

BOULDER COUNTY TRANSPORTATION DEPARTMENT

ENGINEERING DIVISION

90% PLANS OF PROPOSED LOGAN MILL ROAD BRIDGE CONSTRUCTION FOURMILE CANYON DRIVE/LOGAN MILL ROAD INTERSECTION BOULDER COUNTY

BOULDER COUNTY PROJECT NO. 4012.SEPT12C39
BOULDER COUNTY TRANSPORTATION PROJECT NO. BR-1185-000

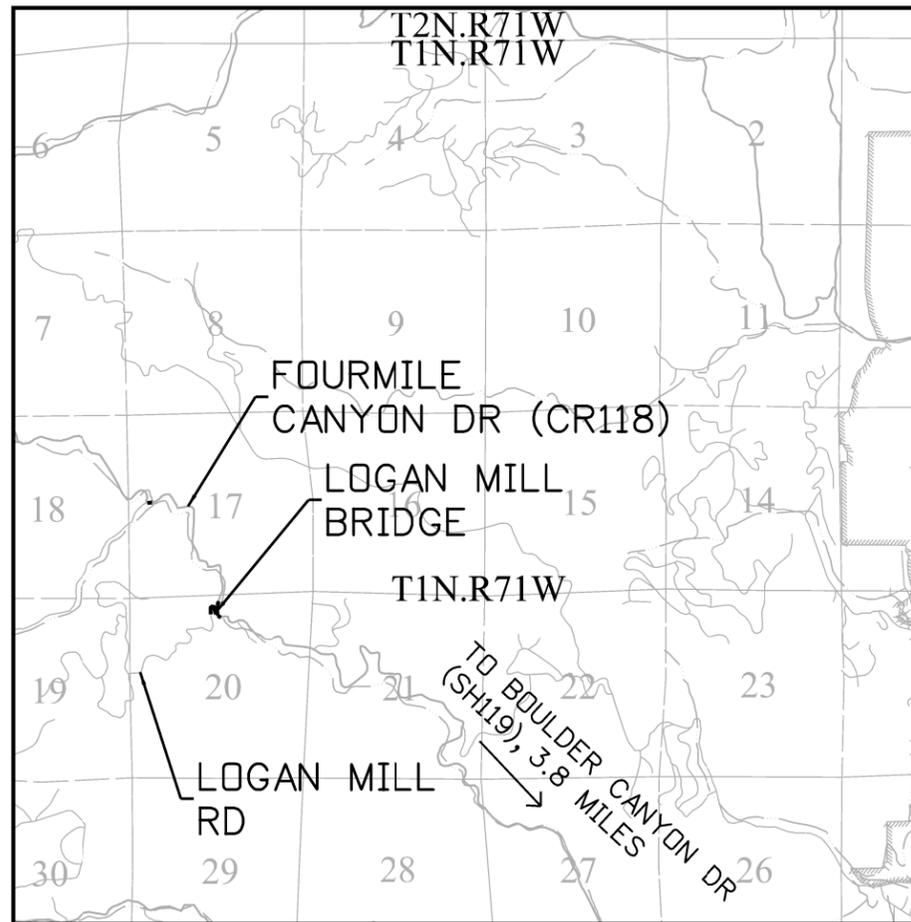
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TABULATION OF LENGTH & DESIGN DATA

STATION	FEET	
	ROADWAY	STRUCTURE
BEGIN FOURMILE CANYON DR STA 101+05.12 (HCL FOURMILE CANYON DR) END FOURMILE CANYON DR STA 105+02.03 (HCL FOURMILE CANYON DR)	396.91	
BEGIN LOGAN MILL RD STA 200+48.81 (HCL LOGAN MILL RD) END LOGAN MILL RD STA 202+32.68 (HCL LOGAN MILL RD)	183.87	62.57
TOTAL	580.78	62.57
SUMMARY OF PROJECT LENGTH	FEET	MILES
ROADWAY (NET LENGTH)	580.78	0.11
MAJOR STRUCTURE (NET LENGTH)	62.57	0.01
PROJECT GROSS LENGTH	643.35	0.12

DESIGN DATA	FOURMILE	LOGAN MILL
ROADWAY CLASSIFICATION	COLLECTOR	LOCAL/COLLECTOR
EXISTING SURFACE TYPE	PAVED	UNPAVED
MINIMUM RADIUS OF CURVE	190'	50'
MAXIMUM GRADE	6.97%	13.52% TIE INTO EX
MINIMUM S.S.D. HORIZONTAL	129'	115'
MINIMUM S.S.D. VERTICAL	200'	80'
MAXIMUM DESIGN SPEED	25 MPH	10 MPH
CLEAR ZONE DISTANCE	1' TO 6'	1' to 12'
MAXIMUM SUPERELEVATION	4%	3%



PROJECT LOCATION MAP



APPROVED FOR CONSTRUCTION

MICHAEL A. THOMAS, P.E. _____ DATE

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

Michael Baker
INTERNATIONAL

DESIGNED: JLW	CAD: EAV	CHECKED: JPZ	DATE: 08/16/16
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LOGAN MILL ROAD
TITLE SHEET

PROJECT NO: 4012.SEPT12C39 SHEET NO: 1

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COLORADO
DEPARTMENT OF TRANSPORTATION
M&S STANDARDS PLANS LIST
 July 04, 2012
 Revised on June 24, 2016

ALL OF THE M&S STANDARD PLANS, AS SUPPLEMENTED AND REVISED, APPLY TO THIS PROJECT WHEN USED BY DESIGNATED PAY ITEM OR SUBSIDIARY ITEM.

GENERAL NOTES:

1. THE INTENT OF THIS CONTRACT IS TO RESTORE THE AREA AFFECTED BY THE 2013 FLOOD TO PRE- FLOOD CONDITIONS AND AS MODIFIED BY THESE PLANS.
2. ALL ELEVATIONS SHOWN ON THESE PLANS ARE REFERENCED TO THE PROJECT BENCHMARKS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING THE PROJECT BENCHMARKS AND OTHER SURVEY MONUMENTS. DAMAGED MONUMENTS SHALL BE REESTABLISHED AND REPLACED BY THE LICENSED LAND SURVEYOR AT THE EXPENSE OF THE PARTY RESPONSIBLE FOR THE DAMAGE.
3. GEOTECHNICAL INFORMATION FOR THIS PROJECT IS BASED UPON THE GEOTECHNICAL INVESTIGATION REPORT BY YEH AND ASSOCIATES, DATED JULY 8, 2014. THE CONTRACTOR SHALL PERFORM WORK IN ACCORDANCE WITH THE GEOTECHNICAL RECOMMENDATIONS.
4. FOR PLAN QUANTITIES OF PAVEMENT MATERIALS, THE FOLLOWING RATES OF APPLICATION WERE USED:
 HOT MIX ASPHALT.....@ 110 LBS./SQ.YD./INCH
 AGGREGATE BASE COURSE CLASS 6.....@ 133 LBS./CU.FT.
 TACK COAT DILUTED EMULSIFIED ASPHALT@ 0.10 GALS/SQ.YD. (DILUTED)
5. BOULDER COUNTY SHALL OBTAIN THE BOULDER COUNTY FLOODPLAIN DEVELOPMENT PERMIT. THE CONTRACTOR SHALL OBTAIN, AT THEIR EXPENSE, ALL OTHER PERMITS REQUIRED TO PERFORM THE PROPOSED WORK PRIOR TO CONSTRUCTION.
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 2011; AND AS SUBSEQUENTLY REVISED; THE CDDT STANDARD PLANS M&S STANDARDS DATED JULY, 2012 AND REVISED; AND THE BOULDER COUNTY MULTI-MODAL TRANSPORTATION STANDARDS; AND THE BOULDER COUNTY STORM DRAINAGE CRITERIA MANUAL.
7. THE CONTRACTOR SHALL HAVE: ONE (1) SIGNED COPY OF THE PLANS ACCEPTED BY THE BOULDER COUNTY ENGINEER, ONE (1) COPY OF THE CONSTRUCTION SPECIFICATIONS FOR THE PROJECT, ONE (1) COPY OF THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD PLANS (M&S STANDARDS), AND ONE (1) COPY OF THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AT THE JOB SITE AT ALL TIMES.
8. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH BOULDER COUNTY AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION. THOSE IN ATTENDANCE SHALL INCLUDE ENGINEER, CONTRACTOR AND ANY OTHER AFFECTED AGENCIES. CONSTRUCTION PLANS WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING.
9. CONTRACTORS MAY USE THE DIGITAL TERRAIN MODEL (DTM IN CONJUNCTION WITH THE DESIGN PLANS. IN THE EVENT OF A CONFLICT, DESIGN PLANS SHALL ALWAYS GOVERN OVER DATA FROM THE DTM.
10. IN THE EVENT THE CONTRACTOR ALLOWS, AUTHORIZES, APPROVES OR CONSTRUCTS ITEMS THAT DIFFER FROM THE APPROVED PLANS, SPECIFICATIONS OR OTHER CONTRACT DOCUMENTS, WITHOUT WRITTEN APPROVAL BY THE ENGINEER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LIABILITY ARISING FROM SUCH CHANGES.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, AND ANY OTHER NEEDED ACTION TO PROTECT THE LIFE, HEALTH AND SAFETY OF THE PUBLIC AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE JOB SITE CONDITIONS THROUGHOUT THE DURATION OF CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROTECTION OF PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED ONLY TO WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER, THE ENGINEER AND THE GOVERNING JURISDICTION HARMLESS FOR ANY AND ALL LIABILITY, IN CONNECTION WITH THE PERFORMANCE OF WORK, EXCEPT FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE ENGINEER OR THE GOVERNING JURISDICTION.
13. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING IN THE EVENT OF A DISCREPANCY BETWEEN CRITERIA PRIOR TO CONSTRUCTION.

GENERAL NOTES CONT'D:

14. UNLESS OTHERWISE DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL CONTAIN ALL WORK WITHIN THE RIGHT OF WAY AND TEMPORARY OR PERMANENT EASEMENTS AS SHOWN ON THE PLANS AND CROSS SECTIONS (ROW SHOWN ON PLANS IS APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD). ANY DISTURBANCE BEYOND THESE LIMITS SHALL BE RESTORED TO ORIGINAL CONDITION BY THE CONTRACTOR AT CONTRACTOR'S OWN EXPENSE. CONSTRUCTION ACTIVITIES IN ADDITION TO NORMAL CONSTRUCTION SHALL INCLUDE THE PARKING OF VEHICLES OR EQUIPMENT, DISPOSAL OF LITTER, AND ANY OTHER ACTION WHICH WOULD ALTER EXISTING CONDITIONS.
15. UNLESS OTHERWISE INDICATED ON THE PLANS, THE DECISION TO BRACE, SHORE AND/OR SHEET PILE FOR STRUCTURE EXCAVATION SHALL BE ENTIRELY THE CONTRACTOR'S RESPONSIBILITY AND WILL BE INCLUDED IN THE COST OF LABOR. HOWEVER, IF THE ENGINEER IS OF THE OPINION THAT AT ANY POINT THE TRENCH WALLS ARE NOT PROPERLY SUPPORTED; THE ENGINEER MAY ORDER THE PLACEMENT OF ADDITIONAL SUPPORTS BY AND AT THE EXPENSE OF THE CONTRACTOR. COMPLIANCE WITH SUCH ORDER SHALL NOT RELIEVE OR RELEASE THE CONTRACTOR FROM RESPONSIBILITIES FOR THE SAFETY OF THE WORK. ALL WORK SHALL BE IN ACCORDANCE WITH ALL STATE AND FEDERAL OSHA REGULATIONS. THE CONTRACTOR SHALL TAKE NOTE THAT EXISTING UTILITIES NEAR THE PROPOSED EXCAVATION SHALL BE PROTECTED DURING CONSTRUCTION. TEMPORARY SHORING IS RECOMMENDED TO LIMIT TRENCH WIDTH AND POTENTIAL DAMAGE TO EXISTING UTILITIES.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCEPTANCE AND CONTROL OF ALL SURFACE AND SUBSURFACE DRAINAGE AND GROUNDWATER ENTERING THE PROJECT AREA. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING DEWATERING IF NEEDED AT NO ADDITIONAL COSTS TO THE PROJECT. DEWATERING METHODS SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL OBTAIN A CONSTRUCTION DEWATERING PERMIT FOR ALL CONSTRUCTION ACTIVITIES.
17. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC) AT (1-800-922-1987) OR 811 FOR LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO EXCAVATION. THE CONTRACTOR SHALL NOTIFY OTHER APPLICABLE UTILITY COMPANIES AS WELL TO OBTAIN FIELD LOCATES OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
18. LOCATIONS OF UNDERGROUND UTILITIES AS SHOWN ON THE PLANS WERE TAKEN FROM THE RECORDS OF THE CONTROLLING AGENCIES OR FROM AGENCY MARKINGS IN THE FIELD. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR COMPLETENESS OR ACCURACY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITIES AND PARTICIPATE IN THE RESOLUTION OF ANY CONFLICTS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
19. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES BY USING EVERY REASONABLE MEANS, INCLUDING FIELD LOCATION OF THE UTILITY. REPAIR OF DAMAGE TO THE EXISTING UTILITIES DURING CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL DOCUMENT THE CONDITION OF EXISTING UTILITIES (VISIBLE FACILITIES) WITH THE ENGINEER AND UTILITY REPRESENTATIVES PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR MUST KEEP ALL EQUIPMENT OPERATION A MINIMUM OF 10 FEET FROM EXISTING OVERHEAD ELECTRIC LINES. IF THIS IS NOT FEASIBLE, OR CONDITIONS WARRANT ADDITIONAL PROTECTION OR POLE STABILIZATION, THE CONTRACTOR MUST CONTACT THE UTILITY OWNER TO ARRANGE PROTECTIVE COVERING AND POLE STABILIZATION. A MINIMUM OF 48 HOURS NOTICE IS REQUIRED.
21. ALL EXISTING UTILITY FACILITIES TO REMAIN IN PLACE WITHIN THE CONSTRUCTION LIMITS SHALL BE PROTECTED BY THE CONTRACTOR.
22. THE SULFATE EXPOSURE CLASS FOR THIS PROJECT IS CLASS 0. SEE SECTION 601 - STRUCTURAL CONCRETE.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING NEARBY PUBLIC OR PRIVATE STREETS OF MUD AND DEBRIS, DUE TO CONSTRUCTION ACTIVITIES, ON A DAILY BASIS OR AS DIRECTED BY THE ENGINEER. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF OTHER WORK.
24. IT IS ANTICIPATED THAT ONE (1) LUMP SUM (LS) ITEM 625 CONSTRUCTION SURVEYING SHALL BE REQUIRED FOR THIS PROJECT IN ACCORDANCE WITH SPECIFICATIONS 625 AND 629. ALONG WITH OTHER DUTIES SPECIFIED IN THE PLANS AND SPECIFICATIONS, THE SURVEYOR SHALL STAKE ALL EASEMENTS AND BOULDER COUNTY RIGHT OF WAY FIRST.

GENERAL NOTES CONT'D:

25. STATIONING LATH WILL BE REMOVED AS DIRECTED AND AT NO ADDITIONAL COST TO THE PROJECT.
26. IT IS ANTICIPATED THAT PUBLIC INFORMATION SERVICES WILL BE REQUIRED FOR THIS PROJECT AND BE PROVIDED BY THE COUNTY.
27. THE FOLLOWING ITEMS ARE REQUIRED:

ITEM NO. 201-00000 CLEARING AND GRUBBING	1 (LUMP SUM)
ITEM NO. 203-01100 PROOF ROLLING	10 (HOUR)
ITEM NO. 203-01597 POTHOLING	10 (HOUR)
ITEM NO. 217-00020 HERBICIDE TREATMENT	4 (HOUR)
ITEM NO. 240-00000 WILDLIFE BIOLOGIST	8 (HOUR)
ITEM NO. 240-00010 REMOVAL OF NEST	6 (HOUR)
ITEM NO. 620-00002 FIELD OFFICE (CLASS 2)	1 (EACH)
ITEM NO. 620-00020 SANITARY FACILITY	1 (EACH)
ITEM NO. 626-00000 MOBILIZATION	1 (LUMP SUM)
ITEM NO. 626-01000 PUBLIC INFORMATION SERVICES	1 (LUMP SUM)

MAINTENANCE OF THE SANITARY FACILITY SHALL INCLUDE CLEANING AT LEAST TWICE A WEEK.

- 28. THE CONTRACTOR SHALL REMOVE DEBRIS AS NEEDED FOR CONSTRUCTION OF THE PROJECT. ALL WORK ASSOCIATED WITH THIS CONSTRUCTION ACTIVITY WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE CLEARING AND GRUBBING IN ITEM 201.
- 29. THE CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO PROTECT THE EXISTING VEGETATION INSIDE AND OUTSIDE THE PROJECT LIMITS. THE CONTRACTOR SHALL FENCE ALL VEGETATION TO BE UNDISTURBED PRIOR TO COMMENCING WORK. ANY COST INCURRED FOR DAMAGE OF SUCH MATERIAL DUE TO CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

PAVEMENT CONSTRUCTION NOTES:

1. DILUTED EMULSIFIED ASPHALT FOR THE TACK COAT SHALL CONSIST OF 1 PART WATER AND 1 PART EMULSIFIED ASPHALT. RATES OF APPLICATION SHALL BE DETERMINED BY THE ENGINEER AT THE TIME OF APPLICATION. TACK COAT SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
2. WATER SHALL BE USED AS A DUST PALLIATIVE WHERE REQUIRED. LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER. THIS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF CONSTRUCTION.
3. ANY LAYER OF HOT MIX ASPHALT THAT IS TO HAVE A SUCCEEDING LAYER PLACED THEREON SHALL BE COMPLETED FULL WIDTH BEFORE SUCCEEDING LAYER IS PLACED.
4. ASPHALT JOINTS SHALL FALL ON LANE LINES, SHOULDER LINES OR MEDIAN LINES, EXCEPT WHERE STATED IN THE PLANS.
5. PRIOR TO PLACING HOT MIX ASPHALT, THE PAVED SURFACE SHALL BE SWEEPED AND CLEANED. THIS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE HOT MIX ASPHALT PAVEMENT ITEMS.
6. THE CONTRACTOR MAY USE AN EXPOSED LONGITUDINAL JOINT FOR A MAXIMUM OF 1 DAY. THE JOINT SHALL CONSIST OF A VERTICAL FACE 1 INCH DEEP, AND AT THE BOTTOM OF THE VERTICAL FACE, A 3:1 SLOPE TO EXISTING PAVEMENT (OR SUBGRADE). THE MAXIMUM DEPTH OF THE 3:1 SLOPE SHALL BE 2 INCHES. AT THE END OF THE FOLLOWING DAY, PLACEMENT OF THE HMA ON THE ADJACENT LANE IS REQUIRED.
7. THE FOLLOWING SHALL BE FURNISHED WITH EACH BITUMINOUS PAVER:
 - A. A SKI TYPE DEVICE AT LEAST 30 FEET IN LENGTH
 - B. SHORT SKI OR SHOE
 - C. 1500 FEET OF CONTROL LINE AND STAKES
8. EMULSIFIED ASPHALT, IF REQUIRED, WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.

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90% SET	 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	CALL UTILITY NOTIFICATION CENTER OF COLORADO	REVISIONS:	NO. DATE REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED: JLW	CAD: EAV	CHECKED: JPZ	DATE: 08/16/16	LOGAN MILL ROAD GENERAL NOTES (SHEET 1 OF 3)	PROJECT NO: 4012.SEPT12C39	SHEET NO: 5
		NO. DATE REVISION DESCRIPTION:	PROJECT NO: 4012.SEPT12C39	SHEET NO: 5								

EARTHWORK/GRADING NOTES:

- DEPTH OF MOISTURE-DENSITY CONTROL FOR THIS PROJECT SHALL BE AS FOLLOWS:
BASES OF CUTS AND FILLS - 1 FOOT
FULL DEPTH OF ALL EMBANKMENTS ON THIS PROJECT.
- EXCAVATION REQUIRED FOR COMPACTION OF BASES OF CUTS AND FILLS WILL BE CONSIDERED AS SUBSIDIARY TO THAT OPERATION AND WILL NOT BE PAID FOR SEPARATELY.
- GRADING WILL BE INSPECTED BY AN OWNER'S REPRESENTATIVE DURING ALL EXCAVATIONS TO EVALUATE CHANGING CONDITIONS.
- TYPE OF COMPACTION FOR THIS PROJECT WILL BE AASHTO T-180. WATER FOR COMPACTION WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK.

DRAINAGE NOTES:

- ALL PIPE LENGTHS ARE GIVEN AND PAID FOR IN THE HORIZONTAL DIMENSION, AND HAVE BEEN ROUNDED TO THE NEAREST FOOT. THE CONTRACTOR SHALL SUPPLY THE ADDITIONAL LENGTH OF PIPE TO ACCOUNT FOR SLOPES AND INCLUDED IN THE COST OF THE WORK. THE PIPE LENGTHS PROVIDED DO NOT INCLUDE THE LENGTH OF FLARED END SECTIONS.
- ALL DOWNSTREAM CONCRETE FLARED END SECTIONS MUST BE INSTALLED WITH JOINT FASTENERS. IN ADDITION, JOINT FASTENERS SHALL BE INSTALLED ON ALL PIPE JOINTS WITHIN 15- FEET OF THE DOWNSTREAM END OF ALL CULVERTS.
- ALL PIPE MATERIAL SHALL BE REINFORCED CONCRETE PIPE (RCP) UNLESS OTHERWISE SPECIFIED. STRENGTH CLASS OF ALL RCP SHALL BE IN ACCORDANCE WITH CDOT M-603-2 AND SECTION 706.02 OF THE STANDARD SPECIFICATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEWATERING AND DIVERSION INCLUDING, BUT NOT LIMITED TO, LIVE STREAM FLOW AND GROUNDWATER. THE CONTRACTOR SHALL OBTAIN THE APPLICABLE DEWATERING PERMIT FOR CONSTRUCTION AT THE SITE. THIS WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE WORK. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS.
- THE CONTRACTOR IS REQUIRED TO KEEP EXISTING CULVERTS FUNCTIONAL AND MAINTAIN PROPER STORMWATER CONVEYANCE UNTIL THE PROPOSED DRAINAGE FACILITIES ARE CONSTRUCTED AND FUNCTIONING PROPERLY. EXISTING CULVERT LOCATIONS FOR REMOVAL AND/OR ABANDONMENT ARE CALLED OUT ON THE PLANS. EXISTING DRAINAGE FACILITIES TO REMAIN SHALL BE PROTECTED IN PLACE, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL PROVIDE SIGNED AND SEALED SHOP DRAWINGS FOR ALL NON CDOT/BOULDER COUNTY STANDARD DRAINAGE STRUCTURES FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION OF THE STRUCTURE.
- THE INFORMATION PROVIDED ON THE DRAINAGE PLAN SET REPRESENTS THE FINAL STORM DRAIN SYSTEM AND CULVERTS.
- OTHER UTILITIES MAY BE CROSSED OR OTHERWISE IMPACT DRAINAGE CONSTRUCTION. CONTRACTOR SHALL PROTECT EXISTING UTILITIES IN PLACE. UNLESS NOTED OTHERWISE, PROTECTION OF EXISTING UTILITIES, INCLUDING INCIDENTAL SHORING, WILL NOT BE MEASURED OR PAID SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
- CONCRETE TOE WALLS SHALL BE REQUIRED AS INDICATED IN THE PLANS. TOE WALLS WILL NOT BE MEASURED OR PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING PIPE SIZES, LENGTHS AND LOCATIONS PRIOR TO ORDERING AND DELIVERY OF THE PIPE MATERIAL TO THE SITE.

SIGNING AND PAVEMENT MARKING NOTES:

POSTS:

- SIGN POSTS SHALL BE 2"x2"x10' (14 GAUGE) GALVANIZED PERFORATED SQUARE STEEL TUBING. SIGN POST BASES SHALL BE 21#4"x21#4" (12 GAUGE, 3' IN LENGTH) GALVANIZED PERFORATED SQUARE STEEL TUBING.
- SIGN POST BASES SHALL BE 2 57#649#32x2 57#649#32(12 GAUGE, 3' IN LENGTH) GALVANIZED PERFORATED SQUARE STEEL TUBING.
- BASES SHALL BE INCLUDED IN THE COST FOR SIGN POSTS. TOP OF BASES SHALL BE 3" ± ABOVE FINISHED GRADE. THE SIGN POST SHALL BE INSTALLED 4" IN TO THE BASE AND BOLTED BOTH WAYS.

SIGNING AND PAVEMENT MARKING NOTES CONT'D: ENVIRONMENTAL NOTES (CONT'D):

- SIGN POST LOCATIONS SHALL BE APPROVED BY THE ENGINEER AND ROAD MAINTENANCE SIGN SHOP REPRESENTATIVE PRIOR TO INSTALLATION.
 - POST LOCATIONS IN CONCRETE MEDIAN OR ISLANDS SHALL HAVE 6" PVC INSTALLED PRIOR TO POURING CONCRETE.
- SIGNS:
- THICKNESS OF ALL SIGN PANELS SHALL BE 0.100".
- PAVEMENT MARKINGS:
- FINAL PAVEMENT STRIPING SHALL BE EPOXY PER CDOT STANDARD SPECIFICATIONS.
 - ALL STOP LINES, CROSSWALKS AND PAVEMENT MARKING SYMBOLS SHALL BE WHITE, PREFORMED THERMOPLASTIC, PREMARK OR EQUIVALENT.
 - STOP LINES SHALL BE 2' WIDE; CROSSWALKS SHALL BE 2' x 9', UNLESS OTHERWISE NOTED.
 - PAVEMENT MARKING ARROWS SHALL BE ELONGATED.
 - BICYCLE DETECTOR PAVEMENT MARKINGS SHALL BE PER MUTCD FIG. 9C-7 B WITH HELMETED BICYCLE SYMBOL.
 - PAVEMENT MARKINGS FOR BIKE LANES SHALL BE PER MUTCD FIG. 9C-3 B WITH HELMETED BICYCLE SYMBOL.
 - PREFORMED THERMOPLASTIC INSTALLATION ON CONCRETE SHALL HAVE THE CONCRETE CURE REMOVED PRIOR TO INSTALLATION OR A BONDING AGENT APPLIED TO THE CONCRETE BEFORE INSTALLATION. INSTALLATION SHALL FOLLOW THE MANUFACTURERS SPECIFICATIONS.

ENVIRONMENTAL NOTES:

- THE CONTRACTOR SHALL COMPLY WITH THE MIGRATORY BIRD TREATY ACT (MBTA) AND THE BALD AND GOLDEN EAGLE PROTECTION ACT (BGEPA), AT ALL TIMES, INCLUDING CONDUCTING PRE-CONSTRUCTION SURVEYS FOR NESTING BIRDS SET FORTH BY U.S. FISH AND WILDLIFE SERVICE (USFWS). THE CONTRACTOR SHALL SCHEDULE WORK TO AVOID TAKING (PURSUE, HUNT, TAKE, CAPTURE OR KILL; ATTEMPT TO TAKE, CAPTURE, KILL OR POSSESS) MIGRATORY BIRDS PROTECTED BY THE MBTA AND BGEPA. THE INCIDENTAL TAKING OF A MIGRATORY BIRD SHALL BE REPORTED TO USFWS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PENALTIES LEVIED BY THE USFWS FOR THE TAKING OF A MIGRATORY BIRD. THE CONTRACTOR SHALL RETAIN A QUALIFIED WILDLIFE BIOLOGIST, WITH A MINIMUM OF THREE YEARS' EXPERIENCE CONDUCTING MIGRATORY BIRD SURVEYS, TO IMPLEMENT THE REQUIREMENTS OF THE MBTA AND BGEPA. THE CONTRACTOR SHALL SUBMIT DOCUMENTATION OF THE BIOLOGIST'S EDUCATION AND EXPERIENCE TO THE ENGINEER FOR ACCEPTANCE PRIOR TO COMMENCEMENT OF ANY ASSOCIATED WORK. A BIOLOGIST WITH LESS EXPERIENCE MAY BE USED BY THE CONTRACTOR SUBJECT TO THE ACCEPTANCE OF THE ENGINEER BASED ON REVIEW OF THE BIOLOGIST'S QUALIFICATIONS. DOCUMENTATION OF THE NEST SURVEYS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.
- THE WILDLIFE BIOLOGIST RETAINED BY THE CONTRACTOR SHALL COMPLETE RAPTOR NEST SURVEYS TO EVALUATE THE PRESENCE OF ACTIVE RAPTOR NESTS WITHIN THE STUDY AREA. IF AN ACTIVE NEST IS LOCATED IN OR NEAR THE STUDY AREA, THE USFWS AND CPW SHALL BE CONTACTED REGARDING USE OF SEASONAL BUFFERS TO PREVENT DISTURBANCE TO NESTING BIRDS DURING CONSTRUCTION.
- TREE TRIMMING AND/OR REMOVAL ACTIVITIES SHALL BE TIMED TO AVOID THE BREEDING SEASON AND TO AVOID IMPACTS TO ACTIVE BIRD NESTS. IF REQUIRED, TREES SHALL BE CLEARED PRIOR TO FEBRUARY 15 OR AFTER AUGUST 31 TO PREVENT RAPTORS (AND OTHER BIRDS) FROM NESTING ON-SITE AND TO AVOID THE TAKING OF, OR DISTURBANCE TO, ACTIVE NESTS DURING THE BREEDING SEASON. WHERE WORK IS TO BE COMPLETED DURING THE NESTING SEASON, MIGRATORY BIRD SURVEYS WILL BE REQUIRED.
- CLEARING AND GRUBBING OF VEGETATION THAT MAY DISTURB GROUND NESTING BIRDS SHALL BE COMPLETED BEFORE BIRDS BEGIN TO NEST OR AFTER THE YOUNG HAVE FLEDGED. IF WORK ACTIVITIES ARE PLANNED BETWEEN APRIL 1 AND AUGUST 3, VEGETATION SHALL BE REMOVED AND/OR TRIMMED TO A HEIGHT OF SIX (6) INCHES OR LESS PRIOR TO APRIL 1. ONCE VEGETATION HAS BEEN REMOVED AND/OR TRIMMED, APPROPRIATE MEASURES, I.E., REPEATED MOWING/TRIMMING, SHALL BE IMPLEMENTED TO ASSURE VEGETATION DOES NOT GROW TO MORE THAN SIX (6) INCHES. FAILURE TO MAINTAIN VEGETATION HEIGHT OF SIX (6) INCHES OR LESS MAY POSTPONE PROJECT CONSTRUCTION.
- THE FOLLOWING WEED MANAGEMENT STRATEGIES WILL BE IMPLEMENTED:
 - VEHICLES SHALL BE INSPECTED BEFORE THEY ARE USED FOR CONSTRUCTION TO ENSURE THAT THEY ARE FREE OF SOIL AND DEBRIS CAPABLE OF TRANSPORTING NOXIOUS WEED SEEDS OR ROOTS. HEAVY CONSTRUCTION EQUIPMENT SHALL BE CLEANED AND POWER WASHED PRIOR TO USE ON THE PROJECT SITE AND BEFORE LEAVING THE SITE.

