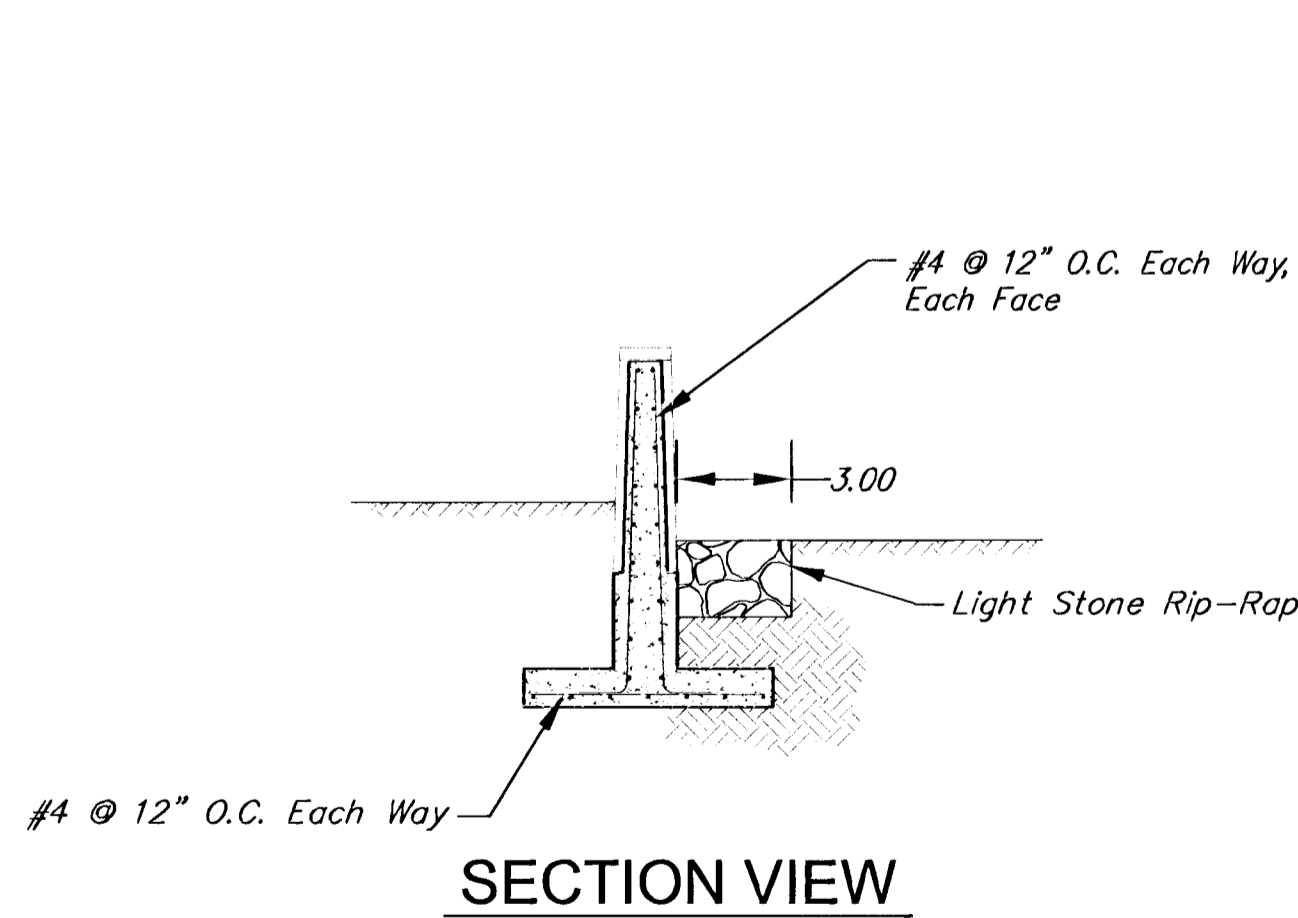
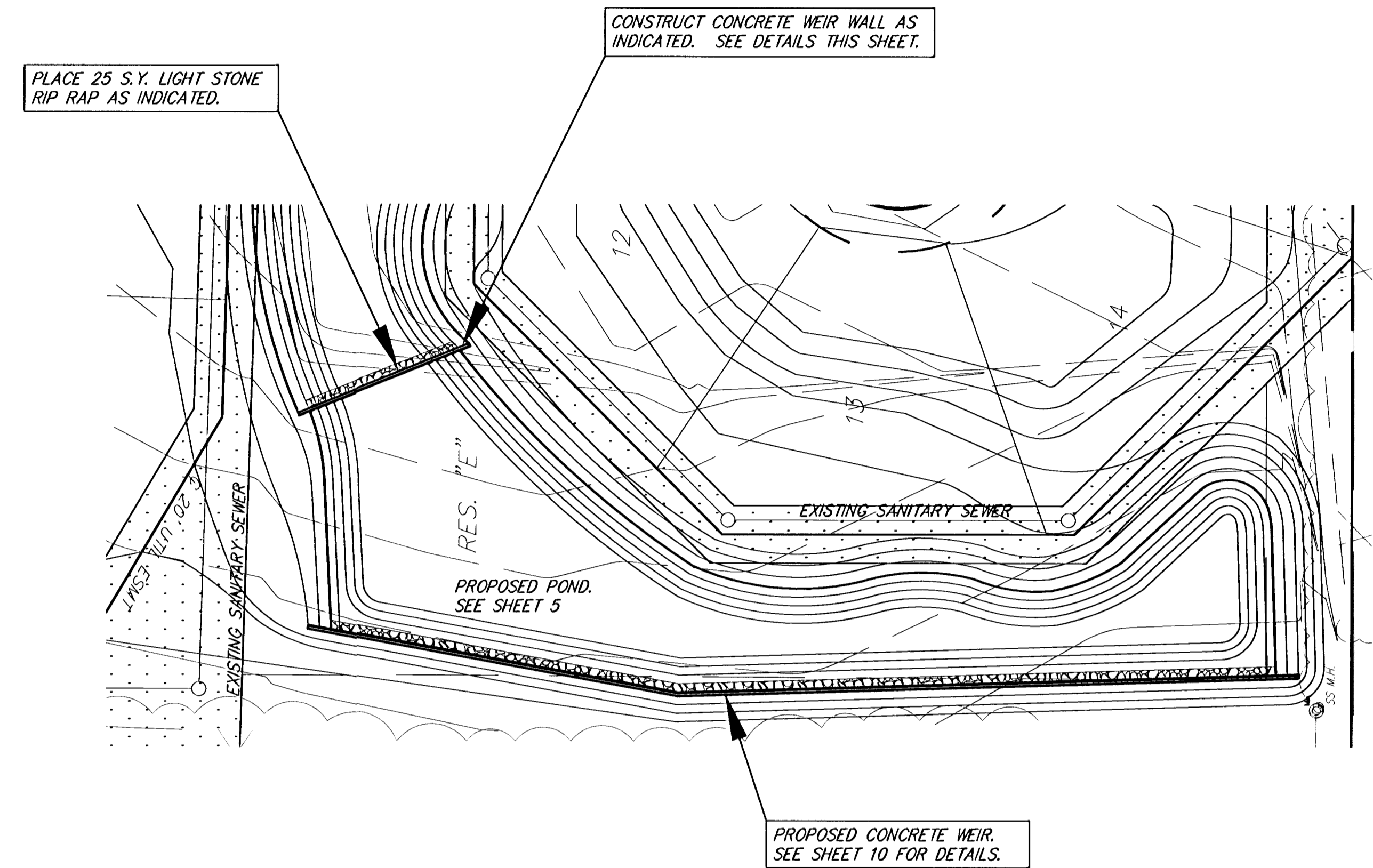
WEIR WALL PLAN

NOTE: WEIR WALL TO BE PAID FOR BY THE BID ITEM FOR CONCRETE WEIR WALL (L.F.)



WEIR WALL DETAIL

Air Entrained Concrete: $f'_c = 4000$ psi @ 28 days
 Reinforcing: $F_y = 60000$ psi
 Cover over Reinforcing is 3" Clear unless otherwise noted.

