GRADING
LETTING DATE
IM-NHS-235-2(340)11--03-77
POLK COUNTY
1000

INDEX OF SHEETS

105-3
09-27-94

NO.	DESCRIPTION
A.01	Title Sheet
A.02	Signature Blocks
A.03	Map
A.04	Legend and Symbol Information Sheet
A.05	Listing of Project Revisions Tab
B.01-.08	Typical Cross Sections
C.01-.08	Estimate of Quantities & General Information
D.01-.05	Plan Sheets of I-235
D.06-.11	Plan & Profile Sheets of I-235
E.01	Plan & Profile Sheets for Maple St.
G.01-.10	Reference Ties & Bench Marks
G.11-.12	Tabulation of Point and Curve Data
G.13-.20	Geometric Plans
H.01-.07	Row Plan Sheets
J.01-.09	Details of Staging Sheets for I-235
L.01	Details of Jointing and Staking on Maple St.
M.01-.18	Details of Sanitary SWR Reloc. for Tichenor St.
M.19-.32	Details of Storm Sewer
Q.01-.15	Soil Profile Information for MSE Retaining Walls
R.01-.03	Borrow Sheets
R.04-.06	Plan & Profile Sheet for Borrow Area Location
R.07	Details for Removal of Lead Contaminated Soil
R.08	Location Map and Haul Route for Borrow Area
T.01-.02	Earthwork Quantity Sheets
U.01-.07	Details of Clearing and Grubbing along I-235
U.08-.14	Details of Removals along I-235
U.15	Details of Wall Section for 765 mm High Vehicle Barrier with Reinforced pavement
U.16	Details of Modified RE-71(1)
U.17	Details of Modified RE-71(2)
U.18	Traffic Control layout for Temporary Closures Multilane on divided highway and Entrance Ramp Closure
U.19	Demolition Detail Sheet
V.01-.03	Bridge Situation Plans Des. # 1002, 1102, 1202
V.04-.34	Details of Retaining Walls
W.01-.40	University Ave. Ramp "A" & Retaining Wall #5824
X.01-.17	Retaining Walls #5820, #5822, #5807, #5808
Z.01-.26	Retaining Walls #5620, #5630
C.01A-Z	EXTRA WORK ORDERS

FOR MAP SEE SHEET A.03

Iowa Department of Transportation
Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

POLK COUNTY

GRADING

ON I-235 IN DES MOINES FROM EAST OF UNIVERSITY AVE EAST TO GUTHRIE AVE (WBL)

SCALES: As Noted

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions, shall apply to construction work on this project.

Value Engineering Saves. Refer to Standard Notation 203-4 on Sheet C.02

PROJECT LENGTH SUMMARY

105-1
09-27-94

DIV.	LOCATION	m	km
	Sta. 33168+65.000 to 33172+05.967	340.967	0.341
	Sta. 572+08.328 to 580+40.00	831.672	0.8317
	Omit for Bridges at:		
	Sta. 33170+61.205 Design No. 1002	93.700	0.0937
	Sta. 572+37.426 Design No. 1102	28.562	0.0286
	Sta. 574+06.853 Design No. 1202	53.677	0.0537
	Total Length of Roadway in Project	996.700	0.9967
	Total Length of Bridges in Project	175.939	0.1759
	Total Length of Project	1172.639	1.1726

TOTAL SHEETS 255

PROJECT NUMBER
IM-NHS-235-2(340)11--03-77

R.O.W. PROJECT NUMBER
IMN-235-2(240)73--0E-77

PROJECT IDENTIFICATION NUMBER
99-77-235-332-07

METRIC STANDARD ROAD PLANS

105-4
09-27-94

The following Standard Road Plans shall be considered applicable to construction work on this project.

NUMBER	DATE	NUMBER	DATE	NUMBER	DATE
RA-49	03-26-96	RC-11	04-27-99	RP-10	04-30-02
RA-53	10-28-97	RC-14	04-27-99	RS-1	10-27-98
RA-55	03-26-96	RC-16A	10-27-98	RS-2	10-27-98
RA-61	02-11-00	RC-16B	09-21-99	RS-26B	10-28-97
RA-64	02-11-00	RF-1	10-03-00	RS-61	10-27-98
RA-66A	03-26-96	RF-21	06-06-95	RS-62	01-12-99
RA-66C	02-11-00	RP-2	10-03-00	RS-63A	04-30-02
RC-10	04-27-99	RP-3	10-03-00	RS-63B	04-30-02

Form 520003 12-97

LICENSED PROFESSIONAL ENGINEER
DANNY J. ZEIMEN
17975
IOWA

I hereby certify that this project was constructed in accordance with the contract documents, the "as-built" plans were prepared under my supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Project Engineer — Date

My license renewal date is December 31, 2003

2003 Year — UNITED CONTRACTOR, INC. Contractor — STEVE BUELER Project Inspector

CORRECTED BY GARY CRABTREE JAN. 13 2004
CHECKED BY CHRISTY McCLAIN

REVISIONS
REVISION DATE: 11/18/03

04-30-02 101-5

DESIGN DATA URBAN

2002 AADT	57912	V.P.D.
2022 AADT	88479	V.P.D.
2022 DHV	3687	V.P.H.
TRUCKS	10	%
Total Design ESALs		

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.01	James R. Schoenrock	Primary Signature Block
M.01	James R. Rasmussen	Howard R. Green Co.
M.17	Hamid Feiz	Allender Butzke Eng. Inc.
A.02	Robert L. Stanley	Geotech
A.02	Dennis L. Hover	Geotech
A.05	James R. Schoenrock	Revision Signature Block

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER
James R. Schoenrock
11343
IOWA

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

Signature — 11/19/03 Date

James R. Schoenrock
Printed or Typed Name

My license renewal date is December 31, 20 03

Pages or sheets covered by this seal: A.1-A.05; B.01-B.08; C.01-C.08; D.01-D.11; E.01; L.01; G.01-G.20; H.01-H.07; J.01-J.09; M.19-M.23; M.25-M.32; R.01-R.08; T.01-T.02; U.01-U.19; V.04-V.34; W.01-W.40; X.01-X.17; Z.01-Z.26

DESIGN TEAM SCHOENROCK/GREEN | METRIC | IOWA DOT * OFFICE OF DESIGN | POLK COUNTY | PROJECT NUMBER IM-NHS-235-2(340)11--03-77 | SHEET NUMBER A.01a REVISED 9-11-02

18-NOV-2003 10:17 egreen W:\Projects\77235180C96\Design_grading_(340)\k77235340.a01a

GEOTECHNICAL DESIGN



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

Robert Stanley 1-14-02

Signature Date

ROBERT L. STANLEY

Printed or Typed Name

My license renewal date is December 31, 20 ~~03~~ 02

Pages or sheets covered by this seal: Q.01 thru Q.08, R.01 thru R.03.

GEOTECHNICAL DESIGN



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

Dennis L Hover 1-14-02

Signature Date

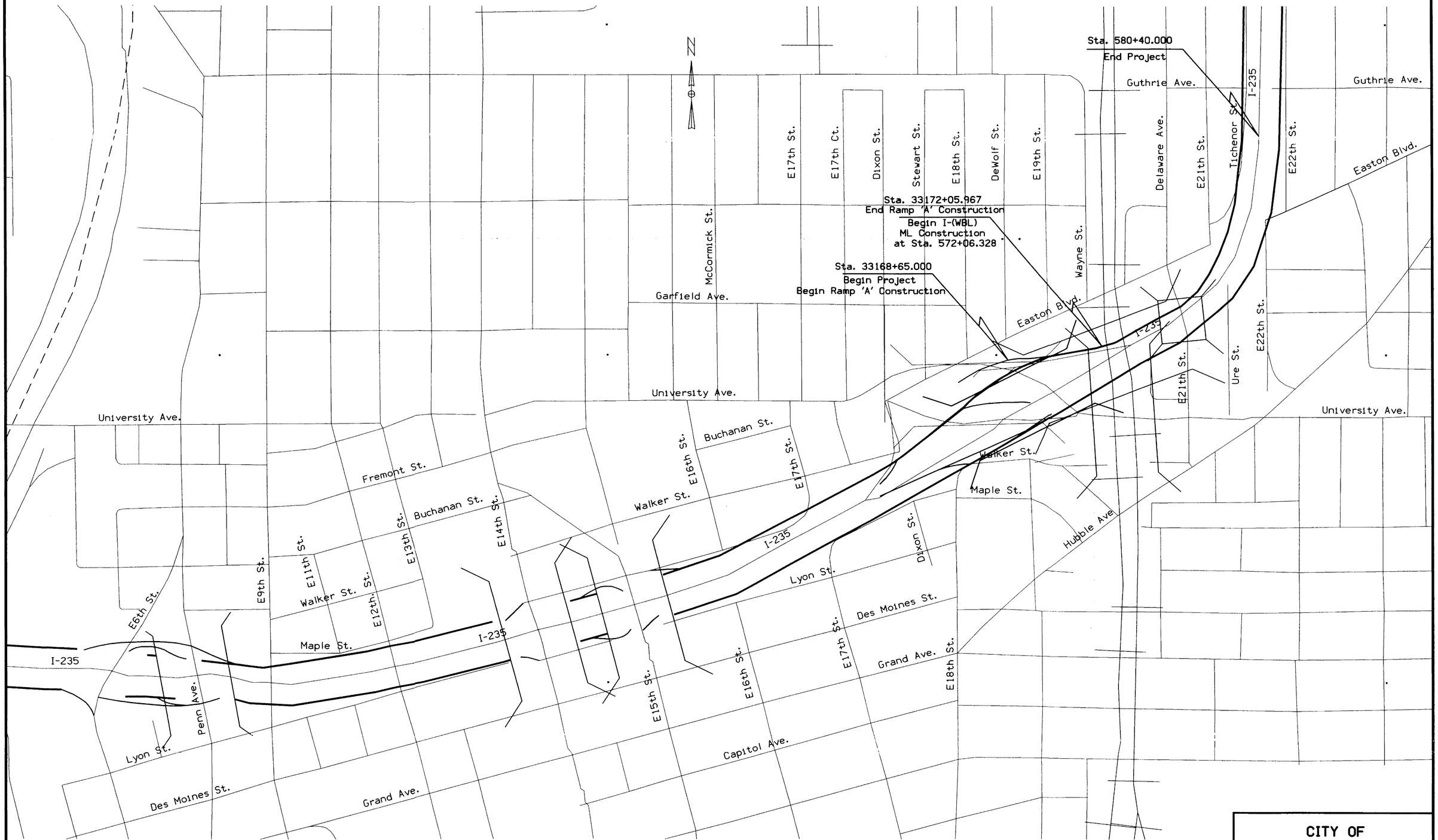
DENNIS L. HOVER

Printed or Typed Name

My license renewal date is December 31, 20 03

Pages or sheets covered by this seal: Q.09 thru Q.15

SIGNATURE BLOCKS SHEET



CITY OF DES MOINES

no scale

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER A.03

12-JAN-2002 09:38 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.a03

STANDARD SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link Fence
- Barbwire Fence
- Security Fence
- Woven Fence
- Barbwire and Woven Fence
- Terrace
- Earth Dam or Dike (Existing)
- Earth Dam or Dike (Proposed)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Proposed Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Proposed Intake
- Existing Utility Access (Manhole)
- Proposed Utility Access (Manhole)

- Fire Hydrant
- WH — Water Hydrant (Rural)
- ST — Septic Tank
- C — Cistern
- LP — L.P. Gas Tank (No Footing)
- UST — Underground Storage Tank
- Latrine
- Luminaire
- Traffic Signal
- Traffic Signal with Luminaire
- TP — Telephone Pedestal
- TVP — Television Pedestal
- Telephone Pole
- Telephone Pole (Second Company)
- Telephone Pole (Third Company)
- Telephone Pole (Fourth Company)
- Telephone Pole (Fifth Company)
- Power Pole
- Power Pole (Second Company)
- Power Pole (Third Company)
- Power Pole (Fourth Company)
- Power Pole (Fifth Company)
- Electrical Highline Tower (Metal or Concrete)
- Telephone Riser Pole
- Power Riser Pole
- Telegraph Pole
- Satellite TV Dish
- —W— Existing Water Line
- —W2— Existing Water Line (Second Company)
- —San.— Existing Sanitary Sewer Line
- —T— Existing Telephone Line
- —T2— Existing Telephone Line (Second Company)
- —FO-1— Existing Fiber Optics Telephone Line
- —St. S.— Existing Storm Sewer Line
- —G— Existing Gas Line
- —G-HP— Existing High Pressure Gas Line
- —G2— Existing Gas Line (Second Company)
- —G2-HP— Existing High Pressure Gas Line (Second Company)
- ------E------ Existing Power Line
- ----- E2----- Existing Power Line (Second Company)
- ----TV---- Cable Television Line

- Guardrail (Beam or Cable)
- GP — Guard Post (one or two)
- Guard Post (over two)
- FP — Filler Pipe
- GV — Gas Valve
- WV — Water Valve
- SL — Speed Limit Sign
- MM — Mile Marker Post
- SIGN — Sign
- WHU — Water Hook Up
- RT — Radio Tower
- TA — Tower Anchor
- EB — Electric Box
- TCB — Traffic Signal Control Box
- RRB — Rail Road Signal Control Box
- TSB — Telephone Switch Box

IOWA 1-CALL# 1-800-292-8989

- QWEST
- MID AMERICAN ENERGY
- MID AMERICAN ENERGY
- UNION PACIFIC
- —T1— QWEST
- —FO-1— QWEST
- —FO-2— McCLOUD U.S.A.
- —FO-3— SPRINT
- —FO-4— AT&T
- —FO-5— QWEST LONG DISTANCE
- ------E1------ CITY OF DES MOINES @ IOWA DOT
- ------E2------ MID AMERICAN ENERGY
- ------E3------ PRIVATE LINES
- ------E4------ WINDSOR HEIGHTS @ IOWA DOT
- ------E5------ WEST DES MOINES @ IOWA DOT
- —G1— MID AMERICAN ENERGY
- —GHP1— MID AMERICAN ENERGY
- —GHP2— AMOCO OIL PIPELINE
- —W1— CITY OF DES MOINES (INCLUDES WINDSOR HEIGHTS)
- —W2— CITY OF WEST DES MOINES
- —W3— PRIVATE WATER
- —San.1— CITY OF DES MOINES
- —San.2— URBANDALE-WINDSOR HEIGHTS SEWER DISTRICT
- —San.3— CITY OF WEST DES MOINES
- —St. S.1— CITY OF DES MOINES @ IOWA DOT
- —St. S.2— CITY OF WINDSOR HEIGHTS @ IOWA DOT
- —St. S.3— CITY OF WEST DES MOINES @ IOWA DOT
- ----TVC1--- BROADBAND CABLE

RIGHT OF WAY LEGEND

- Proposed Right of Way
- Existing Right of Way
- Existing and Proposed Right of Way
- Easement and Existing Right of Way
- Borrow
- Easement (Temporary)
- Easement
- Excess
- Property Line
- A/C Access Control

CONVENTIONAL SIGNS

- Station — Reference Point — Survey Line
- Section Corner
- Proposed Profile Grade
- Railroad
- Existing / Proposed — Field Tile
- Existing / Proposed — Culverts
- Stream

Legend And Symbol Information Sheet

(Symbols are Typical Only, actual size may vary)

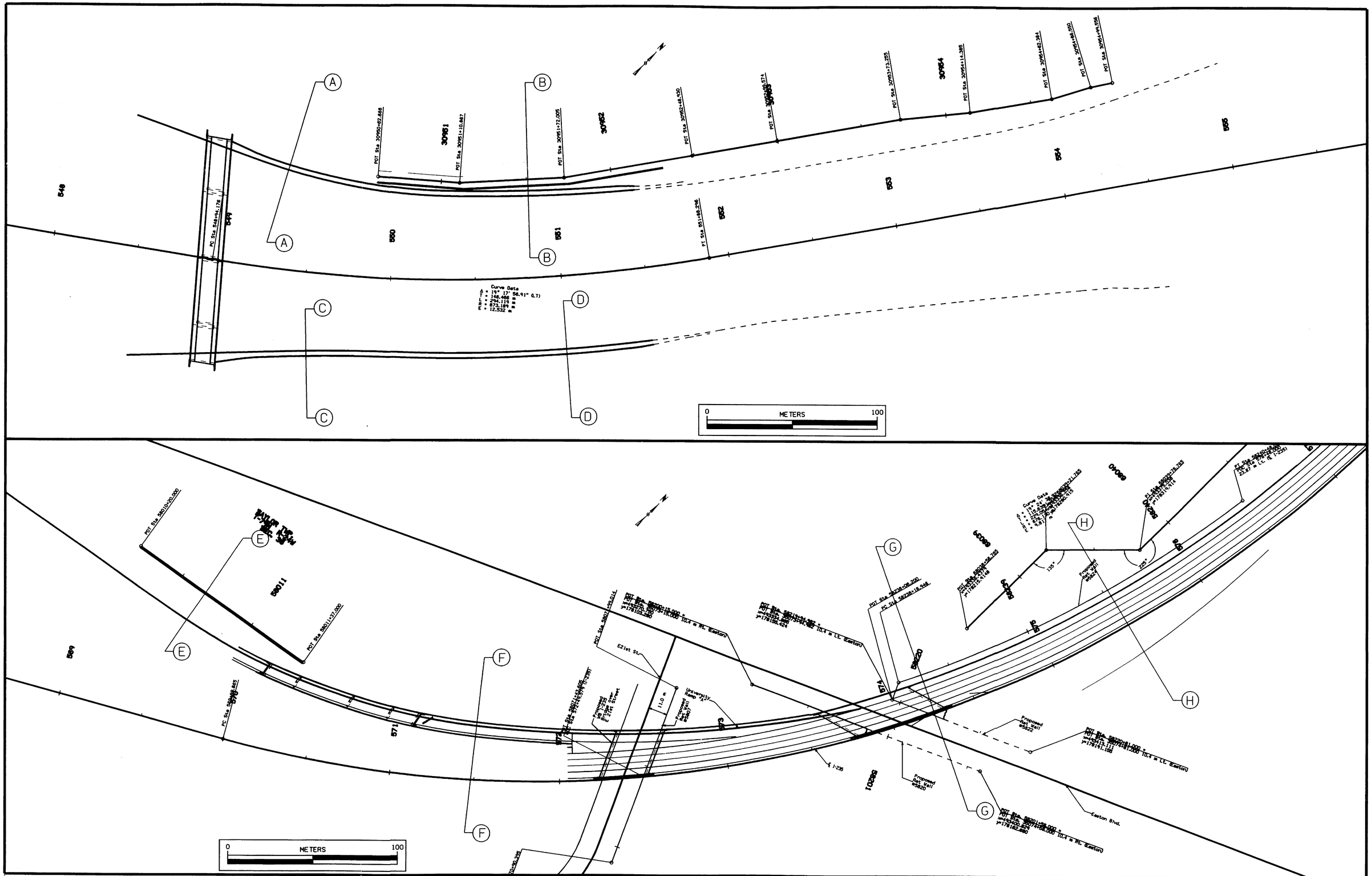
1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER A.04	

12-JAN-2002 09:32 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.a04

LISTING OF PROJECT REVISIONS

111-23
09-27-94

DATE	SHEET NO.	DESCRIPTION OF REVISIONS
9/11/02	A.01	Updated Index of Sheets, Revisions tab, and Signature Block to show appropriate Revision changes.
	A.05	Added Sheet (Tabulation of Revisions)
	B.08	Updated Pavement Thickness on Typical 2212.
	C.01	Updated quantities for Pavement, Removal of Sidewalk/Pavement and added Storm Sewer Bid Items.
	C.01a	Moved 100-4B tab from C.01 to C.01a. Added Removal of Light Pole Reference Note.
	C.02	Added item 49 and 60, and additional information on note 59.
	C.02a	Added items 64 thru 71.
	C.04	Added additional Stations and updated Removal area for Tab 110-1 and 110-5.
	C.07	Updated Tab 104-5A to reflect additional Intake and Utility Accesses, and updated Tab 104-5B to reflect additional Storm Sewer Pipe.
	E.01	Updated Proposed Pavement.
	L.01	Added Sheet to show Jointing and Staking Details.
	M.19	Added Utility Access.
	M.20	Added previously designed Storm Sewer.
	M.21	Added previously designed Storm Sewer.
	M.22-M.24	Removed Existing Ground Line from Profiles.
	M.25	New Storm Sewer Profile Detail.
	M.26	Removed Existing Ground Line from Profiles.
	M.27-M.31	Added new Sheets.
	M.32	Added Intake Under Pavement with Seperation Barrier on Top Detail Sheet.
	U.08	Updated Sidewalk Removal.
	U.09	Updated Removal Sheet.
	U.15	Updated Dimension on Reinforced Pavement.


A
B
C
D
E
F
G
H
548
549
550
551
552
553
554
555
30951
30952
30953
30954
PC Sta 548+94.178
POT Sta 30950+62.688
POT Sta 30951+10.887
POT Sta 30951+72.005
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POT Sta 30954+13.225
POT Sta 30954+14.385
POT Sta 30954+62.384
POT Sta 30954+88.500
POT Sta 30954+99.556
PT Sta 551+82.296
Curve Data
Δ = 19° 17' 56.91" (LT)
D = 6.875°
L = 148.482 m
R = 254.118 m
Rad = 873.169 m
E = 12.532 m
0
METERS
100
POT Sta 560+10.000
POT Sta 560+37.000
PC Sta 560+48.825
EZint St
University Ramp "A"
Proposed MSE Wall 560617
Proposed MSE Wall 560620
Proposed MSE Wall 560622
I-235
Easton Blvd.
POT Sta 560+58.235
PC Sta 560+68.220
PT Sta 560+81.068
Curve Data
Δ = 24° 30' 00.00" (LT)
D = 6.875°
L = 174.533 m
R = 254.118 m
Rad = 834.169 m
E = 14.715 m
135°
225°
Proposed MSE Wall 560620
POT Sta 560+18.000
POT Sta 560+38.000
POT Sta 560+58.000
POT Sta 560+78.000
POT Sta 560+98.000
POT Sta 561+18.000
POT Sta 561+38.000
POT Sta 561+58.000
POT Sta 561+78.000
POT Sta 561+98.000
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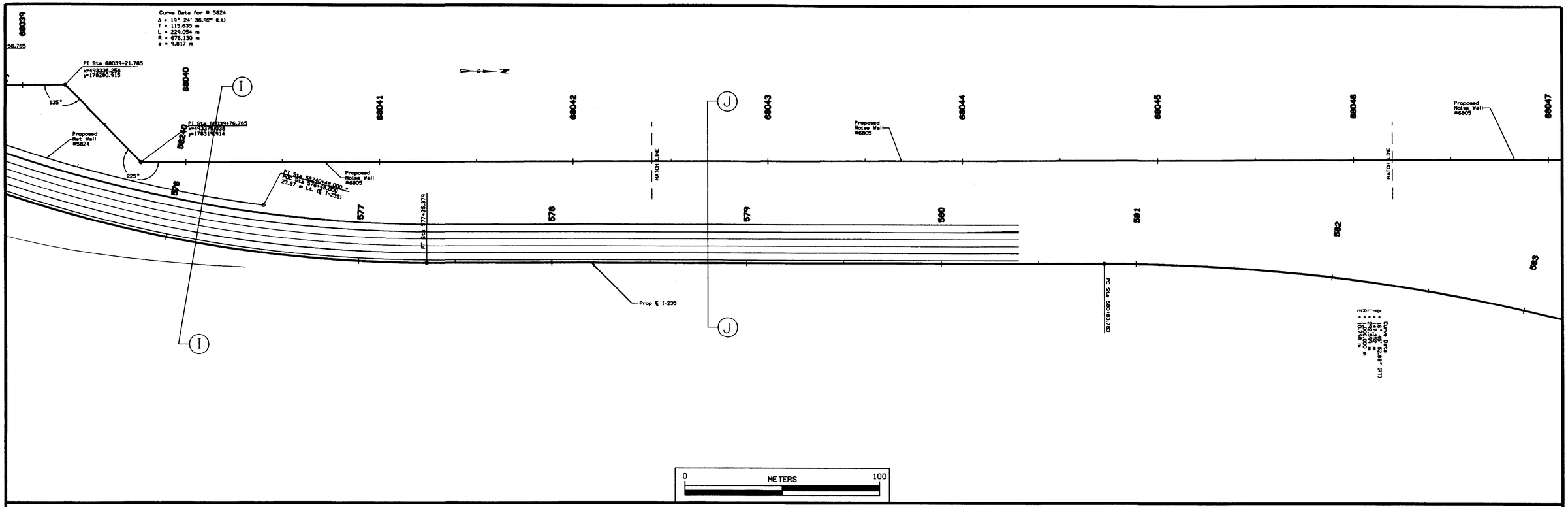
POT Sta 562+98.000
POT Sta



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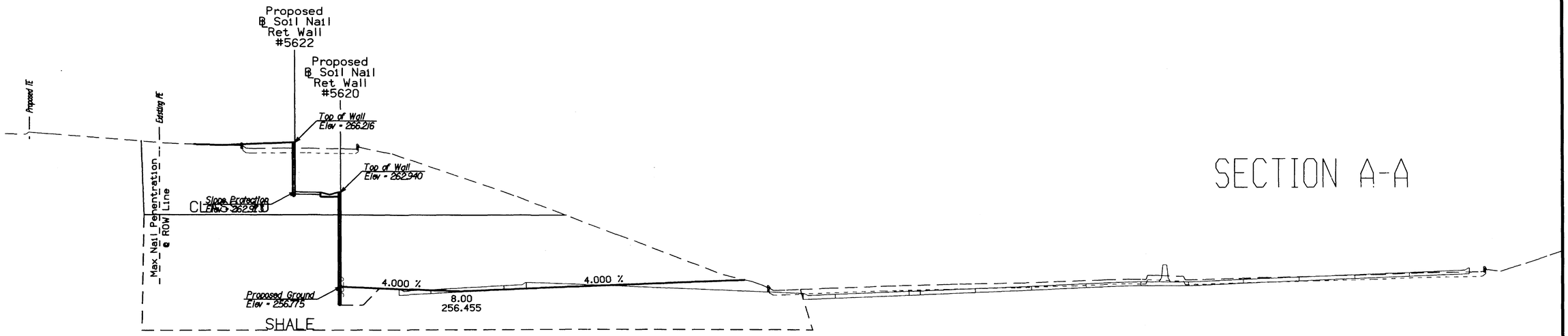
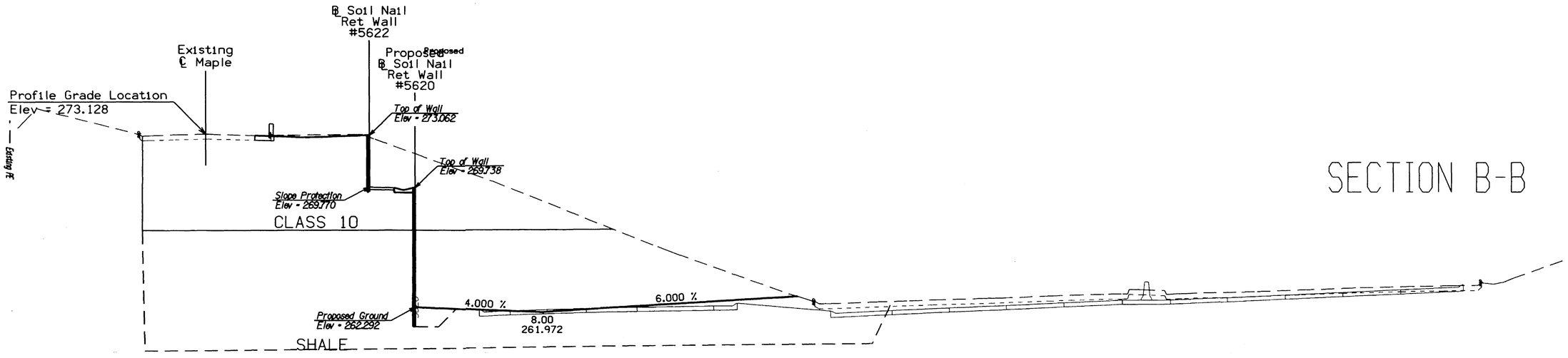


SECTION A-A



SECTION B-B

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER B.03

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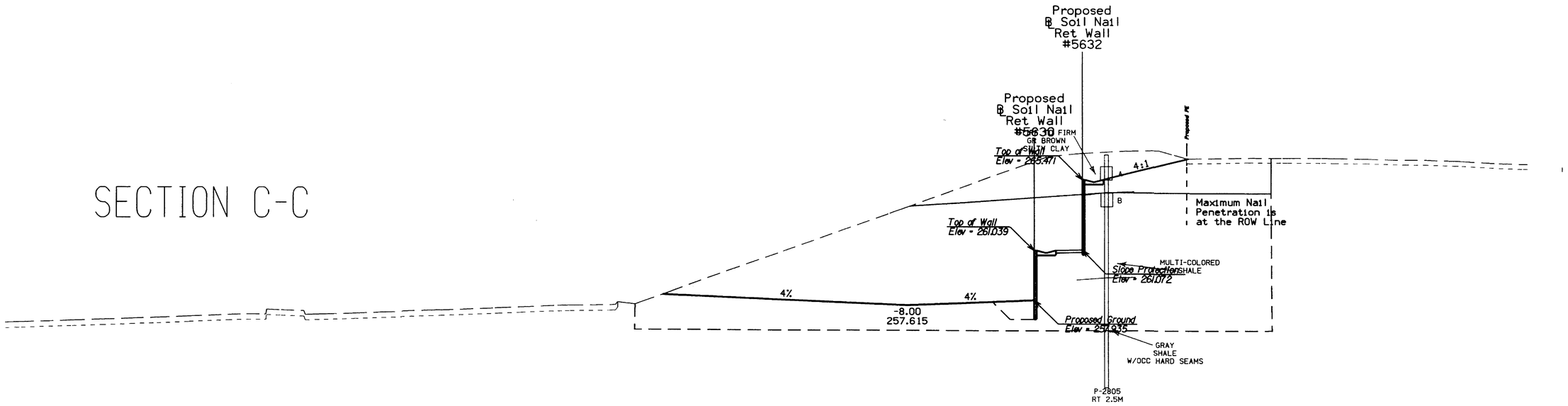
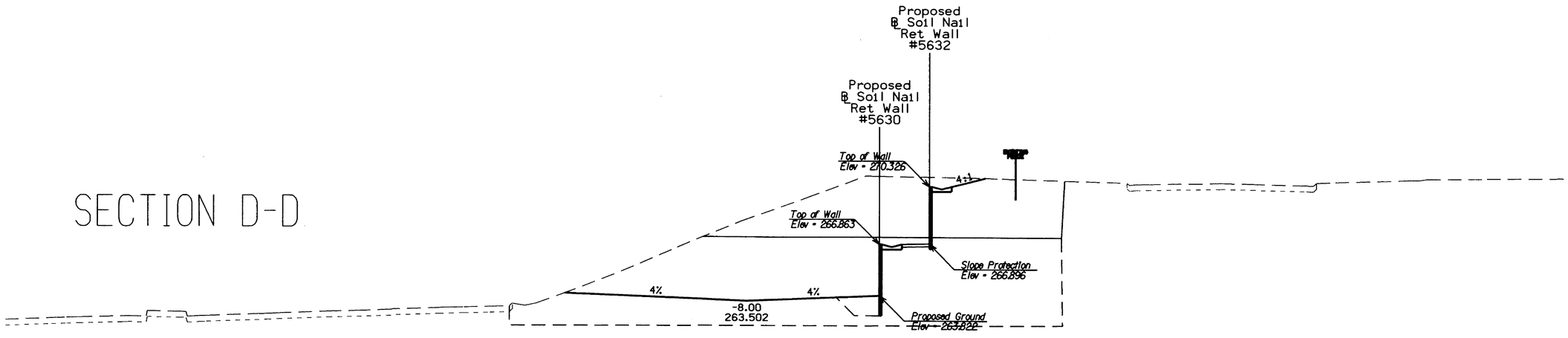
SECTION C-C



SECTION D-D



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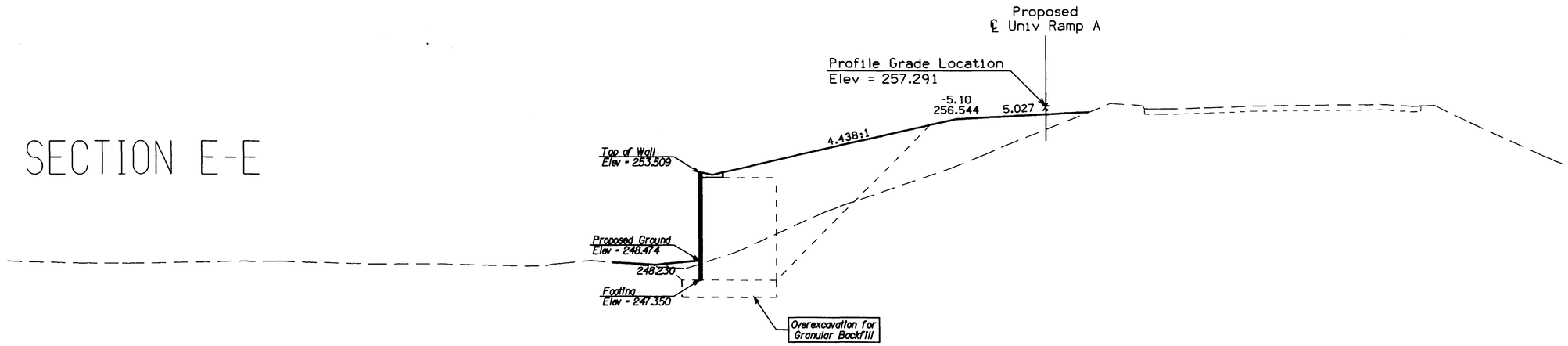
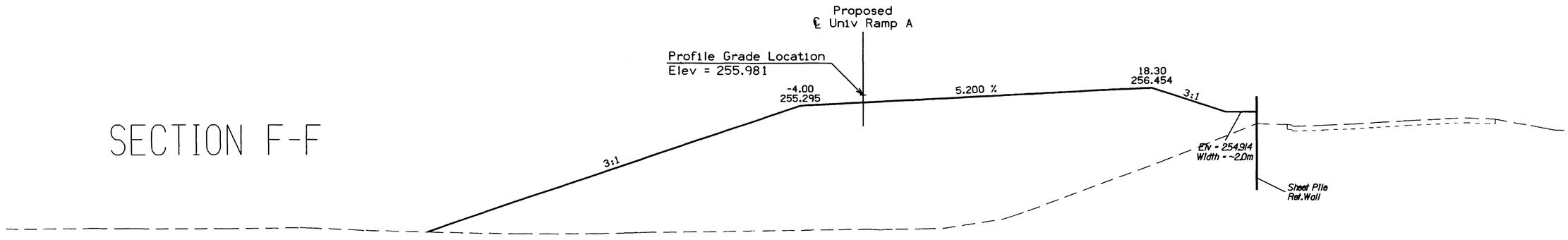
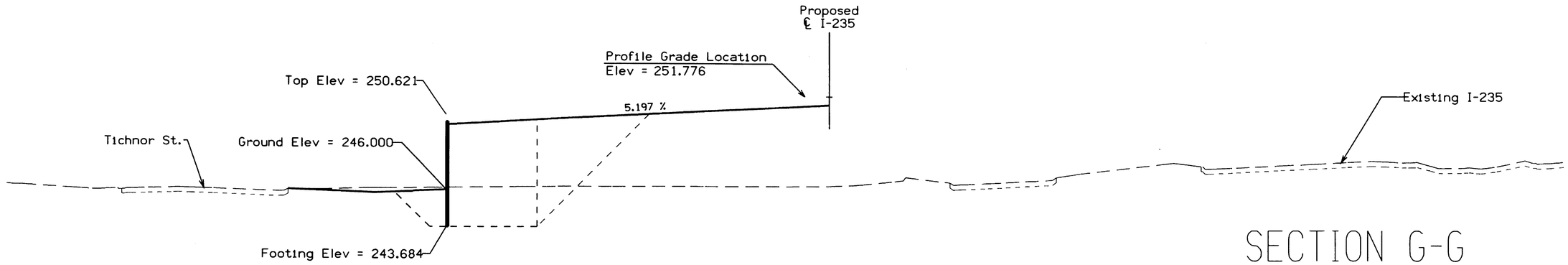
SECTION E-E

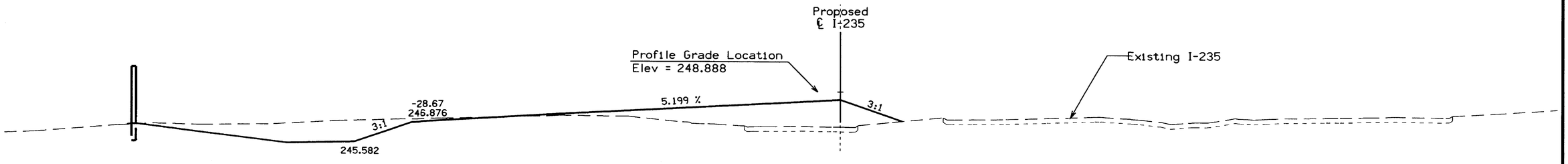


SECTION F-F

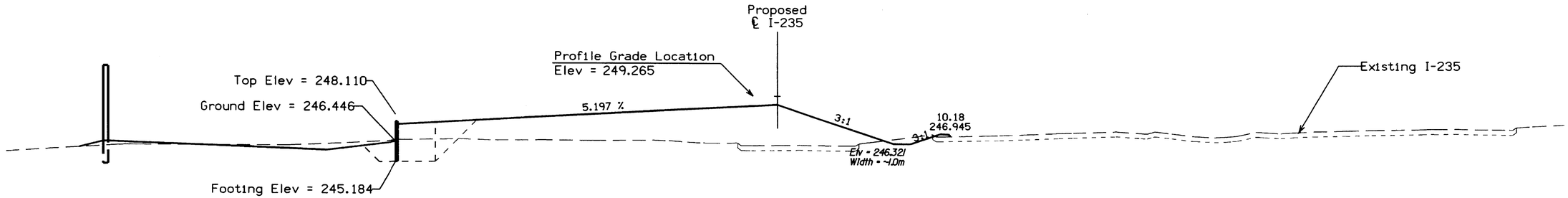




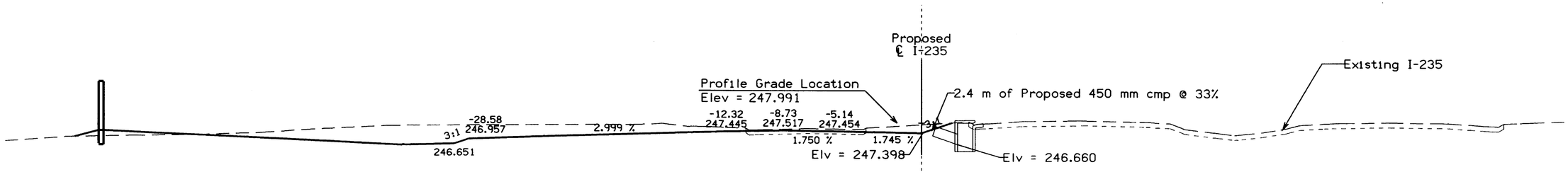
SECTION G-G



SECTION H-H



SECTION I-I

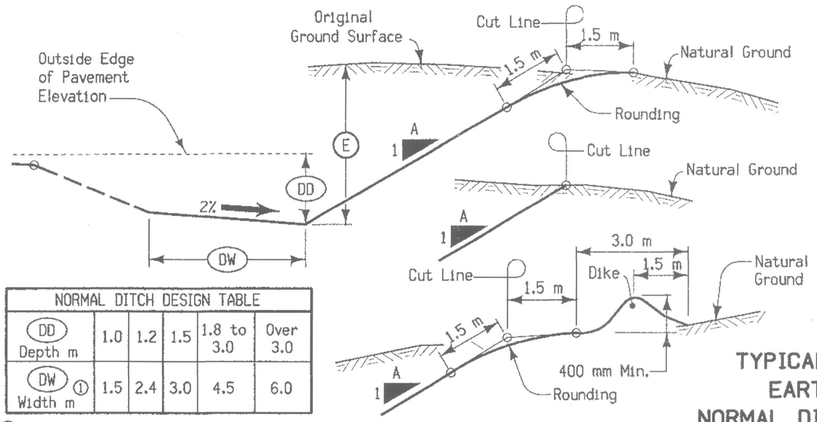


SECTION J-J

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER B.07

14-JAN-2002 14:20 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.B07

4101
10-03-00
Dimensions in mm unless noted.



NORMAL DITCH DESIGN TABLE					
(DD) Depth m	1.0	1.2	1.5	1.8 to 3.0	Over 3.0
(DW) ① Width m	1.5	2.4	3.0	4.5	6.0

① A 30 m transition should be used between width changes.

Notes:

For normal conditions, backslopes (A) shall be 2.5 on 1.0 for E depths less than 7.5 m, unless specified otherwise. Refer to detail project plans and cross sections for Ditch Depth or for Special Ditches.

Refer to project plans for locations of areas where rounding of the back slope is not required.

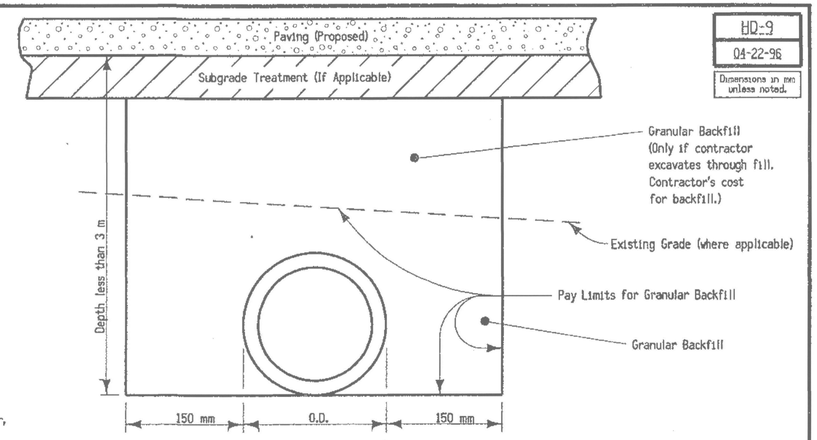
Refer to plans for locations of intercepting ditches. Dike for intercepting ditch shall be made by taking earth from roadway side. Do not excavate back of dike.

TYPICAL CROSS SECTION EARTH EXCAVATION NORMAL DITCH AND BACKSLOPE

HD-9
04-22-96
Dimensions in mm unless noted.

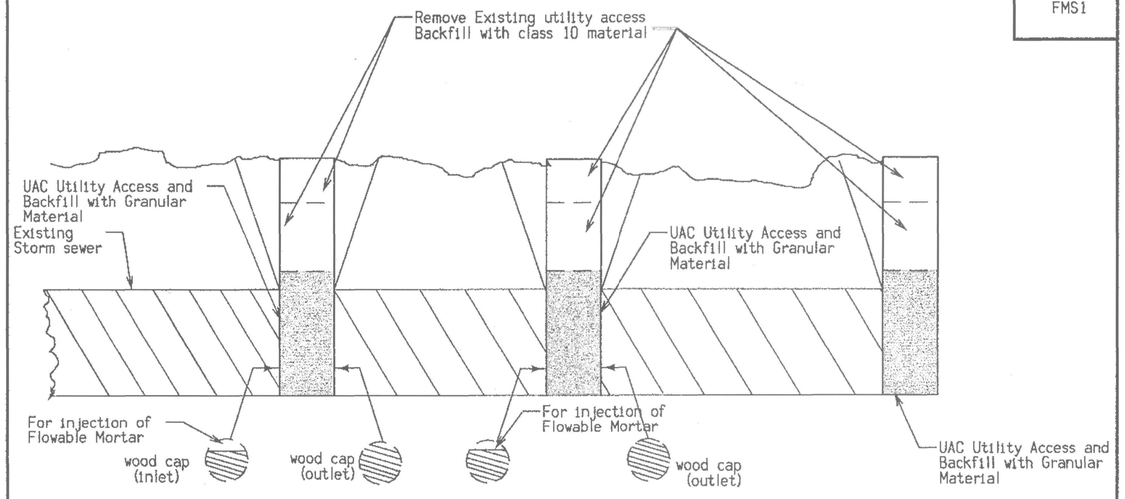
NOTES:

1. All proposed storm sewer pipe to be placed at depths less than 3 m beneath the pavement shall be bedded in granular backfill as detailed hereon.
2. Granular backfill will be measured by the Mg. The weight so measured will be computed using pay limits as detailed hereon, based on 2250 kg per cubic meter. Excavation and granular backfill outside the pay limits will be considered incidental.
3. For granular backfill compaction, flood with sufficient moisture to ensure complete saturation.
4. If the pipe can not be bedded in firm earth, excavation shall be carried below the required elevation as directed by the Engineer, then backfilled with granular backfill material.



(Depth less than 3 m)

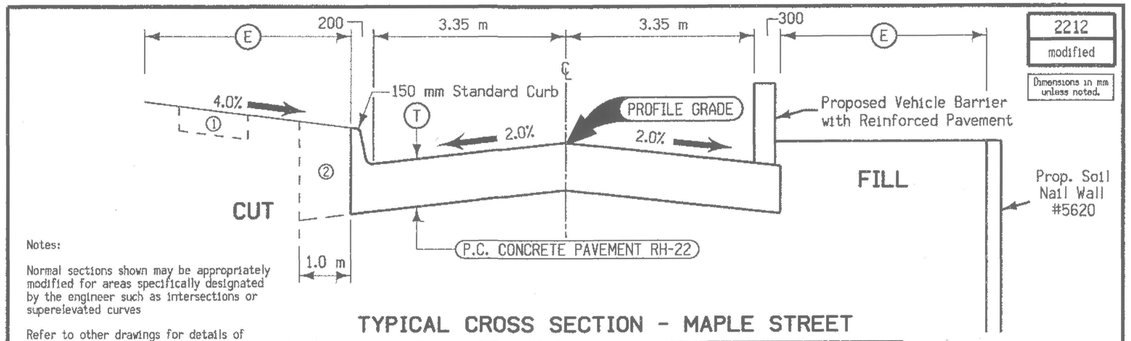
FMS1



When filling existing storm sewer with flowable mortar contractor shall cap the outlet and the existing inlet so as to provede access at the top opening so flowable mortar could be pumped in. When filling of storm sewer pipes is completed. Contractor shall remove all of the existing utility accessed except for the first section. Contractor will be required to back fill the first section with granular material and the remainder of the excavated area will be backfilled with suitable class 10 material. For location of flowable mortar schedule see tab FMS on sheet M.01 and sheet M.08 for details of abandonment of sanitary sewer.

TYPICAL FLOWABLE MORTAR ABANDONMENT

2212
modified
Dimensions in mm unless noted.



Notes:

Normal sections shown may be appropriately modified for areas specifically designated by the engineer such as intersections or superelevated curves

Refer to other drawings for details of shoulder design and construction.

① Refer to other drawings for details of shoulder and possible sidewalk construction

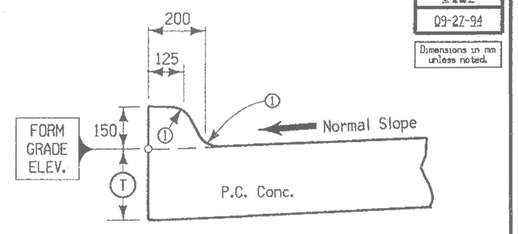
② Excavate and backfill 1.0 m.

③ Backfill

TYPICAL CROSS SECTION - MAPLE STREET

LOCATION			(T)	(E)
ROAD IDENTIFICATION	STATION TO STATION		mm	m
Maple St.	30950+62.686	30951+13.183	260	varies

6127
09-27-94
Dimensions in mm unless noted.



(T) is the thickness specified for pavement

① 75 mm radius

DETAILS OF INTEGRAL 150 mm STANDARD CURB

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2101--100100	CLEAR+GRUB	Ha	11.0	10.500
2	2102--120100	CLASS 12 EXCAVATION, RDWY+BORROW	M3	46137	46137.000
3	2102--120400	CLASS 12 EXCAVATION, BOULDERS OR ROCK FRAGMENTS	M3	500	375.000
4	2102--200100	EMBANKMENT-IN-PLACE	M3	101993	101993.000
5	2102--230100	SPECIAL BACKFILL MAT'L	MG	130.6	0.000
6	2105--102000	TOPSOIL STRIP + STKP	M3	38220	0.000
7	2123--100100	EARTH SHLD FINISH	M	40.0	62.000
8	2301--132230	STD/S-F PCC PAV'T CL C CL 2 ~~260 MM~~ 230 *mm*	M2	316.8	373.510
9	2315--110100	DRIVEWAY SURF CL A CR STONE	MG	45.5	0.000
10	2401--100000	REMOVAL OF EXISTING STRUCTURES	LS	1.0	$ 10000.000
11	2401--205032	RMVL OF LIGHT POLE	EACH	9	10.000
12	2402--401000	GRANULAR BACKFILL	MG	28717	54093.678
13	2415--210000	PRECAST CONC BOX CULV. 3000x1200	M	441.96	438.000
14	2417--060600	CMP RDWY CULV 600 MM	M	23.8	0.000
17 ~~15~~	2503--140300	CONCRETE 100D STORM SEWER PIPE 300 MM DIA	M	20.73	0.000
18 ~~16~~	2503--140450	CONCRETE 100D STORM SEWER PIPE 450 MM DIA	M	39.01	74.150
19 ~~17~~	2503--140600	CONCRETE 100D STORM SEWER PIPE 600 MM DIA	M	20.68	21.700
20 ~~18~~	2503--140900	CONCRETE 100D STORM SEWER PIPE 900 MM DIA	M	4.27	4.270
21 ~~19~~	2503--141500	CONCRETE 100D STORM SEWER PIPE 1500 MM DIA	M	32.92	29.600
22 ~~20~~	2503--141800	CONCRETE 100D STORM SEWER PIPE 1800 MM DIA	M	2.44	2.440
23 ~~21~~	2503--400490	INTAKE, RA-49	EACH	2	2.000
24 ~~22~~	2503--400495	INTAKE, RA-49 (MODIFIED)	EACH	9	5.000
25 ~~23~~	2503--400610	INTAKE, RA-61	EACH	1	1.000
26 ~~24~~	2503--400615	INTAKE, RA-61 (MODIFIED)	EACH	1	0.000
27 ~~25~~	2505--000110	RMV OF G'RAIL	M	432.8	349.200
28 ~~26~~	2506--100000	FLOWABLE MORTAR	M3	176.3	233.820
29 ~~27~~	2510--001000	RMVL OF PAV'T	M2	22160.1	20738.500
30 ~~28~~	2511--100000	RMVL OF SIDEWALK	M2	1751.7	1077.749
31 ~~29~~	2513--235020	CONCRETE BARRIER (VEHICLE)	M	158.5	158.500
32 ~~30~~	2513--235050	REINFORCED PAV'T FOR BARRIER	M2	203.0	190.004
33 ~~31~~	2515--000100	RMVL OF PAVED DRIVEWAY	M2	303.6	75.660
34 ~~32~~	2515--100150	PCC DRIVEWAY 150 MM	M2	22.3	21.470
35 ~~33~~	2518--000100	SAFETY CLOSURES	EACH	11	13.000
36 ~~34~~	2518--100032	PERMANENT RD CLOSURE (URBAN) RE-3B	EACH	5	5.000
38 ~~35~~	2519--400000	SAFETY FENCE	M	1963.0	1295.600
39 ~~36~~	2519--422000	RMVL OF CHAIN LINK FENCE	M	1998.7	1463.250
40 ~~37~~	2519--425000	RMV + REINSTALL CHAIN LINK FENCE	M	832.3	249.700
41 ~~38~~	2526--001000	CONSTRUCTION SURVEY	LS	1	$ 100000.000
42 ~~39~~	2527--101010	PAINTED PAV'T MARK, WATERBORNE	M	202.8	956.000
43 ~~40~~	2528--101000	TRAFFIC CONTROL	LS	1	$ 52000.000
44 ~~41~~	2528--102000	TEMP BARRIER RAIL	M	979.2	960.120
45 ~~42~~	2533--100000	MOBILIZATION	LS	1	$ 924000.000
46 ~~43~~	2535--200421	MECHANICALLY STABILIZED EARTH RETAIN WALL	M2	3228.6	2489.217
49 ~~44~~	2599--999901	CONC 150D JACKED STORM SWR 1800 MM	M	232.86	232.200
51 ~~45~~	2599--999901	STONE COLUMNS, AS PER PLAN	M	5509	4425.000
50 ~~46~~	2599--999901	PORTLAND CEMENT CONCRETE GUTTER	M	117	443.240
52 ~~47~~	2599--999902	SOIL NAIL RETAINING WALL CONSTRUCTION	M2	5255	5633.770
~~48~~		~~OMIT~~			
53 ~~49~~	2599--999915	REMOVAL TEMPORARY ATTENUATOR, SAND FILLED PLASTIC ARRAYS	EACH	24	24.000
15 ~~50~~	2501--321010	TEMPORARY SHEET PILE FOR MSE RETAIN WALL	LS	1	$ 278000.000
16 ~~51~~	2501--321010	TEMPORARY SHEET PILE FOR SOIL NAILING RETAIN WALL	LS	1	$ 0.00
54 ~~52~~	2599--999916	SOIL NAIL RETAINING WALL DESIGN	LS	1	$ 94000.000
55 ~~53~~	2599--999916	SOIL NAIL RETAINING WALL INSTRUMENTATION	LS	1	$ 84000.000
56 ~~54~~	2601--101000	SEEDING + FERTILIZE	Ha	17.1	0.395
57 ~~55~~	2601--103000	STABILIZING CROP SEEDING + FERTILIZE	Ha	4.6	5.400
58 ~~56~~	2601--104200	MULCH	Ha	4.6	7.970
59 ~~57~~	2601--108140	SLOPE PROTECTION WOOD EXCEL MAT RC-14	M2	1200	0.000
60 ~~58~~	2601--109000	WATER-SOD/SPEC DITCH CNTL/SLOPE PROTECT	KI	24	0.000
61 ~~59~~	2602--000010	SILT FENCE	M	1845	686.400
62 ~~60~~	2602--000030	SILT FENCE-DITCH CHECKS	M	209	106.700
47 ~~61~~	2538--101020	SALVAGE, REMOVAL,AND DISPOSAL OF OBSTRUCTIONS ON PARCEL NO. 117, 2001 EASTON	LS	1	$ 25000.000
48 ~~62~~	2538--101020	SALVAGE, REMOVAL,AND DISPOSAL OF OBSTRUCTIONS ON PARCEL NO. 117, 2025 EASTON	LS	1	$ 15000.000
37 ~~63~~	2519--201800	CHAIN LINK FENCE, 1.8 M HEIGHT (RC-10)	M	52.0	202.250

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
~~64~~	~~2503--400400~~	~~INTAKE RA-40~~	~~EACH~~	~~2~~	
~~65~~	~~2503--400700~~	~~INTAKE RA-70~~	~~EACH~~	~~2~~	
~~66~~	~~2503--400500~~	~~STORM SWR UTILTY ACCESS RA-50~~	~~EACH~~	~~1~~	
~~67~~	~~2503--400480~~	~~MODIFIED INTAKE RA-48~~	~~EACH~~	~~1~~	
~~68~~	~~2503--120450~~	~~CONC 75D STROM SWR 450MM~~	~~M~~	~~84.0~~	
~~69~~	~~2422--200450~~	~~UNCL TEMP STORM SWR 450MM~~	~~M~~	~~31.4~~	
~~70~~	~~2503--140375~~	~~CONC 100D STORM SWR 375MM~~	~~M~~	~~64.8~~	
~~71~~	~~2503--120375~~	~~CONC 75D STORM SWR 375MM~~	~~M~~	~~69.6~~	
63	2212--100200	PATCHES FULL-DEPTH REPAIR	M2	15.000	12.800
64	2212--100400	PATCHES BY COUNT (REPAIR)	EA.	1.000	1.000
65	2401--205040	REMOVAL OF UTILITY ACCESS	EA.	1.000	1.000
66	2504--011000	REMOVE SANITARY SEWER PIPE LESS THAN OR EQUAL TO 1000 MM	M	2.000	1.100
67	2506--100000	FLOWABLE MORTAR	M3	74.120	75.690
68	2599--999901	UNCLASSIFIED SANITARY SEWER 250 MM	M	59.000	59.130
69	2599--999901	UNCLASSIFIED SANITARY SEWER 300 MM	M	46.000	47.600
70	2599--999901	UNCLASSIFIED SANITARY SEWER 375 MM	M	8.000	6.890
71	2599--999901	UTILITY ACCESS TYPE A	M	9.000	9.260
72	2599--999901	UTILITY ACCESS TYPE I	M	3.700	3.560
73	2599--999916	BYPASS PUMPING, AS PER PLAN	LS	1.000	$ 50000.000
74	2601--101200	SEEDING AND FERTILIZING (URBAN)	HA	1.000	0.190

FOR SANITARY SEWER ESTIMATE OF QUANTITIES, SUBNOTES AND ADDITIONAL INFORMATION SEE SHEETS M.01 THRU M.18.

FOR SANITARY AND STORM SEWER PARTICIPATION COST SEE SHEET C.08.
FOR TRAFFIC CONTROL SEE TAB. 108-23A ON SHEET J.01
FOR STAGING NOTES SEE TAB. 108-26A ON SHEET J.01
FOR POLLUTION PREVENTION PLAN SEE TAB. 110-12A ON SHEET C.06
FOR SPECIAL EVENTS SEE TAB. 102-15 ON SHEET C.06

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12-88

EXTRA WORK ORDERS (340)

NO.	DESCRIPTION	UNIT	TOTAL
1515	TRAFFIC CONTROL	LUMP SUM	
1520	TEMPORARY TRAFFIC SIGNALS	EACH	4.0
1525	FLAGGER	DAY	4.5
1530	MOBILIZATIONS	LUMP SUM	$ 1,500.00
1550	WB I-235 EASTON SIGN REMOVAL/MODIFY	LUMP SUM	$ 3,987.50
1555	REMOVAL OF BILLBOARD ON PARCEL #117 BROWN TRUCKING	LUMP SUM	$ 10,450.00
1610	PAVEMENT MARKINGS REMOVED	METER	488.00
1615	DEMOLITION BRANDA LEASING SIGN	LUMP SUM	$ 1,100.00
1620	I-235 LIGHTING NEAR EASTON BLVD.	LUMP SUM	$ 5,500.00
1625	TEMPORARY BARRIER RAIL AT MAPLE STREET	LUMP SUM	$ 450.00
1630	SHEET PILING TO PROTECT FIBER OPTIC	LUMP SUM	$ 31,937.94
1645	SOIL NAIL/SHOT CRETE EXTENSION	LUMP SUM	$ 25,576.70
1650	SOIL NAIL WALL VALUE ENGINEERING PAYMENT	LUMP SUM	$ 19,711.65
1655	LANDSCAPING @ 901 WALKER	LUMP SUM	$ 5,101.80
1660	ADDITIONAL MATERIAL CIP MOD. RA-49	LUMP SUM	$ 62,204.15
1665	PRECAST UTILITY ACCESS STRUCTURES	LUMP SUM	$ 36,377.00
1670	INTAKE RA-40	EACH	2.0
1675	INTAKE RA-40	EACH	1.0
1680	INTAKE RA-70	EACH	1.0
1685	STORM SEWER UTILITY ACCESS, RA-50	EACH	1.0
1690	INTAKE, MODIFIED RA-48	EACH	1.0
1695	CONCRETE 1000 ROADWAY PIPE CULVERT 375mm DIA	METER	58.10
1700	CONCRETE 750 ROADWAY PIPE CULVERT 375mm DIA	METER	69.80
1705	CONCRETE 750 ROADWAY PIPE CULVERT 450mm DIA	METER	89.20
1710	UNCLASSIFIED ROADWAY PIPE CULVERT 450mm DIA	METER	33.80
1720	CHAIN LINK FENCE VINYL COATED 1.8m HIGH	METER	86.90
1725	CHAIN LINK FENCE VINYL COATED 0.865m HIGH	METER	158.34
1735	PRICE ADJ/FUEL ADJUSTMENT	EACH	1.0
1740	CHAIN LINK GATE 1.8m HIGH 1.8m WIDE VINYL COATED	METER	1.0
1745	CORROSION ANALYSIS @ SOIL NAIL WALL	LUMP SUM	$ 3,970.65
1750	ADDITIONAL LOAD CELL@ SOIL NAIL WALL	LUMP SUM	$ 4,226.37
1755	#10 SOIL NAIL TENDONS	LUMP SUM	$ 22,168.61
1760	COATINGS FOR SOIL NAIL PLATES, NUTS, & WASHERS	LUMP SUM	$ 16,996.42
1765	ADDITIONAL GROUT AROUND SOIL NAILS	LUMP SUM	$ 17,620.54
1770	RELOCATE MSE WALL #5801 1.0m SOUTH	LUMP SUM	$ 5,187.27
1780	4" WATER SERVICE DISCONNECT @ PARCEL #117	LUMP SUM	$ 4,317.50
1785	SANITARY SEWER REPAIR @ MAPLE STREET	LUMP SUM	$ 468.24

Form 520004
12-88

EXTRA WORK ORDERS (340)

NO.	DESCRIPTION	UNIT	TOTAL
1805	SURVEY MONITORING SOUTH SOIL NAIL WALL W/PRISMS	DAY	
1810	ADHESIVE SURVEY PRISMS	LUMP SUM	$ 14,300.00
1815	SURVEY MONITORING @ SOUTH SOIL NAILWALL W/HUBS	LUMP SUM	$ 995.50
1820	SURVEY FOR IOWA DOT SOIL NAIL REMEDIATION	LUMP SUM	$ 398.75
1830	RELOCATE SAFETY FENCE	METER	91.46
1855	EMERGENCY PATCH EB I-235 @ E. 6TH STREET	LUMP SUM	$ 21,237.45
1860	REPAIR OF 4" SANITARY @ PARCEL #117	LUMP SUM	$ 1,995.40
1870	REPAIR OF 2" WATER SERVICE @ 117 & MAPLE	LUMP SUM	$ 3,622.44
1890	EXTENSION OF RETAINING WALL/LANDSCAPING @ 901 WALKER	LUMP SUM	$ 600.00
1895	50mm TERRA-SEEDING	SQ. METER	
1900	UPPER SOUTH SOIL NAIL WALL REMEDIATION NEAR APT BLDG. E. 9TH & LYON	LUMP SUM	$ 76,149.14
1905	MOW & RAKE & SPRAY WEEDS	LUMP SUM	$ 1,210.00
1915	Added Conduit at Unit. Ramp A Bridge over UPRR	Meter	105.0
1920	Drain Extension Drainage Strips, # 5622	EACH	12.0
1925	Shotcrete on Slope	M2	139.29
1935	Re-Staking of E. 21st St.	LS	$ 895.50
1940	Staking of Added Storm Sewer ADJ To MSE Wall #5820 Along Easton Blvd	LS	$ 410.50
1950	Monitoring of Lower Tier Shotcrete @ South Soil Nail Wall	LS	$ 7,507.50
1955	E. 21st St. PAVT Removal Due To Stone Column Damage	M2	540.34
1960	E. 21st St. Replacement PAVT Due To Stone Column Damage	M2	540.34
1965	Additional Instrumentation Monitoring at South Soil Nail Wall	LS	$ 16,654.96
1970	Added Inclinometers at Soil Nail Wall	LS	$ 3,854.05
1975	Additional Work By United @ CIP Wall Due To Slough @ N. Soil Nail Wall	Lump Sum	$ 5,139.45
1980	Repair of Slough @ N. Soil Nail Wall	Lump Sum	$ 16,374.51
1985	Repair Existing Sanitary Sewer @ E. 21st St.	Lump Sum	2,099.13
1995	Drainage on Top of North Soil Nail Wall Along E.9th Behind Jorgenson	Each	2.0
2040	Sawcut For E. 21st Second PAVT Removal	Lump Sum	$ 225.86
2045	PCC SWK 100 mm Replacement @ E. 21st & Maple St	SQ Meter	193.44
2050	Relocate Water Mtr & Water Service Corner E. 11 & Maple Streets	Lump Sum	$ 2,883.47
2060	Water Service Repair Corner of E 11th & Maple	Lump Sum	$ 7,078.84
2065	Removal of PAVT ACC	SQ. Meter	74.84
2070	Hot Mix Asphalt, 13mm, Type A	Mega Grams	52.33
2075	Granular Backfill For Water Service Repair	Mega Grams	135.03
2085	PCC Curb & Gutter	Meter	27.0
2090	WALKER South Soil Nail Wall Remediation Near Apt Bldg @ E. 9th & Lyon Streets	Lump Sum	$ 76,149.14
2095	50mm Terra Seeding Per 2004	SQ. Meter	6,572.45
2100	Easton Blvd 200 mm Clay Sanitary Sewer Repair	Lump Sum	$ 729.00
2105	Price Adj - Soil Nail Wall Instrumentation	Each	-1.0
2110	Labor Equip/To Relocate Water Line & Meter Pit For Apt @ E. 11th & Maple	Lump Sum	$ 6,420.71
2130	Price Adj - MSE Retaining Wall	Each	-1.0
2150	Survey Markers	Each	16.0

STATE OF IOWA	FHWA REGION 7	FISCAL YEAR		COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER	TOTAL SHEETS C.01A-2

ESTIMATE REFERENCE INFORMATION

100-4B
07-15-97

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
1	2101--100100	CLEAR+GRUB See sheets U.01 thru U.07 for locations. Includes ½ hectare of clearing and grubbing for borrow area.
2	2102--120100	CLASS 12 EXCAVATION, RDWY+BORROW Overhaul will not be measured or paid for, but shall be considered incidental to this project. This material to be wasted as per St'd. Note 213-1.
3	2102--120400	CLASS 12 EXCAVATION, BOULDERS OR ROCK FRAGMENTS Overhaul will not be measured or paid for, but shall be considered incidental to this project. This material to be wasted as per St'd. Note 213-1.
4	2102--200100	EMBANKMENT IN PLACE Estimate includes 32,211 m3 from soil nail area and 49,940 m3 from borrow. Also includes 5 % for settlement (subsidence). See sheet T.01 for earthwork quantities. No payment for overhaul will be allowed.
6	2105--102000	TOPSOIL STRIP + STKP Contractor to stockpile topsoil material by the borrow site as directed by the engineer. See sheet R.01.
7	2123--100100	EARTH SHLD FINISH For earth shoulders on Maple St. See Typical 2212 sheet B.08 for additional details.
8	2301--132230	STD/S-F PCC PAV'T CL C CL 2 260 MM For paving of Maple St. from Sta. 30950+62.686 to Sta. 30951+13.183. See sheets E.01 and L.01 for additional details.
9	2315--110100	DRIVEWAY SURF CL A CR STONE For Hammer Head located Lt. 74.058 m of ML Sta. 549+29.916. See sheet E.01 for additional information.
10	2401--100000	REMOVAL OF EXISTING STRUCTURES See tab 110-2 on sheet C.05 for locations and disposal.
11	2401--205032	RMVL OF LIGHT POLE See tab LP-1 on sheet C.05 for locations. Includes removing light poles, luminaries, and footings and any excess material. Contractor shall dispose of as per St'd. Note 213-1. The Engineer shall count the number of light poles removed by the contractor. The Contractor will be paid the contract price for each light pole removed. These payments shall be full compensation for furnishing all materials, labor, and equipment necessary to remove and dispose the light poles and luminaries and footings and maintain the lighting circuit.
12	2402--401000	GRANULAR BACKFILL Estimate Includes 6077Mg for wall #5801, 3623Mg for wall #5807, 4401Mg for wall #5808, 2525Mg for wall #5820, 1174Mg for wall #5822, 10,443Mg for wall #5824 and 474Mg for storm sewer pipe.
13	2415--210000	PRECAST CONC BOX CULV. 3000x1200 See tab 104-5B on sheet C.07 for location and additional information.
14	2417--060600	CMP RDWY CULV 600 MM To be placed under temporary haul road to borrow located in the rt. ditch rt of sta. 391+00.00. See sheet R.04 for location and additional information.
~~15~~ 15	2503--140300	CONCRETE 100D STORM SEWER PIPE 300 MM DIA
~~16~~ 16	2503--140450	CONCRETE 100D STORM SEWER PIPE 450 MM DIA
~~17~~ 17	2503--140600	CONCRETE 100D STORM SEWER PIPE 600 MM DIA
~~18~~ 18	2503--140900	CONCRETE 100D STORM SEWER PIPE 900 MM DIA
~~19~~ 19	2503--141500	CONCRETE 100D STORM SEWER PIPE 1500 MM DIA
~~20~~ 20	2503--141800	CONCRETE 100D STORM SEWER PIPE 1800 MM DIA See tab 104-5B on sheet C.07 for location and additional information.

ESTIMATE REFERENCE INFORMATION

100-4B
10-29-02

ITEM NO.	ITEM CODE	DESCRIPTION
~~21~~ 21	2503--400490	INTAKE, RA-49
~~22~~ 22	2503--400495	INTAKE, RA-49 (MODIFIED)
~~23~~ 23	2503--400610	INTAKE, RA-61
~~24~~ 24	2503--400615	INTAKE, RA-61 (MODIFIED) See tab 104-5A on sheet C.07 for location and additional information.
~~25~~ 25	2505--000110	RMV OF G'RAIL See tab RBG-1 on sheet C.05 for locations. Disposal as per St'd. Note 213-1. Includes removal of posts which shall be incidental to the bid item.
~~26~~ 26	2506--100000	FLOWABLE MORTAR See sheet U.11 for locations.
~~27~~ 27	2510--001000	RMVL OF PAV'T See Tab. 110-1 on sheet C.04 for location. Pavement to be wasted as per St'd. Note 213-1. Estimate includes 248.9 m of saw cut. Refer to Removal Details on Sheets U.01-U.07.
~~28~~ 28	2511--100000	RMVL OF SIDEWALK See Tab. 110-5 on sheet C.04 for location. Sidewalk to be wasted as per St'd. Note 213-1. Estimate includes 2.37 m of saw cut. Refer to Removal Details on Sheets U.01-U.07.
~~29~~ 29	2513--235020	CONCRETE BARRIER (VEHICLE)
~~30~~ 30	2513--235050	REINFORCED PAV'T FOR BARRIER To be placed along Maple St. (south side) from Sta. 30950+62.686 to Sta. 30952+20. See sheet E.01 and U.08 for additional information.
~~31~~ 31	2515--000100	RMVL OF PAVED DRIVEWAY See Tab. 110-8 on sheet C.04 for location. Paved driveways to be wasted as per St'd. Note 213-1. Refer to Removal Details on Sheets U.01-U.07.
~~32~~ 32	2515--100150	PCC DRIVEWAY 150 MM For paving entrance Lt of Sta. 30950+76.482 (Maple St.).
~~33~~ 33	2518--000100	SAFETY CLOSURES See Tab. 108-13A on sheet C.05 for location.
~~34~~ 34	2518--100032	PERMANENT RD CLOSURE (URBAN) RE-3B See Tab. 102-4 on sheet C.04 for location.
~~35~~ 35	2519--400000	SAFETY FENCE A. To be installed for access control as directed by the engineer. B. The safety fence shall be orange mesh safety fence that shall meet the requirements of Article 4188.03 of the Standard Specifications. The safety fence shall be securelysupported so the fence is in a vertical position without any sagging. The safety fence shall be supported by setting posts a maximum of 3 m apart. The post shall extend at least 0.6 m into the ground. The safety fence shall become the property of the Ia. DOT after construction. C. The length of the safety fence will be determined by measuring along the fence. D. For the length of the safety fence measured, the Contractor will be paid the contract price. These payments shall be full compensation for furnishing all materials, labor, and equipment necessary to complete the work in conformance with the contract documents. E. Includes 235 m of safety fence to be placed around stone column area until grading operations begin.
~~36~~ 36	2519--422000	RMVL OF CHAIN LINK FENCE See Tab. CLR-1 on sheet C.04 for location. Fence to become the property of the contractor.
~~37~~ 37	2519--425000	RMV + REINSTALL CHAIN LINK FENCE Chain link fence to be removed from sta. 289+00.00 to sta. 414+60.00 (english stationing). See sheets R.04 thru R.06 and sheet U.19 for location and additional information.

ESTIMATE REFERENCE INFORMATION

100-4B
10-29-02

ITEM NO.	ITEM CODE	DESCRIPTION
~~39~~ 42	2527--101010	PAINTED PAV'T MARK, WATERBORNE See Tab. 108-22 on sheet C.05 for location.
~~41~~ 44	2528--102000	TEMP BARRIER RAIL Temporary barrier rail is available from the Ia. DOT. The contractor shall pick up the temporary barrier rail from a location just east of the Ia. DOT Des Moines Construction Office. Transporting the temporary barrier rail to the project site shall be incidental to this bid item. See Tab. TBR-1 on sheet C.04 for location. Barrier Rail to remain the property of the Ia. DOT.
~~43~~ 46	2535--200421	MECHANICALLY STABILIZED EARTH RETAIN WALL See sheet V.10 to V.20, V.29 and V.30 for additional details. See supplement specification for method measurement and basis of payment.
~~44~~ 49	2599--999901	CONC 150D JACKED STORM SWR 1800 MM See Tab. 104-5B on sheet C.07 for location. Meathod of measurement and basis of payment as per St'd Spec. 2418.06 and 2418.07.
~~45~~ 51	2599--999901	STONE COLUMNS, AS PER PLAN See supplement specification for method measurement and basis of payment. Includes 702 m at Univ. Ramp 'A' and 4807 m at East 21st St., See sheets Q.14 and Q.15.
~~48~~ 50	2599--999901	PORTLAND CEMENT CONCRETE GUTTER Gutter to be placed behind MSE wall as shown on V.11 and cross sections. Gutter drains will be placed as shown on sheet V.11. This work is to be considered incidental to the PCC Gutter. The gutter unit shall be Class 'C' PCC concrete produced and placed in accordance with Section 2301 and Article 4115.04 of the Standard Specifications. Method of Measurement: The engineer will determine the number of meters of gutter by measuring along the edge next to the MSE Wall. Basis of Payment: For the number of meters of concrete gutter constructed and accepted, measured as provided above, the contractor will be paid the contract unit proce per meter. This payment shall be full compensation furnishing all materials, preparation of subgrade, and placing, compacting, furnishing and curing the concrete gutter.
~~47~~ 52	2599--999916	SOIL NAIL RETAINING WALL CONSTRUCTION
~~49~~ 53	2599--999915	REMOVAL TEMPORARY ATTENUATOR, SAND FILLED PLASTIC ARRAYS Contractor to remove south Temp Attenuator in median at sta. 577+73.228 and dispose of as per St'd. note 213-1. North Temp Attenuator to be removed and installed at the end of the temp barrier rail at sta. 580+63.660-1.525 m Rt. This work is to be c1=onsidered incidental to the removal.
~~15~~ 50	2501--321010	TEMPORARY SHEET PILE FOR MSE RETAIN WALL
~~81~~ 10	2501--321010	TEMPORARY SHEET PILE FOR SOIL NAILING RETAIN WALL See Sheet V.29-V.32 for additional details of Temp. Sheet Pile + Shore. Contractor to leave sheeti pile in place at the end of construction and shall become the property of the Ia. DOT. Sheet pile will be removed under a different project when MSE wall is completed. Method of Measurement: This item will be lump sum for Temp. Sheet Pile Retain Wall. Basis of Payment: The contractor will be paid the lump sum contract price. This payment shall be full compensation for design, materials, labor and installation for the Temp. Sheet Pile Retain Walls. Removal of existing storm sewer which conflicts with temporary sheet pile for MSE retaining Wall shall be incidental to the bid item.

ESTIMATE REFERENCE INFORMATION

100-4B
07-15-97

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
~~52~~ 54	2599--999916	SOIL NAIL RETAINING WALL DESIGN
~~53~~ 55	2599--999916	SOIL NAIL RETAINING WALL INSTRUMENTATION Includes 4 locations: Wall # 5620 Length = 300.0 m Area = 2083 m2 Wall # 5622 Length = 241.1 m Area = 918 m2 Wall # 5630 Length = 310.0 m Area =1266 m2 Wall # 5632 Length = 258.4 m Area = 988 m2 For method of measurement and basis of payment refer to Special Provision.
~~54~~ 56	2601-101000	SEEDING + FERTILIZE Included for all disturbed areas (plus borrow area-12.5 Ha.) following the final construction as designated by the engineer. Seeding Mixture: Fescue,Tall (Turf type) 60 kg per hectare Ryegrass, Perennnial 49 kg per hectare Fertilizer: Rate - 840 kg of 13-13-13 or equivalent chemically combined commericial fertilizer per hectare
~~55~~ 57	2601-103000	STABILIZING CROP SEEDING + FERTILIZE Included for all disturbed areas as disignated by the engineer. This item may be deleted if permanent seeding is accomplished by May 31. Seed Mixture: Spring - March 1 to May 20 Oats 75 kg per hectare Annual Ryegrass 28 kg per hectare Red Clover 6 kg per hectare Timothy 6 kg per hectare Summer - May 21 to July 20 Oats 108 kg per hectare Annual Ryegrass 39 kg per hectare Red Clover 6 kg per hectare Timothy 6 kg per hectare Fall - July 21 to September 30 Oats 72 kg per hectare Annual Ryegrass 28 kg per hectare Red Clover 6 kg per hectare Timothy 6 kg per hectare Fertilizer: Rate - 500 kg of 13-13-13 or equivalent chemically combined commericial fertilizer per hectare
~~56~~ 58	2601-104200	MULCH Mulch: Rate - 3.5 megagrams of dry cereal straw per hectare. All mulch to be consolidated into the soil with the mulch stabilizer.
~~57~~ 59	2601-108140	SLOPE PROTECTION WOOD EXCEL MAT RC-14 Refer to RC-14 - Approximate locations: Sloped areas adjacent curb.
~~58~~ 60	2601-109000	WATER-SOD/SPEC DITCH CNTL/SLOPE PROTECT Estimate based on one watering of the special ditch control. Rate: 40 L/m2. Article 2601.19 shall apply. Additional waterings (3) may be required at the discretion of the engineer subject to local weather conditions and paid by extra work order.
~~59~~ 61	2602--000010	SILT FENCE This item includes 25% more silt fence than the tab. quantity for field adjustments and replacements. Also includes an additional 1460 m for proposed borrow. See Tab. 110-17 on sheet C.03 and R.01 thru R.06 for location.
~~60~~ 62	2602--000030	SILT FENCE FOR DITCH CHECKS This item includes 25% more silt fence than the tab. quantity for field adjustments and replacements. See Tab. 100-18 on sheet C.03 for location.

ESTIMATE REFERENCE INFORMATION

100-4B
07-15-97

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
~~81~~ 47	2538--101020	SALVAGE, REMOVAL, AND DISPOSAL OF OBSTRUCTIONS ON PARCEL NO. 117, 2001 EASTON Item is for the demolition of a 7478 sq. ft. building located at 2001 Easton Blvd. See detail sheet U.19 for location.
~~82~~ 46	2538--101020	SALVAGE, REMOVAL, AND DISPOSAL OF OBSTRUCTIONS ON PARCEL NO. 117, 2025 EASTON Item is for the demolition of a one story, 1288 sq. ft. building located at 2025 Easton Blvd. See detail sheet U.19 for location.
~~83~~ 37	2519--201800	CHAIN LINK FENCE, 1.8 M HEIGHT (RC-10) Item is for chain link fence to be placed at 2001 Eston Blvd.See sheet U.19 for details.
1670 ~~84~~	2503--400400	INTAKE RA-40
~~85~~ 1680	2503--400700	INTAKE RA-70
~~86~~ 1685	2503--400500	STORM SWR UTILITY ACCESS RA-50
~~87~~ 1690	2503--400480	MODIFIED INTAKE RA-48
~~88~~ 1705	2503--120450	CONC 75D STORM SWR 450MM
1715 ~~89~~ 1710	2422--200450	UNCL TEMP STORM SWR 450MM
~~70~~ 1695	2503--140375	CONC 100D STORM SWR 375MM
~~71~~ 1700	2503--120375	CONC 75D STORM SWR 375MM
		Refer to Tab 104-5A and 104-5B on sheet C.07 for storm sewer details

09-27-94 203-1

Plan and profile sheets included in the project are for the purpose of alignment, location and specific directions for the work to be performed under this contract. Irrelevant data on these sheets is not to be considered a part of this contract.

04-03-01 203-2

During construction of this project, the contractor will be required to coordinate his operations with those of other contractors working within the same area. Other work in progress during the same period of the time will include construction of the following projects:

Project	Type of Work
IM-235-2(304)7--13-77	Cottage Grove Bridge
IM-235-2(306)7--13-77	MLK Bridge
BRFIM-235-2(320)9--05-77	3rd St. Bridge
BRFIM-235-2(321)9--05-77	2nd St. Bridge
IM-235-2(305)7--13-77	Grade & Pave (Cottage Grove and MLK)
IM-235-2(442)7--13-77	24th St. San. Sewer Project
BRFIM-235-2(322)9--05-77	Des Moines River Bridge
IM-235-2(326)9--13-77	E 6th St. Bridge
IM-235-2(344)11--13-77	UP RR Bridge
BRFIM-235-2(347)11--05-77	21 st St. Bridge
IM-235-2(460)8--13-77	San. Sewer at School St.
IM-235-2(456)12--13-77	San. Sewer Project
IM-235-2(463)11--13-77	San. Sewer Project
IM-235-2(330)9--13-77	E 9th St. Bridge
IM-235-2(458)10--13-77	San/St. Sew E 12th to E 5th, north side
IM-235-2(468)1--13-77	Bridge Fencing
IM-235-2(472)7--13-77	San. Sewer near Easton
IM-235-2(262)10--13-77	San. Sewer near East High School
IM-235-2(474)13--13-77	Water main relocation at Washington St.
IM-235-2(351)11--13-77	Noise Wall from Easton Blvd. to Guthrie Ave.
Guthrie Ave. Traffic	Signal Contractor

07-15-97 203-4

The contractor is encouraged to take full advantage of specification 1105.15 - Value Engineering Incentive Proposal. A pamphlet and conceptual proposal form will be available at the preconstruction conference.

09-27-94 204-2

All holes resulting from operations of the contractor, including removal of guardrail posts, fence posts, utility poles, or foundation studies, shall be filled and consolidated to finished grade as directed by the engineer to prevent future settlement. The voids shall be filled as soon as practical - preferably the day created and not later than the following day. Any portion of the right-of-way or project limits (including borrow areas and operation sites) disturbed by any such operations shall be restored to an acceptable condition. This operation shall be considered incidental to other bid items in project.

09-27-94 212-1

Sounding and test boring data shown on plans were accumulated for designing and estimating purposes. Their appearance on the plan does not constitute a guarantee that conditions other than those indicated will not be encountered.

10-02-01 213-1

It shall be the contractor's responsibility to provide waste areas or disposal sites for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project. These areas shall not impact wetlands or "Waters Of The U.S." No payment for overhaul will be allowed for material hauled to these sites. No material shall be placed within the right-of-way, unless specifically stated in the plans or approved by the engineer.

09-27-94 213-3

All borrow areas, stockpile areas, haul roads and areas used for equipment on this project will require subsoil tillage to an average depth of 0.4 meters to 0.5 meters prior to placement of topsoil and/or stabilizing crop seeding. Such tillage shall be accomplished on maximum of one meter centers and at right angles to the finished slope of the borrow.

Equipment used to accomplish the tillage shall be equipped with an arrowhead-type shoe so as to provide lateral displacement and limit the movement of the subsoil to the surface. It shall be approved by the Engineer for the use intended. This work will be considered incidental to other work on the project and no payment will be allowed.

It is intended that following subsoil tillage, the area remains in a "loosened" condition. Additional compaction or the operation of heavy equipment, other than required for topsoil placement and shaping shall not be allowed on areas which have received subsoil tillage.

10-02-01 213-7

Unless otherwise directed or authorized, all hot mix asphalt and other bituminous materials which are not specifically addressed or described in the plans shall become the property of the contractor.

The contractor, in accordance with current rules and regulations of the Iowa Department of Natural Resources, may:

1. With the approval of the Engineer, blend or otherwise process the material for use with shoulder or special backfill aggregate, for use on the project.
2. With the approval of the Engineer, place with material in areas designated by the Engineer as Soil Aggregate Subbase without extra charge.
3. Remove the material from the project and stockpile for the contractor's future use.

09-27-94 221-3

Estimated quantity for new concrete pavement includes all integral curb, all street returns and special areas of repairs to connecting pavements.

09-27-94 221-4

In order to avoid any unnecessary surface breaks or premature spalling, the contractor is cautioned to exercise extreme care when performing any of the necessary saw cutting operations for the proposed pavement removal.

12-08-95 222-1

Special care shall be taken when forming at intersections so that the profiles and elevations shown on the cross sections, street return profile sheets, and staking diagram sheets are obtained. Short lengths of forms or flexible forms may be necessary at these locations.

09-27-94 222-2

To obtain the correct form grades at low points where intakes are located, the contractor must exercise extreme care when paving full width pavements. This may require pouring one half of the pavement at a time or other methods approved by the engineer.

09-27-94 232-5

The contractor shall not disturb desirable grass areas and desirable trees outside the construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service area(s) will be subject to the approval of the resident engineer.

09-27-94 232-8

The top 150 millimeters of the disturbed areas shall be free of rock and debris and shall be suitable for the establishment of vegetation, subject to the approval of the Engineer.

10-27-98 213-4

The contractor shall apply necessary moisture to the construction area and haul roads to prevent the spread of dust. Refer to Article 1107.07 of the current Standard Specifications for additional details.

10-28-97 232-10

The contractor is expected to have materials, equipment, and labor available on a daily basis to install and maintain erosion control features on the project. This may involve seeding, silt fence, rock ditch checks, silt basins, or silt dikes.

07-15-97 241-2

Where indicated on the plans or when directed by the Engineer, existing sewer and drainage pipes which are to be abandoned in place shall be completely blocked with permanent bulkheads composed of either class X concrete or brick masonry. Salvaged brick may be used provided they are sound and meet the approval of the Engineer. This work shall be considered as incidental work and the cost of such blocking of abandoned sewers and drainage pipes shall be considered to be included in the contract price for other items.

09-27-94 251-1

The contractor shall be responsible to maintain access to individual properties during construction.

Relocated access shall be completed to individual properties prior to removal of existing access.

If the permanent access cannot be completed prior to removal of the existing access, the contractor shall provide and maintain an alternate access. Temporary Granular Surfacing will be paid for as a contract item or by extra work.

09-27-94 251-2

The contractor is hereby notified that removal of any existing traffic markers, warning devices or guardrail barriers shall be scheduled subject to the approval of the Engineer. The contractor may be required to place temporary warning devices at certain locations where replacement features are not installed the same day during which any such removals take place.

10-02-01 254-1

An incident management plan, provided by the District Office, will be discussed at the pre-construction conference.

09-21-99 262-3

BEFORE YOU DIG:
IOWA 1-CALL# 1-800-292-8989

07-15-97 203-6

All the right-of-way for this project has been acquired in accordance with Standard Specification 1104.09, except the parcels listed below. The Contractor shall contact the Project Engineer prior to entering these properties to verify that acquisition has been completed.

Parcel No.	Station to Station	Reason Not Yet Available	Expected Date of Physical Occupancy
117	570+07 to 573+00	In Condemnation	12/01/02
427	27149+33 to 27149+37	In Condemnation	5/31/02

SN-1

When removal of the contaminated lead soil the area needs to be backfilled with suitable class 10 material within the same day or as directed by the engineer.

SN-2

Bridge contractor will not be permitted to drive piling in the area of East 21st. bridge (Proj. No. IM-235-2(472)7--13-77) until the existing storm sewer has been abandon.

SN-3

Soil Nail Wall #5620 between East 9th St. and East 12th St. (north side) can not be constructed until proposed sanitary sewer (Proj. No. IM-235-2(458)10--13-77) along Maple St. has been completed.

TABULATION OF CHAIN LINK FENCE REMOVAL

CLR-1

STATION TO STATION		LENGTH M	REMARKS
29048+38.831-21.212m Lt.	29048+53.315-7.698m Lt.	21.5	(1)
29048+40.837-20.356m Rt.	29048+51.964-7.583m Rt.	19.0	(1)
29049+40.665-8.918m Rt.	29049+43.460-23.591m Rt.	15.7	(1)
29049+40.161-7.821m Lt.	29049+47.588-22.656m Lt.	18.6	(1)
29048+06.766-12.63m Lt.	29048+24.249-54.42m Lt.	72.6	(1)(2)
575+94.745-39.664m Lt.	576+12.973-13.197m Lt.	54.4	(1)
576+10.968-42.658m Lt.	576+17.593-20.762m Lt.	24.3	(1)
576+59.226-49.582m Lt.	576+62.055-24.206m Lt.	25.5	(1)
576+73.283-50.675m Lt.	576+80.770-27.715m Lt.	28.5	(1)
576+92.258-35.712m Lt.	576+93.752-13.264m Lt.	21.9	(1)
577+24.386-53.036m Lt.	577+24.928-31.742m Lt.	21.3	(1)
577+40.329-53.369m Lt.	577+40.106-14.517m Lt.	38.9	(1)
577+86.341-53.473m Lt.	577+92.260-43.307m Lt.	16.2	(1)
577+89.102-31.932m Lt.	578+01.547-53.886m Lt.	74.8	(1)
578+16.537-54.70m Lt.	578+27.720-19.692m Lt.	56.2	(1)
578+32.293-54.361m Lt.	578+32.760-32.361m Lt.	22.3	(1)
578+47.502-54.263m Lt.	578+46.929-33.330m Lt.	20.9	(1)
578+62.660-54.031m Lt.	578+62.954-33.516m Lt.	20.5	(1)
578+77.870-54.377m Lt.	578+77.780-33.657m Lt.	20.7	(1)
578+93.266-23.211m Lt.	579+08.349-54.308m Lt.	61.8	(1)
579+38.763-54.492m Lt.	579+40.562-32.710m Lt.	22.4	(1)
579+99.895-54.749m Lt.	580+02.840-30.478m Lt.	27.5	(1)(3)
580+14.272-40.652m Lt.	580+14.402-15.549m Lt.	25.1	(1)
580+30.129-54.865m Lt.	580+29.831-19.280m Lt.	35.6	(1)
580+60.590-54.645m Lt.	580+75.661-38.101m Lt.	88.9	(1)
581+05.037-55.587m Lt.	581+19.412-56.185m Lt.	95.0	(1)
581+23.877-21.427m Lt.	581+33.688-56.780m Lt.	56.7	(1)
581+39.731-17.080m Lt.	581+48.325-56.758m Lt.	46.9	(1)
581+62.252-58.603m Lt.	581+65.421-19.092m Lt.	39.6	(1)
581+70.278-19.857m Lt.	581+77.250-60.720m Lt.	50.3	(1)
581+93.216-41.077m Lt.	581+95.365-22.132m Lt.	19.1	(1)
582+00.635-22.605m Lt.	582+05.737-63.290m Lt.	49.4	(1)
574+49.750-10.164m Lt.	578+17.494-1.513m Lt.	379.8	(1)
578+36.992-1.068m Lt.	582+42.179-15.008m Lt.	406.8	(1)
572+06.414-42.664 Lt.	572+31.050-14.239m Lt.	362.9	(1)
572+56.299-7.696m Rt.	573+33.231-29.859m Lt.	217.3	(1)

(1) To become the property of the contractor.
(2) Woven wire fence.
(3) Wood fence.

TABULATION OF SILT FENCES FOR DITCH CHECKS

100-18
09-27-94

LOCATION STATION	SIDE	m	REMARKS
575+15	Lt.	18.2	
575+25	Lt.	18.2	
576+65	Lt.	13.7	
577+60	Lt.	23.5	
578+80	Lt.	25.3	
580+00	Lt.	25.3	
581+20	Lt.	24.1	
582+40	Lt.	18.9	

REMOVAL OF CONCRETE DRIVES

110-8
09-27-94

LOCATION Station	Side	AREA m^2	REMARKS
576+15.557-4.158m	Lt.	8.8	
576+32.105-4.951m		17.4	
576+92.153-11.454m		7.5	
577+07.859-12.323m		8.8	
577+74.716-35.006m		13.4	
577+82.225-38.318m		23.9	
578+14.608-13.159m		8.0	
578+30.223-13.195m		7.1	
578+91.898-13.364m		7.3	
579+21.916-13.470m		8.3	
579+37.263-13.524m		7.5	
579+53.742-13.639m		16.6	
580+12.175-13.674m		7.0	
580+25.622-13.722m		7.0	
580+45.455-13.740		11.8	
580+73.855-13.981m		7.5	
581+07.319-14.342m		6.9	
581+22.526-14.890m		8.7	
581+98.361-20.995m		8.2	
582+21.799-24.090m		10.8	
582+52.686-28.946m		7.9	
582+59.060-31.602m		7.9	
582+67.509-31.744m		7.7	
582+73.802-34.502m		7.6	
582+96.314-37.924m		8.6	
583+02.525-40.856m		8.6	
583+98.298-66.414m		8.1	
584+04.499-69.840m		7.9	
584+42.129-66.992m		8.2	
584+57.686-71.723m		14.5	
584+63.854-75.150m	Lt.	14.1	

LOCATIONS OF ROAD CLOSURE BARRICADES

102-4
10-03-00

Refer to Standard Road Plan RE-3A, RE-3B

No.	LOCATION Station	STANDARD ROAD PLAN	(W) meters	REMARKS
1	30950+60.000	RE-3B	7.8	(1) MAPLE STREET
1	574+30-35.5 m Lt.	RE-3B	7.6	(1) TICHENOR STREET-SOUTH
1	574+49.8-25.6 m Lt.	RE-3B	7.6	(1) E. 21ST STREET
1	577+78.7-53.8 m Lt.	RE-3B	7.7	(1) WASHING STREET
1	584+35.6-71.2 m Lt.	RE-3B	7.6	(1) TICHENOR STREET-NORTH
	(1) See sheets D.02, D.03, D.05 and E.01 for locations.			

REMOVAL OF PAVEMENT

110-1
04-27-99

* Not a bid item.

STATION TO STATION	PAVEMENT TYPE	AREA m^2	SAW CUT m*	REMARKS
572+78.764-12.194m Lt. to 576+33.161-10.636m Lt.	PCC	4092.5	33.6	260 mm thick- EASTON BLVD. RAMPS
571+77.232-29.431m Lt.	ACC/PCC	6503.2		parking lot, 2001 Easton
571+72.021-61.781m Lt.	PCC	694.7		bldg. floor
572+95.080-44.613m Lt.	ACC/PCC	464.5	15.8	parking lot, 2025 Easton
572+88.363-40.857m Lt.	PCC	119.7		bldg. floor
~~549+14.754-57.505m Lt. to 549+98.282-55.836m Lt.~~	~~PCC~~	~~592.1~~		~~260 mm thick~~ - OMIT
574+49.849-25.645m Lt. to 589+35.610-71.220m Lt.	PCC	8036.8	23.0	260 mm thick- TICHENOR STREET
577+65.01-20.576m Rt. to 577+81.54-9.154m Rt.	PCC	45.0		260 mm thick- RED BRIDGE PIER PAD
30950+62.686 to 30952+20.00	PCC	541.6	176.5	260 mm thick- MAPLE STREET
549+14.73 53.7m LT to 549+89.23 51.8m LT	PCC	536.1		260 mm thick- MAPLE STREET

TABULATION OF SILT FENCES

100-17
09-27-94

LOCATION STATION TO STATION		SIDE	LENGTH m	REMARKS
571+00	571+20	Lt.	26	
571+20	571+60	Lt.	46	
571+60	571+80	Lt.	26	
571+80	572+60	Lt.	86	
572+60	572+80	Lt.	26	
572+80	573+00	Lt.	26	
573+00	573+20	Lt.	26	
573+60	574+00	Lt.	46	

TABULATION OF SIDEWALK REMOVAL

110-5
09-27-94

STATION TO STATION		AREA m^2	REMARKS
549+14.735	550+51.52	132.5	Sawcut=1.24 m
65.37m Lt.	64.2m Lt		
573+99.611	574+38.183	50.68	
15.91m Lt.	34.40m Lt.		
574+51.322	577+41.371	375.93	
39.09m Lt.	13.536m Lt.		
577+55.136	577+60.967	7.07	
13.691m Lt.	13.391m Lt.		
577+71.969	577+71.856	18.06	Sawcut=1.21 m
54.06m Lt.	38.27m Lt.		
577+71.857	577+71.791	27.72	
32.29m Lt.	13.19m Lt.		
577+85.444	578+62.008	147.97	Sawcut=1.16 m
53.779m Lt.	13.914m Lt.		
578+73.119	579+77.548	123.85	
14.131m Lt.	14.274m Lt.		
579+87.402	582+57.456	326.71	
14.292m Lt.	30.456m Lt.		
582+54.125	583+30.806	96.51	
31.372m Lt.	48.572m Lt.		
582+60.953	582+72.236	14.10	
31.098m Lt.	33.383m Lt.		
582+75.424	583+00.875	32.14	
34.082m Lt.	39.566m Lt.		
583+04.242	583+24.718	25.93	
40.359m Lt.	45.481m Lt.		
583+28.934	583+40.088	14.63	
46.663m Lt.	49.512m Lt.		
583+35.006	583+46.092	14.63	
49.695m Lt.	52.730m Lt.		
583+61.391	586+25.378	173.13	
41.702m Lt.	83.609m Lt.		
583+67.393	584+40.058	91.34	
45.034m Lt.	67.278m Lt.		
584+43.696	584+54.067	13.22	
68.403m Lt.	71.533m Lt.		
584+60.603	585+31.578	55.53	
73.525m Lt.	87.035m Lt.		

TABULATION OF TEMPORARY CONCRETE BARRIER

TBR-1

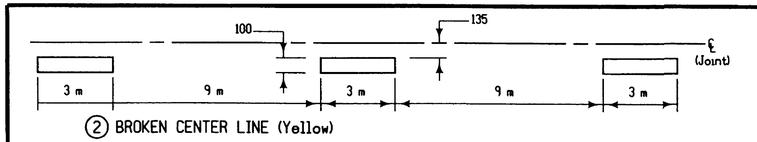
Refer to Standard Road Plan RE-71(1), RE-71(2), RE-75.

NO.	STATION TO STATION		TYPE	LENGTH WITH FOOTING m	LENGTH WITHOUT FOOTING m	REMARKS
1	570+99.584 -	580+63.660-	F	---	979.2	(1)
	14.669 m Lt.	1.525 m Rt.				

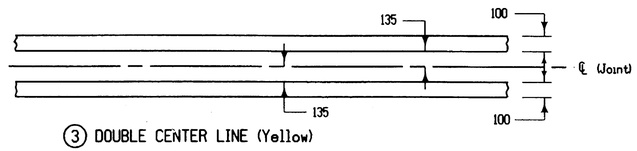
(1) Contractor to remove curb from sta. 580+53.774 - 10.797m Lt to sta. 580+56.168 - 2.931 m Lt. This work is to be considered incidental to the Temp. Barrier Rail. See sheets J.03 thru J.08 for location.

Dimensions in mm unless noted.

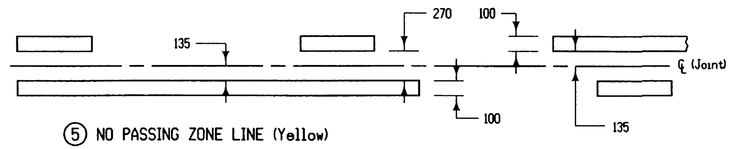
9001
04-03-01



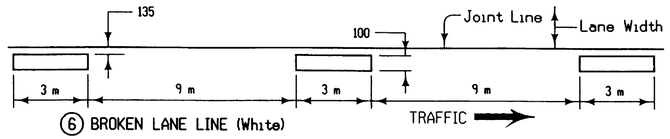
② BROKEN CENTER LINE (Yellow)



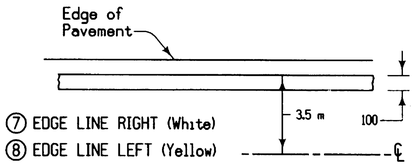
③ DOUBLE CENTER LINE (Yellow)



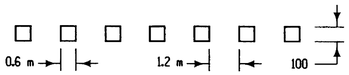
⑤ NO PASSING ZONE LINE (Yellow)



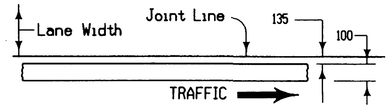
⑥ BROKEN LANE LINE (White)



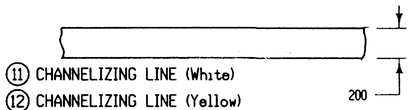
⑦ EDGE LINE RIGHT (White)
⑧ EDGE LINE LEFT (Yellow)



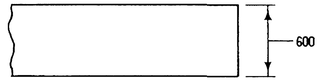
⑨ DOTTED LINE (White)



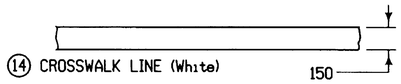
⑩ SOLID LANE LINE (White)



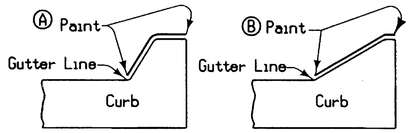
⑪ CHANNELIZING LINE (White)
⑫ CHANNELIZING LINE (Yellow)



⑬ STOP LINE (White)



⑭ CROSSWALK LINE (White)



Ⓐ Paint 300 mm width for 150 mm Standard Curb,
Ⓑ Paint 360 mm width for 150 mm Sloped Curb.

⑮ YELLOW CURB
⑯ WHITE CURB

STANDARD TYPES OF PAVEMENT MARKINGS

TABULATION OF PAVEMENT MARKINGS

108-22
10-31-95

② Broken Center Line (Yellow) ③ Double Center Line (Yellow) ⑤ No-Passing Zone Line (Yellow) ⑥ Broken Lane Line (White) ⑦ Edge Line Right (White) ⑧ Edge Line Left (Yellow) ⑨ Dotted Line (White) ⑩ Solid Lane Line (White) ⑪ Channelizing Line (White) ⑫ Channelizing Line (Yellow) ⑬ Stop Line (White) ⑭ Crosswalk Line (White) ⑮ Yellow Curb ⑯ White Curb

LOCATION				LENGTH (m)														
ROAD IDENTIFICATION	STATION TO STATION	SIDE L	SIDE R	②	③	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	REMARKS
Existing I-235 (WBL)	570+99.379 - 14.311 m Lt. to 572+97.671 - 20.708 m Rt.	X						202.8										
	LENGTH SUBTOTALS							202.8										
	QUANTITY FACTORS			.25	2	1	.25	1	1	.33	1	2	2	6	1.5			
	TOTALS							202.8										

TABULATION OF REMOVALS LIGHT POLES, LUMINAIRES AND CONC. FOOTINGS

LP-1

NO.	LOCATION STATION	OFFSET m	FOOTINGS	REMARKS
1	573+30.739	38.503-Lt.	X	(1)
2	573+43.187	2.259-Lt.	X	(1)
3	573+57.287	18.814-Lt.	X	(1)
4	573+83.917	0.350-Lt.	X	(1)
5	574+38.359	2.798-Rt.	X	(1)
6	574+97.716	10.416-Rt.	X	(1)
7	575+56.013	10.385-Rt.	X	(1)
8	575+91.279	9.379-Rt.	X	(1)
9	576+29.427	7.409-Rt.	X	(1)

(1) To become the property of the contractor.

TABULATION OF SAFETY CLOSURES

108-13A
10-28-97

Refer to Section 2518 of the Standard Specifications

STATION	CLOSURE TYPE Road Qty.	CLOSURE TYPE Hazard Qty.	REMARKS
30951+75	1		(1)
30951+30	1		(1)(2)
30952+40	1		(1)
33170+16		1	(3)(5)
33171+20		1	(3)(5)
33172+00		1	(4)(6)
33172+65		1	(4)(6)
33173+50		1	(4)(7)
574+30		1	(4)(7)
572+90.59-72.06m Lt.	1		(4)
572+79.80-11.75m Rt.	1		(4)

(1) See Sheet E.01 for locations
(2) To be placed across E11th St.
(3) See Sheet D.01 for location.
(4) See Sheet D.02 for locations
(5) Univ 'A' Bridge
(6) E21st St. Bridge
(7) Easton Blvd Bridge

REMOVAL OF EXISTING STRUCTURES

110-2
09-27-94

LOCATION	DESCRIPTION	DISPOSAL
575+17.861-34.528 m Rt.	Footings for Over-Head sign truss	213-1 (1)
572+67.29-14.6 M Lt.	2.7 m X 1.49 m Conc Slab	213-1
572+79.964-5.13 m Lt.	intake	213-1
573+74.95-8.37 m Lt.	intake	213-1
575+05.88-11.72 m Lt.	intake	213-1

(1) Overhead sign truss and signs to become the property of the contractor.

REMOVE BEAM GUARDRAIL

RBG-1

① Lane(s) to which the installation is adjacent.

No.	LOCATION ① Direction of Traffic	Station	Side	STEEL BEAM GUARDRAIL Remove m	REMARKS
1	WBL	33168+15.547	Lt	128.5	Univ. 'A', 213-1
2	WBL	33171+04.962	Lt	53.8	Univ. 'A', 213-1
3	WBL	33172+54.797	Lt	21.7	Univ. 'A', 213-1
4	WBL	575+31.645	Med	54.3	I-235, 213-1
5	WBL	577+74.702	Lt	123.5	I-235, 213-1
6	WBL	574+49.956	Lt	51.0	Along Tichenor St.

POLLUTION PREVENTION PLAN

110-12A
09-27-94

The prime contractor shall be responsible for compliance and implementation of the Pollution Prevention Plan (PPP) for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

1. SITE DESCRIPTION

This Pollution Prevention Plan (PPP) is for the grading of Relocated WBL of I-235 from north of University Ave north to just south of Guthrie Ave.

This PPP covers approximately 553 hectares with an estimated 282 hectares being disturbed. The portion of this PPP covered by this contract has 10 Hectares disturbed (ML) and and 12.5 Hectares disturbed (for borrow area).

