

# A d d e n d u m

Iowa Department of Transportation  
Office of Contracts

Date of Letting: December 17, 2013  
Date of Addendum: December 9, 2013

<b>B.O.</b>	<b>Proposal ID</b>	<b>Proposal Work Type</b>	<b>County</b>	<b>Project Number</b>	<b>Addendum</b>
104	57-1557-638	PCC PAVEMENT WIDENING	JOHNSON	STP-U-1557(638)--70-52	17DEC104.A01

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Notice: Only the bid proposal holders receive this addendum and responsibility for notifying any potential subcontractors or suppliers remains with the proposal holder.

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Make the following changes to the PROPOSAL SCHEDULE OF PRICES:

Change Proposal Line No. 0150 2402-0425031 GRANULAR BACKFILL:

From: 1,825.000 TON

To: 2,535.000 TON

Change Proposal Line No. 0160 2402-2720000 EXCAVATION, CLASS 20:

From: 2,580.000 CY

To: 3,035.000 CY

Change Proposal Line No. 0260 2430-0000100 MODULAR BLOCK RETAINING WALL  
(HEAVY):

From: 11,587.000 SF

To: 7,279.000 SF

Change Proposal Line No. 0450 2505-6000111 HIGH TENSION CABLE GUARDRAIL:

From: 1,798.000 LF

To: 1,880.000 LF

Change Proposal Line No. 1120 2599-9999009 ('LINEAR FEET' ITEM) ORNAMENTAL  
RAILING:

From: 300.000 LF

To: 380.000 LF

Change Proposal Line No. 1130 2599-9999009 ('LINEAR FEET' ITEM) WATER-MAIN  
REMOVED:

From: 424.000 LF

To: 82.000 LF

Add Proposal Line No. 1491 2501-5775000 PILES, STEEL SHEET; 12,146.000 SF

Add Proposal Line No. 1492 2501-8400172 TEMPORARY SHORING; LUMP

Add Proposal Line No. 1493 2528-8400048 TEMPORARY BARRIER RAIL, CONCRETE;  
300.000 LF

If the above changes are not made, they will be made as shown here.

Make the following change to the Estimate Reference Information on plan Sheets C.04 through C07:

Change Estimate Reference Information for Item No. 5 2105-8425015 TOPSOIL, STRIP, SALVAGE, AND SPREAD:

Delete line D for this item.

Add Estimate Reference Information for Item No. 23 2416-0100048 APRONS, CONCRETE, 48 IN. DIA:

B. Bid item for 48" diameter apron includes apron toe support which requires 2 CY PCC each and shall be 7'-10" wide (to match FES end width), 4' deep, and 1'-8" thick, with #4 bars at 18" on center each way.

Change Estimate Reference Information for Item No. 26 2430-0000100 MODULAR BLOCK RETAINING WALL (HEAVY):

Add "excavation and backfill" to line C to be included in the unit price for this item.

Add Estimate Reference Information for Item No. 63 2523-0000100 LIGHTING POLE, TYPE L1:

C. Additional acceptable light pole assembly to include:

Lumca Concept 60 Series, Model CP6112 54N LED Type III Light Distribution.

Lumca Pole: PIL85-E

Lumca CF55 Luminaire Arm –Inverted (curved arm truss component below horizontal member)

Provide light pole assembly with: Dimensions similar to that shown in detail, Smooth black powder coat finish with gold finial on top of fixture and gold ball on top of pole.

Add Estimate Reference Information for Item No. 64 2523-0000100 LIGHTING POLE, TYPE L2:

C. Additional acceptable fixture to include:

- KIM Archetype AR-3-P-70-80-4K-UNIV. Provide with finish as specified in Lighting Unit Schedule

D. Additional acceptable light pole to include:

- Millerbernd, with construction/dimensions substantially equivalent to that shown in detail.
- Union Metal, with construction/dimensions substantially equivalent to that shown in detail.

Change Estimate Reference Information for Item No. 78 2537-8900500 AMENDED SOIL:

A. Furnish and install amended soil for perennial planting beds, refer to Special Provisions for Perennial Plants.

B. Furnish and install amended soil for bioretention cells and swales, refer to Special Provisions for Amended Soil.

C. Refer to R sheets for location and construction details regarding perennial planting beds.

D. Amended soil as backfill for trees and shrubs as shown in the R sheets shall be incidental to the tree and shrub bid items, amended soil in perennial planting beds shall be incidental to the perennial planting bid items.

Add Estimate Reference Information for Item No. 148 2501-5775000 PILES, STEEL SHEET:

A. Refer to V Sheets for details.

B. Bid item includes steel sheet pile, excavation, backfill, subdrain, concrete façade, reinforcement, shear studs, form liner finish, and all appurtenances to construct the wall as shown in the contract documents.

Add Estimate Reference Information for Item No. 149 2501-8400172 TEMPORARY SHORING:

- A. The contractor will be paid a lump sum contract price for temporary shoring. This payment shall be full compensation for all costs associated with designing, furnishing, installing, and removing the temporary shoring.

Add Estimate Reference Information for Item No. 150 2501-8400048 TEMPORARY BARRIER RAIL, CONCRETE:

- A. Temporary Barrier Rail required with Stage I and Stage IIA. Refer to J Sheets for details.

Add Estimate Reference Information for Item No. 111 2599-9999009 WATERMAIN REMOVED:

- A. Refer to Tabulation HRG-11 REMOVAL OF WATERMAIN on the C Sheets.
- B. Plugging of watermain adjacent to removed and abandoned sections shall be considered incidental to removal of watermain.
- C. The contractor will be paid the contract unit price per linear foot. This shall be considered full compensation for furnishing all tools, equipment, labor and materials for removing, backfilling and disposing of watermain.

Make the following change to plan Sheet C.13:

Modified "High Tension Cable Guardrail" tabulation for changes shown on Sheet D.05.

Replace plan Sheet C.13 with attached Sheet C.13.  
Replace plan Sheet D.05 with attached Sheet D.05.

Make the following change to plan Sheets J.02 and J.03:

Modified the staging plan to include temporary barrier rail with Stage I and Stage IIA.

Replace plan Sheets J.02 and J.03 with attached Sheets J.02 and J.03.

Make the following change to plan Sheets D.03 and D.05:

Modified the plan sheets to show station limits for ornamental railing.

Replace plan Sheets D.03 and D.05 with attached Sheets D.03 and D.05.

Make the following change to plan Sheets G.03, G.04, Q.07, S.02, S.03, V.01 through V.04, V.06, V.07, and W.05 through W.15:

Modified the trail plan and profile near Walls 4 and 5 to reduce the required height of the retaining walls; changed the material of Walls 4 and 5 from modular block to sheet pile with a concrete façade; revised the alignment information for the trail; updated the detail for the ornamental railing adjacent to the trail to be set in concrete footings instead of mounted to the walls; and updated the cross sections to reflect the profile changes associated with the trail plan.

Replace plan Sheets G.03, G.04, Q.07, S.02, S.03, V.01 through V.04, V.06, V.07, and W.05 through W.15 with the attached like sheets.

Make the following change to plan Sheet M.06:

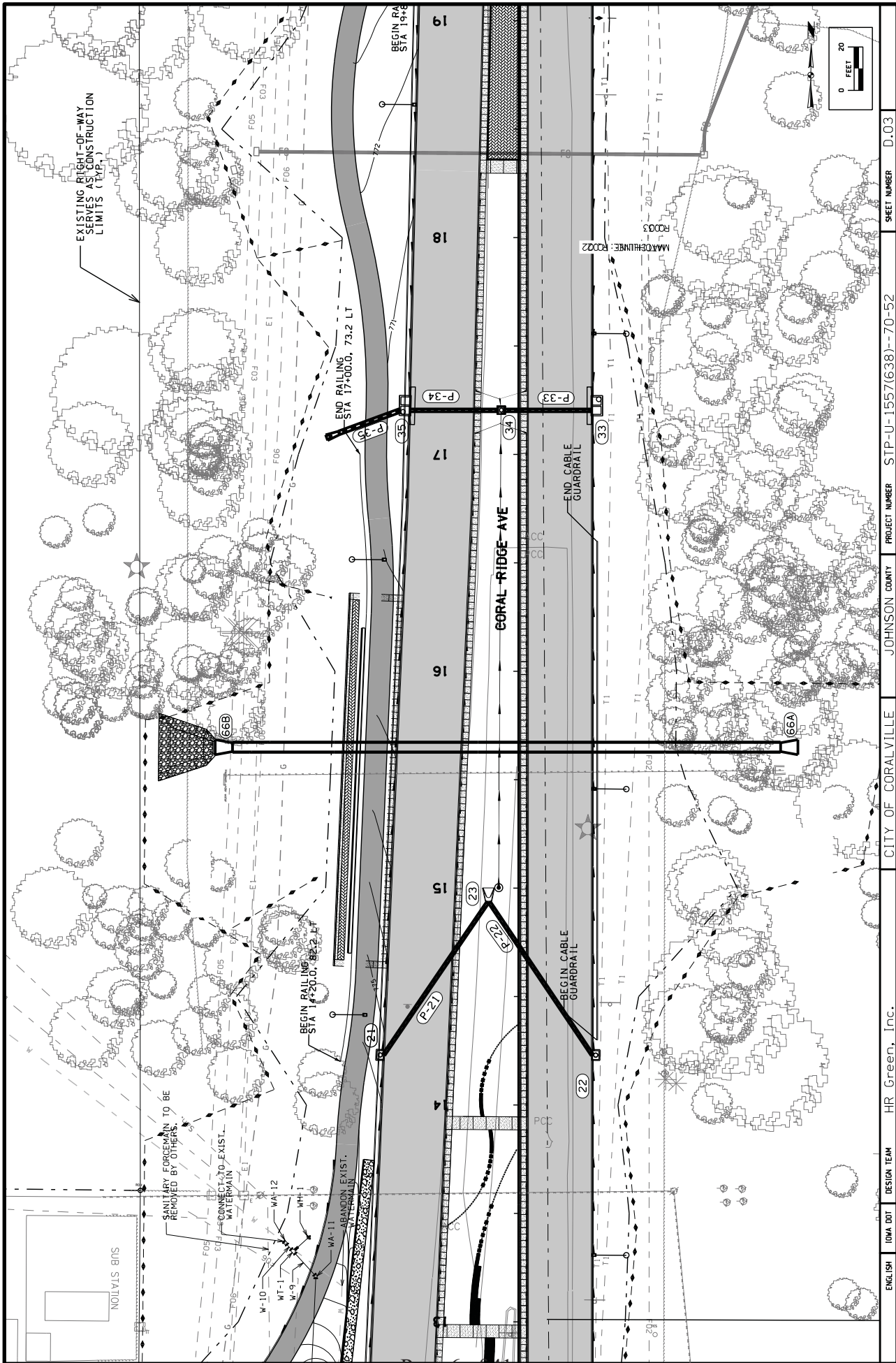
Modified the List of Intakes and Utility Accesses table, line 66A, revised the note to read as follows:  
48" DIA. RCP FES, WITH GUARD

Make the following change to the PROPOSAL SPECIAL PROVISIONS LIST & TEXT:

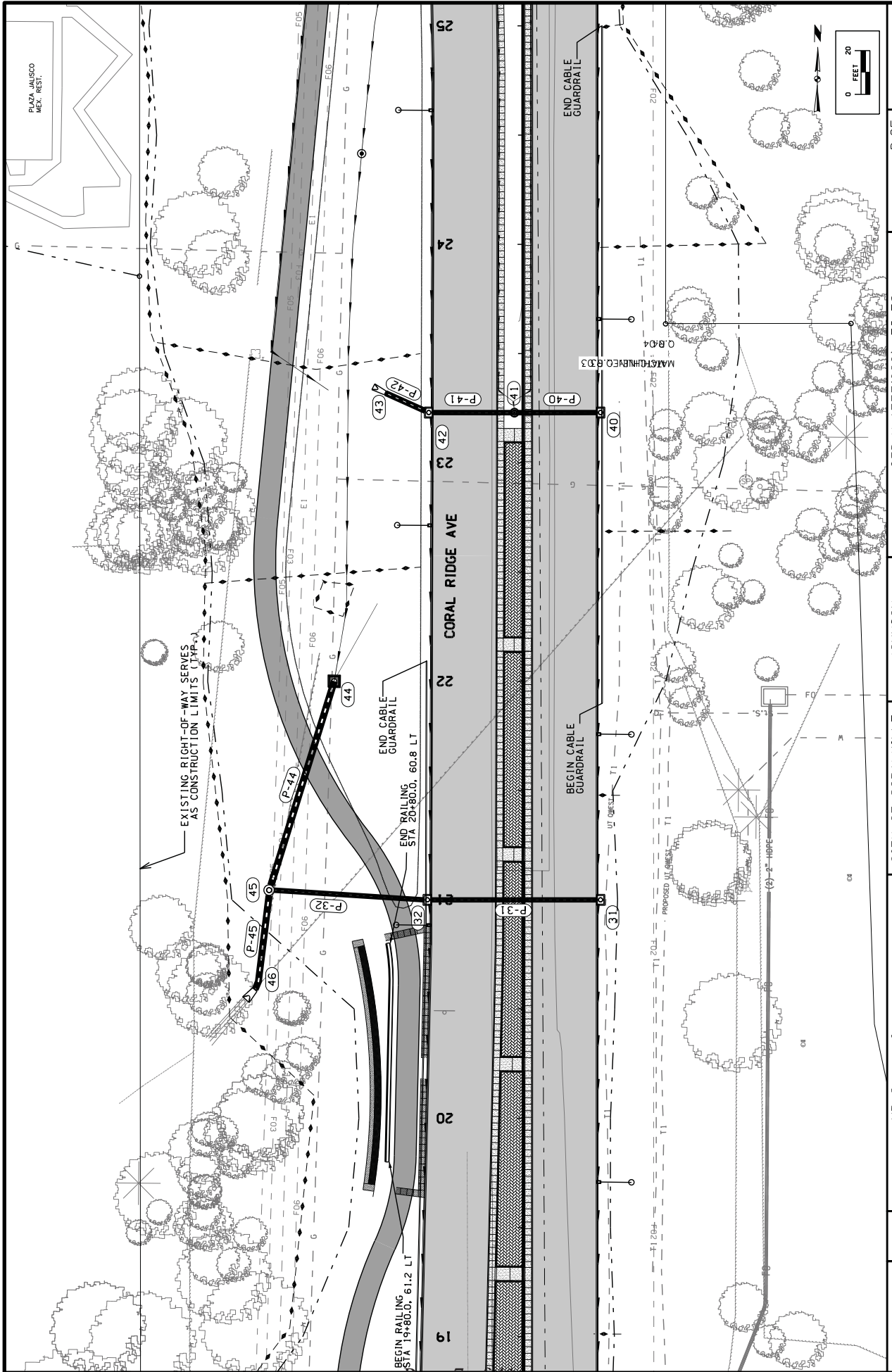
Replace: SP-126014 SPECIAL PROVISIONS FOR ORNAMENTAL RAILING  
Effective Date: December 17, 2013

With: SP-126014a SPECIAL PROVISIONS FOR ORNAMENTAL RAILING  
Effective Date: December 17, 2013

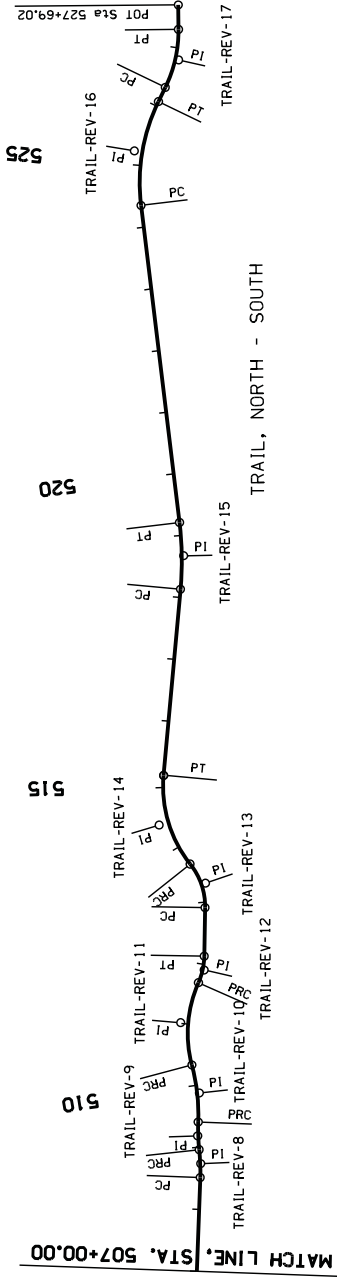
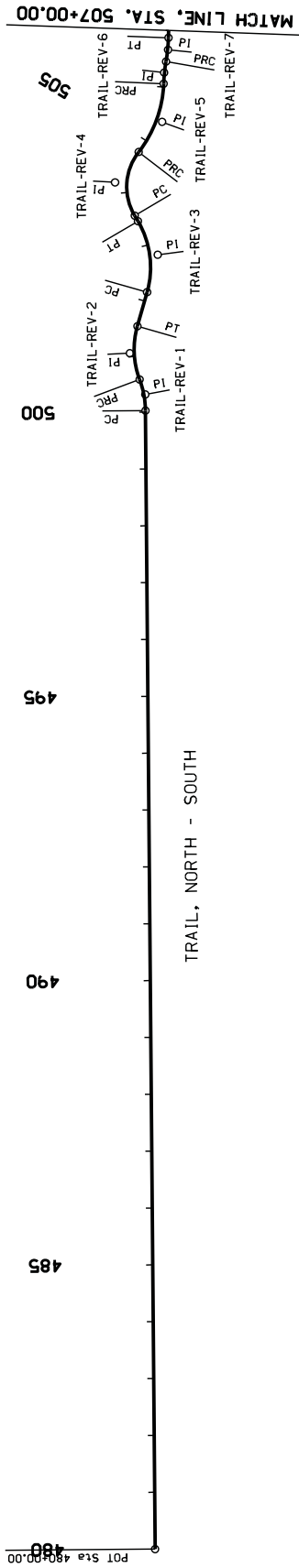




