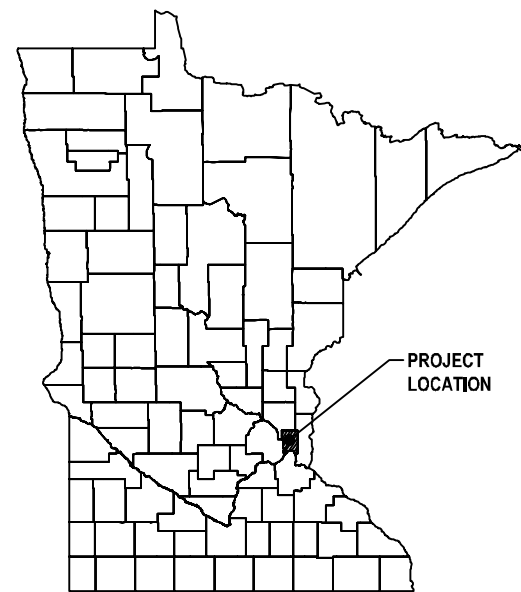


CARL BOLANDER AND SONS

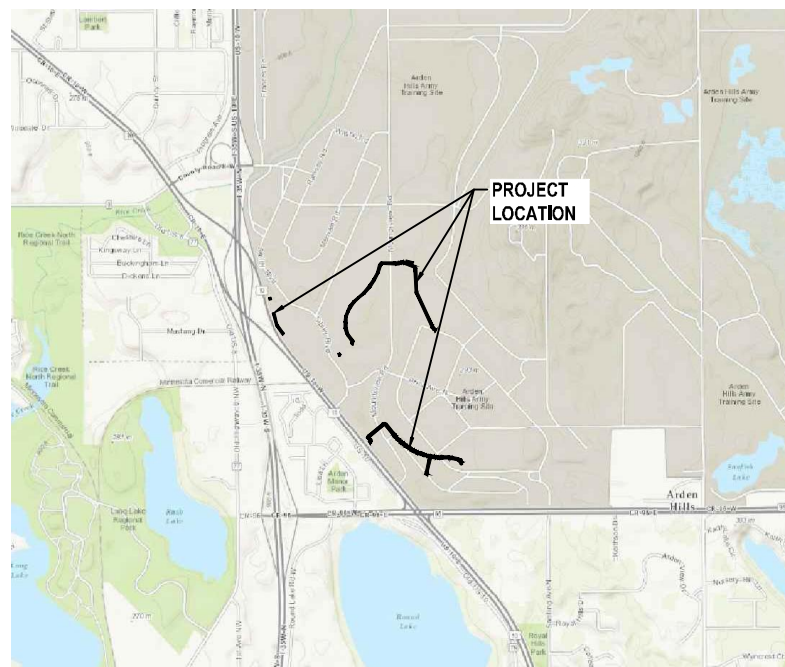


TGRS PIPING REROUTE

JUNE 2016
83125-00(001)



MINNESOTA AREA MAP



LOCATION MAP

SHEET NUMBER	DRAWING LIST	SHEET DESCRIPTION
GN-01	COVER SHEET	
GN-02	LEGEND	
CI-01	PROPOSED SITE PLAN	
CI-02	PLAN AND PROFILE STA A0+00 TO STA A13+00	
CI-03	PLAN AND PROFILE STA A13+00 TO STA A23+00	
CI-04	PLAN AND PROFILE STA B0+00 TO STA B10+00	
CI-05	PLAN AND PROFILE STA B10+00 TO STA B20+00	
CI-06	PLAN AND PROFILE STA C0+00 TO STA C10+00	
CI-07	PLAN AND PROFILE STA C10+00 TO STA C18+75	
CI-08	PLAN AND PROFILE STA D0+00 TO STA D11+00	
CI-09	PLAN AND PROFILE STA D11+00 TO STA D15+25	
CI-10	PLAN AND PROFILE STA E0+00 TO STA E1+50 AND STA F0+00 TO STA F1+50	
CI-11	PLAN AND PROFILE STA G0+00 TO STA 8+00	
CI-12	DRAWING NOTES AND SPECIFICATIONS	
CI-13	MISCELLANEOUS DETAILS	
CI-14	INTERCONNECTION DETAILS	
ME-01	MECHANICAL PIPING PLAN PUMP HOUSE B3	
ME-02	WELL VAULT SC-01	
EL-01	ELECTRICAL SITE PLAN & GENERAL NOTES	
EL-02	ELECTRICAL DEMOLITION	
EL-03	PROPOSED ELECTRICAL WORK-PUMPHOUSE B-3	
EL-04	PROPOSED ELECTRICAL WORK-SC-1, B-13 WELLHEADS	
EL-05	PANELBOARD ARRGT & PARTIAL ONE LINE DIAG'S	
IC-01	CONTROL PANEL ARRANGEMENT & BILL OF MATERIAL	
IC-02s1	CONTROL PANEL POWER DISTRIBUTION DIAGRAM	
IC-02s2	CONTROL PANEL ANALOG INPUT MODULE WIRING DIAGRAM (RACK 1, SLOT 1)	
IC-02s3	CONTROL PANEL DIGITAL INPUT-OUTPUT MODULE WIRING DIAGRAM (RACK 1, SLOT 2)	
IC-02s4	CONTROL PANEL DIGITAL INPUT MODULE WIRING DIAGRAM (RACK 1, SLOT 3)	

DRAFT - NOT FOR BIDDING

<table border="1"> <tr> <td>No.</td> <td>Issue</td> <td>Drawn</td> <td>Approved</td> <td>Date</td> </tr> <tr> <td>B</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>06/03/16</td> </tr> <tr> <td>A</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>09/26/15</td> </tr> </table>				No.	Issue	Drawn	Approved	Date	B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16	A	ISSUED FOR REVIEW	CR/TD	WWW	09/26/15	<p>Bar is one inch on original size drawing 0 1"</p> <p>Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD</p>	<p>GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul, Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com</p>	<table border="1"> <tr> <td>Drawn</td> <td>CR/TD</td> <td>Designer</td> <td>W. WHEELER</td> </tr> <tr> <td>Drafting Check</td> <td>W. WHEELER</td> <td>Design Check</td> <td>E. HOGLUND</td> </tr> <tr> <td>Project Manager</td> <td>E. HOGLUND</td> <td>Date</td> <td>May 31, 2016</td> </tr> </table> <p>This document shall not be used for construction unless signed and sealed for construction.</p>	Drawn	CR/TD	Designer	W. WHEELER	Drafting Check	W. WHEELER	Design Check	E. HOGLUND	Project Manager	E. HOGLUND	Date	May 31, 2016	<table border="1"> <tr> <td>Client</td> <td>CARL BOLANDER AND SONS</td> </tr> <tr> <td>Project</td> <td>TGRS PIPING REROUTE</td> </tr> <tr> <td>Title</td> <td>COVER SHEET</td> </tr> <tr> <td>Project No.</td> <td>83125-00(001)</td> </tr> <tr> <td>Original Size</td> <td>Arch D</td> </tr> <tr> <td>Sheet No.</td> <td>GN-01</td> </tr> </table>	Client	CARL BOLANDER AND SONS	Project	TGRS PIPING REROUTE	Title	COVER SHEET	Project No.	83125-00(001)	Original Size	Arch D	Sheet No.	GN-01
No.	Issue	Drawn	Approved	Date																																										
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16																																										
A	ISSUED FOR REVIEW	CR/TD	WWW	09/26/15																																										
Drawn	CR/TD	Designer	W. WHEELER																																											
Drafting Check	W. WHEELER	Design Check	E. HOGLUND																																											
Project Manager	E. HOGLUND	Date	May 31, 2016																																											
Client	CARL BOLANDER AND SONS																																													
Project	TGRS PIPING REROUTE																																													
Title	COVER SHEET																																													
Project No.	83125-00(001)																																													
Original Size	Arch D																																													
Sheet No.	GN-01																																													
<p>Scale: NTS</p>																																														
<p>Sheet 1 of 1</p>																																														

SURVEY LINETYPES		
FEATURE	EXISTING	PROPOSED
PROPERTY LINE	---	---
CENTER LINE	---	---
EASEMENT	---	---
ROW & MONUMENT	---	---
ROADWAY EASEMENT	---	---
DRAINAGE EASEMENT	---	---

STORM & DRAINAGE		
FEATURE	EXISTING	PROPOSED
STORM MANHOLE	⊙	●
STORM CATCH BASIN	⊠	■
CULVERT/ENDSECTIONS	▷	▷
SWALE/DITCH	---	---
YARD DRAIN	---	---
FLOW ARROW	→	→
STORM PIPE	---	---

TOPOGRAPHY		
FEATURE	EXISTING	PROPOSED
SPLASH BLOCK	■	■
MAIL BOX	⊕	⊕
YARD LIGHT	⊙	⊙
STONE FENCE	---	---
TREE LINE	---	---
DECIDUOUS TREE, TRUNK Ø	•	•
CONIFER TREE, TRUNK Ø	•	•
CONIFER TREE, MULTI-TRUNK Ø	•	•
DECIDUOUS TREE, MULTI-TRK Ø	•	•
TREE BORING	⊙	⊙
TREE REMOVAL	⊙	⊙
BORING/RECEIVING PITS	⊙	⊙
STUMP	⊙	⊙
HEGGE	---	---
BOLLARD	⊙	⊙
SPOT ELEVATION	426.19	426.19
WATER ELEVATION	426.19	426.19
GATE	⊙	⊙
POST	⊙	⊙
STREAM OR RIVER	---	---
TOP OF SLOPE	---	---
TOE OF SLOPE	---	---
TEST BORE HOLE	⊙	⊙

MATERIAL SYMBOLS	
FEATURE	HATCH
CLAY	---
APPROVED BACKFILL	---
SAND	---
SEDIMENT	---
COMPACT STONE SUBBASE	---
SELECT FILL / CRUSHED STONE	---
FILL	---
RIP-RAP	---
BEDROCK	---
SWAMP	---
TOPSOIL	---
ASPHALT	---
CONCRETE	---
CONCRETE MASONRY UNIT	---
ROCK SURFACE	---
EARTH SURFACE	---
PIPE BEDDING	---
TOP COURSE	---
BINDER COURSE	---
GRANITE	---
PEA GRAVEL	---
EASEMENT	---
MARSH OR SWAMP	---
ROCK OUTCROPPING	---

ABBREVIATIONS		
Ø, DIA	=	DIAMETER
AOBE	=	AS ORDERED BY ENGINEER
ASPH	=	ASPHALT
AHD	=	AHEAD
BOB	=	BOTTOM OF BANK
BC	=	BOTTOM OF CURB
BDY	=	BOUNDARY
BV	=	BUTTERFLY VALVE
BLDG	=	BUILDING
BLVD	=	BOULEVARD
BM	=	BENCHMARK
BTD	=	BLACK TOP DRIVE
BK	=	BACK
CL	=	CENTERLINE
CB	=	CATCH BASIN
CATV	=	CABLE TV
C/C	=	CENTER TO CENTER
CIP	=	CAST IRON PIPE
CMP	=	CORRUGATED METAL PIPE
CC	=	CLEANOUT
CONC	=	CONCRETE
CONST	=	CONSTRUCTION
CP	=	CONTROL POINT
CR	=	COUNTY ROAD
CSD	=	CRUSHED STONE DRIVE
CSPA	=	CORRUGATED STEEL PIPE ARCH
CT	=	COPPER TUBING PIPE
CULV	=	CULVERT
DI	=	DRAINAGE INLET
DIP	=	DUCTILE IRON PIPE
DIA, Ø	=	DIAMETER
DN	=	DOWN
E	=	EAST
EL	=	ELEVATION
EP	=	EDGE OF PAVEMENT
EPS	=	EDGE OF PAVED SHOULDER
ES	=	EDGE OF SHOULDER
FND	=	FOUNDATION
FS	=	FAR SIDE
FT	=	FOOT, FEET
GAR	=	GARAGE
GM	=	GAS METER
GP	=	GUY POLE
GRAV	=	GRAVEL
GSB	=	GAS SERVICE BOX
GV	=	GAS VALVE (MAIN LINE)
GS	=	GATE SERVICE
GW	=	GAS WELL
HC	=	HANDICAP
HDPE	=	HIGH DENSITY POLYETHYLENE PIPE
HP	=	HIGH POINT
HPG	=	HIGH PRESSURE GAS
HSE #	=	HOUSE NUMBER
HW	=	HEADWALL
HWY	=	HIGHWAY
HYD	=	HYDRANT
INV	=	INVERT
IB	=	IRON BAR
IP	=	IRON PIPE OR IRON PIN
LF	=	LINEAR FOOT
LP	=	LIGHT POLE
LPG	=	LOW PRESSURE GAS
LT	=	LEFT
MH	=	MANHOLE
MON	=	MONUMENT

ABBREVIATIONS		
N	=	NORTH
NE	=	NORTH EAST
NW	=	NORTH WEST
NITC	=	NOT IN THIS CONTRCT
NYT	=	NEW YORK TELEPHONE
PAVT	=	PAVEMENT
PCCP	=	PRESTRESSED CONCRETE CYLINDER PIPE
PCSP	=	PERFORATED CORRUGATED STEEL PIPE
PS	=	PUMP STATION
PVC	=	POLYVINYL CHLORIDE PIPE
PP	=	POWER POLE
RCP	=	REINFORCED CONCRETE PIPE
RB	=	RECORDED IRON BAR
RD	=	ROAD
RP	=	REFLECTOR POST
RR	=	RAILROAD
ROW	=	RIGHT OF WAY
RT	=	RIGHT
RTE	=	ROUTE
R	=	RADIUS
STA	=	STATION
SA	=	SANITARY MANHOLE (SYMBOL)
SAN	=	SANITARY SEWER
SSMH	=	SANITARY MANHOLE
SHDR	=	SHOULDER
SIB	=	SET IRON BAR
SH	=	STATE HIGHWAY
S	=	SOUTH
SE	=	SOUTH EAST
SF	=	SILT FECE
SBD	=	STRAW BALE DIKE
SPK	=	SPIKE
STP	=	STEEL PIPE
STM	=	STORM SEWER
STM MH	=	STORM MANHOLE
STK	=	STAKE
ST	=	STREET
STY	=	STORY
SW	=	SIDEWALK
SW	=	SOUTH WEST
TB	=	TEST BORE
TOB	=	TOP OF BANK
TBM	=	TEMPORARY BENCH MARK
TC	=	TOP OF CURB
TEL P	=	TELEPHONE POLE
TGL	=	THEORETICAL GRADE LINE
TGRS	=	TCAAP GROUNDWATER RECOVERY SYSTEM
UP	=	UTILITY POLE
UGE	=	UNDERGROUND ELECTRIC
UGT	=	UNDERGROUND TELEPHONE
VCP	=	VITRIFIED CLAY PIPE
VTP	=	VITRIFIED TILE PIPE
WAT	=	WATER
W	=	WEST
WP	=	WATER PIPE
WM	=	WATER METER
WV	=	WATER VALVE
WS	=	WATER SERVICE (H.S.E. LINE)

UTILITY LINETYPES		
FEATURE	EXISTING	PROPOSED
ELECTRIC UNDERGROUND	---	---
ELECTRIC OVERHEAD	---	---
TELEPHONE UNDERGROUND	---	---
TELEPHONE OVERHEAD	---	---
COMMUNICATION UNDERGROUND	---	---
COMMUNICATION OVERHEAD	---	---
GAS	---	---
WATER MAIN	---	---
SANITARY SEWER	---	---
SANITARY SEWER FORCEMAIN	---	---
STORM SEWER	---	---
TGRS	---	---
ABANDONED PIPE	---	---
DEMOLITION	---	---

WATER		
FEATURE	EXISTING	PROPOSED
WATER GATE VALVE	⊙	⊙
WATER BUTTERFLY VALVE	⊙	⊙
HYDRANT VALVE	⊙	⊙
HYDRANT	⊙	⊙
CURB STOP	⊙	⊙
WATER METER	⊙	⊙
AIR RELIEF VALVE	⊙	⊙
WELL	⊙	⊙
SERVICE	---	---
SERVICE RECONNECT	---	---
BLOWOFF/SAMPLE POINT	⊙	⊙
TAPPING SLEEVE	⊙	⊙
WATER SERVICE BOX	⊙	⊙
SPRINKLER HEAD	⊙	⊙
VALVE CHAMBER	⊙	⊙

TRAFFIC		
FEATURE	EXISTING	PROPOSED
TRAFFIC SIGNAL	⊙	⊙
PULL BOX TRAFFIC SIGNAL	⊙	⊙
SIGNAL POLE W/CONTROL	⊙	⊙
ROAD SIGNS	⊙	⊙
MILE MARKER	⊙	⊙
RAISED PAVEMENT MARKER	⊙	⊙

TOPOGRAPHIC LINETYPES		
FEATURE	EXISTING	PROPOSED
FENCE	---	---
GUIDE POSTS GUARD RAIL	---	---
RR TRACKS SMALL SCALE	---	---
SHEET PILING	---	---
SHORE LINE	---	---
WORK LIMIT LINE	---	---

POWER		
FEATURE	EXISTING	PROPOSED
UTILITY POLE	⊙	⊙
GUY WIRE ANCHOR	⊙	⊙
STREET LIGHT	⊙	⊙
BURIED CABLE MARKER	⊙	⊙
TRANSMISSION TOWERS	⊙	⊙
PULL BOX STREET LIGHTS	⊙	⊙
TERMINAL BOX	⊙	⊙
UTILITY MANHOLE	⊙	⊙
HANDHOLE	⊙	⊙
INSPECTION POST	⊙	⊙
UTILITY MARKER	⊙	⊙

EROSION CONTROL		
FEATURE	EXISTING	PROPOSED
SILT FENCE	---	---
INLET PROTECTION	---	---

SURVEY		
FEATURE	EXISTING	PROPOSED
MONUMENT	⊙	⊙
SIB	⊙	⊙
IB	⊙	⊙
RB	⊙	⊙
IRON PIPE	⊙	⊙
CUT-CROSS	⊙	⊙
NAIL	⊙	⊙
DRILL HOLE	⊙	⊙
BENCHMARK	⊙	⊙
TEMPORARY BENCHMARK	⊙	⊙
CONTROL POINT	⊙	⊙
PERMANENT SURVEY MARKER	⊙	⊙

NATURAL GAS		
FEATURE	EXISTING	PROPOSED
GAS VALVE	⊙	⊙
GAS METER	⊙	⊙
GAS MAIN MARKER	⊙	⊙
GAS SERVICE BOX	⊙	⊙
GAS WELL	⊙	⊙

MISC		
FEATURE	EXISTING	PROPOSED
TANK FILLER	⊙	⊙
CLAY DAM	⊙	⊙
CONTRACTOR TEST PIT	⊙	⊙
POST INDICATOR VALVE	⊙	⊙
PUMP	⊙	⊙
VALVE OPERATOR **	⊙	⊙
CHECK VALVE	⊙	⊙

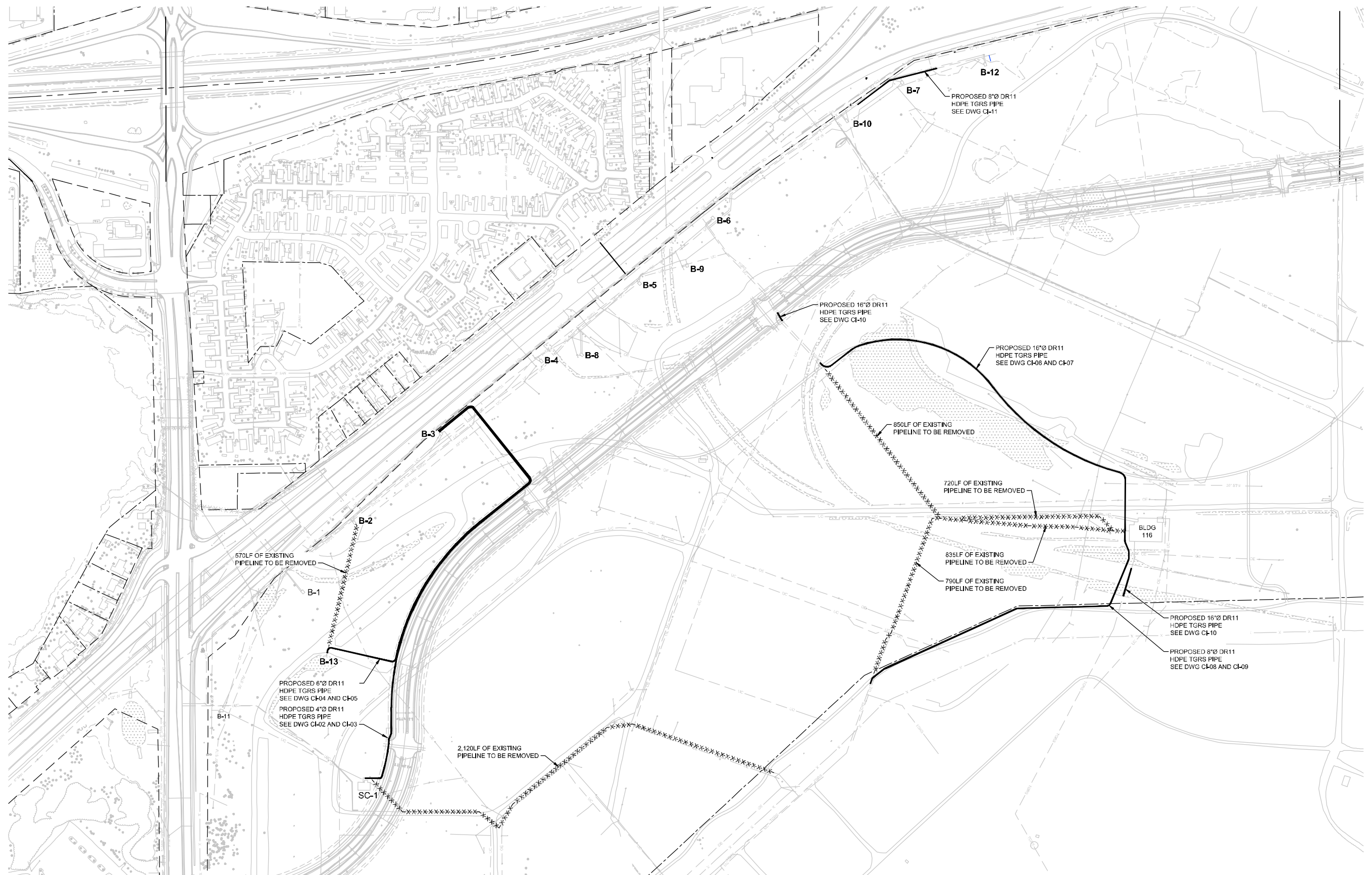
SANITARY		
FEATURE	EXISTING	PROPOSED
SANITARY SEWER MH	⊙	⊙
CLEAN OUT	⊙	⊙
SANITARY SEWER VALVE	⊙	⊙
VENT	⊙	⊙
LATERAL	---	---
END CAP	---	---
MANHOLE DEMOLITION	---	---

