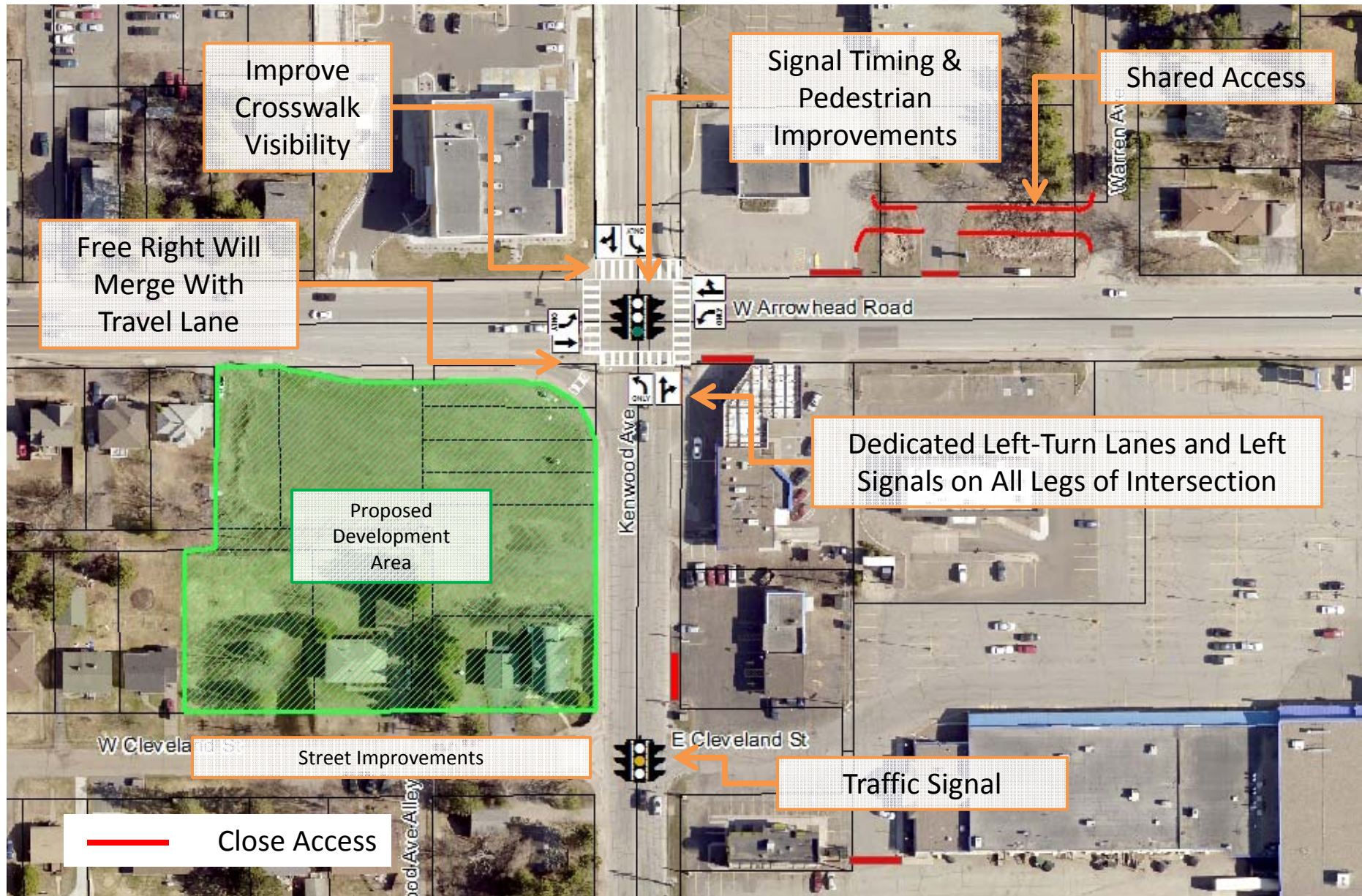


Kenwood/Arrowhead Transportation Improvement Concept*

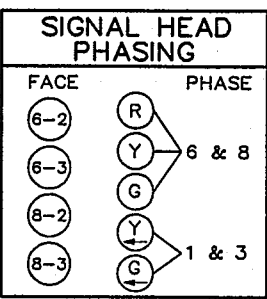
09/23/15



* Not for design



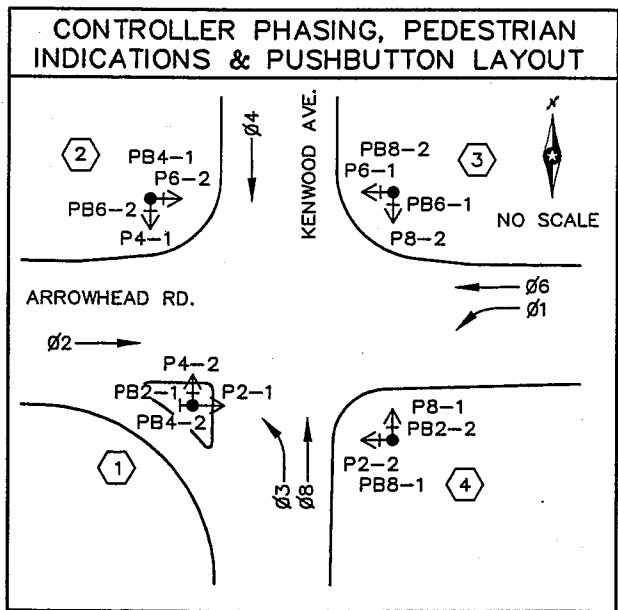
SIGNAL INDICATION CHART						
ALL SIGNAL INDICATIONS SHALL BE 12 INCH						
SIGNAL FACE	R	Y	G	RLTA	YLTA	GLTA
2-1,2-2,2-3	●	●	●			
4-1,4-2,4-3	●	●	●			
6-1	●	●	●			
6-2,6-3	●	●	●	←	←	
8-1	●	●	●			
8-2,8-3	●	●	●	←	←	



- 2 P90 FOUNDATION
TYPE P90 (MOD.)-A30-D30-9
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
R10-12 (36"x48") SIGN OVERHEAD
EXTEND 3" NMC INTO HH-4 WITH:
2 - 12/C #12, 2 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

- A EQUIPMENT PAD (SEE DETAIL)
INSTALL CONTROLLER & CABINET
EXTEND 4" NMC INTO HH-1 WITH:
4 - 12/C #12, 3 - 3/C #12,
13 - 2/C #14, 2 - 3/C #20
EXTEND 4" NMC INTO HH-12 WITH:
4 - 12/C #12, 2 - 3/C #12,
5 - 2/C #14, 2 - 3/C #20
3" NMC STUBBED OUT (THREAD
AND CAP BOTH ENDS)
2" NMC STUBBED OUT (THREAD
AND CAP BOTH ENDS)
(FUTURE TELEPHONE DROP)

- D SIGNAL SERVICE CABINET
METER AND DISCONNECT
EXTEND 1 1/4" NMC INTO CONTROLLER
CABINET WITH:
2 - 1/C #6 AND 1 - 1/C #6 BR.GR.
EXTEND 2" NMC INTO HH-13 WITH:
3 - 1/C #4 AND 1 - 1/C #6 BR.GR.
EXTEND 1 1/4" NMC INTO HH-1 WITH:
4 - 3/C #12 (LUM.)



- 1 P90 FOUNDATION
TYPE P90 (MOD.)-A20
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
EXTEND 3" NMC INTO HH-11 WITH:
2 - 12/C #12, 1 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

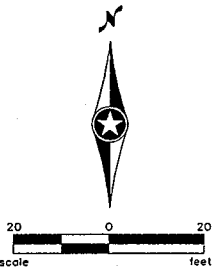
- SIGNAL OPERATION NOTES
- NORMAL OPERATION IS 4 PHASE
 - FLASH MODE SHALL BE ALL RED
 - Ø1 & Ø3 SHALL BE PROTECTED/PERMISSIVE LEFT TURNS
 - Ø2 & Ø6 SHALL BE ON VEHICLE RECALL

MATCH LINE "A"
(SEE SHEET 38)

- 3 P90 FOUNDATION
TYPE P90 (MOD.)-A30
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
R10-12 (36"x48") SIGN OVERHEAD
EXTEND 3" NMC INTO HH-6 WITH:
2 - 12/C #12, 1 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

LOOP DETECTOR CHART				DISTANCE TO CROSSWALK
DESIGNATION	SIZE/FT.	FUNCTION		
D1-1	2-6'X6'	(7)*		20',35'
D2-1,D2-2	1-6'X6'	(3)		150'
D2-3	2-6'X6'	(1)		0',15'
D3-1	2-6'X6'	(7)**		20',35'
D4-1,D4-2	1-6'X6'	(3)		150'
D4-3	2-6'X6'	(7)		0',15'
D4-4	2-6'X6'	(1)		0',15'
D6-1,D6-2	1-6'X6'	(3)		150'
D6-3	1-6'X6'	(7)		0'
D8-1,D8-2	1-6'X6'	(3)		150'
D8-3	2-6'X6'	(7)		0',15'
D8-4	1-6'X6'	(7)		0'
DC-1	1-6'X6'	COUNTING	SEE PLAN	
DC-2	1-6'X6'	COUNTING	SEE PLAN	

- FUNCTION NOTES:
- (1) CALL AND EXTEND
 - (3) EXTEND ONLY
 - (7) DELAY CALL / IMMEDIATE EXTEND
 - *(7) DELAY CALL, IMMEDIATE EXTEND PHASE 1 & 6
 - ** (7) DELAY CALL, IMMEDIATE EXTEND PHASE 3 & 8



- 4 P90 FOUNDATION
TYPE P90 (MOD.)-A30-D30-9
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
EXTEND 3" NMC INTO HH-9 WITH:
2 - 12/C #12, 1 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

- NOTES:
- 1) EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
 - 2) INTERNATIONAL SYMBOLS SHALL BE USED FOR ALL PEDESTRIAN INDICATIONS (HAND AND WALKING PERSON)
 - 3) HANDHOLES SHALL BE PVC TYPE WITH METAL FRAMES, COVERS AND CONCRETE COLLARS (SEE SPECIAL PROVISIONS).
 - 4) EXACT LOCATION OF HANDHOLES, PEDESTALS, POLES, LOOP DETECTORS AND CONTROLLER CABINET SHALL BE DETERMINED BY THE ENGINEER.
 - 5) CONTRACTOR SHALL INSTALL CITY OF DULUTH FURNISHED CONTROLLER AND CABINET ON NEW FOUNDATION.
 - 6) FURNISH AND INSTALL A 3/4" HALF COUPLING, 3/4" NIPPLE AND CONDUIT OUTLET BODY FOR FUTURE EMERGENCY VEHICLE PRE-EMPTION (EVP) EQUIPMENT 4' FROM THE END OF EACH MAST ARM.
 - 7) THERE SHALL BE NO END SLIP FITTERS ON THE MAST ARMS. USE MID ARM MOUNTS 6" FROM END FACING TRAFFIC, WITH REMOVABLE END CAPS.
 - 8) CONTRACTOR SHALL FURNISH AND INSTALL R10-12 (36"x48") SIGN ON MAST ARMS #2 AND #3. (INCIDENTAL TO ITEM No. 2565.5ii)
 - 9) THE PHOTO ELECTRIC CELL AND CHECK SWITCH SHALL BE MOUNTED ON THE SIGNAL SERVICE CABINET (SEE SHEET 36).

NO.	DATE	BY	CKD	APPR	REVISION

NAME: H:\SIGNALS\1753\53-INT DATE: JAN. 1996

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Dennis R. Eger
Date 3-7-96 Reg. No. 10792

DRAWN BY
J.HAMRE
DESIGNED BY
M.COTE
CHECKED BY
D.EYLER
COMM. NO.
0951753

SRF CONSULTING
GROUP, INC.

CITY OF DULUTH
ARROWHEAD ROAD AND KENWOOD AVENUE
INTERSECTION LAYOUT

SHEET
35
OF
68

CLIENT:
UNITED PROPERTIES

3600 American Blvd. W, Ste. 750
Minneapolis, MN 55431

THIS SQUARE APPEARS 1/2" x 1/2" ON
FULL SIZE SHEETS.

08/19/15 PERMIT SET
NO DATE ISSUED FOR

10/15/15 POST BID ADDENDUM 3
10/15/15 POST BID ADDENDUM 2
NO DATE 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 Landscape Architect under the laws of the State of Minnesota.

SIGNATURE: Heidi S. Bringham

TYPED OR PRINTED NAME: HEIDI S. BRINGMAN

DATE: 08/19/2015 REG. NO.: 46914

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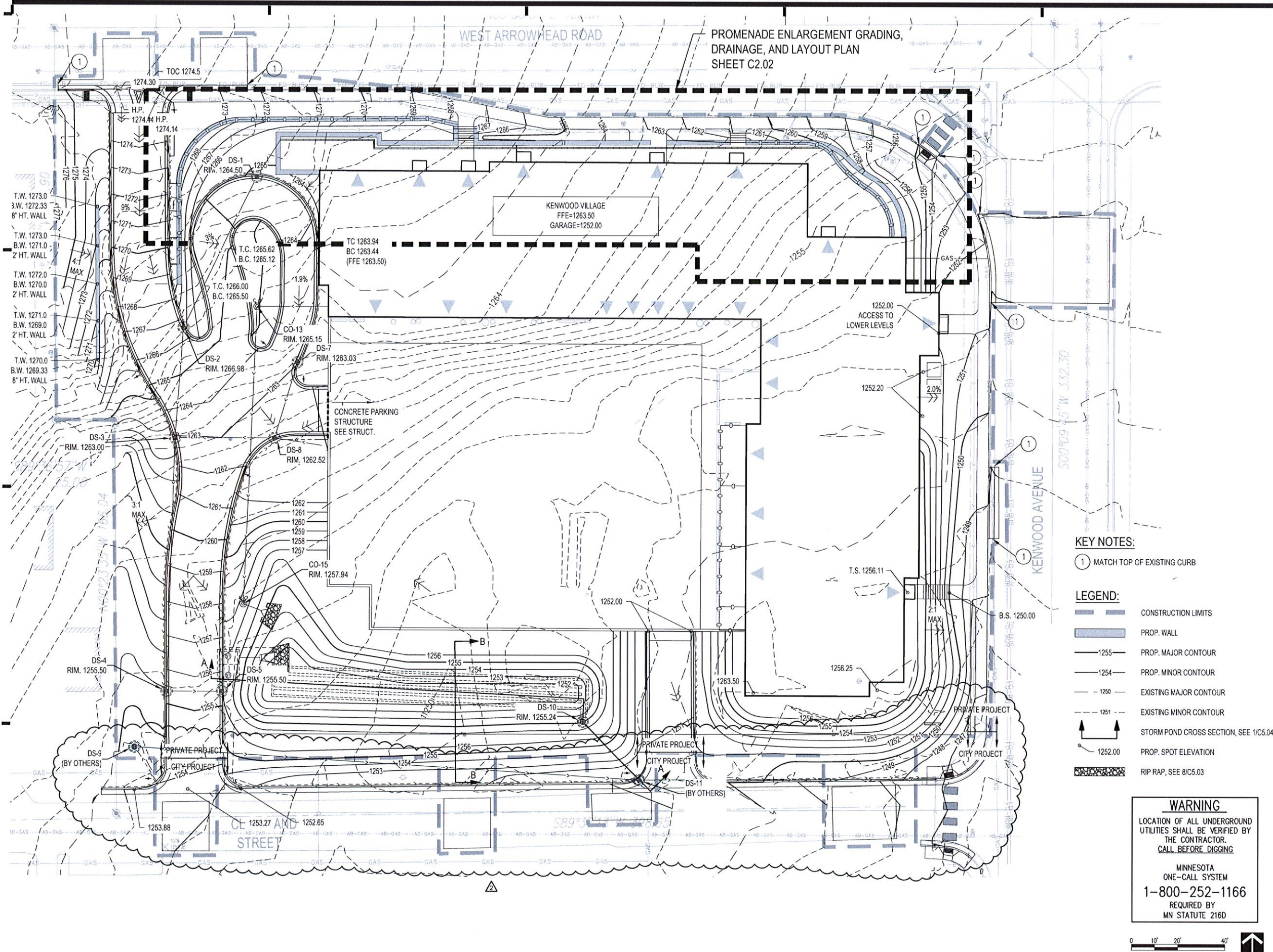
PROJECT NAME:
KENWOOD VILLAGE

Arrowhead Road & Kenwood Avenue
Duluth, Minnesota

DRAWING TITLE:
GRADING AND DRAINAGE
PLAN

FILE: .\\140719\\600 Drawings\\C140719 C2.01 Grading and Drainage.dwg
DRAWN BY: MRH
CHECKED BY: HSB
PROJ. NO: 140719
DRAWING NO:

C2.01



PLANS 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

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

SPRINGS

MARSH

TIMBER
ORCHARD
BRUSH
NURSERY

CATCH BASIN
FIRE HYDRANT
CATLE GUARD

OVERPASS (Highway Over)
UNDERPASS (Highway Under)
BRIDGE

BUILDING (One Story Frame)
F-FRAME
S-STONE
B-BRICK
T-TILE
ST-STUCCO

IRON PIPE OR ROD
MONUMENT (STONE, CONCRETE, OR METAL)
WOODEN HUB
GRAVEL PIT
SAND PIT
BORROW PIT
ROCK QUARRY
SLOPE EASEMENT

UTILITIES 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 LINE
CONDUIT
TELEPHONE CABLE IN CONDUIT
ELECTRIC CABLE IN CONDUIT
TELEPHONE MANHOLE
ELECTRIC MANHOLE
BURIED TELEPHONE CABLE
BURIED ELECTRIC CABLE
AERIAL TELEPHONE CABLE
SEWER (SANITARY OR STORM)
SEWER MANHOLE

MINNESOTA DEPARTMENT OF TRANSPORTATION
CITY OF DULUTH
DEPARTMENT OF PUBLIC WORKS - DIVISION OF ENGINEERING

CONSTRUCTION PLAN FOR: GRADING, AGGREGATE BASE, STORM SEWER, CONCRETE WALK,
CONCRETE CURB & GUTTER, CONCRETE PAVEMENT & BITUMINOUS SURFACING,
ARROWHEAD ROAD, KENWOOD AVENUE AND HOWARD GNESEN ROAD
CITY PROJECT No. 8689MA92

LOCATED ON MSAS 160 (ARROWHEAD ROAD) BETWEEN 276.30' WESTERLY OF KENWOOD AVE AND 826.26' EASTERLY
STATE PROJECT No. 118-160-18
GROSS LENGTH 1102.56 FEET 0.2088 MILES
NET LENGTH 1102.56 FEET 0.2088 MILES
EXCEPTIONS-LENGTH 0.00 FEET 0.000 MILES

LOCATED ON MSAS 151 (KENWOOD AVENUE) BETWEEN SOUTH R/W OF ARROWHEAD ROAD AND 601.00' SOUTHERLY
STATE PROJECT No. 118-151-09
GROSS LENGTH 601.00 FEET 0.1138 MILES
NET LENGTH 601.00 FEET 0.1138 MILES
EXCEPTIONS-LENGTH 0.00 FEET 0.000 MILES

LOCATED ON CSAH 634 (HOWARD GNESEN RD) BETWEEN NORTH R/W OF ARROWHEAD ROAD AND 1666.00' NORTHERLY
ST LOUIS COUNTY STATE PROJECT No. 69-634-11
GROSS LENGTH 1666.00 FEET 0.3155 MILES
NET LENGTH 1666.00 FEET 0.3155 MILES
EXCEPTIONS-LENGTH 0.00 FEET 0.000 MILES

WARNING
LOCATION OF UNDERGROUND UTILITIES
TO BE VERIFIED BY CONTRACTOR
GOPHER STATE ONE CALL
CALL BEFORE DIGGING,
1-800-252-1166
REQUIRED BY LAW

PROJECT LOCATION
ST. LOUIS COUNTY
CITY OF DULUTH
SW 1/4 SEC 10, T50N, R14W
SE 1/4 SEC 10, T50N, R14W
NW 1/4 SEC 15, T50N, R14W
NE 1/4 SEC 15, T50N, R14W

END PROJECT
S.P. 69-634-11
STA 117+50.00

BEGIN PROJECT
S.P. 69-634-11
STA 100+84.00

BEGIN PROJECT
S.P. 118-160-18
STA 50+17.44

END PROJECT
S.P. 118-160-18
STA 99+16.00

BEGIN PROJECT
S.P. 118-151-09
STA 93+15.00

INDEX MAP

SCALES
PLAN 20'
PROFILE 20' HORIZ. 5' VERT.
INDEX MAP 2000'

DESIGN DESIGNATION
ARROWHEAD ROAD
N18 20 7,400,500
R= 20
ADT (Current Year) 1996 = 17,739
ADT (Future Year) 2016 = 26,359
DHV (Design Hr. Vol.) = 1318
D (Directional Distr.) = 50-50 %
T (Heavy Commercial) = 11 %
Design Loading 10 TON
Design Speed 30 MPH
Based on STOPPING Sight Distance
Height of eye 3.5 Height of object 0.5
Design Speed not achieved at:
STA. 52+25 TO STA. 53+25 MPH 25-SIGNAL CONDITION
ROADWAY CLASS HIGH DENSITY ARTERIAL
No. TRAFFIC LANES 4 - 12' PARKING LANES N/A

DESIGN DESIGNATION
KENWOOD AVE & HOWARD GNESEN ROADS
N18 20 5,220,700
R= 20
ADT (Current Year) 1996 = 12,521
ADT (Future Year) 2016 = 18,606
DHV (Design Hr. Vol.) = 930
D (Directional Distr.) = 50-50 %
T (Heavy Commercial) = 11 %
Design Loading 10 TON
Design Speed 30 MPH
Based on STOPPING Sight Distance
Height of eye 3.5 Height of object 0.5
Design Speed not achieved at:
TO STA. MF
ROADWAY CLASS HIGH DENSITY ARTERIAL
No. TRAFFIC LANES 4 - 12' PARKING

SEAWAY WILL
SUBMIT NEW
SHEET FOR
HGR SAN. SEWER

FEDERAL AID PROJECT No. STP 6995(234)

GOVERNING SPECIFICATIONS

THE 1988 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" AS AMENDED BY THE MAY 2, 1994, SUPPLEMENTAL SPECIFICATION SHALL GOVERN. CITY OF DULUTH 1996 CONSTRUCTION SPECIFICATIONS FOR DEPARTMENT OF WATER AND GAS. ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE 1991 MMUTCD, INCLUDING THE FIELD MANUAL DATED APRIL 1995.

INDEX

SHEET No. DESCRIPTION

1. TITLE SHEET
2. GENERAL LAYOUT
3-4. ESTIMATED QUANTITIES
5. DETAILS
6-7. STORM SEWER LEAD PROFILES
8-11. TYPICAL SECTIONS
12-17. TABULATIONS
18-25. PLAN & PROFILE
26-27. TRAFFIC CONTROL PLAN
28. EROSION CONTROL PLAN
29-31. INTERSECTION PLAN
32. STRIPING & MESSAGES
33-38. SIGNAL PLANS
39-68. CROSS SECTIONS

THIS PLAN CONTAINS 68 SHEETS.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

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

15294
DATE REG. NO. JOHN J. HINZMANN Jr.

APPROVAL

RECOMMENDED FOR APPROVAL
CITY ENGINEER-DULUTH REG. NO. DATE

RECOMMENDED FOR APPROVAL
CHIEF ENGINEER WATER AND GAS-DULUTH REG. NO. DATE

RECOMMENDED FOR APPROVAL
ST LOUIS COUNTY ENGINEER REG. NO. DATE

RECOMMENDED FOR APPROVAL
DISTRICT STATE AID ENGINEER REG. NO. DATE

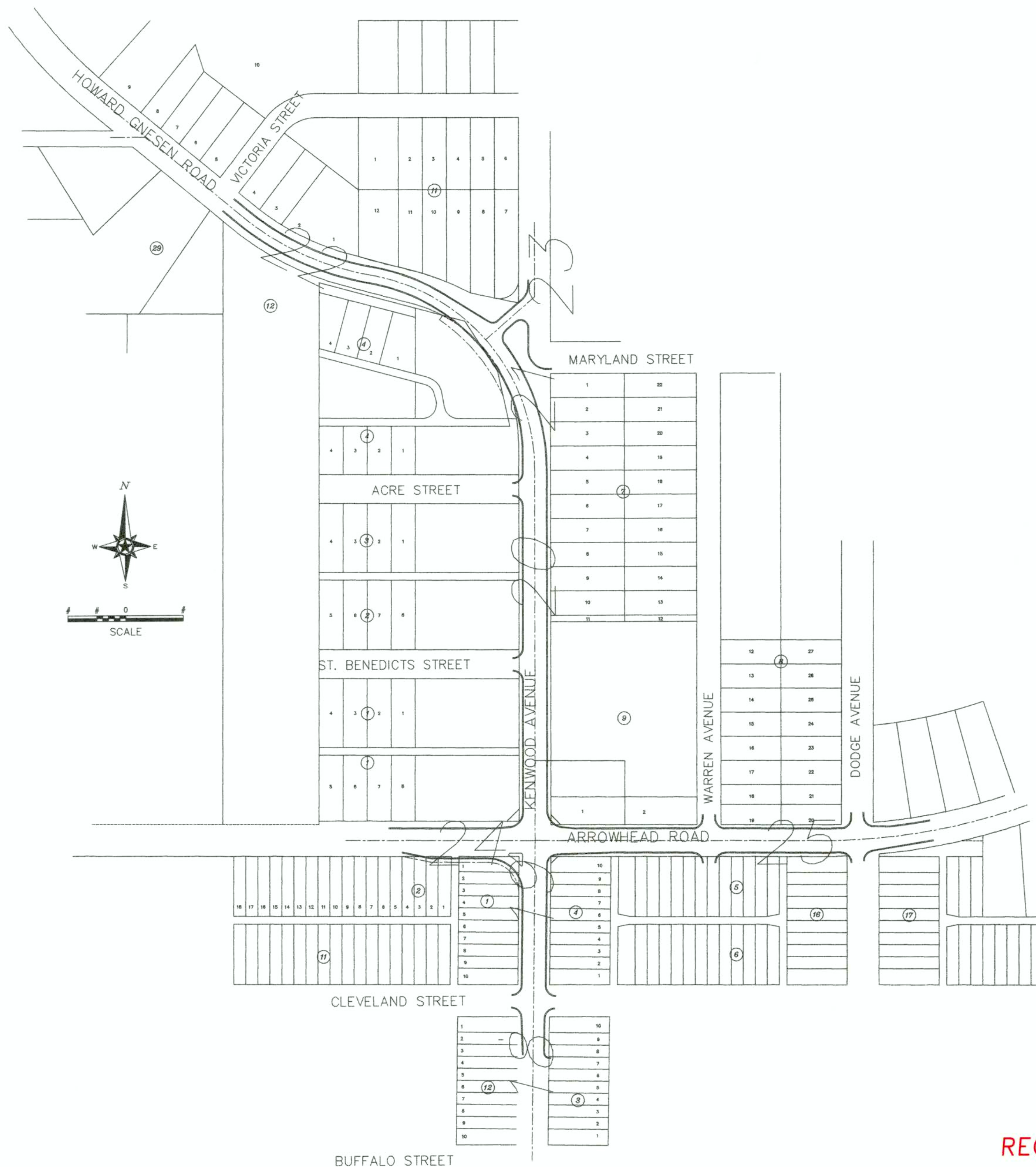
RECOMMENDED FOR APPROVAL
FOR STATE AID DIVISION REG. NO. DATE

APPROVED
STATE AID ENGINEER REG. NO. DATE

THE ORIGINAL SIGNED TITLE SHEET FOR THIS PROJECT IS ON FILE IN THE CITY ENGINEERS OFFICE, CITY OF DULUTH. (F)

RECORD DRAWING 2/98

No. REVISION DATE



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

David D. Rieker
DATE 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98

SHEET 2F OF 68 SHEETS

STATEMENT OF ESTIMATED QUANTITIES			UNIT	EST. QTY.	FINAL QUANTITY	S. P. 118-160-18 ARROWHEAD ROAD ESTIMATED QUANTITY			S. P. 118-151-09 KENWOOD AVENUE ESTIMATED QUANTITY			S. P. 69-634-11 KENWOOD AVENUE/HOWARD GNESEN RD ESTIMATED QUANTITY		
NOTE	ITEM NO.	DESCRIPTION				PARTICIPATING		NON- PARTICIPATING	PARTICIPATING		NON- PARTICIPATING	PARTICIPATING		NON- PARTICIPATING
						ROADWAY	ST. SEWER		ROADWAY	ST. SEWER		ROADWAY	ST. SEWER	
1	0015.601	COMPUTER EQUIPMENT	LUMP SUM	1.00	0.00		0.33			0.18			0.49	
	2021.501	MOBILIZATION	LUMP SUM	1.00	1.00		0.33			0.18			0.49	
	2031.501	FIELD OFFICE TYPE D	EACH	1.00	1.00		0.33			0.18			0.49	
	0041.606	TRAINEES	HOOR	750.00	697.50		250.00			130.00			370.00	
2	2101.501	CLEARING	ACRE	0.95	1.60		0.80						0.15	
2	2101.502	CLEARING	TREE	49.00	56.00		3.00						46.00	
2	2101.506	GRUBBING	ACRE	0.95	1.60		0.80						0.15	
2	2101.507	GRUBBING	TREE	49.00	61.00		3.00						46.00	
3	2104.501	REMOVE SEWER PIPE - STORM	LIN FT	1913.00	3266.00		579.00			554.00			780.00	
4	2104.501	REMOVE CURB & GUTTER	LIN FT	1668.00	1850.00		1668.00							
5	2104.501	REMOVE STONE MASONRY WALL	LIN FT	49.00	49.00								49.00	
6	2104.503	REMOVE CONCRETE SIDEWALK	SQ FT	5208.00	6463.00		249.00			1189.00			3770.00	
7	2104.505	REMOVE PAVEMENT	SQ YD	4383.30	4556.50		2115.00			2268.30				
47	0104.603	SALVAGE BRICK PAVERS	SQ FT	63.00	60.00								63.00	
34	2104.509	REMOVE CATCH BASIN	EACH	18.00	18.00		13.00			3.00			2.00	
34	2104.509	REMOVE MANHOLE	EACH	8.00	12.00		4.00			2.00			2.00	
9	2104.509	REMOVE CONCRETE STEPS	EACH	2.00	1.00					2.00				
48	2104.509	REMOVE SIGN	EACH	1.00	1.00		1.00							
10	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LIN FT	294.00	595.00		55.00			162.00			77.00	
10	2104.513	SAWING BIT PAVEMENT (FULL DEPTH)	LIN FT	1051.00	1028.00		435.00			214.00			402.00	
11	2105.501	COMMON EXCAVATION	CU YD (P)	31172.00	31484.00	(P) 10381.00				(P) 4487.00			(P) 16304.00	
11	2105.503	ROCK EXCAVATION	CU YD	2288.00	1908.40	210.00							2078.00	
12	2105.522	SELECT GRANULAR BORROW (CV)	CU YD (P)	17566.00	17498.00	(P) 5751.00				(P) 2573.00			(P) 9242.00	
12, 15	0105.609	GEOTEXTILE FABRIC TYPE V	SQ YD	22152.00	22152.00	8473.00				2782.00			10897.00	
12, 13	2211.502	AGGREGATE BASE (LV) CLASS 5	CU YD	237.00	420.00	20.00				62.00			155.00	
12	2211.503	AGGREGATE BASE (CV), CLASS 5	CU YD (P)	6784.00	6784.00	(P) 2526.00				(P) 799.00			(P) 3459.00	
12, 14	2301.503	CONCRETE PAVEMENT IRREGULAR WIDTH - 9"	SQ YD	1800.00	1856.00	1800.00								
	2301.511	STRUCTURAL CONCRETE	CU YD	450.00	214.10	450.00								
14	2301.529	REINFORCEMENT BARS (EPOXY COATED)	LB	2037.00	1303.00	2037.00								
14	2301.531	EXPANSION JOINTS, DESIGN E2-1	LIN FT	27.00	27.00	27.00								
14	2301.538	DOWEL BAR	EACH	850.00	875.00	850.00								
14	0301.604	PERMANENT TERMINAL HEADER	LIN FT	211.00	209.00	211.00								
12, 13	2340.508	TYPE 47 WEARING COURSE MIXTURE	TON	1542.00	1876.40	441.00				226.00			875.00	
12	2340.510	TYPE 47 BINDER COURSE MIXTURE	TON	2497.00	2504.40	827.00				342.00			1328.00	
12	2340.514	TYPE 31 BASE COURSE MIXTURE	TON	2617.00	2612.0	827.00				343.00			1447.00	
12	2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GAL	1901.00	1100.00	604.00				251.00			1046.00	
36	2411.501	STRUCTURAL CONCRETE (3A32)	CU YD	15.00	0.00					15.00				
36	2411.541	REINFORCEMENT BARS	LB	500.00	0.00					500.00				
16	0412.602	INSTALL MONUMENT BOX	EACH	1.00	1.00	1.00							48.00	
37	0412.604	BRICK PAVERS	SQ FT	48.00	54.00								175.00	170.00
17	0451.601	ROCK AND BOULDER EXCAVATION IN TRENCH	CU YD	465.00	384.90	30.00	90.00						15.00	20.00
38	0451.601	TRENCH STABILIZATION MATERIAL (CV)	CU YD	75.00	951.00		20.00			20.00			6.00	
45	0412.602	MAILBOX SUPPORT	EACH	6.00	12.00									
18	2502.541	4" PERF PVC PIPE DRAIN	LIN FT	5984.00	5787.00	1651.00				870.00			3463.00	
35	2503.511	8" PVC PIPE SEWER SDR80	LIN FT	867.00	867.00									867.00
44	2503.541	12" RC PIPE SEWER DES 3006 CLASS III	LIN FT	1752.00	1785.00		407.00			188.00			1157.00	
44	2503.541	15" RC PIPE SEWER DES 3006 CLASS III	LIN FT	263.00	274.00								263.00	
44	2503.541	18" RC PIPE SEWER DES 3006 CLASS III	LIN FT	256.00	238.00								256.00	
44	2503.541	21" RC PIPE SEWER DES 3006 CLASS III	LIN FT	716.00	713.00		42.00						674.00	
44	2503.541	24" RC PIPE SEWER DES 3006 CLASS III	LIN FT	74.00	78.00		74.00							
44	2503.541	27" RC PIPE SEWER DES 3006 CLASS III	LIN FT	269.00	267.00					269.00				
44	2503.541	30" RC PIPE SEWER DES 3006 CLASS III	LIN FT	361.00	360.00					361.00				
50	0503.602	8" x 4" PVC WYE	EACH	6.00	8.00									
19	0503.605	3" INSULATION	SQ YD	18.00	86.90	18.00								
20	0504.602	DISCONNECT WATER MAIN	EACH	2.00	2.00								2.00	
20	0504.602	CONNECT TO EXISTING WATER MAIN	EACH	2.00	2.00								2.00	
32	0504.602	6" WATER GATE VALVE AND BOX	EACH	1.00	1.00								1.00	
32	0504.602	WATER MAIN TAP	EACH	2.00	1.00								2.00	
21	0504.602	TEMPORARY WATER SERVICE	EACH	10.00	2.00								10.00	
21	0504.602	WATER SERVICE TAP AND HOOK UP	EACH	10.00	2.00								10.00	
21	0504.602	INSTALL WATER VALVE BOX	EACH	7.00	6.00								7.00	
22	0504.602	ADJUST VALVE BOX	EACH	12.00	18.00	3.00				3.00			6.00	
23	0504.603	HYDRANT TRENCH EXCAVATION	LIN FT	24.00	148.00	6.00				18.00				
39	0504.603	WATER SERVICE TRENCH EXCAVATION	LIN FT	413.00	326.00	60.00				18.00			335.00	
33	0504.603	6" WATER MAIN - DUCTILE IRON CLASS 53	LIN FT	615.00	293.00								615.00	
40	0504.606	DISCONNECT WATER SERVICE CONNECTION	CONNECTION	10.00	2.00								10.00	
24	0505.603	3" HP POLYETHYLENE GAS MAIN	LIN FT	600.00	299.00								600.00	
24	0505.603	2" HP POLYETHYLENE GAS MAIN	LIN FT	400.00	509.00								400.00	

NOTE: SEE JOB FILE 96061 FOR CHANGE ORDERS 1 - 9 AND SUPPLEMENTAL AGREEMENTS 1 - 25 (F)

SEE JOB FILE 96061 FOR FINAL QUANTITIES BREAKDOWN ATTACHED TO ESTIMATE #10, FINAL (F)

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED 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 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98

STATEMENT OF ESTIMATED QUANTITIES					S. P. 118-160-18 ARROWHEAD ROAD ESTIMATED QUANTITY			S. P. 118-151-09 KENWOOD AVENUE ESTIMATED QUANTITY			S. P. 69-634-11 KENWOOD AVENUE/HOWARD GNESEN RD ESTIMATED QUANTITY			
NOTE	ITEM NO.	DESCRIPTION	UNIT	EST. QTY.	FINAL QUANTITY	PARTICIPATING		NON-PARTICIPATING	PARTICIPATING		NON-PARTICIPATING	PARTICIPATING		NON-PARTICIPATING
						ROADWAY	ST. SEWER		ROADWAY	ST. SEWER		ROADWAY	ST. SEWER	
44	2506.501	CONSTRUCT DRAINAGE STRUCTURE, DESIGN 72-4020	LIN FT	22.77	22.45		7.85			14.92				
44	2506.501	CONSTRUCT DRAINAGE STRUCTURE, DESIGN F	LIN FT	77.16	133.60		14.13						63.03	
44	2506.502	CONSTRUCT DRAINAGE STRUCTURE, DESIGN G	EACH	29.00	28.00		12.00			4.00			13.00	
35	2506.503	RECONSTRUCT DRAINAGE STRUCTURES	LIN FT	5.40	15.00							5.40		
44, 35	2506.516	CASTING ASSEMBLY	EACH	35.00	44.00		11.00	7.00		2.00	1.00		9.00	5.00
44, 35	2506.522	ADJUST FRAME AND RING CASTING	EACH	23.00	27.00	7.00	8.00		1.00			7.00		
6	2521.501	4" CONCRETE WALK	SQ FT	25258.00	20214.00	8740.00			1683.00			14835.00		
25	2531.501	CONCRETE CURB AND GUTTER DESIGN B624	LIN FT	6483.00	7034.00	2251.00			779.00			3453.00		
13, 26	2531.507	7" CONCRETE DRIVEWAY PAVEMENT	SQ YD	391.10	637.60		78.80			45.60			266.70	
13, 26	2531.507	8" CONCRETE DRIVEWAY PAVEMENT	SQ YD	326.90	590.30		115.80			70.20			140.90	
41	0531.602	PEDESTRIAN CURB RAMP	EACH	19.00	21.60	10.00				2.00			7.00	
49	0564.602	RELOCATE SIGN	EACH	1.00	1.00	1.00								
27	0563.601	TRAFFIC CONTROL	LUMP SUM	1.00	1.00		0.33		0.18			0.49		
42	0564.602	PAVEMENT MESSAGE (THRU ARROW) EPOXY	EACH	2.00	0.00	2.00								
42	0564.602	PAVEMENT MESSAGE (RIGHT ARROW) EPOXY	EACH	4.00	4.00	2.00						2.00		
42	0564.602	PAVEMENT MESSAGE (LEFT-THRU ARROW) EPOXY	EACH	6.00	0.00	5.00			1.00					
42	0564.602	PAVEMENT MESSAGE (RIGHT-THRU ARROW) EPOXY	EACH	4.00	0.00	3.00			1.00					
42	0564.602	PAVEMENT MESSAGE (ONLY) EPOXY	EACH	2.00	2.00	1.00						1.00		
42	0564.603	4" DOUBLE SOLID LINE YELLOW-EPOXY	LIN FT	3065.00	2490.00	983.00			416.00			1666.00		
42	0564.603	4" SOLID LINE WHITE-EPOXY	LIN FT	7343.00	5511.0	2579.00			832.00			3932.00		
42	0564.603	4" BROKEN LINE WHITE-EPOXY	LIN FT	1126.00	620.60	670.00			146.00			310.00		
42	0564.603	6" SOLID LINE WHITE-EPOXY	LIN FT	530.00	508.00	530.00								
42	0564.603	24" SOLID LINE WHITE-EPOXY	LIN FT	112.00	115.00	100.00						12.00		
28	2564.531	FURNISH AND INSTALL SIGN PANELS - TYPE "D" - SIGNALS	SQ FT	49.00	50.00	25.00			12.00			12.00		
29	2565.511	FULL-TRAFFIC-ACTUATED TRAFFIC CONTROL SIGNAL SYSTEM	SIG SYS	1.00	1.00	0.50			0.25			0.25		
46	2571.501	CONIFEROUS TREE (5' B & B)	TREE	11.00	11.00							11.00		
46	2571.502	DECIDUOUS TREE (2.5' CAL B & B)	TREE	23.00	23.00							23.00		
30	2573.501	BALE CHECK	EACH	150.00	6.00	50.00			50.00			50.00		
30	2573.502	SILT FENCE - HEAVY DUTY	LIN FT	1560.00	372.00	540.00						1020.00		
31	2575.505	SODDING TYPE LAWN	SQ YD	5990.00	5842.00	930.00			210.00			4850.00		
43	2580.501	TEMPORARY LANE MARKING	RD STATION	156.85	67.10	43.75			20.80			92.30		

1	SEE SPECIAL PROVISION S-23.
2	SEE TABULATION D.
3	SEE TABULATION A AND J.
4	SEE TABULATION G.
5	SEE SHEET 20 STA. 105+06 TO 105+42, 29' RT. REMOVE AS DIRECTED BY THE ENGINEER.
6	SEE TABULATION E. 4" CLASS 5 AGGREGATE BASE INCIDENTAL TO CONCRETE WALK.
7	SEE TABULATION H AND J.
8	SEE SPECIAL PROVISION S-25, STATION 105+53 RT. REPLACE AS DIRECTED BY THE ENGINEER.
9	SEE SPECIAL PROVISION S-25, STA. 94+05, 30' RT. AND STA. 94+60, 30' RT.
10	SEE TABULATION F.
11	SEE CROSS SECTION SHEETS. INCLUDES REMOVAL OF APP. 1600 CU YD BITUMINOUS PAVEMENT.
	SEE TABULATION SHEETS 42, 59, AND 68.
12	SEE TABULATION Q.
	SEE TYPICAL SECTIONS.
13	SEE TABULATION J. PLACE MATERIAL AS DIRECTED BY THE ENGINEER.
14	SEE CONCRETE PAVEMENT PANEL AND JOINT LAYOUT SHEET 29.
	SEE PAVEMENT JOINTS SHEETS 30, 31.
15	SEE SPECIAL PROVISION S-28.
16	SEE DETAIL SHEET 5 AND SPECIAL PROVISION S-36
	STA. 100+00.00=52+93.74.
17	SEE SPECIAL PROVISION S-39.
	USE AS DIRECTED BY THE ENGINEER.
18	SEE TABULATION K. SEE TYPICAL SECTIONS.
19	SEE SPECIAL PROVISION S-44. TO BE USED AS DIRECTED BY THE ENGINEER.
20	SEE SHEETS 21, 22. SEE SPECIAL PROVISION S-45, STA. 110+60 AND STA. 116+75.
21	SEE TABULATION L. SEE SPECIAL PROVISION S-45.
22	SEE TABULATION N. SEE SPECIAL PROVISION S-45.
23	SEE SPECIAL PROVISION S-48.
	ARROWHEAD ROAD STA. 61+00, 31' RT., 6 FT. ARROWHEAD ROAD STA. 53+19, 32' RT., 12 FT.
	KENWOOD AVE/HOWARD GNESEN RD STA. 109+43, 61' RT., 6'.
24	SEE SPECIAL PROVISION S-49. SEE PLAN SHEET 21, 22.
	STA. 110+50 TO 117+10.
25	SEE TABULATION M.
26	SEE DETAIL SHEET 8.
27	SEE SHEET 26. SEE SPECIAL PROVISION S-7.
28	SEE SHEET 38. SEE SPECIAL PROVISION DIVISION SS.

29	SEE SHEET 35. SEE SPECIAL PROVISION DIVISION SS.
30	SEE SHEET 28. USE AS DIRECTED BY THE ENGINEER.
31	SEE TABULATION P. SEE SPECIAL PROVISION S-57.
32	SEE SPECIAL PROVISION S-45 STA. 116+75.
33	SEE SPECIAL PROVISION S-45 STA. 110+60 TO STA. 116+75.
34	SEE TABULATION A.
35	SEE TABULATION B AND C.
36	SEE SPECIAL PROVISION S-41 AND DETAIL SHEET 5.
37	SEE SPECIAL PROVISION S-35.
38	SEE SPECIAL PROVISION S-40. USE AS DIRECTED BY THE ENGINEER.
39	SEE TABULATION L. SEE SPECIAL PROVISION S-47.
40	SEE TABULATION L. SEE SPECIAL PROVISION S-46.
41	SEE SPECIAL PROVISION S-52. SEE PLAN AND PROFILE SHEETS FOR LOCATIONS (19 EACH).
42	SEE SHEET 32. SEE SPECIAL PROVISION S-54.
43	SEE SPECIAL PROVISION S-56.
44	SEE TABULATION A AND C.
45	SEE TABULATION S. SEE DETAIL SHEET 11, SPECIAL PROVISION S-37.
46	SEE TABULATION T.
47	CONSISTS OF 8" CONCRETE PAVEMENT WITH 1"-4" BITUMINOUS SURFACE OVERLAY. SEE TABULATION H.
48	SPUR SIGN STA. 52+56.04 LT. SEE SPECIAL PROVISION S-25.10.
49	AMCOO SIGN STA. 53+26.6 RT. SEE SPECIAL PROVISION S-54.
50	TO BE PLACED AS DIRECTED BY THE ENGINEER.