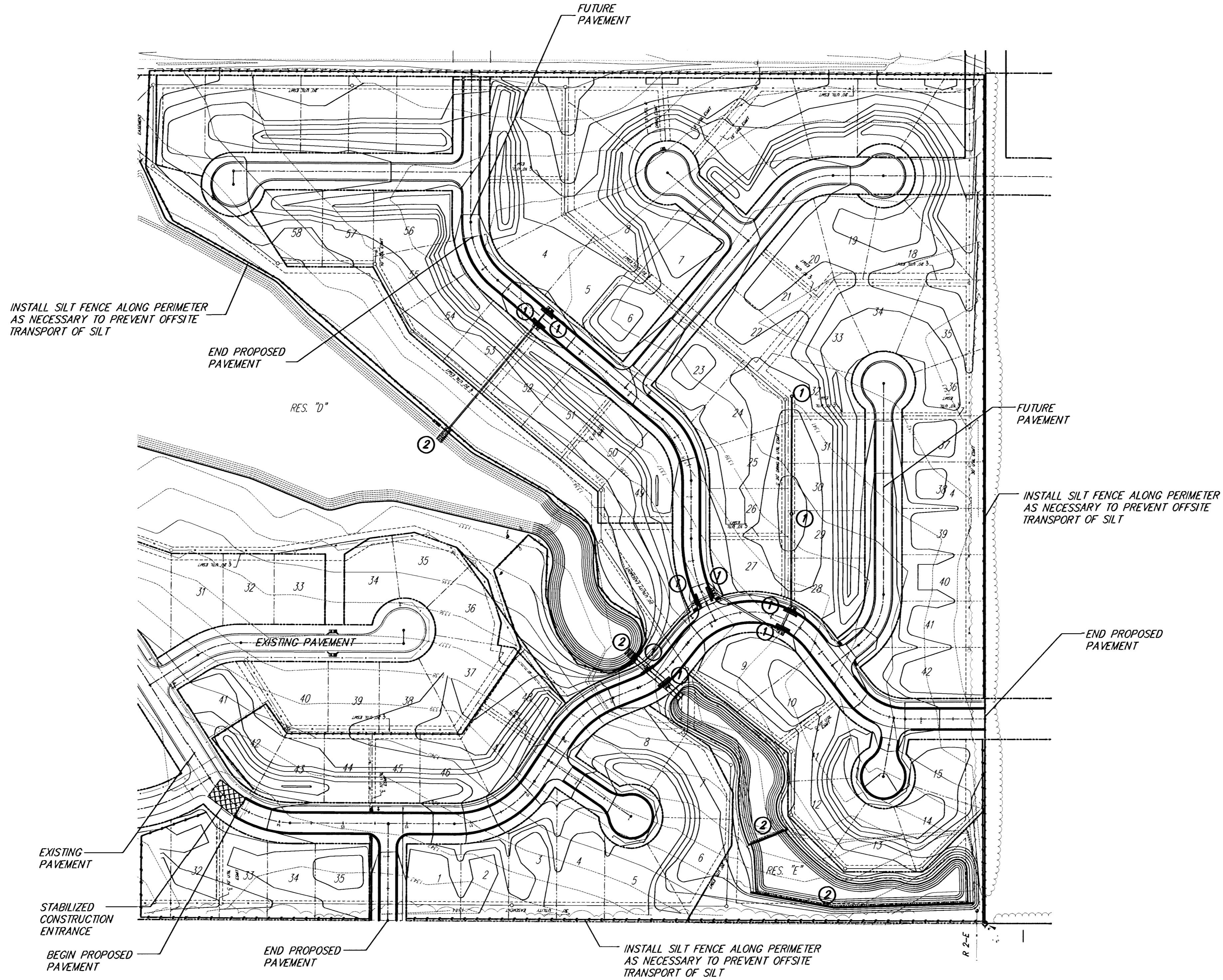


Scale : 1" = 5'

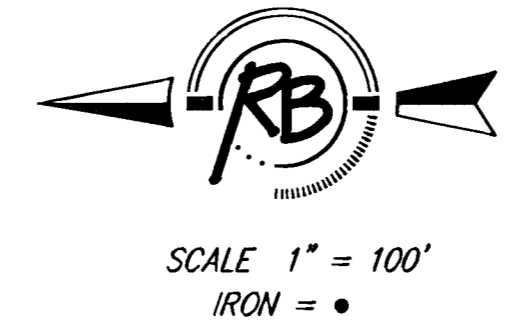
ALL WORK AND MATERIAL ON THIS SHEET SHALL BE BID UNDER 'LUMP SUM' FOR WEIR WALL

* Subtract off cap thickness to maintain final elevation of 1335.00

		TARA FALLS - PHASE 3, DETENTION POND WEIR WALL DETAILS WICHITA, KANSAS	
		Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning 924 North Main Wichita, Kansas 67203 www.rbkansas.com	
(316) 284-8008 (316) 284-4621 fax E-mail: info@rbkansas.com		DESIGN: MWS DRAWN: TEB REVIEW:	SHEET: 11 OF: 16
DRAWING FILE: pond {weir wall}	PROJECT NUMBER: 468-83527	DATE: Mar. 3, 2003	

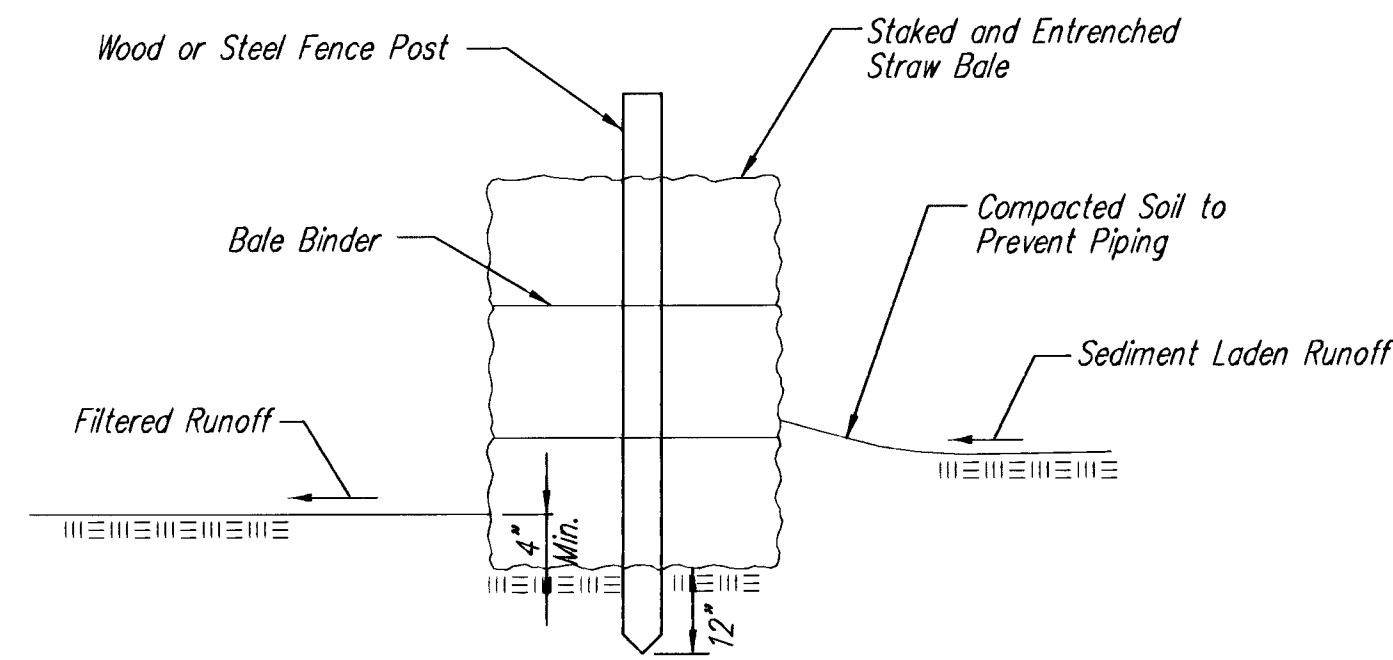


- LEGEND**
- Silt Fence
 - Hay Bale Ditch Check
 - ① Inlet Barrier Protection
 - ② Outfall Protected by Rip Rap



NOTE: SILT FENCE MAY BE USED INSTEAD OF HAYBALE DITCH CHECKS.

TARA FALLS - PHASE 3, DETENTION POND EROSION CONTROL PLAN WICHITA, KANSAS			
	Ruggles & Bohm, P.A. Engineering, Surveying, Land Planning		DESIGN MWS
	924 North Main Wichita, Kansas 67203 www.rbkansas.com		(316) 264-8008 (316) 264-4621 fax E-mail: info@rbkansas.com
DRAWING FILE pond [Erosion Control]		PROJECT NUMBER 468-83527	REVIEW UTILITY DATE Mar. 5, 2003
			SHEET 12 OF 16



STRAW BALE BARRIERS

Material Specification:

Bale slope barriers may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.

When practicable, bale slope barriers should be placed along contours to avoid a concentration of flow.

Bale slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 4" deep and a bale's width wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.

Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the upslope side of the check and compact it. The compacted soil should be no more than 3" to 4" deep.

List of common placement/installation mistakes to avoid:

When practicable, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier fails.

Do not place bale slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out.

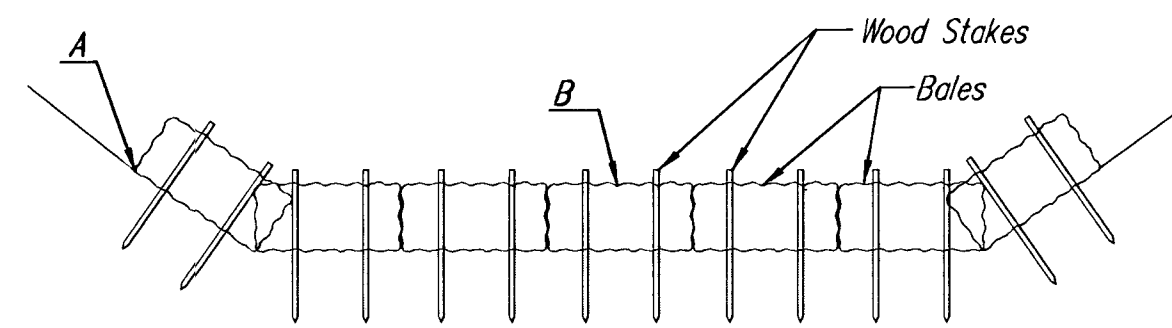
Bale slope barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the slope barrier?

NOTE: Point A must be higher than Point B so that water flows over the bales and not around them.



STRAW BALE DITCH CHECKS

Material Specification:

Bale ditch checks may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture. The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Optional: The downstream scour apron should be constructed of a double-netted straw erosion-control blanket at least 6' wide.

Optional: The metal landscape staples used to anchor the erosion-control blanket should be at least 8" long.

Placement:

Bale ditch checks should be placed perpendicular to the flowline of the ditch.

The ditch check should extend far enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. This prevents water from flowing around the check.

Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.

Bales should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

Ditch grade (%)	Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is 4" deep and a bale's width wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench—it will be used later.

Optional: On the downstream side of the trench, roll out a length of erosion-control blanket (scour apron) equal to the length of the trench. Place the upstream edge of the erosion-control blanket along the bottom upstream edge of the trench. The erosion control blanket should be anchored in the trench with one row of 8" landscape staples placed on 18" centers. The remainder of the erosion-control blanket (the portion that is not lying in the trench) will serve as the downstream scour apron. This section of the blanket should be anchored to the ground with 8" landscape staples placed around the perimeter of the blanket on 18" centers.

The remainder of the blanket should be anchored using two evenly spaced rows of 8" landscape staples on 18" centers placed perpendicular to the flowline of the ditch. Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the upstream side of the check and compact it. The compacted soil should be no more than 3" to 4" deep and extend upstream no more than 24".

List of common placement/installation mistakes to avoid:

Do not place a bale ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow.

Do not place bale ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow.

Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.

Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the top of the lowest center bale.