ENGLISH IDMA DOT DESIGN TEAM HR Green, Inc. PROJECT NUMBER STP-U-1557(638)--70-52 SHEET NUMBER D.03  
 CITY OF CORALVILLE JOHNSON COUNTY  
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ENGLISH	3:41:48 PM	agehart	\\imgcma\data\c08\1939500\Design\193950001.rvt	HR Green, Inc.	CITY OF CORALVILLE	JOHNSON COUNTY	PROJECT NUMBER	STP-U-1557(638)--70-52	SHEET NUMBER	D.05
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101-16  
10-20-09

ALIGNMENT COORDINATES

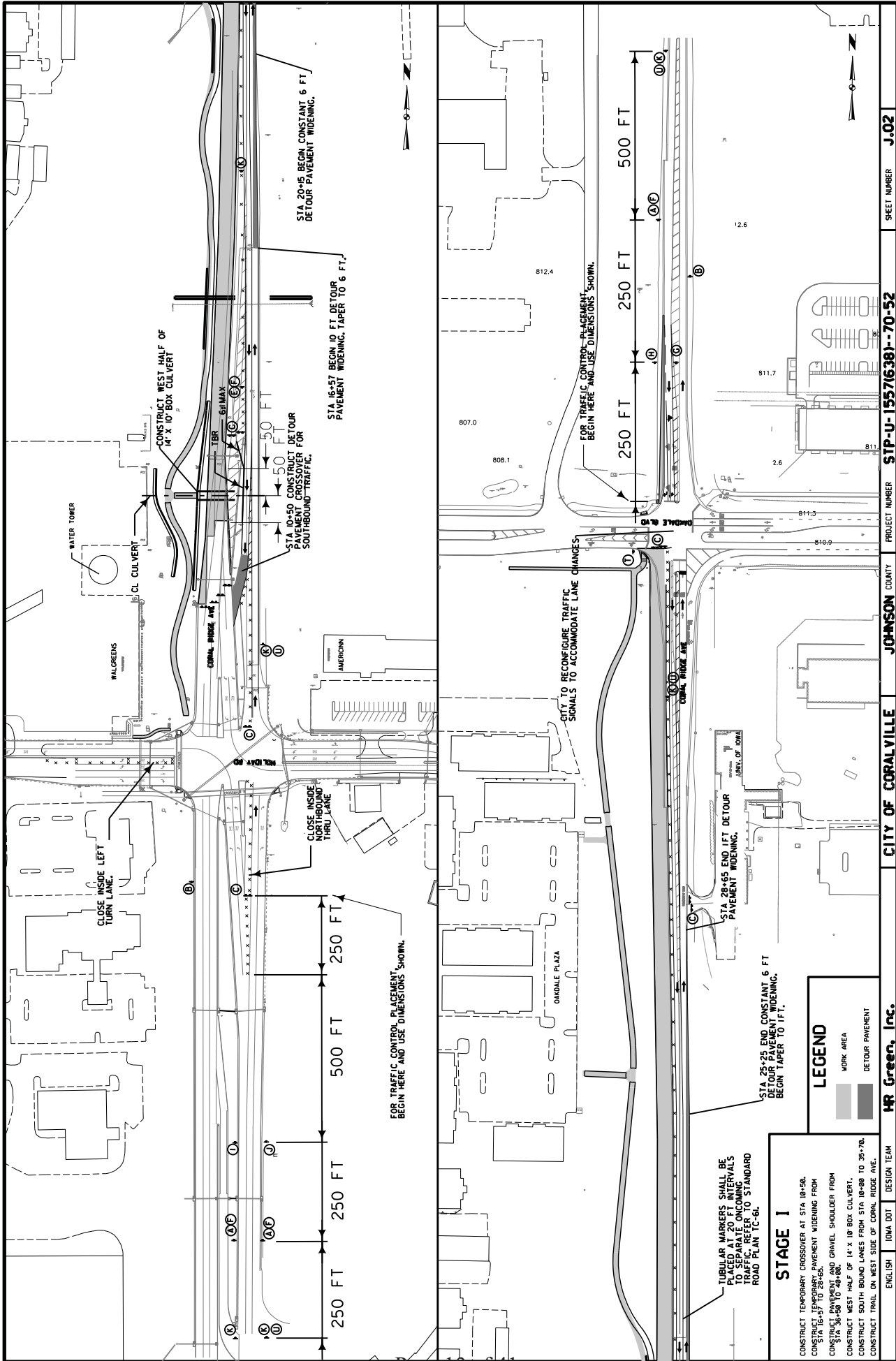
Name	Location	Point on Tangent		Begin Spiral		Simple Curve Pl. or Master Pl. of S/Cs		End Curve		End Spiral		
		Station	Y (Northing)	X (Easting)	Station	Y (Northing)	X (Easting)	Station	Y (Northing)	X (Easting)	Station	Y (Northing)
CORAL RIDGE AVE CRA1		6+00.00	625087.39	2156987.48								
CORAL RIDGE AVE CRA2		47+00.00	629187.28	2156957.36								
TRAIL, E-W TRLE001		600+00.00	625881.43	2156854.09								
TRAIL, E-W TRALE-001												
TRAIL, E-W TRALE-002												
TRAIL, E-W TRALE-003												
TRAIL, E-W TRLE005		609+79.98	625442.28	2157682.78								
TRAIL, N-S TRLO480		480+00.00	62390.78	2156892.54								
TRAIL, N-S TRAIL-REV-1												
TRAIL, N-S TRAIL-REV-2												
TRAIL, N-S TRAIL-REV-3												
TRAIL, N-S TRAIL-REV-4												
TRAIL, N-S TRAIL-REV-5												
TRAIL, N-S TRAIL-REV-6												
TRAIL, N-S TRAIL-REV-7												
TRAIL, N-S TRAIL-REV-8												
TRAIL, N-S TRAIL-REV-9												
TRAIL, N-S TRAIL-REV-10												
TRAIL, N-S TRAIL-REV-11												
TRAIL, N-S TRAIL-REV-12												
TRAIL, N-S TRAIL-REV-13												
TRAIL, N-S TRAIL-REV-14												
TRAIL, N-S TRLO515		515+12.05	626760.64	2156862.96								
TRAIL, N-S TRAIL-REV-12												
TRAIL, N-S TRAIL-REV-13												
TRAIL, N-S TRAIL-REV-14												
TRAIL, N-S TRLO515		527+69.02	628001.96	2156886.56								

101-17  
10-20-09

SPIRAL OR CIRCULAR CURVE DATA

Name	Location	Δ <sub>S/Cs</sub>	Spiral Data				Horizontal Alignment Data				Curve Data				Superelevation Data			
			Es	Ls	Ts	Δs	Δ <sub>S/Cs</sub>	L.I.	S.I.	Δ <sub>S/Cs</sub>	T	L	R	E	e	L	x	
TRAIL, E-W TRALE-001																		
TRAIL, E-W TRALE-002																		
TRAIL, E-W TRALE-003																		
TRAIL, N-S TRAIL-REV-1																		
TRAIL, N-S TRAIL-REV-2																		
TRAIL, N-S TRAIL-REV-3																		
TRAIL, N-S TRAIL-REV-4																		
TRAIL, N-S TRAIL-REV-5																		
TRAIL, N-S TRAIL-REV-6																		
TRAIL, N-S TRAIL-REV-7																		
TRAIL, N-S TRAIL-REV-8																		
TRAIL, N-S TRAIL-REV-9																		
TRAIL, N-S TRAIL-REV-10																		
TRAIL, N-S TRAIL-REV-11																		
TRAIL, N-S TRAIL-REV-12																		
TRAIL, N-S TRAIL-REV-13																		
TRAIL, N-S TRAIL-REV-14																		
TRAIL, N-S TRAIL-REV-15																		
TRAIL, N-S TRAIL-REV-16																		
TRAIL, N-S TRAIL-REV-17																		

ENGLISH IMA DOT DESIGN TEAM HR Green, Inc. PROJECT NUMBER STP-U-15576381-70-52 SHEET NUMBER G.04 REVISED  
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TUBULAR MARKERS SHALL BE PLACED AT 20 FT INTERVALS TO SEPARATE ONCOMING TRAFFIC TO STANDARD ROAD PLAN TC-61.

**STAGE 1**  
 CONSTRUCT TEMPORARY CROSSOVER AT STA 18+58.  
 CONSTRUCT TEMPORARY PAVEMENT WIDENING FROM STA 14+16+57 TO 28+65.  
 CONSTRUCT PAVEMENT AND GRAVEL SHOULDER FROM STA 36+58 TO 48+88.  
 CONSTRUCT SOUTH BOUND LANES FROM STA 18+88 TO 35+70.  
 CONSTRUCT TRAIL ON WEST SIDE OF CORAL RIDGE AVE.

**LEGEND**  
 WORK AREA  
 DETOUR PAVEMENT

STA 25+25 END CONSTANT 6 FT DETOUR PAVEMENT WIDENING. BEGIN TAPER TO 1 FT.

STA 28+65 END LET DETOUR PAVEMENT WIDENING.

CITY TO RECONFIGURE TRAFFIC SIGNALS TO ACCOMMODATE LANE CHANGES.

FOR TRAFFIC CONTROL PLACEMENT BEGIN HERE AND USE DIMENSIONS SHOWN.

STA 16+57 BEGIN 10 FT DETOUR PAVEMENT WIDENING. TAPER TO 6 FT.

STA 20+16 BEGIN CONSTANT 6 FT DETOUR PAVEMENT WIDENING.

CONSTRUCT WEST HALF OF 14" X 10" BOX CULVERT

WATER TOWER  
 WALGREENS  
 CORAL RIDGE AVE  
 TBR  
 61 MAX  
 50 FT  
 50 FT  
 STA 10+60 CONSTRUCT PAVEMENT CROSSOVER FOR SOUTHBOUND TRAFFIC

CLOSE INSIDE NORTHBOUND THRU LANE

CLOSE INSIDE LEFT TURN LANE.

J.02

PROJECT NUMBER STP-U-155716381--70-52

COUNTY

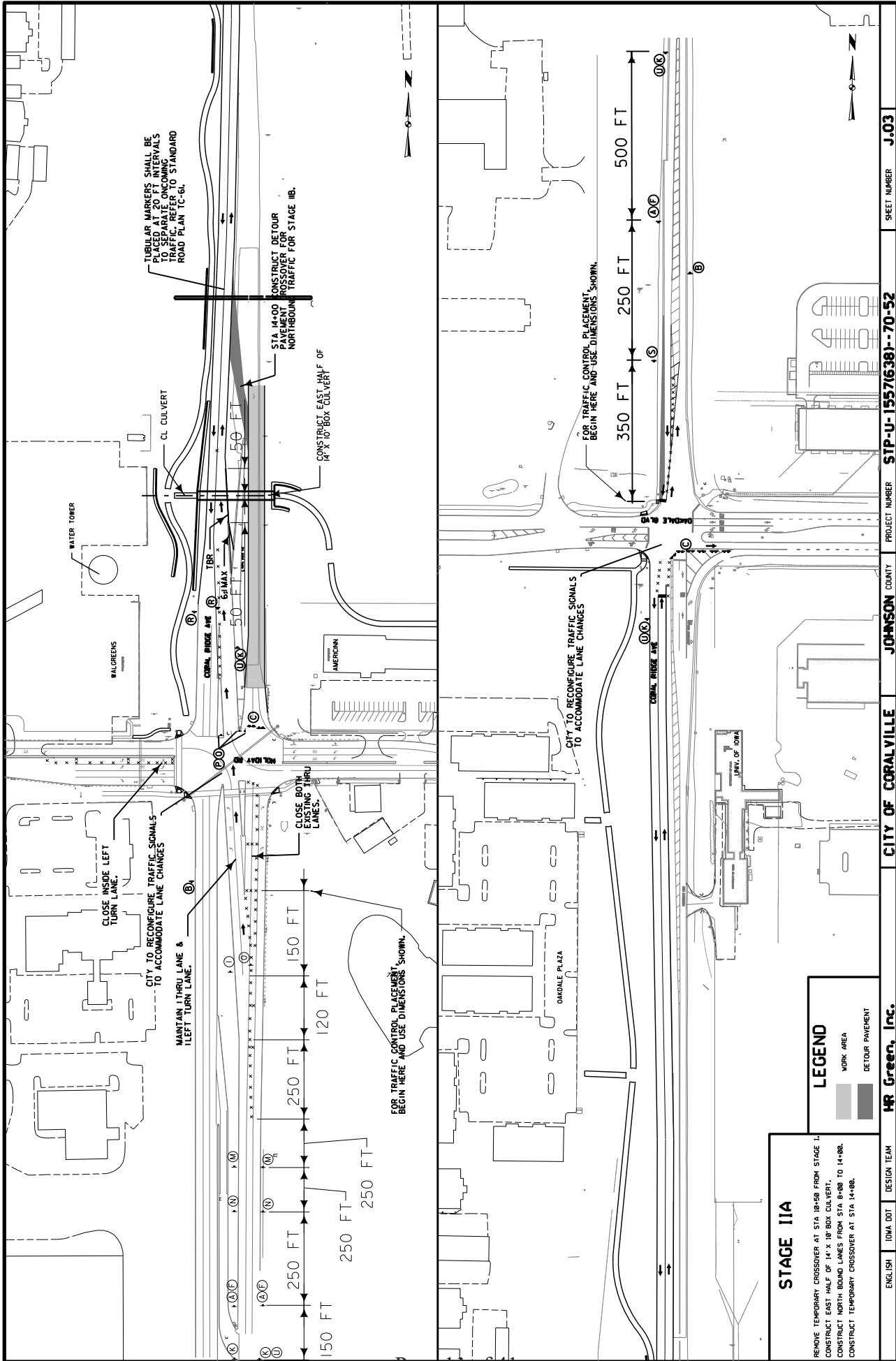
JOHNSON

CITY OF CORALVILLE

HR Green, Inc.  
 DESIGN TEAM

ENGLISH IDMA DOT

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TUBULAR MARKERS SHALL BE USED TO SEPARATE CONCURRENCE INTERVALS TO ACCOMMODATE LANE CHANGES. REFER TO STANDARD ROAD PLAN TC-61.

CONSTRUCT DETOUR CROSSOVER FOR NORTHBOUND TRAFFIC FOR STAGE IIB.

CONSTRUCT EAST HALF OF 14' X 10' BOX CULVERT

CITY TO RECONFIGURE TRAFFIC SIGNALS TO ACCOMMODATE LANE CHANGES

MAINTAIN THRU LANE & LEFT TURN LANE.

CLOSE BOTH EXISTING THRU LANES.

FOR TRAFFIC CONTROL PLACEMENT, BEGIN HERE AND USE DIMENSIONS SHOWN.

FOR TRAFFIC CONTROL PLACEMENT, BEGIN HERE AND USE DIMENSIONS SHOWN.