TABULATION INDEX		PLAN SHEET NO.
A	STORM DRAINAGE STRUCTURES	12
B	SANITARY SEWER STRUCTURES	13
C	CASTING ASSEMBLY INFORMATION	13
D	CLEARING AND GRUBBING	14
E	CONCRETE WALK	14
F	SAW PAVEMENT	14
G	REMOVE CURB AND GUTTER	14
H	REMOVE PAVEMENT	14
J	ALLEY AND ENTRANCE	15
K	4" PERFORATED PVC PIPE DRAIN	16
L	WATER SERVICE	16
M	CONCRETE CURB AND GUTTER	16
N	ADJUST VALVE BOX	16
P	SODDING	16
Q	GRADING AND PAVEMENT	17
R	BASIS FOR BITUMINOUS QUANTITIES	17
S	MAILBOX SUPPORT	17
T	TREES	17

THE FOLLOWING STANDARD PLATES, APPROVED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.	
STANDARD PLATES	
PLATE NUMBER	DESCRIPTION
1103J	TYPICAL DOWELL BAR ASSEMBLY
1141D	PAVEMENT KEYWAY FOR KEYED JOINT CONSTRUCTION
1150P	CONSTRUCTION OF HEADER JOINTS
3000L	REINFORCED CONCRETE PIPE
3006G	GASKET JOINT FOR R.C. PIPE
4005L	MANHOLE OR CATCH BASIN - DESIGN F
4006L	MANHOLE OR CATCH BASIN - DESIGN G OR DESIGN H
4007C	PRECAST MACHANICAL JOINT SEWER MANHOLE
4010G	CONCRETE SHORT CONE AND ADJUSTING RING
4011E	PRECAST CONCRETE BASE
4101C	RING CASTING FOR MANHOLE OR CATCH BASIN
4129F	CATCH BASIN FRAME CASTING
4154B	CATCH BASIN GRATE CASTING
4160D	CURB BOX CASTING FOR CATCH BASIN
4180H	MANHOLE OR CATCH BASIN STEP
7035J	CONCRETE WALK AND CURB RETURNS AT ENTRANCES
7036D	PEDESTRIAN CURB RAMP
7100G	CONCRETE CURB AND GUTTER
7111H	INSTALLATION AND REINFORCEMENT OF CATCH BASIN CASTINGS
7112B	INSTALLATION AND REINFORCEMENT OF CATCH BASINS AND MANHOLES
8000I	STANDARD BARRICADES
8110C	TRAFFIC SIGNAL BRACKETING (POLE MOUNTED)
8115C	PEDESTRIAN PUSHBUTTON INSTALLATION
8119C	GROUND MOUNTED CABINET FOUNDATION
8120K	P80 AND P90 POLE FOUNDATION
8121D	TRANSFORMER BASE WITH POLE BASE PLATE
8123D	POLE AND MAST ARM (LUMINAIRE AND TRAFFIC LIGHTS)
8124D	MAST ARM SIGNAL HEAD MOUNTS
8130D	SAW CUT LOOP DETECTORS
9102D	TURF ESTABLISHMENT AREAS

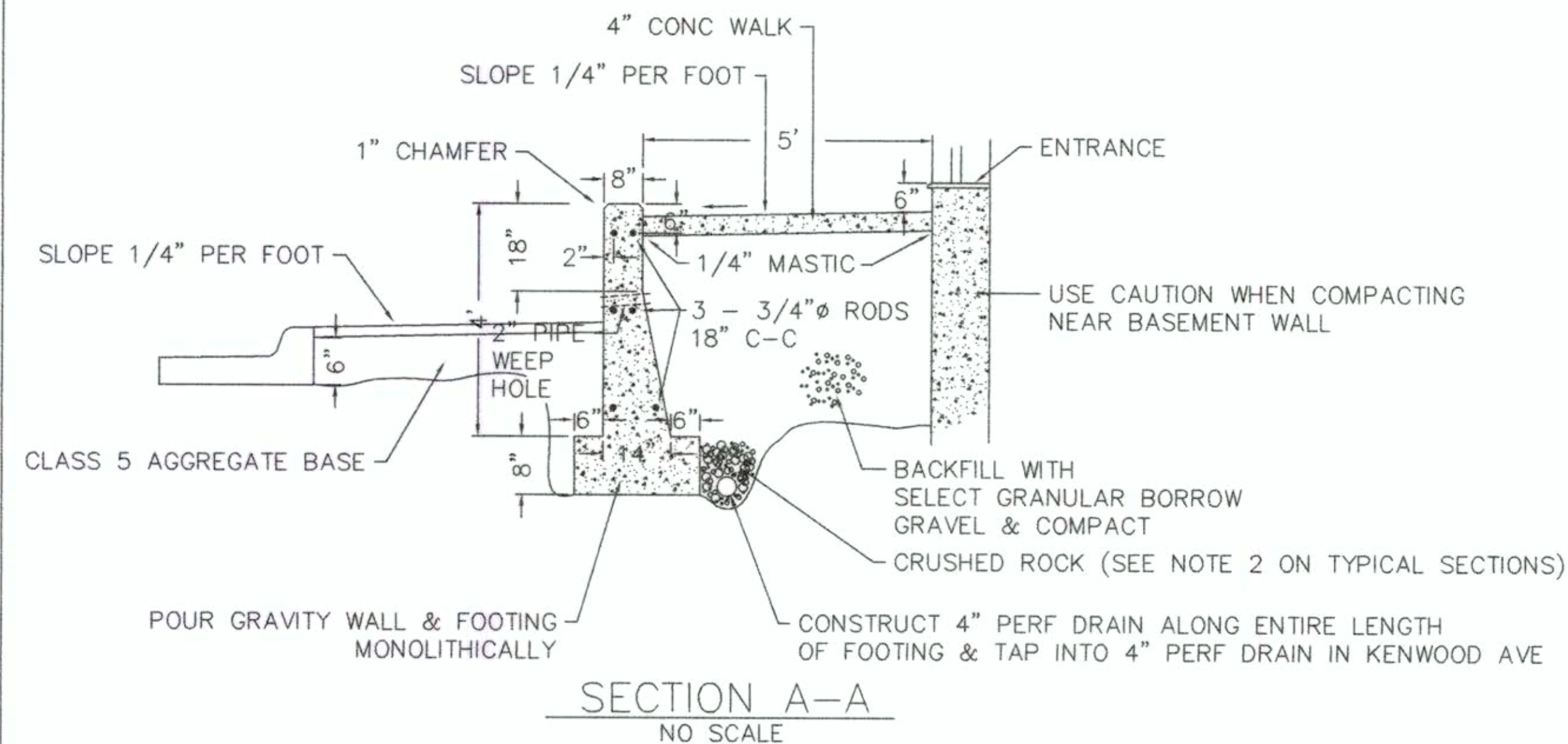
NOTE: SEE JOB FILE 96061 FOR CHANGE ORDERS 1 - 9 AND SUPPLEMENTAL AGREEMENTS 1 - 25 (F)

SEE JOB FILE 96061 FOR FINAL QUANTITIES BREAKDOWN ATTACHED TO ESTIMATE #10, FINAL. (F)

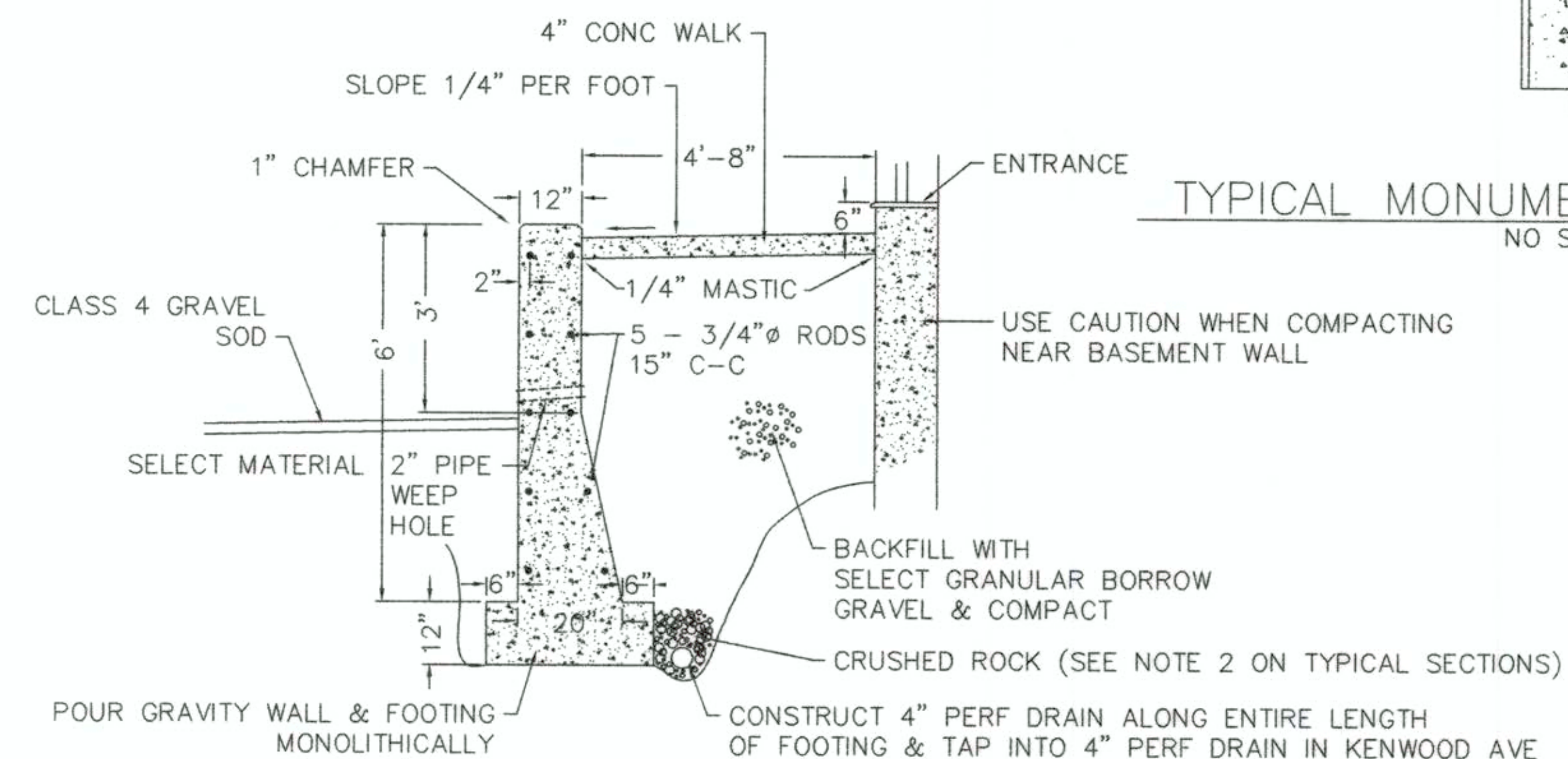
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Frank D. Ricker
DATE 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98

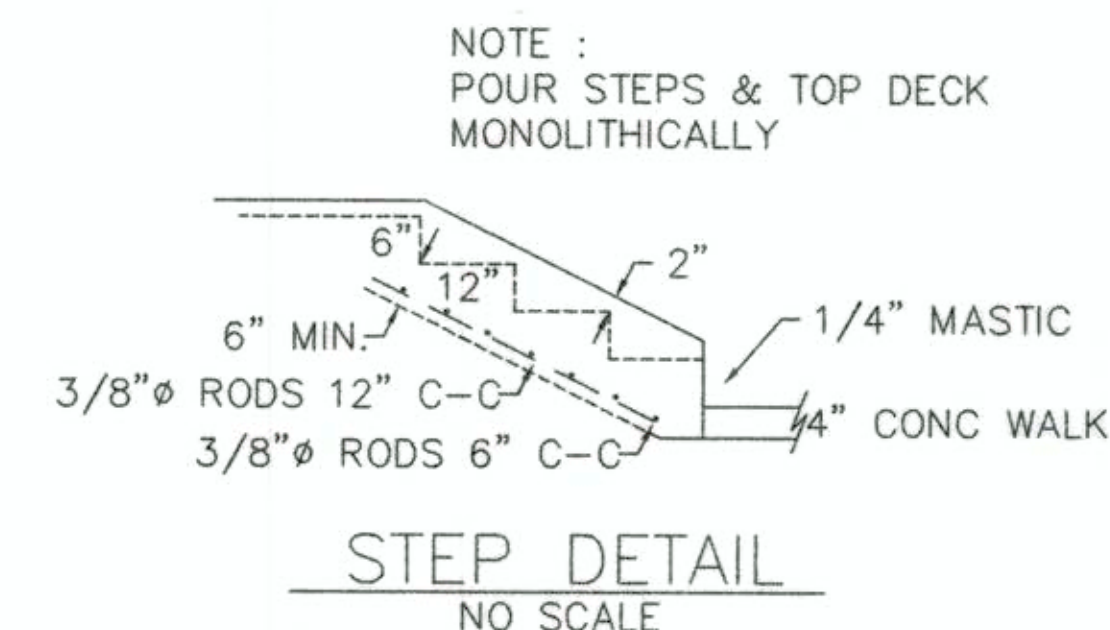
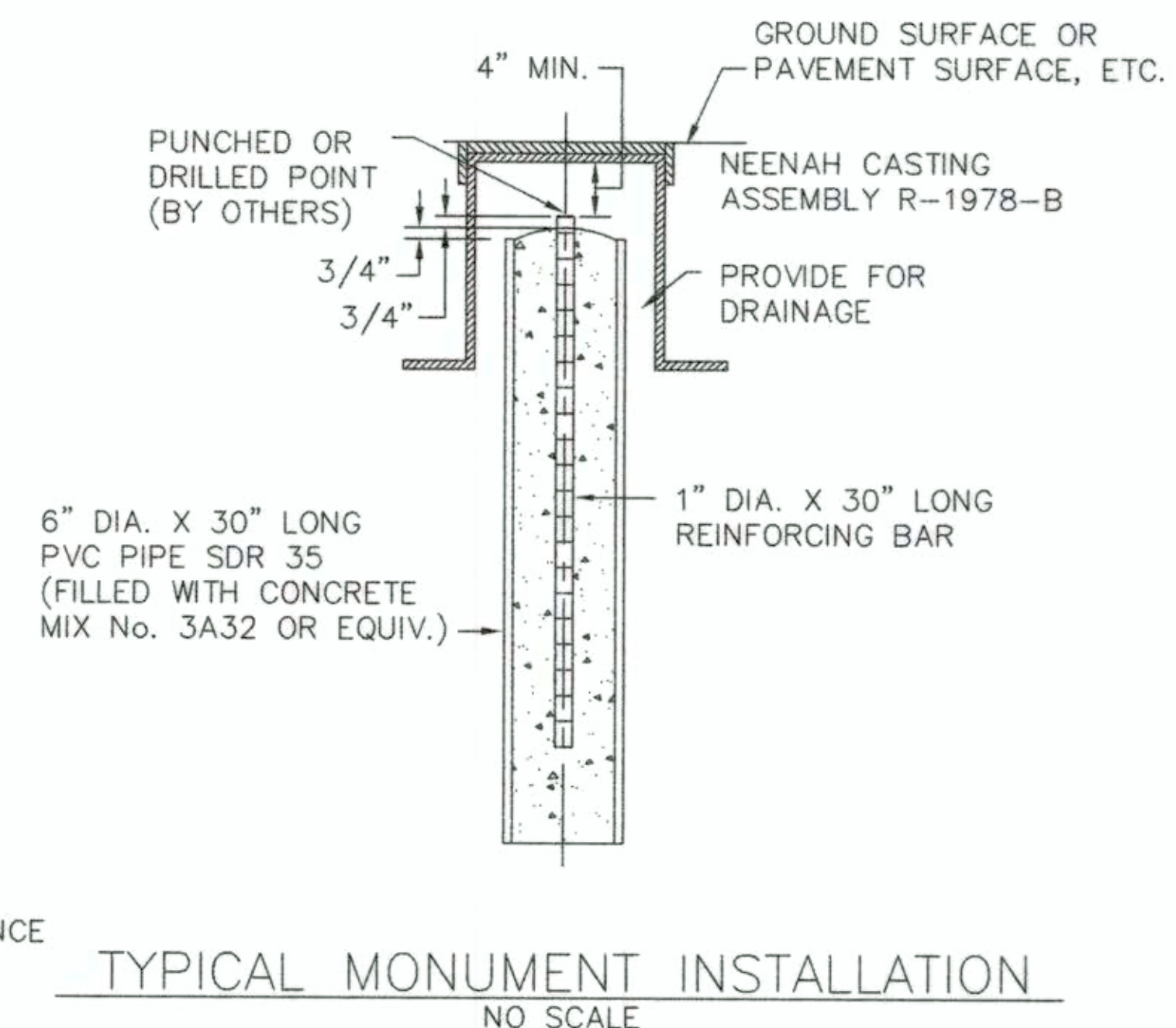
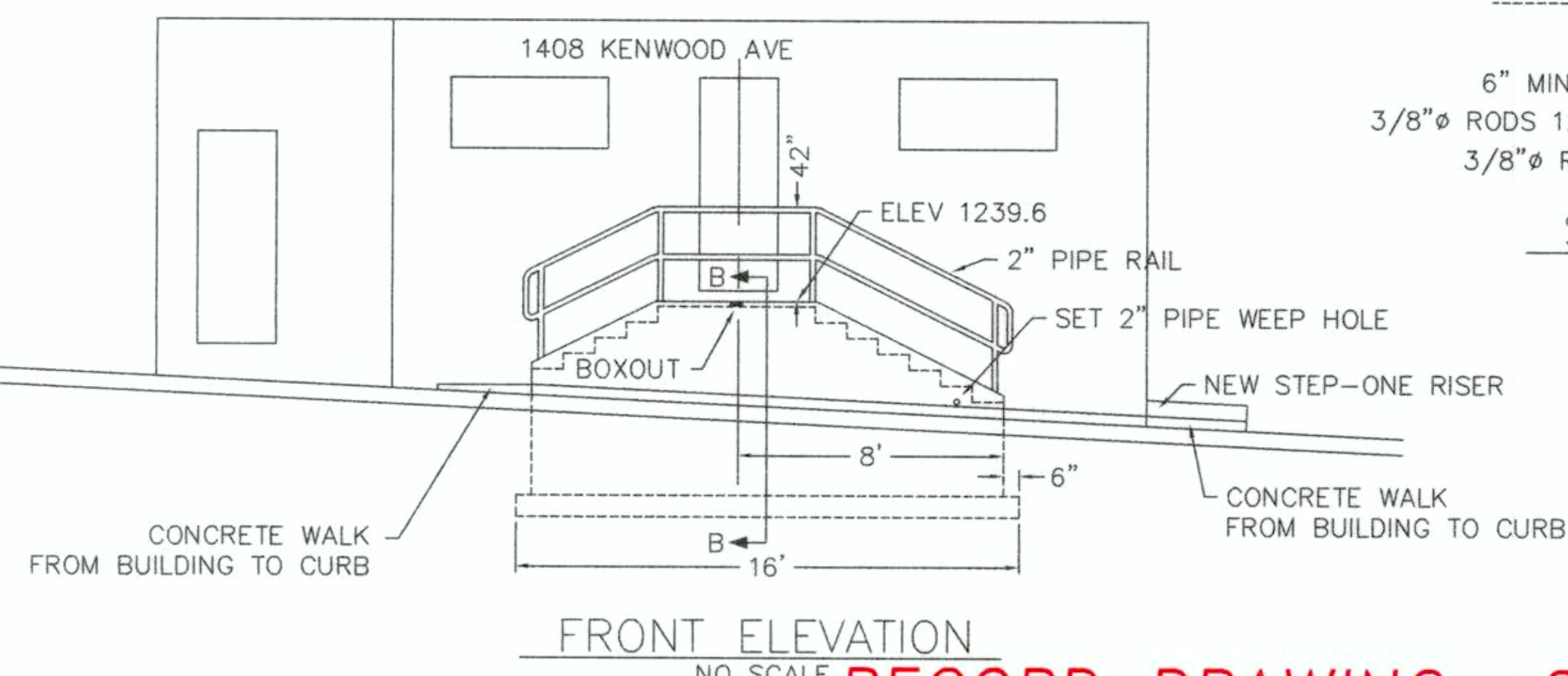
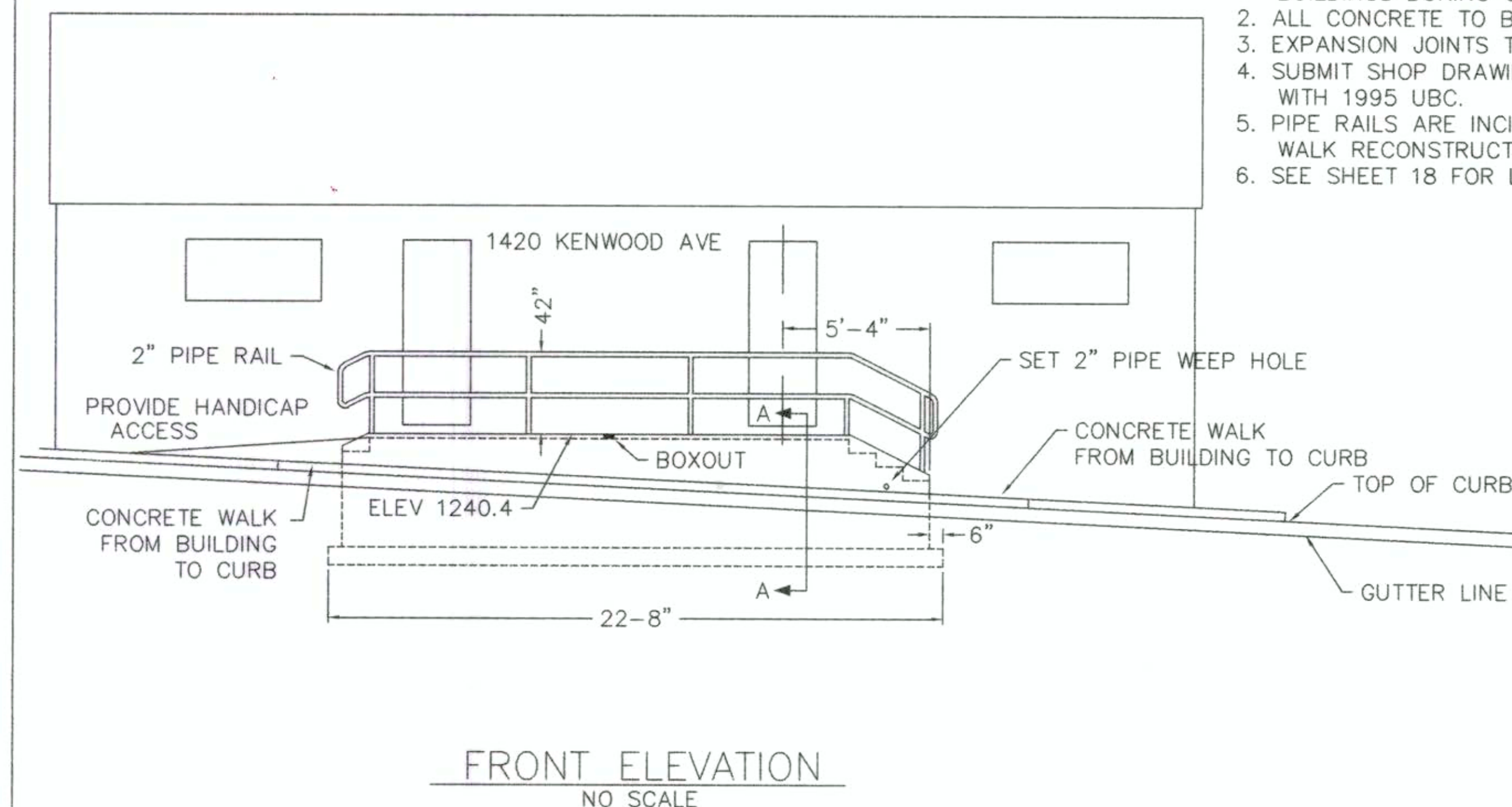


1420 KENWOOD AVENUE STAIRWAY NOT REMOVED,
STORM SEWER RELOCATED TO AVOID STAIRWAY. (F)



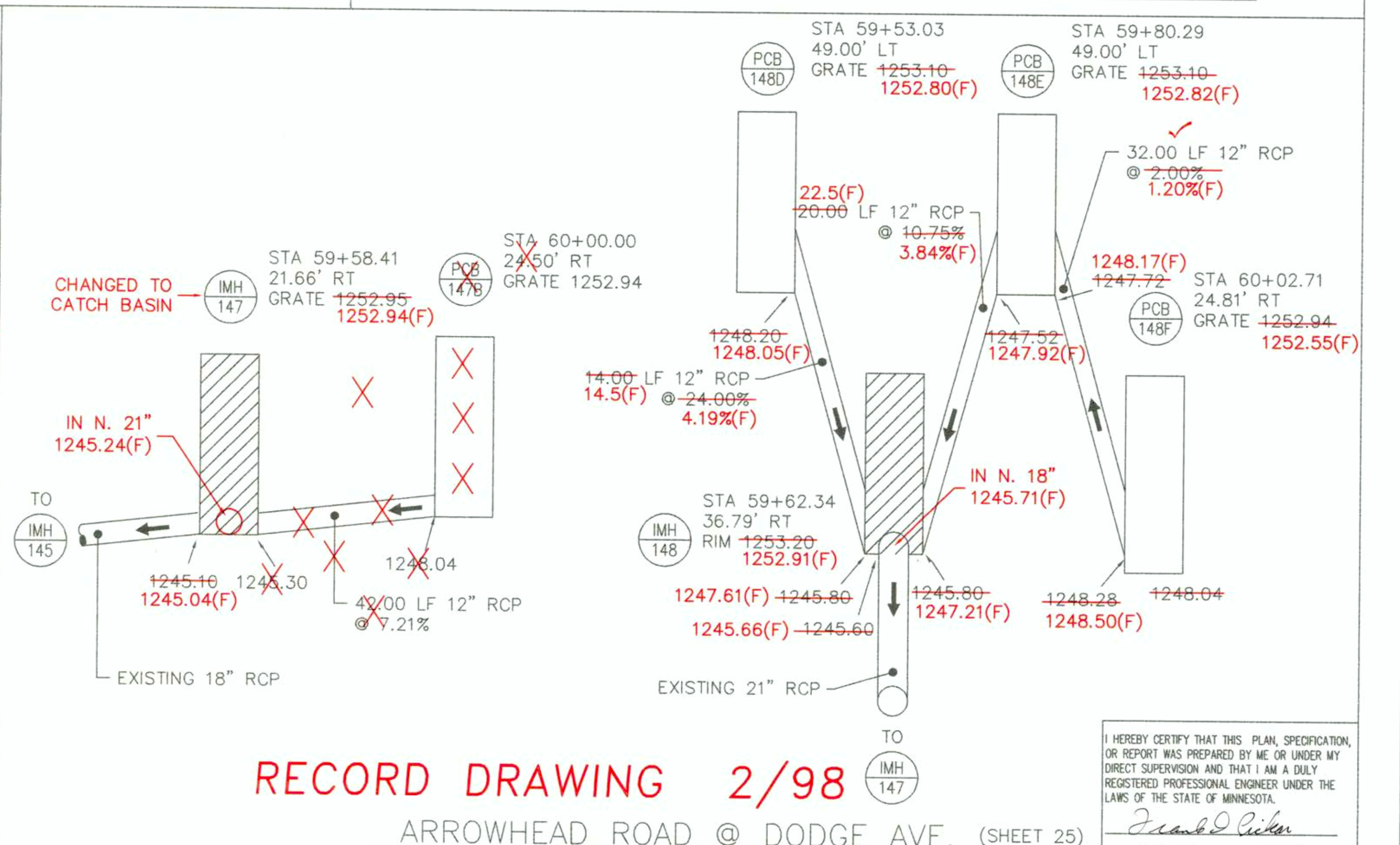
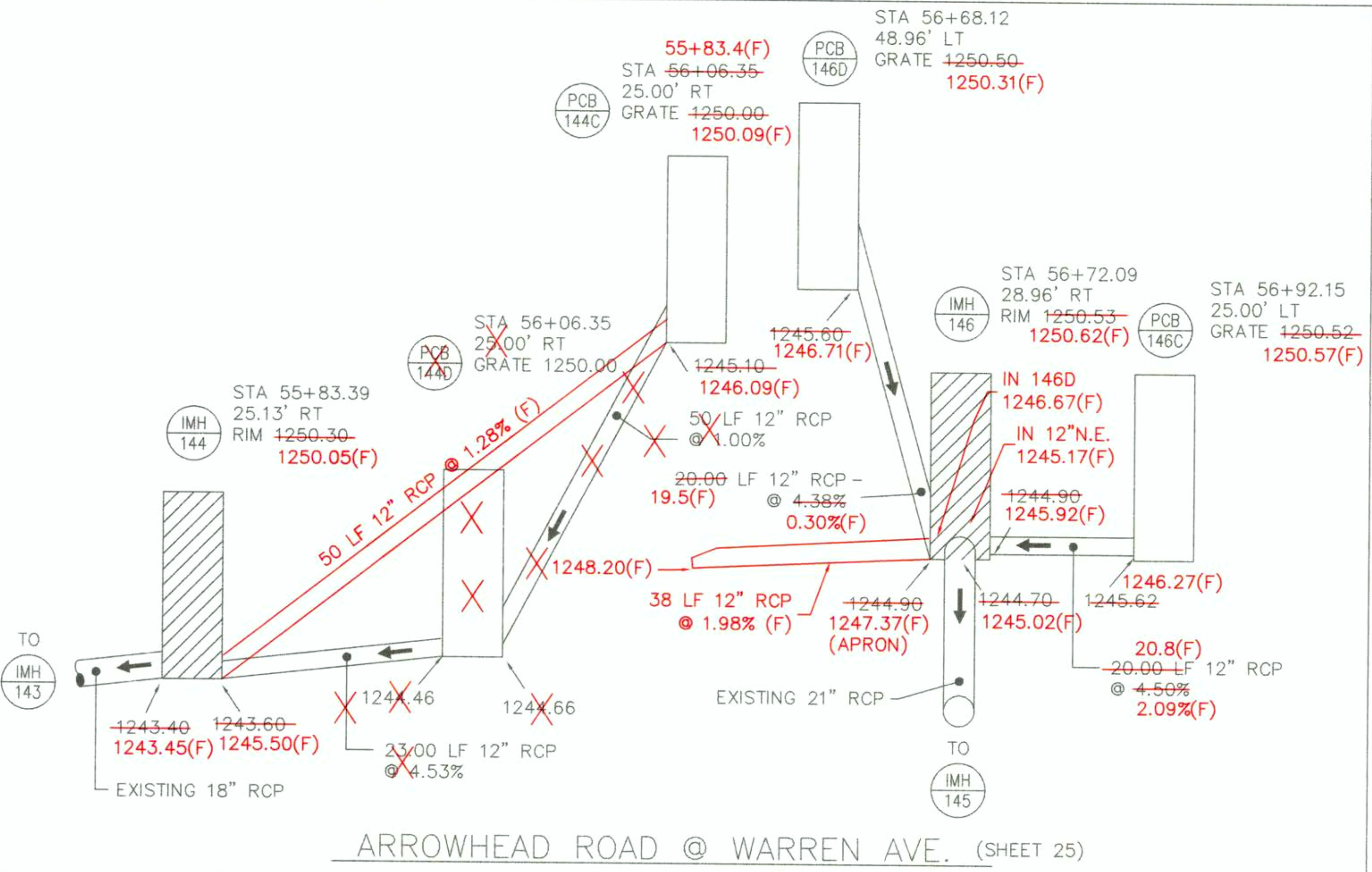
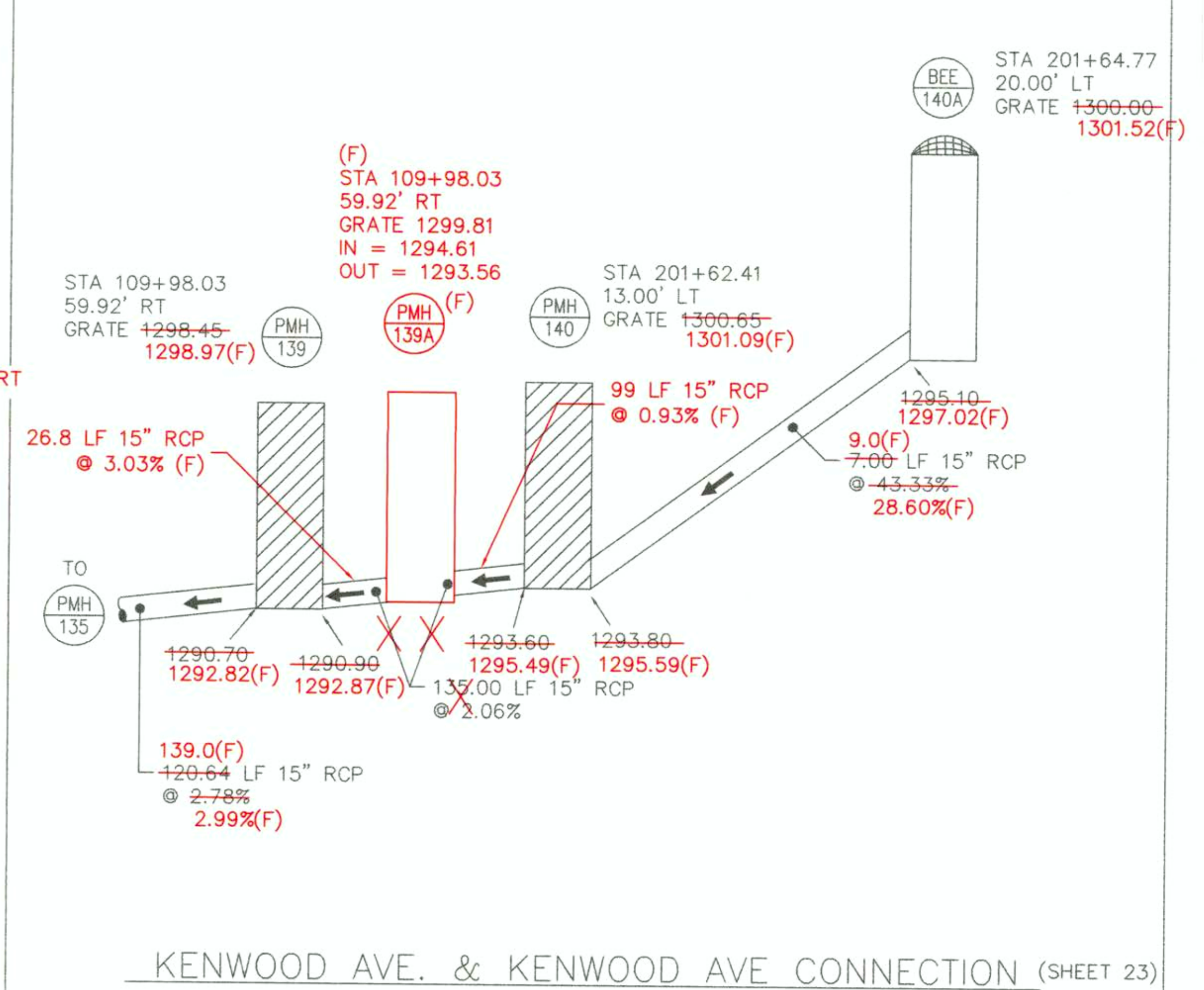
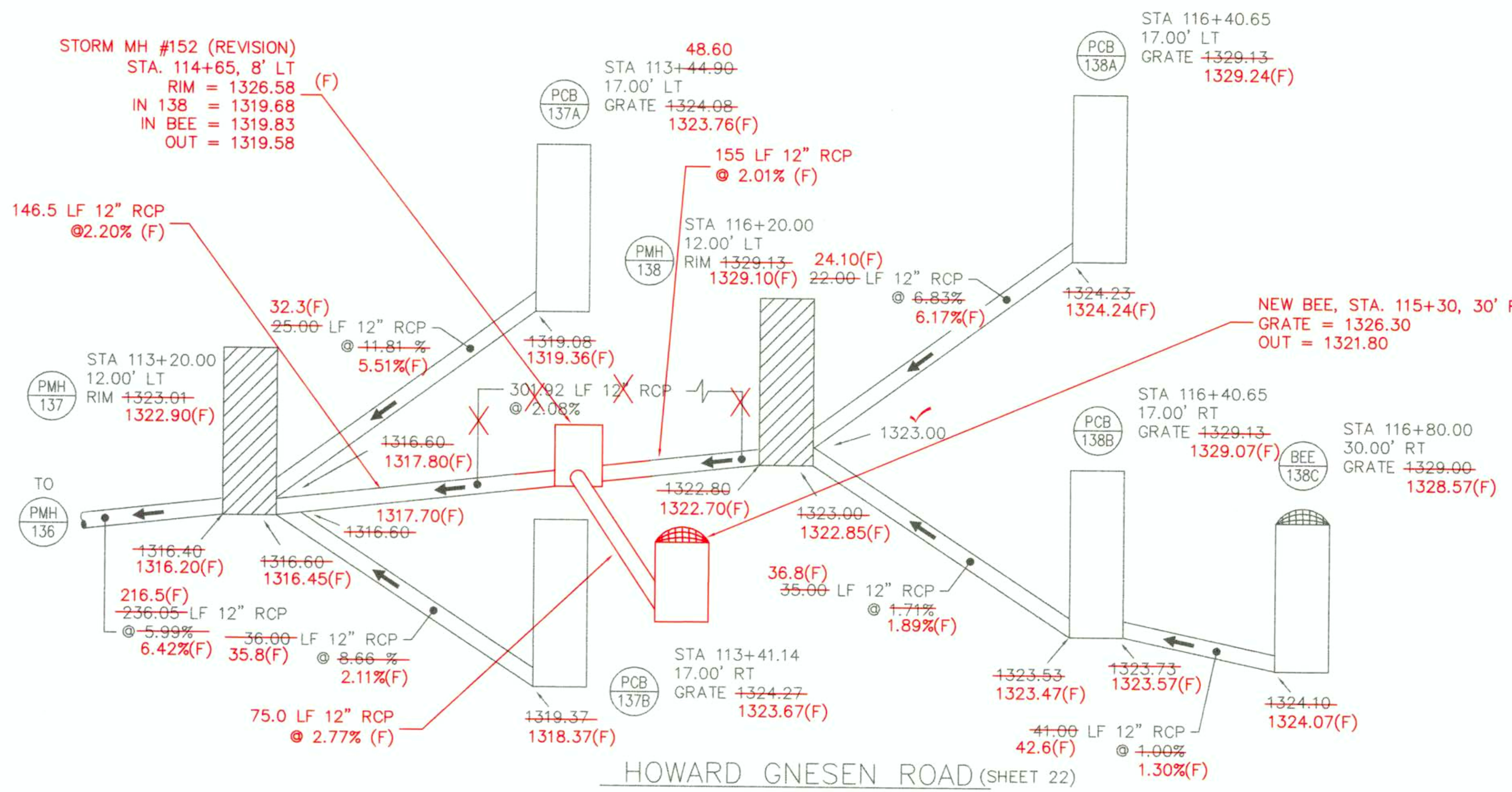
1408 KENWOOD AVENUE STAIRWAY REMOVED,
BUILDING DEMOLISHED BY OTHERS. (F)

- NOTE :
1. CONTRACTOR MUST MAINTAIN ACCESS TO BOTH BUILDINGS DURING CONSTRUCTION
 2. ALL CONCRETE TO BE STRUCTURAL CONCRETE (3A32)
 3. EXPANSION JOINTS TO BE LOCATED IN THE FIELD
 4. SUBMIT SHOP DRAWINGS FOR PIPE RAIL TO COMPLY WITH 1995 UBC.
 5. PIPE RAILS ARE INCIDENTAL TO STAIRWAY AND WALK RECONSTRUCTION.
 6. SEE SHEET 18 FOR LOCATION.



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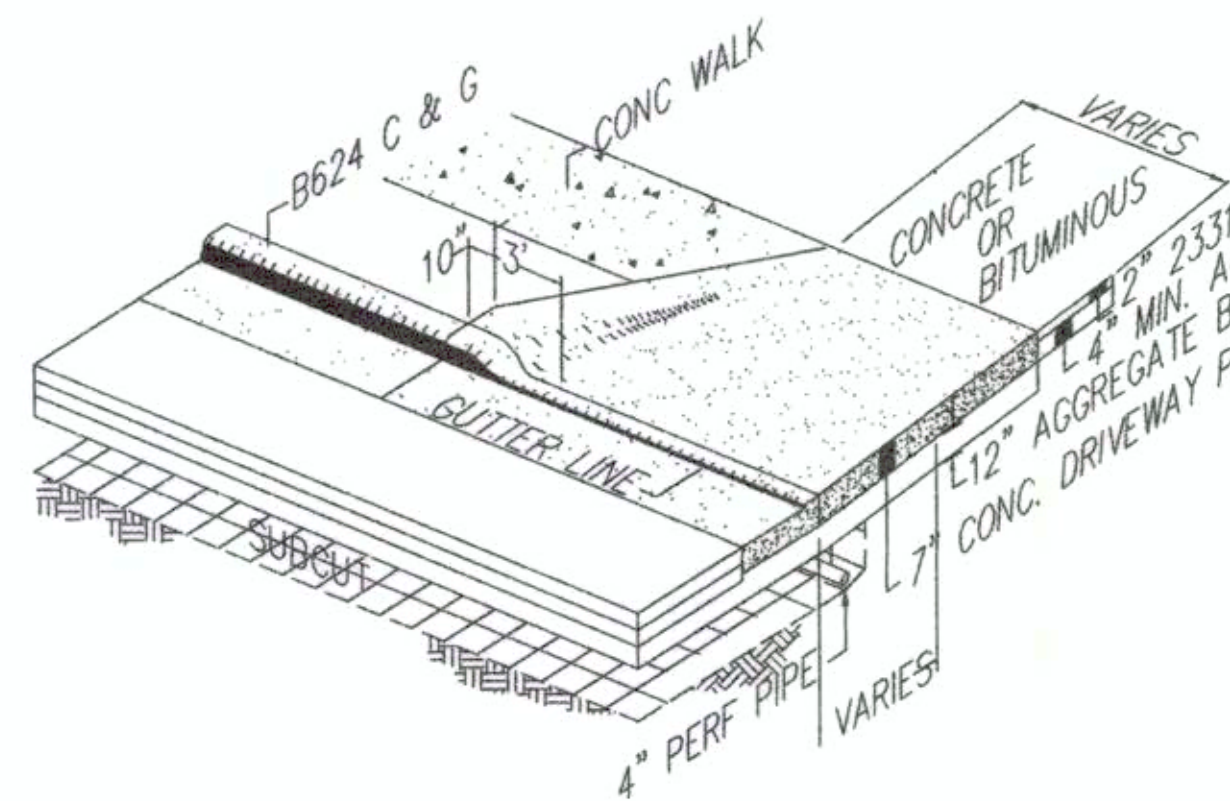
James D. Baker
2-20-98 REG. NO. 7756



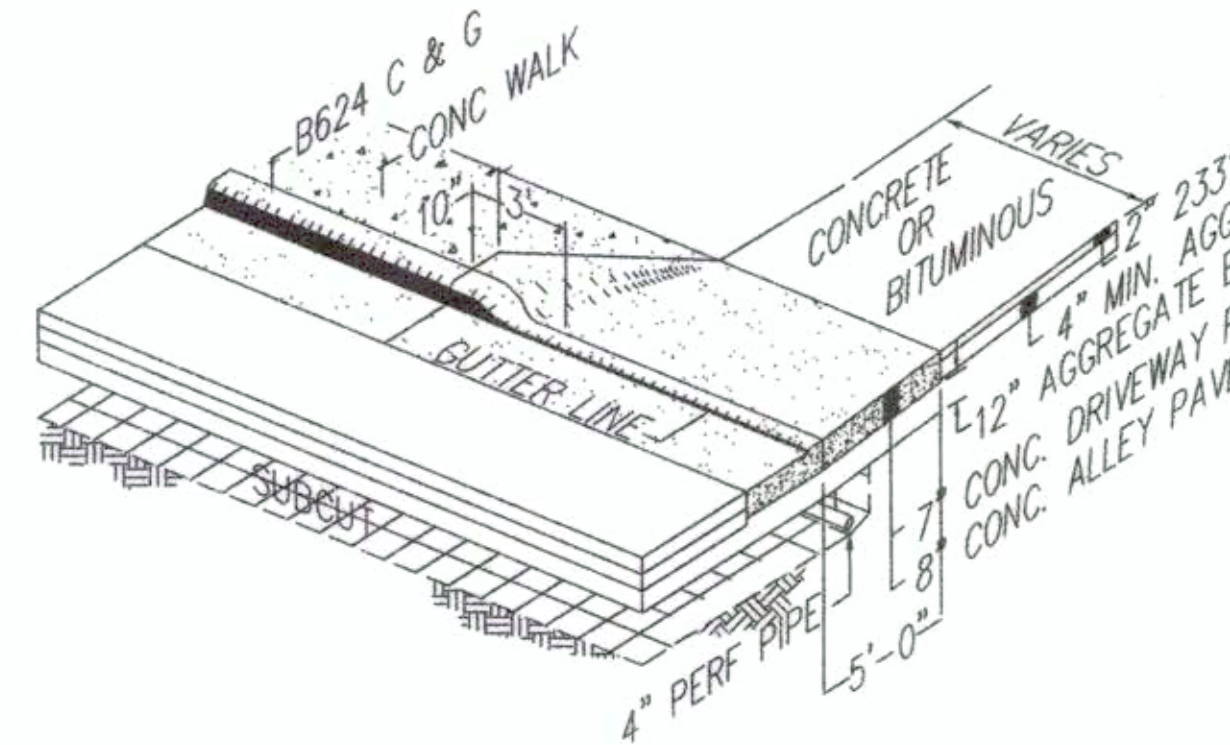
RECORD DRAWING 2/98

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 J. J. J. J.
 DATE 2-20-98 REG. NO. 7756

NOTE:
CONCRETE DRIVEWAYS REPLACE IN KIND
AGGREGATE BASE FOR CONCRETE AND
BITUMINOUS DRIVEWAYS REPLACE IN KIND
AS DIRECTED BY THE ENGINEER



DRIVEWAY ENTRANCES @ BOULEVARD



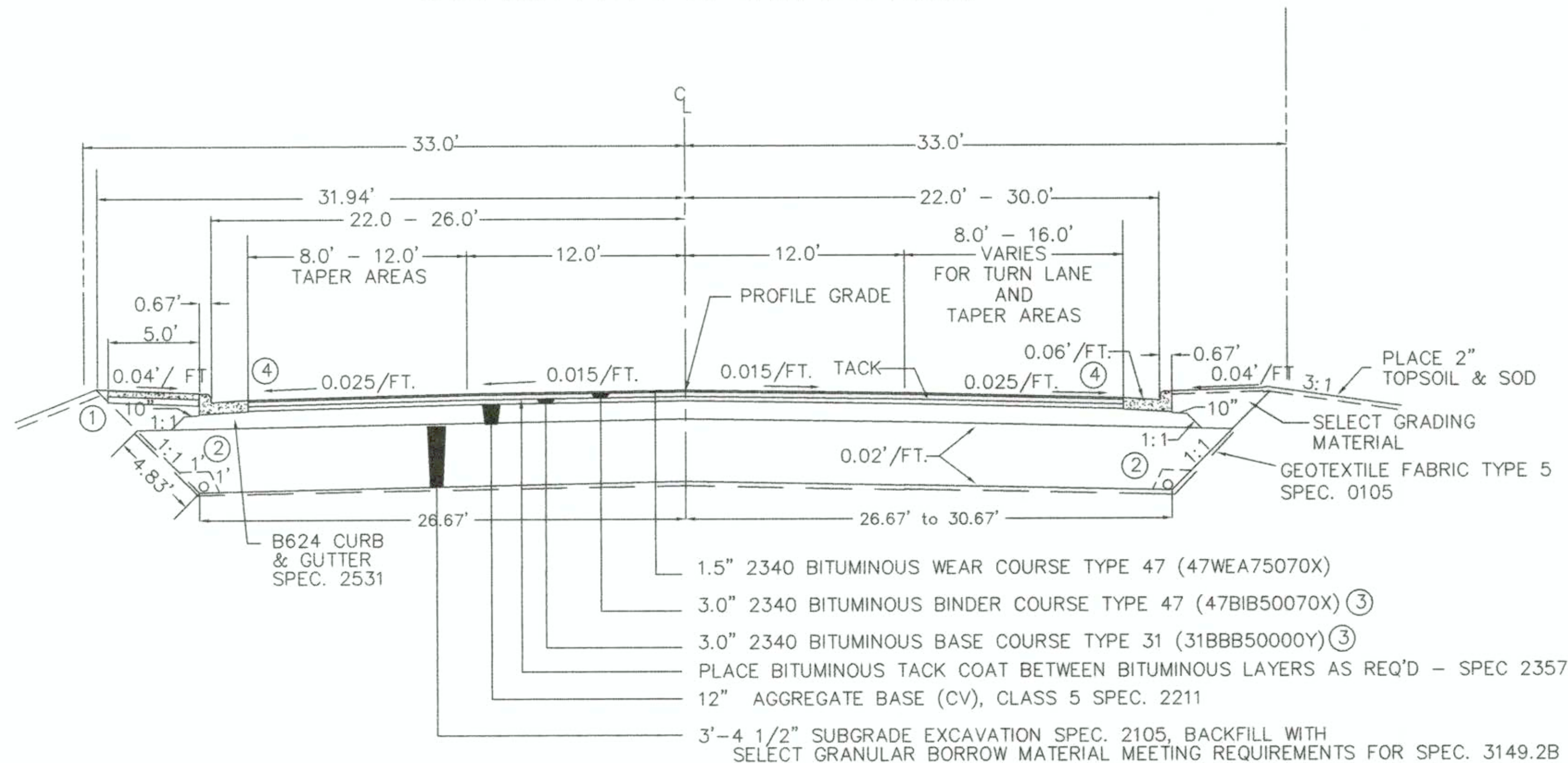
DRIVEWAY & ALLEY ENTRANCES

ENTRANCE DETAILS

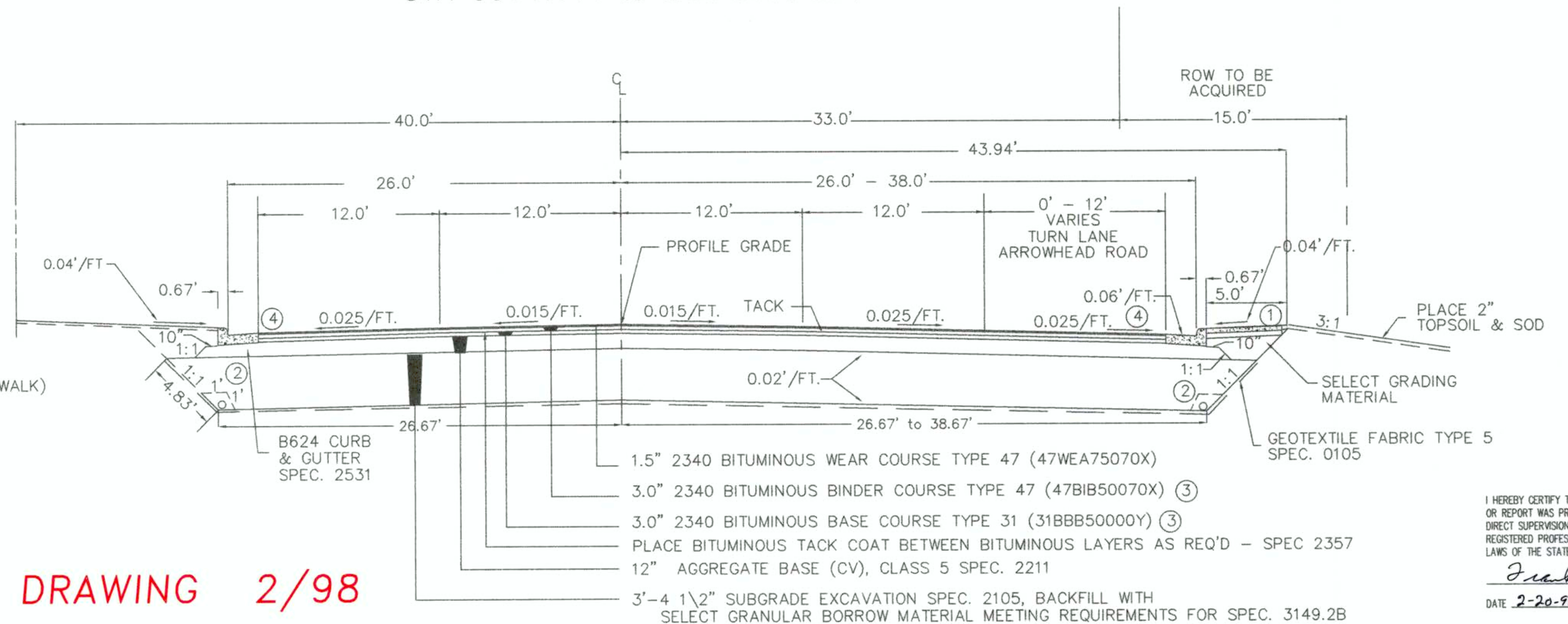
NOTE:

