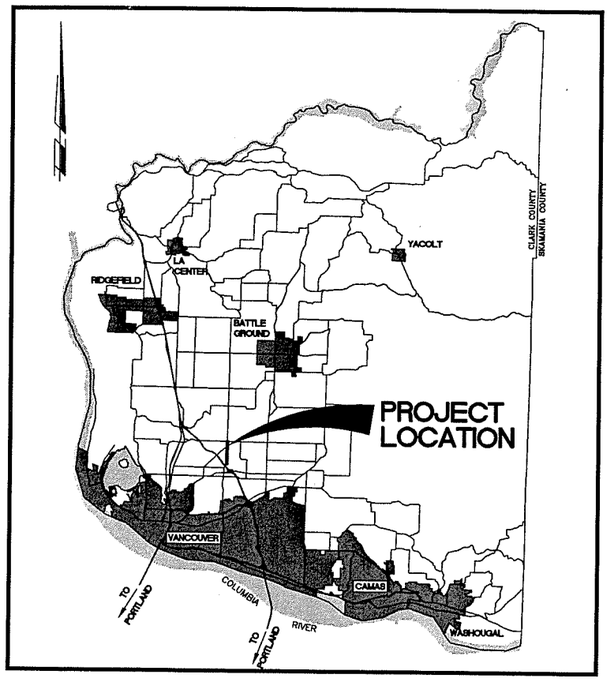
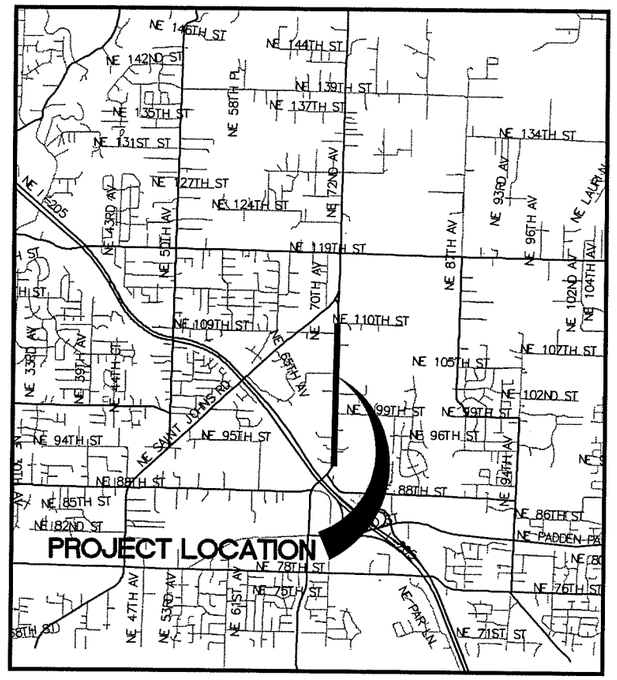
CAPITAL IMPROVEMENTS PROGRAM
COUNTY ROAD PROJECT #310122

NE 72ND AVENUE

VICINITY OF NE 88TH STREET TO NE ST. JOHNS ROAD

PLANS FOR THE CONSTRUCTION OF
ROADWAYS AND STORM DRAINAGE





INDEX OF SHEETS

1 CV1 COVER SHEET
2 SQ1 SUMMARY OF QUANTITIES AND LEGEND
3 LAY1 SHEET LAYOUT
4 TS1 TYPICAL SECTIONS
5 HV1 HORIZONTAL AND VERTICAL CONTROL
6 HV2 HORIZONTAL AND VERTICAL CONTROL
7 SSP1 SLURRY SEAL PLAN
8 EC1 EROSION CONTROL PLAN
9 EC2 EROSION CONTROL PLAN
10 EC3 EROSION CONTROL DETAILS & NOTES
11 RD1 ROADWAY DETAIL I
12 RD2 ROADWAY DETAIL II
13 DD1 DRAINAGE DETAILS I
14 DD2 DRAINAGE DETAILS II
15 DD3 DRAINAGE DETAILS III
16 DD4 DRAINAGE DETAILS IV
17 RW1 RETAINING WALL
18 RW2 RETAINING WALL DETAILS
19 PP1 PLAN & PROFILE (STA 35+00 TO STA 40+00)
20 PP2 PLAN & PROFILE (STA 40+00 TO STA 45+00)
21 PP3 PLAN & PROFILE (STA 45+00 TO STA 50+00)
22 PP4 PLAN & PROFILE (STA 50+00 TO STA 55+00)
23 PP5 PLAN & PROFILE (STA 55+00 TO STA 60+00)
24 PP6 PLAN & PROFILE (STA 60+00 TO STA 65+00)
25 PP7 PLAN & PROFILE (STA 65+00 TO STA 70+00)
26 PP8 PLAN & PROFILE (STA 70+00 TO STA 75+00)
27 PP9 PLAN & PROFILE (STA 75+00 TO STA 80+00)
28 PP10 PLAN & PROFILE (STA 80+00 TO STA 85+00)
29 PP11 PROFILES NE 99TH STREET AND BE 109TH STREET
30 DP1 DRAINAGE PLAN 72ND AVE (STA 35+00 TO 40+00)
31 DP1B DRAINAGE PLAN (STA 35+00 TO 40+00; LINE "J")
32 DP2 DRAINAGE PLAN 72ND AVE (STA 40+00 TO 45+00)
33 DP3 DRAINAGE PLAN 72ND AVE (STA 45+00 TO 50+00)
34 DP4 DRAINAGE PLAN 72ND AVE (STA 50+00 TO 55+00)
35 DP5 DRAINAGE PLAN 72ND AVE (STA 55+00 TO 60+00)
36 DP6 DRAINAGE PLAN 72ND AVE (STA 60+00 TO 65+00)
37 DP7 DRAINAGE PLAN 72ND AVE (STA 65+00 TO 70+00)
38 DP8 DRAINAGE PLAN 72ND AVE (STA 70+00 TO 75+00)
39 DP9 DRAINAGE PLAN 72ND AVE (STA 75+00 TO 80+00)
40 DP10 DRAINAGE PLAN 72ND AVE (STA 80+00 TO 85+00)
41 DP101 DRAINAGE PLAN; 99TH ST (STA 0+00 TO 5+00)
42 DP102 DRAINAGE PLAN; 99TH ST (STA 5+00 TO 10+00)
43 DP103 DRAINAGE PLAN; 99TH ST (STA 10+00 TO 15+00)
44 DP104 DRAINAGE PLAN; 99TH ST (STA 15+00 TO 20+00)
45 DP105 DRAINAGE PLAN; 99TH ST (STA 20+00 TO 25+00)
46 DP106 DRAINAGE PLAN; 99TH ST (STA 25+00 TO 30+00)
47 WP1 WATER LINE PLAN (STA 35+00 TO STA 40+00)
48 WP2 WATER LINE PLAN (STA 40+00 TO STA 45+00)
49 WP3 WATER LINE PLAN (STA 45+00 TO STA 50+00)
50 WP4 WATER LINE PLAN (STA 50+00 TO STA 55+00)
51 IO1 INTERSECTION PLAN
52 SS1 SIGNING & STRIPING PLAN
53 SS2 RAILROAD CROSSING AND SIGNING & STRIPING PLAN
54 SS3 SIGNING & STRIPING PLAN
55 SS4 SIGNING & STRIPING PLAN
56 SS5 SIGNING & STRIPING DETAILS
57 L1 LAYOUT MAIN TRACK AND SIDING
58 L2 PROFILES MAIN TRACK AND SIDING
59 L3 RAILROAD CROSS SECTIONS
60 L4 RAILROAD CONSTRUCTION DETAILS
61 L5 RAILROAD TYPICAL SECTIONS
62 L6 RAILROAD CONSTRUCTION DETAILS
63 RR1 RAILROAD CROSSING STANDARD PLANS
64 RR2 RAILROAD CROSSING STANDARD PLANS
65 RR3 RAILROAD CROSSING STANDARD PLANS
66 RR4 RAILROAD CROSSING STANDARD PLANS
67 RTD1 RAILROAD TRACK DETAILS
68 LS1 LANDSCAPE PLAN
69 LS2 LANDSCAPE PLAN
70 LS3 LANDSCAPE PLAN
71 LS4 LANDSCAPE PLAN
72 LS5 LANDSCAPE PLAN

PRELIMINARY

99% REVIEW SET

ENG #

COMMISSIONERS:

BETTY SUE MORRIS, Chair
MARC BOLDT, Commissioner
STEVEN J. STUART, Commissioner

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WASHINGTON

DEPARTMENT OF
PUBLIC WORKS

ENGINEERING PROGRAM- DESIGN SECTION

MICHAEL M. ENRICKS
STATE OF WASHINGTON
29030
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES:MAY 26, 2007

JOHN MILNE
STATE OF WASHINGTON
31148
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES:JULY 7, 2007

Quality Assurance	Project Manager	Public Works Director/ County Engineer
Larry Maddux, PLS DATE:	Carolyn Heniges, P.E. DATE:	Peter Capell, P.E. DATE:

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WASHINGTON

Recommended for Approval

Grading _____ Erosion _____

Storm Water Plan _____

Development Review Manager Date

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SUMMARY OF QUANTITIES

QUANT 310122	QUANT CITY VANC.	UNIT	BID ITEM DESCRIPTION
1		L.S.	MOBILIZATION
1		EST.	MINOR CHANGE
20		HOUR	REPLACEMENT STAKING SERVICES
			TRAFFIC CONTROL
6000		HOUR	FLAGGERS AND SPOTTERS
1		L.S.	TRAFFIC CONTROL SUPERVISOR
175		HOUR	OTHER TRAFFIC CONTROL LABOR
1		L.S.	OTHER TEMPORARY TRAFFIC CONTROL
214		S.F.	CONSTRUCTION SIGNS CLASS "A"
			PREPARATION
2		ACRE	CLEARING AND GRUBBING
1		EST.	ROADSIDE CLEANUP
1		L.S.	REMOVAL OF STRUCTURES AND OBSTRUCTIONS
			GRADING
13700		C.Y.	ROADWAY EXCAVATION (INCL HAUL)
6130		C.Y.	EMBANKMENT COMPACTION
0		TON	COMMON BORROW (INCL. HAUL)
0		TON	GRAVEL BORROW (INCL. HAUL)
750		MGAL	WATER
0		S.Y.	CONSTRUCTION GEOTEXTILE FOR SOIL STABILIZATION
			SURFACING
0		S.Y.	GRAVEL DWY; GRAVEL ACCESS RD; GRAVEL APPROACH
21212		TON	CRUSHED SURFACING BASE COURSE
667		TON	CRUSHED SURFACING TOP COURSE
0		TON	BALLAST (INCL. HAUL)
6236		TON	HMA CL A PG 64-22
7846		TON	HMA CL E PG 64-22
218		L.F.	SAWCUT EXISTING PAVEMENT
2140		S.Y.	PLANING BITUMINOUS PAVEMENT
0		S.Y.	ASPHALT CONCRETE EXTENSION
			STRUCTURES
0		L.F.	COATED CHAIN LINK FENCE FOR WALL TYPE 6
225		S.F.	GEOGRID SOIL REINFORCEMENT FABRIC
534		S.F.	STRUCTURAL EARTH WALL
			DRAINAGE STRUCTURES, STORM SEWERS, SANITARY SEWERS, WATERMAINS, AND
0		L.F.	CULVERT PIPE 18 IN. DIAM.
0		L.F.	CULVERT PIPE 24 IN. DIAM.
0		L.F.	CULVERT PIPE 30 IN. DIAM.
0		L.F.	CULVERT PIPE 36 IN. DIAM.
105		L.F.	DUCTILE IRON PIPE 10 IN. DIAM.
0		L.F.	DUCTILE IRON PIPE 12 IN. DIAM.
792		L.F.	STORM SEWER PIPE, 10 IN. DIAM.
1398		L.F.	STORM SEWER PIPE, 12 IN. DIAM.
0		L.F.	STORM SEWER PIPE, 15 IN. DIAM.
1368		L.F.	STORM SEWER PIPE, 18 IN. DIAM.
1373		L.F.	STORM SEWER PIPE, 24 IN. DIAM.
488		L.F.	STORM SEWER PIPE, 30 IN. DIAM.
1236		L.F.	STORM SEWER PIPE, 36 IN. DIAM.
2453		L.F.	STORM SEWER PIPE, 42 IN. DIAM.
130		L.F.	CLASS IV REINF. CONC. CULVERT PIPE 36 IN. DIAM.
136		L.F.	CLASS IV REINF. CONC. CULVERT PIPE 18 IN. DIAM.
0		L.F.	CLASS IV REINF. CONC. CULVERT PIPE 42 IN. DIAM.
118		L.F.	CLASS V REINF. CONC. CULVERT PIPE 36 IN. DIAM.
11		EACH	MANHOLE 48 IN. DIAM. TYPE 1
12		EACH	MANHOLE 60 IN. DIAM. TYPE 1
3		EACH	MANHOLE 72 IN. DIAM. TYPE 1
1		EACH	MANHOLE 84 IN. DIAM. TYPE 1
0		EACH	MANHOLE 96 IN. DIAM. TYPE 2
0		EACH	MANHOLE 48 IN. DIAM. TYPE 3
0		EACH	CONSTRUCT MANHOLE 48 IN. DIAM. TYPE 3 OVER EXISTING STM SEWER
1		EACH	MANHOLE 60 IN. DIAM. TYPE 3
9		EACH	MANHOLE 72 IN. DIAM. TYPE 3
1		EACH	MANHOLE 60 IN. DIAM. TYPE 2 WITH SUMP
0		EACH	MANHOLE 72 IN. DIAM. TYPE 2 WITH SUMP
0		EACH	MANHOLE 72 IN. DIAM. TYPE 3 WITH SUMP
10		EACH	CATCH BASIN TYPE 1
1		EACH	COMBINATION CURB INLET TYPE 1
16		EACH	COMBINATION INLET
14		EACH	CONCRETE COMBINATION CURB INLET, TYPE 2 48 IN. DIAM.
16		EACH	CONCRETE DITCH INLET
0		EACH	SIDEWALK CHASE
0		EACH	ADJUST MANHOLE/CATCH BASIN/INLET/DRYWELL METHOD 1
8100	2208	EACH	TRENCH SAFETY SYSTEM
1		EACH	TRASH RACK
	0	EACH	ADJUST WATER/GAS VALVE RIM, COVER & FRAME
	180	L.F.	DUCTILE IRON PIPE FOR WATER MAIN, 6 IN. DIAM.
	510	L.F.	DUCTILE IRON PIPE FOR WATER MAIN, 8 IN. DIAM.
	1518	L.F.	DUCTILE IRON PIPE FOR WATER MAIN, 12 IN. DIAM.
	2208	L.F.	TRENCH EXCAVATION AND BACKFILL
	7	EACH	MJ VALVE 8 INCH
	9	EACH	MJ BUTTERFLY VALVE 12 INCH
	1	EACH	12 IN. X 12 IN. MJ CROSS
	6	EACH	12 IN. X 12 IN. MJ TEE
	5	EACH	12 IN. X 6 IN. FLG TEE
	2	EACH	PLUG, 8"/12"
	7	EACH	TEMPORARY BLOWOFF VALVE
	5	EACH	6 IN. MJXFLG VALVE
	5	EACH	NEW FIRE HYDRANT ASSEMBLY

			EROSION CONTROL AND PLANTING
0		ACRE	EROSION CONTROL SEEDING AND MULCHING
260		S.Y.	EROSION CONTROL BLANKET (PERMANENT)
2		EACH	STABILIZED CONSTRUCTION ENTRANCE
2		EACH	TIRE WASH (Recirculating)
30		EACH	INLET PROTECTION
8500		L.F.	SILT FENCE
1		EACH	EROSION CONTROL & SPILL PREVENTION REINSPECTION FEE
150		HOUR	EROSION PREVENTION AND SEDIMENT CONTROL LEAD
1		L.S.	SPCC PLAN
782		C.Y.	TOPSOIL TYPE B
260		C.Y.	BARK MULCH
1		L.S.	LANDSCAPE RESTORATION
62		EACH	PSIPE 1-1/2 IN. CALIPER TREES (Prunus subhirtella "Autumn Flowering Cherry")
49		EACH	PSIPE 1-1/2 IN. CALIPER TREES (Acer platanoides "Crimson Sentry")
260		C.Y.	BARK MULCH
			OTHER
9381		L.F.	CEMENT CONC. TRAFFIC CURB AND GUTTER
958		S.Y.	CEMENT CONCRETE APPROACH, 3-DAY
253		L.F.	TYPE C PRECAST TRAFFIC CURB
150		L.F.	BEAM GUARDRAIL TYPE 1
2		EACH	BEAM GUARDRAIL FLARED TERMINAL
0		L.F.	FENCE RELOCATION
150		L.F.	COATED CHAIN LINK FENCE - TYPE 1
0		EACH	DOUBLE 14 FT. COATED CHAIN LINK GATE
5629		S.Y.	CEMENT CONCRETE SIDEWALK
113		C.Y.	LIGHT, LOOSE RIPRAP
1		L.S.	RAILROAD CROSSING AND SIDING UPGRADE
0		EACH	MAILBOX SUPPORT, TYPE 1
0		EACH	MAILBOX SUPPORT, TYPE 2
1		L.S.	RELOCATE POWER POLES

PRELIMINARY

LEGEND

- ROW LINE
- NEW EDGE OF PAVEMENT
- NEW CURB LINE
- NEW CENTER LINE
- NEW FENCE LINE
- NEW STORM DRAIN OR CULVERT
- NEW FILL LIMITS
- NEW CUT LIMITS
- SAWCUT LINE
- PERMANENT SLOPE EASEMENT
- NEW SILT FENCE
- EXISTING EDGE OF PAVEMENT
- EXISTING CURB LINE
- EXISTING CENTER LINE
- EXISTING FENCE LINE
- EXISTING TELEPHONE LINE
- EXISTING WATER LINE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING SANITARY SEWER LINE
- EXISTING STORM DRAINAGE
- EXISTING GAS LINE
- EXISTING CULVERT
- EXISTING DITCH CENTER LINE
- EXISTING GUARDRAIL

SYMBOLS

- NEW CATCH BASIN (CB)
- NEW MANHOLE (MH)
- NEW CURB INLET (CI)
- NEW COMBINATION CURB INLET (CCI)
- NEW MAIL BOX
- NEW HANDICAP RAMP
- CURVE TABLE
- EXISTING TRANSFORMER
- EXISTING ELEC TOWER
- EXISTING SANITARY SEWER MH
- EXISTING FIRE HYDRANT
- EXISTING CLEAN OUT
- EXISTING GAS VALVE
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SIGNAL POLE
- EXISTING TELEPHONE VAULT
- EXISTING TELEVISION BOX
- EXISTING WELL
- EXISTING BRUSH LINE
- EXISTING HEDGE
- EXISTING CURB INLET (CI)
- EXISTING CATCH BASIN (CB)
- EXISTING STORM MH
- EXISTING MISC MH
- EXISTING SHRUB
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING DECIDUOUS TREE
- EXISTING J BOX
- EXISTING TELEPHONE MANHOLE
- EXISTING TELEPHONE POLE
- EXISTING LIGHT
- EXISTING GUY ANCHOR
- EXISTING POWER POLE
- EXISTING MAIL BOX
- EXISTING TELEPHONE PEDESTAL
- EXISTING SPRINKLER HEAD
- TRAVERSE POINT
- TEST HOLE

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SHEET 2 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL M. EMRICK STATE OF WASHINGTON 29600 PROFESSIONAL ENGINEER EXPIRES MAY 26, 2005

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
SUMMARY OF QUANTITIES AND LEGEND

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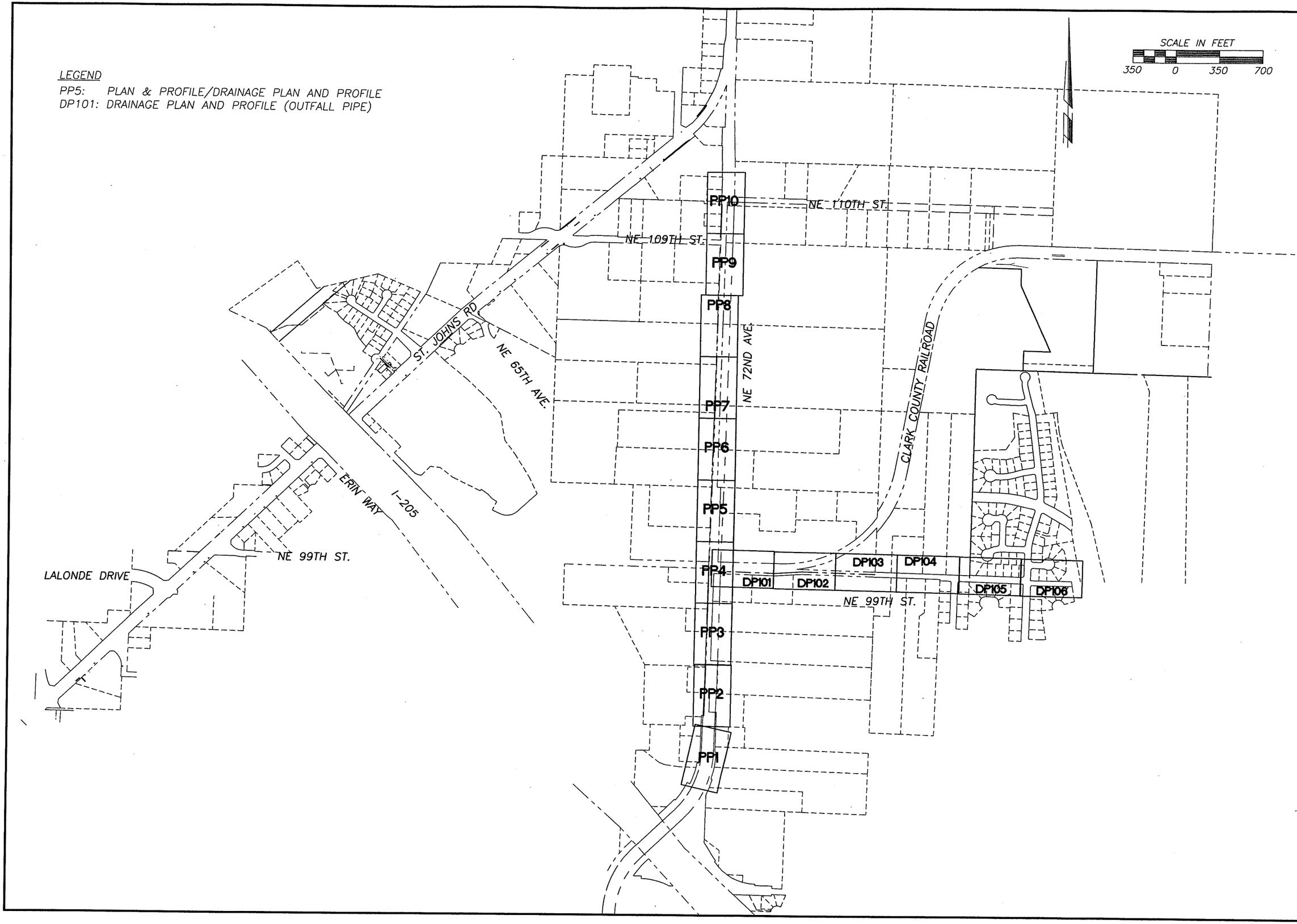
LEGEND

PP5: PLAN & PROFILE/DRAINAGE PLAN AND PROFILE

DP101: DRAINAGE PLAN AND PROFILE (OUTFALL PIPE)



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STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES MAY 26, 2007

ENGINEERING PROGRAM
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NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
SHEET LAYOUT

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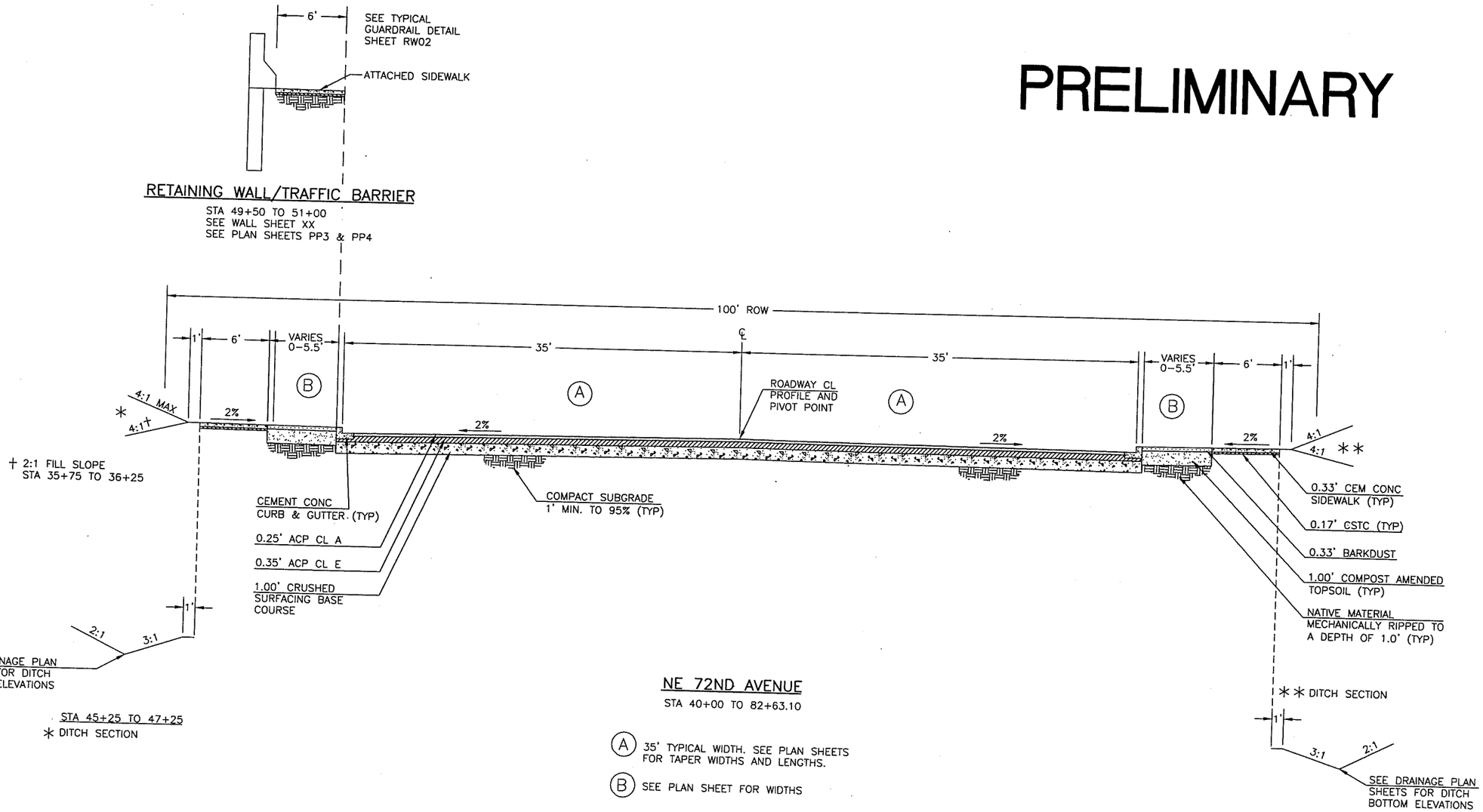

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STEVEN M. KURRICK STATE OF WASHINGTON 29030 REGISTERED PROFESSIONAL ENGINEER EXPIRES: MAY 28, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
TYPICAL SECTIONS

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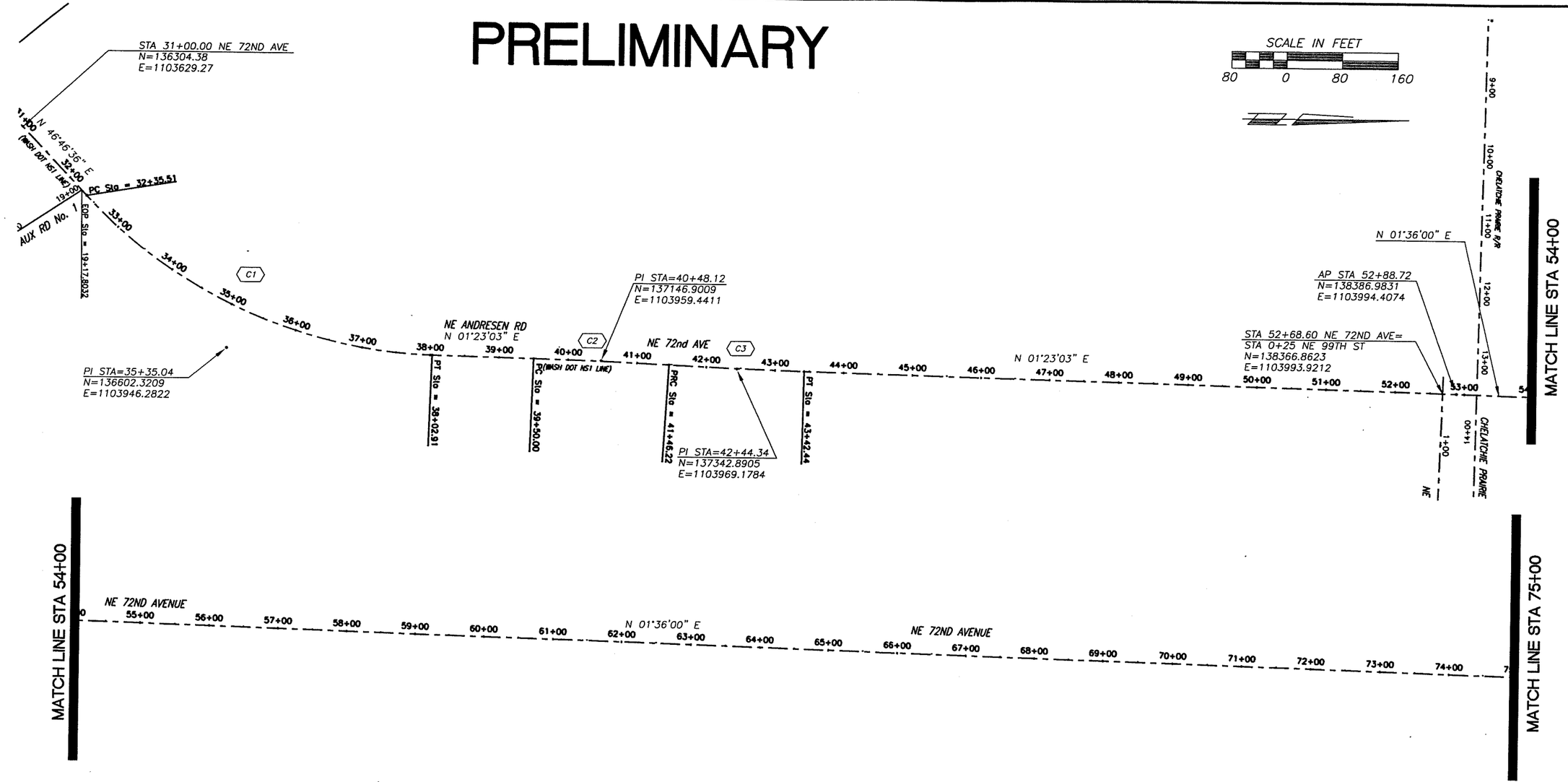
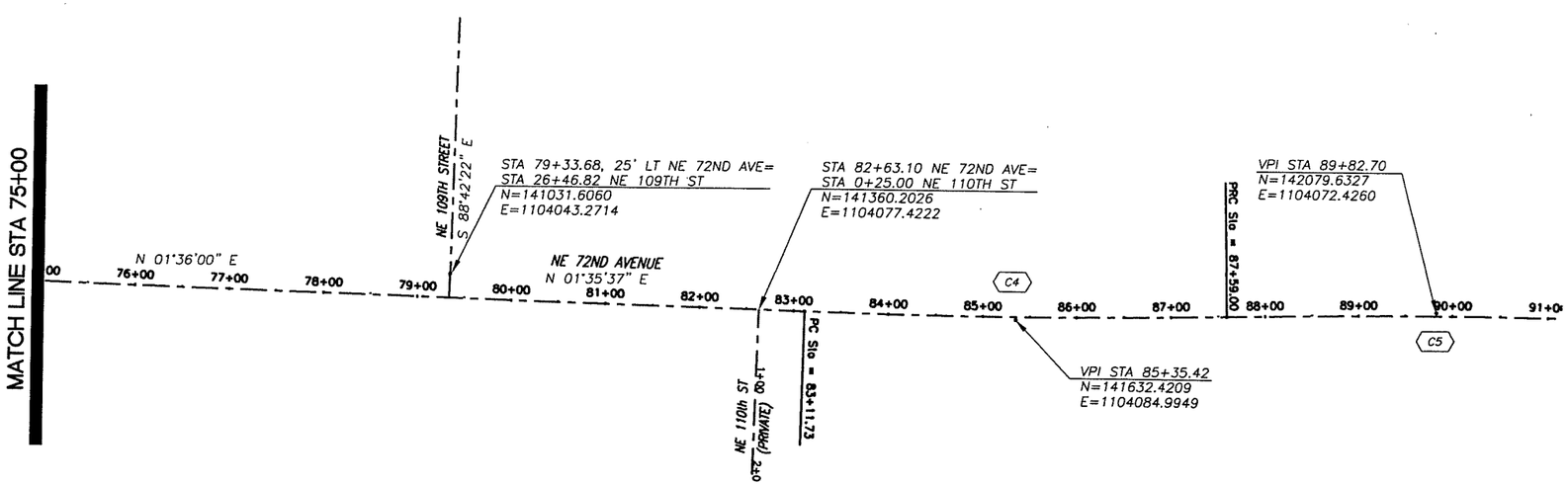
PRELIMINARY





NUMBER	DELTA ANGLE	TANGENT	RADIUS	ARC LENGTH	CHORD LENGTH
C1	45°23'33"	299.54'	716.20'	567.41'	552.69'
C2	01°27'36"	98.12'	7700.00'	196.22'	196.22'
C3	01°27'36"	98.12'	7700.00'	196.22'	196.22'
C4	03°12'12"	223.69'	8000.00'	447.27'	447.21'
C5	03°12'12"	223.69'	8000.00'	447.27'	447.21'

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SHEET 5 OF 72

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EXPIRES JULY 26, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
HORIZONTAL AND VERTICAL CONTROL

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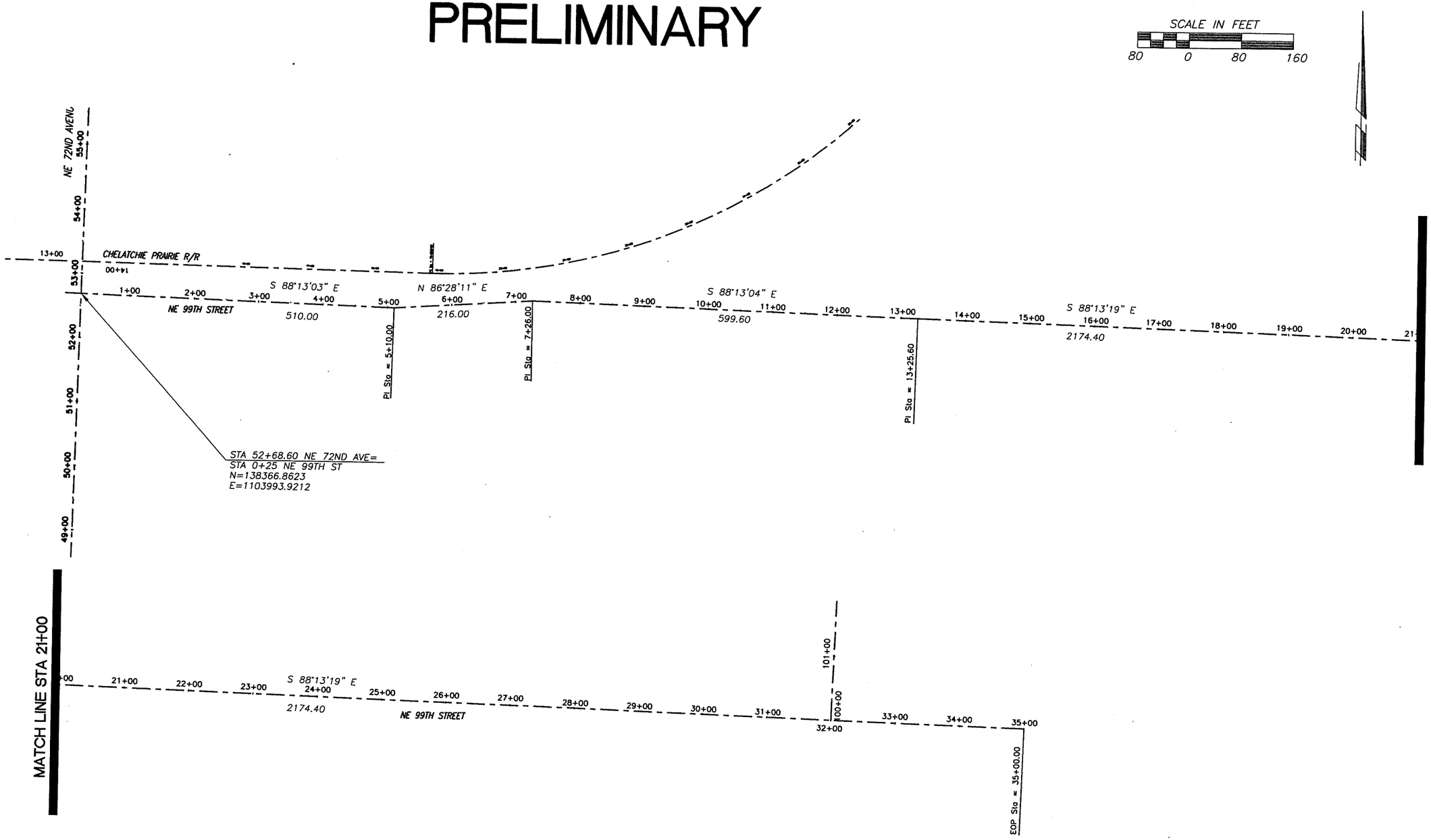

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VERT.	SEE SHEET
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SHEET	6 OF 72

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NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON
MICHAEL M. ELDRICK
29630
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: JULY 26, 2005

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
HORIZONTAL AND VERTICAL CONTROL

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WASHINGTON

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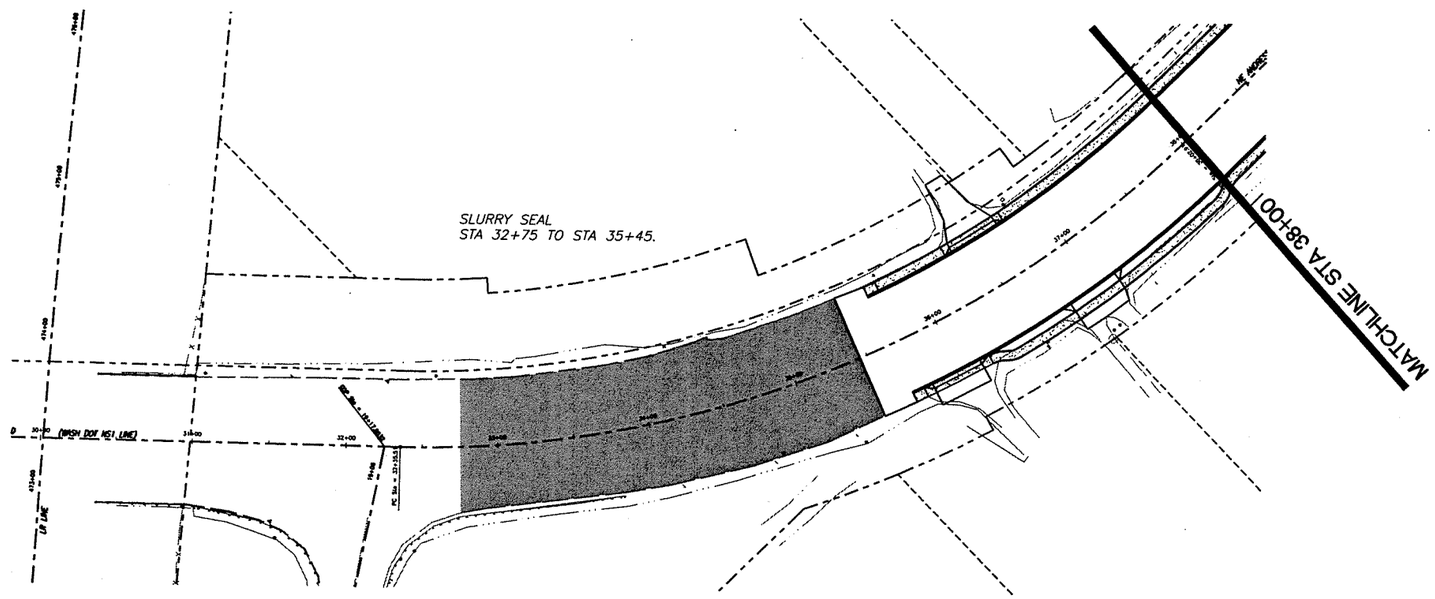
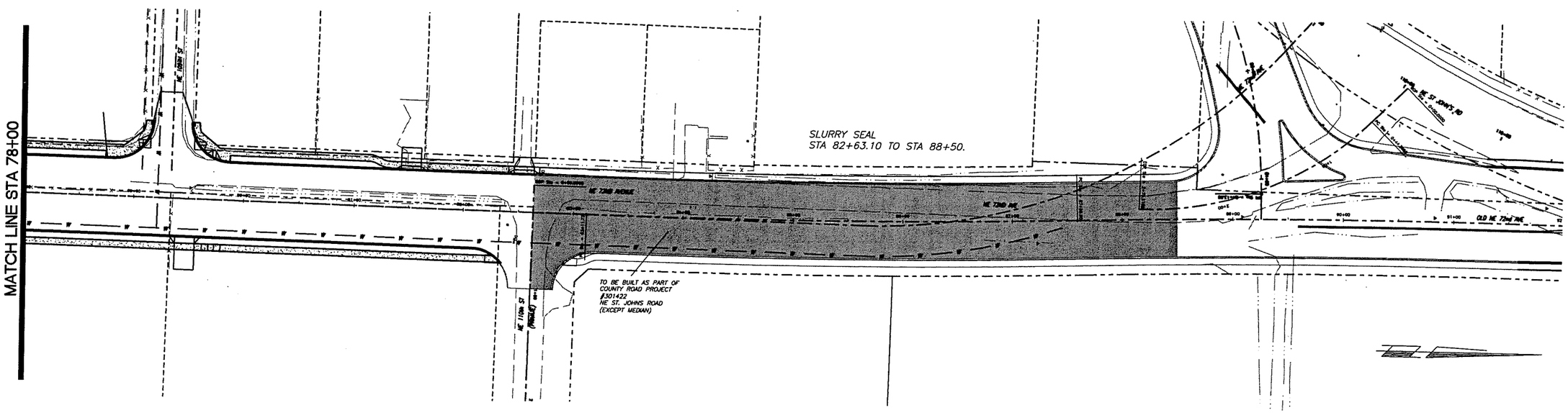
PRELIMINARY

SCALE IN FEET

50 0 50 100

REMOVE EXISTING STRIPING AND RPM'S. APPLY SLURRY SEAL.





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MICHAEL M. ENRICK
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES MAY 25, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
SLURRY SEAL PLAN

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WASHINGTON

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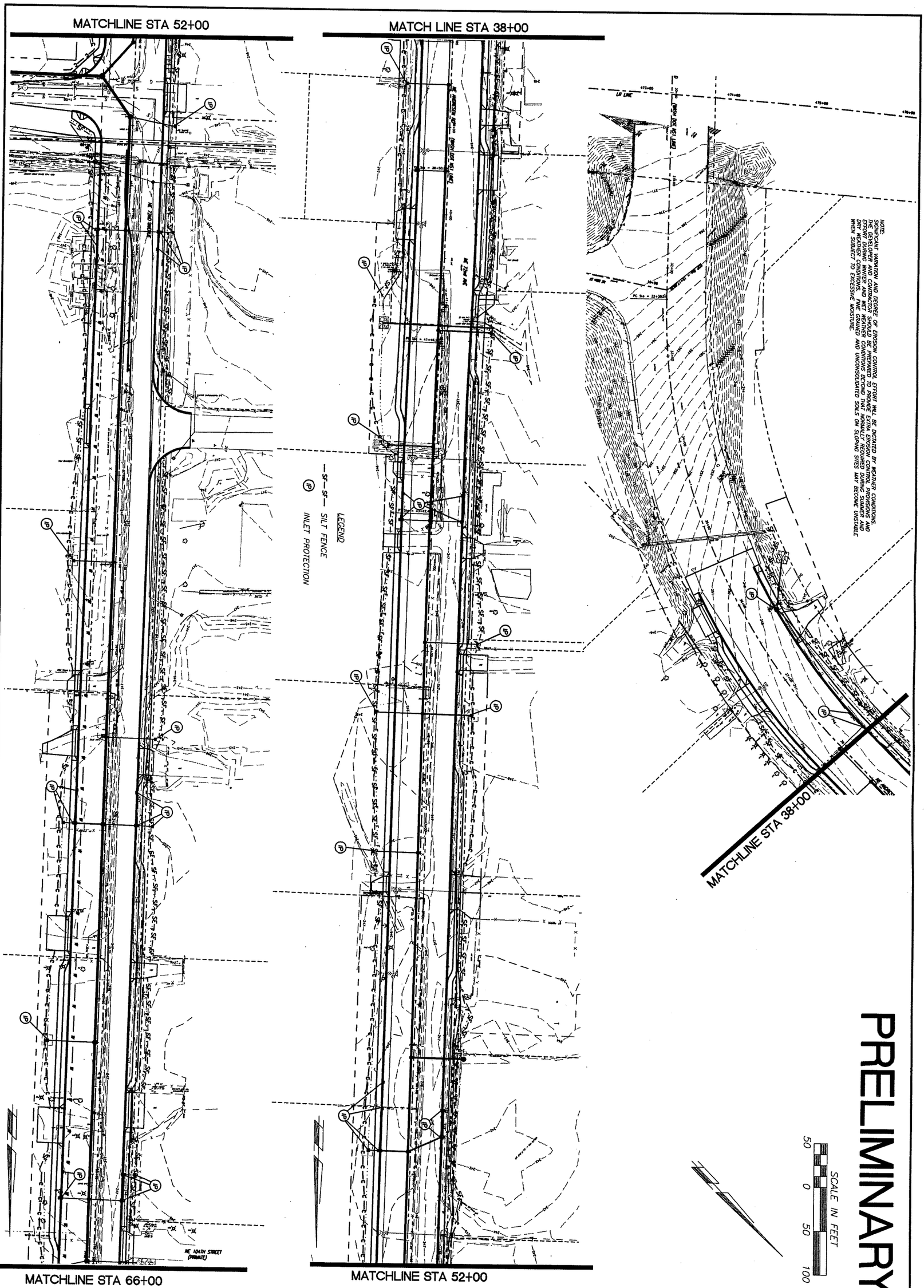

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD

EROSION CONTROL PLAN

MICHAEL M. EMRICK
STATE OF WASHINGTON
29030
PROFESSIONAL ENGINEER
EXPIRES: MAY 28, 2007

CALL 48 HOURS BEFORE YOU DIG
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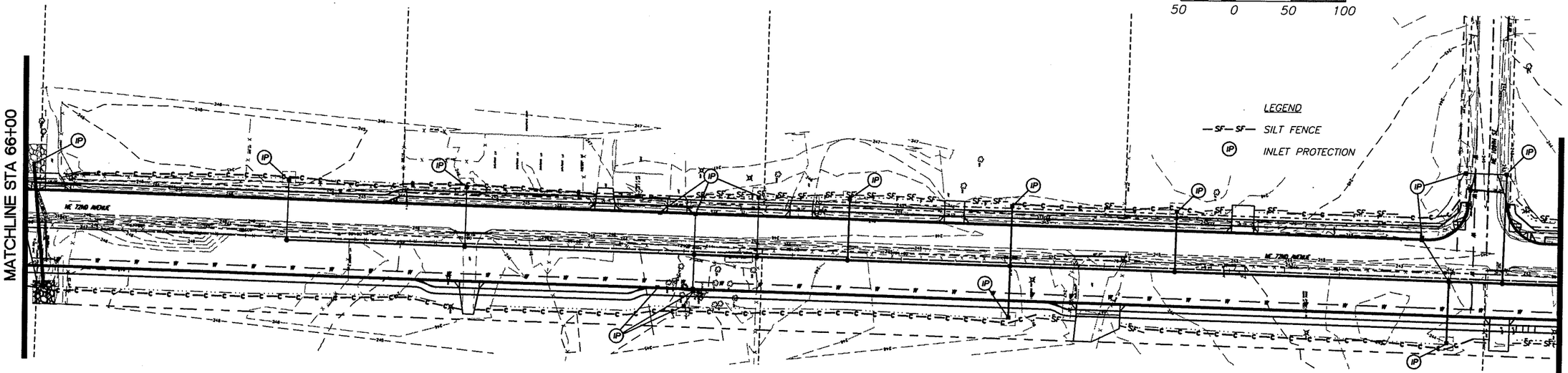
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	EC1
SHEET	8 OF 72

NOTE:
SIGNIFICANT VARIATION AND DEGREE OF EROSION CONTROL EFFORT WILL BE DICTATED BY WEATHER CONDITIONS. THE DEVELOPER AND CONTRACTOR SHOULD BE PREPARED TO PROVIDE EXTRA EROSION CONTROL PROVISIONS AND EFFORT DURING WINTER AND WET WEATHER CONDITIONS BEYOND THAT NORMALLY REQUIRED DURING SUMMER AND DRY WEATHER CONDITIONS. FINE GRAINED AND UNCONSOLIDATED SOILS ON SLOPING SITES MAY BECOME UNSTABLE WHEN SUBJECT TO EXCESSIVE MOISTURE.

SCALE IN FEET
50 0 50 100

LEGEND
—SF—SF— SILT FENCE
(IP) INLET PROTECTION

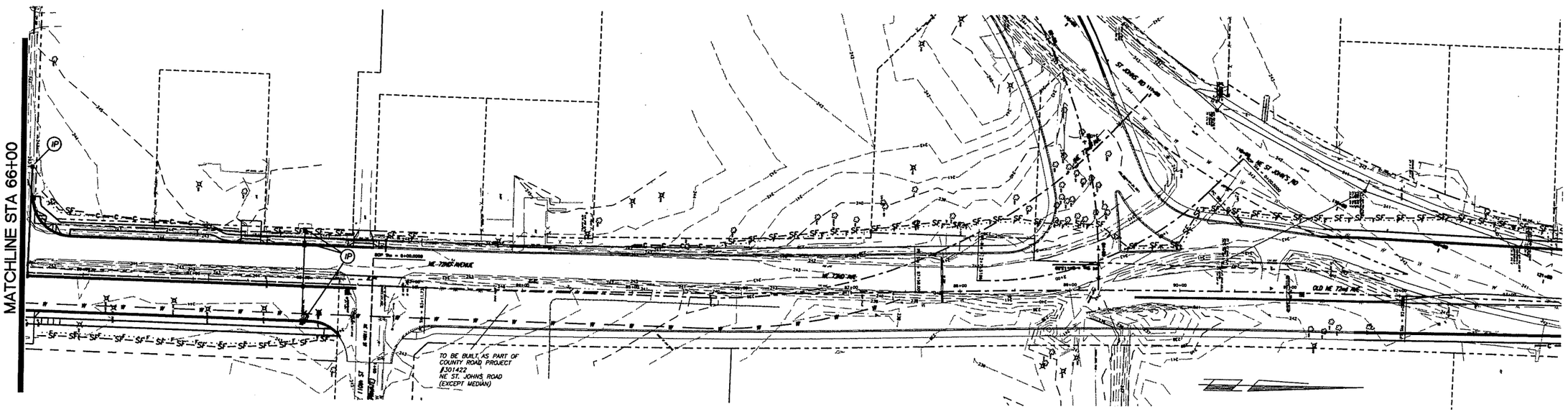
MATCHLINE STA 66+00



MATCHLINE STA 80+00

PRELIMINARY

MATCHLINE STA 66+00



DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	EC2
SHEET	9 OF 72

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NORTHWEST UTILITIES NOTIFICATION CENTER

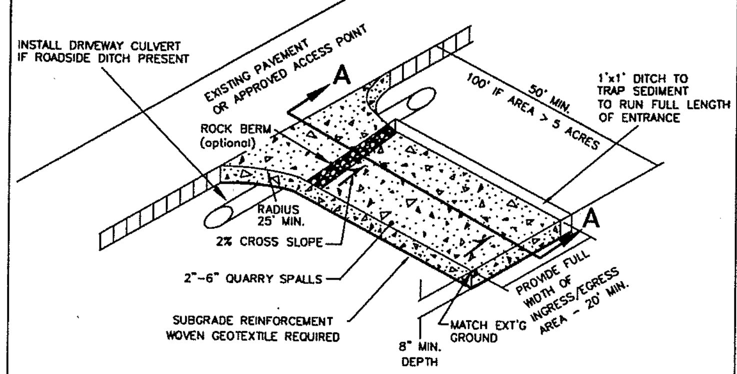
MICHAEL E. ERICK
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES MAY 26, 2007

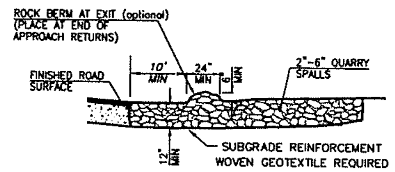
ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
EROSION CONTROL PLAN

proud past, promising future
CLARK COUNTY
WASHINGTON

n:\CIP\PROJECTS\310122-NE72Ave-H99toST Johns\DESIGN\DWGS\Ec01-3.dwg, 7/28/2005 2:52:51 PM, kerlinr





1. EXCAVATE MINIMUM OF 12" OF EXISTING SOILS.
2. PLACE MINIMUM OF 12" OF 2"-6" QUARRY SPALLS
3. CONSTRUCT ROCK BERM ALONG TRANSITION POINT TO FINISH ROAD SURFACES, DIVERT RUNOFF TO ONSITE AREA (OPTIONAL).