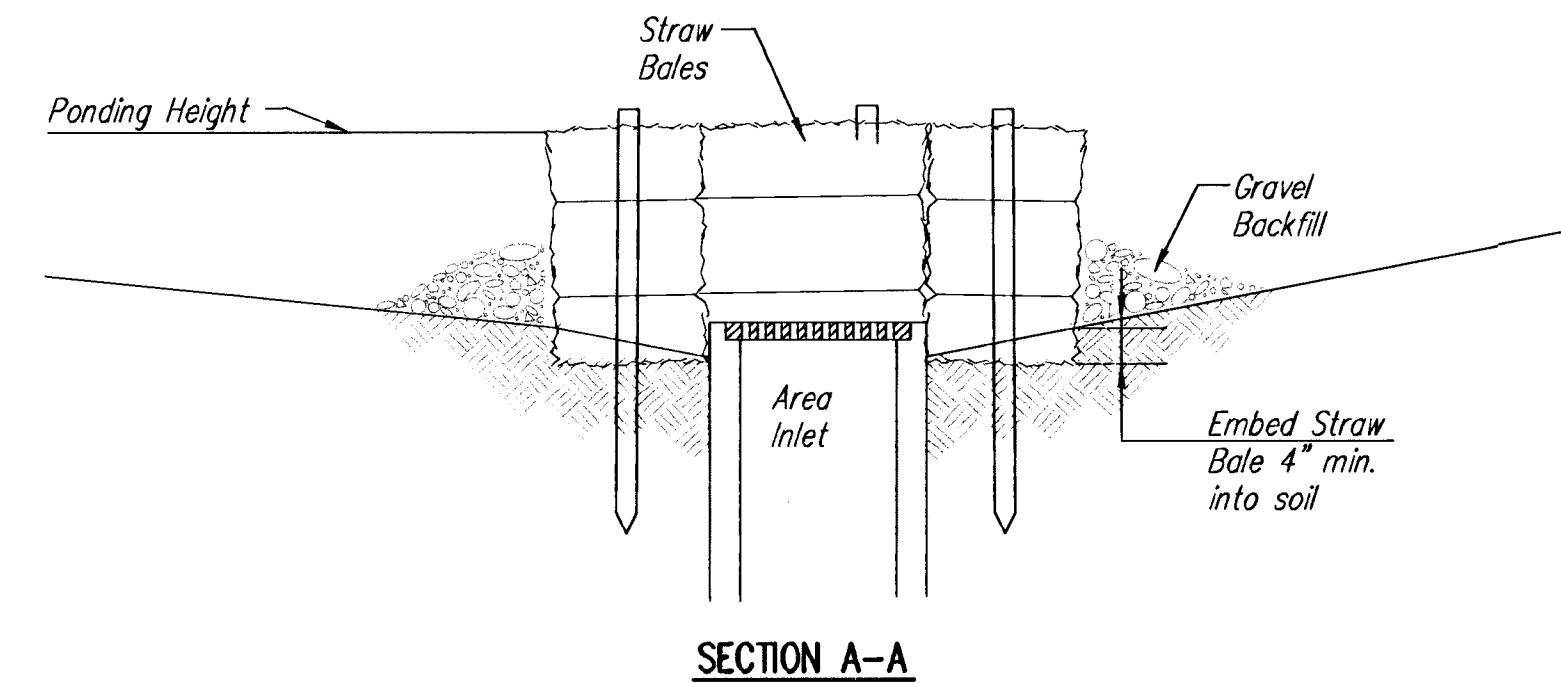
Do not place bale ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.

Bale ditch checks must be dug into the ground. Bales at ground level do not work because they allow water to flow under the check.

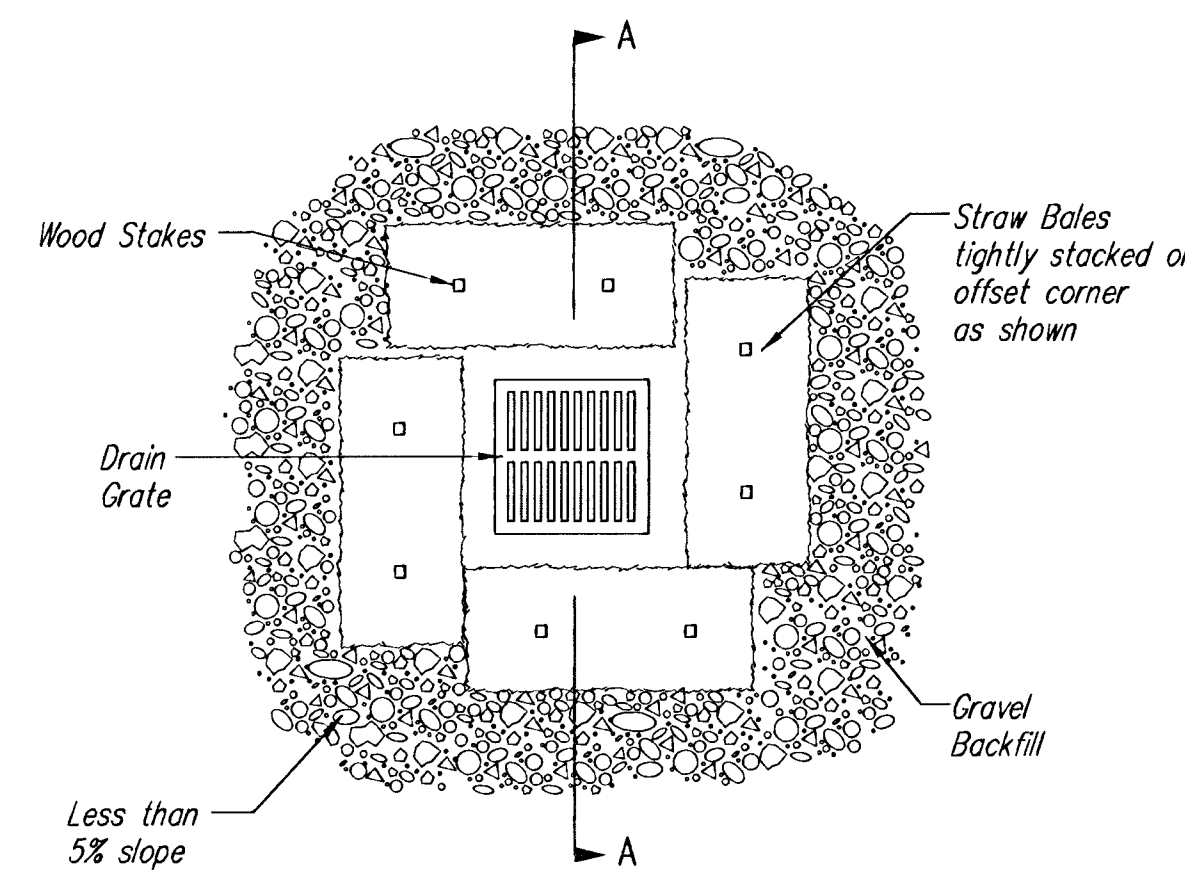
Inspection and Maintenance:

Bale ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does water flow through spaces between abutting bales?
- Are any bales and/or scour aprons (optional) dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the ditch check?



SECTION A-A



STRAW BALE BARRIERS FOR AREA INLETS (INLET PROTECTION)

Material Specification:

Bale area inlet barriers should be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture.

The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.

Placement:

Bale area inlet barriers should be placed directly around the perimeter of a drop inlet. When a bale area inlet barrier is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper Installation Method:

Excavate a trench around the perimeter of the area inlet that is at least 4" deep by a bale's width wide.

Place the bales in the trench, making sure that they are butted tightly. Some bales may need to be shortened to fit into the trench around the area inlet. Two stakes should be driven through each bale, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.

Once all the bales have been installed and anchored, place the excavated soil against the receiving side of the barrier and compact it. The compacted soil should be no more than 3" to 4" deep.

Note: When a bale area inlet barrier is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

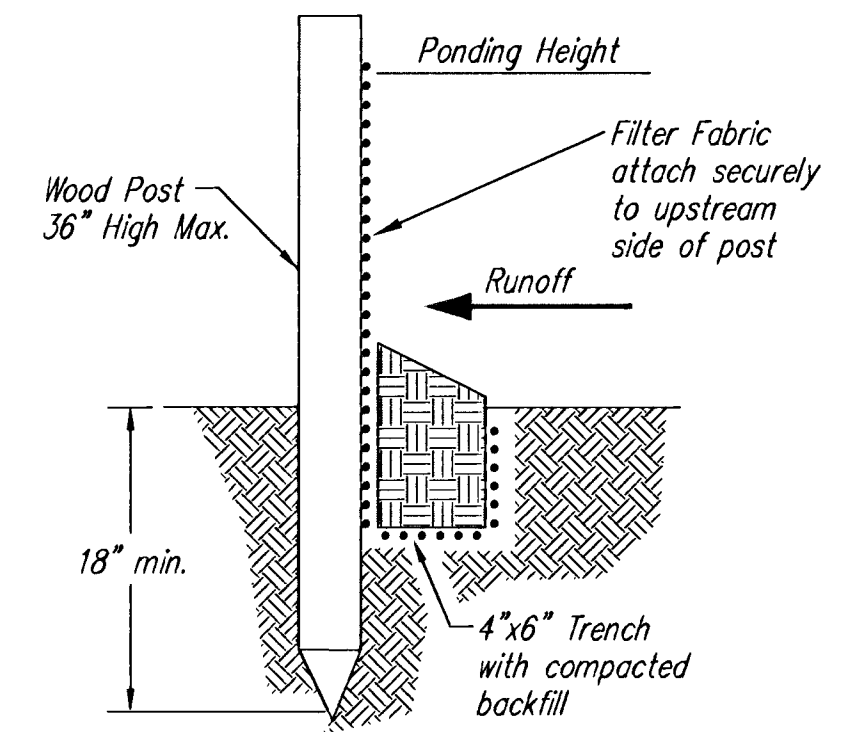
List of common placement installation mistakes to avoid:

Bales should be placed directly against the perimeter of the area inlet. This allows overtopping water to flow directly into the inlet instead of onto nearby soil causing scour. Bale area inlet barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

Bale area inlet barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the area inlet barrier?
- Does water flow through spaces between abutting bales?
- Are any bales dislodged?
- Are bales decomposing due to age and/or water damage?
- Does sediment need to be removed from behind the area inlet barrier?



SILT FENCE BARRIERS

SILT FENCE BARRIERS

Material Specification:

Silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.

When practicable, silt fence slope barriers should be placed along contours to avoid a concentration of flow.

Silt fence slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 6" deep by 4" wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.