COMMUNICATIONS		
FEATURE	EXISTING	PROPOSED
PEDESTAL	⊙	⊙
POLICE OR FIRE CALL BOX	⊙	⊙

RAILROAD		
FEATURE	EXISTING	PROPOSED
RR SIGNAL	⊙	⊙
RR SIGNAL CONTROL BOX	⊙	⊙
RR SWITCHSTAND	⊙	⊙
RR FROG POINT	⊙	⊙
RR BUMPER	⊙	⊙

DRAFT - NOT FOR BIDDING

<p>Bar is one inch on original size drawing 0 1"</p>		<p>Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD</p>		<p>Drawn CR/ID Designer W. WHEELER Client CARL BOLANDER AND SONS Drafting Check W. WHEELER Design Check E. HOGLUND Project TGRS PIPING REROUTE Project Manager E. HOGLUND Date May 25, 2016 Title LEGEND Project No. 83125-00(001) This document shall not be used for construction unless signed and sealed for construction. Scale NONE Arch D Sheet No. GN-02</p>	
<p>B ISSUED FOR REVIEW CR/ID WWW 06/03/16</p>		<p>A ISSUED FOR REVIEW CR/ID WWW 03/25/15</p>		<p>No. Issue Drawn Approved Date</p>	



DRAFT - NOT FOR BIDDING

No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	03/25/15

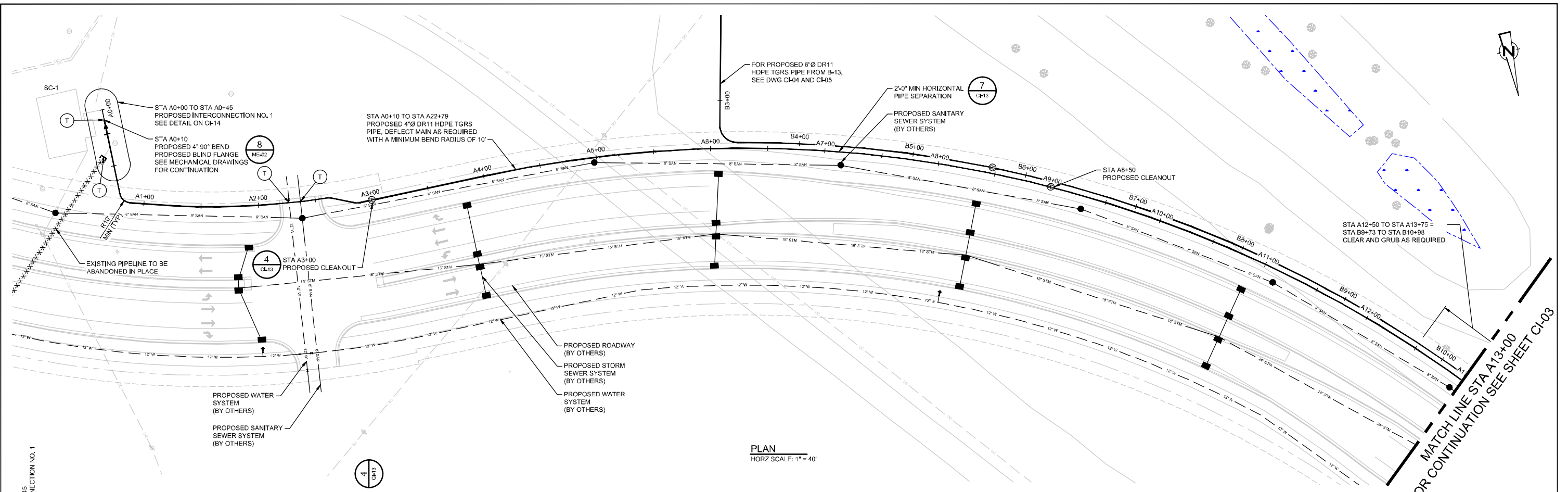
Bar is one inch on original size drawing
0 1"

Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization.
© 2015 GHD

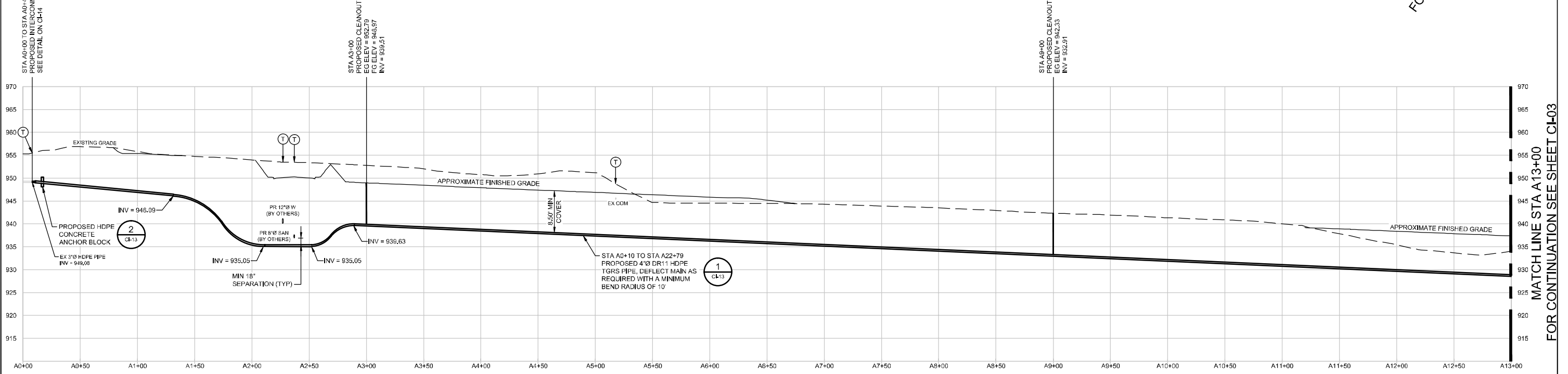
GHD
GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn: CR/TD
Drafting Check: W. WHEELER
Project Manager: E. HOGLUND
Designer: W. WHEELER
Design Check: E. HOGLUND
Date: Jun 1, 2016
Scale: 1" = 200'

Client: **CARL BOLANDER AND SONS**
Project: **TGRS PIPING REROUTE**
Title: **PROPOSED SITE PLAN**
Project No.: **83125-00(001)**
Original Size: **Arch D**
Sheet No.: **CI-01**
Sheet 1 of 1



PLAN
HORZ SCALE: 1" = 40'

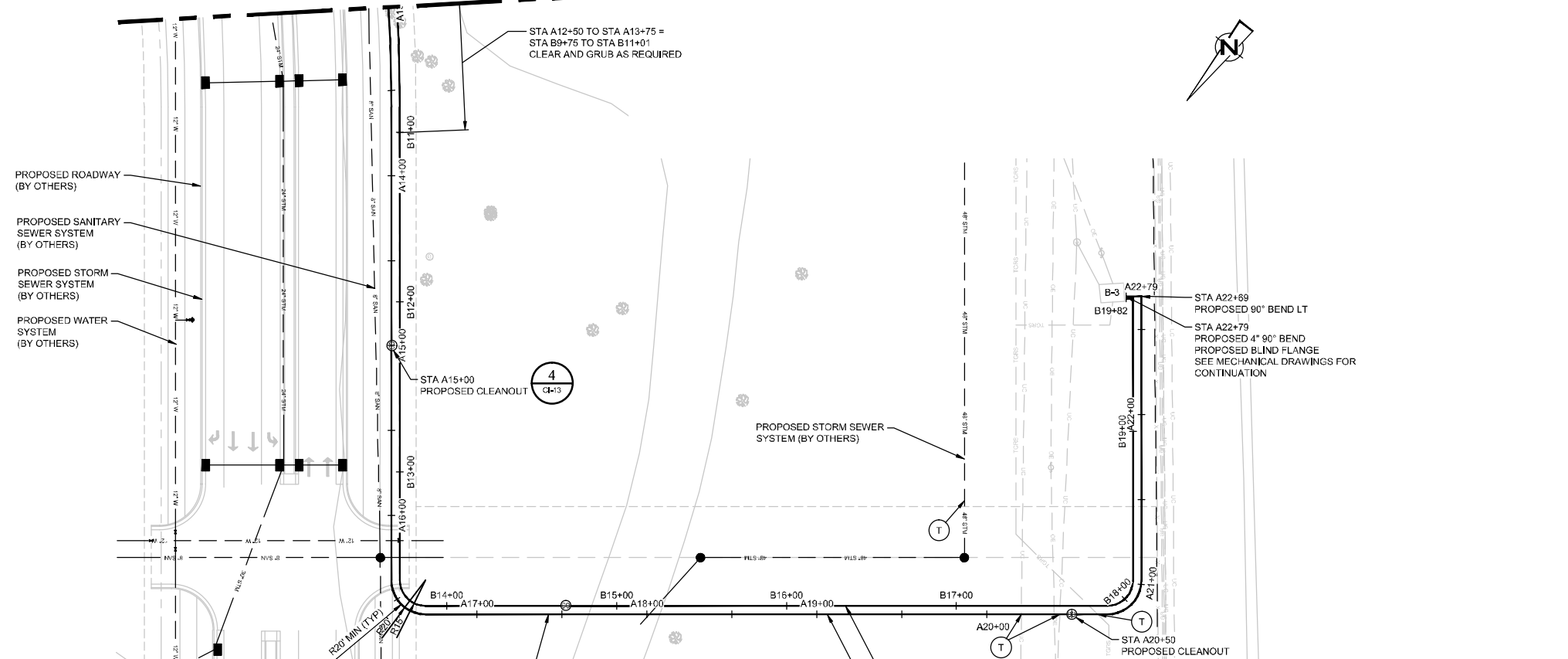


PROFILE
HORZ SCALE: 1" = 40'
VERT SCALE: 1" = 10'

DRAFT - NOT FOR BIDDING

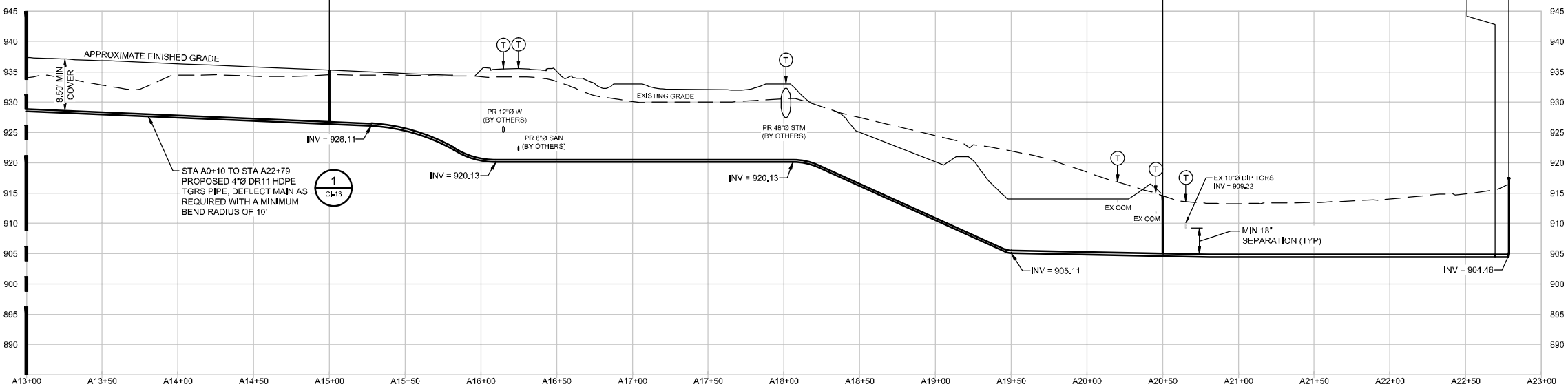
<table border="1"> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>																		<p>Bar is one inch on original size drawing 0 1"</p>	<p>GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul, Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com</p>	<table border="1"> <tr> <td>Drawn</td> <td>CR/TD</td> <td>Designer</td> <td>W. WHEELER</td> </tr> <tr> <td>Drafting Check</td> <td>W. WHEELER</td> <td>Design Check</td> <td>E. HOGLUND</td> </tr> <tr> <td>Project Manager</td> <td>E. HOGLUND</td> <td>Date</td> <td>Jun 1, 2016</td> </tr> <tr> <td colspan="2">This document shall not be used for construction unless signed and sealed for construction.</td> <td>Scale</td> <td>AS NOTED</td> </tr> </table>	Drawn	CR/TD	Designer	W. WHEELER	Drafting Check	W. WHEELER	Design Check	E. HOGLUND	Project Manager	E. HOGLUND	Date	Jun 1, 2016	This document shall not be used for construction unless signed and sealed for construction.		Scale	AS NOTED	<table border="1"> <tr> <td>Client</td> <td>CARL BOLANDER AND SONS</td> </tr> <tr> <td>Project</td> <td>TGRS PIPING REROUTE</td> </tr> <tr> <td>Title</td> <td>PLAN AND PROFILE</td> </tr> <tr> <td>Project Name</td> <td>STA A0+00 TO STA A13+00</td> </tr> <tr> <td>Project No.</td> <td>83125-00(001)</td> </tr> <tr> <td>Original Scale</td> <td>Arch D</td> </tr> <tr> <td>Sheet No.</td> <td>CI-02</td> </tr> </table>	Client	CARL BOLANDER AND SONS	Project	TGRS PIPING REROUTE	Title	PLAN AND PROFILE	Project Name	STA A0+00 TO STA A13+00	Project No.	83125-00(001)	Original Scale	Arch D	Sheet No.	CI-02
Drawn	CR/TD	Designer	W. WHEELER																																																
Drafting Check	W. WHEELER	Design Check	E. HOGLUND																																																
Project Manager	E. HOGLUND	Date	Jun 1, 2016																																																
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS NOTED																																																
Client	CARL BOLANDER AND SONS																																																		
Project	TGRS PIPING REROUTE																																																		
Title	PLAN AND PROFILE																																																		
Project Name	STA A0+00 TO STA A13+00																																																		
Project No.	83125-00(001)																																																		
Original Scale	Arch D																																																		
Sheet No.	CI-02																																																		
<table border="1"> <tr> <td>B</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>06/03/16</td> </tr> <tr> <td>A</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>03/26/15</td> </tr> <tr> <td>No.</td> <td>Issue</td> <td>Drawn</td> <td>Approved</td> <td>Date</td> </tr> </table>	B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16	A	ISSUED FOR REVIEW	CR/TD	WWW	03/26/15	No.	Issue	Drawn	Approved	Date	<p>Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD</p>	<p>Sheet 1 of 1</p>																																		
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16																																															
A	ISSUED FOR REVIEW	CR/TD	WWW	03/26/15																																															
No.	Issue	Drawn	Approved	Date																																															

MATCH LINE STA A13+00
FOR CONTINUATION SEE SHEET CI-02



PLAN
HORZ SCALE: 1" = 40'

MATCH LINE STA A13+00
FOR CONTINUATION SEE SHEET CI-02



PROFILE
HORZ SCALE: 1" = 40'
VERT SCALE: 1" = 10'

DRAFT - NOT FOR BIDDING

No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	02/26/15

Bar is one inch on original size drawing	0 1"
Reuse of Documents	This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD

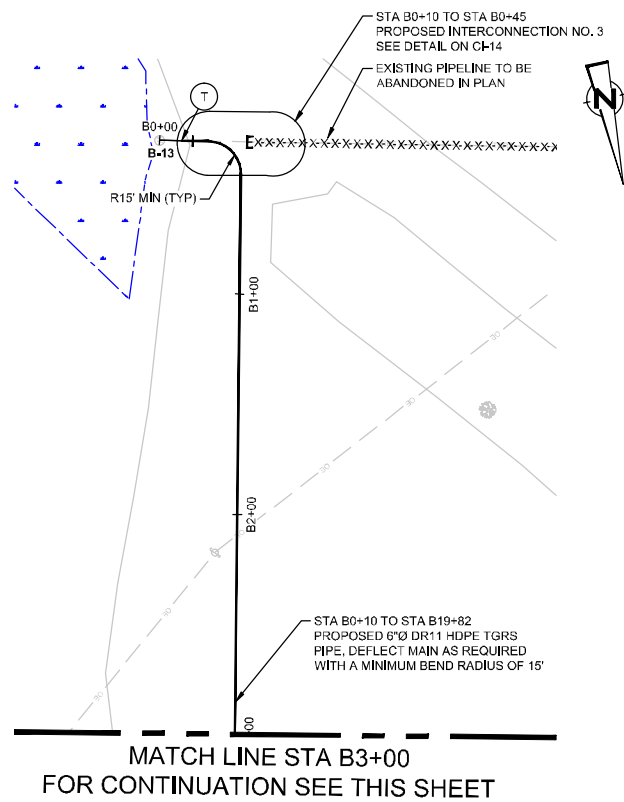
Bar is one inch on original size drawing
0 1"

Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD

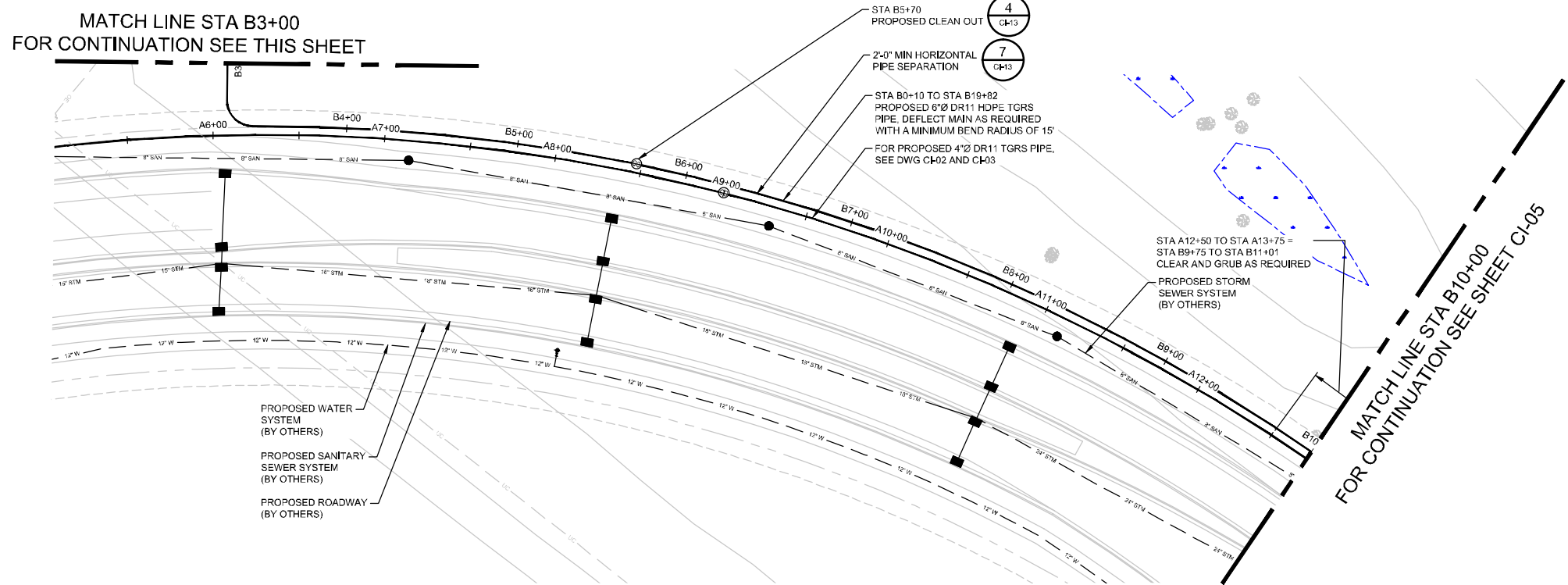
GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	CR/TD	Designer	W. WHEELER
Drafting Check	W. WHEELER	Design Check	E. HOGLUND
Project Manager	E. HOGLUND	Date	Jun 1, 2016
Scale	AS NOTED		

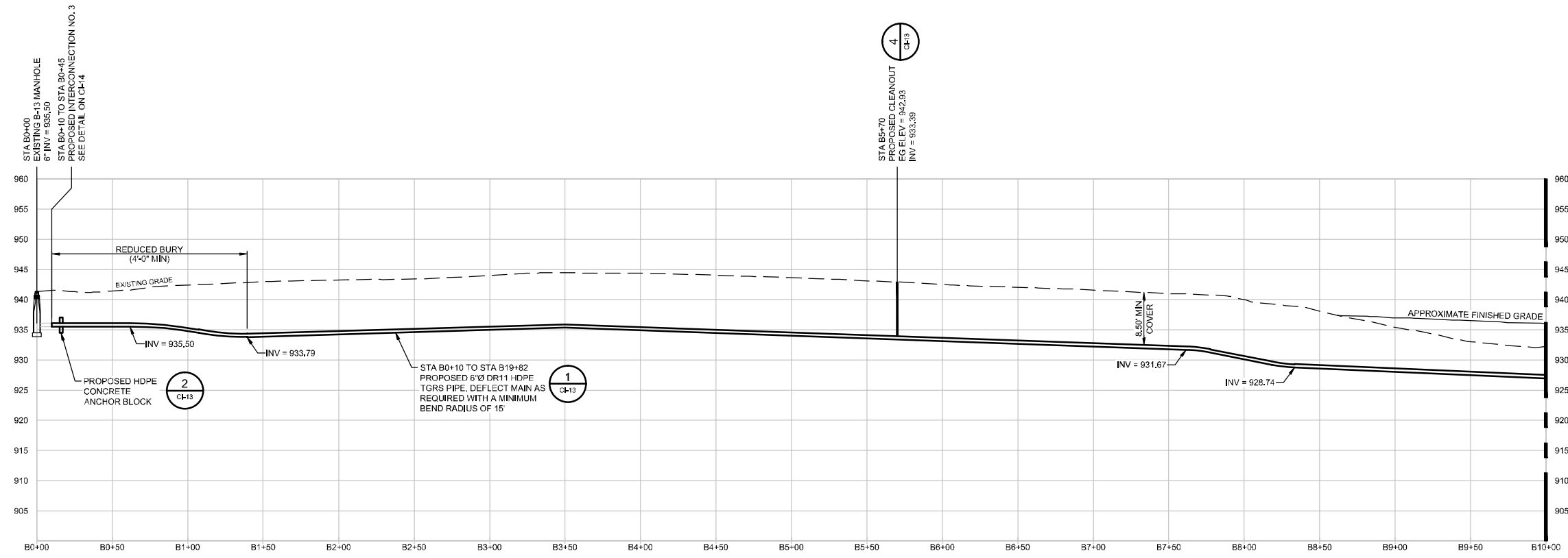
Client	CARL BOLANDER AND SONS
Project	TGRS PIPING REROUTE
Title	PLAN AND PROFILE STA A13+00 TO STA A23+00
Project No.	83125-00(001)
Original Size	Arch D
Sheet No.	CI-03
Sheet	1 of 1



PLAN
HORZ SCALE: 1" = 40'



PLAN
HORZ SCALE: 1" = 40'

