STORM WATER DRAIN #307

to serve

NORTHGATE ADDITION & UNPLATTED TRACT "B"

CITY OF WICHITA, KANSAS

James L. Armour, P.E. City Engineer

Project Number
468-84253

O.C.A. Number
751445

GENERAL NOTES:

1. Contractor will be required to provide notice to utility companies a minimum of Forty-Eight (48) hours prior to any excavation, as follows:

   Kansas One-Call 687-2470

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

Cox Communications	262-4270
Kansas Gas Service	1-888-482-4950
Westar Energy	383-8650
Aquila Energy	1-800-303-0357
AT&T	268-2245
City of Wichita Water Dept.	268-4563
City of Wichita Sewer Maint.	268-4024
City of Wichita Storm Sewer Maint.	268-4090
City of Wichita Traffic Maint.	268-4034

2. Utility service lines, poles, valve boxes, meters, and etcetera 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. The Contractor will be required to work around existing utilities within the right-of-way which do not conflict with proposed construction.

3. All excess material from channel excavation shall be stockpiled within 500 feet west or south of the extents of channel construction at a location to be determined by the engineer. Stockpile shall be seeded with Rye Grass at 5 lbs./1000 sq. ft. and surrounded with silt fencing (≈3500 L.F.)

4. Trees and shrubs in public right-of-way which are in direct conflict with proposed new construction shall be removed by the Contractor with the Engineer's approval. Trees and shrubs which are not in direct conflict with proposed new construction shall be saved and protected from damage.

5. The Contractor shall be responsible for preserving property irons. The Contractor will be required to re-establish any property irons which are damaged or destroyed by his construction operations. Such irons shall be re-established by a licensed land surveyor in accordance with state laws

6. At conclusion of construction, an as-built survey will be completed by the engineer. The contractor will be required to finish and smooth grade all locations as necessary that are not within ±0.3' of plan grade. The contractor shall include all costs associated with the regrading and/or remobilization in the bid item "Channel Excavation."

7. All existing and proposed erosion control measures including silt fencing, erosion control mat, straw bales, inlet barriers, and const. entrance shall be maintained throughout construction by the contractor and until project is accepted by the City of Wichita. The on-site engineer shall complete weekly reports on the status of erosion control measures. The contractor shall be required to comply with maintenance and/or replacement of erosion control measures as determined by the on-site engineer until project is accepted by City of Wichita.

8. The Contractor shall protect traffic by use of proper and necessary flags, lights, signals, barricades or other warning devices as needed, all in accordance with the latest edition of the Manual On Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration. Cost to be included in lump sum bid item "Traffic Control."

9. All areas disturbed during construction shall be seeded, mulched, and fertilized as follows (Permanent Seeding):

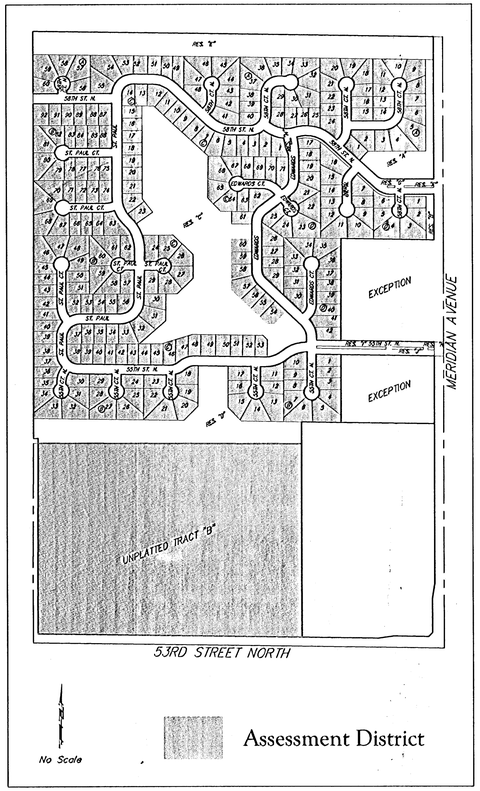
   Seed: Kansas Premium Fescue Blend: 8 lbs./1000 sq. ft.
   Annual Rye Grass: 2 lbs./1000 sq. ft.
   Mulch: Prairie Hay: 2 tons/acre (no mulch required in areas where Erosion Control Matting is installed)
   Fertilizer: 12-24-12: 850 lbs./acre

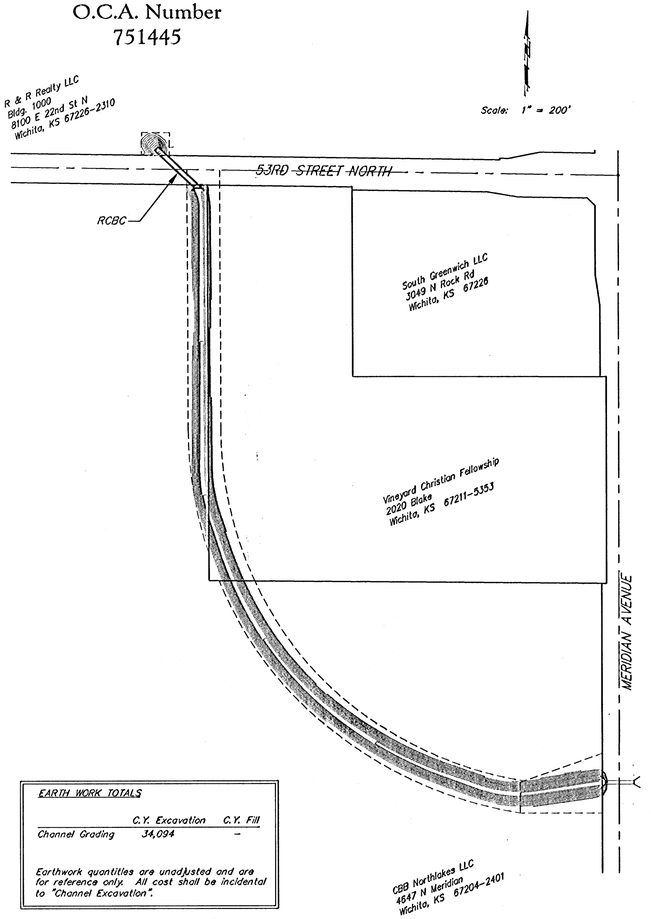
   All costs associated with seeding, mulching, and fertilizing shall be included in bid item "Project Seeding." All seeding operations shall conform to City of Wichita Standard Specifications.

10. Best available topsoil shall be stripped and stockpiled separately. Channel bottom and side slopes shall be overexcavated 9" and replaced with 9" of best available topsoil. Topsoil shall be compacted to a minimum of 90% Standard Proctor Density. Cost of overexcavation is incidental to Bid Item "Channel Excavation."

11. Abandoned dewatering wells will be encountered during construction of the channel. Contractor shall cut or break well pipe at least 2 feet below proposed grade. All costs associated with cutting or breaking dewatering wells shall be included in "Site Clearing and Restoration."

12. See Special Provisions for Required Construction Completion Date and related Incentives/Damages.





EARTH WORK TOTALS		
	C.Y. Excavation	C.Y. Fill
Channel Grading	34,094	–

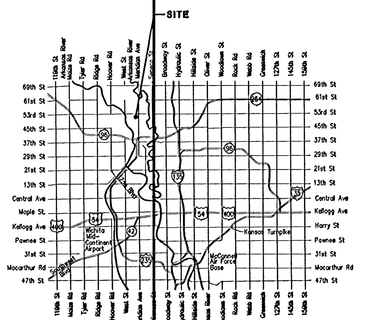
Earthwork quantities are unadjusted and are for reference only. All cost shall be incidental to "Channel Excavation".

Sheet Index

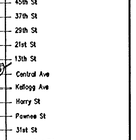
Benchmark

COW Benchmark at the intersection of Meridian and 53rd St N, NE Corner
Top of Concrete Headwall.
44' North of Centerline
37' East of Centerline
50.90' NE of Section Corner
9' NE of end radial to curb
26' East of Section Line
Elev. = 1391.37 NGVD29

COW Benchmark at the intersection of Meridian and Keywest, NW Corner,
59' West of Centerline
32.3' North of Centerline
11.8' North of N curb line of Keywest
4.8' NW of center of Power Pole
Elev. = 1379.36 NGVD29



Vicinity Map



As Built - 4/18/07 KK

March 2007

Baughman

Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.7271 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

COW Benchmark at the intersection
of Meridian and 53rd St N, NE Corner,
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44' North of Centerline
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26' East of Section Line
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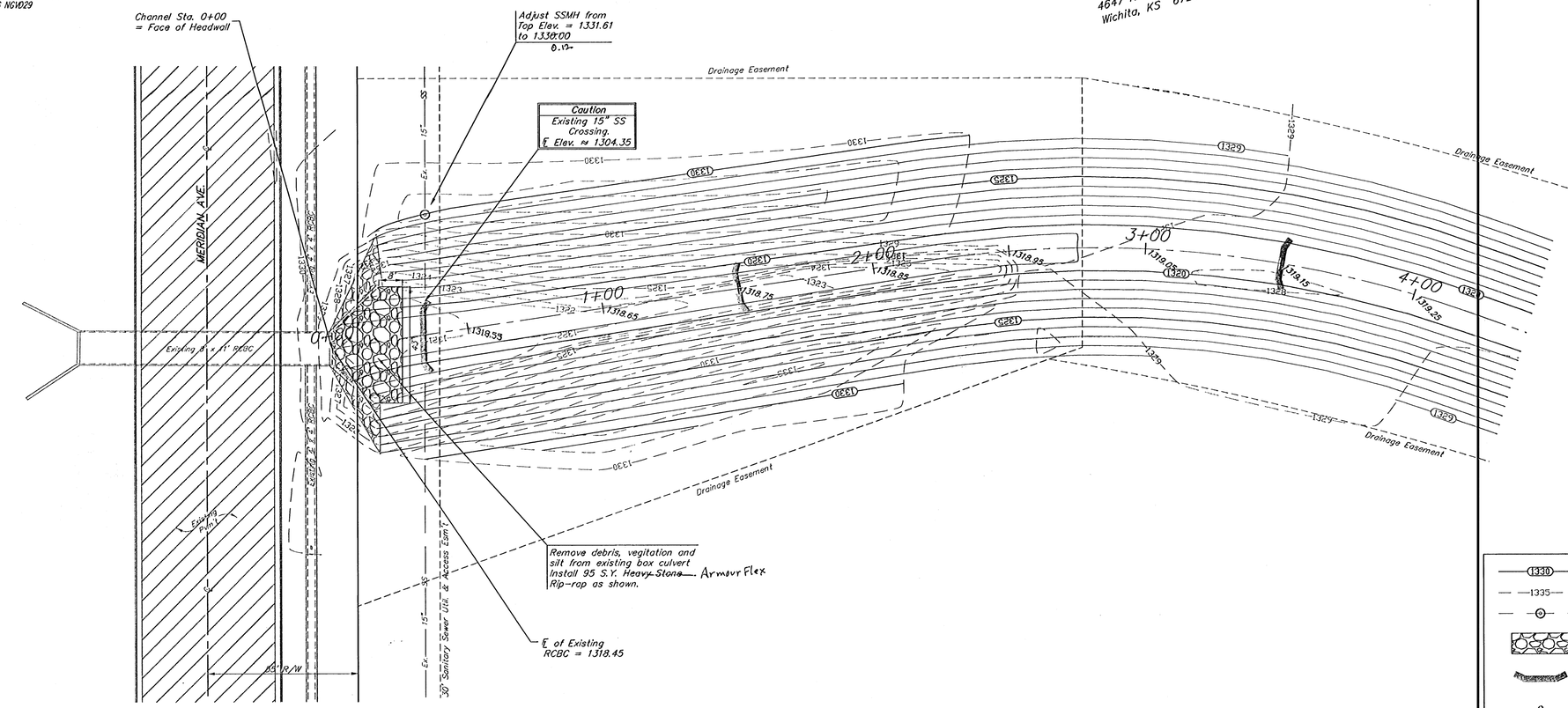
Elev. = 1329.36 NGVD29

CBB Northlakes LLC
4647 N Meridian
Wichita, KS 67204-2401

Scale: 1" = 20'



EROSION CONTROL MEASURE	UNITS	QUANTITY
INSTALL STRAW BALE BARRIER	EA	3
INSTALL HEAVY-STONE RIP RAP	SY	95
QUANTITIES ARE FOR INFORMATION ONLY! CONTRACTOR SHALL VERIFY QUANTITIES PER FINAL BID QUANTITY SHEET.		

- Proposed Contours
- Existing Contours
- Existing San. Sewer
- Rip Rap to be installed
- Straw Bale Barriers to be installed (This Project)
- Dewatering Well (Abondoned)

As Built 6/18/07 KH

Baughman

Northgate Offsite Drainage

Channel Plan

Storm Water Drain #307

Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.7771 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER	DESIGN	DRAWN
468-84253	RDM/AEG	RDM
REVISIONS	APPROVED	DATE
	AEG	3-14-07
	SCALE	
	Noted	
	SHEET	
	2 OF 22	

Northgate\53rd St SWD\OFFSITE CHANNEL.dwg

COW Benchmark at the intersection
of Meridian and 53rd St N, NE Corner,
Top of Concrete Headwall.
44' North of Centerline
37' East of Centerline
50.90' NE of Section Corner
9' NE of and radial to curb
28' East of Section Line
Elev. = 1331.37 NGVD29

COW Benchmark at the intersection
of Meridian and Keywest, NW Corner,
59' West of Centerline
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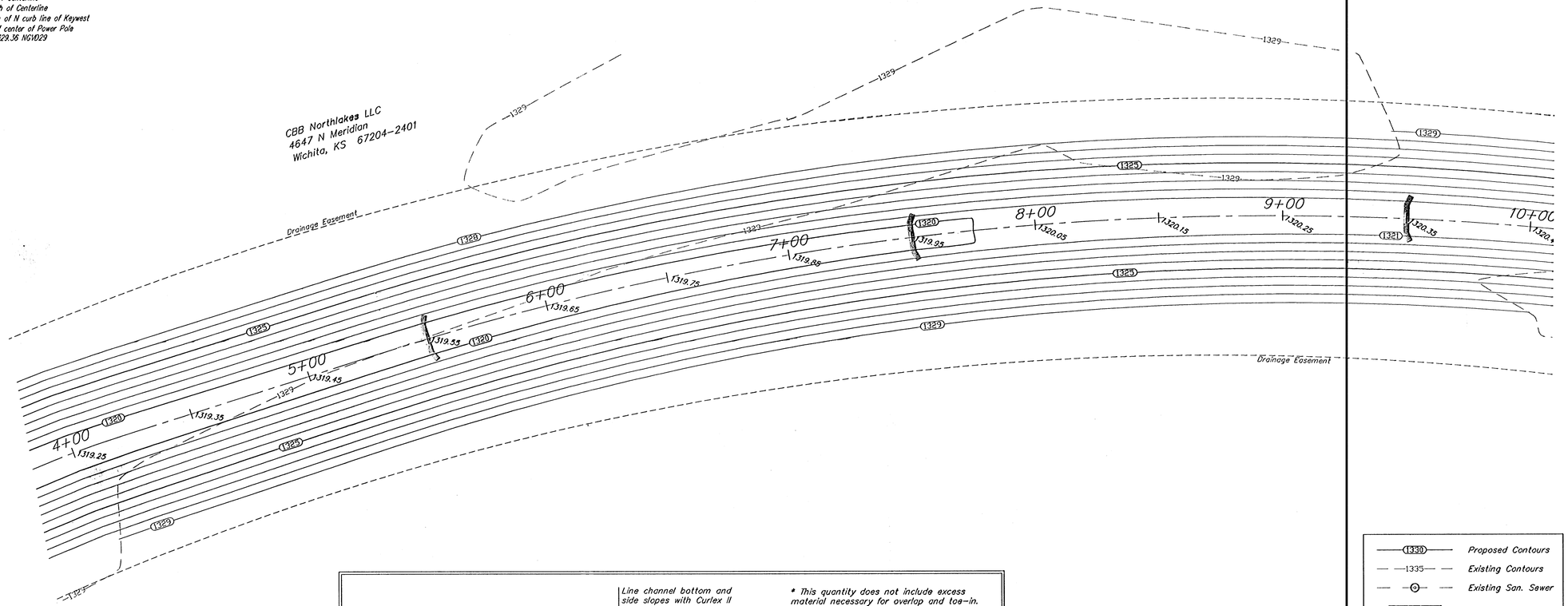
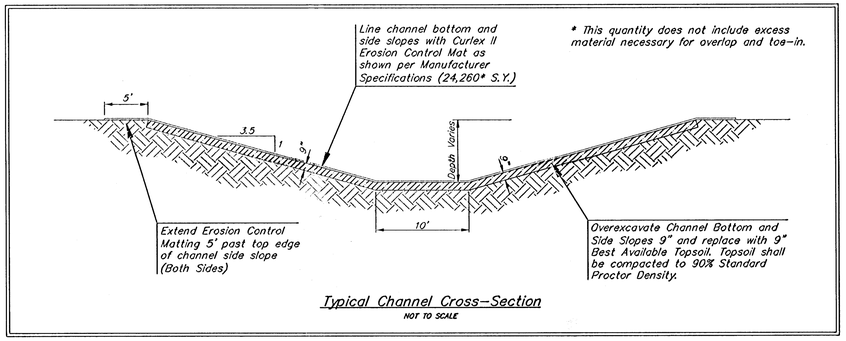
11.8' North of N curb line of Keywest
4.8' NW of center of Power Pole
Elev. = 1329.36 NGVD29

CBB Northlakes LLC
4647 N Meridian
Wichita, KS 67204-2401

Scale: 1" = 20'





Typical Channel Cross-Section
NOT TO SCALE

EROSION CONTROL MEASURE	UNITS	QUANTITY
INSTALL STRAW BALE BARRIER	EA	3
INSTALL EROSION CONTROL MATTING	SY	24,260

QUANTITIES ARE FOR INFORMATION ONLY! CONTRACTOR SHALL VERIFY QUANTITIES PER FINAL BID QUANTITY SHEET.

