

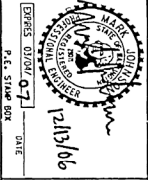
CULVERT PLAN
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SCALE IN FEET

FILE NAME: 405001C-019
 TIME: 6:05:44 PM
 DATE: 12/6/2006
 DESIGNED BY: M. JOHNSON
 CHECKED BY: K. BUNGER
 BROU. ENGR.: S. DESBRADL
 REGIONAL ADM.: M. BRITTON
 REGIONAL ADM.: R. HAIN

REGIONAL STATE
 NO. 10
 WASH
 JOB NUMBER
 OGC515
 CONTRACT NO.

FED-AID PROJ. NO.
 LOCATION NO.

DATE: 12/13/06
 P.E. STATE BOX



DATE: P.E. STATE BOX

Washington State
 Department of Transportation

SPRING VALLEY RESTORATION
 AND SOUTH 373RD STREET
 BRIDGE REPLACEMENT
 CULVERT LAYOUT AND GENERAL NOTES

S1
 SHEET
 OF
 58
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NOTES

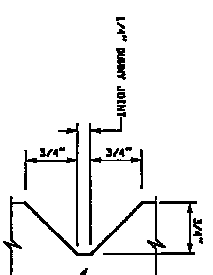
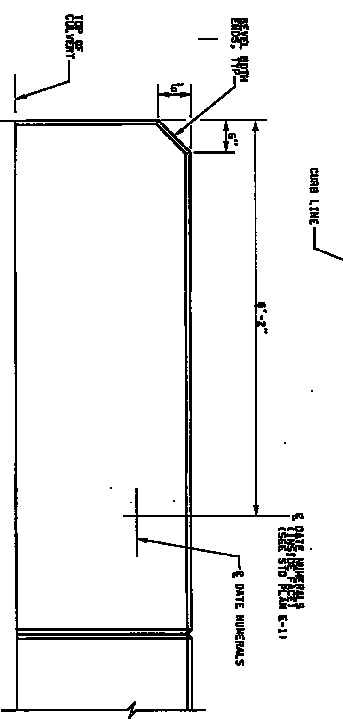
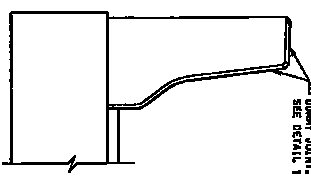
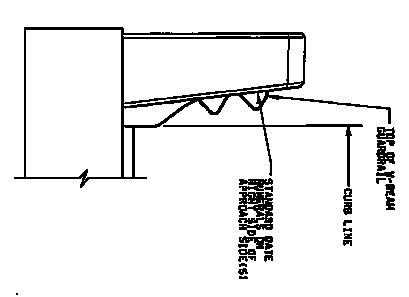
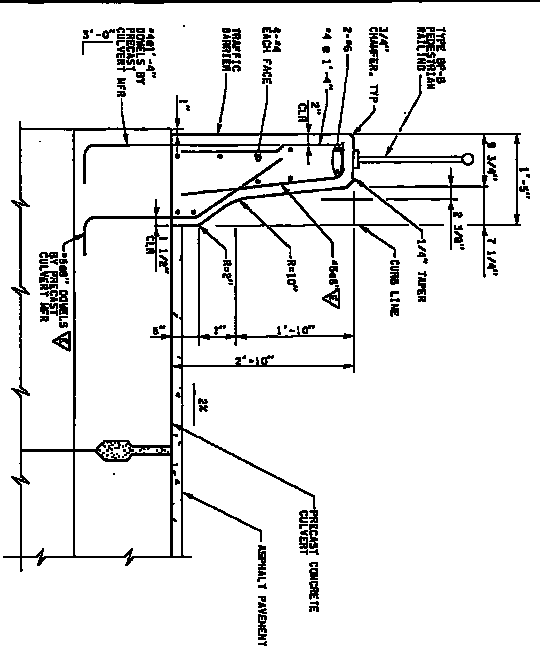
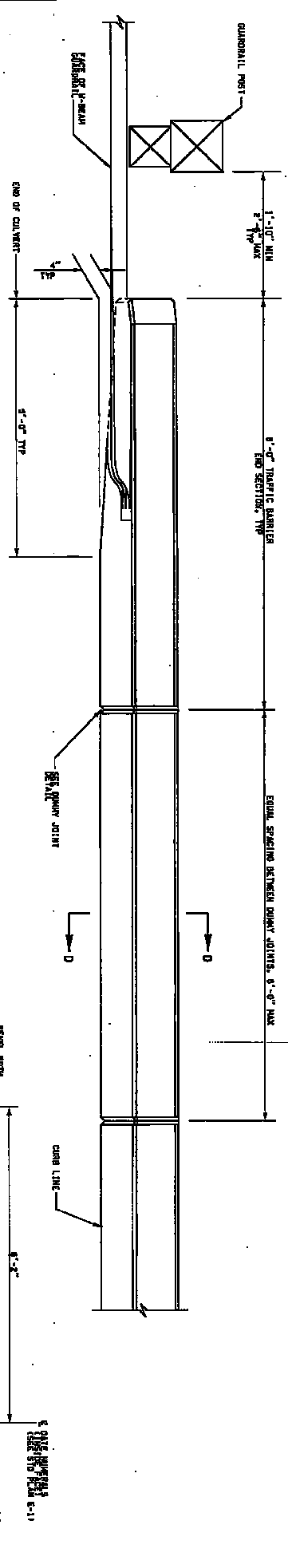
- ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION DATED 2006 (LATEST EDITION) AND AMENDMENTS, AS SUPPLEMENTED BY THE PLANS AND SPECIAL PROVISIONS FOR PRECAST REINFORCED CONCRETE STRUCTURES.
- PRECAST CONCRETE THREE-SIDED CULVERT SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF WSDOT STANDARD SPECIFICATIONS FOR BRIDGES AND STRUCTURES, SECTIONS 5 AND 16. PILES, PILECAP, AND MINOWALLS HAVE BEEN DESIGNED BY THE ENGINEER.
- SUBMIT DESIGN CALCULATIONS AND SHOP DRAWINGS FOR PRECAST CULVERT IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
- PRECAST CULVERT SHALL HAVE 35" WIDE OPENING WITH 6" CLEAR HEIGHT. DECK THICKNESS SHALL NOT EXCEED 18".
- PRECAST CULVERT DESIGN LOADS:
 - DEAD LOAD OF EARTH AND ROADWAY: 120 PCF
 - VEHICLE LIVE LOAD: HS-20 WITH IMPACT FACTOR OF 1.3
 - LATERAL EARTH PRESSURE DUE TO LOCK BACKFILL: 10 PCF
 - LATERAL EARTH PRESSURE AT MINOWALLS (INCLUDING SURCHARGE): 300 PSF
 - SEISMIC LOAD: LATERAL UNIFORM PRESSURE OF 300 PSF
 - IMPACT LOAD ON TRAFFIC BARRIER: 10 KIPS (OVER 5' LENGTH OF BARRIER)
- DESIGN LOAD CASES:
 - USE LOADS IN WHICHEVER COMBINATION PRODUCES THE MAXIMUM STRESS IN THE ELEMENT BEING DESIGNED, USING LOAD AND REDUCTION FACTORS AS PRESCRIBED IN ASHTO.
 - STATIC DEAD LOAD, VEHICLE LIVE LOAD, AND LATERAL EARTH PRESSURE
 - SEISMIC DEAD LOAD, LATERAL EARTH PRESSURE, AND SEISMIC LOAD
 - IMPACT: IMPACT LOAD (FOR END CULVERT UNITS WITH TRAFFIC BARRIER)
- ADDITIONAL DESIGN REQUIREMENTS FOR PRECAST CULVERT:
 - DESIGN END CULVERT UNITS FOR LOADING DUE TO CANTILEVERED MINOWALLS
 - DESIGN END CULVERT UNITS FOR LOADING DUE TO IMPACT LOAD ON TRAFFIC BARRIER
- PRECAST, PRESTRESSED CONCRETE PILES SHALL BE IN ACCORDANCE WITH STANDARD PLAN E-4 AND E-4a AND SHALL MEET THE FOLLOWING REQUIREMENTS:
 - SIZE: 20" OCTAGONAL
 - ULTIMATE BEARING CAPACITY = 580 KIPS
 - NUMBER OF 0.8" DIAMETER PRESTRESSING STRANDS: 16
 - CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS: 7 KSI
 - PROVIDE PILE TO PILE-CAP CONNECTION IN ACCORDANCE WITH STANDARD PLAN E-4a
- CONCRETE CLASSES SHALL BE AS FOLLOWS:
 - PRECAST CULVERT, CAST-IN-PLACE MINOWALLS AND FOOTINGS: CLASS 4000 ($f'c = 4000$ PSI)
 - INCLUDE AIR ENTRAINMENT AND WATER REDUCING ADJUTIVES IN ALL CONCRETE. $SA_{min} = 0.015$ ($CO = 3$)
 - PRECAST, PRESTRESSED PILING: CLASS 7000 ($f'c = 7000$ PSI)
- ALL EXPOSED EDGES AND CORNERS OF CONCRETE SHALL BE CHAMFERED "X" UNLESS SHOWN OTHERWISE.
- REINFORCING STEEL NOTES:
 - SUBMIT REINFORCING STEEL SHOP DRAWINGS (PLACING DIMENSIONS AND BONDING LIST) FOR REVIEW BY THE ENGINEER. SHOP DRAWINGS SHALL BE PREPARED IN ACCORDANCE WITH THE CAST MANUAL OF STANDARD PRACTICE AND THE ACI DETAILING MANUAL.
 - REINFORCING STEEL SHALL CONFORM TO ASTM A615 (ASHTO M31), GRADE 60. EPOXY-COATED REINFORCEMENT IS INDICATED ON THE PLANS BY THE SYMBOL ∇ .
 - ALL BARS, UNLESS OTHERWISE SHOWN, SHALL BE 90 DEGREE STANDARD HOOKS AS DEFINED IN THE LATEST EDITION OF ACI 318.
 - REINFORCEMENT SHALL BE LAP SPLICED AT LOCATIONS INDICATED IN THE PLANS OR AT LOCATIONS APPROVED BY THE ENGINEER. THE METHOD OF THE REINFORCING STEEL SHOP DRAWINGS. MINIMUM LAP SPlice LENGTHS SHALL BE AS FOLLOWS:

$f'c = 4,000$ PSI

BAR SIZE	LAP SPlice LENGTH
4	2'-8"
5	3'-1"
6	3'-8"
7	4'-2"
8	6'-0"
9	7'-1"

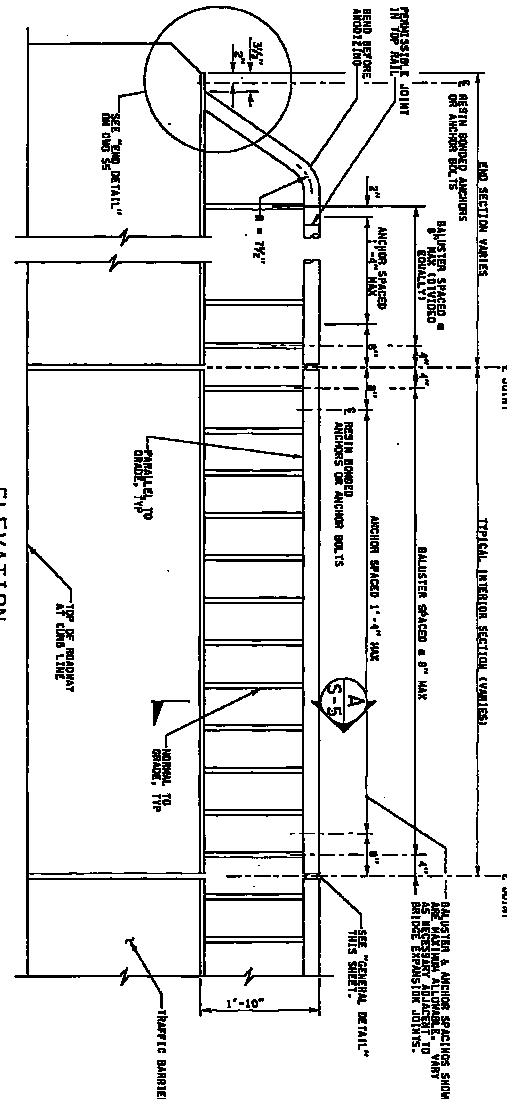
FOR "AS CONSTRUCTED"
 PLAN ONLY

12. FOR LOCATIONS OF BORINGS, SEE DWG PVI. FOR BORINGS LOGS, SEE APPENDIX A.

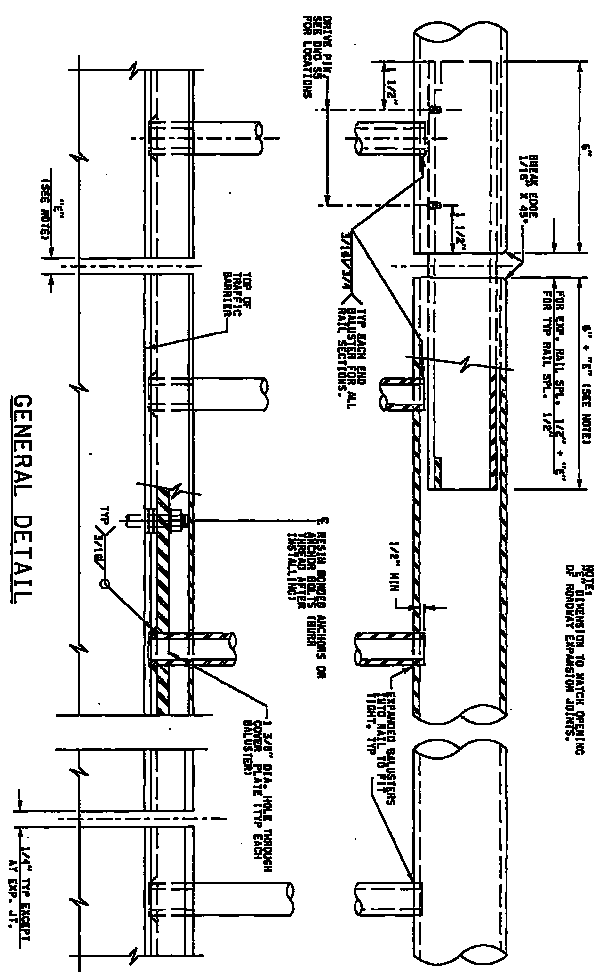


FOR 'AS CONSTRUCTED' PLANS ONLY

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DATE	12/02/2005	DESIGNED BY	N. JOHNSON	CHECKED BY	N. JOHNSON
ESTIMATED BY	N. JOHNSON	PROD. ENGR.	M. BRITTON	REGIONAL ADM.	R. HAIN
REVISION		DATE		BY	
QUANTITY	10 WASH.	FED. AID PROJ. NO.			
CONTRACT NO.	060516	LOCATION NO.			
DATE	12/02/05	DATE			
Washington State Department of Transportation		Washington State Department of Transportation		Washington State Department of Transportation	