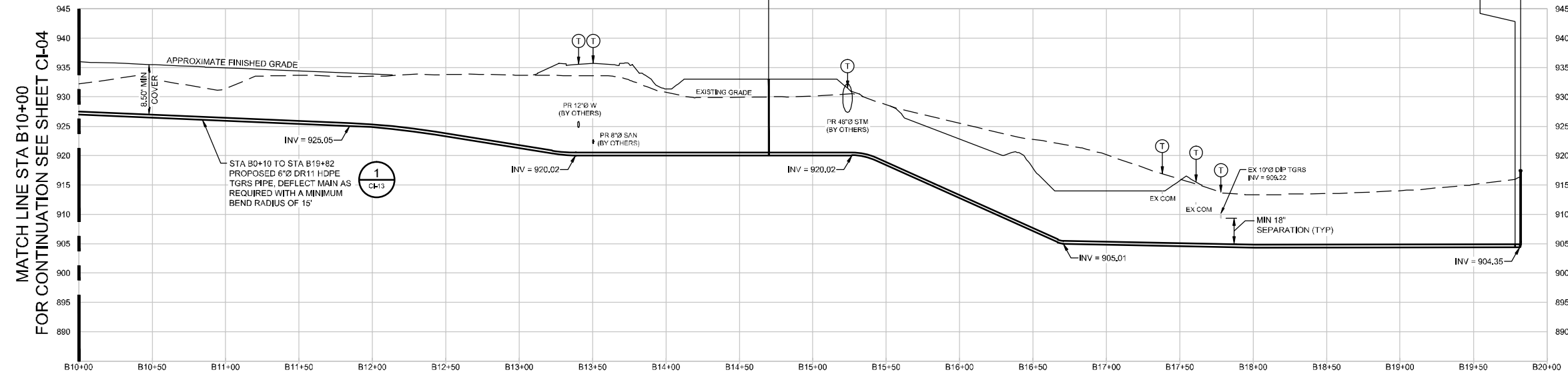
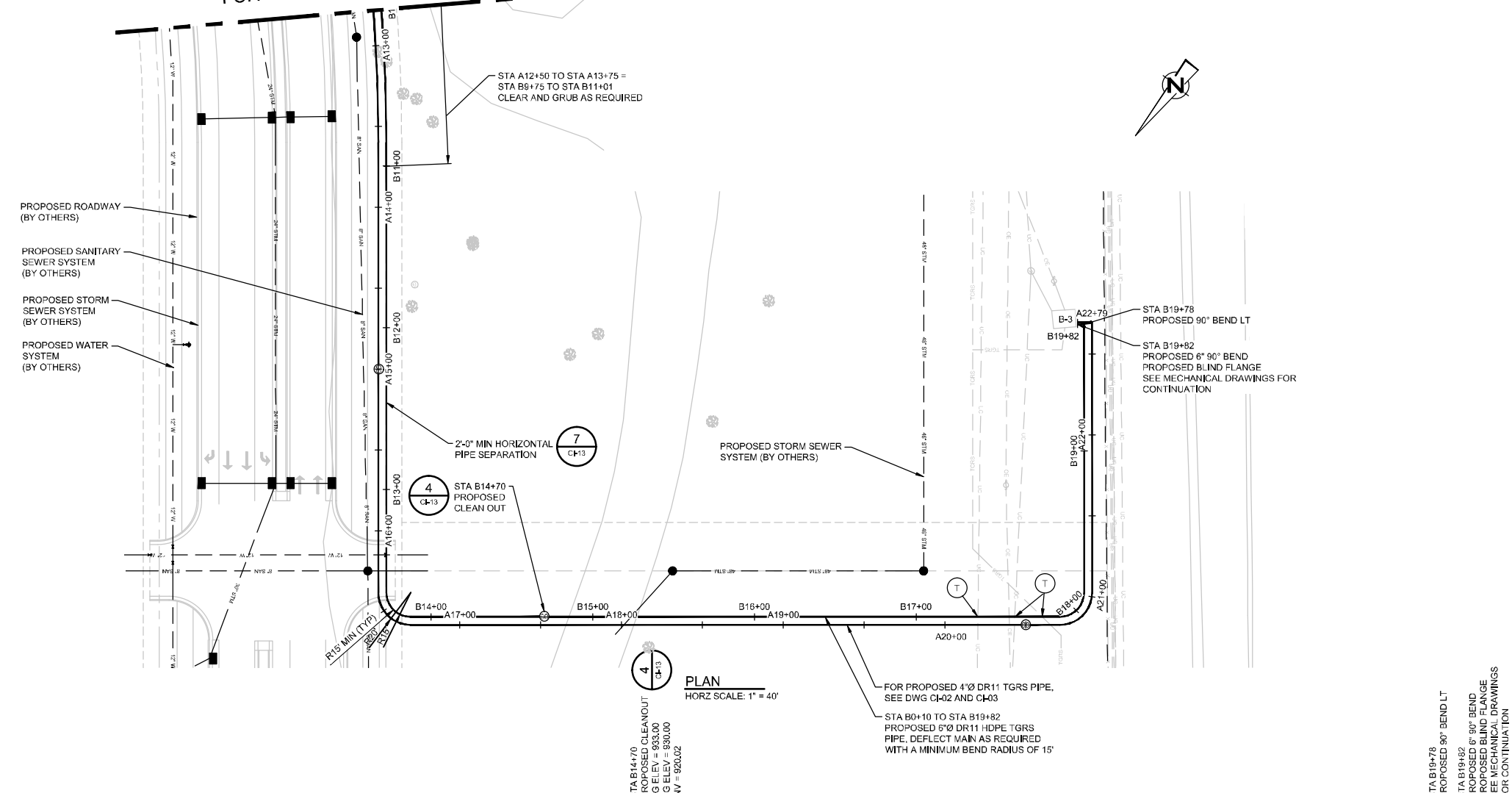


PROFILE
HORZ SCALE: 1" = 40'
VERT SCALE: 1" = 10'

DRAFT - NOT FOR BIDDING

<table border="1"> <tr> <td>B</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>06/03/16</td> </tr> <tr> <td>A</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>03/26/15</td> </tr> <tr> <td>No.</td> <td>Issue</td> <td>Drawn</td> <td>Approved</td> <td>Date</td> </tr> </table>		B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16	A	ISSUED FOR REVIEW	CR/TD	WWW	03/26/15	No.	Issue	Drawn	Approved	Date	<p>Bar is one inch on original size drawing 0 1"</p> <p>Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD</p>	<p>GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul, Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com</p>	<table border="1"> <tr> <td>Drawn</td> <td>CR/TD</td> <td>Designer</td> <td>W. WHEELER</td> </tr> <tr> <td>Drafting Check</td> <td>W. WHEELER</td> <td>Design Check</td> <td>E. HOGLUND</td> </tr> <tr> <td>Project Manager</td> <td>E. HOGLUND</td> <td>Date</td> <td>Jun 1, 2016</td> </tr> <tr> <td>Scale</td> <td>AS NOTED</td> <td>Original Size</td> <td>Arch D</td> </tr> </table>	Drawn	CR/TD	Designer	W. WHEELER	Drafting Check	W. WHEELER	Design Check	E. HOGLUND	Project Manager	E. HOGLUND	Date	Jun 1, 2016	Scale	AS NOTED	Original Size	Arch D	<table border="1"> <tr> <td>Client</td> <td>CARL BOLANDER AND SONS</td> </tr> <tr> <td>Project</td> <td>TGRS PIPING REROUTE</td> </tr> <tr> <td>Title</td> <td>PLAN AND PROFILE STA B0+00 TO STA B10+00</td> </tr> <tr> <td>Project No.</td> <td>83125-00(001)</td> </tr> <tr> <td>Sheet No.</td> <td>CI-04</td> </tr> </table>	Client	CARL BOLANDER AND SONS	Project	TGRS PIPING REROUTE	Title	PLAN AND PROFILE STA B0+00 TO STA B10+00	Project No.	83125-00(001)	Sheet No.	CI-04
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16																																										
A	ISSUED FOR REVIEW	CR/TD	WWW	03/26/15																																										
No.	Issue	Drawn	Approved	Date																																										
Drawn	CR/TD	Designer	W. WHEELER																																											
Drafting Check	W. WHEELER	Design Check	E. HOGLUND																																											
Project Manager	E. HOGLUND	Date	Jun 1, 2016																																											
Scale	AS NOTED	Original Size	Arch D																																											
Client	CARL BOLANDER AND SONS																																													
Project	TGRS PIPING REROUTE																																													
Title	PLAN AND PROFILE STA B0+00 TO STA B10+00																																													
Project No.	83125-00(001)																																													
Sheet No.	CI-04																																													

MATCH LINE STA B10+00
FOR CONTINUATION SEE SHEET CI-04



DRAFT - NOT FOR BIDDING

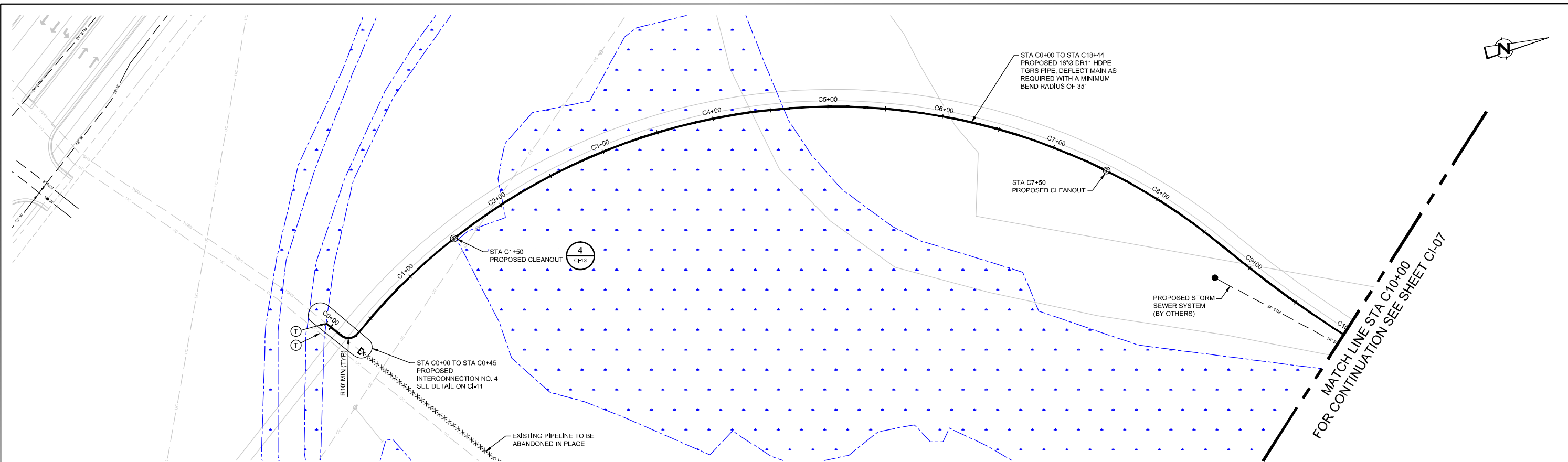
No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	02/26/15

Bar is one inch on original size drawing
0 1"

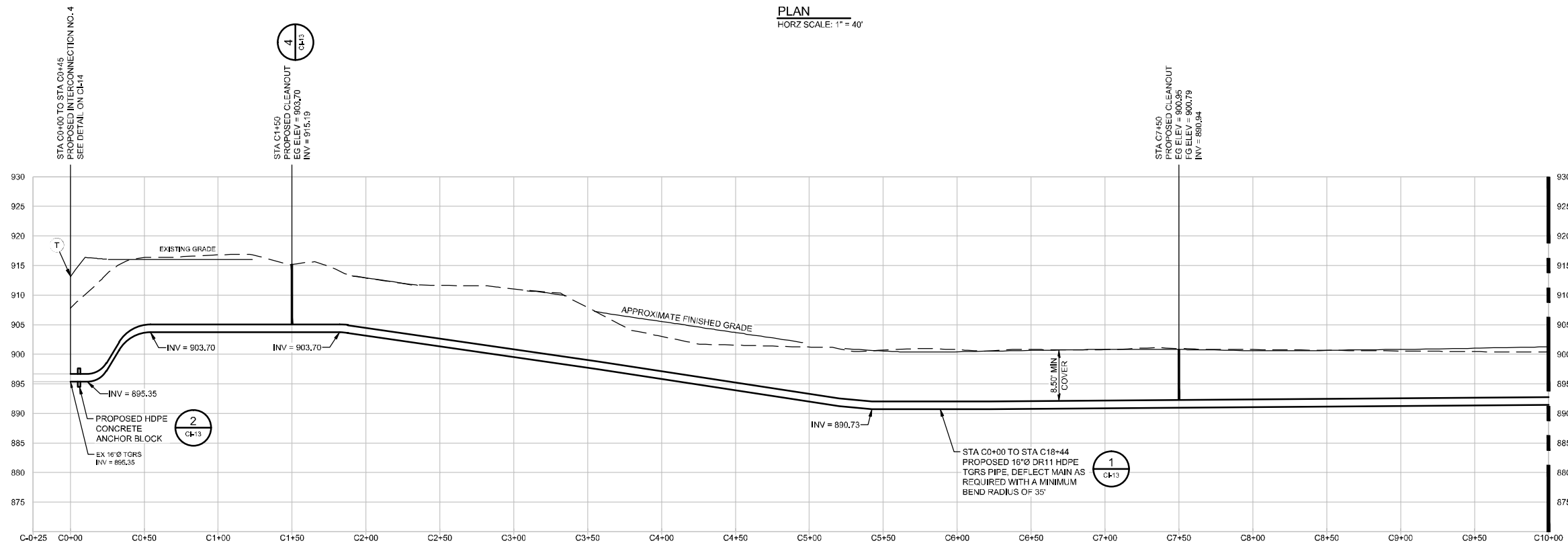
Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization.
© 2015 GHD

GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	CR/TD	Designer	W. WHEELER	Client	CARL BOLANDER AND SONS	
Drafting Check	W. WHEELER	Design Check	E. HOGLUND	Project	TGRS PIPING REROUTE	
Project Manager	E. HOGLUND	Date	Jun 1, 2016	Title	PLAN AND PROFILE	
		Scale	AS NOTED	Project No.	83125-00(001)	
				Original Size	Arch D	
				Sheet No.	CI-05	
					Sheet 1 of 1	



PLAN
HORZ SCALE: 1" = 40'



PROFILE
HORZ SCALE: 1" = 40'
VERT SCALE: 1" = 10'

DRAFT - NOT FOR BIDDING

No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	02/26/15

Bar is one inch on original size drawing	0 1"
Reuse of Documents	This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD

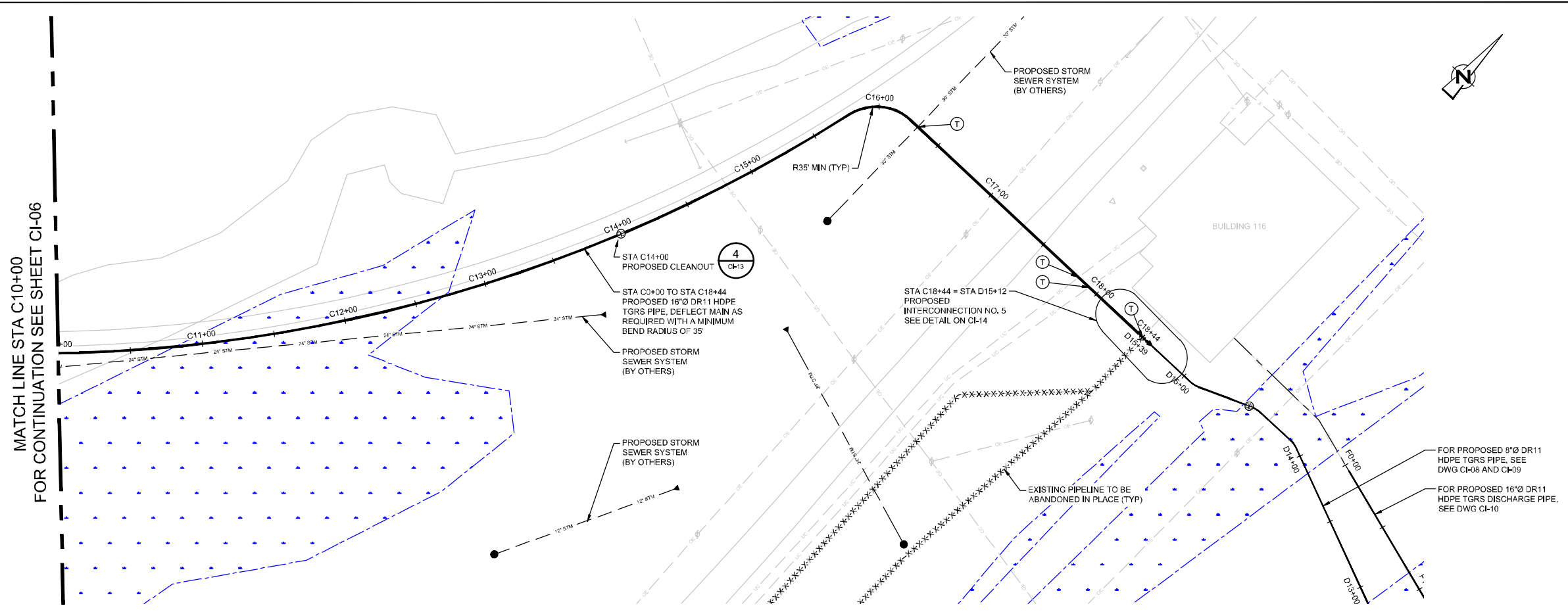
Bar is one inch on original size drawing
0 1"

Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD

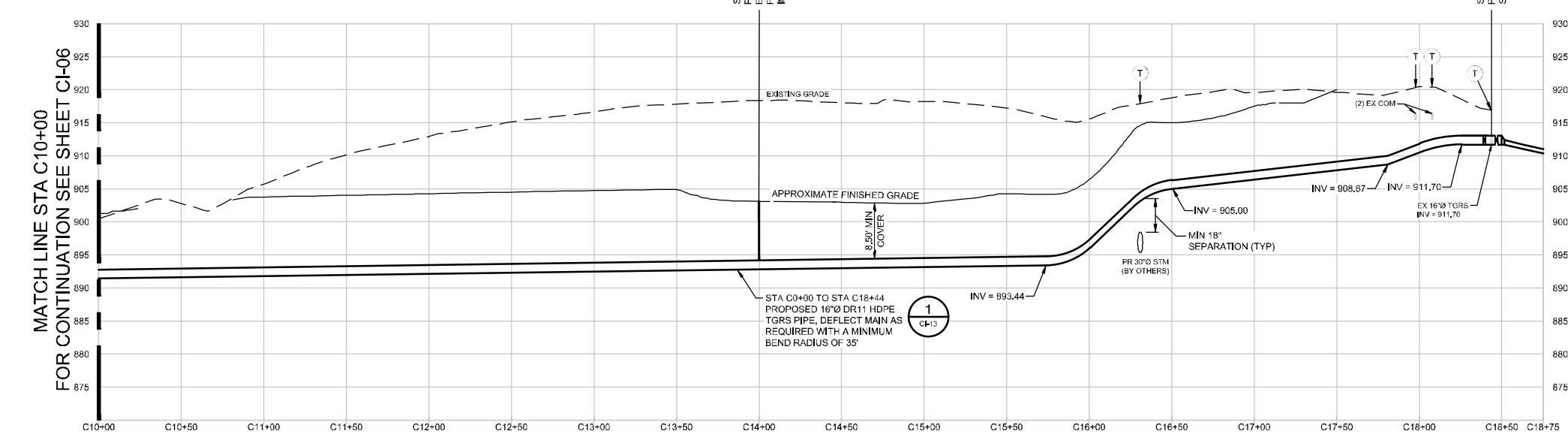
GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	CR/TD	Designer	W. WHEELER
Drafting Check	W. WHEELER	Design Check	E. HOGLUND
Project Manager	E. HOGLUND	Date	Jun 1, 2016
Scale	AS NOTED		

Client	CARL BOLANDER AND SONS
Project	TGRS PIPING REROUTE
Title	PLAN AND PROFILE
	STA C0+00 TO STA C10+00
Project No.	83125-00(001)
Original Size	Arch D
Sheet No.	CI-06



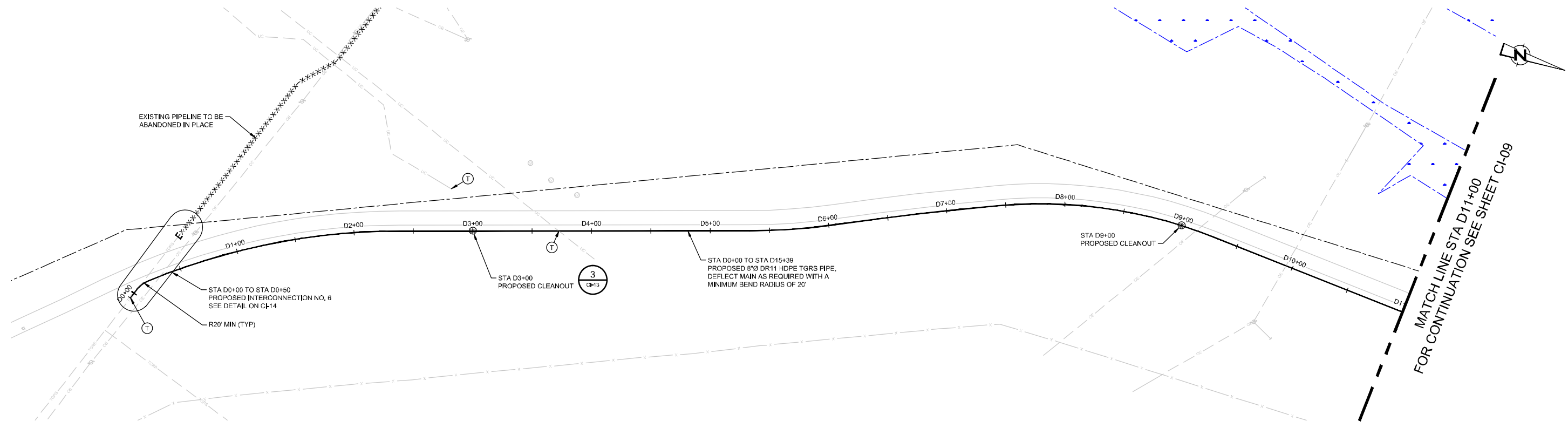
PLAN
HORZ SCALE: 1" = 40'