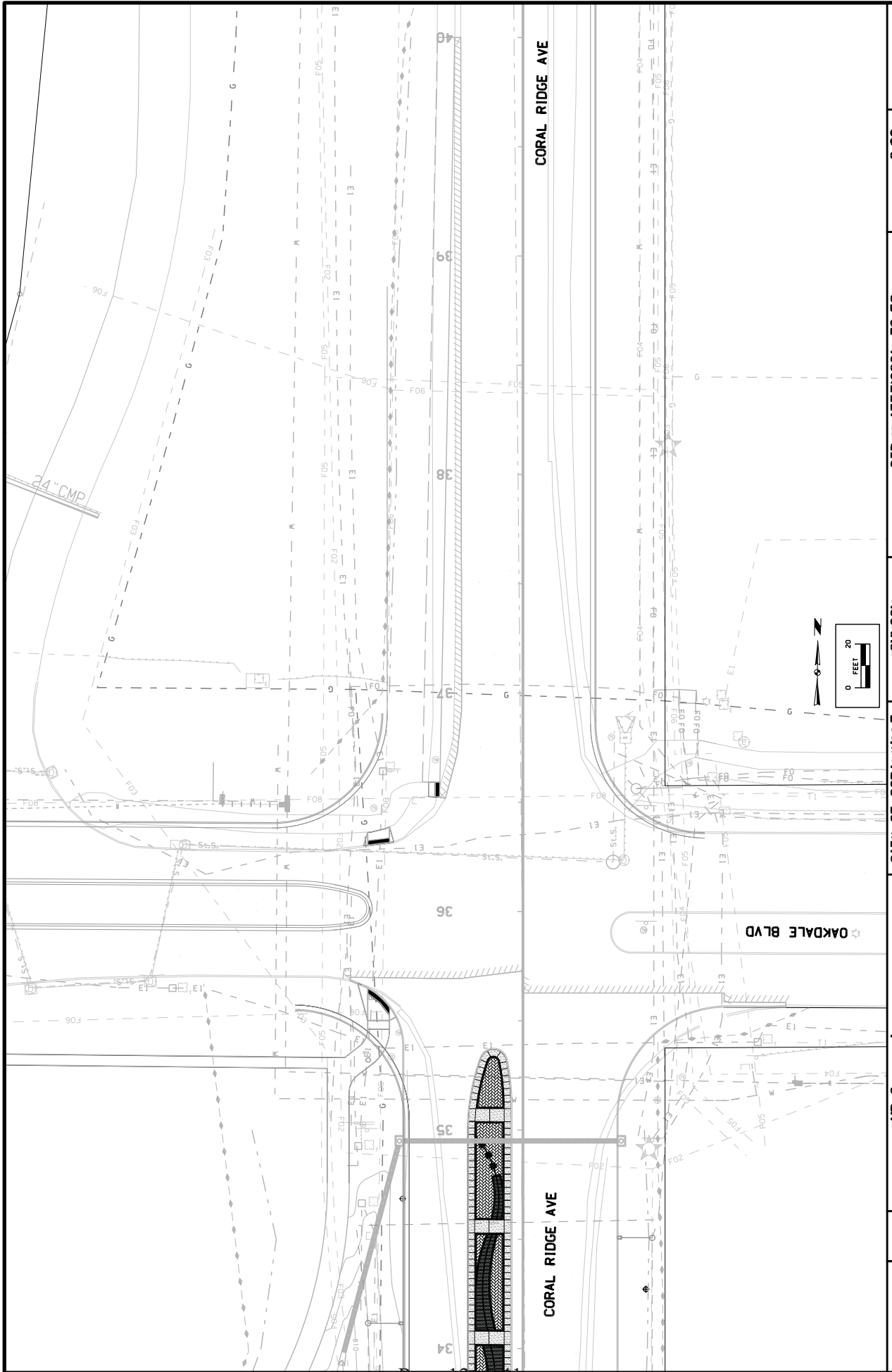
CITY TO RECONFIGURE TRAFFIC SIGNALS TO ACCOMMODATE LANE CHANGES

**LEGEND**

- WORK AREA
- DETOUR PAVEMENT

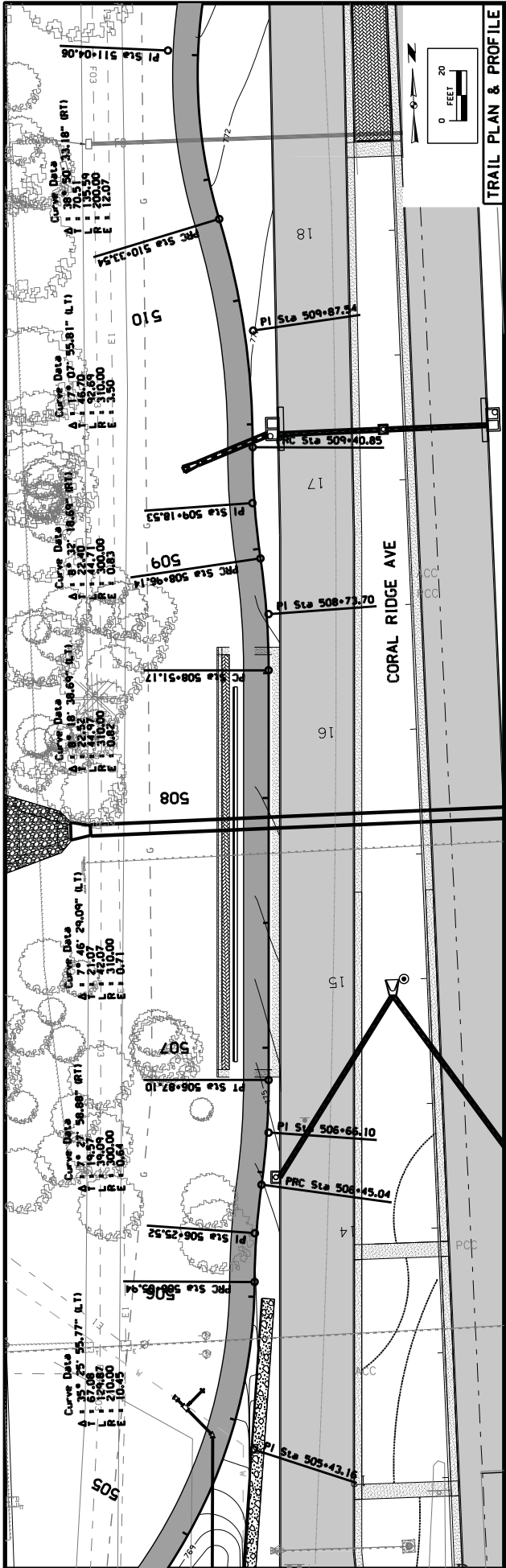
**STAGE IIA**

- REMOVE TEMPORARY CROSSOVER AT STA. 10+50 FROM STAGE I.
- CONSTRUCT EAST HALF OF 14' X 18' BOX CULVERT.
- CONSTRUCT NORTH BOUND LANES FROM STA. 8+00 TO 14+00.
- CONSTRUCT TEMPORARY CROSSOVER AT STA. 14+00.

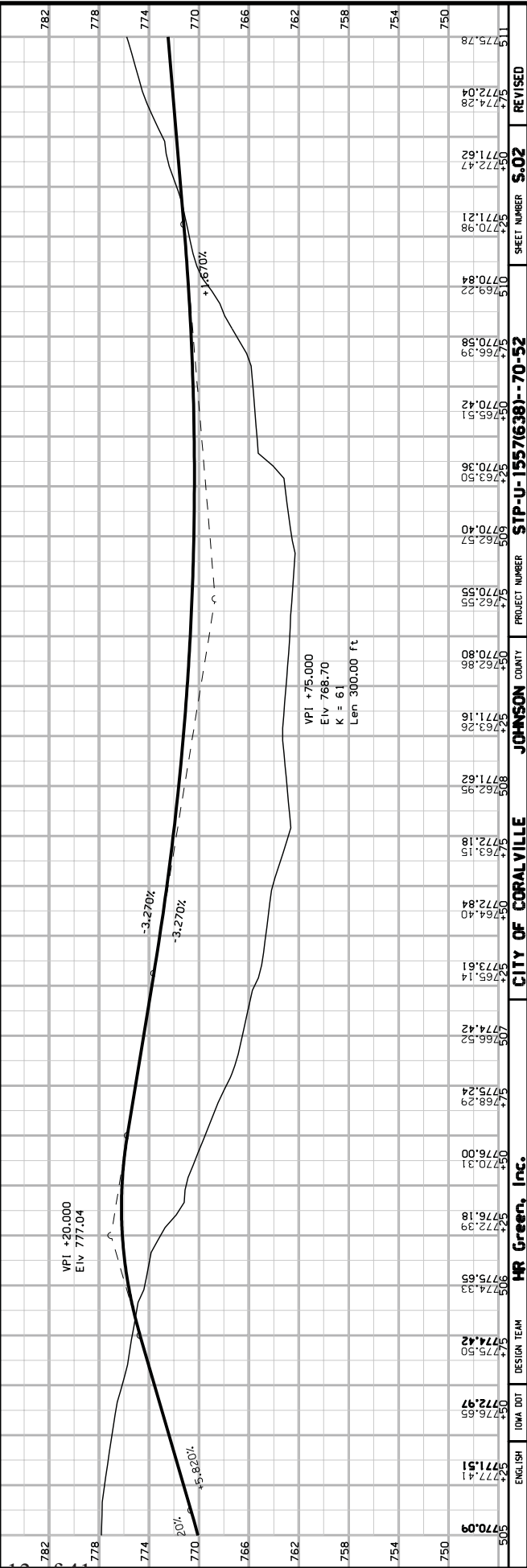


ENGLISH | IDMA DOT | DESIGN TEAM | **HR Green, Inc.** | **CITY OF CORALVILLE** | JOHNSON COUNTY | PROJECT NUMBER | **STP-U-15576381--70-52** | SHEET NUMBER | **0.06**

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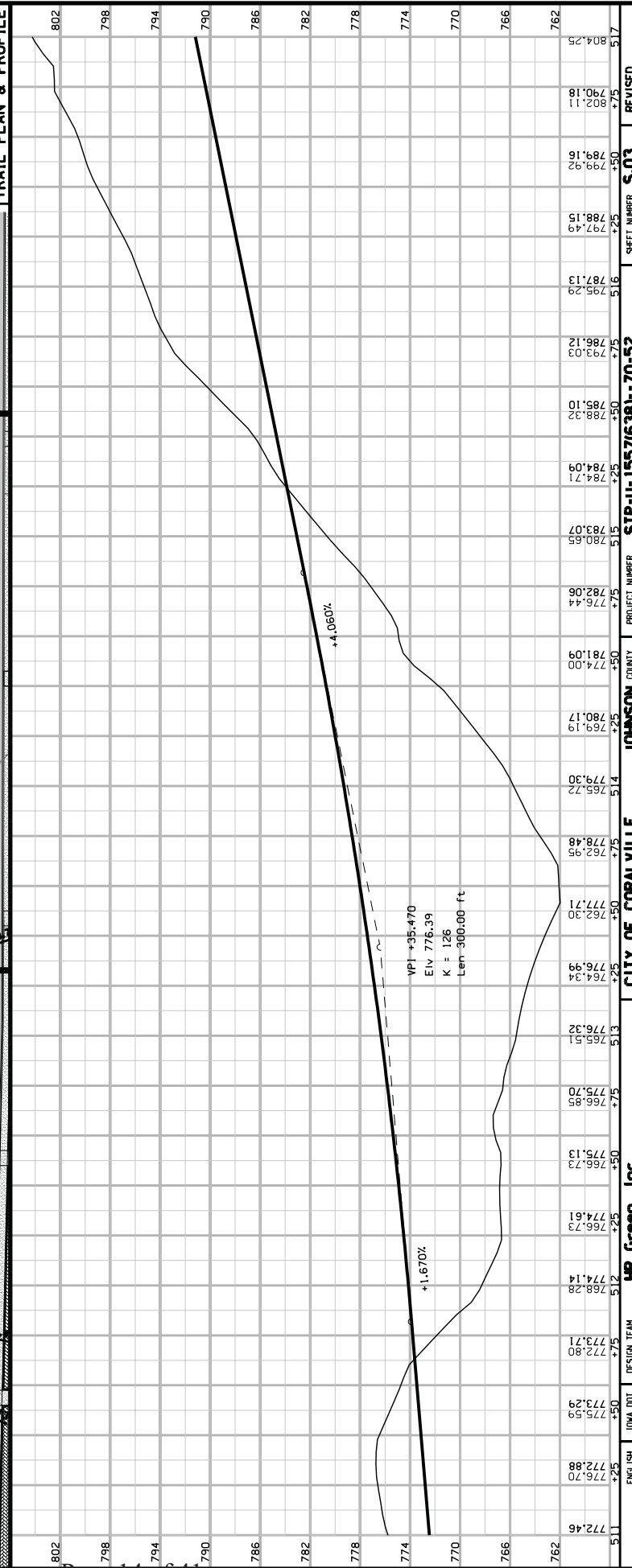
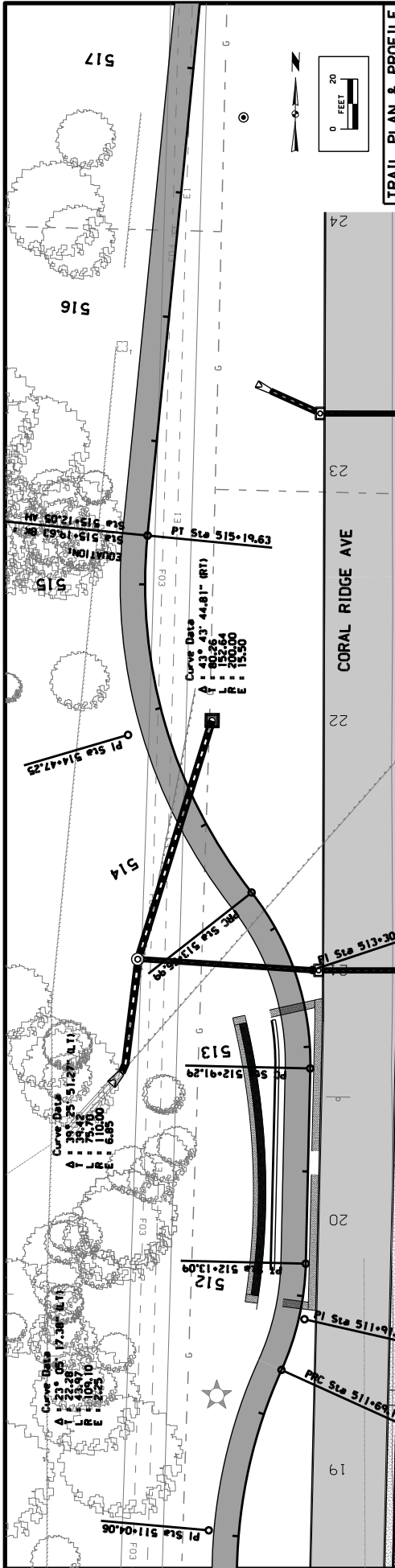


**TRAIL PLAN & PROFILE**



STATION	ELEVATION	PROJECT NUMBER	COUNTY	CITY	DESIGN TEAM	DATE	REVISION
505	770.09	STP-U-155716381--70-52	JOHNSON	CITY OF CORALVILLE	HR Green, Inc.	12/5/2013	S.02
506	771.51						
507	772.97						
508	774.42						
509	775.89						
510	777.35						
511	778.81						
512	780.27						
513	781.73						
514	783.19						
515	784.65						
516	786.11						
517	787.57						
518	789.03						
519	790.49						

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STATION	ELEVATION	PROJECT NUMBER	COUNTY	CITY	DESIGN TEAM	DATE	REVISION
511	772.46	STP-U-1557(6381)-70-52	JOHNSON	CORALVILLE	HR Green, Inc.	12/5/2013	S.03
512	772.80						
513	775.13						
514	776.32						
515	776.73						
516	777.71						
517	779.30						
518	780.17						
519	781.09						
520	782.06						
521	783.07						
522	784.71						
523	785.10						
524	786.12						
525	788.32						
526	789.16						
527	790.18						
528	791.18						
529	792.18						
530	793.03						
531	794.15						
532	795.29						
533	796.13						
534	797.43						
535	798.15						
536	799.16						
537	800.18						
538	801.18						
539	802.18						
540	803.18						

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**GENERAL NOTES:**

CLASS 20 EXCAVATION MATERIAL UNSUITABLE FOR BACKFILLING SHALL BE DISPOSED OF IN A MANNER THAT WILL LEAVE THE SITE IN A NEAT CONDITION. BATTERS SHALL MATCH WHERE THE RETAINING WALLS MEET THE RCB CULVERT END SECTIONS.

TEMPORARY SHORING (SHEET PILE OR OTHER) SHALL BE REQUIRED AS NECESSARY TO PROTECT THE EARTH UNDER THE TRAFFIC LANE FROM SLOUGHING IN DURING CONSTRUCTION.

THE CONTRACTOR SHALL SUBMIT A TEMPORARY SHORING PLAN TO THE ENGINEER FOR APPROVAL. THE TEMPORARY SHORING PLAN SHALL BE DESIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF IOWA. THE CONTRACTOR SHALL SUBMIT 6 COPIES OF PLANS FOR TEMPORARY SHORING. THE CONTRACTOR SHALL PROVIDE CALCULATIONS AND DETAILS FOR THE TEMPORARY SHORING PLAN. THE CONTRACTOR SHALL NOT PROCEED WITH INSTALLATION OF THE TEMPORARY SHORING WITHOUT NOTICE TO PROCEED FROM THE ENGINEER.

THE TEMPORARY SHORING SUBMITTAL SHALL INCLUDE:

- DESIGN CALCULATIONS (INCLUDING A GLOBAL STABILITY ANALYSIS)
- SOIL PROPERTIES
- SHORING PLAN LAYOUT (SHOWING LOCATION OF TRAFFIC)
- SHORING DETAILS

TEMPORARY SHORING SHALL BE PAID FOR AS A LUMP SUM INCLUDING ALL COST FOR DESIGNING, FURNISHING, INSTALLING AND REMOVAL. ALL MATERIAL USED FOR SHORING SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. SHORING IS TO BE REMOVED IMMEDIATELY UPON COMPLETION OF THE PROJECT. IN ADDITION TO THE REQUIREMENTS NOTED ABOVE, ARTICLE 1107.07 OF THE STANDARD SPECIFICATIONS STILL APPLIES.

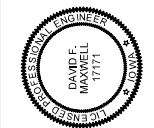
PROJECT TRAFFIC CONTROL PLAN  
 THE CONTRACTOR SHALL MAINTAIN THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08, STANDARD SPECIFICATIONS PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS, TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING, AND PAVEMENT MARKINGS INSTALLED WITHIN THE LIMITS OF THIS PROJECT SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SIGNING (MUTCD) AND THE IOWA ADMINISTRATIVE CODE (IAC) CHAPTER 100, PROJECT STAGING AND CONSTRUCTION OF 14' X 10' BOX CULVERT (STA. 12+00), SHALL PROGRESS IN ORDER OF STAGING AS OUTLINED ON THE J SHEETS. THE CONTRACTOR MAY PROPOSE A REVISED STAGING PLAN OR REVISED PORTIONS OF THE STAGING PLAN. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER IN WRITING ANY PROPOSED CHANGES TO THE STAGING PLAN.

**ESTIMATED BOX CULVERT QUANTITIES**

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
11	2310-5151040	PCC OVERLAY, FURNISH ONLY	CY	25	
12	2310-5151051	PCC OVERLAY, PLACE ONLY (BONDED)	SY	221	
15	2402-0425031	GRANULAR BACKFILL	TON	2,275	
16	2402-2720000	EXCAVATION, CLASS 20	CY	3,035	
17	2415-2100000	PRECAST CONCRETE BOX CULVERT, 14' X 10'	LF	142	
149	2501-8400172	TEMPORARY SHORING	LS	1	

**ITEM NO. ESTIMATE REFERENCE INFORMATION**

- 15 INCLUDES COST OF 2'-0" BEDDING AND GRANULAR BACKFILL.
- 16 INCLUDES EXCAVATION NECESSARY TO PLACE 2'-0" BEDDING.
- 17 INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE CULVERT TIES, LIFTING HOLE PLUGS, ENGINEERING FABRIC, JOINT MATERIAL AND GROUT AS REQUIRED.
- 149 THE CONTRACTOR WILL BE PAID A LUMP SUM CONTRACT PRICE FOR TEMPORARY SHORING. THIS PAYMENT SHALL BE FULL COMPENSATION FOR ALL COSTS ASSOCIATED WITH DESIGNING, FURNISHING, INSTALLING AND REMOVING THE TEMPORARY SHORING.



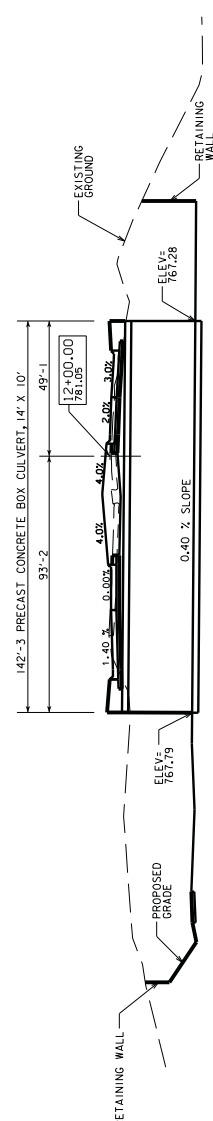
I hereby certify that this engineering document was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Iowa.

