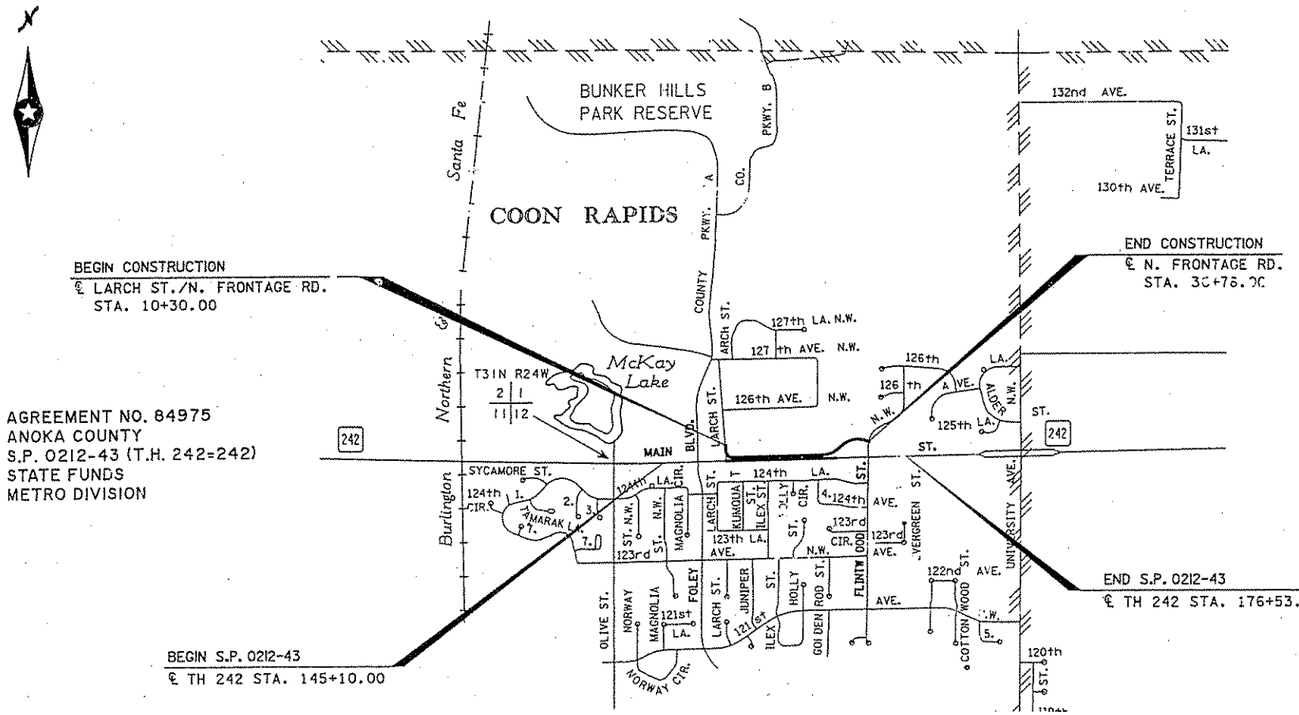
MINN. PROJ. NO. STATE FUNDS

MINNESOTA DEPARTMENT OF TRANSPORTATION
ANOKA COUNTY

NORTH FRONTAGE ROAD AND TH 242 (MAIN STREET)

CONSTRUCTION PLAN FOR GRADING, DRAINAGE, PAVING, CONCRETE CURB & GUTTER

LOCATED ON TH 242 (MAIN STREET) FROM 600 FT. W. OF FOLEY BLVD. TO 550 FT. E. OF FLINTWOOD STREET IN COON RAPIDS.



AGREEMENT NO. 84975
ANOKA COUNTY
S.P. 0212-43 (T.H. 242=242)
STATE FUNDS
METRO DIVISION

PLAN SYMBOLS

STATE LINE
COUNTY LINE
TOWNSHIP OR RANGE LINE
SECTION LINE
QUARTER LINE
SIXTEENTH LINE
RIGHT-OF-WAY LINE
PRESENT RIGHT-OF-WAY LINE
CONTROL OF ACCESS LINE
PROPERTY LINE (Except Land Lines)
VACATED PLATTED PROPERTY
CORPORATE OR CITY LIMITS
TRUNK HIGHWAY CENTER LINE
CONC. RETAINING WALL
RAILROAD
RAILROAD RIGHT-OF-WAY LINE
RIVER OR CREEK
DRY RUN
DRAINAGE DITCH
DRAIN TILE
CULVERT
DROP INLET
GUARD RAIL
BARBED WIRE FENCE
WOVEN WIRE FENCE
CHAIN LINK FENCE
RAILROAD SNOW FENCE
STONE WALL OR FENCE
HEDGE
RAILROAD CROSSING SIGN
RAILROAD CROSSING BELL
ELECTRIC WARNING SIGN
CROSSING GATE
MEANDER CORNER
MAIL BOX
SPRINGS
MARSH
TIMBER, ORCHARD, BRUSH, NURSERY
CATCH BASIN
FIRE HYDRANT
CATTLE GUARD
OVERPASS (Highway Over)
UNDERPASS (Highway Under)
BRIDGE
BUILDING (One Story Frame)
F-FRAME C-CONCRETE
S-STONE T-TILE
B-BRICK ST-STUCCO
IRON PIPE OR RC
MONUMENT (STONE, CONCRETE, OR METAL)
WOODEN HUB
GRAVEL PIT
SAND PIT
BORROW PIT
ROCK QUARRY
SOIL BORING

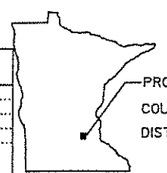
UTILITY SYMBOLS

POWER POLE LINE
TELEPHONE OR TELEGRAPH POLE LINE
JOINT TELEPHONE AND POWER ON POWER POLES ON TELEPHONE POLES
ANCHOR
STEEL TOWER
STREET LIGHT
PEDESTAL (TELEPHONE CABLE TERMINAL)
GAS MAIN
WATER MAIN
CONDUIT
TELEPHONE CABLE IN CONDUIT
ELECTRIC CABLE IN CONDUIT
TELEPHONE MANHOLE
ELECTRIC MANHOLE
BURIED TELEPHONE CABLE
BURIED ELECTRIC CABLE
AERIAL TELEPHONE CABLE
SEWER, (SANITARY)
SEWER, (STORM)
SEWER MANHOLE
HANDHOLE

DESIGN DESIGNATION FOR: TH 242 / N. FRONTAGE RD. S.P. 0212-43

FUNCTIONAL CLASSIFICATION	HIGH DENSITY ARTERIAL	RESIDENTIAL
NO. OF TRAFFIC LANES	2	2
NO. OF PARKING LANES	0	0
STRUCTURAL DESIGN	10 TON	7 TON
R-VALUE	60	60
	STA. 145+10 TO STA. 176+53.55	STA. 12+41 TO STA. 30+80
DESIGN SPEED	MP/H	30 MP/H
STOPPING SIGHT DISTANCE BASED ON:		
HEIGHT OF EYE	3.5'	3.5'
HEIGHT OF OBJECT	0.5'	0.5'
ADT (CURRENT YEAR) (2003)	20,000	200
ADT (FUTURE YEAR) (2023)	33,000	200
ESALS	5,600,000	22,400
HCADT	3%	0%
GROSS LENGTH	3,143.00 FEET 0.595 MILES	2,048.00 FEET 0.388 MILES
BRIDGES-LENGTH	0 FEET 0 MILES	0 FEET 0 MILES
EXCEPTIONS-LENGTH	0 FEET 0 MILES	0 FEET 0 MILES
NET-LENGTH	3,143.00 FEET 0.595 MILES	2,048.00 FEET 0.388 MILES
REF. POINT	REF. POINT 5+00.351 TO REF. POINT 5+00.0949	

NOTE: LENGTH BASED ON ℄ TH 242



PROJECT LOCATION
COUNTY ANOKA
DISTRICT METRO

SCALES
PLAN 50'
PROFILE VERT. 5' HOR. 50'
INDEX MAP 1000'
GENERAL LAYOUT 150'
CROSS SECTIONS VERT. 10' HOR. 10'

I HEREBY CERTIFY THAT THE FINAL REVISIONS, IF ANY, OF THIS PLAN WERE MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE ..... REG. NO. .....

GOVERNING SPECIFICATIONS:

THE 2000 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION 'STANDARD SPECIFICATIONS FOR CONSTRUCTION' SHALL GOVERN.

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MMUTCD, INCLUDING 'FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS', DATED JANUARY, 2001.

INDEX

SHEETS 13 & 29 HAVE BEEN DELETED

THIS PLAN CONTAINS 49 SHEETS

SRF CONSULTING GROUP, INC.

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: NATHEN A. WILL
ENGR. Nathen A. Will
License # 26391 Date 4-10-03

APPROVED Douglas J. Vierbicher — CITY OF COON RAPIDS ENGINEER — 4-15-03 DATE
APPROVED [illegible] — ANOKA COUNTY ENGINEER — 4/14/03 DATE
RECOMMENDED FOR APPROVAL [illegible] — METRO DISTRICT TRANSPORTATION ENGINEER — 4/17/03 DATE
RECOMMENDED FOR APPROVAL Joseph F. Kowalski — METRO DISTRICT MATERIALS ENGINEER — 4/22/03 DATE
RECOMMENDED FOR APPROVAL [illegible] — METRO DISTRICT WATER RESOURCES ENGINEER — 4/23/03 DATE
RECOMMENDED FOR APPROVAL Charles Hudrlik — METRO DISTRICT TRAFFIC ENGINEER — 5/7/03 DATE
RECOMMENDED FOR APPROVAL for L. R. Sarazin — STATE PRE-LETTING ENGINEER — 6/2/03 DATE
OFFICE OF LAND MANAGEMENT APPROVAL K.A. Rasmussen — ASS'T DIRECTOR, LAND MANAGEMENT — 6-2-2003 DATE
APPROVED [illegible] — STATE DESIGN ENGINEER — 02 JUNE '03 DATE

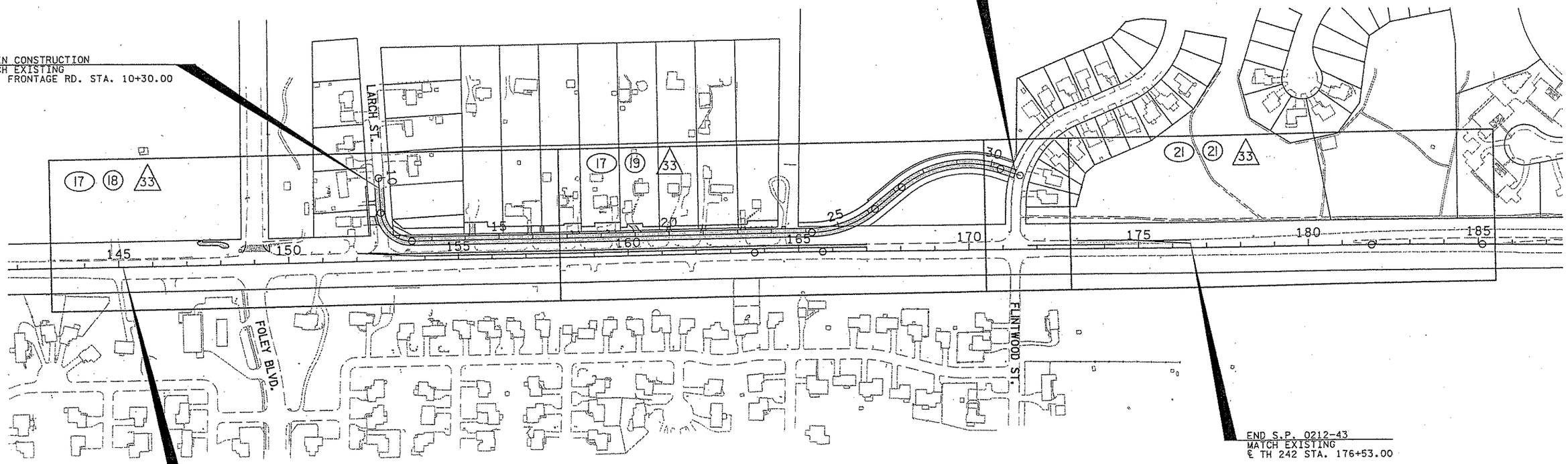
THIS PLAN AND/OR SPECIFICATION WAS PREPARED SPECIFICALLY FOR THIS PROJECT, AND ANY RE-USE OF DETAILS OR SPECIFICATIONS ON OTHER PROJECTS IS NOT INTENDED OR AUTHORIZED BY THE DESIGNER. LIABILITY FOR ANY RE-USE IS THE RESPONSIBILITY OF THE PERSON, AGENCY, OR CORPORATION USING PLAN OR SPECIFICATION DATA FROM THIS PROJECT.

STATE PROJ. NO. S.P. 0212-43 (TH 242=242)

SHEET NO. 1 OF 51 SHEETS

BEGIN CONSTRUCTION
MATCH EXISTING
℄ N. FRONTAGE RD. STA. 10+30.00

END CONSTRUCTION
MATCH EXISTING
℄ N. FRONTAGE RD. STA. 30+78.00



BEGIN S.P. 0212-43
℄ TH 242 STA. 145+10.00

END S.P. 0212-43
MATCH EXISTING
℄ TH 242 STA. 176+53.00

150 0 150
scale feet

LEGEND

- (X) EXISTING TOPOGRAPHY, UTILITIES AND REMOVAL PLAN AND SHEET NO.
- (X) CONSTRUCTION PLAN SHEET NO.
- SIGNING AND STRIPING PLAN SHEET NO.
- PROPOSED CONSTRUCTION AREA

NO	DATE	BY	CKD	APPR	REVISION
...\4102.gia					

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
GENERAL LAYOUT
242 N. FRONTAGE ROAD
STA. 142+00 TO STA. 173+00

SHEET 2 OF 49

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5/22/2003
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STATEMENT OF ESTIMATED QUANTITIES

TAB	NOTES	ITEM NO.	ITEM DESCRIPTION		UNIT	TOTAL QUANTITY	S.P. 0212-43 (18) N. FRONTAGE ROAD ROADWAY QUANTITIES	S.P. 0212-43 (18) T.H. 242 ROADWAY QUANTITIES
		2021.501	MOBILIZATION		LUMP SUM	1	0.7	0.3
		2031.501	FIELD OFFICE TYPE D		EACH	1	0.8	0.2
A		2101.502	CLEARING		TREE	27	27	
A		2101.507	GRUBBING		TREE	27	27	
		2102.502	PAVEMENT MARKING REMOVAL		LIN FT	1450		1450
	(19)	2104.501	REMOVE PIPE CULVERTS		LIN FT	390	390	
B		2104.501	REMOVE CURB AND GUTTER		LIN FT	90	90	
		2104.505	REMOVE CONCRETE DRIVEWAY PAVEMENT		SQ YD	80	80	
B	(20)	2104.505	REMOVE BITUMINOUS PAVEMENT		SQ YD	1094	675	419
G		2104.509	REMOVE SIGN TYPE C		EACH	4	2	2
B		2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)		LIN FT	37	37	
B		2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)		LIN FT	1875	250	1625
		2104.523	SALVAGE MAIL BOX SUPPORT		EACH	9	9	
	(14)	2104.523	SALVAGE ORNAMENTAL LIGHT		EACH	1	1	
N		2104.523	SALVAGE SIGN TYPE C		EACH	2		2
		2104.525	ABANDON AND SEAL WELL SHAFT		EACH	1	1	
L		2105.501	COMMON EXCAVATION	(P)	CU YD	8639	6771	1868
	(16)	2105.607	EXCAVATION SPECIAL		CU YD	7046	7046	
L	(1)	2105.609	SELECT GRANULAR BORROW		TON	450		450
		2130.501	WATER		MGAL	30	20	10
C	(11)	2211.503	AGGREGATE BASE (CV) CLASS 5		CU YD	1760	810	950
C		2360.501	TYPE SP 12.5 WEARING COURSE MIX (2,C)		TON	650	650	
C		2360.501	TYPE SP 12.5 WEARING COURSE MIX (4,C)		TON	160		160
C		2360.502	TYPE SP 12.5 NON WEAR COURSE MIX (4,C)		TON	390		390
C		2357.502	BITUMINOUS MATERIAL FOR TACK COAT		GALLON	180		180
	(13)	2411.618	MODULAR BLOCK RETAINING WALL		SQ FT	207	207	
H		2501.515	15" RC PIPE APRON		EACH	4	2	2
H		2501.515	21" RC PIPE APRON		EACH	1	1	
H		2501.569	18" CS SAFETY APRON		EACH	1		1
		2501.602	TRASH GUARD FOR 15" PIPE APRON		EACH	1	1	
H		2503.541	12" RC PIPE SEWER DESIGN 3006		LIN FT	165	165	
H		2503.541	15" RC PIPE SEWER DESIGN 3006		LIN FT	642	520	122
H		2503.541	18" RC PIPE SEWER DESIGN 3006		LIN FT	790	309	481
H		2503.541	21" RC PIPE SEWER DESIGN 3006		LIN FT	694	694	
	(15)	2503.603	4" CIP SERVICE PIPE		LIN FT	10	10	
		2504.602	RELOCATE HYDRANT AND VALVE		EACH	2	2	
		2504.602	ADJUST CURB BOX		EACH	3	3	
		2504.602	ADJUST VALVE BOX		EACH	1	1	
	(10)	2504.603	WATERMAIN LOWERING		LIN FT	50	50	
	(15)	2504.603	1" TYPE K COPPER PIPE		LIN FT	10	10	
	(9)	2504.604	WATERMAIN INSULATION		SQ YD	222	222	
H		2506.501	CONST DRAINAGE STRUCTURE DESIGN H		LIN FT	27.3	19.7	7.6
H		2506.501	CONST DRAINAGE STRUCTURE DESIGN G		LIN FT	19.4	14.9	4.5
H		2506.501	CONST DRAINAGE STRUCTURE DES 48-4020		LIN FT	51.4	31.7	19.7
H		2506.501	CONST DRAINAGE STRUCTURE DES 54-4020		LIN FT	5	5	
	(17)	2506.502	CONST DRAINAGE STRUCTURE DESIGN SPECIAL		EACH	1	1	
I		2506.516	CASTING ASSEMBLY		EACH	23	17	6
		2506.522	ADJUST FRAME & RING CASTING		EACH	1	1	
		2506.503	RECONSTRUCT DRAINAGE STRUCTURE		LIN FT	24	24	
H		2511.501	RANDOM RIPRAP CL II		CU YD	66.9	63	3.9

SEE SHEET 4 FOR NOTES.

NO	DATE	BY	CKD	APPR	REVISION
1	5-1-03	DF	NW		REVISED SEQ FOR SIGN AND PAVEMENT MARKINGS

...\4102.eqa

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
STATEMENT OF ESTIMATED QUANTITIES
242 N. FRONTAGE ROAD

SHEET 3 OF 49

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5/22/2003
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STATEMENT OF ESTIMATED QUANTITIES

TAB	NOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL QUANTITY	S.P. 0212-43 (18) N. FRONTAGE ROAD ROADWAY QUANTITIES	S.P. 0212-43 (18) T.H. 242 ROADWAY QUANTITIES
D		2531.501	CONCRETE CURB & GUTTER DESIGN B424	LIN FT	1358		1358
D		2531.501	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	2113	2113	
D		2531.507	6" CONCRETE DRIVEWAY PAVEMENT	SQ YD	132	132	
D	(12)	2531.604	7" CONCRETE VALLEY GUTTER	SQ YD	34	34	
		2540.602	INSTALL MAIL BOX SUPPORT	EACH	9	9	
	(14)	2545.602	INSTALL ORNAMENTAL LIGHT	EACH	1	1	
		2550.602	ADJUST HANDHOLE	EACH	1	1	
M		2554.509	GUIDE POSTS TYPE B	EACH	2		2
		2563.601	TRAFFIC CONTROL	LUMP SUM	1	0.3	0.7
J		2564.531	SIGN PANELS TYPE C	SQ FT	51.75	51.75	
N		2564.537	INSTALL SIGN TYPE C	EACH	2	1	1
M		2564.554	SNOW PLOW MARKER X4-5	EACH	2		2
K		2564.602	PAVEMENT MESSAGE (RT-ARROW) POLY PREFORMED	EACH	2		2
K		2564.603	4" SOLID LINE WHITE-EPOXY	LIN FT	2900		2900
K		2564.603	4" DOUBLE SOLID LINE YELLOW-EPOXY	LIN FT	2450		2450
K		2564.603	24" SOLID LINE YELLOW-EPOXY	LIN FT	50		50
	(4)	2573.512	TEMPORARY DITCH CHECKS TYPE 3	LIN FT	90	55	35
	(5)	2573.530	INLET PROTECTION A	EACH	3		3
F	(2)	2573.603	SILT FENCE TYPE MACHINE SLICED	LIN FT	1630	890	740
F		2575.501	SEEDING	ACRE	3.2	1.9	1.3
	(8)	2575.502	SEED MIXTURE 28B	POUND	45	45	
F	(6)	2575.502	SEED MIXTURE 60B	POUND	230	100	130
F		2575.505	SODDING TYPE SALT RESISTANT	SQ YD	1500	1500	
F	(3)	2575.511	MULCH MATERIAL TYPE 1	TON	6.4	3.8	2.6
		2575.519	DISK ANCHORING	ACRE	3.2	1.9	1.3
		2575.523	EROSION CONTROL BLANKET CATEGORY 3	SQ YD	780		780
F	(7)	2575.532	COMMERCIAL FERT ANALYSIS 22-5-10	POUND	640	380	260
		2581.501	REMOVABLE PREFORMED PLASTIC MARKING	LIN FT	2100		2100

NOTES:
(1) QUANTITY FOR TH 242 RIGHT TURN LANE SECTION.
(2) FOR TEMPORARY EROSION CONTROL PURPOSES ALONG TH 242 RIGHT OF WAY OR CONSTRUCTION LIMITS, SHOULD FOLLOW AS CLOSELY AS POSSIBLE TO A SINGLE ELEVATION CONTOUR, BUT NOT TO BE USED AT CULVERT INLET OR OUTLET LOCATIONS.
(3) APPLY AT RATE OF 2 TONS PER ACRE.
(4) FOR TEMPORARY EROSION CONTROL PURPOSES ALONG TH 242 IN DITCH BOTTOMS AND AT CULVERT AND STORM INLET LOCATIONS.
(5) SILT FENCE BOX TO PROTECT DROP INLETS. SEE TEMPORARY EROSION CONTROL STANDARD PLAN SHEET.
(6) APPLY AT RATE OF 100 POUNDS PER ACRE.
(7) SLOW RELEASE TYPE. APPLY AT RATE OF 200 POUNDS PER ACRE.
(8) APPLY AT A RATE OF 50 POUNDS PER ACRE OVER POND AREA.
(9) POLYSTYRENE BOARD PER MNDOT 3760, MINIMUM THICKNESS IS 2 INCHES AND MINIMUM WIDTH 4 FEET. TO BE USED AT THE DIRECTION OF THE ENGINEER IN THE FIELD.
(10) INCLUDES SHUTDOWN, REMOVAL, FITTINGS, RESTRAINTS, EXCAVATION AND BACKFILL, AND DISINFECTION. TO BE USED AT THE DIRECTION OF THE ENGINEER IN THE FIELD.
(11) QUANTITY INCLUDES CLASS 5 FOR TEMPORARY ACCESS TO DRIVEWAYS. USED AS DIRECTED BY THE ENGINEER IN THE FIELD.
(12) CONNECTION TO FLINTWOOD STREET. SEE DETAIL IN PROPOSAL. INCLUDES TRIANGULAR SECTION, V-GUTTER. CURB CONSIDERED PART OF TRIANGULAR SECTION.
(13) ROOT CUTTING (INCIDENTAL).
(14) SEE NOTE Q ON CONSTRUCTION PLANS FOR LOCATION. INCLUDES SALVAGE AND INSTALLATION OF MODULAR BLOCK WALL.
(15) SEE CONSTRUCTION PLANS FOR LOCATION.
(16) QUANTITY REQUIRED FOR POND EXCAVATION. ANY DEWATERING REQUIRED IS CONSIDERED TO BE INCIDENTAL.
(17) QUANTITY FOR POND OUTLET STRUCTURE. PAY ITEM INCLUDES GRATE.
(18) STATE FUNDS (LUMP SUM)
(19) LENGTH INCLUDES APRONS.
(20) SEE NOTE 26 ON CONSTRUCTION/SOILS NOTES SHEET FOR AVERAGE THICKNESS.
(P) PLAN QUANTITY.

INDEX OF TABULATIONS

NO	DATE	BY	CKD	APPR	REVISION
1	5-1-03	DF	NW		REVISED SEQ FOR SIGN AND PAVEMENT MARKINGS

...\4102.eqb

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
STATEMENT OF ESTIMATED QUANTITIES
242 N. FRONTAGE ROAD

SHEET 4 OF 49

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CONSTRUCTION / SOILS NOTES

GRADING, BASE AND SURFACE

1 "TOP OF GRADING SUBGRADE" IS DEFINED AS THE BOTTOM OF CLASS 5 AGGREGATE BASE.

2 "SUITABLE GRADING MATERIAL" ON THIS PROJECT, WHETHER OBTAINED LOCALLY OR FROM BORROW, SHALL CONSIST OF ALL GRANULAR SOILS EXCEPT TOPSOIL, DEBRIS, PEAT MUCK AND ORGANIC OR OTHER UNSTABLE MATERIAL.

3 "GRANULAR MATERIAL" SHALL MEET THE REQUIREMENTS OF SPEC. 3149.2B1.

4 "SELECT GRANULAR MATERIAL" SHALL MEET THE REQUIREMENTS OF SPEC. 3149.2B2.

5 BLANK

6 STRIP ALL TOPSOIL AND IN PLACE SLOPE DRESSING WHERE PRESENT IN AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. FOR ESTIMATING PURPOSES, THE DEPTH OF TOPSOIL AVAILABLE IS CONSIDERED TO BE 12 INCHES.

7 ALL TOPSOIL STRIPPING WILL BE CONSIDERED COMMON EXCAVATION.

8 PROVIDE FOR SUBGRADE CORRECTIONS AND SUBCUTS FOR UNIFORMITY AND COMPACTION AND EMBANKMENT CONSTRUCTION DETAILS AS INDICATED IN THE TYPICAL SECTIONS. SELECTED GRADING SOILS FROM THE ROADBED OR ADJACENT CUTS SHALL BE USED IN THE LOWER PORTION OF THE NEW CONSTRUCTION AND THE GRANULAR MATERIAL AND/OR SELECT GRANULAR MATERIAL SHALL BE USED IN THE UPPER PORTION.

9 COMPACTION OF THE AGGREGATE BASE LAYER SHALL BE OBTAINED BY THE "PENETRATION INDEX METHOD" MnDOT SPEC. 2211.3 C3.

10 COMPACTION OF THE GRADING PORTIONS OF PERMANENT CONSTRUCTION SHALL BE OBTAINED BY THE "SPECIFIED DENSITY METHOD" MnDOT SPEC. 2211.3 C1.

11 THE BOTTOM OF ALL SUBCUTS SHALL BE SHAPED AND COMPACTED BY THE "QUALITY COMPACTION METHOD" WITH A MINIMUM OF 4 PASSES OF AN APPROVED ROLLER.

12 WHERE WIDENING ADJACENT TO EXISTING PAVEMENT, EXCAVATIONS SHALL BE BACKFILLED PROMPTLY TO AVOID UNDERMINING OF THE EXISTING PAVEMENT. CUT VERTICALLY TO THE BOTTOM OF THE PROPOSED SURFACING, THEN 2V:1H TO THE BOTTOM OF THE RECOMMENDED SUBGRADE TREATMENT.

13 WHERE MATCHING NEW SURFACING, AT CROSSROADS OR PROJECT TERMINI, TO EXISTING PAVEMENTS, CUT VERTICALLY TO THE BOTTOM OF THE PROPOSED SURFACING, THEN 1V:2OH TO THE BOTTOM OF THE RECOMMENDED SUBGRADE TREATMENT.

14 PROVIDE 1V:2OH LONGITUDINAL TAPERS BETWEEN CHANGES IN SUBGRADE AND SUBCUT DEPTHS.

15 DITCH BOTTOMS, TOE OF FILL, CUT RUNOUTS AND THE TOP EDGE OF THE BACKSLOPES SHALL BE ROUNDED REGARDLESS OF THE SECTION USED ON THE CROSS SECTION SHEETS.

16 PROVIDE FOR A UNIFORM BITUMINOUS TACK COAT BETWEEN ALL BITUMINOUS COURSES. THE TACK COAT SHALL BE IN ACCORDANCE WITH MN/DOT SPECIFICATION 2357 WITH THE FOLLOWING MODIFICATIONS:

1. THE TACK COAT SHALL CONSIST OF EMULSIFIED ASPHALT (CSS-1 OR CSS-1H) AND SHALL BE APPLIED BETWEEN ALL BITUMINOUS COURSES.
2. THE TACK COAT SHALL BE APPLIED AT A UNIFORM RATE OF 0.03 TO 0.05 GAL/SY BETWEEN BITUMINOUS LAYERS AND 0.07 TO 0.10 GAL/SY ON MILLED BITUMINOUS SURFACES AND CONCRETE.

17 STABILIZING AGGREGATE SHALL BE INCORPORATED INTO THE SUBGRADE TO ACHIEVE SATISFACTORY SURFACE STABILITY AT LOCATIONS DEEMED NECESSARY BY THE ENGINEER, IN ACCORDANCE WITH THE PROVISIONS OF SPEC. 2105.3G. GRANULAR MATERIAL WHICH IS FURNISHED BY THE CONTRACTOR SHALL BE STABILIZED, IF NECESSARY, AT THE CONTRACTOR'S EXPENSE. WHERE STABILIZING AGGREGATE IS DEEMED NECESSARY, IT SHALL BE APPLIED AT A RATE OF APPROXIMATELY 200 LBS/SY.

REMOVALS

18 PROVIDE FOR THE REMOVAL AND DISPOSAL OF ANY IN PLACE SURFACING, OTHER STRUCTURES OR DEBRIS THAT WOULD INTERFERE WITH CONSTRUCTION. BITUMINOUS AND CONCRETE DISTURBED BY CONSTRUCTION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE RECYCLED TO THE EXTENT ALLOWED IN BASE AND SURFACING ITEMS OR DISPOSED OF OUTSIDE OF THE RIGHT-OF-WAY IN ACCORDANCE WITH MnDOT SPEC. 2104.3C.

19 PROVIDE A SAWCUT AT THE TERMINI PROPOSED CONSTRUCTION, WHEN CONNECTING TO IN PLACE PAVEMENT AND WHEN PLACING NEW PAVEMENT ADJACENT TO EXISTING PAVEMENT IN ORDER TO PROVIDE A UNIFORM JOINT.

CONSTRUCTION / SOILS NOTES

TURF ESTABLISHMENT

20 PLACE A MINIMUM OF 6 INCHES OF TOPSOIL ON ALL AREAS SCHEDULED FOR PERMANENT TURF ESTABLISHMENT.

21 SEEDING REQUIREMENTS ON THIS PROJECT ARE AS FOLLOWS:

A. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE SEEDED OR SODDED PER THE PERMANENT TURF ESTABLISHMENT PLANS.
B. PROVIDE COMMERCIAL GRADE OF SLOW RELEASE FERTILIZER, ANALYSIS 22-5-10, OR EQUIVALENT ON ALL AREAS TO BE SEEDED OR SODDED AT A RATE OF 200 LBS/ACRE.
C. PERMANENT TURF ESTABLISHMENT AND EROSION CONTROL MEASURES SHALL BE CONSTRUCTED WITH 14 DAYS OF ROUGH GRADING IN ALL AREAS AS CONSTRUCTION IS COMPLETED, INCLUDING DRAINAGE DITCHES ALONG ALL SURCHARGE AREAS.

MISCELLANEOUS

22 WHENEVER THE WORD "INCIDENTAL" IS USED IN THIS PLAN, IT SHALL MEAN THIS WORK WILL BE INCIDENTAL FOR WHICH NO DIRECT COMPENSATION WILL BE MADE.

23 ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, DATED JANUARY 2001.

24 THE CONTRACTOR IS HEREBY REMINDED OF HIS RESPONSIBILITY UNDER STATE LAW TO CONTACT ALL UTILITIES THAT MAY HAVE FACILITIES IN THE AREA. CONTACT MUST BE MADE THROUGH GOPHER STATE ONE-CALL.

25 WHERE SEDIMENT DEPOSITS IN WATERS OF THE STATE, THE MATERIAL MUST BE REMOVED IN 7 DAYS.

26 THE EXISTING PAVEMENT THICKNESSES ARE ASSUMED TO BE AS FOLLOWS:
TH 242 EXISTING RIGHT TURN LANES AT LARCH ST. AND FLINTWOOD ST. - 7" BITUMINOUS
TH 242 EXISTING SHOULDERS - 5" BITUMINOUS
BITUMINOUS DRIVEWAYS - 2" DRIVEWAY PAVEMENT REMOVAL INCLUDED IN COMMON EXCAVATION.
THE CONTRACTOR SHALL INVESTIGATE AND MAKE OWN DETERMINATION OF ACTUAL PAVEMENT DEPTHS AND TYPES.

THE FOLLOWING STANDARD PLATES APPROVED BY THE DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION SHALL APPLY ON THIS PROJECT.

MN/DOT STANDARD PLATES

PLATE NO.	DESCRIPTION
3000 L	REINFORCED CONCRETE PIPE
3006 G	GASKET JOINT FOR R.C. PIPE
3007 C	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3100 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3128 H	METAL SAFETY APRON & GRATE
3133 C	RIPRAP AT RCP OUTLETS
3145 E	CONCRETE PIPE TIES
4011 E	PRECAST CONCRETE BASE
4020 I	MANHOLE OR CATCH BASIN COVER
4101 D	RING CASTING FOR MANHOLE OR CATCH BASIN
4108 F	ADJUSTING RINGS FOR CATCH BASINS AND MANHOLES
4110 F	COVER CASTING FOR MANHOLE
4129 G	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 802A
4143 E	STOOL GRATE & CONCRETE FRAME
4154 B	CATCH BASIN GRATE CASTING
4160 D	CURB BOX CASTING FOR CATCH BASIN - CASTING NO. 823A AND 833A
4180 J	MANHOLE OR CATCH BASIN STEP
7100 G	CONCRETE CURB & GUTTER
7111 J	INSTALLATION & REINFORCEMENT OF CATCH BASIN CASTINGS
8000 I	STANDARD BARRICADES
8150 B	INSTALLATION OF CULVERT MARKERS
9102 D	TURF ESTABLISHMENT AREAS (AT PIPE CULVERT ENDS)

NO	DATE	BY	CKD	APPR	REVISION
...\4102.csn					

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
CONSTRUCTION/SOILS NOTES, STANDARD PLATES
242 N. FRONTAGE ROAD

SHEET 5 OF 49

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(L)	EARTHWORK TABULATION				
STATION	EXCAVATION TOTALS (EV)			EMBANKMENT TOTALS (CV)	
	COMMON EXCAVATION (CY)	TOPSOIL STRIPPING (CY)	COMPACTION SUBCUT (CY)	SUITABLE GRADING (CY)	SLOPE DRESSING (CY)
10+30.00					
10+50.00	0	40	20	27	9
10+71.70	0	43	20	21	6
11+00.00	0	56	19	24	8
11+20.00	0	43	9	23	7
11+50.00	3	66	19	32	11
12+00.00	13	117	51	55	36
12+50.00	10	125	33	84	95
13+00.00	0	117	3	130	144
13+50.00	0	101	4	119	106
14+00.00	47	101	30	67	49
14+50.00	95	113	48	49	32
14+75.00	59	66	26	20	12
15+00.00	76	67	29	18	13
15+50.00	132	110	57	28	30
15+91.00	80	80	46	26	17
16+50.00	99	116	58	42	25
17+00.00	84	98	50	21	24
17+26.40	67	25	30	6	10
17+50.00	56	22	27	4	9
18+00.00	56	91	56	21	21
18+32.60	17	61	37	21	12
18+50.00	3	31	17	11	6
19+03.90	0	108	28	61	56
19+50.00	0	103	9	75	80
20+00.00	0	88	16	70	53
20+50.00	0	86	17	83	59
21+03.30	0	112	16	88	95
21+50.00	0	93	13	113	88
22+00.00	0	91	11	156	105
22+16.00	0	30	2	40	30
22+50.00	12	65	12	80	69
23+00.00	48	91	32	98	109
23+36.20	22	73	15	45	61
23+50.00	0	28	4	7	17
24+00.00	0	101	10	92	88
24+50.00	0	110	0	159	102
25+00.00	0	133	5	119	102
25+50.00	0	159	22	101	68
26+00.00	13	120	46	61	15
26+50.00	37	82	59	10	14
27+00.00	56	91	59	9	18
27+50.00	57	89	59	8	17
28+00.00	45	87	59	8	16
28+50.00	28	88	59	12	17
29+00.00	10	89	52	22	17
29+50.00	1	93	25	45	20
30+00.00	0	101	4	77	23
30+50.00	3	95	30	57	20
30+78.00	12	49	33	8	9
SUBTOTAL (N. FRONTAGE ROAD)	1241	4144	1386	2553	2050

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...\4102.eta					

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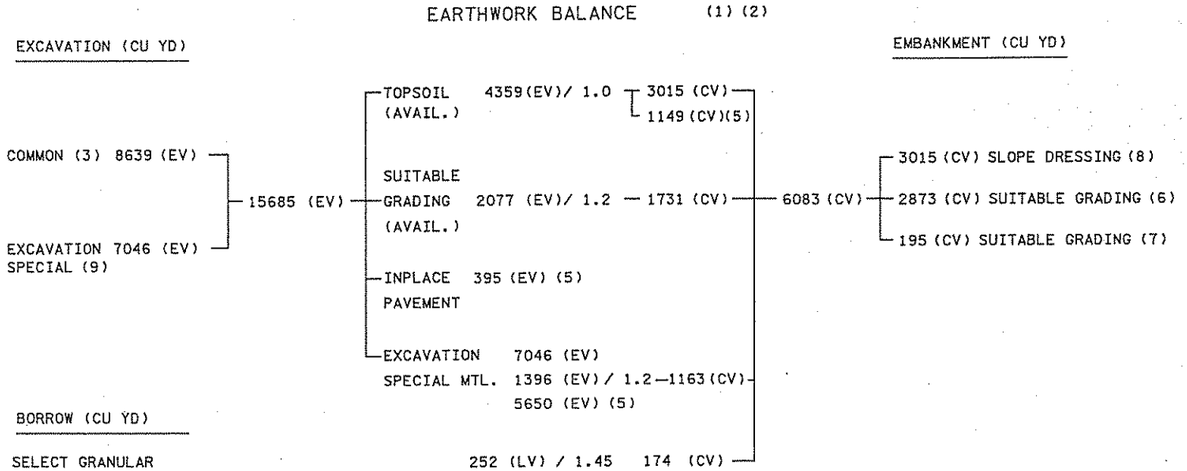
SRF CONSULTING GROUP, INC.