SECTION A-A

NOTES:

1. FOR DEVELOPMENT PROJECTS REVIEWED BY ENGINEERING SERVICES. NOT FOR USE WITH SINGLE FAMILY OR DUPLEX RESIDENTIAL BUILDING PERMITS. SEE BUILDING DEPT. FOR GRAVEL CONSTRUCTION ENTRANCE PLAN.
2. INSTALL WOVEN GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.
3. VEHICLE WASHDOWN AREA, IF REQUIRED, IS TO BE INSTALLED AND USED TO REMOVE SEDIMENT FROM VEHICLES THAT ARE ABOUT TO ENTER AN ESTABLISHED ROAD.
4. WASHDOWN AREA TO BE MADE UP OF CLEAN 2"- 6" QUARRY SPALLS, 1" DEEP (MIN) OVER WOVEN GEOTEXTILE FABRIC. WASHDOWN AREA TO BE FULL WIDTH OF ENTRANCE AND 50' (MIN.), AND 100' IF EXPOSED SOIL IS OVER 5 ACRES.
5. AT TIME OF PRECONSTRUCTION MEETING, THE COUNTY INSPECTOR MAY REQUIRE THE ENTRANCE TO BE PAVED TO THE EDGE OF THE RIGHT-OF-WAY PRIOR TO THE INSTALLATION OF A WASHDOWN ENTRANCE TO AVOID DAMAGE TO THE EXISTING ROADWAY.
6. THE RESPONSIBLE EROSION CONTROL INDIVIDUAL IS TO ENSURE THAT ALL VEHICLES USE THIS ENTRANCE AND ARE TO BE INSPECTED AND CLEANED OF SOILS BEFORE LEAVING PROJECT, AND THAT THE ENTRANCE IS TO BE KEPT CLEAN AT ALL TIMES.

DWG: E-1.DWG

NO.	REVISIONS	DATE	BY

Department of Public Works
CLARK COUNTY WASHINGTON
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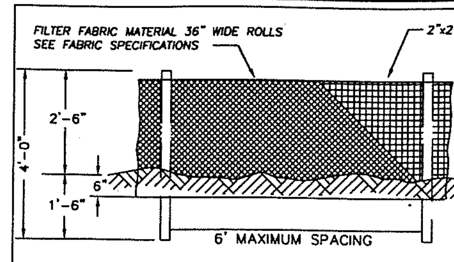
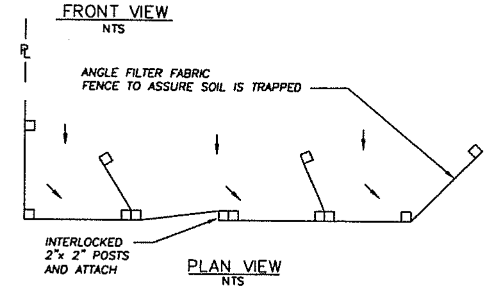
STANDARD CONSTRUCTION ENTRANCE
APPROVED
COUNTY ENGINEER — 01/01/04 DATE
STANDARD E-1
PLAN No. DESIGNED SCH DRAWN SCH DATE 07/07/03



FRONT VIEW
NTS

SEDIMENT FENCE FABRIC SPECIFICATIONS
(Woven Polyproylene sediment fence fabric)

PROPERTY	TEST PROCEDURE	MIN. FABRIC VALUE
Grab Tensile Strength	ASTM D-4632	180 lbs.
Grab elongation	ASTM D-4632	15%
trapezoid Tear	ASTM D-4533	70 lbs.
Mullen Burst	ASTM D-3786	300 psi.
Puncture	ASTM D-4833	80 lbs.
Permitivity	ASTM D-4491	0.07 sec-1
Permeability	ASTM D-4491	.005 cm/sec
A.O.S.	ASTM D-4751	50 U.S. Sieve
UV Resistance(500 hrs)	ASTM D-4355	90%



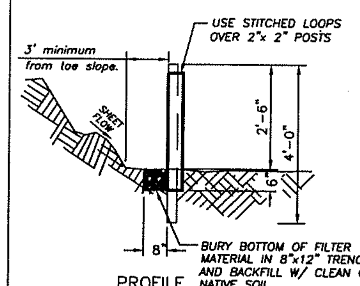
PLAN VIEW
NTS

NOTES

1. THIS SEDIMENT BARRIER UTILIZES STANDARD STRENGTH OR EXTRA STRENGTH SYNTHETIC FILTER FABRICS, IT IS DESIGNED FOR SITUATIONS IN WHICH ONLY SHEET OR OVERLAND FLOWS ARE EXPECTED. (SEE FABRIC SPECIFICATIONS ABOVE)
2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
3. POST ARE TO BE 2"x2" FIR, PINE OR STEEL FENCE POSTS.
4. POST TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
5. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
6. SEDIMENT FENCE TO BE SPACED ON SLOPES PER TABLE BELOW.

INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS

% SLOPE	SLOPE	MAX. SPACING ON SLOPE
10% FLATTER	10:1 OR FLATTER	300 ft.
10>%<15	10:1>x<7.5:1	150 ft.
15>%<20	7.5:1>x<5:1	100 ft.
20>%<30	5:1>x<3.5:1	50 ft.
30>%<50	3.5:1>x<2:1	25 ft.



PROFILE
NTS

DWG: E-4.DWG

NO.	REVISIONS	DATE	BY

Department of Public Works
CLARK COUNTY WASHINGTON
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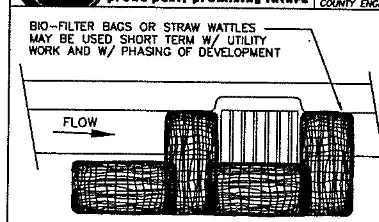
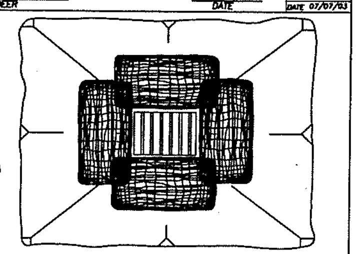
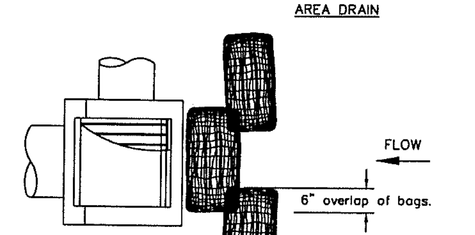
STANDARD SEDIMENT FENCE
APPROVED
COUNTY ENGINEER — 01/01/04 DATE
STANDARD E-4
PLAN No. DESIGNED SCH DRAWN SCH DATE 07/07/03



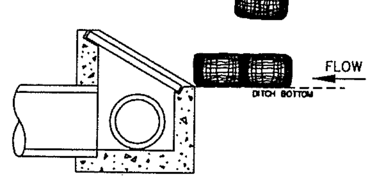
CATCH BASIN



AREA DRAIN



PLAN VIEW



DITCH INLET

NOTES:

1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPE.
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2" WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. STRAW WATTLES MUST BE STABILIZED BY ATTACHING WIRE CLIPS TO THE CATCH BASIN PER MANUFACTURES SPECIFICATIONS.
4. INLET PROTECTION MUST BE REGULARLY INSPECTED BY THE EROSION CONTROL INDIVIDUAL TO INSURE PROPER PLACEMENT/FUNCTION AND MAINTENANCE.
5. SEE INLET PROTECTION NOTES STD. PLAN E-3

DWG: E-3c.DWG

NO.	REVISIONS	DATE	BY

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CLARK COUNTY WASHINGTON
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INLET PROTECTION TYPE 4 BIOFILTER BAGS
APPROVED
COUNTY ENGINEER — 01/01/04 DATE
STANDARD E-3c
PLAN No. DESIGNED SCH DRAWN SCH DATE 06/07/03

STANDARD NOTES FOR EROSION CONTROL PLAN

1. The Contractor shall install and maintain BMP's as shown and perform all actions necessary to prevent erosion, and control sediment from leaving the construction site. Site Contractor shall comply with Clark County Code Chapter 40.380.050.

2. All erosion control measures shall be in-place and in working condition prior to disturbing and exposing any soil surfaces (i.e. silt fence, construction entrance, sedimentation barriers, sedimentation traps).

3. All erosion prevention and control BMP's shall be maintained and repaired as needed to insure continued performance of their intended function. Needed repairs shall be made as soon as practicable. They are to remain in place and operational during all phases of construction. Construction activities shall not continue or resume until repairs to erosion control facilities are made and the facilities are functional. Any sediment leaving the site or discharging to a sensitive area shall be stopped and controlled immediately. Contaminated areas shall be cleaned and restored.

4. Clearing limits and work area limits shall be delineated and marked. Do not disturb more area than needed for construction requirements.

5. All sensitive or critical areas (wetlands, steep slopes, natural waterways), and buffers shall all be clearly delineated and clearly marked, and protected from sediment deposition.
6. Sediment laden runoff shall be prevented from entering all existing storm water catch basins and inlets affected by construction.

7. No exposed, bare soils shall remain unstabilized for more than two days during the period October 1 thru April 30 or for more than seven days during the period of May 1 through September 30. All disturbed soil surfaces shall be stabilized by a suitable application of "Best Management Practices".

8. Where feasible, no more than 500 feet of trench shall be open at one time. Excavated material shall be placed on the up-hill side of trenches provided it does not conflict with safety requirements.

9. Dewatering devices shall discharge into a sediment trap or sediment pond. No discharge shall be made to a paved street or stormwater collection system without first removing sediment.

10. Cut and fill slopes shall be constructed in a manner that will minimize erosion. Erosion shall be controlled and prevented by such measures as roughening the surface, installation of interceptor ditches, terracing, covering with matting, mulch or plastic sheeting. Runoff shall be prevented from entering a slope and from undercutting the base of slopes.

11. Any soil or debris transported onto roadways and sidewalks shall be removed. Deposits shall be completely removed by shoveling and/or sweeping. Washing shall not be utilized unless specifically approved in writing by the County.

12. All permanent infiltration systems shall be isolated and protected from sediment laden runoff entering to avoid risk of reducing the ability of the systems to infiltrate. Isolation and protection shall not be removed until the drainage area tributary to the system is completely stabilized.

CONTINUED ON SHEET 2

DWG: ECN1.DWG

NO.	REVISIONS	DATE	BY

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STANDARD NOTES FOR EROSION CONTOL PLAN
APPROVED
COUNTY ENGINEER — 01/01/04 DATE
STANDARD ECN1
PLAN No. DESIGNED SCH DRAWN SCH DATE 06/02/02

STANDARD NOTES FOR EROSION CONTROL PLAN (CONTINUED)

13. All conveyance channels, both temporary and permanent shall be stabilized to prevent erosion of the channel. Stabilization shall extend to areas at outlets and downstream reaches vulnerable to erosion resulting from flow discharging from the channel.

14. If BMP's shown are utilized but are insufficient to prevent sediment from reaching water bodies, adjacent properties, or public rights-of-way; additional BMP's shall be implemented immediately to prevent further encroachment of sediment.

15. Stabilized areas shall be provided for employee parking and storage of construction materials. Erodeable stockpiles of earthen materials, such as topsoil, silty and clayey soils; and landscape materials, shall be covered when not being incorporated in the work. Erosion control BMP's shall be utilized as necessary to prevent sediment laden runoff from leaving or sediment being transported from these areas from vehicle activity.

16. All pollutants other than sediment that occur during construction shall be handled and disposed of in a manner that does not cause contamination of storm water.

17. The Contractor shall keep an inspection log of the condition of the erosion control facilities. Erosion control facilities shall be inspected at least weekly and after each rainfall. The inspection log shall be kept at the project site at a designated location and shall be available for review by the County. An individual that has successfully completed the County's Erosion Control Certification course shall perform inspections and maintain the log.

18. All temporary BMP's shall be removed within 30 days after final site stabilization is achieved. Trapped sediment shall be deposited and stabilized on site. Areas disturbed resulting from removal shall be permanently stabilized.

19. Construction shall not be considered complete and acceptable until all disturbed soil surfaces have been protected from erosion with permanent landscaping, covering with impervious surfaces, restored to original undisturbed condition or permanently stabilized.

20. Vegetated stabilization and landscaping shall be fertilized, watered and maintained to insure that growth of vegetation is established and sustained.

21. During dry weather construction periods the contractor shall provide project-specific dust control measures that may include: Seeding, Mulching, Matting, Water, Tackifier, or Chemical Soil Stabilizers. The contractor shall maintain the dust control measures through dry weather periods until all disturbed areas have been stabilized. Immediately re-stabilize areas disturbed by contractor's operations or other activities (wind, water, vandalism, etc.).

22. Entry onto the construction site shall be restricted to a single approved entrance as shown on the plan.

23. Maintenance and repair of heavy equipment and vehicles which involve potential contaminants (oil,solvents,hydraulic fluid, etc.) must be conducted in a manner which prevents contamination of soils, surface water and ground water. Tarps, drip pans, or other appropriate measures shall be used as necessary.

24. Stripping, topsoil, and unsuitable material stockpiles shall be hydroseeded with "regreen wheat x wheat grass hybrid" by Hobbs and Hobkins (or approved equal). Maintenance of stockpile areas and reapplication of hydroseed covering shall be required if bare soil is present. During winter and wet weather conditions, stockpiles shall be covered with plastic sheeting per detail E-16.

SHEET 2 OF 2

DWG: ECN2.DWG

NO.	REVISIONS	DATE	BY

Department of Public Works
CLARK COUNTY WASHINGTON
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STANDARD NOTES (CONTINUED) FOR EROSION CONTOL PLAN
APPROVED
COUNTY ENGINEER — 01/01/04 DATE
STANDARD ECN2
PLAN No. DESIGNED SCH DRAWN SCH DATE 07/22/03

PRELIMINARY

DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	EC3
SHEET	10 OF 72

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MICHAEL M. EMRICK, STATE OF WASHINGTON, REGISTERED PROFESSIONAL ENGINEER 29030
EXPIRES MAY 25, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
EROSION CONTROL DETAILS

CLARK COUNTY WASHINGTON
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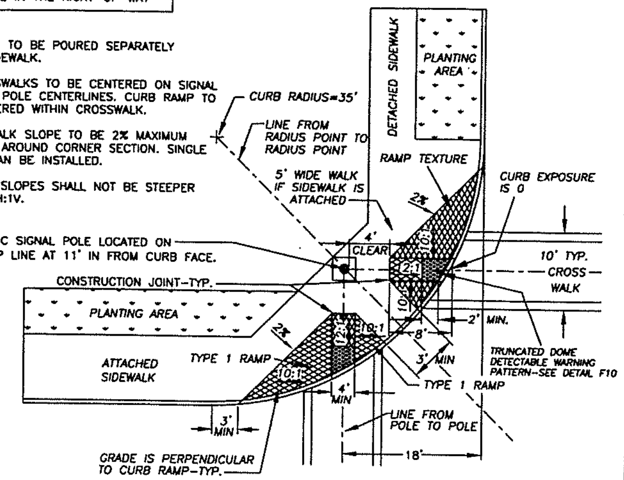
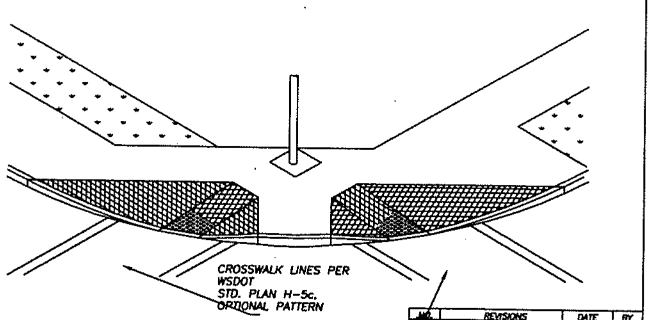
F2 — TYPE 2 RAMP

NEW CONSTRUCTION
FOR USE WITH SIDEWALKS LOCATED ANYWHERE IN THE RIGHT-OF-WAY

NOTES:

1. RAMPS TO BE POURED SEPARATELY FROM SIDEWALK.
2. CROSSWALKS TO BE CENTERED ON SIGNAL POLE TO POLE CENTERLINES. CURB RAMP TO BE CENTERED WITHIN CROSSWALK.
3. SIDEWALK SLOPE TO BE 2% MAXIMUM RADIALLY AROUND CORNER SECTION. SINGLE RAMPS CAN BE INSTALLED.
4. RAMP SLOPES SHALL NOT BE STEEPER THAN 12H:1V.





NO.	REVISIONS	DATE	BY
1	TRUNCATED DOMES	8/14/03	SCH

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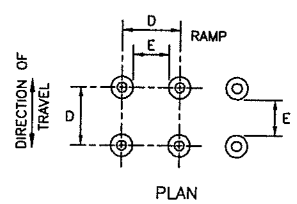
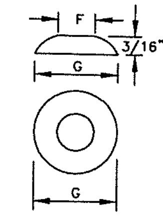
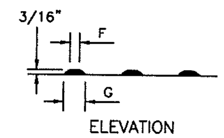
TYPE 2 RAMP — F2 — APPROVED: COUNTY ENGINEER, 8/22/00

F10 — TRUNCATED DOME DETECTABLE WARNING PATTERN





	MIN.	MAX.
D	1 5/8"	2 3/8"
E	5/8"	1 1/2"
F	7/16"	3/4"
G	7/8"	1 7/16"



TRUNCATED DOMES (SEE NOTE 2)
DETECTABLE WARNING
PATTERN DETAIL

NOTES

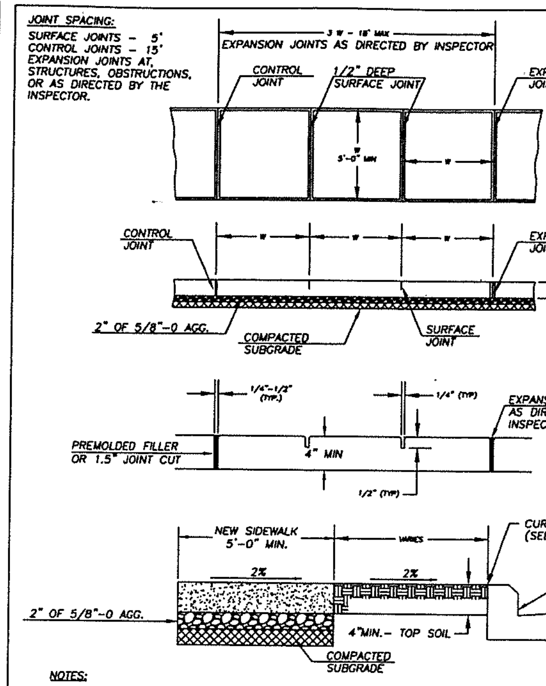
1. AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREA.
2. THE DETECTABLE WARNING PATTERNS CAN BE CREATED BY ACCEPTABLE MEANS THAT WILL ACHIEVE THE TRUNCATED DOME DIMENSIONS AND SPACING SHOWN.
3. PLACE TRUNCATED DOME DETECTABLE WARNING TEXTURE IN THE LOWER 24" OF THE THROAT OF THE RAMP ONLY. ARRANGE DOMES USING IN-LINE PATTERN ONLY AS SHOWN. COLOR OF TEXTURE (COATING) SHALL BE SAFETY YELLOW IN COMPLIANCE WITH WSDOT STD. SPEC. OR AS INSTRUCTED BY COUNTY INSPECTOR.
4. FOR CONSTRUCTION OF SIDEWALK RAMPS OUTSIDE OF PUBLIC RIGHT-OF-WAY, CHECK WITH STATE BUILDING CODES.

Department of Public Works — CLARK COUNTY WASHINGTON — proud past, promising future

TRUNCATED DOME DETECTABLE WARNING PATTERN — STANDARD F10 — APPROVED: COUNTY ENGINEER, 01/01/04

F12 — SIDEWALK DETAIL

JOINT SPACING:
SURFACE JOINTS - 5'
CONTROL JOINTS - 15'
EXPANSION JOINTS AT STRUCTURES, OBSTRUCTIONS, OR AS DIRECTED BY THE INSPECTOR.



NOTES:

1. CONCRETE SHALL BE 3,000 PSI MIN. (CLASS 3000), 3 1/2" SLUMP (± 1")
2. FINISH SHALL BE MEDIUM BROOM PERPENDICULAR TO PEDESTRIAN TRAFFIC UNLESS OTHERWISE DIRECTED.
3. ALL EXISTING EDGES SHALL BE SAWCUT.
4. NO FILLER REQUIRED FOR SURFACE JOINTS.
5. ALL JOINTS AND EDGES SHALL BE FINISHED WITH 1/4" RADIUS EDGER (3" SMOOTH EACH SIDE)
6. FOR SIDEWALKS ADJACENT TO THE CURB AND POURED AT THE SAME TIME AS THE CURB, THE JOINT BETWEEN THEM SHALL BE A TROWELED JOINT WITH A MIN. 1/2" RADIUS.

NO.	REVISIONS	DATE	BY
1	CHANGE SUBGRADE &	07/28/02	KB
2	BASE AGG. & NOTES	10/07/02	SCH

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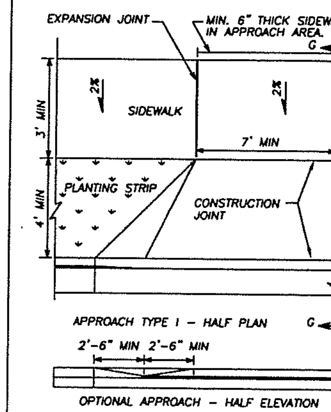
SIDEWALK DETAIL — STANDARD F12 — APPROVED: COUNTY ENGINEER, 01/01/04

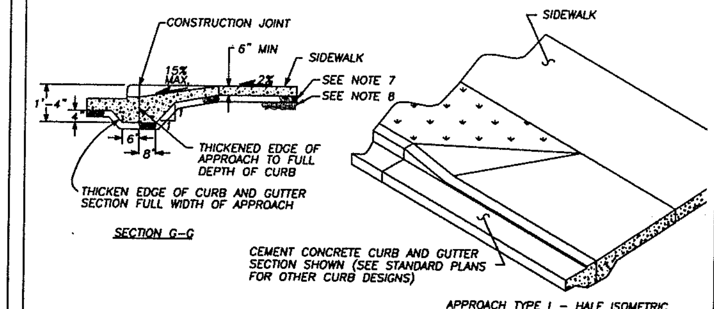
F14 — DETAIL - TYPE 1 CEMENT CONCRETE APPROACH

NOTES:

1. A MINIMUM 3' WIDE ACCESSIBLE ROUTE SHALL BE MAINTAINED IN ALL PEDESTRIAN ACCESSIBLE AREAS.
2. CONTRACTION POINTS SHALL BE PLACED ALONG SIDEWALKS IN ACCORD WITH SIDEWALK DETAIL. ALL JOINTS SHALL BE CLEANED AND EDGED.
3. CHANGES IN LEVEL UP TO 1/4" MAY BE VERTICAL AND WITHOUT EDGE TREATMENT. CHANGES IN LEVEL BETWEEN 1/4" AND 1/2" SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 2:1.
4. CEMENT CONCRETE APPROACHES SHALL BE CONSTRUCTED OF AIR-ENTRAINED CLASS 3000 AND MAY BE POURED INTEGRAL WITH CURB.
5. EXISTING CURB, GUTTER, AND SIDEWALK TO BE SAWCUT AND REMOVED FOR INSTALLATION OF APPROACH.
6. COMMERCIAL DRIVEWAY REQUIRES REINFORCING STEEL (6"x6" 10 GA WIRE MESH) MIN. 3" COVER.
7. 3" DEPTH 3/4"-0 CRUSHED AGGREGATE BASE COMPACTED TO 95% OF MAX. DRY DENSITY.
8. SUBGRADE PREPARATION PER WSDOT STD. SPEC. 2-06.3(1).



NOTE: USE TYPE 1 APPROACH ONLY WHEN A SIDEWALK IS USED AT THE BACK OF THE APPROACH.



NO.	REVISIONS	DATE	BY
1	NOTES #6, 7, & 8	10/09/02	SCH

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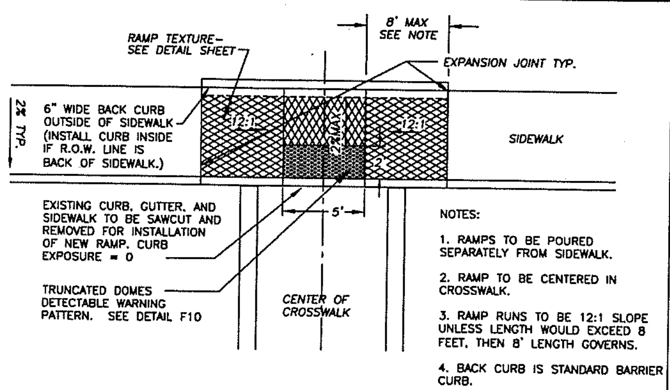
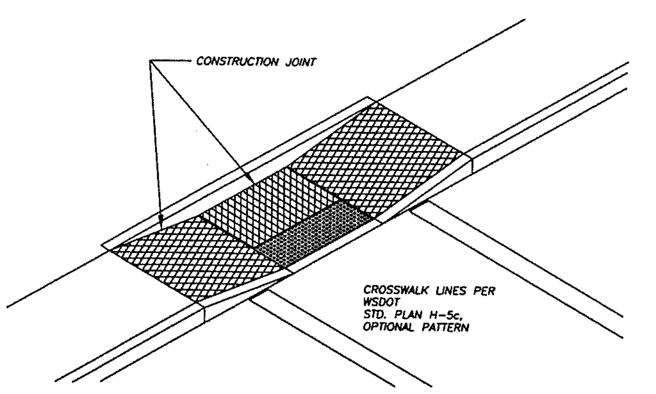
DETAIL - TYPE 1 CEMENT CONCRETE APPROACH — F14 — APPROVED: COUNTY ENGINEER, 8/22/00

F3 — TYPE 3 RAMP



NOTES:

1. RAMPS TO BE POURED SEPARATELY FROM SIDEWALK.
2. RAMP TO BE CENTERED IN CROSSWALK.
3. RAMP RUNS TO BE 12:1 SLOPE UNLESS LENGTH WOULD EXCEED 8 FEET, THEN 8' LENGTH GOVERNS.
4. BACK CURB IS STANDARD BARRIER CURB.



NO.	REVISIONS	DATE	BY
1	TRUNCATED DOME PATTERN	8/15/03	SCH

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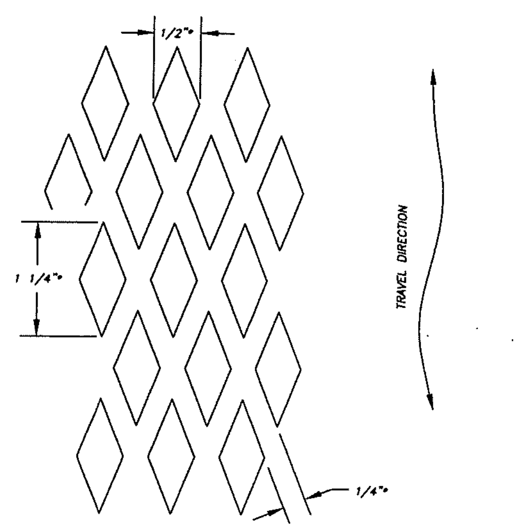
TYPE 3 RAMP — F3 — APPROVED: COUNTY ENGINEER, 8/22/00

F11 — RAMP TEXTURE DETAIL



* NOMINAL DIMENSIONS

RAMP TEXTURE DETAIL

RAMP TEXTURE IS TO BE DONE WITH AN EXPANDED METAL GRATE PLACED AND REMOVED FROM WET CONCRETE TO LEAVE A DIAMOND PATTERN AS SHOWN. THE LONG AXIS OF THE DIAMOND PATTERN SHALL BE IN THE DIRECTION OF TRAVEL. GROOVES SHALL BE 1/8" DEEP AND 1/4" WIDE. ALTERNATIVE TEXTURE PATTERNS SHALL BE APPROVED BY REVIEWING AUTHORITY BEFORE USE.

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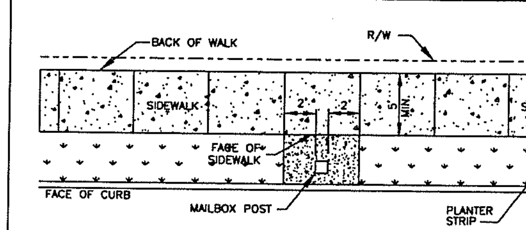
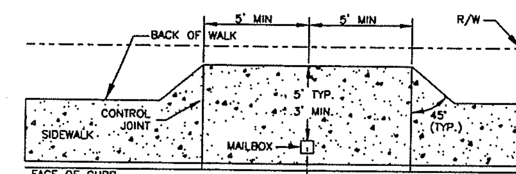
RAMP TEXTURE DETAIL — F11 — APPROVED: COUNTY ENGINEER, 8/22/00

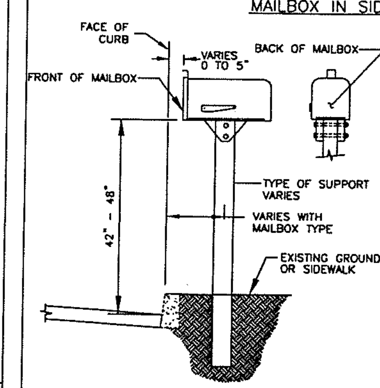
F13 — SIDEWALK MAILBOX PLACEMENT



MAILBOX IN PLANTER STRIP



MAILBOX IN SIDEWALK



NOTES:

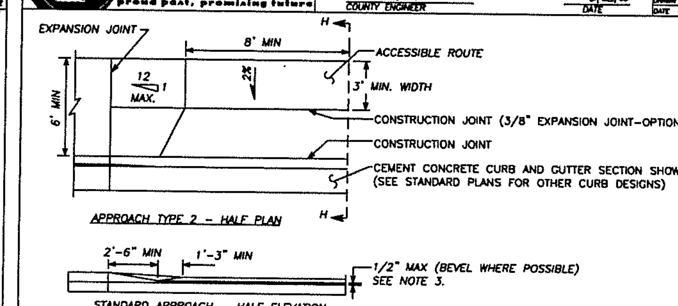
1. SEE CURRENT WSDOT STANDARD PLAN No. H-12 FOR MAILBOX, POST, BRACKET AND OTHER INSTALLATION DETAILS.
2. MAILBOXES MUST BE POSTMASTER APPROVED. CONTACT MIKE WENTZEL (MAINTENANCE MANAGER) AT 992-5052.
3. LOCATION OF MAILBOXES ARE SUBJECT TO APPROVAL BY COUNTY ENGINEERING FOR ACCESS AND SIGHT DISTANCE REQUIREMENTS. CONTACT ENGINEERING SERVICES AT 397-2375 ext. 4997
4. INSTALL EXPANSION JOINT MATERIAL AROUND MAILBOX POST WHEN SET IN SIDEWALK.
5. EXTEND SIDEWALK JOINTS THROUGH WIDENED SIDEWALK SECTION.
6. COLLECTION BOX UNITS (CBU) AND CONCRETE BASE ARE INSTALLED BY THE U.S. POSTAL SERVICE. SEE NOTE 2 FOR CONTACT.
7. A MAILBOX TURNOUT CONFORMING TO DETAIL F13b IS REQUIRED FOR ALL STREETS EXCEPT ACCESS AND SUBCOLLECTOR STREETS WHERE THE POSTED SPEED LIMIT IS 25 MPH OR LESS.

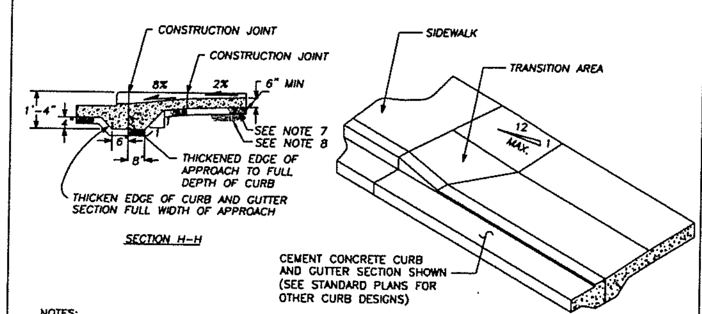
WSDOT STD. PLANS WEB SITE ADDRESS:
http://www.wsdot.wa.gov/eesc/design/designstandards/HTM/TOC.pdf

Department of Public Works — CLARK COUNTY WASHINGTON — proud past, promising future

SIDEWALK MAILBOX PLACEMENT — STANDARD F13 — APPROVED: COUNTY ENGINEER, 01/01/04

F15 — CEMENT CONCRETE APPROACH DETAIL - TYPE 2





NOTES:

1. A MINIMUM 3' WIDE ACCESSIBLE ROUTE SHALL BE MAINTAINED IN ALL PEDESTRIAN ACCESSIBLE AREAS.
2. CONTRACTION JOINTS SHALL BE PLACED ALONG SIDEWALKS IN ACCORD WITH SIDEWALK DETAIL. ALL JOINTS SHALL BE CLEANED AND EDGED.
3. CHANGES IN LEVEL UP TO 1/4" MAY BE VERTICAL AND WITHOUT EDGE TREATMENT. CHANGES IN LEVEL BETWEEN 1/4" AND 1/2" SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 2:1.
4. CEMENT CONCRETE APPROACHES SHALL BE CONSTRUCTED OF AIR-ENTRAINED CONCRETE CLASS 3000 AND MAY BE POURED INTEGRAL WITH CURB.
5. EXISTING CURB, GUTTER AND SIDEWALK TO BE SAWCUT AND REMOVED FOR INSTALLATION OF APPROACH.
6. COMMERCIAL DRIVEWAY REQUIRES REINFORCING STEEL (6"x6" 10 GA WIRE MESH) MIN. 3" COVER
7. 3" DEPTH 3/4"-0 CRUSHED AGGREGATE BASE COMPACTED TO 95% OF MAX. DRY DENSITY.
8. SUBGRADE PREPARATION PER WSDOT STD. SPEC. 2-06.3(1).

NO.	REVISIONS	DATE	BY
1	NOTES #6, 7, & 8	10/09/02	SCH

Department of Public Works — CLARK COUNTY WASHINGTON — proud past, promising future

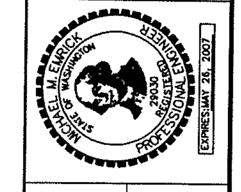
CEMENT CONCRETE APPROACH DETAIL - TYPE 2 — F15 — APPROVED: COUNTY ENGINEER, 8/22/00

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
ROADWAY DETAIL 1

DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	RD1
SHEET	11 OF 72

CALL 48 HOURS BEFORE YOU DIG — 1-800-553-4344 "It's the Law" — NORTHWEST UTILITIES NOTIFICATION CENTER



CLARK COUNTY WASHINGTON — proud past, promising future

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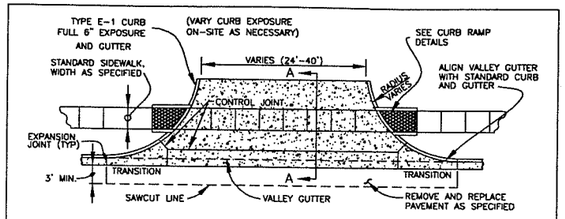
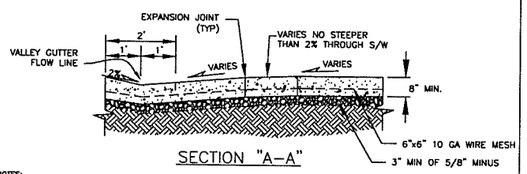


PLAN VIEW

COMMERCIAL DRIVEWAY ENTRANCE



SECTION "A-A"

NOTES:

1. CONCRETE SHALL BE 3300 PSI (MIN. BREAKING STRENGTH @ 28 DAYS) WITH 3" SLUMP (±1"). TOTAL AIR CONTENT (% BY VOLUME OF CONCRETE) SHALL NOT BE LESS THAN 4% OR MORE THAN 7%. MEDIUM BROOM FINISH PARALLEL TO DRIVEWAY CENTERLINE.
2. ALL JOINTS SHALL BE FINISHED WITH 1/4" RADIUS EDGE UNLESS OTHERWISE NOTED.
3. DRIVEWAYS EXCEEDING 15' IN TOTAL WIDTH SHALL HAVE ADDITIONAL LONGITUDINAL JOINTS AS DIRECTED. CONTROL JOINT SPACING SHALL NOT EXCEED 15'.
4. DRIVEWAY SHALL BE CONSTRUCTED WITH REINFORCING STEEL (6x6 10 GA WIRE MESH). MIN. 3" COVER.
5. ALL EXISTING EDGES SHALL BE SAW CUT.
6. 3" DEPTH 5/8"-0 CRUSHED AGGREGATE BASE COMPACTED TO 95% OF MAX. DRY DENSITY.
7. SUBGRADE PREPARATION PER WSDOT STD. SPEC. 2-06.3(1).
8. EXISTING CURB SHALL BE REMOVED TO EXISTING JOINT OR SAWCUT SUCH THAT 3' MIN. OF NEW STREET SECTION IS CONSTRUCTED ADJACENT TO NEW DRIVEWAY.
9. MAXIMUM 2% CROSS SLOPE ACROSS PEDESTRIAN CROSSING.
10. CURB RADIUS PER TABLES 40.350.030-2 THRU 8, OR AS APPROVED BY COUNTY ENGINEER.

NO.	REVISIONS	DATE	BY

DWG: F17.DWG

Department of Public Works
CLARK COUNTY WASHINGTON
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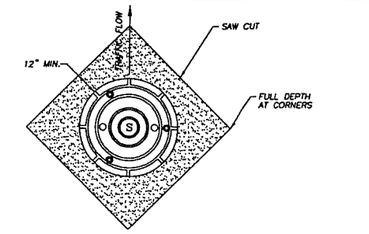
MAJOR COMMERCIAL CONCRETE APPROACH

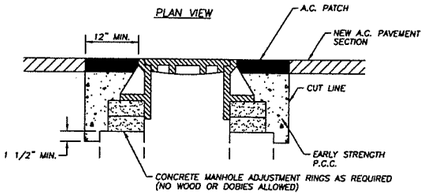
APPROVED
Peter Capell — COUNTY ENGINEER — 01/01/04 DATE

F17

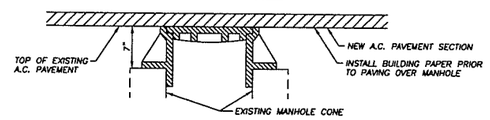
DESIGNED SCH
DRAWN SCH
DATE 07/16/03



PLAN VIEW



STEPS 2,3, & 4



STEP 1

STEP 1 COVER EXISTING MANHOLE WITH BUILDING PAPER AND CONSTRUCT A.C. PAVEMENT OVER TOP OF MANHOLE.
STEP 2 SAW CUT AND REMOVE PAVEMENT AROUND MANHOLE 12" MIN. FROM MANHOLE FRAME.
STEP 3 RAISE MANHOLE FRAME AND COVER USING CONCRETE RINGS AND MECHANICAL ADJUSTMENT DEVICES TO FINISH GRADE MATCHING PROFILE AND CROSS SLOPE.
STEP 4 BACKFILL WITH EARLY STRENGTH P.C.C. AND A.C. TO DEPTHS AS DIRECTED.

NO.	REVISIONS	DATE	BY

DWG:

Department of Public Works
CLARK COUNTY WASHINGTON
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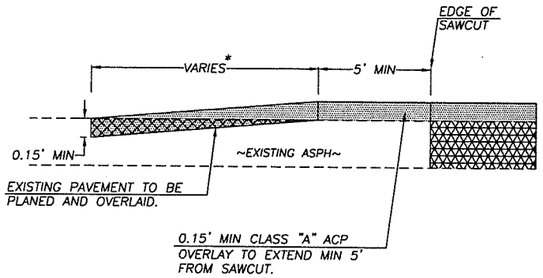
APPROVED
Peter Capell — COUNTY ENGINEER — 9/12/00 DATE

F27

DESIGNED
DRAWN
DATE



* LENGTH VARIES TO MAKE SMOOTH TRANSITION TO EXISTING ROAD GRADE. (MINIMUM 15 FEET)

TO BE USED AS AN ALTERNATIVE IN LIEU OF FULL LANE REMOVAL AND REPLACEMENT WHEN APPROVED BY CLARK COUNTY.

NO.	REVISIONS	DATE	BY
1	NOTE	03/09/01	BK
2	FIG 1	09/02/01	DS
3	CHANGED ACP GLASS	03/26/02	KB

DWG: U7.DWG

Department of Public Works
CLARK COUNTY WASHINGTON
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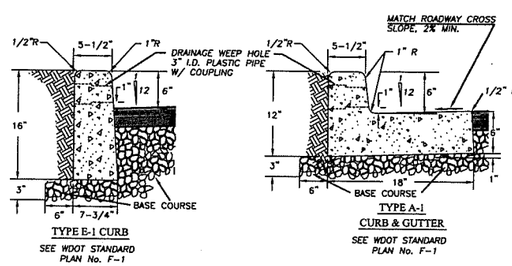
BUTT JOINT PLANING AND OVERLAY DETAIL

APPROVED
Peter Capell — COUNTY ENGINEER — 9/30/02 DATE

STANDARD U7

PLAN No.
DESIGNED
DRAWN
DATE 3/28/02



TYPE E-1 CURB

SEE WDOT STANDARD PLAN No. F-1

TYPE A-1 CURB & GUTTER

SEE WDOT STANDARD PLAN No. F-1

NOTES

1. CONCRETE SHALL BE 3000 PSI MIN. (CLASS 3000) 3 1/2" SLUMP (MAX.)
2. CURBS ADJACENT TO PAVEMENT OR SIDEWALK TO HAVE EXPANSION AND/OR CONTRACTION JOINTS TO MATCH EXISTING PATTERNS.
3. 3/8" EXPANSION JOINTS TO BE PROVIDED AT EACH POINT OF TANGENCY OF THE CURB, COLD JOINTS, EACH SIDE OF INLET STRUCTURES AND DRIVEWAYS. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED AND NON EXTRUDING.
4. CONTRACTION JOINT SPACING NOT TO EXCEED 15 FEET. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES. WEEP HOLES TO BE CENTERED WITH CONTRACTION JOINTS.
5. BASE COURSE SHALL BE TO SUBGRADE OF STREET SECTION OR 3 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 6" BEHIND THE CURB.
6. DRAINAGE WEEP HOLES TO BE 3" I.D. PLASTIC PIPE WITH COUPLING. FINISH PIPE END FLUSH WITH FACE OF CURB.
7. GROUT ANY VOIDS IN CONCRETE SURROUNDING PIPE.
8. DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.
9. CURB TO BE BRUSH FINISHED. ALL EXISTING EDGES SHALL BE SAWCUT.
10. ALL MATERIALS AND WORKMANSHIP FOR TYPE E-1 & A-1 SHALL BE IN ACCORDANCE WITH WDOT STANDARD PLAN No. F-1, APPROVED 7/18/97 OR MOST CURRENT REVISION.

NO.	REVISIONS	DATE	BY

DWG: F18.DWG

Department of Public Works
CLARK COUNTY WASHINGTON
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CONCRETE CURBS

APPROVED
Peter Capell — COUNTY ENGINEER — 01/01/04 DATE

STANDARD F18

PLAN No.
DESIGNED SCH
DRAWN SCH
DATE 07/24/03

OPEN CUT UTILITY TRENCH BACKFILL DETAIL (COLLECTOR OR ARTERIAL)

SURFACING:

1. All A.C.P. shall be saw cut to provide a straight, clean edge prior to paving.
2. The cut line shall be one continuous straight line from the outer excavation limits of manhole, valve box, etc. to manhole, valve box, etc.
3. Pave with an 0.5 ft. minimum compacted depth A.C.P., or match existing or design section, whichever is greater.
4. Lifts for A.C.P. (Class A) shall be 0.15 ft. minimum and 0.35 ft. maximum for non-surface lifts (0.25' maximum for surface lift); the temperature shall be 250 degree minimum, 350 degree maximum, compacted to 92% of the theoretical maximum.
5. All joints shall be tacked, sealed and sanded.
6. Trench shall be plated until paved.
7. For longitudinal installation, full lane width including turn lanes restoration shall be required or as directed by Clark County. For transverse installation refer to surfacing restoration of detail U6. See Section 12.20A.120.C.

BASE COURSE:

1. 0.80 ft. minimum depth (1-1/4" minus) C.S.B.C. (W.S.D.O.T. approved material).
2. Compacted to 95% of maximum density. See trench zone.
3. Equivalent depth of A.T.B. may be substituted.
4. For transverse or diagonal trenches in existing roadway pavement, CDF will be used from the bottom of full pavement section to a maximum CDF section of 3 feet or to 6" above the top of the pipe, which ever is less. See note 13 of Std. Plan UGN of this Manual.

TRENCH ZONE:

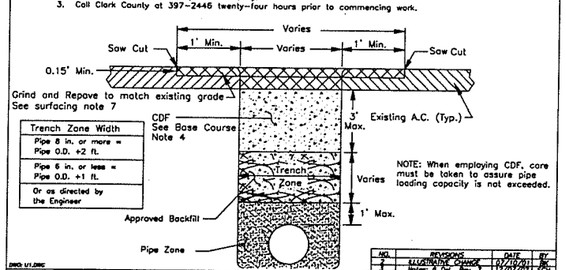
1. Granular backfill as approved by local agency or W.S.D.O.T. specifications for granular backfill. Compacted to 95% of maximum density in the trench zone using Method C compaction as per Section 2-03.3(14)C.
2. Native material may be used if approved prior to construction by Clark County.
3. Trench zone width -- see below.

PIPE ZONE:

1. Pipe zone material as specified by utility owner, and shall conform to section 9-03.12(3) WSDOT Specs.
2. 1.0 ft. max. from top of the pipe. 6" from top of pipe when CDF backfill used.

CONDITIONS:

1. A copy of the permit and requirements shall be on the job site at all times.
2. The permit holder shall be responsible for all restoration and maintenance of ditches, shoulders, driveways, landscaping, etc.
3. Call Clark County at 397-2446 twenty-four hours prior to commencing work.



Trench Zone Width
Pipe 8 in. or more = Pipe O.D. +2 ft.
Pipe 6 in. or less = Pipe O.D. +1 ft.
Or as directed by the Engineer

NOTE: When employing CDF, care must be taken to assure pipe loading capacity is not exceeded.

