

LEGEND

--- = CORPORATE LIMITS
--- = CENTERLINE

EXISTING

----- = R.O.W.
----- = PROPERTY LINE
---UGT--- = UNDERGROUND TELEPHONE LINE
---UGE--- = UNDERGROUND ELECTRIC LINE
---UGE-3--- = UNDERGROUND ELECTRIC 3 PHASE
---P-OH--- = OVERHEAD ELECTRIC LINE
---GAS--- = GAS MAIN
---PETRO--- = GASOLINE MAIN
---UGTV--- = UNDERGROUND CABLE TV
---UGFO--- = UNDERGROUND FIBER OPTIC LINE
□ = TELEPHONE/CABLE TV PEDESTAL
□ = CONTROL CABINET/TRANSFORMER
○ = SIGN
□ = CATCH BASIN
⊙ = STORM SEWER MANHOLE
○ = OUTLET CONTROL STRUCTURE
->->- = STORM SEWER LINE
===== = CONCRETE CURB & GUTTER

PROPOSED

===== = CONCRETE CURB & GUTTER
■ = CATCH BASIN
->->- = STORM SEWER LINE

NOTE:

1. THE EXACT LOCATION OF UNDERGROUND UTILITIES SUCH AS GAS, TELEPHONE, FIBER OPTIC, ELECTRIC, CABLE TV, AND PIPE LINES ARE UNKNOWN. THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL (651-454-0002) BEFORE COMMENCING EXCAVATION.

2. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

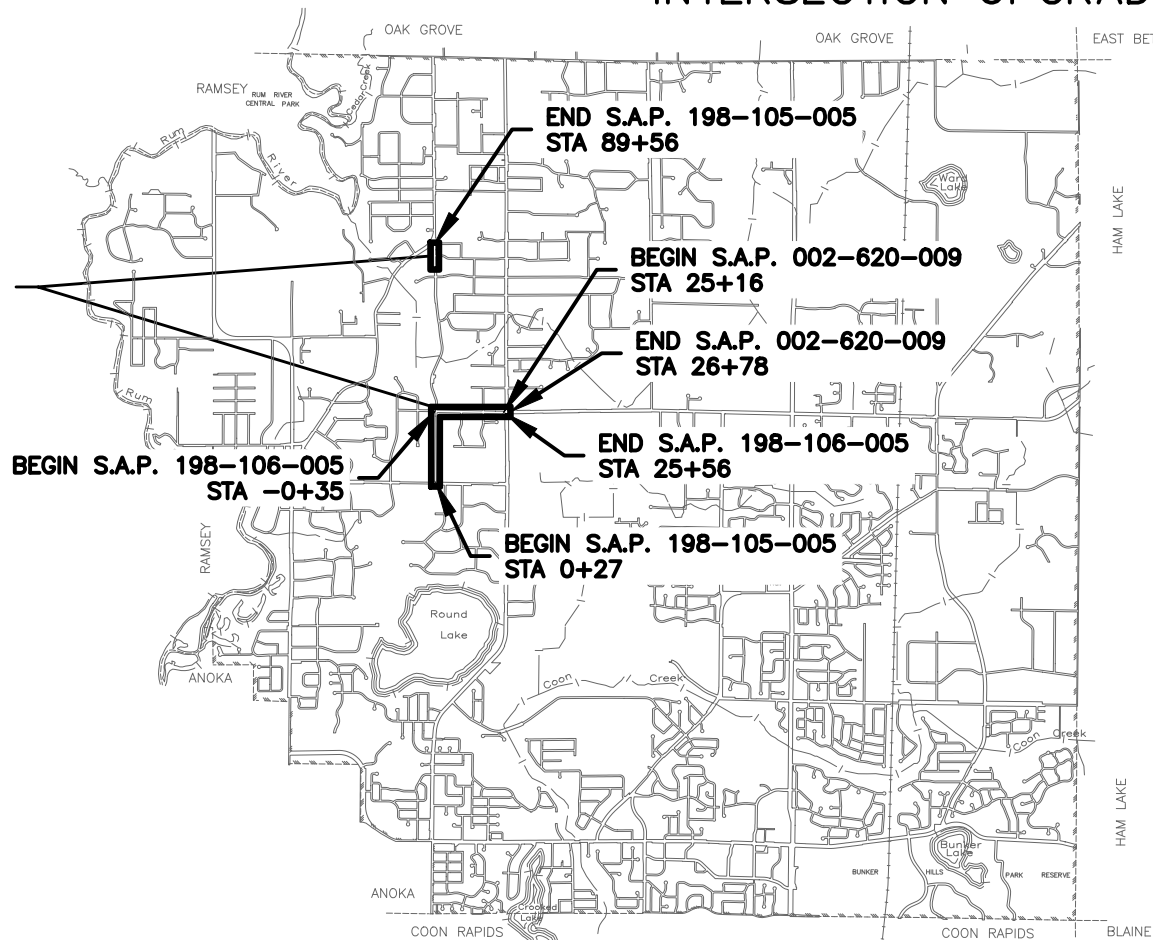
CITY OF
ANDOVER, MINNESOTA
CONSTRUCTION PLANS
FOR ROAD RECONSTRUCTION
CITY PROJECT NO. 21-39
161ST AVENUE NW
S.A.P. 198-106-005
LOCATED ON 161ST AVE NW FROM TULIP ST NW TO ROUND LAKE BLVD (CSAH 9)
TULIP STREET NW
S.A.P. 198-105-005
LOCATED ON TULIP ST NW FROM 157TH AVE NW (CSAH 20) TO VALLEY DR (CSAH 58)
161ST AVENUE NW (CSAH 20) + ROUND LAKE BLVD NW (CSAH 9)
S.A.P. 002-620-009
INTERSECTION UPGRADES

PROJECT LOCATIONS



NO SCALE

PLAN REVISIONS SUMMARY			
NO.	BY	DATE	REVISIONS



SHEET	INDEX DESCRIPTION
1	TITLE SHEET
2	STATEMENT OF ESTIMATED QUANTITIES/STANDARD PLATES
3	EARTHWORK SUMMARY
4	PROJECT LAYOUT
5	CONSTRUCTION NOTES
6-7	DETAILS
8-9	TYPICAL SECTIONS
10-13	EXISTING CONDITIONS/REMOVALS
14-15	STORM SEWER
16-21	STREET PLAN/PROFILES
22-25	SIGNING/STRIPING
26-31	PEDESTRIAN CURB RAMP
32-41	STANDARD PLANS
	CSAH 9/CSAH 20 INTERSECTION AND SIGNAL PLANS

THIS PLAN CONTAINS 41 SHEETS



GOVERNING SPECIFICATIONS

THE 2020 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AND THE "SUPPLEMENTAL SPECIFICATIONS" DATED SEPTEMBER 2022 SHALL GOVERN.

CITY OF ANDOVER UTILITY AND STREET CONSTRUCTION SPECIFICATIONS SHALL APPLY.

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE LATEST MMUTCD, INCLUDING THE LATEST FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

161ST AVENUE NW DESIGN DESIGNATION	
STOPPING SIGHT DISTANCE BASED ON: 3.5' HEIGHT OF EYE 0.5' HEIGHT OF OBJECT	
161ST AVENUE NW (S.A.P. 198-106-005)	2591 FEET (0.491 MILES)
DESIGN	10 TON
DESIGN SPEED	35 MPH
R VALUE	30
ESALS	422,000
EXISTING A.D.T. (2023)	1,180
20 YR. PROJECTED A.D.T. (2043)	1,460
% H.C.A.D.T.	9.06%
FUNCTIONAL CLASSIFICATION	COLLECTOR
NO. OF TRAFFIC LANES	2
NO. OF PARKING LANES	0

TULIP STREET NW DESIGN DESIGNATION	
STOPPING SIGHT DISTANCE BASED ON: 3.5' HEIGHT OF EYE 0.5' HEIGHT OF OBJECT	
TULIP STREET NW (S.A.P. 198-105-005)	8929 FEET (1.691 MILES)
DESIGN	10 TON
DESIGN SPEED	35 MPH
R VALUE	50
ESALS	414,000
EXISTING A.D.T. (2023)	760
20 YR. PROJECTED A.D.T. (2043)	890
% H.C.A.D.T.	9.0%
FUNCTIONAL CLASSIFICATION	COLLECTOR
NO. OF TRAFFIC LANES	2
NO. OF PARKING LANES	0

APPROVED:

ANOKA COUNTY ENGINEER _____ DATE _____

RECOMMENDED FOR APPROVAL:

DISTRICT STATE AID ENGINEER: _____ DATE _____
REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

APPROVED:

APPROVED FOR STATE AID FUNDING: STATE AID ENGINEER _____ DATE _____

ANDOVER, MINNESOTA

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

David D. Berkowitz DAVID D. BERKOWITZ, PE
ANDOVER DIRECTOR OF PUBLIC WORKS/CITY ENGINEER
DATE 2/21/2023 LIC. NO. 26757

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S.A.P. 198-106-005, 198-105-005, AND
002-620-009 CITY PROJ. NO. 21-39

161st Ave NW & Tulip Street NW Reconstruction (City Project 21-39) STATEMENT OF ESTIMATED QUANTITIES				PROJECT TOTALS						TULIP STREET (SAP 198-105-005)				161ST AVENUE NW (SAP 198-106-005)				CSAH 9 / CSAH 20 INTERSECTION (SAP 002-620-009)		
				TOTAL QUANTITIES		STREETS		STORM SEWER		STREETS		STORM SEWER		STREETS		STORM SEWER		STREETS		
NOTES	TAB	ITEM NO.	DESCRIPTION	UNIT	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.	EST. QUAN.	ACTUAL QUAN.
		1	2021.501 Mobilization	LS	1.00		0.88		0.12		0.41		0.07		0.35		0.05		0.12	
		2	2101.502 Grubbing	EA	25		25								25					
		3	2101.502 Clearing	EA	25		25								25					
	A	4	2102.503 Pavement Marking Removal	LF	138		138												138	
	A	5	2102.518 Pavement Marking Removal	SF	810		810												810	
		6	2104.502 Salvage Casting	EA	20			20					15				5			
	B	7	2104.502 Remove Drainage Structure	EA	8			8					5				3			
		8	2104.502 Salvage Sign	EA	2		2												2	
		9	2104.503 Remove Sewer Pipe (Storm)	LF	306			306					186				120			
		10	2104.503 Sawing Concrete Pavement (Full Depth)	LF	115		115				20				85				10	
		11	2104.503 Sawing Bit Pavement (Full Depth)	LF	891		891				420				260				211	
		12	2104.503 Remove Curb & Gutter	LF	4,271		4,271				2,490				1,880				101	
1		13	2104.518 Remove Concrete Pavement	SF	2,440		2,440				240				2,200					
1	B	14	2104.518 Remove Bituminous Pavement	SF	2,610		2,610				1,120				650				840	
		15	2104.518 Remove Concrete Walk	SF	204		204												204	
2		16	2104.602 Salvage and Reinstall Mailbox	EA	6		6				5				1					
3		17	2105.607 Common Excavation	CY	520		520				290				200				30	
4		18	2105.607 Subgrade Excavation	CY	300		300								300					
5		19	2105.607 Select Granular Borrow (LV)	CY	200		200				100				100					
6		20	2105.607 Salvage Reclaim Material (LV)	CY	3,400		3,400				1,790				1,610					
7		21	2112.519 Subgrade Preparation	RDST	61.6		61.6				35.7				25.9					
8		22	2130.523 Water	MGAL	100		100				50				50					
9		23	2211.509 Aggregate Base Class 5	TN	42		42				10				10				22	
		24	2215.504 Full Depth Reclamation	SY	22,520		22,520				12,130				10,390					
		25	2232.504 Mill Bituminous Surface (1.5")	SY	80		80				50				30					
		26	2357.505 Bituminous Material For Tack Coat	GAL	1,150		1,150				610				520				20	
		27	2360.509 Type SP 9.5 Wearing Course Mx (3.C)	TN	2,580		2,580				1,390				1,190					
		28	2360.509 Type SP 9.5 Wearing Course Mx (2.B) - Driveways	TN	30		30				20				10					
10		29	2360.509 Type SP 12.5 Wearing Course Mixture (3.C)	TN	2,910		2,910				1,570				1,340					
	C	30	2360.509 Type SP 12.5 Bituminous Mixture for Patching	TN	20		20												20	
11		31	2451.607 Crushed Rock (CV)	CY	20		10		10		5		5		5					
		32	2501.502 15" RC Pipe Apron & Grate	EA	2			2			1		1				1			
		33	2501.502 18" RC Pipe Apron & Grate	EA	1			1									1			
		34	2501.602 12" Skimmer	EA	1			1			1		1							
		35	2501.602 12" Dissipator	EA	2			2			2		2							
		36	2501.602 18" Skimmer	EA	1			1									1			
		37	2501.602 15" Dissipator	EA	1			1									1			
		38	2503.503 12" RC Pipe Sewer Des 3006 Class V	LF	107			107			50				57					
		39	2503.503 15" RC Pipe Sewer Des 3006 Class V	LF	172			172			130				42					
		40	2503.503 18" RC Pipe Sewer Des 3006 Class V	LF	15			15							15					
		41	2503.602 Connect to Existing Pipe Sewer	EA	6			6			4				2					
		42	2503.603 Clean & Video Tape New Storm Sewer	LF	312			312			162				150					
12		43	2504.602 Irrigation System Modifications	EA	45		45				15				30					
13		44	2506.502 Casting Assembly - Storm	EA	8			8			6				3					
14		45	2506.502 Install Casting - Storm	EA	20			20			15				5					
		46	2506.602 Construct Drainage Structure, Type 420	EA	1			1			1									
		47	2506.602 Construct Drainage Structure, Type 421-48" Dia.	EA	6			6			3						3			
	C	48	2521.602 Drill and Grout Reinf Bar (Epoxy Coated)	EA	24		24												24	
		49	2521.618 6" Concrete Walk - Special	SF	667		667												667	
	C	50	2531.503 Concrete Curb & Gutter Design B418	LF	240		240								60				180	
		51	2531.503 Concrete Curb & Gutter Design B618	LF	4,190		4,190				2,490				1,700					
15		52	2531.504 6" Concrete Driveway Pavement	SY	60		60				30				30					
16		53	2531.602 Clean and Patch Conc. Curb and Gutter Joint	EA	320		320				200				120					
		54	2531.604 8" Concrete Valley Gutter	SY	90		90								90					
	C	55	2531.618 Truncated Domes	SF	110		110												110	
		56	2583.601 Traffic Control	LS	1.00		0.88		0.12		0.41		0.07		0.35		0.05		0.12	
	C	57	2564.502 Install Sign	EA	2		2												2	
		58	2565.610 Rewse Signal System	SVS	1		1												1	
		59	2573.502 Storm Drain Inlet Protection	EA	28		28				18				10					
		60	2573.503 Silt Fence, Type H1 or M5	LF	1,260		1,200		60		450		30		750		30			
		61	2573.503 Sediment Control Log Type Wood Chip	LF	100			100					50				50			
		62	2574.507 Loam Topsoil Borrow (LV)	CY	702		692		10		390		5		270		5		32	
		63	2574.508 Fertilizer Type 3	LB	260		248		12		144		4		104		6			
17	D	64	2575.504 Rolled Erosion Prevention Category 15	SY	100		100												100	
		65	2575.504 Rolled Erosion Prevention Category 20	SY	110			110					40				70			
		66	2575.505 Seeding	AC	0.65		0.62		0.03		0.36		0.01		0.26		0.02			
		67	2575.505 Weed Spraying	AC	0.65		0.62		0.03		0.36		0.01		0.26		0.02			
		68	2575.508 Seed Mixture 25-151	LB	146		140		6		80		2		60		4			
18		69	2575.508 Hydraulic Mulch Matrix	LB	1,625		1,550		75		900		25		650		50			
		70	2582.503 4" Solid Line Paint	LF	21,580		21,580				19,070				2,510					
		71	2582.503 4" Broken Line Paint	LF	2,080		2,080				2,080									
		72	2582.503 4" Double Solid Line Paint	LF	10,890		10,890				7,460				3,430					
		73	2582.503 18" Solid Line Paint	LF	80		80				55				25					
		74	2582.503 24" Solid Line Paint	LF	600		600				200				400					
	A	75	2582.503 24" Solid Line Preform Tape	LF	173		173												173	
		76	2582.518 Pavement Message Paint	SF	380		380				180				200					
	A	77	2582.518 Crosswalk Preform Thermoplastic	SF	1,028		1,028												1,028	

- Notes:**
- Regardless of depth. Shall be used for roadway, driveway, and flumes, etc.
 - Includes salvage and reinstall of existing mailbox, and temporary placement of mailbox in barrel at EA existing location during construction.
 - For all excavation except subgrade excavation where unsuitable material encountered. Includes disposing excess or unsuitable material off-site.
 - Suitable material can be used as curb backfill. Excess or material with sod chunks / debris shall be disposed of off-site.
 - Only to be used if sufficient material not generated on-site. Approximately 1,000 CY is available for use at the Andover Public Works yard if needed. Contractor to load and haul from stockpile.
 - Item shall be used for excavating, placing, hauling, and stockpiling salvaged reclaim material. Excess material not used on-site shall become property of contractor and disposed of off-site.
 - Includes grading, placing salvaged reclaim where necessary and compaction of reclaimed aggregate base.
 - Item shall be used for dust control only as directed by the engineer. Water to achieve compaction shall be incidental.
 - For use for driveway replacements, roadway core, and under curb and gutter if sufficient reclaim material not available.
 - Includes quantity (tonnage) for construction of bituminous curb integral with base course pavement.
 - For construction of rock checks and under structures if water table is high. Rock shall be 1.5" nominal diameter.
 - Based upon number or irrigation heads removed / replaced. Item shall include all items necessary to temporarily cap existing systems, replace damaged lines, heads, adjust systems, and return them to pre-project condition or better. Work shall be performed by a licensed irrigation contractor. Irrigation systems shall be protected if at all possible.
 - For new structures and if salvage castings are not re-useable or broken.
 - Item includes new concrete adjusting rings, wrap rings with geotextile fabric, concrete collar.
 - Concrete shall be high early strength.
 - Clean joint and patch with 3U18 compound. Average joint 3" wide x 1" deep. Item for all joints, regardless of actual depth/width. Locations determined in field by engineer.
 - Type 3 Fertilizer applied at 400 #/acre, Seeding, and Type 25-121 seed mix applied at 61 #/acre are incidental to this pay item.
 - Applicaton rate of 2,500 lb / acre minimum. Apply on all areas without erosion control blanket or sod.

BASIS OF ESTIMATED QUANTITIES

Bituminous Wear Course	120 # / SY / inch
Bit. Non-Wear Course	120 # / SY / inch
Aggregate Base, Class 5	110 # / SY / inch
Tack Coat	0.05 Gal / SY
Hydraulic Mulch Matrix	2500 # / acre
Fertilizer, Type 3	400 # / acre
Seed Mixture 25-151	200 # / acre

These Standard Plates as approved by the FHWA shall apply.

STANDARD PLATES	
Plate No.	Description
7038A	Detectable Warning Surface Truncated Domes
7100H	Concrete Curb and Gutter
8000K	Temporary Channelizers
8130E	Saw Cut Loop Detectors
8132B	Preformed Rigid PVC Conduit Loop Detector Layout

NO.	DATE	BY	DESCRIPTION OF REVISIONS

DESIGNED JJL	DRAWN JAK
CHECKED DDB	
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA SIGNATURE <i>David D. Berkowitz</i> DATE 2/21/2023 LIC. NO. 26757 DAVID D. BERKOWITZ TYPED OR PRINTED NAME	



161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21–39
SAP 198–106–005, 198–105–005, 002–620–009

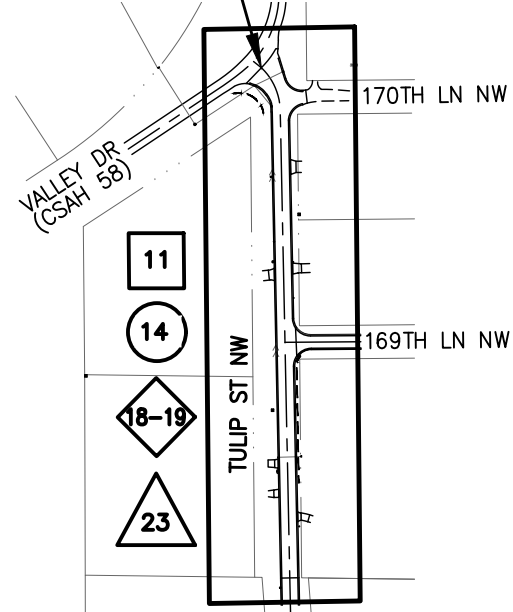
STATEMENT OF ESTIMATED QUANTITIES
SHEET NO. 2 OF 41 SHEETS

EARTHWORK CALCULATIONS				
TULIP STREET NW		161st AVENUE NW		
Roadway Length =	3,574 LF	Roadway Length =	2,591 LF	
Existing Bit Roadway Area =	12,130 SY	Existing Bit Roadway Area =	10,384 SY	
Proposed Curb Length =	2,490 LF	Proposed Curb Length =	1,630 LF	
Existing Pavement Section=	3.5" Bit, 8" Class 5	Existing Pavement Section=	3" Bit, 6" Class 5	
Proposed Pavement Section =	3.75" Bit, 8" Class 5	Proposed Pavement Section =	3.75" Bit, 5.5" Class 5	
Salvage Reclaim	Tulip Street	161st Ave	TOTAL	
	1,179 CY (CV)	1,010 CY (CV)	2,189 CY (CV)	Pavement Area x 3.5" (depth of proposed bit section)
	32 CY (CV)	32 CY (CV)	64 CY (CV)	Assume 50' of Subgrade Correction in Areas TBD x 8"
	62 CY (CV)	20 CY (CV)	82 CY (CV)	Storm Sewer and Manhole Replacement Areas x 8"
		81 CY (CV)	81 CY (CV)	Turn Lane Removal
	1,273 CY (CV)	1,143 CY (CV)	2,416 CY (CV)	Salvage Reclaim Material
Salvaged Reclaim Utilized On-Site	Tulip Street	161st Ave	TOTAL	
	CY (CV)	149 CY (CV)	149 CY (CV)	Turn Lane Construction Area x 6"
	23 CY (CV)	15 CY (CV)	38 CY (CV)	2" Under Proposed Curb x 3'
	25 CY (CV)	25 CY (CV)	50 CY (CV)	Miscellaneous Utilized On-Site
	48 CY (CV)	189 CY (CV)	237 CY (CV)	
Excess Salvaged Reclaim material =	1,225 CY (CV)	954 CY (CV)	2,179 CY (CV)	Dispose of off-site.
Common Excavation				
For all excavation except areas identified as Subgrade Excavation.				
Volume =	288 CY (EV)	189 CY (EV)	477 CY (EV)	Curb Replacement Length x 2.5' x 1.25'
Suitable material for curb backfill =	58 CY (EV)	38 CY (EV)	96 CY (EV)	Assume 20% of common excavation suitable for backfill
Excess Common Exc. material =	230 CY (EV)	151 CY (EV)	381 CY (EV)	Dispose of off-site. Can use as curb backfill if free of debris/sod chunks/roots, etc.
Subgrade Excavation				
For Areas of Turn Lane Construction				
Volume =	0 CY (EV)	298 CY (EV)	298 CY (EV)	Turn lane construction areas x 1'. Dispose of off-site.
Loam Topsoil Borrow				
Volume =	277 CY (CV)	181 CY (CV)	458 CY (CV)	Curb length x 3' x 1'. Utilize salvaged topsoil (if any), suitable common ex. material for partial curb backfill.

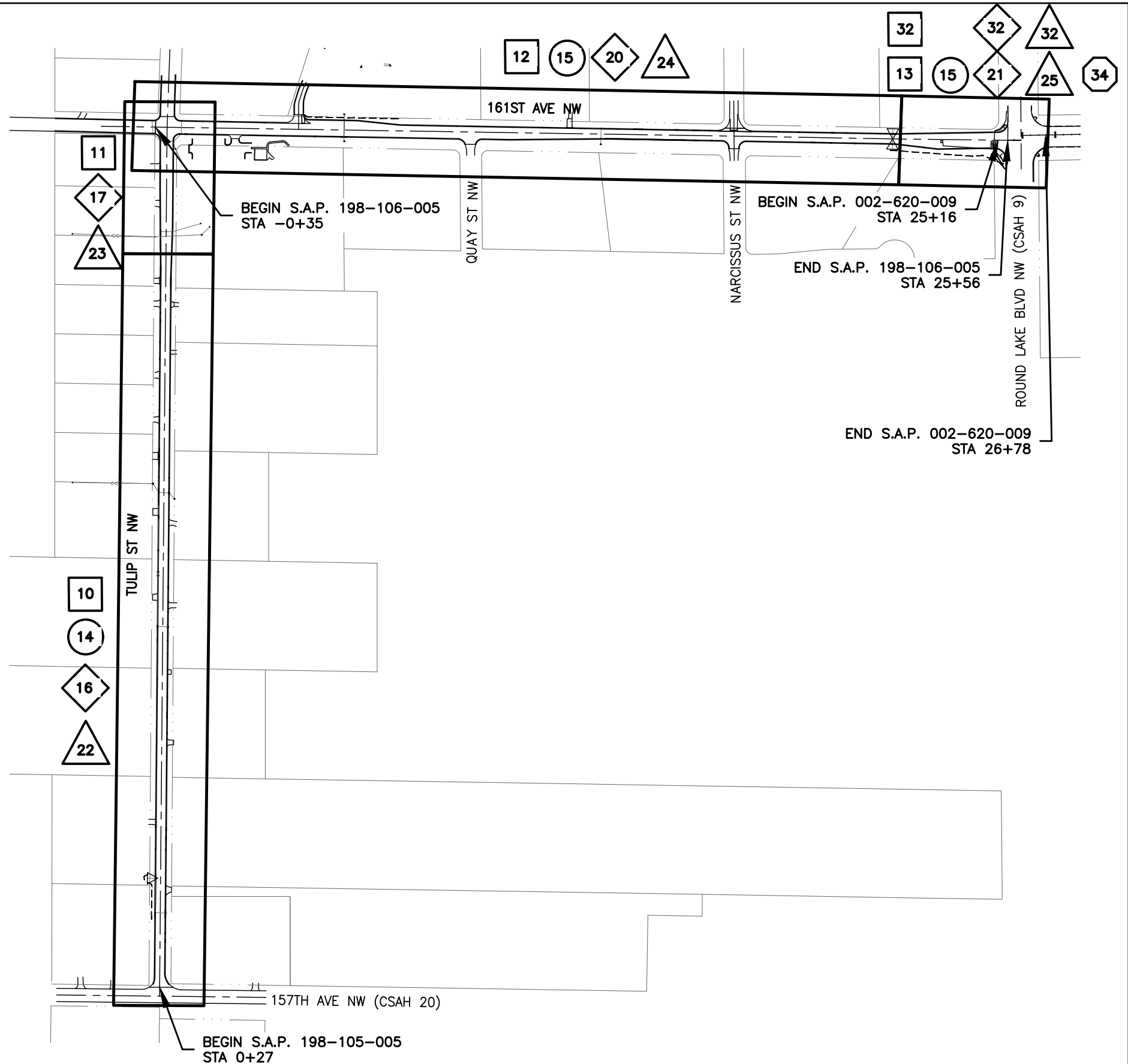
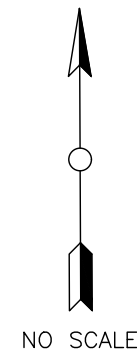
EARTHWORK SUMMARY				
	Tulip Street	161st Ave	TOTAL	
Common Excavation	288 CY (EV)	189 CY (EV)	477 CY (EV)	Excess not re-used on-site becomes property of contractor and shall be disposed of off-site.
Salvage Reclaim Material	1,273 CY (CV)	1,143 CY (CV)		
	1,790 CY (LV)	1,610 CY (LV)	3,400 CY (LV)	Excess not re-used on-site becomes property of contractor and shall be disposed of off-site.
Subgrade Excavation	0 CY (EV)	300 CY (EV)	300 CY (EV)	Excess not re-used on-site becomes property of contractor and shall be disposed of off-site.
Loam Topsoil Borrow	277 CY (CV)	181 CY (CV)		
	390 CY (LV)	260 CY (LV)	650 CY (LV)	
Excess Material - Dispose of Off-Site	1,455 CY (EV)	1,405 CY (EV)		
	1,900 CY (LV)	1,830 CY (LV)	3,730 CY (LV)	Excess common excavation + subgrade excavation + salvaged reclaim to dispose off-site

Swell Factors
EV to LV = 1.3
LV to CV = 1.4
1 CY Class 5 = 1.5 tons

END S.A.P. 198-105-005
STA 89+56



- XX = REMOVALS
- XX = STORM SEWER
- = STREETS
- = STRIPING
- XX = SIGNAL PLANS



NO.	DATE	BY	DESCRIPTION OF REVISIONS

DESIGNED JJL	DRAWN JAK
CHECKED DDB	SIGNATURE <i>David D. Berkowitz</i> DATE 2/21/2023
	LIC. NO. 26757



161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21-39
SAP 198-106-005, 198-105-005, 002-620-009

PROJECT LAYOUT
SHEET NO. 4 OF 41 SHEETS

1/2" MORTAR BETWEEN RINGS, CASTING, AND CONE. FINISH SMOOTH ON THE INSIDE.

SURROUND RINGS WITH GEOTEXTILE FABRIC, TYPE 4, WITH MINIMUM 6" CONCRETE COLLAR OVER FABRIC.

RINGS (2 MIN., 1'-0" MAX. OF RINGS AND MORTAR)

ALL STORM DOG HOUSES WRAPPED WITH GEOTEXTILE FABRIC, TYPE 4. OVERLAP FABRIC 12" ONTO ITSELF.

GROUT INVERT TO DRAIN. GROUT BENCH TO 1/2 PIPE DIA.

CEMENT MORTAR

6" PRECAST CONC. BASE

4'-0"

9" MIN.

VARIES

27"

NOTE: NO WOOD SHALL BE USED FOR ADJUSTING CASTING, CEMENT MORTAR ONLY. TYPICALLY USED FOR REAR YARD DRAINAGE AREAS AND PARKING LOTS.

CAST IRON CATCH BASIN FRAME & COVER CASTINGS R-3250A UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.

CAST IRON CATCH BASIN FRAME & COVER CASTINGS R-3508C SHALL BE USED WHEN NEEDED IN A DRIVEWAY OR SURMOUNTABLE CURB.

CAST IRON CATCH BASIN FRAME & COVER CASTING R-3508B SHALL BE USED WHEN NEEDED IN A COMMERCIAL DRIVEWAY OR VALLEY GUTTER.

CAST IRON CATCH BASIN FRAME AND COVER CASTING R-2561A OR R-2535-A SHALL BE USED WHEN NEEDED IN A GREEN SPACE OR BACKYARD DRAINAGE AREA. WRAP FROM CASTING OVER RINGS TO STRUCTURE WITH INT-SHIELD GATOR WRAP, OR APPROVED EQUAL, INSTEAD OF CONCRETE COLLAR IN GREEN AREAS.

PRECAST REINFORCED CONCRETE CONE SECTION AND PRECAST BASE PER ASTM C478.

FILL OPENING BETWEEN PIPE AND MANHOLE WALL WITH CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH. WRAP OUTSIDE OF DOGHOUSE WITH GEOTEXTILE FABRIC, TYPE 4, OVERLAP FABRIC 12" ONTO ITSELF.

ALL MORTAR SHALL CONFORM TO ASTM C270 AND MEET THE REQUIREMENTS OF MNDOT 2506.2B.

ALL MORTAR SHALL CONFORM TO ASTM C270 AND MEET THE REQUIREMENTS OF MNDOT 2506.2B.

CATCH BASIN, TYPE 401

12/10/21

STANDARD DRAWING NO. 401L

CITY OF ANDOVER

SURROUND RINGS WITH GEOTEXTILE FABRIC, TYPE 4, WITH MINIMUM 6" CONCRETE COLLAR OVER FABRIC. CONCRETE MAY BE POURED WITH CURB AND GUTTER.

RINGS (2 MIN., 1.0' MAX. OF RINGS AND MORTAR)

1/2" MORTAR BETWEEN RINGS, CASTING, AND TOP SLAB. FINISH SMOOTH ON THE INSIDE.

5" PRECAST REINFORCED CONCRETE

ALL STORM DOG HOUSES WRAPPED WITH GEOTEXTILE FABRIC, TYPE 4. OVERLAP FABRIC 12" ONTO ITSELF.

NOTE: USE 4 FOOT DIAMETER CATCH BASIN MANHOLE (421) WHEN DEPTH EXCEEDS 4.5 FEET.

30"

4"

3"

6"

2"

NOTES: NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.

IN NEW DEVELOPMENTS CAST IRON FRAME AND GRATE CASTINGS TYPE R-3501-TB SHALL BE USED. CAST IRON FRAME AND GRATE CASTINGS TYPE R-3067-V (ON A GRADE) OR R-3067-VB (LOW POINTS) SHALL BE USED IN RECONSTRUCTION AREAS OR AS CALLED OUT IN PLANS.

PRECAST REINFORCED CONCRETE BASE SLAB PER ASTM C478.

FILL OPENING BETWEEN PIPE AND MANHOLE WALL WITH CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH. WRAP OUTSIDE OF DOGHOUSE WITH GEOTEXTILE FABRIC, TYPE 4, OVERLAP FABRIC 12" ONTO ITSELF.

ALL MORTAR SHALL CONFORM TO ASTM C270 AND MEET THE REQUIREMENTS OF MNDOT 2506.2B.

DOGHOUSE SHALL BE GROUTED ON BOTH THE OUTSIDE AND INSIDE.

MAXIMUM DIAMETER RCP STORM SEWER PIPE IS 15" ON THE SHORT SIDE AND 18" ON THE LONG SIDE OF CATCH BASIN.

GROUT SUMP TO PIPE INVERT UNLESS A SUMP IS CALLED OUT IN PLANS.

CATCH BASIN, TYPE 420

2/22/16

STANDARD DRAWING NO. 420F

CITY OF ANDOVER

1/2" MORTAR BETWEEN RINGS, CASTING, AND TOP SLAB. FINISH SMOOTH ON THE INSIDE.

SURROUND RINGS WITH GEOTEXTILE FABRIC, TYPE 4, WITH MINIMUM 6" CONCRETE COLLAR OVER FABRIC. CONCRETE MAY BE POURED WITH CURB AND GUTTER.

RINGS (2 MIN., 1.0' MAX. OF RINGS AND MORTAR)

PRECAST TYPE II COVER SLAB

2 STRIPS BITUMASTIC SEAL ON SLAB JOINTS

CEMENT MORTAR

12-16" O.C.

24" (2'x3')

0'-9" MIN.

VAR. (4' MIN.)

VAR. (4' MIN.)

ALL STORM DOG HOUSES WRAPPED WITH GEOTEXTILE FABRIC, TYPE 4. OVERLAP FABRIC 12" ONTO ITSELF.

NOTE: NO WOOD SHALL BE USED FOR ADJUSTING CASTING; CEMENT MORTAR ONLY.

IN NEW DEVELOPMENTS CAST IRON FRAME AND GRATE CASTINGS TYPE R-3501-TB SHALL BE USED. CAST IRON FRAME AND GRATE CASTINGS TYPE R-3067-V (ON A GRADE) OR R-3067-VB (LOW POINTS) SHALL BE USED IN RECONSTRUCTION AREAS OR AS CALLED OUT IN PLANS.

MANHOLE STEPS SHALL BE CAST IRON, ALUMINUM, OR STEEL REINFORCED PLASTIC PER ASTM C478. LOCATION SHALL BE EASILY ACCESSIBLE.

PRECAST REINFORCED CONCRETE BASE SLAB & COVER SLAB PER ASTM C478.

PRECAST REINFORCED CONCRETE MANHOLE SECTIONS PER ASTM C478, FURNISHED WITH O-RING GASKETS & LUBRICANT.

FILL OPENING BETWEEN PIPE AND MANHOLE WALL WITH CEMENT MORTAR. INSIDE SURFACE SHALL BE FINISHED SMOOTH. WRAP OUTSIDE OF DOGHOUSE WITH GEOTEXTILE FABRIC, TYPE 4, OVERLAP FABRIC 12" ONTO ITSELF.

ALL MORTAR SHALL CONFORM TO ASTM C270 AND MEET THE REQUIREMENTS OF MNDOT 2506.2B.

* REFER TO PLANS FOR SUMP DEPTH, IF ANY.

MH DIA.	SLAB THICKNESS
48"	6"
54"-102"	8"
108"	10"
120"	12"

CATCH BASIN/MANHOLE WITH SUMP, TYPE 421

1/10/20

STANDARD DRAWING NO. 421G

CITY OF ANDOVER

DEFLECTOR PLATE

OVERFLOW 1 CENTER OF FILTER ASSEMBLY

OVERFLOW 2 TOP OF CURB BOX

10" FILTER ASSEMBLY

CURB

NEENAH R-3067-V

HIGH-FLOW FABRIC MIRAFI FF101

WIMCO INLET PROTECTION

N.T.S.

* OR APPROVED EQUAL *

R/W

R/W

R/W

R/W

CONCRETE CURB & GUTTER

EXPANSION JOINT

CONTRACTION JOINT

TURF ESTABLISHMENT AREA

RADIUS (PER PLAN) URBAN=20' RURAL=50'

EXPANSION JOINT

PLAN

6"x 6" (#6) MESH

SLOPE @ 3/4" PER FT.

8"

5.0' GUTTER

SECTION A-A

CONCRETE VALLEY GUTTER

2/19/08

STANDARD DRAWING NO. 504E

CITY OF ANDOVER

EXIST. BIT.

BIT. WEAR

BIT. BASE

MILL EXISTING BITUMINOUS 12" WIDTH x 1.5" DEPTH

SAWCUT EXISTING FULL DEPTH

MATCH EXISTING BITUMINOUS

3/08/09

STANDARD DRAWING NO. 520

CITY OF ANDOVER

C&G

RIGHT OF WAY

60' MIN.

30' MAX. (IN R/W) (24' IN C-D-S)

PROPERTY LINE

5' MIN. (RESIDENTIAL) 10' MIN. (COMMERCIAL, MULTI-FAMILY)

PLAN

4" MIN.

3'

1-1/4"

3'

EXISTING JOINT

EXPANSION JOINT

CONTRACTION JOINT (8'-10' SPACING)

CURB SECTION AT DRIVEWAY

3" R.

3/4" per foot

13 1/2"

5"

18" (or match ex.)