**DAVID F. MAXWELL, P.E.**  
 License Number: 17171  
 Date of Expiration: 31, DECEMBER 31, 2013  
 Pages or sheets covered by this seal: 5.03, 5.06, 5.07, V.01--V.07

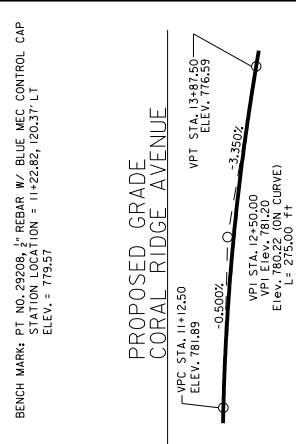
DATE \_\_\_\_\_

DESIGN FOR 0'00'00" SKEW  
 14' X 10' X 142'-3"  
**PRECAST CONCRETE BOX CULVERT**  
**GENERAL NOTES AND QUANTITIES**  
 STA. 12+00.00 JOHNSON COUNTY JULY, 2013  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 1 OF 3 FILE NO. \_\_\_\_\_ DESIGN NO. \_\_\_\_\_

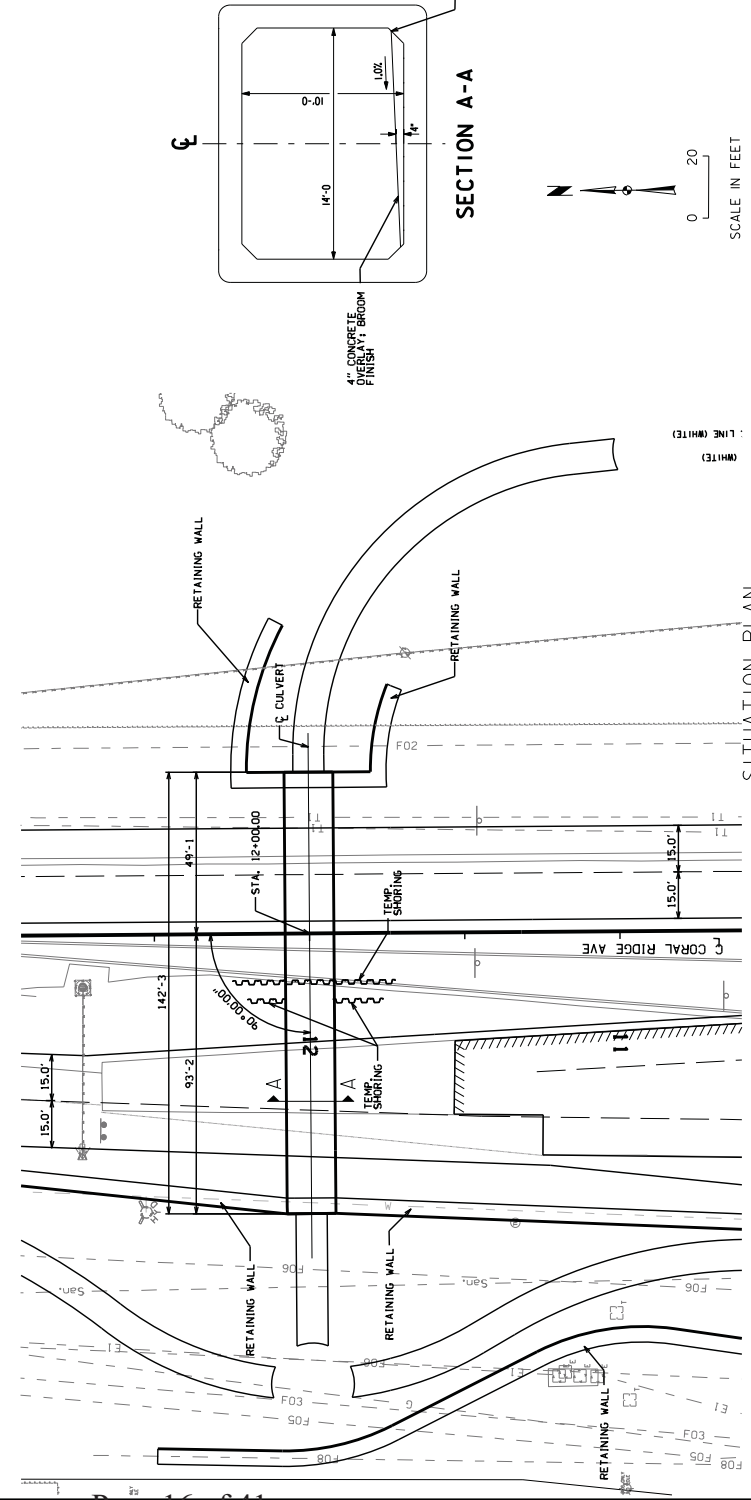
790	790
785	785
780	780
775	775
770	770
765	765
760	760
755	755



LONGITUDINAL SECTION ALONG CULVERT



BENCH MARK: PT NO. 29209, 2" REBAR W/ BLUE MEC CONTROL CAP  
STATION LOCATION = 11+22.82, 12037' LT  
ELEV. = 795.57



SITUATION PLAN

**TRAFFIC ESTIMATE**

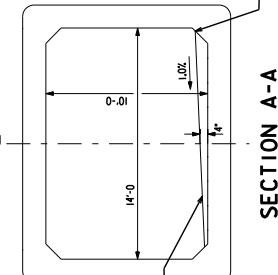
2002 AADT, 16,000 V.P.D.  
2035, AADT, 37,100 V.P.D.  
2% TRUCKS

**LOCATION**

CORAL RIDGE AVE, APPROX. 450 FT NORTH OF HOLIDAY RD  
T-806, R07W  
SECTION 25  
CLEAR CREEK TOWNSHIP  
JOHNSON COUNTY  
CITY OF CORALVILLE, IA

**PLAN NOTES**

1. ALL UNITS ARE IN FEET UNLESS OTHERWISE NOTED.



SECTION A-A



DESIGN FOR 0°00'00" SKEW  
14' X 10' X 142'-3"  
PRECAST CONCRETE BOX CULVERT  
SITUATION PLAN  
STA. 12+00.00  
JOHNSON COUNTY  
JULY, 2013  
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 2 OF 3 FILE NO. \_\_\_\_\_ DESIGN NO. \_\_\_\_\_



**GENERAL NOTES:**

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A 14' x 10' x 142'-3 PRECAST REINFORCED CONCRETE BOX CULVERT AT STATION 12+00.00. Faint lines on plans indicate existing structure. UTILITY COMPANIES AND MUNICIPALITIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE, LOCATION AND EARTH COVER. PRECAST BOX CULVERTS ARE DESIGNED FOR HL-93 LIVE LOAD AND EARTH FILL OF 5 FEET. THE PRECAST R.C.B. BARREL SHALL CONFORM TO IOWA D.O.T. SINGLE PRECAST R.C.B. CULVERT STANDARDS. AT THE CONTRACTOR'S OPTION, PRECAST BARREL SECTIONS MAY CONFORM TO ASTM C1577. EXCESS CLASS 20 EXCAVATION MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED AT THE CONSTRUCTION SITE, AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL FURNISH AND INSTALL CULVERT TIES FOR ALL JOINTS. THE CONTRACTOR SHALL FURNISH AND INSTALL CULVERT TIES FOR THE BARREL AND THE LAST BARREL SECTION WILL BE ATTACHED TO THE END SECTIONS WITH TWO TIES PER SIDE. THE END SECTION JOINTS WILL HAVE TWO TIES PER SIDE. CULVERT TIES SHALL BE INCLUDED IN THE COST FOR PRECAST CONCRETE BOX CULVERT. TIE RODS WILL BE 1 INCH DIAMETER STEEL AND SHALL MEET REQUIREMENTS OF ASTM A709 GRADE 36 OR EQUAL. CULVERT TIE SPACINGS SHALL BE AS SHOWN ON THE "GRANULAR BEDDING DETAIL". A MINIMUM OF 2 FEET OF GRANULAR MATERIAL WITH A MAXIMUM AGGREGATE SIZE OF 3/8 INCH SHALL BE USED AS BEDDING FOR THE PRECAST BOX CULVERT. THE BEDDING SHALL BE SHAPED TO A FLAT BASE USING A TEMPLATE. THE 2 FOOT GRANULAR BEDDING SHALL BE BID AS GRANULAR BACKFILL. THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED PRECAST BOX CULVERT TO THE CITY OF CORALVILLE FOR APPROVAL. THE DETAILS SHALL INCLUDE THE FOLLOWING INFORMATION AS FOUND ON THE "SUBMITTAL SHOP DRAWING" STANDARD SHEET:

- A SITUATION PLAN DRAWING SHOWING THE OUT TO OUT DIMENSION FOR THE LINE OF THE CULVERT SECTIONS.
- DIMENSION THE NUMBER OF PRECAST SECTIONS AND SECTION LENGTHS.
- A DETAIL OF THE PRECAST BARREL SECTIONS SHOWING A CROSS SECTION WITH DIMENSIONS AND REINFORCEMENT INFORMATION SUCH AS: THE CONTRACTOR SHALL PROVIDE LOCATION, INFORMATION SUCH AS: THE SUBMITTAL SHOP DRAWING SHEET REGARDLESS OF WHICH PRECAST BOX OPTION IS SELECTED.

APPROVAL OF DETAILS IS NOT REQUIRED FOR PROJECTS CONFORMING TO "ASTM C1577" AND "IOWA STANDARDS" PRECAST BOX OPTIONS. HOWEVER, THE DETAILS SHALL BE RECEIVED BY THE CITY OF CORALVILLE PRIOR TO THE START OF FABRICATION. APPROVAL OF DETAILS IS REQUIRED FOR "NONSTANDARD" PRECAST BOX OPTIONS. BOXES REQUIRING OPENINGS OR ATTACHMENTS SHALL BE CONSIDERED NONSTANDARD. THE CONTRACTOR SHALL ALLOW THIRTY WORKING DAYS FOR THE ENGINEER'S REVIEW PRIOR TO THE START OF FABRICATION. DETAILS REQUIRING APPROVAL SHALL BE DESIGNED AND SEALED BY A PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF IOWA. BOXCAR SOFTWARE VERSION 3.1 OR LATER OR OTHER EQUIVALENT SOFTWARE CAN BE USED TO DESIGN THE PRECAST BOX CULVERT BARREL SECTIONS. THE CONTRACTOR SHALL PROVIDE THE MANUFACTURER'S DESIGN MANUAL FOR THE IOWA STANDARDS AS FOUND IN THE "IOWA BRIDGE DESIGN MANUAL". THE MINIMUM REQUIREMENTS INCLUDE REINFORCEMENT CLEARANCE REQUIREMENTS USED IN THE "IOWA STANDARDS".

**INSTALLATION NOTES:**

PRECAST CONCRETE BOX CULVERT SECTIONS SHALL BE LAID WITH THE GROOVE END OF EACH SECTION UP-GRADE, AND THE SECTIONS SHALL BE TIGHTLY JOINED. CONCRETE TIES TO BE USED ONLY TO HOLD BOX SECTIONS TOGETHER, NOT FOR PULLING SECTIONS TIGHT. JOINT OPENINGS BETWEEN SECTIONS SHOULD BE AS TIGHT AS PRACTICABLE AND LIMITED TO A MAXIMUM OF 1/8 INCH OPENINGS. THE JOINT ON THE BOTTOM OF THE ROPE GASKET AS PER MATERIALS 1M-49109. WATER TIGHT 1 INCH BUTYL BUTYL ROPE GASKET SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER AND SHALL EXTEND VERTICALLY 6 INCHES ABOVE THE BOTTOM FILLET. ALL JOINTS SHALL BE TRIMMED CLEAN ON THE INSIDE AFTER SEALING. THE CONTRACTOR SHALL PLACE A 2 FOOT WIDE PIECE OF ENGINEERING FABRIC AROUND THE TOP AND SIDES OF EACH PRECAST JOINT. THE FABRIC SHALL BE ATTACHED TO THE WALLS AND TOP OF EACH SECTION TO PREVENT THE FABRIC FROM SLIPPING OFF THE JOINT DURING BACKFILLING OPERATIONS. ATTACHMENT METHODS SHALL BE APPROVED BY THE ENGINEER. ALL COSTS INCLUDING MATERIAL AND LABOR ASSOCIATED WITH PROVIDING THE ENGINEERING FABRIC AND INSTALLING IT AS REQUIRED SHALL BE INCLUDED IN THE BID ITEM "PRECAST CONCRETE BOX CULVERT". THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, DURING BACKFILLING THE COMPACTOR ADJACENT TO THE BOTTOM CORNER RADIUS OR CHAMFER SHALL BE ACCOMPLISHED WITH A MECHANICAL HAND COMPACTOR. THE CONTRACTOR SHALL FURNISH AND INSTALL LIFTING HOLE PLUGS FOR EACH SECTION. LIFTING HOLES SHALL BE PLUGGED WITH A PRECAST CONCRETE PLUG OR PLASTIC PLUG APPROVED BY THE ENGINEER. SEALED AND COVERED WITH A 2'-X-2' PIECE OF ENGINEERING FABRIC CENTERED OVER THE PLUG AND ATTACHED TO THE SECTION TO PREVENT THE FABRIC FROM SLIPPING. THE FLOOR OF THE PRECAST CONCRETE BOX CULVERT SECTIONS SHALL BE INTENTIONALLY ROUGHENED OR RAKED TO A MINIMUM DEPTH OF 1/4 INCH TO ACCOMMODATE THE CONCRETE OVERLAY. THE ROUGHENING OF THE PRECAST SECTIONS SHALL BE DONE WITH A MECHANICAL DEVICE SUCH AS WIRE BRUSH OR FINING HAKE. FINING SHALL BE CONSIDERED LONG-DURATION TOOLS. THE SPACING CAN BE EQUAL SPACES, 1 INCH OR GREATER. THE OPERATION SHALL BE DONE AT SUCH TIME AND MANNER THAT THE DESIRED SURFACE TEXTURE WILL BE ACHIEVED WHILE MINIMIZING DISPLACEMENT OF THE LARGER AGGREGATE PARTICLES AND BEFORE THE SURFACE PERMANENTLY SETS. THE CONTRACTOR SHALL PROVIDE CONTRACTION JOINTS IN THE OVERLAY TO BE LOCATED AT JOINTS BETWEEN INDIVIDUAL PRECAST CULVERT SECTIONS. SEE STANDARD ROADWAY PLAN PY-101, TYPE "C" CONTRACTION JOINT AND DETAIL B.

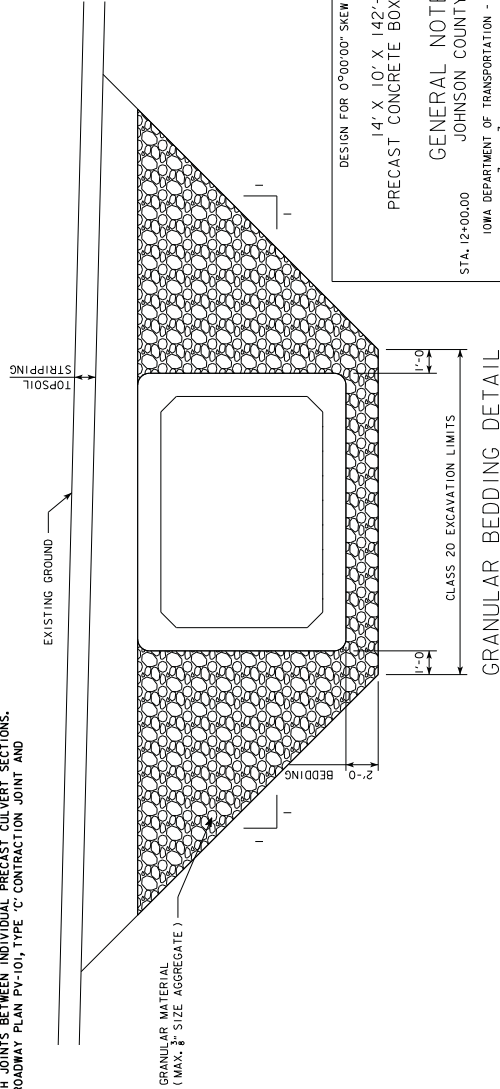
**SPECIFICATIONS:**

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 5TH ED., SERIES OF 2010. CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, CURRENT SERIES, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

**DESIGN STRESSES:**

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, CURRENT SERIES, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