NO.	REVISIONS	DATE	BY
1	ILLUSTRATIVE CHANGE	07/10/01	BK
2	Notes: 6 Del., Rev. 7	12/07/01	SCH

DWG: U1.DWG

Department of Public Works
CLARK COUNTY WASHINGTON
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OPEN CUT UTILITY TRENCH BACKFILL DETAIL COLLECTOR OR ARTERIAL ROADWAY

APPROVED
Peter Capell — COUNTY ENGINEER — 7/20/01 DATE

STANDARD U1

PLAN No.
DESIGNED
DRAWN
DATE 04/25/03

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: RD2
SHEET 12 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL H. KERRICK STATE OF WASHINGTON 29030 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: MAY 25, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
ROADWAY DETAIL II

proud past, promising future
CLARK COUNTY WASHINGTON

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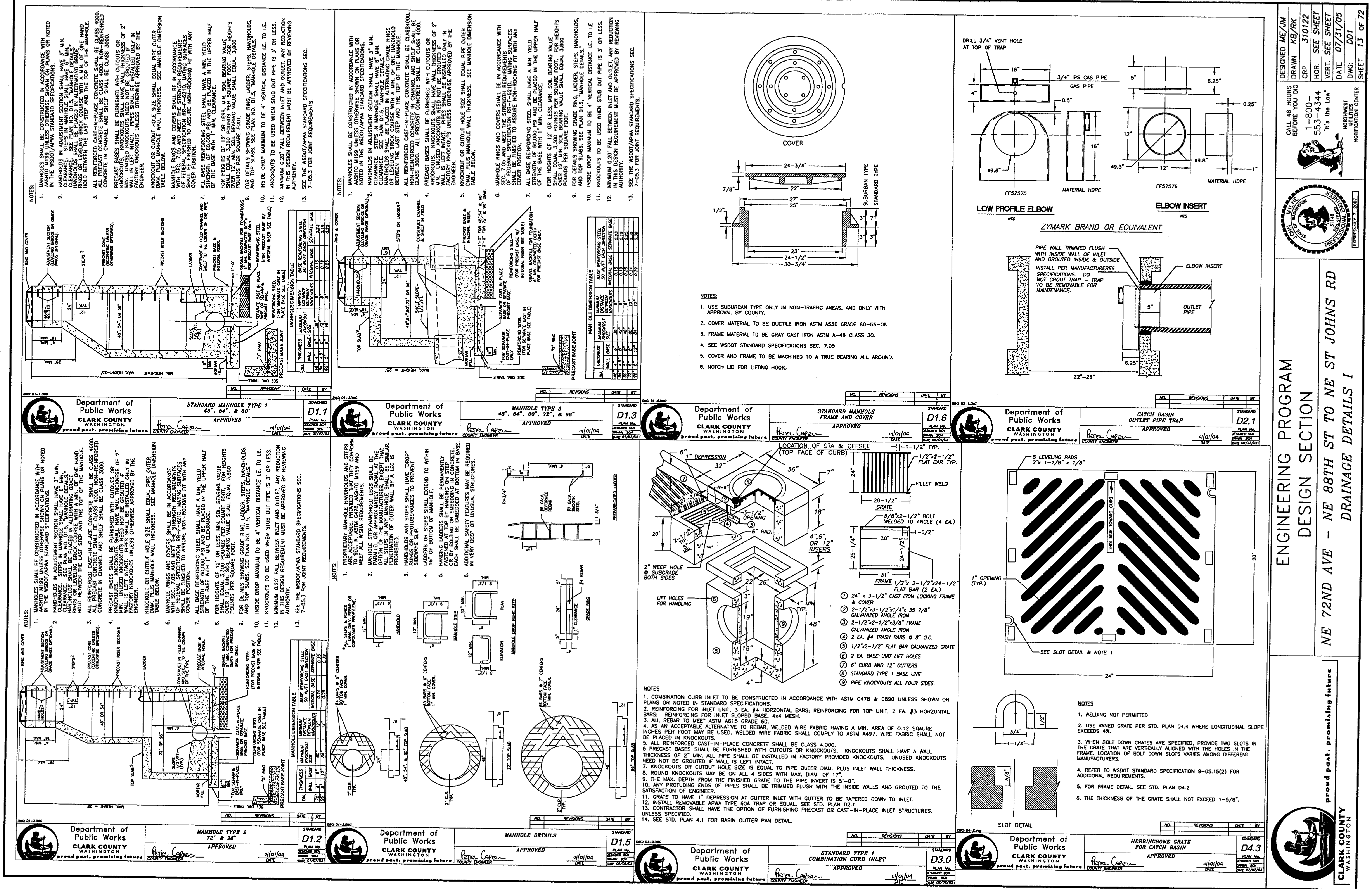

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Department of Public Works
CLARK COUNTY WASHINGTON
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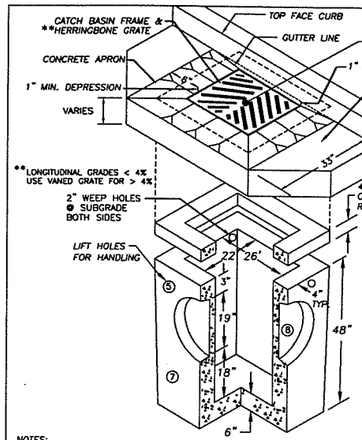
STANDARD MANHOLE TYPE 1
48", 54", & 60"
APPROVED
D1.1
MANHOLE TYPE 3
48", 54", 60", 72", & 96"
D1.3
STANDARD MANHOLE FRAME AND COVER
D1.6
COVER
24-3/4"
22"
27"
25"
23"
24-1/2"
30-3/4"
SUBURBAN TYPE
STANDARD TYPE
NOTES:
1. USE SUBURBAN TYPE ONLY IN NON-TRAFFIC AREAS, AND ONLY WITH APPROVAL BY COUNTY.
2. COVER MATERIAL TO BE DUCTILE IRON ASTM A536 GRADE 80-55-06
3. FRAME MATERIAL TO BE GRAY CAST IRON ASTM A-48 CLASS 30.
4. SEE WSDOT STANDARD SPECIFICATIONS SEC. 7.05
5. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
6. NOTCH LID FOR LIFTING HOOK.
CATCH BASIN OUTLET PIPE TRAP
D2.1
DRILL 3/4" VENT HOLE AT TOP OF TRAP
3/4" IPS GAS PIPE
GAS PIPE
LOW PROFILE ELBOW
ELBOW INSERT
MATERIAL HDPE
FF57575
FF57576
ZYMARK BRAND OR EQUIVALENT
PIPE WALL TRIMMED FLUSH WITH INSIDE WALL OF INLET AND GROUTED INSIDE & OUTSIDE
INSTALL PER MANUFACTURERES SPECIFICATIONS. DO NOT GROUT TRAP - TRAP TO BE REMOVABLE FOR MAINTENANCE.
OUTLET PIPE
MANHOLE TYPE 2
72" & 96"
D1.2
MANHOLE DETAILS
D1.5
STANDARD TYPE 1 COMBINATION CURB INLET
D3.0
LOCATION OF STA & OFFSET (TOP FACE OF CURB)
1" DEPRESSION
2" WEEP HOLE @ SUBGRADE BOTH SIDES
LIFT HOLES FOR HANDLING
4", 6", OR 12" RISERS
29-1/2" GRATE
31" FRAME
1/2"x2-1/2" FLAT BAR TYP.
FILLET WELD
5/8"x2-1/2" BOLT WELDED TO ANGLE (4 EA.)
1/2"x 2-1/2"x24-1/2" FLAT BAR (2 EA.)
1 24" x 3-1/2" CAST IRON LOCKING FRAME & COVER
2 2-1/2"x3-1/2"x1/4"x 35 7/8" GALVANIZED ANGLE IRON
3 2-1/2"x2-1/2"x3/8" FRAME GALVANIZED ANGLE IRON
4 2 EA. #4 TRASH BARS @ 8" O.C.
5 1/2"x2-1/2" FLAT BAR GALVANIZED GRATE
6 2 EA. BASE UNIT LIFT HOLES
7 6" CURB AND 12" GUTTERS
8 STANDARD TYPE 1 BASE UNIT
9 PIPE KNOCKOUTS ALL FOUR SIDES.
NOTES
1. COMBINATION CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 & C890 UNLESS SHOWN ON PLANS OR NOTED IN STANDARD SPECIFICATIONS.
2. REINFORCING FOR INLET UNIT, 3 EA. #4 HORZONTAL BARS; REINFORCING FOR TOP UNIT, 2 EA. #3 HORZONTAL BARS; REINFORCING FOR INLET SLOPED BASE, 4x4 MESH.
3. ALL REBAR TO MEET ASTM A615 GRADE 60.
4. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQAURE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
5. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000.
6. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
7. KNOCKOUTS OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS INLET WALL THICKNESS.
8. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 17".
9. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
10. ANY PROTUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
11. GRATE TO HAVE 1" DEPRESSION AT GUTTER INLET WITH GUTTER TO BE TAPERED DOWN TO INLET.
HERRINGBONE GRATE FOR CATCH BASIN
D4.3
8 LEVELING PADS 2"x 1-1/8" x 1/8"
THIS SIDE TOWARD CURB
1" OPENING (TYP.)
SEE SLOT DETAIL & NOTE 1
24"
20"
SLOT DETAIL
NOTES
1. WELDING NOT PERMITTED
2. USE VANED GRATE PER STD. PLAN D4.4 WHERE LONGITUDINAL SLOPE EXCEEDS 4%.
3. WHEN BOLT DOWN GRATES ARE SPECIFIED, PROVIDE TWO SLOTS IN THE GRATE THAT ARE VERTICALLY ALIGNED WITH THE HOLES IN THE FRAME. LOCATION OF BOLT DOWN SLOTS VARIES AMONG DIFFERENT MANUFACTURERS.
4. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
5. FOR FRAME DETAIL, SEE STD. PLAN D4.2
6. THE THICKNESS OF THE GRATE SHALL NOT EXCEED 1-5/8".
ENGINEERING PROGRAM
DESIGN SECTION
NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE DETAILS I
CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITY NOTIFICATION CENTER
DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DD1
SHEET 13 OF 72
CLARK COUNTY WASHINGTON



PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	18"
ALL METAL PIPE	21"
CPSSP * (Std. Spec. 9-05.20	18"
SOLID WALL PVC (Std. Spec. 9-05.12(1)	21"
PROFILE WALL PVC (Std. Spec. 9-05.12(2)	21"

*CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES:

1. CURB INLET TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C478 (AASHTO) M 199) & C890 UNLESS SHOWN ON PLANS OR NOTED IN STANDARD SPECIFICATIONS.
2. REINFORCING FOR INLET UNIT, 3 EA. #4 HORIZONTAL BARS.
3. REINFORCING FOR TOP UNIT, 2 EA. #3 HORIZONTAL BARS.
4. ALL REBAR TO MEET ASTM A615 GRADE 60.
5. AS AN ACCEPTABLE ALTERNATIVE TO REBAR, WELDED WIRE FABRIC HAVING A MIN. AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WELDED WIRE FABRIC SHALL COMPLY TO ASTM A497. WIRE FABRIC SHALL NOT BE PLACED IN KNOCKOUTS.
6. ALL REINFORCED CAST-IN-PLACE CONCRETE SHALL BE CLASS 4,000.
7. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS OR KNOCKOUTS. KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MIN. ALL PIPE SHALL BE INSTALLED IN FACTORY PROVIDED KNOCKOUTS. UNUSED KNOCKOUTS NEED NOT BE GROUTED IF WALL IS LEFT INTACT.
8. KNOCKOUTS OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAM. PLUS INLET WALL THICKNESS.
9. ROUND KNOCKOUTS MAY BE ON ALL 4 SIDES WITH MAX. DIAM. OF 20".
10. THE MAX. DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT IS 5'-0".
11. ANY PROTRUDING ENDS OF PIPES SHALL BE TRIMMED FLUSH WITH THE INSIDE WALLS AND GROUTED TO THE SATISFACTION OF ENGINEER.
12. CATCH BASIN FRAME AND GRATE SHALL BE IN ACCORDANCE WITH WDOT STANDARD SPECIFICATIONS AND MEET THE STRENGTH REQUIREMENTS OF FEDERAL SPECIFICATION RR-F-621D. MATING SURFACES SHALL BE FINISHED TO ASSURE NON-ROCKING FIT WITH ANY COVER POSITION.
13. FRAME MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO RISER.
14 INSTALL REMOVABLE APWA TYPE 60A TRAP OR EQUAL. SEE STD. PLAN D2.1.
15. CONTRACTOR SHALL HAVE THE OPTION OF FURNISHING PRECAST OR CAST-IN-PLACE INLET STRUCTURES, UNLESS SPECIFIED.

NO.	REVISIONS	DATE	BY

DWG: D4-0.DWG

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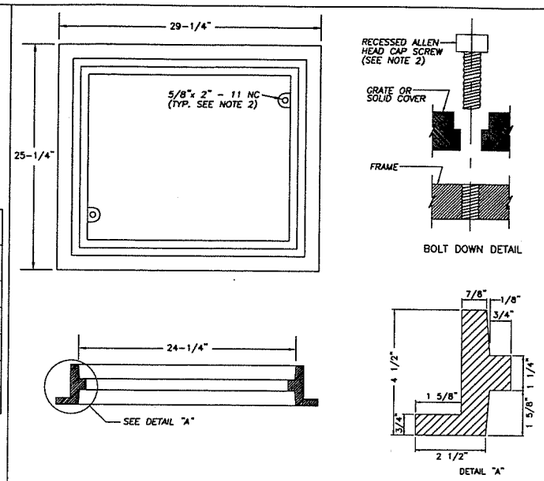
STANDARD CATCH BASIN TYPE 1
APPROVED
Peter Capen, COUNTY ENGINEER — 01/01/04 DATE
STANDARD D4.0
PLAN No.
DESIGNED SCH
DRAWN SCH
DATE 07/07/03



NOTES

1. THIS FRAME IS DESIGNED TO ACCOMODATE 20"x 24" GRATES OR COVERS AS SHOWN ON STD. PLANS D4.3 AND D4.4.
2. WHEN BOLT DOWN GRATES OR COVERS ARE SPECIFIED, PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE OR COVER SLOTS. TAP EACH HOLE TO ACCEPT A 5/8"x 2" - 11 NC ALLEN HEAD CAP SCREW. LOCATION OF BOLT DOWN HOLES VARIES AMONG DIFFERENT MANUFACTURERS.
3. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
4. SEE WSDOT STD. SPEC. SECTION 7.05.

NO.	REVISIONS	DATE	BY

DWG: D4-2.dwg

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REVERSIBLE FRAME FOR CATCH BASIN
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STANDARD D4.2
PLAN No.
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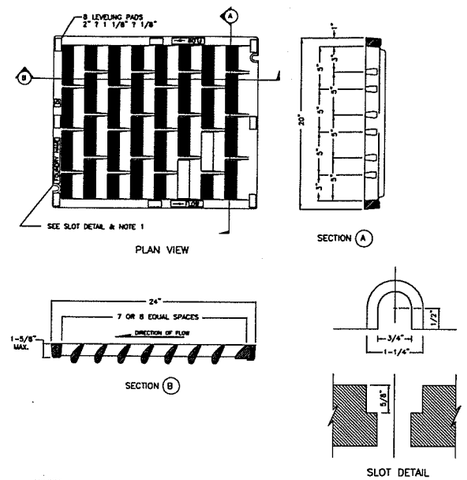

NOTES

1. WELDING NOT PERMITTED
2. USE HERRINGBONE GRATE PER STD. PLAN D4.3 WHERE LONGITUDINAL SLOPE IS LESS THAN 4%.
3. WHEN BOLT DOWN GRATES ARE SPECIFIED, PROVIDE TWO SLOTS IN THE GRATE THAT ARE VERTICALLY ALIGNED WITH THE HOLES IN THE FRAME. LOCATION OF BOLT DOWN SLOTS VARIES AMONG DIFFERENT MANUFACTURERS.
4. REFER TO WSDOT STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
5. FOR FRAME DETAIL, SEE STD. PLAN D4.2

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DWG: D4-4.dwg

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VANE GRATE FOR CATCH BASIN
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STANDARD D4.4
PLAN No.
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DRAWN SCH
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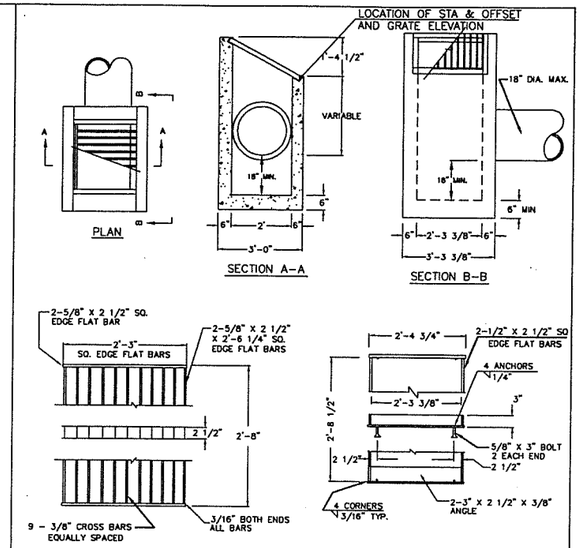

NOTES:

1. DITCH INLET CONSTRUCTION IN ACCORDANCE WITH ASTM C-478
2. CATCH BASIN, FRAME, AND GRATES SHALL BE FLAT BAR STEEL OR APPROVED EQUAL.
3. INSIDE FRAME DIMENSIONS: 2'-3 3/8"x 2'-8 1/2"".
4. 3/8" CROSS BARS SHALL BE FLUSH WITH THE GRATE SURFACE AND MAY BE FILLET WELDED. RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.

NO.	REVISIONS	DATE	BY

DWG: D6.DWG

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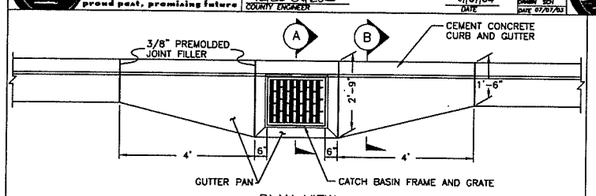
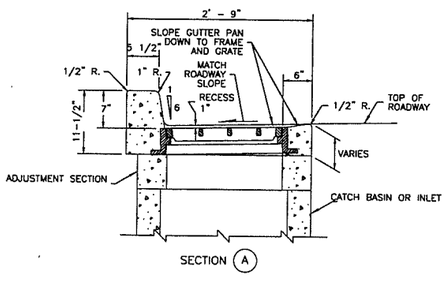
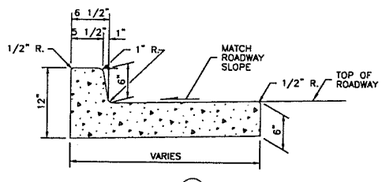
DITCH INLET
APPROVED
Peter Capen, COUNTY ENGINEER — 01/01/04 DATE
STANDARD D6
PLAN No.
DESIGNED SCH
DRAWN SCH
DATE 08/17/02



PLAN VIEW
CATCH BASIN GUTTER PAN



SECTION (A)



SECTION (B)

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CATCH BASIN GUTTER PAN
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STANDARD D4.1
PLAN No.
DESIGNED SCH
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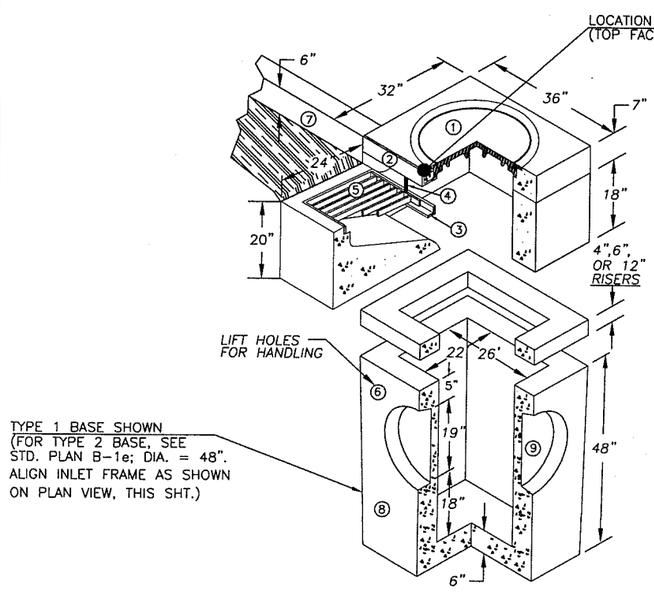


ISOMETRIC VIEW

#	
1	24"ALUMINUM LOCKING FRAME & COVER
2	2 1/2"x3 1/2"x1/4"x 35 7/8" GALVANIZED ANGLE IRON
3	2"x2 1/2"x1/4"x33" GALVANIZED ANGLE IRON
4	2 EA. #4 TRASH BARS @12" O.C.
5	24 3/4"x 28 1/2" GALVANIZED GRATE
6	2 EA. BASE UNIT LIFT HOLES
7	6" CURB AND 18" GUTTERS
8	STANDARD TYPE 1 BASE UNIT
9	PIPE KNOCKOUTS ALL FOUR SIDES.

WEIGHT:

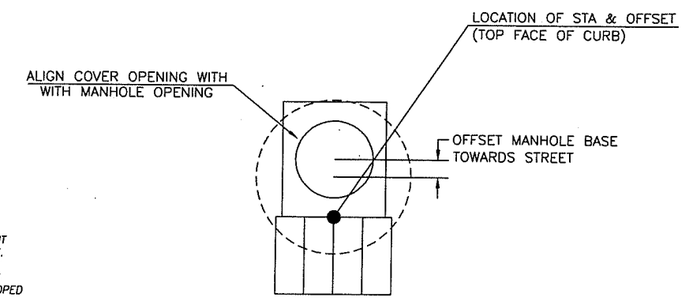
TOP WEIGHT 420 LB.

RISER WITH GRATE WEIGHT 1920 LB.

BASE WEIGHT 2200 LB.

NOTES:

1 REINFORCING FOR INLET UNIT 3 EA. #4 HORIZONTAL BARS.
2 REINFORCING FOR TOP UNIT 2 EA. #3 HORIZONTAL BARS
3 REINFORCING FOR INLET SLOPED BASE, 4x4 MESH
4 GUTTER IS TAPERED DOWN TO GRATE INLET
5 ALL CONCRETE IS 4,000 PSI MIN.
6 ALL REBAR MEETS ASTM A615 GRADE 60.



PLAN VIEW AND PLACEMENT DETAIL

TYPE 2 COMBINATION CURB INLET
NTS

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EXPIRES: JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE DETAILS II

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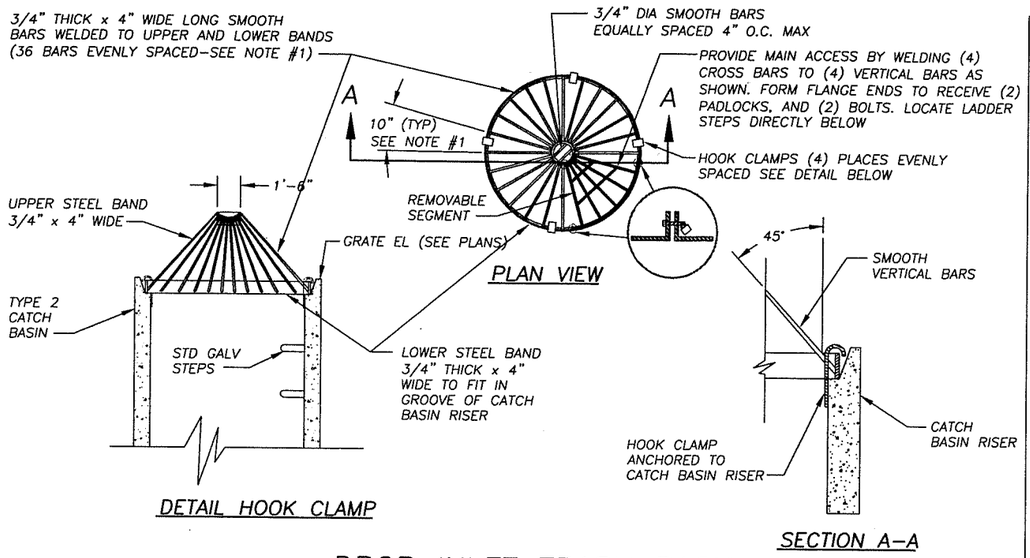

DROP INLET TRASH RACK

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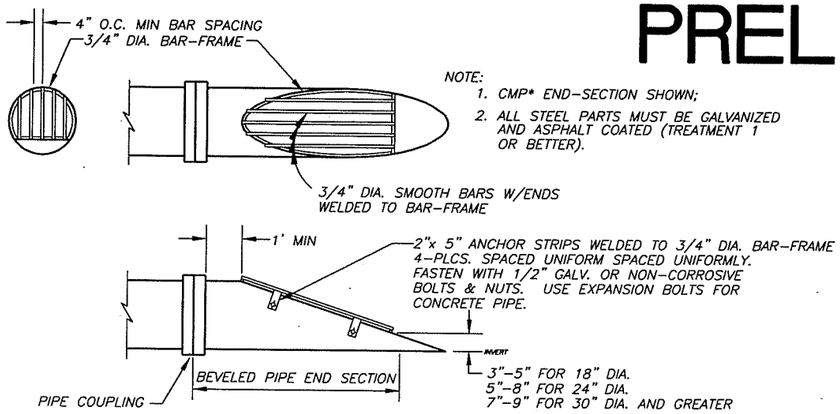
PRELIMINARY

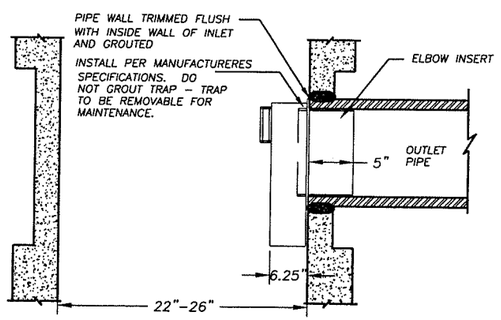


NOTE:
1. CMP* END-SECTION SHOWN;
2. ALL STEEL PARTS MUST BE GALVANIZED AND ASPHALT COATED (TREATMENT 1 OR BETTER).

DEBRIS RACK

NTS

NOTE: FOR 12" DIP TRAP USE 12" ⊕ 90 DEG. DIP ELBOW



CATCH BASIN OUTLET PIPE TRAP

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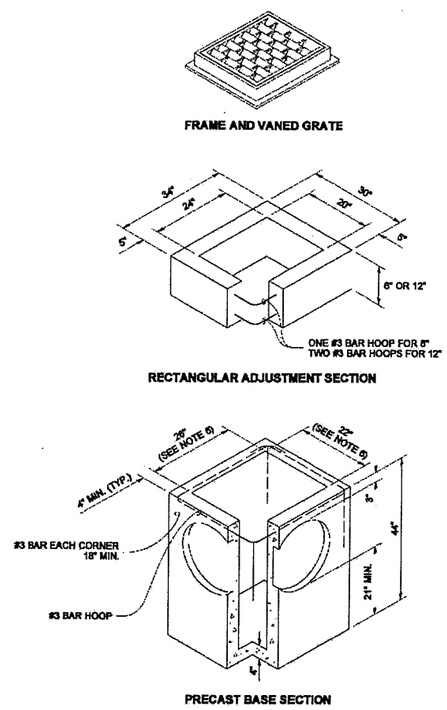


NOTES

1. AS AN ACCEPTABLE ALTERNATE TO REBAR, WIRE MESH HAVING A MINIMUM AREA OF 0.12 SQUARE INCHES PER FOOT MAY BE USED. WIRE MESH SHALL NOT BE PLACED IN KNOCKOUTS.
2. THE KNOCKOUT DIAMETER SHALL NOT BE GREATER THAN 20". KNOCKOUTS SHALL HAVE A WALL THICKNESS OF 2" MINIMUM TO 2.5" MAXIMUM. PROVIDE A 1.5" MINIMUM GAP BETWEEN THE KNOCKOUT WALL AND THE OUTSIDE OF THE PIPE. AFTER THE PIPE IS INSTALLED, FILL THE GAP WITH JOINT MORTAR IN ACCORDANCE WITH STANDARD SPECIFICATION 9-04.3.
3. THE MAXIMUM DEPTH FROM THE FINISHED GRADE TO THE PIPE INVERT SHALL BE 5'.
4. FRAME AND GRATE MAY BE INSTALLED WITH FLANGE DOWN OR CAST INTO ADJUSTMENT SECTION.
5. THE PRECAST BASE SECTION MAY HAVE A ROUNDED FLOOR AND THE WALLS MAY BE SLOPED AT A RATE OF 1:24 OR STEEPER.
6. OPENING SHALL BE MEASURED AT THE TOP OF THE PRECAST BASE SECTION.

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP * (STD. SPEC. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	18"
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	15"

* CORRUGATED POLYETHYLENE STORM SEWER PIPE

MATTHEW J. WITHEY — STATE OF WASHINGTON — 23144 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES JULY 1, 2005

CATCH BASIN TYPE 1

STANDARD PLAN B-1

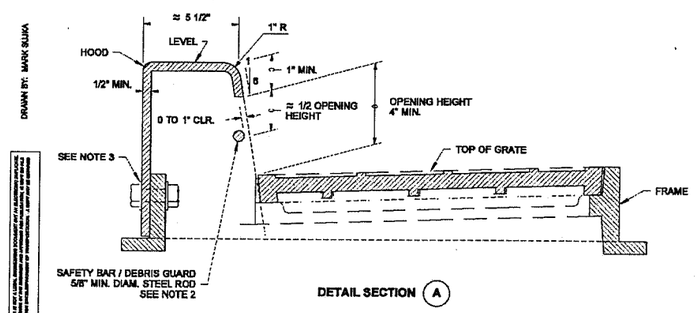
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 07-21-03
STATE BRIDGE ENGINEER DATE

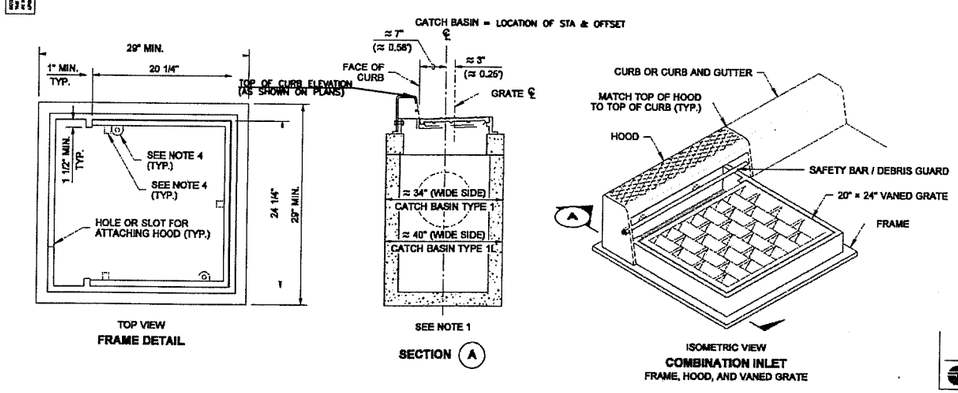
Washington State Department of Transportation

DRAWN BY: MARK SUIKA



NOTES

1. THE ASYMMETRY OF THE COMBINATION INLET SHALL BE CONSIDERED WHEN CALCULATING THE OFFSET DISTANCE FOR THE CATCH BASIN. SEE SECTION "A".
2. THE DIMENSIONS OF THE FRAME AND HOOD MAY VARY SLIGHTLY AMONG DIFFERENT MANUFACTURERS. THE FRAME MAY HAVE CAST FEATURES INTENDED TO SUPPORT A GRATE GUARD. HOOD UNITS SHALL MOUNT OUTSIDE OF THE FRAME. THE METHODS FOR FASTENING THE SAFETY BAR / DEBRIS GUARD ROD TO THE HOOD MAY VARY. THE HOOD MAY INCLUDE CASTING LUGS. THE TOP OF THE HOOD MAY BE CAST WITH A PATTERN.
3. ATTACH THE HOOD TO THE FRAME WITH TWO 3/4" x 2" HEX HEAD BOLTS, NUTS, AND OVERSIZE WASHERS. THE WASHERS SHALL BE USED ON THE SLOTTED SIDE, AND SHALL HAVE DIAMETERS ADEQUATE TO ASSURE FULL BEARING ACROSS THE SLOTS.
4. WHEN BOLT DOWN GRATES ARE SPECIFIED IN THE CONTRACT, PROVIDE TWO HOLES IN THE FRAME THAT ARE VERTICALLY ALIGNED WITH THE GRATE SLOTS. TAP EACH HOLE TO ACCEPT A 5/8" x - 11 NC x 2" ALLEN HEAD CAP SCREW. LOCATION OF BOLT DOWN HOLES VARIES AMONG DIFFERENT MANUFACTURERS. SEE "BOLT DOWN DETAIL", STANDARD PLAN B-2e.
5. ONLY DUCTILE IRON VANED GRATES SHALL BE USED. SEE STANDARD PLANS B-2b AND B-2c FOR GRATE DETAILS. REFER TO STANDARD SPECIFICATION 9-05.15(2) FOR ADDITIONAL REQUIREMENTS.
6. THIS PLAN IS INTENDED TO SHOW THE INSTALLATION DETAILS OF A MANUFACTURED PRODUCT. IT IS NOT THE INTENT OF THIS PLAN TO SHOW THE SPECIFIC DETAILS NECESSARY TO FABRICATE THE CASTINGS SHOWN ON THIS DRAWING.



MATTHEW J. WITHEY — STATE OF WASHINGTON — 23144 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES MAY 1, 2005

COMBINATION INLET

STANDARD PLAN B-2e

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE DETAILS III

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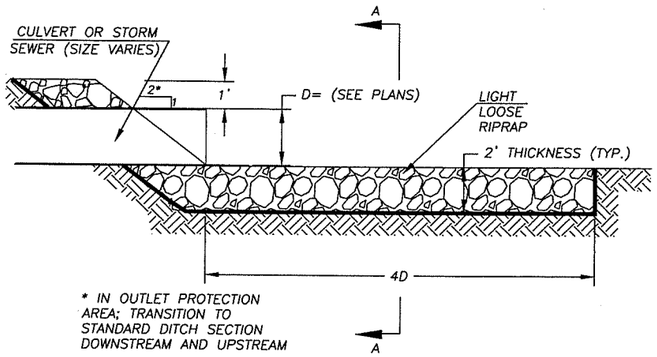
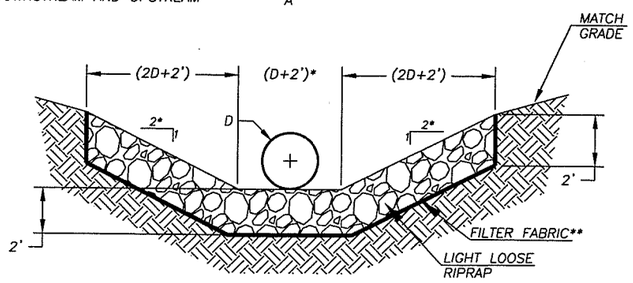


* IN OUTLET PROTECTION AREA; TRANSITION TO STANDARD DITCH SECTION DOWNSTREAM AND UPSTREAM

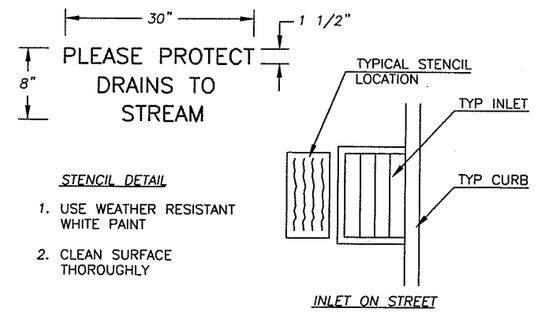


SECTION A-A

** CONSTRUCTION GEOTEXTILE FOR SEPARATION OR SOIL STABILIZATION (WSDOT 9-33, TABLE 3)

OUTFALL DISCHARGE PROTECTION

N.T.S.



STENCIL DETAIL

1. USE WEATHER RESISTANT WHITE PAINT
2. CLEAN SURFACE THOROUGHLY

INLET STENCIL DETAIL

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NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD

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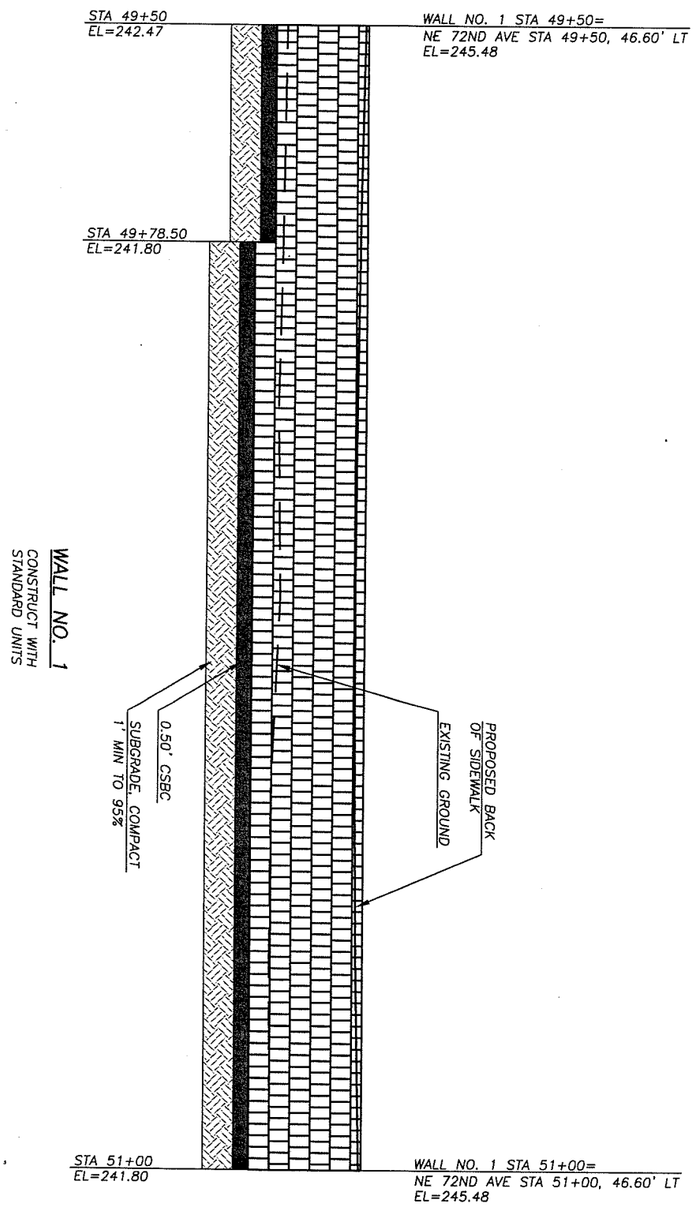

PRELIMINARY

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
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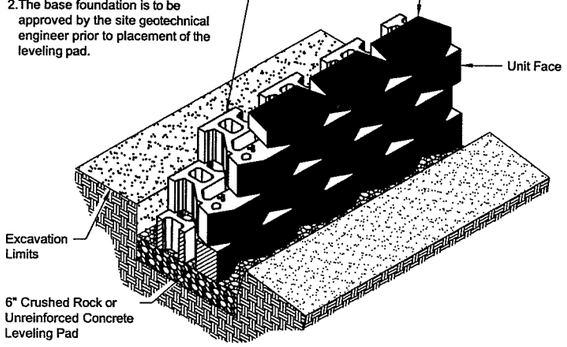
SHEET	17 OF 72

Base Leveling Pad Notes:

1. The leveling pad is to be constructed of crushed stone or 2,000 psi± unreinforced concrete
2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

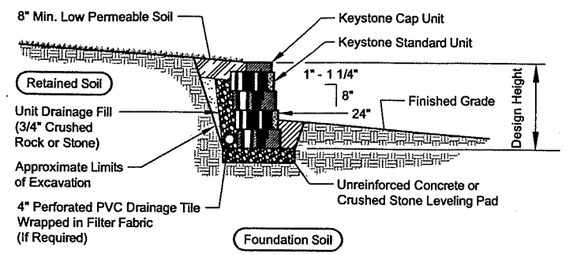
Standard Unit	
Width:	18"
*Depth:	18"
Height:	8"
*Weight:	102 lbs

Cap Unit	
Width:	18"
*Depth:	10 1/2"
Height:	4"
*Weight:	45 lbs



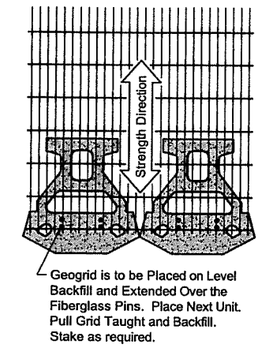
Standard Unit/Base Pad Isometric Section View

* Dimensions & Weight May Vary by Region

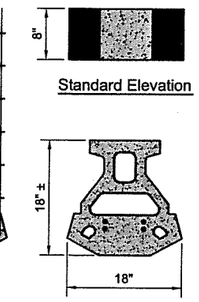


Typical Gravity Wall Section

Standard Unit - 1" Setback

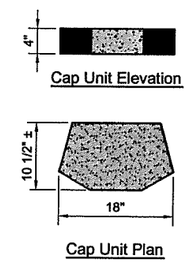


Grid & Pin Connection



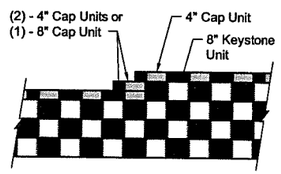
Standard Unit

* Dimensions May Vary by Region



3-Plane Split Cap Unit Option

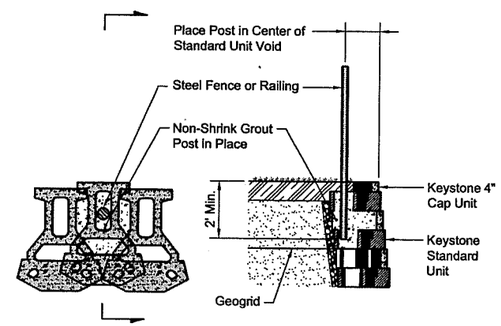
* Dimensions & Availability Will Vary by Region



Note:

1. Secure all cap units with Keystone Kapseal or equal.

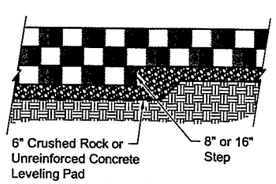
Top of Wall Steps



Fence Plan Detail

Fence SectionDetail

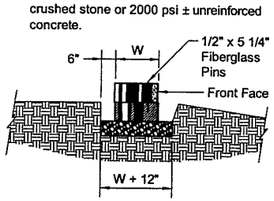
Standard Unit - 1" Setback



Elevation

Note:

1. The leveling pad is to be constructed of crushed stone or 2000 psi ± unreinforced concrete.



Section

Leveling Pad Detail

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HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: RW2
SHEET 18 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL W. KERRICK STATE OF WASHINGTON 29030 REGISTERED PROFESSIONAL ENGINEER EXPIRES MAY 26, 2007

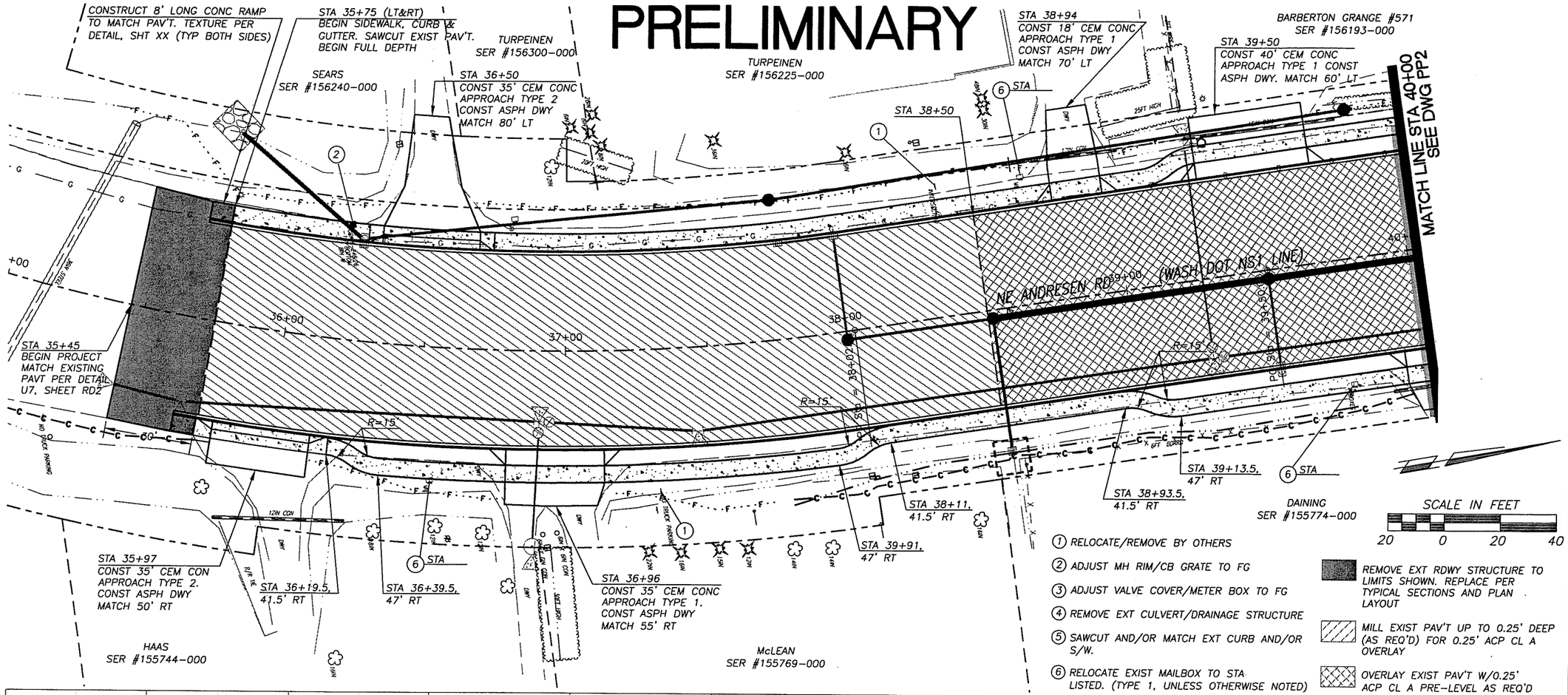
ENGINEERING PROGRAM
DESIGN SECTION

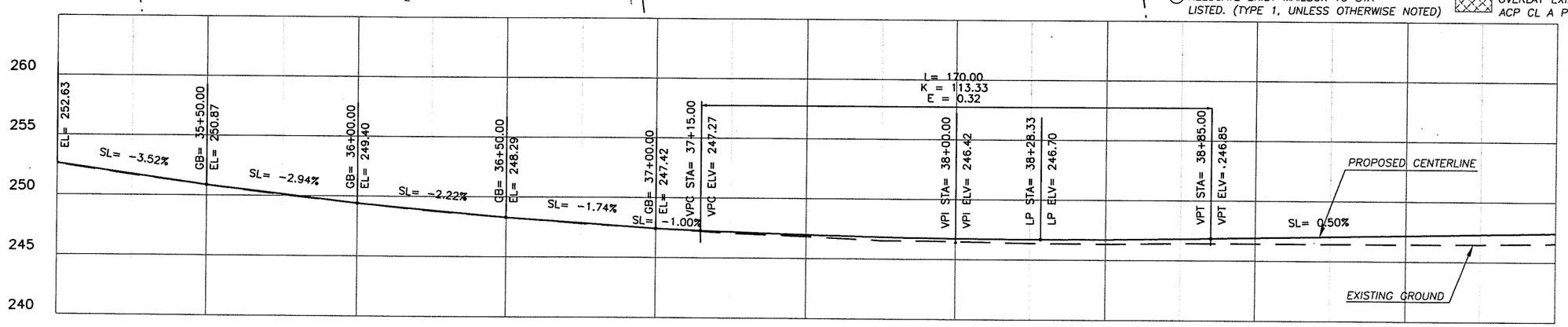
NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
RETAINING WALL DETAILS

proud past, promising future
CLARK COUNTY WASHINGTON

n:\CIP\PROJECTS\310122-NE72Ave-H99toSTJohns\DESIGN\DWGS\RW01-2.dwg, 7/28/2005 2:57:27 PM, kerlinr

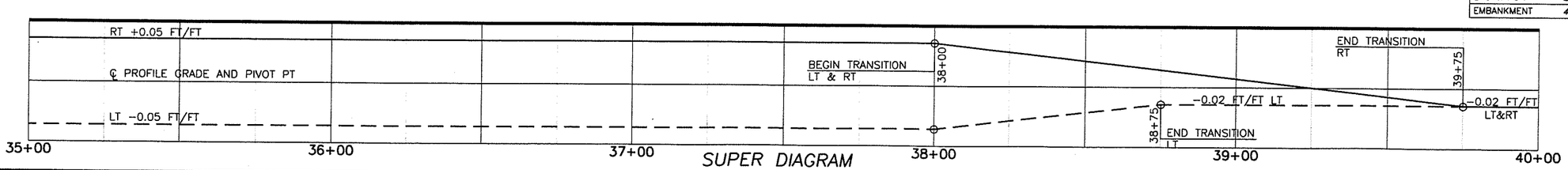
PRELIMINARY





UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	230 CY
EMBANKMENT	490 CY



SUPER DIAGRAM

DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	PP1
SHEET	19 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON MICHAEL M. ENDICK 22002 PROFESSIONAL ENGINEER EXPIRES MAY 28, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 35+00 TO STA 40+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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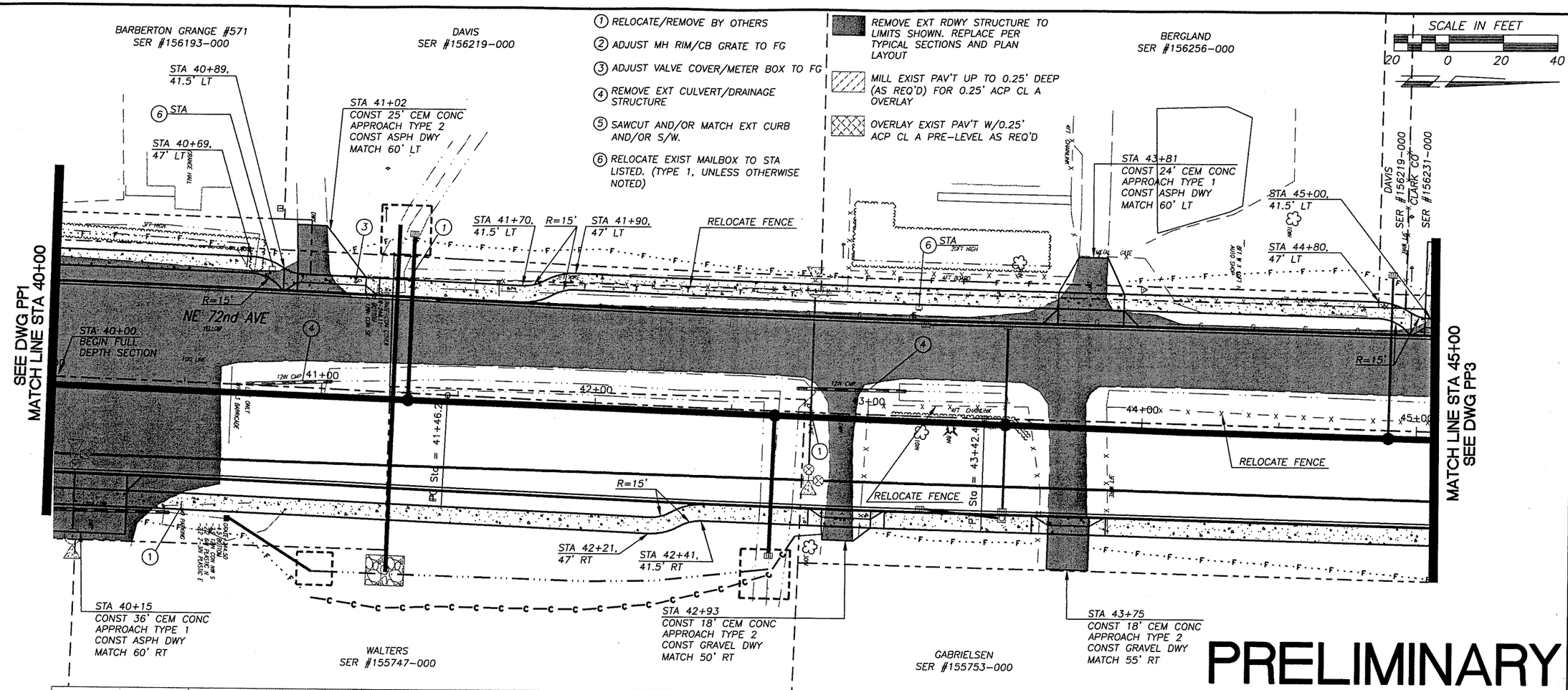

UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	1250 CY
EMBANKMENT	950 CY

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP2
SHEET 20 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON
MICHAEL M. EMICK
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: JULY 26, 2002

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 40+00 TO STA 45+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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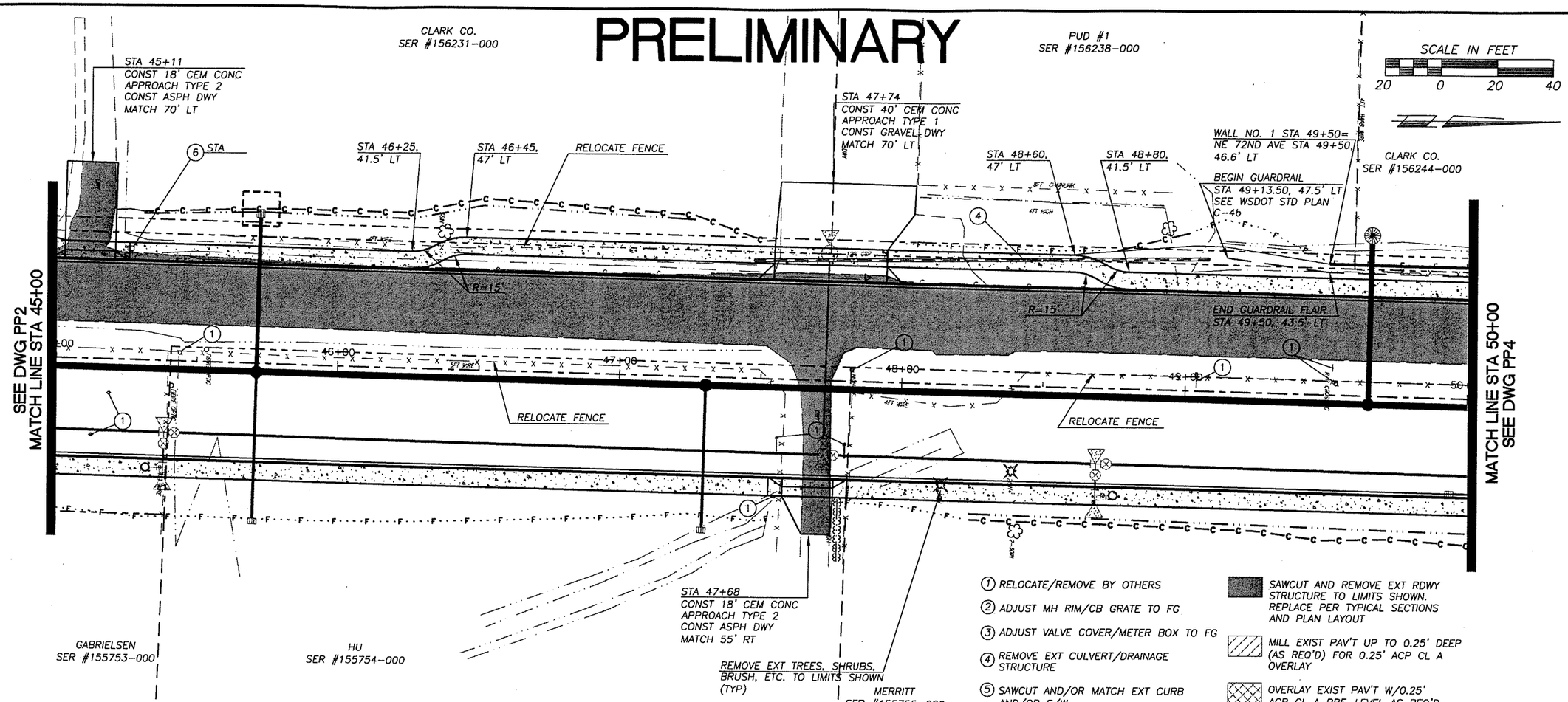
PRELIMINARY

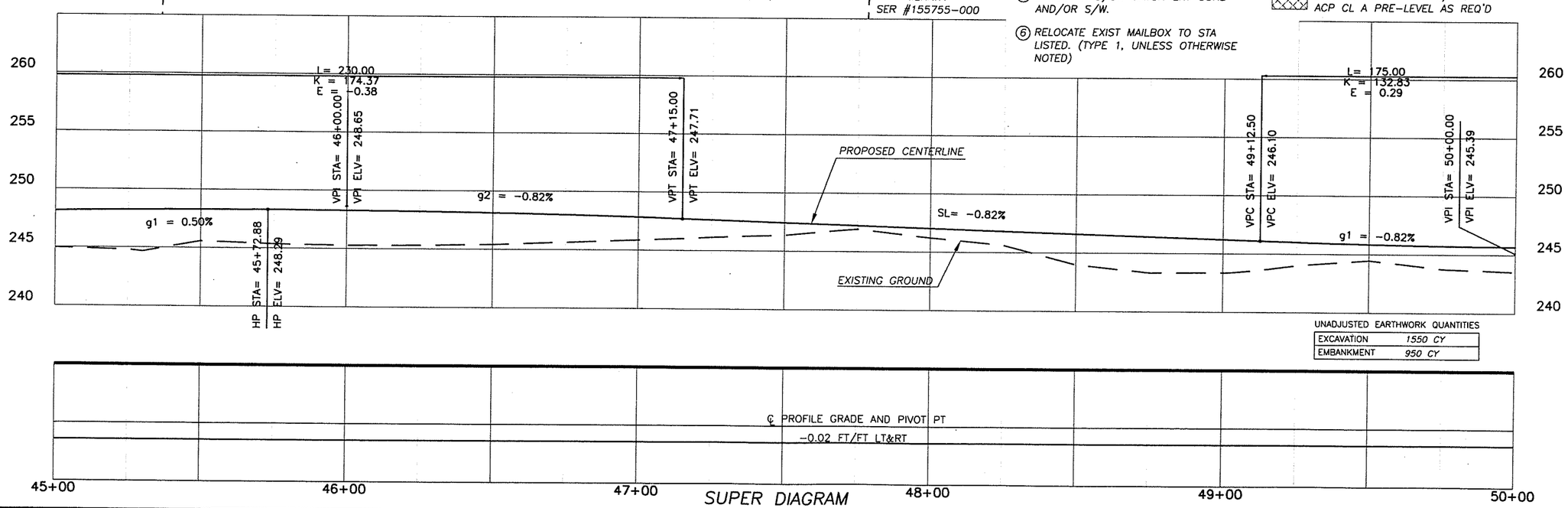


1. RELOCATE/REMOVE BY OTHERS
2. ADJUST MH RIM/CB GRATE TO FG
3. ADJUST VALVE COVER/METER BOX TO FG
4. REMOVE EXT CULVERT/DRAINAGE STRUCTURE
5. SAWCUT AND/OR MATCH EXT CURB AND/OR S/W.
6. RELOCATE EXIST MAILBOX TO STA LISTED. (TYPE 1, UNLESS OTHERWISE NOTED)