Roll out a continuous length of silt fence fabric on the downslope side of the trench. Place the edge of the fabric in the trench starting at the top upslope edge. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt-fence fabric should remain exposed.

Lay the exposed silt fence upslope of the trench to clear an area for driving in the posts. Just downslope of the trench, drive posts into the ground to a depth of at least 18". Place posts no more than 4' apart.

Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

List of common placement/installation mistakes to avoid:

When practicable, do not place silt fence slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. When the flow concentrates, it overtops the barrier and the silt fence slope barrier quickly deteriorates. Do not place silt-fence posts on the upslope side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not place silt fence slope barriers in areas with shallow soils underlain by rock. If the barrier is not sufficiently anchored, it will wash out. Silt fence slope barriers must be dug into the ground—silt fence at ground level does not work because water will flow underneath.

Inspection and Maintenance:

Silt fence slope barriers should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Are there any points along the slope barrier where water is concentrating?
- Does water flow under the slope barrier?
- Do the silt fences sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the slope barrier?

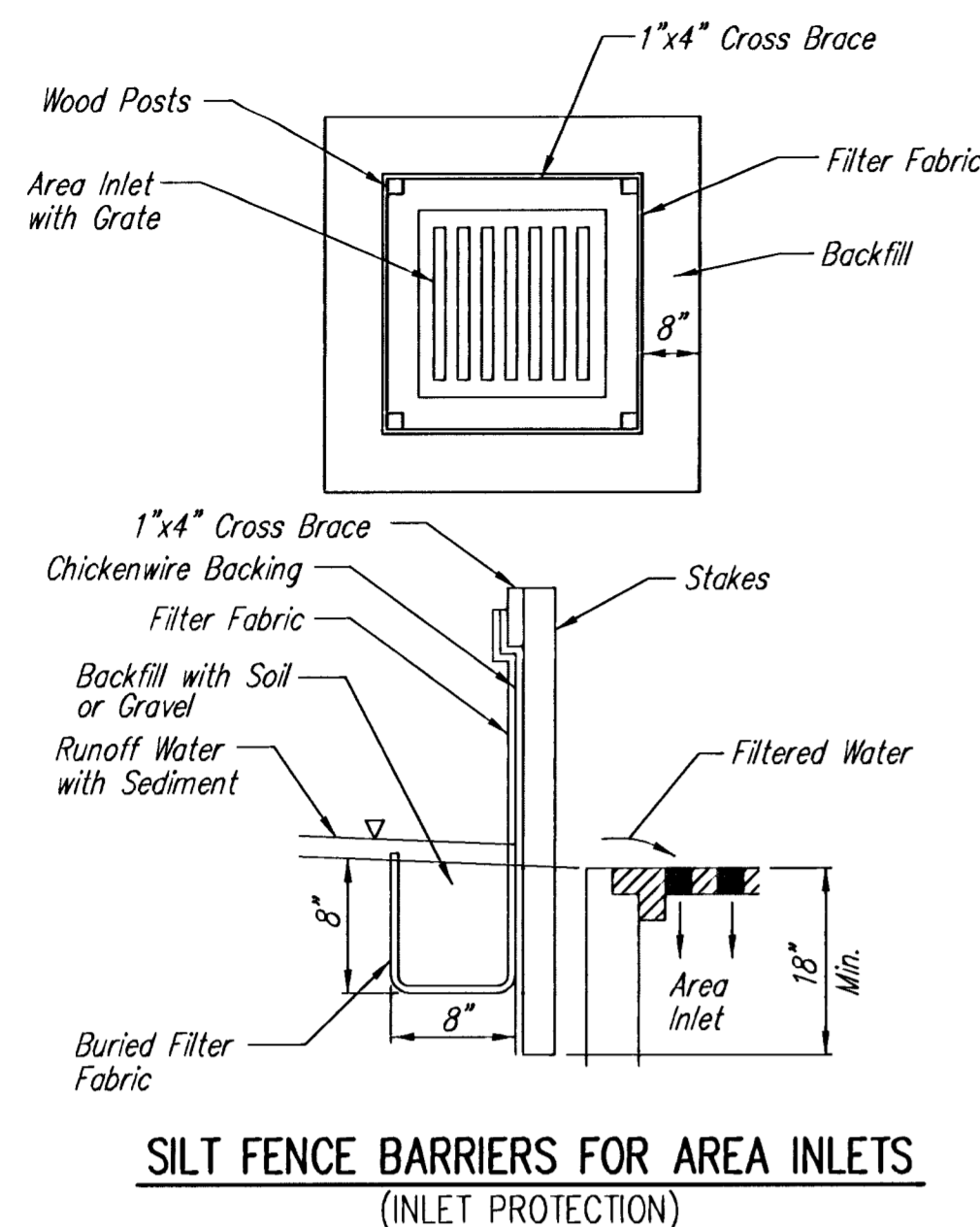


SOIL EROSION BMP DETAILS

CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER 468-83527 OCA NO. 751328

DATE MAY 2001 SHEET 13 OF 16



SILT FENCE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

Material Specification:

Silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The wire or polymeric mesh backing used to help support the silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. The material used to frame the tops of the posts should be 1" by 4" boards. Silt fence fabric and support backing should be attached to the wooden posts and frame with staples, wire, zip ties, or nails.

Placement:

Place a silt fence drop inlet barrier in a location where it is unlikely to be overtopped. Water should flow through silt fence, not over it. Silt fence barriers for area inlets often fail when repeatedly overtopped. When used as a barrier for area inlets, silt fence fabric and posts must be supported at the top by a wooden frame. When a silt fence barrier for area inlets is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper installation method:

Excavate a trench around the perimeter of the area inlet that is at least 8" deep by 8" wide. Drive posts to a depth of at least 18" around the perimeter of the area inlet. The distance between posts should be 4' or less. If the distance between two adjacent corner posts is more than 4', add another post(s) between them. Connect the tops of all the posts with a wooden frame made of 1" by 4" boards. Use nails or screws for fastening. Attach the wire or polymeric-mesh backing to the outside of the post/frame structure with staples, wire, zip ties, or nails. Roll out a continuous length of silt fence fabric long enough to wrap around the perimeter of the area inlet. Add more length for overlapping the fabric joint. Place the edge of the fabric in the trench, starting at the outside edge of the trench. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Attach the silt fence to the outside of the post/frame structure with staples, wire, zip ties, or nails. The joint should be overlapped to the next post.

Note: When a silt fence barrier for area inlet is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

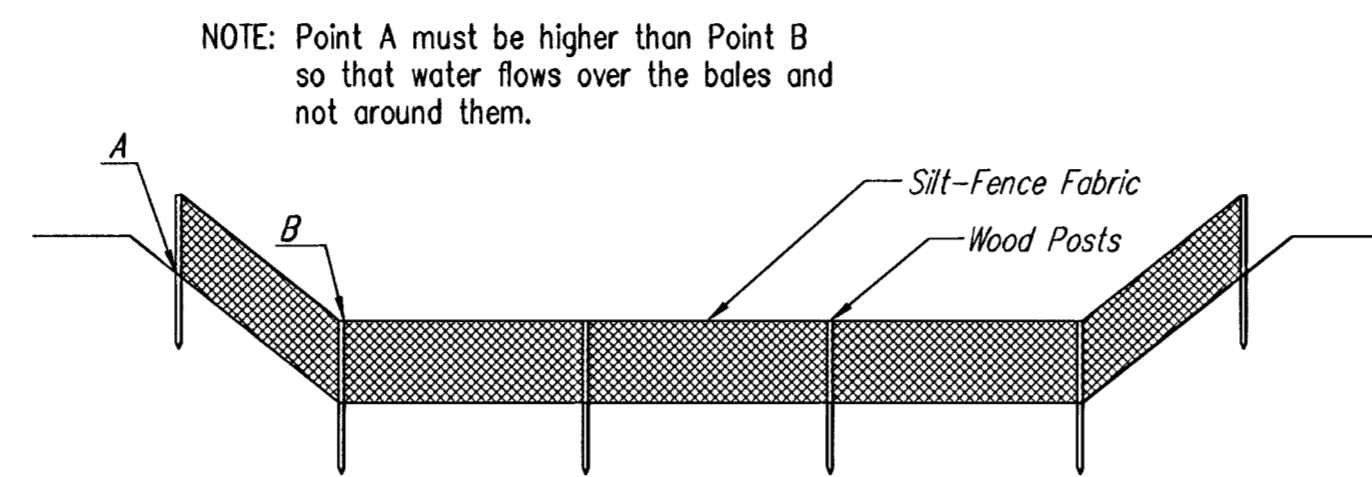
List of common placement/installation mistakes to avoid:

Water should flow through a silt fence barrier for area inlet—not over it. Place a silt fence barrier for area inlet in a location where it is unlikely to be overtopped. Silt fence barrier for area inlets often fail when repeatedly overtopped. Do not place posts on the outside of the silt fence barrier for area inlet. In this configuration, the force of the water is not resisted by the posts, but only by the staples (wire, zip-ties, nails, etc.). The silt fence will rip and fail. Do not install silt fence barrier for area inlets without framing the top of the posts. The corner posts around area inlets are stressed in two directions whereas a normal silt fence is only stressed in one direction. This added stress requires more support.

Inspection and Maintenance:

Silt fence barrier for area inlets should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

- Does water flow under the silt fence?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the area inlet barrier?



ELEVATION
SILT FENCE DITCH CHECKS
(STREAM PROTECTION)

Material Specification:

Silt fence fabric should conform to the AASHTO M288 96 silt fence specification. The posts used to support the silt fence fabric should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long. Silt fence fabric should be attached to the wooden posts with staples, wire, zip ties, or nails.

Placement:

Place silt fence in ditches where it is unlikely that it will be overtopped. Water should flow through a silt fence ditch check, not over it. Silt fence ditch checks often fail when overtopped. Silt fence ditch checks should be placed perpendicular to the flowline of the ditch. The silt fence should extend far enough so that the ground level at the ends of the fence is higher than the top of the low point of the fence. This prevents water from flowing around the check. Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead. Silt fence should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.

