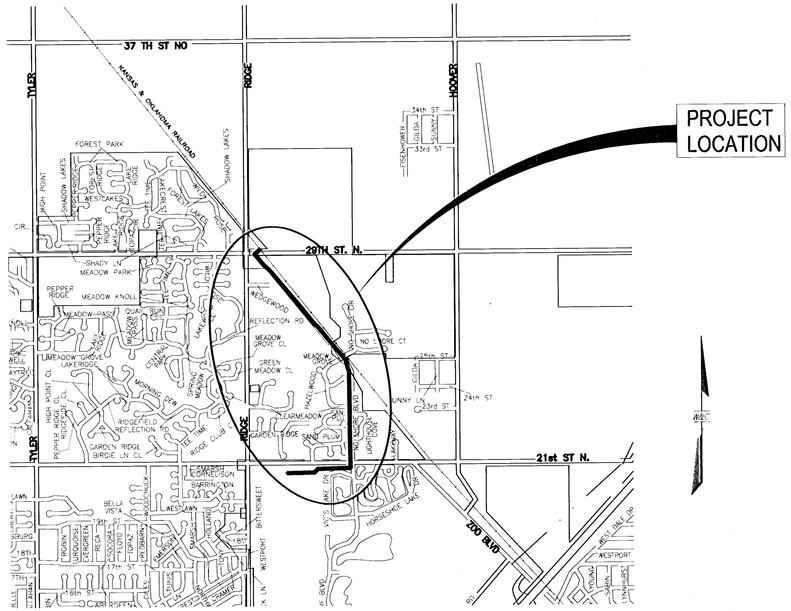
MAIN 19 SOUTHWEST INTERCEPTOR SEWER
PHASE 1B - FORCE MAIN
CITY OF WICHITA, KANSAS
NEIL D. CABLE, P.E. - CITY ENGINEER

CITY OF WICHITA



LOCATION MAP
NOT TO SCALE

Nowak Construction Co., Inc. - Contractor
Shearer, City - Inspector
Released 8/15/04
As-Built
.pdf by JDL 12/6/04

SHEET INDEX

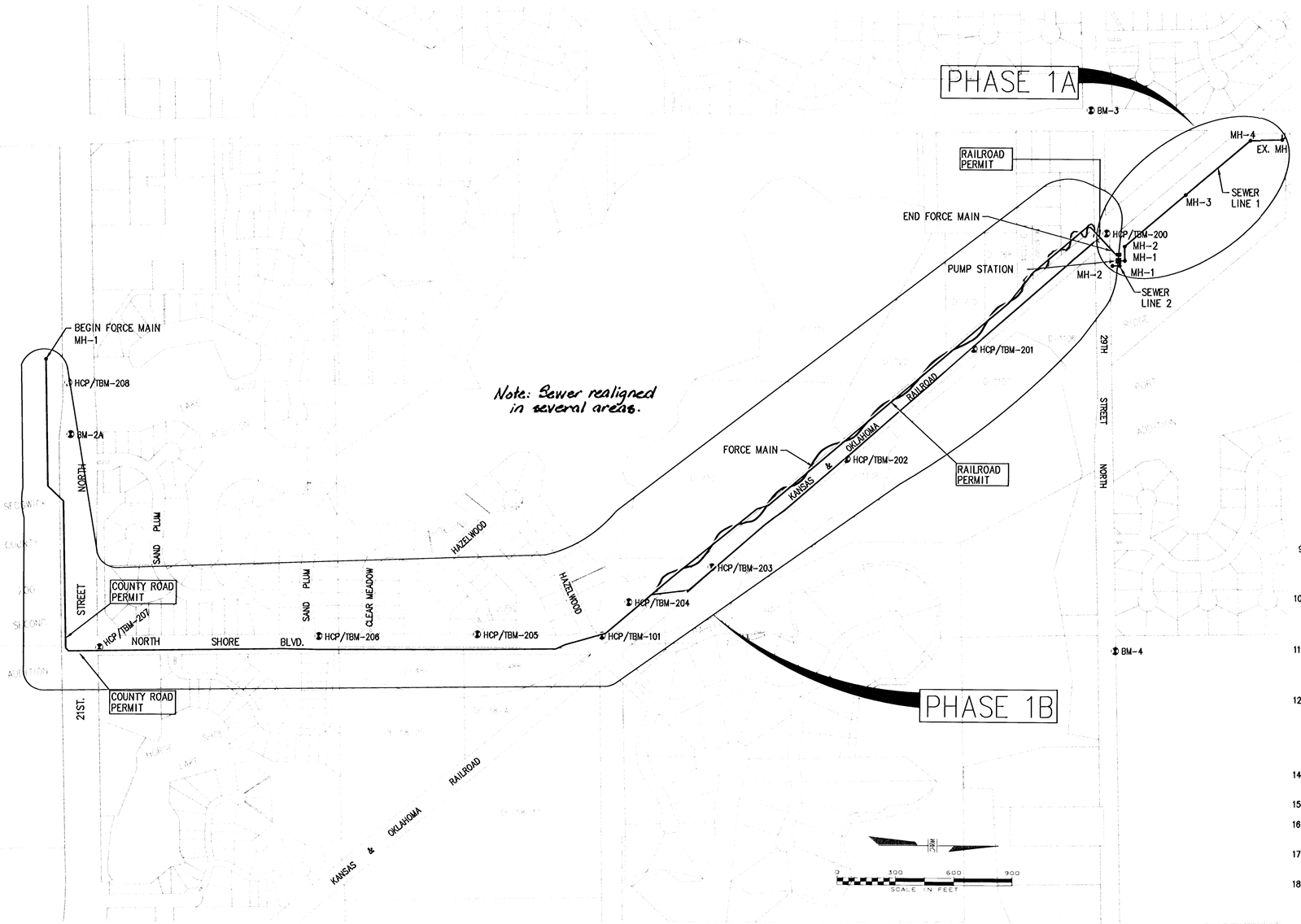
LEGEND

SYMBOL	DESCRIPTION
	BUILDING / STRUCTURE
	RAILROAD TRACKS
	EDGE OF PAVEMENT
	CURB AND GUTTER
	GRAVEL SURFACING
W	WATER LINE
W.M.	WATER METER
W.V.	WATER VALVE
F.H.	FIRE HYDRANT
G	GAS LINE
GAS REG.	GAS REGULATOR
G.V.	GAS VALVE
SWS	STORM WATER SEWER LINE
INLET	STORM WATER INLET
M.H.	MANHOLE
24" CMP	CULVERT PIPE
SS	SANITARY SEWER LINE
FM	SANITARY SEWER FORCE MAIN
T	UNDERGROUND TELEPHONE LINE
UGE	UNDERGROUND ELECTRIC LINE
OHE	OVERHEAD ELECTRIC LINE
FO	FIBER OPTIC LINE
	UTILITY POLE
	TELEPHONE PEDESTAL
	UTILITY DEADMAN/GUY WIRE
CATV	CABLE TELEVISION LINE
6" BUSH	BUSH
6" CEDAR / 6" DECO	TREE
	TREE LINE EDGE
	SIGN POST
	ROADWAY GUARD RAIL
	STREAM FLOW DIRECTION
x 1338	SPOT ELEVATION
BH-1	SOIL BORING LOCATION
	WOOD FENCE
	WROUGHT IRON FENCE
	BARBED WIRE FENCE
	CHAIN LINK FENCE
	PROPERTY LINE / RIGHT-OF-WAY LINE
	LOT LINE
	EASEMENT LINE (EXISTING)
	EASEMENT LINE (PROPOSED)
	NEW FORCE MAIN WARNING SIGN

DAVID W. HERZBERG LICENSED PROFESSIONAL ENGINEER 16758 6-10-03 KANSAS

OCA NO. 743-990
CITY OF WICHITA
PROJECT NO. 468-83186
APRIL 2003

WILSON & COMPANY
Engineers & Architects



BENCHMARK DATUM: CITY OF WICHITA

BM-2A CITY OF WICHITA BENCHMARK DISK NEAR THE EAST END OF A HUBGUARD, LOCATED ON THE SOUTH SIDE OF 21ST. STREET NORTH, 1500 FEET EAST OF RIDGE ROAD. ELEVATION: 138.03 (SEE SHEET 3)

BM-3 CITY OF WICHITA BENCHMARK DISK AT THE SW/COR. OF RIDGE ROAD AND 29TH STREET NORTH INTERSECTION. ELEVATION: 139.15

BM-4 CITY OF WICHITA BENCHMARK DISK AT THE NORTH RIGHT OF WAY LINE OF 29TH STREET NORTH AND LOCATED 1/2 MILE EAST OF RIDGE ROAD. ELEVATION: 141.07

VERTICAL AND HORIZONTAL CONTROL

HCP/TBM-101 TOP OF WCEA ALUM. CAP (SEE SHEET 7)
N = 11778.158, E = 15669.602, EL. = 140.38
GAS LINE MARKER POST 22' E
CENTER OF GAS VALVE 18.7' SSE
TOP CENTER OF T.PED 61.7' N

HCP/TBM-200 SET 5/8" REBAR (SEE SHEET 10)
TOP OF N. RAIL 11.15' SW
N. EDGE PVM'T 29TH 16.8' S
RR X-ING SIGN POST 8.0' SE
N = 14357.266, E = 13591.543, EL. = 139.29

HCP/TBM-201 SET 5/8" REBAR (SEE SHEET 9)
3" STEEL POST 24.8' NE
RR SWITCH FROG 30.9' SW
RR P.O.S. N. RAIL 88.6' NW
N = 13679.484, E = 14187.462, EL. = 137.02

HCP/TBM-202 SET 5/8" REBAR (SEE SHEET 8)
FIBER OPTIC CABLE ROUTE MARKER POST #661 6.8' NE
FIBER OPTIC CABLE ROUTE MARKER POST #661 78.0' NW
TOP OF NORTH RAIL 38.9' SW
N = 13031.078, E = 14758.170, EL. = 138.00

HCP/TBM-203 SET 5/8" REBAR (SEE SHEET 8)
TOP OF N. RAIL 18.0' SW
SE COR. BRIDGE ABUT 60.0' NNW
FIBER OPTIC CABLE ROUTE MARKER SIGN #663 67.4' N
N = 12339.431, E = 15316.353, EL. = 134.61

HCP/TBM-204 SET 5/8" REBAR (SEE SHEET 7)
BOC 2.7' SW
KEEP RIGHT SIGN POST 36.3' SW
NO THRU TRAFFIC SIGN POST 90.0' NW
NO THRU TRAFFIC SIGN POST 104.6' NW
N = 11913.683, E = 15497.597, EL. = 137.18

HCP/TBM-205 SET 5/8" REBAR (SEE SHEET 6)
BOC 2.8' E
TOP OF CENTER FH 40.7' N
E. EDGE CONC. WALK 7.6' W
N = 11136.283, E = 15667.113, EL. = 135.75

HCP/TBM-206 SET 5/8" REBAR (SEE SHEET 6)
CURB RETURN 2.2' E
FIRE HYDRANT 4.15' W
BASE OF STREET SIGN POST 9.2' SW
N = 10325.074, E = 15680.305, EL. = 135.76

HCP/TBM-207 SET 5/8" REBAR (SEE SHEET 5)
S. END CURB & GUTTER 12.7' NNW
STREET SIGN 11.4' NNW
TELEPHONE PAD 15.3' NNW
N = 9198.343, E = 15743.713, EL. = 133.99

HCP/TBM-208 SET 5/8" REBAR (SEE SHEET 3)
3 NAILS IN E. POLE OF H-POLE 30.4' NNW
BACK OF GUARD RAIL 13.4' NNW
OBJECT MARKER SIGN 43.3' NNW
N = 9030.022, E = 14387.869, EL. = 137.71

GENERAL NOTES

1. CONTRACTOR SHALL PROVIDE NOTICE TO UTILITY COMPANIES A MINIMUM OF SEVENTY-TWO (72) HOURS PRIOR TO ANY EXCAVATION, AS FOLLOWS:
   KANSAS ONE-CALL 687-2470
   THE CONTRACTOR SHALL NOTIFY THE FOLLOWING IN CASE OF AN EMERGENCY.

AQUILA NATURAL GAS	800-303-0357 OR 941-1608
SBC TELEPHONE CO.	800-870-8390 OR 268-2245
WESTAR ENERGY	383-8600 OR 261-6512
COX COMMUNICATIONS	262-0661 OR 262-4270
AT&T FIBER OPTIC	800-252-1133 OR 841-5887
CITY OF WICHITA WATER & SEWER	262-6000 OR 268-4908
CITY OF WICHITA TRAFFIC ENG.	268-4448