SAWCUT AND REMOVE EXT RDWY STRUCTURE TO LIMITS SHOWN. REPLACE PER TYPICAL SECTIONS AND PLAN LAYOUT

MILL EXIST PAV'T UP TO 0.25' DEEP (AS REQ'D) FOR 0.25' ACP CL A OVERLAY

OVERLAY EXIST PAV'T W/0.25' ACP CL A PRE-LEVEL AS REQ'D



SUPER DIAGRAM

UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	1550 CY
EMBANKMENT	950 CY

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP3
SHEET 21 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

JAMES M. ELDRIDGE
STATE OF WASHINGTON
20630
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: MAY 25, 2005

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 45+00 TO STA 50+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

n:\CIP\PROJECTS\310122-NE72Ave-H99toSTJohns\DESIGN\DWGS\PP3.dwg, 7/28/2005 2:58:46 PM, kerlinr

PRELIMINARY

SCALE IN FEET 20 0 20 40

CLARK CO. SER#156244-000

SMITH SER #156220-000

STA 52+54
CONST 32' CEM CONC
APPROACH TYPE 2
CONST GRAVEL DWY
MATCH 60' LT

CLARK CO. SER #119590-008

WALL NO.1 STA 51+00=
NE 72ND AVE STA 51+00, 46.6' LT

BEGIN GUARDRAIL FLAIR
STA 51+00, 43.5' LT

END GUARDRAIL
STA 51+36.50, 47.5' LT
SEE WSDOT STD PLAN C-4b

CLARK CO. SER #300002-000

PC 53+74.45, 5.5' RT*
PRC 54+14.83, 0.00*
PT 54+54.95, 5.5' LT*

SEE DWG PP3
MATCH LINE STA 50+00

MATCH LINE STA 55+00
SEE DWG PP5

NE 72ND AVENUE

RELOCATE FENCE

RELOCATE FENCE

GIBSON SER #155756-000

RELOCATE FENCE

RELOCATE FENCE

53+27.70, 5.5' RT*
BEGIN TYPE C
TRAFFIC CURB

REMOVE EXT TREES, SHRUBS, BRUSH, ETC. TO LIMITS SHOWN (TYP)

MERRITT SER #155755-000

MUTUAL MATERIALS COMPANY SER #119460-000

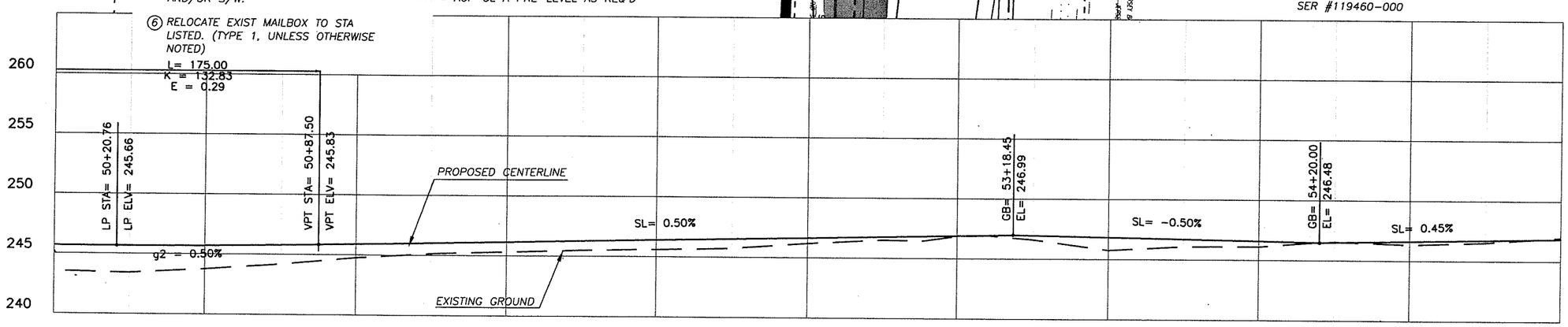
*OFFSET IS TO CENTER OF CURB

1. RELOCATE/REMOVE BY OTHERS
2. ADJUST MH RIM/CB GRATE TO FG
3. ADJUST VALVE COVER/METER BOX TO FG
4. REMOVE EXT CULVERT/DRAINAGE STRUCTURE
5. SAWCUT AND/OR MATCH EXT CURB AND/OR S/W.
6. RELOCATE EXIST MAILBOX TO STA LISTED. (TYPE 1, UNLESS OTHERWISE NOTED)

SAWCUT AND REMOVE EXT RDWY STRUCTURE TO LIMITS SHOWN. REPLACE PER TYPICAL SECTIONS AND PLAN LAYOUT

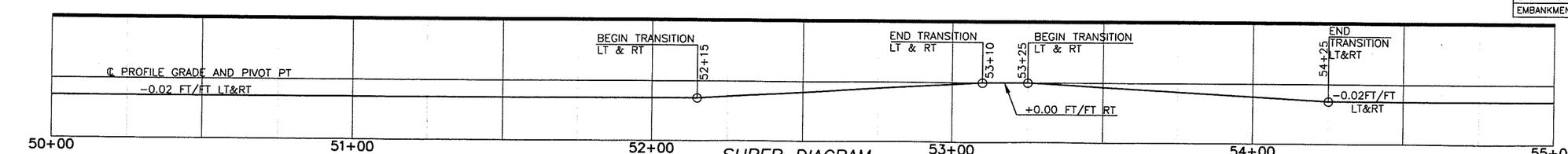
MILL EXIST PAV'T UP TO 0.25' DEEP (AS REQ'D) FOR 0.25' ACP CL A OVERLAY

OVERLAY EXIST PAV'T W/0.25' ACP CL A PRE-LEVEL AS REQ'D



UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	2900 CY
EMBANKMENT	200 CY



SUPER DIAGRAM

DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	PP4
SHEET	22 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON MICHAEL M. EMICK 22080 REGISTERED PROFESSIONAL ENGINEER EXPIRES MAY 28, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 50+00 TO STA 55+00)

CLARK COUNTY WASHINGTON
proud past, promising future

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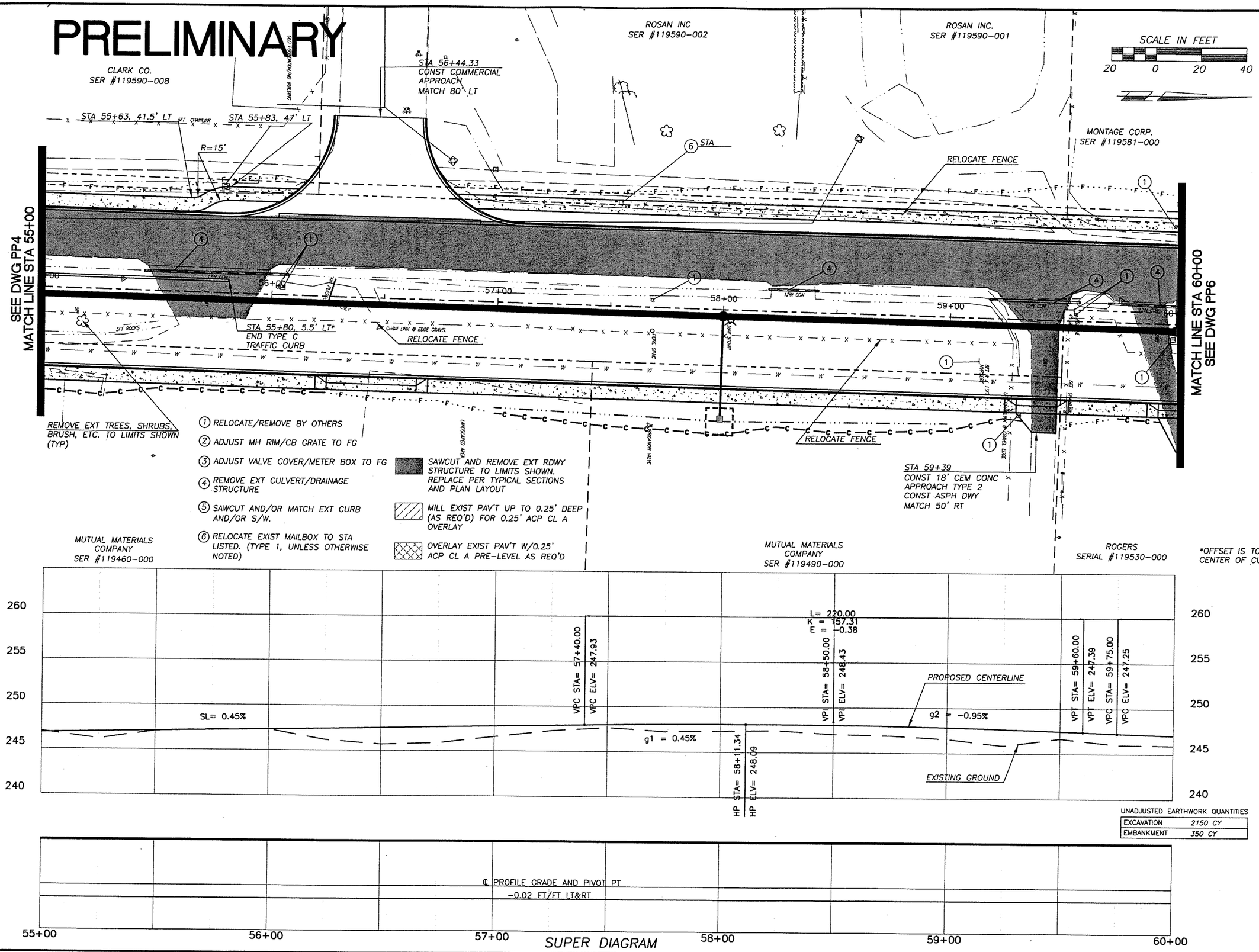
PRELIMINARY



UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	2150 CY
EMBANKMENT	350 CY

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP5
SHEET 23 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL M. EMRICK
STATE OF WASHINGTON
20035
PROFESSIONAL ENGINEER
EXPIRES: MAY 25, 2005

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 55+00 TO STA 60+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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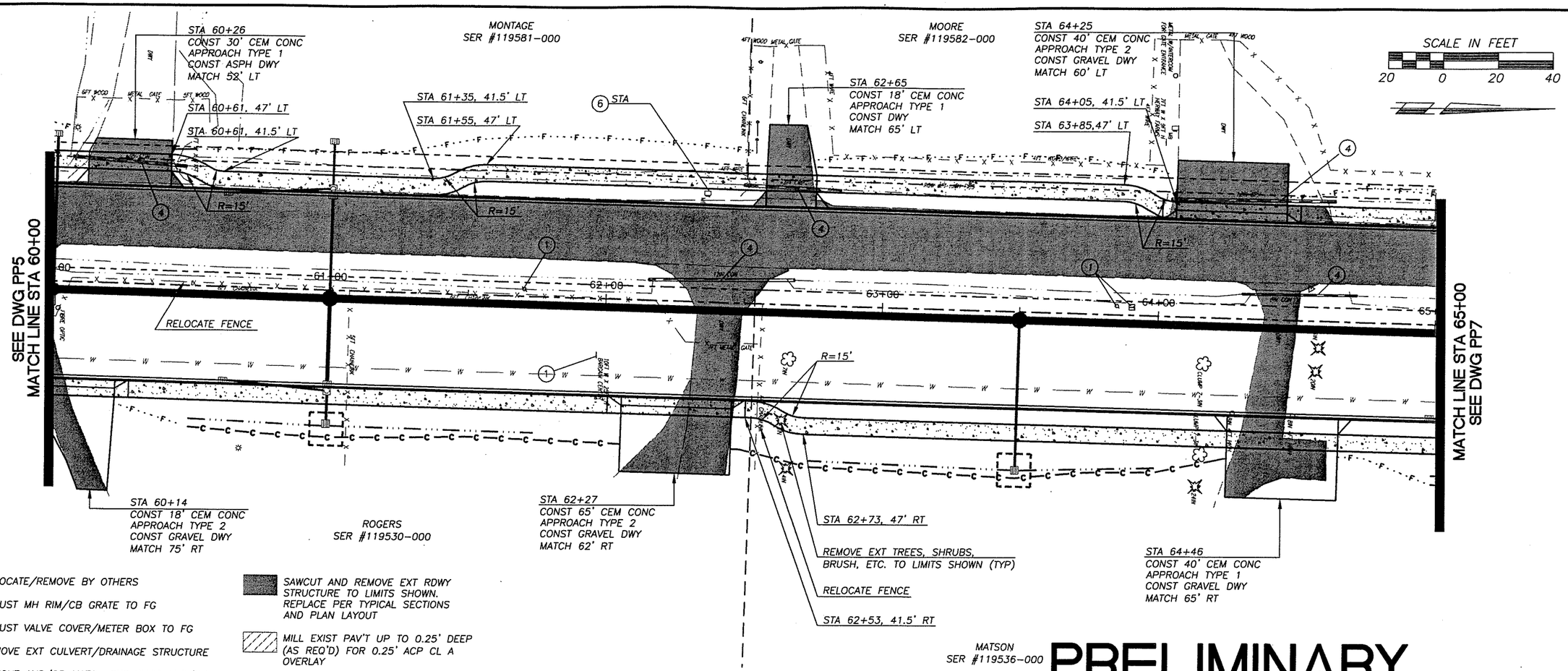


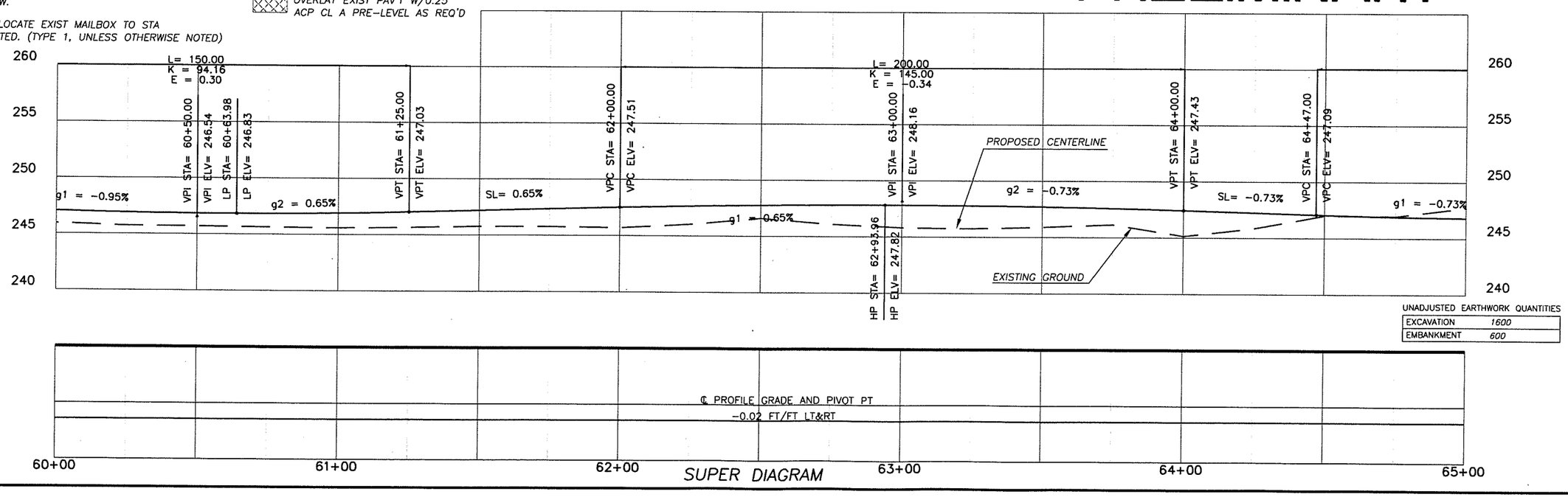
PRELIMINARY

1. RELOCATE/REMOVE BY OTHERS
2. ADJUST MH RIM/CB GRATE TO FG
3. ADJUST VALVE COVER/METER BOX TO FG
4. REMOVE EXT CULVERT/DRAINAGE STRUCTURE
5. SAWCUT AND/OR MATCH EXT CURB AND/OR S/W.
6. RELOCATE EXIST MAILBOX TO STA LISTED. (TYPE 1, UNLESS OTHERWISE NOTED)

SAWCUT AND REMOVE EXT RDWY STRUCTURE TO LIMITS SHOWN. REPLACE PER TYPICAL SECTIONS AND PLAN LAYOUT

MILL EXIST PAV'T UP TO 0.25' DEEP (AS REQ'D) FOR 0.25' ACP CL A OVERLAY

OVERLAY EXIST PAV'T W/0.25' ACP CL A PRE-LEVEL AS REQ'D



SUPER DIAGRAM

UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	1600
EMBANKMENT	600

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP6
SHEET 24 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL M. ERRICK
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES MAY 19, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 60+00 TO STA 65+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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1. RELOCATE/REMOVE BY OTHERS
2. ADJUST MH RIM/CB GRATE TO FG
3. ADJUST VALVE COVER/METER BOX TO FG
4. REMOVE EXT CULVERT/DRAINAGE STRUCTURE
5. SAWCUT AND/OR MATCH EXT CURB AND/OR S/W.
6. RELOCATE EXIST MAILBOX TO STA LISTED. (TYPE 1, UNLESS OTHERWISE NOTED)

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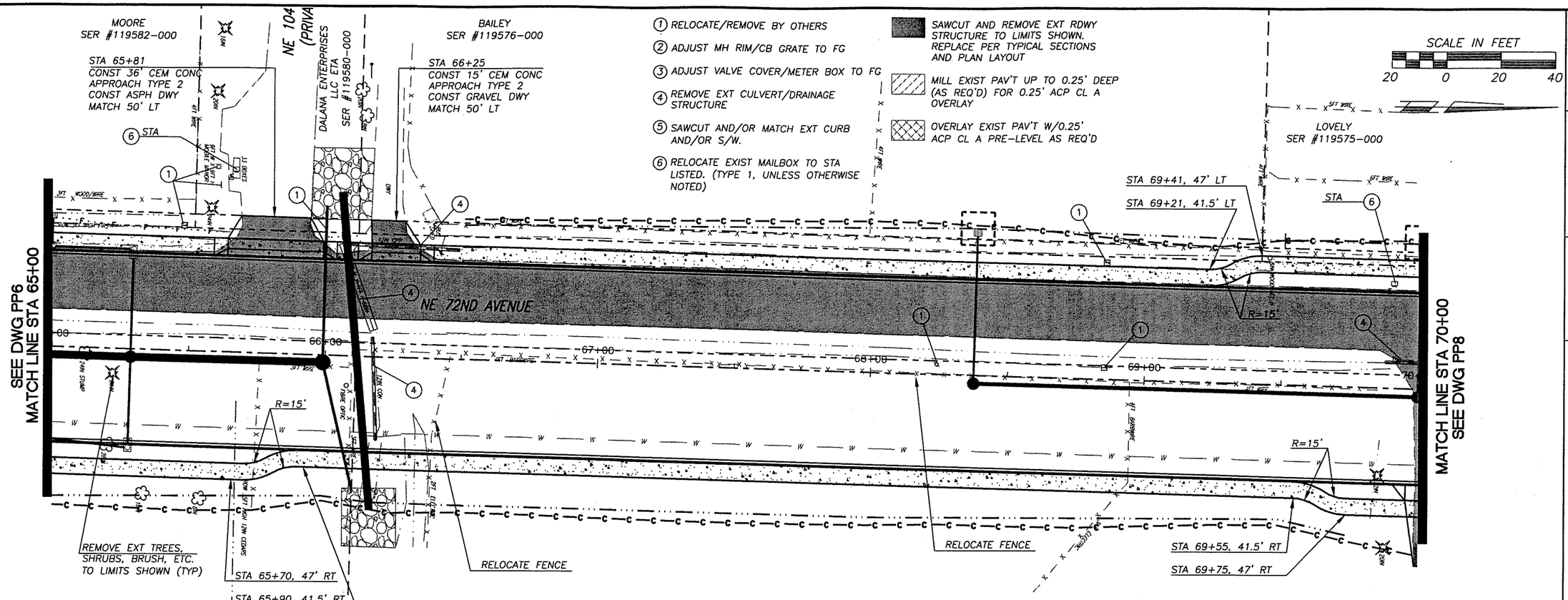
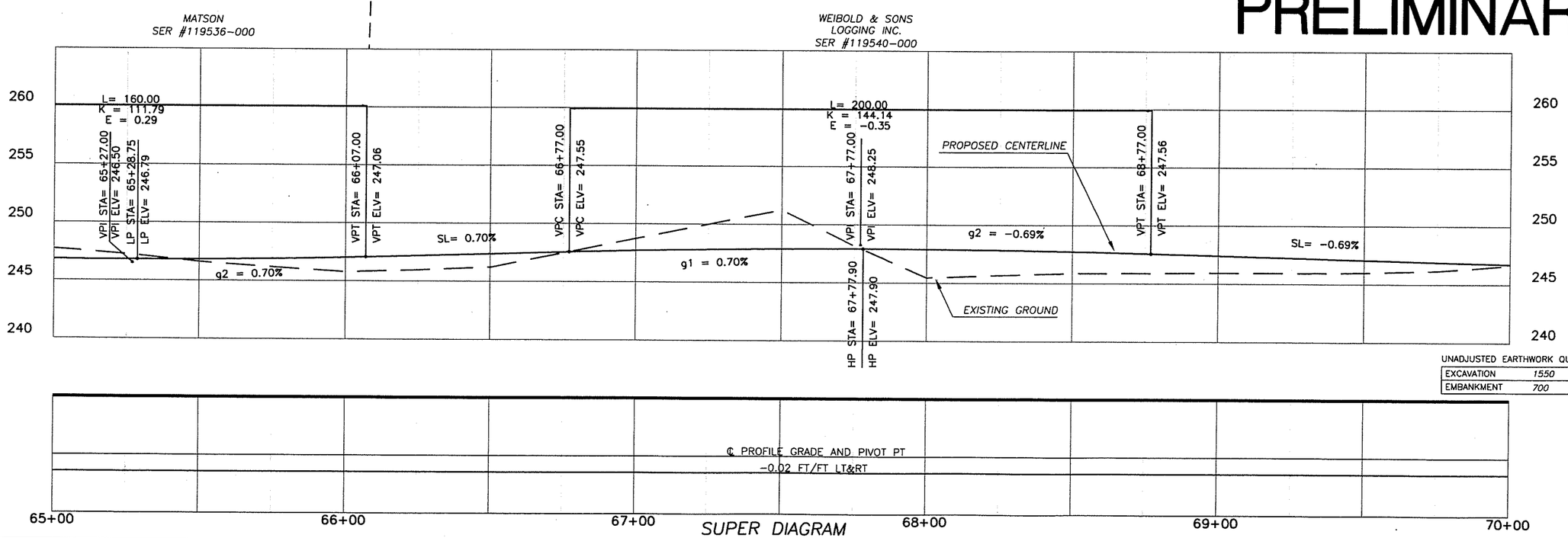
MILL EXIST PAV'T UP TO 0.25' DEEP (AS REQ'D) FOR 0.25' ACP CL A OVERLAY

OVERLAY EXIST PAV'T W/0.25' ACP CL A PRE-LEVEL AS REQ'D

SCALE IN FEET
20 0 20 40



PRELIMINARY



UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	1550
EMBANKMENT	700

DESIGNED ME/JM
DRAWN KB/RK
CRP. 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP7
SHEET 25 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL M. ENRICK
STATE OF WASHINGTON
21300
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: MAY 28, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 65+00 TO STA 70+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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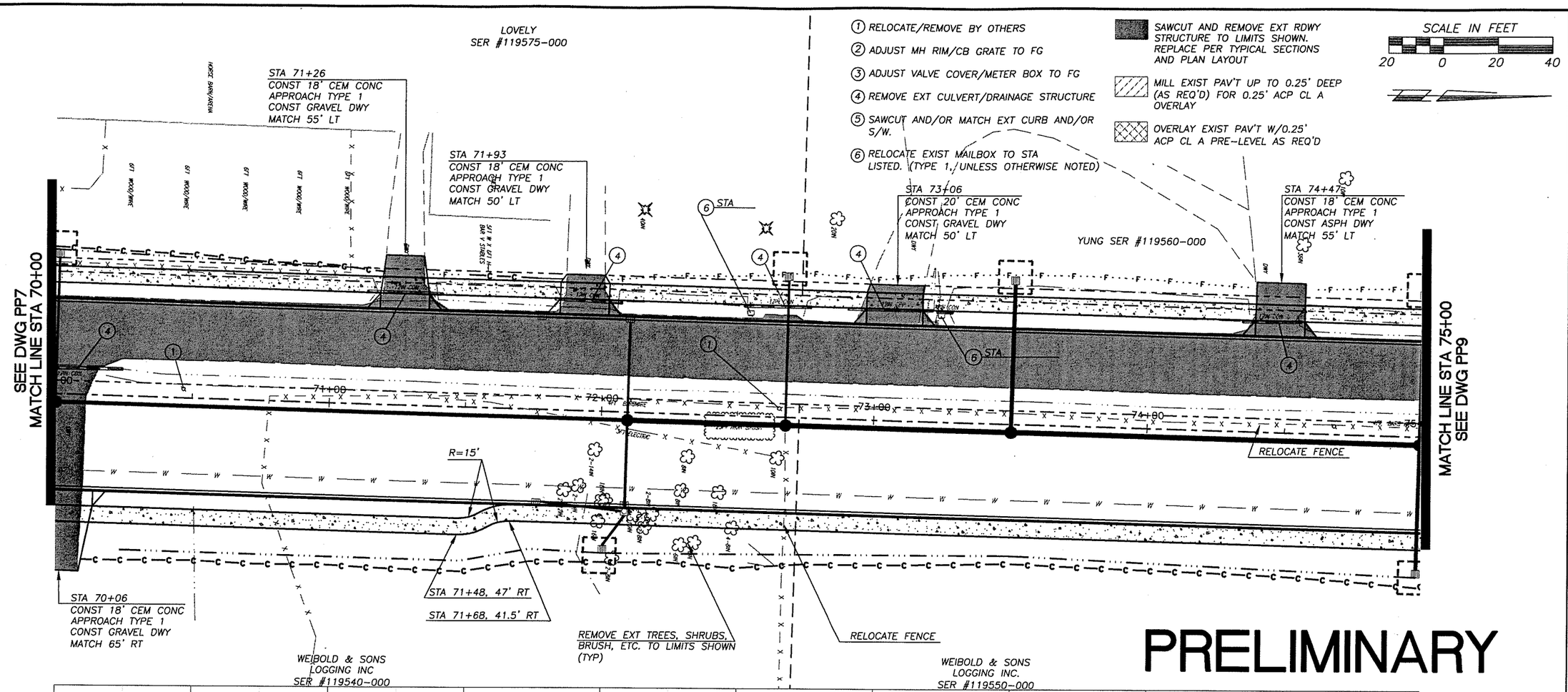
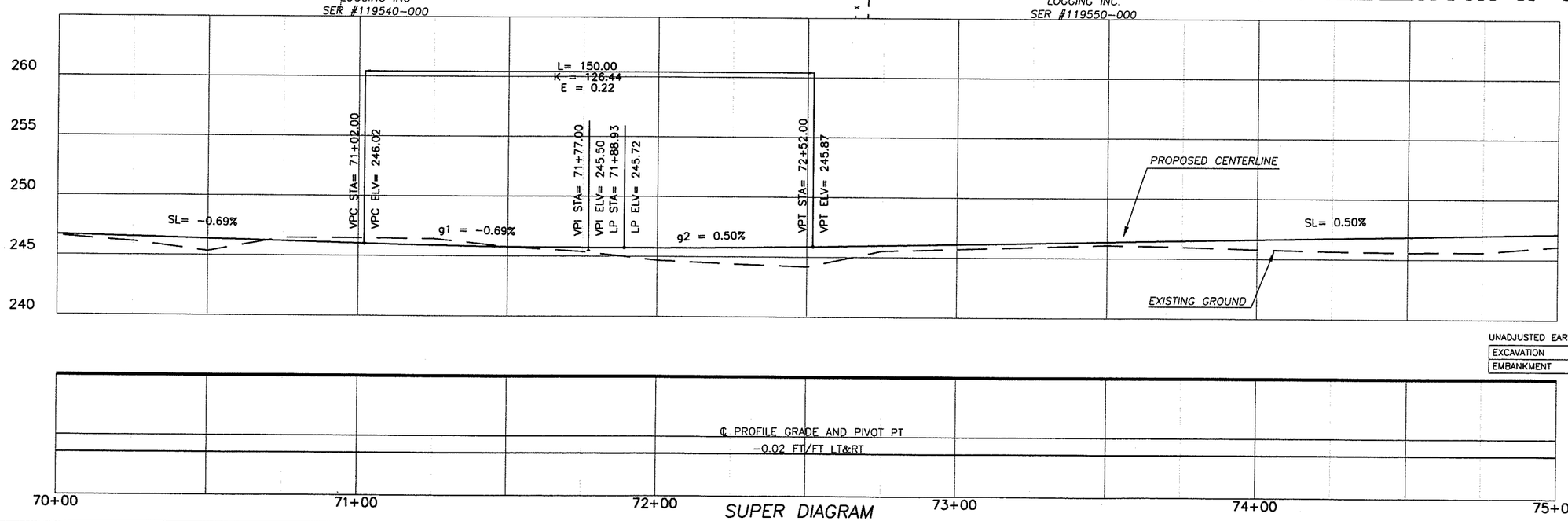


PRELIMINARY



SUPER DIAGRAM

UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	1450
EMBANKMENT	450

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP8
SHEET 26 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON KEITH M. ERICK 23630 REGISTERED PROFESSIONAL ENGINEER EXPIRES MAY 26, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 70+00 TO STA 75+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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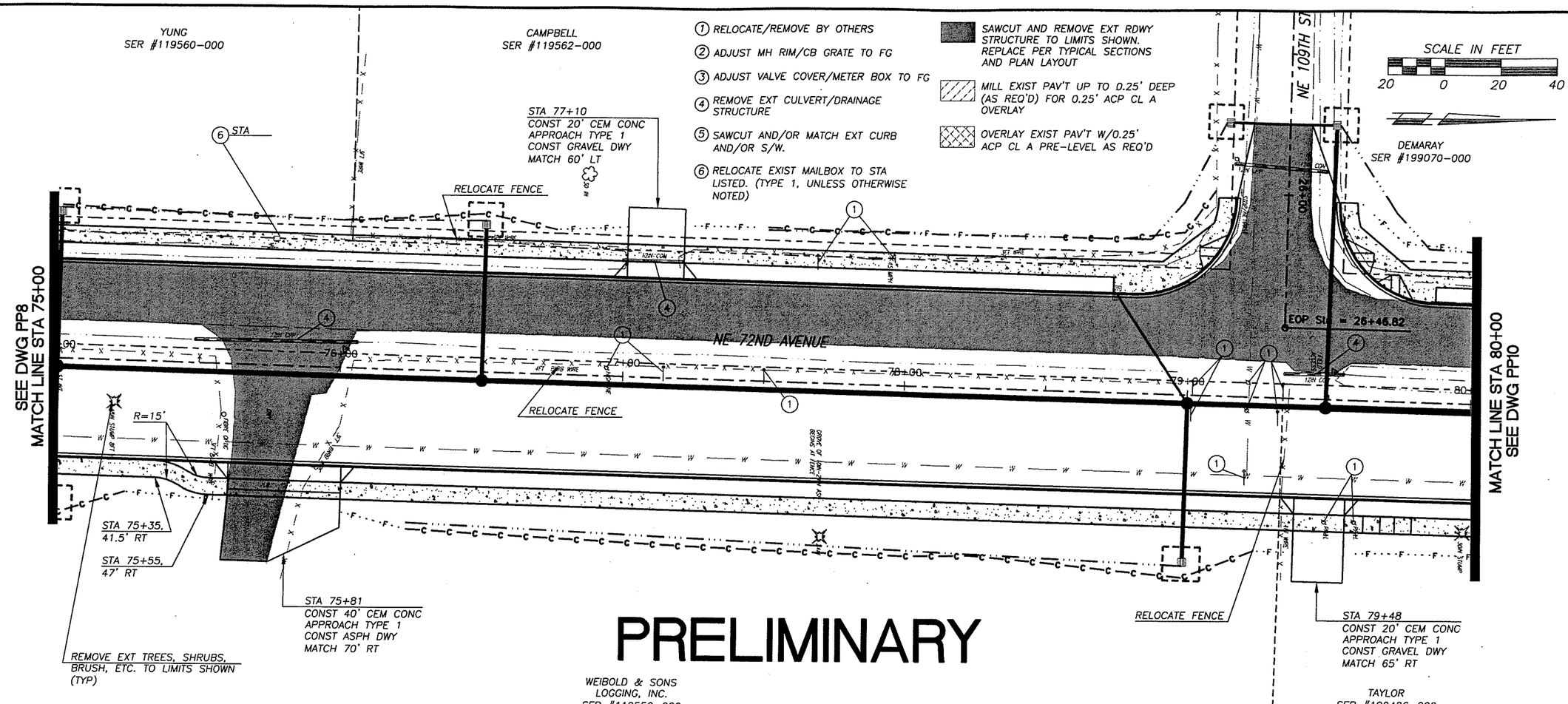

UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	700
EMBANKMENT	1100

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP9
SHEET 27 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

MICHAEL W. KERLICK
STATE OF WASHINGTON
23030
PROFESSIONAL ENGINEER
EXPIRES MAY 26, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 75+00 TO STA 80+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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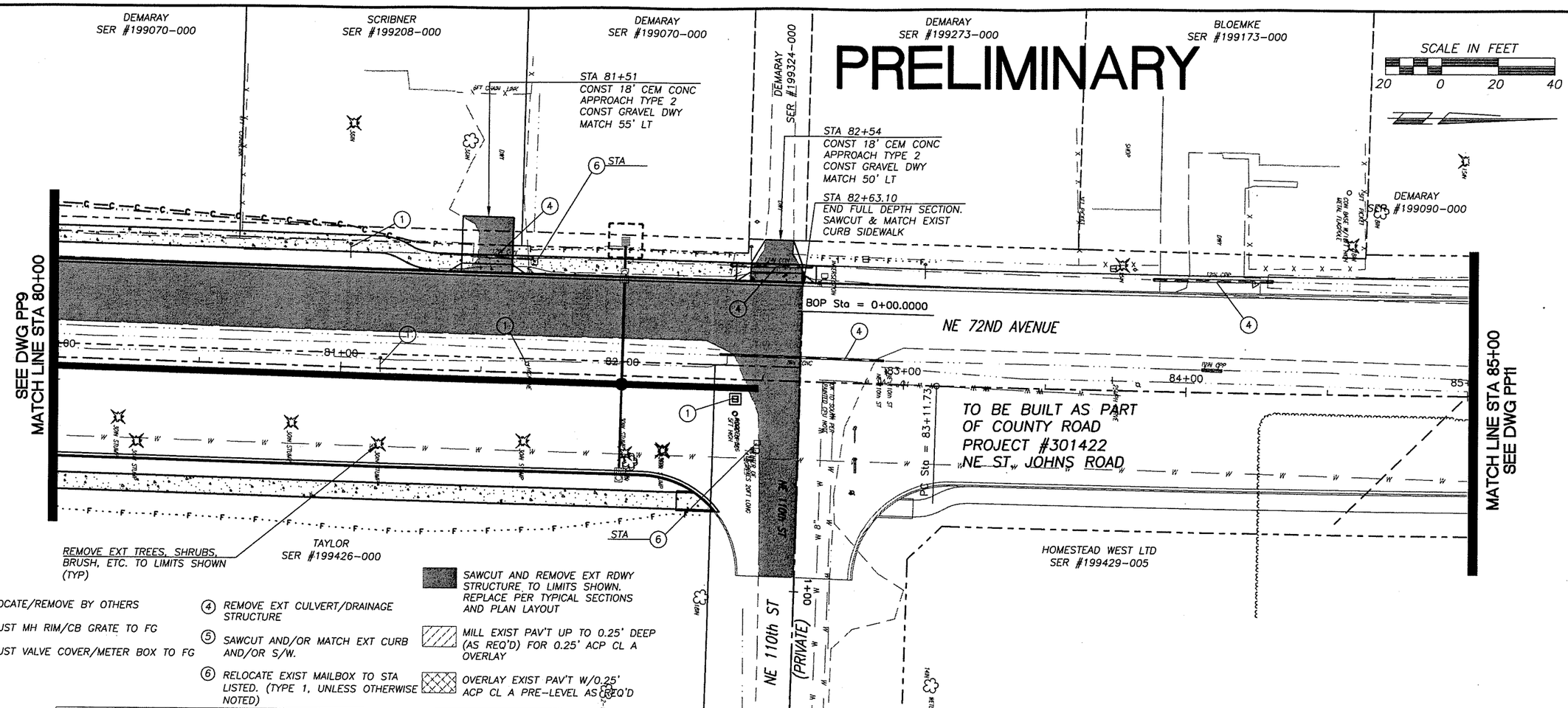
PRELIMINARY



UNADJUSTED EARTHWORK QUANTITIES

EXCAVATION	750
EMBANKMENT	250

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP10
SHEET 28 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON
DANIEL M. ERICK
PROFESSIONAL ENGINEER
EXPIRES MAY 26, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
PLAN & PROFILE (STA 80+00 TO STA 85+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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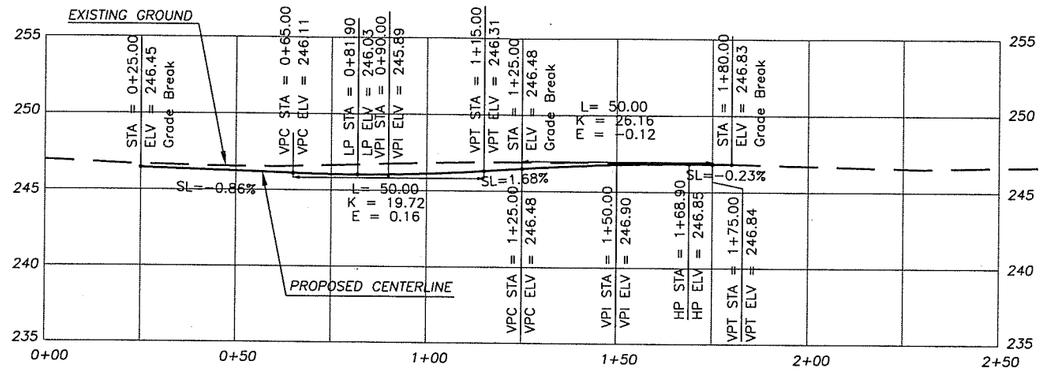
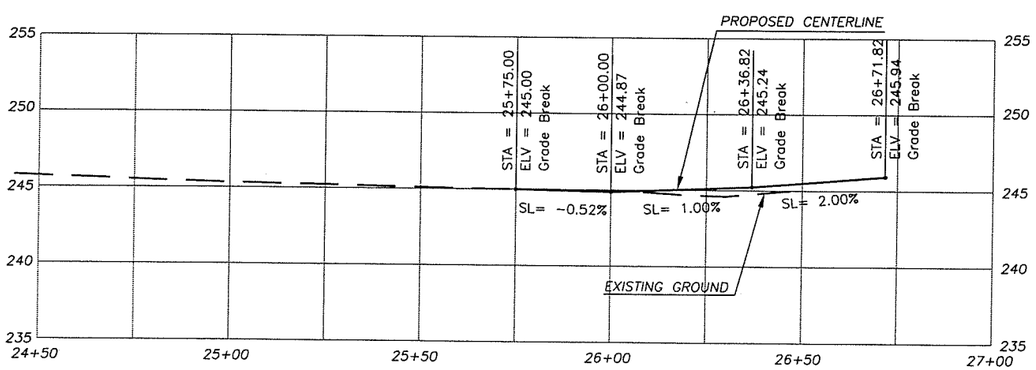
SCALE IN FEET

20 0 20 40



PROFILE

NE 99TH STREET



PROFILE

NE 109TH STREET

PRELIMINARY

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: PP11
SHEET 29 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON
MICHAEL M. EMICK
NO. 19800
REGISTERED PROFESSIONAL ENGINEER
EXPIRES JAN 26, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
PROFILES NE 99TH STREET AND BE 109TH STREET

proud past, promising future

CLARK COUNTY
WASHINGTON

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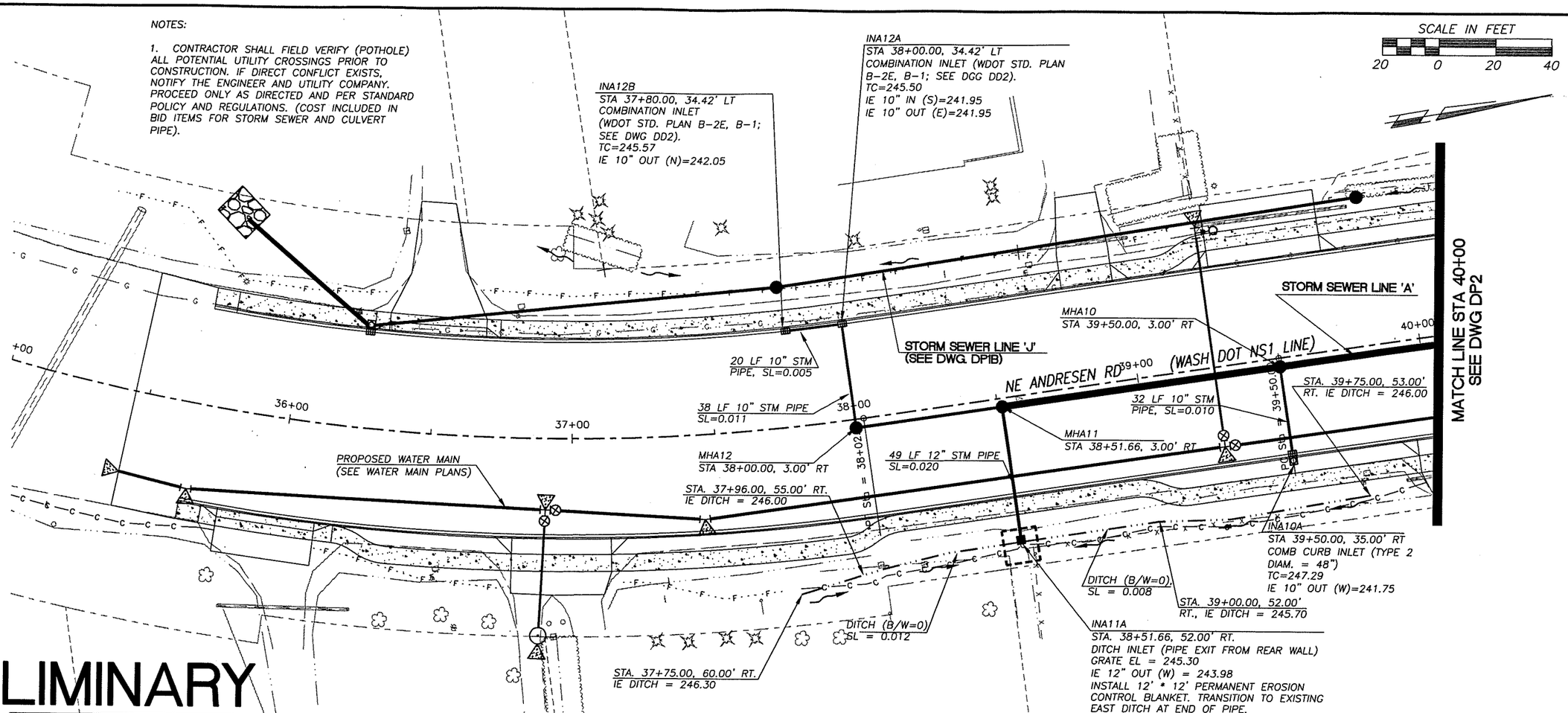
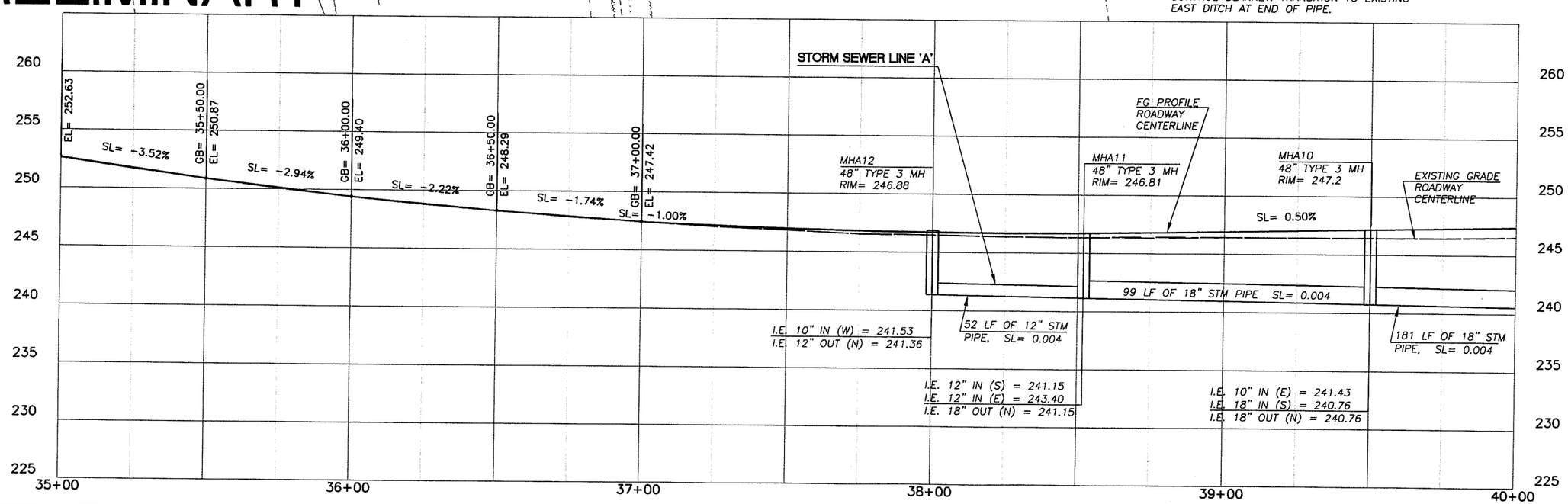
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



PRELIMINARY



DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG. DP1
SHEET 30 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

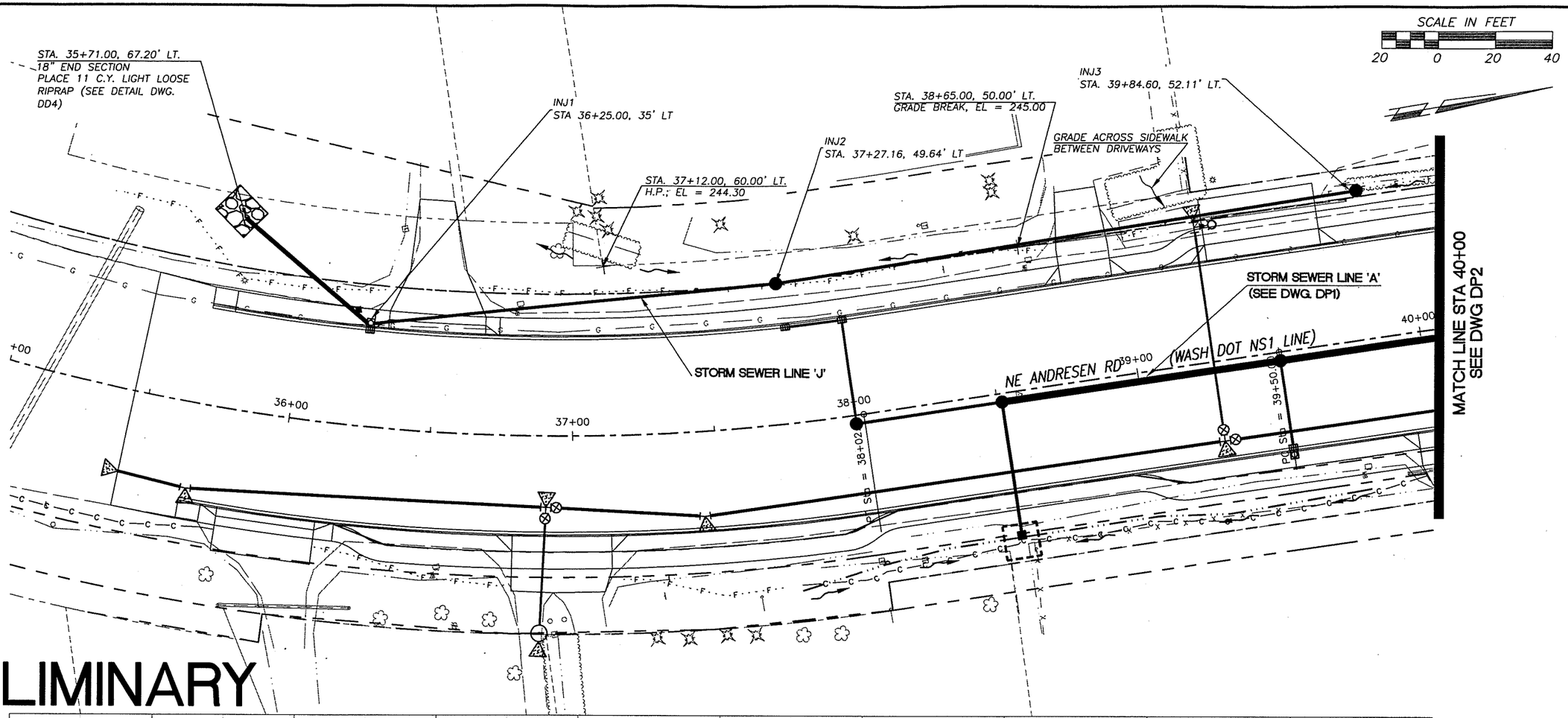
STATE OF WASHINGTON
MICHAEL BENTON
31148
PROFESSIONAL ENGINEER
EXPIRES: JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

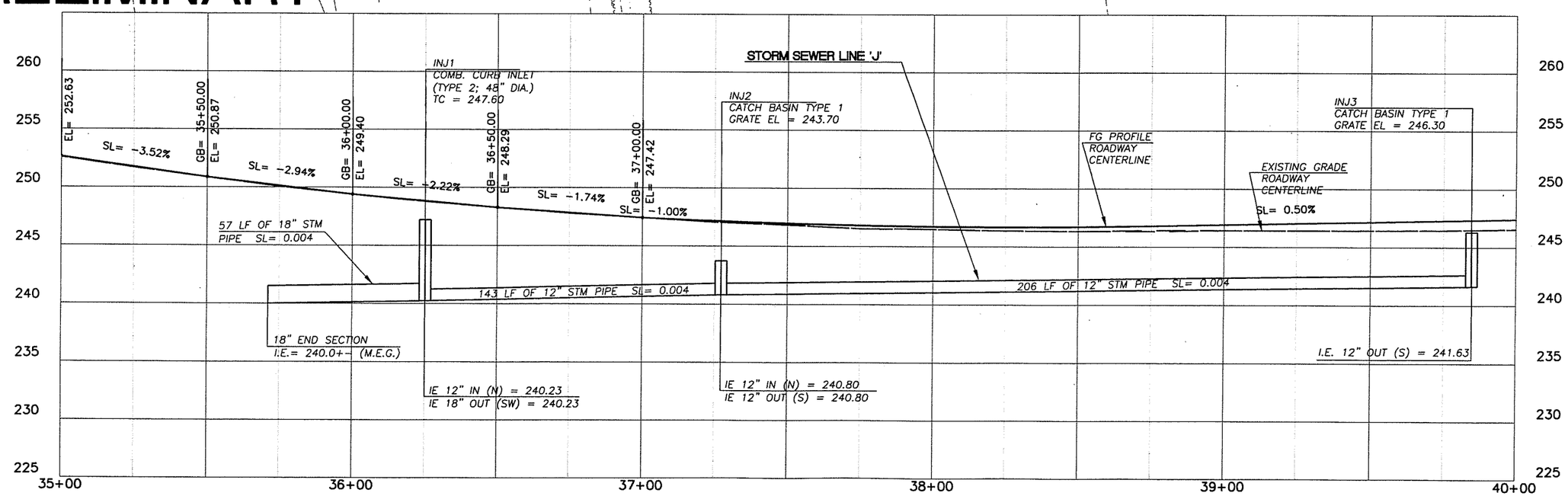
NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 35+00 TO 40+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

n:\CIPPROJECTS\310122-NE72Ave-H99toSTJohns\DESIGN\DWGS\DP1.dwg, 7/28/2005 3:02:57 PM, kerlinr



PRELIMINARY



DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP1B
SHEET 31 OF 72

CALL 48 HOURS BEFORE YOU DIG
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NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON
JILL E. ZIMMERMAN
31144
REGISTERED PROFESSIONAL ENGINEER
EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN (STA 35+00 TO 40+00; LINE "J")

proud past, promising future
CLARK COUNTY
WASHINGTON

n:\CIP\PROJECTS\310122-NE72Ave-H99toSTJohns\DESIGN\DWGS\DP1B.dwg, 7/28/2005 3:03:26 PM, kerlinr

PRELIMINARY

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).