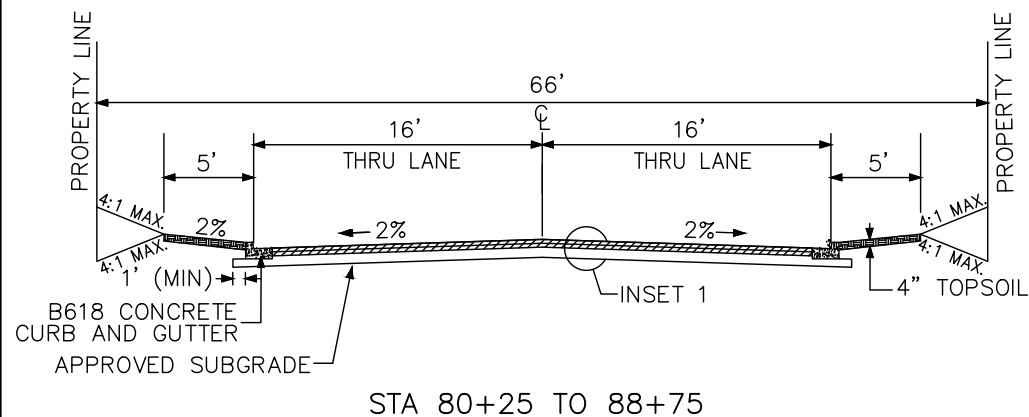
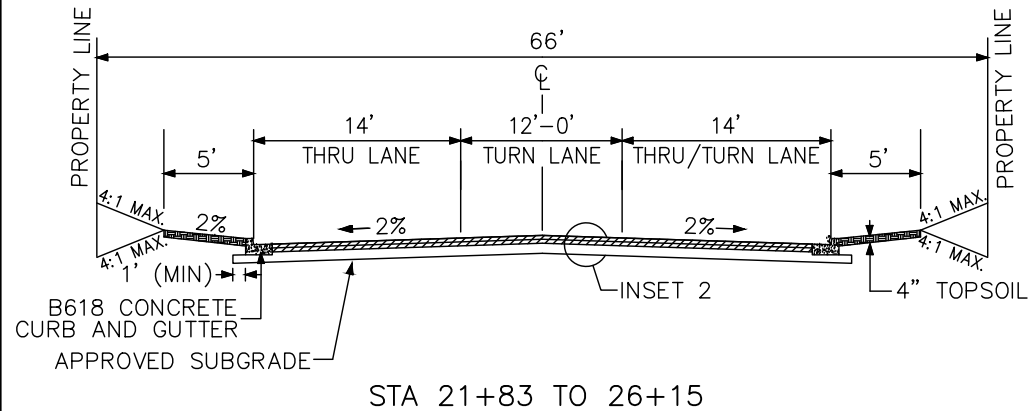
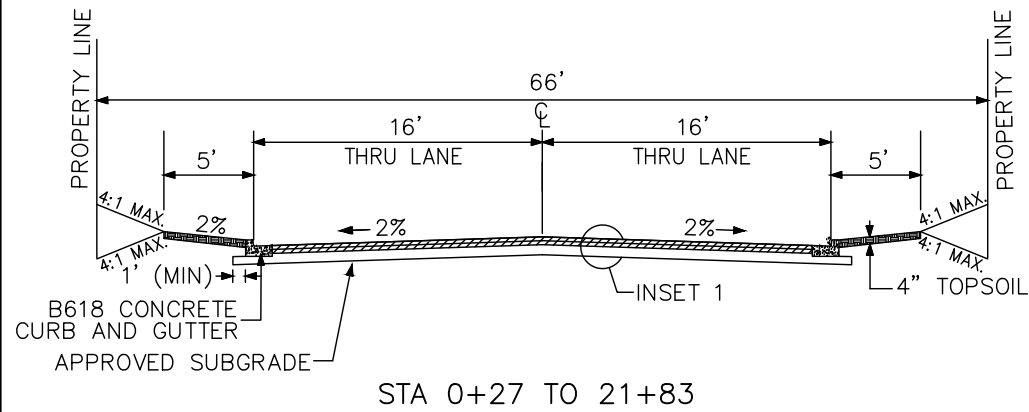
B618 CURB SECTION

CURB CUT CONSTRUCTION

12/21/2020

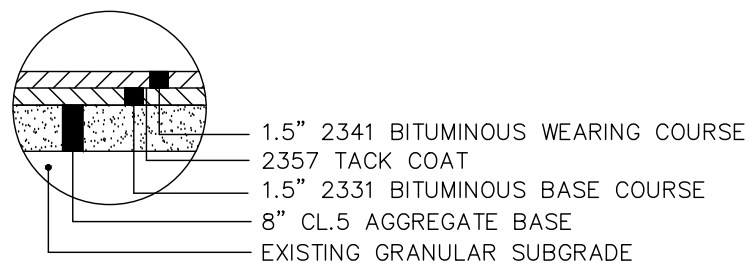
STANDARD DRAWING NO. 521

CITY OF ANDOVER

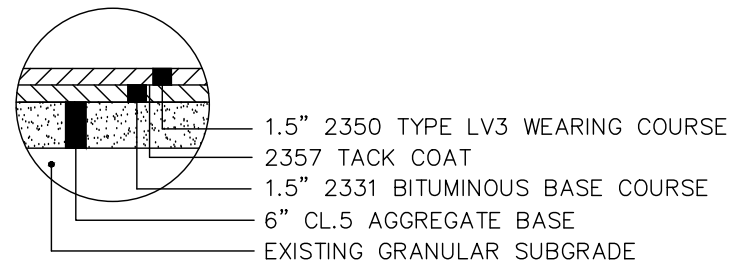


TULIP ST EXISTING STREET SECTIONS

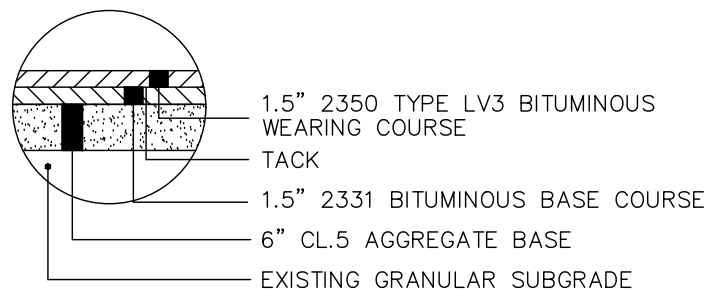
SAP 198-105-005



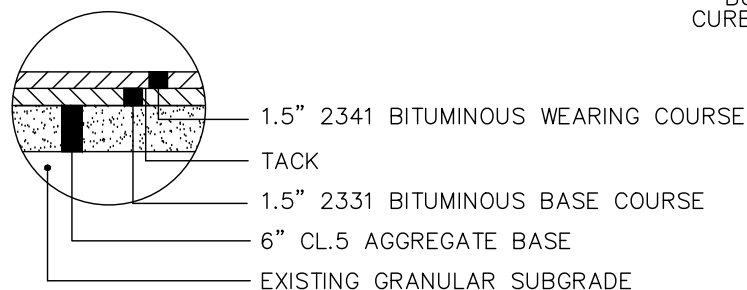
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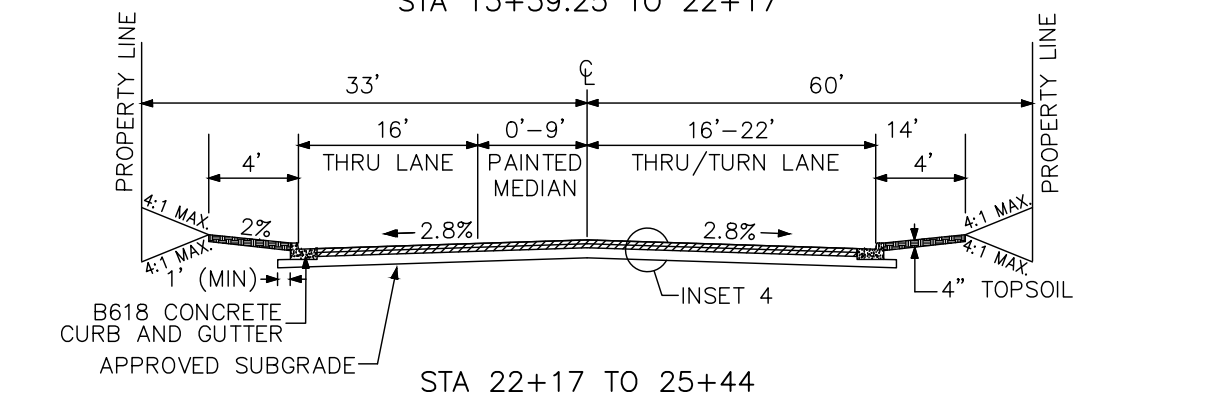
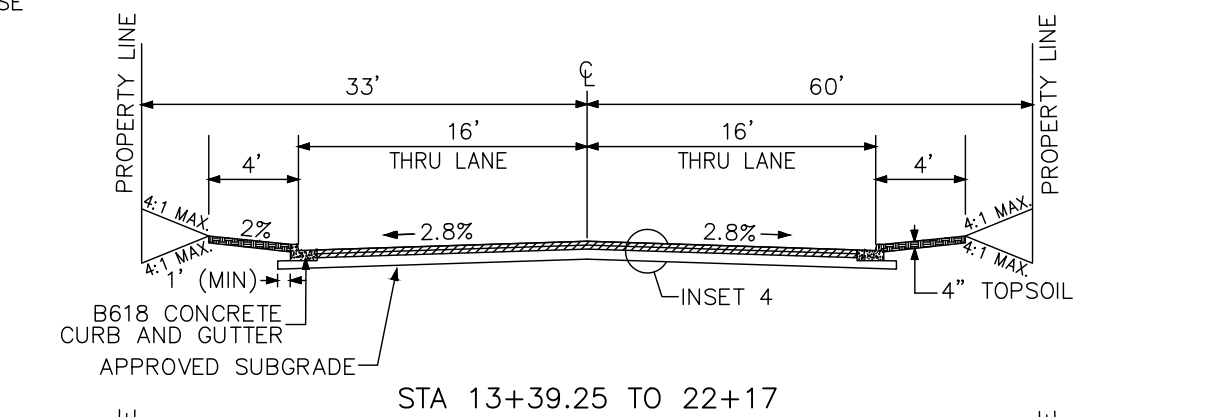
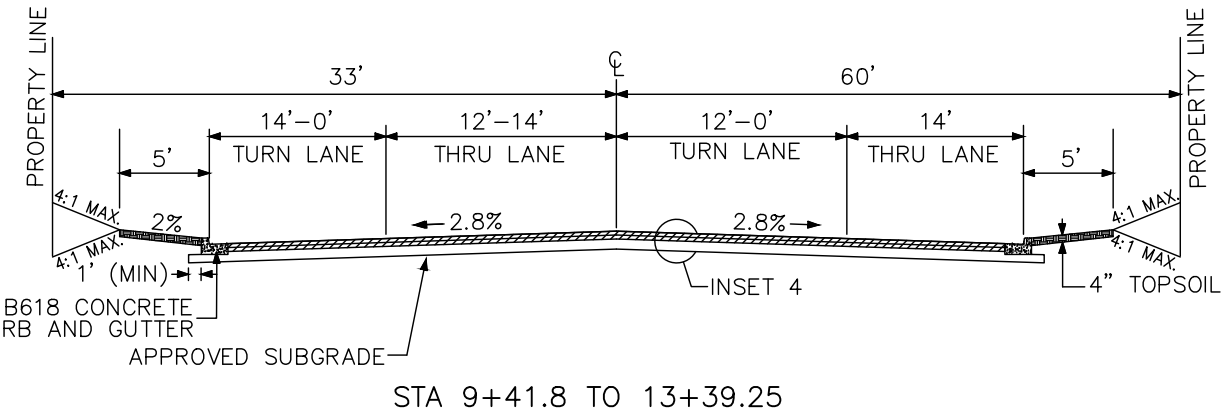
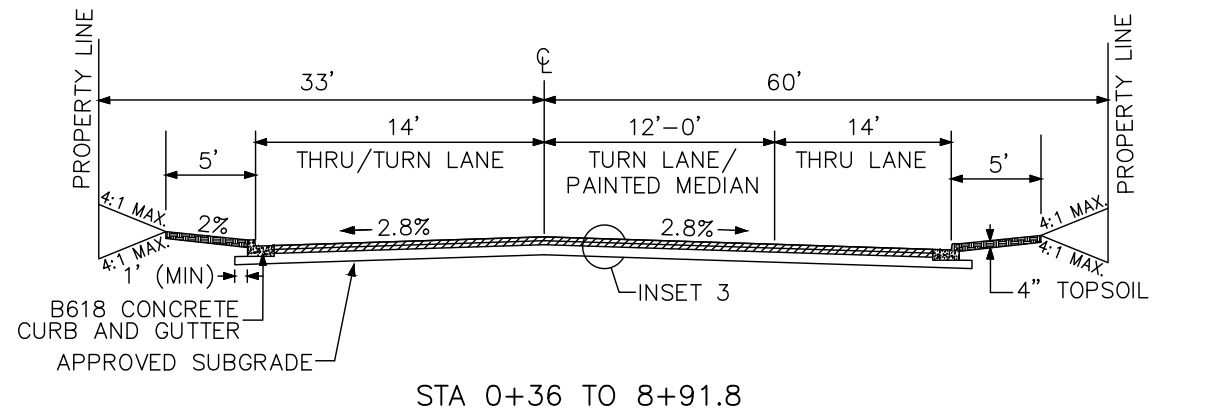
INSET 2 (TULIP ST NW)



INSET 3 (161ST AVE NW)



INSET 4 (161ST AVE NW)



161ST AVE EXISTING STREET SECTIONS

SAP 198-106-005

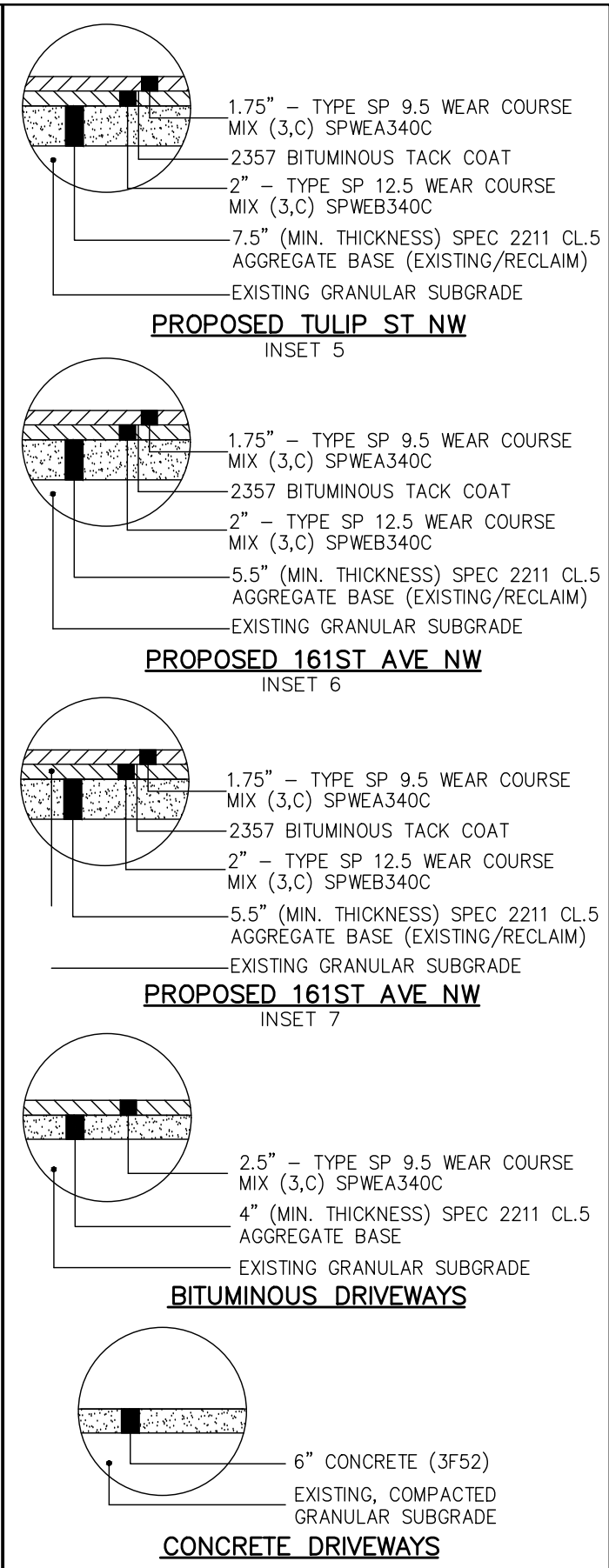
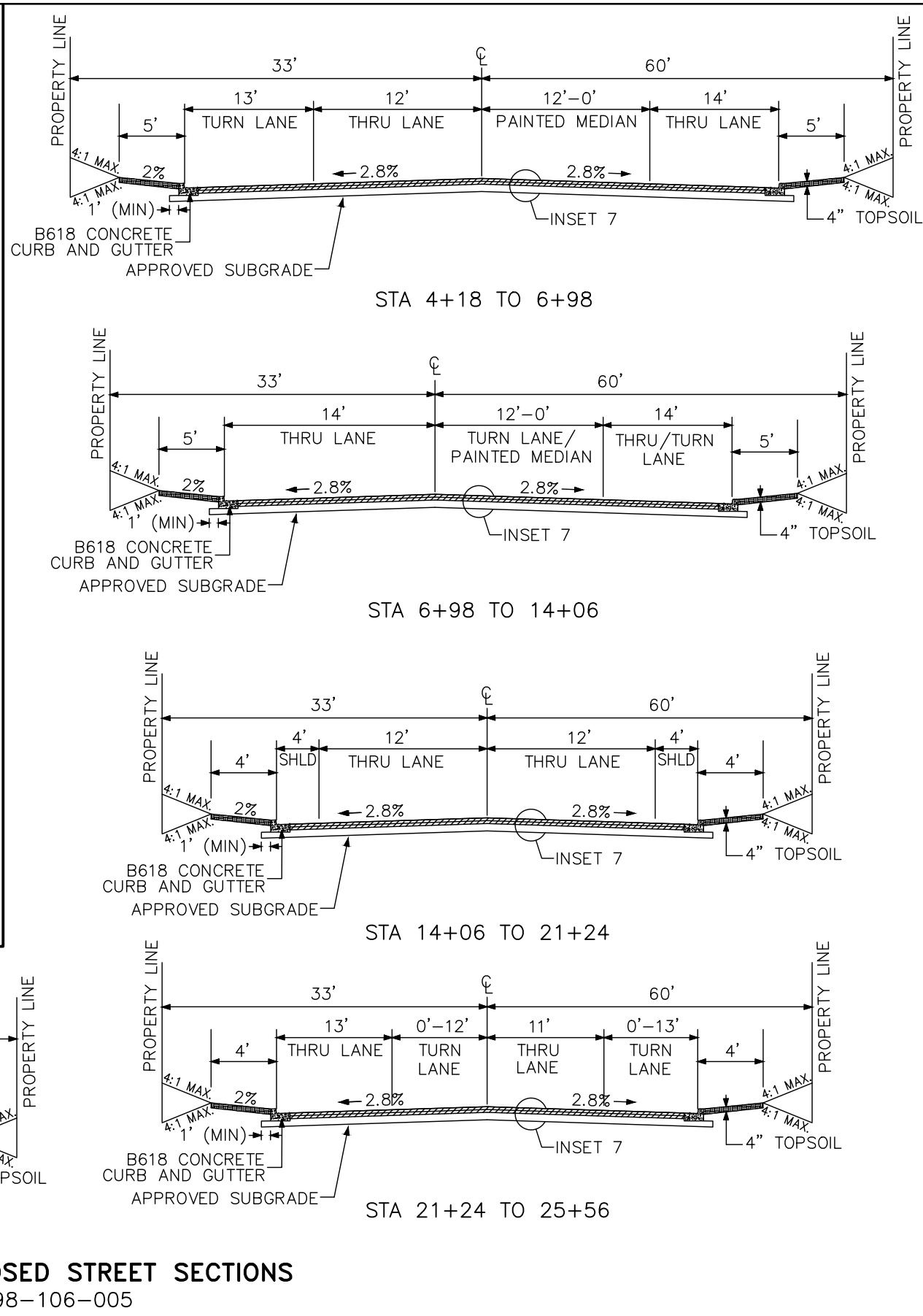
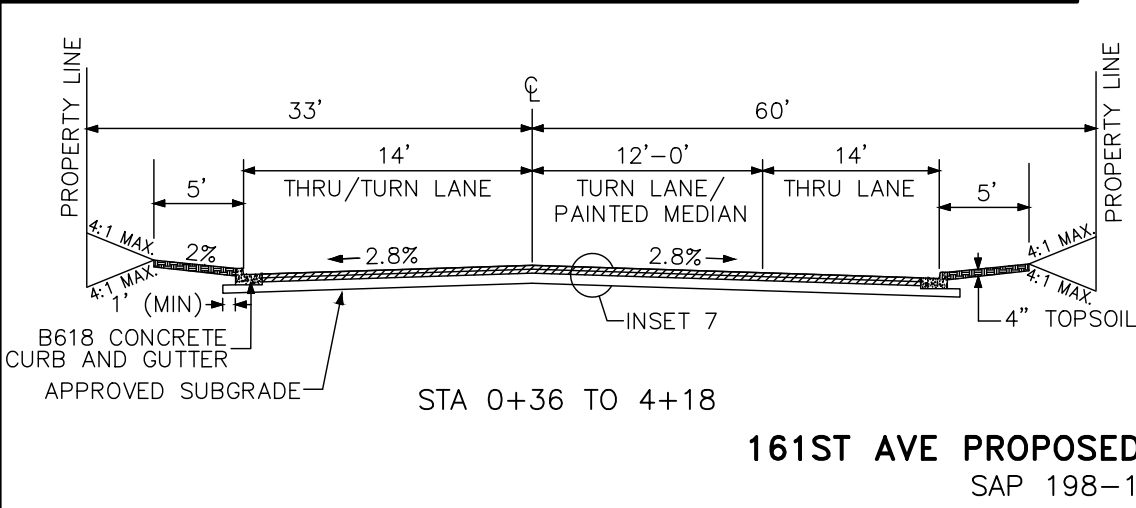
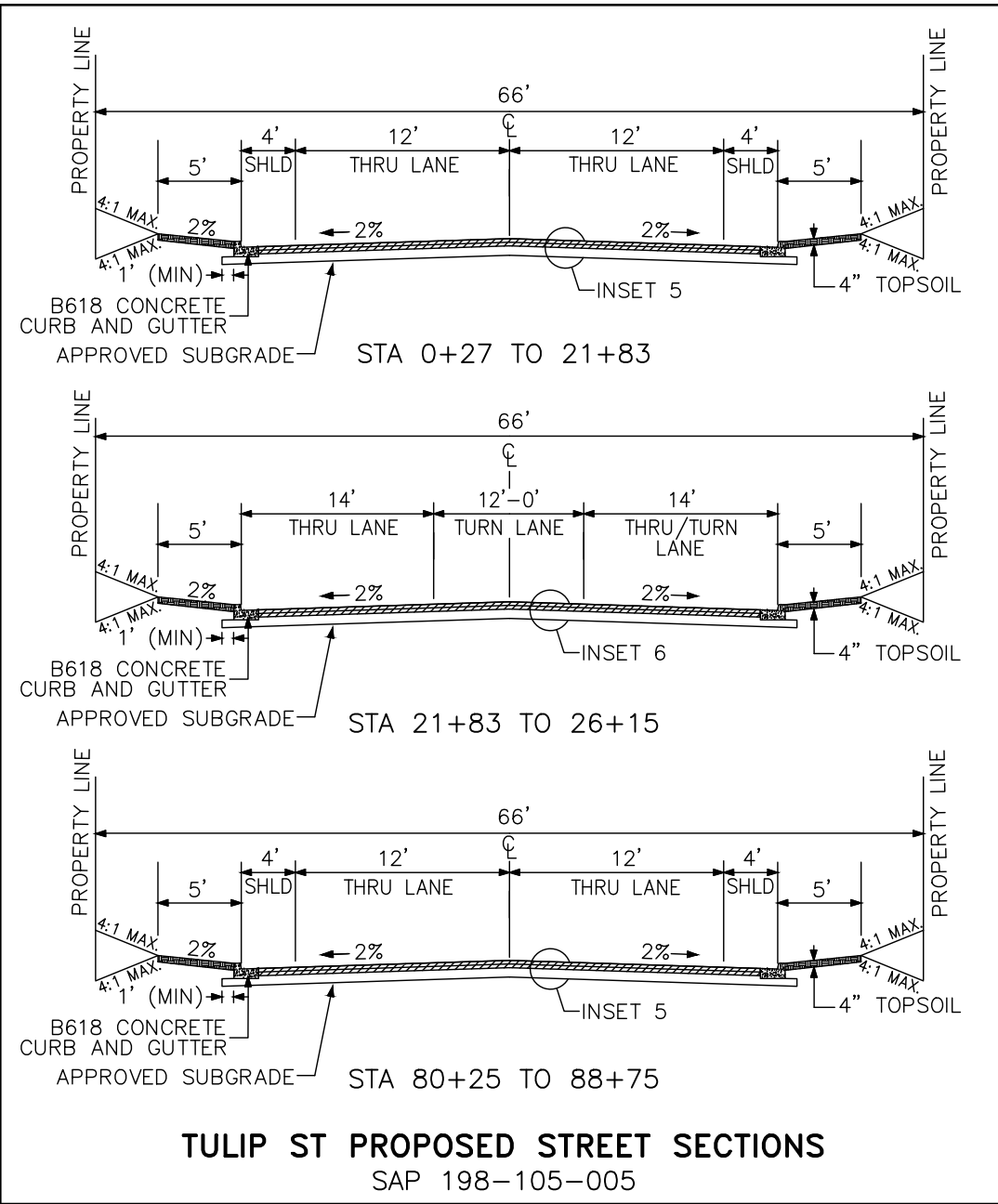
NO.	DATE	BY	DESCRIPTION OF REVISIONS

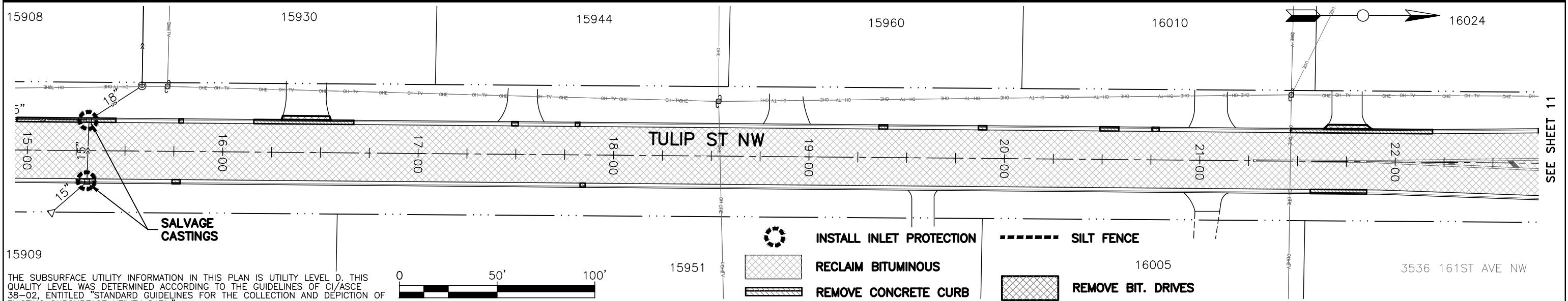
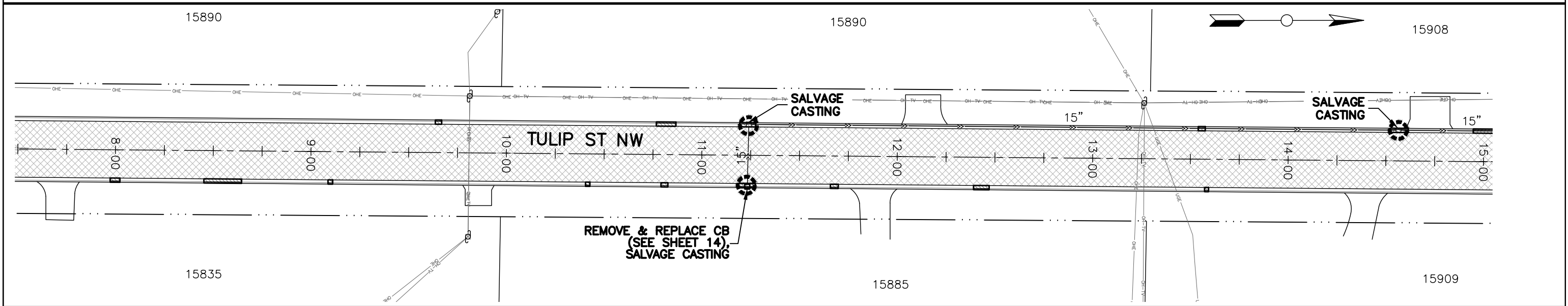
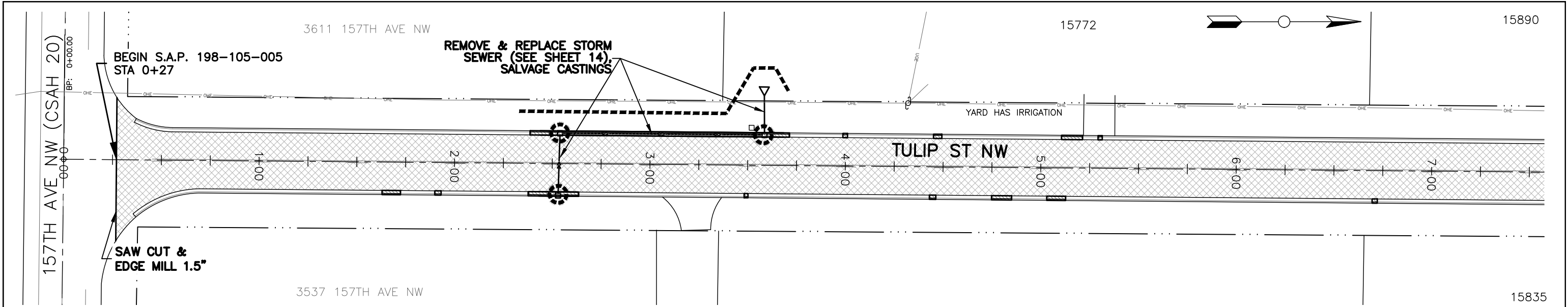
DESIGNED JJL	DRAWN JAK
CHECKED DDB	DATE 2/21/2023
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. SIGNATURE: <i>David D. Berkowitz</i> DATE: 2/21/2023 LIC. NO.: 26757 TYPED OR PRINTED NAME: DAVID D. BERKOWITZ	



161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009
--

EXISTING TYPICAL SECTIONS
SHEET NO. 8 OF 41 SHEETS





THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

DESIGNED JJL
DRAWN JAK
CHECKED DDB

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

David D. Berkowitz
DAVID D. BERKOWITZ
TYPED OR PRINTED NAME

DATE 2/21/2023 LIC. NO. 26757

0 50' 100'

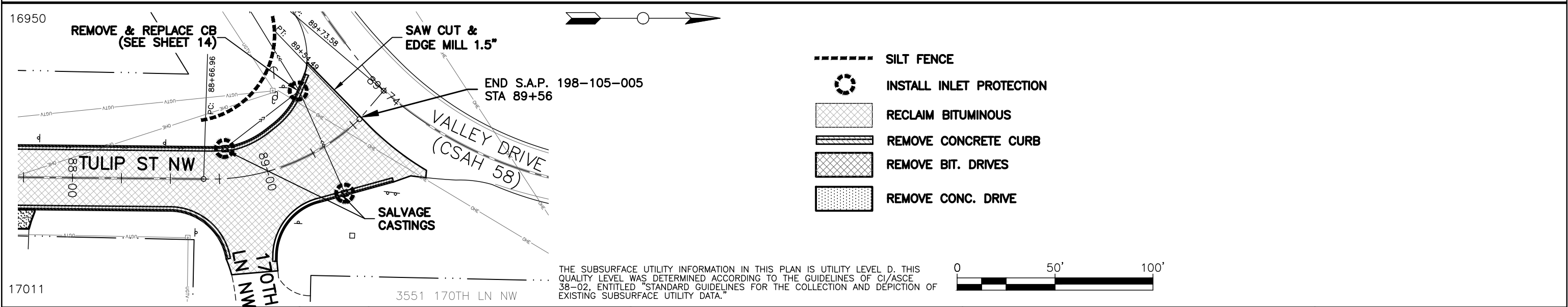
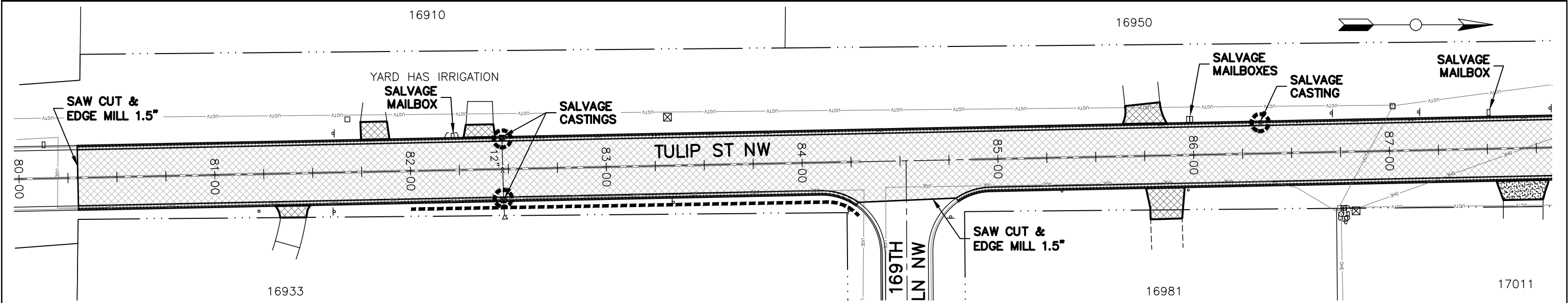
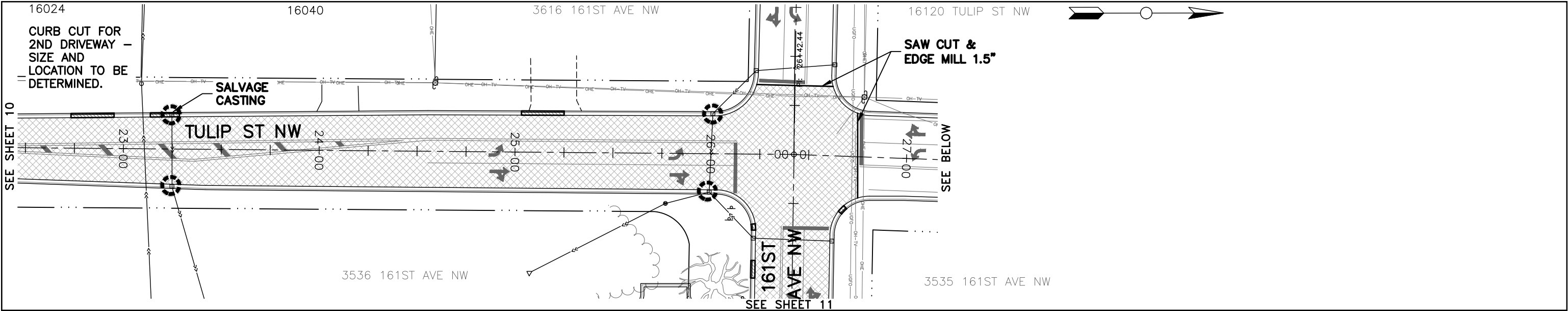
INSTALL INLET PROTECTION
RECLAIM BITUMINOUS
REMOVE CONCRETE CURB

----- SILT FENCE
REMOVE BIT. DRIVES

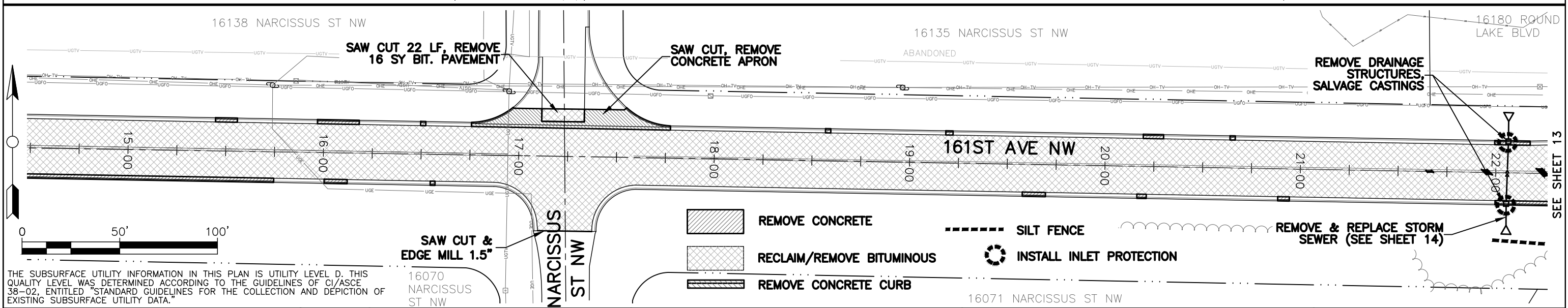
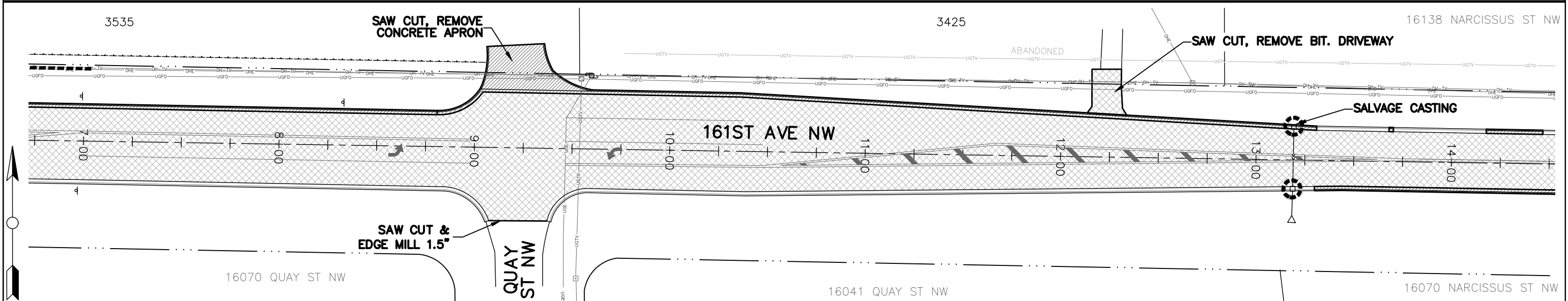
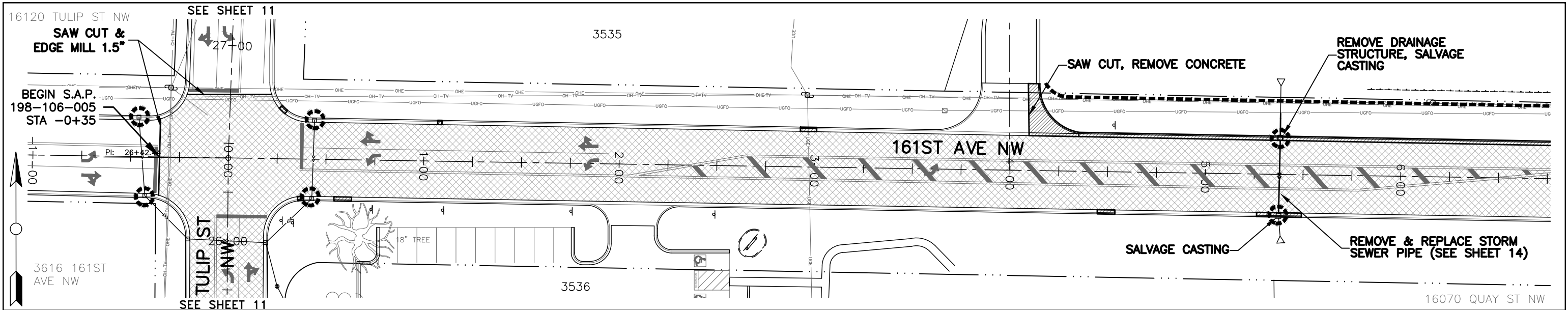
CITY OF ANDOVER