The PPP is located in an area of one soil association Clarion-Nicollet-Webster. The estimated average SCS runoff curve number for this PPP after completion will be 58.

Refer to the following grading plans (Polk County IM-NHS-235-2(340)11--03-77 for locations of typical slopes, ditch grades, and major structural and non-structural controls. A copy of these plans will be on file at the project engineer's office. Runoff from this will flow into various unnamed ditches and waterways which flow into the Des Moines River and Deans Lake.

POTENTIAL SOURCES OF POLLUTION:
Site sources of pollution generated as a result of this work relate to silts and sediment which may be transported as a result of a storm event. However, this PPP provides conveyance for other (non-project related) operations. These other operations have storm water runoff, the regulation of which is beyond the control of this PPP. Potentially this runoff can contain various pollutants related to site-specific land uses. Examples are:

Rural Agricultural Activities:
Runoff from agricultural land use can potentially contain chemicals including herbicides, pesticides, fungicides. and fertilizers.

Commercial and Industrial Activities:
Runoff from commercial, industrial, and commerce land use may contain constituents associated with the specific operation. Such operations are subject to potential leaks and spills which could be commingled with run-off from the facility. Pollutants associated with commercial and industrial activities are not readily available since they are typically proprietary.

2. CONTROLS

Prior to beginning grading, excavation or clearing and grubbing operations, silt fence shall be placed by the prime contractor along the perimeter of the disturbed areas at locations in which runoff can move offsite. Vegetation in areas not needed for construction shall be preserved. As areas reach their final grade, additional silt fences, intercepting ditches, letdowns, bridge end drains, and earth dikes shall be installed as specified in the plans and/or as required by the project engineer. This will include using silt fence as ditch checks and to protect intakes. Temporary stabilizing seeding shall be completed as soon as practicable after completion of the final grading. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. No more than 70,000 square meters of exposed erodible area is allowed in any one grading spread without permission of the project engineer. Other stabilizing methods shall be used outside the seeding period.

This work shall be done in accordance with Section 2525 of the Standard Specification If the work involved is not applicable to any contract items, the work shall be paid for according to Article 1109.03 paragraph B.

As the work progresses, additional erosion control items such as silt fence and silt fence for ditch checks and other appropriate measures shall be installed by the grading contractor as determined by the engineer after field investigation. The construction will be completed with the establishment of permanent perennial vegetation of all disturbed areas by the erosion control contractor.

POLLUTION PREVENTION PLAN

110-12A
09-27-94

3. OTHER CONTROLS

Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

APPROVED STATE OR LOCAL PLANS:
During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

4. MAINTENANCE

The contractor is required to maintain all temporary erosion control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. Cleaning of silt control devices shall begin when the features have lost 50% of their capacity.

5. INSPECTIONS

Inspections will be made by department personnel every seven calendar days and after each rain event that is 13 mm or greater. The findings of this inspection shall be recorded in the project diary. This PPP may be revised based on the findings of the inspection. The contractor shall implement all revisions. All corrective actions shall be completed within 3 calender days of the inspection.

6. NON-STORM DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains), slope drains and bridge end drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone or erosion stone.

TABULATION OF SPECIAL EVENTS

102-15
09-27-94

EVENT	LOCATION	DATE/S
World Pork Expo	Des Moines-Fairgrounds	June 23-24,2002
Drake Relays	Des Moines	April 26-27,2002
Nat'l. Balloon Classic	Indianola	August 8-18,2002
Iowa State Fair	Des Moines-Fairgrounds	August 8-19,2002
Iowa High School Wrestling Tournaments	Des Moines Vets Auditorium	February 25-28,2002 February 27-March 1,2003
Girls State Basketball Tournament	Des Moines Vets Auditorium	March 4-8,2002 March 10-15,2003
Boys State Basketball Tournament	Des Moines Vets Auditorium	March 11-16,2002 March 17-22,2003
IOWA STATE FOOTBALL 2002 Oct. 5 Oct. 12 Nov. 2 Nov. 23	UNIVERSITY OF IOWA FOOTBALL 2002 Sept. 14 Sept. 21 Oct. 5 Oct. 12 Nov. 2 Nov. 9	

LIST OF INTAKES AND UTILITY ACCESSES

104-5A
09-27-94

NUMBER	LOCATION	TYPE OR STANDARD ROAD PLAN	FORM GRADE Elev.	BOTTOM WELL Elev.	NOTE
88001	577+73.9 (45.3m LT)	RA-49 mod	246.298	243.445	4.0mx1.2m
88002	576+60.0 (37.0m LT)	RA-61	245.490	243.960	
88003	575+74.3 (28.1m LT)	RA-49 mod	245.389	243.155	4.0mx1.2m
88004	575+20.0 (32.3m LT)	RA-61 mod	245.088	243.085	4.0mx1.2m
88005	574+89.0 (52.7m LT)	RA-49	245.882	243.420	
88006	574+14.6 (29.0m LT)	RA-49 mod	246.273	242.925	4.0mx1.2m
88007	573+96.8 (19.4m LT)	RA-49 mod	245.106	242.895	4.29mx4.29m (1)
88008	573+11.7 (46.3m LT)	RA-49 mod	246.485	242.775	4.1mx2.7m
88009	573+08.4 (73.0m RT)	RA-49 mod	246.134	242.550	2.7mx2.7m
~~88010~~	~~573+10.7 (78.5m RT)~~	~~RA-49 mod~~	~~245.696~~	~~242.590~~	~~1.6mx1.6m~~
88011	573+07.7 (46.9m LT)	RA-49 mod	246.485	242.640	2.7mx2.7m
88012	573+05.0 (73.3m RT)	RA-49 mod	246.134	242.560	2.7mx2.7m
	(1) Requires one RA-66A Type 3B Grate				
88604	35073+40.7 (7.36m RT)	RA-49	246.012	241.536	
88605	35074+03.3 (6.80m RT)	RA-40	244.698	243.109	(1)
88606	35074+27.0 (6.80m RT)	RA-40	244.601	243.252	(2)
	(1) Construct to Keyway Elevation (244.348)				
	(2) Construct to Keyway Elevation (244.251)				
86414	550+55.486 (62.60m LT)	RA-70	271.698	270.498	2.4m Ext.
86415	549+91.377 (62.30m LT)	RA-70	267.915	2766.715	3.0m Ext.
86416	549.38.251 (65.53m LT)	RA-50	264.684	263.484	
86422	30951+43.631 (3.61m RT)	RA-48 mod	271.90	2270.70	1.7mx1.36m

LIST OF STORM SEWER PIPE

104-5B
09-27-94

LINE NUMBER	LOCATION From	LOCATION To	CLASS "D"	PIPE DIAMETER mm	LENGTH OF LINE m	SLOPE %	FLOW LINES INLET Elevation	FLOW LINES OUTLET Elevation	FLOW LINES OTHER Elevation	GRANULAR BACKFILL Mg	PIPE PROFILE SHEET NO.	NOTE
P-88001	#88001	#88003	RCB	3000x1200	190.80	0.15	243.70	243.41			M.24 & M.25	
P-88002	#88002	Tee in P-88001	100	600	3.00	1.00	244.06	244.04			M.24	
P-88003	#88003	#88004	RCB	3000x1200	51.21	0.15	243.41	243.34			M.23 & M.24	
P-88004	#88004	#88006	RCB	3000x1200	99.97	0.15	243.34	243.18			M.22 & M.23	
P-88005	#88005	Tee in P-88004	100	600	17.68	0.70	243.61	243.49			M.23	
P-88006	#88006	#88007	RCB	3000x1200	17.68	0.15	243.18	243.15			M.23	
P-88007	#88007	#88008	RCB	3000x1200	82.30	0.15	243.15	243.03		474	M.23 & M.25	
P-88008	#88008	#88009	150	1800	116.43	0.15	243.03	242.85			M.22	Jacked pipe
P-88009	#88009	USED EXISTING	100	900	4.27	0.15	242.85	242.84			M.22	
P-88011	#88011	#88012	150	1800	116.43	0.15	243.04	242.86			M.26	Jacked pipe
P-88011a	#88011	#88008	100	1800	1.22	1.00	242.94	242.93			M.22	
P-88012	#88012	#88009	100	1800	1.22	1.00	242.86	242.85			M.22	
P-88504	(2)	#88011	100	1500	32.92	0.20	243.24	243.18			M.22	(2) Existing Utility Access at Sta. 572+76.2 (65.1m Lt.). New Box added.
P-88602	Sta 35073+40.1 -7.36m Rt.	Sta 35073+01.3 -7.36m Rt.	100	450	39.01	0.60	241.60	241.37			M.25	
	(1)	#88005			(3)		245.06	245.05				(1) Existing Utility Access at Sta. 574+88.2 (54.8m Lt.)
												(3) Existing 300 mm pipe. Contractor tie 1.2 m into intake #88005 and remove remaining 51.0 m.
P-88604	#88605	#88604	75	450	61.39	0.50	243.17	242.86			M.27	
P-88605	#88606	#88605	75	450	22.54	0.50	243.31	243.20			M.27	(4) Existing Utility Access at Sta. 577+73.1 (12.0m Lt.)
P-88024	#88001	(4)	UCL	450	31.39	0.60	245.25	245.06			M.25	
P-86414	#86414	#86415	100	375	58.2	6.45	270.555	266.796			M.31	
P-86415	#86415	#86416	75	375	48.2	6.64	266.766	263.565			M.31	
P-86416	#86416	#86417	75	375	21.6	1.24	263.535	263.298			M.31	(5) Existing Utility Intake at Sta. 30951+44.048 (4.8m Lt.)
P-86422	#86422	(5)	100	375	6.52	0.35	270.860	270.837			M.31	

ESTIMATED PROJECT QUANTITIES
100% D.O.T. STORM SEWER COSTS

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
25	2503--400610	INTAKE, RA-61	EACH	1	1.0
26	2503--400615	INTAKE, RA-61 (MODIFIED)	EACH	1	0.0
19	2503--140600	CONCRETE 100D STORM SEWER PIPE 600 MM DIA	M	3.0	21.7
		EXTRA WORK ORDER			
1665	2599-9999116	PRECAST UTILITY ACCESS STRUCTURE	Lump Sum	1.0	$ 3,377.00

ESTIMATED PROJECT QUANTITIES
100% CITY OF DES MOINES STORM SEWER COSTS

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
19	2503--140600	CONCRETE 100D STORM SEWER PIPE 600 MM DIA	M	17.68	21.7
21	2503--141500	CONCRETE 100D STORM SEWER PIPE 1500 MM DIA	M	32.92	29.6
23	2503--400490	INTAKE, RA-49	EACH	1	2.0

ESTIMATED PROJECT QUANTITIES
100% CITY OF DES MOINES SANITARY SEWER COSTS

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
64	2212--100400	PATCH BY COUNT (REPAIR)	EACH	1	1.0
65	2401--205040	RMVL OF UTILITY ACCESS	EACH	1	1.0
66	2504--011000	RMV SAN SWR PIPE 8"/= TO 1000 MM	M	2	1.1
67	2506--100000	FLOWABLE MORTAR	M3	74.12	75.69
68	2599--999901	UNCLASSIFIED SANITARY SEWER 250 MM	M	59	59.13
69	2599--999901	UNCLASSIFIED SANITARY SEWER 300 MM	M	46	47.6
70	2599--999901	UNCLASSIFIED SANITARY SEWER 375 MM	M	8	6.89
71	2599--999901	UTILITY ACCESS, TYPE A	M	9	9.26
72	2599--999901	UTILITY ACCESS, TYPE I	M	3.7	3.56
73	2599--999916	BYPASS PUMPING AS PER PLANS	LS	1	$ 50,000.00
74	2601--101200	SEED + FERTILIZE (URBAN)	HA	1	0.19
63	2212--100200	PATCH FULL DEPTH REPAIR	M2	15	12.80

ESTIMATED PROJECT QUANTITIES
59.2% D.O.T. COSTS and 40.8% CITY OF DES MOINES STORM SEWER COSTS

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
18	2503--140450	CONCRETE 100D STORM SEWER PIPE 450 MM DIA	M	39.01	79.15
20	2503--140900	CONCRETE 100D STORM SEWER PIPE 900 MM DIA	M	4.27	4.27
22	2503--141800	CONCRETE 100D STORM SEWER PIPE 1800 MM DIA	M	2.44	2.44
13	2415--210000	PRECAST CONC BOX CULV. 3000x1200	M	441.96	438.0
49	2599--999901	CONC 150D JACKED STORM SWR 1800 MM	M	232.86	232.2
24	2503--400495	INTAKE, RA-49 (MODIFIED)	EACH	9	5
		EXTRA WORK ORDERS			
1660	2599-9999116	ADDITIONAL MATERIAL CIP MOD RA-49	Lump Sum	1.0	$ 62,201.15

LIST OF INTAKES AND UTILITY ACCESSES

NUMBER	LOCATION	TYPE OR STANDARD ROAD PLAN	DOT COSTS 100%	CITY COST 100%	PARTICIPATION 59.2% DOT/40.8% CITY
88001	577+73.9 (45.3m LT)	RA-49 mod			×
88002	576+60.0 (37.0m LT)	RA-61	×		
88003	575+74.3 (28.1m LT)	RA-49 mod			×
88004	575+20.0 (32.3m LT)	RA-61 mod	×		
88005	574+89.0 (52.7m LT)	RA-49		×	
88006	574+14.6 (29.0m LT)	RA-49 mod			×
88007	573+96.8 (19.4m LT)	RA-49 mod			×
88008	573+11.7 (46.3m LT)	RA-49 mod			×
88009	573+08.4 (73.0m RT)	RA-49 mod			×
~~88010~~	~~573+10.7 (78.5m RT)~~	~~RA-49 mod~~			×
88011	573+07.7 (46.9m LT)	RA-49 mod			×
88012	573+05.0 (73.3m RT)	RA-49 mod			×
	(1) Requires one RA-66A Type 3B Grate				

LIST OF STORM SEWER PIPE

LINE NUMBER	LOCATION From	LOCATION To	CLASS "D"	PIPE DIAMETER mm	LENGTH OF LINE m	DOT COSTS 100%	CITY COST 100%	PARTICIPATION 59.2% DOT 40.8% CITY
P-88001	#88001	#88003	RCB	3000x1200	190.80			190.80
P-88002	#88002	Tee in P-88001	100	600	3.00	3.00		
P-88003	#88003	#88004	RCB	3000x1200	51.21			51.21
P-88004	#88004	#88006	RCB	3000x1200	99.97			99.97
P-88005	#88005	Tee in P-88004	100	600	17.68		17.68	
P-88006	#88006	#88007	RCB	3000x1200	17.68			17.68
P-88007	#88007	#88008	RCB	3000x1200	82.30			82.30
P-88008	#88008	#88009	150	1800	116.43			116.43
P-88009	#88009	USED EXISTING	100	900	4.27			4.27
P-88011	#88011	#88012	150	1800	116.43			116.43
P-88011a	#88011	#88008	100	1800	1.22			1.22
P-88012	#88012	#88009	100	1800	1.22			1.22
P-88504	(2)	#88011	100	1500	32.92		32.92	
P-88602	Sta 35073+40.1 -7.36m Rt.	Sta 35073+01.3 -7.36m Rt.	100	450	39.01			39.01

STA. 33168+65.000
BEGIN PROJECT
UNIVERSITY RAMP A

SAYLOR TWP.
T-79N R-24W
SEC. 36

PROPOSED UNIV RAMP A
BRIDGE OVER UPRR
92.1 m x 7.8 m Continuous
Welded Curved Girder Bridge
15° 38' 53" Skew Lt. Ahead
Design No. 1002

Union Pacific Railroad

Easton Blvd

33169

℄ Univ A

Prop
Ret Wall
#5801

PC Sta 33169+51.166

33170

Proposed
Safety Fence

UAC Guardrail

Existing
WB I-235

33171

STA. 33172+05.500
END CONSTRUCTION
UNIVERSITY RAMP A

33172

PCC Sta 33171+50.000

Proposed
Safety
Fence

569

PC Sta 569+99.865

570

571

572

Existing
EB I-235

℄ I-235

Proposed
Sheet Pile
Wall #5881

STA. 572+08.500
BEGIN CONSTRUCTION
ML I-235

For Removal Information Refer to Sheets U.01-U.07	For Retaining Wall Info. Refer to Sheets V.10-V.34
For Alignment Information Refer to Sheets G.11-G.20	For Storm Sewer Information Refer to Sheets M.19-M.26
	For Bridge Situation Plans Refer to Sheets V.01-V.03

0 METERS 50

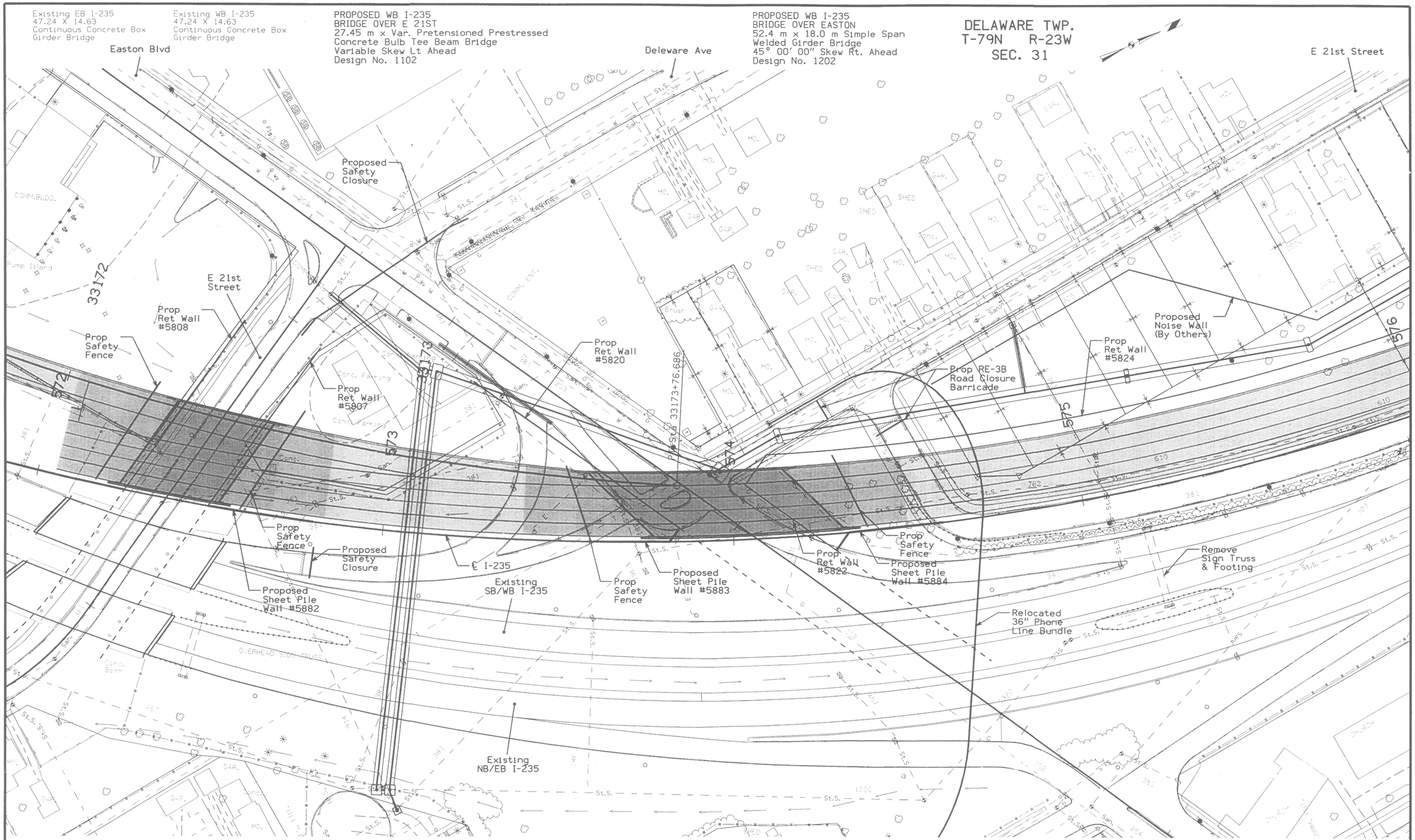
Existing EB I-235
80.47 X 12.19 SKEWED
I-BEAM BRIDGE

Existing WB I-235
82.30 X 11.89 SKEWED
I-BEAM BRIDGE

PLAN SHEET OF I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.01

SYSTEMTIME USERNAME DGNSPEC



For Removal Information Refer to Sheets U.01-U.07	For Retaining Wall Info. Refer to Sheets V.10-V.34	
For Alignment Information Refer to Sheets G.11-G.20	For Storm Sewer Information Refer to Sheets M.19-M.26	For Bridge Situation Plans Refer to Sheets V.01-V.03

0 METERS 50

PLAN SHEET OF I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.02

DELWARE TWP.
T-79N R-23W
SEC. 31

Washington Ave

E 21st Street

Proposed Noise Wall (By Others)

Prop Ret Wall #5824

Prop RE-3B Road Closure Barricade

Proposed Noise Wall (By Others)

576

577

578

579

℄ I-235

Pedestrian Bridge to be removed with (349) project

Existing SB/WB I-235

Existing NB/EB I-235

For Removal Information Refer to Sheets U.01-U.07	For Retaining Wall Info. Refer to Sheets V.10-V.34
For Alignment Information Refer to Sheets G.11-G.20	For Storm Sewer Information Refer to Sheets M.19-M.26

0 METERS 50

PLAN SHEET OF I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.03

SYSTEMTIME USERNAME DGNSPEC

DELWARE TWP.
T-79N R-23W
SEC. 31

E 21st Street

STA. 580+40.000
END PROJECT
ML I-235

Noise Wall
(By Others)

580 581 582 583

℄ I-235

POT Sta 580+83.783

UAC
Sign
Truss

Existing
SB/WB I-235

Existing
NB/EB I-235

For Removal Information
Refer to Sheets U.01-U.07

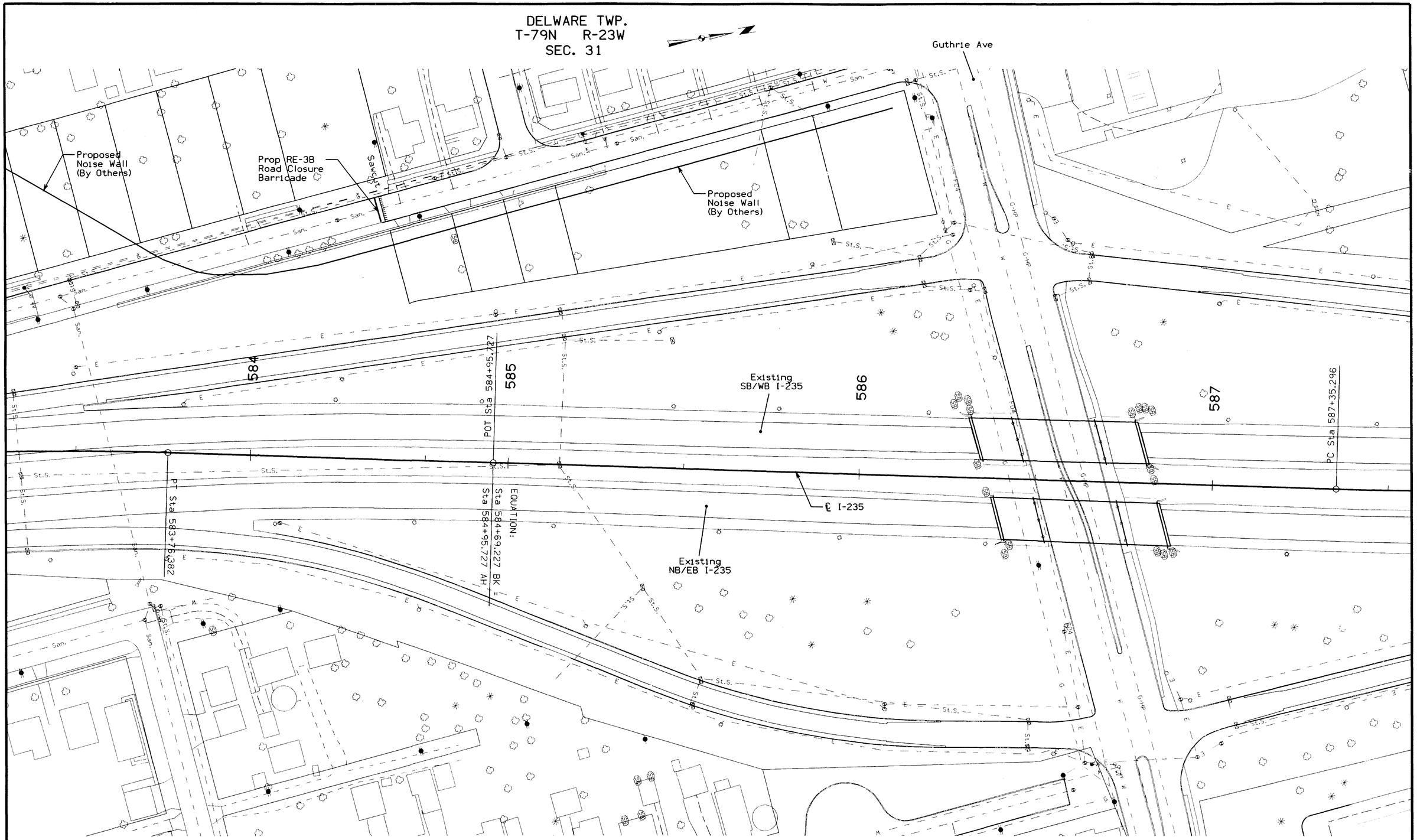
For Alignment Information
Refer to Sheets G.11-G.20

0 METERS 50

PLAN SHEET OF I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.04

SYSTEMTIME USERNAME DGNSPEC

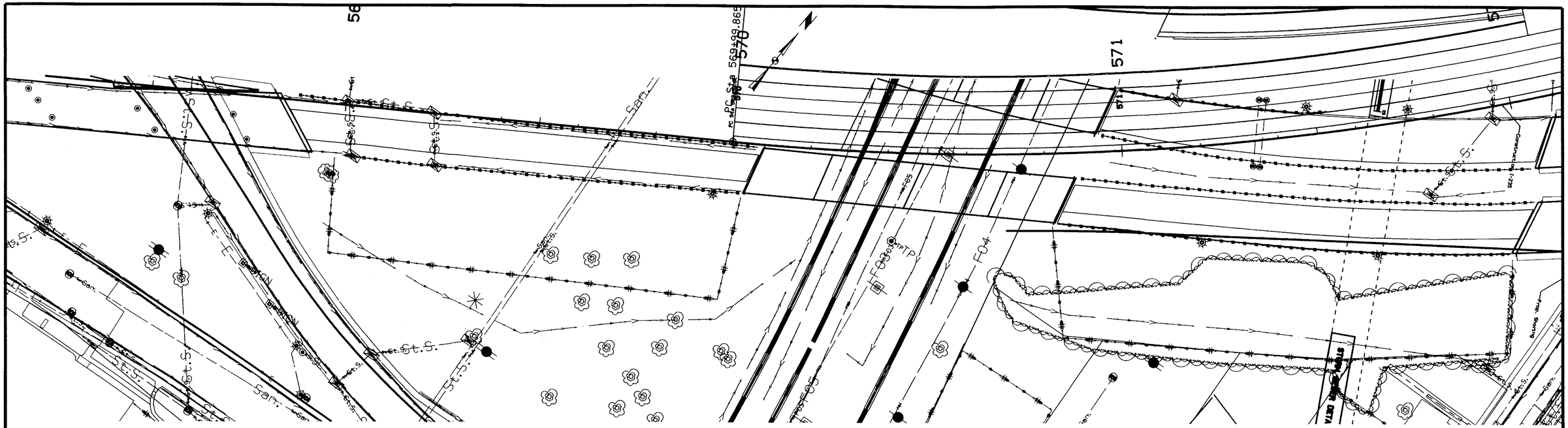


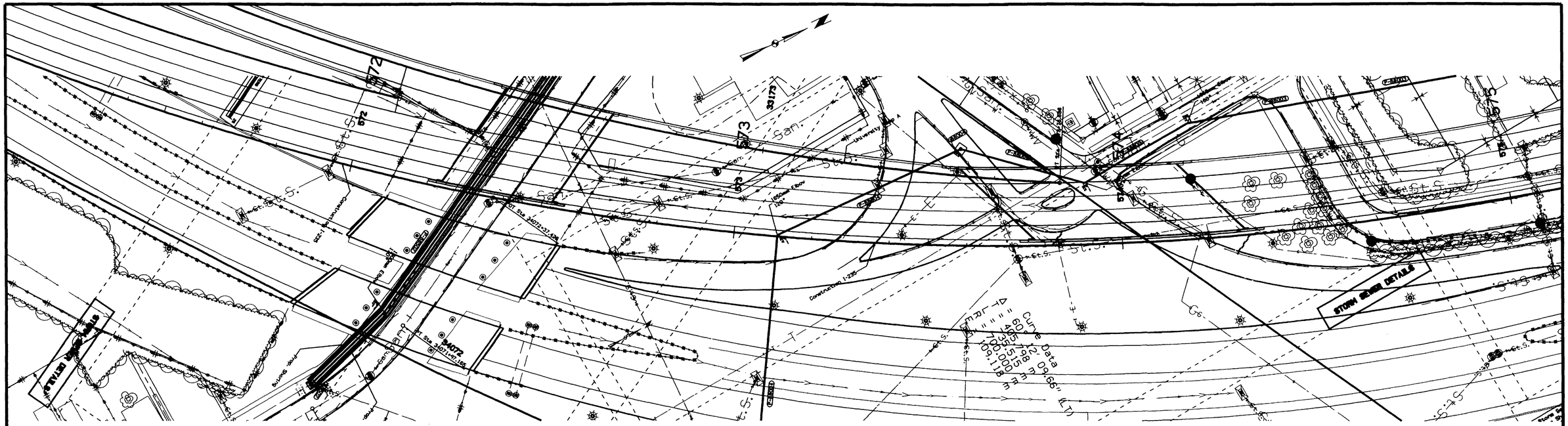
For Removal Information Refer to Sheets U.01-U.07

For Alignment Information Refer to Sheets G.11-G.20

PLAN SHEET OF I-235

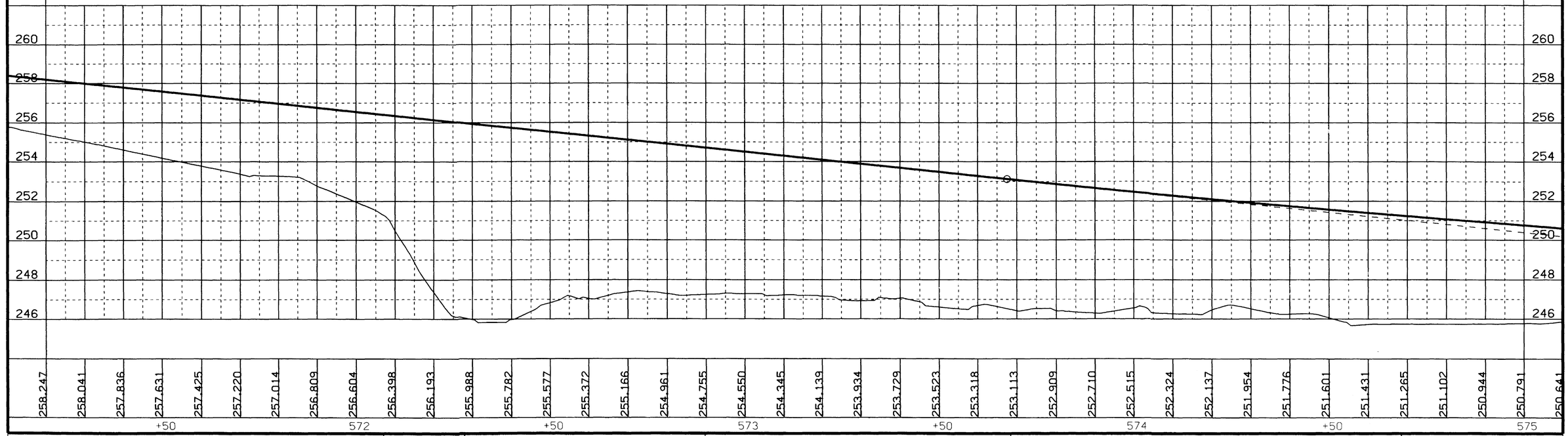
500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.05


569+99.865
570
571
F-E BRIDGE
F-E BRIDGE
F-E BRIDGE



For Bridge Situation Plan
Refer to Sheet No. V.01

PLAN AND PROFILE SHEET OF I-235



500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.07

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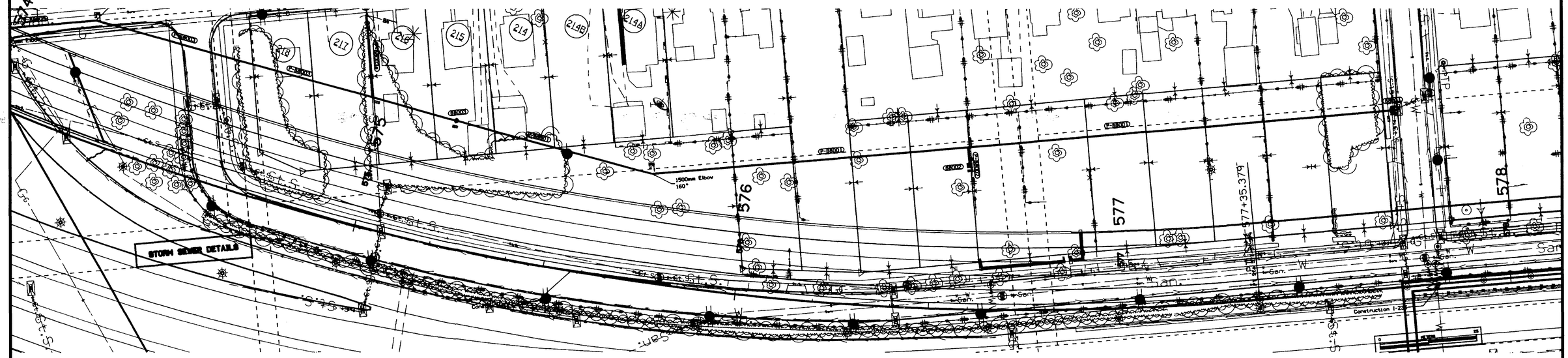
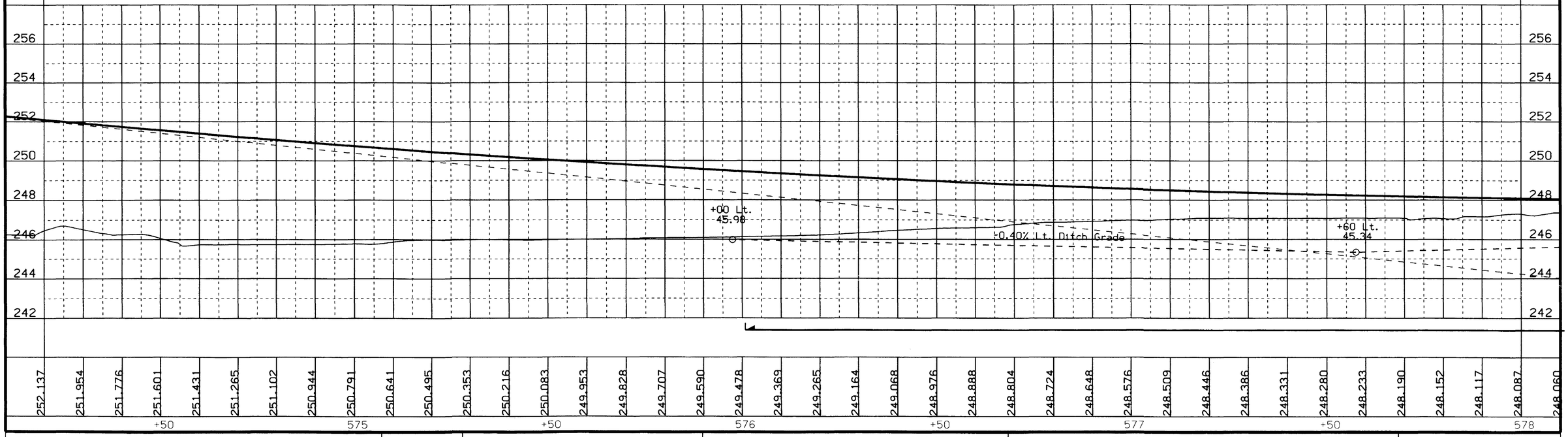


For Bridge Situation Plan
Refer to Sheet No. V.03

0 METERS 50

PLAN AND PROFILE SHEET OF I-235



500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.08

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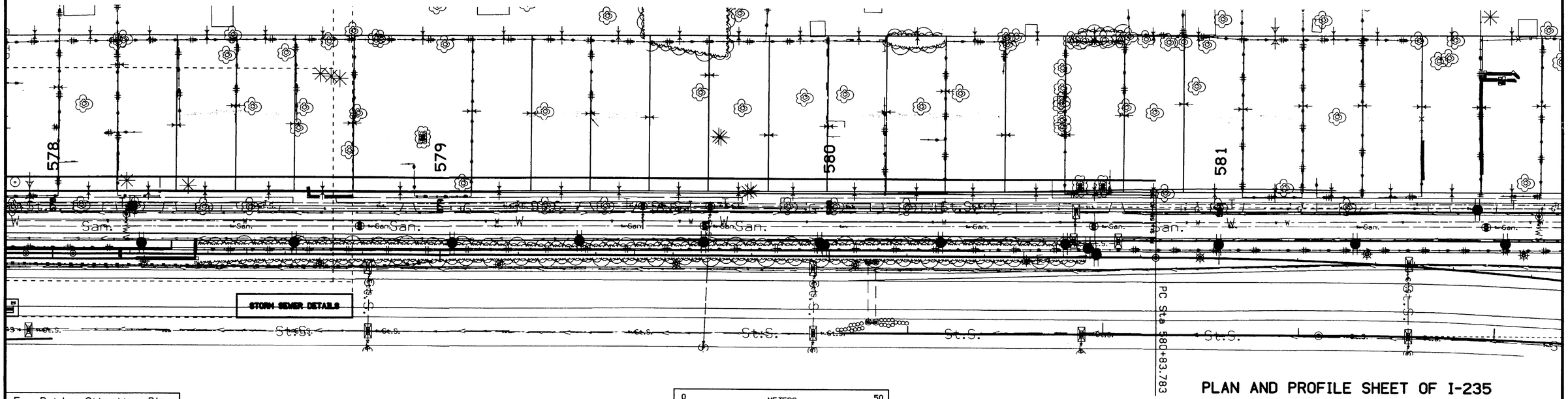
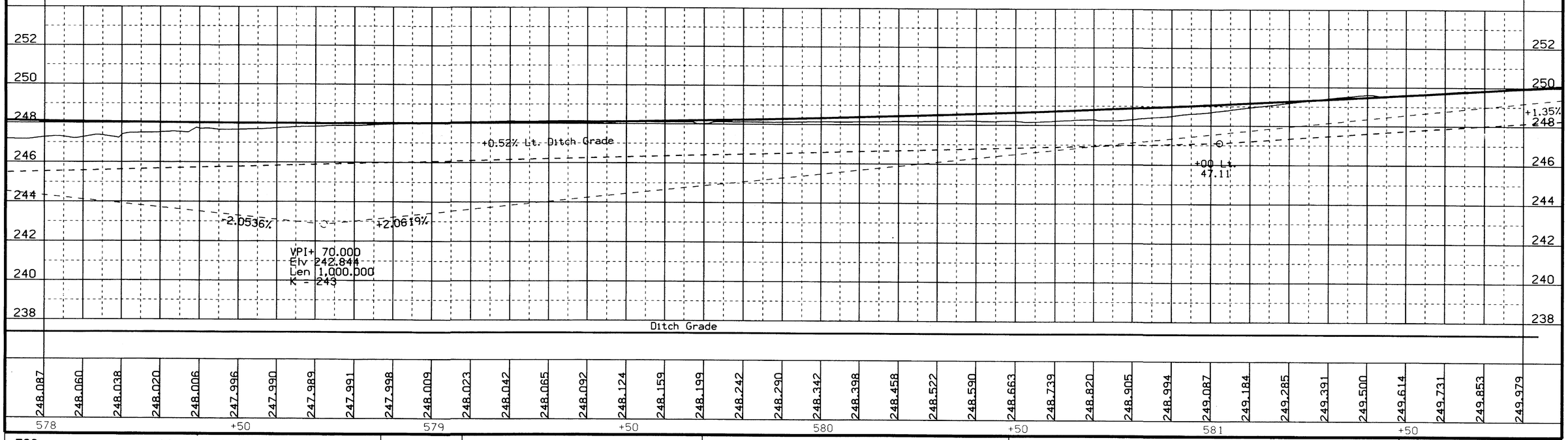


PLAN AND PROFILE SHEET OF I-235

For Bridge Situation Plan
Refer to Sheet No. V.__

0 METERS 50



500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.09

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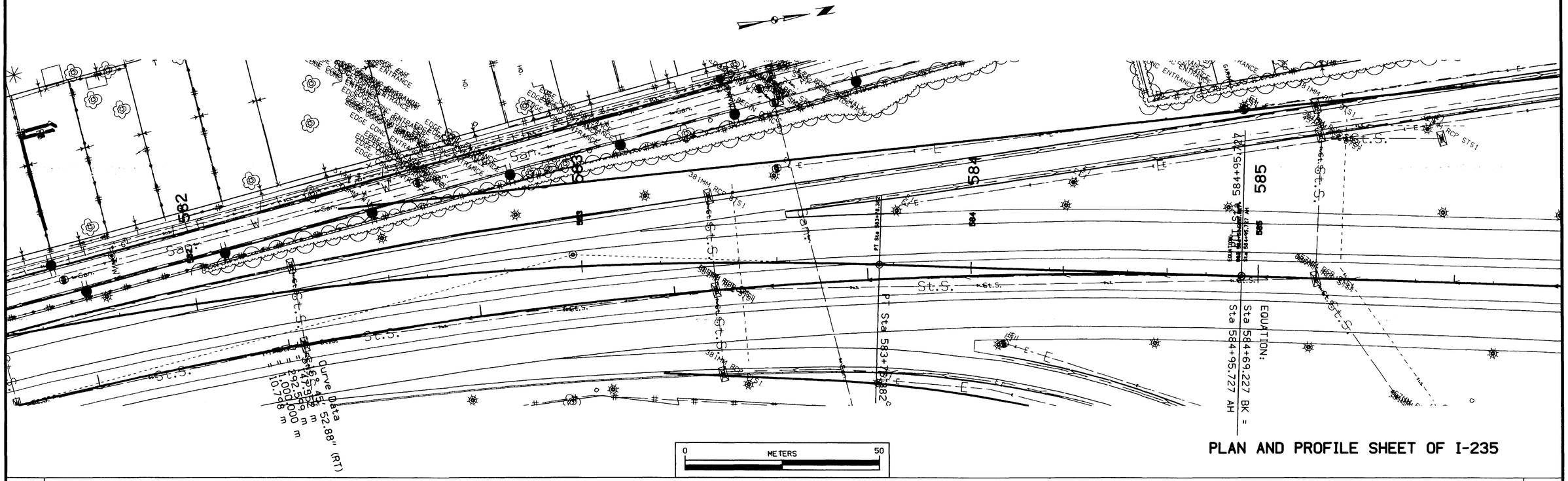
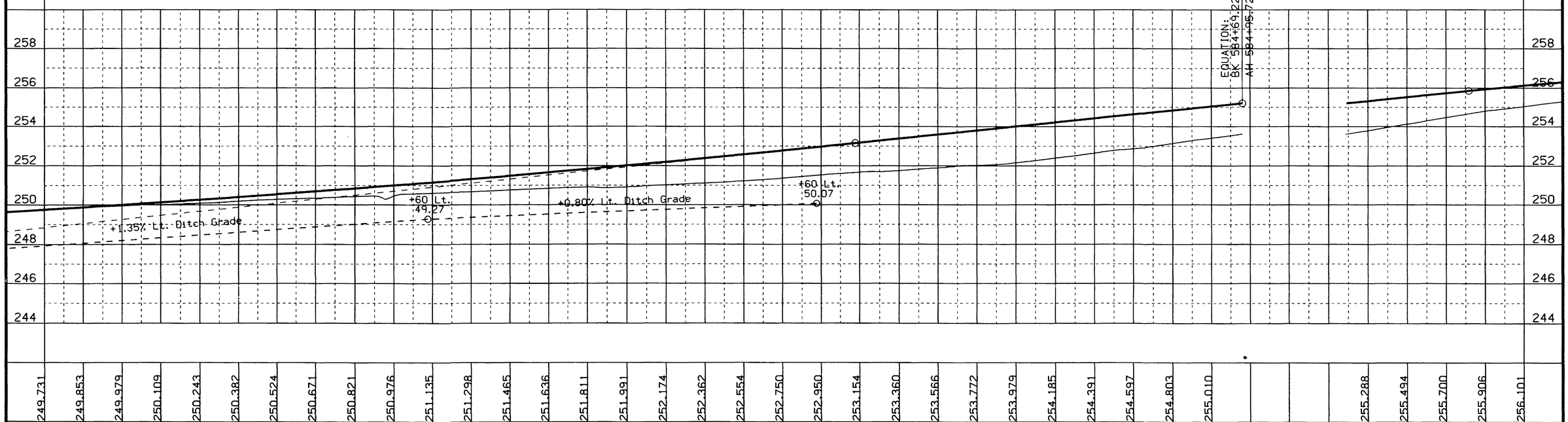


PLAN AND PROFILE SHEET OF I-235



500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.10

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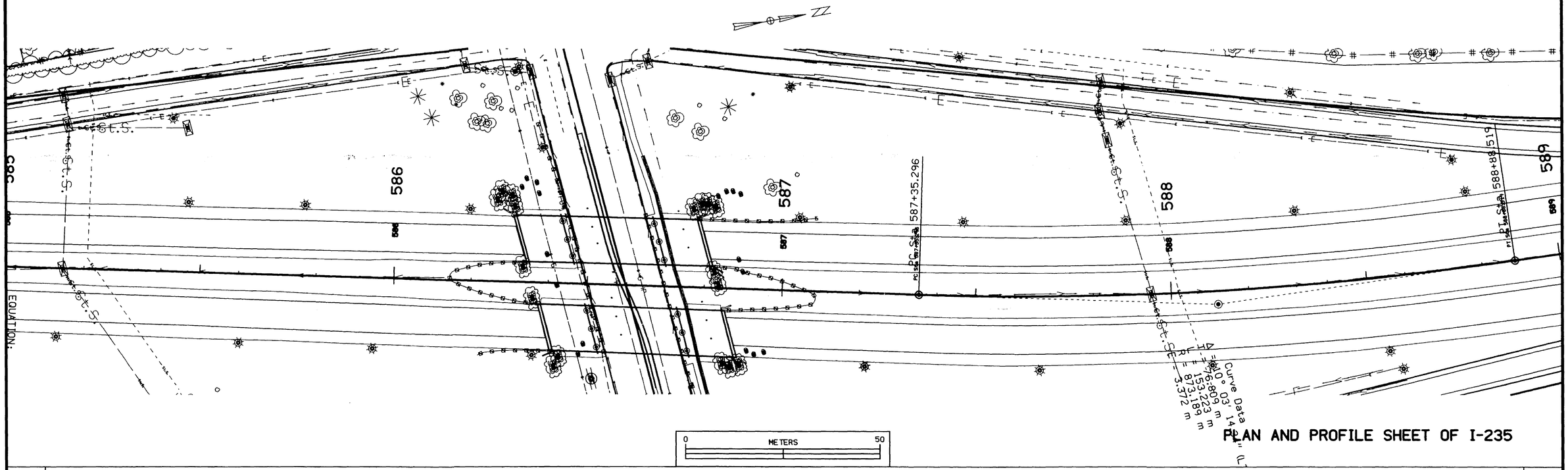

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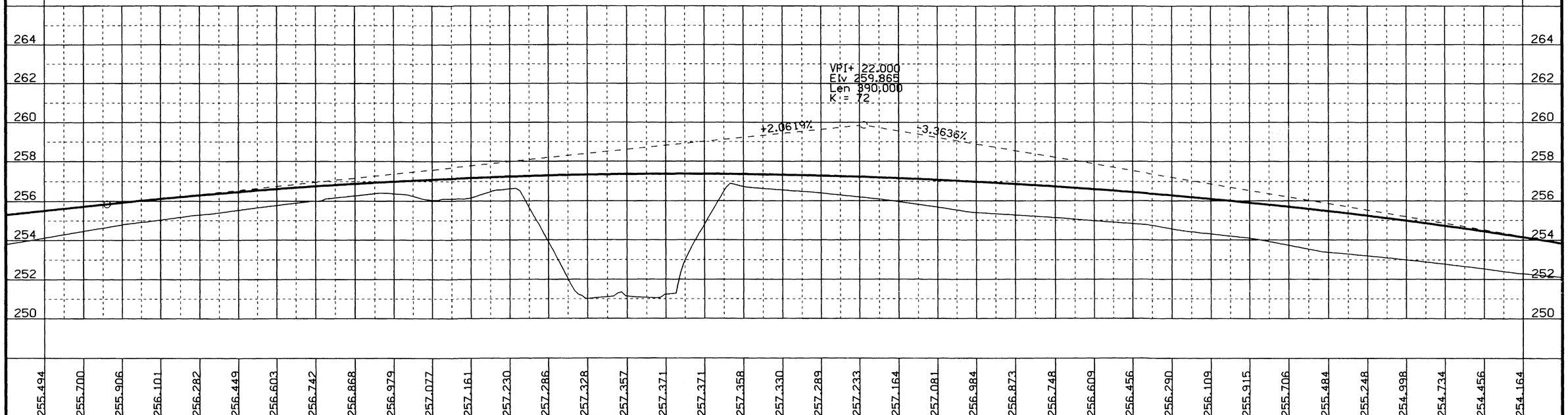

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER D.11

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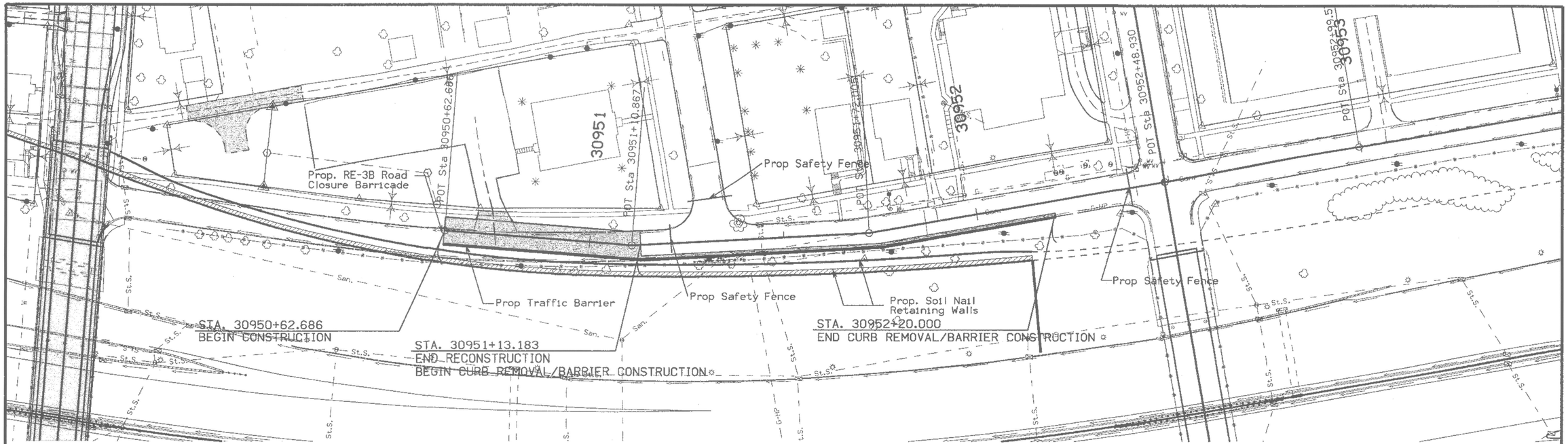
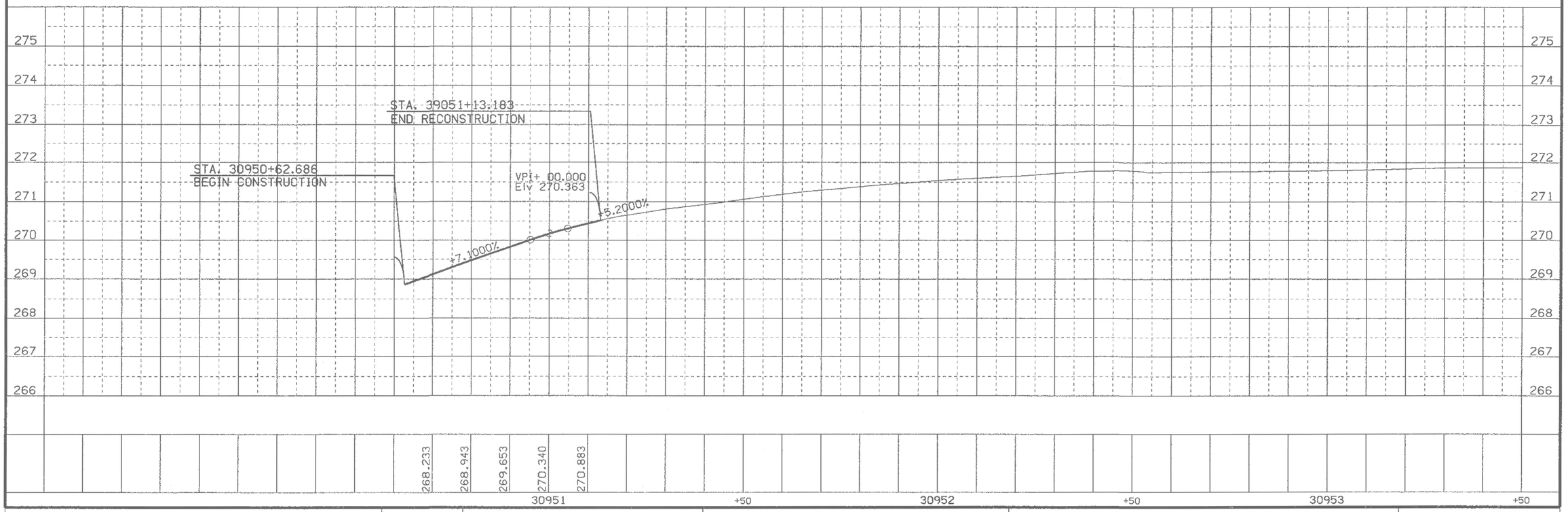




500	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER E.01

10-SEP-2002 14:02 ehouge w:\Projects\77235180C96\Design_grading_(340)\k77235340.e01

General Information for GPS Project

State Plane Coordinate Zone 1402 (Iowa Lambert)

State Plane Coordinates Held at Point No. 148

Average Project Lattitude = 41° 36' 11.11861"

Resulting Radius = 6363589.134

Mean Project Elevation = 272.00

Sea Level Factor = 0.999957259

Average Project Scale Factor = 0.999973247

Combined Factor (Grid) = 0.999930506

1/Grid = 1.000069498

Vertical Datum = NAVD 88 ₂# Horizontal Datum = NAD 83 (Pre HARN)

Preliminary Suvey based on Project Coordinates - Reference Ties
and Coordinates on "G" sheets are relative to Project Coordinates.

Local Project Plane Coordinate Conversion Equation:
a. Local Project Plane Coord. y = [(State Plane y - hold point y) 1/grid factor] + hold point y
b. Local Project Plane Coord. x = [(State Plane x - hold point x) 1/grid factor] + hold point x

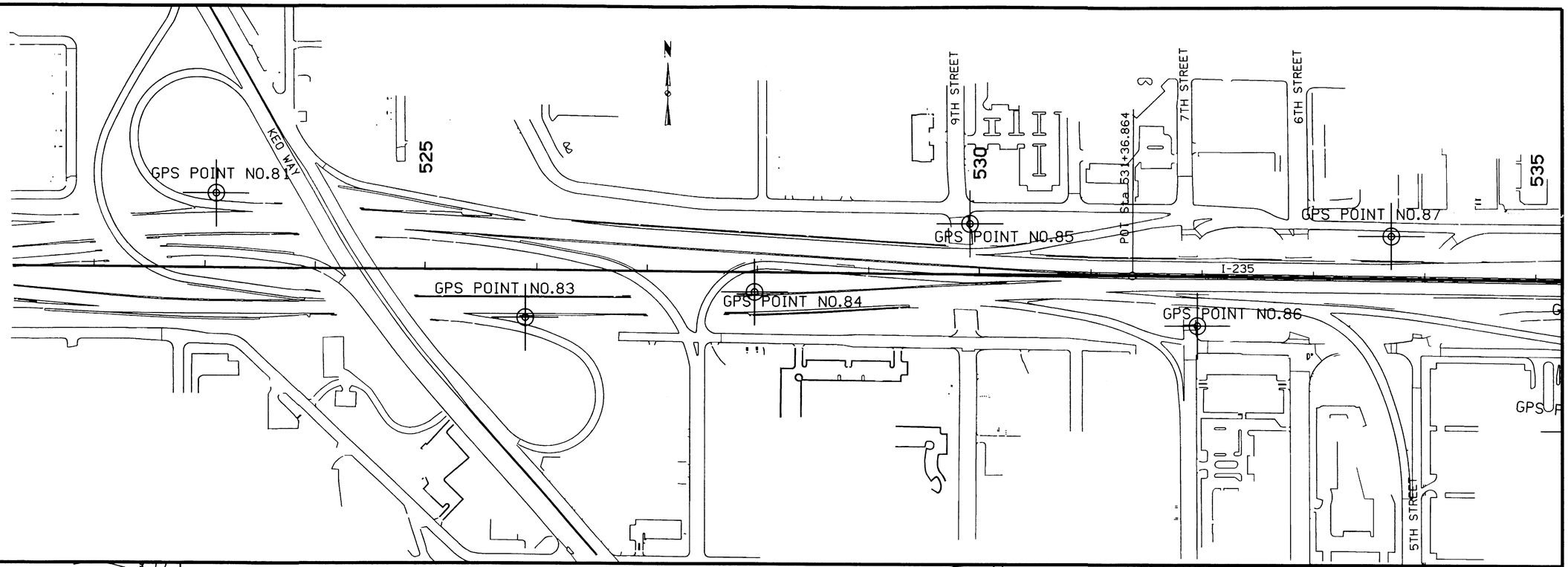
Point	State Plane Coord. (Y)	State Plane Coord. (X)	Point Scale Factor	Project Grid Coord. (Y)	Project Grid Coord. (X)
NO.7701	168750.189	476789.431	0.99996377	168749.610	476788.529
NO.7702	174179.428	499712.570	0.99996891	174179.226	499713.261
NO.7703	193944.951	497742.025	0.99999366	193946.123	497742.579
NO.8503	206933.504	490040.857	1.00001518	206935.579	490040.876
NO.9101	154230.920	476070.514	0.99995372	154229.332	476069.562
DODGE	189142.449	482782.998	0.99998673	189143.287	482782.512
NO.1	174352.175	489192.117	0.99996908	174351.985	489192.077
NO.2	181015.641	486762.860	0.99997636	181015.914	486762.651
NO.3	183471.131	493696.949	0.99997933	183471.575	493697.222
NO.6	180988.816	473841.994	0.99997629	180989.087	473840.887
NO.11	176922.963	475788.806	0.99997172	176922.952	475787.834
NO.14	176797.701	477219.861	0.99997159	176797.681	477218.989
NO.16	176889.110	478203.592	0.99997170	176889.096	478202.788
NO.17	177226.614	478217.303	0.99997206	177226.624	478216.500
NO.18	176895.439	479012.566	0.99997170	176895.426	479011.818
NO.19	176805.070	477464.951	0.99997160	176805.051	477464.096
NO.20	176587.374	479015.175	0.99997138	176587.340	479014.428
NO.22	176854.901	479719.900	0.99997166	176854.885	479719.202
NO.24	176913.231	479814.563	0.99997173	176913.219	479813.871
NO.25	177191.302	480345.075	0.99997203	177191.309	480344.420
NO.26	176920.669	480351.498	0.99997174	176920.658	480350.843
NO.28	176970.029	480866.132	0.99997179	176970.021	480865.513
NO.30	176992.685	481462.037	0.99997182	176992.679	481461.460
NO.31	176910.082	481811.201	0.99997173	176910.070	481810.648
NO.32	176937.733	482493.598	0.99997176	176937.723	482493.092
NO.36	176894.729	483048.002	0.99997172	176894.716	483047.535
NO.37	176824.710	483832.841	0.99997164	176824.692	483832.428
NO.38	176835.699	484429.570	0.99997166	176835.682	484429.199
NO.40	176813.110	484730.494	0.99997163	176813.091	484730.144
NO.42	176740.617	484857.099	0.99997155	176740.593	484856.758
NO.44	176728.922	485076.012	0.99997154	176728.897	485075.686
NO.46	176765.153	485337.823	0.99997158	176765.131	485337.515
NO.52	176893.639	477763.083	0.99997170	176893.626	477762.249
NO.53	176791.586	478530.623	0.99997159	176791.566	478529.842
NO.54	177266.156	481981.221	0.99997211	177266.169	481980.680
NO.55	176968.055	482890.638	0.99997179	176968.047	482890.160
NO.56	176902.058	483472.588	0.99997172	176902.045	483472.150
NO.57	176848.312	484201.993	0.99997167	176848.296	484201.606
NO.58	176773.661	485474.334	0.99997159	176773.639	485474.035
NO.59	176783.331	485725.799	0.99997160	176783.310	485725.518
NO.61	176940.146	485943.549	0.99997177	176940.136	485943.283
NO.64	176935.555	486335.328	0.99997177	176935.545	486335.089
NO.65	176903.044	486588.594	0.99997173	176903.031	486588.373
NO.66	176967.312	486732.007	0.99997180	176967.304	486731.796
NO.68	176910.400	487089.665	0.99997174	176910.388	487089.479
NO.71	177083.256	487541.632	0.99997193	177083.256	487541.477
NO.72	177210.976	487604.934	0.99997207	177210.985	487604.784
NO.73	177154.380	487818.657	0.99997201	177154.385	487818.521
NO.77	177283.590	488009.283	0.99997215	177283.604	488009.161
NO.78	177274.903	488124.042	0.99997214	177274.916	488123.928
NO.79	177187.368	488071.744	0.99997204	177187.375	488071.626
NO.80	177264.540	488312.404	0.99997213	177264.553	488312.303
NO.81	177293.589	488546.238	0.99997216	177293.604	488546.153
NO.82	177706.297	488421.696	0.99997261	177706.340	488421.602
NO.83	177182.778	488825.633	0.99997204	177182.785	488825.567
NO.84	177206.219	489033.266	0.99997206	177206.228	489033.215
NO.85	177267.939	489227.589	0.99997213	177267.952	489227.551
NO.86	177176.626	489431.583	0.99997203	177176.632	489431.559
NO.87	177257.478	489606.042	0.99997212	177257.490	489606.031
NO.88	177172.563	489836.026	0.99997203	177172.569	489836.031
NO.89	177168.471	489955.866	0.99997202	177168.477	489955.879
NO.90	177288.755	490015.654	0.99997215	177288.769	490015.671
NO.91	177168.527	490032.601	0.99997202	177168.533	490032.619
NO.92	177164.512	490406.839	0.99997202	177164.518	490406.883
NO.93	177197.261	490776.335	0.99997206	177197.269	490776.405
NO.94	177109.019	490954.380	0.99997196	177109.021	490954.462
NO.95	177356.122	490906.207	0.99997223	177356.141	490906.286
NO.96	177178.628	491104.065	0.99997204	177178.635	491104.158
NO.97	177108.478	491404.072	0.99997196	177108.480	491404.186
NO.98	177272.425	491703.643	0.99997214	177272.438	491703.777
NO.99	177299.666	492014.609	0.99997217	177299.681	492014.765
NO.100	177456.735	491918.685	0.99997234	177456.761	491918.834
NO.101	177469.631	492426.954	0.99997235	177469.658	492427.139
NO.102	177639.357	492715.178	0.99997254	177639.396	492715.383
NO.103	177800.455	492779.780	0.99997272	177800.505	492779.989
NO.104	177727.117	493239.313	0.99997264	177727.162	493239.554
NO.105	177839.205	493064.690	0.99997276	177839.258	493064.919

Point	State Plane Coord. (Y)	State Plane Coord. (X)	Point Scale Factor	Project Grid Coord. (Y)	Project Grid Coord. (X)
NO.108	178135.372	493416.705	0.99997309	178135.445	493416.958
NO.110	178456.119	493445.337	0.99997344	178456.214	493445.592
NO.111	178707.622	493446.972	0.99997372	178707.735	493447.228
NO.113	179178.135	493472.926	0.99997425	179178.281	493473.183
NO.116	179408.749	493579.704	0.99997451	179408.911	493579.969
NO.117	179370.014	493252.100	0.99997447	179370.173	493252.342
NO.121	179732.303	493644.247	0.99997488	179732.487	493644.516
NO.122	180107.342	493640.331	0.99997531	180107.552	493640.600
NO.123	180564.396	493766.210	0.99997584	180564.638	493766.488
NO.124	180754.924	493689.869	0.99997607	180755.179	493690.141
NO.126	180912.902	493754.109	0.99997625	180913.168	493754.386
NO.128	181348.264	493767.817	0.99997676	181348.560	493768.095
NO.130	181681.171	493690.921	0.99997716	181681.491	493691.193
NO.132	182204.143	493711.574	0.99997779	182204.499	493711.848
NO.133	182525.037	493675.413	0.99997818	182525.415	493675.684
NO.134	183049.731	493677.174	0.99997882	183050.146	493677.446
NO.148	177083.577	489770.200	0.99997193	177083.577	489770.200

I-235
GPS POINTS
COORDINATES LISTING

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.01

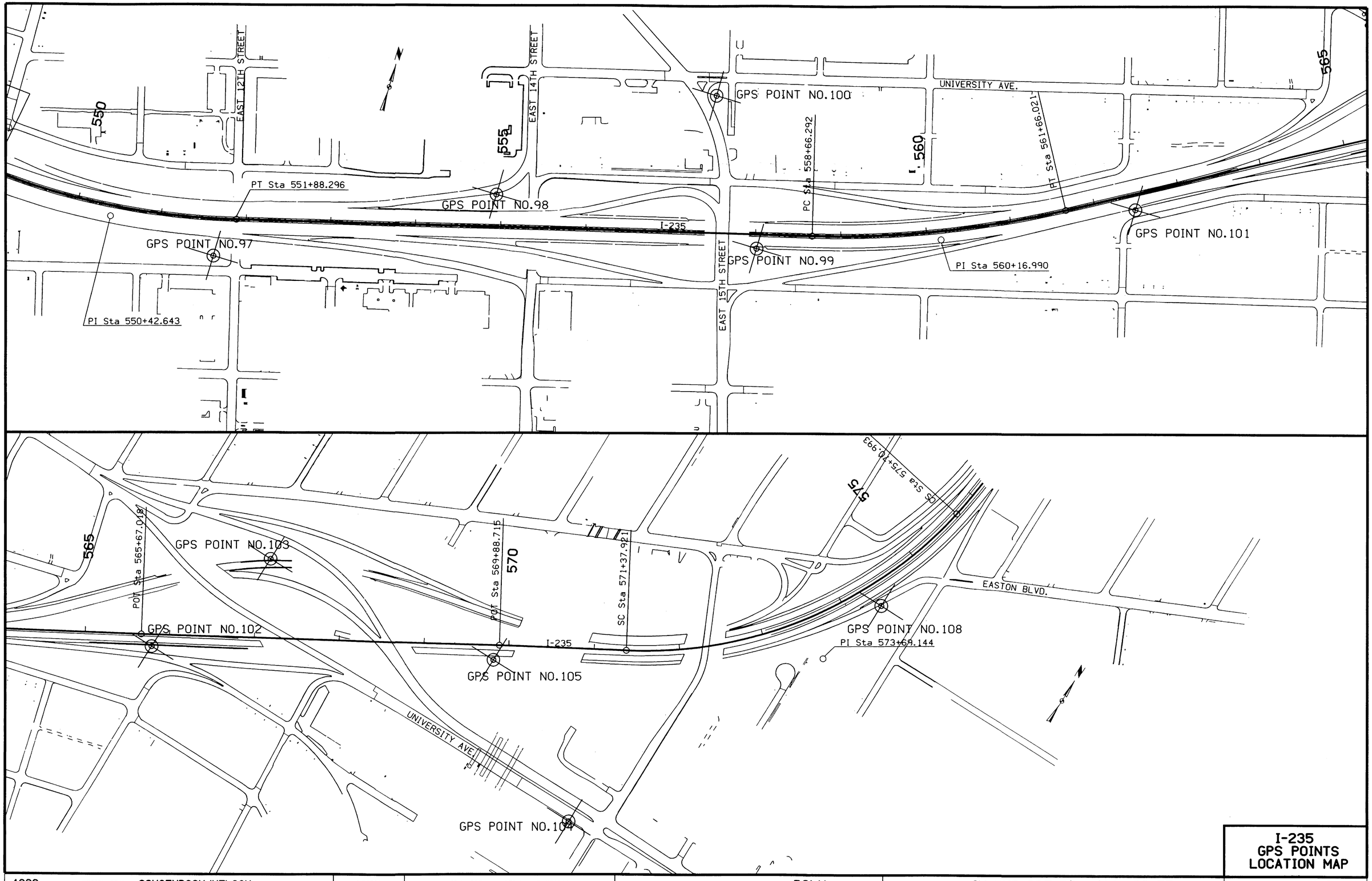
12-JAN-2002 07:17 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g01



I-235 GPS POINTS LOCATION MAP

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.02

12-JAN-2002 07:22 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g03



I-235 GPS POINTS LOCATION MAP

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.03

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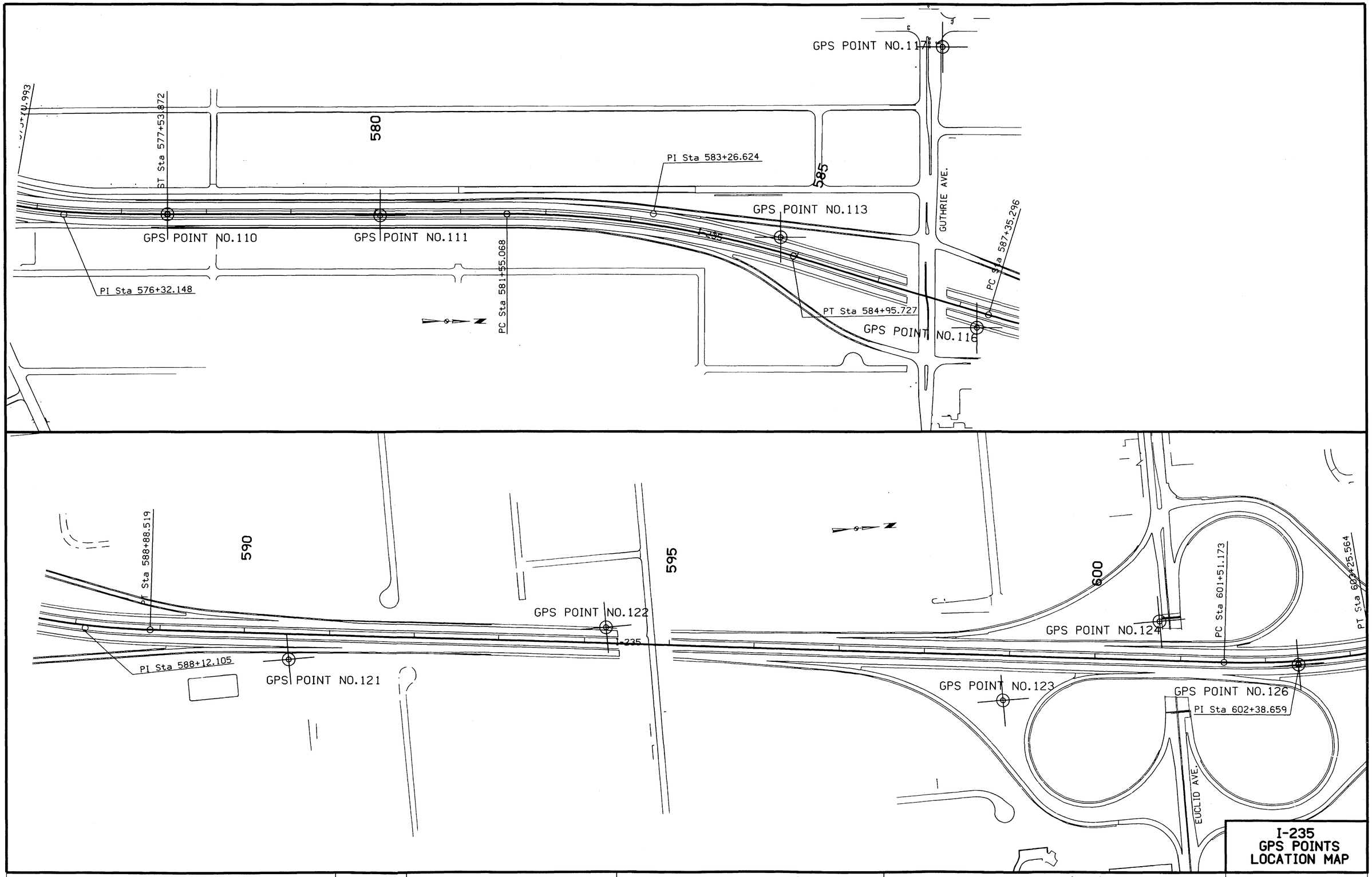

I-235 GPS POINTS LOCATION MAP

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.04

12-JAN-2002 07:23 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g03

ALIGNMENT

THE MAINLINE ALIGNMENT FOR THIS SURVEY IS A RETRACE OF THE PRESENT ALIGNMENT OF I-235 FROM P.O.T. STA.1329+51.00 OF THE I-80-3(18)125 AS BUILT PLANS AT THE WEST MIX-MASTER. THIS ALIGNMENT RUNS EAST AND NORTHEAST TO THE INTERSECTION OF I-80 AT THE EAST MIX-MASTER.

THE STATIONING FOR THIS PROJECT WAS TAKEN FROM P.O.T. STA.1329+51.00 OF THE I-80-3(18)125 AS BUILT PLANS. THIS STATIONING WAS CONVERTED TO METRIC STA.405+23.546 AND THAN CARRIED AHEAD THRU OUT THE SURVEY.

VERTICAL DATUM

THE VERTICAL PLANE FOR THIS SURVEY RELATIVE TO NAVD 88 DATUM. THE BENCH LEVEL RUN STARTED SOUTH OF I-235 AT BM 599 THEN RUN NORTHERLY FROM Q-155 (BM#599 THIS SURVEY) ALONG 50TH STREET TO I-235 THEN EASTERLY ALONG I-235 TO JUST WEST OF THE I-235 DES MOINES RIVER BRIDGE THEN SOUTH TO BM K-4 (#598 THIS SURVEY) EL=244.850(METERS), BENCHES WERE THEN RUN NORTH TO I-235,THEN NORTHEASTERLY ALONG I-235 TO BM#590 NEAR THE EAST MIXMASTER. BENCHES WERE THEN RUN FROM BM#590 NORTH ALONG I-35 THEN EAST ALONG A GRAVEL ROAD NORTH TO BM#735 NEAR ANKENY TO BM J-33 (#735 THIS SURVEY)

EQUATIONS TO BENCHES ALONG THE PROJECT ARE AS FOLLOWS:

BM#599 THIS SURVEY EL=255.751(METERS)
= USC@GS BM#Q-155 EL=255.751(METERS) WAS FOUND AND USED AS BEGINNING DATUM BENCH.
=JOHN ADAMS PROJ # IM-35-3(69)82--13-77 EL 294.550 (METERS) AT NE MIXMASTER
USC@GS BM # K-4 EL=244.850 (METERS)
=BM#598 THIS SURVEY) EL=244.850(METERS)
BM#541 THIS SURVEY EL 294.550 (METERS)
= BM#183C ASBUILT PLANS PROJ # I-IG-35-3(3)77 EL=294.550(METERS)
= BM#2B RESURFACING PLANS PROJ # I-IR-35-4(37)88--14-77 EL=294.550((METERS)
= BM#183C I-235 CONSTRUCTION PLANS EL=192.403(FEET)
= CITY DATUM OF DES MOINES EL=192.403(FEET)

BM#735 THIS SURVEY EL=286.187 (METERS)
= USC@GS BM#J-33 ELEVATION OF 286.187 (METERS)

BENCHMARKS					ELEVATION
No. 501	Sta. 405+61.579	21.48 Rt.	FD IHCBM WING,SE COR OF THE E.BOUND I-235 BRG OVER I-35		300.858
No. 500	Sta. 410+52.538	151.92 Rt.	CUT X NW BOLT FIRE HYD AT NE QUAD 50TH ST AND PLEASANT ST		296.941
No. 502	Sta. 411+28.741	3.15 Lt.	CUT X SOUTH BASE OF OVERHEAD SIGN ON I-235 JUST EAST OF 50TH ST BR IN THE MEDIAN		294.727
No. 503	Sta. 414+52.740	33.64 Rt.	CUT X N.SIDE 2ND CONC SIGN BASE E. OF 50TH ST BRG,S.SIDE OF I-235		298.712
No. 602	Sta. 418+30.783	220.44 Lt.	FD IHCBM INLET HDWL 1.83 X 1.83 RCB ON 42ND ST		296.792
No. 504	Sta. 418+32.388	3.86 Rt.	CUT X 1ST CONC SIGN BASE W. OF 42ND ST BRG,IN THE MEDIAN		297.490
No. 601	Sta. 418+36.128	32.39 Lt.	FD IHCBM NW HANDRAIL OF 42ND ST BRIDGE		304.011
No. 600	Sta. 418+37.021	176.57 Rt.	SET RR SPK PP SW QUAD OF 42ND AND VAN BUREN DR.		299.316
No. 505	Sta. 421+78.426	20.02 Rt.	CUT X N SIDE 7TH CONC LIGHT BASE E. OF 42ND ST BRG,S.SIDE OF I-235		293.930
No. 506	Sta. 424+79.058	19.90 Rt.	CUT X N SIDE 4TH CONC LIGHT BASE W. OF VALLEY WEST DR. BRG.,ON THE S.SIDE OF I-235		288.304
No. 605	Sta. 426+35.612	343.71 Rt.	SET RR SPK E.SIDE P. POLE NW QUAD 35TH ST AND WOODLAND AVE		292.416
No. 604	Sta. 426+36.093	32.03 Lt.	FD IHCBM NW HANDRAIL 35TH ST BRIDGE		291.162
No. 603	Sta. 426+57.439	268.35 Lt.	CUT X CONC TRAFFIC SIGNAL BASE NE QUAD 35TH ST AND WESTOWN PARKWAY		284.833
No. 507	Sta. 428+01.993	25.58 Rt.	FD IHC BM, INLET HDWL 1.22 X 1.83 RCB		281.429
No. 508	Sta. 430+86.376	25.05 Lt.	CUT X S. SIDE CONC BASE OF 5TH LIGHT POLE E. OF VALLEY WEST DR.,ON THE S.SIDE OF I-235		277.098
No. 606	Sta. 434+37.290	276.57 Rt.	SET RR SPK W.SIDE P. POLE SE QUAD 28TH & WOODLAND		284.433
No. 509	Sta. 434+42.364	2.30 Rt.	CUT X 1ST CONC SIGN BASE W. OF THE 22ND ST. BRG. IN MEDIAN		272.605
No. 607	Sta. 434+51.286	34.67 Lt.	FD IHCBM NW HANDRAIL 28TH ST BRIDGE		279.035
No. 608	Sta. 434+85.813	298.32 Lt.	SET RR SPK W.SIDE P. POLE ON 28TH ST +-168M NORTH OF I-235		283.604
No. 510	Sta. 436+83.581	18.39 Rt.	CUT X N. SIDE 1ST CONC LIGHT BASE W. OF BRG OVER 22ND ST,S. SIDE OF I-235		270.963
No. 610	Sta. 439+63.659	81.13 Rt.	CUT X NW COR TRAFFIC SIG. BASE,NE QUAD 22ND ST & EASTBOUND RAMP TO I-235		266.672
No. 511	Sta. 439+89.317	16.59 Rt.	CUT X HANDRAIL SE COR E. BOUND I-235 BRG OVER 22ND ST		276.139
No. 609	Sta. 440+12.259	308.58 Lt.	ARROWHEAD ON F-HYDRANT,NE QUAD KINGMAN AVE & 22ND		275.923
No. 512	Sta. 442+49.024	18.24 Rt.	CUT X N. SIDE 1ST CONC LIGHT BASE E. OF I-235 BRG OVER 22ND ST, S. SIDE OF I-235		270.595
No. 513	Sta. 444+52.153	23.09 Rt.	CUT X N. SIDE 1ST CONC LIGHT BASE W. OF I-235 BRG OVER 17TH ST, S. OF I-235		266.023
No. 514	Sta. 447+20.777	16.38 Rt.	CUT X HANDRAIL SE COR E. BOUND I-235 BRG OVER 17TH ST		265.971
No. 515	Sta. 449+79.473	23.95 Lt.	SET RR SPK 1ST LIGHT POLE E. OF I-235 BRG OVER 17TH ST,N.SIDE OF I-235		262.905
No. 516	Sta. 453+30.332	21.30 Rt.	CUT X N.SIDE 1ST OVERHEAD SIGN W. OF I-235 BRG OVER 8TH ST		260.451
No. 517	Sta. 456+78.079	20.52 Rt.	CUT X HANDRAIL SW COR E.BOUND I-235 BRG OVER 8TH ST		260.770
No. 518	Sta. 459+76.624	22.06 Rt.	CUT X NE COR 1ST OVERHEAD SIGN BASE E. OF I-235 BRG OVER 8TH ST,S.SIDE I-235		257.104
No. 519	Sta. 461+98.905	18.79 Lt.	CUT X SW COR 2ND OVERHEAD SIGN BASE E. OF I-235 BRG OVER 8TH ST,N.SIDE I-235		253.719
No. 520	Sta. 463+43.919	21.86 Rt.	CUT X NW COR 1ST OVERHEAD SIGN BASE W. OF 63RD ST BRG,S.SIDE I-235		255.790
No. 611	Sta. 466+65.106	318.38 Lt.	SET RR SPK W.SIDE P.POLE NW QUAD 63RD @ WEST DR.		273.968
No. 612	Sta. 466+68.213	30.30 Lt.	FD IHCBM NW HANDRAIL 63RD ST. BRIDGE		270.362
No. 521	Sta. 466+73.624	16.68 Rt.	CUT X NW COR OF THE SW PYLON OF THE 63RD ST BRG		263.845
No. 613	Sta. 466+89.689	229.20 Rt.	SET RR SPK E.SIDE P. POLE W SIDE 63RD ST +- 115M SOUTH OF I-235		262.342
No. 522	Sta. 469+84.133	23.62 Rt.	CUT X HANDRAIL SW COR I-235 BRG OVER CUMMINS PKWY		262.887
No. 523	Sta. 473+78.973	23.22 Rt.	CUT X N.SIDE 4TH CONC LIGHT BASE W. OF 63RD ST BRG,S.SIDE OF I-235		260.710
No. 617	Sta. 474+59.583	492.07 Lt.	SET RR SPK E.SIDE 2ND P. POLE N. OF 56TH & KINGMAN AVE		275.246
No. 616	Sta. 474+74.492	284.10 Lt.	SET RR SPK E.SIDE 1ST P. POLE S. OF 942 56TH ST		260.764
No. 615	Sta. 474+86.837	33.60 Lt.	FD IHCBM NW WING 56TH ST BRIDGE		267.769
No. 614	Sta. 475+20.552	242.05 Rt.	SET RR SPK E.SIDE P. POLE AT SE QUAD 56TH ST @ HARWOOD DR.		282.001
No. 524	Sta. 475+68.662	22.99 Rt.	CUT X N.SIDE 2ND CONC LIGHT BASE W. OF 63RD ST BRG,S.SIDE OF I-235		264.380
No. 525	Sta. 477+95.298	24.80 Rt.	CUT X N.SIDE 5TH CONC LIGHT BASE W. OF MILEPOST NO.5,S.SIDE OF I-235		270.499
No. 526	Sta. 479+36.418	20.72 Rt.	CUT X N.SIDE 1ST CONC LIGHT BASE W. OF MILEPOST NO. 5,S.SIDE OF I-235		275.077
No. 527	Sta. 481+76.730	31.67 Rt.	SET RR SPK 610MM QUAD ELM STA.287+87.00,135.00 RT		277.393
No. 620	Sta. 484+57.607	192.36 Lt.	CUT X TOP BOLT F-HYDRANT SW QUAD POLK BOULEVARD & CHAMBERLAIN AVE		291.263
No. 528	Sta. 485+10.114	20.35 Rt.	CUT X NW COR SW PYLON FOOTING OF S.BOUND POLK BLVD BRG		283.466
No. 619	Sta. 485+25.183	35.22 Rt.	CUT X SW WING N.BOUND POLK BOULEVARD BRG		290.226
No. 618	Sta. 485+77.967	189.97 Rt.	CUT X SW BOLT F-HYDRANT NE QUAD POLK BOLV. & HARWOOD DR.		293.970
No. 529	Sta. 487+49.646	24.00 Rt.	CUT X 3RD CONC LIGHT BASE E OF POLK BLVD BRG OVER I-235, SOUTH SIDE I-235		290.524
No. 530	Sta. 489+61.868	20.84 Rt.	CUT X N SIDE 5TH CONC LIGHT BASE W 42ND STREET BRG , S.SIDE OF I-235		291.252
No. 531	Sta. 490+88.780	34.17 Rt.	CUT X NW COR CONC UMBRELLA INTAKE, E. OF 42ND ST. BRG OVER I-235, S. OF I-235		289.945
No. 621	Sta. 491+14.119	246.75 Lt.	SET RR SPK E.SIDE P. POLE SW QUAD CHAMBERLAIN AVE & 42ND ST		292.966
No. 622	Sta. 491+15.761	36.37 Lt.	FD IHCBM NW WING OF 42ND ST. BRIDGE		295.702
No. 623	Sta. 491+26.159	336.35 Rt.	SET RR SPK W.SIDE P. POLE NE QUAD WOODLAND AVE & 42ND ST		295.784
No. 532	Sta. 492+64.741	22.57 Rt.	CUT X N.SIDE 5TH CONC LIGHT BASE E. OF 42ND ST BRG OVER I-235, ON ST S.SIDE OF I-235.		290.368
No. 533	Sta. 494+24.406	2.08 Rt.	CUT X S SIDE 1ST CONC OVERHEAD SIGN BASE E. OF 42ND ST BRG N. OF E.BOUND I-235, IN MEDIAN		289.809
No. 534	Sta. 496+11.668	26.85 Rt.	CUT X N SIDE 6TH CONC LIGHT BASE E. OF 1ST FOOT BRG E. OF 42ND ST BRG S. SIDE OF I-235		290.600
No. 535	Sta. 497+85.576	20.68 Rt.	CUT X N SIDE 7TH CONC LIGHT BASE W OF I-235 BRG OVER 35TH ST, S.SIDE OF I-235		290.790
No. 536	Sta. 499+97.661	20.71 Lt.	FD BOLT NW WING W.BOUND I.235 BRG OVER 35TH ST		291.528
No. 624	Sta. 500+24.187	63.71 Rt.	SET RR SPK NW.SIDE P.POLE SE QUAD ROLLINS AVE & 35TH ST		282.198
No. 625	Sta. 500+25.468	166.23 Rt.	SET RR SPK NW.SIDE P.POLE SE QUAD CENTER ST & 35TH STREET		283.154
No. 626	Sta. 500+26.569	258.76 Rt.	SET RR SPK W.SIDE OF 2ND P. POLE S. FROM CENTER ST & 35TH ST		284.625
No. 537	Sta. 501+82.336	20.67 Rt.	CUT X N SIDE 5TH CONC LIGHT BASE E OF I-235 BRG OVER 35TH ST, S.SIDE OF I-235		286.257
No. 538	Sta. 503+93.570	24.39 Rt.	CUT X N.SIDE 1ST CONC LIGHT BASE W OF 35TH ST BRG, S.SIDE I-235		284.346
No. 630	Sta. 504+11.650	251.98 Lt.	SET RR SPK E.SIDE P. POLE SW QUAD SCHOOL ST & 31ST		292.284
No. 629	Sta. 504+30.808	37.67 Lt.	CUT X NE WING 31ST ST BRG		290.976
No. 627	Sta. 504+34.575	370.32 Rt.	SET RR SPK W.SIDE P. POLE SE QUAD 31ST ST & PLEASANT ST.		284.739
No. 628	Sta. 504+35.492	151.32 Rt.	SET RR SPK S.SIDE P. POLE NE QUAD CENTER ST & 31ST ST.		291.258
No. 539	Sta. 505+63.446	24.98 Rt.	CUT X N.SIDE 5TH CONC LIGHT BASE E OF 35TH ST BRG, S.SIDE OF I-235		288.468
No. 540	Sta. 508+05.556	24.43 Rt.	CUT X SW WING E.BOUND I-235 BRG OVER 28TH ST		292.156

No. 541 Sta. 510+77.635 3.01 Rt. CUT X S.SIDE 1ST CONC OVERHEAD SIGN BASE E OF BRG OVER 25TH ST, N OF E-BOUND I-235, IN MEDIAN------- 289.687

No. 638 Sta. 512+17.790 393.15 Lt. SET RR SPK S.SIDE P. POLE NW QUAD COTTAGE GROVE & 26TH ST.---------- 294.126

No. 637 Sta. 512+97.679 280.07 Lt. CUT X SW BOLT F-HYDRANT NE QUAD COTTAGE GROVE & 25TH ST.---------- 293.901

No. 542 Sta. 513+13.207 24.69 Rt. CUT X N SIDE 2ND CONC LIGHT BASE W OF SE.BOUND COTTAGE GROVE BRG, S.SIDE OF I-235---------- 286.405

No. 636 Sta. 513+28.836 178.78 Lt. CUT X N.SIDE CONC LIGHT BASE SW QUAD COTTAGE GROVE & 24TH ST.---------- 291.940

No. 639 Sta. 514+10.316 326.60 Lt. SET RR SPK S.SIDE P. POLE SE QUAD DRAKE PARK AVE & 24TH ST.---------- 292.779

No. 635 Sta. 514+34.463 33.65 Rt. CUT X HANDRAIL SW COR OF THE SE.BOUND COTTAGE GROVE BRG---------- 291.129

No. 640 Sta. 515+49.844 37.07 Lt. CUT X SIDEWALK NE COR OF THE NW BOUND COTTAGE GROVE BRG---------- 290.966

No. 543 Sta. 515+71.765 20.65 Rt. CUT X N.SIDE 1ST CONC LIGHT BASE W OF NW.BOUND COTTAGE GROVE BRG, S.SIDE OF I-235---------- 283.288

No. 631 Sta. 516+54.677 457.89 Rt. SET RR SPK NW.SIDE OF THE 2ND P. POLE S. OF LEYNER ST & M.L.KING PKWY. ON THE W.SIDE OF ROAD---------- 279.137

No. 634 Sta. 516+61.534 89.74 Rt. CUT X S.SIDE CONC LIGHT BASE NE QUAD 21ST ST. & COTTAGE GROVE---------- 288.755

No. 633 Sta. 517+16.927 171.39 Rt. SET RR SPK NE.SIDE P.POLE SW QUAD M.L.KING PKWY & COTTAGE GROVE---------- 288.048

No. 632 Sta. 517+34.982 298.88 Rt. SET RR SPK NW.SIDE P.POLE SE QUAD CROCKER ST & M.L.KING PKWY.---------- 285.591

No. 544 Sta. 517+47.988 3.14 Rt. CUT X S.SIDE 1ST CONC OVERHEAD SIGN BASE W OF MARTIN LUTHER KING, JR PARKWAY,IN MEDIAN---------- 282.055

No. 641 Sta. 517+86.300 42.56 Lt. CUT X HANDRAIL NE COR S.BOUND M.L.KING PKWY BRG------ 289.579

No. 643 Sta. 518+72.714 269.28 Rt. SET RR SPK E.SIDE P. POLE SW QUAD COTTAGE GROVE & 19TH ST---------- 290.158

No. 642 Sta. 518+87.768 40.97 Rt. CUT X HANDRAIL SE COR OF THE N.BOUND 19TH ST BRG-------- 287.586

No. 644 Sta. 518+92.573 375.74 Rt. CUT X W. BOLT F-HYDRANT NE QUAD 19TH ST & LEYNER------- 289.271

No. 545 Sta. 519+88.687 3.05 Rt. (X) ON CONC SIGN BASE N. LEG OF OVERHEAD SIGN KEO WAY SIGN INFO---------- 278.662

No. 546 Sta. 522+03.402 42.70 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY ASBUILT STA 420+/-00---------- 275.021

No. 648 Sta. 523+05.647 258.52 Lt. SET RR SPK E.SIDE P. POLE AT 473 KEO WAY---------- 267.967

No. 647 Sta. 524+14.673 70.90 Lt. CUT X W.SIDE OF 1ST CONC LIGHT BASE N. OF THE I-235 W.BOUND BRG OVER KEO WAY ON E.SIDE KEO WAY------ 264.610

No. 547 Sta. 524+16.227 42.01 Rt. (X) ON HANDRAIL BRIDGE S.W. COR BR. OVER KEO WAY EASTBOUND LANE FREEWAY--------- 271.187

No. 646 Sta. 524+71.383 75.32 Rt. CUT X 1ST CONC LIGHT BASE S. OF I-235 E.BOUND BRG KEO WAY ON THE W.SIDE OF KEO WAY---------- 263.494

No. 548 Sta. 526+31.190 43.37 Rt. (X) ON CONC SIGN BASE RT. S. LEG OF OVERHEAD SIGN EASTBOUND LANE FREEWAY EAST OF KEO WAY---------- 271.185

No. 645 Sta. 526+76.719 253.72 Rt. SET RR SPK W.SIDE P. POLE NE QUAD KEO WAY & CROCKER------ 260.436

No. 549 Sta. 529+06.161 12.03 Rt. (X) ON CONC SIGN BASE N. LEG OF OVERHEAD SIGN WEST OF 9TH STREET BRIDGE------ 275.015

No. 651 Sta. 529+69.395 50.36 Lt. SET RR SPK N.SIDE P. POLE SW QUAD DAY & 9TH ST---------- 280.429

No. 649 Sta. 529+99.236 160.46 Rt. SET RR SPK W.SIDE OF 2ND P. POLE S. OF 9TH ST & SCHOOL ST,E.SIDE OF 9TH-------- 278.648

No. 650 Sta. 530+02.973 55.69 Rt. CUT X HANDRAIL SE END 9TH ST BRG---------- 280.300

No. 550 Sta. 531+70.119 27.23 Rt. (X) ON CIR CONC LUM BASE AT 5TH AVE EXIT SIGN WEST OF 7TH STREET BR.--------- 270.048

No. 652 Sta. 531+77.628 44.06 Lt. CUT X N.SIDE CONC TRAFFIC SIGNAL BASE,SW QUAD DAY ST & 7TH ST---------- 276.923

No. 654 Sta. 531+98.656 241.35 Rt. SET RR SPK W.SIDE P. POLE NE QUAD 7TH & CROCKER ST------- 269.889

No. 653 Sta. 532+09.861 55.36 Rt. SET RR SPK S.SIDE P. POLE NE QUAD 7TH & SCHOOL ST-------- 273.295

No. 656 Sta. 532+72.822 56.22 Rt. CUT X HANDRAIL SW END OF 7TH ST BRG---------- 273.245

No. 655 Sta. 532+81.838 222.42 Rt. SET RR SPK E.SIDE 1ST P.POLE N. OF 6TH AVE & CROCKER ST,ON W.SIDE OF 6TH ST---------- 267.651

No. 657 Sta. 532+95.057 60.64 Lt. SET RR SPK W.SIDE P. POLE NE QUAD DAY ST & 7TH ST-------- 276.326

No. 551 Sta. 533+17.185 17.57 Rt. (X) ON SE COR CONC INTAKE MH BASIN COVER RT. JUST EAST OF 6TH AVE BR.------- 267.311

No. 659 Sta. 533+87.646 77.66 Rt. CUT X NE COR TRAFFIC SIG. BASE,SW QUAD 5TH AVE & SCHOOL ST---------- 270.401

No. 660 Sta. 534+04.265 274.40 Rt. CUT X TOP BOLT F-HYDRANT SE QUAD 5TH AVE & CROCKER------ 265.534

No. 658 Sta. 534+60.811 52.13 Lt. CUT X S.SIDE OF 1ST CONC LIGHT BASE EAST OF 5TH AV & W.BOUND 6TH ST OFF RAMP------ 267.326

No. 552 Sta. 536+06.277 18.09 Rt. (X) ON CIR CONC LUM BASE JUST WEST OF 3RD ST. BR. RT SIDE OF EASTBOUND LANE------ 258.873

No. 662 Sta. 536+23.975 56.77 Rt. CUT X SE COR CONC TRAFF. SIG. BASE,NW QUAD 3RD ST & SCHOOL ST---------- 263.538

No. 661 Sta. 536+29.621 216.01 Rt. CUT X W.SIDE 1ST CONC LIGHT BASE N. OF CROCKER & 3RD ST,W.SIDE OF 3RD ST------ 261.143

No. 663 Sta. 536+49.809 72.58 Lt. CUT X HANDRAIL NE END OF 3RD ST BRG.---------- 262.162

No. 667 Sta. 537+55.460 243.87 Rt. CUT X W.SIDE CONC LIGHT BASE,NW QUAD CROCKER ST & 2ND AVE---------- 255.497

No. 664 Sta. 537+57.079 202.45 Lt. CUT X NW.SIDE CONC LIGHT LIGHT BASE S. OF LAUREL & 2ND ST---------- 256.140

No. 666 Sta. 537+88.958 37.81 Rt. CUT X HANDRAIL SE COR 2ND ST BRG---------- 259.414

No. 665 Sta. 537+92.106 102.66 Lt. CUT X W.SIDE 1ST CONC LIGHT BASE N. 2ND ST BRG.------ 258.551

No. 553 Sta. 538+70.031 17.30 Rt. CUT X HANDRAIL SW COR I-235 BRG OVER DES MOINES RIVER---------- 251.389

No. 554 Sta. 541+45.784 17.10 Rt. (X) ON HANDRAIL S.E. COR DES MOINES RIVER BRIDGE-------- 250.072

No. 555 Sta. 543+82.138 14.05 Rt. (X) ON CIR CONC LUM BASE WEST SIDE E 6TH ST BRIDGE------ 252.982

No. 669 Sta. 545+18.421 245.14 Rt. ARROWHEAD F-HYDRANT,NW QUAD E.6TH ST & LYON---------- 256.165

No. 670 Sta. 545+39.488 36.33 Lt. CUT X HANDRAIL NW COR 6TH ST BRG---------- 260.776

No. 668 Sta. 546+31.701 479.93 Rt. ARROWHEAD F-HYDRANT,SE QUAD E.6TH ST & GRAND AVE------ 249.831

No. 671 Sta. 546+62.091 240.87 Lt. CUT X E SIDE 1ST CONC LIGHT BASE S OF BUCHANAN & PENN AVE---------- 267.104

No. 556 Sta. 547+01.864 19.31 Rt. (X) ON CIR CONC LUM BASE------- 254.680

No. 672 Sta. 547+25.193 27.41 Rt. CUT X HANDRAIL SW COR PENN AVE BRG---------- 260.219

No. 673 Sta. 547+68.354 305.82 Rt. CUT X TOP BOLT F-HYDRANT SW QUAD DES MOINES ST & PENN AVE---------- 258.301

No. 557 Sta. 548+77.847 0.22 Rt. (X) ON CONC SIGN BASE WEST SIDE E 9TH ST BRIDGE AT FREEWAY 235 MEDIAN---------- 256.091

No. 675 Sta. 548+97.220 50.91 Lt. FD. IHCBM HANDRAIL NE COR E.9TH ST BRG.---------- 262.909

No. 674 Sta. 549+14.287 222.82 Rt. SET RR SPK E.SIDE P. POLE NE QUAD E.9TH ST & DES MOINES ST---------- 261.951

No. 558 Sta. 551+00.221 0.20 Rt. (X) ON CONC SIGN BASE AT FREEWAY 235 MEDIAN WEST OF E. 12TH ST BRIDGE------ 262.879

No. 676 Sta. 551+76.427 194.23 Lt. CUT X E. BOLT F-HYDRANT NW QUAD WALKER ST & E.12TH ST---------- 276.281

No. 677 Sta. 551+82.940 47.96 Lt. FD IHCBM HANDRAIL NW COR E.12TH ST BRG---------- 273.864

No. 678 Sta. 551+83.852 165.29 Rt. SET RR SPK E.SIDE PO.POLE NW QUAD E.12TH ST & DES MOINES ST---------- 271.602

No. 559 Sta. 552+12.798 0.10 Rt. (X) ON CONC SIGN BASE EAST OF E. 12TH ST BRIDGE AT FREEWAY 235 MEDIAN---------- 265.761

No. 560 Sta. 554+76.904 26.91 Rt. (X) ON CIR CONC LUM BASE WEST OF E. 14TH ST BRIDGE------ 264.813

No. 681 Sta. 555+23.925 247.96 Rt. FD BRASS DISK NE COR 1ST CONC SIGN BASE N. OF GRAND AVE & E.14TH ST, ON THE W.SIDE OF E.14TH-------- 269.210

No. 680 Sta. 555+30.682 39.07 Lt. FD IHCBM WINGWALL NW COR E.14TH ST BRG---------- 270.757

No. 679 Sta. 555+46.543 194.99 Lt. SET RR SPK W.SIDE P. POLE NE QUAD WALKER & E.14TH-------- 269.715

No. 561 Sta. 557+36.401 14.57 Rt. (X) ON HANDRAIL S.W. COR BRIDGE OVER E. 15TH ST.-------- 268.043

No. 683 Sta. 557+48.034 70.00 Rt. FD BRASS DISK NE COR CONC TRAFF SIG/LIGHT BASE SW QUAD LYON & E.15TH ST---------- 262.563

No. 682 Sta. 557+55.421 174.04 Rt. CUT X E.SIDE CONC SIGN BASE NW QUAD E.15TH ST & DES MOINES ST---------- 263.639

No. 684 Sta. 557+70.445 72.15 Lt. FD BRASS DISK SW COR CONC TRAFF SIG BASE NE QUAD E.15TH ST & MAPLE ST---------- 262.475

No. 562 Sta. 559+58.988 17.58 Rt. (X) ON CIR CONC LUM BASE 24METERS S.W. OF MM 10--------- 264.351

No. 685 Sta. 559+95.942 58.99 Lt. CUT X TOP BOLT F-HYDRANT NW QUAD MAPLE ST & E.16TH------ 260.351

No. 687 Sta. 559+96.150 63.53 Rt. SET RR SPK N.SIDE P. POLE N. OF LYON ST & E.16TH ST------ 259.420

No. 688 Sta. 562+13.859 110.52 Rt. SET RR SPK NW.SIDE P.POLE NE QUAD E.17TH & LYON ST------- 257.392

No. 686 Sta. 562+41.488 47.14 Lt. SET RR SPK SE.SIDE P.POLE NW QUAD MAPLE ST & E.17TH------ 259.204

No. 563 Sta. 562+89.566 18.08 Rt. (X) ON CONC SIGN BASE STATE FAIRGROUNDS EXIT ON E. UNIVERSITY AVE---------- 260.328

No. 693 Sta. 563+61.383 280.34 Lt. SET RR SPK S.SIDE P. POLE NE QUAD UNIVERSITY & E.17TH ST---------- 255.881

No. 692 Sta. 563+69.441 99.90 Lt. SET RR SPK S.SIDE P. POLE NW QUAD E.17TH COURT & WAKER ST---------- 257.987

No. 689 Sta. 563+95.912 31.75 Rt. CUT X SW BOLT F-HYDRANT JUST IN FRONT 1743 MAPLE------- 258.914

No. 564 Sta. 564+95.663 24.72 Lt. (X) ON CONC SIGN BASE STATE CAPITAL EXIT SIGN WEST BOUND LANE S.E. LEG OF OVERHEAD SIGN------ 258.981

No. 694 Sta. 565+24.411 152.01 Lt. CUT X N.SIDE CONC LIGHT BASE,SE QUAD DIXON & UNIV------ 255.239

No. 690 Sta. 565+53.636 91.09 Rt. SET RR SPK NE.SIDE P.POLE SW QUAD E.18TH ST & MAPLE------ 255.179

No. 695 Sta. 566+81.799 23.14 Lt. CUT X N.SIDE 1ST CONC LIGHT BASE W. OF E.BOUND I-235 BRG OVER E.BOUND UNIVERSITY,N. OF E.BOUND I-235,S. OF E.BOUND UNIV.------ 252.280

No. 565 Sta. 567+08.978 14.12 Rt. (X) ON HANDRAIL S.W. COR BRIDGE OVER UNIVERSITY AV EAST BOUND LANE OF FREEWAY 235---------- 258.390

No. 691 Sta. 567+56.577 103.35 Rt. SET RR SPK N.SIDE P. POLE NE QUAD E.19TH & WALKER-------- 251.587

No. 700 Sta. 568+34.688 47.99 Lt. CUT X 2ND CONC LIGHT BASE W. OF E.BOUND I-235 BRG OVER W.BOUND UNIVER. AVE,S. OF W.BOUND I-235, N. OF W.BOUND UNIVERSITY------- 250.985

No. 701 Sta. 568+40.536 168.11 Lt. SET RR SPK S.SIDE P. POLE NW QUAD DEWOLF & EASTON-------- 251.483

No. 696 Sta. 569+19.325 110.51 Rt. CUT X N.SIDE 2ND CONC LIGHT BASE W. OF R.R. BRG OVER UNIVERSITY AVE, S.SIDE OF UNIVERSITY----------- 245.464