SCALE IN FEET
20 0 20 40

STA 41+27.00, 62.00' LT
18" END SECTION W/GRATE
IE=242.60. TRANSITION TO EXISTING WEST DITCH.
INSTALL 18' * 18' PERMANENT EROSION CONTROL BLANKET

INA9A (OVERFLOW)
STA 41+31.75, 59.00' LT
CATCH BASIN TYPE 1
GRATE EL = 244.00
IE 18" OUT (E) = 240.50

INA7D
STA 43+21.86, 34.42' LT
COMBINATION INLET (WDOT STD PLAN B-2E, B-1; SEE DWG DD2)
TC=247.39
IE 10" OUT (N)=244.10

INA7C
STA 43+50.76, 34.42' LT
COMBINATION INLET (WDOT STD PLAN B-2E, B-1; SEE DWG DD2)
TC=247.36
IE 10" IN (S)=243.82
IE 10" OUT (E)=243.60

INA6A
STA 44+89.76, 57.00' LT
CATCH BASIN TYPE 1
GRATE EL = 245.00
IE 12" OUT (E) = 241.50

GRADE TO DRAIN

SEE DWG DP1
MATCH LINE STA 40+00

NE 72nd AVE

STORM SEWER LINE 'A'

62 LF 18" STM PIPE
SL=0.009

MHA8
STA 42+65.77, 1.68' RT

28 LF 10" STM PIPE
SL=0.010

38 LF 10" STM PIPE
SL=0.086

60 LF 12" STM PIPE
SL=0.029

MHA7
STA 43+50.76, 2.18'RT

MHA6
STA 44+89.76, 3.00'RT

41+00
42+00
43+00
44+00
45+

PROPOSED WATER MAIN
(SEE WATER MAIN PLANS)

130 LF 18" STM PIPE
SL=0.004

36 LF 12" STM PIPE,
SL = 0.003

PC Sta = 41+46.2

MHA9
STA 41+31.75, 2.61' RT

52 LF 18" STM PIPE
SL=0.010

28 LF 10" STM PIPE
SL=0.010

PC Sta = 43+42.4

32 LF 10" STM PIPE
SL=0.021

MATCH LINE STA 45+00
SEE DWG DP3

DITCH, B/W = 2'
SL=0.005

STA 41+68, 49' LT+-
CONNECT 12' STORM PIPE TO EXISTING INLET
IE 12" = 241.90

STA 41+00.00, 68.00' RT
12" END SECTION
IE=242.00
PLACE 12' * 12' PERMANENT EROSION CONTROL BLANKET

STA 41+25.00, 67.00' RT
18" END SECTION W/GRATE
IE=242.14. PLACE 22 CY LIGHT, LOOSE RIPRAP AT OUTLET (SEE DETAIL, DWG DD4)

STA 42+00.00, 66.00' RT
DITCH IE = 242.50

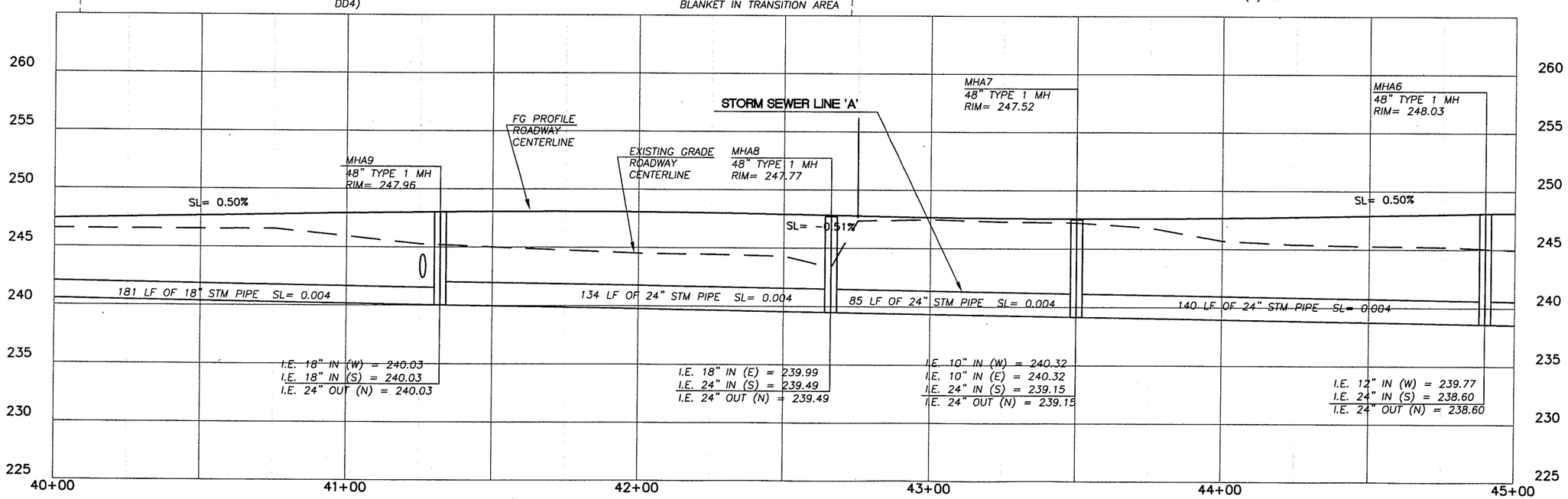
STA 42+25.00, 65.00' RT
DITCH IE = 242.63

STA 42+66.00, 59.00' RT
DITCH IE = 242.85
TRANSITION TO EXISTING EAST DITCH. INSTALL 20' * 20' PERMANENT EROSION CONTROL BLANKET IN TRANSITION AREA

INA8A (OVERFLOW)
STA 41+32.00, 54.00' RT
CATCH BASIN TYPE 1
GRATE EL = 244.00
IE 18" OUT (W) = 240.51

INA7B
STA 43+21.86, 34.42' RT
COMBINATION INLET (WDOT STD PLANS B-2E, B-1; SEE DWG DD2)
TC=247.39
IE 10" OUT (N)=244.10

INA7A
STA 43+50.76, 35.00' RT
COMB CURB INLET (TYPE 2; 48" DIAM)
TC=247.38
IE 10" IN (S) = 243.82
IE 10" OUT (W)=241.00



DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	DP2
SHEET	32 OF 72

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NORTHWEST UTILITIES NOTIFICATION CENTER

JOHN M. MILLER
STATE OF WASHINGTON
21148
REGISTERED PROFESSIONAL ENGINEER
EXPIRES JULY 7, 2005

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 40+00 TO 45+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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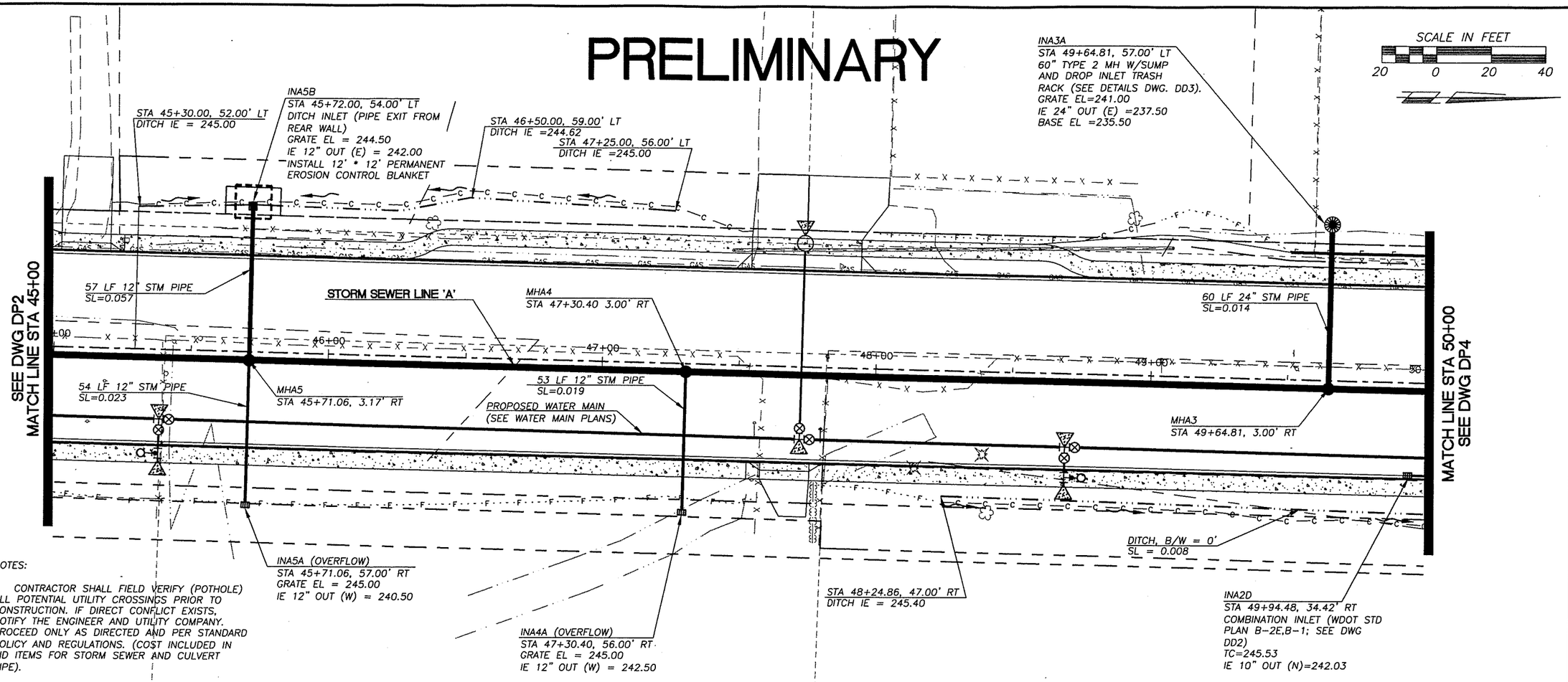
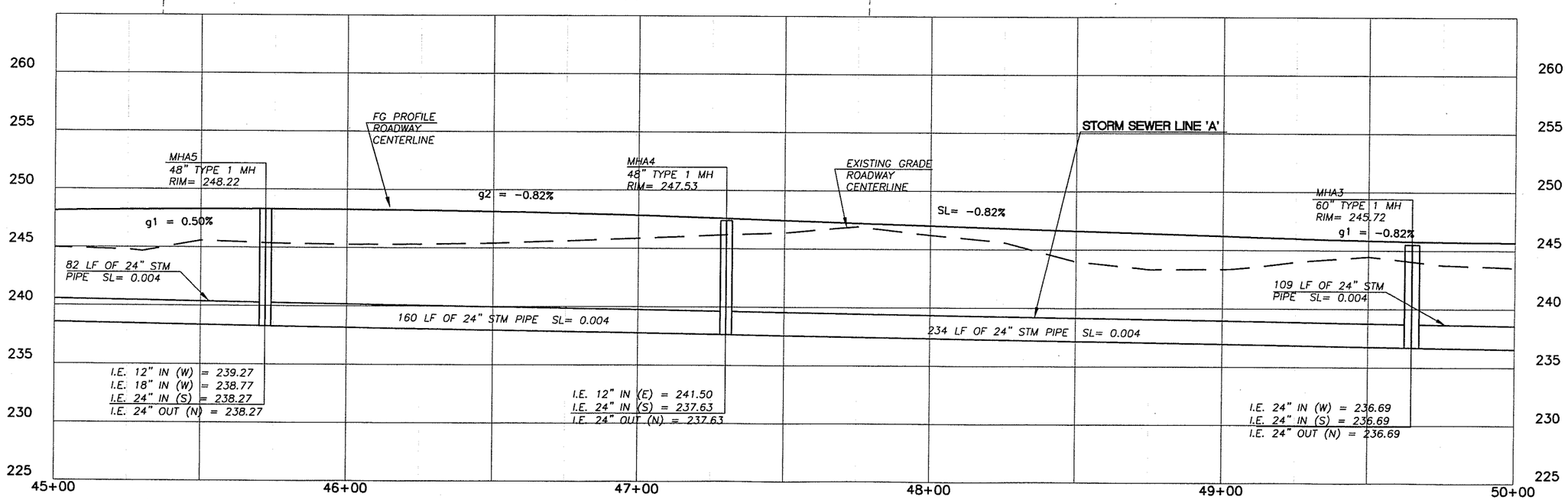
PRELIMINARY



NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	DP3
SHEET	33 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON MILAN E. MILAN 31148 REGISTERED PROFESSIONAL ENGINEER EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 45+00 TO 50+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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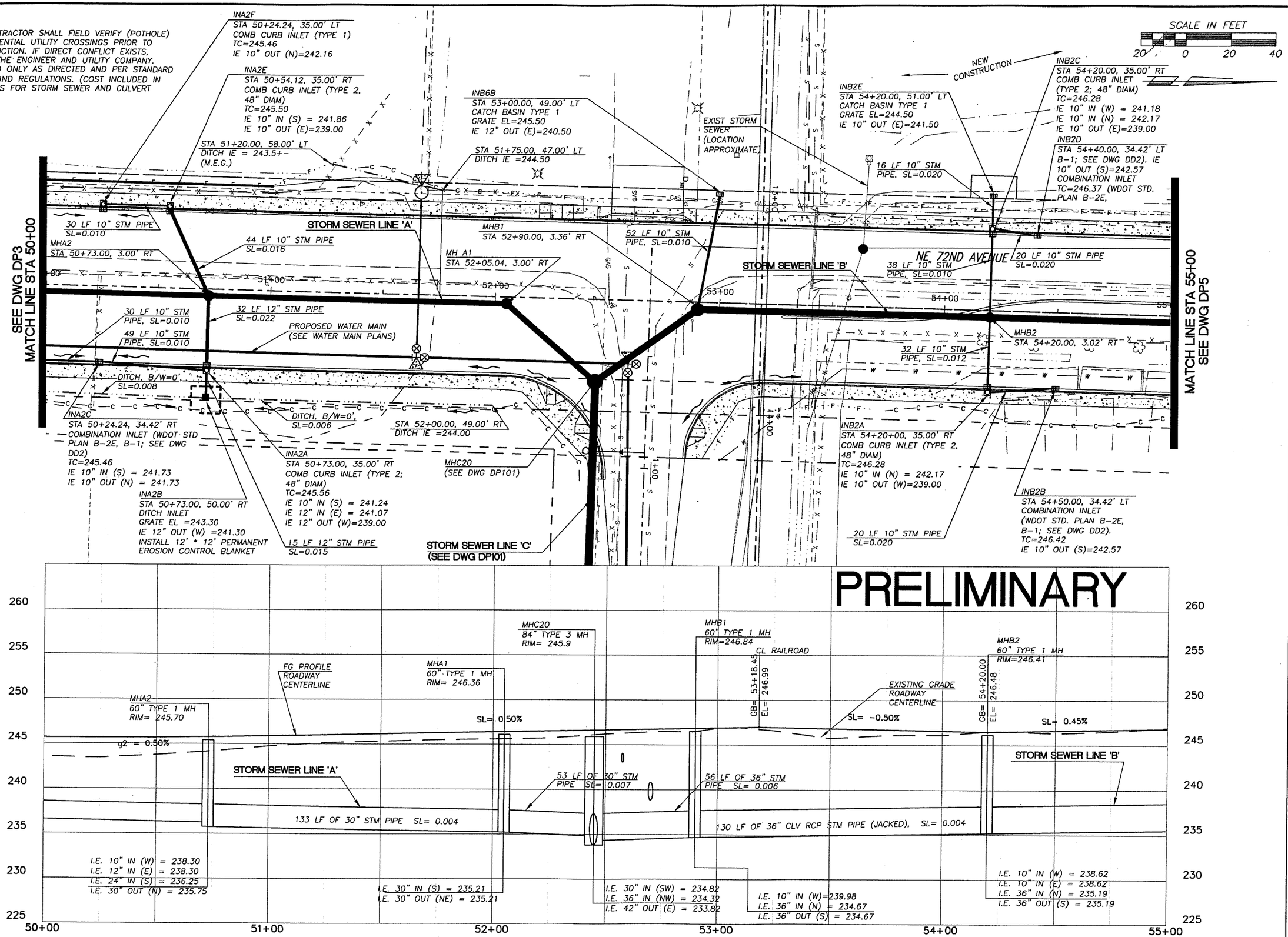
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	DP4
SHEET	34 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON JAMES E. MALLINE 21146 REGISTERED PROFESSIONAL ENGINEER EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 50+00 TO 55+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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NOTE: APPROVAL REQUIRED FROM CLARK COUNTY DEVELOPMENT ENGINEERING DIVISION PRIOR TO REMOVAL OF TEMPORARY PIPE RESTRICTIONS AND ANY NEW CONNECTIONS TO STORM SEWERS

SCALE IN FEET

20 0 20 40

NEW CONSTRUCTION

STORM SEWER LINE 'B'

SEE DWG DP4
MATCH LINE STA 55+00

MATCH LINE STA 60+00
SEE DWG DP6

56+00 57+00 58+00 59+00 60

MHB3
STA 58+00.00, 3.00' RT

50 LF 12" STM PIPE
SL=0.040

DITCH, B/W = 0',
SL = 0.005

DITCH, B/W = 0',
SL = 0.005

STA 59+00.00, 48.00' RT
DITCH IE = 246.00

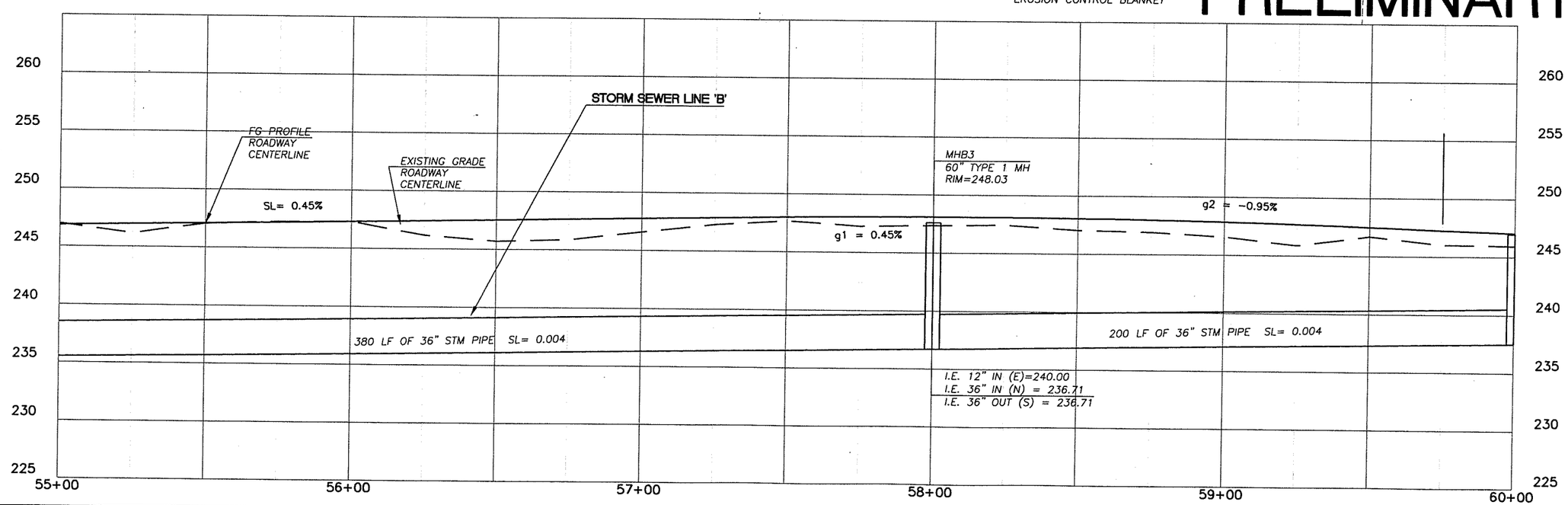
STA 57+00.00, 47.00' RT
DITCH IE =246.00

INB3A
STA 58+00.00, 50.00' RT
DITCH INLET (PIPE EXIT FROM REAR WALL)
GRATE EL =245.50
IE 12" OUT (W) =242.00
INSTALL 12' * 12' PERMANENT EROSION CONTROL BLANKET

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).

PRELIMINARY



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DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP5
SHEET 35 OF 72

CALL 48 HOURS BEFORE YOU DIG
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"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON
MILLIKEN
STEVEN
EXPIRES: OCT. 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 55+00 TO 60+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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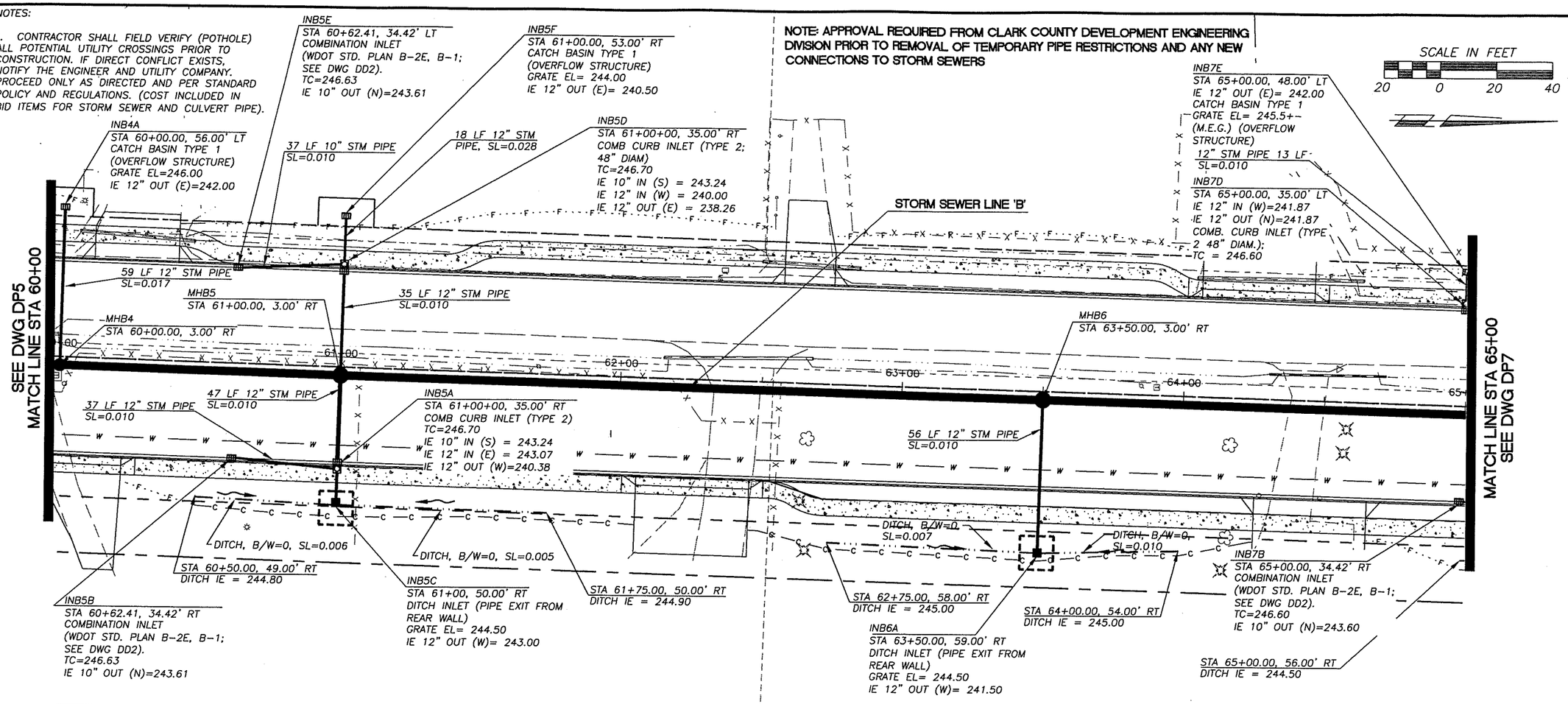
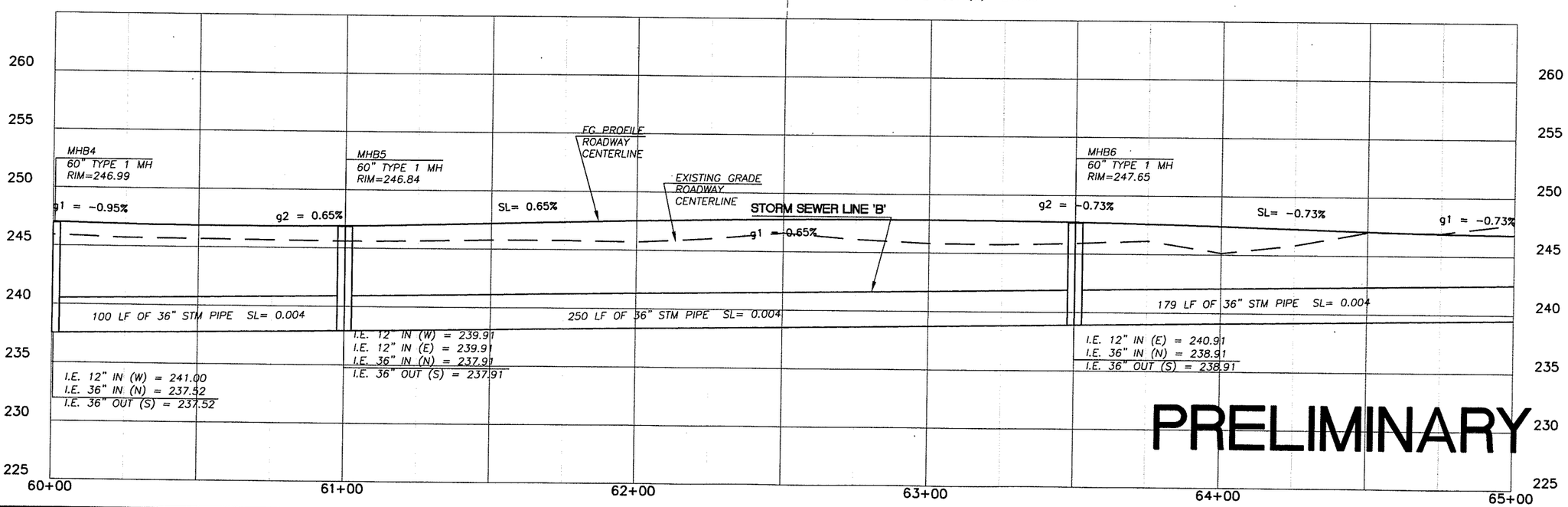
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).

NOTE: APPROVAL REQUIRED FROM CLARK COUNTY DEVELOPMENT ENGINEERING DIVISION PRIOR TO REMOVAL OF TEMPORARY PIPE RESTRICTIONS AND ANY NEW CONNECTIONS TO STORM SEWERS





PRELIMINARY

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CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP6
SHEET 36 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

ALLAN M. MCGINNIS STATE OF WASHINGTON 31148 REGISTERED PROFESSIONAL ENGINEER EXPIRES: JULY 2, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 60+00 TO 65+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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NOTE: APPROVAL REQUIRED FROM CLARK COUNTY DEVELOPMENT ENGINEERING DIVISION PRIOR TO REMOVAL OF TEMPORARY PIPE RESTRICTIONS AND ANY NEW CONNECTIONS TO STORM SEWERS

NOTES:

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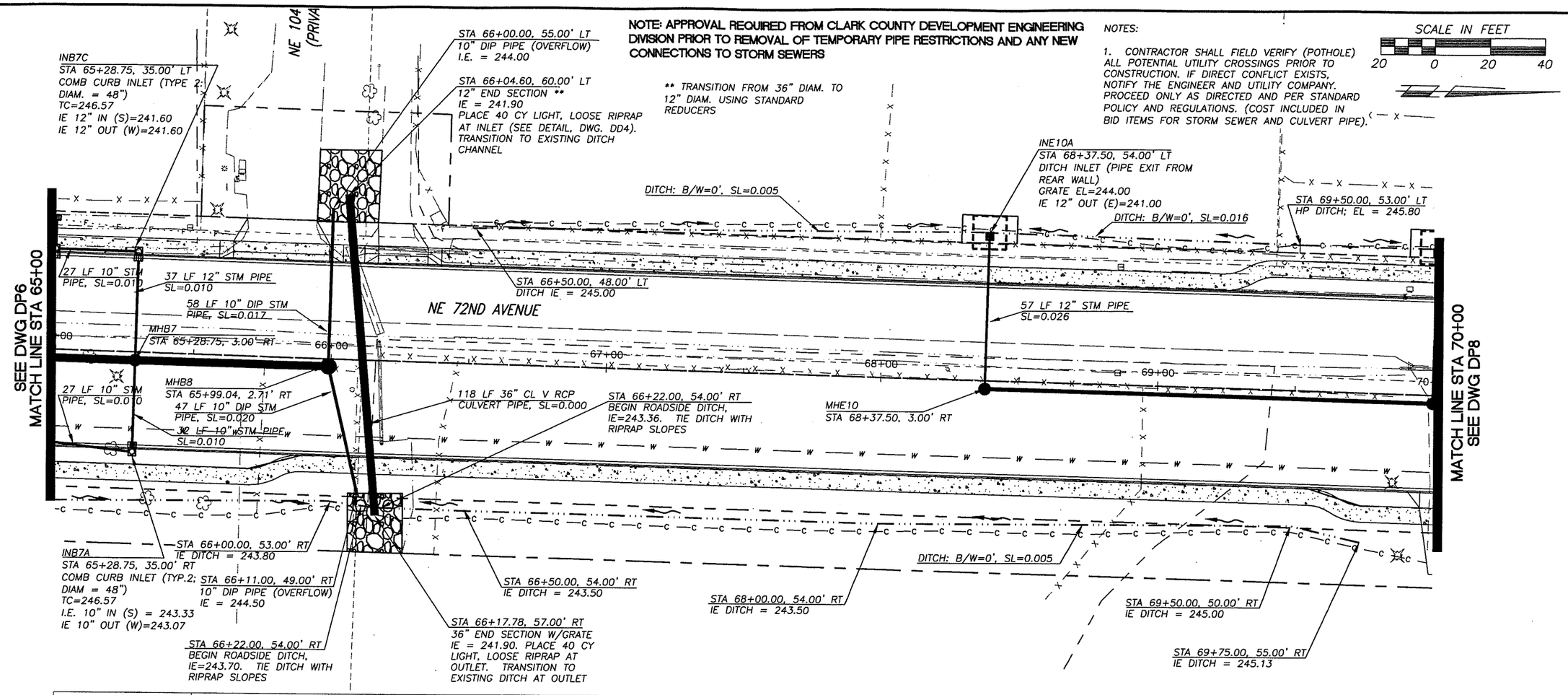
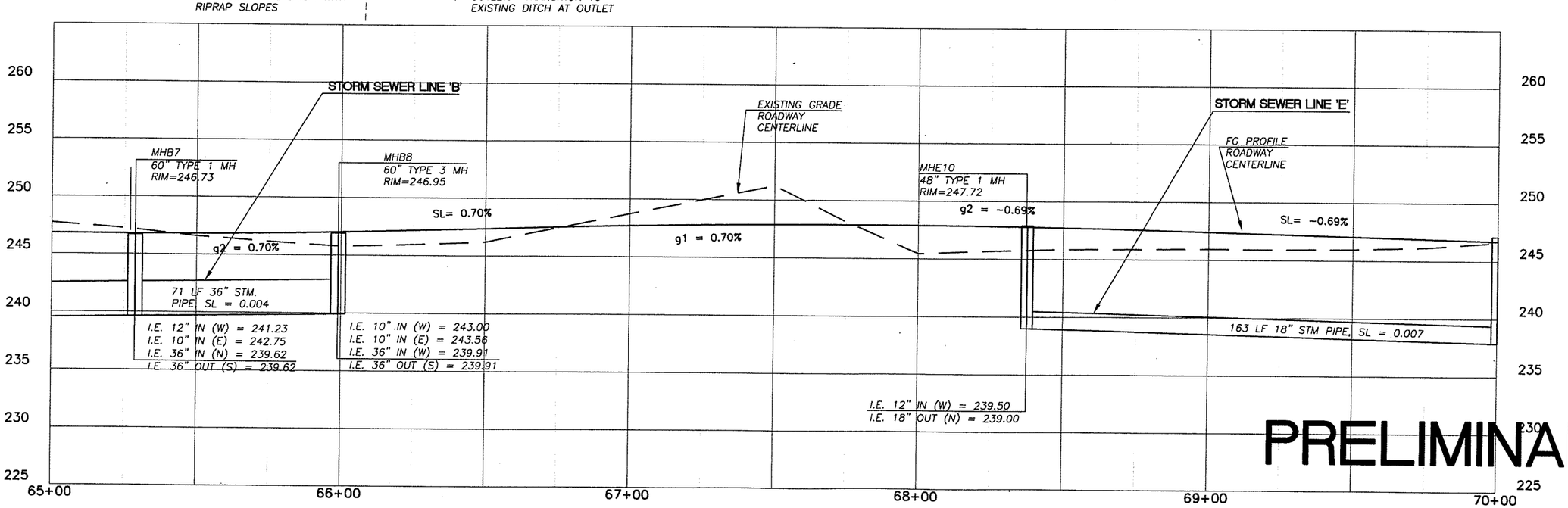
SCALE IN FEET

20 0 20 40





PRELIMINARY

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CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP7
SHEET 37 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON MICHAEL E. MILNE 31149 REGISTERED PROFESSIONAL ENGINEER EXPIRES: JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 65+00 TO 70+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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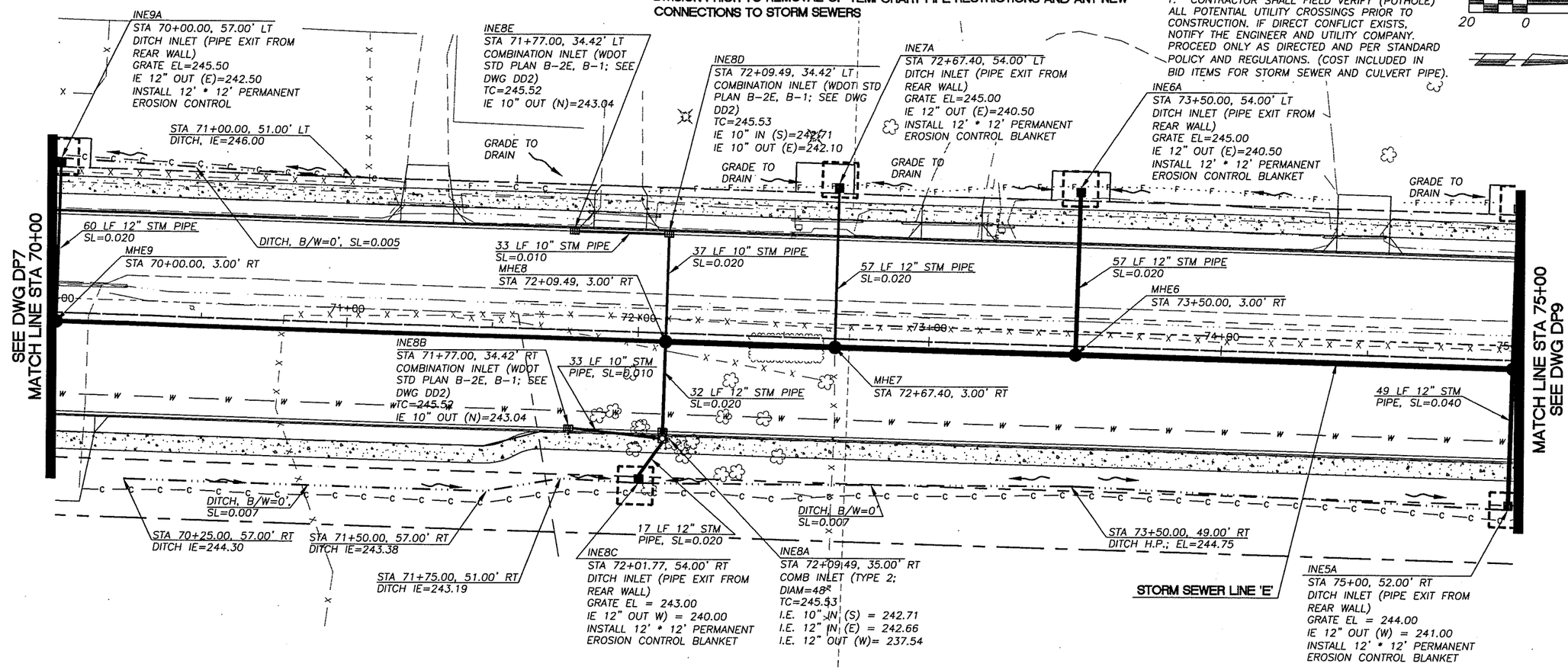
NOTE: APPROVAL REQUIRED FROM CLARK COUNTY DEVELOPMENT ENGINEERING DIVISION PRIOR TO REMOVAL OF TEMPORARY PIPE RESTRICTIONS AND ANY NEW CONNECTIONS TO STORM SEWERS

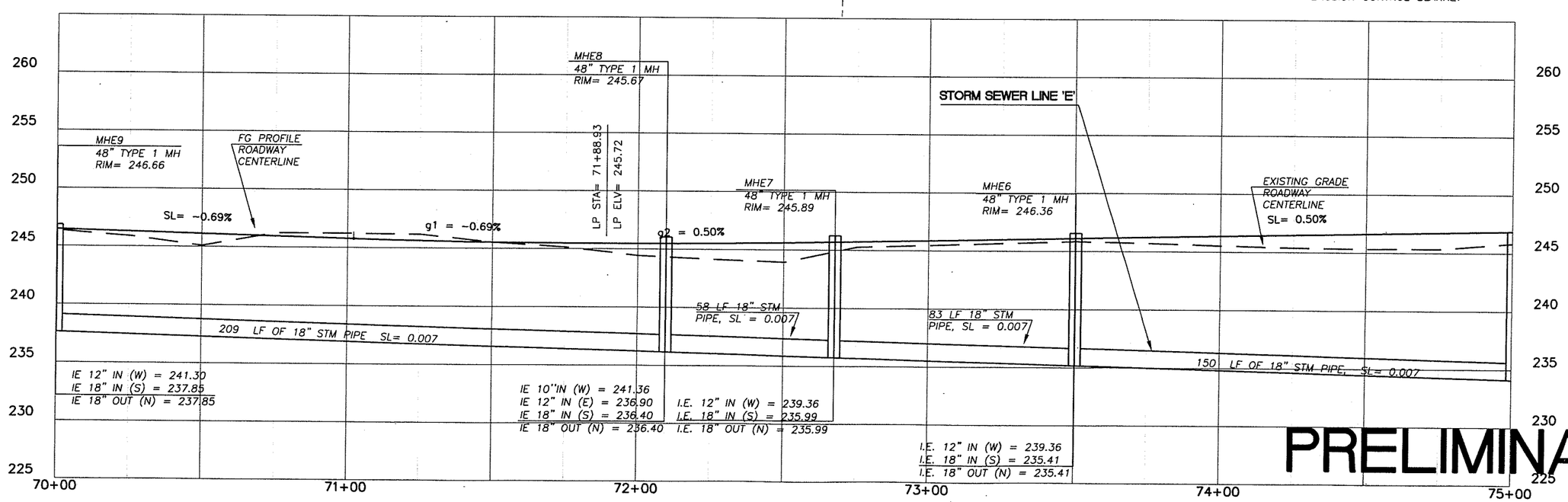
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).

SCALE IN FEET

20 0 20 40





PRELIMINARY

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP8
SHEET 38 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

STATE OF WASHINGTON JOHN MILNE 31148 PROFESSIONAL ENGINEER EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 70+00 TO 75+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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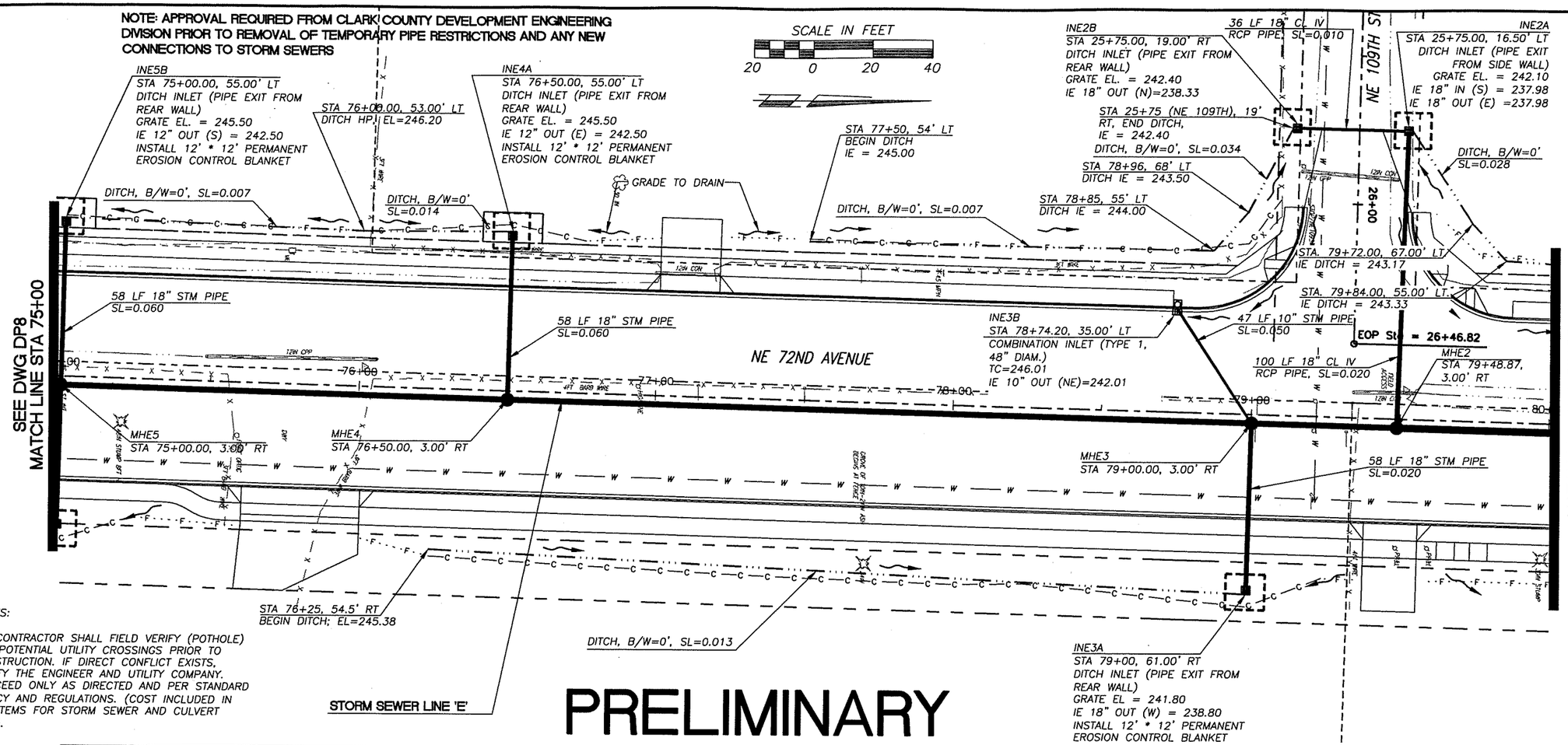
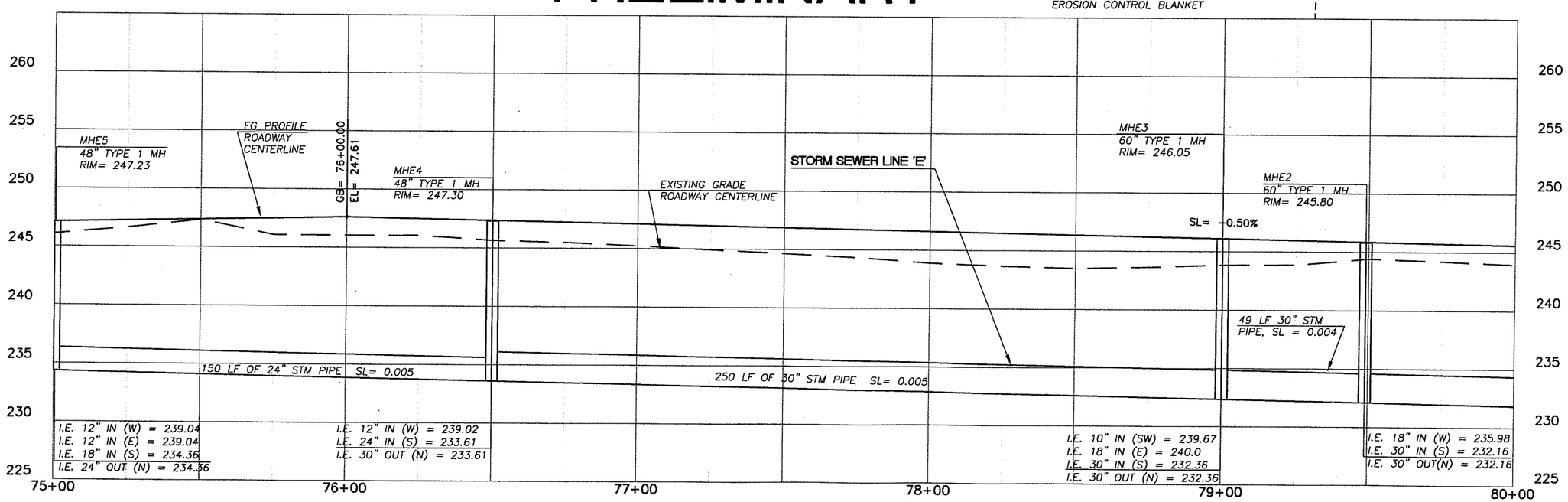
NOTE: APPROVAL REQUIRED FROM CLARK COUNTY DEVELOPMENT ENGINEERING DIVISION PRIOR TO REMOVAL OF TEMPORARY PIPE RESTRICTIONS AND ANY NEW CONNECTIONS TO STORM SEWERS



NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).