2. UNDERGROUND UTILITY SERVICE LINES AND OVERHEAD UTILITY POLE LINES ARE TO BE ADJUSTED AS NECESSARY BY OTHER 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. THE CONTRACTOR SHALL NOTIFY PIPELINE COMPANIES AT LEAST 72 HOURS IN ADVANCE OF ANY WORK BEING PERFORMED ACROSS AND/OR ADJACENT TO PIPELINES.
4. THE CONTRACTOR SHALL GIVE ALL PROPERTY OWNERS AND/OR TENANTS OF DEVELOPED PROPERTY ABUTTING THE CONSTRUCTION OF THIS PROJECT A MINIMUM OF TEN (10) DAYS ADVANCE NOTICE PRIOR TO START OF CONSTRUCTION AND AGAIN 48 HOURS PRIOR TO WORKING ADJACENT TO PROPERTY.
5. CONTRACTOR SHALL NOT START WORK ON THE PROJECT UNTIL THE PROJECT INSPECTOR IS ASSIGNED TO THE PROJECT AND IS PRESENT ON THE SITE. ANY WORK DONE WITHOUT INSPECTION WILL BE REQUIRED TO BE UNCOVERED FOR INSPECTION.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING SHOWN 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.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS FLOW OF SEWAGE THROUGH CONSTRUCTION. CONTRACTOR'S PROPOSED METHOD FOR MAINTAINING SEWAGE FLOW SHALL BE APPROVED BY THE ENGINEER. COST OF MAINTAINING FLOW OF SEWAGE THROUGH CONSTRUCTION WILL NOT BE PAID FOR DIRECTLY AND THIS COST OF WORK SHALL BE CONSIDERED AS SUBSIDIARY TO OTHER PAY ITEMS OF WORK.
8. PROPERTIES WITHIN THE PROJECT LIMITS MAY HAVE UNDERGROUND SPRINKLER SYSTEMS IN PUBLIC RIGHT-OF-WAY AND DEDICATED EASEMENTS WHICH CONFLICT WITH NEW CONSTRUCTION. CONTRACTOR WILL BE REQUIRED TO REMOVE SUCH IMPROVEMENTS SHOULD THEY NOT BE REMOVED BY THEIR OWNER AT THE TIME OF CONSTRUCTION OF THE PROJECT. THE CONTRACTOR WILL COORDINATE WITH AND NOTIFY THE CITY OF SPRINKLER SYSTEMS WHICH ARE REQUIRED TO BE REMOVED AND REPAIRED. PORTIONS OF UNDERGROUND SPRINKLER SYSTEMS NOT IN CONFLICT WITH NEW CONSTRUCTION SHALL BE PROTECTED FROM DAMAGE AND SHALL REMAIN IN PLACE.
9. MAILBOXES WITHIN THE LIMITS OF THE PROJECT SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AS APPROVED BY THE ENGINEER. CONTRACTOR WILL BE REQUIRED TO MAKE SATISFACTORY PROVISIONS FOR MAIL DELIVERY TO PROPERTIES AFFECTED BY THIS PROJECT DURING ITS CONSTRUCTION.
10. CONTRACTOR SHALL REMOVE AND RESET ALL FENCES AND SIGNS AS REQ'D FOR CONSTRUCTION. FENCES OR SIGNS WHICH ARE DAMAGED DURING CONSTRUCTION OR DEEMED UNSUITABLE FOR RE-USE BY THE ENGINEER SHALL BE REPLACED WITH NEW FENCE OR SIGN OF SAME TYPE. CONTRACTOR SHALL COORDINATE THIS WORK WITH OWNER.
11. 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.
12. ALL LAWN/TURF AREAS DISTURBED BY CONSTRUCTION OF THE PROPOSED IMPROVEMENTS SHALL BE RESTORED WITH THE SAME GRASS/SOD AS EXISTING. RESTORATION OF DISTURBED AREAS SHALL INCLUDE, BUT NOT BE LIMITED TO, TOP SOIL PREPARATION, SODDING AND/OR RESODDING. ALL SODDING WORK SHALL BE IN ACCORDANCE WITH THE CITY OF WICHITA STANDARD SPECIFICATIONS AND THE CITY OF WICHITA ADMINISTRATIVE REGULATION NO. AR78 WHICH GOVERNS CLEANUP AND RESTORATION OR REPLACEMENT FOLLOWING CONSTRUCTION.
14. THE CONTRACTOR SHALL PREVENT ANY CONSTRUCTION DEBRIS FROM ENTERING THE EXISTING SANITARY SEWER DURING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM ALL MANHOLE COVERS.
16. MANHOLES SHALL BE TYPE "P" MANHOLES. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THE STANDARD DETAIL DRAWINGS.
17. ALL EXISTING WATER LINES AS SHOWN ON PLANS ARE APPROXIMATED FROM RECORD INFORMATION. EXISTING WATER LINES WERE NOT LOCATED FOR THIS PROJECT.
18. PIPING MATERIAL ACCEPTABLE FOR THE FORCE MAIN ON THIS PROJECT IS PVC C905 DR 18 OR HDPE C906 DR 17 (DI OD SIZE). AT ALL LOCATIONS, WHERE PIPE IS INSTALLED BY HORIZONTAL DIRECTIONAL DRILL, THE PIPE SHALL BE HDPE. HDPE PIPE SHALL BE CONNECTED TO PVC WITH MECHANICAL JOINT FITTINGS & ADAPTORS APPROVED BY THE ENGINEER. ANY LOCATION NOT SHOWN ON PLANS WHERE CONTRACTOR CHOOSES TO INSTALL PIPE BY HORIZONTAL DIRECTIONAL DRILL, WITH ENGINEERS APPROVAL, THE COST OF PIPE, FITTINGS, ADAPTORS AND INSTALLATION SHALL BE PAID AS "PIPE IN PLACE".
19. CONTRACTOR TO MAINTAIN/PROVIDE ACCESS TO ALL BUSINESSES & PROPERTIES THROUGH OUT CONSTRUCTION.
20. TESTING OF SEWERS AND MANHOLES SHALL BE CONDUCTED BY THE CONTRACTOR. ALL COST FOR THIS WORK SHALL BE SUBSIDIARY TO OTHER PAY ITEMS OF WORK.
21. CURLEX/EXCELSOR BLANKET OR APPROVED EQUAL SHALL BE INSTALLED AT ALL DISTURBED AREAS REQUIRING SEEDING FOR EROSION CONTROL BMP. INSTALLATION PER MANUFACTURERS RECOMMENDATION. EROSION CONTROL BMP'S SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

NO.	REVISION	DATE	BY

DAVID H. HERBERT LICENSED 16758 6-10-03 KANSAS PROFESSIONAL ENGINEER

WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE 1B
468-83186
FORCE MAIN
KEY MAP & GENERAL NOTES

NEIL D. CABLE, P.E., CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	MEK/KMD
DATE	JUNE 2003
FILE NO.	X1460002
SHEET NO.	2

WILSON & COMPANY
WICHITA, KANSAS

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21ST STREET NORTH

SECTION LINE

BM-2A

HCP/TBM-208

INLET

M.H.

SWS

SS

W

BIKE PATH (BITUM.)

PEDESTRIAN BRIDGE

BIG SLOUGH

3 - 24" COTTONWOOD

3" COTTONWOOD

INSTALL 651.32 LF
16" FORCE MAIN

INSTALL 48.68 LF
16" FORCE MAIN

MATCH LINE STA 7+00.00

REMOVE AND REPLACE
17 LF ASPHALT PVMT
FLOWABLE FILL 21 LF

PROPOSED 25' SANITARY
SEWER ESM'T

INSTALL FORCE MAIN
WARNING SIGN (TYP.)

STA. 0+00.00 MH-1
N = 8914.78 E = 14268.11
CONST TYPE P MH, 5' DIA
OVER EXIST 24" SS
BEGIN 16" FORCE MAIN

154' W of W end of asphalt bridge &
90' S of S curbline of 21st St. N.

PI STA 6+51.32
N = 8929.05 E = 14919.28
INSTALL 45° BEND
DEFLECT 45°00'00" LT

60' S of S face of concrete walk &
33' W of W edge of asphalt road

SEDGWICK COUNTY
ZOO 2ND ADDITION

DE-1678

0 40 80 120
SCALE IN FEET

16" FORCE MAIN

Note: Vertical information not verified.

0 5
SCALE IN FEET

STA 0+00.00
MH-1
TOP EL. 133.20

EX. 24" PVC FL 124.56 (N-S)

PW STA 1+86.00
INSTALL 22.5° BEND
DEFLECT 22°30'18" VERT

PW STA 2+03.44
INSTALL 22.5° BEND
DEFLECT 23°04'36" VERT

PW STA 3+14.14
INSTALL 22.5° BEND
DEFLECT 22°27'38" VERT

PW STA 3+21.77
INSTALL 22.5° BEND
DEFLECT 22°00'14" VERT

CL BIG SLOUGH

CL BIKE PATH

MATCH LINE STA 7+00.00

EXISTING GROUND

FUTURE CHANNEL

FLOWABLE FILL

90° bend
raise line

-1.495%

-43.194%

-0.497%

40.760%

0.300%

TOP 127.80
TOP 126.31
TOP 125.02
TOP 117.50
TOP 117.02
TOP 116.95
TOP 120.06
TOP 120.29
TOP 120.59
TOP 120.89
TOP 121.19

17.41 LF
18" PIPE
@ -43.194%

7.63 LF
16" PIPE
@ 40.760%

186.00 LF 16" PIPE @ -1.495%

110.73 LF 16" PIPE @ -0.497%

378.23 LF 16" PIPE @ 0.300%

0+00 0+50 1+00 1+50 2+00 2+50 3+00 3+50 4+00 4+50 5+00 5+50 6+00 6+50 7+00

150 145 140 135 130 125 120 115 110 105

NO.	REVISION	DATE	BY

DAVID W. HERSBERGER
LICENSED
16758
6-10-03
KANSAS
PROFESSIONAL ENGINEER

WILSON & COMPANY

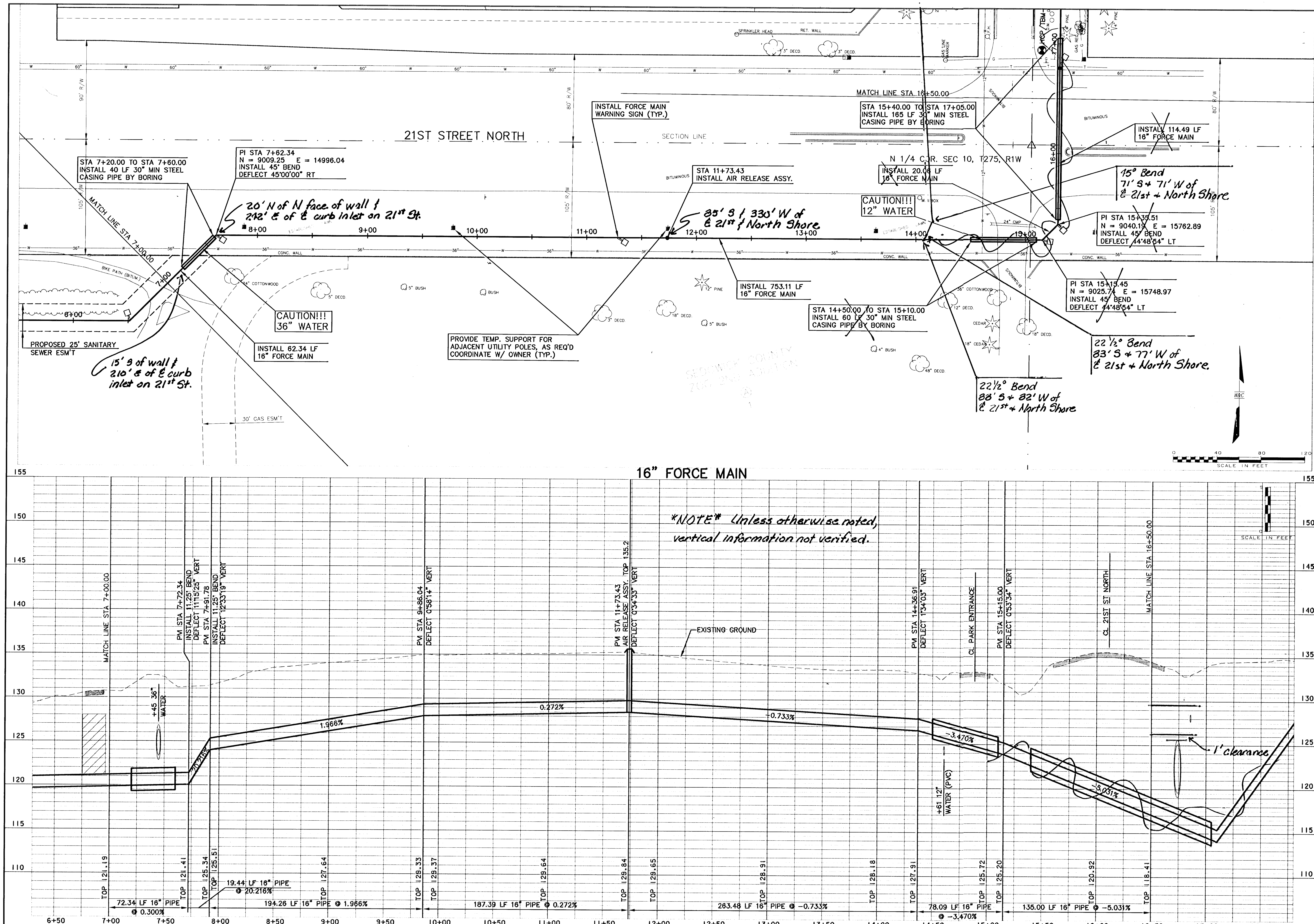
CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 00+00.00 TO STA. 7+00.00

NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB

DRAWN: MEK/KMD
DATE: JUNE 2003
FILE NO.: X1460002
SHEET NO.: 3

WILSON & COMPANY
WICHITA, KANSAS



21ST STREET NORTH
SECTION LINE
MATCH LINE STA 16+50.00
STA 7+20.00 TO STA 7+60.00
INSTALL 40 LF 30" MIN STEEL
CASING PIPE BY BORING
PI STA 7+62.34
N = 9009.25 E = 14996.04
INSTALL 45° BEND
DEFLECT 45°00'00" RT
INSTALL FORCE MAIN
WARNING SIGN (TYP.)
STA 11+73.43
INSTALL AIR RELEASE ASSY.
STA 15+40.00 TO STA 17+05.00
INSTALL 165 LF 30" MIN STEEL
CASING PIPE BY BORING
N 1/4 COR. SEC 10, T27S, R1W
INSTALL 20.00 LF
16" FORCE MAIN
CAUTION!!!
12" WATER
INSTALL 114.49 LF
16" FORCE MAIN
45° Bend
71' S + 71' W of
℄ 21st + North Shore
PI STA 15+35.51
N = 9040.19 E = 15762.89
INSTALL 45° BEND
DEFLECT 44°48'54" LT
PI STA 15+13.45
N = 9025.74 E = 15748.97
INSTALL 45° BEND
DEFLECT 44°48'54" LT
20' N of N face of wall +
212' E of ℄ curb inlet on 21st St.
85' S + 330' W of
℄ 21st + North Shore
MATCH LINE STA 7+00.00
CAUTION!!!
36" WATER
INSTALL 62.34 LF
16" FORCE MAIN
PROVIDE TEMP. SUPPORT FOR
ADJACENT UTILITY POLES, AS REQ'D
COORDINATE W/ OWNER (TYP.)
INSTALL 753.11 LF
16" FORCE MAIN
STA 14+50.00 TO STA 15+10.00
INSTALL 60 LF 30" MIN STEEL
CASING PIPE BY BORING
22 1/2° Bend
83' S + 77' W of
℄ 21st + North Shore.
22 1/2° Bend
88' S + 82' W of
℄ 21st + North Shore
PROPOSED 25' SANITARY
SEWER ESM'T
15' S of wall +
210' E of ℄ curb
inlet on 21st St.
30' GAS ESM'T
CONC. WALL
BIKE PATH (BITUM.)
SCALE IN FEET
16" FORCE MAIN
NOTE Unless otherwise noted,
vertical information not verified.
MATCH LINE STA 7+00.00
PVI STA 7+72.34
INSTALL 11.25° BEND
DEFLECT 11°15'25" VERT
PVI STA 7+91.78
INSTALL 11.25° BEND
DEFLECT 12°33'19" VERT
PVI STA 9+86.04
DEFLECT 0°58'14" VERT
PVI STA 11+73.43
AIR RELEASE ASSY. TOP 135.2
DEFLECT 0°34'33" VERT
EXISTING GROUND
PVI STA 14+36.91
DEFLECT 1°34'03" VERT
CL PARK ENTRANCE
PVI STA 15+15.00
DEFLECT 0°53'34" VERT
CL 21ST ST NORTH
MATCH LINE STA 16+50.00
+45 36" WATER
+61 12" WATER (PVC)
1' clearance
1.966%
0.272%
-0.733%
-3.470%
-5.031%
20.216%
TOP 121.19
TOP 121.41
TOP 125.34
TOP 125.51
TOP 127.64
TOP 129.33
TOP 129.37
TOP 129.64
TOP 129.84
TOP 129.65
TOP 128.91
TOP 128.18
TOP 127.91
TOP 125.72
TOP 125.20
TOP 120.92
TOP 118.41
72.34 LF 16" PIPE @ 0.300%
19.44 LF 16" PIPE @ 20.216%
194.26 LF 16" PIPE @ 1.966%
187.39 LF 16" PIPE @ 0.272%
263.48 LF 16" PIPE @ -0.733%
78.09 LF 16" PIPE @ -3.470%
135.00 LF 16" PIPE @ -5.031%
6+50
7+00
7+50
8+00
8+50
9+00
9+50
10+00
10+50
11+00
11+50
12+00
12+50
13+00
13+50
14+00
14+50
15+00
15+50
16+00
16+50
17+00
17+50
155
150
145
140
135
130
125
120
115
110

WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 7+00.00 TO STA. 16+50.00
NEIL D. CABLE P.E. - CITY ENGINEER

DAVID N. HERBERGER
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KANSAS
PROFESSIONAL ENGINEER

DESIGN DWH	CHECKED WOB
DRAWN MEK/KMD	
DATE JUNE 2003	
FILE NO. X1460002	
SHEET NO. 4	

WILSON & COMPANY
WICHITA, KANSAS

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45° Bend
125' N + 85' W of
E 21st + North Shore

CAUTION!!!
10" GAS

45° Restrained bend
48' S of S line of drive
& 10' E of back of curb

See Previous Sheet

21ST STREET NORTH

N 1/4 COR. SEC 10, T27S, R1W

MATCH LINE STA 16+50.00

STA 18+15.00 TO STA 18+75.00
60 LF HORIZ DIRECTIONAL DRILL
60 LF HDPE PIPE

20' S of S line to 22' N of N line
STA 20+30.00 TO STA 21+35.00
105 LF HORIZ DIRECTIONAL DRILL
105 LF HDPE PIPE

NORTH SHORE BOULEVARD

60' N of N line of drive, 10' E of back of curb
STA 21+77.24
INSTALL AIR RELEASE ASSY

Moved line to 10' E of back of curb

INSTALL 979.99 LF
16" FORCE MAIN

PROVIDE TEMP. SUPPORT FOR
ADJACENT UTILITY POLES, AS REQ'D
COORDINATE W/ OWNER (TYP.)