~~No. 566 Sta. 570+04.242 16.39 Rt. (X) ON HANDRAIL S.W. COR. BRIDGE OVER RR TRACKS - EAST BOUND LANE FREEWAY------- 257.000~~

No. 702 Sta. 571+16.860 142.19 Lt. SET RR SPK SE.SIDE 3RD P.POLE E. OF WAYNE ST & EASTON,IN BETWEEN 2 SETS RR TRACKS--------------------- 248.231

No. 697 Sta. 571+18.138 223.57 Rt. CUT X NW COR TRAFF SIG BASE,SW QUAD E.21ST & UNIVERSITY--------------------- 246.284

No. 698 Sta. 572+18.700 321.43 Rt. CUT X NW COR TRAFF SIG BASE,SE QUAD HUBBELL AVE & UNIVERSITY AVE--------------- 245.533

~~No. 567 Sta. 572+51.033 4.09 Rt. IHC BM N.W. HANDRAIL BR. OVER EAST 21ST STREET - EAST BOUND LANE FREEWAY------- 251.772~~

No. 703 Sta. 572+80.955 99.92 Lt. SET RR SPK W.SIDE P. POLE SE QUAD DELAWARE & EASTON------ 246.903

No. 699 Sta. 573+00.385 434.58 Rt. SET RR SPK N.SIDE P. POLE N. OF E.22ND CT. & UNIVERSITY AVE----------------- 245.547

No. 709 Sta. 574+13.836 85.91 Rt. SET RR SPK E.SIDE P. POLE W. OF E.22ND ST & ELIZABETH AVE----------------- 245.908

No. 704 Sta. 574+42.993 70.76 Lt. SET RR SPK W.SIDE P. POLE SE QUAD TICHENOR & E.22ND------ 246.545

No. 568 Sta. 575+38.598 2.55 Lt. (X) ON CONC SIGN BASE STATE FAIRGROUNDS EXIT SIGN WEST BOUND LANE SIGN LEG AT MEDIAN CL---------- 247.466

No. 707 Sta. 575+55.490 95.99 Rt. SET RR SPK SW.SIDE P.POLE NE QUAD EASTON BLVD. & E.22ND ST---------------------- 246.864

No. 708 Sta. 576+24.981 233.01 Rt. SET RR SPK NW.SIDE P.POLE NE QUAD EASTON BLVD & SEARLE ST---------------------- 248.741

No. 705 Sta. 576+59.139 21.07 Lt. SET RR SPK SW.SIDE P.POLE IN FRONT OF 1452 TICHENOR------ 246.981

No. 569 Sta. 577+65.065 17.36 Lt. (X) ON CIR CONC LUM BASE 1ST LUM POLE S. OF OVERHEAD WALK-WAY W. SIDE OF FREEWAY 235----------------- 247.483

No. 706 Sta. 578+48.683 31.76 Lt. CUT X SE BOLT F-HYDRANT IN FRONT OF 1608 TICHENOR------ 247.610

No. 570 Sta. 578+98.785 17.79 Lt. (X) ON CIR CONC LUM BASE 2ND LUM POLE N. OF OVERHEAD WALK-WAY W. SIDE FREEWAY 235------------ 248.010

No. 571 Sta. 580+40.727 17.88 Lt. (X) ON CONC SIGN BASE OVERHEAD SIGN IN SOUTHBOUND LANE OF 235 WEST LEG OF SIGN--------------- 248.579

No. 710 Sta. 581+64.240 23.28 Lt. SET RR SPK E.SIDE P. POLE IN FRONT OF 1824 TICHENOR------ 249.468

No. 572 Sta. 582+06.702 17.44 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY 235--------- 249.343

No. 711 Sta. 583+66.143 53.33 Lt. CUT X NE BOLT F-HYDRANT IN FRONT OF 2026 TICHENOR------ 250.277

No. 573 Sta. 584+33.113 17.50 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY 235 AT FROG OF GUTHRIE AVE EXIT RT TWIN LUMINAIRE POLE------------ 252.247

No. 712 Sta. 585+10.338 80.99 Lt. SET RR SPK NW.SIDE P.POLE E. OF TICHENOR & ALPHA--------- 250.113

No. 574 Sta. 586+30.414 17.81 Lt. IHC BM S.W. WING OF BR. SOUTHBOUND LANE FREEWAY BR. OVER GUTHRIE AVE.---------- 257.098

No. 713 Sta. 586+50.705 76.19 Lt. CUT X S.SIDE 1ST CONC LIGHT BASE W. OF GUTHRIE & W.BOUND GUTHRIE OFF RAMP,N.SIDE OF GUTHRIE--------- 250.181

No. 714 Sta. 587+14.615 204.57 Rt. SET RR SPK NW.SIDE P.POLE SE QUAD E.23RD & GUTHRIE------- 251.264

No. 575 Sta. 588+99.999 18.61 Rt. (X) ON CIR CONC LUM BASE TWIN LUMINAIRE POLE AT FROG OF ON RAMP FROM GUTHRIE AVE. TO N.-------- 253.454

No. 576 Sta. 591+78.655 21.82 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY 235 5 METERS N. OF MM NO.12-------- 250.211

No. 577 Sta. 594+42.872 18.50 Rt. IHC BM ON S.E. WING BR. NORTHBOUND LANE FREEWAY BR. OVER HULL AVE.------------ 254.558

No. 715 Sta. 594+61.530 110.95 Lt. SET RR SPK NE.SIDE P.POLE SW QUAD E.22ND CT & HULL------- 249.414

No. 716 Sta. 594+85.303 96.90 Rt. CUT X TOP BOLT F-HYDRANT IN FRONT OF 2314 HULL---------- 251.210

No. 578 Sta. 596+88.006 25.73 Rt. (X) ON CONC SIGN BASE RT. E. LEG OF SIGN BASE AT E. EUCLID AVE EXIT RAMP EASTBOUND---------------------- 256.551

No. 579 Sta. 599+27.856 19.07 Rt. (X) ON CIR CONC LUM BASE APPROX 170M S. OF EAST EUCLID AVE OVERHEAD BR. RT SIDE OF FREEWAY------------ 258.013

No. 719 Sta. 600+83.948 164.18 Lt. CUT X E.SIDE CONC LIGHT BASE,NE QUAD EUCLID AVE & W.BOUND EUCLID OFF RAMP-------- 262.643

No. 718 Sta. 601+12.280 41.06 Rt. FD IHCBM WING,NE COR EUCLID BRG---------------------- 269.298

No. 580 Sta. 601+29.736 24.27 Rt. (X) ON CIR CONC LUM BASE 1ST LUM POLE ON RT SIDE N. OF OVERHEAD BR. ON E. ECULID AVE.------------- 262.181

No. 717 Sta. 601+30.304 244.31 Rt. SET RR SPK SW.SIDE P.POLE JUST SW OF 2438 E.EUCLID------- 276.744

No. 581 Sta. 603+61.608 19.32 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY 3 METERS N. OF RCP OUTLET------ 269.718

No. 582 Sta. 605+62.929 26.49 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY/RAMP-------- 274.931

No. 583 Sta. 607+59.391 21.81 Rt. (X) ON CIR CONC LUM BASE RT SIDE OF FREEWAY 14 METERS S. OF MM 13---------- 281.004

No. 584 Sta. 609+70.363 31.59 Lt. (X) ON CIR CONC SIGN BASE WEST LEG OF SIGN GRAND VIEW COLLEGE NEXT RIGHT SIGN W. SIDE OF FREEWAY------------ 280.002

No. 585 Sta. 612+97.092 38.32 Lt. SET RR SPK E.SD .3 MAPLE IN WEST ROW OF FREEWAY--------- 282.631

No. 586 Sta. 614+40.517 27.52 Rt. (X) ON INLET HDWL RT. 1.22 X 1.22 RCB---------------- 282.662

No. 587 Sta. 618+88.253 18.53 Rt. IHC BM S.E. WING BRIDGE NORTHBOUND LANE FREEWAY BR. OVER BROADWAY AVE---------- 293.674

No. 588 Sta. 622+23.115 18.53 Rt. IHC BM S.E. WING BRIDGE OVER RR TRACKS NORTHBOUND LANE BR.------------ 294.117

No. 589 Sta. 624+75.269 74.57 Rt. (X) ON CONC SIGN BASE EAST LEG OF OVERHEAD SIGN NORTHBOUND LANE AT EXIT TO I-80 EAST (DAVENPORT) ((END OF I-235))--------------- 293.129

No. 590 Sta. 627+11.819 138.33 Rt. IHC BM N.W. HANDRAIL BR. I-35 NORTHBOUND BR. OVER I-80 EASTBOUND (AT THE MIXMASTER)------------ 294.550

No. 566A, STA. 571+10.9, 36.3 LT. BRASS D.O.T PLUG ON BARRIER RAIL N.E. CORNER OF WBL I-235 BRIDGE OVER EASTON BLVD. - - - - - - - - 257.697

No. 567A, STA. 572+68.1, 25.9 LT. BRASS D.O.T PLUG ON BARRIER RAIL, N.E. CORNER OF WBL BRIDGE ON I-235 OVER E.21ST STREET - - - - - - - - - 254.875

No. 567B, STA. 574+18.4, 19.7 LT. BRASS D.O.T. PLUG ON BARRIER RAIL N.W. CORNER OF WB OFF RAMP "A" BRIDGE, I-235, OVER UP RR TRACKS - - - 252.149

P.I. STA.394+14.574
FOUND X CL BRIDGE
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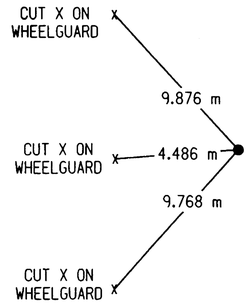

STA.394+32.043,71.783 LT
GPS NO.11 SET FENO MONU.
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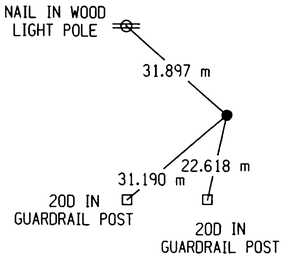

P.O.T. STA.396+14.574
SET IRON PIN
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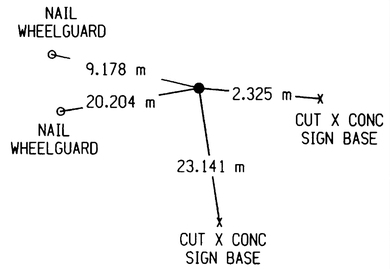

STA.408+63.079,54.840 RT
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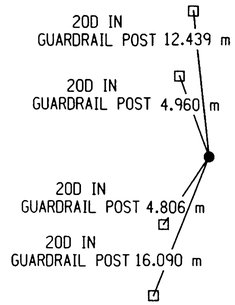
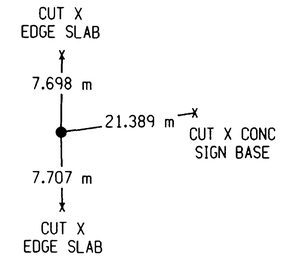


P.O.T. STA.411+07.574
SET IRON PIN
XC=477463.432, YC=176852.752



STA.411+08.192,47.703 RT
GPS NO.19 SET FENO MONU.
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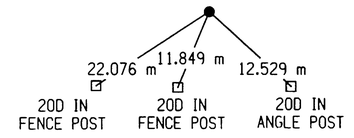

STA.414+06.429,40.591 LT
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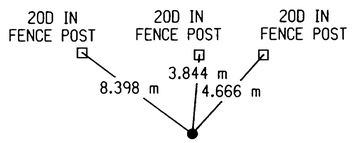

STA.418+46.964,35.645 LT
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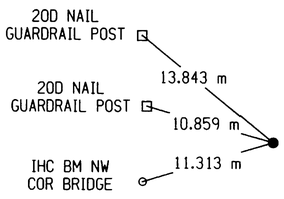

STA.418+60.995,373.159 LT
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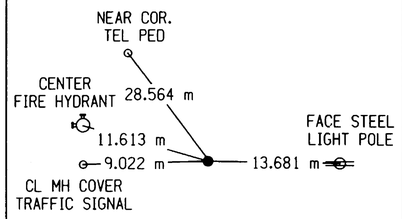

STA.421+73.925,62.195 RT
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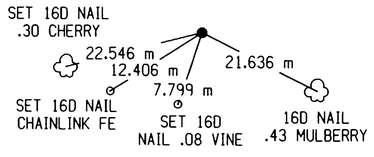

STA.426+56.000,41.210 LT
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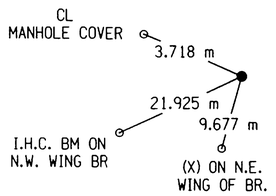

STA.426+58.318,266.879 RT
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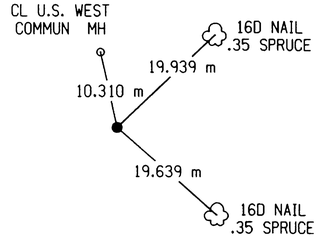

P.I. STA.433+63.348
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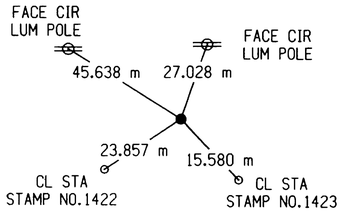

STA.434+63.228,48.581 LT
GPS NO.24 CUT (X) ON SWK
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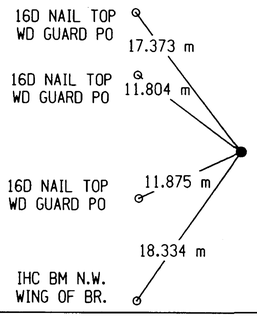

STA.439+98.255,2.319 LT
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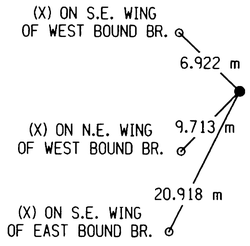

STA.440+18.912,272.257 LT
GPS NO.25 (X) ON CURB
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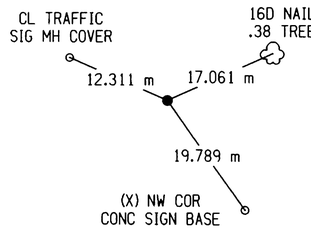

P.I. STA.445+15.281
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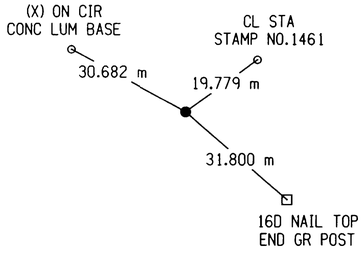
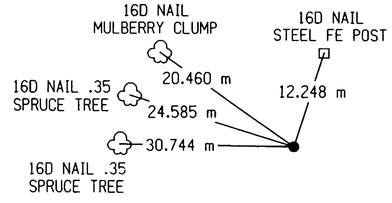
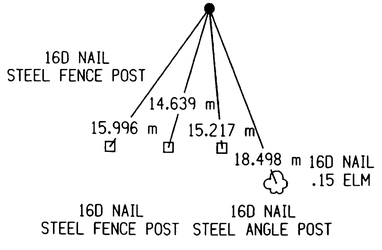


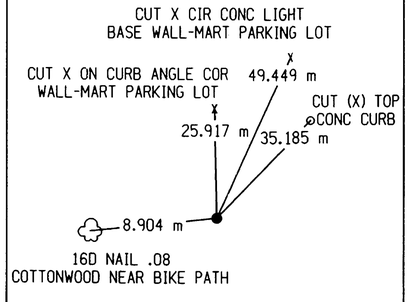
STA.451+10.905,26.271 LT
GPS NO.30 (SET IRON PIN)
XC=481461.460, YC=176992.679



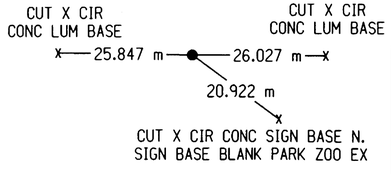
STA.454+60.588,54.219 RT
GPS NO.31 SET FENO MONU.
XC=481810.648, YC=176910.070



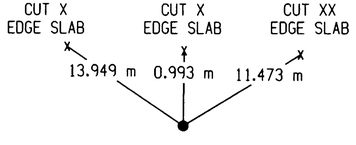
STA.456+28.457,302.904 LT
GPS NO.54 SET FENO MONU.
XC=481980.680, YC=177266.169



STA.461+42.852,22.428 RT
GPS NO.32 (SET IRON PIN)
XC=482493.092, YC=176937.723



P.I. STA.463+00.657
FD CUT X
XC=482651.030, YC=176959.194



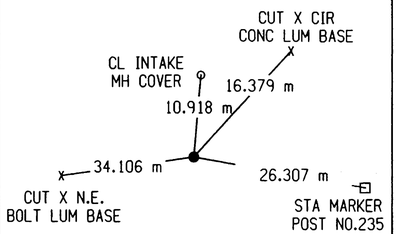
DETAILS OF REFERENCE INFORMATION

All References Plumb Distances
(unless otherwise noted)

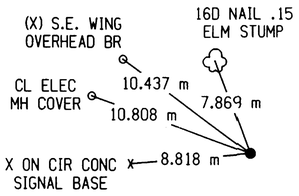
1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.08

12-JAN-2002 07:25 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g05

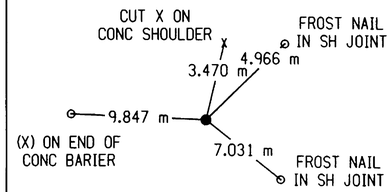
STA.465+38.501,25.594 LT
GPS NO.55 (SET IRON PIN)
XC=482890.160, YC=176968.047



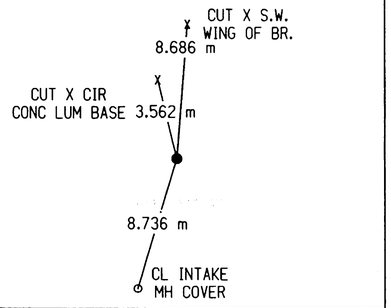
STA.467+00.629,36.525 RT
GPS NO.36 (SET IRON PIN)
XC=483047.535, YC=176894.716



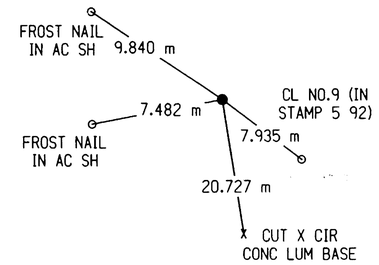
STA.471+23.687,0.552 LT
GPS NO.56 SET FENO MONU.
XC=483472.150, YC=176902.045



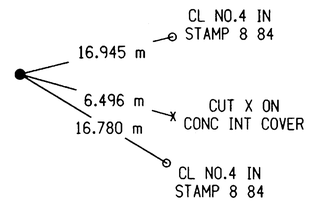
STA.474+88.501,51.357 RT
GPS NO.37 (SET IRON PIN)
XC=483832.428, YC=176824.692



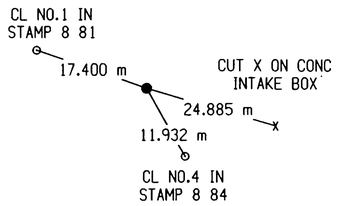
STA.478+55.116,1.932 RT
GPS NO.38 (SET IRON PIN)
XC=484201.606, YC=176848.296



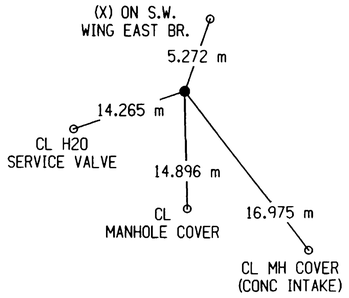
STA.480+83.033,1.439 LT
GPS NO.38 (SET IRON PIN)
XC=484429.199, YC=176835.682



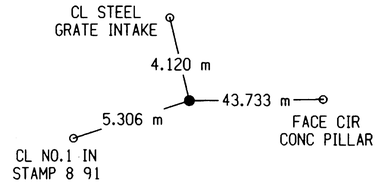
P.I. STA.483+84.821
GPS NO.40 (FD IRON PIN)
XC=484730.144, YC=176813.091



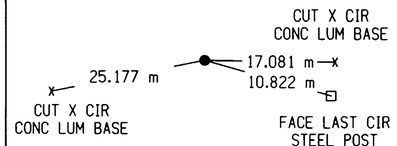
STA.485+24.647,40.464 RT
GPS NO.42 (SET IRON PIN)
XC=484856.758, YC=176740.593



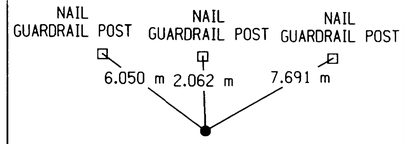
P.I. STA.487+40.121
GPS NO.44 (FD IRON PIN)
XC=485075.686, YC=176728.897



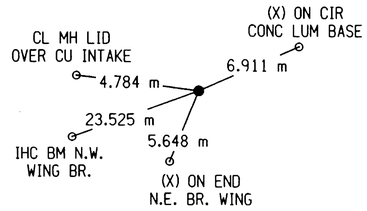
STA.490+01.297,36.115 LT
GPS NO.46 SET FENO MONU.
XC=485337.515, YC=176765.131



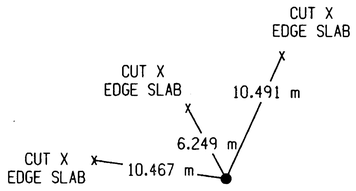
PC 491+19.518
SET IRON PIN
XC=485455.752, YC=176729.070



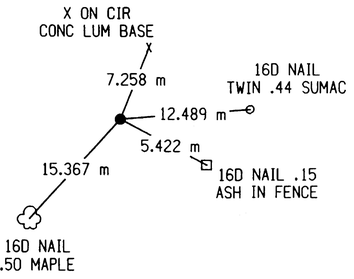
STA.491+39.887,44.135 LT
GPS NO.58 X ON CONC AT MH
XC=485474.035, YC=176773.640



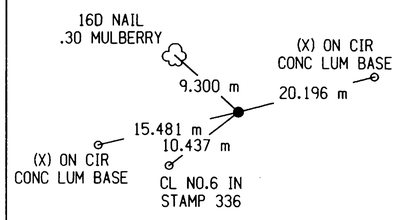
PT 493+44.300
SET IRON PIN
XC=485670.709, YC=176785.765



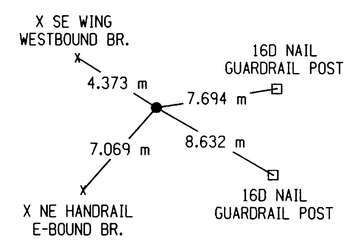
STA.493+90.782,29.146 RT
GPS NO.59 (SET IRON PIN)
XC=485725.518, YC=176783.310



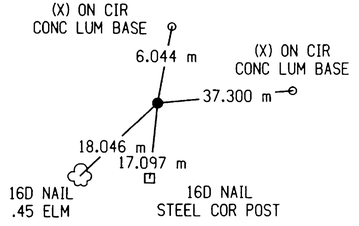
P.I. STA.496+57.553
GPS NO.61 (FD CONC MONU.)
XC=485943.283, YC=176940.136



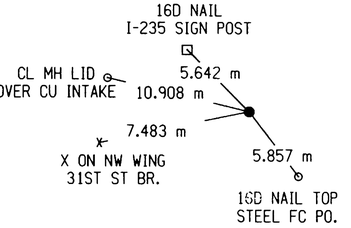
STA.500+41.919,1.471 LT
GPS NO.64 SET FENO MONU.
XC=486335.089, YC=176935.545



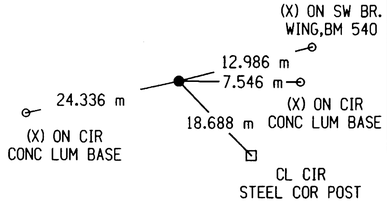
STA.502+95.675,27.119 RT
GPS NO.65 SET IRON PIN
XC=486588.373, YC=176903.032



STA.504+38.086,39.364 LT
GPS NO.66 SET FENO MONU.
XC=486731.796, YC=176967.304



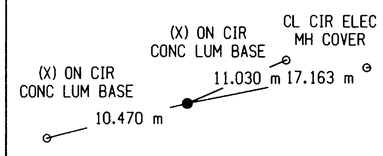
STA.507+92.979,25.439 RT
GPS NO.68 SET IRON PIN
XC=487089.479, YC=176910.388



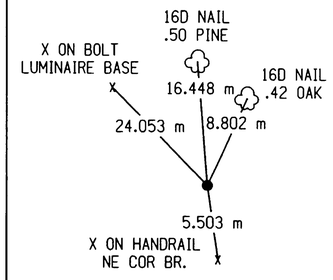
P.I. CTA.508+51.552
FOUND CONC MONU.
XC=487144.603, YC=176921.547



STA.512+71.290,29.556 RT
GPS NO.71 (SET IRON PIN)
XC=487541.477, YC=177083.256



STA.513+81.999,58.034 LT
GPS NO.72 (SET IRON PIN)
XC=487604.784, YC=177210.985



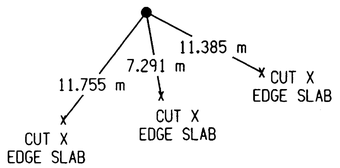
DETAILS OF REFERENCE INFORMATION

All References Plumb Distances
(unless otherwise noted)

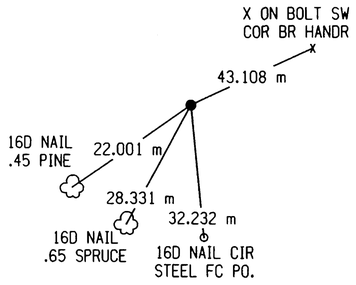
1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.09

12-JAN-2002 07:26 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g05

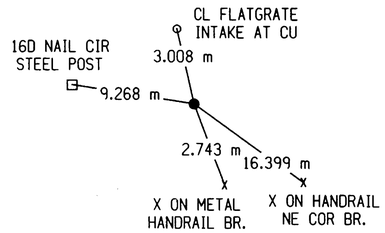
P.I. STA.515+53.052
CUT X UNDER BR ON APRON
XC=487781.443, YC=177233.854



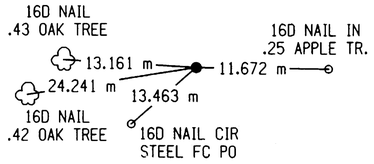
STA.515+69.268,61.324 RT
GPS NO.73 SET FENO MONU.
XC=487818.521, YC=177154.385



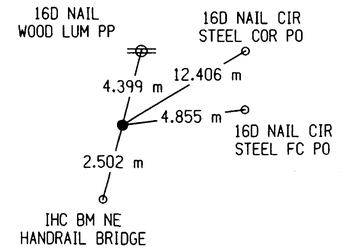
STA.517+72.805,51.869 LT
GPS NO.77 CUT X ON SWK
XC=488009.161, YC=177283.604



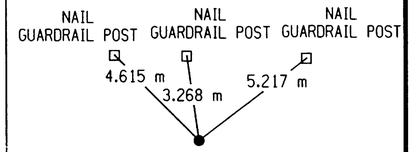
STA.518+36.165,43.773 RT
GPS NO.79 (SET IRON PIN)
XC=488071.626, YC=177187.375



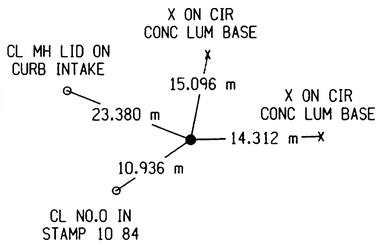
STA.518+87.648,44.251 LT
GPS NO.78 (CUT X ON SWK)
XC=488123.928, YC=177274.916



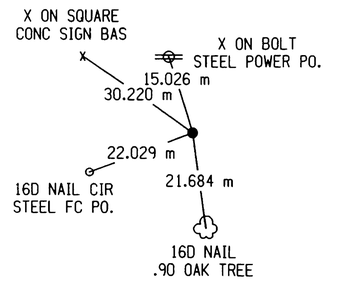
P.I. STA.519+00.733
SET IRON PIN
XC=488136.599, YC=177230.545



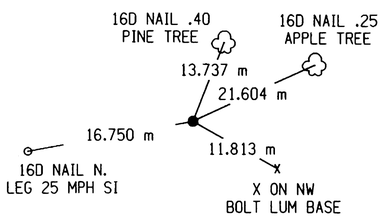
STA.520+76.191,35.249 LT
GPS NO.80 (SET IRON PIN)
XC=488312.303, YC=177264.553



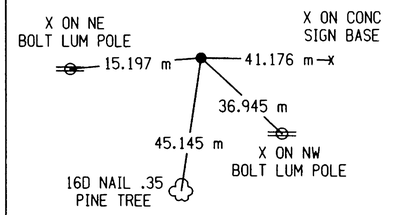
STA.521+82.364,477.799 LT
GPS NO.82 SET FENO MONU.
XC=488421.602, YC=177706.340



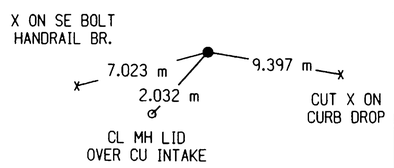
STA.523+09.830,65.953 LT
GPS NO.81 SET IRON PIN
XC=488546.153, YC=177293.604



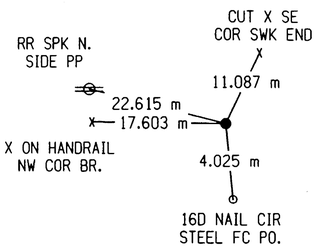
STA.525+90.021,42.887 RT
GPS NO.83 (SET IRON PIN)
XC=488825.567, YC=177182.785



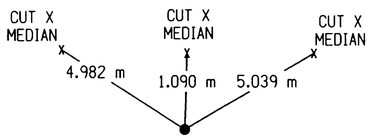
STA.527+97.498,17.977 RT
GPS NO.84 (SET IRON PIN)
XC=489033.215, YC=177206.228



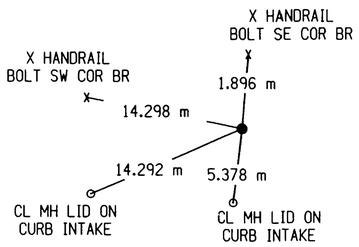
STA.529+91.393,45.120 LT
GPS NO.85 (CUT X ON SWK)
XC=489227.551, YC=177267.952



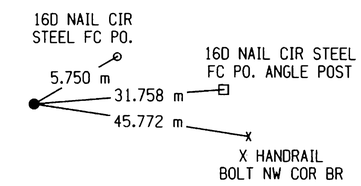
P.I. STA.531+36.863
CUT X CONC MEDIAN
XC=489372.699, YC=177221.804



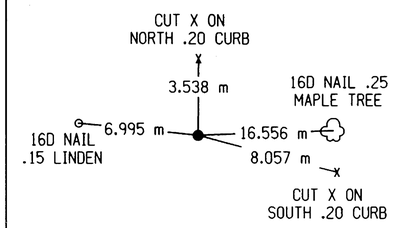
STA.531+96.243,44.487 RT
GPS NO.86 (CUT X ON SWK)
XC=489431.560, YC=177176.633



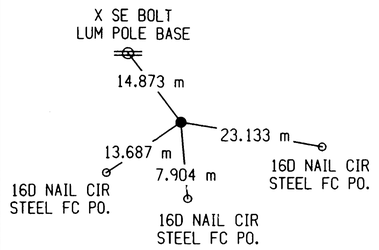
STA.533+69.766,38.386 LT
GPS NO.87 (FENO MONU)
XC=489606.031, YC=177257.490



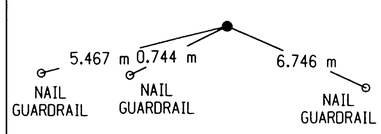
STA.535+35.939,133.615 RT
GPS NO.148 (SET FENO MONU
XC=489770.200, YC=177083.577



STA.536+00.734,43.866 RT
GPS NO.88 (IRON PIN)
XC=489836.031, YC=177172.569



POST 536+46.096
FOUND X CUT
XC=489881.897, YC=177215.907



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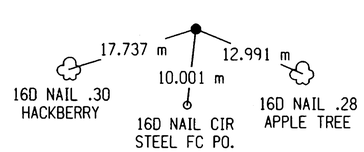

PI 537+51.353
SET HINGE NAIL
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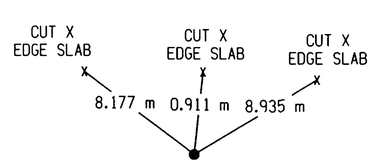

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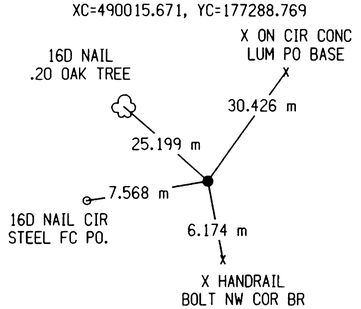

STA.537+99.317,42.082 RT
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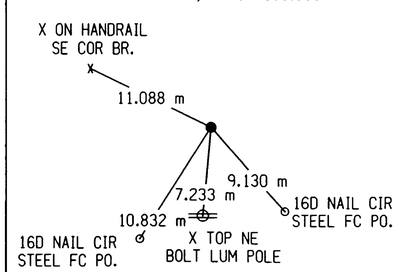

DETAILS OF REFERENCE INFORMATION

All References Plumb Distances
(unless otherwise noted)

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.10

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TABULATION OF POINT AND CURVE DATA

116-1
Special

POINT OR CURVE NO.	BASELINE LOCATION	BEGIN ALIGNMENT OR BEGIN CURVE			P.I.			END ALIGNMENT OR END CURVE			CURVE DATA					BACK TANGENT BEARING	FORWARD TANGENT BEARING
		STATION	COORDINATE		STATION	COORDINATE		STATION	COORDINATE		Δ	T	L	R	E		
			X	Y		X	Y		X	Y	Deg/Sec/Min	m	m	m	m		
33211	E15A	32157+68.773	491,955.175	177362.706													N 85° 20′ 28.717″ E
33212	E15A	32158+26.506	492,012.7172	177,367.3954	32158+88.284	492,074.2915	177,372.4130	32159+49.439	492,132.7927	177,392.2668	14° 05′ 13.81″	61.7784	122.9337	500.0000	3.7734	N 85° 20′ 28.717″ E	N 71° 15′ 14.909″ E
33213	E15A	32159+49.439	492,132.7927	177,392.2668	32161+65.693	492,235.5005	177,427.1231	32161+65.693	492,329.6507	177,480.9712	11° 01′ 15.66″	108.4613	216.2534	1124.2526	5.1956	N 71° 15′ 14.909″ E	N 60° 13′ 59.254″ E
33214	E15A	32164+38.733	492,566.6637	177,616.5279	32165+38.622	492,653.3727	177,666.1201	32166+38.437	492,743.1885	177,709.8346	3° 48′ 50.67″	99.8891	199.7045	3000.0000	1.6616	N 60° 13′ 59.254″ E	N 64° 02′ 49.924″ E
33215	E15A							32167+20.000	492,016.5260	177,745.5289						N 64° 02′ 49.924″ E	
33241	E15D	32457+44.997	491,988.3887	177,244.4651													N 69° 20′ 28.717″ E
33242	E15D	32460+54.517	492,278.0065	177,353.6640	32461+50.099	492,367.4425	177,387.3854	32462+45.279	492,450.4128	177,434.8392	9° 06′ 29.46″	95.5821	190.7614	1200.0000	3.7886	N 69° 20′ 28.717″ E	N 60° 13′ 59.254″ E
33243	E15D	32463+65.893	492,555.1122	177,494.7208	32464+28.854	492,609.7660	177,525.9793	32464+91.556	492,658.8570	177,565.4028	9° 00′ 00.00″	62.9614	125.6637	800.0000	2.4661	N 60° 13′ 59.254″ E	N 60° 13′ 59.254″ E
33244	E15D	32466+24.336	492,762.3854	177,648.5433	32466+87.298	492,811.4764	177,687.9668	32467+50.000	492,866.1302	177,719.2253	9° 00′ 00.00″	62.9614	125.6637	800.0000	2.4661	N 60° 13′ 59.254″ E	N 60° 13′ 59.254″ E
33311	UnivA	33165+82.757	492,675.4864	177,752.4113													N 25° 56′ 16.505″ E
33312	UnivA	33166+11.467	492,688.0442	177,778.2295	33166+82.938	492,719.3054	177,842.5012	33167+43.632	492,789.6966	177,854.8785	54° 05′ 21.67″	71.4711	132.1652	140.0000	15.3087	N 25° 56′ 16.505″ E	N 80° 01′ 38.178″ E
33313	UnivA	33169+51.166	492,994.0943	177,890.8190	33170+52.682	493,094.0765	177,908.3995	33171+50.000	493,173.5750	177,971.5305	28° 28′ 51.29″	101.5161	198.8343	400.0000	12.2912	N 80° 01′ 38.178″ E	N 51° 32′ 46.888″ E
33314	UnivA	33171+50.000	493,173.5750	177,971.5305	33172+64.344	493,263.1193	178,042.6390	33173+76.686	493,325.3819	178,138.5451	18° 33′ 16.32″	114.3442	226.6864	700.0000	9.1562	N 51° 32′ 46.888″ E	N 32° 59′ 30.567″ E
33321	UnivB	33260+70.000	492,272.5546	177,384.3724													N 60° 23′ 26.357″ E
33322	UnivB	33262+01.538	492,393.0828	177,437.0533	33262+98.354	492,481.7945	177,475.8277	33263+94.983	492,565.8354	177,523.8939	6° 09′ 27.10″	96.8154	193.4445	1800.0000	2.5980	N 60° 23′ 26.357″ E	N 60° 13′ 59.254″ E
33323	UnivB	33267+78.283	492,898.5599	177,714.1916	33268+00.874	492,918.1702	177,725.4075	33268+22.550	492,940.7528	177,726.0324	28° 10′ 54.27″	22.5912	44.2678	90.0000	2.7080	N 60° 13′ 59.254″ E	N 88° 24′ 53.520″ E
33332	UnivC	33363+10.000	492,394.1591	177,497.0493	33363+53.252	492,431.0754	177,519.5861	33363+96.394	492,464.9364	177,546.4962	7° 04′ 17.16″	43.2519	86.3939	700.0000	1.3324	N 58° 35′ 47.577″ E	N 51° 31′ 30.412″ E
33333	UnivC	33367+46.394	492,738.9448	177,764.2562	33368+63.392	492,830.5400	177,837.0488	33369+58.117	492,938.8806	177,792.8813	60° 39′ 15.33″	116.9976	211.7233	200.0000	27.3687	N 51° 31′ 30.412″ E	S 67° 49′ 14.254″ E
33334	UnivC	33370+18.117	492,994.4410	177,770.2309	33370+57.718	493,031.1115	177,755.2813	33370+96.307	493,070.7120	177,755.4337	22° 23′ 59.44″	39.6008	78.1902	200.0000	3.8089	S 67° 49′ 14.254″ E	N 89° 46′ 46.301″ E
33522	EastonB	35270+70.000	493,143.7094	177,882.1405	35270+90.004	493,159.9936	177,893.7591	35271+10.000	493,176.8381	177,904.5493	2° 51′ 53.24″	20.0042	40.0000	800.0000	0.2500	N 54° 29′ 32.878″ E	N 57° 21′ 26.119″ E
33523	EastonB	35272+24.742	493,273.4567	177,966.4411	35273+18.236	493,352.1829	178,016.8714	35274+10.629	493,414.9145	178,086.1951	15° 12′ 54.15″	93.4935	185.8868	700.0000	6.1613	N 57° 21′ 26.119″ E	N 42° 08′ 31.969″ E
33524	EastonB	35274+10.629	493,414.9145	178,086.1951	35274+48.701	493,440.4597	178,114.4247	35274+83.384	493,440.7631	178,152.4955	41° 41′ 08.18″	38.0719	72.7551	100.0000	6.5440	N 42° 08′ 31.969″ E	N 0° 27′ 23.791″ E
33525	EastonB							35275+23.384	493,441.0819	178,192.4942						N 0° 27′ 23.791″ E	
33541	EastonD	35474+66.344	493,454.2580	178,198.5109													N 1° 06′ 55.161″ W
33542	EastonD							25478+00.000	493,447.7634	178,532.1033						N 1° 06′ 55.161″ W	
33611	GuthrieA	36186+47.675	493,478.1463	179,350.6194													N 19° 51′ 52.692″ E
33612	GuthrieA	36188+56.264	493,549.0246	179,546.7968	36189+13.257	493,568.3909	179,600.3990	36189+70.000	493,578.8311	179,656.4280	9° 18′ 33.90″	56.9934	113.7360	700.0000	2.3087	N 19° 51′ 52.692″ E	N 10° 33′ 18.794″ E
33621	GuthrieB	36283+20.000	493,481.0292	179,043.3592													N 17° 22′ 43.548″ E
33622	GuthrieB	36283+60.000	493,492.9767	179,081.5332	36284+01.870	493,505.4827	179,121.4917	36284+43.308	493,527.4387	179,157.1430	14° 14′ 53.81″	41.8698	83.3076	335.0000	2.5863	N 17° 22′ 43.548″ E	N 31° 37′ 37.353″ E
33623	GuthrieB	36285+48.041	493,582.3597	179,246.3214	36285+83.714	493,601.0663	179,276.6964	36286+18.909	493,610.5307	179,311.0912	16° 14′ 30.28″	35.6732	70.8680	250.0000	2.5069	N 31° 37′ 37.353″ E	N 15° 23′ 07.075″ E
33624	GuthrieB							36286+58.909	493,621.1430	179,349.6577							
33631	GuthrieC	36382+39.000	493,418.7947	178,973.5155												N 15° 23′ 07.075″ E	N 8° 55′ 25.338″ E
33632	GuthrieC							36386+20.725	493,478.0076	179,350.6203						N 8° 55′ 25.338″ E	
33641	GuthrieD	36486+68.990	493,621.1430	179,349.6577													N 2° 23′ 07.075″ E
33642	GuthrieD	36487+97.316	493,626.4839	179,477.8725	36488+27.633	493,627.7456	179,508.1634	36488+57.947	493,628.2725	179,538.4760	1° 23′ 22.44″	30.3171	60.6313	2500.0000	0.1838	N 2° 23′ 07.075″ E	N 0° 59′ 44.633″ E
33643	GuthrieD	36489+34.447	493,629.6019	179,614.9644	36490+34.808	493,631.3460	179,715.3098	36491+35.000	493,643.1267	179,814.9764	5° 44′ 43.49″	100.3605	200.5528	2000.0000	2.5133	N 0° 59′ 44.633″ E	N 6° 44′ 28.124″ E
23301	Univ.	33062+68.891	492,379.1570	177,779.0910													S 89° 41′ 35.350″ E
23302	Univ.	33064+18.891	492,529.1548	177,778.2877	33064+66.246	492,576.5094	177,778.0341	33065+13.115	492,622.3534	177,766.1661	14° 12′ 25.38″	47.3552	94.2247	380.0000	2.9168	S 89° 41′ 35.350″ E	S 75° 29′ 09.970″ E
23303	Univ.	33065+94.115	492,700.7684	177,745.8663	33066+36.542	492,741.8411	177,735.2336	33066+78.410	492,784.2516	177,736.4072	16° 05′ 56.51″	42.4267	84.2943	300.0000	2.9558	S 75° 29′ 09.970″ E	N 88° 24′ 53.520″ E
23304	Univ.	33067+54.712	492,860.5246	177,738.5179												N 88° 24′ 53.520″ E	N 88° 24′ 53.520″ E
23309	Univ.							33071+74.397	493,280.1578	177,743.2395						N 88° 24′ 53.520″ E	
23501	Easton	35065+59.457	492,597.1495	177,771.7845													N 32° 34′ 05.464″ E
23502	Easton	35065+70.698	492,603.2007	177,781.2581	35065+97.308	492,617.5252	177,803.6841	35066+22.713	492,641.1012	177,816.0246	29° 48′ 09.73″	26.6105	52.0155	100.0000	3.3630	N 32° 34′ 05.464″ E	N 62° 22′ 15.192″ E
23504	Easton	35067+59.298	492,762.1086	177,879.3700												N 62° 22′ 15.192″ E	S 65° 03′ 48.296″ W
23505	Easton	35071+67.172	493,131.9580	178,051.3355												S 65° 03′ 48.296″ W	S 65° 27′ 23.791″ W
23506	Easton	35074+06.765	493,349.9035	178,150.8584												S 65° 27′ 23.791″ W	S 65° 27′ 23.791″ W
23507	Easton	35078+43.063	493,746.7810	178,332.0890												S 65° 27′ 23.791″ W	
23601	Guthrie	36083+58.238	493,241.3900	179,352.2115													N 89° 36′ 52.925″ W
23602	Guthrie	36086+59.704	493,542.8488	179,350.1842												N 89° 36′ 52.925″ W	N 89° 36′ 52.925″ W
23603	Guthrie							36089+23.024	493,806.1625	179,348.4135						N 89° 36′ 52.925″ W	
23404	E21 St.	34069+65.489	493,280.1578	177,743.2395													N 0° 14′ 42.042″ W
23406	E21 St.	34071+65.341	493,279.3031	177,943.1105	34071+81.496	493,279.2340	177,959.2655	34071+97.165	493,272.5200	177,973.9594	24° 18′ 42.23″	16.1551	31.8240	75.0000	1.6816	N 0° 14′ 42.042″ W	N 24° 33′ 24.276″ W
23409	E21 St.							34073+25.937	493,219.0032	178,091.0839						N 24° 33′ 24.276″ W	
32621	E6B	26243+10.000	490,541.9533	177,141.5225													S 74° 39′ 32.595″ E
32624	E6B							26245+38.408	490,762.2228	177,081.0944						S 74° 39′ 32.595″ E	
32625	E6B	26245+39.273	490,762.2228	177,081.0944													S 86° 19′ 10.292″ E
32626	E6B							26247+58.204	490,980.7026	177,067.0407						S 86° 19′ 10.292″ E	
32632	E6C	26343+00.000	490,536.2424	177,199.1700	26343+54.144	490,590.3194	177,196.4773	26344+07.770	490,643.4917	177,206.6889	13° 43′ 18.08″	54.1440	107.7699	450.0000	3.2224	S 87° 08′ 57.952″ E	S 79° 07′ 43.971″ E
32633	E6C	26345+35.734	490,769.1595	177,230.8230	26345+63.939	490,796.8585	177,236.1425	26345+91.775	490,824.9482	177,233.5944	16° 03′ 16.12″	28.2051	56.0407	200.0000	1.9596	S 79° 07′ 43.971″ E	S 84° 48′ 59.906″ E
32634	E6C							26346+11.775	490,844.8665	177,231.7875						S 84° 48′ 59.906″ E	

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.11

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TABULATION OF POINT AND CURVE DATA

116-1
Special

POINT OR CURVE NO.	BASELINE LOCATION	BEGIN ALIGNMENT OR BEGIN CURVE			P.I.			END ALIGNMENT OR END CURVE			CURVE DATA					BACK TANGENT BEARING	FORWARD TANGENT BEARING
		STATION	COORDINATE		STATION	COORDINATE		STATION	COORDINATE		Δ	T	L	R	E		
			X	Y		X	Y		X	Y	Deg/Sec/Min	m	m	m	m		
32711	PennA	27146+08.646	490,844.8665	177,231.7875													S 84° 48′ 59.906″ E
32712	PennA	27147+04.713	490,940.5405	177,223.1085												S 84° 48′ 59.906″ E	S 84° 49′ 06.086″ E
32713	PennA	27147+61.106	490,996.7025	177,218.0155	27147+89.902	491,025.3814	177,215.4148	27148+18.569	491,053.2496	177,208.1616	9° 24′ 25.00″	28.7966	57.4638	350.0000	1.1787	S 84° 49′ 06.086″ E	S 75° 24′ 41.083″ E
32715	PennA	27149+18.569	491,150.0255	177,182.9739	27149+75.465	491,205.0865	177,168.6433	27150+31.373	491,261.8516	177,172.4910	18° 27′ 58.54″	56.8953	112.8040	350.0000	4.5347	S 75° 24′ 41.083″ E	N 86° 07′ 20.375″ E
32716	PennA	27150+31.373	491,261.8516	177,172.4910	27151+28.885	491,359.1401	177,179.0853	27152+25.732	491,453.3219	177,204.3503	11° 08′ 19.68″	97.5117	194.4088	1000.0000	4.7206	N 86° 07′ 20.375″ E	N 74° 59′ 00.691″ E
32741	PennD	27447+49.136	490,980.7634	177,063.4652													N 83° 29′ 11.723″ E
32742	PennD	27449+25.000	491,155.4925	177,083.4145												N 83° 29′ 11.723″ E	N 83° 29′ 11.723″ E
32743	PennD	27449+45.131	491,175.4933	177,085.6980	27449+78.116	491,208.2652	177,089.4397	27450+11.081	491,241.2024	177,091.2110	3° 26′ 06.50″	32.9848	65.9499	1100.0000	0.4942	N 83° 29′ 11.723″ E	N 86° 55′ 18.219″ E
22601	E6th St.	26042+78.486	490,756.0260	176,880.7825													N 14° 53′ 34.546″ W
22602	E6th St.	26043+30.134	490,742.7518	176,930.6953	26044+10.197	490,722.1745	177,008.0690	26044+82.445	490,760.6731	177,078.2685	43° 38′ 02.45″	80.0632	152.3114	200.0000	14.3249	N 14° 53′ 34.546″ W	N 28° 44′ 27.901″ E
22603	E6th St.	26045+68.436	490,802.0220	177,153.6655												N 28° 44′ 27.901″ E	N 28° 44′ 27.901″ E
22604	E6th St.	26047+27.256	490,878.3925	177,292.9185	26047+99.779	490,913.2660	177,356.5065	26048+69.572	490,915.2420	177,429.0026	27° 10′ 49.07″	72.5230	142.3157	300.0000	8.3996	N 28° 44′ 27.901″ E	N 1° 33′ 40.718″ E
22605	E6th St.							26048+98.970	490,916.0430	177,458.3895						N 1° 33′ 40.718″ E	
22701	Penn Ave	27045+65.232	490,982.2895	176,973.7105													N 0° 58′ 26.704″ W
22702	Penn Ave	27046+64.234	490,980.6065	177,072.6975	27046+94.584	490,980.0905	177,103.0435	27047+24.475	490,970.5950	177,131.8703	17° 15′ 28.18″	30.3504	60.2412	200.0000	2.2638	N 0° 58′ 26.704″ W	N 18° 13′ 54.889″ W
22703	Penn Ave	27047+34.375	490,967.4975	177,141.2734												N 18° 13′ 54.889″ W	N 18° 13′ 54.889″ W
22704	Penn Ave	27048+24.709	490,939.2351	177,227.0730	27048+67.069	490,925.9825	177,267.3055	27049+08.767	490,925.4512	177,309.6612	17° 30′ 47.62″	42.3590	84.0575	275.000	3.2054	N 18° 13′ 54.889″ W	N 0° 43′ 07.265″ W
22705	Penn Ave							27050+51.051	490,923.6665	177,451.9345						N 0° 43′ 07.265″ W	
22901	E 9th St.	29047+50.297	491,127.1600	176,986.8430													N 0° 32′ 07.036″ W
22902	E 9th St.	29047+80.000	491,126.8825	177,016.5450												N 0° 32′ 07.036″ W	N 0° 39′ 44.288″ W
22903	E 9th St.	29048+92.898	491,125.5775	177,129.4354												N 0° 39′ 44.288″ W	N 0° 39′ 43.861″ W
22904	E 9th St.	29050+29.655	491,123.9970	177,266.1830												N 0° 39′ 43.861″ W	N 1° 02′ 23.625″ W
22905	E 9th St.	29050+45.000	491,123.7185	177,281.5260												N 1° 02′ 23.625″ W	N 1° 23′ 20.521″ W
22906	E 9th St.							29051+14.532	491,122.0330	177,351.0370						N 1° 23′ 20.521″ W	
23001	E 12th St.	30050+18.534	491,462.5615	176,992.4850													N 14° 58′ 15.439″ W
23002	E 12th St.	30051+88.628	491,418.6211	177,156.8059												N 14° 58′ 15.439″ W	N 14° 58′ 15.439″ W
23003	E 12th St.	30052+65.015	491,398.8880	177,230.6005												N 14° 58′ 15.439″ W	N 14° 58′ 17.296″ W
23004	E 12th St.							30053+57.574	491374.9765	177320.0175						N 14° 58′ 17.296″ W	
23101	E 14th St.	31053+75.767	491,792.2684	177,091.0524													N 15° 00′ 49.710″ W
23102	E 14th St.	31055+36.086	491,750.7374	177,245.8989												N 15° 00′ 49.710″ W	N 15° 00′ 49.248″ W
23104	E 14th St.							31057+30.725	491,700.3161	177,433.8940						N 15° 00′ 49.248″ W	
10013	I-235	541+00.000	490,334.8943	177,188.6467													S 85° 43′ 02.402″ E
10014	I-235	548+94.176	491,126.8532	177,129.3399	550+42.643	491,274.9048	177,118.2529	551+88.296	491,418.3010	177,156.7200	19° 17′ 56.91″	148.4661	294.1195	873.1894	12.3544	S 85° 43′ 02.402″ E	N 74° 59′ 00.691″ E
10015	I-235	558+66.292	492,073.1446	177,332.3866	560+16.990	492,218.6961	177,371.4319	561+66.021	492,349.5095	177,446.2491	14° 45′ 01.44″	150.6976	299.7287	1164.2526	9.6321	N 74° 59′ 00.691″ E	N 60° 13′ 59.254″ E
10016	I-235	569+99.865	493,073.3297	177,860.2292	574+05.662	493,425.5835	178,061.6965	577+35.379	493,425.7991	178,467.4942	60° 12′ 09.66″	405.7977	735.5145	700.0000	94.4022	N 60° 13′ 59.254″ E	N 0° 01′ 49.589″ E
10025	I-235	580+83.783	493,425.9842	178,815.8982	582+31.136	493,426.0625	178,963.2505	583+76.382	493,468.6400	179,104.3173	16° 45′ 52.88″	147.3523	292.5990	1000.0000	10.6827	N 0° 01′ 49.589″ E	N 16° 47′ 42.467″ E
10026	I-235	587+35.296	493,564.6911	179,422.5516	588+12.105	493,586.8850	179,496.0840	588+88.519	493,595.9011	179,572.3617	10° 03′ 14.34″	76.8087	153.2230	873.1894	3.3587	N 16° 47′ 42.467″ E	N 6° 44′ 28.124″ E
10027	I-235							601+51.173	493,744.1164	180,826.2862						N 6° 44′ 28.124″ E	

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.12
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12-JAN-2002 07:32 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g20

GEOMETRIC PLAN

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND

(10014) Curve Reference Number

0 METERS 50

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.13

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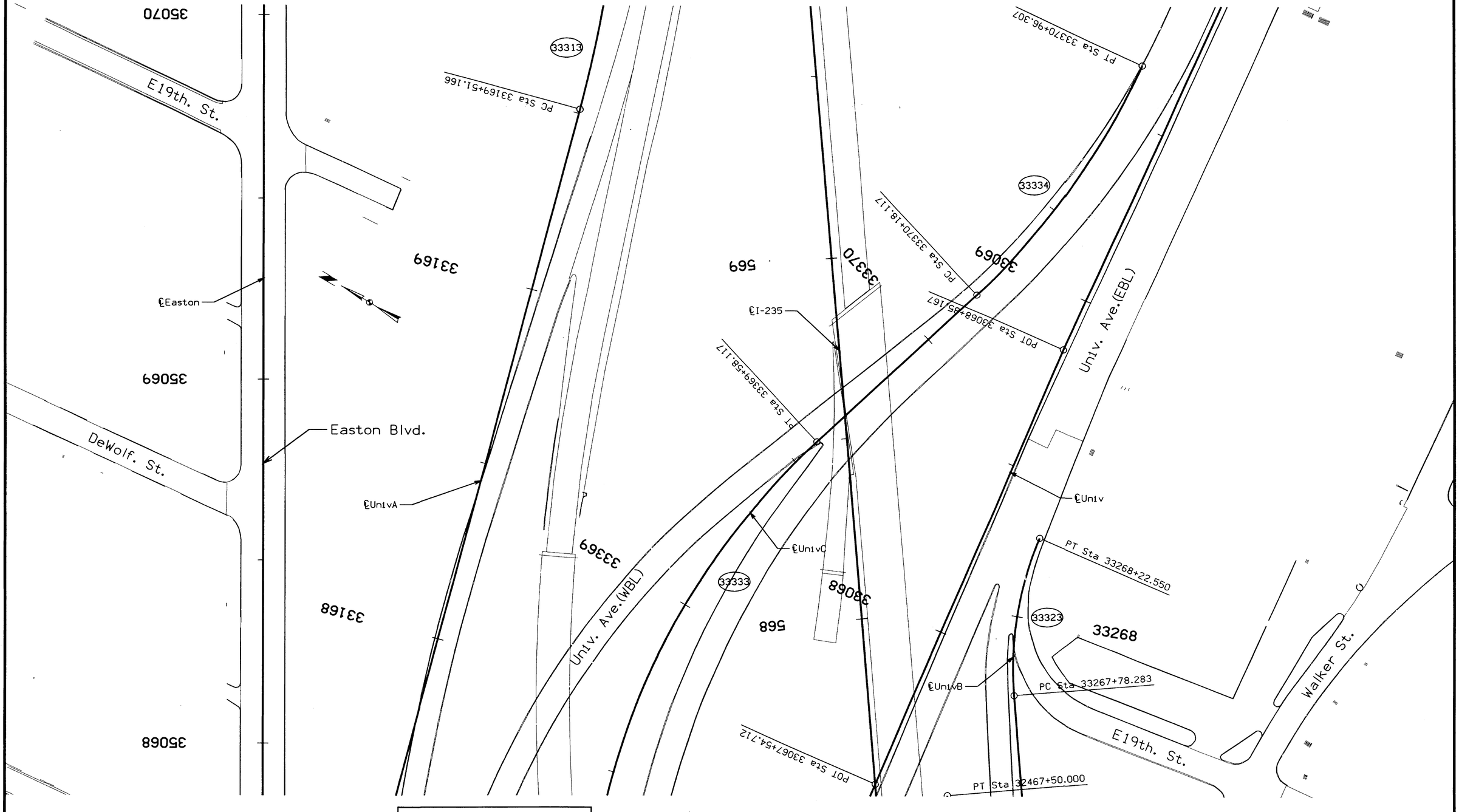

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND

(10014) Curve Reference Number

0 METERS 50

GEOMETRIC PLAN

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	G.14

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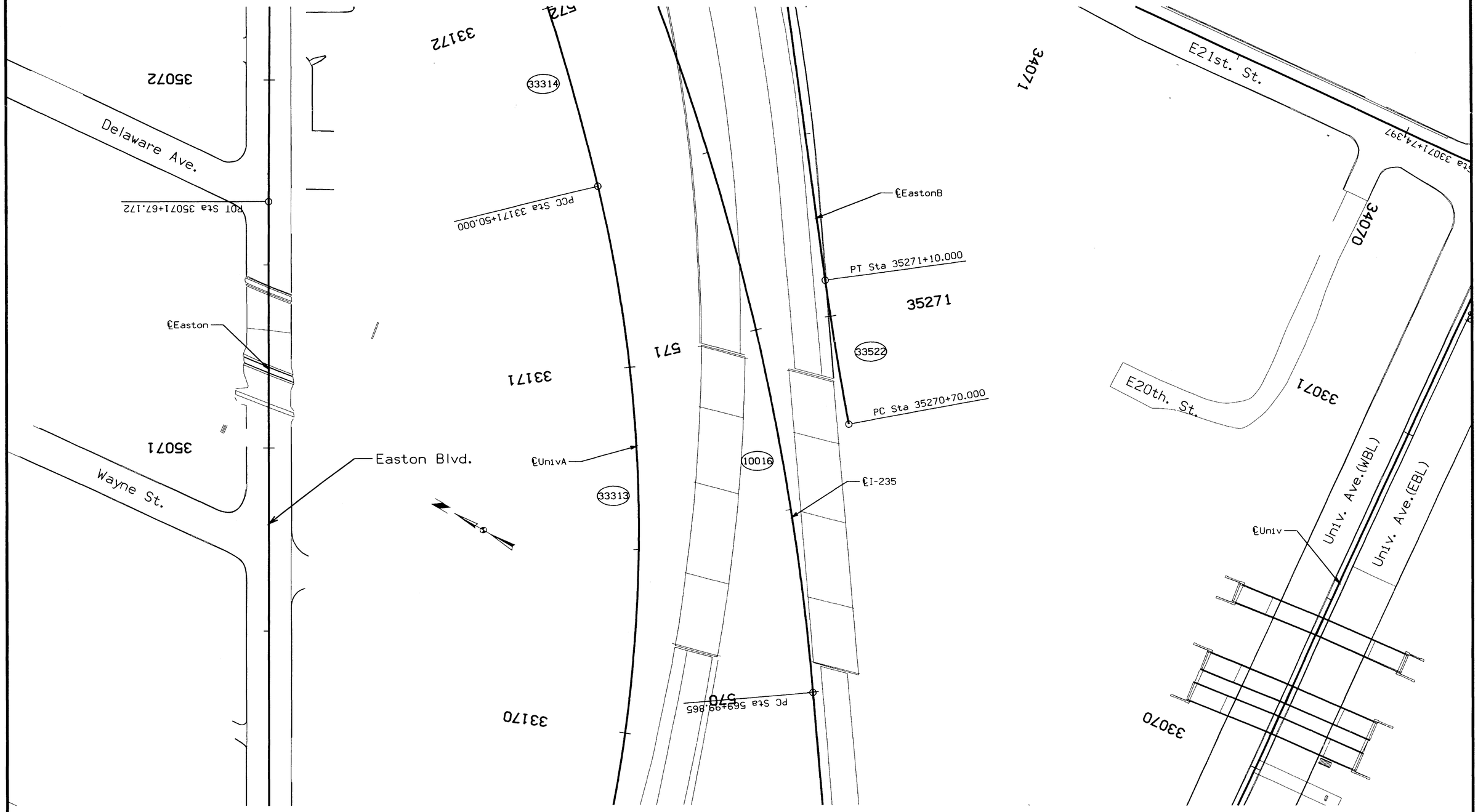

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND

(10014) Curve Reference Number

0 METERS 50

GEOMETRIC PLAN

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.15

12-JAN-2002 07:04 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g24

Delaware Ave.

35073

POT Sta 34073+25.937

PCC Sta 33171+50.000

34073

33172

33173

Easton Blvd.

PT Sta 33173+76.686

574

575

35074

E21st. St.

POT Sta 35074+06.765

Tichenor St.

℄UnivA

33314

572

573

10016

℄I-235

℄Easton

35075

POT Sta 34072+37.426

E21st. St.

34072

PT Sta 34071+92.165

PC Sta 34071+65.341

23406

PC Sta 35272+24.742

35272

33523

33524

POT Sta 35275+23.384

POT Sta 35474+66.3

E22nd. St.

35275

PT Sta 35274+83.384

℄EastonB

35273

Ure St.

35274

PCC Sta 35274+10.62

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND

(10014) Curve Reference Number

0 METERS 50

GEOMETRIC PLAN

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.16

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E21st. St.

35074

a 35074+06.765

575

Tichenor St.

576

℄I-235

10016

577

PT Sta 577+35.379

Washington Ave.

578

E21st. St.

Tichenor St.

35075

POT Sta 35275+23.384

POT Sta 35474+66.344

E22nd. St.

35275

35475

35476

35477

℄EastonD

POT Sta 35478+00.000

Easton Blvd.

35076

E22nd. St.

E22nd. St.

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND

(10014) Curve Reference Number

0 METERS 50

GEOMETRIC PLAN

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.17

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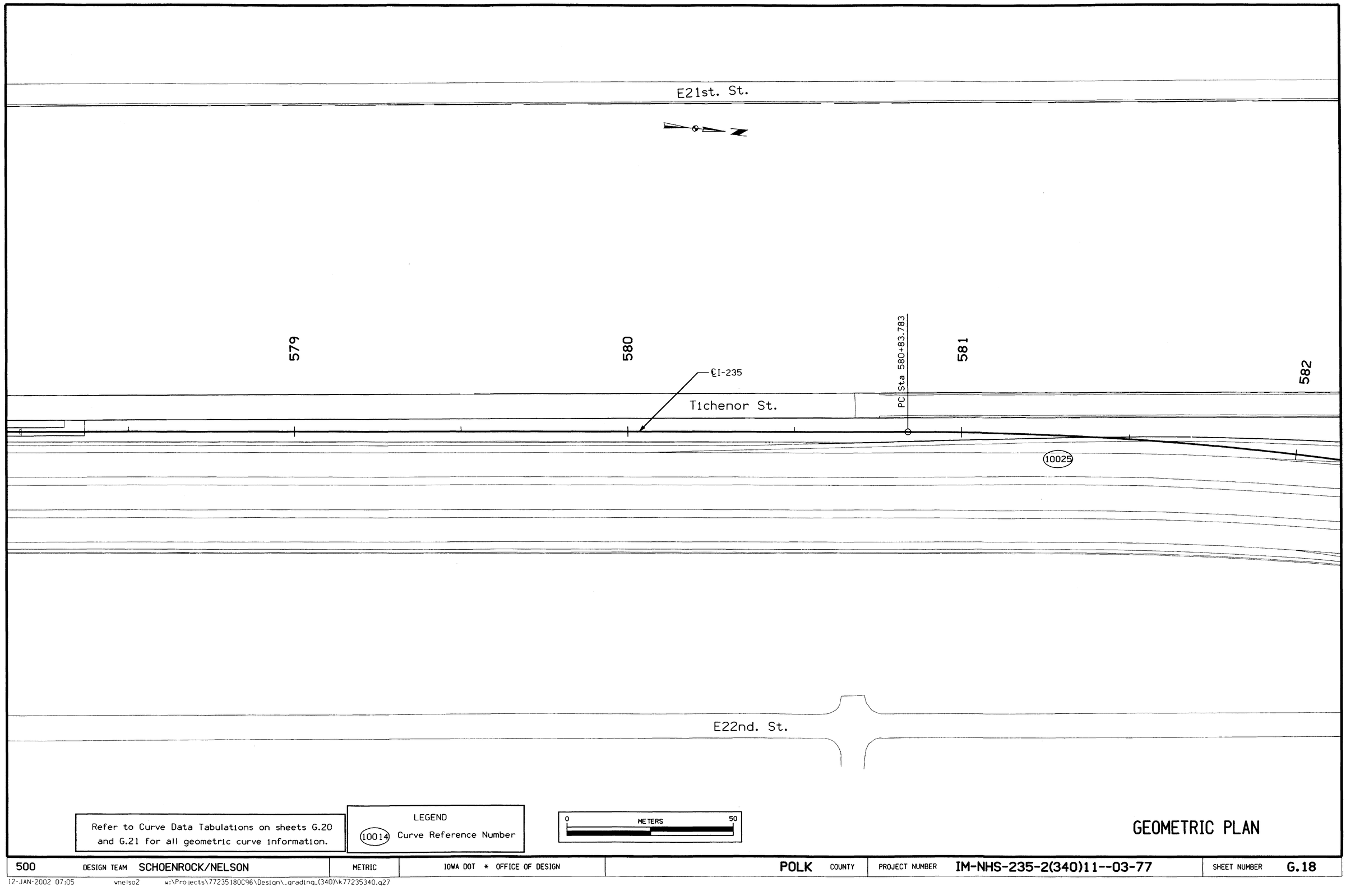

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND

(10014) Curve Reference Number

0 METERS 50

GEOMETRIC PLAN

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	G.18

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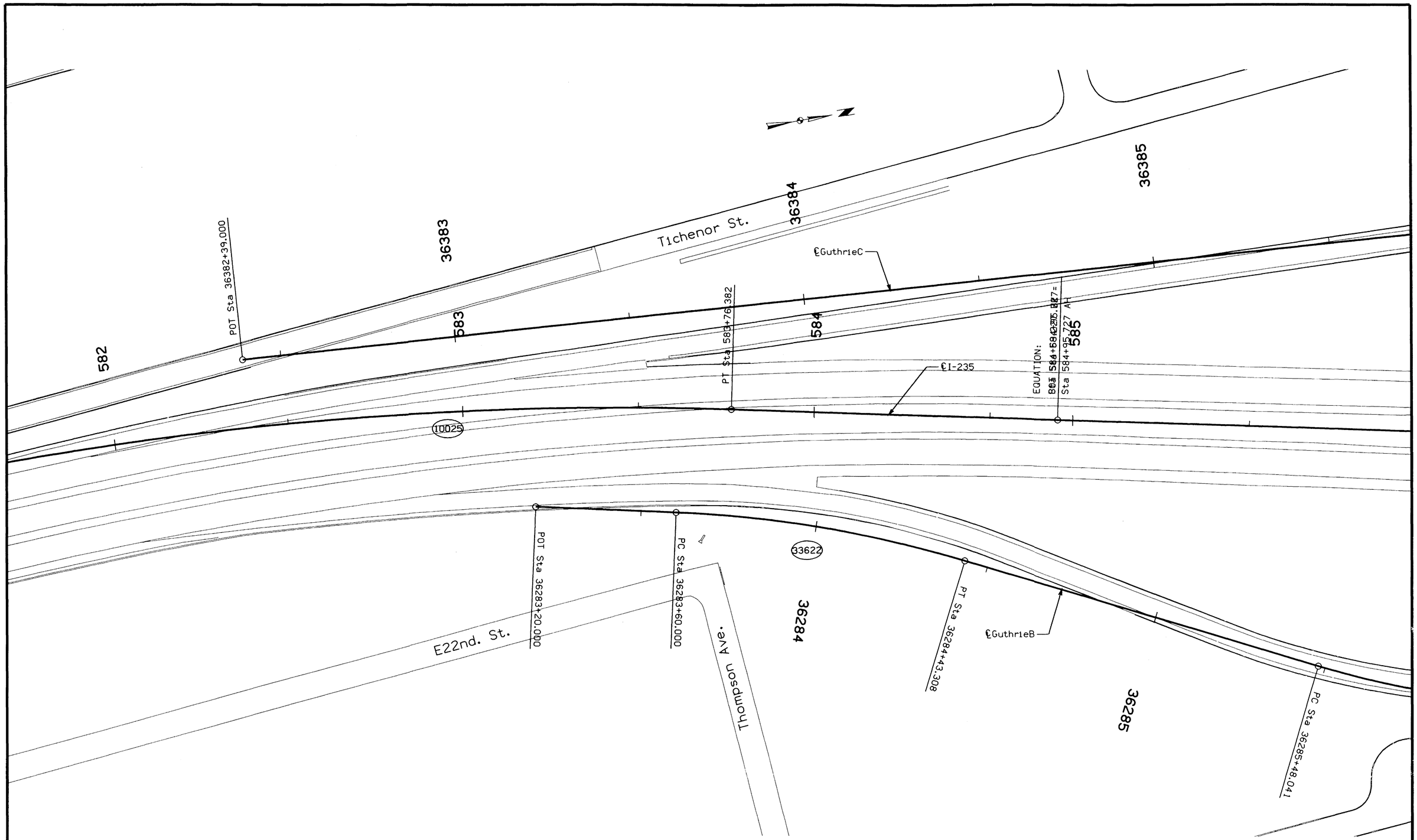

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

GEOMETRIC PLAN

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER G.19

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GEOMETRIC PLAN

Refer to Curve Data Tabulations on sheets G.20 and G.21 for all geometric curve information.

LEGEND
(10014) Curve Reference Number

0 METERS 50

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	G.20

12-JAN-2002 07:06 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.g29

422

422

SAMUEL SAFURI

422

AMERICAN DREAM HOME, INC.

East 9th. St.

427

THE WOLFORD GROUP LYRONE HAYGOOD ETAL

ELISABETH JORGENSEN & PETER SIMONSON

427

CAPITAL INVESTMENTS

Maple St.

East 11th. St.

SAM JR & C ALBERTA LINGREN

℄ I-235

Penn Ave.

443

JAMES PROBASCO

425

139

RJC COMPANIES

Lyon St.

0 METERS 50

RIGHT OF WAY
PLAN SHEET

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.01

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Maple St.

SAM JR. & C ALBERTA LINGREN

WESLEY UNITED METHODIST CHURCH

DES MOINES INDEPENDENT SCHOOL DISTRICT (EAST HIGH SCHOOL)

DES MOINES INDEPENDENT SCHOOL DISTRICT (EAST HIGH SCHOOL)

551

552

553

554

PT Sta 551+88.296

℄ I-235

East 12th St.

Lyon St.

DES MOINES GENERAL HOSPITAL

FRANCES TORIELLO DES MOINES GENERAL HOSPITAL (C.P.)

DES MOINES GENERAL HOSPITAL

FRANCES TORIELLO DES MOINES GENERAL HOSPITAL (C.P.)

DES MOINES GENERAL HOSPITAL

RIGHT OF WAY
PLAH SHEET

0 METERS 50

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.02	

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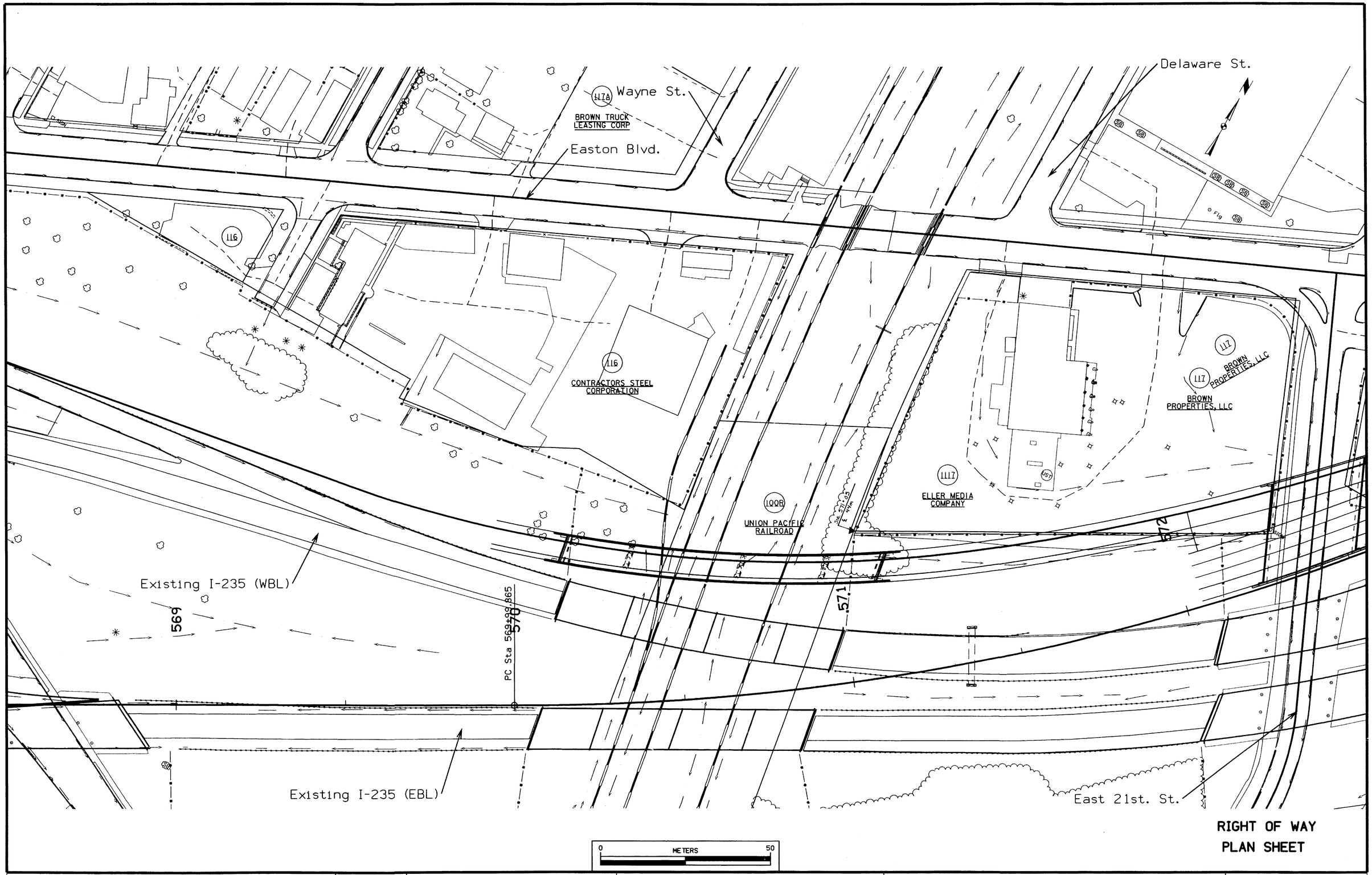

RIGHT OF WAY
PLAN SHEET

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.03

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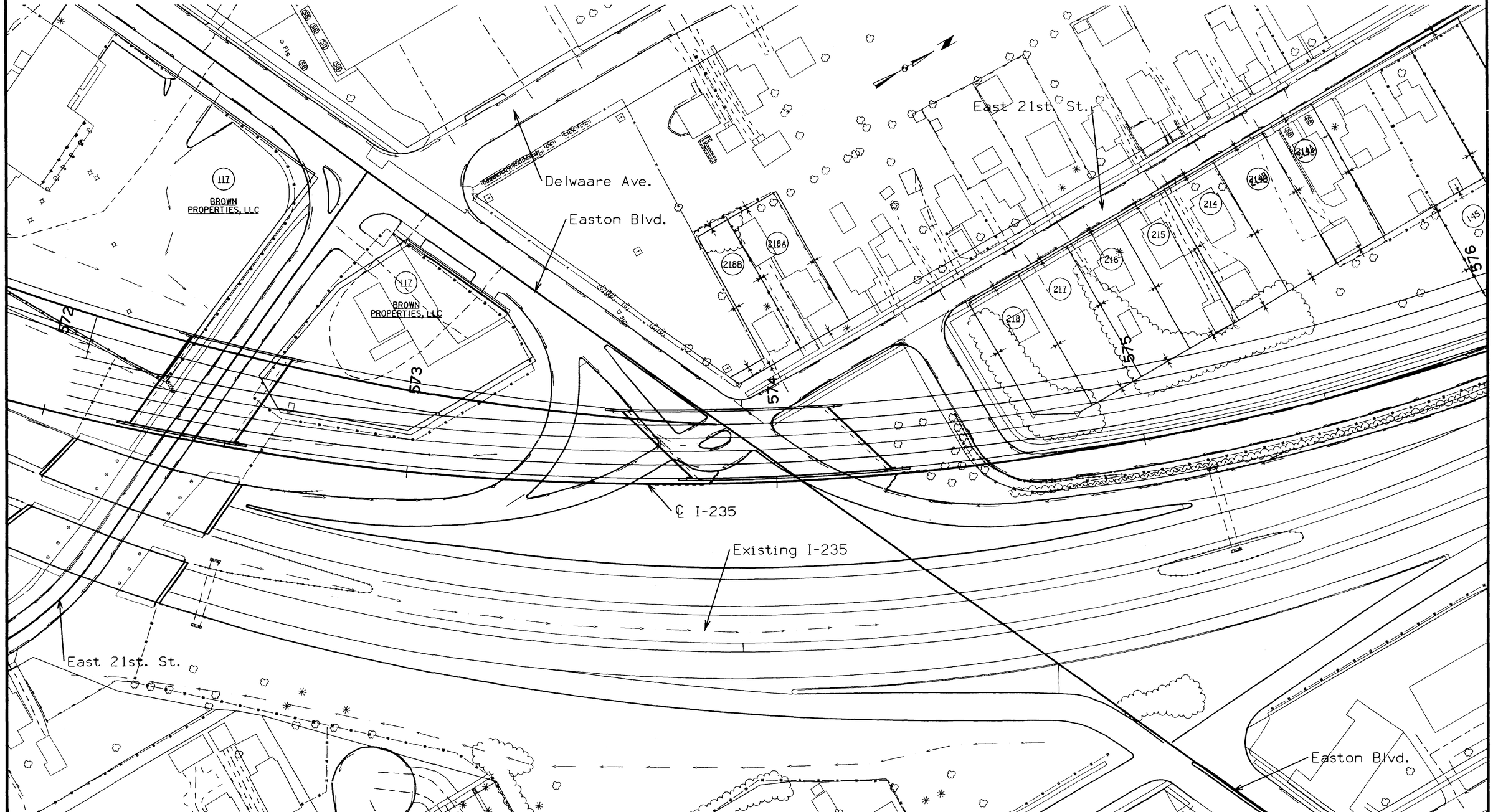

RIGHT OF WAY
PLAN SHEET

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.04

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East 21nd. St.

Washington Ave.

145 146 147 148 149 150 150A 151 152 153 154 155 156 157 158 159 160 161 162 163

576 577 578 579

577+35.379

℄ I-235

Existing I-235

East 22nd. St.

0 METERS 50

RIGHT OF WAY
PLAN SHEET

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.05

25-JAN-2002 07:05 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.h05

163 164 165 166 167 168 169 170 171 171A 172 173 174 175 176 177 178 179 180 181 182 183 184 184A 185

580 581 582 583

Tichenor St.

PC Sta 580+83.783

℄ I-235

Curve Data
Δ = 16° 45' 52.88" (RT)
T = 147.352 m
R = 292.559 m
L = 1,000.000 m
E = 10.798 m

Existing I-235

East 22nd St.

0 METERS 50

RIGHT OF WAY
PLAN SHEET

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.06

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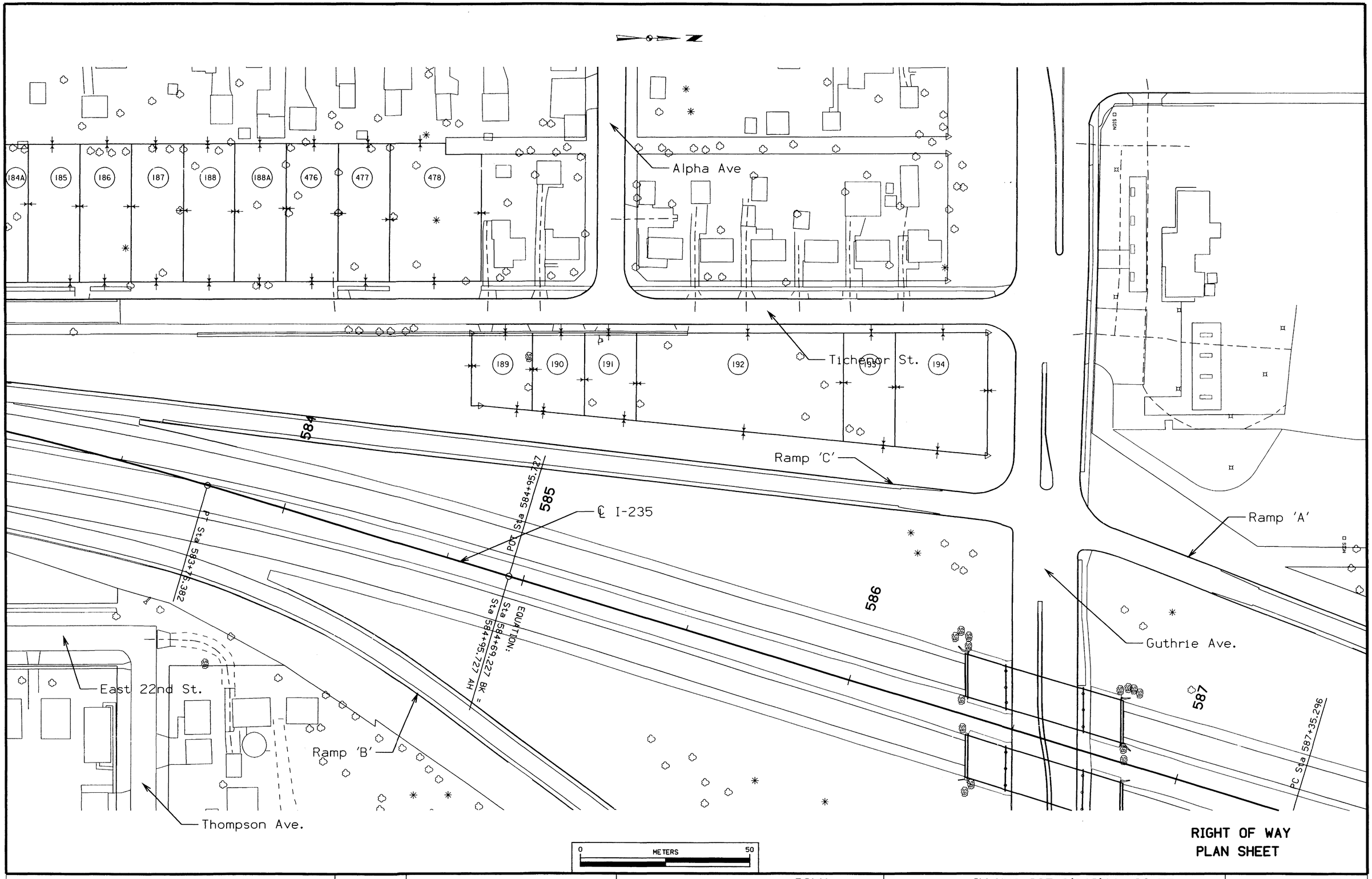

RIGHT OF WAY
PLAN SHEET

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER H.07

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TRAFFIC CONTROL PLAN

108-23A
09-27-94

1. Thru Traffic on I-235 shall be maintained at all times.
2. Access for residents on Alpha, Thompson and E. 22nd St. shall be maintained at all times.
3. Traffic control on this project shall be in accordance with Standard Road Plan RS-1,RS-2, RS-26B,RS-61,RS-62 and RS-63B For additional complementary information,refer to Part VI of the Manual on Uniform Traffic Control Devices and the current Supplemental Spec. for traffic Control.
4. The following restrictions apply:
   A. Work will be allowed from 9:00 pm to 6:00 am, beginning at 9:00 pm Sunday and ending at 6:00 am on Friday. No work will be permitted from 6:00 am Friday to 9:00 pm Sunday.
   B. Traffic control cannot be put in place before 9:00 pm Sunday through Thursday. Traffic controll must be completely removed before 6:00 am.
5. The contractor shall coordinate traffic control with other projects in the area.
6. All traffic control devices shall be furnished, erected, maintained and removed by the contractor.
7. Where possible, all post mounted signs shall be placed at least 0.6 meters beyond the curb or edge of shoulder.
8. The location for storage of equipment by the contractor during non-working hours shall be as approved by the engineer in charge of construction.
   Parking of private vehicals on Intrstate right-of-way will not be allowed. Parking of unattended equipment within the median or storage of equipment within 15 meters of the edge of pavement will not be allowed.
9. Permanent signing that conveys a message contrary to the message of the temporary signing and not applicable to the working conditions shall be covered by the contractor when directed by the engineer.
10. Proposed sign spacing may be modified, as approved by the engineer, to meet existing field conditions or to prevent obstruction of the motorist's view of permanent signing.
11. Proposed changes in the traffic control plan shall be reviewed with the Office of Construction before changes are made.
12. Contractor will be allowed to close the outside of the NB lane on US 65 in the area of the proposed borrow.

STAGING NOTES

108-26A
09-27-94

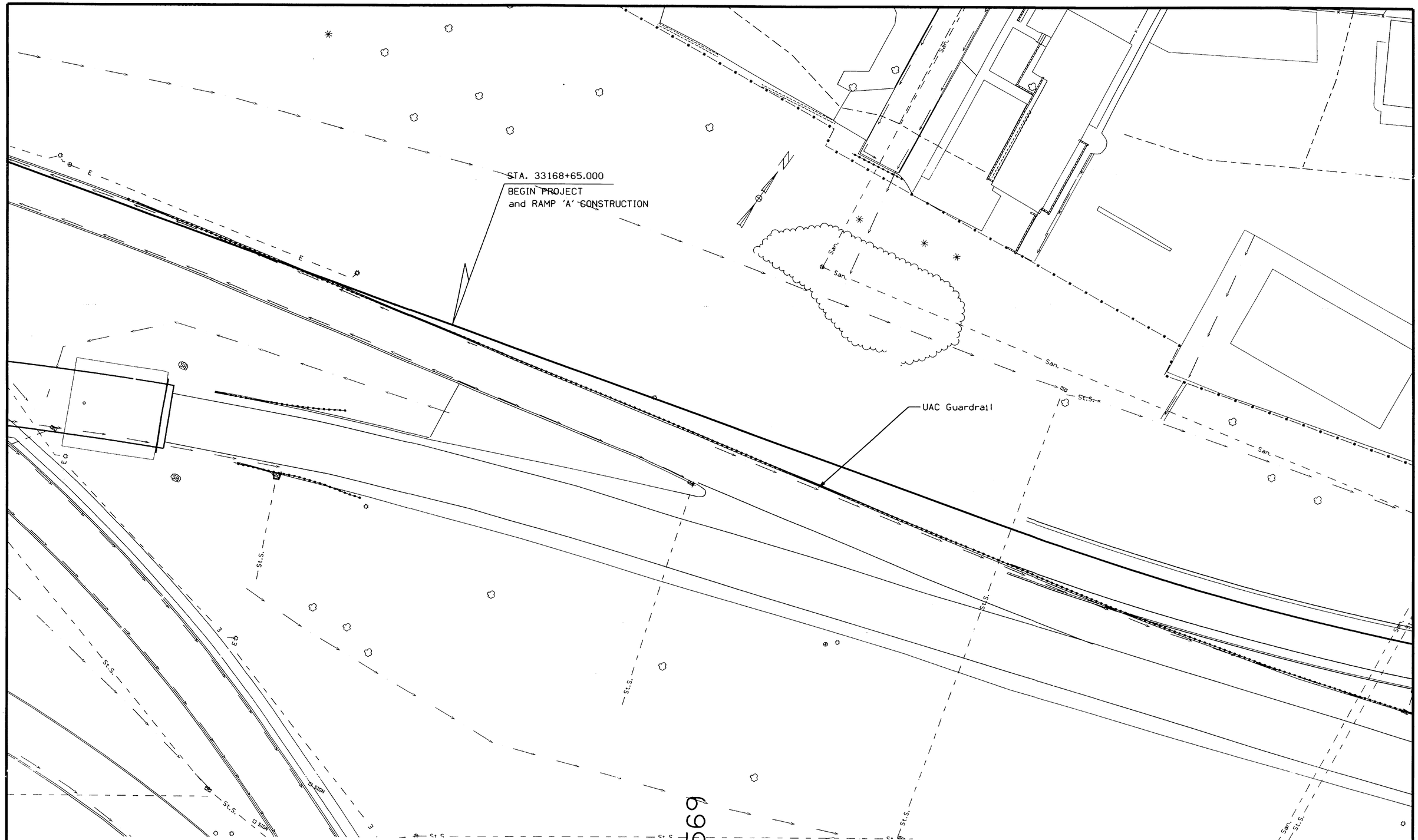
PROPOSED STAGING SEQUENCE

1. Remove Washington Ave. pedestrian bridge.
2. Install bridge piles on E. 9th St. bridge (by others).
3. Close Easton Blvd. westbound entrance and exit ramps prior to stone columns.
4. Demo Holm's Radiator, 2025 Easton Blvd., and Remove topsoil from parcel 117.
5. Remove topsoil from parcel 117.
6. Remediate soil and place stone columns for the retaining wall and bridge abutment.
7. Drive piles at Easton Blvd. bridge.
8. Construct storm and sanitary sewers.
9. Construct MSE wall at Easton Blvd. and east abutment of E. 21st St., and west of University Ramp 'A'.
10. Build berms at Easton Blvd.
11. Construct Easton Blvd. bridge.
12. Demo Brown Trucking, 2001 Easton Blvd.
13. Drive piles at E. 21st St. and University Ramp 'A' bridges.
14. Build berms at E. 21st St., and University Ave. ramp 'A' bridges.
15. Construct E. 21st St. and University Ramp 'A' bridges.

SN-1
When removal of the contaminated lead soil the area needs to be backfilled with suitable class 10 material within the same day or as directed by the engineer.

SN-2
Bridge contractor will not be permitted to drive piling in the area of East 21st. bridge (Proj. No. IM-235-2(472)7--13-77) until the existing storm sewer has been abandon.

SN-3
Soil Nail Wall #5620 between East 9th St. and East 12th St. (north side) can not be constructed until proposed sanitary sewer (Proj. No. IM-235-2(458)10--13-77) along Maple St. has been completed.



For Bridge Situation Plan
Refer to Sheet No. V.01

STAGING SHEET FOR I-235

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.02

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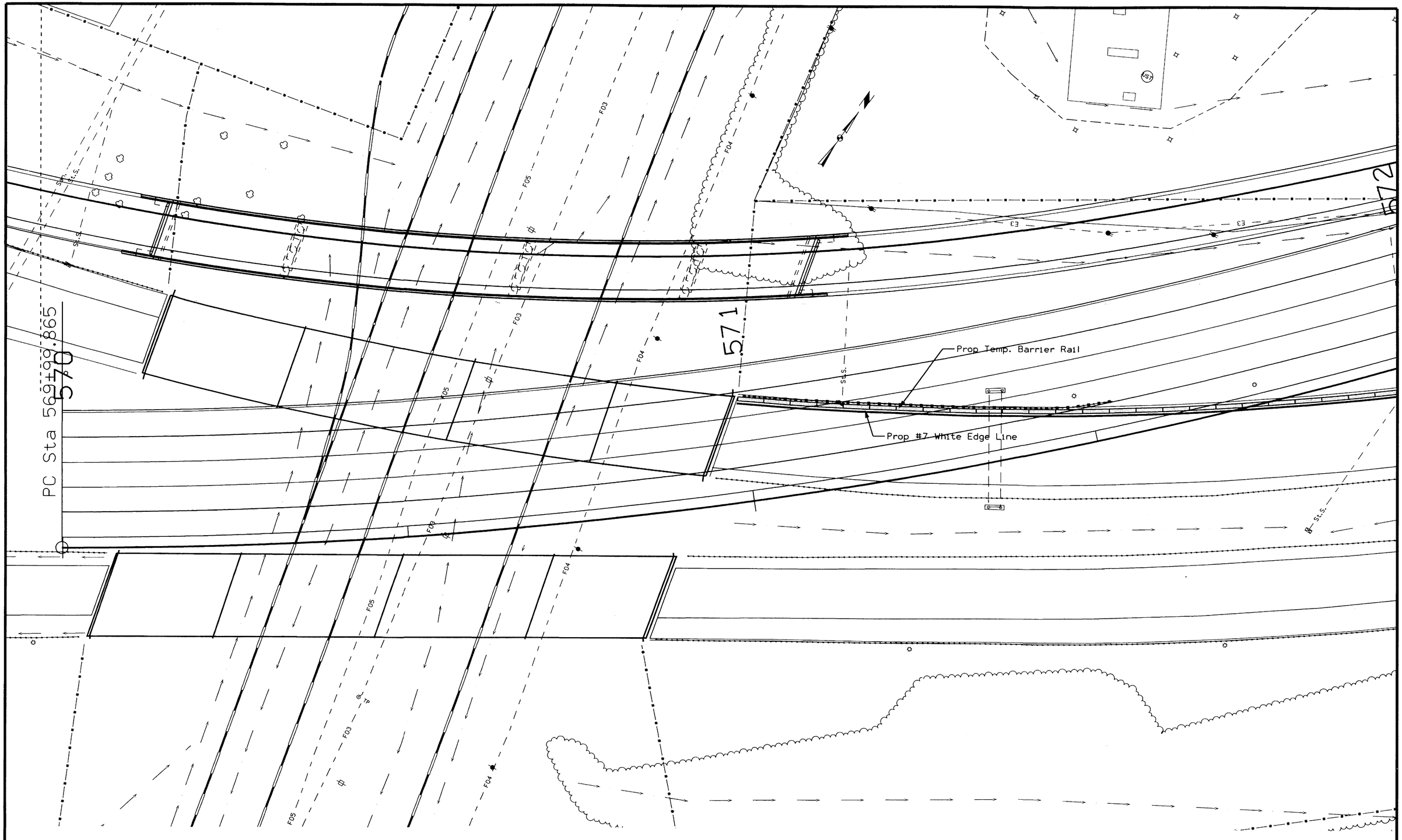

For Bridge Situation Plan
Refer to Sheet No. V.Q1

0 METERS 25

STAGING SHEET FOR I-235

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.03

12-JAN-2002 09:02 wneiso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.i03

Sta. 33172+05.967
End Ramp 'A' Construction
Begin I-235 (WBL)
ML Construction
at Sta. 572+08.328

Prop Temp. Barrier Rail

Prop #7 White\Edge Line

Prop Temp. Barrier Rail

572

573

For Bridge Situation Plan
Refer to Sheet No. V.02

0 METERS 25

STAGING SHEET FOR I-235

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.04

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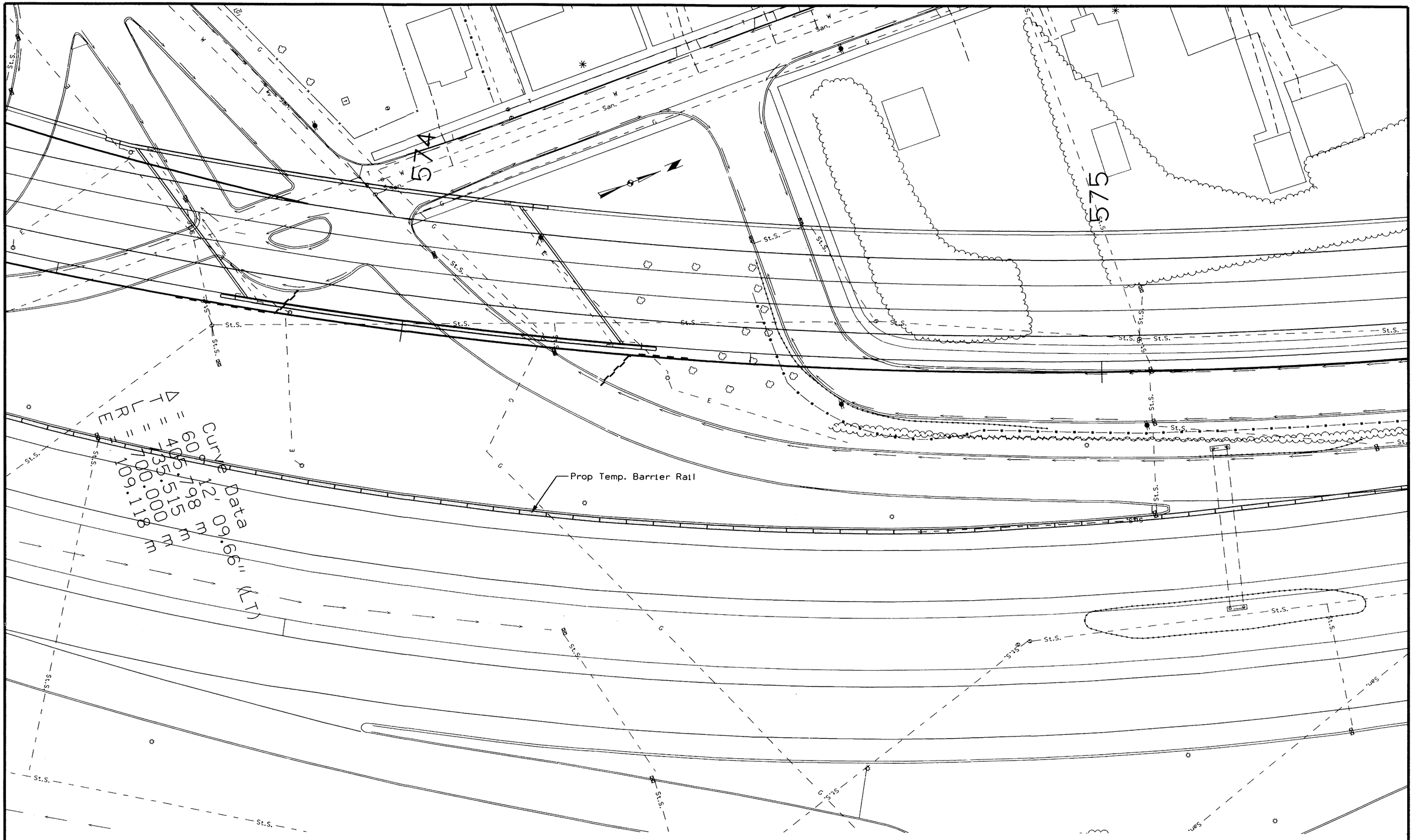

For Bridge Situation Plan
Refer to Sheet No. V.03

0 METERS 25

STAGING SHEET FOR I-235

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.05

12-JAN-2002 06:56 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340_j05

576

577

Prop Temp. Barrier Rail

0 METERS 25

STAGING SHEET FOR I-235

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.06

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PT Sta 577+35.379

578

579

Prop Temp. Barrier Rail

Remove Concrete and Temp.
Attenuators Sand Fill

35

STAGING SHEET FOR I-235

0 METERS 25

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.07

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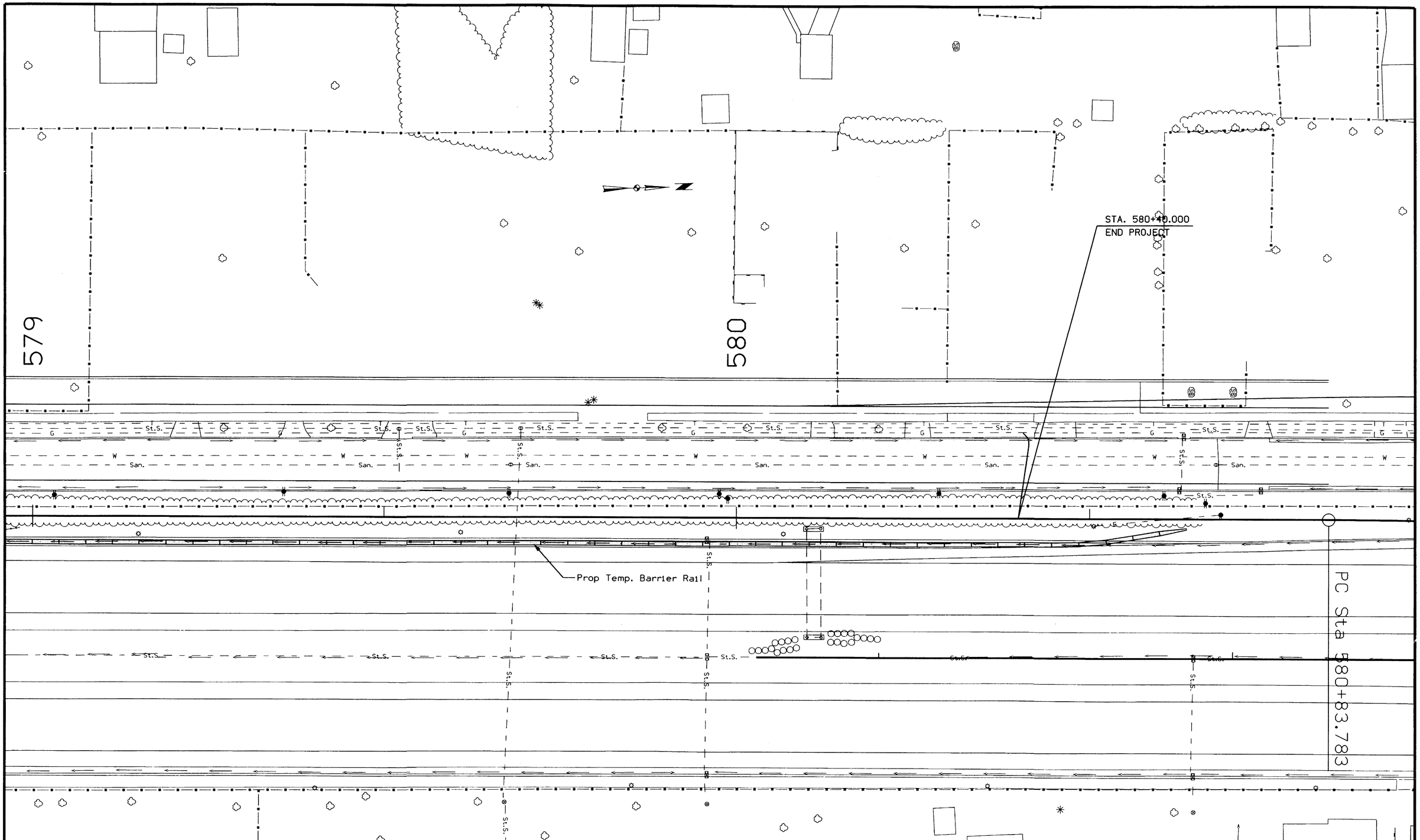

35

STAGING SHEET FOR I-235

250	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.08

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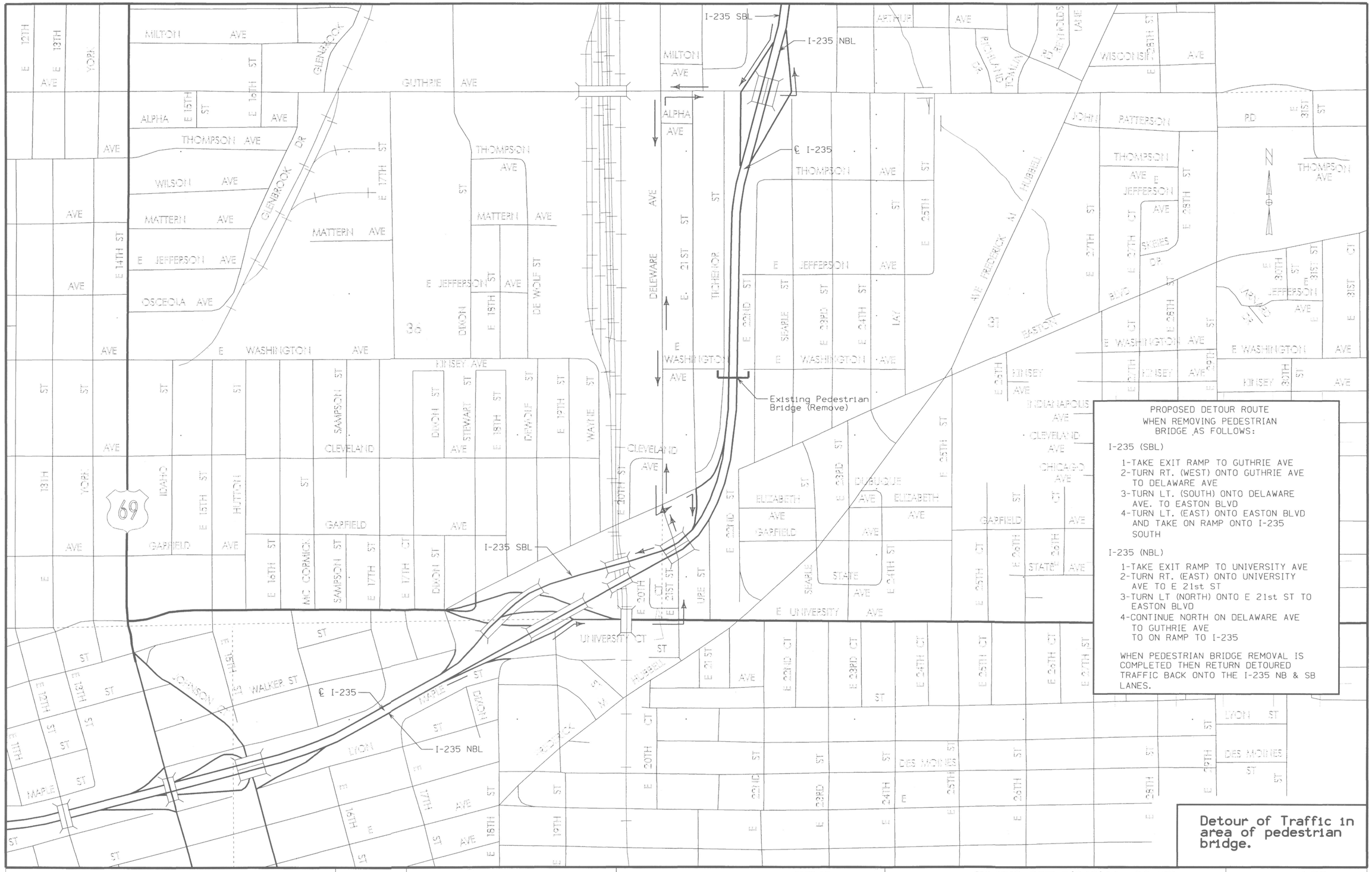


PROPOSED DETOUR ROUTE
WHEN REMOVING PEDESTRIAN
BRIDGE AS FOLLOWS:

I-235 (SBL)

1-TAKE EXIT RAMP TO GUTHRIE AVE
2-TURN RT. (WEST) ONTO GUTHRIE AVE TO DELAWARE AVE
3-TURN LT. (SOUTH) ONTO DELAWARE AVE. TO EASTON BLVD
4-TURN LT. (EAST) ONTO EASTON BLVD AND TAKE ON RAMP ONTO I-235 SOUTH

I-235 (NBL)

1-TAKE EXIT RAMP TO UNIVERSITY AVE
2-TURN RT. (EAST) ONTO UNIVERSITY AVE TO E 21st ST
3-TURN LT (NORTH) ONTO E 21st ST TO EASTON BLVD
4-CONTINUE NORTH ON DELAWARE AVE TO GUTHRIE AVE TO ON RAMP TO I-235

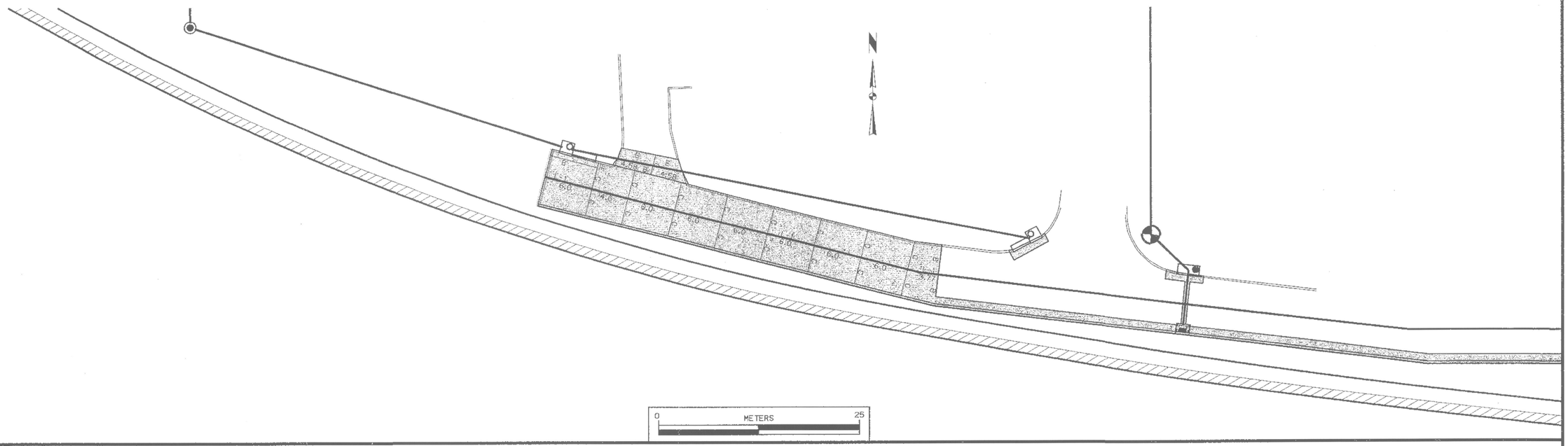
WHEN PEDESTRIAN BRIDGE REMOVAL IS COMPLETED THEN RETURN DETOURED TRAFFIC BACK ONTO THE I-235 NB & SB LANES.