1330 — Proposed Contours
1335 — Existing Contours
— ⊙ — Existing San. Sewer
Rip Rap to be installed
Straw Bale Barriers to be installed (This Project)
Dewatering Well (Abondoned)

As Built 6/18/07 KF

Baughman

Northgate Offsite Drainage
Channel Plan
Storm Water Drain #307

Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.7271 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER 468-84253
DESIGN REM/AEG
DRAWN REM
APPROVED AEG
DATE 3-14-07
SCALE Noted
REVISIONS:
SHEET 3 OF 22

Northgate\OFFSITE CHANNEL.dwg

COW Benchmark at the intersection
of Meridian and 53rd St N, NE Corner,
Top of Concrete Headwall.
44' North of Centerline
37' East of Centerline
50.90' NE of Section Corner
3' NE of and radial to curb
26' East of Section Line
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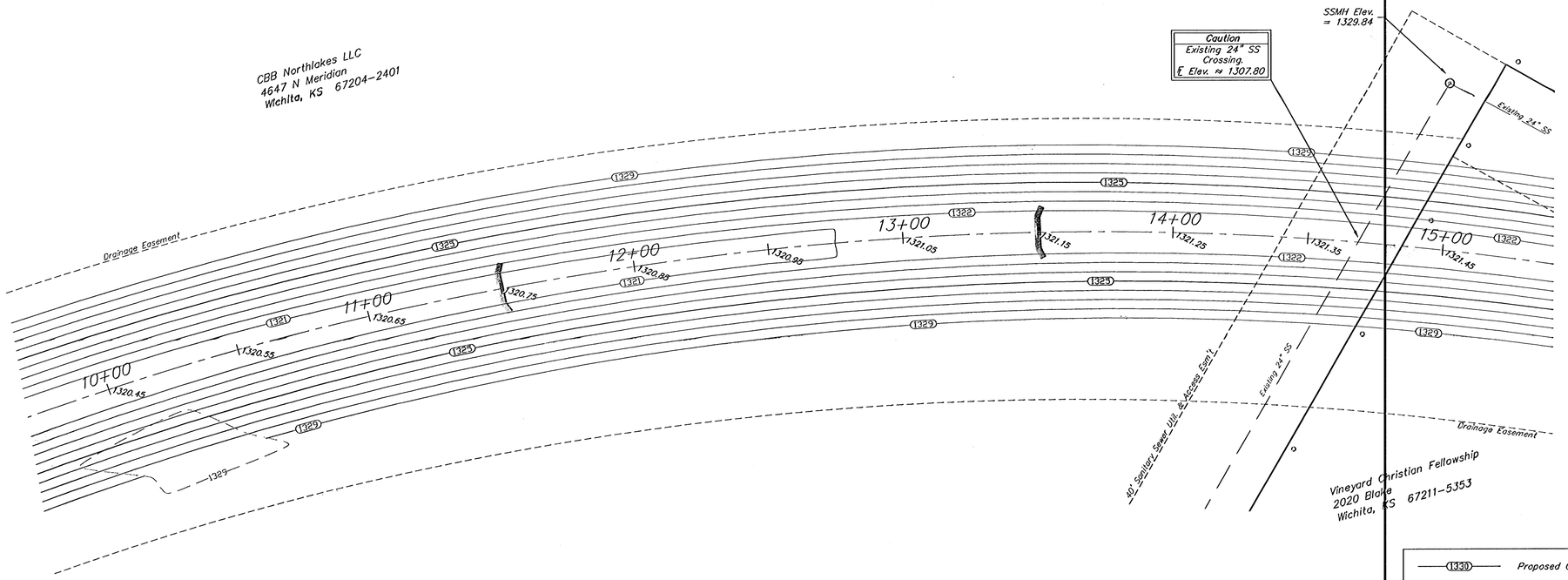
4.8' NW of center of Power Pole
Elev. = 1329.36 NGVD29

Scale: 1" = 20'



1330	Proposed Contours
1335	Existing Contours
	Existing San. Sewer
	Rip Rap to be installed
	Straw Bale Barriers to be installed (This Project)
	Dewatering Well (Abondoned)

EROSION CONTROL MEASURE	UNITS	QUANTITY
INSTALL STRAW BALE BARRIER	EA	2

QUANTITIES ARE FOR INFORMATION ONLY! CONTRACTOR SHALL VERIFY QUANTITIES PER FINAL BID QUANTITY SHEET.

As Built 6/18/05 KK

Baughman

Northgate Offsite Drainage
Channel Plan
Storm Water Drain #307

Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.7771 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER 46884253
DESIGN RDM/AEO
DRAWN RDM
APPROVED AEO
DATE 3-14-07
REVISIONS
SCALE Noted
SHEET 4 OF 22

Northgate\OFFSITE CHANNEL.dwg

COW Benchmark at the Intersection
of Meridian and 53rd St N, NE Corner,
Top of Concrete Headwall.
44' North of Centerline
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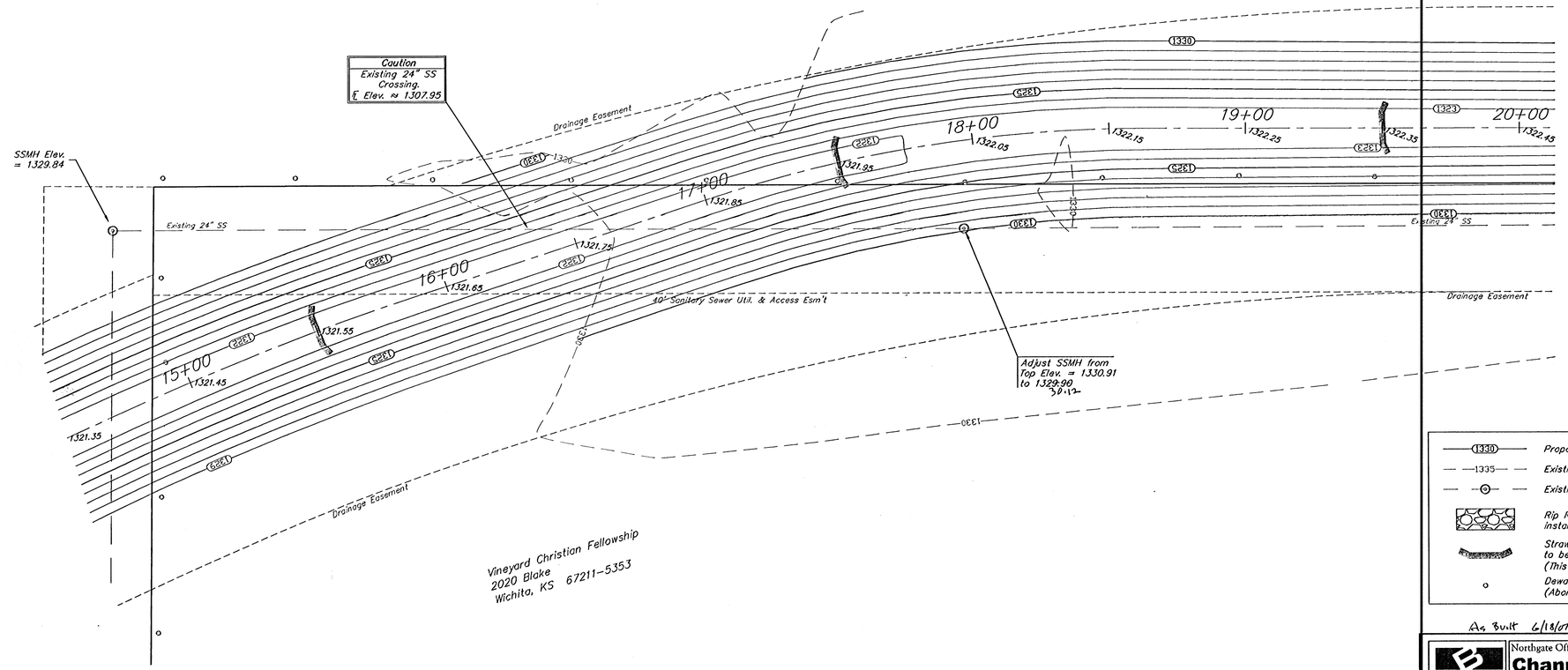
Elev. = 1329.36 NGVD29

Scale: 1" = 20'

CBB Northlakes LLC
4647 N Meridian
Wichita, KS 67204-2401



Vineyard Christian Fellowship
2020 Blake
Wichita, KS 67211-5353

EROSION CONTROL MEASURE	UNITS	QUANTITY
INSTALL STRAW BALE BARRIER	EA	3

QUANTITIES ARE FOR INFORMATION ONLY!
CONTRACTOR SHALL VERIFY QUANTITIES PER
FINAL BID QUANTITY SHEET.

1330 — Proposed Contours
1335 — Existing Contours
Existing San. Sewer
Rip Rap to be installed
Straw Bale Barriers to be Installed (This Project)
Dewatering Well (Abandoned)

As Built 6/18/07 KK

Baughman

Northgate Offsite Drainage
Channel Plan
Storm Water Drain #307

Baughman Company, P.A. 315 Ellis St. Wichita, KS 67211 P 316.262.3231 F 316.262.0749
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER 468-84253
DESIGN RDM/AEG
DRAWN RDM
APPROVED AEG
DATE 3-14-07
REVISIONS
SCALE Noted
SHEET 5 OF 22

Northgate\OFFSITE CHANNEL.dwg

COW Benchmark at the intersection
of Meridian and 53rd St N, NE Corner,
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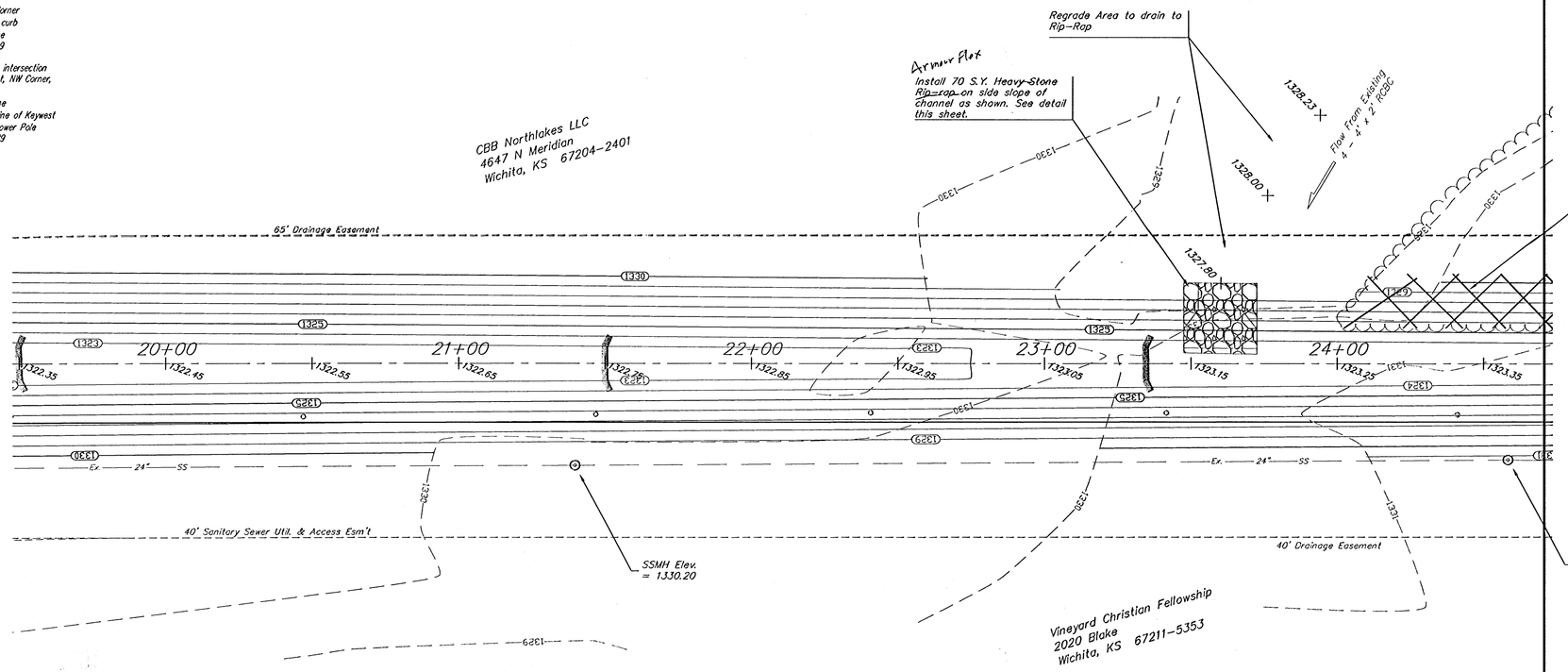

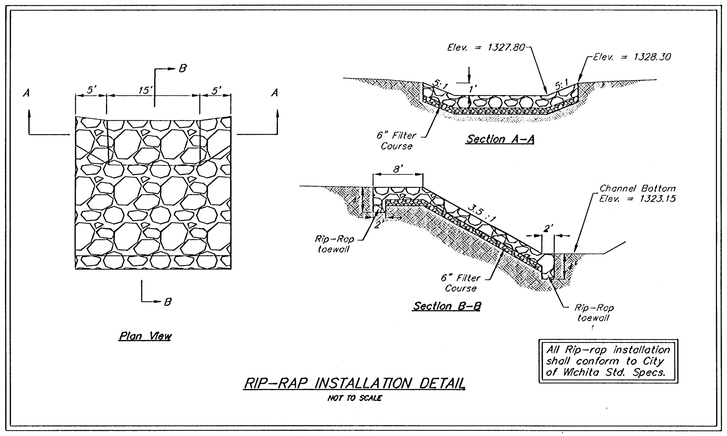

RIP-RAP INSTALLATION DETAIL
NOT TO SCALE

EROSION CONTROL MEASURE	UNITS	QUANTITY
INSTALL STRAW BALE BARRIER	EA	2
INSTALL HEAVY-STONE RIP RAP	SY	70
QUANTITIES ARE FOR INFORMATION ONLY! CONTRACTOR SHALL VERIFY QUANTITIES PER FINAL BID QUANTITY SHEET.		