PI STA 28+29.99
N = 10134.54 E = 15745.99
DEFLECT 01°42'57" RT

Moved line to
10' E of back
of curb.

INSTALL 70.01 LF
16" FORCE MAIN

HCP/TBM-207

PROTECT ADJACENT
GAS REGULATOR
STATION

TELEPHONE PEDESTAL TO BE
RELOCATED BY SWB,
CONTRACTOR TO COORDINATE

CAUTION!!!
60" WATER

PROTECT ADJACENT WATER
VALVE AND HYDRANT AS
REQ'D. COORDINATE W/
CITY (TYP.)

INSTALL FORCE MAIN
WARNING SIGN (TYP.)

PROTECT SPRINKLER
SYSTEM CONTROLS (TYP.)

LIGHTHOUSE COVE

MATCH LINE STA 27+00.00

NOTE:
UNDERGROUND SPRINKLER SYSTEM
EXISTS IN AREA OF CONSTRUCTION
ADJACENT TO NORTH SHORE BLVD.

SCALE IN FEET
0 40 80 120

16" FORCE MAIN

NOTE Vertical information not verified.

MATCH LINE STA 16+50.00
+74 60" WATER (PCCP)
+80 UGT
+86 10" GAS (STEEL)
PVI STA 17+10.00
INSTALL 11.25° BEND
DEFLECT 12°45'11" VERT
PVI STA 17+85.73
INSTALL 11.25° BEND
DEFLECT 9°25'09" VERT
CL DRIVE
+66 8" WATER (PVC)
+40 UGE
CL LIGHTHOUSE COVE
PVI STA 21+38.38
INSTALL 11.25° BEND
DEFLECT 11°06'35" VERT
PVI STA 21+53.59
INSTALL 11.25° BEND
DEFLECT 11°06'33" VERT
PVI STA 21+77.24
AIR RELEASE ASSY. TOP 135.5
DEFLECT 12°9'16" VERT
PVI STA 22+38.00
DEFLECT 11°9'09" VERT
MATCH LINE STA 27+00.00
EXISTING GROUND
0.211%
-2.386%
-0.084%
0.210%
17.404%
HORIZ DIRECTIONAL DRILL
HORIZ DIRECTIONAL DRILL
+64 42" SWS (RCP)
+27 8" WATER (PVC)
+08 10" SS (PVC)
See previous sheet

60 LF 16" PIPE @ -5.031%
75.73 LF 16" PIPE @ 17.404%
352.65 LF 16" PIPE @ 0.210%
15.21 LF 16" PIPE @ 19.855%
23.65 LF 16" PIPE @ 0.211%
60.76 LF 16" PIPE @ -2.386%
462.00 LF 16" PIPE @ -0.084%

TOP 118.41 | TOP 115.89 | TOP 115.39 | TOP 128.57 | TOP 128.60 | TOP 128.81 | TOP 129.02 | TOP 129.23 | TOP 129.31 | TOP 132.33 | TOP 132.38 | TOP 131.84 | TOP 130.93 | TOP 130.88 | TOP 130.79 | TOP 130.71 | TOP 130.63 | TOP 130.54

16+00 16+50 17+00 17+50 18+00 18+50 19+00 19+50 20+00 20+50 21+00 21+50 22+00 22+50 23+00 23+50 24+00 24+50 25+00 25+50 26+00 26+50 27+00

155 150 145 140 135 130 125 120 115 110

SCALE IN FEET
0 5 10

DAVID W. HERBERGER
LICENSED
PROFESSIONAL ENGINEER
16758
6-10-03
KANSAS

NO.	REVISION	DATE	BY

WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 16+50.00 TO STA. 27+00.00
NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	MEK/KMD
DATE	JUNE 2003
FILE NO.	X1460002
SHEET NO.	5

WILSON & COMPANY
WICHITA, KANSAS

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PI STA 28+37.37
N = 10341.89 E = 15749.00
DEFLECT 1°08'05" LT

PROVIDE TEMP SUPPORT FOR ADJACENT TELEPHONE PEDESTALS AS REQ'D COORDINATE W/ OWNER (TYP)

SAND PLUM

CLEAR MEADOW

HAZELWOOD COURT

HCP/TBM-206

REMOVE AND RESET SIGN, AS REQ'D

NORTH SHORE BOULEVARD

INSTALL 791.35 LF 16" FORCE MAIN

PROVIDE TEMP SUPPORT FOR ADJACENT UTILITY POLES, AS REQ'D COORDINATE W/ OWNER (TYP)

HCP/TBM-205

PROTECT SPRINKLER SYSTEM CONTROLS AND METERING EQUIPMENT

MATCH LINE STA 38+00.00

MATCH LINE STA 27+00.00

LIGHTHOUSE COVE

INSTALL 137.37 LF 16" FORCE MAIN

CAUTION!!! 2" GAS

~~STA 28+40.00 TO STA 29+20.00~~
80 LF HORIZ DIRECTIONAL DRILL
80 LF HDPE PIPE

2.0' S of S line of drive to 30' N of N line of drive, 10' back of curb

CAUTION!!! 2" GAS

STA 30+65.00 TO 31+55.00
90 LF HORIZ DIRECTIONAL DRILL
90 LF HDPE PIPE

STA 32+25.00 TO STA 33+15.00
90 LF HORIZ. DIRECTIONAL DRILL
90 LF HDPE PIPE

INSTALL FORCE MAIN WARNING SIGN (TYP.)

NOTE: Line moved to 10' E of back of curb.

~~STA 34+55.00 TO STA 35+50.00~~
95 LF HORIZ. DIRECTIONAL DRILL
95 LF HDPE PIPE

27' S of S line of drive to 25' N of N line of drive, 10' back of curb.

INSTALL 171.28 LF 16" FORCE MAIN

PI STA 36+28.72
N = 11133.24 E = 15744.81
DEFLECT 0°27'45" LT

NOTE:
UNDERGROUND SPRINKLER SYSTEM EXISTS IN AREA OF CONSTRUCTION ADJACENT TO NORTH SHORE BLVD.

SCALE IN FEET 0 40 80 120

16" FORCE MAIN

NOTE Vertical information not verified.

SCALE IN FEET 0

MATCH LINE STA 27+00.00
+01 2" GAS
PVI STA 28+10.00
DEFLECT 0°41'48" VERT
+46 UGT (100 PR)
+61 8" WATER (PVC)
+60 CATV
+63 UGE
CL LIGHTHOUSE COVE
+16 10" SS (PVC)
PVI STA 30+25.00
DEFLECT 0°50'34" VERT
+44 8" SS (PVC)
+43 2" GAS (PE)
CL DRIVE
CL DRIVE
EXISTING GROUND
+26 OHE
CL DRIVE
+37 4" WATER (PVC)
PVI STA 35+56.05
INSTALL 11.25° BEND
DEFLECT 11°10'58" VERT
PVI STA 35+78.74
INSTALL 11.25° BEND
DEFLECT 10°50'18" VERT
MATCH LINE STA 38+00.00

-0.084%
-1.300%
0.171%
0.772%
19.947%

HORIZ DIRECTIONAL DRILL
HORIZ DIRECTIONAL DRILL
HORIZ DIRECTIONAL DRILL
SS MH 7'± RT

TOP 130.54
TOP 130.46
TOP 130.45
TOP 129.28
TOP 127.98
TOP 127.66
TOP 127.79
TOP 127.96
TOP 128.13
TOP 128.30
TOP 128.47
TOP 128.57
TOP 135.09
TOP 135.25
TOP 134.03
TOP 134.80

110.00 LF 16" PIPE @ 0.084%
215.00 LF 16" PIPE @ -1.300%
531.05 LF 16" PIPE @ 0.171%
22.66 LF 16" PIPE @ 19.947%
221.29 LF 16" PIPE @ 0.772%

26+66.50 27+00 27+50 28+00 28+50 29+00 29+50 30+00 30+50 31+00 31+50 32+00 32+50 33+00 33+50 34+00 34+50 35+00 35+50 36+00 36+50 37+00 37+50 38+00

150 145 140 135 130 125 120 115 110 105

NO.	REVISION	DATE	BY

DAVID W. HERBERT
LICENSED
16758
6-10-03
KANSAS
PROFESSIONAL ENGINEER

WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 27+00.00 TO STA. 38+00.00

NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	MEK/KMD
DATE	JUNE 2003
FILE NO.	X1460002
SHEET NO.	6

WILSON & COMPANY
WICHITA, KANSAS

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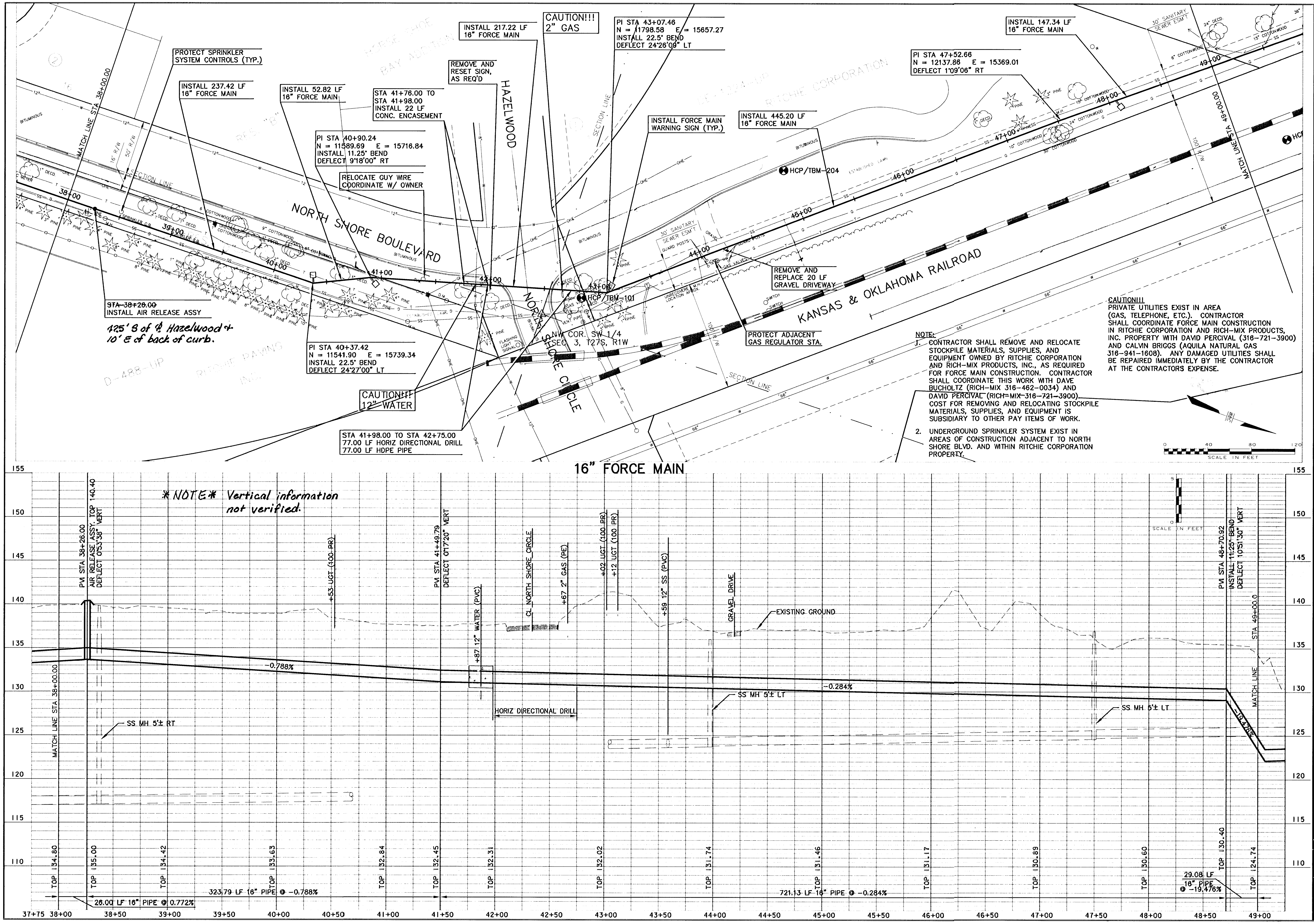