- MATERIAL FOR EROSION BALES, MULCHING, OR COMPOST SHALL CONSIST OF CERTIFIED WEED-FREE MATERIAL. COLORADO CERTIFIED WEED-FREE STRAW IS IDENTIFIED BY BLUE AND ORANGE TWINE BINDING THE BALES (CDOT RIVER, LAKE, POND, OR WETLAND ONE OF THE FOLLOWING PROCEDURES WILL BE NECESSARY:
 - REMOVE ALL MUD AND DEBRIS FROM EQUIPMENT (TRACKS, TURRETS, BUCKETS, DRAGS, TEETH, ETC.) AND SPRAY/SOAK EQUIPMENT WITH A SOLUTION OF COMMERCIAL GRADE QUATERNARY AMMONIUM DISINFECTANT COMPOUND CONTAINING AT LEAST 8.0% ACTIVE INGREDIENT DILUTED IN SOLUTION TO ACHIEVE AT LEAST 0.8% CONCENTRATION (ROUGHLY 12 OUNCES OF PRODUCT PER GALLON OF WATER). SPECIFICALLY, A 1:15 SOLUTION OF QUAT 4 OR SUPER HDQ NEUTRAL INSTITUTIONAL CLEANER AND WATER, CAN BE USED FOR EFFECTIVE TREATMENT. TREATED EQUIPMENT SHOULD BE KEPT MOIST FOR AT LEAST 10 MINUTES, MANAGING RINSATE AS A SOLID WASTE IN ACCORDANCE WITH LOCAL, COUNTY, STATE, OR FEDERAL REGULATIONS, OR
 - REMOVE ALL MUD AND DEBRIS FROM EQUIPMENT (TRACKS, TURRETS, BUCKETS, DRAGS, TEETH, ETC.) AND SPRAY/SOAK EQUIPMENT WITH WATER HOTTER THAN 140 DEGREES FAHRENHEIT FOR AT LEAST 10 MINUTES.
 - CLEAN HAND TOOLS, BOOTS, AND ANY OTHER EQUIPMENT THAT WILL BE USED IN THE WATER WITH ONE OF THE ABOVE OPTIONS AS WELL. DO NOT MOVE WATER FROM ONE WATER BODY TO ANOTHER. BE SURE EQUIPMENT IS DRY BEFORE USE.

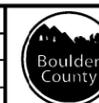
- IN ORDER TO COMPLY WITH THE ENDANGERED SPECIES ACT (ESA), THE FOLLOWING CONSERVATION MEASURES SHALL BE IMPLEMENTED FOR THE DURATION OF THE PROJECT TO PREVENT AND OFFSET ANY AFFECTS THE PROPOSED ACTION MAY HAVE ON FEDERALLY LISTED PREBLE'S MEADOW JUMPING MOUSE, UTE LADIES'-TRESSES, COLORADO BUTTERFLY PLANT, AND OTHER BIOLOGICAL RESOURCES.
 - THE USFWS WILL BE CONTACTED BY TELEPHONE AT (303) 236-4773, IF ANY LISTED SPECIES ARE ENCOUNTERED DURING CONSTRUCTION.
 - VEGETATION WILL NOT BE REMOVED OR DISTURBED DURING THIS PROJECT, EXCEPT FOR AREAS WITHIN THE PLANNED LIMITS OF DISTURBANCE. THESE AREAS SHALL BE RESEEDED IN ACCORDANCE WITH THE STORMWATER MANAGEMENT PLAN (SWMP).
 - EQUIPMENT WILL BE OPERATED AND MAINTAINED WITHIN PLANNED LIMITS OF DISTURBANCE. THE STAGING AREA SHALL BE LOCATED WITHIN AREAS WHICH HAVE BEEN SEVERELY DISTURBED BY THE FLOODING. AT THE END OF THE PROJECT, GROUND WITHIN THE CONSTRUCTION FOOTPRINT SHALL BE PREPARED, COVERED WITH TOPSOIL, AND RESEEDED.
 - WASTE SHALL BE PROMPTLY REMOVED IN ACCORDANCE WITH CDOT STANDARD SPECIFICATIONS TO MINIMIZE SITE DISTURBANCE AND AVOID ATTRACTING PREDATORS. THE CONTRACTOR SHALL COVER EXPOSED HOLES OR PILES OF LOOSE DIRT WITH BOARDS, TARPS, OR OTHER MATERIALS TO PREVENT ENTRAPMENT.
 - THE CONTRACTOR SHALL USE THE NATIVE SEED MIX PROVIDED BY BOULDER COUNTY AND USE ONLY WEED FREE CERTIFIED MATERIALS, INCLUDING GRAVEL, SAND, TOP SOIL, SEED AND MULCH. CONSTRUCTION SHALL BE COMPLETED BEFORE ANY RESTORATION/SEEDING EFFORTS BEGIN. RIPRAP BEING INSTALLED TO PROTECT THE CREEK SHALL BE COVERED WITH SOIL AND REVEGETATED WITH A NATIVE SEED MIX TO IMPROVE THE RIPARIAN HABITAT.
- WATER-RELATED ACTIVITIES/USE IN THE SOUTH PLATTE RIVER BASIN MAY AFFECT LISTED SPECIES IN NEBRASKA AND THESE ACTIVITIES/USES ARE SUBJECT TO THE PROVISIONS OF THE ESA. THEREFORE, THE CONTRACTOR SHALL NOT USE ON-SITE SOURCES OF WATER FOR ANY CONSTRUCTION ACTIVITY, INCLUDING STORING OR USING ON-SITE WATER FOR DUST ABATEMENT, SOIL COMPACTION, CONCRETE MIXING, OR OTHER ACTIVITIES.

90% SET



CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN
ADVANCE BEFORE YOU DIG, GRADE,
OR EXCAVATE FOR THE MARKING
OF UNDERGROUND MEMBER
UTILITIES

NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker
INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
JLW	EAV	JPZ	08/16/16

LOGAN MILL ROAD
GENERAL NOTES
(SHEET 2 OF 3)

PROJECT NO: 4012.SEPT12C39 SHEET NO: 6

ENVIRONMENTAL NOTES (CONT'D):

9. THE CONTRACTOR SHALL ENSURE THAT NO MATERIALS, EQUIPMENT, OR VEHICLES ARE STAGED OR PARKED NEAR WETLANDS OR DRAINAGE AREAS, UNLESS SPECIFICALLY ALLOWED AS NOTED IN THE PLANS.
10. THE CONTRACTOR SHALL NOT PARK ANY VEHICLES OR EQUIPMENT IN, OR DISTURB ANY AREAS NOT APPROVED BY THE ENGINEER; THE CONTRACTOR SHALL ADHERE TO THE CONSTRUCTION LIMITS AS NOTED IN THE PLANS AND DEMARCATATE THE WORK AREA TO PREVENT GROUND DISTURBANCE OUTSIDE THOSE PRESCRIBED AREAS.
11. THE CONTRACTOR SHALL REMOVE IN A TIMELY MANNER ALL SEDIMENT, MUD, DEBRIS, OR OTHER POTENTIAL POLLUTANTS WHICH MAY BE DISCHARGED TO, OR ACCUMULATE IN, THE FLOW LINES AND PUBLIC RIGHT-OF-WAYS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT.
12. ALL EROSION/SEDIMENT CONTROL AND STORMWATER RESPONSIBILITIES SHALL BE IMPLEMENTED AS STATED IN THE SWMP. BIODEGRADABLE HYDRAULIC FLUID SHALL BE USED WHEN WORKING IN OR ADJACENT TO SURFACE WATER AS SPECIFIED BY THE BOULDER COUNTY STORMWATER DRAINAGE CRITERIA.
13. ORANGE PLASTIC FENCING WILL BE USED TO DEFINE NO-WORK AREAS TO PROTECT ADJACENT RIPARIAN AREAS AND ENVIRONMENTAL AREAS OF CONCERN.
14. CONTAMINATED MATERIAL, INCLUDING ASBESTOS-CONTAINING SOIL AND PETROLEUM-IMPACTED SOIL AND/OR GROUNDWATER MAY BE ENCOUNTERED DURING PROJECT ACTIVITIES IN THIS AREA. WORKERS SHALL BE ALERT DURING EXCAVATIONS FOR VISUAL AND OLFACTORY SIGNS OF PETROLEUM CONTAMINATION. IF SOIL AND/OR GROUNDWATER CONTAMINATION IS ENCOUNTERED DURING CONSTRUCTION, WORK WILL STOP IMMEDIATELY AND THE PROCEDURES OUTLINED IN THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) SPECIFICATION 250 AND SUBSECTION 107.25 SHALL BE FOLLOWED. IN THE EVENT THAT SUSPECT ACMS ARE ENCOUNTERED (I.E., DEBRIS WITH BUILDING MATERIALS), WORKERS MUST FOLLOW CDOT SPECIFICATION 250.07 ASBESTOS CONTAINING MATERIAL MANAGEMENT AND THE CDOT ASBESTOS-CONTAMINATED SOIL MANAGEMENT STANDARD OPERATING PROCEDURE.
15. IF PALEONTOLOGICAL (E.G., ANIMAL BONES OR FOSSILS) RESOURCES ARE DISCOVERED OR UNCOVERED DURING CONSTRUCTION, WORK WILL STOP IMMEDIATELY AND THE ENGINEER NOTIFIED SO FURTHER ACTIONS MAY BE TAKEN, INCLUDING RETAINING A CERTIFIED PALEONTOLOGIST.
16. IF ANY ARCHAEOLOGICAL RESOURCES ARE FOUND (E.G., ARTIFACTS SUCH AS, BUT NOT LIMITED TO, HISTORIC TRASH LIKE BOTTLES, DISHWARE, HOUSEHOLD OR MINING ITEMS, ETC.; PREHISTORIC STONE TOOLS SUCH AS PROJECTILE POINTS OR OTHER FLAKED STONE ITEMS; OR FEATURES SUCH AS BUILDING FOUNDATIONS, TRAILS, WAGON ROADS, RAILROAD GRADES, STONE WALL REMAINS, MINE ADITS, OR PROSPECT PITS; OR PREHISTORIC FEATURES LIKE HEARTHES, ETC.), WORK WILL BE IMMEDIATELY HALTED IN THE VICINITY OF THE FIND, THE ENGINEER NOTIFIED, AND A CERTIFIED ARCHEOLOGIST WILL BE PROMPTLY NOTIFIED.
17. IF BONES OF POTENTIAL HUMAN ORIGIN ARE DISCOVERED DURING CONSTRUCTION, GROUND-DISTURBING WORK MUST BE STOPPED IN THE VICINITY OF THE DISCOVERY, AND THE COUNTY CORONER, THE COUNTY SHERIFF, THE COLORADO STATE HISTORIC PRESERVATION OFFICER (SHPO), AND THE COLORADO STATE ARCHAEOLOGIST WILL BE PROMPTLY NOTIFIED. WORK CANNOT RESUME IN THE VICINITY OF THE FIND UNTIL CLEARANCE IS GRANTED.
18. ALL EQUIPMENT SHALL BE CLEANED AND FREE OF CONTAMINANTS PRIOR TO WORK IN AND ADJACENT TO ANY SURFACE WATER WITHIN THE PROJECT AREA.

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90% SET	 <p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="font-size: 8px;">REVISIONS:</th> <th style="font-size: 8px;">NO.</th> <th style="font-size: 8px;">DATE</th> <th style="font-size: 8px;">REVISION DESCRIPTION:</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:									 <p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="font-size: 8px;">DESIGNED:</th> <th style="font-size: 8px;">CAD:</th> <th style="font-size: 8px;">CHECKED:</th> <th style="font-size: 8px;">DATE:</th> </tr> <tr> <td style="text-align: center;">JLW</td> <td style="text-align: center;">EAV</td> <td style="text-align: center;">JPZ</td> <td style="text-align: center;">08/16/16</td> </tr> </table>	DESIGNED:	CAD:	CHECKED:	DATE:	JLW	EAV	JPZ	08/16/16	<p>LOGAN MILL ROAD GENERAL NOTES (SHEET 3 OF 3)</p> <p>PROJECT NO: 4012.09PT12C39 SHEET NO: 7</p>
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CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		DRAINAGE		STRUCTURES		SWMP										PROJECT TOTALS		
			PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.									PLAN	AS CONST.	
201-00000	CLEARING AND GRUBBING	LS	1.00																	1.00	
202-00001	REMOVAL OF STRUCTURE	EACH	2																	2	
202-00010	REMOVAL OF TREE	EACH	34																	34	
202-00020	REMOVAL OF CONCRETE BOX CULVERT	EACH			12															12	
202-00027	REMOVAL OF RIPRAP	SY			208															208	
202-00035	REMOVAL OF PIPE	LF			151															151	
202-00070	REMOVAL OF BARRICADE	EACH	12																	12	
202-00090	REMOVAL OF DELINEATOR	EACH	6																	6	
202-00210	REMOVAL OF CONCRETE PAVEMENT	SY	7																	7	
202-00220	REMOVAL OF ASPHALT MAT	SY	1,224																	1,224	
202-00710	REMOVAL OF POWER POLE	EACH	1																	1	
202-00810	REMOVAL OF GROUND SIGN	EACH	1																	1	
203-00060	EMBANKMENT MATERIAL (COMPLETE IN PLACE)	CY	6,244																	6,244	
203-00100	MUCK EXCAVATION	CY	50																	50	
203-01100	PROOF ROLLING	HOURL	10																	10	
203-01597	POTHOLING	HOURL	10																	10	
206-00000	STRUCTURE EXCAVATION	CY					422													422	
206-00100	STRUCTURE BACKFILL (CLASS 1)	CY					205													205	
206-00360	MECHANICAL REINFORCEMENT OF SOIL	CY					205													205	
207-00205	TOPSOIL	CY							400											400	
208-00002	EROSION LOG (12 INCH)	LF							815											815	
208-00020	SILT FENCE	LF							90											90	
208-00045	CONCRETE WASHOUT STRUCTURE	EACH							1											1	
208-00070	VEHICLE TRACKING PAD	EACH							2											2	
208-00103	REMOVAL AND DISPOSAL OF SEDIMENT (LABOR)	HOURL							10											10	
208-00105	REMOVAL AND DISPOSAL OF SEDIMENT (EQUIPMENT)	HOURL							10											10	
208-00206	EROSION CONTROL SUPERVISOR	DAY							90											90	
208-00106	SWEEPING (SEDIMENT REMOVAL)	HOURL							90											90	
210-00810	RESET GROUND SIGN	EACH							2											2	
211-03005	DEWATERING	LS	1																	1	
212-00006	SEEDING (NATIVE)	ACRE							1											1	
212-00032	SOIL CONDITIONING	ACRE							1											1	
212-00100	TREE RETENTION AND PROTECTION	LS							1.00											1.00	
213-00004	MULCHING (WEED FREE STRAW)	ACRE							0.55											0.55	

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								JLW	JLW	JPZ	08/16/16			

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CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		DRAINAGE		STRUCTURES		SWMP								PROJECT TOTALS		
			PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.							PLAN	AS CONST.	
213-00061	MULCH TACKIFIER	LB							99.00									99.00	
216-00201	SOIL RETENTION BLANKET (STRAW-COCONUT) (BIODEGRADABLE CLASS 1)	SY							1470.00									1470.00	
217-00020	HERBICIDE TREATMENT	HOUR							4									4	
240-00000	WILDLIFE BIOLOGIST	HOUR							8									8	
240-00010	REMOVAL OF NESTS	HOUR							6									6	
304-06007	AGGREGATE BASE COURSE (CLASS 6)	CY							300									300	
403-34721	HOT MIX ASPHALT (GRADING SX) (75) (PG 58-28)	TON	336					40										376	
420-00102	GEOTEXTILE (EROSION CONTROL) (CLASS 1)	SY			571													571	
502-11489	STEEL PILING (HP 14X89)	LF					324											324	
503-00030	DRILLED CAISSON (30 INCH)	LF					1,048											1,048	
506-00218	RIPRAP (18 INCH)	CY			29													29	
506-00409	SOIL RIPRAP (9 INCH)	CY			66													66	
506-00418	SOIL RIPRAP (18 INCH)	CY			146													146	
506-00424	SOIL RIPRAP (24 INCH)	CY			349													349	
507-00100	CONCRETE SLOPE AND DITCH PAVING (REINFORCED)	CY			1.3													1.3	
509-00000	STRUCTURAL STEEL	LB					65											65	
515-00120	WATERPROOFING (MEMBRANE)	SY	281															281	
601-03000	CONCRETE CLASS D	CY					281											281	
601-03050	CONCRETE CLASS D (WALL)	CY					70											70	
601-40005	CUT STONE VENEER	SF					3,489											3,489	
601-40301	STRUCTURAL CONCRETE COATING	SF					100											100	
601-40302	STRUCTURAL CONCRETE COATING (ANTI-GRAFFITI)	SF					100											100	
602-00000	REINFORCING STEEL	LB					37,069											37,069	
603-01185	18 INCH REINFORCED CONCRETE PIPE (COMPLETE IN PLACE)	LF			55													55	
603-02365	45X29 INCH REINFORCED CONCRETE PIPE ELLIPTICAL (COMPLETE IN PLACE)	LF			48													48	
603-05018	18 INCH REINFORCED CONCRETE END SECTION	EACH			1													1	
603-05136	45X29 INCH REINFORCED CONCRETE END SECTION ELLIPTICAL	EACH			4													4	
604-00305	INLET TYPE C (5 FOOT)	EACH			1													1	
606-00301	GUARDRAIL TYPE 3 (6-3 POST SPACING)	LF	305															305	
606-01370	TRANSITION TYPE 3G	EACH	1															1	
606-01385	TRANSITION TYPE 3J	EACH	3															3	
606-01390	END ANCHORAGE TYPE 3K	EACH	4															4	
606-01395	TRANSITION TYPE 3L	EACH	2															2	
606-02003	END ANCHORAGE (NONFLARED)	EACH	3															3	
606-10805	BRIDGE RAIL TYPE 8 (SPECIAL)	LF					155											155	

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION	 Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	LOGAN MILL ROAD SUMMARY OF QUANTITIES (SHEET 2 OF 3)	PROJECT NO: 4012.0912C39	SHEET NO: 9
								JLW	JLW	JPZ	08/16/16			

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CONTRACT ITEM NO.	CONTRACT ITEM	UNIT	ROADWAY		DRAINAGE		STRUCTURES		SWMP								PROJECT TOTALS		
			PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.	PLAN	AS CONST.							PLAN	AS CONST.	
607-11300	FENCE COMBINATION WIRE WITH TREATED WOODEN POSTS	LF	65															65	
614-00011	SIGN PANEL (CLASS I)	SF	6															6	
614-00216	STEEL SIGN POST (2X2 INCH TUBING)	LF	12															12	
618-01992	PRESTRESSED CONCRETE BOX (DEPTH LESS THAN 32 INCHES)	SF					1,517											1,517	
620-00001	FIELD OFFICE (CLASS 1)	EACH	1															1	
620-00020	SANITARY FACILITY	EACH	1															1	
621-00000	TEMPORARY STREAM CROSSING	LS	1															1	
622-00270	BOLLARD	EACH	12															12	
623-00000	FIRE DISTRICT FIRE SUPPLY SYSTEM	LS	1															1	
625-00000	CONSTRUCTION SURVEYING	LS	1															1	
626-01000	PUBLIC INFORMATION SERVICES	LS	1															1	
627-00001	PAVEMENT MARKING PAINT	GAL	11															11	
630-XXXX	TRAFFIC CONTROL	LS	1															1	
XXX-XXXX	STREAM RESTORATION	LF			450													450	

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

 **BOULDER COUNTY TRANSPORTATION DEPARTMENT**
ENGINEERING DIVISION
 **Michael Baker INTERNATIONAL**

DESIGNED:	CAD:	CHECKED:	DATE:
JLW	JLW	JPZ	08/16/16

LOGAN MILL ROAD
SUMMARY OF QUANTITIES
(SHEET 3 OF 3)
PROJECT NO: 4012.SEPT12C39 SHEET NO: 10

TO ESTABLISH GEOMETRIC CONTROL FOR THE CONSTRUCTION OF THIS PROJECT, THE DEPARTMENT HAS PROVIDED THE FOLLOWING INFORMATION:

<input checked="" type="checkbox"/> Horizontal Control	Plans
<input checked="" type="checkbox"/> Vertical Control	Plans
<input checked="" type="checkbox"/> Roadway Alignment	Plans
<input type="checkbox"/> Original Terrain Data	
<input type="checkbox"/> Other:	

* Specify the information format, ie., plan sheet, computer disk, computer printout, or other. The information marked is either contained on the plans or is available from the Engineer.

TYPE OF PROJECT

- | | |
|---|--|
| <input type="checkbox"/> Landscaping | <input type="checkbox"/> Major Reconstruction |
| <input type="checkbox"/> Signalization | <input type="checkbox"/> New Roadway Construction |
| <input type="checkbox"/> Safety Improvement | <input type="checkbox"/> Bridge Replacement |
| <input type="checkbox"/> Asphalt Overlay | <input type="checkbox"/> Bridge Widening |
| <input type="checkbox"/> Concrete Overlay | <input type="checkbox"/> New Bridge |
| <input type="checkbox"/> Minor Widening | <input checked="" type="checkbox"/> Other: <u>Flood Recovery and Restoration</u> |

SURVEY WORK TO BE PERFORMED BY OTHERS: _____

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 625:

- Establish and Maintain Project Centerline or Engineer Approved Offset Line(s)
- Verification and Maintenance of Horizontal and Vertical Control
- Verify or Determine existing grades and alignments
- Verify or Determine existing topography
- GPS/RTS (Global Positioning System/Robotic Total Station) Construction Machine Control
- Clearing and Grubbing Limits (Section 201)
- Removal Limits (Section 202)
- Reset Items (Section 210)
- Excavation and Embankment (Section 203)

- Excavation
 - Unclassified
 - Stripping
 - Muck
 - Rock
 - Borrow
 - Other: _____
 - Potholing

- Embankment
- Site Grading
- Erosion Control (Perm)
- Other: _____
- As Staked Earthwork Quantities (See General Notes)

- Landscaping
 - Top Soil (Section 207)
 - Seeding (Section 212)
 - Mulching (Section 213)
 - Planting (Section 214)
 - Herbicide (Section 217)
 - Other: Seeding Boundaries

- Erosion Control (Section 208)
 - Seeding (Temp)
 - Silt Fence
 - Erosion Bales
 - Erosion Logs
 - Riprap (Temp)
 - Other: _____

- Roadway Bases
 - Untreated Subgrade
 - Treated Subgrade
 - Aggregate Base Course (Section 304)
 - Reconditioning
 - PMBB - Plant Mix Bituminous Base
 - Other: _____

	Slope Staking (Y/N)	Grid (Y/N)	Grade (Y/N)	Special Interval
Excavation	Y	N	Y	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Slope Staking (Y/N)	Grid (Y/N)	Grade (Y/N)	Special Interval
Embankment	Y	N	Y	-
	-	-	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

	Grid (Y/N)	Grade (Y/N)	Special Interval	Special Offset
Roadway Bases	-	-	-	-
	N	Y	-	-
	-	-	-	-
	-	-	-	-
	-	-	-	-

- Pavements
 - HMA - Hot Mix Asphalt (Section 403)
 - Concrete (Section 412)
 - Heating & Scarifying Treatment
 - Prime Coat, Tack Coat & Rejuvenating Agent (Section 407)
 - Seal Coat or Chip Seal (Section 409)
 - Other: _____

	Grid (Y/N)	Special Interval	Special Offset
Pavements	N	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Roadway Elements
 - Curb and Gutter (Section 609)
 - Drop inlets - alignment and grades (Section 604)
 - Retaining Walls
 - Guard Rail (Section 606)
 - Sidewalk (Section 608)
 - Overlay Stationing
 - Other: Fire Department Pullouts

	Tangent Interval	Curve Interval	Special Offset
Curb & Gutter	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Riprap (Perm) (Section 506)
- Slope and Ditch Paving (Section 507)

	Left Interval	Center Interval	Right Interval
Stationing	-	-	-
	-	-	-
	-	-	-
	-	-	-
	-	-	-

- Minor Structures
 - Structure Excavation limits (Section 206)
 - Culverts (Section 603)
 - Culverts w/ Headwalls and Wingwalls (Section 601)
 - Concrete Box Culverts w/ Headwalls and Wingwalls
 - Pipes (Section 603)
 - Sanitary Sewer
 - Storm Sewer
 - Water
 - Irrigation
 - Miscellaneous
 - Manholes (Section 604)
 - Inlets (Section 604)
 - Permanent Water Quality BMP (Section 208)
 - Other: _____

- Major Structures - Overhead Signs (Section 614), Concrete Box Culverts, Bridges - and all other structures assigned a structure number
 - Structure Excavation limits (Section 206)
 - Concrete Box Culverts (Section 603) w/ Headwalls and Wingwalls (Section 601)
 - Piling locations and cut off elevations (Section 502)
 - Caisson locations and elevations (Section 503)
 - Footing locations, alignment, and elevations
 - Abutment/Pier locations, alignment, and elevations
 - Wingwall skew angles/offsets
 - Structural concrete form locations
 - Substructure As-constructed survey required for Bridges (Subsection 601 .12) and Overhead signs (S-614-50)
 - Bridge expansion joint(s) alignment and grade (longitudinal and transverse)
 - Deck grades at Girder 10th or "n" th point locations and elevations
 - Slope and Ditch Paving (Section 507)
 - Other: Retaining Walls, Moment Slab

- Fencing (Section 607)
 - Temporary
 - Permanent
 - Sound Barrier
 - Other: _____

- Delineators (Section 612)
 - Temporary
 - Permanent

- Lighting (Section 613) and Traffic Control Devices (Permanent) (Section 614)
 - Signal pole locations and elevations
 - Light pole locations and elevations
 - Sign locations
 - Field verify sign post locations, elevations, and lengths before fabrication.
 - Other: _____

- Pavement Marking (Section 627)
 - Striping (Temp)
 - Striping (Perm)
 - Symbols
 - Other: _____
- Temporary Lighting and Construction Traffic Control Devices (Section 630)
 - Signal pole locations and elevations (Temp)
 - Light pole locations and elevations (Temp)
 - Sign Locations (Temp)
 - Other: _____
- All Easements (Temp Staking by P.L.S. Only)
- Right of Way (Temp Staking by P.L.S. Only)

WORK PERFORMED BY THE CONTRACTOR'S SURVEYOR UNDER SECTION 629:

- Monumentation (Section 629)
 - Control
 - Right of Way
 - Land corners, Aliquot corners
 - Easements
 - Reference the specified existing monuments: ** _____
 - Replace the specified existing monuments: ** _____
 - Locate monuments. It is estimated _____ hours are required.

NOTE: All 629 items shall include adequate research, calculations, and evaluations of evidence for monuments to be set.

** A Tabulation of Survey Monuments may be provided on the plans.

GENERAL NOTES:

- Unless indicated otherwise on this Survey Tabulation Sheet, all survey work and staking intervals shall be done in accordance with the latest edition of the CDDT Survey Manual.
- Adequate information for establishing lines, grades, and locations for all work items have been specified on the plans. Any additional information required to stake the item or element shall be generated by the Contractor's surveyor.
- The Contractor's surveyor shall provide an estimate of the man-hours necessary to complete the work items indicated on this sheet. A copy of this sheet, with the estimated man-hours written on the blank line to the left of the specified items, shall be submitted with the Survey Schedule to the Engineer 3 days prior to the Presurvey Conference - Construction Survey.
- Stakes and Monuments which are damaged or destroyed by the progress of construction shall be replaced by the Contractor at no additional cost to the Department.
- The Contractor shall furnish an As Staked (or GPS/RTS Construction Machine Control) Earthwork Quantity report to the Engineer prior to completion of twenty percent (20%) of the planned earthwork in any phase as per the CDDT Survey Manual. A printed copy of the As Staked (or GPS/RTS Construction Machine Control) Earthwork data report and a computer disk with that information on it, in the specified format shall be submitted to the Engineer. The Contractor shall field verify original ground cross sections at a maximum 500 feet intervals.
- Prior to beginning work on any subsequent operation, such as placing base course or paving, the Contractor shall certify in writing to the Engineer that the final grade is within specified tolerance.
- The Contractor's surveyor shall perform all field surveying and calculations necessary to tie plan grades into field grades.
- The Contractor shall coordinate construction staking on the project with any utility work.
- Fieldbooks shall contain daily records of points set and or measurements observed. The information recorded shall contain: date, crew members' names, point no., description, staking information, and sketches. If the survey information is collected electronically, information recorded shall be provided to the Project Engineer in a hard copy format that is intuitive, clear and related to the supplemental information recorded in the field books. All linear surveys, such as slope stakes and blue tops, shall have the station and offset information related to the measured information. Non-linear surveys such as structures staking shall have sketches relating electronic information, such as point numbers, to the sketch.
- The Contractor's surveyor shall submit the following fieldbooks to the Engineer:
 - Horizontal Control (Primary & Secondary)
 - Vertical Control (i.e. Benchmarks)
 - Property Pin Ties
 - Horizontal Alignment
 - Grading
 - Slope Staking
 - Minor Structures
 - Major Structures
 - One fieldbook for each work category shown on this sheet
 - Other Fieldbook(s): _____

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90% SET	<p style="font-size: 8px;">CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="font-size: 8px;">REVISONS:</th> <th style="font-size: 8px;">NO.</th> <th style="font-size: 8px;">DATE</th> <th style="font-size: 8px;">REVISION DESCRIPTION:</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISONS:	NO.	DATE	REVISION DESCRIPTION:					<p style="font-size: 8px;">BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p style="font-size: 8px;">Michael Baker INTERNATIONAL</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="font-size: 8px;">DESIGNED:</th> <th style="font-size: 8px;">CAD:</th> <th style="font-size: 8px;">CHECKED:</th> <th style="font-size: 8px;">DATE:</th> </tr> <tr> <td style="text-align: center;">JLW</td> <td style="text-align: center;">EAV</td> <td style="text-align: center;">JPZ</td> <td style="text-align: center;">08/16/16</td> </tr> </table>	DESIGNED:	CAD:	CHECKED:	DATE:	JLW	EAV	JPZ	08/16/16	<p style="font-size: 8px;">LOGAN MILL ROAD SURVEY TABULATIONS</p> <p style="font-size: 8px;">PROJECT NO: 4012.SEPT12C39 SHEET NO: 11</p>
REVISONS:	NO.	DATE	REVISION DESCRIPTION:																		
DESIGNED:	CAD:	CHECKED:	DATE:																		
JLW	EAV	JPZ	08/16/16																		

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SUMMARY OF EARTHWORK QUANTITIES	
EMBANKMENT MATERIAL (COMPLETE IN PLACE)	
ROADWAY - REGULAR EMBANKMENT	CUBIC YARDS
REPLACEMENT OF MUCK	5,380
TOTAL	50
TOTAL	5,430
STRUCTURE EXCAVATION (SPECIAL)	
BRIDGE & WALLS	CUBIC YARDS
TOTAL	419
TOTAL	419
MUCK EXCAVATION	
AS DIRECTED BY THE ENGINEER	CUBIC YARDS
TOTAL	50
TOTAL	50
FOR INFORMATION ONLY	
UNCLASSIFIED EXCAVATION	
ROADWAY	CUBIC YARDS
TOTAL	1,269
TOTAL	1,269
COMPACTION (AASHTO T180)	
TOTAL EMBANKMENT (NET)	CUBIC YARDS
TOTAL	5,430
TOTAL	5,430
EARTHWORK QUANTITIES BALANCE	
UNCLASSIFIED EXCAVATION	
TOTAL UNCLASSIFIED EXCAVATION	CUBIC YARDS
TOTAL FROM CONTRACTORS SOURCE	1,269
TOTAL	4,975
EMBANKMENT (NET)	
TOTAL	5,430
EMBANKMENT (NET) TIMES COMPACTION FACTOR (1.15)	
TOTAL	6,244