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1335 — Existing Contours
Existing San. Sewer
Rip Rap to be installed
Straw Bale Barriers to be installed (This Project)
Dewatering Well (Abondoned)

As Built 6/8/07 KE

Baughman

Nothgate Offsite Drainage
Channel Plan
Storm Water Drain #307

Baughman Company, P.A. 315 Elk St. Wichita, KS 67211 P 316.263.7711 F 316.263.2149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER 46884253
DESIGN RDM/AEG
DRAWN RDM
APPROVED AEG
DATE 3-14-07
SCALE Noted
SHEET 6 OF 22
REVISIONS:

Northgate\OFFSITE CHANNEL.dwg

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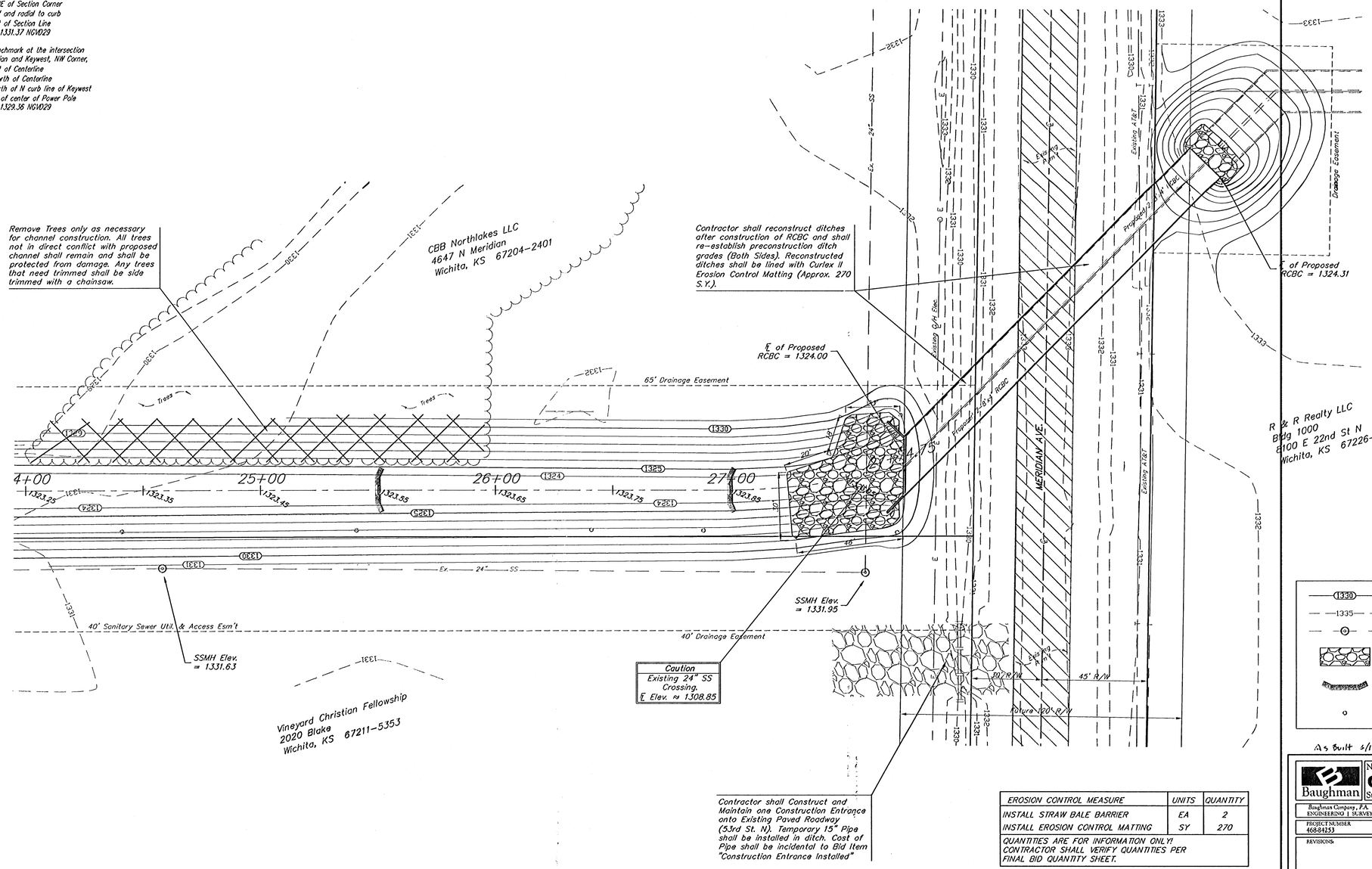

Remove Trees only as necessary for channel construction. All trees not in direct conflict with proposed channel shall remain and shall be protected from damage. Any trees that need trimmed shall be side trimmed with a chainsaw.

Contractor shall reconstruct ditches after construction of RCBC and shall re-establish preconstruction ditch grades (Both Sides). Reconstructed ditches shall be lined with Curlex II Erosion Control Matting (Approx. 270 S.Y.).

Caution
Existing 24" SS
Crossing.
℄ Elev. ≈ 1308.85

Contractor shall Construct and Maintain one Construction Entrance onto Existing Paved Roadway (53rd St. N). Temporary 15" Pipe shall be installed in ditch. Cost of Pipe shall be incidental to Bid Item "Construction Entrance Installed"

EROSION CONTROL MEASURE	UNITS	QUANTITY
INSTALL STRAW BALE BARRIER	EA	2
INSTALL EROSION CONTROL MATTING	SY	270

QUANTITIES ARE FOR INFORMATION ONLY! CONTRACTOR SHALL VERIFY QUANTITIES PER FINAL BID QUANTITY SHEET.

As Built 6/18/07 KK

Baughman
Nothgate Offsite Drainage
Channel Plan
Storm Water Drain #307

Baughman Company, P.A. 315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER
468-84253

REVISIONS:

DESIGN RDM/AEG
DRAWN RDM
APPROVED AEG
DATE 3-14-07
SCALE Noted
SHEET **7** OF **22**

Northgate\OFFSITE CHANNEL.dwg

COW Benchmark at the intersection of Meridian and 53rd St N, NE Corner, Top of Concrete Headwall. 44' North of Centerline 31' East of Centerline 50.90' NE of Section Corner 9' NE of end radial to curb 25' East of Section Line Elev. = 1331.37 NGVD29

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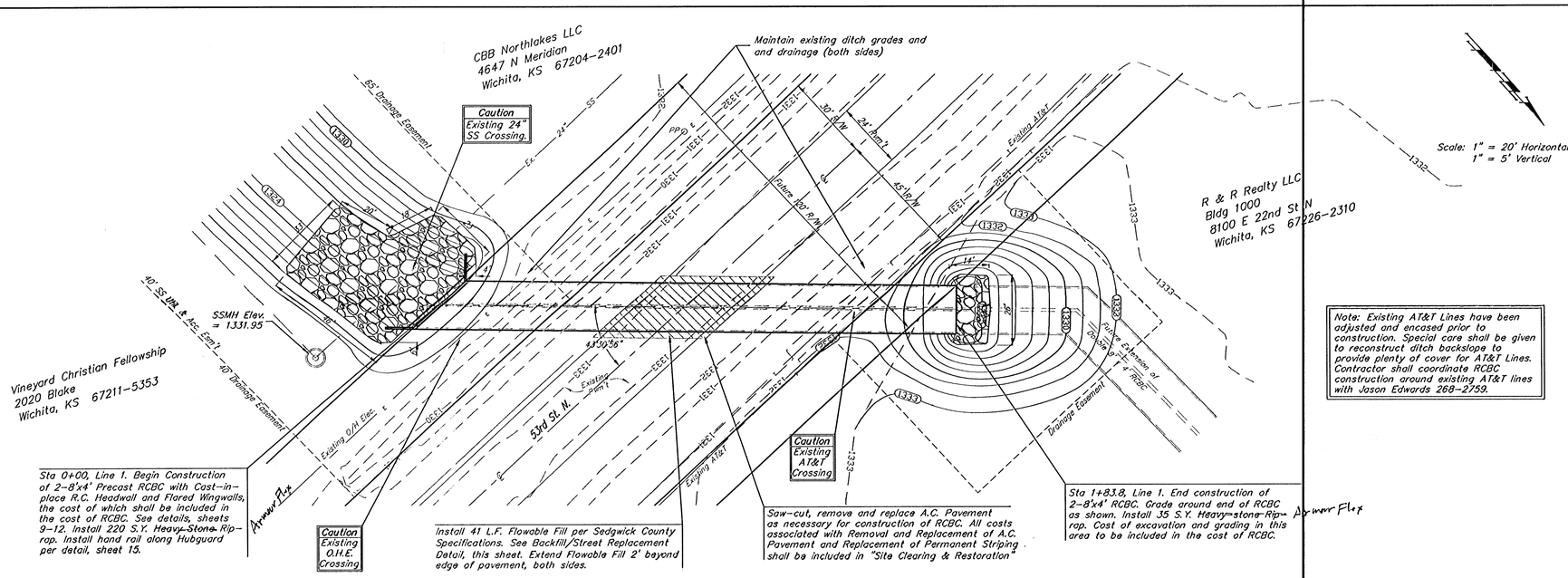


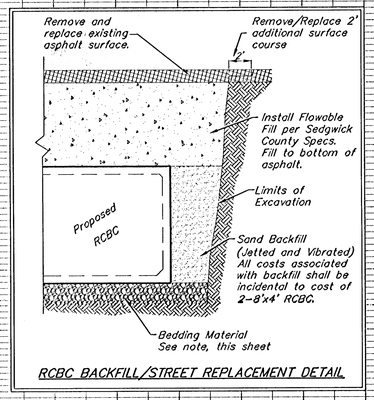
Sta 0+00, Line 1. Begin Construction of 2-8'x4' Precast RCBC with Cast-in-place R.C. Headwall and Flared Wingwalls, the cost of which shall be included in the cost of RCBC. See details, sheets 9-12. Install 220 S.Y. Heavy Stone Rip-rap. Install hand rail along Hubguard per detail, sheet 15.

Install 41 L.F. Flowable Fill per Sedgwick County Specifications. See Backfill/Street Replacement Detail, this sheet. Extend Flowable Fill 2' beyond edge of pavement, both sides.

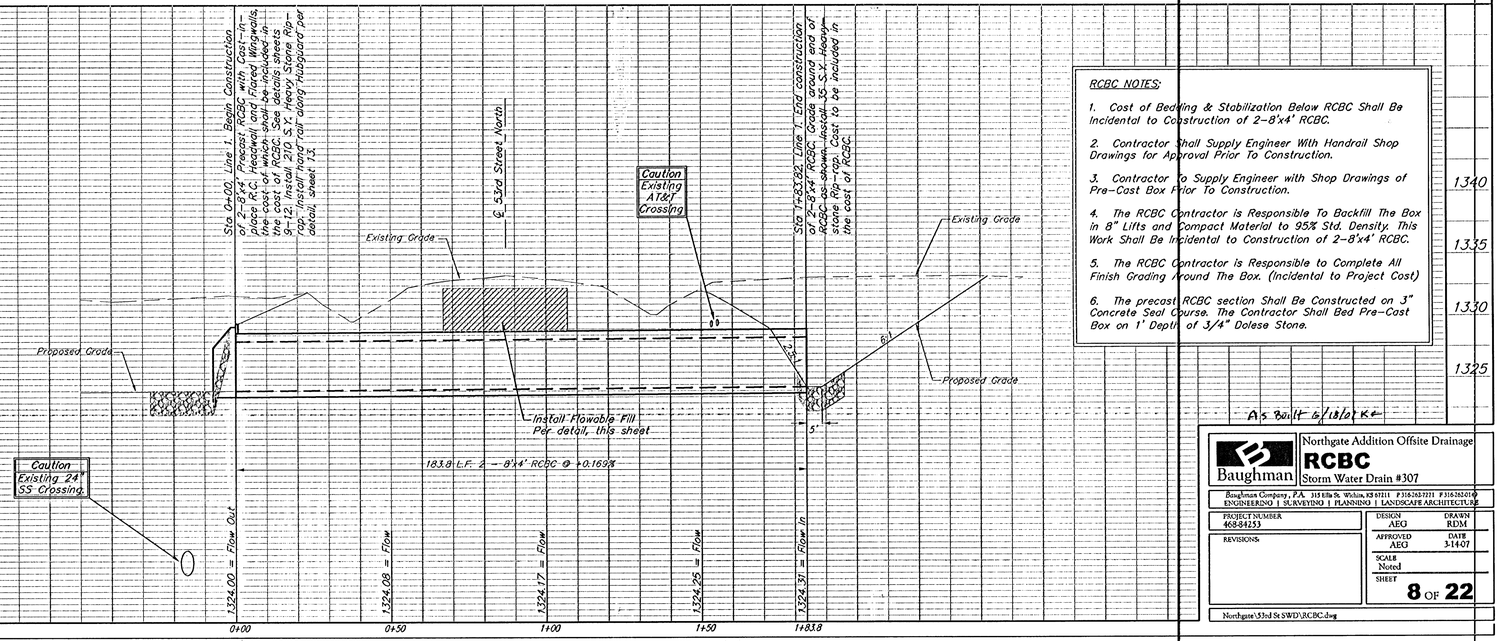
Saw-cut, remove and replace A.C. Pavement as necessary for construction of RCBC. All costs associated with Removal and Replacement of A.C. Pavement and Replacement of Permanent Striping shall be included in "Site Clearing & Restoration"

Sta 1+83.8, Line 1. End construction of 2-8'x4' RCBC. Grade around end of RCBC as shown. Install 35 S.Y. Heavy-stone-Rip-rap. Cost of excavation and grading in this area to be included in the cost of RCBC. Armor Flex

Note: Existing AT&T Lines have been adjusted and encased prior to construction. Special care shall be given to reconstruct ditch backslope to provide plenty of cover for AT&T Lines. Contractor shall coordinate RCBC construction around existing AT&T lines with Jason Edwards 268-2759.



RCBC BACKFILL/STREET REPLACEMENT DETAIL



RCBC NOTES:

1. Cost of Bedding & Stabilization Below RCBC Shall Be Incidental to Construction of 2-8'x4' RCBC.
2. Contractor Shall Supply Engineer With Handrail Shop Drawings for Approval Prior To Construction.
3. Contractor To Supply Engineer with Shop Drawings of Pre-Cast Box Prior To Construction.
4. The RCBC Contractor is Responsible To Backfill The Box in 8" Lifts and Compact Material to 95% Std. Density. This Work Shall Be Incidental to Construction of 2-8'x4' RCBC.
5. The RCBC Contractor is Responsible to Complete All Finish Grading Around The Box. (Incidental to Project Cost)
6. The precast RCBC section Shall Be Constructed on 3" Concrete Seal Course. The Contractor Shall Bed Pre-Cast Box on 1' Depth of 3/4" Dolese Stone.

As Built 6/18/07 KE

Baughman

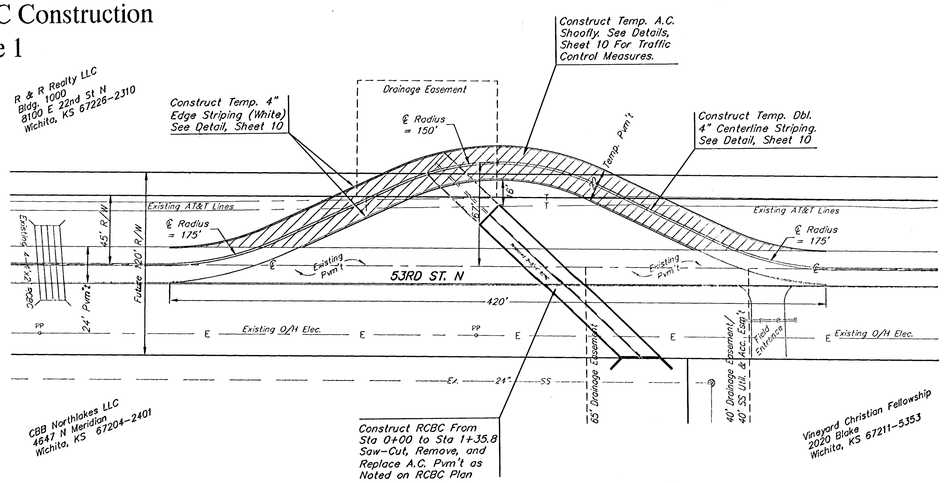
Northgate Addition Offsite Drainage
RCBC
Storm Water Drain #307

Baughman Company, P.A. 315 Ellis St. Wichita, KS 67211 P 316.263.7271 F 316.263.0140
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER	DESIGN	DRAWN
468-84253	AEG	RDM
REVISIONS	APPROVED AEG	DATE 3-14-07
	SCALE Noted	
	SHEET 8 OF 22	

Northgate\53rd St SWD\RCBC.dwg

RCBC Construction
Phase 1

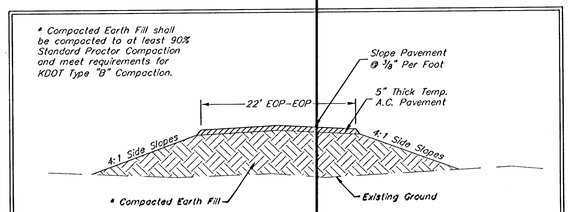


Scale: 1" = 40'

NOTES:

1. All cost associated with Construction and Removal of Tempory A.C. Shoofly shall be included in the lump sum bid item "Temporary Shoofly." This includes, but is not limited to the construction and removal of: Compacted Earth Fill, Temporary A.C. Pavement, Temporary Pavement Striping.