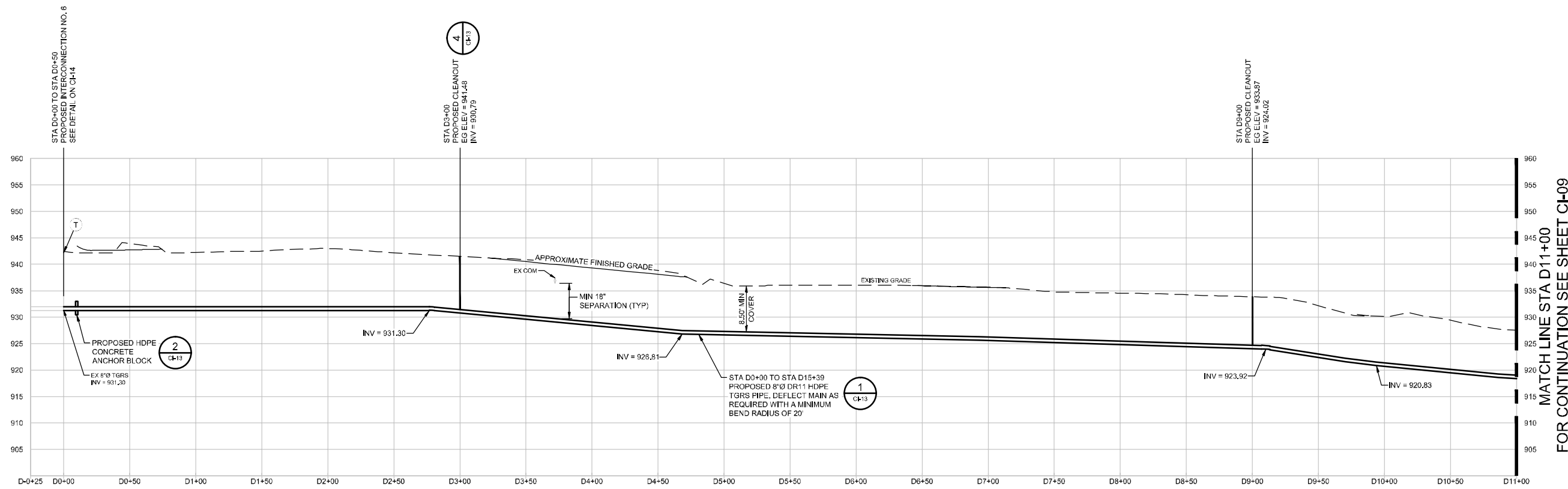
PROFILE
HORZ SCALE: 1" = 40'
VERT SCALE: 1" = 10'

DRAFT - NOT FOR BIDDING

				Bar is one inch on original size drawing 0 1"		 GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul, Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com		Drawn: CR/TD Designer: W. WHEELER Drafting Check: W. WHEELER Design Check: E. HOGLUND Project Manager: E. HOGLUND Date: Jun 1, 2016 Scale: AS NOTED		Client: CARL BOLANDER AND SONS Project: TGRS PIPING REROUTE Title: PLAN AND PROFILE STA C10+00 TO STA C18+75 Project No.: 83125-00(001) Original Size: Arch D Sheet No.: CI-07	
B ISSUED FOR REVIEW CR/TD WWW 06/03/16				A ISSUED FOR REVIEW CR/TD WWW 08/26/15		Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD		This document shall not be used for construction unless signed and sealed for construction.		Sheet 1 of 1	



PLAN
HORIZ SCALE: 1" = 40'



PROFILE
HORIZ SCALE: 1" = 40'
VERT SCALE: 1" = 10'

DRAFT - NOT FOR BIDDING

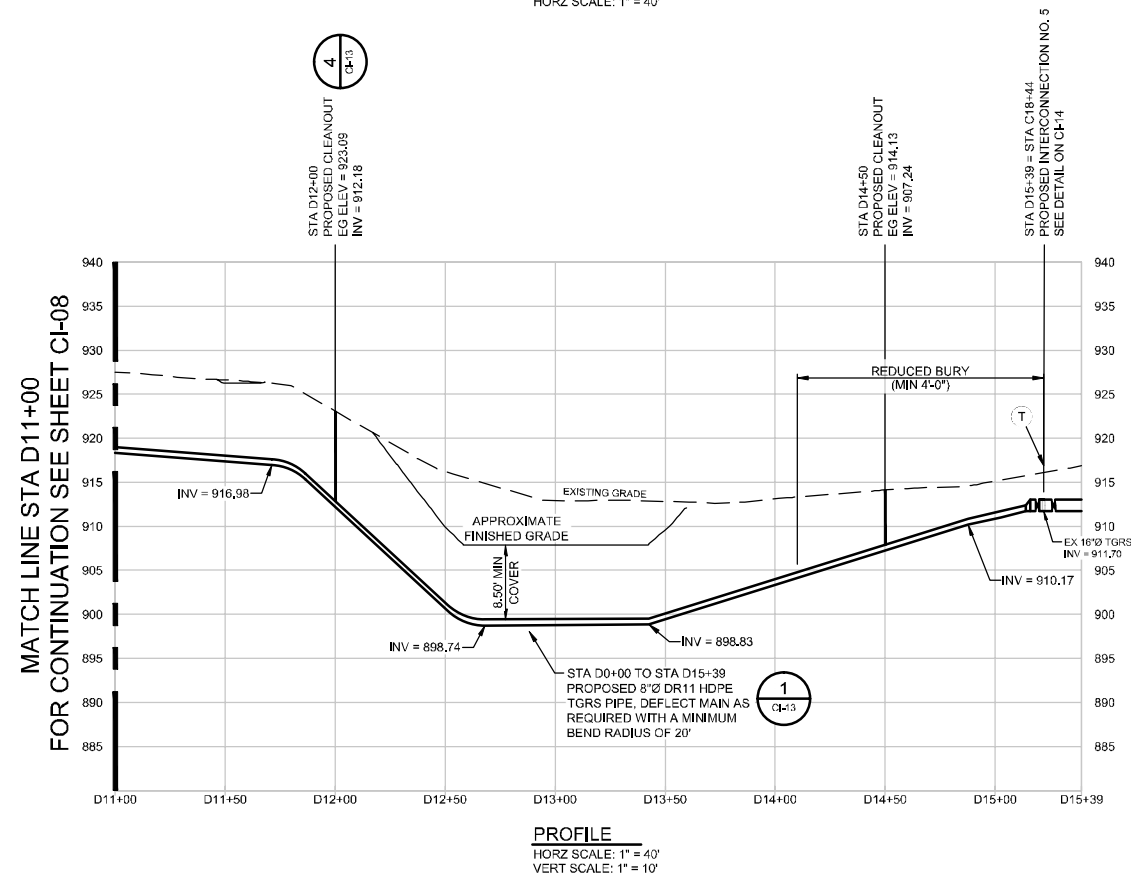
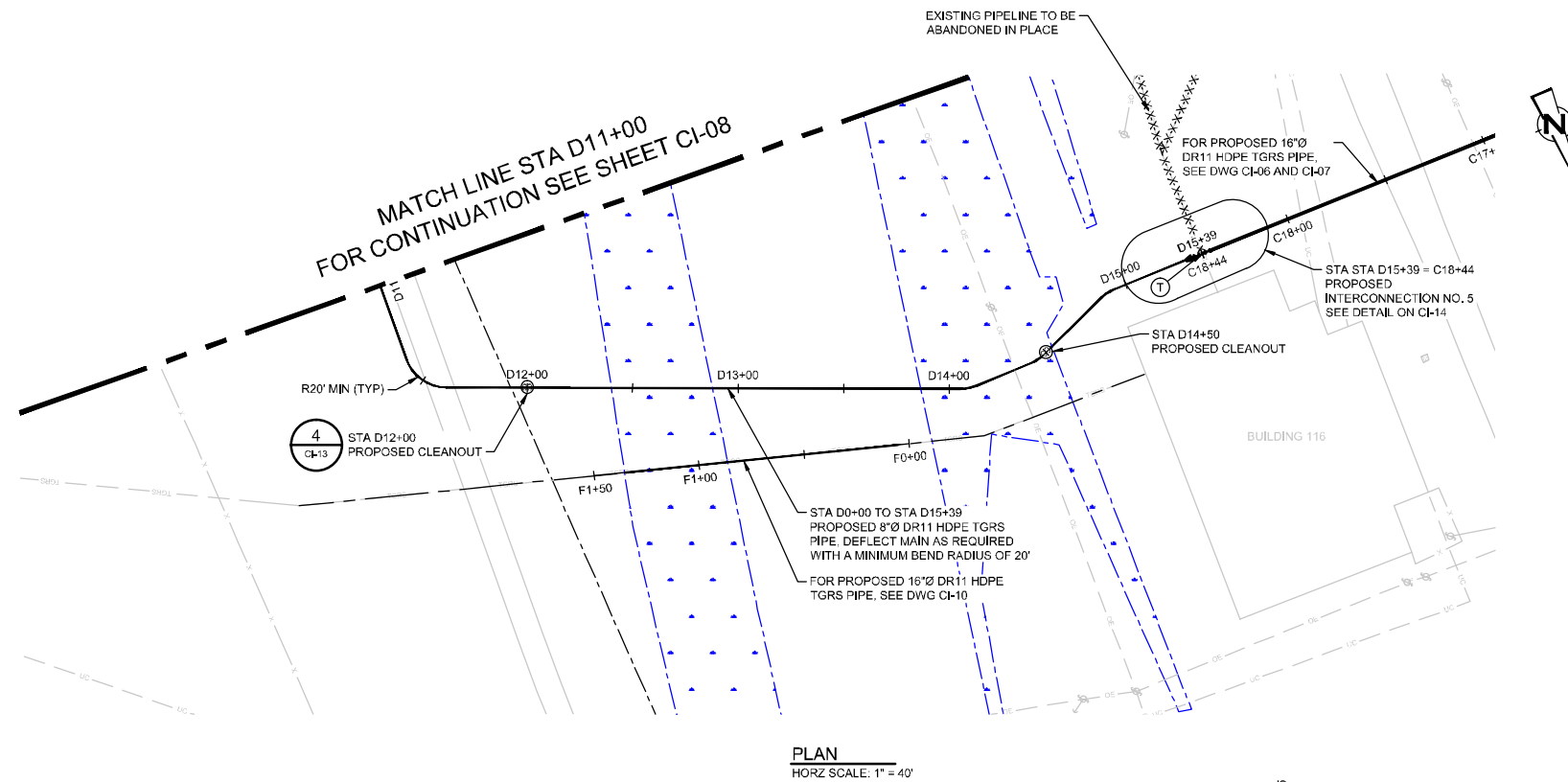
No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	02/26/15

Bar is one inch on original size drawing	0 1"
Reuse of Documents	This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD

GHD
GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

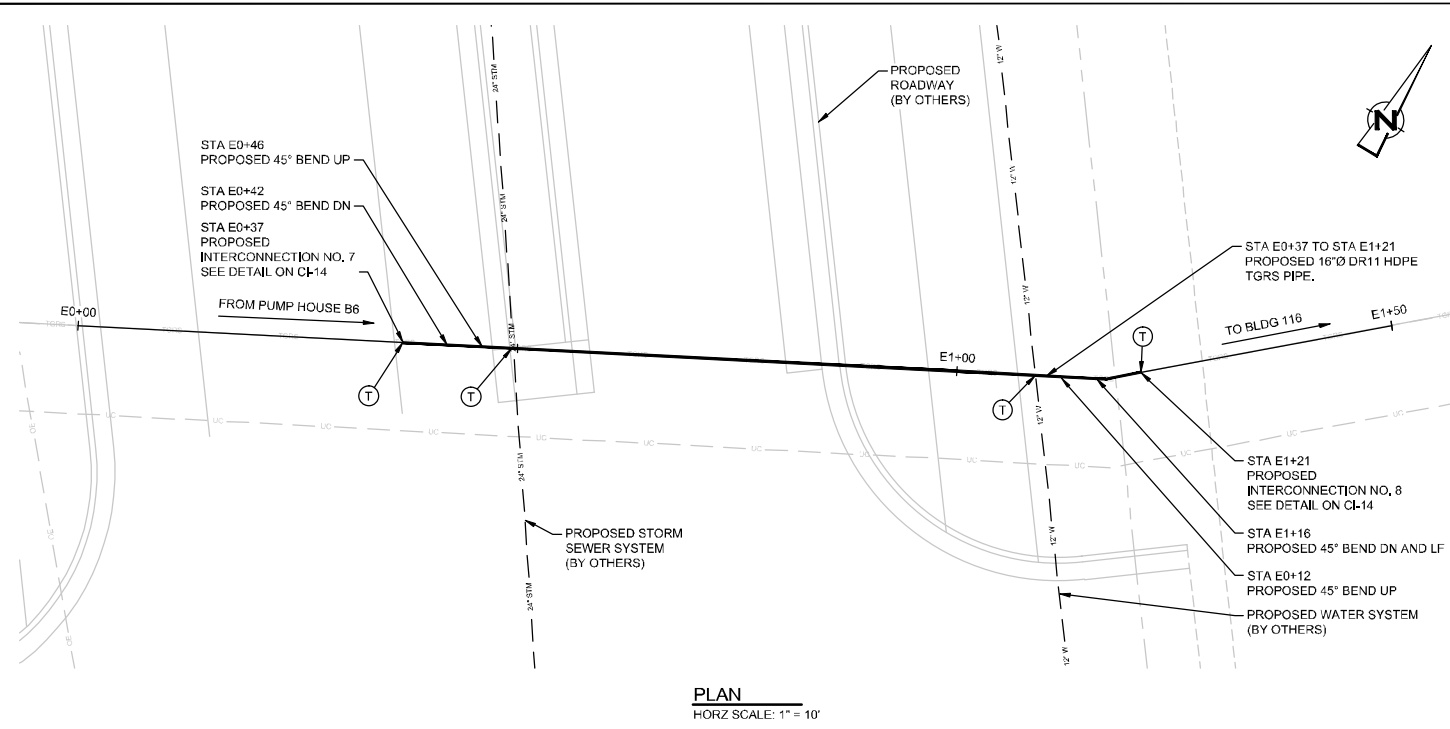
Drawn	CR/TD	Designer	W. WHEELER
Drafting Check	W. WHEELER	Design Check	E. HOGLUND
Project Manager	E. HOGLUND	Date	Jun 1, 2016
Scale	AS NOTED	This document shall not be used for construction unless signed and sealed for construction.	

Client	CARL BOLANDER AND SONS		
Project	TGRS PIPING REROUTE		
Title	PLAN AND PROFILE		
Project No.	83125-00(001)		
Original Size	Arch D	Sheet No.	CI-08
Sheet	1	of	1

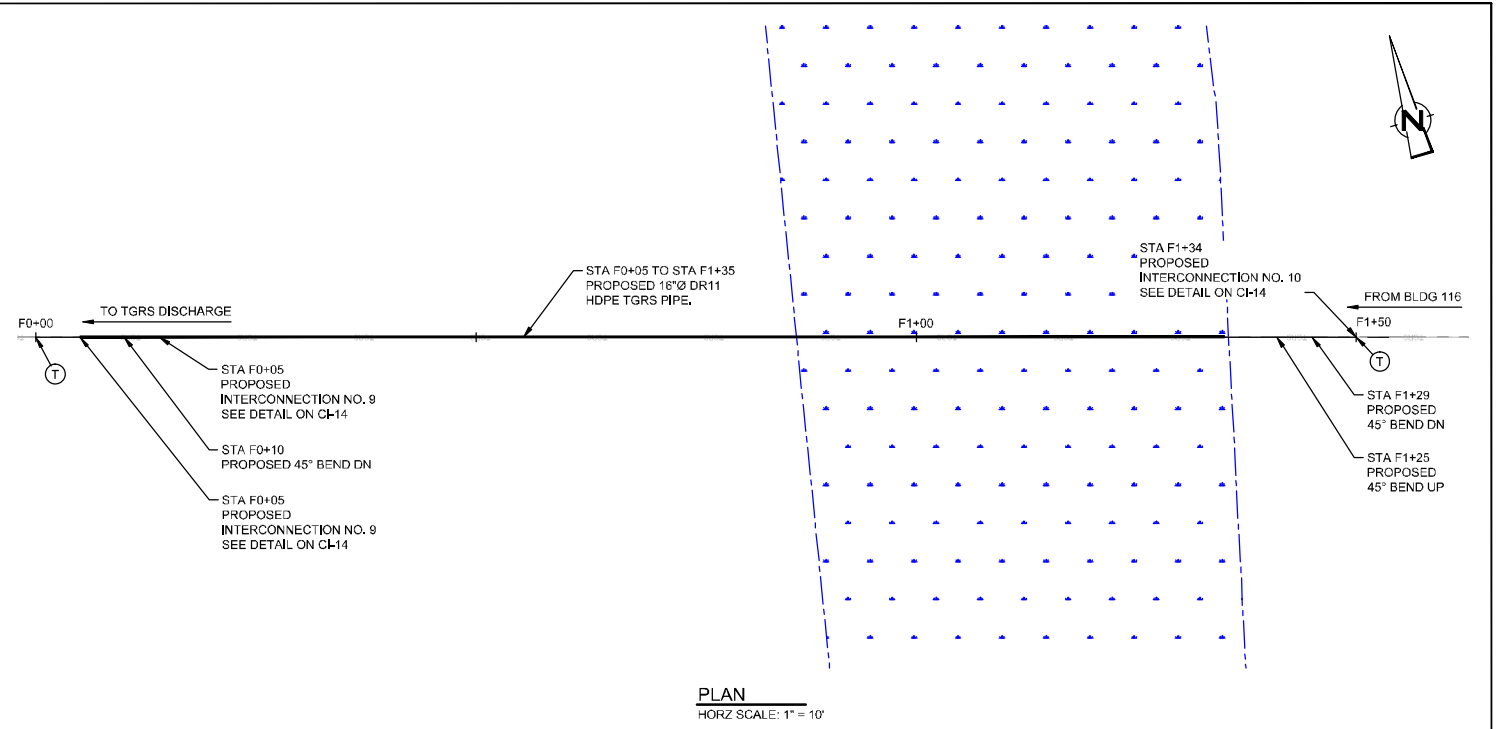


DRAFT - NOT FOR BIDDING

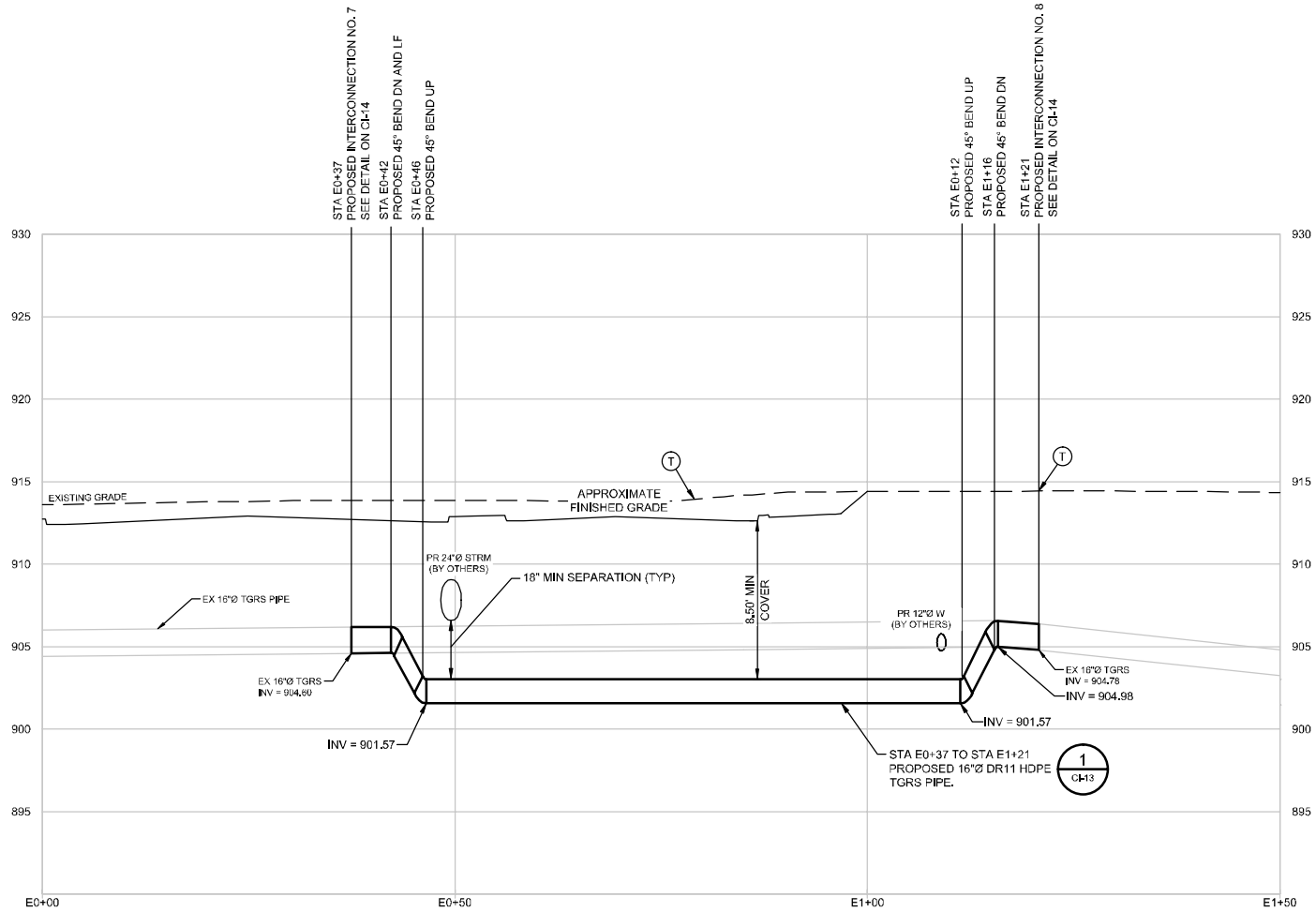
				Bar is one inch on original size drawing 0 1"		 GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul, Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com		Drawn: CR/TD	Designer: W. WHEELER	Client: CARL BOLANDER AND SONS
				Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be re-used in whole or in part for any other project without GHD's written authorization. © 2016 GHD				Drafting Check: W. WHEELER	Design Check: E. HOGLUND	Project: TGRS PIPING REROUTE
B ISSUED FOR REVIEW				CR/TD	WWW	06/03/16			Title: PLAN AND PROFILE	
A ISSUED FOR REVIEW				CR/TD	WWW	08/26/15			Project Manager: E. HOGLUND	
No.	Issue	Drawn	Approved	Date					Date: Jun 1, 2016	
								Scale: AS NOTED		
								Original Size: Arch D		
								Sheet No. CI-09		
								Sheet 1 of 1		