TABULATION OF REMOVALS, RESETS AND ADJUSTMENTS														
ALIGNMENT	STATION TO STATION	CLEAR AND GRUBBING	REMOVAL OF STRUCTURE	REMOVAL OF TREE	REMOVAL OF RIPRAP	REMOVAL OF BARRICADE	REMOVAL OF CONCRETE PAVEMENT	REMOVAL OF POWER POLE	RESET MARKER	REMOVAL OF DELINEATOR	REMOVAL OF ASPHALT MAT	REMOVAL OF GROUND SIGN	RESET GROUND SIGN	REMARKS
		LS	EA	EA	SY	LF	SY	EA	EA	EA	SY	EA	EA	
FOURMILE CANYON	101+05 TO 105+02	0.5		21	138						6	1,224	1	2
LOGAN MILL	200+48 TO 203+21	0.5	2	13	70	12	7	1	1					
TOTALS		1	2	34	208	12	7	1	1	6	1,224	1	2	

TABULATION OF SURFACING QUANTITIES				
ALIGNMENT	STATION TO STATION	HDT MIX ASPHALT (GRADING SX) (75) (PG 58-28)		REMARKS
		TON	AGGREGATE BASE COURSE (CLASS 6) CY	
FOURMILE CANYON	100+55.00 TO 102+37.00	84	56	
LOGAN MILL	200+60.00 TO 202+80.00	252	250	
TOTALS		336	307	

TABULATION OF GUARDRAIL									
ALIGNMENT	STATION TO STATION	SIDE	GUARDRAIL TYPE 3 (6-3)	END ANCHORAGE (NON-FLARED)	END ANCHORAGE TYPE 3K	TRANSITION TYPE 3G	TRANSITION TYPE 3J	TRANSITION TYPE 3L	REMARKS
			LF	EACH	EACH		EACH	EACH	
LOGAN MILL	200+59.80 TO 201+34.82	LT	108.9	1	4	1	3		
FOURMILE CANYON	101+16.19 TO 103+07.10	LT	160.0	1				1	
FOURMILE CANYON	103+90.30 TO 104+22.47	LT	35.7	1				1	
TOTALS			305	3	4	1	3	2	

TABULATION OF FENCE					
ALIGNMENT	STATION TO STATION	SIDE	FENCE COMBINATION WIRE WITH TREATED WOODEN POSTS	BOLLARD	REMARKS
			LF	EACH	
LOGAN MILL	202+02 TO 202+29	RT	65	12	
TOTALS			65	12	

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		LOGAN MILL ROAD ROADWAY TABULATIONS (SHEET 1 OF 2)							

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PAVEMENT SIGNING AND MARKING LEGEND

	NEW	EXISTING
SINGLE POST MOUNTED SIGN		
EDGE LINE, WHITE, 4"	———	
CENTER LINES, YELLOW, 4"	====	

TABULATION OF PAVEMENT MARKINGS										
ALIGNMENT	STATION		MARKING TYPE	PAVEMENT MARKINGS						DESCRIPTION
				DBL YELLOW SOLID 4 IN			WHITE SOLID 4 IN			
				LF	SF	GAL	LF	SF	GAL	
FOURMILE CANYON DR	100+55	102+37	CENTER	483	322	3.2				
FOURMILE CANYON DR	100+55	102+37	EDGE				1010	337	3.4	
LOGAN MILL	200+60	202+80	CENTER	236	157	1.6				
LOGAN MILL	200+60	202+80	EDGE				521	174	1.7	
			TOTAL (GAL)			5			6	ROUNDED UP TO NEXT FULL GALLON

TABULATION OF SIGNS												
SIGN NO.	ALIGNMENT	STATION	DIRECTION	SIGN CODE	SIGN PANEL SIZE			BACKGROUND COLOR	LEGEND	SIGN PANEL	STEEL SIGN SUPPORT (2-INCH ROUND) (POST AND SOCKET)	REMARKS
										CLASS I		
					W"	x	H"			SF		
1	LOGAN MILL	201+77	WB	W1-1L	30		30	YELLOW	TURN	6.25	12	
TOTAL										6.25	12	

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						JLW EAV JPZ 08/16/16	PROJECT NO: 4012.SEPT12C39 SHEET NO: 13			

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TABULATION OF DRAINAGE STRUCTURES

ID	LOCATION	STATION-OFFSET		LINE		PIPE INVERT ELEVATIONS		GRADE (%)	INLET TYPE C (5 FOOT)	REINFORCED CONCRETE PIPE (COMPLETE IN PLACE)		END SECTION		CONCRETE SLOPE AND DITCH PAVING (REINFORCED)	SOIL RIPRAP (9 INCH)	SOIL RIPRAP (18 INCH)	SOIL RIPRAP (24 INCH)	RIPRAP (18 INCH)	GEOTEXTILE (DRAINAGE) (CLASS 1)	REMOVAL OF CONCRETE BOX CULVERT	REMOVAL OF PIPE	DESCRIPTION
										18 INCH	45 x 29 INCH	18 INCH	45 x 29 INCH									
										EA	LF	EA	LF									
CH-LM-100	LOGAN MILL	200+74.95, 12.8 LT	TO 201+25.99, 24.10 LT		P-LM-100									6	95				107		57	
P-LM-100	LOGAN MILL	201+25.99, 24.10 LT	TO 201+54.61, 22.78 LT	CH-LM-100	CH-LM-101	6358.72	6358.1	2.5%		25		2						29	29			
CH-LM-101	LOGAN MILL	201+54.61, 22.78 LT	TO 201+73.67, 30.03 LT	P-LM-100	P-LM-101										51				51			
P-LM-101	LOGAN MILL	201+73.67, 30.03 LT	TO 202+37.60, 29.02 LT	CH-LM-101	FOURMILE CREEK	6352.65	6352.07	2.5%		23		2					38		29		22	
CH-LM-102	LOGAN MILL	200+48.56, 9.00 RT	TO 201+95.99, 21.14 RT		IN-LM-102									60					121			
IN-LM-102	LOGAN MILL	201+95.99, 21.14 RT		CH-LM-102	P-102				1				1.3									
P-102	LOGAN MILL	201+95.99, 21.14 RT	TO 202+40.07, 30.37 RT	IN-LM-102	FOURMILE CREEK	6352.97	6352.42	1.0%		55		1					11		9		72	
STREAM																	300		225			STREAM PROTECTION
	LOGAN MILL	202+67, 24 LT																		12		TEMPORARY STREAM CROSSING
TOTAL									1	55	48	1	4	1.3	66	146	349	29	571	12	151	

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY	BOULDER COUNTY TRANSPORTATION DEPARTMENT				ENGINEERING DIVISION				LOGAN MILL ROAD DRAINAGE TABULATIONS			
							Michael Baker		DESIGNED: JLW	CAD: EAV	CHECKED: JPZ	DATE: 08/16/16	PROJECT NO: 4012.SEPT12C39	SHEET NO: 14				

CONTROL DIAGRAM - TASK ORDER 3

A PARCEL OF LAND IN SECTIONS 17, 18 20, 21, 28 & 27,
TOWNSHIP 1 NORTH, RANGE 71 WEST AND OF THE 6TH P.M.,
COUNTY OF BOULDER, STATE OF COLORADO.

- SHEET 1 OF 1 -

DEA CP-301



DEA CP-302



DEA CP-303
"BOULDER 267"



DEA CP-304



DEA CP-305



GROUND COORDINATE TABLE:

PT #	NORTHING	EASTING	ELEV.	DESCRIPTION
301	260918.86	37998.29	6498.1	#5 REBAR W/ 1-1/4" ORANGE PLASTIC CAP
302	257914.18	40324.93	6370.5	#5 REBAR W/ 1-1/4" ORANGE PLASTIC CAP
303	256805.77	43418.89	6233.4	2" BRASS CAP IN 4" CONCRETE POST "BOULDER 267"
304	254795.59	45583.99	6018.9	#5 REBAR W/ 1-1/4" ORANGE PLASTIC CAP
305	249657.54	50020.78	5760.7	#5 REBAR W/ 1-1/4" ORANGE PLASTIC CAP

NOTES:

- 1.) The basis of coordinates for this map is the North America Datum of 1983-2011 (NAD 83 (2011)) U.S. Survey Feet, based locally upon the David Evans and Associates, Inc. Control Point DEA CP 302 for ground coordinate scale factor determination.
- 2.) The basis of elevations for this map is the North American Vertical Datum of 1988 (NAVD 88), based locally upon the CP 302. Elevations computed from a NGS OPUS Solution Report using a four (4) hour occupation data set at DEA CP 302.
- 3.) To modify ground control to Colorado State Plane North Zone; add 1,000,000 feet to North coordinate, add 3,000,000 feet to East coordinate and multiply by 1/csf (combined scale factor = 1/1.000328515 = 0.999671593).
- 4.) Fieldwork for control was completed November 2013.
- 5.) Set 18" long #5 rebar with 1-1/4" outside diameter orange plastic cap marked "DEA INC" at all control points unless otherwise noted, see Ground Coordinate Table above.

NOTICE:

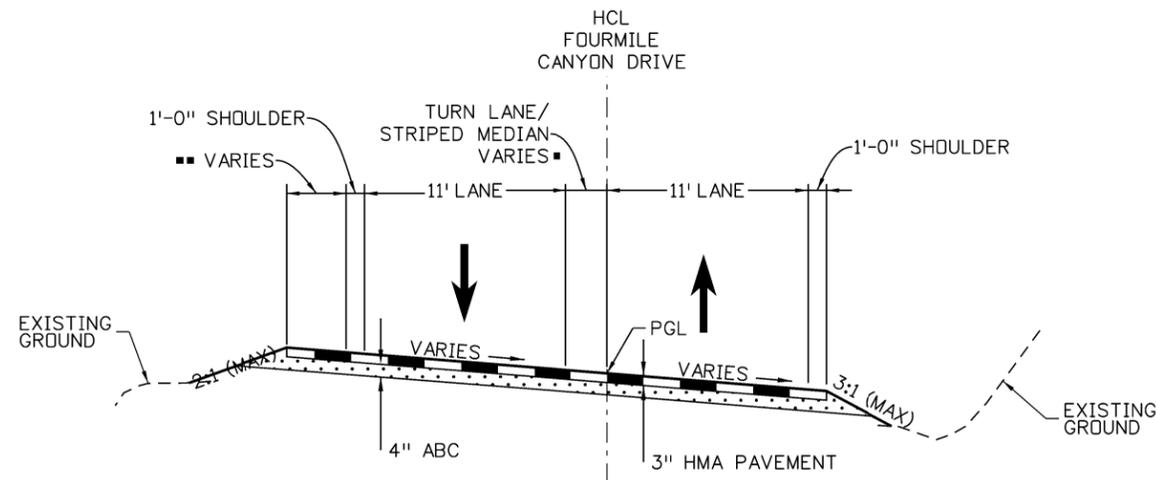
According to Colorado law you MUST commence any legal action based upon any defect in this survey within three years after you first discovered such defect. In NO event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon.



90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: 8px;">REVISIONS:</th> <th style="font-size: 8px;">NO.</th> <th style="font-size: 8px;">DATE</th> <th style="font-size: 8px;">REVISION DESCRIPTION:</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:													 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: 8px;">DESIGNED:</td> <td style="font-size: 8px;">CAD:</td> <td style="font-size: 8px;">CHECKED:</td> <td style="font-size: 8px;">DATE:</td> </tr> <tr> <td style="text-align: center;">DEA</td> <td style="text-align: center;">DEA</td> <td> </td> <td style="text-align: center;">08/16/16</td> </tr> </table>	DESIGNED:	CAD:	CHECKED:	DATE:	DEA	DEA		08/16/16	LOGAN MILL ROAD SURVEY CONTROL PROJECT NO: 4012.SEPT12C39 SHEET NO: 15
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:																										
DESIGNED:	CAD:	CHECKED:	DATE:																										
DEA	DEA		08/16/16																										

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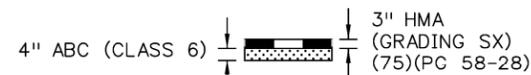


- STA 101+05.12 TO STA 101+16.19 0'-0" TO 5'-9"
- STA 104+38.33 TO STA 104+58.38 5'-9" TO 5'-11"
- STA 104+58.38 TO STA 104+80.00 5'-11" TO 1'-0"
- STA 104+80.00 TO STA 105+02.03 1'-0" TO 1'-0"

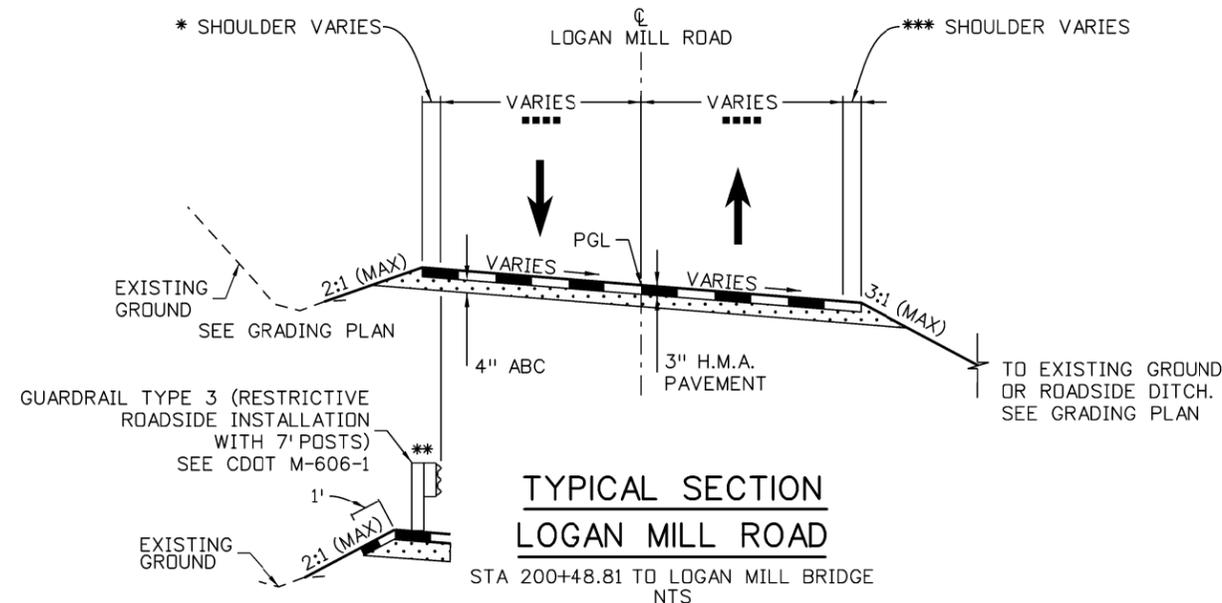
**TYPICAL SECTION
FOURMILE CANYON DR**
STA 101+05.12 TO STA 101+16.19
STA 104+38.33 TO STA 105+02.03
NTS

- TURN LANE**
- STA 101+05.12 TO STA 101+47.87 0'-0" TO 1'-6"
 - STA 101+47.87 TO STA 102+46.97 1'-6" TO 11'-0"
 - STA 102+46.97 TO STA 103+29.72 11'-0" TO 11'-3"

- STRIPED MEDIAN**
- STA 103+58.25 TO STA 103+73.13 0'-0" TO 8'-6"
 - STA 103+73.13 TO STA 103+97.41 8'-6" TO 6'-3"
 - STA 103+97.41 TO STA 104+37.26 6'-3" TO 1'-7"
 - STA 104+37.26 TO STA 104+60.81 1'-7" TO 0'-0"



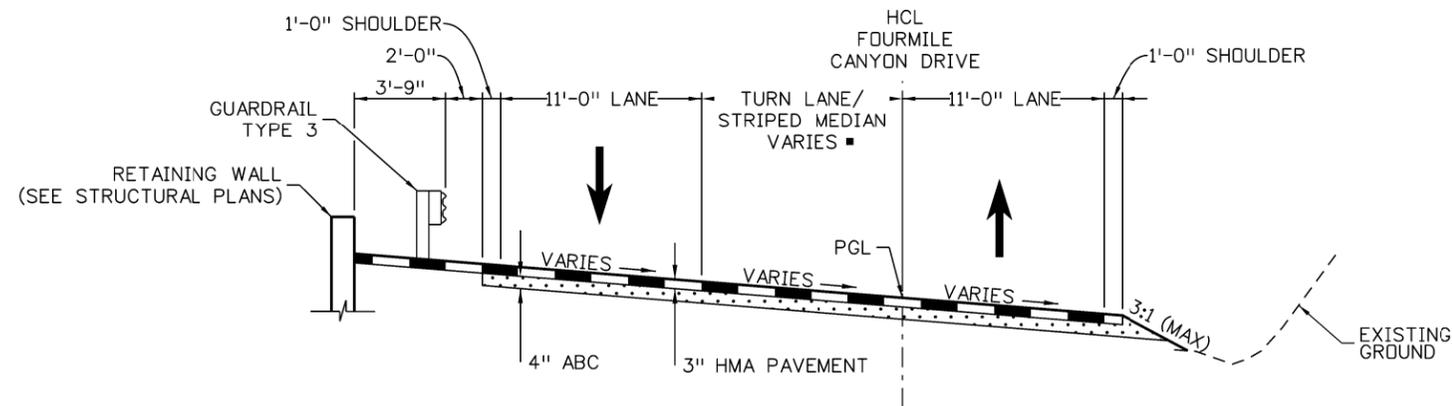
PAVEMENT DETAIL
NTS



- * STA 200+80.78 LT TO STA 202+33.95 LT 1'-0"
- * STA 200+84.80 LT TO STA 202+33.95 LT 1'-0" TO 2'-0"
- ** STA 200+48.81 LT TO STA 201+80.78 LT

- LEFT LANE**
- STA 200+48.81 TO STA 200+59.80 6'-5" TO 7'-8"
 - STA 200+59.80 TO STA 200+88.01 7'-8" TO 11'-0"
 - STA 200+88.01 TO LOGAN MILL BRIDGE 11'-0"
- RIGHT LANE**
- STA 200+48.81 TO STA 201+14.85 6'-5" TO 11'-0"
 - STA 201+14.85 TO LOGAN MILL BRIDGE 11'-0"
- *** STA 200+48.81 TO STA 201+84.77 1'-0" TO 1'-0"
- *** STA 200+84.77 TO STA 202+33.95 1'-0" TO 1'-0"

**TYPICAL SECTION
LOGAN MILL ROAD**
STA 200+48.81 TO LOGAN MILL BRIDGE
NTS



**TYPICAL SECTION
FOURMILE CANYON DR W/ RETAINING WALL**
STA 101+16.19 TO STA 103+26.22
STA 103+70.96 TO STA 104+38.33
NTS

NOTES:

1. ROADWAY SUPERELEVATION VARIES. SEE ROADWAY PROFILES.
2. SEE STRUCTURAL SHEETS FOR ROADWAY STRUCTURAL SECTION AT APPROACH SLAB.
3. SEE GRADING PLAN FOR EMBANKMENT SLOPE SLOPES AT DRIVEWAYS AND DRAINAGE STRUCTURES.

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



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**BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION**
Michael Baker INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
JLW	EAV	JPZ	08/16/16

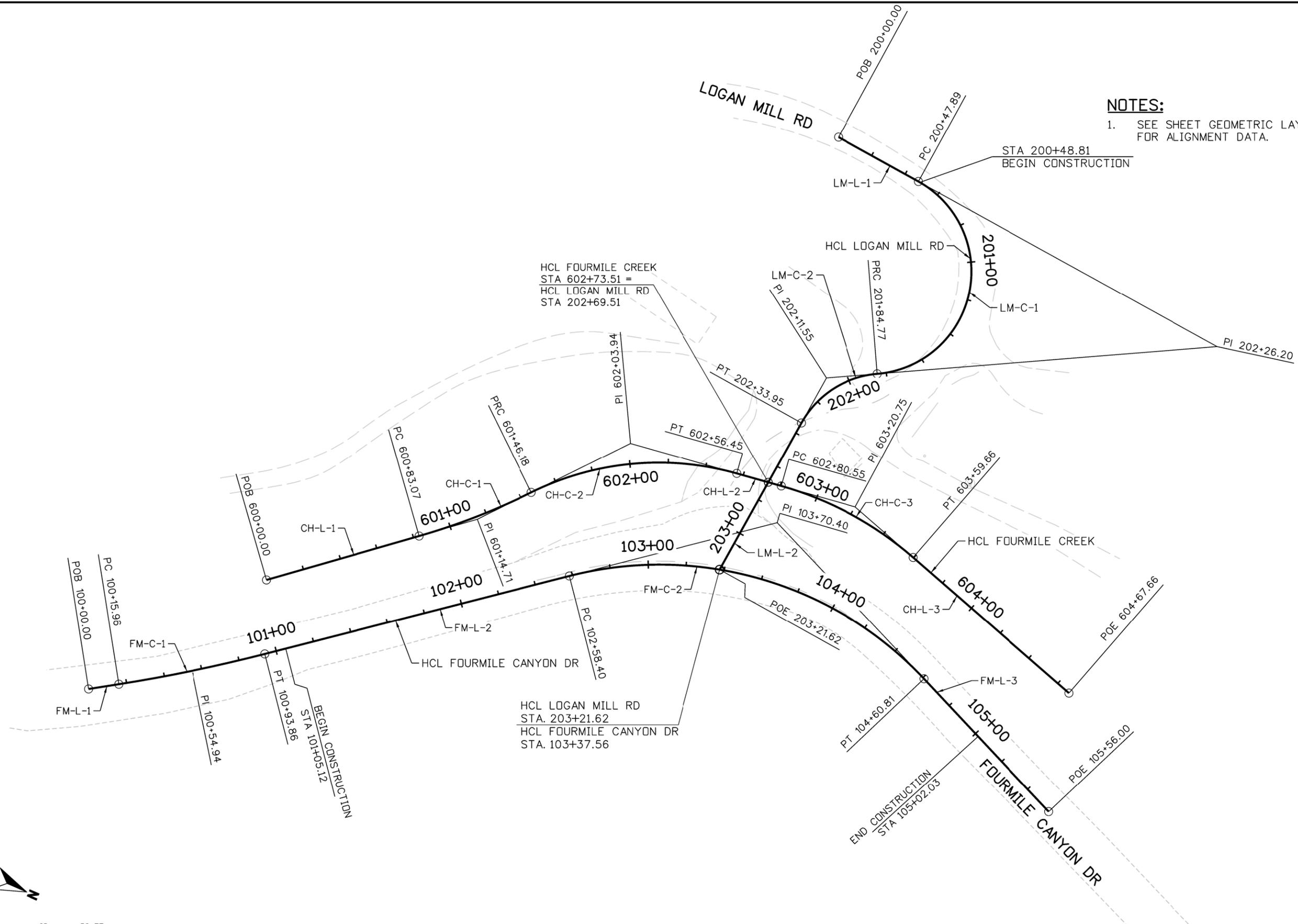
LOGAN MILL ROAD
TYPICAL SECTIONS
(SHEET 1 OF 1)

PROJECT NO: 4012.SEP12C39 SHEET NO: 16

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NOTES:

1. SEE SHEET GEOMETRIC LAYOUT (2 OF 2) FOR ALIGNMENT DATA.



90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

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BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

Michael Baker INTERNATIONAL

DESIGNED: **JLW** CAD: **EAV** CHECKED: **JPZ** DATE: **08/16/16**

LOGAN MILL ROAD
 GEOMETRIC LAYOUT
 (SHEET 1 OF 2)

PROJECT NO: 4012.SEPT12C39 SHEET NO: 17

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HORIZONTAL ALIGNMENT DATA (HCL FOURMILE CANYON DR)											
LINE NUMBER	CURVE NUMBER	POINT TYPE	STATION	NORTHING	EASTING	BEARING	DISTANCE FEET	RADIUS FEET	LENGTH FEET	CURVE DELTA	CURVE DIRECTION
		POB	100+00.00	258263.25	39072.71						
FM-L-1						N32°18'13W	15.96				
		PC	100+15.96	258276.73	39064.18						
	FM-C-1	PI	100+54.94	258309.68	39043.35			825.00	77.90	5°24'37"	LEFT
		PT	100+93.86	258340.52	39019.51						
FM-L-2						N37°42'50W	164.54				
		PC	102+58.40	258470.68	38918.86						
	FM-C-2	PI	103+70.40	258559.28	38850.34			190.00	202.41	61°02'19"	RIGHT
		PT	104+60.81	258662.13	38894.69						
FM-L-3						N23°19'29E	95.19				
		PDE	105+56.00	258749.55	38932.38						

NOTES:
 1. SEE SHEET GEOMETRIC LAYOUT (1 OF 2) FOR ALIGNMENT GRAPHICS.

HORIZONTAL ALIGNMENT DATA (HCL LOGAN MILL RD)											
LINE NUMBER	CURVE NUMBER	POINT TYPE	STATION	NORTHING	EASTING	BEARING	DISTANCE FEET	RADIUS FEET	LENGTH FEET	CURVE DELTA	CURVE DIRECTION
		POB	200+00.00	258508.98	38653.15						
LM-L-1						N05°29'36E	47.89				
		PC	200+47.89	258556.65	38657.73						
	LM-C-1	PI	202+26.20	258734.14	38674.80			53.50	136.89	146°35'54"	RIGHT
		PCC	201+84.77	258576.57	38758.26						
	LM-C-2	PI	202+11.55	258552.90	38770.80			50.00	49.17	56°20'51"	LEFT
		PT	202+33.95	258550.22	38797.44						
LM-L-2						S84°15'21E	87.68				
		PDE	203+21.62	258541.44	38884.68						

HORIZONTAL ALIGNMENT DATA (HCL FOURMILE CREEK)											
LINE NUMBER	CURVE NUMBER	POINT TYPE	STATION	NORTHING	EASTING	BEARING	DISTANCE FEET	RADIUS FEET	LENGTH FEET	CURVE DELTA	CURVE DIRECTION
		POB	600+00.00	258325.96	38983.60						
CH-L-1						N 39° 21'31" W	83.07				
		PC	600+83.07	258390.19	38930.92						
	CH-C-1	PI	601+14.71	258414.66	38910.85			350.00	63.10	10°19'49"	LEFT
		PRC	601+46.18	258435.12	38886.73						
	CH-C-2	PI	602+03.94	258472.49	38842.68			150.00	110.28	42°07'19"	RIGHT
		PT	602+56.45	258529.75	38835.07						
CH-L-2						N 7° 34'01" W	24.10				
		PC	602+80.55	258553.64	38831.90						
	CH-C-3	PI	603+20.75	258593.50	38826.61			180.00	79.11	25°10'53"	RIGHT
		PT	603+59.66	258631.81	38838.77						
CH-L-3						N 17° 36'52" E	108.00				
		PDE	604+67.66	258734.75	38871.45						

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Legend

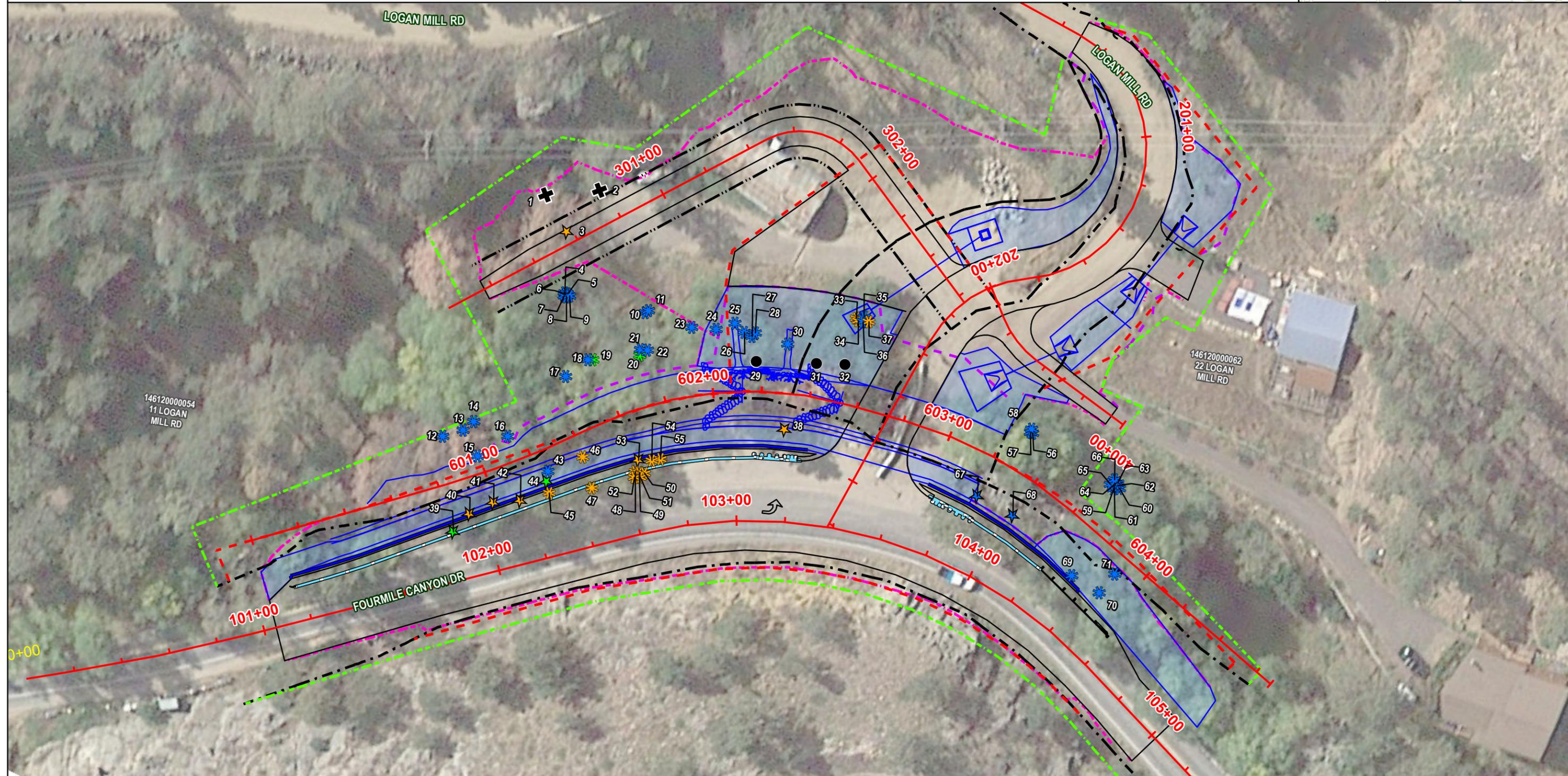
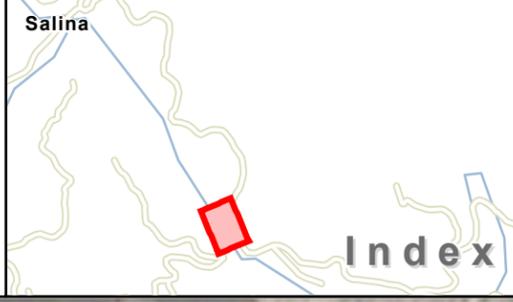
- Centerline
- - - Existing Right-of-Way (ROW)
- Drainage Feature
- Edge of Roadway
- - - Proposed ROW
- - - Toe-of-Fill
- Guardrail
- · - · - Proposed ROW Access Control
- · - · - Top-of-Cut
- Wall
- · - · - Permanent Easement
- Rip Rap
- · - · - Temporary Easement

Tree Type

- ★ Conifer - Shrub
- ★ Conifer - Small (2-6 inches)
- ★ Conifer - Medium (6-12 inches)
- ★ Conifer - Large (12+ inches)
- ✿ Deciduous - Shrub
- ✿ Deciduous - Small (2-6 inches)
- ✿ Deciduous - Medium (6-12 inches)
- ✿ Deciduous - Large (12+ inches)

- ✕ Dead - Standing
- Dead - Stump

Note: Tree locations are only accurate to a distance of 4-10 meters and will be field verified during construction.