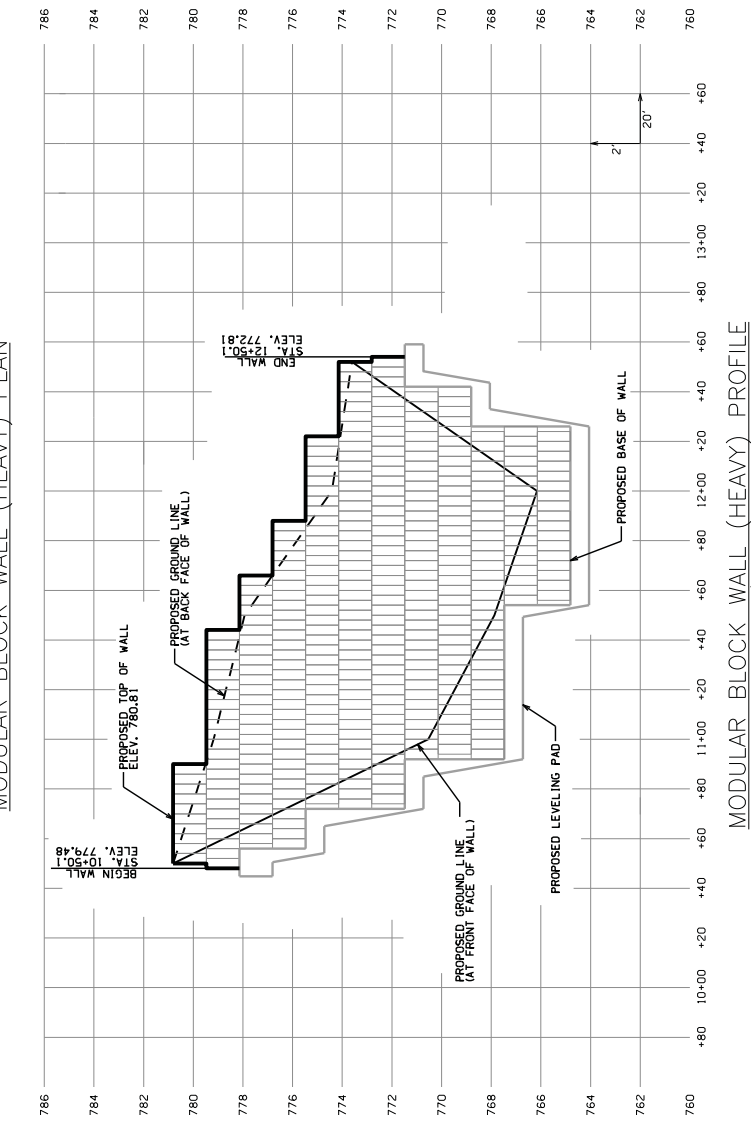
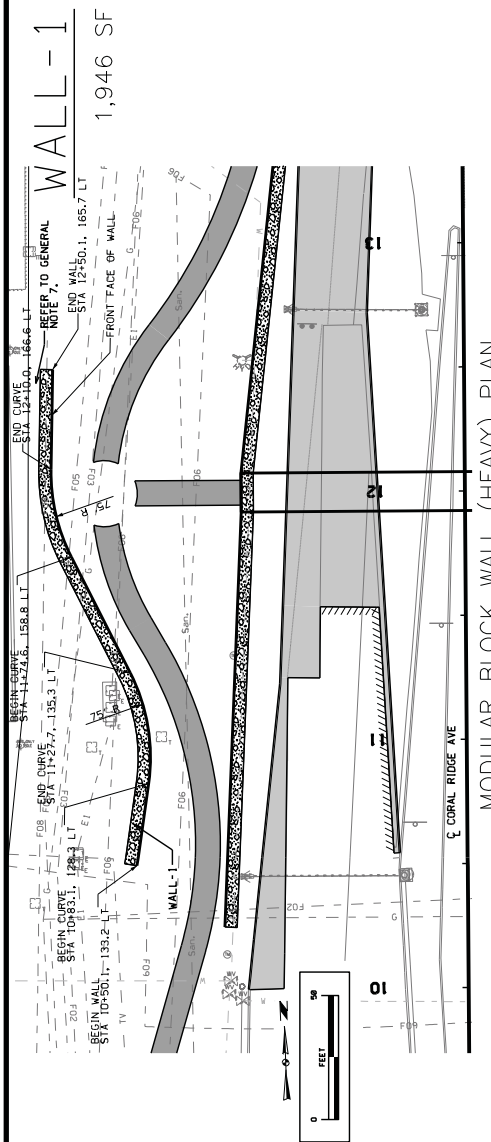
STANDARDS:		
FOR DETAILS AND NOTES NOT SHOWN REFER TO THE FOLLOWING IOWA D.O.T. - HIGHWAY STANDARDS:		
STANDARD	ISSUED	REVISED
PRCB G1-13	INDEX AND GENERAL NOTES	JANUARY, 2013
PRCB G2-13	TYPICAL CULVERT BARREL DETAILS	JANUARY, 2013



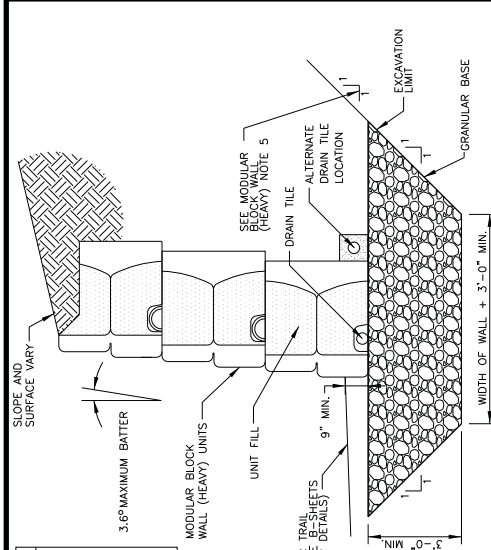
GRANULAR BEDDING DETAIL

DESIGN FOR 0°00'00" SKEW  
 14' X 10' X 142'-3  
 PRECAST CONCRETE BOX CULVERT  
 GENERAL NOTES  
 JOHNSON COUNTY  
 STA. 12+00.00  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 3 OF 3 FILE NO. \_\_\_\_\_ DESIGN NO. \_\_\_\_\_

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 cityofcoralville.com 515-395-5000 Design\1193950\101.rvt  
 CITY OF CORALVILLE JOHNSON COUNTY PROJECT NUMBER **S1P-U-1557(638)-70-52** SHEET NUMBER **V.03** REVISED  
 DESIGN FOR 0°00'00" SKEW  
 14' X 10' X 142'-3  
 PRECAST CONCRETE BOX CULVERT  
 GENERAL NOTES  
 JOHNSON COUNTY  
 STA. 12+00.00  
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. 3 OF 3 FILE NO. \_\_\_\_\_ DESIGN NO. \_\_\_\_\_



RETAINING WALL QUANTITIES	
MODULAR BLOCK WALL (HEAVY)	1,946 SF
WALL-1	3,928 SF
WALL-2	1,405 SF
WALL-3	8,136 SF
STEEL SHEET PILE WALL	4,010 SF
WALL-4	
WALL-5	



**MODULAR BLOCK WALL (HEAVY) CROSS SECTION**  
NOT TO SCALE

**GENERAL NOTES:**

- UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED ON THE D SHEETS FROM AVAILABLE SURVEY DATA AND RECORDS. THE OWNER DOES NOT WARRANT THE LOCATION OF THESE FACILITIES AS PRECISE. IT IS POSSIBLE THERE MAY BE OTHERS. THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXISTENCE AND PRECISE LOCATION OF ALL FACILITIES AND TO AVOID DAMAGE.
- ALL STATIONING GIVEN FROM CORAL RIDGE AVE CENTERLINE UNLESS OTHERWISE NOTED. OFFSETS ARE TO FACE OF WALL AT PROPOSED GROUND LINE (AT FRONT FACE OF WALL).

**MODULAR BLOCK WALL (HEAVY) NOTES:**

- RETAINING WALLS SHALL BE CONSTRUCTED WITH APPROVED PRE-CAST CONCRETE RETAINING WALL MODULES.
- DESIGN SPECIFICATIONS FOR MODULAR BLOCK WALL (HEAVY) SHALL BE TAKEN FROM THE SPECIAL PROVISIONS FOR MODULAR BLOCK WALL (HEAVY).
- THE COLOR OF ALL THE WALLS SHOULD MATCH; THE COLOR SHALL BE AS APPROVED BY THE ENGINEER. A SAMPLE OF EACH BLOCK TYPE SHALL BE PROVIDED FOR APPROVAL BY THE ENGINEER PRIOR TO THE ORDERING OF THE MATERIALS.
- EACH COURSE OF BLOCK MUST BE SET IN RUNNING BOND IN RELATION TO THE COURSE BELOW. A MECHANICALLY INTERLOCKING SYSTEM SHALL TIE THE COURSES OF BLOCK TOGETHER.
- THERE ARE LOCATIONS ALONG THE WALL THAT DUE TO RIGHT-OF-WAY LIMITATIONS A CONSTRUCTION EXCAVATION OPEN EXCAVATION MUST BE LIMITED TO 15 FEET ALONG THE WALL. THE CONTRACTOR SHALL PLAN THE WORK ACCORDINGLY.
- BATTERS SHALL MATCH WHERE THE RETAINING WALLS MEET THE RCB CULVERT END SECTIONS.
- SEE ADDITIONAL DETAILS FOR RETAINING WALLS ON SHEET V.05.

**STEEL SHEET PILE WALL NOTES:**

- THE SHEET PILE WALL SHALL BE CONSTRUCTED WITH CONCRETE AESTHETIC FACIAR ON THE STEEL SHEET PILE WALLS AS DETAILED IN THESE PLANS AND TO BE CONFORMED TO THE PROCEEDING SHEETS. THIS INCLUDES BUT IS NOT LIMITED TO THE CONCRETE, STEEL REINFORCEMENT, SHEAR STUDS, EXPANSION JOINTS, CONSTRUCTION JOINTS, AND FORM LINER FINISH.
- REINFORCING STEEL SHALL BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH ED., SERIES OF 2012, SECTION 5, GRADE 60.
- CONCRETE SHALL BE CLASS C MIX IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH ED., SERIES OF 2012, SECTION 5,  $f_c = 4.0$  ksi.
- MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
- ALL CONCRETE EDGES SHALL HAVE A  $\frac{1}{4}$ " CHAMFER.
- THE STEEL SHEET PILE MATERIAL SHALL MEET THE REQUIREMENTS FOR ASTM A328/A328M OR A572/A572M GRADE 50 STEEL FOR STRENGTH AND WELDABILITY. OTHER SHEET PILE MAY BE USED IN PLACE OF THE ONE DETAILED, BUT THE MINIMUM SECTION MODULUS REQUIRED SHALL NOT BE LESS THAN 19.4 CUBIC INCH PER FOOT OF WALL. SHEET PILES SHALL BE DRIVEN TO A MINIMUM DEPTH OF THE ELEVATION SHOWN ON THE PLANS.
- SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M. 453.10, APPENDIX A.
- SEE ADDITIONAL DETAILS FOR RETAINING WALLS ON V.07.

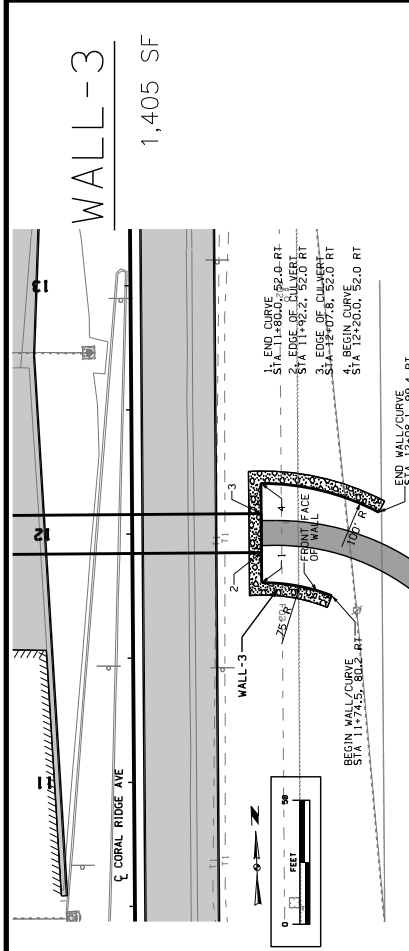
PROJECT NUMBER **S1P-U-1537(638)-70-52** SHEET NUMBER **V.04** REVISED

CITY OF CORALVILLE JOHNSON COUNTY

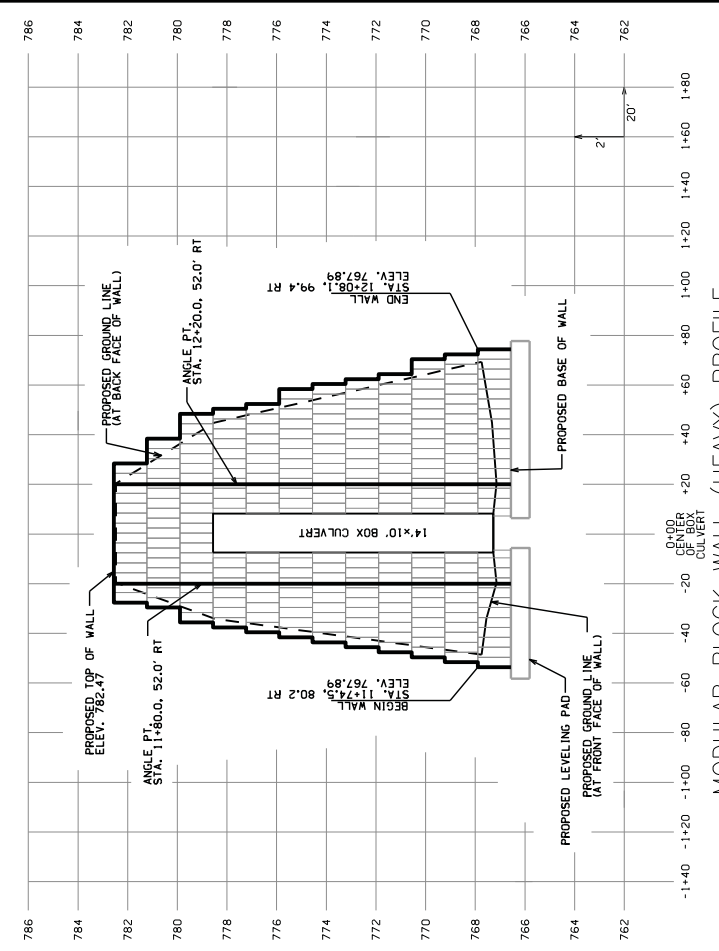
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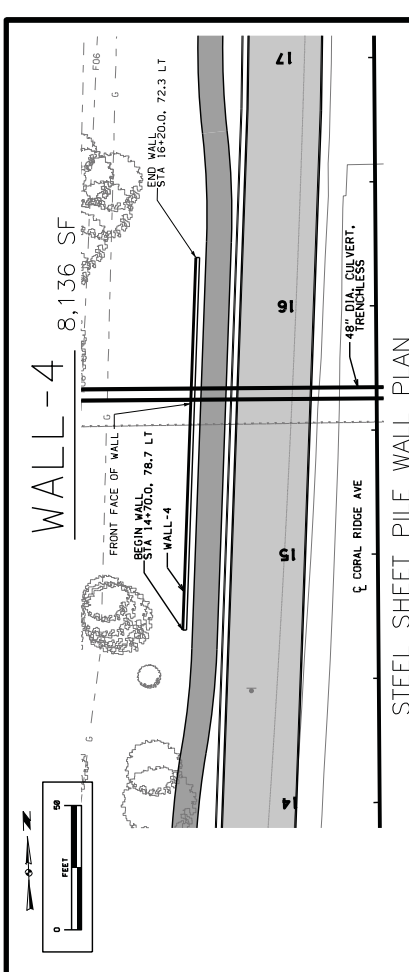
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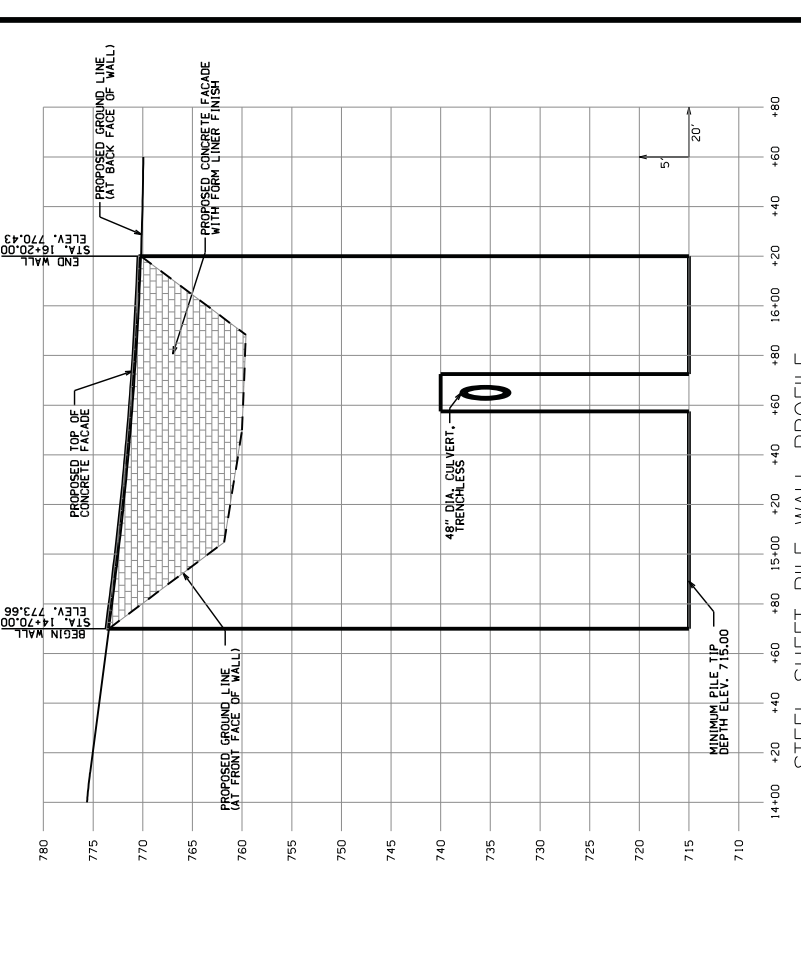
MODULAR BLOCK WALL (HEAVY) PLAN