PROTECT SPRINKLER SYSTEM CONTROLS (TYP.)
INSTALL 237.42 LF 16" FORCE MAIN
INSTALL 52.82 LF 16" FORCE MAIN
STA 41+76.00 TO STA 41+98.00 INSTALL 22 LF CONC. ENCASEMENT
REMOVE AND RESET SIGN, AS REQ'D
INSTALL 217.22 LF 16" FORCE MAIN
CAUTION!!! 2" GAS
PI STA 43+07.46 N = 11798.58 E = 15657.27 INSTALL 22.5° BEND DEFLECT 24°26'09" LT
INSTALL FORCE MAIN WARNING SIGN (TYP.)
INSTALL 445.20 LF 16" FORCE MAIN
PI STA 47+52.66 N = 12137.86 E = 15369.01 DEFLECT 1°09'06" RT
INSTALL 147.34 LF 16" FORCE MAIN
PI STA 40+90.24 N = 11589.69 E = 15716.84 INSTALL 11.25° BEND DEFLECT 9°18'00" RT
RELOCATE GUY WIRE COORDINATE W/ OWNER
HAZELWOOD
NORTH SHORE BOULEVARD
NORTH SHORE CIRCLE
KANSAS & OKLAHOMA RAILROAD
RITCHIE CORPORATION
HCP/TBM-204
HCP/TBM-101
NW COR. SW 1/4 SEC. 3, T27S, R1W
STA 38+26.00 INSTALL AIR RELEASE ASSY
125' S of ℄ Hazelwood + 10' E of back of curb.
PI STA 40+37.42 N = 11541.90 E = 15739.34 INSTALL 22.5° BEND DEFLECT 24°27'00" LT
CAUTION!!! 12" WATER
STA 41+98.00 TO STA 42+75.00 77.00 LF HORIZ DIRECTIONAL DRILL 77.00 LF HDPE PIPE
REMOVE AND REPLACE 20 LF GRAVEL DRIVEWAY
PROTECT ADJACENT GAS REGULATOR STA.
30' SANITARY SEWER ESM'T
MATCH LINE STA 38+00.00
MATCH LINE STA 49+00.00
CAUTION!!! PRIVATE UTILITIES EXIST IN AREA (GAS, TELEPHONE, ETC.). CONTRACTOR SHALL COORDINATE FORCE MAIN CONSTRUCTION IN RITCHIE CORPORATION AND RICH-MIX PRODUCTS, INC. PROPERTY WITH DAVID PERCIVAL (316-721-3900) AND CALVIN BRIGGS (AQUILA NATURAL GAS 316-941-1608). ANY DAMAGED UTILITIES SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT THE CONTRACTORS EXPENSE.
NOTE:
1. CONTRACTOR SHALL REMOVE AND RELOCATE STOCKPILE MATERIALS, SUPPLIES, AND EQUIPMENT OWNED BY RITCHIE CORPORATION AND RICH-MIX PRODUCTS, INC., AS REQUIRED FOR FORCE MAIN CONSTRUCTION. CONTRACTOR SHALL COORDINATE THIS WORK WITH DAVE BUCHOLTZ (RICH-MIX 316-462-0034) AND DAVID PERCIVAL (RICH-MIX 316-721-3900) COST FOR REMOVING AND RELOCATING STOCKPILE MATERIALS, SUPPLIES, AND EQUIPMENT IS SUBSIDIARY TO OTHER PAY ITEMS OF WORK.
2. UNDERGROUND SPRINKLER SYSTEM EXIST IN AREAS OF CONSTRUCTION ADJACENT TO NORTH SHORE BLVD. AND WITHIN RITCHIE CORPORATION PROPERTY.
SCALE IN FEET
16" FORCE MAIN
NOTE Vertical information not verified.
PVI STA 38+26.00 AIR RELEASE ASSY. TOP 140.40 DEFLECT 0°53'38" VERT
PVI STA 41+49.79 DEFLECT 0°17'20" VERT
PVI STA 48+70.92 INSTALL 11.25° BEND DEFLECT 10°51'30" VERT
+53 UGT (100 PR)
+87 12" WATER (PVC)
CL NORTH SHORE CIRCLE
+67 2" GAS (PE)
+02 UGT (100 PR)
+12 UGT (100 PR)
+59 12" SS (PVC)
GRAVEL DRIVE
EXISTING GROUND
-0.788%
-0.284%
-19.476%
SS MH 5'± RT
SS MH 5'± LT
HORIZ DIRECTIONAL DRILL
TOP 134.80
TOP 135.00
TOP 134.42
TOP 133.63
TOP 132.84
TOP 132.45
TOP 132.31
TOP 132.02
TOP 131.74
TOP 131.46
TOP 131.17
TOP 130.89
TOP 130.60
TOP 130.40
TOP 124.74
26.00 LF 16" PIPE @ 0.772%
323.79 LF 16" PIPE @ -0.788%
721.13 LF 16" PIPE @ -0.284%
29.08 LF 16" PIPE @ -19.476%
155
150
145
140
135
130
125
120
115
110
37+75
38+00
38+50
39+00
39+50
40+00
40+50
41+00
41+50
42+00
42+50
43+00
43+50
44+00
44+50
45+00
45+50
46+00
46+50
47+00
47+50
48+00
48+50
49+00

NO.	REVISION	DATE	BY

DAVID W. HERBERGER LICENSED 16758 6-10-03 KANSAS PROFESSIONAL ENGINEER

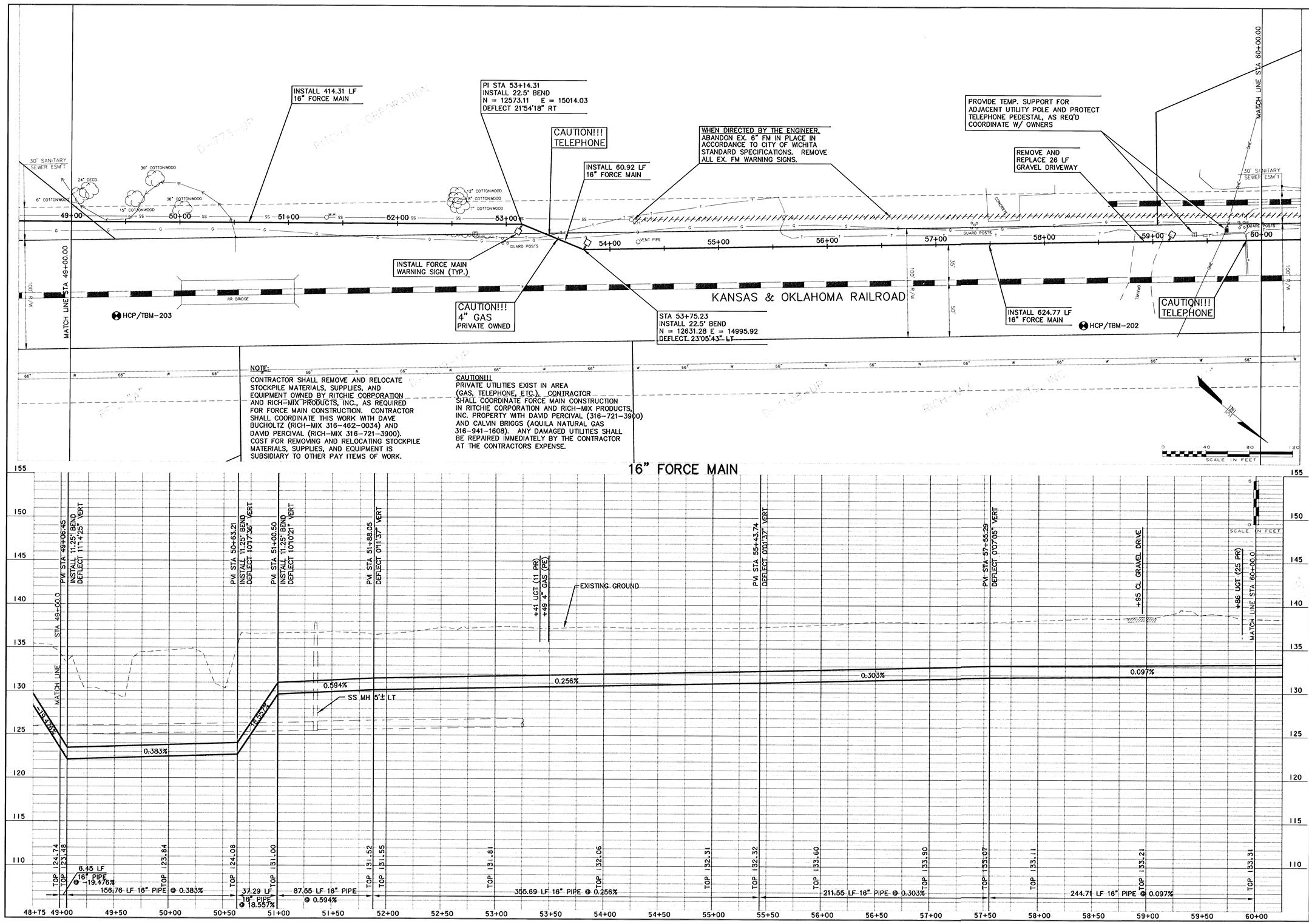
WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 38+00.00 TO STA. 49+00.00

NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN MEK/KMD	
DATE JUNE 2003	
FILE NO. X1460002	
SHEET NO. 7	

WILSON & COMPANY
WICHITA, KANSAS



NOTE:
CONTRACTOR SHALL REMOVE AND RELOCATE STOCKPILE MATERIALS, SUPPLIES, AND EQUIPMENT OWNED BY RITCHIE CORPORATION AND RICH-MIX PRODUCTS, INC., AS REQUIRED FOR FORCE MAIN CONSTRUCTION. CONTRACTOR SHALL COORDINATE THIS WORK WITH DAVE BUCHOLTZ (RICH-MIX 316-462-0034) AND DAVID PERCIVAL (RICH-MIX 316-721-3900). COST FOR REMOVING AND RELOCATING STOCKPILE MATERIALS, SUPPLIES, AND EQUIPMENT IS SUBSIDIARY TO OTHER PAY ITEMS OF WORK.

CAUTION!!!
PRIVATE UTILITIES EXIST IN AREA (GAS, TELEPHONE, ETC.). CONTRACTOR SHALL COORDINATE FORCE MAIN CONSTRUCTION IN RITCHIE CORPORATION AND RICH-MIX PRODUCTS, INC. PROPERTY WITH DAVID PERCIVAL (316-721-3900) AND CALVIN BRIGGS (AQUILA NATURAL GAS 316-941-1608). ANY DAMAGED UTILITIES SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT THE CONTRACTORS EXPENSE.

16" FORCE MAIN

NO.	REVISION	DATE	BY

DAVID W. HERBSTRITT
LICENSED
16758
6-10-03
KANSAS
PROFESSIONAL ENGINEER

WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 49+00.00 TO STA. 60+00.00

NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	MEK/KMD
DATE	JUNE 2003
FILE NO.	X1460002
SHEET NO.	8

WILSON & COMPANY
WICHITA, KANSAS

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MATCH LINE STA 60+00.00

30' SANITARY SEWER ESM'T

WHEN DIRECTED BY THE ENGINEER, ABANDON EX. 6" FM IN PLACE IN ACCORDANCE TO CITY OF WICHITA STANDARD SPECIFICATIONS. REMOVE ALL EX. FM WARNING SIGNS.

STA 64+86.00 TO STA 66+30.00
INSTALL 144 LF OF 30" MIN STEEL CASING PIPE BY BORING

STA 70+68.37
INSTALL AIR RELEASE ASSY

REMOVE AND RESET
15' LF FENCE AS REQ'D

MATCH LINE STA 71+00.00

30' SANITARY SEWER ESM'T

14" COTTONWOOD

12" COTTONWOOD

14" ELM

CONC.

GUARD POSTS

60+00 61+00 62+00 63+00 64+00 65+00 66+00 67+00 68+00 69+00 70+00 71+00

100' R/W

35'

50'

INSTALL FORCE MAIN WARNING SIGN (TYP.)

INSTALL 987.49 LF 16" FORCE MAIN

KANSAS & OKLAHOMA RAILROAD

HCP/TBM-201

SWITCH

STA 69+87.49
INSTALL 11.25° BEND
N = 13859.25 E = 13951.19
DEFLECT 11°14'26" LT

INSTALL 112.51 LF 16" FORCE MAIN

66' W

SCALE IN FEET 0 40 80 120

NOTE:
CONTRACTOR SHALL REMOVE AND RELOCATE STOCKPILE MATERIALS, SUPPLIES, AND EQUIPMENT OWNED BY RITCHIE CORPORATION AND RICH-MIX PRODUCTS, INC., AS REQUIRED FOR FORCE MAIN CONSTRUCTION. CONTRACTOR SHALL COORDINATE THIS WORK WITH DAVE BUCHOLTZ (RICH-MIX 316-462-0034) AND DAVID PERCIVAL (RICH-MIX 316-721-3900). COST FOR REMOVING AND RELOCATING STOCKPILE MATERIALS, SUPPLIES, AND EQUIPMENT IS SUBSIDIARY TO OTHER PAY ITEMS OF WORK.

CAUTION!!!
PRIVATE UTILITIES EXIST IN AREA (GAS, TELEPHONE, ETC.). CONTRACTOR SHALL COORDINATE FORCE MAIN CONSTRUCTION IN RITCHIE CORPORATION AND RICH-MIX PRODUCTS, INC. PROPERTY WITH DAVID PERCIVAL (316-721-3900) AND CALVIN BRIGGS (AQUILA NATURAL GAS 316-941-1608). ANY DAMAGED UTILITIES SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT THE CONTRACTORS EXPENSE.

16" FORCE MAIN

MATCH LINE STA 60+00.0

+71 CL RR SPUR

PM STA 70+68.37
AIR RELEASE ASSY. TOP 139.7
DEFLECT 1°08'12" VERT

MATCH LINE STA 71+00.0

0.097%

-1.887%

TOP 133.31 TOP 133.40 TOP 133.50 TOP 133.60 TOP 133.70 TOP 133.79 TOP 133.89 TOP 133.99 TOP 134.08 TOP 134.18 TOP 134.28 TOP 134.34 TOP 133.74

1068.37 LF 16" PIPE @ 0.097%

31.83 LF 16" PIPE @ -1.887%

155 150 145 140 135 130 125 120 115 110

59+75 60+00 60+50 61+00 61+50 62+00 62+50 63+00 63+50 64+00 64+50 65+00 65+50 66+00 66+50 67+00 67+50 68+00 68+50 69+00 69+50 70+00 70+50 71+00

SCALE IN FEET 0 5

NO.	REVISION	DATE	BY

DAVID W. HERRSTROM LICENSED PROFESSIONAL ENGINEER 16758 6-10-03 KANSAS

WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN PLAN & PROFILE
STA. 60+00.00 TO STA. 71+00.00

NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	MEK/KMD
DATE	JUNE 2003
FILE NO.	X1460002
SHEET NO.	9

WILSON & COMPANY WICHITA, KANSAS

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INSTALL 91.78 LF 16" FORCE MAIN

PI STA 71+91.78
N = 13986.05 E = 13791.03
INSTALL 11°25' BEND
DEFLECT 11°15'34" RT

WHEN DIRECTED BY THE ENGINEER ABANDON EX. 6" FM IN PLACE IN ACCORDANCE TO CITY OF WICHITA STANDARD SPECIFICATIONS. REMOVE ALL EX. FM WARNING SIGNS.

REMOVE AND REPLACE 100 LF GRAVEL DRIVEWAY

REMOVE AND REPLACE 50 LF GRAVEL DRIVEWAY

INSTALL 356.21 LF 16" FORCE MAIN

PI STA 75+47.99
N = 14257.43 E = 13560.29
INSTALL 45° BEND
DEFLECT 45°00'00" RT

INSTALL 20.00 LF 16" FORCE MAIN

PI STA 75+67.99
N = 14277.36 E = 13561.91
INSTALL 45° BEND
DEFLECT 42°10'06" RT

29TH STREET NORTH

CAUTION!!! TELEPHONE

INSTALL 173.16 LF 16" FORCE MAIN

CAUTION!!! AT&T FIBER OPTIC

CAUTION!!! TELEPHONE

NOTE:
UNDERGROUND SPRINKLER SYSTEM EXIST IN AREAS OF CONSTRUCTION ADJACENT TO 29TH ST. N.

MATCH LINE STA 71+00.00

INSTALL FORCE MAIN WARNING SIGN (TYP.)