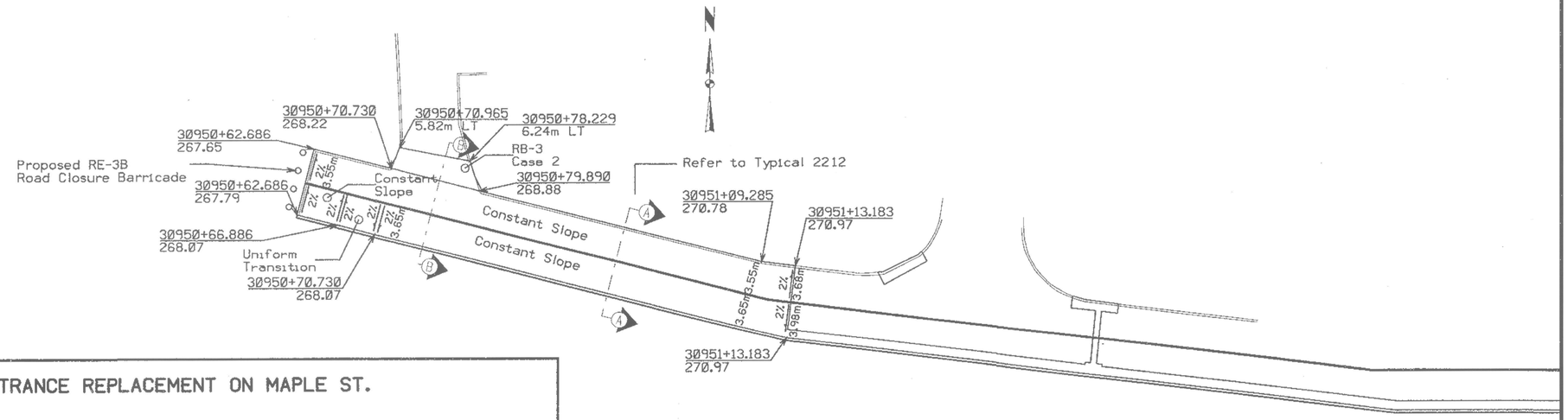
Detour of Traffic in area of pedestrian bridge.

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.09

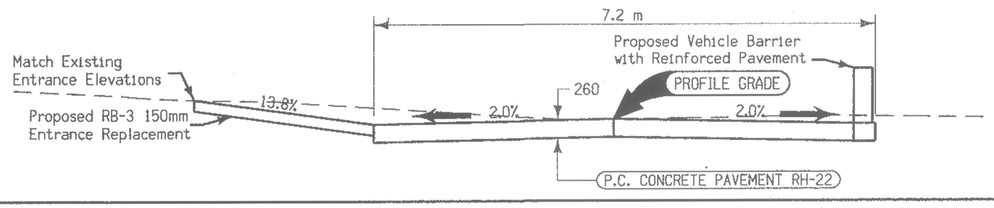
11-FEB-2002 14:14 strimbl w:\Projects\77235180C76\Design_grading_(340)\k77235340_J09

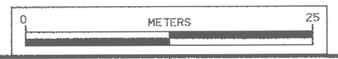
JOINTING DETAILS - MAPLE STREET





CROSS SECTION B-B - ENTRANCE REPLACEMENT ON MAPLE ST.





STAKING DETAILS - MAPLE STREET

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER L.01

16-SEP-2002 08:00 ehouge w:\Projects\77235180C96\Design_grading_(340)\k77235340.L00

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
63	2201--100200	PATCH FULL DEPTH	M2	15	12.8
64	2212--100400	PATCH BY COUNT (REPAIR)	EACH	1	1
65	2401--205040	RMVL OF UTILITY ACCESS	EACH	1	1
66	2504--011000	RMV SAN SWR PIPE </= TO 1000 MM	M	2	1.1
67	2506--100000	FLOWABLE MORTAR	M3	74.12	75.69
68	2599--999901	UNCLASSIFIED SANITARY SEWER 250 MM	M	59	59.13
69	2599--999902	UNCLASSIFIED SANITARY SEWER 300 MM	M	46	47.6
70	2599--999903	UNCLASSIFIED SANITARY SEWER 375 MM	M	8	6.89
71	2599--999904	UTILITY ACCESS, TYPE A	M	9	9.26
72	2599--999905	UTILITY ACCESS, TYPE I	M	3.7	3.56
73	2599--999916	BYPASS PUMPING AS PER PLANS	LS	1	1
74	2601--101200	SEED + FERTILIZE (URBAN)	HA	1	0.19

DESIGN WORK SHEET FOR SANITARY SEWER

DSS-1

UTILITY ACCESSES

No.	Location: Station	Location: Coordinates: Northing	Location: Coordinates: Easting	Type	Top Elev.	Bottom Well Elev.	Notes
S-1	Sta. 20+67.00	179131.3434	493417.4236	I	249.830	246.149	
S-2	Sta. 20+08.00 = Sta. 30+00.00	179089.0594	493376.2773	A	249.815	245.647	
S-3	Sta. 20+00.00	179082.2406	493372.0935	A	249.702	-	(1)

NOTES:
(1) Diameter and Bottom Well Elevation as necessary.See Staging Notes on Sheet M.02.

SANITARY SEWER PIPES

Pipe No.	Location of Pipe: From	Location of Pipe: To	Type of Pipe	Length of Pipe m	Pipe Diameter mm	Slope of Pipe %	Flow Line: In	Flow Line: Out	Flow Line: Other
P-1	S-1	S-2	(2)	59	250	0.80	246.250	245.778	
P-2	Ex.	S-2	(2)	46	300	0.65	246.087	245.788	
P-3	S-2	S-3	(2)	8	375	0.70	245.748	245.692	

NOTES:
(2) See DSS-2 on sheet M.02, Sanitary Sewer Pipe Materials

ESTIMATE REFERENCE INFORMATION

100-4B
07-15-97

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
63	2201--100200	FULL DEPTH PATCH
64	2212--100400	INCLUDES PATCHING OF CONCRETE ON GUTHRIE AVENUE WHERE BYPASS PUMPING PIPE CONNECTS INTO EXISTING UTILITY ACCESS. REFER TO TAB 102-6C, SHEET M.02.
65	2401--205040	FOR REMOVAL OF UTILITY ACCESS #NE0112.
66	2504--011000	INCLUDES REMOVAL AND DISPOSAL OF EXISTING 300mm VCP AT UTILITY ACCESS #NE0112. SEE SHEET M.05 FOR LOCATION.
67	2506--100000	INCLUDES ABANDONMENT OF SCHEDULED PIPES AND EXISTING UTILITY ACCESS WITH FLOWABLE MORTAR AND CRUSHED STONE. REFER TO TAB "FMS" ON SHEET M.01 AND SHEETS M.06 AND M.08 FOR ADDITIONAL INFORMATION AND LOCATIONS. DEMOLITION AND REQUIRED BACKFILL IS INCIDENTAL TO THIS BID ITEM.
68 69 70	2599--999901 2599--999902 2599--999903	INCLUDES PIPES IN ACCORDANCE WITH URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, SPECIAL PROVISION I, SECTION 4010 - SANITARY SEWERS. MEASUREMENT AND PAYMENT AS PER PART 1, PARAGRAPH 1.08.
71	2599--999904	INCLUDE IN BID PRICE MISCELLANEOUS PIPE STUBS UP TO 1 M IN LENGTH NECESSARY FOR CONNECTION OF EXISTING PIPES TO NEW UTILITY ACCESS. CONSTRUCT IN ACCORDANCE WITH URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, UTILITY ACCESS, TYPE A (SANITARY SEWER)
72	2599--999905	INCLUDE IN BID PRICE MISCELLANEOUS PIPE STUBS UP TO 1 M IN LENGTH NECESSARY FOR CONNECTION OF EXISTING PIPES TO NEW UTILITY ACCESS. CONSTRUCT IN ACCORDANCE WITH URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, UTILITY ACCESS, TYPE I (SANITARY SEWER)
73	2599--999916	INCLUDES BYPASS PUMPING BETWEEN STRUCTURES S-3 AND EXISTING UTILITY ACCESS ON GUTHRIE AVENUE. PIPING INCLUDES 92m OF OPEN-CUT OR DIRECTIONAL BORED 100mm HDPE PIPE AND 170m OF DIRECTIONAL BORED 100mm HDPE PIPE. PUMPING EQUIPMENT SHALL BE SIZED TO PUMP A PEAK FLOW OF 1.1 MGD. ELECTRICITY AND MONITORING SHALL BE PROVIDED BY CONTRACTOR. PUMPING SHALL BE MAINTAINED UNTIL PROJECT IM-235-2(456)12--13-77 (GROUP 1 I-235 SANITARY SEWER RELOCATION) IS COMPLETE. REFER TO STAGING NOTES ON SHEET M.02 AND SHEETS M.04 AND M.06 (DETAIL 3) FOR LOCATION OF BYPASS.
74	2601--101200	INCLUDED FOR ALL DISTURBED AREAS FOLLOWING THE FINAL CONSTRUCTION AS DESIGNATED BY THE ENGINEER SEED MIXTURE: SEEDING RATE - 2 KGS PER 100 M BLUEGRASS, KY (PARK) - 70% FESCUE, CREEPING RED - 20% RYEGRASS, PERENNIAL (FINELEAF - PENNFINE, MANHATTAN OR EQUIV.) - 10% FERTILIZER RATE: 8.5 KG OF CHEMICALLY COMBINED COMMERCIAL FERTILIZER PER 100 M NOTE: THE TOP 150 MM OF THE SEEDBED SHALL BE FREE OF ROCK AND DEBRIS AND SHALL BE SUITABLE FOR THE ESTABLISHMENT OF VEGETATION WITH THE APPROVAL OF THE ENGINEER.

TRAFFIC CONTROL PLAN

108-23A
09-27-94

Access for residents on Alpha, Tichenor, Thompson, and E. 22nd Street shall be maintained at all times.

The connection of the 100mm HDPE bypass piping, to the existing Utility Access #ETI084, requires open-cut of the center lane of Guthrie Avenue. See Traffic Control Detail sheet M.07.

Traffic control on the project shall be in accordance with Standard Road Plan RS-26B and RS-63B. For additional complementary information, refer to Part VI of the Manual on Uniform Traffic Control Devices and the current Standard Specifications.

All traffic control devices shall be furnished, erected, maintained, and removed by the Contractor.

Where possible, all post-mounted signs shall be placed at least 0.6 meters beyond the curb or edge of shoulder.

The location for storage of equipment by the Contractor during nonworking hours shall be as approved by the Engineer in charge of construction.

Proposed changes in the traffic control plan shall be reviewed with the Office of Construction before changes are made.

FLOWABLE MORTAR/CRUSHED STONE SCHEDULE

FMS
MODIFIED

PIPE/UTILITY ACCESS NO.	LOCATION: FROM	LOCATION: TO	DIAMETER (mm)	LENGTH/DEPTH (m)	FLOWABLE MORTAR VOLUME (m^3)	CRUSHED STONE VOLUME (m^3)
P-10	NE0110	S-1	250	45	2.2	-
~~P-11~~	~~NE0110~~	~~NE0112~~	~~300~~	~~5~~	~~0.4~~	~~-~~
P-12	NE0108	NE0110	300	92	6.5	-
P-13	NE0106	NE0108	300	95	6.8	-
P-14	NE0104	NE0106	300	101	7.2	-
P-15	NE0102	NE0104	300	100	7.1	-
P-16	NE0100	NE0102	300	89	6.3	-
P-17	NEL053	NE0100	300	101	7.2	-
P-18	NEL055	NEL053	300	109	7.7	-
P-19	NEL057	NEL055	300	70	5.0	-
P-20	NEL059	NEL057	300	142	10.1	-
NE0110	-	-	1200	0.725	0.82	2
NE0108	-	-	1200	0.750	0.85	2
NE0106	-	-	1200	0.750	0.85	2
NE0104	-	-	1200	0.750	0.85	2
NE0102	-	-	1200	0.750	0.85	2
NE0100	-	-	1200	0.750	0.85	2
NEL053	-	-	1200	0.750	0.85	2
NEL055	-	-	1200	0.750	0.85	2
NEL057	-	-	1200	0.750	0.85	2

SOIL BORING SCHEDULE

SB
MODIFIED

NUMBER	LOCATION	EXISTING GRADE ELEV.	DEPTH OF BORE (M)
B-1	N 179085.436, E 493409.361	249.781	4.6
B-2	N 179082.102, E 493379.689	249.713	6.1

LICENSED PROFESSIONAL ENGINEER
JAMES R. RASMUSSEN 14546
IOWA

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

JAMES R. RASMUSSEN, P.E. DATE
License Number: 14546
My license renewal date is DECEMBER 31, 2003.
Pages or sheets covered by this seal:
M.01 THROUGH M.16

STAGING NOTES

108-26
09-27-94

Utility Access S-2 and S-3 shall be constructed first including the 375 mm pipe between. One pipe length east and northeast of S-2 may also be installed. Utility Access S-3 shall be sized to fit the required equipment to bypass pump the peak flow of 1.1 MGD (765 GPM) through a 100 mm HDPE pipe. The required depth of this utility access shall be determined by the Contractor, but must be lower than the future invert to the west shown on the plans. The inverts for S-3 shall be formed by the I-235 Sanitary Sewer Relocation - Group 1 Contractor (Project Number IM-235-2(456)12-13-77).

Construct the 100 mm HDPE pipe for bypass pumping as shown in detail. This pipe will run from S-3, through S-2, to existing sanitary sewer Utility Access #ETI084 in the center of Guthrie Avenue. Proper fittings shall be provided within both utility accesses for future bypass pumping required for the Group 1 Sanitary Sewer Relocation project. The pump(s) and piping shall be easily transferred from S-3 and temporarily connected to pipe fittings in S-2. The 100 mm pipe can be open cut or directional bored north through existing Iowa DOT property and then directional bored through an existing City-owned alley south of Alpha to Guthrie Avenue. The pavement at Guthrie will need to be open cut to tie in the 100 mm HDPE. A detail showing the bypass-pumping route and traffic control is shown on M.06.

Coordinate the connection to existing sewers during minimal daily flow times. Contractor shall accomodate existing sanitary sewer flows. Construct 250 mm sanitary sewer from S-2 northeast to Tichenor. At S-1, construct Type I utility access connecting the proposed 250 mm sewer and the existing sanitary sewer from the north. Allow sewer to flow into completed sanitary sewer and begin bypass pumping from S-3 to Guthrie Avenue.

Contractor shall coordinate with the Wastewater Reclamation Facility prior to working on connection of line P-2 with the existing sewer, since there is a sanitary sewer pump station located upstream near E.25th Street and Thompson Avenue. Abandon sewer north along Tichenor with flowable mortar from Utility Access #NE0110, just south of proposed S-1. Construct sanitary sewer from S-2 east toward existing Utility Access #NE0112. Demolish and dispose of existing Utility Access #NE0112. Remove necessary length of existing 300 mm VCP and connect to existing 300 mm VCP with coupling as shown. Allow sewer to flow into completed sanitary sewer and continue bypass pumping from S-3 to Guthrie Avenue.

Testing of P-1, P-2, and P-3 will not be required. The 30 day wait for deflection testing shall be waived. The Contractor shall inspect the sewers by televising the pipe after construction is complete.

Abandon existing sewer between demolished Utility Access #NE0112 and existing Utility Access #NE0110 with flowable mortar. Cap and abandon Utility Access #NE0110 as shown in detail. Abandon remaining sewer pipes and cap remaining utility accesses from proposed connection, south under I-235 as shown in detail and listed in schedule. Monitor amount of concrete used between utility accesses and compare with schedule to determine if pipe is full.

The Contractor shall provide the proper pump(s) and electricity as required for bypass pumping. Bypass pumping shall be maintained until Group 1 Contractor completes construction. When the Group 1 Contractor is ready to tie into S-3, the flow to the south from S-2 shall be plugged. The Contractor shall remove the piping and pumping equipment from S-3 and relocate the necessary piping and pumping equipment to S-2. The connection to the existing 100 mm HDPE shall be made and bypass pumping continued to Guthrie Avenue. The pumping shall be maintained until the Group 1 Contractor finishes connection into S-3, forms the inverts, and completes the necessary tests on the completed sewer. When the Group 1 Contractor has completed construction, the plug to the south in S-2 shall be removed and the sewer allowed to flow to the completed sanitary sewer. The pumping equipment shall be removed and the 100 mm HDPE pipe shall be capped on each end. A watertight seal shall be formed at all holes in S-2 and S-3.

The Contractor shall hand-deliver a notice to each abutting property 72 hours before entering their property to begin construction. Notices will be supplied by City Engineer.

TABULATION OF FULL-DEPTH PATCHES

102-6C
MODIFIED

LOCATION			DIMENSION				REMARKS
COUNT	STATION OR MILEPOST	LANE L,R or B	LENGTH x WIDTH m			Patch Thickness mm	
1	N 179351.5095 E 493350.3215	L	3.9	X	3.9	200	

10-27-98 213-4
The contractor shall apply necessary moisture to the construction area and haul roads to prevent the spread of dust. Refer to Article 1107.07 of the current Standard Specifications for additional details.

09-27-94 252-1
Blading and shaping as well as any other incidental work in preparation for any maintenance of temporary crossing or detours shall be considered incidental to other work on the project. Additional surfacing needed for temporary crossings or detours during construction shall be furnished and spread at contract price.

09-27-94 261-2
Before performing earthwork, tiling, or excavation within 91.4 meters of an existing pipeline, the contractor shall notify the pipeline company and the pipeline company shall mark the location of the pipeline as required by Section 479.47 of the Code of Iowa.

The contractor shall exercise all due caution when working in the vicinity of pipelines carrying combustible or toxic materials which are present on this project. Pipeline location shown on the plans represents the best information available at the time of plan preparation.

SANITARY SEWER PIPE MATERIALS

DSS-2

Pipe No.	Alternatives for Pipe Material	Required Pipe Bedding and Haunch Support	Required Primary and Secondary Backfill to 300 mm Above the Top of the Pipe	
			Trench Width Less Than 1.2 m at Top of Pipe	Trench Width Greater Than 1.2 m at Top of Pipe
P-1	1	7	7	7
	2	7	7	7
	3	7	7	7
	5	7	8	8
	6	7	8	8
P-2	5	7	8	8
P-3	1	7	7	7
	2	7	7	7
	3	7	7	7
	4	7	8	8
	5	7	8	8
	6	7	8	8

NOTES:
(1) PVC, ASTM D 3034
(2) PVC, ASTM F 949
(3) PVC Truss, ASTM D 2680
(4) LRCP, ASTM C 76
(5) DIP, AWWA C 151
(6) VCP, ASTM C 700
(7) Class I Granular Bedding Material, Section 3010, 2.03 Urban Standard Specifications for Public Improvements
(8) Class I, Class II, Class III, or Class IVA Material, Section 3010, 2.03 through 2.06 Urban Standard Specifications for Public Improvements.

ALIGNMENT

THE MAINLINE ALIGNMENT FOR THE GRADING PROJECT IM-NHS-2(340)11--03-77 IS A RETRACE OF THE PRESENT ALIGNMENT OF I-235 FROM P.O.T. STA. 1329+51.00 OF THE I-80-3(18)125 AS BUILT PLANS AT THE WEST MIX-MASTER. THIS ALIGNMENT RUNS EAST AND NORTHEAST TO THE INTERSECTION OF I-80 AT THE EAST MIX-MASTER.

THE STATIONING FOR THE GRADING PROJECT WAS TAKEN FROM P.O.T. STA. 1329+51.00 OF THE I-80-3(18)125 AS BUILT PLANS. THIS STATIONING WAS CONVERTED TO METRIC STA. 405+23.546 AND THAN CARRIED AHEAD THRU OUT THE SURVEY.

HORIZONTAL DATUM INFORMATION

THE COORDINATES FOR ALL THE GPS POINTS (REFERRED TO AS CONTROL MONUMENTS), WERE PROVIDED BY THE IOWA DEPARTMENT OF TRANSPORTATION SURVEY AND PHOTOGRAMMETRY DEPARTMENT. THE COORDINATES USED ARE ON A MODIFIED STATE PLANE COORDINATE SYSTEM (REFERRED TO AS THE LOCAL PROJECT PLANE COORDINATES). THE CONTROL POINT ELEVATIONS LISTED IN THESE G-SHEETS WERE ESTABLISHED FROM THE BENCHMARK LEVEL LOOP FOR THE PROJECT.

THE SUPPLEMENTAL CONTROL POINTS (REFERRED TO AS CONTROL POINTS), WERE SET FROM THE GPS CONTROL MONUMENTS. ELEVATIONS FOR SUPPLEMENTAL CONTROL WERE ESTABLISHED FROM THE BENCHMARK LEVEL LOOP.

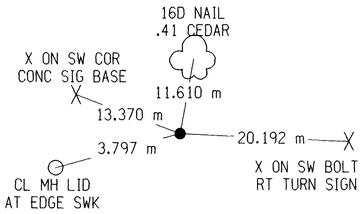
VERTICAL DATUM INFORMATION

THE BENCHMARKS WERE PROVIDED BY THE IOWA DEPARTMENT OF TRANSPORTATION SURVEY AND PHOTOGRAMMETRY DEPARTMENT, AND ARE LISTED IN THE PLANS FOR THE GRADING PROJECT.

BENCH MARKS	STATION	DESCRIPTION	ELEV.
No. 574	586+30.414, 17.81 LT	IHC BM S.W. WING OF BR. SOUTHBOUND LANE FREEWAY BR. OVER GUTHRIE AVE.	257.098
No. 711	583+66.143, 53.33 LT	CUT X NE BOLT F-HYDRANT IN FRONT OF 2026 TICHENOR.	250.277
No. 712	585+10.338, 80.99 LT	SET RR SPK NW. SIDE P. POLE E. OF TICHENOR & ALPHA.	250.113

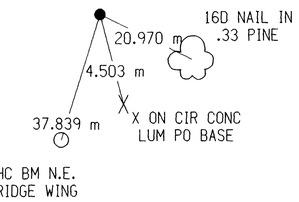
STA.585+94.898,283.891 LT SURVEY CONTROL MONUMENT

GPS NO.117 (CUT X ON SWK)
XC=493252.342, YC=179370.173



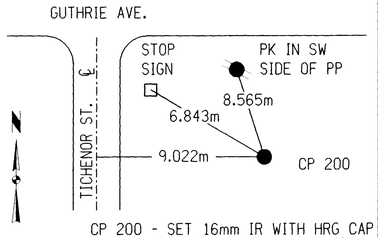
STA.587+26.651,18.568 RT SURVEY CONTROL MONUMENT

GPS NO.116 (IRON PIN)
XC=493579.969, YC=179408.911



SURVEY CONTROL POINT #200

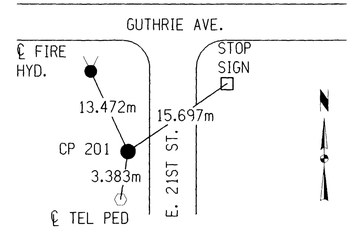
SET 16mm IRON ROD
XC=493426.490, YC=179327.796
ZC=249.541



CP 200 - SET 16mm IR WITH HRG CAP
14.387m S. OF S. BC LINE/GUTHRIE

SURVEY CONTROL POINT #201

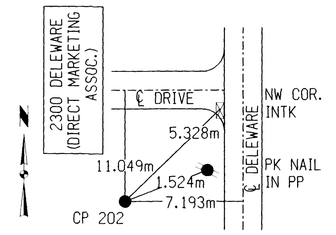
SET 16mm IRON ROD
XC=493318.114, YC=179326.880
ZC=249.739



CP 201 - SET 16mm IR WITH HRG CAP - SW QUADRANT OF E. 21ST & GUTHRIE (1.295m W. OF W. BC E. 21ST)

SURVEY CONTROL POINT #202

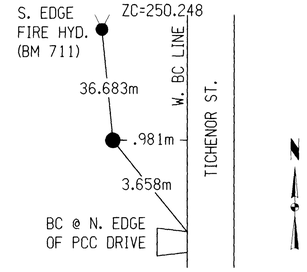
SET 16mm IRON ROD
XC=493219.412, YC=179190.045
ZC=248.749



CP 202 - SET 16mm IR WITH HRG CAP IN W. ROW DELAWARE AVE. IN FRONT OF #2300

SURVEY CONTROL POINT #204

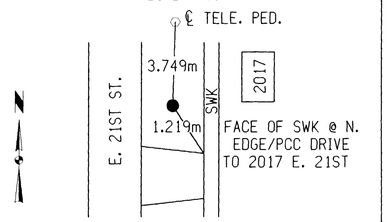
SET 16mm IRON ROD
XC=493412.842, YC=179040.126
ZC=250.248



CP 204 - SET 16mm IR WITH HRG CAP

SURVEY CONTROL POINT #205

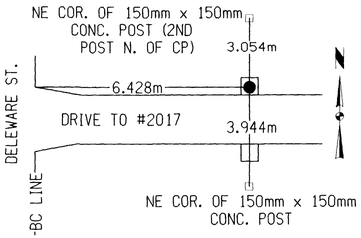
SET 16mm IRON ROD
XC=493327.498, YC=179056.104
ZC=249.934



CP 205 - SET 16mm IR WITH HRG CAP IN PARKING IN FRONT OF 2017 E. 21ST ST.
0.640m E. OF E. BC/E. 21ST ST.

SURVEY CONTROL POINT #206

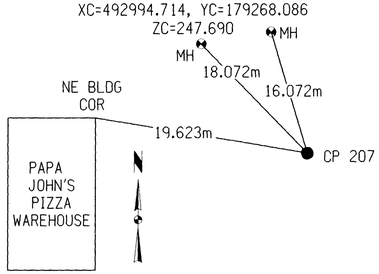
SET 16mm IRON ROD
XC=493237.592, YC=179052.103
ZC=250.176



CP 206 - FND 19mm GP IN STONE DRIVEWAY POST (POST ON N. SIDE OF DRIVE TO 2017 DELAWARE AVE)

SURVEY CONTROL POINT #207

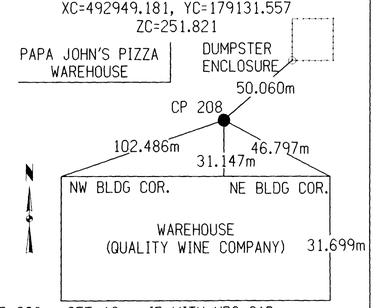
SET 16mm IRON ROD
XC=492994.714, YC=179268.086
ZC=247.690



CP 207 - SET 16mm IR WITH HRG CAP S. OF GUTHRIE AVE RR BRIDGE & W. OF W. RR DITCH

SURVEY CONTROL POINT #208

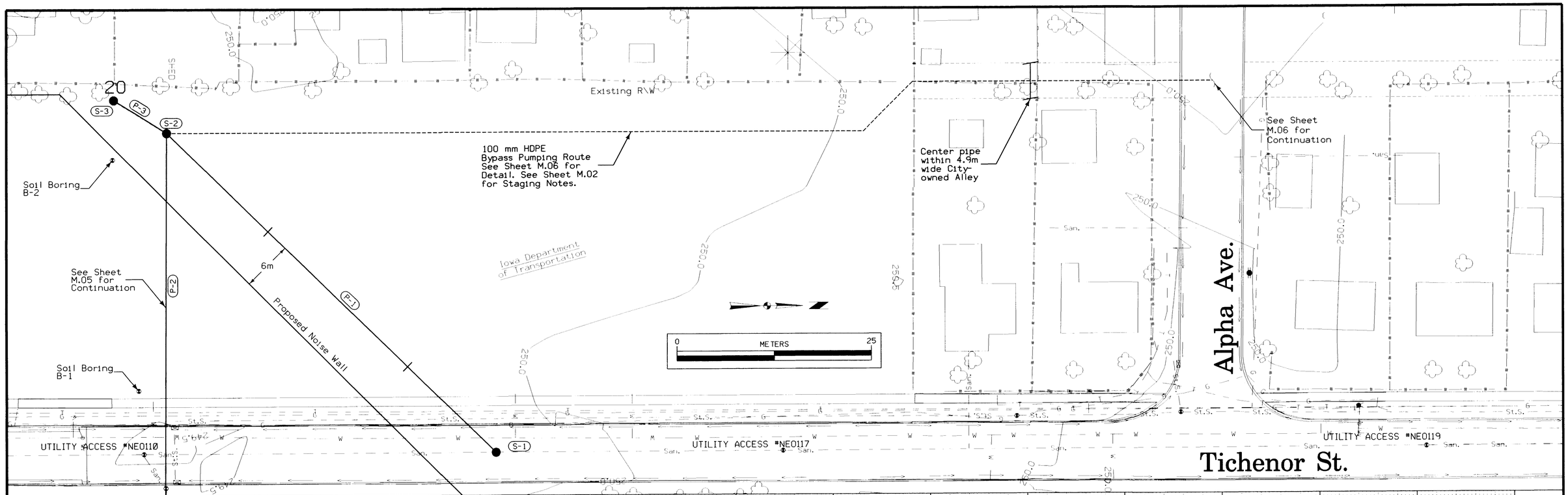
SET 16mm IRON ROD
XC=492949.181, YC=179131.557
ZC=251.821



CP 208 - SET 16mm IR WITH HRG CAP

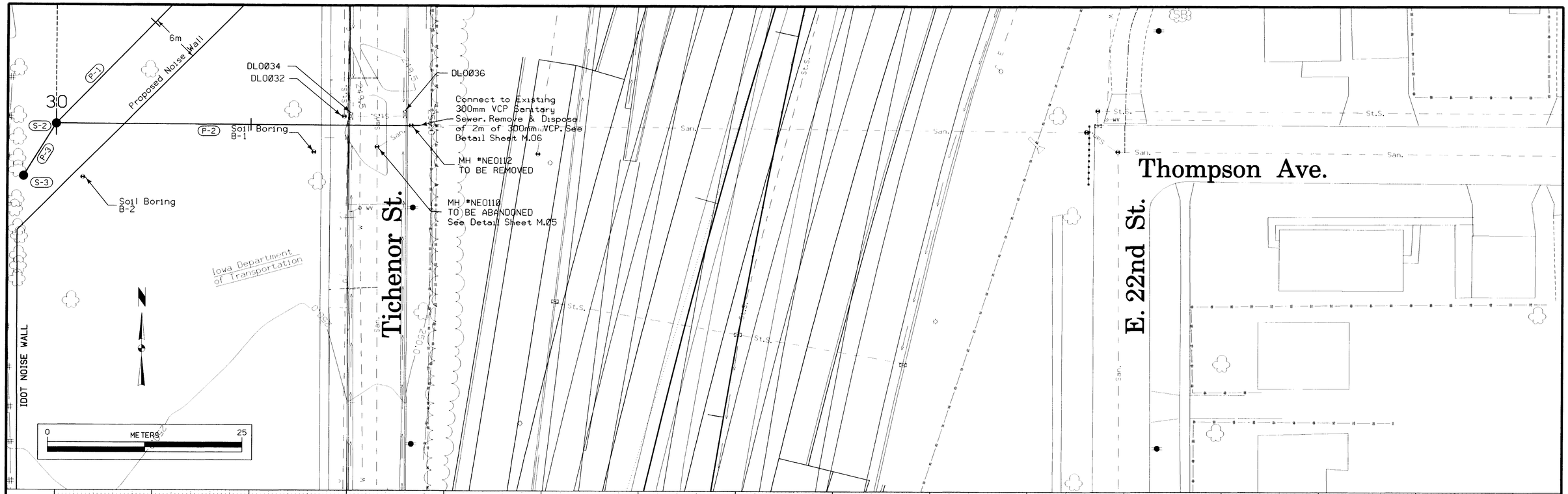
DETAILS OF BENCHMARK AND REFERENCE INFORMATION

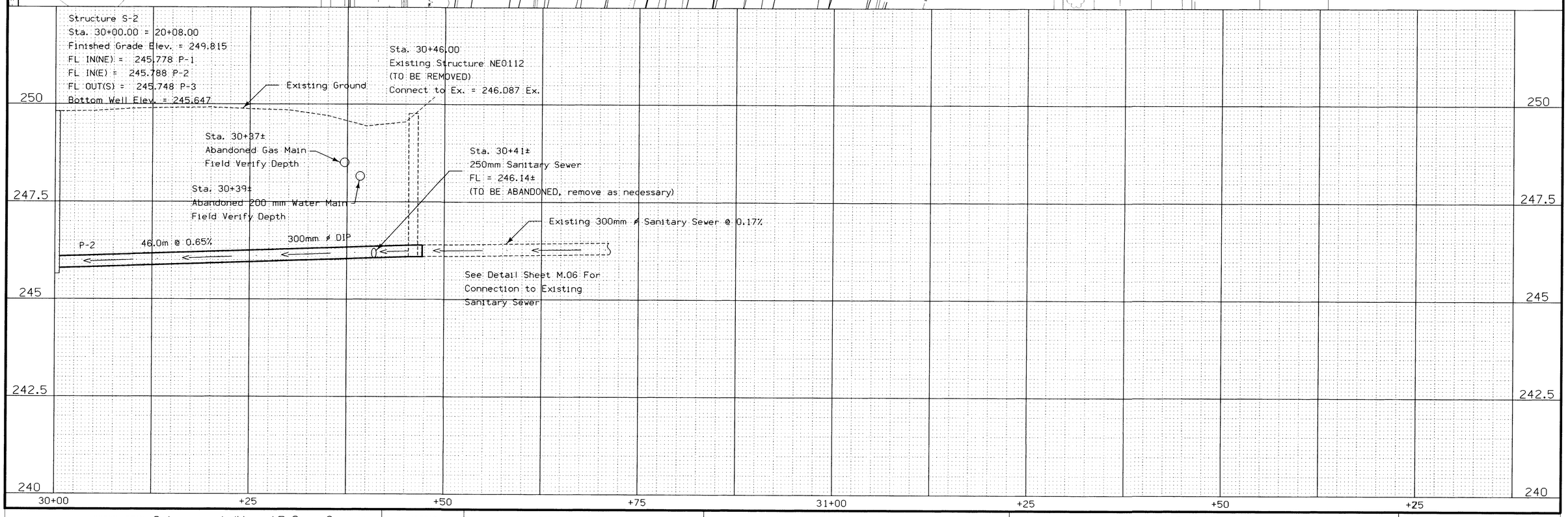
DESIGN TEAM Schoenrock/Howard R. Green Company	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.03



DESIGN TEAM	METRIC		COUNTY	PROJECT NUMBER	SHEET NUMBER
Schoenrock/Howard R. Green Company		IOWA DOT * OFFICE OF DESIGN	POLK	IM-NHS-235-2(340)11--03-77	M.04

10/21/2003 jmurkin o:\cad\520500J\As-Builts\k77235340.m04





DESIGN TEAM Schoenrock/Howard R. Green Company	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.05

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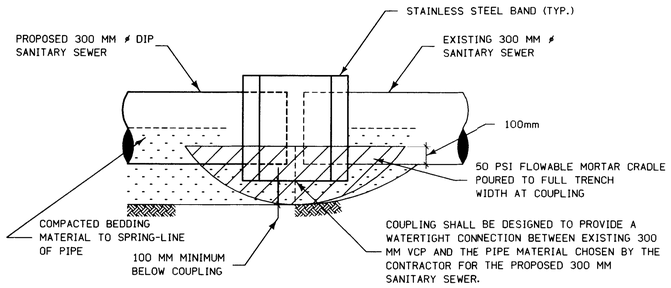
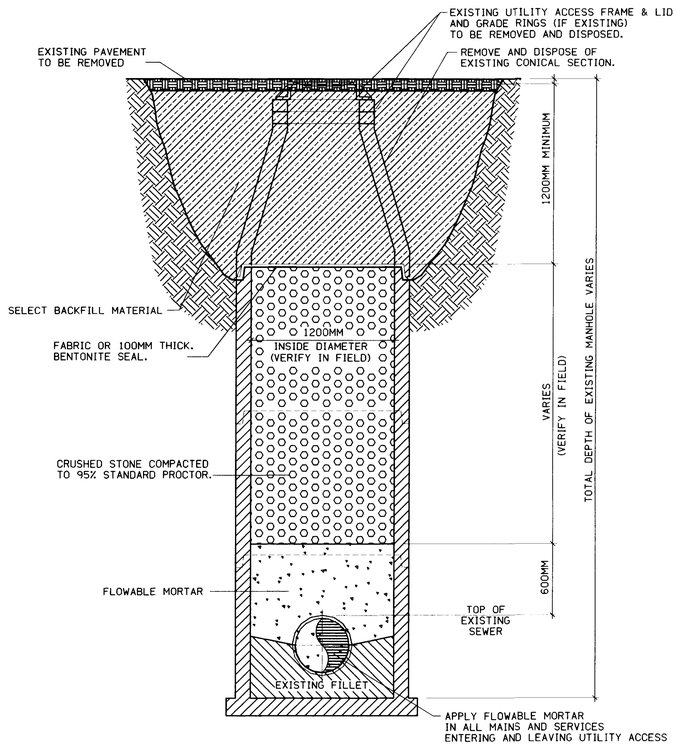


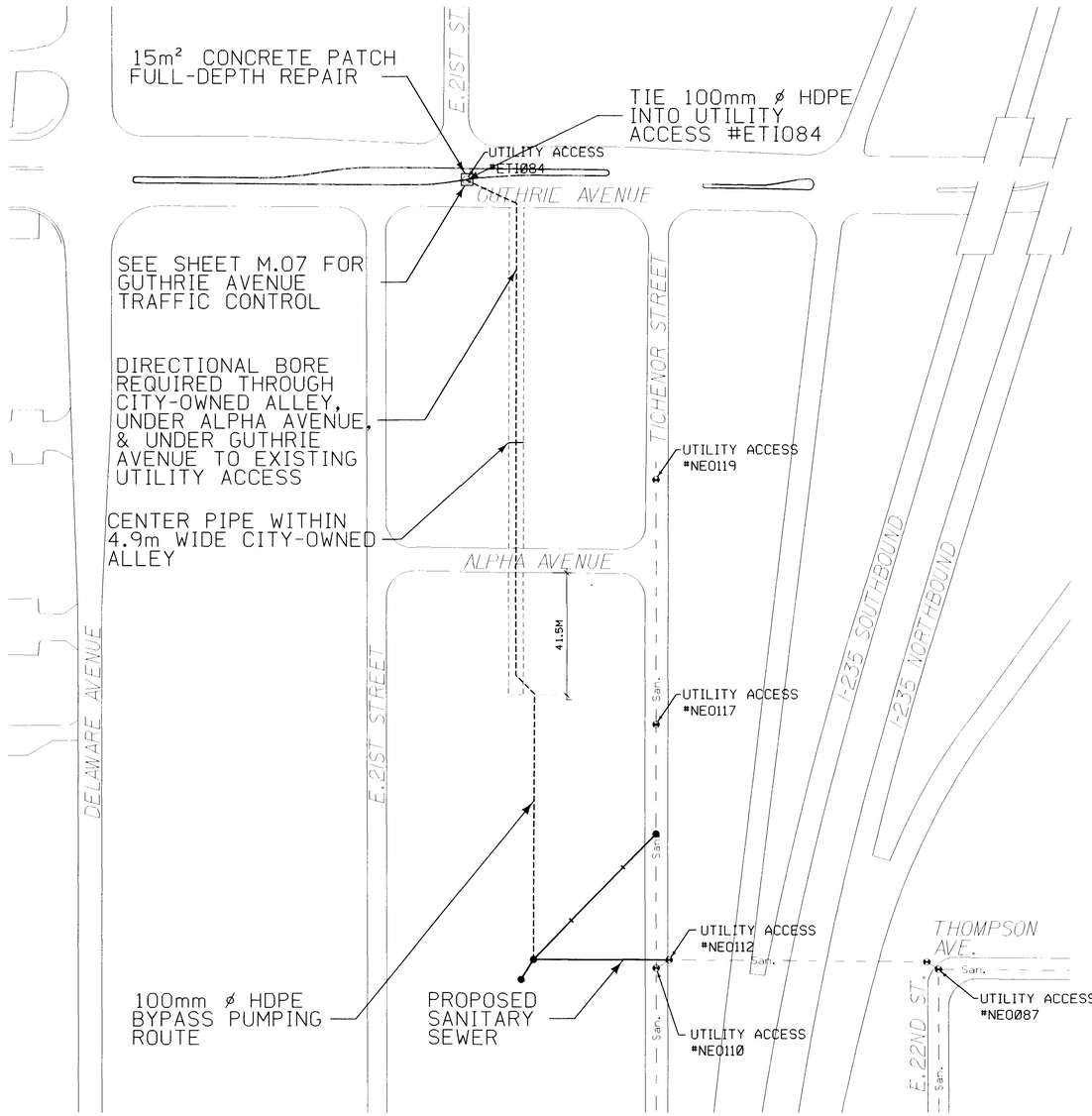
1 STA. 30+46 CONNECTION TO EXISTING SEWER



SECTION

2 UTILITY ACCESS DEMOLITION

NOTES:
1. See M.01 for Flowable Mortar Schedule and list of Utility Accesses.
2. See Sheet M.08 for Locations of utility Abandonment.



3 BYPASS PUMPING DETAIL

0 METERS 100

NORTH

2 UTILITY ACCESS DEMOLITION

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	COUNTY	PROJECT NUMBER	SHEET NUMBER
Schoenrock/Howard R. Green Company			POLK	IM-NHS-235-2(340)11--03-77	M.06

GUTHRIE AVENUE

90m | 40m | 60m | 30m

12.8m

AVOID 400MM ø WATER MAIN

AVOID STORM SEWER AND GAS MAIN

100mm HDPE BYPASS PUMPING ROUTE

APPROXIMATELY 158.5m ELECTRICAL; VARIES 1m TO 2m FROM FENCE

200 mm PE BYPASS; VARIES 1m TO 2m FROM FENCE

4.9m WIDE CITY-OWNED ALLEY

ALPHA AVENUE

DELAWARE AVENUE

E 21ST

ROAD WORK AHEAD
W21-4
1200 X 1200

W4-2
1200 X 1200

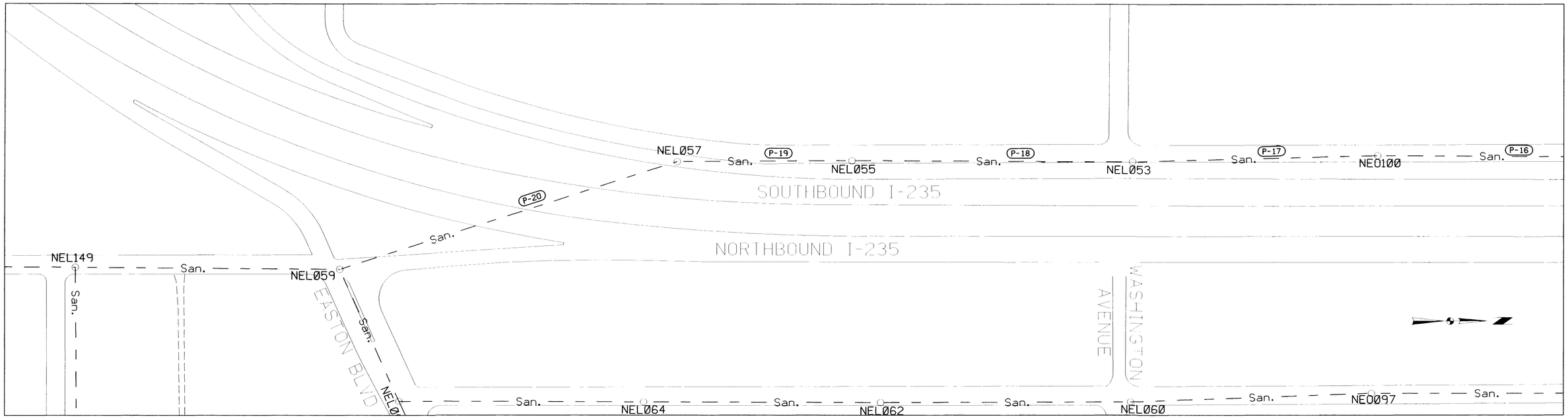
NOTE:
Refer to Standard Road Plan RS-63B for further detail.

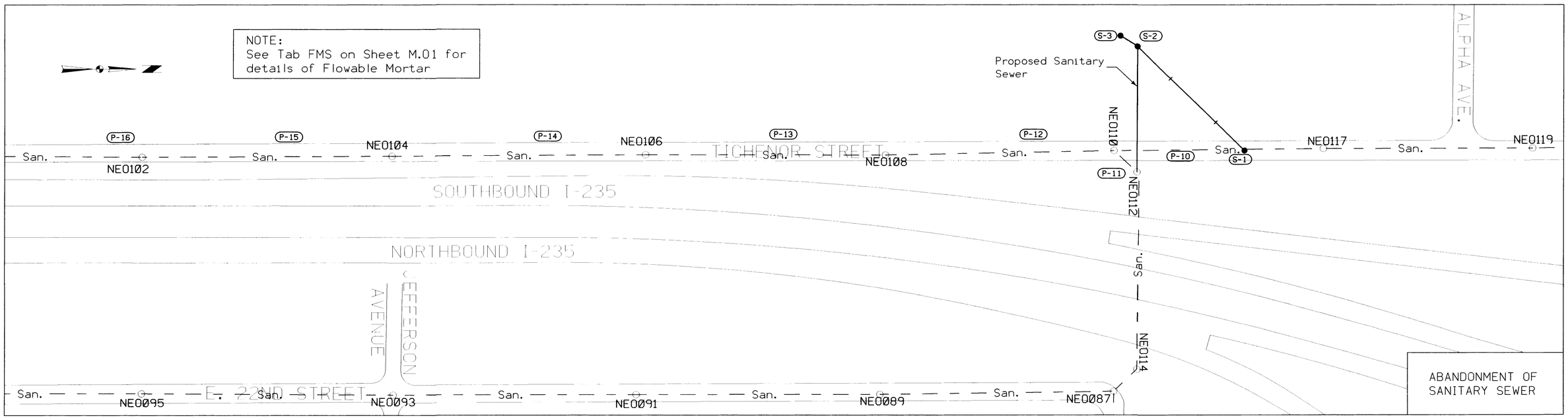
TRAFFIC CONTROL LEGEND

- Type II Barricade
- Channelizing Device
- Traffic Sign
- Drum
- Type III Barricade

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	COUNTY	PROJECT NUMBER	SHEET NUMBER
Schoenrock/Howard R. Green Company			POLK	IM-NHS-235-2(340)11--03-77	M.07

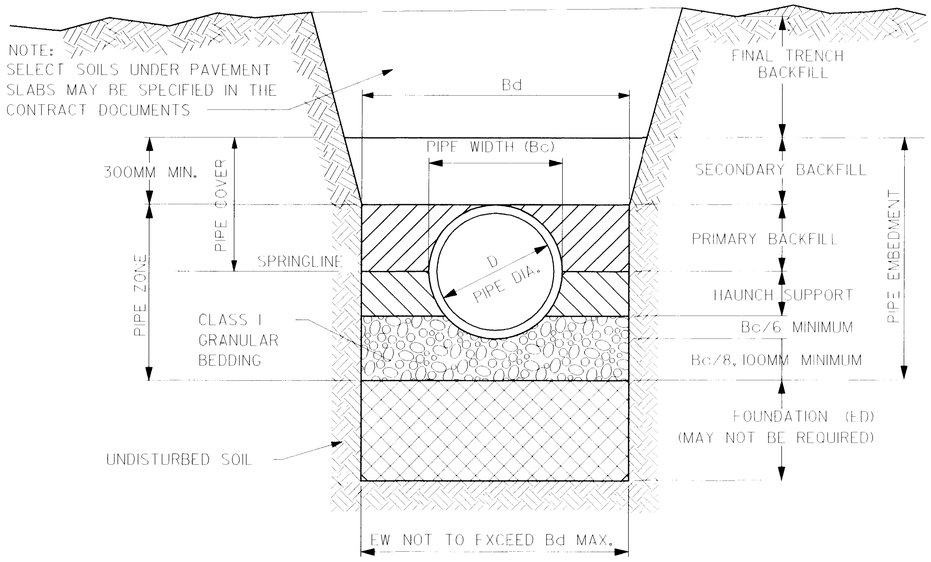
10/21/2003 jmurkin o:\cad\520500J\As-Builts\k77235340.m07





DESIGN TEAM Schoenrock/Howard R. Green Company	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.08

10/21/2003 jmurkin o:\cad\520500J\As-Builts\k77235340.m08



NOTES:

1. HAND PLACED BACKFILL SHALL BE SELECTED, FINELY DIVIDED EXCAVATED MATERIAL FREE FROM DEBRIS, STONES, ORGANIC MATTER OR FROZEN LUMPS AND CAREFULLY COMPACTED.

2. CLEAN CRUSHED STONE FOR BEDDING:
   - 25MM MATERIAL FOR PIPE SIZES (D) 450MM OR LESS
   - 38MM MATERIAL FOR PIPE SIZES (D) GREATER THAN 450MM
   (SEE SECTION 3010.2.03)

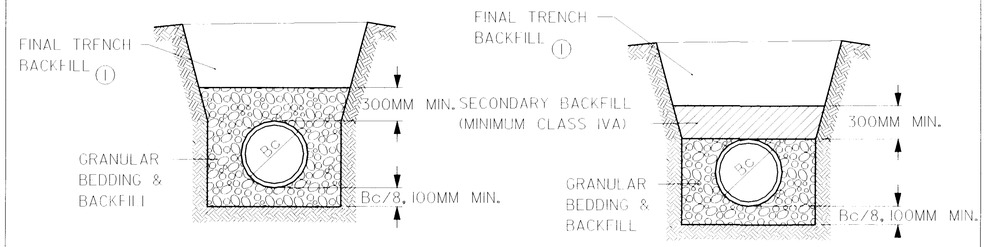
3. A. TRENCH WIDTH (RIGID PIPE)
   MAX WIDTH: Bd = 1.25(Bc)+300MM
   MIN. WIDTH: Bd=Bc+450MM
   B. TRENCH WIDTH (SEMI-RIGID AND FLEXIBLE PIPE)
   MIN. WIDTH: Bd=1.25(Bc)+300MM
   OR: Bd = Bc+450MM
   C. TRENCH WIDTH REQUIREMENTS MAY BE MODIFIED BY JURISDICTIONAL ENGINEER BASED UPON SITE CONDITIONS
   Bd = TRENCH WIDTH AT TOP OF PIPE
   EW=EXCAVATION WIDTH AT BOTTOM OF TRENCH

   DEPTH OF BEDDING MATERIAL BELOW PIPE = BC/8, 100MM MINIMUM

4. EXTRA FOUNDATION ROCK (CLEAN CRUSHED STONE - 64MM MATERIAL) WHEN REQUIRED SHALL BE PLACED BELOW NORMAL BEDDING. MEASUREMENT SHALL BE MADE IN CUBIC METER (LENGTH X EW X ED) AND PAID AT THE UNIT PRICE BID.

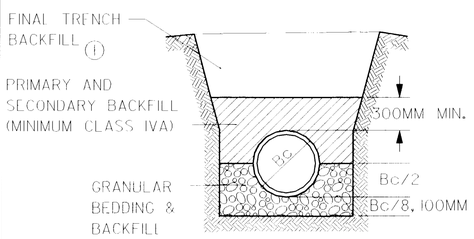
5. FOR ROCK EXCAVATION, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 150MM AND REFILLED WITH NORMAL BEDDING.

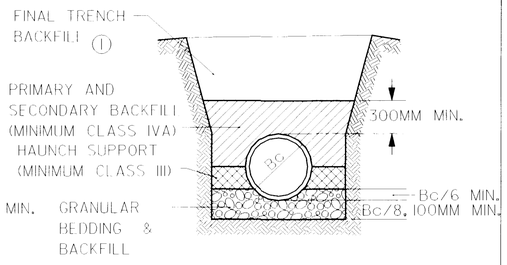
REV.	DATE	BY		
1	01/25/01		PIPE EMBEDMENT DETAILS	FIGURE: 3010.1
DATE: 01-01-98				SHEET 1 OF 3



BACKFILL 300MM ABOVE TOP OF PIPE

CRUSHED STONE ENCASEMENT (CSE)





CLASS B BACKFILL CLASS C BACKFILL

(1) FINAL TRENCH BACKFILL SHALL BE MINIMUM CLASS IV A. CLASS IVB MAY BE USED IF APPROVED BY THE JURISDICTIONAL ENGINEER. PLACE CLASS II MATERIAL BELOW THE FINAL TOP 600MM OF BACKFILL UNDER PAVEMENT SLABS.

- HIGHER QUALITY MATERIALS REPRESENTED BY LOWER CLASS NUMBERS. SEE SECTION 3010.2.03 - 2.08 FOR MATERIAL PROPERTIES.

SEE SHEET 3 FOR CHART

REV.	DATE	BY		
			PIPE EMBEDMENT DETAILS	FIGURE: 3010.1
DATE: 01/25/01				SHEET 2 OF 3

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS

REV.	DATE	BY

DATE: 01/25/01

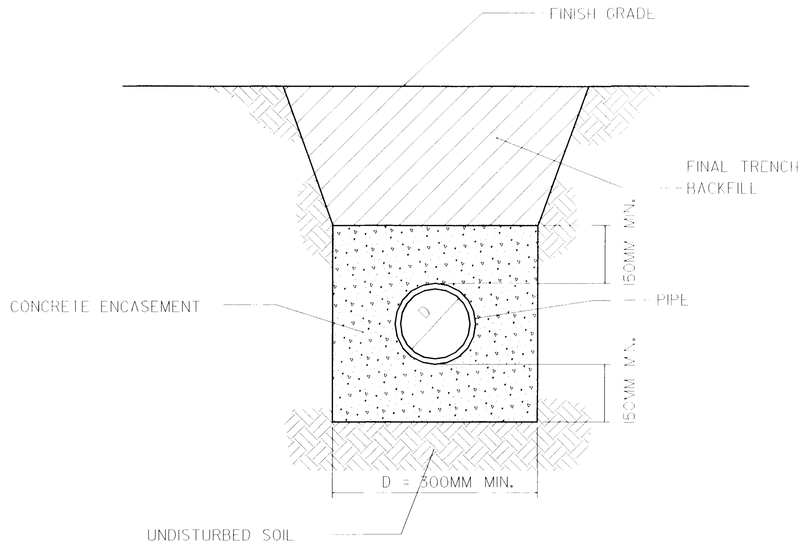
PIPE EMBEDMENT DETAILS

	Type of Pipe	Material	Use	Allowable Depth of Fill Above Top of Pipe, M			
				Class C Backfill	Class B Backfill	CSE	Backfill 300MM Above the Top of Pipe
Rigid	Pipe Stiffness >4490 kPa	RCP; ASTM C 76 Class III; 300MM-600MM	Storm, Gravity	Up to 2.4	Up to 3.0	Up to 3.0	Up to 3.0
		RCP; ASTM C 76 Class III; 675MM 2100MM	Storm, Gravity	Up to 3.0	Up to 4.0	Up to 4.0	Up to 4.0
		RCP; ASTM C 76 Class IV; 300MM-600MM	Storm, Gravity	Up to 3.6	Up to 4.8	Up to 4.8	Up to 4.8
		RCP; ASTM C 76 Class IV; 600MM-675MM	Storm, Gravity	Up to 4.8	Up to 7.0	Up to 7.0	Up to 7.0
		RCP; ASTM C 76 Class V; 300MM-525MM	Storm, Gravity	Up to 5.8	Up to 7.6	Up to 7.6	Up to 7.6
		RCP; ASTM C 76 Class V; 600MM-2100MM	Storm, Gravity	Up to 9.1	Up to 12.2	Up to 12.2	Up to 12.2
		RCAP; ASTM C 506 (Class A III); 450MM-2100MM Equiv.	Storm, Gravity				Up to 4.0
		RCEP; ASTM C507 (Class HE III); 450MM-2100MM Equiv.	Storm, Gravity				Up to 2.7
		RCEP; ASTM C507 (Class VE III); 900MM-2100MM Equiv.	Storm, Gravity				Up to 4.0
		Ductile Iron; AWWA C151(Class 52); 200MM-1350MM	Sanitary, Gravity	Up to 15.2, No Bedding Required			
		Ductile Iron; AWWA C151(Class 52); 100MM-1600MM	Sanitary, Force Main	Up to 15.2, No Bedding Required			
		Extra Strength, VCP; ASTM C 700 200MM-250MM	Sanitary, Gravity	Up to 4.8	Up to 6.0	Up to 7.3	Up to 7.3
		Extra Strength, VCP; ASTM C 700 300MM-525MM	Sanitary, Gravity	Up to 3.6	Up to 4.6	Up to 5.5	Up to 5.5
		Extra Strength, VCP; ASTM C 700 600MM-1050MM	Sanitary, Gravity	Up to 4.0	Up to 5.5	Up to 7.0	Up to 7.0
Semi-Rigid	Pipe Stiffness 1055 to 4480 kPa	PVC; ASTM D 3034 (SDR 23.5); 200MM-375MM	Sanitary, Gravity			Up to 9.1	Up to 9.1
		PVC; ASTM D 2680 (Truss); 200MM-375MM	Sanitary, Gravity			Up to 9.1	Up to 9.1
		PVC; AWWA C900 (DR18); 100MM 300MM	Sanitary, Force Main	Up to 9.1, No Bedding Required			
		PVC; AWWA C905 (DR18); 350MM-600MM	Sanitary, Force Main	Up to 9.1, No Bedding Required			
Flexible	Pipe Stiffness 320 to 1040 kPa	PVC; ASTM D 3034 (SDR 35 & 26); 200MM 375MM	Sanitary, Gravity				Up to 9.1
		PVC; ASTM F 679 (I TWall); 450MM 675MM	Sanitary, Gravity				Up to 9.1
		PVC; ASTM F 949 (A-2000); 200MM-900MM	Sanitary, Gravity				Up to 9.1
		PVC; ASTM F 1803 (Closed Profile); 525MM-900MM	Sanitary, Gravity				Up to 9.1
		PVC; ASTM F 949 (A-2000); 300MM-900MM	Storm, Gravity			Up to 9.1	Up to 9.1
		HDPE; AASHTO M 294 ; 300MM	Storm, Gravity				Up to 3.4
	Pipe Stiffness 150 to 310 kPa	HDPE; AASHTO M 294 ; 375MM 900MM	Storm Gravity				Up to 3.4

Notes:
- Lined reinforced concrete pipe (LRCP), used for sanitary sewer applications, shall follow depth requirements of RCP (minimum Class IV).
- Allowable depth of bury may be modified by Jurisdictional Engineer based upon site conditions and installation methods.
- Water Main Pressure Pipe: In areas where sand or other suitable soil backfill is available, Water Main Pressure Pipe (excluding PE Pipe) may be backfilled with these natural materials (Class I material not required) using a flat trench bottom and bellhole shaping.

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS

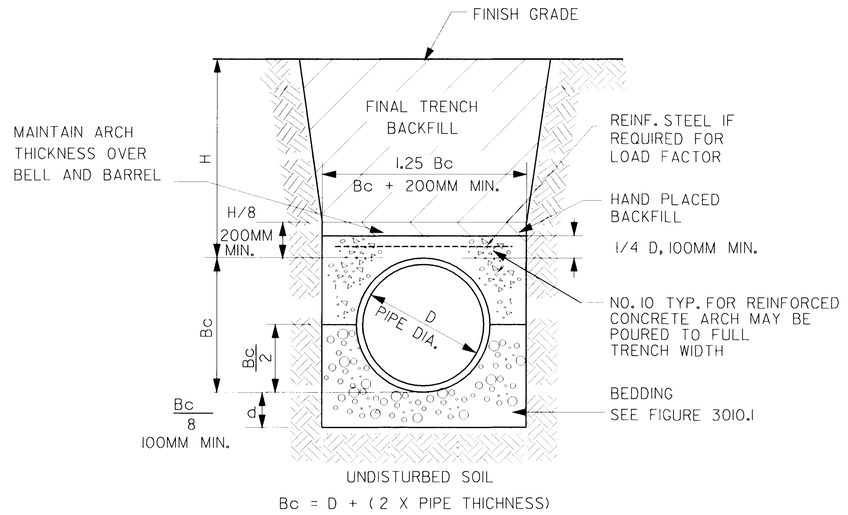
FIGURE: 3010.1



NOTES

1. PROVIDE MINIMUM CONCRETE THICKNESS OF 150MM AROUND PIPE. TRENCH WALLS SHALL BE USED TO FORM CONCRETE.
2. MINIMUM CONCRETE STRENGTH SHALL BE 17,240 kPa BEFORE FINAL TRENCH BACKFILL IS PLACED.
3. INSTALL AND SUPPORT PIPE AS SPECIFIED.

REV.	DATE	BY	P.C. CONCRETE ENCASEMENT	FIGURE: 3010.2
DATE: 01-01-98				SHEET 1 OF 1



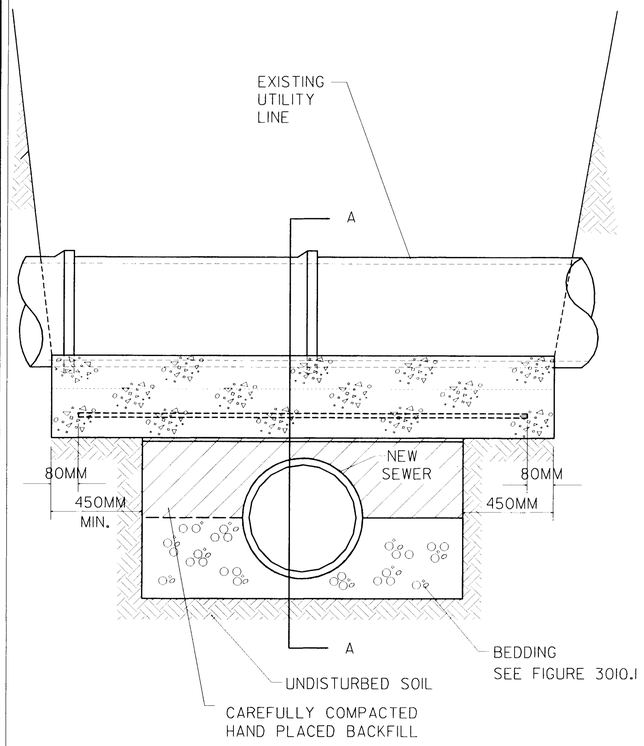
Bc = D + (2 X PIPE THICHNESS)

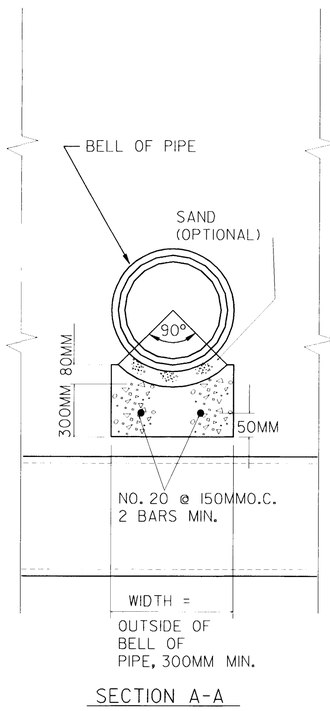
LOAD FACTOR:	
4.8	AREA TRANSVERSE STEEL = 0.01 x AREA OF CONCRETE AT CROWN; MAX. SPACING = 300MM
3.4	AREA TRANSVERSE STEEL = 0.004 x AREA OF CONCRETE ARCH AT CROWN; MAX. SPACING OF REINFORCING STEEL = 300MM
2.8	NON-REINFORCED P.C. CONCRETE ARCH.

REV.	DATE	BY	P.C. CONCRETE ARCH	FIGURE: 3010.3
DATE: 01-01-98				SHEET 1 OF 1

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS

DESIGN TEAM Schoenrock/Howard R. Green Company	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	M.11





SECTION A-A

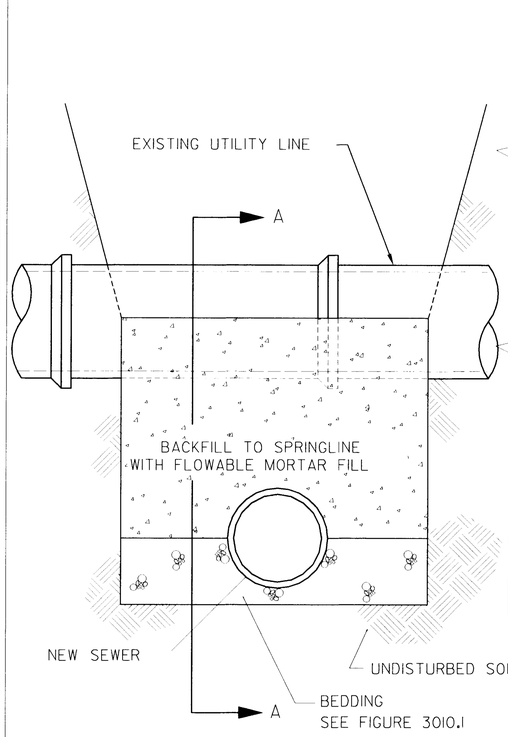
NOTES:

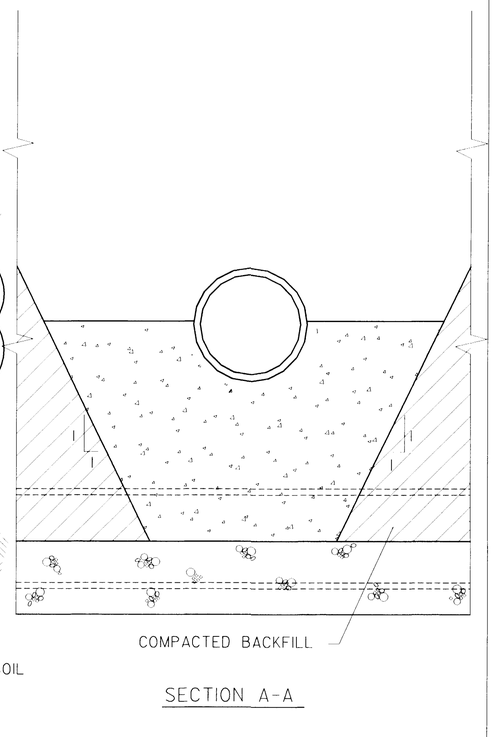
REINFORCED CONCRETE BEAM UTILITY LINE SUPPORT TO BE USED WHEN NEW SEWER EXCAVATION IS CROSSING UNDER AN EXISTING UTILITY LINE (SEWER LINES, WATER LINES, GAS LINES, ETC...) AS DIRECTED BY THE ENGINEER.

ALLOW CONCRETE TO CURE A MIN. OF 48 HOURS BEFORE COMPLETING BACKFILL.

SPECIAL DESIGN REQUIRED FOR TRENCH WIDTH GREATER THAN 2M OR TRENCH DEPTH GREATER THAN 4.5M.

REV.	DATE	BY	REINFORCED P.C. CONCRETE BEAM UTILITY LINE SUPPORT	FIGURE: 3010.5
DATE: 01-01-98				SHEET 1 OF 1





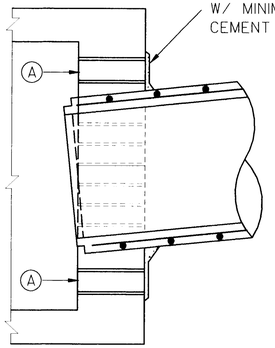
SECTION A-A

NOTES:

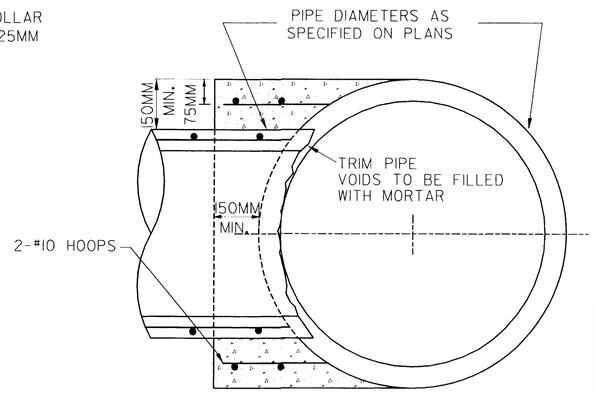
1. FLOWABLE MORTAR FILL UTILITY LINE SUPPORT TO BE USED WHEN NEW UTLIITY EXCAVATION IS CROSSING UNDER AN EXISTING UTILITY LINE (SEWER LINES, WATER LINES, GAS LINES, ETC.) AS DIRECTED BY THE ENGINEER.
2. ALLOW FLOWABLE MORTAR FILL TO CURE A MINIMUM OF 24 HRS. BEFORE COMPLETING BACKFILL.
3. UNCOMPACTED BACKFILL SHALL BE TRIMMED AWAY FROM SLOPES BEFORE POURING FLOWABLE MORTAR.
4. SIDE SLOPES OF FLOWABLE MORTAR FILL TO BE 1:1 SLOPE OR GREATER. SEE SECTION A-A.

REV.	DATE	BY	FLOWABLE MORTAR FILL UTILITY LINE SUPPORT	FIGURE: 3010.6
DATE: 01-01-98				SHEET 1 OF 1

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS

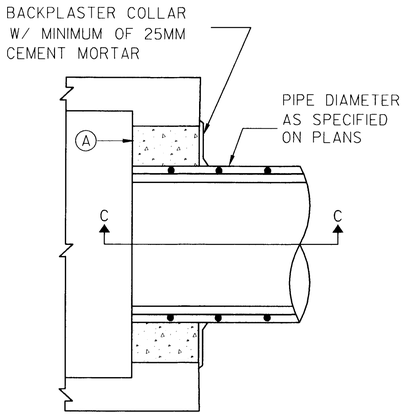


SECTION C-C



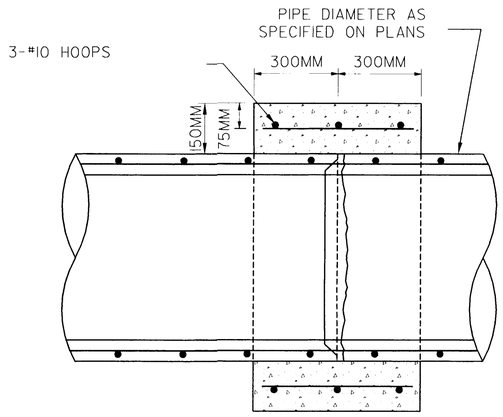
DETAIL OF TYPE I CONCRETE
COLLAR CONNECTION

(A) BREAK OUT OPENING IN INTAKE BOX WALL FOR NEW PIPE CONNECTION. BRICK UP AROUND NEW PIPE WITH BRICK OR BLOCK LAID IN RICH CEMENT MORTAR.

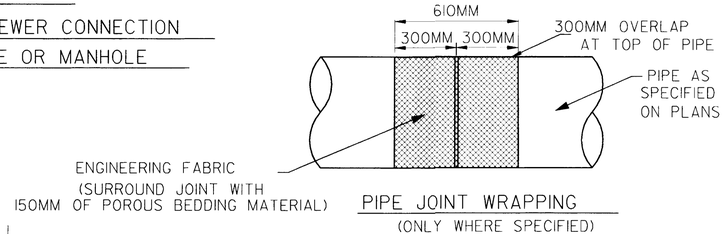


PART PLAN OF BOX

DETAIL OF STORM SEWER CONNECTION
TO EXISTING INTAKE OR MANHOLE



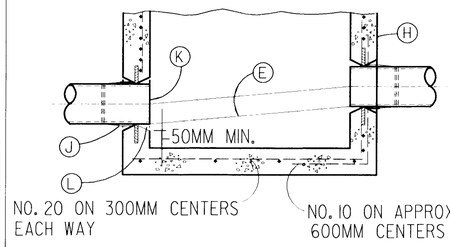
DETAIL OF TYPE II CONCRETE
COLLAR CONNECTION



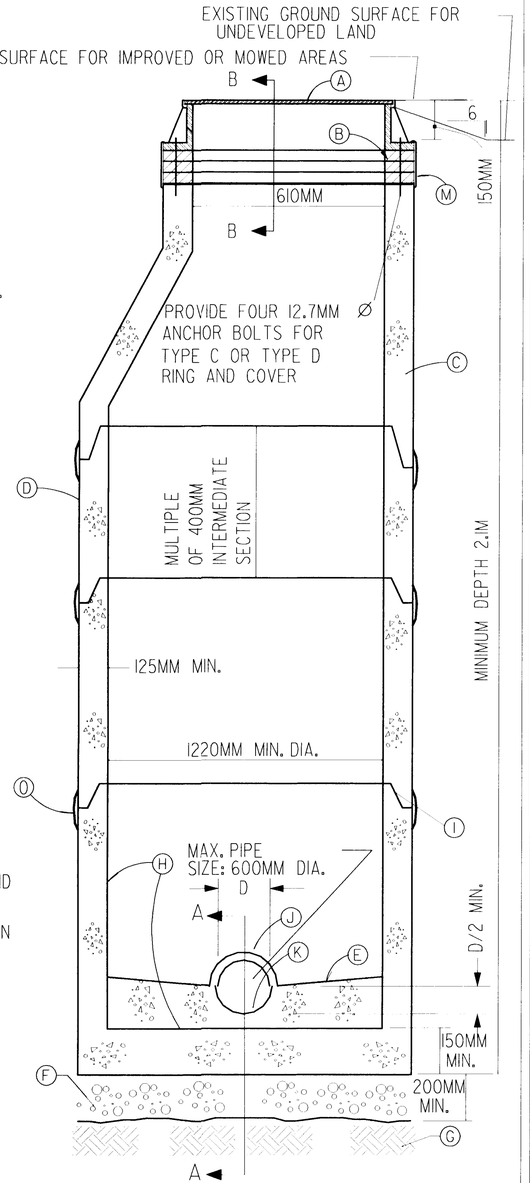
PIPE JOINT WRAPPING
(ONLY WHERE SPECIFIED)

REV.	DATE	BY	PIPE CONNECTION DETAILS (STORM SEWER)	FIGURE: 4020.1A
1	01/25/01			
DATE: 01-01-98				SHEET 1 OF 1

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS



SECTION A-A



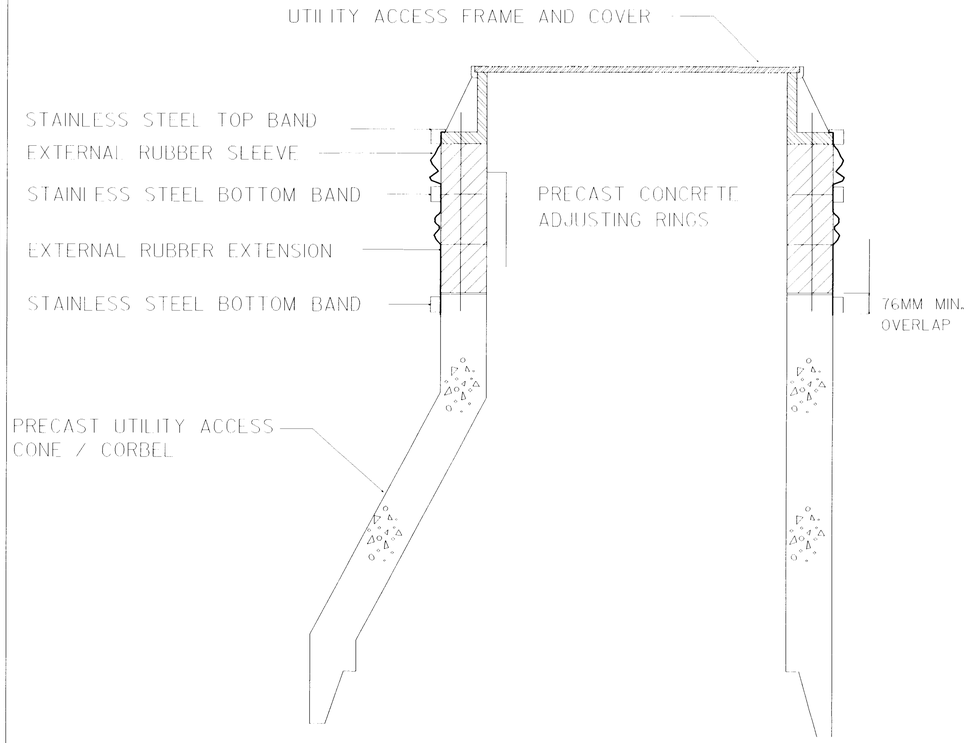
HALF SECTION

NOTE REFERENCE

- (A) RING & COVER-SEE SPECIFICATIONS
- (B) ADJUSTING RINGS
- (C) 1.2M ECCENTRIC CONE SECTION
- (D) STANDARD UTILITY ACCESS SECTIONS.
- (E) CONCRETE FILL, SLOPE=20MM PER METER
- (F) 200MM MIN. THICKNESS OF GRANULAR BEDDING MATERIALS
- (G) UNDISTURBED SOIL
- (H) BASE INTEGRAL WITH BASE RISER
- (I) JOINT GASKET
- (J) PIPE CONNECTION PER SECTION 6020, 2.01I
- (K) EXTEND PIPE THROUGH UTILITY ACCESS WALL AND TRIM OFF PIPE INSIDE UTILITY ACCESS
- (L) VOID BETWEEN PIPE AND UTILITY ACCESS SECTION KEEP FREE OF FOREIGN MATERIAL
- (M) CHIMNEY SEAL PER SECTION 6020, 2.06 & 3.04
- (O) APPLY BITUMINOUS JOINT COMPOUND TO OUTSIDE OF EACH SECTION JOINT

SEE SHEET 2 FOR SECTION B-B (CHIMNEY SEAL DETAIL)

REV.	DATE	BY		
2	01/25/01			
1	JAN, 1999			
DATE: 01-01-98			TYPE "A" UTILITY ACCESS (SANITARY SEWER)	FIGURE: 6020.1
				SHEET 1 OF 2



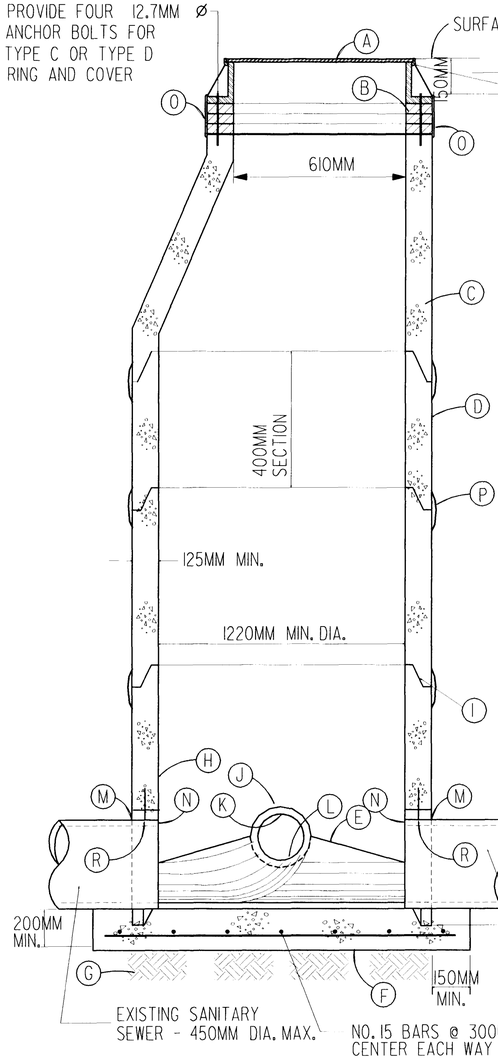
EXTERNAL CHIMNEY SEAL DETAIL

SECTION B-B

REV.	DATE	BY		
1	01/25/01			
DATE: 01-25-99			TYPE "A" UTILITY ACCESS (SANITARY SEWER)	FIGURE: 6020.1
				SHEET 2 OF 2

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS

DESIGN TEAM	METRIC		COUNTY	PROJECT NUMBER	SHEET NUMBER
Schoenrock/Howard R. Green Company	IOWA DOT * OFFICE OF DESIGN	POLK		IM-NHS-235-2(340)11--03-77	M.14

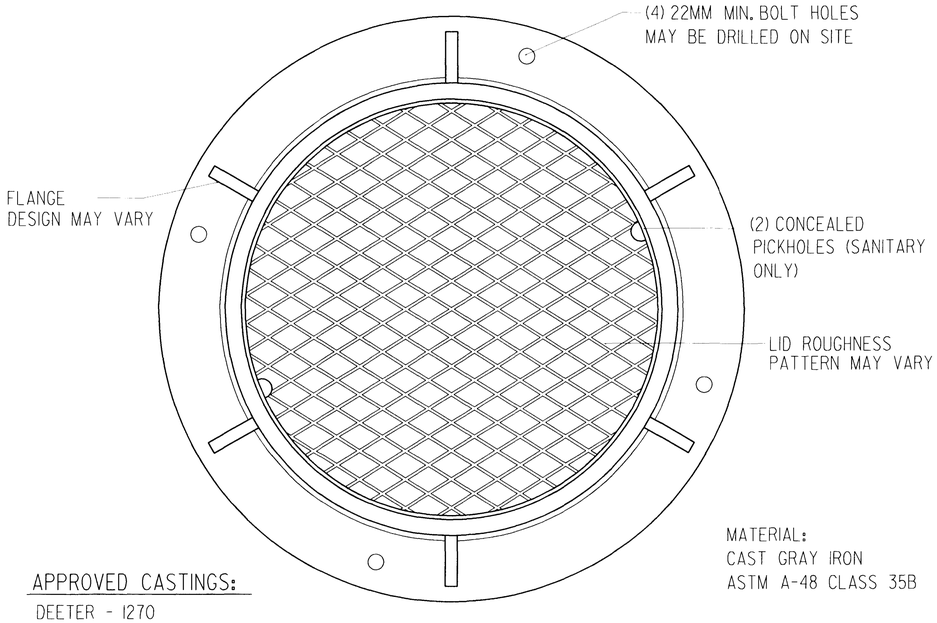


NOTE REFERENCE

- (A) RING & COVER-SEE SPECIFICATIONS
- (B) ADJUSTING RINGS
- (C) ECCENTRIC CONE SECTION
- (D) STANDARD UTILITY ACCESS SECTIONS. PROVIDE ONE 400MM SECTION.
- (E) CONCRETE FILL, SHAPED INVERT
- (F) CONC. UTILITY ACCESS BASE, POURED IN PLACE
- (G) UNDISTURBED SOIL
- (H) BASE SECTION WITH SQUARE EDGED BEARING
- (I) JOINT GASKET
- (J) FLEXIBLE WATERTIGHT PIPE CONNECTION INTEGRAL WITH BASE SECTION
- (K) EXTEND NEW PIPE THROUGH UTILITY ACCESS WALL AND TRIM OFF PIPE INSIDE UTILITY ACCESS
- (L) VOID BETWEEN PIPE AND UTILITY ACCESS SECTION KEEP FREE OF FOREIGN MATERIAL
- (M) WATERTIGHT JOINT AT ARCHED OPENING
- (N) TRIM OFF TOP OF PIPE INSIDE UTILITY ACCESS
- (O) CHIMNEY SEAL
  EXTERNAL (SHOWN); ALL APPLICATION OR INTERNAL; PER 6020, 2.06
- (P) APPLY BITUMINOUS JOINT COMPOUND TO OUTSIDE OF EACH SECTION JOINT
- (R) A-LOK

NOTES:
1) MAX. DIA. OF NEW SEWER IS 450MM. LARGER DIAMETER MAY BE USED WITH JURISDICTIONAL ENGINEER APPROVAL.
2) TO BE USED ONLY WHEN BOTH EXISTING SANITARY LINES WILL REMAIN IN PLACE
3) MIN. DEPTH 2.1M

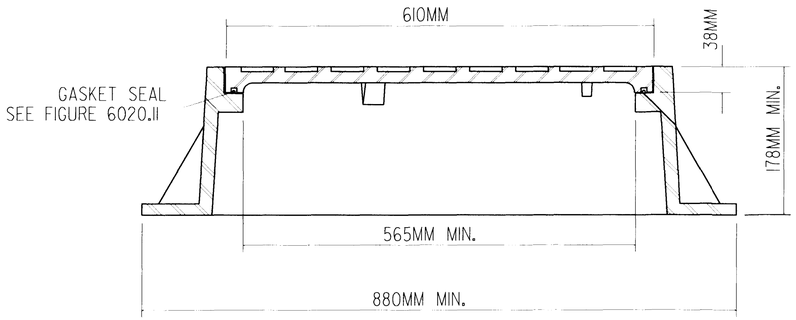
REV.	DATE	BY	TYPE "I" UTILITY ACCESS (SANITARY SEWER)	FIGURE: 6020.4
1	01/25/01			SHEET 1 OF 1
DATE: 01-01-98				



MATERIAL:
CAST GRAY IRON
ASTM A-48 CLASS 35B

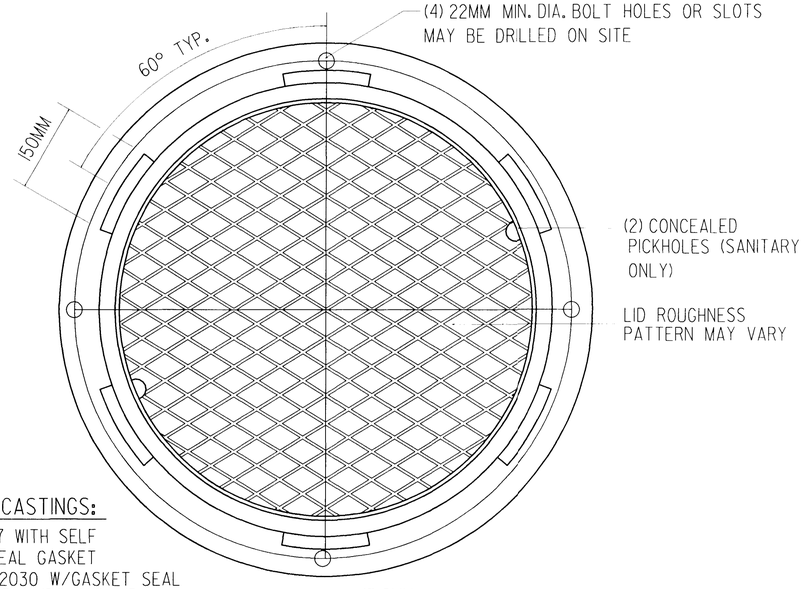
APPROVED CASTINGS:

DEETER - 1270
E. JORDAN - 1120 W/GASKET SEAL
NEENAH - 1670 A



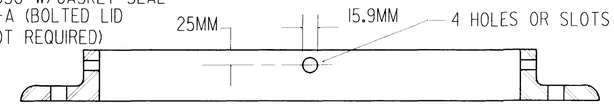
REV.	DATE	BY	TYPE "A" RING AND COVER (SANITARY SEWER)	FIGURE: 6020.7
1	01/25/01			SHEET 1 OF 1
DATE: 01-01-98				

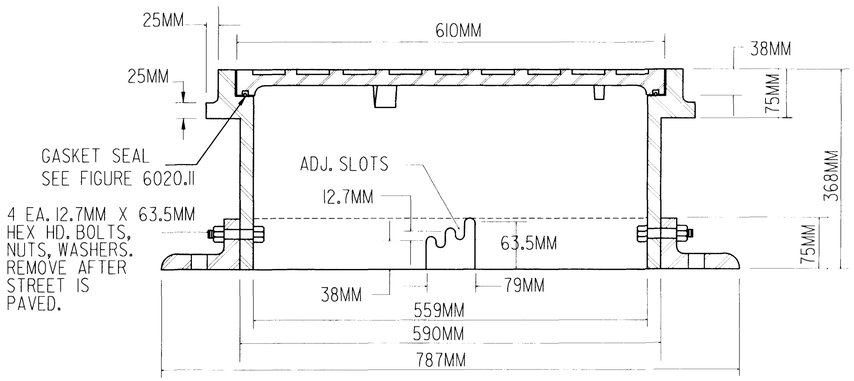
FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS



APPROVED CASTINGS:

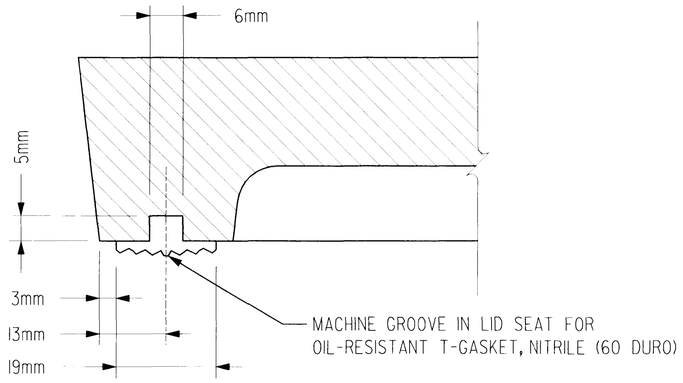
DEETER - 1187 WITH SELF SEAL GASKET
E. JORDAN - 2030 W/GASKET SEAL
NEENAH - 1673-A (BOLTED LID NOT REQUIRED)



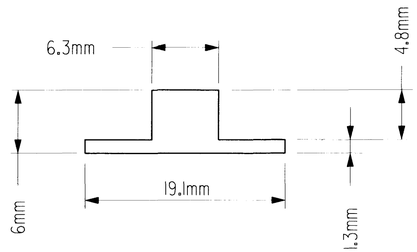


MATERIAL:
CAST GRAY IRON
ASTM A-48 CLASS 35B

REV.	DATE	BY	TYPE "B" RING AND COVER (SANITARY SEWER)	FIGURE: 6020.8
1	01/25/01			SHEET 1 OF 1
DATE: 01-01-98				



GROOVE DETAIL



GASKET DETAIL

REV.	DATE	BY	UTILITY ACCESS COVER GASKET (SANITARY SEWER)	FIGURE: 6020.11
DATE: 01-01-98				SHEET 1 OF 1

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO SI UNITS

BORING LOG NO. 1

Project No.: 011357

Project: I-235 Widening Sanitary Sewer
E 22nd Street & Thompson West of I-235
Des Moines, Iowa

Client: Howard R. Green Company
4685 Merle Hay Road Ste.106
Des Moines, IA 50310-1317

Surface Elevation: Existing Grade
Datum:

Date Drilled: 9/12/01
Drilling Depth, m.: 4.6

Drilling Method: 100mm CFA
Page: 1 of 1

Elevation m	Depth m	Sample No.	Type	SPT b/0.30 m	Moisture Content, %	Dry Density kN/m^3	Unconfined Compressive Strength kN/m^2	Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation m
	0							Brown and dark brown sandy lean clay, damp to moist		CL		
	1							Very dark brown lean clay with sand after .6 m				
		1	ST		17.4	16.5	668	FILL Dark brown and brown mixed after 1.5 m				
	2											2.1
	3	2	SS	36	11.6			Gray silty fine sand, damp to moist SAND		SM		3.5
	4							Gray lean clay with sand, trace gravel, moist GLACIAL TILL		CL		
		3	ST		16.0	17.6	179	Sand seam near 4.3 m				4.6
	5							End of Boring				
	6											
	7											
	8											

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation
Time: at completion ____ hrs. ____ days
Depth to water: Dry m. ____ m. ____ m.

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical * Environmental *

BORING LOG NO. 2

Project No.: 011357

Project: I-235 Widening Sanitary Sewer
E 22nd Street & Thompson West of I-235
Des Moines, Iowa

Client: Howard R. Green Company
4685 Merle Hay Road Ste.106
Des Moines, IA 50310-1317

Surface Elevation: Existing Grade
Datum:

Date Drilled: 9/12/01
Drilling Depth, m.: 6.1

Drilling Method: 100mm CFA
Page: 1 of 1

Elevation m	Depth m	Sample No.	Type	SPT b/0.30 m	Moisture Content, %	Dry Density kN/m^3	Unconfined Compressive Strength kN/m^2	Material Description*	Graphic Log	USCS	Water Level	Depth / Elevation m
	0							Brown and dark brown lean clay with sand, moist		CL		0.3
								FILL		CL-CH		
	1							Very dark brown lean to fat clay, moist TOPSOIL				1.2
		1	ST		17.8	16	214	Gray lean clay, moist		CL		
	2							Gray-brown sandy lean clay with trace gravel after 1.7 m				
	3	2	SS	17	16.2							
	4							Gray after 3.5 m GLACIAL TILL				
		3	ST		21.2	16	105					
	5											
	6	4	ST		20.3	16	125					6.1
								End of Boring				
	7											
	8											

*The stratification lines represent the approximate boundary lines between material types: in-situ, the transition may be gradual.

Water Level Observation
Time: at completion ____ hrs. ____ days
Depth to water: Dry m. ____ m. ____ m.

ALLENDER BUTZKE ENGINEERS, INC.
Geotechnical * Environmental *

LICENSED PROFESSIONAL ENGINEER
HAMID FEIZ 13650
IOWA

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

HAMID FEIZ, P.E. DATE
License Number: 13650
My license renewal date is DECEMBER 31, 2003.
Pages or sheets covered by this seal:
M.17, M.18

DESIGN TEAM	Howard R Green Company	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	M.17

10/21/2003 jmurkin o:\cad\520500J\As-Builts\k77235340.m17-m18

GEOTECHNICAL EXPLORATION

GEOTECHNICAL EXPLORATION

I-235 WIDENING SANITARY SEWER
E 22ND STREET & THOMPSON WEST OF I-235
DES MOINES, IOWA

PN 011357

October 26, 2001

PROJECT INFORMATION
The project consists of approximately 640 lineal meters of sanitary sewer from East 22nd Street and Thompson to the west across I-235 connecting to the Wayne Street box culvert. The flow line of the sewer will vary in depth generally between 1.8 to 6.7 meters. Tunneling may be utilized to install the sewer at some street and railroad crossings.

FIELD EXPLORATION
Five borings were conducted at this site to depths of 4.6 to 8 meters below existing grades on September 12 and October 17, 2001. Approximate locations of the borings are shown on the plans.

SUBSURFACE CONDITIONS
Soil Profile
The five borings encountered fill, topsoil, glacial till, and sand. Detailed descriptions of soils encountered by this exploration are provided on the Boring Logs. Not all borings encountered the same sequence of deposits. The following sections summarize the major soil types encountered in the borings at this site.

Fill - Dark brown and brown sandy lean clay (CL), gray mixed with brown lean clay (CL), and very dark brown and brown lean to fat clay (CL-CH) were encountered at the ground surface in Boring Nos. 1, 2, and 4. Approximately 0.3 meters of crushed rock were encountered at ground surface in Boring No. 4. The lower boundary of the damp to very moist fill was encountered between depths of 0.3 and 3.2 meters below existing grades.

Topsoil - Dark brown lean clay (CL) and very dark brown lean to fat clay (CL-CH) were encountered beneath the fill or at ground surface in Boring Nos. 3 and 5. The lower boundary of the damp to moist topsoil was encountered near depths of 1.2, 0.6, and 0.5 meters below existing grades in Boring Nos. 2, 3, and 5, respectively.

Glacial Till - Glacial till consisting of brown, brown-gray, and gray sandy lean clay (CL), lean clay (CL), and lean clay with sand (CL) containing traces of gravel, was encountered beneath the sand in Boring No. 1 and beneath the topsoil and/or fill other borings. As is common, interbedded sand seams or layers were randomly encountered within the glacial till in several borings at various depths. The moist to very moist Wisconsinan glacial till exhibited medium stiff to stiff consistencies. All borings terminated in the glacial till between depths of 4.5 and 8 meters below existing grades.

Sand - Brown and gray poorly graded fine sand (SP) was encountered in Boring No. 1 from 2.7 to 3.5 meters and in Boring No.3 from 1.7 to 3.4 meters below existing grades. Moisture content of the sand varied from damp to moist depending upon texture and location within the soil strata.

Groundwater Level Observations
The borings were monitored during and shortly after drilling operations to detect moisture seepage and groundwater accumulation. The results of our water level observations are noted on the Boring Logs. Upon completion of drilling operations, groundwater accumulation was observed near a depth of 3 meters below existing grade in Boring No. 4. Boring No. 3 was caved-and -wet near a depth of 2.6 meters below existing grade. Other borings remained dry shortly after completion of drilling operation. It should be recognized that these short-term water levels are not necessarily a true indication of the groundwater table. Long-term observations would be necessary to accurately define the groundwater variations at this site. Fluctuation of groundwater levels can occur due to seasonal variations in the amount of rainfall, surface drainage, subsurface drainage, site topography, irrigation practices, and ground cover (pavement or vegetation).

ANALYSES AND RECOMMENDATIONS
Excavation Stability and Dewatering
The excavations at this site will encounter both cohesive and granular soils with wet sand seams or layers. If excavations encounter only cohesive soils with no wet sand seams or layers, it is expected that the water seepage can be controlled by permitting it to drain into temporary construction sumps and be pumped outside the perimeter of the excavations. More extensive dewatering such as sand points and wells may be required for excavations which extend down into water bearing sand layers such as near Boring No. 3. We recommend that water levels be maintained 0.6 meters or more below the bottom of excavations in saturated sand to prevent upward seepage forces which could reduce subgrade support.

The extent of bracing or sloping of open cut excavations will be dependent upon depth of cut, groundwater conditions, soils encountered, length of time the excavation will be open, area

GEOTECHNICAL EXPLORATION

available for excavation and local governing regulations. Predominately cohesive soils may appear to stand nearly vertical in shallow excavations for short periods of time. However, soil creep, surcharge loads, precipitation, subsurface moisture seepage, construction activity vibrations and other factors may cause these soils to cave within an unpredictable period of time. Excavations encountering sand may tend to cave rapidly, especially if water is flowing through the sand. Unstable granular excavation walls may also cause surrounding cohesive soils to become unstable. Temporary shoring, flattening of the excavation slopes or use of trench boxes may be required to maintain a safe condition. It is to be noted that provisions for shoring and bracing of deep excavations are required by OSHA.

The on-site soils can be excavated utilizing conventional excavation equipment. Random boulders, if encountered, may require special excavation techniques if the size inhibits removal with conventional equipment.

Granular soils can generally be suitably compacted with vibratory compaction equipment whereas cohesive soils are more suitable for compaction with sheepsfoot or pneumatic type compactors. For cohesive soils, moisture contents within a range of -1 to +4 percent of the material's optimum moisture content are necessary to achieve the desired fill qualities. The on-site soils, free of debris and organics, would be considered suitable soil types for general backfill applications. The recommended degrees of compaction guidelines for the backfill, depending upon anticipated future site use, are provided in the following Table A.

At the time of this geotechnical exploration, moisture content of the Wisconsinan glacial till and topsoil deposits were generally near or slightly above the recommended moisture content range for compaction. Adjustment of soil moisture content may be required in order to lower or raise the moisture to within the recommended moisture content range. Discing and aeration is generally the most economical method to lower soil moisture content, if climatic conditions allow. Chemical stabilization of very moist soils can be accomplished with quicklime or flyash if construction scheduling does not permit field drying.

TABLE A
RECOMMENDED DEGREE OF COMPACTION GUIDELINES

Construction Application	Standard Proctor (ASTM D698) Cohesive Soil	Standard Proctor (ASTM D698) Cohesionless Soil	*Relative Density (D4253 & D4254) Cohesionless Soil
Class 1	95%	98%	70%
Class 2	90%	93%	45%
Class 3	85%	88%	20%

Class 1 - Subgrade for building foundations, slabs-on-grade, pavements and other critical backfill areas.
Class 2 - Backfill adjacent to structures not supporting other structures - Minor subsidence possible.
Class 3 - Backfill in non-critical areas - Moderate subsidence possible.

*Use Relative Density technique (ASTM D4253 & D4254) where Standard Proctor technique (ASTM D698) does not result in a definable maximum dry density and optimum moisture content.