- ① 4" CONCRETE WALK SPEC. 2521
4" CLASS 5 AGGREGATE BASE, SPEC 2211 (INCIDENTAL TO CONCRETE WALK)
- ② 4" PVC PERF PIPE SPEC. 2502
COARSE FILTER AGGREGATE SPEC. 3149.2H (27 LIN FT/CU YD)
5' WIDE GEOTEXTILE FABRIC, TYPE 1, SPEC. 3733
- ③ CONSTRUCT IN TWO LAYERS
- ④ SEE TYPICAL PAVEMENT SECTION SHEET 10

ARROWHEAD ROAD STA 53+77.74 to STA 61+20.00



ARROWHEAD ROAD STA 50+17.44 to STA 51+94.74



RECORD DRAWING 2/98

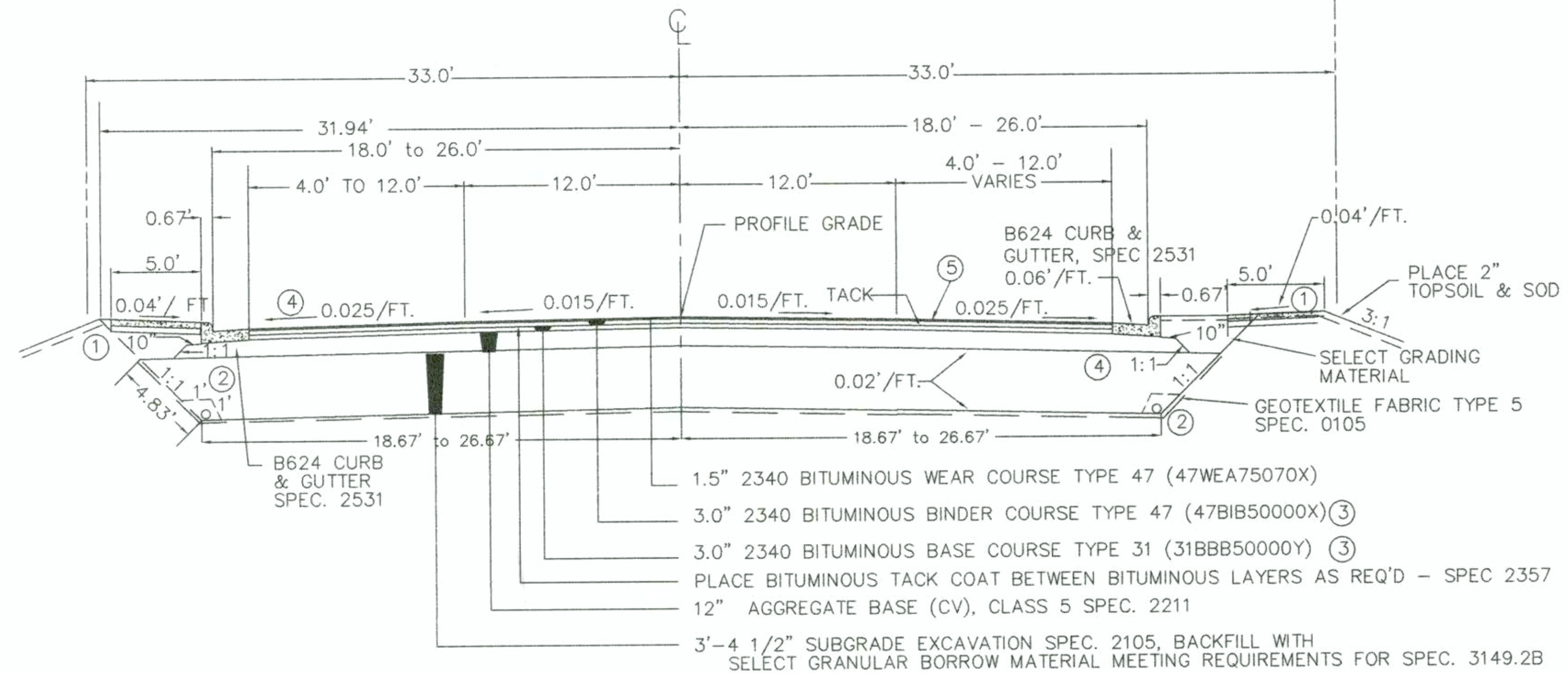
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DATE 2-20-98 REG. NO. 7756

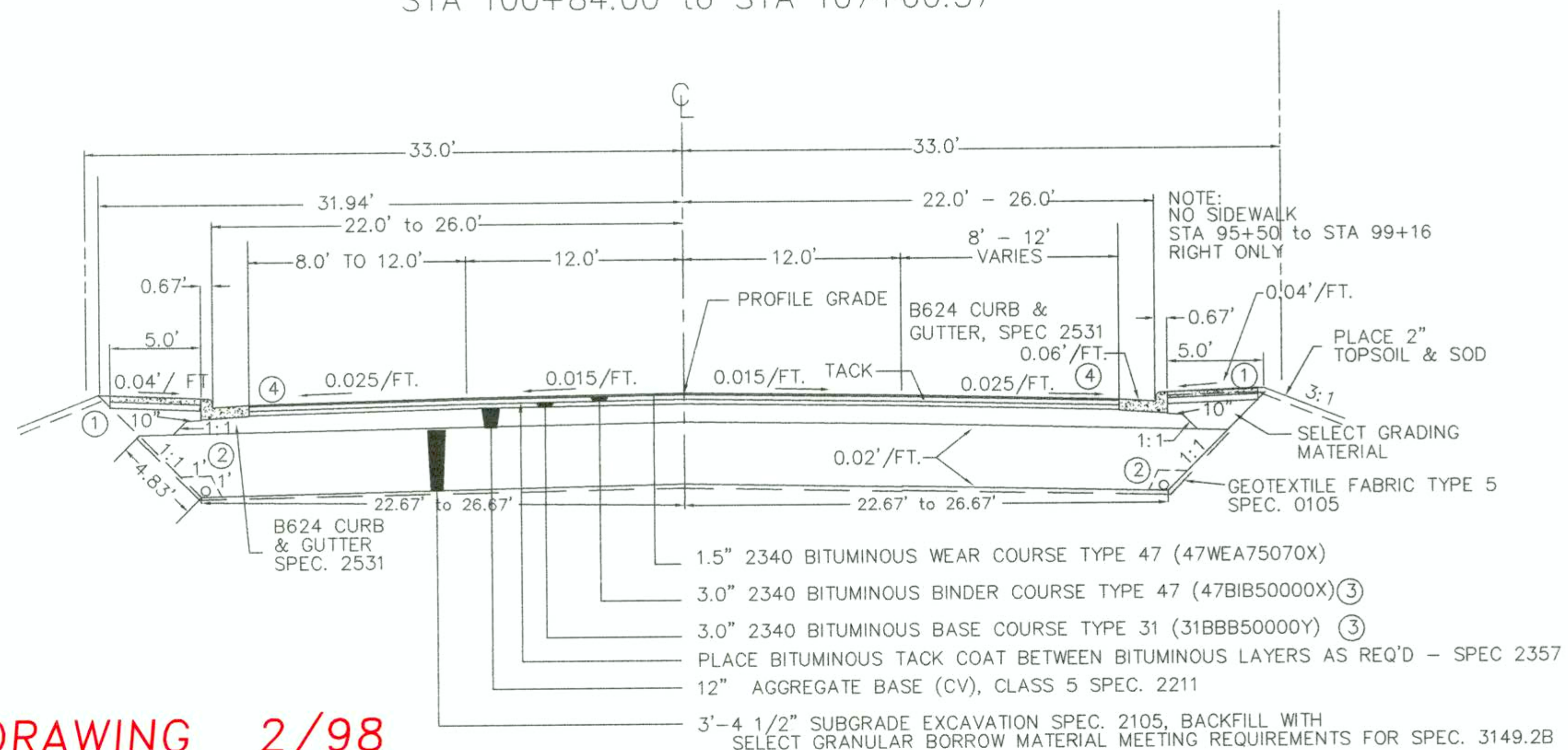
KENWOOD AVE / HOWARD GNESEN RD
STA 107+66.57 to STA 116+73.94

NOTE:
~~VARIABLE BOULEVARD STA 112+50 TO STA 113+00 LT~~
~~4" CONC. WALK STA 113+00 TO STA 116+73 LT~~
5' (F)

NOTE:
~~VARIABLE BOULEVARD STA 108+30 TO STA 110+50 RT~~
~~4" CONC. WALK STA 110+70 TO STA 116+73 RT~~
5' (F)



KENWOOD AVE / HOWARD GNESEN RD
STA 95+50.00 to STA 99+16.00
STA 100+84.00 to STA 107+66.57



NOTES:

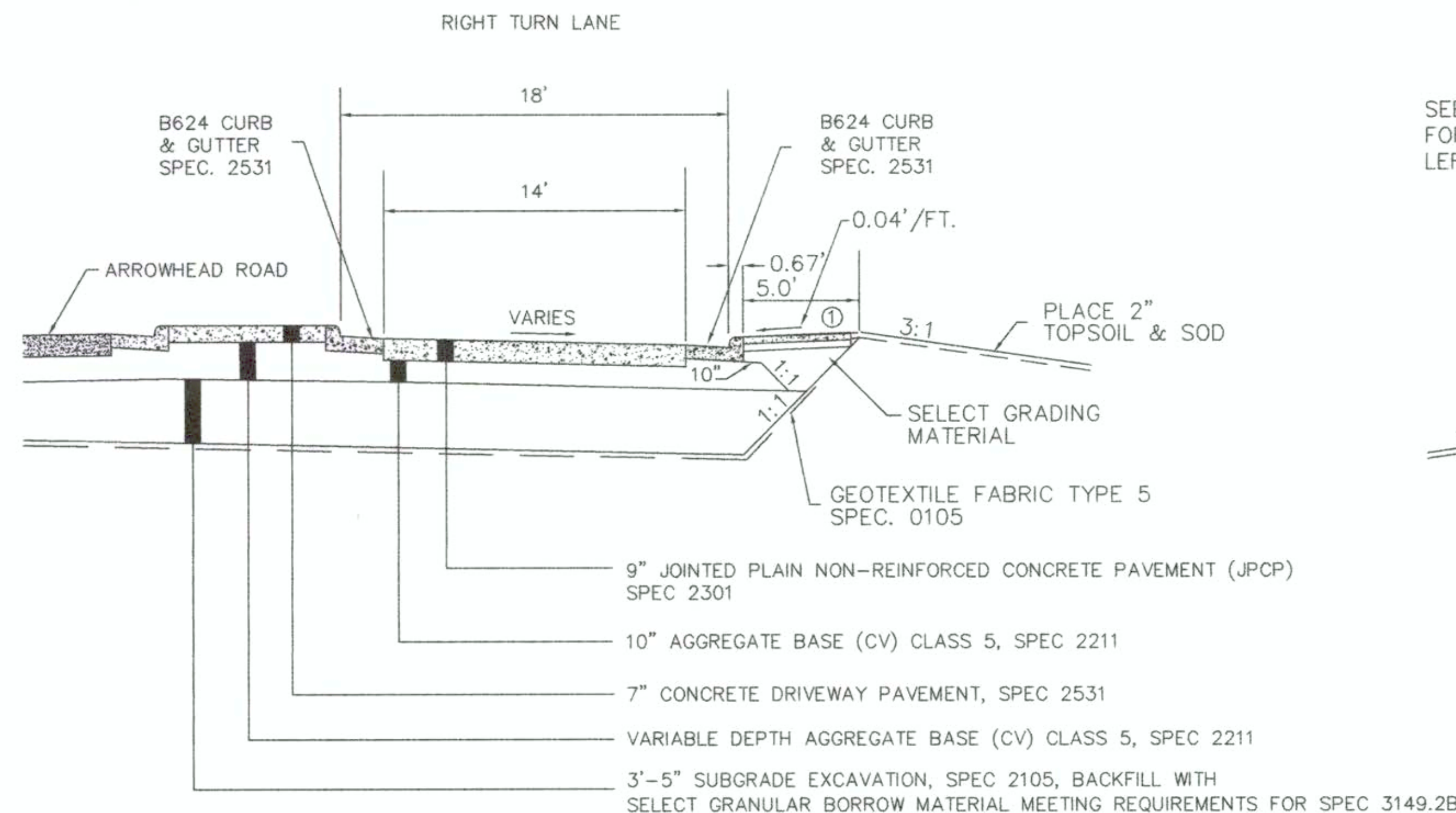
- ① 4" CONCRETE WALK SPEC. 2521
- ② 4" CLASS 5 AGGREGATE BASE, SPEC. 2211 (INCIDENTAL TO CONCRETE WALK)
- ③ 4" PVC PERFORATED PIPE SPEC. 2502
- ④ COARSE FILTER AGGREGATE SPEC. 3149.2H (27 LIN FT/CU YD)
- ⑤ 5' WIDE GEOTEXTILE FABRIC, TYPE 1, SPEC. 3733
- ⑥ CONSTRUCT IN TWO LAYERS
- ⑦ SEE TYPICAL PAVEMENT SECTION SHEET 10
- ⑧ SEE PLAN & PROFILE SHEETS & CROSS SECTION SHEETS FOR SUPER ELEVATION AND CURB ELEVATIONS

RECORD DRAWING 2/98

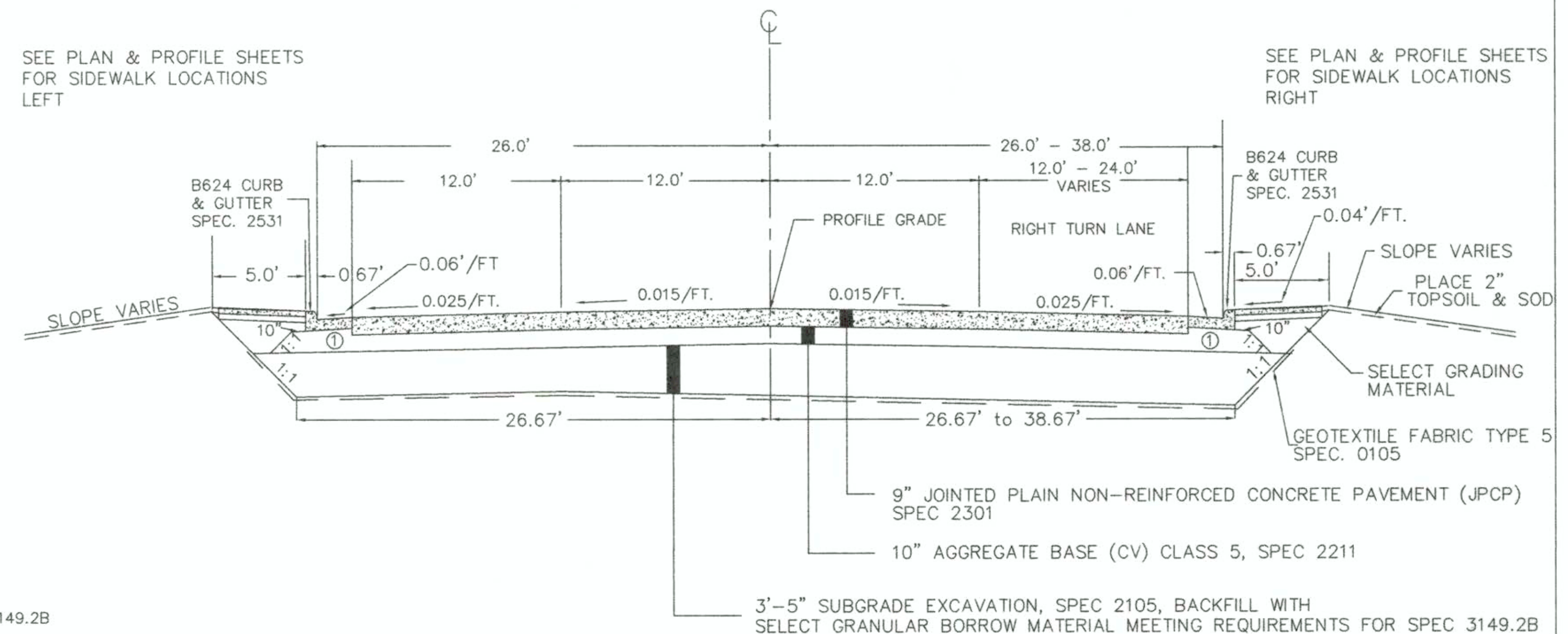
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DATE 2-20-98 REG. NO. 7756

CONCRETE PAVEMENT
ARROWHEAD ROAD STA 51+94.74 to KENWOOD AVE
RIGHT TURN LANE



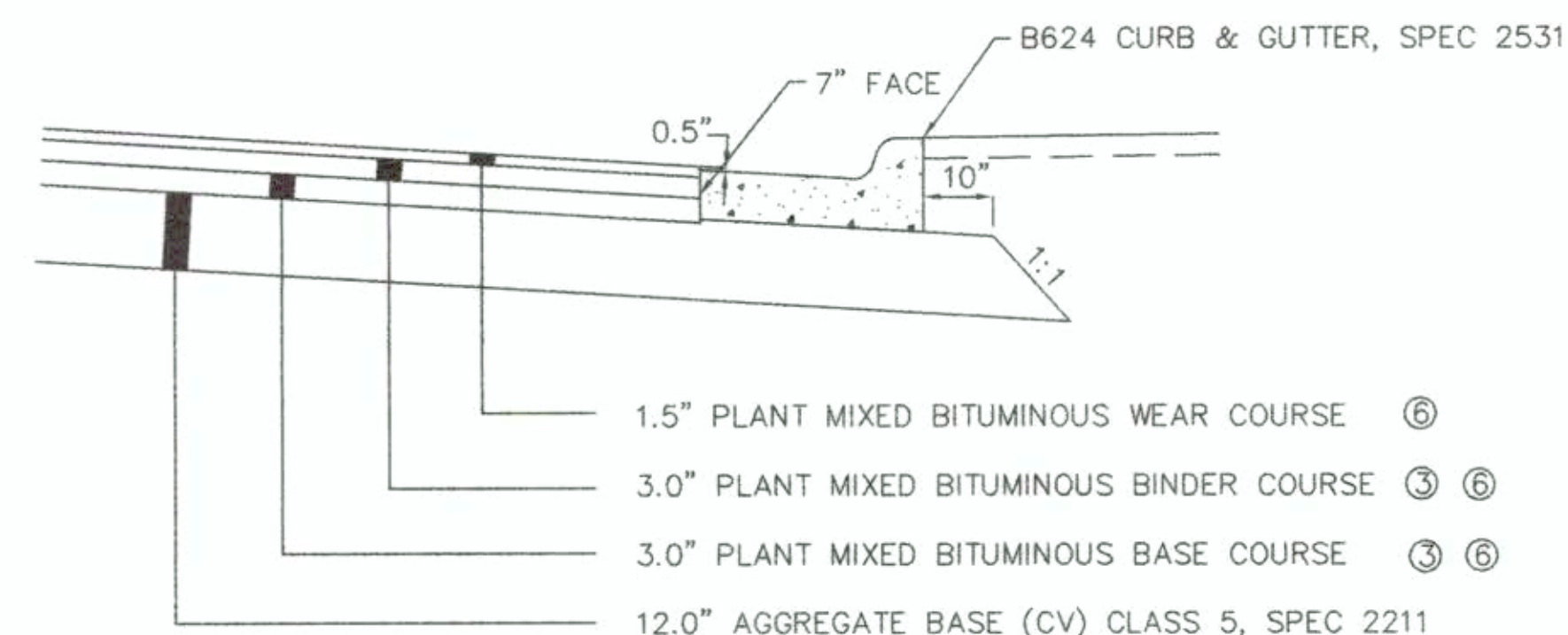
CONCRETE PAVEMENT
ARROWHEAD ROAD STA 51+94.74 to STA 53+77.74
KENWOOD AVE / HOWARD GNESEN RD STA 99+16.00 to STA 100+84.00



TYPICAL BITUMINOUS PAVEMENT SECTION

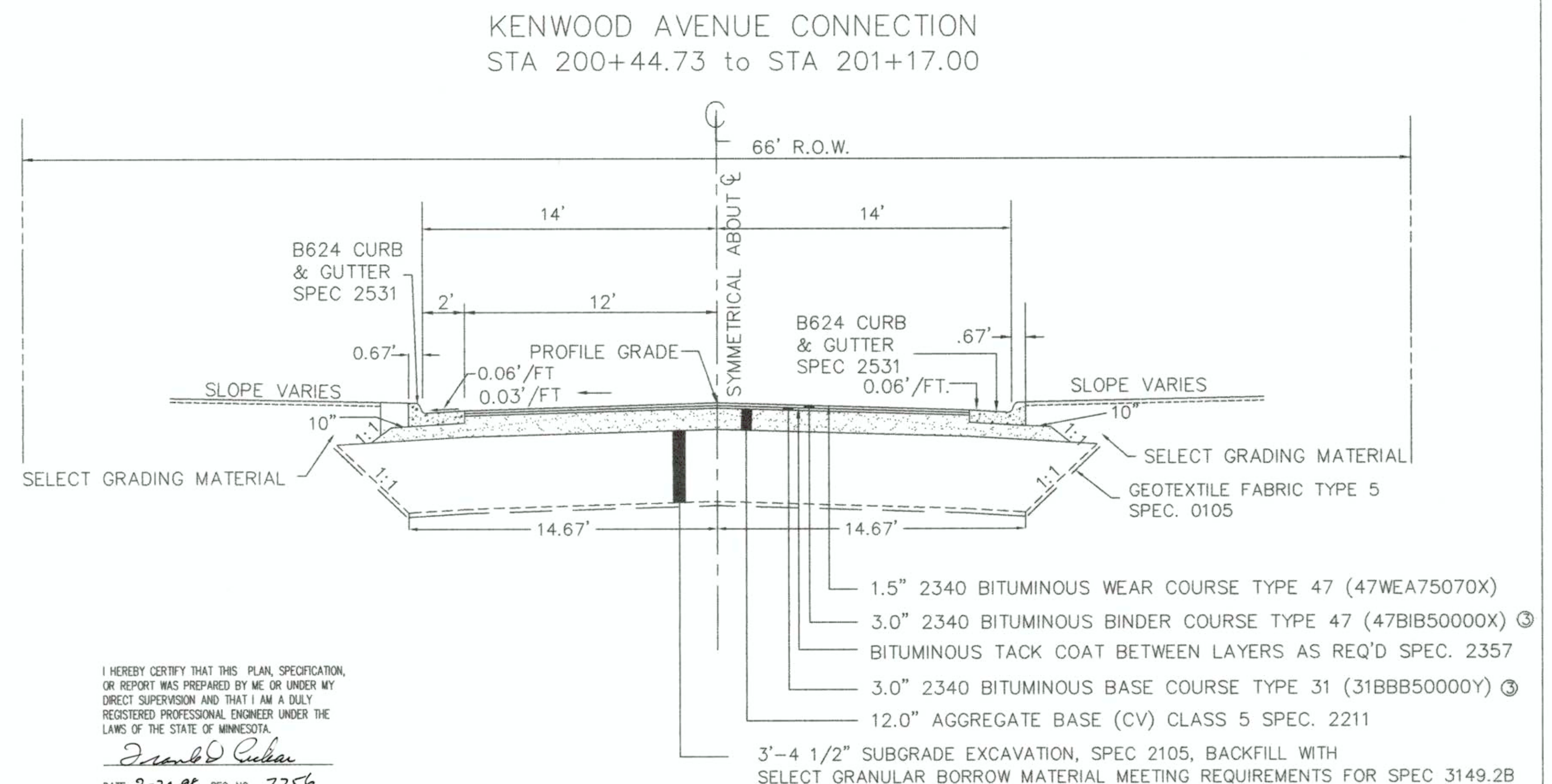
ARROWHEAD ROAD STA 50+17.44 to STA 51+94.74
ARROWHEAD ROAD STA 53+77.74 to STA 61+20.00

KENWOOD AVE / HOWARD GNESEN RD STA 95+50.00 to STA 99+16.00
KENWOOD AVE / HOWARD GNESEN RD STA 100+84.00 to STA 116+73.94
KENWOOD AVENUE CONNECTION STA 200+44.73 to STA 201+70.00



NOTES:

- ① 4\"/>

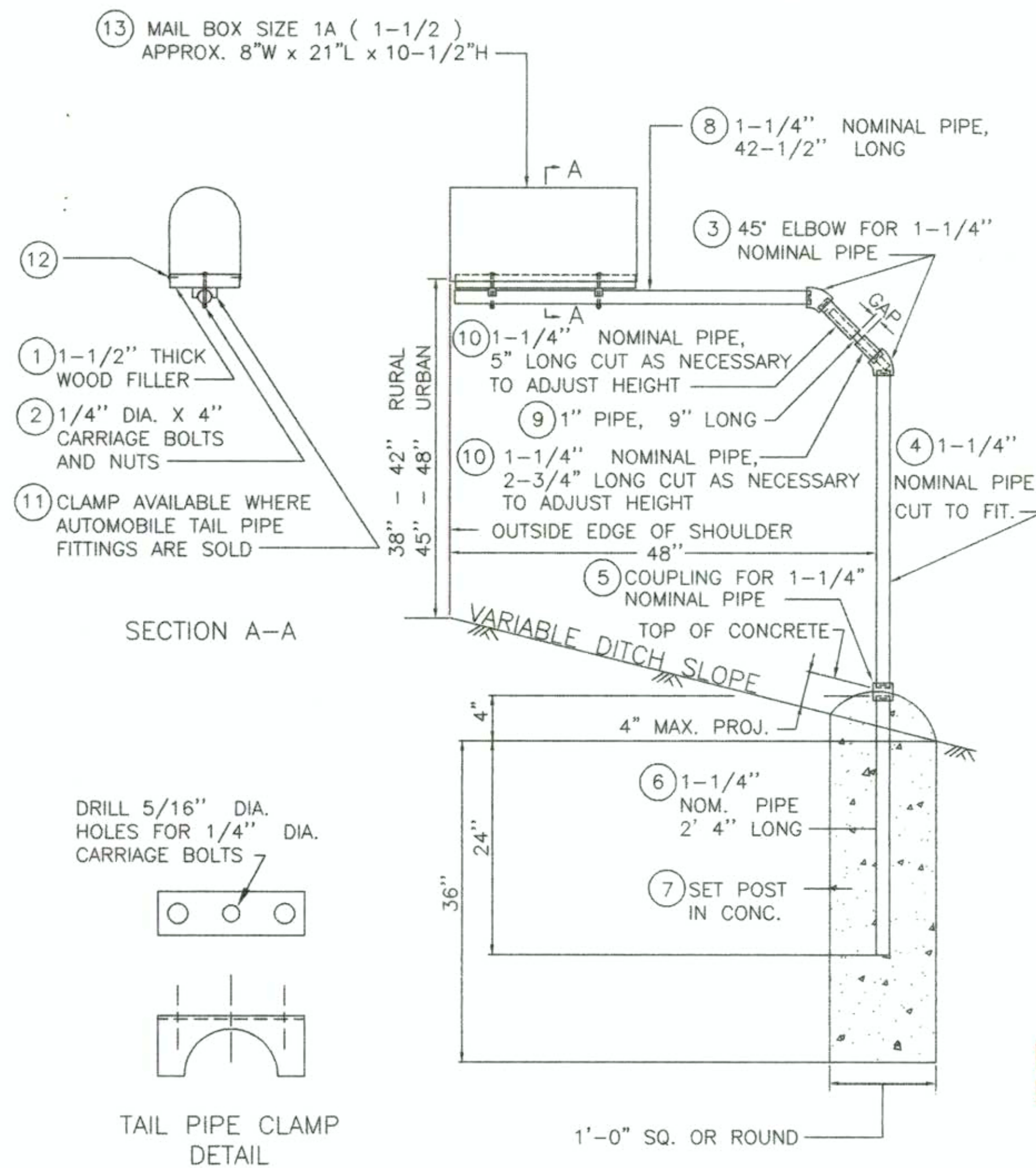


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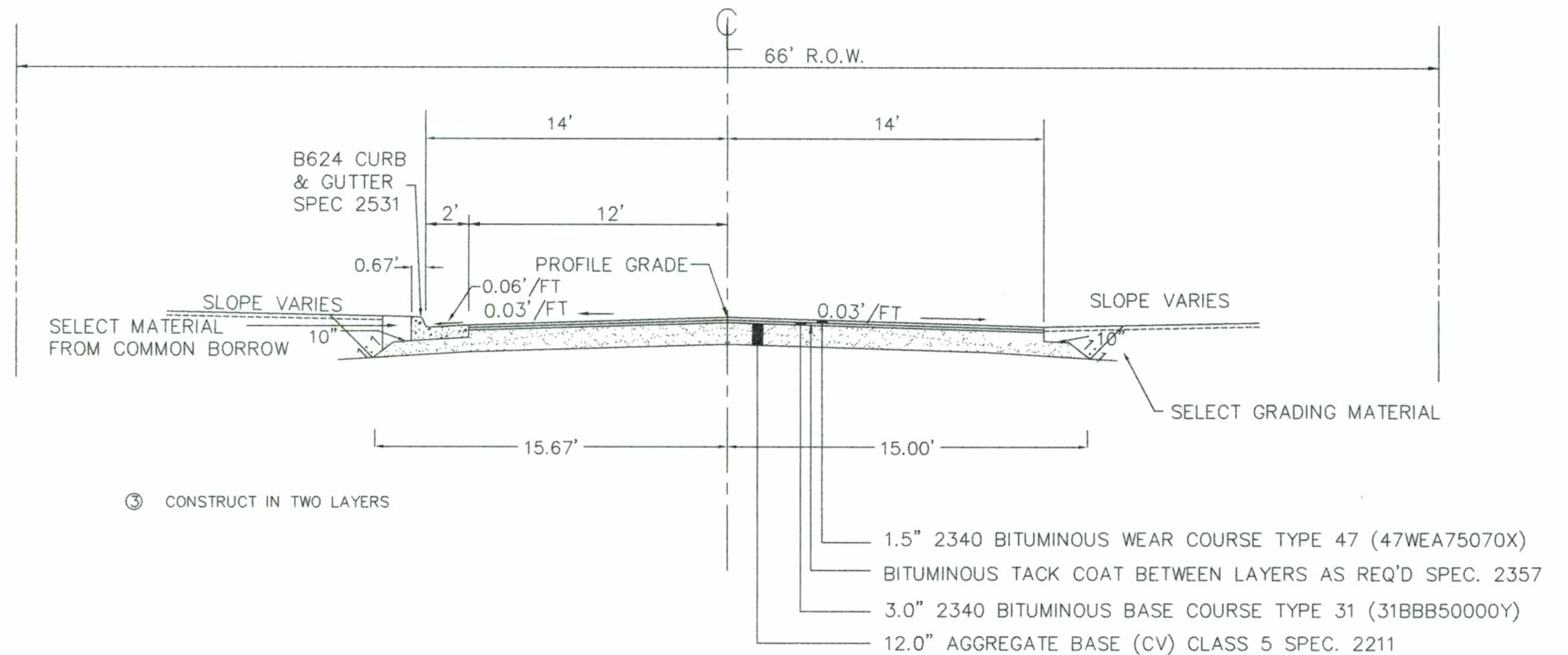
Frank D. Ruben
DATE 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98

RECOMMENDED MAIL BOX SUPPORT



MARYLAND STREET-KENWOOD AVENUE CONNECTION MARYLAND STREET to STA 202+00.00 (SEE SHEET 23)



NOTE: SEE JOB FILE 96061 FOR
DETAILS OF MAIL BOX SUPPORT USED. (F)

LIST OF MATERIALS

ITEM NO.	NUMBER REQUIRED	DESCRIPTION
1	1	1-1/2" THICK WOOD FILLER CUT TO FIT SNUG UNDER MAIL BOX
2	2	1/4" DIA. X 4" LONG CARRIAGE BOLTS & NUTS
3	2	45° ELBOW FOR 1-1/4" NOMINAL PIPE
4	1	1-1/4" NOMINAL PIPE, CUT TO FIT
5	1	COUPLING FOR 1-1/4" NOMINAL PIPE
6	1	1-1/4" NOMINAL PIPE, 2' 4" LONG
7		0.10 CU. YD. 3Y43 CONCRETE
8	1	1-1/4" NOMINAL PIPE, 42-1/2" LONG
9	1	1" PIPE, 9" LONG
10	1	1-1/4" NOMINAL PIPE, 5" LONG
		1-1/4" NOMINAL PIPE, 2-3/4" LONG
11	2	1-1/2" TAIL PIPE CLAMP
12	9	NO. 10 X 1" SHEET METAL SCREWS
13	1	MAIL BOX SIZE 1A (1-1/2) APPROX. 8"W X 21"L X 10-1/2"H

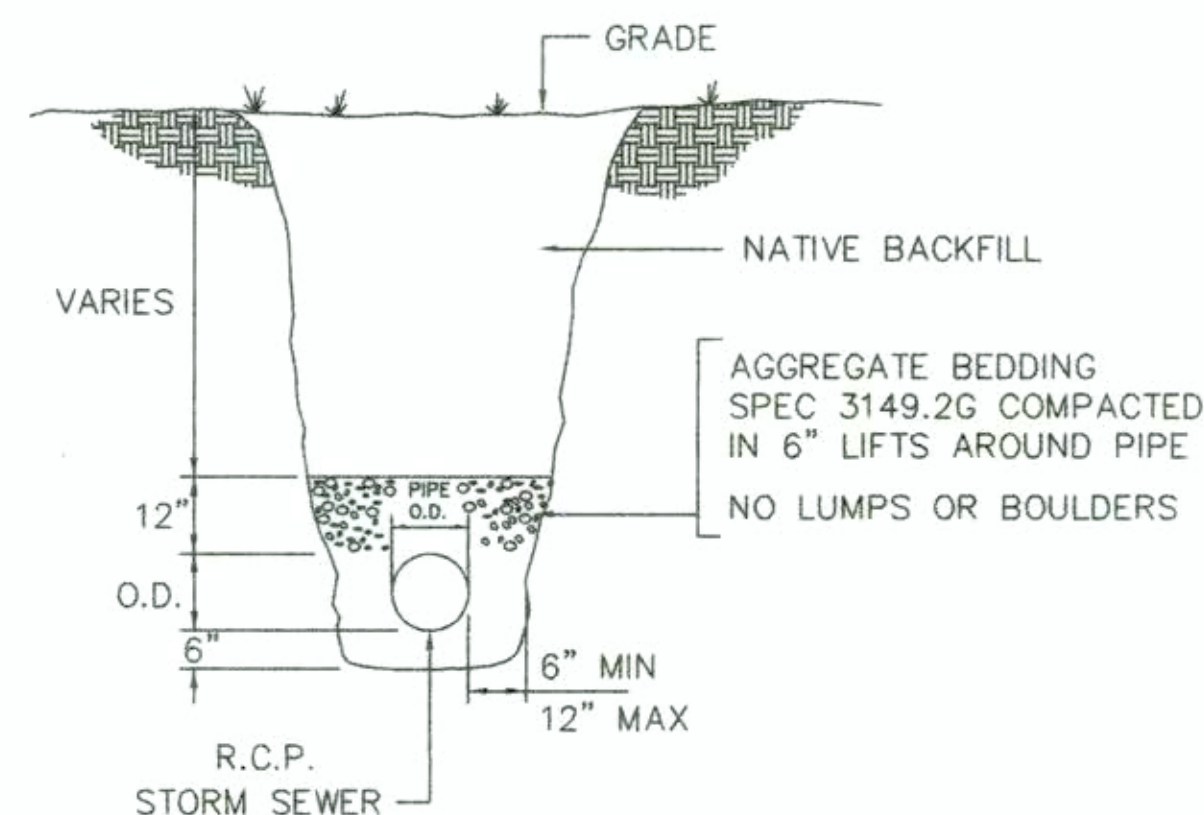
NOTES:

ALL PIPE AND PIPE COUPLINGS SHALL CONFORM TO SPEC. 3362

ALL FASTENERS SHALL CONFORM TO SPEC. 3391

ALL MATERIALS SHALL BE GALVANIZED PER SPEC. 3392

REFERENCE DATE: 5-3-91



TYPICAL TRENCH @
STORM SEWER

NO SCALE

RECORD DRAWING 2/98

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED 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 2-20-98 REG. NO. 7756

STORM DRAINAGE STRUCTURES																DESIGN 3006									
STRUCTURE - LOCATION			STATION	OFFSET	MH/CB DESIGN	EXISTING RIM ELEV.	NEW RIM ELEV.	INVERT OUT ELEV.	DRAINS TO NO.	REMOVE MH EACH	REMOVE CB EACH	REMOVE PIPE SEWERS LIN FT	ADJUST MANHOLE STRUCTURES EACH	CONSTRUCT MANHOLE LIN FT	CONSTRUCT CATCH BASIN EACH	CASTING ASSEMBLY EACH	12"	15"	18"	21"	24"	27"	30"		
NO.																	R. C. P. LIN FT	R. C. P. LIN FT	R. C. P. LIN FT	R. C. P. LIN FT	R. C. P. LIN FT	R. C. P. LIN FT			
S. A. P. 118-160-18 ARROWHEAD ROAD																									
127	MH	ARROWHEAD ROAD	52+82.72	12.11 LT.	72-4020	1254.80	1255.35	1247.50	129	1		24		7.85		A-2									
127A	CB	ARROWHEAD ROAD	52+53.69	23.44 LT.	EXIST.	1255.61		1252.50	127		1	32													
127B	CB	ARROWHEAD ROAD	52+72.55	35.13 LT.	EXIST.	1255.59		1251.90	127		1	25													
127C	CB	ARROWHEAD ROAD	53+14.99	36.94 LT.	EXIST.	1255.94		1252.70	128		1	42													
127D	CB	ARROWHEAD ROAD	51+93.66	37.00 RT.	G		1258.11	1253.21	127E						1	B-5	78								
127E	CB	ARROWHEAD ROAD	52+37.75	27.42 LT.	G		1256.15	1251.34	127						1	B-5	48								
150	MH	ARROWHEAD ROAD	52+82.66	53.98 LT.	F		1256.68	1249.50	127					7.18		A-2				42					
150A	CB	ARROWHEAD ROAD	52+68.63	69.96 LT.	G		1257.00	1252.10	150						1	B-5	21								
150B	CB	ARROWHEAD ROAD	53+18.83	70.04 LT.	G		1257.00	1252.10	150						1	B-5	39								
128	MH	ARROWHEAD ROAD	52+82.53	11.42 RT.	EXIST.	1254.12		1248.50	129	1		46													
128A	CB	ARROWHEAD ROAD	52+49.82	23.40 RT.	EXIST.	1254.29		1250.20	128		1	35													
129	MH	ARROWHEAD ROAD	53+18.84	39.64 RT.	EXIST.	1253.45		1246.10	130	1															
129	MH	ARROWHEAD ROAD	53+18.22	52.61 RT.	F		1252.25	1245.30	130					6.95		B-5					269				
131	MH	ARROWHEAD ROAD	53+20.75	24.10 LT.	EXIST.	1253.92		1247.90	129	1		64													
131A	CB	ARROWHEAD ROAD	52+72.17	81.15 LT.	EXIST.	1257.68		1254.60	131		1	75													
142	MH	ARROWHEAD ROAD	54+60.37	27.68 LT.	EXIST.	1252.38	1252.20	1246.20	143				1			A-2									
143	MH	ARROWHEAD ROAD	54+59.52	24.64 RT.	EXIST.	1251.17	1251.70	1242.00	149				1			A-2									
144	MH	ARROWHEAD ROAD	55+83.39	25.13 RT.	EXIST.	1250.95	1250.30	1243.40	143				1			A-2									
144A	CB	ARROWHEAD ROAD	55+94.83	19.52 LT.	EXIST.	1250.24		1246.90	144		1	45													
144B	CB	ARROWHEAD ROAD	55+95.55	17.87 RT.	EXIST.	1250.07		1247.80	144		1	13													
144C	CB	ARROWHEAD ROAD	56+06.35	25.00 LT.	G		1250.00	1245.10	144D						1	B-5	50								
144D	CB	ARROWHEAD ROAD	56+06.35	25.00 RT.	G		1250.00	1244.46	144						1	B-5	23								
146	MH	ARROWHEAD ROAD	56+72.09	28.96 LT.	EXIST.	1250.74	1250.53	1244.70	145				1			A-2									
146A	CB	ARROWHEAD ROAD	56+81.40	19.24 LT.	EXIST.	1250.85		1248.00	146		1	14													
146B	CB	ARROWHEAD ROAD	56+68.75	36.09 LT.	EXIST.	1250.24		1247.20	146		1	8													
146C	CB	ARROWHEAD ROAD	56+92.15	25.00 LT.	G		1250.52	1245.62	146						1	B-5	20								
146D	CB	ARROWHEAD ROAD	56+68.12	48.96 LT.	G		1250.50	1245.60	146						1	B-5	20								
145	MH	ARROWHEAD ROAD	56+72.02	24.63 RT.	EXIST.	1251.31	1250.59	1243.90	144				1			A-2									
148	MH	ARROWHEAD ROAD	59+62.34	36.79 LT.	EXIST.	1253.35	1253.20	1245.60	147				1			A-2									
148A	CB	ARROWHEAD ROAD	59+52.67	41.70 LT.	EXIST.	1253.00		1249.50	148		1	11													
148B	CB	ARROWHEAD ROAD	59+80.32	43.00 LT.	EXIST.	1253.19		1250.20	148A		1	27													
148C	CB	ARROWHEAD ROAD	60+03.82	20.86 LT.	EXIST.	1252.81		1249.30	148		1	44													
148D	CB	ARROWHEAD ROAD	59+53.03	49.00 LT.	G		1253.10	1248.20	148						1	B-5	14								
148E	CB	ARROWHEAD ROAD	59+80.29	49.00 LT.	G		1253.10	1247.52	148						1	B-5	20								
148F	CB	ARROWHEAD ROAD	60+02.71	24.81 LT.	G		1252.94	1248.28	148E						1	B-5	32								
147	MH	ARROWHEAD ROAD	59+58.41	21.66 RT.	EXIST.	1253.71	1252.95	1245.10	145				1			A-2									
147A	CB	ARROWHEAD ROAD	60+02.67	18.16 RT.	EXIST.	1254.22		1251.30	151		1	74													
147B	CB	ARROWHEAD ROAD	60+00.00	24.50 RT.	G		1252.94	1248.04	147						1	B-5	42								
151	MH	ARROWHEAD ROAD	59+44.57	27.57 LT.	EXIST.	1253.62	1252.50	UNKNOWN	146				1			A-2									
TOTAL ARROWHEAD ROAD										4	13	579	8	21.98	12		407		42	74	269				
S. A. P. 118-151-09 KENWOOD AVENUE																									
149	MH	KENWOOD AVENUE	93+18.64	26.04 RT.	72-4020	1233.70	1233.70	1225.45	SOUTH	1				8.25		A-2									
130	MH	KENWOOD AVENUE	96+79.34	29.50 RT.	72-4020	1246.01	1245.27	1238.60	149	1		361		6.67		A-2							361		
130A	CB	KENWOOD AVENUE	96+84.00	36.00 LT.	EXIST.	1246.62		1243.90	130		1	66													
130B	CB	KENWOOD AVENUE	97+00.00	22.00 LT.	EXIST.	1246.54		1243.50	130		1	55													
130C	CB	KENWOOD AVENUE	97+00.00	22.00 RT.	EXIST.	1246.47		1243.30	130		1	21													
130D	CB	KENWOOD AVENUE	96+82.00	49.00 LT.	G		1246.90	1241.58	130						1	B-5	78								
130E	CB	KENWOOD AVENUE	97+03.54	25.00 LT.	G		1245.75	1240.85	130						1	B-5	60								
130F	CB	KENWOOD AVENUE	97+03.54	25.00 RT.	G		1245.75	1241.20	130						1	B-5	24								
130G	CB	KENWOOD AVENUE	96+56.00	49.00 LT.	G		1246.90	1242.22	130D						1	B-5	26								
TOTAL KENWOOD AVENUE										2	3	503		14.92	4		188						361		
S. A. P. 69-634-11 KENWOOD AVE-HOWARD GNESEN ROAD																									
132	MH	KENWOOD AVENUE	103+40.00	11.00 LT.	F		1273.26	1266.00	150					7.26		A-2				286					
132A	CB	KENWOOD AVENUE	103+51.95	38.00 LT.	EXIST.	1273.38		UNKNOWN	SOUTH		1	41													
132B	CB	KENWOOD AVENUE	103+77.95	38.00 LT.	EXIST.	1273.57		UNKNOWN	132A																

SANITARY SEWER STRUCTURES													
STRUCTURE - LOCATION			STATION	OFFSET	DESIGN	EXISTING RIM ELEV.	NEW RIM ELEV.	INVERT OUT ELEV.	DRAINS TO STRUCTURE	ADJUST MH EACH	RECONSTRUCT MH LIN FT	CASTING ASSEMBLY TYPE	8" PVC SEWER LIN FT
NO.	TYPE	STREET											
S. A. P. 118-160-18 ARROWHEAD ROAD													
221	MH	ARROWHEAD ROAD	51 + 61.71	18.24 R	MH	1259.77	1260.58	1249.37	204	1		A-3	
204	MH	ARROWHEAD ROAD	53 + 14.01	18.13 R	MH	1253.48	1253.65	1241.20	203	1		A-3	
205	MH	ARROWHEAD ROAD	53 + 13.95	0.41 L	MH	1254.00	1254.06	1241.80	204	1		A-3	
222	MH	ARROWHEAD ROAD	54 + 65.55	14.97 L	MH	1251.27	1251.87	1239.07	SOUTH	1		A-3	
223	MH	ARROWHEAD ROAD	56 + 38.45	15.83 L	MH	1250.67	1250.61	1242.70	222	1		A-3	
224	MH	ARROWHEAD ROAD	56 + 46.64	15.64 L	MH	1250.78	1250.67	1242.90	223	1		A-3	
225	MH	ARROWHEAD ROAD	59 + 51.03	14.22 L	MH	1253.29	1253.09	1239.99	224	1		A-3	
TOTAL ARROWHEAD ROAD										7		7	
S. A. P. 118-151-09 KENWOOD AVENUE													
200	MH	KENWOOD AVENUE	93 + 21.28	19.89 R	MH	1233.88	1233.88	1221.98	SOUTH				
201	MH	KENWOOD AVENUE	93 + 36.87	19.87 R	MH	1234.07	1234.07	1222.27	200				
202	MH	KENWOOD AVENUE	95 + 20.30	20.23 R	MH	1240.62	1240.62	1228.62	201				
203	MH	KENWOOD AVENUE	96 + 67.59	20.00 R	MH	1245.99	1245.18	1233.79	202	1		A-3	
TOTAL KENWOOD AVENUE										1		1	
S. A. P. 69-634-11 KENWOOD AVE/HOWARD GNESEN ROAD													
206	MH	KENWOOD AVENUE	103 + 78.91	19.36 R	MH	1274.34	1275.08	1265.19	205	1		A-3	
207	MH	KENWOOD AVENUE	103 + 99.63	19.63 R	MH	1275.33	1276.08	1264.48	206	1		A-3	
208	MH	KENWOOD AVENUE	107 + 05.87	19.63 R	MH	1286.65	1287.08	1276.00	207	1		A-3	
209	MH	KENWOOD AVENUE	108 + 90.12	40.34 R	MH	1294.12	1295.00	1282.02	208	1			
210	MH	KENWOOD AVENUE	110 + 02.55	102.24 R	MH	1298.86	1298.86	1284.26	209				
211	MH	KENWOOD AVENUE	110 + 56.80	155.76 R	MH	1300.25	1300.25	1285.65	210				
212	MH	KENWOOD AVENUE CONN	110 + 90.79	157.64 R	MH	1301.05	1300.97	1292.15	211	1		A-3	
213	MH	KENWOOD AVENUE CONN	110 + 67+/-	98+/-	BEND	---	---	---	211				
214	MH	KENWOOD AVENUE CONN	110 + 78.69	51.71 R	MH	1309.19	1305.70	1298.99	210	1			
215	MH	HOWARD GNESEN ROAD	111 + 19.33	36.78 R	MH	1314.16	1312.00	1302.26	214		2.16		
216	MH	HOWARD GNESEN ROAD	111 + 49.55	41.77 R	MH	1314.32	1314.32	1304.62	215				
217	MH	HOWARD GNESEN ROAD	112 + 44.82	19.03 R	MH	1322.59	1319.35	1311.29	216		3.24		
218	MH	HOWARD GNESEN ROAD	115 + 36.03	15.74 R	MH	1327.29	1327.56	1315.66	217	1		A-3	
219	MH	HOWARD GNESEN ROAD	118 + 48.77	18.48 R	MH	1332.65	1332.65	1319.85	218				
TOTAL KENWOOD AVE/HOWARD GNESEN ROAD										7		5.40	
TOTAL										15		13	

NOTE: SEE PLAN AND PROFILE SHEETS FOR FINAL ELEVATIONS (F)