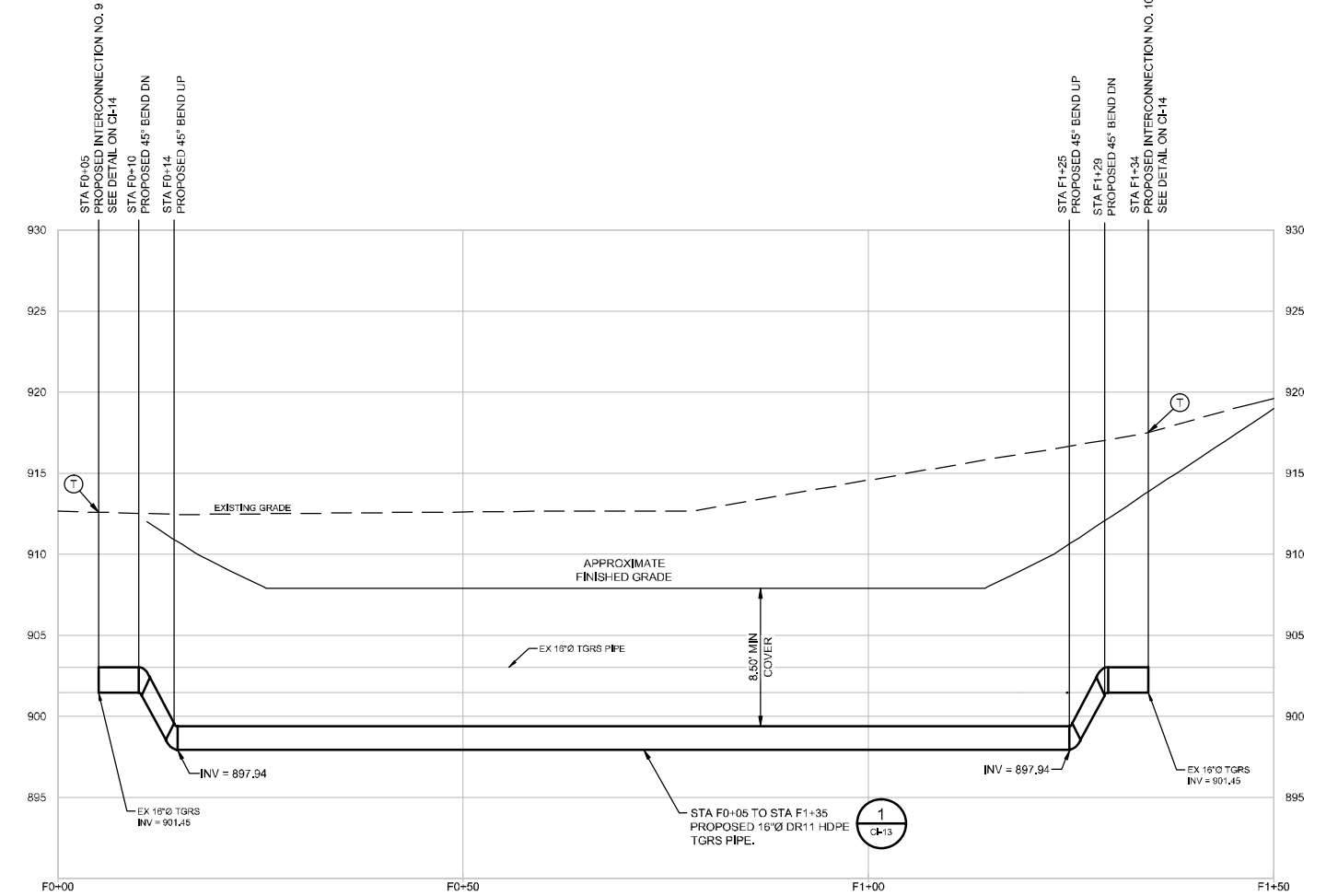
PLAN
HORZ SCALE: 1" = 10'



PLAN
HORZ SCALE: 1" = 10'



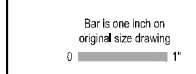
PROFILE
HORZ SCALE: 1" = 10'
VERT SCALE: 1" = 5'



PROFILE
HORZ SCALE: 1" = 10'
VERT SCALE: 1" = 5'

DRAFT - NOT FOR BIDDING

No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	02/26/15

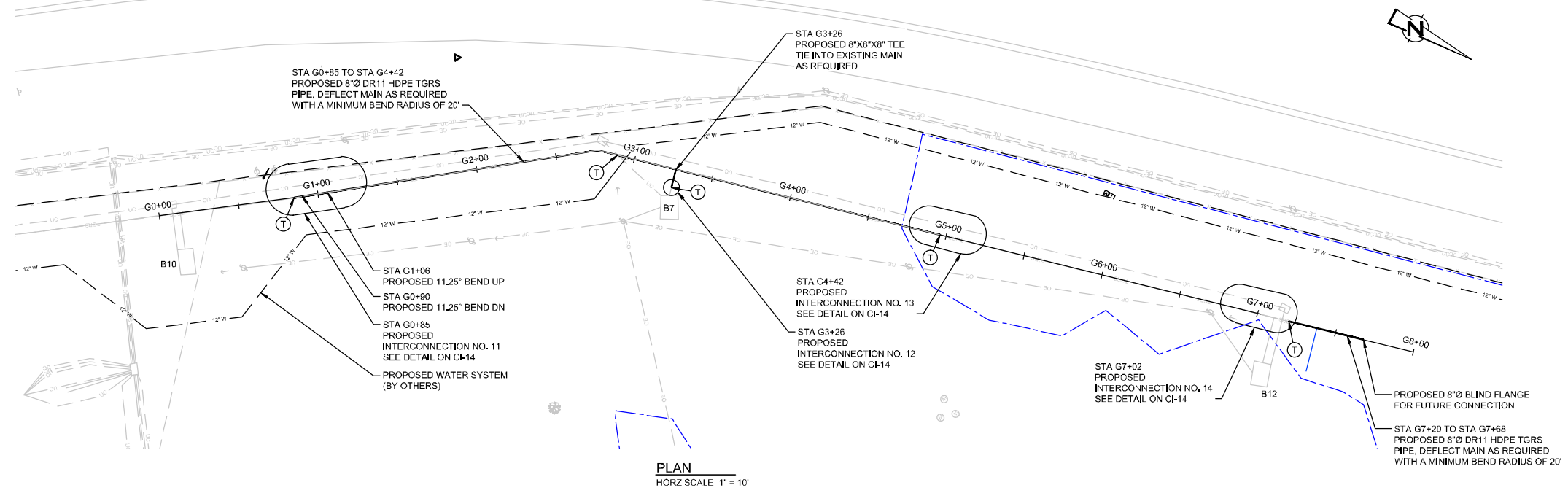


Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD

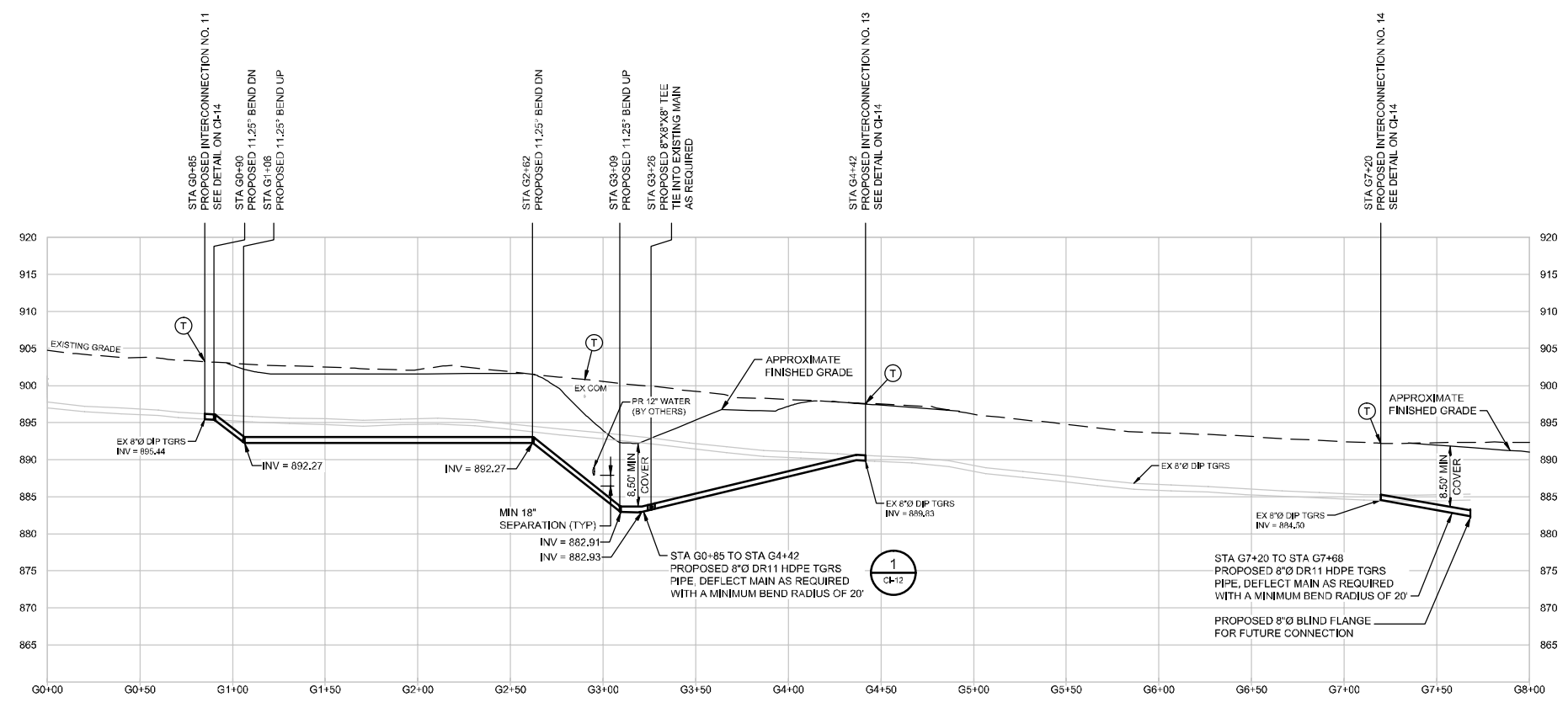
GHD
GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	C. ROHRICH	Designer	W. WHEELER
Drafting Check	W. WHEELER	Design Check	E. HOGLUND
Project Manager	E. HOGLUND	Date	Jun 1, 2016
Scale	AS NOTED		

Client	CARL BOLANDER AND SONS		
Project	TGRS PIPING REROUTE		
Title	PLAN AND PROFILE		
	STA E0+00 TO STA E1+50 AND STA F0+00 TO STA F1+50		
Project No.	83125-00(001)		
Original Size	Arch D	Sheet No.	CI-10
			Sheet 1 of 1



PLAN
HORIZ SCALE: 1" = 10'




PROFILE
HORIZ SCALE: 1" = 10'
VERT SCALE: 1" = 5'

DRAFT - NOT FOR BIDDING

No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16
A	ISSUED FOR REVIEW	CR/TD	WWW	03/26/15

Bar is one inch on original size drawing	0 1"
Reuse of Documents	This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD



GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	CR/TD	Designer	W. WHEELER
Drafting Check	W. WHEELER	Design Check	E. HOGLUND
Project Manager	E. HOGLUND	Date	Jun 1, 2016
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS NOTED

Client	CARL BOLANDER AND SONS		
Project	TGRS PIPING REROUTE		
Title	PLAN AND PROFILE		
Project No.	83125-00(001)		
Original Size	Arch D	Sheet No.	CI-11
		Sheet	1 of 1

GENERAL NOTES

- THE SURVEY FOR THIS PROJECT WAS COMPLETED BY KIMLEY-HORN.
- THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND FURNISH COPIES TO THE OWNER OR THEIR REPRESENTATIVE PRIOR TO COMMENCING WORK.
- THE METHODS, PROCEDURES, AND SEQUENCE OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS PERTINENT TO THE WORK OF THE CONTRACT, NO ALLOWANCE SHALL BE MADE ON THE BEHALF OF THE CONTRACTOR FOR ANY ERROR OR NEGLIGENCE ON HIS PART.
- THE CONTRACTORS WORK SHALL BE CONFINED TO THE LIMITS OF RIGHT-OF-WAYS AND EASEMENTS. THE CONTRACTOR SHALL OBTAIN ANY ADDITIONAL EASEMENTS OR WORK RELEASES SHOULD THE CONTRACTOR REQUIRE ADDITIONAL AREA TO ACCOMMODATE HIS OPERATIONS.
- MAINTENANCE AND PROTECTION OF TRAFFIC:
 - THE CONTRACTOR SHALL MAINTAIN TRAFFIC THROUGHOUT THE LENGTH OF THE CONTRACT.
 - PRIOR TO THE START OF ANY CONSTRUCTION PHASE, ALL PROPOSED MAINTENANCE AND PROTECTION OF TRAFFIC RELATED WORK SHALL BE COMPLETE. THIS INCLUDES, WHERE APPLICABLE, ALL SIGNS, PAVEMENT MARKINGS, BARRIERS, DELINEATION (CONES, DRUMS, ETC.), PAVEMENT MODIFICATIONS AND OTHER RELATED WORK.
- THE CONTRACTOR SHALL POST WARNING SIGNS AT ALL APPROACHES TO THE PROJECT AREA AND AT CONSTRUCTION ENTRANCES, THE CONTRACTOR SHALL PROVIDE FLAGMEN WHEN AND WHERE NECESSARY.
- THE CONTRACTOR SHALL SUBMIT A WORK ZONE TRAFFIC CONTROL PLAN FOR REVIEW AND APPROVAL BY THE OWNER AND OWNERS REPRESENTATIVE PRIOR TO THE START OF WORK.
- CONSTRUCTION INGRESS AND EGRESS
 - THE CONTRACTOR SHALL KEEP TO A MINIMUM THE MOVEMENT OF CONSTRUCTION VEHICLES AND EQUIPMENT IN AND OUT OF DESIGNATED TRAVEL LANES. ONLY NECESSARY OR AUTHORIZED VEHICLES, AS DETERMINED BY THE OWNER OR THEIR REPRESENTATIVE, SHALL BE ALLOWED TO ENTER THE WORK AREA.
 - STABILIZED CONSTRUCTION ENTRANCES SHALL BE PROVIDED.
- PUBLIC INGRESS AND EGRESS
 - THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF ONE TRAVEL LANE AT ALL TIMES, FLAGMEN OR OTHER TRAFFIC DEVICES SHALL BE UTILIZED TO DIRECT THE FLOW OF TRAFFIC.
 - THE CONTRACTOR SHALL MAINTAIN ACCESS TO EXISTING DRIVEWAYS, PARKING LOTS, AND DRIVEWAY ENTRIES AT ALL TIMES.
 - WHERE DIRECT ACCESS TO DRIVEWAYS IS NOT POSSIBLE DUE TO NECESSARY CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL PLAN ALTERNATE MEANS OF ACCESS AND SUBMIT SUCH PLANS TO THE OWNER OR THEIR REPRESENTATIVE FOR REVIEW BEFORE OPERATIONS COMMENCE.
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND FIELD MEASUREMENTS.
 - OTHER UNDERGROUND UTILITIES NOT SHOWN MAY BE ENCOUNTERED.
 - THE CONTRACTOR SHALL CONTACT ALL APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION TO REQUESTED DETAILED FIELD LOCATIONS OF EACH UTILITY.
- THE CONTRACTOR IS RESPONSIBLE TO CALL GOPHER STATE ONE CALL AT 1-800-262-1166 OR 811 FOR UTILITY MARKOUT PRIOR TO THE START OF ANY EXCAVATION WORK ON THIS PROJECT.
- THE CONTRACTOR SHALL PERFORM TEST PITS TO VERIFY THE LOCATION AND ELEVATION OF UTILITIES AT INTERCONNECTIONS AND CROSSINGS AS SHOWN, DIRECTED OR REQUIRED.
- THE CONTRACTOR SHALL EXCAVATE IN ADVANCE OF THE PIPE LAYING OPERATIONS AND EXPOSE ALL EXISTING UNDERGROUND UTILITIES TO PREVENT DAMAGE DURING CONSTRUCTION AND TO DETERMINE REQUIRED CHANGES IN GRADE NECESSARY TO INSTALL THE NEW PIPELINE TO AVOID CONFLICTS.
- THE CONTRACTOR SHALL INSTALL THOSE MEASURES REQUIRED TO LIMIT EROSION OF AREAS DISTURBED BY WORK. CLEARING SHALL BE PERFORMED ON AN AS NEEDED BASIS, PHASED TO REDUCE EROSION POTENTIAL AND VISUAL IMPACT.
- BLASTING WILL NOT BE PERMITTED.
- IF MATERIALS AT THE DESIGN GRADE IS UNSUITABLE AS DETERMINED BY THE OWNER OR THEIR REPRESENTATIVE, THE CONTRACTOR WHEN ORDER IN WRITING, SHALL EXCAVATE ADDITIONAL MATERIAL TO THE DEPTH NECESSARY AND SHALL BACKFILL TO THE PROPOSED GRADE WITH SELECT BACKFILL MATERIAL.
- IF MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION THAT ARE SUSPECTED OF BEING CONTAMINATED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OR THEIR REPRESENTATIVE FOR DIRECTION REQUIRING TESTING, SEPARATION, CONTAINMENT AND DISPOSAL PROCEDURES.
- THE CONTRACTOR SHALL BE PRESENT AND ASSIST IN THE FINAL WALK INSPECTION. THE CONTRACTOR SHALL PROVIDE SUFFICIENT PERSONNEL AND EQUIPMENT TO DEMONSTRATE TO THE OWNER OR THEIR REPRESENTATIVE THAT ALL NEW FACILITIES OPERATE AS REQUIRED.

SHOP DRAWING SUBMITTAL, RECORD DRAWINGS, AND CORRESPONDENCE PROCEDURE

- THE SUBMITTAL OF SHOP DRAWINGS SHALL CONFORM TO PROCEDURES IN THIS SECTION.
 - SUBMITTALS OF SHOP DRAWINGS SHALL BE MADE TO: CARL BOLANDER AND SONS CO., 251 STARKEY STREET, ST. PAUL, MINNESOTA 55107. ALL SUBMITTALS AND DRAWINGS SHALL BE MADE IN THE ENGLISH LANGUAGE.
 - ALL SHOP DRAWINGS SHALL BE SUBMITTED TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO ANY CONSTRUCTION ACTIVITIES.
 - SHOP DRAWINGS FOR COMPONENTS OF SYSTEMS SHALL BE SUBMITTED AS ONE COMPLETE PACKAGE, REVIEWED AND COORDINATED BY THE CONTRACTOR, FOR ALL ASPECTS OF THE SYSTEM. PARTIAL SUBMITTAL PACKAGES WILL NOT BE REVIEWED.
- A LETTER OF TRANSMITTAL SHALL ACCOMPANY EACH SUBMISSION. IF DATA FOR MORE THAN ONE SECTION OF THE SPECIFICATIONS ARE SUBMITTED, A SEPARATE TRANSMITTAL LETTER SHALL ACCOMPANY EACH SECTION SUBMITTED.

C. AT THE BEGINNING OF EACH LETTER OF TRANSMITTAL AND EACH LETTER OF INQUIRY, PROVIDE A REFERENCE HEADING INDICATING THE FOLLOWING:

- OWNER'S NAME
- PROJECT NAME
- CONTRACT NO.
- TRANSMITTAL NO.
- SECTION AND ITEM NO.

D. IF SHOP DRAWING SUBMITTALS SHOW VARIATION FROM THE REQUIREMENTS OF THE CONTRACT BECAUSE OF STANDARD SHOP PRACTICES OR FOR OTHER REASONS, THE CONTRACTOR SHALL MAKE SPECIFIC MENTION OF SUCH VARIATION IN HIS LETTER OF TRANSMITTAL.

E. ALL SHOP DRAWINGS SUBMITTED FOR APPROVAL SHALL HAVE AN IDENTIFYING TITLE. THE CONTRACTOR SHOULD HAVE A RUBBER STAMP MADE FOR AFFIXING THIS TITLE. THE SECTION AND ITEM NUMBER SHALL BE COMPLETED IN INK.

F. ALL SHOP DRAWINGS SUBMITTED SHALL BEAR THE STAMP OF APPROVAL AND SIGNATURE OF THE CONTRACTOR AS EVIDENCE THAT THEY HAVE BEEN REVIEWED BY THE CONTRACTOR. SUBMITTALS WITHOUT THIS STAMP OF APPROVAL WILL NOT BE REVIEWED BY THE ENGINEER AND WILL BE RETURNED TO THE CONTRACTOR. THE STAMP SHALL CONTAIN THE FOLLOWING MINIMUM INFORMATION.

CONTRACTOR'S NAME: _____ DATE: _____

REFERENCE: _____

ITEM: _____

SPECIFICATIONS: _____

SECTION: _____ PAGE NO.: _____ PARA. NO.: _____

DRAWING NO. _____ OF _____

LOCATION: _____ SUBMITTAL NO.: _____ APPROVED BY: _____

G. A NUMBER SHALL BE ASSIGNED TO EACH SUBMITTAL BY THE CONTRACTOR STARTING WITH NO. 1 AND THENCE NUMBERED CONSECUTIVELY. RESUBMITTALS SHALL BE IDENTIFIED BY THE SAME NUMBER FOLLOWED BY THE SUFFIX "A" FOR THE FIRST RESUBMITTAL, THE SUFFIX "B" FOR THE SECOND RESUBMITTAL, ETC.

H. THE CONTRACTOR SHALL INITIALLY SUBMIT TO THE ENGINEER A MINIMUM OF THREE HARD COPIES OF ALL SUBMITTALS, IN ADDITION TO THE NUMBER THE CONTRACTOR REQUIRES RETURNED. IN LIEU OF SUBMITTING HARD COPIES, A FILE TRANSFER PROTOCOL (FTP) SITE MAY BE SET UP FOR THIS PROJECT FOR EASE OF DATA TRANSFER, PROJECT RELATED SHOP DRAWINGS, SUBMITTALS, DATA, ETC. CAN BE UPLOADED/DOWNLOADED TO THIS FTP SITE. PROCEDURES, USERNAMES, AND PASSWORDS WILL BE ESTABLISHED FOR THE FTP SITE DURING OR PRIOR TO THE PRECONSTRUCTION MEETING.

I. AFTER THE OWNER OR THEIR REPRESENTATIVE COMPLETES HIS REVIEW, THE SHOP DRAWINGS WILL BE MARKED WITH ONE OF THE FOLLOWING NOTATIONS:

- APPROVED.
- FURNISH AS CORRECTED.
- REVISE AND RESUBMIT.
- REJECTED.

J. IF A SUBMITTAL IS ACCEPTED, IT WILL BE MARKED "APPROVED" OR "FURNISH AS CORRECTED". UPON RETURN OF A SUBMITTAL MARKED "APPROVED" OR "FURNISH AS CORRECTED," THE CONTRACTOR MAY ORDER, SHIP OR FABRICATE THE MATERIALS INCLUDED ON THE SUBMITTAL, PROVIDED IT IS IN ACCORDANCE WITH THE CORRECTIONS INDICATED. FOR EXTENSIVE CORRECTIONS OR CORRECTIONS OF MAJOR IMPORTANCE AFFECTING OTHER ITEMS, THE ENGINEER MAY REQUIRE THAT THE CONTRACTOR MAKE THE CORRECTIONS INDICATED THEREON AND RESUBMIT FOR A FINAL REVIEW.

K. IF A SUBMITTAL IS UNACCEPTABLE, IT WILL BE MARKED WITH "REVISE AND RESUBMIT" OR "REJECTED". UPON RETURN OF A SUBMITTAL MARKED "REVISE AND RESUBMIT," THE CONTRACTOR SHALL MAKE THE CORRECTIONS INDICATED AND REPEAT THE INITIAL APPROVAL PROCEDURE. THE "REJECTED" NOTATION IS USED TO INDICATE MATERIAL OR EQUIPMENT THAT IS NOT ACCEPTABLE. UPON RETURN OF A SUBMITTAL SO MARKED, THE CONTRACTOR SHALL REPEAT THE INITIAL APPROVAL PROCEDURE UTILIZING ACCEPTABLE MATERIAL OR EQUIPMENT.