The following table provides check spacing for a given ditch grade:

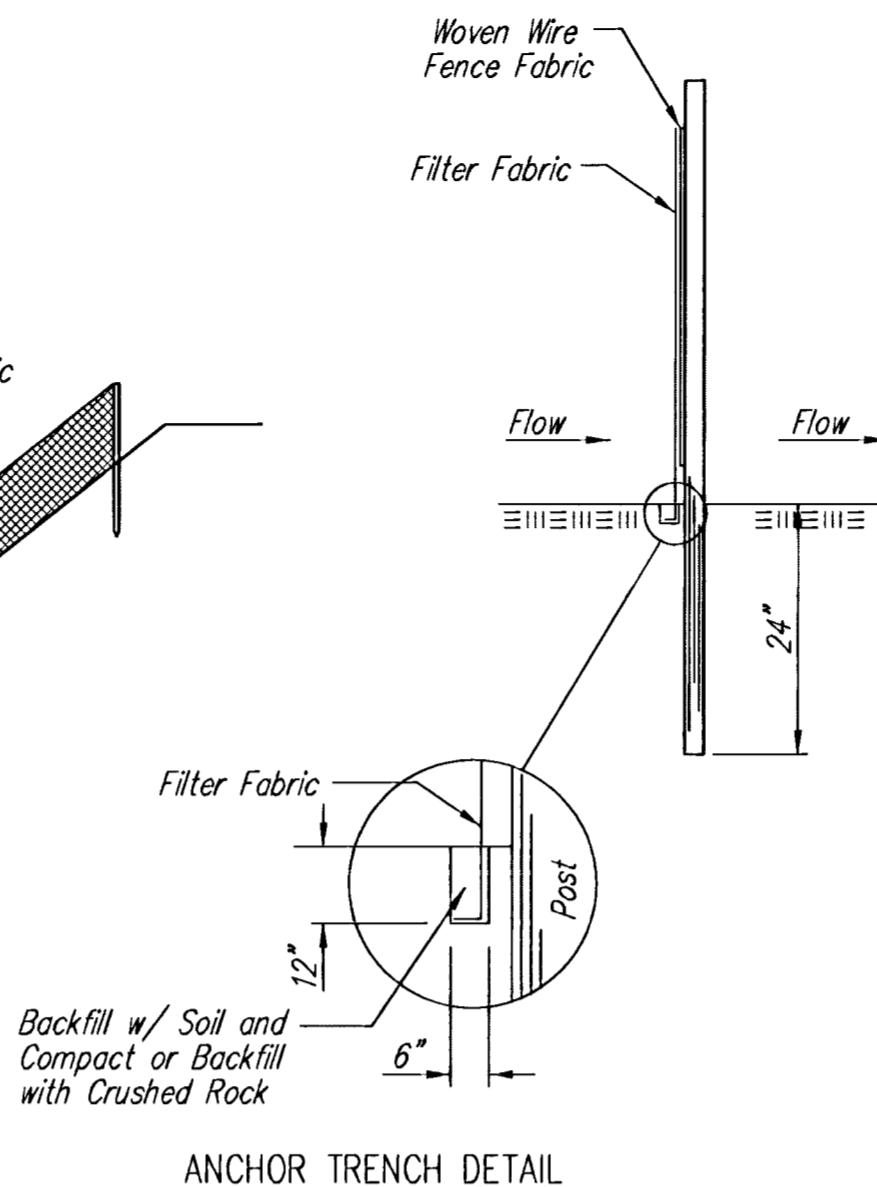
Ditch Check Ditch grade (%)	Spacing Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

Proper installation method:

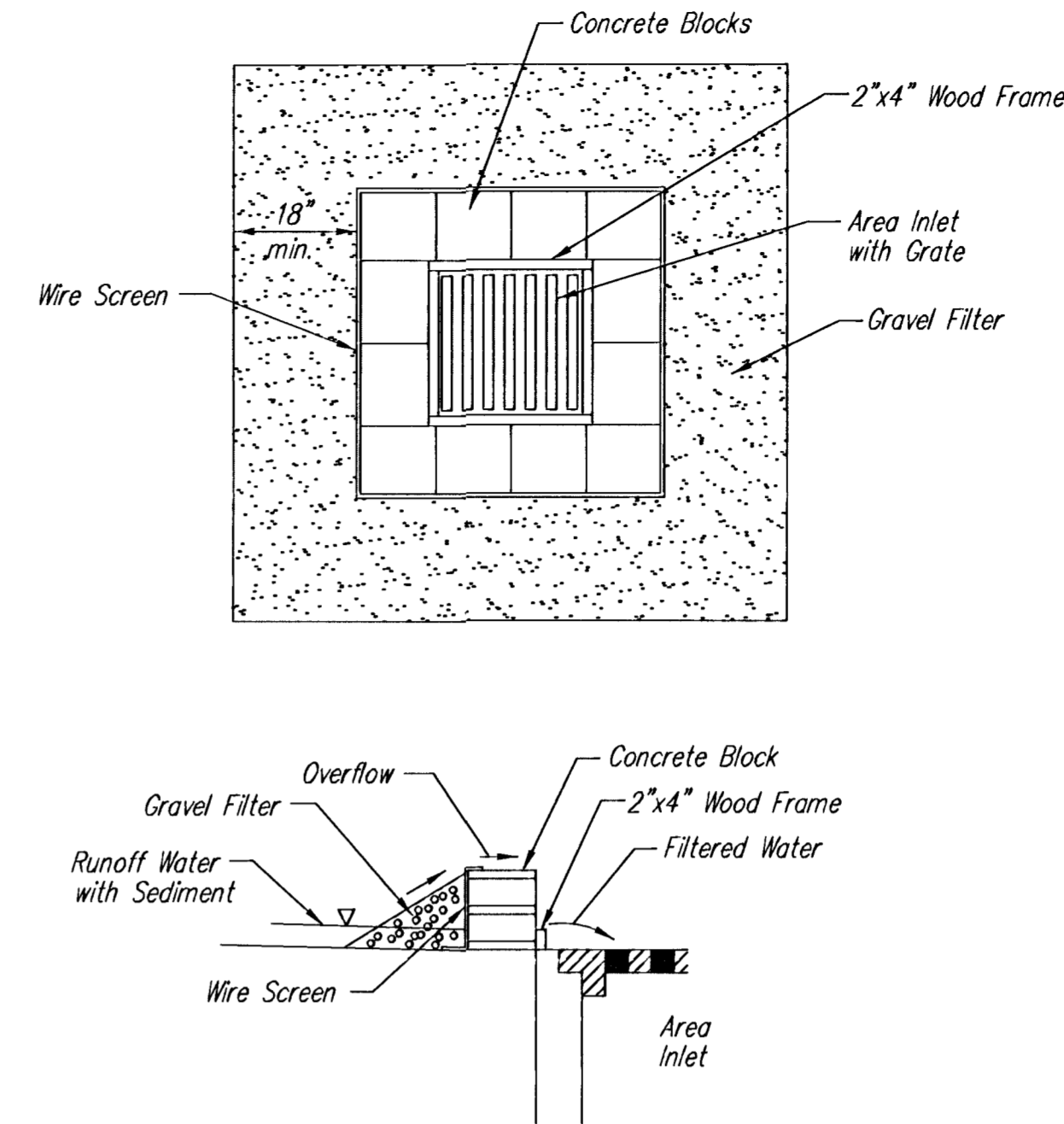
Excavate a trench perpendicular to the ditch flowline that is at least 12" deep by 6" wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench for later use. Roll out a continuous length of silt fence fabric on the downstream side of the trench. Place the edge of the fabric in the trench starting at the top upstream edge of the trench. Line two sides of the trench with the fabric as shown on detail. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt fence fabric should remain exposed. Lay the exposed silt fence on the upstream side of the trench to clear an area for driving in the posts. Just downstream of the trench, drive posts into the ground to a depth of at least 24". Place posts no more than 4' apart. Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

List of common placement/installation mistakes to avoid:

Water should flow through a silt fence ditch check—not over it. Place silt fence in ditches where it is unlikely that it will be overtopped. Silt fence installations quickly deteriorate when water overtops them. Do not place silt fence posts on the upstream side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, nails, etc.). The silt fence will rip and fail. Do not place a silt fence ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow. Do not place silt fence ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow. Follow prescribed ditch check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks. Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the fence is higher than the low point on the top of the fence. Do not place silt fence ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.



ANCHOR TRENCH DETAIL



CONCRETE BLOCK FILTER FOR AREA DRAIN
(INLET PROTECTION)

Gravel barriers provide little filtering of large inflow waters. However, when installed correctly and maintained, they can effectively treat low runoff flows.

Placement of gravel filters around area drains must be completed in a manner that will not cause local flooding.

Gravel filters can be used if the immediate and adjacent area to the area drain consists of soil or pavement.

Only gravel filters are to be installed on top of the pavement.

Instructions for Installing:

- STEP 1: Place concrete blocks around the grate. The blocks can be stacked one or two high and should be supported by a 2"x4" board.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary.

An alternative method is use of gravel bags that are supported to prevent collapsing.

Use of rock having diameters smaller than 1" may result in clogging of pores and reduce the amount of water flowing into an inlet.

Maintenance:

All gravel filters installed around area drains should be inspected and repaired after each runoff event. Sediment should be removed when material is within 3" of the top of any block. Periodically, the gravel should be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets after every runoff event.

Inspection and Maintenance:

Silt fence ditch checks should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

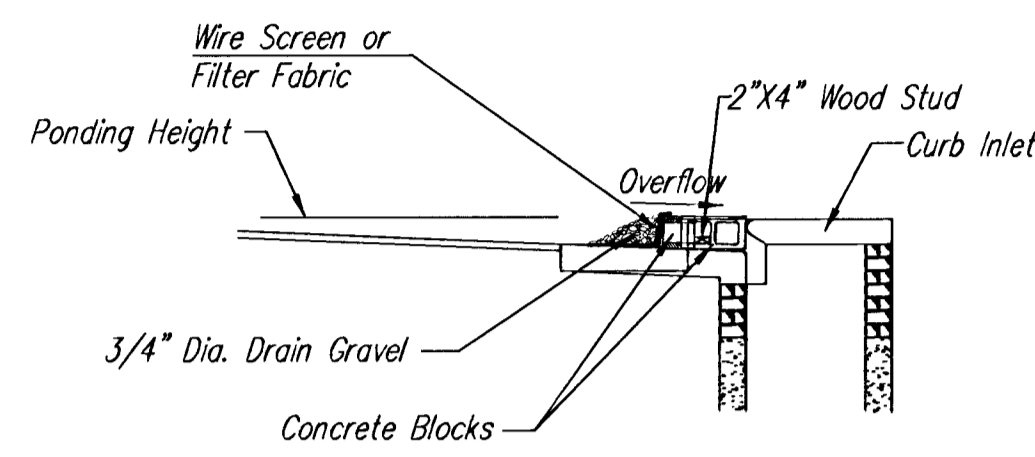
- Does water flow around the ditch check?
- Does water flow under the ditch check?
- Does the silt fence sag excessively?
- Has the silt fence torn or become detached from the posts?
- Does sediment need to be removed from behind the ditch check?