C CASTING ASSEMBLY INFORMATION							
TYPE OF STRUCTURE		CATCH BASIN		CATCH BASIN		MANHOLE	
TYPE OF ASSEMBLY		B-5		M3-9		A-2	A-3
CASTING DESCRIPTION		FRAME	GRATE	CURB BOX	FRAME	GRATE	FRAME & CASTING
CASTING NUMBER		802A	816	823A	700-9	730-9	FRAME & CASTING
STANDARD PLATE NUMBER		4129F	4154B	4160D	4101C	4142D	CITY OF DULUTH
							CITY OF DULUTH
TOTAL		30			3	19	13

* SEE SPECIAL PROVISIONS FOR STANDARD PLATE NO. 4142D

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

Donald P. Liska
DATE 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98

D CLEARING & GRUBBING QUANTITIES						
STA. TO STA.	LOCATION	TREE SIZE & TYPE	CLEARING SPEC. 2101.501 ACRE	GRUBBING SPEC. 2101.506 ACRE	CLEARING SPEC. 2101.502 TREE	GRUBBING SPEC. 2101.507 TREE
S. A. P. 118-160-18 ARROWHEAD ROAD						
49+67 TO 52+61	LT.		0.80	0.80		
56+78	39' LT.	12" SPRUCE			1	1
56+88	28' LT.	12" SPRUCE			1	1
58+35	35' LT.	8" APPLE			1	1
TOTAL ARROWHEAD ROAD			0.80	0.80	3	3
S. A. P. 69-634-11 KENWOOD AVE/HOWARD GNESEN RD						
103+40	33' LT.	12" MAPLE			1	1
103+40	40' LT.	6" SPRUCE			2	2
105+03	25' LT.	8" MAPLE			1	1
105+28	25' LT.	8" MAPLE			1	1
105+10 TO 105+38	33' RT.	5" SPRUCE			6	6
106+12	33' RT.	8" SPRUCE			1	1
106+23	29' RT.	8" SPRUCE			1	1
105+97	30' LT.	12" PINE			1	1
106+11	29' LT.	12" SPRUCE			1	1
106+33	30' LT.	8" SPRUCE			1	1
106+52	26' LT.	10" SPRUCE			1	1
106+57	22' LT.	10" SPRUCE			1	1
106+57	32' LT.	10" PINE			1	1
106+68	22' LT.	10" SPRUCE			1	1
106+94	21' LT.	12" MAPLE			1	1
106+94	21' LT.	6" MAPLE			1	1
106+94	28' LT.	15" MAPLE			1	1
106+94	36' LT.	2 12" MAPLE			2	2
108+43 TO 108+73	25' -40' LT.		0.05	0.05		
109+00	25' LT.	12" SPRUCE			1	1
109+01	19' LT.	12" SPRUCE			1	1
109+08	20' LT.	12" SPRUCE			1	1
109+18	17' LT.	12" SPRUCE			1	1
109+28	16' LT.	12" SPRUCE			1	1
109+40	15' LT.	15" SPRUCE			1	1
109+52	13' LT.	12" SPRUCE			1	1
109+63	14' LT.	12" SPRUCE			1	1
109+75	14' LT.	7" SPRUCE			1	1
109+89	14' LT.	9" SPRUCE			1	1
109+79	25' LT.	18" MAPLE			1	1
110+00	15' LT.	9" SPRUCE			1	1
110+10	19' LT.	5" SPRUCE			1	1
110+24	23' LT.	24" OAK			1	1
110+33	23' LT.	6" SPRUCE			1	1
110+41	20' LT.	16" OAK			1	1
110+48	21' LT.	6" SPRUCE			1	1
110+57	21' LT.	6" SPRUCE			1	1
110+66	19' LT.	6" SPRUCE			1	1
110+57	32' LT.	8" OAK			1	1
110+71	29' LT.	14" OAK			1	1
110+98 TO 112+50	15' -40' LT.		0.10	0.10		
TOTAL KENWOOD AVE/HOWARD GNESEN RD			0.15	0.15	46	46
TOTAL			0.95	0.95	49	49

E CONCRETE WALK		
LOCATION STATION TO STATION	REMOVE CONCRETE WALK 2104.503 SQ. FT.	CONSTRUCT 4" CONCRETE WALK 2521.501 SQ. FT.
S. A. P. 118-160-18 ARROWHEAD ROAD		
50 + 17 TO 50 + 46 RT.	145	
50 + 17 TO 52 + 68 RT.		1295
51 + 45 TO 52 + 68 LT.		805
53 + 18 TO 56 + 43 RT.		1845
53 + 18 TO 56 + 43 LT.		1845
53 + 25 LT.	104	
56 + 70 TO 59 + 50 RT.		1475
56 + 70 TO 59 + 50 LT.		1475
TOTAL ARROWHEAD ROAD	249	8740
S. A. P. 118-151-09 KENWOOD AVENUE		
93 + 93 LT.	33	33
95 + 78 TO 96 + 68 LT.		425
95 + 78 TO 96 + 50 LT.	288	
96 + 89 TO 99 + 6 LT.	868	
96 + 68 TO 99 + 16 LT.		1225
TOTAL KENWOOD AVENUE	1189	1683
S. A. P. 69-634-11 KENWOOD AVE/HOWARD GNESEN RD		
101 + 06 TO 102 + 73 RT.	835	
102 + 73 TO 102 + 85 RT.	54	
102 + 85 TO 109 + 48 RT.	2740	
103 + 42 RT.	60	
106 + 36 RT.	15	
107 + 91 RT.	66	
100 + 84 TO 103 + 65 LT.		1375
100 + 84 TO 109 + 50 RT.		4330
103 + 65 TO 107 + 27 LT.		1750
107 + 27 TO 117 + 00 LT.		4380
109 + 50 TO 117 + 00 RT.		3000
TOTAL KENWOOD AVE/HOWARD GNESEN RD	3770	14835
TOTAL	5208	25258

F SAW PAVEMENT (FULL DEPTH)		CONCRETE 2104.511 LIN FT	BITUMINOUS 2104.513 LIN FT
LOCATION			
S. A. P. 118-160-18 ARROWHEAD ROAD			
50 + 17.44 ARROWHEAD		45	48
51 + 71 LT. ENTRANCE			120
54 + 35 RT. ENTRANCE			24
54 + 45 LT. ENTRANCE			28
55 + 24 LT. ENTRANCE			30
WARREN AVENUE LT.			30
WARREN AVENUE RT.			40
57 + 91 LT. ENTRANCE			36
61 + 20 ARROWHEAD			24
DODGE AVENUE LT.			55
DODGE AVENUE RT.			10
60 + 57 LT. ENTRANCE		55	435
TOTAL ARROWHEAD ROAD			
S. A. P. 118-151-09 KENWOOD AVENUE			
93 + 17 KENWOOD (UTILITY TRENCH)		45	
95 + 22 KENWOOD (UTILITY TRENCH)		60	
95 + 01 RT. ENTRANCE			12
95 + 50 KENWOOD		45	
96 + 19 LT. ENTRANCE		12	
96 + 67.99 LT.			24
96 + 67.99 RT.			24
97 + 25 RT. ENTRANCE			30
97 + 83 RT. ENTRANCE			30
98 + 32 RT. ENTRANCE			30
98 + 98 RT. ENTRANCE			40
117 + 50 KENWOOD			24
TOTAL KENWOOD AVENUE			214
S. A. P. 69-634-11 KENWOOD AVE-HOWARD GNESEN RD			
101 + 06 RT. ENTRANCE			50
101 + 21 LT. ENTRANCE		65	
102 + 11 RT. ENTRANCE			24
102 + 27 LT. ENTRANCE			24
103 + 65 LT. ST. BENEDICTS			24
104 + 80 LT. ENTRANCE			24
105 + 46 LT. ALLEY			24
105 + 52 RT. ENTRANCE		12	
105 + 71 LT. ENTRANCE			12
106 + 58 RT. ENTRANCE			12
107 + 27 LT. ACROSS STREET			24
107 + 58 RT. ENTRANCE			12
108 + 04 RT. ENTRANCE			12
108 + 78 LT. ENTRANCE			12
110 + 88 LT. ENTRANCE			12
111 + 94 RT. ENTRANCE			12
112 + 52 RT. ENTRANCE			12
113 + 21 RT. ENTRANCE			12
113 + 33 LT. ENTRANCE			12
114 + 33 LT. ENTRANCE			12
114 + 50 LT. ENTRANCE			16
115 + 00 RT. ENTRANCE			12
115 + 75 RT. ENTRANCE			24
116 + 64 RT. ENTRANCE			12
116 + 68 LT. ENTRANCE			12
TOTAL KENWOOD AVE-HOWARD GNESEN RD			402
TOTAL			294
TOTAL			1051

NOTE: SEE JOB FILE 96061 FOR ITEM RECORD ACCOUNTS FOR FINAL QUANTITIES & LOCATIONS. (F)

G REMOVE CURB & GUTTER SPEC. 2104.501	
LOCATION	LIN FT
S. A. P. 118-160-18 ARROWHEAD ROAD	
50 + 17 TO 50 + 55 LT.	38
50 + 17 TO 50 + 55 RT.	38
53 + 29 TO 56 + 55 LT.	327
53 + 29 TO 56 + 55 RT.	327
56 + 55 TO 59 + 64 LT.	312
56 + 55 TO 59 + 64 RT.	312
59 + 64 TO 61 + 20 LT.	150
59 + 64 TO 61 + 20 RT.	164
TOTAL	
1668	

H REMOVE PAVEMENT SPEC. 2104.505		
LOCATION	SQ YD AREA	REMARKS
S. A. P. 118-160-18 ARROWHEAD ROAD		
50 + 56 TO 53 + 30	1810.0	8" CONCRETE PAVEMENT
TOTAL ARROWHEAD ROAD		
1810.0		
S. A. P. 118-151-09 KENWOOD AVENUE		
95 + 50 TO 99 + 16	1996.3	MAINLINE INCL. CLEVELAND ST. APPROACHES
TOTAL KENWOOD AVENUE		
1996.3		
TOTAL		
3806.3		

RECORD DRAWING 2/98

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
David D. Belan
DATE 2-20-98 REG. NO. 7756

ALLEY & ENTRANCE TABULATION										
		REMOVE ENTRANCE			CONSTRUCT ENTRANCE				WEAR COURSE TYPE 47 2430.508 TON	REMARKS
STATION	LOCATION	WIDTH TYPE	REMOVE PAVEMENT 2104.505 SQ YD	REMOVE SEWER PIPE (STORM) 2104.501 LIN FT	DISTANCE FROM C/L FT	AGGREGATE BASE (LV) CLASS 5 2211.502 CU YD	7" CONCRETE DRIVEWAY PAVEMENT 2531.507 SQ YD	8" CONCRETE DRIVEWAY PAVEMENT 2531.507 SQ YD		
S. A. P. 118-160-18 ARROWHEAD ROAD										
51 + 71	LT.	45' CONC	60		26.7 - 40		41.0	66.8		ENTRANCE TO MURPHY OIL
52 + 50	RT.				26					CONC. ISLAND (AGG. BASE INCL. IN ITEM 2211.503, AGG. BASE CLASS V (CV))
53 + 43	RT.	18' BIT	14		20 - 27					ENTRANCE TO AMOCO - REMOVE ONLY
53 + 93	RT.	25' BIT	19		20 - 27					ENTRANCE TO AMOCO - REMOVE ONLY
54 + 35	RT.	40' BIT			27 - 32	5		23.6	6	ENTRANCE TO AMOCO
54 + 45	LT.	24' BIT	37		26.7 - 32	5		11.8	2	ENTRANCE TO NORWEST BANK
55 + 24	LT.	28' BIT	37		26.7 - 32	5		13.6	2	ENTRANCE TO FIRST BANK
56 + 55.23	RT.	28' BIT	62							WARREN AVENUE
57 + 91	LT.	16' BIT			26.7 - 32	5	8.3		2	ENTRANCE TO 1315 W. ARROWHEAD
58 + 63	LT.	16' CONC	36		26.7 - 40		22.5			ENTRANCE TO 1303 W. ARROWHEAD
59 + 63.94	RT.	30' BIT	33				7.0			DODGE AVENUE
60 + 57	LT.	12' CONC	7		20 - 25					ENTRANCE TO 1235 W. ARROWHEAD
TOTAL ARROWHEAD ROAD			305			20	78.8	115.8	12	
S. A. P. 118-151-09 KENWOOD AVENUE										
93 + 36	RT.	35' CONC	70			12			18	BUFFALO STREET INTERSECTION
93 + 80	RT.	12' CONC	8		22 - 27	10	8.0			ENTRANCE TO 1402 KENWOOD
95 + 01	RT.	12' CONC	7		22 - 27	5	8.0		4	ENTRANCE TO 1410 KENWOOD
95 + 40	RT.	27' CONC		51						COMMERCIAL ENTRANCE
96 + 19	LT.	12' CONC	19		26 - 40		20.3			ENTRANCE TO 1417 KENWOOD
97 + 25	RT.	24' CONC	28		22 - 40	5		13.3	6	ENTRANCE TO 1506 KENWOOD
97 + 60	LT.	12' CONC	9							ENTRANCE TO 1501 KENWOOD - REMOVE ONLY
97 + 83	RT.	24' CONC	28		22 - 40	5		13.3	6	ENTRANCE TO 1506 KENWOOD
98 + 13	LT.	12' CONC	12		22 - 40	5	9.3			ENTRANCE TO 1507 KENWOOD
98 + 32	RT.	24' CONC	14		22 - 40	5		13.3	4	ENTRANCE TO 1520 KENWOOD
98 + 72	RT.	24' CONC	28							ENTRANCE TO 1520 KENWOOD - REMOVE ONLY
98 + 78	LT.	24' CONC	21		26.7 - 32	5		13.3		ENTRANCE TO VACANT LOT
98 + 98	RT.	36' CONC			26.7 - 40	10		17.0	10	ENTRANCE TO 1520 KENWOOD
99 + 44	RT.	28' CONC	28							ENTRANCE TO 1520 KENWOOD - REMOVE ONLY
TOTAL KENWOOD AVENUE			272	51		62	45.6	70.2	48	
S. A. P. 69-634-11 KENWOOD AVE-HOWARD GNESEN RD										
101 + 06	RT.	24' BIT			26.7 - 40	15		13.3	14	ENTRANCE TO NORWEST BANK
101 + 21	LT.	50' CONC			26.7 - 40			62.2		ENTRANCE TO MURPHY OIL
101 + 83	LT.	24' GRAVEL		135	26.7 - 40	5		11.8		ALLEY
102 + 11	RT.	24' BIT		40	26.7 - 40	5		11.8	4	ENTRANCE TO FIRST BANK
102 + 27	LT.	24' BIT		32	26.7 - 40	5		11.8	4	ENTRANCE TO 1621 KENWOOD
103 + 65	LT.			42	26.7 - 40					
103 + 67	RT.	12' GRAVEL		25	26.7 - 40	5	6.4			ENTRANCE TO 1630 KENWOOD
104 + 15	RT.			16	26.7 - 40					
104 + 80	LT.	24' BIT			26.7 - 40	5		11.8	4	ENTRANCE TO 1701 KENWOOD
105 + 46	LT.	24' BIT			26.7 - 40	5		11.8	4	ALLEY
105 + 52	RT.	12' CONC		22	26.7 - 40		18.4			ENTRANCE TO 1706 KENWOOD
105 + 71	LT.	12' BIT			26.7 - 40	5		6.4	4	ENTRANCE TO 1709 KENWOOD
106 + 00	RT.			28	26.7 - 40					
106 + 58	RT.	12' BIT		20	26.7 - 40	5	6.4		4	ENTRANCE TO 1714 KENWOOD
107 + 00	RT.	12' GRAVEL		18	26.7 - 40	5	6.4			ENTRANCE TO VACANT LOT
107 + 58	RT.	12' BIT			26.7 - 40	15	6.4		18	ENTRANCE TO 1722 KENWOOD
108 + 04	RT.	12' BIT			26.7 - 40	15	6.4		18	ENTRANCE TO 1728 KENWOOD
108 + 75	RT.	12' GRAVEL			26.7 - 44		27.0			ENTRANCE TO 1732 KENWOOD
108 + 78	LT.	12' BIT			20 - 40	15	12.0		4	ENTRANCE TO 1731 KENWOOD
110 + 88	LT.	12' BIT			20 - 40	5	12.0		4	ENTRANCE TO 1731 KENWOOD
111 + 94	RT.	12' BIT		28	18.7 - 40	5	12.0		4	ENTRANCE TO 6 HOWARD GNESEN RD
112 + 52	RT.	12' BIT			18.7 - 40	5	12.0		4	ENTRANCE TO 10 HOWARD GNESEN RD
113 + 21	RT.	12' BIT			18.7 - 26		12.0		2	ENTRANCE TO 12 HOWARD GNESEN RD
113 + 33	LT.	12' BIT			18.7 - 45	5	12.0		4	ENTRANCE TO 5 HOWARD GNESEN RD
114 + 00	RT.	16' CONC		22	18.7 - 36		33.0			ENTRANCE TO 14 HOWARD GNESEN RD
114 + 33	LT.	12' BIT			18.7 - 45	5	12.0		4	ENTRANCE TO 9 HOWARD GNESEN RD
114 + 50	LT.	16' BIT			18.7 - 45	5	15.0		4	ENTRANCE TO 17 HOWARD GNESEN RD
115 + 00	RT.	12' BIT			18.7 - 33	5	12.0		4	ENTRANCE TO 16 HOWARD GNESEN RD
115 + 75	RT.	24' BIT			18.7 - 40	5	21.3		4	ENTRANCE TO 18 HOWARD GNESEN RD
116 + 64	RT.	12' BIT			18.7 - 40	5	12.0		4	ENTRANCE TO 20 HOWARD GNESEN RD
116 + 68	LT.	12' BIT			18.7 - 40	5	12.0		4	ENTRANCE TO 23 HOWARD GNESEN RD
TOTAL KENWOOD AVE-HOWARD GNESEN RD				428		155	266.7	140.9	120	
TOTAL			577	479		237	391.1	326.9	180	

NOTE: SEE JOB FILE 96061 FOR ITEM RECORD ACCOUNTS FOR FINAL QUANTITIES & LOCATIONS. (F)

RECORD DRAWING 2/98

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

Frank D. Pika

DATE 2-20-98 REG. NO. 7756

K 4" PERF. PVC PIPE DRAIN SPEC. 2502.541	
LOCATION	LIN FT
S. A. P. 118-160-18 ARROWHEAD ROAD	
50+17.44 TO 52+38 LT	220
50+17.44 TO 51.93 RT	177
53+50 TO 56+08 LT	256
53+38 TO 56+06 RT	268
56+93 TO 59+30 RT	237
56+75 TO 59+30 RT	255
60+01 TO 61+20 LT	119
60+01 TO 61+20 RT	119
ARROWHEAD ROAD TOTAL	1651
S. A. P. 118-151-09 KENWOOD AVENUE	
93+18 TO 96+78 RT	420
97+02 TO PCB127D LT	205
97+02 TO 99+47 RT	245
KENWOOD AVENUE TOTAL	870
S. A. P. 69-634-11 KENWOOD AVENUE - HOWARD GNESEN ROAD	
100+70 TO 103+65 LT	295
100+70 TO 104+02 RT	332
104+02 TO 107+27 LT	325
104+02 TO 110+42 RT	640
107+64 TO 111+00 LT	336
111+00 TO 113+43 LT	243
110+80 TO 113+43 RT	263
113+43 TO 116+40 LT	297
113+43 TO 116+40 RT	297
116+40 TO 117+50 LT	110
116+40 TO 117+50 RT	110
KENWOOD AVENUE CONNECTION	
200+35 TO 201+63 LT	110
200+35 TO PMH 139 RT	105
KENWOOD AVENUE TOTAL	3463
TOTAL	5984

M CONCRETE CURB & GUTTER DESIGN B624 SPEC. 2531.501		
STATION TO STATION	LOCATION	LIN FT
S. A. P. 118-160-18 ARROWHEAD ROAD		
50 + 17 TO 52 + 67	LT.	299
50 + 17 TO 52 + 67	RT.	266
53 + 20 TO 56 + 55	LT.	377
53 + 20 TO 56 + 55	RT.	382
56 + 55 TO 59 + 64	LT.	306
56 + 55 TO 59 + 64	RT.	310
59 + 64 TO 61 + 20	LT.	151
59 + 64 TO 61 + 20	RT.	160
TOTAL ARROWHEAD ROAD		2251
S. A. P. 118-151-09 KENWOOD AVENUE		
95 + 50 TO 96 + 68	LT.	116
95 + 50 TO 96 + 68	RT.	123
96 + 68 TO 99 + 16	LT.	253
96 + 68 TO 99 + 16	RT.	287
TOTAL KENWOOD AVENUE		779
S. A. P. 69-634-11 KENWOOD AVE-HOWARD GNESEN RD		
100 + 84 TO 103 + 65	LT.	281
100 + 84 TO 103 + 65	RT.	281
103 + 65 TO 107 + 27	LT.	363
103 + 65 TO 107 + 27	RT.	362
107 + 27 TO 110 + 61	LT.	321
107 + 27 TO 110 + 61	RT.	320
110 + 61 TO 116 + 74	LT.	615
110 + 61 TO 116 + 74	RT.	618
KENWOOD AVE CONNECTOR		
200 + 42 TO 201 + 70	LT.	108
200 + 42 TO END AT MARYLAND	RT.	184
TOTAL KENWOOD AVE-HOWARD GNESEN RD		3453
TOTAL		6483

L WATER SERVICE TABULATION		WATER SERVICE TRENCH EXCAVATION SPEC. 0504.603 LIN FT	INSTALL WATER VALVE BOX SPEC. 0504.602 (1) EACH	WATER SERVICE TAP AND HOOKUP SPEC. 0504.602 EACH	TEMPORARY WATER SERVICE SPEC. 0504.602 EACH	DISCONNECT WATER SERVICE CONNECTION SPEC. 0504.606 CONNECTION	REMARKS
LOCATION	ADDRESS						
S. A. P. 118-160-18 ARROWHEAD ROAD							
50 + 41	1413 ARROWHEAD ROAD	40					INSULATE
56 + 72	1315 ARROWHEAD ROAD	6					MOVE BACK
58 + 54	1303 ARROWHEAD ROAD	8					MOVE BACK
60 + 20	1235 ARROWHEAD ROAD	6					MOVE BACK
TOTAL ARROWHEAD ROAD		60					
S. A. P. 118-151-09 KENWOOD AVENUE							
97 + 19	1506 KENWOOD AVENUE	6					MOVE BACK
97 + 90	1507 KENWOOD AVENUE	6					MOVE BACK
98 + 44	1520 KENWOOD AVENUE	6					MOVE BACK
TOTAL KENWOOD AVENUE		18					
S. A. P. 69-634-11 KENWOOD AVE-HOWARD GNESEN RD							
100 + 79	1601 KENWOOD AVENUE	6					MOVE BACK
101 + 27	1339 ARROWHEAD ROAD	6	1				MOVE BACK
103 + 28	WAS 1628 KENWOOD AVE	6					CUT OFF AT MAIN
104 + 09	ST. JOHNS	6	1				MOVE BACK
105 + 42	1706 KENWOOD AVENUE	6	1				MOVE BACK
106 + 30	1709 KENWOOD AVENUE	6	1				MOVE BACK
106 + 45	1714 KENWOOD AVENUE	20	1				REPLACE & MOVE BACK
107 + 36	1722 KENWOOD AVENUE	20	1				REPLACE & MOVE BACK
107 + 89	1728 KENWOOD AVENUE	20	1				REPLACE & MOVE BACK
108 + 47	1732 KENWOOD AVENUE	6					REPLACE & MOVE BACK
108 + 93	1731 KENWOOD AVENUE	6					MOVE BACK
201 + 47 CONN	1801 KENWOOD AVENUE	6					MOVE BACK
201 + 47 CONN	1815 KENWOOD AVENUE	6					MOVE BACK
112 + 23	6 HOWARD GNESEN RD	21		1	1	1	1 REPLACE & MOVE BACK
112 + 62	10 HOWARD GNESEN RD	28		1	1	1	1 REPLACE & MOVE BACK
113 + 31	5 HOWARD GNESEN RD	6		1	1	1	1 MOVE BACK
113 + 42	12 HOWARD GNESEN RD	6		1	1	1	1 MOVE BACK
114 + 00	9 HOWARD GNESEN RD	24		1	1	1	1 LOWER
114 + 32	14 HOWARD GNESEN RD	27		1	1	1	1 LOWER
114 + 97	17 HOWARD GNESEN RD	30		1	1	1	1 LOWER
115 + 12	16 HOWARD GNESEN RD	25		1	1	1	1 LOWER
116 + 06	18 HOWARD GNESEN RD	23		1	1	1	1 LOWER
116 + 37	20 HOWARD GNESEN RD	25		1	1	1	1 LOWER
TOTAL KENWOOD AVE-HOWARD GNESEN RD		335	7	10	10	10	
TOTAL		413	7	10	10	10	

NOTE: SEE JOB FILE 96061 FOR ITEM RECORD ACCOUNTS FOR FINAL QUANTITIES & LOCATIONS. (F)

N ADJUST VALVE BOX SPEC. 0504.602		VALVE TYPE
LOCATION		
S. A. P. 118-160-18 ARROWHEAD ROAD		
53 + 09	40' RT.	WATER
56 + 67	33' RT.	WATER
61 + 00	23' RT.	HYDRANT VALVE
S. A. P. 118-151-09 KENWOOD AVENUE		
93 + 28	33' RT.	WATER
95 + 25	20' LT.	GAS VALVE
96 + 59	33' LT.	WATER
S. A. P. 69-634-11 KENWOOD AVE-HOWARD GNESEN		
103 + 57	33' LT.	WATER
109 + 70	17' RT.	WATER
109 + 33	47' RT.	WATER
109 + 38	76' RT.	WATER
109 + 63	66' RT.	WATER
110 + 42	118' RT.	GAS
TOTAL		12 EACH

P SODDING TYPE LAWN SPEC. 2575.505		SQ YD
LOCATION		
S. A. P. 118-160-18 ARROWHEAD ROAD		
50 + 17 TO 99 + 16 KENWOOD AVENUE RT.		80
54 + 50 TO 61 + 20 RT.		450
54 + 50 TO 61 + 20 LT.		400
TOTAL ARROWHEAD ROAD		930
S. A. P. 118-151-09 KENWOOD AVENUE		
95 + 75 TO 96 + 68 LT.		70
96 + 68 TO 99 + 16 LT.		140
TOTAL KENWOOD AVENUE		210
S. A. P. 69-634-11 KENWOOD AVENUE - HOWARD GNESEN ROAD		
100 + 84 TO 103 + 65 LT.		220
100 + 84 TO 108 + 30 RT.		580
103 + 65 TO 107 + 27 LT.		280
107 + 27 TO 113 + 00 LT.		830
108 + 30 TO 110 + 61 RT.		1070
110 + 61 TO 113 + 00 RT.		670
113 + 00 TO 117 + 50 LT.		600
113 + 00 TO 117 + 50 RT.		600
TOTAL KENWOOD AVENUE - HOWARD GNESEN ROAD		4850
TOTAL		5990

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J. Lamb D. Huber

DATE 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98

Q	GRADING, BITUMINOUS AND CONCRETE PAVEMENT QUANTITIES								
	GEOTEXTILE FABRIC TYPE V	SELECT GRANULAR BORROW	AGGREGATE BASE		BITUMINOUS				CONCRETE PAVEMENT
	0105.609 SQ YD	2105.522 CU YD	CLASS V (LV) 2211.503 CU YD	CLASS V (CV) 2211.503 CU YD	TYPE 47 WEAR 2340.508 TON	TYPE 47 BINDER 2340.510 TON	TYPE 31 BASE 2340.514 TON	TACK COAT 2357.502 GAL	2301.503 SQ YD
LOCATION (STA. TO STA.)									
S. A. P. 118-160-18 ARROWHEAD RD									
50 + 17.44 TO 50 + 77.44	422	149		137	31	59	59	44	
50 + 77.44 TO 51 + 94.74	904	413		295	65	129	129	94	
51 + 94.74 TO 53 + 77.74	2092	997		603					
53 + 77.74 TO 54 + 50.00	473	214		154	34	66	66	48	1800
54 + 50.00 TO 59 + 31.10	3538	3005		1052	235	450	450	328	
59 + 31.10 TO 60 + 50.00	1044	973		285	64	123	123	90	
ENTRANCES									
50 + 17.44 TO 60 + 50.00			20		12				
TOTAL ARROWHEAD ROAD	8473	5751	20	2526	441	827	827	604	1800
S. A. P. 118-151-09 KENWOOD AVENUE									
95 + 50.00 TO 96 + 00.00	328	165		96	21	40	41	30	
96 + 00.00 TO 97 + 00.00	678	685		200	44	84	84	62	
96 + 67.99 STREET LT.	132	94		28	7	14	14	10	
96 + 67.99 STREET RT.	132	94		28	7	14	14	10	
97 + 00.00 TO 99 + 16.00	1512	1535		447	99	190	190	139	
ENTRANCES									
95 + 50.00 TO 99 + 16.00			62		48				
TOTAL KENWOOD AVENUE	2782	2573	62	799	226	342	343	251	
S. A. P. 69-634-11 KENWOOD AVE/HOWARD GNESEN RD									
100 + 84.00 TO 107 + 66.57	4778	4850		1413	314	601	601	437	
103 + 65.00 STREET LT.	132	94		28	7	14	14	10	
107 + 27.00 STREET LT.	132	94		28	7	14	14	10	
107 + 66.57 TO 110 + 87.50	2103	2118		617	135	259	259	188	
110 + 87.50 TO 116 + 73.94	2900	1693		883	184	352	352	256	
116 + 73.94 TO 117 + 50.00	397	194		92	20	39	39	29	
ENTRANCES									
100 + 84.00 TO 117 + 50.00			155		120				
KENWOOD AVENUE CONNECTION									
200 + 26.00 TO 200 + 46.00	97	36		26	7	14	14	10	
200 + 46.00 TO 201 + 19.00	358	163		89	18	35	35	25	
201 + 70.00 TO 202 + 00.00				31	8		14	5	
MARYLAND STREET									
299 + 85.00 TO 202 + 00.00				252	55		105	76	
TOTAL KENWOOD AVE/HOWARD GNESEN RD	10897	9242	155	3459	875	1328	1447	1046	
TOTAL	22152	17566	237	6784	1542	2497	2617	1901	1800

NOTE: SEE JOB FILE 96061 FOR ITEM RECORD ACCOUNTS FOR FINAL QUANTITIES & LOCATIONS. (F)

R	BASIS FOR PLANNED QUANTITY PLANT-MIXED BITUMINOUS SURFACE AND AGGREGATE BASE		
2211	AGGREGATE BASE	CLASS 5	105 POUND PER CUBIC FOOT
2340	BASE COURSE	TYPE 31	110 POUND PER SQUARE YARD PER INCH THICK
2340	BINDER COURSE	TYPE 47	110 POUND PER SQUARE YARD PER INCH THICK
2340	WEAR COURSE	TYPE 47	115 POUND PER SQUARE YARD PER INCH THICK
2357	TACK COAT		0.03 GALLON PER SQUARE YARD

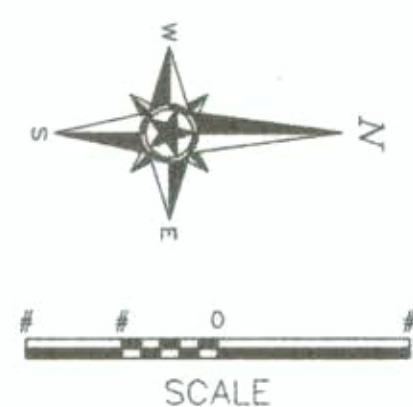
T	DECIDUOUS TREE SPEC. 2571.502		CONIFEROUS TREE SPEC. 2571.501	
	MAPLE, AUTUMN BLAZE 2.5' CAL. B & B		BLACK HILLS SPRUCE 5' B & B	
	STA.	L/R	STA.	L/R
	111 + 25	RT	110 + 25	RT
	112 + 25	LT	110 + 40	RT
	112 + 25	RT	110 + 45	RT
	112 + 85	LT		
	112 + 85	RT	TECHNY ARBORVITAE	
	113 + 55	LT	5' B & B	
	113 + 55	RT	STA.	L/R
	114 + 15	LT	108 + 80	RT
	114 + 15	RT	108 + 90	RT
	114 + 75	LT	109 + 00	RT
	114 + 75	RT	109 + 10	RT
	115 + 30	LT	109 + 20	RT
	115 + 30	RT	109 + 30	RT
	116 + 20	LT	109 + 40	RT
	116 + 20	RT	109 + 50	RT
	117 + 00	LT		
	117 + 00	RT	TOTAL	11
NORTHWOOD RED MAPLE				
	2.5' CAL. B & B			
	STA.	L/R		
	108 + 90	RT		
	109 + 20	RT		
	109 + 50	RT		
	109 + 80	RT		
	110 + 10	RT		
	110 + 40	RT		
	TOTAL	23		

S	MAILBOX SUPPORT SPEC. 0412.602	
	LOCATION	LT/RT
112 + 25		RT
113 + 30		RT
114 + 15		RT
114 + 80		RT
115 + 90		RT
116 + 50		RT
TOTAL		6

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION,
OR REPORT WAS PREPARED BY ME OR UNDER MY
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LAWS OF THE STATE OF MINNESOTA.

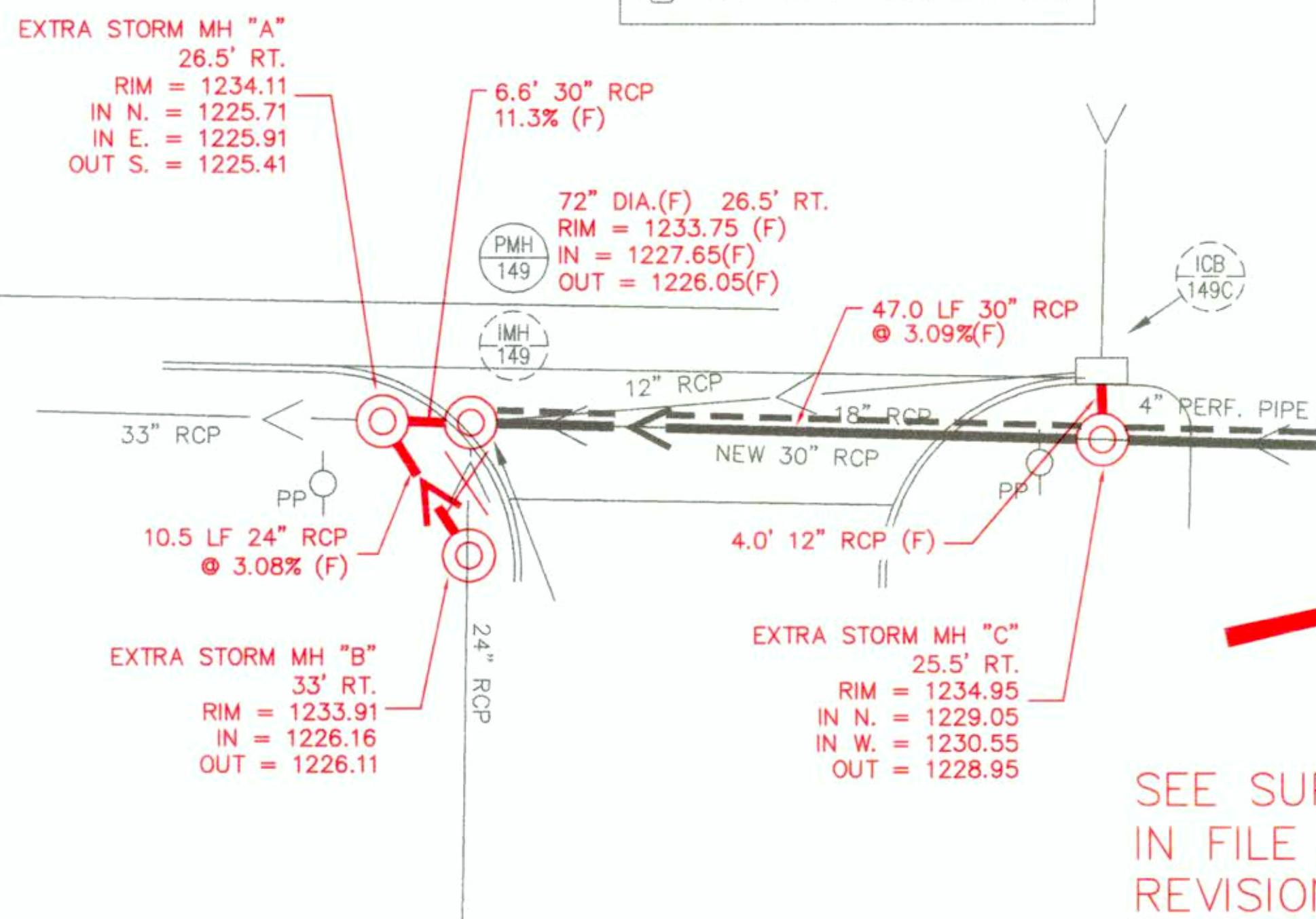
Frank D. Baker
DATE 2-26-98 REG. NO. 7756

RECORD DRAWING 2/98



LEGEND	
	REMOVE CONCRETE WALK
	NEW CONC. APRON OR WALK
	NEW BITUMINOUS SURFACE
	CONSTRUCT PEDESTRIAN RAMP

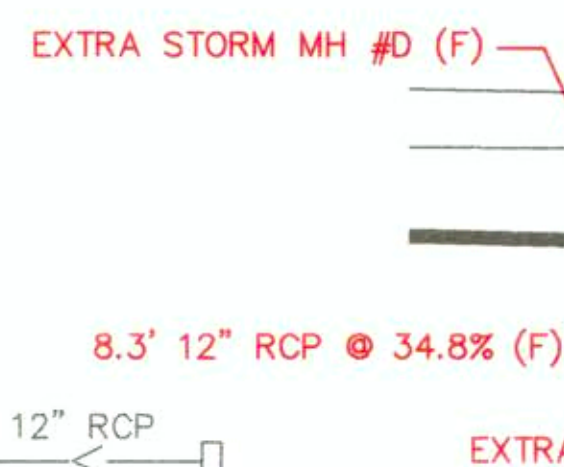
BENCHMARK:
TOP NUT ON HYDRANT, S.E. CORNER OF
BUFFALO & KENWOOD ELEV. = 1237.17 (F)



SEE SUPPLEMENTAL AGREEMENT #14
IN FILE 96061 FOR STORM SEWER
REVISION. (F)

BEGIN UTILITY CONSTRUCTION

BEGIN CONSTRUCTION
S.P. 118-151-09
STA 93+15.00



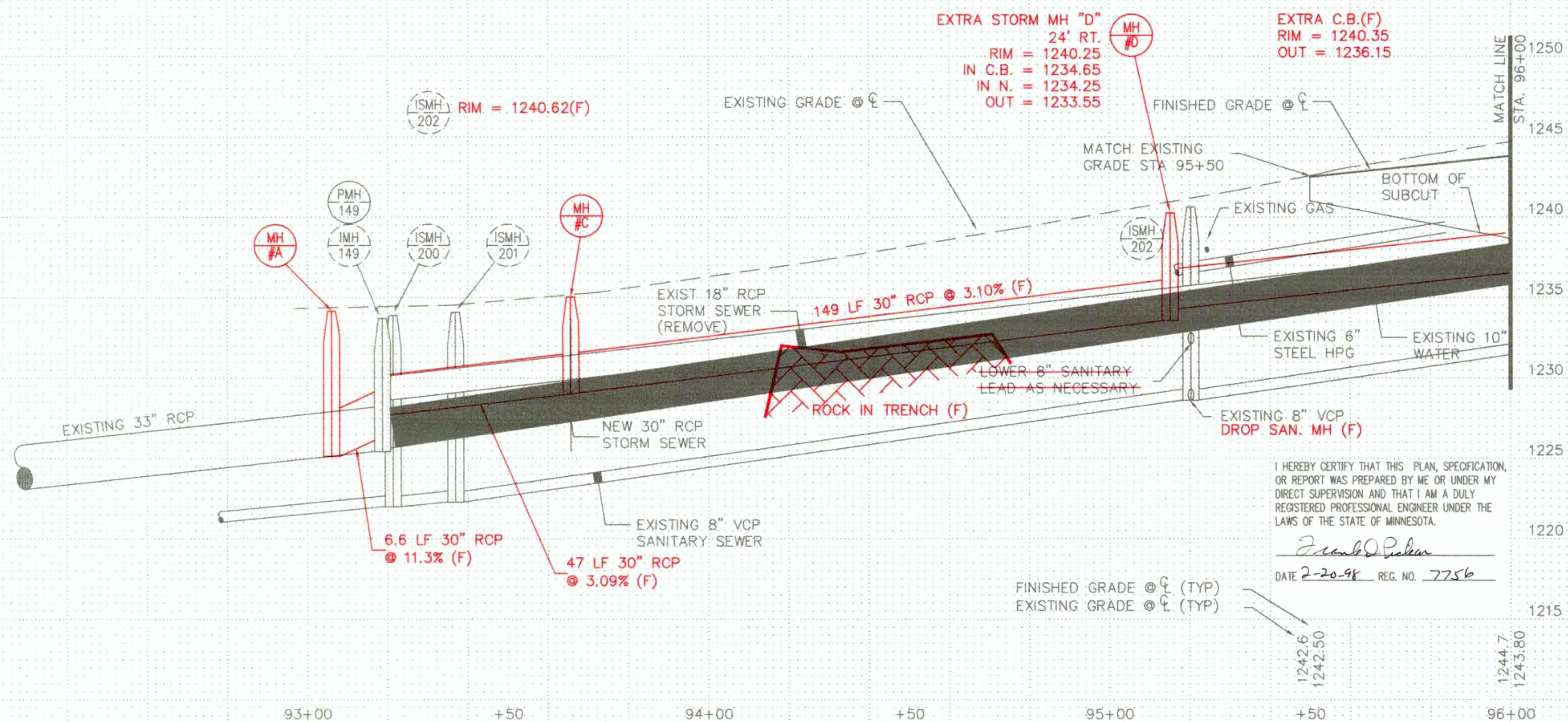
BLOCK 12
MYERS & WHIPPLES ADDITION

KENWOOD AVENUE
N 0° 59' 28" E

KENWOOD PARK ADDITION

BLOCK 3

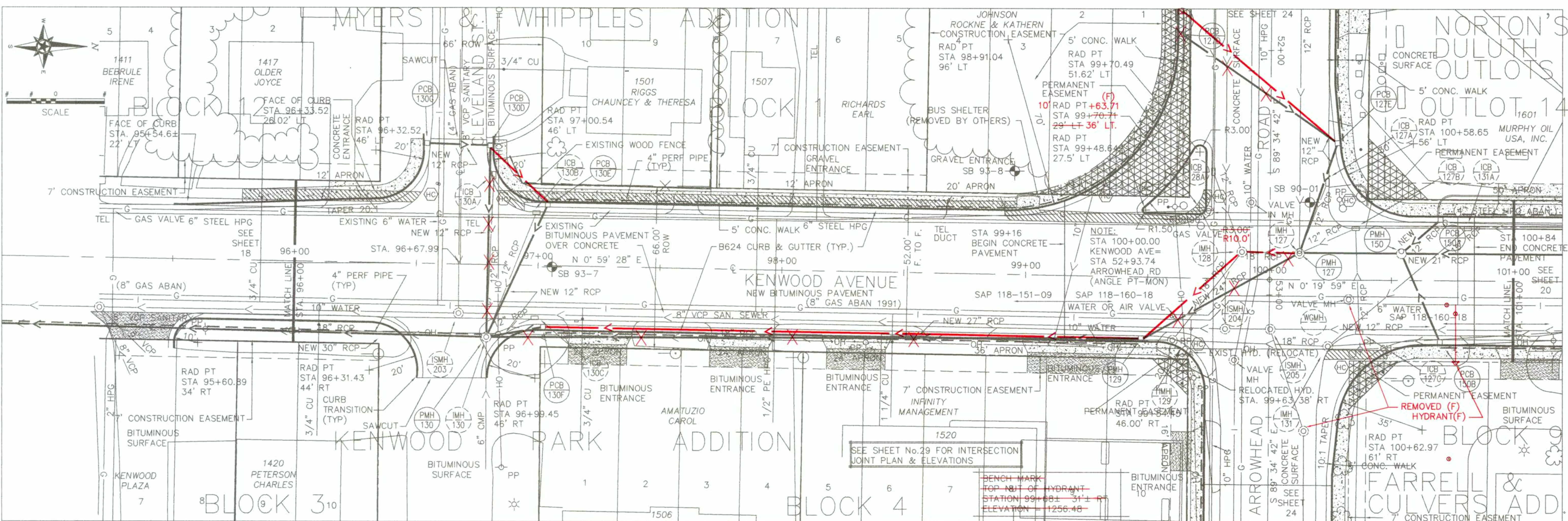
WARNING
LOCATION OF UNDERGROUND UTILITIES
TO BE VERIFIED BY CONTRACTOR
GOPHER STATE ONE CALL
CALL BEFORE DIGGING,
1-800-252-1166
REQUIRED BY LAW



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

Frank D. Peltier
DATE 2-20-98 REG. NO. 7756

RECORD DRAWING 2/98



LEGEND

- REMOVE CONCRETE WALK
- NEW CONC. APRON OR WALK
- NEW BITUMINOUS SURFACE
- CONSTRUCT PEDESTRIAN RAMP

WARNING
LOCATION OF UNDERGROUND UTILITIES
TO BE VERIFIED BY CONTRACTOR
GOPHER STATE ONE CALL
CALL BEFORE DIGGING,
1-800-252-1166
REQUIRED BY LAW

STORM MH #130 (F)
25' RT. (72')
RIM = 1245.53
IN N. = 1238.83
IN W. = 1240.33
OUT = 1238.68

STORM MH #130F (F)
25' RT.
RIM = 1246.01
IN N. = 1239.46
OUT = 1239.41

STORM MH #128 (F)
25' RT.
RIM = 1254.40
IN = 1247.35
OUT = 1247.30

STORM MH #129 (F)
25' RT.
RIM = 1252.42
IN = 1246.32
OUT = 1245.52

STORM MH #127 (F)
25' RT.
RIM = 1255.32
IN N. = 1248.47
IN W. = 1250.92
OUT = 1248.42

STORM MH #150 (F)
25' RT.
RIM = 1256.73
IN N. = 1249.63
IN W. = 1251.48
IN E. = 1250.93
OUT = 1249.58

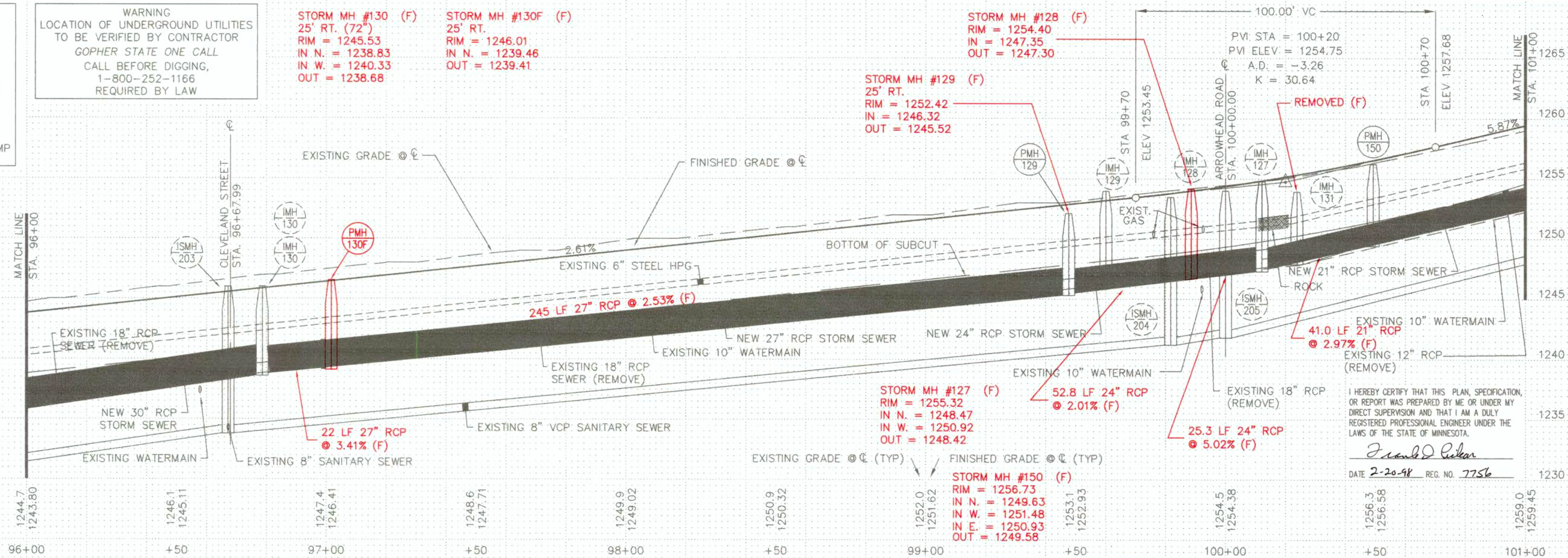
REMOVED (F)

EXISTING 10" WATERMAIN
41.0 LF 21" RCP
@ 2.97% (F)