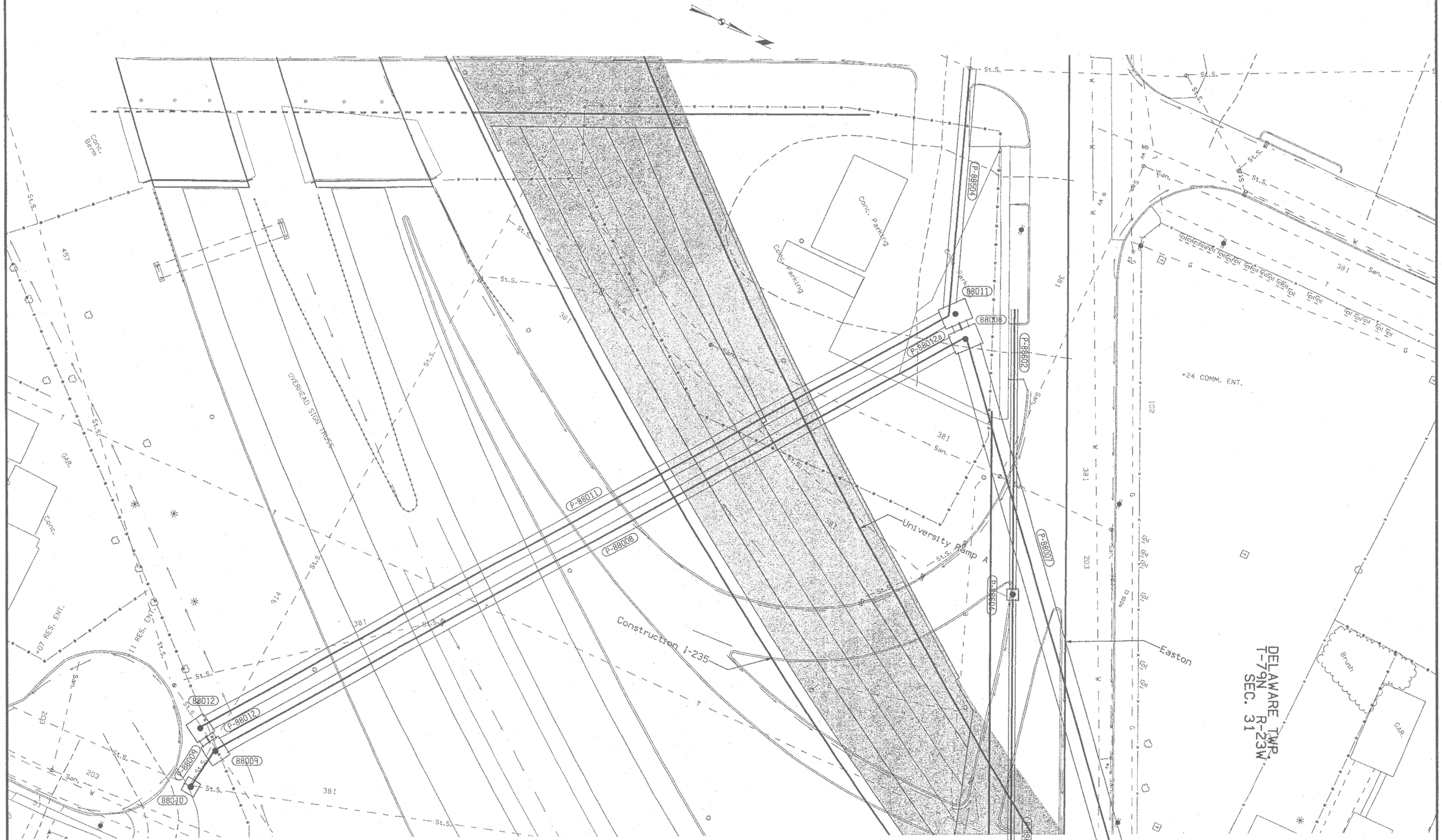
Tunnels in the glacial till could encounter boulders and localized sand pockets. Tunnels near Boring No. 3 will encounter extensive and unstable wet granular soils (sand) which may require stabilization, such as grouting, freezing, or other measures to complete tunneling operations.

GENERAL
The analyses and recommendations in this report are based in part upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations which may occur between borings or across the site. The nature and extent of such variations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

It is recommended that the geotechnical engineer be provided the opportunity to review the plans and specifications so that comments can be made regarding the interpretation and implementation of our geotechnical recommendations in the design and specifications. It is further recommended that the geotechnical engineer be retained for testing and observation during earthwork and foundation construction phases to help determine that the design requirements are fulfilled.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer.

The scope of our service was not intended to include any environmental assessment or exploration for the presence of hazardous or toxic materials in the soil, surface water, groundwater or air on, below or adjacent to this site.



For Storm Sewer Profile Details
Refer to Sheets No. M.22 - M.28

STORM SEWER DETAILS

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.19	

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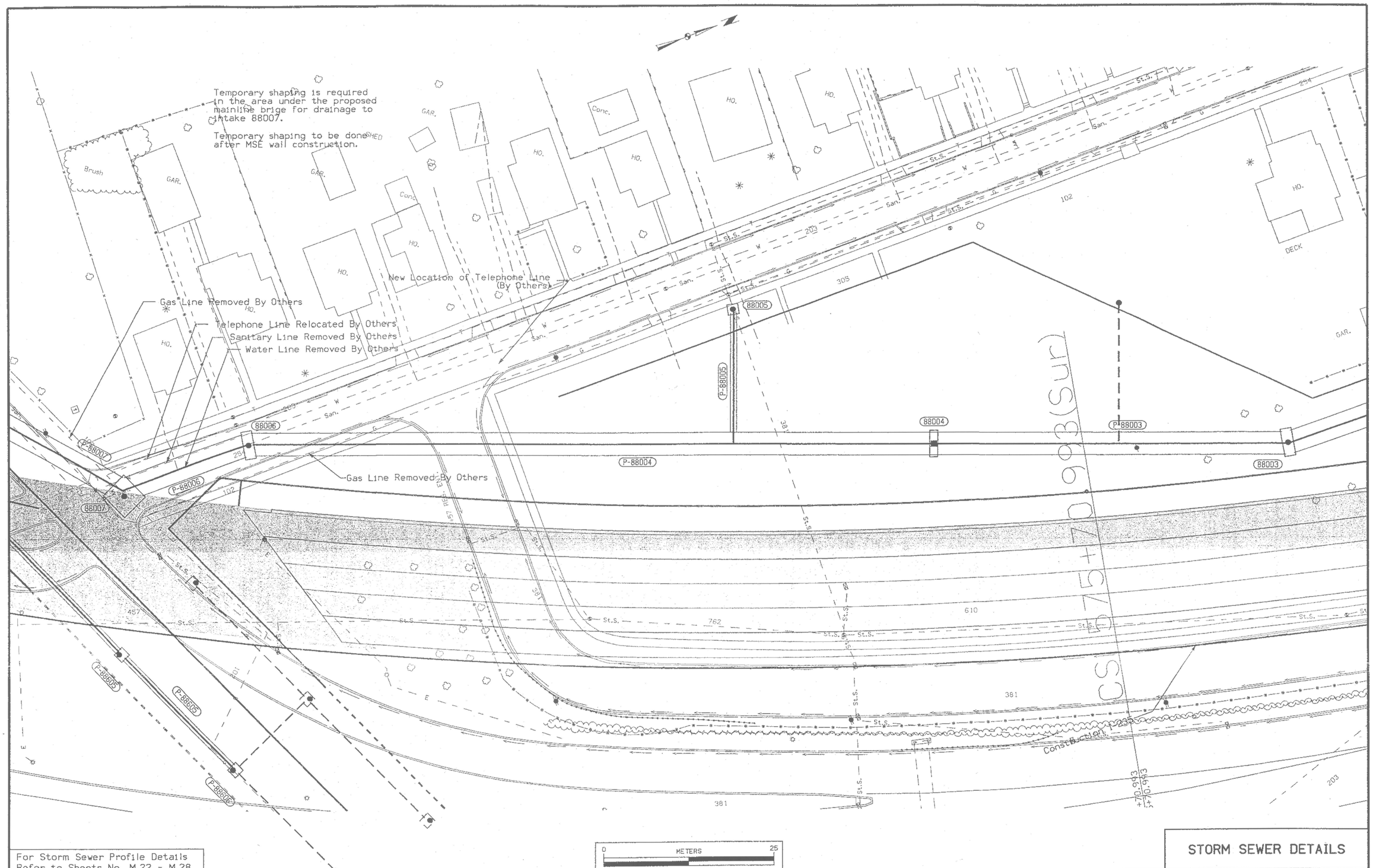

For Storm Sewer Profile Details
Refer to Sheets No. M.22 - M.28

STORM SEWER DETAILS

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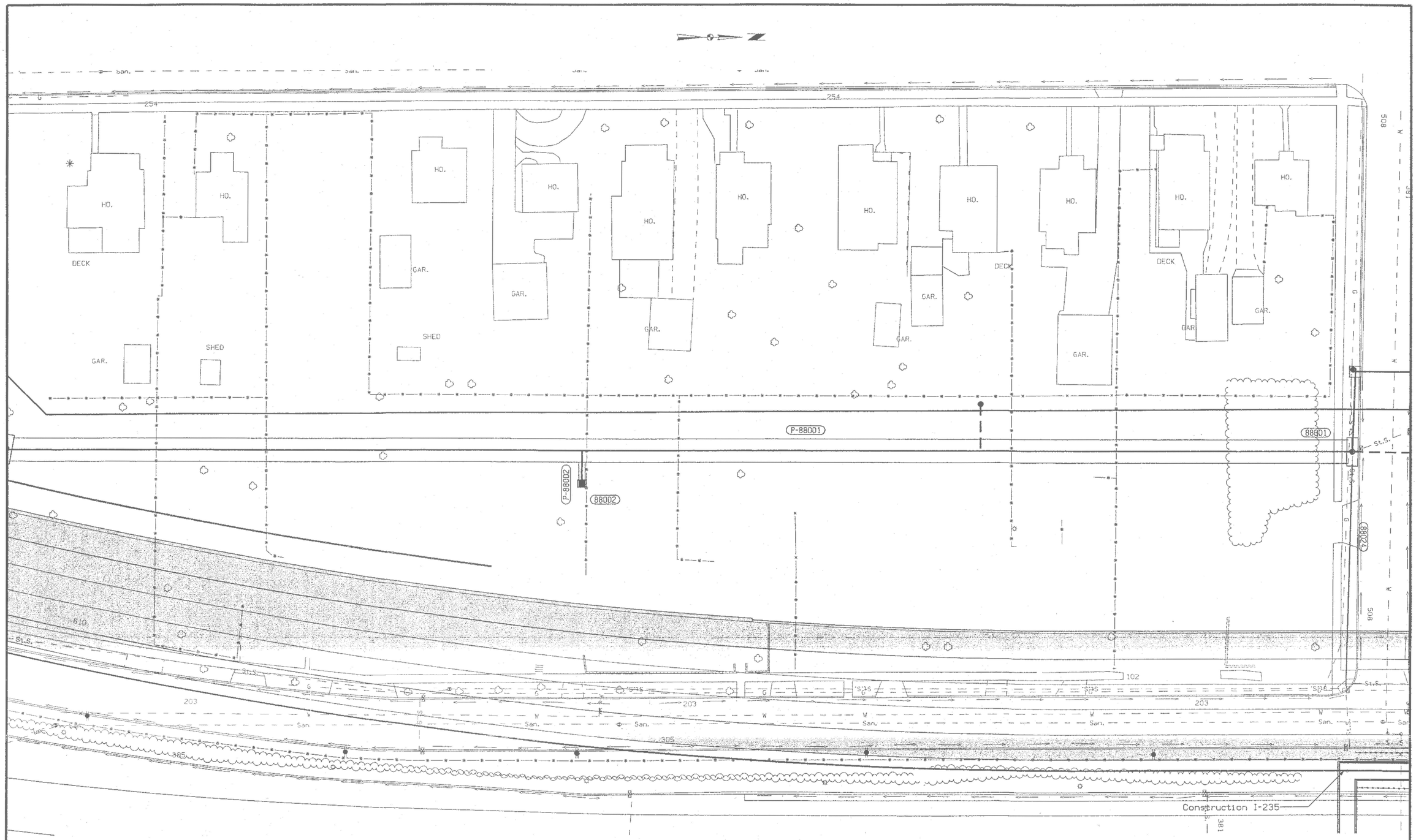

For Storm Sewer Profile Details
Refer to Sheets No. M.22 - M.28

STORM SEWER DETAILS

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.21

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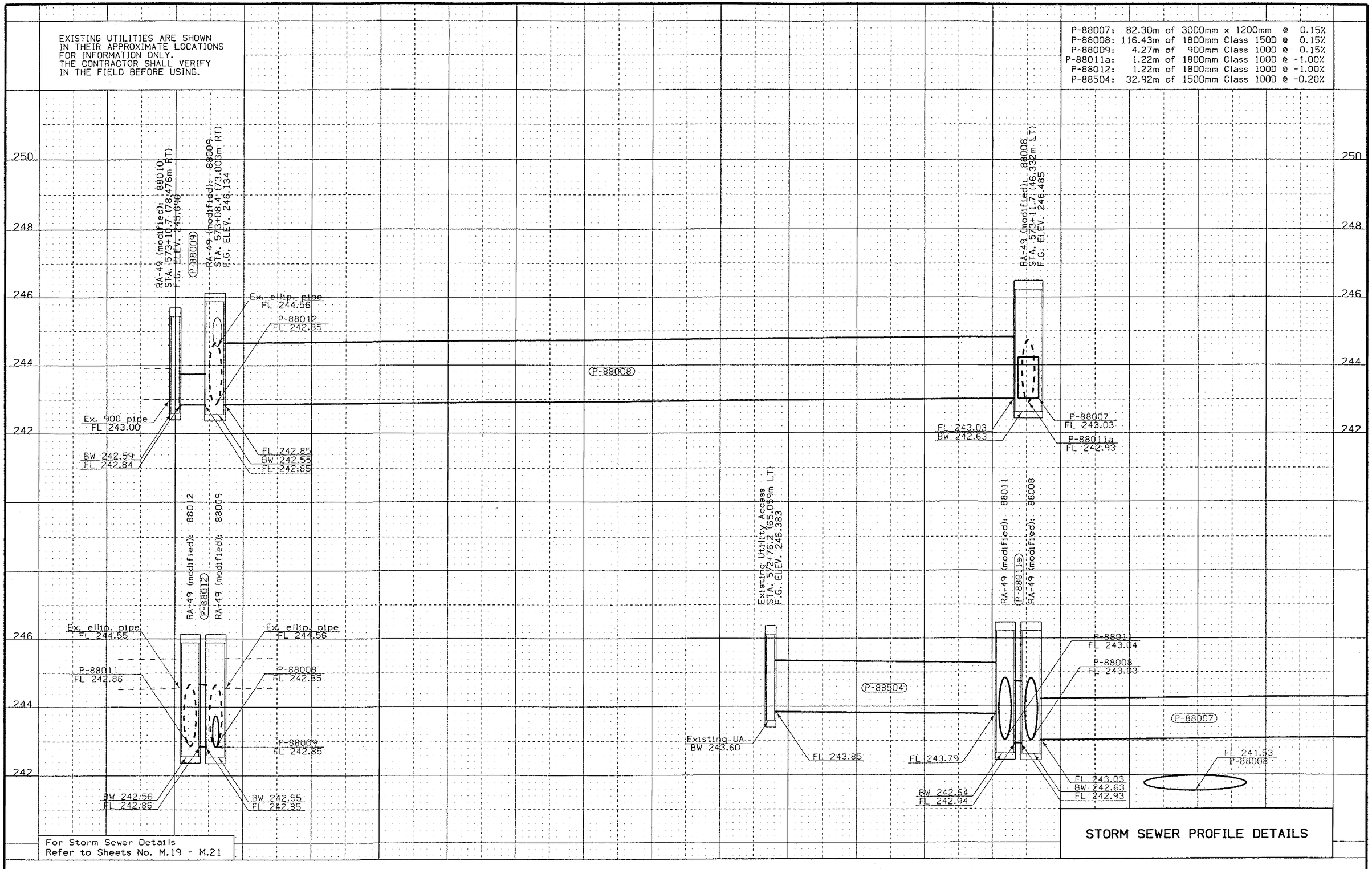
EXISTING UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY IN THE FIELD BEFORE USING.

P-88007:	82.30m	of	3000mm x 1200mm	@	0.15%
P-88008:	116.43m	of	1800mm Class 150D	@	0.15%
P-88009:	4.27m	of	900mm Class 100D	@	0.15%
P-88011a:	1.22m	of	1800mm Class 100D	@	-1.00%
P-88012:	1.22m	of	1800mm Class 100D	@	-1.00%
P-88504:	32.92m	of	1500mm Class 100D	@	-0.20%



For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

STORM SEWER PROFILE DETAILS

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	M.22

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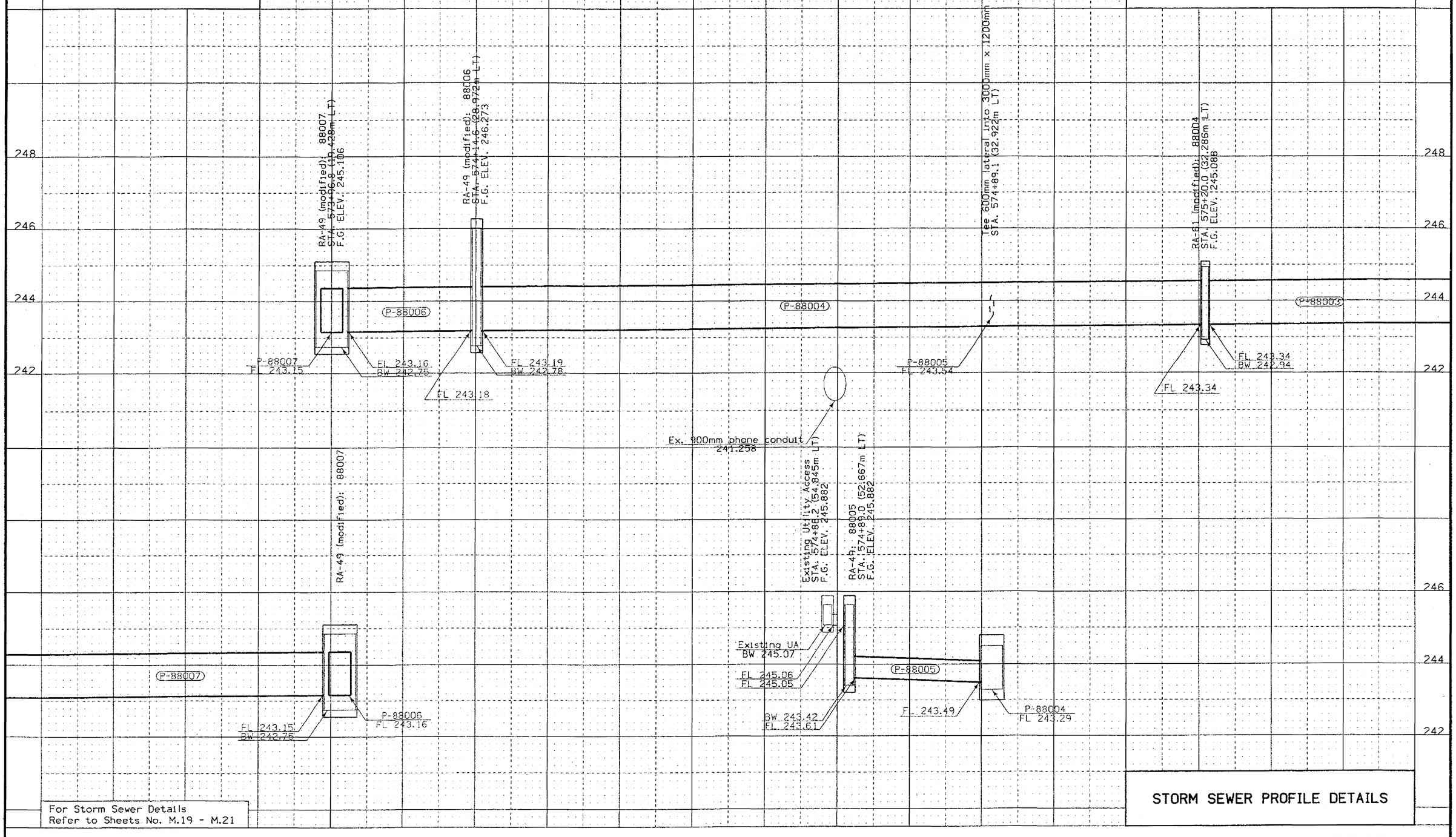
EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

P-88003: 51.21m of 3000mm x 1200mm @ 0.15%
P-88004: 99.97m of 3000mm x 1200mm @ 0.15%
P-88005: 17.68m of 600mm Class 100D @ -0.70%
P-88006: 17.68m of 3000mm x 1200mm @ 0.15%
P-88007: 82.30m of 3000mm x 1200mm @ 0.15%



For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

STORM SEWER PROFILE DETAILS

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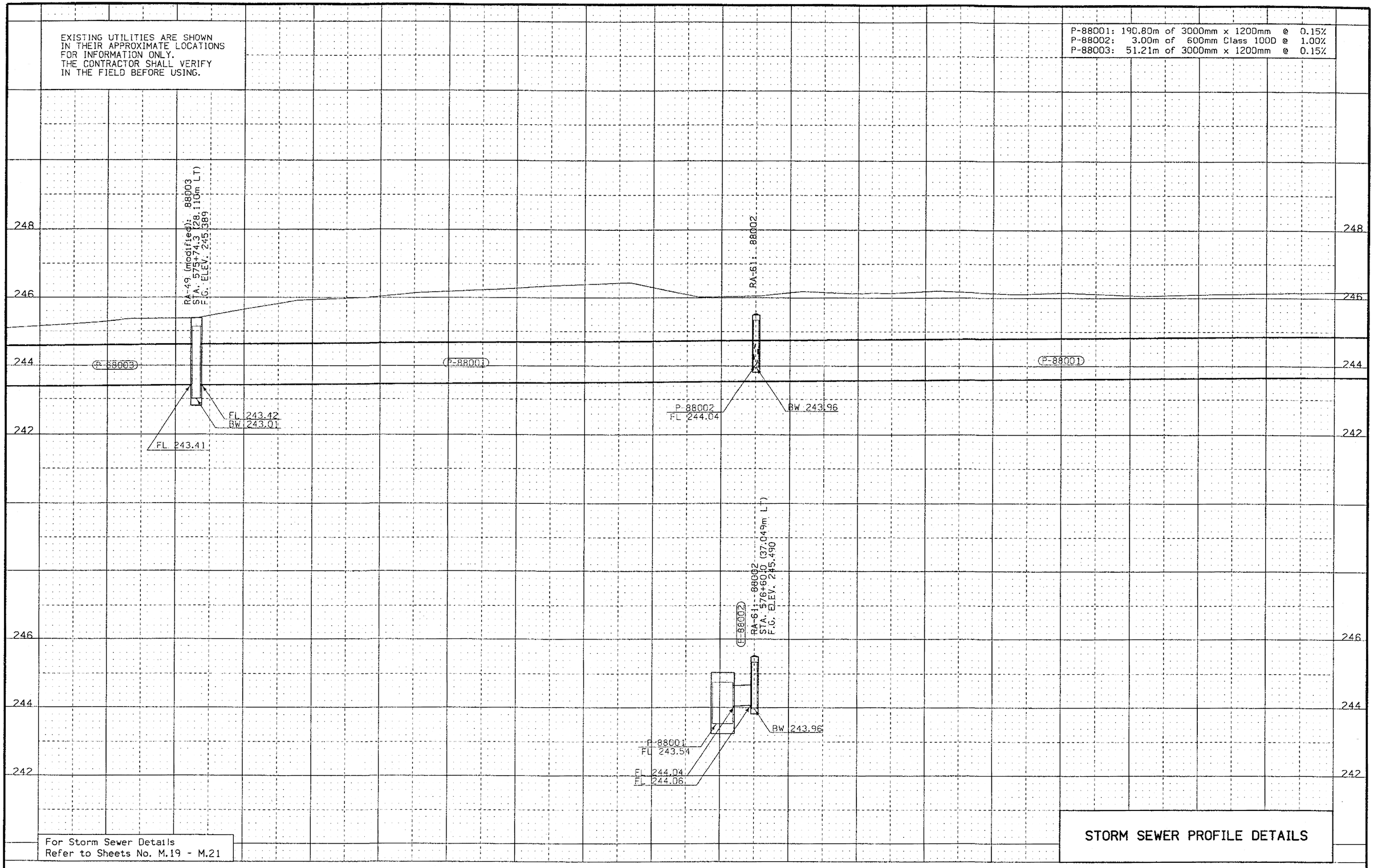
EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

P-88001: 190.80m of 3000mm x 1200mm @ 0.15%
P-88002: 3.00m of 600mm Class 100D @ 1.00%
P-88003: 51.21m of 3000mm x 1200mm @ 0.15%

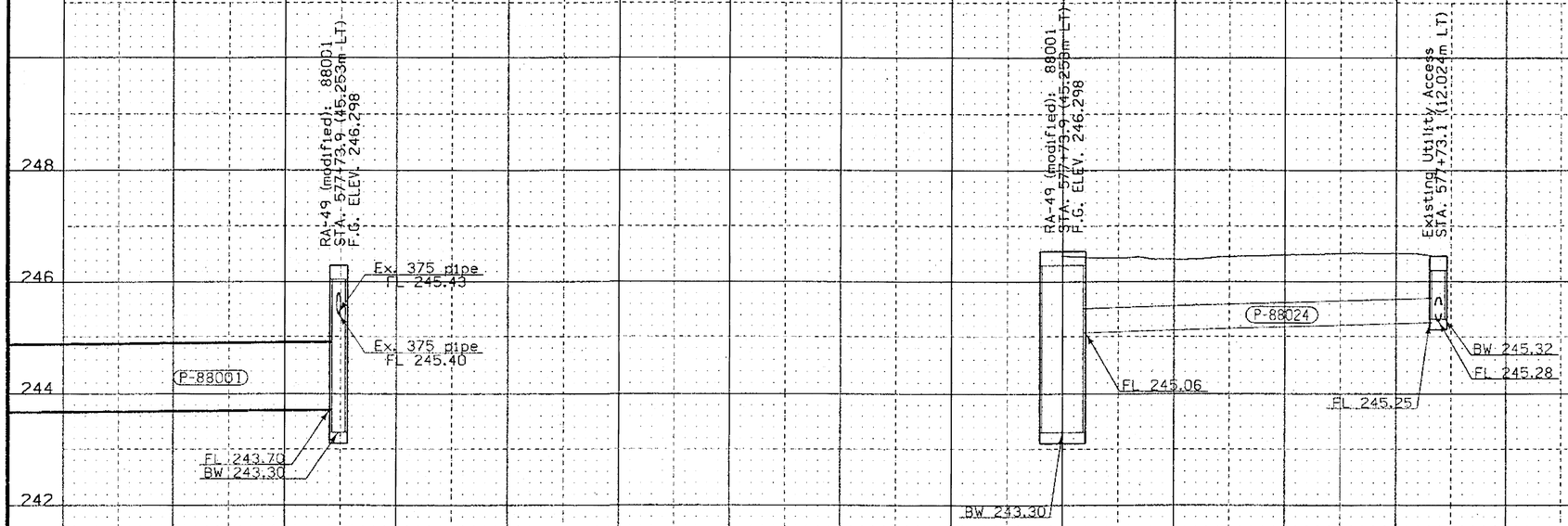


For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

STORM SEWER PROFILE DETAILS

EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

P-88001: 190.80m of 3000mm x 1200mm @ 0.15%
P-88024: 31.39m of 450mm Class UCL @ 0.60%

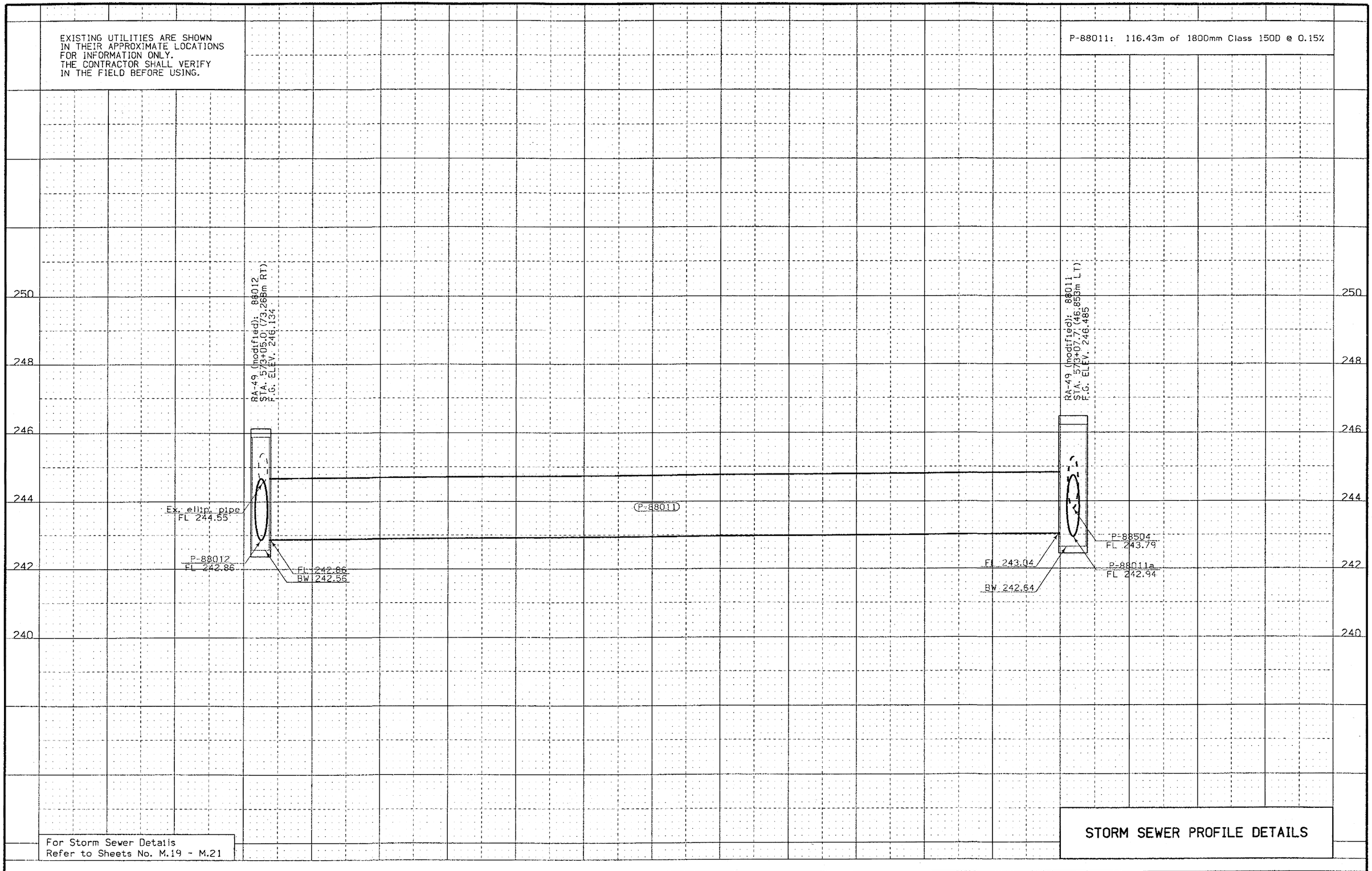


For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

STORM SEWER PROFILE DETAILS

EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

P-88011: 116.43m of 1800mm Class 150D @ 0.15%

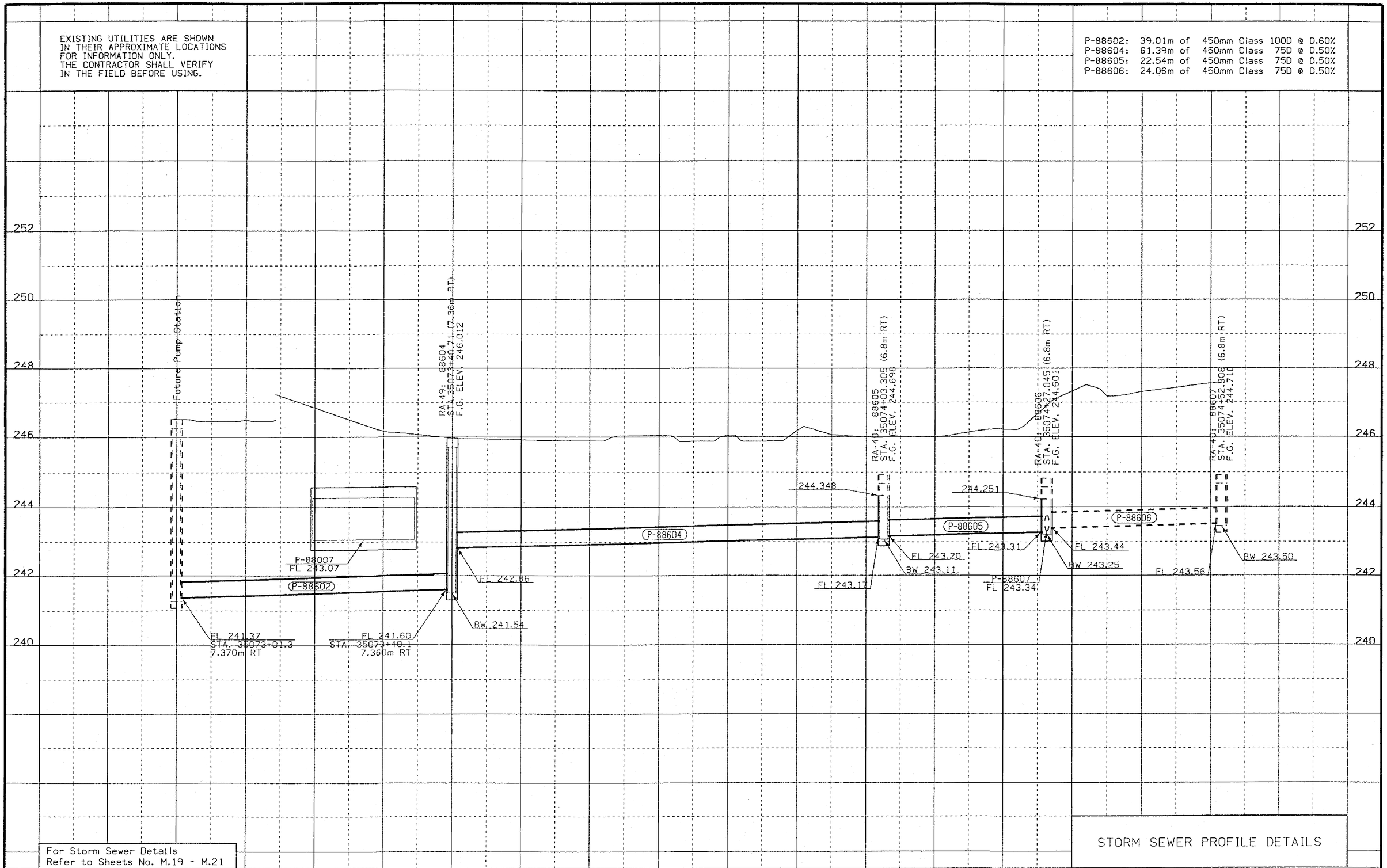


For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

STORM SEWER PROFILE DETAILS

EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

P-88602: 39.01m of 450mm Class 100D @ 0.60%
P-88604: 61.39m of 450mm Class 75D @ 0.50%
P-88605: 22.54m of 450mm Class 75D @ 0.50%
P-88606: 24.06m of 450mm Class 75D @ 0.50%



For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

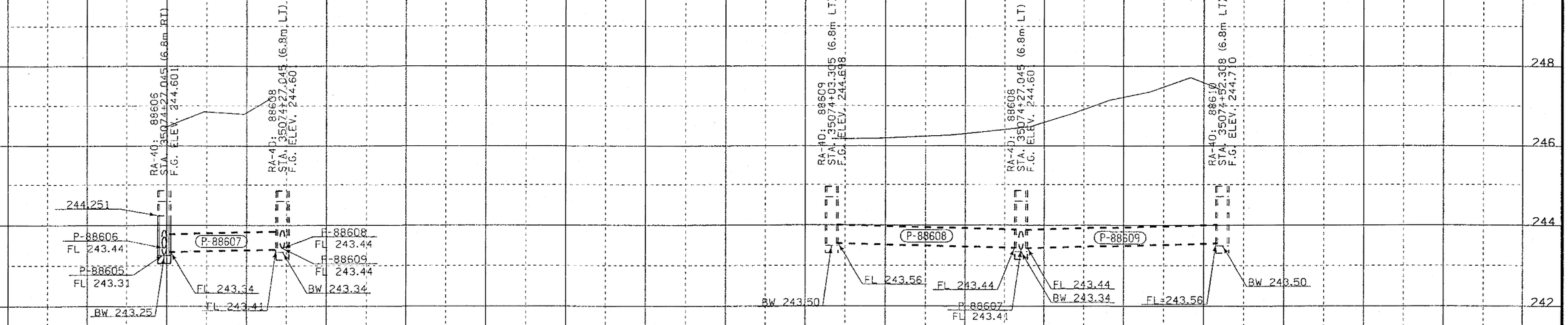
STORM SEWER PROFILE DETAILS

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.27

14-AUG-2002 16:52 lwinger w:\Projects\77235180C96\Design_grading_(340)\K77235340.m27

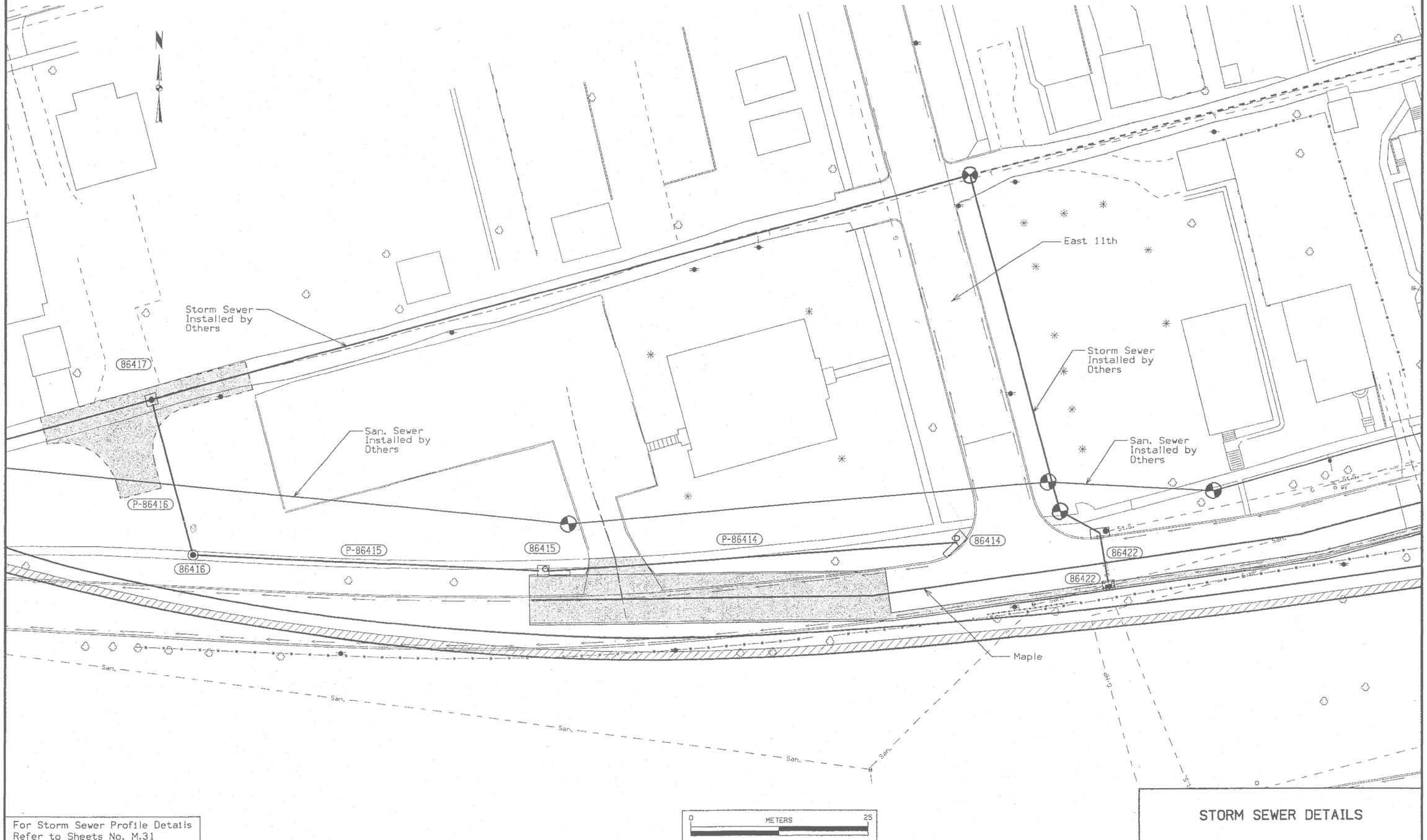
EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

P-88607: 13.60m of 450mm Class 100D @ 0.50%
P-88608: 22.54m of 450mm Class 75D @ 0.50%
P-88609: 24.06m of 450mm Class 75D @ 0.50%



For Storm Sewer Details
Refer to Sheets No. M.19 - M.21

STORM SEWER PROFILE DETAILS



For Storm Sewer Profile Details
Refer to Sheets No. M.31

STORM SEWER DETAILS

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER M.29

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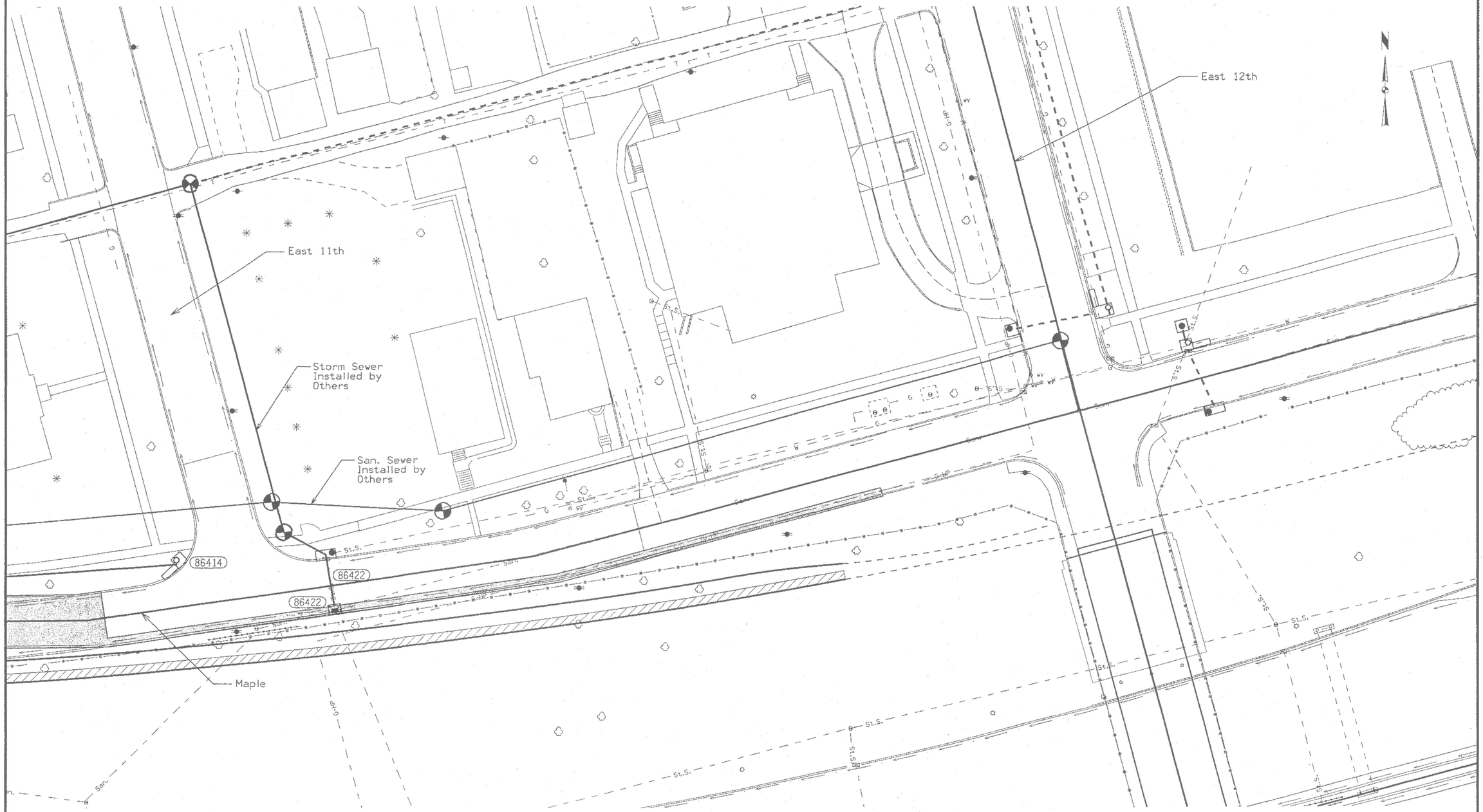


For Storm Sewer Profile Details
Refer to Sheets No. M.31

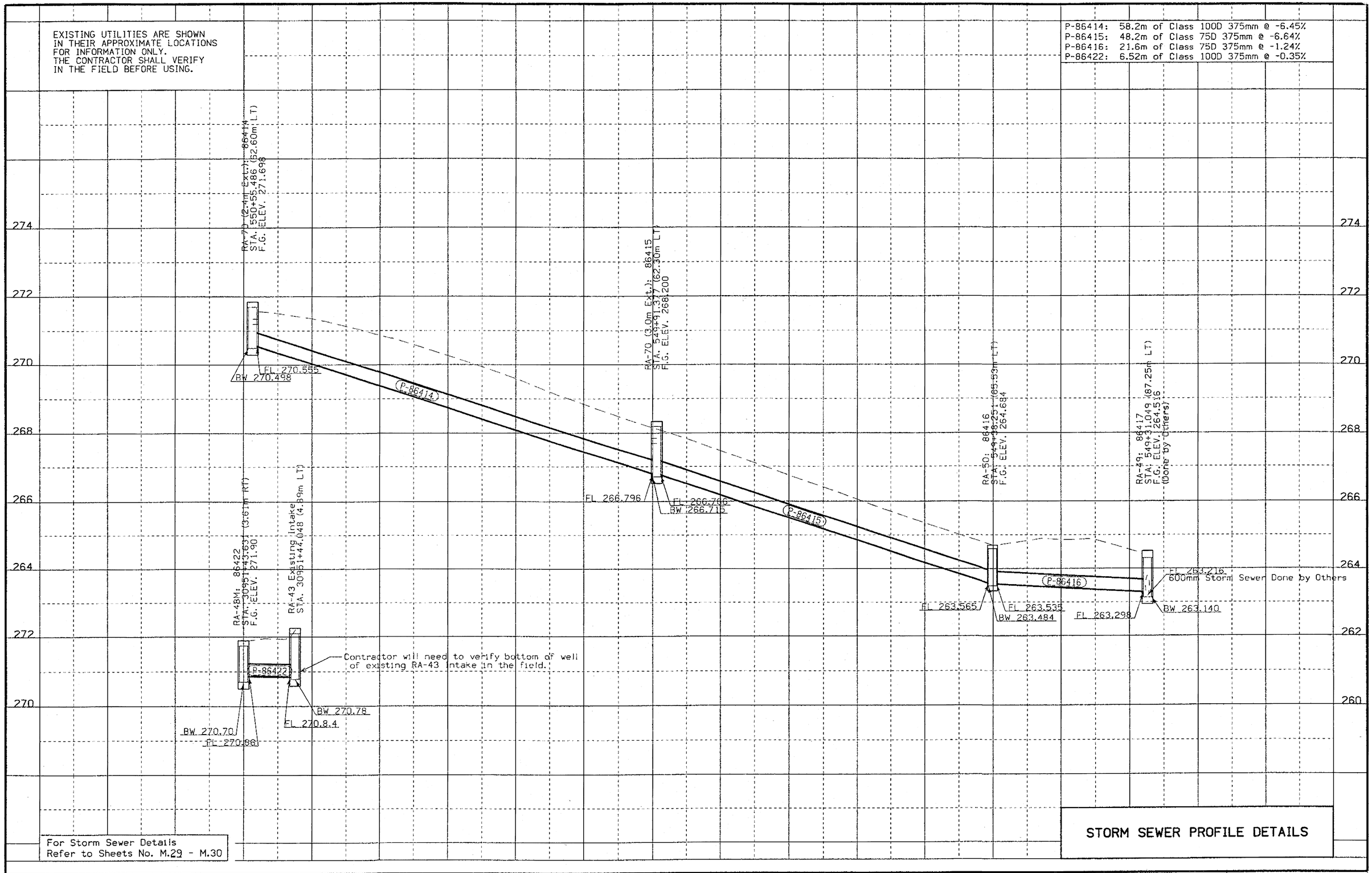
STORM SEWER DETAILS

250	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	M.30

05-SEP-2002 07:40 jwinger w:\Projects\77235180C96\Design_grading_(340)\K77235340.m30

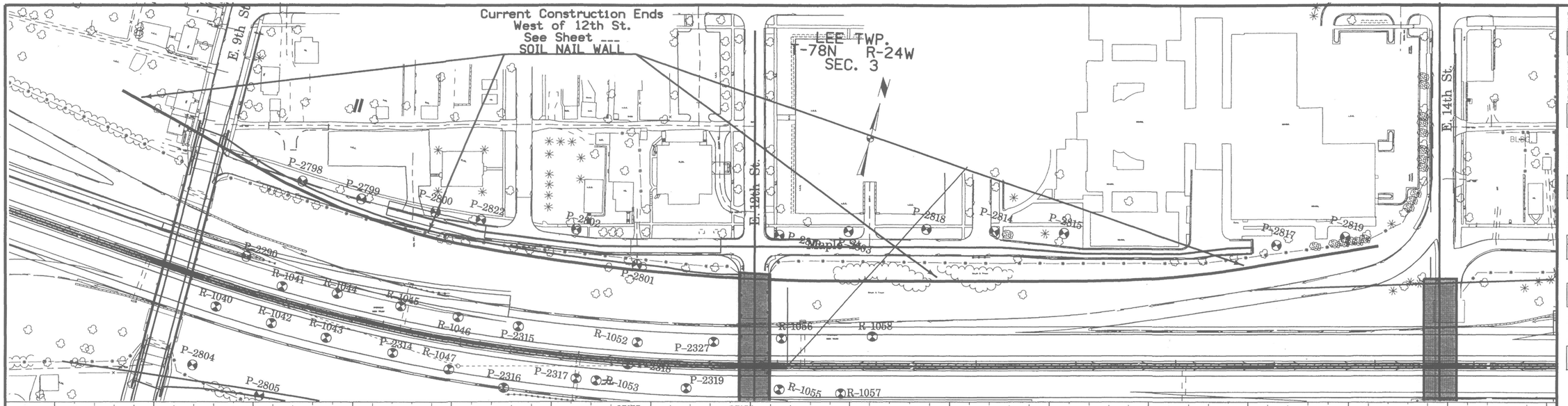
EXISTING UTILITIES ARE SHOWN
IN THEIR APPROXIMATE LOCATIONS
FOR INFORMATION ONLY.
THE CONTRACTOR SHALL VERIFY
IN THE FIELD BEFORE USING.

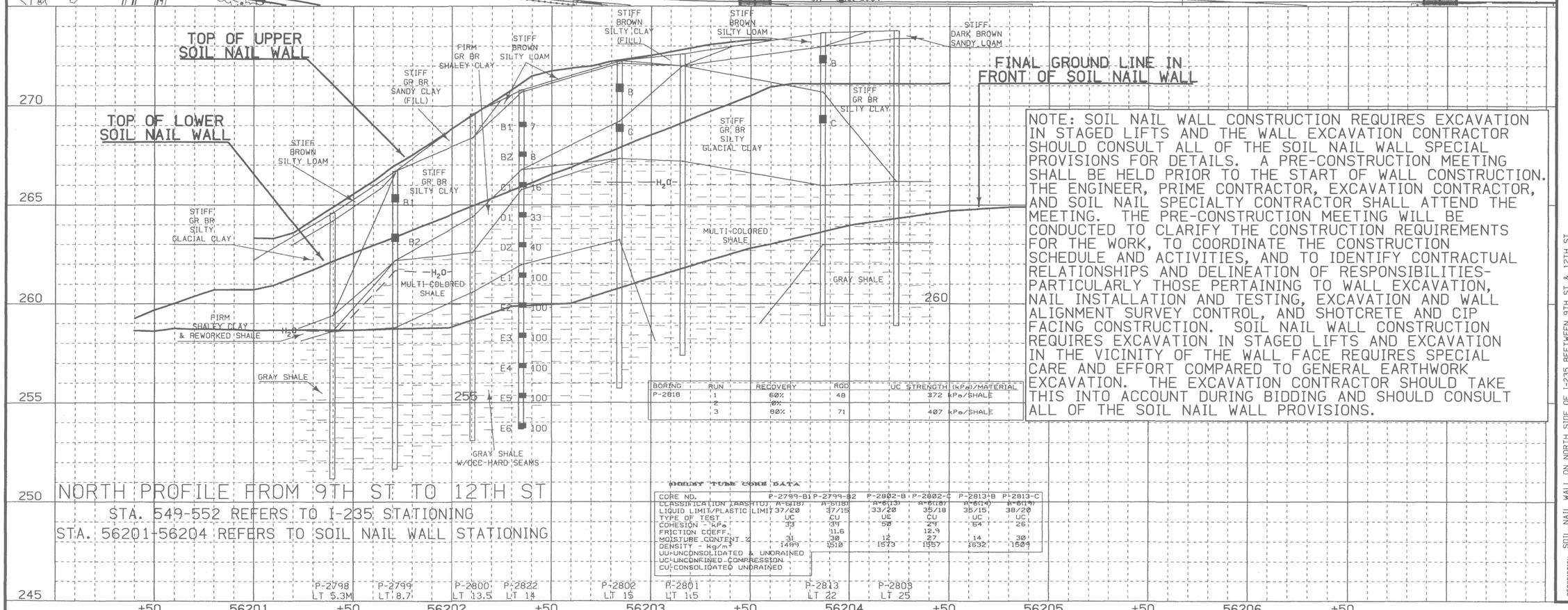
P-86414: 58.2m of Class 100D 375mm @ -6.45%
P-86415: 48.2m of Class 75D 375mm @ -6.64%
P-86416: 21.6m of Class 75D 375mm @ -1.24%
P-86422: 6.52m of Class 100D 375mm @ -0.35%



For Storm Sewer Details
Refer to Sheets No. M.29 - M.30

STORM SEWER PROFILE DETAILS





NORTH PROFILE FROM 9TH ST TO 12TH ST

STA. 549-552 REFERS TO I-235 STATIONING

STA. 56201-56204 REFERS TO SOIL NAIL WALL STATIONING

BORING	RUN	RECOVERY	RQD	UC STRENGTH (kPa)/MATERIAL
P-2818	1	60%	48	372 kPa/SHALE
	2	0%		
	3	80%	71	407 kPa/SHALE

SHELBY TUBE CORE DATA

CORE NO.	P-2799-B1	P-2799-B2	P-2802-B	P-2802-C	P-2813-B	P-2813-C
CLASSIFICATION (AASHTO)	A-6(18)	A-6(18)	A-6(13)	A-6(18)	A-6(14)	A-6(19)
LIQUID LIMIT/PLASTIC LIMIT	37/20	37/15	33/20	35/18	35/15	38/20
TYPE OF TEST	UC	CU	UC	CU	UC	UC
COHESION - kPa	33	34	50	24	64	26
FRICTION COEFF.		11.6		12.9		
MOISTURE CONTENT %	31	30	12	27	14	30
DENSITY - kg/m³	1499	1510	1573	1557	1632	1504

UU-UNCONSOLIDATED & UNDRAINED
UC-UNCONFINED COMPRESSION
CU-CONSOLIDATED UNDRAINED

NOTE: SOIL NAIL WALL CONSTRUCTION REQUIRES EXCAVATION IN STAGED LIFTS AND THE WALL EXCAVATION CONTRACTOR SHOULD CONSULT ALL OF THE SOIL NAIL WALL SPECIAL PROVISIONS FOR DETAILS. A PRE-CONSTRUCTION MEETING SHALL BE HELD PRIOR TO THE START OF WALL CONSTRUCTION. THE ENGINEER, PRIME CONTRACTOR, EXCAVATION CONTRACTOR, AND SOIL NAIL SPECIALTY CONTRACTOR SHALL ATTEND THE MEETING. THE PRE-CONSTRUCTION MEETING WILL BE CONDUCTED TO CLARIFY THE CONSTRUCTION REQUIREMENTS FOR THE WORK, TO COORDINATE THE CONSTRUCTION SCHEDULE AND ACTIVITIES, AND TO IDENTIFY CONTRACTUAL RELATIONSHIPS AND DELINEATION OF RESPONSIBILITIES- PARTICULARLY THOSE PERTAINING TO WALL EXCAVATION, NAIL INSTALLATION AND TESTING, EXCAVATION AND WALL ALIGNMENT SURVEY CONTROL, AND SHOTCRETE AND CIP FACING CONSTRUCTION. SOIL NAIL WALL CONSTRUCTION REQUIRES EXCAVATION IN STAGED LIFTS AND EXCAVATION IN THE VICINITY OF THE WALL FACE REQUIRES SPECIAL CARE AND EFFORT COMPARED TO GENERAL EARTHWORK EXCAVATION. THE EXCAVATION CONTRACTOR SHOULD TAKE THIS INTO ACCOUNT DURING BIDDING AND SHOULD CONSULT ALL OF THE SOIL NAIL WALL PROVISIONS.

SHALE ROCK
SELECT SAND SANDY SOIL
SELECT SOIL UNSUITABLE
PLUGGED MOISTURE
BLOW WATER
DENS. CORE SHELBY
SAMPLE NO.

DESCRIPTION SOIL NAIL WALL ON NORTH SIDE OF I-235 BEETWEEN 9TH ST & 12TH ST — DATE 10/01 SOILS BOOK NO. ___
SOIL SURVEYOR J. CHESTER — DATE 8/00 DESIGNER/CADD G. KRETLOW

DESIGN TEAM STANLEY/KRETLOW	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER Q.01

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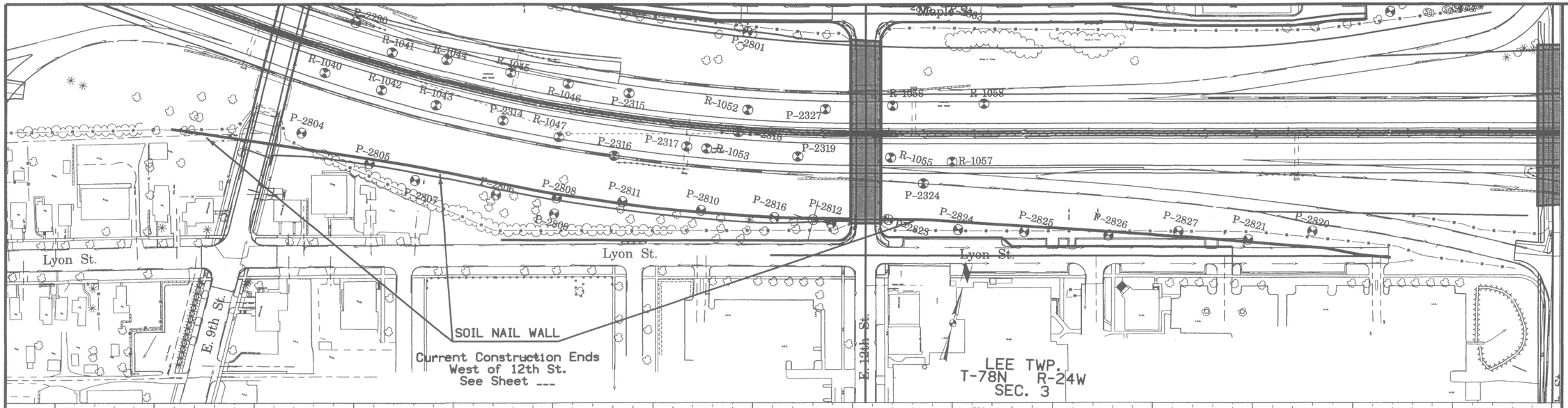

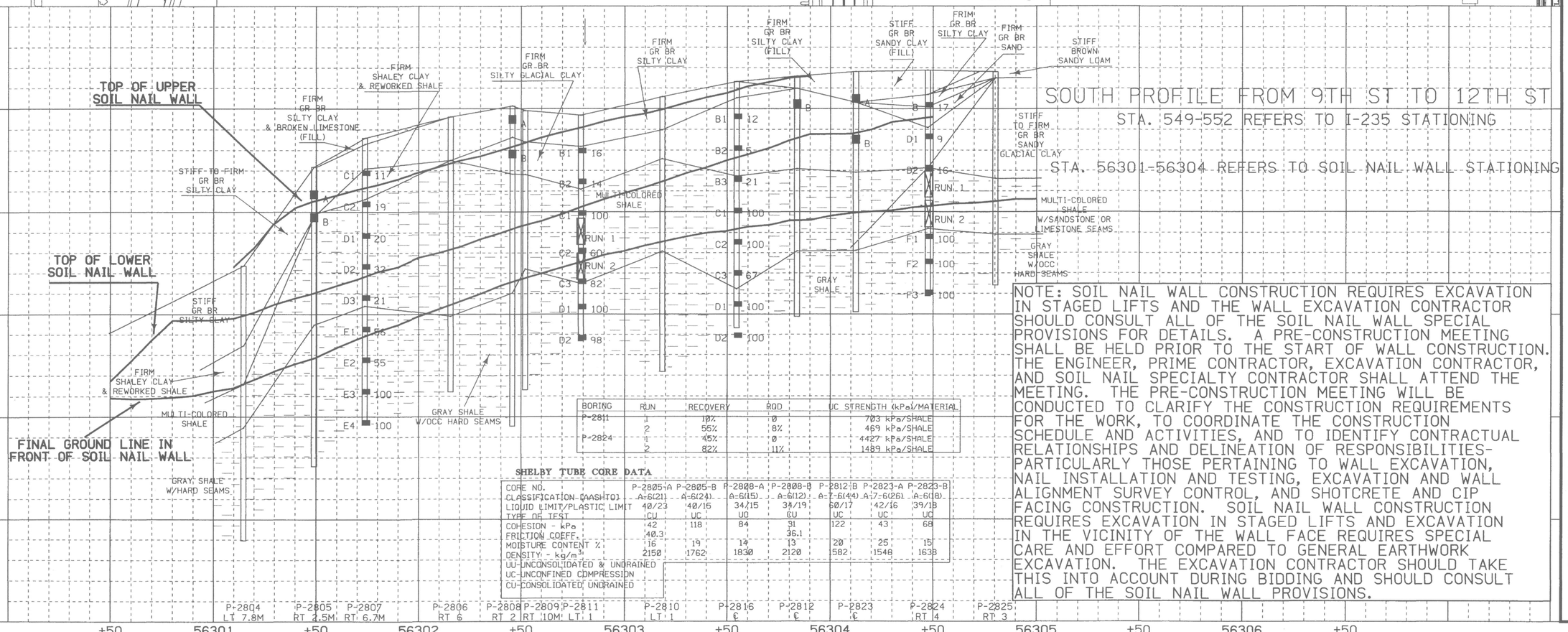

SOUTH PROFILE FROM 9TH ST TO 12TH ST

STA. 549-552 REFERS TO I-235 STATIONING

STA. 56301-56304 REFERS TO SOIL NAIL WALL STATIONING

BORING	RUN	RECOVERY	RQD	UC STRENGTH (kPa)/MATERIAL
P-2811	1	10%	0	703 kPa/SHALE
	2	55%	8%	469 kPa/SHALE
P-2824	1	45%	0	4427 kPa/SHALE
	2	82%	11%	1489 kPa/SHALE

SHELBY TUBE CORE DATA

CORE NO.	P-2805-A	P-2805-B	P-2808-A	P-2808-B	P-2812-B	P-2823-A	P-2823-B
CLASSIFICATION (AASHTO)	A-6(21)	A-6(24)	A-6(15)	A-6(12)	A-7-6(44)	A-7-6(26)	A-6(18)
LIQUID LIMIT/PLASTIC LIMIT	40/23	40/15	34/15	34/19	60/17	42/16	39/18
TYPE OF TEST	CU	UC	UC	CU	UC	UC	UC
COHESION - kPa	42	118	84	91	122	43	68
FRICTION COEFF.	40.3			36.1			
MOISTURE CONTENT %	16	19	14	13	20	25	15
DENSITY - kg/m³	2150	1762	1830	2120	582	1548	1638

UU-UNCONSOLIDATED & UNDRAINED
UC-UNCONFINED COMPRESSION
CU-CONSOLIDATED, UNDRAINED

NOTE: SOIL NAIL WALL CONSTRUCTION REQUIRES EXCAVATION IN STAGED LIFTS AND THE WALL EXCAVATION CONTRACTOR SHOULD CONSULT ALL OF THE SOIL NAIL WALL SPECIAL PROVISIONS FOR DETAILS. A PRE-CONSTRUCTION MEETING SHALL BE HELD PRIOR TO THE START OF WALL CONSTRUCTION. THE ENGINEER, PRIME CONTRACTOR, EXCAVATION CONTRACTOR, AND SOIL NAIL SPECIALTY CONTRACTOR SHALL ATTEND THE MEETING. THE PRE-CONSTRUCTION MEETING WILL BE CONDUCTED TO CLARIFY THE CONSTRUCTION REQUIREMENTS FOR THE WORK, TO COORDINATE THE CONSTRUCTION SCHEDULE AND ACTIVITIES, AND TO IDENTIFY CONTRACTUAL RELATIONSHIPS AND DELINEATION OF RESPONSIBILITIES- PARTICULARLY THOSE PERTAINING TO WALL EXCAVATION, NAIL INSTALLATION AND TESTING, EXCAVATION AND WALL ALIGNMENT SURVEY CONTROL, AND SHOTCRETE AND CIP FACING CONSTRUCTION. SOIL NAIL WALL CONSTRUCTION REQUIRES EXCAVATION IN STAGED LIFTS AND EXCAVATION IN THE VICINITY OF THE WALL FACE REQUIRES SPECIAL CARE AND EFFORT COMPARED TO GENERAL EARTHWORK EXCAVATION. THE EXCAVATION CONTRACTOR SHOULD TAKE THIS INTO ACCOUNT DURING BIDDING AND SHOULD CONSULT ALL OF THE SOIL NAIL WALL PROVISIONS.

SHALE ROCK
SELECT SAND SANDY SOIL
SELECT SOIL UNSUITABLE
PLUGGED MOISTURE
BLOW WATER
DENS. CORE SHELBY
SAMPLE

DESCRIPTION SOIL NAIL WALL ON SOUTH SIDE OF I-235 BETWEEN 9TH ST AND 12TH ST DATE 10/01 SOILS BOOK NO. ___
SOIL SURVEYOR J. CHESTER ___ DATE 8/00 DESIGNER/CADD G. KRETLOW ___

DESIGN TEAM	STANLEY/KRETLOW	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	Q.02

14-JAN-2002 07:15 gkretl2 w:\Projects\77235180C96\Soils\(340)_grading\K77235340_q02

DESIGN TEAM STANLEY/KRETLOW	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER Q.03

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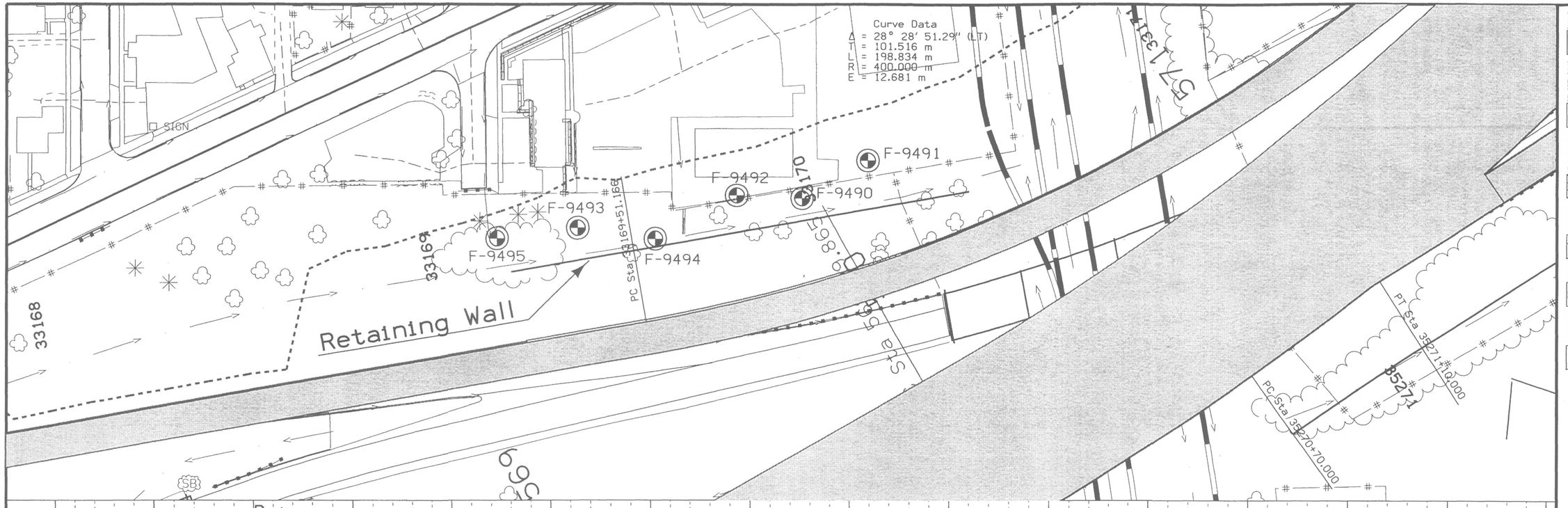

DESIGN TEAM	METRIC		COUNTY	PROJECT NUMBER	SHEET NUMBER
STANLEY/KRETLOW		IOWA DOT * OFFICE OF DESIGN	POLK	IM-NHS-235-2(340)11--03-77	Q.04

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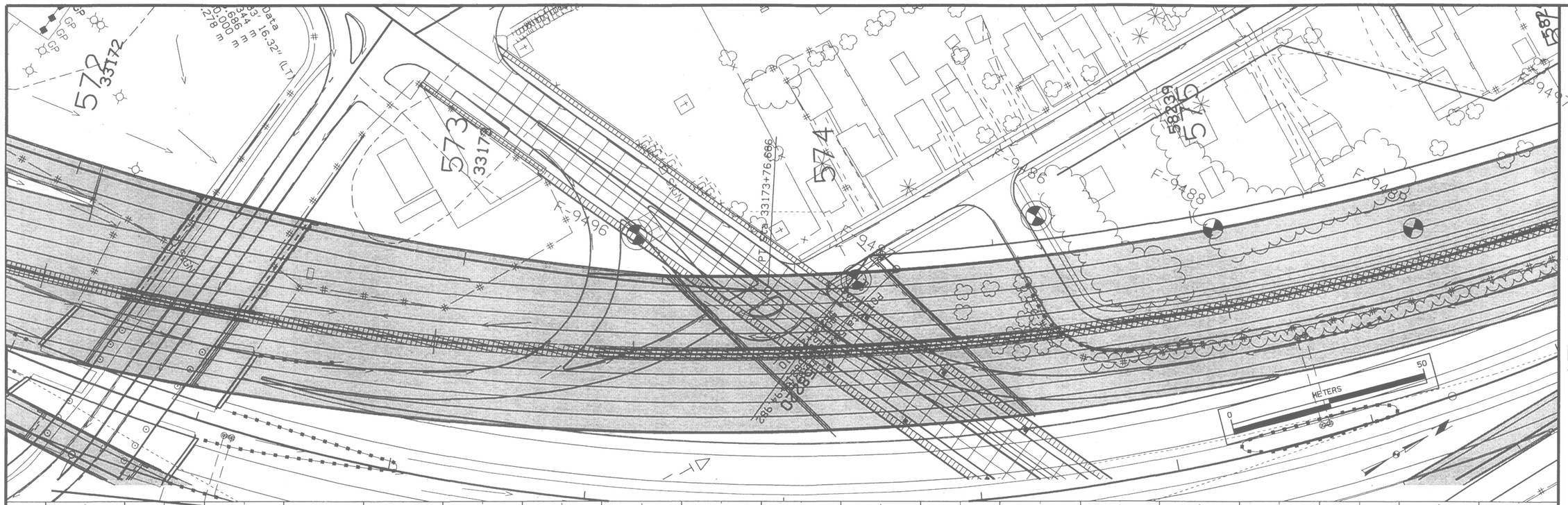

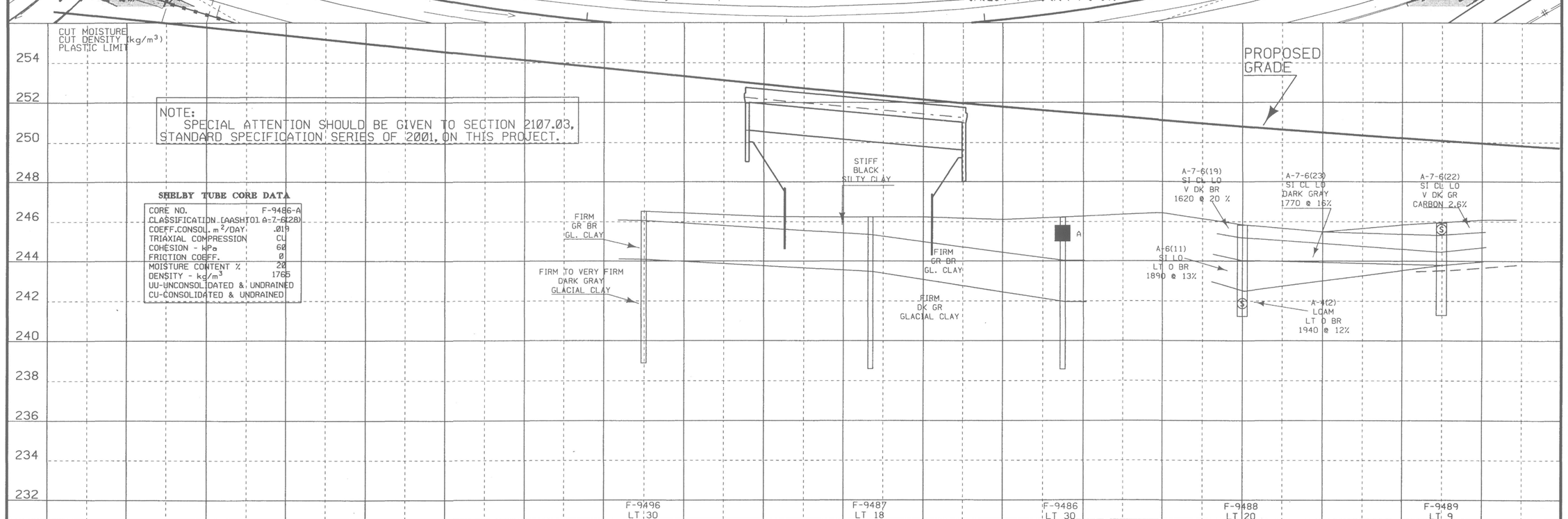

SHALE
ROCK
SELECT SAND
SANDY SOIL
SELECT SOIL
UNSUITABLE
PLUGGED
MOISTURE
BLOW
WATER
DENS. CORE
SHELBY
SAMPLE

DESCRIPTION I-235 FROM UNIVERSITY TO GUTHRIE — DATE 1-02 SOILS BOOK NO. K''
SOIL SURVEYOR L. SLINTKEN — DATE 2/01 DESIGNER/CADD G. KRETLOW

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN		COUNTY	PROJECT NUMBER	SHEET NUMBER
STANLEY/KRETLOW			POLK		IM-NHS-235-2(340)11--03-77	Q.05

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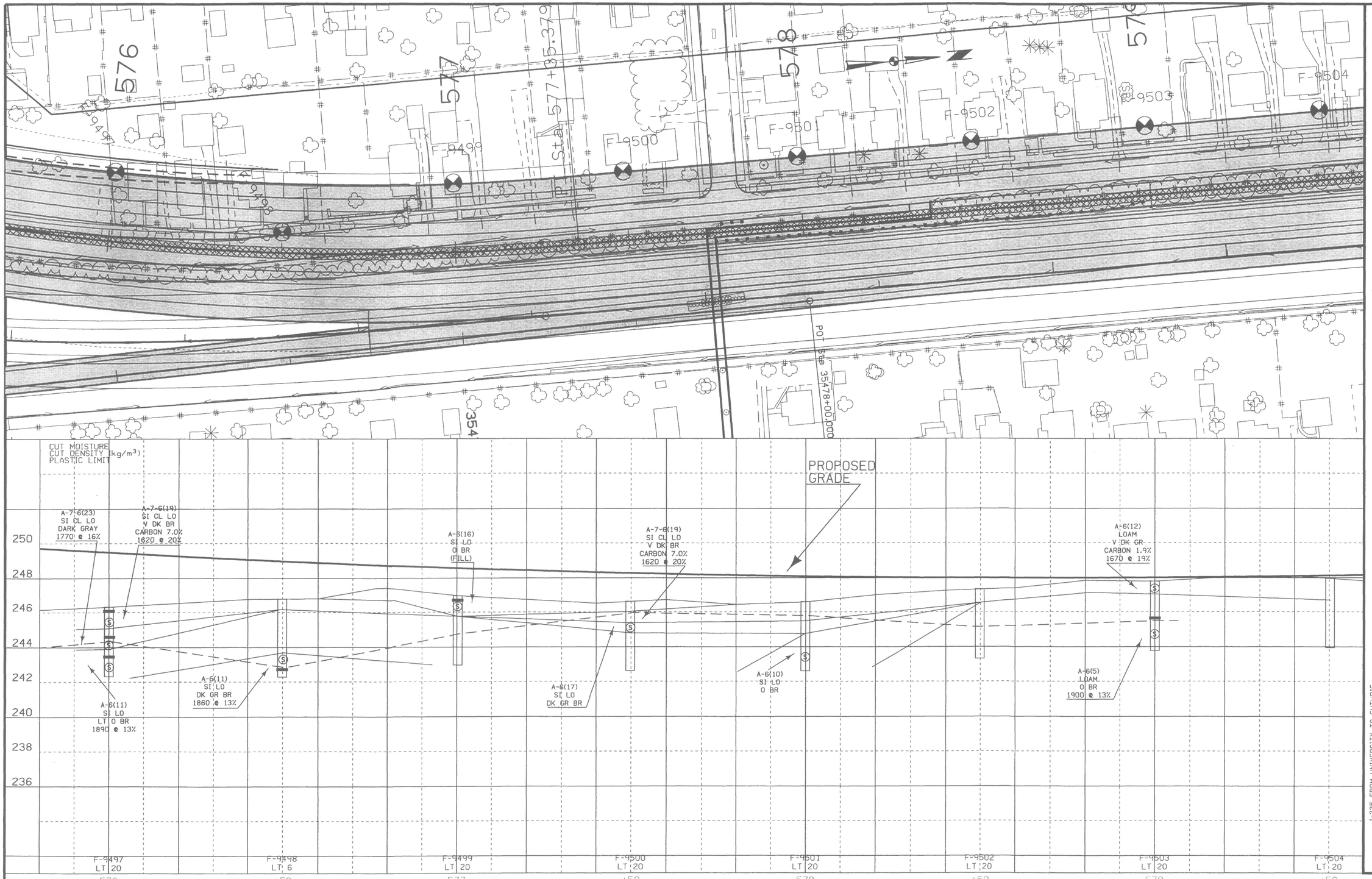
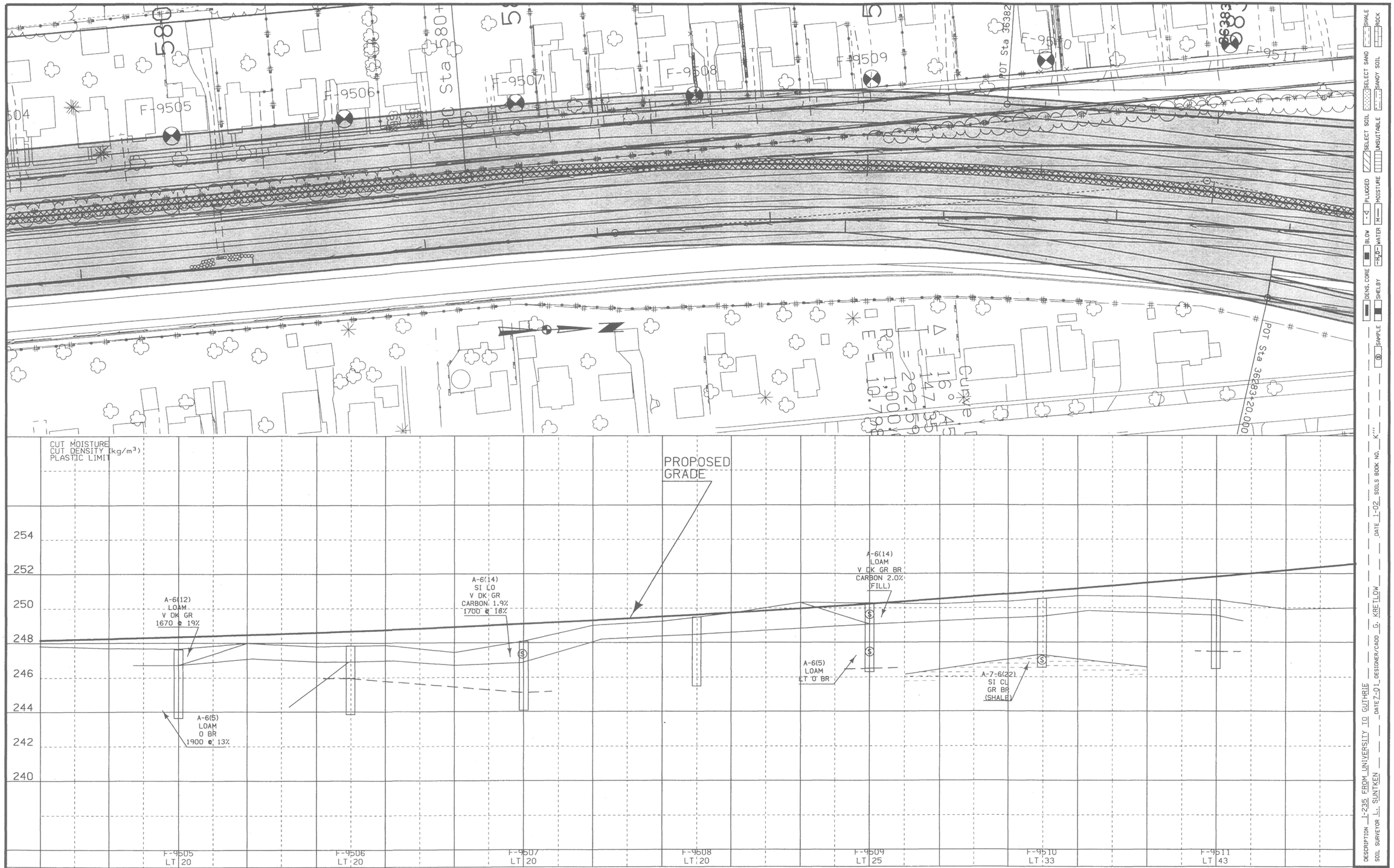


DESIGN TEAM STANLEY/KRETLOW	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER Q.06



DESIGN TEAM STANLEY/KRETLOW	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER Q.07

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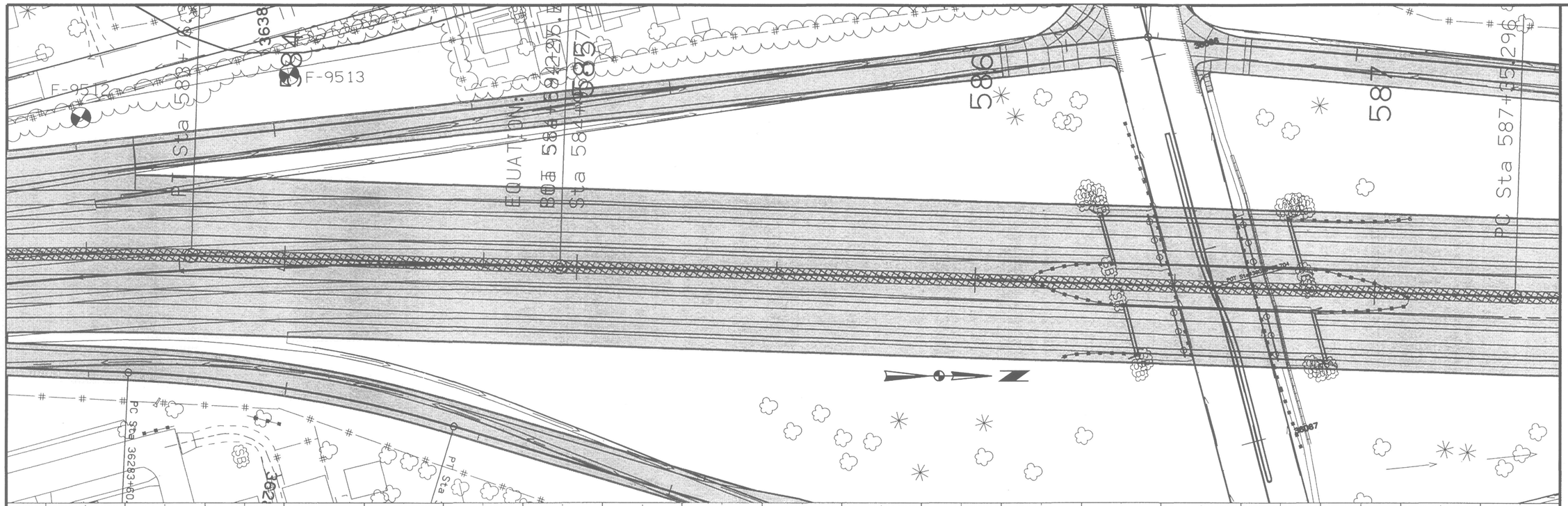

DESIGN TEAM STANLEY/KRETLOW	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER Q.08

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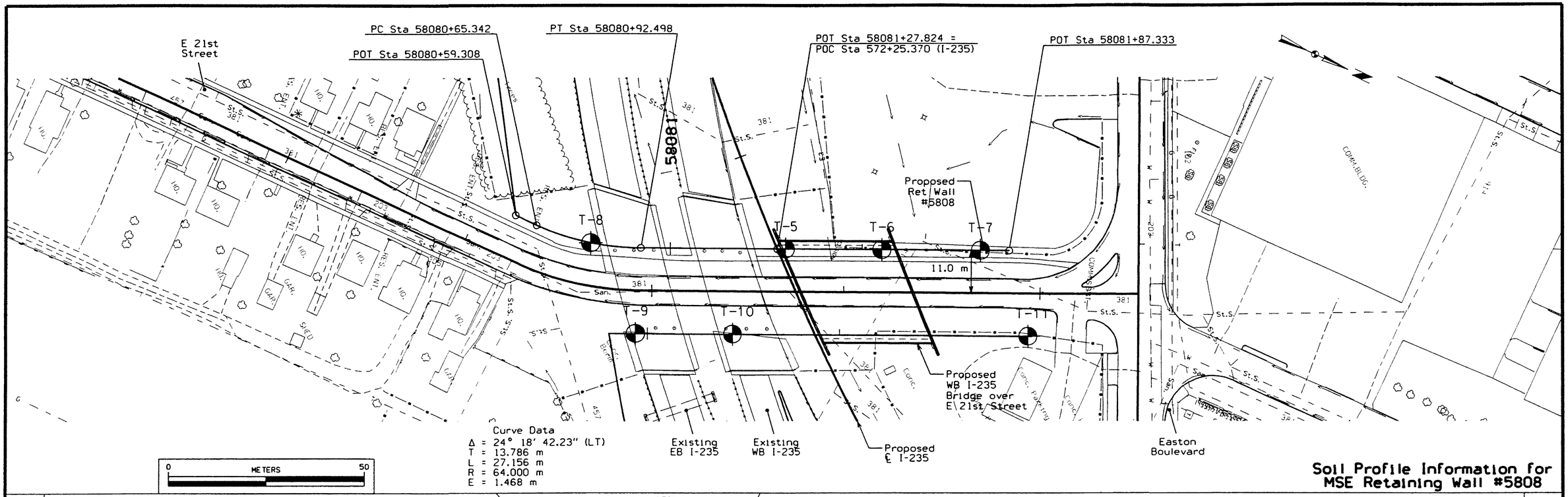
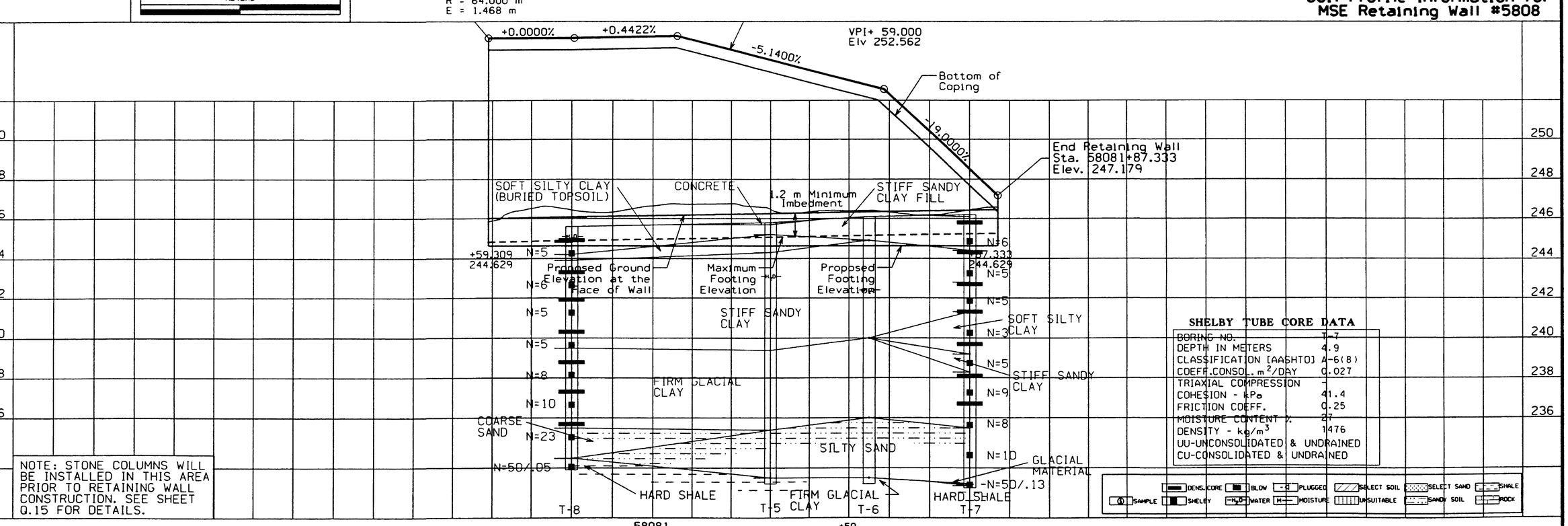


Soil Profile Information for MSE Retaining Wall #5808



NOTE: STONE COLUMNS WILL BE INSTALLED IN THIS AREA PRIOR TO RETAINING WALL CONSTRUCTION. SEE SHEET Q.15 FOR DETAILS.

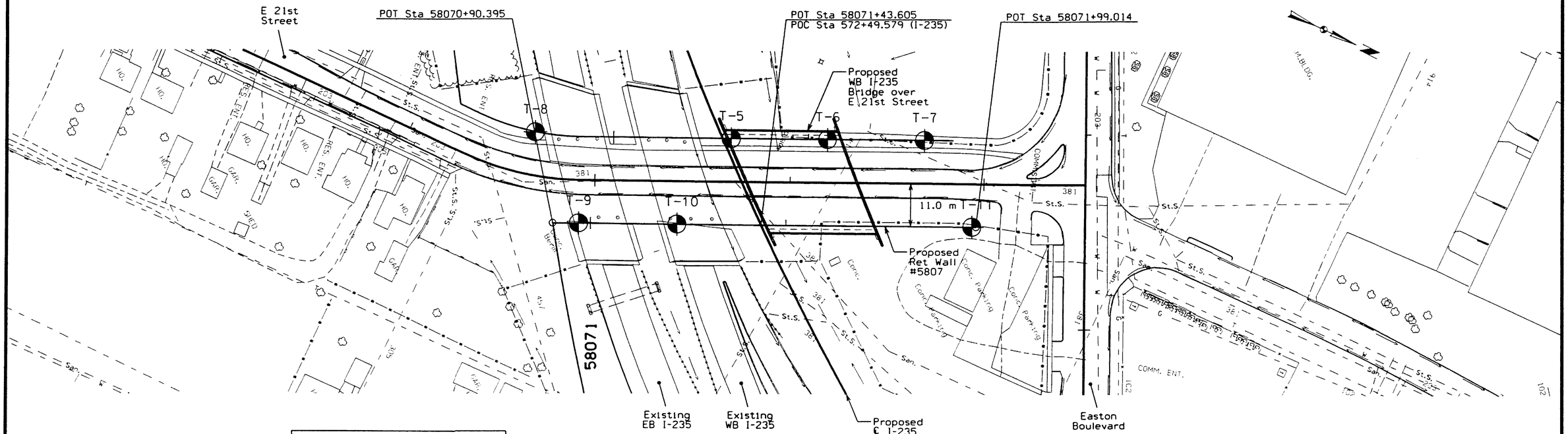
SHELBY TUBE CORE DATA

BORING NO.	T-7
DEPTH IN METERS	4.9
CLASSIFICATION [AASHTO]	A-6(8)
COEFF.CONSOL. m^2/DAY	0.027
TRIAXIAL COMPRESSION	-
COHESION - kPa	41.4
FRICTION COEFF.	0.25
MOISTURE CONTENT %	27
DENSITY - kg/m^3	1476
UU-UNCONSOLIDATED & UNDRAINED	
CU-CONSOLIDATED & UNDRAINED	

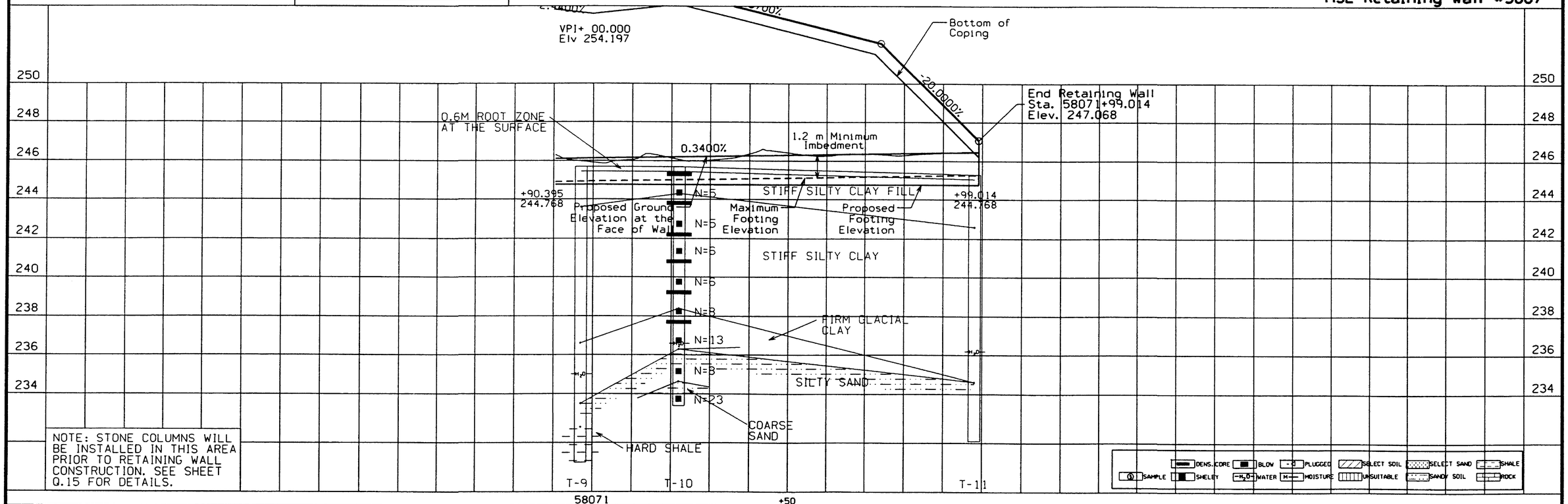
DENS. CORE · BLOW · PLUGGED · SELECT SOIL · SELECT SAND · SHALE
SAMPLE · SHELBY · WATER · MOISTURE · UNSUITABLE · SANDY SOIL · ROCK

58081 +50

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER 0.09

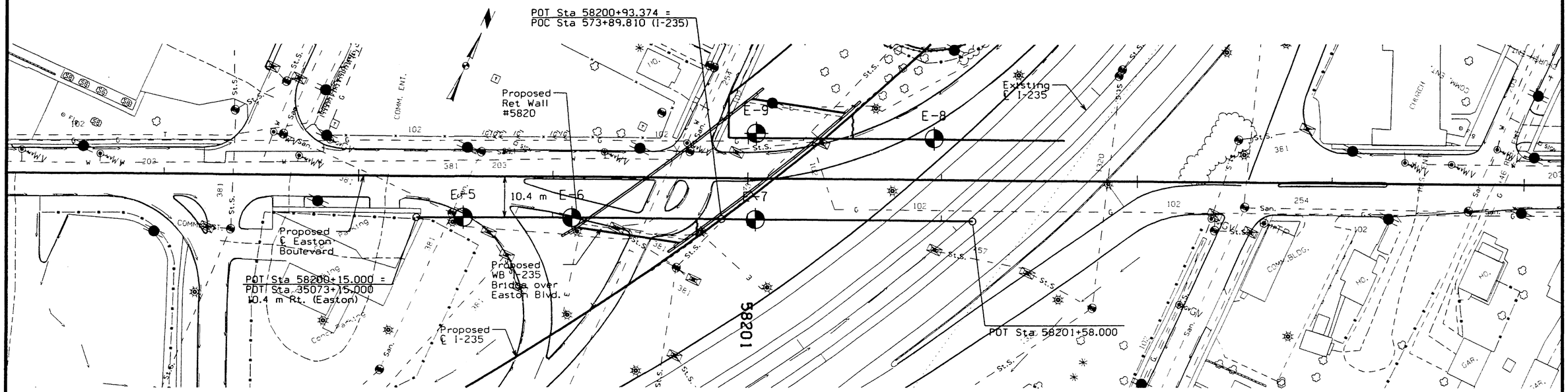


Soil Profile Information for MSE Retaining Wall #5807



NOTE: STONE COLUMNS WILL BE INSTALLED IN THIS AREA PRIOR TO RETAINING WALL CONSTRUCTION. SEE SHEET Q.15 FOR DETAILS.