L. SHOP DRAWINGS OR OTHER SUBMITTALS NOT BEARING THE ENGINEER'S "APPROVED" NOTATION SHALL NOT BE ISSUED TO SUBCONTRACTORS NOR UTILIZED FOR CONSTRUCTION PURPOSES. NO WORK SHALL BE PERFORMED OR EQUIPMENT INSTALLED WITHOUT AN "APPROVED" DRAWING OR SUBMITTAL.

M. IN THE EVENT THE CONTRACTOR OBTAINS THE ENGINEER'S APPROVAL FOR THE USE OF EQUIPMENT OTHER THAN THAT WHICH IS SHOWN OR SPECIFIED, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE AND USING METHODS APPROVED BY THE ENGINEER, MAKE ALL CHANGES TO THE WORK, INCLUDING STRUCTURES, PIPING, ELECTRICAL, EQUIPMENT AND CONTROLS, THAT MAY BE NECESSARY TO ACCOMMODATE THIS EQUIPMENT.

N. SHOP DRAWINGS SHALL BE SUBMITTED WELL IN ADVANCE OF THE NEED FOR THE MATERIAL OR EQUIPMENT FOR CONSTRUCTION AND WITH AMPLE ALLOWANCE FOR TIME REQUIRED TO MAKE DELIVERY OF MATERIAL OR EQUIPMENT AFTER DATA COVERING SUCH IS APPROVED. THE CONTRACTOR SHALL ASSUME THE RISK FOR ALL MATERIALS OR EQUIPMENT WHICH ARE FABRICATED OR DELIVERED PRIOR TO THE APPROVAL OF SHOP DRAWINGS. NO MATERIALS OR EQUIPMENT WILL BE PERMITTED TO BE INCORPORATED INTO THE WORK NOR WILL SUCH BE INCLUDED IN MONTHLY ESTIMATES UNTIL APPROVAL THEREOF HAS BEEN OBTAINED IN THE SPECIFIED MANNER.

O. THE ENGINEER WILL REVIEW AND PROCESS ALL SUBMITTALS PROMPTLY, BUT A REASONABLE TIME SHOULD BE ALLOWED FOR THIS. FOR THE DRAWINGS BEING REVISED AND RESUBMITTED, AND FOR TIME REQUIRED TO RETURN THE APPROVED DRAWINGS TO THE CONTRACTOR.

P. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW SUBMITTALS MADE BY HIS SUPPLIERS AND SUBCONTRACTORS BEFORE TRANSMITTING THEM TO THE ENGINEER TO ASSURE PROPER COORDINATION OF THE WORK AND TO DETERMINE THAT EACH SUBMITTAL IS IN ACCORDANCE WITH HIS DESIRES AND THAT THERE IS SUFFICIENT INFORMATION ABOUT MATERIALS AND EQUIPMENT FOR THE ENGINEER TO DETERMINE COMPLIANCE WITH THE CONTRACT DOCUMENTS. INCOMPLETE OR INADEQUATE SUBMITTALS WILL BE RETURNED FOR REVISION WITHOUT REVIEW.

Q. APPROVAL OF SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF FURNISHING MATERIALS AND EQUIPMENT OF PROPER DIMENSION, SIZE, QUALITY, QUANTITY, AND ALL PERFORMANCE CHARACTERISTICS TO EFFICIENTLY PERFORM THE REQUIREMENTS AND INTENT OF THE CONTRACT DOCUMENTS. APPROVAL SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS OF ANY SORT ON THE SHOP DRAWINGS. APPROVAL IS INTENDED ONLY TO ASSURE CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE PROJECT SITE. THE CONTRACTOR IS ALSO RESPONSIBLE FOR INFORMATION THAT PERTAINS SOLELY TO THE FABRICATION PROCESS OR TO THE TECHNIQUE OF CONSTRUCTION AND FOR THE COORDINATION OF THE WORK OF ALL TRADES.

2. RECORD DOCUMENTS

A. THE CONTRACTOR SHALL MAINTAIN AND PROVIDE THE ENGINEER WITH RECORD DOCUMENTS AS SPECIFIED BELOW EXCEPT WHERE OTHERWISE SPECIFIED OR MODIFIED.

B. MAINTENANCE OF DOCUMENTS:

- MAINTAIN IN CLEAN, DRY, LEGIBLE CONDITION THE FOLLOWING: CONTRACT DRAWINGS, SPECIFICATIONS, ADDENDA, APPROVED SHOP DRAWINGS, CHANGE ORDERS, OTHER MODIFICATIONS OF CONTRACT, TEST RECORDS, SURVEY DATA, FIELD ORDERS, AND ALL OTHER DOCUMENTS PERTINENT TO THE WORK OF THE CONTRACTOR.
- PROVIDE FILES AND RACKS FOR PROPER STORAGE AND EASY ACCESS. FILE IN ACCORDANCE WITH FILING FORMAT OF UNIFORM CONSTRUCTION INDEX (UCI).
- MAKE DOCUMENTS AVAILABLE AT ALL TIMES FOR INSPECTION BY ENGINEER AND OWNER.
- RECORD DOCUMENTS SHALL NOT BE USED FOR ANY OTHER PURPOSE.

C. MARKING SYSTEM: PROVIDE COLORED PENCILS FOR MARKING CHANGES, REVISIONS, ADDITIONS AND DELETIONS, TO THE RECORD SET OF CONTRACT DRAWINGS.

D. RECORDING:

- LABEL EACH DOCUMENT "PROJECT RECORD" IN 2-INCH HIGH PRINTED LETTERS.
- KEEP RECORD DOCUMENTS CURRENT.
- DO NOT PERMANENTLY CONCEAL ANY WORK UNTIL REQUIRED INFORMATION HAS BEEN RECORDED.
- DRAWINGS:

LEGIBLY MARK TO RECORD ACTUAL CONSTRUCTION INCLUDING:

- DEPTHS OF VARIOUS ELEMENTS OF FOUNDATION IN RELATION TO DATUM.
- HORIZONTAL AND VERTICAL LOCATION OF UNDERGROUND UTILITIES AND APPURTENANCES REFERENCED TO PERMANENT SURFACE IMPROVEMENTS.
- LOCATION OF INTERNAL UTILITIES AND APPURTENANCES CONCEALED IN CONSTRUCTION REFERENCED TO VISIBLE AND ACCESSIBLE FEATURES OF STRUCTURE.
- FIELD CHANGES OF DIMENSION AND DETAIL.
- CHANGES MADE BY CHANGE ORDER OR FIELD ORDER.
- DETAILS NOT ON ORIGINAL CONTRACT DRAWINGS.

5. SPECIFICATIONS AND ADDENDA:

LEGIBLY MARK UP EACH SECTION TO RECORD:

- MANUFACTURER, TRADE NAME, CATALOG NUMBER, AND SUPPLIER OF EACH PRODUCT AND ITEM OF EQUIPMENT ACTUALLY INSTALLED.
 - CHANGE MADE BY CHANGE ORDER OR FIELD ORDER.
 - OTHER INFORMATION NOT ORIGINALLY SPECIFIED.
- SHOP DRAWINGS: MAINTAIN AS RECORD DOCUMENTS AND LEGIBLY ANNOTATE DRAWINGS TO RECORD CHANGES MADE AFTER REVIEW.

E. SUBMITTAL:

- AT COMPLETION OF PROJECT, DELIVER RECORD DOCUMENTS TO ENGINEER.
- ACCOMPANY SUBMITTAL WITH TRANSMITTAL LETTER CONTAINING:
 - DATE.
 - PROJECT TITLE AND NUMBER.
 - THE NAME AND ADDRESS OF THE CONTRACTOR.
 - TITLE AND NUMBER OF EACH RECORD DOCUMENT.
 - CERTIFICATION THAT EACH DOCUMENT AS SUBMITTED IS COMPLETE AND ACCURATE.
 - SIGNATURE OF CONTRACTOR, OR AN AUTHORIZED REPRESENTATIVE THEREOF.

CIVIL SPECIFICATIONS

1. WATER PIPE AND FITTINGS

- POLYETHYLENE (HDPE) SHALL BE DR11, PE4710 AND CONFORM TO AWWA C-906, LATEST REVISION. HDPE RESTRAINED JOINTS SHALL BE ACCOMPLISHED BY COMPLETION BUTT FUSION JOINTS.
- HDPE FITTINGS SHALL BE PE4710 MOLDED FITTINGS, HAVING A PRESSURE RATING EQUAL TO OR GREATER THAN THE PIPE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL FITTINGS SHALL BE SUITABLE FOR USE AS PRESSURE CONDUITS, AND PER AWWA C-906, HAVING NOMINAL BURST VALUES OF 3.5 TIMES THE WORKING PRESSURE RATING OF THE FITTING. MOLDED FITTINGS SHALL MEET REQUIREMENTS OF ASTM D2883 FOR SOCKET-TYPE FITTINGS, ASTM D3261 FOR BUTT-TYPE FITTINGS, OR ASTM F1055 FOR ELECTROFUSION-TYPE FITTINGS, AND THE REQUIREMENTS OF AWWA C-906.
- HDPE SHALL HAVE A TRACER WIRE INSTALLED 12" ABOVE PIPELINE AND MAGNETIC WARNING TAPE MARKER LAID DIRECTLY ABOVE THE FULL LENGTH OF PIPE APPROXIMATELY 18" BELOW GROUND SURFACE. TAPE TO BE THREE (3) INCHES WIDE, ALARMA TAPE, PAUL POTTER WARNING TAPES, INC., OR EQUAL. THIS TAPE WILL CARRY IDENTIFICATION MEANT FOR USE WITH WATER SYSTEMS.
- THE MANUFACTURER SHALL FURNISH A SWORN STATEMENT THAT INSPECTION AND TESTS HAVE BEEN MADE AND THAT THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF ANSI SPECIFICATION A21.51 (AWWA C-151), LATEST REVISION, FOR DI PIPE AND FITTINGS AND WITH THE REQUIREMENTS OF AWWA C-906, LATEST REVISION, FOR HDPE PIPE.
- FOR THE USE OF NON-HDPE FITTINGS, THE FITTINGS SHALL BE MECHANICAL RESTRAINED JOINT FITTINGS AND SHALL BE COMPACT TYPE DUCTILE IRON FITTINGS IN ACCORDANCE WITH AWWA C-153 (ANSI 21.53), LATEST REVISION. JOINTS SHALL CONFORM TO AWWA C-111, LATEST REVISION, AND SHALL BE MANUFACTURED BY U.S. PIPE OR APPROVED EQUAL.
- ALL DUCTILE IRON FITTINGS EXCEPT SOLID SLEEVES SHALL BE FURNISHED WITH A SEAL-COATED CEMENT MORTAR LINING INSTALLED IN ACCORDANCE WITH ANSI SPECIFICATION A21.4 (AWWA C-104) LATEST REVISION EXCEPT THAT THE CEMENT LINING SHALL BE DOUBLE THE THICKNESS SPECIFIED.
- BOLTS FURNISHED FOR MECHANICAL JOINTS SHALL BE FLOURCOAL CARBON COATED OR TYPE 304 STAINLESS STEEL, HIGH-STRENGTH, LOW-ALLOY BOLTS, WITH ROLLED THREADS, TEE HEAD, AND HEXAGONAL NUT, CONFORMING TO THE REQUIREMENTS OF ANSI A52.11 (AWWA C-111), LATEST REVISION, WHERE CONNECTIONS ARE REQUIRED AT THE BEGINNING AND END OF THE PIPELINE AND FOR CONNECTIONS TO EXISTING MAINS, SUITABLE TRANSITION PIECES SHALL BE PROVIDED.
- RESTRAINED JOINTS SHALL BE MADE BY RESTRAINING THE PIPE ON EACH SIDE OF THE FITTING AND SHALL BE RATED FOR A PULLOUT FORCE OF GREATER THAN OR EQUAL TO THE UTILIZED PIPE.

2. EXCAVATION AND BACKFILL

- TREES, LANDSCAPING, ETC. SHALL NOT BE REMOVED UNLESS NOTED ON THE DRAWINGS WITHOUT APPROVAL OF THE OWNER OR THEIR REPRESENTATIVE. CONTRACTOR SHALL PRESERVE AND PROTECT TREES AND LANDSCAPING AS REQUIRED. IF DAMAGE RESULTING FROM CONTRACTOR'S OPERATIONS APPEARS DURING A PERIOD OF UP TO 12 MONTHS AFTER COMPLETION OF THE PROJECT HE SHALL REPLACE DAMAGED ITEMS AT NO EXPENSE TO THE OWNER.
- CONTRACTOR SHALL BE WHOLLY RESPONSIBLE FOR DESIGNING, INSTALLING, AND OPERATING ALL SHEETING, SHORING, BRACING, UNDERPINNING, PROTECTION AND DEWATERING AS NECESSARY TO COMPLETE THE PROJECT.
- SHORING AND BRACING SHALL BE MAINTAINED IN EXCAVATIONS REGARDLESS OF TIME EXCAVATIONS WILL BE OPEN. CARRY DOWN SHORING OR BRACING AS EXCAVATION PROGRESSES.
- REMOVAL OF SHORING AND BRACING SHALL BE DONE SO AS NOT TO DAMAGE TO WORK. REMOVAL SHALL BE EQUAL ON BOTH SIDES OF EXCAVATION TO ENSURE NO UNEQUAL LOADS ON PIPING OR STRUCTURES.
- THE CONTRACTOR SHALL PERFORM ALL TEST PITS OF EXISTING INFRASTRUCTURE PRIOR TO CONSTRUCTION TO DETERMINE EXISTING LOCATION AND CONDITION OF FACILITIES. THE CONTRACTOR SHALL NOTIFY THE OWNER OR THEIR REPRESENTATIVE OF ANY POTENTIAL CONFLICTS WITH THE PROPOSED PIPELINE SO ALIGNMENT CORRECTIONS CAN BE MADE PRIOR TO CONFLICT.
- EXCAVATIONS FOR PIPELINES SHALL BE OPEN-CUT EXCAVATIONS, SHORED AND BRACED WHERE NECESSARY TO PREVENT POSSIBLE INJURY TO WORKERS AND/OR THE PUBLIC AND TO NEW AND EXISTING FACILITIES.
- SUBGRADES FOR ROADWAYS, STRUCTURES, AND TRENCH BOTTOMS SHALL BE FIRM, DENSE, AND THOROUGHLY COMPACTED AND CONSOLIDATED. SHALL BE FREE OF MUD, MUCK, AND OTHER SOFT OR UNSUITABLE MATERIALS; AND SHALL REMAIN FIRM AND INTACT UNDER ALL CONSTRUCTION OPERATIONS.
- ALL EXCAVATIONS OUTSIDE THE LINES AND GRADES SHOWN ON THE CONTRACT DRAWINGS AND WHICH IS NOT APPROVED BY THE OWNER OR THEIR REPRESENTATIVE SHALL BE AT THE CONTRACTOR'S EXPENSE. THE UNAUTHORIZED EXCAVATION SHALL BE FILLED AND COMPACTED WITH SELECT BACKFILL MATERIAL BY THE CONTRACTOR AT HIS EXPENSE.
- THE MINIMUM DENSITY FOR GENERAL BACKFILL SHALL BE 95% OF MAXIMUM DENSITY OBTAINED IN THE LABORATORY IN ACCORDANCE WITH ASTM D1557, LATEST REVISION.
- CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ALL SETTLEMENT THAT OCCURS. HE SHALL MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY WITHIN 30 DAYS AFTER NOTICE FROM THE OWNER OR THEIR REPRESENTATIVE.

3. INSTALLATION NOTES

- PIPING SHALL BE INSTALLED AND TESTED ACCORDANCE WITH AWWA C-906, LATEST REVISION, FOR HDPE PIPE WITH INSTALLATION AND TESTING PER AWWA MANUAL M-55. TEST GRANULAR BEDDING SOURCE MATERIAL FOR GRAIN SIZE (ASTM D422) AND MAXIMUM DRY DENSITY (ASTM D698) AT A FREQUENCY OF 1 TEST PER 5,000 CY.
- THE CONSTRUCTION OF THE FACILITIES SHALL BE UNDER THE SUPERVISION OF A PERSON OR FIRM QUALIFIED TO PRACTICE PROFESSIONAL ENGINEERING IN MINNESOTA, WHENEVER ENGINEERING SERVICES ARE REQUIRED BY SUCH LAW FOR SUCH PURPOSES.
- WHERE SUCH FACILITIES ARE UNDER THE SUPERVISION OF A PROFESSIONAL ENGINEER, HE SHALL CERTIFY TO THE OWNER THAT THE CONSTRUCTED FACILITIES HAVE BEEN UNDER HIS SUPERVISION AND THAT THE WORKS HAVE BEEN FULLY COMPLETED IN ACCORDANCE WITH THE APPROVED ENGINEERING REPORTS, PLANS, SPECIFICATIONS AND APPROVALS.
- THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AHEAD OF THE PIPE LAYING OPERATION, SO THAT, IF MINOR ADJUSTMENTS MUST BE MADE IN ELEVATION AND/OR ALIGNMENT DUE TO INTERFERENCE FROM THESE UTILITIES, SAID CHANGES CAN BE MADE IN ADVANCE OF THE WORK.
- ALL PIPE AND APPURTENANCES SHALL BE LAID TO CONFORM TO THE LOCATION SHOWN ON THE PLANS, OR AS REQUIRED BY THE ENGINEER. EACH PIPE AND FITTINGS SHALL BE CAREFULLY BEDDED THROUGH ITS LENGTH AS SHOWN ON THE DRAWINGS. THE BEDDING SHALL CONFORM WITH MNDOT 3149.2F GRANULAR BEDDING WITH 100 PERCENT PASSING THE 1" SIEVE AND NOT MORE THAN 10 PERCENT PASSING 800 SIEVE. COMPACT BEDDING AND TRENCH BACKFILL TO 95 PERCENT SPD.
- DEFLECTIONS SHALL NOT EXCEED ONE-HALF OF THOSE RECOMMENDED FOR THE TYPE OF PIPE OR JOINT USED.
- UTILITY CROSSINGS SHALL BE LAID TO PROVIDE MINIMUM VERTICAL DISTANCE OF 18" (46 CM) BETWEEN THE OUTSIDE OF PIPE TO OUTSIDE OF PIPE. THIS SHALL BE THE CASE WHERE THE PROPOSED MAIN IS EITHER ABOVE OR BELOW THE EXISTING UTILITY. THE CROSSING SHALL BE ARRANGED SO THAT THE PROPOSED PIPE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE EXISTING UTILITY CENTERLINE.
- CUTTING OF PIPE FOR INSERTING VALVES, FITTINGS AND CLOSURE PIECES SHALL BE DONE IN A NEAT AND CAREFUL MANNER WITHOUT DAMAGE TO THE PIPE. CUTS SHALL BE MADE BY APPROVED METHOD TO PRODUCE CLEAN SQUARE CUTS AND IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- ALL PIPE CROSSING UNDER PAVED AREAS ARE TO BE BACKFILLED TO SUB-GRADE WITH COMPACTED SELECT MATERIAL IN ACCORDANCE WITH MNDOT 3149.2D1-GRANULAR BACKFILL, TO 5' OUTSIDE THE PAVEMENT EDGES.
- EXCAVATIONS FOR STRUCTURES AND PIPELINES SHALL BE OPEN EXCAVATIONS, SHORED AND BRACED WHERE NECESSARY TO PREVENT DAMAGE OR INJURY TO WORKMEN, PUBLIC, STRUCTURES AND PIPELINES.
- PIPE TRENCH SHALL HAVE SIDE SLOPES COMPLYING WITH ALL CODES AND ORDINANCES, SHORE AND BRACE WHERE SLOPING IS NOT POSSIBLE.
- TRENCH WIDTH SHALL BE MINIMIZED TO GREATEST EXTENT POSSIBLE BUT SHALL BE SUFFICIENT TO INSTALL PIPE, AND ALLOW THOROUGH COMPACTING OF PIPE BEDDING AND BACKFILL MATERIAL AND SHALL CONFORM TO TYPICAL TRENCH DETAIL SHOWN ON DRAWINGS.
- MINIMUM COVER OVER PIPING SHALL BE 3.5 FEET UNLESS OTHERWISE SHOWN OR APPROVED BY THE OWNER. THE CONTRACTOR IS REQUIRED AND RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY AND ALL EXCESS MATERIALS.


4. TESTING NOTES

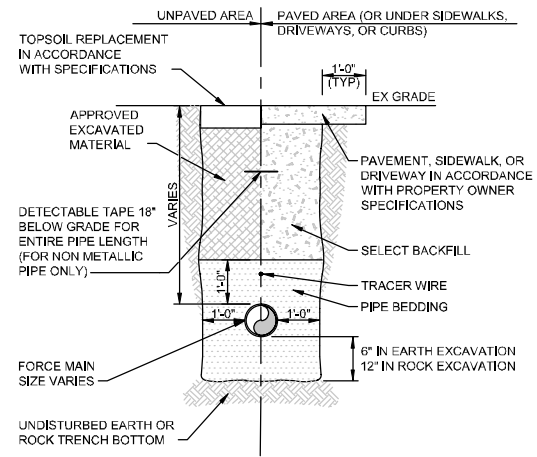
- THE NEW PIPELINE SHALL BE HYDROSTATIC TESTED TO 185 PSI, AT THE LOWEST POINT IN THE SYSTEM, FOR A MINIMUM PERIOD OF TWO (2) HOURS. THE TEST SHALL COMMENCE AFTER ALLOWING TIME FOR INITIAL EXPANSION. THE CONTRACTOR WILL INFORM THE OWNER OR THEIR REPRESENTATIVE WHEN THEY ARE READY FOR THE 2 HOUR TEST TO START.
- PIPELINES WHICH FAIL TO HOLD SPECIFIED TEST PRESSURE OR WHICH EXCEED THE MAKE-UP WATER ALLOWABLE RATE (SPECIFIED BELOW) SHALL BE REPAIRED AND RETESTED.
- TESTING AT A MINIMUM SHALL COMPLY WITH THE REQUIREMENTS OF AWWA C-600 SPECIFICATION, SECTION 4, "HYDROSTATIC TESTING FOR DUCTILE IRON WATER MAINS" AND MANUAL M-65, PE DESIGN AND INSTALLATION.
- MAKE-UP WATER ALLOWABLE (U.S. GALLON) PER 100 FT. OF PIPE SHALL BE AS SPECIFIED BELOW FOR A 2 HOUR TEST:

NOMINAL PIPE DIAMETER (IN)	MAKE-UP WATER ALLOWANCE U.S. GALLON PER 100 FEET OF PIPE
6	0.60
8	1.00
16	3.30

- UPON SUCCESSFUL COMPLETION OF PRESSURE TESTING THE LINE SHALL BE FLUSHED WITH WATER TO CREATE A MINIMUM VELOCITY OF 2.5 FPS (225 GPM FOR 6", 400 GPM FOR 8", AND 1,600 GPM FOR 16"), A MINIMUM OF 30 MINUTES OR UNTIL PIPELINE IS CLEAN OF DEBRIS WHICHEVER IS GREATER.