ANOKA COUNTY
EARTHWORK TABULATION AND SUMMARY
242 N. FRONTAGE ROAD

SHEET 6 OF 49

EARTHWORK BALANCE (1) (2)



NOTES:

(1) SEE CONSTRUCTION/SOIL NOTES FOR MATERIAL DEFINITIONS AND ADDITIONAL INFORMATION.

(2) 120% SHRINKAGE FACTOR USED FROM EXCAVATED VOLUME (EV) TO COMPACTED VOLUME (CV), EXCEPT FOR TOPSOIL. SHRINKAGE FACTORS ARE ASSUMED VALUES, USED ONLY FOR THE PURPOSE OF ESTIMATED QUANTITIES. IT SHALL BE UNDERSTOOD THAT NO WARRANTY IS MADE OR IMPLIED AS TO THE ACCURACY, SUFFICIENCY, OR RELIABILITY OF THE SHRINKAGE FACTOR.

(3) QUANTITY INCLUDES 4,359 CU.YD. (EV) OF TOPSOIL STRIPPING (ESTIMATED TO BE 1' THICK). QUANTITY INCLUDES 2,203 CU.YD. (EV) OF COMPACTION SUBCUT EXCAVATION. SEE TYPICAL SECTIONS FOR ADDITIONAL INFORMATION.

(5) EXCESS MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR, AND SHALL BE DISPOSED OF OUTSIDE THE PROJECT LIMITS.

(6) QUANTITY INCLUDES 116 CU.YD. (LV) OF SUITABLE GRADING FOR SWALE AND BERM GRADING BETWEEN STATIONS 147+00 AND 148+30 ON T.H. 242.

(7) SUITABLE GRADING MATERIAL REQUIRED FOR POND CONSTRUCTION.

(8) QUANTITY INCLUDES 844 CU.YD. (CV) OF SLOPE DRESSING FOR POND CONSTRUCTION.

(9) QUANTITY INCLUDES 4,651 CU.YD. (EV) OF COMMON EXCAVATION (SUITABLE GRADING) FOR POND CONSTRUCTION. QUANTITY INCLUDES 2,395 CU.YD. (EV) OF TOPSOIL STRIPPING FOR POND CONSTRUCTION. DEWATERING IS TO BE CONSIDERED INCIDENTAL TO EXCAVATION SPECIAL.

(L) EARTHWORK TABULATION

STATION	EXCAVATION TOTALS (EV)			EMBANKMENT TOTALS (CV)	
	COMMON EXCAVATION (CY)	TOPSOIL STRIPPING (CY)	COMPACTION SUBCUT (CY)	SUITABLE GRADING (CY)	SLOPE DRESSING (CY)
152+91.01					
153+71.63	30	8	38	2	3
154+21.63	19	5	24	1	2
154+71.63	19	5	24	1	2
155+21.63	19	5	24	1	2
155+71.63	19	5	24	1	2
155+97.13	9	2	12	1	1
156+21.63	9	2	12	1	1
156+71.63	19	5	24	1	2
157+12.63	16	4	19	1	1
157+71.63	23	6	28	1	2
158+21.63	19	5	24	1	2
158+48.03	10	3	12	1	1
158+71.63	9	2	11	1	1
159+21.63	19	5	24	1	2
159+54.23	12	3	15	1	1
159+71.63	7	2	8	0	1
160+25.53	20	5	25	1	2
160+71.63	17	5	22	1	1
161+21.63	19	5	24	1	2
161+71.63	19	5	24	1	2
162+24.93	20	5	25	1	2
162+71.63	18	5	22	1	1
163+21.63	19	5	24	1	2
163+37.83	6	2	8	0	1
163+71.63	12	3	16	1	1
164+21.63	19	5	24	1	2
164+57.83	14	4	17	1	1
164+71.63	5	1	7	0	0
165+21.63	19	5	24	1	2
165+77.92	21	5	27	1	2
166+40.08	23	6	29	1	2
167+08.59	18	7	24	1	2
SUBTOTAL (T.H. 242)	**527**	**140**	**665**	**30**	**51**
173+21.00					
174+00.00	80	17	40	44	16
175+00.00	97	24	48	57	23
176+00.00	87	27	43	51	24
176+51.00	45	7	21	22	7
SUBTOTAL (T.H. 242 RIGHT TURN LANE)	**309**	**75**	**152**	**174**	**70**
TOTAL	**2077**	**4359**	**2203**	**2757**	**2171**

STATION	EXCAVATION TOTALS (EV)			EMBANKMENT TOTALS (CV)	
	EXCAVATION SPECIAL		COMPACTION SUBCUT (CY)	SUITABLE GRADING MATERIAL (CY)	SLOPE DRESSING (CY)
	COMMON (CY)	TOPSOIL (CY)			
0+00.00					
0+55.00	424	188	0	46	78
1+45.00	1351	685	0	110	253
2+35.00	1480	697	0	38	250
2+75.00	681	298	0	1	104
3+25.00	528	333	0	0	101
3+95.00	187	194	0	0	58
SUBTOTAL (POND GRADING)	**4651**	**2395**	**0**	**195**	**844**

NO	DATE	BY	CKD	APPR	REVISION
...\4102.etb					

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Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
EARTHWORK TABULATION AND SUMMARY
242 N. FRONTAGE ROAD

SHEET 7 OF 49

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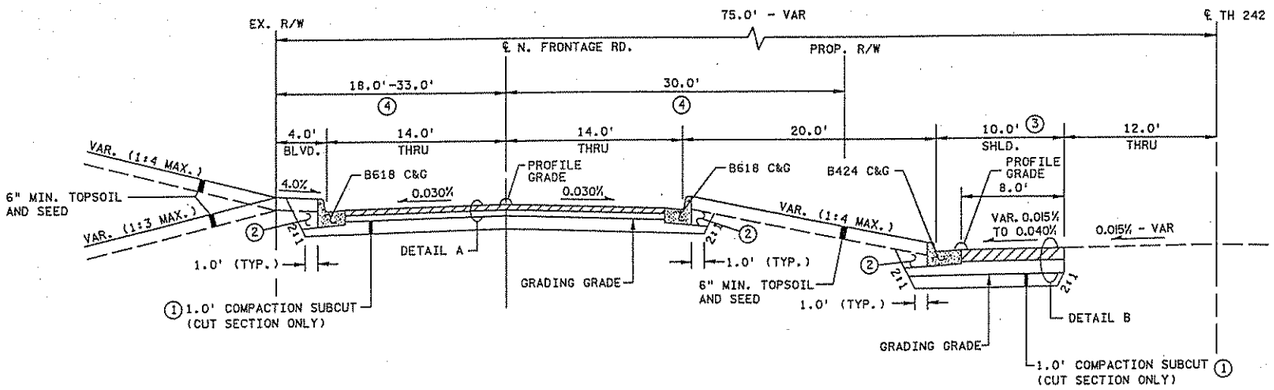
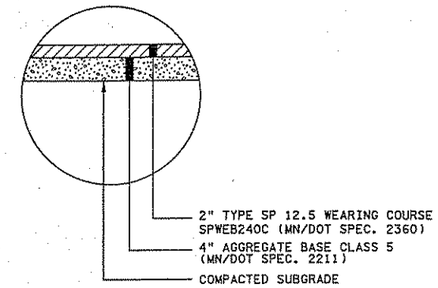


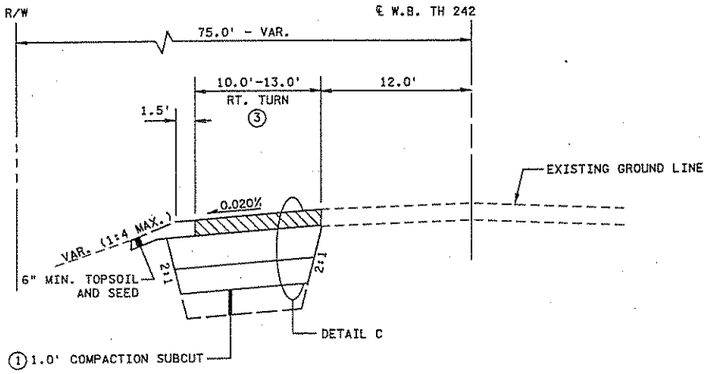
N. FRONTAGE ROAD / TH 242 SHOULDER

TYPICAL SECTION
STA. 10+30.00 TO STA. 30+78.00
TH 242 RT TURN LN STA. 152+77 TO STA. 153+83 ⑤



DETAIL A

N. FRONTAGE ROAD; FRONTAGE ROAD DRIVEWAYS



TH 242

STA. 173+21 TO STA. 176+51

GENERAL NOTES:

ALL CROSS SLOPES ARE FOOT PER FOOT.

NOTES:

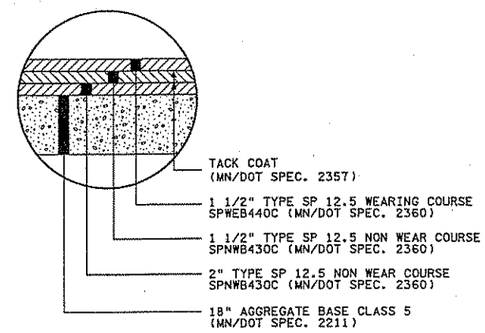
① SUBCUT FOR UNIFORMITY AND COMPACTION (MN/DOT SPEC. 2112) MODIFIED TO A 1.0' DEPTH. PAID FOR AS COMMON EXCAVATION AND INCLUDED IN QUANTITY.

② BACKFILL WITH SUITABLE GRADING MATERIAL.

③ SAWCUT AND REMOVE EXISTING SHOULDER/PAVEMENT.

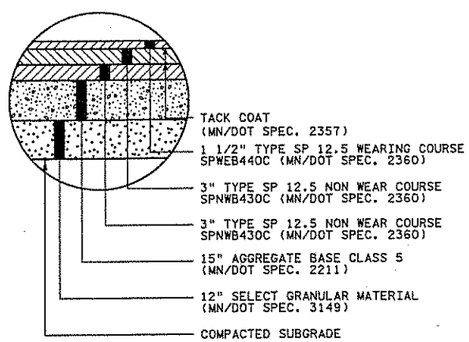
④ PROPOSED R/W STA. 25+78.38 (RT) TO STA. 30+62.88 (RT); STA. 23+78.64 (LT) TO STA. 30+60.98 (LT)

⑤ USE DETAIL C IN LIEU OF DETAIL B FOR RIGHT TURN TAPER.



DETAIL B

TH 242 SHOULDER AND FOLEY BLVD. PATCH



DETAIL C

TH 242 TURN LANE

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SRF CONSULTING GROUP, INC.

ANOKA COUNTY
TYPICAL SECTIONS
242 N. FRONTAGE ROAD

SHEET 8 OF 49

(C) AGGREGATE AND BITUMINOUS SUMMARY

ALIGNMENT	AGGREGATE		BITUMINOUS			
	SELECT GRANULAR	CLASS 5 BASE	TYPE SP 12.5 NON WEAR SPNWB430C	TYPE SP 12.5 WEAR SPWEB440C	TYPE SP 12.5 WEAR SPWEB240C	TACK
	(ton)	(cu yd)	(ton)	(ton)	(ton)	(gal)
FRONTAGE ROAD (STA 10+30 TO 30+78)	0	810	0	0	650	0
T.H. 242 TURN LANE, SHOULDER AND FOLEY BLVD PATCH	450	950	390	160	0	180
PROJECT TOTALS:	450	1760	390	160	650	180

(B) MISCELLANEOUS REMOVAL AND SAWING

ALIGNMENT	REMOVE		SAWING	
	BITUMINOUS PAVEMENT	CURB AND GUTTER	CONCRETE PAVEMENT	BITUMINOUS PAVEMENT
	(sq yd)	(lin ft)	(lin ft)	(lin ft)
FRONTAGE ROAD (STA 10+30 TO 30+78)	675	90	37	250
T.H. 242 TURN LANE, SHOULDER AND FOLEY BLVD PATCH	419	0	0	1625
PROJECT TOTALS:	1094	90	37	1875

(F) TURF ESTABLISHMENT AND EROSION CONTROL

ALIGNMENT	SEED TYPE		MULCH MATERIAL (1)	SILT FENCE MACHINE SLICED	SEEDING	SODDING TYPE SALT RESISTANT	(1) (2) COMM. FERT. 22-5-10
	60B	28B	TYPE 1				
	(lb)	(lb)	(ton)	(lin ft)	(acre)	(sq yd)	(ton)
FRONTAGE ROAD (STA 10+30 TO 30+78)	100	45	3.8	890	1.9	1500	380
T.H. 242 (STA 152+90 TO 167+00)	130	0	2.6	740	1.3	0	260
PROJECT TOTALS:	230	45	6.4	1630	3.2	1500	640

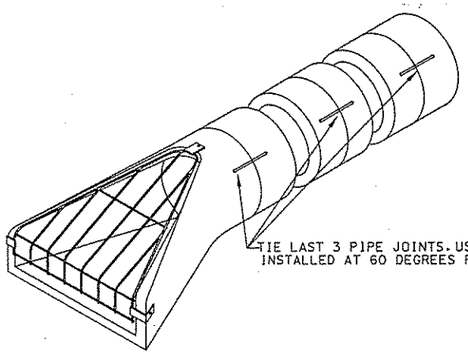
(1) QUANTITES ARE BASED ON THE FOLLOWING BASIS:
SEED MIXTURE 60B - 100 LB/ACRE
SEED MIXTURE 28B - 50 LB/ACRE
MULCH TYPE 1 - 2 TON/ACRE
COMM. FERT. 22-5-10 - 200 LB/ACRE
(2) COMMERCIAL FERTILIZER SHALL BE THE SLOW RELEASE TYPE.

(D) CURB & GUTTER, WALK, AND DRIVEWAY APRON

ALIGNMENT	C&G DESIGN B424	C&G DESIGN B618	6in CONCRETE DRIVEWAY PAVEMENT	7in CONCRETE VALLEY GUTTER
	(lin ft)	(lin ft)	(sq ft)	(sq yd)
FRONTAGE ROAD (STA 10+30 TO 30+78)	0	2113	132	34
T.H. 242 (STA 152+90 TO 167+00)	1358	0	0	0
PROJECT TOTALS:	1358	2113	132	34

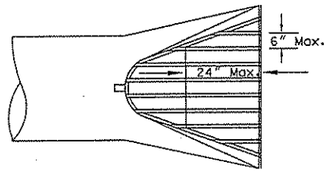
(A) CLEARING AND GRUBBING

ALIGNMENT	CLEARING	GRUBBING
	(tree)	(tree)
FRONTAGE ROAD (STA 14+85 TO 23+54)	27	27
T.H. 242 (STA 149+00 TO 171+00)	0	0
PROJECT TOTALS:	27	27



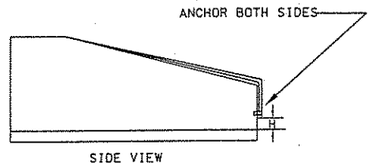
TIE LAST 3 PIPE JOINTS. USE 2 TIE BOLT FASTENERS PER JOINT INSTALLED AT 60 DEGREES FROM TOP OR BOTTOM OF PIPE

PROVIDE 3 CLIPS TO FASTEN TRASH GUARD TO FLARED END. HOT DIP GALVANIZE AFTER FABRICATION.



NOTES: TRASH GUARDS INSTALLED ON INLETS ONLY.

APRON SIZE	SIZE OF BARS	"H"	BOLTS
12"-18"	3/4"	4"	5/8"
21"-42"	1"	6"	3/4"
48"-72"	1 1/4"	12"	1"



SIDE VIEW

TRASH GUARD FOR CONC. APRONS

NO	DATE	BY	CKD	APPR	REVISION
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DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
TABULATIONS
242 N. FRONTAGE ROAD

SHEET 9 OF 49

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(N) SALVAGE AND INSTALL SIGN TYPE C

SIGN NO.	ALIGN 1	QUANTITY	POSTS NO. & TYPE	POSTS KNEE BRACE QUANT.	POSTS LENGTH (FT)	(1) MTG. HEIGHT (MIN.) (FT)	PANEL SIZE (IN)	PANEL AREA (SF)	PANEL TOTAL AREA (SF)	CODE NO.	PANEL LEGEND
C-201	TH 242	1	2-U	0	13.0	7	30 X 30	6.3	6.3	R3-X1	RIGHT TURN LANE
C-202	TH 242	1	2-U	0	13.0	7	30 X 30	6.3	6.3	R1-1	STOP
PROJECT TOTAL		2									

NOTES:

(1) MOUNTING HEIGHT IS MINIMUM SEE SHEET 34 FOR TYPICAL MOUNTING.

(K) PERMANENT PAVEMENT MARKINGS

ALIGNMENT	EPOXY SOLID LINE 4" WHITE (Lin ft)	EPOXY SOLID LINE 4" DOUBLE-YELLOW (Lin ft)	EPOXY SOLID LINE 24" YELLOW (Lin ft)	POLY PREFORMED PAVEMENT MESSAGE RIGHT ARROW (EACH)
FRONTAGE ROAD (STA 30+78)	0	0	0	0
T.H. 242 (152+90 TO 176+50)	2900	2450	50	2
PROJECT TOTALS:	2900	2450	50	2

(J) SIGN PANELS TYPE C

	QUANTITY	POSTS NO. & TYPE	POSTS KNEE BRACE	POSTS LENGTH	MOUNTING HEIGHT (ft) (1)	PANEL SIZE (in)	PANEL AREA (sq ft)	PANEL TOTAL AREA (sq ft)	CODE NO.	PANEL LEGEND (2)
C-1	1	2 - U	0	14	7	30 X 30	6.25	6.25	W1-1(R)	CURVE ARROW RIGHT
						24 X 24	4.00	4.00	W13-1	ADVISORY SPEED
C-2	1	2 - U	0	14	7	30 X 30	6.25	6.25	W1-1(L)	CURVE ARROW LEFT
						24 X 24	4.00	4.00	W13-1	ADVISORY SPEED
C-3	1	2 - U	0	14	7	30 X 30	6.25	6.25	R1-1	STOP SIGN
C-4	1	2 - U	1	14	7	36 X 36	9.00	9.00	W3-1A	STOP AHEAD
C-5	1	2 - U	1	14	7	48 X 24	8.00	8.00	W1-6(L)	LEFT ARROW
C-6	1	2 - U	1	14	7	48 X 24	8.00	8.00	W1-6(R)	RIGHT ARROW
PROJECT TOTALS:								51.75		

GENERAL NOTES:
1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICES.
2. SEE SHEETS 34 -36 FOR STRUCTURAL DETAILS.
3. SEE STANDARD SIGNS MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE "C" SIGN PANELS.

SPECIFIC NOTES:
1. MOUNTING HEIGHT IS MINIMUM, SEE SHEET 34 FOR TYPICAL MOUNTING.
2. FOR PUNCHING AND MOUNTING, SEE SHEET 36 .

(G) REMOVE SIGN TYPE C

SIGN NO.	ALIGN 1	QUANTITY	POSTS NO. & TYPE	POSTS KNEE BRACE QUANT.	PANEL SIZE (IN)	PANEL AREA (SF)	PANEL TOTAL AREA (SF)	CODE NO.	PANEL LEGEND
C-101	TH 242	1	1-U	0	30 X 24	5.0	5.0	R5-3	NO MOTOR VEHICLES
C-102	TH 242	1	1-U	0	30 X 24	5.0	5.0		NO DUMPING
C-103	TH 242	1	1-U	0	24 X 6	1.0	1.0		STREET SIGN
C-104	TH 242	1	2-U	0	30 X 30	6.3	6.3	R3-X1	RIGHT TURN LANE
PROJECT TOTAL		4							

(M) DELINEATORS AND MARKERS

	PANEL LEGEND	QUANTITY	CODE NO.
	SNOW PLOW MARKER	2	X4 - 5
	GUIDE POSTS TYPE B	2	
PROJECT TOTALS:		4	

(E) EXISTING PRIVATE UTILITIES

ALIGNMENT	OFFSET LEFT (ft)	OFFSET RIGHT (ft)	IN PLACE UTILITY	ADJUST AS NEEDED
CONNEXUS ENERGY				
T.H. 242 (STA 164+50 TO 165+35)	52		BURIED	X
T.H. 242 (STA 171+45 TO 174+40)	90		BURIED	X
CENTERPOINT ENERGY (MINNEGASCO)				
T.H. 242 (STA 143+45 TO 176+50)	43 TO 68		BURIED 4" STEEL GAS	X
QWEST				
T.H. 242 (STA 156+30 TO 163+15)	48 TO 68		TELEPHONE PEDESTALS	X

NOTES: THE "ADJUST AS NEEDED" COLUMN IS BASED UPON THE BEST INFORMATION AVAILABLE AND MAY NOT REFLECT THE ACTUAL EFFECTS ON THE UTILITIES BY CONSTRUCTION. ACTUAL DETERMINATION WILL BE MADE IN THE FIELD DURING CONSTRUCTION.

UTILITIES ARE SHOWN AT APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL DETERMINE THE ACTUAL LOCATION OF ALL UTILITIES IN THE FIELD.

UTILITY COMPANY INFORMATION

CONNEXUS ENERGY ATTN: CARY TRACY 14601 RAMSEY BLVD. ANOKA, MN 55303 PHONE 763-323-2765	CITY OF COON RAPIDS ATTN: DOUG VIERZBA 11155 ROBINSON DRIVE NW COON RAPIDS, MN 55433-3761 PHONE 763-767-6465
CENTERPOINT ENERGY (MINNEGASCO) ATTN: STEVE GUHANICK 700 WEST LINDEN AVENUE P.O. BOX 1165 MINNEAPOLIS, MN 55440-1165 PHONE 612-321-5421	Mn/DOT ATTN: ROGER VANDENHEUVEL 6000 MINNEHAHA AVENUE ST. PAUL, MN 55111 PHONE 612-725-2311
QWEST ATTN: J.D. VISKER 425 MONROE STREET ANOKA, MN 55303 PHONE 763-712-5008	COMCAST (AT&T BROADBAND) ATTN: DOUG ZAHN 1238 GREY FOX ROAD ARDEN HILLS, MN 55112 PHONE 651-493-5355

NO	DATE	BY	CKD	APPR	REVISION
1	5-1-03	DF	NW		REVISED TABULATIONS K, M, AND J

...\4102.tbb

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO. S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
TABULATIONS
242 N. FRONTAGE ROAD

SHEET 10 OF 49

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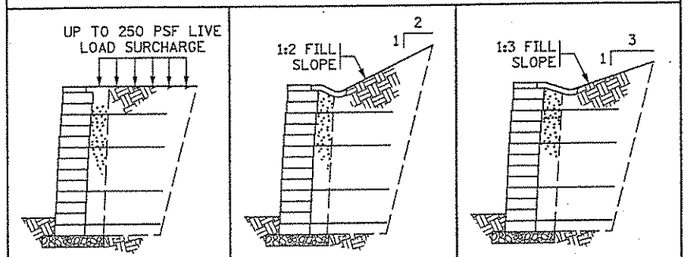
LOADING CASES



250 PSF - LL SURCHARGE
CASE 1

1:2 SLOPED FILL
CASE 3

1:3 SLOPED FILL
CASE 4

CASE 2 IS OMITTED INTENTIONALLY FOR FUTURE RECONSIDERATION

NOTES TO CONTRACTOR:

APPROVED COMBINATIONS OF MODULAR BLOCK UNIT AND SOIL REINFORCEMENT PRODUCTS LIST WITH MBW REINFORCEMENT CLASS NOTED ARE HELD AND MAINTAINED BY THE FOUNDATIONS UNIT, AND POSTED AT www.mrr.dot.state.mn.us/geotechnical/foundations/foundations.asp UNDER FOUNDATIONS UNIT. ONLY APPROVED PRODUCT COMBINATIONS, INCLUDING BLOCK PRODUCED FROM APPROVED SOURCES MEETING DURABILITY AND QUALITY CONTROL REQUIREMENTS, MAY BE USED IN STANDARD DESIGNS.

PROVIDE DETAILED DRAWINGS FOR CONSTRUCTION CONTAINING:

- SUBMIT, WITH THE DETAILED DRAWINGS, A COPY OF Mn/DOT STANDARD SHEETS FOR LOADING CASE(S) USED WITH OPTIONS USED MARKED IN THE TABLE.
- ELEVATION VIEW WITH REINFORCEMENT PLACEMENT REQUIREMENTS, WALL FACING LAYOUT, AND GEOMETRIC INFORMATION. TOP OF WALL MAY EXTEND UP TO 4" ABOVE PLAN TOP OF WALL ELEVATION.
- PLAN VIEW WITH BOTTOM AND TOP OF WALL ALIGNMENT, AND PLAN LIMITS OF WALL ALIGNMENT.
- CROSS SECTIONS DETAILING BATTER, REINFORCEMENT, VERTICAL SPACING, REINFORCEMENT LENGTHS, SUBSURFACE DRAINAGE, SURFACE DRAINAGE, AND WATER RUNOFF COLLECTION ABOVE WALL.
- REINFORCEMENT LAYOUT: REINFORCEMENT SHALL BE PLACED AT 100% COVERAGE RATIO. REINFORCEMENT ELEVATIONS SHALL BE CONSISTENT ACROSS LENGTH OF WALL STRUCTURE.
- NOTE BLOCK, REINFORCEMENT, AND FILL PLACEMENT METHODS AND REQUIREMENTS.
- DETAIL ALL WALL FILL PENETRATIONS AND WALL FACE PENETRATIONS. DETAIL REINFORCEMENT AND/OR WALL FACING UNIT PLACEMENT AROUND PENETRATIONS.
- DETAILS THAT ARE SPECIFIC TO VENDOR PRODUCTS AND THEIR INTERACTION WITH OTHER PROJECT COMPONENTS.
- LIST INFORMATION ON APPROVED COMBINATION OF MBW UNIT AND GEOSYNTHETIC REINFORCEMENT, INCLUDING Mn/DOT CLASSIFICATION CODE, NOMINAL BLOCK WIDTH, PROPERTIES FOR FIELD IDENTIFICATION, AND INSTALLATION INSTRUCTIONS.
- DETAILS OF CAP UNITS AND INSTALLATION/FASTENING INSTRUCTIONS FOR THE CAPS. CAP UNITS SHALL BE SET IN A BED OF ADHESIVE DESIGNED TO WITHSTAND MOISTURE AND TEMPERATURE EXTREMES, REMAIN FLEXIBLE, AND SHALL BE SPECIFICALLY FORMULATED FOR BONDING MASONRY TO MASONRY.
- CERTIFICATION BY PROFESSIONAL ENGINEER THAT THE CONSTRUCTION LAYOUT MEETS THE REQUIREMENTS OF PLANS AND Mn/DOT MSEW STANDARDS. DEVIATION FROM STANDARD DESIGN TABLES ARE PERMITTED BY VALUE ENGINEERING SUBMITTAL ONLY ON PROJECTS WITH OVER 5000 SQ. FT. OF WALL.

DEFINITION OF TERMS

MBW	=	MODULAR BLOCK WALL
LL	=	LIVE LOAD
C.I.P.	=	CAST-IN-PLACE
H	=	WALL HEIGHT
S	=	VERTICAL REINFORCEMENT SPACING
REINFORCEMENT COVERAGE RATIO	=	WIDTH OF SOIL REINFORCEMENTS TO HORIZONTAL SPACING (100% COVERAGE RATIO REQUIRED)

DESIGN CRITERIA

DESIGN CRITERIA FOLLOWS THE AASHTO SPECIFICATION FOR HIGHWAY BRIDGES (16TH EDITION WITH 1998 INTERIMS) EXCEPT FOR THE DEVIATIONS NOTED BELOW. DESIGN CRITERIA ARE IN ACCORDANCE WITH Mn/DOT POLICY, AS RECORDED IN THE Mn/DOT ROAD DESIGN MANUAL.

A. THE MINIMUM REINFORCEMENT LENGTH IS 4 FT. OR 0.7H, WHICHEVER IS GREATER.
B. THE REINFORCEMENT FILL FRICTION ANGLE IS 35°.
C. THE ALLOWABLE CONNECTION LOAD, AT A GIVEN NORMAL LOAD, IS COMPUTED AS THE ULTIMATE CONNECTION STRENGTH REDUCED BY A SAFETY FACTOR EQUAL TO 2.0.
D. THE LATERAL EARTH PRESSURE COMPUTATION FOR EXTERNAL STABILITY CALCULATIONS USES AN INTERFACE ANGLE SET EQUAL TO THE RETAINED BACKFILL ANGLE.
E. THE LATERAL EARTH PRESSURE COMPUTATION FOR INTERNAL STABILITY CALCULATIONS INCORPORATES THE EFFECTS OF WALL FACE BATTER.

MINIMUM FACTORS OF SAFETY:
OVERTURNING: 2.0
SLIDING: 1.5
ECCENTRICITY: $e < L/6$
BEARING CAPACITY: 2.5
DEEP SEATED STABILITY: 1.3

BEARING:
A. SEE FOUNDATION REPORT FOR ALLOWABLE SOIL BEARING PRESSURE.
B. CASES 1 AND 4 - ALLOWABLE SOIL BEARING CAPACITY (ULTIMATE BEARING CAPACITY REDUCED BY A SAFETY FACTOR OF 2.5) OF 2000 PSF IS REQUIRED FOR WALLS UP TO 10 FT. IN HEIGHT. FOR WALLS GREATER THAN 10 FT. IN HEIGHT, THE REQUIRED ALLOWABLE BEARING CAPACITY IS EQUAL TO: 2000 PSF + (H-10)625 PSF) WITH H IN FEET.
C. CASE 3 - ALLOWABLE SOIL BEARING CAPACITY (ULTIMATE BEARING CAPACITY REDUCED BY A SAFETY FACTOR OF 2.5) OF 2500 PSF IS REQUIRED FOR WALLS UP TO 10 FT. IN HEIGHT. FOR WALLS GREATER THAN 10 FT. IN HEIGHT, THE REQUIRED ALLOWABLE BEARING CAPACITY IS EQUAL TO: 2500 PSF + (H-10)(850 PSF) WITH H IN FEET.

REINFORCED WALL FILL CHARACTERISTICS:
A. SELECT GRANULAR BORROW MODIFIED FOLLOWING SPEC. 3149.2B2. MODIFICATION: SELECT GRANULAR BORROW MODIFIED, FOR SPECIAL USE IN EMBANKMENT OR BACKFILL CONSTRUCTION OR OTHER SPECIFIED PURPOSES, MAY BE ANY PIT-RUN OR CRUSHER-RUN MATERIAL THAT IS GRADED FROM COARSE TO FINE, SUCH THAT 100% OF THE MATERIAL MUST PASS THE 2" SIEVE, AND THAT THE RATIO OF THE PORTION PASSING THE #200 SIEVE DIVIDED BY THE PORTION PASSING THE 1" SIEVE MAY NOT EXCEED 10% BY MASS (THAT IS: #200/1" RATIO)
B. INTERNAL ANGLE OF FRICTION (Φ_r) = 35°
C. COHESION (C) = 0
D. MOIST UNIT WEIGHT (γ_r) = 125 PSF

COARSE FILTER AGGREGATE CHARACTERISTICS:
A. COARSE FILTER AGGREGATE TO MEET SPEC. 3149.2H. INCIDENTAL, NO DIRECT PAYMENT WILL BE MADE.

RETAINED BACKFILL CHARACTERISTICS:
A. INTERNAL ANGLE OF FRICTION (Φ_b) = 30°
B. COHESION (C) = 0
C. MOIST UNIT WEIGHT (γ_b) = 120 PSF

FOUNDATION SOILS CHARACTERISTICS:
A. INTERNAL ANGLE OF FRICTION (Φ_f) = 30°
B. COHESION (C) = 0
C. UNIT WEIGHT (γ_f) = 120 PSF

SUMMARY OF ESTIMATED QUANTITIES FOR MBW WALLS

		UNIT	QUANTITY
	STRUCTURE EXCAVATION CLASS ___	CU. YD.	
	STRUCTURE EXCAVATION CLASS ___	CU. YD.	
	REINFORCED WALL FILL (CV)	CU. YD.	
	STRUCTURAL CONCRETE (1A43)	CU. YD.	
(1)(2)	MBW WALL	SQ. FT.	
	TYPE I GEOTEXTILE	SQ. YD.	

(1) VERTICAL FACE AREA OF MODULAR BLOCK AS MEASURED FROM PLAN TOP OF WALL TO 2 FT. BELOW FINISHED GRADE AT BOTTOM OF WALL.

(2) PAY ITEM FOR MBW WALLS SHALL BE 2411.

NOTES TO DESIGNER:

HEIGHT AND LOCATION RESTRICTIONS FOR ISSUES SUCH AS FREEZE-THAW DURABILITY ARE GOVERNED BY APPROPRIATE TECHNICAL MEMORANDUMS. CURRENT GOVERNING TECH. MEMO. NO.: 01-05-MRR-01 MAY BE FOUND AT www.dot.state.mn.us/tecsup/tmemo/index.html.

IN ADDITION TO THE STANDARD SHEETS, PLAN AND FRONT ELEVATION VIEWS OF THE MODULAR BLOCK RETAINING WALLS SHALL BE INCLUDED IN THE PLANS. THE PLAN VIEW MUST SHOW ALIGNMENT BASELINE, LIMITS OF BOTTOM OF WALL ALIGNMENT, AND LIMITS OF TOP OF WALL ALIGNMENT AS ALIGNMENTS VARY WITH BATTER OF WALL SYSTEM ACTUALLY SUPPLIED. THE FRONT ELEVATION MUST IDENTIFY BOTTOM AND TOP OF WALL ELEVATIONS, EXISTING GRADES, AND FINISHED GRADES.

IF THE WALL IS CURVED, THE RADIUS AT THE BOTTOM AND THE TOP OF EACH WALL SEGMENT AND THE P.C. AND P.T. STATION POINTS OFF OF BASELINE AND LIMITS OF BOTTOM AND TOP OF WALL ALIGNMENT MUST BE SHOWN.

REFERENCE STANDARD PLATES AND PROVIDE DETAILS FOR TRAFFIC BARRIERS, CURB AND GUTTER, HANDRAILS AND FENCING AS REQUIRED BY PROJECT CONDITIONS. SEE AASHTO AND Mn/DOT DESIGN MANUALS, STANDARD PLATES AND DETAILS FOR REQUIREMENTS.

SURFACE DRAINAGE PATTERNS SHALL BE SHOWN IN THE PLAN VIEW. PROVIDE DIMENSIONS FOR WIDTH AND DEPTH OF THE DRAINAGE SWALE AS WELL AS THE TYPE OF IMPERVIOUS LINER MATERIAL. SURFACE WATER RUNOFF SHOULD BE COLLECTED ABOVE AND DIVERTED AROUND WALL FACE.

DETAIL LINES AND GRADES OF THE INTERNAL DRAINAGE COLLECTION PIPE. DETAIL OR NOTE THE DESTINATION OF INTERNAL WALL DRAINS AS WELL AS THE METHOD OF TERMINATION (DAYLIGHT END OF PIPE OR CONNECTION INTO HYDRAULIC STRUCTURE). THE SPACING FOR DRAIN PIPE OUTLET SHALL NOT BE MORE THAN 250 FT.

SOFT SOILS AND/OR HIGH WATER CONDITIONS (DEFINED AS GROUNDWATER WITHIN A DEPTH EQUAL TO THE WALL HEIGHT H) MAY NOT BE SUITABLE FOR APPLICATION OF STANDARD DESIGNS AND REQUIRE SPECIAL CONSIDERATION BY THE FOUNDATIONS UNIT.

STANDARD DESIGN CHARTS ARE NOT APPLICABLE TO:
- PROJECT/SITES WHERE FOUNDATION SOILS SHEAR STRENGTH AND/OR BEARING CAPACITY DO NOT MEET OR EXCEED VALUES USED IN THE DEVELOPMENT OF STANDARD DESIGN CHARTS.
- PROJECTS WITH A LARGE QUANTITY OF FACE AREA WHERE PROJECT SPECIFIC DESIGNS ARE RECOMMENDED, AS DEFINED IN Mn/DOT ROAD DESIGN MANUAL.
- WHERE SLOPES IN FRONT OF WALL ARE STEEPER THAN 1:3.
- WHERE MAXIMUM WALL HEIGHT EXCEEDS 12 FT.
- WHERE WALLS ARE TIERED.
- WALLS WITH NOISE WALLS.