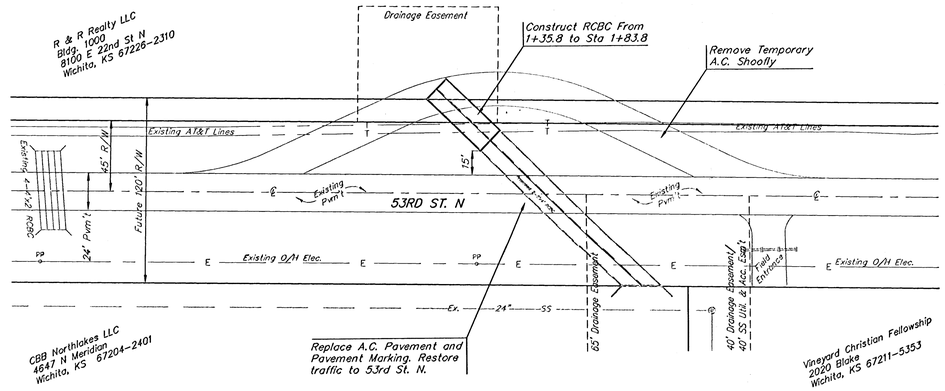
2. Contractor shall maintain the condition of temporary pavement and temporary striping until it is no longer needed.



Temporary Shoofly Pavement / Compacted Fill Detail

QUANTITIES FOR TEMPORARY SHOOFLY (FOR INFORMATION ONLY)		
ITEM	UNITS	QUANTITY
5" A.C. PAVEMENT	S.Y.	820
4" CENTERLINE STRIPING (YELLOW)	L.F.	1,500
4" EDGE LINE STRIPING (WHITE)	L.F.	900

RCBC Construction
Phase 2



Scale: 1" = 40'

NOTES:

1. All disturbed areas within 53rd Street R/W shall be regraded and restored to pre- construction conditions. All costs associated with regrading and restoring site shall be incidental to the lump sum bid item "Site Clearing and Restoration."

2. Any Pavement or Striping which is damaged during during construction shall be repaired as necessary at the Contractor's Expense, with no additional cost to the project.

3. Pavement replacement shall meet Sedgwick County Standards for BM-2 Type pavement mix.

4. Final Permanent Striping shall be "Thermoplastic" Type and meet Sedgwick County Standards.

PROJECT BENCHMARKS:

COW Benchmark at the Intersection of Meridian and 53rd St N, NE Corner, Top of Concrete Headwall.
44' North of Centerline
37' East of Centerline
50.90' NE of Section Corner
9' NE of and radial to curb
26' East of Section Line
Elev. = 1331.37 NGVD29

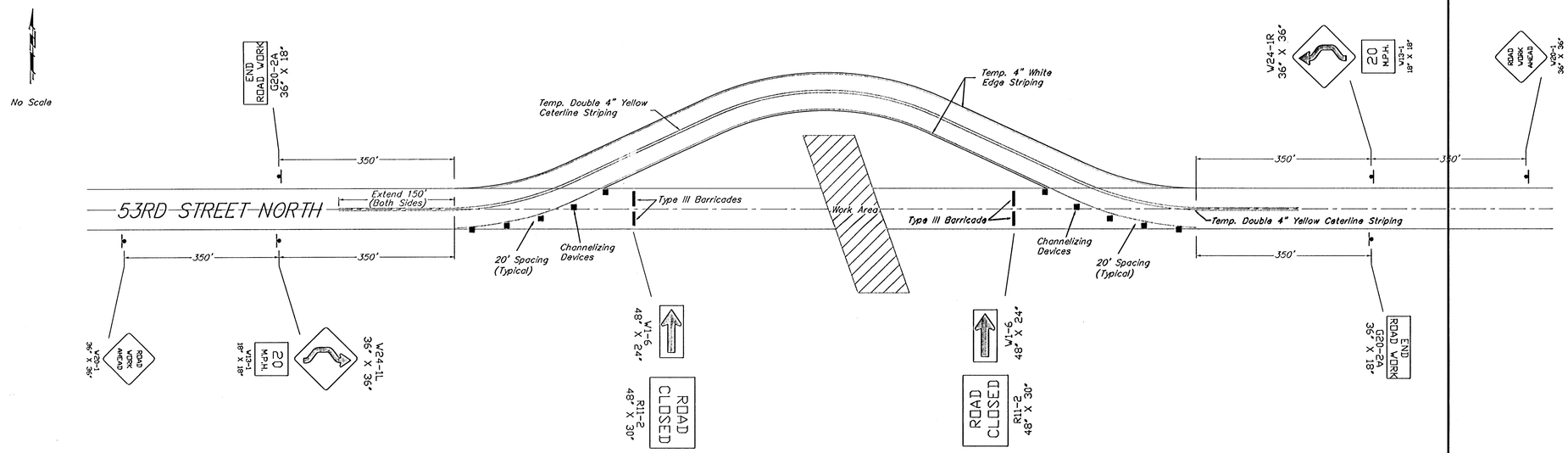
COW Benchmark at the intersection of Meridian and Keywest, NW Corner,
59' West of Centerline
32.3' North of Centerline
11.8' North of N curb line of Keywest
4.8' NW of center of Power Pole
Elev. = 1329.36 NGVD29

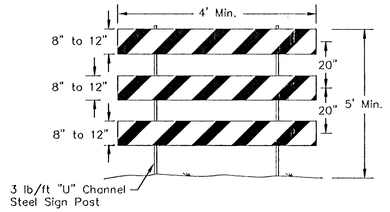
Baughman

Northgate Offsite Drainage
Construction Phasing & Temporary Shoofly
Storm Water Drain #307

Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.2691 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER	DESIGN	DRAWN
46884253	RDM/AEG	RDM
REVISIONS	APPROVED AEG	DATE 3-14-07
	SCALE Noted	
	SHEET 9 OF 22	





TYPE III BARRICADE

NOTES:

1. The Contractor shall protect traffic by use of proper and necessary flags, lights, signals, barricades or other warning devices as needed, all in accordance with the latest edition of the Manual On Uniform Traffic Control Devices (MUTCD).

2. Channelizing Devices shall be either "Reflectorized Drum" type at least 36" tall, or "Tubular Markers" at least 28" tall with retroreflectorized bands.

3. All cost associated with the Installation, Maintenance, and Removal of Traffic Control Devices shall be included in Lump Sum Bid Item "Traffic Control."

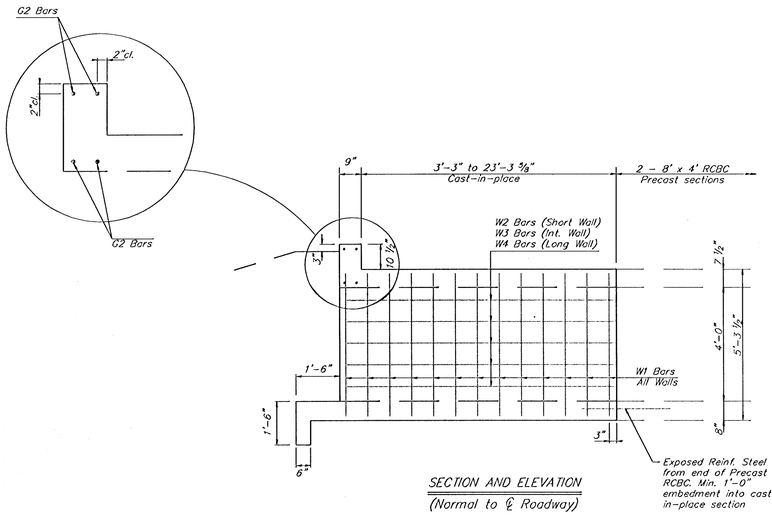
Baughman

Northgate Offsite Drainage
Traffic Control & Sign Details
Storm Water Drain #307

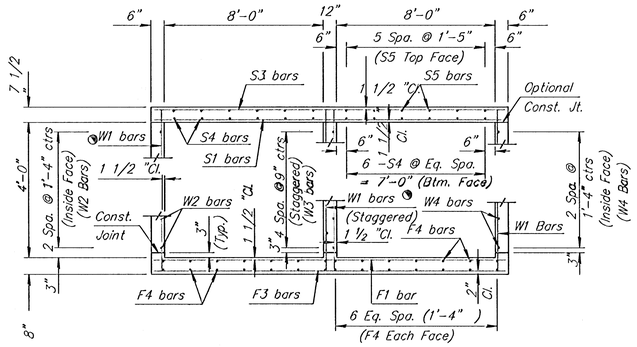
Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.263.7271 F 316.263.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER	DESIGN	DRAWN
468-84253	RDM/AEG	RDM
REVISIONS:	APPROVED AEG	DATE 3-14-07
	SCALE No Scale	
	SHEET 10 OF 22	

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KS	468-84253	2006	11	22

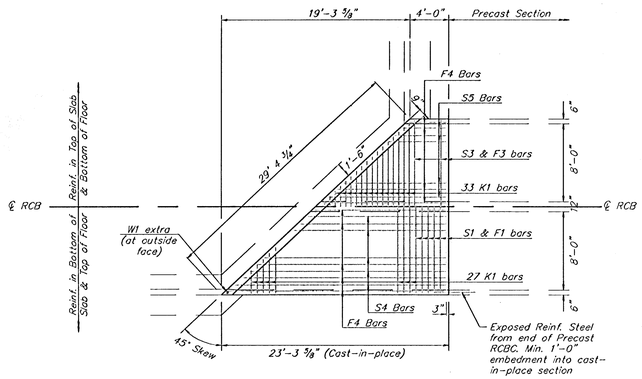


SECTION AND ELEVATION
(Normal to ℄ Roadway)

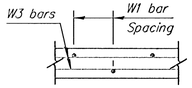


TYPICAL SECTION

◔ See RCB Auxillary Details for Optional Splice.



PLAN



PLAN OF INTERIOR WALL

Varies from 17'-6" to 2'-4" by 7" Increments
K1
(Cut 2 each length)

Varies from 17'-5 3/8" to 1'-3 1/2" by 6" Increments
K2
(Cut 2 each length)

Varies from 23'-0" to 3'-9" by 1'-9" Increments
S4
(Cut 2 each length)

Varies from 23'-0" to 3'-9" by 1'-9" Increments
S5
(Cut 2 each length)

Varies from 23'-0" to 3'-9" by 1'-7 1/4" Increments
F4
(Cut 2 each length)

BENDING DIAGRAM
All Dimensions are out to out of bars.

GENERAL NOTES

LOADING: HS20-44 AASHTO Specifications, 1983 Edition.
UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.
FILL HEIGHT: Unless otherwise noted, the Design Fill Height is measured from the riding surface at the culvert and shall include the surfacing.
CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a 3/4 inch triangular moulding. Where Grade 4.0 Concrete (AE) is specified, it shall be placed in the top slab above the Construction Joint.
REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. All dimensions relative to reinforcing steel shall be to centerline of bar unless otherwise noted.
EXCAVATION: Excavation for culverts less than bridge length shall not be paid for directly but shall be subsidiary to Grade 4.0 Concrete. Excavation for RCB Bridges shall be paid for as Class III Excavation.
SEAL COURSE: A Seal Course may be required by the Engineer. The Seal Course shall be unreinforced Concrete (Commercial Grade) to a minimum depth of 3 inches or as determined by the Engineer. Concrete for the seal course shall be paid for at the unit price set for Concrete for Seal Course.
FOUNDATION STABILIZATION: Foundation Stabilization may be required as directed by the Engineer. The depth of Foundation Stabilization shall be determined by the Engineer. Foundation Stabilization shall be paid for at the determined Unit Price set for Foundation Stabilization. See Auxiliary Details.
QUANTITIES: The quantities shown in the Culvert Summary include apron and/or soil saver quantities when their construction is required by the plans. Payment for additional quantities that result from including seal course and/or floating apron, as a change in original plans, shall be made at the Unit Price bid for the various items involved.
GRANULAR BACKFILL (WINGWALLS): Special backfill procedures may be required at the direction of the Engineer. See Auxiliary Details Sheet.
STRIKE LINE: Wingwalls and that portion of the RCB outside the Strike Line shall be constructed level. Footing for wingwalls shall be constructed with the culvert floor. See wingwall detail sheet.

△ Epoxy Coated Bars
✳ See Bending Diagram

BAR SCHEDULE

F1				F3				F4			S1				S3				S4				S5		
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	Length
5	7 1/2"	6	17'-8"	N/A	N/A	N/A	N/A	5	6 1/2"	7	17'-8"	4	28	✳	5	7 1/2"	6	17'-8"	N/A	N/A	N/A	N/A	5	6 1/2"	7	17'-8"	4	12	✳	4	12	✳

K1				K2				W1				W2				W3				W4				G1		G2					
Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	Spa.	No.	Length	Size	No.	Length	Size	No.	Length	Size	Spa.	No.	Length
5	7 1/2"	56	✳	5	6 1/2"	66	✳	4	9"	56	5'-0"	4	N/A	3	3'-9"	4	5	13'-4"	4	N/A	3	23'-0"	N/A	N/A	N/A	7	4	26'-0"	N/A	N/A	N/A	N/A

Minimum Splice Length	
#4	1'-3"
#5	1'-8"
#6	2'-0"

Minimum Splice Length		
Concrete (Grade 4.0)	11.7	C.Y.
Concrete (Grade 4.0) (AE)	6.3	C.Y.
Reinf. Steel (Gr. 60)	812	Lbs.
Reinf. Steel (Epoxy Coated)	1,244	Lbs.
Class III Excavation		C.Y.
Foundation Stabilization (Set)	1	C.Y.
Concrete for Seal Course (Set)	1	C.Y.
Granular Backfill (Wingwalls) (Set)	1	C.Y.

NO.	DATE	REVISIONS	BY	APP'D

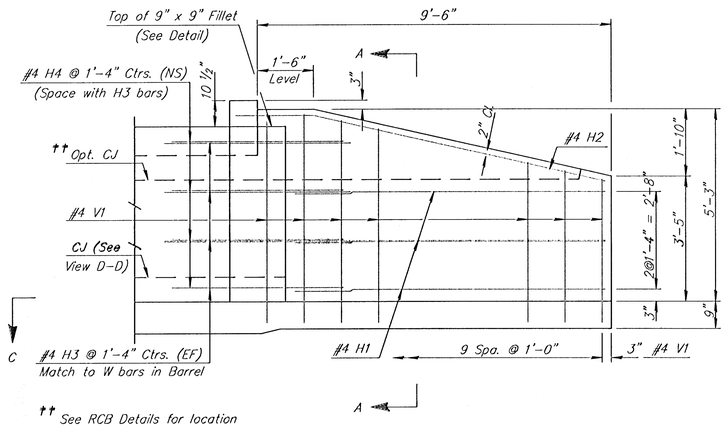
DOUBLE 8 ft x 4 ft RCB
(47° SKEW LT.)

BR 2.8.4 P
Sedgwick Co.

FINAL APPROVAL		6-5-06	APP'D	KENNETH T. HURST
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN. CK.	TRACE CK.

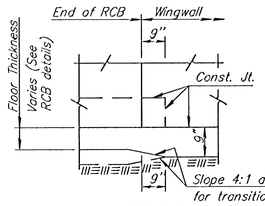
Date: 4/7/2006
File: V:\DWGS\gawco134.dgn
Plot Date: 10/2/2006
Plot Scale: 1.0000 '/ Inch

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KS	468-84253	2007	12	22

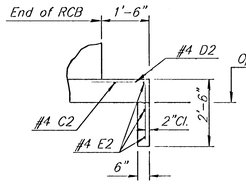


†† See RCB Details for location of construction joint.

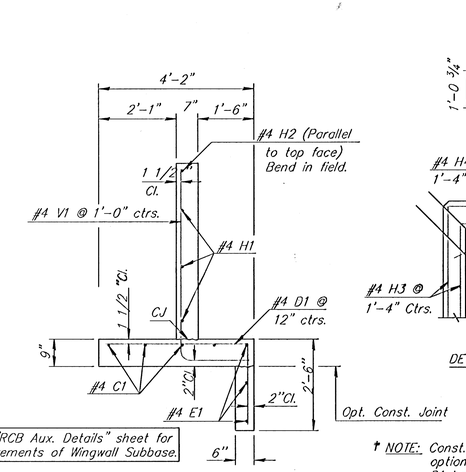
ELEVATION OF WINGWALL
(Backface Shown)



VIEW D-D



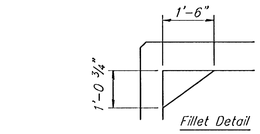
SECTION E-E



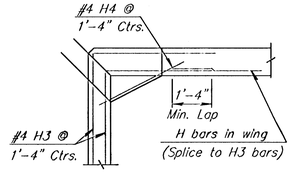
See "RCB Aux. Details" sheet for requirements of Wingwall Subbase.

SECTION A-A

† NOTE: Const. Jt. may be used at Contractor's option when approved by the Engineer. D1 bars or mesh may be spliced thus: Minimum overlap shall be 1'-3". No increase in quantities or cost shall be allowed when Contractor elects this option.