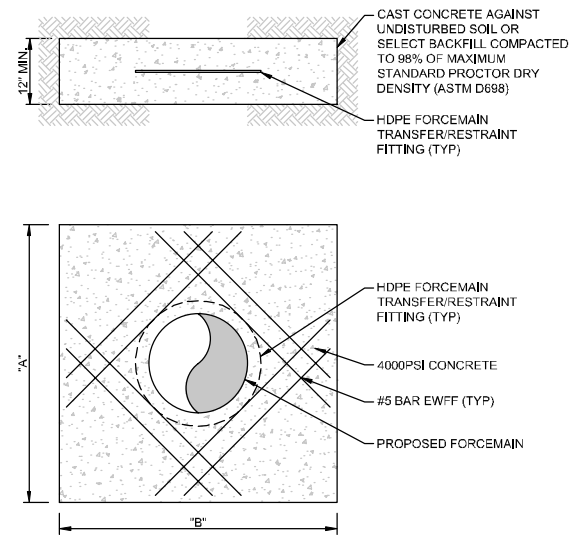
DRAFT - NOT FOR BIDDING

				Bar is one inch on original size drawing 0 _____ 1"		 <p>GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com</p>	Drawn CR/TD	Designer W. WHEELER	Client CARL BOLANDER AND SONS		
				Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD			Drafting Check W. WHEELER	Design Check E. HOGLUND	Project TGRS PIPING REROUTE		
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16							
A	ISSUED FOR REVIEW	CR/TD	WWW	03/25/15							
No.	Issue	Drawn	Approved	Date							
						This document shall not be used for construction unless signed and sealed for construction.	Scale NONE	Project No. 83125-00(001)	Original Size Arch D	Sheet No. CI-12	Sheet 1 of 1



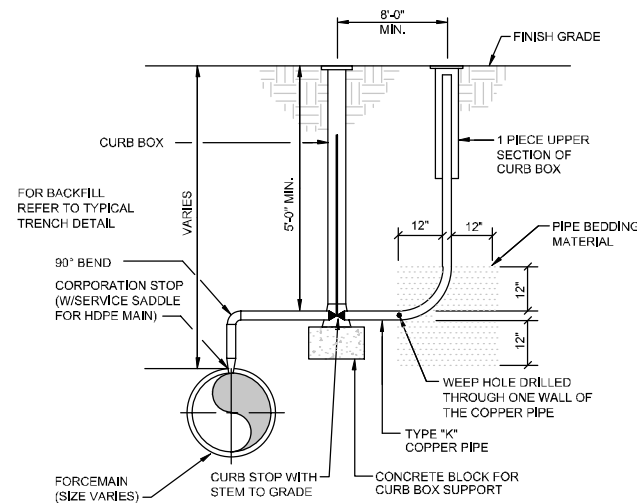
- NOTES:**
- DIMENSIONS ARE PAVEMENT LIMITS WHERE APPROPRIATE.
 - TEST GRANULAR BEDDING SOURCE MATERIAL FOR GRAIN SIZE (ASTM D422) AND MAXIMUM DRY DENSITY (ASTM D698) AT A FREQUENCY OF 1 TEST PER 5,000 CUBIC YARDS. TEST BULK WET DENSITY (ASTM D2922) OF TRENCH BEDDING AND BACKFILL MATERIALS AT FREQUENCY OF 1 TEST PER 5,000 CY.

DETAIL 1
1/2" = 1'-0"
TYPICAL TRENCH
CI-01



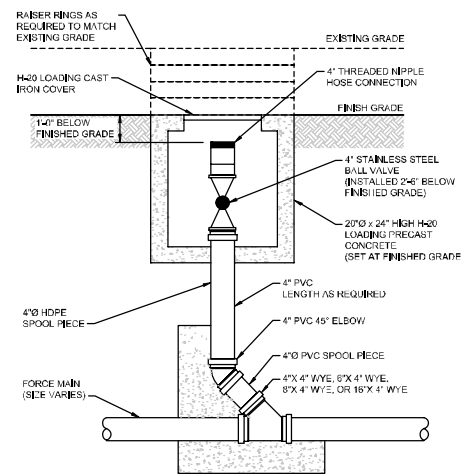
SIZE	"A"	"B"
4"	30"	30"
6"	36"	36"
16"	60"	60"

DETAIL 2
NTS
HDPE CONCRETE ANCHOR BLOCK
CI-01

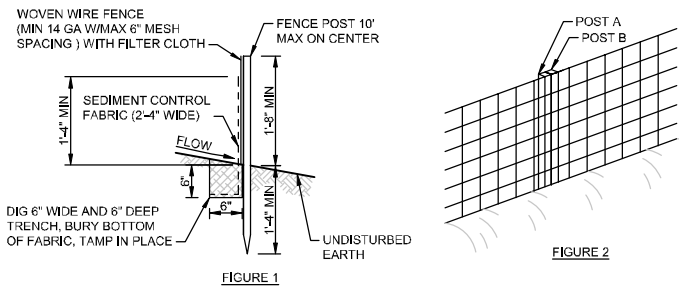


FM	AIR RELIEF
4"	1"
6"	1"
8"	1"
16"	2"

DETAIL 3
NTS
TYPICAL MANUAL AIR RELEASE ASSEMBLY DETAIL
CI-04



DETAIL 4
3/4" = 1'-0"
4 INCH PVC FORCE MAIN CLEANOUT
CI-02

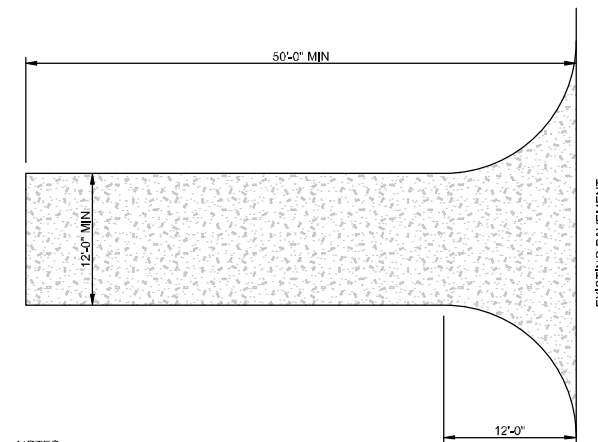


- NOTES:**
- SILT FENCE HEIGHT TO BE 1'-6" MIN ABOVE GROUND. CONSTRUCTED OF FABRIC WITH MIN TENSILE STRENGTH OF 136 LBS.
 - WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL "T" OR "U" TYPE OR HARDWOOD.
 - FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE. SILT FENCE TO HAVE FACTORY ATTACHED FENCE POSTS.
 - REFER TO DRAWING FOR LOCATION OF SILT FENCE.
 - MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

DETAIL 5
3/4" = 1'-0"
SILT FENCE
CI-01

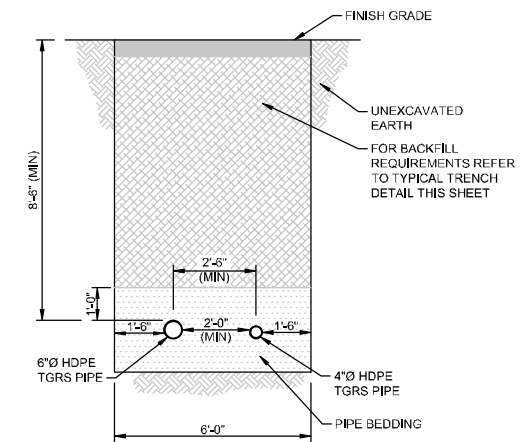


- INSTALLATION SEQUENCE:**
- DIG A 6" X 6" TRENCH ALONG SILT FENCE LOCATIONS SHOWN.
 - UNROLL SILT FENCE POSITIONING THE POSTS ON THE DOWNSTREAM SIDE.
 - DRIVE POSTS INTO THE GROUND AS SHOWN ON FIGURE 1.
 - LAY THE BOTTOM 12" OF FABRIC FLAP IN THE BOTTOM OF THE TRENCH, BACKFILL AND COMPACT. ADJACENT SECTIONS OF THE SILT FENCE ARE JOINED AS SHOWN IN FIGURE 3. A COUPLER CAN BE USED TO SECURE ADJACENT POSTS AS SHOWN IN FIGURE 2.



- NOTES:**
- STONE SIZE - USE 1'-4" INCH STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
 - LENGTH - NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30-FOOT MINIMUM LENGTH WOULD APPLY)
 - THICKNESS - NOT LESS THAN 6 INCHES.
 - WIDTH - 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24 - FOOT IF SINGLE ENTRANCE TO SITE.
 - GEOTEXTILE - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
 - SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
 - MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
 - WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
 - PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

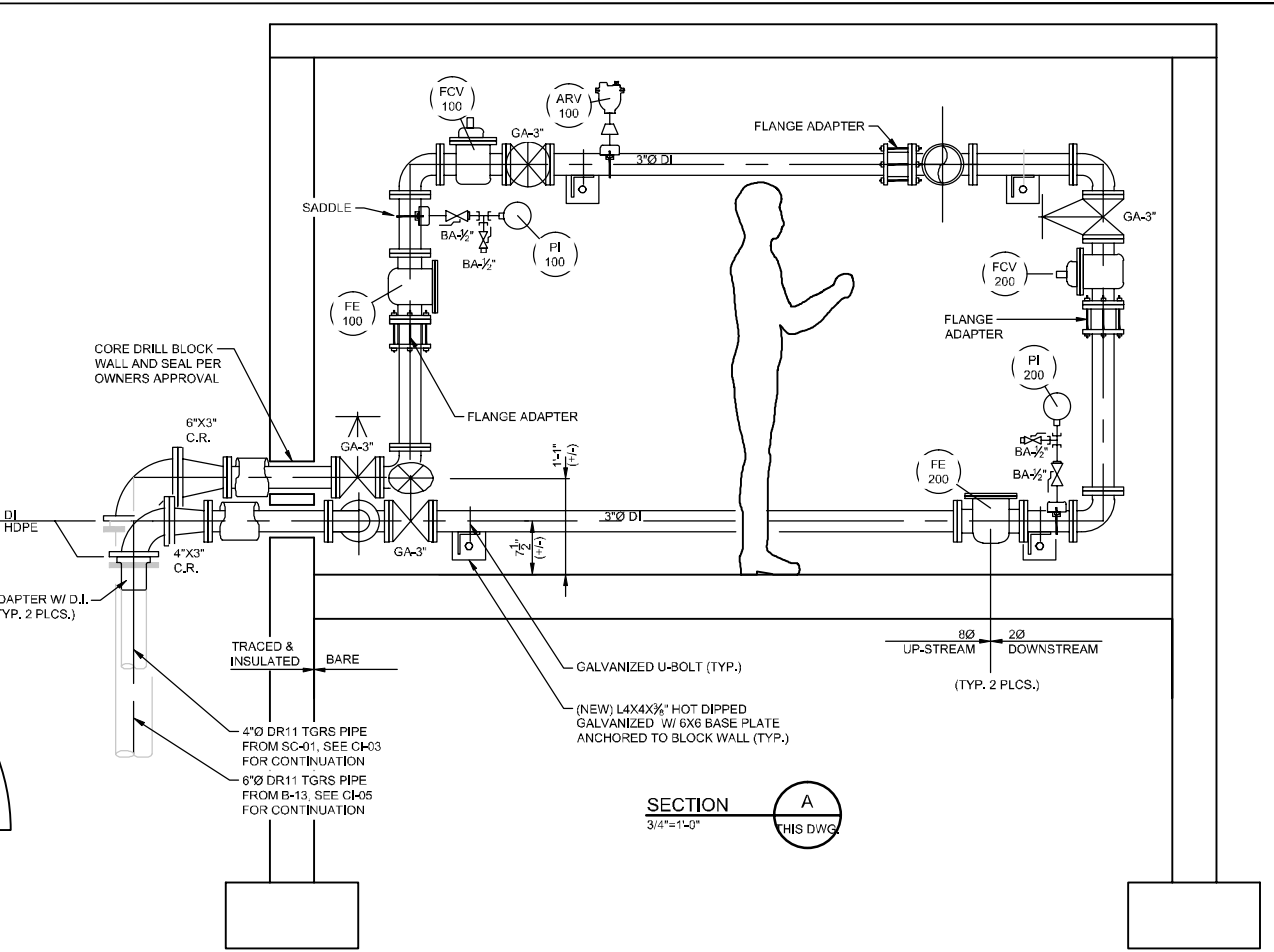
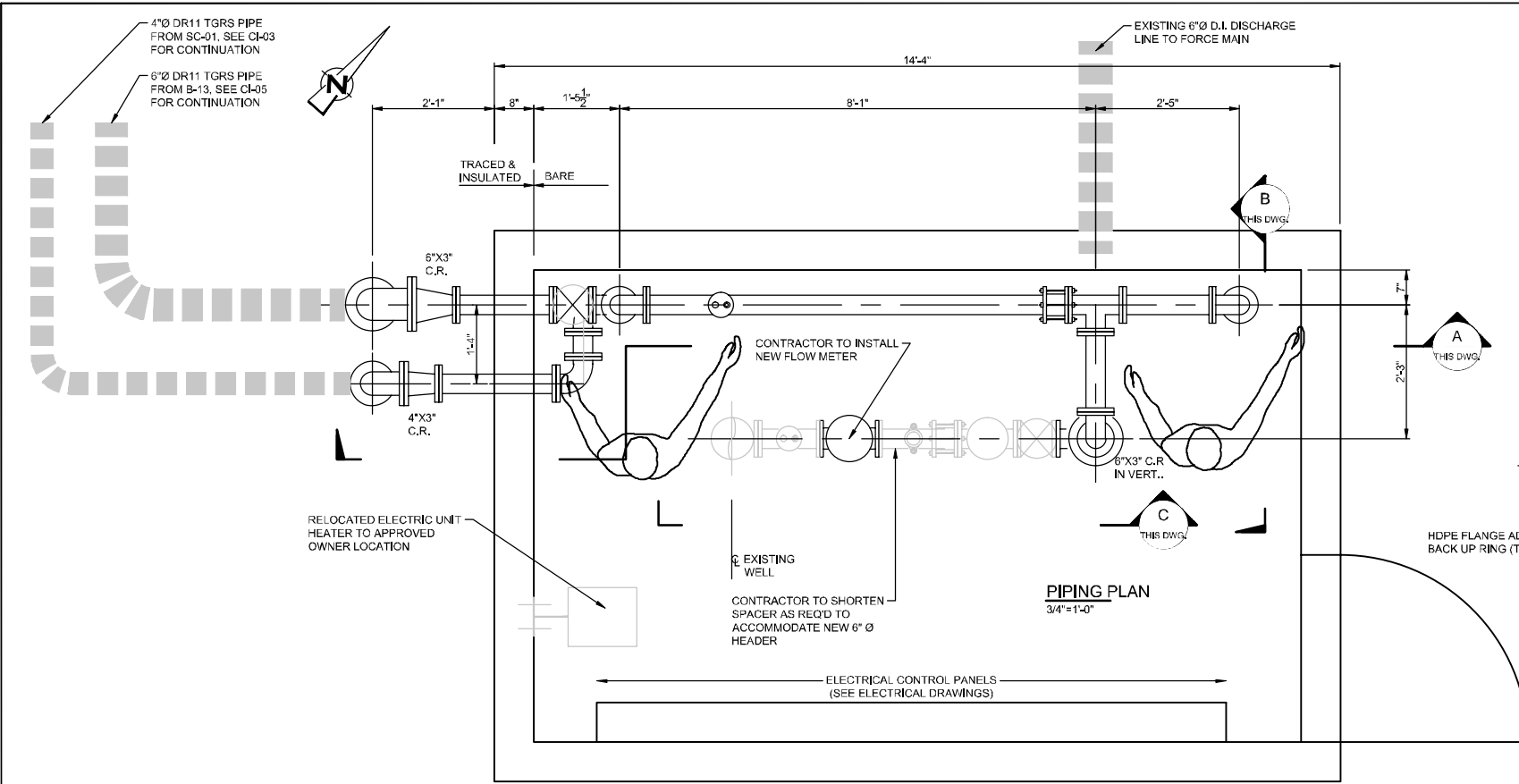
DETAIL 6
1/8" = 1'-0"
STABILIZED CONSTRUCTION ENTRANCE
CI-01



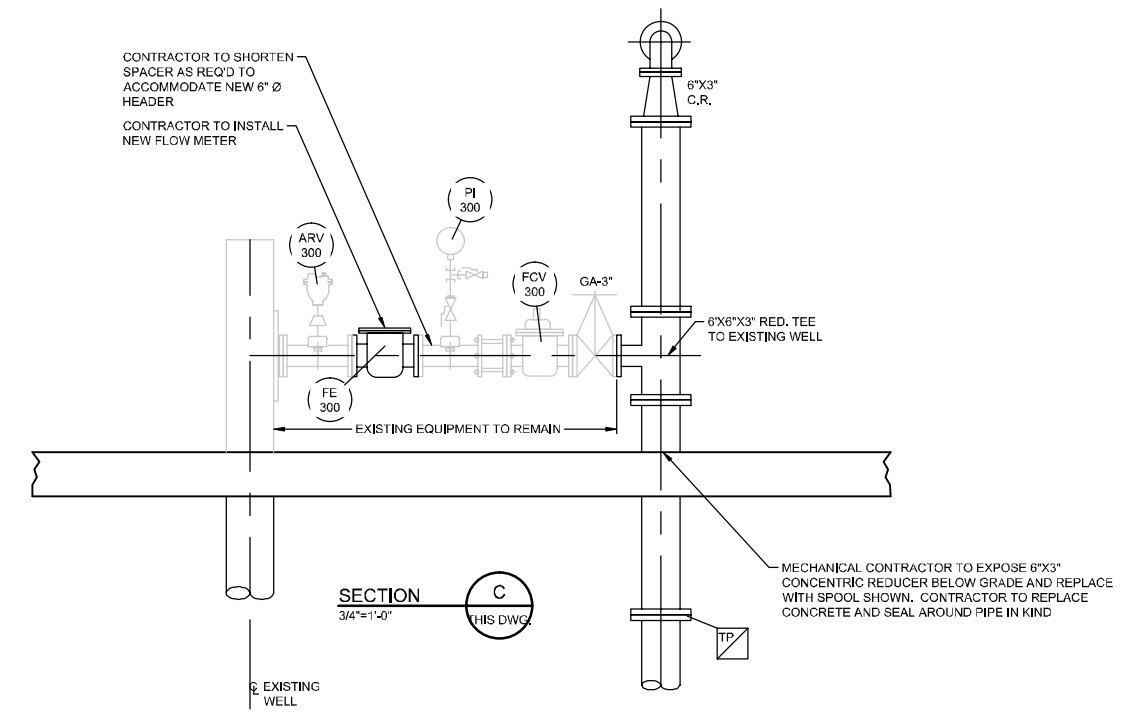
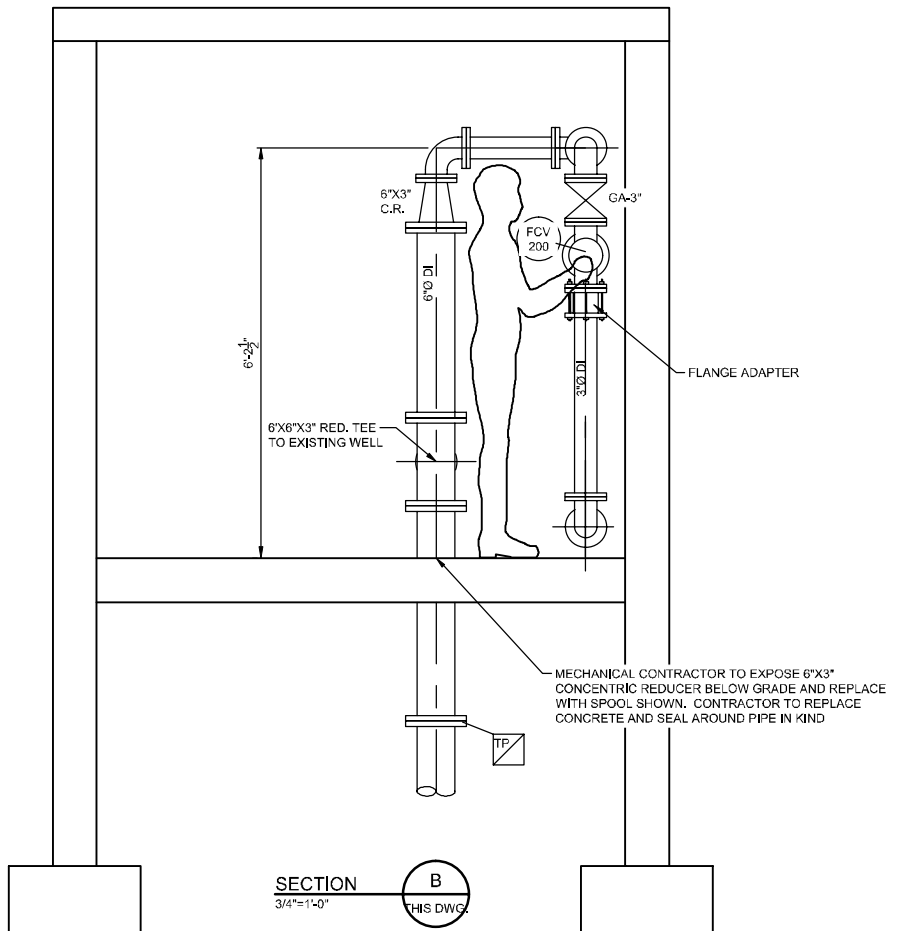
DETAIL 7
NTS
MINIMUM PIPE SEPARATION
CI-02

DRAFT - NOT FOR BIDDING

<table border="1"> <tr> <td>B</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>06/03/16</td> </tr> <tr> <td>A</td> <td>ISSUED FOR REVIEW</td> <td>CR/TD</td> <td>WWW</td> <td>03/25/15</td> </tr> </table>				B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16	A	ISSUED FOR REVIEW	CR/TD	WWW	03/25/15	<p>Bar is one inch on original size drawing 0 1"</p> <p>Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD</p>		<p>GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com</p>		<table border="1"> <tr> <td>Drawn</td> <td>CR/TD</td> <td>Designer</td> <td>W. WHEELER</td> <td>Client</td> <td>CARL BOLANDER AND SONS</td> </tr> <tr> <td>Drafting Check</td> <td>W. WHEELER</td> <td>Design Check</td> <td>E. HOGLUND</td> <td>Project</td> <td>TGRS PIPING REROUTE</td> </tr> <tr> <td>Project Manager</td> <td>E. HOGLUND</td> <td>Date</td> <td>May 27, 2016</td> <td>Title</td> <td>MISCELLANEOUS DETAILS</td> </tr> <tr> <td colspan="4">This document shall not be used for construction unless signed and sealed for construction.</td> <td>Project No.</td> <td>83125-00(001)</td> </tr> <tr> <td>Scale</td> <td>AS NOTED</td> <td>Original Size</td> <td>Arch D</td> <td>Sheet No.</td> <td>CI-13</td> </tr> </table>		Drawn	CR/TD	Designer	W. WHEELER	Client	CARL BOLANDER AND SONS	Drafting Check	W. WHEELER	Design Check	E. HOGLUND	Project	TGRS PIPING REROUTE	Project Manager	E. HOGLUND	Date	May 27, 2016	Title	MISCELLANEOUS DETAILS	This document shall not be used for construction unless signed and sealed for construction.				Project No.	83125-00(001)	Scale	AS NOTED	Original Size	Arch D	Sheet No.	CI-13
B	ISSUED FOR REVIEW	CR/TD	WWW	06/03/16																																													
A	ISSUED FOR REVIEW	CR/TD	WWW	03/25/15																																													
Drawn	CR/TD	Designer	W. WHEELER	Client	CARL BOLANDER AND SONS																																												
Drafting Check	W. WHEELER	Design Check	E. HOGLUND	Project	TGRS PIPING REROUTE																																												
Project Manager	E. HOGLUND	Date	May 27, 2016	Title	MISCELLANEOUS DETAILS																																												
This document shall not be used for construction unless signed and sealed for construction.				Project No.	83125-00(001)																																												
Scale	AS NOTED	Original Size	Arch D	Sheet No.	CI-13																																												