40 20 0 40 Feet

Horizontal Scale: 1" = 40'

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

Michael Baker INTERNATIONAL

DESIGNED: CAD: CHECKED: DATE: **08/16/16**

LOGAN MILL ROAD TREE INVENTORY PLANS
(1 of 1)

PROJECT NO: 4012.SEPT12C39 SHEET NO: 20

Map ID	Type	Size	Easting	Northing	ROW	Riparian	Removal	Potential Removal	Protect in Place	Replace
1	Dead - Standing		38805.30	258380.85	Outside	No	X			0*
2	Dead - Standing		38794.82	258400.53	Outside	No	X			0*
3	Conifer	Small	38815.77	258394.94	Outside	No	X			0*
4	Deciduous	Large	38838.98	258403.96	Outside	No			X	
5	Deciduous	Large	38838.98	258405.28	Outside	No			X	
6	Deciduous	Large	38839.47	258404.60	Outside	No			X	
7	Deciduous	Large	38840.35	258404.33	Outside	No			X	
8	Deciduous	Large	38840.37	258405.30	Outside	No			X	
9	Deciduous	Large	38839.45	258406.43	Outside	No			X	
10	Deciduous	Large	38833.40	258437.73	Outside	Yes			X	
11	Deciduous	Large	38832.00	258438.62	Outside	Yes			X	
12	Deciduous	Large	38912.99	258381.24	Outside	Yes			X	
13	Deciduous	Large	38907.57	258387.94	Outside	Yes			X	
14	Deciduous	Large	38902.47	258390.60	Outside	Yes			X	
15	Deciduous	Large	38914.85	258397.61	Outside	Yes		X		
16	Deciduous	Large	38902.47	258405.81	Outside	Yes		X		
17	Deciduous	Large	38870.47	258417.96	Outside	Yes			X	
18	Deciduous	Large	38860.59	258423.75	Outside	Yes			X	
19	Deciduous	Medium	38859.63	258425.52	Outside	Yes			X	
20	Deciduous	Medium	38850.19	258442.57	Outside	Yes			X	
21	Deciduous	Large	38848.17	258441.99	Outside	Yes			X	
22	Deciduous	Large	38847.18	258444.72	Outside	Yes			X	
23	Deciduous	Large	38831.28	258457.78	Outside	Yes			X	
24	Deciduous	Large	38828.10	258467.28	Outside	Yes	X			0*
25	Deciduous	Large	38822.71	258473.28	Outside	Yes	X			0*
26	Deciduous	Large	38824.68	258478.37	Outside	Yes	X			0*
27	Deciduous	Large	38824.92	258481.99	Outside	Yes	X			0*
28	Deciduous	Large	38823.05	258482.63	Outside	Yes	X			0*
29	Dead - Stump		38833.79	258487.67	Outside	Yes	X			0*
30	Deciduous	Large	38821.99	258496.76	Outside	Yes	X			0*
31	Dead - Stump		38824.66	258510.77	Outside	Yes	X			0*
32	Dead - Stump		38820.38	258521.79	Outside	Yes	X			0*
33	Deciduous	Small	38801.04	258518.43	Outside	No	X			0*
34	Deciduous	Small	38801.78	258519.63	Outside	No	X			0*
35	Deciduous	Large	38799.40	258521.26	Outside	No	X			0*
36	Deciduous	Large	38801.30	258521.60	Outside	No	X			0*
37	Deciduous	Small	38800.34	258523.78	Outside	No	X			0*
38	Conifer	Small	38854.84	258509.58	Outside	Yes	X			0*
39	Conifer	Medium	38947.54	258400.95	Inside	No	X			1
40	Conifer	Small	38938.18	258404.09	Inside	No	X			1
41	Conifer	Small	38929.91	258411.29	Inside	No	X			1
42	Conifer	Small	38924.83	258421.14	Inside	No	X			1
43	Deciduous	Large	38909.11	258426.69	Outside	Yes	X			0*
44	Conifer	Medium	38913.34	258428.06	Inside	No	X			1
45	Deciduous	Small	38917.16	258430.78	Inside	No	X			1
46	Deciduous	Small	38897.99	258437.61	Outside	Yes	X			0*
47	Deciduous	Small	38908.28	258446.14	Inside	No	X			1
48	Deciduous	Small	38895.10	258459.90	Inside	No	X			1
49	Deciduous	Small	38894.83	258461.53	Inside	No	X			1
50	Deciduous	Small	38894.10	258463.50	Inside	No	X			1

Map ID	Type	Size	Easting	Northing	ROW	Riparian	Removal	Potential Removal	Protect in Place	Protect in Place
51	Deciduous	Small	38896.30	258462.56	Inside	No	X			1
52	Deciduous	Small	38897.35	258460.46	Inside	No	X			1
53	Conifer	Small	38890.29	258459.21	Outside	Yes	X			0*
54	Deciduous	Small	38888.08	258464.25	Inside	Yes	X			1
55	Deciduous	Small	38886.21	258467.33	Inside	Yes	X			1
56	Deciduous	Large	38815.64	258603.88	Outside	Yes			X	
57	Deciduous	Large	38815.64	258602.89	Inside	Yes			X	
58	Deciduous	Large	38814.36	258602.89	Inside	Yes			X	
59	Deciduous	Large	38823.48	258643.60	Outside	Yes			X	
60	Deciduous	Large	38822.28	258645.63	Outside	Yes			X	
61	Deciduous	Large	38822.38	258643.42	Outside	Yes			X	
62	Deciduous	Large	38821.51	258644.70	Outside	Yes			X	
63	Deciduous	Large	38820.40	258644.16	Outside	Yes			X	
64	Deciduous	Large	38820.98	258643.47	Outside	Yes			X	
65	Deciduous	Large	38822.22	258641.57	Outside	Yes			X	
66	Deciduous	Large	38819.88	258642.52	Outside	Yes			X	
67	Conifer	Large	38848.51	258593.27	Inside	Yes		X		
68	Conifer	Large	38850.08	258609.94	Inside	Yes			X	
69	Deciduous	Large	38863.02	258641.93	Inside	Yes	X			1
70	Deciduous	Large	38865.12	258655.13	Inside	Yes	X			1
71	Deciduous	Large	38855.37	258658.01	Outside	Yes		X		
Total Conifer Tree			10		Inside: 7	Yes: 6	8	1	1	
Total Deciduous Tree			56		Inside: 13	Yes: 38	24	3	29	
Total Shrub - Conifer			0		Inside: 0	Yes: 0	0	0	0	
Total Shrub - Deciduous			0		Inside: 0	Yes: 0	0	0	0	
Total Dead - Standing			2		Inside: 0	Yes: 0	2	0	0	
Total Dead - Stump			3		Inside: 0	Yes: 3	3	0	0	
Grand Total			71		Inside: 20	Yes: 45	37	4	30	

Notes:
 * Not being replaced by Project, will be replaced by others: Conifer = 5; Deciduous = 11
 ** During construction it will be determined if trees designated as potential removal are required to be removed or if they can remain in place.

Note:
 Small = 2 inch - 6 inch dbh
 Medium = 6 inch - 12 inch dbh
 Large = 12 inch + dbh

90% SET



CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN
 ADVANCE BEFORE YOU DIG, GRADE,
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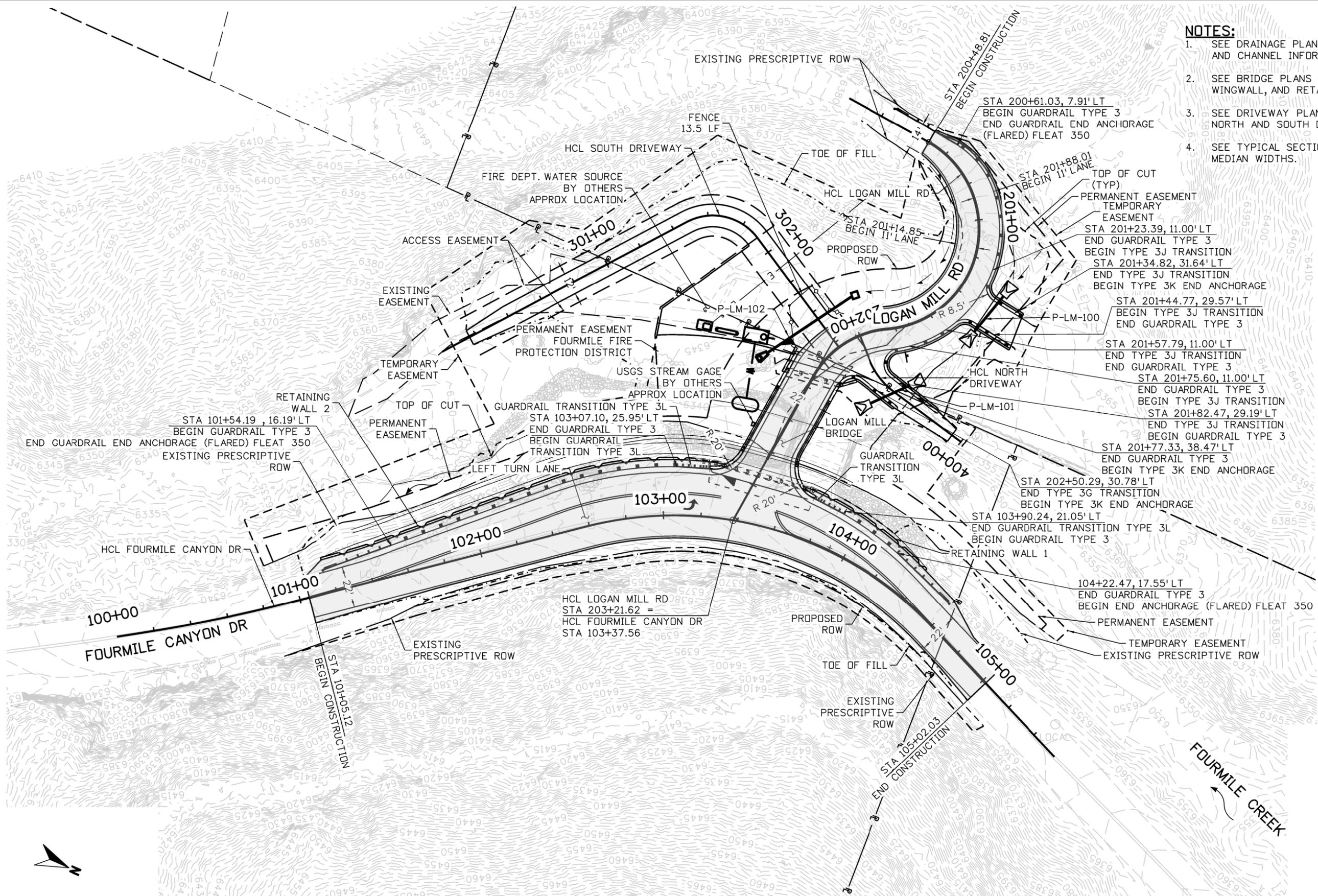
Michael Baker
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DESIGNED: CAD: CHECKED: DATE: **08/16/16**

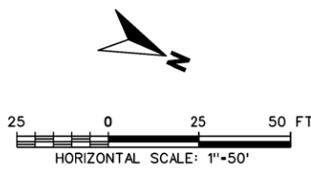
LOGAN MILL ROAD
TREE INVENTORY TABLE
 (Sheet 1 of 1)

PROJECT NO: 4012.SEPT12C39 SHEET NO: 21

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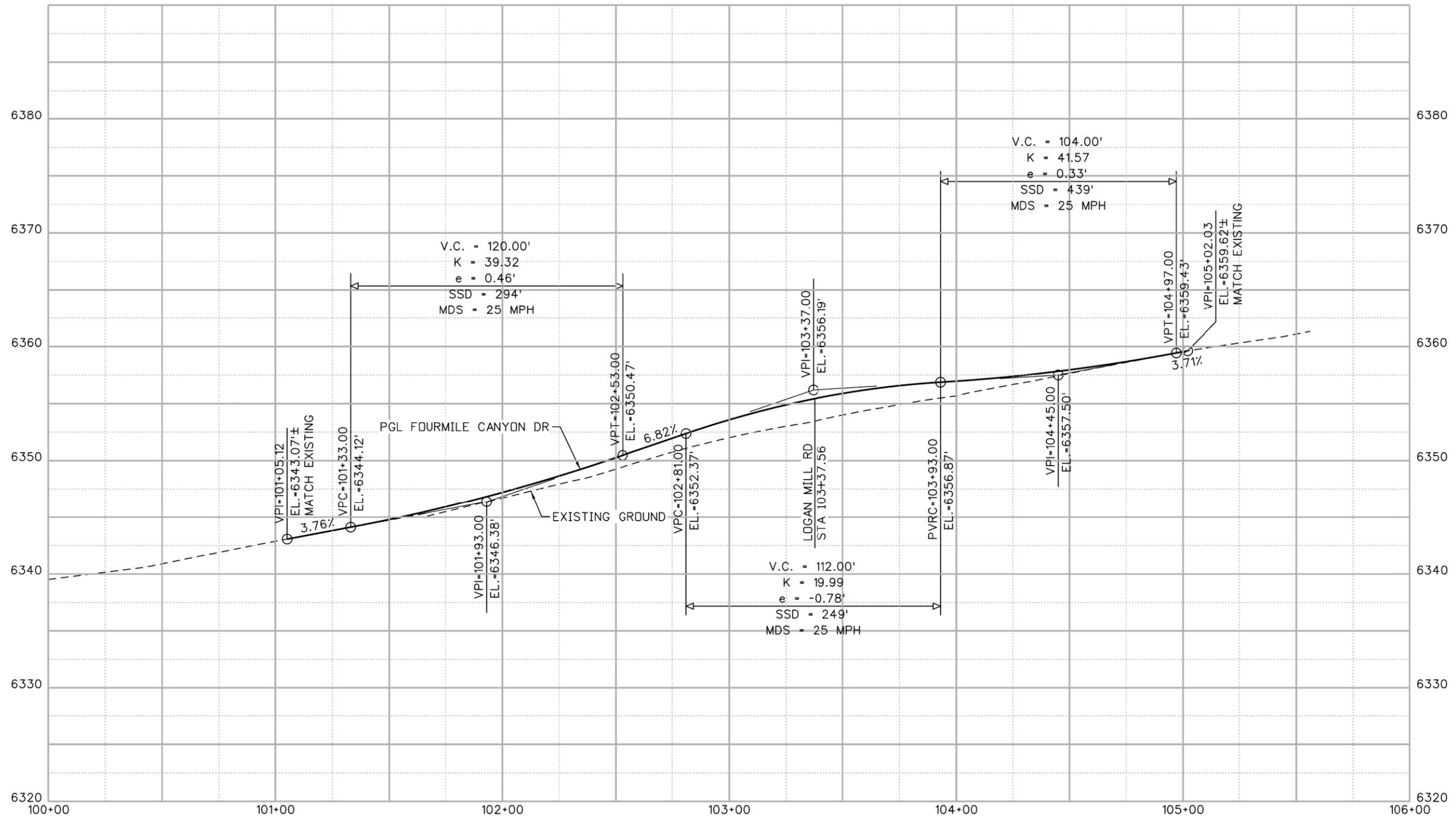


- NOTES:**
1. SEE DRAINAGE PLANS FOR CULVERT AND CHANNEL INFORMATION.
 2. SEE BRIDGE PLANS FOR BRIDGE, WINGWALL, AND RETAINING WALL INFORMATION.
 3. SEE DRIVEWAY PLAN AND PROFILES FOR NORTH AND SOUTH DRIVEWAY DESIGN.
 4. SEE TYPICAL SECTIONS FOR TURN LANE AND MEDIAN WIDTHS.

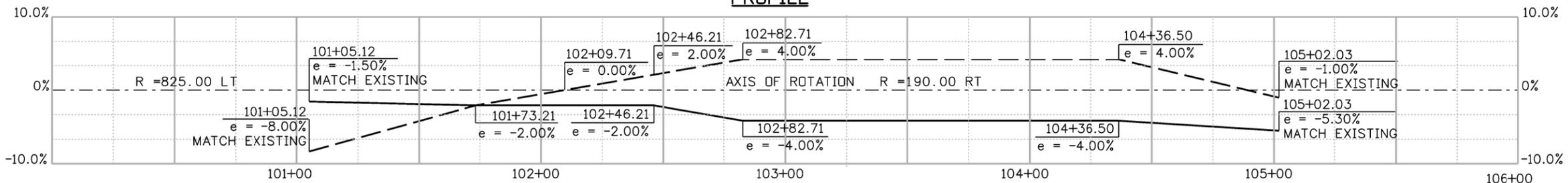


90% SET	CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION	DESIGNED:	CAD:	CHECKED:	DATE:	PROJECT NO: 4012.SEPT12C39	SHEET NO: 22
		REVISIONS:	NO.	DATE		REVISION DESCRIPTION:	JLW	EAV	JPZ		

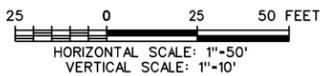
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PROFILE



SUPERELEVATION



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CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:

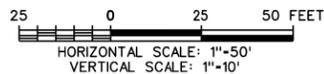
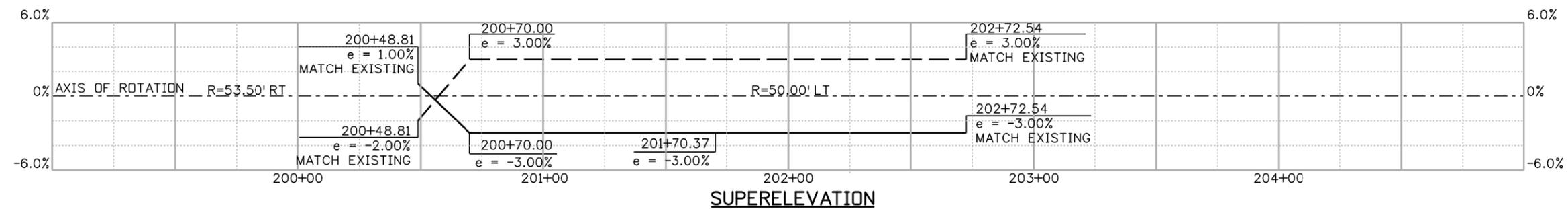
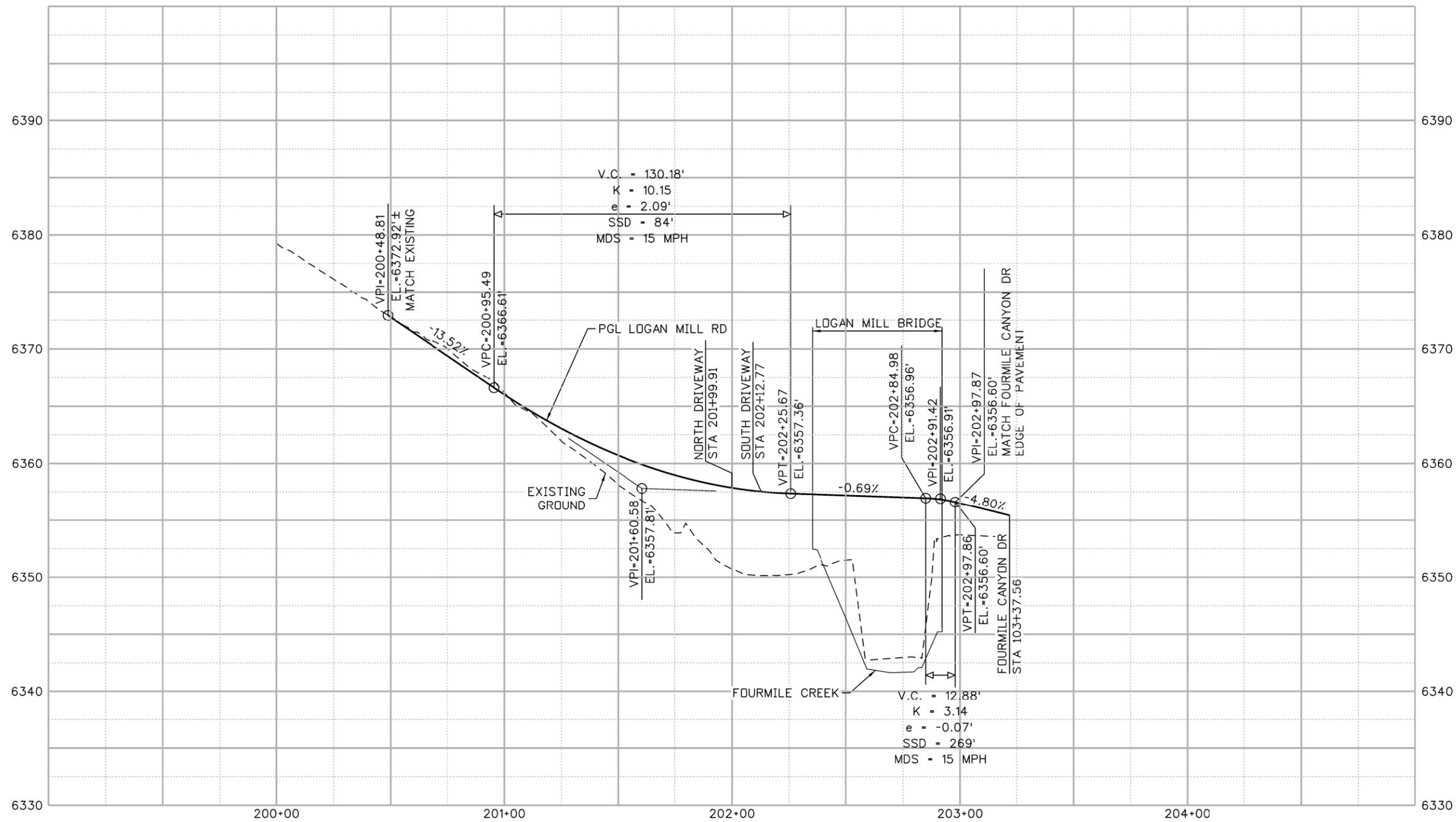
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED: JLW	CAD: EAV	CHECKED: JPZ	DATE: 08/16/16
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LOGAN MILL ROAD
FOURMILE CANYON DRIVE
PROFILE

PROJECT NO: 4012.SEPT12C39 SHEET NO: 23

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CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



NO.	DATE	REVISION DESCRIPTION:

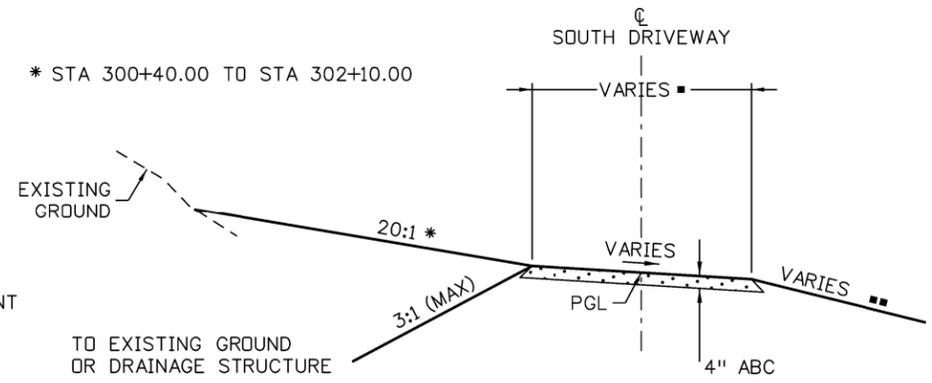
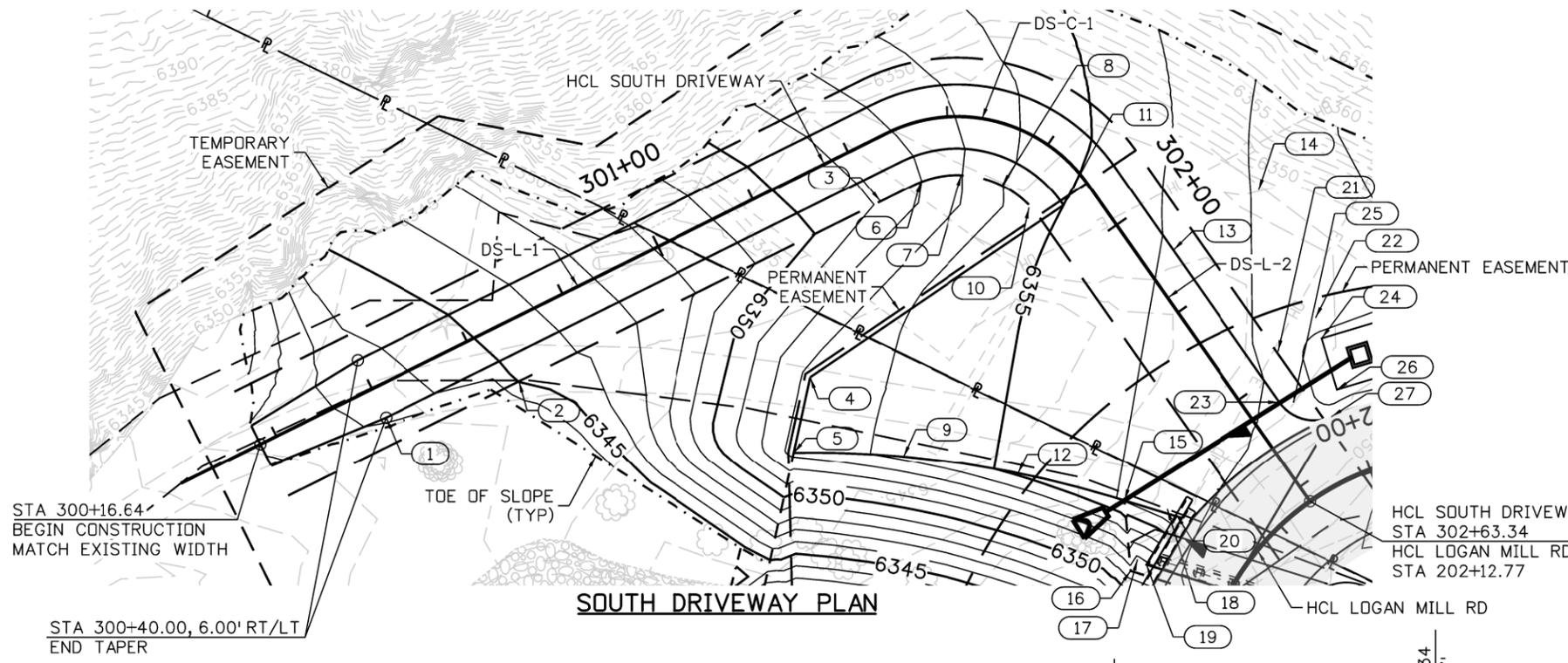


BOULDER COUNTY TRANSPORTATION DEPARTMENT
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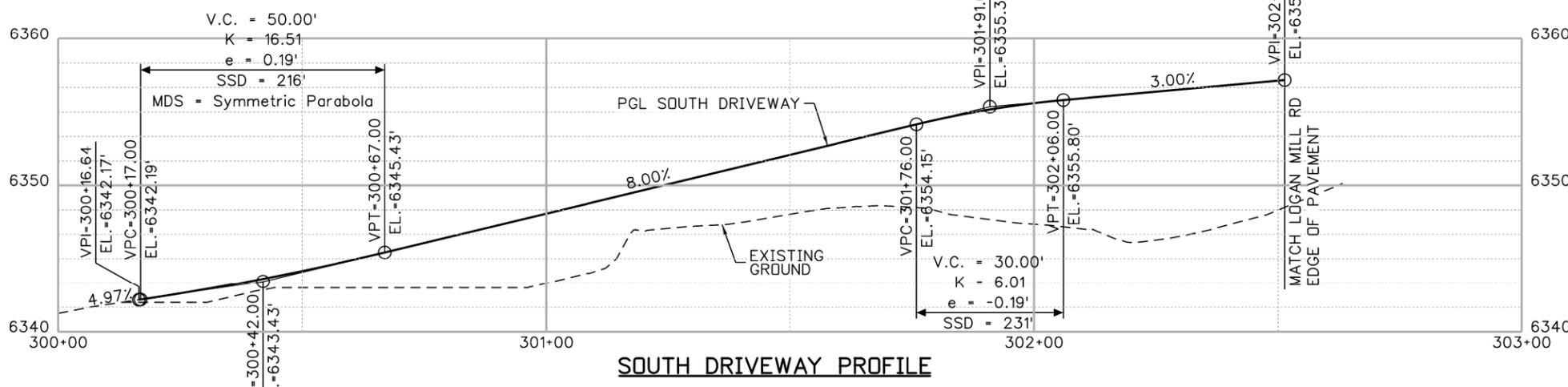
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LOGAN MILL ROAD PROFILE
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 24

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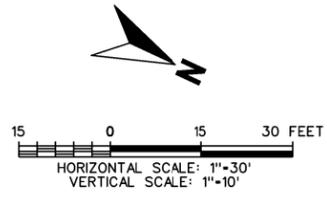


- TYPICAL SECTION SOUTH DRIVEWAY**
SOUTH DRIVEWAY STA 300+16.64 TO STA 302+44.76 NTS
- STA 300+16.64 TO STA 300+40.00 8'-3"± TO 12'-0"
 - STA 300+40.00 TO STA 302+44.76 12'-0"
 - STA 300+16.64 TO STA 300+60.00 3:1 (MAX)
 - STA 300+60.00 TO STA 302+00.00 SEE GRADING POINT TABLES
 - STA 302+00 TO STA 302+44.76 3% TO CHANNEL BANK



NOTES:
1. SEE GRADING POINT TABLES FOR GRADING POINT INFORMATION.