SPRING VALLEY RESTORATION AND SOUTH 3780D STREET BRIDGE REPLACEMENT			TRAFFIC BARRIER DETAILS		
Sheet	17	of	58		



ELEVATION
BALUSTERS AND HANDRAIL SECTION
ATTACHMENT DETAILS NOT SHOWN.



- NOTES**
1. SHOP DRAWINGS OF RAILING SHALL BE SUBMITTED FOR APPROVAL SHOWING COMPLETE DIMENSIONS AND DETAILS OF FABRICATION AND METHOD OF AIR BRIDGES.
 2. PIPE RAILING, PIPE RAILING SPICES, COVER PLATES AND GORTON EXPANDED CHANNELS TO BE WELDED TO RAILING CHANNELS OR BOLTED.
 3. CUTTING SHALL BE 1/2\"/>
 - 4. WELDING OF ALUMINUM SHALL CONFORM TO STD SPEC. SECTION 5-23.14.13.1.
 - 5. ALL ALUMINUM PARTS SHALL BE OVER A SEVEN ANGLE FINISH.
 - 6. ALL STEEL PARTS SHALL BE OVER A SEVEN ANGLE FINISH.
 - 7. PIPE RAILING, PIPE BALUSTERS AND PIPE WELDING SPICES SHALL BE ASSEMBLED TO CONFORM TO THE SHOP DRAWINGS.