MODULAR BLOCK WALL (HEAVY) PROFILE

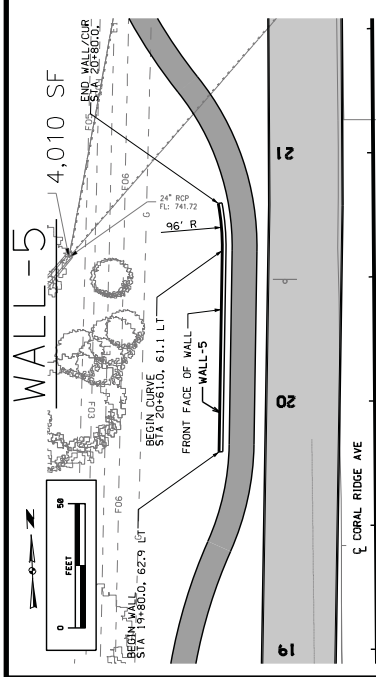


STEEL SHEET PILE WALL PLAN

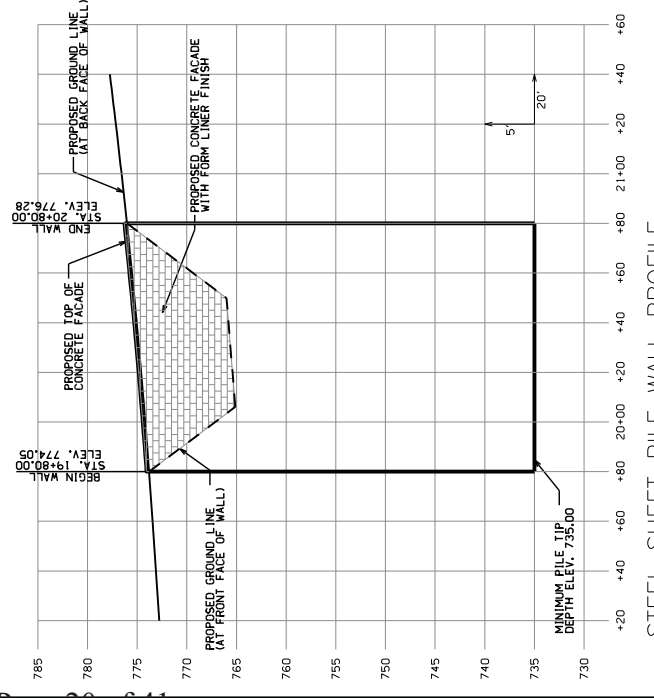


STEEL SHEET PILE WALL PROFILE

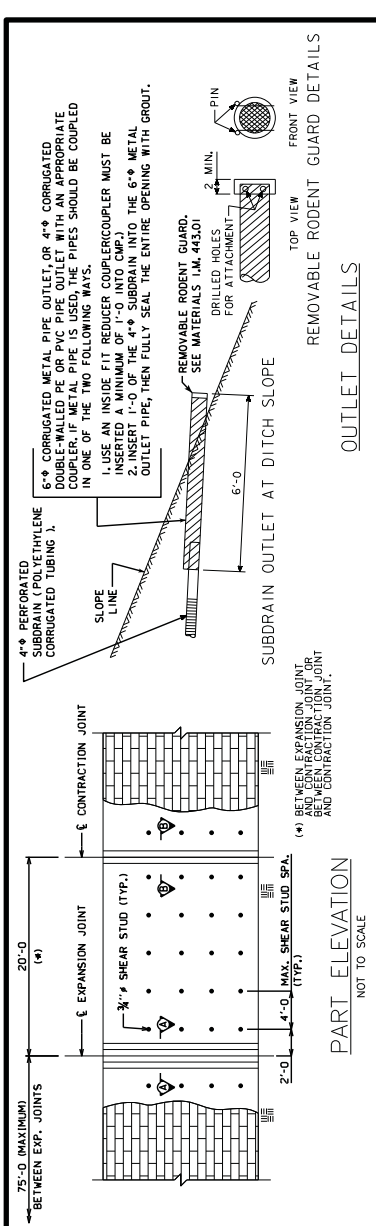
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 CITY OF CORALVILLE | JOHNSON COUNTY | PROJECT NUMBER **STP-U-1557(638)-70-52** | SHEET NUMBER **V.06** | REVISED



STEEL SHEET PILE WALL PLAN



STEEL SHEET PILE WALL PROFILE

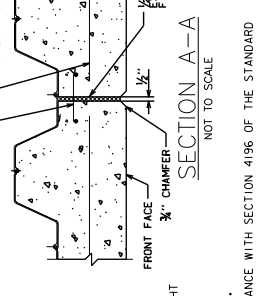


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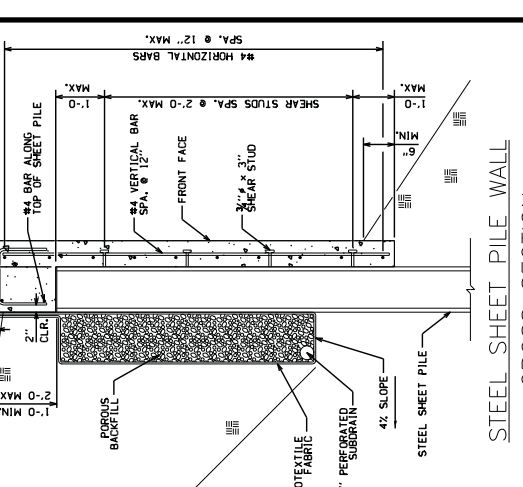
SUBDRAIN AND BACKFILL NOTES:

1. THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING POROUS BACKFILL AND SUBDRAIN OUTLET) SHALL BE INCLUDED IN THE PRICE FOR "PILES, STEEL SHEET".
2. THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE WALL IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE WALL. THE SUBDRAIN OUTLET SHALL BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE FABRIC AND BACKFILL MATERIAL.
3. AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE PLACED AGAINST THE EXCAVATION FACE. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE WALL TO A HEIGHT OF 4\"/>

SUBDRAIN AND BACKFILL DETAILS



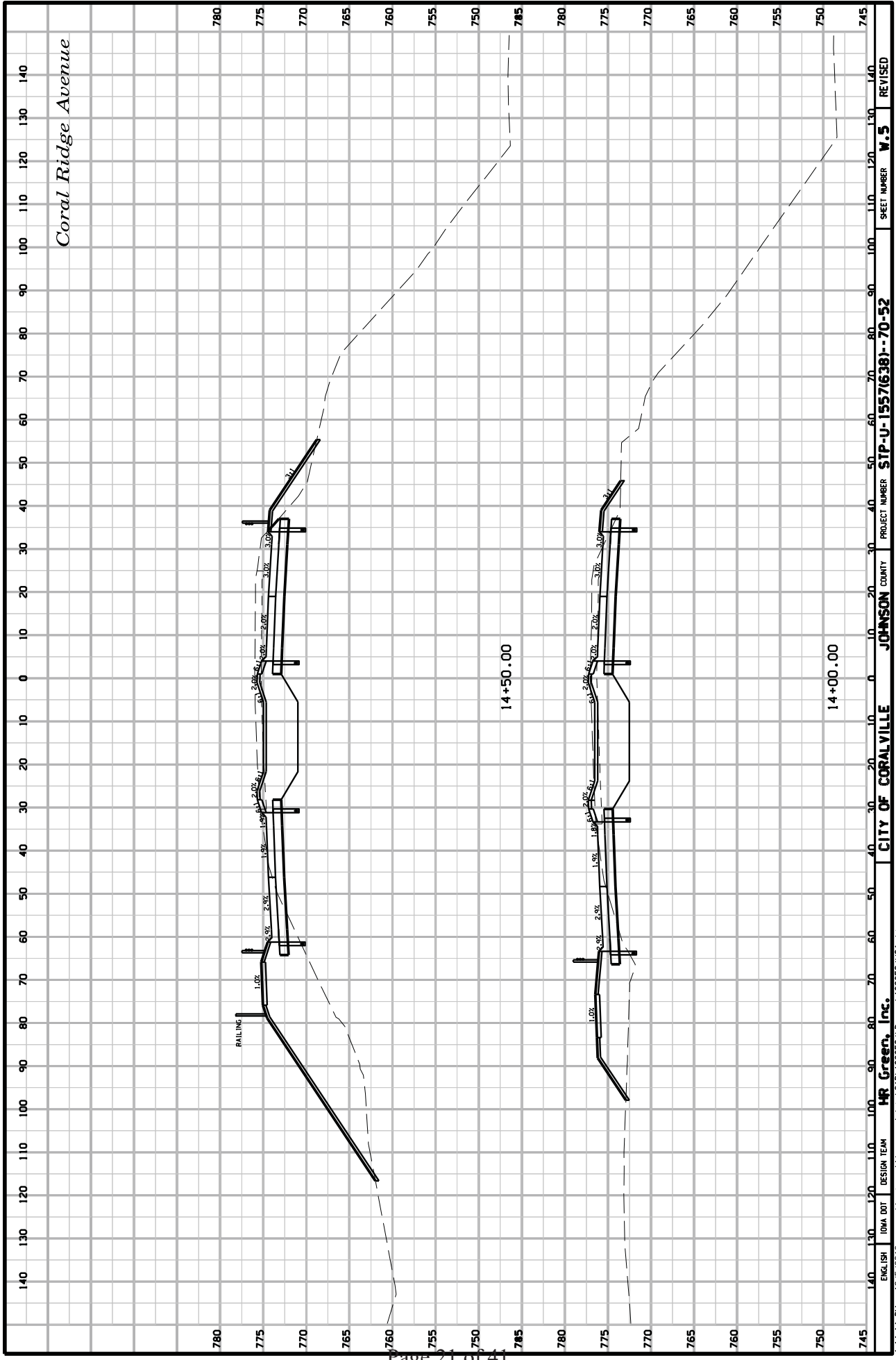
OUTLET DETAILS



CROSS SECTION

CONCRETE FORM LINER NOTES:

1. THE FORM LINER PATTERN USED TO CREATE THE CONCRETE AESTHETIC FACADE SURFACE TEXTURE SHALL BE PLACED DEEP FROM THE BOTTOM OF THE SCAFFOLDED WOOD JOINTS TO THE OUTERMOST SURFACE OF THE WALL.
2. ONLY ONE TEXTURE PATTERN SHALL BE USED ON THE PROJECT. TEXTURE PRODUCED SHALL BE SIMILAR TO THE FOLLOWING PATTERNS:  
 A. CUSTOM ROCK FORM LINER (PATTERN NO. 1002 WEATHERED LIMESTONE)  
 B. GREENBREAK GROUP, INC. (PATTERN NO. 229 RUNNING BOND ASH) (MODIFIED)  
 C. GREENBREAK GROUP, INC. (PATTERN NO. 229 RUNNING BOND ASH)
3. CONTRACTOR SHALL SUBMIT A SAMPLE OF THE PROPOSED FORM LINER TO THE CITY FOR APPROVAL. NO PRODUCTION OF THE CONCRETE AESTHETIC FACADE FOR THE SHEET PILE WALLS SHALL BEGIN UNTIL THE PROPOSED FORM LINER HAS BEEN APPROVED.
4. FORM LINERS SHALL EASILY ATTACH TO FORMS AND BE REMOVABLE WITHOUT CAUSING CONCRETE SURFACE DAMAGE. IF RECOMMENDED BY THE FORM LINER MANUFACTURER, USE STRUCTURAL BACKERS TO PREVENT FORM LINER FROM SHEDDING OFF THE FORMS. FORM LINERS SHALL BE INSTALLED IN ACCORDANCE WITH THE CHARACTER OF THE CONCRETE TO THE DESIGN INTENT INCLUDING SHAPE, LINES, AND DIMENSIONS SPECIFIED IN THE PLANS AND TO AVOID VISIBLE PATTERN REPEATS.
5. RELEASE AGENTS SHALL BE COMPATIBLE WITH FORM LINER MATERIALS AND SHALL BE NON-STAINING. APPLY RELEASE AGENTS IN ACCORDANCE WITH THE FORM LINER MANUFACTURER'S RECOMMENDATIONS.
6. MATCH PATTERNS OF FORM LINER JOINTS TO MAKE FORMED CONCRETE SURFACES APPEAR UNIFORM AND CONTINUOUS WITHOUT VISIBLE SEAM AND FORM MARKS. WHEN JOINTS ARE UNAVOIDABLE, MAKE JOINTS ALONG BLOCKING, SEALING OR OTHER MEANS IN ORDER TO MAINTAIN THE APPROPRIATE DEPTH AND CHARACTER OF TEXTURE AT CUT EDGES OF FORM LINERS AND TO PREVENT MORTAR LEAKAGE. FORMS SHALL BE WATERTIGHT.
7. STRIP FORMWORK IN ACCORDANCE WITH THE FORM LINER MANUFACTURER'S RECOMMENDATIONS AFTER THE CONCRETE HAS SUFFICIENT STRENGTH TO AVOID SURFACE DAMAGE. CLEAN AND REPAIR FORM LINER SURFACES PRIOR TO RE-USE. DO NOT RE-USE FORM LINERS IF DAMAGED FROM PREVIOUS USE ON THE PROJECT.



Coral Ridge Avenue

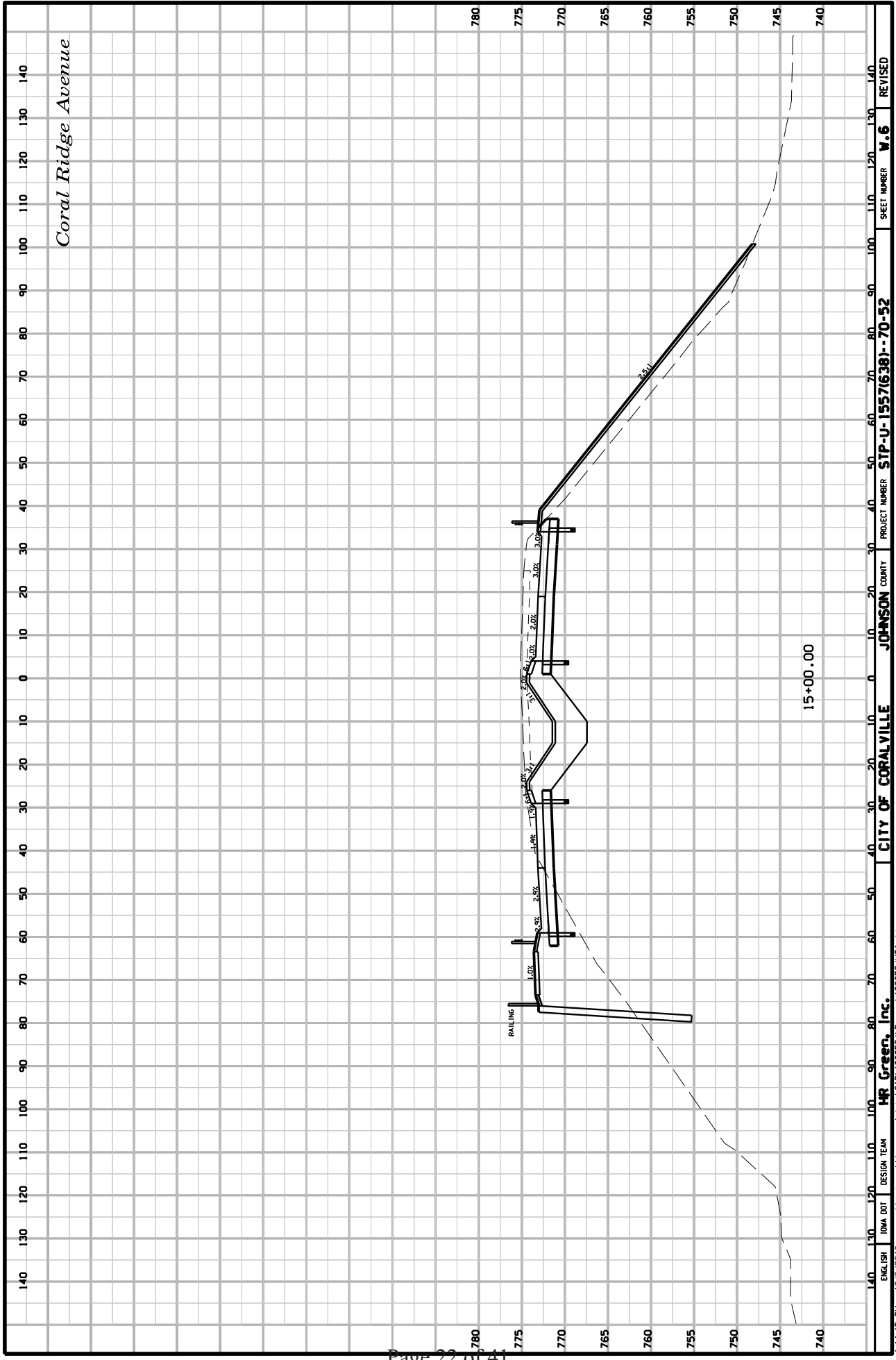
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**HR Green, Inc.**  
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**CITY OF CORALVILLE JOHNSON COUNTY**

PROJECT NUMBER **SIP-U-1557(6381)-70-52**

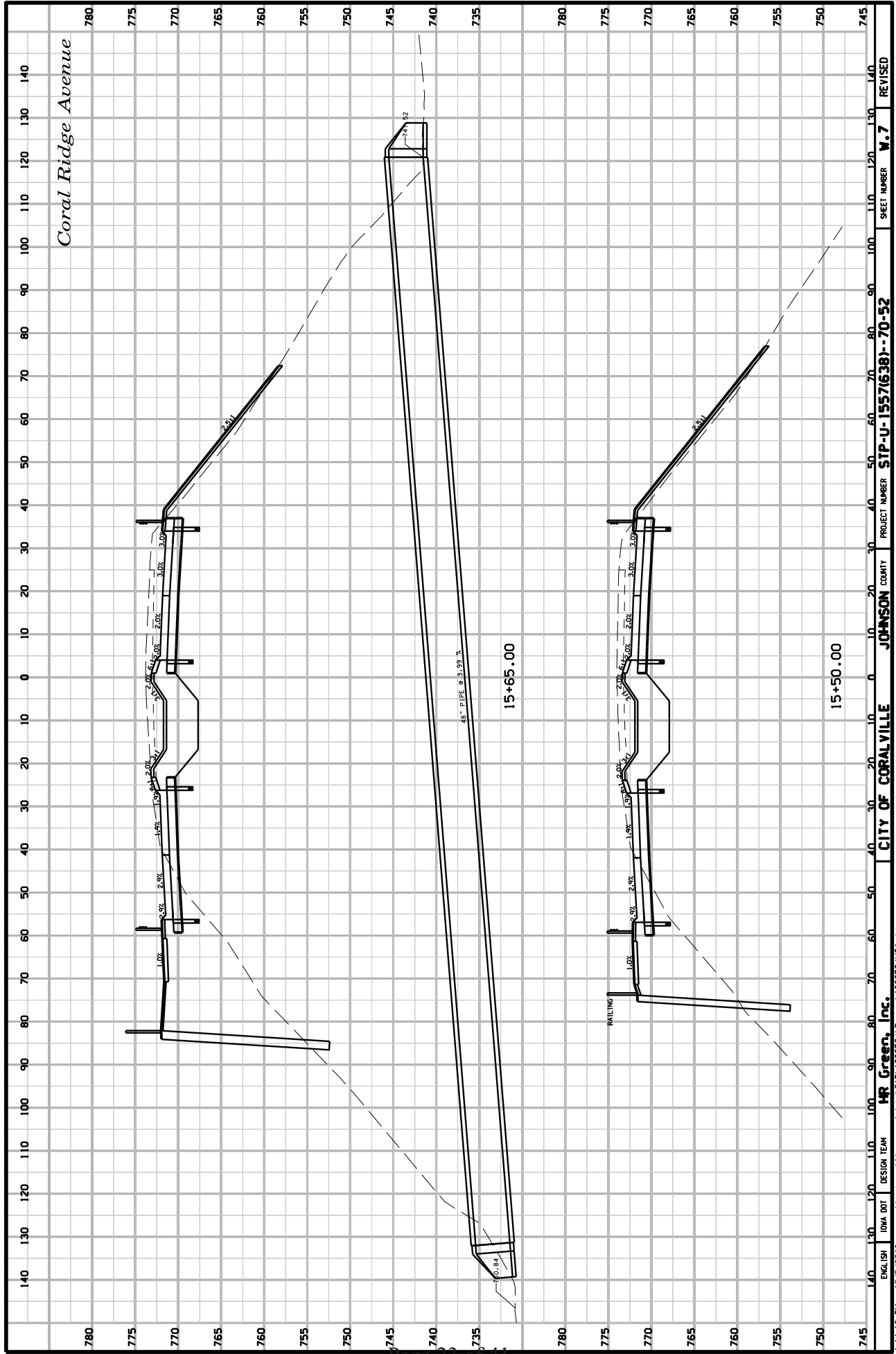
SHEET NUMBER **W.5** REVISED



Coral Ridge Avenue

15+00.00

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780	775	770	765	760	755	750	745	740																				
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Coral Ridge Avenue