161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21-39
SAP 198-106-005, 198-105-005, 002-620-009

REMOVALS
TULIP ST NW: 0+27 TO 22+50
SHEET NO. 10 OF 41 SHEETS



				DESIGNED JJL	DRAWN JAK	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA <i>David D. Berkowitz</i> SIGNATURE DATE 2/21/2023 LIC. NO. 26757	CITY OF ANDOVER	161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009	REMOVALS TULIP ST NW: 22+50 TO 26+75/ 80+30 TO 89+56 SHEET NO. 11 OF 41 SHEETS
NO.	DATE	BY	DESCRIPTION OF REVISIONS	CHECKED DDB					



NO.	DATE	BY	DESCRIPTION OF REVISIONS

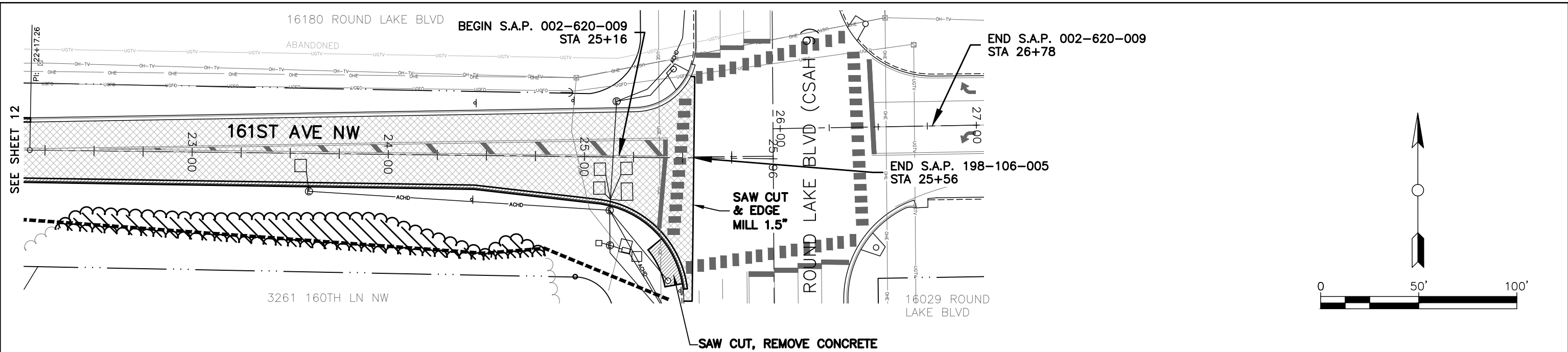
DESIGNED JJL	DRAWN JAK
CHECKED DDB	SIGNATURE <i>David D. Berkowitz</i>
	DATE 2/21/2023
	LIC. NO. 26757
	DAVID D. BERKOWITZ TYPED OR PRINTED NAME



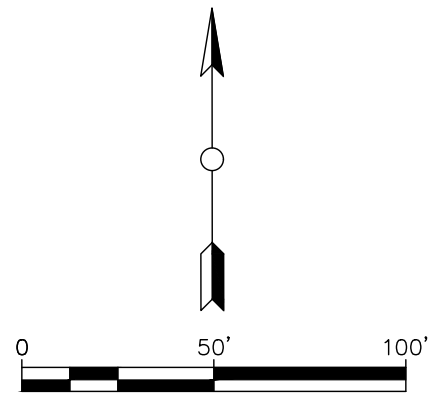
161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21-39
SAP 198-106-005, 198-105-005, 002-620-009

REMOVALS
161ST AVE NW: -0+35 TO 22+25
SHEET NO. 12 OF 41 SHEETS

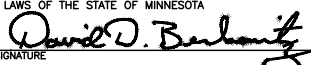
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

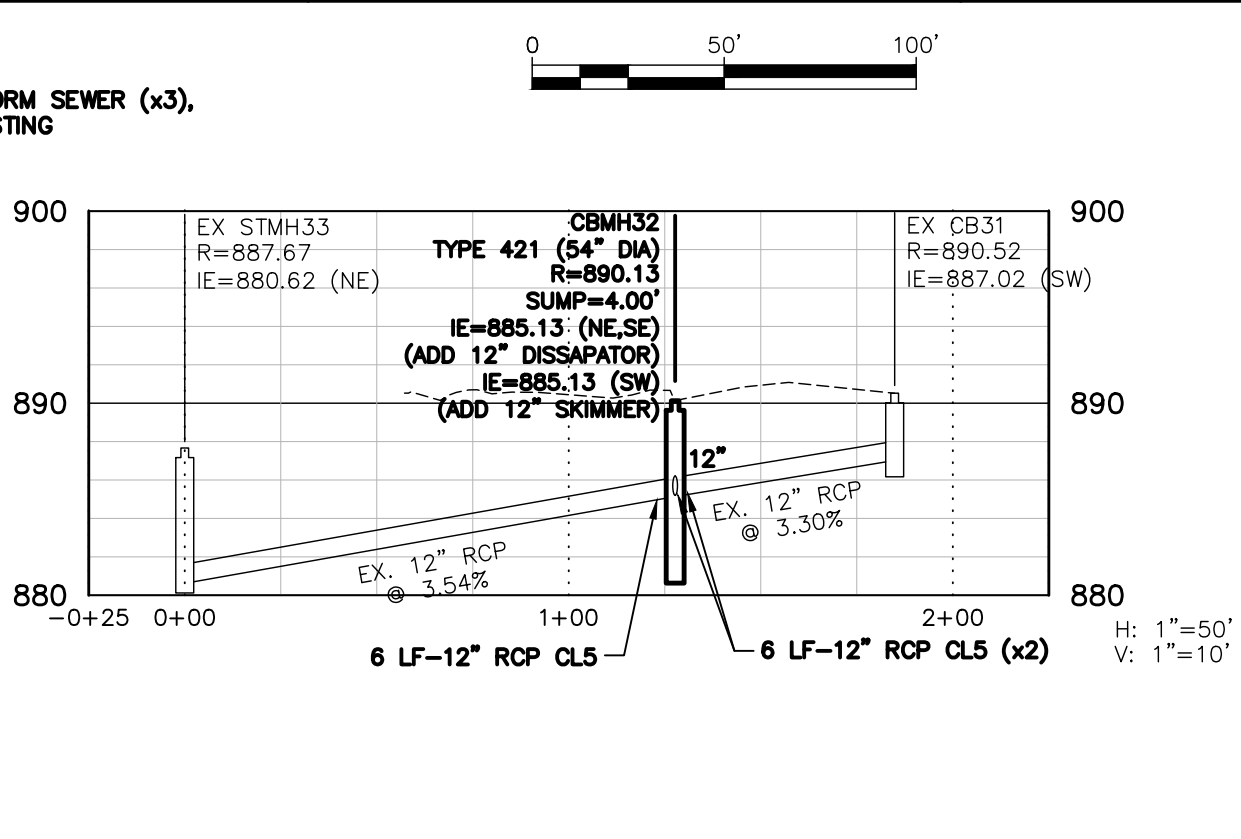
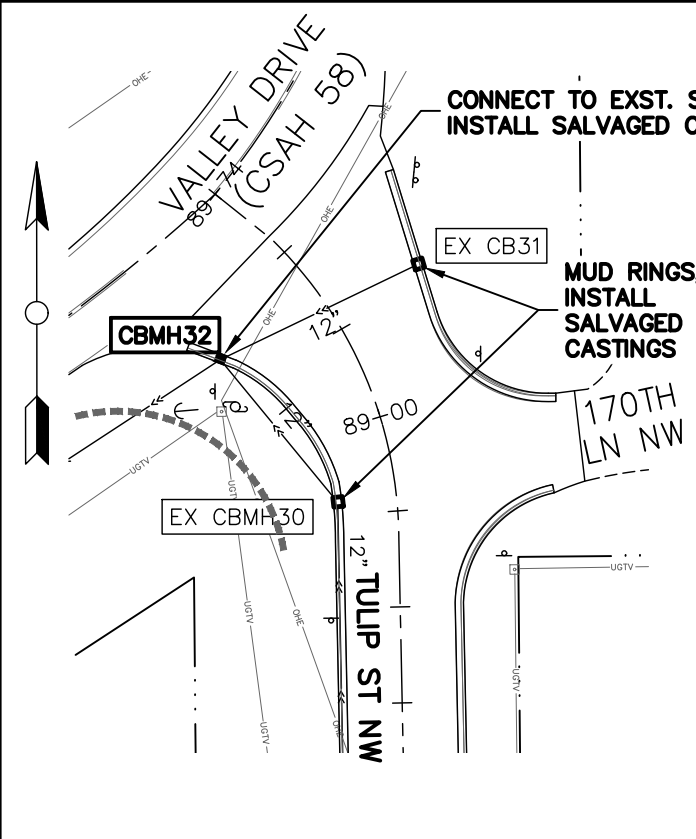
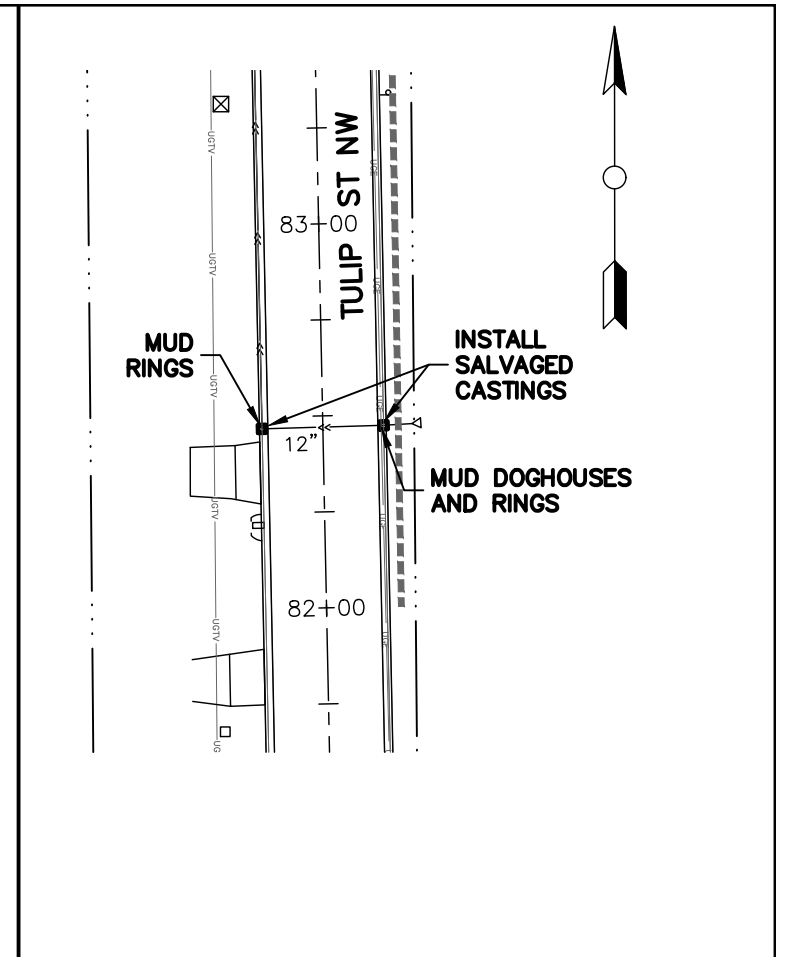
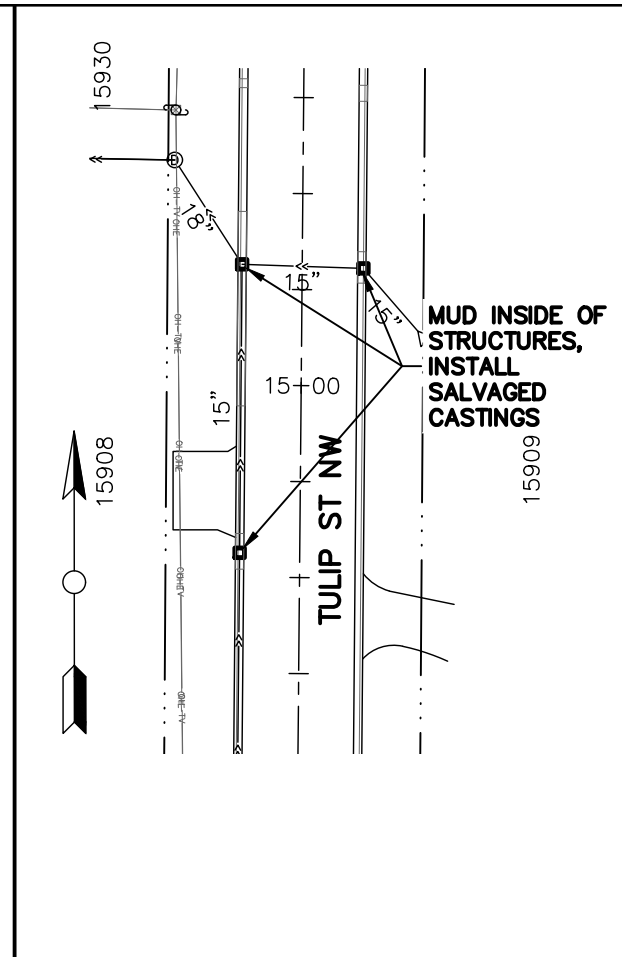
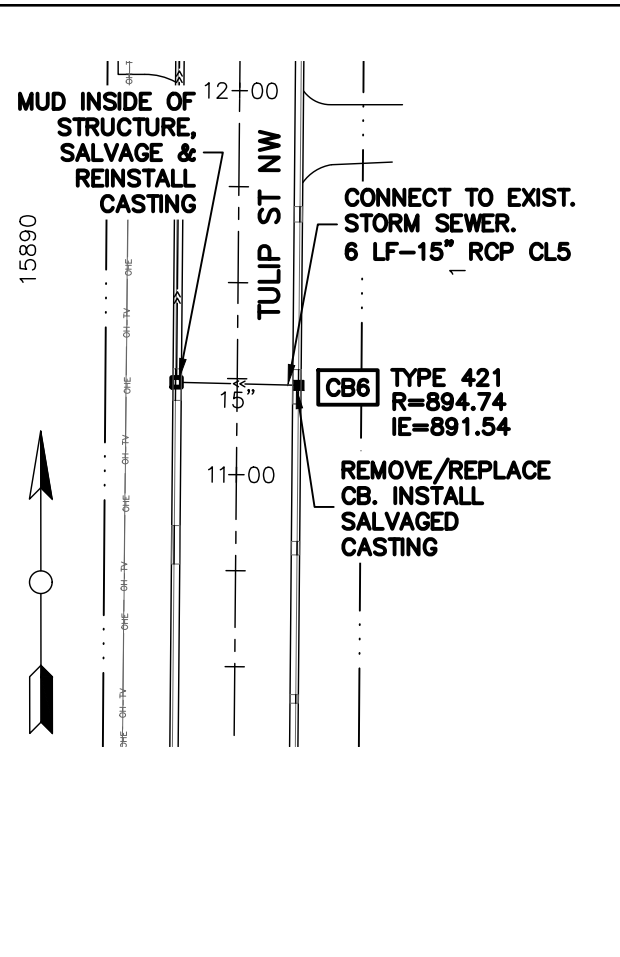
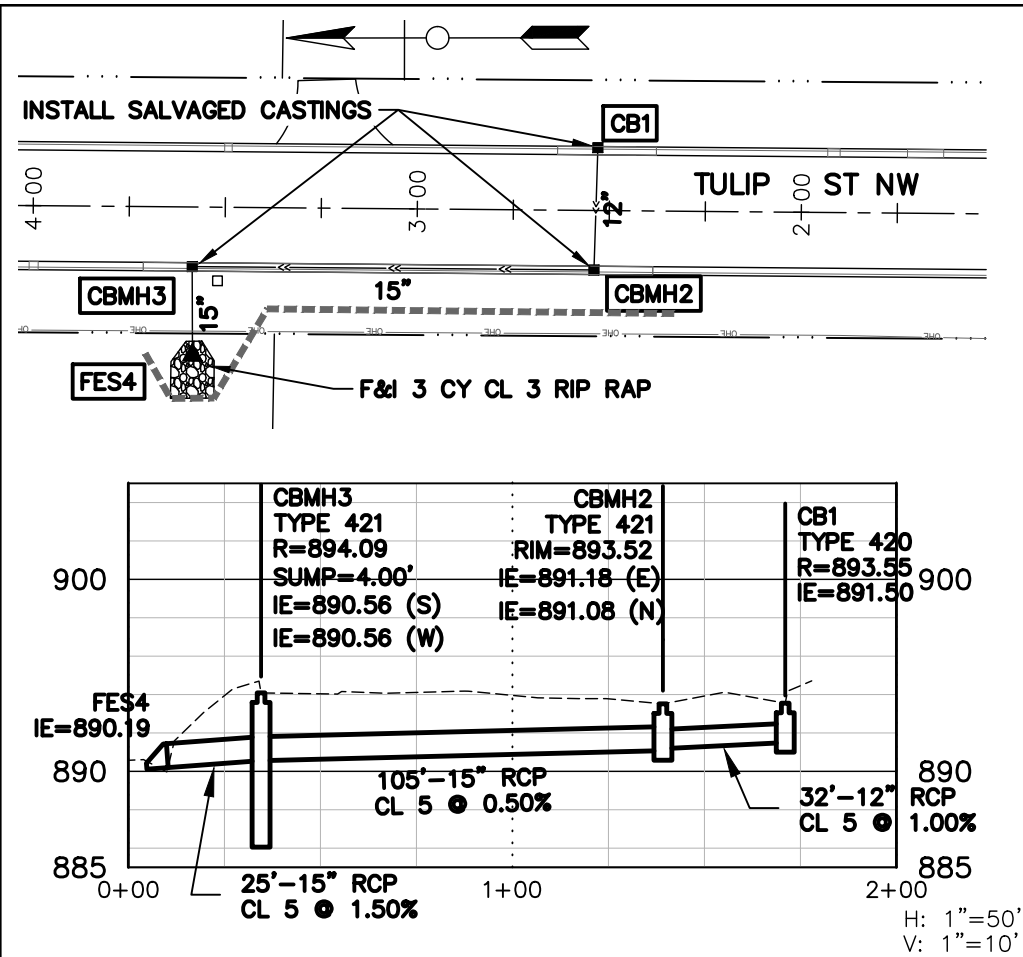


-  RECLAIM BITUMINOUS
-  REMOVE CONCRETE CURB
-  CLEAR & GRUB TREES
-  SILT FENCE



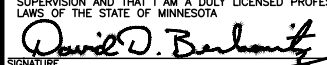
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

				DESIGNED JJL	DRAWN JAK	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA  DAVID D. BERKOWITZ TYPED OR PRINTED NAME DATE 2/21/2023 LIC. No. 26757	CITY OF ANDOVER	161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009	REMOVALS 161ST AVE NW: 22+25 TO 25+56 SHEET NO. 13 OF 41 SHEETS
				CHECKED DDB					
NO.	DATE	BY	DESCRIPTION OF REVISIONS						



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF C/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

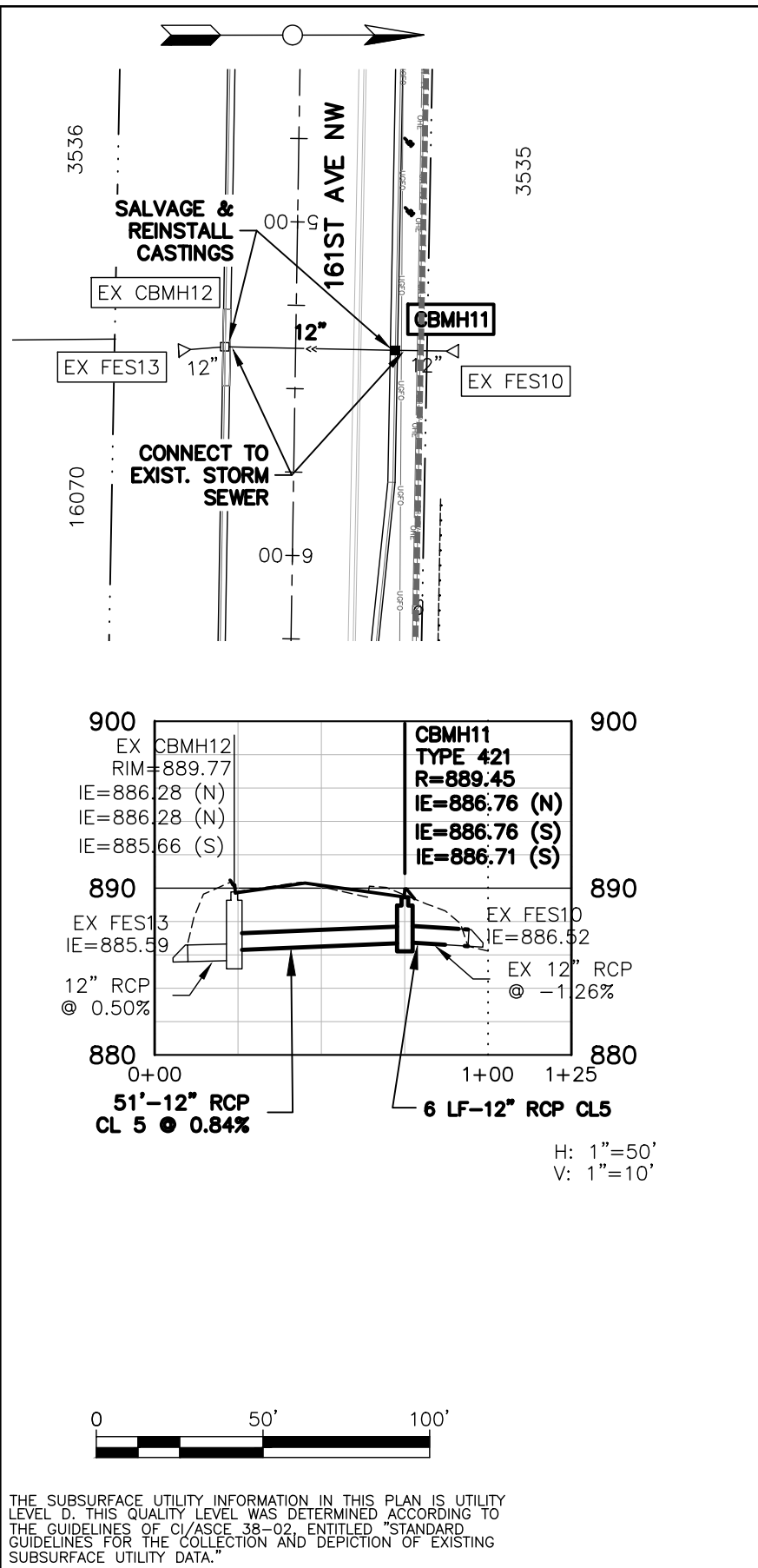
NO.	DATE	BY	DESCRIPTION OF REVISIONS

DESIGNED JJL	DRAWN JAK
CHECKED DDB	DATE 2/21/2023
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA	
 DAVID D. BERKOWITZ TYPED OR PRINTED NAME	
LIC. NO. 26757	



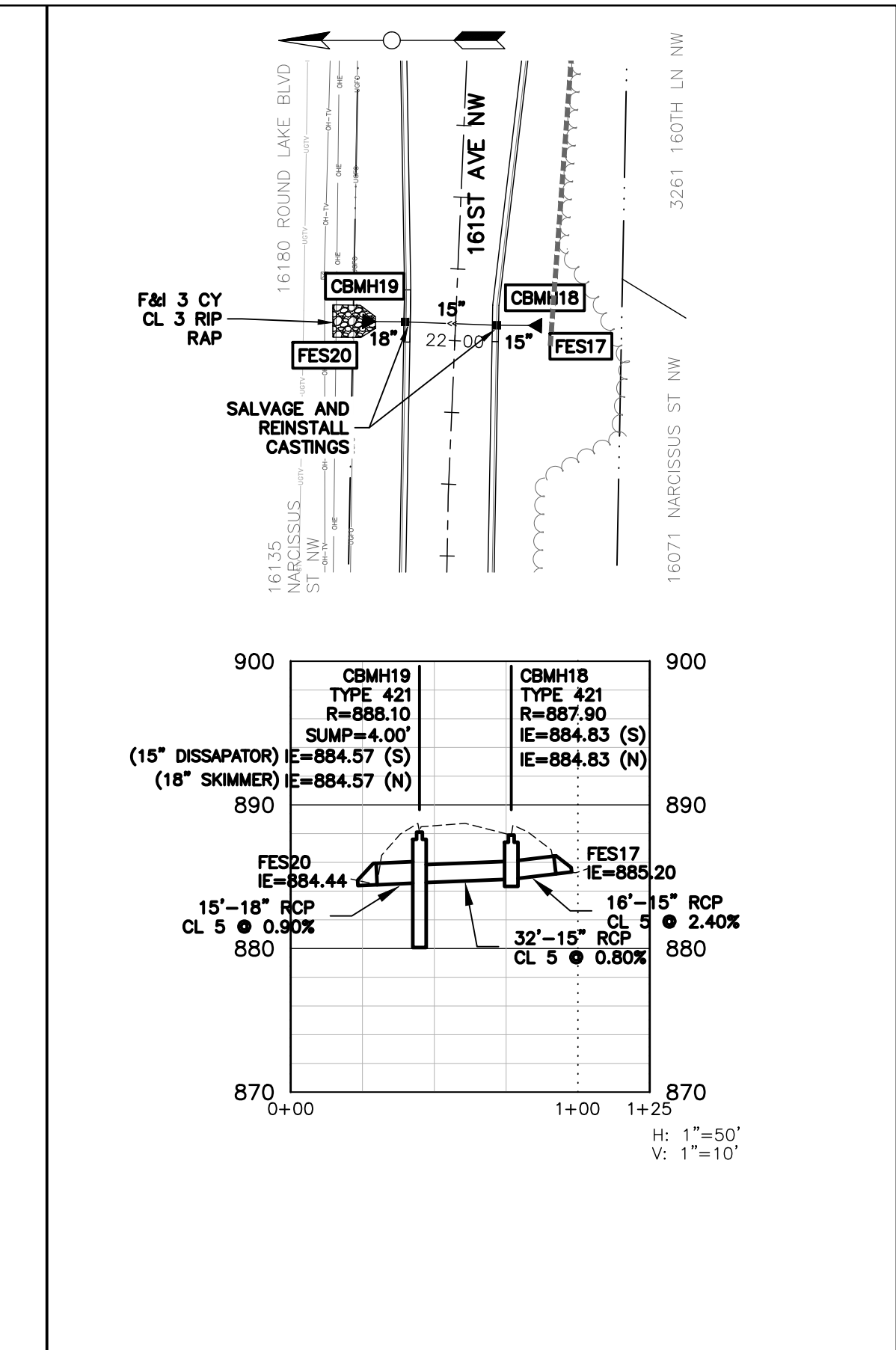
161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21-39
SAP 198-106-005, 198-105-005, 002-620-009

STORM SEWER
TULIP ST NW
SHEET NO. 14 OF 41 SHEETS



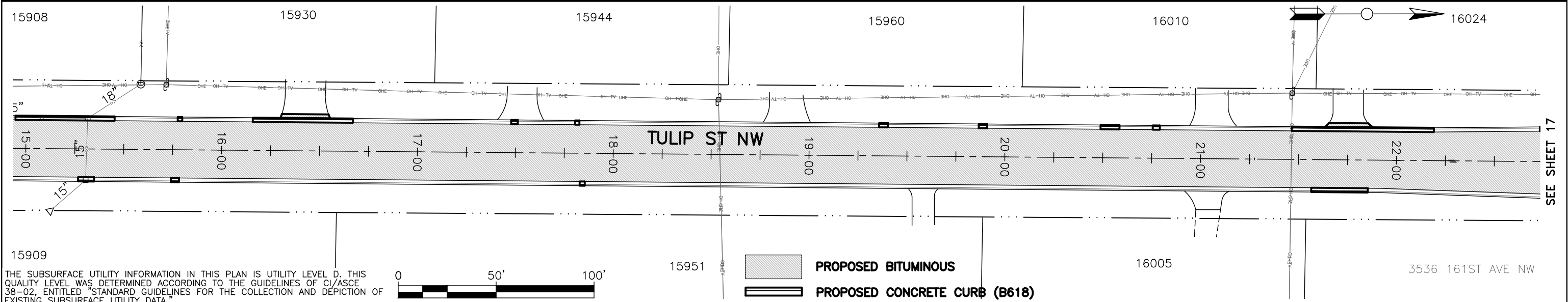
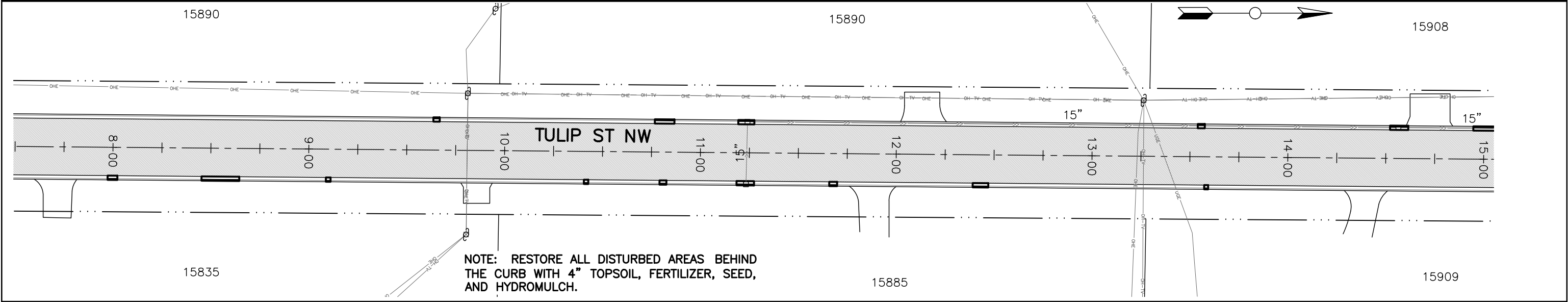
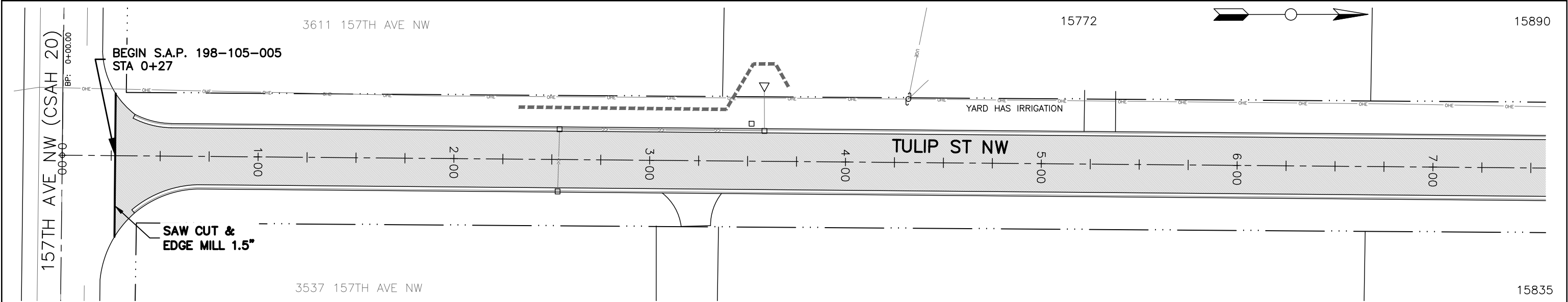
NO.	DATE	BY	DESCRIPTION OF REVISIONS

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CHECKED DDB	DATE 2/21/2023	DATE 2/21/2023	LIC. NO. 26757

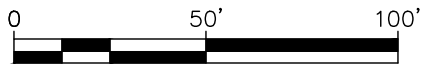


161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009
--

STORM SEWER 161ST AVE NW SHEET NO. 15 OF 41 SHEETS
--



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."



PROPOSED BITUMINOUS
PROPOSED CONCRETE CURB (B618)

NO.	DATE	BY	DESCRIPTION OF REVISIONS

DESIGNED
JJL
DRAWN
JAK
CHECKED
DDB
DATE
2/21/2023

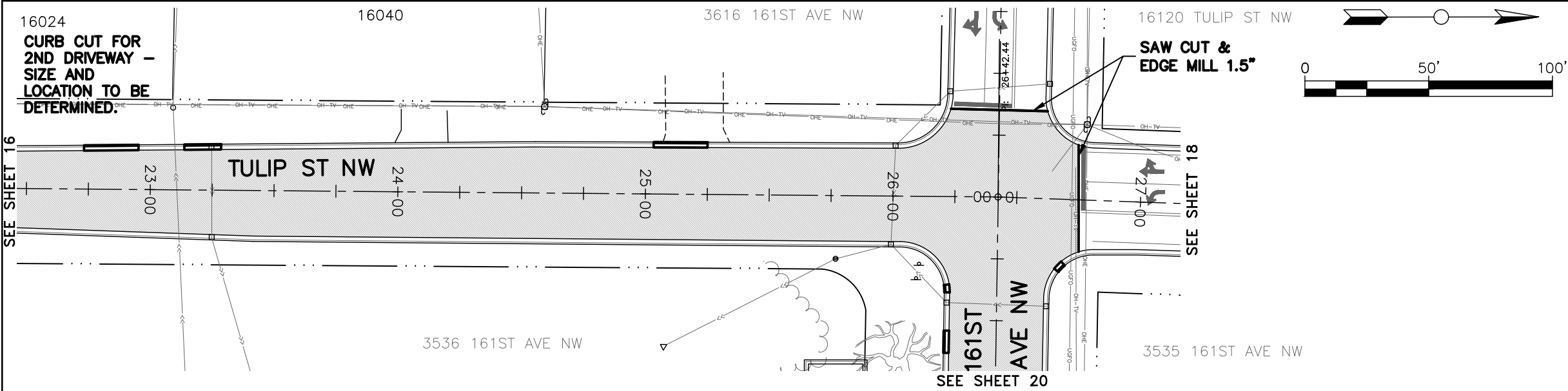
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

DAVID D. BERKOWITZ
TYPED OR PRINTED NAME
LIC. NO. 226757



161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21-39
SAP 198-106-005, 198-105-005, 002-620-009

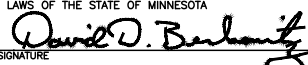
STREET
TULIP ST NW: 0+27 TO 22+50
SHEET NO. 16 OF 41 SHEETS

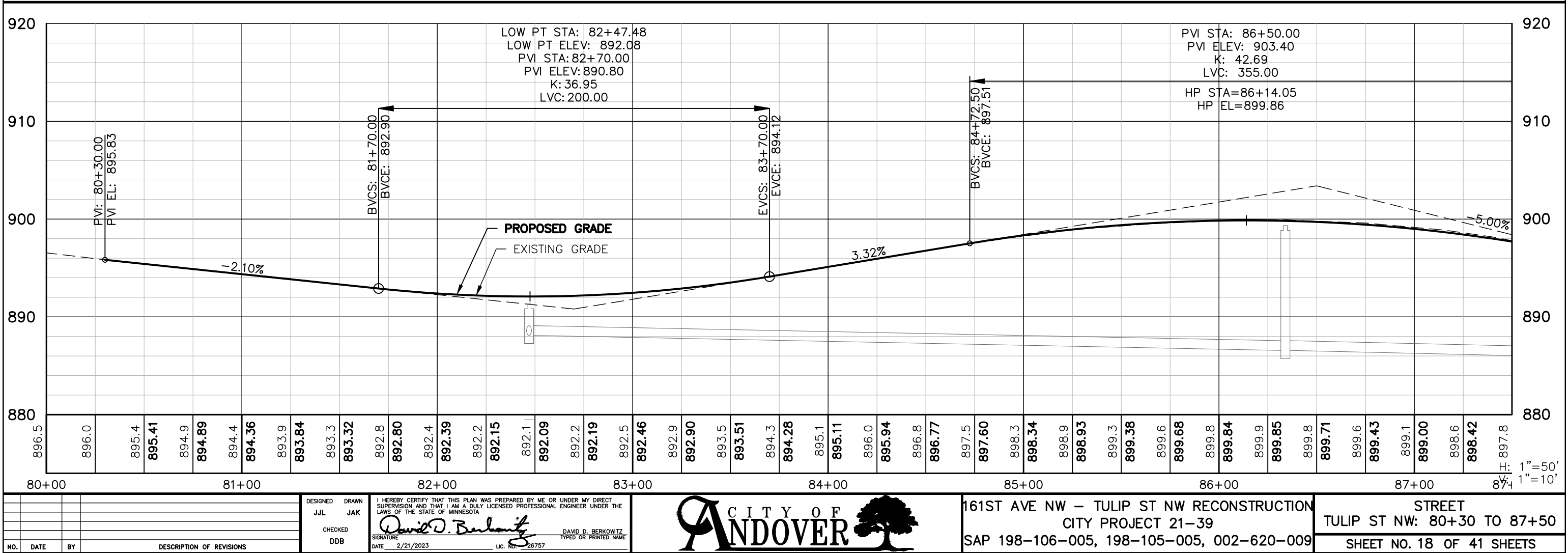
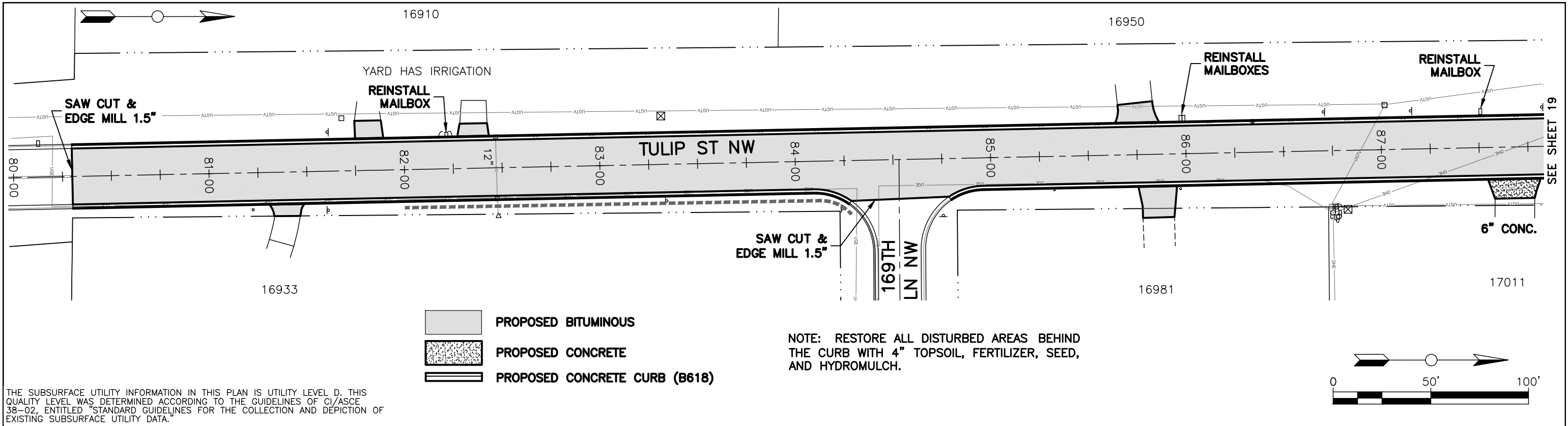


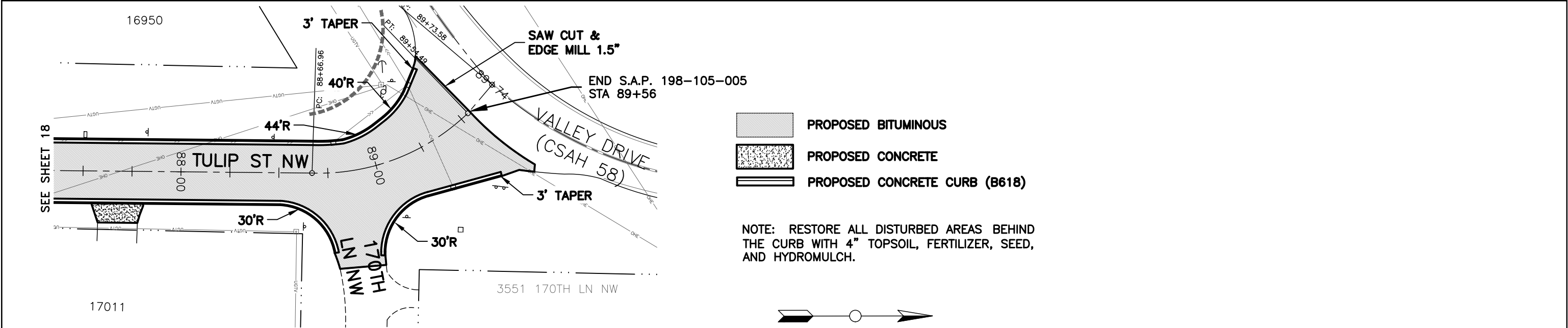
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-  PROPOSED BITUMINOUS
-  PROPOSED CONCRETE CURB (B618)

NOTE: RESTORE ALL DISTURBED AREAS BEHIND THE CURB WITH 4" TOPSOIL, FERTILIZER, SEED, AND HYDROMULCH.