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER 0.10



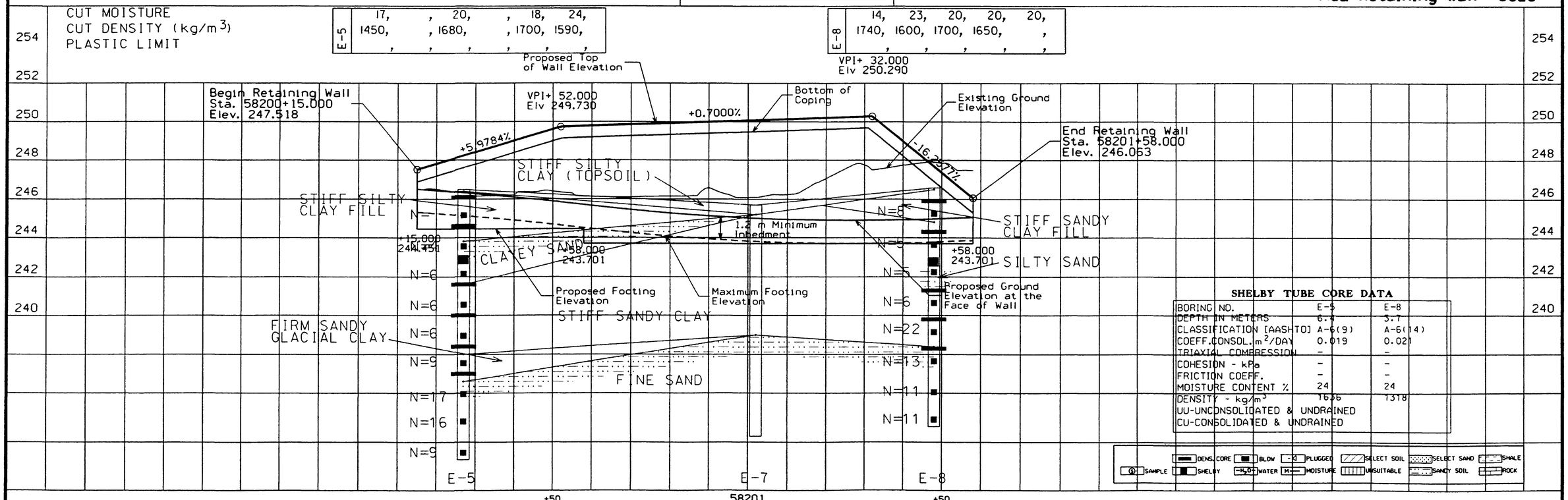
0 METERS 50

Soil Profile Information for MSE Retaining Wall #5820

CUT MOISTURE
CUT DENSITY (kg/m³)
PLASTIC LIMIT

E-5					
	17,	,	20,	, 18,	24,
	1450,	,	1680,	, 1700,	1590,
	,	,	,	, ,	,

E-8					
	14,	23,	20,	20,	20,
	1740,	1600,	1700,	1650,	,
	,	,	,	,	,

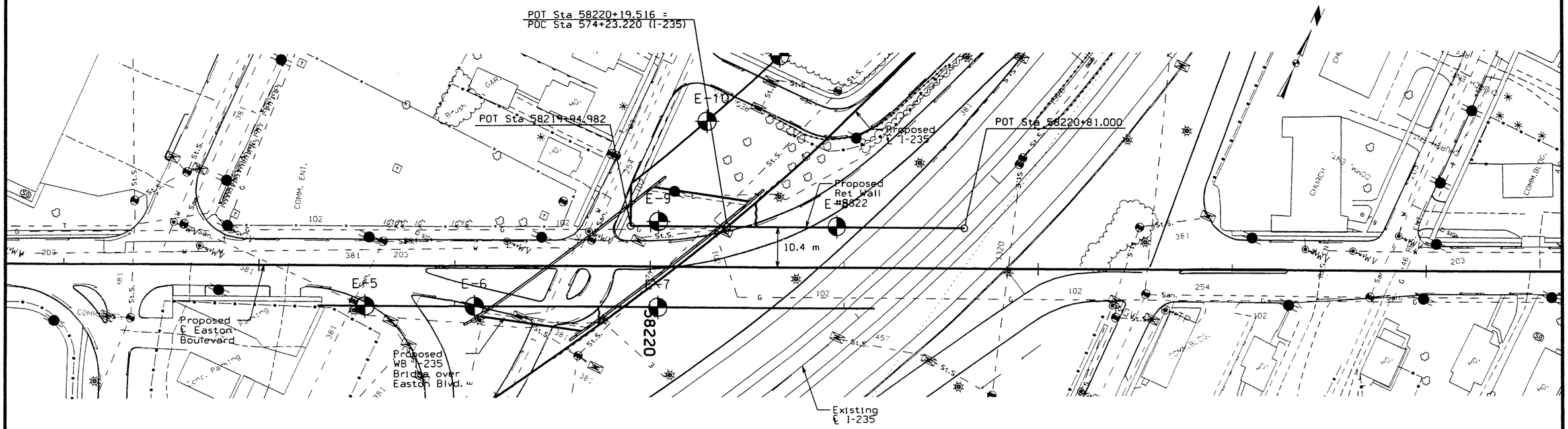


SHELBY TUBE CORE DATA

BORING NO.	E-5	E-8
DEPTH IN METERS	6.4	3.7
CLASSIFICATION [AASHTO]	A-6(9)	A-6(14)
COEFF.CONSOL. m^2/DAY	0.019	0.021
TRIAXIAL COMPRESSION	-	-
COHESION - kPa	-	-
FRICTION COEFF.	-	-
MOISTURE CONTENT %	24	24
DENSITY - kg/m^3	1636	1318
UU-UNCONSOLIDATED & UNDRAINED		
CU-CONSOLIDATED & UNDRAINED		

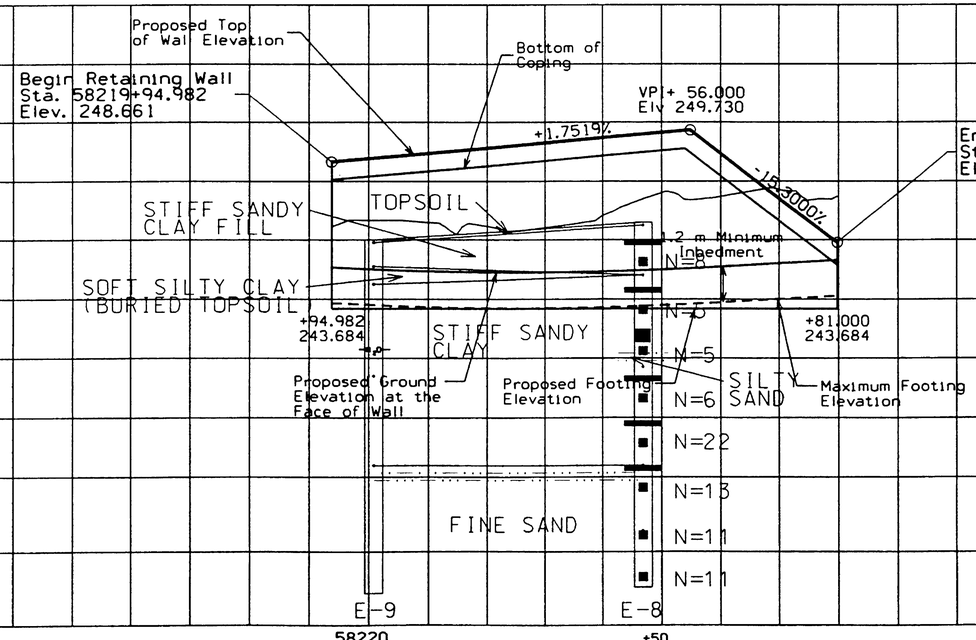
DENS. CORE · BLOW · PLUGGED · SELECT SOIL · SELECT SAND · SHALE
SAMPLE · SHELBY · H_2O WATER · MOISTURE · UNSUITABLE · SANDY SOIL · ROCK

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER 0.11



Soil Profile Information for MSE Retaining Wall #5822

E-8	14,	23,	20,	20,	20,
	1740,	1600,	1700,	1650,	,
	,	,	,	,	,

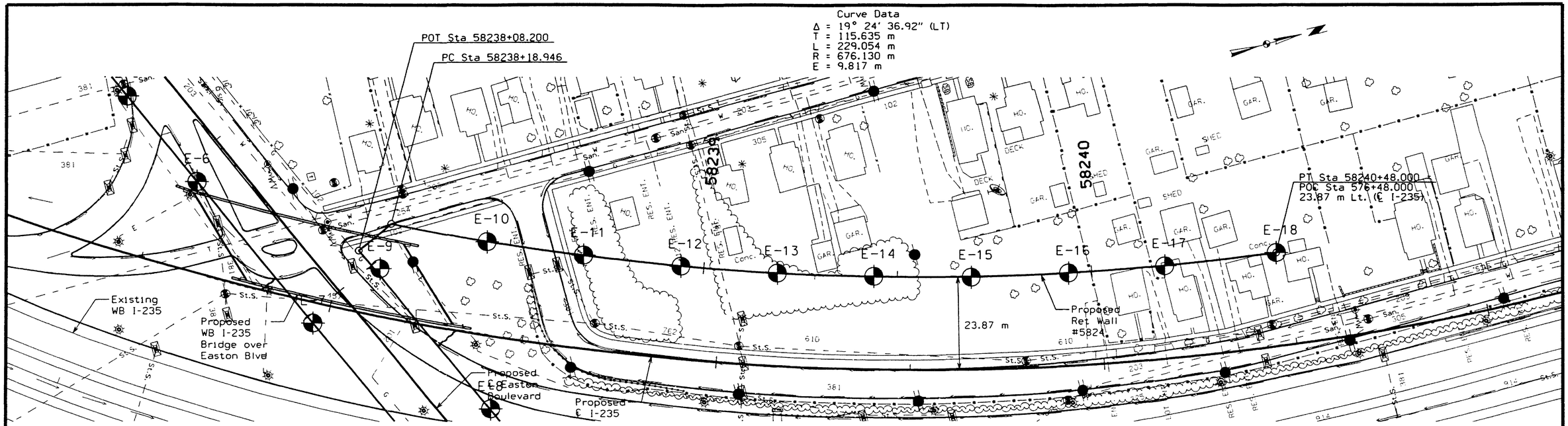


SHELBY TUBE CORE DATA

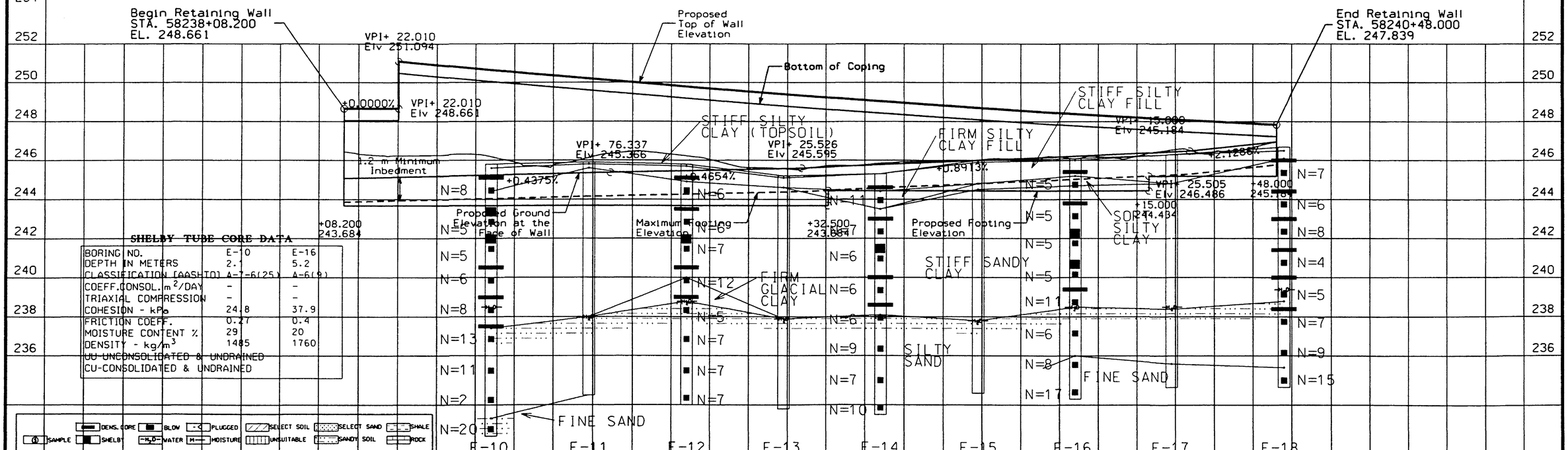
BORING NO.	E-8
DEPTH IN METERS	3.7
CLASSIFICATION [AASHTO]	A-6(14)
COEFF.CONSDL. m^2/DAY	0.021
TRIAXIAL COMPRESSION	-
COHESION - kP_a	-
FRICTION COEFF.	-
MOISTURE CONTENT %	24
DENSITY - kg/m^3	1318
UU-UNCONSOLIDATED & UNDRAINED	
CU-CONSOLIDATED & UNDRAINED	

DENS. CORE | BLOW | PLUGGED | SELECT SOIL | SELECT SAND | SHALE
SAMPLE | SHELBY | WATER | MOISTURE | UNSUITABLE | SANDY SOIL | ROCK

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER 0.12



Soil Profile Information for MSE Retaining Wall #5824



SHELBY TUBE CORE DATA

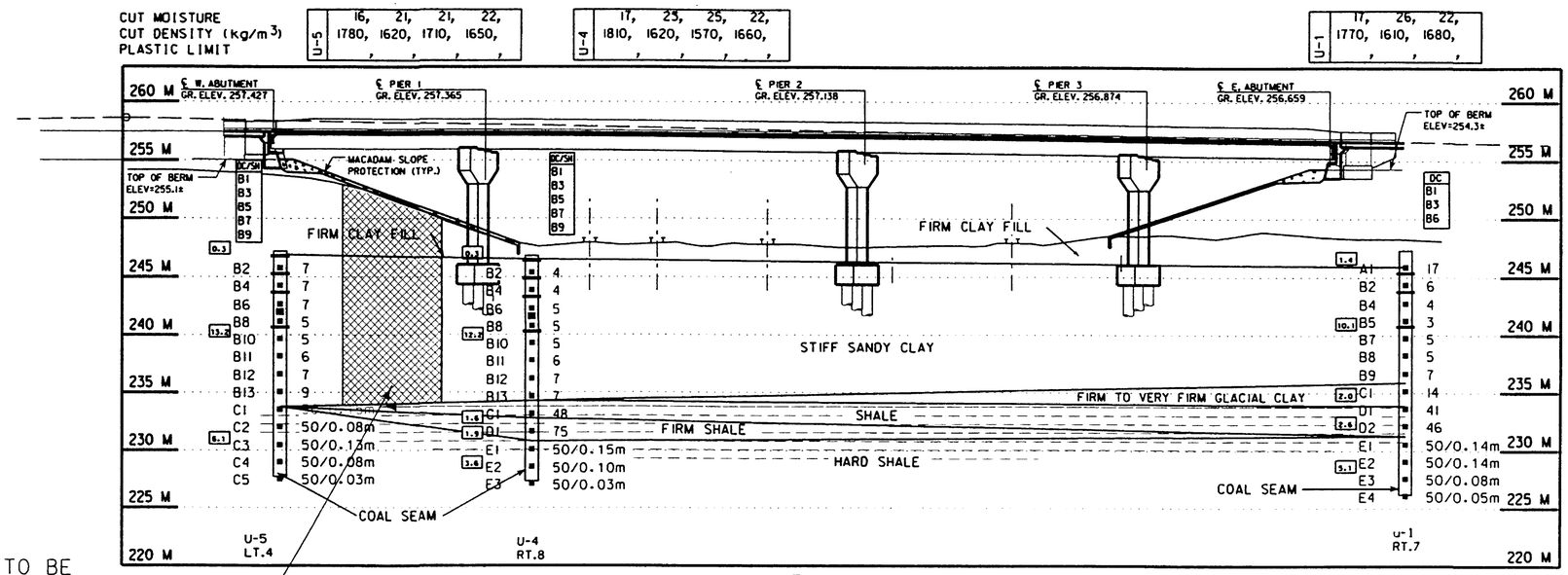
BORING NO.	E-10	E-16
DEPTH IN METERS	2.1	5.2
CLASSIFICATION [AASHTO]	A-7-6(25)	A-6(9)
COEFF.CONSOL. m^2/DAY	-	-
TRIAXIAL COMPRESSION	-	-
COHESION - kPa	24.8	37.9
FRICTION COEFF.	0.27	0.4
MOISTURE CONTENT %	29	20
DENSITY - kg/m^3	1485	1760

~~UU-UNCONSOLIDATED & UNDRAINED~~
CU-CONSOLIDATED & UNDRAINED

DENS. CORE · BLOW · PLUGGED · SELECT SOIL · SELECT SAND · SHALE
SAMPLE · SHELBY · H_2O WATER · M MOISTURE · UNSUITABLE · SANDY SOIL · ROCK

DESIGN TEAM	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER 0.13

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.



LONGITUDINAL SECTION ALONG ℄ UNIVERSITY AVE. RAMP A

BLOW COUNT
LAYER - N. BLOWS

B2 ■ 5

XI
YI
ZI — INDICATES DENSITY CORE(DC) OR SHELBY(SH) SAMPLE NUMBERS

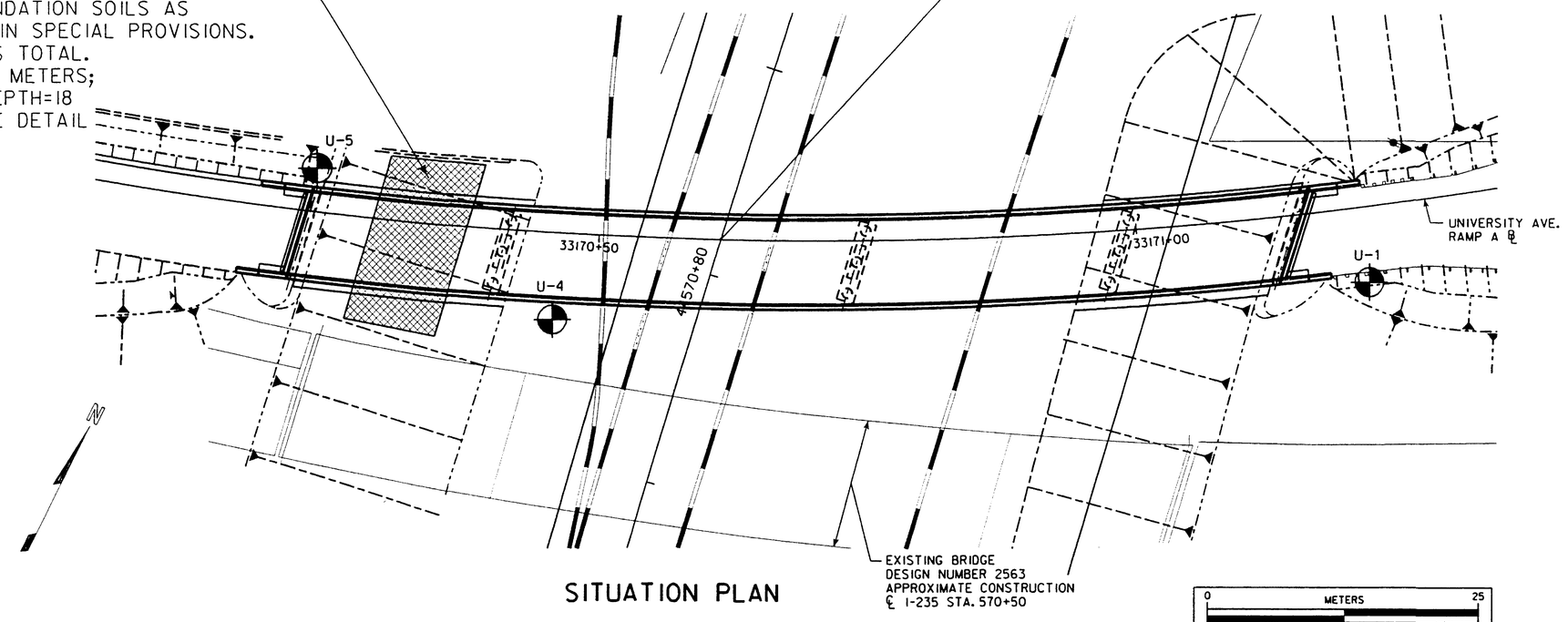
— INDICATES LAYER THICKNESS (m)

SHELBY TUBE CORE DATA

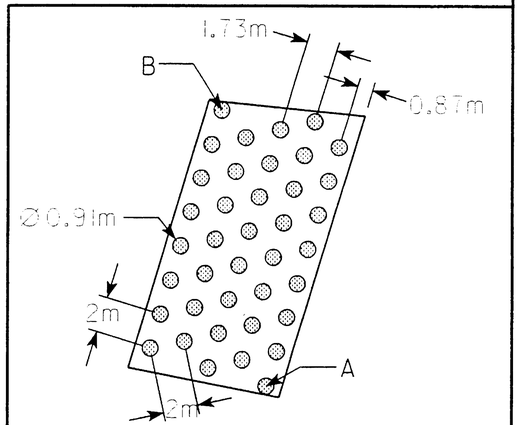
BORING NO.	U-4	U-5
DEPTH IN METERS	4.9	4.9
CLASSIFICATION [AASHTO]	A-6(8)	A-6(8)
COEFF.CONSOL. m^2/DAY	N/A	0.0043
TRIAXIAL COMPRESSION	CU	N/A
COHESION - kPa	33	N/A
FRICTION COEFF.	0.21	N/A
MOISTURE CONTENT %	20	21
DENSITY - kg/m^3	1720	1680

UU-UNCONSOLIDATED & UNDRAINED
CU-CONSOLIDATED & UNDRAINED

STONE COLUMNS TO BE INSTALLED PRIOR TO EMBANKMENT CONSTRUCTION: FIVE ROWS WITH A SPACING OF 2m BETWEEN ADJACENT COLUMNS AND 1.73m BETWEEN ROWS. INSTALL TO SHALE OR OTHER FOUNDATION SOILS AS DESCRIBED IN SPECIAL PROVISIONS. 39 COLUMNS TOTAL. 702 LINEAR METERS; AVERAGE DEPTH=18 METERS, SEE DETAIL



SITUATION PLAN



STONE COLUMN GRID CONTROL POINTS

Points	Station	Offset
A	33170+34.7	9.7R
B	33170+30.7	5.5L

STONE COLUMN LAYOUT DETAIL

DENS. CORE | BLOW | PLUGGED | SELECT SOIL | SELECT SAND | SHALE
SAMPLE | SHELBY | WATER | MOISTURE | UNSUITABLE | SANDY SOIL | ROCK

DESIGNED BY _____ CHECKED BY _____
DETAILED BY _____ CADD FILE H771002.g14

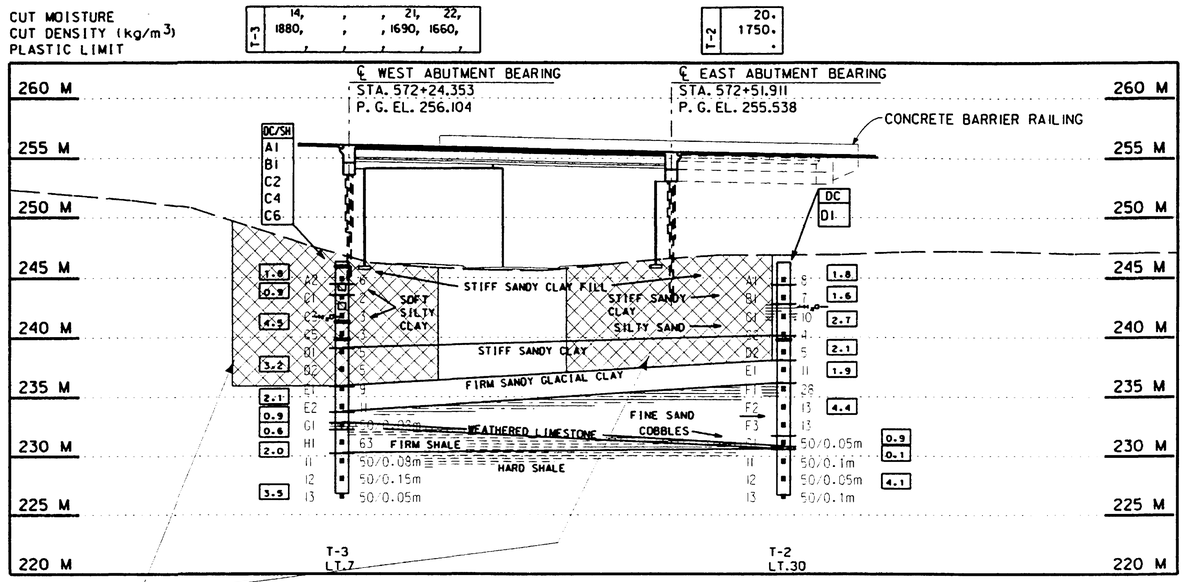
POLK COUNTY | PROJECT NUMBER IM-NHS-235-2(340)11--03-77 | SHEET NUMBER Q.14

BENCH MARK NO. 698: STA. 572+18.700, RT. 321.43 m. CUT "X" IN N.W. CORNER TRAFFIC SIGNAL BASE, S.E. QUAD HUBBELL AVE. & UNIVERSITY AVE. EL. 245.533

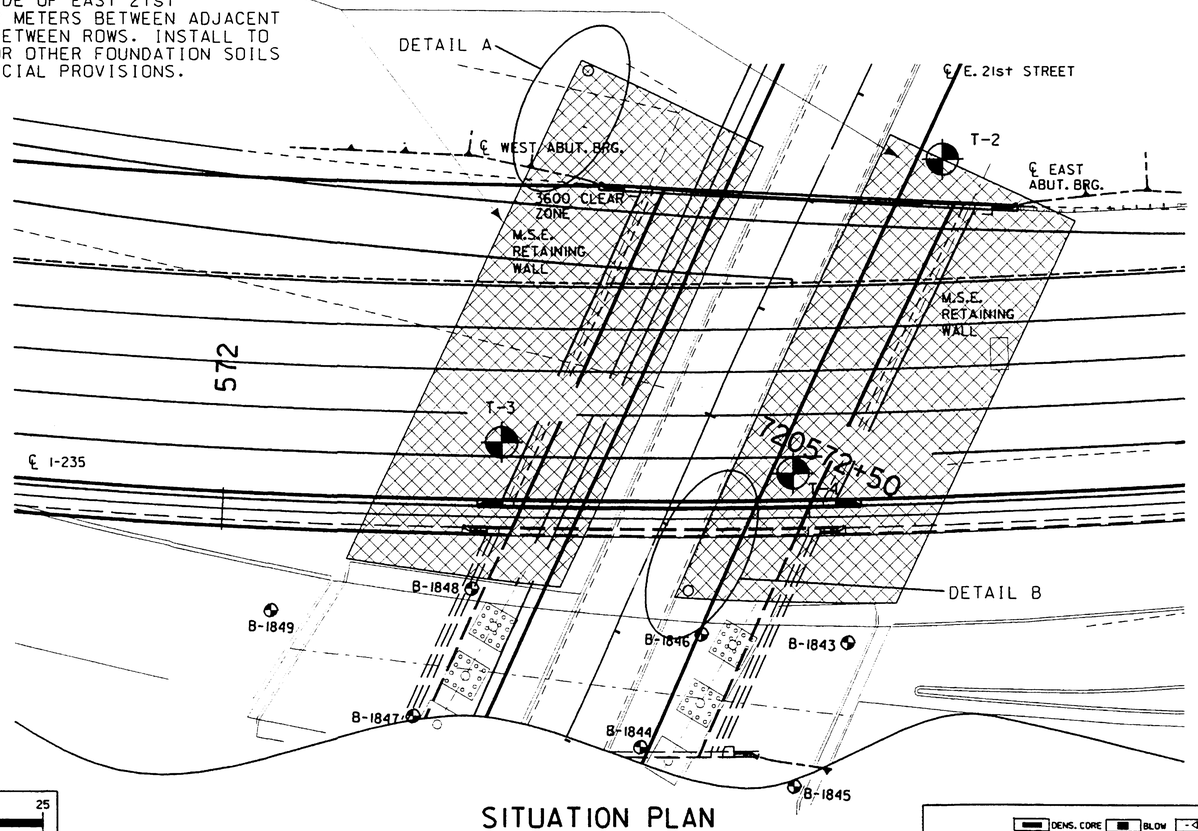
BENCH MARK NO. 567: STA. 572+51.033, RT. 4.09 m. IHC BM. N.W. HANDRAIL BRG. OVER E. 21st STREET EASTBOUND LANE I-235. EL. 251.772

ESTIMATED STONE COLUMN QUANTITIES		
	WEST ABUTMENT	EAST ABUTMENT
NO. OF COLUMNS	219	196
AVERAGE DEPTH	13m	10m
LINEAR METERS	2847m	1960m

STONE COLUMNS TO BE INSTALLED PRIOR TO EMBANKMENT CONSTRUCTION: TEN ROWS ON EACH SIDE OF EAST 21st WITH A SPACING OF 2 METERS BETWEEN ADJACENT COLUMNS AND 1.73m BETWEEN ROWS. INSTALL TO FIRM GLACIAL CLAY OR OTHER FOUNDATION SOILS AS DESCRIBED IN SPECIAL PROVISIONS.



LONGITUDINAL SECTION ALONG PROFILE GRADE LINE



SITUATION PLAN

0 METERS 25

DENS. CORE · BLOW · PLUGGED · SELECT SOIL · SELECT SAND · SHALE
SAMPLE · SHELBY · WATER · MOISTURE · UNSUITABLE · SANDY SOIL · ROCK

THIS SHEET IS INCLUDED TO SHOW SOIL INFORMATION. DETAILS AND NOTES SHOWN ELSEWHERE IN THESE PLANS SHALL BE USED FOR STRUCTURE CONSTRUCTION.

OC/SH
XI
YI
ZI
- INDICATES DENSITY CORE(DC) OR SHELBY(SH) SAMPLE NUMBERS

- INDICATES LAYER THICKNESS (m)

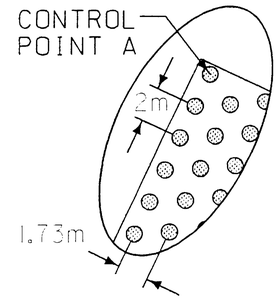
BLOW COUNT
LAYER - N. BLOWS

B2 ■ 5

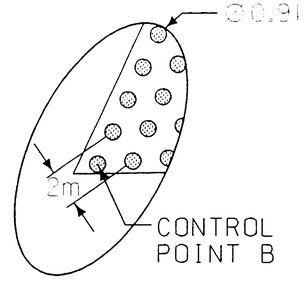
SHELBY TUBE CORE DATA

BORING NO.	F-3	F-3
DEPTH IN METERS	1.8	5.4
CLASSIFICATION [AASHTO]	A-6, 13	A-6, 10+
COEFF.CONSOL. m^2/DAY	0.007	N.A.
TRIAXIAL COMPRESSION	N.A.	CU
COHESION - kPa	N.A.	14.5
FRICTION COEFF.	N.A.	0.32
MOISTURE CONTENT %	26	22
DENSITY - kg/m^3	1510	1700
UU-UNCONSOLIDATED & UNDRAINED		
CU-CONSOLIDATED & UNDRAINED		

DETAIL A



DETAIL B



STONE COLUMN GRID CONTROL POINTS

Points	Station	Offset
A	**572+30.6**	**37.9L**
B	**572+39.6**	**5.6R**

STONE COLUMN LAYOUT DETAIL

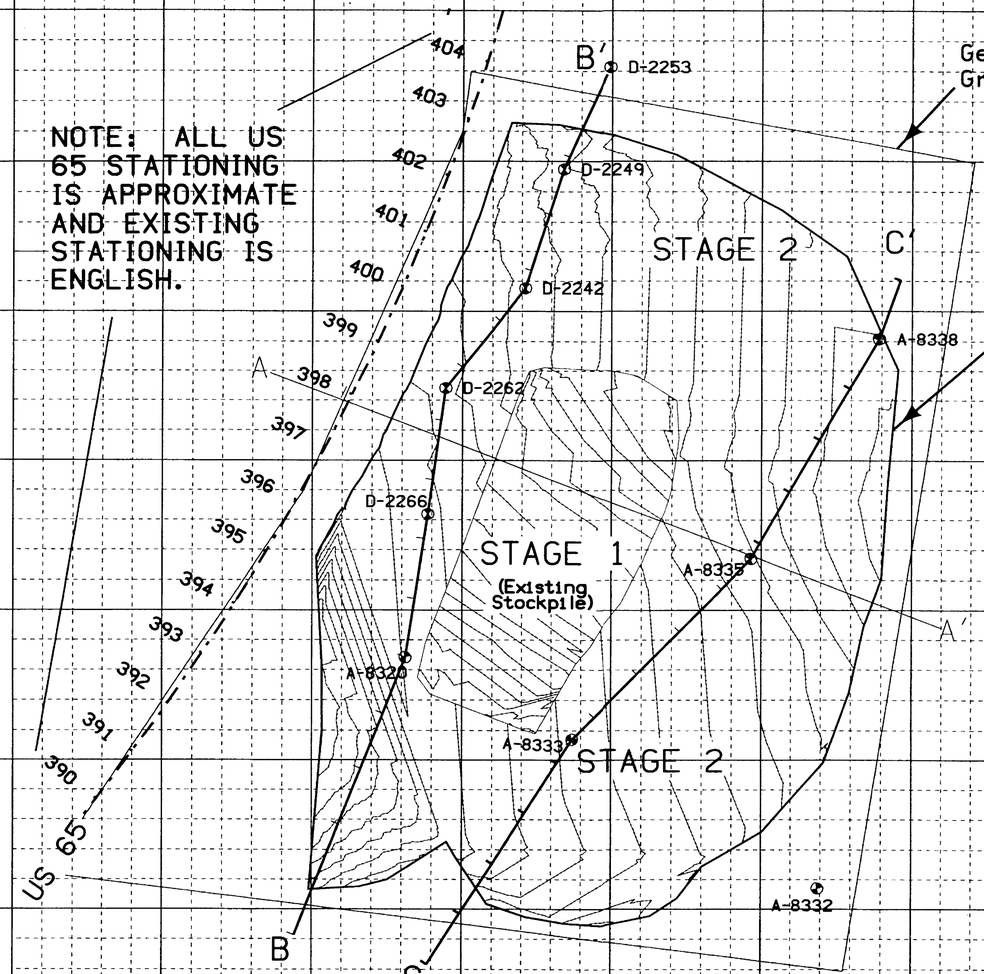
DESIGNED BY _____ CHECKED BY _____
DETAILED BY _____ CADD FILE H771102.Q15

POLK COUNTY

PROJECT NUMBER IM-NHS-235-2(340)11--03-77

SHEET NUMBER Q.15

US 65 STOCKPILE & BORROW SITE

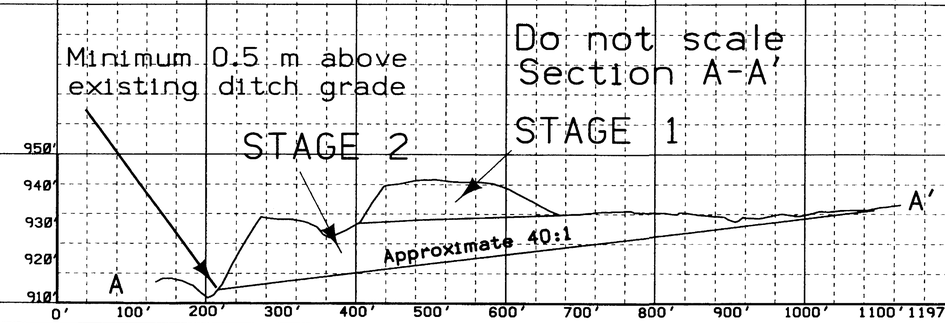


NOTE: STAGE 1, IF THE EXISTING BORROW SITE IS USED, THE EXISTING STOCKPILE SHALL BE REMOVED BEFORE STAGE 2 EXCAVATION.

STAGE 2, INTENT IS TO CUT THE BACKSLOPE IN A UNIFORM MANNER AS FAR BACK AS NEEDED TO OBTAIN THE REQUIRED REMAINDER OF MATERIAL. FINAL SHAPE TO BE APPROVED BY ENGINEER IN GENERAL ACCORDANCE WITH INTENT SHOWN ON THIS SHEET.

NOTE: REMOVAL OF EXISTING TREES ON EXISTING BACKSLOPE, WILL BE AS DIRECTED BY ENGINEER.

NOTE: STRIP 0.2M OF TOPSOIL OFF OF THE BORROW AREA TO BE USED AND STOCKPILED AS DIRECTED BY THE ENGINEER.



ESTIMATED VOLUMES OF CLASS 10		
STAGE 1	28,905 M3	CLASS 10
STAGE 2	150,416 M3	CLASS 10
TOTAL	179,321 M3	CLASS 10

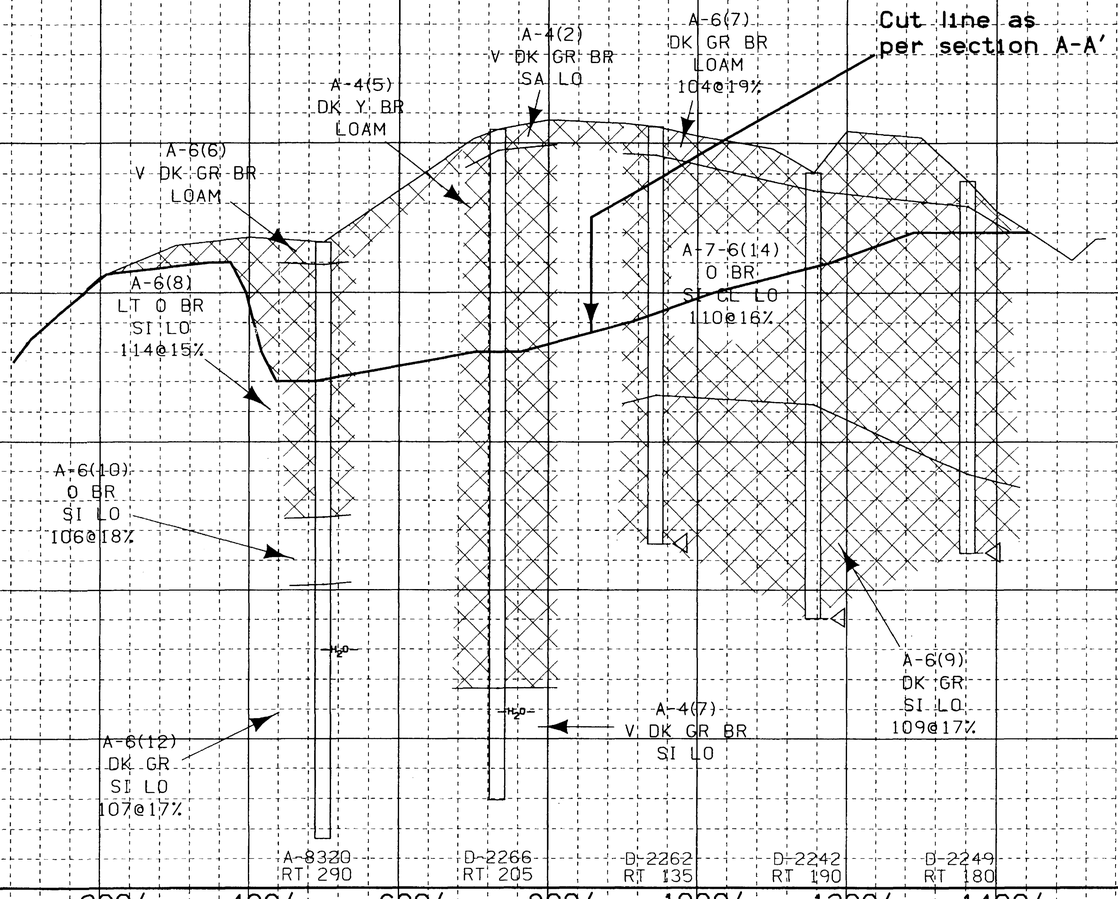
DESCRIPTION Borrow Just South of Rising Sun Avenue and East of US 65 — DATE 12/01 SOILS BOOK NO. X, Y#
SOIL SURVEYOR A. Meyer, G. Runyan DATE 3/98 DESIGNER/CADD D. Elders

SHALE ROCK SELECT SAND SANDY SOIL SELECT SOIL UNSUITABLE PLUGGED MOISTURE BLOW WATER DENS. CORE SHELBY SAMPLE

DESIGN TEAM	STANLEY/EILDERS	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11-03-77	SHEET NUMBER R.01

07-MAR-2002 13:43 gkretl2 w:\Projects\7706502001\Soils\Borrow_Sht.R01

SOIL PROFILE B - B'



DESCRIPTION Borrow Just South of Rising Sun Avenue and East of US 65 — DATE 12/01 SOILS BOOK NO. X, Y"

SOIL SURVEYOR A. Meyer, G. Runyan DATE 3/00 DESIGNER/CADD D. Elders — DATE

SHALE | ROCK | SELECT SAND | SANDY SOIL | SELECT SOIL | UNSUITABLE | PLUGGED | MOISTURE | BLOW | WATER | DENS. CORE | SHELBY | SAMPLE

DESIGN TEAM	STANLEY/EILDERS	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11-03-77	SHEET NUMBER R.02

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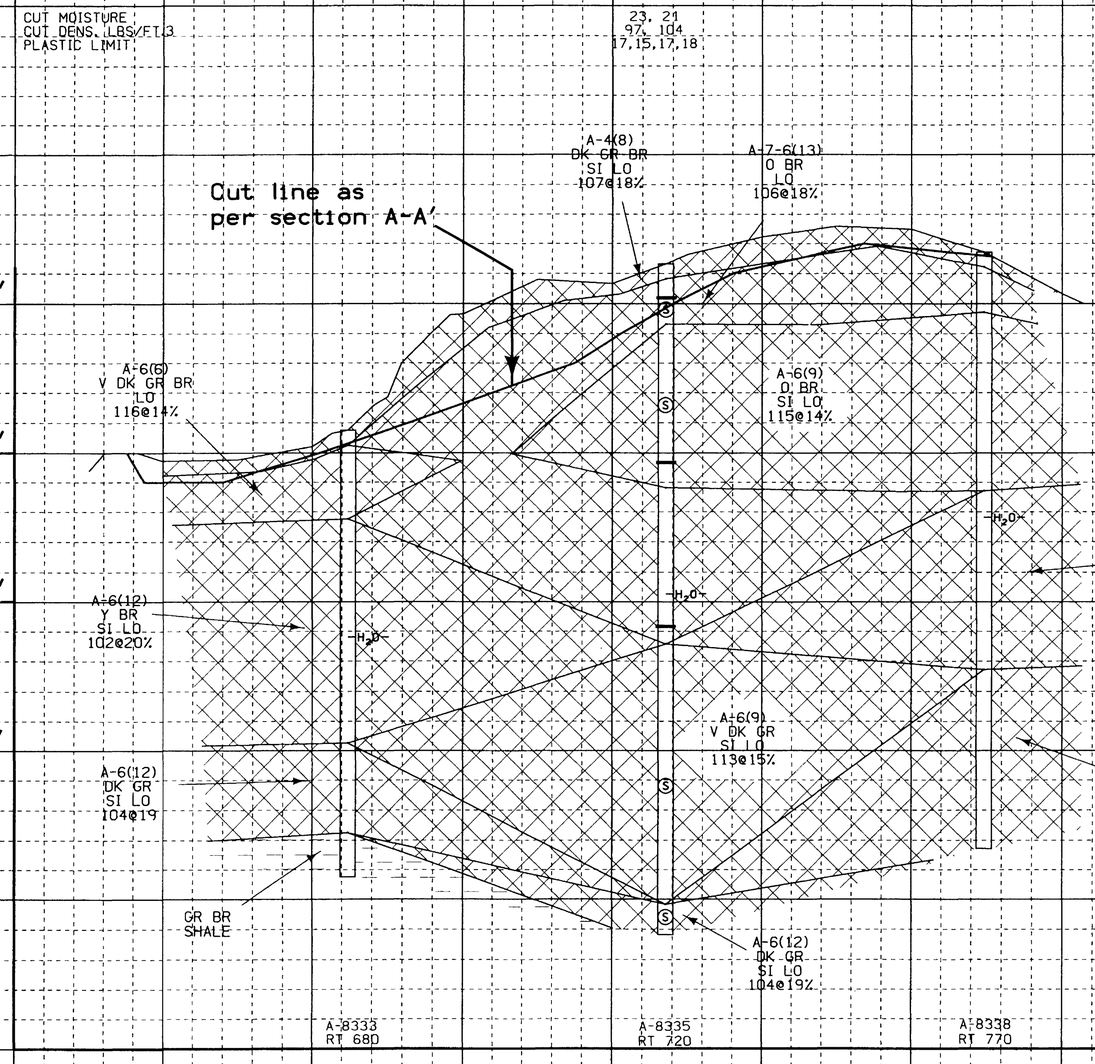
SOIL PROFILE C - C'



SHALE ROCK
SELECT SAND SANDY SOIL
SELECT SOIL UNSUITABLE
PLUGGED MOISTURE
BLOW WATER
DENS. CORE SHELBY
SAMPLE

DESCRIPTION Borrow Just South of Rising Sun Avenue and East of US 65 DATE 12/01 SOILS BOOK NO. X, Y
SOIL SURVEYOR A. Meyer, G. Runyan DATE 3/08 DESIGNER/CADD D. Elders

DESIGN TEAM	STANLEY/EILDERS	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11-03-77	SHEET NUMBER R.03

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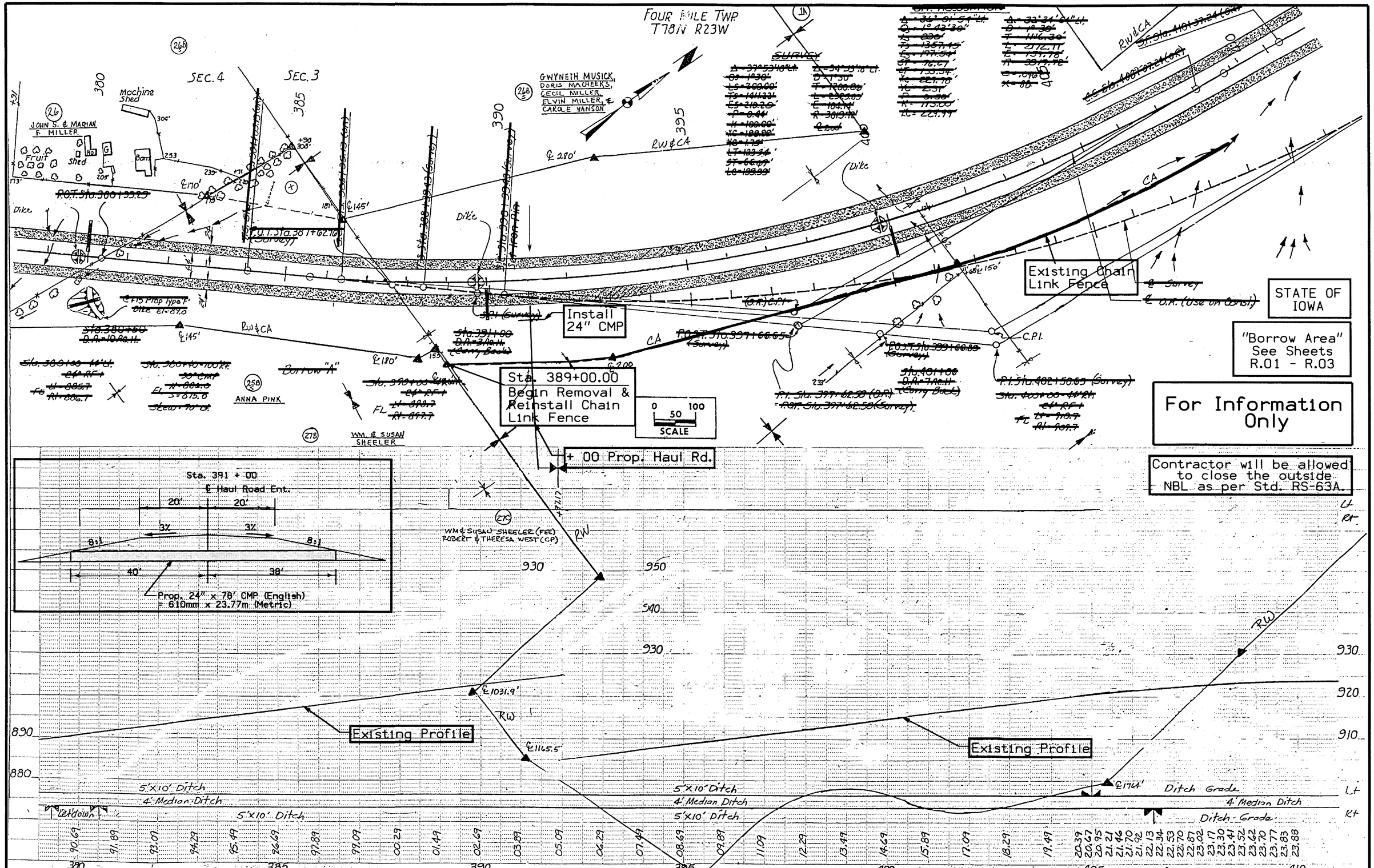

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER R.04

29-JAN-2002 12:20 nstreit w:\Projects\77235180C96\Design_grading_(340)\k77235340.r04

FOUR MILE TWP
T78N R23W
Sec. 3

STATE OF IOWA

"Borrow Area" See Sheets R.01 - R.03

LEGEND
- Iowa Power & Light Co.
-T- N.W. Bell Tel. Co.

Existing Chain Link Fence

Sta. 414 + 60.00
End Removal & Reinstall Chain Link Fence

EQUATION: STA. 414 + 83.58 (BACK) = STA. 419 + 42.77 (AHEAD) ELEV. = 922.4624

-0.70%

BRIDGE

SCALE 0 50 100

1A DOROTHY FRANCES MEACHAM

For Information Only

Ditch Grade | 4' Median | Trans. | 2' Med | Vari: Ditch Grade

23.88 23.91 23.94 23.95 23.94 23.91 23.88 23.83 23.77 23.70 23.61 23.52 23.41 23.29 23.16 23.02 22.86 22.70

TOE DITCH | 2' MED. | TRANS. | 4' MEDIAN | DITCH GRADE
TOE DITCH | NO DITCH | DITCH GRADE | DITCH GRADE

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER R.05

24-JAN-2002 12:29 nstrelt w:\Projects\77235180C96\Design_grading_(340)\k77235340.r04

FOUR MILE TWP.
T78N R23W
SEC. 4

9400 9405 9410 9415 9420

~~10' ROW for Prop. New Street for Housing Development~~

~~P.O.T. Sta. 9400+55.55~~

~~12"x30' Corr. Pipes~~
~~24"x15' Conc. Pipe~~
~~10"x30' Corr. Pipe~~
~~12"x30' Corr. Pipe~~
~~12"x30' Conc. Pipe~~
~~10" Pipe Culvert~~

HO. ±53' Ent. 123'
HO. ±62' Ent. 124'
HO. ±76' Ent. 129'
HO. 127'
HO. ±106' Ent. 123'
HO. ±30' Ent. 125'
HO. 93'

SEC. LINE

33' 4'-0" 33'

& Rising Sun Dr.

~~P.I. Sta. 9410+39.60~~

~~P.O.T. Sta. 9410+39.60~~

~~10"x 8" Corr. Pipe~~

~~P.O.T. Sta. 9400+55.55~~

~~Δ=L°31'01"~~
~~D=4°~~
~~T=82.17'~~
~~L=164.17'~~
~~E=2.36'~~
~~R=1432.39'~~

~~SIDE ROAD CONNECTION LT. & RT. STA. 411+00.00~~

~~P.O.T. Sta. 410+22.28~~

3525 2525

E. Rebecca Ave (Main Line)

① Charles Meacham

~~P.O.T. Sta. 9419+46.77~~
~~P.O.T. Sta. 9413+41.65~~
~~Side Road Survey~~

85°26'06" Tan-Tan

15"x 8" Corr. Pipe

±97' Ent. 128' 136'

Well 110

Well

~~P.O.T. Sta. 411+00.00 (Base)~~
~~P.O.T. Sta. 411+46.77 (Line 1)~~
~~P.O.T. Sta. 411+41.65~~

~~Sta. 9411+21~~
~~24"x 19' Corr. Pipe~~

Existing Chain Link Fence

~~P.I. Sta. 410+22.28~~

C.S. Sta. 408+22.28

STATE OF IOWA

"Borrow Area" See Sheets R.01 - R.03

For Information Only

LEGEND
N.W. Bell Tel. Co.
Iowa Power & Light Co.

0 50 100
SCALE

930
920
910

Ent. ±53
Ent. ±30
Ent. ±56
Ent. ±67
Ent. ±53
Ent. ±62
Ent. ±28
Ent. ±76
Ent. ±106

USE AS CONSTRUCTED & EXISTING GRADE

910
900
890

Lt. 885.6
Rt. 887.0
FL.

9400 9405 9410 9415 9420

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER R.06

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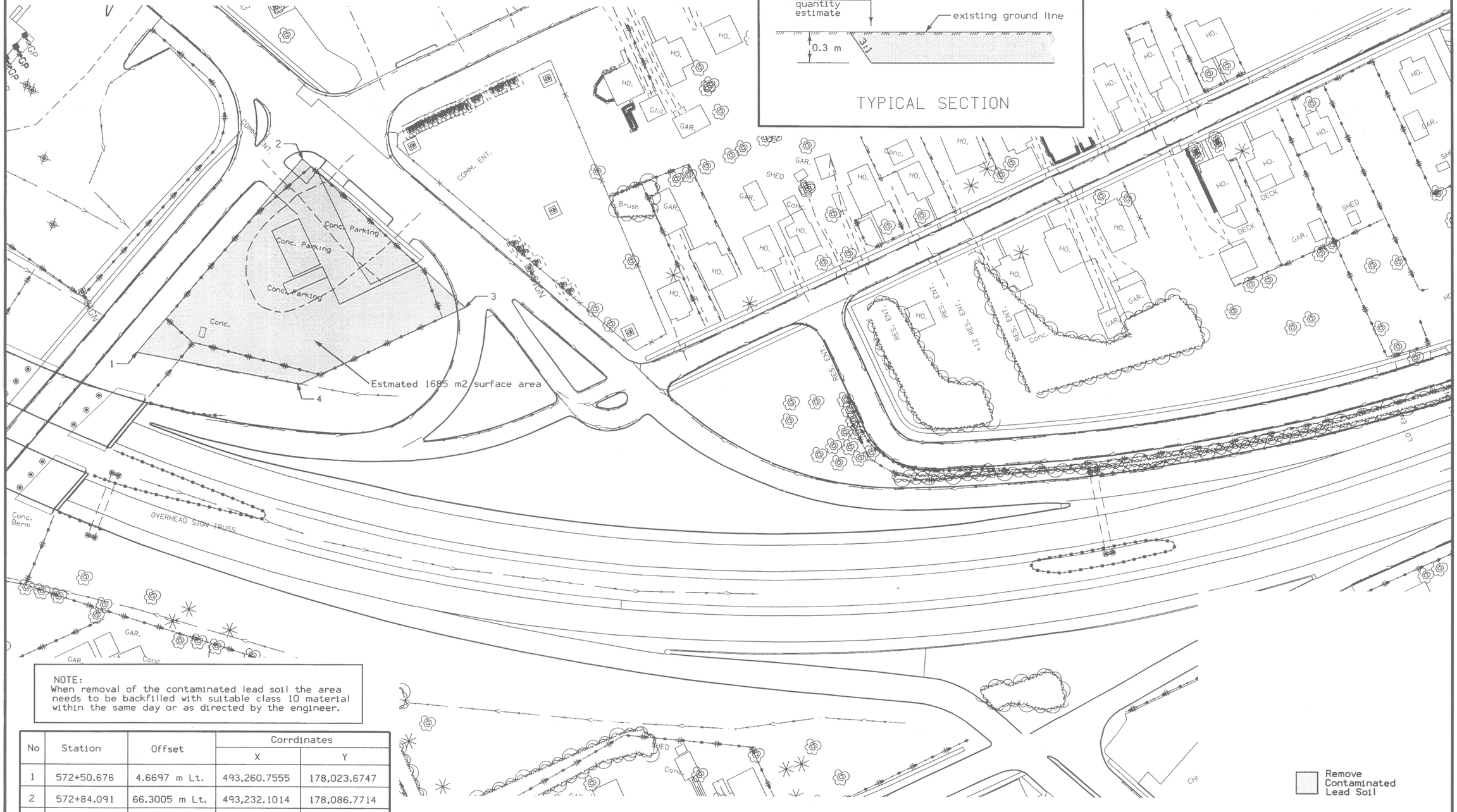

NOTE:
When removal of the contaminated lead soil the area needs to be backfilled with suitable class 10 material within the same day or as directed by the engineer.

No	Station	Offset	Corrdinates	
			X	Y
1	572+50.676	4.6697 m Lt.	493,260.7555	178,023.6747
2	572+84.091	66.3005 m Lt.	493,232.1014	178,086.7714
3	573+39.150	33.5130 m Lt.	493,288.1448	178,110.1338
4	572+94.994	4.0239 m Lt.	493,288.3092	178,058.0304

Cut = 861

F+5% = 0
To ML Sta. XXX+XX± = 861
861

0 METERS 50

Remove Contaminated Lead Soil

DETAILS OF REMOVAL FOR LEAD CONTAMINATED SOIL

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER R.07

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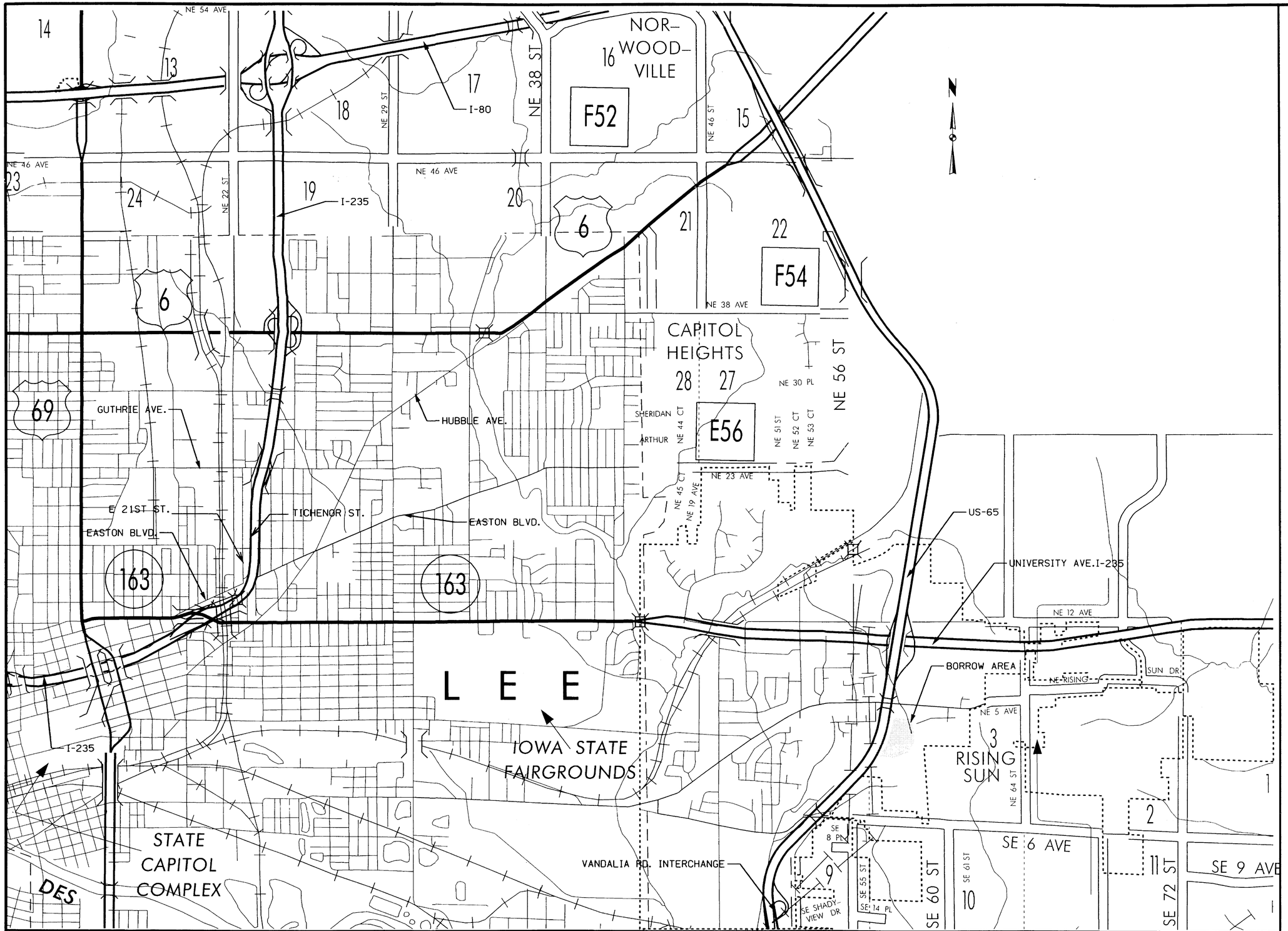

LOCATION OF BORROW AREA RT. OF US 65 STA. 397+00±

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER R.08

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TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

1QT-29
04-25-00

STATION	TEMP CUT	OVERCUT AT TOE OF WALL +C	SHALE -C	ADJ SUIT CUT	TEMP FILL	OVERCUT AT TOE OF WALL +F	ADJ FILL	SHRINK	ADJ FILL + SHRINK
	Soil Nail Retaining Wall #5620								
56200+40.000									
56200+50.000	994	24	2	1016	0	24	24	5%	25
56200+60.000	1164	24	36	1152	0	24	24	5%	25
56200+70.000	1377	24	120	1281	0	24	24	5%	25
56200+80.000	1488	24	255	1257	0	24	24	5%	25
56200+90.000	1495	24	378	1141	0	24	24	5%	25
56201+00.000	1482	24	473	1033	27	24	51	5%	54
56201+10.000	1447	24	590	881	31	24	55	5%	58
56201+20.000	1445	24	675	794	7	24	31	5%	33
56201+30.000	1465	24	821	668	7	24	31	5%	33
56201+40.000	1482	24	865	641	9	24	33	5%	35
56201+50.000	1483	24	932	575	11	24	35	5%	37
56201+60.000	1467	24	1046	445	11	24	35	5%	37
56201+70.000	1474	24	1043	455	11	24	35	5%	37
56201+80.000	1500	24	1051	473	11	24	35	5%	37
56201+90.000	1520	24	1009	535	7	24	31	5%	33
56202+00.000	1519	24	965	578	5	24	29	5%	30
56202+10.000	1524	24	1051	497	4	24	28	5%	29
56202+20.000	1543	24	1151	416	4	24	28	5%	29
56202+30.000	1552	24	1250	326	3	24	27	5%	28
56202+40.000	1548	24	1336	236	3	24	27	5%	28
56202+50.000	1526	24	1271	279	3	24	27	5%	28
56202+60.000	1509	24	1220	313	2	24	26	5%	27
56202+70.000	1506	24	1204	326	3	24	27	5%	28
56202+80.000	1503	24	1237	290	2	24	26	5%	27
56202+90.000	1465	24	1234	255	0	24	24	5%	25
56203+00.000	1406	24	1146	284	0	24	24	5%	25
56203+10.000	1376	24	1081	319	0	24	24	5%	25
56203+20.000	1349	24	1019	354	0	24	24	5%	25
56203+30.000	1310	24	952	382	0	24	24	5%	25
56203+40.000	1269	24	879	414	1	24	25	5%	26
	Soil Nail Retaining Wall #5630								
56300+50.000	1288	24	0	1312	0	24	24	5%	25
56300+60.000	1379	24	0	1403	0	24	24	5%	25
56300+70.000	1492	24	0	1516	0	24	24	5%	25
56300+80.000	1565	24	166	1423	0	24	24	5%	25
56300+90.000	1513	24	396	1141	0	24	24	5%	25
56301+00.000	1454	24	515	963	0	24	24	5%	25
56301+10.000	1431	24	544	911	0	24	24	5%	25
56301+20.000	1402	24	686	740	0	24	24	5%	25
56301+30.000	1394	24	973	445	0	24	24	5%	25
56301+40.000	1086	19	880	225	0	19	19	5%	20
56301+48.000	1551	29	1222	358	0	29	29	5%	30
56301+60.000	1235	24	1013	246	0	24	24	5%	25
56301+70.000	1185	24	1060	149	0	24	24	5%	25
56301+80.000	1141	24	998	167	0	24	24	5%	25
56301+90.000	1109	24	956	177	0	24	24	5%	25
56302+00.000	1103	24	934	193	0	24	24	5%	25
56302+10.000	1083	24	916	191	0	24	24	5%	25
56302+20.000	1034	24	871	187	0	24	24	5%	25
56302+30.000	996	24	820	200	0	24	24	5%	25
56302+40.000	975	24	772	227	0	24	24	5%	25
56302+50.000	967	24	722	269	0	24	24	5%	25
56302+60.000	954	24	697	281	0	24	24	5%	25
56302+70.000	938	24	630	332	0	24	24	5%	25
56302+80.000	922	24	545	401	0	24	24	5%	25
56302+90.000	911	24	494	441	0	24	24	5%	25
56303+00.000	900	24	445	479	0	24	24	5%	25
56303+10.000	891	24	538	377	0	24	24	5%	25
56303+20.000	891	24	614	301	0	24	24	5%	25
56303+30.000	885	24	540	369	0	24	24	5%	25
56303+40.000	869	24	475	418	0	24	24	5%	25
56303+50.000	851	24	423	452	0	24	24	5%	25
56303+60.000									

STATION	TEMP CUT	WALL OVERCUT +C	SOIL REMED OVERCUT +C	ADJ SUIT CUT	TEMP FILL	WALL OVERCUT +F	WALL THICK (1) -F	GRAN BKFL FOR WALL STRAPS -F	GRAN BKFL FOR SOIL REMED -F	ADJ FILL	SHRINK	ADJ FILL + SHRINK
	University Ramp A											
33168+65.000	0	0	0	0	36	0	0	0	0	36	5%	38
33168+70.000	0	0	0	0	73	0	0	0	0	73	5%	77
33168+75.000	0	0	0	0	83	0	0	0	0	83	5%	87
33168+80.000	0	0	0	0	110	0	0	0	0	110	5%	116
33168+85.000	0	0	0	0	155	0	0	0	0	155	5%	163
33168+90.000	0	0	0	0	208	0	0	0	0	208	5%	218
33168+95.000	0	0	0	0	263	0	0	0	0	263	5%	276
33169+00.000	0	0	0	0	316	0	0	0	0	316	5%	332
33169+05.000	0	0	0	0	374	0	0	0	0	374	5%	393
33169+10.000	0	0	0	0	387	0	0	0	0	387	5%	406
33169+15.000	0	0	0	0	329	0	1	5	0	323	5%	339
33169+20.000	0	1	7	8	265	0	3	22	2	238	5%	250
33169+25.000	0	28	18	46	222	13	4	44	2	185	5%	194
33169+30.000	1	55	23	79	212	25	4	53	0	180	5%	189
33169+35.000	1	76	25	102	231	35	4	59	0	203	5%	213
33169+40.000	1	90	27	118	260	41	4	68	0	229	5%	240
33169+45.000	1	83	26	110	289	37	5	74	0	247	5%	259
33169+50.000	0	78	27	105	311	35	5	80	0	261	5%	274
33169+55.000	0	75	27	102	325	35	5	86	0	269	5%	282
33169+60.000	0	69	28	97	346	32	5	92	0	281	5%	295
33169+65.000	0	58	28	86	375	26	5	100	0	296	5%	311
33169+70.000	0	55	28	83	388	23	6	102	0	303	5%	318
33169+75.000	1	58	28	87	398	23	5	103	0	313	5%	329
33169+80.000	0	52	28	80	419	20	5	110	0	324	5%	340
33169+85.000	0	48	29	77	434	18	5	115	0	332	5%	349
33169+90.000	0	52	29	81	437	19	5	115	0	336	5%	353
33169+95.000	0	57	29	86	436	21	5	116	0	336	5%	353
33170+00.000	2	62	29	93	433	24	5	118	0	334	5%	351
33170+05.000	3	68	30	101	425	28	5	119	0	329	5%	345
33170+10.000	6	103	31	140	417	48	6	127	0	332	5%	349
33170+15.000	7	135	33	175	414	65	6	135	0	338	5%	355
33170+20.000	14	122	31	167	326	60	6	120	0	260	5%	273
33170+25.000	27	85	27	139	194	42	5	80	0	151	5%	159
33170+30.000	30	49	21	100	121	24	3	40	0	102	5%	107
33170+35.000	20	26	15	61	68	14	2	14	0	66	5%	69
33170+40.000	6	9	6	21	22	5	1	1	0	25	5%	26
33170+45.000												
	gap for bridge over UPRR											
33170+95.000	0	0	0	0	16	0	0	0	0	16	5%	17
33171+00.000	0	0	0	0	134	0	0	0	0	134	5%	141
33171+05.000	0	0	0	0	371	0	0	0	0	371	5%	390
33171+10.000	0	0	0	0	663	0	0	0	0	663	5%	696
33171+15.000	0	0	0	0	938	0	0	0	0	938	5%	985
33171+20.000	0	0	0	0	1079	0	0	0	0	1079	5%	1133
33171+25.000	0	0	0	0	1127	0	0	0	0	1127	5%	1183
33171+30.000	0	0	0	0	1169	0	0	0	0	1169	5%	1227
33171+35.000	0	0	0	0	1205	0	0	0	0	1205	5%	1265
33171+40.000	0	0	0	0	1250	0	0	0	0	1250	5%	1313
33171+45.000	0	0	0	0	1302	0	0	0	0	1302	5%	1367
33171+50.000	0	0	0	0	1353	0	0	0	0	1353	5%	1421
33171+55.000	0	0	0	0	1388	0	0	0	0	1388	5%	1457
33171+60.000	0	0	0	0	1409	0	0	0	0	1409	5%	1479
33171+65.000	0	0	0	0	1434	0	0	0	0	1434	5%	1506
33171+70.000	0	0	0	0	1465	0	0	0	0	1465	5%	1538
33171+75.000	0	0	0	0	1496	0	0	0	0	1496	5%	1571
33171+80.000	0	0	0	0	1527	0	0	0	0	1527	5%	1603
33171+85.000	0	0	0	0	1556	0	0	0	0	1556	5%	1634
33171+90.000	0	0	0	0	1566	0	0	0	0	1566	5%	1644
33171+95.000	0	0	0	0	1579	0	0	0	0	1579	5%	1658
33172+00.000	0	0	0	0	1754	0	0	0	0	1754	5%	1842
33172+05.500												

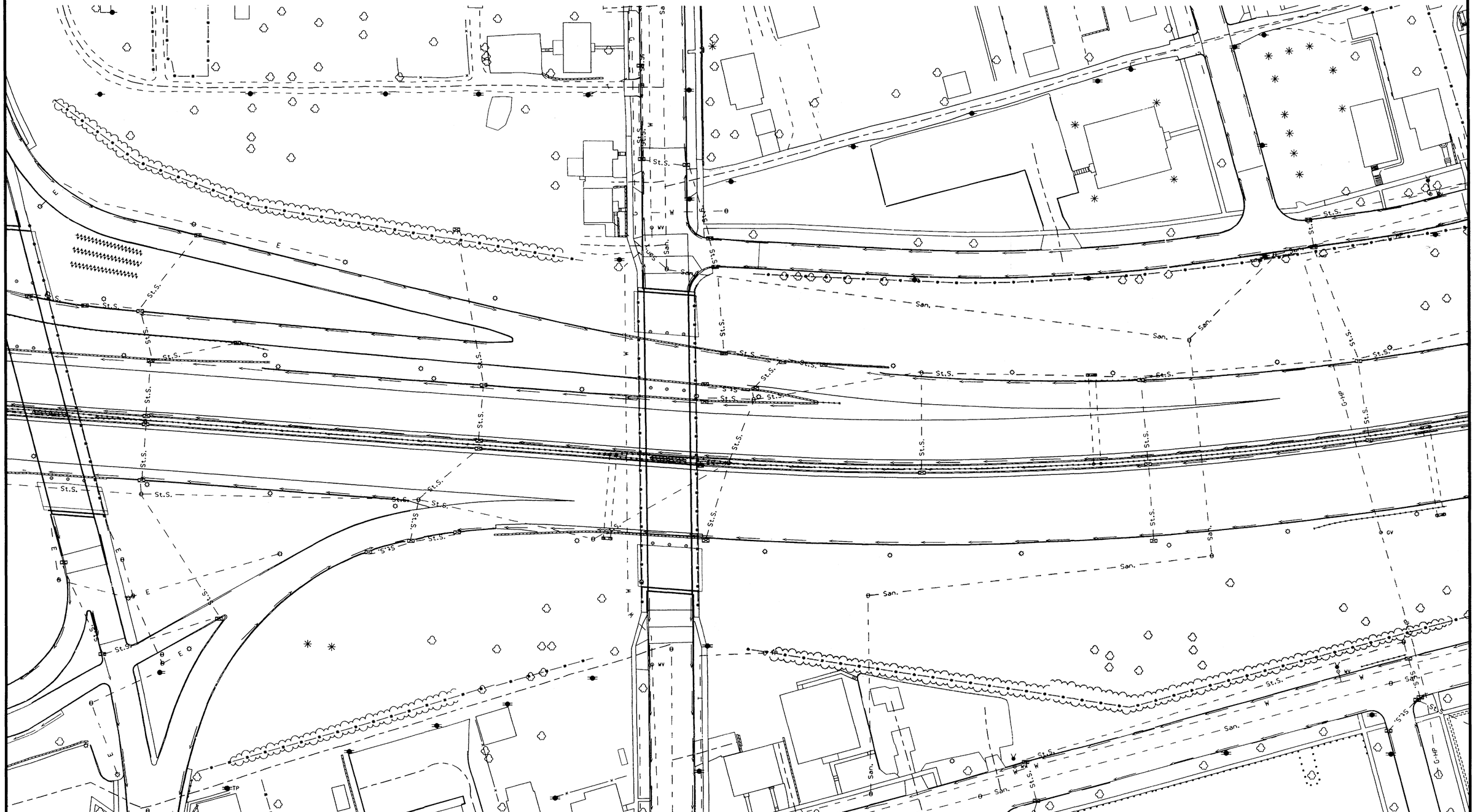
TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

107-29
04-25-00

STATION	TEMP CUT	WALL OVERCUT +C	ADJ SUIT CUT	TEMP FILL	WALL OVERCUT +F	WALL THICK (1) -F	GRAN BKFL FOR WALL STRAPS -F	DISPOSAL OF CONTAM SOIL -F	ADJ FILL	CONTAM. SOIL FILL	SHRINK	ADJ FILL + SHRINK	CONTAM. SOIL FILL + SHRINK
Mainline from University Ramp A to the E 21st Street Bridge													
572+08.500	0	0	0	3718	0	0	0		3718		5%	3904	
572+20.000	0	0	0	3885	0	0	0		3885		5%	4079	
572+40.000													
Mainline from E 21st Street Bridge to Easton Blvd Bridge													
572+60.000	2	247	249	4865	0	19	905		3941		5%	4138	
572+80.000	6	0	6	6026	0	0	0		6026		5%	6327	
573+00.000	4	0	4	5493	0	0	0		5493		5%	5768	
573+20.000	0	37	37	5021	6	3	73		4951		5%	5199	
573+40.000	0	137	137	4105	5	9	251		3850		5%	4043	
573+60.000													
Mainline from Easton Blvd Bridge to End of Project													
574+20.000													
574+40.000	24	620	644	1792	195	16	597		1374		5%	1443	
574+60.000	48	398	446	2642	139	11	431	300	2039	300	5%	2141	315
574+80.000	197	386	583	2987	126	10	360	380	2363	380	5%	2481	399
575+00.000	327	366	693	2743	117	9	309	140	2402	140	5%	2522	147
575+20.000	294	290	584	2626	101	9	312		2406		5%	2526	
575+40.000	240	214	454	2389	77	8	255		2203		5%	2313	
575+60.000	179	174	353	2009	64	7	181		1885		5%	1979	
575+80.000	109	188	297	1659	75	7	144		1583		5%	1662	
576+00.000	66	203	269	1371	87	5	113		1340		5%	1407	
576+20.000	57	169	226	1120	75	4	71		1120		5%	1176	
576+40.000	45	129	174	895	61	3	40		913		5%	959	
576+60.000	174	67	241	621	34	1	17		637		5%	669	
576+74.500	277	0	277	291	0	0	0		291		5%	306	
576+76.000	34	0	34	27	0	0	0		27		5%	28	
576+80.000	94	0	94	70	0	0	0		70		5%	74	
577+00.000	362	0	362	350	0	0	0		350		5%	368	
577+20.000	207	0	207	371	0	0	0		371		5%	390	
577+40.000	138	0	138	415	0	0	0		415		5%	436	
577+60.000	77	0	77	440	0	0	0		440		5%	462	
577+80.000	57	0	57	450	0	0	0		450		5%	473	
578+00.000	60	0	60	411	0	0	0		411		5%	432	
578+20.000	80	0	80	280	0	0	0		280		5%	294	
578+40.000	147	0	147	153	0	0	0		153		5%	161	
578+60.000	258	0	258	94	0	0	0		94		5%	99	
578+80.000	421	0	421	55	0	0	0		55		5%	58	
579+00.000	462	0	462	52	0	0	0		52		5%	55	
579+20.000	523	0	523	53	0	0	0		53		5%	56	
579+40.000	562	0	562	41	0	0	0		41		5%	43	
579+60.000	334	0	334	68	0	0	0		68		5%	71	
579+80.000	125	0	125	140	0	0	0		140		5%	147	
580+00.000	57	0	57	260	0	0	0		260		5%	273	
580+20.000	48	0	48	329	0	0	0		329		5%	345	
580+40.000	32	0	32	400	0	0	0		400		5%	420	

STATION	TEMP CUT	WALL OVERCUT +C	ADJ SUIT CUT	TEMP FILL	WALL OVERCUT +F	WALL THICK (1) -F	GRAN BKFL FOR WALL STRAPS -F	ADJ FILL	SHRINK	ADJ FILL + SHRINK
E 21st Street										
34072+35.000										
34072+40.000	1	18	19	0	18	0	0	18	5%	19
34072+45.000	3	46	49	84	26	2	81	27	5%	28
34072+50.000	4	85	89	240	37	5	235	37	5%	39
34072+55.000	1	87	88	259	37	5	253	38	5%	40
34072+60.000	0	59	59	152	25	5	146	26	5%	27
34072+65.000	1	40	41	57	26	4	52	27	5%	28
34072+70.000	1	29	30	8	27	2	5	28	5%	29
34072+75.000	0	41	41	39	27	1	37	28	5%	29
34072+80.000	0	72	72	40	41	3	66	12	5%	13
34072+85.000	0	79	79	47	47	2	46	46	5%	48
34072+90.000	1	78	79	62	50	1	20	91	5%	96
34072+95.000	2	48	50	16	35	0	5	46	5%	48
34073+00.000	1	10	11	2	10	0	0	12	5%	13
34073+05.000	1	0	1	3	0	0	0	3	5%	3
Easton Boulevard										
35073+15.000										
35073+20.000	23	25	48	0	25	0	0	25	5%	26
35073+25.000	28	23	51	0	23	0	0	23	5%	24
35073+30.000	33	22	55	0	22	0	0	22	5%	23
35073+35.000	40	20	60	0	20	0	0	20	5%	21
35073+40.000	50	19	69	0	19	0	0	19	5%	20
35073+45.000	60	18	78	0	18	0	0	18	5%	19
35073+50.000	71	16	87	0	16	0	0	16	5%	17
35073+55.000	82	15	97	0	15	0	0	15	5%	16
35073+60.000	93	45	138	43	18	1	42	18	5%	19
35073+65.000	105	86	191	189	32	2	81	138	5%	145
35073+70.000	116	91	207	381	37	2	80	336	5%	353
35073+75.000	125	89	214	407	35	2	81	359	5%	377
35073+80.000	131	91	222	285	36	2	82	237	5%	249
35073+85.000	135	94	229	169	36	2	80	123	5%	129
35073+87.000	55	35	90	39	10	1	31	17	5%	18
35073+90.000	94	25	119	25	6	0	23	8	5%	8
35073+95.000	175	77	252	63	6	1	61	7	5%	7
35074+00.000	181	176	357	174	29	4	150	49	5%	51
35074+05.000	185	199	384	272	48	5	188	127	5%	133
35074+10.000	189	202	391	371	51	5	194	223	5%	234
35074+15.000	199	201	400	470	52	5	190	327	5%	343
35074+20.000	222	145	367	501	43	3	119	422	5%	443
35074+25.000	247	90	337	432	32	2	48	414	5%	435
35074+25.500	26	9	35	38	3	0	5	36	5%	38



DETAILS OF CLEARING and GRUBBING ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.01

25-JAN-2002 08:58 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.u01

Maple St.

℄ I-235

East 12th St.

Lyon St

0 METERS 50

DETAILS OF CLEARING and GRUBBING ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.02

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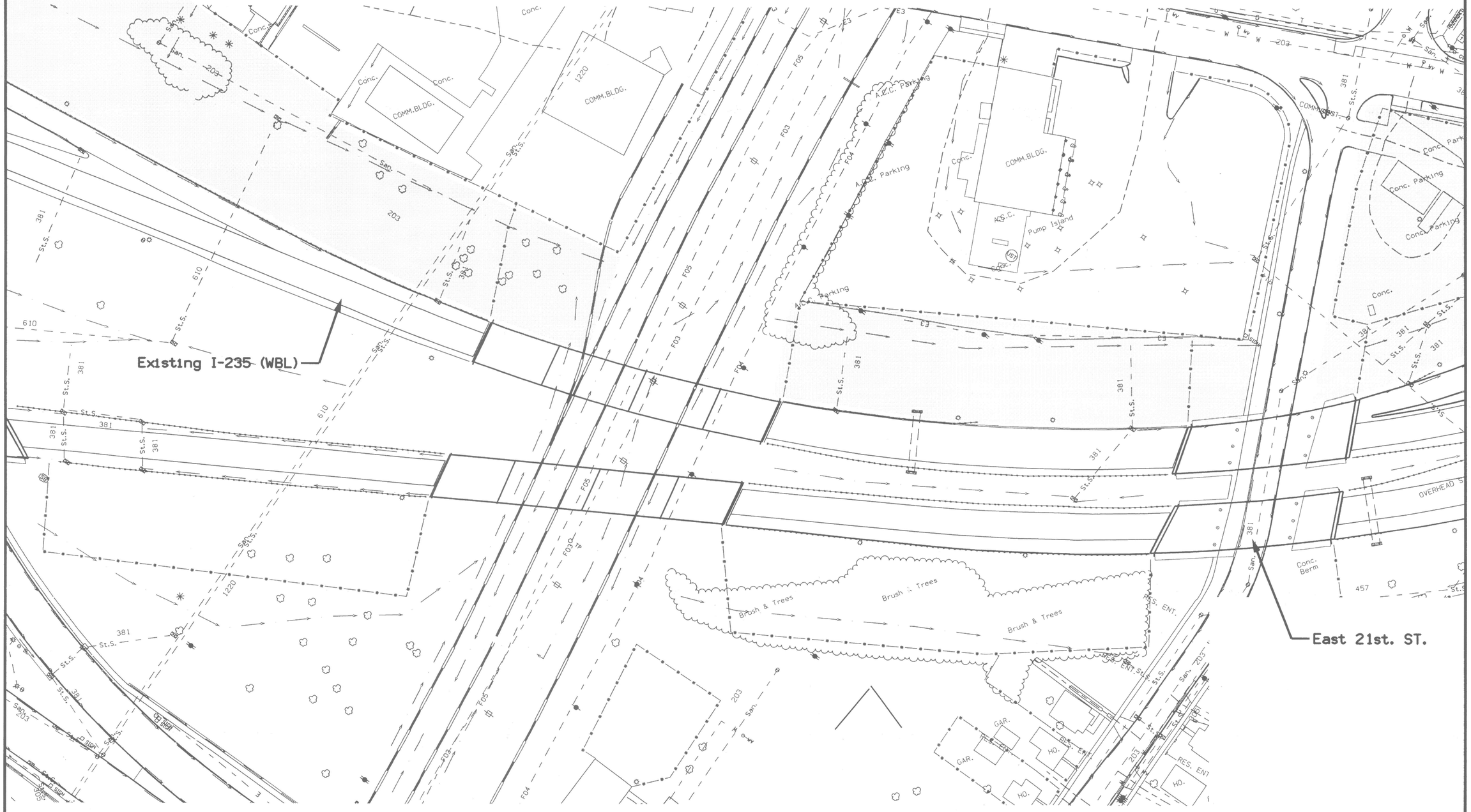

DETAILS OF CLEARING
and GRUBBING ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.03

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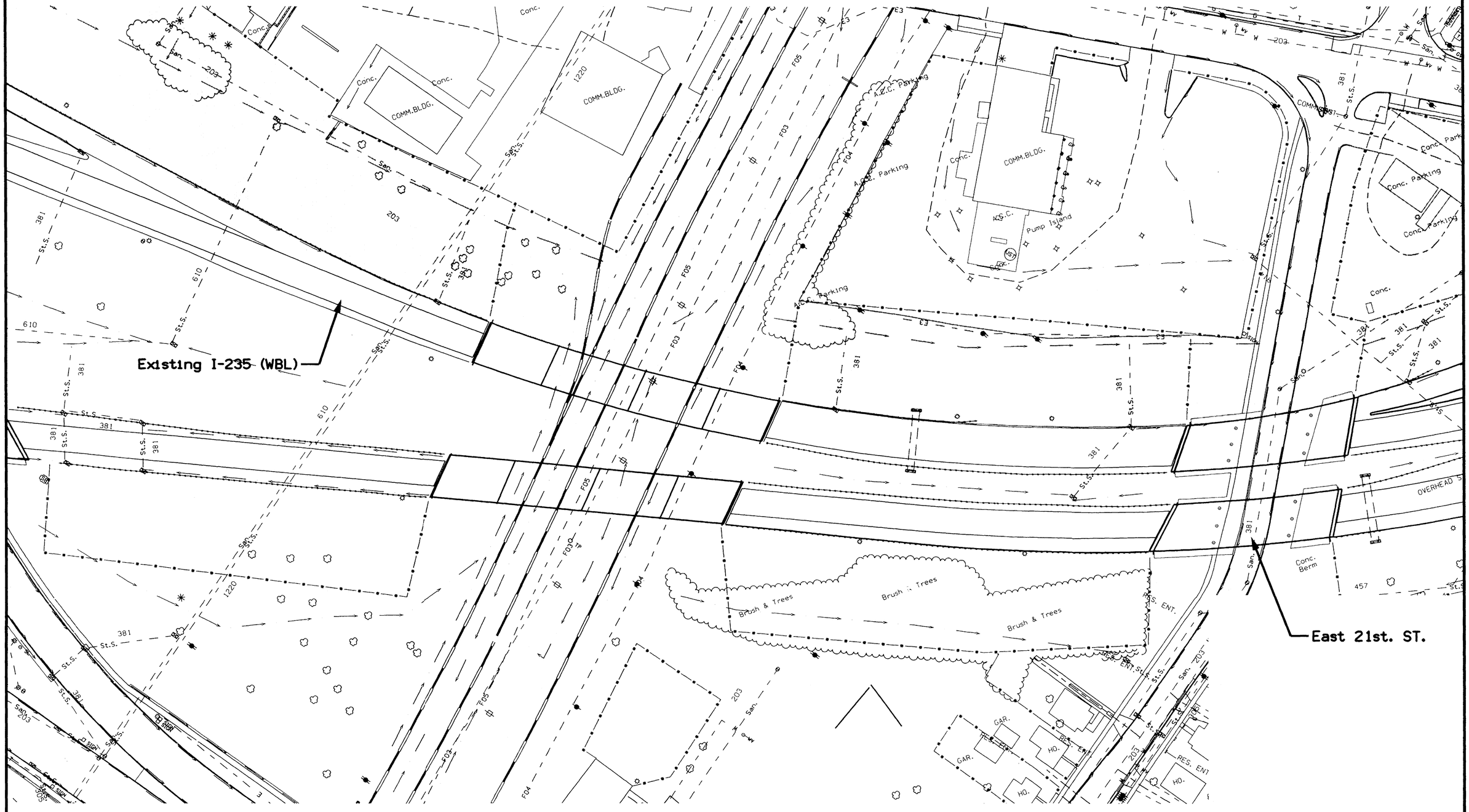

DETAILS OF CLEARING
and GRUBBING ALONG I-235

0 METERS 50

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.03

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Delware Ave.

Easton Blvd.

East 21st. St.

Existing I-235

Easton Blvd.

0 METERS 50

DETAILS OF CLEARING and GRUBBING ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.04

25-JAN-2002 08:59 wnelso2 w:\Projects\77235180C96\Design\grading_(340)\k77235340.u04

East 21nd. St.

Washington Ave.

℄ I-235

Existing I-235

East 22nd. St.

0 METERS 50

DETAILS OF CLEARING and GRUBbING ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.05

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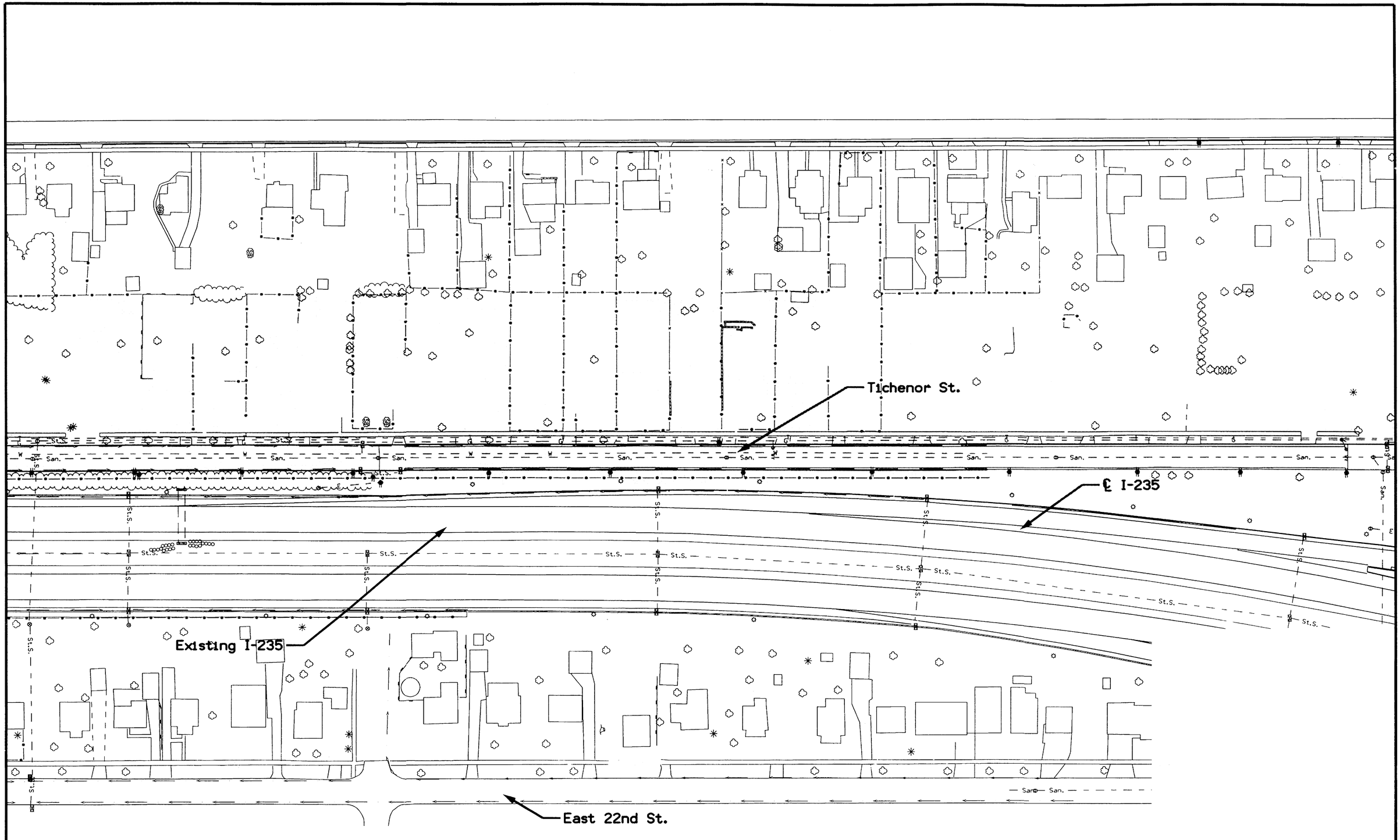

DETAILS OF CLEARING
and GRUBbING ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.06

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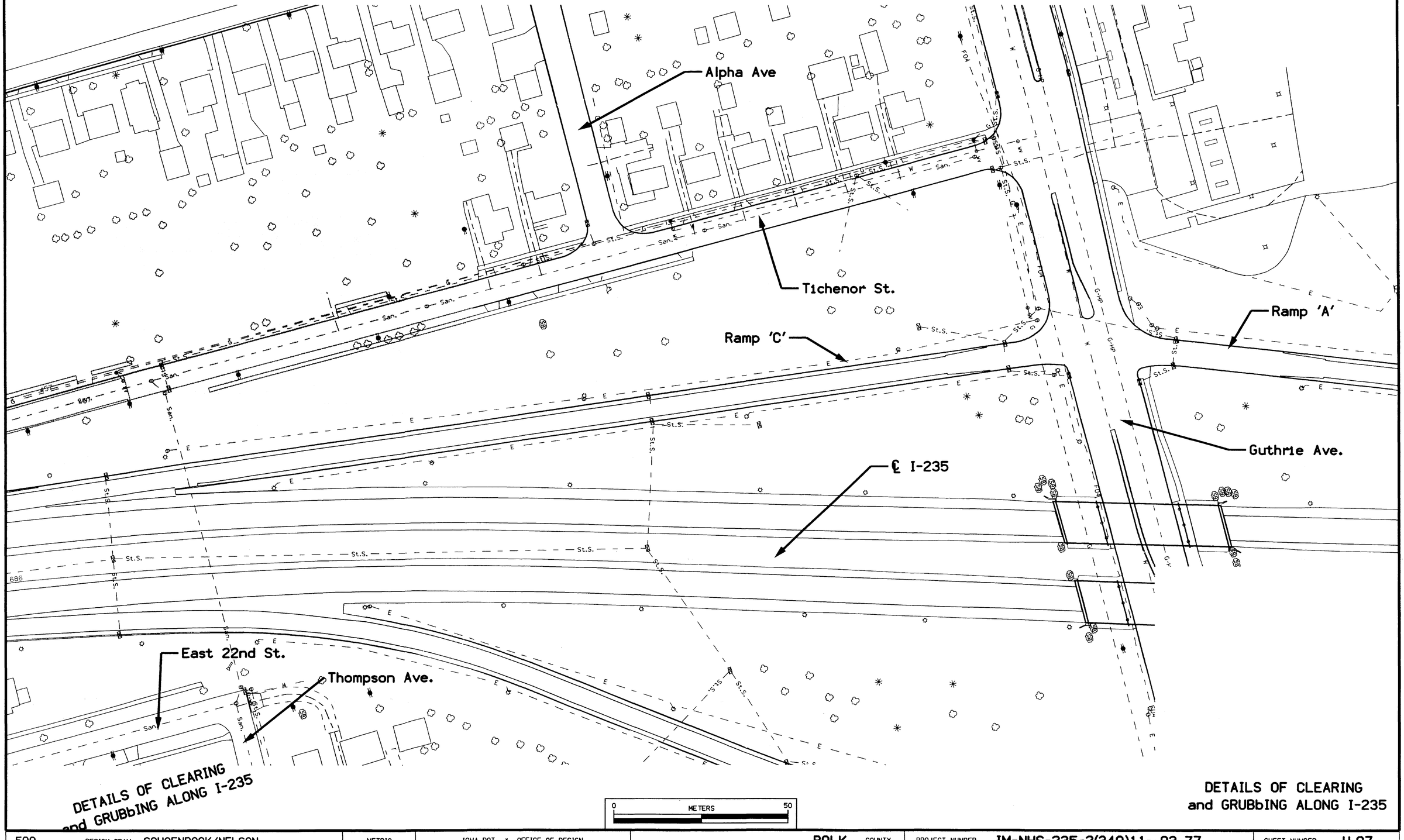

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.07

25-JAN-2002 09:01 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.u07

East 9th. St.

East 11th. St.

Maple St.

Existing I-235

℄ I-235

Penn Ave.

Sidewalk Removal A=92.83 sq. m

Sidewalk Removal A=49.65 sq. m

Sawcut

Pavement Removal A=1077.68 sq. m

Remove San. Sewer

Remove Storm Sewer

Utility Access Sewer

Remove San. Sewer

Remove San. Sewer

Remove Existing Pavement

Remove Existing Sidewalk

0 METERS 50

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.08

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Maple St.

Sawcut

Pavement Removal See Sheet U.08

℄ I-235

East 12th St.

Lyon St

Remove Existing Pavement

Remove Existing Sidewalk

0 METERS 50

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.09

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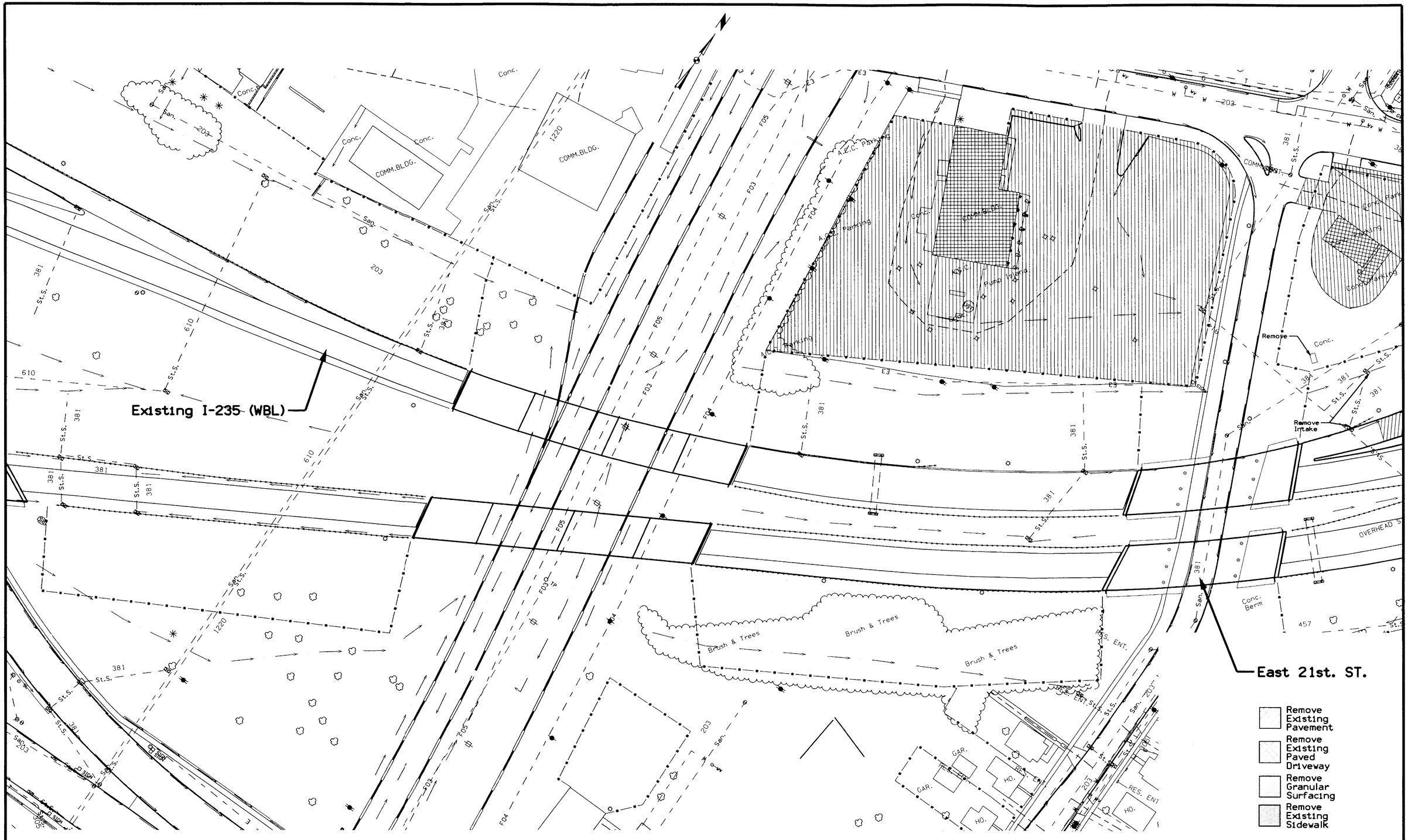

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.10

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Safety Closure

Delware Ave.

Easton Blvd.

East 21st. St.

Existing I-235

Prop RE-3B Rd. Closure Barricade

Prop RE-3B Rd. Closure Barricade

Safety Closure

Easton Blvd.

Remove Existing Pavement

Remove Existing Paved Driveway

Remove Granular Surfacing

Remove Existing Sidewalk

0 METERS 50

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.11	

25-JAN-2002 16:44 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.u11

East 21nd. St.

Washington Ave.

Remove Intake

Remove Storm Sewer

Fill & Abandon San. Sewer

Remove Intake

Remove Intake

Fill & Abandon San. Sewer

Remove Storm Sewer

Remove Lighting Fixture

℄ I-235

Existing I-235

East 22nd. St.

Remove Existing Pavement

Remove Existing Paved Driveway

Remove Granular Surfacing

Remove Existing Sidewalk

0 METERS 50

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.12

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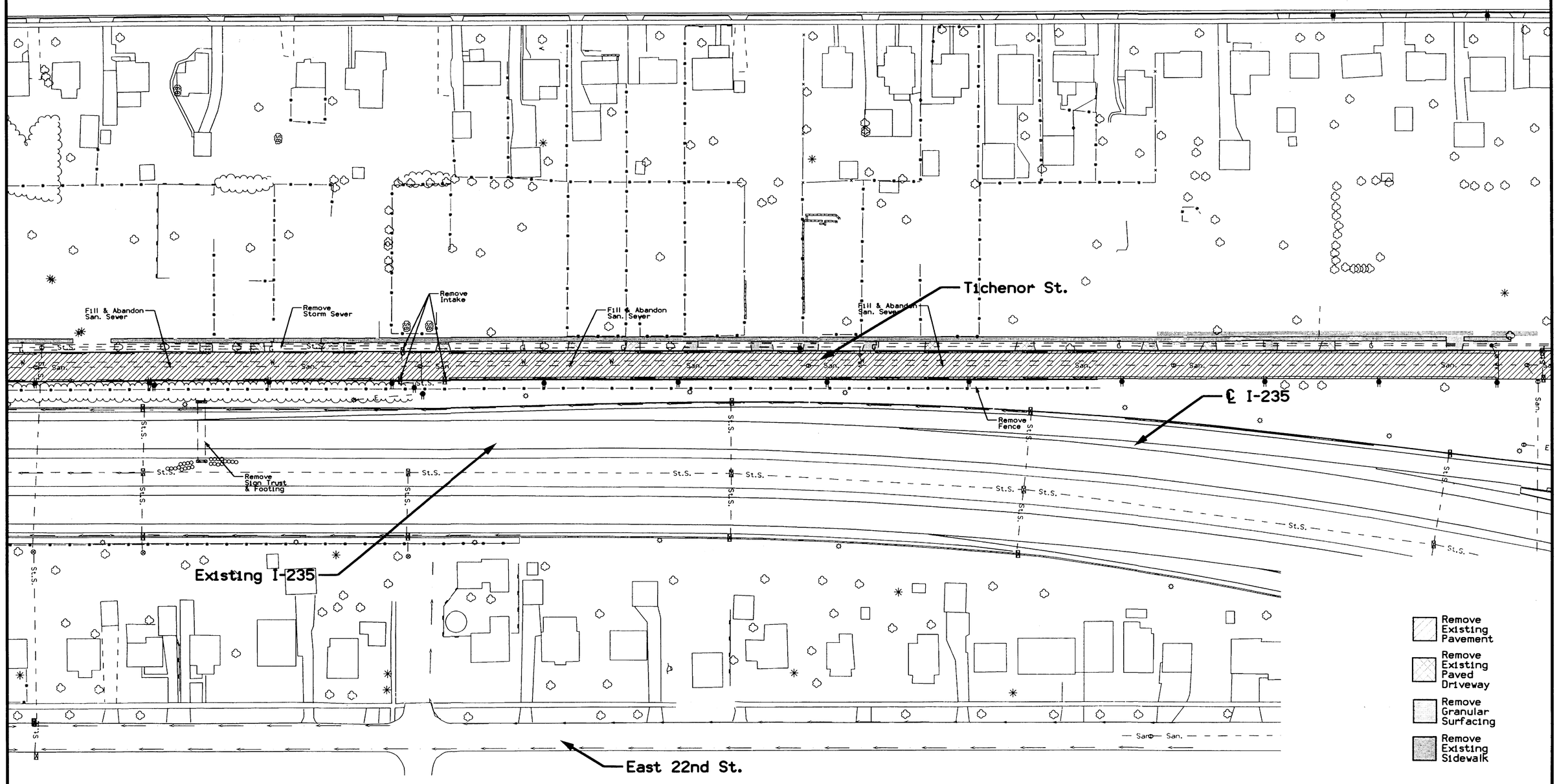

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.13

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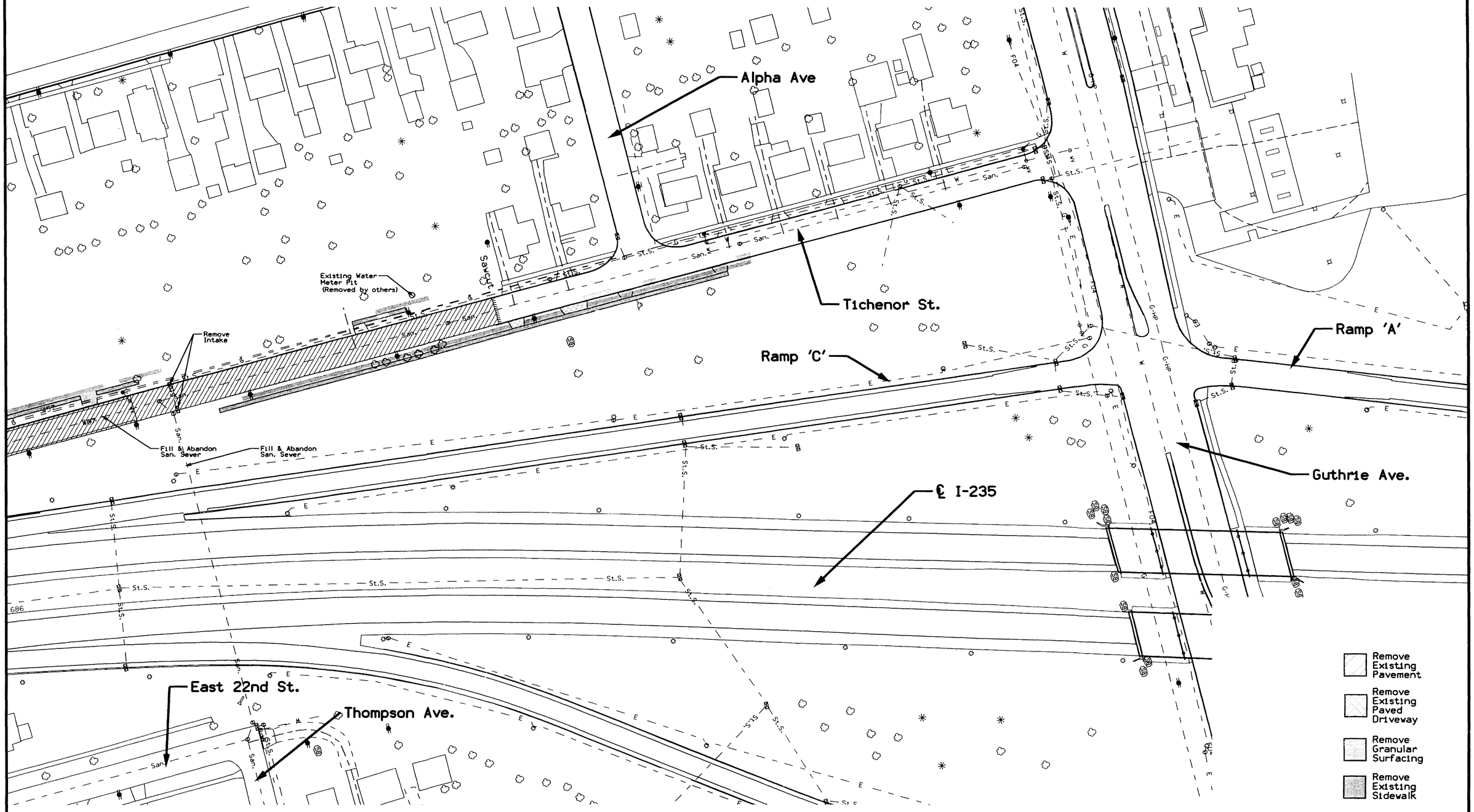
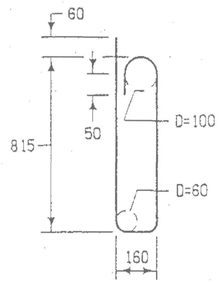


DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.14

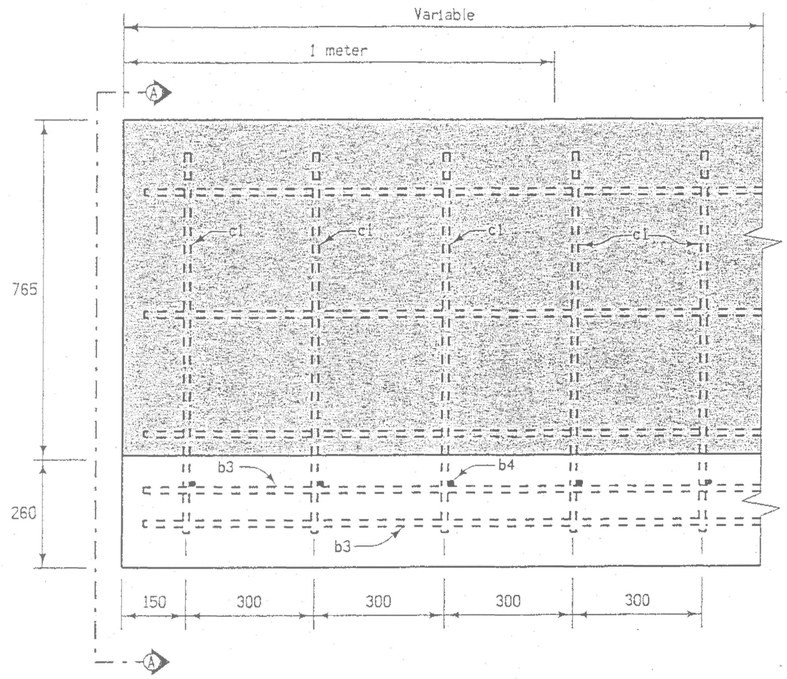
25-JAN-2002 09:35 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.u14

BENT BAR DETAILS



c1

NOTE: All dimensions shown out to out.
D = Pin Diameter



BACK ELEVATION

SECTION A-A

REINFORCING STEEL for (1) lineal meter of VERTICAL WALL								
MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	TOTAL LENGTH	TOTAL MASS	SPACING
b3	15	Footing Longitudinal	——	6	1000	6.00 m	9.42 Kg/m	(1)
b4	15	Footing Transverse	——	3	1085	3.25 m	5.10 Kg/m	300
c1	15	Wall Vertical	(2)	3	2002	6.00 m	9.42 Kg/m	300
d2	15	Wall Horizontal	——	1	1000	1.00 m	1.57 Kg/m	275
d3	15	Wall Horizontal	——	2	1000	2.00 m	3.14 Kg/m	275
d4	15	Wall Horizontal	——	2	1000	2.00 m	3.14 Kg/m	275
			Total			20.25 m	31.79 Kg/m	

GENERAL NOTES:

Details shown hereon are for the construction of a Reinforced Concrete Vertical Barrier Wall. The Wall Section shall be reinforced as detailed and cast in place. The materials and the construction methods used shall be in accordance with the current Standard and Supplemental Specifications.

Details shown are typical. Alternate design details may be submitted to the Engineer for approval.

The concrete for the barrier wall section shall be Class 'D' Structural Concrete placed and finished as specified for "Precast and Prestressed Concrete Bridge Units" in the current Standard Specifications or by a method approved by the Engineer. All exposed corners 90 degrees or sharper are to be filleted with a 13 millimeter dressed and beveled strip.

All reinforcing bars shall be epoxy coated and be grade 400. Minimum clear distance from face of concrete to the nearest reinforcing bar is to be 50 millimeters.

The price bid for "Concrete Barrier, (Vehicle)", per meter shall be concidered full compensation for construction of the barrier wall section as detailed hereon.
This shall include:
Furnishing and placement of structural concrete
Furnishing and installing epoxy coated reinforcing bars.

The price bid for "Reinforced Pavement for Barrier ", per square meter, shall be full compensation for construction of the reinforced paved shoulder as detailed hereon.
This shall include:
Furnishing and placement of P.C. Concrete Pavement
Required pavement joints
Epoxy coated reinforcing steel bars b3, b4 and c1.