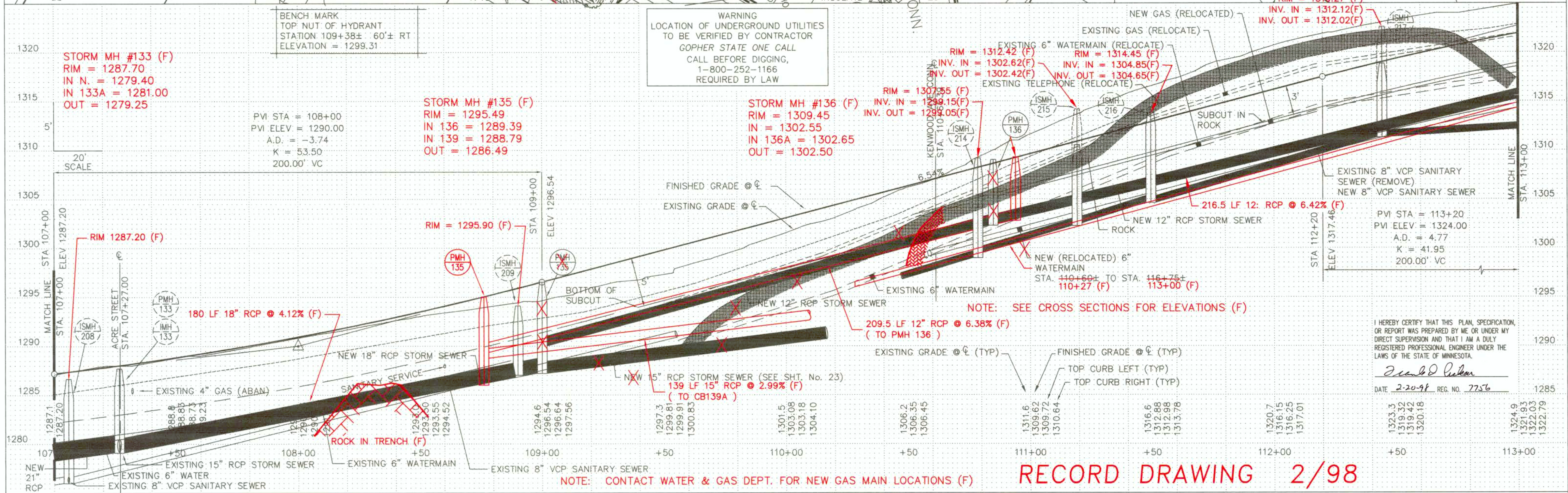
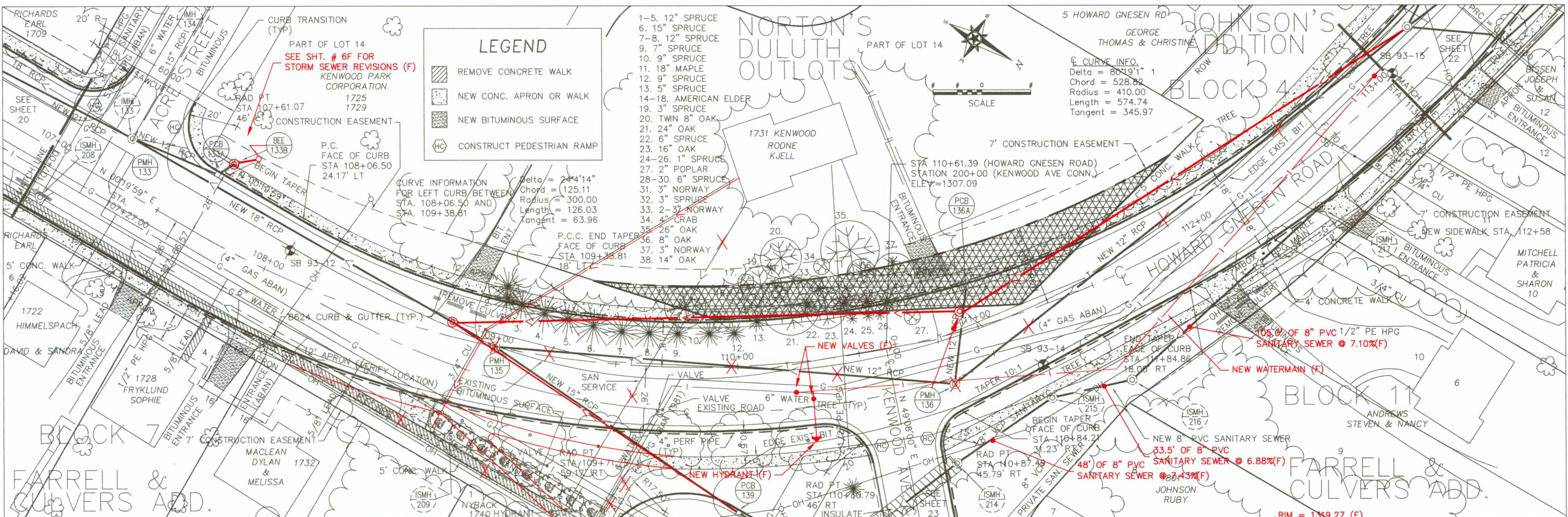
25.3 LF 24" RCP
@ 5.02% (F)

EXISTING 18" RCP
(REMOVE)

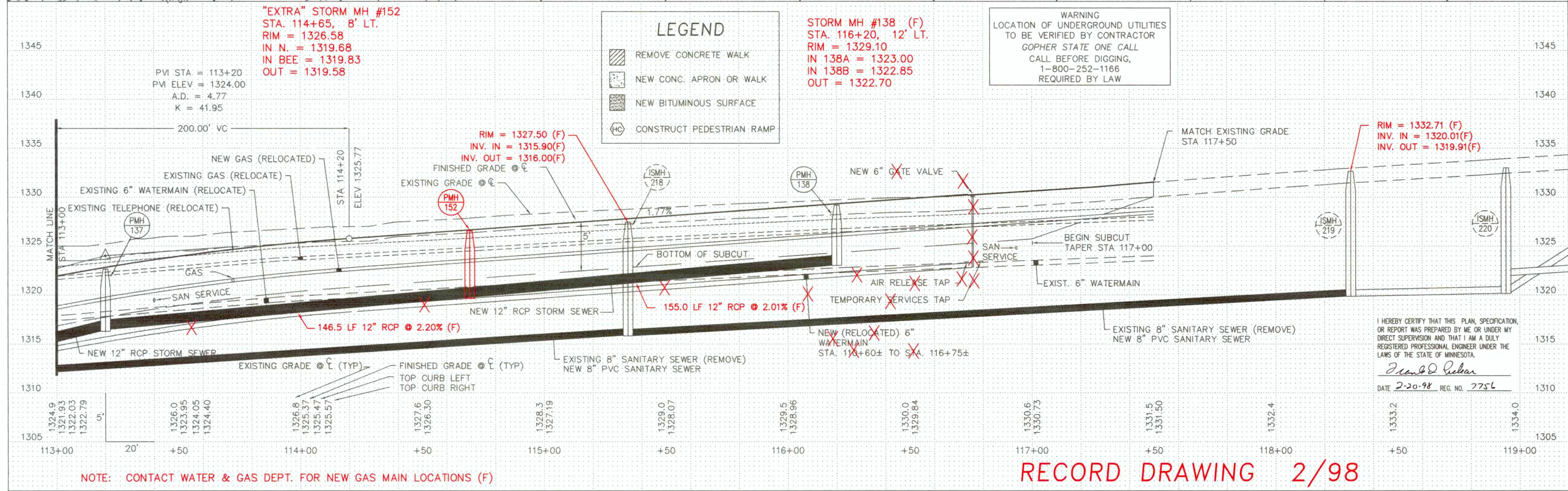
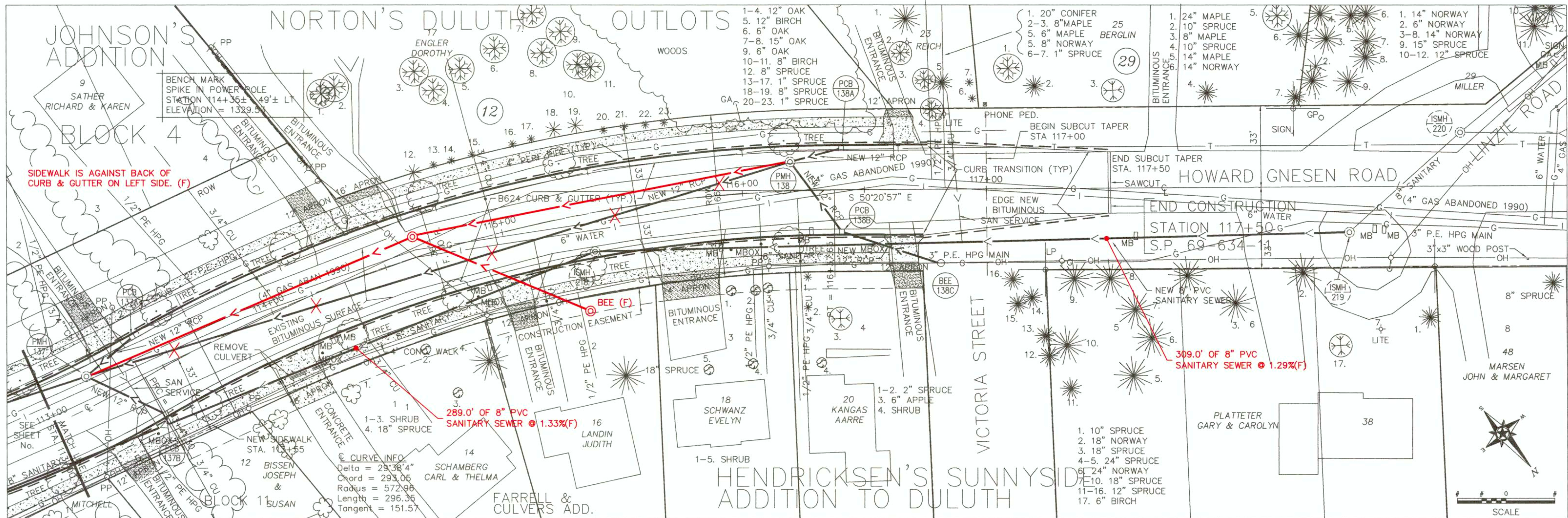
DATE 2-20-98 REG. NO. 7756

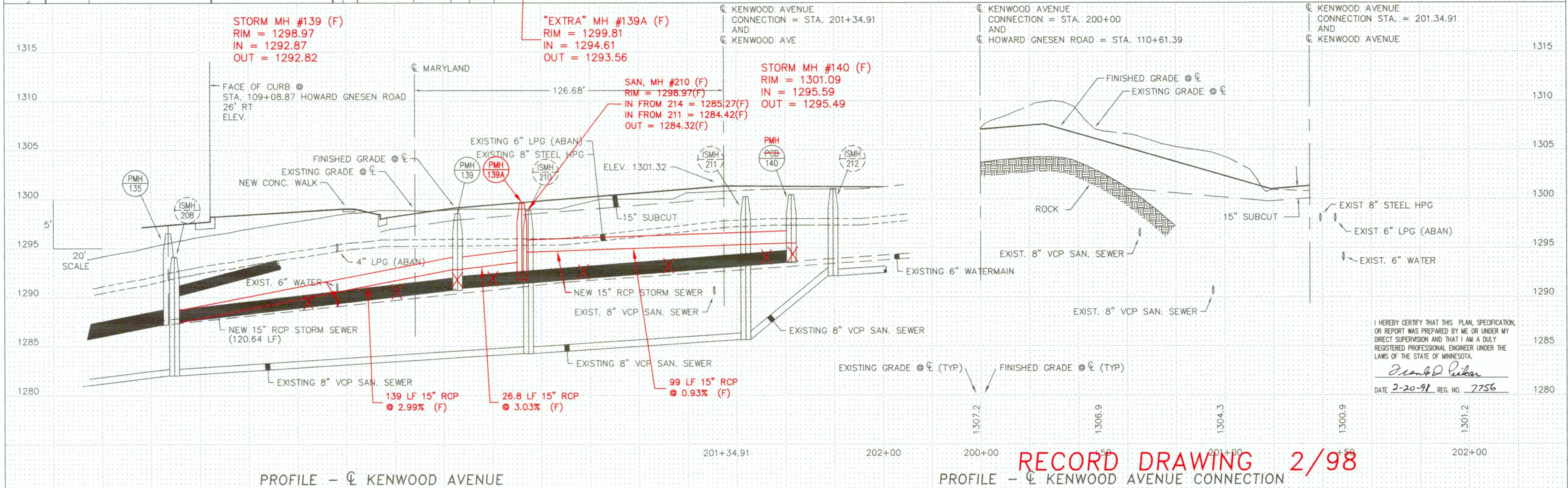
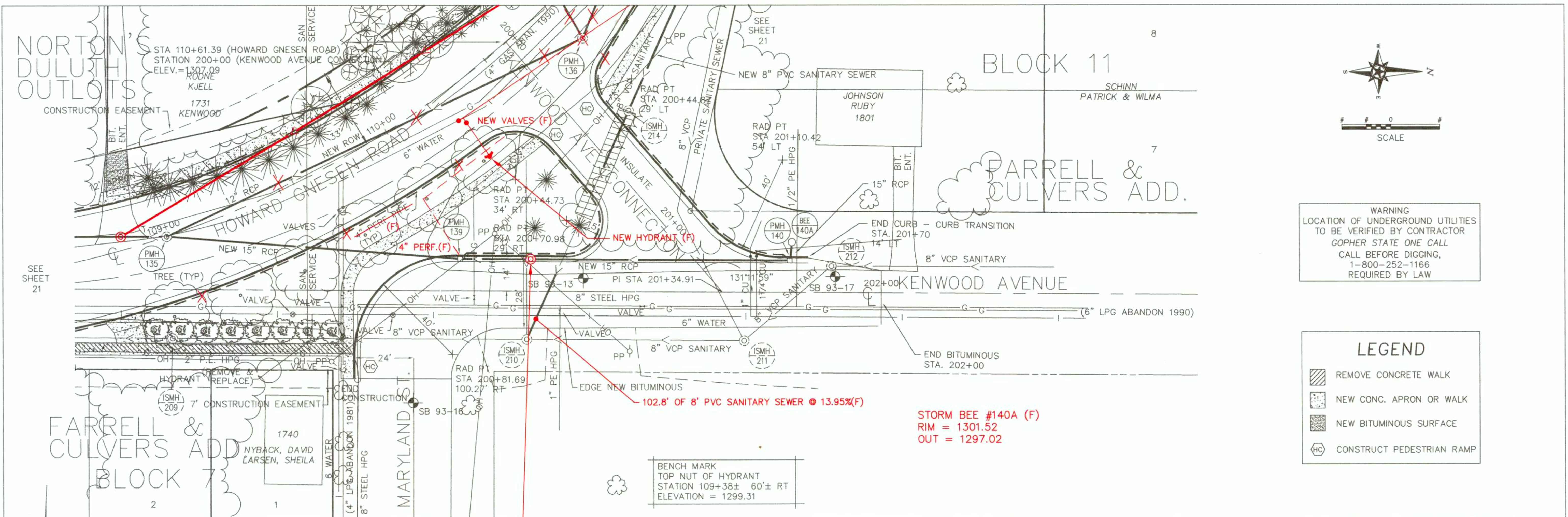


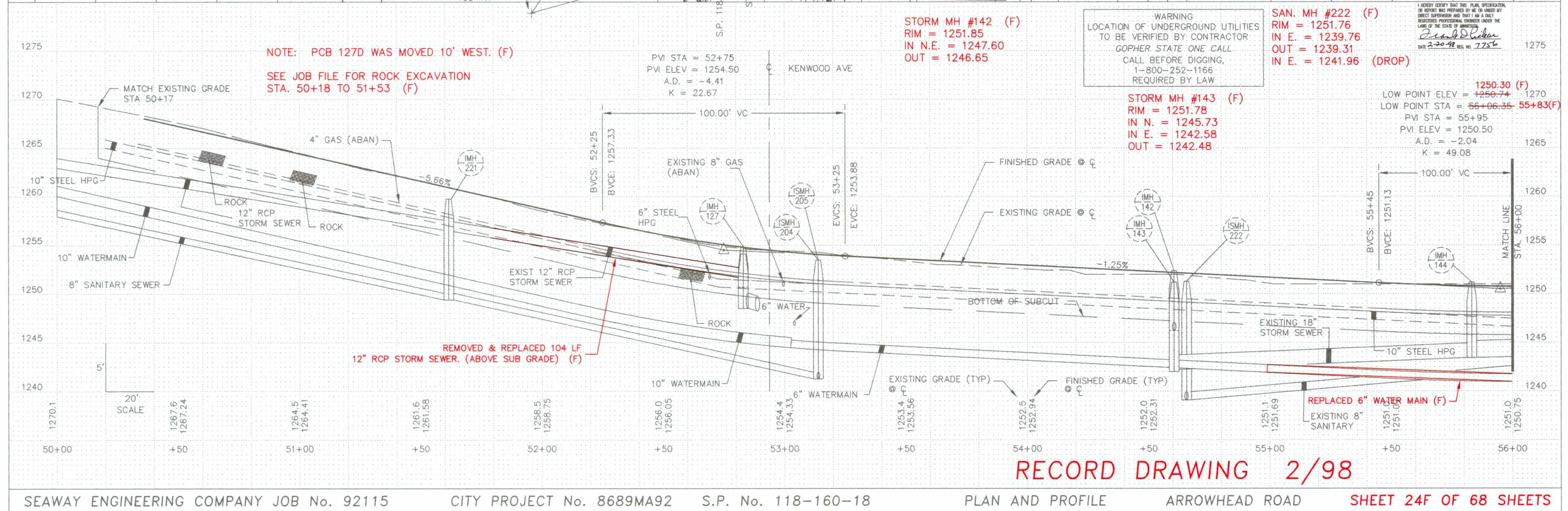
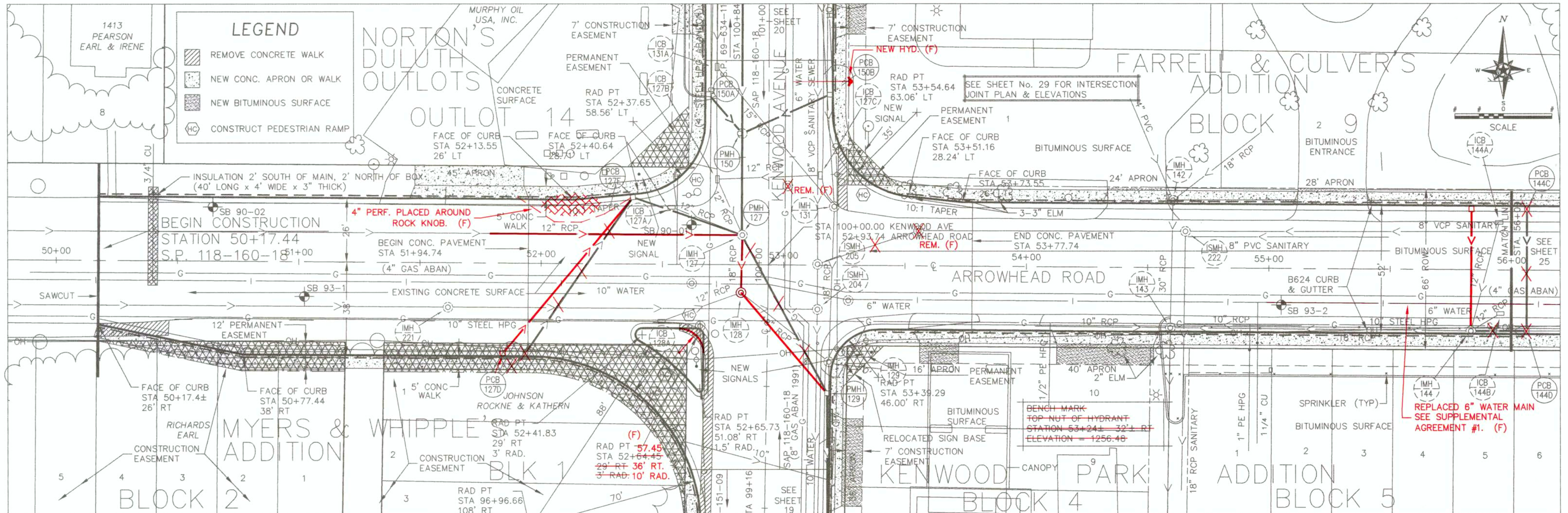
RECORD DRAWING 2/98

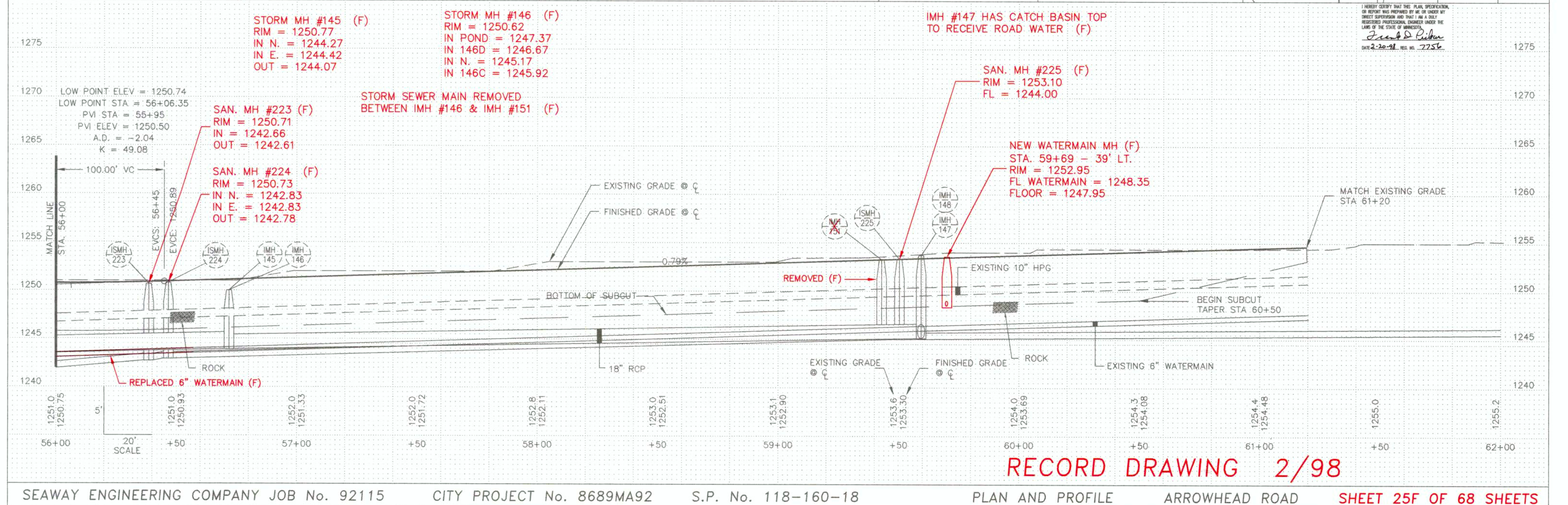
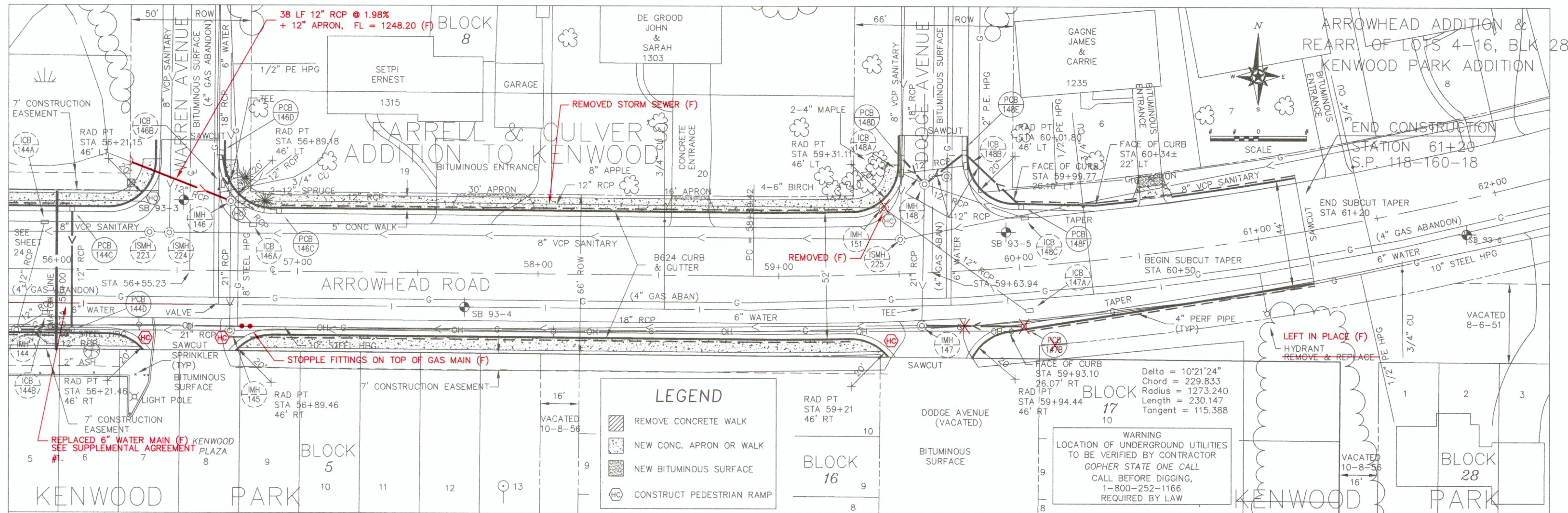


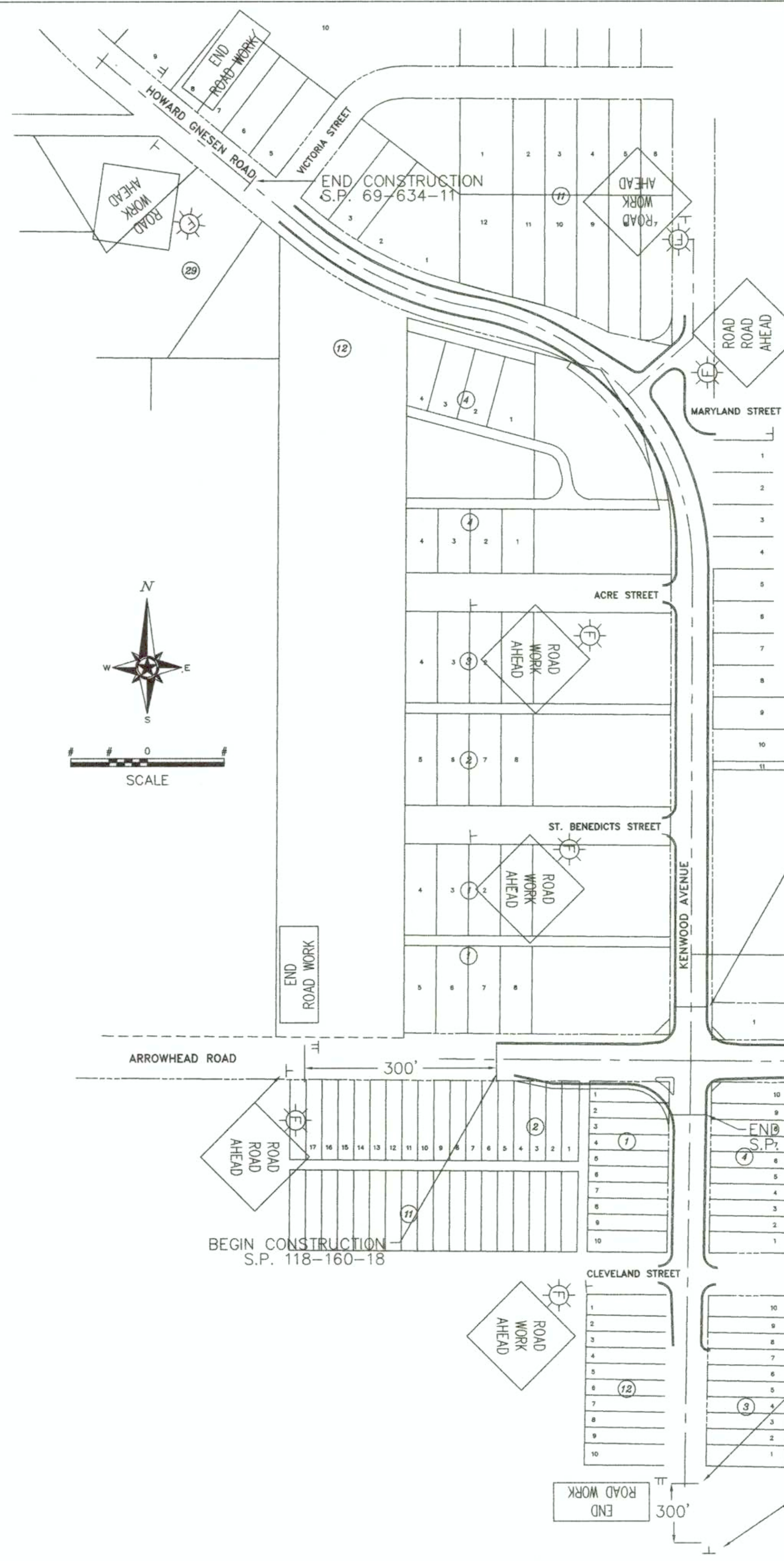
RECORD DRAWING 2/98











TRAFFIC - BILL OF MATERIALS				
THE FOLLOWING ITEMS ARE INCLUDED AND PAID FOR UNDER ITEM 0563.601 (TRAFFIC CONTROL) - LUMP SUM				
SIGN No.	MESSAGE	SIZE	No. REQ'D	NOTES
W20-1 (T)	ROAD WORK AHEAD	48x48	4	1,2
W20-1 (T)	ROAD WORK AHEAD	36x36	10	1,2
W20-5	LEFT LANE CLOSED AHEAD	48x48		1,2
W20-5	RIGHT LANE CLOSED AHEAD	48x48		1,2
	([) TYPE III BARRICADE	6' OR 8'		1,5
W20-X3	MERGE	48x48		1,2
G20-2A	END ROAD WORK	48x24	4	1
W20-3	ROAD CLOSED AHEAD	48x48		1,3
W4-2	([) LANE TRANSITION	48x48		1,2
R4-7	([) KEEP RIGHT, KEEP LEFT	24x30		1,2
R11-4	ROAD CLOSED TO THRU TRAFFIC	60x30		1,4,5
R11-2	ROAD CLOSED	48x30		1,2
W6-3	([) TWO WAY TRAFFIC	48x48		1,2
	FLASHING AMBER WARNING LIGHTS		14	5,6
	STEADY BURN WARNING LIGHTS			7
	CHANNELIZATION DEVICE (DRUM)			1,9
	CHANNELIZATION DEVICE (TUBE DELINEATORS)			1,9
	TEMPORARY PORTABLE CONCRETE BARRIER, DESIGN 8333			1,9

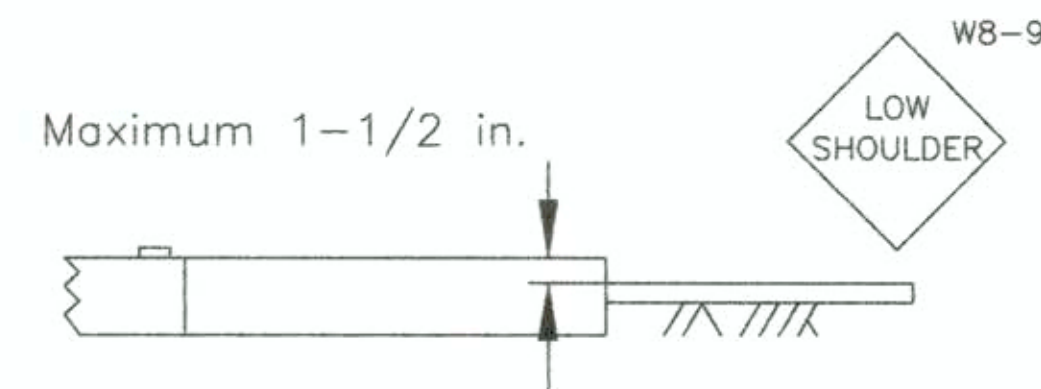
- NOTES
1. THE NUMBER AND PLACEMENT OF SIGNS AND DEVICES WILL DEPEND UPON THE SEQUENCE OF THE CONTRACTOR'S OPERATION.
 2. "ROAD WORK AHEAD" SIGNS SHALL BE MOUNTED 250 FEET (1 BLOCK) IN ADVANCE OF CONSTRUCTION AND SHALL HAVE A TYPE "A" LOW INTENSITY FLASHING AMBER WARNING LIGHT MOUNTED ON THEM.
 3. "ROAD CLOSED AHEAD" SIGNS SHALL BE ERECTED 250' IN ADVANCE OF THE ACTUAL CLOSURE, OR AT THE INTERSECTION IN ADVANCE OF THE CLOSURE AND SHALL HAVE A TYPE "A" LOW INTENSITY FLASHING AMBER WARNING LIGHT MOUNTED ON THEM.
 4. "ROAD CLOSED" SHALL BE INSTALLED ON TYPE III BARRICADES AND SHALL BE LOCATED AT THE POINT OF CLOSURE.
 5. TYPE "A" LOW INTENSITY AMBER FLASHING WARNING LIGHTS SHALL BE MOUNTED ON ALL ADVANCE WARNING SIGNS AND ON ALL TYPE III BARRICADES WHEN USED AT NIGHT OR TO IDENTIFY HAZARDS.
 6. ADDITIONAL SIGNING WILL BE REQUIRED FOR SEPARATE LANE CLOSURES. THIS SIGNING SHALL BE IN CONFORMANCE WITH PART VI AND SECTION 6K OF THE FIELD MANUAL DATED APRIL 1995 OF THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AND SHALL BE CONSIDERED INCIDENTAL TO TRAFFIC CONTROL.
 7. RETROREFLECTIVE DRUMS SHALL BE USED ON CHANNELIZATION DEVICES TO DELINEATE THE EDGE OF THE TRAVELED WAY NEXT TO WORK ZONES OR HAZARDOUS AREAS AT NIGHT.
 8. CONTRACTOR RESPONSIBLE FOR ALL TRAFFIC STRIPING FOR TRAFFIC CONTROL DURING CONSTRUCTION.
 9. CONTRACTOR RESPONSIBLE FOR PLACEMENT OF CHANNELIZATION DEVICES TO CONTROL TRAFFIC THROUGH CONSTRUCTION AREAS. USE 30 FOOT SPACING FOR TUBES AND DRUMS WHEN USED FOR CHANNELIZATION.
 10. CONTRACTOR REQUIRED TO SUBMIT TRAFFIC CONTROL PLAN TO ENGINEER FOR APPROVAL PRIOR TO STARTING ANY WORK ON THE PROJECT. CONTRACTOR ALSO REQUIRED TO SUBMIT TRAFFIC CONTROL PLAN CHANGES FOR APPROVAL PRIOR TO CHANGING HIS SEQUENCE OF CONSTRUCTION OPERATIONS.

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

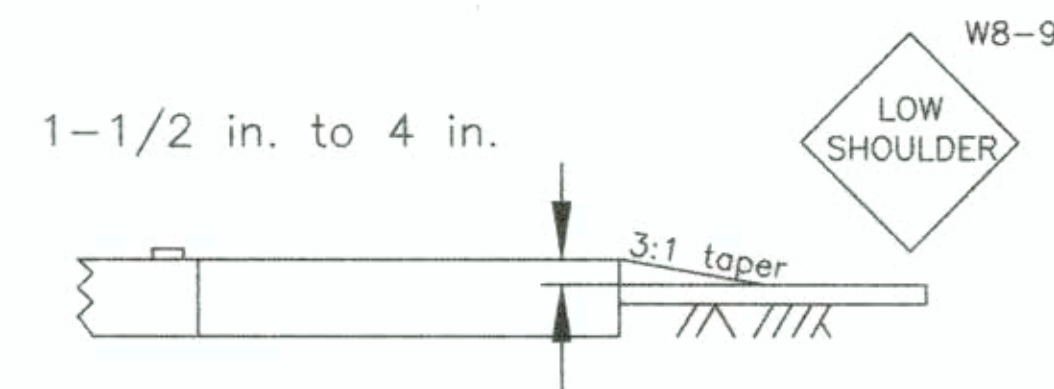
David D. Baker

DATE 2-20-98 REG. NO. 7756

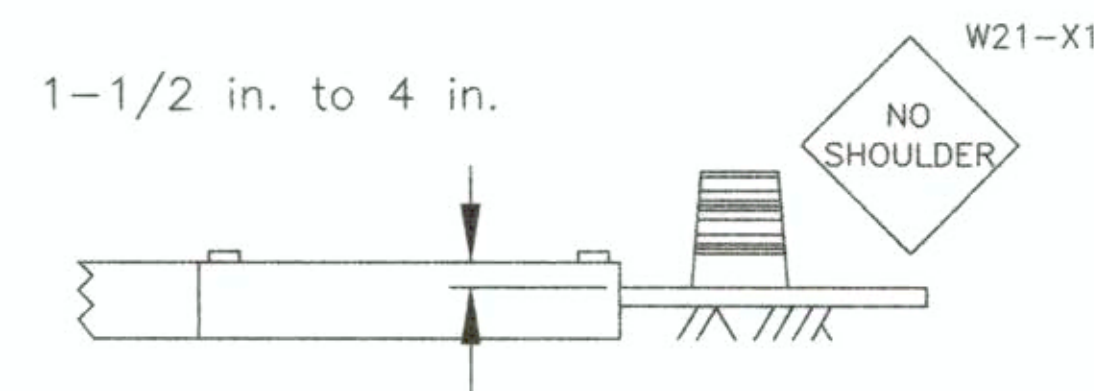
EDGE DROP OFF



EDGE DROP OFF - WITH TAPER

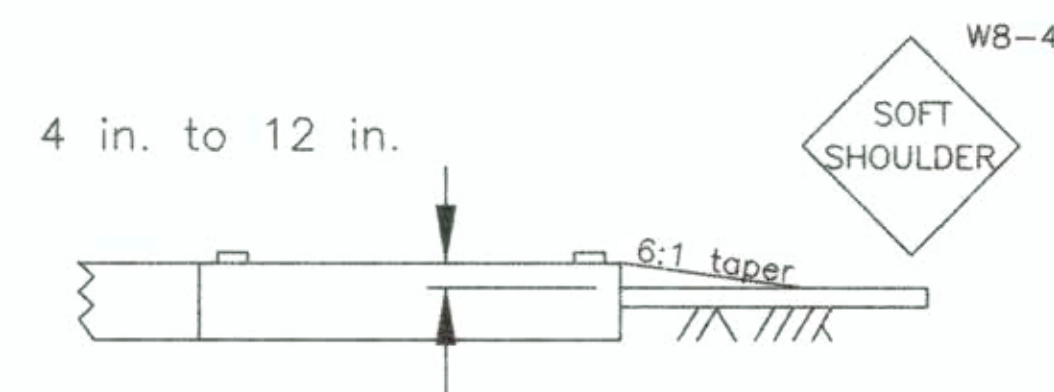


SHOULDER SHALL BE CLOSED WITH APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES AT A MAXIMUM OF 100 FT. SPACING.



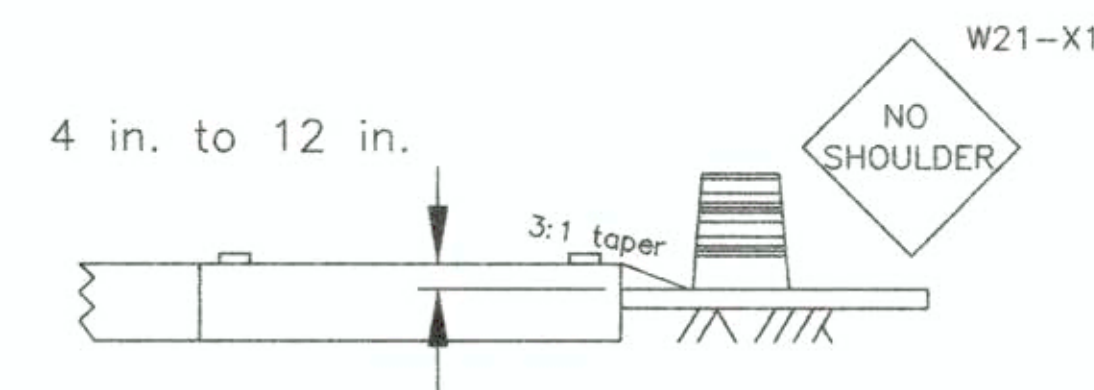
EDGE DROP-OFF WITH TAPER (SHOULDER - OPEN)

THIS CONDITION WILL NOT BE PERMITTED UNLESS THE 6:1 SLOPE IS COMPACTED SO THAT A VEHICLE MAY SAFELY DRIVE ONTO IT WITHOUT LOSING CONTROL AND IN THE OPINION OF THE ENGINEER THERE ARE NO OTHER HAZARDOUS CONDITIONS.

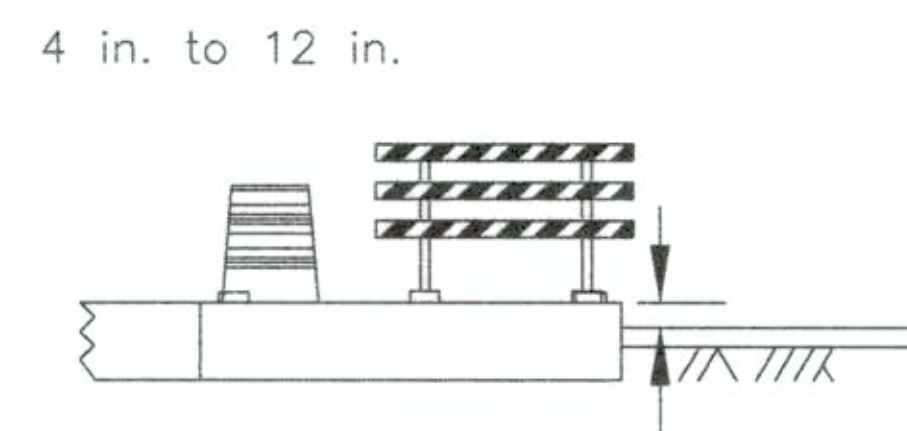


EDGE DROP-OFF WITH TAPER (SHOULDER - CLOSED)

SHOULDER SHALL BE CLOSED WITH APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES AT A MAXIMUM OF 100 FT. SPACING.

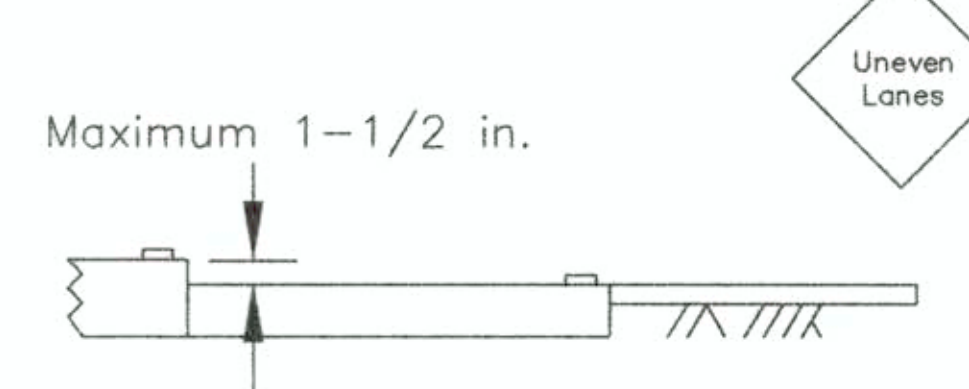


ADJACENT LANE SHALL BE CLOSED WITH APPROPRIATE LANE CLOSURE LAYOUT. CHANNELIZING DEVICES TO BE AT A MAXIMUM OF 100 FT. SPACING AND TYPE III EVERY 1000 FT.

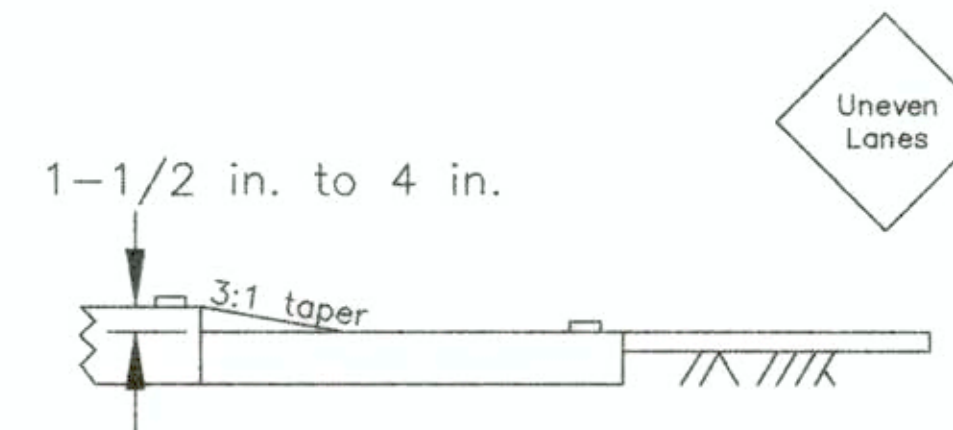


NOTE: SIGNS ARE REQUIRED ONLY ON THE SIDE OF THE ROAD THAT IS AFFECTED BY CONSTRUCTION. (EXCEPT SIGNS THAT ARE FOR A LANE CLOSURE ON DIVIDED HIGHWAYS.)

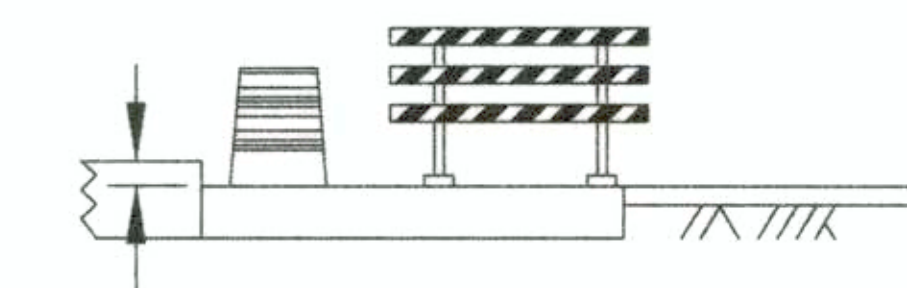
UNEVEN LANES



UNEVEN LANES - WITH TAPER



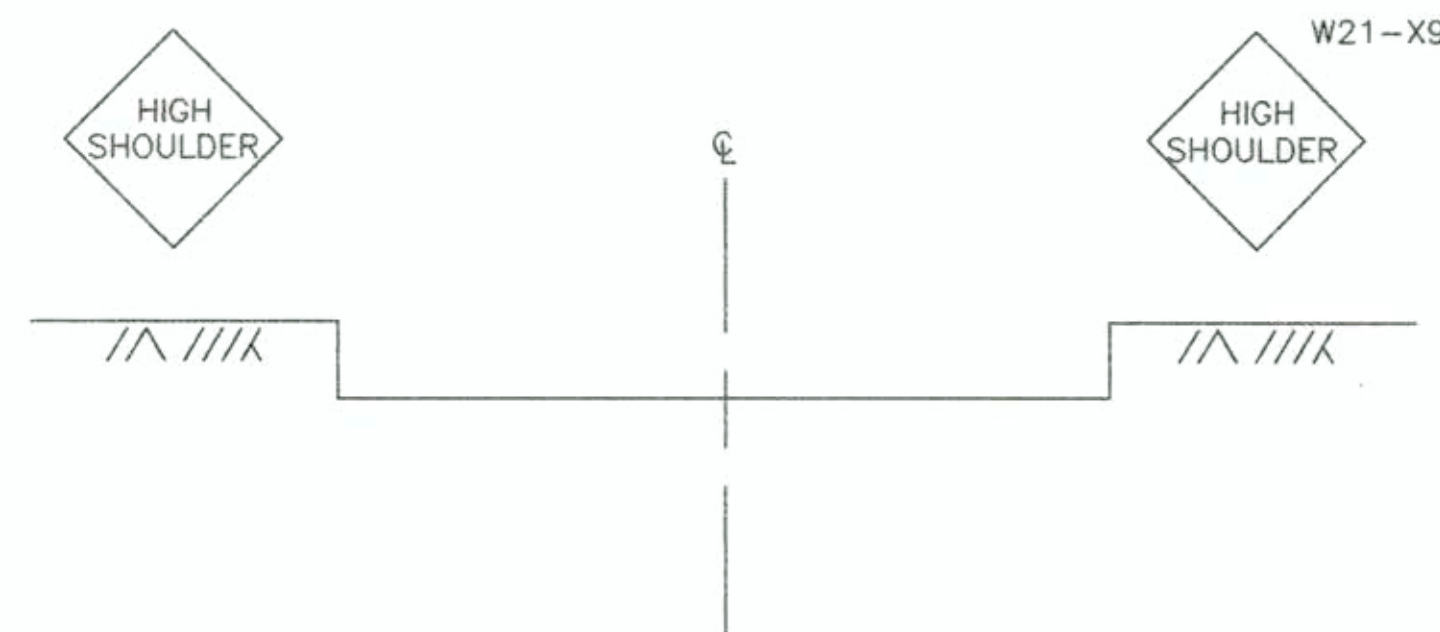
1-1/2 in. to 4 in.