IF USING CONCRETE RAILING, INCLUDE STANDARD BRIDGE DETAIL "CONCRETE RAILING (TYPE F)" IN PLAN SET.

PROVIDE PROJECT SPECIFIC AESTHETIC REQUIREMENTS INCLUDING COLOR AND FASCIA SURFACING IN THE SPECIAL PROVISIONS.

CHAPTER 9 OF THE Mn/DOT "ROAD DESIGN MANUAL" CONTAINS GUIDELINES, TRAFFIC SAFETY AND OTHER ASPECTS.

GENERAL NOTES:

UTILITIES:
EXISTING AND PROPOSED UTILITIES ARE SHOWN IN THE GRADING PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING FACILITIES AND SHALL EXERCISE CARE IN ADJACENT CONSTRUCTION.

EXCAVATION AND EARTHWORK:
ALL EXCAVATION AND EMBANKMENT WORK SHALL CONFORM TO Mn/DOT 2451.

CAST-IN-PLACE CONCRETE:
ALL CONCRETE SHALL CONFORM TO Mn/DOT 2461, EXCEPT AS NOTED.

CONSTRUCTION:
CONSTRUCTION SHALL BE IN ACCORDANCE WITH Mn/DOT 2411, EXCEPT AS NOTED.

GEOMETRICS AND GRADES:
DATA FOR BASELINE GEOMETRY IS TABULATED FOR WALL ALIGNMENT, SEE LAYOUT SHEETS. WALL ALIGNMENT REFERENCE IS ALONG FRONT FACE OF WALL.
SEE ALIGNMENT AND CROSS SECTIONS FOR WALL LOCATIONS AND ELEVATIONS.

THE FILL SLOPE CONVENTION OF 1 VERTICAL TO HORIZONTAL IS USED IN THIS PLAN.

COMPACTION REQUIREMENTS:
COMPACT REINFORCED WALL FILL IN ACCORDANCE WITH Mn/DOT SPEC. 2105.3F1 UNLESS RECOMMENDED OTHERWISE BY THE SOILS ENGINEER.

COMPACT GRANULAR BEDDING IN ACCORDANCE WITH Mn/DOT SPEC. 2105.3F1 UNLESS RECOMMENDED OTHERWISE BY THE SOILS ENGINEER.

FILE NAME 4102.MDC

REVISED: 11-12-02
APPROVED: JULY 12, 2002
STATE BRIDGE ENGINEER

REVISION DATE 11-12-02

STANDARD SHEET NO. 5-297.640
STANDARD APPROVED: JULY 12, 2002
TITLE: MODULAR BLOCK RETAINING WALL GENERAL NOTES AND SUMMARY OF QUANTITIES

MODULAR BLOCK WALL REINFORCEMENT LAYOUT

CASE 4 - 1:3 FILL SLOPE

MBW REINFORCEMENT CLASS	STRENGTH OF SOIL REINF. (PLF) LG. TERM (T_{al})	STRENGTH OF SOIL REINF. (PLF) DESIGN (T_a)	① MINIMUM REINFORCEMENT LENGTH, L (FT.)	MAXIMUM WALL HEIGHT (FT.)	② NOMINAL BLOCK WIDTH (IN.)	WALL BATTER RANGE (DEGREES) ≥	WALL BATTER RANGE (DEGREES) <	③ MAXIMUM UNREINFORCED WALL HT. A (IN.)	ZONE 1 H1 (FT.)	ZONE 1 $S1_{MAX}$ (IN.)	ZONE 2 H2 (FT.)	ZONE 2 $S2_{MAX}$ (IN.)	ZONE 3 H3 (FT.)	ZONE 3 $S3_{MAX}$ (IN.)
MBW-700	1050	700	0.7 H	12.0	12	0	3	24	8.5	24	3.5	16		
						3	7	24	9.2	24	2.8	16		
						7	10	24	11.2	24	0.8	16		
						10	15	24	12.0	24				
					21	0	3	32	4.6	32	3.9	24	3.5	16
						3	7	32	5.2	32	3.9	24	2.9	16
						7	10	32	5.2	32	5.9	24	0.9	16
						10	15	32	5.9	32	6.1	24		
MBW-1050	1575	1050	0.7 H	12.0	12	0	3	24	12.0	24				
						3	7	24	12.0	24				
						7	10	24	12.0	24				
						10	15	24	12.0	24				
					21	0	3	42	5.6	42	3.3	32	3.1	24
						3	7	42	8.2	42	2.6	32	1.2	24
						7	10	42	8.5	42	3.5	32		
						10	15	42	9.8	42	2.2	32		
MBW-1400	2100	1400	0.7 H	12.0	12	0	3	24	12.0	24				
						3	7	24	12.0	24				
						7	10	24	12.0	24				
						10	15	24	12.0	24				
					21	0	3	42	8.9	42	3.1	32		
						3	7	42	10.8	42	1.2	32		
						7	10	42	12.0	42				
						10	15	42	12.0	42				

INSTRUCTIONS TO CONTRACTOR:

USE AS MANY ZONES AS WALL HEIGHT REQUIRES, STARTING WITH ZONE 1 AND ADDING ADDITIONAL ZONES TO THE BOTTOM OF THE WALL AS NEEDED TO MAKE UP THE TOTAL WALL HEIGHT (H) NEEDED.

REINFORCEMENT CLASS, NOMINAL BLOCK WIDTH AND WALL BATTER ARE GENERALLY THE CONTRACTOR'S OPTION TO SELECT FROM Mn/DOT APPROVED PRODUCTS LISTS LOCATED AT www.mrr.dot.state.mn.us/geotechnical/foundations/foundations.asp.

NOTES TO CONTRACTOR:

① OR 4 FT. MINIMUM, WHICHEVER IS GREATER.

② WIDTH - AS MEASURED FROM FRONT TO BACK FACE OF BLOCK UNIT.

③ MAXIMUM DISTANCE FROM TOP OF WALL TO FIRST REINFORCEMENT LAYER. UNREINFORCED WALLS ARE NOT INCLUDED IN THIS STANDARD BUT MAY BE CONSTRUCTED UP TO AT LEAST THE HEIGHT GIVEN IN THE TABLE FOR A GIVEN NOMINAL BLOCK WIDTH AND THE SPECIFIED FILL MATERIALS CONTAINED IN THIS STANDARD.

④ PAY LIMITS OF STRUCTURAL EXCAVATION. ACTUAL EXCAVATION SLOPE IS DETERMINED BY OSHA REGULATIONS AND IN-SITU SOILS; EXCAVATION BEYOND "LIMITS OF STRUCTURAL EXCAVATION" AT CONTRACTOR'S EXPENSE.

⑤ THE WRAP LENGTH FOR GEOTEXTILE FABRIC SHALL NOT BE MORE THAN 6".

⑥ INSPECT EXCAVATION SLOPES FOR ACTIVE SEEPAGE AND PLACE ADDITIONAL DRAINS WHERE SEEPAGE OCCURS AS DIRECTED BY THE ENGINEER.

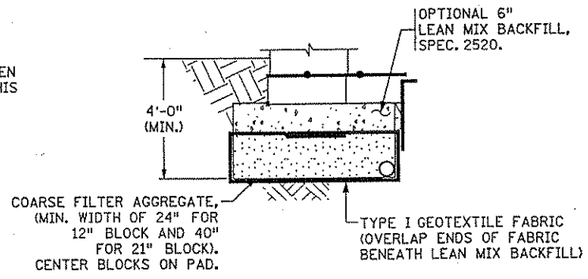
⑦ PLACE DRAIN AT BOTTOM OF REINFORCED SOIL IF PIPE CAN BE SLOPED TO OUTLET. DO NOT OUTLET ONTO A SIDEWALK.

⑧ IF PIPE AT THIS ELEVATION CANNOT BE SLOPED TO DRAIN, OMIT DRAIN AND USE "CONCRETE PAD WITHOUT DRAIN" DETAIL.

⑨ 4" THERMOPLASTIC PERFORATED PIPE, SPEC. 3245, WRAP WITH TYPE I GEOTEXTILE, SPEC. 3733 (TYP.) INSTALLATION AS PER SPEC. 2502, WITH PRECAST CONCRETE HEAD WALL AT OUTLET.

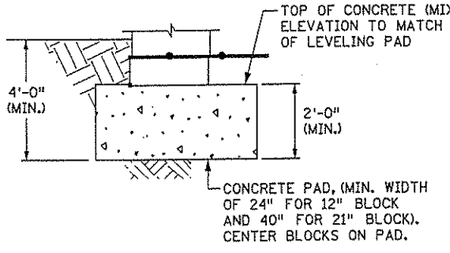
⑩ S_{MAX} = 0.5 $S1_{MAX}$ IF THE WALL HEIGHT IS WITHIN ZONE 1.
S_{MAX} = 0.5 $S2_{MAX}$ IF THE WALL HEIGHT IS WITHIN ZONE 2.
S_{MAX} = 0.5 $S3_{MAX}$ IF THE WALL HEIGHT IS WITHIN ZONE 3.

⑪ THE REINFORCED WALL FILL DRAIN MAY BE CONNECTED INTO FOOTING DRAIN, INSTEAD OF OUT LETTING THROUGH THE WALL. IF CAPACITY IS ADEQUATE TO TRANSMIT THE FLOW.



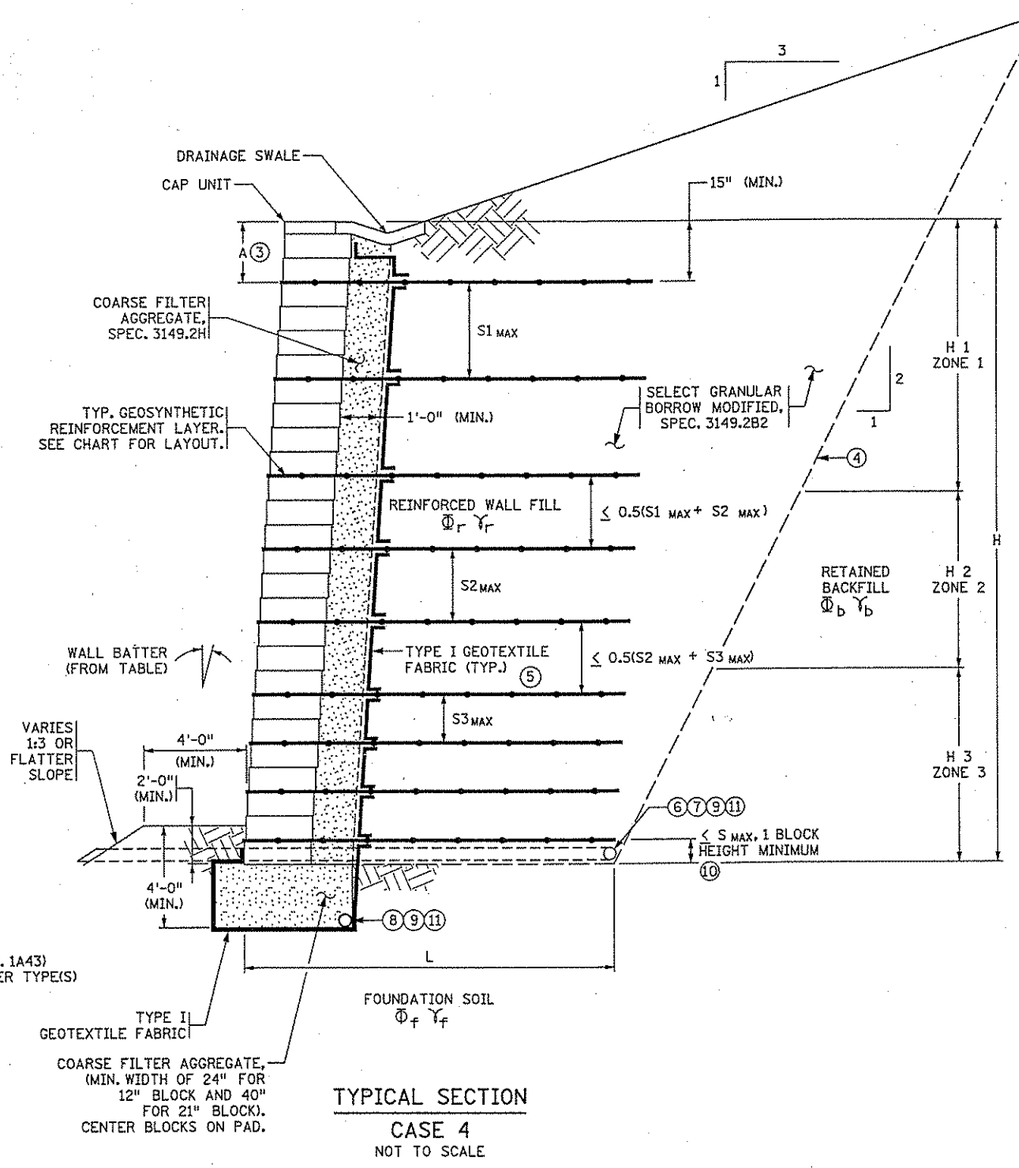
OPTIONAL CONCRETE LEVELING PAD

NOT TO SCALE



CONCRETE PAD WITHOUT DRAIN

NOT TO SCALE



TYPICAL SECTION

CASE 4

NOT TO SCALE

FILE NAME 4102FR.MDD

REVISED: 11-12-02

APPROVED: JULY 12, 2002

STATE BRIDGE ENGINEER

STANDARD SHEET NO.	TITLE:
5-297.644	MODULAR BLOCK RETAINING WALL SOIL REINFORCEMENT FOR 1:3 FILL SLOPE, CASE 4
STANDARD APPROVED: JULY 12, 2002	

REVISION DATE 11-12-02

STATE PROJ. NO. 0212-43 (TH242) SHEET NO. 12 OF 49 SHEETS

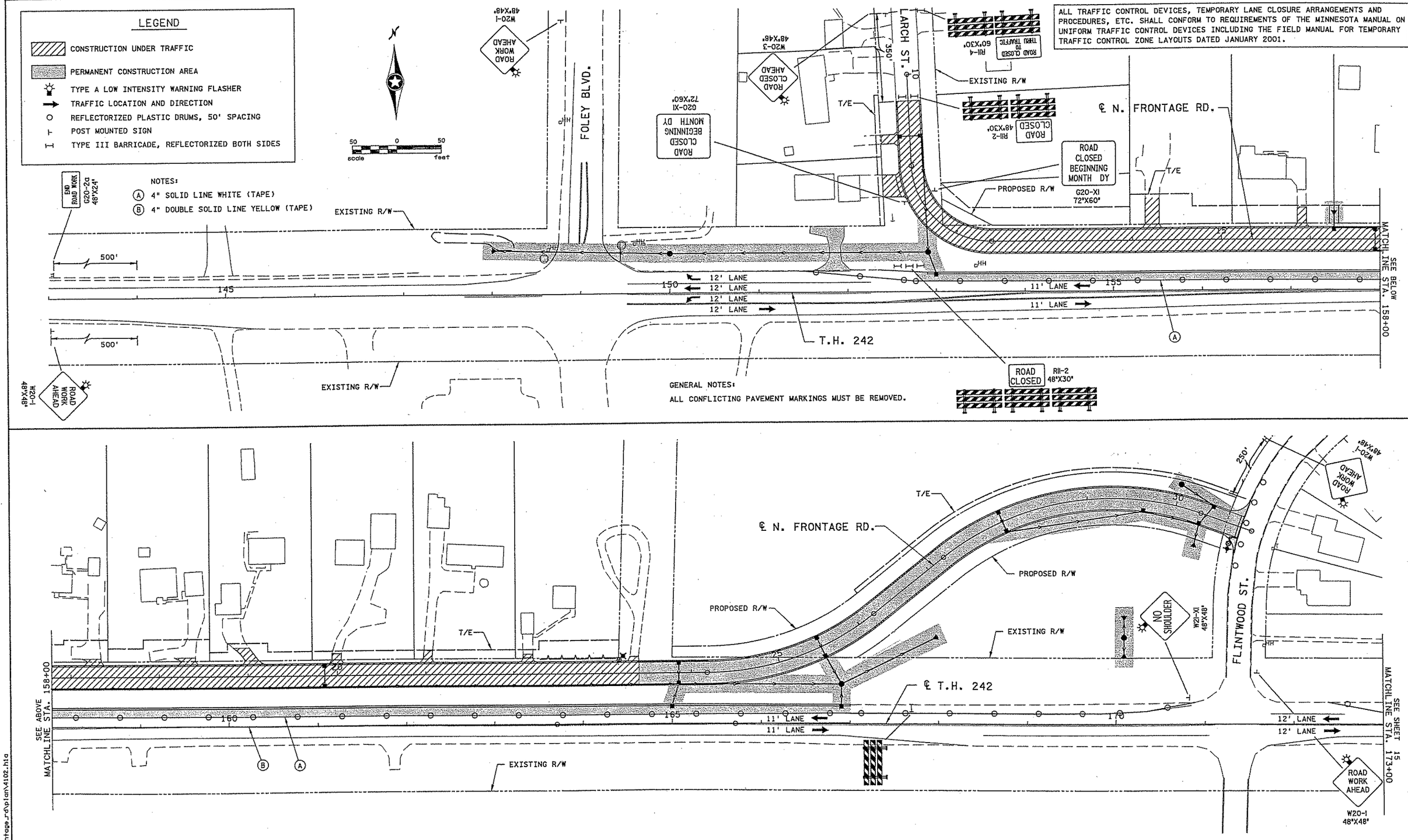
LEGEND

- CONSTRUCTION UNDER TRAFFIC
- PERMANENT CONSTRUCTION AREA
- TYPE A LOW INTENSITY WARNING FLASHER
- TRAFFIC LOCATION AND DIRECTION
- REFLECTORIZED PLASTIC DRUMS, 50' SPACING
- POST MOUNTED SIGN
- TYPE III BARRICADE, REFLECTORIZED BOTH SIDES

ALL TRAFFIC CONTROL DEVICES, TEMPORARY LANE CLOSURE ARRANGEMENTS AND PROCEDURES, ETC. SHALL CONFORM TO REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS DATED JANUARY 2001.

NOTES:
(A) 4" SOLID LINE WHITE (TAPE)
(B) 4" DOUBLE SOLID LINE YELLOW (TAPE)

GENERAL NOTES:
ALL CONFLICTING PAVEMENT MARKINGS MUST BE REMOVED.



NO	DATE	BY	CKD	APPR	REVISION
...\4102.hla					

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
STAGING AND TRAFFIC CONTROL PLAN
242 N. FRONTAGE ROAD
T.H. 242 AND NORTH FRONTAGE ROAD

SHEET 14 OF 49

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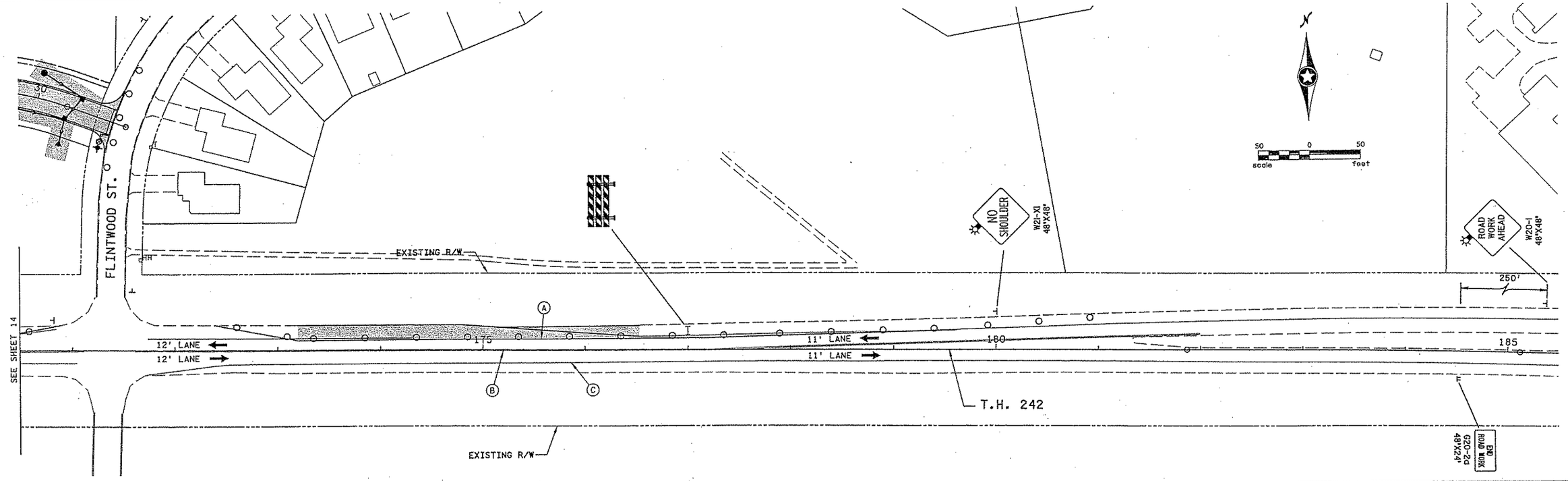

LEGEND

- CONSTRUCTION UNDER TRAFFIC
- PERMANENT CONSTRUCTION AREA
- TYPE A LOW INTENSITY WARNING FLASHER
- TRAFFIC LOCATION AND DIRECTION
- REFLECTORIZED PLASTIC DRUMS, 50' SPACING
- POST MOUNTED SIGN
- TYPE III BARRICADE, REFLECTORIZED BOTH SIDES

NOTES:

(A) 4" SOLID LINE WHITE (TAPE)
(B) 4" DOUBLE SOLID LINE YELLOW (TAPE)
(C) 4" SOLID LINE WHITE (TAPE)

GENERAL NOTES:

ALL CONFLICTING PAVEMENT MARKINGS MUST BE REMOVED.

GENERAL TRAFFIC CONTROL NOTES:

1. ALL TRAFFIC CONTROL DEVICES, TEMPORARY LANE CLOSURE ARRANGEMENTS AND PROCEDURES, ETC. SHALL CONFORM TO REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS DATED JANUARY 2001.
2. THE LOCATIONS AND QUANTITIES OF TRAFFIC CONTROL DEVICES SHOWN ON THESE PLANS ARE APPROXIMATE AND ARE SUBJECT TO REVISION BY THE ENGINEER.
3. THE CONTRACTOR SHALL MAINTAIN A 2-FT MINIMUM CLEAR DISTANCE BETWEEN THE EDGE OF THE TRAVEL LANE AND THE NEAREST EDGE OF ANY ADJACENT TRAFFIC CONTROL DEVICES (DRUMS, BARRICADES, BARRIERS, ETC.)
4. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AT ALL TIMES TO THE SATISFACTION OF THE ENGINEER.
5. THE CONTRACTOR SHALL PROVIDE CHANNELIZING DEVICES (AND SIGNING IF NECESSARY) AT ALL PRIVATE ENTRANCE LOCATIONS WHERE NEEDED, TO SAFELY GUIDE TRAFFIC TO AND FROM THE TRAVEL CORRIDOR, TO THE SATISFACTION OF THE ENGINEER.
6. THE CONTRACTOR SHALL REMOVE, SALVAGE, OR COVER AS APPROPRIATE, ALL EXISTING SIGNING WHICH CONFLICTS WITH THIS TRAFFIC CONTROL PLAN TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL RESTORE ALL APPROPRIATE, ORIGINAL SIGNING WHEN AND AS DIRECTED BY THE ENGINEER.
7. THESE TRAFFIC CONTROL LAYOUTS DO NOT SHOW ALL INPLACE SIGNING. CONTRACTOR SHALL RELOCATE ALL APPROPRIATE INPLACE SIGNING TO MAINTAIN PROPER SIGN VISIBILITY DURING CONSTRUCTION AS DEEMED NECESSARY BY THE ENGINEER.
8. 1:3 MAXIMUM TEMPORARY CONSTRUCTION EDGE SLOPES SHALL BE MAINTAINED AT ALL TIMES EXCEPT WHEN EXCAVATION WORK TEMPORARILY MANDATES STEEPER EDGE SLOPES. WHEN STEEPER EDGE SLOPES ARE NECESSARY (AS APPROVED BY THE ENGINEER), CONTRACTOR SHALL PROVIDE PPCB AND ATTENUATORS (INCIDENTAL).
9. THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, AS APPROPRIATE, ALL SIGNS, PAVEMENT MARKINGS, AND DEVICES SHOWN ON THESE PLANS TO THE SATISFACTION OF THE ENGINEER.
10. ALL SIGN COLORS SHALL BE STANDARD UNLESS OTHERWISE INDICATED AND CONFORM TO THE REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CODE DEVICES.

ALL TRAFFIC CONTROL DEVICES, TEMPORARY LANE CLOSURE ARRANGEMENTS AND PROCEDURES, ETC. SHALL CONFORM TO REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING THE FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS DATED JANUARY 2001.

NO	DATE	BY	CKD	APPR	REVISION
...\4102.hlb					

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
STAGING AND TRAFFIC CONTROL PLAN
242 N. FRONTAGE ROAD
T.H. 242 AND NORTH FRONTAGE ROAD

SHEET 15 OF 49

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5/22/2003
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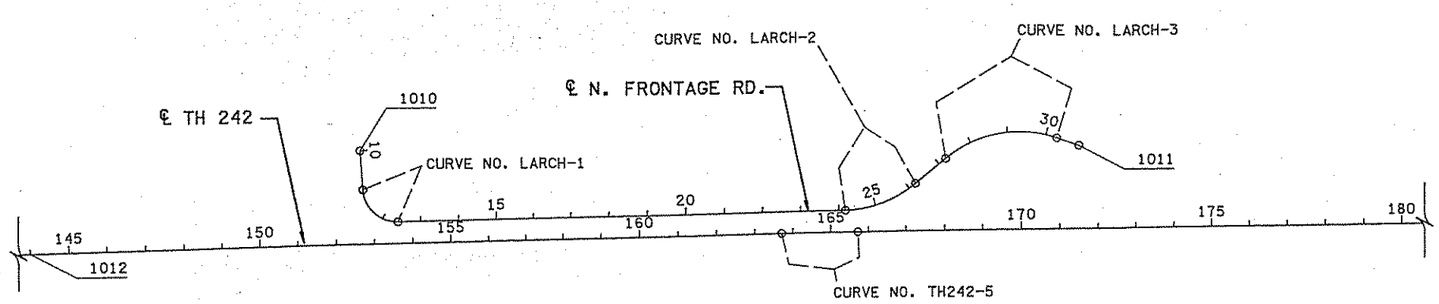

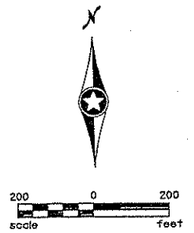

PT. NO.	POINT	STATION	CURVE DATA Δ	D	R	T	L	COORDINATES X	Y	AZIMUTH
℄ N. FRONTAGE RD.										
1010	POT	10+00.00						496,334.068	159,187.380	176° 17' 56.31"
LARCH-1	PC	11+03.36						496,340.739	159,084.239	
	PI	11+89.33	87° 22' 35.89" LT	63° 39' 43.12"	90.000'	85.971'	137.251'	496,346.289	158,998.448	PI
	CC							496,430.552	159,090.049	
	PT	12+40.61						496,432.244	159,000.064	88° 55' 20.41"
LARCH-2	PC	24+18.20						497,609.627	159,022.212	
	PI	25+23.51	38° 41' 12.67" LT	19° 05' 54.94"	300.000'	105.314'	202.564'	497,714.923	159,024.193	PI
	CC							497,603.985	159,322.159	
	PT	26+20.76						497,795.875	159,091.555	50° 14' 07.75"
LARCH-3	PC	27+22.42						497,874.019	159,156.580	
	PI	28+91.02	58° 40' 19.79" RT	19° 05' 54.94"	300.000'	168.601'	307.207'	498,003.619	159,264.423	PI
	CC							498,065.909	158,925.976	
	PT	30+29.63						498,163.122	159,209.789	108° 54' 27.53"
1011	POT	30+90.26						498,220.486	159,190.140	
℄ TH 242										
1012	POT	144+00.00						495,471.248	158,924.977	88° 55' 20.35"
TH242-5	PC	163+70.61						497,441.508	158,962.040	
	PI	164+70.74	0° 30' 02.37" RT	0° 15' 00.00"	22,918.312'	100.132'	200.263'	497,541.623	158,963.923	PI
	CC							497,872.555	136,047.782	
	PT	165+70.87						497,641.750	158,964.932	89° 25' 22.72"

LEGEND

1022 ALIGNMENT POINT NO. (SEE ALIGNMENT TABULATION)

HORIZONTAL CONTROL IS BASED ON ANOKA COUNTY COORDINATES

NO	DATE	BY	CKD	APPR	REVISION

...\4102.apa

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Print Name: NATHEN A. WILL

Date 5-22-03 License # 26391

STATE PROJECT NO.

S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 001.4102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY

ALIGNMENT PLAN AND TABULATION
242 N. FRONTAGE ROAD

SHEET 16 OF 49

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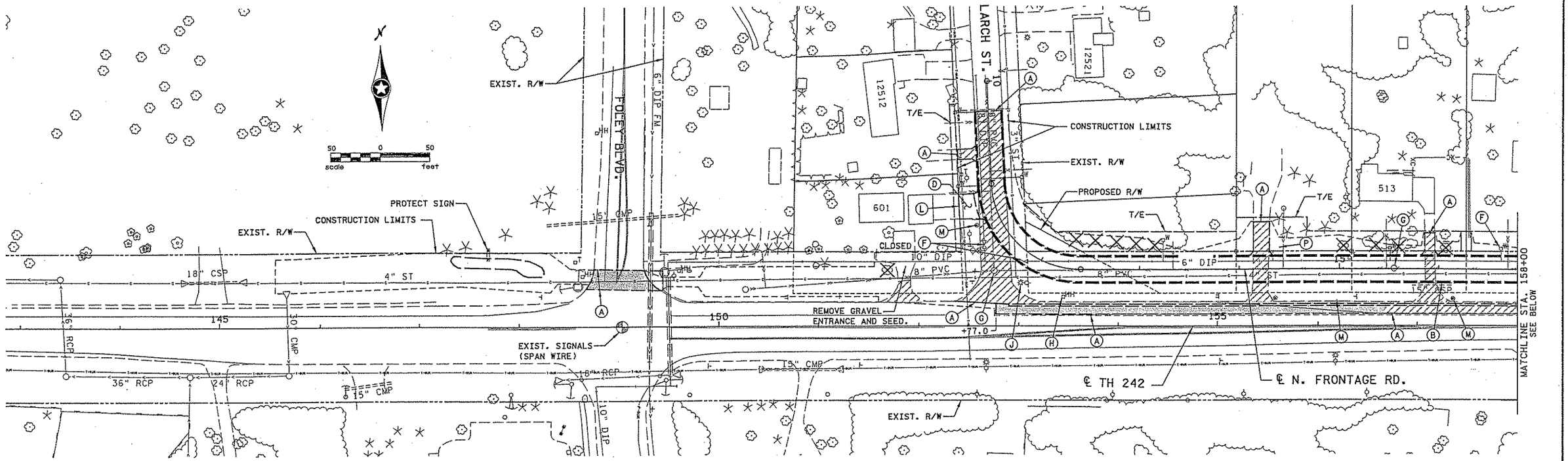

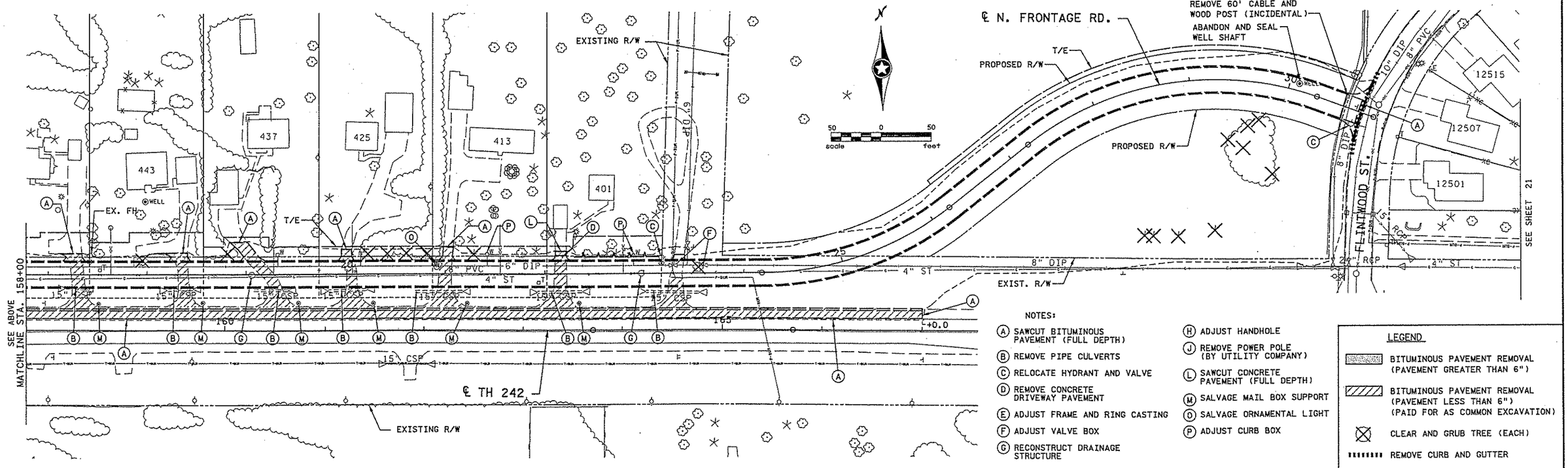

NOTES:

- (A) SAWCUT BITUMINOUS PAVEMENT (FULL DEPTH)
- (B) REMOVE PIPE CULVERTS
- (C) RELOCATE HYDRANT AND VALVE
- (D) REMOVE CONCRETE DRIVEWAY PAVEMENT
- (E) ADJUST FRAME AND RING CASTING
- (F) ADJUST VALVE BOX
- (G) RECONSTRUCT DRAINAGE STRUCTURE
- (H) ADJUST HANDHOLE
- (J) REMOVE POWER POLE (BY UTILITY COMPANY)
- (L) SAWCUT CONCRETE PAVEMENT (FULL DEPTH)
- (M) SALVAGE MAIL BOX SUPPORT
- (O) SALVAGE ORNAMENTAL LIGHT
- (P) ADJUST CURB BOX

LEGEND

- BITUMINOUS PAVEMENT REMOVAL (PAVEMENT GREATER THAN 6")
- BITUMINOUS PAVEMENT REMOVAL (PAVEMENT LESS THAN 6") (PAID FOR AS COMMON EXCAVATION)
- CLEAR AND GRUB TREE (EACH)
- REMOVE CURB AND GUTTER

NO	DATE	BY	CKD	APPR	REVISION
1	5-1-03	DF	NW		DELETED NOTES TO SALVAGE SIGNS

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Date 5-22-03 License # 26391

STATE PROJECT NO.

S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY

EXISTING TOPOGRAPHY, UTILITIES, AND REMOVAL PLAN
242 N. FRONTAGE ROAD

SHEET 17 OF 49

NOTES:

(A) TRANSITION B618 CURB AND GUTTER TO 3" BITUMINOUS CURB IN 3.0'
(B) B424 CURB AND GUTTER
(C) B618 CURB AND GUTTER
(E) 5' TRANSITION CURB 4" HEIGHT TO 0" HEIGHT
(F) 6" CONCRETE DRIVEWAY PAVEMENT
(G) 2" BITUMINOUS DRIVEWAY
(J) INSTALL MAIL BOX SUPPORT
(M) GRADE DITCH TO POSITIVELY DRAIN. (PAID FOR COMMON EXCAVATION)

→ = FLOW ARROW

N

50 0 50
scale feet

CONSTRUCT 1.5' (MIN.) HIGH BERM USING 1:4 SLOPES AND 3.0' BERM TOP. (PAID FOR AS COMMON EXCAVATION)

EXISTING R/W
CONSTRUCTION LIMITS
EX. SIGN
18" CSP
INV. 890.23
15" CMP
FOLEY BLVD.
6" DIP FM
EXISTING 3" BITUMINOUS CURB
LARCH ST.
10" DIP
8" PVC
12512
2521
601
513
T/E
BEGIN CONSTRUCTION MATCH EXISTING N. FRONTAGE RD. STA. 10+30
℄ N. FRONTAGE RD.
CONSTRUCTION LIMITS
EXISTING R/W
PROPOSED R/W
EXTEND 4" SANITARY SEWER AND 1" COPPER WATER SERVICE 10' PAST EXIST. RIGHT OF WAY (PLUG INCIDENTAL)
10" DIP
8" PVC
6" DIP
12.5'
15
B-5
10.0'
EXISTING SIGNALS (SPAN WIRE)
36" RCP
24" RCP
18" RCP
15" CMP
30" CMP
145
150
155
+77
+83
BEGIN SP 0212-43
℄ TH 242 STA. 145+10
℄ TH 242
MATCHLINE STA. 16+78.37
SEE SHEET NO. 19

B.M. ELEV. 896.53
MN/DOT DISC # 0212K 1980
2.6 MI EAST OF TH 10-TH 47 AT TH 242 MP 5.3, 70 FT NORTH OF TH242.