Estimated quantites required for one meter of barrer wall:
Concrete Barrier Section
0.20 cubic meters of Class 'D' Structural Concrete
7.9 kilograms of epoxy coated reinforcing steel
Reinforced Paved Shoulder
1.20 square meters of Class 'C' Concrete
23.9 kilograms of epoxy coated reinforcing steel

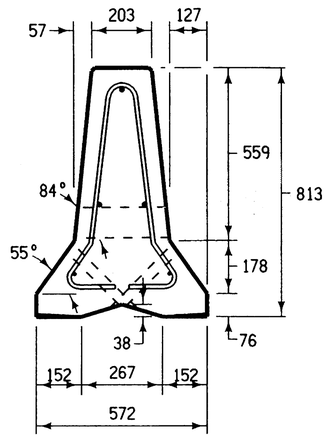
(1) For spacing see details on this sheet.

(2) See Bent Bar Detail

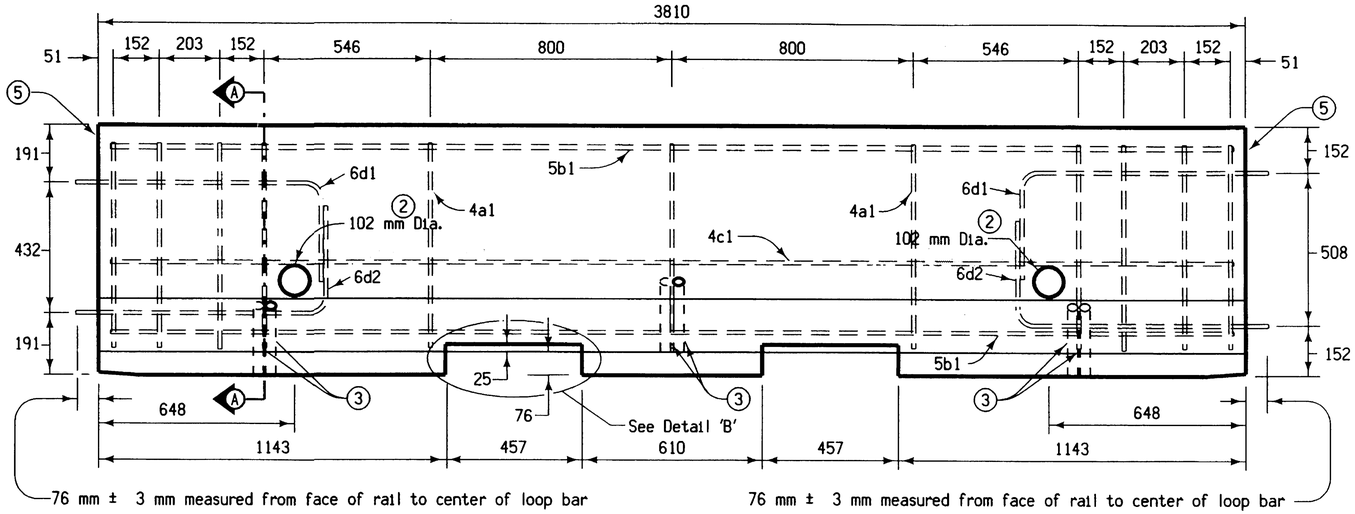
(3) When reinforced bridge approach pavement is present this joint is non-existent.

All dimensions given in millimeters unless noted.

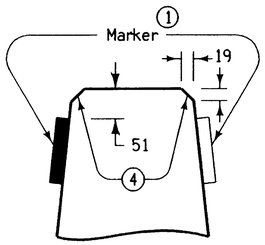
DETAILS OF WALL SECTION
FOR 765 mm HIGH VEHICLE BARRIER
WITH REINFORCED PAVEMENT



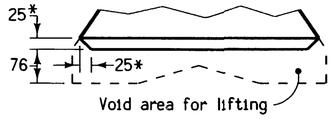
END VIEW



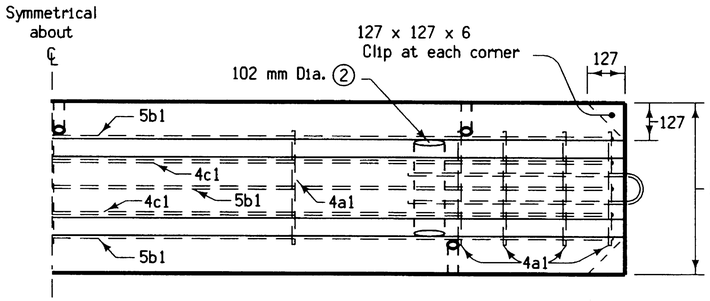
ELEVATION VIEW



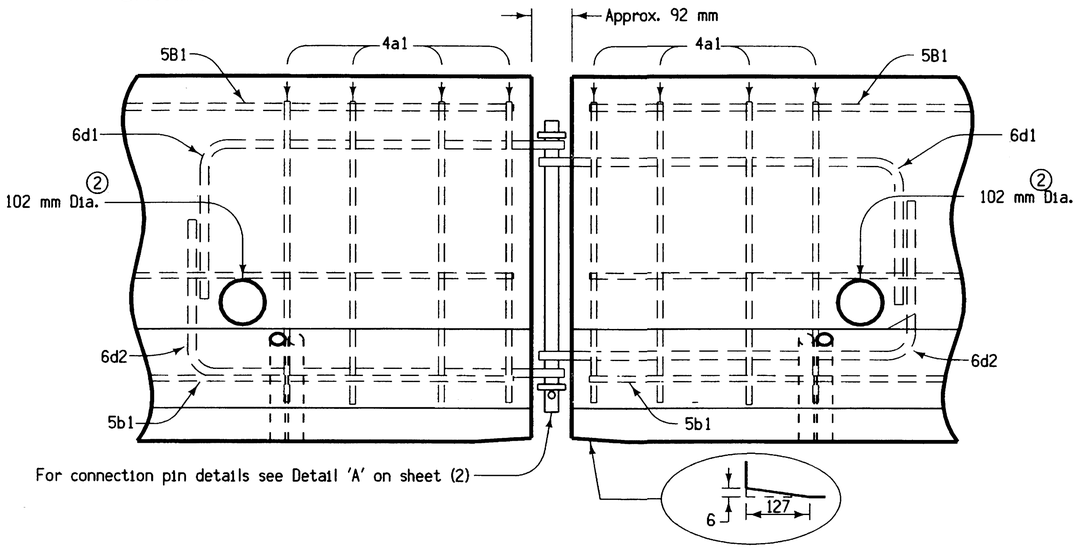
MARKER PLACEMENT DETAIL



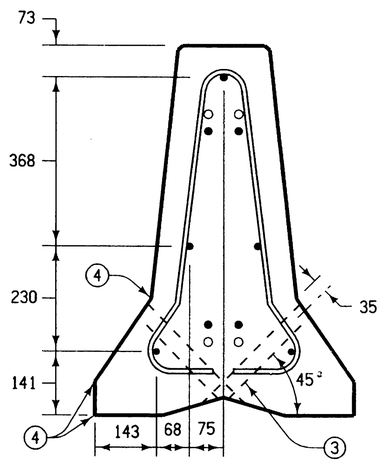
DETAIL 'B'
LIFTING SLOT DETAIL
* 25 mm Chamfer to prevent spalling



PLAN VIEW



DETAILS OF BARRIER CONNECTION



SECTION A-A
TYPICAL SECTION
Stirrup Placement

GENERAL NOTES:

These details are for the fabrication and installation of temporary concrete barrier rail. Details shown are typical.

All reinforcement is grade 60, ASTM A 615, except the loop bars 6d1 and 6d2. The loop reinforcing bars 6d1, 6d2, shall be smooth bars, ASTM A709, HPS 70 W, S84, zone 2 or an approved equivalent.

The Contractor shall provide for an approved monitoring schedule with a person on call and available 24 hours a day, each day of the week, to realign barrier rail which has been struck. Initiation of service shall be within one hour of notification of need.

Markers shall be furnished and installed by the Contractor. Markers shall be placed on the barrier as recommended by the manufacturer and as shown in the Marker Placement Detail. The markers shall be installed at 3.8 meter spacing and face oncoming traffic. Refer to Details of Barrier Placement. The Contractor shall maintain the markers and promptly repair or replace any damaged or missing units. All costs for furnishing, installing and maintaining markers shall be included in the price bid for the temporary barrier rail.

Unless stated otherwise in the plans, the barrier rail sections shall remain the property of the Contractor and at the completion of the work shall be removed from the site by the Contractor.

When Temporary Barrier Rail is installed within 610 millimeters of a dropoff, tie downs as described and shown on Standard Road Plan RE-75 shall be required.

Contract Item is "Temporary Barrier Rail"

NOTE:
Currently approved equivalent steel for the loop reinforcing bars includes:
1. MMFX-2 microcomposite steel. MMFX Steel Corporation.

1. Color same as adjacent edgeline.
2. 102 mm diameter 11 gauge steel round mechanical tubing sleeve.
3. Sleeves for the future tie-down system are to be constructed out of 31 mm nominal, (35 mm actual inside diameter) EMT (Electrical Metallic Tubing). EMT to be tied to stirrup for support.
4. 25 mm radius allowed.
5. Per Materials I. M. 571, one end of each rail shall be permanently marked with the following information:
   - RE-71
   - Type A
   - Manufacturer
   - Date Manufactured (month and year)

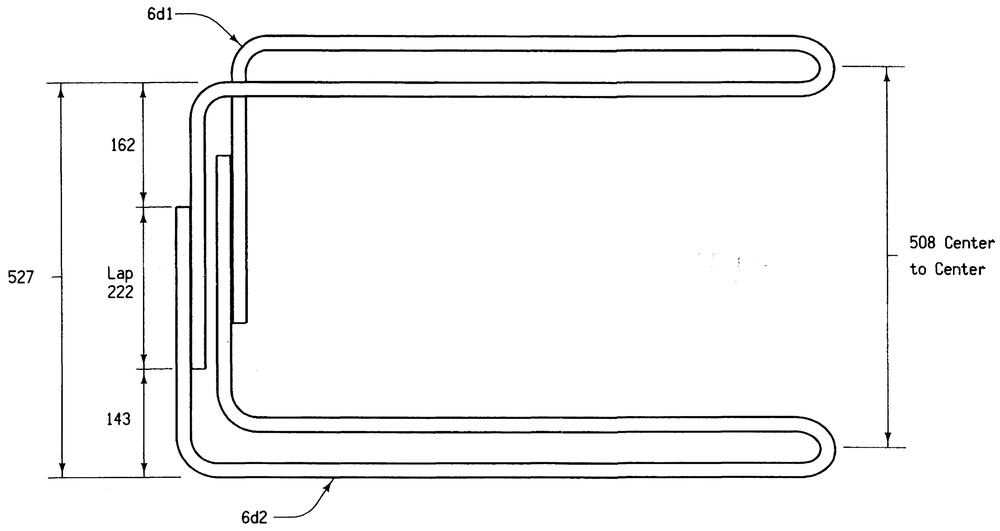
MODIFIED RE-71(1)

F-SHAPE (PRECAST) TEMPORARY CONCRETE BARRIER RAIL

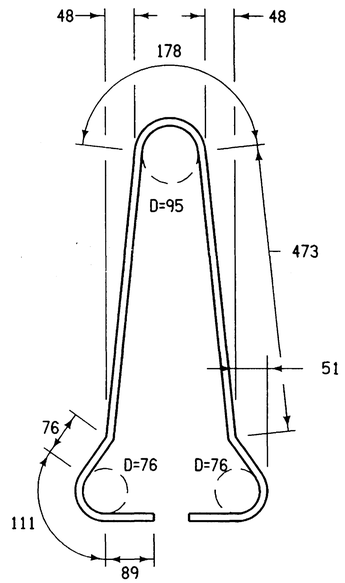
(PAGE 1 OF 2)

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC		POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.16	

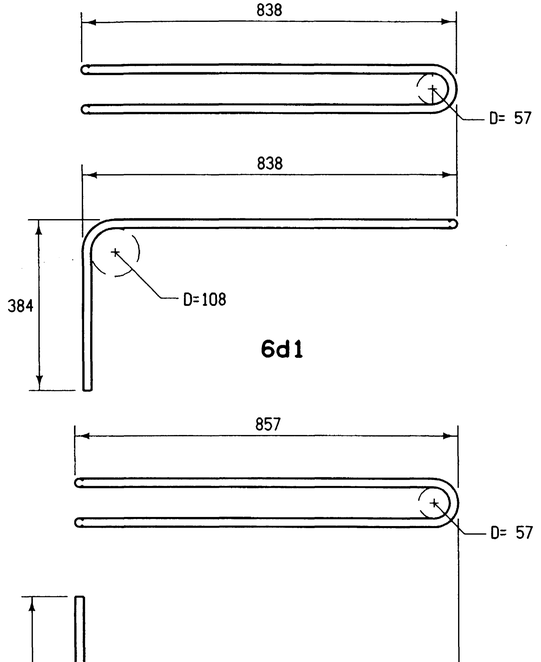
27-JAN-2002 16:44 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.u16



RIGHT LOOP BAR ASSEMBLY 6d1 and 6d2

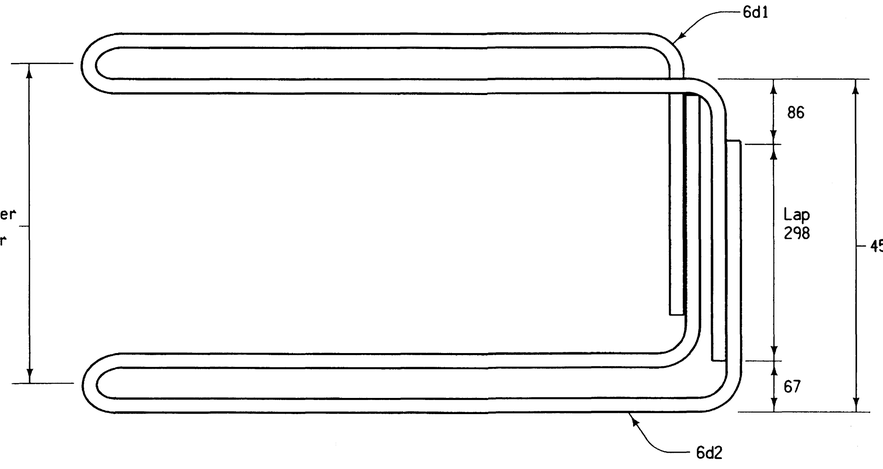


Vertical Hoops
4a1



6d1

6d2

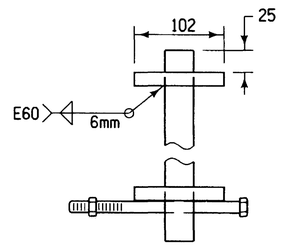


LEFT LOOP BAR ASSEMBLY 6d1 and 6d2

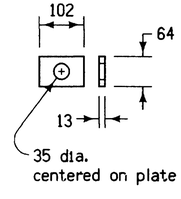
Lengths measured along outside of hoops.

REINFORCING BARS
Per 3.8 m Barrier Section

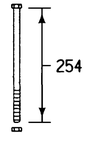
MARK	METRIC DIA.	ENGLISH BAR SIZE	SHAPE	NO. of BARS	LENGTH m	WEIGHT kg
a1	13	4		11	1.7	18.60
b1	16	5		3	3.7	17.23
c1	13	4		2	3.7	7.41
d1	19	6		2	2.4	10.73
d2	19	6		2	2.4	10.73
					TOTAL	64.70



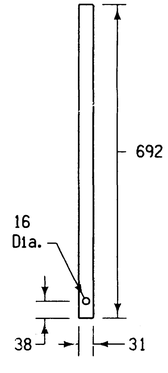
ENLARGED PIN DETAIL



TOP & BOTTOM PLATE
A36 Steel



BOLT & NUT
12.7 dia. bolt & nut
(ASTM A490, Grade 8)



ROD
A36 Steel

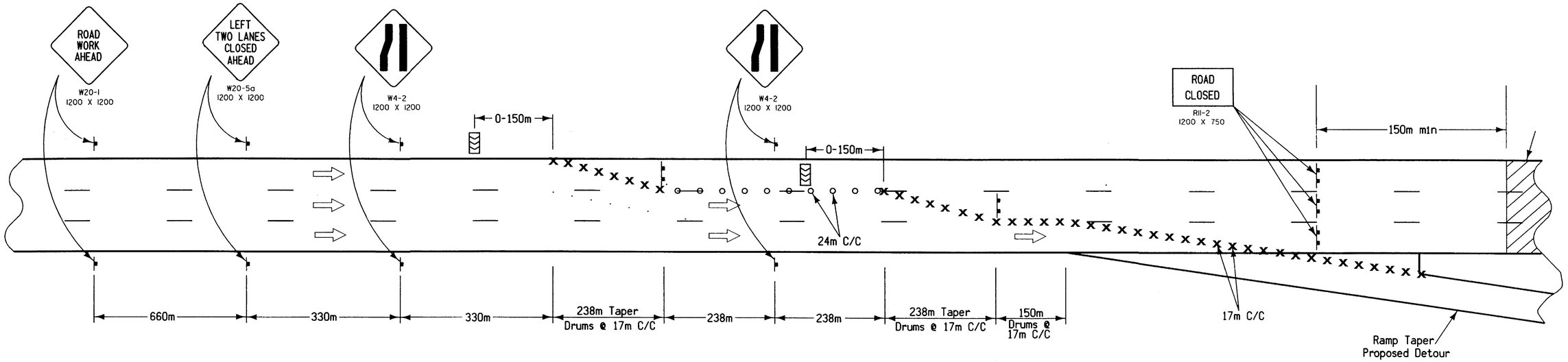
DETAIL 'A'
CONNECTION PIN DETAILS

Note:
The single loop reinforcing bars 6d1, and 6d2 shall be smooth bars, ASTM A–709, HPS 7OW, S84, Zone 2, or

Currently approved equivalent steel for the loop reinforcing bars includes:
1. MMFX–2 microcomposite steel. MMFX Steel Corperation.

MODIFIED RE-71(2)

F-SHAPE (PRECAST)
TEMPORARY CONCRETE BARRIER RAIL
(PAGE 2 OF 2)



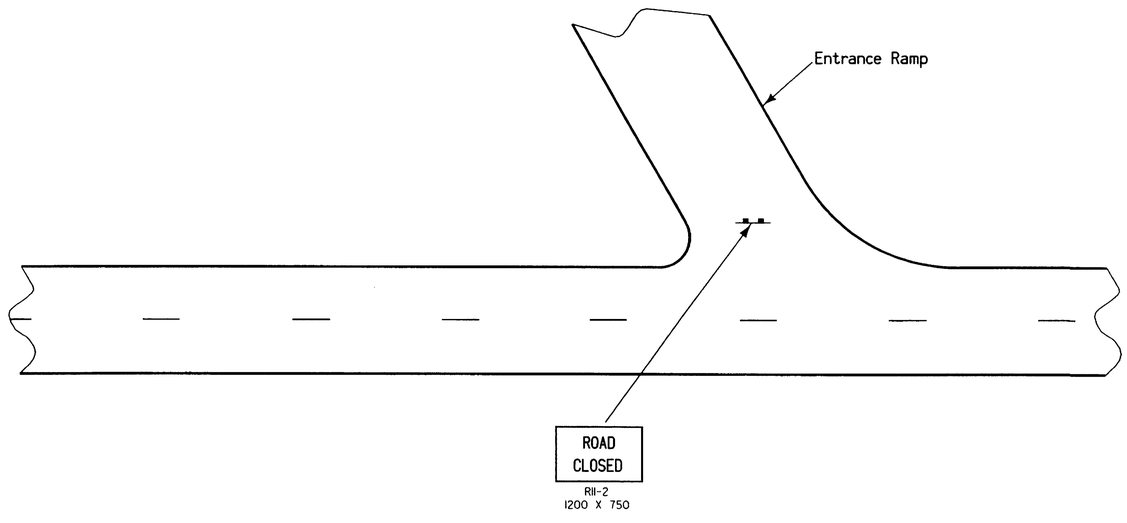
TRAFFIC CONTROL LAYOUT FOR TEMPORARY CLOSURES MULTILANE ON DIVIDED HIGHWAY

GENERAL NOTES:

1. This layout is intended for short-term use during off peak hours.

LEGEND

- Traffic Sign
- x Drum
- o Channelizing Device (Vertical Panel, Type I or Type II Barricade) (to be weighted)
- Type II Barricade (to be weighted)
- Type III Barricade
- Sequencing Arrow (Type "C")



TRAFFIC CONTROL LAYOUT FOR ENTRANCE RAMP CLOSURE

All dimensions given in millimeters unless noted.

MODIFIED DETAIL SHEET

METRIC VERSION

TRAFFIC CONTROL LAYOUT FOR TEMPORARY CLOSURES MULTILANE ON DIVIDED HIGHWAY AND ENTRANCE RAMP CLOSURE

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.18

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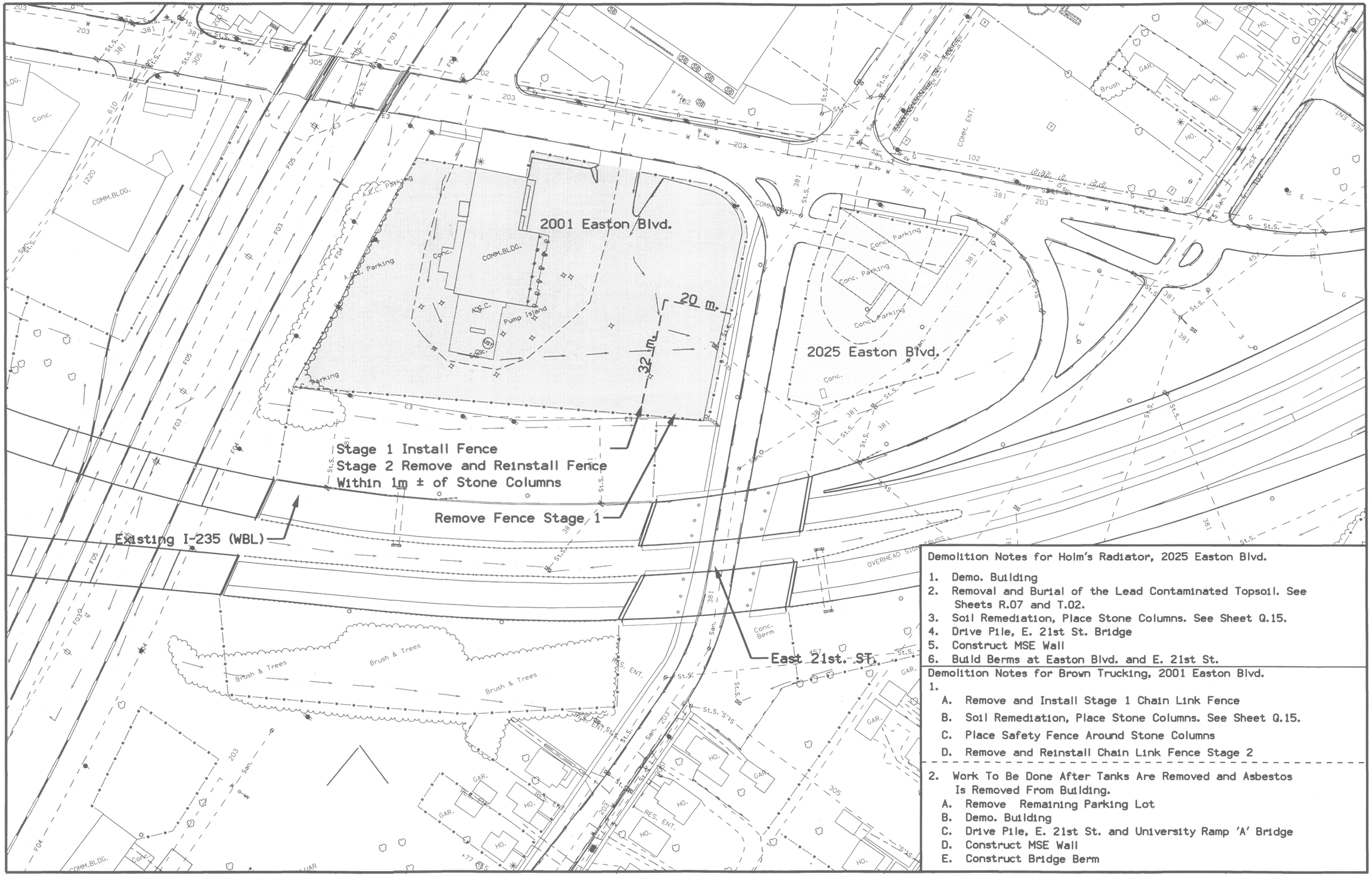


Demolition Notes for Holm's Radiator, 2025 Easton Blvd.

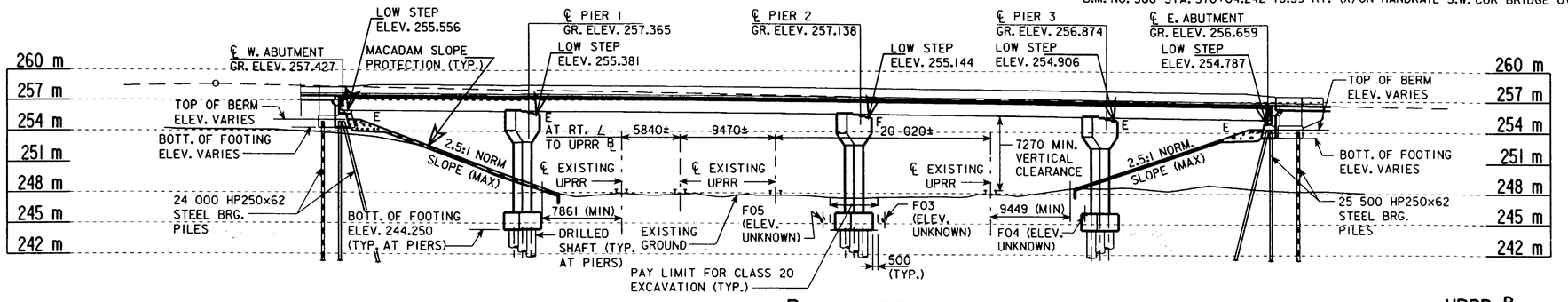
1. Demo. Building
2. Removal and Burial of the Lead Contaminated Topsoil. See Sheets R.07 and T.02.
3. Soil Remediation, Place Stone Columns. See Sheet Q.15.
4. Drive Pile, E. 21st St. Bridge
5. Construct MSE Wall
6. Build Berms at Easton Blvd. and E. 21st St.

Demolition Notes for Brown Trucking, 2001 Easton Blvd.

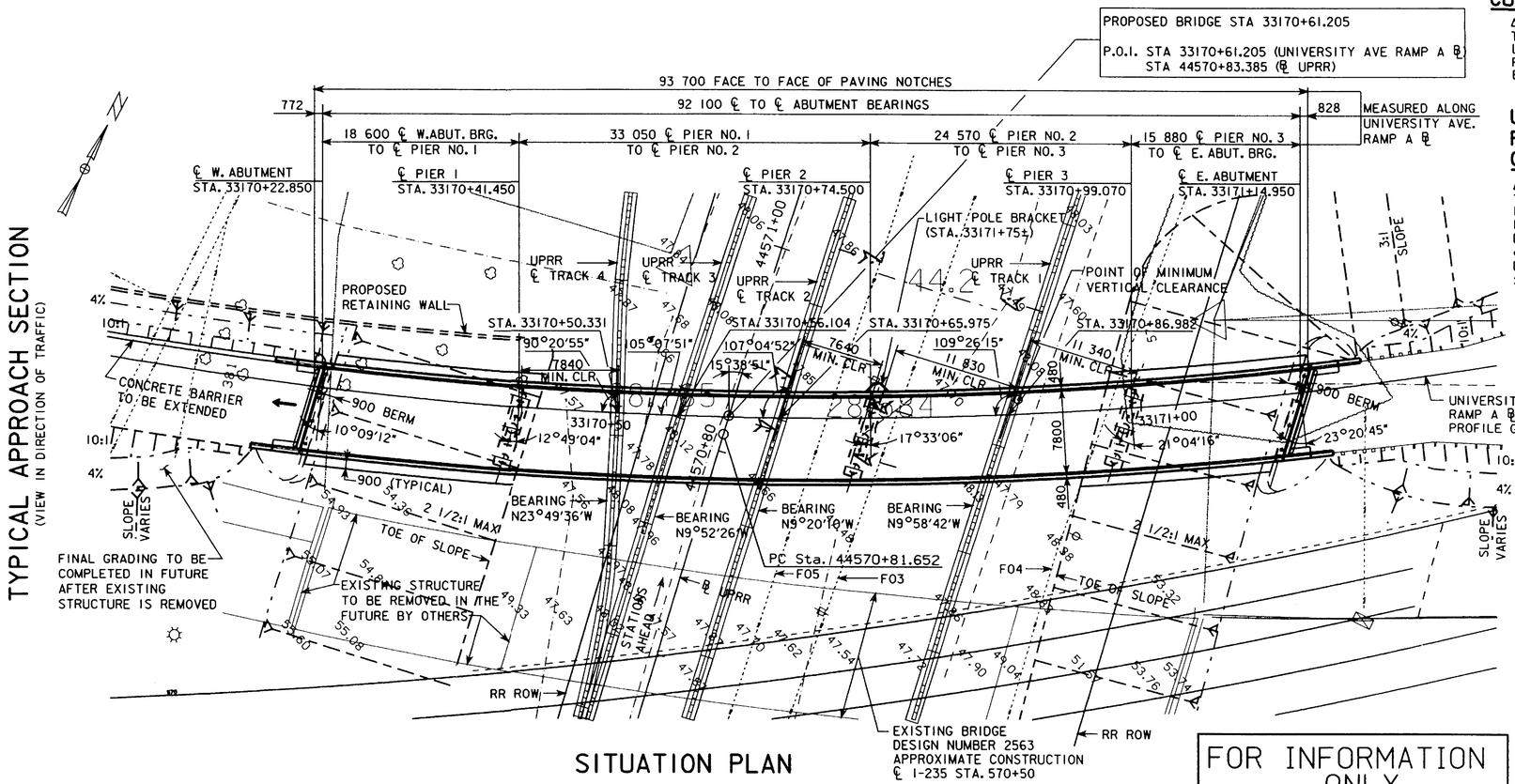
1.
   A. Remove and Install Stage 1 Chain Link Fence
   B. Soil Remediation, Place Stone Columns. See Sheet Q.15.
   C. Place Safety Fence Around Stone Columns
   D. Remove and Reinstall Chain Link Fence Stage 2

2. Work To Be Done After Tanks Are Removed and Asbestos Is Removed From Building.
   A. Remove Remaining Parking Lot
   B. Demo. Building
   C. Drive Pile, E. 21st St. and University Ramp 'A' Bridge
   D. Construct MSE Wall
   E. Construct Bridge Berm

B.M. NO. 566 STA. 570+04.242 16.39 RT. (X) ON HANDRAIL S.W. COR BRIDGE OVER RR TRACKS EAST BOUND LANE FREEWAY ELEV. 257.000



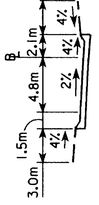
LONGITUDINAL SECTION ALONG ℄ UNIVERSITY AVE. RAMP A



SITUATION PLAN

TYPICAL APPROACH SECTION

(VIEW IN DIRECTION OF TRAFFIC)

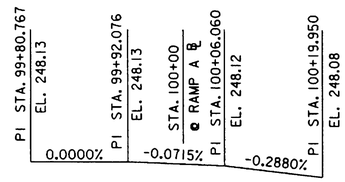


UPRR ℄ CURVE DATA (UAC)

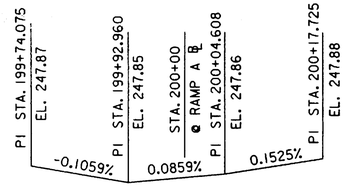
Δ = 5°50'01.24" (RT)
T = 47.895 m
L = 95.708 m
R = 940.000 m
E = 1.219 m

UNIVERSITY AVE. RAMP A ℄ CURVE DATA

Δ = 28°28'51.29" (LT)
T = 101.516 m
L = 198.834 m
R = 400.000 m
E = 12.681 m
e = 5.9%
L = 58.0 m
x = 20.0 m



UPRR TRACK #1 TOP OF RAIL
(USE AS CONSTRUCTED)



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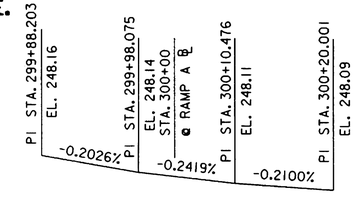

UPRR TRACK #3 TOP OF RAIL
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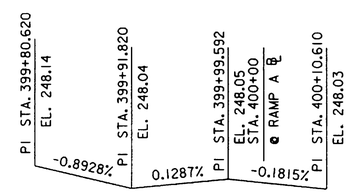


UPRR TRACK #4 TOP OF RAIL
(USE AS CONSTRUCTED)

NOTES:

TRACK PROFILES, ALIGNMENTS AND STATIONING ARE BASED ON SURVEY INFORMATION WITH RESPECT TO THE INDIVIDUAL TRACKS. UNION PACIFIC RAILROAD ℄ CURVE DATA IS AS OBTAINED FROM THE IOWA DEPARTMENT OF TRANSPORTATION.

SEE DESIGN SHEET 31 FOR LIGHTING CONDUIT LAYOUT DETAILS.

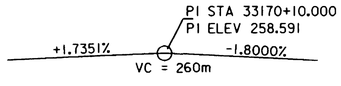
FOR INFORMATION ONLY

TRAFFIC ESTIMATE (RAMP A)

1996 ADT = 48,500 V.P.D.
2025 ADT = 74,100 V.P.D.
TRUCKS 8%

CONSTRUCTION CLEARANCE

MINIMUM CLEARANCES TO BE MAINTAINED DURING CONSTRUCTON:
HORIZ. CLEARANCE=3.66 m FROM ℄ TRACK
VERT. CLEARANCE=6.40 m



PROFILE GRADE ON UNIVERSITY AVE. RAMP A ℄

MINIMUM VERTICAL CLEARANCE

OVERHEAD STATION=33170+88.077; 1.4 m LT
OVERHEAD ELEVATION=256.920
DEPTH OF SUPERSTRUCTURE=1.49 m
UNDERPASS STATION=44570+93.075; 25.097 m RT
UNDERPASS ELEVATION=248.16
MINIMUM VERTICAL CLEARANCE=7.27 m

LOCATION

UNIVERSITY AVE. RAMP A OVER
UNION PACIFIC RAILROAD
T-79N R-24W
SECTION 36
DES MOINES TOWNSHIP
POLK COUNTY
CITY OF DES MOINES
FEDERAL RAILROAD ADMINISTRATION IDENTIFICATION NO.
IOWA CROSSING NO. 14216
FHWA NO. 608630

DESIGN FOR 15°38'51" SKEW (L.A.)

92.1 m x 7.8 CONTINUOUS WELDED CURVED GIRDER BRIDGE

18.600m, 33.050m, 24.570m, 15.880m SPANS

SITUATION PLAN

STATION : 33170+61.205 NOVEMBER 2001

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF ____ FILE NO. 29554 DESIGN NO. 1002

DESIGNED BY KRP CHECKED BY EHF
DETAILED BY FTE CADD FILE h771002.s02

12 JAN 2002 07:12 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.v01

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.01

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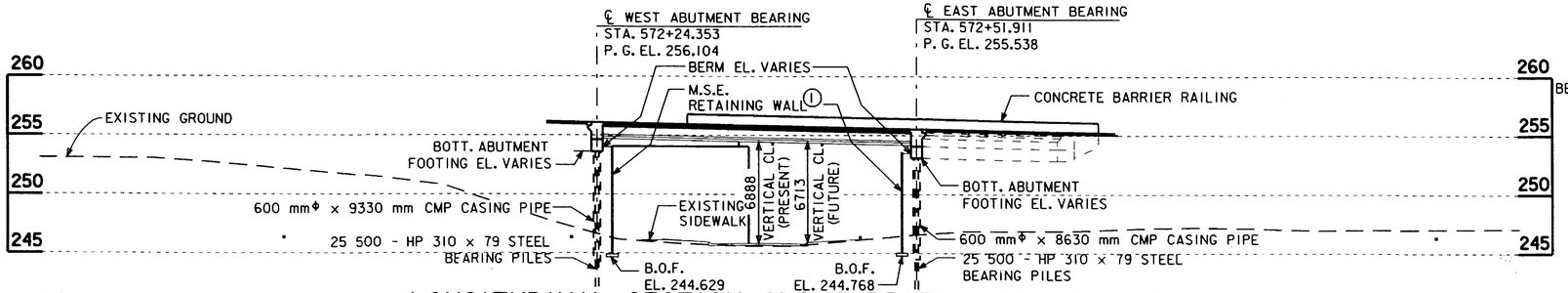
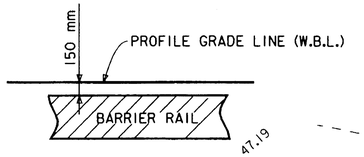
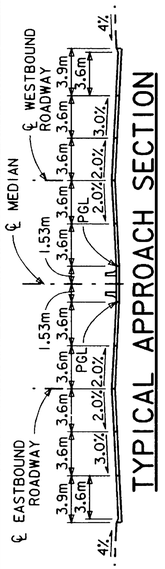


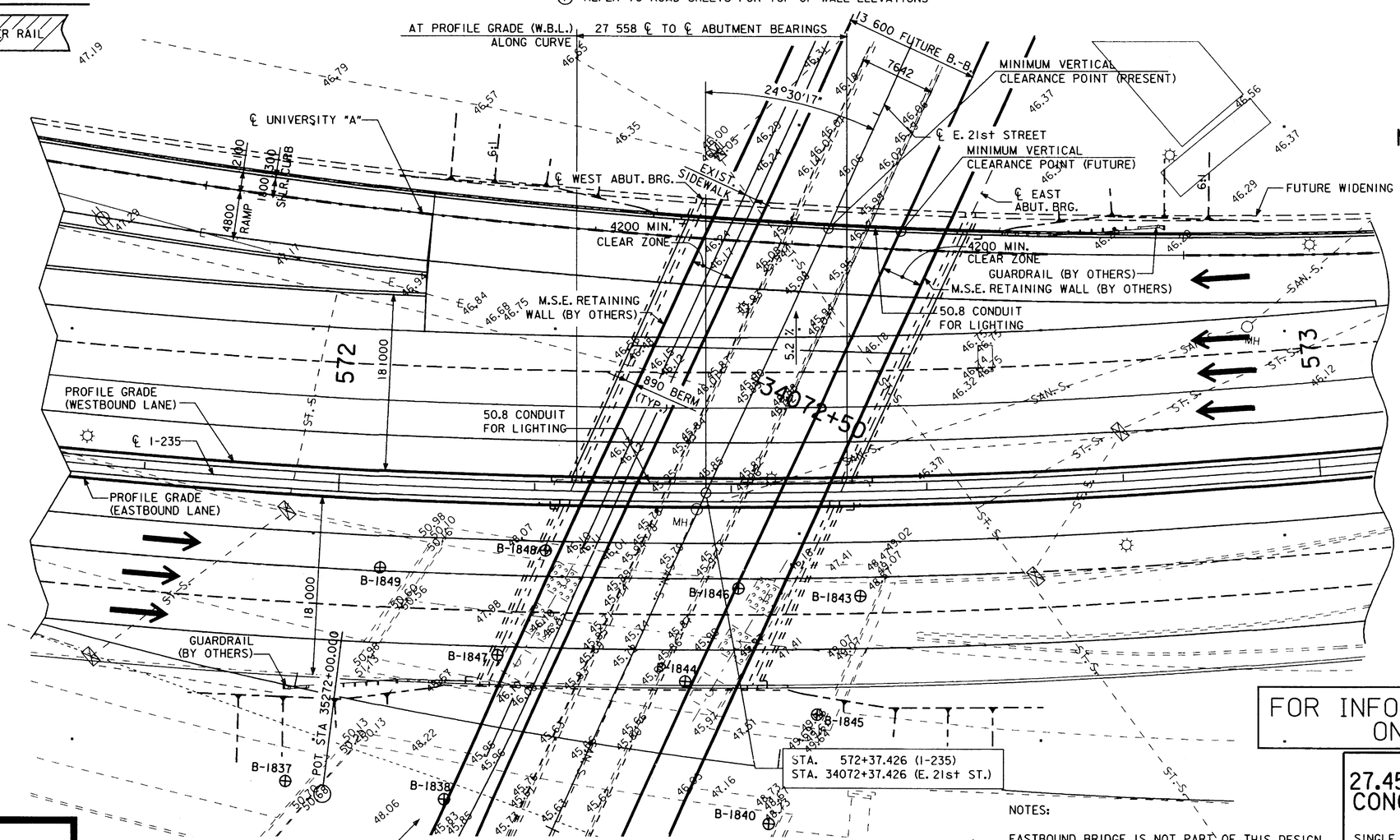
LONGITUDINAL SECTION ALONG PROFILE GRADE LINE

① REFER TO ROAD SHEETS FOR TOP OF WALL ELEVATIONS





TYPICAL APPROACH SECTION



EXISTING CONTINUOUS CONCRETE GIRDER BRIDGES - DESIGN NO. 2363

SITUATION PLAN

NOTE:
SHEET PILING NOT SHOWN.
REFER TO ROAD SHEETS FOR SHEET PILING LAYOUT.

NOTES:

EASTBOUND BRIDGE IS NOT PART OF THIS DESIGN.

ALL DIMENSIONS IN MILLIMETERS (mm) UNLESS NOTED OTHERWISE.

ALL ELEVATIONS ON THESE PLANS SHOWN IN METERS.

ADD 200 METERS TO ALL SPOT ELEVATIONS.

BENCH MARK NO. 698: STA. 572+18.700, RT. 321.43 m. CUT "X" IN N.W. CORNER TRAFFIC SIGNAL BASE, S.E. QUAD HUBBELL AVE. & UNIVERSITY AVE. EL. 245.533

BENCH MARK NO. 567: STA. 572+51.033, RT. 4.09 m. IHC BM. N.W. HANDRAIL BRG. OVER E. 21st STREET EASTBOUND LANE I-235. EL. 251.772

-2.0537 %

P.I. STA. 568+90.000
P.I. ELEV. 262.970

PROPOSED GRADE ON I-235

MINIMUM VERTICAL CLEARANCE PRESENT

OVERHEAD STATION = 572+50.053
26.364 m LT.
OVERHEAD ELEVATION = 254.284
DEPTH OF SUPERSTRUCTURE = 1.385
UNDERPASS STATION = 34072+66.555
UNDERPASS ELEVATION = 246.011
MINIMUM VERTICAL CLEARANCE = 6888

MINIMUM VERTICAL CLEARANCE FUTURE

OVERHEAD STATION = 572+57.696
25.823 m LT.
OVERHEAD ELEVATION = 254.156
DEPTH OF SUPERSTRUCTURE = 1.401
UNDERPASS STATION = 34072+69.295
UNDERPASS ELEVATION = 246.041
MINIMUM VERTICAL CLEARANCE = 6713

CURVE DATA (I-235)

Δ = 60° 12' 09.66" (LT)
T = 405.798 m
L = 735.515 m
E = 109.118 m
R = 700.000 m
e = 5.2%
l = 167.0
x = 96.3 m

CURVE DATA (UNIV. "A")

Δ = 18° 33' 16.32" (LT)
T = 114.3442 m
L = 226.6864 m
E = 9.2775 m
R = 700.000 m

LOCATION

I - 235 OVER EAST 21st STREET
T 79 N R 23 W
SECTION 31
LEE TOWNSHIP
POLK COUNTY
CITY OF DES MOINES
FHWA # 608760

TRAFFIC ESTIMATE

ADT = 48,500 VPD (1996)
ADT = 74,100 VPD (2025)
8% TRUCKS

FOR INFORMATION ONLY

DESIGN FOR VARIABLE° SKEW L.A.

27.45 m x VAR. PRETEN. PRESTRESSED CONCRETE BULB TEE BEAM BRIDGE

OVER EAST 21st STREET

SINGLE SPAN — BTCM BEAMS

SITUATION PLAN (W.B.L.)

STATION: 572+37.426 (I-235)
STATION: 34072+37.426 (E. 21st ST.)
NOVEMBER, 2001

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 29 FILE NO. 29554 DESIGN NO. 1102

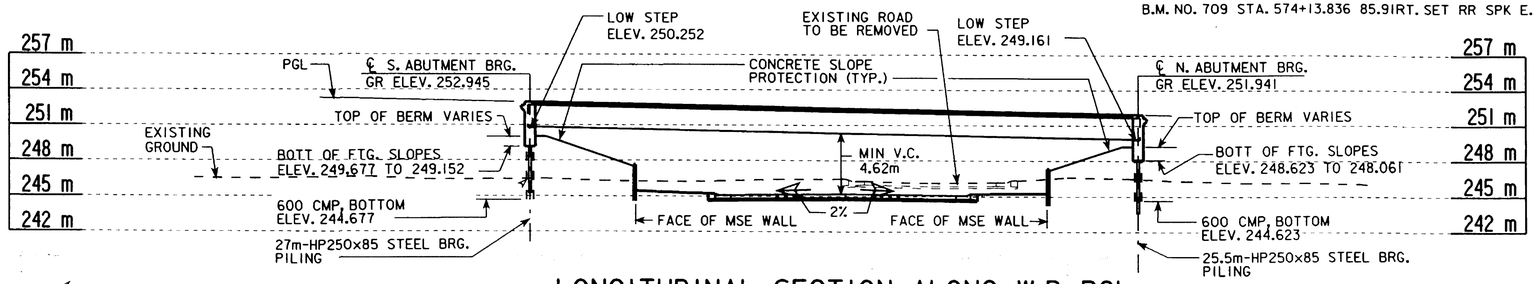
WHKS & CO.
ENGINEERS PLANNERS LAND SURVEYORS
MASON CITY, IA DUBUQUE, IA AMES, IA ROCHESTER, MN

DESIGNED BY K.B.K. CHECKED BY F.K.D.
DETAILED BY L.M.G. CADD FILE H771102.S02

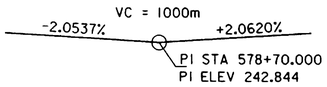
1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--05-77	SHEET NUMBER V.02

12-JAN-2002 07:12 wneiso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.v01

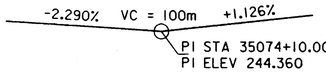
B.M. NO. 709 STA. 574+13.836 85.9IRT. SET RR SPK E. SIDE P. POLE W. OF E. 22ND ST & ELIZABETH AVE ELEV. 245.908



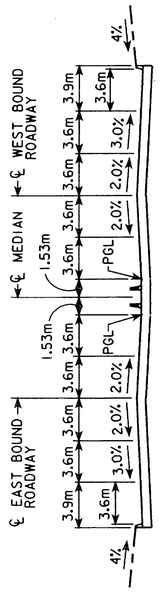
LONGITUDINAL SECTION ALONG W.B. PGL



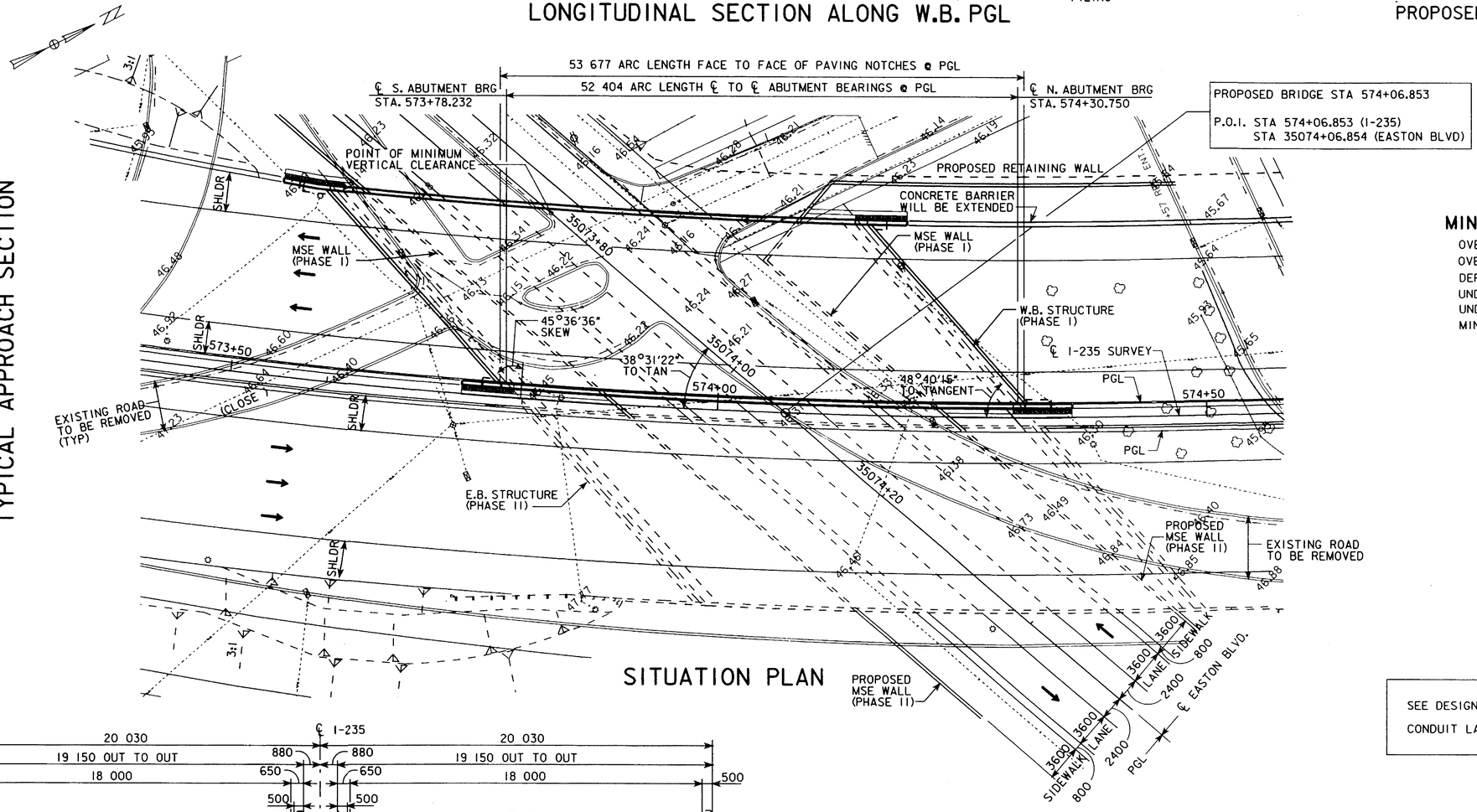
PROPOSED GRADE ON I-235



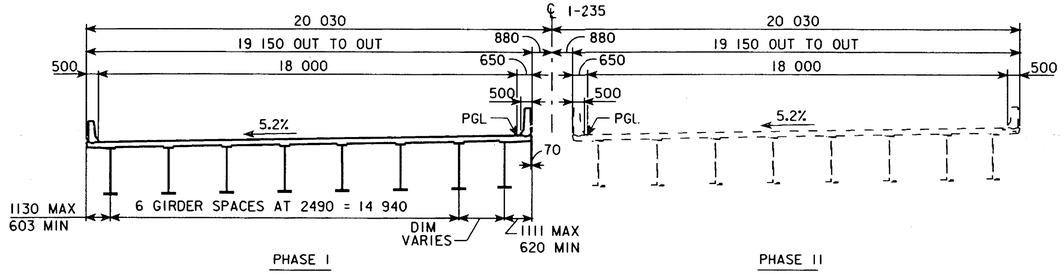
PROPOSED GRADE ON EASTON BLVD



TYPICAL APPROACH SECTION



SITUATION PLAN



TYPICAL DECK SECTION ON I-235

I-235 CURVE DATA

Δ = 60°12'09.70" (LT)
T = 405.798 m
L = 735.515 m
E = 109.118 m
R = 700.0 m
e = 5.2%
P.I. STA. 574+05.662

MINIMUM VERTICAL CLEARANCE

OVERHEAD STATION=573+80.823 m; 19.665 LT
OVERHEAD ELEVATION=251.950
DEPTH OF SUPERSTRUCTURE=2.12 m
UNDERPASS STATION=35073+74.52; 0.00 LT
UNDERPASS ELEVATION=245.208
MINIMUM VERTICAL CLEARANCE=4.62 m

LOCATION

WB I-235 OVER EASTON BLVD
T-79 N R-23 W
SECTION 31
DELAWARE TOWNSHIP
POLK COUNTY
CITY OF DES MOINES
FHWA #608570

TRAFFIC ESTIMATE

ADT = 48 500 VPD (1996)
ADT = 74 100 VPD (2025)
8% TRUCKS

SEE DESIGN SHEET 27 FOR LIGHTING CONDUIT LAYOUT DETAILS.

FOR INFORMATION ONLY

DESIGNED BY RDW CHECKED BY EHF
DETAILED BY FTE CADD FILE h771202.s02

DESIGN FOR 45°00'00" SKEW (R.A.)

52.4m x 18.0m SIMPLE SPAN WELDED GIRDER BRIDGE

53.6m SPAN

SITUATION PLAN

STATION : 574+06.853 (I-235) NOVEMBER 2001
STATION : 35074+06.854 (EASTON BLVD)

POLK COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF ____ FILE NO. 29554 DESIGN NO. 1202

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.03

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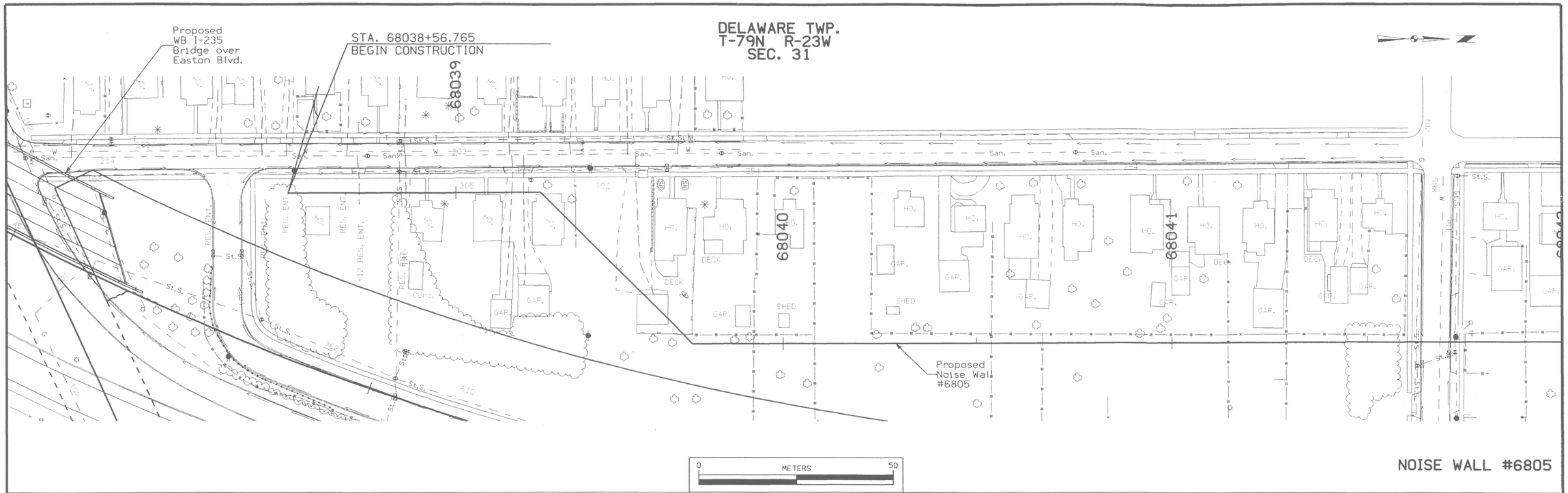
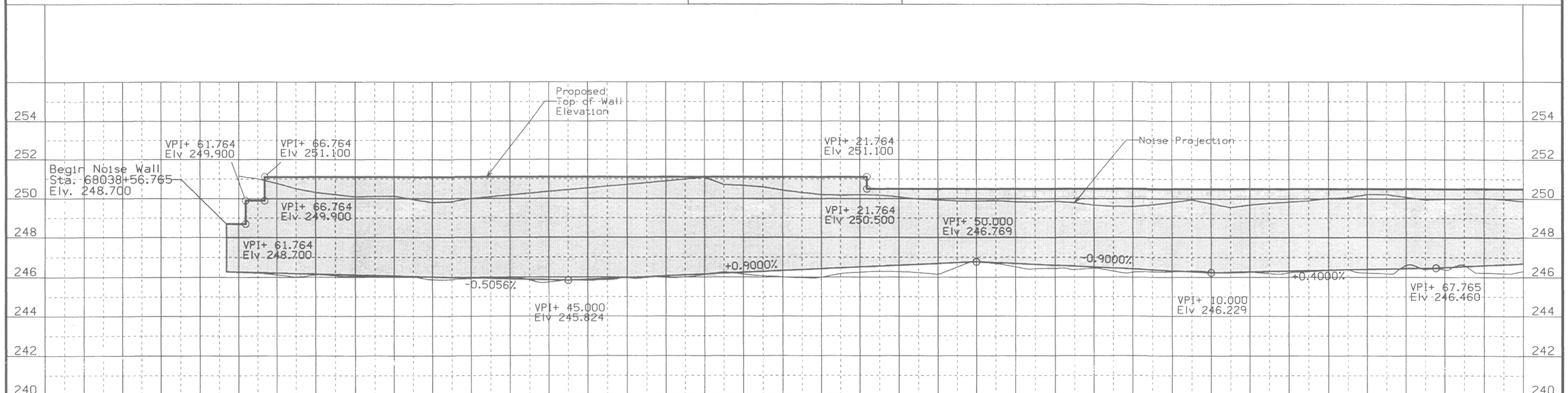


NOISE WALL #6805

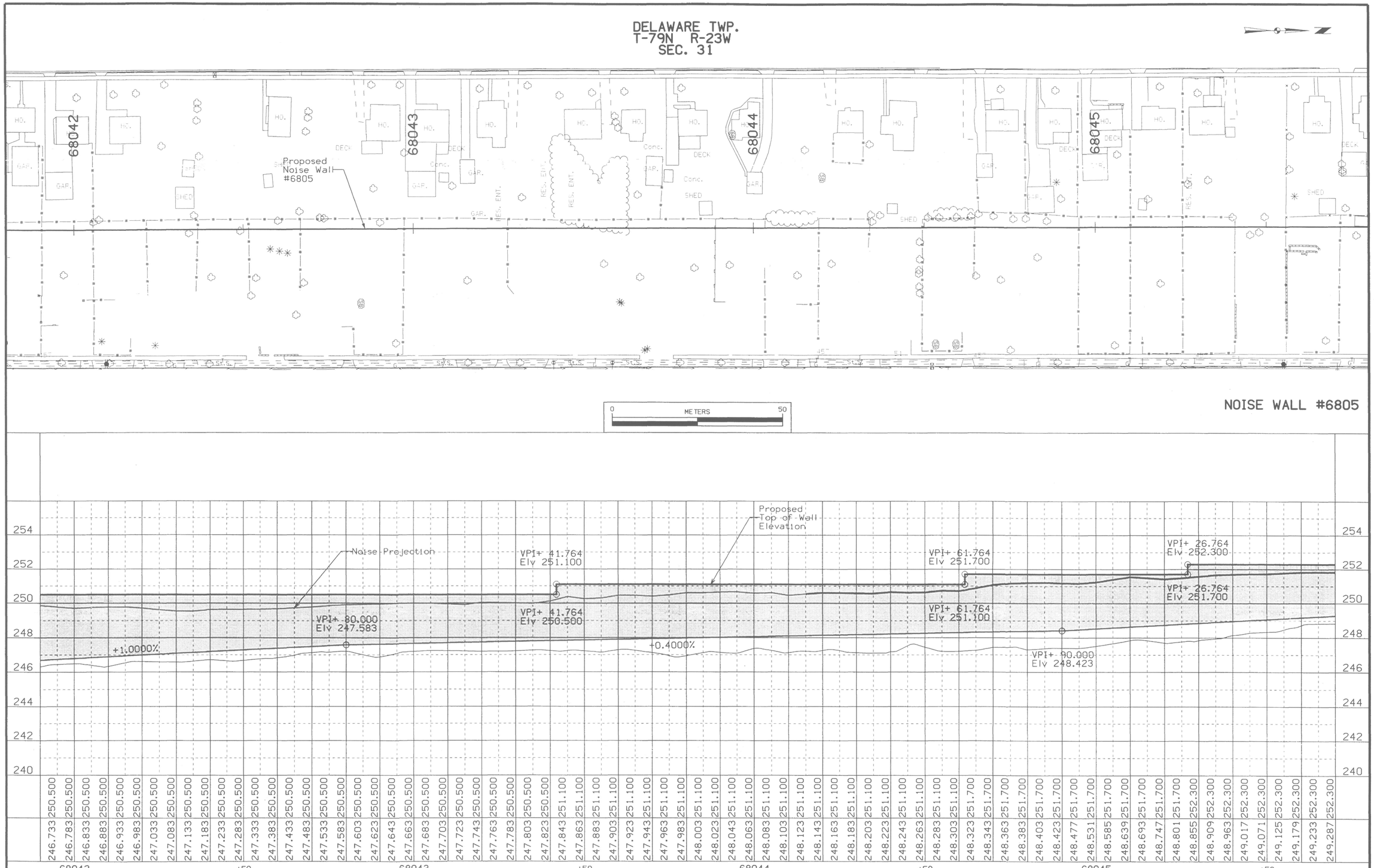


Proposed Top of Wall Elevations	Proposed Ground Elevations at the Face of Wall
248.700	246.254
249.900	246.229
251.100	246.203
251.100	246.178
251.100	246.153
251.100	246.128
251.100	246.102
251.100	246.077
251.100	246.052
251.100	246.026
251.100	246.001
251.100	245.976
251.100	245.951
251.100	245.925
251.100	245.900
251.100	245.875
251.100	245.849
251.100	245.824
251.100	245.869
251.100	245.914
251.100	245.959
251.100	246.004
251.100	246.049
251.100	246.094
251.100	246.139
251.100	246.184
251.100	246.229
251.100	246.274
251.100	246.319
251.100	246.364
251.100	246.409
251.100	246.454
251.100	246.499
250.500	246.544
250.500	246.589
250.500	246.634
250.500	246.679
250.500	246.724
250.500	246.769
250.500	246.724
250.500	246.679
250.500	246.634
250.500	246.589
250.500	246.544
250.500	246.499
250.500	246.454
250.500	246.409
250.500	246.364
250.500	246.319
250.500	246.274
250.500	246.229
250.500	246.249
250.500	246.269
250.500	246.289
250.500	246.309
250.500	246.329
250.500	246.349
250.500	246.369
250.500	246.389
250.500	246.409
250.500	246.429
250.500	246.449
250.500	246.483
250.500	246.533
250.500	246.583
250.500	246.633
250.500	246.683

68039 +50 68040 +50 68041 +50 68

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.04

14-JUN-2002 15:34 jvorthe x:\Projects 77235180096 Design\grading\340\k77235340.v04



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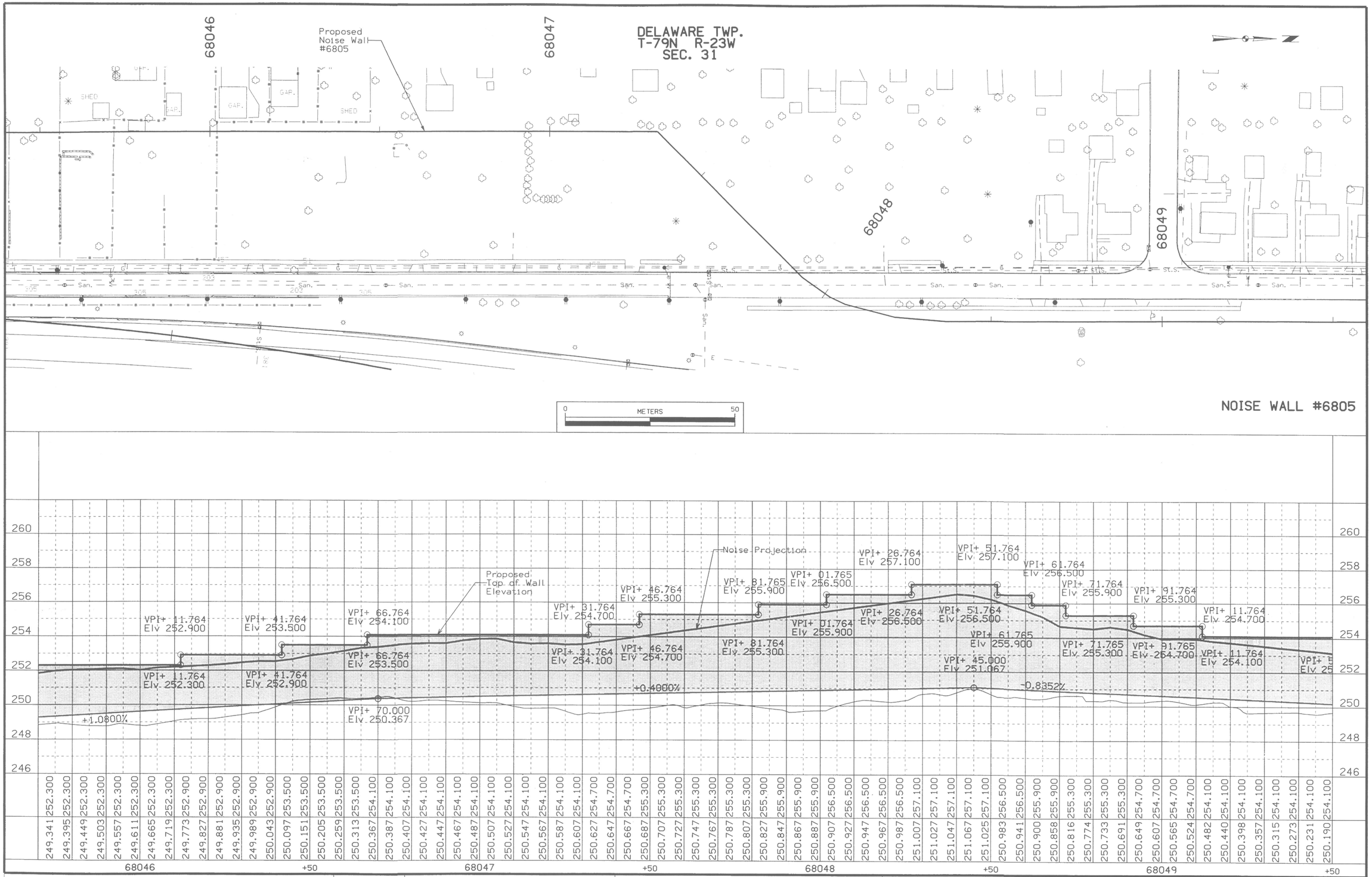

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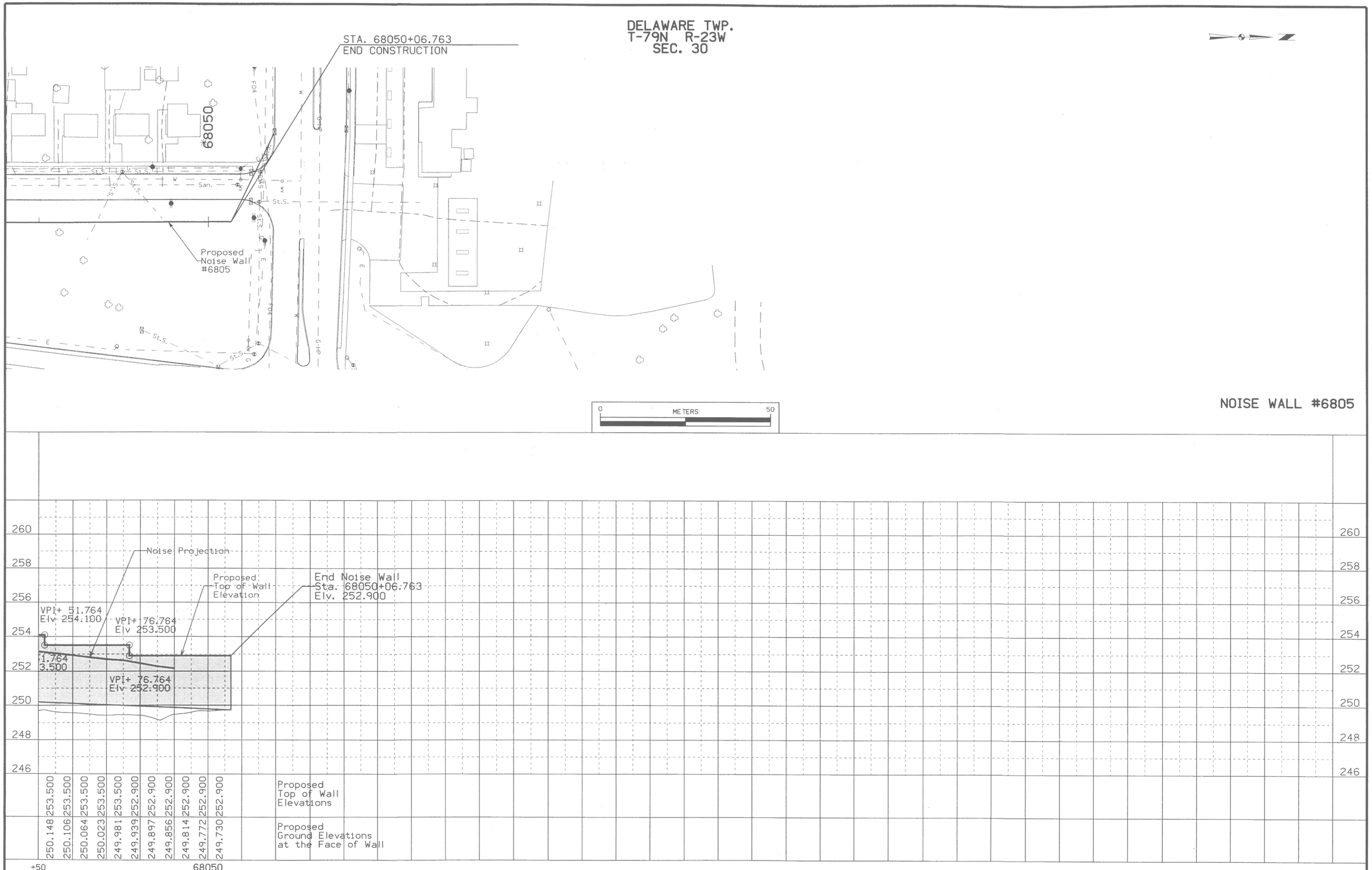

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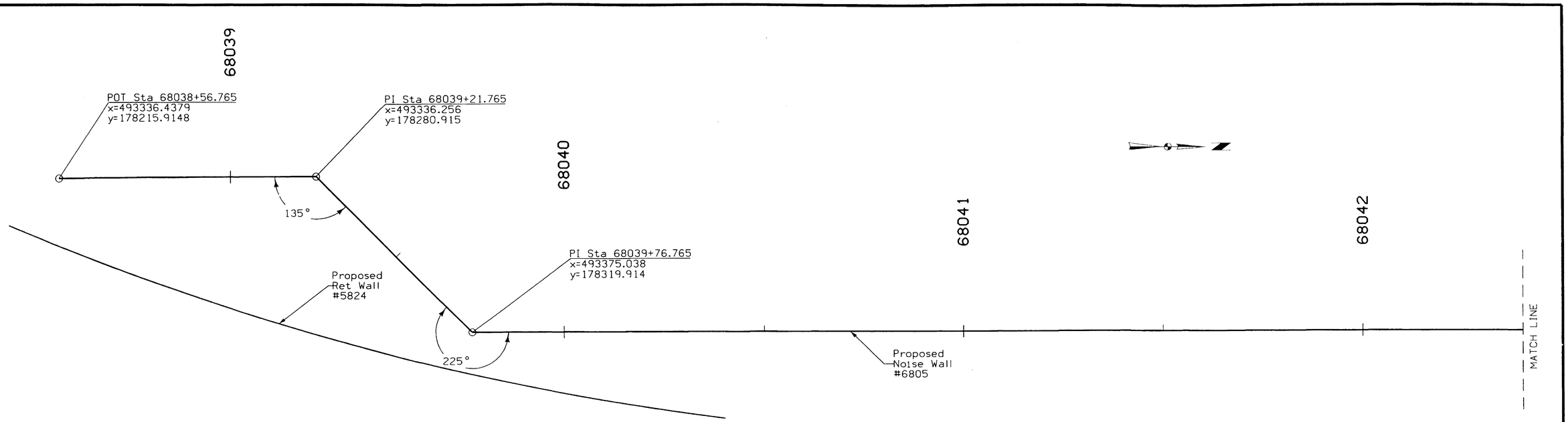
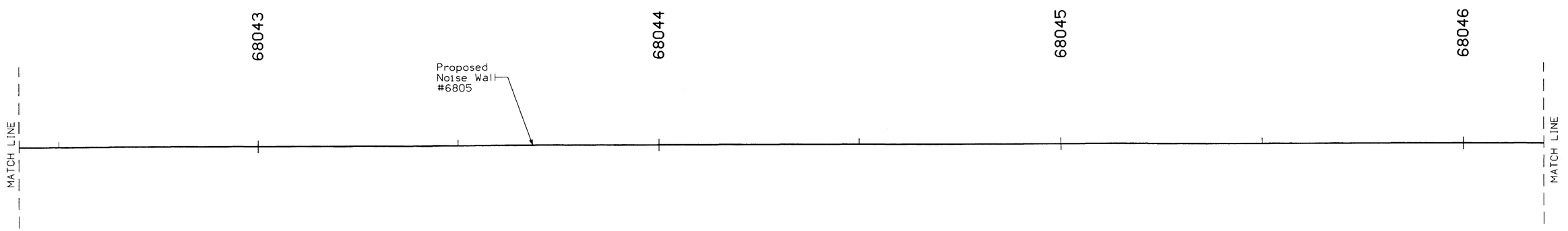
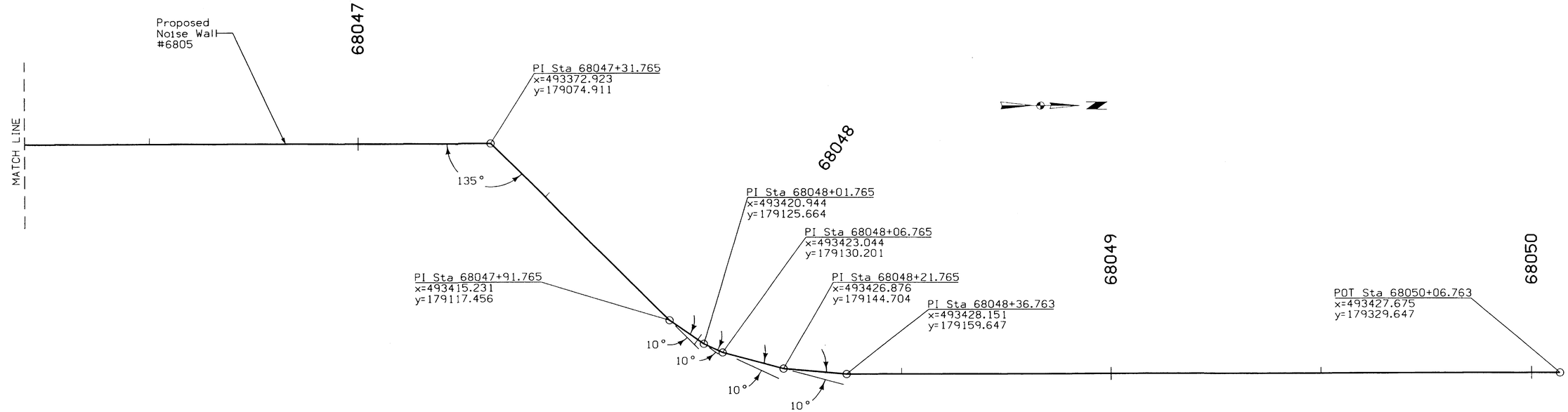




Noise Wall #6805
Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.08



Noise Wall #6805
Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	V.09

MSE RETAINING WALL #5801 CONSTRUCTION NOTES

RW-1 Modified

(1) The maximum allowable soil bearing pressure for the MSE Wall foundation is 143.6 kPa for spread foundations bearing on the the Granular Backfill replaced in the over-excavation area shown on the Q Sheets and cross sections.

(2) See the Q Sheets for the soil profile at the MSE wall location, the soil property information, and the over-excavation required.

(3) Total settlement due to foundation loads is estimated to be 0.1 m and differential settlement may be one-half of the total settlement

(4) The panels for the MSE Wall shall be cast as per the MSE Wall Details sheets.

(5) MSE Wall subdrain and outlet shall be designed for positioning at the lowest possible point within the Granular Backfill in the MSE Wall backfill as allowed by the location and elevation of the outlet. The MSE Wall design and construction shall, if necessary, provide for penetration the drain outlet through the wall.

(6) For estimating purposes only, the following rules were used:

(a) The length of the reinforcing straps is based on the following formula:

strap length = 0.7 x wall height

(b) The wall height is the distance between the the Proposed Top of Wall Elevation and the Proposed Footing Elevation.

(c) Both the Granular Backfill and the excavation behind the wall were calculated based on the average end area between cross sections. The average end area was computed with the estimated wall heights and strap lengths. These quantities may need to be adjusted if the required strap length is greater than the estimated strap length, and/or if the footing elevation is adjusted.

(7) MSE Wall and Sheet Pile Retaining Wall shop drawings shall be sent to:

Iowa Department of Transportaion
Office of Design
I-235 Design Squad
800 Lincoln Way
Ames, IA 50010

RETAINING WALLS #5807 & #5808 CONSTRUCTION NOTES

RW-1 Modified

(1) MSE Wall shall be designed for a surcharge height of 0.61 meters to account for live loads behind the wall.

(2) MSE Wall shall be designed to accommodate the intermediate and ultimate sloped backfill as shown on the cross sections.

(3) The maximum allowable soil bearing pressure for the MSE Wall foundation is 300.0 kPa for spread foundations bearing in the existing fill with Stone Columns directly below the foundation spaced at 2 meters apart. The existing fill should be tested by qualified personnel before foundation construction.

(4) Below the existing fill, there is one natural soil type and the soil properties are listed in the "Shelby Tube Core Data" tables on the Q sheets.

(5) Total maximum settlement due to foundation loads is estimated to be 74 mm for wall #5807 and 147 mm for wall #5808; and differential settlement may be one-half of the total settlement. Settlement amounts will vary with wall height.

(6) Temporary Sheet Pile Retaining Wall shall be designed by the MSE Wall Vendor. The sheet pile layout shall be designed and constructed to accomodate the future extension of the MSE Wall. Refer to the MSE Wall Details sheets.

(7) The panels for the MSE Wall shall be cast as per the MSE Wall Details sheets.

(8) Subdrain outlet locations shall be determined by the MSE Wall Vendor, and shall coordinate with the E 21st Street Bridge, with the proposed storm sewer, and with the existing storm sewer.

(9) For estimating purposes only, the following rules were used:

(a) The length of the reinforcing straps is based on the following formula:

strap length = 0.7 x wall height

(b) The wall height is the distance between the the Proposed Top of Wall Elevation and the Proposed Footing Elevation.

(c) Both the Granular Backfill and the excavation behind the wall were calculated based on the average end area between cross sections. The average end area was computed with the estimated wall heights and strap lengths. These quantities may need to be adjusted if the required strap length is greater than the estimated strap length, and/or if the footing elevation is adjusted.

(10) MSE Wall and Sheet Pile Retaining Wall shop drawings shall be sent to:

Iowa Department of Transportaion
Office of Design
I-235 Design Squad
800 Lincoln Way
Ames, IA 50010

RETAINING WALLS #5820 , #5822, & #5824 CONSTRUCTION NOTES

RW-1 Modified

(1) MSE Wall shall be designed for a surcharge height of 0.61 meters to account for live loads behind the wall.

(2) MSE Wall shall be designed to accommodate the intermediate and ultimate sloped backfill as shown on the cross sections.

(3) The maximum allowable soil bearing pressure for the MSE Wall foundation is 185.0 kPa for spread foundations bearing in the Stiff Clay.

(4) Below the existing fill, there is one natural soil type and the soil properties are listed in the "Shelby Tube Core Data" tables on the Q sheets.

(5) Total maximum settlement due to foundation loads is estimated to be 100 mm and differential settlement may be one-half of the total settlement. Settlement amounts will vary with wall height.

(6) Temporary Sheet Pile Retaining Wall shall be designed by the MSE Wall Vendor. The sheet pile layout shall be designed and constructed to accomodate the future extension of the MSE Wall. Refer to the MSE Wall Details sheets.

(7) The panels for the MSE Wall shall be cast as per the MSE Wall Details sheets.

(8) Subdrain outlet locations shall be determined by the MSE Wall Vendor, and shall coordinate with the Easton Blvd Bridge, with the proposed storm sewer, and with the existing storm sewer.

(9) For estimating purposes only, the following rules were used:

(a) The length of the reinforcing straps is based on the following formula:

strap length = 0.7 x wall height

(b) The wall height is the distance between the the Proposed Top of Wall Elevation and the Proposed Footing Elevation.

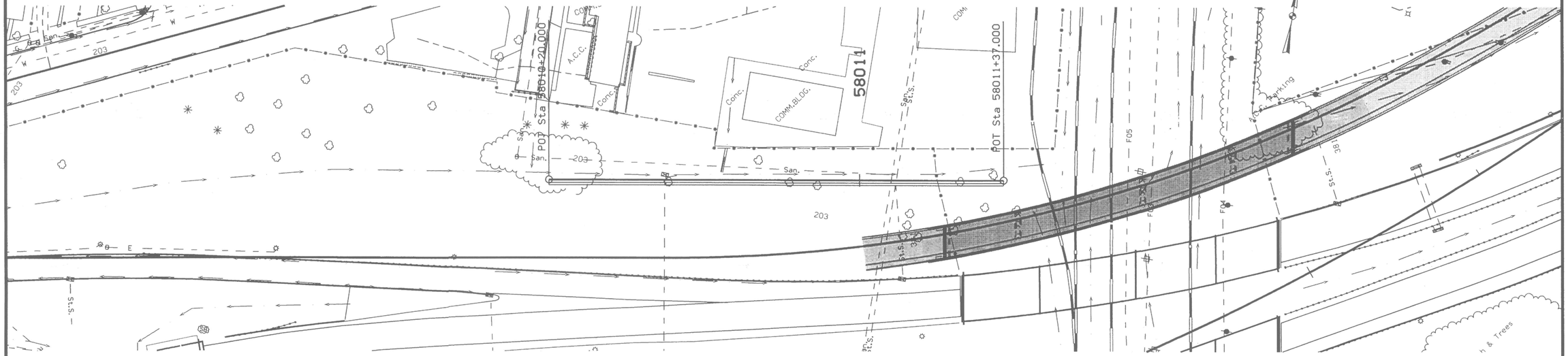
(c) Both the Granular Backfill and the excavation behind the wall were calculated based on the average end area between cross sections. The average end area was computed with the estimated wall heights and strap lengths. These quantities may need to be adjusted if the required strap length is greater than the estimated strap length, and/or if the footing elevation is adjusted.

(10) MSE Wall and Sheet Pile Retaining Wall shop drawings shall be sent to:

Iowa Department of Transportaion
Office of Design
I-235 Design Squad
800 Lincoln Way
Ames, IA 50010

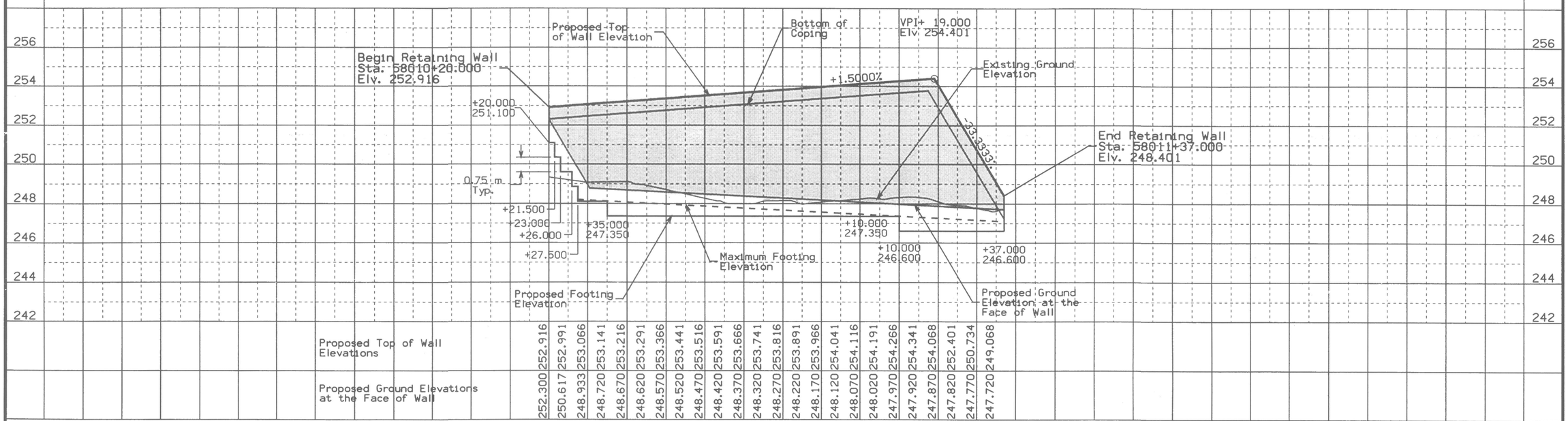
MSE RETAINING WALL DESIGN & CONSTRUCTION INFORMATION

SAYLOR TWP.
T-79N R-24W
SEC. 36



0 METERS 50

Retaining Wall #5801

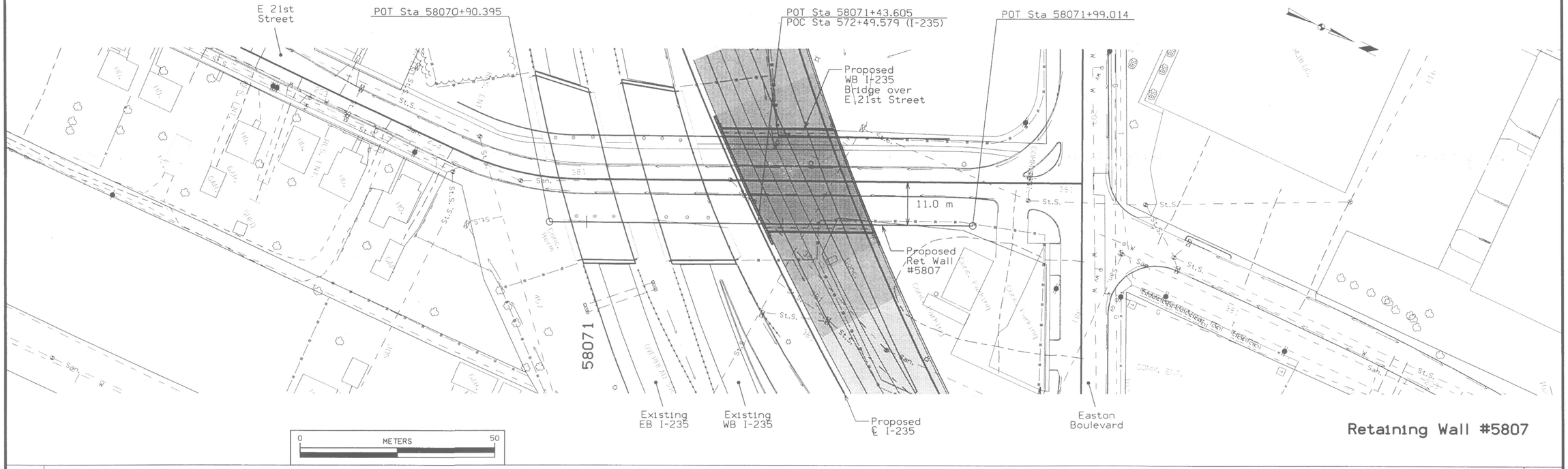


Proposed Top of Wall Elevations	252.916	252.991	253.066	253.141	253.216	253.291	253.366	253.441	253.516	253.591	253.666	253.741	253.816	253.891	253.966	254.041	254.116	254.191	254.266	254.341	254.068	252.401	250.734	249.068
Proposed Ground Elevations at the Face of Wall	252.300	250.617	248.933	248.720	248.670	248.620	248.570	248.520	248.470	248.420	248.370	248.320	248.270	248.220	248.170	248.120	248.070	248.020	247.970	247.920	247.870	247.820	247.770	247.720

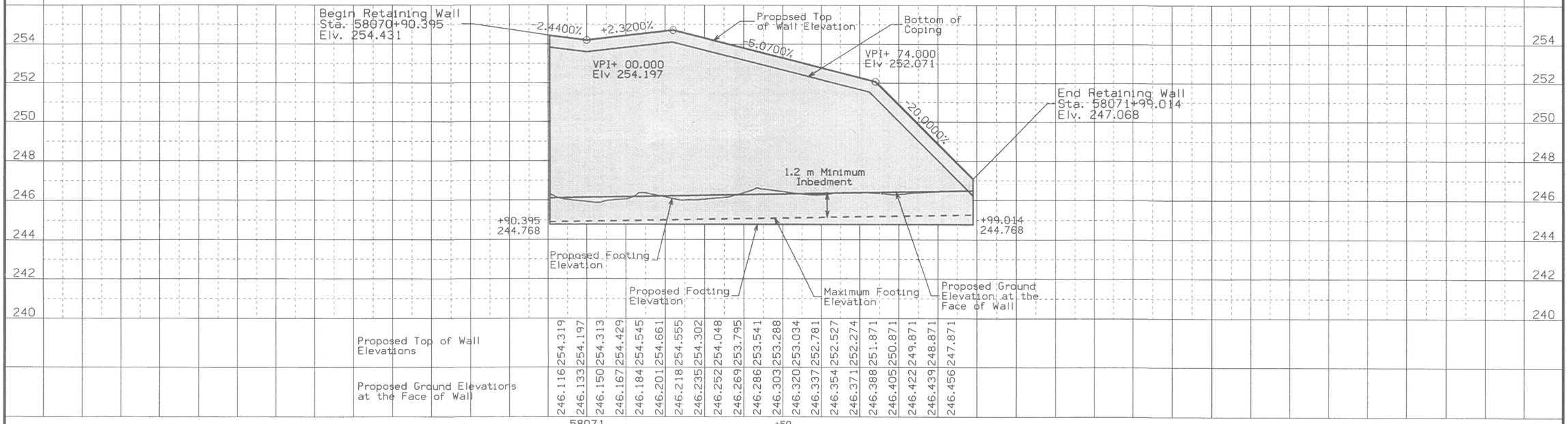
+50 58011

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.11

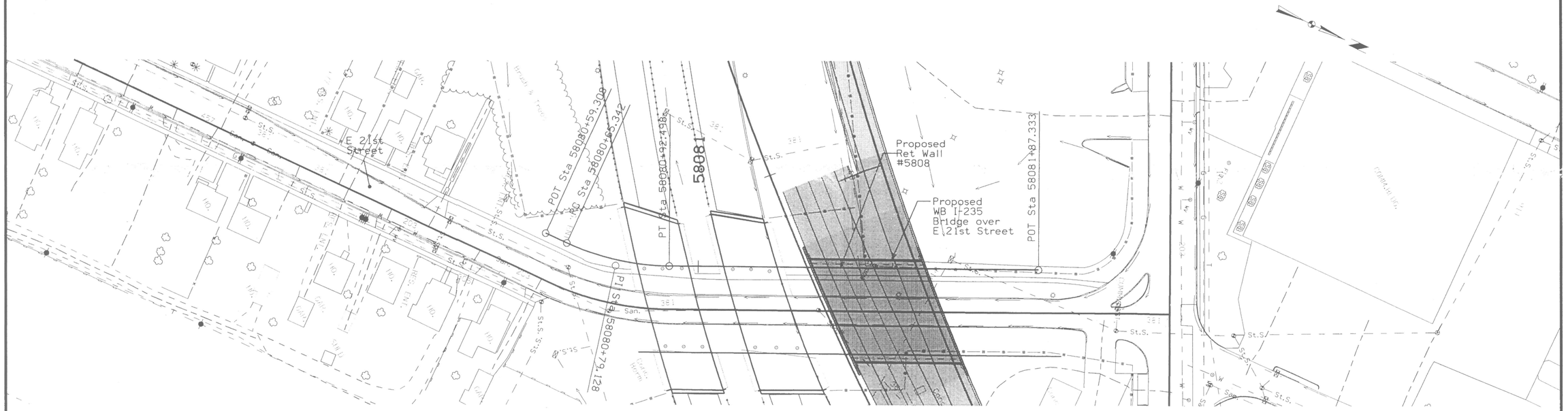
28-JAN-2002 10:59 wnelso2 w:\Projects\77235180C96\Design_grading_(340)\k77235340.v11

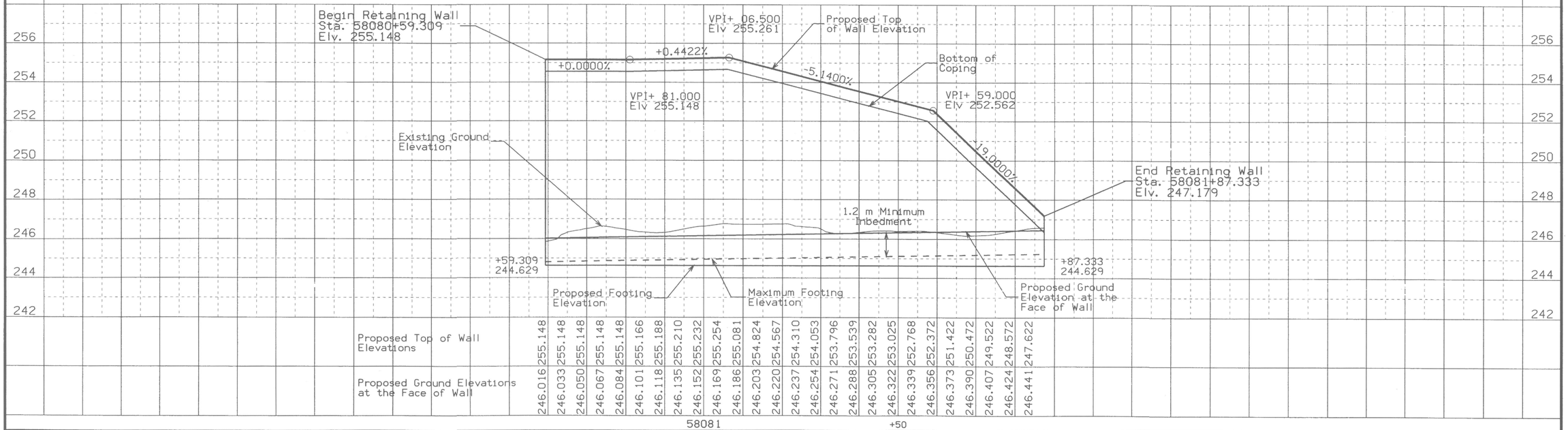


Retaining Wall #5807



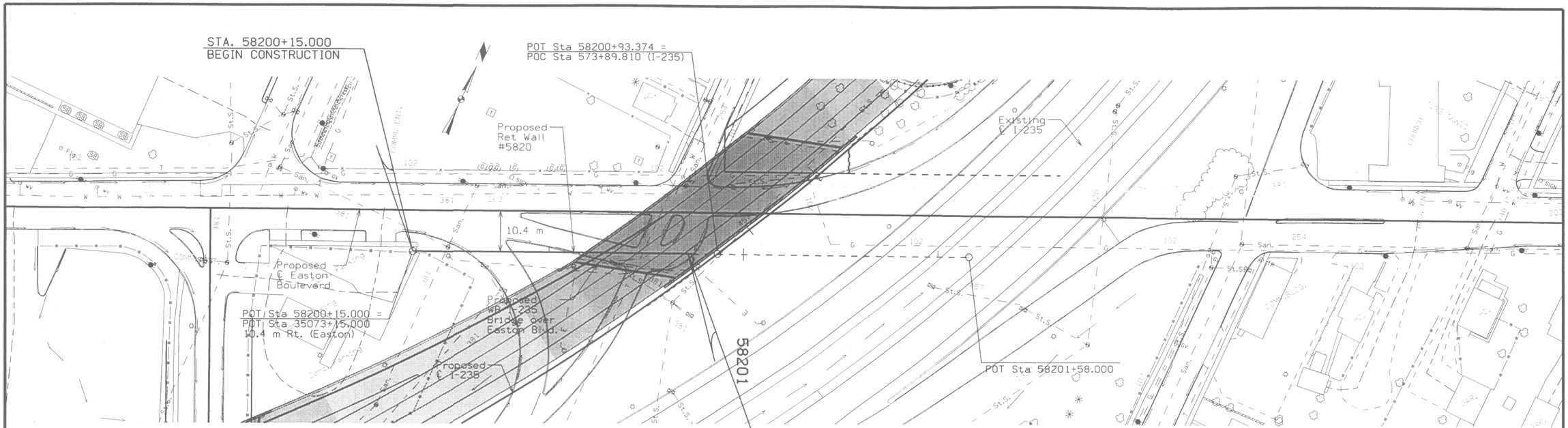
| | | |





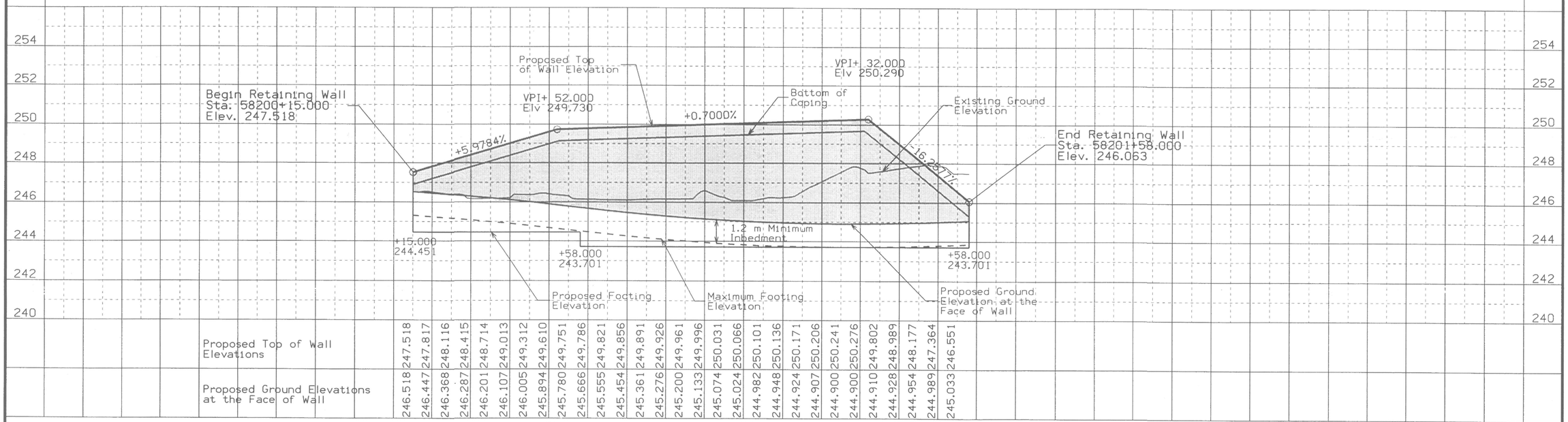
500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.13

14-JAN-2002 16:32 ...orthe ...s Projects ...235(50)--Design ...grading\340-P...235340...13

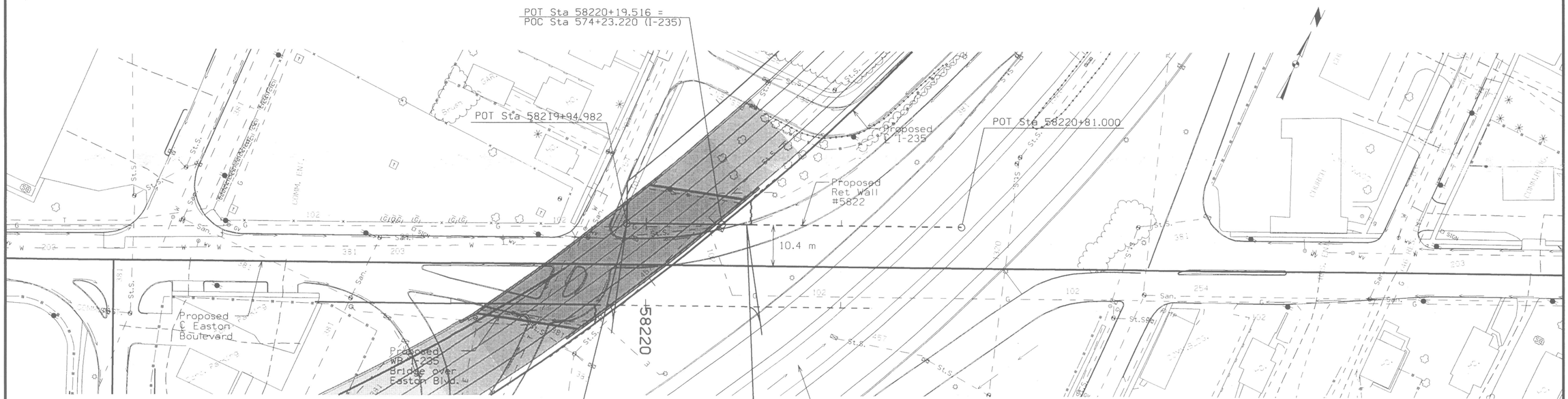


MSE Retaining Wall #5820

Existing Features that will be removed are not shown. For Removal Information Refer to Sheet No. H.	For Additional MSE Wall Details Refer to Sheet No. V. & V.
	For MSE Wall Alignment Details Refer to Sheet No. V.

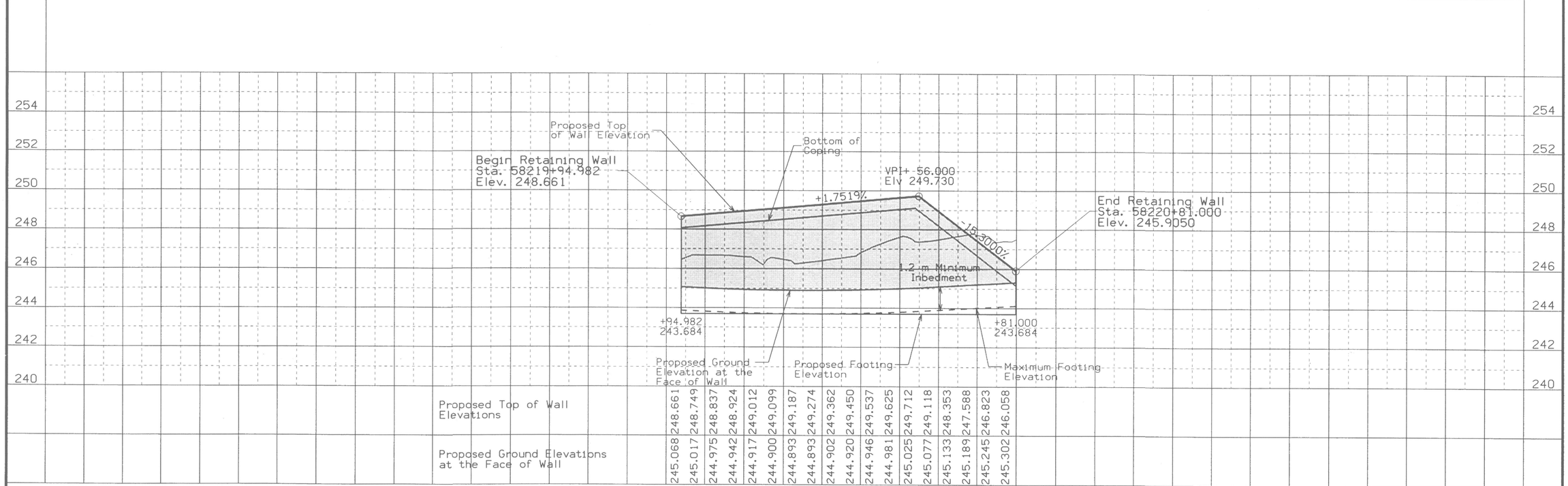


| | | |

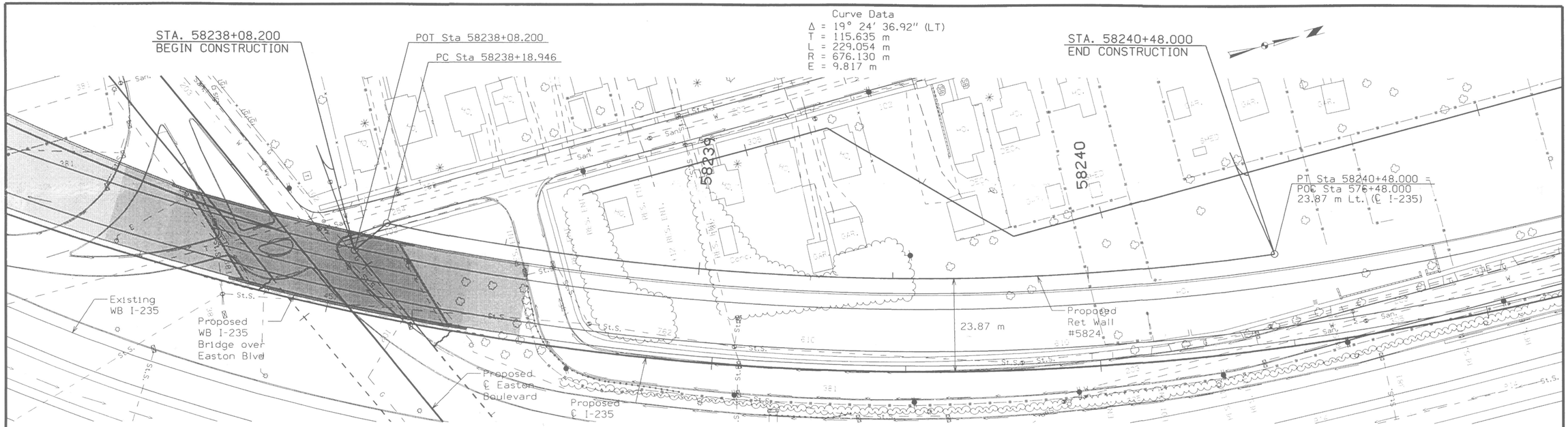


MSE Retaining Wall #5822

Existing Features that will be removed are not shown. For Removal Information Refer to Sheet No. H.	For Additional MSE Wall Details Refer to Sheet No. V. & V.
	For MSE Wall Alignment Details Refer to Sheet No. V.