HORIZONTAL ALIGNMENT DATA (HCL DRIVEWAY SOUTH)											
LINE NUMBER	CURVE NUMBER	POINT TYPE	STATION	NORTHING	EASTING	BEARING	DISTANCE FEET	RADIUS FEET	LENGTH FEET	CURVE DELTA	CURVE DIRECTION
DS-L-1		PDB	300+00.00	258362.63	38863.81						
		PC	301+48.11	258455.33	38748.29	N 51° 15' 17" W	148.11				
	DS-C-1	PI	301+73.85	258471.44	38728.22			30	42.55	81° 15' 49"	RIGHT
		PT	301+90.66	258493.73	38741.09						
DS-L-2		PDE	302+63.34	258556.67	38777.44	N 30° 00' 33" E	72.68				



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NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

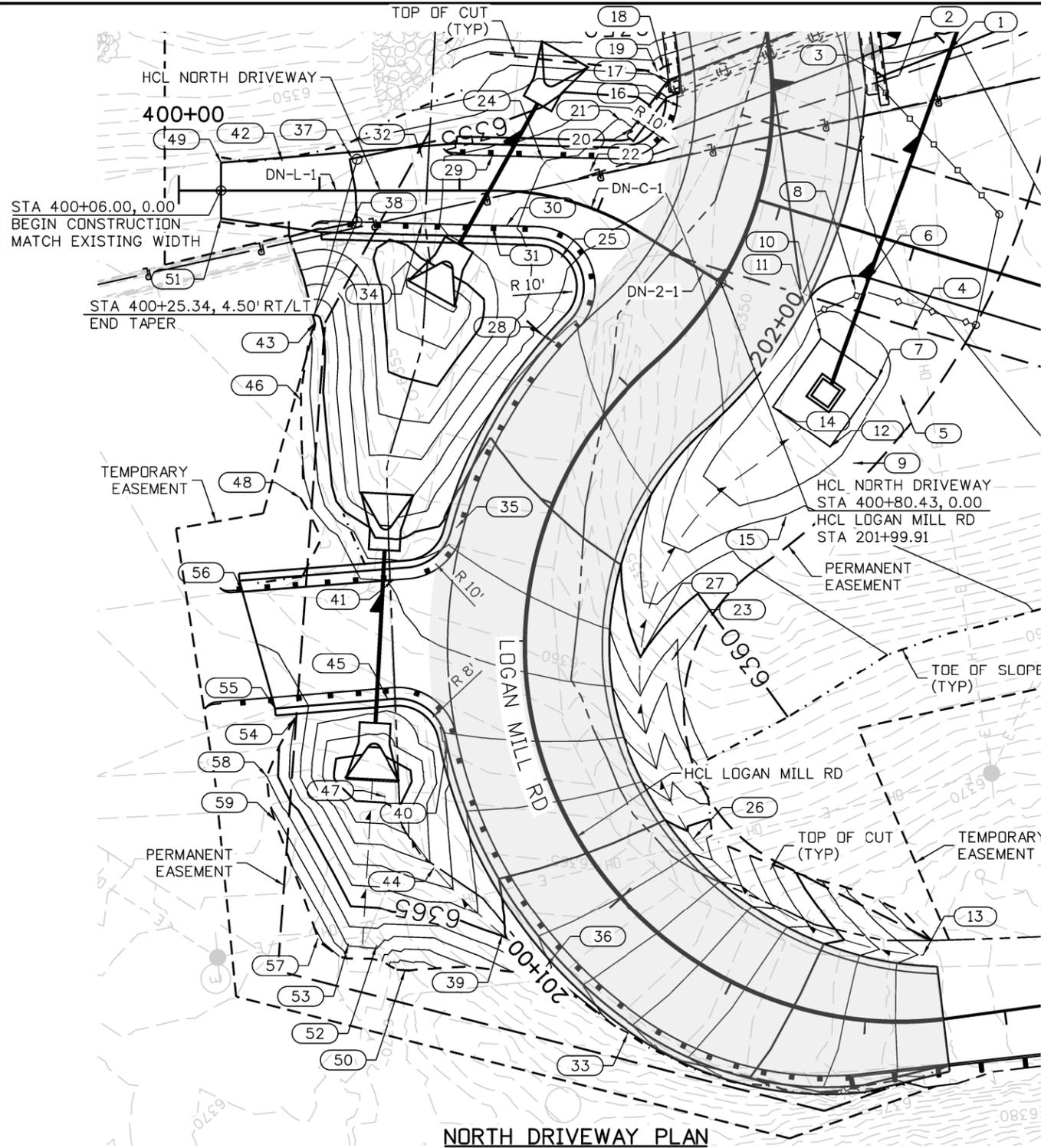
Michael Baker INTERNATIONAL

DESIGNED: JLW	CAD: EAV	CHECKED: JPZ	DATE: 08/16/16
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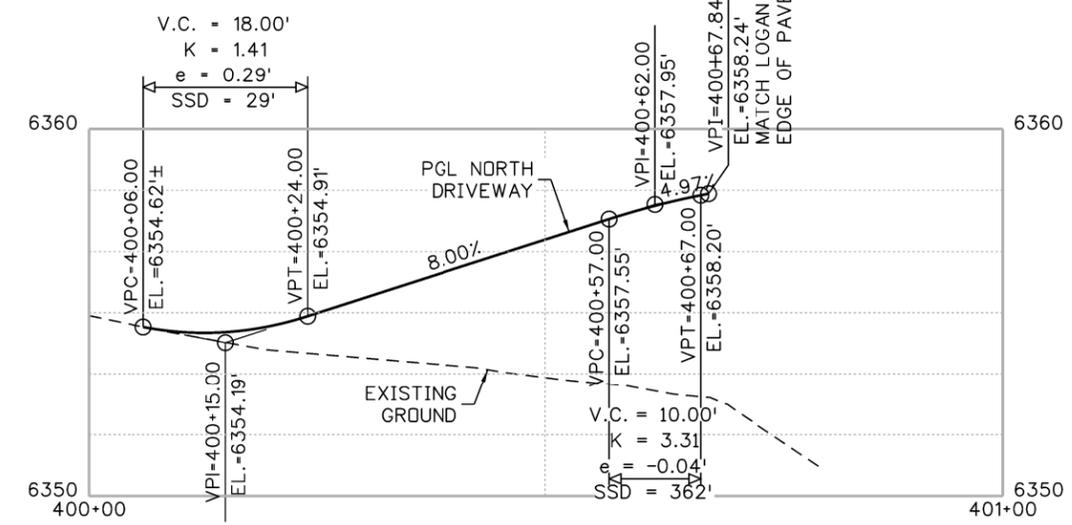
LOGAN MILL ROAD DRIVEWAY PLAN AND PROFILE SOUTH DRIVEWAY

PROJECT NO: 4012.SEP12C39 SHEET NO: 26

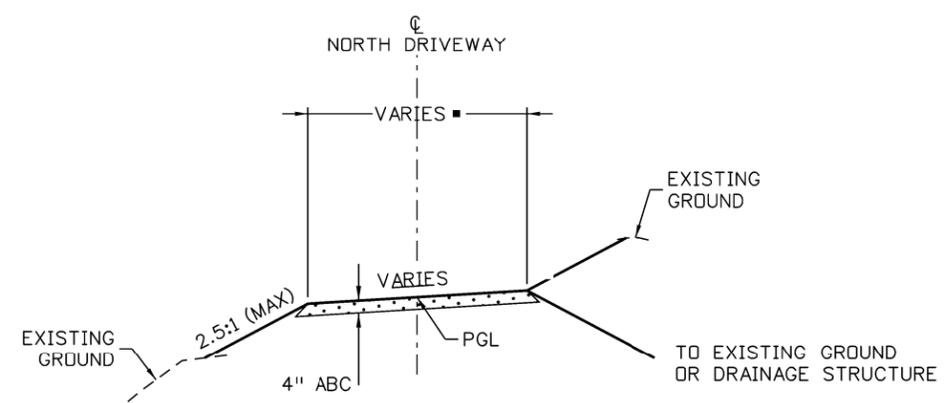
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NORTH DRIVEWAY PLAN



NORTH DRIVEWAY PROFILE



TYPICAL SECTION NORTH DRIVEWAY
NTS

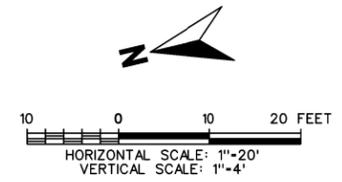
NOTES:

- SEE GRADING POINT TABLES FOR GRADING POINT INFORMATION.

- STA 400+06.00 TO STA 400+46.94
- STA 400+06.00 TO STA 400+30.00 8'-0"± TO 10'-0"
- STA 400+30.00 TO STA 400+57.11 10'-0"

HORIZONTAL ALIGNMENT DATA (HCL DRIVEWAY NORTH)

LINE NUMBER	CURVE NUMBER	POINT TYPE	STATION	NORTHING	EASTING	BEARING	DISTANCE FEET	RADIUS FEET	LENGTH FEET	CURVE DELTA	CURVE DIRECTION
DN-L-1		POB	400+00.00	258636.71	38797.71						
		PC	400+44.67	258593.23	38787.47	S 13° 15' 14" W	44.67				
	DN-C-1	PI	400+55.95	258582.25	38784.88			40	21.99	31° 29' 54"	RIGHT
		PT	400+66.66	258574.24	38776.94						
DN-L-2		POE	400+80.43	258564.46	38767.25	S 44° 45' 08" W	13.77				



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NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

Michael Baker INTERNATIONAL

DESIGNED: **JLW** CAD: **EAV** CHECKED: **JPZ** DATE: **08/16/16**

LOGAN MILL ROAD DRIVEWAY PLAN AND PROFILE NORTH DRIVEWAY

PROJECT NO: 4012.SEP12C39 SHEET NO: 27

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NORTH DRIVEWAY POINT TABLE				
PT #	NORTHING	EASTING	ELEV.	DESC.
1	258524.93	38792.01	6356.07	EDGE OF FIRE ACCESS (ABC)
2	258532.87	38790.06	6356.88	EDGE OF FIRE ACCESS (ABC)
3	258534.82	38790.26	6356.94	EDGE OF FIRE ACCESS (ABC)
4	258539.39	38754.41	6357.41	RIPRAP DRAINAGE BERM
5	258543.09	38745.78	6357.89	RIPRAP DRAINAGE BERM
6	258543.58	38762.95	6357.15	EDGE OF DRIVEWAY (ABC)
7	258545.75	38748.77	6356.56	EDGE OF EX. INLET GRADING
8	258546.02	38761.90	6357.41	RIPRAP DRAINAGE BERM
9	258552.01	38737.87	6357.65	RIPRAP DRAINAGE BERM
10	258552.38	38756.26	6356.56	EDGE OF EX. INLET GRADING
11	258553.57	38761.33	6357.42	EDGE OF LOGAN MILL RD (HMA)
12	258554.67	38740.87	6356.32	EDGE OF EX. INLET GRADING
13	258558.30	38667.32	6372.13	DITCH CENTERLINE
14	258561.30	38748.35	6356.32	EDGE OF EX. INLET GRADING
15	258563.06	38732.69	6358.10	RIPRAP DRAINAGE BERM
16	258564.22	38792.87	6357.74	EDGE OF LOGAN MILL RD (HMA)
17	258565.15	38797.01	6352.77	2' MAINTENANCE BENCH
18	258565.41	38798.99	6352.73	2' MAINTENANCE BENCH
19	258566.41	38798.55	6352.73	2' MAINTENANCE BENCH
20	258571.92	38791.47	6357.14	2' MAINTENANCE BENCH
21	258573.19	38793.02	6357.10	2' MAINTENANCE BENCH
22	258579.05	38787.00	6357.40	EDGE OF DRIVEWAY (ABC)
23	258583.57	38716.63	6361.50	RIPRAP DRAINAGE BERM
24	258585.29	38790.15	6356.96	EDGE OF DRIVEWAY (ABC)
25	258585.90	38775.92	6357.80	EDGE OF DRIVEWAY (ABC)
26	258586.49	38691.00	6365.28	DITCH CENTERLINE
27	258587.84	38718.04	6360.00	DITCH CENTERLINE
28	258589.50	38764.35	6359.18	EDGE OF LOGAN MILL RD (HMA)
29	258592.08	38792.33	6356.50	EDGE OF DRIVEWAY (ABC)
30	258592.46	38782.09	6356.85	EDGE OF DRIVEWAY (ABC)
31	258594.37	38782.60	6356.65	EDGE OF DRIVEWAY (ABC)
32	258601.86	38794.37	6355.77	EDGE OF DRIVEWAY (ABC)
33	258601.95	38666.24	6367.34	DITCH CENTERLINE
34	258604.05	38785.14	6355.79	EDGE OF DRIVEWAY (ABC)
35	258609.25	38741.93	6360.75	EDGE OF LOGAN MILL RD (HMA)
36	258611.16	38678.10	6365.75	DITCH CENTERLINE
37	258611.66	38796.42	6355.03	EDGE OF DRIVEWAY (ABC)
38	258613.72	38787.69	6354.95	EDGE OF DRIVEWAY (ABC)
39	258616.15	38683.94	6364.92	DITCH CENTERLINE
40	258617.56	38712.21	6363.14	EDGE OF LOGAN MILL RD (HMA)
41	258619.60	38736.77	6361.96	EDGE OF DRIVEWAY (ABC)
42	258621.44	38798.46	6354.60	EDGE OF DRIVEWAY (ABC)
43	258622.21	38774.98	6360.47	TOP OF CUT
44	258623.40	38695.53	6362.18	DITCH CENTERLINE
45	258624.39	38720.31	6362.48	EDGE OF DRIVEWAY (ABC)
46	258626.64	38764.76	6361.71	TOP OF CUT
47	258627.91	38706.93	6360.46	DITCH CENTERLINE
48	258629.91	38751.13	6362.20	TOP OF CUT
49	258629.95	38800.24	6354.78	EDGE OF DRIVEWAY (ABC)
50	258630.80	38682.18	6370.03	TOP OF CUT
51	258631.79	38792.44	6354.54	EDGE OF DRIVEWAY (ABC)
52	258634.00	38686.60	6366.80	BOTTOM OF DITCH
53	258637.83	38687.74	6366.80	BOTTOM OF DITCH
54	258637.86	38720.83	6364.00	TOP OF CUT
55	258640.31	38722.77	6363.51	EDGE OF DRIVEWAY (ABC)
56	258640.99	38740.09	6362.42	EDGE OF DRIVEWAY (ABC)
57	258641.88	38689.48	6369.22	TOP OF CUT
58	258643.67	38713.65	6366.00	TOP OF CUT
59	258643.99	38707.33	6367.30	TOP OF CUT

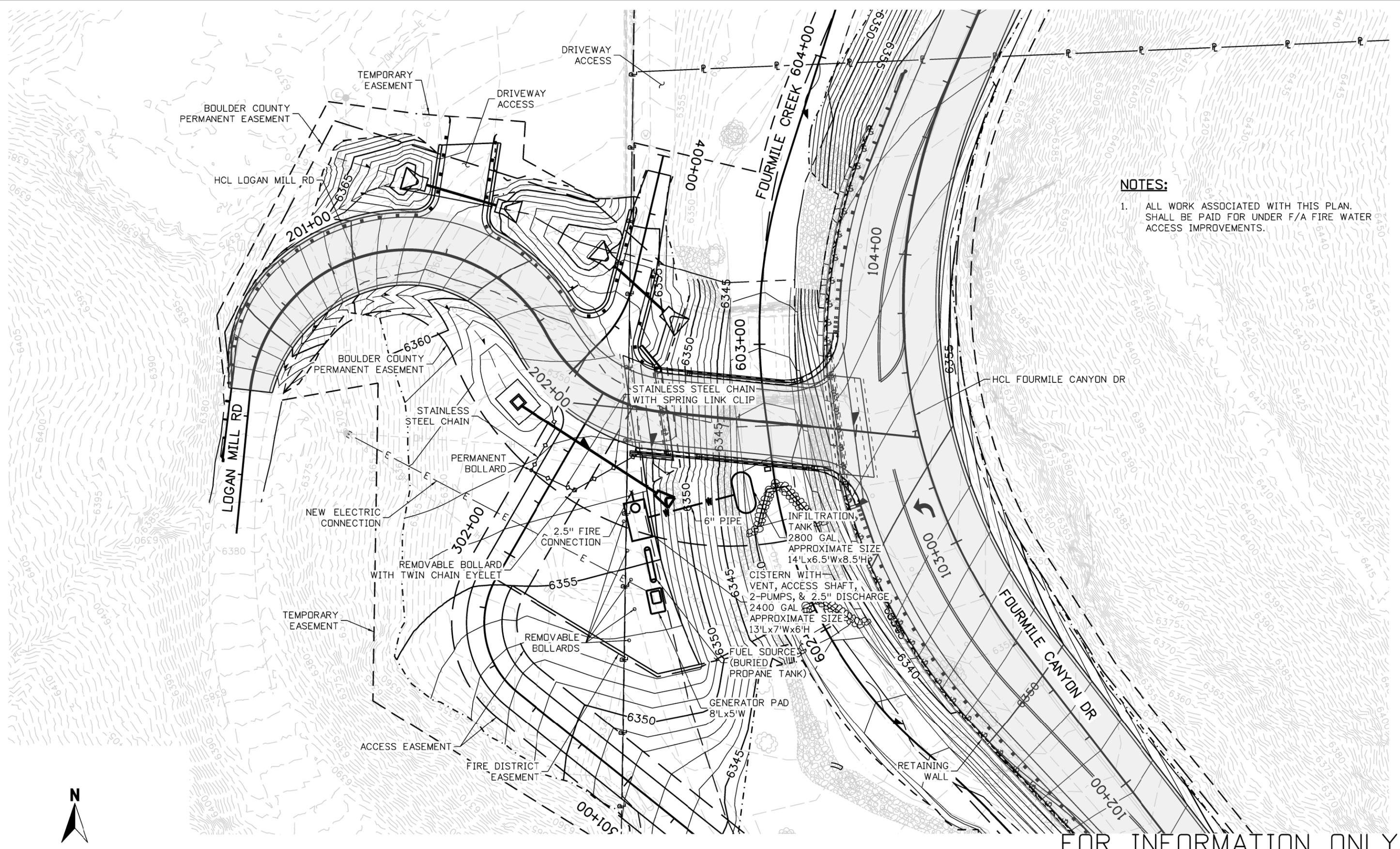
SOUTH DRIVEWAY POINT TABLE				
PT #	NORTHING	EASTING	ELEV.	DESC.
1	258392.35	38836.37	6343.31	EDGE OF DRIVEWAY (ABC)
2	258412.16	38819.66	6345.03	EDGE OF SHOULDER
3	258459.67	38760.46	6351.11	EDGE OF SHOULDER
4	258461.55	38795.89	6353.34	EDGE OF FIRE ACCESS (ABC)
5	258464.71	38810.06	6356.36	EDGE OF FIRE ACCESS (ABC)
6	258464.92	38753.87	6351.98	EDGE OF SHOULDER
7	258471.42	38749.38	6352.98	EDGE OF SHOULDER
8	258479.21	38747.94	6353.98	EDGE OF SHOULDER
9	258483.74	38802.06	6354.27	EDGE OF FIRE ACCESS (ABC)
10	258485.55	38749.71	6354.61	EDGE OF SHOULDER
11	258491.24	38746.58	6355.00	EDGE OF DRIVEWAY (ABC)
12	258504.69	38795.78	6355.19	EDGE OF FIRE ACCESS (ABC)
13	258513.48	38745.57	6356.10	EDGE OF DRIVEWAY (ABC)
14	258523.32	38728.53	6357.09	GRADING POINT
15	258524.93	38792.01	6356.07	EDGE OF FIRE ACCESS (ABC)
16	258531.52	38803.47	6351.67	2' MAINTENANCE BENCH
17	258531.77	38800.98	6351.74	2' MAINTENANCE BENCH
18	258532.87	38790.06	6356.88	EDGE OF FIRE ACCESS (ABC)
19	258533.72	38801.16	6351.79	2' MAINTENANCE BENCH
20	258534.82	38790.26	6356.94	EDGE OF FIRE ACCESS (ABC)
21	258539.39	38754.41	6357.41	RIPRAP DRAINAGE BERM
22	258543.09	38745.78	6357.89	RIPRAP DRAINAGE BERM
23	258543.58	38762.95	6357.15	EDGE OF DRIVEWAY
24	258545.75	38748.77	6356.56	EDGE OF EX. INLET GRADING
25	258546.02	38761.90	6357.41	RIPRAP DRAINAGE BERM
26	258552.38	38756.26	6356.56	EDGE OF EX. INLET GRADING
27	258553.57	38761.33	6357.42	EDGE OF LOGAN MILL RD (HMA)

NOTES:

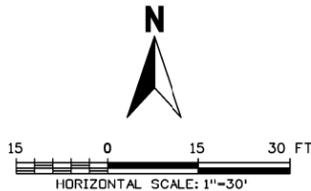
- SEE DRIVEWAY PLAN AND PROFILE FOR GRAPHICS.

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS: NO. DATE REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED: JLW	CAD: JLW	CHECKED: JPZ	DATE: 08/16/16	PROJECT NO: 4012.SEPT12C39	SHEET NO: 28
		LOGAN MILL ROAD GRADING POINT TABLES							

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- NOTES:**
1. ALL WORK ASSOCIATED WITH THIS PLAN. SHALL BE PAID FOR UNDER F/A FIRE WATER ACCESS IMPROVEMENTS.



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CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

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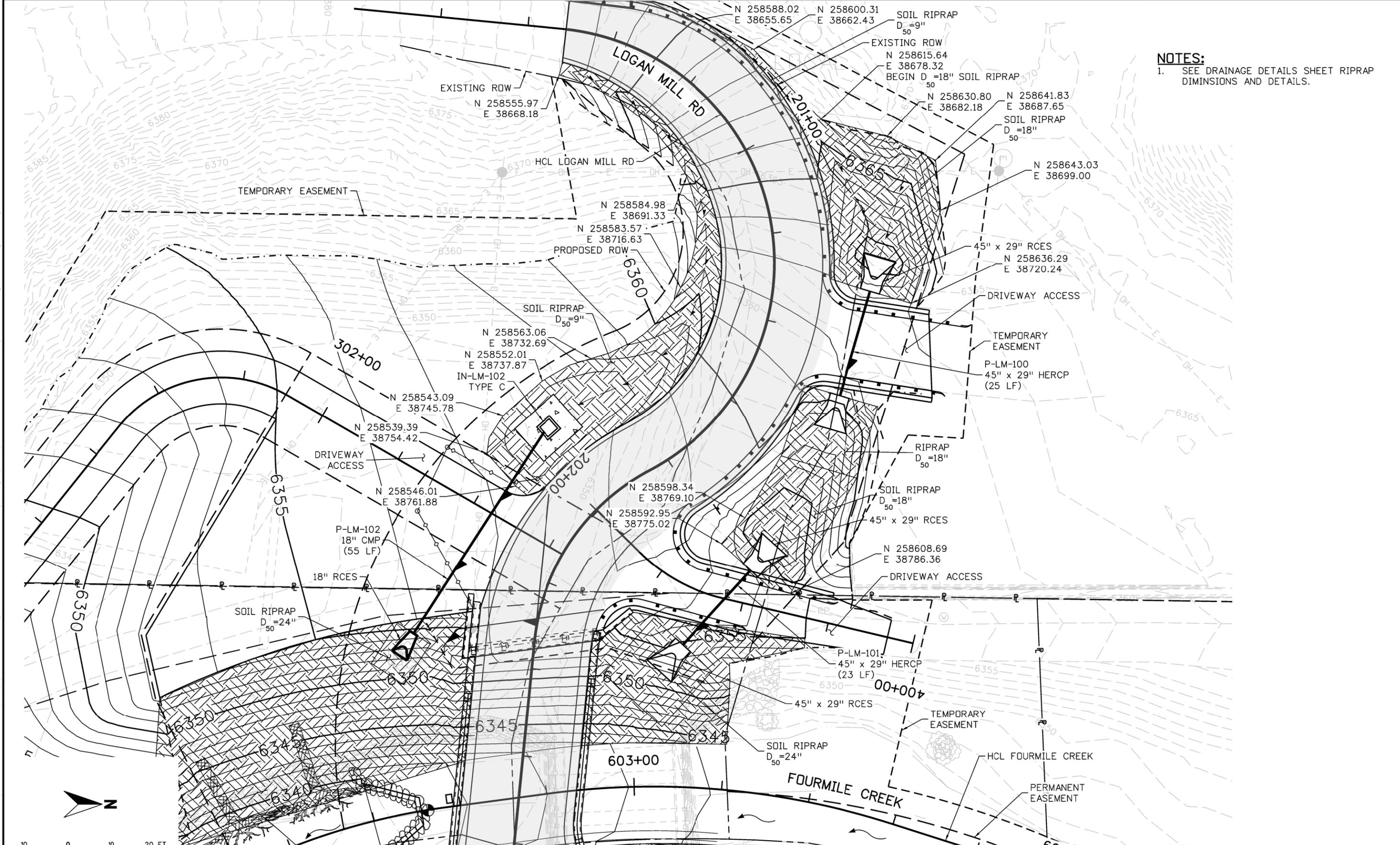
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LOGAN MILL ROAD FIRE WATER ACCESS PLAN

PROJECT NO: 4012.SEPT12C39 SHEET NO: 29

FOR INFORMATION ONLY

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NOTES:
1. SEE DRAINAGE DETAILS SHEET RIPRAP DIMENSIONS AND DETAILS.

HORIZONTAL SCALE: 1"=20'

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CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



NO.	DATE	REVISION DESCRIPTION:

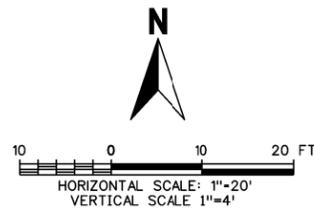
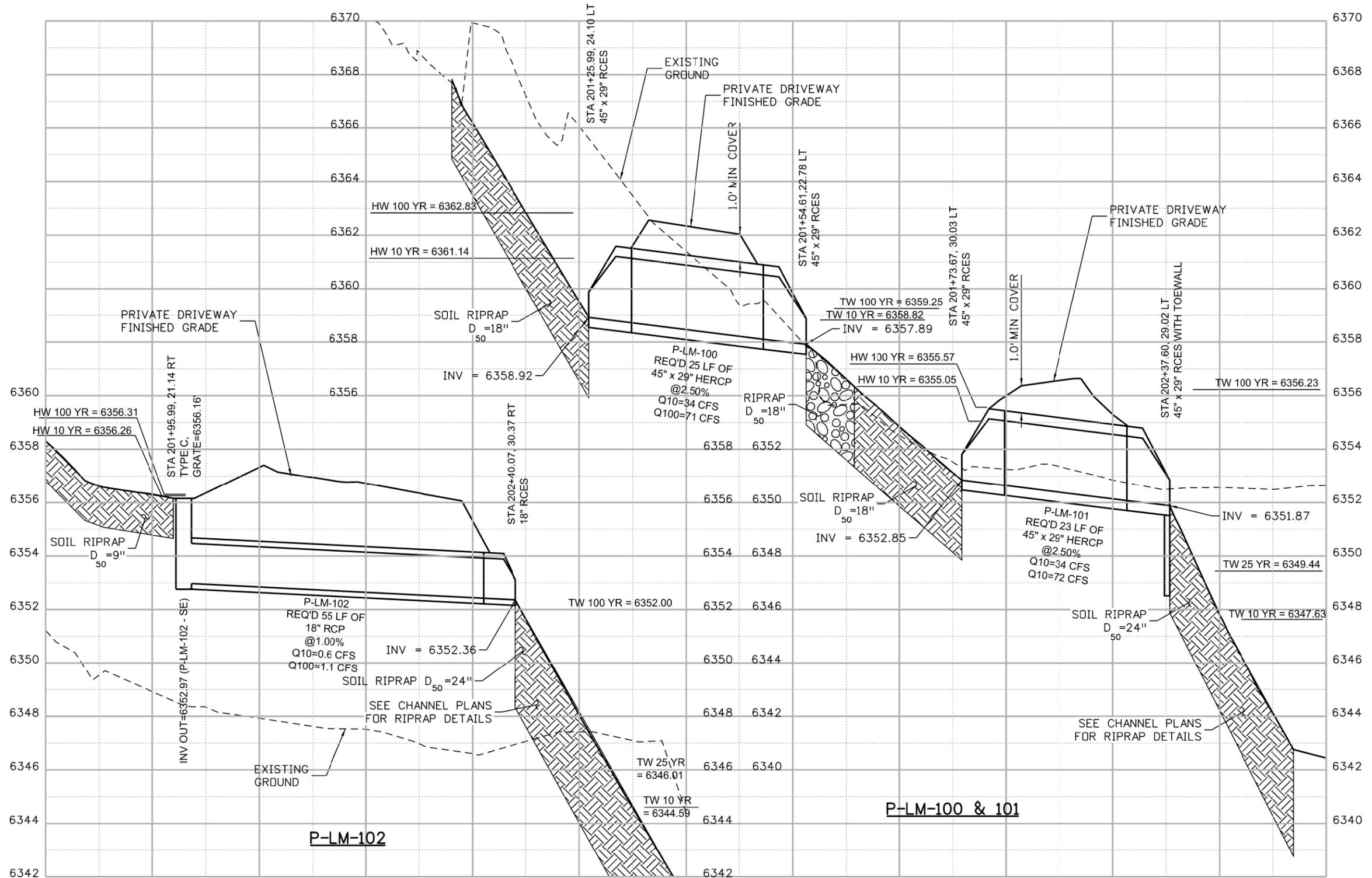
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

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LOGAN MILL ROAD DRAINAGE PLAN
PROJECT NO: 4012.SEPT12C39 SHEET NO: 30

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CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

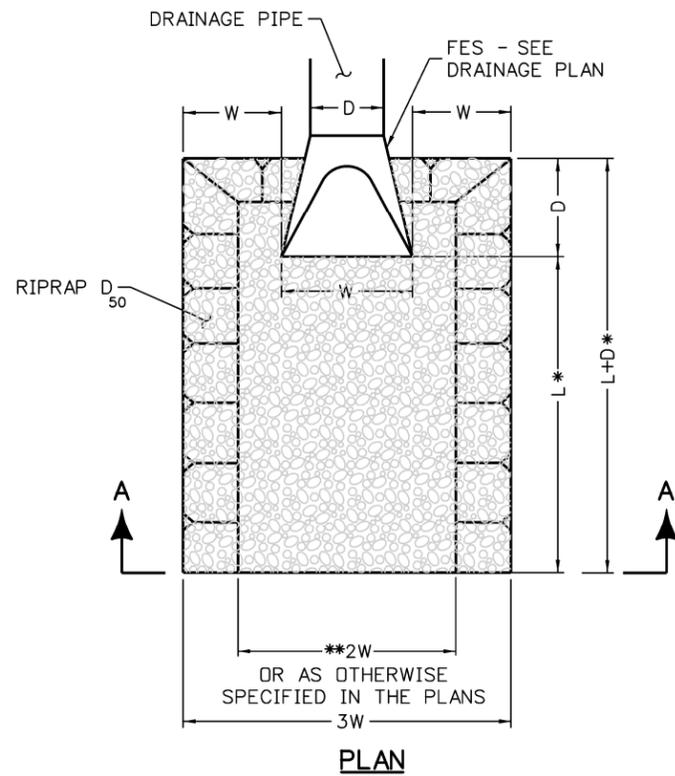


**BOULDER COUNTY TRANSPORTATION DEPARTMENT
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DESIGNED: **JLW** CAD: **EAV** CHECKED: **JPZ** DATE: **08/16/16**