PROPOSED LT. DITCH

APRON (202)
(TH 242)
STA. 148+00
OFFSET 50' (RT)

MH (203)
(TH 242)
T.C. 898.70
STA. 150+00
OFFSET 45' (LT)

EXISTING DITCH GROUND LINE
EXISTING 30" CSP
INV. 890.23
INV. 891.88
190'-18" RCP @ 0.45%
+6.70%
EXISTING 10" DIP W.M.
BEGIN S.D.G. (LT)
STA. 145+67
INV. 889.73
END S.D.G. (LT)
STA. 148+00
INV. 891.36
EXIST. 16" CASING
EXIST. 24" CASING
INV. 892.78
INV. 892.88
SEE SHEET NO. 23

N. FRONTAGE ROAD

CB (111) (LARCH)
T.C. 897.01
STA. 10+70.00
12.83' (LT)

MH (204) (TH242)
T.C. 902.91
STA. 152+91.00
45.0' (LT)

CB (113) (LARCH)
T.C. 901.15
STA. 16+27.00
12.83' (LT)

CB (115) (LARCH)
T.C. 900.86
STA. 16+73.00
12.83' (RT)

BEGIN CONSTRUCTION
N. FRONTAGE RD.
MATCH EXISTING
STA. 10+30.00
ELEV. 897.77

VPI 11+15.000 ELEV. 896.871
VPC +40.00 ELEV. 897.67
150.00 ' V.C.
L.P. 10+69.68
L.P. ELEV. 897.51
DRIVE (RT.)
+20.0
-1.06%
VPT +90.00 ELEV. 900.10
VPC +75.00 ELEV. 903.75
+4.30%
130'-15" RCP @ 0.30%
INV. 894.08
INV. 893.69
EXIST. 6" DIP W.M.
EXIST. 8" DIP W.M.
EXIST. 8" PVC SAN. SWR.
EXIST. 8" PVC SANITARY SEWER
VPI 14+00.000 ELEV. 909.126
250.00 ' V.C.
H.P. 14+06.10
H.P. ELEV. 906.57
FINISHED GRADE
EXISTING GROUND
+21.4
0.5' TO GRADING GRADE
WATERMAIN INSULATION (5' WIDE)
VPT +25.00 ELEV. 904.25
+91.1
INV. 897.63
47'-15" RCP @ 1.0%
INV. 897.16
INV. 896.70
WATERMAIN INSULATION (5' WIDE)
VPI 16+60.000 ELEV. 898.986
270.00 ' V.C.
L.P. 16+73.31
L.P. ELEV. 901.36
DRIVE (LT)
℄ DRIVE (LT)

920 910 900 890 880 870
10+00 11+00 12+00 13+00 14+00 15+00 16+00
145+00 146+00 147+00 148+00 149+00 150+00

NO	DATE	BY	CKD	APPR	REVISION
...\4102.cpa					

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Print Name: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO.
S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
CONSTRUCTION PLAN AND PROFILE
242 N. FRONTAGE ROAD
T.H. 242 AND N. FRONTAGE ROAD

SHEET 18 OF 49

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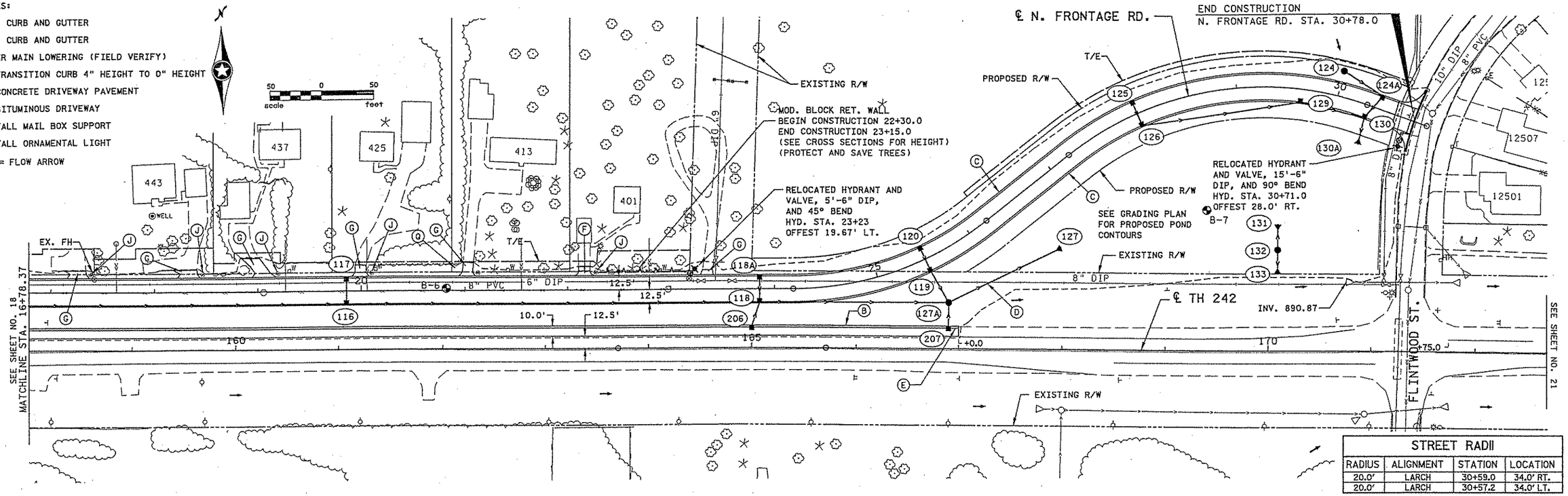
NOTES:

(B) B424 CURB AND GUTTER
(C) B618 CURB AND GUTTER
(D) WATER MAIN LOWERING (FIELD VERIFY)
(E) 5' TRANSITION CURB 4" HEIGHT TO 0" HEIGHT
(F) 6" CONCRETE DRIVEWAY PAVEMENT
(G) 2" BITUMINOUS DRIVEWAY
(J) INSTALL MAIL BOX SUPPORT
(Q) INSTALL ORNAMENTAL LIGHT
→ = FLOW ARROW

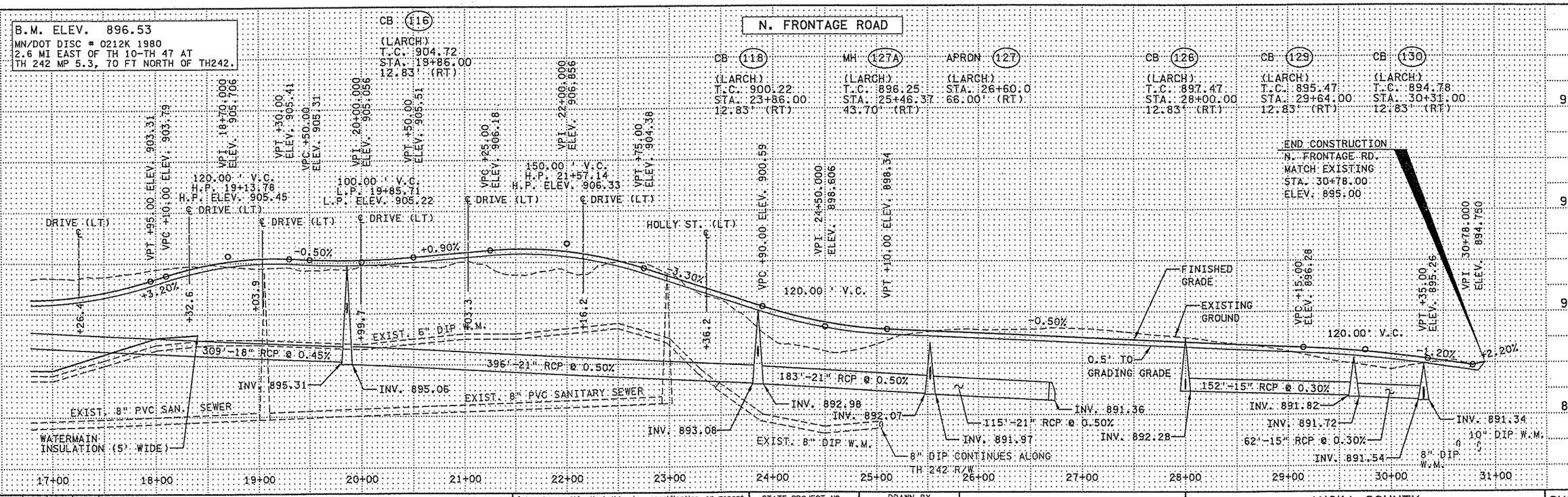


STREET RADII			
RADIUS	ALIGNMENT	STATION	LOCATION
20.0'	LARCH	30+59.0	34.0' RT.
20.0'	LARCH	30+57.2	34.0' LT.

B.M. ELEV. 896.53
MN/DOT DISC # 0212K 1980
2.6 MI EAST OF TH 10-TH 47 AT
TH 242 MP 5.3, 70 FT NORTH OF TH242.

N. FRONTAGE ROAD

CB (116) (LARCH) T.C. 904.72 STA. 19+86.00 12.83' (RT)
CB (118) (LARCH) T.C. 900.22 STA. 23+86.00 12.83' (RT)
MH (127A) (LARCH) T.C. 896.25 STA. 25+46.37 43.70' (RT)
APRON (127) (LARCH) STA. 26+60.0 66.00' (RT)
CB (126) (LARCH) T.C. 897.47 STA. 28+00.00 12.83' (RT)
CB (129) (LARCH) T.C. 895.47 STA. 29+64.00 12.83' (RT)
CB (130) (LARCH) T.C. 894.78 STA. 30+31.00 12.83' (RT)



NO	DATE	BY	CKD	APPR	REVISION
...\4102.opb					

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Print Name: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO. S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 001.4102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
CONSTRUCTION PLAN AND PROFILE
242 N. FRONTAGE ROAD
T.H. 242 AND N. FRONTAGE ROAD

SHEET 19 OF 49

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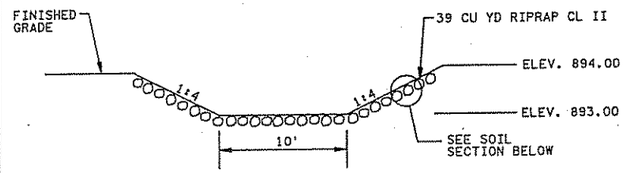
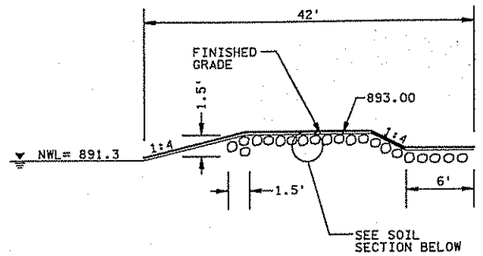
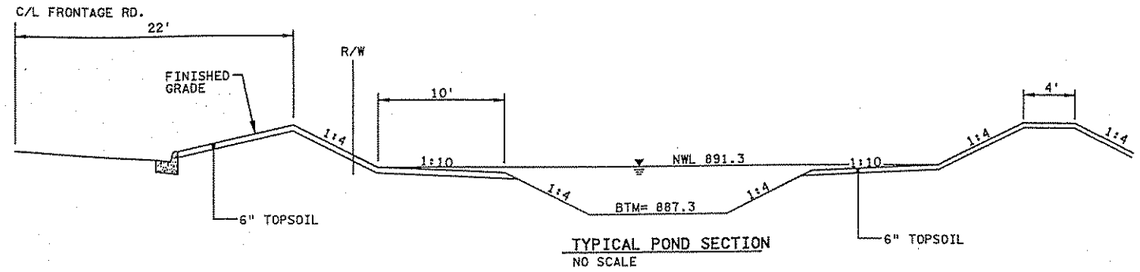


CROSS SECTION VIEW
NO SCALE



PROFILE VIEW



TYPICAL POND SECTION
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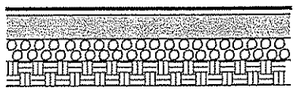
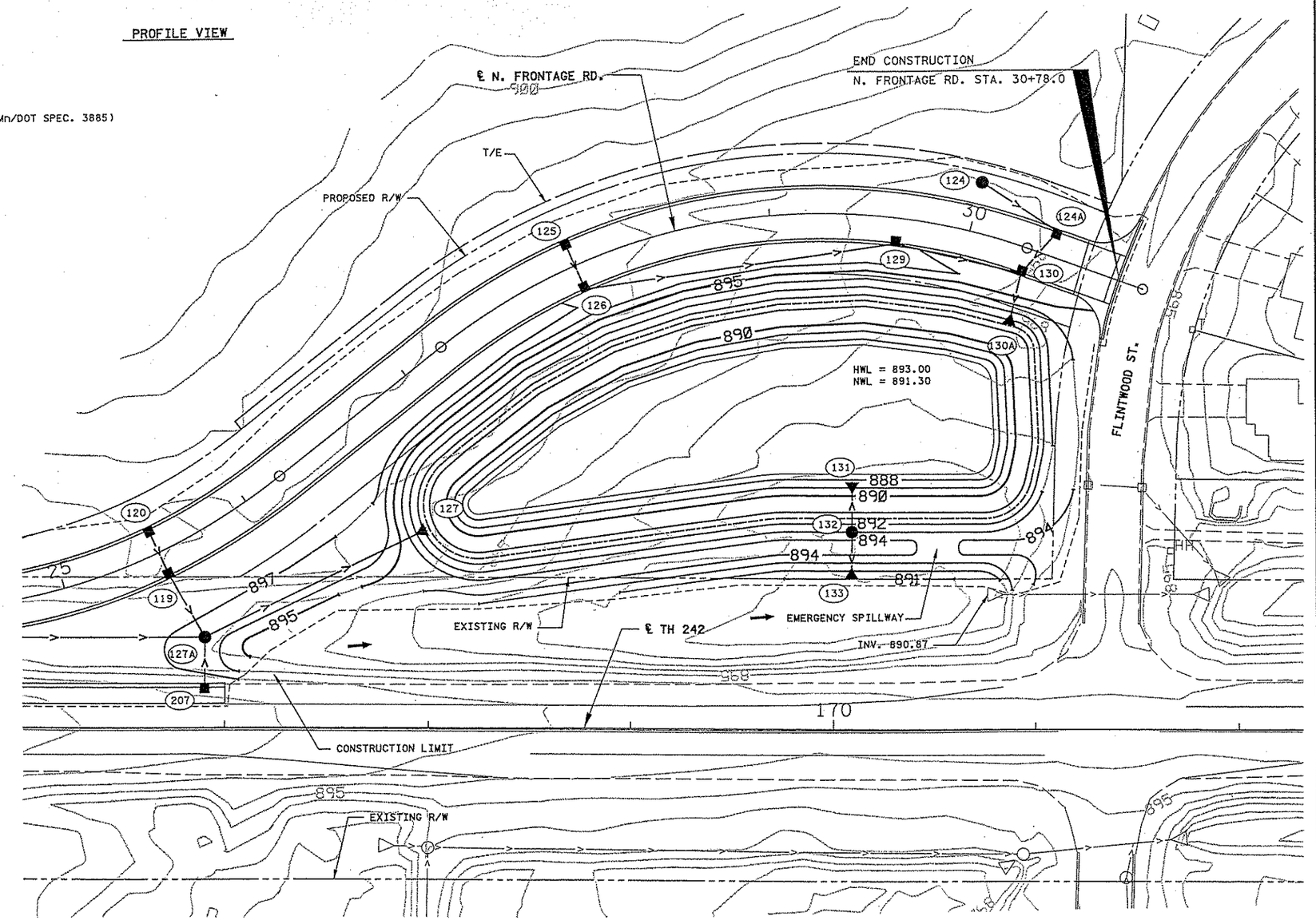


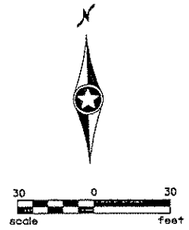
BIODEGRADABLE CATEGORY 3 EROSION CONTROL BLANKET (Mn/DOT SPEC. 3885)
3" TOPSOIL AND SEED MIXTURE 28B.
9" RIPRAP CL. II ①
GEOTEXTILE FABRIC TYPE III (INCIDENTAL TO RIPRAP)

SOIL SECTION
NO SCALE

POND EMERGENCY SPILLWAY

NOTES:
SEE SHEET 24 FOR LOCATION OF EMERGENCY SPILLWAY.
① FILL ANNULAR SPACE WITH TOPSOIL.





NO	DATE	BY	CKD	APPR	REVISION
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DRAWN BY D.FITCHORN
DESIGNED BY P.MCLARNON
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
GRADING PLAN
242 N. FRONTAGE ROAD
POND AT FRONTAGE RD. AND FLINTWOOD ST.

SHEET 20 OF 49

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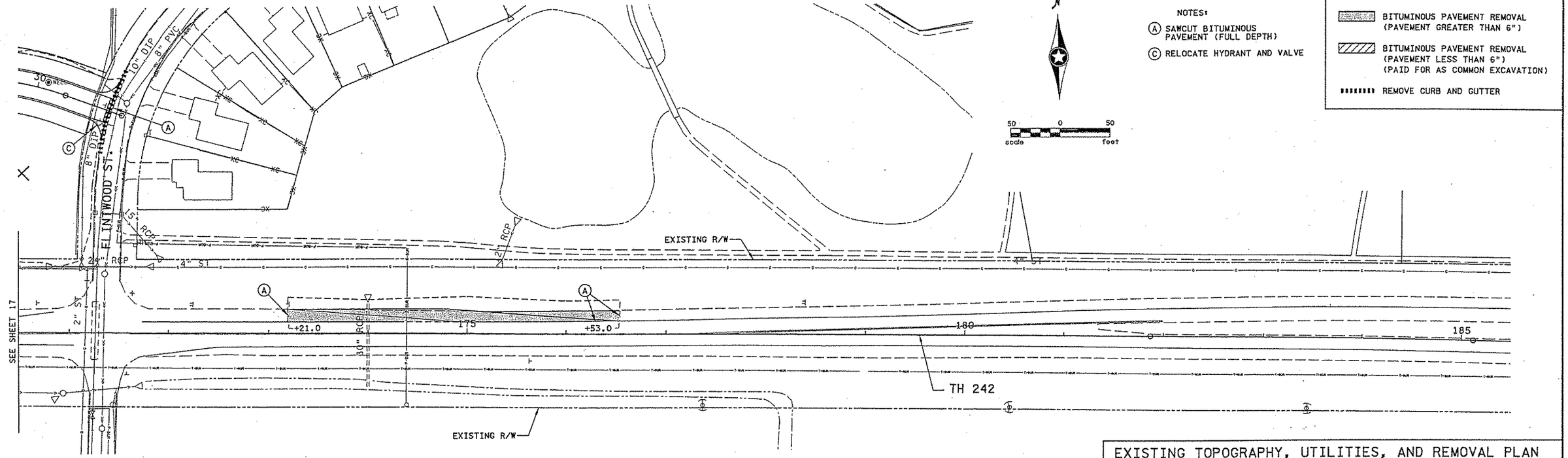
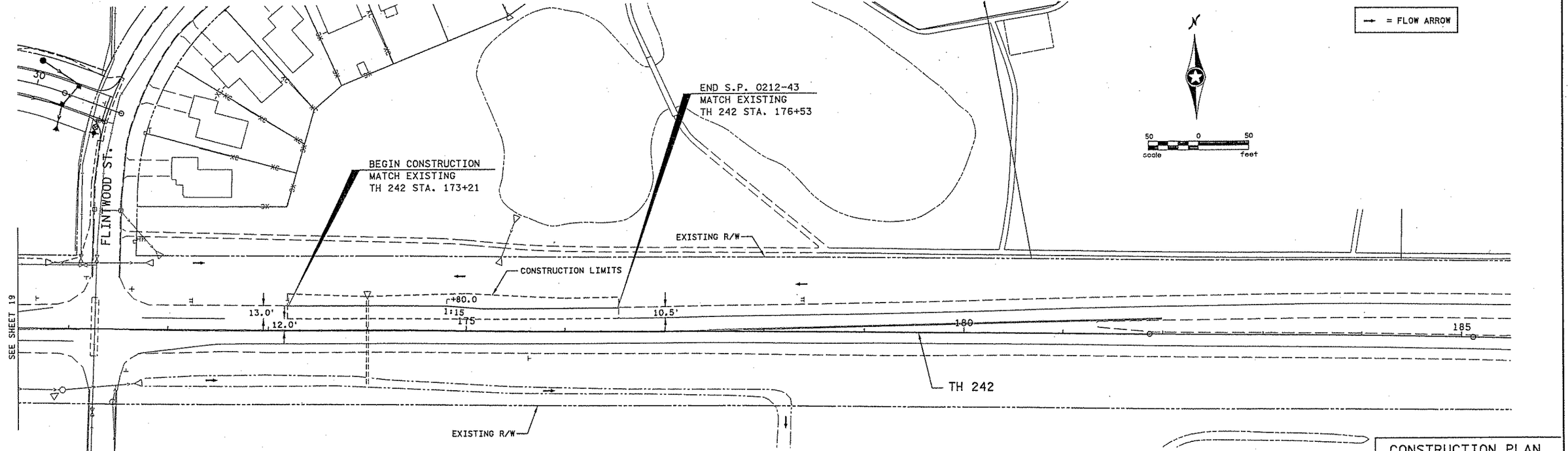


EXISTING TOPOGRAPHY, UTILITIES, AND REMOVAL PLAN



CONSTRUCTION PLAN

NO	DATE	BY	CKD	APPR	REVISION
1	5-1-03	DF	NW		DELETED NOTES TO SALVAGE SIGNS
...\4102.tpb					

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S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
T.H. 242 SHOULDER EXIST. TOPOGRAPHY AND CONSTRUCTION PLAN
242 N. FRONTAGE ROAD
T.H. 242 AND NORTH FRONTAGE ROAD

SHEET 21 OF 49

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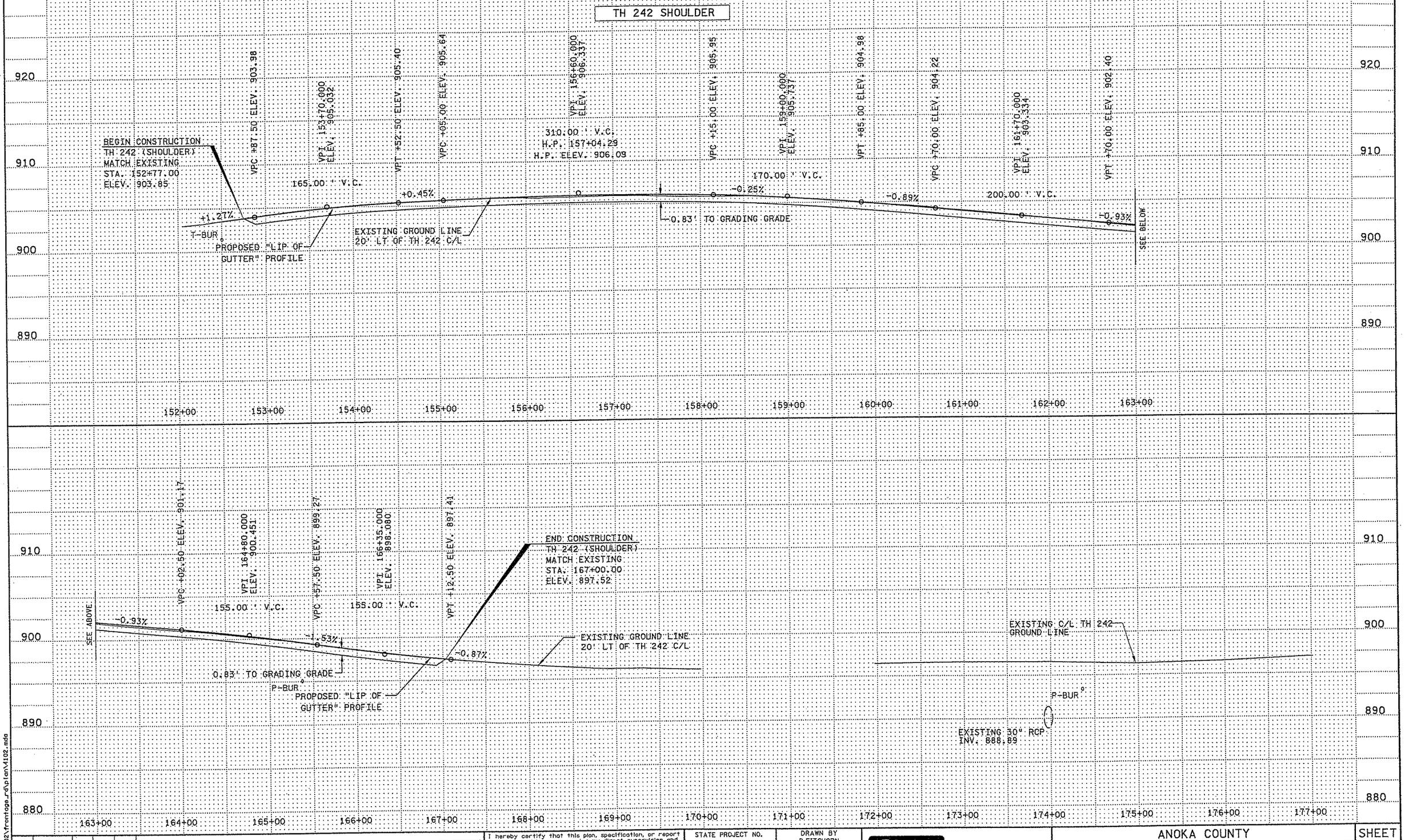

NO	DATE	BY	CKD	APPR	REVISION
					...\4102.mda

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Print Name: NATHEN A. WILL

Date 5-22-05 License # 26391

STATE PROJECT NO.

S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY

T.H. 242 SHOULDER PROFILE
242 N. FRONTAGE ROAD

SHEET 22 OF 49

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5/22/2005
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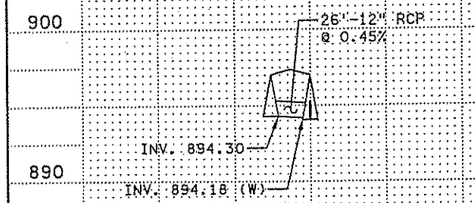
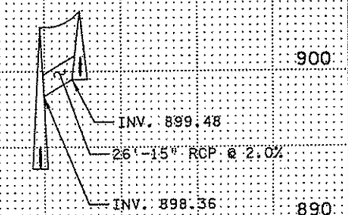
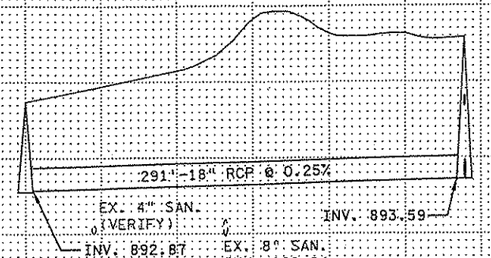
CB (110) CB (111)
(LARCH)
T.C. 897.01
STA. 10+70.00
12.83' (RT)



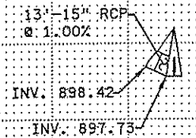
MH (204) CB (205)
(TH242)
T.C. 903.98
STA. 153+00.00
21.0' (LT)



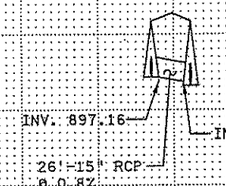
MH (203) MH (204)
(TH242)
T.C. 898.70
STA. 150+00.00
45.0' (LT)



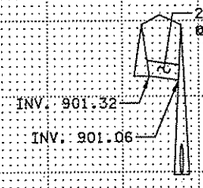
APRON (109) CB (113)
(LARCH)
STA. 16+27.00
32.5' (LT)



CB (114) CB (115)
(LARCH)
T.C. 900.86
STA. 16+73.00
12.83' (LT)

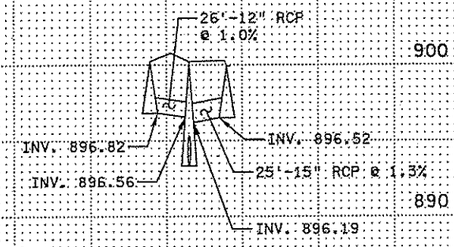


CB (117) CB (116)
(LARCH)
T.C. 904.72
STA. 19+86.00
12.83' (LT)



CB (118A) CB (118) CB (206)
(LARCH)
T.C. 900.22
STA. 23+86.00
12.83' (LT)

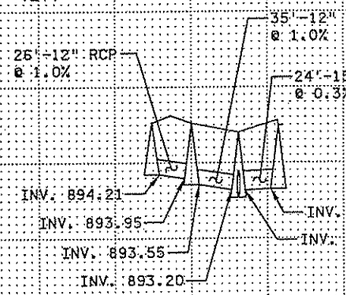
(TH242)
T.C. 899.92
STA. 165+00.00
12.83' (LT)



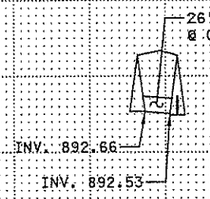
CB (120)
(LARCH)
T.C. 897.61
STA. 25+50.00
12.83' (LT)

CB (119) MH (127A) CB (207)
(LARCH)
T.C. 897.61
STA. 25+50.00
12.83' (RT)

(TH242)
T.C. 897.45
STA. 166+90.00
12.83' (LT)



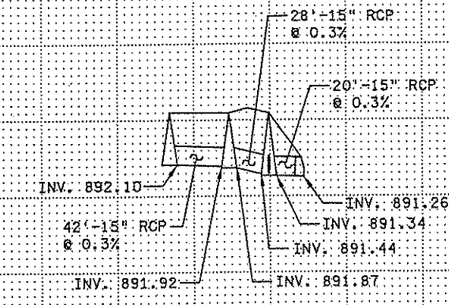
CB (125) CB (126)
(LARCH)
T.C. 896.36
STA. 28+00.00
12.83' (LT)



DI (124) CB (124A) CB (130) APRON (130A)
(LARCH)
T.C. 895.50
STA. 30+00.00
25.0' (LT)

(LARCH)
T.C. 896.36
STA. 30+41.00
12.83' (LT)

(LARCH)
STA. 30+34.00
39.0' (RT)



NO	DATE	BY	CKD	APPR	REVISION

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Print Name: NATHEN A. WILL

Date 5-22-03 License # 26391

STATE PROJECT NO.

S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY

MISCELLANEOUS STORM PROFILES
242 N. FRONTAGE ROAD

SHEET 23 OF 49

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DRAINAGE TABULATION

(H)

FLOWS FROM: STR. OR APRON INLET POINT NO.	LOCATION	STATION (A)	OFFSET (A) FT	L / R (A)	TOP OF CASTING FT	INV ELEV FROM FT	PIPE SLOPE FT/FT	INV ELEV TO FT	FLOWS TO: STR. OR APRON OUTLET POINT NO.	NEW STRUCTURE CONSTRUCTION: (D) (G) DESIGN TYPE	NEW STRUCTURE CONSTRUCTION: PAY HEIGHT LIN FT	NEW STRUCTURE CONSTRUCTION: CASTING ASSEMBLY TYPE	STEPS RE-QUIRED (E)	DRAINAGE PIPE (F) RCP (DESIGN 3006) 12" CL II L.F.	12" CL II APR	15" CL II L.F.	15" CL II APR	18" CL II L.F.	18" CL II APR	21" CL II L.F.	21" CL II APR	SOD TYPE SALT-RES. SQ YD	RIP RAP (B) CL II CU YD	FOOTNOTES
109	LARCH	16+27.00	32.50	L	N/A	898.42	0.010	897.73	113	15" RC APR						13	1							(C), (N)
110	LARCH	10+70.00	12.83	R	897.01	894.30	0.0045	894.18	111	H	2.7	3250-A		26										
111	LARCH	10+70.00	12.83	L	897.01	894.08	0.003	893.69	204	G	2.9	3250-A				130								
113	LARCH	16+27.00	12.83	L	901.15	897.63	0.010	897.16	114	48-4020	3.5	3250-A				47								
113	LARCH	16+27.00	13.62	L					114															
114	LARCH	16+73.00	12.83	L	900.86	897.16	0.008	896.95	115	48-4020	3.7	3250-A				26								
114	LARCH	16+73.00	13.62	L					115															
115	LARCH	16+73.00	12.83	R	900.86	896.70	0.0045	895.31	116	48-4020	4.2	3250-A						309						
115	LARCH	16+73.00	13.62	R					116															
116	LARCH	19+86.00	12.83	R	904.72	895.06	0.005	893.68	118	48-4020	9.7	3250-A	YES							396				
116	LARCH	19+86.00	13.62	R					118															
117	LARCH	19+86.00	12.83	L	904.72	901.32	0.010	901.06	116	H	3.4	3250-A		26										
118A	LARCH	23+86.00	12.83	L	900.22	896.82	0.010	896.56	118	H	3.4	3250-A		26										
118	LARCH	23+86.00	12.83	R	900.22	892.98	0.005	892.79	127A	48-4020	7.2	3250-A	YES							183				
118	LARCH	23+86.00	13.62	R					127A															
119	LARCH	25+50.00	12.83	R	897.61	893.55	0.010	892.84	127A	G	4.1	3250-A		35										
120	LARCH	25+50.00	12.83	L	897.61	894.21	0.010	893.95	119	H	3.4	3250-A		26										
124	LARCH	30+00.00	25.00	L	895.50	892.10	0.003	891.97	124A	H	3.4	M-11				42								
124A	LARCH	30+41.00	12.83	L	896.36	891.87	0.003	891.44	130	48-4020	4.5	3250-A				28								
125	LARCH	28+00.00	12.83	L	896.36	892.66	0.005	892.53	126	H	3.4	3250-A		26										
126	LARCH	28+00.00	12.83	R	897.06	892.28	0.003	891.82	129	G	4.8	3250-A	YES			152								
127A	LARCH	25+46.37	43.70	R	897.00	891.97	0.005	891.36	127	54-4020	5.0	A-7D	YES							115				
127A	LARCH	25+46.37	43.70	R					127															
127	LARCH	26+60.00	66.00	R	N/A	891.36	N/A	N/A	SWALE	21" RC APR											1	15	10	(C)
129	LARCH	29+64.00	12.83	R	894.81	891.72	0.003	891.54	130	G	3.1	3250-A				62								
130	LARCH	30+31.00	12.83	R	894.78	891.34	0.003	N/A	130A	48-4020	3.4	3250-A				20								
130	LARCH	30+31.00	13.62	R					130A															
130A	LARCH	30+34.00	39.00	R	N/A	891.26	N/A	N/A	SWALE	15" RC APR							1					15	8	(C)
131	LARCH	29+53.02	132.98	R	N/A	888.30	0.008	888.55	132	15" RC APR						24	1							(C)
132	LARCH	29+57.45	157.67	R	893.00	888.55	0.010	891.30	133	DES. SPEC.	N/A		YES			23							3.1	(O)
132	LARCH	29+57.45	158.46	R																				
133	LARCH	29+63.30	180.93	R	N/A	891.30	N/A	891.00	SWALE	15" RC APR							1					15	2.9	(C)
202	TH242	148+00.00	50.00	L	N/A	891.88	N/A	N/A	SWALE	18" CS APR									1			15	3.9	(C), (M)
203	TH242	149+81.16	45.00	L	898.70	892.77	0.0045	891.88	202	48-4020	5.9	A-7D	YES					190						
203	TH242	149+81.16	45.00	L					202															
204	TH242	152+53.46	45.00	L	902.91	893.59	0.0025	892.87	203	48-4020	9.3	A-7D	YES					291						
204	TH242	152+53.46	45.00	L					203															
205	TH242	153+00.00	21.00	L	903.98	899.48	0.020	898.36	204	G	4.5	B-9				26								
206	TH242	165+00.00	21.00	L	899.92	896.52	0.013	896.52	118	H	3.4	B-9				25								
207	TH242	166+90.00	21.00	L	897.45	893.25	0.003	893.17	127A	H	4.2	B-9				24								
TOTALS:											103.2			165		642	4	790	1	694		60	27.9	

NOTES:

(A) STATIONS, OFFSETS, AND TOP OF CASTING ELEVATIONS ARE GIVEN TO CENTER OF GRATE.
DESIGN 4020 STRUCTURES FURNISHED WITH TWO STATIONS AND OFFSETS.
SUMP DEPTH IS 0.10' FOR CATCH BASINS.
CENTER OF GRATE IS MEASURED 1.17' FROM THE FACE OF CURB ON LARCH.
CENTER OF GRATE IS MEASURED 1.0' FROM THE FACE OF CURB ON TH 242.

(B) GEOTEXTILE FABRIC, SPEC. 3733 SHALL BE USED IN LIEU OF GRANULAR FILTER BLANKET MATERIAL (INCIDENTAL TO RIPRAP CONSTRUCTION). PLACE RIPRAP TO BOTTOM OF POND WHERE APPLICABLE.

(C) TIE LAST THREE JOINTS AT APRON END.

(D) F & I CASTING. THE FOLLOWING DESIGNATIONS ARE USED IN THE TABULATION TO INDICATE THE DESIGN OF DRAINAGE STRUCTURE TO BE USED:
XX-4020 SEE Mn/DOT STD. PLATE 4020.
H/G SEE Mn/DOT STD. PLATE 4006.

(E) FURNISHING AND INSTALLING STEPS CONSIDERED (INCIDENTAL).

(F) USE CLASS C BEDDING ON ALL STORM SEWER (INCIDENTAL).

(G) INLET PROTECTION SHALL BE USED AROUND ALL CB'S BEFORE THE ROAD IS PAVED. SEE STANDARD EROSION CONTROL PLAN SHEETS.

(M) METAL SAFETY APRON. SEE MN/DOT STD PLATE 3128.

(N) SEE TRASH GUARD DETAIL ON SHEET 9 .

(O) SEE POND OUTLET STRUCTURE GRATE AND RIPRAP DETAIL ON SHEET 25 .