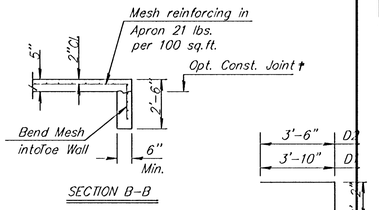


Fillet Detail

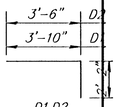


DETAIL OF 9" x 1'-6" FILLET
(Plan View)

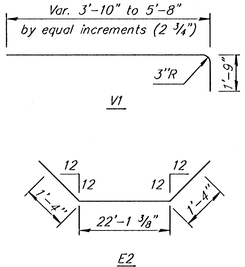
NOTE:
EF = Each Face
NS = Near Side
FS = Far Side
CJ = Const. Joint



SECTION B-B

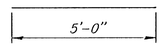


D1,D2

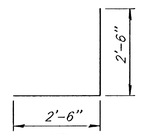


E2

V1

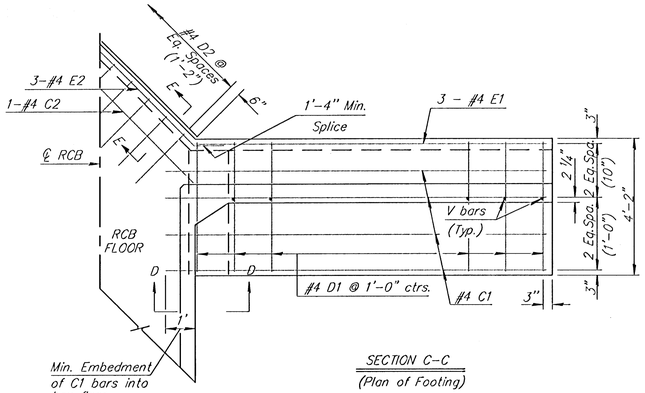


H3R

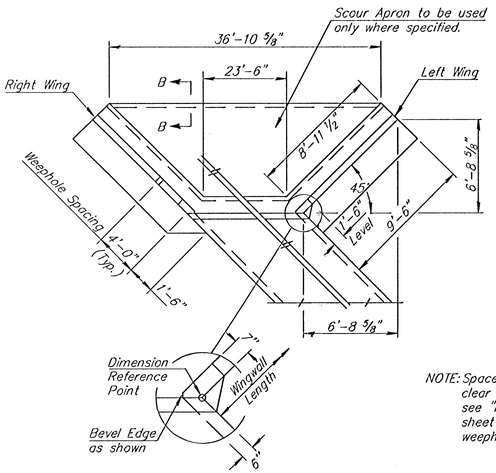


H3L

BENDING DIAGRAM
(All dimensions are out to out of bars.)



SECTION C-C
(Plan of Footing)



WING DIMENSIONS FOR 45° SKEWED BOX
(3 1/2 :1 Embankment Slope)

NOTE: Space weepholes to clear reinforcing steel. see "RCB Aux. Details" sheet for additional weephole details.

BAR SCHEDULE

* See bending diagram (all reinf. is #4)

41° Skew	Bar	C1	D1	E1	C2	D2	E2	V1	H1	H3R	H4
	Number	8	20	6	1	21	3	20	6	4	8
	Length	10'-4"	6'-0"	8'-9"	25'-6"	5'-8"	26'-3"	*	8'-2"	5'-0"	2'-4"

SUMMARY OF WING QUANTITIES	
Concrete (Grade 4.0)	
Wingwalls	4.6 C.Y.
Apron	4.3 C.Y.
Reinf. Steel	463 Lb.
Welded Wire Fabric	55 Lb.

GENERAL NOTES

UNIT STRESSES: Grade 4.0 Concrete; f'c = 4,000 p.s.i.
Reinforcing Steel; fy = 60,000 p.s.i.

CONCRETE: Grade 4.0 Concrete shall be used throughout. Bevel all exposed edges with a 3/4 inch triangular moulding.

REINFORCING: All reinforcing shall conform to ASTM A615, Grade 60. Welded Wire Fabric shall conform to ASTM A185. All dimensions relative to reinforcing steel shall be to center-line of bar unless otherwise noted.

QUANTITIES: Wingwall Quantities include all quantities outside the neat lines of the box, excluding the hubguard.

APRON: A 5" concrete slab shall be constructed between the downstream wings in locations subject to scour only when specified on the plans or by the Engineer. Wire Reinforcing mesh shall be electrically welded and shall be composed of 6 x 6-W1.4 x W1.4 welded wire fabric and shall be classified as pounds of reinforcing.

FOUNDATION AND BACKFILL MATERIAL: Soils judged as high plasticity clays, fat clays, expansive clays, or organic clays are unsuitable for foundation and/or backfill material for wingwalls and will not be used. Where these conditions exist, Foundation Stabilization and/or Granular Backfill (Wingwalls) shall be used as determined by the Engineer. See "RCB Auxiliary Details" sheet for additional details.

NO.	DATE	REVISIONS	BY	APP'D

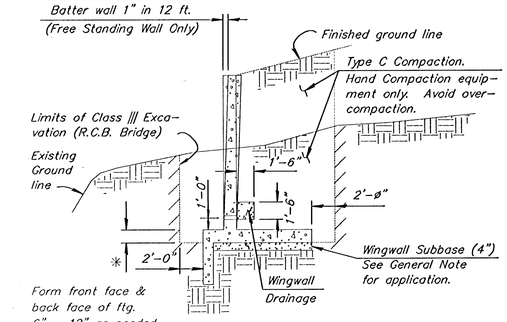
KANSAS DEPARTMENT OF TRANSPORTATION

Br. No. -87-.00(000) Sta. 1+00

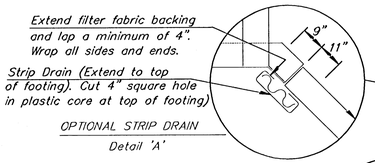
4 ft Rise (45° SKEW)

BR 10-15.04 Sedgwick Co.

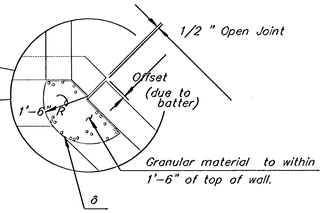
FHWA APPROVAL		6-5-98	APP'D	KENNETH F. HURST
DESIGNED	DETAILED		QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.		QUAN.CK.	TRACE CK.

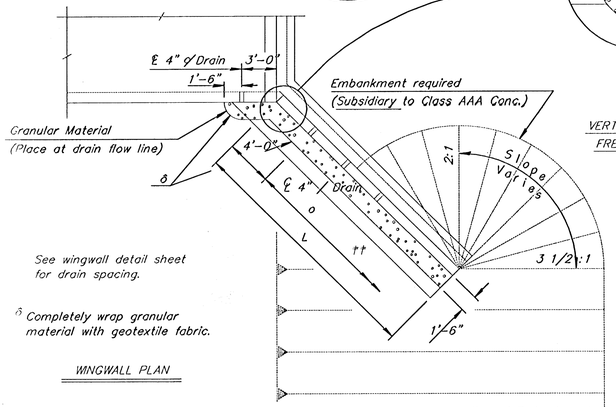


SECTION THRU WINGWALL



OPTIONAL STRIP DRAIN
Detail 'A'



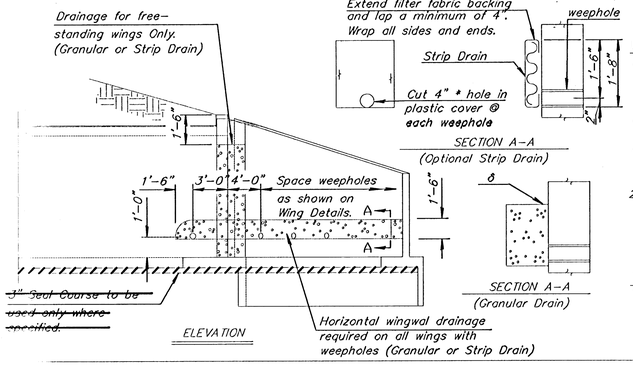


See wingwall detail sheet for drain spacing.

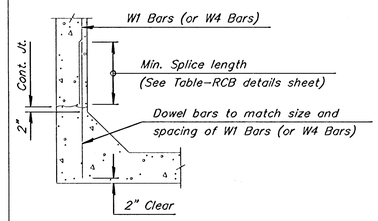
δ Completely wrap granular material with geotextile fabric.

WINGWALL PLAN

VERTICAL WINGWALL DRAINAGE FOR FREE-STANDING WINGWALLS ONLY
(RCB Rise 12 ft. & over)



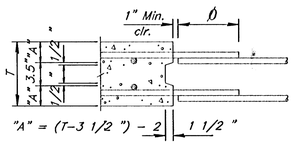
ELEVATION

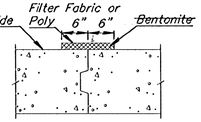


OPTIONAL BAR DETAIL

The Contractor shall have the option of using Dowel Bars to match vertical wall bars as shown, however no allowance will be made for additional steel required for bar lops.

() Longitudinal bars shall extend through the joint to provide a minumum lap equal to the required splice length. See RCB Details Sh. for required splice length.



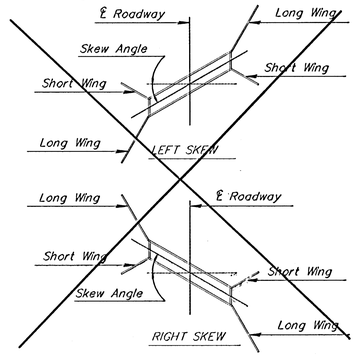


VERTICAL CONSTRUCTION JOINTS

NOTE: Vertical construction joints shall be perpendicular to the longitudinal axis of the RCB and shall be placed at any location as needed for construction and as approved by the Engineer.

NOTE: Horizontal construction joints shall be a roughened finish.

NOTE: Barrel Construction Joints located in a median with less than 5 ft. of fill or at locations specified by the Engineer, shall be protected by a bentonite based system as shown. Place the bentonite on the exterior walls and top slab. See requirements for bentonite in the KDOT Specifications for "Bridge Backwall Protection System". Material and installation of the bentonite system shall be subsidiary to the bid item "Class AAA Concrete".



PLAN VIEW SKEWED R.C.B.

GENERAL NOTES

Wingwall Drainage:

1. All wingwalls with weepholes shall have horizontal wingwall drainage as shown. Free-standing wingwalls shall also have the vertical wingwall drainage. Strip drains may be used in lieu of aggregate. See KDOT Specifications for "Abutment Strip Drains" for strip drain requirements.
2. Construction and materials for wingwall drainage, including weepholes, geotextile fabric, granular material, and strip drain shall be subsidiary to the bid item, "3-10'x5' RCBC". Granular material for wingwall drainage shall conform to the requirements of UD-1. Weepholes may be a formed opening or corrugated polyethylene tubing.

Wingwall Subbase:

1. Wingwall subbase shall be constructed at all wingwall footings to assure the assumed coefficient of friction between the concrete footing and the foundation, with the following exceptions;

a) Wingwall subbase will not be required for footings on RCB's 6 feet or less in height unless otherwise determined by the Engineer.
b) The subbase will also not be required for footings founded on rock or clean, granular material as determined by the Engineer.

2. Subbase shall consist of 4" compacted granular material consisting of commercial grade clean sand or UD-1 material. All excavation, material and labor necessary to construct the wingwall subbase shall be subsidiary to "3-10'x5' RCBC".

Seal Course:

~~1. Seal Course consisting of 3" min. of Commercial Grade Concrete shall be constructed to the limits directed by the Engineer. No reinforcing in the floor of the slab or wall footing shall be placed until the Seal Course has gained sufficient strength to permit working upon it without injury.~~

GENERAL NOTES

Foundation Stabilization:

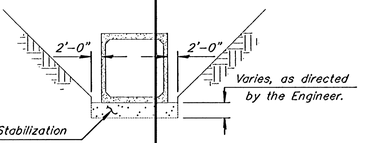
1. At sites where the wingwall footing or culvert floor is located within the limits of an existing streambed or is founded on unsuitable material, the Engineer will determine the depth of Foundation Stabilization.
2. Foundation Stabilization may be required under the box and/ or wingwalls as directed by the Engineer. The granular material placed for foundation stabilization shall be paid subsidiary to L.S. Bid Item 3-10'x5' RCBC. Material for Foundation Stabilization shall be suitable backfill material as approved by the Engineer. The excavation for the placement of granular material shall be subsidiary to the bid item, "3-10'x5' RCBC".

Granular Backfill (Wingwalls):

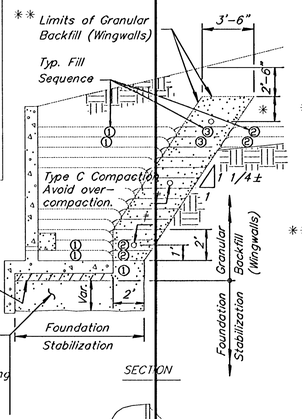
1. In locations where the material behind the wingwall consist of soils judged as high plasticsity clays, fat clays, expansive clays or organic clays, Granular Backfill (Wingwalls) shall be used. Granular Backfill construction may be used separately or combined with Foundation Stabilization as directed by the Engineer.

~~2. Measurement for the bid item, "Granular Backfill (Wingwalls)", shall be measured in Cubic Yards to the theoretical limits as shown. Drainage pipe, rodent screens, and excavation shall be subsidiary to the bid item, "Granular Backfill (Wingwalls)".~~

3. Material for Granular Backfill (Wingwalls) shall conform to the requirements of UD-1 or BD-1. Drainage Pipe shall be corrugated polyethylene tubing conforming to KDOT Specifications.



SECTION

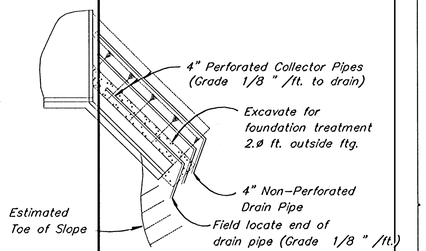


SECTION

* Omit Drain Pipe when distance is less than 2'-ø".

† 4" Perforated Pipe (Install ea. 4' in Elev.)

** NOTE: As an alternative, all backfill for the wall (within 2'-6" of finish grade) may be granular backfill material. ~~Measurement for quantity shall be to the same limits as listed in the General Notes.~~



PLAN

GRANULAR BACKFILL AND FOUNDATION STABILIZATION

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	468-84253	2007	13	22

NO	DATE	REVISIONS	BY	APP'D
3	3-28-97	Wrap granular drains	RAM	KFH
2	9-24-96	Strip drain & bentonite at joint	RAM	KFH
1	12-2-91	Change drainage details	RAM	KFH

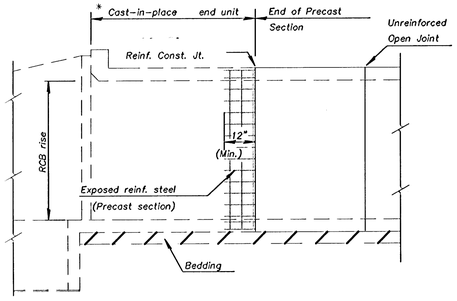
KANSAS DEPARTMENT OF TRANSPORTATION

RCB AUXILIARY DETAILS

~~BRØ2Ø~~

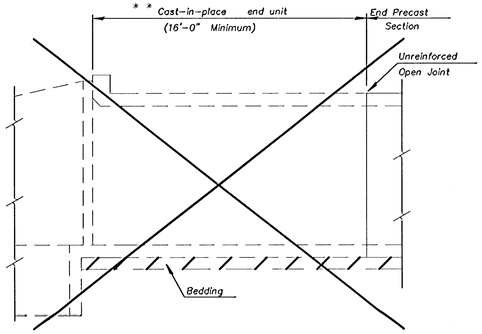
FHWA APPROVAL		3-31-97	APP'D	KENNETH F. HURST	
DESIGNED	RAM	DETAILED	RDR	QUANTITIES	TRACED
DESIGN CK.	RRH	DETAIL CK.	RRH	QUAN. CK.	TRACE CK.

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KS	468-84253	2006	14	22



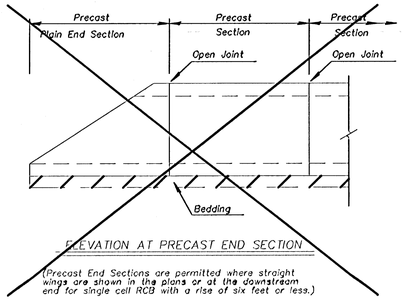
ELEVATION AT HEADWALL

* Minimum barrel length of cast-in-place end unit shall equal the RCB rise or 8'-0", whichever is less. This length can be used when the joint between the cast-in-place end unit and the pre-cast section is reinforced as shown.



ELEVATION AT HEADWALL

** Minimum barrel length of cast-in-place end unit shall be 16'-0" when using an unreinforced open joint at the end of the precast section.



ELEVATION AT PRECAST END SECTION

(Precast End Sections are permitted where straight wings are shown in the plans or at the downstream end for single cell RCB with a rise of six feet or less.)