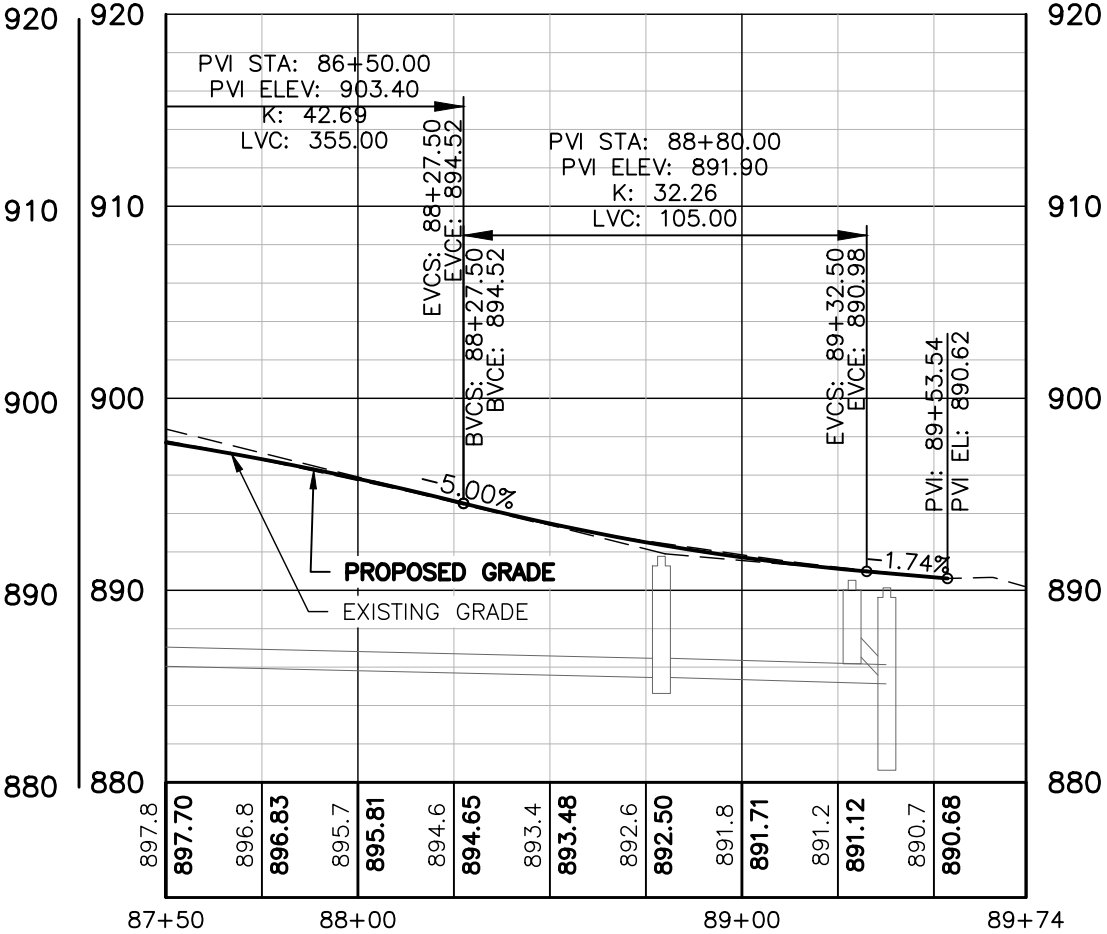
				DESIGNED JJL	DRAWN JAK	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA  DAVID D. BERKOWITZ TYPED OR PRINTED NAME DATE 2/21/2023 LIC. No. 26757	CITY OF ANDOVER	161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009	STREET TULIP ST NW: 22+50 TO 26+75 SHEET NO. 17 OF 41 SHEETS
				CHECKED DDB					
NO.	DATE	BY	DESCRIPTION OF REVISIONS						

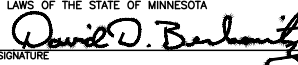


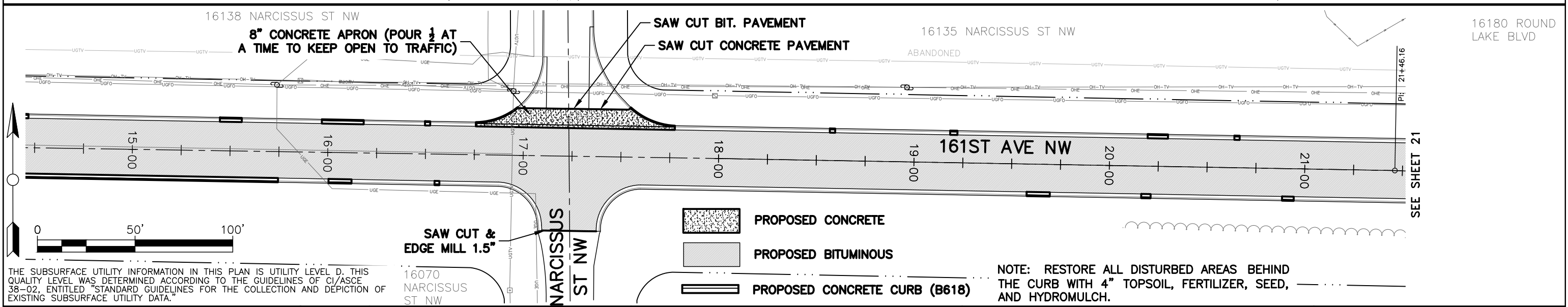
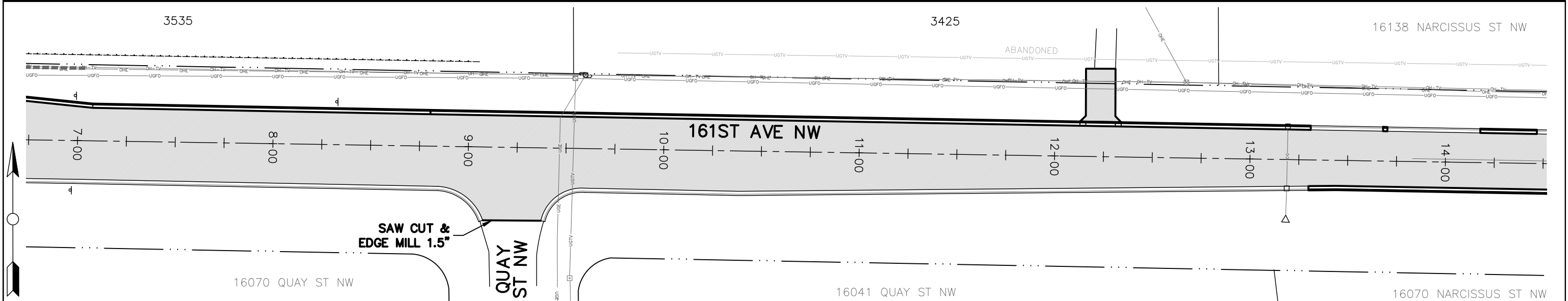
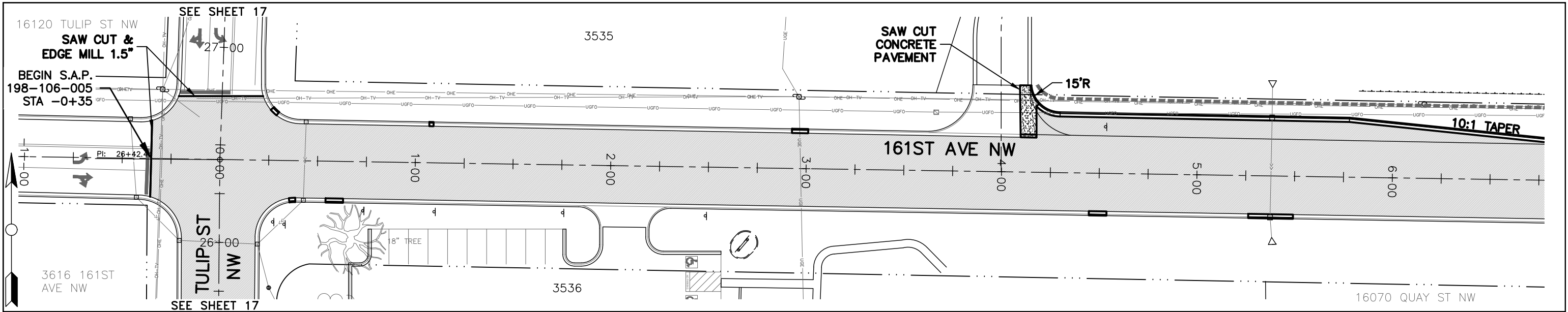


THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

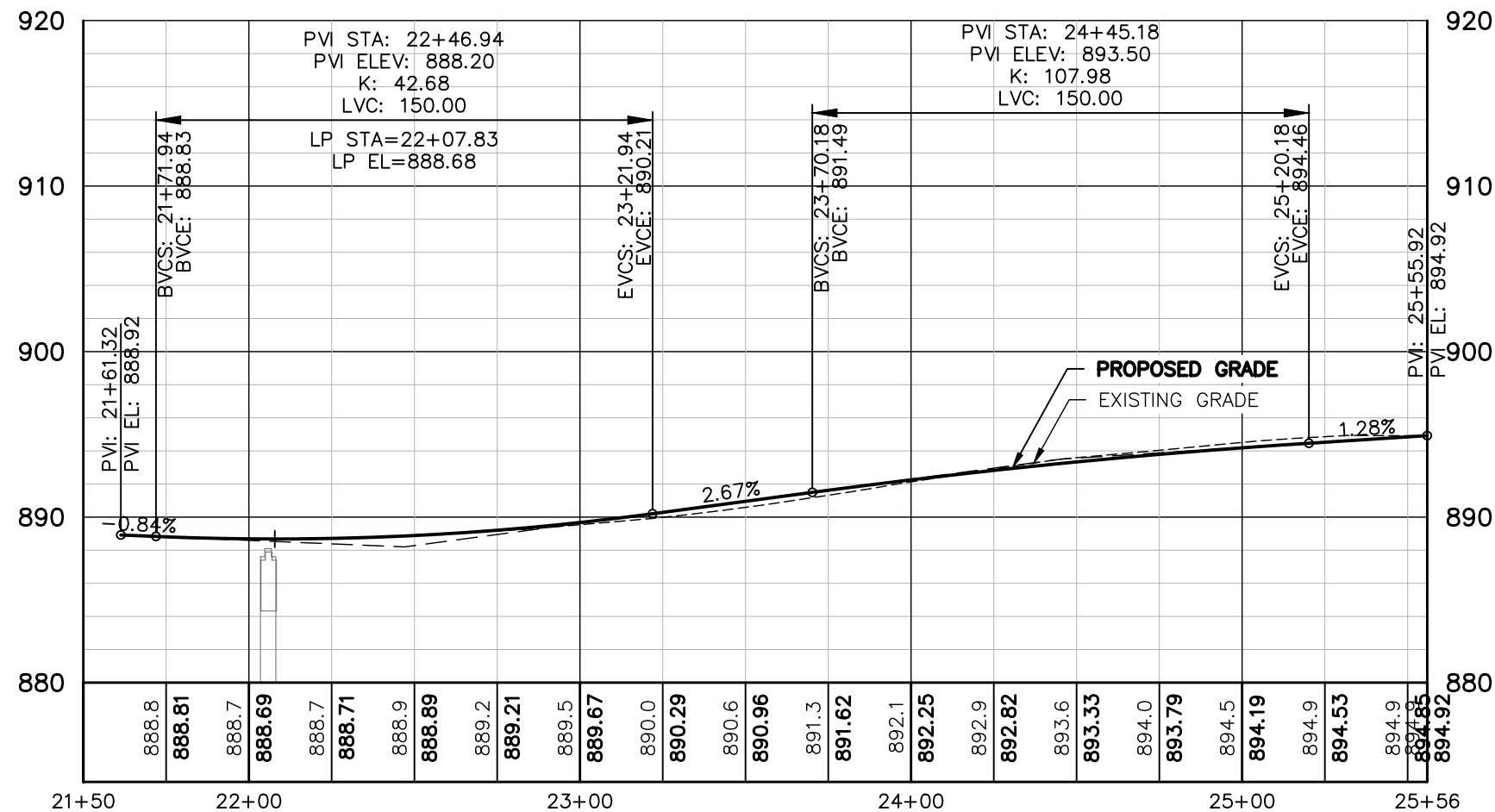
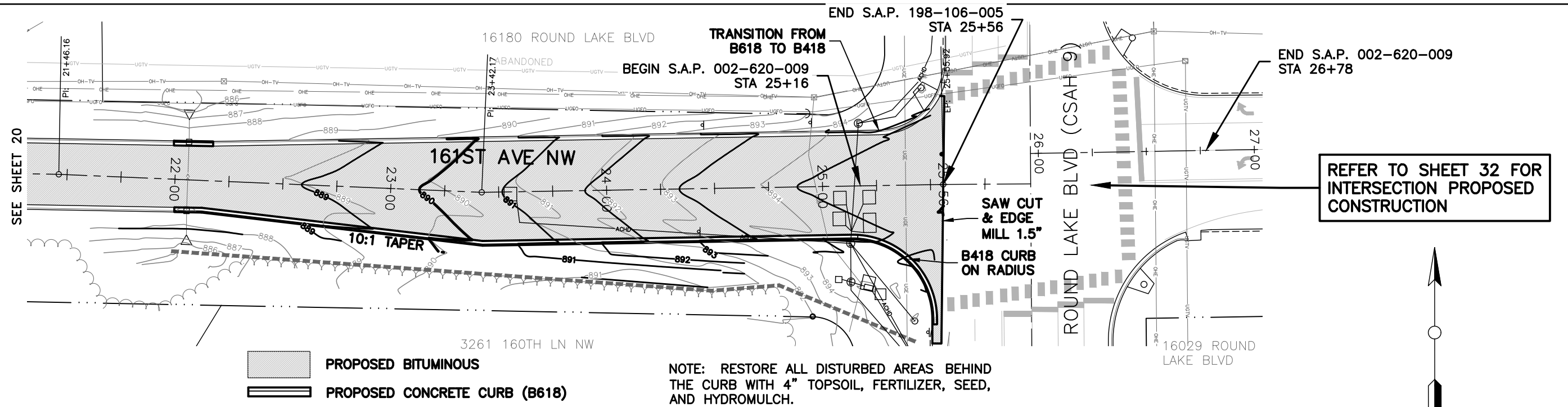
H: 1"=50'
V: 1"=10'



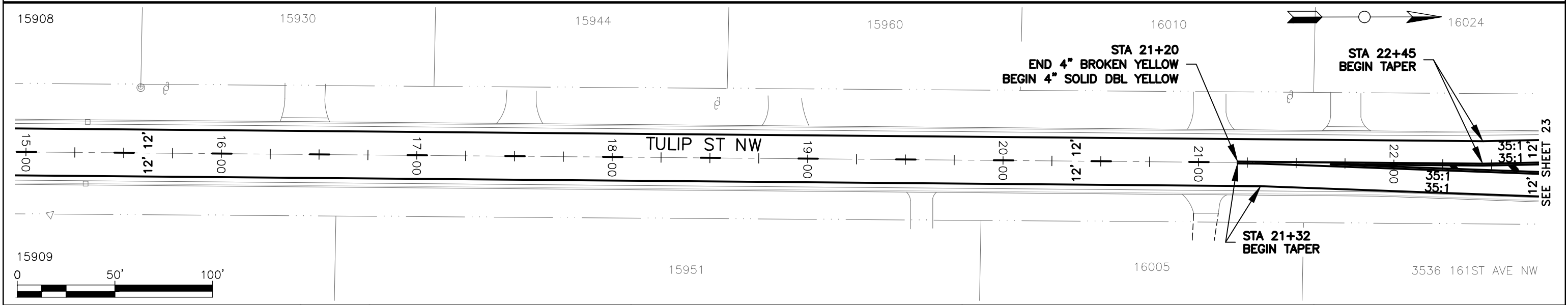
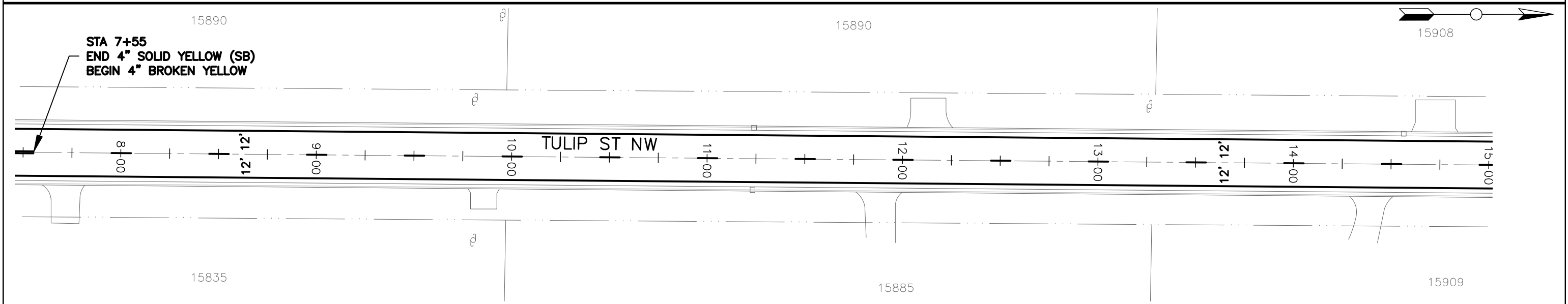
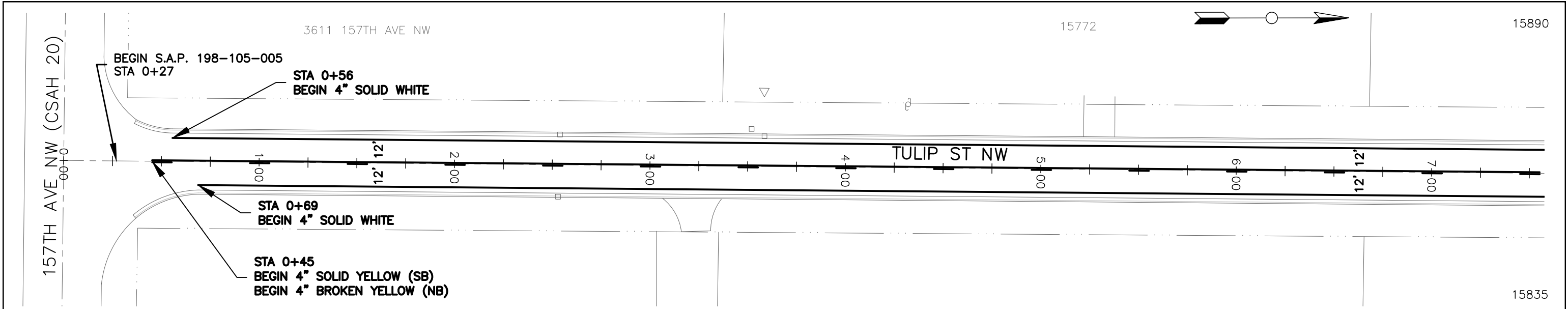
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			CHECKED DDB				SHEET NO. 19 OF 41 SHEETS	
NO.	DATE	BY	DESCRIPTION OF REVISIONS					



THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF C/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."				DESIGNED JJL DRAWN JAK CHECKED DDB DATE 2/21/2023		I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. DAVID D. BERKOWITZ TYPED OR PRINTED NAME LIC. NO. 26757				161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009		STREET 161ST AVE NW: -0+35 TO 21+50 SHEET NO. 20 OF 41 SHEETS	
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NO.	DATE	BY	DESCRIPTION OF REVISIONS

DESIGNED
JJL

DRAWN
JAK

CHECKED
DDB

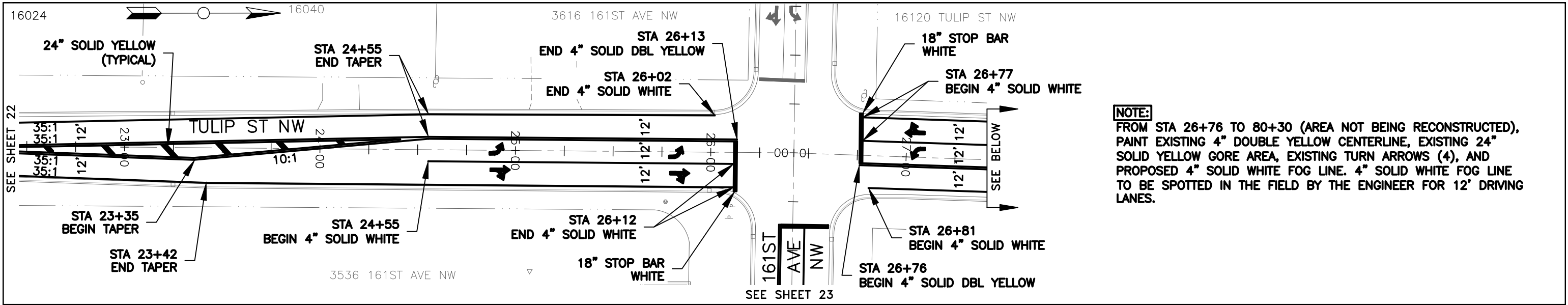
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DAVID D. BERKOWITZ
TYPED OR PRINTED NAME
DATE 2/21/2023 LIC. NO. 26757

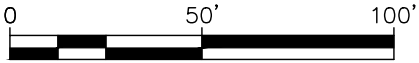
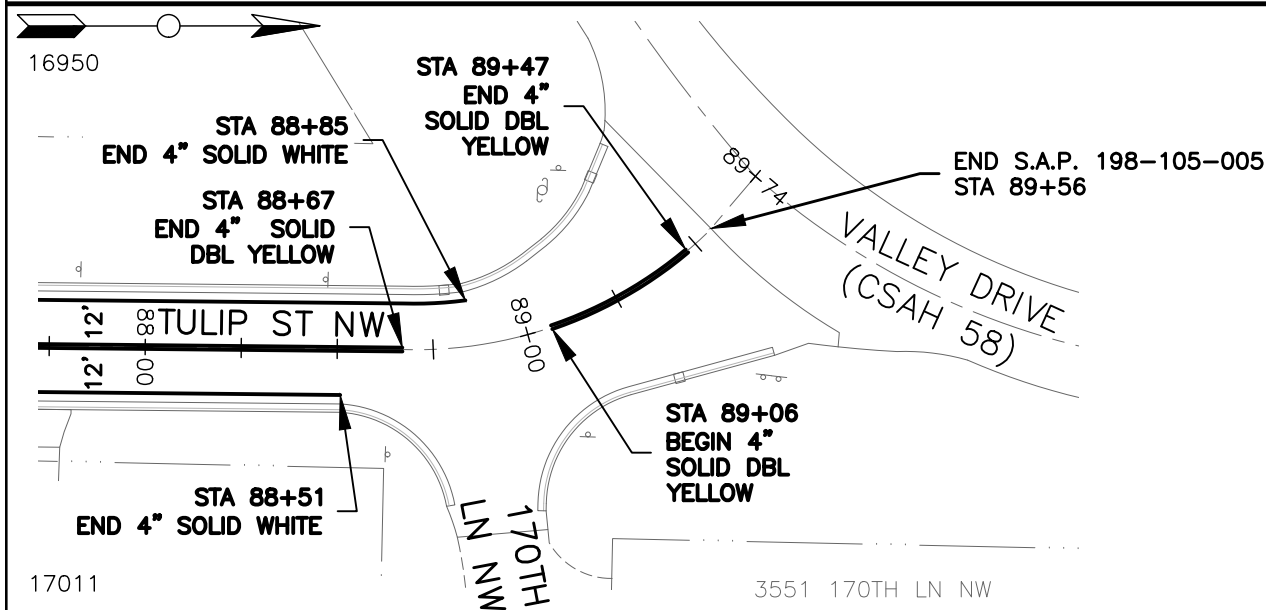
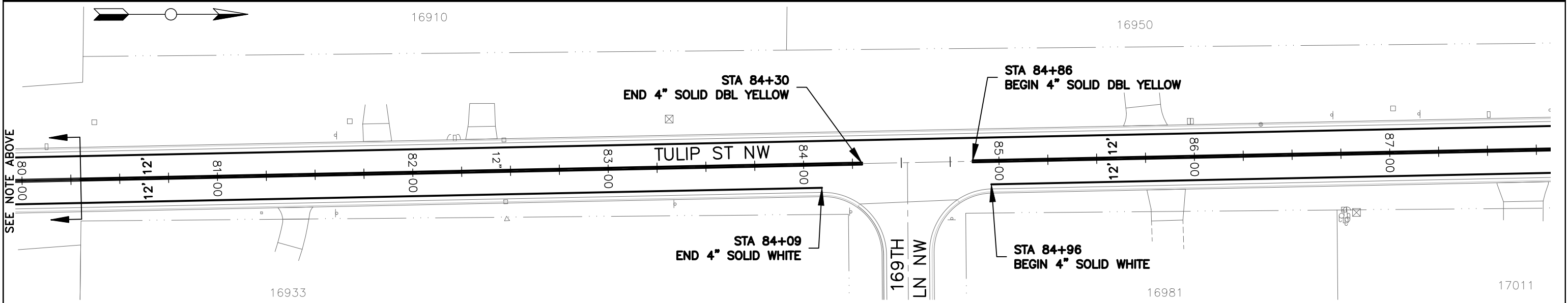


161ST AVE NW – TULIP ST NW RECONSTRUCTION
CITY PROJECT 21-39
SAP 198-106-005, 198-105-005, 002-620-009

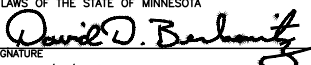
STRIPING
TULIP ST NW: 0+27 TO 22+50
SHEET NO. 22 OF 41 SHEETS



[NOTE:]
 FROM STA 26+76 TO 80+30 (AREA NOT BEING RECONSTRUCTED),
 PAINT EXISTING 4" DOUBLE YELLOW CENTERLINE, EXISTING 24"
 SOLID YELLOW GORE AREA, EXISTING TURN ARROWS (4), AND
 PROPOSED 4" SOLID WHITE FOG LINE. 4" SOLID WHITE FOG LINE
 TO BE SPOTTED IN THE FIELD BY THE ENGINEER FOR 12' DRIVING
 LANES.



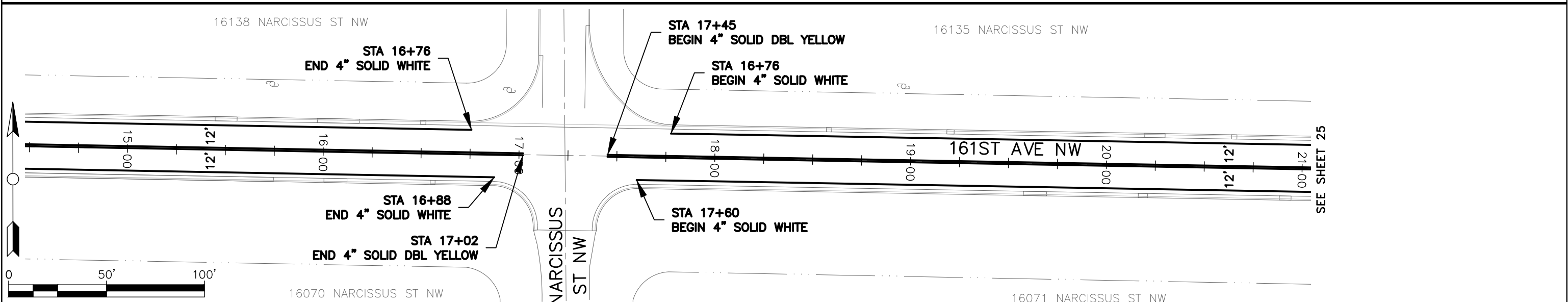
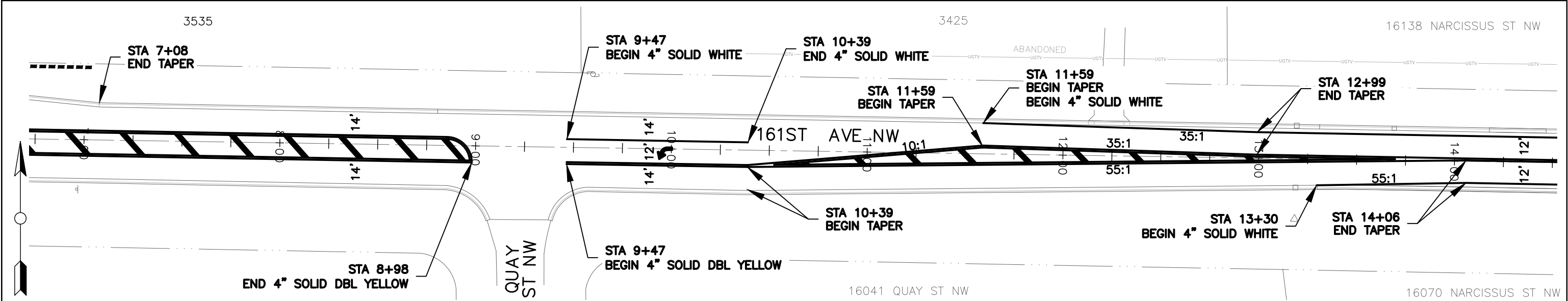
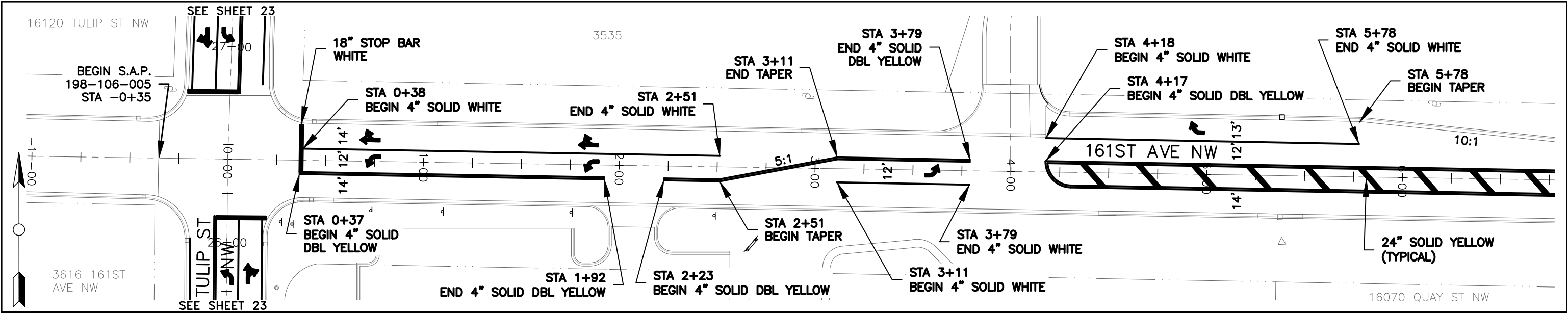
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CHECKED DDB	DATE 2/21/2023	
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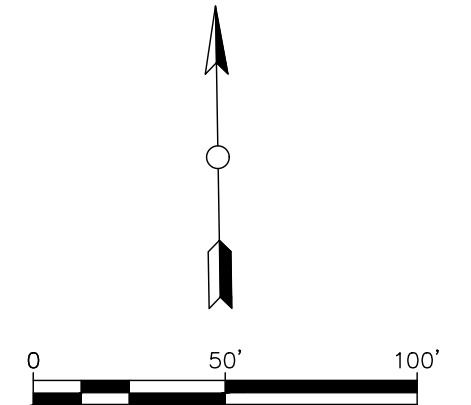
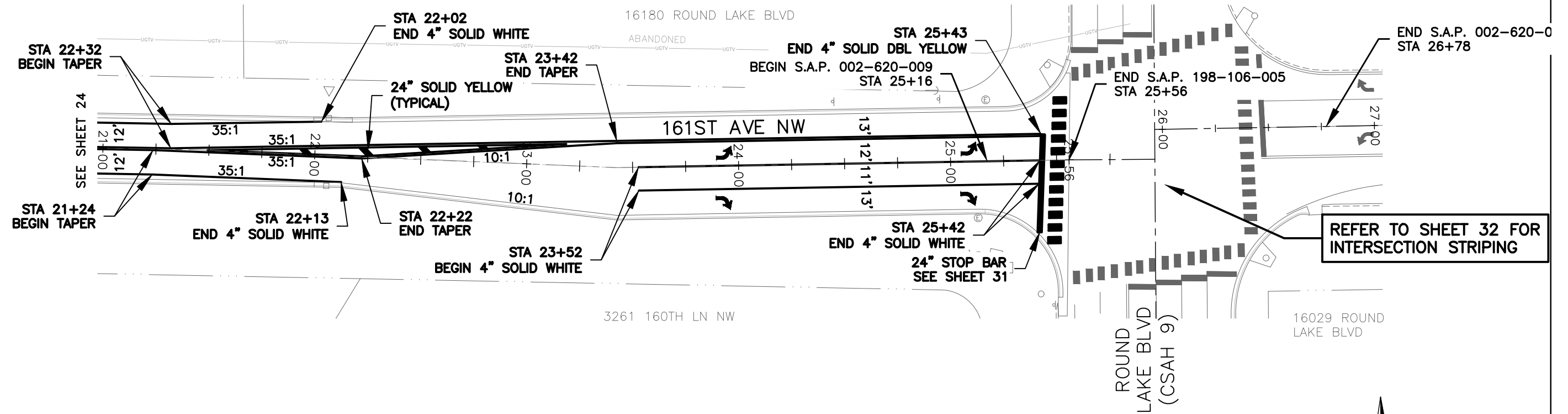


161ST AVE NW – TULIP ST NW RECONSTRUCTION
 CITY PROJECT 21-39
 SAP 198-106-005, 198-105-005, 002-620-009

STRIPING
 TULIP ST NW: 22+50 TO 26+75/
 80+30 TO 89+56
 SHEET NO. 23 OF 41 SHEETS



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NO.	DATE	BY	DESCRIPTION OF REVISIONS