(I) CASTING ASSEMBLIES SUMMARY

ASSEMBLY	RING OR FRAME CASTING	COVER OR GRATE CASTING (A)	CURB BOX	STANDARD PLATE NO. (B)	QUANTITY	REMARKS
M-11	ROUND CONC.			4143	1	STOOL GRATE
		731		4143		
			N/A			
B-9	805 SQUARE			4132	3	CATCH BASIN
		816		4154		
			N/A			
(C) R-3250-A					15	CATCH BASIN
(D) R-3508-A2					1	CATCH BASIN
			N/A			
A-7D	700-4			4101	3	MANHOLE
		715		4110		
			N/A			
PROJECT TOTALS:					23	

NOTES:
(A) USE BENT BOLT WITH 816 GRATE.
(B) USE SHEET 5 FOR STANDARD PLATE SUMMARY.
(C) USE NEENAH R3250-A OR APPROVED EQUAL.
(D) USE DRIVEWAY NEENAH R-3508-A2 OR APPROVED EQUAL.

NO	DATE	BY	CKD	APPR	REVISION

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL
Date 5-22-03 License # 26391

STATE PROJECT NO. S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY
TABULATIONS
242 N. FRONTAGE ROAD

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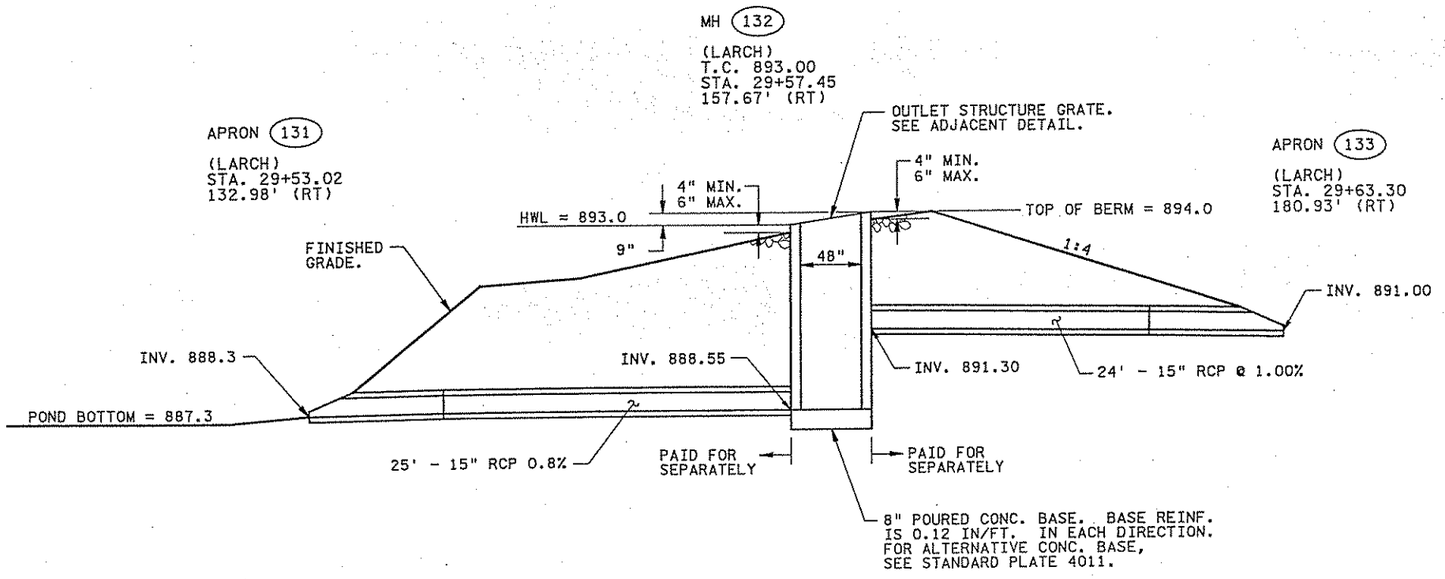


NOTES:

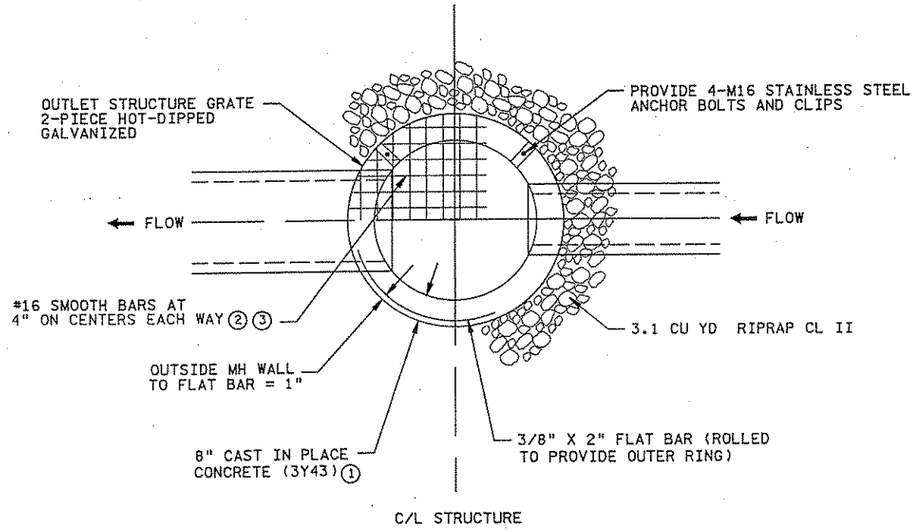
① WALL CONSTRUCTION MAY BE CLASS II PRECAST RC PIPE. SEE STANDARD PLATE 3000.

② PROVIDE FULL PENETRATION TACK WELD EVERY OTHER BAR - MINIMUM.

③ ALL REBAR SIZES ARE METRIC UNLESS OTHERWISE NOTED.

DRAINAGE STRUCTURE DESIGN SPECIAL - STRUCTURE NO. 132

NO SCALE



OUTLET STRUCTURE GRATE AND RIPRAP DETAIL

NO SCALE

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SRF CONSULTING GROUP, INC.

ANOKA COUNTY
DRAINAGE DETAILS
242 N. FRONTAGE ROAD

SHEET 25 OF 49

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LEGEND

- SODDING TYPE SALT RESISTANT
- SEED MIXTURE 60B / MULCH MATERIAL TYPE I
- SEED MIXTURE 28B
- EROSION CONTROL BLANKETS CATEGORY 3
- SILT FENCE, TYPE MACHINE SLICED
- (B) TEMPORARY DITCH CHECK TYPE 3
- (A) INLET PROTECTION
- (R) RIPRAP

NOTES:

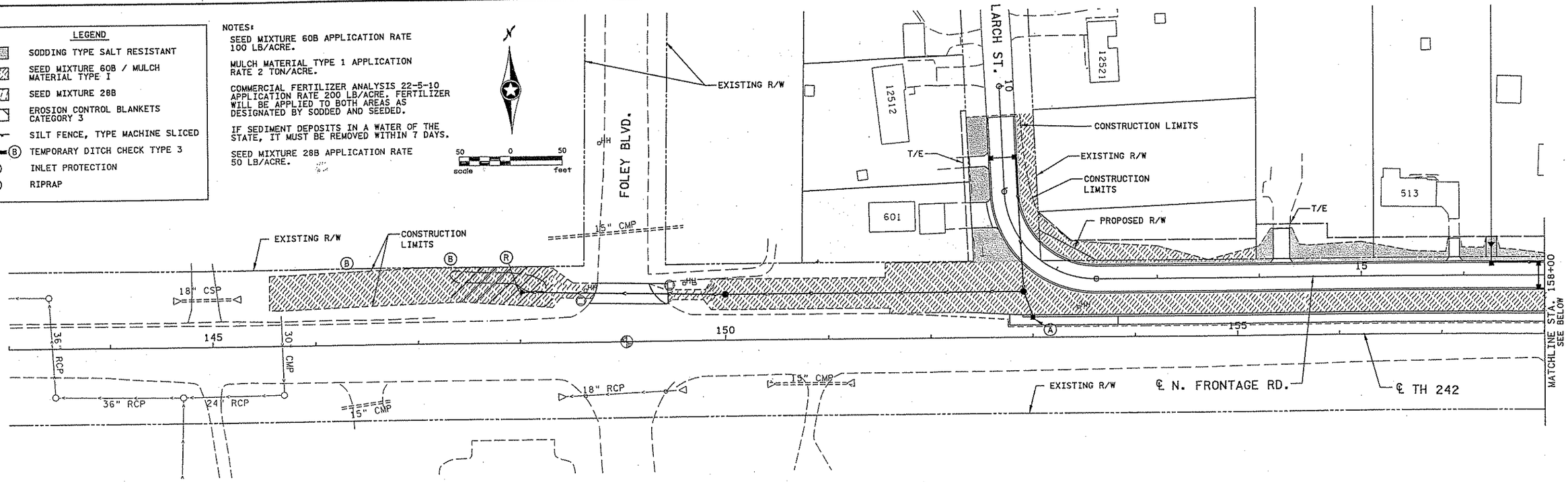
SEED MIXTURE 60B APPLICATION RATE 100 LB/ACRE.

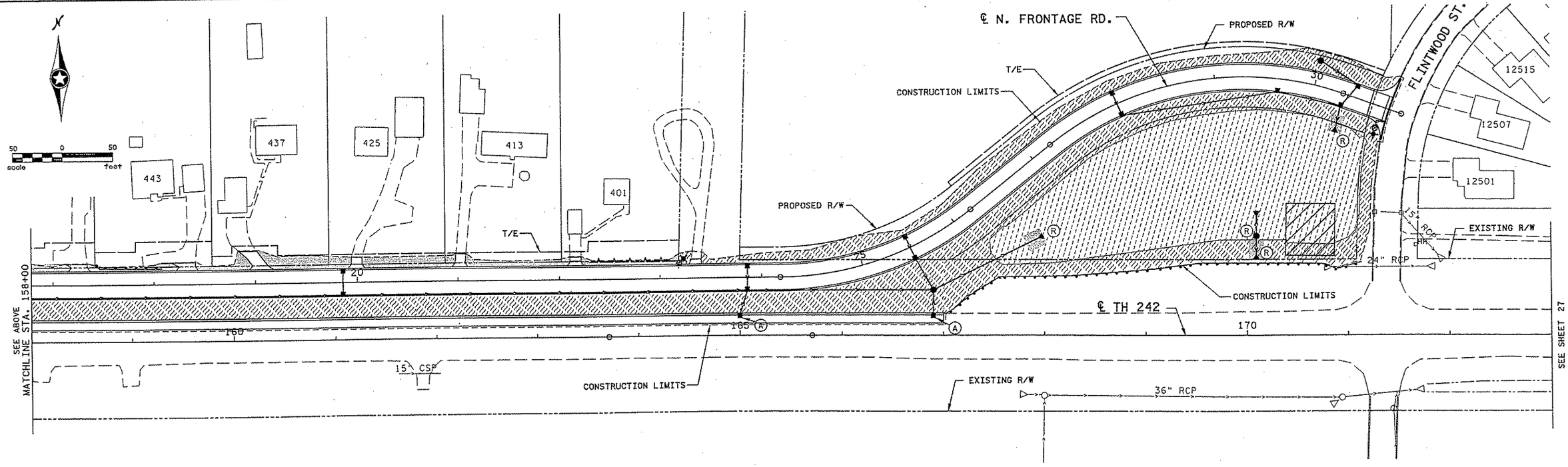
MULCH MATERIAL TYPE 1 APPLICATION RATE 2 TON/ACRE.

COMMERCIAL FERTILIZER ANALYSIS 22-5-10 APPLICATION RATE 200 LB/ACRE. FERTILIZER WILL BE APPLIED TO BOTH AREAS AS DESIGNATED BY SODDED AND SEEDED.

IF SEDIMENT DEPOSITS IN A WATER OF THE STATE, IT MUST BE REMOVED WITHIN 7 DAYS.

SEED MIXTURE 28B APPLICATION RATE 50 LB/ACRE.





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SRF CONSULTING GROUP, INC.

ANOKA COUNTY

TURF ESTABLISHMENT AND EROSION CONTROL PLANS

242 N. FRONTAGE ROAD

T.H. 242 AND NORTH FRONTAGE ROAD

SHEET 26 OF 49

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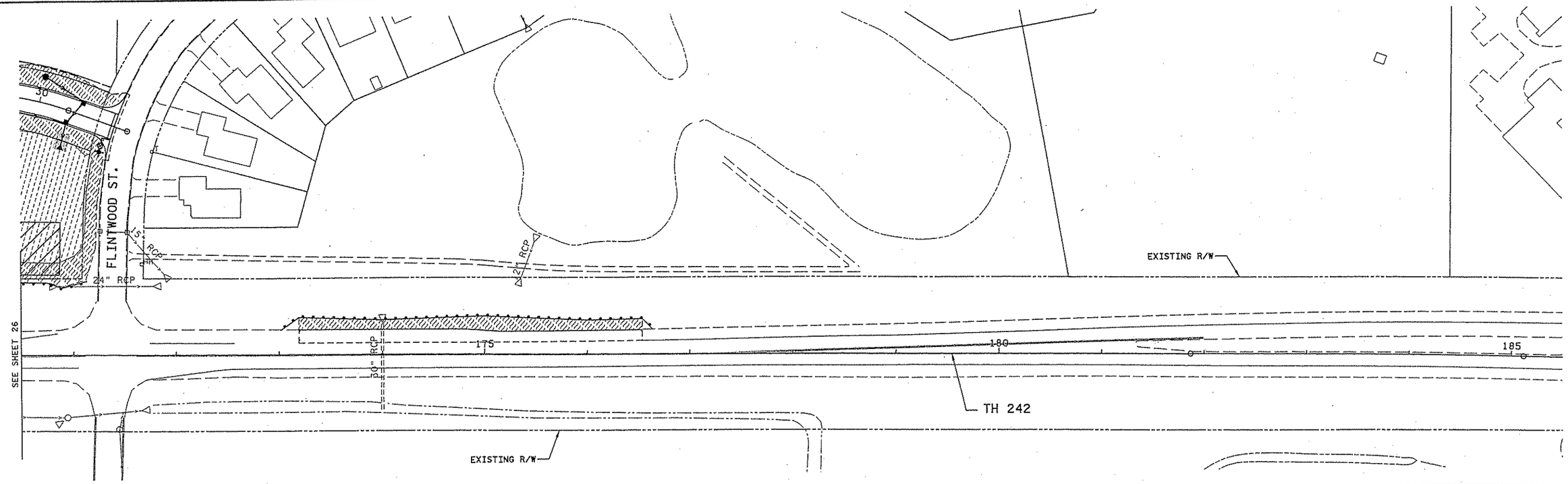

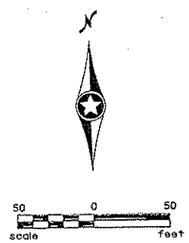

LEGEND

- SODDING TYPE SALT RESISTANT
- SEED MIXTURE 60B / MULCH MATERIAL TYPE I
- SEED MIXTURE 28B
- EROSION CONTROL BLANKETS CATEGORY 3
- SILT FENCE, TYPE MACHINE SLICED
- (B) TEMPORARY DITCH CHECK TYPE 3
- (A) INLET PROTECTION
- (R) RIPRAP

NOTES:

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CHECKED BY N.WILL
COMM. NO. 001:4102

SRF CONSULTING GROUP, INC.

ANOKA COUNTY

TURF ESTABLISHMENT AND EROSION CONTROL PLANS
242 N. FRONTAGE ROAD
T.H. 242 AND NORTH FRONTAGE ROAD

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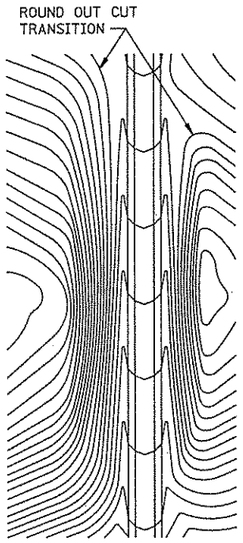
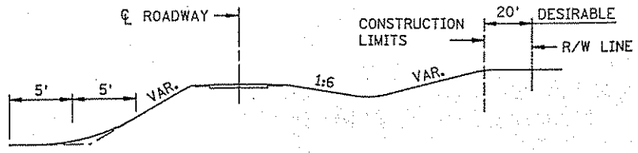
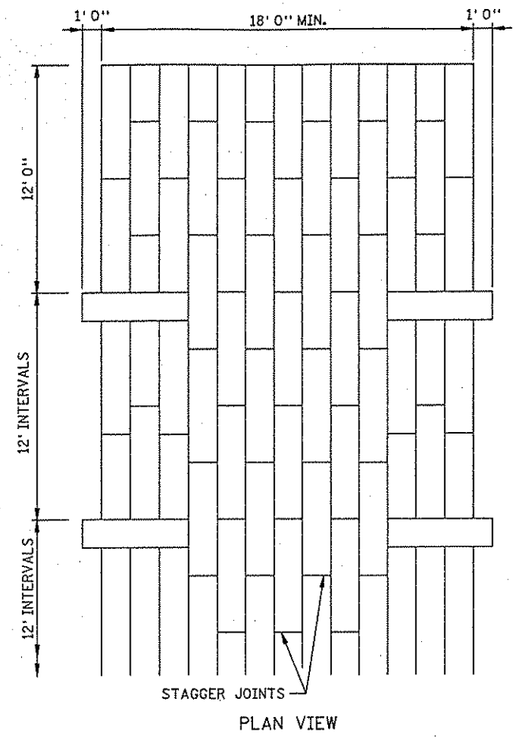


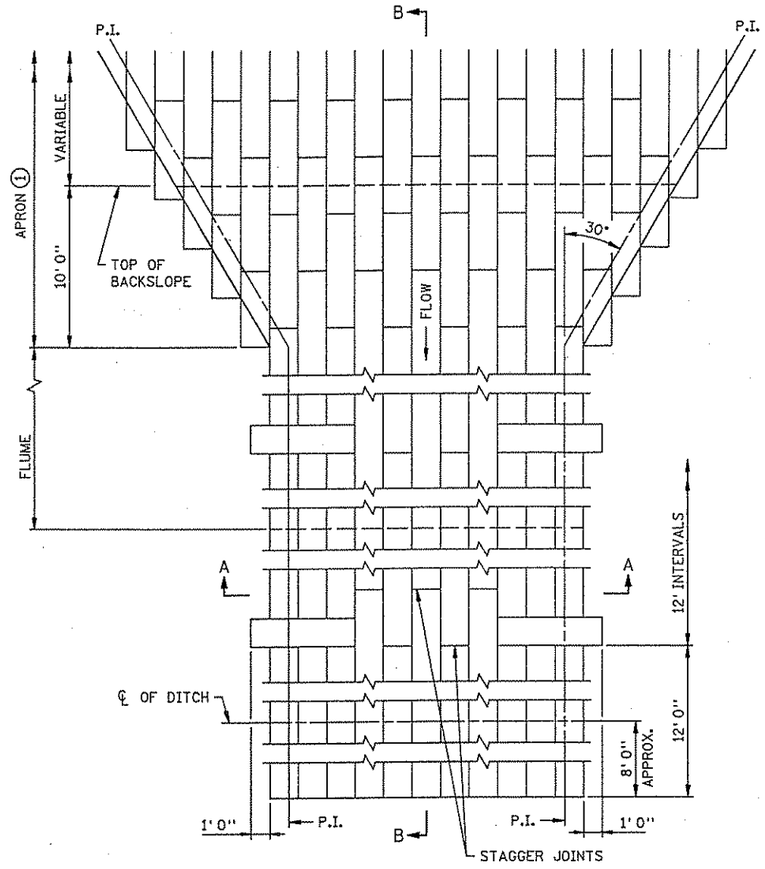
CONTOURING ROAD CUTS



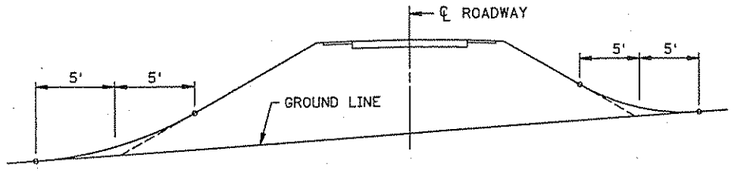
ROUNDING SHOULDERS AND BACKSLOPES



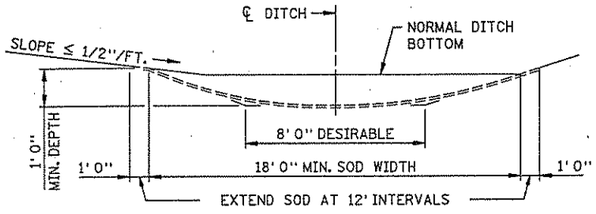
PLAN VIEW



PLAN VIEW

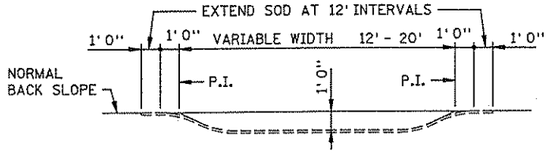


SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES

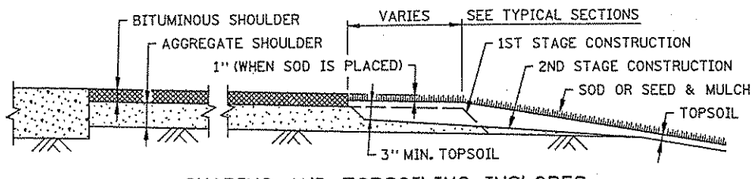


SODDED DITCH CROSS SECTION

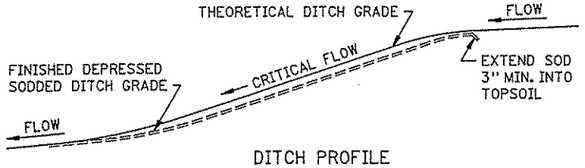
WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.



SECTION A-A

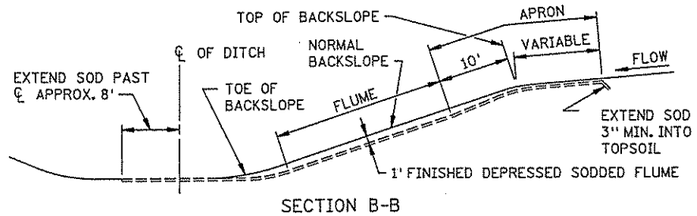


SHAPING AND TOPSOILING INSLOPES



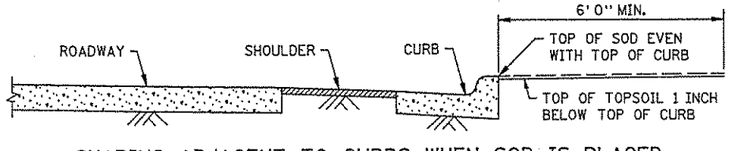
DITCH PROFILE

SODDED DITCH DETAILS



SECTION B-B

SODDED FLUME DETAILS



SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED

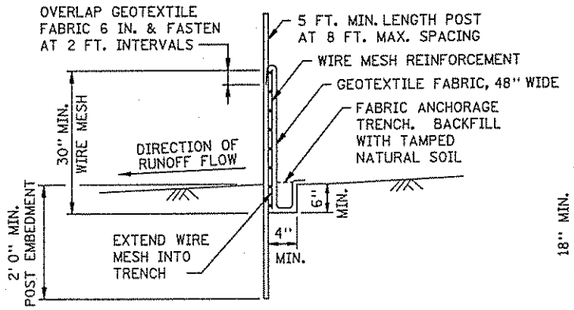
NOTES:

SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.

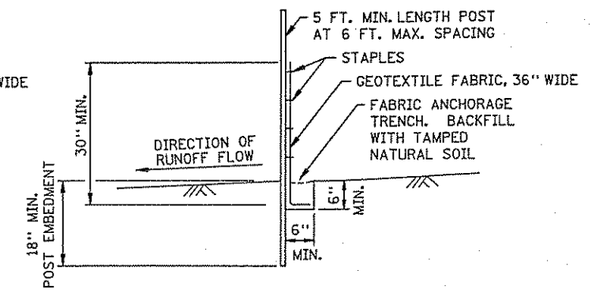
(1) CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

STANDARD SHEET NO. 5-297.404	TITLE: PERMANENT EROSION CONTROL ALONG ROADWAYS, DITCHES AND FLUMES
STANDARD APPROVED: NOVEMBER 20, 2002	
STATE PROJ. NO. 0212-43 (TH 242)	SHEET NO. 28 OF 49 SHEETS

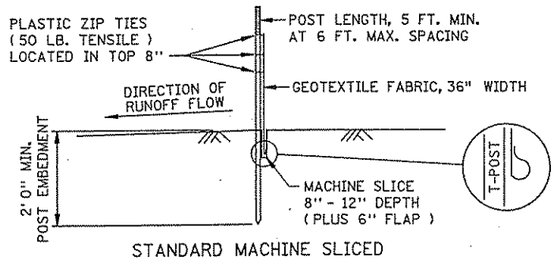
FILE NAME 4102FR.ECA



HEAVY DUTY



PREASSEMBLED

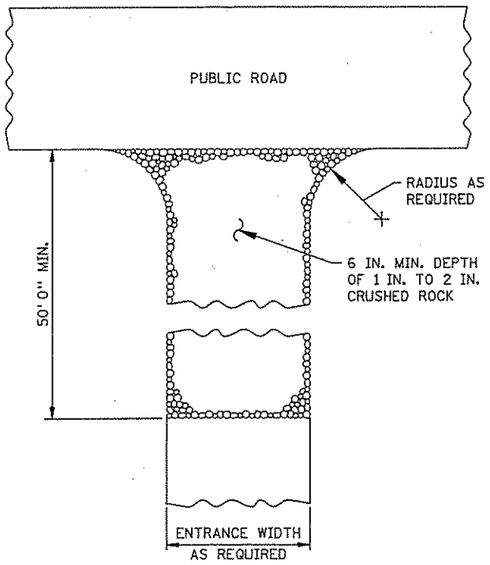


STANDARD MACHINE SLICED

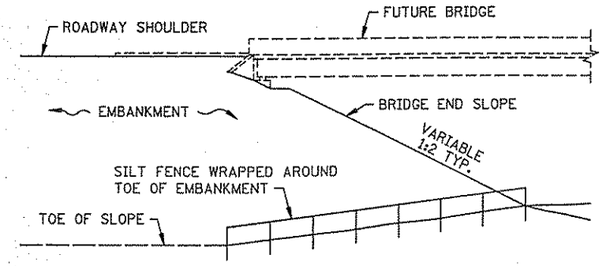
SILT FENCE DETAILS

TO PROTECT AREAS FROM SHEET FLOW
(SEE SPEC. 3886)

DESIGN GUIDELINES:
MAXIMUM CONTRIBUTING AREA: 3 ACRES

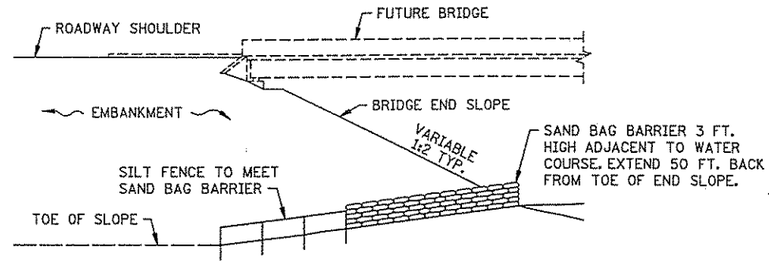


ROCK CONSTRUCTION ENTRANCE ①



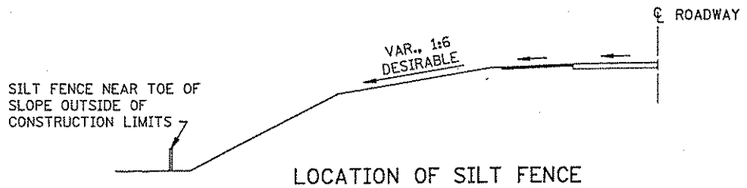
BRIDGE FILL

DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: STAGNANT
CONTRIBUTING SLOPE AREA: 1/2 ACRE

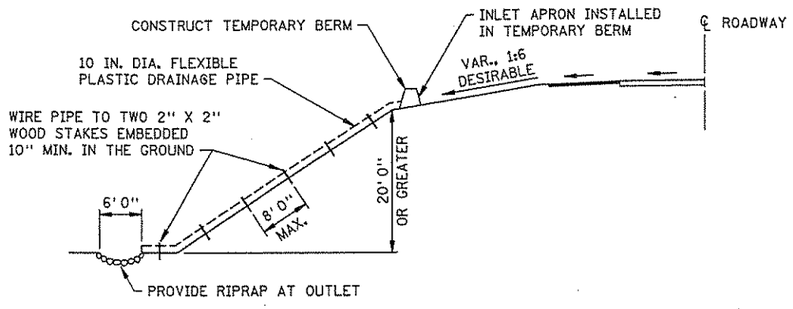


BRIDGE FILL

DESIGN GUIDELINES:
MAX. WATER COURSE FLOW VELOCITY: 7 FT./SEC.
CONTRIBUTING SLOPE AREA: 1 ACRE

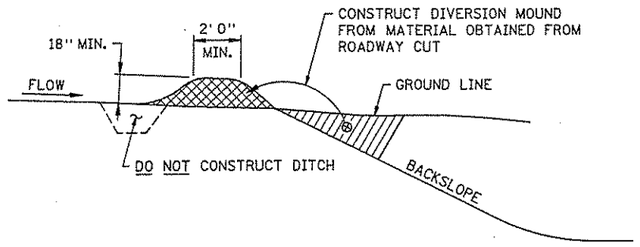


LOCATION OF SILT FENCE
AT TOE OF ROADWAY EMBANKMENT



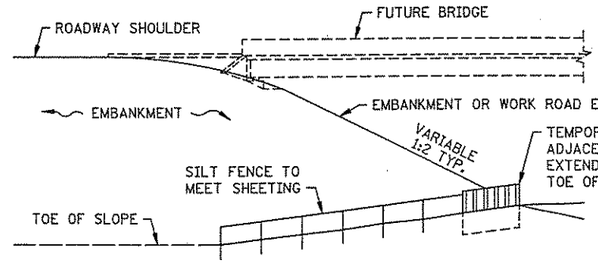
TEMPORARY DRAIN ON FILL SLOPE

DESIGN GUIDELINES:
STORM FREQUENCY: 2 YEAR - 24 HOUR
MAXIMUM DRAINAGE AREA: 3 ACRES



DIVERSION MOUND

DESIGN GUIDELINES:
STORM FREQUENCY: 10 YEAR - 24 HOUR
MAXIMUM DRAINAGE AREA: 5 ACRES
MAXIMUM DIVERSION: GRADE 5%



EMBANKMENT OR WORK ROAD FILL

DESIGN GUIDELINES:
MAX. WATER COURSE FLOW VELOCITY: 15 FT./SEC.
CONTRIBUTING SLOPE AREA: 3 ACRES

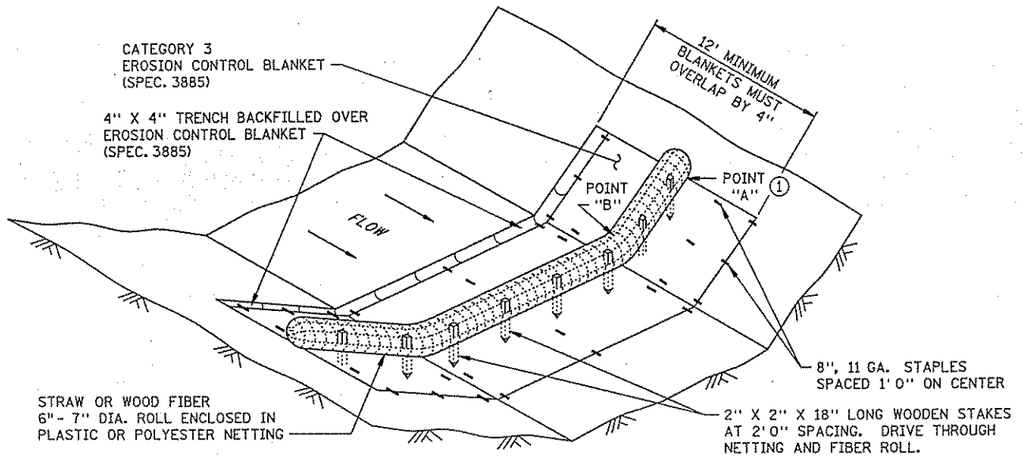
SILT FENCE AT BRIDGE EMBANKMENT

NOTES:
SEE SPECS. 2573 & 3886.

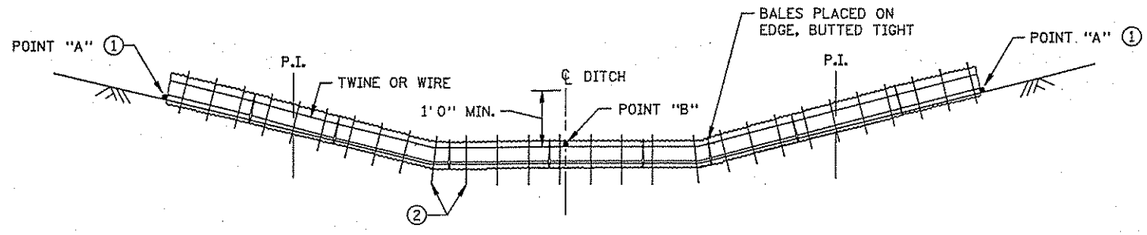
① ROCKS AT ENTRANCE CLEAN WORKSITE MUD OFF OF TRUCK TIRES BEFORE DRIVING ON MAIN ROAD. THIS WILL PREVENT AUTO DAMAGE. WE NEED TO KEEP CONSTRUCTION SEDIMENT OUT OF DRAINAGE SYSTEMS AND WETLANDS.

STANDARD SHEET NO. 5-297.405 (2 OF 4)	TITLE: TEMPORARY EROSION CONTROL
STANDARD APPROVED: JULY 30, 2001	
S.P. 0212-43 (TH 242)	SHEET NO. 30 OF 49 SHEETS

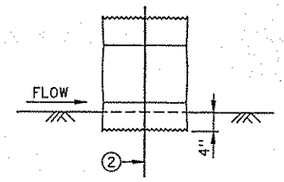
FILE NAME 4102FR.ECC



BIOROLL BLANKET SYSTEM
(TYPE 3 SPEC. 3889)

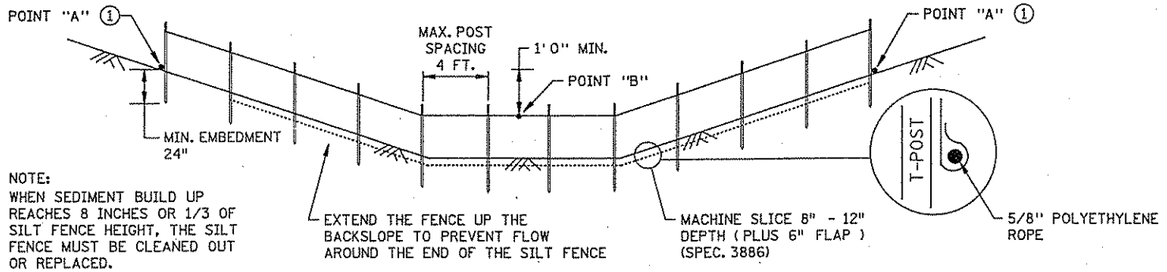


BALE DITCH CHECK
(USED ON ROUGH GRADED SOIL. REMOVE AFTER ROUGH GRADING IS COMPLETED. CAN BE USED AT WETLAND PERIMETERS ANYTIME)



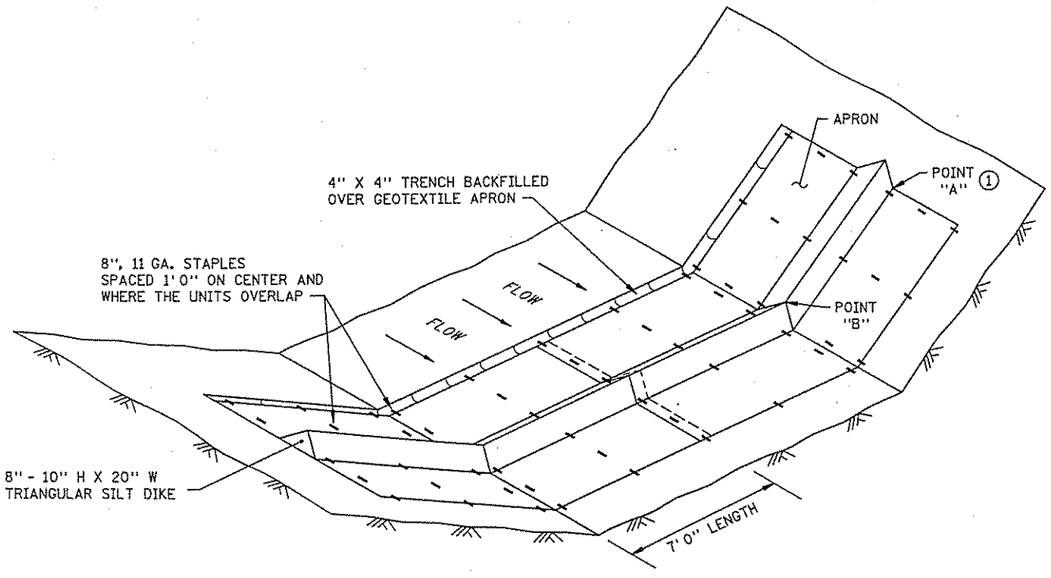
EMBEDMENT METHOD

BALE CHECK DETAIL

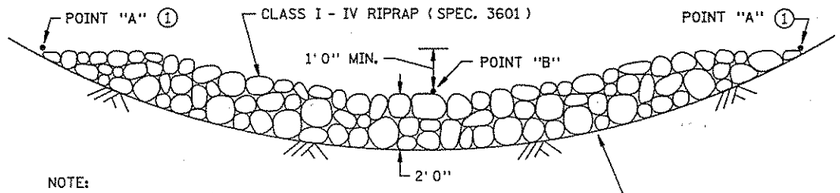


NOTE:
WHEN SEDIMENT BUILD UP REACHES 8 INCHES OR 1/3 OF SILT FENCE HEIGHT, THE SILT FENCE MUST BE CLEANED OUT OR REPLACED.