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

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140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

SHEET NUMBER **W.7** REVISED

PROJECT NUMBER **SIP-U-1557(638)-70-52**

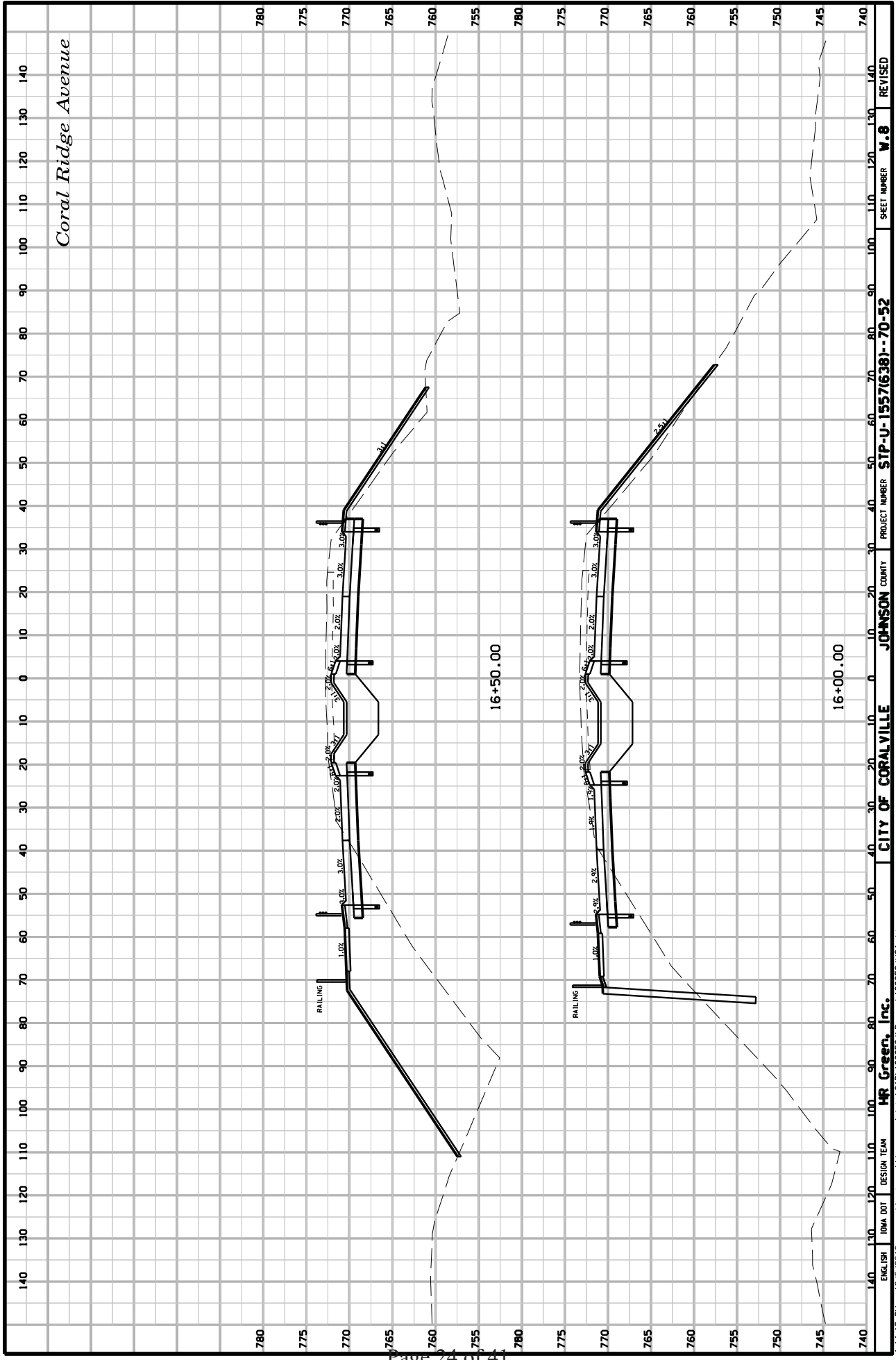
COUNTY **JOHNSON**

CITY OF **CORALVILLE**

**HR Green, Inc.**

DESIGN TEAM  
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Coral Ridge Avenue

16+50.00

16+00.00

REVISION

SHEET NUMBER **W.8**

PROJECT NUMBER **SIP-U-1557(638)-70-52**

COUNTY **JOHNSON**

CITY OF **CORALVILLE**

**HR Green, Inc.**

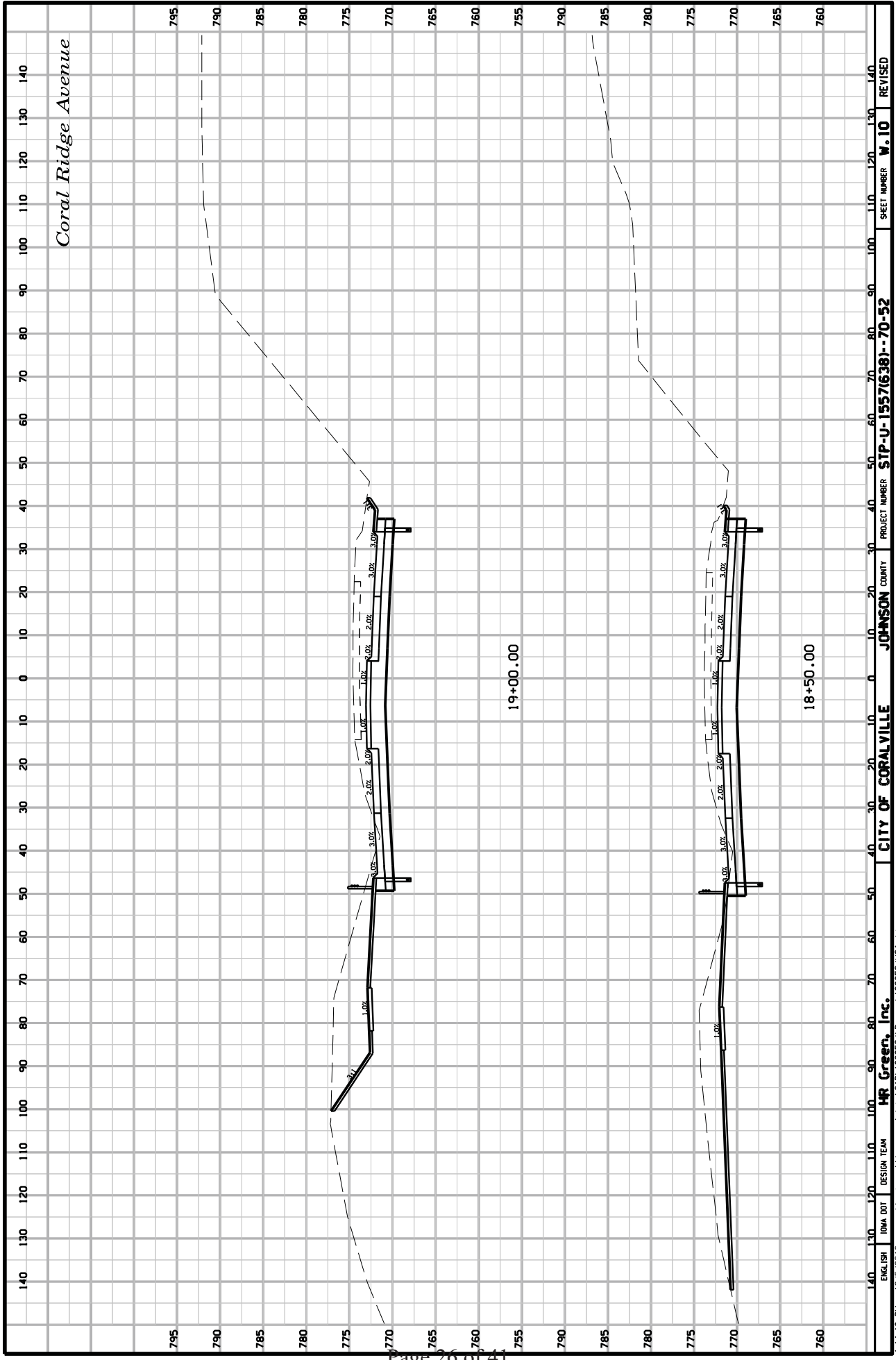
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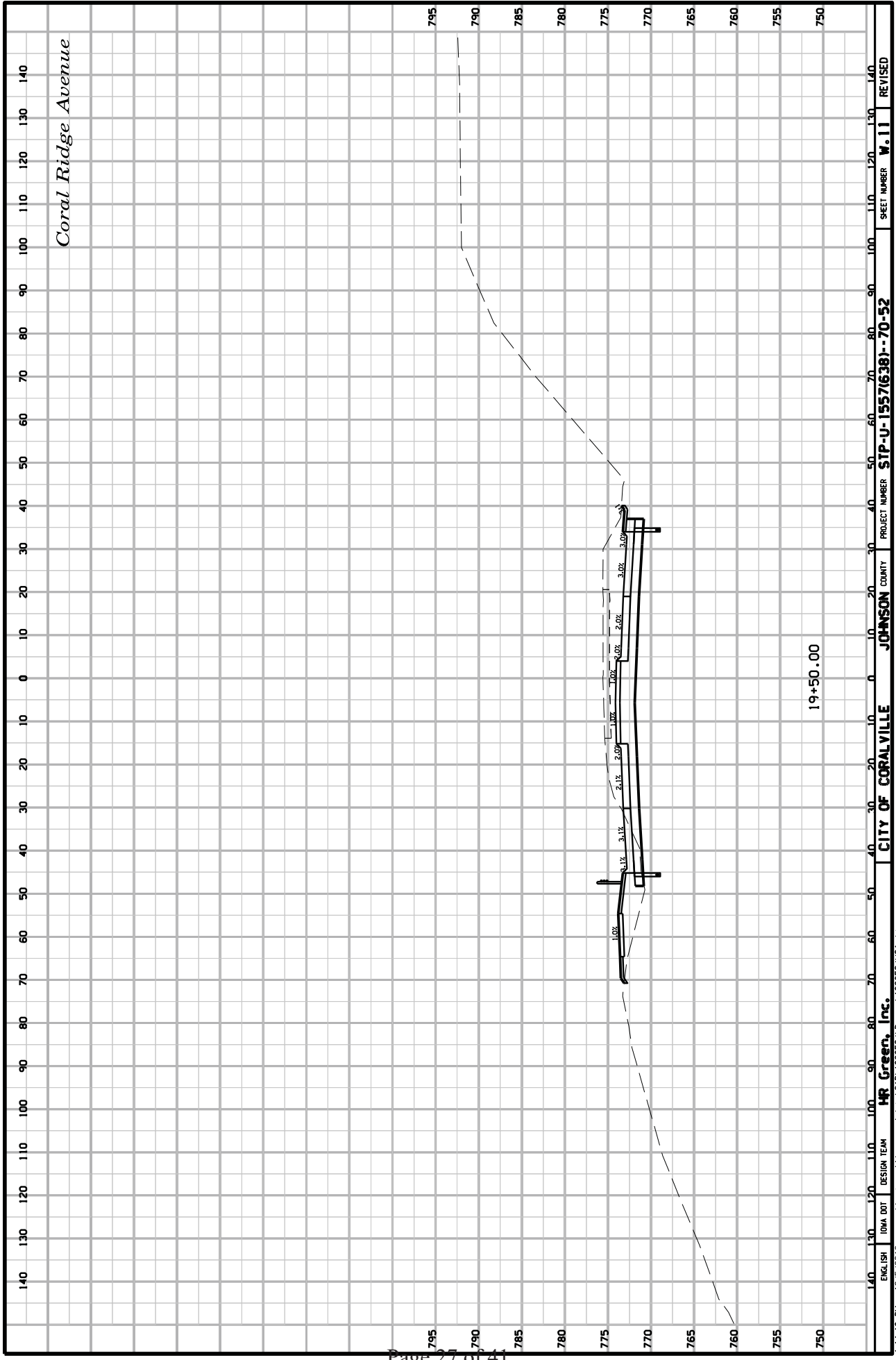