STA 75+75.00 TO STA 77+17.00
INSTALL 142 LF 30" MIN STEEL CASING PIPE BY BORING

CAUTION!!! 66" WATER

CAUTION!!! 16" WATER

KANSAS & OKLAHOMA RAILROAD

CAUTION!!! ELECTRIC

HCP / TBM-200

GUY WIRE TO BE RELOCATED BY COX. CONTRACTOR TO COORDINATE

PI STA 77+41.15
N = 14395.91 E = 13688.13
DEFLECT 3°00'00" LT
WHEN DIRECTED BY THE ENGINEER REMOVE EX. 6"X12" MJ REDUCER (PHASE 1A) AND CONNECT WITH 12"X16" MJ CONCENTRIC REDUCER. ABANDON EX. 6"ø FM (S) END 16" FORCE MAIN

PROJECT
PHASE 1A

CAUTION!!! 4" GAS

INSTALL 27.7 LF 10" PIPE

PUMP STATION SITE

STA 0+64.5 MH-2
CONST TYPE P MH, 4' DIA SLEEP
EXIST. 10" SS. PLUG AND ABANDON IN PLACE 10" SEWER (W)

LINE 1

STA 0+00.0
N = 14413.46 E = 13732.94
BEGIN GRAVITY SEWER LINE 1

PROPOSED 15' SANITARY

GRAVITY SEWER LINE 1
SEE SHEET NO 11

INSTALL 38.8 LF 10" PIPE

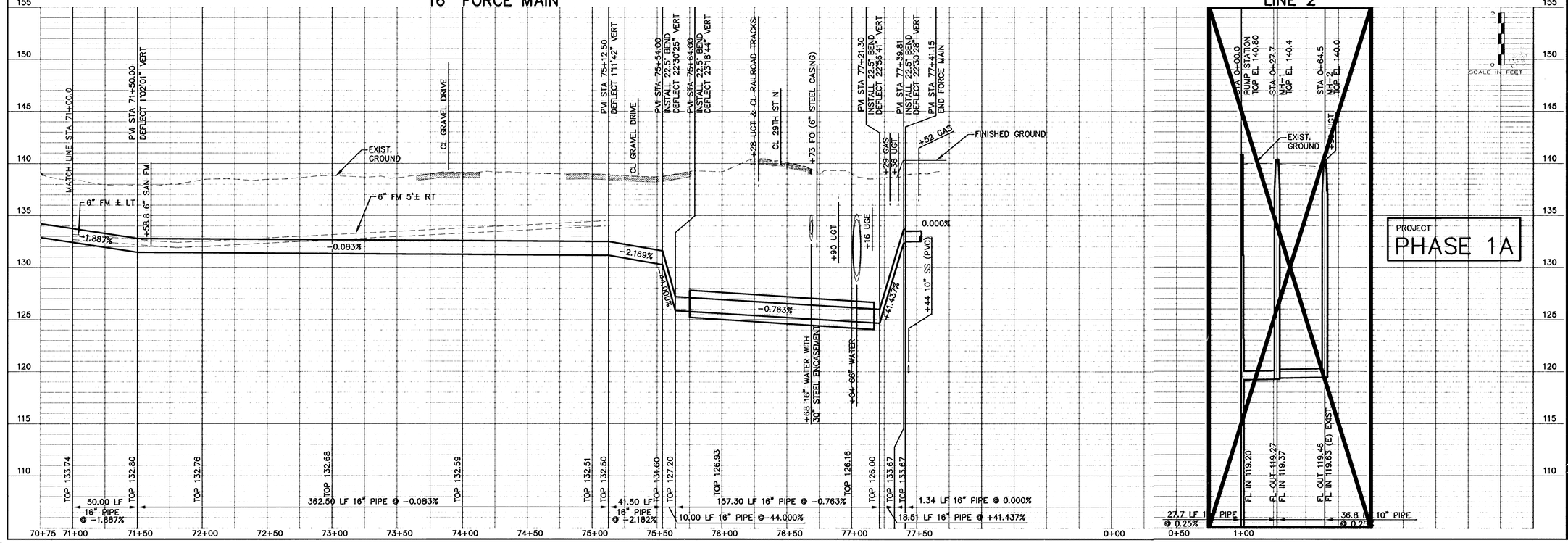
STA 0+27.7 MH-1
N = 14419.73 E = 13760.60
CONST TYPE P MH, 4' DIA

16" FORCE MAIN

LINE 2

SCALE IN FEET

PROJECT
PHASE 1A



NO.	REVISION	DATE	BY

DAVID W. HERBERGER LICENSED ENGINEER 16758 6-10-03 KANSAS PROFESSIONAL ENGINEER

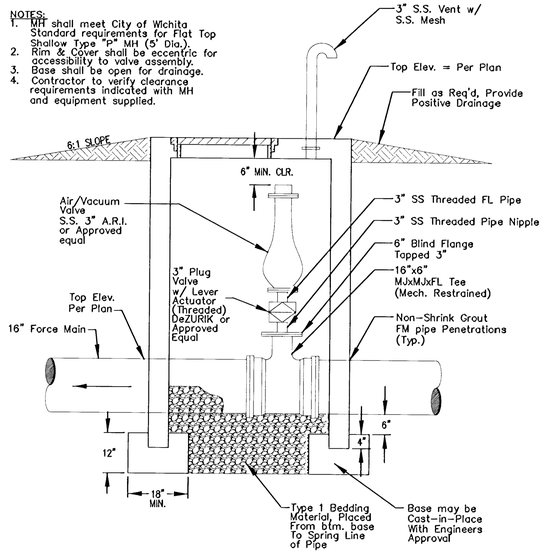
WILSON & COMPANY

CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE 1B
468-83186
FORCE MAIN PLAN & PROFILE
STA. 71+00.00 TO STA. 77+67.15

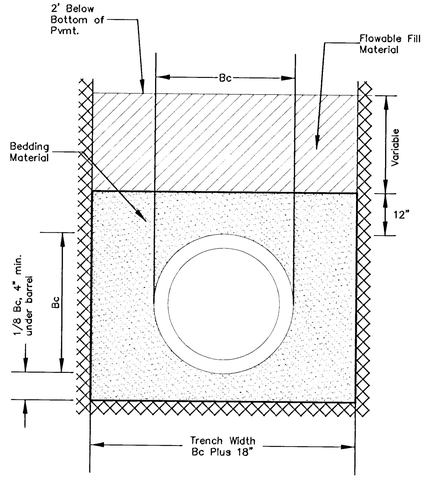
NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	MEK/KMD
DATE	JUNE 2003
FILE NO.	X1460002
SHEET NO.	10

WILSON & COMPANY
WICHITA, KANSAS

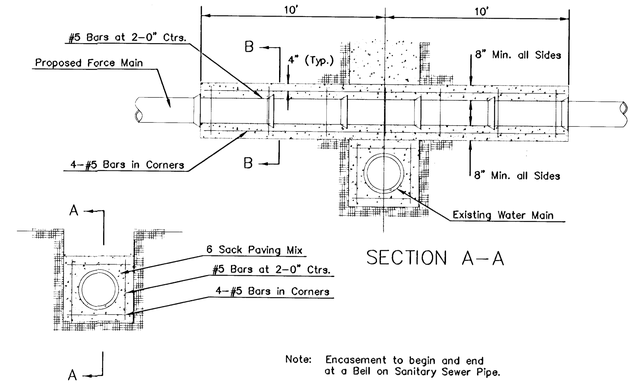


AIR RELEASE VALVE ASSEMBLY



Note: Length as req'd per City specification, Flowable fill req'd at all open trenched paved road crossings.

DETAIL OF FLOWABLE FILL FOR SANITARY SEWER PIPE & * WATER LINE.



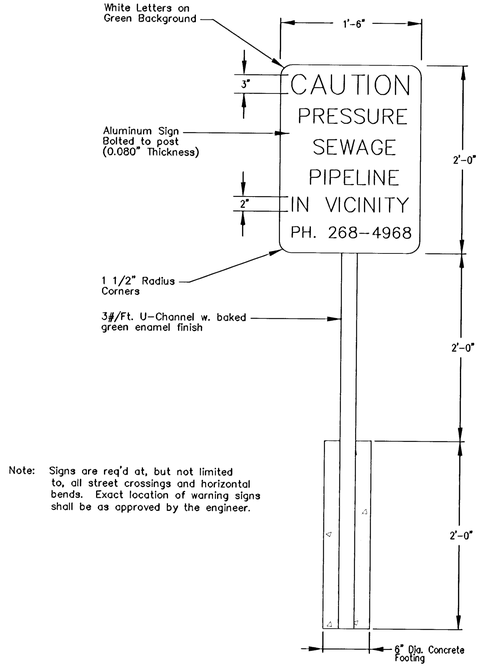
SECTION A-A

SECTION B-B

Note: Encasement to begin and end at a Bell on Sanitary Sewer Pipe.

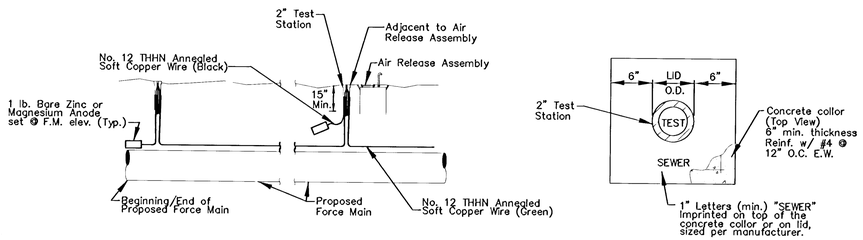
REINFORCED CONCRETE ENCASEMENT OF SANITARY SEWER *

~~COST IS SUBSIDIARY TO PIPE INSTALLATION~~



Note: Signs are req'd at, but not limited to, all street crossings and horizontal bends. Exact location of warning signs shall be as approved by the engineer.

FORCE MAIN WARNING SIGN DETAIL



TRACER WIRE

Conductive type pipe locator/tracer wire shall be installed to locate all force main pipe regardless of pipe material. The wire shall extend the entire length of the proposed pipe. The wire shall be taped to the force main and pulled with the pipe. Split-bolt connectors shall be used at splice locations. Electrical tape shall cover all splices so no bare wire is exposed. Test stations shall be installed adjacent to all air release assemblies along the force main and near the ends of the force main. Intermediate locator stations may be required as directed by the Engineer. Any exceptions to the location of test stations shall be approved by the engineer. At each test station, the tracer wire shall be connected to a 1 lb. Zinc or magnesium anode. Anodes shall also be attached to the tracer wire at both the beginning and the end of the proposed force main. A typical layout of the tracer wire and test station is provided in the above figure.

WIRE

The tracer wire shall be Green No. 12 THHN annealed soft copper wire with thermal plastic insulation. The insulation shall be heat, oil, and gasoline resistant as manufactured by Temple Electric or approved equal. To allow for grade adjustment, a minimum of 12" of excess wire shall be coiled at the bottom of the test station for all wires. The insulation sheathing shall be removed such that 1" bare copper wire is exposed at all points of connection.

TEST STATIONS

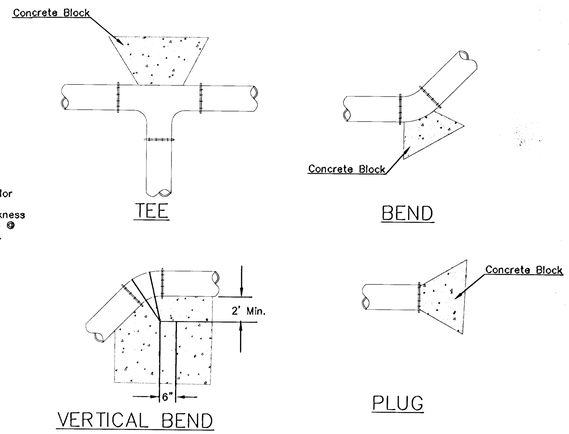
The test station shall be 2 inch flush style test station T2PS3C as manufactured by HANDLEY Industries or approved equal. All test stations shall be manufactured using molded green tops or sufficiently coated with green enamel paint. The tracer wire and the anode wire shall be installed to allow 10 inches of wire within the test station. The location of all test stations shall be approved by the engineer, recorded, and shown in the as-built drawings.

ANODES

The anodes shall be 1 lb. bare zinc or magnesium. The anodes shall be buried at the same elevation as the force main at each test station. The anodes shall be connected to Black No. 12 THHN annealed soft copper wire which shall be extended to the test station.

TRACER WIRE DETAIL *

COST IS SUBSIDIARY TO PIPE INSTALLATION



PIPE SIZE	THRUST AT FITTINGS IN TONS-AT 150psi/in² P					
	PLUG	90°	45°	22 1/2°	11 1/4°	TEE
6"	2.8	3.95	2.15	1.09	.55	2.8
8"	4.9	6.95	3.75	1.90	.96	4.9
12"	11.4	16.1	8.75	4.45	2.25	11.4
16"	20.15	28.5	15.4	7.85	3.95	20.15
20"	31.15	44.0	23.85	12.15	6.10	31.15
24"	44.55	63.0	34.1	17.4	8.75	44.55

Note: Thrust Blocking is required at all fittings and shall meet City of Wichita water specifications.

TYPICAL THRUST BLOCKS *

COST IS SUBSIDIARY TO PIPE INSTALLATION

* BASED FROM CITY OF WICHITA STANDARD

NO.	REVISION	DATE	BY

DAVID W. HERGERT LICENSED KANSAS PROFESSIONAL ENGINEER 16758 6-10-03

WILSON & COMPANY

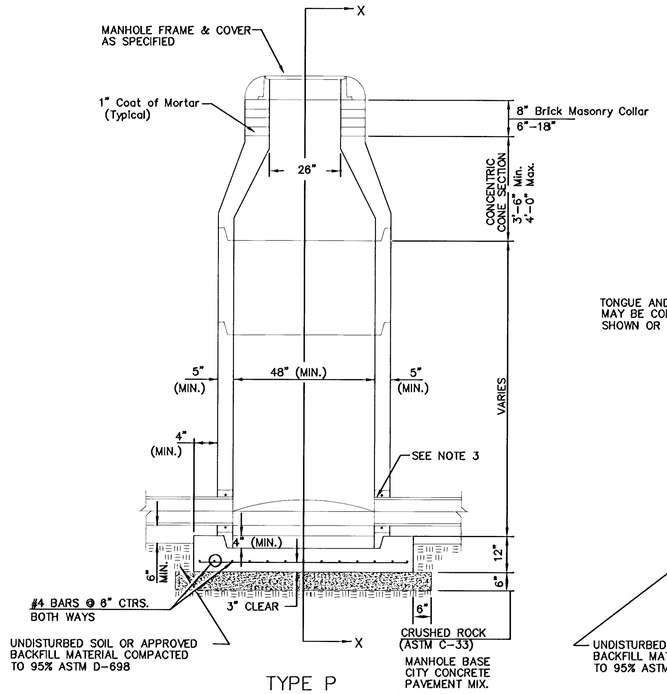
CITY OF WICHITA, KANSAS
MAIN 19 SW INTERCEPTOR SEWER PHASE IB
468-83186
FORCE MAIN
MISCELLANEOUS DETAILS
NEIL D. CABLE P.E. - CITY ENGINEER

DESIGN	CHECKED
DWH	WOB
DRAWN	
KMD	
DATE	
JUNE 2003	
FILE NO.	
X1460002	
SHEET NO.	
21	

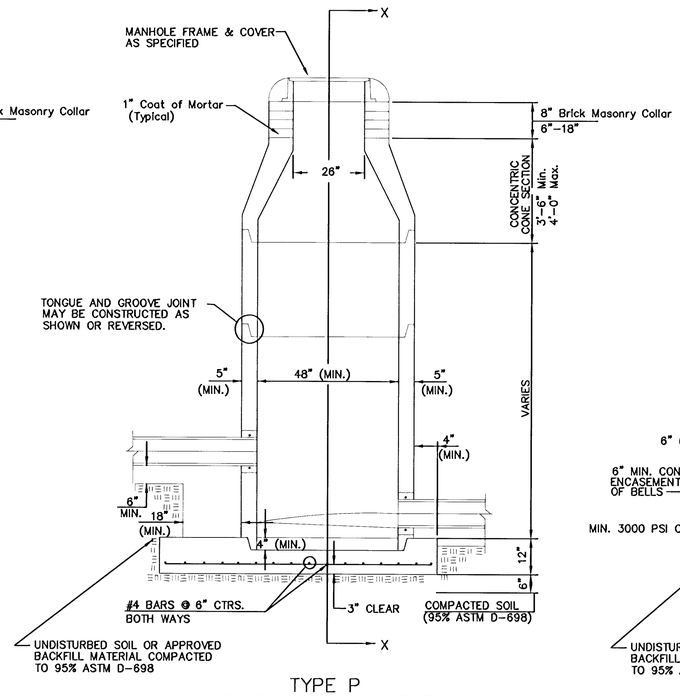
WILSON & COMPANY
WICHITA, KANSAS

P:\X1460002.Wichita\CADD\468-83186 PH 1B\Drawings\Sht 21.dwg, FM SHT 21, 06/09/2003 04:28:46 PM