LANE SHALL BE CLOSED WITH APPROPRIATE LANE CLOSURE LAYOUT. CHANNELIZING DEVICES AT A MAXIMUM OF 100 FT. SPACING AND A TYPE III BARRICADE EVERY 1000 FT.

NOTE: FOR DIVIDED HIGHWAYS, USE SIGNS ON RIGHT AND LEFT SIDE. SIGN SEQUENCE SHOWN FOR ONE DIRECTION ONLY; OTHER DIRECTION SHALL BE IDENTICAL.

MILLED EDGE



NOTE: MILLED EDGES SHOULD BE TREATED WITH TAPERS, CHANNELIZERS, AND SIGNING AS SHOWN ON EDGE DROP-OFF DETAILS.

GUIDELINES

THESE GUIDELINES ARE INTENDED TO INCREASE TRAFFIC SAFETY USING TRAFFIC CONTROL DEVICES, SAFETY RELATED APPURTENANCES, AND CONSTRUCTION TECHNIQUES FOR UNEVEN LANES, MILLED EDGES, AND EDGE DROP-OFFS THAT OCCUR IN HIGHWAY WORK ZONES. THE BEST WAY TO INCREASE TRAFFIC SAFETY IS TO MAKE EVERY ATTEMPT TO MINIMIZE EXPOSURE TO UNEVEN LANES, MILLED EDGES, AND EDGE DROP-OFFS; HOWEVER IT IS REALIZED THAT THIS IS OFTEN NOT POSSIBLE OR FEASIBLE. ONLY WHEN UNEVEN LANES, MILLED EDGES, OR EDGE DROP-OFFS ARE DEEMED NECESSARY, SHALL THE APPROPRIATE PORTION(S) OF THESE GUIDELINES BE APPLIED TO ENHANCE TRAFFIC SAFETY.

APPROPRIATE UNEVEN LANE WARNING SIGNS OR SHOULDER WARNING SIGNS SHALL BE REPEATED AFTER EACH INTERSECTION.

MAXIMUM WARNING SIGN SPACING SHALL BE:

- A - 1 MILE WHEN THE SPEED LIMIT IS GREATER THAN 30 MPH AND
- B - 1/4 MILE WHEN THE SPEED LIMIT IS 30 MPH OR LESS.

WHEN SPACE PERMITS, MINIMUM WARNING SIGN SIZE SHALL BE:

- A - 48" x 48" WHEN THE SPEED LIMIT IS GREATER THEN 30 MPH AND
- B - 36" x 36" WHEN THE SPEED LIMIT IS 30 MPH OR LESS.

1. FOR DROP-OFFS OF 1-1/2" OR LESS, APPROPRIATE WARNING SIGNS SHALL BE PROVIDED.
2. FOR DROP-OFFS GREATER THAN 1-1/2" UP TO 4":
 - A - THE EDGE SHALL BE TAPERED AND COMPACTED AT A RATE OF 3:1 AND APPROPRIATE WARNING SIGNS SHALL BE PROVIDED; OR
 - B - IF THE TAPER IS NOT PROVIDED, TRAFFIC SHALL NOT BE PERMITTED TO CROSS THE DROP-OFF AND THAT PORTION OF THE ROADWAY SHALL BE CLOSED TO TRAFFIC WITH THE APPROPRIATE WARNING SIGNS AND DEVICES.
3. FOR DROP-OFFS GREATER THAN 4" UP TO 12":
 - A - THE EDGE SHALL BE TAPERED AND COMPACTED AT A RATE OF 6:1 AND APPROPRIATE WARNING SIGNS SHALL BE PROVIDED, (6:1 TAPER SHALL NOT BE USED AS A TRAFFIC CARRYING LANE);
 - B - THE EDGE SHALL BE TAPERED AND COMPACTED AT A RATE OF 3:1, TRAFFIC SHALL NOT BE ALLOWED TO CROSS THE DROP-OFF, AND THAT PORTION OF THE ROADWAY SHALL BE CLOSED TO TRAFFIC WITH APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES; OR
 - C - IF A TAPER IS NOT PROVIDED, THE TRAFFIC OR AUXILIARY LANE ADJACENT TO THE DROP-OFF SHALL BE CLOSED TO TRAFFIC WITH THE APPROPRIATE WARNING SIGNS AND CHANNELIZING DEVICES OR POSITIVE BARRIER, SUCH AS A PORTABLE PRECAST CONCRETE BARRIER, SHALL BE PROVIDED TO PREVENT TRAFFIC FROM CROSSING THE DROP-OFF.
4. DROP-OFFS GREATER THAN 4" ADJACENT TO TRAFFIC CARRYING LANES ARE PERMITTED WITHOUT TAPERS OR POSITIVE BARRIERS FOR:
 - A - PROJECTS WITHIN URBAN AREA WHEN THE SPEED LIMIT IS 30 MPH OR LESS; OR
 - B - SHORT TERM (7 CALENDER DAYS OR LESS) CONCRETE OR UTILITY REPAIR, LESS THAN 50' IN LENGTH WHEN SPEED LIMIT IS GREATER THAN 30 MPH.
5. AT NO TIME SHALL THERE BE MORE THAN ONE UNEVEN LANE CONDITION BETWEEN THE TRAFFIC CARRYING LANES WHICH INCLUDE AUXILIARY LANES, TURN LANES, AND RAMP ACCESS OR EGRESS AREAS. WEATHER PERMITTING, ALL EXPOSED UNEVEN LANE CONDITIONS WITHIN THE TRAFFIC CARRYING LANES SHALL BE "MATCHED" WITHIN 24 HOURS.
6. MILLING OPERATIONS SHALL BE REQUIRED TO COMPLETE THE FULL WIDTH OF THE SECTION UNDER CONSTRUCTION AT THE END OF EACH WORK PERIOD.

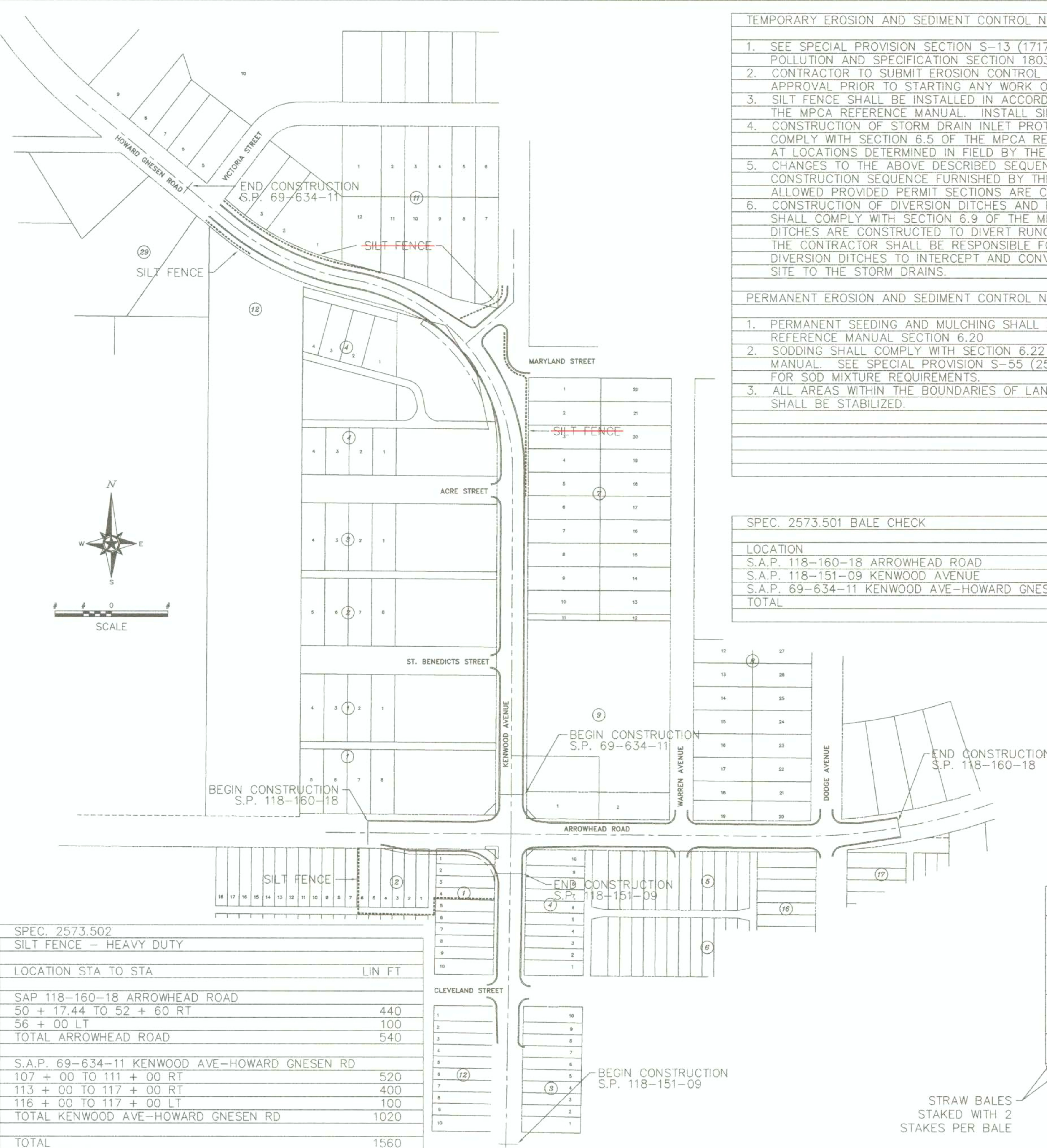
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

James D. Baker

DATE 2-20-98 REG. NO. 7756

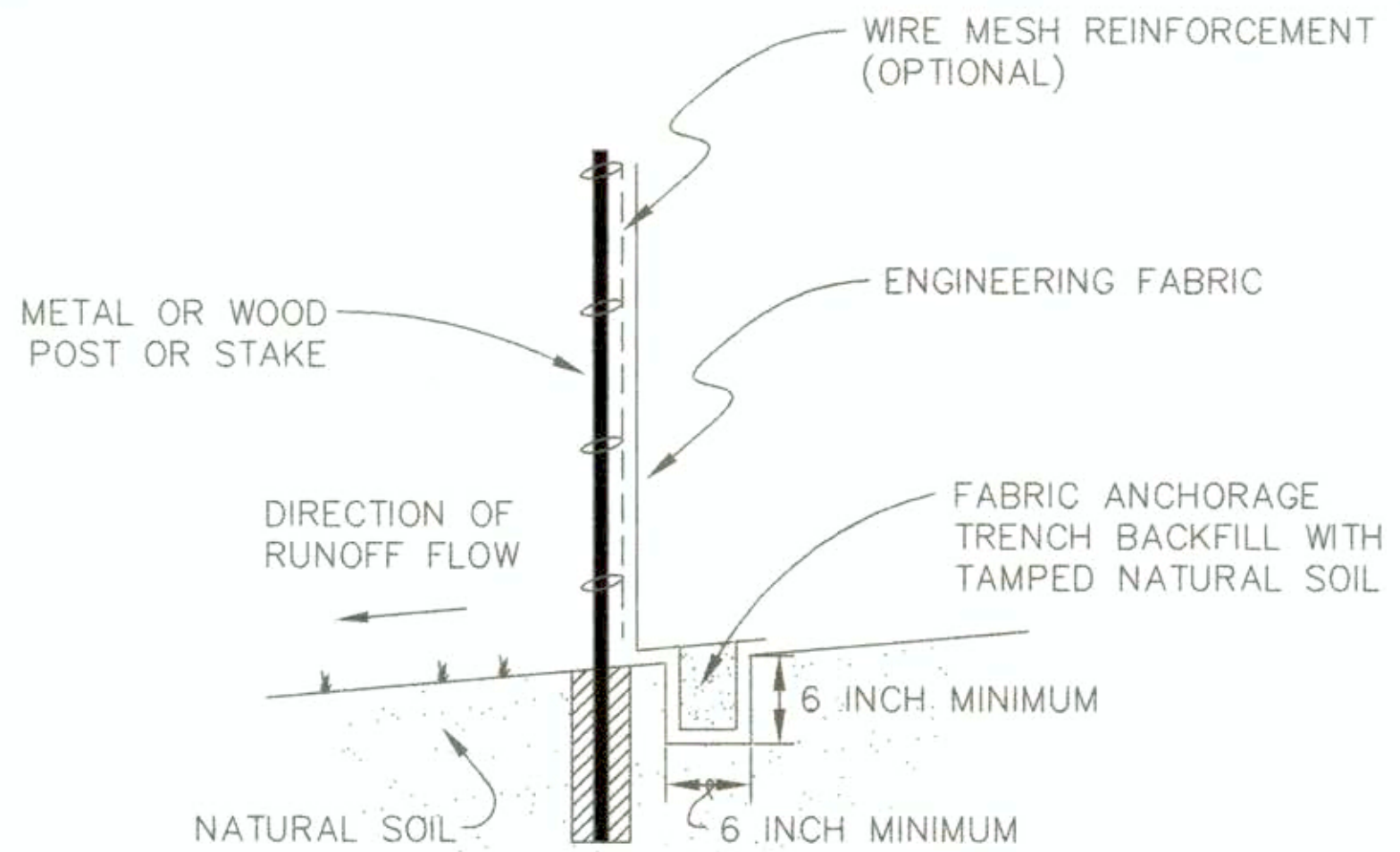
Traffic Control Treatment of Longitudinal Joints and Edge Drop-offs in Work Zones

RECORD DRAWING 2/98



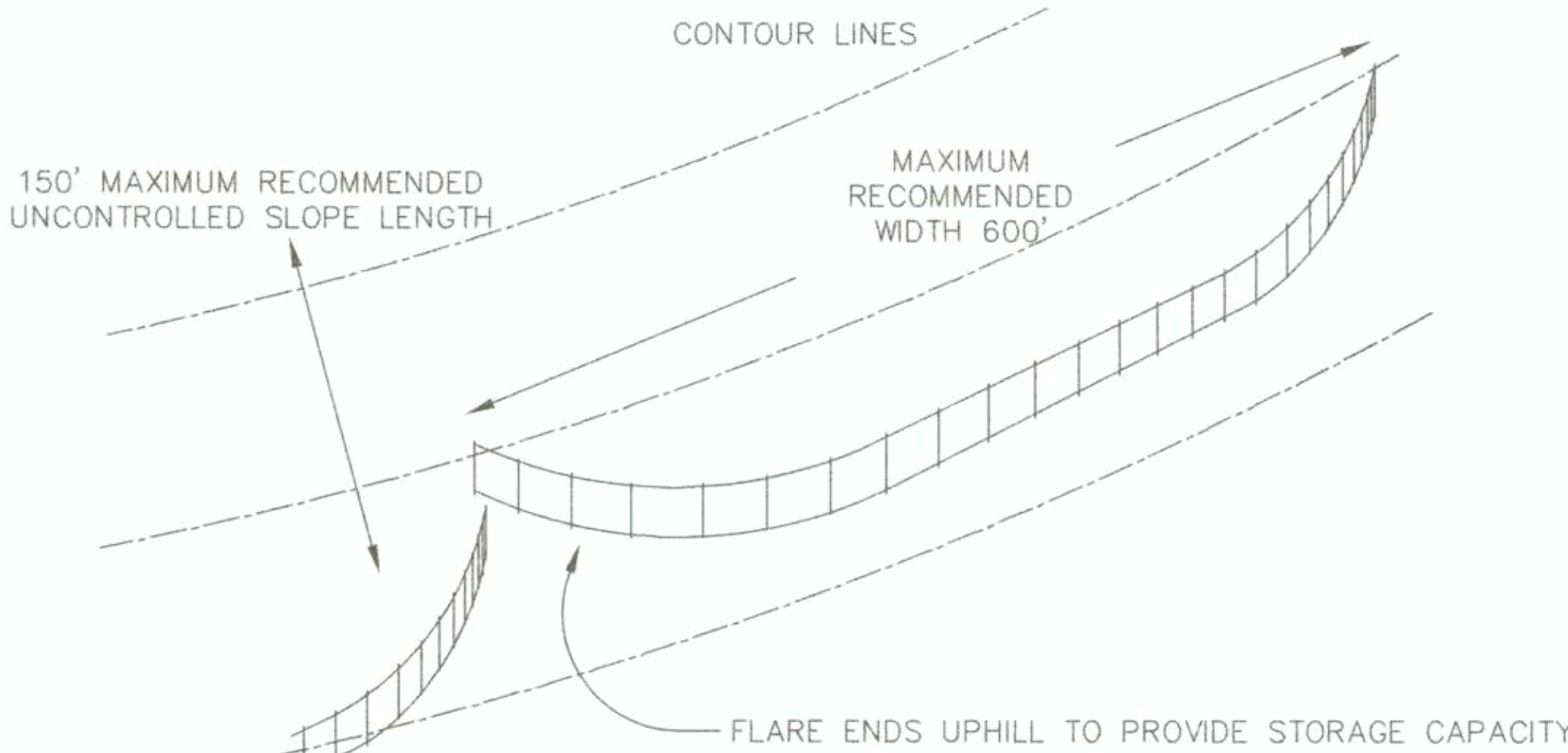
TEMPORARY EROSION AND SEDIMENT CONTROL NOTES	
1.	SEE SPECIAL PROVISION SECTION S-13 (1717) AIR AND WATER POLLUTION AND SPECIFICATION SECTION 1803.5 EROSION CONTROL.
2.	CONTRACTOR TO SUBMIT EROSION CONTROL PLAN TO ENGINEER FOR APPROVAL PRIOR TO STARTING ANY WORK ON THE PROJECT.
3.	SILT FENCE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 6.3 OF THE MPCA REFERENCE MANUAL. INSTALL SILT FENCE AS SHOWN ON PLAN.
4.	CONSTRUCTION OF STORM DRAIN INLET PROTECTION SHALL COMPLY WITH SECTION 6.5 OF THE MPCA REFERENCE MANUAL AT LOCATIONS DETERMINED IN FIELD BY THE ENGINEER.
5.	CHANGES TO THE ABOVE DESCRIBED SEQUENCE OR TO THE CONSTRUCTION SEQUENCE FURNISHED BY THE CONTRACTOR ARE ALLOWED PROVIDED PERMIT SECTIONS ARE COMPLIED WITH.
6.	CONSTRUCTION OF DIVERSION DITCHES AND PERMANENT DIVERSIONS SHALL COMPLY WITH SECTION 6.9 OF THE MPCA REFERENCE MANUAL. DITCHES ARE CONSTRUCTED TO DIVERT RUNOFF TO STORM DRAINS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING THE DIVERSION DITCHES TO INTERCEPT AND CONVEY RUNOFF FROM THE SITE TO THE STORM DRAINS.
PERMANENT EROSION AND SEDIMENT CONTROL NOTES	
1.	PERMANENT SEEDING AND MULCHING SHALL COMPLY WITH MPCA REFERENCE MANUAL SECTION 6.20
2.	SODDING SHALL COMPLY WITH SECTION 6.22 OF THE MPCA REFERENCE MANUAL. SEE SPECIAL PROVISION S-55 (2575) TURF ESTABLISHMENT FOR SOD MIXTURE REQUIREMENTS.
3.	ALL AREAS WITHIN THE BOUNDARIES OF LAND DISTURBING ACTIVITIES SHALL BE STABILIZED.

SPEC. 2573.501 BALE CHECK		
LOCATION		EACH
S.A.P. 118-160-18 ARROWHEAD ROAD		50
S.A.P. 118-151-09 KENWOOD AVENUE		50
S.A.P. 69-634-11 KENWOOD AVE-HOWARD GNESEN RD		50
TOTAL		150



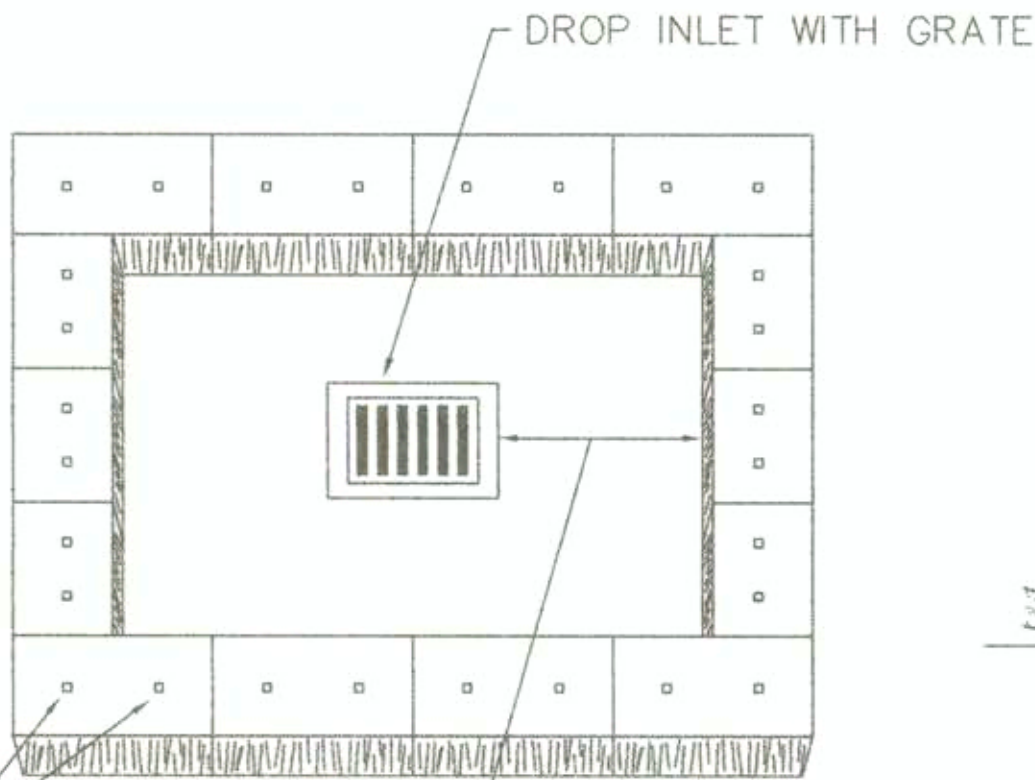
NOTE: DEPENDING UPON CONFIGURATION, ATTACH FABRIC TO WIRE MESH WITH HOG RINGS, STEEL POSTS WITH TIE WIRES, OR WOOD POSTS WITH STAPLES.

TYPICAL INSTALLATION FOR SILT FENCE
NO SCALE

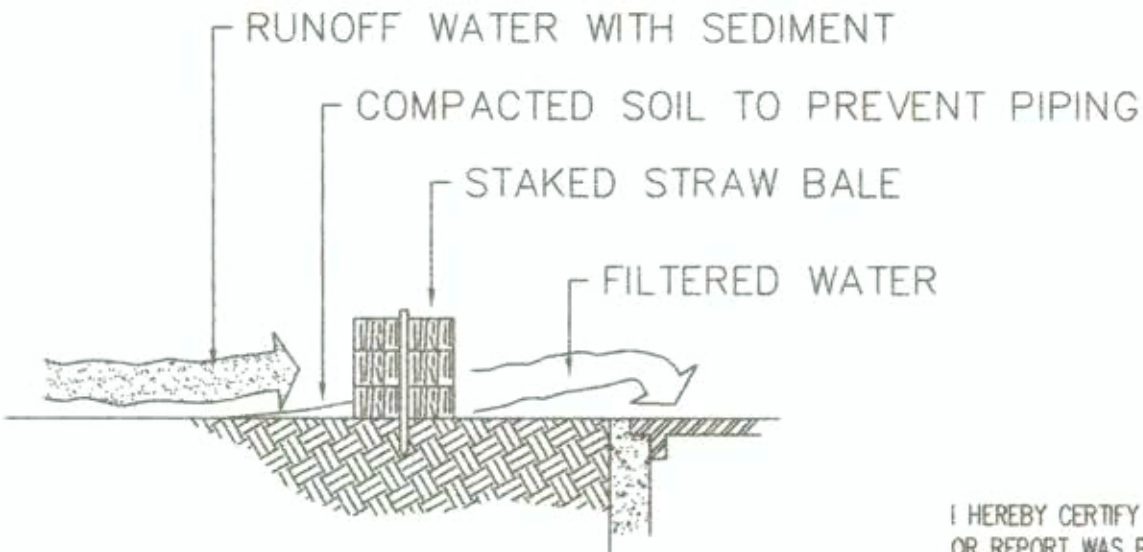


TYPICAL SILT FENCE LAYOUT
NO SCALE

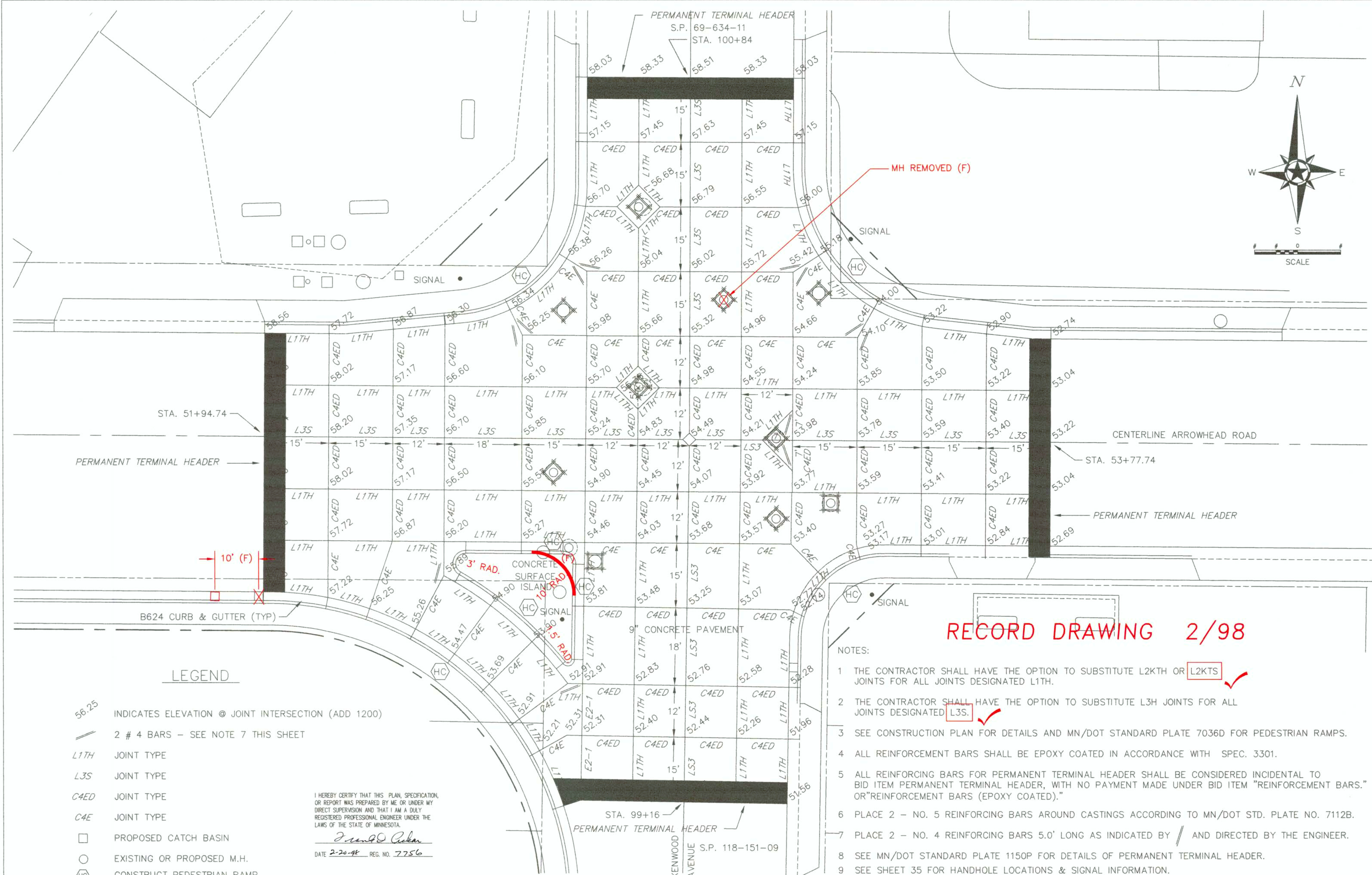
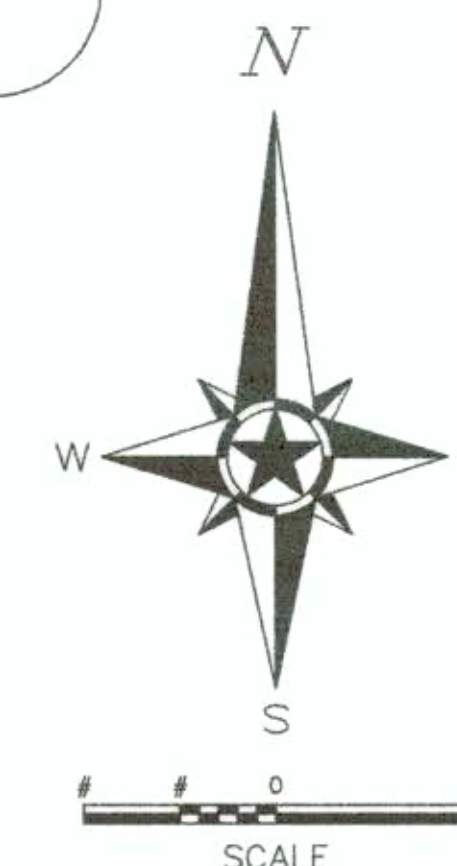
SPEC. 2573.502 SILT FENCE - HEAVY DUTY	
LOCATION STA TO STA	LIN FT
SAP 118-160-18 ARROWHEAD ROAD	
50 + 17.44 TO 52 + 60 RT	440
56 + 00 LT	100
TOTAL ARROWHEAD ROAD	540
S.A.P. 69-634-11 KENWOOD AVE-HOWARD GNESEN RD	
107 + 00 TO 111 + 00 RT	520
113 + 00 TO 117 + 00 RT	400
116 + 00 TO 117 + 00 LT	100
TOTAL KENWOOD AVE-HOWARD GNESEN RD	1020
TOTAL	1560



TYPE B-STRAW BALE INLET SEDIMENT FILTER
NO SCALE



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
David D. Parker
DATE 2-20-98 REG. NO. 7756



LEGEND

- 56.25 INDICATES ELEVATION @ JOINT INTERSECTION (ADD 1200)
- 2 # 4 BARS - SEE NOTE 7 THIS SHEET
- L1TH JOINT TYPE
- L3S JOINT TYPE
- C4ED JOINT TYPE
- C4E JOINT TYPE
- PROPOSED CATCH BASIN
- EXISTING OR PROPOSED M.H.
- HC CONSTRUCT PEDESTRIAN RAMP

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

Donald D. Acker
DATE 2-20-98 REG. NO. 7756

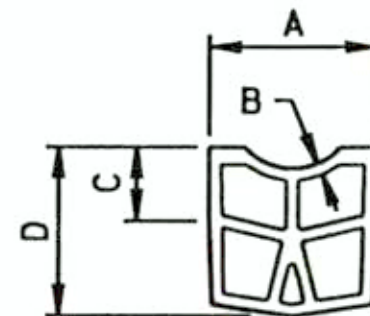
RECORD DRAWING 2/98

NOTES:

- 1 THE CONTRACTOR SHALL HAVE THE OPTION TO SUBSTITUTE L2KTH OR L2KTS JOINTS FOR ALL JOINTS DESIGNATED L1TH. ✓
- 2 THE CONTRACTOR SHALL HAVE THE OPTION TO SUBSTITUTE L3H JOINTS FOR ALL JOINTS DESIGNATED L3S. ✓
- 3 SEE CONSTRUCTION PLAN FOR DETAILS AND MN/DOT STANDARD PLATE 7036D FOR PEDESTRIAN RAMPS.
- 4 ALL REINFORCEMENT BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.
- 5 ALL REINFORCING BARS FOR PERMANENT TERMINAL HEADER SHALL BE CONSIDERED INCIDENTAL TO BID ITEM PERMANENT TERMINAL HEADER, WITH NO PAYMENT MADE UNDER BID ITEM "REINFORCEMENT BARS." OR "REINFORCEMENT BARS (EPOXY COATED)."
- 6 PLACE 2 - NO. 5 REINFORCING BARS AROUND CASTINGS ACCORDING TO MN/DOT STD. PLATE NO. 7112B.
- 7 PLACE 2 - NO. 4 REINFORCING BARS 5.0' LONG AS INDICATED BY // AND DIRECTED BY THE ENGINEER.
- 8 SEE MN/DOT STANDARD PLATE 1150P FOR DETAILS OF PERMANENT TERMINAL HEADER.
- 9 SEE SHEET 35 FOR HANDHOLE LOCATIONS & SIGNAL INFORMATION.

REQUIRED DIMENSIONS

JOINT TYPE	TRANSVERSE
NOMINAL SEALER SIZE	13/16"
A	0.80" +0.14" -0.05"
B	0.08" ± 0.02"
C	0.60" MIN.
D	0.80" MIN.
WEB AND WALL THICKNESS, UNLESS NOTED	0.03" MIN.



TYPICAL SHAPE FOR SATISFACTORY INSTALLATION IN JOINT (5 CELL MIN.)

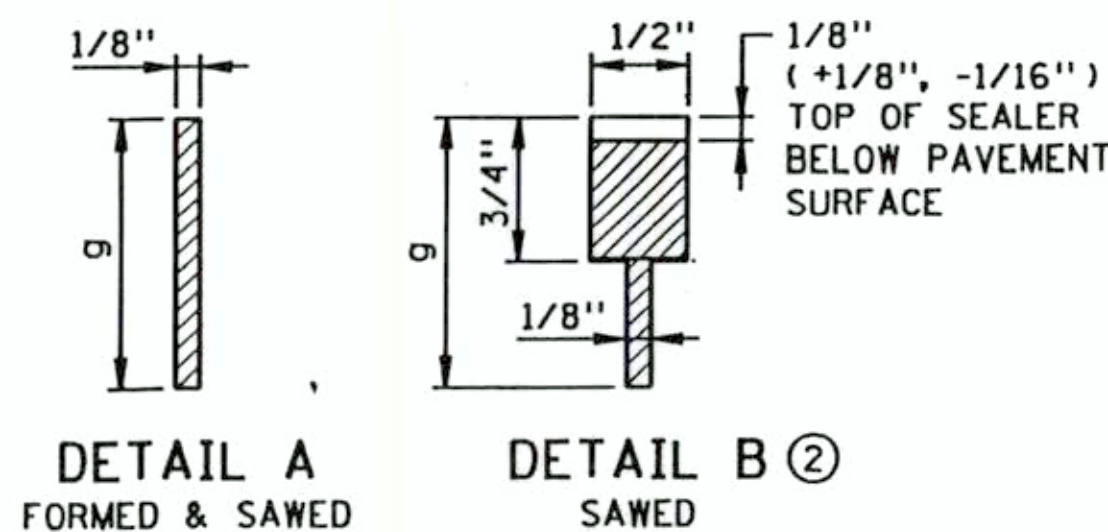
SPEC. REFERENCE 3721

CONTRACTION JOINT SEALER PREFORMED ELASTIC TYPE

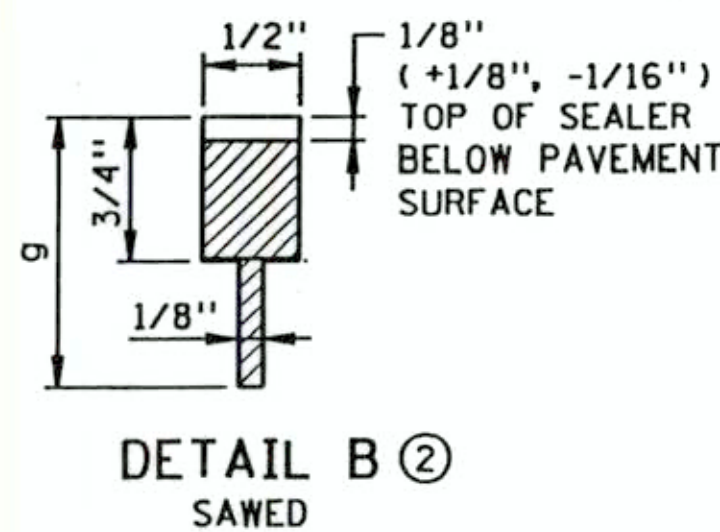
NOTES:

"A" DIMENSION SHALL APPLY AT ANY POINT THROUGHOUT "C" DEPTH. IN ITS FINAL POSITION, THE TOP CORNERS OF THE PREFORMED JOINT SEALER SHALL BE PLACED NOT LESS THAN 1/8 IN., NOR MORE THAN 5/16 IN. BELOW THE PAVEMENT SURFACE.

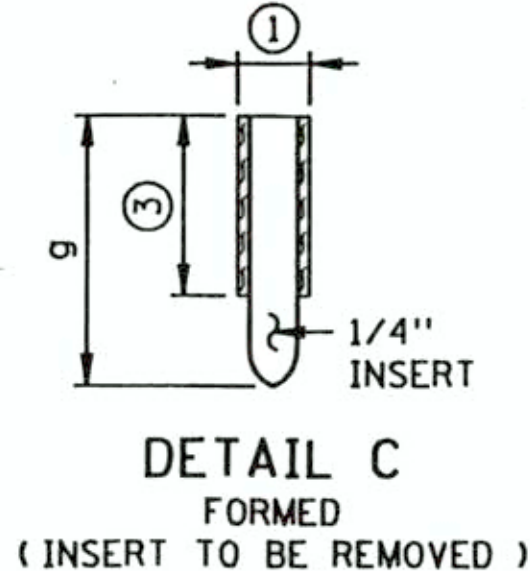
SHARP INTERNAL CORNERS WILL NOT BE PERMITTED. ALL CORNERS SHALL BE PROVIDED WITH SUITABLE FILLET. CURRENTLY APPROVED CONFIGURATIONS ARE ON FILE IN THE MATERIALS ENGINEERING SECTION, MINNESOTA DEPARTMENT OF TRANSPORTATION.



DETAIL A
FORMED & SAWED



DETAIL B
SAWED



DETAIL C
FORMED
(INSERT TO BE REMOVED)

CONTRACTION JOINT CLASS DESIGNATION, DETAIL & SEALER SPEC. TABLE

CLASS DESIGNATION		JOINT DETAIL	JOINT SEALER SPEC.
WITHOUT DOWELS	WITH DOWELS		
C1A	C1A-D	A	UNSEALED
C2B	C2B-D	B	3723
C2X	C2X-D	B OR C	3723
C3D	C3D-D	D	3721
C3X	C3X-D	C OR D	3721
C4E	C4E-D	E	SILICONE

LEGEND

C = CONTRACTION JOINT
 NO. = SEALANT TYPE
 1 = UNSEALED
 2 = 3723
 3 = 3721
 4 = SILICONE
 LETTER = DETAIL
 X = MORE THAN 1 DETAIL
 -D = DOWEL BARS

EXAMPLE

C2B-D

CONTRACTION JOINT DEPTH & DOWEL BAR TABLE

PAVEMENT THICKNESS †	CONCRETE PAVEMENT JOINT DEPTH 9 ⑤	CONCRETE BASE JOINT DEPTH 9	DOWEL BAR DIAMETER
6"	1-1/2"	1-1/4"	3/4"
6-1/2"	1-5/8"	1-1/4"	3/4"
7"	1-3/4"	1-1/2"	1"
7-1/2"	1-7/8"	1-1/2"	1"
8"	2"	1-1/2"	1"
8-1/2"	2-1/8"	1-1/2"	1"
9"	2-1/4"	1-1/2"	1-1/4"
9-1/2"	2-3/8"	2"	1-1/4"
10"	2-1/2"	2"	1-1/4"
10-1/2"	2-5/8"	—	1-1/4"
11"	2-3/4"	—	1-1/2"
11-1/2"	2-7/8"	—	1-1/2"
12"	3"	—	1-1/2"
12-1/2"	3-1/8"	—	1-1/2"
13"	3-1/4"	—	1-3/4"
13-1/2"	3-3/8"	—	1-3/4"
14"	3-1/2"	—	1-3/4"

NOTES:

- DESIGN C3X OR C3X-D - PRIOR TO INSTALLING PREFORMED JOINT SEALER IN THE FORMED JOINT (DETAIL C), THE JOINT SHALL BE WIDENED TO A NOMINAL WIDTH OF 3/8" BY SAWING ALONG THE FULL LENGTH OF THE FORMED JOINT.
- DESIGN C2X OR C2X-D - PRIOR TO SEALING FORMED JOINT (DETAIL C), WITH HOT POUR SEALER, THE JOINT SHALL BE WIDENED TO A NOMINAL WIDTH OF 1/2" FOR A DEPTH OF 3/4", + 1/8", - 1/16", BY SAWING ALONG THE FULL LENGTH OF THE FORMED JOINT. THE SEALER SHALL BE FILLED TO THE SAME DEPTH AS SHOWN IN DETAIL B.
- WHEN USING PREFORMED JOINT SEALER, THE DEPTH SHALL BE 1/4" MORE THAN THE PREFORMED SEALER, WHEN COMPRESSED, TO FIT THE JOINT DESIGN WIDTH.
- THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING. PRIOR TO SEALING THE JOINT, A 1/2" DIA. CLOSED CELL BACKER ROD SHALL BE PLACED SUCH THAT THE TOP OF THE BACKER ROD IS 1/2" BELOW THE SURFACE OF THE PAVEMENT. SILICONE SHALL BE TOOLED INTO THE JOINT MAINTAINING A SEALANT BEAD THICKNESS OF 1/4".
- FOR UNBONDED OVERLAYS, THE JOINT DEPTH "G" SHALL BE T/3.

CONTRACTION JOINT NOTES:

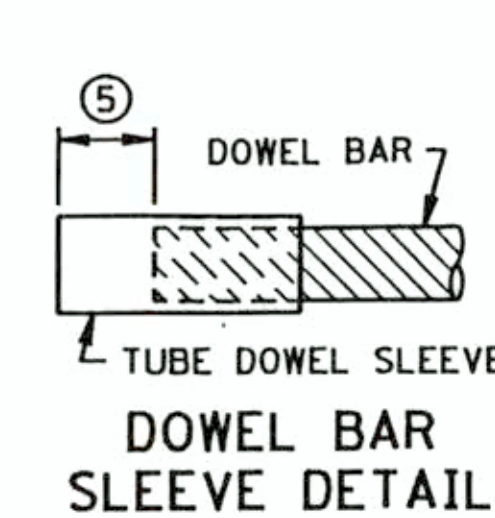
IN CONCRETE BASE CONSTRUCTION THE CONTRACTION JOINTS SHALL BE SPACED AT 30 FT. INTERVALS AND AT RIGHT ANGLES TO THE LONGITUDINAL JOINTS, EXCEPT AS NOTED BELOW. WHERE THE CONCRETE BASE IS CONSTRUCTED ADJACENT TO EXISTING PAVEMENT OR BASE, THE CONTRACTION JOINTS IN THE NEW BASE SHALL MATCH THOSE IN THE EXISTING PAVEMENT OR BASE, EXCEPT THAT THE SPACING SHALL NOT BE LESS THAN 15 FT., NOR MORE THAN 30 FT.

JOINT WIDTH TOLERANCES: + 1/16 IN. AND - 1/32 IN.

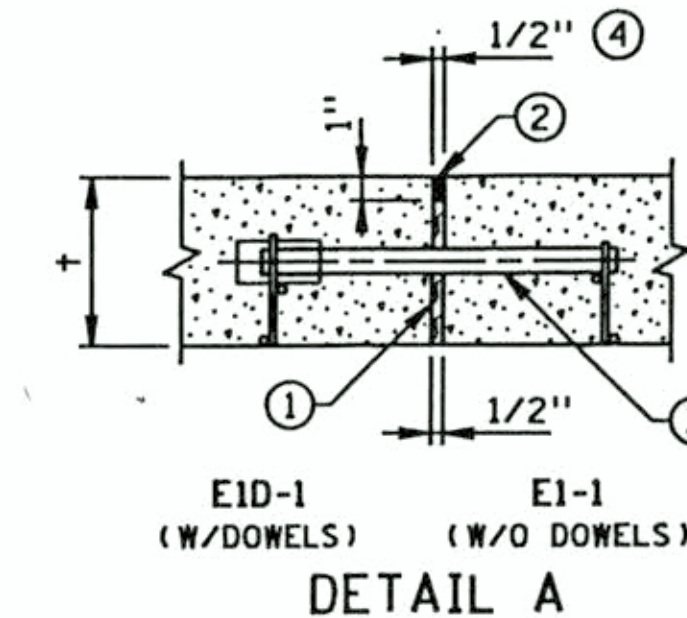
GENERAL NOTES:

SEE THE FOLLOWING STANDARD PLATES AND STANDARD PLAN SHEET FOR ADDITIONAL DETAILS: DOWEL BAR ASSEMBLY, 1103; CONSTRUCTION OF HEADER JOINTS, 1150; AND CONCRETE PAVEMENT WITH SKEWED JOINTS, 5-297.215 - .219.

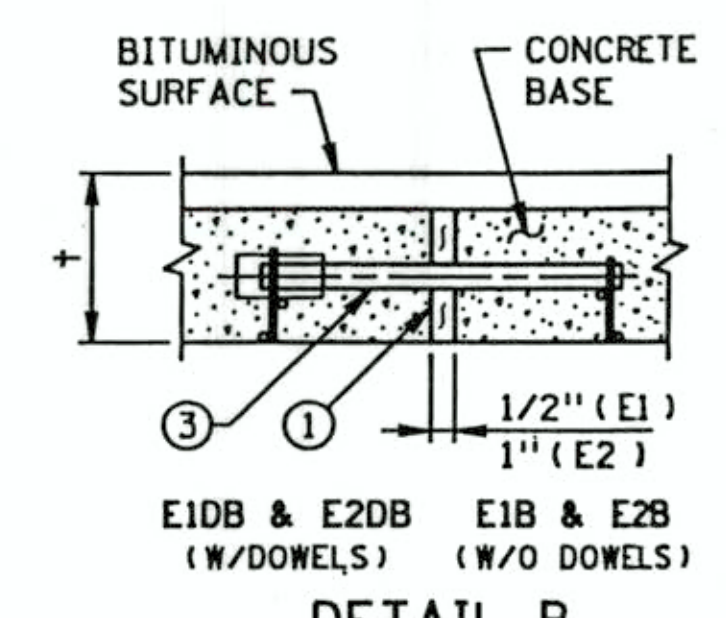
SEE PAVING LAYOUTS IN THE PLANS FOR JOINT CLASS DESIGNATION TO BE USED AND SPECIAL REINFORCEMENT REQUIRED.