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**HR Green, Inc.**

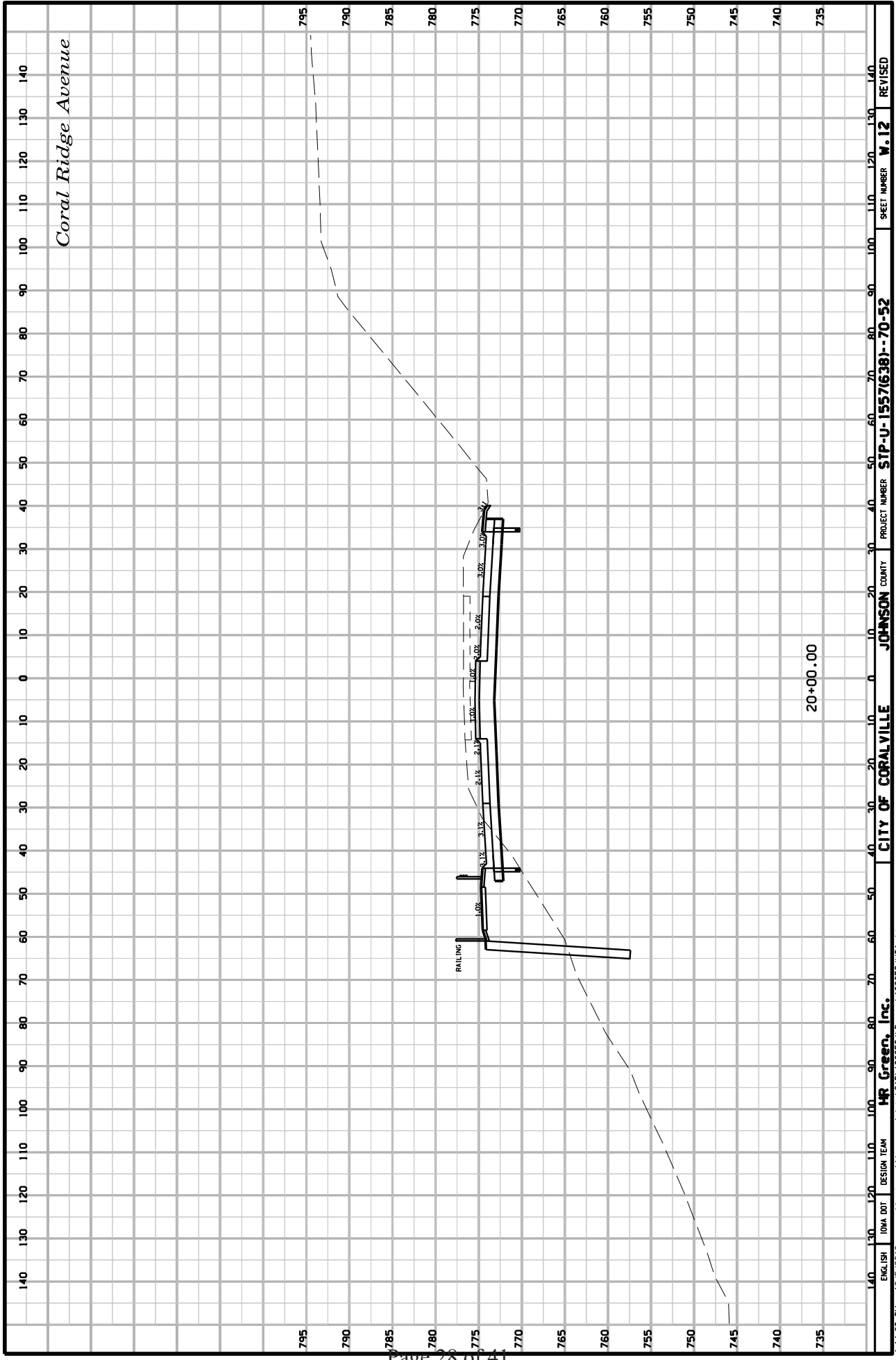


Coral Ridge Avenue

19+50.00

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795	790	785	780	775	770	765	760	755	750																	795	790	785	780	775	770	765	760	755	750
														CITY OF CORALVILLE		JOHNSON COUNTY		PROJECT NUMBER		SIP-U-1557(638)-70-52										SHEET NUMBER		W. 11		REVISED	
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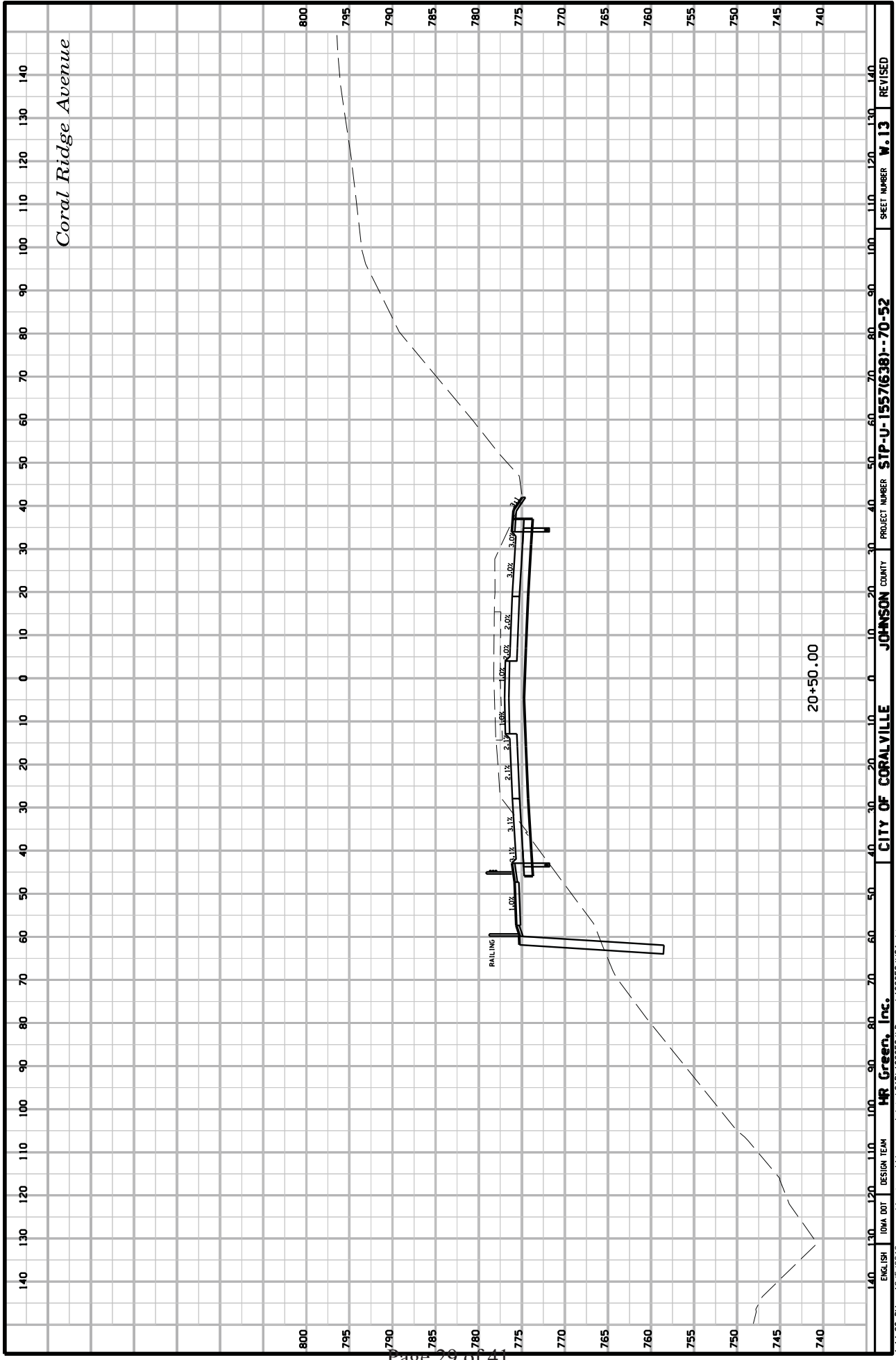
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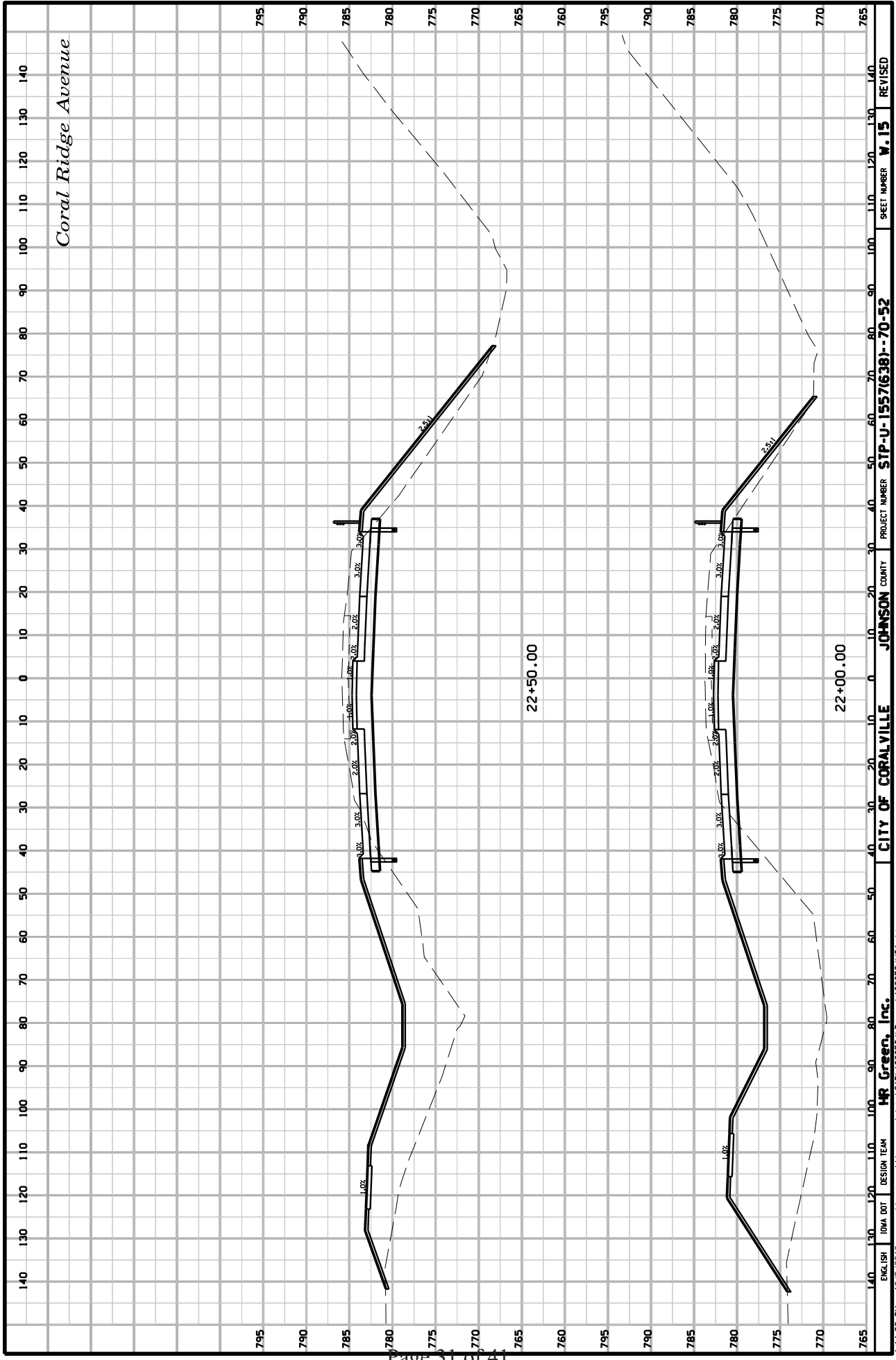
Coral Ridge Avenue

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															PROJECT NUMBER: <b>SIP-U-15576381-70-52</b> COUNTY: <b>JOHNSON</b> CITY OF <b>CORALVILLE</b> DESIGN TEAM: <b>HR Green, Inc.</b> DESIGNER: <b>HR Green, Inc.</b> SHEET NUMBER: <b>W.12</b> REVISION:														







Coral Ridge Avenue

REVISION

SHEET NUMBER

W. 15

PROJECT NUMBER

SIP-U-1557(638)-70-52

COUNTY

JOHNSON

CITY OF CORALVILLE

DESIGN TEAM

HR Green, Inc.

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**SPECIAL PROVISIONS  
FOR  
ORNAMENTAL RAILING**

**Johnson County**

**STP-U-1557(638)—70-52**

**Effective Date**

**December 17, 2013**

**THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING  
MODIFICATIONS. THESE ARE SPECIAL PROVISIONS AND SHALL PREVAIL OVER THOSE  
PUBLISHED IN THE STANDARD SPECIFICATIONS.**



## **PART 1 GENERAL**

### **1.01 SUMMARY**

- A. Section Includes:
  - 1. Aluminum decorative railings with stainless-steel, wire-rope guard infill.
  - 2. Stainless-steel decorative railings with stainless-steel, wire-rope guard infill.

### **1.02 DEFINITIONS**

Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.

### **1.03 MEASUREMENT AND PAYMENT**

- A. Basis of Measurement: The number of lineal feet of Ornamental Railing shall be measured from centerline to centerline of end posts as shown in plans.
- B. Basis of Payment: For the number of lineal feet of Ornamental Railing constructed and measured, the Contractor will be paid the contract unit price per lineal foot. These payments shall be full compensation for furnishing all material and for construction of Ornamental Railing as provided herein.

### **1.04 QUALITY ASSURANCE**

- A. Perform work in accordance with applicable requirements of the Iowa DOT Standard Specifications for Highway and Bridge Construction, Series 2012, and all local and state codes and ordinances.
- B. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified Professional Engineer licensed in the State of Iowa, using performance requirements and design criteria indicated.
- C. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
  - 1. Aluminum: The lesser of minimum yield strength divided by 1.65 or minimum ultimate tensile strength divided by 1.95.
  - 2. Stainless Steel: 60 percent of minimum yield strength.
- D. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Top Rails of Guards:
    - Uniform load of 50 pounds/feet applied in any direction.
  - 2. Concentrated load of 200 pounds/feet applied in any direction.
  - 3. Uniform and concentrated loads need not be assumed to act concurrently.
  - 4. Infill of Guards:
    - Concentrated load of 50 pounds/feet applied horizontally on an area of 1 square foot.
    - Infill load and other loads need not be assumed to act concurrently.
  - 5. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
  - 6. Temperature Change: 120°F, ambient; 180°F, material surfaces.

8. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
9. Source Limitations: Obtain each type of railing from single source from single manufacturer.
10. Product Options: Information on contract documents establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field testing, and in-service performance.
11. Do not modify intended aesthetic effects, as judged solely by Engineer, except with Engineer's approval. If modifications are proposed, submit comprehensive explanatory data to Engineer for review.
12. Product Options: Plans indicate size, profiles, and dimensional requirements of railings and are based on the specific system indicated.
13. Welding Qualifications: Qualify procedures and personnel according to the following:

AWS D1.1/D1.1M, "Structural Welding Code - Steel."  
 AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."  
 AWS D1.6, "Structural Welding Code - Stainless Steel."

**E. PRECONSTRUCTION TESTING**

Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on laboratory mockups. Payment for these services will be made by Contractor. Retesting of products that fail to meet specified requirements shall be done at Contractor's expense.

1. Build laboratory mockups at testing agency facility; use personnel, materials, and methods of construction that will be used at Project site.
2. Test railings according to ASTM E 894 and ASTM E 935. Notify Engineer seven days in advance of the dates and times when laboratory mockups will be tested.

**1.05 SUBMITTALS**

**A. Product Data: For the following:**

1. Manufacturer's product lines of railings assembled from standard components.
2. Grout, anchoring cement, and paint products.
3. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
4. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

**B. Samples for Verification: For each type of exposed finish required.**

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Fittings and brackets.
3. Welded connections.
4. Brazed connections.
5. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill.
6. Show method of finishing members at intersections.
7. Samples need not be full height.

- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer licensed in the State of Iowa responsible for their preparation.
- D. Qualification Data: For qualified professional engineer, testing agency  
Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- E. Welding certificates.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.
- G. Preconstruction test reports.
- H. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
  - 1. Build mockups as shown on plans.
  - 2. Build mockups for each form and finish of railing consisting of two posts, top rail, infill area, and anchorage system components that are full height and are not less than 24 inches in length.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## **PART 2 MATERIALS**

### **2.01 MANUFACTURERS**

- A. The ornamental railing system shall be aluminum post and rail with a stainless steel cable rail or stainless steel post and rail, with a stainless steel cable rail as detailed in the contract documents and manufactured by the following approved manufacturers, subject to compliance with requirements:
  - 1. Ultra-tec Cable Railing
    - Contact: The Wagner Companies  
P.W. Box 423  
Butler, WI 53007  
414-214-0444  
414-365-8025 (fax)
  - 2. Cable-Rail
    - Contact: Feeney Architectural Products  
2603 Union Street  
Oakland, CA 94607  
Toll Free: (800) 888-2418  
Phone: (510) 893-9473  
Fax: (510) 893-9484
  - 3. Sightlines Architectural Cable Systems
    - 1620 Central Ave N.E.  
Suite 159  
Minneapolis MN 55413  
Phone: 952.470.0824  
Fax: 612-789-0614
  - 4. Approved Equal

**2.02 METALS, GENERAL**

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.
- C. Provide cast-metal brackets with flange tapped for concealed anchorage to threaded hanger bolt.
- D. Provide either formed- or cast-metal brackets with predrilled hole for exposed bolt anchorage.
- E. Provide formed-steel brackets with predrilled hole for bolted anchorage and with snap-on cover that matches rail finish and conceals bracket base and bolt head.
- F. Provide extruded-aluminum brackets with interlocking pieces that conceal anchorage. Locate set screws on bottom of bracket.

**2.03 STAINLESS STEEL**

- A. Tubing: ASTM A 554, Grade MT 304.
- B. Pipe: ASTM A 312/A 312M, Grade TP 304.
- C. Castings: ASTM A 743/A 743M, Grade CF 8 or CF 20.
- D. Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 304.
- E. Bars and Shapes: ASTM A 276, Type 304.
- F. Wire Rope and Fittings:
  - 1. Wire Rope: 1-by-19 wire rope made from wire complying with ASTM A 492, Type 316.
  - 2. Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

**2.04 FASTENERS**

- A. Fastener Materials: Unless otherwise indicated, provide the following:
  - 1. Aluminum Components: Type 316 stainless-steel fasteners.
  - 2. Stainless-Steel Components: Type 316 stainless-steel fasteners.
  - 3. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.
  - 4. Galvanized-Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
  - 5. Dissimilar Metals: Type 316 stainless-steel fasteners.
  - 6. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
  - 7. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless otherwise.

8. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.
- ~~9. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.~~
- ~~10. Post-Installed Anchors: Torque-controlled expansion anchors.~~
11. 9. Material for Exterior Locations and Where Stainless Steel Is Indicated:  
Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

## 2.05 FABRICATION

- A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly.
- C. Disassemble units only as necessary for shipping and handling limitations.
- D. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- E. Make up wire-rope assemblies in the shop to field-measured dimensions with fittings machine swaged.
- F. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes.
- G. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.
- H. Cut, drill, and punch metals cleanly and accurately.
- I. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
- J. Remove sharp or rough areas on exposed surfaces.
- K. Form work true to line and level with accurate angles and surfaces.
- L. Fabricate connections that will be exposed to weather in a manner to exclude water.
- M. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.
- N. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- O. Connections: Fabricate railings with welded or nonwelded connections unless otherwise indicated.
- P. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

- Q. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
- R. Obtain fusion without undercut or overlap.
- S. Remove flux immediately.
- T. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.
- U. Welded Connections: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
- V. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
  1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
  2. Form changes in direction as follows:
    - a. As detailed.
    - b. By radius bends of radius indicated or by inserting prefabricated elbow fittings of radius indicated.
    - c. By bending to smallest radius that will not result in distortion of railing member.
  3. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
  4. Close exposed ends of hollow railing members with prefabricated end fittings.
  5. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
  6. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch or less.  
Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
  7. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

## 2.06 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable.
- D. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples.
- E. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- F. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- G. STAINLESS-STEEL FINISHES
  1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
  2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
  3. Run grain of directional finishes with long dimension of each piece.
  4. Directional Satin Finish: No. 4.
  5. Dull Satin Finish: No. 6.
  6. Satin, Reflective, Directional Polish: No. 7.
  7. Mirrorlike Reflective, Nondirectional Polish: No. 8.
  8. When polishing is completed, passivate and rinse surfaces.
  9. Remove embedded foreign matter and leave surfaces chemically clean.
  10. Sputter-Coated Finish: Titanium nitride coating deposited by magnetic sputter-coating process over indicated mechanical finish.

### PART 3 EXECUTION

#### 3.01 PREPARATION

- A. Pre-installation Conference: Conduct conference at Project site.
- B. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.
- C. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- D. Coordinate installation of anchorages for railings railing posts in concrete encasements.
- ~~E. Furnish setting plans, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.~~
- ~~F. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not suit structural performance requirements.~~

#### 3.02 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings.
- C. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- D. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
- E. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

- F. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- G. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- H. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- ~~I. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.~~

**3.03 INSTALLATION, RAILING CONNECTIONS**

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components.
- B. Use wood blocks and padding to prevent damage to railing members and fittings.
- C. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- D. Welded Connections: Use fully welded joints for permanently connecting railing components.
- E. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- F. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement.
- G. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

**3.04 INSTALLATION, ANCHORING POSTS**

- ~~A. Leave anchorage joint exposed with 1/8 inch buildup, sloped away from post.~~
- ~~B. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:~~
  - ~~1. For aluminum railings, attach posts as indicated using fittings designed and engineered for this purpose.~~
  - ~~2. For stainless steel railings, weld flanges to posts and bolt to metal supporting surfaces.~~

Encase railing posts in concrete as shown in the plans or anchor per manufacturer's recommendations.

**3.05 INSTALLATION, ATTACHING RAILINGS**

Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends or connected to railing ends using nonwelded connections.

**3.06 FIELD QUALITY CONTROL**

- A. Testing Agency: Contracting Authority will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.



- B. Extent and Testing Methodology: Testing agency will randomly select completed railing assemblies for testing that are representative of different railing designs and conditions in the completed Work.
- C. Railings will be tested according to ASTM E 894 and ASTM E 935 for compliance with performance requirements.
- D. Remove and replace railings where test results indicate that they do not comply with specified requirements unless they can be repaired in a manner satisfactory to Engineer and will comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### **3.07 CLEANING**

Clean aluminum and stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

### **3.08 PROTECTION**

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer.
- B. Remove protective coverings at time of Substantial Completion.
- C. Restore finishes damaged during installation and construction period so no evidence remains of correction work.
- D. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.