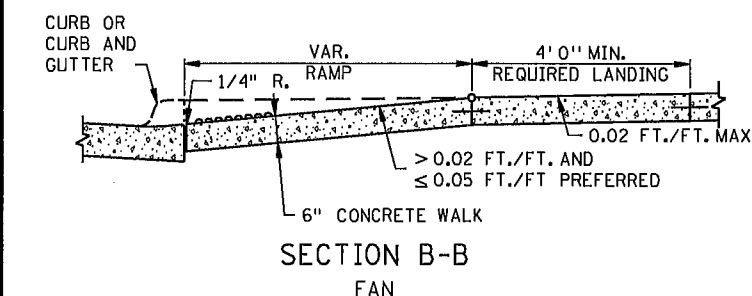
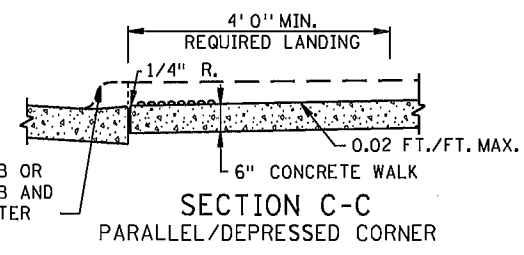
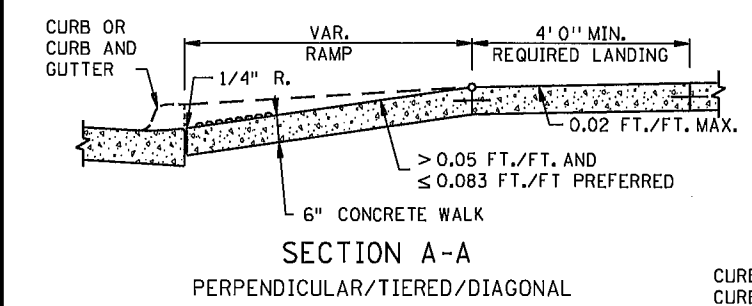
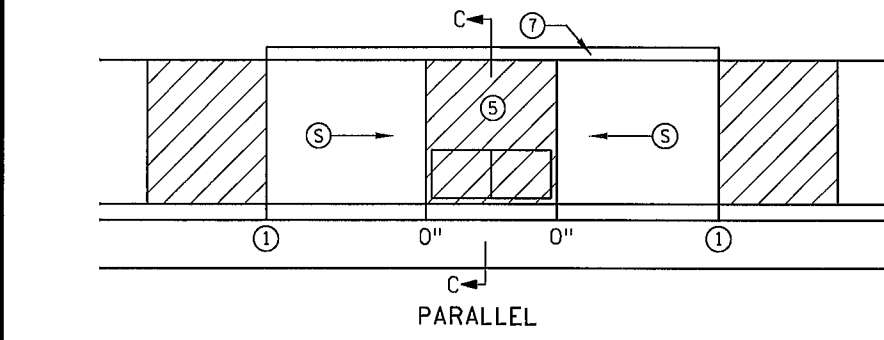
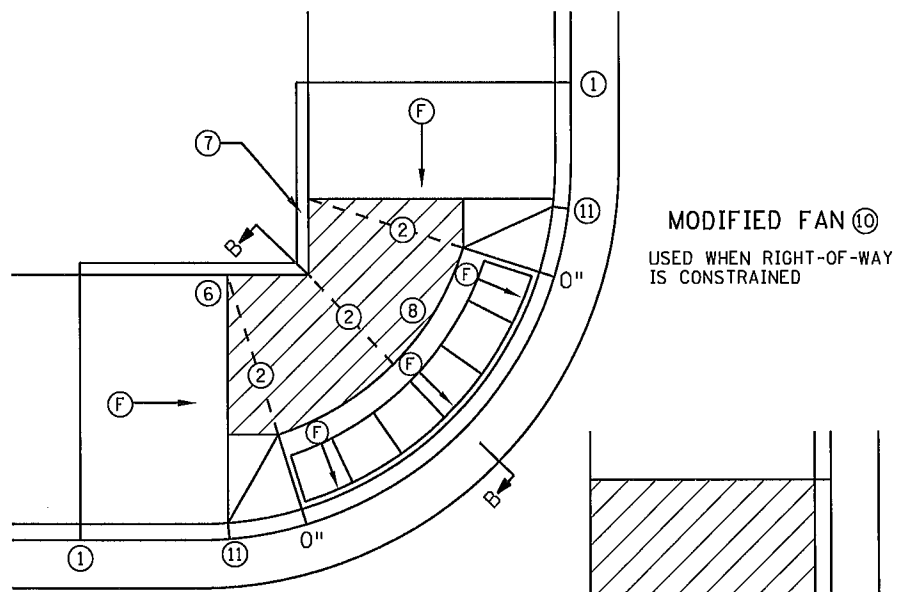
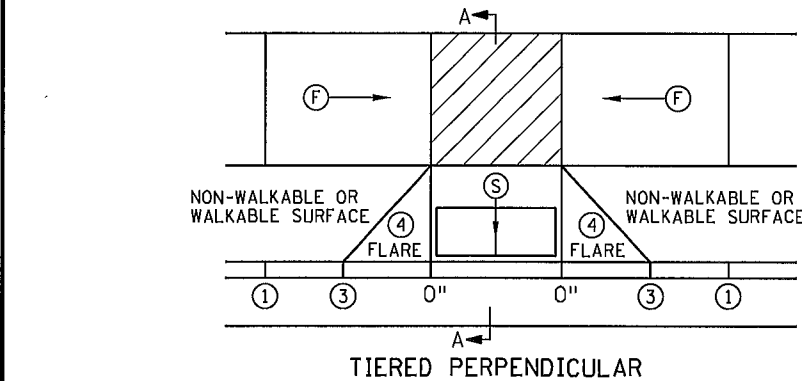
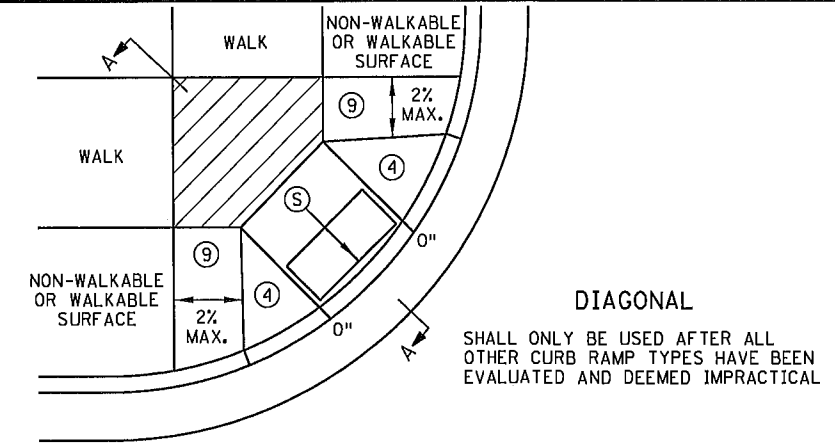
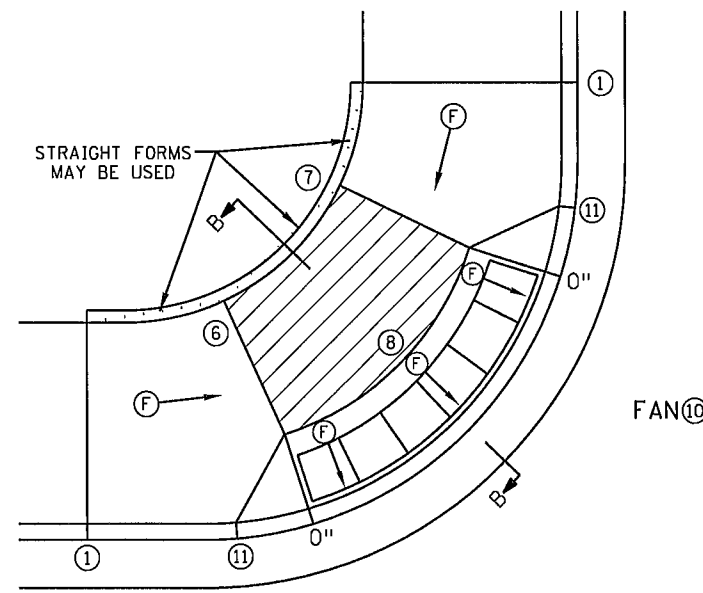
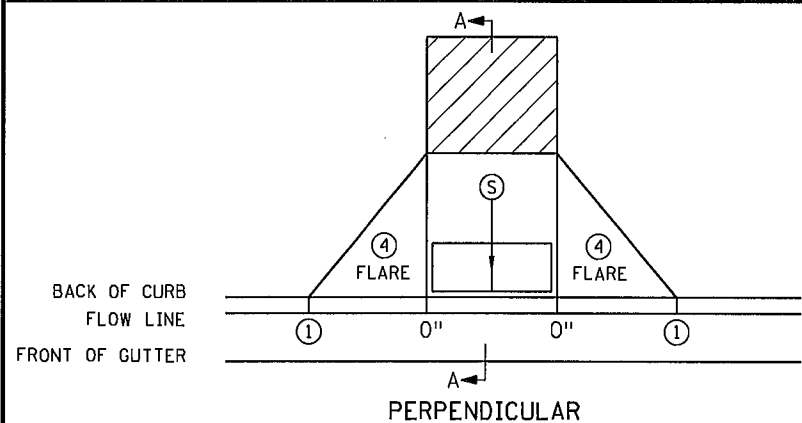
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CHECKED DDB		



161ST AVE NW – TULIP ST NW RECONSTRUCTION CITY PROJECT 21-39 SAP 198-106-005, 198-105-005, 002-620-009	STRIPING 161ST AVE NW: 21+00 TO 25+56 SHEET NO. 25 OF 41 SHEETS
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PLOTTED/REVISED: 02/08/2023

DISTRICT #: PLOT NAME: \$\$\$PLOTNAME\$\$\$
PATH & FILENAME: P:\002-620-009 161st Signal Mod\Plan\002-620-009 STD.dgn



- NOTES:**
- LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE GREATER THAN 2%.
- INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.
- SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL RUNNING SLOPE IS GREATER THAN 5.0%.
- CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR, 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOPS OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.
- ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL, THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH, EXCEPT AS STATED IN (6) BELOW.
- TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR, FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 OF 6 FOR ALL SEPARATELY POURED INITIAL LANDINGS.
- WHEN SIDEWALK IS AT BACK OF CURB, TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE. MAINTAIN POSITIVE BOULEVARD DRAINAGE TO TOP OF CURB.
- ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.
- 4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER THE ENTIRE PAR WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK WITH THE EXCEPTION OF 3" MAXIMUM ON EACH OUTSIDE EDGE WHICH ENSURES THE DETECTABLE WARNINGS ARE ENCASED IN CONCRETE WHEN ADJACENT TO TURF, WHEN ADJACENT TO CONCRETE FLARES 0" - 3" OFFSET IS ALLOWED.
- WHEN DESIGNING OR ORDERING RECTANGULAR DETECTABLE WARNING SURFACES SHOULD BE 6" LESS THAN THE INCOMING PAR. ARC LENGTH OF THE RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.
- RECTANGULAR DETECTABLE WARNINGS SHALL BE SETBACK 3" FROM THE BACK OF CURB. RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB.
- (1) MATCH FULL HEIGHT CURB.
- (2) 4' MINIMUM DEPTH LANDING REQUIRED ACROSS TOP OF RAMP.
- (3) 3" HIGH CURB WHEN USING A 3' LONG RAMP, 4" HIGH CURB WHEN USING A 4' LONG RAMP.
- (4) SEE SHEET 4 OF 6, TYPICAL SIDE TREATMENT OPTIONS, FOR DETAILS ON FLARES AND RETURNED CURBS.
- (5) DETECTABLE WARNINGS MAY BE PART OF THE 4' X 4' MIN. LANDING AREA IF IT IS NOT FEASIBLE TO CONSTRUCT THE LANDING OUTSIDE OF THE DETECTABLE WARNING AREA.
- (6) THE GRADE BREAK SHALL BE PERPENDICULAR TO THE BACK OF WALK. THIS WILL ENSURE THAT THE GRADE BREAK IS PERPENDICULAR TO THE DIRECTION OF TRAVEL. (TYPICAL FOR ALL)
- (7) WHEN ADJACENT TO GRASS, GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS LESS THAN 5% RUNNING SLOPE SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.
- (8) A 7' MIN TOP RADIUS GRADE BREAK IS REQUIRED TO BE CONSTRUCTIBLE.
- (9) PAVE FULL WALK WIDTH.
- (10) "S" SLOPES ON FANS SHALL ONLY BE USED WHEN ALL OTHER FEASIBLE OPTIONS HAVE BEEN EVALUATED AND DEEMED IMPRACTICAL.
- (11) INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3" CURB HEIGHT. REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

LEGEND	
THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT, IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.	
(S)	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
(F)	INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.
(X)	LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX. 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.
X"	CURB HEIGHT

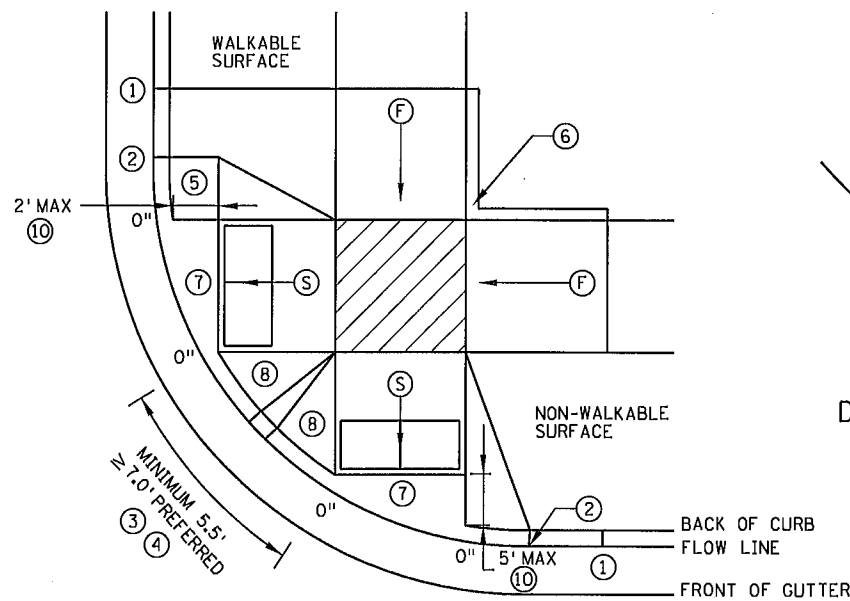
REVISION:
APPROVED: 11-04-2021
Jeff J. Perkins
OPERATIONS DIVISION

STANDARD PLAN 5-297.250 1 OF 6
APPROVED: 11-04-2021
REVISOR:
THOMAS J. VICKI
STATE DESIGN ENGINEER

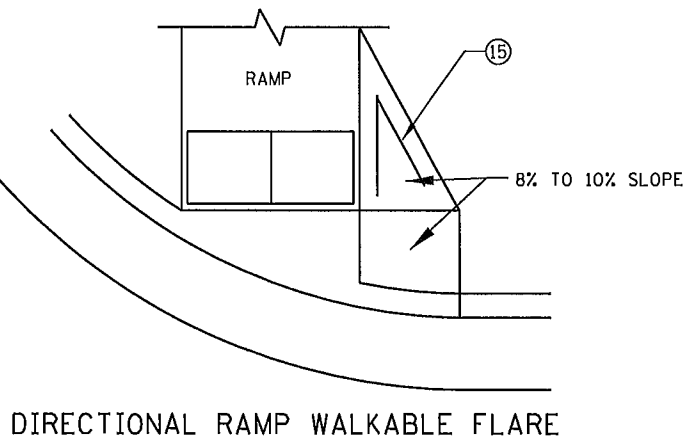
PEDESTRIAN CURB RAMP DETAILS

PLOTTED/REVISED: 02/08/2023

DISTRICT #: PLOT NAME: \$\$\$PLOTNAME\$\$\$ PATH & FILENAME: P:\002-620-009 161st SignalMod\Plan\002-620-009 STD.dgn

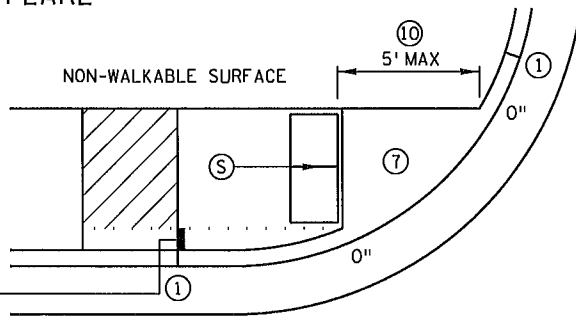


COMBINED DIRECTIONAL

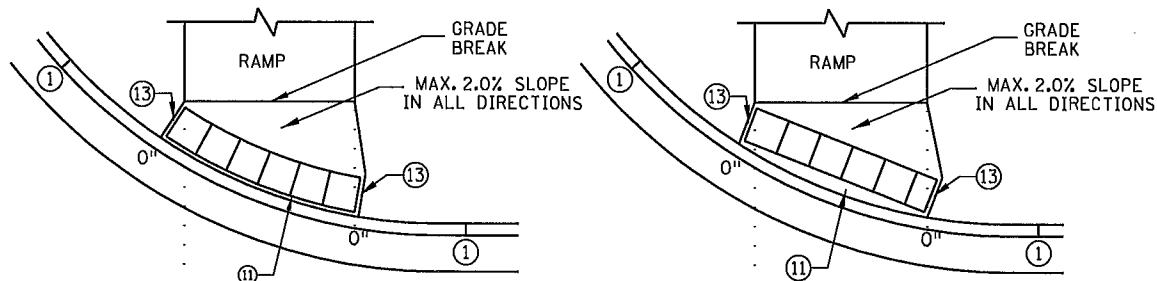


DIRECTIONAL RAMP WALKABLE FLARE

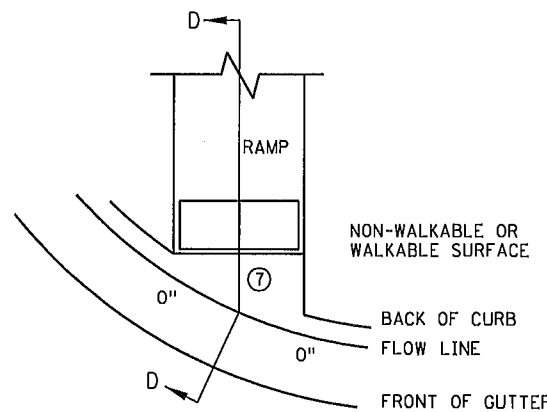
IF NON-CONCRETE BLVD. IS CONSTRUCTED AND IS LESS THAN 2' IN WIDTH AT TOP OF CURB TRANSITION, PAVE CONCRETE RAMP WIDTH TO ADJACENT BACK OF CURB.



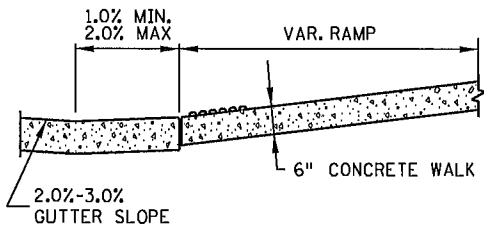
STANDARD ONE-WAY DIRECTIONAL ⑨



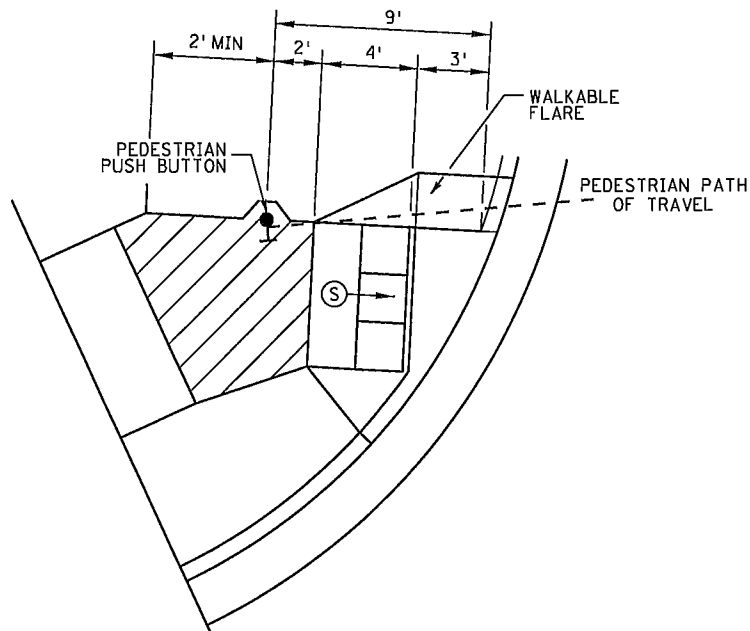
ONE-WAY DIRECTIONAL WITH DETECTABLE WARNING AT BACK OF CURB



CURB FOR DIRECTIONAL RAMPS ⑭



SECTION D-D



SEMI-DIRECTIONAL RAMP ③④⑨

3' DOME SETBACK, 4' LONG RAMP AND PUSH BUTTON 9' FROM THE BACK OF CURB
PRIMARYLY USED FOR APS APPLICATIONS WHERE THE PAR DOES NOT CONTINUE PAST THE PUSH BUTTON (DEAD-END SIDEWALK)

NOTES:

LANDINGS SHALL BE LOCATED ANYWHERE THE PEDESTRIAN ACCESS ROUTE (PAR) CHANGES DIRECTION, AT THE TOP OF RAMPS THAT HAVE RUNNING SLOPES GREATER THAN 5.0%, AND IF THE APPROACHING WALK IS INVERSE GRADE.

INITIAL CURB RAMP LANDINGS SHALL BE CONSTRUCTED WITHIN 15' FROM THE BACK OF CURB, WITH 6' FROM THE BACK OF CURB BEING THE PREFERRED DISTANCE, ONLY APPLICABLE WHEN THE INITIAL RAMP RUNNING SLOPE IS OVER 5.0%.

SECONDARY CURB RAMP LANDINGS ARE REQUIRED FOR EVERY 30" OF VERTICAL RISE WHEN THE LONGITUDINAL SLOPE IS GREATER THAN 5.0%.

CONTRACTION JOINTS SHALL BE CONSTRUCTED ALONG ALL GRADE BREAKS WITHIN THE PAR. 1/4" DEEP VISUAL JOINTS SHALL BE USED AT THE TOP GRADE BREAK OF CONCRETE FLARES ADJACENT TO WALKABLE SURFACES.

ALL GRADE BREAKS WITHIN THE PAR SHALL BE PERPENDICULAR TO THE PATH OF TRAVEL. THUS BOTH SIDES OF A SLOPED WALKING SURFACE MUST BE EQUAL LENGTH.

TO ENSURE INITIAL RAMPS AND INITIAL LANDINGS ARE PROPERLY CONSTRUCTED, LANDINGS SHALL BE CAST SEPARATELY, FOLLOW SIDEWALK REINFORCEMENT DETAILS ON SHEET 6 AND THE ADA SPECIAL PROVISION (PROSECUTION OF WORK).

TOP OF CURB SHALL MATCH PROPOSED ADJACENT WALK GRADE.

WHEN THE BOULEVARD IS 4' WIDE OR LESS, THE TOP OF CURB TAPER SHALL MATCH THE RAMP SLOPES TO REDUCE NEGATIVE BOULEVARD SLOPES FROM THE TOP BACK OF CURB TO THE PAR.

ALL RAMP TYPES SHOULD HAVE A MINIMUM 3' LONG RAMP LENGTH.

4' MINIMUM WIDTH OF DETECTABLE WARNING IS REQUIRED FOR ALL RAMPS. DETECTABLE WARNINGS SHALL CONTINUOUSLY EXTEND FOR A MIN. OF 24" IN THE PATH OF TRAVEL. DETECTABLE WARNING TO COVER THE ENTIRE PAR WIDTH OF SHARED-USE PATHS AND THE ENTIRE PAR WIDTH OF THE WALK WITH THE EXCEPTION OF 3" MAXIMUM ON EACH OUTSIDE EDGE WHICH ENSURES THE DETECTABLE WARNINGS ARE ENCASED IN CONCRETE WHEN ADJACENT TO TURF. WHEN ADJACENT TO CONCRETE FLARES 0" - 3" OFFSET IS ALLOWED.

WHEN DESIGNING OR ORDERING RECTANGULAR DETECTABLE WARNING SURFACES SHOULD BE 6" LESS THAN THE INCOMING PAR. ARC LENGTH OF THE RADIAL DETECTABLE WARNINGS SHOULD NOT BE GREATER THAN 20 FEET.

RADIAL DETECTABLE WARNINGS SHALL BE SETBACK 3" MINIMUM TO 6" MAXIMUM FROM THE BACK OF CURB. SEE NOTES ⑩ & ⑪ FOR INFORMATION REGARDING RECTANGULAR DETECTABLE WARNING PLACEMENT.

① MATCH FULL CURB HEIGHT.

② 3" HIGH CURB WHEN USING A 3' LONG RAMP
4" HIGH CURB WHEN USING A 4' LONG RAMP.

③ 3" MINIMUM CURB HEIGHT (5.5' MIN. DISTANCE REQUIRED BETWEEN DOMES)
4" PREFERRED (7' MIN. DISTANCE REQUIRED BETWEEN DOMES).

④ THE "BUMP" IN BETWEEN THE RAMPS SHOULD NOT BE IN THE PATH OF TRAVEL FOR COMBINED DIRECTIONAL RAMPS. IF THIS OCCURS MODIFY THE RAMP LOCATION OR SWITCH RAMP TO A FAN/DEPRESSED CORNER.

⑤ WHEN USING CONCRETE PAVED FLARES ON THE OUTSIDE OF DIRECTIONAL RAMPS, AND ADJACENT TO A WALKABLE SURFACE, DIRECTIONAL RAMP FLARES SHALL BE USED. SEE THE DETAIL ON THIS SHEET.

⑥ GRADING SHALL ALWAYS BE USED WHEN FEASIBLE. V CURB, IF USED, SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS. WHEN ADJACENT TO PARKING LOTS, CONCRETE OR BITUMINOUS TAPERS SHOULD BE USED OVER V CURB TO REDUCE TRIPPING HAZARDS AND FACILITATE SNOW & ICE REMOVAL.

⑦ MAX. 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK AND DRAIN TO FLOW LINE. SHALL BE CONSTRUCTED INTEGRAL WITH CURB AND GUTTER.

⑧ 8% TO 10% WALKABLE FLARE.

⑨ PLACE DOMES AT THE BACK OF CURB WHEN ALLOWABLE SETBACK CRITERIA IS EXCEEDED.

⑩ FRONT EDGE OF DETECTABLE WARNING SHALL BE SET BACK 2' MAXIMUM WHEN ADJACENT TO WALKABLE SURFACE, AND 5' MAXIMUM WHEN ADJACENT TO NON-WALKABLE SURFACE WITH ONE CORNER SET 3" FROM BACK OF CURB. A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.

⑪ RECTANGULAR DETECTABLE WARNINGS MAY BE SETBACK UP TO 9" FROM THE BACK OF CURB WITH CORNERS SET 3" FROM BACK OF CURB. IF 9" SETBACK IS EXCEEDED USE RADIAL DETECTABLE WARNINGS.

⑫ FOR DIRECTIONAL RAMPS WITH THE DETECTABLE WARNINGS PLACED AT THE BACK OF CURB, THE DETECTABLE WARNINGS SHALL COVER THE ENTIRE WIDTH OF THE WALK/PATH. THIS ENSURES A DETECTABLE EDGE AND HELPS ELIMINATE THE CURB TAPER OBSTRUCTING THE PATH OF PEDESTRIAN TRAVEL.

⑬ THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE BACK OF CURB. MAINTAIN 3" BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑭ TO BE USED FOR ALL DIRECTIONAL RAMPS, EXCEPT WHERE DOMES ARE PLACED ALONG THE BACK OF CURB.

⑮ PLACE 2 NO. 4 BARS 4 INCHES FROM SIDE OF FORMS WITH A MINIMUM 2 INCHES OF CONCRETE COVER ALONG EACH SIDE OF FLARE (INCIDENTAL).

LEGEND

THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT. IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.

⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.

⑥ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE GREATER THAN 2.0% AND LESS THAN 5.0% IN THE DIRECTION SHOWN AND CROSS SLOPE SHALL NOT EXCEED 2.0%.

⑦ LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.

X" CURB HEIGHT

REVISION:

APPROVED: 11-04-2021

Jeffrey Perkins
OPERATIONS DIVISION

MINNESOTA

DEPARTMENT OF TRANSPORTATION

STANDARD PLAN 5-297.250

2 OF 6

APPROVED: 11-04-2021

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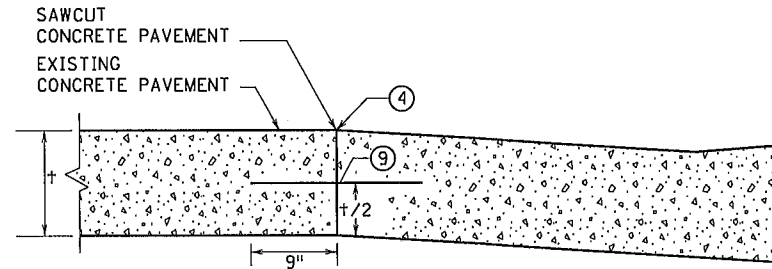
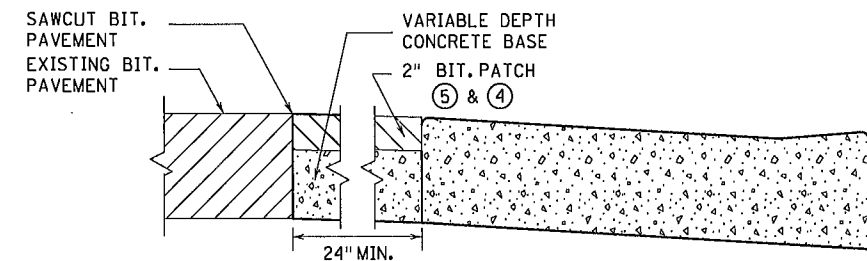
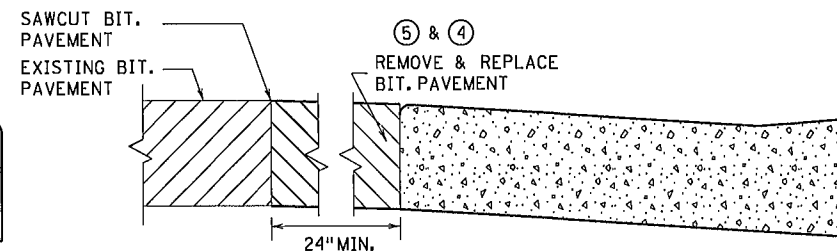
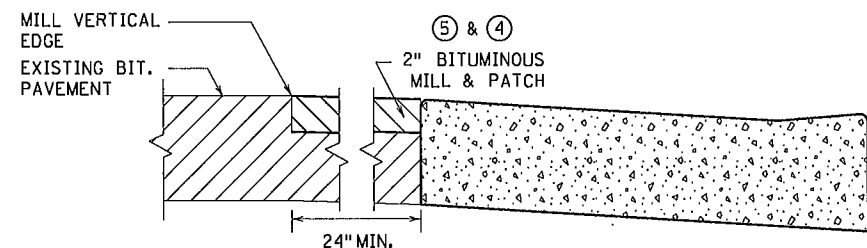
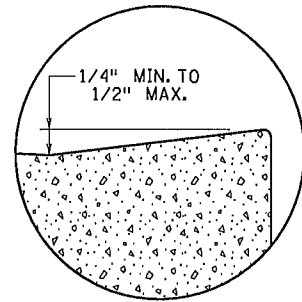
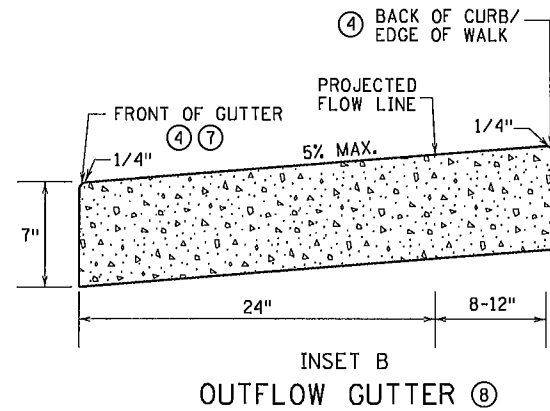
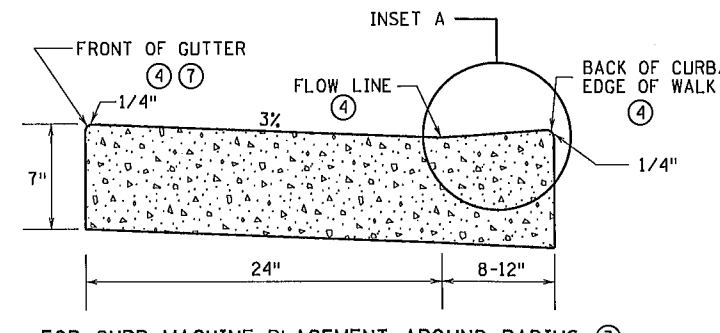
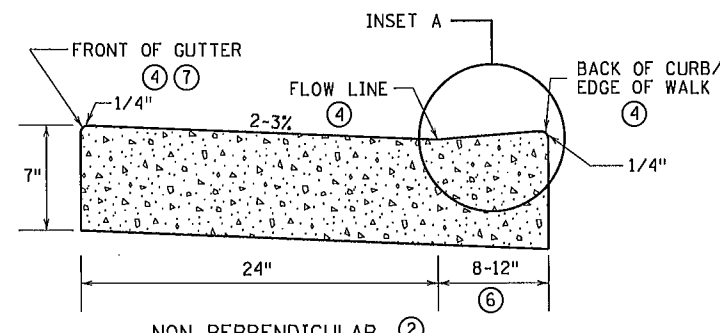
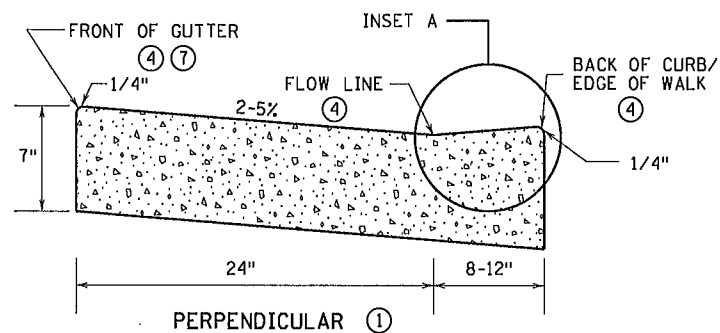
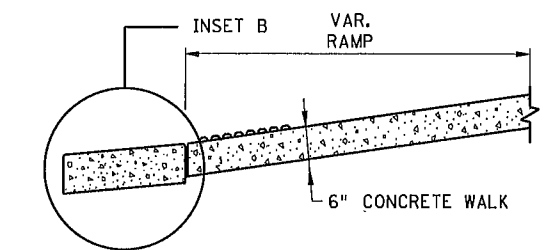
THOMAS STYBRICKI
STATE DESIGN ENGINEER

STATE PROJ. NO. SAP 002-620-009 CP. NO CP 21-39 SHEET NO. 27 OF 41 SHEETS

PEDESTRIAN CURB RAMP DETAILS

PLOTTED/REVISED: 02/08/2023

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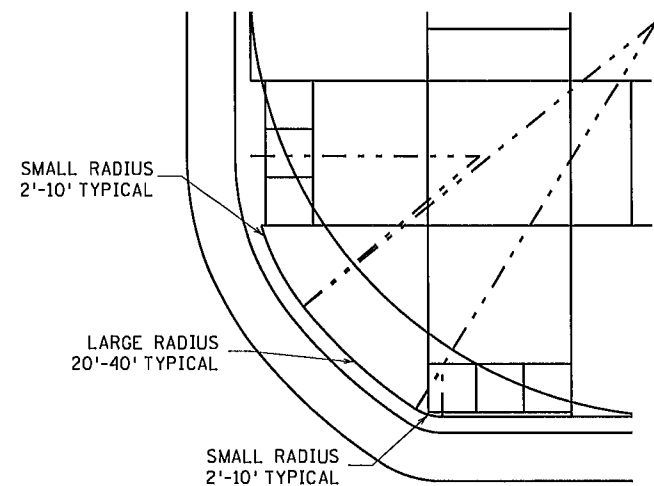
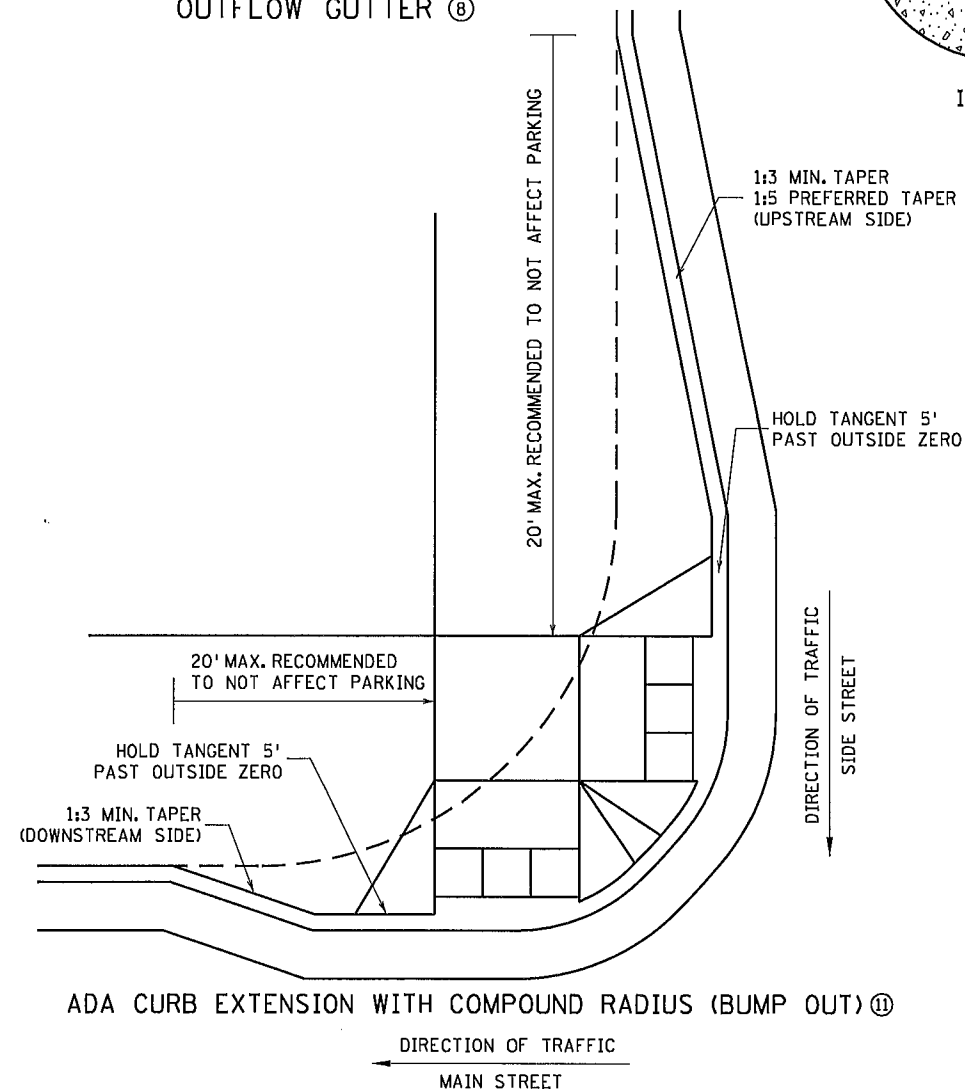


ONLY ALLOWED PER ENGINEER'S APPROVAL

PAVEMENT TREATMENT OPTIONS IN FRONT OF CURB & GUTTER FOR USE ON CURB RAMP RETROFITS

NOTES:

- POSITIVE FLOW LINE DRAINAGE SHALL BE MAINTAINED THROUGH THE PEDESTRIAN ACCESS ROUTE (PAR) AT A 2% MAXIMUM. NO PONDING SHALL BE PRESENT IN THE PAR.
- ANY VERTICAL LIP THAT OCCURS AT THE FLOW LINE SHALL NOT BE GREATER THAN 1/4 INCH.
- ① FOR USE AT CURB CUTS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: PERPENDICULAR, TIERED PERPENDICULAR, PARALLEL, AND DIAGONAL RAMPS.
- ② FOR USE AT CURB RAMPS WHERE THE PEDESTRIAN'S PATH OF TRAVEL IS ASSUMED NON PERPENDICULAR TO THE GUTTER FLOW LINE. RAMP TYPES INCLUDE: FANS & DEPRESSED CORNERS.
- ③ BEGIN GUTTER SLOPE TRANSITION 10' OUTSIDE OF ALL CURB RAMPS.
- ④ THERE SHALL BE NO VERTICAL DISCONTINUITIES GREATER THAN 1/4".
- ⑤ ELEVATION CHANGE TAKES PLACE FROM THE EXISTING TO NEW FRONT OF GUTTER. PATCH IS USED TO MATCH THE NEW GUTTER FACE INTO THE EXISTING ROADWAY.
- ⑥ VARIABLE WIDTH FOR DIRECTIONAL CURB APPLICATIONS. SEE SHEET 2 FOR DIRECTIONAL CURB SLOPE REQUIREMENTS.
- ⑦ TOP FRONT OF GUTTER SHALL BE CONSTRUCTED FLUSH WITH PROPOSED ADJACENT PAVEMENT ELEVATION. TOP 1.5" OF THE GUTTER FACE MUST BE A FORMED EDGE. PAR GUTTER SHALL NOT BE OVERLAID.
- ⑧ SHOULD BE USED AT VERTICALLY CONSTRAINED AREAS WHEN AT A DRAINAGE HIGH POINT OR SUPER ELEVATED ROADWAY SEGMENTS.
- ⑨ DRILL AND GROUT NO. 4 EPOXY-COATED 18" LONG TIE BARS AT 30" CENTER TO CENTER INTO EXISTING CONCRETE PAVEMENT 1' MINIMUM FROM ALL JOINTS.
- ⑩ HELPS PROVIDE TWO SEPARATE RAMPS, REDUCES THE DOME SETBACK LENGTH AND MINIMIZES DIRECTIONAL CURB. THIS RADIUS DESIGN CLOSELY FOLLOWS THE TURNING VEHICLE PATH WHILE OPTIMIZING CURB RAMP LENGTH.
- ⑪ CURB EXTENSIONS SHOULD BE USED IN VERTICALLY CONSTRAINED AREAS, USUALLY IN DOWNTOWN ROADWAY SEGMENTS WHERE ON-STREET PARKING IS AVAILABLE. CURB EXTENSIONS SHOULD BE CONSIDERED FOR APS INTERSECTIONS WHERE SPACE IS LIMITED. PUSH BUTTONS MUST MEET APS CRITERIA AS DESCRIBED IN THE PUSH BUTTON LOCATION DETAIL SHEET.