MACHINE SLICED SILT FENCE
(TYPE 1 SPEC. 3889)

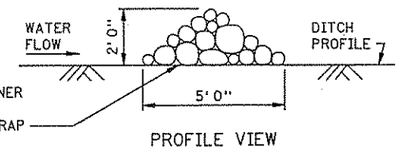


GEOTEXTILE TRIANGULAR DIKE
(TYPE 6 SPEC. 3889)



NOTE:
ROCK DITCH CHECK SHALL BE REMOVED FROM THE CLEAR ZONE AFTER SEEDING OR TURF IS ESTABLISHED AND PRIOR TO FINAL ACCEPTANCE.

CROSS SECTION



PROFILE VIEW

ROCK CHECK
(TYPE 7 SPEC. 3889)

NOTES:

SEE SPECS. 2573, 3882, 3885, 3886 & 3889.

SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM SPACING FORMULA:

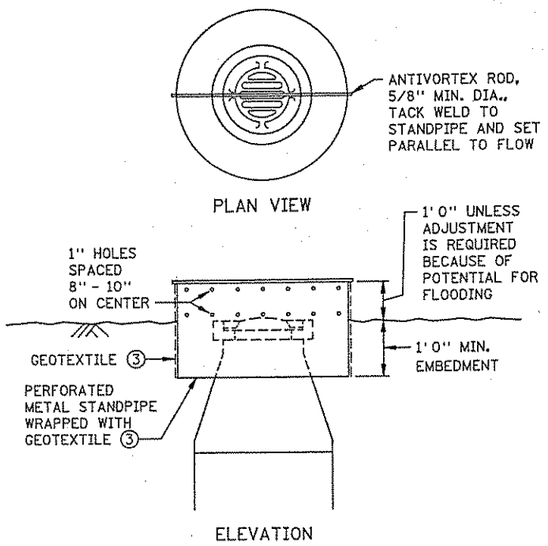
$$\text{SPACING OF DITCH CHECKS (FT)} = \left(\frac{\text{HEIGHT OF DITCH CHECK (FT) X 100}}{\text{DITCH GRADE IN PERCENT}} \right)$$

(1) POINT A MUST BE 1'0" MIN. HIGHER THAN POINT B TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

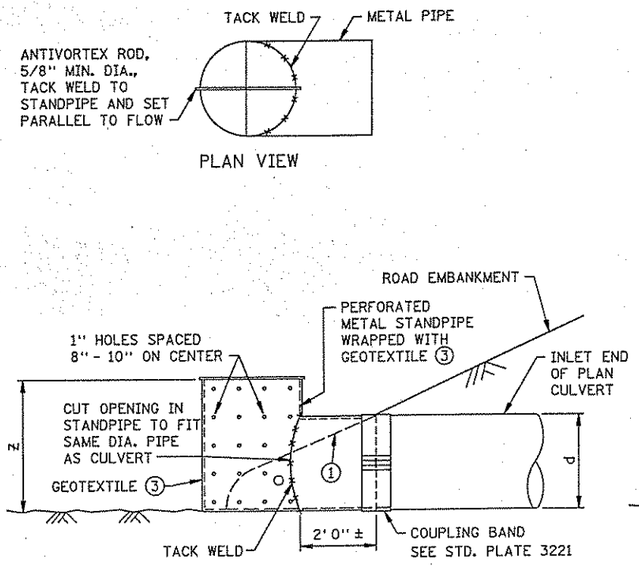
(2) TWO 2 IN. X 2 IN. WOOD STAKES OR REINFORCING BARS IN EACH BALE AND EMBEDDED IN THE GROUND 10 IN. MINIMUM.

STANDARD SHEET NO.	TITLE:
5-297.405 (3 OF 4)	TEMPORARY EROSION CONTROL DITCH CHECKS
STANDARD APPROVED: NOVEMBER 5, 2002	

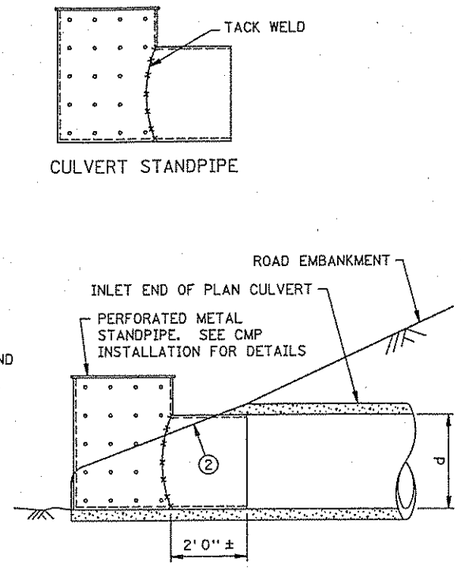
FILE NAME 4102FR.ECD



RISER STANDPIPE
TO PROTECT DROP INLET



ELEVATION OF CSP INSTALLATION

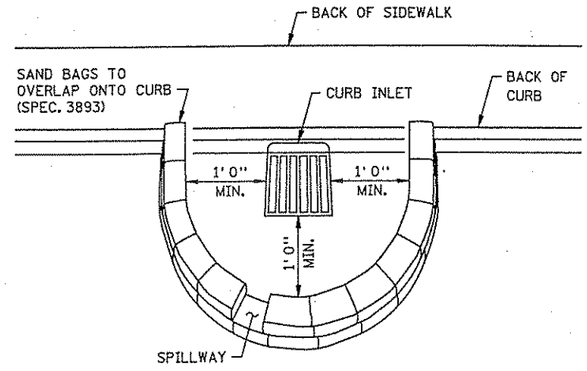


ELEVATION OF RCP INSTALLATION

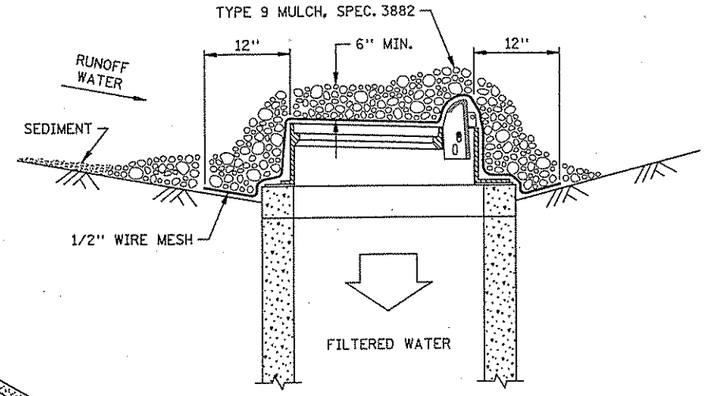
CULVERT STANDPIPE PROTECTION
FOR SEDIMENT CONTROL ON CULVERT INLET
(TYPE D SPEC. 3891)

CULVERT SIZE: 12" - 36"

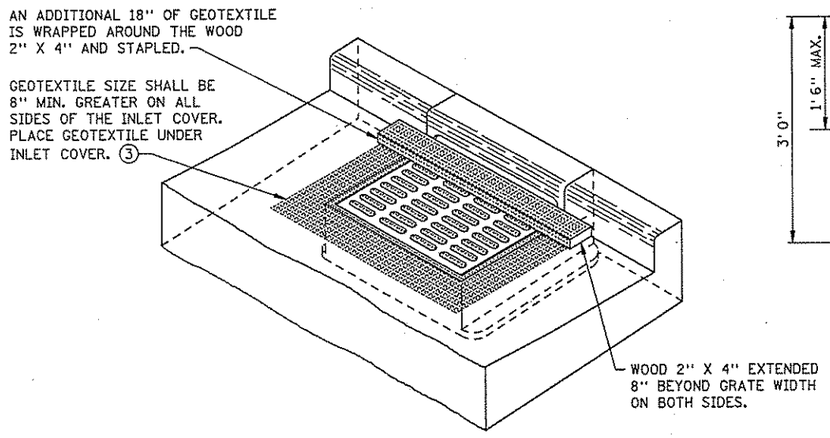
d = DIA. OF STANDPIPE EQUAL TO DIA. OF PLAN CULVERT
z = LENGTH OF PERFORATED STANDPIPE (d + 12")



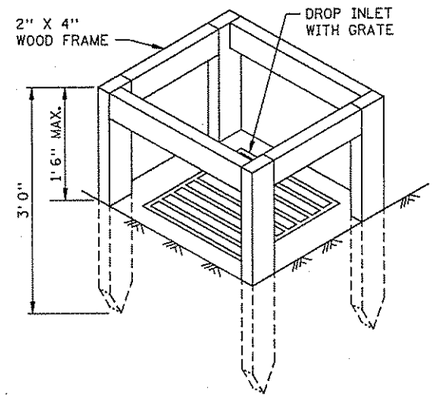
SANDBAG BARRIER AT STREET INLET
THIS INLET PROTECTION IS USED DURING ROUGH GRADING ONLY. USE BEFORE ROAD IS OPEN TO TRAFFIC OR IS PAVED.
(SPEC. 3893)

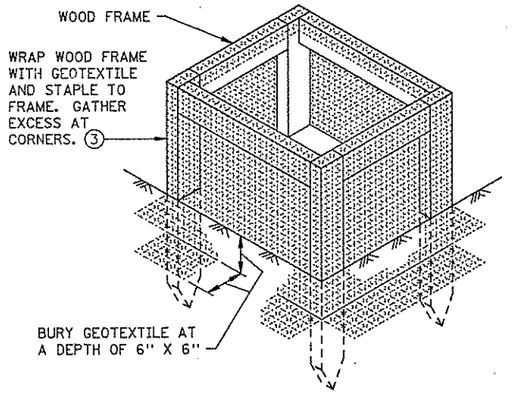


AGGREGATE FILTER AT CURB INLET
(TYPE B WITHOUT CURB SPEC. 3891)
(TYPE C WITH CURB SPEC. 3891)



GEOTEXTILE FILTER AT STREET INLET WITH CURB BOX
TYPE C SPEC. 3891





SILT FENCE BOX TO PROTECT DROP INLETS
USE WHERE INLET DRAINS AN AREA WITH SLOPES AT 1:3 or LESS
(TYPE A SPEC. 3891)

NOTES:
SEE SPECS. 2573, 3891 & 3893.

MANUFACTURED ALTERNATIVES LISTED ON Mn/DOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED.

(1) FOR CSP, REMOVE TEMPORARY STANDPIPE AND INSTALL CULVERT APRON AFTER VEGETATION IS ESTABLISHED.

(2) FOR RCP, INSTALL CULVERT APRON AND SLIDE TEMPORARY STANDPIPE INTO RCP. AFTER VEGETATION IS ESTABLISHED REMOVE TEMPORARY STANDPIPE.

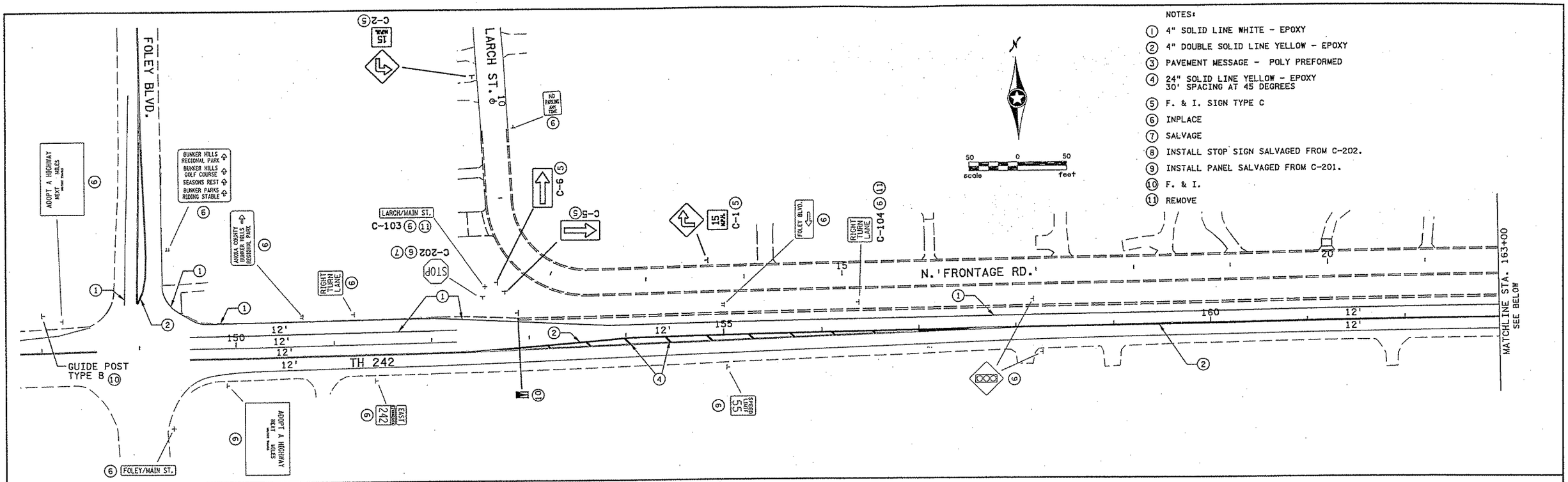
(3) ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886 FOR MACHINE SLICED.

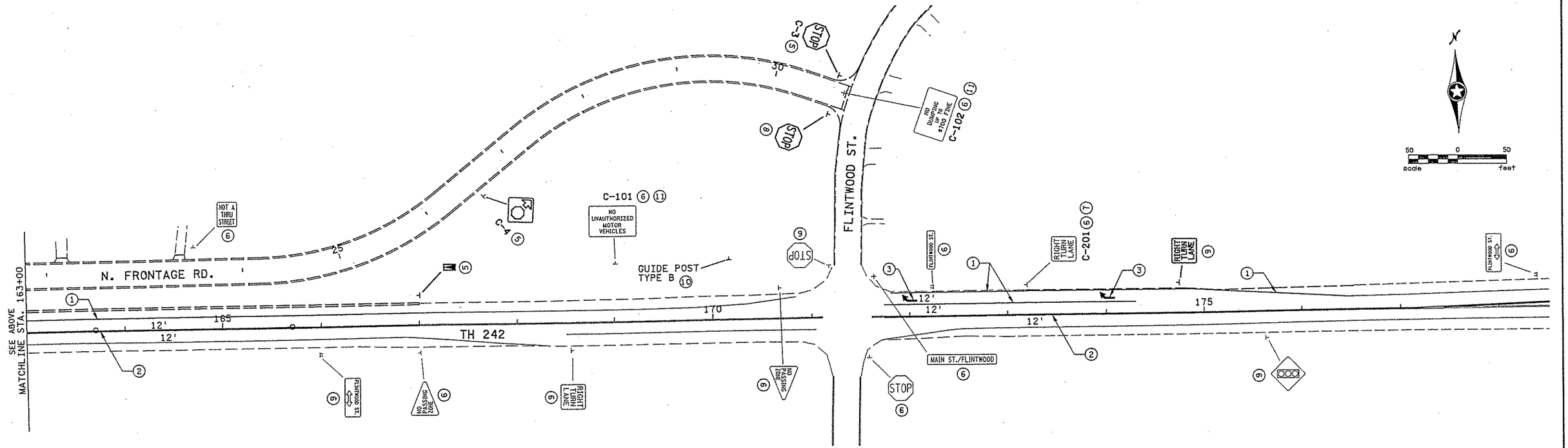
STANDARD SHEET NO. 5-297.405 (4 OF 4)	TITLE: TEMPORARY EROSION CONTROL TEMPORARY INLET PROTECTION
STANDARD APPROVED: NOVEMBER 5, 2002	
STATE PROJ. NO. 0212-43 (TH 242)	SHEET NO. 32 OF 49 SHEETS

FILE NAME 4102.ECE

NOTES:

1. 4" SOLID LINE WHITE - EPOXY
2. 4" DOUBLE SOLID LINE YELLOW - EPOXY
3. PAVEMENT MESSAGE - POLY PREFORMED
4. 24" SOLID LINE YELLOW - EPOXY 30' SPACING AT 45 DEGREES
5. F. & I. SIGN TYPE C
6. INPLACE
7. SALVAGE
8. INSTALL STOP SIGN SALVAGED FROM C-202.
9. INSTALL PANEL SALVAGED FROM C-201.
10. F. & I.
11. REMOVE





NO	DATE	BY	CKD	APPR	REVISION
1	5-1-03	DF	NW		ADDED EXISTING SIGNS AND NOTES

...\4102.SIA

I hereby certify that this plan, specification, or report 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: NATHEN A. WILL

Date 5-27-03 License # 26391

STATE PROJECT NO.

S.P. 0212-43 (TH 242)

DRAWN BY D.FITCHORN
DESIGNED BY M.C.HANSEN
CHECKED BY N.WILL
COMM. NO. 0014102

SRF CONSULTING GROUP, INC.

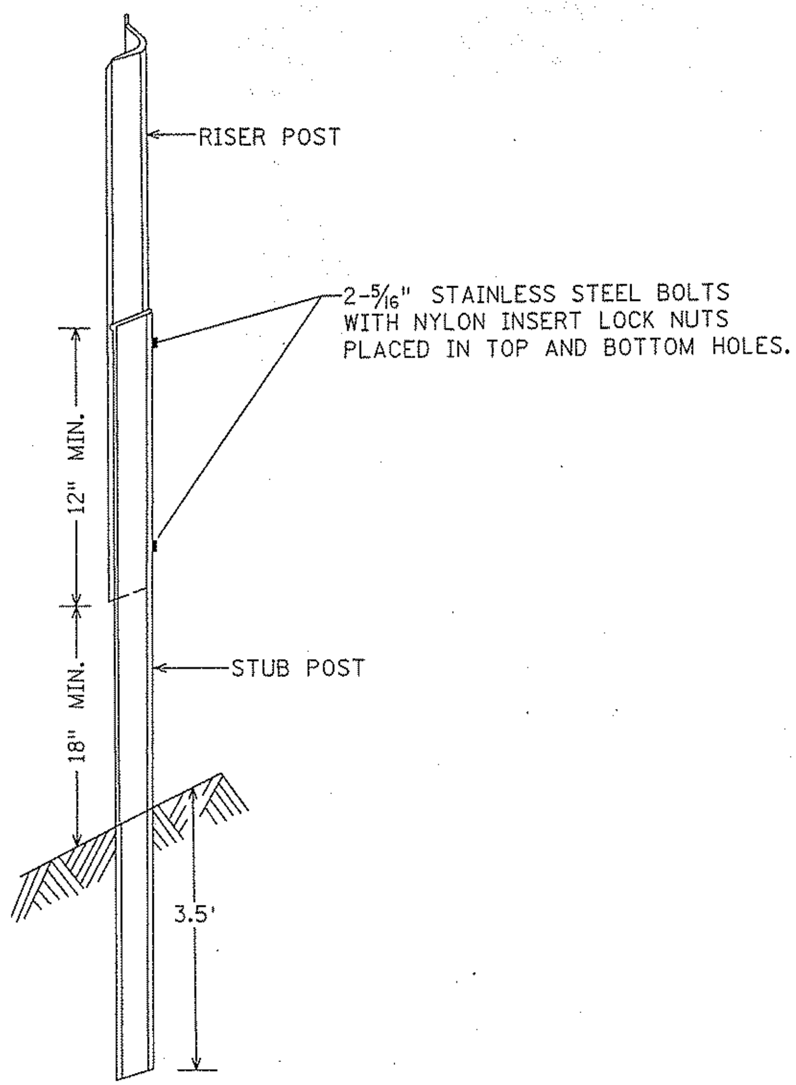
ANOKA COUNTY

SIGNING AND STRIPING PLAN
242 N. FRONTAGE ROAD

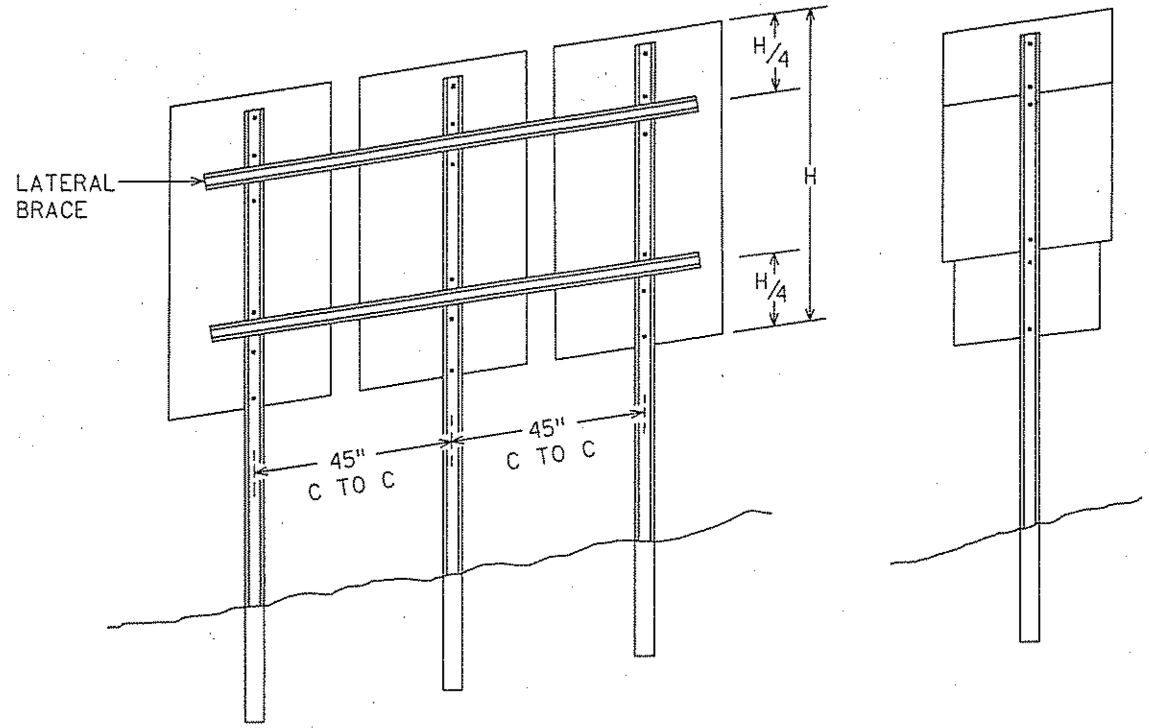
SHEET 33 OF 49

8:15:41 AM
5/22/2003
N:\civil\04TY\4102\Frontage_Rd\PLAN\4102.SIA

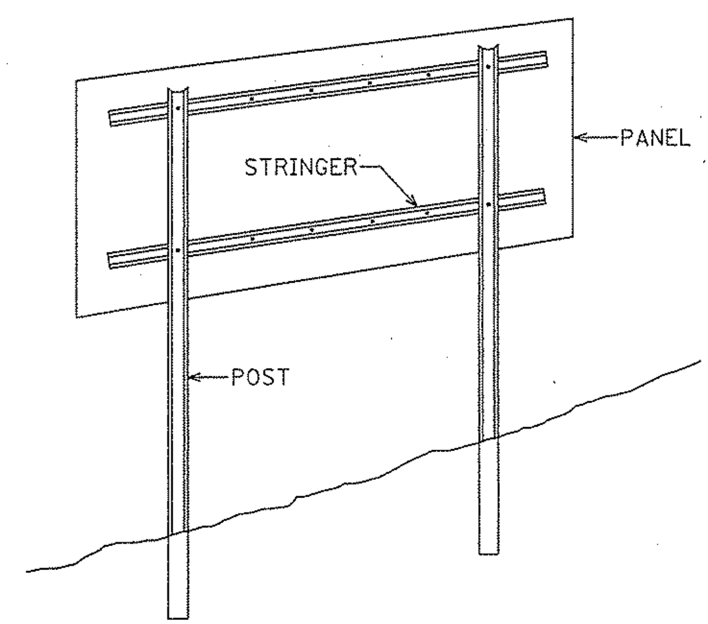
TYPE "C" & "D" POST



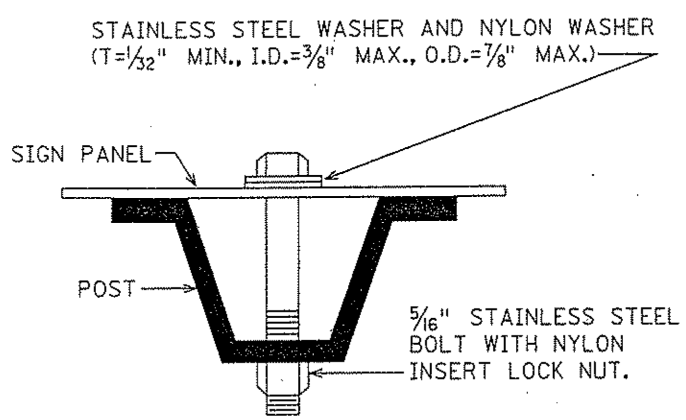
"U POST" SPLICE



TYPICAL TYPE "C" INSTALLATIONS



TYPICAL TYPE "D" INSTALLATION



"U POST" MOUNTING
TYPE "C" SIGNS

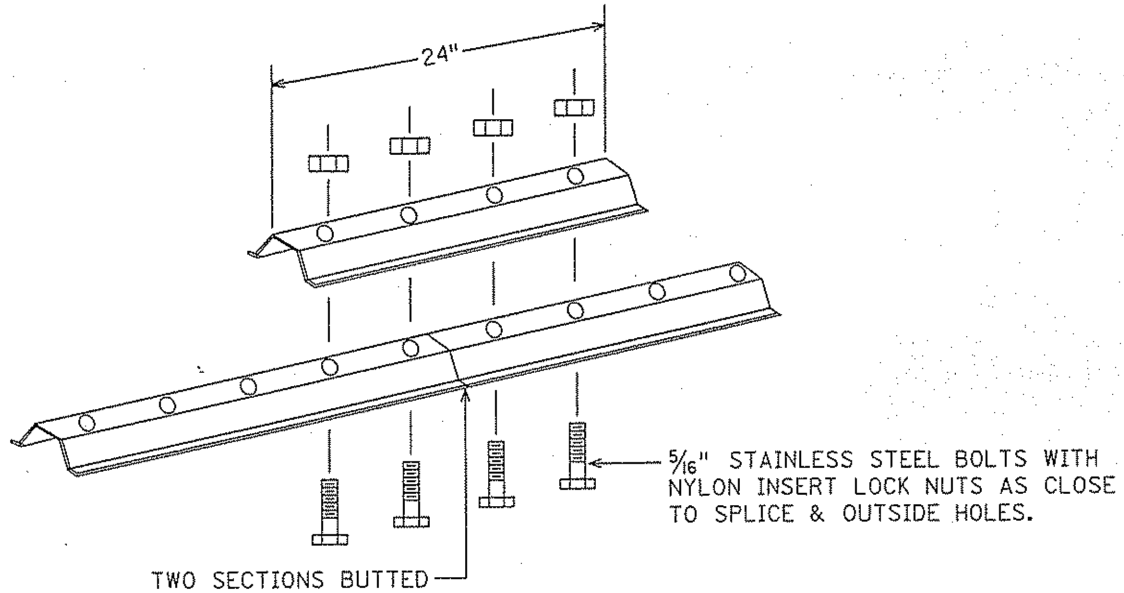
NOTES:

1. USE 3# STUB POSTS, RISER POSTS, STRINGERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACE STUB POSTS. ALL SHALL CONFORM TO MN/DOT 3401.
2. FOR TYPE "D" SIGN POSTS LENGTHS AND SPACINGS, SEE SIGN DATA SHEET.
3. TYPE "D" SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH TYPE "D" STRINGER AND PANEL-JOINT DETAIL (SEE STANDARD SIGNS MANUAL).
4. MOUNTING (PUNCHING CODE) FOR TYPE "C" SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
5. ALL RISER (VERTICAL) "U POSTS" SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
6. USE STAINLESS STEEL 5/16" BOLTS, WASHERS, AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
7. STAINLESS STEEL WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
8. BRACING STUBS SHALL BE NO MORE THAN 4" ABOVE GROUND AND EMBEDDED AT LEAST 3 1/2'.
9. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MN/DOT 3306 AND GALVANIZED IN ACCORDANCE WITH MN/DOT 3394.
10. COLLARS SHALL BE USED TO SHIM OVERLAYS AND DEMOUNTABLE LEGEND AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MN/DOT 3352.2A5.
11. 2 AND 3 POST TYPE "C" SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE. INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
12. WHERE 2 OR MORE SINGLE POST SIGNS (TYPE "C") ARE MOUNTED SIDE BY SIDE, THEY SHALL BE REINFORCED LATERALLY BY AT LEAST 2 POST SECTIONS, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN SKETCH.

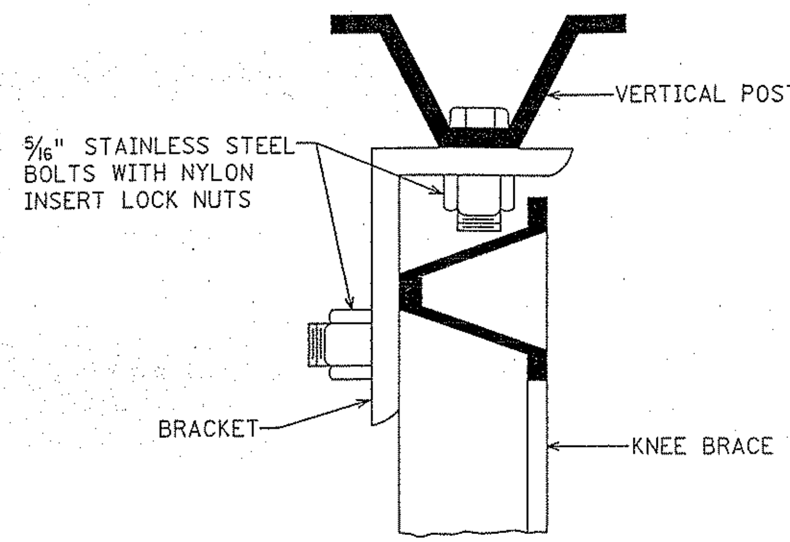
TYPE C & D SIGN STRUCTURAL DETAILS

Sheet 1 of 3

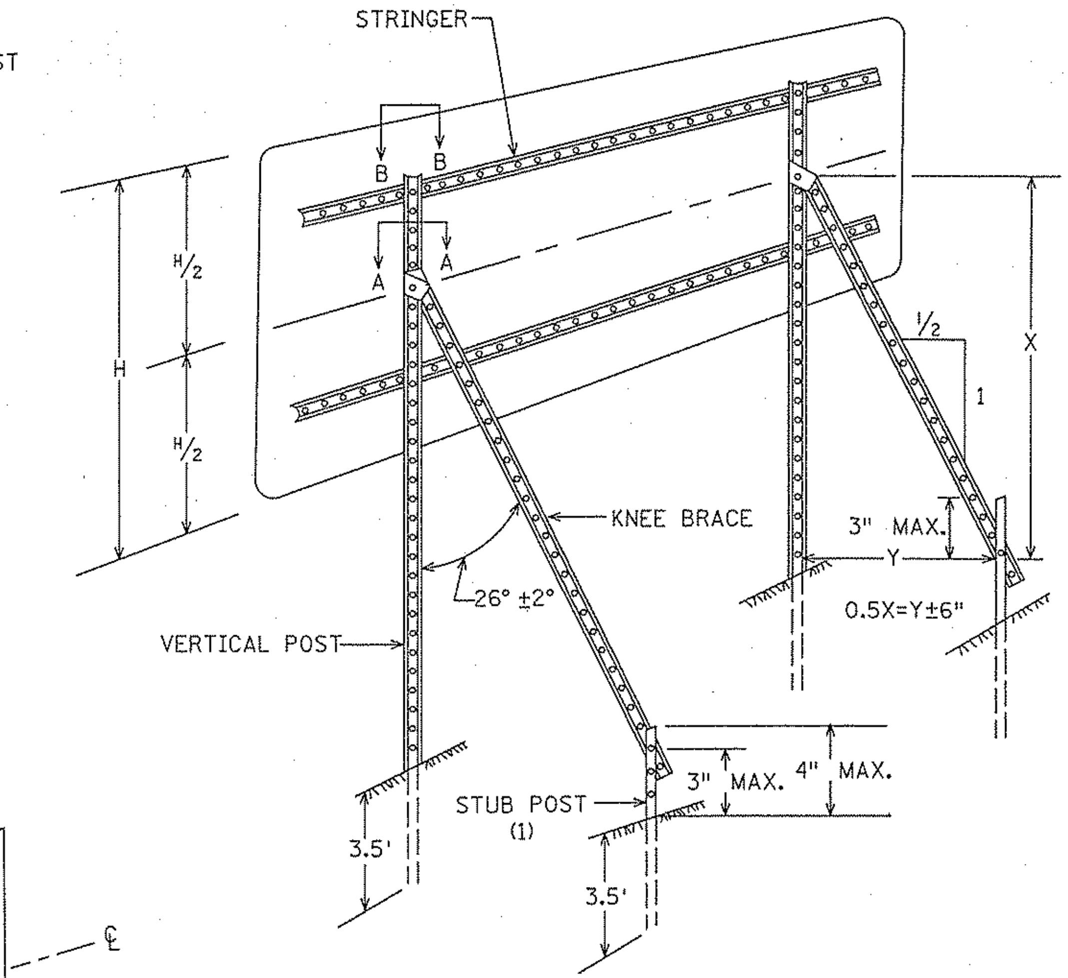
Revised 7-25-01



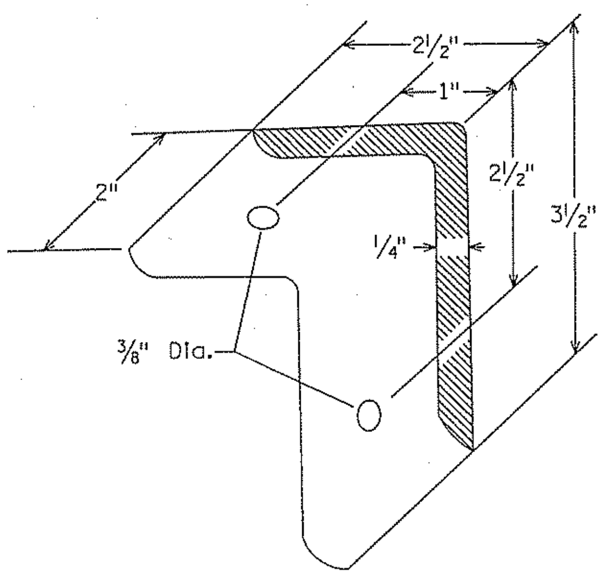
LATERAL BRACE OR STRINGER SPLICE DETAIL (EXPLODED VIEW)



SECTION A-A

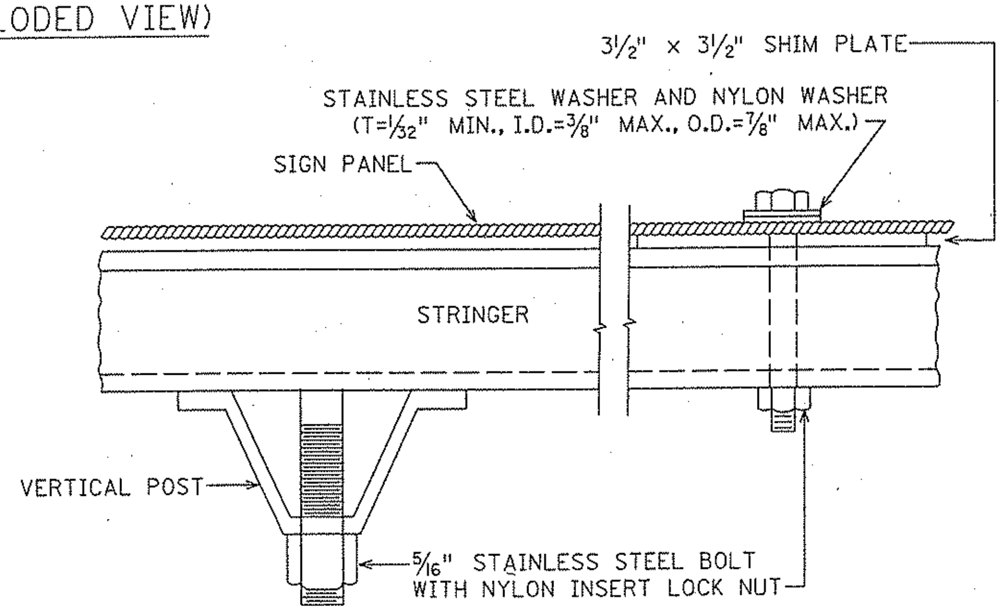


TYPICAL "A-FRAME" INSTALLATION TYPE "D" SIGNS

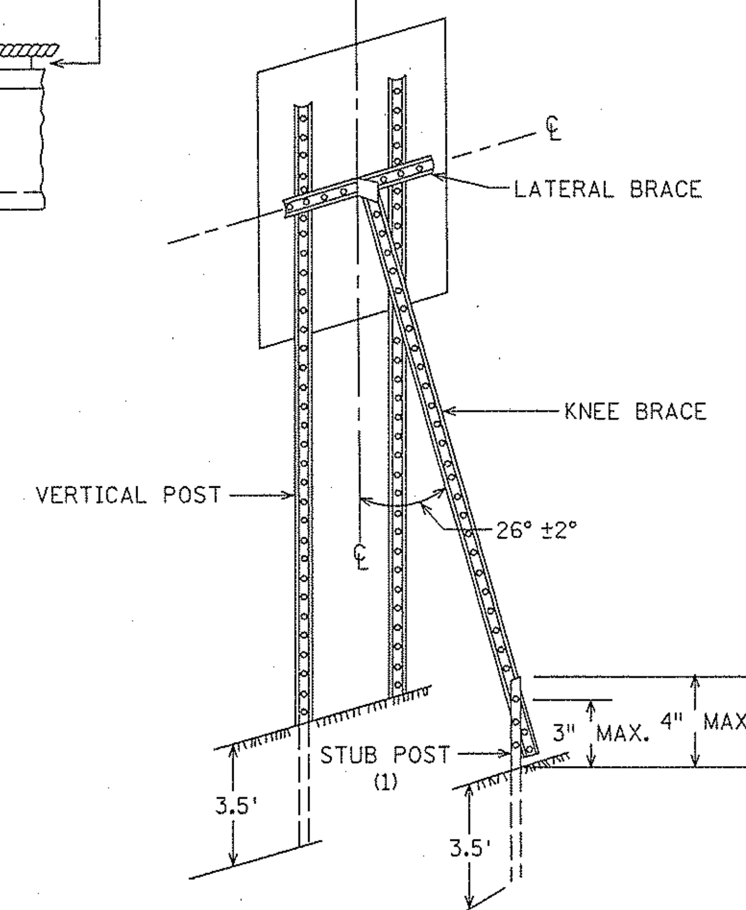


A-FRAME BRACKET

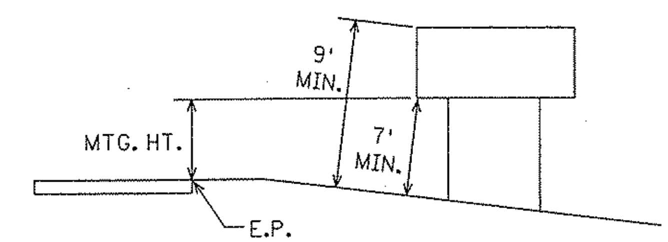
(STEEL MN/DOT 3306 GALVANIZED PER MN/DOT 3394)



SECTION B-B

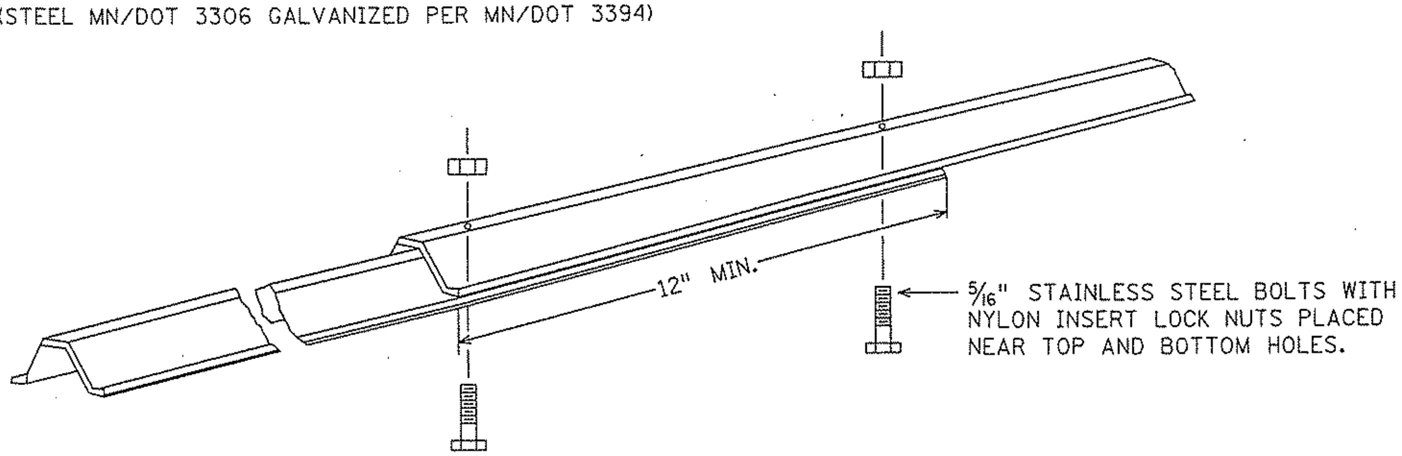


TYPICAL "A-FRAME" INSTALLATION TYPE "C" SIGNS



TYPICAL MOUNTING

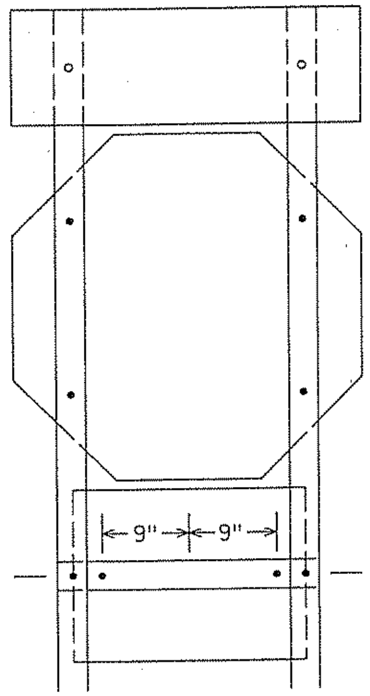
(1) OFFSET STUB POST 1' TOWARD ROADWAY RELATIVE TO VERTICAL POST.