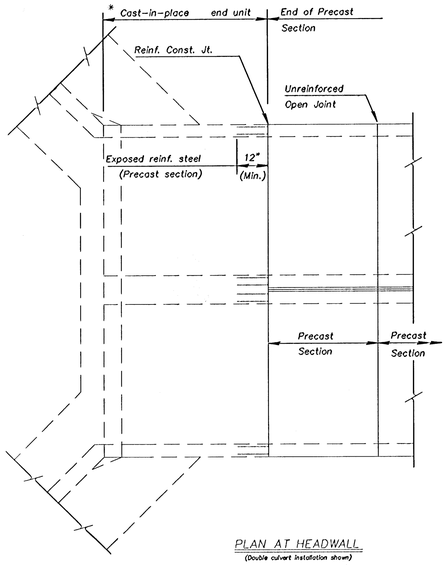
GENERAL NOTES

PRECAST BOX CULVERTS: If precast boxes are specified, construct them at the locations shown in the plans and according to the requirement shown on this sheet. ~~When approved by the Engineer, precast box culverts may be used in lieu of cast-in-place box culverts. If the Contractor chooses the precast option, use the cast-in-place quantities as the cost basis. This cost includes all labor equipment, material and incidentals necessary to complete the installation.~~

Cast-in-place concrete work shall conform to the requirements of the KDOT Specifications and KDOT's "Guidelines for Structural Design and Detail of Reinforced Concrete Box Culverts". Use Class AAA concrete and Grade 60 reinforcing steel conforming to ASTM A615M for cast-in-place construction.

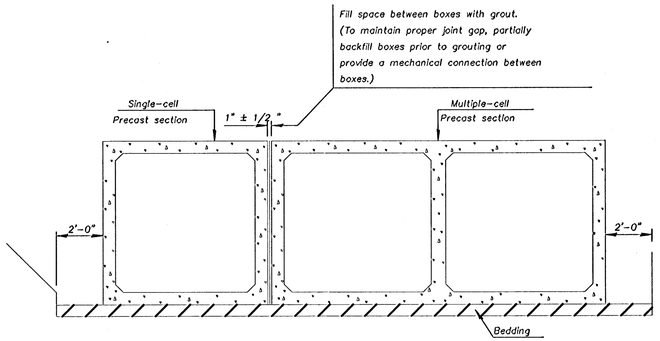
SPECIFICATIONS: Single-cell Precast Concrete Box Culverts shall conform to the requirements of the following specifications except as noted in the KDOT Specifications. Design multiple-cell precast boxes in accordance with the criteria used to develop the single-cell precast boxes. (See Appendix of ASTM Specification C 1433, Table 2 and the latest AASHTO Specifications.)

~~DISTRIBUTION SLAB: Fill heights less than 2 feet require a distribution slab. Precast distribution slabs may be used for fill heights over 1 foot, otherwise use cast-in-place.~~

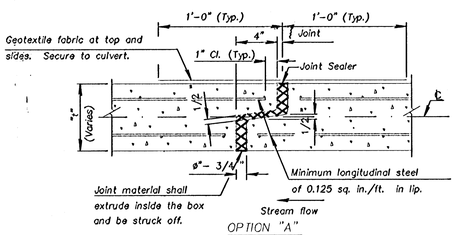


PLAN AT HEADWALL
(Double culvert installation shown)

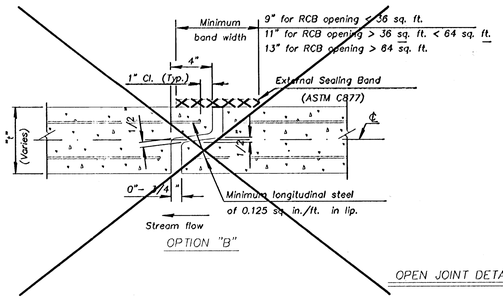
NOTE: Minimum length of precast section shall be 4'-0".



TYPICAL INSTALLATION DETAILS

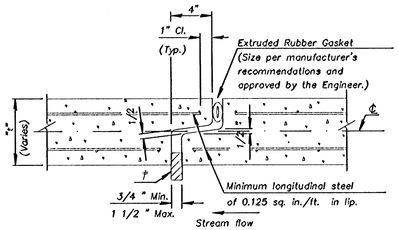


OPTION "A"



OPTION "B"

OPEN JOINT DETAIL



OPTION "C"

† Insert temporary, 3/4"-1" wide, hardwood wedges to prevent over-compressing gasket.

REVISED 10/09/01

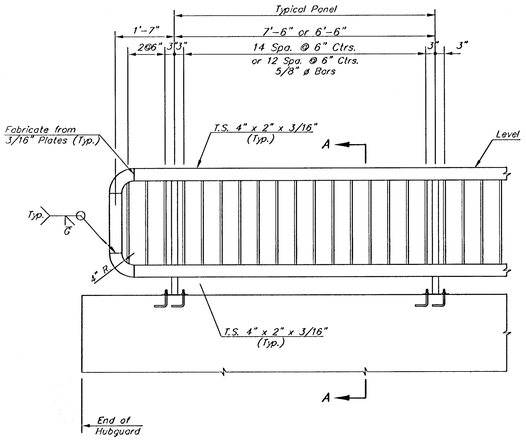
NO.	DATE	REVISIONS	BY	APP'D
4	11-03-00	Revised ASTM / Added Note	RAM	KTH
3	12-20-96	Revised CIP end unit details.	RAM	KTH
2	1-17-95	Revised general notes	LSR	KTH
1	6-22-94	Added option 'C' & revised notes	RAM	KTH

KANSAS DEPARTMENT OF TRANSPORTATION

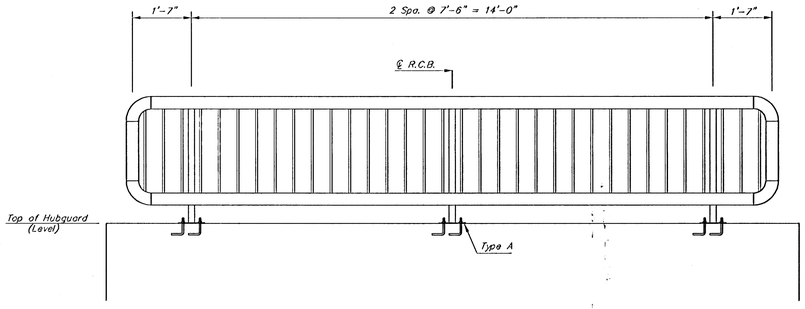
PRECAST CONCRETE BOX CULVERT DETAILS

BRD31

FHWA APPROVAL		11-27-00	APP'D	KENNETH F. HIRS	
DESIGNED	DETAILED	PF	QUANTITIES	CADD	
DESIGN CK.	DETAIL CK.	RAM	QUAN. CK.	CADD CK.	

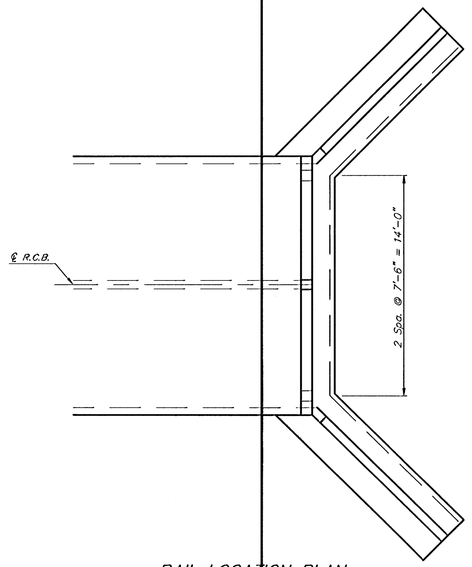


HANDRAIL ELEVATION

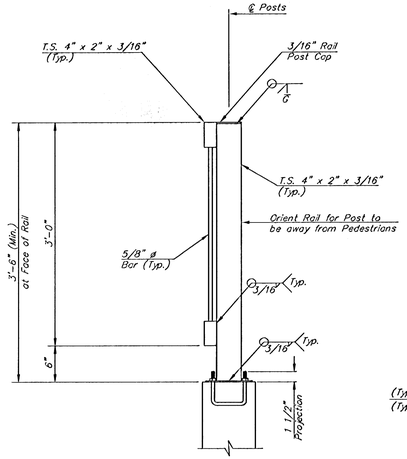


HUBGUARD SECTION

(2 Required)

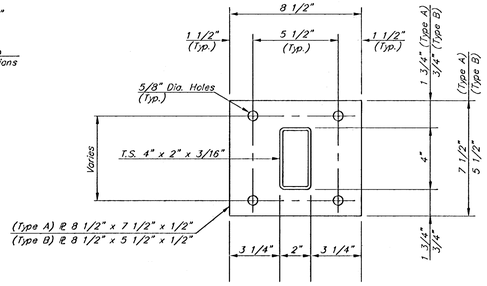


RAIL LOCATION PLAN



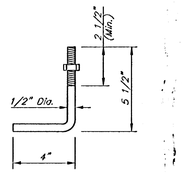
SECTION A–A

Note:
Rail Post on Hubguard shown,
Rail Posts on Wingwalls not shown
but similar controlling criteria.



BASE PLATE

5 Required (Type A)
8 Required (Type B)



Galvanized (ATSM A153)

(May Substitute expandable anchor bolts when approved by the Engineer)

ANCHOR BOLT

Orient to provide min. 2" edge clearance to either hubguard face or adjacent bolts)

BASIS OF PAYMENT

All labor, Materials, Anchor Bolts, Fabrication, Installation, and Ect. Necessary to Place the Handrails as shown shall be incidental to Lump Sum Bid Item "RCBC."

GENERAL NOTES

The horizontal members of the rail and posts shall be hollow structural tubing. All structural steel and tubing shall comply to A.S.T.M. Designation A36 or A500 Grade B respectively.

Rail shall be fabricated in lengths as shown.

Posts and bars shall be set vertical and shimmed if required.

The paint system shall be provided by Carboline: 350 Hanley Industrial Ct., St. Louis, MO. The application will be in accordance with the manufacturers recommendations. The paint procedure is as follows:

1. Abrasive blast to commercial finish SSPC–SP6 to obtain a surface profile of 1–1/2 mils.
2. Apply 2 coats of Carboline GP 818 Primer (2 to 4 mils per coat).
3. Apply one topcoat of Subsil 30 HS (2 to 3 Mils) (Color: Carboline C900). An approved substitutuion of the total paint sytem will be allowed with the approval of the Engineer.

Material and construction shall conform to the Structural Welding Code A.W.S. D1.1–00.

Shop details must be submitted and approved by the Engineer.

The Handrail Shall be Painted Black & a Test Piece Shall Be Supplied To the Engineer Prior To Cons. For Its Approval.

Baughman

Northgate Offsite Drainage

Handrail Details

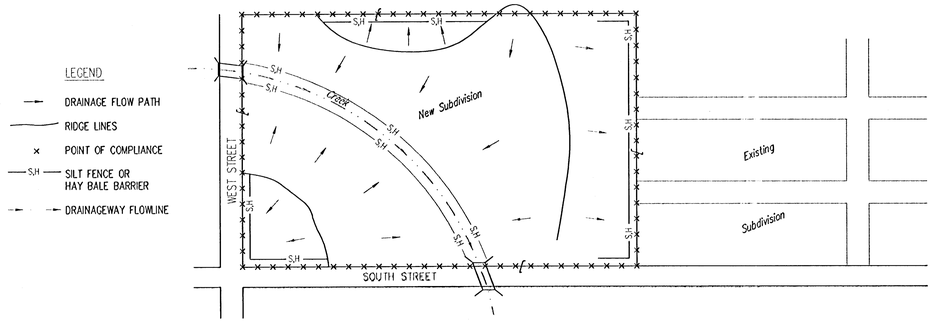
Storm Water Drain #307

Baughman Company, P.A. 315 Elk St. Wichita, KS 67211 P 316.263.7211 F 316.263.6149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER	DESIGN	DRAWN
46884253	AEO	RDM
REVISIONS	APPROVED	DATE
	AEO	3-14-07
	SCALE	None
	SHEET	15 OF 22

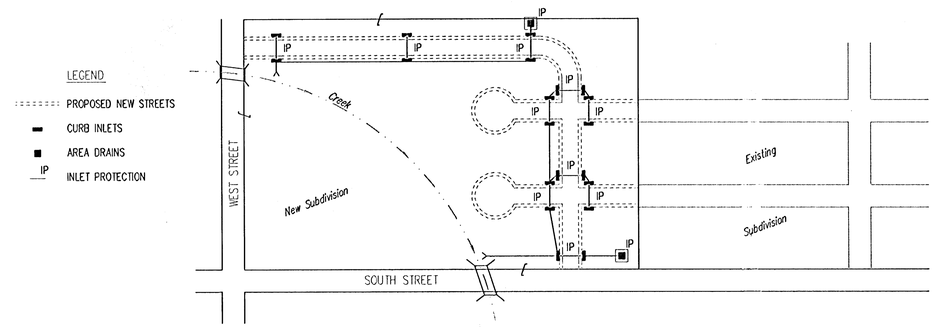
Northgate\33rd St SWD\RCBC_Handrail.dwg

PHASE 1 – INITIAL EARTHWORK AND UTILITIES (EXCEPT STORM SEWER)



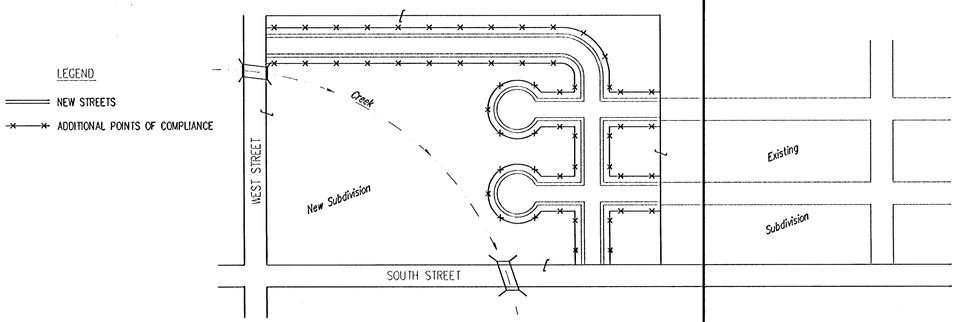
1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, THE POINTS OF COMPLIANCE ARE THE PERIMETER BOUNDARIES AND ANY DRAINAGE WAYS OR STORM SEWERS DRAINING THROUGH OR FROM THE SITE. SHOULD LAKES BE CONSTRUCTED WITHIN THE SUBDIVISION THAT WILL DISCHARGE DURING STORMS, THEY ARE ALSO A POINT OF COMPLIANCE.
2. HAY BALES OR SILT FENCE MUST BE CONSTRUCTED ALONG THE PROPERTY LINE WHERE ON SITE WATER CAN DRAIN OFF THE PROPERTY. THESE EROSION CONTROL DEVICES WILL ALSO BE INSTALLED ALONG ANY DRAINAGE DITCH OR LAKE THAT CAN DISCHARGE.
3. SHOULD SILT OR SEDIMENT ENTER THE DITCHES OR STREETS ON THE ADJACENT BOUNDARY STREETS, APPROPRIATE EROSION CONTROL DEVICES WILL BE PLACED WITHIN THE SUBDIVISION TO PREVENT THIS.
4. ANY MUD TRACKED ONTO ADJACENT STREETS WILL BE REMOVED WITHIN 48 HOURS OR BY FRIDAY AT 6:00 PM, WHICHEVER IS EARLIER.
5. CONTRACTORS WORKING WITHIN THE SITE WILL NOT BE REQUIRED TO USE INDIVIDUAL EROSION CONTROL DEVICES AS LONG AS THOSE SPECIFIED ABOVE ARE IN PLACE AND EFFECTIVE. CONTRACTORS WORKING ON THE BOUNDARY LINE STREETS OR ON ADJACENT PROPERTIES TO EXTEND UTILITIES ARE EXPECTED TO USE EROSION CONTROL DEVICES AT THEIR WORK LOCATIONS, AS NEEDED.
6. UTILIZE STABILIZED CONSTRUCTION ENTRANCE AT ENTRANCE AND EXIT ONTO ANY EXISTING PUBLIC STREETS.
7. IF THE INITIAL EARTH WORK AND UTILITIES ARE DONE AS PART OF A PUBLIC IMPROVEMENT PROJECT, THESE EROSION CONTROL DEVICES WILL BE INSTALLED BY THE CONTRACTOR AS SPECIFIED IN THE INDIVIDUAL PROJECT CONTRACTS. THE CONTRACTOR WILL MAINTAIN THE DEVICES UNTIL COMPLETION OF THE CONTRACT, AT WHICH TIME THE DEVELOPER WILL ASSUME MAINTENANCE RESPONSIBILITIES. IF THESE CONTRACTS ARE NOT PUBLIC IMPROVEMENT PROJECTS, THE DEVELOPER WILL BE RESPONSIBLE FOR INSTALLING AND MAINTAINING THESE DEVICES.
8. WITHIN 14 DAYS OF COMPLETION OF EARTHWORK ACTIVITIES IN ANY GIVEN AREA, THAT AREA SHALL BE TEMPORARILY OR PERMANENTLY SEEDED AND MULCHED.