COMBINED DIRECTIONAL ⑩ (COMPOUND RADIUS)

REVISION:
APPROVED: 11-04-2021
Jeffrey Perkins
OPERATIONS DIVISION

MINNESOTA
DEPARTMENT
OF
TRANSPORTATION

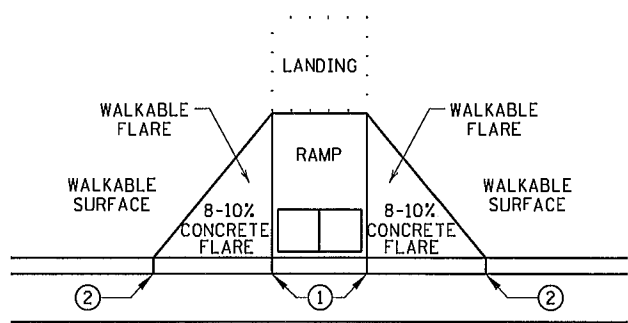
STANDARD PLAN 5-297.250 3 OF 6
APPROVED: 11-04-2021
REVISED:
THOMAS STYBRICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

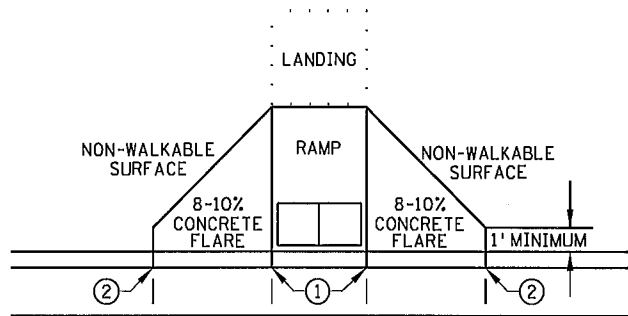
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SAP 198-106-005

PLOTTED/REVISED: 02/08/2023

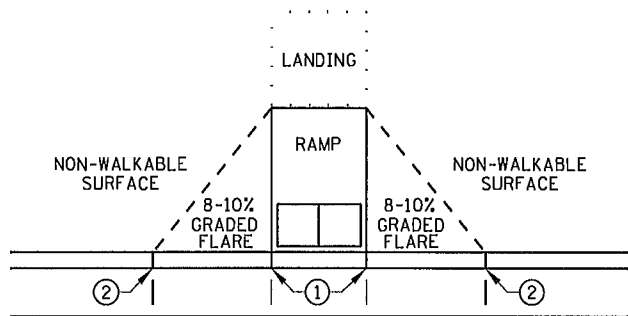
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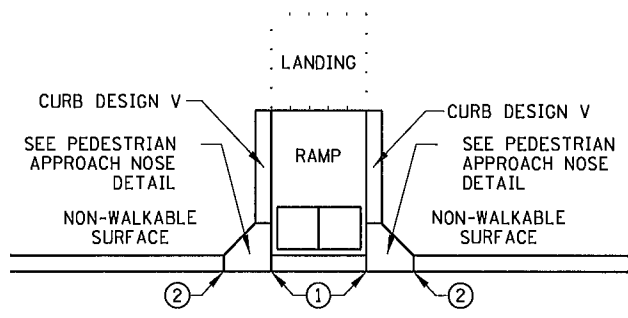
PAVED FLARES
ADJACENT TO WALKABLE SURFACE



PAVED FLARES
ADJACENT TO NON-WALKABLE SURFACE

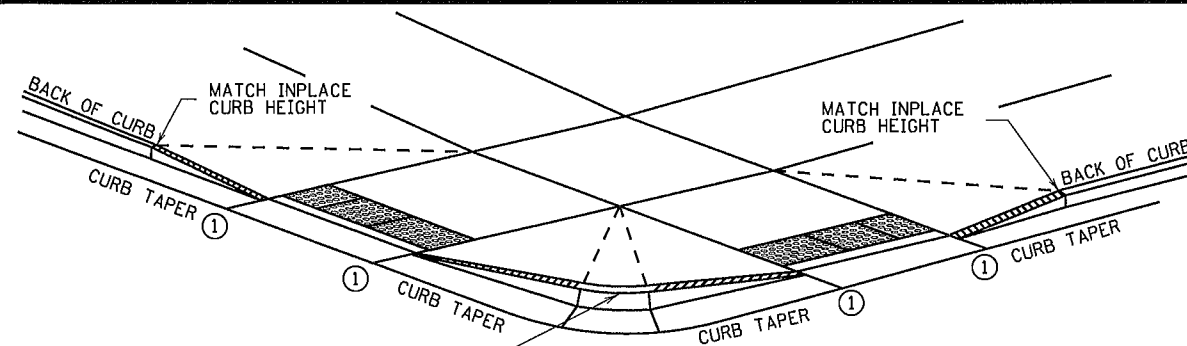


GRADED FLARES



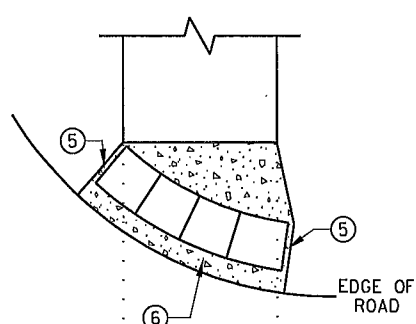
RETURNED CURB ④

TYPICAL SIDE TREATMENT OPTIONS ③ ⑩

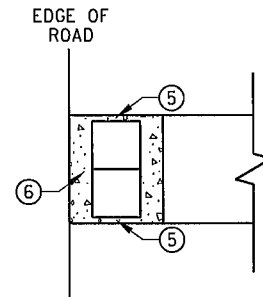


3" MINIMUM CURB HEIGHT, 4" PREFERRED
(MEASURED AT FRONT FACE OF CURB)
FOR A MIN. 6" LENGTH (MEASURED ALONG FLOW LINE)

DETECTABLE EDGE WITH ⑦
CURB AND GUTTER

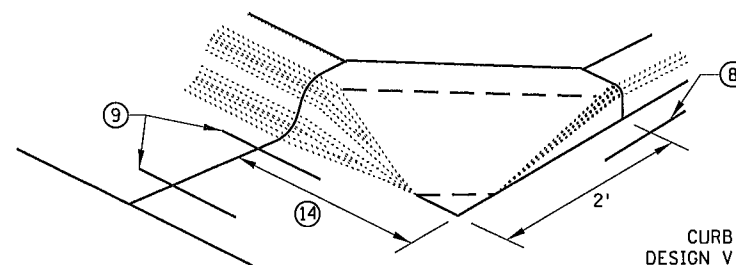


RADIAL DETECTABLE WARNING

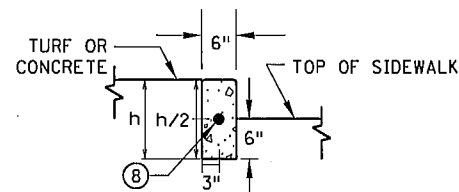


RECTANGULAR DETECTABLE WARNING

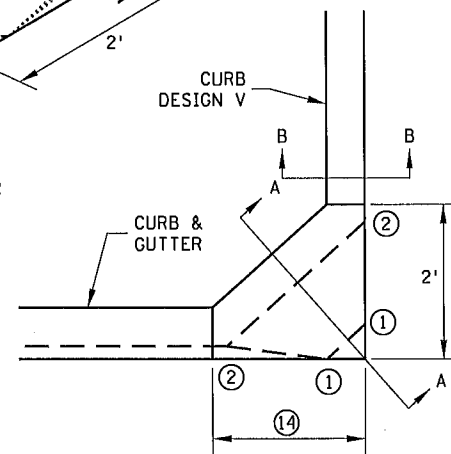
DETECTABLE EDGE WITHOUT CURB AND GUTTER



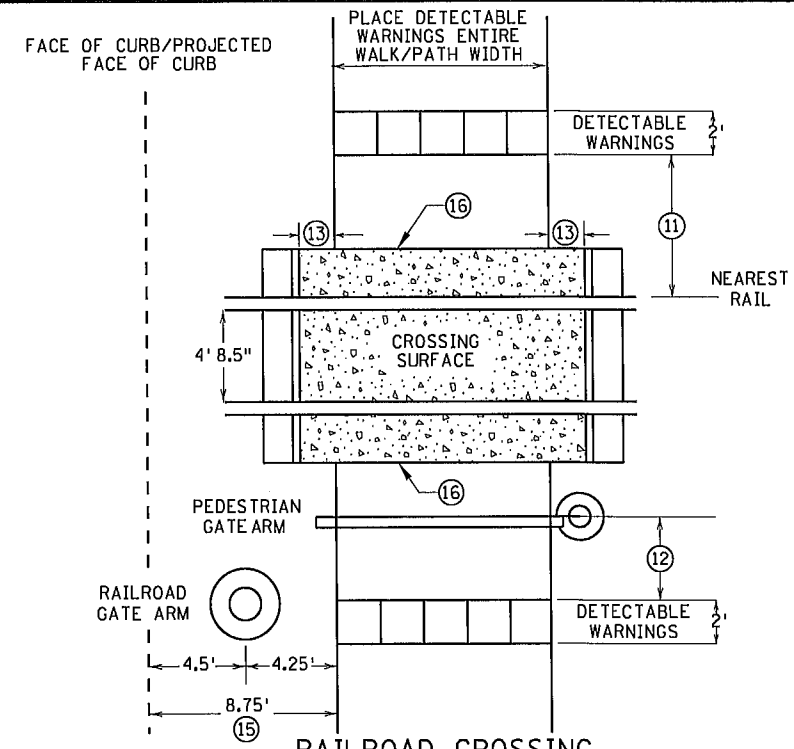
SECTION A-A



SECTION B-B



PEDESTRIAN APPROACH
NOSE DETAIL
(FOR RETURNED CURB
SIDE TREATMENT)



RAILROAD CROSSING
PLAN VIEW

NOTES:

INTERMEDIATE CURB HEIGHTS TAPER SHALL RISE AT 8-10% TO A MINIMUM 3 INCH CURB HEIGHT. INCREASE CURB TAPER LENGTH AT LESS THAN 8% OR REDUCE INTERMEDIATE CURB HEIGHT TO 2+ INCHES IF NECESSARY TO MATCH ADJACENT BOULEVARD OR SIDEWALK GRADES.

SEE STANDARD PLATE 7038 AND THIS SHEET FOR ADDITIONAL DETAILS ON DETECTABLE WARNING.

A WALKABLE SURFACE IS DEFINED AS A PAVED SURFACE ADJACENT TO A CURB RAMP WITHOUT RAISED OBSTACLES THAT COULD MISTAKENLY BE TRAVERSED BY A USER WHO IS VISUALLY IMPAIRED.

CONCRETE FLARE LENGTHS ADJACENT TO NON-WALKABLE SURFACES SHOULD BE LESS THAN 8' LONG MEASURED ALONG THE RAMPS FROM THE BACK OF CURB.

① 0" CURB HEIGHT. SEE INSET A ON SHEET 3 OF 6.

② FULL CURB HEIGHT.

③ SIDE TREATMENTS ARE APPLICABLE TO ALL RAMP TYPES AND SHOULD BE IMPLEMENTED AS NEEDED AS FIELD CONDITIONS DICTATE. THE ENGINEER SHALL DETERMINE THE RAMP SIDE TREATMENTS BASED ON MAINTENANCE OF BOTH ROADWAY AND SIDEWALK, ADJACENT PROPERTY CONSIDERATIONS, AND MITIGATING CONSTRUCTION IMPACTS.

④ TYPICALLY USED FOR MEDIANS AND ISLANDS.

⑤ WHEN NO CONCRETE FLARES ARE PROPOSED, THE CONCRETE WALK SHALL BE FORMED AND CONSTRUCTED PERPENDICULAR TO THE EDGE OF ROADWAY. MAINTAIN 3" MAX. BETWEEN EDGE OF DOMES AND EDGE OF CONCRETE.

⑥ IF NO CURB AND GUTTER IS PLACED IN RURAL SECTIONS, DETECTABLE WARNINGS SHALL BE PLACED 1' FROM THE EDGE OF BITUMINOUS ROADWAY AND/OR BITUMINOUS SHARED-USE PATH TO PROVIDE VISUAL CONTRAST.

⑦ ALL CONSTRUCTED CURBS MUST HAVE A CONTINUOUS DETECTABLE EDGE FOR THE VISUALLY IMPAIRED. THIS DETECTABLE EDGE REQUIRES DETECTABLE WARNINGS WHEREVER THERE IS ZERO-INCH HIGH CURB. CURB TAPERS ARE CONSIDERED A DETECTABLE EDGE WHEN THE TAPER STARTS WITHIN 3" OF THE EDGE OF THE DETECTABLE WARNINGS, AND UNIFORMLY RISES TO A 3-INCH MINIMUM CURB HEIGHT. ANY CURB NOT PART OF A CURB TAPER AND LESS THAN 3 INCHES IN HEIGHT IS NOT CONSIDERED A DETECTABLE EDGE AND THEREFORE IS NOT COMPLIANT WITH ACCESSIBILITY STANDARDS.

⑧ DRILL AND GROUT 1 - NO. 4 12" LONG REINFORCEMENT BAR (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE V CURB.

⑨ DRILL AND GROUT 2 - NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) WITH 3" MIN. COVER. REINFORCEMENT BARS ARE NOT NEEDED IF THE APPROACH NOSE IS POURED INTEGRAL WITH THE CURB AND GUTTER.

⑩ SIDE TREATMENT EXAMPLES SHOWN ARE WHEN THE INITIAL LANDING IS APPROXIMATELY LEVEL WITH THE FULL HEIGHT CURB (I.E. 6" LONG RAMP FOR 6" HIGH CURB). WHEN THE INITIAL LANDING IS MORE THAN 1" BELOW FULL HEIGHT CURB REFER TO SHEETS 1 & 2 TO MODIFY THE CURB HEIGHT TAPERS AND MAINTAIN POSITIVE BOULEVARD DRAINAGE. CONSTRUCT THESE TAPERS AT 0"-3" AT 8-10%, THEN LESS THAN 5% FROM 3" CURB TO FULL CURB HEIGHT.

⑪ NEAREST EDGE OF DETECTABLE WARNING SURFACES SHALL BE PLACED 12' MINIMUM TO 15' MAXIMUM FROM THE NEAREST RAIL. FOR SKEWED RAILWAYS IN NO INSTANCE SHALL THE DETECTABLE WARNING BE CLOSER THAN 12' MEASURED PERPENDICULAR TO THE NEAREST RAIL.

⑫ WHEN PEDESTRIAN GATES ARE PROVIDED, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE SIDE OF THE GATES OPPOSITE THE RAIL, 2' FROM THE APPROACHING SIDE OF THE GATE ARM. THIS CRITERIA GOVERNS OVER NOTE ⑪.

⑬ CROSSING SURFACE SHALL EXTEND 2' MINIMUM PAST THE OUTSIDE EDGE OF WALK OR SHARED-USE PATH.

⑭ 3' FOR MEDIANS AND SPLITTER ISLANDS. NOSE CAN BE REDUCED TO 2' ON FREE RIGHT ISLANDS.

⑮ SIDEWALK TO BE PLACED 8.75' MIN. FROM THE FACE OF CURB/PROJECTED FACE OF CURB. THIS ENSURES MIN. CLEARANCE BETWEEN THE SIDEWALK AND GATE ARM COUNTERWEIGHT SUPPORTS.

⑯ CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE.

REVISION:

APPROVED: 11-04-2021

Jeffrey Perkins
OPERATIONS DIVISION



DEPARTMENT
OF
TRANSPORTATION

STANDARD PLAN 5-297.250

4 OF 6

APPROVED: 11-04-2021

REVISED:

Thomas Styrbicki
STATE DESIGN ENGINEER

STATE PROJ. NO. SAP 002-620-009 CP. NO CP 21-39 SHEET NO. 29 OF 41 SHEETS

PEDESTRIAN CURB RAMP DETAILS

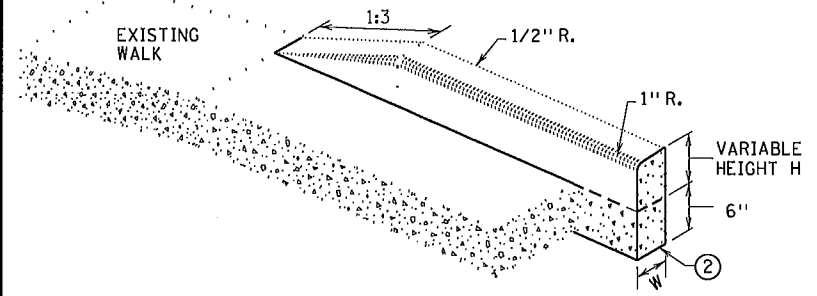
PLOTTED/REVISED: 02/08/2023

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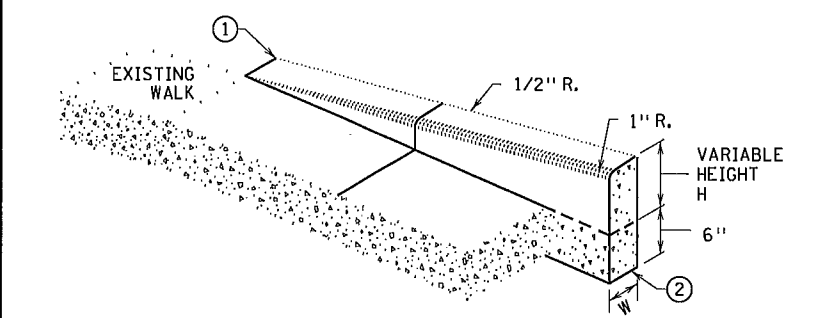
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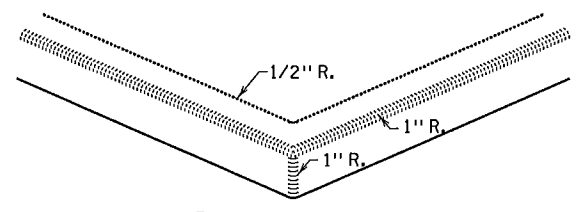
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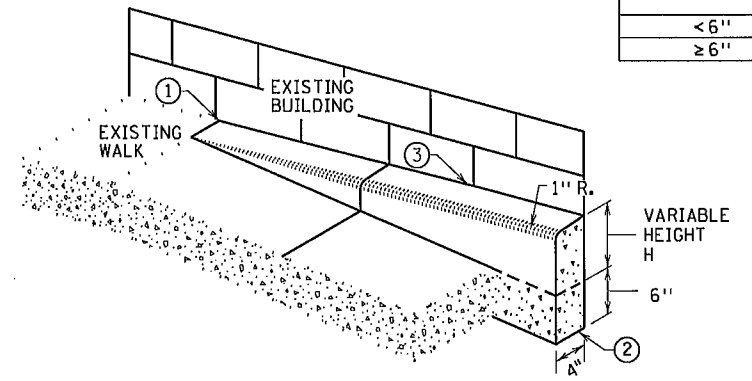
V CURB ADJACENT TO LANDSCAPE
CURB WITHIN SIDEWALK LIMITS



V CURB ADJACENT TO LANDSCAPE
CURB OUTSIDE SIDEWALK LIMITS

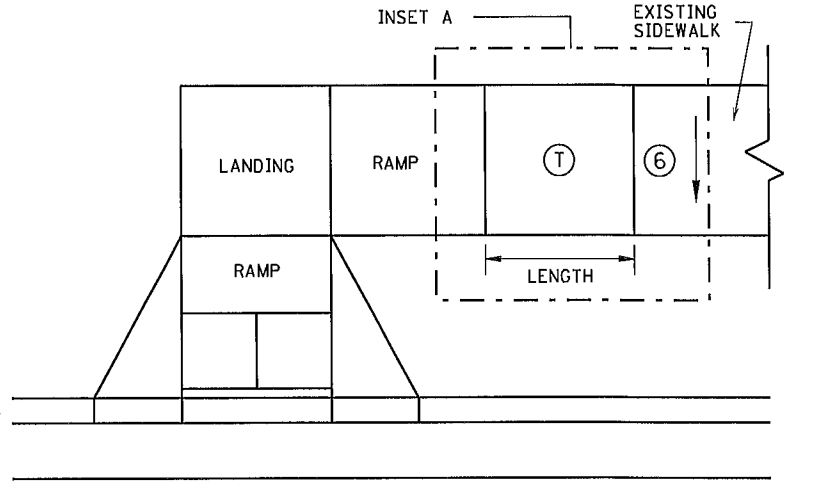


V CURB INTERSECTION

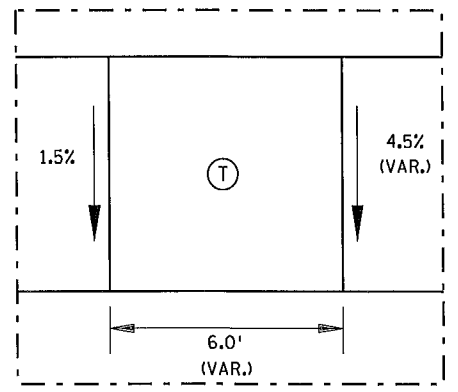


V CURB ADJACENT TO BUILDING
OR BARRIER

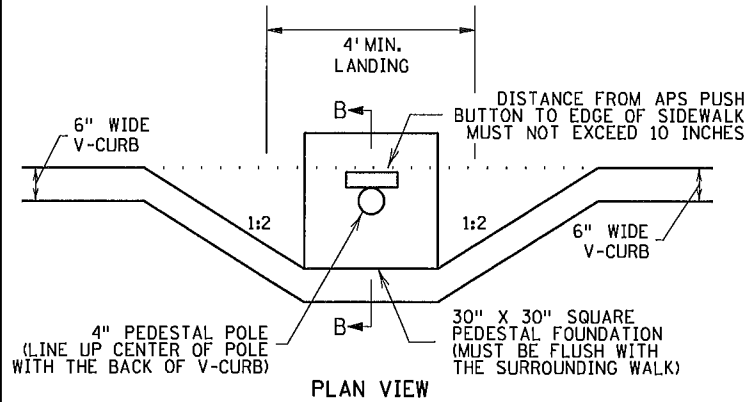
CONCRETE CURB DESIGN V	
CURB HEIGHT H	CURB WIDTH W
< 6"	4"
≥ 6"	6"



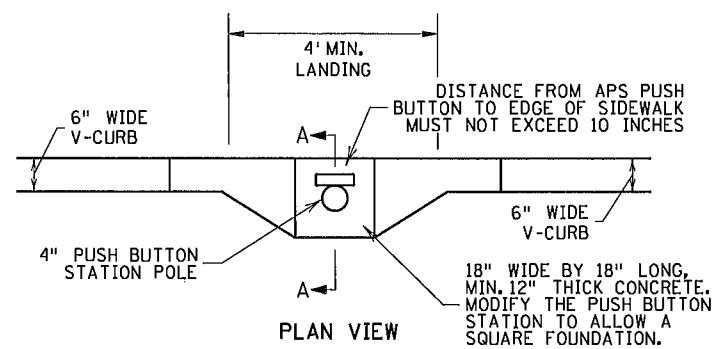
TRANSITION PANEL ④ ⑤



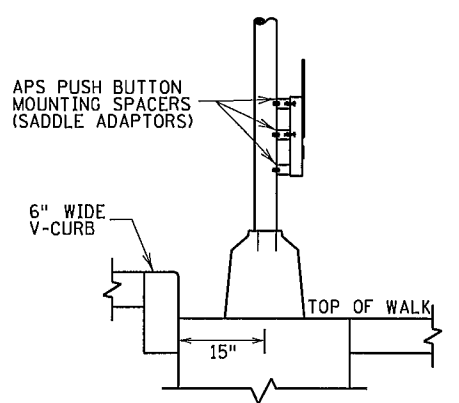
INSET A



PLAN VIEW

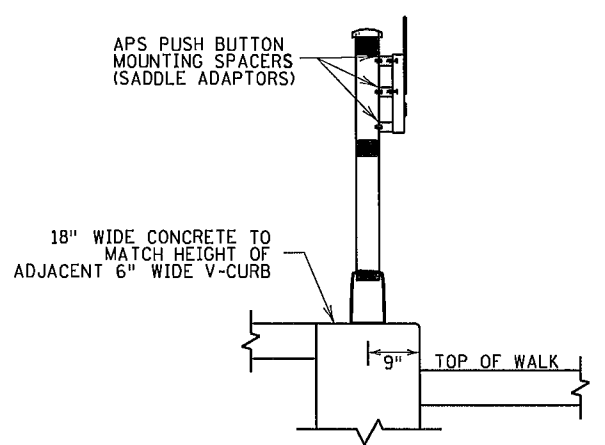


PLAN VIEW



SECTION B-B

SIGNAL PEDESTAL & PUSH BUTTON (V-CURB)



SECTION A-A

PUSH BUTTON STATION (V-CURB)

NOTES:

- A WALKABLE FLARE IS AN 8-10% CONCRETE FLARE THAT IS REQUIRED WHEN THE FLARE IS ADJACENT TO A WALKABLE SURFACE, OR WHEN THE PEDESTRIAN PATH OF TRAVEL OF A PUSH BUTTON TRAVERSES THE FLARE.
- ALL V CURB CONTRACTION JOINTS SHALL MATCH CONCRETE WALK JOINTS.
- WHERE RIGHT-OF-WAY ALLOWS, USE OF V CURB SHOULD BE MINIMIZED. GRADING ADJACENT TURF OR SLOPING ADJACENT PAVEMENT IS PREFERRED.
- V CURB SHALL BE PLACED OUTSIDE THE SIDEWALK LIMITS WHEN RIGHT OF WAY ALLOWS.
- V CURB NEXT TO BUILDING SHALL BE A 4" WIDTH AND SHALL MATCH PREVIOUS TOP OF SIDEWALK ELEVATIONS.
- ① END TAPERS AT TRANSITION SECTION SHALL MATCH INPLACE SIDEWALK GRADES.
- ② ALL V CURB SHALL MATCH BOTTOM OF ADJACENT WALK.
- ③ CONSTRUCT USING APPROVED EXPANSION MATERIAL PER MNDOT TYPE A-E EXPANSION. LEAVE A MINIMUM 1/2" TOP GAP AND SEAL WITH MNDOT APPROVED SILICONE PER MNDOT SPEC 3722.
- ④ THE MAX. RATE OF CROSS SLOPE TRANSITIONING IS 1' LINEAR FOOT OF SIDEWALK PER HALF PERCENT CROSS SLOPE. WHEN PAR WIDTH IS GREATER THAN 6' OR THE RUNNING SLOPE IS GREATER THAN 5%, DOUBLE THE CALCULATED TRANSITION LENGTH.
- ⑤ TRANSITION PANELS ARE TO ONLY BE USED AFTER THE RAMP, OR IF NEEDED, LANDING ARE AT THE FULL CURB HEIGHT (TYPICAL SECTION).
- ⑥ EXISTING CROSS SLOPE GREATER THAN 2.0%.

LEGEND

- THESE LONGITUDINAL SLOPE RANGES SHALL BE THE STARTING POINT, IF SITE CONDITIONS WARRANT, LONGITUDINAL SLOPES UP TO 8.3% OR FLATTER ARE ALLOWED.
- ⑤ INDICATES PEDESTRIAN RAMP - SLOPE SHALL BE BETWEEN 5.0% MINIMUM AND 8.3% MAXIMUM IN THE DIRECTION SHOWN AND THE CROSS SLOPE SHALL NOT EXCEED 2.0%.
- ⑦ LANDING AREA - 4' X 4' MIN. (5' X 5' MIN. PREFERRED) DIMENSIONS AND MAX 2.0% SLOPE IN ALL DIRECTIONS. LANDING SHALL BE FULL WIDTH OF INCOMING PAR.
- ① TRANSITION PANEL(S) - TO BE USED FOR TRANSITIONING THE CROSS-SLOPE OF A RAMP TO THE EXISTING WALK CROSS-SLOPE. RATE OF TRANSITION SHOULD BE 0.5% PER 1 LINEAR FOOT OF WALK. SEE THIS SHEET FOR ADDITIONAL INFORMATION.

REVISION:
APPROVED: 11-04-2021
Jeffrey Perkins
OPERATIONS DIVISION

MINNESOTA
DEPARTMENT
OF
TRANSPORTATION

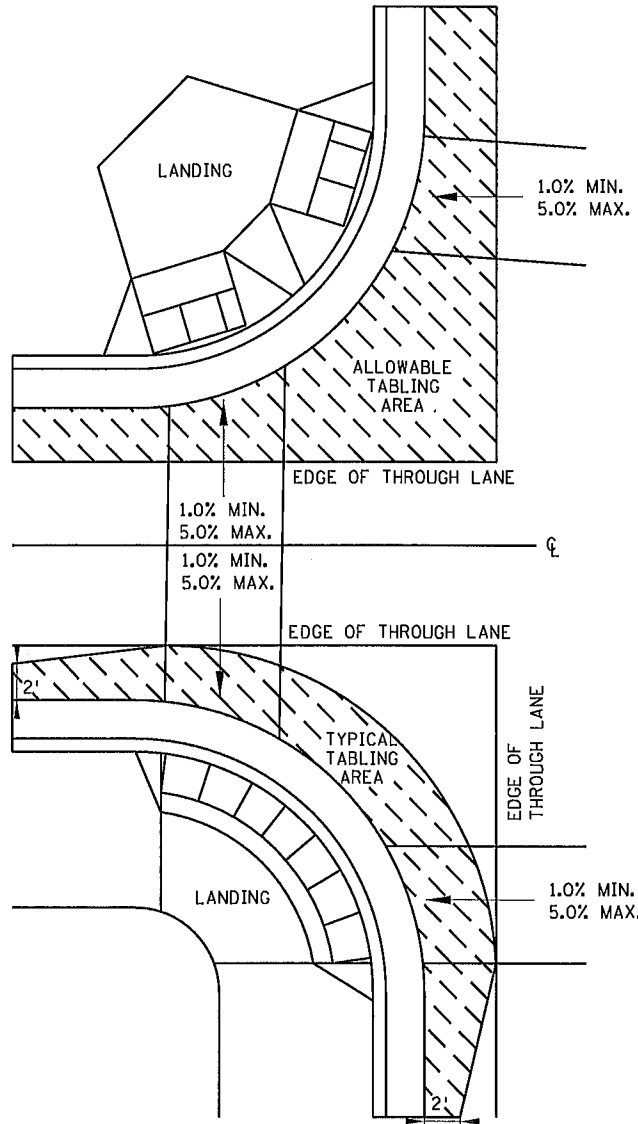
STANDARD PLAN 5-297.250
5 OF 6
APPROVED: 11-04-2021
REVISED:
THOMAS STYRBICKI
STATE DESIGN ENGINEER

PEDESTRIAN CURB RAMP DETAILS

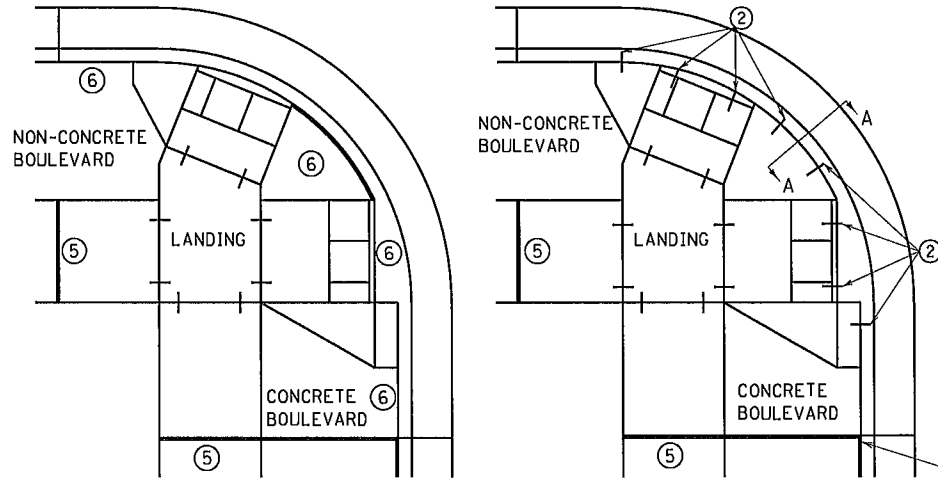
STATE PROJ. NO. SAP 002-620-009 CP. NO. CP 21-39 SHEET NO. 30 OF 41 SHEETS

PLOTTED/REVISED: 02/08/2023

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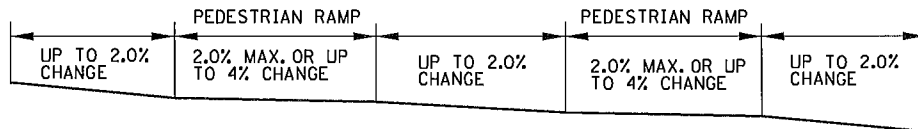


CURB LINE AND ROAD CROSSING ADJUSTMENTS

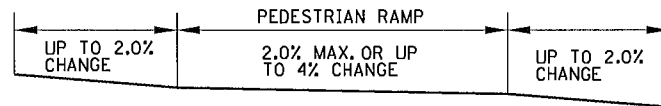


EXPANSION MATERIAL PLACEMENT FOR CONCRETE ROADWAYS

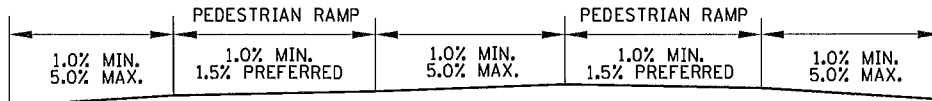
CURB LINE REINFORCEMENT ④ PLACEMENT ON BITUMINOUS ROADWAYS



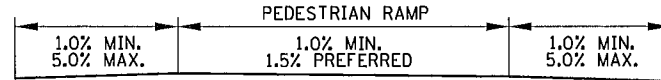
FLOW LINE PROFILE "TABLE" - TWIN PERPENDICULARS



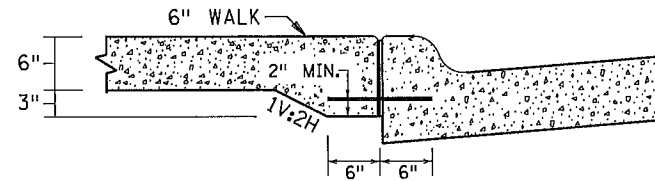
FLOW LINE PROFILE "TABLE" - FAN



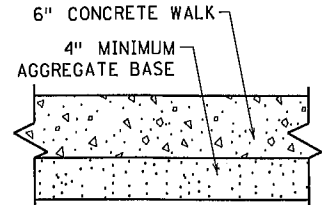
FLOW LINE PROFILE RAISE - TWIN PERPENDICULARS



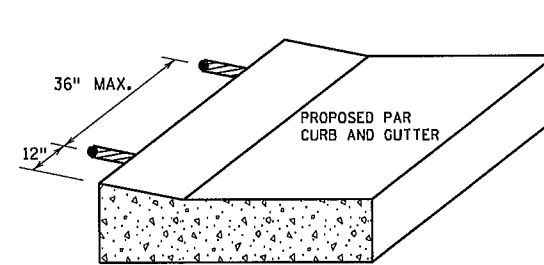
FLOW LINE PROFILE RAISE - FAN



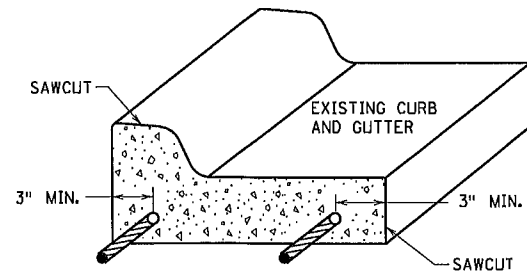
SECTION VIEW A-A THICKENED SECTION THROUGH CURB RAMP FLARES



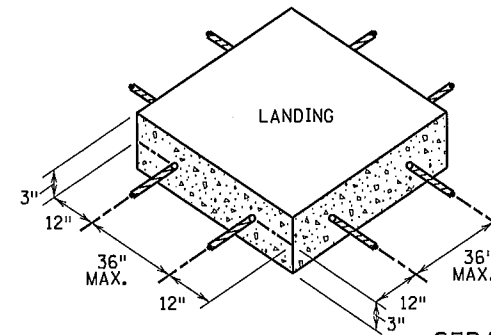
TYPICAL SIDEWALK SECTION WITHIN INTERSECTION CORNER



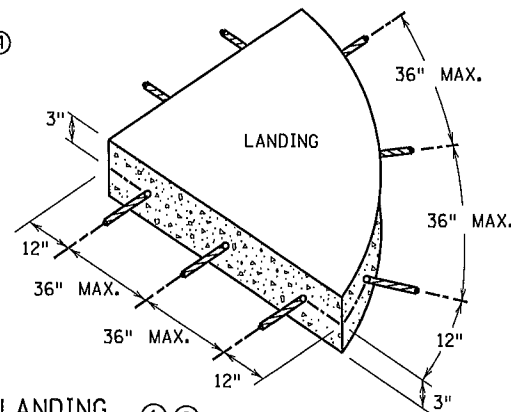
CURB RAMP REINFORCEMENT DETAILS ② ④



CURB AND GUTTER REINFORCEMENT ③



SEPARATE LANDING POUR REINFORCEMENT ① ②



GENERAL NOTES:

"TABLING" OF CROSSWALKS MEANS MAINTAINING LESS THAN 2% CROSS SLOPE WITHIN A CROSSWALK, IS REQUIRED WHEN A ROADWAY IS IN A STOP OR YIELD CONDITION AND THE PROJECT SCOPE ALLOWS.

RECONSTRUCTION PROJECTS: ON FULL PAVEMENT REPLACEMENT PROJECTS "TABLING" OF ENTIRE CROSSWALK SHALL OCCUR WHEN FEASIBLE.

MILL & OVERLAY PROJECTS: "TABLING" OF FLOW LINES, IN FRONT OF THE PEDESTRIAN RAMP, IS REQUIRED WHEN THE EXISTING FLOW LINE IS GREATER THAN 2%. WARPING OF THE BITUMINOUS PAVEMENT CAN NOT EXTEND INTO THE THROUGH LANE. TABLE THE FLOW LINE TO 2% OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA:

- 1) 1.0% MIN. CROSS-SLOPE OF THE ROAD
- 2) 5.0% MAX. CROSS-SLOPE OF THE ROAD
- 3) "TABLE" FLOW LINE UP TO 4% CHANGE FROM EXISTING SLOPE IN FRONT OF PEDESTRIAN RAMP
- 4) UP TO 2% CHANGE IN FLOW LINE FROM EXISTING SLOPE BEYOND THE PEDESTRIAN CURB RAMP

STAND-ALONE ADA RETROFITS: FOLLOW MILL & OVERLAY CRITERIA ABOVE HOWEVER ALL PAVEMENT WARPING IS DONE WITH BITUMINOUS PATCHING ON BITUMINOUS ROADWAYS AND FULL-DEPTH APRON REPLACEMENT ON CONCRETE ROADWAYS.