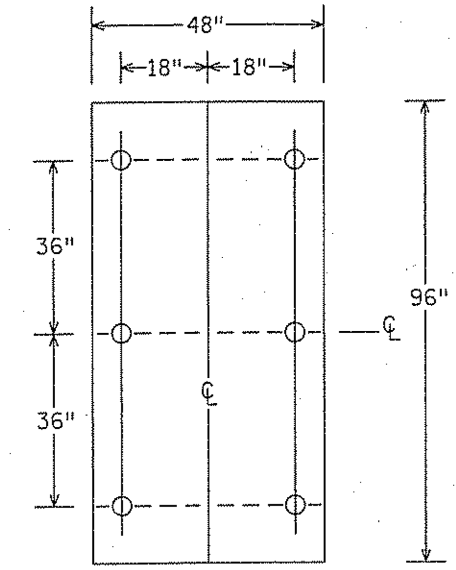
KNEE BRACE SPLICE

TYPE C & D SIGN STRUCTURAL DETAILS

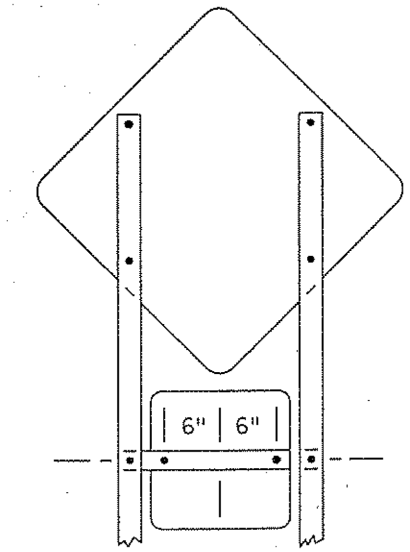
Sheet 2 of 3



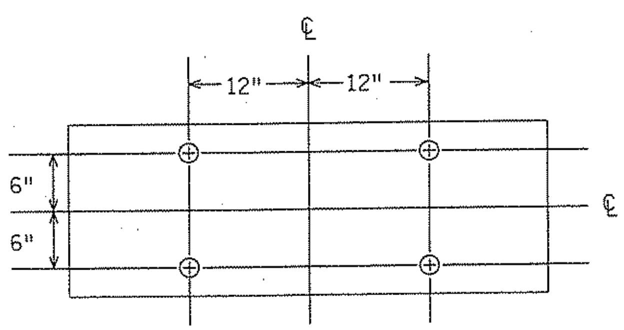
R6-1, R1-1 & (R6-3 OR R6-3a)
MOUNTING



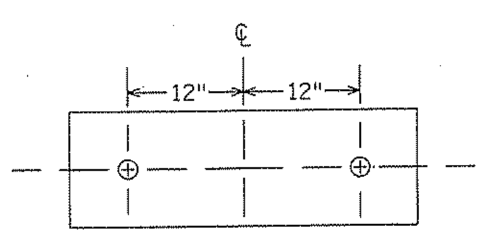
PUNCHING FOR R2-4a
SPEED LIMIT



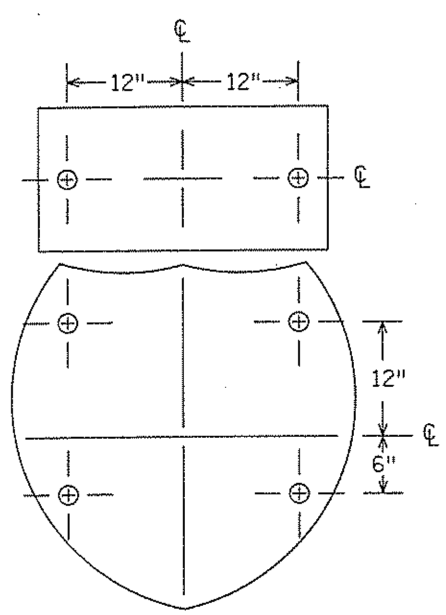
(W1-1, W1-2, W1-3, W1-4 OR W1-5) & W13-1
MOUNTING



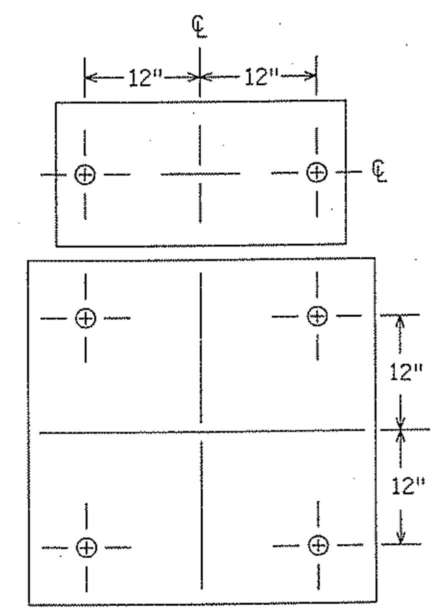
PUNCHING FOR R6-1(48"x18")



PUNCHING FOR R6-1(36"x12")



(M3-1A, M3-2A, M3-3A OR M3-4A) [30"x15"] AND
M1-1 [45"x36" OR 36"x36"]
PUNCHING



(M3-1, M3-1A, M3-2, M3-2A, M3-3, M3-3A M3-4 OR
M3-4A) [30"x15"] AND (M1-4 OR M1-5A) [36"x36"]
PUNCHING

TYPE C & D SIGN

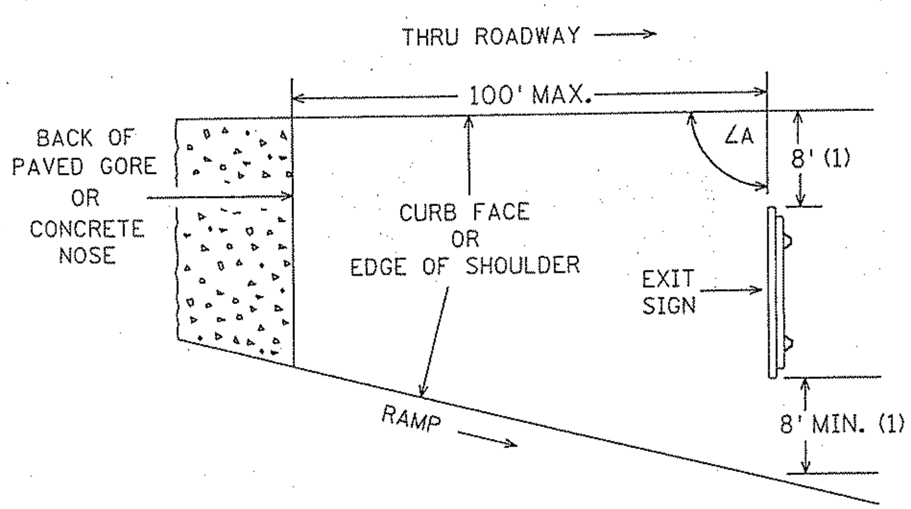
STRUCTURAL DETAILS

Sheet 3 of 3

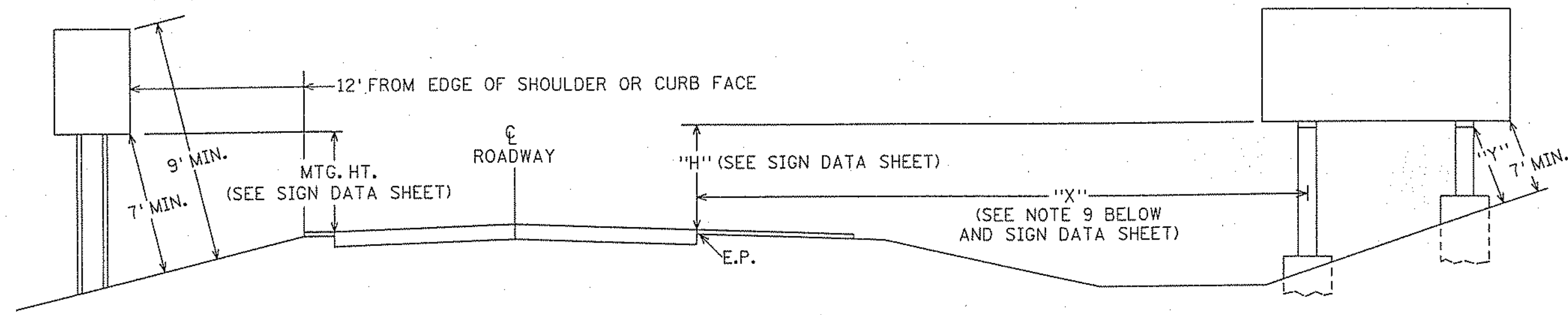
Revised 12-28-01

CDSIGN.STR CD3 6-18-99

GORE PLACEMENT



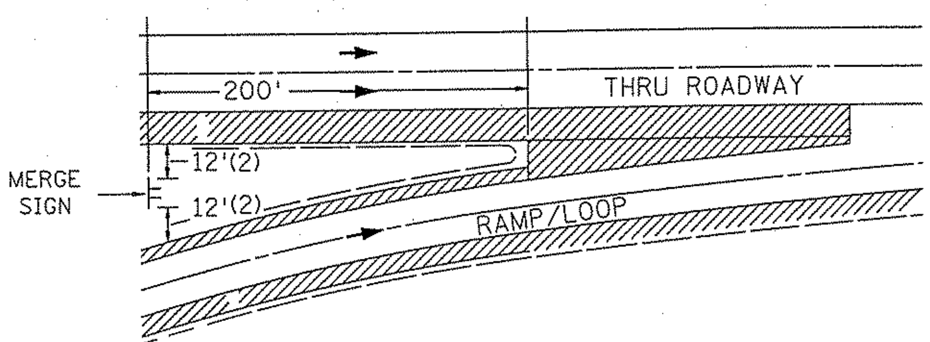
ROADSIDE PLACEMENT



ROUTE MARKER, REGULATORY & WARNING SIGNS - TYPE "C"

MINOR GUIDE SIGNS - TYPE "D"

MAJOR GUIDE SIGN - TYPE "A"



SPECIFIC NOTES:

(1) EXIT SIGNS

IF THESE OFFSETS CANNOT BE ATTAINED WITHIN 100 FEET OF THE PAVED GORE, A 4 FOOT OFFSET IS ACCEPTABLE. IF THE 4 FOOT OFFSETS CANNOT BE ATTAINED WITHIN 100 FEET OF THE PAVED GORE, CONTACT THE OTE SIGNING UNIT.

IF THE GORE NEEDS TO BE DELINEATED, INSTALL A HAZARD MARKER PLATE X4-2 JUST BEYOND THE PAVED GORE. IN ADDITION, INSTALL RAMP DELINEATORS ON SEPARATE POSTS TO MAINTAIN THEIR PROPER LOCATIONS AND SPACINGS.

(2) MERGE SIGNS

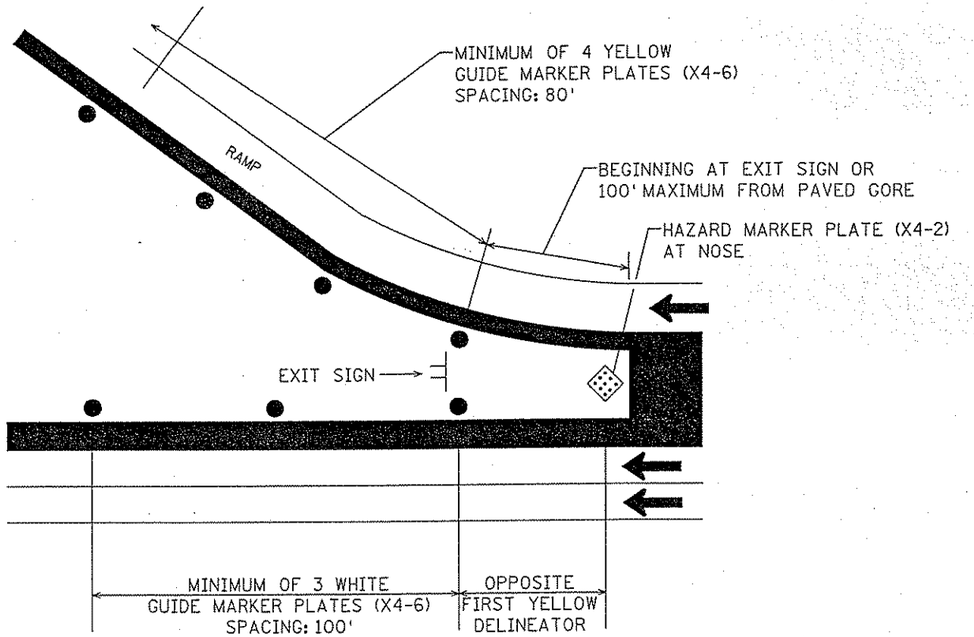
IF THESE OFFSETS CANNOT BE ATTAINED WITHIN 200 FEET OF THE PAVED GORE, A 4 FOOT OFFSET IS ACCEPTABLE, UNLESS THE SIGN IS TO BE MOUNTED ON A LIGHT POLE STANDARD (MINIMUM 2 FOOT OFFSET) LOCATED WITHIN 200 FEET OF THE PAVED GORE. IF THE 4 FOOT OFFSETS CANNOT BE ATTAINED WITHIN 200 FEET OF THE PAVED GORE, CONTACT THE OTE SIGNING UNIT.

NOTES:

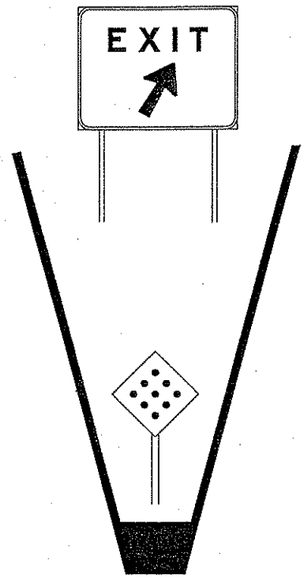
1. IF A SECONDARY SIGN IS MOUNTED BELOW A MAJOR SIGN, THE MAJOR SIGN SHALL BE AT LEAST 8' ABOVE THE PAVEMENT EDGE AND THE SECONDARY SIGN AT LEAST 5'.
2. ALL ROUTE MARKERS, WARNING AND REGULATORY SIGNS SHALL BE AT LEAST 6' ABOVE PAVEMENT EDGE EXCEPT WHERE HEAVY PEDESTRIAN TRAFFIC IS ENCOUNTERED THEY SHALL BE 7'.
3. SIGN FACES SHALL BE VERTICAL.
4. OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.
5. TO AVOID SPECULAR GLARE, ∠A SHALL BE APPROXIMATELY 93° FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF PAVEMENT AND APPROXIMATELY 92° FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF PAVEMENT. THIS APPLIES TO SIGNS TYPE "A", "C", & "D" AND INCLUDES SIGNS IN THE GORE.
6. "Y" IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'.
7. WHERE "X" IS LESS THAN 30', "H" SHALL BE 7' ±6". WHERE "X" IS 30' OR GREATER, MINIMUM AND PREFERRED "H" IS 5'.
8. LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.
9. WHEN A TYPE A SIGN IS INSTALLED DIRECTLY BEHIND TRAFFIC BARRIER, THE LEFT EDGE OF THE SIGN PANEL SHALL BE LOCATED A MINIMUM OF 4 FEET BEHIND THE FACE OF THE TRAFFIC BARRIER.

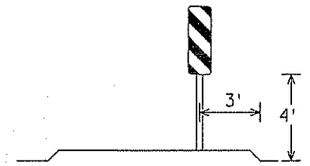
SIGN PLACEMENT

Revised 8-25-98

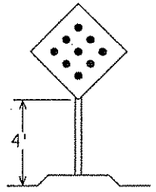


PLAN A
RAMP DELINEATION

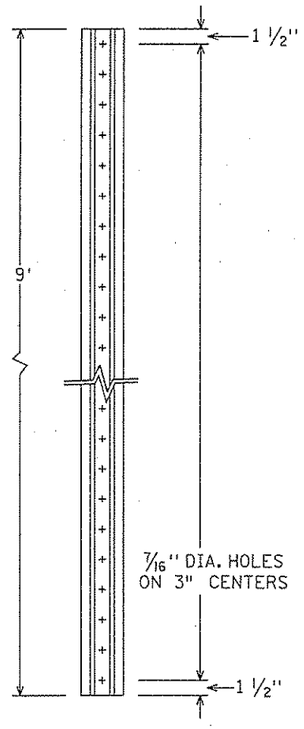




RAISED ISLAND
CLEARANCE MARKER
(X4-4)

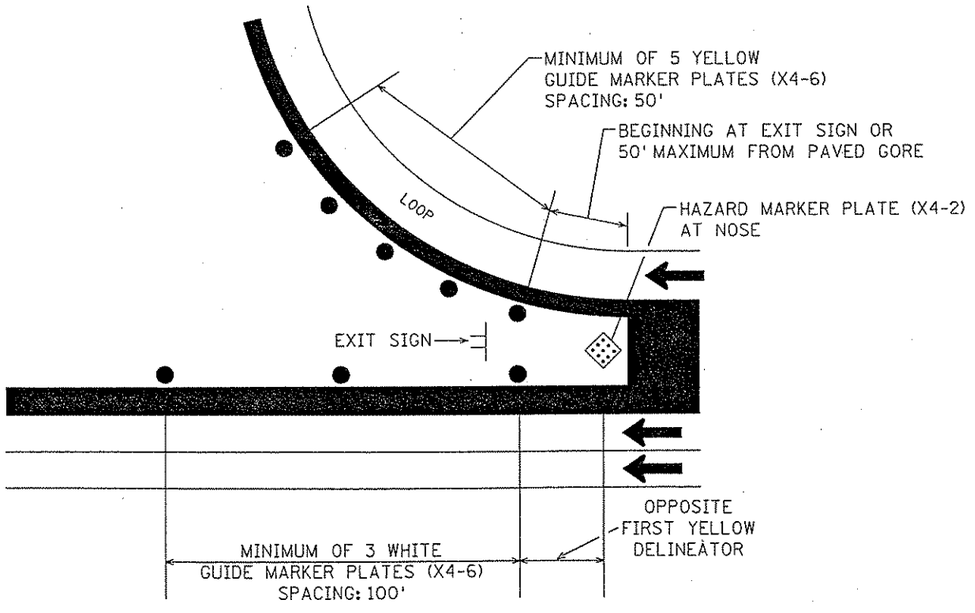


RAISED ISLAND
HAZARD MARKER PLATE
(X4-2)

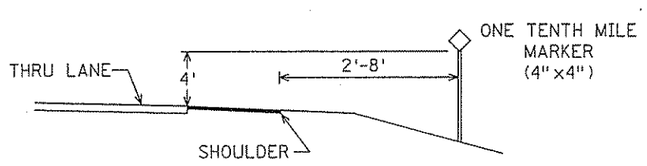


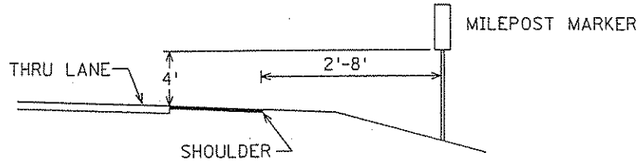
MN/DOT 3401
NORMAL WEIGHT= 2 LB./FT.

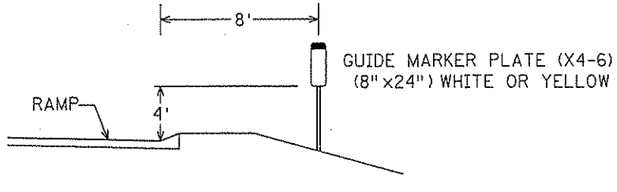
DELINEATOR POST

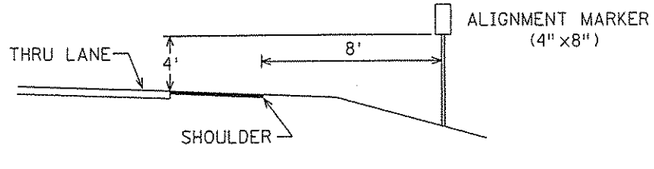


PLAN B
LOOP DELINEATION









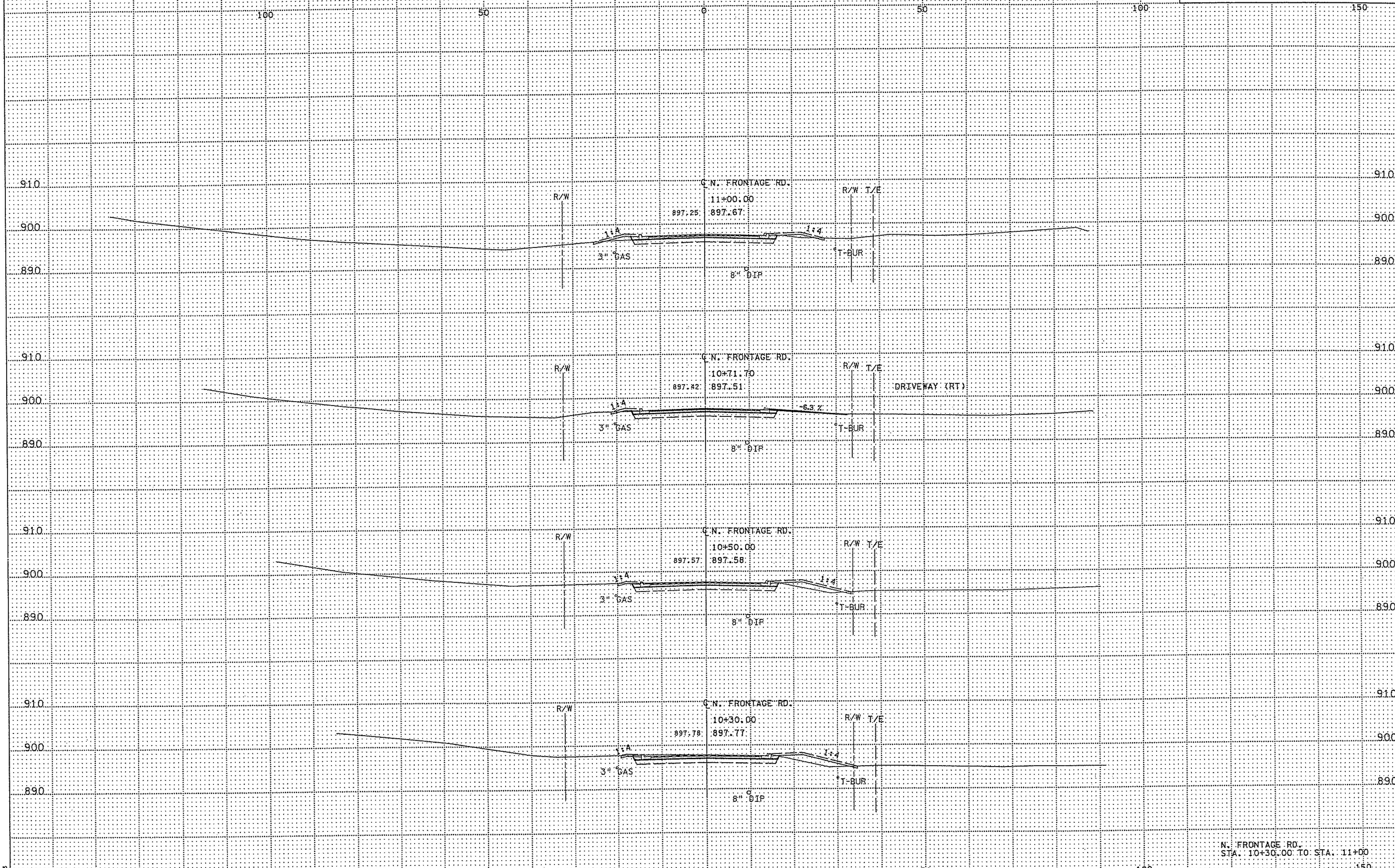
TYPICAL PLACEMENT

DELINEATORS AND MARKERS

Revised 3-23-00

S.P. 0212-43 (TH 242)

Fed. Proj. No.



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State Proj. No. S.P. 0212-43 (TH 242)

Sheet No. 39 of 49 Sheets

5/22/2003

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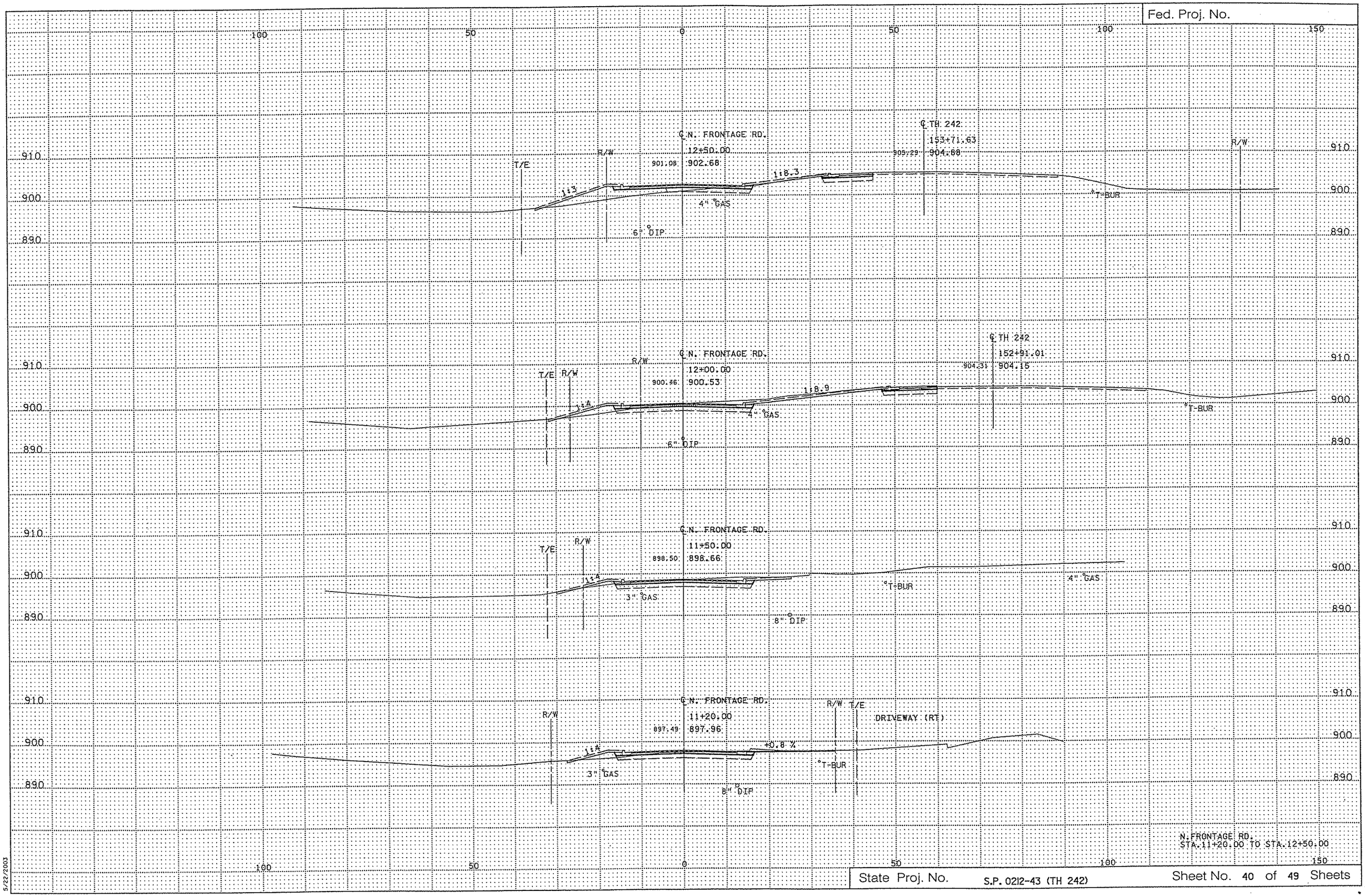

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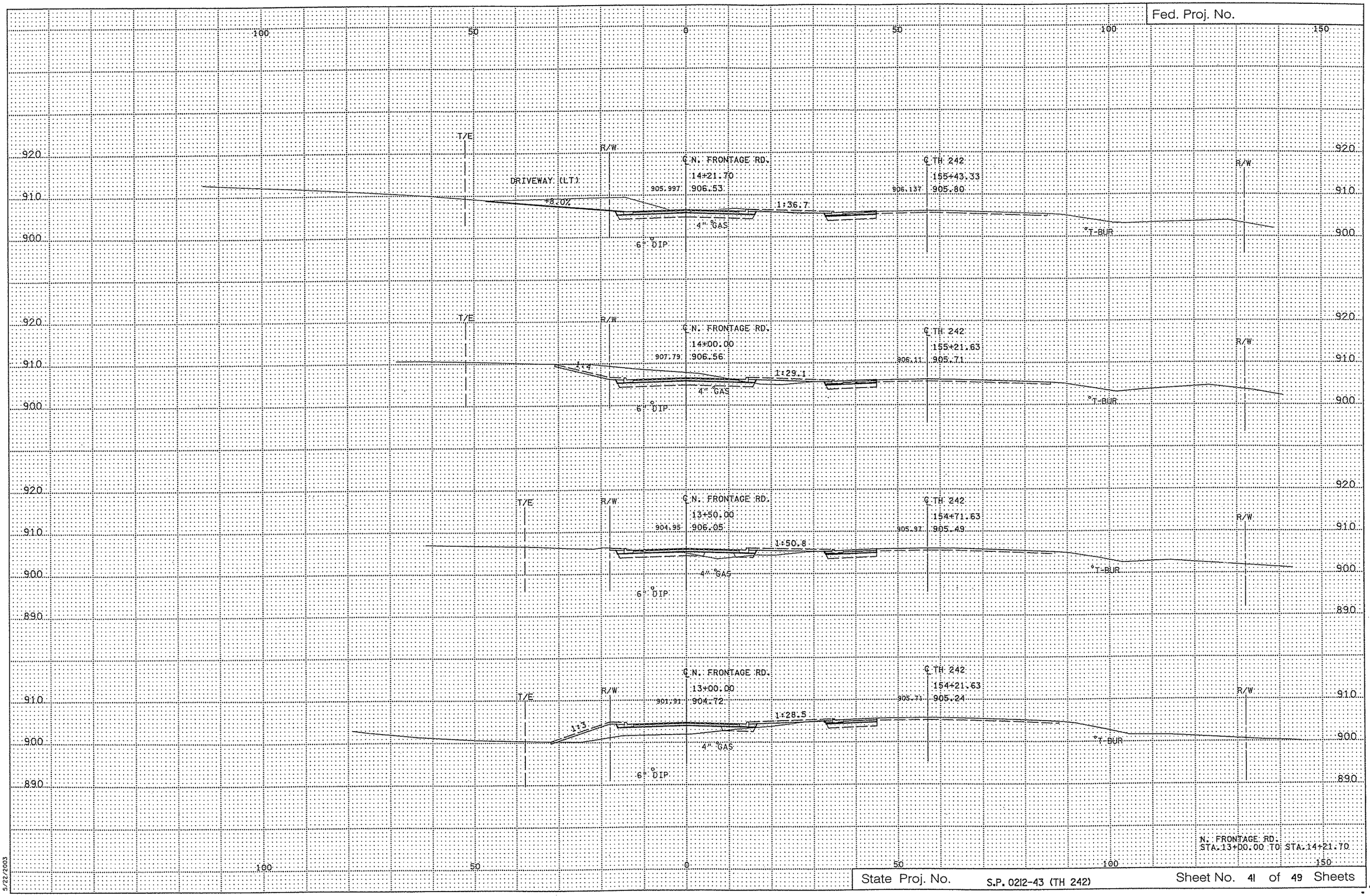