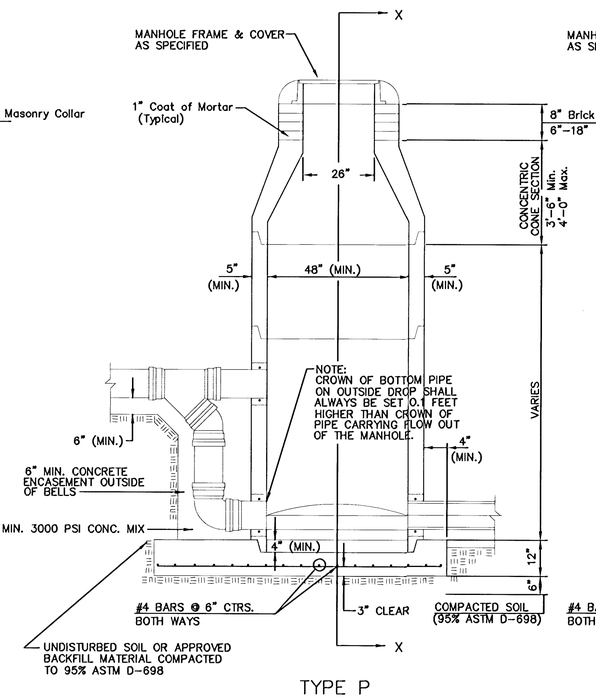
SEWER APPURTENANCES DETAILS



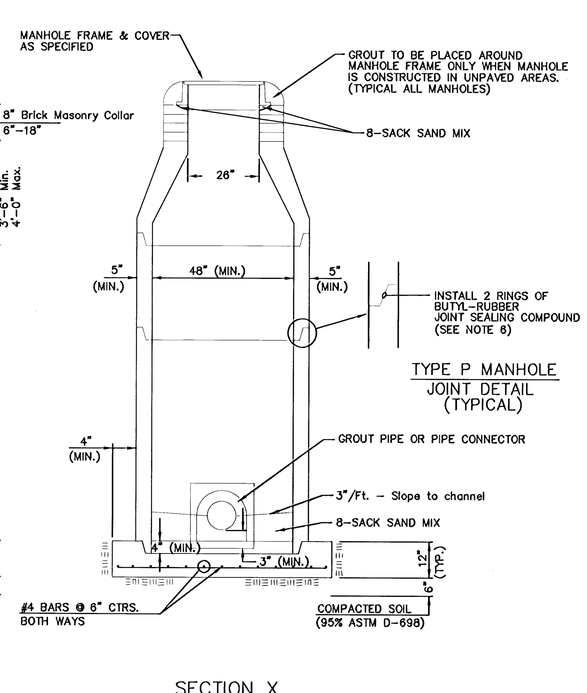
TYPE P
STANDARD MANHOLE



TYPE P
INSIDE DROP MANHOLE



TYPE P
OUTSIDE DROP MANHOLE



SECTION X
(TYPICAL)

GENERAL NOTES

PRECAST MANHOLE NOTES

1. ALL PRECAST CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST REVISIONS OF A.S.T.M. C478 AS MODIFIED BY THE SPECIFICATIONS.
2. NON-SHRINK GROUT SHALL BE NON-METALLIC TYPE.
3. APPROVED FLEXIBLE WATERSTOP GASKETS SHALL BE INSTALLED TO JOIN THE SEWER TO THE MANHOLE WALL WHEN A.B.S. COMPOSITE PIPE OR P.V.C. PIPE IS USED. FOR OTHER TYPES OF PIPE THE SEWER SHALL BE GROUTED IN PLACE WITH NON-SHRINK GROUT. THE SEWER PIPE SHALL BE SUPPORTED WITH CONCRETE ENCASEMENT A MINIMUM OF 3 FEET FROM THE MANHOLE WALL AND TO THE FIRST JOINT FOR V.C.P. SUCH THAT THE JOINT REMAINS FLEXIBLE.

* ~~4. ALL INSIDE SURFACES OF THE CONCRETE MANHOLE WHICH WOULD BE EXPOSED TO SEWER GAS SHALL BE COATED WITH 2 COATS TNEMEC SERIES 66 HI-BUILD EPOXOLINE, DRY THICKNESS OF 8 MILS (MIN.)~~

5. EXTERIOR MANHOLE WALLS SHALL BE COATED WITH 1 COAT MOBILARMA 633 BITUMINOUS COATING.
6. JOINT SEALING COMPOUND SHALL BE KENT SEAL NO. 2 OR APPROVED EQUAL.
7. PRECAST MANHOLES SHALL BE SET AT LEAST 4 INCHES INTO THE MANHOLE BASE.
8. TOP OF MANHOLE FLOOR SLAB SHALL BE AT LEAST 3 INCHES BELOW THE FLOW LINE OF THE OUTLET PIPE TO INSURE SUFFICIENT MINIMUM THICKNESS OF SHAPED INVERT.
9. LIFTING HOLES SHALL BE FILLED WITH NON-SHRINK GROUT AND THE INTERIOR SURFACE COATED AS SPECIFIED.
10. MORTAR USED IN MASONRY CONSTRUCTION SHALL CONTAIN 8 SACKS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE BASES SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE FOR CONCRETE PAVEMENT CONSTRUCTION AS SPECIFIED IN THE CITY STANDARD PAVING SPECIFICATIONS USING CITY CONCRETE PAVEMENT MIX WITHOUT AIR ENTRAINING ADMIXTURE. MORTAR SHALL BE PLACED AROUND THE MANHOLE RING AS SHOWN ON THE DRAWINGS WHEN MANHOLES ARE CONSTRUCTED IN UNPAVED AREAS. ~~MANHOLES CONSTRUCTED WHERE PIPE SIZES ARE SMALLER THAN 24" SHALL HAVE AN INSIDE DIAMETER OF 4'. MANHOLES CONSTRUCTED WHERE PIPE SIZES ARE 24" OR LARGER SHALL HAVE AN INSIDE DIAMETER OF 5'.~~ COMPLETED MANHOLE SHALL BE WITHOUT LEAKS AND WATER TIGHT.
11. REINFORCING STEEL SHALL BE INSTALLED IN THE MANHOLE BASES AND SHALL CONSIST OF NO. 4 BARS PLACED ON 6" CENTERS IN BOTH DIRECTIONS. THE MANHOLE BASE REINFORCEMENT SHALL BE PLACED AT LEAST 3" ABOVE THE BOTTOM OF THE MANHOLE BASE. ALL COSTS FOR FURNISHING AND INSTALLING REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
12. OPENINGS SHALL BE CUT INTO THE MANHOLE WALL WHEN OUTSIDE DROPS ARE CONSTRUCTED ON EXISTING MANHOLES. SUCH OPENINGS CUT INTO EXISTING MANHOLES SHALL BE AS SMALL AS PRACTICAL TO FACILITATE INSTALLING AND GROUTING THE NEW PIPE IN PLACE. WATERSTOP GASKETS SHALL BE USED WITH P.V.C. AND A.B.S. COMPOSITE PIPE. THE NEW PIPE SHALL BE GROUTED INTO THE OPENING USING AN APPROVED NON-SHRINK GROUT FOR THE FULL MANHOLE WALL THICKNESS. THE EXTERIOR OF THE COMPLETED CONNECTION SHALL BE SEALED WITH AN APPROVED BITUMINOUS COATING SUCH THAT THE CONNECTION WILL BE WATER TIGHT. FLOOR OF MANHOLE SHALL BE MODIFIED TO FORM NEW FLOW CHANNEL FOR THE NEW CONNECTION AS INDICATED BY THE DRAWING. THIS WORK, INCLUDING MODIFICATION OF MANHOLE FLOOR, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR OUTSIDE DROP STACK CONSTRUCTED ON EXISTING MANHOLE.
13. THE FLOORS OF ALL MANHOLES SHALL BE SHAPED WITH FLOW CHANNELS SUCH THAT THE MANHOLES WILL BE SELF CLEANING AND FREE OF AREAS WHERE SOLIDS COULD BE DEPOSITED AS SEWAGE FLOWS THROUGH THE MANHOLE FROM ALL INLET PIPES TO THE OUTLET PIPE. FLOW CHANNELS SHALL BE FORMED TO MATCH THE BOTTOM HALVES OF THE INFLOWING PIPES AND THE OUTFLOWING PIPE AS SHOWN BY THE DRAWINGS EXCEPT FOR INSIDE DROP MANHOLES. FLOW CHANNELS FOR INSIDE DROP MANHOLES SHALL BE CONSTRUCTED AS INDICATED BY THE DRAWING. MANHOLE FLOORS SHALL HAVE SLOPES OF 3 INCHES PER FOOT IN THE AREAS OUTSIDE OF THE FLOW CHANNELS SLOPED TOWARD THE FLOW CHANNELS. PIPES LAID THROUGH MANHOLES SHALL HAVE THE TOP HALF REMOVED TO NEAT LINES FOR THE FULL INSIDE DIAMETER OF THE MANHOLE. MANHOLE FLOORS SHALL THEN BE SHAPED AROUND THE BOTTOM HALF OF THE PIPE WHICH FORMS THE FLOW CHANNEL.
14. PIPES INSTALLED WITHIN THE EXCAVATION MADE FOR THE MANHOLE SHALL BE CRADLED WITH CONCRETE TO THE LIMITS OF THE MANHOLE EXCAVATION. WHEN CLAY PIPE IS USED, THE CRADLE SHALL EXTEND TO THE FIRST JOINT OUTSIDE THE MANHOLE. THE CRADLE SHALL BE TERMINATED AT THE CLAY PIPE JOINT IN A MANNER WHICH WILL MAINTAIN THE FLEXIBILITY OF THE JOINT. COST OF CRADLE WITHIN MANHOLE EXCAVATION OR TO CLAY PIPE JOINTS ADJACENT TO MANHOLE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
15. MANHOLE COVER CASTINGS AND MANHOLE FRAME CASTINGS SHALL CONFORM TO THE REQUIREMENTS AS INDICATED IN THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE STANDARD DETAIL DRAWING.
16. THE VERTICAL DROP IN INSIDE DROP MANHOLES SHALL NOT EXCEED 2' FOR INFLOWING PIPES SIZED 12" OR SMALLER AND 2' FOR INFLOWING PIPES LARGER THAN 12". THE CROWNS OF INFLOWING PIPES SHALL NEVER BE SET LOWER THAN THE CROWN OF THE OUTFLOWING PIPE.
17. STANDARD MANHOLES AND STANDARD INSIDE DROP MANHOLES SHALL BE BID AS STANDARD MANHOLES FOR THE TYPE AND DIAMETER INDICATED. OUTSIDE DROP MANHOLES SHALL BE BID AS STANDARD OUTSIDE DROP MANHOLES FOR THE TYPE AND DIAMETER INDICATED. ALL MANHOLE DIAMETERS WILL BE 4' UNLESS INDICATED OTHERWISE (SEE NOTE 10).
18. A BRICK MASONRY COLLAR SHALL BE INSTALLED BETWEEN THE CAST IRON FRAME AND THE CONCENTRIC CONE. THE COLLAR WILL HAVE 8" WALLS AND A VERTICAL HEIGHT OF 6" MINIMUM AND 18" MAXIMUM. A 1" COAT OF MORTAR WILL BE PLASTERED ON THE OUTSIDE OF THE COLLAR. THE USE OF PRE-CAST CONCRETE SPACERS FOR MANHOLE TOP ADJUSTMENT IS ALSO ALLOWED.
19. CRUSHED ROCK CONFORMING TO ASTM C-33 WITH A GRADATION OF NO. 67 SHALL BE INSTALLED AT THE BASE OF THE MANHOLE TO A DEPTH OF NO LESS THAN 6", AND SHALL EXTEND NO LESS THAN 6" OUTSIDE THE DIAMETER OF THE CONCRETE FLOOR OF THE MANHOLE.

* 20. ALL INSIDE SURFACES OF CONCRETE MANHOLES WHICH WOULD BE EXPOSED TO SEWER GAS SHALL BE LINED WITH DURAPLATE PLASTIC LINER AS MANUFACTURED BY A-LOC PRODUCTS, INC. OR APPROVED EQUAL.

21. 5' DIAMETER MANHOLES SHALL MAINTAIN 5' DIAMETER FROM THE MANHOLE BASE TO THE CONE SECTION. REDUCTION OF THE MANHOLE DIAMETER FROM 5' TO 4' IS NOT ALLOWED.
22. WHERE A MANHOLE IS TO BE PLACED OVER AN EXISTING LIVE SEWER LINE, THE BASE MAY BE CAST IN PLACE WITH ENGINEERS APPROVAL.