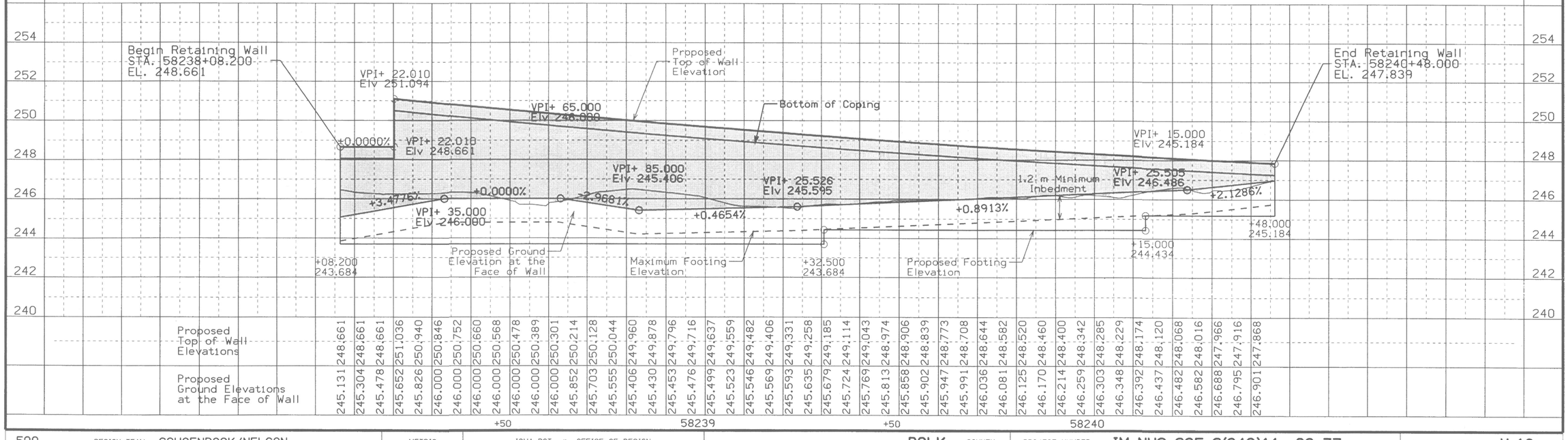


| | | |



Existing Features that will be removed are not shown. For Removal Information Refer to Sheet No. H.	For Additional MSE Wall Details Refer to Sheet No. V. & V.
	For MSE Wall Alignment Details Refer to Sheet No. V.

MSE Retaining Wall #5824

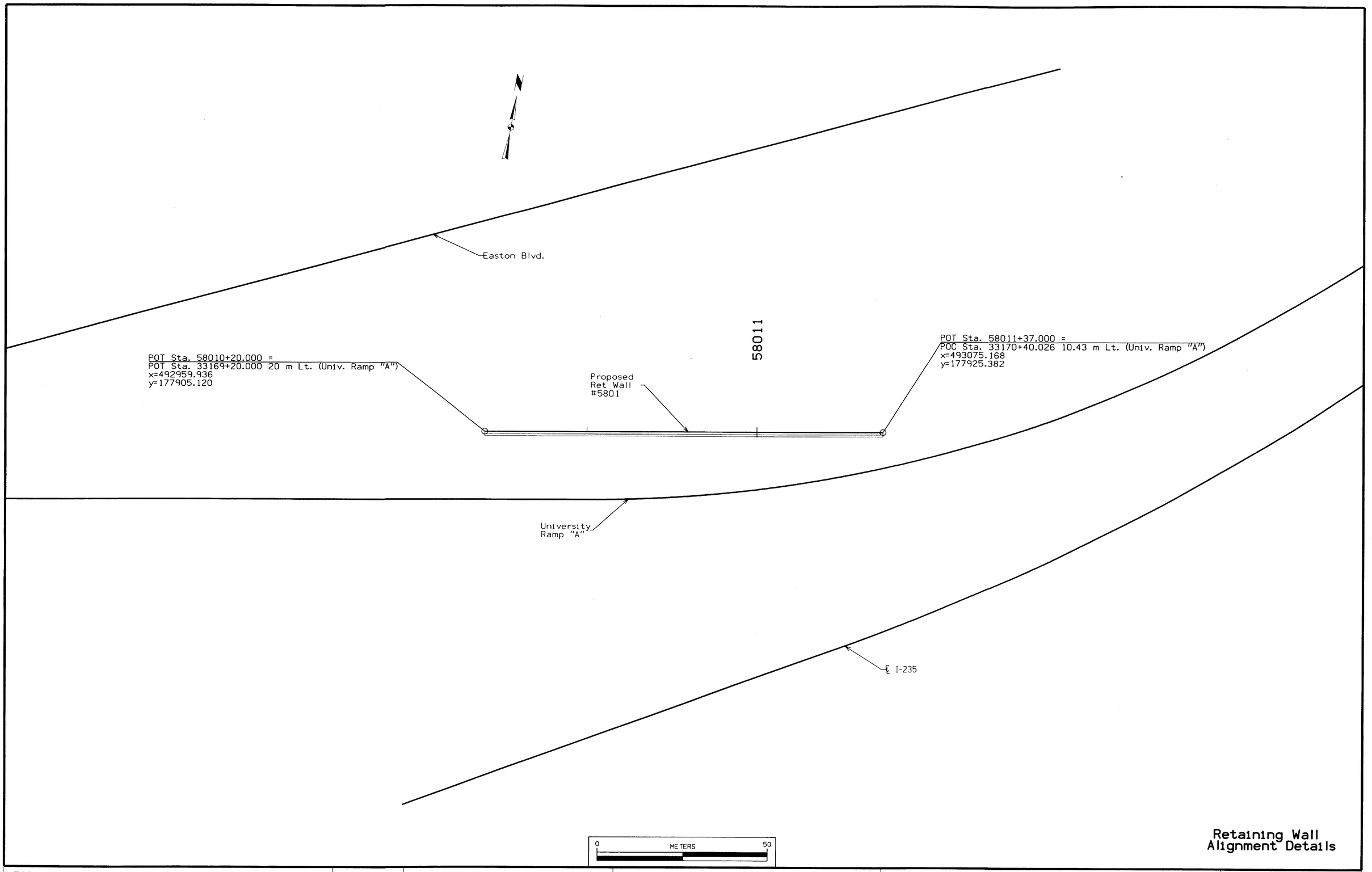


Proposed Top of Wall Elevations	248.661	248.661	248.661	251.036	250.940	250.846	250.752	250.660	250.568	250.478	250.389	250.301	250.214	250.128	250.044	249.960	249.878	249.796	249.716	249.637	249.559	249.482	249.406	249.331	249.258	249.185	249.114	249.043	248.974	248.906	248.839	248.773	248.708	248.644	248.582	248.520	248.460	248.400	248.342	248.285	248.229	248.174	248.120	248.068	248.016	247.966	247.916	247.868
Proposed Ground Elevations at the Face of Wall	245.131	245.304	245.478	245.652	245.826	246.000	246.000	246.000	246.000	246.000	246.000	246.000	245.852	245.703	245.555	245.406	245.430	245.453	245.476	245.499	245.523	245.546	245.569	245.593	245.635	245.679	245.724	245.769	245.813	245.858	245.902	245.947	245.991	246.036	246.081	246.125	246.170	246.214	246.259	246.303	246.348	246.392	246.437	246.482	246.582	246.688	246.795	246.901

+50 58239 +50 58240

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.16

14-JUN-2002 16:34 lorthe x: Projects 5235180046 Design Grading\340 IM-NHS-235-2(340)--11



Retaining Wall Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.17

CIRCULAR CURVE DATA

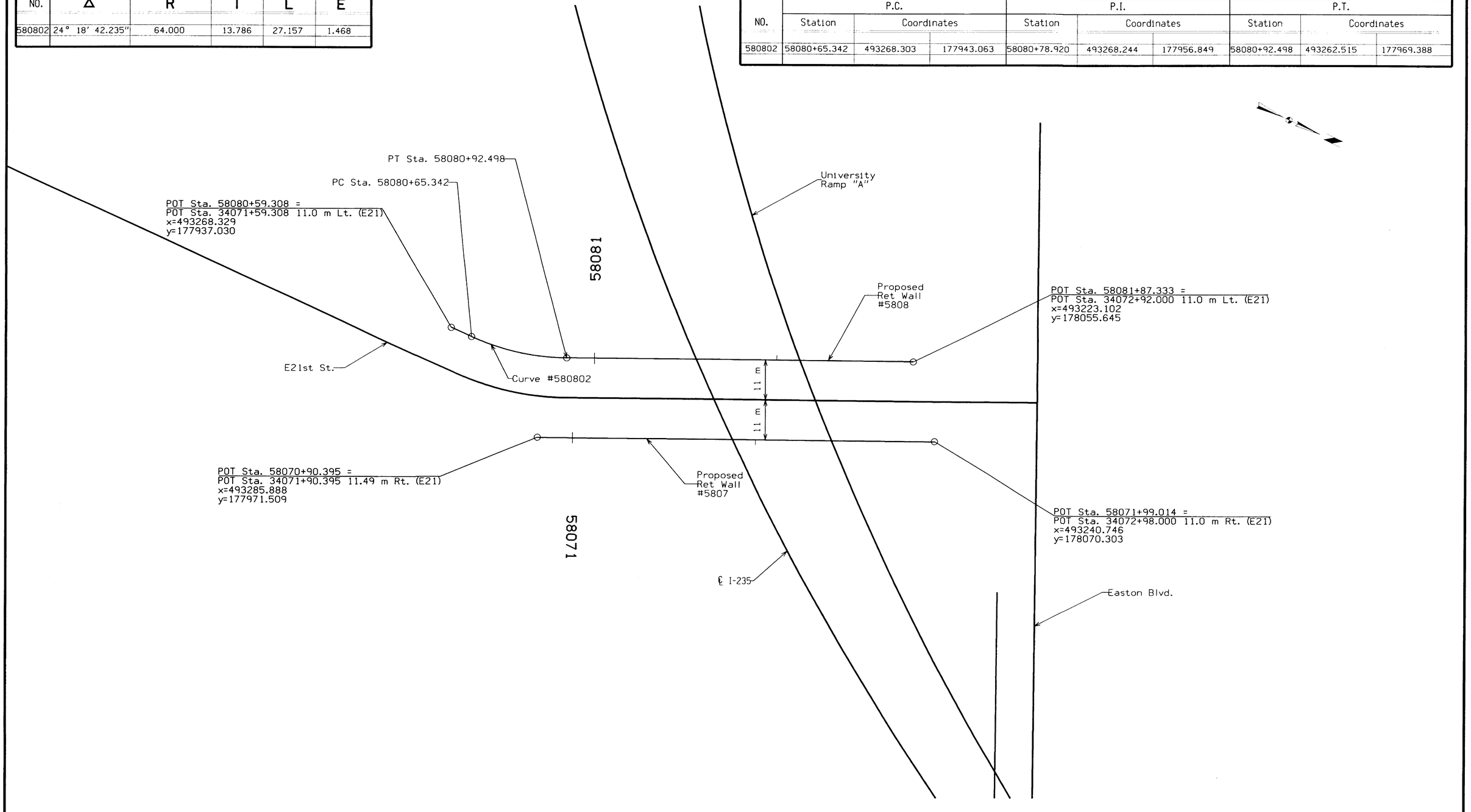
101-10C
09-27-94

NO.	Δ	R	T	L	E
580802	24° 18' 42.235"	64.000	13.786	27.157	1.468

CIRCULAR CURVE COORDINATES

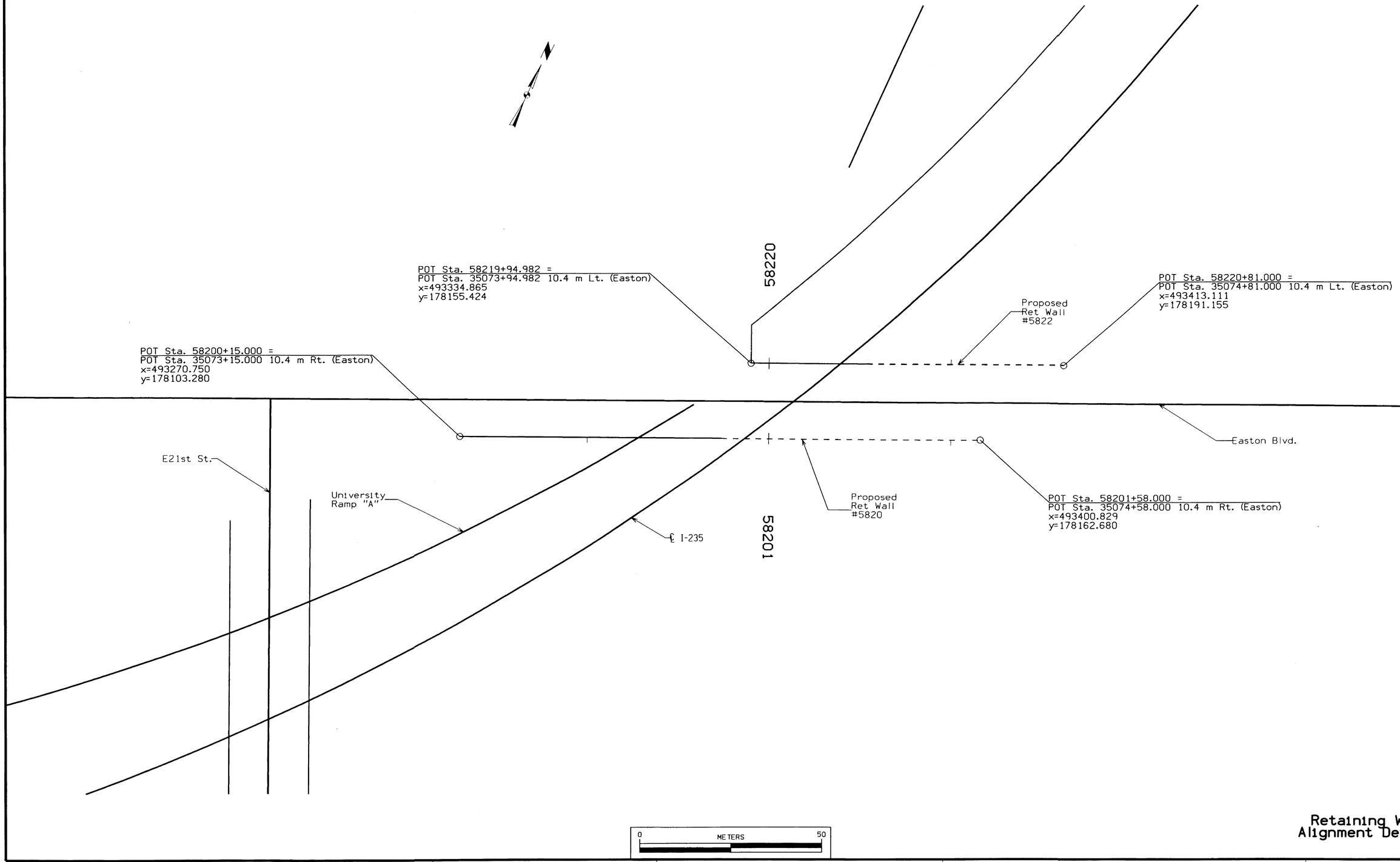
101-10A
07-15-97

NO.	P.C.			P.I.			P.T.		
	Station	Coordinates		Station	Coordinates		Station	Coordinates	
580802	58080+65.342	493268.303	177943.063	58080+78.920	493268.244	177956.849	58080+92.498	493262.515	177969.388



Retaining Wall Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.18



Retaining Wall Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.19

CIRCULAR CURVE DATA

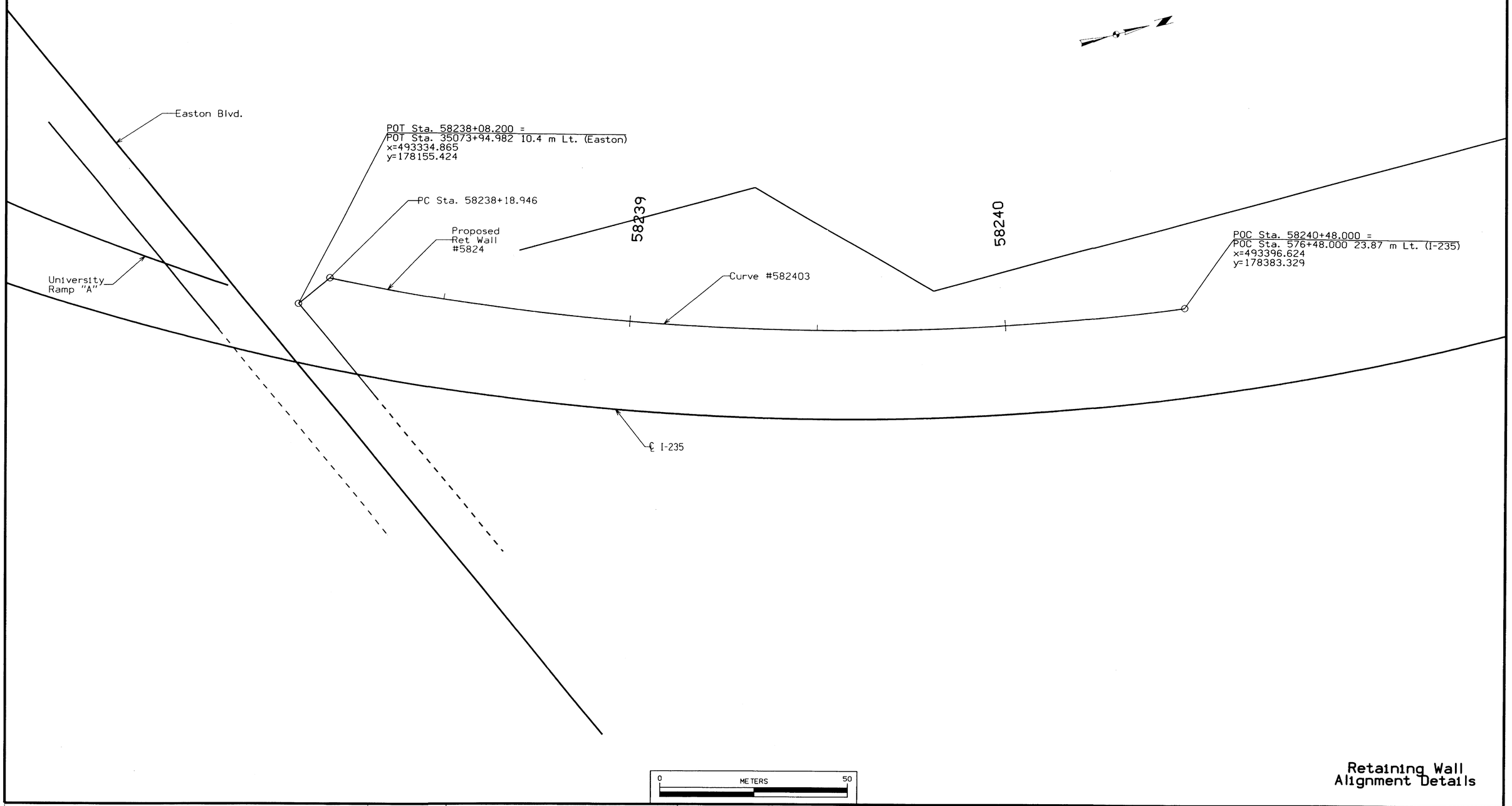
1Q1-10C
09-27-94

NO.	Δ	R	T	L	E
582403	19° 24' 36.918"	676.130	115.635	229.055	9.817

CIRCULAR CURVE COORDINATES

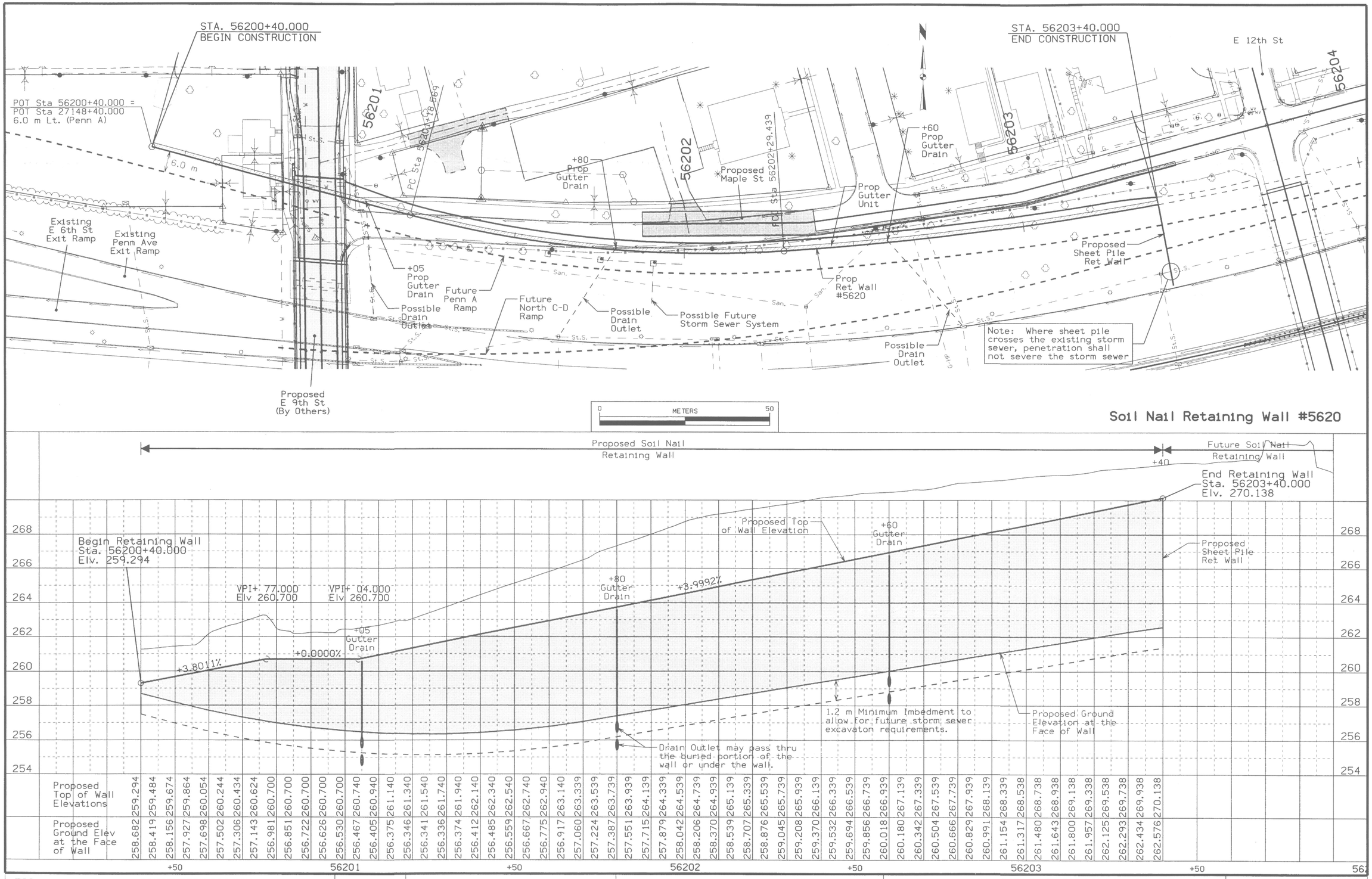
1Q1-10A
07-15-97

NO.	P.C.			P.I.			P.T.		
	Station	Coordinates		Station	Coordinates		Station	Coordinates	
582403	58238+18.946	493330.402	178165.199	58239+34.581	493382.166	178268.601	58240+48.000	493396.624	178383.329



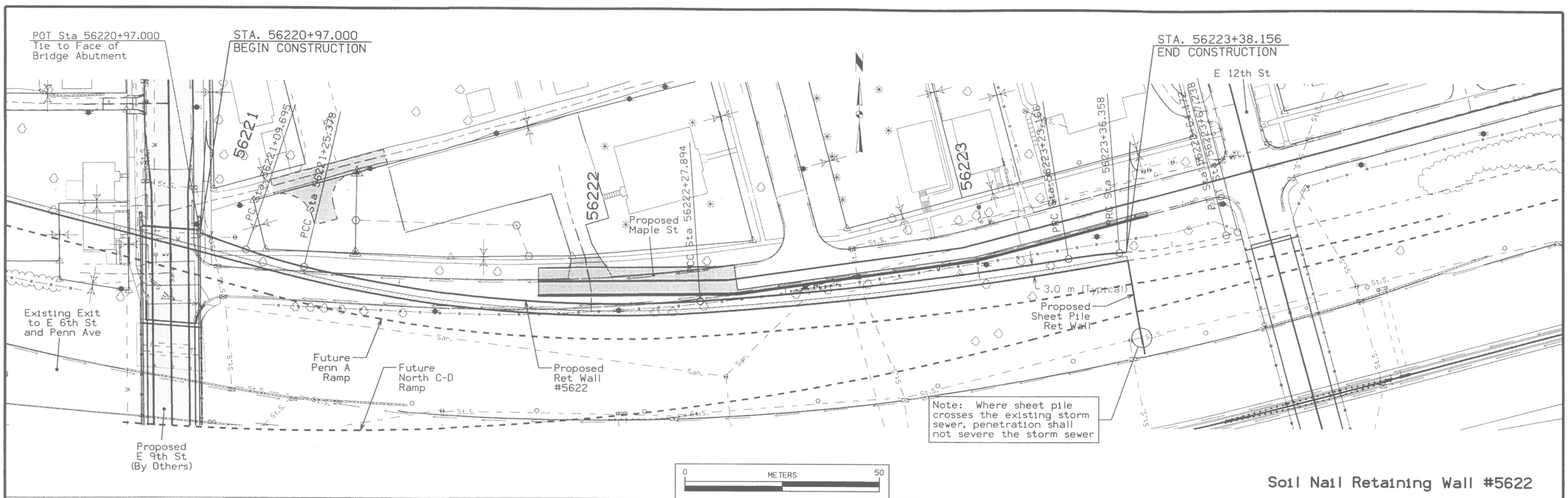
Retaining Wall
Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.20

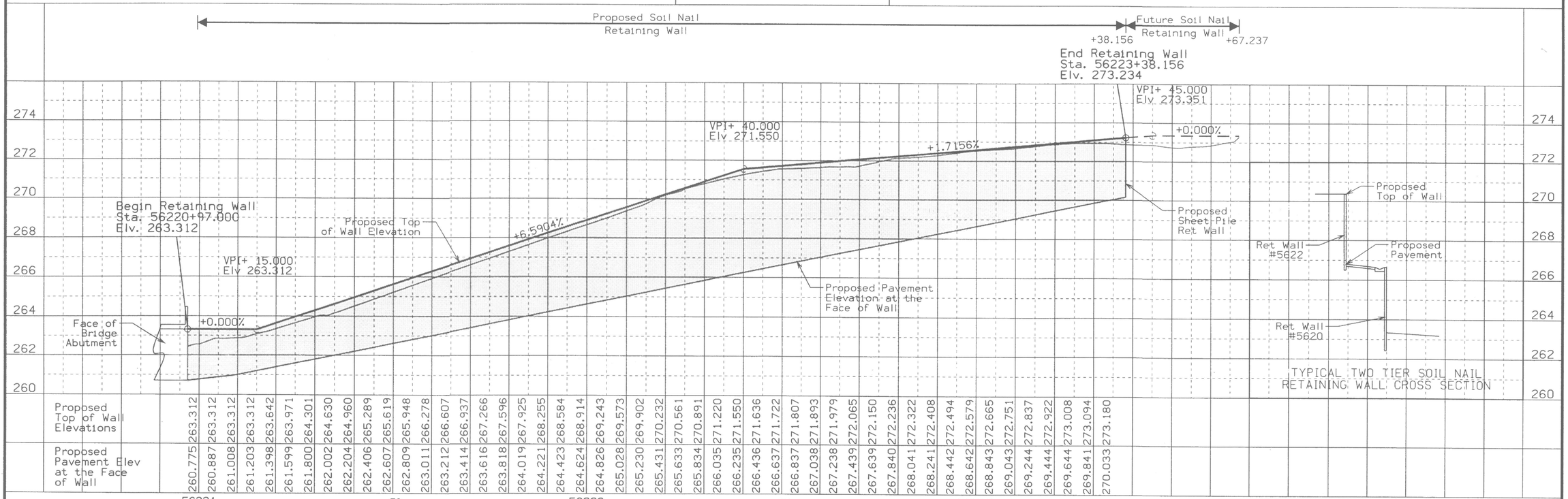


500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.21

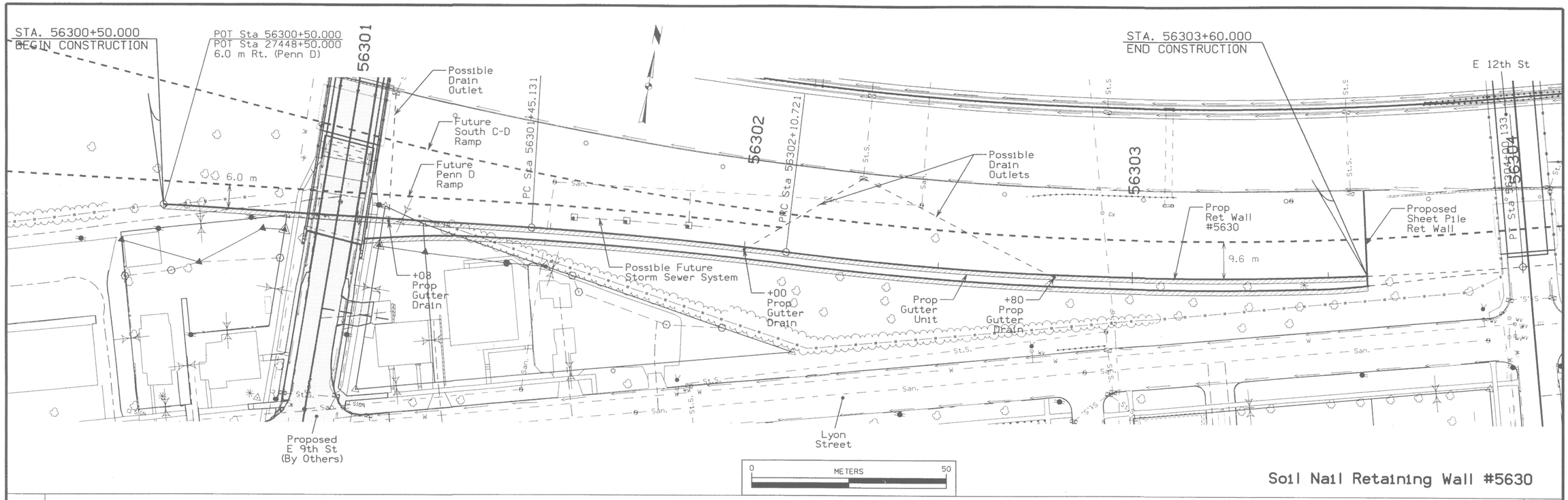
28-JAN-2002 08:10 Northe x: Projects 77235180C96 Design Lgrading_(340)-F77235340.v21



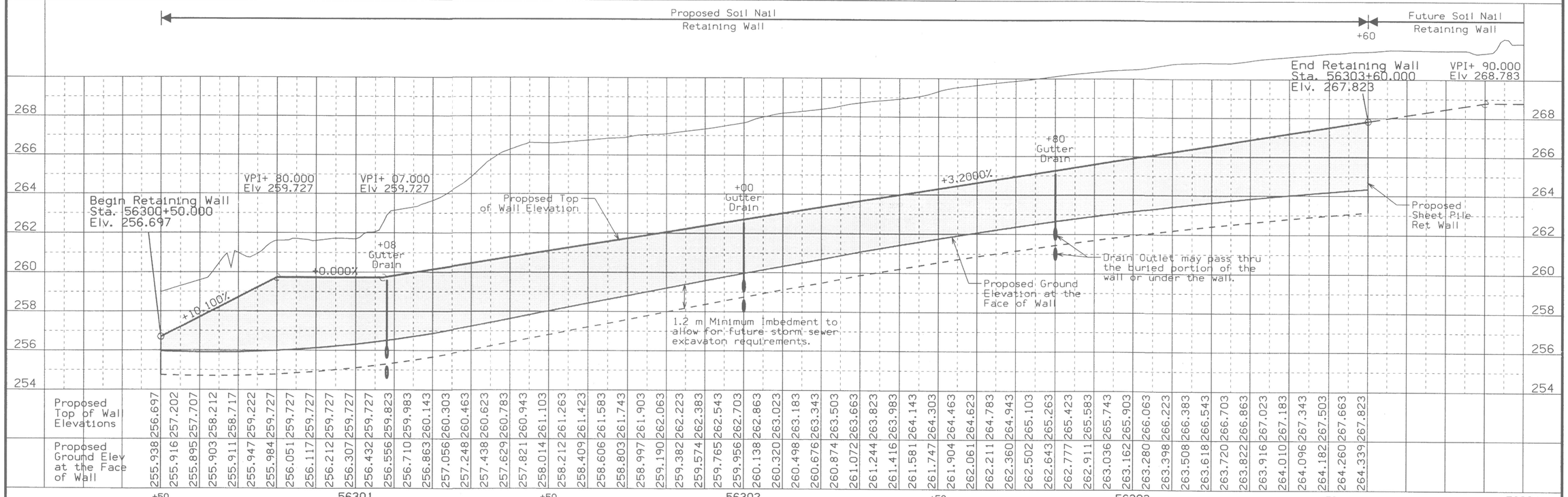
Soil Nail Retaining Wall #5622



500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.22



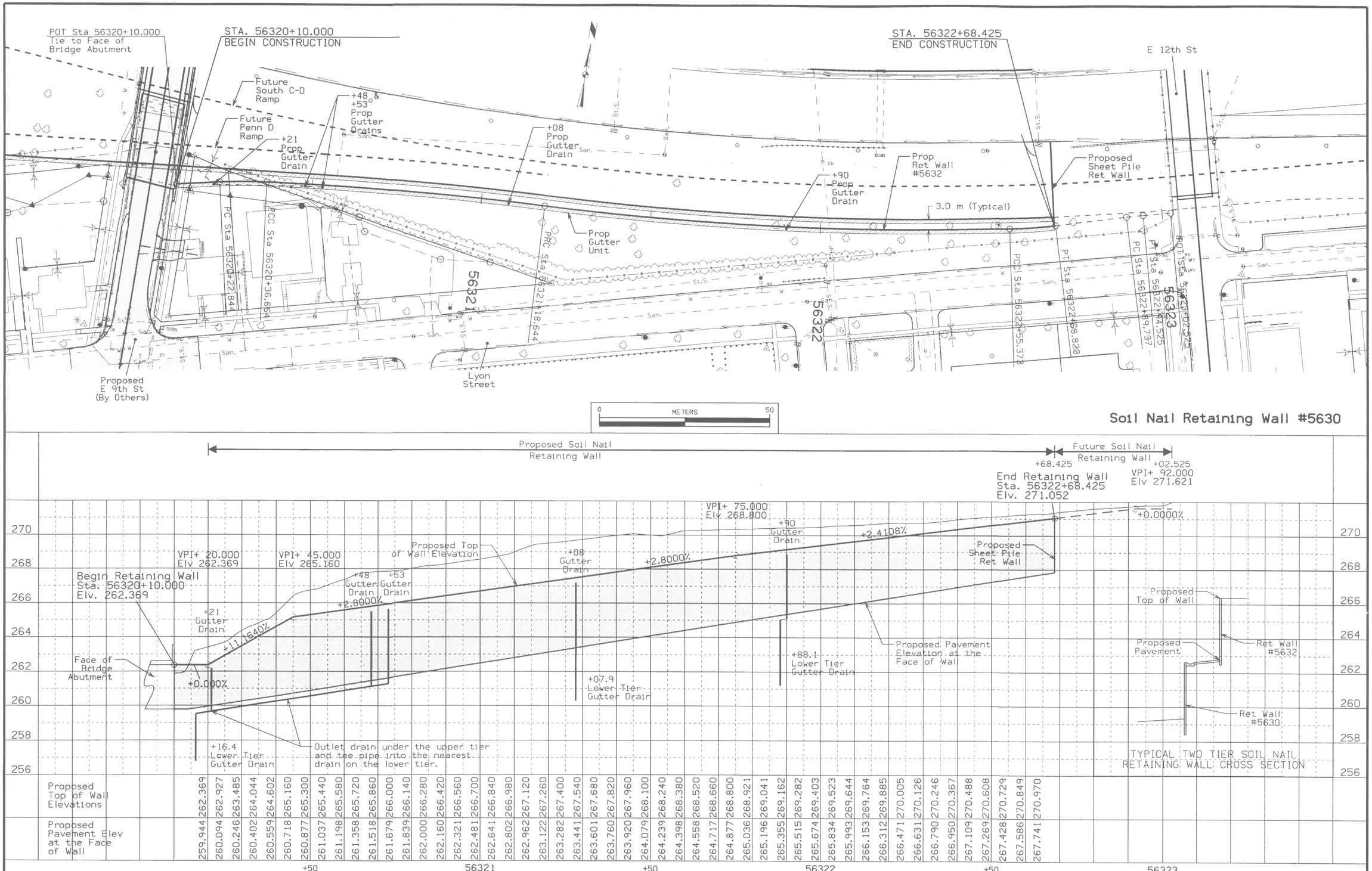
Soil Nail Retaining Wall #5630



	+50	56301	+50	56302	+50	56303	+50	56304
Proposed Top of Wall Elevations	256.697	257.202 257.707 258.212 258.717 259.222 259.727 259.727 259.727 259.727 259.727 259.823 259.983 260.143 260.303 260.463 260.623 260.783 260.943 261.103 261.263 261.423 261.583 261.743 261.903 262.063 262.223 262.383 262.543 262.703 262.863 263.023 263.183 263.343 263.503 263.663 263.823 263.983 264.143 264.303 264.463 264.623 264.783 264.943 265.103 265.263 265.423 265.583 265.743 265.903 266.063 266.223 266.383 266.543 266.703 266.863 267.023 267.183 267.343 267.503 267.663 267.823						
Proposed Ground Elev at the Face of Wall	255.938	255.916 255.895 255.903 255.911 255.947 255.984 256.051 256.117 256.212 256.307 256.432 256.556 256.710 256.863 257.056 257.248 257.438 257.629 257.821 258.014 258.212 258.409 258.606 258.803 258.997 259.190 259.382 259.574 259.765 259.956 260.138 260.320 260.498 260.676 260.874 261.072 261.244 261.416 261.581 261.747 261.904 262.061 262.211 262.360 262.502 262.643 262.777 262.911 263.036 263.162 263.280 263.398 263.508 263.618 263.720 263.822 263.916 264.010 264.096 264.182 264.260 264.339						

500	DESIGN TEAM	SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN		POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	V.23

28-JAN-2002 08:11 jporthe x:\Projects\772351800\46 Design\grading\340\sk772351340_23



Proposed Top of Wall Elevations	Proposed Pavement Elev at the Face of Wall
262.369	259.944
262.927	260.094
263.485	260.246
264.044	260.402
264.602	260.559
265.160	260.718
265.300	260.877
265.440	261.037
265.580	261.198
265.720	261.358
265.860	261.518
266.000	261.679
266.140	261.839
266.280	262.000
266.420	262.160
266.560	262.321
266.700	262.481
266.840	262.641
266.980	262.802
267.120	262.962
267.260	263.122
267.400	263.282
267.540	263.441
267.680	263.601
267.820	263.760
267.960	263.920
268.100	264.079
268.240	264.239
268.380	264.398
268.520	264.558
268.660	264.717
268.800	264.877
268.921	265.036
269.041	265.196
269.162	265.355
269.282	265.515
269.403	265.674
269.523	265.834
269.644	265.993
269.764	266.153
269.885	266.312
270.005	266.471
270.126	266.631
270.246	266.790
270.367	266.950
270.488	267.109
270.608	267.269
270.729	267.428
270.849	267.586
270.970	267.741

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.24

CIRCULAR CURVE DATA

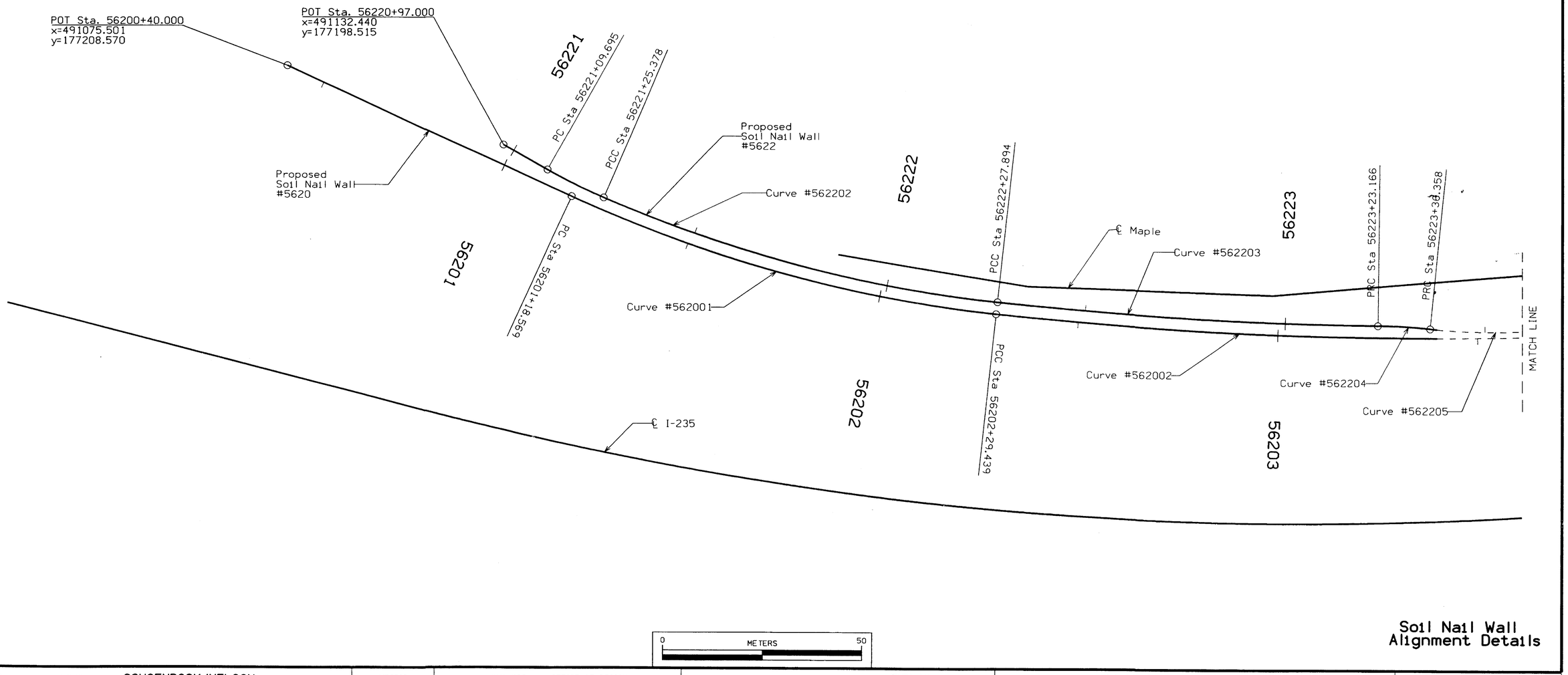
1Q1-10C
09-27-94

NO.	Δ	R	T	L	E
562201	5° 59′ 25.26″	150.000	7.849	15.683	0.205
562202	17° 13′ 30.50″	341.000	51.648	102.517	3.889
562203	5° 30′ 29.75″	991.000	47.673	95.272	1.146
562204	5° 02′ 20.37″	150.000	6.600	13.192	0.145
562205	10° 37′ 26.43″	150.000	13.947	27.814	0.644
562001	18° 27′ 58.54″	344.000	55.920	110.870	4.516
562002	11° 08′ 19.68″	994.000	96.927	193.242	4.715
562003	9° 34′ 21.63″	500.000	41.866	83.537	1.750

CIRCULAR CURVE COORDINATES

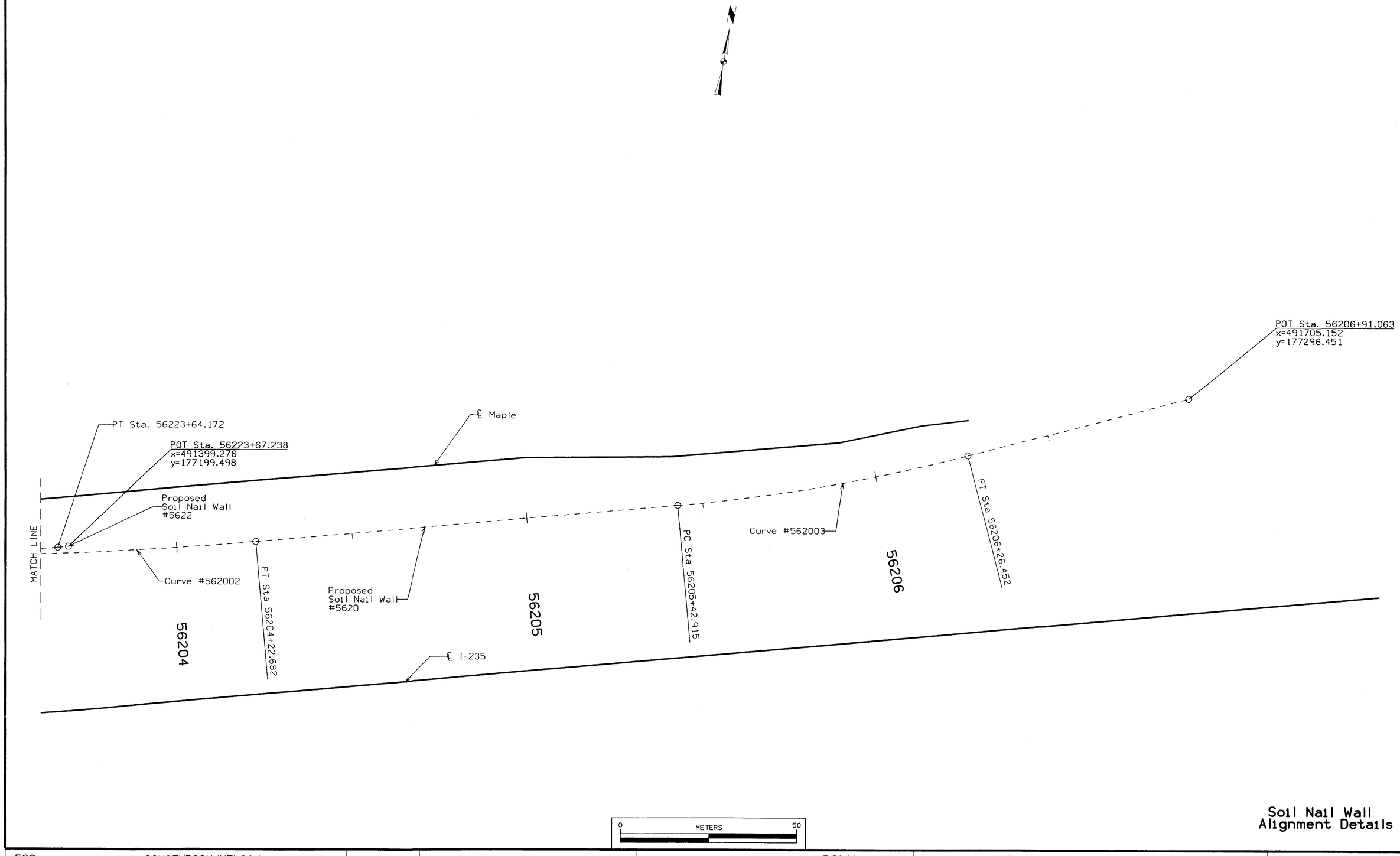
1Q1-10A
02-15-97

NO.	P.C. Station	P.C. Coordinates		P.I. Station	P.I. Coordinates		P.T. Station	P.T. Coordinates	
562201	56221+09.695	491144.418	177194.312	56221+17.543	491151.824	177191.713	56221+25.378	491159.461	177189.901
562202	56221+25.378	491159.461	177189.901	56221+77.026	491209.713	177177.978	56222+27.894	491261.243	177181.470
562203	56222+27.894	491261.243	177181.470	56222+75.567	491308.807	177184.694	56223+23.166	491355.841	177192.469
562204	56223+23.166	491355.841	177192.469	56223+29.767	491362.353	177193.545	56223+36.358	491368.934	177194.046
562205	56223+36.358	491368.934	177194.046	56223+50.305	491382.841	177195.103	56223+64.172	491396.314	177198.706
562001	56201+18.569	491151.537	177188.781	56201+74.489	491205.654	177174.696	56202+29.439	491261.446	177178.477
562002	56202+29.439	491261.446	177178.477	56203+26.366	491358.151	177185.032	56204+22.682	491451.767	177210.145
562003	56205+42.915	491567.895	177241.297	56205+84.781	491608.331	177252.145	56206+26.452	491646.400	177269.566



Soil Nail Wall Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.25



Soil Nail Wall
Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.26

CIRCULAR CURVE DATA

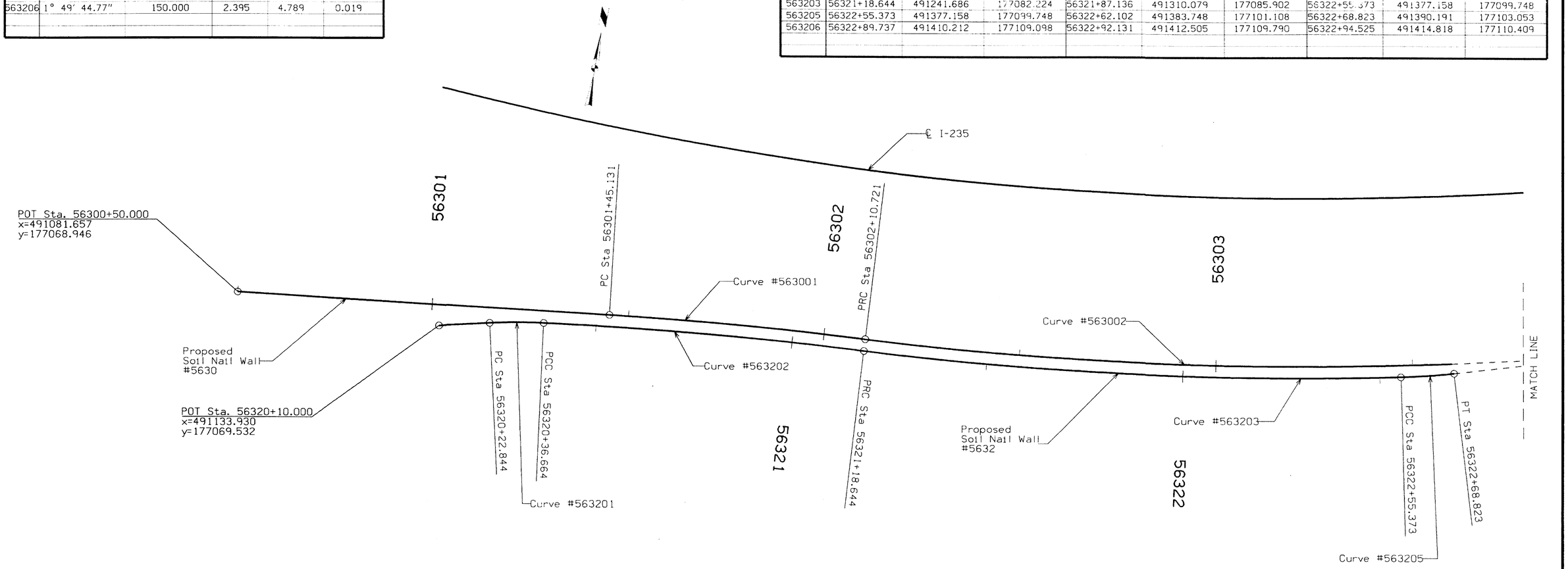
1Q1-1QC
09-27-94

NO.	Δ	R	T	L	E
563001	3° 26′ 06.50″	1094.000	32.805	65.590	0.492
563002	11° 55′ 51.92″	909.600	95.050	189.412	4.953
563004	1° 13′ 05.81″	3394.000	36.085	72.167	0.192
563201	5° 16′ 43.37″	150.000	6.915	13.820	0.159
563202	4° 18′ 19.14″	1091.000	81.980	81.980	0.771
563203	8° 35′ 03.24″	912.600	68.493	136.729	2.567
563205	5° 08′ 15.19″	150.000	6.730	13.450	0.151
563206	1° 49′ 44.77″	150.000	2.395	4.789	0.019

CIRCULAR CURVE COORDINATES

1Q1-1QA
07-15-97

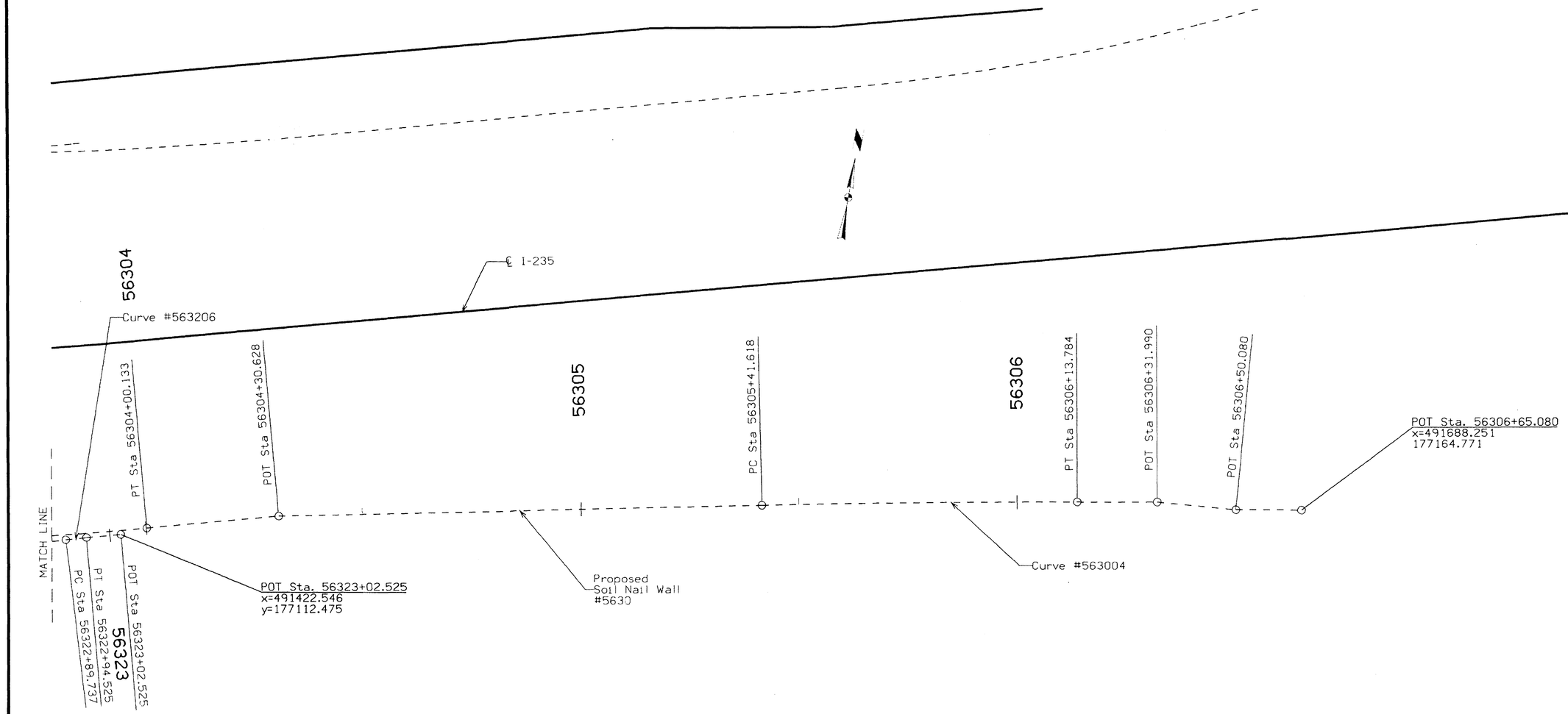
NO.	P.C. Station	P.C. Coordinates		P.I. Station	P.I. Coordinates		P.T. Station	P.T. Coordinates	
563001	56301+45.131	491176.174	177079.737	56301+77.936	491208.767	177083.458	56302+10.721	491241.525	177085.220
563002	56302+10.721	491241.525	177085.220	56303+05.771	491336.437	177090.324	56304+00.133	491428.244	177114.940
563004	56305+41.618	491566.574	177144.400	56305+77.702	491601.971	177151.410	56306+13.784	491637.510	177157.666
563201	56320+22.844	491146.463	177072.347	56320+29.759	491153.209	177073.863	56320+36.664	491160.067	177074.752
563202	56320+36.664	491160.067	177074.752	56320+77.673	491200.736	177080.022	56321+18.644	491241.686	177082.224
563203	56321+18.644	491241.686	177082.224	56321+87.136	491310.079	177085.902	56322+55.373	491377.158	177099.748
563205	56322+55.373	491377.158	177099.748	56322+62.102	491383.748	177101.108	56322+68.823	491390.191	177103.053
563206	56322+89.737	491410.212	177109.098	56322+92.131	491412.505	177109.790	56322+94.525	491414.818	177110.409



0 METERS 50

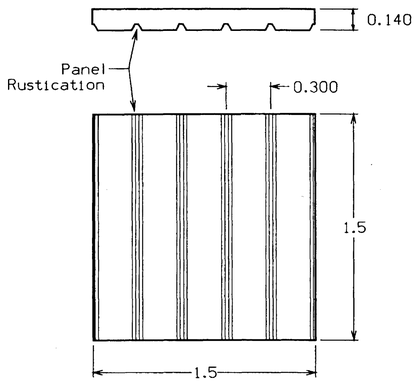
Soil Nail Wall Alignment Details

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.27

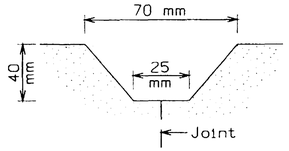


Soil Nail Wall
Alignment Details

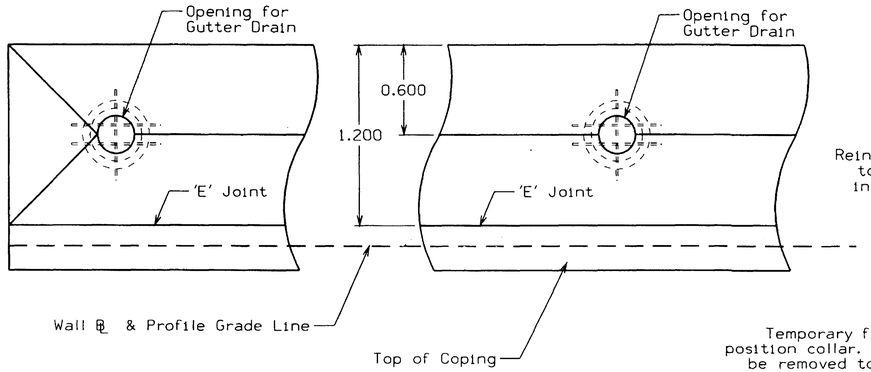
500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.28

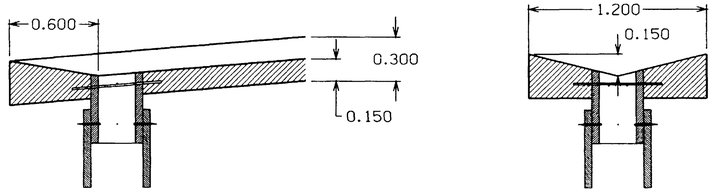


PANEL DIMENSIONS



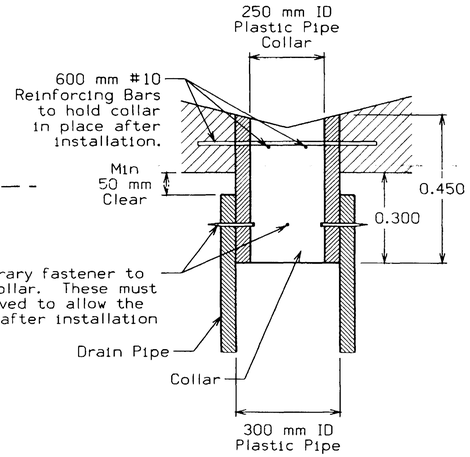
RUSTICATION DIMENSIONS



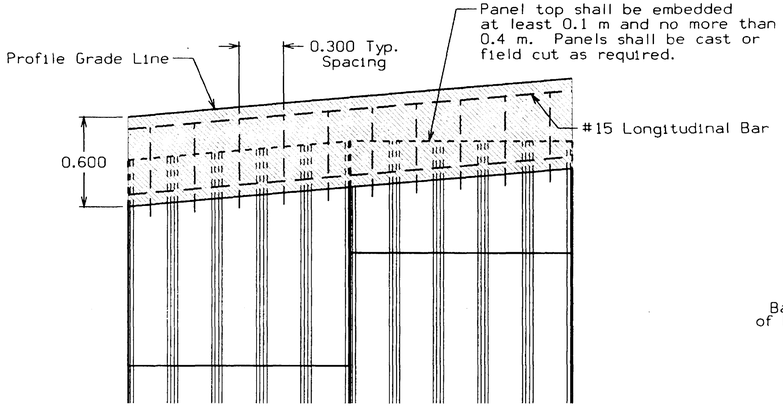


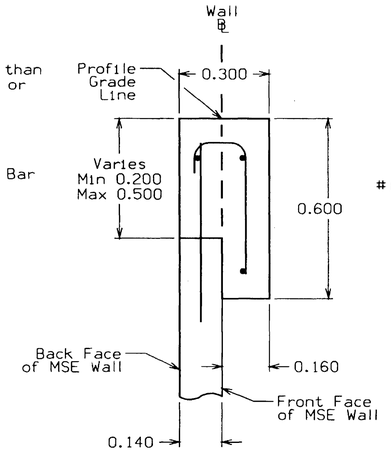
Gutter unit shall be Class 'C' PCC concrete produced and placed in accordance with Section 2301 and Article 4115.04 of the Standard Specifications.

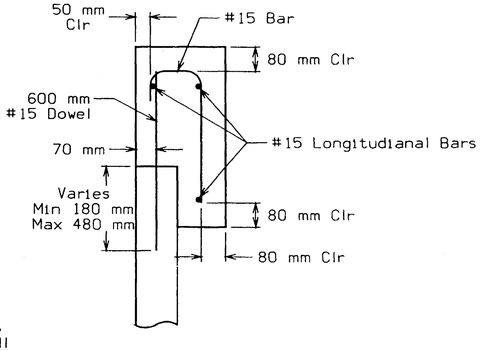
GUTTER DETAILS

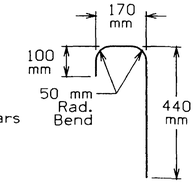


GUTTER DRAIN DETAILS



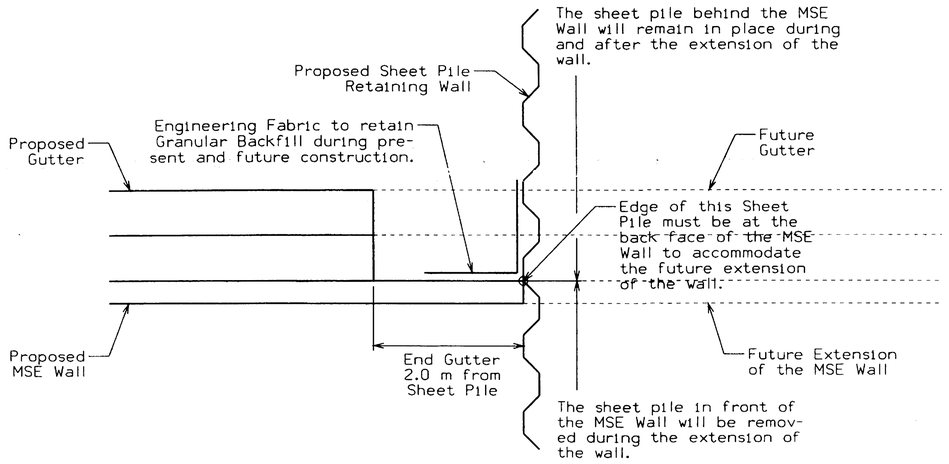






COPING DETAILS

MSE RETAINING WALL DETAILS
[Sheet 1 of 2]

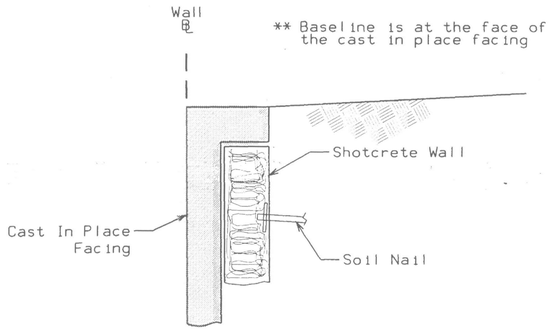


SHEET PILE DETAILS

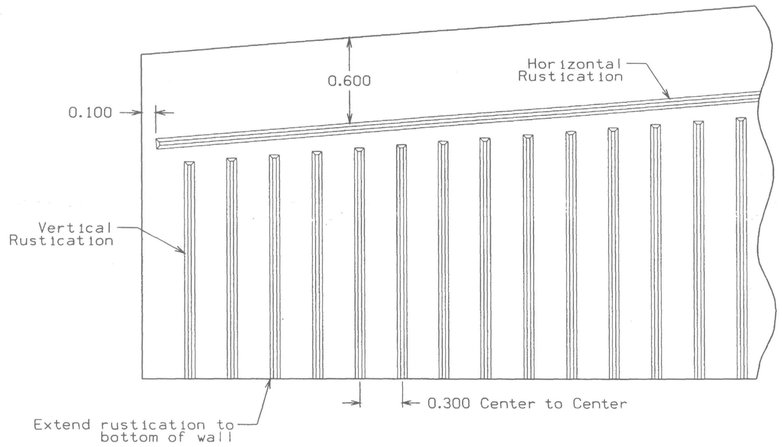
MSE RETAINING WALL
DETAILS
[Sheet 2 of 2]

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.30

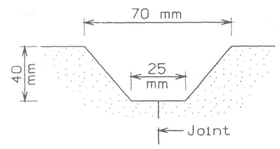
SYSTEM TIME ..... USER NAME ..... DGN FILE



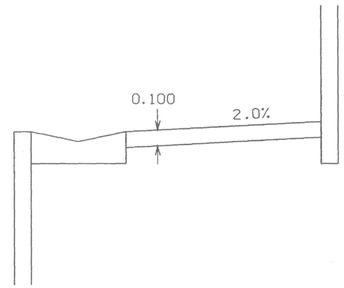
BASELINE DETAILS



RUSTICATION DETAILS

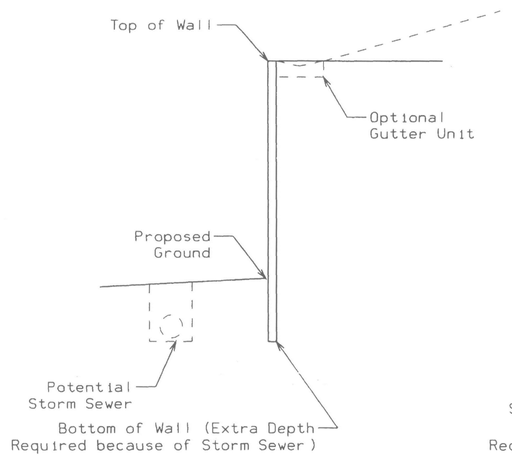


RUSTICATION DIMENSIONS

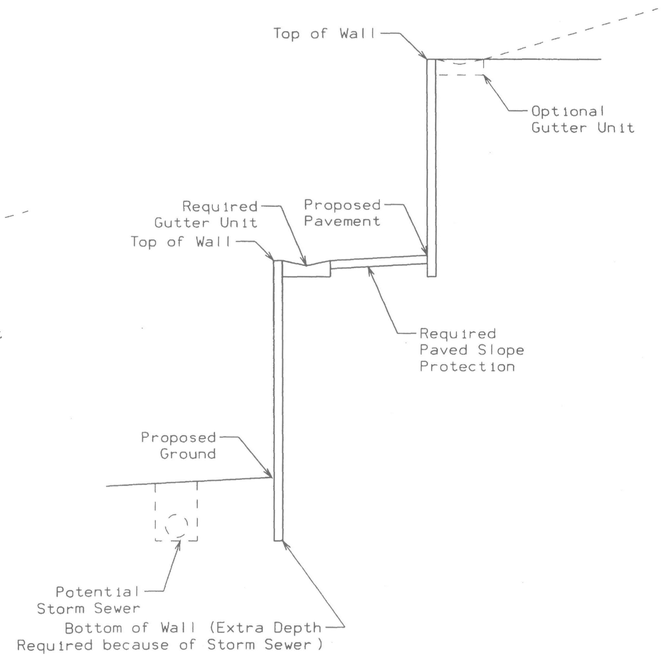


Paved slope protection shall be Class 'C' PCC concrete produced and placed in accordance with Section 2301 and Article 4115.04 of the Standard Specifications.

PAVED SLOPE PROTECTION DETAILS



SINGLE TIER
TYPICAL CROSS SECTION

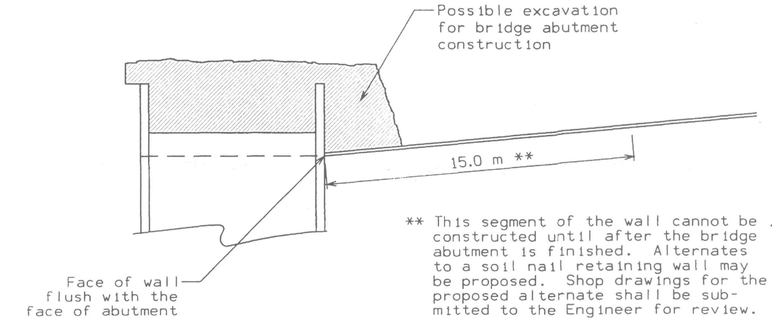


TWO TIER
TYPICAL CROSS SECTION

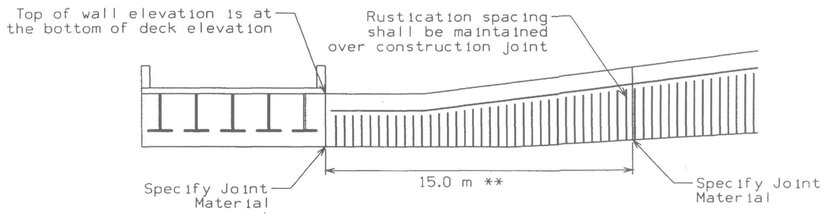
SOIL NAIL RETAINING WALL DETAILS
[Sheet 1 of 2]

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER	V.31

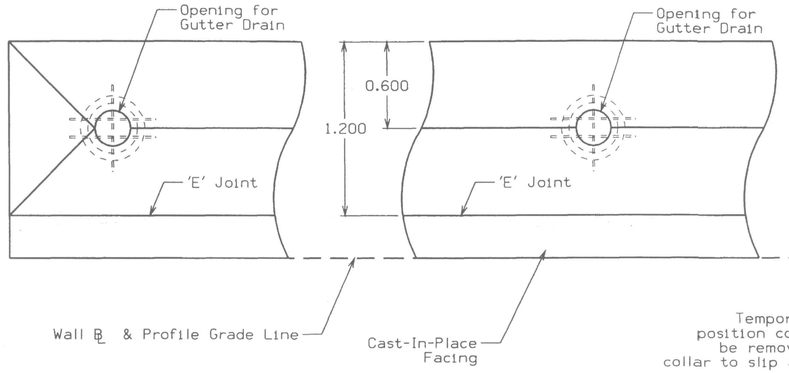
SYSTEMTIME USERTIME DGNSPEC

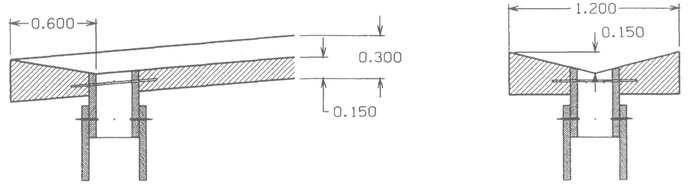


** This segment of the wall cannot be constructed until after the bridge abutment is finished. Alternates to a soil nail retaining wall may be proposed. Shop drawings for the proposed alternate shall be submitted to the Engineer for review.



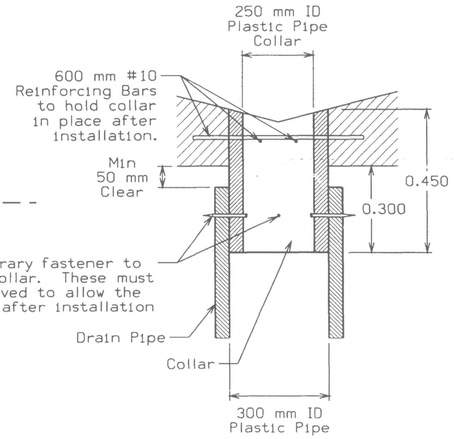
DETAILS OF TIE TO BRIDGE ABUTMENT



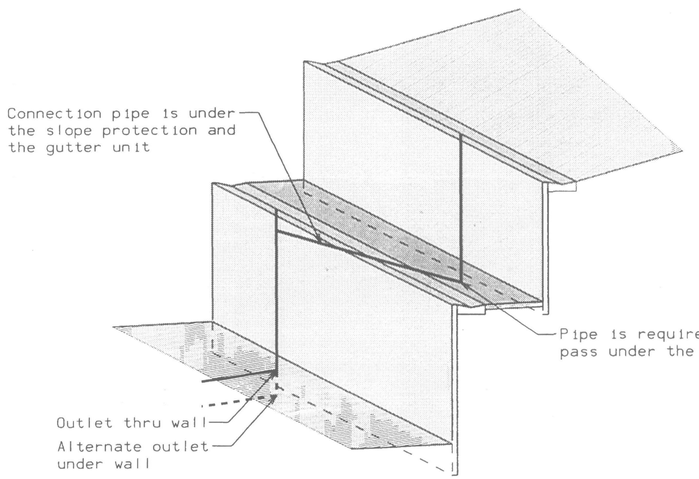


Gutter unit shall be Class 'C' PCC concrete produced and placed in accordance with Section 2301 and Article 4115.04 of the Standard Specifications.

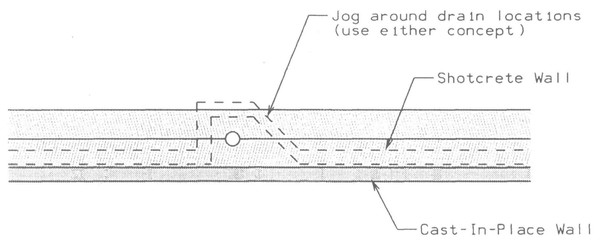
GUTTER DETAILS



GUTTER DRAIN DETAILS



DETAILS OF DRAIN SYSTEM

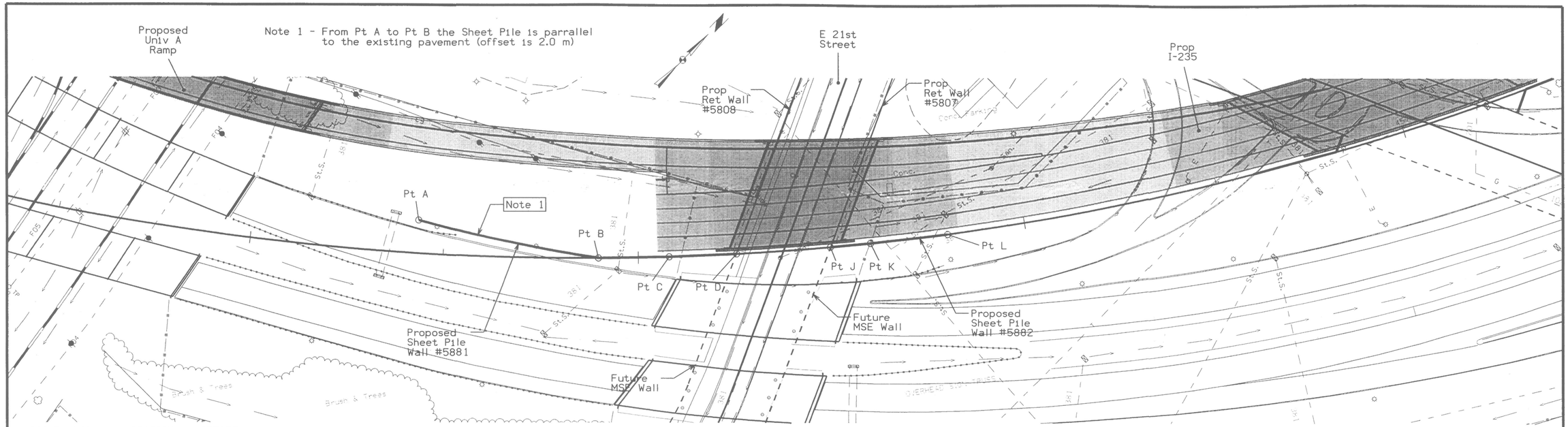


SOIL NAIL RETAINING WALL DETAILS [Sheet 2 of 2]

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.32

SYSTEMTIME USERNAME DGNSPEC

Note 1 - From Pt A to Pt B the Sheet Pile is parrallel to the existing pavement (offset is 2.0 m)



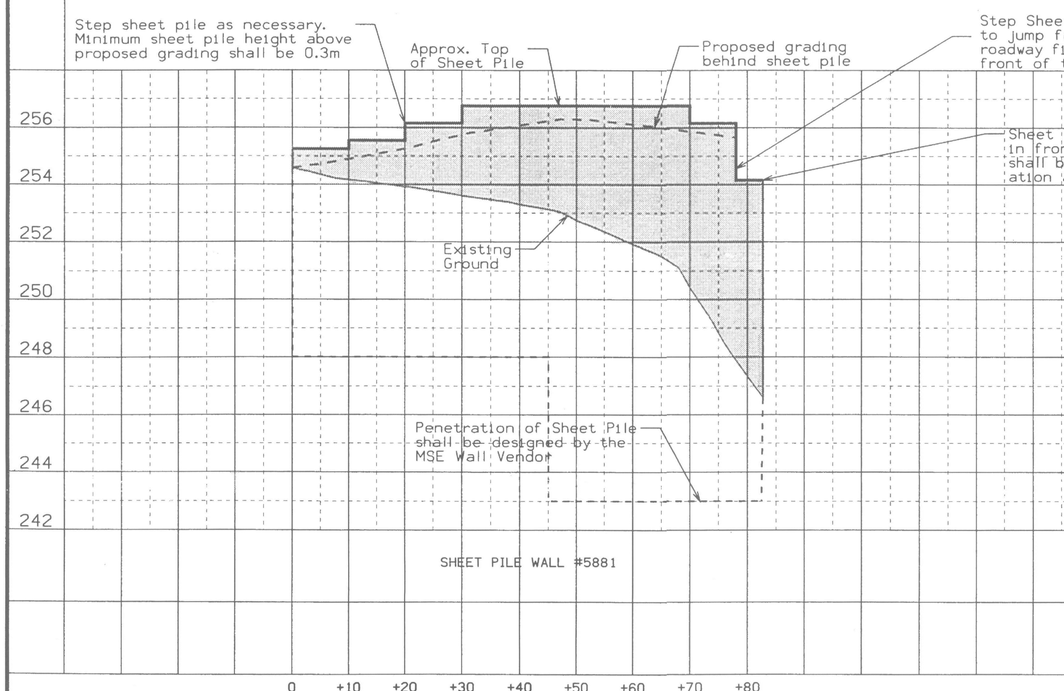
POINT	ALIGN	STATION	OFFSET	X	Y
Pt A	UNIV A	33171+45.000	23.407	493183.966	177949.935
Pt B	UNIV A	33171+90.000	29.026	493223.492	177975.624
Pt C	I-235	572+08.000	0.000	493236.102	177988.710
Pt D	I-235	572+25.370	0.000	493247.834	178001.519

For Details of Sheet Pile Connection to MSE Wall refer to the MSE Wall Details

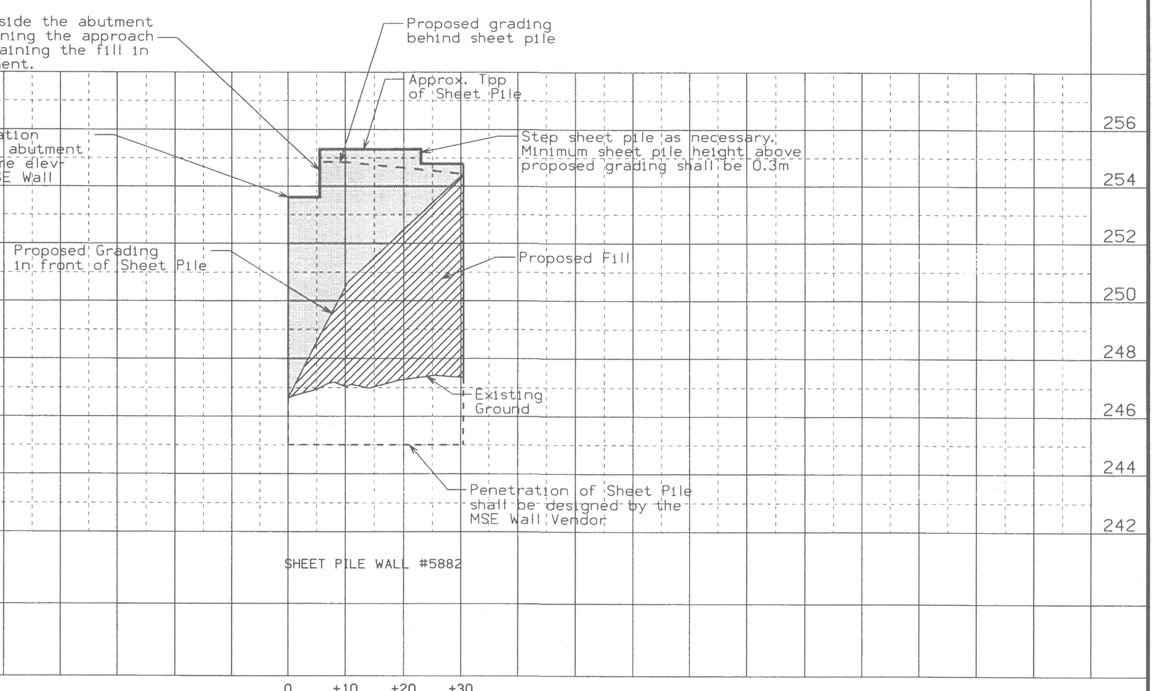
0 METERS 50

POINT	ALIGN	STATION	OFFSET	X	Y
Pt J	I-235	572+49.579	0.000	493263.646	178019.848
Pt K	I-235	572+60.000	0.000	493270.257	178027.905
Pt L	I-235	572+80.000	0.000	493282.603	178043.638

Sheet Pile for MSE Retaining Walls #5807 & 5808



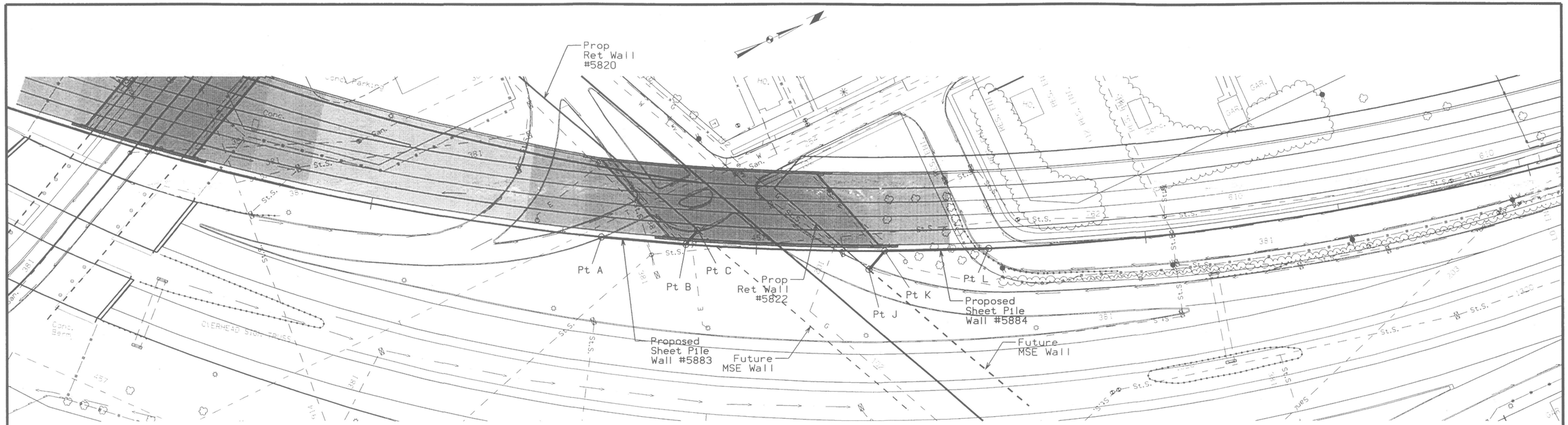
SHEET PILE WALL #5881



SHEET PILE WALL #5882

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.33

SYSTEMTIME USERNAME DGNSPEC



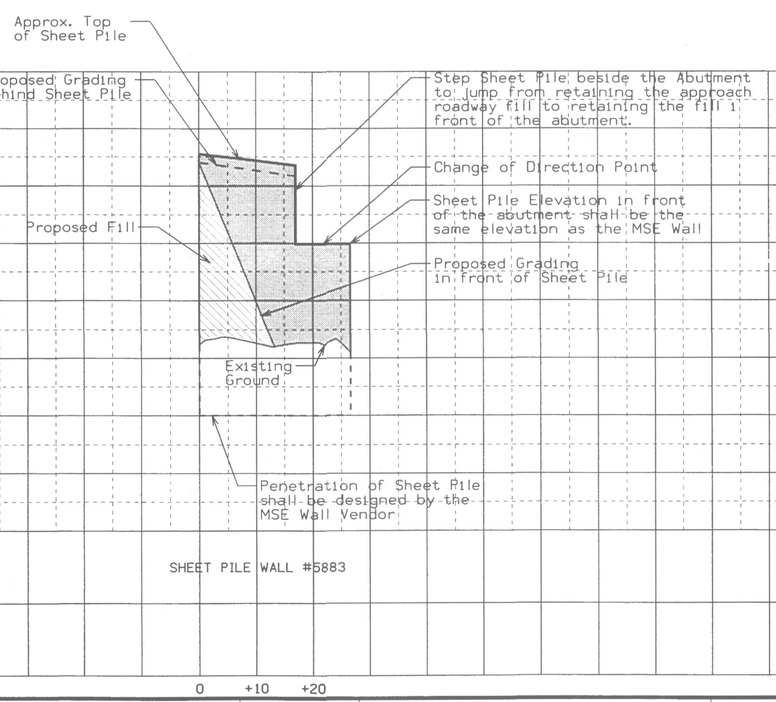
POINT	ALIGN	STATION	OFFSET	X	Y
Pt A	I-235	573+60.000	0.000	493327.348	178109.902
Pt B	I-235	573+81.848	0.000	493338.226	178128.848
	5820	58200+87.000	4.771	493338.226	178128.848
Pt C	5820	58200+87.000	0.000	493336.244	178133.188

For Details of Sheet Pile Connection to MSE Wall refer to the MSE Wall Details

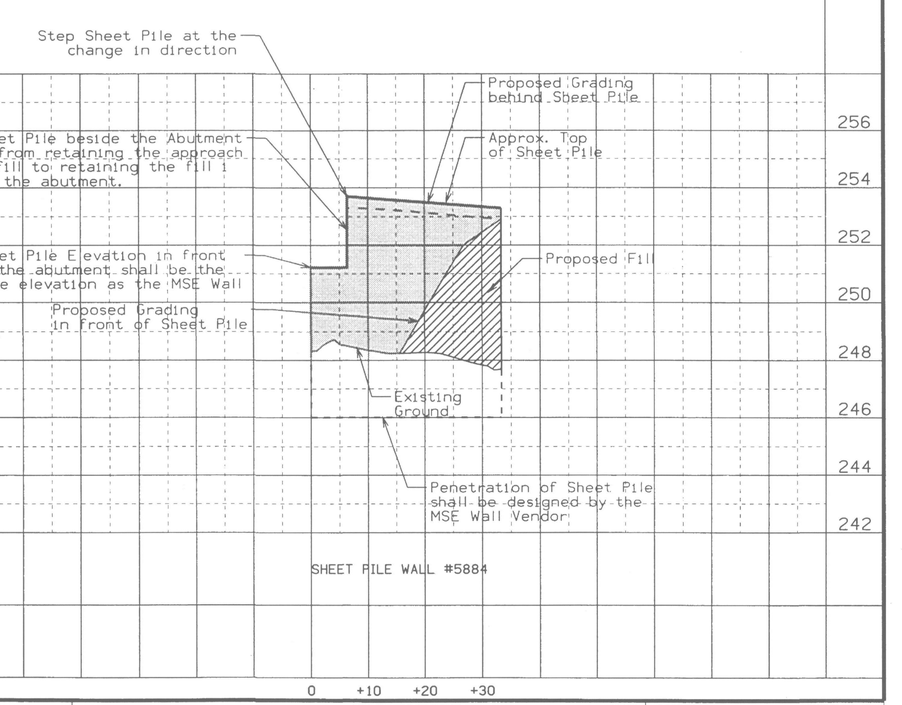
0 METERS 50

POINT	ALIGN	STATION	OFFSET	X	Y
Pt J	5822	58220+27.000	0.000	493363.990	178168.724
Pt K	5822	58220+27.000	-6.342	493361.356	178174.493
	I-235	574+33.030	0.000	493361.356	178174.493
Pt L	I-235	574+60.000	0.000	493372.185	178199.192

Sheet Pile for MSE Retaining Walls #5820 & 5822



SHEET PILE WALL #5883



SHEET PILE WALL #5884

500	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER V.34

SYSTEMTIME USERTIME DGNSPEC

GRADING

IM-NHS-235-2(340)11--03-77

LETTING DATE

POLK COUNTY

INDEX OF SHEETS

105-3
09-27-94

NO.	DESCRIPTION
A.01	Title Sheet
A.02	Signature Blocks
A.03	Map
A.04	Legend and Symbol Information Sheet
A.05	Listing of Project Revisions Tab
B.01-.08	Typical Cross Sections
C.01-.08	Estimate of Quantities & General Information
D.01-.05	Plan Sheets of I-235
D.06-.11	Plan & Profile Sheets of I-235
E.01	Plan & Profile Sheets for Maple St.
G.01-.10	Reference Ties & Bench Marks
G.11-.12	Tabulation of Point and Curve Data
G.13-.20	Geometric Plans
H.01-.07	Row Plan Sheets
J.01-.09	Details of Staging Sheets for I-235
L.01	Details of Jointing and Staking on Maple St.
M.01-.18	Details of Sanitary SWR Reloc. for Tichenor St.
M.19-.32	Details of Storm Sewer
Q.01-.15	Soil Profile Information for MSE Retaining Walls
R.01-.03	Borrow Sheets
R.04-.06	Plan & Profile Sheet for Borrow Area Location
R.07	Details for Removal of Lead Contaminated Soil
R.08	Location Map and Haul Route for Borrow Area
T.01-.02	Earthwork Quantity Sheets
U.01-.07	Details of Clearing and Grubbing along I-235
U.08-.14	Details of Removals along I-235
U.15	Details of Wall Section for 765 mm High Vehicle Barrier with Reinforced pavement
U.16	Details of Modified RE-71(1)
U.17	Details of Modified RE-71(2)
U.18	Traffic Control layout for Temporary Closures Multilane on divided highway and Entrance Ramp Closure
U.19	Demolition Detail Sheet
V.01-.03	Bridge Situation Plans Des. # 1002, 1102, 1202
V.04-.34	Details of Retaining Walls
W.01-.40	University Ave. Ramp "A" & Retaining Wall #5824
X.01-.17	Retaining Walls #5820, #5822, #5807, #5808
Z.01-.26	Retaining Walls #5620, #5630
C.01A-Z	EXTRA WORK ORDERS

Iowa Department of Transportation

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

POLK COUNTY

GRADING

ON I-235 IN DES MOINES FROM EAST OF UNIVERSITY AVE EAST TO GUTHRIE AVE (WBL)

SCALES: As Noted

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions, shall apply to construction work on this project.

Value Engineering Saves. Refer to Standard Notation 203-4 on Sheet C.02

PROJECT LENGTH SUMMARY

105-1
09-27-94

DIV.	LOCATION	m	km
	Sta. 33168+65.000 to 33172+05.967	340.967	0.341
	Sta. 572+08.328 to 580+40.00	831.672	0.8317
	Omit for Bridges at:		
	Sta. 33170+61.205 Design No. 1002	93.700	0.0937
	Sta. 572+37.426 Design No. 1102	28.562	0.0286
	Sta. 574+06.853 Design No. 1202	53.677	0.0537
	Total Length of Roadway in Project	996.700	0.9967
	Total Length of Bridges in Project	175.939	0.1759
	Total Length of Project	1172.639	1.1726

TOTAL SHEETS 255

PROJECT NUMBER
IM-NHS-235-2(340)11--03-77

R.O.W. PROJECT NUMBER
IMN-235-2(240)73--0E-77

PROJECT IDENTIFICATION NUMBER
99-77-235-332-07

METRIC STANDARD ROAD PLANS

105-4
09-27-94

The following Standard Road Plans shall be considered applicable to construction work on this project.

NUMBER	DATE	NUMBER	DATE	NUMBER	DATE
RA-49	03-26-96	RC-11	04-27-99	RP-10	04-30-02
RA-53	10-28-97	RC-14	04-27-99	RS-1	10-27-98
RA-55	03-26-96	RC-16A	10-27-98	RS-2	10-27-98
RA-61	02-11-00	RC-16B	09-21-99	RS-26B	10-28-97
RA-64	02-11-00	RF-1	10-03-00	RS-61	10-27-98
RA-66A	03-26-96	RF-21	06-06-95	RS-62	01-12-99
RA-66C	02-11-00	RP-2	10-03-00	RS-63A	04-30-02
RC-10	04-27-99	RP-3	10-03-00	RS-63B	04-30-02

Form 520003 12-97

I hereby certify that this project was constructed in accordance with the contract documents, the "as-built" plans were prepared under my supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

LICENSED PROFESSIONAL ENGINEER DANNY J. ZEIMEN 17975 IOWA

Danny Zeimen — Project Engineer — 12-26-08 Date

My license renewal date is December 31, 2003

2003 Year — UNITED CONTRACTOR, INC. Contractor — STEVE HUELSEN, CHRISTY McCLAIN Project Inspector

CORRECTED BY GARY CRABTREE JAN. 13 2004
CHECKED BY CHRISTY McCLAIN

SCANNED

REVISIONS
REVISION DATE: 11/18/03

FOR MAP SEE SHEET A.03

04-30-02 101-5

DESIGN DATA URBAN

2002 AADT	57912	V.P.D.
2022 AADT	88479	V.P.D.
2022 DHV	3687	V.P.H.
TRUCKS	10	%
Total Design ESALs		

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.01	James R. Schoenrock	Primary Signature Block
M.01	James R. Rasmussen	Howard R. Green Co.
M.17	Hamid Feiz	Allender Butzke Eng. Inc.
A.02	Robert L. Stanley	Geotech
A.02	Dennis L. Hover	Geotech
A.05	James R. Schoenrock	Revision Signature Block

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER James R. Schoenrock 11343 IOWA

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

James Schoenrock 11/19/03
Signature — Date

James R. Schoenrock
Printed or Typed Name

My license renewal date is December 31, 20 03

Pages or sheets covered by this seal: A.1-A.05; B.01-B.08; C.01-C.08; D.01-D.11; E.01; L.01; G.01-G.20; H.01-H.07; J.01-J.09; M.19-M.23; M.25-M.32; R.01-R.08; T.01-T.02; U.01-U.19; V.04-V.34; W.01-W.40; X.01-X.17; Z.01-Z.26

1000	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER A.01a REVISED 9-11-02

18-NOV-2003 10:17 egreen W:\Projects\77235180C96\Design_grading_(340)\k77235340.a01a



PROPOSED DETOUR ROUTE WHEN REMOVING PEDESTRIAN BRIDGE AS FOLLOWS:

I-235 (SBL)

1-TAKE EXIT RAMP TO GUTHRIE AVE
2-TURN RT. (WEST) ONTO GUTHRIE AVE TO DELAWARE AVE
3-TURN LT. (SOUTH) ONTO DELAWARE AVE. TO EASTON BLVD
4-TURN LT. (EAST) ONTO EASTON BLVD AND TAKE ON RAMP ONTO I-235 SOUTH

I-235 (NBL)

1-TAKE EXIT RAMP TO UNIVERSITY AVE
2-TURN RT. (EAST) ONTO UNIVERSITY AVE TO E 21st ST
3-TURN LT (NORTH) ONTO E 21st ST TO EASTON BLVD
4-CONTINUE NORTH ON DELAWARE AVE TO GUTHRIE AVE TO ON RAMP TO I-235

WHEN PEDESTRIAN BRIDGE REMOVAL IS COMPLETED THEN RETURN DETOURED TRAFFIC BACK ONTO THE I-235 NB & SB LANES.

Detour of Traffic in area of pedestrian bridge.

1000	DESIGN TEAM SCHOENROCK/NELSON	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK COUNTY	PROJECT NUMBER	IM-NHS-235-2(340)11--03-77	SHEET NUMBER J.09

11-FEB-2002 14:14 atrimbl w:\Projects\77235180C96\Design_grading_(340)\k77235340.j09

East 9th. St.

East 11th. St.

Maple St.

Existing I-235

℄ I-235

Penn Ave.

Sidewalk Removal A=92.83 sq. m

Sidewalk Removal A=49.65 sq. m

Sawcut

Pavement Removal A=1077.68 sq. m

Remove San. Sewer

Remove Storm Sewer

Remove San. Sewer

Utility Access Sewer

Remove San. Sever

Remove Existing Pavement

Remove Existing Sidewalk

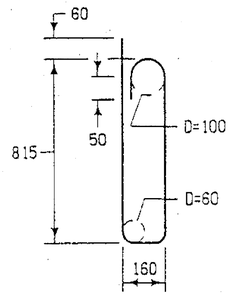
0 METERS 50

DETAILS OF REMOVALS ALONG I-235

500	DESIGN TEAM SCHOENROCK/GREEN	METRIC	IOWA DOT * OFFICE OF DESIGN	POLK	COUNTY	PROJECT NUMBER IM-NHS-235-2(340)11--03-77	SHEET NUMBER U.08

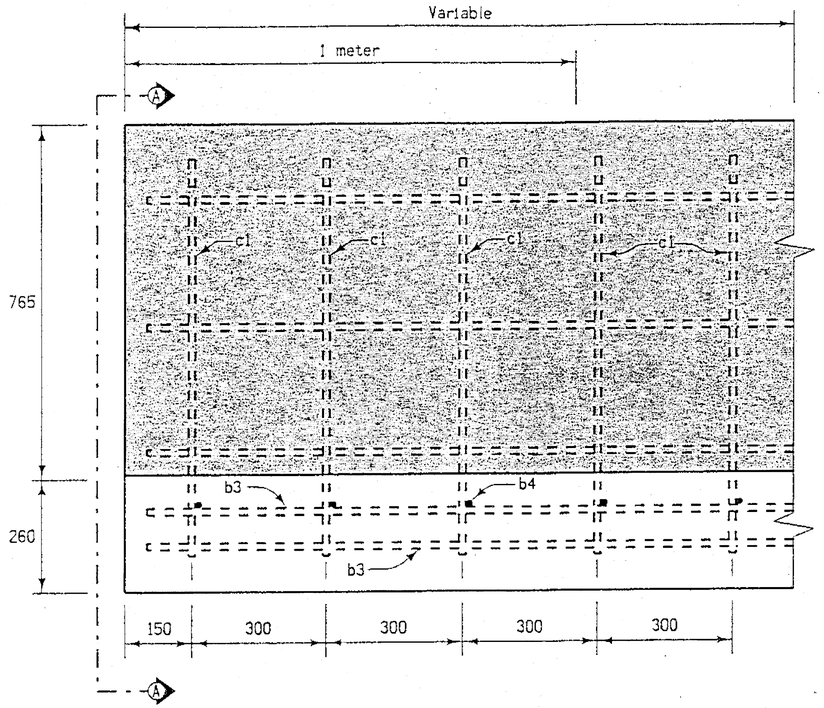
11-SEP-2002 08:45 enaude w:\Projects\77235180C96\Design_grading_(340)\k77235340.u08

BENT BAR DETAILS

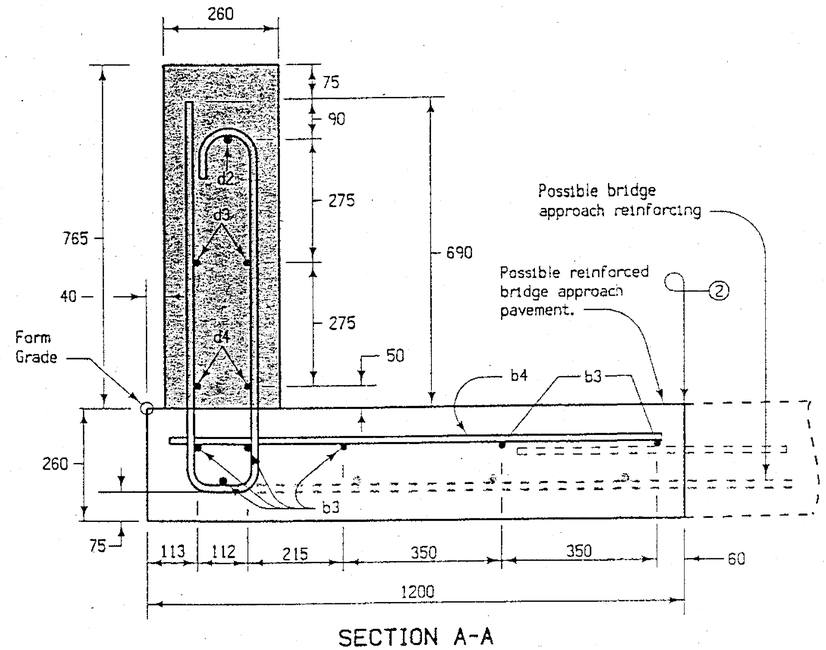


c1

NOTE: All dimensions shown out to out.
D = Pin Diameter



BACK ELEVATION



SECTION A-A

REINFORCING STEEL for (1) lineal meter of VERTICAL WALL								
MARK	SIZE	LOCATION	SHAPE	NO.	LENGTH	TOTAL LENGTH	TOTAL MASS	SPACING
b3	15	Footing Longitudinal	——	6	1000	6.00 m	9.42 Kg/m	①
b4	15	Footing Transverse	——	3	1085	3.25 m	5.10 Kg/m	300
c1	15	Wall Vertical	②	3	2002	6.00 m	9.42 Kg/m	300
d2	15	Wall Horizontal	——	1	1000	1.00 m	1.57 Kg/m	275
d3	15	Wall Horizontal	——	2	1000	2.00 m	3.14 Kg/m	275
d4	15	Wall Horizontal	——	2	1000	2.00 m	3.14 Kg/m	275
			Total			20.25 m	31.79 Kg/m	

GENERAL NOTES:

Details shown hereon are for the construction of a Reinforced Concrete Vertical Barrier Wall. The Wall Section shall be reinforced as detailed and cast in place. The materials and the construction methods used shall be in accordance with the current Standard and Supplemental Specifications.

Details shown are typical. Alternate design details may be submitted to the Engineer for approval.

The concrete for the barrier wall section shall be Class 'D' Structural Concrete placed and finished as specified for "Precast and Prestressed Concrete Bridge Units" in the current Standard Specifications or by a method approved by the Engineer. All exposed corners 90 degrees or sharper are to be filleted with a 13 millimeter dressed and beveled strip.

All reinforcing bars shall be epoxy coated and be grade 400. Minimum clear distance from face of concrete to the nearest reinforcing bar is to be 50 millimeters.

The price bid for "Concrete Barrier, (Vehicle)", per meter shall be concidered full compensation for construction of the barrier wall section as detailed hereon.
This shall include:
Furnishing and placement of structural concrete
Furnishing and installing epoxy coated reinforcing bars.

The price bid for "Reinforced Pavement for Barrier ", per square meter, shall be full compensation for construction of the reinforced paved shoulder as detailed hereon.
This shall include:
Furnishing and placement of P.C. Concrete Pavement
Required pavement joints
Epoxy coated reinforcing steel bars b3, b4 and c1.

Estimated quantites required for one meter of barrer wall:
Concrete Barrier Section
0.20 cubic meters of Class 'D' Structural Concrete
7.9 kilograms of epoxy coated reinforcing steel
Reinforced Paved Shoulder
1.20 square meters of Class 'C' Concrete
23.9 kilograms of epoxy coated reinforcing steel

① For spacing see details on this sheet.

② See Bent Bar Detail

③ When reinforced bridge approach pavement is present this joint is non-existent.

All dimensions given in millimeters unless noted.

DETAILS OF WALL SECTION FOR 765 mm HIGH VEHICLE BARRIER WITH REINFORCED PAVEMENT