**SOIL EROSION
BMP DETAILS**

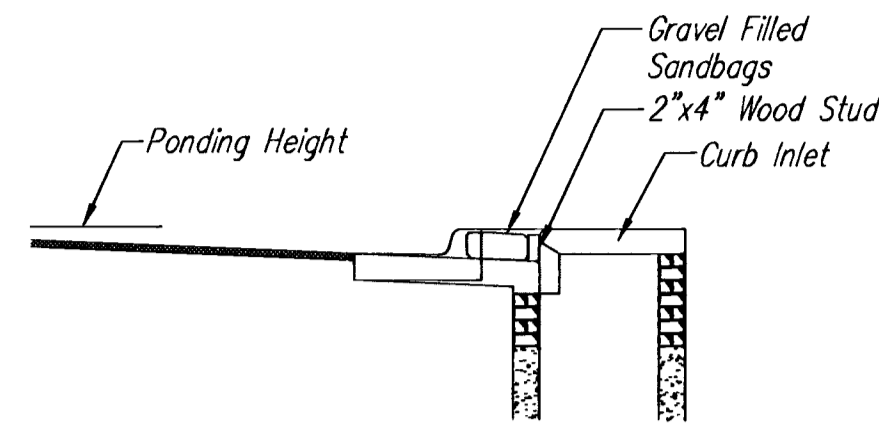
CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER: 468-83527 OCA NO.: 751328

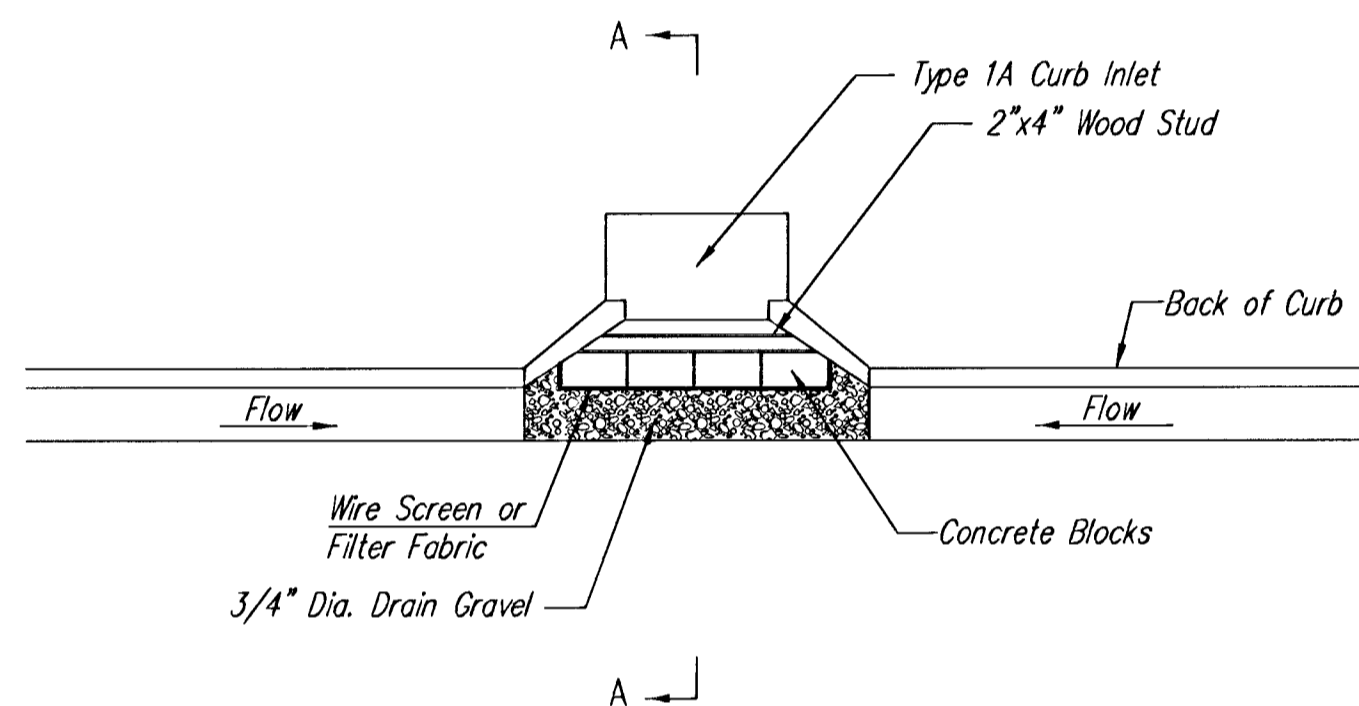
DATE: MAY 2001 SHEET: 14 OF 16



SECTION A-A



SECTION B-B



CURB INLET GRAVEL FILTERS
(INLET PROTECTION-RESIDENTIAL STREETS ONLY)

NOTE: Other types of curb inlet protection may be approved by the city so long as equal protection is provided.

A gravel inlet filter shall be installed at sump locations on residential streets. This type of protection is not to be used on arterial or collector streets at any time that it would pose an undue traffic hazard.

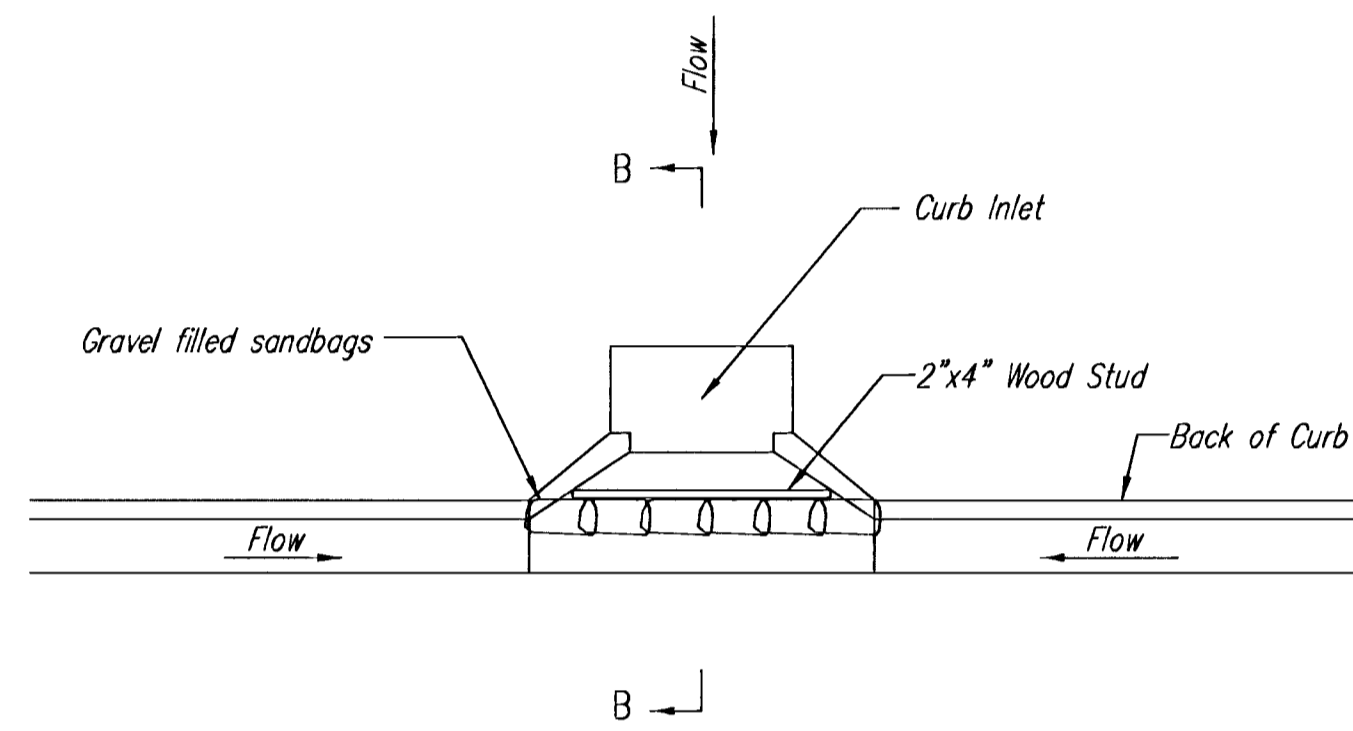
Instructions for Installing:

- STEP 1: Place concrete blocks around the inlet as shown on drawing. Insert 2x4 board as shown.
- STEP 2: Wrap 1/2" mesh wire screen around the concrete blocks.
- STEP 3: Place 1" to 1-1/2" diameter rock around the blocks and wire screen. Be sure the rock extends down from the top of the concrete block.
- STEP 4: To prevent damage to vehicles, signs warning drivers about the structures may be necessary. An alternative installation is the use of gravel bags supported by a 2"x4" board to prevent collapsing.

Use of rock with diameters smaller than 1" in the bag may result in clogging of pores and reduce the amount of water flowing into an inlet.