THE CITY OF WICHITA

CITY ENGINEER'S OFFICE
CITY HALL - SEVENTH FLOOR
455 NORTH MAIN STREET
WICHITA, KANSAS 67202
(316) 268-4501
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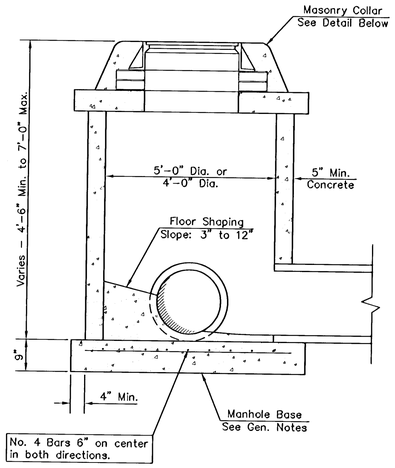
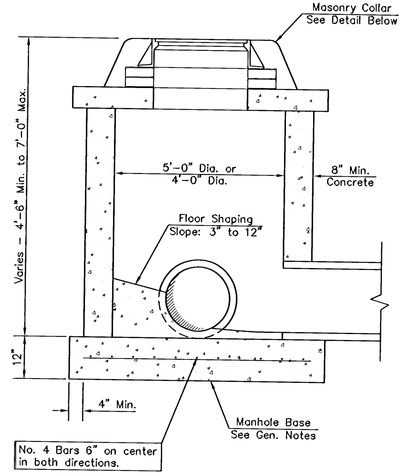
STANDARD
TYPE 'P'
MANHOLES

NEIL D. CABLE P.E. - CITY ENGINEER

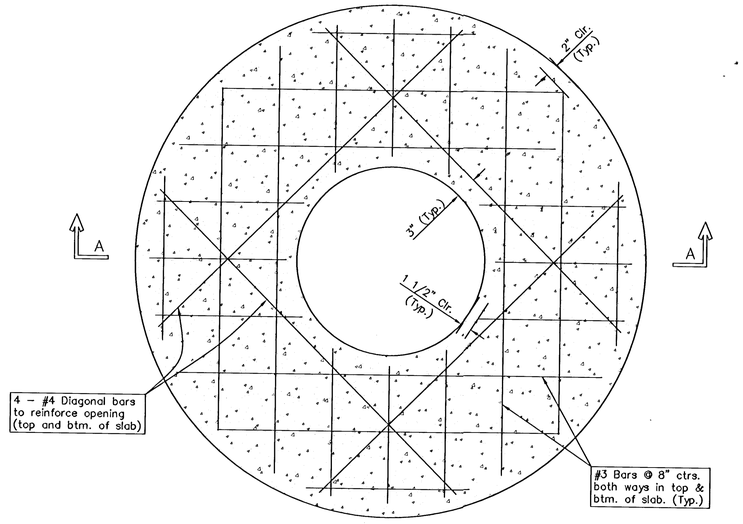
PROJECT NUMBER	OCA NO.
468-83186	734-990
DATE: FEB. 2003	SHEET 22



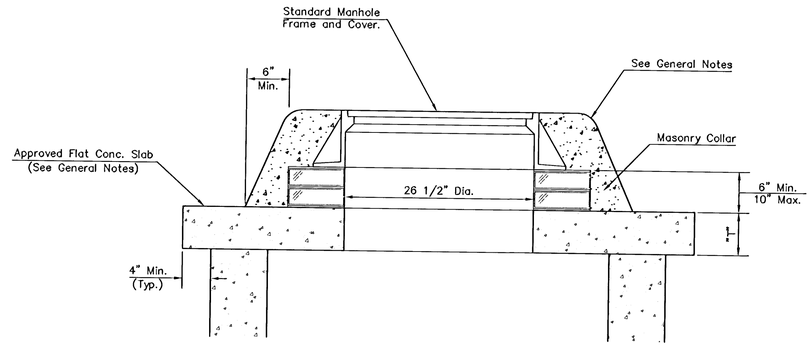
SHALLOW TYPE "P" MANHOLE



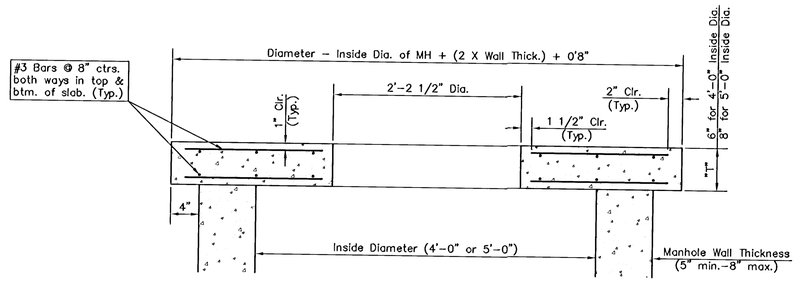
SHALLOW TYPE "C" MANHOLE



PLAN



MASONRY COLLAR DETAIL



SECTION A–A

FLAT CONCRETE SLAB DETAILS

* NOTE: For this project, cost for shallow type manhole req'd for air release valve shall be considered subsidiary to air release assembly.

GENERAL NOTES

1. Mortar used in masonry construction shall contain 8 sacks of cement per cubic yard. Concrete used in manhole bases shall conform to the requirements of concrete for concrete pavement construction as specified in the city standard paving specifications using city concrete cement mix without air entraining admixture. Mortar shall be placed around the manhole ring as shown on the drawings when manholes are constructed in unpaved areas. Manholes constructed where pipe sizes are smaller than 24" shall have an inside diameter of 4'. Manholes constructed where pipe sizes are 24" or larger shall have an inside diameter of 5'. Completed manhole shall be without leaks and water tight.

2. Reinforcing steel shall be installed in the manhole bases and shall consist of no. 4 bars placed on 6" centers in both directions. The manhole base reinforcement shall be placed 6" above the bottom of the manhole base. All costs for furnishing and installing reinforcing steel shall be included in the unit price bid for the manhole.

3. The floors of all manholes shall be shaped with flow channels such that the manholes will be self cleaning and free of areas where solids could be deposited as sewage flows through the manhole from all inlet pipes to the outlet pipe. Flow channels shall be formed to match the bottom halves of the inflowing pipes and the outflowing pipe as shown by the drawings. Manhole floors shall have slopes of 3 inches per foot in the areas outside of the flow channels sloped toward the flow channels. Pipes laid through manholes shall have the top half removed to neat lines for the full inside diameter of the manhole. Manhole floors shall then be shaped around the bottom half of the pipe which forms the flow channel.

4. Pipes installed within the excavation made for the manhole shall be cradled with concrete to the limits of the manhole excavation. When clay pipe is used, the cradle shall extend to the first joint outside the manhole. The cradle shall be terminated at the clay pipe joint in a manner which will maintain the flexibility of the joint. Cost of cradle within manhole excavation or to clay pipe joints adjacent to manhole shall be included in the unit price bid for the manhole.

5. Manhole cover castings and manhole frame castings shall conform to the requirements as indicated in the standard specifications and as shown in the standard detail drawings.

6. The crowns of inflowing pipes shall never be set lower than the crown of the outflowing pipe.

* 7. Standard shallow manholes type "P" and "C" shall be paid for at the unit price bid per each for the type and diameter indicated. All standard shallow manhole diameters will be 4' unless indicated otherwise.

8. All brick used in manhole construction shall meet Grade SW of ASTM C652 or C62–87.

THE CITY OF WICHITA
CITY ENGINEER'S OFFICE
CITY HALL – SEVENTH FLOOR
455 NORTH MAIN STREET
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SHALLOW MANHOLES TYPE 'P' & 'C'

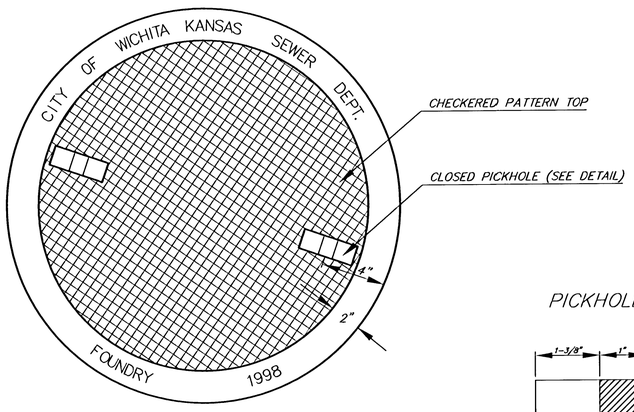
NEIL D. CABLE P.E. – CITY ENGINEER

PROJECT NUMBER	OCA NO.
468-83186	743-990
DATE: FEB. 2003	SHEET 23

MANHOLE FRAME AND COVER DETAIL

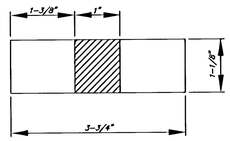
ADOPTED AS STANDARD DESIGN BY
CITY OF WICHITA, KANSAS

MANHOLE COVER
Weight = 180 Lbs.

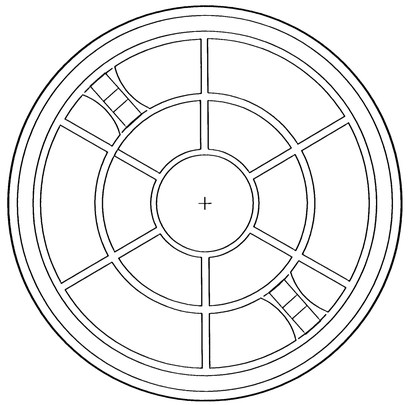


TOP VIEW

PICKHOLE DETAIL



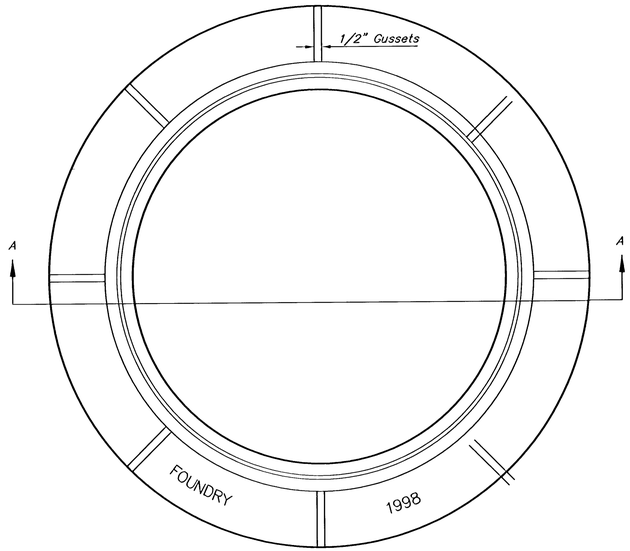
TOP VIEW



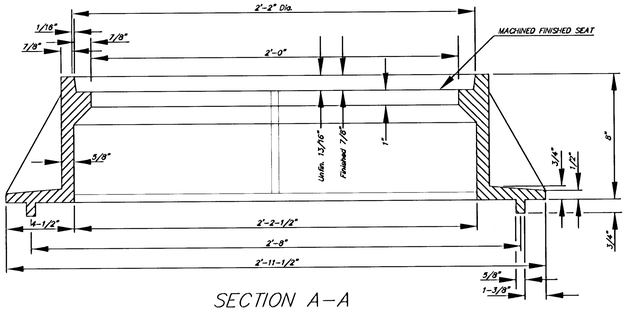
BOTTOM VIEW

SECTION VIEW

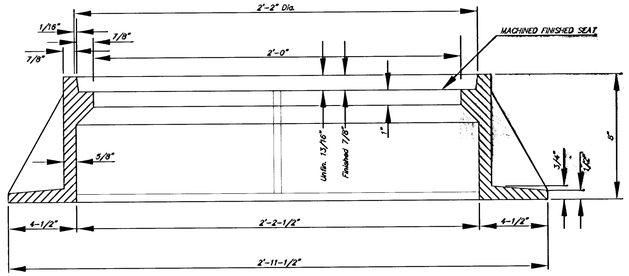
MANHOLE FRAME
Weight = 240 Lbs.



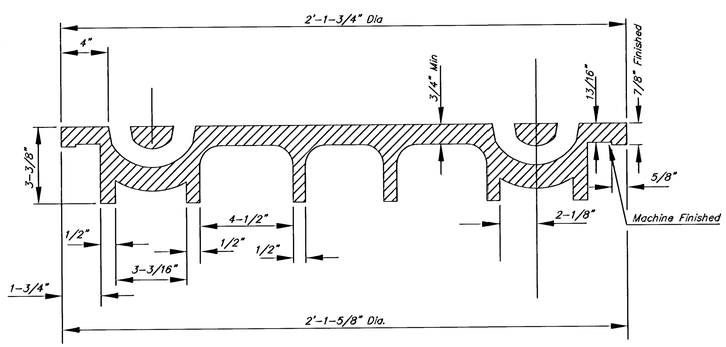
TOP VIEW



SECTION A–A
MUD RING



SECTION A–A



SECTION VIEW

GENERAL NOTES

1. MANHOLE CASTINGS SHALL BE MANUFACTURED USING GOOD QUALITY GRAY IRON CONFORMING TO CLASS 30 OF A.S.T.M. DESIGNATION A–48. DIMENSIONS AND WEIGHTS SHOWN ON THE DETAILED DRAWINGS SHALL BE CONSIDERED AS MINIMUM REQUIREMENTS AND ANY DEVIATIONS FROM THE DIMENSIONS SHOWN MUST BE SPECIFICALLY APPROVED. THE FINISHED CASTINGS SHALL BE OF UNIFORM QUALITY, FREE FROM BLOWHOLES, POROSITY, HARD SPOTS, SHRINKAGE DISTORTIONS OR OTHER DEFECTS.

2. MANHOLE CASTINGS SHALL WEIGH A MINIMUM OF 180 POUNDS ON THE SOLID COVER AND 240 POUNDS ON THE MANHOLE RING. THIS IS A TOTAL OF 420 POUNDS ON A RING AND COVER SET. CASTINGS WEIGHING LESS THAN THE MINIMUM SPECIFICATIONS WILL NOT BE ACCEPTED.

3. MANHOLE CASTINGS SHALL BE MANUFACTURED SUCH THAT A COVER MANUFACTURED BY ANY ONE FOUNDRY WILL FIT INTERCHANGEABLY INTO A FRAME MANUFACTURED BY ANOTHER FOUNDRY AND STILL MEET ALLOWABLE CLEARANCES AND NON–ROCKING REQUIREMENTS. THIS WILL REQUIRE MANUFACTURING OF THE MATCHING FACES ON THE COVER AND THE FRAME TO CLOSE TOLERANCES.

4. THE OUTSIDE CIRCUMFERENCE OF THE VERTICAL FACE OF THE COVER AND THE INSIDE CIRCUMFERENCE OF THE VERTICAL FACE IN THE FRAME RECESS SHALL BE MANUFACTURED TO TOLERANCES SUCH THAT THE CLEARANCE BETWEEN THE COVER AND FRAME WILL NOT EXCEED 1/8" AT ANY POINT AROUND THE CIRCUMFERENCE OF THE COVER. THE SEATING SURFACES BETWEEN THE COVER AND FRAME SHALL BE MACHINED SUCH THAT THESE SEATING SURFACES SHALL MAKE FULL CONTACT FOR THEIR FULL CIRCUMFERENCE TO PRECLUDE THE COVER FROM ROCKING IN THE FRAME.

5. THE MANHOLE FRAME AND COVER SHALL BE MARKED WITH LETTERING INDICATING THE NAME OF THE MANUFACTURER AND THE YEAR WHEN THE COVER OR FRAME WAS CAST. THE COVER SHALL BE FURTHER IDENTIFIED WITH REGARDS TO OWNERSHIP USING LETTERS AT LEAST 1 INCH IN HEIGHT. THIS IDENTIFICATION SHALL BE "CITY OF WICHITA SEWER DEPARTMENT". THE WORD DEPARTMENT MAY BE ABBREVIATED. THE TEXTURE OF THE TOP SURFACE OF THE COVER SHALL BE MANUFACTURED IN A CHECKERED PATTERN DESIGN AS INDICATED ON THE DRAWINGS. SMOOTH BLOCKOUTS SHALL BE UTILIZED TO HIGHLIGHT THE LETTERING ON THE COVER SURFACE. THE TOTAL AREA OF SMOOTH SURFACE BLOCKOUT SHALL NOT EXCEED THE AREA AS INDICATED ON THE DRAWING. POSITIONING OF SMOOTH BLOCKOUTS AND LETTERING MAY VARY FROM THAT SHOWN ON THE DETAILED DRAWING.

THE CITY OF WICHITA

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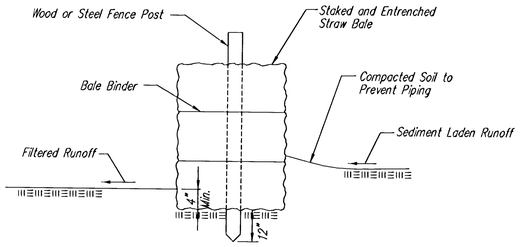
MANHOLE FRAME AND COVER

NEIL D. CABLE P.E. – CITY ENGINEER

PROJECT NUMBER	OCA NO.
468-83186	743-990
DATE: FEB. 2003	SHEET 24



STRAW BALE BARRIERS

Material Specification:

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

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.
When practicable, bale slope barriers should be placed along contours to avoid a concentration of flow.
Bale slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 4" deep and a bale's width wide. Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.
Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.
Once all the bales have been installed and anchored, place the excavated soil against the upslope side of the check and compact it. The compacted soil should be no more than 3" to 4" deep.