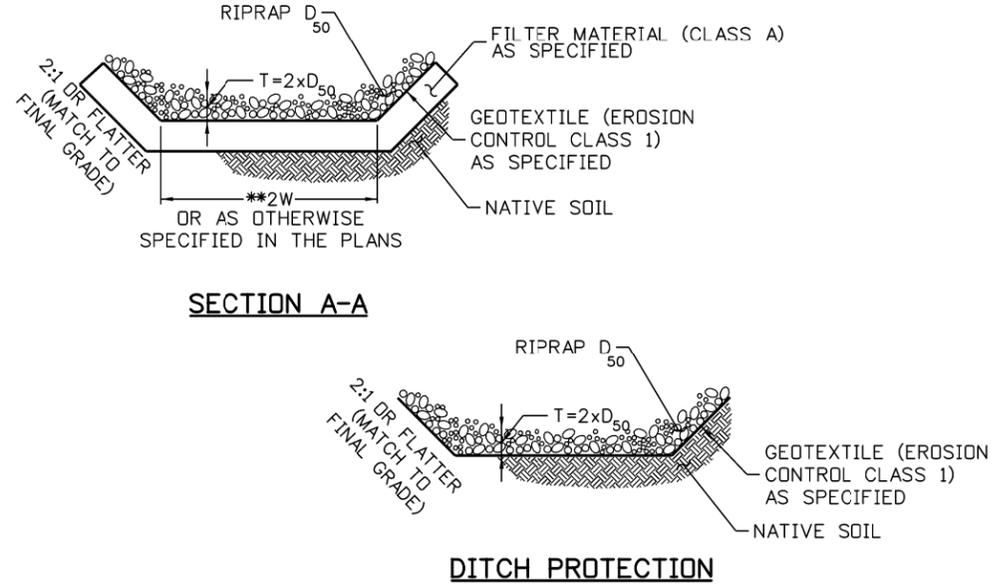
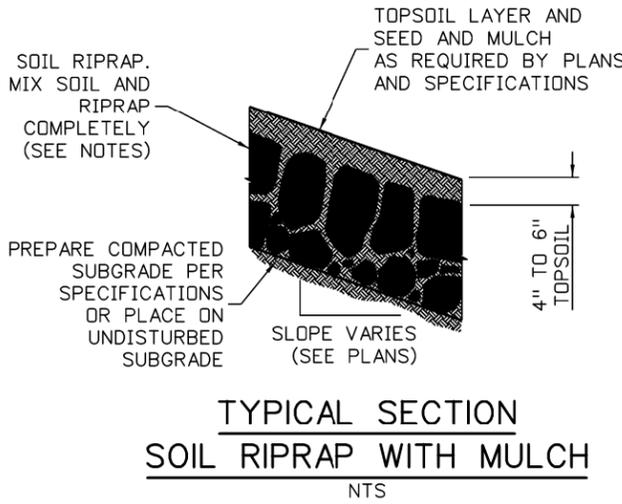
**LOGAN MILL ROAD
DRAINAGE PROFILE**
PROJECT NO: 4012.SEPT12C39 SHEET NO: 31

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* $3D < L < 10D$ (SEE TABLE)
 ** EQUALS CHANNEL WIDTH FOR PIPE INLETS

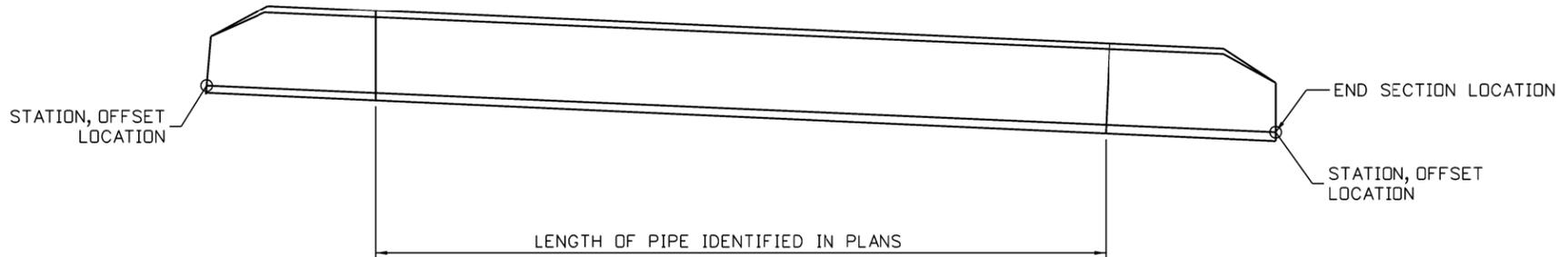
INLET/OUTLET PROTECTION
 NOT TO SCALE
 FILTER MATERIAL (CLASS A) SHALL BE 6" THICK



PIPE ID	TYPE	DESCRIPTION	D	L	W
			INCHES	FEET	FEET
P-LM-100	OUTLET	OUTLET	45	9	6

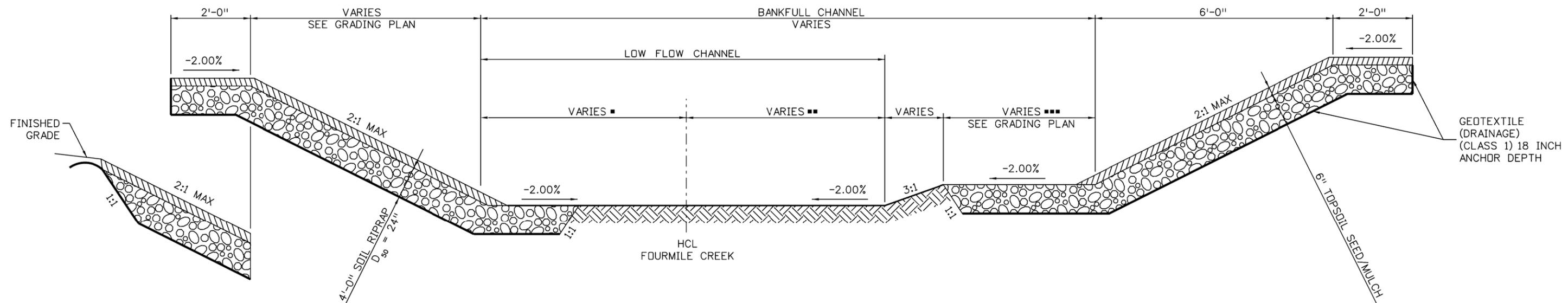
NOTES:

1. SOIL RIPRAP AND RIPRAP DETAILS ARE APPLICABLE TO SLOPED AREAS. REFER TO THE DRAINAGE PLANS FOR ACTUAL LOCATIONS AND LIMITS.
2. MIX UNIFORMLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL OR GRAVEL BY VOLUME PRIOR TO PLACEMENT.
3. PLACE SOIL RIPRAP OR RIPRAP MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE DESIGN RIPRAP TOP GRADE.
4. CRIMP OR TACKIFY MULCH ON SOIL RIPRAP OR AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.
5. SEE STORMWATER MANAGEMENT PLAN FOR SEEDING MIXTURE AND DETAILS.
6. BENCH RIPRAP AS NECESSARY TO MATCH EXISTING GRADE AND PLACE STONE-SOIL OR STONE-GRAVEL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE FINISHED GRADE.
7. ALL DITCHES SHALL HAVE SOIL RIPRAP LINED WITH GEOTEXTILE (EROSION CONTROL CLASS 1).
8. FLOW DIRECTION MAY VARY. SEE DRAINAGE PLANS.
9. DIMENSIONS OF DITCH FEATURES ARE LOCATION SPECIFIC. SEE DRAINAGE PLANS AND TABLES.



90% SET	CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION	DESIGNED: CAD: CHECKED: DATE:				PROJECT NO: 4012.SEPT12C39 SHEET NO: 32
		REVISIONS:	MEM	EAV		JPZ	08/16/16			

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STA 600+45 LT TO 602+66.18 LT
 STA 602+94.04 LT TO 603+20.02 LT
 SEE GRADING PLAN

TYPICAL SECTION - FOURMILE CREEK
LOOKING UPSTREAM
 NTS

- STA 600+31.26 TO STA 600+45.00
- STA 600+45.00 TO STA 600+60.00
- STA 600+60.00 TO STA 600+75.00
- STA 600+75.00 TO STA 600+95.00
- STA 600+95.00 TO STA 601+15.00
- STA 601+15.00 TO STA 601+25.00
- STA 601+25.00 TO STA 603+15.00
- STA 603+15.00 TO STA 603+20.02

- 0'-0" TO 8'-3"
- 8'-3" TO 6'-5"
- 6'-5" TO 5'-5"
- 5'-5" TO 6'-3"
- 6'-3" TO 10'-0"
- 10'-0"
- TRANSITION TO EXISTING

- STA 600+31.26 TO STA 600+45.00
- STA 600+45.00 TO STA 600+60.00
- STA 600+60.00 TO STA 600+75.00
- STA 600+75.00 TO STA 600+90.00
- STA 600+90.00 TO STA 601+10.00
- STA 601+10.00 TO STA 601+20.00
- STA 601+20.00 TO STA 601+35.00
- STA 601+35.00 TO STA 601+50.00
- STA 601+50.00 TO STA 601+70.00
- STA 601+70.00 TO STA 603+15.00
- STA 603+15.00 TO STA 603+20.02

- 8'-6" TO 7'-10"
- 7'-10" TO 6'-10"
- 6'-10" TO 5'-9"
- 5'-9" TO 4'-9"
- 4'-9" TO 4'-4"
- 4'-4" TO 4'-7"
- 4'-7" TO 5'-7"
- 5'-7" TO 7'-6"
- 7'-6" TO 10'-0"
- 10'-0"
- TRANSITION TO EXISTING

- STA 600+31.26 TO STA 601+70.00
- STA 601+70.00 TO STA 601+85.00
- STA 601+85.00 TO STA 602+00.00
- STA 602+00.00 TO STA 602+15.00
- STA 602+15.00 TO STA 602+30.00
- STA 602+30.00 TO STA 602+43.04
- STA 602+43.04 TO STA 602+70.00
- STA 602+70.00 TO STA 602+98.84
- STA 602+98.84 TO STA 603+20.02

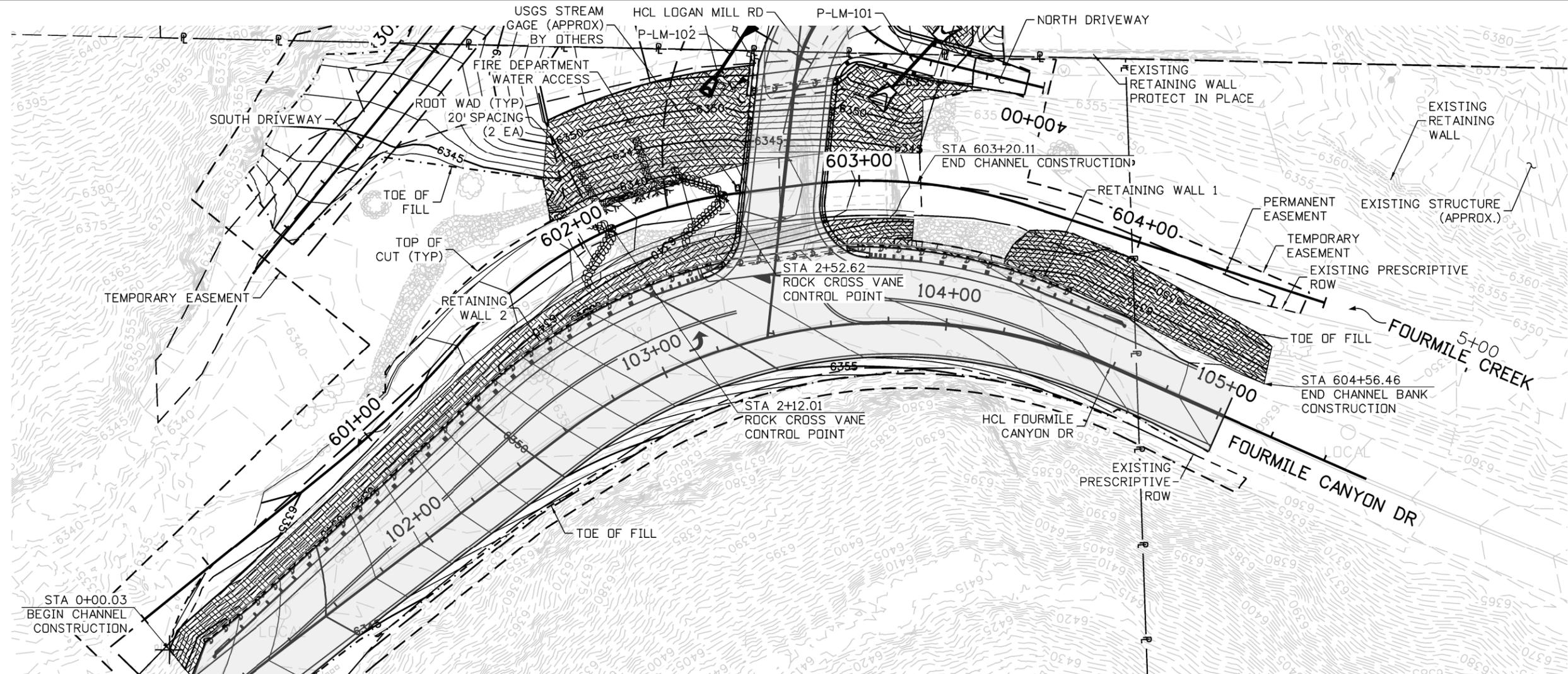
- 0'-0" TO 1'-3"
- 1'-3" TO 2'-2"
- 2'-2" TO 2'-6"
- 2'-6" TO 2'-6"
- 2'-6" TO 2'-2"
- 2'-2" TO 1'-7"
- 1'-7" TO 1'-2"
- TRANSITION TO EXISTING

NOTES:

1. SOIL RIPRAP DETAILS ARE APPLICABLE TO SLOPED AREAS. REFER TO THE DRAINAGE PLANS FOR ACTUAL LOCATIONS AND LIMITS.
2. MIX UNIFORMLY 65% RIPRAP BY VOLUME WITH 35% OF APPROVED SOIL BY VOLUME PRIOR TO PLACEMENT.
3. PLACE RIPRAP-SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE DESIGN RIPRAP TOP GRADE.
4. CRIMP OR TACKIFY MULCH OR AS CALLED FOR IN THE PLANS AND SPECIFICATIONS.
5. SEE STORMWATER MANAGEMENT PLAN 2 FOR SEEDING MIXTURE AND DETAILS.
6. BENCH RIPRAP AS NECESSARY TO MATCH EXISTING GRADE AND PLACE STONE-SOIL MIX TO RESULT IN SECURELY INTERLOCKED ROCK AT THE DESIGN THICKNESS AND GRADE. COMPACT AND LEVEL TO ELIMINATE ALL VOIDS AND ROCKS PROJECTING ABOVE FINISHED GRADE.

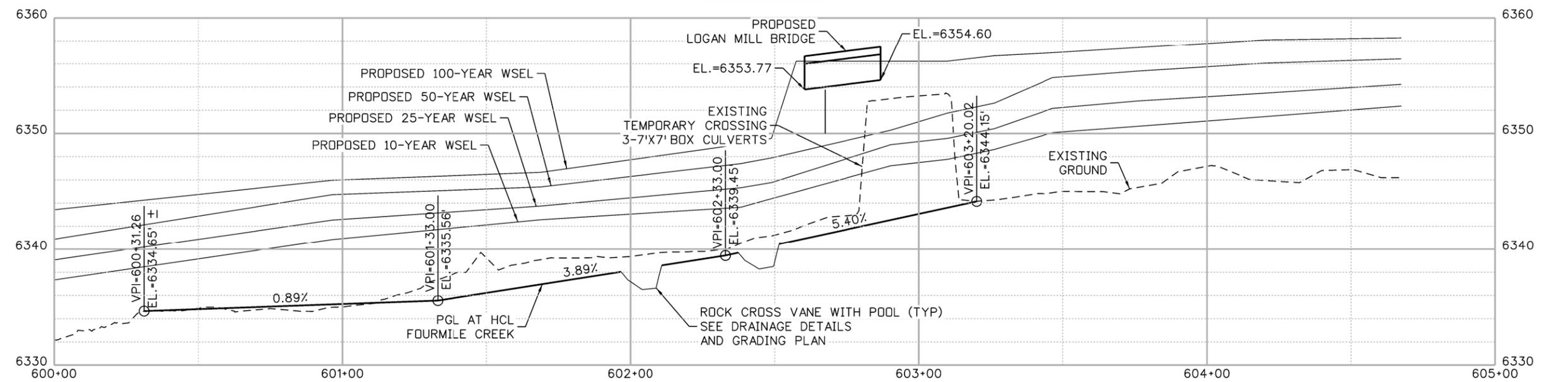
90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:
						BMC	BMC	JPZ	08/16/16
<p>LOGAN MILL ROAD CHANNEL TYPICAL SECTION</p> <p>PROJECT NO: 4012.SEPT12C39 SHEET NO: 33</p>									

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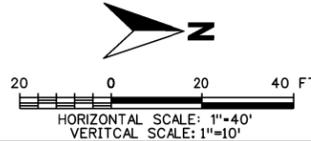


NOTES:
 1. SEE CHANNEL DETAILS SHEET FOR ROCK CROSS VANE AND ROOT WAD DETAILS.

CHANNEL PLAN



CHANNEL PROFILE



90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION

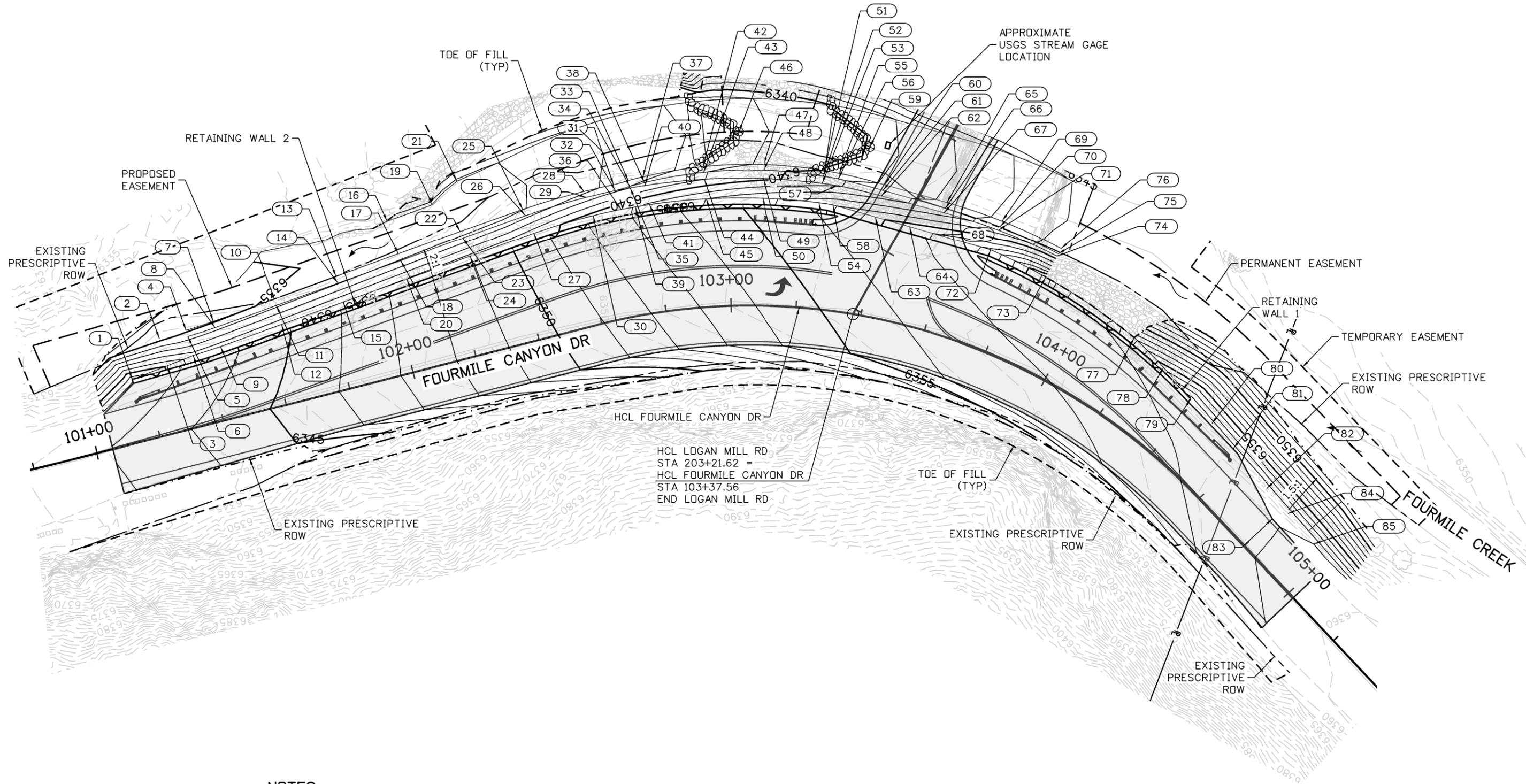
Michael Baker INTERNATIONAL

DESIGNED: **JLW** CAD: **EAV** CHECKED: **JPZ** DATE: **08/16/16**

LOGAN MILL ROAD CHANNEL PLAN AND PROFILE

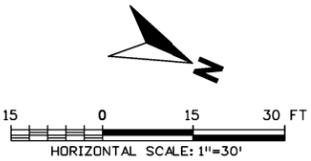
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HCL LOGAN MILL RD
 STA 203+21.62 =
 HCL FOURMILE CANYON DR
 STA 103+37.56
 END LOGAN MILL RD

- NOTES:**
- SEE CHANNEL GRADING PLAN (2 OF 2) FOR GRADING DATA.



90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

Michael Baker INTERNATIONAL

DESIGNED: **JLW** CAD: **EAV** CHECKED: **JPZ** DATE: **08/16/16**

LOGAN MILL ROAD
CHANNEL GRADING PLAN
(SHEET 1 OF 2)

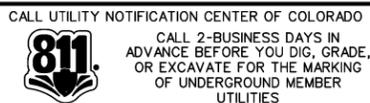
PROJECT NO: 4012.SEPT12C39 SHEET NO: 35

CHANNEL POINT TABLE			
PT #	NORTHING	EASTING	ELEV.
1	258646.87	38867.33	6358.45
2	258623.61	38857.01	6351.67
3	258591.29	38850.88	6351.29
4	258572.46	38849.90	6347.20
5	258546.77	38853.24	6353.34
6	258522.57	38856.41	6343.92
7	258462.01	38874.48	6353.37
8	258450.74	38882.94	6336.79
9	258452.09	38884.32	6337.43
10	258456.29	38888.61	6340.43
11	258465.69	38871.63	6337.59
12	258466.79	38873.07	6338.19
13	258467.31	38873.80	6338.21
14	258470.90	38878.61	6341.21
15	258481.35	38861.48	6338.37
16	258482.20	38862.99	6338.95
17	258483.24	38864.86	6338.99
18	258486.16	38870.10	6341.99
19	258498.22	38853.50	6339.14
20	258498.84	38855.09	6339.71
21	258499.79	38857.49	6339.77
22	258501.98	38863.07	6342.77
23	258515.99	38847.84	6340.03
24	258516.40	38849.52	6340.61
25	258516.94	38851.67	6340.65
26	258518.37	38857.50	6343.65
27	258534.59	38844.52	6341.11
28	258534.82	38846.29	6341.57
29	258535.05	38848.04	6341.60
30	258535.93	38854.65	6344.80
31	258554.41	38841.89	6342.19
32	258554.65	38843.69	6342.51
33	258554.84	38845.10	6342.54
34	258555.77	38852.07	6346.10
35	258572.17	38840.41	6343.21
36	258572.22	38842.25	6343.39
37	258572.26	38843.38	6343.42
38	258591.92	38843.60	6344.35
39	258591.99	38842.80	6344.33
40	258592.15	38840.98	6344.29

CHANNEL POINT TABLE CONT'D			
41	258520.54	38846.80	6340.30
42	258520.90	38848.50	6340.88
43	258521.33	38850.54	6340.92
44	258463.46	38876.27	6338.02
45	258463.17	38875.90	6338.01
46	258459.62	38878.86	6337.82
47	258458.41	38877.44	6337.20
48	258467.20	38880.96	6341.02
49	258463.52	38883.41	6340.82
50	258635.46	38861.82	6355.59
51	258655.87	38871.76	6358.49
52	258664.91	38876.27	6358.57
53	258684.52	38891.24	6358.92
54	258688.23	38887.83	6358.86
55	258679.27	38883.39	6358.75
56	258699.19	38893.27	6359.00
57	258525.97	38835.65	6340.51
58	258487.19	38847.33	6338.63
59	258346.39	38990.65	6341.72
60	258360.58	38976.51	6338.48
61	258413.72	38895.53	6335.69
62	258409.54	38905.12	6335.52
63	258398.83	38915.23	6335.39
64	258356.77	38971.87	6335.48
65	258355.54	38970.36	6334.82
66	258362.09	38964.56	6334.90
67	258363.34	38966.09	6335.55
68	258367.14	38970.73	6338.55
69	258376.67	38950.81	6335.05
70	258377.97	38952.40	6335.73
71	258381.78	38957.04	6338.73
72	258391.24	38937.03	6335.20
73	258392.59	38938.69	6335.91
74	258396.40	38943.33	6338.91
75	258405.96	38923.12	6335.35
76	258407.43	38924.75	6336.09
77	258411.46	38929.20	6339.09
78	258420.74	38909.27	6335.54
79	258422.30	38910.81	6336.27
80	258426.57	38915.02	6339.27
81	258435.67	38895.44	6335.95
82	258437.25	38896.82	6336.65
83	258441.75	38900.78	6339.65
84	258354.49	38982.59	6339.88
85	258349.03	38975.88	6334.54

NOTES:
1. SEE CHANNEL GRADING PLAN (1 OF 2) FOR GRAPHICS.

90% SET



REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

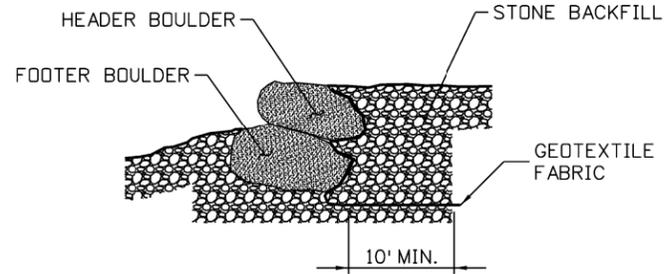
DESIGNED: **JLW** CAD: **EAV** CHECKED: **JPZ** DATE: **08/16/16**

LOGAN MILL ROAD
CHANNEL GRADING PLAN
(SHEET 2 OF 2)

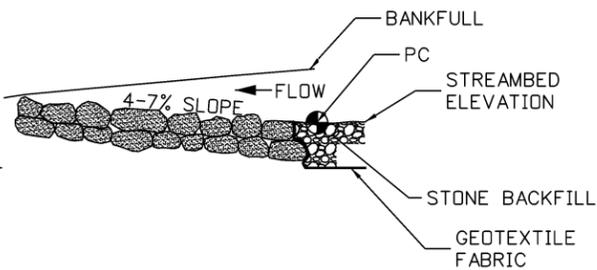
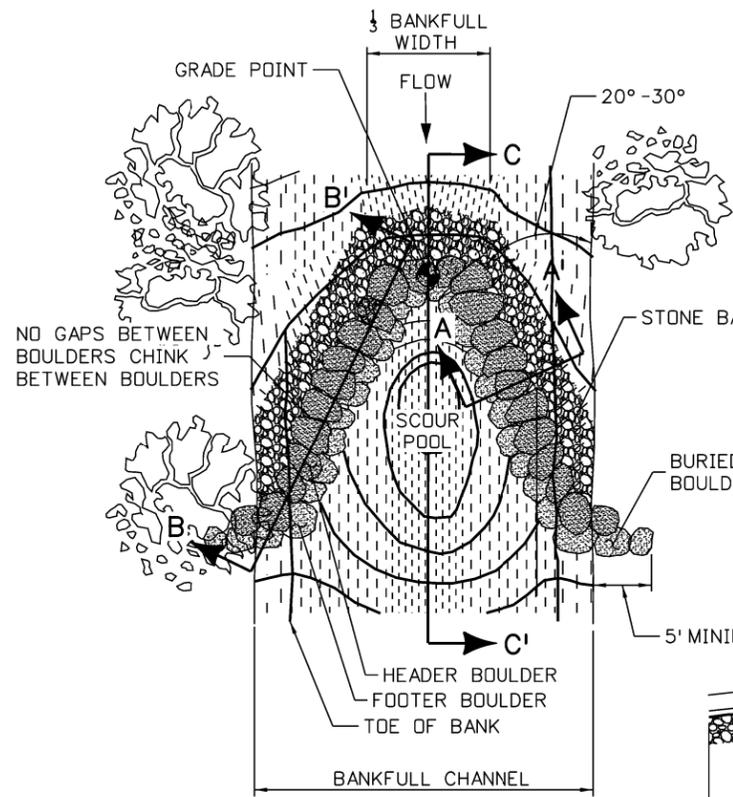
PROJECT NO: 4012.SEPT12C39 SHEET NO: 36

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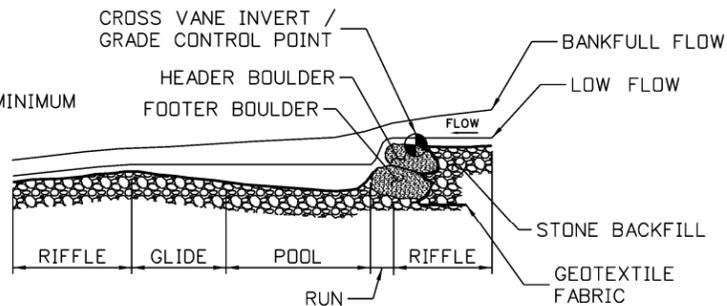
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CROSS SECTION A - A'

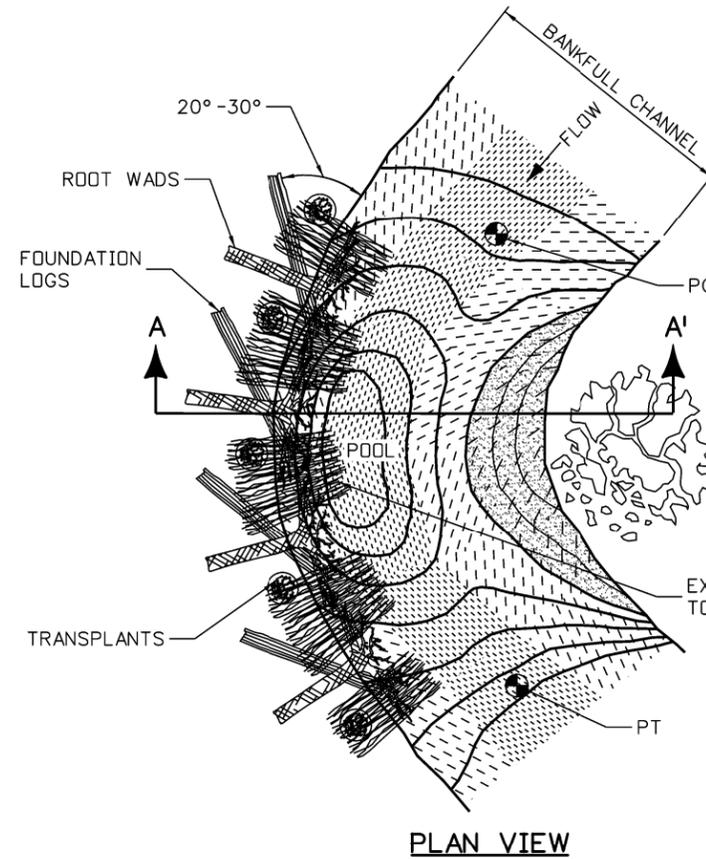


CROSS SECTION B - B'

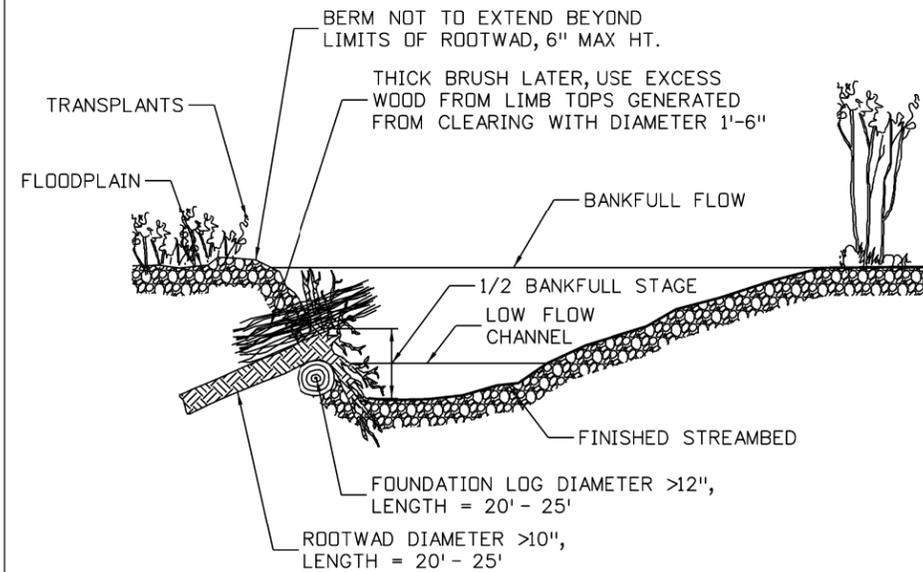


PROFILE C - C'

ROCK CROSS VANE
NTS



PLAN VIEW



CROSS SECTION A - A'

ROOT WADS
NTS

NOTES:
TRENCHING METHOD:
 IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, A FOUNDATION LOG SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAMBED. ONE-HALF OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

DRIVE POINT METHOD:
 SHARPEN THE END OF THE LOG WITH A CHAINSAW BEFORE "DRIVING" IT INTO THE BANK. ORIENT ROOT WADS UPSTREAM SO THAT THE STREAM FLOW MEETS THE ROOT WAD AT A 90 DEGREE ANGLE, DEFLECTING THE WATER AWAY FROM THE BANK.