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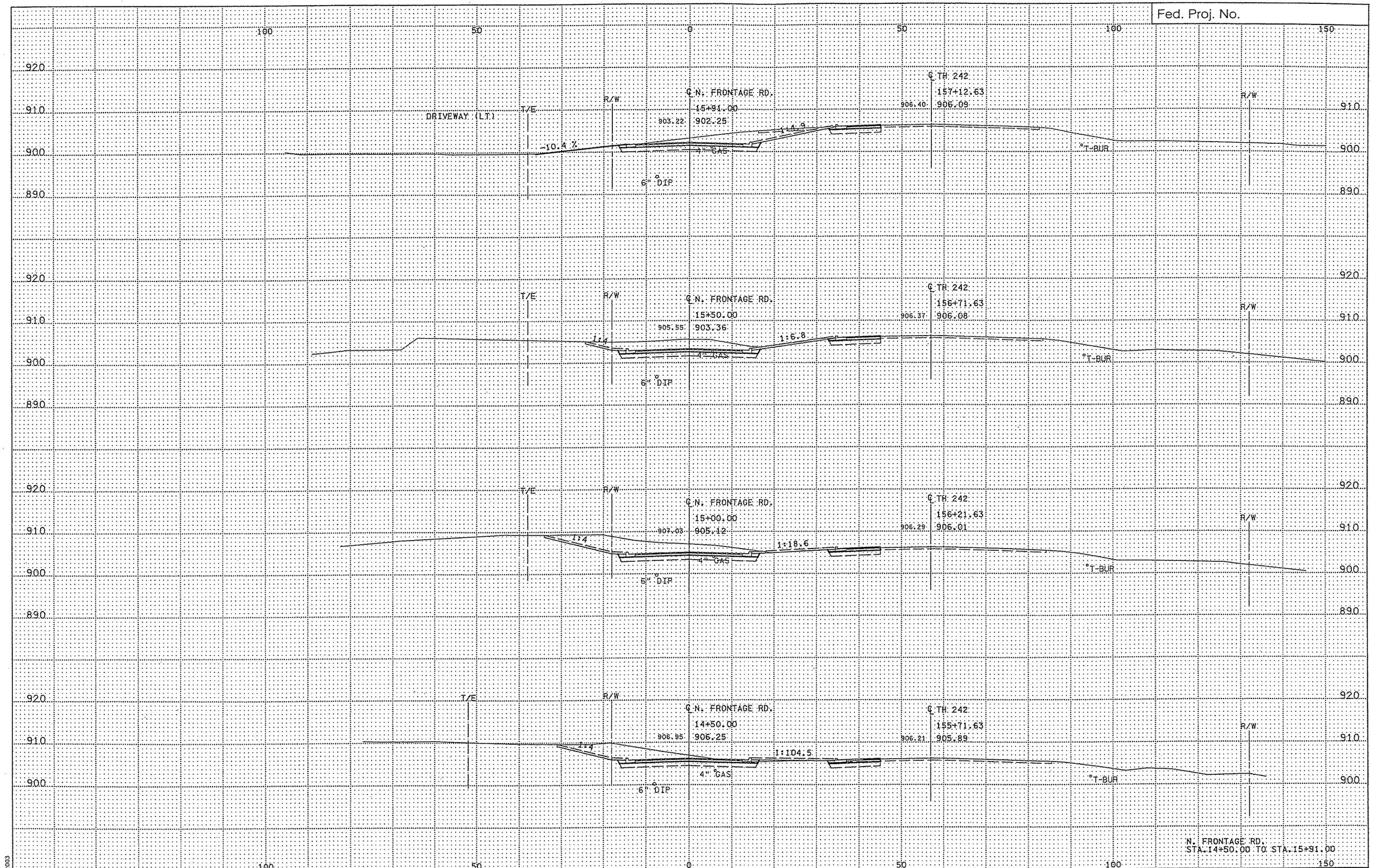

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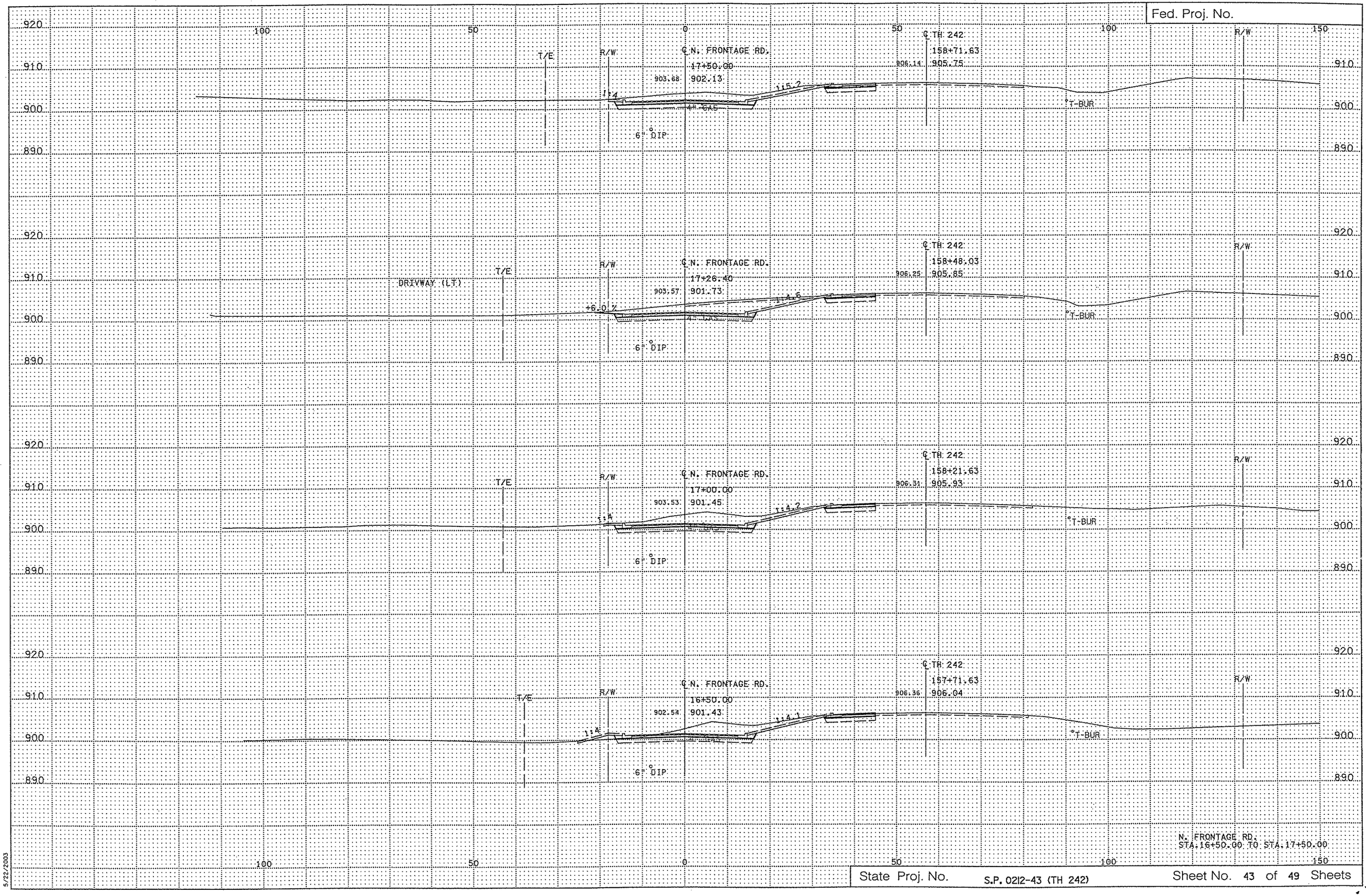

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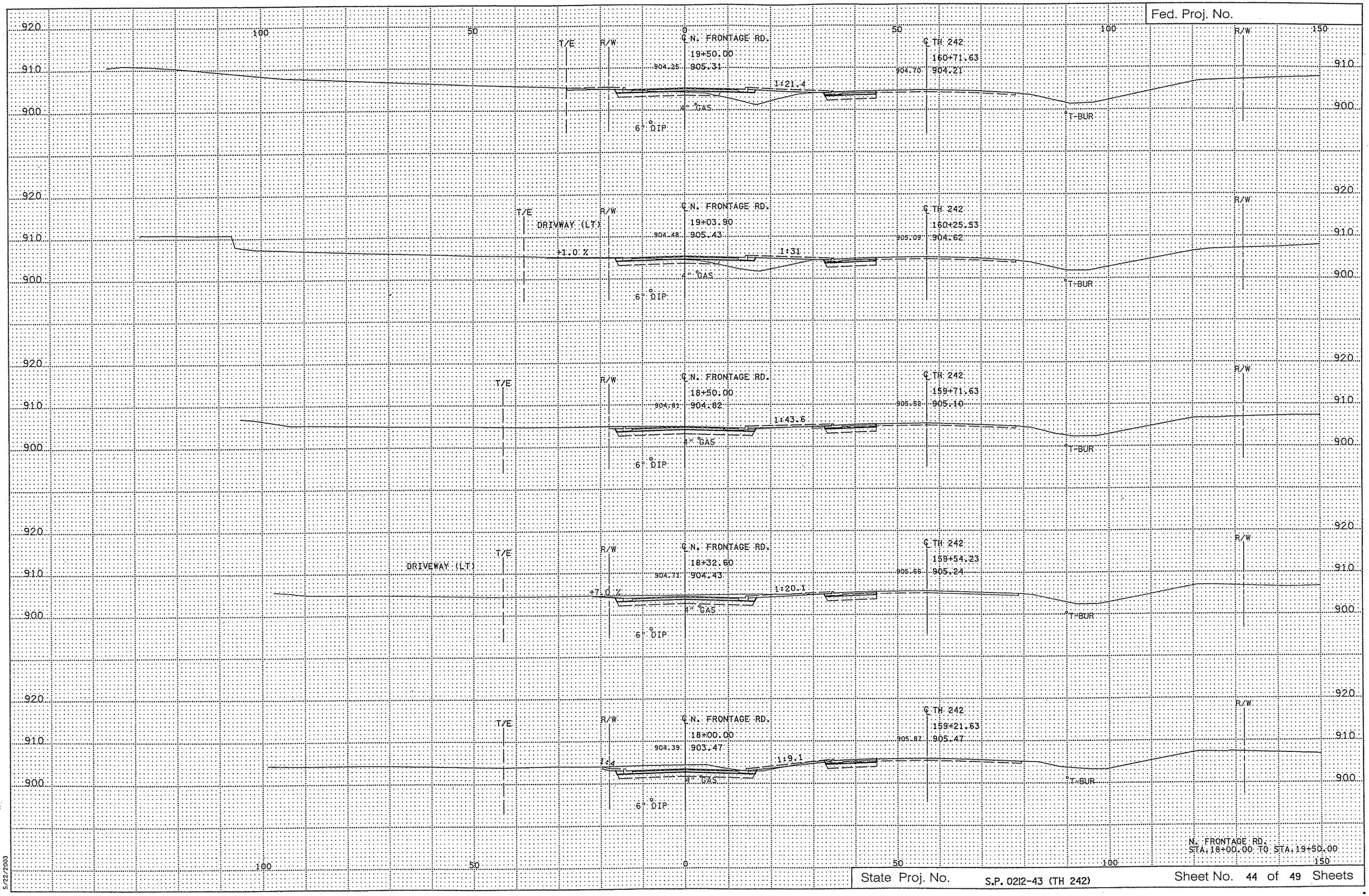

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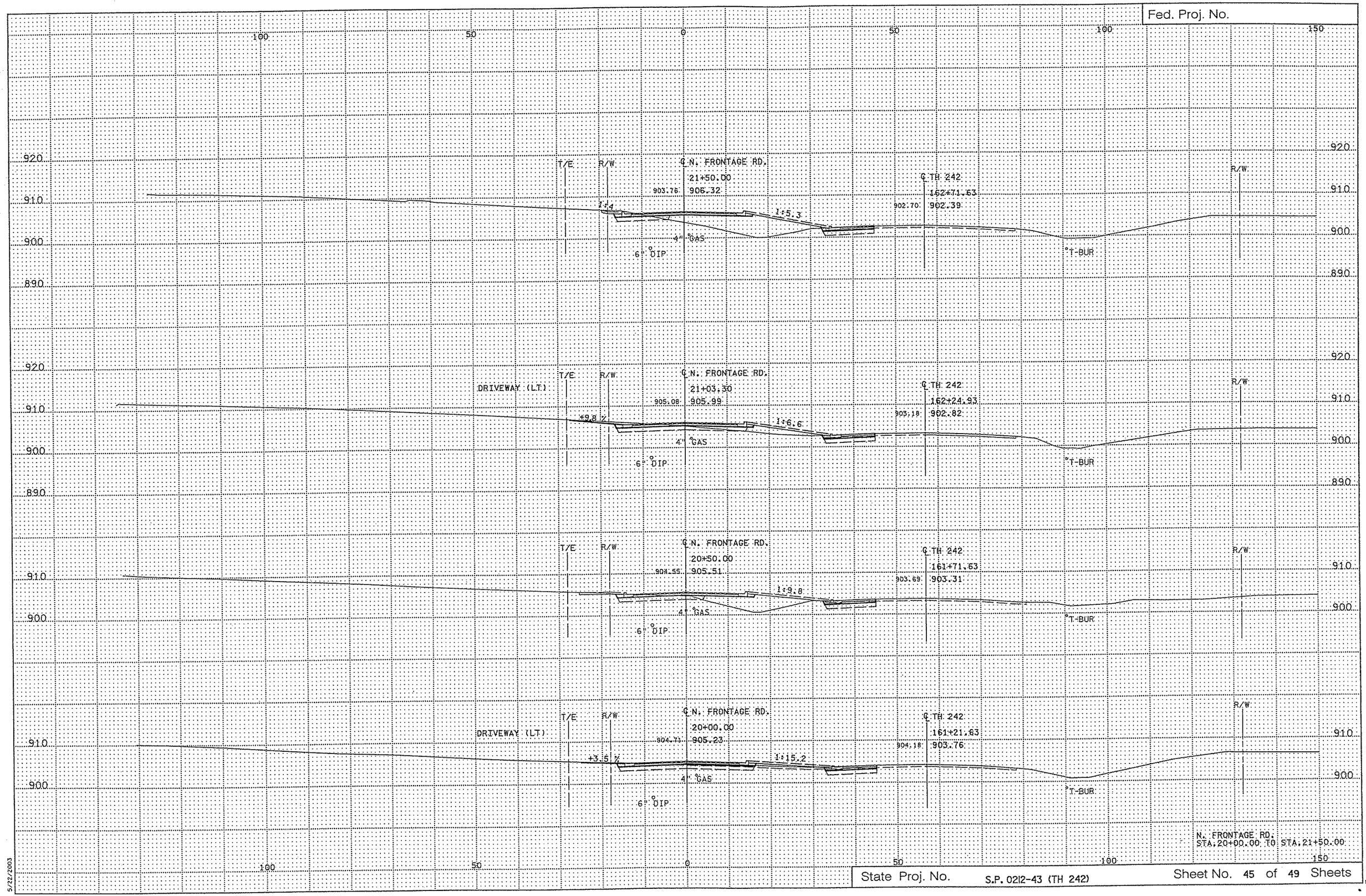

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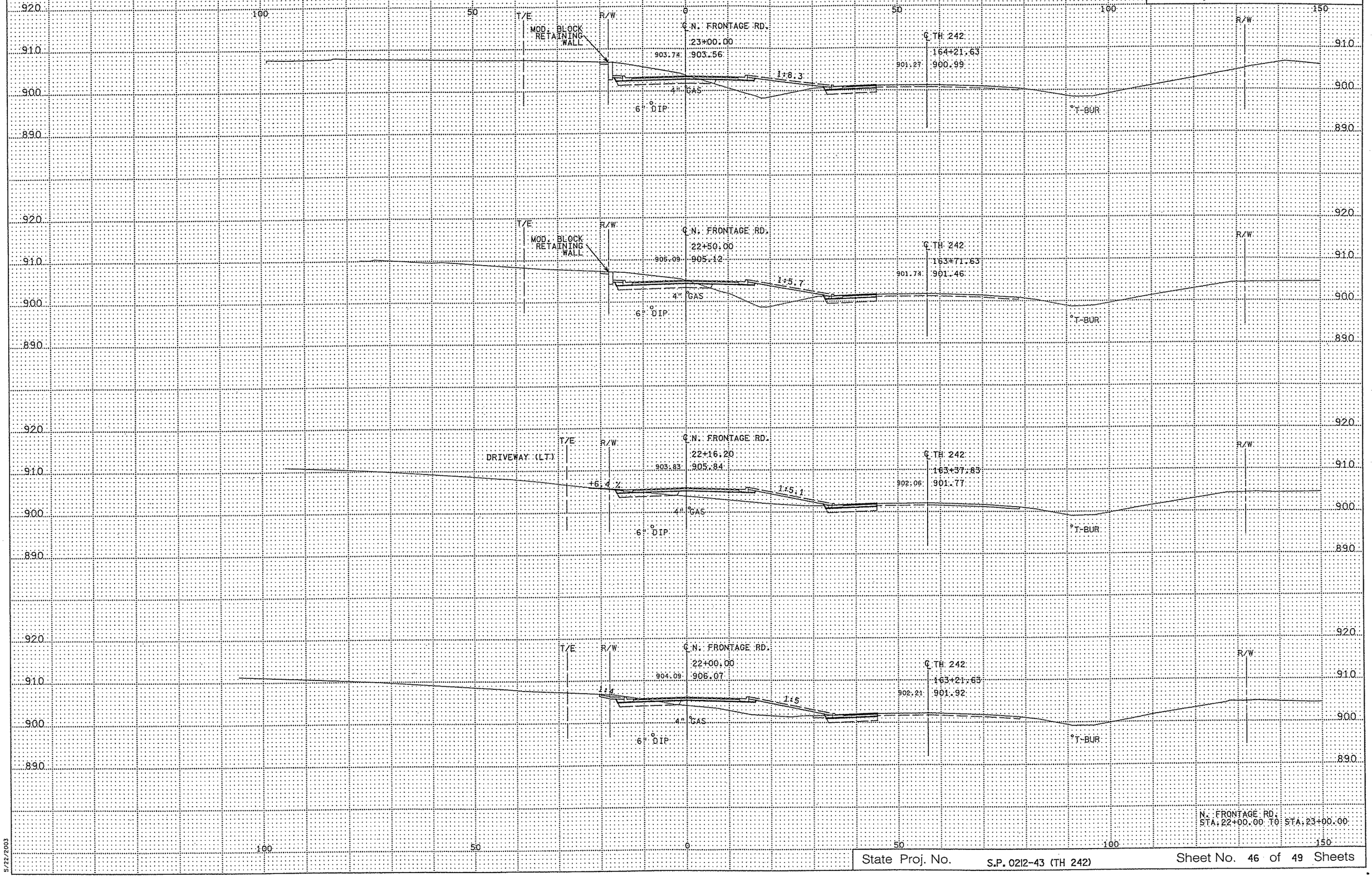

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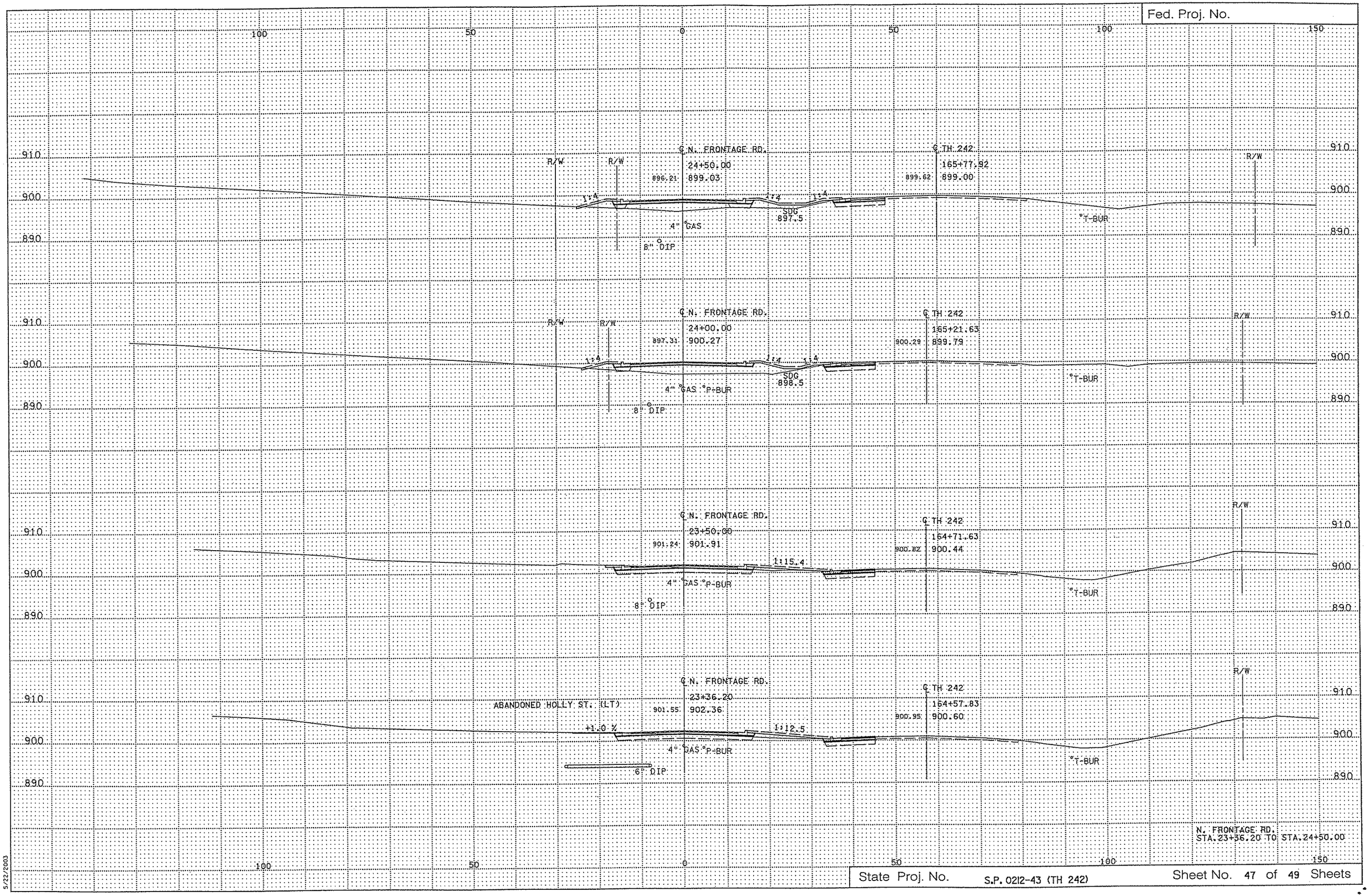

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Sheet No. 47 of 49 Sheets

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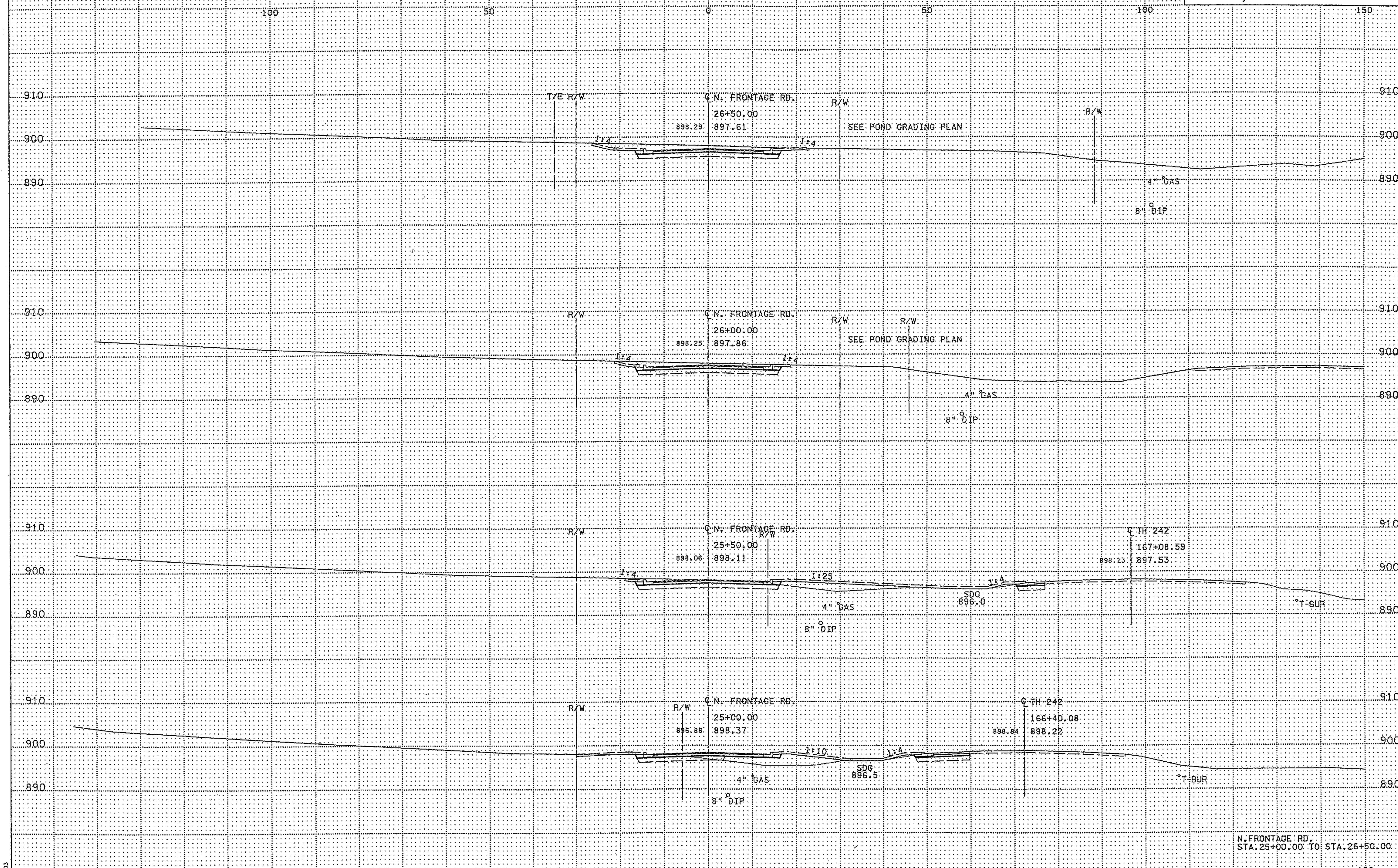

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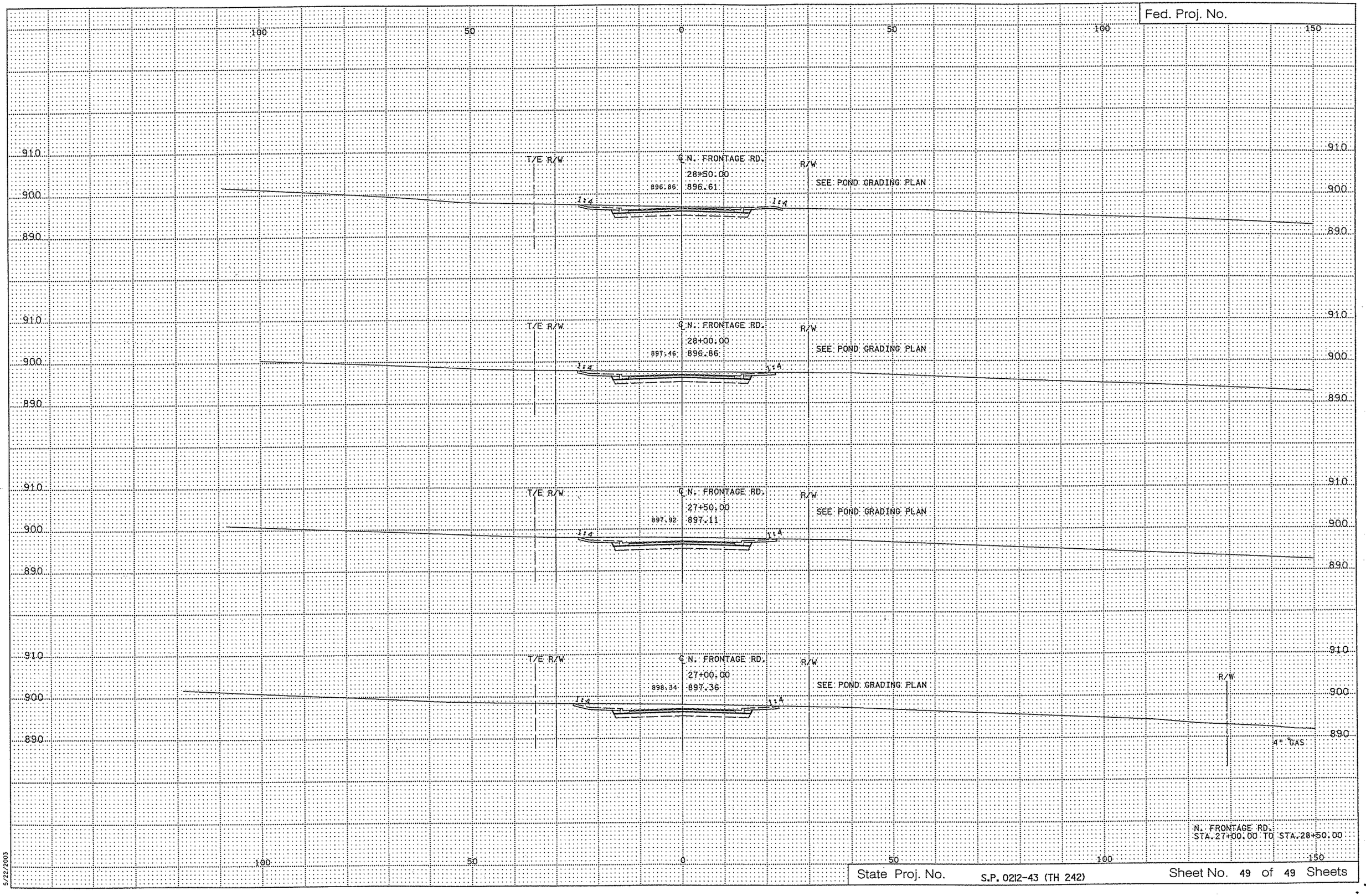

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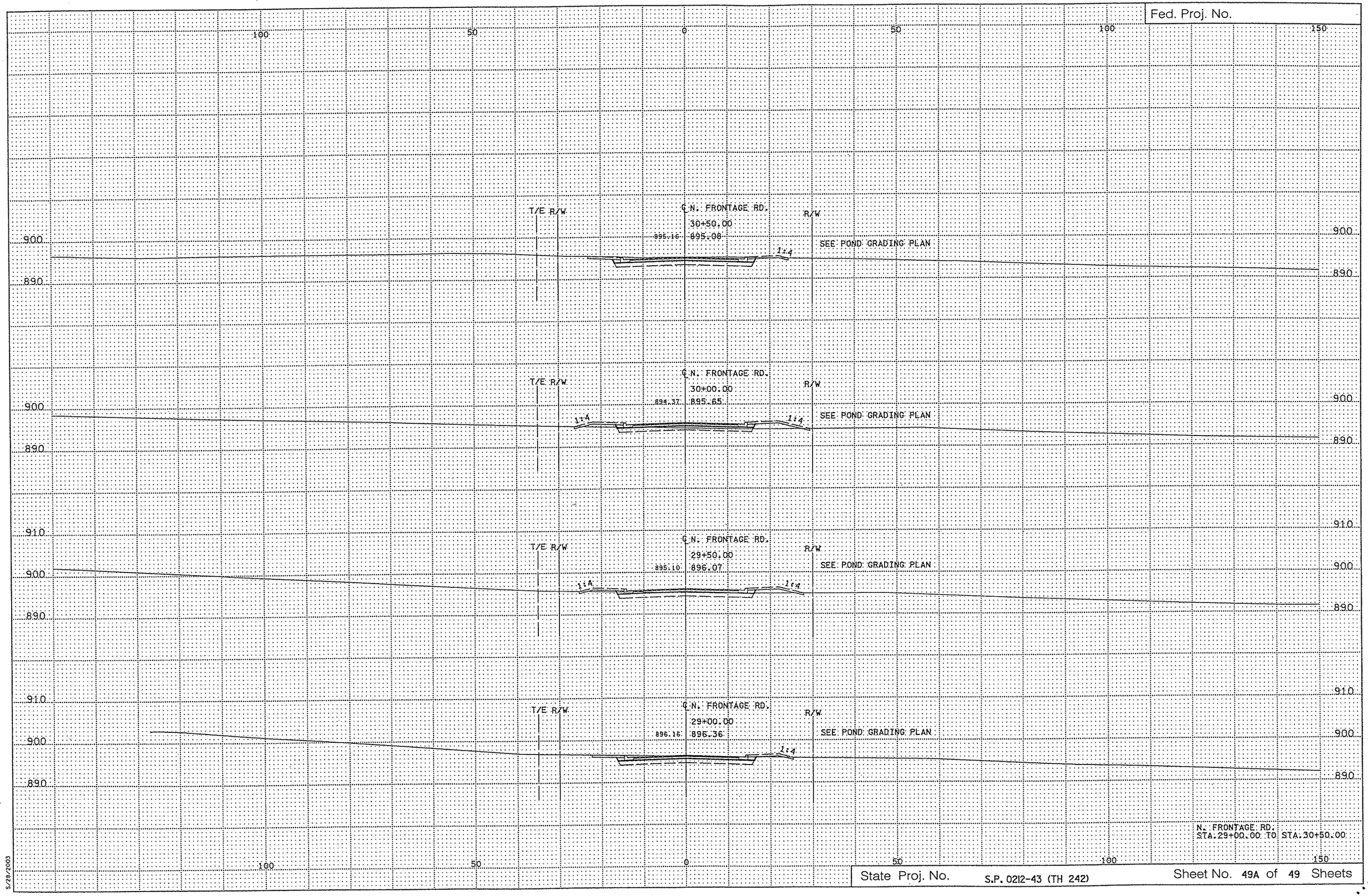

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Sheet No. 49A of 49 Sheets

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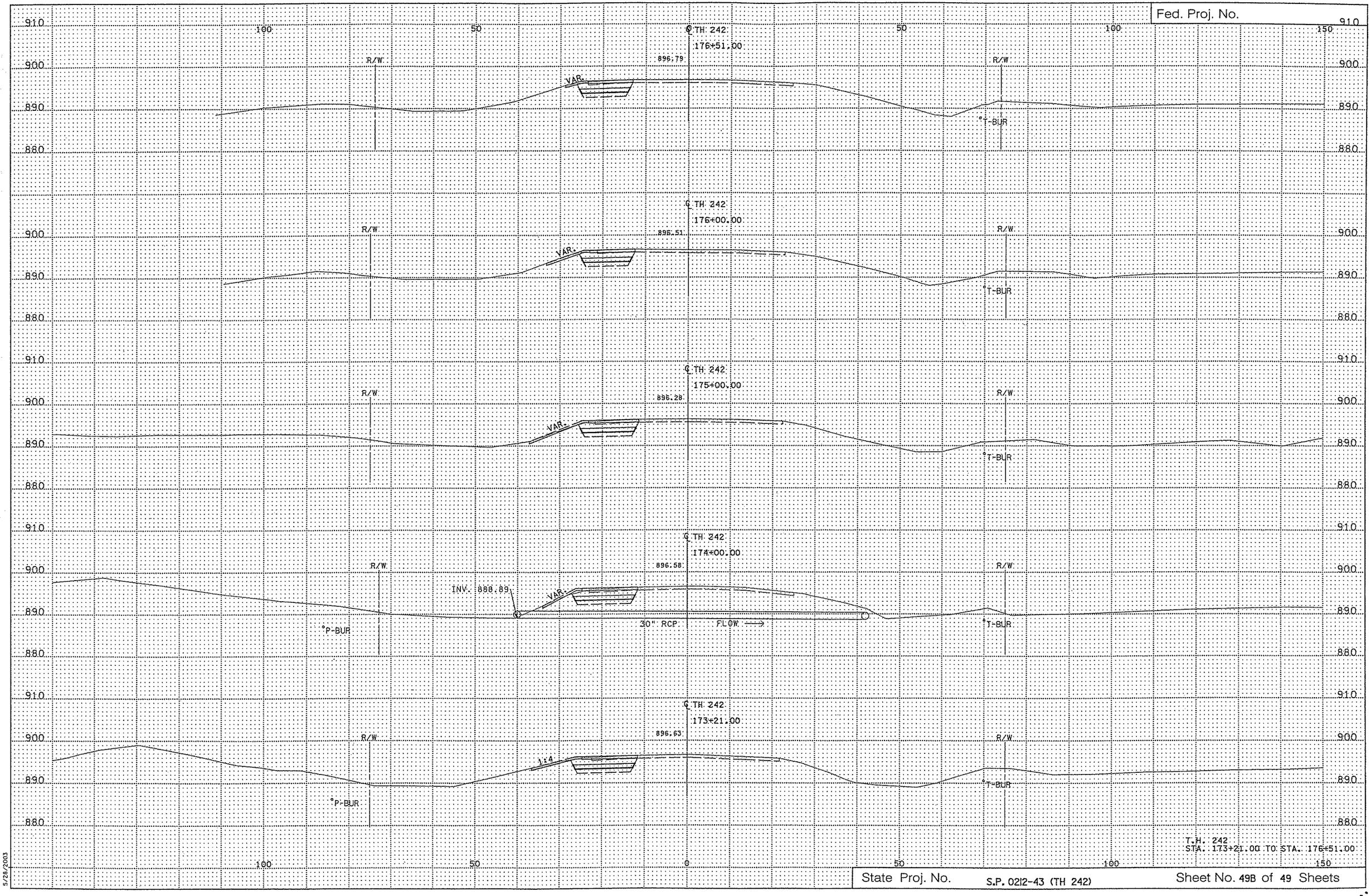

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State Proj. No. S.P. 0212-43 (TH 242) Sheet No. 49B of 49 Sheets

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