RAISING OF CURB LINES SHOULD OCCUR IN VERTICALLY CONSTRAINED AREAS. RAISE THE CURB LINES ENOUGH TO ALLOW COMPLIANT RAMPS OR AS MUCH AS POSSIBLE WHILE ADHERING TO THE FOLLOWING CRITERIA:

- 1) 1.0% MIN. AND 5.0% MAXIMUM CROSS-SLOPE OF THE ROAD
- 2) 1.0% MIN. FLOW LINE (ON EITHER SIDE OF PEDESTRIAN RAMP) TO MAINTAIN POSITIVE DRAINAGE
- 3) 5.0% RECOMMENDED MAX. FLOW LINE
- 4) LONGITUDINAL THROUGH LANE ROADWAY TAPERS SHOULD BE 1" VERTICAL PER 15' HORIZONTAL

NOTES:

- ① TO ENSURE RAMPS AND LANDINGS ARE PROPERLY CONSTRUCTED, ALL INITIAL LANDINGS AT A TOP OF A RAMPED SURFACE (RUNNING SLOPE GREATER THAN 2%) SHALL BE FORMED AND PLACED SEPARATELY IN AN INDEPENDENT CONCRETE POUR. FOLLOW SIDEWALK REINFORCEMENT DETAILS ON THIS SHEET FOR ALL SEPARATELY POURED INITIAL LANDINGS.
- ② DRILL AND GROUT NO. 4 12" LONG REINFORCEMENT BARS (EPOXY COATED) AT 36" MAXIMUM CENTER TO CENTER MINIMUM 12" SPACING FROM CONSTRUCTION JOINTS. BARS TO BE ADJUSTED TO MATCH RAMP GRADE. BARS TO BE PAID BY EACH.
- ③ DRILL AND GROUT 2 - NO. 4 X 12" LONG (6" EMBEDDED) REINFORCEMENT BARS (EPOXY COATED). REINFORCEMENT REQUIRED FOR ALL CONSTRUCTION JOINTS. BARS TO BE PAID BY EACH.
- ④ THIS CURB LINE REINFORCEMENT DETAIL SHALL BE USED ON BITUMINOUS ROADWAYS. FOR CONCRETE ROADWAYS, SEE NOTE 6.
- ⑤ CONSTRUCT WITH EXPANSION MATERIAL PER MNDOT SPECIFICATION 3702 TYPES A-E. EXPANSION MATERIAL SHALL MATCH FULL HEIGHT OF ADJACENT CONCRETE.
- ⑥ USE AN APPROVED TYPE F (1/4 INCH THICK) SEPARATION MATERIAL. SEPARATION MATERIAL SHALL MATCH FULL HEIGHT DIMENSION OF ADJACENT CONCRETE.

REVISION:

APPROVED: 11-04-2021

Jeffrey Perkins
OPERATIONS DIVISION

MINNESOTA
DEPARTMENT
OF
TRANSPORTATION

STANDARD PLAN 5-297.250

6 OF 6

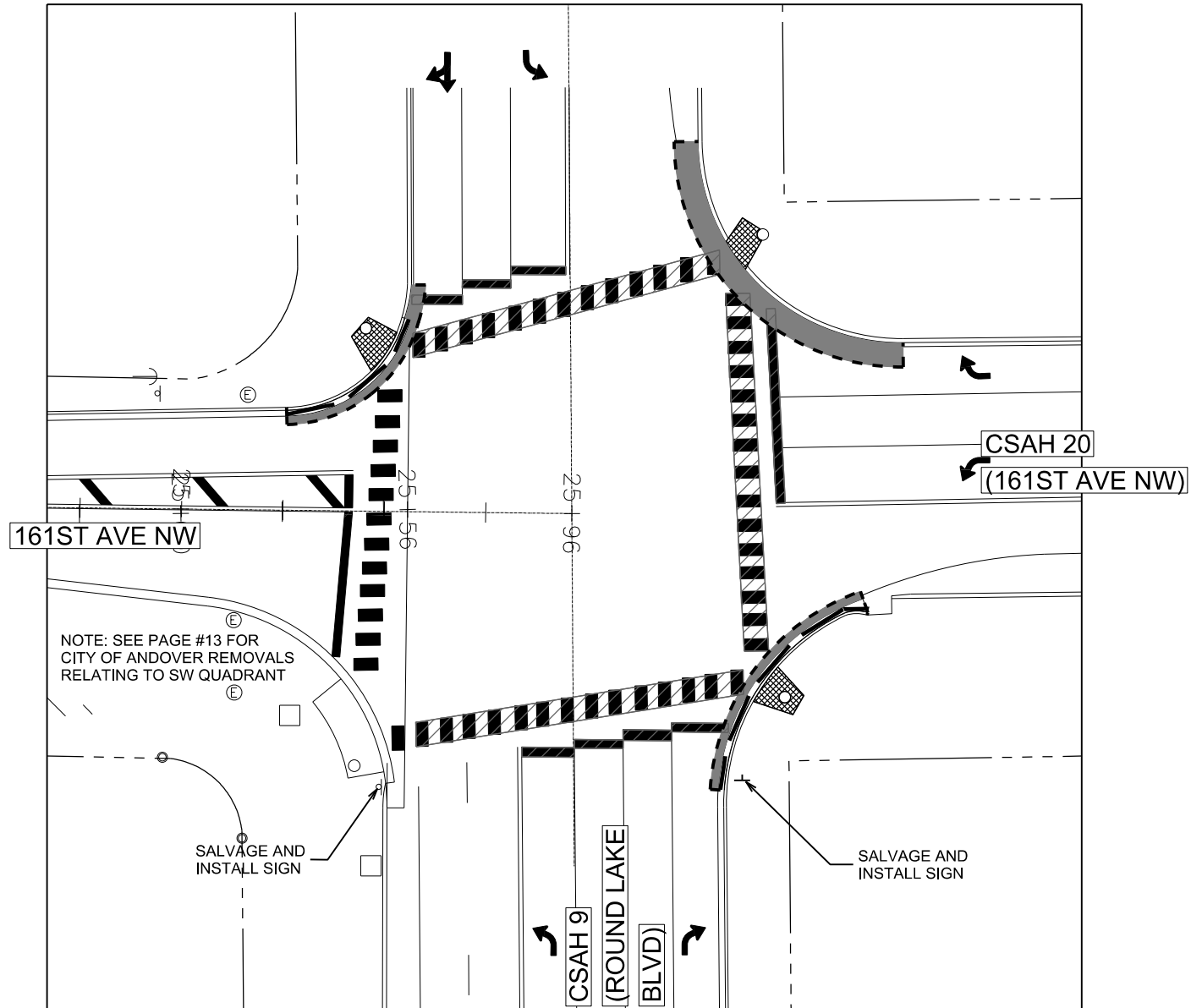
THOMAS STYRICKI
STATE DESIGN ENGINEER

APPROVED: 11-04-2021
REVISED:

PEDESTRIAN CURB RAMP DETAILS

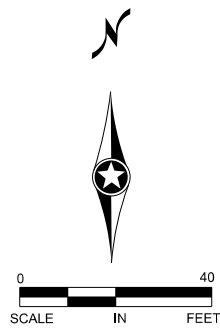
STATE PROJ. NO. SAP 002-620-009 CP. NO. CP 21-39 SHEET NO. 31 OF 41 SHEETS
SAP 198-106-005

INTERSECTION REMOVALS

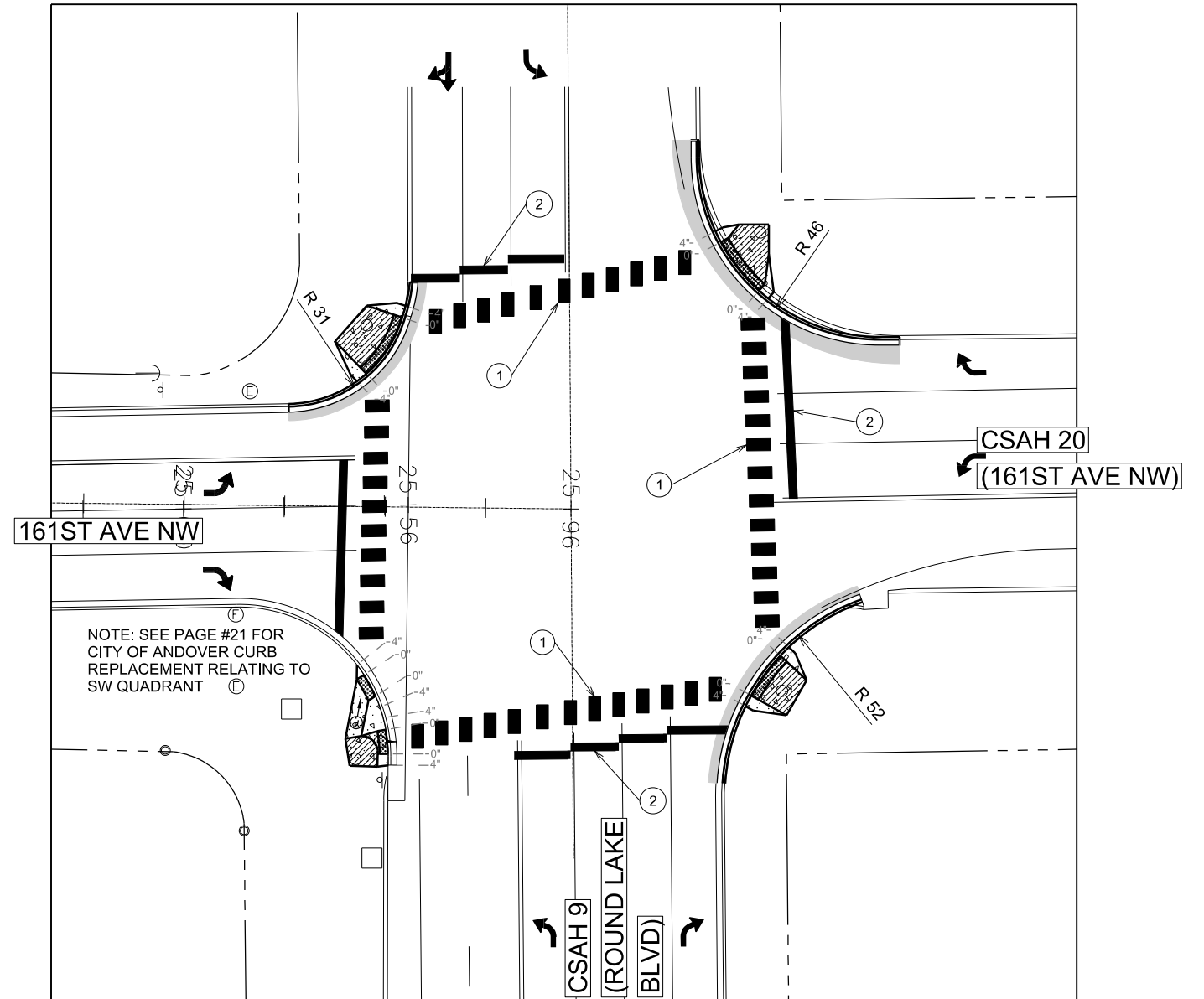


INTERSECTION REMOVALS LEGEND

- | | |
|---|----------------------------|
|  | SAWCUT |
|  | REMOVE C&G |
|  | REMOVE BITUMINOUS PAVEMENT |
|  | REMOVE CONCRETE WALK |
|  | REMOVE PAVEMENT STRIPE |



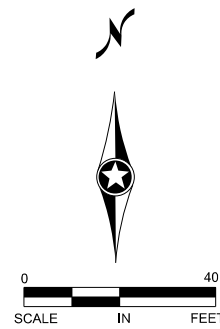
INTERSECTION DETAILS



- ① INSTALL CROSSWALK PREFORM THERMOPLASTIC (3'X6' CROSSWALK). LOCATION TO BE FIELD VERIFIED
- ② INSTALL 24" SOLID LINE PREFORM TAPE. LOCATION TO BE FIELD VERIFIED

INTERSECTION DETAILS LEGEND

- | | |
|---|--|
|  | B418 C&G |
|  | REPLACE BITUMINOUS
MATCH EXISTING DEPTH |
|  | 6" CONCRETE WALK/PAVEMENT |
|  | LAND AREA - 4'X4' MIN. DIMS
MAX 2.0% SLOPE IN ALL DIRECTIONS |
|  | TRUNCATED DOMES. SEE
STANDARD PLATE 7038 |
| X" | CURB HEIGHT |
|  | INDICATES PEDESTRIAN RAMP - SLOPE
SHALL BE BETWEEN 5.0% MINIMUM AND
8.3% MAXIMUM IN THE DIRECTION SHOWN
AND THE CROSS SLOPE SHALL NOT
EXCEED 2.0%. |
|  | INDICATES PEDESTRIAN RAMP - SLOPE
SHALL BE GREATER THAN 2.0% AND
LESS THAN 5.0% IN THE DIRECTION SHOWN
AND CROSS SLOPE SHALL NOT EXCEED 2.0%. |



NO	DATE	BY	CKD	APPR	REVISION	
NAME: P:\002-620-009 161st Signal Mod\Plan\002-620-009_IN.dgn					02/08/2023	1:18:28 PM

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: Aaron P. Anderson

SIGNATURE:

DATE: _____ LICENSE NO. 58657

DRAWN BY APA DATE 02/01/23

DESIGN BY APA DATE 02/01/23

CHECKED BY CO DATE 02/01/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
CP 21-39

INTERSECTION DETAILS

Sheet 32 of 41 Sheets

PAVEMENT MARKINGS AND REMOVALS					A
LOCATION	PAVEMENT MARKING REMOVAL	PAVEMENT MARKING REMOVAL	24" SOLID LINE PREFORM TAPE	CROSSWALK PREFORM THERMOPLASTIC	NOTES
	LIN FT	SQ FT	LIN FT	SQ FT	
NORTH LEG	50	270	50	270	
EAST LEG	38	270	38	270	
SOUTH LEG	50	270	50	270	
WEST LEG			35	216	
TOTALS	138	810	173	1026	

BASIS OF QUANTITIES		
SPEC NO	DESCRIPTION	RATE
2211	AGGREGATE BASE CLASS 5	1.8 TONS / CU YD
2357	BITUMINOUS MATERIAL FOR TACK COAT	0.05 GAL / SQ YD / LIFT
2360	TYPE SP12.5 WEARING COURSE MIXTURE	115 LBS / SQ YD / IN
2575	SEED MIXTURE 25-121	61 LBS / ACRE
2574	FERTILIZER TYPE 3	400 LBS / ACRE

REMOVALS, SAWING AND MILLING								B
Location	REMOVE (SPEC. 2104)			SALVAGE (SPEC. 2104)	SAWING (SPEC. 2104)		EXCAVATION (SPEC. 2106)	NOTES
	BIT. PAVEMENT	CONC. CURB & GUTTER	CONCRETE WALK	SIGN	BIT. PAVEMENT	CONC. PAVEMENT	COMMON	
	(SQ YD)	(LIN FT)	(SQ FT)	(EA)	(LIN FT)	(LIN FT)	(CU YD)	
NW Quad	13	61	71		47	5	10	
NE Quad	56		61		92		10	
SE Quad	14	40	72	1	72	5	10	
SW Quad				1				
Total	83	101	204	2	211	10	30	

TURF ESTABLISHMENT AND EROSION CONTROL		D
LOCATION	ROLLED EROSION PREVENTION CATEGORY 15	COMMON TOPSOIL BORROW
	SQ YD	CU YD
NW Quad	20	8
NE Quad	20	8
SE Quad	20	8
SW Quad	40	8
TOTAL	100	32
Note:		
TYPE 3 FERTILIZER AND TYPE 25-121 SEED ARE INCIDENTAL TO ROLLED EROSION PREVENTION CATEGORY 15. SEE "BASIS OF PLANNED QUANTITIES" FOR APPLICATION RATES.		

BITUMINOUS, CONCRETE, AGGREGATE AND SIGN CONSTRUCTION								C
LOCATION	CONCRETE CURB AND GUTTER DESIGN B418	6" CONCRETE WALK	DRILL AND GROUT REINF BAR (EPOXY COATED)	TRUNCATED DOMES	BITUMINOUS MATERIAL FOR TACK COAT	TYPE SP 12.5 BITUMINOUS MIXTURE FOR PATCHING	AGGREGATE BASE CLASS 5	INSTALL SIGN
	LIN FT	SQ FT	EA	SQ FT	GALLON	TON	TON	EACH
NW Quad	48	192	6	32	5	4	6	
NE Quad	71	156	6	30	5	11	5	
SE Quad	61	141	6	24	5	5	5	1
SW Quad		178	6	24	5		6	1
PROJECT	180	667	24	110	20	20	22	2

NO	DATE	BY	CKD	APPR	REVISION			
NAME: P:\002-620-009 161st Signal Mod\Plan\002-620-009_IN.dgn					02/08/2023		1:18:28 PM	

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

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DRAWN BY APA DATE 02/01/23

DESIGN BY APA DATE 02/01/23

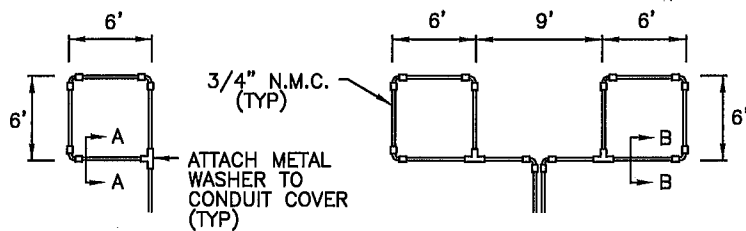
CHECKED BY CO DATE 02/01/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
CP 21-39

161ST/CSAH 9
TABULATIONS

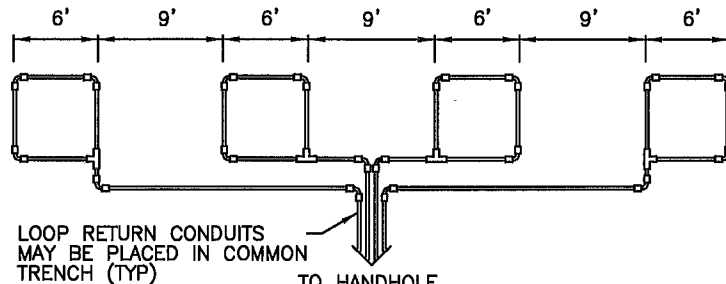


LOOP DETECTOR
DETAIL 'A'
(LOOP PHASING FOR
SINGLE CONNECTION)

LOOP CONNECTIONS SHALL BE
LABELED AND SPLICED IN THE
HANDHOLE AS FOLLOWS:

L1 TO 1A
1B TO 2A
2B TO L2

LOOP DETECTOR
DETAIL 'B'
(LOOP PHASING FOR
SERIES CONNECTION)

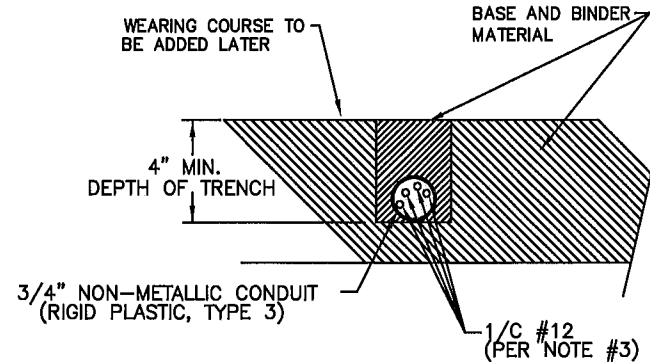


LOOP CONNECTIONS SHALL BE LABELED AND SPLICED
IN THE HANDHOLE AS FOLLOWS:

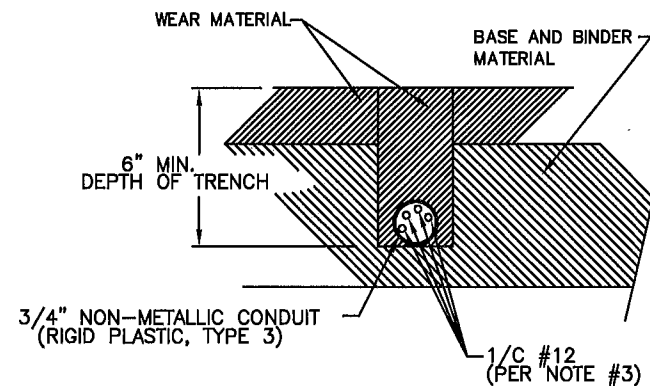
L1 TO 1A
1B TO 2A
2B TO 3A
3B TO 4A
4B TO L2

SPLICE CONTROL CABLE TO L1 & L2 IN HANDHOLE.
ALL CONDUCTORS SHALL BE TAGGED IN HANDHOLE
(1A, 1B, ECT)

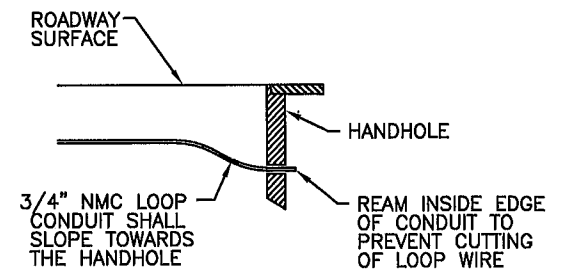
LOOP DETECTOR
DETAIL 'C'
(LOOP PHASING FOR
SERIES CONNECTION)



SECTION A-A
DETAIL FOR LOOP INSTALLATION
IN NEW ROADWAY



SECTION B-B
DETAIL FOR LOOP INSTALLATION
IN EXISTING ROADWAY



DRAINAGE DETAIL

LOOP DETECTOR WIRING

- 1) ALL CORNERS SHALL BE 90° CONDUIT BENDS.
- 2) CONNECT WIRES IN HANDHOLES USING SPLICE KIT METHOD DESCRIBED IN THE SPECIAL PROVISIONS.
- 3) LOOP DETECTOR WIRES SHALL BE #12 AWG CROSSED LINKED POLYETHYLENE (XLP). SEE SPECIAL PROVISIONS.
- 4) LOOP LEAD IN WIRES SHALL BE TWISTED A MIN. OF (5) TURNS PER FOOT THROUGH THE CONDUIT TO THE HANDHOLE.
- 5) NMC DESIGNATES NON-METALLIC CONDUIT (SPEC. 3803)
- 6) LOOPS 6' x 6' THRU 6' x 14' SHALL HAVE (4) TURNS.
- 7) LOOPS 6' x 15' AND LARGER SHALL HAVE (2) TURNS.

LEGEND OF SYMBOLS

CONTROLLER AND SERVICE EQUIP. NO's	Ⓐ
SIGNAL BASE NO.	Ⓢ
SIGNAL FACE NO.	Ⓜ
LUMINAIRE NO.	Ⓛ
CONTROLLER AND CABINET	Ⓢ
CONTROLLER AND CABINET - IN PLACE	Ⓢ
HANDHOLE	Ⓢ
HANDHOLE - IN PLACE	Ⓢ
RIGID STEEL CONDUIT (RSC)	=====
RIGID STEEL CONDUIT (RSC) - IN PLACE	=====
SIGNAL FACE WITH BACKGROUND SHIELD	→
SIGNAL FACE W/O BACKGROUND SHIELD	→
SIGNAL FACE - IN PLACE	→
PEDESTRIAN INDICATORS	→
PEDESTRIAN INDICATORS - IN PLACE	→
PEDESTRIAN PUSH BUTTONS ON PEDESTAL OR POLE	Ⓢ
PEDESTRIAN PUSH BUTTON STATION	Ⓢ
TRAFFIC SIGNAL PEDESTAL	Ⓢ
TRAFFIC SIGNAL PEDESTAL - INPLACE	Ⓢ
TRAFFIC SIGNAL POLE AND MAST ARM	Ⓢ
TRAFFIC SIGNAL POLE AND MAST ARM - IN PLACE	Ⓢ
STREET LIGHT POLE AND LUMINAIRE	Ⓢ
STREET LIGHT POLE AND LUMINAIRE - IN PLACE	Ⓢ
MAST ARM AND LUMINAIRE	Ⓢ
MAST ARM AND LUMINAIRE - INPLACE	Ⓢ
WOOD POLE	Ⓢ
WOOD POLE - IN PLACE	Ⓢ
SOURCE OF POWER	Ⓢ
RAILROAD SIGNAL - IN PLACE	Ⓢ
RIGHT OF WAY LINE	---
CENTERLINE	---
EDGE OF ROADWAY	---
SHOULDERLINE	---
CURB LINE	---
STOP BAR	---
EMERGENCY VEHICLE PREEMPTION DETECTOR	---

ABBREVIATIONS

3-1(EG)	SIGNAL HEAD PHASE "3" - NO "1"	P2-1(EG)	PED INDICATION PHASE "2" - NO. "1"
BR. GR.	BARE GROUND	PB	PUSH BUTTON
CH. SW.	CHECK SWITCH	PB2-1(EG)	PUSH BUTTON PHASE "2" - NO. "1"
CLR	CLEAR	PEC	PHOTOELECTRIC CELL
D2-1(EG)	DETECTOR PHASE "2" - NO. "1"	PED	PEDESTRIAN
DWK	DON'T WALK	R	RED
EQG	EQUIPMENT GROUND	R&S	REMOVE AND SALVAGE
EVP	EMERGENCY VEHICLE PRE-EMPTION	RLTA	RED LEFT TURN ARROW
F&I	FURNISH AND INSTALL	RRTA	RED RIGHT TURN ARROW
FL	FLASH/FLASHING	RSC	RIGID STEEL CONDUIT
FYLTA	FLASHING YELLOW LEFT TURN ARROW	SOP	SOURCE OF POWER
G	GREEN	SPR	SPARE
GLTA	GREEN LEFT TURN ARROW	ST. LHT	STREET LIGHT
GRN	GREEN	STA	STATION
GR. R	GROUND ROD	SW	SWITCH
GRTA	GREEN RIGHT TURN ARROW	SWD	SWITCHED
GTHA	GREEN THRU ARROW	S&I	SALVAGE AND INSTALL
HH	HANDHOLE	TOW	TELEPHONE DROP WIRE
HPS	HIGH PRESSURE SODIUM	WLK	WALK
JB	JUNCTION BOX	YEL	YELLOW
LED	LIGHT EMITTING DIODE	YLTA	YELLOW LEFT TURN ARROW
LUM	LUMINAIRE	YRTA	YELLOW RIGHT TURN ARROW
NEU	NEUTRAL	YTHA	YELLOW THRU ARROW
NMC	NONMETALLIC CONDUIT		

WIRE COLOR CODE KEY

R	RED
O	ORANGE
BL	BLUE
WH	WHITE
BLK	BLACK
BRN	BROWN
CL	CLEAR
G	GREEN
R/BLK	RED WITH BLACK STRIPE
O/BLK	ORANGE WITH BLACK STRIPE
BL/BLK	BLUE WITH BLACK STRIPE
WH/BLK	WHITE WITH BLACK STRIPE
WH/R	WHITE WITH RED STRIPE
BLK/WH	BLACK WITH WHITE STRIPE
BLK/R	BLACK WITH RED STRIPE

TABULATION OF SIGNAL QUANTITIES

ITEM NO	ITEM	UNIT	TOTAL ESTIMATED QUANTITY
2565	REVISE SIGNAL SYSTEM	SYSTEM	1

TRAFFIC SIGNAL STANDARD PLATES

THESE TRAFFIC SIGNAL STANDARD PLATES AS APPROVED BY FHWA SHALL APPLY:

PLATE NO.	DESCRIPTION
8000 J	CHANNELIZERS, TYPE A, B, C (3 SHEETS)
8110 E	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
8123 G	POLE & MAST ARM-LUMINAIRES & TRAFFIC LIGHTS ASSEMBLY (2 SHEETS)

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT
SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER
THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: SEAN R. THIEL

DATE: 2/9/23

SIGNATURE: Sean R. Thiel

LICENSE NO. 45129

DRAWN BY ST DATE 2/3/23

DESIGN BY ST DATE 1/12/23

CHECKED BY BL DATE 2/6/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
City Project 21-39

REVISE SIGNAL SYSTEM
DETAILS AND STANDARD PLATES
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)

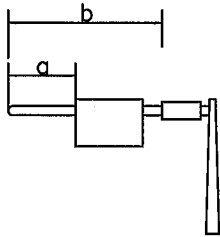
SHEET 34 OF 41 SHEETS

NO DATE BY CKD APPR REVISION

NAME: P:\002-620-009 161st Signal Mod\Base\Signal\Signal_DETAILS_002-620-009.dwg

SIGNS FOR TRAFFIC SIGNAL SYSTEM							
SIGN PANELS TYPE C (SIGNALS) (FURNISH & INSTALL)							
SIGN PANEL	POLE NO.	a (FT)	b (FT)	SIZE (IN)	UNIT AREA (SQ FT)	NO. REQ.	PANEL LEGEND
R10-X12	1,2,3,4	1'	-	36 x 42	10.50	4	LEFT TURN YIELD ON FLASHING YELLOW ARROW
TOTAL QUANTITIES					42.00	4	

SIGNS FOR TRAFFIC SIGNAL SYSTEM							
SIGN PANELS TYPE D (SIGNALS) (FURNISH & INSTALL)							
SIGN PANEL	POLE NO.	a (FT)	b (FT)	SIZE (IN)	UNIT AREA (SQ FT)	NO. REQ.	PANEL LEGEND
D-1	1	-	28'	96 x 24	16.00	1	161st Ave NW
D-2	2	-	21'	120 x 24	20.00	1	Round Lake Blvd
D-3	3	-	33'	96 x 24	16.00	1	161st Ave NW
D-4	4	-	31'	120 x 24	20.00	1	Round Lake Blvd
TOTAL QUANTITIES					72.00	4	

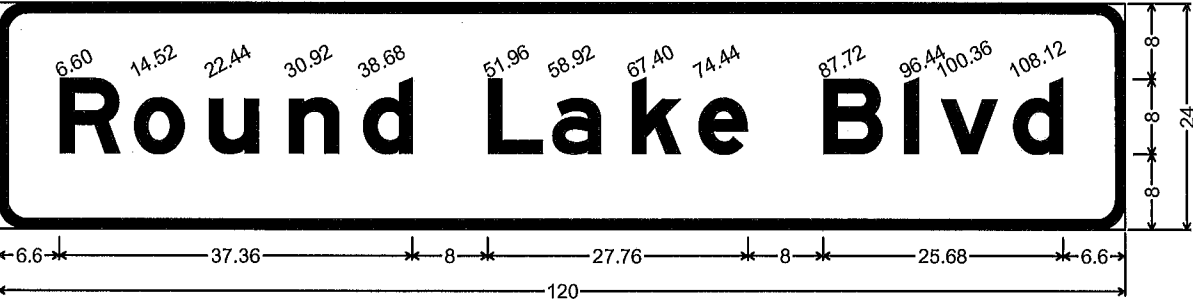


GENERAL SIGNING NOTES:

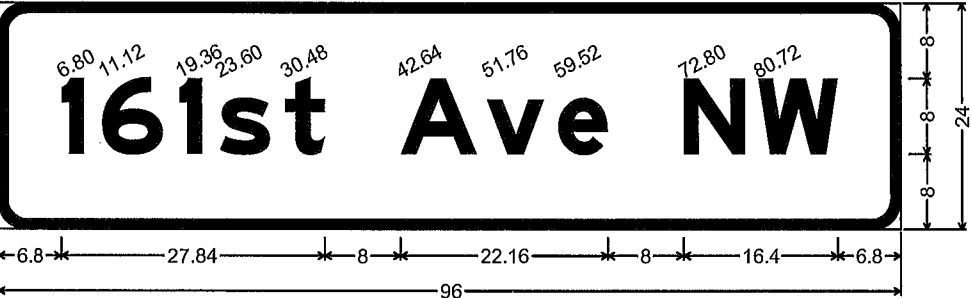
- 1) COLOR FOR ALL TYPE D SIGNS SHALL BE WHITE LEGEND AND BORDER ON GREEN BACKGROUND, FULLY REFLECTORIZED.
- 2) CORNERS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED. CORNERS OF STANDARD SIGN PANELS WITH MARGINS SHALL BE TRIMMED.
- 3) SEE STANDARD PLAN 5-297.731 FOR SIGN MOUNTING TO MAST ARM.
- 4) SEE STANDARD SIGNS MANUAL FOR DETAILED DRAWINGS OF TYPE C SIGN PANELS.
- 5) CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS OF THE NEW TYPE D SIGN PANELS FOR ENGINEER APPROVAL. PRIOR TO FABRICATION OF THESE NEW SIGNS.
- 6) FURNISHING AND INSTALLING NEW TYPE C AND TYPE D SIGNS AS WELL AS REMOVAL OF EXISTING TYPE D SIGNS SHALL BE INCLUDED AS PART OF BID ITEM FOR "REVISE SIGNAL SYSTEM". SEE SPECIAL PROVISIONS.
- 7) MAST ARM POLE MOUNTED SIGN PANELS SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR USING CONTRACTOR FURNISHED AND INSTALLED MOUNTING HARDWARE.
- 8) "a" & "b" DISTANCE = DISTANCE FROM END OF MAST ARM TO THE EDGE OF THE SIGN PANEL.

CONDUCTOR COLOR CODE			
FROM		TO DEVICE	
SIGNAL SERVICE	1/C 6 EGC	AS SHOWN ON PLAN	
SOP	3-1/C 2	R WH SIGNAL SERVICE	
		BLK	
SIGNAL SERVICE	3-1/C 6	BLK WH SIGNAL CABINET	
		G	
SIGNAL CABINET	(6SM) CABLE	SIGNAL CABINET	
SIGNAL CABINET TO DEVICE			
6PR 19		AS SHOWN ON PLAN	
COAXIAL CABLE		AS SHOWN ON PLAN	
4/C 18	R BLK WH G	AS SHOWN ON PLAN	
2/C 14	BLK WH OR CLR	AS SHOWN ON PLAN	
3/C 20	R OR O WH OR YEL BLK OR BL	AS SHOWN ON PLAN	
CAT 5		AS SHOWN ON PLAN	
SIGNAL CABINET TO DEVICE			
6/C 14	R BLK WH BLK/R	RED/R/LA YEL/YLA 4 AND 5 SECTION HEADS	
4/C 14	R BLK WH BLK/R	RED/DWK YEL/WLK 3 SECTION HEAD PED HEADS	
4/C 14	R BLK WH BLK/R	FYA YLA GLA NEU 5 SECTION (CLUSTER HEADS ONLY)	
3/C 14	BLK G WH	EVP LIGHT/AWF LUMINAIRE VIDEO CAMERA ENFORCEMENT LIGHT	

NOTES:
ARRANGE AND TERMINATE CONDUCTORS AND CABLES AS SHOWN WITHOUT SPLICE.
NUMBER ONLY MEANS AWG CONDUCTOR SIZE (e.g. 14=14AWG)
1/C MEANS AN INDIVIDUAL CONDUCTOR NOT PART OF A CABLE ASSEMBLY



3.00" Radius, 1.00" Border, Black on, None;
"Round Lake Blvd", E Mod 2K;



3.00" Radius, 1.00" Border, Black on, None;
"161st Ave NW", E Mod 2K;

CONDUCTOR AND CABLE SPECIFICATION CHART		
NUMBER OF CONDUCTORS & AWG SIZE	TYPE	Specification Number
1/C 2	INDIVIDUAL SERVICE CONDUCTORS	3815.2B.1
1/C 6	FEEDER AND BRANCH CONDUCTORS	3815.2B.1
1/C 6 INS.GR.	Grounding Conductors	3815.2B.5
2/C 14	Loop Detector Lead-In Cable	3815.2C.4
3/C 14	Signal Control Cable	3815.2C.3
4/C 14	Signal Control Cable	3815.2C.3
6/C 14	Signal Control Cable	3815.2C.3
12/C 14	Signal Control Cable	3815.2C.3
6PR 19	Telephone Cables Outdoor	3815.2C.6.b
3/C 20	EVP Detector Cable	3815.2C.5

CABLE LABELING ABBREVIATIONS		
ABBREVIATION	LABEL REFERENCE DISCRIPTION & EXAMPLE	COMPONENT
X-Y	INDICATION NUMBER 2-1	SIGNAL HEAD
X-Y	LOOP NUMBER D2-1	DETECTOR
X-Y	PUSH BUTTON NUMBER PB2-1	PUSH BUTTON
X-Y	PED INDICATION NUMBER P2-1	PED INDICATION
X-Y	LUMINAIRE NUMBER L1	LUMINAIRE
X-Y	EVP PHASE NUMBER EVP 2+5	EVP DETECTOR
X-Y	EVP LIGHT PHASE NUMBER EVPL 2+5	EVP CON. LIGHT
X-Y	VIDEO DETECTION PHASE V2-1	VIDEO DETECTION
X-Y	RADAR DETECTION PHASE RD2-1	RADAR DETECTION
SS	SIGNAL SERVICE	SERVICE WIRE
CC	CABINET COMMS	COMMS CABLE
FO	FIBER OPTIC	FIBER CABLE
SPARE Y	SPARE WIRE TO POLE NUMB. SPARE1	SPARE WIRE
ELYZ *	ENFORC. LIGHT POLE & DIRECTION	ENFORCEMENT LIGHT
PTZ1	PTZ CAMERA POLE NUMBER PTZ1	PTZ CAMERA
IC	INTERCONNECT CABLE	INTERCONNECT
EGC	EQUIPMENT GROUNDING CONDUCTOR	GROUND

X = SIGNAL SYSTEM PHASE NUMBER; REFER TO THE PLAN
Y = SIGNAL SYSTEM ASSIGNED COMPONENT NUMBER; REFER TO THE PLAN
Z * = DIRECTION
FURNISH AND INSTALL LABELS ON CABLES WITH ABBREVIATIONS SHOWN ON THIS TABLE AND IN ACCORDANCE WITH THE WIRING DIAGRAM.

NO	DATE	BY	CKD	APPR	REVISION
NAME: P:\002-620-009 161st Signal Mod\BaselSignal\SIGNAL_DETAILS_002-620-009.dwg					

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: SEAN R. THIEL DATE: 2/9/23
SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

DRAWN BY ST DATE 2/3/23
DESIGN BY ST DATE 1/12/23
CHECKED BY BL DATE 2/6/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
City Project 21-39

REVISE SIGNAL SYSTEM
SIGNING AND MISC DETAILS
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)
SHEET 35 OF 41 SHEETS

PVC LOOP DETECTORS				
NUMBER	SIZE (FT.)	LOCATION	FUNCTION	STATUS
D1-1	2-6x6	0' & 30'	1	INPLACE
D1-2	2-6x6	-15' & 15'	7	INPLACE
D2-1	6x6	475'	1	INPLACE
D2-2	6x6	475'	1	INPLACE
D3-1	2-6x6	7' & 37'	1	3
D3-2	2-6x6	-8' & 22'	7	3
D4-1	6x6	180'	3,8	2
D4-2	6x6 & 6x8	5' & 20'	7	1
D4-3	2-6x6	5' & 20'	1	1
D5-1	2-6x6	0' & 30'	1	INPLACE
D5-2	2-6x6	-15' & 15'	7	INPLACE
D6-1	6x6	475'	1	INPLACE
D7-1	2-6x6	20' & 50'	1	2
D7-2	2-6x6	5' & 35'	7	2
D8-1	2-6x6	400'	3,8	INPLACE
D8-2	6x6 & 6x10	-14' & 1'	7	INPLACE
D8-3	2-6x6	-9' & 6'	1	INPLACE
D8-3	6x6	21'	1	1

LOOP DETECTORS FUNCTIONS:

- 1) CALL AND EXTEND
- 3) EXTEND ONLY
- 7) DELAYED CALL- IMMEDIATE EXTEND
- 8) CARRY OVER (STRETCH)

LOOP DETECTOR STATUS:

- 1 = F & I NEW PVC LOOP DETECTOR.
- 2 = F & I NEW PVC LOOP DETECTOR WITH NEW LEAD-IN CABLE AND NEW SPLICE KIT.
- 3 = F & I NEW PVC LOOP DETECTORS FOR D3-1 & D3-2 WITH NEW LEAD-IN CABLE AND NEW SPLICE KIT AND UTILIZE THE EXISTING DETECTORS (OLD D8-4) IN THE WB CSAH 20 LEFT TURN LANE. WITH FINAL WB CSAH 20 LEFT TURN DETECTOR LAYOUT OF TWO D3-1 DETECTORS AT 7' AND 37' AND TWO D3-2 DETECTORS AT -8' AND 22'. PROTECT EXISTING LOOP DETECTORS IN ROADWAY.