Quantity	Item	Description
2	FCV-100 FCV-200	CLA-VAL COMBINATION BACK PRESSURE AND SOLENOID SHUT-OFF VALVE OR BACK PRESSURE AND PUMP CONTROL VALVE EQUIPPED FOR RAPID CLOSING MODEL 58-40 OR SIMILAR CLA-VAL MODEL - VERIFY SIMILAR TO EXISTING FCV-300 3 INCH FLANGED GLOBE STYLE VALVE ENERGIZED TO OPEN - CLOSE IF FAIL FCV-100 TO BE INSTALLED HORIZONTALLY, FCV-200 TO BE INSTALLED VERTICALLY X-105L LIMIT SWITCH ASSEMBLY REFER TO: TYPICAL EQUIPMENT SPECIFICATION FORM - TCAAP GROUNDWATER REMEDIATION SYSTEM FOR DETAILS
3	FE-100 FE-200 FE-300	3-INCH NEPTUNE HIGH PERFORMANCE TURBINE METER TRICON/E3 TRANSMITTER FOR TOTAL FLOW AND FLOW RATE DIGITAL PULSE AND 4-20 MA SIGNALS AND LOCAL READING FE-100 & FE-300 TO BE INSTALLED HORIZONTALLY, FE-200 TO BE INSTALLED VERTICALLY
1	ARV-100	1/2 - INCH APCO AIR/VACUUM VALVE - VERIFY SIMILAR TO EXISTING ARV-300 MODEL NO 141 OR SIMILAR APCO MODEL INSTALL AT HORIZONTAL HIGH POINT
2	PI-100 PI-200	STANDARD PRESSURE GAUGE WITH LOCAL READING CONTRACTOR TO SELECT AND INSTALL SIMILAR TO EXISTING PI-300
4	GA-3"	STANDARD 3-INCH GATE VALVE CONTRACTOR TO SELECT AND INSTALL SIMILAR TO EXISTING B-3 GATE VALVE
4	BA-1/2"	STANDARD 1/2 - INCH BALL VALVE CONTRACTOR TO SELECT AND INSTALL SIMILAR TO EXISTING PI-300 BALL VALVES



CONTRACTOR TO FIELD VERIFY ALL DIMENSION PRIOR TO FABRICATION

DRAFT - NOT FOR BIDDING

No.	Issue	Drawn	Approved	Date
B	ISSUED FOR REVIEW	BMS	MJP	6/06/16
A	ISSUED FOR REVIEW AND COMMENT	BMS	MJP	8/31/15

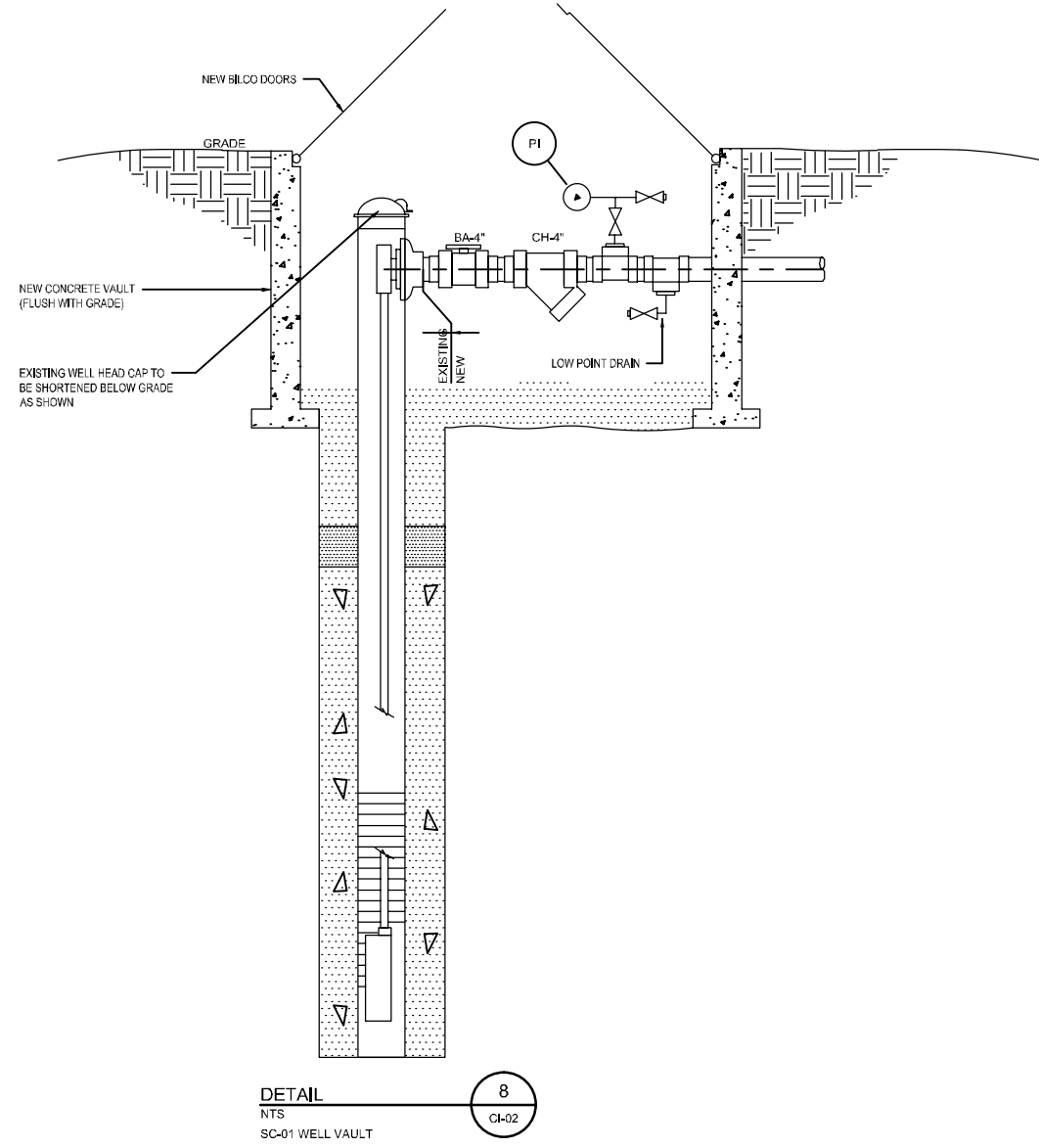
Bar	Size
Bar	one inch on original size drawing
0	1"

Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2015 GHD

GHD Services Inc.
1801 Old Highway 8 Northwest Suite 114
St. Paul, Minnesota 55112 USA
T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	B. SUCHAN	Designer	B. SUCHAN
Drafting Check		Design Check	M. PLUSZKA
Project Manager	E. HOGLUND	Date	Jun 1, 2016
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS NOTED

Client	CARL BOLANDER AND SONS
Project	TGRS PIPING REROUTE
Title	MECHANICAL PIPING PLAN
	PUMP HOUSE B3
Project No.	83125-00(001)
Original Size	Arch D
Sheet No.	ME-01
Sheet	1 of 1

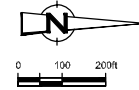
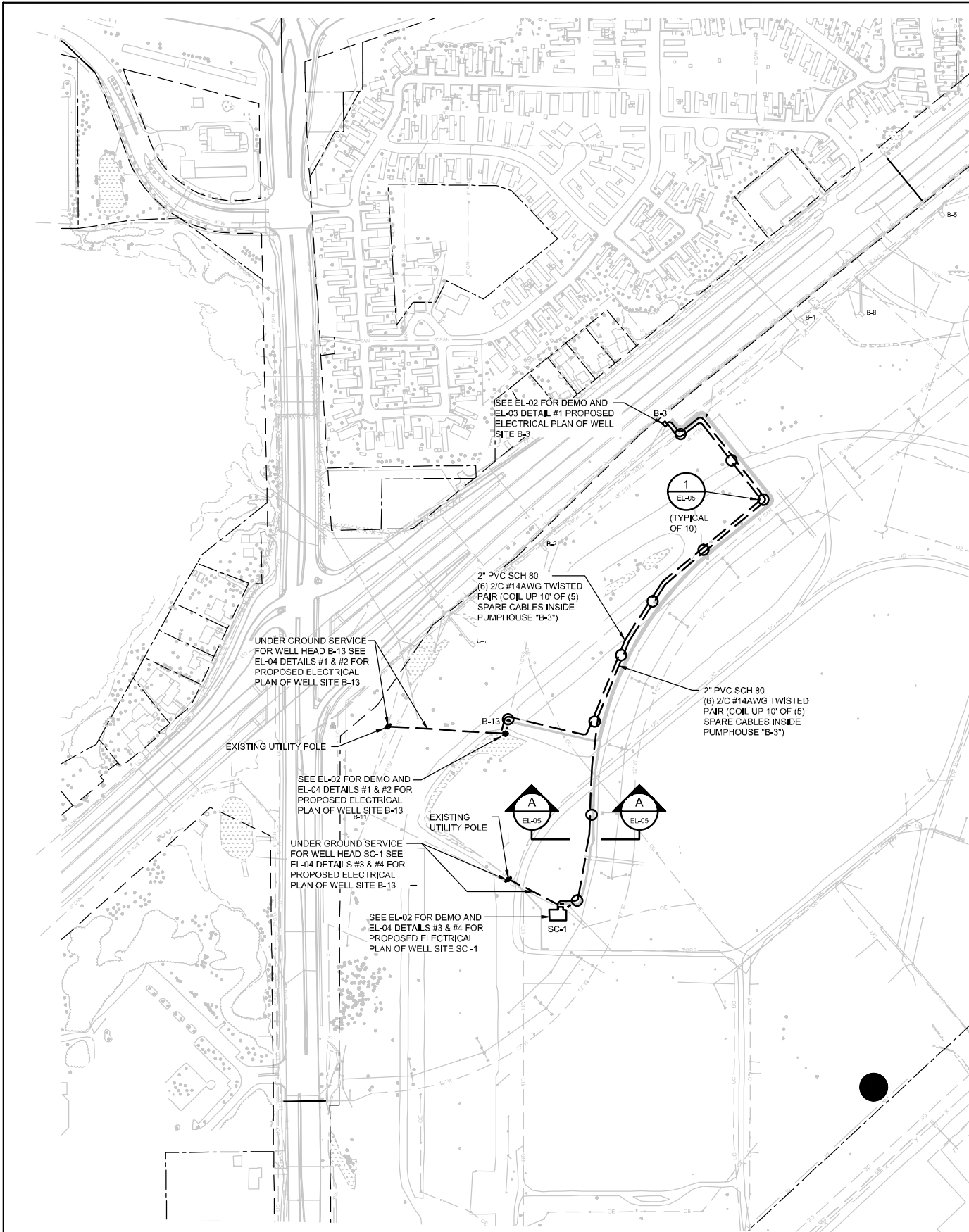


DETAIL
NTS
SC-01 WELL VAULT

8
CH-02

DRAFT - NOT FOR BIDDING

			<p>Bar is one inch on original size drawing 0 1"</p>		<p>GHD Services Inc. 1801 Old Highway 8 Northwest Suite 114 St. Paul, Minnesota 55112 USA T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com</p>	Drawn: B. SUCHAN Drafting Check:	Designer: B. SUCHAN Design Check: M. PLUSKA	Client: CARL BOLANDER AND SONS Project: TGRS PIPING REROUTE Title: WELL VAULT SC-01									
<table border="1"> <tr> <td>A</td> <td>ISSUED FOR REVIEW</td> <td>BMS</td> <td>MJP</td> <td>6/06/16</td> </tr> <tr> <td>No.</td> <td>Issue</td> <td>Drawn</td> <td>Approved</td> <td>Date</td> </tr> </table>			A	ISSUED FOR REVIEW		BMS	MJP	6/06/16	No.	Issue	Drawn	Approved	Date	Reuse of Documents <small>This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2016 GHD</small>	Project Manager: E. HOGLUND Date: Jun 1, 2016	Project No.: 83125-00(001) Original Size: Arch D Scale:	Sheet No.: ME-02
A	ISSUED FOR REVIEW	BMS	MJP	6/06/16													
No.	Issue	Drawn	Approved	Date													



GENERAL MATERIAL & INSTALLATION REQ'S.

1. MATERIAL AND INSTALLATION SHALL BE IN ACCORDANCE WITH NEMA, UL, OSHA, AND NEC STANDARDS.
2. ALL CONDUIT SHALL BE NEC RIGID GALV. STEEL CONDUIT UNLESS OTHERWISE NOTED. MINIMUM CONDUIT SIZE SHALL BE 3/4".
3. EXPOSED RGS CONDUIT SHALL BE SUPPORTED EVERY 10'-0" MINIMUM AND SHALL BE INSTALLED IN A MANNER SUCH THAT IT DOES NOT CONSTITUTE A TRIPPING HAZARD OR INFRINGE UPON PROVIDING 8'-0" MINIMUM HEAD CLEARANCE.
4. ALL WALL-THRU CONDUIT PENETRATIONS SHALL BE WEATHER SEALED USING MODULAR MECHANICAL SEALS (2 SEALS PER CORE)
5. ALL INTERCONNECTING WIRING SHALL BE TAGGED WITH APPROPRIATE CIRCUIT NUMBERS AT BOTH TERMINAL ENDS.
6. SUPPORTS AND HANGERS: ALL EQUIPMENT/DEVICE/FIXTURE SUPPORTS AND HANGERS SHALL BE TYPE 304 STAINLESS STEEL OF 1/4" THICK MINIMUM. PVC CONDUIT IS NOT PERMITTED AS EQUIPMENT/DEVICE/FIXTURE SUPPORTING MEMBER.
7. ROUTE WIRING CONDUIT BASED ON FIELD CONDITIONS AND AS APPROVED BY ENGINEER.
8. UPDATE ALL PANELBOARD SCHEDULES TO REFLECT COMPLETED WORK.
9. FIELD VERIFY ALL POWER SOURCES AS INDICATED ON DRAWINGS (LIGHTING & POWER PANELS) OF EQUIPMENT BEING REMOVED, RELOCATED OR REPLACED.

GENERAL NOTES

1. THE CONTRACTOR SHALL NOT SCALE THE DRAWINGS TO ESTABLISH DIMENSIONS, ALL DIMENSIONS SHALL BE CHECKED ON-SITE PRIOR TO ASSEMBLY OR CONSTRUCTION OF ANY WORK.
2. THE STRUCTURE HAS BEEN DESIGNED FOR THE IN-SERVICE LOADS, THE METHODS, PROCEDURES AND SEQUENCES OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR, SUPPORTING FORMWORK FOR CONCRETE CONSTRUCTION SHALL NOT BE REMOVED BEFORE THE CONCRETE HAS GAINED SUFFICIENT STRENGTH TO SAFELY SUPPORT THE DEAD AND SUPERIMPOSED LOADS, THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID OVERLOADS, AND MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
3. THE CONTRACTOR SHALL REFER TO MECHANICAL & ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SIZE AND LOCATION OF SLEEVES, ANCHORS, INSERTS AND OPENINGS REQUIRED, PRINCIPAL OPENINGS IN THE STRUCTURE ARE SHOWN ON THE DRAWINGS, SLEEVES AND OPENINGS NOT SHOWN ON STRUCTURAL DRAWINGS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.
4. MATERIALS SPECIFIED ON THE DRAWINGS AND/OR IN THE SPECIFICATIONS SHALL BE USED UNLESS THE CONTRACTOR OBTAINS WRITTEN APPROVAL OF THE ENGINEER TO USE ALTERNATIVE MATERIALS. WHEN REQUESTING SUCH APPROVAL, THE CONTRACTOR SHALL PROVIDE ADEQUATE AND DETAILED MANUFACTURER'S LITERATURE AND TECHNICAL DATA FOR EACH MATERIAL PRIOR TO ITS POTENTIAL USE.
5. CONTRACTOR SHALL NOT DERIVE SUPPORTS FROM EXISTING STRUCTURE TO FACILITATE NEW CONSTRUCTION, IF SUCH SUPPORT IS SPECIFICALLY ALLOWED BY THE ENGINEER, CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND APPROVAL DETAILED DESIGN, CALCULATIONS AND DRAWINGS SEALED BY LICENSED PROFESSIONAL ENGINEER VERIFYING ADEQUACY/SAFETY OF EXISTING STRUCTURE. IF DAMAGE TO EXISTING STRUCTURE OCCURS, CONTRACTOR AT ITS OWN COST SHALL REPAIR THE DAMAGE AND RESTORE TO ORIGINAL CONDITION AND SATISFACTION OF THE ENGINEER.
6. NO EXCAVATION WORK MAY BEGIN UNTIL ALL UNDERGROUND UTILITIES HAVE BEEN LOCATED AND MARK OUTS HAVE BEEN APPROVED BY THE OWNER. UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THE DRAWINGS.

CONCRETE NOTES

1. CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301, 305, 306, 308, 315, 318 AND 350R SPECIFICATIONS.
2. LATEST REVISION AND/OR VERSION OF ALL CODES AND REFERENCE STANDARDS SHALL BE FOLLOWED.
3. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS. SLUMP SHALL BE 3 1/2 INCHES ± 1 INCH.
4. CONCRETE SHALL BE AIR ENTRAINED. CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II WITH AIR-ENTRAINING ADMIXTURE CONFORMING TO ASTM C260, AIR CONTENT (% BY VOLUME) SHALL NOT BE LESS THAN 4% NOR GREATER THAN 6.5% AND SHALL DEPEND ON MAXIMUM SIZE AGGREGATE USED. WATER TO CEMENT RATIO SHALL NOT EXCEED .40 BY WEIGHT.
5. NO ADMIXTURE SHALL CONTAIN CALCIUM CHLORIDE BASED COMPOUNDS, FLYASH AND POZZOLAN CONTENT SHALL NOT EXCEED 25% BY WEIGHT OF CEMENT.
6. REINFORCING BARS SHALL CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS.
7. LAP SPLICES IN REINFORCING BARS IN ACCORDANCE WITH THE TABLE BELOW.
8. CONCRETE PROTECTION FOR REINFORCING BARS (UNLESS OTHERWISE NOTED):
 - A. FOOTINGS - 3 INCH BOTTOM AND SIDES, 2 INCH TOP
 - B. GRADE BEAMS - 2 INCH BOTTOM AND SIDES, 1 1/2 INCH TOP (TO STIRRUPS)
 - C. PIERS - 1 1/2 INCH (TO TIES)
 - D. FORMED SLABS - 1 1/2 INCH TOP AND BOTTOM
 - E. WALLS AND PADS - 2 INCH
 - F. EXTERIOR SLABS ON FILL - 2 1/2 INCH BOTTOM, 2 INCH TOP
 - G. INTERIOR SLABS ON FILL - 2 1/2 INCH BOTTOM, 1 1/2 INCH TOP
9. NO CONSTRUCTION JOINT SHALL BE MADE UNLESS SHOWN ON DRAWINGS OR APPROVED IN WRITING BY THE ENGINEER.
10. ANCHOR BOLTS SHALL BE CARBON STEEL CONFORMING TO ASTM F1554 SPECIFICATIONS, WITH HEAVY HEX NUTS AND WASHERS, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED CONFORMING TO ASTM A123 AND A153 SPECIFICATIONS UNLESS OTHERWISE SPECIFIED, AND SHALL BE ACCURATELY PLACED USING TEMPLATES.
11. GROUT IN DRILLED HOLES FOR ANCHOR BOLTS AND REINFORCING STEEL DOWELS, AND UNDER BASE PLATES SHALL BE NON-SHRINK NON-METALLIC "MASTERFLOW 713" OR "MASTERFLOW 928" BY DEGUSSA BUILDING SYSTEMS OR APPROVED EQUAL. MANUFACTURER'S INSTRUCTIONS CONCERNING HOLE SIZE, SURFACE PREPARATION AND INSTALLATION SHALL BE FOLLOWED.
12. EDGE TOOL TOP HORIZONTAL EDGES OF PIERS AND EQUIPMENT (PUMP) PADS, OTHER EXPOSED EDGES SHALL HAVE 3/4 INCH CHAMFER.
13. PADS SHALL BE TROWEL FINISHED TO WITHIN 1/8 INCH OF ELEVATIONS SHOWN ON DRAWINGS, FOLLOWING TROWELLING, PROVIDE NON-SLIP MEDIUM BROOM FINISH.
14. PROVIDE CORNER REINFORCING BARS TO MATCH HORIZONTAL BARS AT CORNERS AND INTERSECTIONS FOR CONTINUITY.
15. NOT USED.


BAR SIZE	LAP SPlice LENGTHS (IN)			
	TOP BARS		OTHERS	
	A	B	A	B
#3 (10)	19	24	15	19
#4 (13)	25	32	19	25
#5 (16)	31	40	24	31
#6 (19)	37	48	29	37
#7 (22)	54	70	42	54
#8 (25)	62	80	48	62
#9 (29)	70	91	54	70
#10 (32)	79	102	61	79
#11 (36)	87	113	67	87

1. BAR SIZES IN PARENTHESIS (13) ARE CORRESPONDING METRIC SIZES.
2. LAP SPLICES SHALL BE CLASS B SPLICES EXCEPT THAT CLASS A SPLICES ARE ALLOWED WHEN ONE-HALF OR LESS OF TOTAL REINFORCEMENT IS SPLICED WITHIN A LAP LENGTH.
3. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12" OF CONCRETE BELOW BARS.

DRAFT - NOT FOR BIDDING

A ISSUED FOR REVIEW		PED	JD	6/06/16
No.	Issue	Drawn	Approved	Date

Bar is one inch on original size drawing	
0 1"	
Reuse of Documents	
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be used in whole or in part for any other project without GHD's written authorization. © 2015 GHD	


GHD Services Inc.
 1801 Old Highway 8 Northwest Suite 114
 St. Paul Minnesota 55112 USA
 T 1 651 639 0913 F 1 651 639 0923 W www.ghd.com

Drawn	P.DIFRANCISCO	Designer	P.DIFRANCISCO
Drafting Check	J.DAVIS	Design Check	J.DAVIS
Project Manager	E.HOGLUND	Date	Jun 1, 2016
This document shall not be used for construction unless signed and sealed for construction.		Scale	1"=200'

Client	CARL BOLANDER AND SONS		
Project	TGRS PIPING REROUTE		
Title	ELECTRICAL SITE PLAN & GENERAL NOTES		
Project No.	83125-00(001)		
Original Size	Arch D	Sheet No.	EL-01
Sheet	1	of	1