PHASE 2 – INSTALLATION OF STORM SEWER



1. DURING THIS PHASE OF SUBDIVISION DEVELOPMENT, ALL EROSION CONTROL DEVICES REQUIRED IN PHASE 1 SHALL REMAIN IN PLACE AND BE MAINTAINED.
2. AS NEW STORM SEWERS, WITH INLETS, ARE INSTALLED, THE STORM SEWERS MUST NOW BE PROTECTED SO ALL NEW INLETS BECOME POINTS OF COMPLIANCE.
3. AREA DRAINS – AS SOON AS WATER CAN FLOW INTO THESE DRAINS, HAY BALE OR SILT FENCE PROTECTION WILL BE INSTALLED AROUND THEM.
4. CURB OPENING INLETS – AS SOON AS WATER CAN FLOW INTO THESE DRAINS, INLET PROTECTION DEVICES MUST BE INSTALLED. IF WATER CANNOT FLOW INTO CURB INLETS UNTIL STREET CONSTRUCTION IS COMPLETE, THEN STREET CONTRACTOR WILL INSTALL INLET PROTECTION. SEE PHASE 3 – STREET CONSTRUCTION.
5. THE STORM SEWER CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING THESE DEVICES.
6. THE SUBDIVISION DEVELOPER WILL MAINTAIN THESE EROSION CONTROL DEVICES ONCE INSTALLED.
7. ALL DISTURBED GROUND WILL BE FINAL GRADED AND TEMPORARILY OR PERMANENTLY SEEDED WITHIN 14 DAYS IF COMPLETION OF WORK IN ANY GIVEN PART OF THE SUBDIVISION.
8. ONCE ALL DISTURBED GROUND DRAINING TO AN INLET HAS BEEN RESTABILIZED WITH GRASS OR SOD, THE SUBDIVISION DEVELOPER WILL BE RESPONSIBLE FOR PERMANENTLY REMOVING THE INLET PROTECTION.

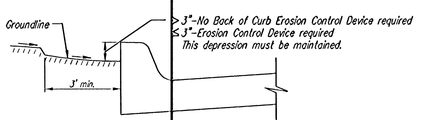
PHASE 3 – STREET CONSTRUCTION



1. DURING THIS PHASE OF SUBDIVISION CONSTRUCTION, NEW STREETS ARE INSTALLED. ALL EROSION CONTROL DEVICES INSTALLED DURING PHASE 1 AND 2 MUST STILL BE MAINTAINED. THE POINT OF COMPLIANCE NOW SHIFTS TO THE BACK OF CURB ALONG EACH STREET.
2. CURB OPENING INLET PROTECTION:
   A. SUMP AREAS – INLET PROTECTION SHALL BE PROVIDED WHEN STREET SUBGRADE WORK IS COMPLETED.
   B. NON-SUMP LOCATIONS – PROVIDE INLET PROTECTION AS SOON AS BASE COURSE ASPHALT IS INSTALLED, BEFORE THE SURFACE COURSE LIFT.
3. EROSION CONTROL DEVICES WILL BE REQUIRED BACK OF CURB WHEREVER WATER CAN FLOW OVER THE CURB AND THE CURB HAS BEEN BACKFILLED TO WITHIN 3" OR LESS OF THE TOP OF CURB (SEE CURB BACKFILL DETAIL). FOR CURBS NOT YET ENTIRELY BACKFILLED (3" OR MORE BELOW TOP OF CURB), ADDITIONAL DEVICES WILL BE REQUIRED AT POINTS WHERE WATER BREAKS OVER CURB WHICH COULD RESULT IN THE PLACEMENT OF SEDIMENT IN THE GUTTER.
4. SEE DETAIL SHEET FOR BACK OF CURB PROTECTION.
5. THE BACK OF CURB PROTECTION SPECIFIED ON THIS PLAN MAY HAVE TO BE SUPPLEMENTED WITH HAY BALE OR SILT FENCE EROSION CONTROL DEVICES AT LOCATIONS WHERE CONCENTRATED FLOW RESULTS IN SEDIMENT BEING CARRIED OVER THE EXCELSIOR MATS.
6. THE STREET CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING BACK OF CURB EROSION CONTROL DEVICES.
7. THE INDIVIDUAL LOT OWNERS WILL BE RESPONSIBLE FOR MAINTAINING THE BACK OF CURB EROSION CONTROL DEVICES IN FRONT OF THEIR LOTS UNTIL SUCH TIME AS ADJACENT DISTURBED EARTH IS STABILIZED WITH GRASS OR SOD.

GENERAL NOTES:
1. THE INTENT OF ALL EROSION CONTROL DEVICES IS TO PREVENT ERODED SOIL FROM ENTERING DITCHES, STORM SEWERS, LAKES, STREETS OR ANY OTHER OTHER DRAINAGE FEATURE.
2. THIS SHEET IS INTENDED TO PROVIDE GUIDELINES AS TO WHAT TYPE OF EROSION CONTROL DEVICES WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS. CONTRACTORS ARE EXPECTED TO BID PROJECTS ACCORDINGLY.
3. EROSION CONTROL DEVICES SHALL BE MAINTAINED DURING THE CONSTRUCTION PROCESS TO REMAIN EFFECTIVE. MAINTENANCE SHALL BE AS INDICATED ON SOIL EROSION BMP'S DETAIL SHEETS.
4. PERSONS DESTROYING EROSION CONTROL DEVICES SHALL BE RESPONSIBLE FOR IMMEDIATELY REPAIRING THEM OR INSTALLING SUITABLE REPLACEMENT DEVICES.
5. THE DEVELOPMENT OF ANY SUBDIVISION THAT DISTURBS 1 ACRE OR MORE WILL REQUIRE A FEDERAL/STATE NPDES STORMWATER PERMIT. THE PREPARATION OF A STORMWATER POLLUTION PREVENTION PLAN IS REQUIRED. EROSION CONTROL DEVICES ARE REQUIRED. THE DETAILS SHOWN ON THIS SHEET ARE THE MINIMUM STANDARDS TO BE SHOWN ON POLLUTION PREVENTION PLANS.
6. FOR SUBDIVISIONS SMALLER THAN 1 ACRE, SOIL EROSION DEVICES ARE REQUIRED. ALSO, DEVELOPERS AND CONTRACTORS ARE ENCOURAGED TO DEVELOP POLLUTION PREVENTION PLANS FOR EACH PROJECT PRIOR TO CONSTRUCTION.
7. FAILURE TO USE AND MAINTAIN SOIL EROSION DEVICES IS A VIOLATION OF SECTION 16.32 OF THE CITY CODE AND WILL SUBJECT THE SUBDIVISION DEVELOPER AND CONTRACTORS TO THE PENALTIES PROVIDED THEREIN.
8. THE APPLICATION OF EROSION CONTROL DEVICES SHOWN ON THIS SHEET IS FOR SITUATIONS NORMALLY ENCOUNTERED. FROM TIME TO TIME, SITUATIONS WILL ARISE THAT MAY REQUIRE DEVICES OTHER THAN THAT SHOWN. EROSION CONTROL DEVICES, OTHER THAN THOSE SHOWN, MAY BE UTILIZED SO LONG AS THEY ARE EFFECTIVE AND MAINTAINED.
9. A STABILIZED EARTH SURFACE IS DEFINED AS ONE THAT IS HARD SURFACED WITH CONCRETE, ASPHALT, OR THE LIKE, OR ONE ON WHICH 70% OF THE GRASS HAS GERMINATED ON THE ENTIRE SURFACE.

SEE DETAIL SHEET FOR BACK OF CURB PROTECTION DETAIL



CURB BACKFILL DETAIL
(STREET CONSTRUCTION ONLY)

CITY OF WICHITA

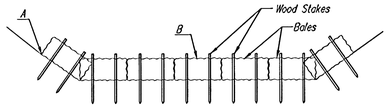
SOIL EROSION BMPs

SUBDIVISION DEVELOPMENT PROJECTS

JIM ARMOUR, P.E.
CITY ENGINEER

PROJECT NUMBER	OCA NO.
468-84253	751445
DATE 3-14-07	SHEET 16 OF 22

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 8' 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.
Straw bale ditch 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".

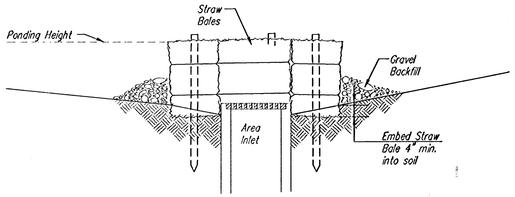
List of common placement/installation mistakes to avoid:

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.

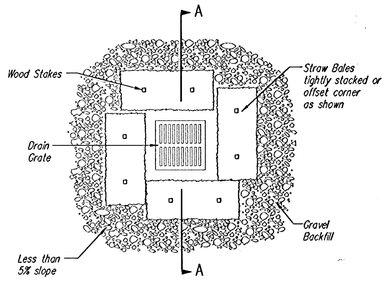
Inspection and Maintenance:

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.
Twine should be used to bind bales. The use of wire binding is prohibited because it does not biodegrade readily.

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.

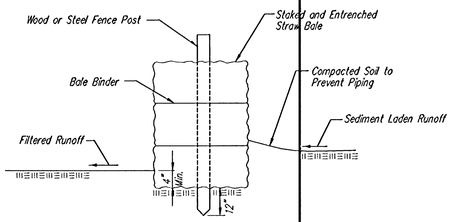
List of common placement installation mistakes to avoid:

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 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?



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.
Twine should be used to bind bales. The use of wire binding is prohibited because it does not biodegrade readily.

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 practical, 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?

CITY OF WICHITA

SOIL EROSION BMPs

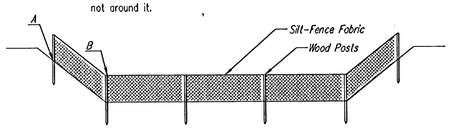
STRAW BALE DITCH CHECK AND BARRIER DETAILS

JIM ARMOUR, P.E.
CITY ENGINEER

PROJECT NUMBER	OCA NO.
468-84253	751445

DATE 3-14-07

NOTE: Point A must be higher than Point B so that water flows over the silt fence fabric and not around it.



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.
Silt fence ditch 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.

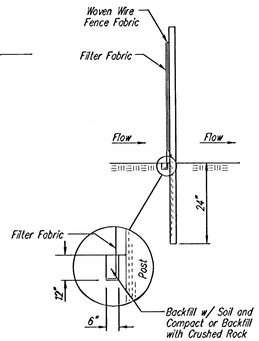
List of common placement/installation mistakes to avoid:

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.

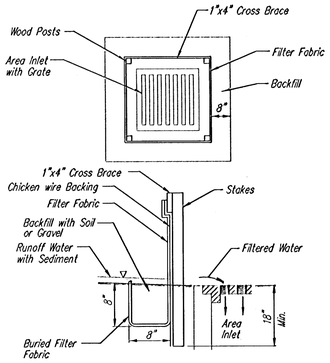
Inspection and Maintenance:

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?



ANCHOR TRENCH DETAIL



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.

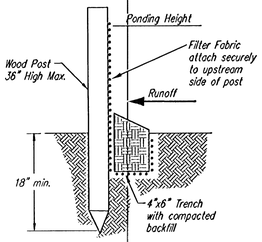
List of common placement/installation mistakes to avoid:

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?



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?

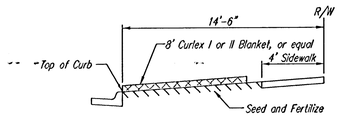
CITY OF WICHITA

SOIL EROSION BMPs

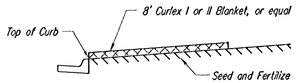
SILT FENCE DITCH CHECK AND BARRIER DETAILS

JIM ARMOUR, P.E.
CITY ENGINEER

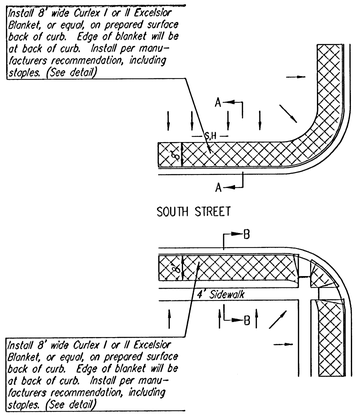
PROJECT NUMBER	OCA NO.
468-84253	751445
DATE 3-14-07	SHEET 18 OF 22



SECTION B-B



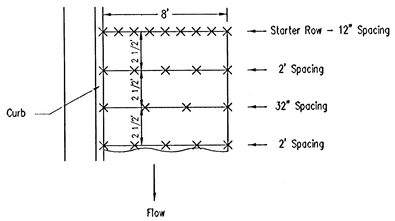
SECTION A-A



NOTES:

1. EXCELSIOR MAT TO BE INSTALLED WHEN SOD IS NOT SPECIFIED ON PROJECT.
2. EXCELSIOR BLANKET TO BE INSTALLED OVER SEED AND FERTILIZER, AS SPECIFIED IN THE PROJECT SPECIFICATIONS.
3. AFTER INSTALLATION OF EXCELSIOR BLANKET, AT LOCATIONS WHERE CONCENTRATED FLOW CARRIES SEDIMENT OVER THE CURB AND INTO THE GUTTER, SUPPLEMENTAL EROSION CONTROL DEVICES WILL BE INSTALLED BY THE CONTRACTOR AS NEEDED, TO FIX THE PROBLEM.

BACK OF CURB PROTECTION DETAIL

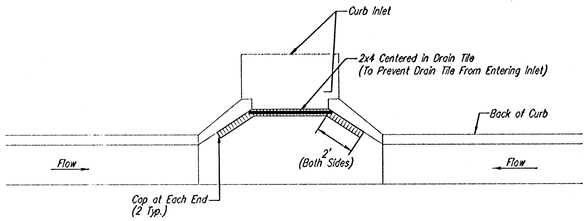


STAPLE PATTERN

NOTES: Use 6" seam overlap

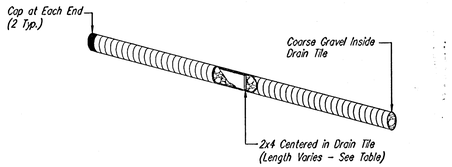
STAPLE

DETAILS FOR CURLEX I OR II BLANKETS



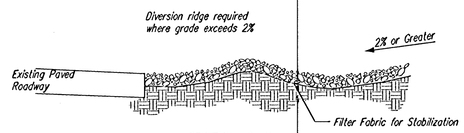
Note:
Place 4" perforated PVC pipe, filled with 1/2"-1" dia. gravel, in front of curb inlet as shown.

2X4 LENGTH	INLET TYPE	INLET OPENING
5'-6"	I-A	5'-0"
10'-6"	I-A	10'-0"
15'-6"	I-A	15'-0"

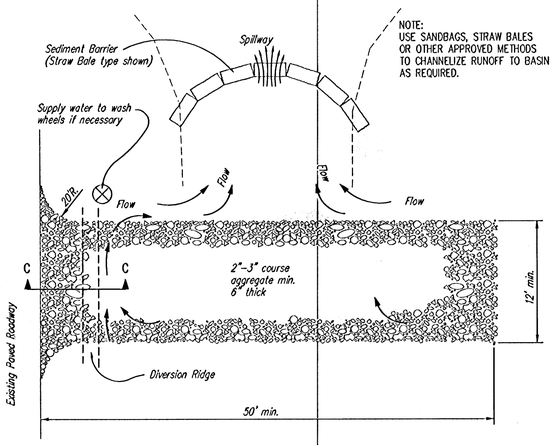


CURB INLET PROTECTION

4" PERFORATED PIPE W/ GRAVEL



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.