EXTEND BRUSH MATERIAL TO 1/4 BANKFULL WIDTH MAX.

BERM NOT TO EXTEND BEYOND LIMITS OF ROOTWAD, 6" MAX HT.

THICK BRUSH LATER, USE EXCESS WOOD FROM LIMB TOPS GENERATED FROM CLEARING WITH DIAMETER 1'-6"

1/2 BANKFULL STAGE
LOW FLOW CHANNEL

FOUNDATION LOG DIAMETER >12",
LENGTH = 20' - 25'

ROOTWAD DIAMETER >10",
LENGTH = 20' - 25'

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
BMC	BMC	JPZ	08/16/16

LOGAN MILL ROAD CHANNEL DETAILS
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 37

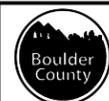
brett.terrell 6/16/2016 6:37:50 PM E:\16\2016 pwr\DCPWAPP\lbr.mbakercorp.com\pwrprod\Documents\Projects\Lakewood\Office\Boulder\County_Emergency_Transportation\107\08_Sheet_Files\06_Structures\06N Bridge\139423_BRDG_02.dgn

SUMMARY OF APPROXIMATE QUANTITIES:

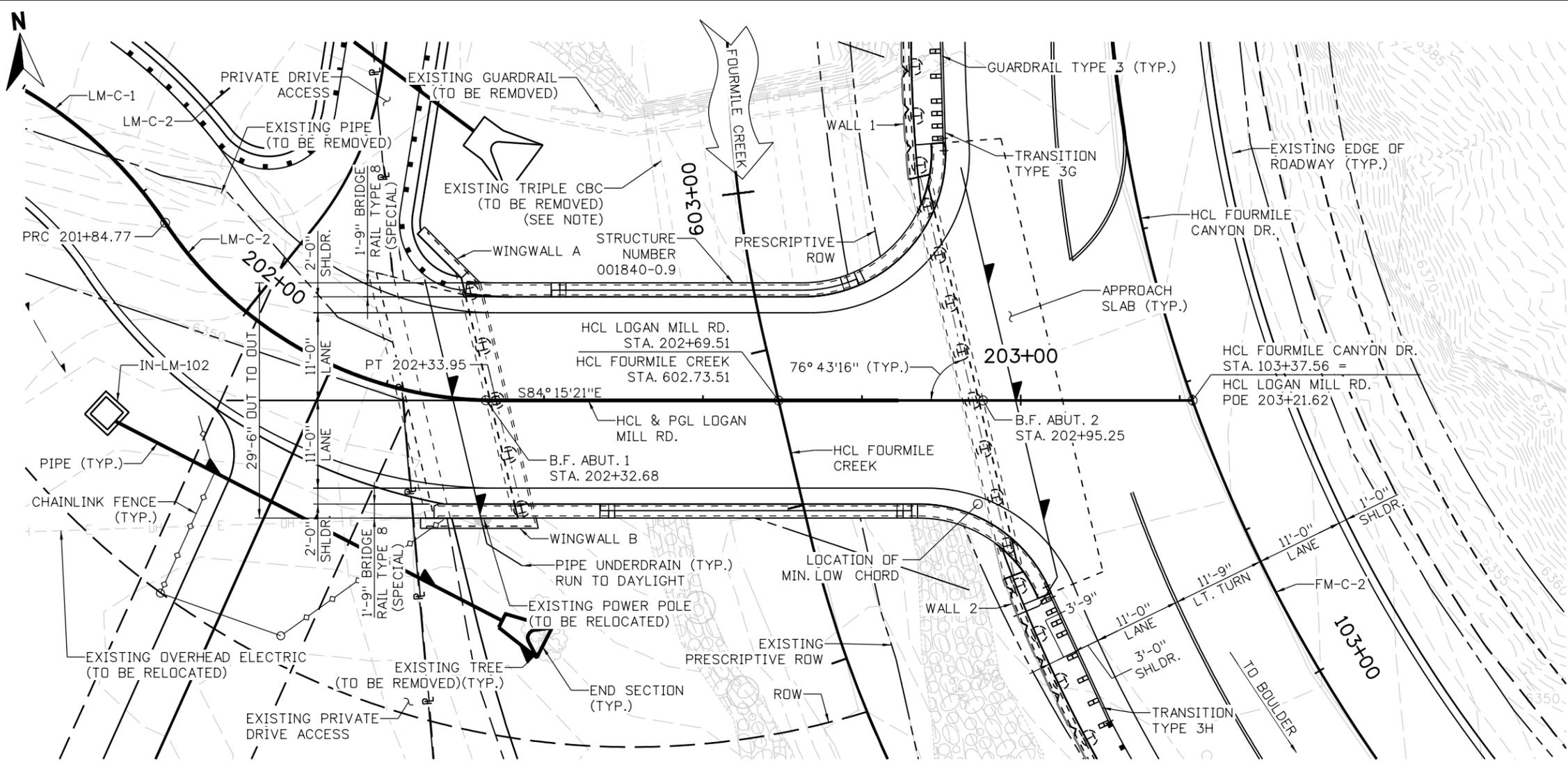
ITEM	DESCRIPTION	UNIT	SUPER-STRUCTURE	ABUT. 1	ABUT. 2	APPROACH SLABS	TOTALS
206	STRUCTURE EXCAVATION	CY		2	298		300
206	STRUCTURE BACKFILL (CLASS 1)	CY		70	136		206
206	MECHANICAL REINFORCEMENT OF SOIL	CY		70	136		206
403	HOT MIX ASPHALT (GRADING SX) (75) (PG 25-28)	TN	31			16	47
502	STEEL PILING (HP12x74)	LF		164	161		325
503	DRILLED CAISSON (24 INCH)	LF					0
515	WATERPROOFING (MEMBRANE)	SY	187			94	281
601	CONCRETE CLASS D	CY	76.0	18.0	48.0	37.0	179.0
601	CUT STONE VENEER	SF		219	516		735
601	STRUCTURAL CONCRETE COATING	SF					0
601	STRUCTURAL CONCRETE COATING (ANTI-GRAFFITI)	SF					0
602	REINFORCING STEEL	LB	11,400	2,700	7,200	5,550	26,850
606	BRIDGE RAIL TYPE 8 (SPECIAL)	LF		155			155
618	PRESTRESSED CONCRETE BOX (DEPTH LESS THAN 32 INCHES)	SF	1,517				1,517
621	TEMPORARY STREAM CROSSING	LS					1

DESIGN DATA:

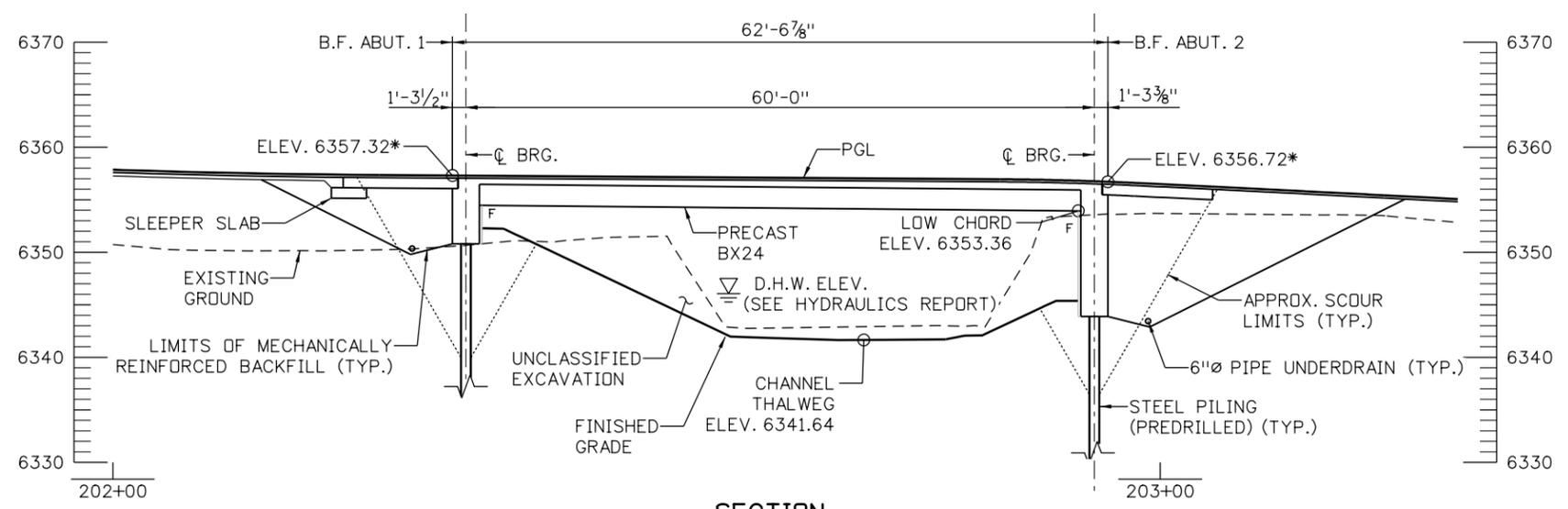
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION WITH INTERIMS THROUGH 2012
 DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN (LRFD)
 LIVE LOAD: HL-93 (DESIGN TRUCK OR DESIGN TANDEM, AND DESIGN LANE LOAD)
 DEAD LOAD: ASSUMES 36 LBS. PER SQ. FT. FOR OVERLAY
 ASSUMES 250 LBS. PER LN. FT. FOR BRIDGE RAIL TYPE 8 (SPECIAL)
 VEHICULAR COLLISION FORCE: TEST LEVEL 2 (TL-2)
 SEISMIC ZONE 1
 REINFORCED CONCRETE:
 CLASS D CONCRETE: f'c = 4,500 PSI
 REINFORCING STEEL: fy = 60,000 PSI
 PRECAST PRESTRESSED CONCRETE:
 CLASS PS CONCRETE: f'c = (SEE DETAILS)
 PRESTRESSING STEEL: f's = 270,000 PSI
 SEVERITY OF SULFATE EXPOSURE: CLASS 0

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	LOGAN MILL ROAD GENERAL INFORMATION (2 OF 2) PROJECT NO: 4012.SEPT12C39 SHEET NO: 39
							DLT	BMT		8/16/2016	

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PLAN
NET CHANNEL WIDTH NOT SHOWN



SECTION
TAKEN AT HCL LOGAN MILL RD.

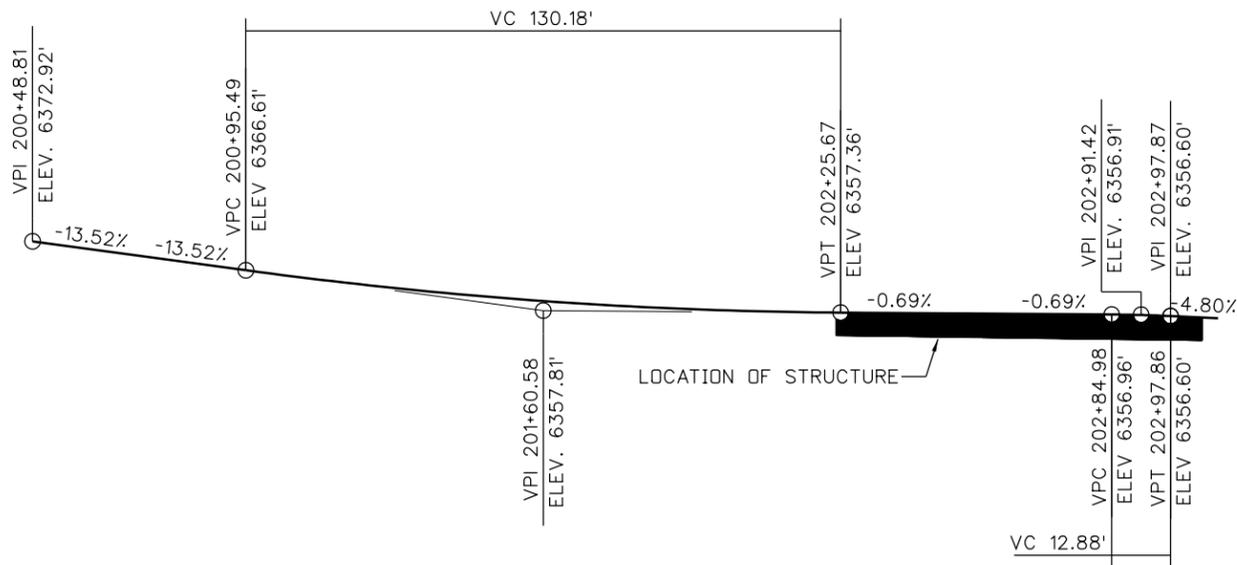
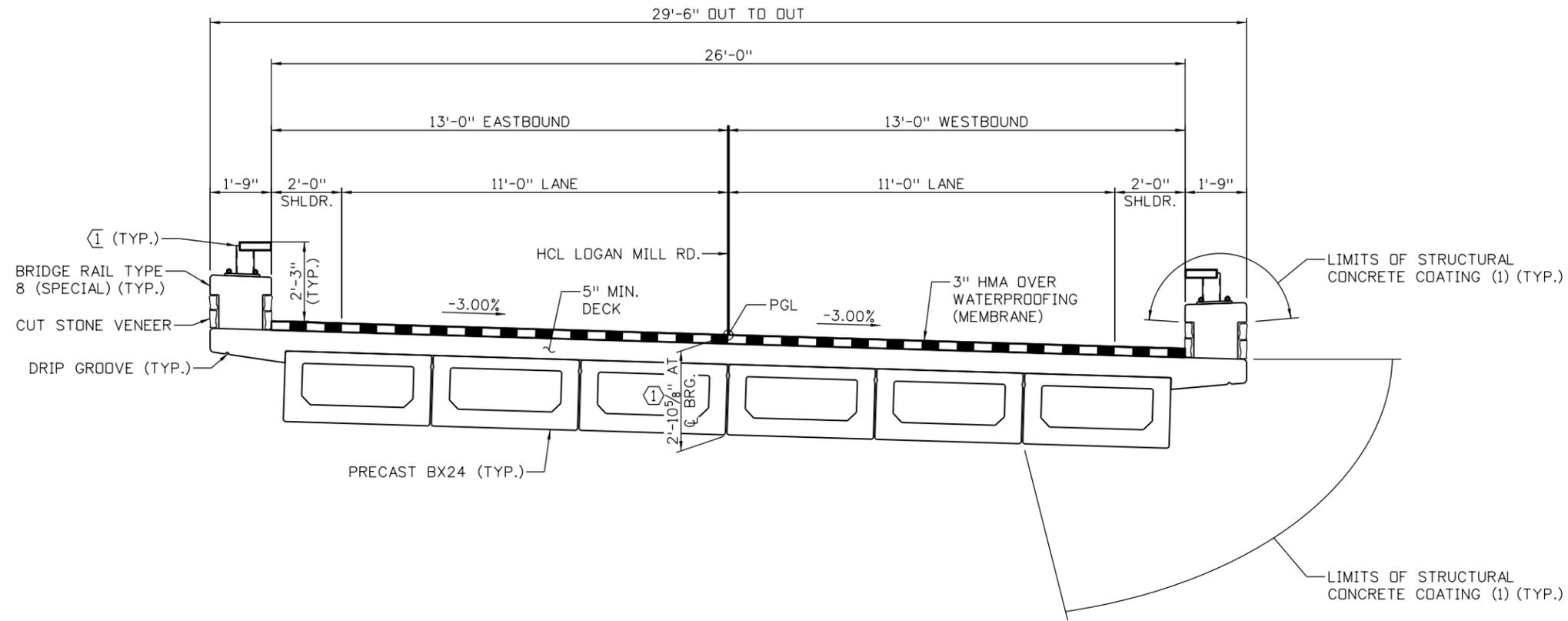
* FINISHED GRADE ELEVATIONS

NOTES:

1. FOR ALIGNMENT DATA, UTILITY INFORMATION, REMOVALS AND RESETS, SIGNS, GATES, FENCE AND TRANSITION DETAILS, SEE ROADWAY PLANS.
2. FOR FINISHED GRADING, INLETS, PIPE, AND END SECTION DETAILS, SEE DRAINAGE PLANS.
3. GEOTECHNICAL INFORMATION AND RECOMMENDATIONS CAN BE FOUND IN THE PRELIMINARY GEOTECHNICAL AND PAVEMENT INVESTIGATION REPORT, LOGAN MILL ROAD OVER FOURMILE CREEK, JULY, 2014.
4. CROSSING PROVIDES FOR APPROXIMATE 25-YEAR HYDRAULIC DESIGN CAPACITY.
5. SHORING IS NOT ANTICIPATED FOR BRIDGE CONSTRUCTION BASED ON 1:1 CUT SLOPES BUT MAY BE NECESSARY TO FACILITATE A CONSTRUCTION WORK ZONE. ANY SHORING SHALL BE BORNE BY THE CONTRACTOR.
6. SEE RETAINING WALL PLANS FOR RETAINING WALL DETAILS.
7. BRIDGE SHALL BE CONSTRUCTED OFF ALIGNMENT, UTILIZING THE EXISTING CBC TO PHASE TRAFFIC.
8. PRIVATE ACCESS DRIVES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
9. UNCLASSIFIED EXCAVATION IS INCLUDED WITH THE ROADWAY PLANS.

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION 	DESIGNED:	CAD:	CHECKED:	DATE:
						DLT	BMT		8/16/2016
PROJECT NO: 4012.SEPT12C39 SHEET NO: 40									

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NOTES:

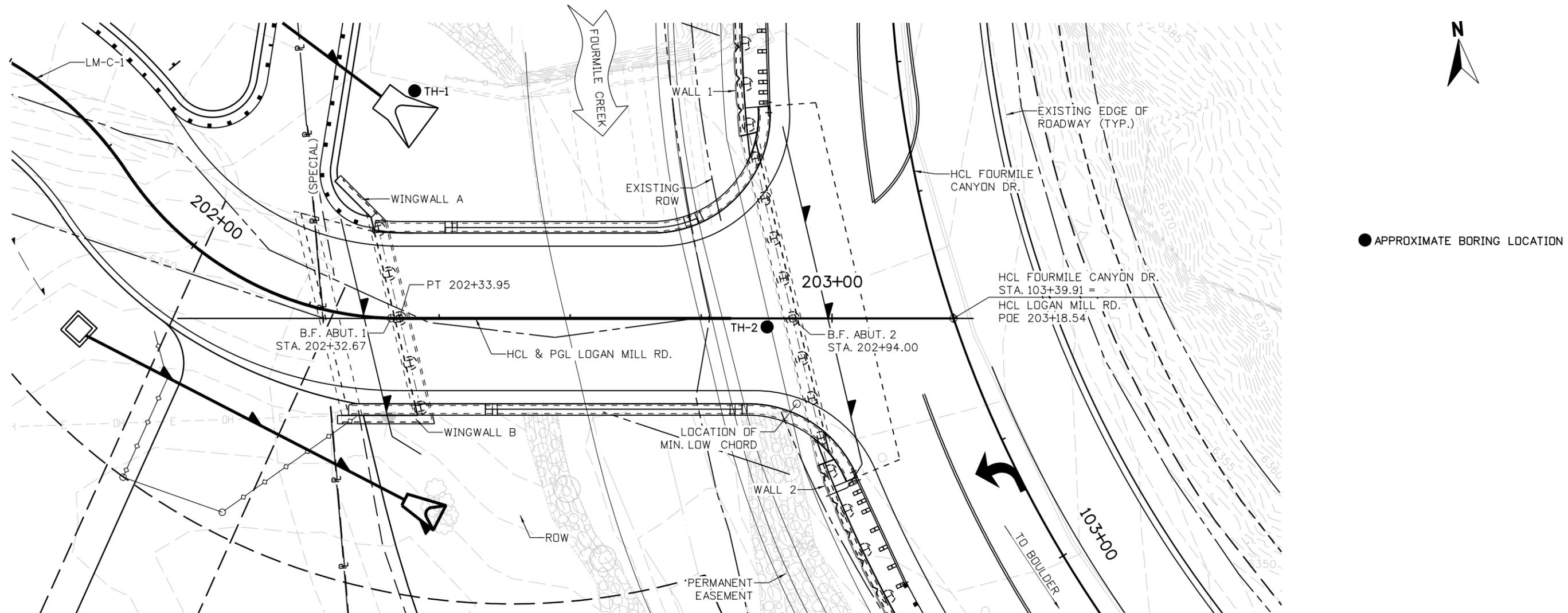
1. HAUNCH VARIES. 2" AT C BRG., 1" MIN. AT C SPAN.
2. STRUCTURAL CONCRETE COATING SHALL BE GREY, EQUIVALENT TO FED-STD 595C COLOR 26492.
3. HMA SHALL BE HOT MIX ASPHALT (GRADING SX) (75) (PG 58-28).
4. FOR CUT STONE VENEER DETAILS, SEE RETAINING WALL ARCHITECTURAL DETAILS.

KEYNOTES:

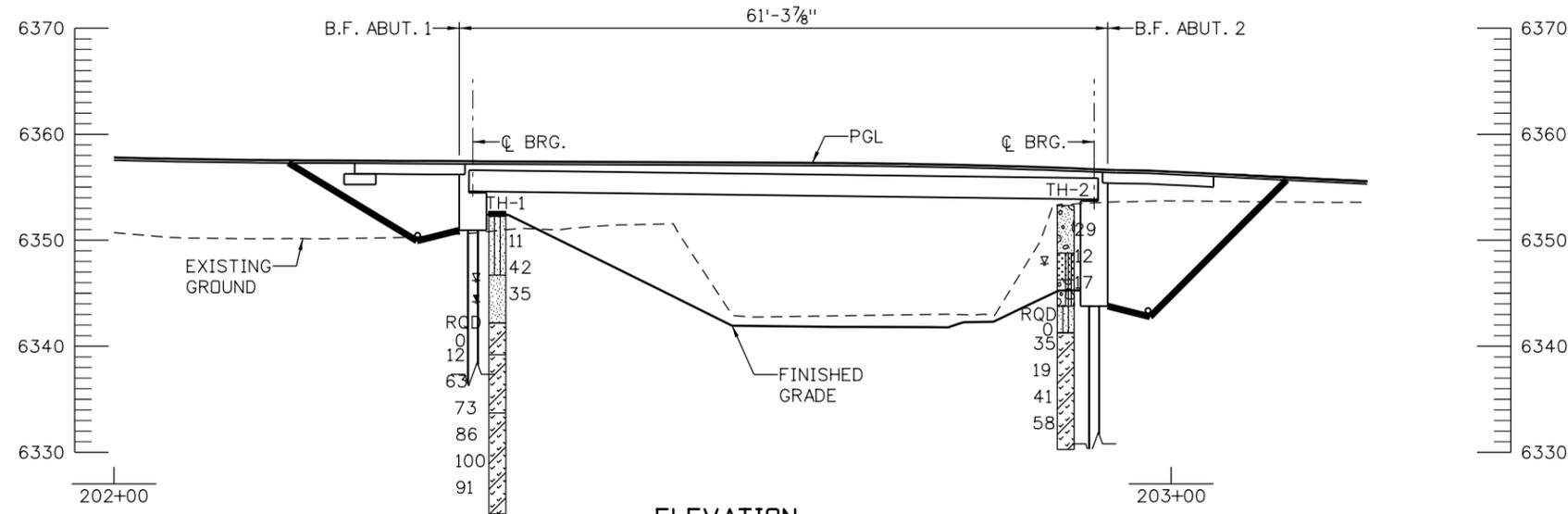
- ① DIMENSION SHOWN INCLUDES $\pm 1/2$ " GIRDER DEPTH TOLERANCE.
- ② STRUCTURAL STEEL SHALL BE PAINTED BLACK, EQUIVALENT TO FEDERAL STANDARD 595C COLOR 17038.

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	LOGAN MILL ROAD GENERAL LAYOUT (2 OF 2)
							DLT	BMT		

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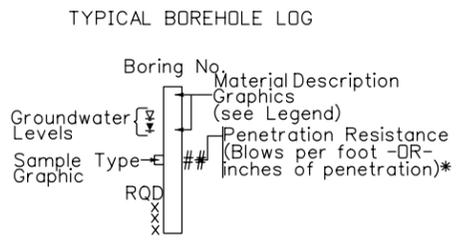


PLAN
NET CHANNEL WIDTH NOT SHOWN



ELEVATION
TAKEN AT HCL LOGAN MILL RD.

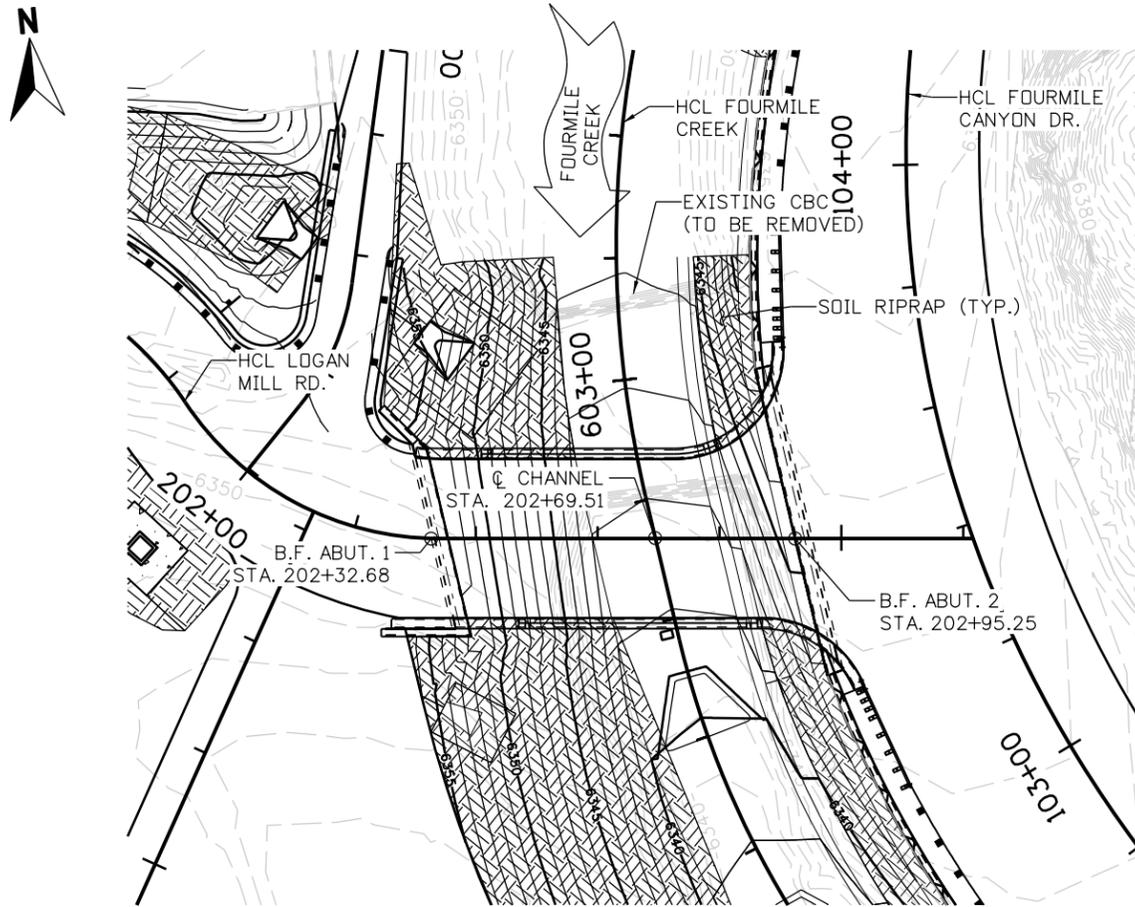
- Asphalt
- USCS Silty Sand
- USCS Poorly-graded Sand
- USCS Poorly-graded Gravelly Sand
- USCS Well-graded Sand with Silt
- USCS Poorly-graded Gravel with Silt



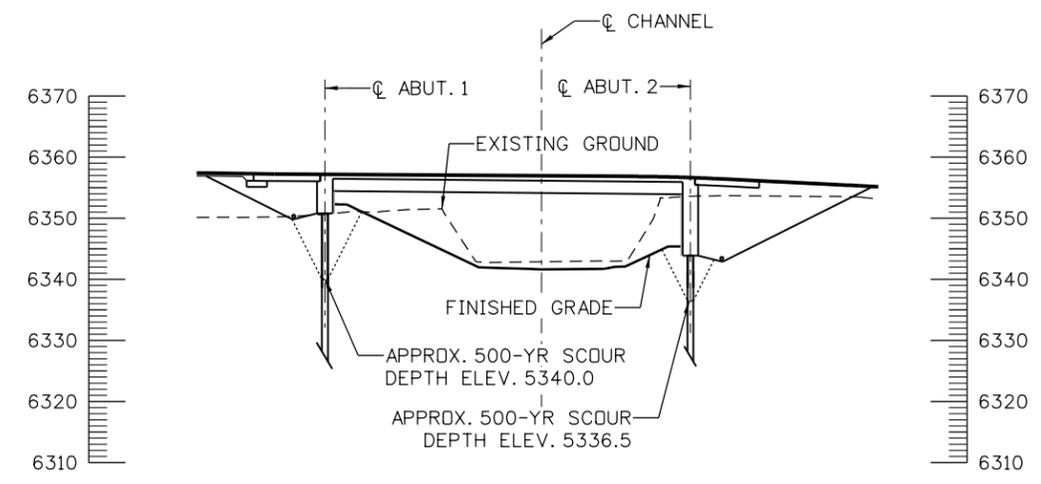
*e.g. A value of 50/3 or 50:3 indicates that 50 blows were applied to the sampler, with a penetration of 3 inches.