List of common placement/installation mistakes to avoid:

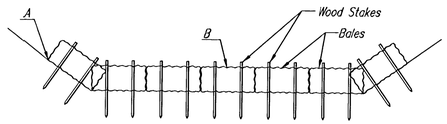
When practicable, do not place bale slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. Concentrated flow over a slope barrier creates a scour hole on the downslope side of the barrier. The scour hole eventually undermines the bales and the barrier fails.
Do not place bale slope barriers in areas with shallow soils underlain by rock. If the barrier is not anchored sufficiently, it will wash out.
Bale slope barriers must be dug into the ground. Bales at ground level do not work because they allow water to flow under the barrier.

Inspection and Maintenance:

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

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

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



STRAW BALE DITCH CHECKS

Material Specification:

Bale ditch checks may be constructed of wheat straw, oat straw, prairie hay, or bromegrass hay that is free of weeds declared noxious by the Kansas State Board of Agriculture.
The stakes used to anchor the bales should be a hardwood material with the following minimum dimensions: 2" square (nominal) by 4' long.
Optional: The downstream scour apron should be constructed of a double-netted straw erosion-control blanket at least 6' wide.
Optional: The metal landscape staples used to anchor the erosion-control blanket should be at least 8" long.

Placement:

Bale ditch checks should be placed perpendicular to the flowline of the ditch.
The ditch check should extend far enough so that the ground level at the ends of the check is higher than the top of the lowest center bale. This prevents water from flowing around the check.
Checks should not be placed in ditches where high flows are expected. Rock checks should be used instead.
Bales should be placed in ditches with slopes of 6% or less. For slopes steeper than 6%, rock checks should be used.
The following table provides check spacing for a given ditch grade:

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

Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is 4" deep and a bale's width wide. Extend the trench in a straight line along the entire length of the proposed ditch check. Place the soil on the upstream side of the trench-it will be used later.
Optional: On the downstream side of the trench, roll out a length of erosion-control blanket (scour apron) equal to the length of the trench. Place the upstream edge of the erosion-control blanket along the bottom upstream edge of the trench. The erosion control blanket should be anchored in the trench with one row of 8" landscape staples placed on 18" centers. The remainder of the erosion-control blanket (the portion that is not lying in the trench) will serve as the downstream scour apron. This section of the blanket should be anchored to the ground with 8" landscape staples placed around the perimeter of the blanket on 18" centers. The remainder of the blanket should be anchored using two evenly spaced rows of 8" landscape staples on 18" centers placed perpendicular to the flowline of the ditch.
Place the bales in the trench, making sure that they are butted tightly. Two stakes should be driven through each bale along the centerline of the ditch check, approximately 6" to 8" in from the bale ends. Stakes should be driven at least 12" into the ground.
Once all the bales have been installed and anchored, place the excavated soil against the upstream side of the check and compact it. The compacted soil should be no more than 3" to 4" deep and extend upstream no more than 24".

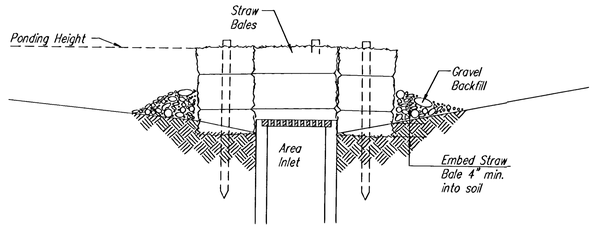
List of common placement/installation mistakes to avoid:

Do not place a bale ditch check directly in front of a culvert outlet. It will not stand up to the concentrated flow.
Do not place bale ditch checks in ditches that will likely experience high flows. They will not stand up to concentrated flow.
Follow prescribed ditch-check spacing guidelines. If spacing guidelines are exceeded, erosion will occur between the ditch checks.
Do not allow water to flow around the ditch check. Make sure that the ditch check is long enough so that the ground level at the ends of the check is higher than the top of the lowest center bale.
Do not place bale ditch checks in channels with shallow soils underlain by rock. If the check is not anchored sufficiently, it will wash out.
Bale ditch checks must be dug into the ground. Bales at ground level do not work because they allow water to flow under the check.

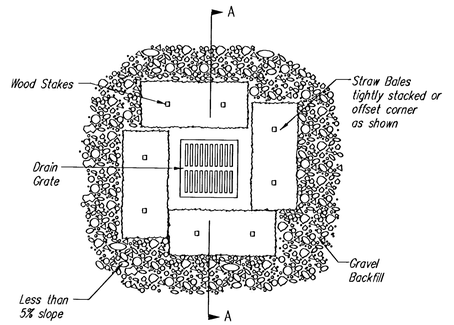
Inspection and Maintenance:

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

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



SECTION A-A



STRAW BALE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

Material Specification:

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

Placement:

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

Proper Installation Method:

Excavate a trench around the perimeter of the area inlet that is at least 4" deep by a bale's width wide.
Place the bales in the trench, making sure that they are butted tightly. Some bales may need to be shortened to fit into the trench around the area inlet. Two stakes should be driven through each bale, approximately 6" to 8" in from the bale ends.
Stakes should be driven at least 12" into the ground.
Once all the bales have been installed and anchored, place the excavated soil against the receiving side of the barrier and compact it. The compacted soil should be no more than 3" to 4" deep.
Note: When a bale area inlet barrier is placed in a shallow median ditch, make sure that the top of the barrier is not higher than the paved road. In this configuration, water may spread onto the roadway causing a hazardous condition.

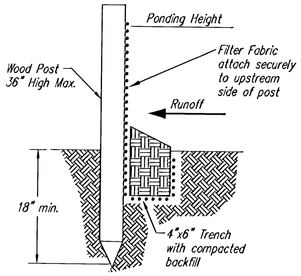
List of common placement installation mistakes to avoid:

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

Inspection and Maintenance:

Bale area inlet barriers should be inspected every 7 days and within 24 hours of a rainfall 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 andlor water damage?
Does sediment need to be removed from behind the area inlet barrier?



SILT FENCE BARRIERS

SILT FENCE BARRIERS

Material Specification:

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

Placement:

A slope barrier should be used at the toe of a slope when a ditch does not exist. The slope barrier should be placed on nearly level ground 5' to 10' away from the toe of a slope. The barrier is placed away from the toe of the slope to provide adequate storage for settling out sediment.
When practicable, silt fence slope barriers should be placed along contours to avoid a concentration of flow.
Silt fence slope barriers can also be placed along right-of-way fence lines to keep sediment from crossing onto adjacent property. When placed in this manner, the slope barrier will not likely follow contours.

Proper installation method:

Excavate a trench the length of the planned slope barrier that is 6" deep by 4" wide.
Make sure that the trench is excavated along a single contour. When practicable, slope barriers should be placed along contours to avoid a concentration of flow. Place the soil on the upslope side of the trench for later use.
Roll out a continuous length of silt fence fabric on the downslope side of the trench.
Place the edge of the fabric in the trench starting at the top upslope edge. Line all three sides of the trench with the fabric. Backfill over the fabric in the trench with the excavated soil and compact. After filling the trench, approximately 24" to 36" of silt-fence fabric should remain exposed.
Lay the exposed silt fence upslope of the trench to clear an area for driving in the posts.
Just downslope of the trench, drive posts into the ground to a depth of at least 18".
Place posts no more than 4' apart.
Attach the silt fence to the anchored post with staples, wire, zip ties, or nails.

List of common placement/installation mistakes to avoid:

When practicable, do not place silt fence slope barriers across contours. Slope barriers should be placed along contours to avoid a concentration of flow. When the flow concentrates, it overtops the barrier and the silt fence slope barrier quickly deteriorates.
Do not place silt-fence posts on the upslope side of the silt fence fabric. In this configuration, the force of the water is not restricted by the posts, but only by the staples (wire, zip ties, iiails, 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 BMP DETAILS

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

PROJECT NUMBER	OCA NO.
468-83186	743-990
DATE: FEB. 2003	SHEET 25

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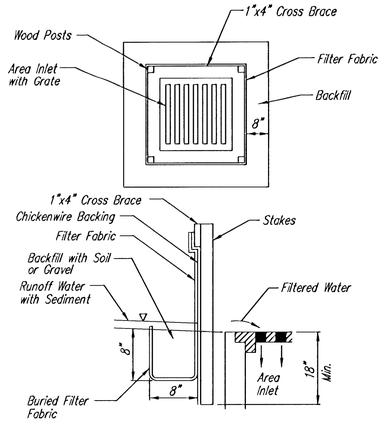


SILT FENCE BARRIERS FOR AREA INLETS
(INLET PROTECTION)

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 barrierfor area inlets, silt fence fabric and posts must be supported at the top by a wooden frame.
When a silt fence barrier for area inlets is located near an inlet that has steep approach slopes, the storage capacity behind the barrier is drastically reduced. Timely removal of sediment must occur for a barrier to operate properly in this location.

Proper installation method:

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

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

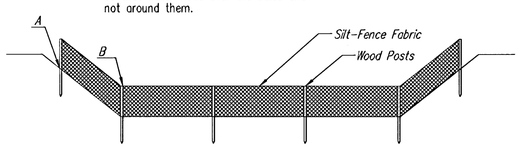
List of common placement/installation mistakes to avoid:

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

Inspection and Maintenance:

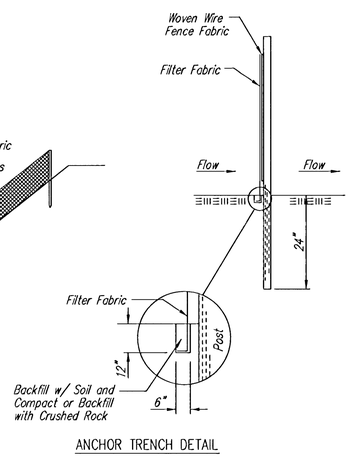
Silt fence barrier for area inlets should be inspected every 7 days and within 24 hours of a rainfall of 1/2" or more. The following is a list of questions that should be addressed during each inspection:

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



ELEVATION

SILT FENCE DITCH CHECKS
(STREAM PROTECTION)



ANCHOR TRENCH DETAIL

Material Specification:

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

Placement:

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

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

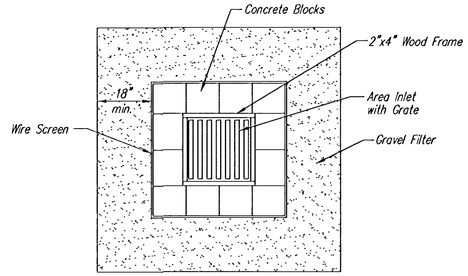
Ditch grade (%)	Check Spacing (feet)
0.5	200
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

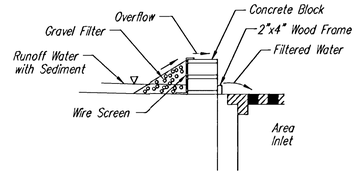
Proper installation method:

Excavate a trench perpendicular to the ditch flowline that is 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.





CONCRETE BLOCK FILTER FOR AREA DRAIN
(INLET PROTECTION)

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

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

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

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

Instructions for Installing:

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

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

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

Maintenance:

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

Inspection and Maintenance:

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

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

CITY OF WICHITA

SOIL EROSION BMP DETAILS

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

PROJECT NUMBER	OCA NO.
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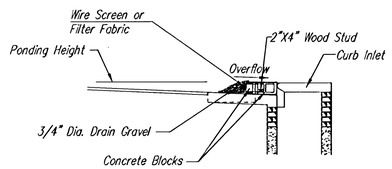
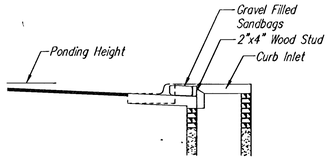
DATE: FEB. 2003	SHEET 26



SECTION A-A



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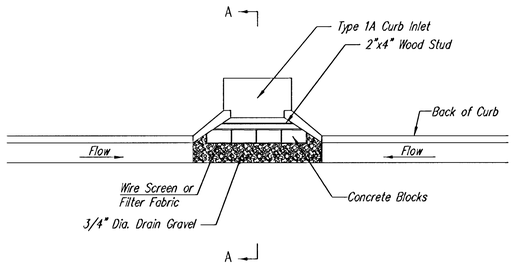


CURB INLET GRAVEL FILTERS
(INLET PROTECTION-RESIDENTIAL STREETS ONLY)

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

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

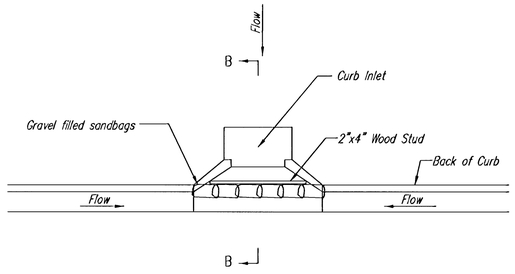
Instructions for Installing:

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

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

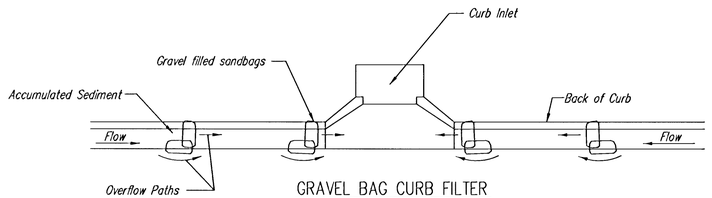
Maintenance:

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



CURB INLET SANDBAG FILTERS
(INLET PROTECTION)

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



GRAVEL BAG CURB FILTER
(INLET PROTECTION)

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

CURB SEDIMENT TRAPS

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

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

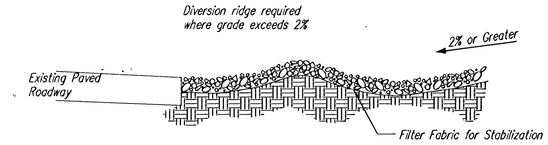
Spacing:

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

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

Maintenance:

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



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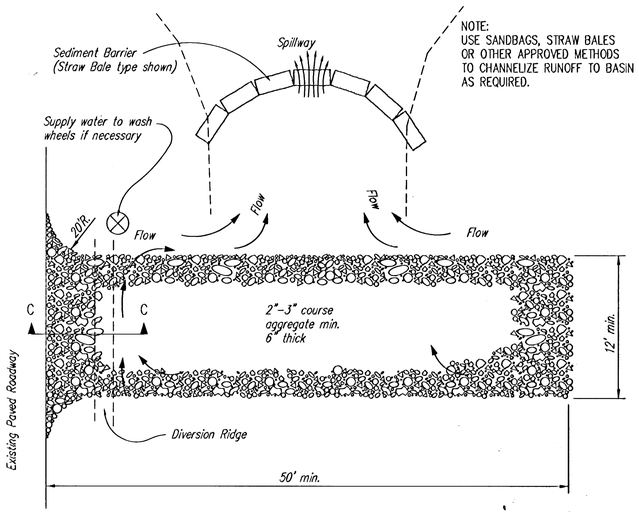

STABILIZED CONSTRUCTION ENTRANCE

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 STABLIZED 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 BMP DETAILS

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

PROJECT NUMBER 468-83186
OCA NO. 743-990
DATE FEB. 2003
SHEET 27

18-05-03-13

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