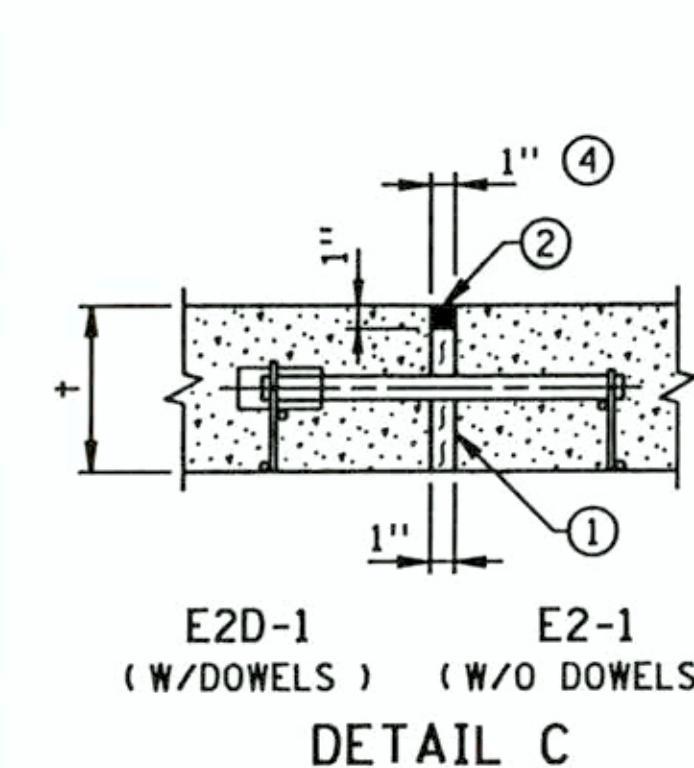
DOWEL BAR SLEEVE DETAIL



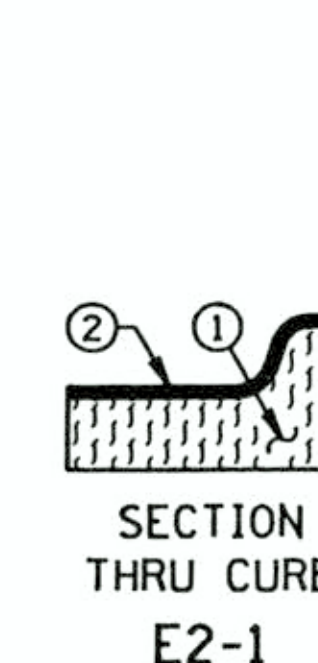
DETAIL A



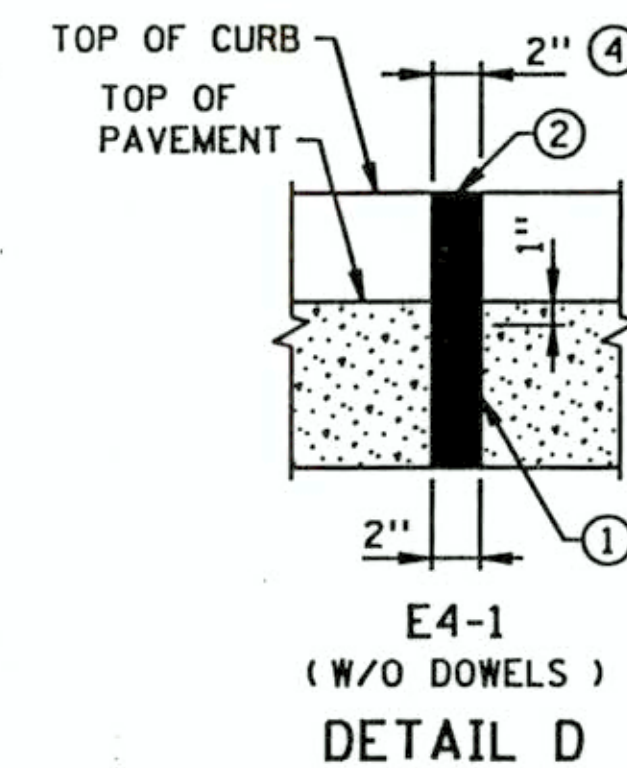
DETAIL B



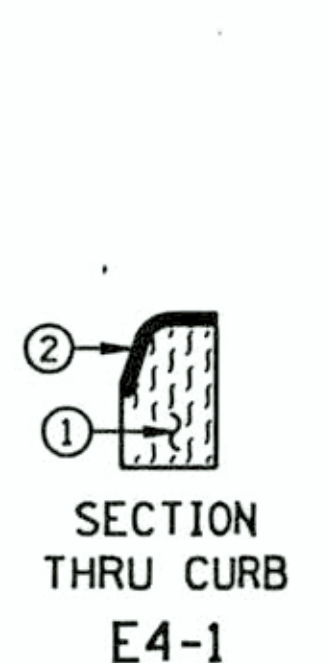
DETAIL C



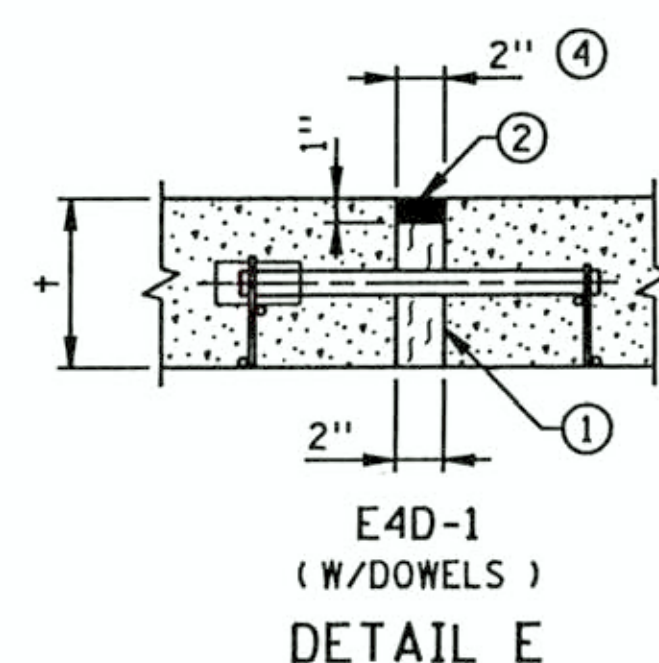
SECTION THRU CURB
E2-1



DETAIL D



SECTION THRU CURB
E4-1



DETAIL E

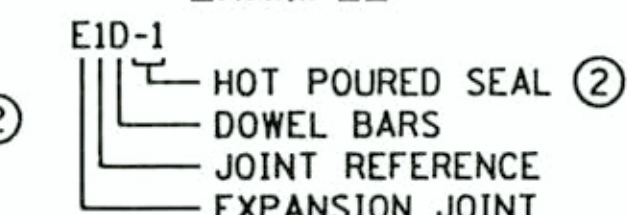
EXPANSION JOINTS

CLASS DESIGNATION		JOINT DETAIL	JOINT SEALER SPEC.
WITH DOWELS	WITHOUT DOWELS		
E1D-1	E1-1	A	②
E1DB	E1B	B	UNSEALED
E2D-1	E2-1	C	②
E2DB	E2B	B	UNSEALED
E4D-1	E4-1	D	②
		E	②

LEGEND

E = EXPANSION JOINT
 NO. = JOINT REFERENCE
 -1 = HOT POURED SEAL
 D = DOWEL BARS
 B = CONCRETE BASE
 S = CONCRETE SILL

EXAMPLE



NOTES:

- PREFORMED JOINT FILLER MATERIAL, SPEC. 3702.
- JOINT SEALER SPEC. 3723. TOP OF SEALER, FLUSH TO 1/8 IN. BELOW TOP OF PAVEMENT SURFACE. MAKE TOP OF SEALER FOR CURB SECTION E JOINTS FLUSH WITH SURFACE (0 IN.) ± 1/8 IN.
- DOWEL BAR ASSEMBLY, SEE STANDARD PLATE 1103.
- JOINT WIDTH IS EQUAL TO HALF OF THE JOINT NUMBER IN 1/2 IN. INTERVALS (i.e. E1 = 1/2 IN., E2 = 1 IN., E3 = 1-1/2 IN., E4 = 2 IN., E8 = 4 IN.).
- SPACE FROM END OF DOWEL BAR TO END OF SLEEVE TO BE EQUAL TO EXPANSION JOINT WIDTH.

I hereby certify that this plan, specification or report was prepared 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 2-20-98 Reg. No. 7756

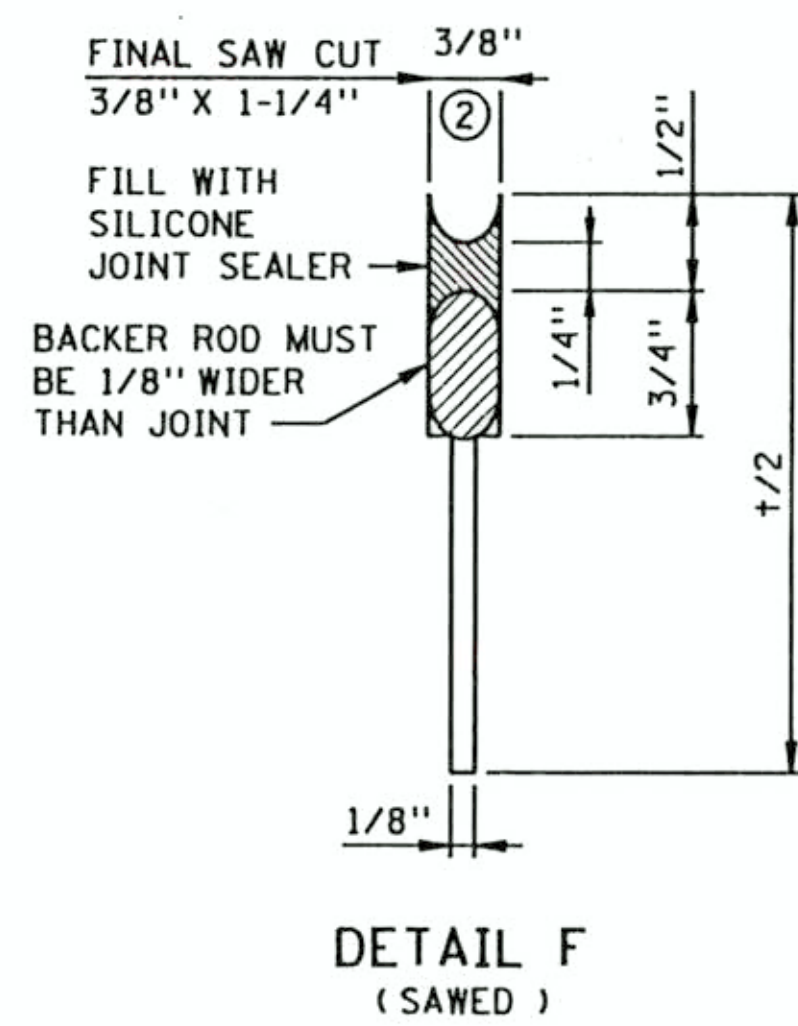
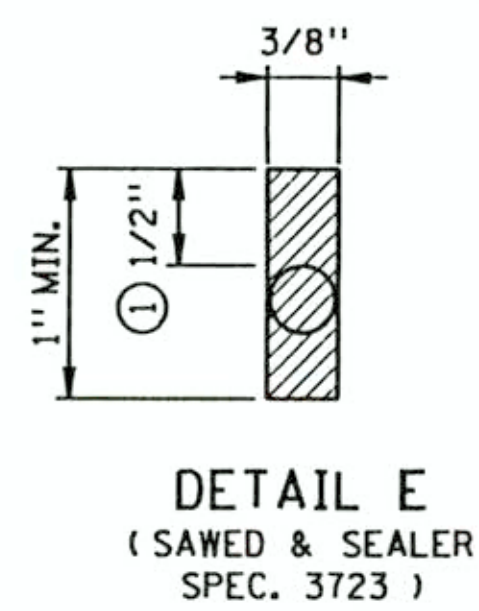
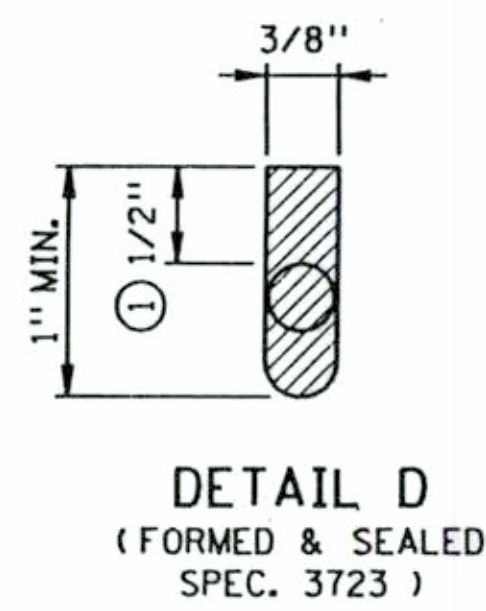
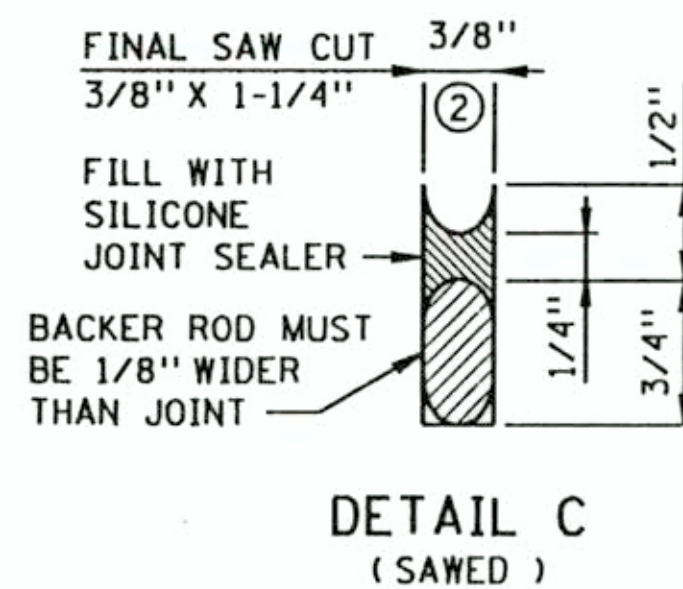
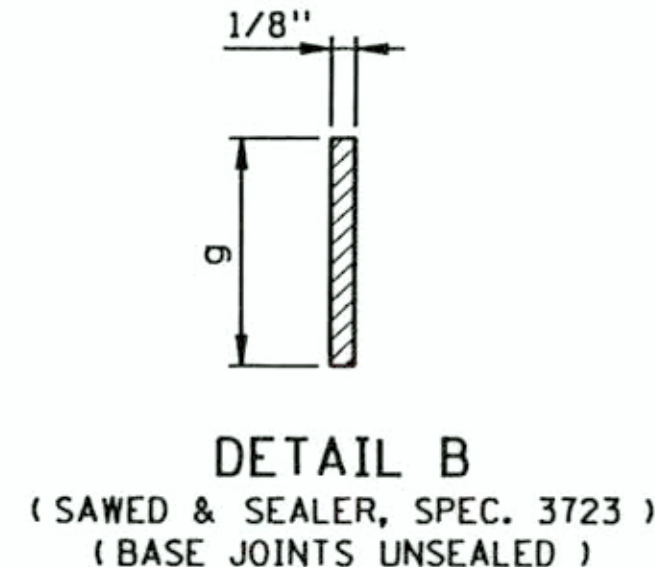
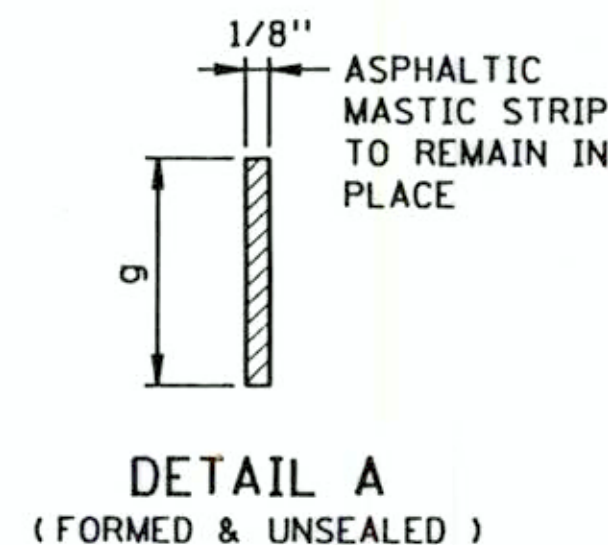
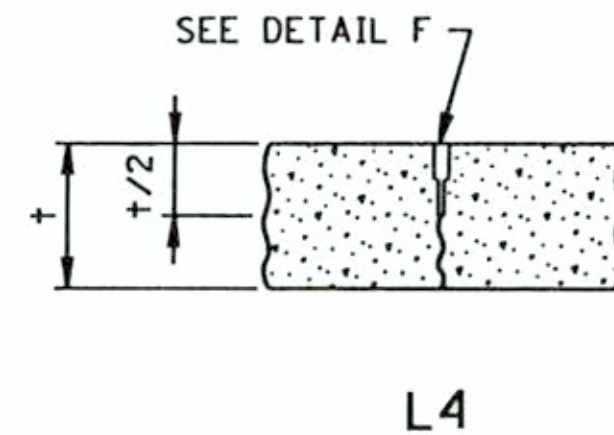
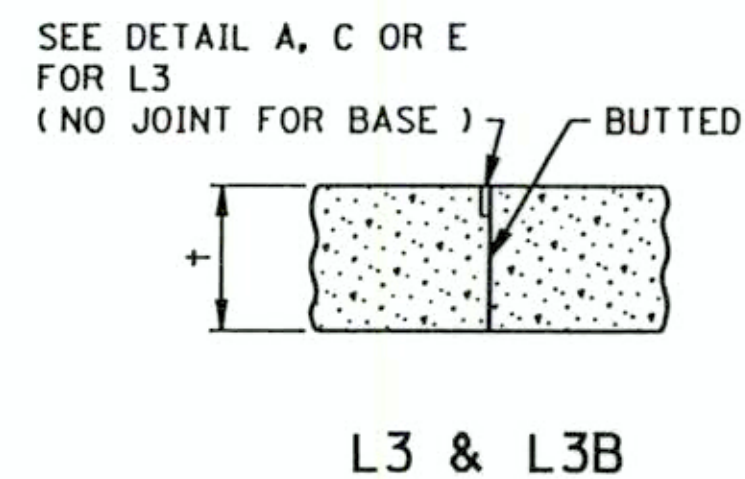
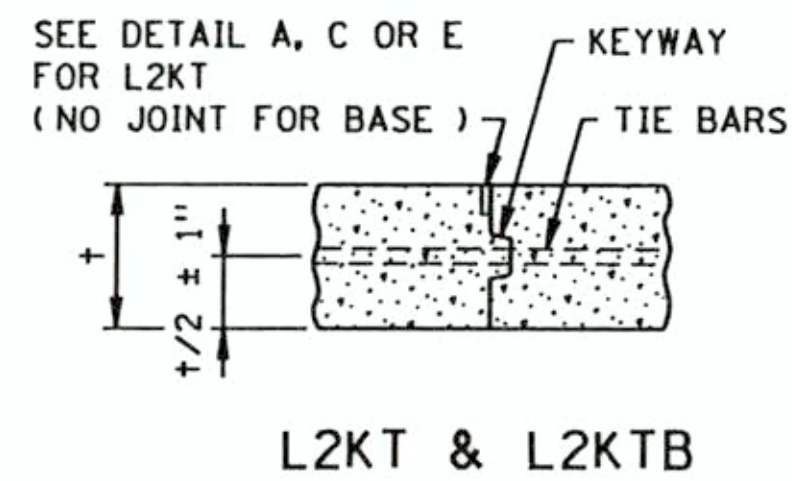
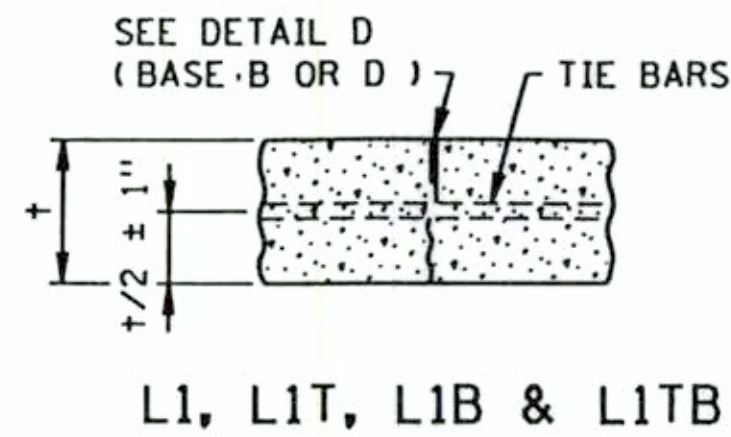
EXPANSION JOINTS DESIGN E

STANDARD SHEET NO.
5-297.221 (1 OF 2)
STANDARD APPROVED:
JANUARY 25, 1993

TITLE:
PAVEMENT JOINTS
CONTRACTION (DESIGN C) AND EXPANSION (DESIGN E)
STATE PROJ. NO. 118-160-18 SHEET NO. 30 OF 68 SHEETS

RECORD DRAWING 2/98

CONTRACTION JOINTS DESIGN C



LONGITUDINAL JOINT CLASS DESIGNATION,
DETAIL & SEALER SPECIFICATION TABLE

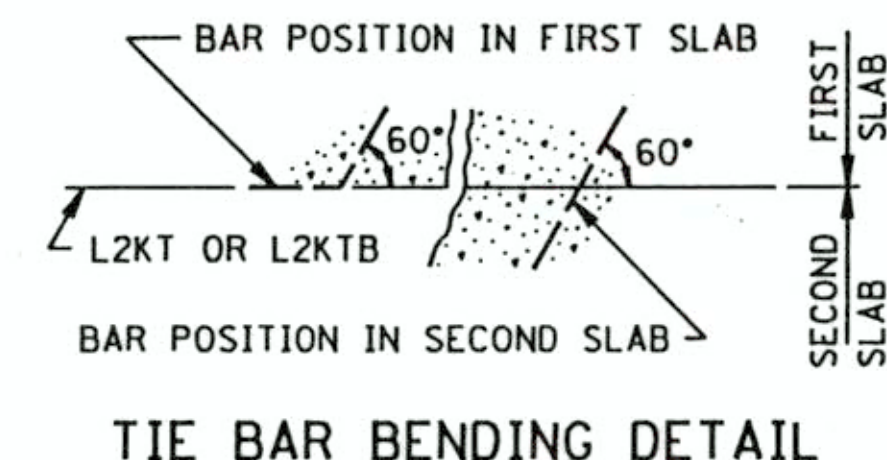
CLASS DESIGNATION				JOINT DETAIL	JOINT SEALER SPECIFICATION
WITHOUT TIE BARS	WITH TIE BARS	WITH KEYWAY & TIE BARS	BUTTED		
L1H L1BU	L1TH L1TBU	L2KTH L2KTS	L3H L3S	B A OR B D OR E C D OR E C F	3723 UNSEALED 3723 SILICONE 3723 SILICONE SILICONE
L4S					

LEGEND
L = LONGITUDINAL JOINT
NO. = JOINT REFERENCE
K = KEYWAY
T = TIE BARS
B = CONCRETE BASE
U = UNSEALED
H = HOT POUR
S = SILICONE

JOINT REFERENCE NUMBERS
1 = SAWED TO A DEPTH OF 1/3
2 = KEYED CONSTRUCTION JOINT
3 = BUTTED CONSTRUCTION JOINT
4 = SAWED TO A DEPTH OF 1/2

LONGITUDINAL JOINT
DEPTH TABLE

PAVEMENT THICKNESS †	CONCRETE PAVEMENT JOINT DEPTH g	CONCRETE BASE JOINT DEPTH g
6"	2"	2"
6-1/2"	2-1/8"	2"
7"	2-1/4"	2-1/4"
7-1/2"	2-1/2"	2-1/4"
8"	2-5/8"	2-1/2"
8-1/2"	2-7/8"	2-1/2"
9"	3"	2-3/4"
9-1/2"	3-1/4"	3"
10"	3-3/8"	
10-1/2"	3-1/2"	
11"	3-5/8"	
11-1/2"	3-7/8"	
12"	4"	
12-1/2"	4-1/8"	
13"	4-3/8"	
13-1/2"	4-1/2"	
14"	4-5/8"	



LONGITUDINAL JOINT NOTES:

TIE BARS FOR L1TB JOINTS SHALL BE THE SAME SIZE AND SPACING AS SHOWN ON STANDARD PLAN SHEETS 5-297.216 - .219.

EXCEPT WHEN NOTED OTHERWISE IN THE PLANS, THE TIE BAR SPACING FOR ALL L2KT AND L2KTb JOINTS SHALL BE 2' 6" C. TO C. AND BENT 60° AS SHOWN.

TIE BARS IN THE L2KT AND L2KTb JOINTS SHALL BE THE SAME SIZE AND LENGTH AS USED FOR THE L1T OR L1TB JOINTS, WHEN TYING PAVEMENT TO PAVEMENT OR BASE TO BASE. TIE BARS IN THE L2KT OR L2KTb JOINTS SHALL BE NO. 4 X 2' 6", WHEN TYING CURB & GUTTER TO PAVEMENT OR BASE.

ALL TIE BARS SHALL MEET THE REQUIREMENTS OF GRADE 60 FOR AASHTO M-31 OR M-53.

NORMALLY, TIED PAVEMENT WIDTHS SHALL NOT EXCEED 30 FEET, EXCEPT BRIDGE APPROACH PANELS AND PAVEMENT TAPERS.

JOINT WIDTH TOLERANCE IS + 1/16 IN. TO - 1/32 IN.

SPEC. 3723 SEALER - TOP OF SEALER FLUSH TO - 3/16 IN. BELOW TOP OF PAVEMENT SURFACE.

- THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING. PRIOR TO SEALING THE JOINT, A CLOSED CELL BACKER ROD CAPABLE OF WITHSTANDING SEALANT TEMPERATURES OF 400 DEGREES F, WITH A DIAMETER 1/8 IN. LARGER THAN THE JOINT OPENING, MAY BE PLACED 1/2 IN. BELOW THE TOP OF THE PAVEMENT.
- THE JOINT FACES SHALL BE CLEANED AND DRIED BY SANDBLASTING AND AIR BLASTING. PRIOR TO SEALING THE JOINT, A 1/2 IN. DIAMETER CLOSED CELL BACKER ROD SHALL BE PLACED SUCH THAT THE TOP OF THE BACKER ROD IS 1/2 IN. BELOW THE SURFACE OF THE PAVEMENT. SILICONE SHALL BE TOOLED INTO THE JOINT MAINTAINING A SEALANT BEAD THICKNESS OF 1/4 IN.

GENERAL NOTES:

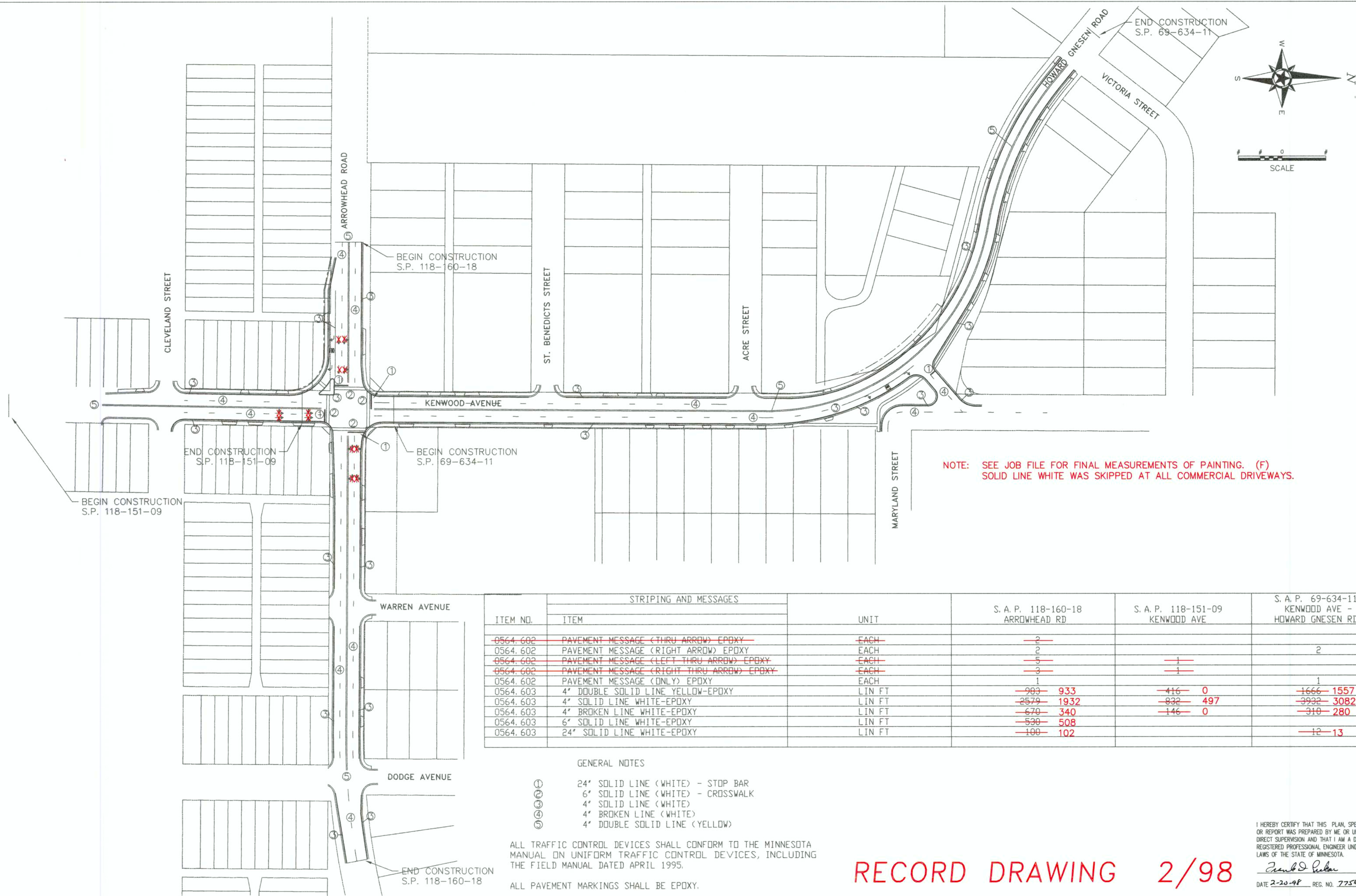
SEE THE FOLLOWING STANDARD PLATES AND STANDARD PLAN SHEETS FOR ADDITIONAL DETAILS: DOWEL BAR ASSEMBLY 1103, PAVEMENT KEYWAY 1141 AND CONCRETE PAVEMENT WITH SKEWED JOINTS 5-297.216 - .219.

SEE PAVING LAYOUTS IN THE PLANS FOR JOINT CLASS DESIGNATIONS TO BE USED & SPECIAL REINFORCEMENT REQUIRED.

Report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
James D. Galar
Date: 2-20-98 Reg. No. 7756

RECORD DRAWING 2/98

STANDARD SHEET NO. 5-297.221 (2 OF 2)	TITLE: PAVEMENT JOINTS LONGITUDINAL (DESIGN L)
STANDARD APPROVED: JANUARY 25, 1993	
STATE PROJ. NO. 118-160-18	SHEET NO. 31 OF 68 SHEETS



NOTE: SEE JOB FILE FOR FINAL MEASUREMENTS OF PAINTING. (F)
SOLID LINE WHITE WAS SKIPPED AT ALL COMMERCIAL DRIVEWAYS.

ITEM NO.	STRIPING AND MESSAGES		UNIT	S. A. P. 118-160-18 ARROWHEAD RD	S. A. P. 118-151-09 KENWOOD AVE	S. A. P. 69-634-11 KENWOOD AVE - HOWARD GNESEN RD
	ITEM					
0564.602	PAVEMENT MESSAGE (THRU ARROW) EPOXY		EACH	2		
0564.602	PAVEMENT MESSAGE (RIGHT ARROW) EPOXY		EACH	2		2
0564.602	PAVEMENT MESSAGE (LEFT THRU ARROW) EPOXY		EACH	5	1	
0564.602	PAVEMENT MESSAGE (RIGHT THRU ARROW) EPOXY		EACH	3	1	
0564.602	PAVEMENT MESSAGE (ONLY) EPOXY		EACH	1		1
0564.603	4" DOUBLE SOLID LINE YELLOW-EPOXY		LIN FT	983 933	416 0	1666 1557
0564.603	4" SOLID LINE WHITE-EPOXY		LIN FT	2579 1932	832 497	3932 3082
0564.603	4" BROKEN LINE WHITE-EPOXY		LIN FT	670 340	146 0	310 280
0564.603	6" SOLID LINE WHITE-EPOXY		LIN FT	530 508		
0564.603	24" SOLID LINE WHITE-EPOXY		LIN FT	100 102		12 13

GENERAL NOTES

- ① 24" SOLID LINE (WHITE) - STOP BAR
- ② 6" SOLID LINE (WHITE) - CROSSWALK
- ③ 4" SOLID LINE (WHITE)
- ④ 4" BROKEN LINE (WHITE)
- ⑤ 4" DOUBLE SOLID LINE (YELLOW)

ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MINNESOTA
MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, INCLUDING
THE FIELD MANUAL DATED APRIL 1995.
ALL PAVEMENT MARKINGS SHALL BE EPOXY.

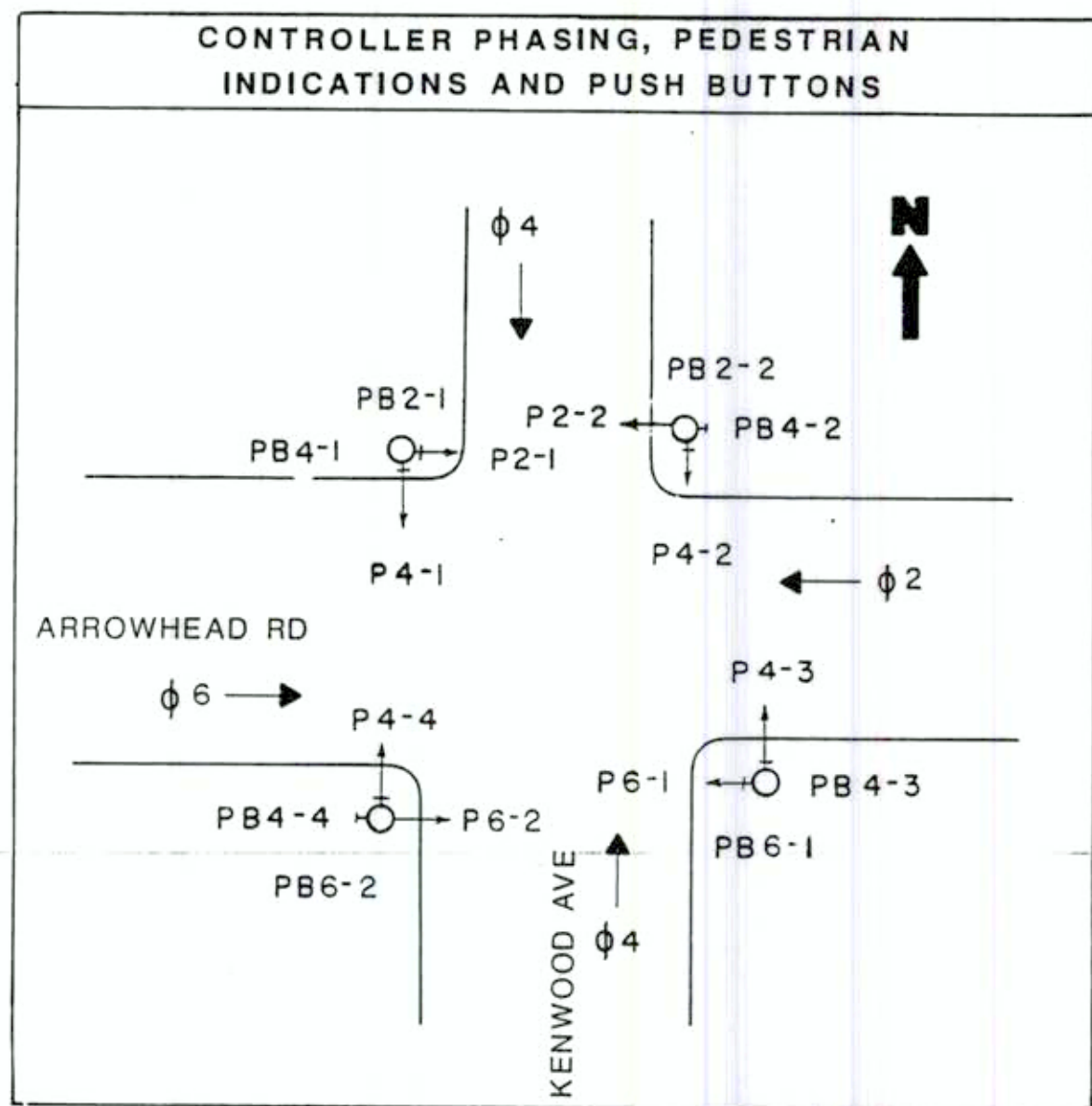
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION,
OR REPORT WAS PREPARED BY ME OR UNDER MY
DIRECT SUPERVISION AND THAT I AM A DULY
REGISTERED PROFESSIONAL ENGINEER UNDER THE
LAWS OF THE STATE OF MINNESOTA.
Frank D. Huber
DATE 2-20-98 REG. NO. 7756

SIGNAL INDICATION CHART							
FACE	PHASE	FLASH	TYPE & SIZE (INCHES)				
2-1, 2-2	2	R	12	12	12		
2-3	2	R	12	12	12		
6-1, 6-2, 6-3	2	R	12	12	12		
4-1, 4-2	4	R	12	12	12		
4-3, 4-4	4	R	12	12	12		

DETECTOR CHART			
DESIGNATION	PHASE	SIZE	FUNCTION
D2-1	2	6'x6'	1
D2-2	2	6'x6'	1
D6-1	2	6'x6'	1
D6-2	2	6'x6'	1
D4-1	4	14'x8'	1
D4-2	4	6'x12'	1
D4-3	4	6'x12'	2

FUNCTION:
 1. CALL & EXTEND
 2. DELAY CALL, IMMEDIATE EXTEND

SERVICE EQUIPMENT
 S.O.P. POLE INPLACE - USE INPLACE
 F & I SERVICE EQUIPMENT (SEE SPECIAL PROVISIONS) -
 EXTEND 1-2" RSC WITH 2-1/C #6, 4-1/C #10 AND
 1-1/C #6 BR.GR. INTO HH #2

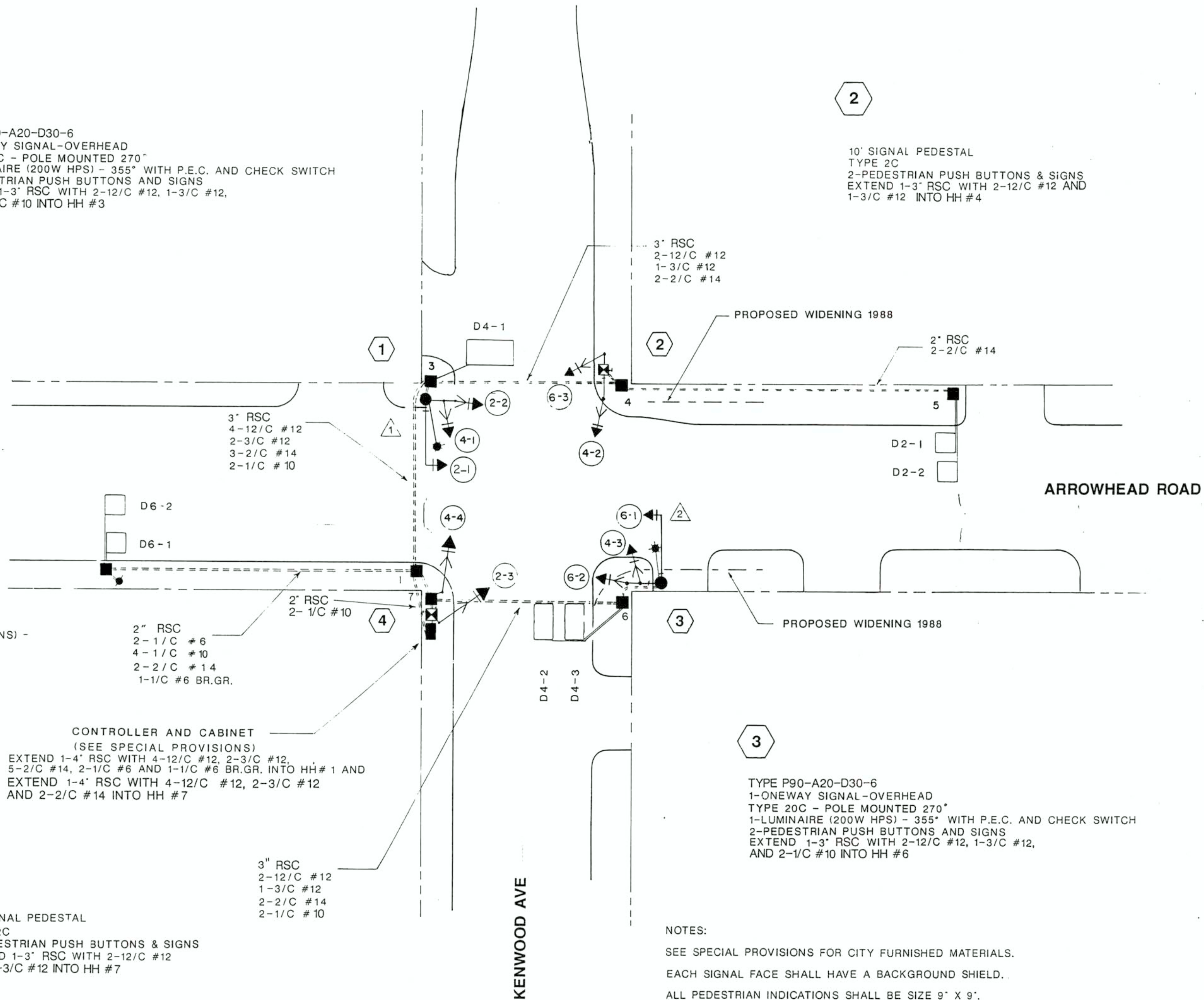


1

TYPE P90-A20-D30-6
 1-ONEWAY SIGNAL-OVERHEAD
 TYPE 20C - POLE MOUNTED 270"
 1-LUMINAIRE (200W HPS) - 355" WITH P.E.C. AND CHECK SWITCH
 2-PEDESTRIAN PUSH BUTTONS AND SIGNS
 EXTEND 1-3" RSC WITH 2-12/C #12, 1-3/C #12,
 AND 2-1/C #10 INTO HH #3

2

10' SIGNAL PEDESTAL
 TYPE 2C
 2-PEDESTRIAN PUSH BUTTONS & SIGNS
 EXTEND 1-3" RSC WITH 2-12/C #12 AND
 1-3/C #12 INTO HH #4



4

10' SIGNAL PEDESTAL
 TYPE 2C
 2-PEDESTRIAN PUSH BUTTONS & SIGNS
 EXTEND 1-3" RSC WITH 2-12/C #12
 AND 1-3/C #12 INTO HH #7

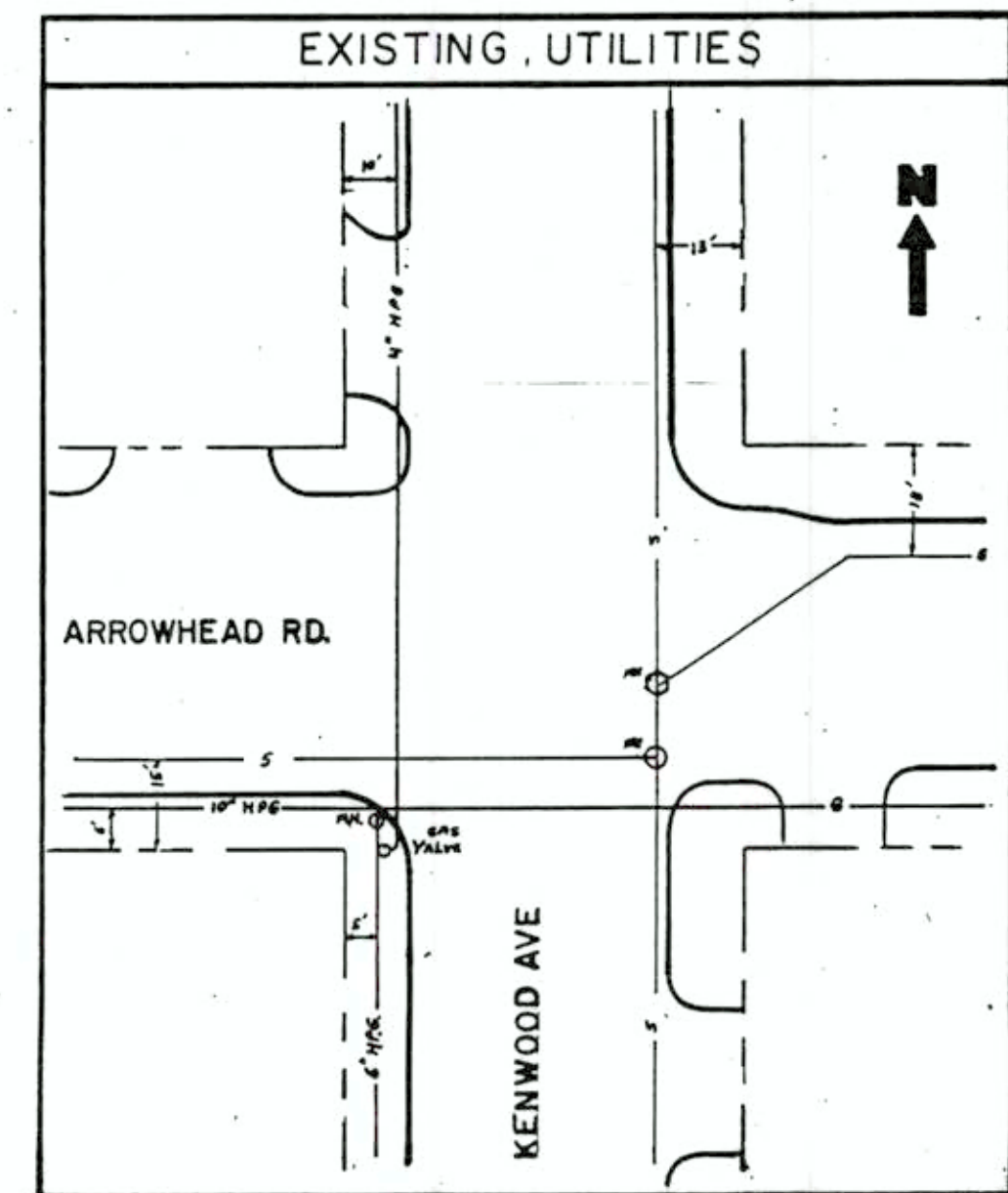
CONTROLLER AND CABINET
 (SEE SPECIAL PROVISIONS)
 EXTEND 1-4" RSC WITH 4-12/C #12, 2-3/C #12,
 5-2/C #14, 2-1/C #6 AND 1-1/C #6 BR.GR. INTO HH #1 AND
 EXTEND 1-4" RSC WITH 4-12/C #12, 2-3/C #12
 AND 2-2/C #14 INTO HH #7

3

TYPE P90-A20-D30-6
 1-ONEWAY SIGNAL-OVERHEAD
 TYPE 20C - POLE MOUNTED 270"
 1-LUMINAIRE (200W HPS) - 355" WITH P.E.C. AND CHECK SWITCH
 2-PEDESTRIAN PUSH BUTTONS AND SIGNS
 EXTEND 1-3" RSC WITH 2-12/C #12, 1-3/C #12,
 AND 2-1/C #10 INTO HH #6

NOTES:
 SEE SPECIAL PROVISIONS FOR CITY FURNISHED MATERIALS.
 EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
 ALL PEDESTRIAN INDICATIONS SHALL BE SIZE 9" X 9".
 PROVIDE EXTENDED SIGNAL BRACKETING IN CONJUNCTION WITH TYPE 20C SIGNAL
 BRACKET AT POLES 1 AND 3 FOR BACKGROUND SHIELD ON INSIDE SIGNAL FACE.

I hereby certify that this plan, specification or
 report was prepared 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 2-20-98 Reg. No. 7756



INTERSECTION LAYOUT

INTERSECTION OF ARROWHEAD RD
 AND KENWOOD AVE
 IN DULUTH

RECORD DRAWING 2/98

FOR INFORMATION ONLY

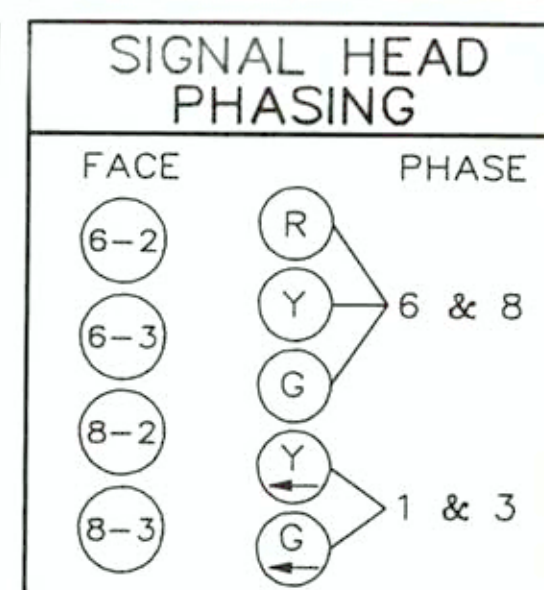
CSAH 69-634-08

SAP 118-160-18
 SAP 118-160-12

CITY JOB NO. 8168 TR 87

SHEET 2 OF 3

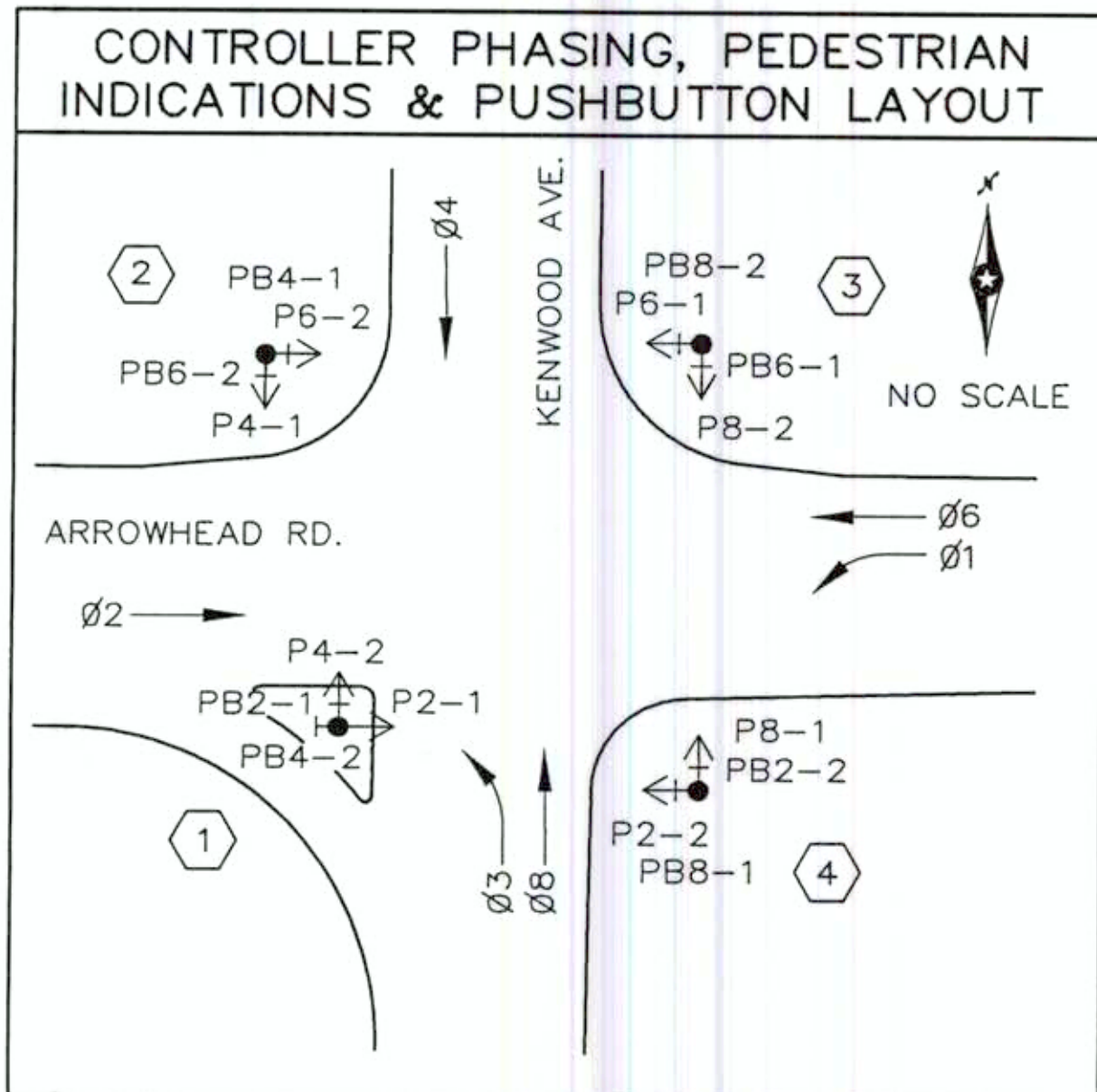
SIGNAL INDICATION CHART						
ALL SIGNAL INDICATIONS SHALL BE 12 INCH						
SIGNAL FACE	R	Y	G	RLTA	YLTA	GLTA
2-1,2-2,2-3	●	●	●			
4-1,4-2,4-3	●	●	●			
6-1	●	●	●			
6-2,6-3	●	●	●		←	←
8-1	●	●	●			
8-2,8-3	●	●	●		←	←



- 2 P90 FOUNDATION
TYPE P90 (MOD.)-A30-D30-9
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
R10-12 (36"x48") SIGN OVERHEAD
EXTEND 3" NMC INTO HH-4 WITH:
2 - 12/C #12, 2 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

- A EQUIPMENT PAD (SEE DETAIL)
INSTALL CONTROLLER & CABINET
EXTEND 4" NMC INTO HH-1 WITH:
4 - 12/C #12, 3 - 3/C #12,
13 - 2/C #14, 2 - 3/C #20
EXTEND 4" NMC INTO HH-12 WITH:
4 - 12/C #12, 2 - 3/C #12,
5 - 2/C #14, 2 - 3/C #20
3" NMC STUBBED OUT (THREAD
AND CAP BOTH ENDS)
2" NMC STUBBED OUT (THREAD
AND CAP BOTH ENDS)
(FUTURE TELEPHONE DROP)

- D SIGNAL SERVICE CABINET
METER AND DISCONNECT
EXTEND 1 1/4" NMC INTO CONTROLLER
CABINET WITH:
2 - 1/C #6 AND 1 - 1/C #6 BR.GR.
EXTEND 2" NMC INTO HH-13 WITH:
3 - 1/C #4 AND 1 - 1/C #6 BR.GR.
EXTEND 1 1/4" NMC INTO HH-1 WITH:
4 - 3/C #12 (LUM.)