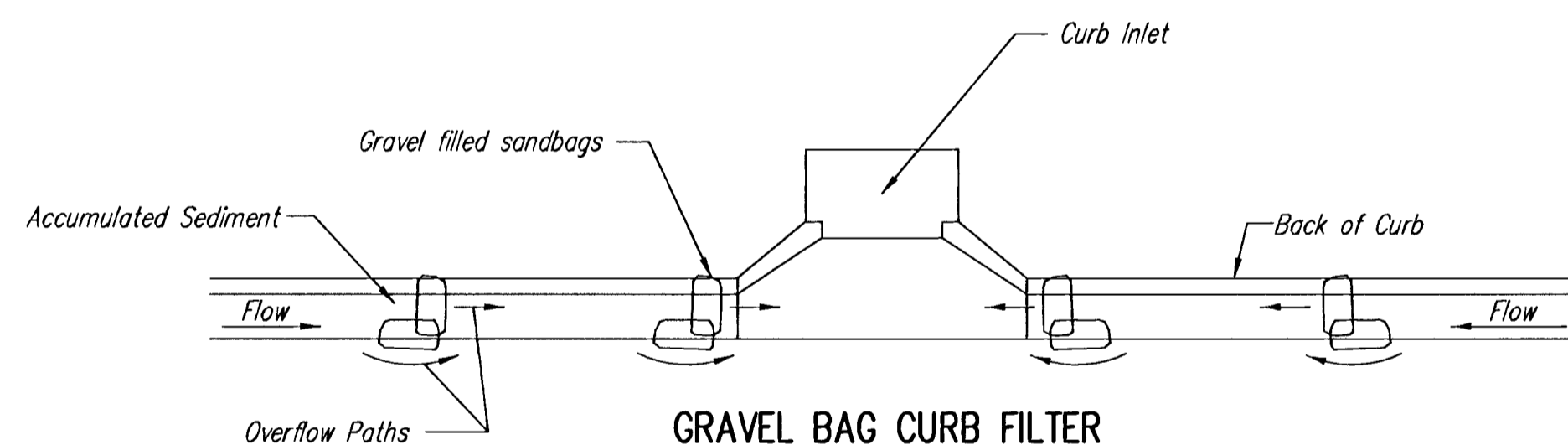
Maintenance:

All curb inlet gravel filters shall be inspected and repaired after each runoff event. Sediment deposits are to be removed once material is within 8 cm (3 inches) of the top of any block. Periodically, the gravel shall be raked to increase infiltration and filtering of runoff waters. Accumulated sediment is to be removed immediately from roads and streets.



CURB INLET SANDBAG FILTERS
(INLET PROTECTION)

NOTE: Other types of curb inlet protection may be approved by the City so long as equal protection is provided.



GRAVEL BAG CURB FILTER
(INLET PROTECTION)

NOTE: Place two or more sets of bags in a manner that results in maximum support. The flow line bag must be lower than top of curb.

CURB SEDIMENT TRAPS

When inlets are located on streets having a grade (i.e., sump conditions do not exist), installing gravel (or sand) bags in the gutter flow line to create small sediment traps can be considered. Gravel bags are recommended over sand bags to allow for drainage.

If the spacing between bags becomes too large, little sediment may be trapped. Spacing of bags should be completed using the table or graph that illustrates placement distances based upon street slope. When installed in the gutter, bag tops must be lower than the sidewalk.

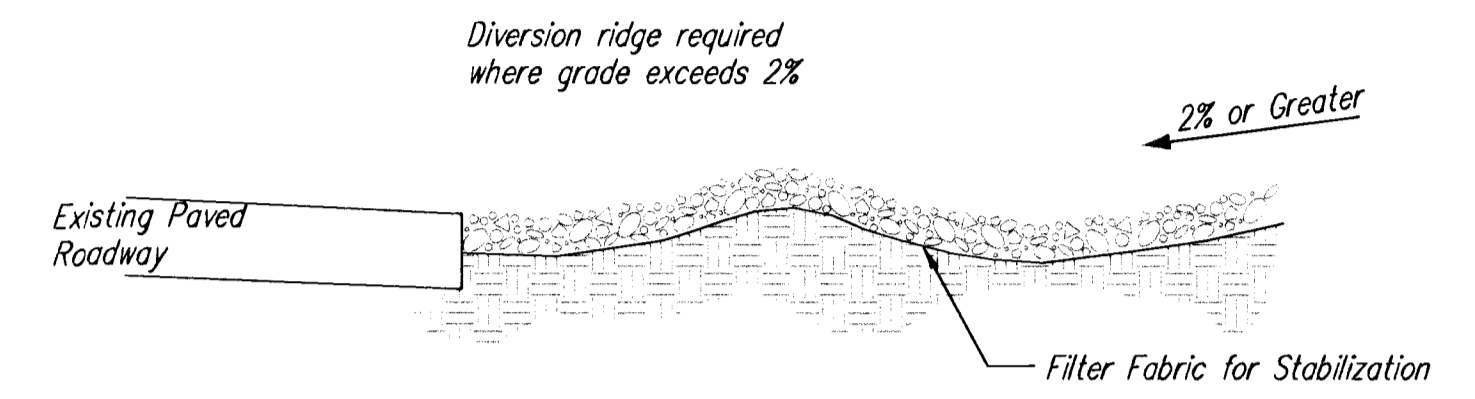
Spacing:

Gravel bags are to be placed according to street grades using the following table or graph that appears below.

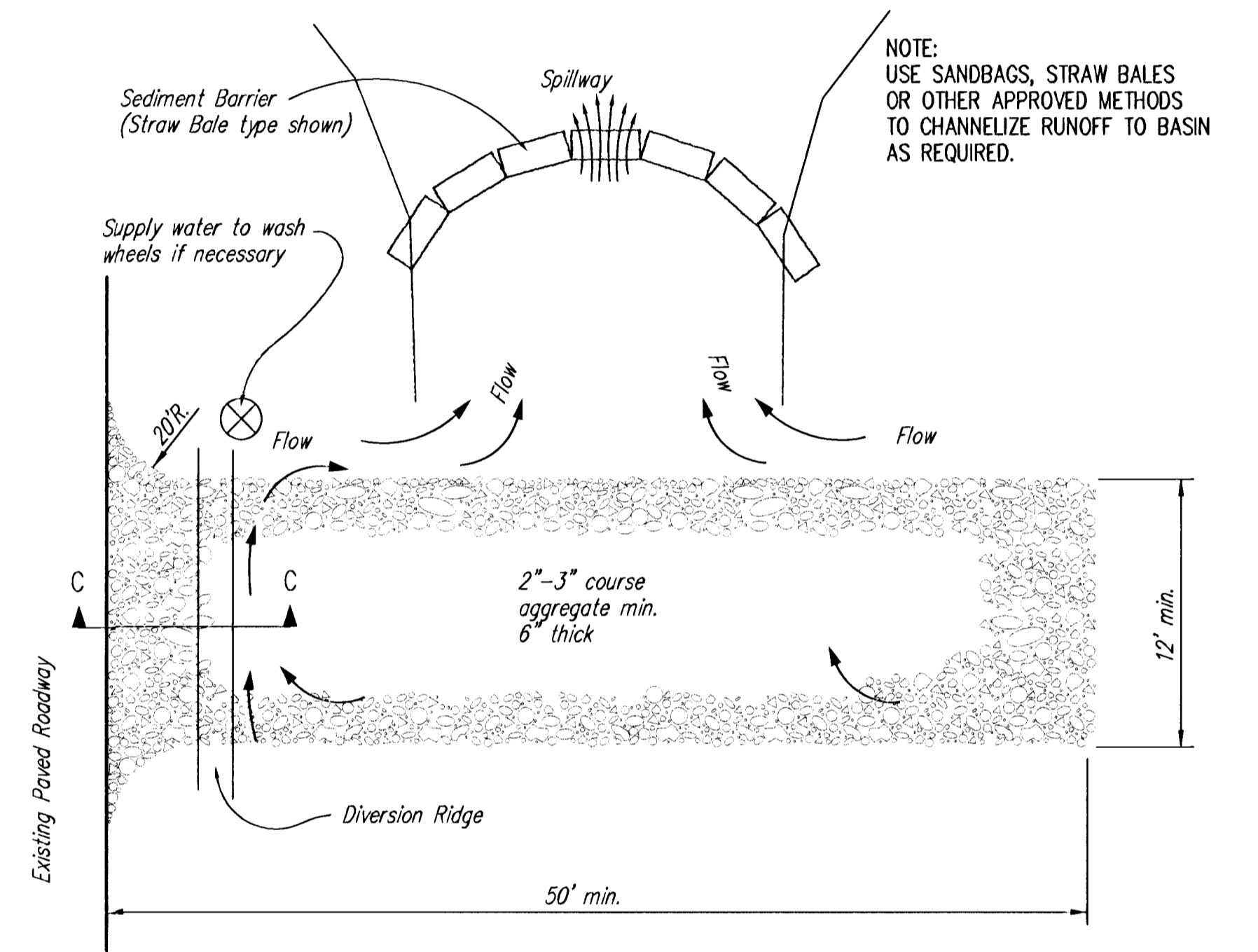
GRADE (%)	SPACING (FEET)
0.5	75
1.0	45
2.0	18
3.0	12
4.0	9
5.0	6

Maintenance:

Collected sediment shall be removed after every runoff event. Bags that are destroyed by vehicular traffic or through natural deterioration are to be immediately replaced.



SECTION C-C



STABILIZED CONSTRUCTION ENTRANCE

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN, AS SHOWN ABOVE.
4. DRIVE ENTRANCES ONTO RESIDENTIAL LOTS WILL NOT BE REQUIRED TO HAVE THE SEDIMENT BARRIER SHOWN, BUT WHEEL WASHING MAY BE REQUIRED IF STABILIZED ENTRANCE IS NOT SUFFICIENT TO KEEP MUD FROM BEING TRACKED ONTO ADJACENT STREET. ENTRANCE SHALL EXTEND FROM BACK OF CURB TO DWELLING.