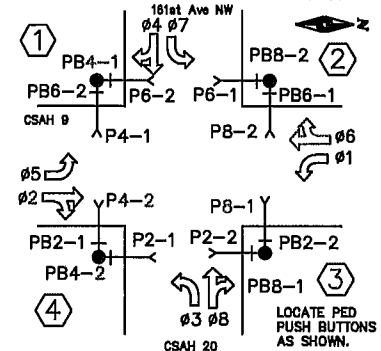
LOCATION=DISTANCE FROM STOP BAR TO FRONT OF DETECTOR.

NOTE: WHEN INSTALLING NEW LOOP DETECTORS D3-1, D3-2, AND D8-3 (ADDITIONAL 3RD DETECTOR), ENSURE THAT ALL EXISTING LOOP DETECTOR ROADWAY CONDUITS FOR THE WB CSAH 20 APPROACH ARE EXACTLY LOCATED & PROTECTED DURING NEW LOOP INSTALLATION. ANY DAMAGE TO THESE EXISTING LOOP DETECTORS (ALL CONDUITS, WIRING, SPLICE KITS) DUE TO CONTRACTOR LOOP DETECTOR INSTALLATION WORK WILL REQUIRE THE CONTRACTOR TO FULLY REPLACE THE DAMAGED PVC LOOP DETECTORS AT NO EXPENSE TO THE CITY AND COUNTY.

MATCH LINE A - SEE NEXT SHEET

MATCH LINE B - SEE NEXT SHEET

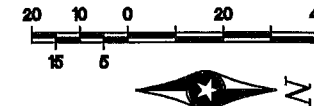
CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



SIGNAL SYSTEM OPERATIONS:

- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- NORMAL OPERATION SHALL BE 8 PHASE, WITH PHASES 1 & 5 BEING REVISED FROM PROTECTED LEFT TURNS TO FLASHING YELLOW ARROW OPERATIONS. PHASES 3 & 7 ARE NEW AND ARE FLASHING YELLOW ARROWS (PHASES 1, 3, 5 AND 7 FLASH BY TIME-OF-DAY PROGRAMS).
- VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

MATCH LINE D - SEE NEXT SHEET

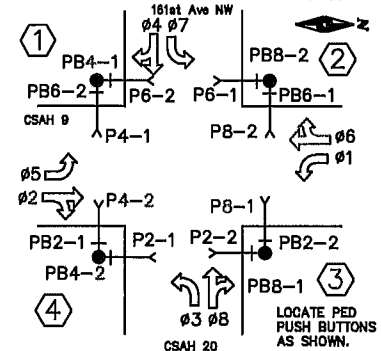


SEE SHEET 37 FOR GENERAL NOTES AND DETAILED POLE NOTES

MATCH LINE A - SEE NEXT SHEET

MATCH LINE B - SEE NEXT SHEET

CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



SIGNAL SYSTEM OPERATIONS:

- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- NORMAL OPERATION SHALL BE 8 PHASE, WITH PHASES 1 & 5 BEING REVISED FROM PROTECTED LEFT TURNS TO FLASHING YELLOW ARROW OPERATIONS. PHASES 3 & 7 ARE NEW AND ARE FLASHING YELLOW ARROWS (PHASES 1, 3, 5 AND 7 FLASH BY TIME-OF-DAY PROGRAMS).
- VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

MATCH LINE C - SEE NEXT SHEET

STATUS:

- 1 = REMOVE IN-PLACE OVERHEAD 3 SECTION SIGNAL AND F & I NEW OVERHEAD 4 SECTION SIGNAL ON END OF EXISTING OR NEW MAST ARM.
- 2 = REMOVE IN-PLACE POLE MOUNTED 3 SECTION SIGNAL AND F & I NEW POLE MOUNTED 4 SECTION SIGNAL (ON NEW TYPE 10B BRACKETING).
- 3 = F & I NEW OVERHEAD SIGNAL ON NEW MOUNT ON NEW MAST ARM.

LED SIGNAL HEADS

SIGNAL HEAD	ALL SIGNAL INDICATIONS SHALL BE 12".				
	R	Y	FYA	G	STATUS
1-1	←	←	←	←	1
1-2	←	←	←	←	2
2-1, 2-2, 2-3	•	•	•	•	INPLACE
3-1	←	←	←	←	3
3-2	←	←	←	←	2
4-1	•	•	•	•	INPLACE
4-2	•	•	•	•	3
5-1	←	←	←	←	1
5-2	←	←	←	←	2
6-1, 6-2, 6-3	•	•	•	•	INPLACE
7-1	←	←	←	←	3
7-2	←	←	←	←	2
8-1	•	•	•	•	INPLACE
8-2	•	•	•	•	3

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: SEAN R. THIEL DATE: 2/9/23
SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

DRAWN BY: ST DATE: 1/25/23

DESIGN BY: ST DATE: 1/12/23

CHECKED BY: BL DATE: 2/2/23



ANOKA COUNTY
HIGHWAY DEPT.

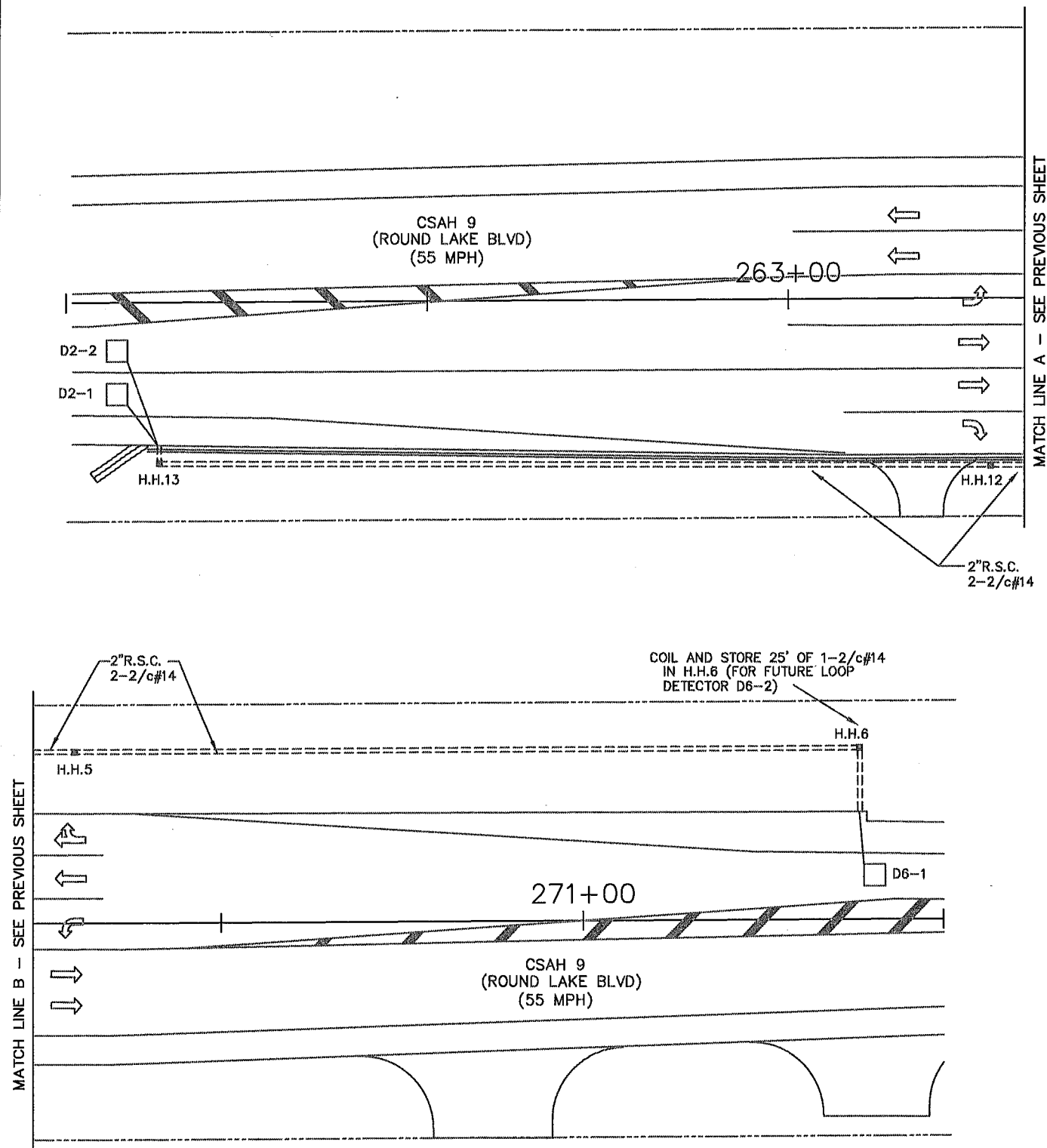
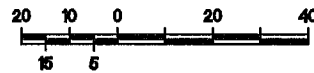
SAP 002-620-009
SAP 198-106-005
City Project 21-39

REVISE SIGNAL SYSTEM
INTERSECTION LAYOUT
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)

SHEET 36 OF 41 SHEETS

NAME: P:\002-620-009 161st Signal Mod\Base\Signal\002-620-009_Signal.layout.dwg

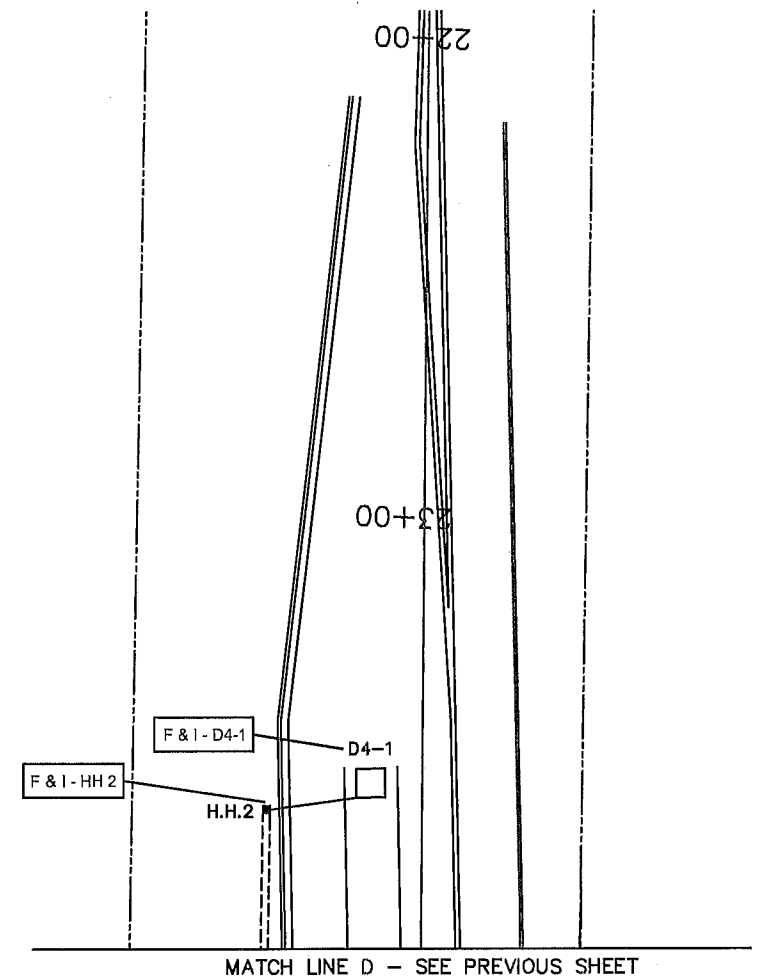
NO DATE BY CKD APPR REVISION



MATCH LINE A - SEE PREVIOUS SHEET

MATCH LINE C - SEE PREVIOUS SHEET

MATCH LINE B - SEE PREVIOUS SHEET



NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\002-620-009 161st Signal Mod\BaselSignal\002-620-009_SignalLayout.dwg

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ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
City Project 21-39

REVISE SIGNAL SYSTEM
INTERSECTION LAYOUT
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)
SHEET 37 OF 41 SHEETS

NOTES:

- 1) ALL ITEMS OF THIS SIGNAL SYSTEM ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE, UNLESS OTHERWISE NOTED ON PLANS.
- 2) ALL HANDHOLES ARE PVC HANDHOLES WITH METAL FRAMES AND COVERS AND ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE UNLESS OTHERWISE NOTED ON PLANS.
- 3) ALL PEDESTRIAN SIGNAL HEADS ARE ONE-SECTION LED "HAND/WALKING PERSON" COUNTDOWN TIMER INDICATIONS AND ARE INPLACE (REUSE AND MAINTAIN INPLACE).
- 4) ALL LOOP DETECTORS ARE INPLACE AND SHALL BE REUSED AND MAINTAINED INPLACE AND OPERATIONAL, EXCEPT AS FOLLOWS: CONTRACTOR SHALL FURNISH AND INSTALL NEW LOOP DETECTORS D3-1, D3-2, D4-1, D4-2, D4-3, D7-1, AND D7-2 IN PVC PER DETAILS INCLUDED ELSEWHERE IN THE PLANS. LOOP DETECTOR WIRES FOR NEW LOOP DETECTORS SHALL BE CROSS-LINKED POLYETHYLENE (XLP) #12 AWG IN 3/4" NMC. SEE SPECIAL PROVISIONS.
- 5) ANY DAMAGE TO INPLACE TRAFFIC SIGNAL FACILITIES (CONDUIT, CABLES, HANDHOLES, SIGNAL POLES, ETC.), DUE TO TRAFFIC SIGNAL REVISION WORK, SHALL BE REPAIRED BY CONTRACTOR TO THE SATISFACTION OF THE ENGINEER, AT NO EXPENSE TO THE CITY AND COUNTY.
- 6) LOCATION OF NEW LOOP DETECTORS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- 7) ALL NEW VEHICULAR SIGNAL HEADS SHALL HAVE A BACKGROUND SHIELD FURNISHED & INSTALLED BY CONTRACTOR.
- 8) F & I = NEW, FURNISH AND INSTALL.
S & I = INPLACE, SALVAGE AND INSTALL.
- 9) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS TO BE INSTALLED AND MADE OPERATIONAL BY CONTRACTOR.
- 10) SEE SPECIAL PROVISIONS & DETAILS REGARDING SIGNS TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCLUDED AS PART OF THE "REVISE SIGNAL SYSTEM" PAY ITEM).

INPLACE — CONTROLLER AND CABINET
(SALVAGE)
INSTALL — CONTROLLER AND CABINET
(FURNISHED BY COUNTY)

Ⓐ INPLACE (MAINTAIN INPLACE) CABINET FOUNDATION
EXTEND INTO H.H.15:
METERED SIGNAL SERVICE
2"R.S.C.
3-1/c#6
EXTEND INTO H.H.1:
4"R.S.C.
5-12/c#12
4-3/c#12
2-3/c#20
7-2/c#14
EXTEND INTO H.H.14:
4"R.S.C.
5-12/c#12
4-3/c#12
2-3/c#20
8-2/c#14
STUB OUT 2-3"R.S.C. FROM CABINET
TO NORTH (THREAD AND CAP
BOTH ENDS—FOR FUTURE USE)

Ⓑ SIGNAL SERVICE CABINET
CABINET FOUNDATION
EXTEND INTO H.H.15:
METERED SIGNAL SERVICE
2"R.S.C.
3-1/c#6
UNMETERED STREET LIGHT SERVICE
2-3/c#12 (LUM)
STUB OUT 2"R.S.C. (FOR
SERVICE BY CONNEXUS)

Ⓐ INPLACE (MAINTAIN INPLACE) PA100 POLE FOUNDATION
TYPE PA100-A-45-D40-9 (DAVIT AT 350')
2-ONE WAY SIGNALS—OVERHEAD (11' AND
23' FROM END OF MAST ARM)
1-TYPE 10B—POLE MOUNTED 180° (6-1, P6-2)
ONE WAY EVP DETECTOR AND LIGHT—OVERHEAD (Ø6,1)
EXTEND INTO H.H.1:
3"R.S.C.
3-12/c#12
2-3/c#12
1-3/c#20
1-3/c#12 (LUM)

INPLACE (REMOVE) LUMINAIRE - 250 W HPS
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 1-1)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 8-3)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P4-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED

F & I LUMINAIRE - LED
1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 1-1)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 3-2, P4-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 3-2)
TYPE D SIGN PANEL - OVERHEAD (D-1)
R10-X12 SIGN PANEL - ADJACENT TO 1-1

Ⓒ INPLACE (MAINTAIN INPLACE) PA100 POLE FOUNDATION
TYPE PA100-A-50-D40-9 (DAVIT AT 350')
2-ONE WAY SIGNALS—OVERHEAD (11' AND
23' FROM END OF MAST ARM)
1-TYPE 10B—POLE MOUNTED 180° (2-1, P2-2)
ONE WAY EVP DETECTOR AND LIGHT—OVERHEAD (Ø2,5)
EXTEND INTO H.H.7:
3"R.S.C.
3-12/c#12
2-3/c#12
1-3/c#20
1-3/c#12 (LUM)

INPLACE (REMOVE) LUMINAIRE - 250 W HPS
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 5-1)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 4-3)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P8-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED

F & I LUMINAIRE - LED
1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 5-1)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 7-2, P8-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 7-2)
TYPE D SIGN PANEL - OVERHEAD (D-3)
R10-X12 SIGN PANEL - ADJACENT TO 5-1

Ⓓ INPLACE (MAINTAIN INPLACE) PA90 POLE FOUNDATION
TYPE PA90-A
1-TYPE 10B—POLE MOUNTED 180° (8-1, P8-2)
EXTEND INTO H.H.3:
3"R.S.C.
2-12/c#12
2-3/c#12
1-3/c#20

INPLACE (REMOVE) 30 - FOOT MAST ARM
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 8-2)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 5-2)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P6-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED
ONE WAY EVP DETECTOR AND LIGHT - OVERHEAD AT 6' (Ø8, 3)

INSTALL 35 - FOOT MAST ARM (WITH MID-MOUNT AT 11' FROM END OF MAST
ARM) - FURNISHED BY COUNTY

F & I 1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 3-1)
1 - STRAIGHT MOUNT SIGNAL - OVERHEAD AT 11' (NEW 8-2)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 5-2, P6-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 5-2)
TYPE D SIGN PANEL - OVERHEAD (D-2)
R10-X12 SIGN PANEL - ADJACENT TO 3-1
1-6/c#14

Ⓔ INPLACE (MAINTAIN INPLACE) PA100 POLE FOUNDATION
TYPE PA100-A
1-TYPE 10B—POLE MOUNTED 180° (4-1, P4-2)
EXTEND INTO H.H.11:
3"R.S.C.
2-12/c#12
2-3/c#12
1-3/c#20

INPLACE (REMOVE) 40 - FOOT MAST ARM
ONE WAY SIGNAL AND MOUNT OVERHEAD AT 0' (OLD 4-2)
TYPE 10 B BRACKETING AT 90 DEG
ONE WAY SIGNAL AND MOUNT - POLE MOUNTED 90 DEG (OLD 1-2)
TYPE D SIGN PANEL - OVERHEAD

INPLACE (S & I) 1 - SET CD PED SIGNALS - POLE MOUNTED 90 DEG (P2-1)
2 - RELOCATE PEDESTRIAN PUSH BUTTONS AS NEEDED
ONE WAY EVP DETECTOR AND LIGHT - OVERHEAD AT 6' (Ø4, 7)

INSTALL 50 - FOOT MAST ARM (WITH MID-MOUNT AT 10' FROM END OF MAST
ARM) - FURNISHED BY COUNTY

F & I 1 - ANGLE MOUNT SIGNAL - OVERHEAD AT 0' (NEW 7-1)
1 - STRAIGHT MOUNT SIGNAL - OVERHEAD AT 10' (NEW 4-2)
TYPE 10 B BRACKETING - POLE MOUNTED 90 DEG (FOR 1-2, P2-1)
1 - ONE WAY SIGNAL - POLE MOUNTED 90 DEG (NEW 1-2)
TYPE D SIGN PANEL - OVERHEAD (D-4)
R10-X12 SIGN PANEL - ADJACENT TO 7-1
1-6/c#14

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: SEAN R. THIEL DATE: 2/9/23
SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

DRAWN BY ST DATE 1/25/23

DESIGN BY ST DATE 1/12/23

CHECKED BY BL DATE 2/2/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
City Project 21-39

REVISE SIGNAL SYSTEM
POLE AND GENERAL NOTES
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)

SHEET 38 OF 41 SHEETS

NOTES:

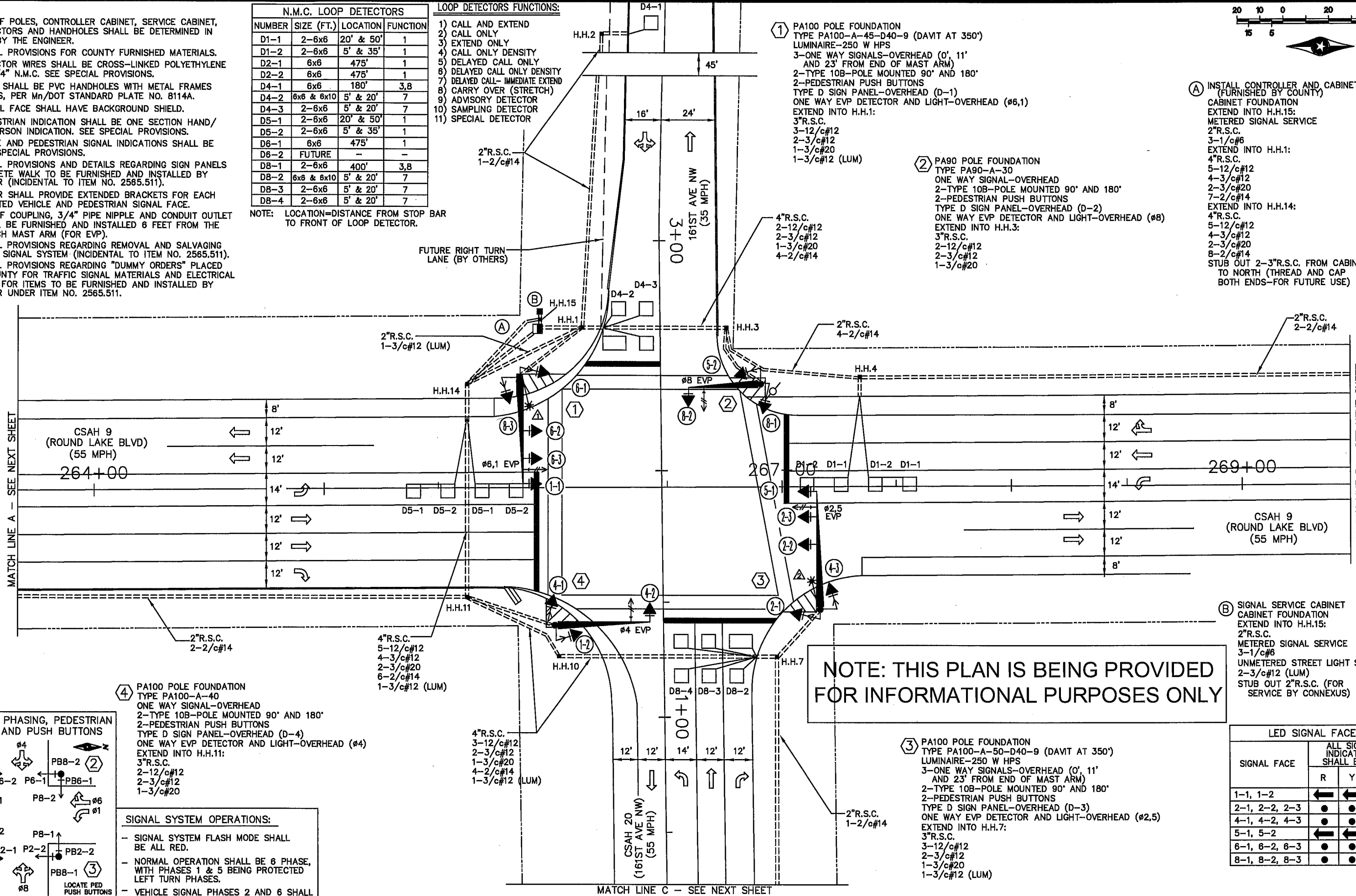
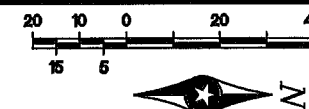
- 1) LOCATION OF POLES, CONTROLLER CABINET, SERVICE CABINET, LOOP DETECTORS AND HANDHOLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- 2) SEE SPECIAL PROVISIONS FOR COUNTY FURNISHED MATERIALS.
- 3) LOOP DETECTOR WIRES SHALL BE CROSS-LINKED POLYETHYLENE (XLP) IN 3/4" N.M.C. SEE SPECIAL PROVISIONS.
- 4) HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS, PER Mn/DOT STANDARD PLATE NO. 8114A.
- 5) EACH SIGNAL FACE SHALL HAVE BACKGROUND SHIELD.
- 6) EACH PEDESTRIAN INDICATION SHALL BE ONE SECTION HAND/WALKING PERSON INDICATION. SEE SPECIAL PROVISIONS.
- 7) ALL VEHICLE AND PEDESTRIAN SIGNAL INDICATIONS SHALL BE LED. SEE SPECIAL PROVISIONS.
- 8) SEE SPECIAL PROVISIONS AND DETAILS REGARDING SIGN PANELS AND CONCRETE WALK TO BE FURNISHED AND INSTALLED BY CONTRACTOR (INCIDENTAL TO ITEM NO. 2565.511).
- 9) CONTRACTOR SHALL PROVIDE EXTENDED BRACKETS FOR EACH POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL FACE.
- 10) A 3/4" HALF COUPLING, 3/4" PIPE NIPPLE AND CONDUIT OUTLET BODY SHALL BE FURNISHED AND INSTALLED 6 FEET FROM THE END OF EACH MAST ARM (FOR EVP).
- 11) SEE SPECIAL PROVISIONS REGARDING REMOVAL AND SALVAGING OF INPLACE SIGNAL SYSTEM (INCIDENTAL TO ITEM NO. 2565.511).
- 12) SEE SPECIAL PROVISIONS REGARDING "DUMMY ORDERS" PLACED BY THE COUNTY FOR TRAFFIC SIGNAL MATERIALS AND ELECTRICAL EQUIPMENT, FOR ITEMS TO BE FURNISHED AND INSTALLED BY CONTRACTOR UNDER ITEM NO. 2565.511.

N.M.C. LOOP DETECTORS				
NUMBER	SIZE (FT.)	LOCATION	FUNCTION	
D1-1	2-6x6	20' & 50'	1	
D1-2	2-6x6	5' & 35'	1	
D2-1	6x6	475'	1	
D2-2	6x6	475'	1	
D4-1	6x6	180'	3,8	
D4-2	6x6 & 6x10	5' & 20'	7	
D4-3	2-6x6	5' & 20'	7	
D5-1	2-6x6	20' & 50'	1	
D5-2	2-6x6	5' & 35'	1	
D6-1	6x6	475'	1	
D6-2	FUTURE	-	-	
D8-1	2-6x6	400'	3,8	
D8-2	6x6 & 6x10	5' & 20'	7	
D8-3	2-6x6	5' & 20'	7	
D8-4	2-6x6	5' & 20'	7	

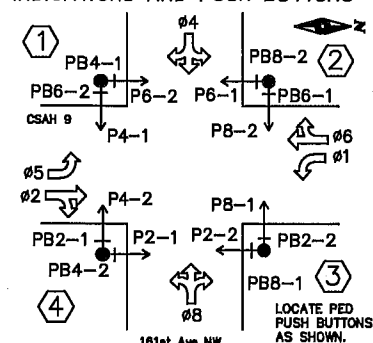
NOTE: LOCATION=DISTANCE FROM STOP BAR TO FRONT OF LOOP DETECTOR.

LOOP DETECTORS FUNCTIONS:

- 1) CALL AND EXTEND
- 2) CALL ONLY
- 3) EXTEND ONLY
- 4) CALL ONLY DENSITY
- 5) DELAYED CALL ONLY
- 6) DELAYED CALL ONLY DENSITY
- 7) DELAYED CALL- IMMEDIATE EXTEND
- 8) CARRY OVER (STRETCH)
- 9) ADVISORY DETECTOR
- 10) SAMPLING DETECTOR
- 11) SPECIAL DETECTOR



CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS



- ④ PA100 POLE FOUNDATION
TYPE PA100-A-40
ONE WAY SIGNAL-OVERHEAD
2-TYPE 10B-POLE MOUNTED 90° AND 180°
2-PEDESTRIAN PUSH BUTTONS
TYPE D SIGN PANEL-OVERHEAD (D-4)
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (Ø4)
EXTEND INTO H.H.11:
3"R.S.C.
2-12/c#12
2-3/c#12
1-3/c#20

SIGNAL SYSTEM OPERATIONS:

- SIGNAL SYSTEM FLASH MODE SHALL BE ALL RED.
- NORMAL OPERATION SHALL BE 6 PHASE, WITH PHASES 1 & 5 BEING PROTECTED LEFT TURN PHASES.
- VEHICLE SIGNAL PHASES 2 AND 6 SHALL OPERATE ON RECALL.

NOTE: THIS PLAN IS BEING PROVIDED FOR INFORMATIONAL PURPOSES ONLY

- ③ PA100 POLE FOUNDATION
TYPE PA100-A-50-D40-9 (DAVIT AT 350°)
LUMINAIRE-250 W HPS
3-ONE WAY SIGNALS-OVERHEAD (0°, 11° AND 23° FROM END OF MAST ARM)
2-TYPE 10B-POLE MOUNTED 90° AND 180°
2-PEDESTRIAN PUSH BUTTONS
TYPE D SIGN PANEL-OVERHEAD (D-3)
ONE WAY EVP DETECTOR AND LIGHT-OVERHEAD (Ø2,5)
EXTEND INTO H.H.7:
3"R.S.C.
3-12/c#12
2-3/c#12
1-3/c#20
1-3/c#12 (LUM)

- ⑤ SIGNAL SERVICE CABINET
CABINET FOUNDATION
EXTEND INTO H.H.15:
2"R.S.C.
METERED SIGNAL SERVICE
3-1/c#6
UNMETERED STREET LIGHT SERVICE
2-3/c#12 (LUM)
STUB OUT 2"R.S.C. (FOR SERVICE BY CONNEXUS)

LED SIGNAL FACES				
SIGNAL FACE	ALL SIGNAL INDICATIONS SHALL BE 12".			
	R	Y	G	
1-1, 1-2	←	←	←	
2-1, 2-2, 2-3	•	•	•	
4-1, 4-2, 4-3	•	•	•	
5-1, 5-2	←	←	←	
6-1, 6-2, 6-3	•	•	•	
8-1, 8-2, 8-3	•	•	•	

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PRINT NAME: SEAN R. THIEL DATE: 2/9/23
SIGNATURE: *Sean R. Thiel* LICENSE NO. 45129

DRAWN BY ST DATE 2/3/23
DESIGN BY ST DATE 1/12/23
CHECKED BY BL DATE 2/6/23



ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
City Project 21-39

INPLACE SIGNAL SYSTEM
"FOR INFORMATION ONLY"
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)
SHEET 40 OF 41 SHEETS

NO	DATE	BY	CKD	APPR	REVISION

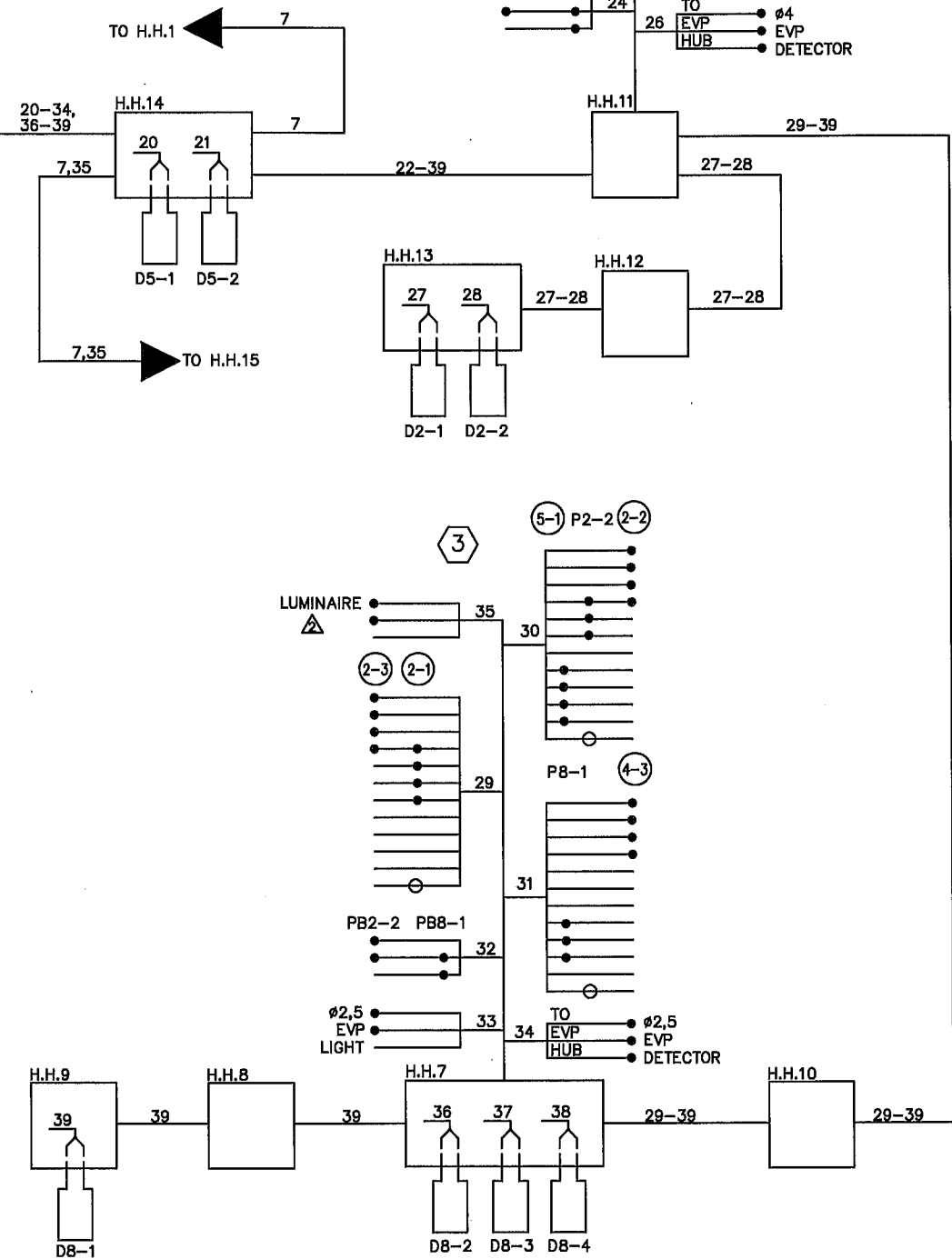
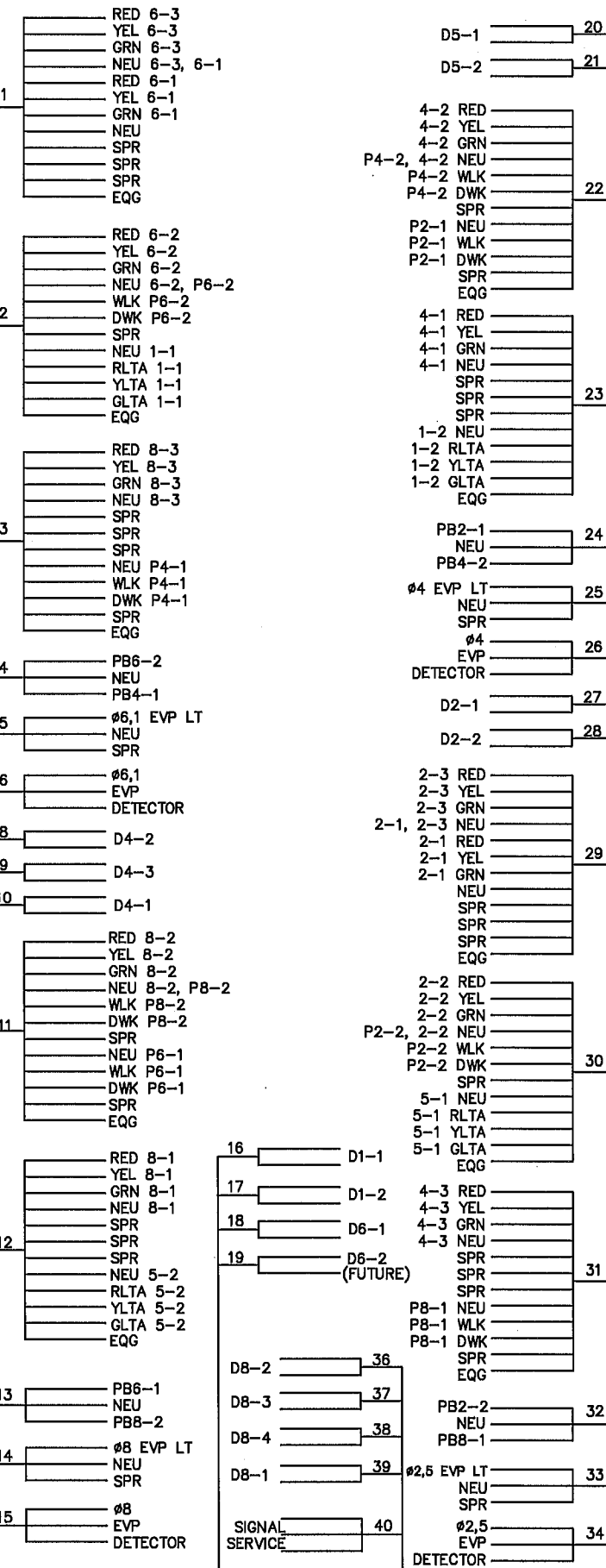
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CONTROLLER CABINET

CONDUCTOR COLOR CODING

R	BLK	2-1/c#6
O	WH	
BL		
WH	R	3/c#12
R/BLK	WH	
O/BLK	BLK	
BL/BLK		
WH/BLK	BLK	2/c#14
BLK	CLEAR	
BLK/WH		
G/BLK	R OR O	3/c#20
G	WH OR YEL	
	BLK OR BL	

NOTE:
ALL TERMINAL BLOCK CONNECTIONS
SHALL BE ARRANGED AS SPECIFIED ABOVE.



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ANOKA COUNTY
HIGHWAY DEPT.

SAP 002-620-009
SAP 198-106-005
City Project 21-39

INPLACE SIGNAL SYSTEM
"FOR INFORMATION ONLY"
CSAH 9 (ROUND LK BLVD) AT CSAH 20 (161ST AVE)
SHEET 41 OF 41 SHEETS

NO	DATE	BY	CKD	APPR	REVISION

NAME: P:\002-620-009 161st Signal Mod\Baseline\Signal\002-620-009_Signal_InplaceLayout.dwg