PRELIMINARY



DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP9
SHEET 39 OF 72

CALL 48 HOURS BEFORE YOU DIG 1-800-553-4344 "It's the Law" NORTHWEST UTILITIES NOTIFICATION CENTER

JOHN M. LAKE STATE OF WASHINGTON 31142 REGISTERED PROFESSIONAL ENGINEER EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 75+00 TO 80+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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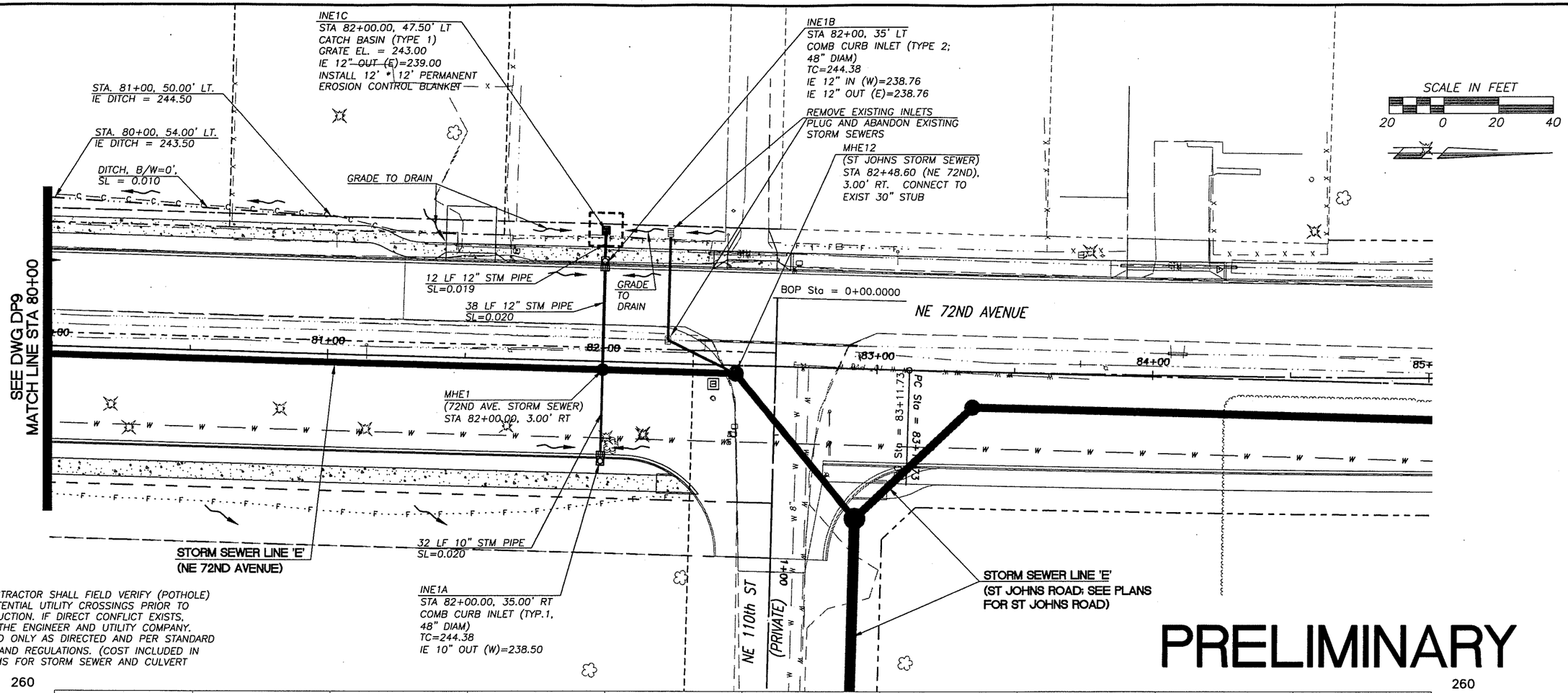

NOTES:

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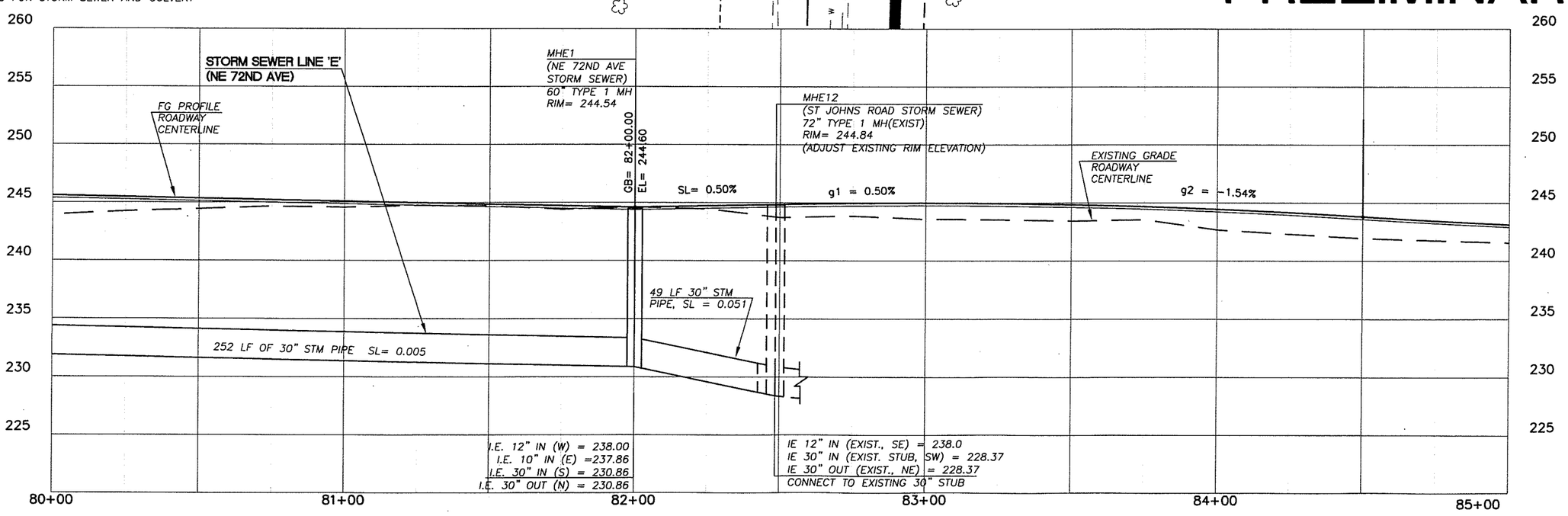
PRELIMINARY



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DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP10
SHEET 40 OF 72

CALL 48 HOURS BEFORE YOU DIG
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NORTHWEST UTILITIES NOTIFICATION CENTER

JOHN E. MILLER
STATE OF WASHINGTON
31148
REGISTERED PROFESSIONAL ENGINEER
EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN 72ND AVE (STA 80+00 TO 85+00)

proud past, promising future
CLARK COUNTY
WASHINGTON

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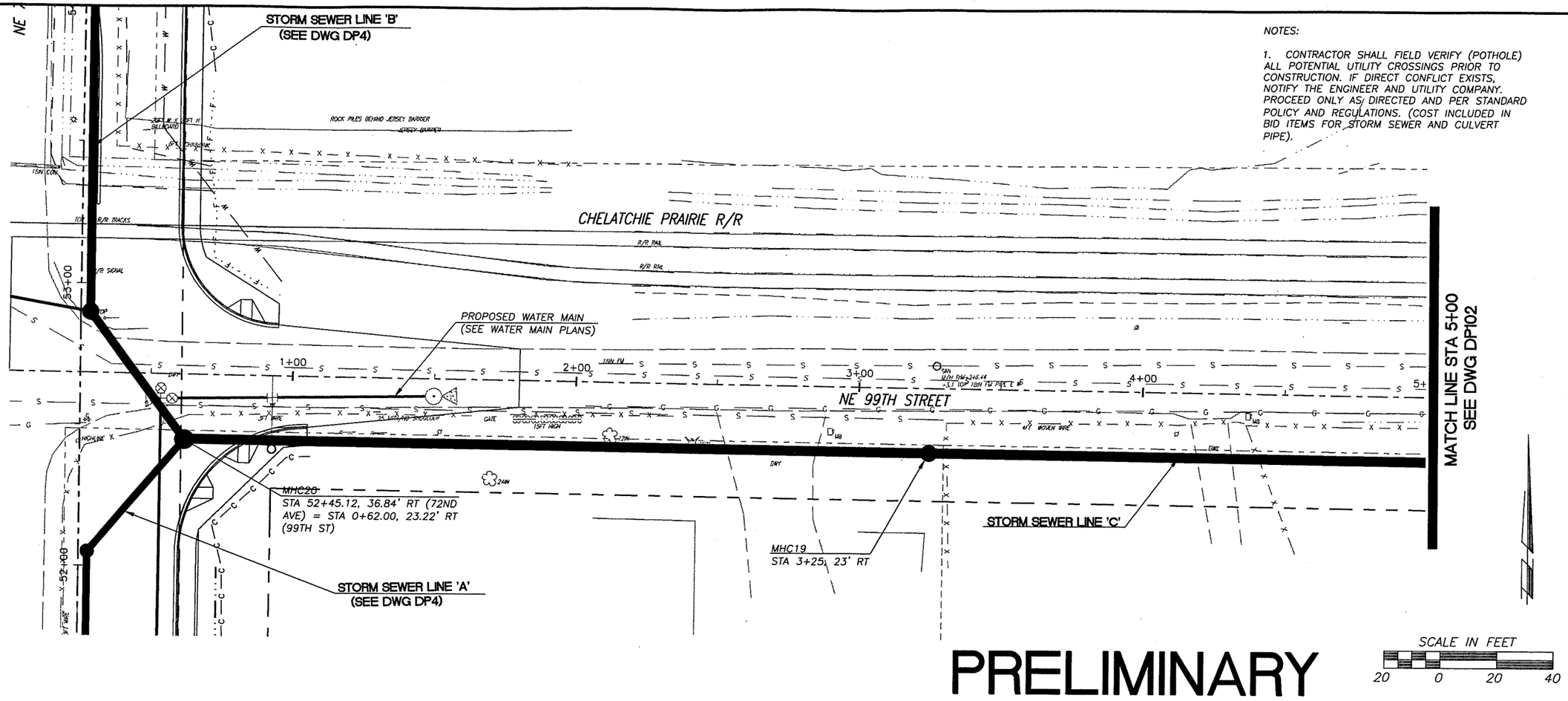
NOTES:

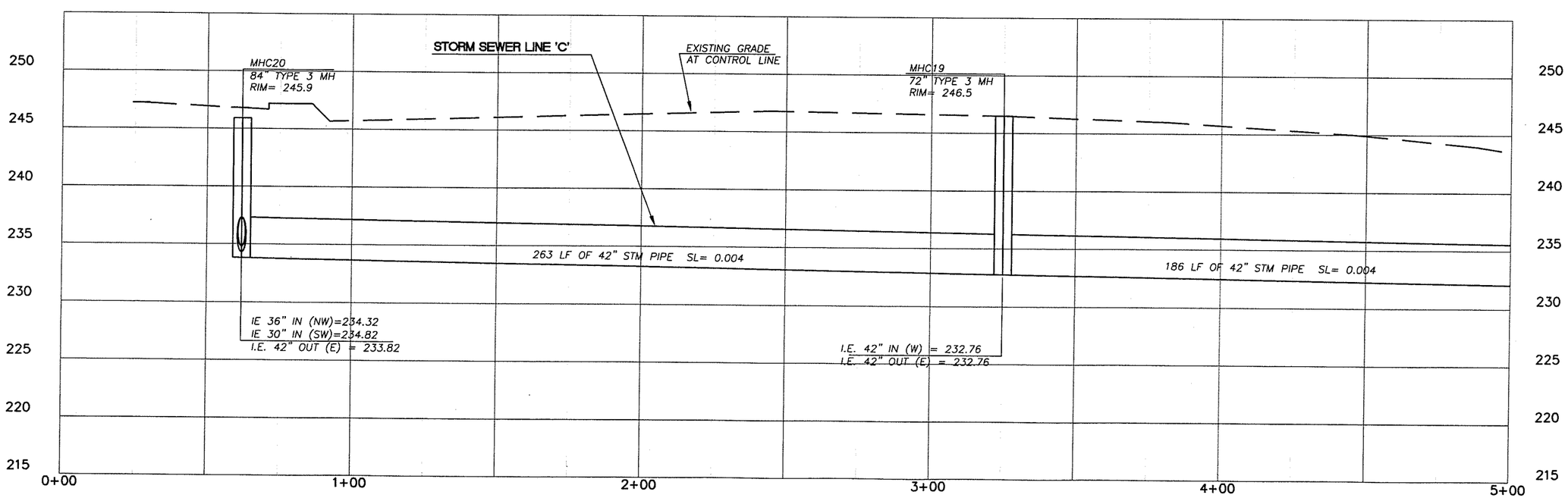
1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



PRELIMINARY

SCALE IN FEET

20 0 20 40



DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP101
SHEET 41 OF 72

CALL 48 HOURS BEFORE YOU DIG
1-800-553-4344
"It's the Law"
NORTHWEST UTILITIES NOTIFICATION CENTER

JOHN WILLIE WASHINGTON STATE REGISTERED PROFESSIONAL ENGINEER 21148
EXPIRES JULY 1, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN; 99TH ST (STA 0+00 TO 5+00)

proud past, promising future
CLARK COUNTY WASHINGTON

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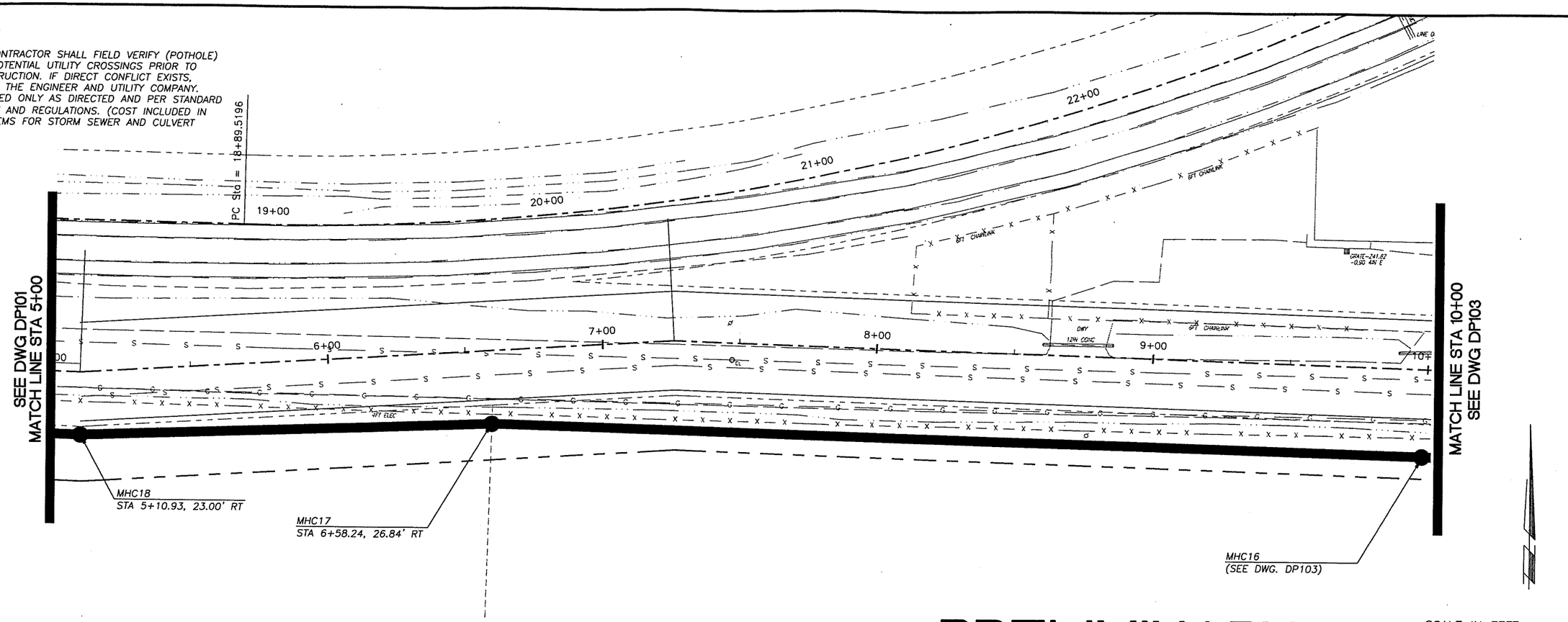
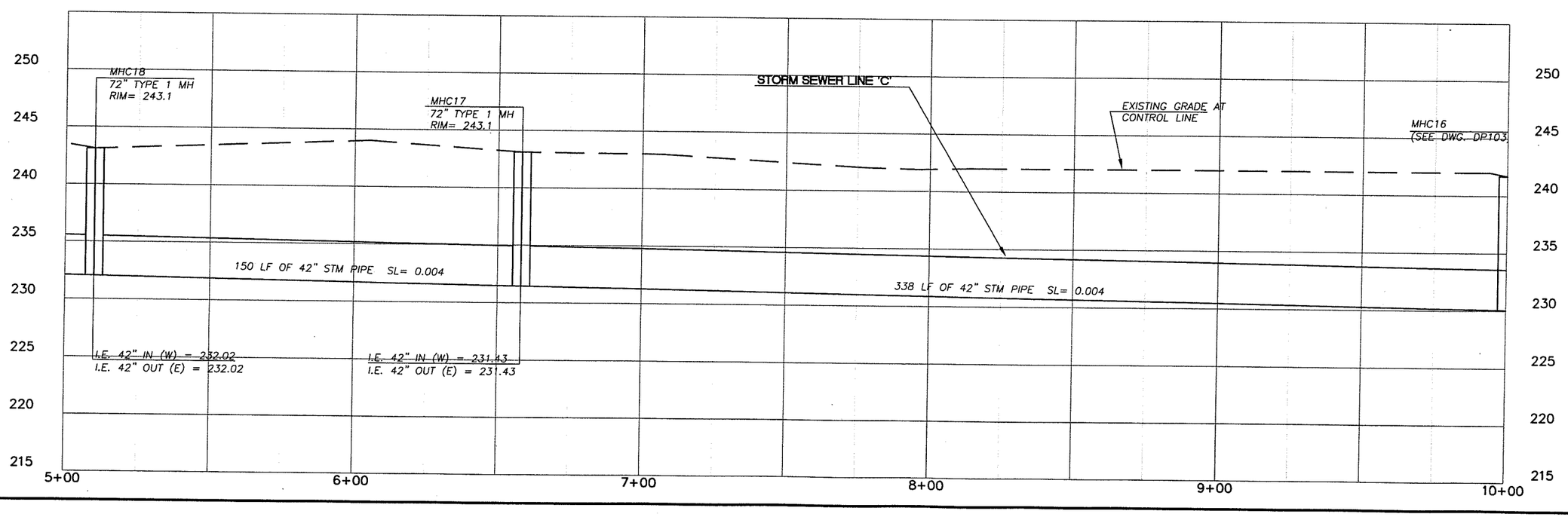
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



PRELIMINARY

SCALE IN FEET
20 0 20 40



DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: DP102
SHEET 42 OF 72

CALL 48 HOURS BEFORE YOU DIG
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NORTHWEST UTILITIES NOTIFICATION CENTER

MILNE STATE OF WASHINGTON 22148 REGISTERED PROFESSIONAL ENGINEER
EXPIRES: JULY 2, 2007

ENGINEERING PROGRAM
DESIGN SECTION

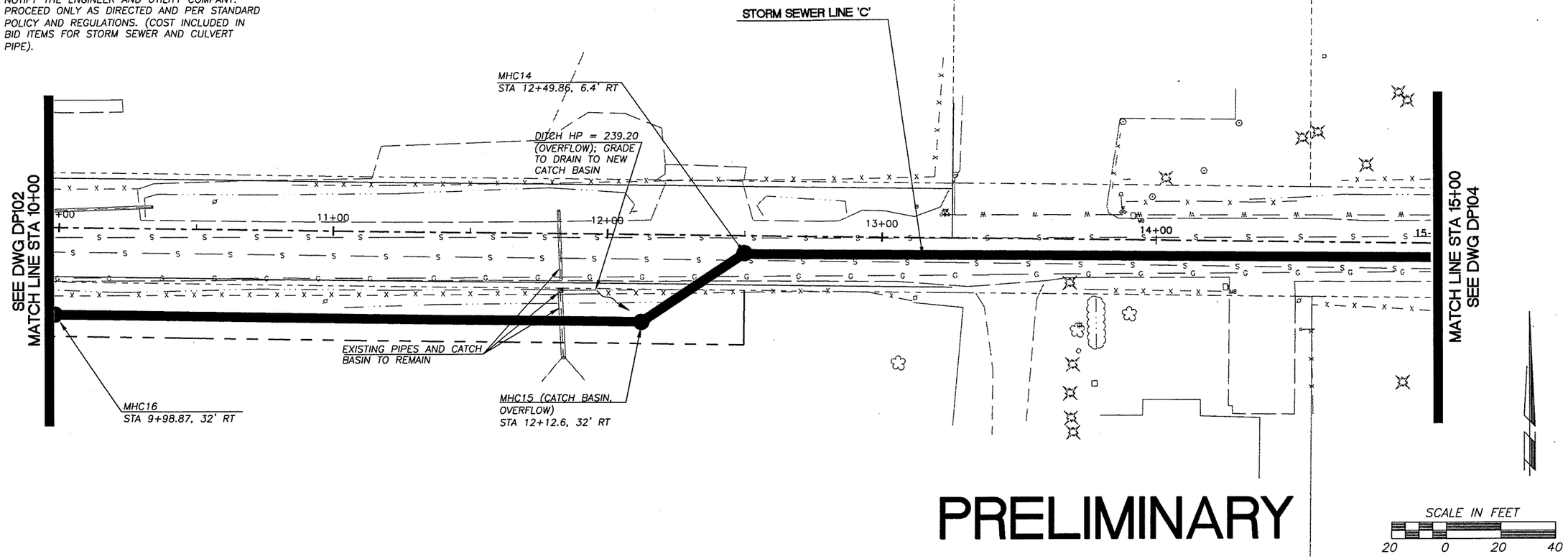
NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN; 99TH ST (STA 5+00 TO 10+00)

proud past, promising future
CLARK COUNTY WASHINGTON

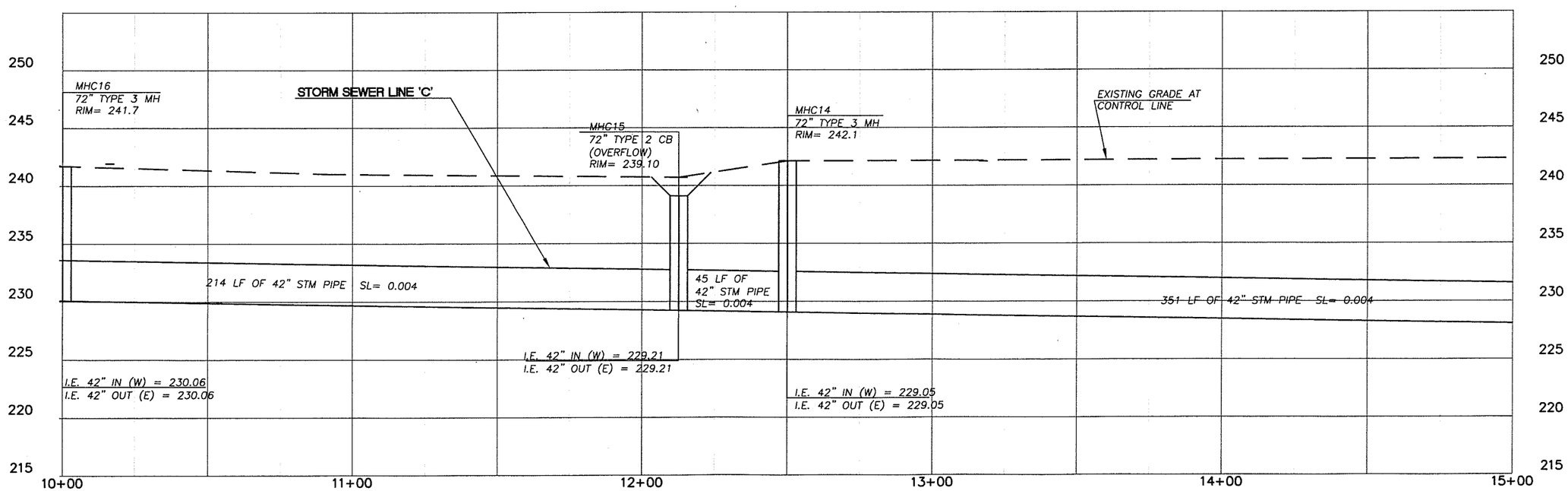
n:\CIP\PROJECTS\310122-NE72Ave-H99toSTJohns\DESIGN\DWGS\DP102.dwg, 7/28/2005 3:09:00 PM, kerlinr

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



PRELIMINARY



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CRP 310122
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DATE 07/31/05
DWG: DP103
SHEET 43 OF 72

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STATE OF WASHINGTON
M.L.N. 31148
PROFESSIONAL ENGINEER
EXPIRES: JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN; 99TH ST (STA 10+00 TO 15+00)

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CLARK COUNTY WASHINGTON

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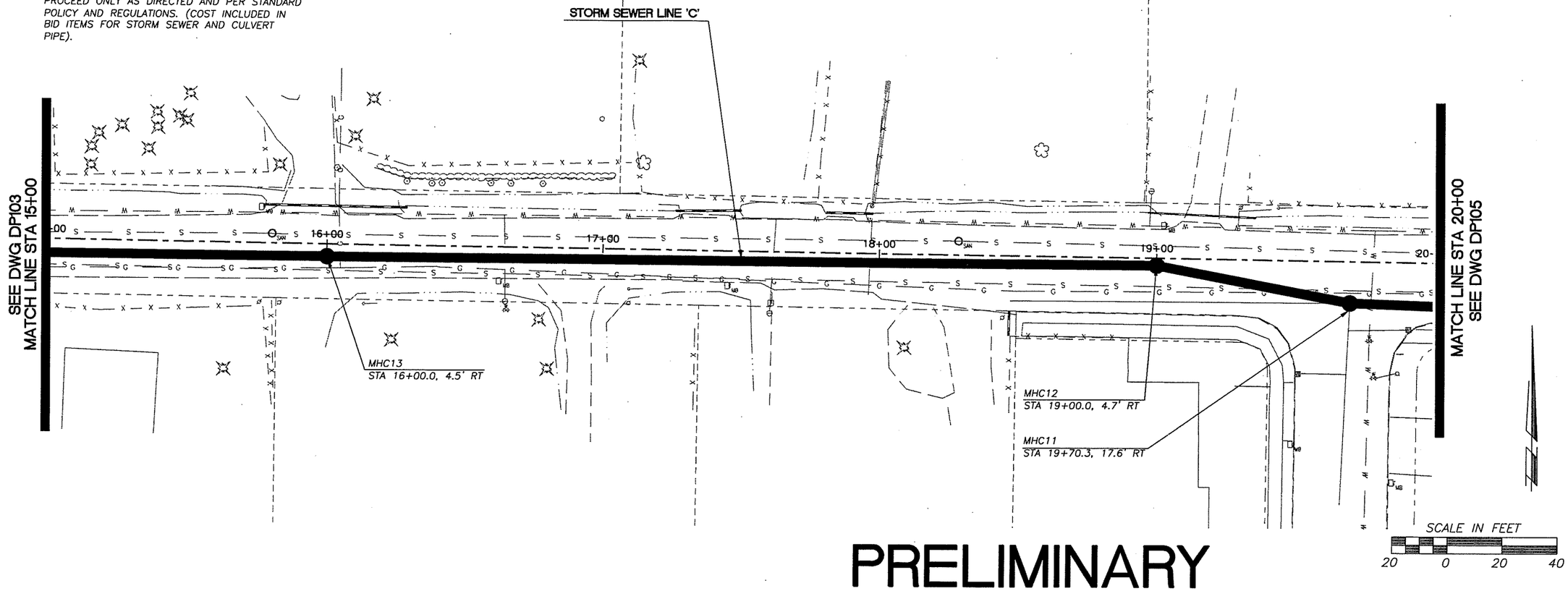
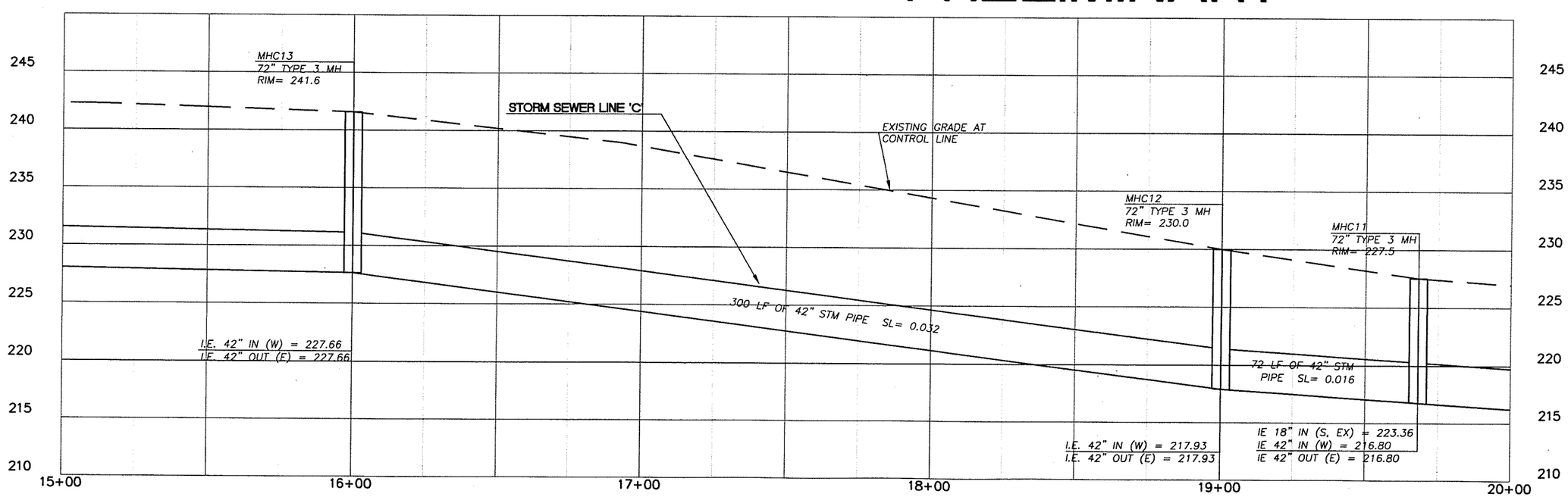
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



PRELIMINARY



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CRP 310122
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DATE 07/31/05
DWG: DP104
SHEET 44 OF 72

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JOHN MILLER
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER
EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN; 99TH ST (STA 15+00 TO 20+00)

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CLARK COUNTY
WASHINGTON

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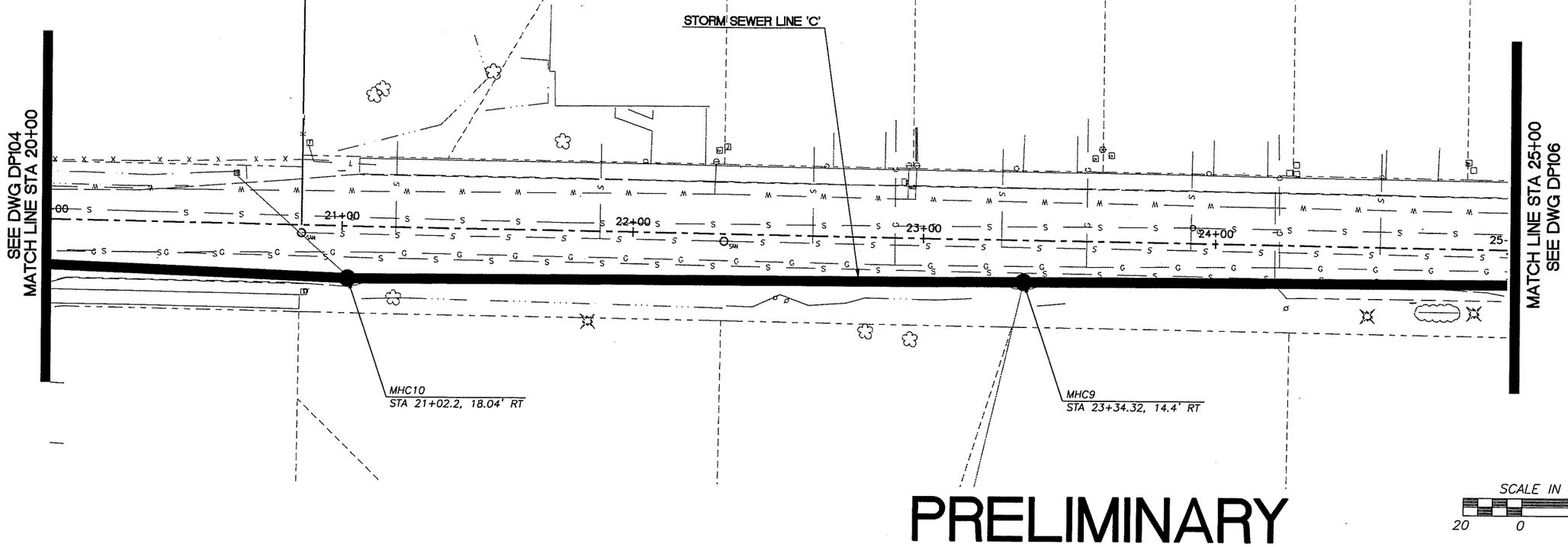
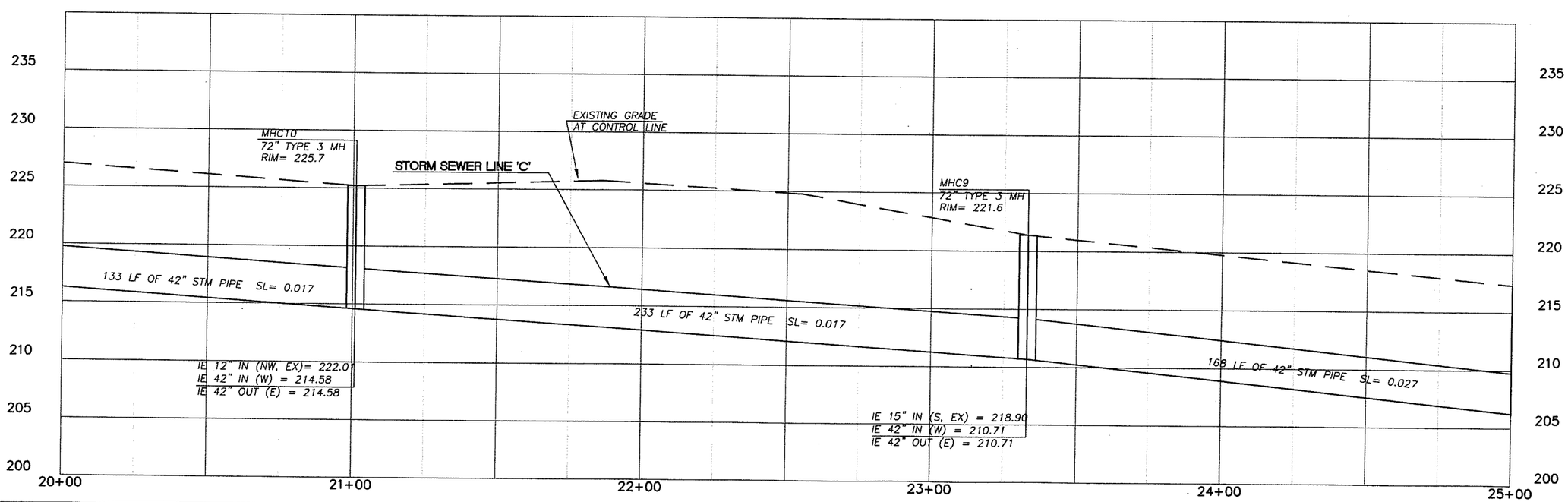
NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).



PRELIMINARY



DESIGNED ME/JM
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CRP 310122
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VERT. SEE SHEET
DATE 07/31/05
DWG: DP105
SHEET 45 OF 72

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STATE OF WASHINGTON
JOHN MILNE
17148
REGISTERED PROFESSIONAL ENGINEER
EXPIRES JULY 7, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN; 99TH ST (STA 20+00 TO 25+00)

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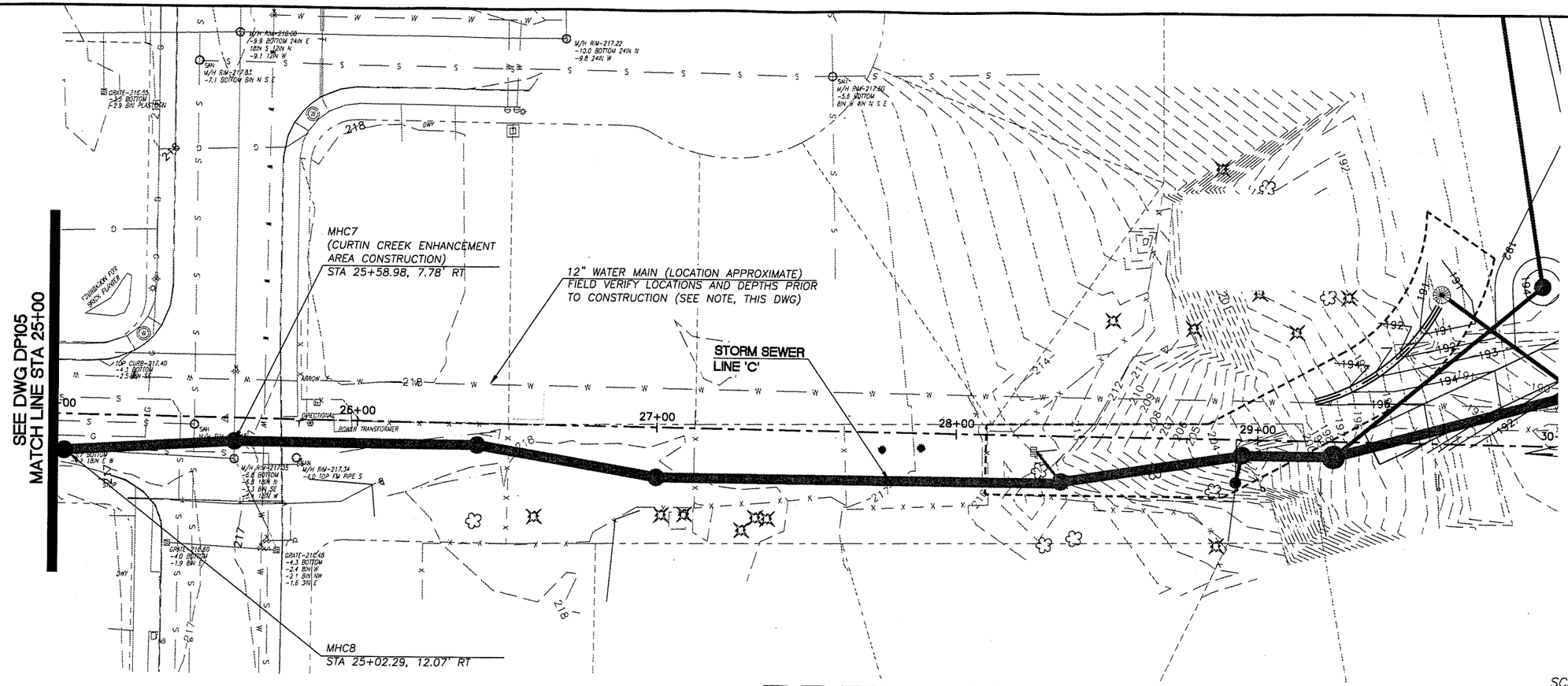


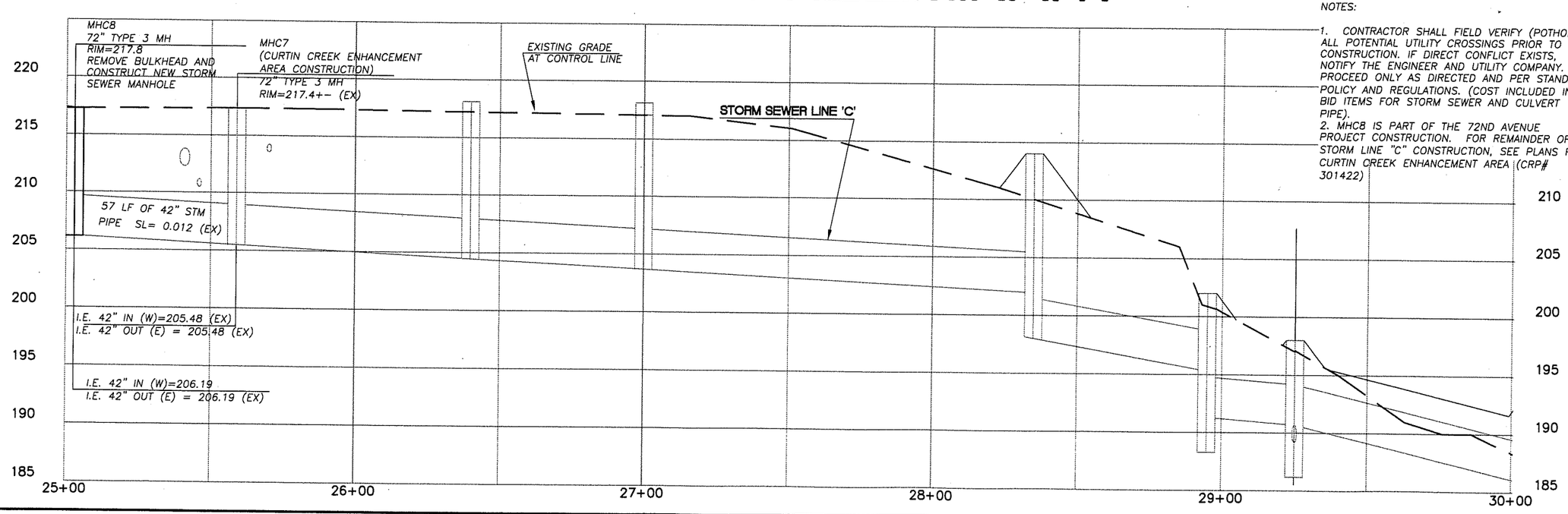
PRELIMINARY

SCALE IN FEET

20 0 20 40

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY (POTHOLE) ALL POTENTIAL UTILITY CROSSINGS PRIOR TO CONSTRUCTION. IF DIRECT CONFLICT EXISTS, NOTIFY THE ENGINEER AND UTILITY COMPANY. PROCEED ONLY AS DIRECTED AND PER STANDARD POLICY AND REGULATIONS. (COST INCLUDED IN BID ITEMS FOR STORM SEWER AND CULVERT PIPE).
2. MHC8 IS PART OF THE 72ND AVENUE PROJECT CONSTRUCTION. FOR REMAINDER OF STORM LINE "C" CONSTRUCTION, SEE PLANS FOR CURTIN CREEK ENHANCEMENT AREA (CRP# 301422)



DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	DP106
SHEET	46 OF 72

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STATE OF WASHINGTON MILLIE WASHINGTON REGISTERED PROFESSIONAL ENGINEER EXPIRES JULY 1, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
DRAINAGE PLAN; 99TH ST (STA 25+00 TO 30+00)

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CLARK COUNTY WASHINGTON

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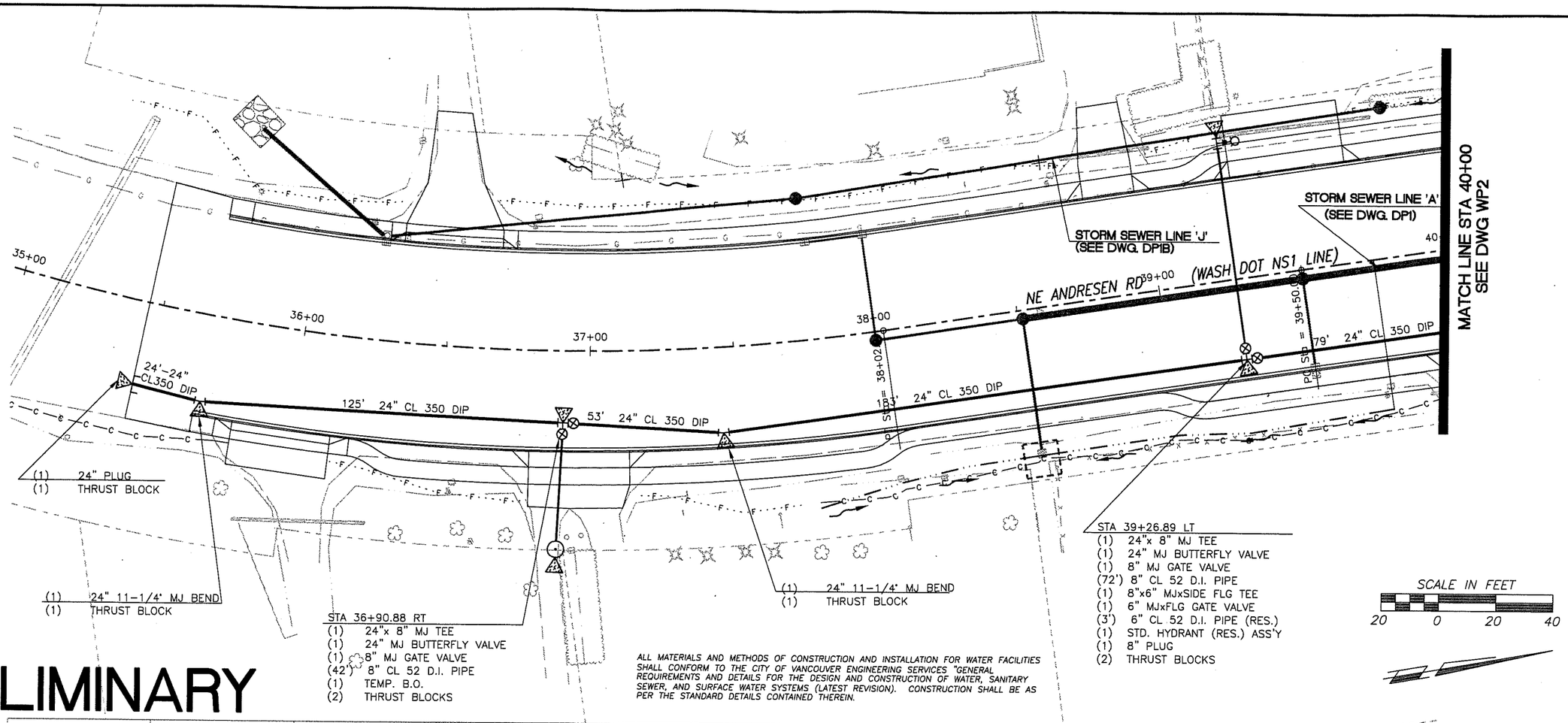
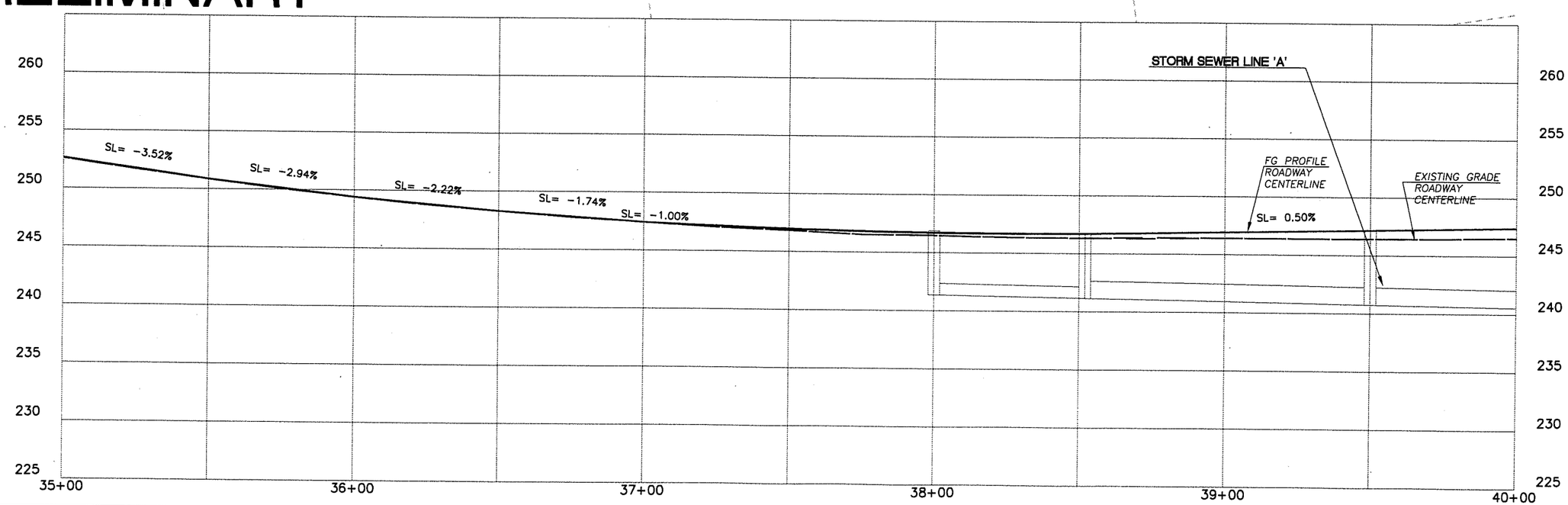


PRELIMINARY

ALL MATERIALS AND METHODS OF CONSTRUCTION AND INSTALLATION FOR WATER FACILITIES SHALL CONFORM TO THE CITY OF VANCOUVER ENGINEERING SERVICES "GENERAL REQUIREMENTS AND DETAILS FOR THE DESIGN AND CONSTRUCTION OF WATER, SANITARY SEWER, AND SURFACE WATER SYSTEMS (LATEST REVISION). CONSTRUCTION SHALL BE AS PER THE STANDARD DETAILS CONTAINED THEREIN.



DESIGNED	ES
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	WP1
SHEET	47 OF 72

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD

WATER LINE PLAN (STA 35+00 TO STA 40+00)

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PRELIMINARY

SCALE IN FEET
20 0 20 40

SEE DWG WP1
MATCH LINE STA 40+00

NE 72nd AVE

STORM SEWER LINE 'A'
(SEE DWG DP2)

41+00
42+00
43+00
44+00

PC Sta = 41+46.2

PT Sta = 43+42.4

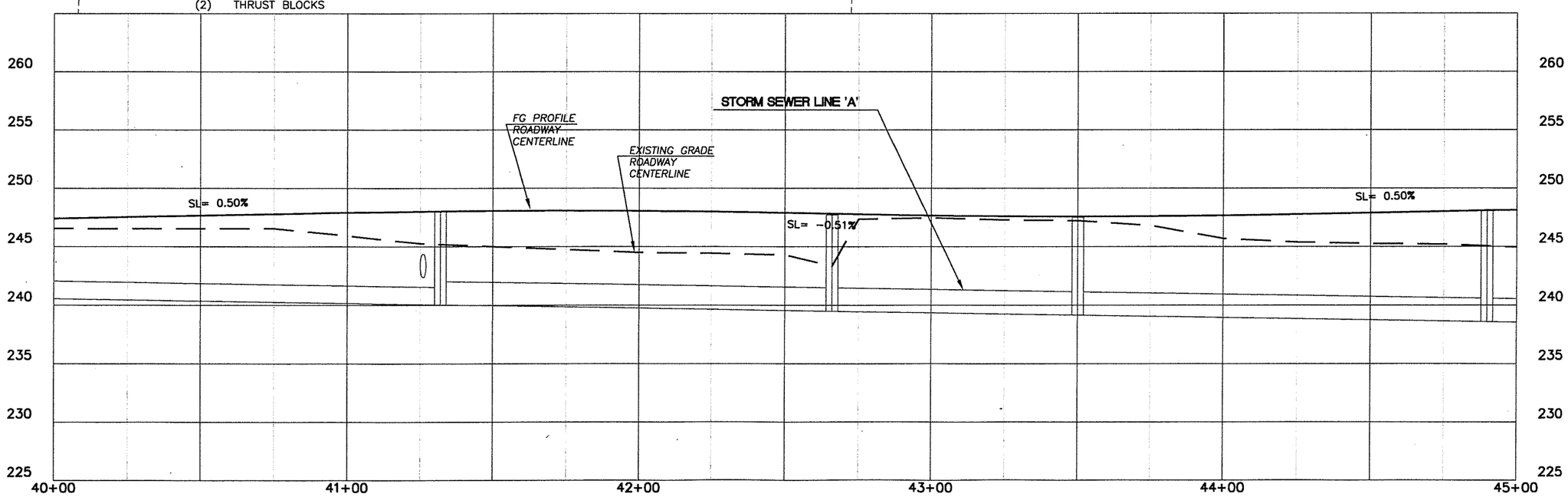
264' 24" CL 350 DIP

256' 24" CL 350 DIP

MATCH LINE STA 45+00
SEE DWG WP3

STA 40+11.21 RT
(1) 24"x 8" MJ TEE
(1) 24" MJ BUTTERFLY VALVE
(1) 8" MJ GATE VALVE
(42') 8" CL 52 D.I. PIPE
(1) TEMP. B.O.
(2) THRUST BLOCKS

STA 42+79.10 LT
(1) 24"x 8" MJ TEE
(1) 24" MJ BUTTERFLY VALVE
(1) 8" MJ GATE VALVE
(67') 8" CL 52 D.I. PIPE
(1) TEMP. B.O.
(2) THRUST BLOCKS



DESIGNED	ES
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CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	WP2
SHEET	48 OF 72

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
WATER LINE PLAN (STA 40+00 TO STA 45+00)

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WASHINGTON

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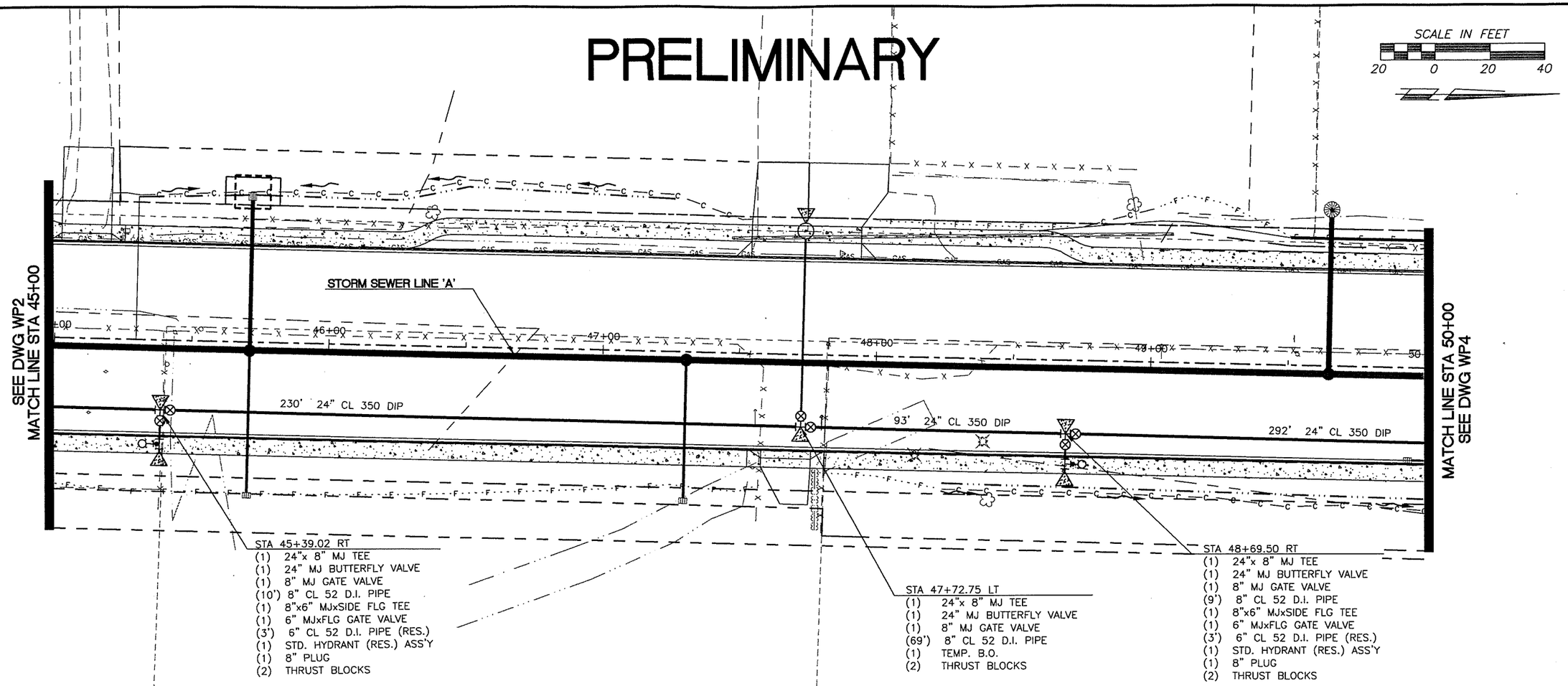
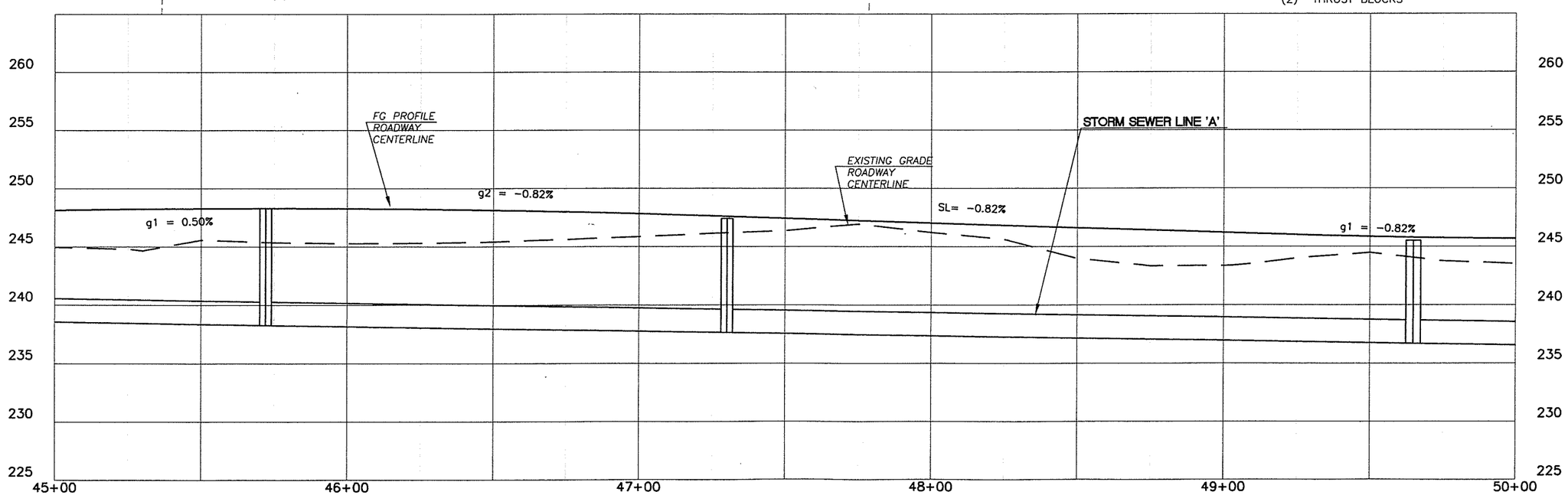
PRELIMINARY