CITY OF WICHITA

SOIL EROSION BMPs

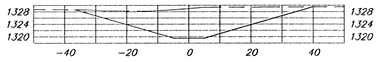
BACK OF CURB PROTECTION, CURB INLET PROTECTION AND CONSTRUCTION ENTRANCE

JIM ARMOUR, P.E.
CITY ENGINEER

PROJECT NUMBER	OCA NO.
468-84253	751445

DATE 3-14-07

5+50



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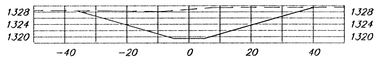

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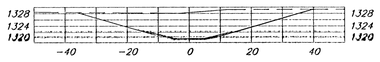

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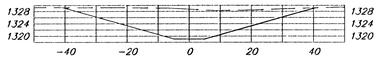
3+00



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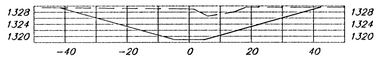

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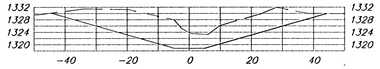

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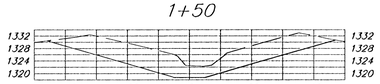

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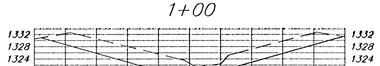

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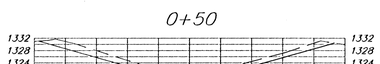

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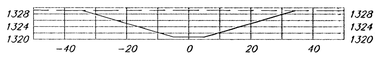

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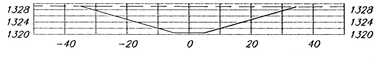

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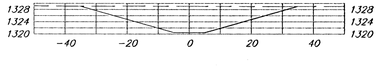

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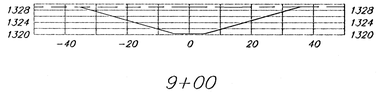

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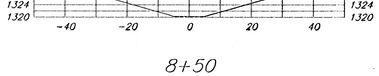

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8+00

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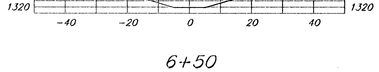
7+00



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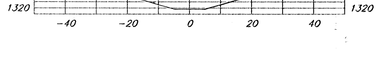

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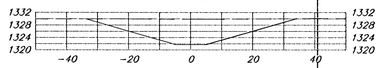

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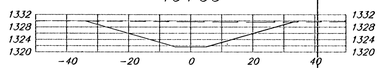

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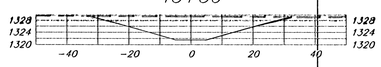

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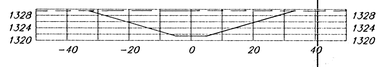

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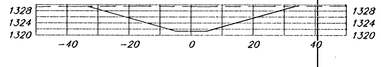

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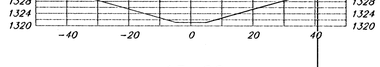

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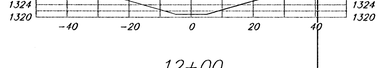


12+00

Baughman

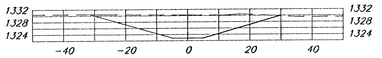
Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.7271 F 316.263.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER
468-84253

SHEET
20 OF 22

Northgate\53rd St SWD\OFFSITE CHANNEL.dwg

22+00



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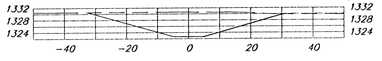
21+00



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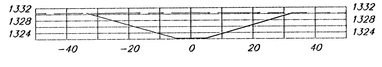
20+00

19+50

19+00



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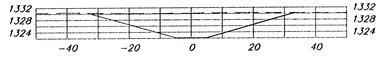

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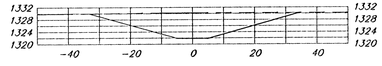
17+50

17+00



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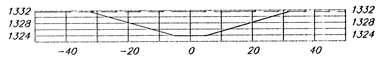
27+00



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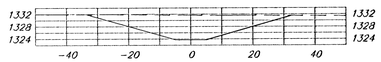

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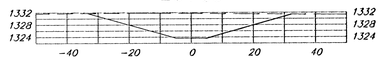

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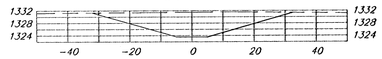

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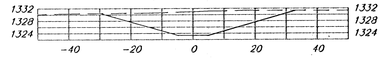

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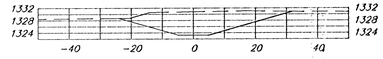

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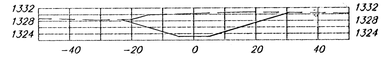

23+00

22+50

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
0+20	256.8193	0.0000	239.7765	0.0000	239.7765	0.0000
0+50	174.7785	0.0000	519.2537	0.0000	759.0302	0.0000
1+00	386.0155	0.0000	786.3319	0.0000	1545.3621	0.0000
1+50	463.2230	0.0000	872.6309	0.0000	2417.9930	0.0000
2+00	479.2184	0.0000	871.1841	0.0000	3289.1770	0.0000
2+50	461.6604	0.0000	834.3675	0.0000	4123.5445	0.0000
3+00	439.4564	0.0000	776.1121	0.0000	4899.6566	0.0000
3+50	398.7447	0.0000	728.2399	0.0000	5627.8966	0.0000
4+00	387.7545	0.0000	727.7840	0.0000	6355.6805	0.0000
4+50	398.2522	0.0000	745.9003	0.0000	7101.5809	0.0000
5+00	407.3201	0.0000	750.5741	0.0000	7852.1549	0.0000
5+50	403.2999	0.0000	739.7468	0.0000	8591.9017	0.0000
6+00	395.6267	0.0000	728.5048	0.0000	9320.4065	0.0000
6+50	391.1585	0.0000	717.8575	0.0000	10038.2640	0.0000
7+00	384.1276	0.0000	707.1335	0.0000	10745.3975	0.0000
7+50	379.5766	0.0000	697.3795	0.0000	11442.7770	0.0000
8+00	373.5933	0.0000	685.1034	0.0000	12127.8804	0.0000
8+50	366.3183	0.0000	673.1898	0.0000	12801.0703	0.0000
9+00	360.7267	0.0000	660.8426	0.0000	13461.9129	0.0000
9+50	352.9834	0.0000	646.2961	0.0000	14108.2090	0.0000
10+00	345.0165	0.0000	634.9228	0.0000	14743.1318	0.0000
10+50	340.7001	0.0000	628.1619	0.0000	15371.2936	0.0000
11+00	337.7147	0.0000	622.0149	0.0000	15993.3085	0.0000
11+50	334.0614	0.0000	615.4194	0.0000	16608.7279	0.0000
12+00	330.5916	0.0000	611.7282	0.0000	17220.4561	0.0000
12+50	330.0749	0.0000	617.0401	0.0000	17837.4962	0.0000
13+00	336.3284	0.0000	614.7229	0.0000	18452.2190	0.0000
13+50	327.5723	0.0000	599.2337	0.0000	19051.4527	0.0000
14+00	319.6001	0.0000	588.6277	0.0000	19640.0805	0.0000
14+50	316.1178	0.0000	582.5703	0.0000	20222.6507	0.0000
15+00	313.0581	0.0000	576.3511	0.0000	20799.0018	0.0000
15+50	309.4011	0.0000	574.9537	0.0000	21373.9554	0.0000
16+00	311.5489	0.0000	584.1361	0.0000	21958.0916	0.0000
16+50	319.3182	0.0000	599.9234	0.0000	22558.0150	0.0000
17+00	328.5991	0.0000	602.3809	0.0000	23160.3959	0.0000
17+50	321.9723	0.0000	597.8125	0.0000	23758.2084	0.0000
18+00	323.6652	0.0000	587.3846	0.0000	24345.5930	0.0000
18+50	310.7102	0.0000	576.4179	0.0000	24922.0110	0.0000
19+00	311.8212	0.0000	581.3470	0.0000	25503.3580	0.0000
19+50	316.0336	0.0000	578.3027	0.0000	26081.6608	0.0000
20+00	308.5333	0.0000	562.4788	0.0000	26644.1394	0.0000
20+50	298.9438	0.0000	549.2448	0.0000	27193.3842	0.0000
21+00	294.2407	0.0000	540.4324	0.0000	27733.8167	0.0000
21+50	289.4264	0.0000	515.6979	0.0000	28249.5145	0.0000
22+00	267.5273	0.0000	479.3451	0.0000	28728.8596	0.0000
22+50	250.1654	0.0000	437.8536	0.0000	29166.7133	0.0000
23+00	222.7166	0.0000	427.1879	0.0000	29593.9011	0.0000
23+50	238.6463	0.0000	459.8590	0.0000	30053.7601	0.0000
24+00	258.0014	0.0000	498.7017	0.0000	30552.4618	0.0000
24+50	280.5964	0.0000	529.2104	0.0000	31081.6722	0.0000
25+00	290.9509	0.0000	547.6780	0.0000	31629.3502	0.0000
25+50	300.5414	0.0000	566.3817	0.0000	32195.7320	0.0000
26+00	311.1509	0.0000	570.7860	0.0000	32766.5179	0.0000
26+50	305.2979	0.0000	552.7669	0.0000	33319.2848	0.0000
27+00	291.6903	0.0000	523.5678	0.0000	33842.8526	0.0000
27+50	273.7629	0.0000	250.9583	0.0000	34093.8109	0.0000
27+74.75	273.7629	0.0000	0.0000	0.0000	34093.8109	0.0000

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Baughman Company, P.A. 315 Ella St. Wichita, KS 67211 P 316.262.7271 F 316.262.0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

PROJECT NUMBER
468-84253

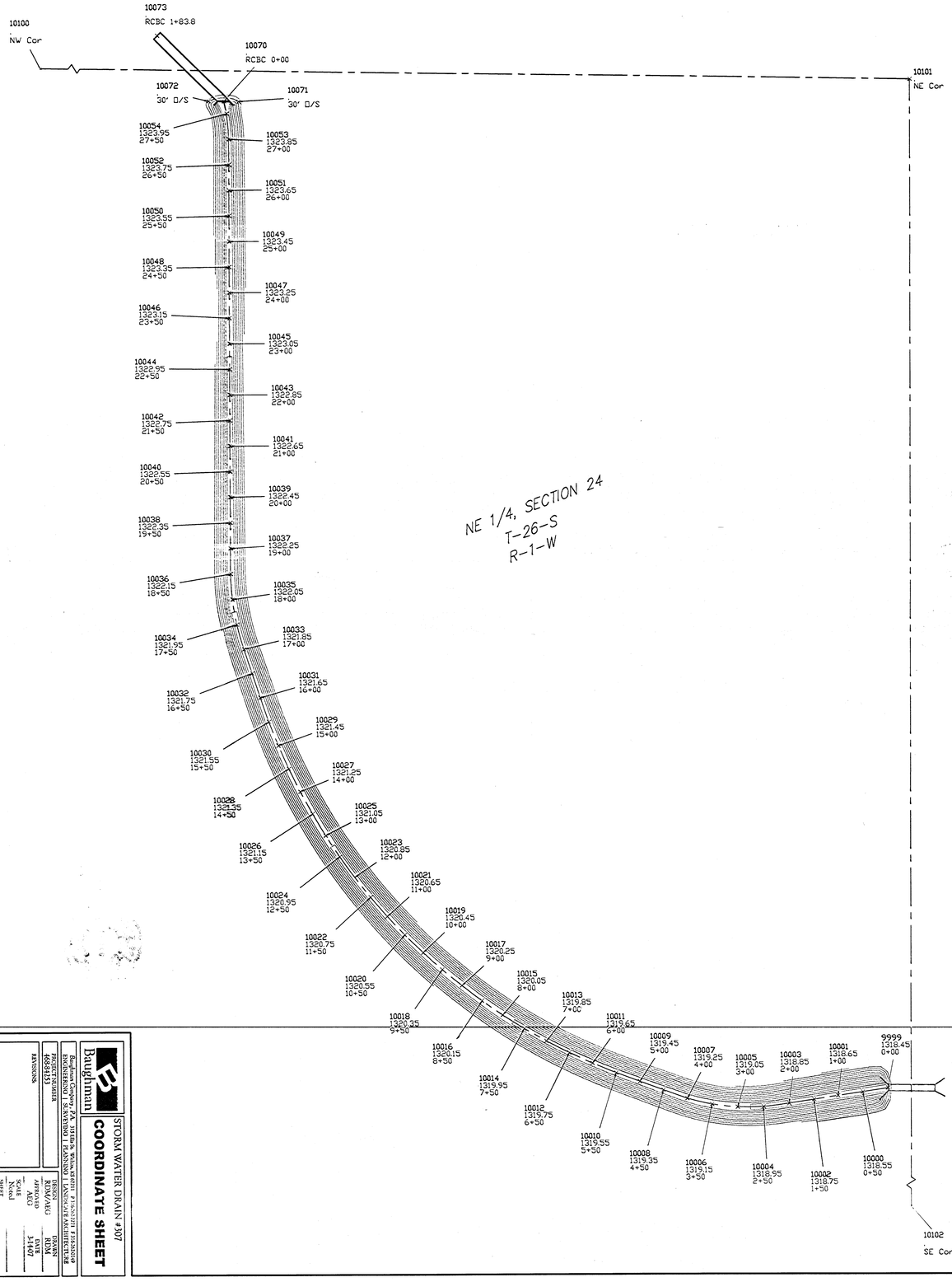
SHEET
21 OF 22

Northgate\53rd St SWD\OFFSITE CHANNEL.dwg

POINT	NORTHING	EASTING	ELEV.	DESC.
9999	3028.02	4952.74	1318.45	0+00
10000	3020.58	4903.30	1318.55	0+50
10001	3013.14	4853.86	1318.65	1+00
10002	3005.70	4804.41	1318.75	1+50
10003	2998.26	4754.97	1318.85	2+00
10004	2991.85	4705.40	1318.95	2+50
10005	2991.11	4655.43	1319.05	3+00
10006	2996.61	4605.77	1319.15	3+50
10007	3008.25	4557.18	1319.25	4+00
10008	3024.73	4509.58	1319.35	4+50
10009	3041.63	4462.58	1319.45	5+00
10010	3058.75	4415.95	1319.55	5+50
10011	3077.57	4369.63	1319.65	6+00
10012	3098.33	4324.14	1319.75	6+50
10013	3121.00	4279.58	1319.85	7+00
10014	3145.54	4236.02	1319.95	7+50
10015	3171.91	4193.54	1320.05	8+00
10016	3200.05	4152.22	1320.15	8+50
10017	3229.91	4112.12	1320.25	9+00
10018	3261.45	4073.33	1320.35	9+50
10019	3294.60	4035.90	1320.45	10+00
10020	3329.31	3999.92	1320.55	10+50
10021	3365.52	3965.44	1320.65	11+00
10022	3403.15	3932.52	1320.75	11+50
10023	3442.14	3901.23	1320.85	12+00
10024	3482.43	3871.62	1320.95	12+50
10025	3523.93	3843.75	1321.05	13+00
10026	3566.58	3817.65	1321.15	13+50
10027	3610.29	3793.39	1321.25	14+00
10028	3655.00	3771.01	1321.35	14+50
10029	3700.61	3750.52	1321.45	15+00

POINT	NORTHING	EASTING	ELEV.	DESC.
10030	3747.05	3732.01	1321.55	15+50
10031	3794.22	3715.44	1321.65	16+00
10032	3841.61	3699.51	1321.75	16+50
10033	3889.01	3683.58	1321.85	17+00
10034	3937.11	3670.01	1321.95	17+50
10035	3986.33	3661.31	1322.05	18+00
10036	4036.17	3657.57	1322.15	18+50
10037	4086.16	3657.39	1322.25	19+00
10038	4136.16	3657.35	1322.35	19+50
10039	4186.16	3657.31	1322.45	20+00
10040	4236.16	3657.27	1322.55	20+50
10041	4286.16	3657.23	1322.65	21+00
10042	4336.16	3657.19	1322.75	21+50
10043	4386.16	3657.15	1322.85	22+00
10044	4436.16	3657.11	1322.95	22+50
10045	4486.16	3657.07	1323.05	23+00
10046	4536.16	3657.04	1323.15	23+50
10047	4586.16	3657.00	1323.25	24+00
10048	4636.16	3656.96	1323.35	24+50
10049	4686.16	3656.92	1323.45	25+00
10050	4736.16	3656.88	1323.55	25+50
10051	4786.16	3656.84	1323.65	26+00
10052	4836.16	3656.80	1323.75	26+50
10053	4886.16	3656.75	1323.85	27+00
10054	4935.88	3652.05	1323.95	27+50
10070	4960.04	3646.70		RCBC 0+00
10071	4959.59	3676.68		30' D/S
10072	4960.48	3616.69		30' D/S
10073	5088.57	3515.29		RCBC 1+83.8
10100	5039.21	2353.08		NW Cor
10101	5000.00	5000.00		NE Cor
10102	2353.21	4998.14		SE Cor

Scale: 1" = 100'



Baughman

COORDINATE SHEET

STORM WATER DRAIN #307

Baughman Company, P.A. 3001 SW 15th St. Topeka, KS 66604-3811 (785) 232-0754 FAX (785) 232-8201

PROJECT NUMBER 4683153

DESIGN RDM/AVG

DRAWN RDM

APPROVED

DATE 3/14/07

SCALE None

PLOTTED

SHEET 22 OF 22

REVISIONS

N:\eng\wp\93\93-03\93-03coordinate sheet.dwg

98-13-03-05