**FOR "AS CONSTRUCTED
PLANS" ONLY**

FILE NAME	40940000.dwg	DATE	12/6/2006	DESIGNED BY	M. JOHNSON	CHECKED BY	S. HUNTER	PROJECT NO.	10 WASH	DATE	12/6/06	SCALE	AS SHOWN
TIME	8:07:05 PM	DATE	12/6/2006	ENTERED BY	K. BLUNGER	CHECKED BY	S. HUNTER	PROJECT NO.	06C515	DATE	12/6/06	SCALE	AS SHOWN
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CHECKED BY	S. HUNTER	DATE	12/6/2006	PROJECT NO.	06C515	DATE	12/6/06	SCALE	AS SHOWN				
PROJECT NO.	06C515	DATE	12/6/2006	SCALE	AS SHOWN								
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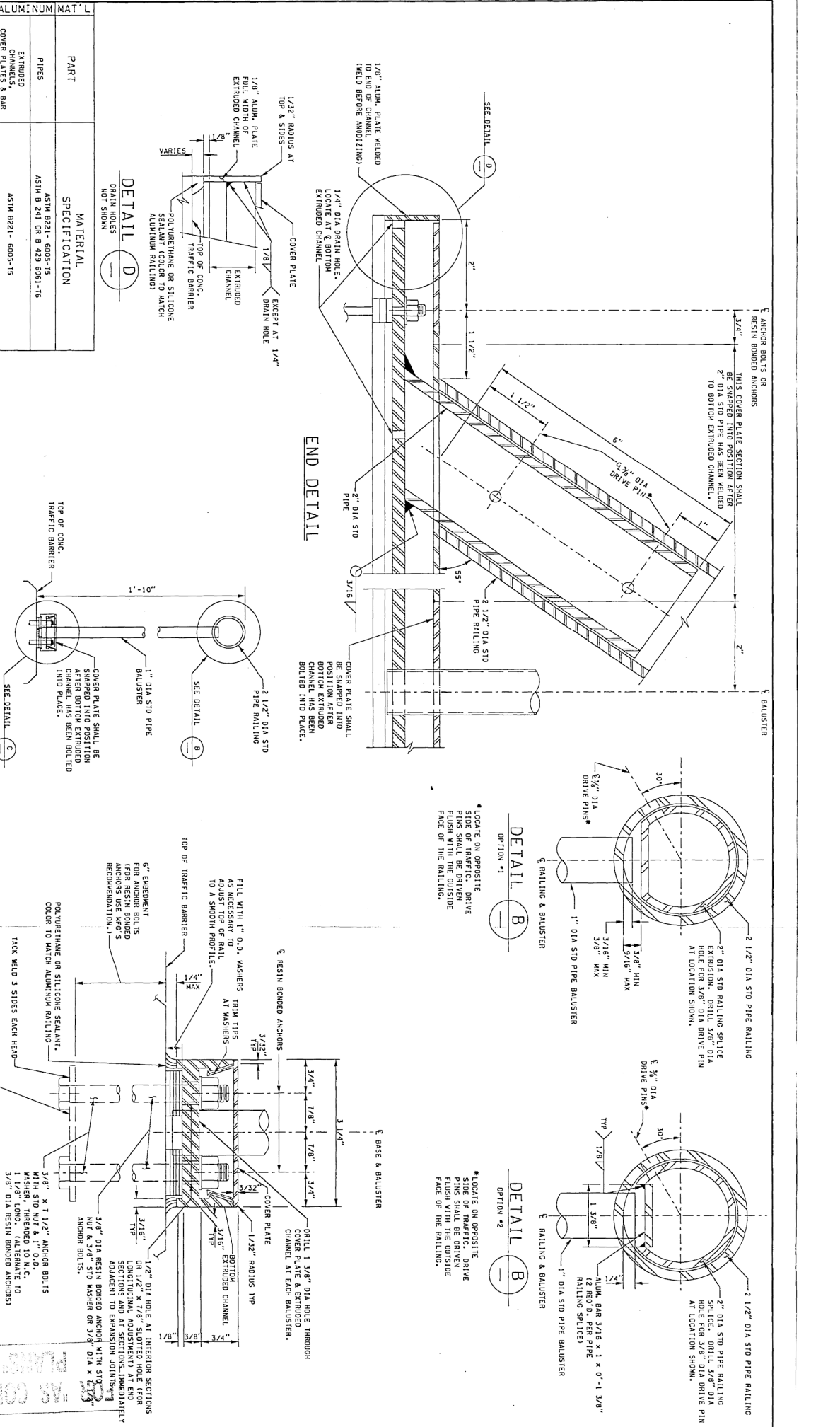
Washington State
Department of Transportation

SPRING VALLEY RESTORATION
AND SOUTH 373RD STREET
BRIDGE REPLACEMENT

BRIDGE RAILING DETAILS

S4
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DESIGNED BY	M. JOHNSON	CHECKED BY	S. DESPABEL	PROJ. ENGR.	M. BRITTON	REGIONAL ADM.	R. HALT	WASHINGTON STATE Department of Transportation	SPRING VALLEY RESTORATION AND SOUTH 373RD STREET BRIDGE RAILING DETAILS	NO COMP. MARKS ONLY	SHEET	19	OF	50	TOTAL	SHEETS			



NO COMP. MARKS ONLY