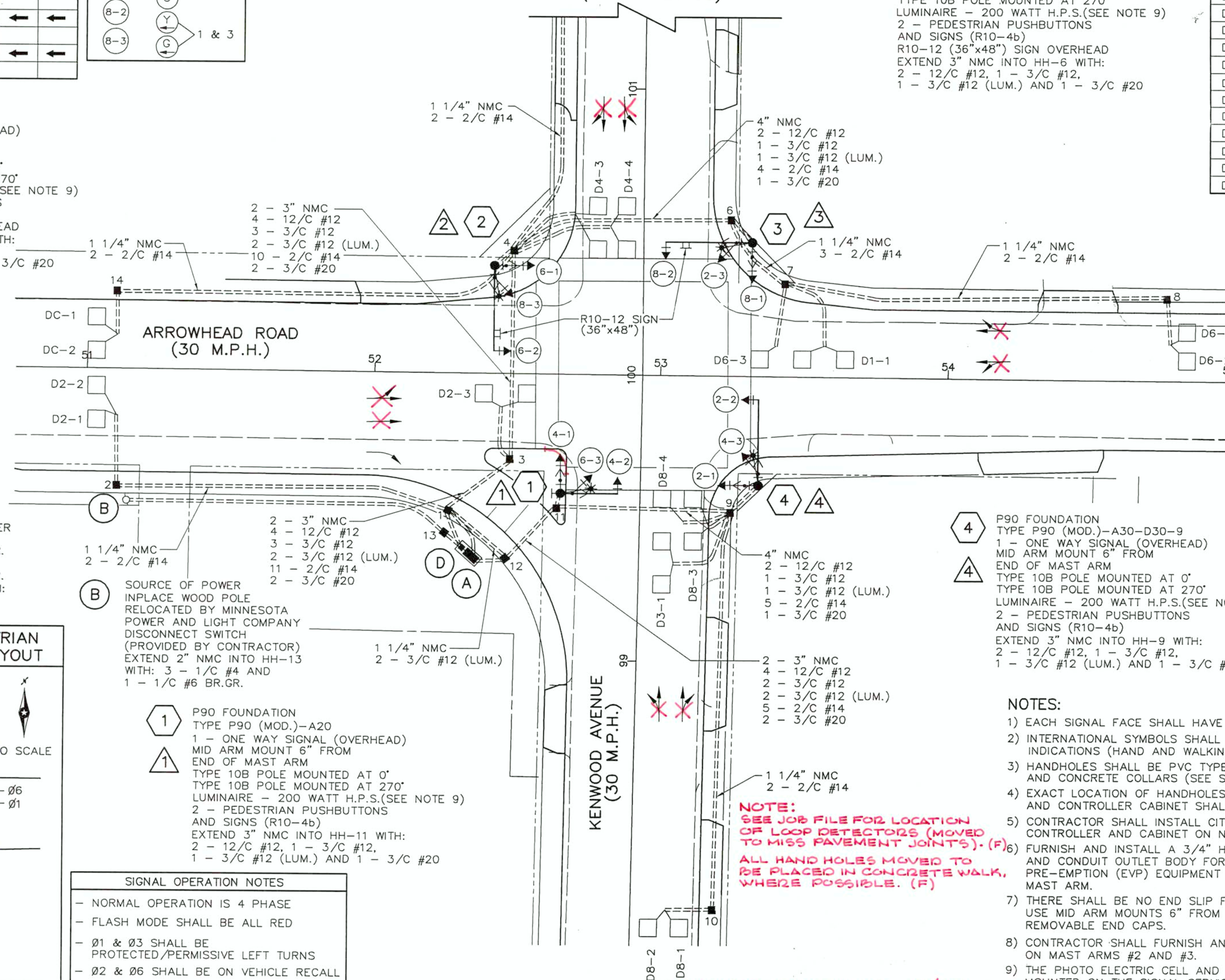


- B SOURCE OF POWER
INPLACE WOOD POLE
RELOCATED BY MINNESOTA
POWER AND LIGHT COMPANY
DISCONNECT SWITCH
(PROVIDED BY CONTRACTOR)
EXTEND 2" NMC INTO HH-13
WITH: 3 - 1/C #4 AND
1 - 1/C #6 BR.GR.

- 1 P90 FOUNDATION
TYPE P90 (MOD.)-A20
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
EXTEND 3" NMC INTO HH-11 WITH:
2 - 12/C #12, 1 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

- SIGNAL OPERATION NOTES**
- NORMAL OPERATION IS 4 PHASE
 - FLASH MODE SHALL BE ALL RED
 - Ø1 & Ø3 SHALL BE PROTECTED/PERMISSIVE LEFT TURNS
 - Ø2 & Ø6 SHALL BE ON VEHICLE RECALL

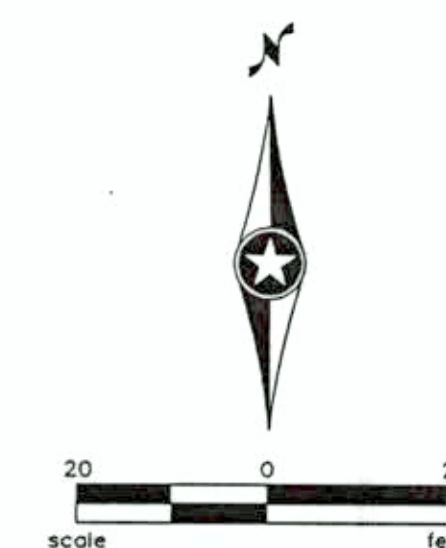
MATCH LINE "A"
(SEE SHEET 38)



- 3 P90 FOUNDATION
TYPE P90 (MOD.)-A30
1 - ONE WAY SIGNAL (OVERHEAD)
MID ARM MOUNT 6" FROM
END OF MAST ARM
TYPE 10B POLE MOUNTED AT 0'
TYPE 10B POLE MOUNTED AT 270'
LUMINAIRE - 200 WATT H.P.S.(SEE NOTE 9)
2 - PEDESTRIAN PUSHBUTTONS
AND SIGNS (R10-4b)
R10-12 (36"x48") SIGN OVERHEAD
EXTEND 3" NMC INTO HH-6 WITH:
2 - 12/C #12, 1 - 3/C #12,
1 - 3/C #12 (LUM.) AND 1 - 3/C #20

LOOP DETECTOR CHART			DISTANCE TO CROSSWALK
DESIGNATION	SIZE/FT.	FUNCTION	
D1-1	2-6'X6'	(7)*	20',35'
D2-1,D2-2	1-6'X6'	(3)	150'
D2-3	2-6'X6'	(1)	0',15'
D3-1	2-6'X6'	(7)**	20',35'
D4-1,D4-2	1-6'X6'	(3)	150'
D4-3	2-6'X6'	(7)	0',15'
D4-4	2-6'X6'	(1)	0',15'
D6-1,D6-2	1-6'X6'	(3)	150'
D6-3	1-6'X6'	(7)	0'
D8-1,D8-2	1-6'X6'	(3)	150'
D8-3	2-6'X6'	(7)	0',15'
D8-4	1-6'X6'	(7)	0'
DC-1	1-6'X6'	COUNTING	SEE PLAN
DC-2	1-6'X6'	COUNTING	SEE PLAN

- FUNCTION NOTES:**
- (1) CALL AND EXTEND
 - (3) EXTEND ONLY
 - (7) DELAY CALL / IMMEDIATE EXTEND
 - * (7) DELAY CALL, IMMEDIATE EXTEND PHASE 1 & 6
 - ** (7) DELAY CALL, IMMEDIATE EXTEND PHASE 3 & 8



I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
James D. Epler
Date 2-20-98 Reg. No. 7756

NOTE:
SEE JOB FILE FOR LOCATION OF LOOP DETECTORS (MOVED TO MISS PAVEMENT JOINTS). (F)
ALL HAND HOLES MOVED TO BE PLACED IN CONCRETE WALK, WHERE POSSIBLE. (F)

- NOTES:**
- EACH SIGNAL FACE SHALL HAVE A BACKGROUND SHIELD.
 - INTERNATIONAL SYMBOLS SHALL BE USED FOR ALL PEDESTRIAN INDICATIONS (HAND AND WALKING PERSON) (SEE SPECIAL PROVISIONS).
 - HANDHOLES SHALL BE PVC TYPE WITH METAL FRAMES, COVERS AND CONCRETE COLLARS (SEE SPECIAL PROVISIONS).
 - EXACT LOCATION OF HANDHOLES, PEDESTALS, POLES, LOOP DETECTORS AND CONTROLLER CABINET SHALL BE DETERMINED BY THE ENGINEER.
 - CONTRACTOR SHALL INSTALL CITY OF DULUTH FURNISHED CONTROLLER AND CABINET ON NEW FOUNDATION.
 - FURNISH AND INSTALL A 3/4" HALF COUPLING, 3/4" NIPPLE AND CONDUIT OUTLET BODY FOR FUTURE EMERGENCY VEHICLE PRE-EMPTION (EVP) EQUIPMENT 4' FROM THE END OF EACH MAST ARM.
 - THERE SHALL BE NO END SLIP FITTERS ON THE MAST ARMS. USE MID ARM MOUNTS 6" FROM END FACING TRAFFIC, WITH REMOVABLE END CAPS.
 - CONTRACTOR SHALL FURNISH AND INSTALL R10-12 (36"x48") SIGN ON MAST ARMS #2 AND #3.
 - THE PHOTO ELECTRIC CELL AND CHECK SWITCH SHALL BE MOUNTED ON THE SIGNAL SERVICE CABINET (SEE SHEET 36).

RECORD DRAWING 2/98

NO	DATE	BY	CKD	APPR	REVISION
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

NAME: H:\SIGNALS\1753\53-INT DATE: JAN. 1996

53-INT FEB. 01, 1996

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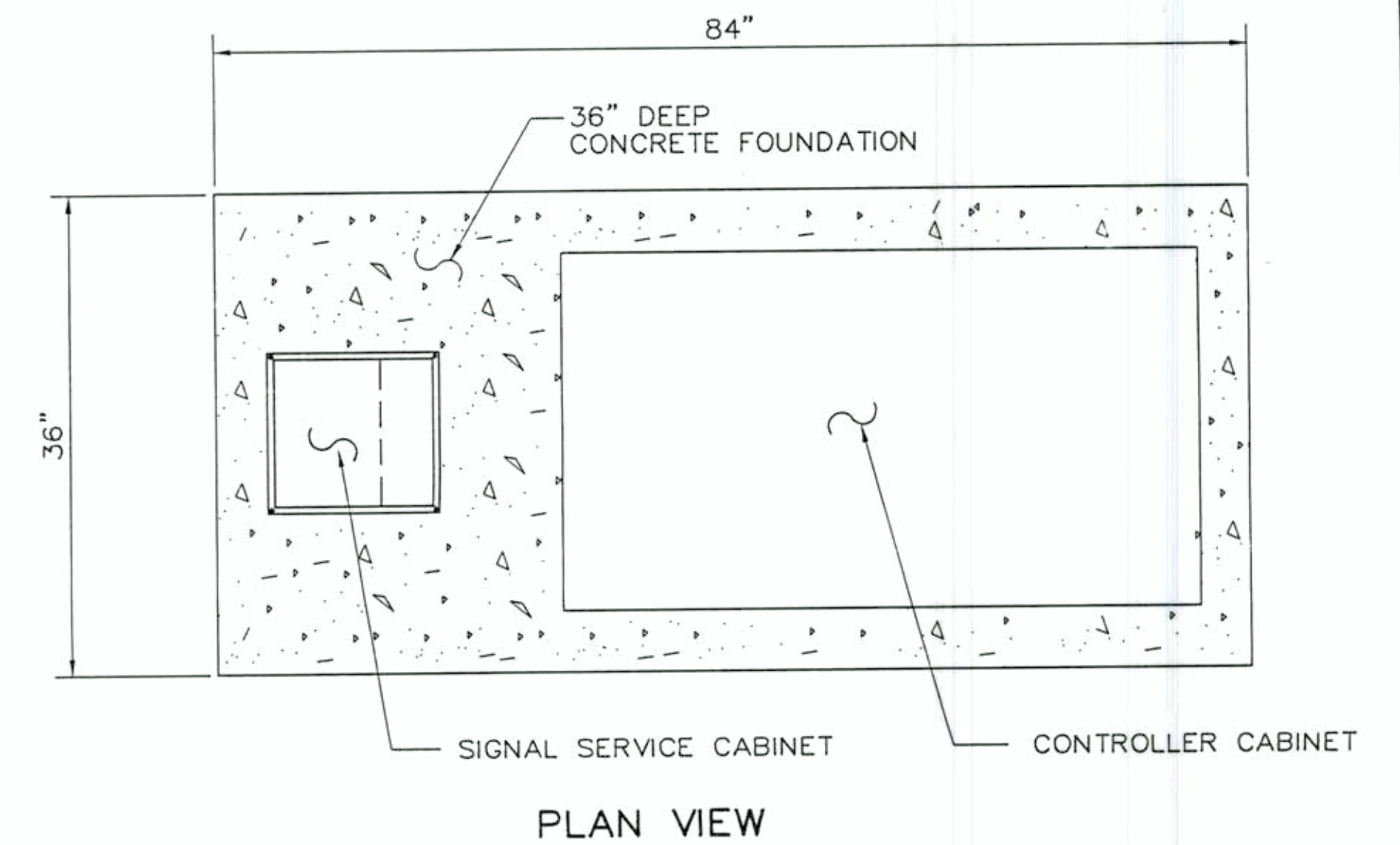
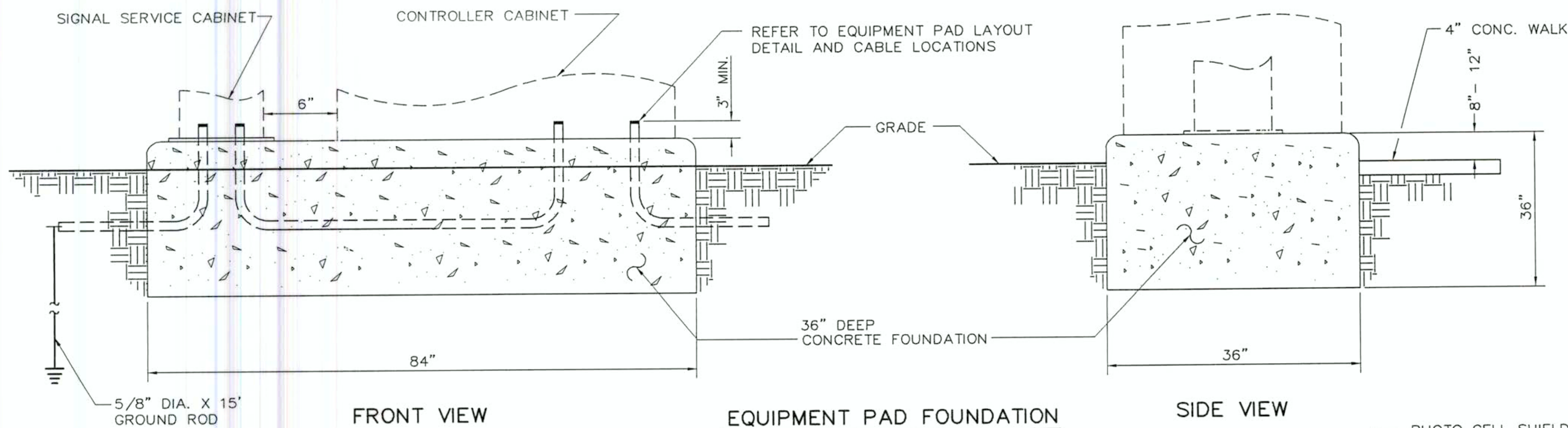
James D. Epler
Date 3-7-96 Reg. No. 10792

DRAWN BY
J.HAMRE
DESIGNED BY
M.COTE
CHECKED BY
D.EYLER
COMM. NO.
0951753

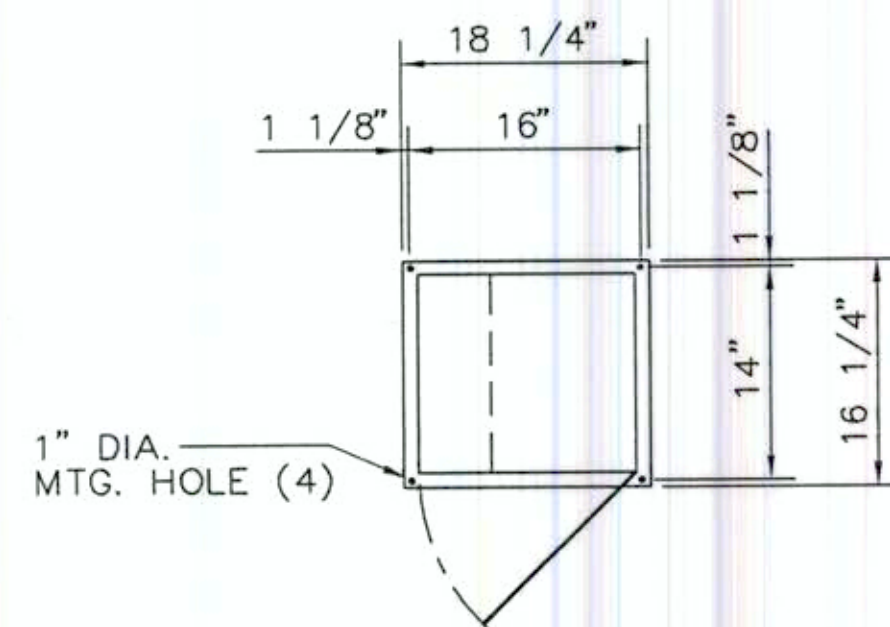
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GROUP, INC.

CITY OF DULUTH
ARROWHEAD ROAD AND KENWOOD AVENUE
INTERSECTION LAYOUT

SHEET
35F
OF
68



SIGNAL SERVICE CABINET DETAILS



BASE LAYOUT

CONSTRUCTION NOTES

PEDESTAL SHALL BE FABRICATED FROM #12 GA. ALL FORMED AND WELDED COLD ROLLED STEEL FOR USE AS OUTDOOR WEATHERPROOF SERVICE ENTRANCE EQUIPMENT. DOOR OPENINGS SHALL BE SEALED WITH NEOPRENE GASKET. ALL HINGES, HINGE PINS AND LOCKS SHALL BE OF NON-CORRODING CONSTRUCTION. THE PEDESTAL SHALL BE PROTECTED INSIDE AND OUTSIDE WITH A RUST INHIBITING RED IRON OXIDE PRIMER AND FINISHED WITH AN OVEN BAKED ENAMEL, ALUMINUM IN COLOR.

- 1) PROVIDE CLEARANCE TO REMOVE PHOTO CELL
- 2) PHOTO CELL LENS AND SHIELD SHALL BE ORIENTED TO ELIMINATE INTERFERENCE BY MAN MADE LIGHT SOURCES. PHOTO CELL LENS SHALL NORMALLY FACE NORTH.
- 3) PAINT 1 1/2\" RSC SAME AS CABINET AFTER TREATING SURFACE AS DIRECTED BY THE ENGINEER.

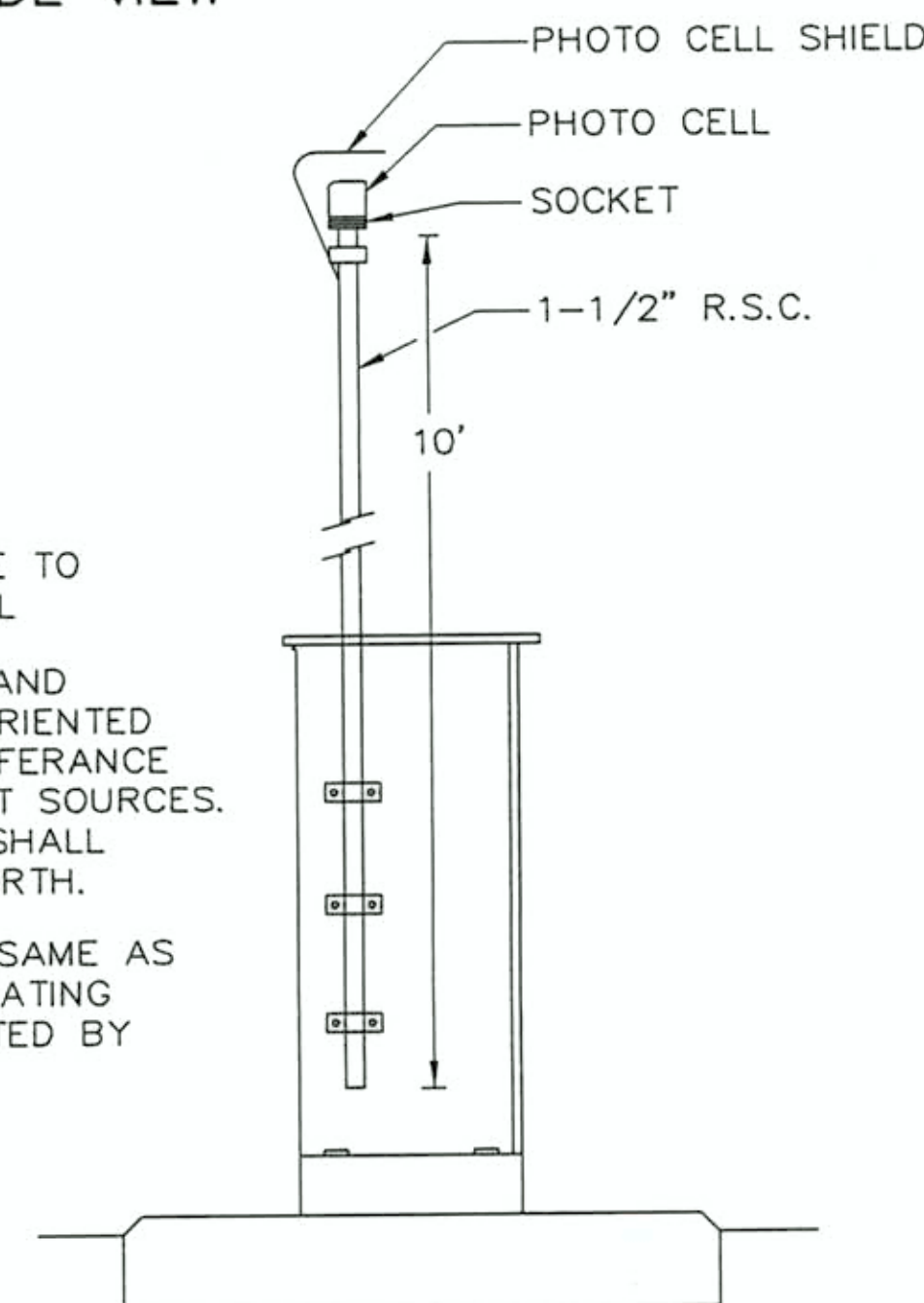
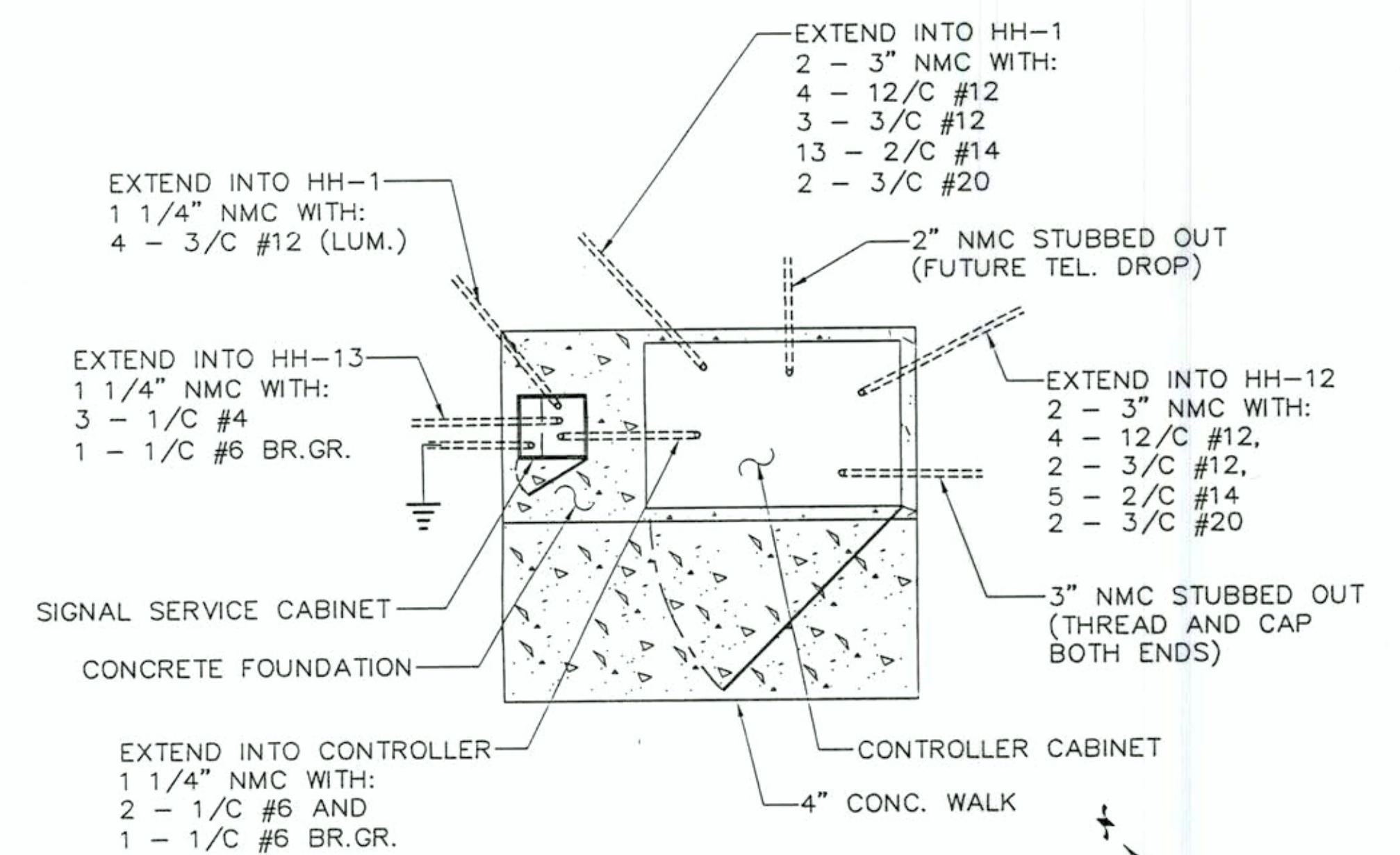


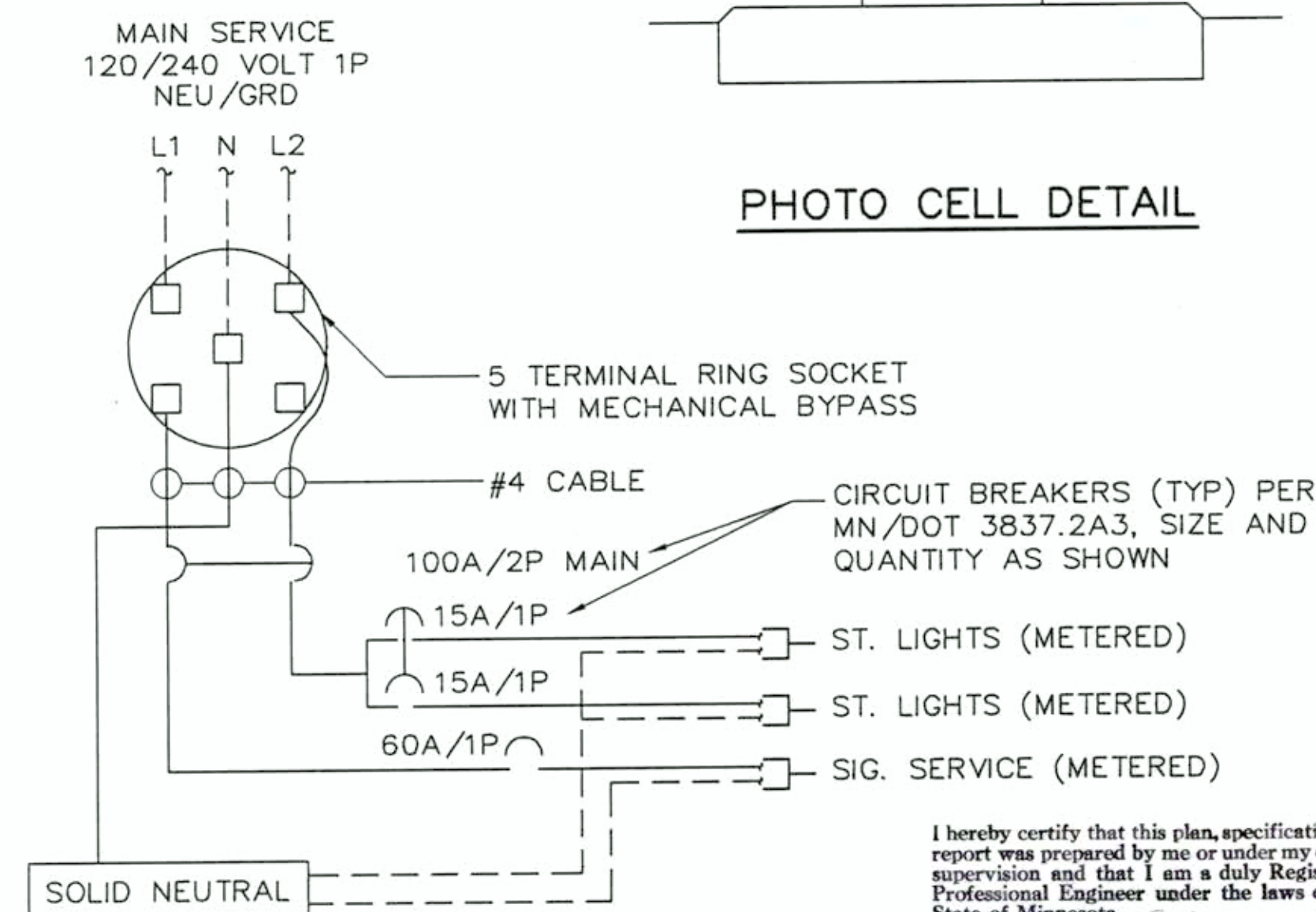
PHOTO CELL DETAIL



EQUIPMENT PAD DETAIL

NOTES:

- 1) ANCHOR RODS, NUTS AND WASHERS PER MN/DOT 3385 OR APPROVED EQUAL SET AS RECOMMENDED BY CABINET MANUFACTURER. NUMBER, SIZE AND LENGTH OF ANCHOR RODS SHALL BE AS REQUIRED BY THE CABINET MANUFACTURER.
- 2) UPPER PART OF FOUNDATION SHALL BE BEVELED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER IN THE FIELD.
- 3) TOP OF CONDUITS SHALL BE CAPPED AFTER INSTALLATION (UNTIL CABLES ARE INSTALLED). CONDUIT SHALL PROJECT A MINIMUM OF 2\"/>



SIGNAL SERVICE CABINET WIRING DIAGRAM

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Date 2-20-96 Reg. No. 7756

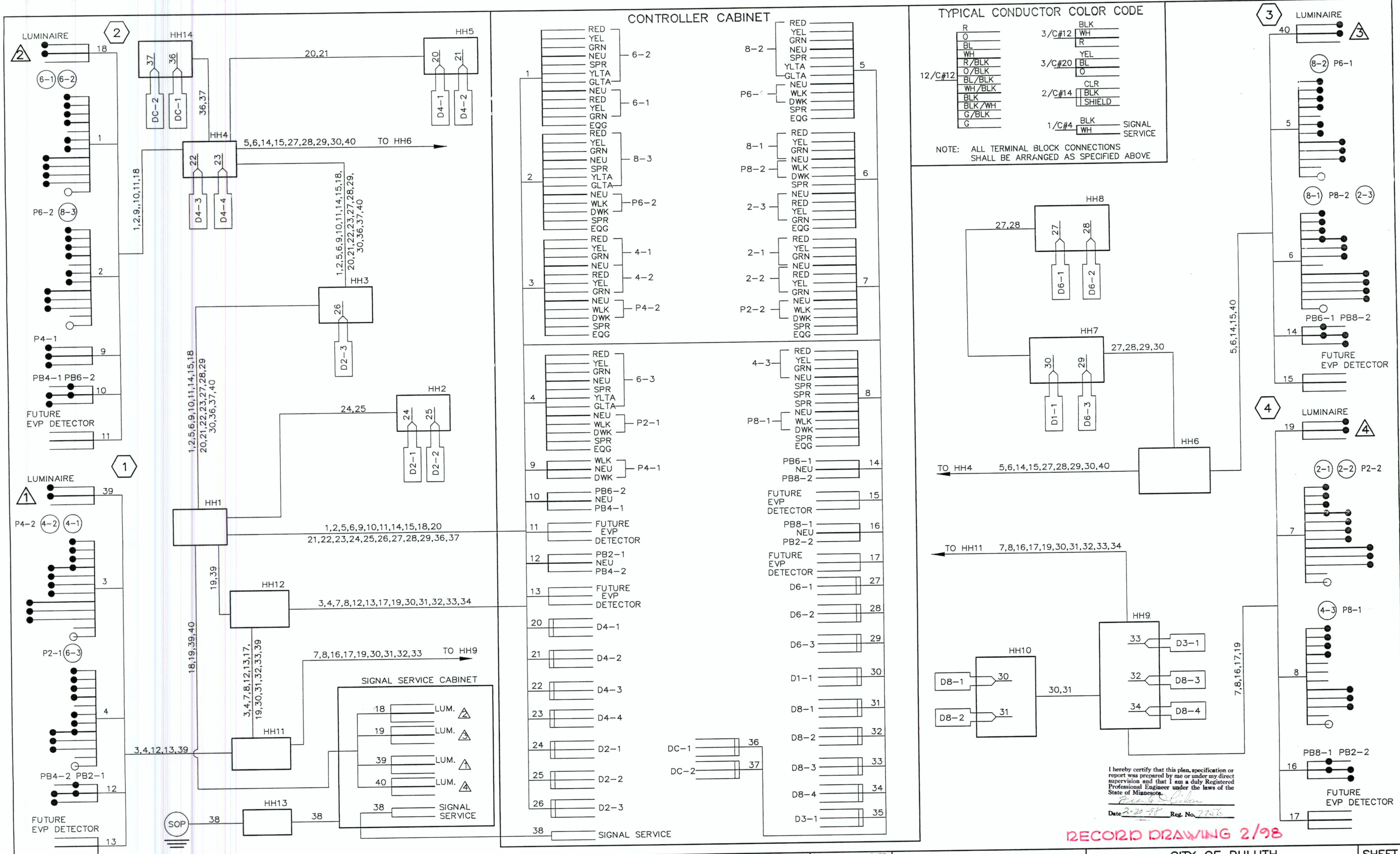
I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
Dennis P. Egle
Date 3-7-96 Reg. No. 10792

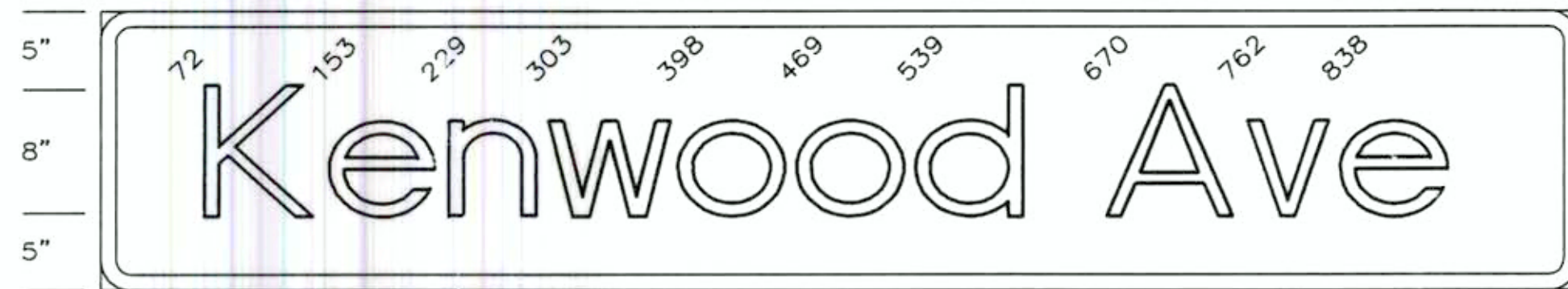
DRAWN BY J. HAMRE DATE 2-96
DESIGNED BY M. COTE DATE 2-96
CHECKED BY D. EYLER DATE 2-96
COMM. NO. 0951753

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CITY OF DULUTH
ARROWHEAD ROAD AND KENWOOD AVENUE
EQUIPMENT PAD DETAILS

SHEET
36F
OF
68

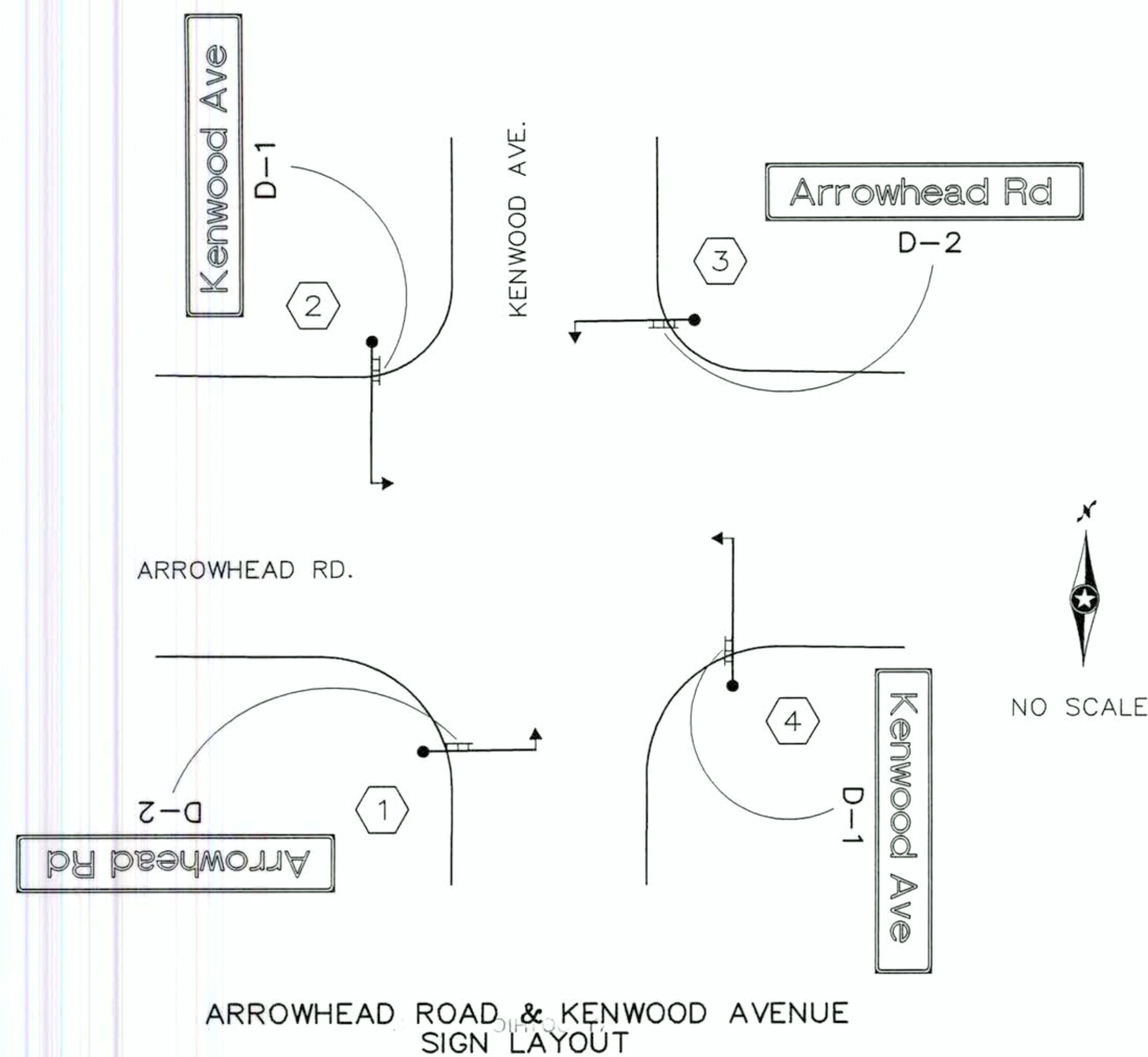




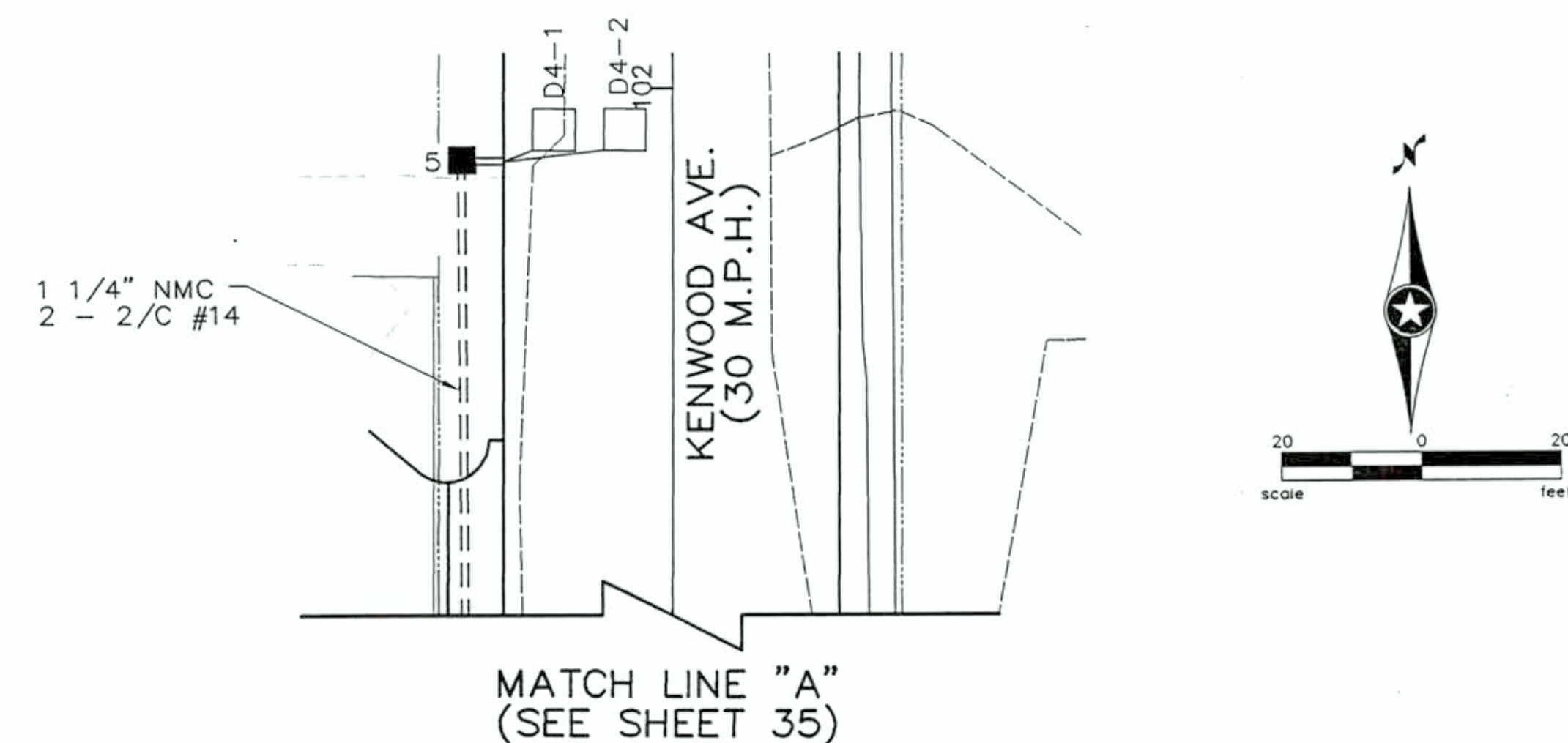
D-1 96" x 18", 3.0" R. 1.0" B.
LINE 1 = 81.71" : 8" - 6" "E" MODIFIED



D-2 102" x 18", 3.0" R. 1.0" B.
LINE 1 = 86.6" : 8" - 6" "E" MODIFIED



TYPE "D" SIGNS								
SIGN PANEL	SIZE	NUMBER REQUIRED	BRACKETS PER SIGN	BRACKET SPACING	SQUARE FT. PER SIGN	a	b	POLE NUMBER
D-1	96" x 18"	2	3	30"	12.0		1'-6"	(2) (4)
D-2	102" x 18"	2	3	30"	12.75		1'-6"	(1) (3)



NOTES:

- COLOR - HIGH INTENSITY WHITE LEGEND AND BORDER ON HIGH INTENSITY GREEN BACKGROUND, FULLY REFLECTORIZED.
- CORNERS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED.
- BORDERS SHALL BE AS SHOWN ON PLANS.
- FOR STRUCTURAL DETAILS, TYPE "D" SIGNS, SEE STANDARD SIGNS MANUAL, PAGE 105B.
- FOR TYPE "D" STRINGER AND PANEL - JOINT DETAIL, SEE STANDARD SIGNS MANUAL, PAGE 105.
- LETTERING STYLE SHALL BE HIGHWAY GOTHIC CONFORMING TO MN/DOT STANDARDS.

MAST ARM SIGN DIMENSIONING DETAIL

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Date 2-20-98 Reg. No. 7756

RECORD DRAWING 2/98

NO	DATE	BY	CKD	APPR	REVISION

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Date 3-7-96 Reg. No. 10792

DRAWN BY M.BRESSLER DATE 2-96
DESIGNED BY M.COTE 2-96
CHECKED BY D.EYLER 2-96
COMM. NO. 0952282

SRF CONSULTING GROUP, INC.

CITY OF DULUTH
ARROWHEAD ROAD AND KENWOOD AVENUE
MAST ARM SIGN DETAILS
AND MATCH LINE LAYOUT

SHEET 38F
OF 68