DESIGNED	ES
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	WP3
SHEET	49 OF 72

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
WATER LINE PLAN (STA 45+00 TO STA 50+00)

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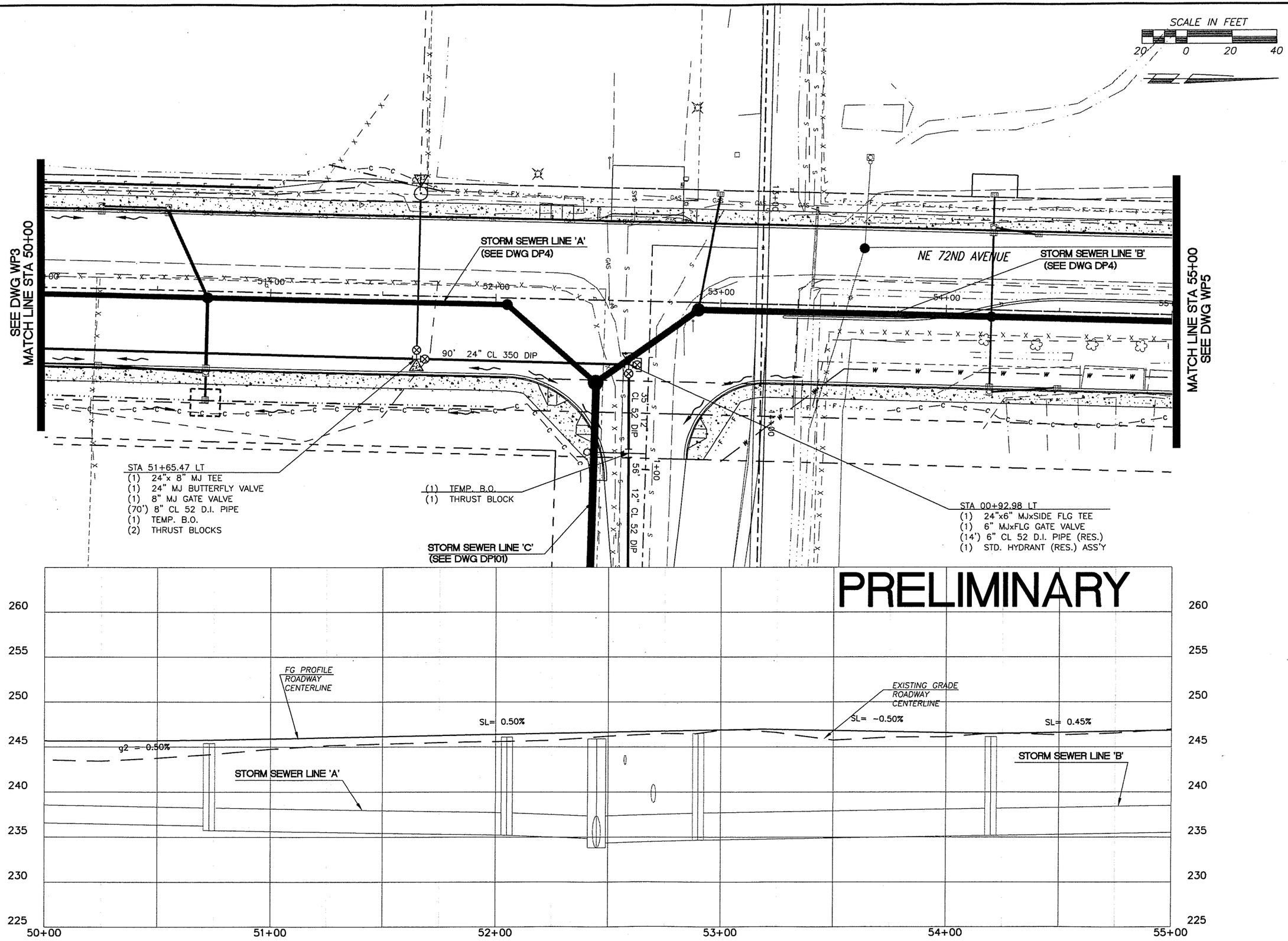

DESIGNED	ES
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG.	WP4
SHEET	50 OF 72

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
WATER LINE PLAN (STA 50+00 TO STA 55+00)

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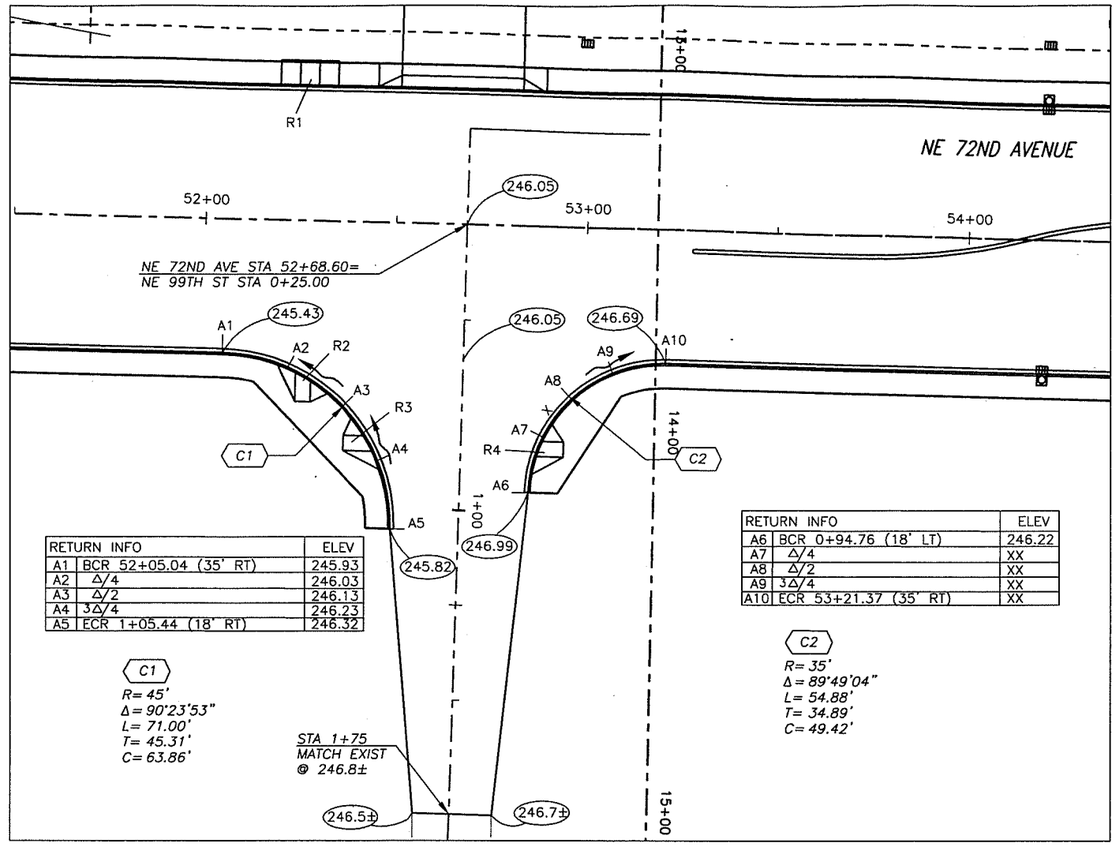
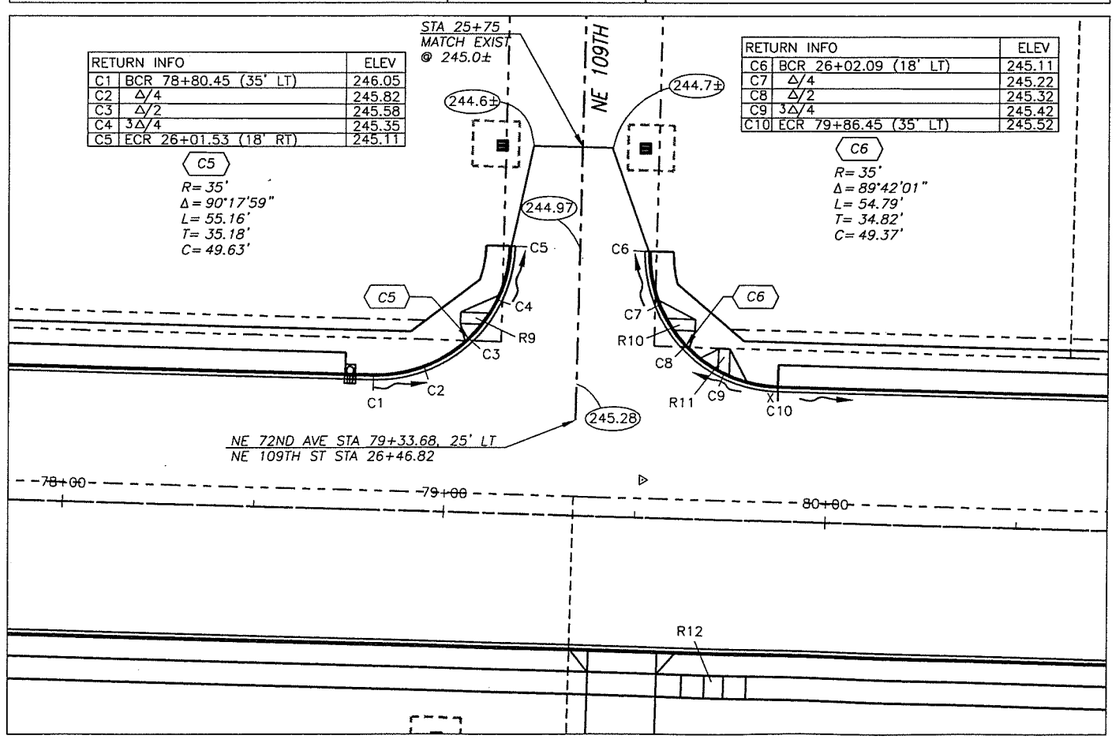


RETURN INFO		ELEV
A1	BCR 52+05.04 (35' RT)	245.93
A2	Δ/4	246.03
A3	Δ/2	246.13
A4	3Δ/4	246.23
A5	ECR 1+05.44 (18' RT)	246.32

C1
R= 45'
Δ= 90°23'53"
L= 71.00'
T= 45.31'
C= 63.86'

RETURN INFO		ELEV
A6	BCR 0+94.76 (18' LT)	246.22
A7	Δ/4	XX
A8	Δ/2	XX
A9	3Δ/4	XX
A10	ECR 53+21.37 (35' RT)	XX

C2
R= 35'
Δ= 89°49'04"
L= 54.88'
T= 34.89'
C= 49.42'



RETURN INFO		ELEV
C1	BCR 78+80.45 (35' LT)	246.05
C2	Δ/4	245.82
C3	Δ/2	245.58
C4	3Δ/4	245.35
C5	ECR 26+01.53 (18' RT)	245.11

C5
R= 35'
Δ= 90°17'59"
L= 55.16'
T= 35.18'
C= 49.63'

RETURN INFO		ELEV
C6	BCR 26+02.09 (18' LT)	245.11
C7	Δ/4	245.22
C8	Δ/2	245.32
C9	3Δ/4	245.42
C10	ECR 79+86.45 (35' LT)	245.52

C6
R= 35'
Δ= 89°42'01"
L= 54.79'
T= 34.82'
C= 49.37'

SCALE IN FEET
20 0 20 40

CL OF RAMPS @ FACE			
#	STATION	OFFSET	TYPE
R1	52+29.7	35.0' LT	TYPE 3
R2	52+29.7	38.1' RT	TYPE 1
R3	0+76.3	23.6' RT	TYPE 1
R4	0+75.7	23.6' LT	TYPE 1
R5	XX+XX	XX.X' RT	TYPE X
R6	XX+XX	XX.X' LT	TYPE X
R7	XX+XX	XX.X' LT	TYPE X
R8	XX+XX	XX.X' LT	TYPE X
R9	26+20.8	23.8' RT	TYPE 1
R10	26+21.1	23.6' RT	TYPE 1
R11	79+72.0	37.0' LT	TYPE 1
R12	79+72.0	35.0' LT	TYPE 3

PRELIMINARY

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DWG:	101
SHEET	51 OF 72

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NORTHWEST UTILITY NOTIFICATION CENTER

EXPIRES:MAY 26, 2007

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
INTERSECTION PLAN

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CLARK COUNTY
WASHINGTON

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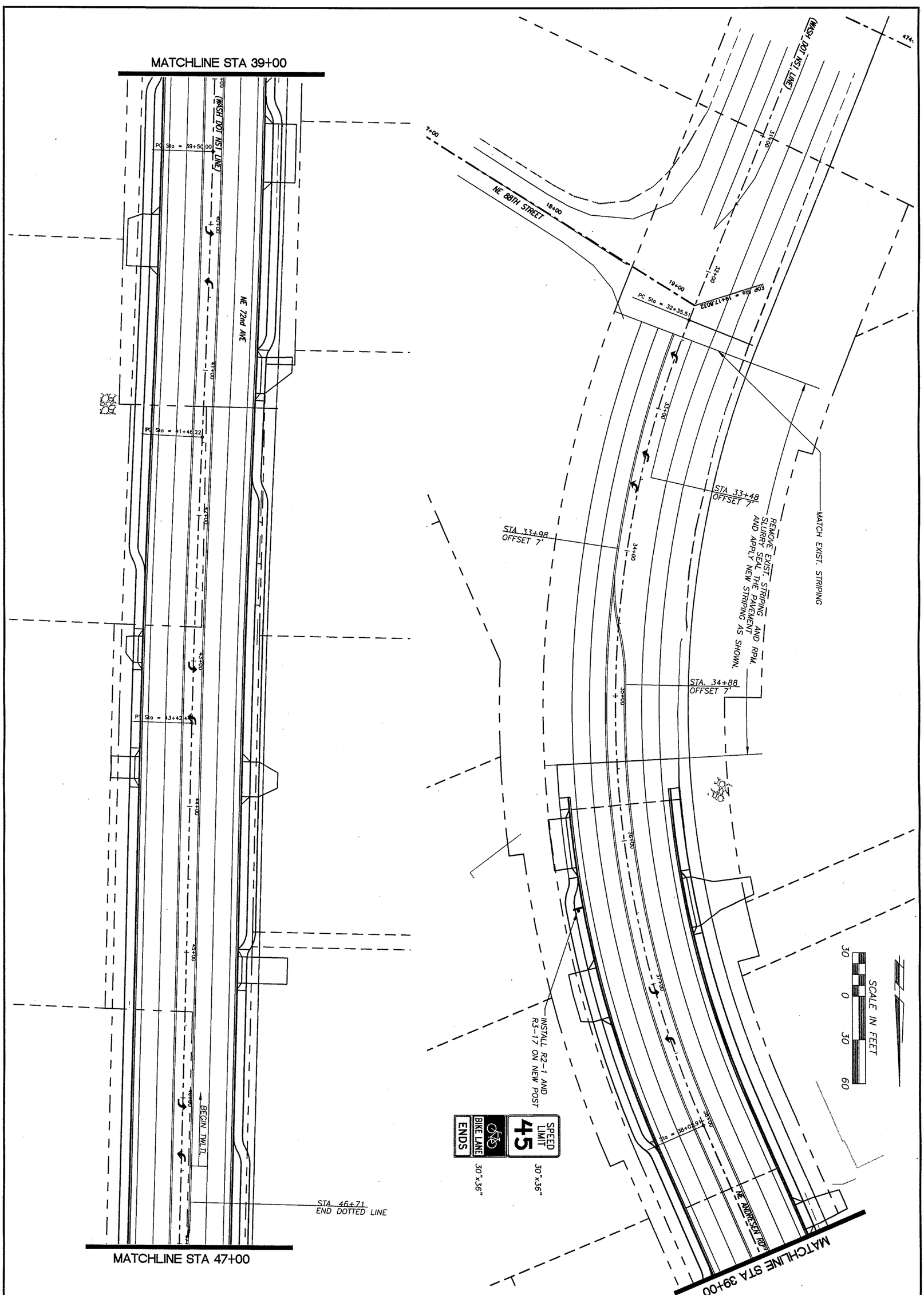

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CLARK COUNTY
WASHINGTON

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
SIGNING & STRIPING PLAN

STATE OF WASHINGTON
EJAZ KHAN
35938
REGISTERED PROFESSIONAL ENGINEER
EXPIRES: JAN. 01, 2006

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CRP	310122
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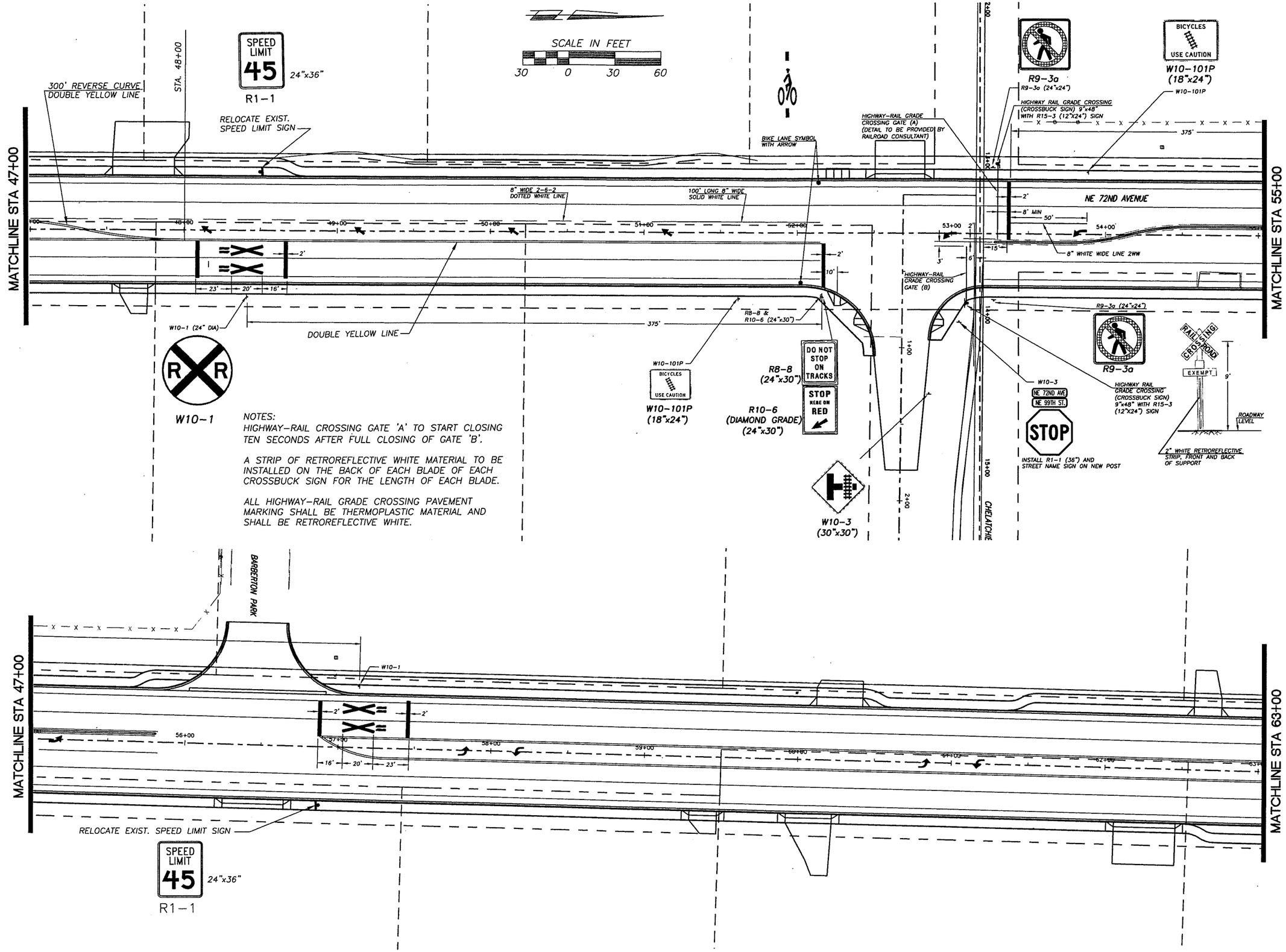
VERT.	SEE SHEET
DATE	07/31/05
DWG:	SS1
SHEET	52 OF 72



NOTES:
HIGHWAY-RAIL CROSSING GATE 'A' TO START CLOSING TEN SECONDS AFTER FULL CLOSING OF GATE 'B'.

A STRIP OF RETROREFLECTIVE WHITE MATERIAL TO BE INSTALLED ON THE BACK OF EACH BLADE OF EACH CROSSBUCK SIGN FOR THE LENGTH OF EACH BLADE.

ALL HIGHWAY-RAIL GRADE CROSSING PAVEMENT MARKING SHALL BE THERMOPLASTIC MATERIAL AND SHALL BE RETROREFLECTIVE WHITE.

DESIGNED	EK
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	SS2
SHEET	53 OF 72

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STATE OF WASHINGTON KEITH BRAUN 33534 REGISTERED PROFESSIONAL ENGINEER EXPIRES JAN. 01, 2006

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
SIGNING & STRIPING PLAN

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CLARK COUNTY WASHINGTON

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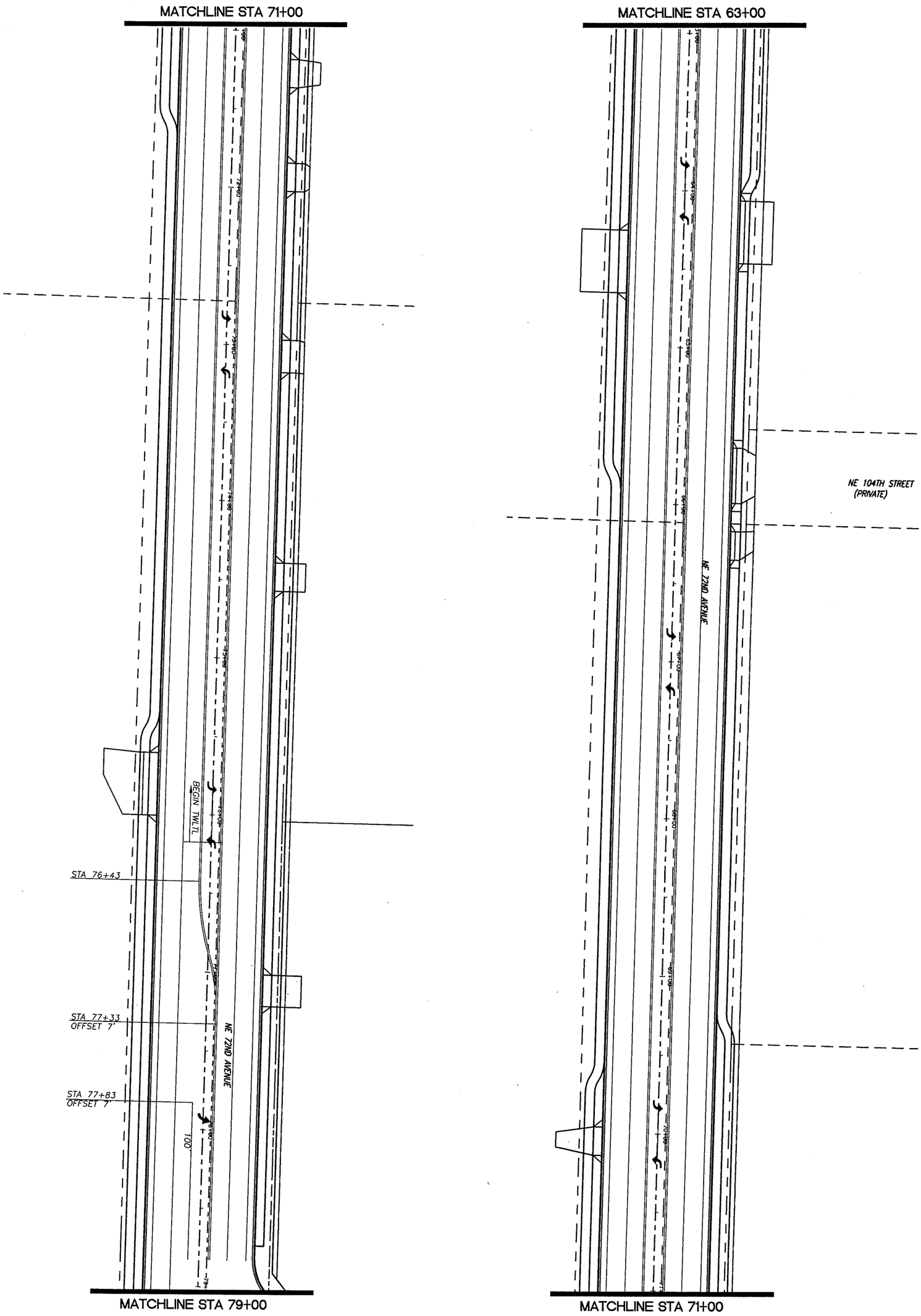

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WASHINGTON

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
SIGNING & STRIPING PLAN

EJAZ KHAN
STATE OF WASHINGTON
35938
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES: JAN. 01, 2006

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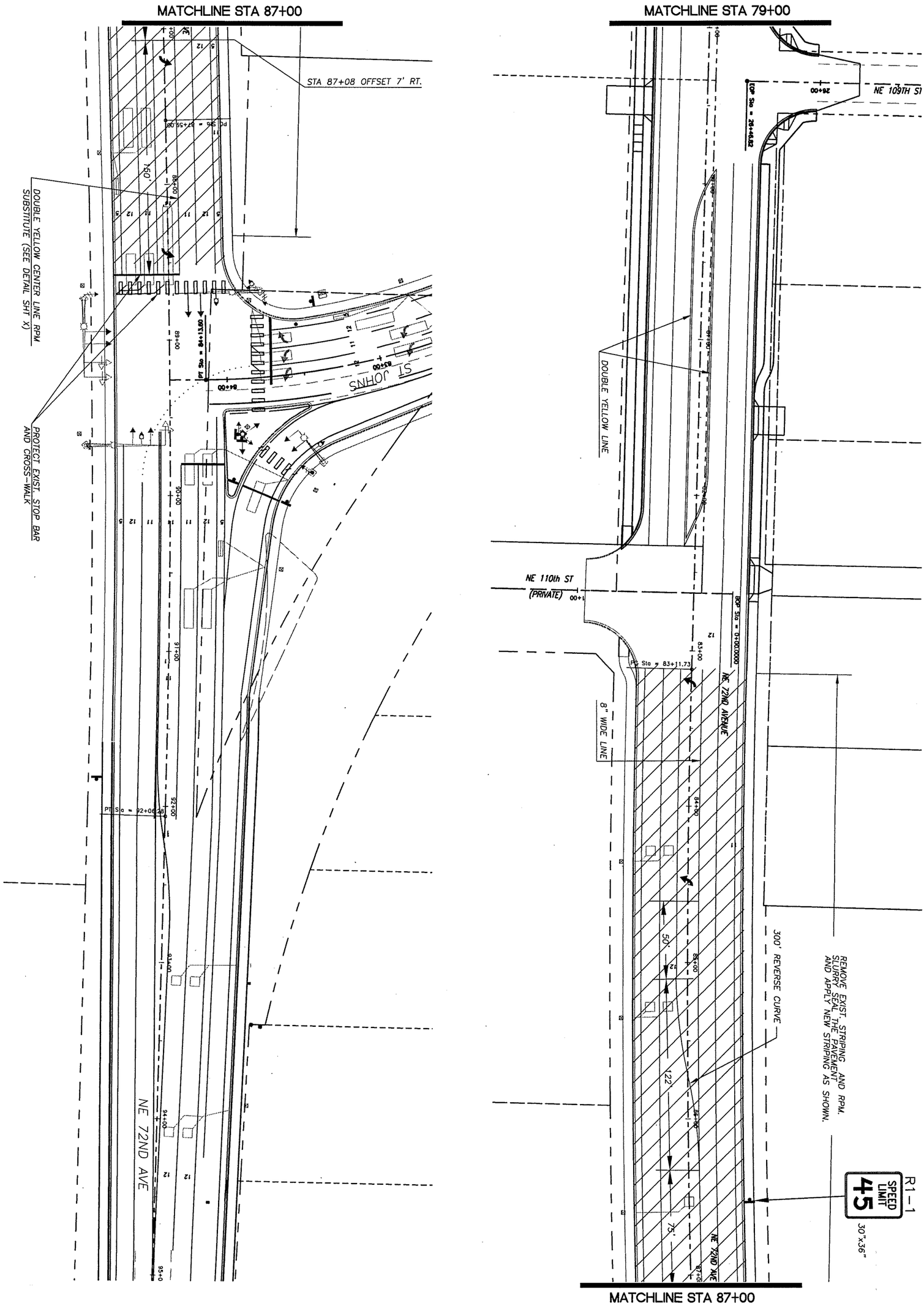
DESIGNED	EK
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	SS3
SHEET	54 OF 72



proud past, promising future

CLARK COUNTY
WASHINGTON

ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD

SIGNING & STRIPING PLAN

EJAZ KHAN
STATE OF WASHINGTON
35938
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES: JAN. 01, 2006

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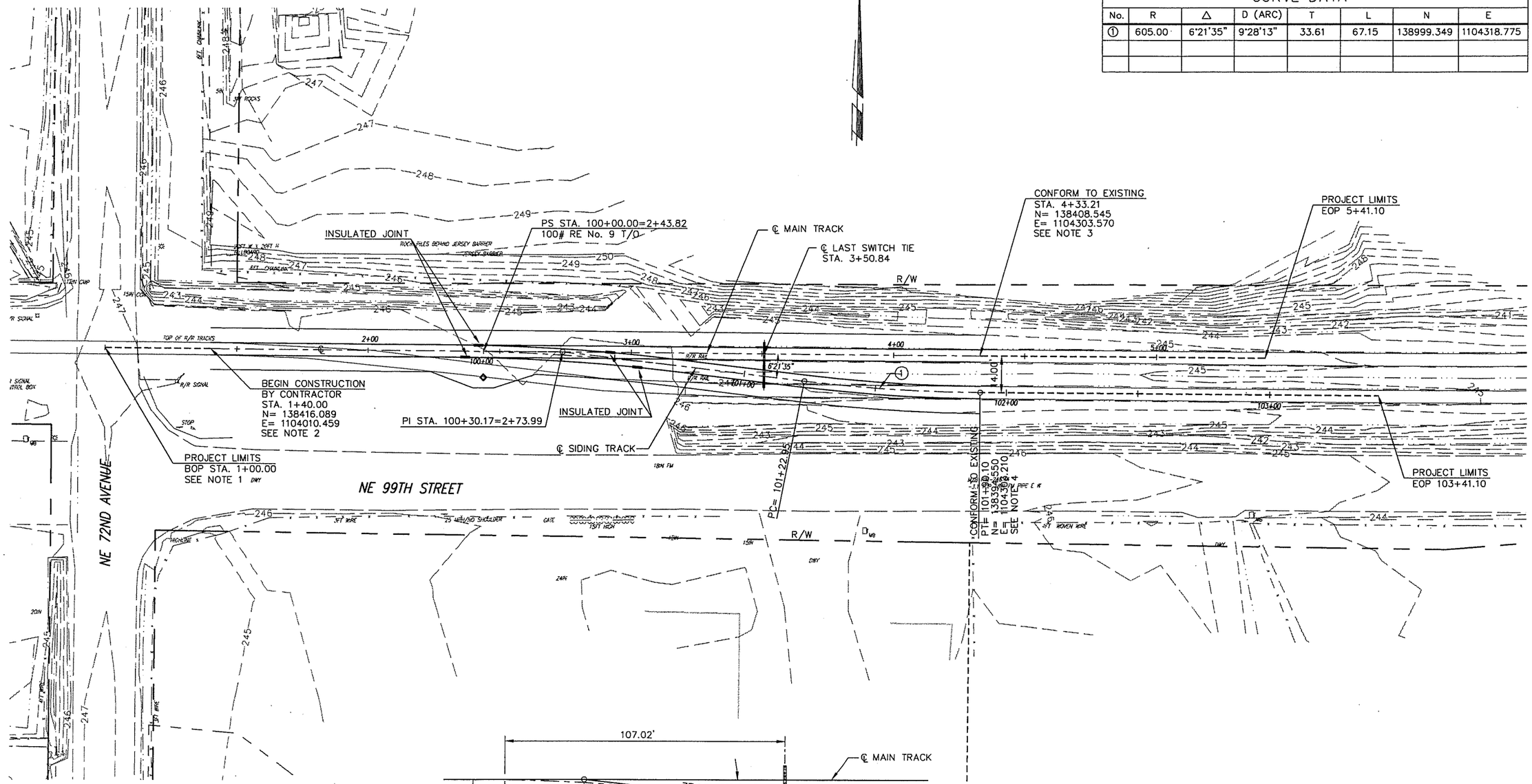
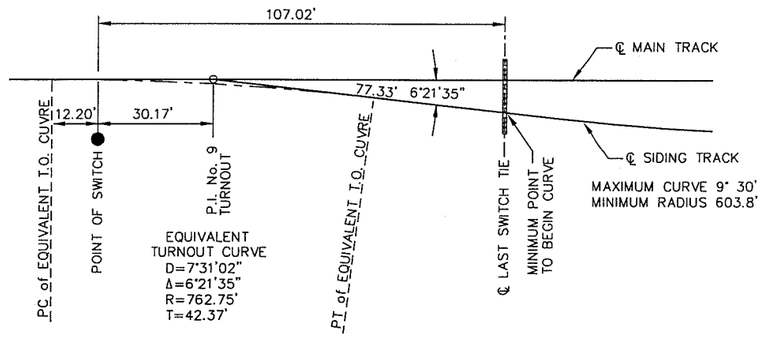
DESIGNED	EK
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	SS4
SHEET	55 OF 72

CURVE DATA							
No.	R	Δ	D (ARC)	T	L	N	E
1	605.00	6°21'35"	9°28'13"	33.61	67.15	138999.349	1104318.775





NUMBER 9 TURNOUT
TRACK ALIGNMENT GEOMETRY DETAIL
SCALE: 1"=20'

NOTES:

1. ADJUST TO MATCH EXISTING TRACK FROM STATION 1+00.00 TO 1+40.00.
2. REMOVE EXISTING TRACKS AND INSTALL NEW TRACKS.
3. ADJUST TO MATCH EXISTING TRACK FROM STATION 4+33.21 TO 5+41.10
4. ADJUST TO MATCH EXISTING TRACK FROM STATION 101+90.10 TO 103+12.46

PRELIMINARY

SCALE IN FEET
20 0 20 40

DESIGNED ME/JM
DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
DWG: L1
SHEET 57 OF 72

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ENGINEERING PROGRAM
DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
LAYOUT MAIN TRACK AND SIDING

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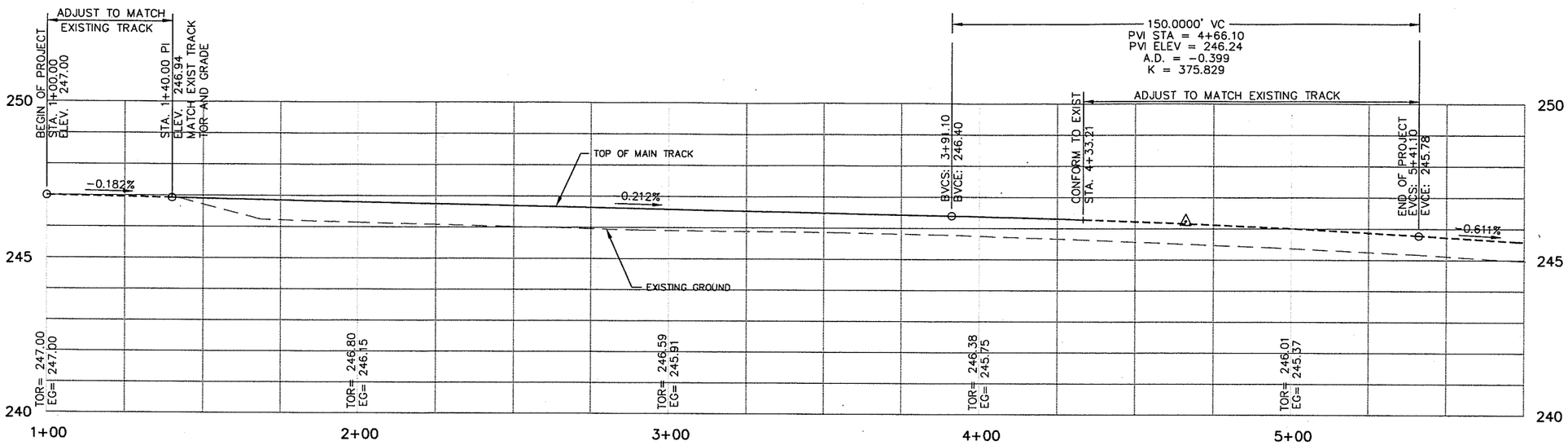
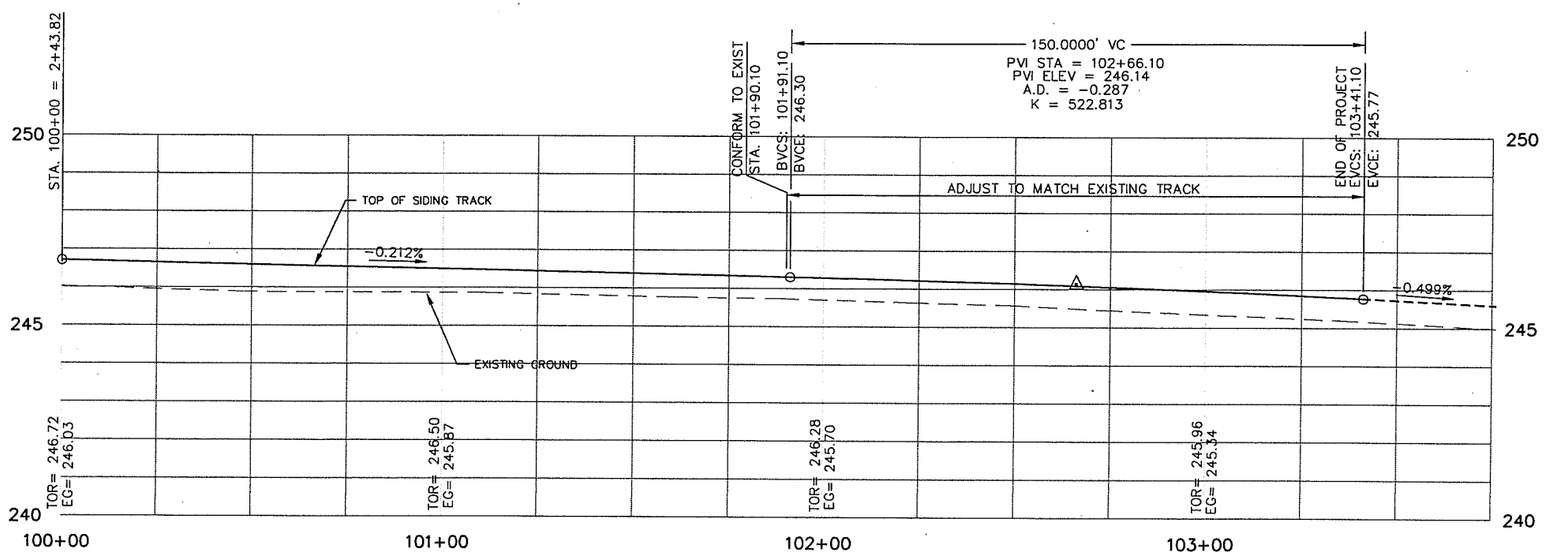


PROFILE MAIN TRACK

PRELIMINARY



PROFILE SIDING TRACK

SCALE IN FEET
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DRAWN KB/RK
CRP 310122
HOR. SEE SHEET
VERT. SEE SHEET
DATE 07/31/05
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SHEET 58 OF 72

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PROFILES MAIN TRACK AND SIDING

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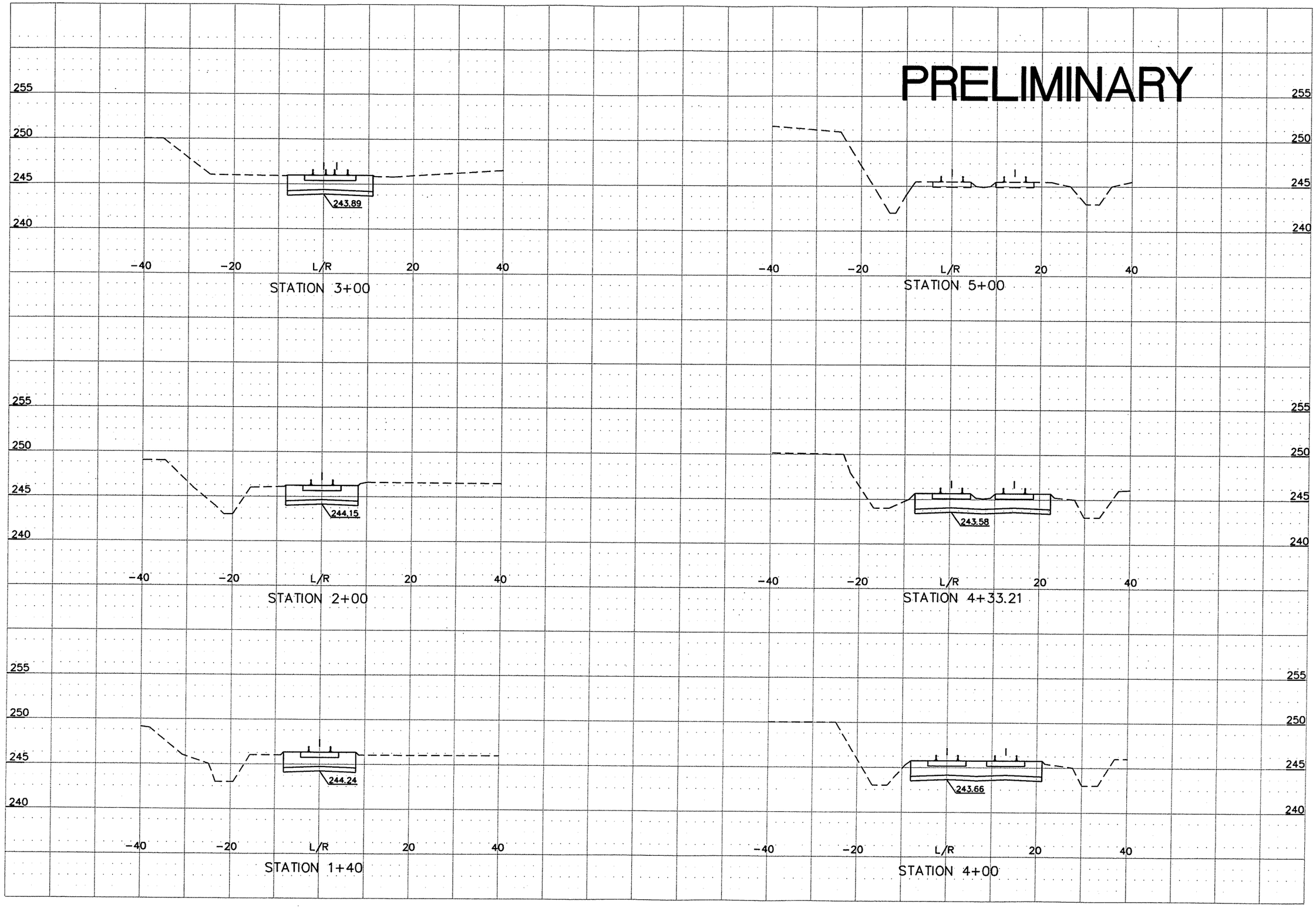
PRELIMINARY



DESIGNED	ME/JM
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VERT.	SEE SHEET
DATE	07/31/05
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SHEET	59 OF 72

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RAILROAD CROSS SECTIONS

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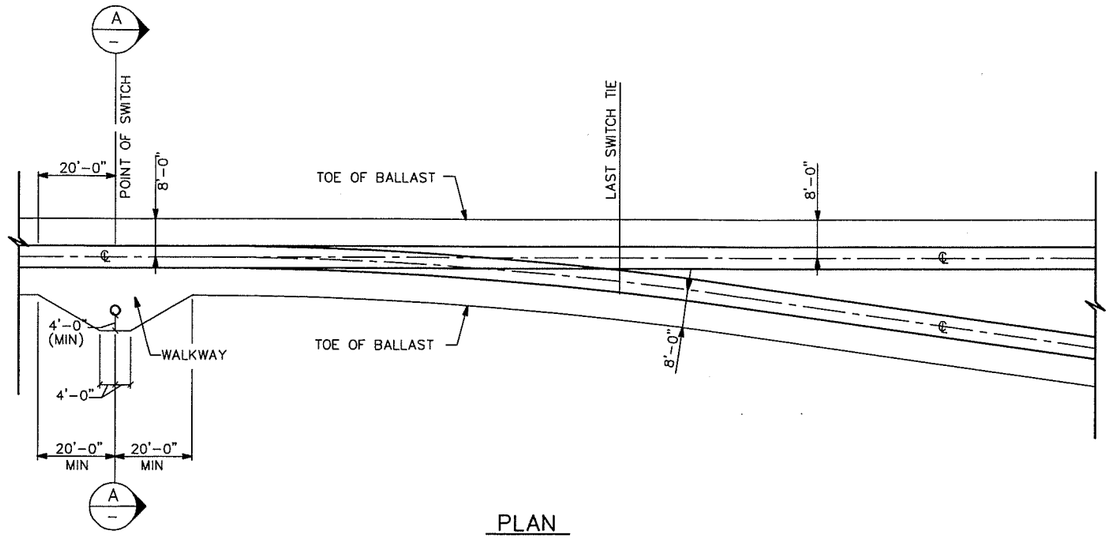
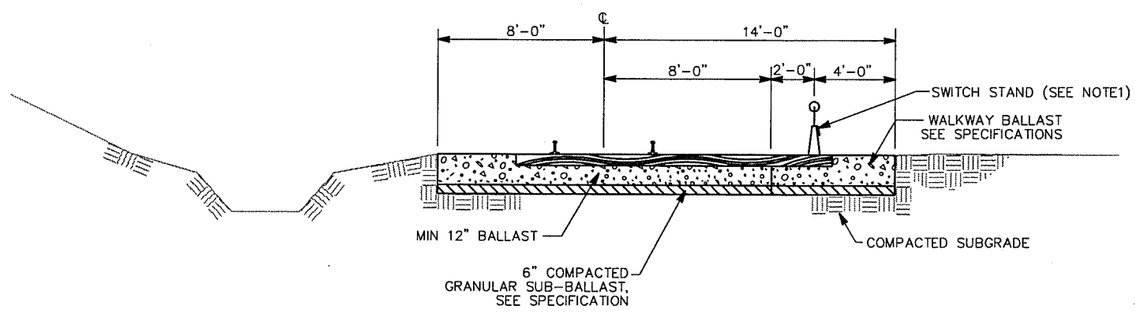


PLAN



SECTION A-A

PRELIMINARY

GRADING AND BALLAST
THROUGH TURNOUT DETAILS
NTS

NOTES

1. SWITCH STAND SHALL CONFORM TO BNSF STANDARD PLAN-DWG. NO. 2153 REV. NO. 8 OR LATER FOR RACOR STYLE 36E & 36EH RIGID SWITCH STAND WITH TRI-HANDLE AT 30° OR STRAIGHT.

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VERT. SEE SHEET
DATE 07/31/05
DWG: L4
SHEET 60 OF 72

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DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
RAILROAD CONSTRUCTION DETAILS

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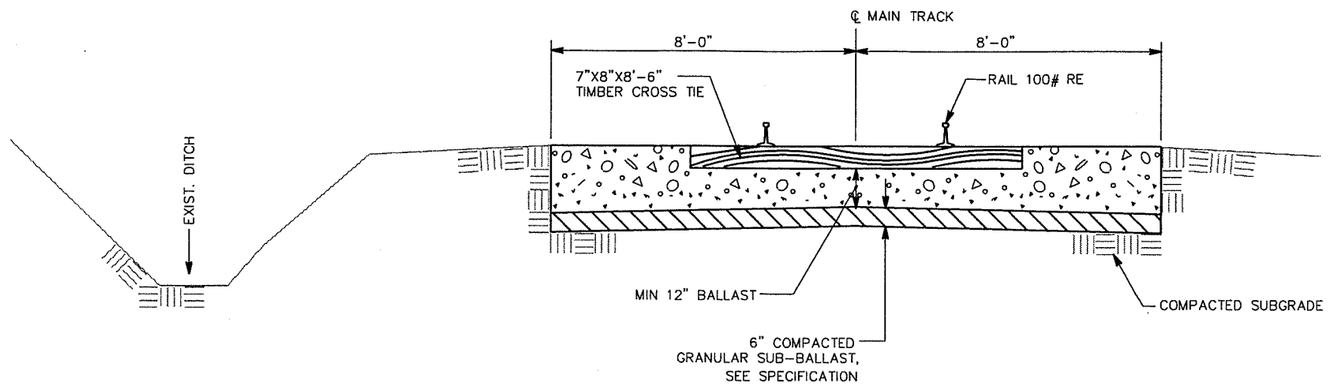
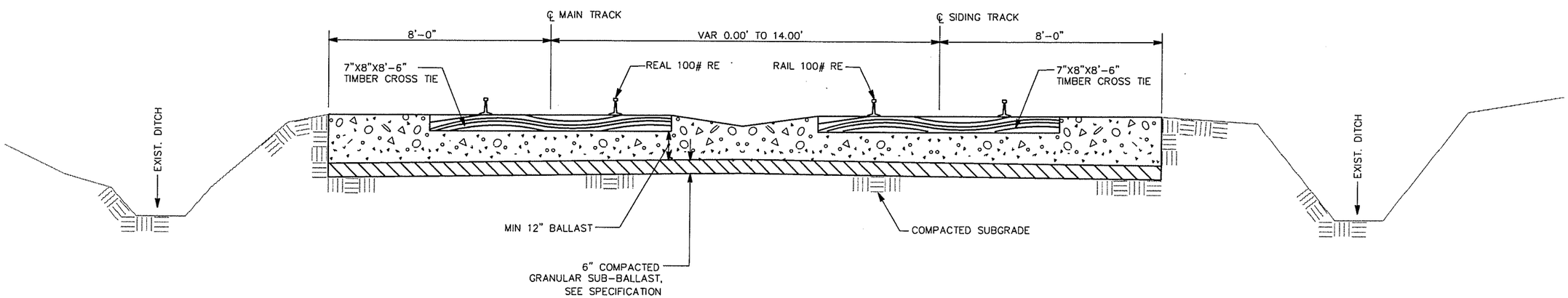


MAIN TRACK TYPICAL SECTION
STA. 1+40.00 TO 2+43.82
NTS

PRELIMINARY



SIDING TRACK TYPICAL SECTION
STA. 2+43.82 TO 4+33.21
NTS

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VERT.	SEE SHEET
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SHEET	61 OF 72

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DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
RAILROAD TYPICAL SECTIONS

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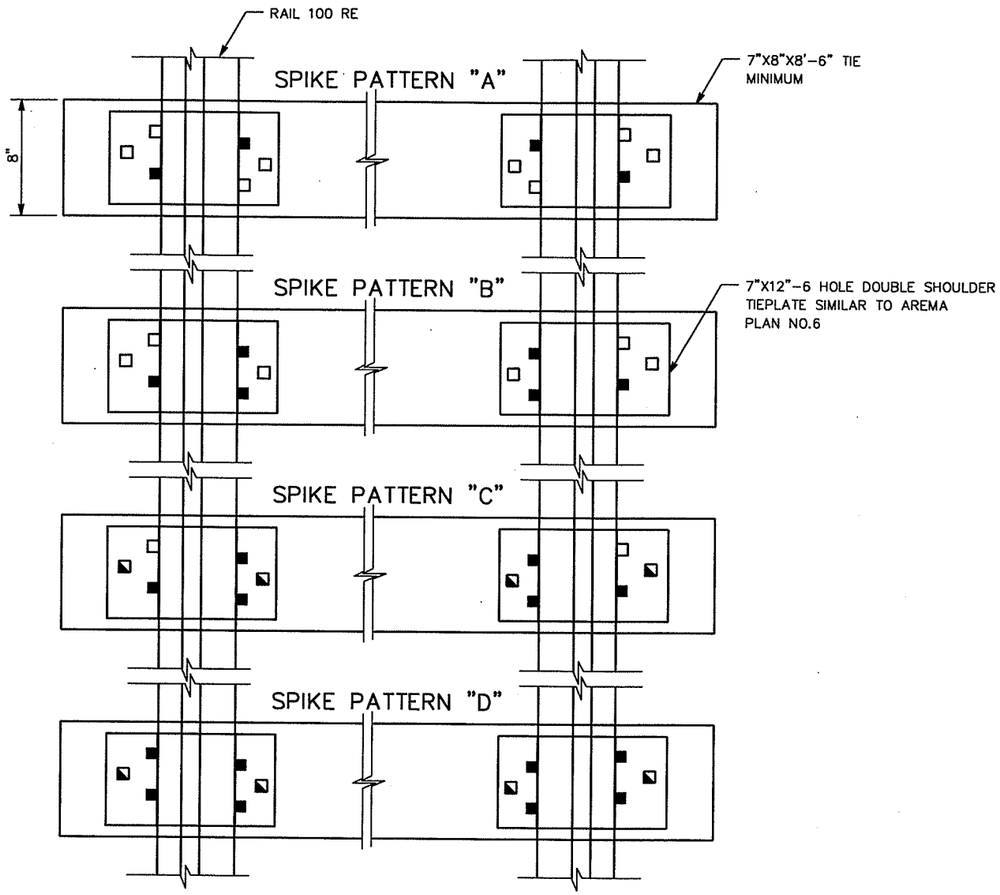


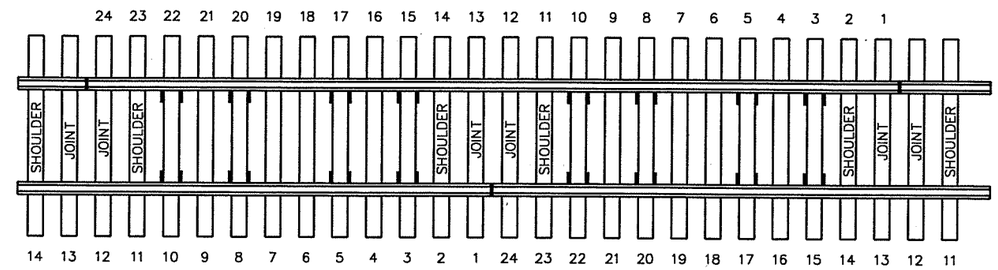
TRACK ALIGNMENT	SPIKES PER TIE PLATE	SPIKING PATTERN
TANGENTS AND CURVES LESS THAN 6 DEGREE	2	A
CURVES 6 DEGREE AND OVER BUT LESS THAN 12 DEGREE	3	B
CURVES OVER 12 DEGREE	5	C
GRADE CROSSING 9'-0" LONG TIES RAIL JOINT TO RAIL JOINT	6	D

■ TRACK SPIKE.