**SOIL EROSION
BMP DETAILS**

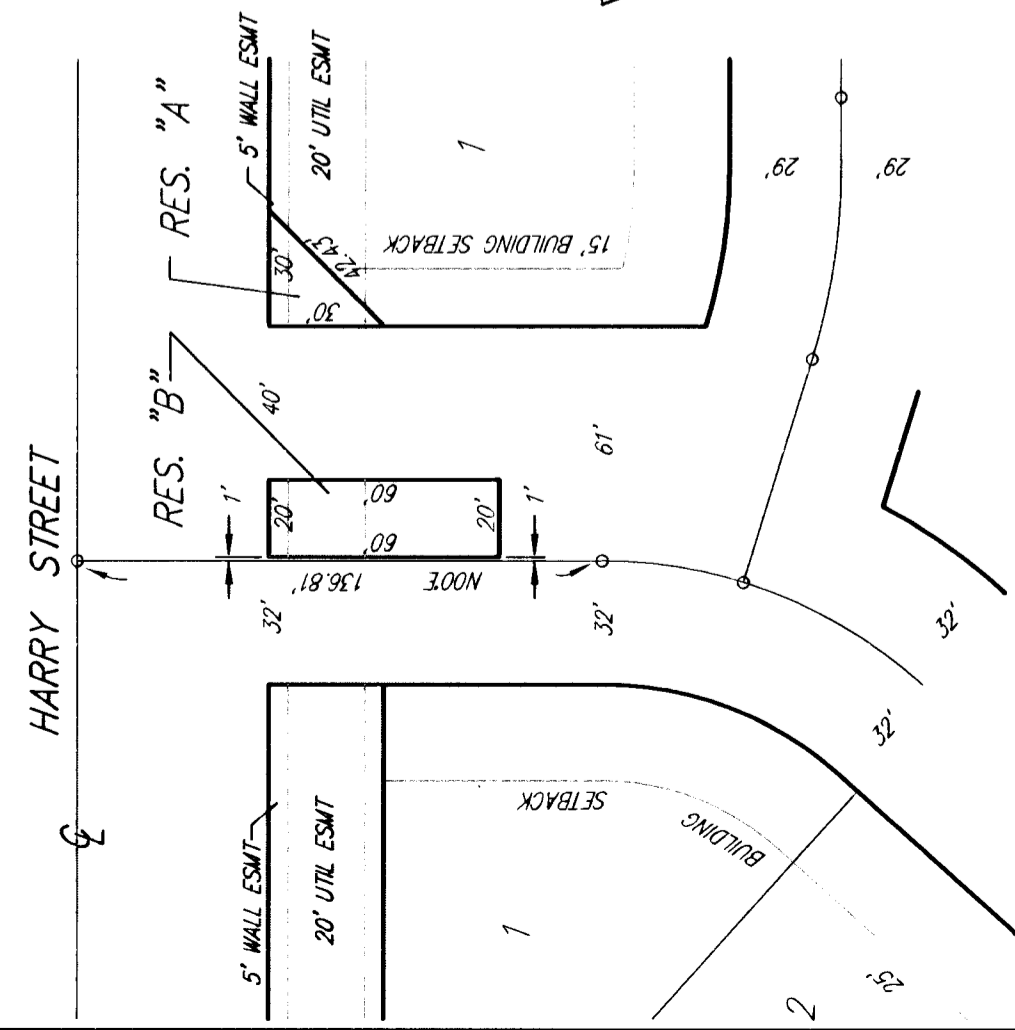
CHRISTOPHER M. CARRIER, P.E.
STORM WATER ENGINEER

PROJECT NUMBER 468-83527 OCA NO. 751328

DATE MAY 2001 SHEET 15 OF 16

TARA FALLS ADDITION

SEDGWICK COUNTY, KANSAS



DETAIL "A"
SCALE: 1" = 30'

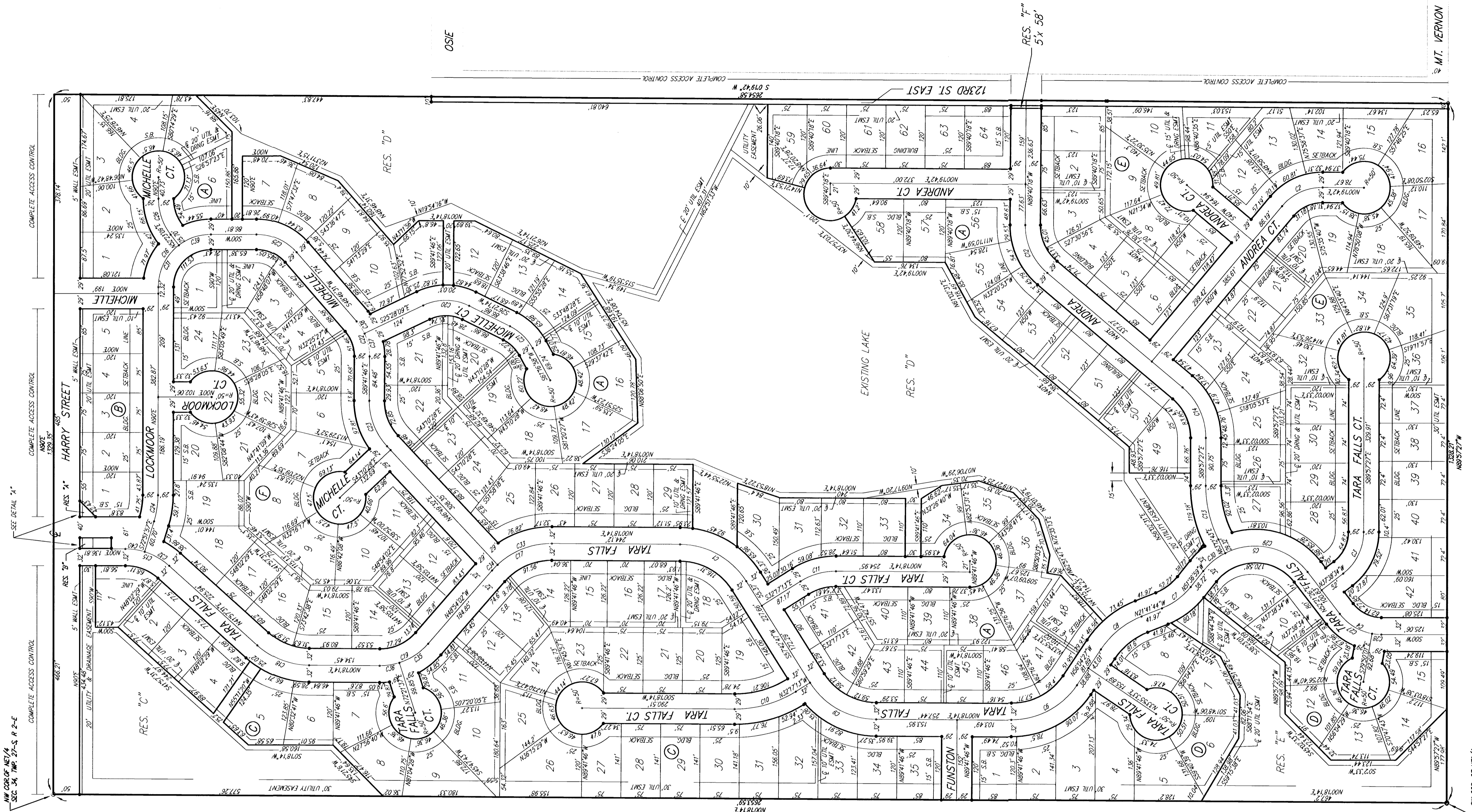
SCALE: 1" = 100'

- = 1/2" REBAR #3@8 CAP (SET)
- = 1/2" REBAR #3@11 CAP (FOUND)
- = 40# NAIL (FOUND)

BENCHMARK:
R.R. SPIKE IN UTILITY POLE 48' WEST AND 40' SOUTH
OF THE S.W. COR. SEC. 24, T12S, R2E
ELEV. 1571.19 CITY DATUM
ELEV. 1544.59 N.G.D.

CURVE	CURVE LENGTH	RADIUS	DELTA
C1	150.20'	150.00'	57.2733°
C2	87.64'	100.00'	50.7842°
C3	91.91'	100.00'	52.7853°
C4	228.85'	100.00'	103.9226°
C5	442.80'	150.00'	152.7441°
C6	684.83'	150.00'	202.5514°
C7	1004.00'	150.00'	302.7454°
C8	1500.00'	150.00'	427.3454°
C9	1920.00'	150.00'	572.3454°
C10	2250.00'	150.00'	727.3454°
C11	2400.00'	150.00'	882.3454°
C12	2360.00'	150.00'	1037.3454°
C13	2100.00'	150.00'	1192.3454°
C14	1680.00'	150.00'	1347.3454°
C15	1140.00'	150.00'	1502.3454°
C16	580.00'	150.00'	1657.3454°
C17	210.00'	150.00'	1812.3454°
C18	60.00'	150.00'	1967.3454°
C19	15.00'	150.00'	2122.3454°
C20	3.00'	150.00'	2277.3454°
C21	0.75'	150.00'	2432.3454°
C22	0.19'	150.00'	2587.3454°
C23	0.05'	150.00'	2742.3454°
C24	0.01'	150.00'	2897.3454°
C25	0.00'	150.00'	3052.3454°
C26	0.00'	150.00'	3207.3454°
C27	0.00'	150.00'	3362.3454°
C28	0.00'	150.00'	3517.3454°
C29	0.00'	150.00'	3672.3454°
C30	0.00'	150.00'	3827.3454°
C31	0.00'	150.00'	3982.3454°
C32	0.00'	150.00'	4137.3454°
C33	0.00'	150.00'	4292.3454°
C34	0.00'	150.00'	4447.3454°
C35	0.00'	150.00'	4602.3454°
C36	0.00'	150.00'	4757.3454°
C37	0.00'	150.00'	4912.3454°
C38	0.00'	150.00'	5067.3454°
C39	0.00'	150.00'	5222.3454°
C40	0.00'	150.00'	5377.3454°

BLOCK	LOT NO.	ELEVATION (M.G. U.D.)
A	5, 6, 7, 8, 9, 10	1327
A	11, 12, 13, 14, 15	1336
A	27, 28, 29, 30, 31, 32	1336
A	33, 34, 35, 36, 37	1336
A	48, 49, 50, 51, 52, 53	1336
A	54, 55, 56, 57, 58	1336
A	59, 60, 61 & 62	1336
C	1, 2, 3, 4, 5	1337
D	6, 7 & 8	1339
D	9, 10, 11 & 12	1340
D	13	1340
D	14 & 15	1341



REVISED

TARA FALLS ADDITION FINAL PLAT WICHITA, KANSAS

Ruggles & Bohm, P.A.
Engineering, Surveying, Land Planning

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Wichita, Kansas 67203
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(316) 264-4621 fax
E-mail: info@rbkansas.com

DESIGN: MWS
DRAWN: TEB
REVIEW: []
UTILITY: []

DRAWING FILE: pond {plot copy}
PROJECT NUMBER: 468-83527
DATE: Mar. 4, 2003

SHEET 16 OF 16