◪ HOLD DOWN SPIKE

TRACK SPIKING PATTERNS

16 ANCHORS PER 39 FT. RAIL



APPLICATION OF RAIL ANCHORS ON TANGENT & CURVE TRACK

NTS

PRELIMINARY

NOTES:

1. RAIL ANCHORS MUST NOT BE PLACED AGAINST JOINT OR SHOULDER TIES
2. RAIL ANCHORS SHALL BE DRIVEN ON BASE OF RAIL UNTIL LOCKING NOTCH ENGAGES EDGE OF OPPOSITE FLANGE. ANCHORS MUST NOT BE DRIVEN ALONG THE RAIL: IF ADJUSTMENTS ARE NECESSARY, REMOVE AND REAPPLY.

DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
HOR.	SEE SHEET
VERT.	SEE SHEET
DATE	07/31/05
DWG:	L6
SHEET	62 OF 72

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DESIGN SECTION

NE 72ND AVE - NE 88TH ST TO NE ST JOHNS RD
RAILROAD CONSTRUCTION DETAILS

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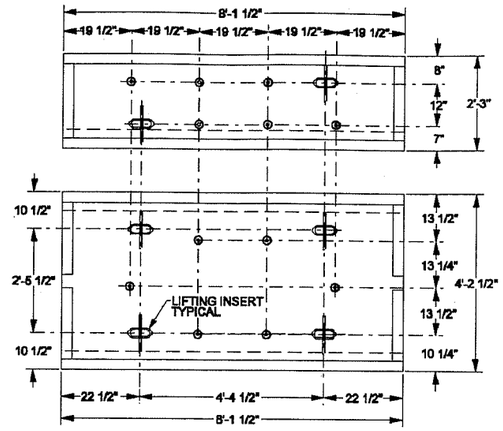
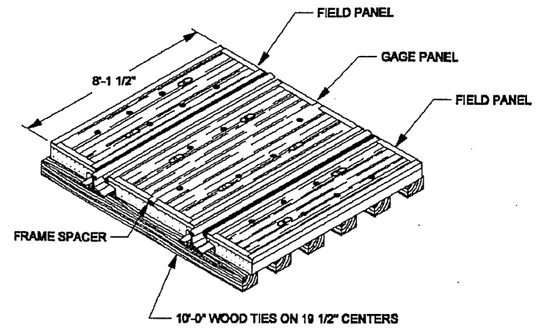
ACAD FILE: L6.dwg





NOTES:
1/4" RUBBER INTERFACE PAD TO BE PLACED BETWEEN PANEL AND TIES FOR 141 LB. RAIL SECTION. PAD TO BE NAILED TO TIES,

CROSSING TYPE - 10W

RAIL SIZE	PANEL HEIGHT	GAGE PANEL WEIGHT	FIELD PANEL WEIGHT
115	7 1/8"	2850 LBS.	1550 LBS.
133-141	7 7/8"	3125 LBS.	1675 LBS.

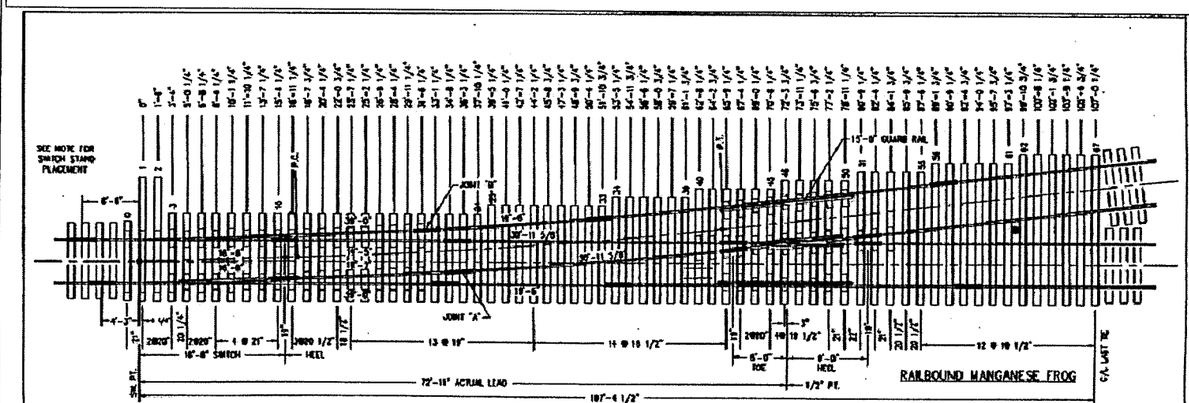
200100

ITEM NUMBERS			
133-141 LB. UPRR	133-141 LB. BNSF	115 LB. UPRR	115 LB. BNSF
540-1301	055590975	540-0202	055590973

COMMON STANDARDS

LAYOUT FOR CONCRETE PANELS ON 10'-0" LONG WOOD TIES (10W)

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO: 200100



BILL OF TIES FOR ELECTRIC LAYOUT			
NUMBER	DESCRIPTION	SIZE	FT. BM.
1 PC.	NO. 0	8" X 10" X 8'-0"	80
2 PCS.	NO'S 1 & 2	8" X 10" X 14'-0"	187
22 PCS.	3 TO 24 INCL	7" X 9" X 10'-0"	1155
9 PCS.	25 TO 33 INCL	7" X 9" X 11'-0"	520
6 PCS.	34 TO 39 INCL	7" X 9" X 12'-0"	378
5 PCS.	40 TO 45 INCL	7" X 9" X 13'-0"	410
5 PCS.	46 TO 50 INCL	7" X 9" X 14'-0"	350
5 PCS.	51 TO 55 INCL	7" X 9" X 15'-0"	394
6 PCS.	56 TO 61 INCL	7" X 9" X 16'-0"	504
4 PCS.	62 TO 67 INCL	7" X 9" X 17'-0"	536
67 PCS.		TOTAL FT. BM.	4513

MANUAL LAYOUT WITHOUT LOCK			
NUMBER	DESCRIPTION	SIZE	FT. BM.
1 PC.	NO. 0	7" X 9" X 8'-0"	48
2 PCS.	NO'S 1 & 2	7" X 9" X 14'-0"	148
TOTAL FT. BM. FOR MANUAL WITHOUT LOCK			4460

MANUAL WITH CLOSE CLEARANCE LOCK			
NUMBER	DESCRIPTION	SIZE	FT. BM.
3 PCS.	NO'S 0, 1 & 2	7" X 9" X 14'-0"	221
TOTAL FT. BM. FOR MANUAL WITH CLOSE CLEARANCE LOCK			4487

MANUAL LAYOUT WITH HIGH LOCK			
NUMBER	DESCRIPTION	SIZE	FT. BM.
3 PCS.	NO'S 0, 1 & 2	7" X 9" X 14'-0"	353
TOTAL FT. BM. FOR MANUAL WITH HIGH LOCK			4548

LIST OF ASSOCIATED DRAWINGS

SWITCH LAYOUT	1723.01, .05
RODS, CLIPS	1750.01
HEEL BLOCK	1751.01
SWITCH STOPS	1752.01
STOCK RAILS	1760.02
POINTS RAILS	1761.01
GAGE PLATES	1753.01, .02, .03, .04
BRACE PLATES	1754.01
SLIDE PLATES	1755.01
ROLLER RISER PLATE	1756.01
TURNOUT PLATES	1758.01, 1757.01
FROG	1833.01, 1838.01
GUARD RAIL	2005.01

PROPERTIES OF TURNOUT

FROG No.	9
FROG ANGLE	6°-21'-35"
THROW OF SWITCH AT HEAD ROD	5"
LENGTH OF SWITCH POINTS	16'-8"
HEEL SPREAD OF SWITCH	8 1/4"
SWITCH ANGLE	1°-16'-22"
LEAD	72'-11"
RADIUS	597.71'
DEGREE OF CURVE	9°-35'-50"
CENTRAL ANGLE OF CURVE	4°-25'-15"

NOTES FOR INSTALLATION

1. PLACE CENTER OF GUARD RAIL AS CLOSE AS POSSIBLE AND AHEAD OF THE 1/2" POINT OF FROG.
2. FLANGEWAY OPENING OF 1 7/8" MUST BE MAINTAINED.
3. BOX ANCHOR 184 TIES IN EACH DIRECTION OF THE SWITCH ON BOTH MAIN AND SIDE TRACK.
4. SWITCH STAND SHALL BE PLACED SO THAT CONNECTING ROD WILL BE IN TENSION WHEN THE SWITCH IS SET FOR MAIN LINE, EXCEPT IN LOCKNOWS, SUCH AS LARGER TRACKS, WHERE SPACE BETWEEN TRACKS WILL NOT PERMIT.
5. IN SIGNAL TERRITORY, THE LOCATION OF INSULATED JOINTS "A" AND "B" SHOULD BE NO CLOSER THAN 36 INCHES AND NOT MORE THAN FOUR FEET APART MEASURED ALONG THE TURNOUT.

BURLINGTON NORTHERN INC
STANDARD PLAN
Overland Park, Kansas

NO. 9 BOLTED TURNOUT
WITH RAILBOUND FROG
16'-8" STRAIGHT SWITCH
ELECTRIC AND MANUAL

RAIL: 115 & 132 LB RE

DATE: 04/14/92	SCALE: NONE	
DWG. NO.	SHEET NO.	REV. NO.
2061	03	00

DESIGNED	ME/JM
DRAWN	KB/RK
CRP	310122
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VERT.	SEE SHEET
DATE	07/31/05
DWG:	RR1
SHEET	63 OF 72

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DESIGN SECTION

NE 72ND AVE – NE 88TH ST TO NE ST JOHNS RD
RAILROAD CROSSING STANDARD PLANS

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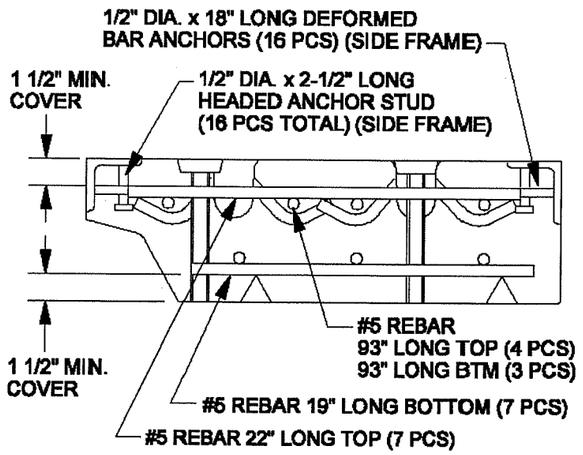
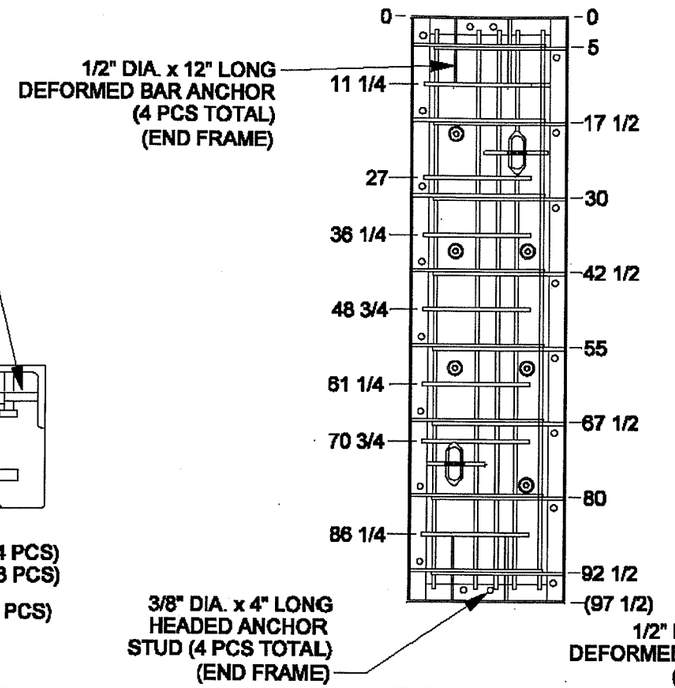
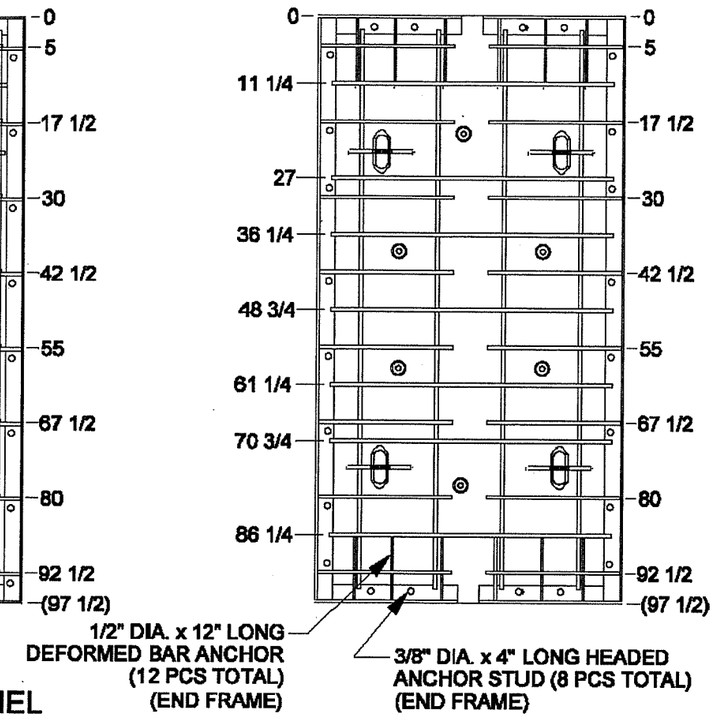


CROSS SECTION - FIELD PANEL



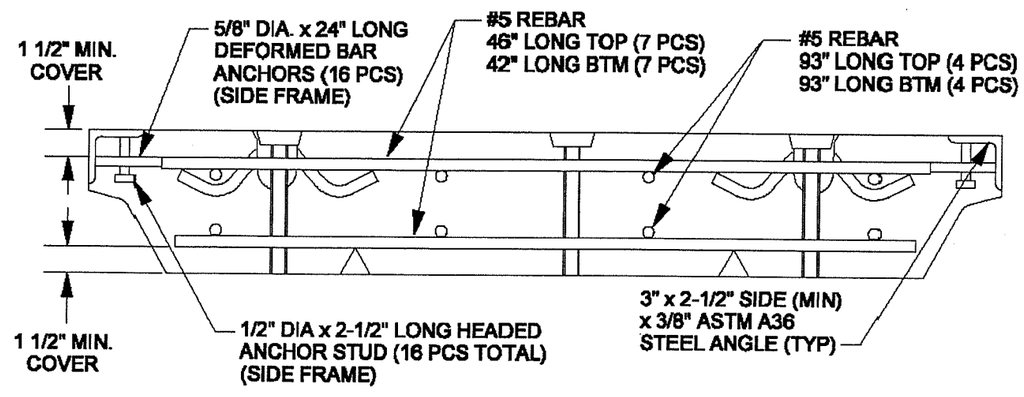
FIELD PANEL



GAGE PANEL

NOTES:
CONCRETE COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
@ 28DAYS = 6000 psi MINIMUM
@ SHIPMENT = 4000 psi MINIMUM
@ REMOVAL FROM FORMS = 2500 psi MINIMUM.

CROSSING TYPE - 10W



CROSS SECTION - GAGE PANEL

200102

COMMON STANDARDS

PRECAST CONCRETE PANELS FOR 10'-0" LONG WOOD TIES (10W)

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO: 200102

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CRP 310122
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DATE 07/31/05
DWG: RR2
SHEET 64 OF 72

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200901

MATERIAL SPECIFICATIONS:

1) STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36 SPECIFICATIONS. WELDING TO BE PER AWS CODE.

2) ALL EXPOSED STEEL TO RECEIVE ONE COAT PRIMER.

3) END ANGLES FOR GAGE PANEL SHOULD HAVE 3" GAP MINIMUM TO IMPROVE SHUNT RESISTANCE. REINFORCING MATERIAL AND CLADDING TO BE CONSTRUCTED TO MEET SHUNTING REQUIREMENT. A NON-CONDUCTIVE SPACER TO BE ATTACHED TO GAGE FRAME.

4) CLADDING ON ENDS OF PANELS SHOULD EXTEND BEYOND CONCRETE +1/8", -0" TO IMPROVE MATCH WITH ADJACENT PANELS.

5) REINFORCING STEEL SHALL CONFORM TO CURRENT ASTM A615 SPECIFICATION, GRADE 60. IF ANY WELDING OF REINFORCEMENT STEEL IS REQUIRED, MATERIAL SHALL CONFORM TO ASTM A706 SPECIFICATION, GRADE 60.

6) CONCRETE MATERIAL MIXING, PLACING AND CURING TO BE IN ACCORDANCE WITH PCI "MANUAL FOR QUALITY CONTROL: PRECAST AND PRESTRESSED CONCRETE." MANUAL 115, EDITION 4. CEMENT SHALL HAVE NO MORE THAN 0.6% TOTAL ALKALI CONTENT. MAXIMUM WATER/CEMENT RATIO=0.44 (BY WEIGHT). AIR ENTRAINMENT=6%+/- 1% IN PLASTIC CONCRETE. SLUMP 3" MAXIMUM.

7) COPIES OF THE CONCRETE DESIGN MIX TO BE SUBMITTED TO RAILROADS FOR APPROVAL PRIOR TO THE START OF THE CASTING OPERATION.

8) TOP SURFACE SHALL BE NON-CRACK DESIGN AND IS TO BE SEALED TO PREVENT ION MIGRATION DUE TO SALTING.

9) CURING SHALL FOLLOW THE RECOMMENDATIONS AND PROCEDURES OF PCI IN 4TH EDITION DIVISION 4.

10) 3/16" WEEP/INSPECTION HOLES SHALL BE PLACED EVERY 2-FT. MIN. ALONG THE TOP OF THE STEEL FRAME ALONG A LINE 3/4" FROM OUTSIDE EDGE.

11) FLANGEWAY FILLER TO BE PERMANENTLY PREATTACHED AND HAVE THE FOLLOWING PROPERTIES:

- * TENSILE STRENGTH (ASTM D412) 850PSI MIN.
- * ULTIMATE ELONGATION (ASTM D412) 400% MIN.
- * TEAR STRENGTH (ASTM D624) AT 25 DEGREES CELSIUS, 150-PLI MIN.
- * HARDNESS (ASTM D2240) 75+/-5% SHORE A.
- * COMPRESSION SET (ASTM 395 METHOD B) 100 DEGREES CELSIUS FOR 70 HOURS 45% MAX.
- * ACCELERATED AGING TEST (ASTM D573) 70 HOURS AT 100 DEGREES CELSIUS MUST NOT EXHIBIT A REDUCTION IN PROPERTIES BY GREATER THAN 20%.
- * OZONE RESISTANCE TEST (ASTM D518) MUST HAVE NO CRACKING AFTER EXPOSURE TO 50-PPHM OZONE FOR 96 HOURS AT 40 DEGREES CELSIUS.
- * VOLUME RESISTIVITY = $1X10^{12}$ (OHM-CM) OR GREATER (ASTM D257), BUT USING 18% NACL/WATER SOLUTION IN PLACE OF DISTILLED WATER FOR 168 HOURS AT 25 DEGREES CELSIUS AND TESTED AT 500 VDC.
- * ELECTRICAL RESISTANCE: MINIMUM RESISTANCE 10 MEGA OMS MEASURED AT 500 VDC.
- * LOW TEMPERATURE BRITTLENESS (ASTM D2137) AT -40 DEGREES CELSIUS.
- * A SAMPLE SECTION OF THE FLANGEWAY MATERIAL SHALL BE PHYSICALLY TESTED BY APPLYING A LATERAL FORCE OF 10 LB/IN AT 50 DEGREES CELSIUS. THE MAXIMUM LATERAL DISPLACEMENT OF THE TEST IS NOT TO EXCEED 1/4" (CROSSING TYPE 10C ONLY). TEST RESULTS MUST BE SUBMITTED FOR RAILROAD APPROVAL.
- * MANUFACTURER TO DESIGN THE PREATTACHED FLANGEWAY FILLER TO ALLOW FOR REMOVAL OF PANELS FOR MAINTENANCE WITHOUT DAMAGING THE FLANGEWAY FILLER OR ANY OTHER COMPONENTS DESIGNED TO HOLD IT TOGETHER..

TOLERANCES:

1) OUT OF SQUARE 3/16" (MEASURED ALONG THE DIAGONAL)

2) LENGTH, WIDTH, AND THICKNESS: +/-1/8"

3) THE BOTTOM SURFACE, WHICH WILL BE IN CONTACT WITH THE TIES, SHALL NOT UNDULATE IN ANY DIRECTION MORE THAN 3/32". SEE SPECIAL TESTING NOTE 3 BELOW.

4) REINFORCEMENT PLACEMENT SHALL BE +/-3/4" HORIZONTAL, +/-1/8" VERTICAL

FINISH:

1) ALL RECESSES AND MINOR CONCRETE SPALLS ARE TO BE FILLED AND FINISHED TO THE PANEL DIMENTIONS USING THE PROPER BONDING AGENT AND REPAIR MATERIAL SURFACE OF THE REPAIRED AREA IS TO MATCH THE COLOR AND TEXTURE OF THE SURROUNDING AREAS.

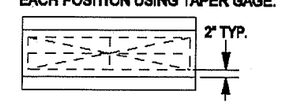
2) THE DRIVING SURFACE IS TO HAVE A LIGHT BROOM FINISH OR AS APPROVED BY RAILROADS. THE ADDITION OF WATER TO THE CONCRETE SURFACE FINISH DURING CASTING IS NOT PERMITTED.

SPECIAL TESTING:

1) TWICE ANNUALY, VENDORS SHALL SUBMIT (VIA AN INDEPENDENT TESTING LABORATORY TO THE RAILROADS) THE FOLLOWING TEST ON THE APPROVED MIXED DESIGN
   - * ASTM C666 FREEZE/THAW
   - * ASTM C227 MORTAR BAR METHOD
   - * ASTM C1260 AT TOTAL ALKALI BURDEN = 0.06%

2) GAGE PANELS SHALL BE DESIGNED WITH SHUNT RESISTANT FEATURES IN ORDER TO PROVIDE A MINIMUM ELECTRICAL RESISTANCE IN ACCORDANCE WITH THE STANDARD ELECTRICAL TEST (DWG 500930).

3) A REPRESENTATIVE SAMPLE OF PANELS SHALL BE CHECKED PERIODICALLY FOR BOTTOM FLATNESS BY USING A STRAIGHT EDGE CALIBRATED TO WITHIN +/-1/32" AND A TAPER GAGE AS FOLLOWS:
   8 POSITIONS OF FLATBAR (—) CHECK FLATNESS AT EACH POSITION USING TAPER GAGE.



GENERAL:

1) THE MANUFACTURER SHALL BE ISO 9000 OR AAR M-1003 CERTIFIED. ALL TESTING PERSONNEL SHALL BE A MINIMUM OF ACI LEVEL I CERTIFIED.

2) THE FABRICATOR SHALL BE RESPONSIBLE FOR LOADING AND PROPERLY SECURING ALL PRECASTCONCRETE MEMBERS FOR SHIPMENT.

3) THE MANUFACTURER SHALL WARRANTY PRODUCT FOR A MINIMUM OF TEN YEARS AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP.

4) MAUNFACTURER TO PERMANENTLY MARK EACH PANEL WITH A CONCRETE IMPRINT FOR SIZE OF RAIL, WEIGHT OF PANEL, MANUFACTURER'S I.D., MONTH/DAY/YEAR OF MANUFACTURE, AND CROSSING TYPE. END OF EACH PANEL TO BE STENCILED PAINTED WITH SIZE OF RAIL, WEIGHT OF PANEL AND CROSSING TYPE.

COMMON STANDARDS

GENERAL SPECIFICATIONS FOR ROAD CROSSINGS WITH CONCRETE PANELS

FILE OWNER: UPRR	DATE: APRIL 24, 2001
REV. NO.: 0	DWG NO:200901

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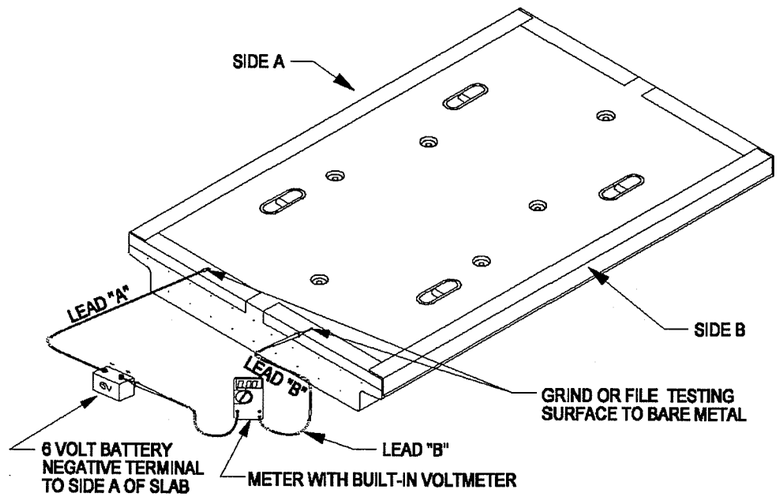
200903



STANDARD ELECTRICAL TEST

ELECTRICAL TEST STEPS:

1. BATTERY SHALL BE 5.0 (FIVE) AMPS OR GREATER.
2. SLABS ARE READY FOR TESTING WHEN 72 HOURS HAVE ELAPSED FROM CASTINGOF CONCRETE.
3. MUST BE LESS THAN 2.0 (TWO) AMPS TO PASS THE TEST. RE-TEST AFTER TWO (2) DAYS IF GREATER THAN 2.0 (TWO) AMPS. REJECT IF AMPERAGE REMAINS ABOVE 2.0 (TWO) AMPS.
4. 0.3-0.4 AMPS IS A NORMAL READING. 2.0 (TWO) AMPS OR LESS PASS THE TEST.

COMMON STANDARDS

SHUNT RESISTANCE TEST FOR CONCRETE PANELS

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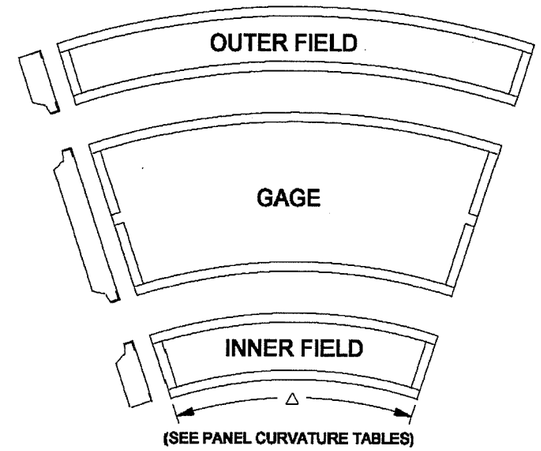
REV. NO.: 0	DWG NO:200903

200902



CURVATURE TABLE (ON CONCRETE TIES)

DEGREE OF CURVE	RADIUS IN FEET	Δ	CURVE PANEL?
2° OR LESS	2865'	0.20°	NO
3°	1910'	0.30°	YES
4°	1433'	0.40°	YES
5°	1146'	0.50°	YES
6°	955'	0.60°	YES
7°	819'	0.70°	YES
8°	717'	0.80°	YES
9°	637'	0.90°	YES
10°	574'	1.00°	YES
11°	522'	1.10°	YES
12°	478'	1.20°	YES
13°	442'	1.30°	YES
14°	410'	1.40°	YES

CURVATURE TABLE (ON WOOD TIES)

DEGREE OF CURVE	RADIUS IN FEET	Δ	CURVE PANEL?
3° OR LESS	1910'	0.24°	NO
4°	1433'	0.32°	YES
5°	1146'	0.40°	YES
6°	955'	0.48°	YES
7°	819'	0.56°	YES
8°	717'	0.66°	YES
9°	637'	0.74°	YES
10°	574'	0.82°	YES
11°	522'	0.90°	YES
12°	478'	0.98°	YES
13°	442'	1.06°	YES
14°	410'	1.14°	YES

NOTES:
A CURVED PANEL IS A PANEL THAT IS PIE SHAPED WITH A LONGER OUTER LENGTH THAN THE INNER LENGTH WITH TRUE RADIUSED OUTER AND INNER STEEL.

CURVED PANELS USE STANDARD REINFORCEMENT SIMILAR TO TANGENT PANEL STANDARD REINFORCEMENT.

LAG HOLES ON 10W AND 9W CROSSINGS MUST LINE UP WITH THE CENTERLINE OF TIES.

XING TYPE (RAIL WT.)	BNSF ITEM NO.	UPRR ITEM NO.
10W (115)	055590002	NON-STOCK
0W (133-141)	055590001	NON-STOCK
9W	NON-STOCK	NON-STOCK
10C	NON-STOCK	NON-STOCK
85C	NON-STOCK	NON-STOCK

COMMON STANDARDS

CURVED CONCRETE PANELS

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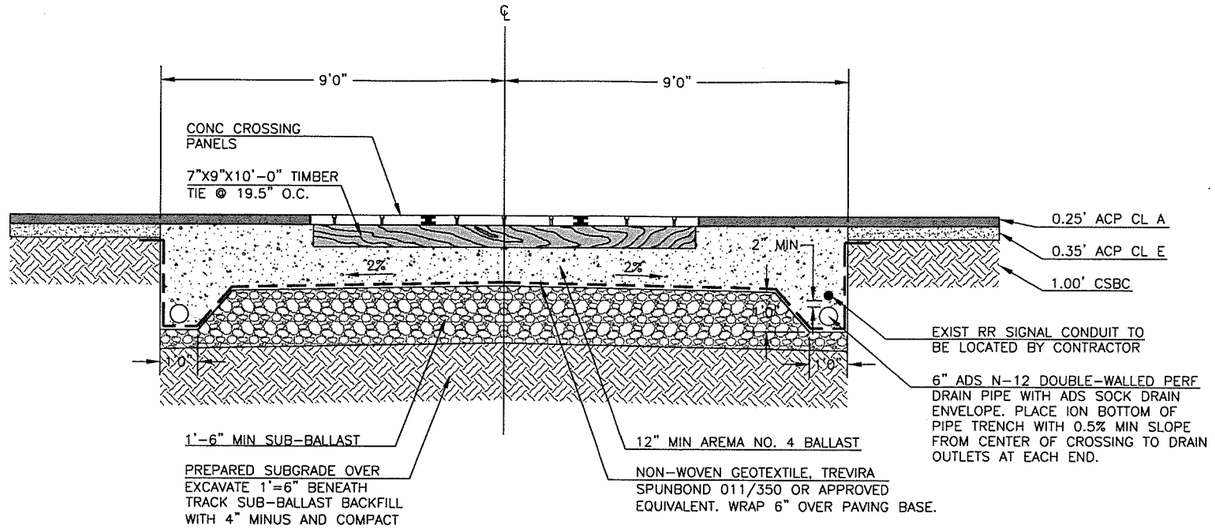
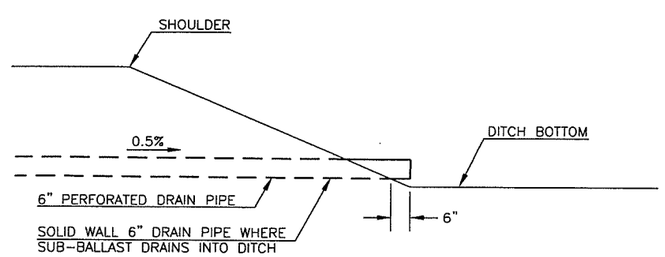


CROSSING DRAINAGE DETAIL

TYPICAL SECTION



CROSSING DRAINAGE DETAIL

TYPICAL OUTFALL

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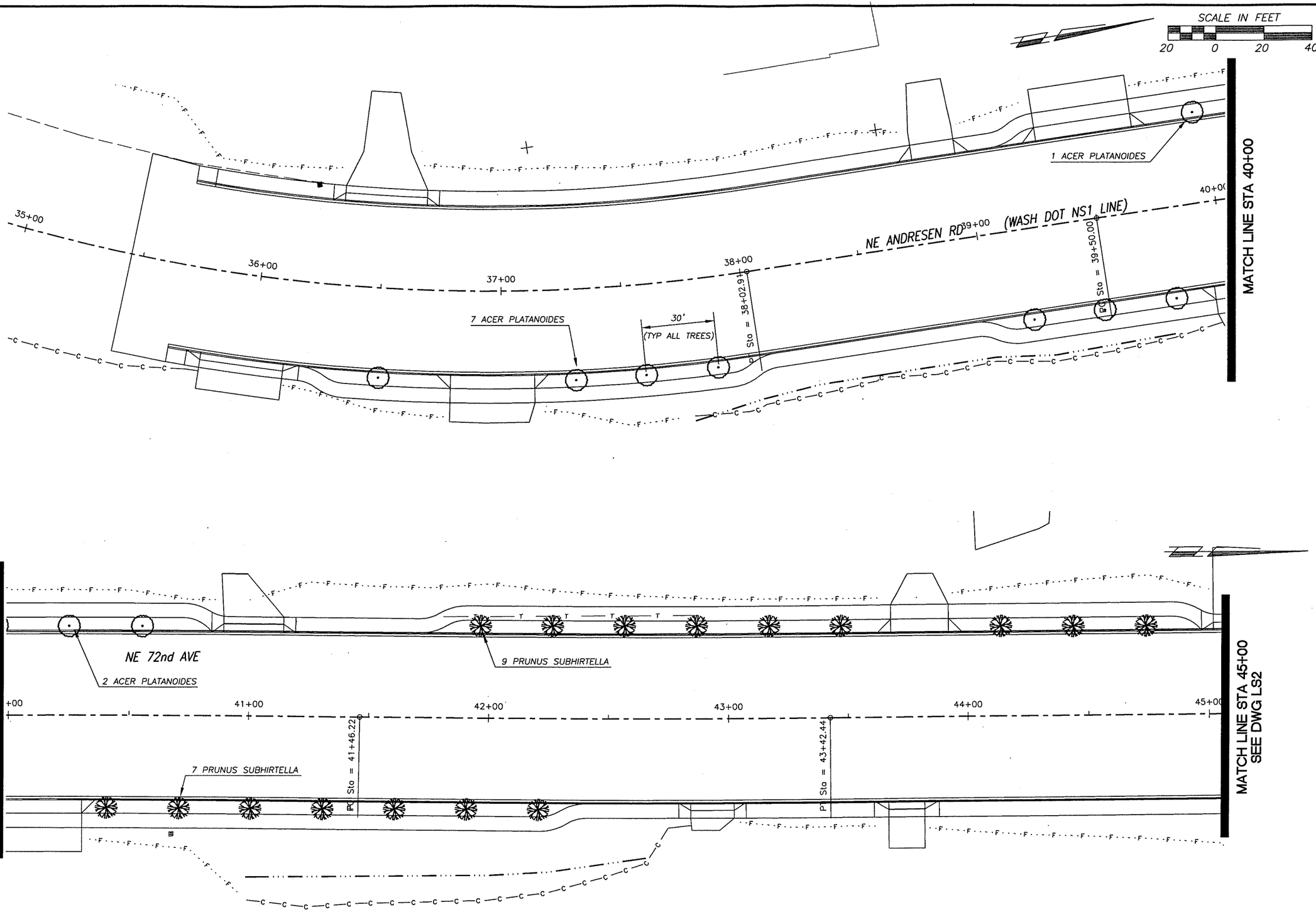

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MICHAEL L. EMICK
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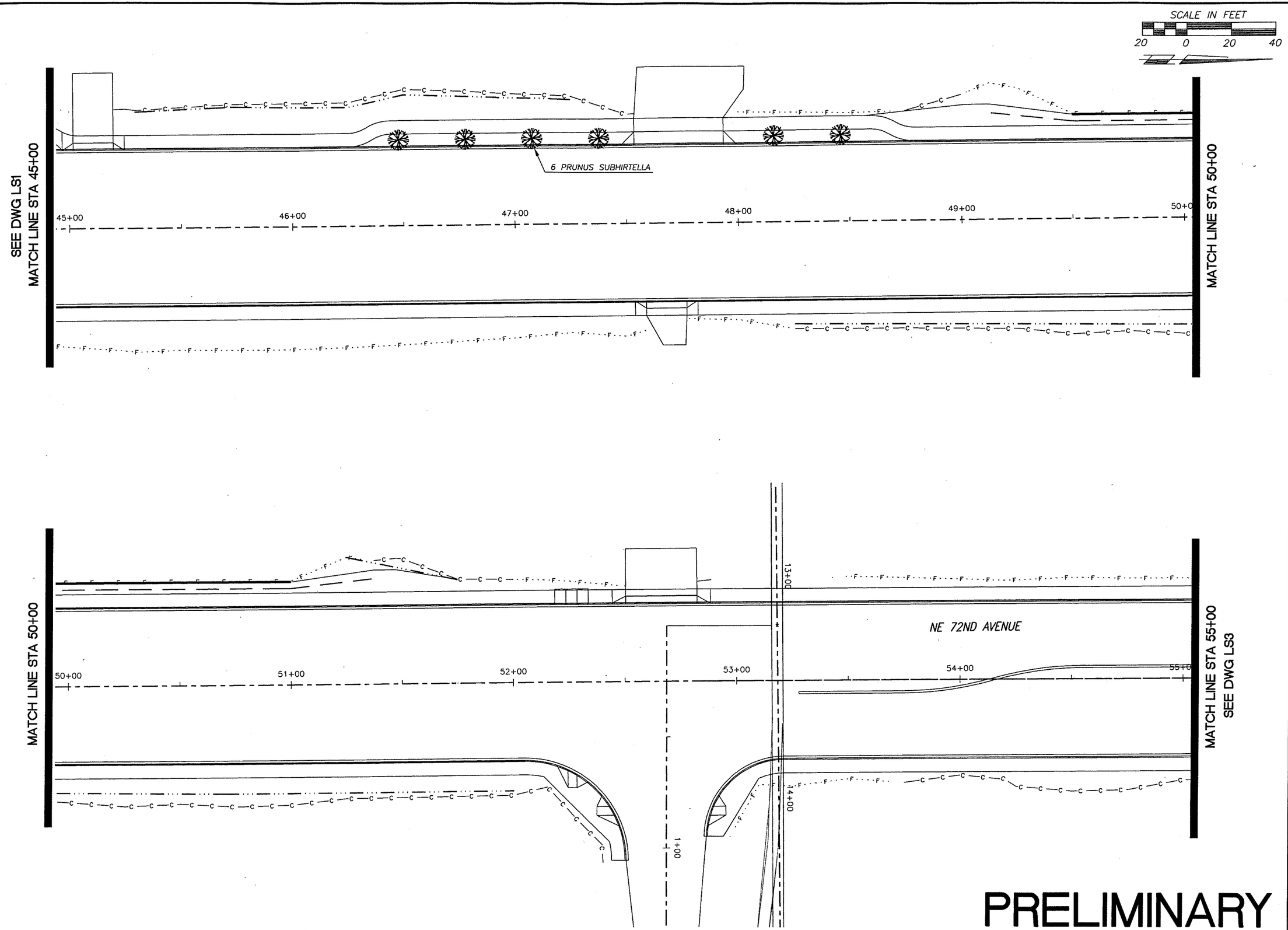

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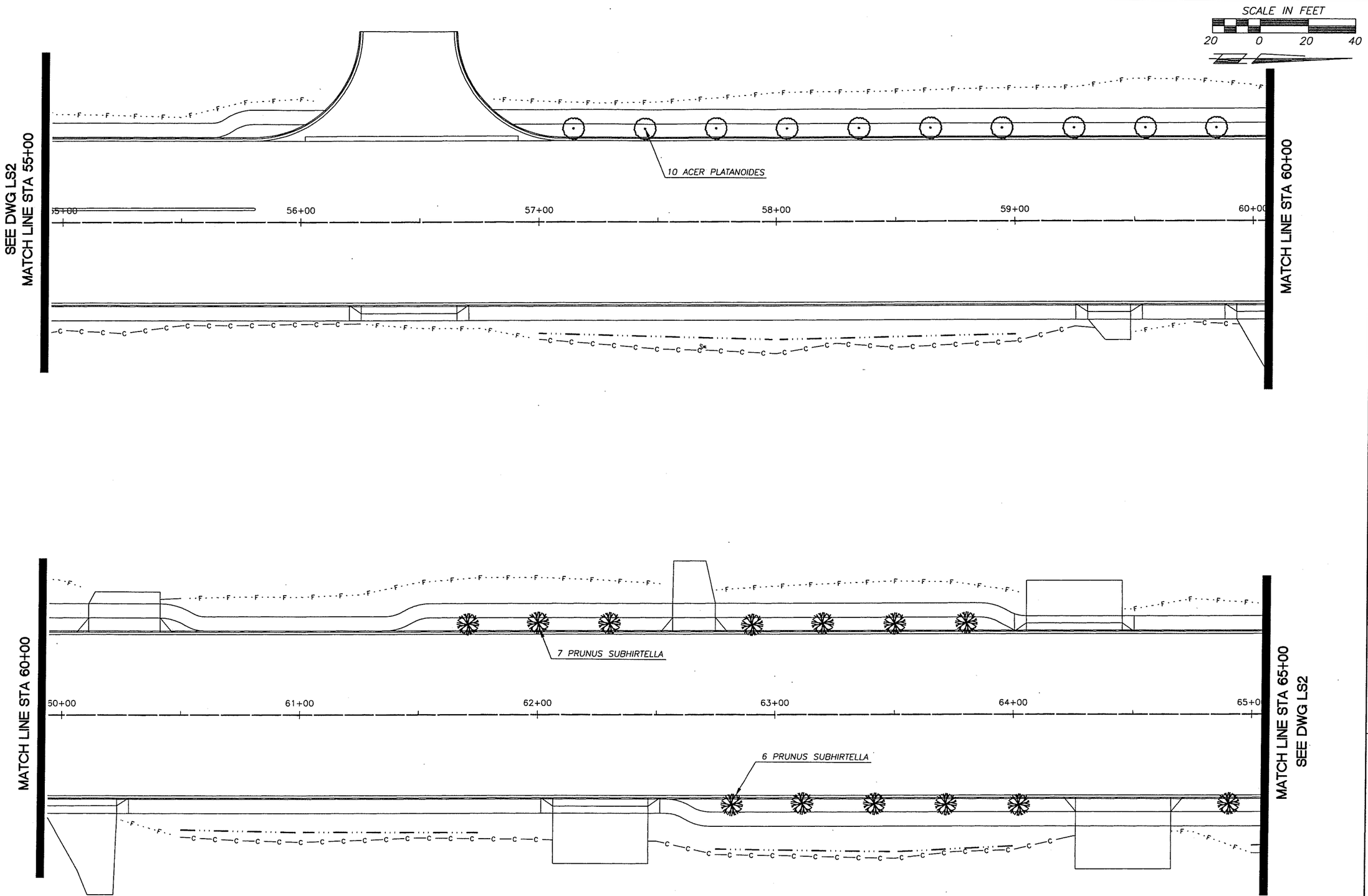

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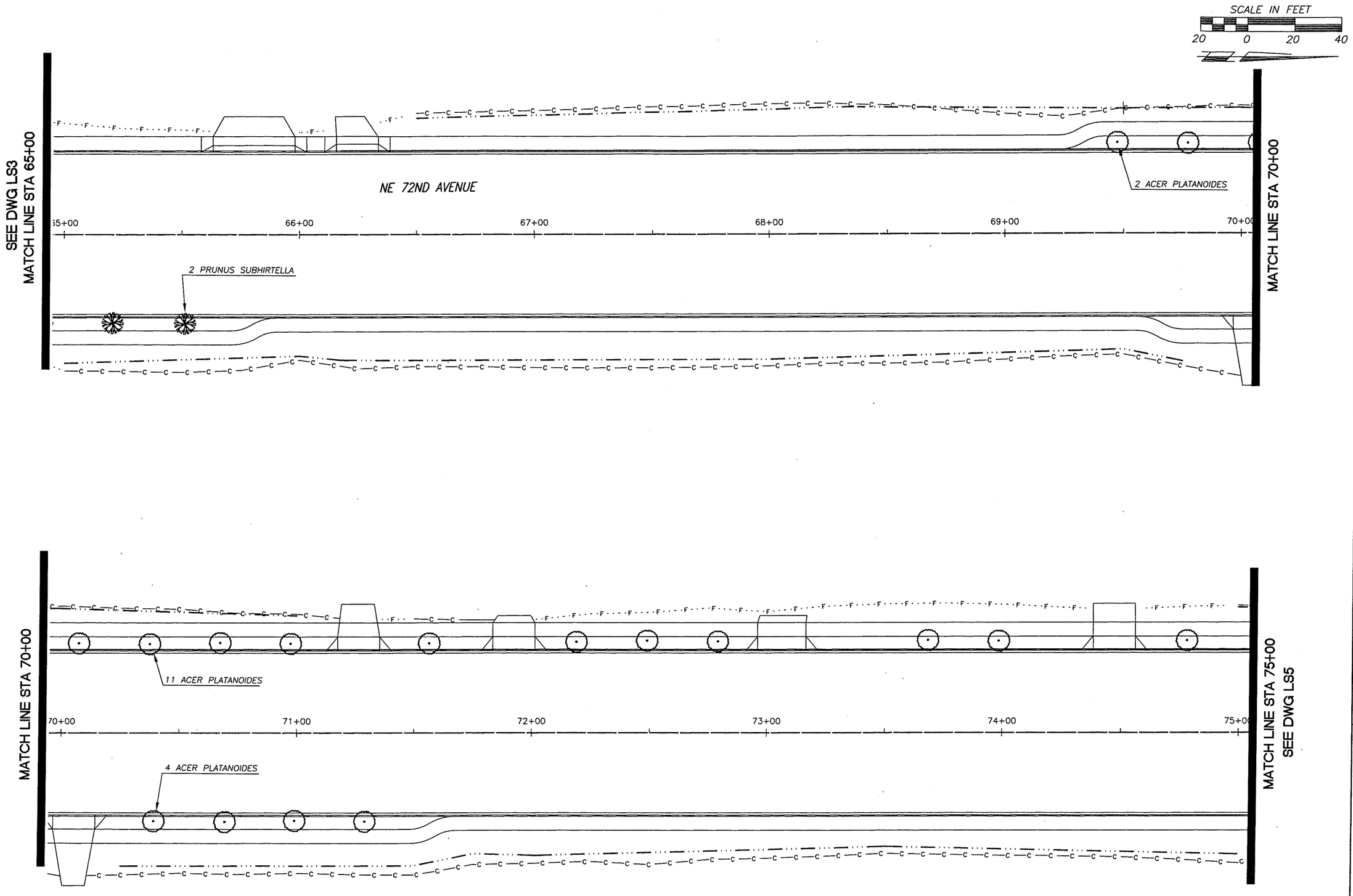

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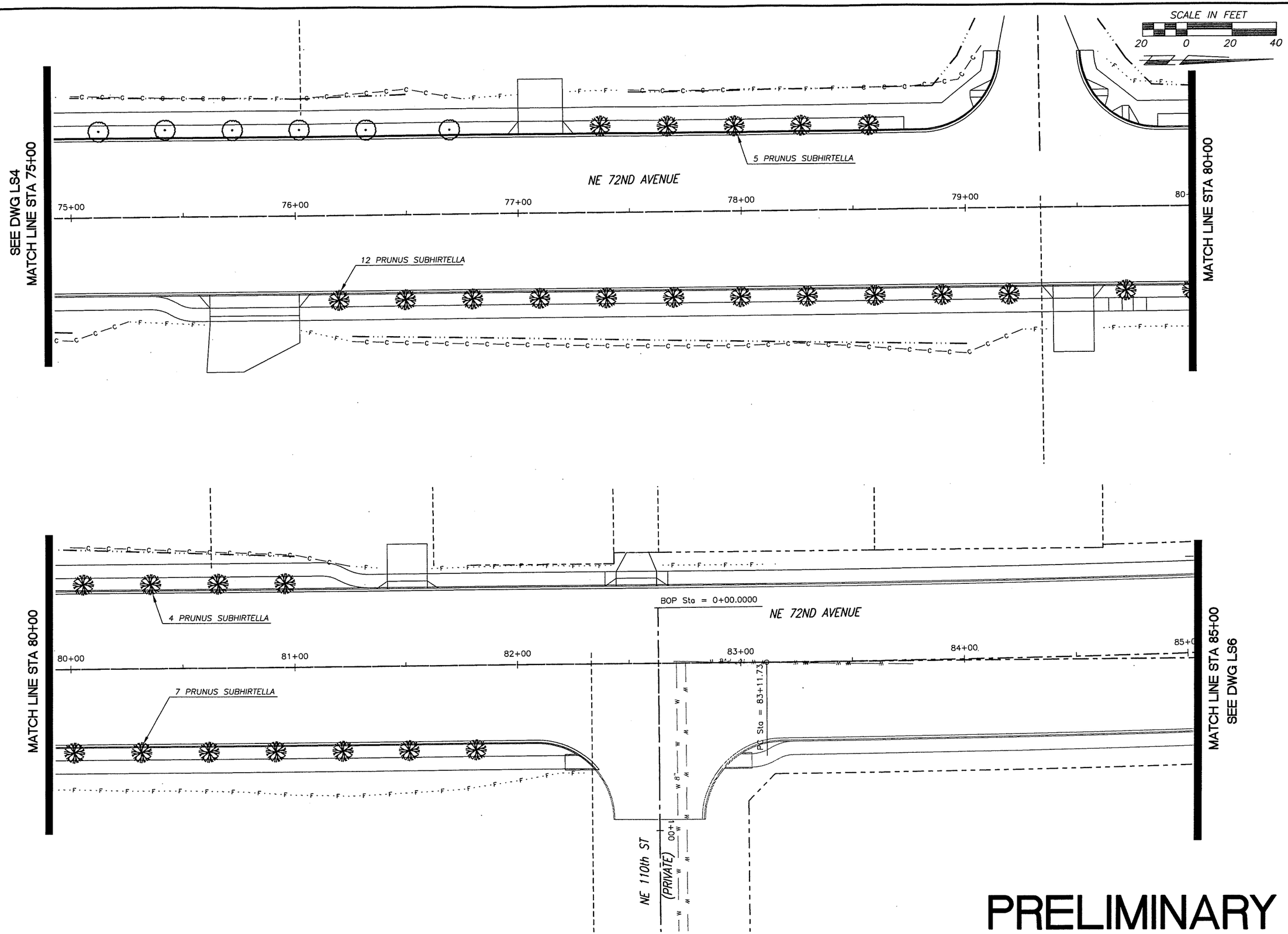

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