NO.	DATE	REVISION DESCRIPTION:

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PROPOSED BRIDGE PLAN VIEW



PROPOSED BRIDGE SECTION VIEW
TAKEN ALONG HCL LOGAN MILL ROAD

**DATA FOR FOURMILE CREEK
AT LOGAN MILL ROAD:**

DRAINAGE AREA: UNKNOWN
 AVERAGE CHANNEL SLOPE: 0.03 FT/FT
 CHANNEL BOTTOM MATERIAL:
 COHESIVE NON-COHESIVE
 BOTTOM MATERIAL SIZE: CLAY SILT SAND
 GRAVEL COBBLES OTHER
 STREAM FORM: STRAIGHT MEANDERING BRAIDED
 MANNINGS "n" FOR DESIGN:
 CHANNEL = 0.065 OVERBANK = 0.015 TO 0.080
 DEBRIS: BRUSH TREES/LOGS ICE OTHER

NOTES:

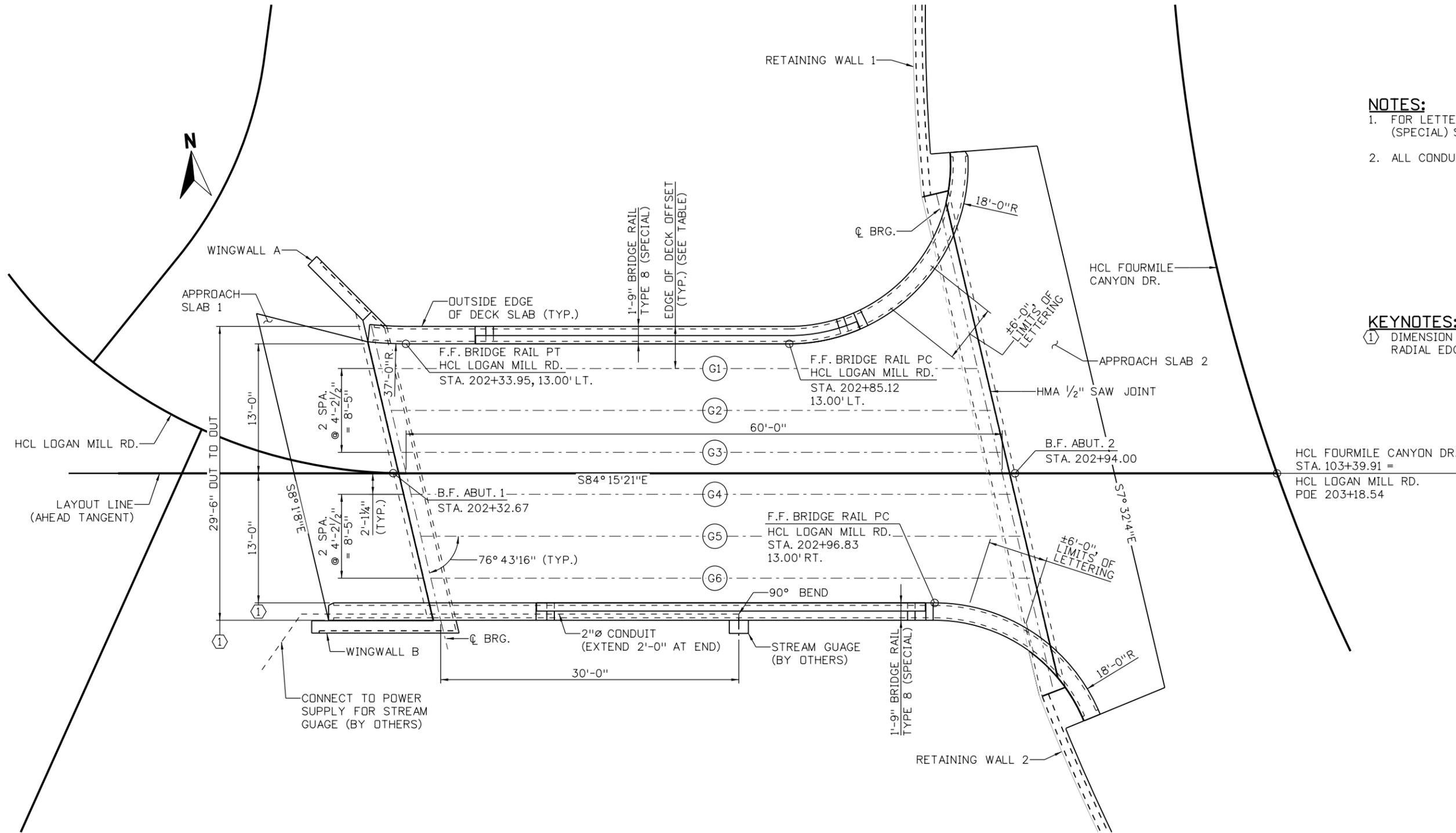
- FOR WATER SURFACE ELEVATION PROFILE, SEE DRAINAGE PLANS.

COMPARISON OF HYDRAULICS

	VELOCITY	FREEBOARD	WSEL
EXISTING CULVERT	16.8 FT/S	N/A	6357.47
PROPOSED BRIDGE	9.3 FT/S	N/A	6356.23

90% SET	CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	LOGAN MILL ROAD HYDRAULIC INFORMATION (1 OF 2) PROJECT NO: 4012.SEPT12C39 SHEET NO: 43
							DLT	BMT		8/16/2016	

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NOTES:

1. FOR LETTERING, SEE BRIDGE RAIL TYPE 8 (SPECIAL) SHEETS.
2. ALL CONDUIT SHALL BE SCHEDULE 80 PVC.

KEYNOTES:

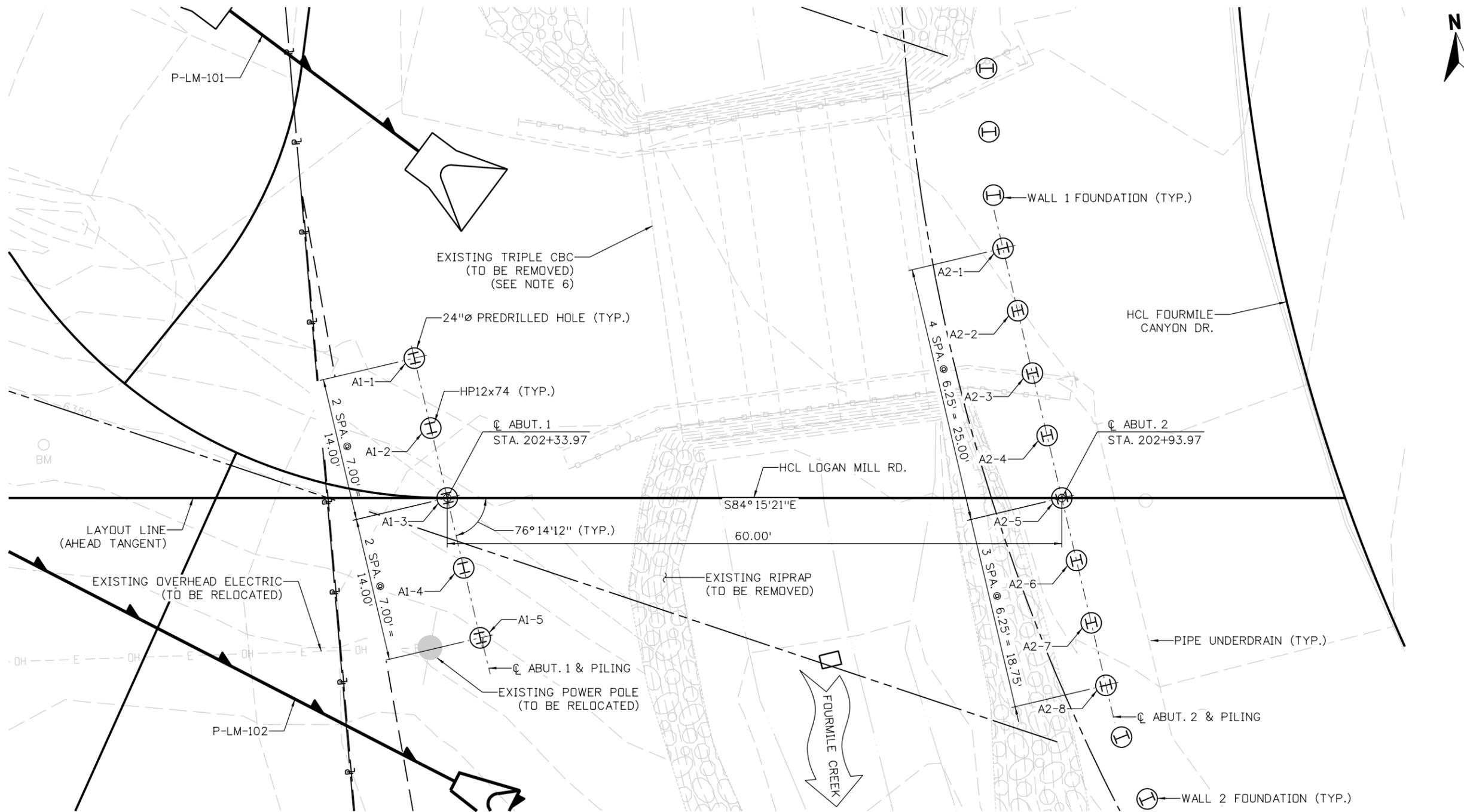
- ① DIMENSION SHOWN DOES NOT ACCOUNT FOR RADIAL EDGE OF DECK AT BRIDGE ENDS.

PLAN

EDGE OF DECK OFFSETS											
	LOCATION										
	CL BRG. A1	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	CL BRG. A2
LEFT EDGE OF DECK	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"					
RIGHT EDGE OF DECK	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"	4'-2 3/4"					

90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD CONSTRUCTION LAYOUT</p> <p>PROJECT NO: 4012.SEPT12C39 SHEET NO: 44</p>
							DLT	BMT		8/16/2016	

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PLAN

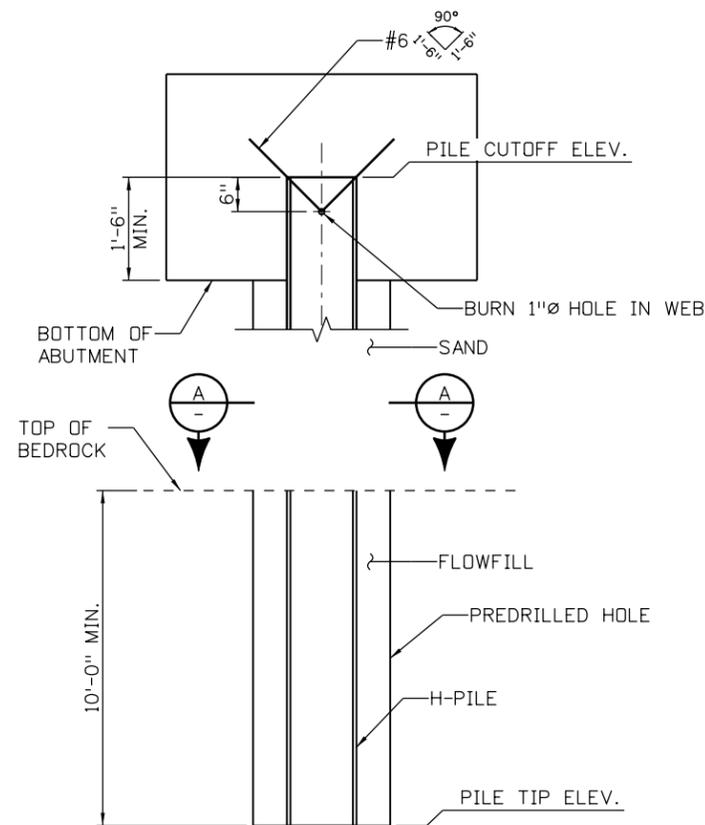
NOTES:

1. ORIENT PILES AS SHOWN.
2. EXISTING TRIPLE CBC SHALL BE PARTIALLY REMOVED TO FACILITATE FOUNDATION INSTALLATION BUT SHALL REMAIN IN SERVICE TO CARRY TRAFFIC DURING CONSTRUCTION.
3. FOR WALL FOUNDATION DETAILS, SEE RETAINING WALL PLANS.
4. FOR PIPE DETAILS, SEE DRAINAGE PLANS.
5. FOR UNDERDRAIN DETAILS, SEE MECHANICALLY STABILIZED BACKFILL SHEET.
6. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL UTILITIES.

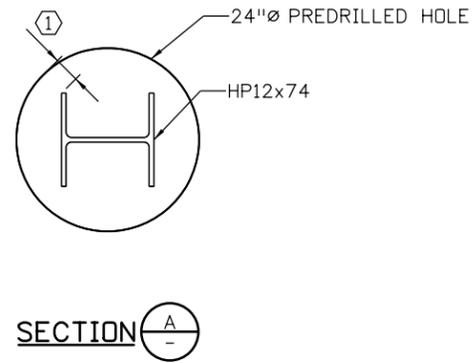


90% SET		CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES			REVISIONS:	NO.	DATE	REVISION DESCRIPTION:		BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION				LOGAN MILL ROAD FOUNDATION LAYOUT	
		DESIGNED:	CAD:	CHECKED:	DATE:	PROJECT NO: 4012.SEPT12C39	SHEET NO: 45								
									Michael Baker INTERNATIONAL	DLT	BMT	8/16/2016			

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TYPICAL PILE DETAIL



SECTION A-A

NOTES:

1. PILING SHALL BE PLACED PLUMB.
2. PREDRILLED HOLES SHALL BE BACKFILLED WITH 1,000 PSI FLOW-FILL TO TOP OF BEDROCK. THIS MATERIAL REQUIREMENT SUPERCEDES THE CDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 502.06.
3. PREDRILLED HOLES SHALL BE BACKFILLED WITH SAND ABOVE TOP OF BEDROCK.
4. IF NECESSARY, PILE SPLICES SHALL BE WELDED IN ACCORDANCE WITH THE CDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 502.08.
5. EXCAVATIONS SHALL BE CAREFULLY OBSERVED BY QUALIFIED PERSONNEL COMPETENT TO IDENTIFY WEATHERED LENSES IN THE BEDROCK AND TO ESTIMATE THE THICKNESS AND DEPTH OF THE WEATHERED LENSES, IF ANY. TIP ELEVATIONS SHALL BE EXTENDED AN ADDITIONAL DEPTH EQUAL TO OR GREATER THAN THE THICKNESS OF THE SUM OF WEATHERED LENSES.
6. CASING TO BEDROCK SHOULD BE ANTICIPATED.
7. NOMINAL TIP RESISTANCE AT TIP ELEVATION = 10 KSF.
RESISTANCE FACTOR FOR TIP RESISTANCE = 0.50.

NOMINAL SIDE RESISTANCE IN BEDROCK = 12 KSF.
RESISTANCE FACTOR FOR SIDE RESISTANCE = 0.55.

NOMINAL UPLIFT RESISTANCE IN BEDROCK = XX KSF.
RESISTANCE FACTOR FOR UPLIFT RESISTANCE = 0.45.

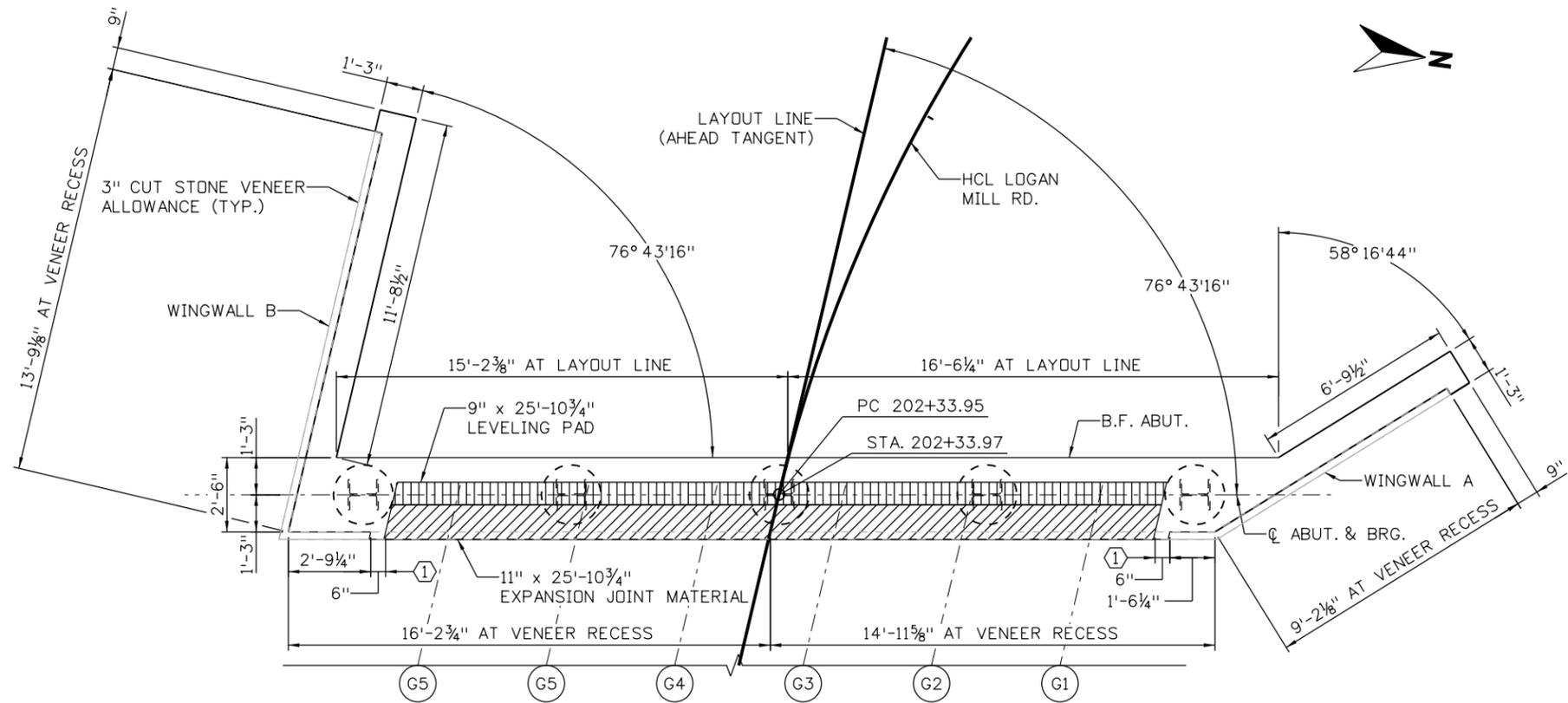
KEYNOTES:

- ① 3/8" PER PLAN. 1/2" MIN.

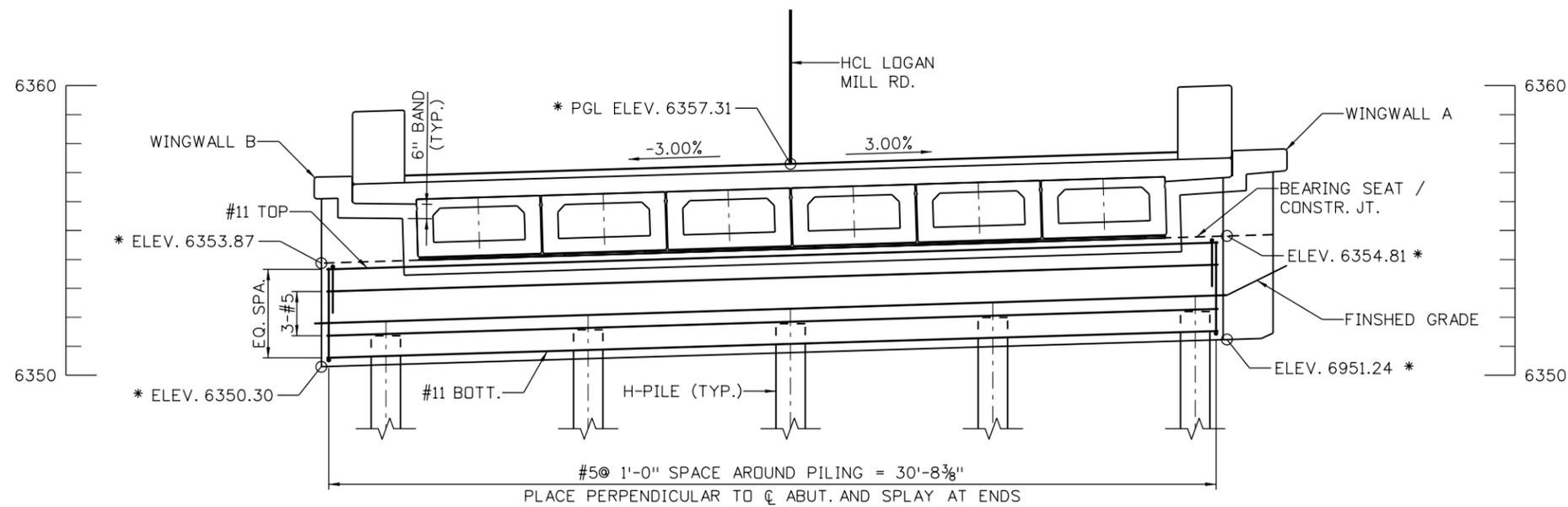
LOCATION	MAXIMUM SERVICE LOAD PER PILE (KIPS)	MAXIMUM FACTORED LOAD PER PILE (KIPS)	ESTIMATED TOP OF BEDROCK ELEVATION
ABUT. 1	150.43	191.07	6326.0
ABUT. 2	157.95	200.62	6333.0

LOCATION	PILE CUTOFF ELEVATION	AS-BUILT PILE TIP ELEVATION
A1-1	6351.36	
A1-2	6351.57	
A1-3	6351.78	
A1-4	6351.99	
A1-5	6352.20	
A2-1	6344.45	
A2-2	6344.63	
A2-3	6344.82	
A2-4	6345.01	
A2-5	6345.20	
A2-6	6345.38	
A2-7	6345.57	
A2-8	6345.76	

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BEARING SEAT PLAN



ELEVATION
LOOKING BACK STATION
CUT STONE VENEER NOT SHOWN

* ELEVATIONS GIVEN AT ϕ ABUTMENT

NOTES:

1. ABUTMENT CONCRETE SHALL BE CONCRETE CLASS D (BRIDGE).
2. FOR BACKFILL DETAILS, SEE MECHANICALLY STABILIZED BACKFILL SHEET.
3. CUT STONE VENEER EMBEDMENTS NOT SHOWN. SEE RETAINING WALL PLANS FOR DETAILS.

KEYNOTES:

- ① DIMENSION TAKEN 3" INSIDE F.F. ABUTMENT.

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



NO.	DATE	REVISION DESCRIPTION:

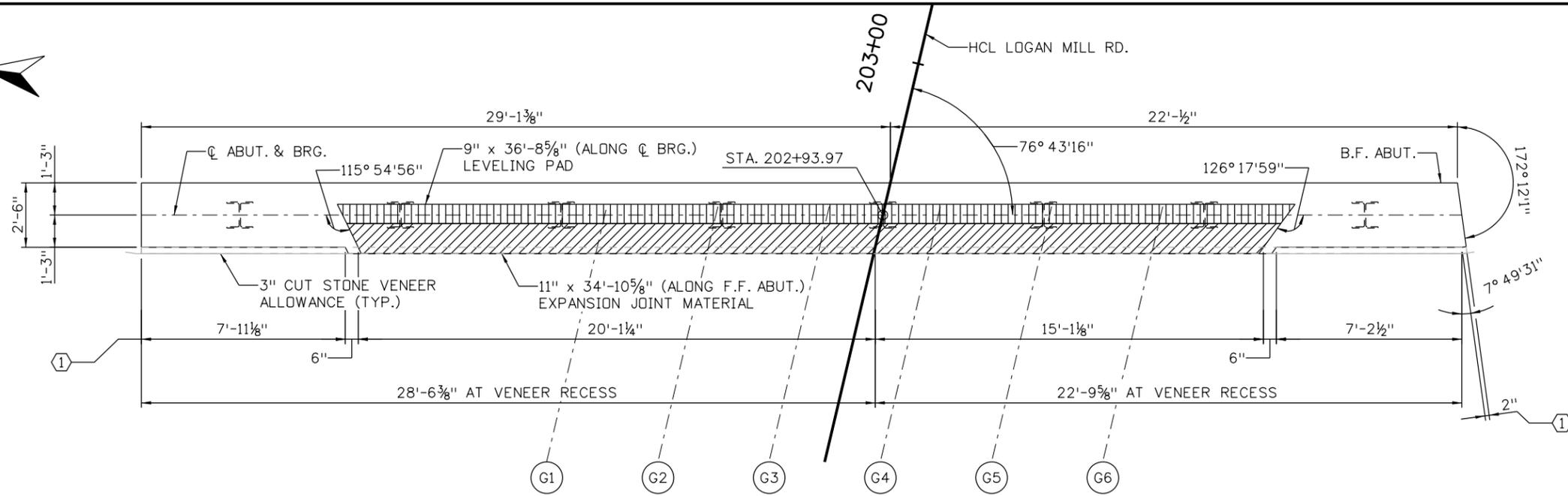


BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		8/16/2016

LOGAN MILL ROAD
ABUTMENT 1
DETAILS
PROJECT NO: 4012.SEPT12C39 SHEET NO: 47

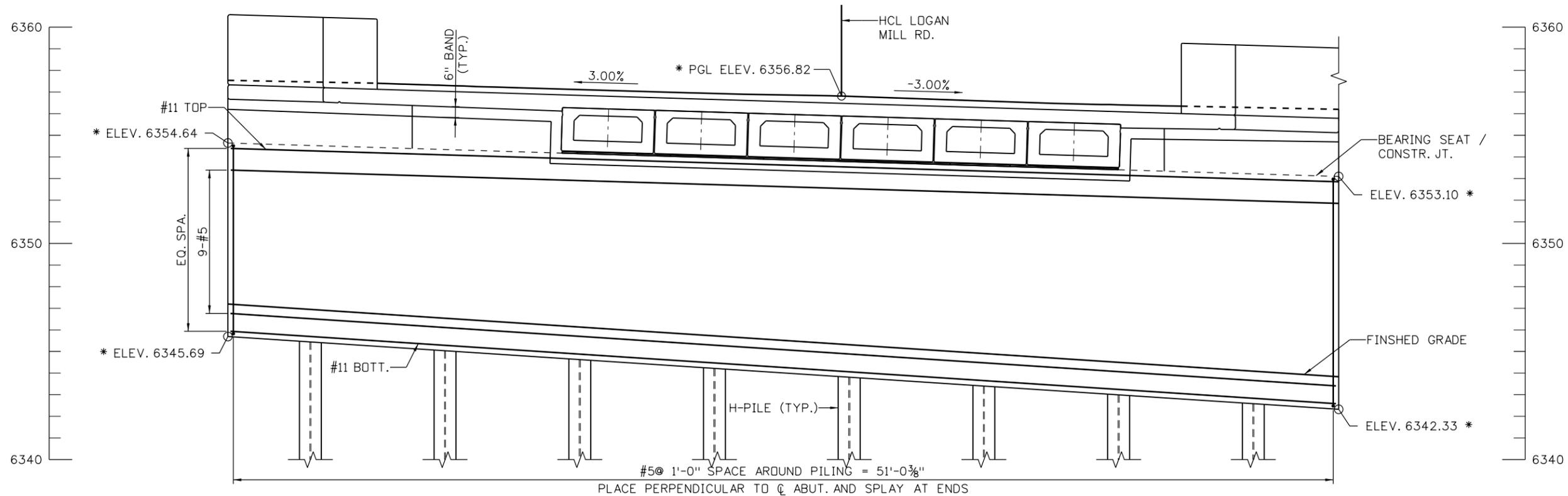
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BEARING SEAT PLAN

NOTES:
1. FOR NOTES, SEE ABUTMENT 1 SHEET.

KEYNOTES:
① DIMENSION TAKEN 3" INSIDE F.F. ABUTMENT.



ELEVATION

LOOKING AHEAD STATION
CUT STONE VENEER NOT SHOWN

* ELEVATIONS GIVEN AT ϕ ABUTMENT

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



NO.	DATE	REVISION DESCRIPTION:

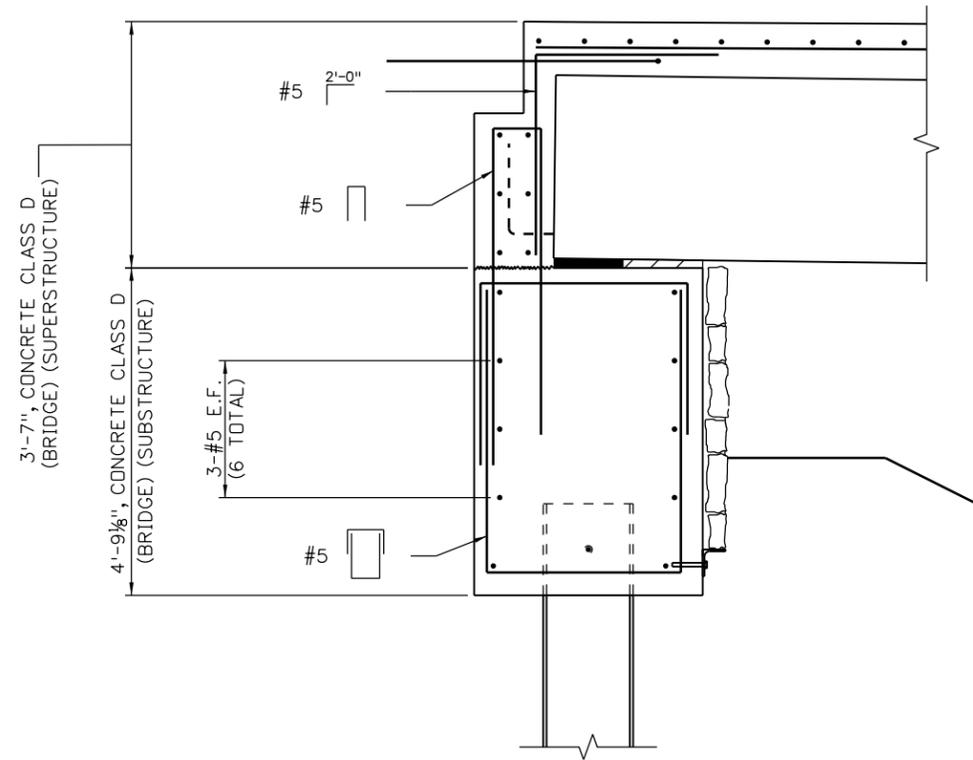


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ENGINEERING DIVISION
Michael Baker INTERNATIONAL
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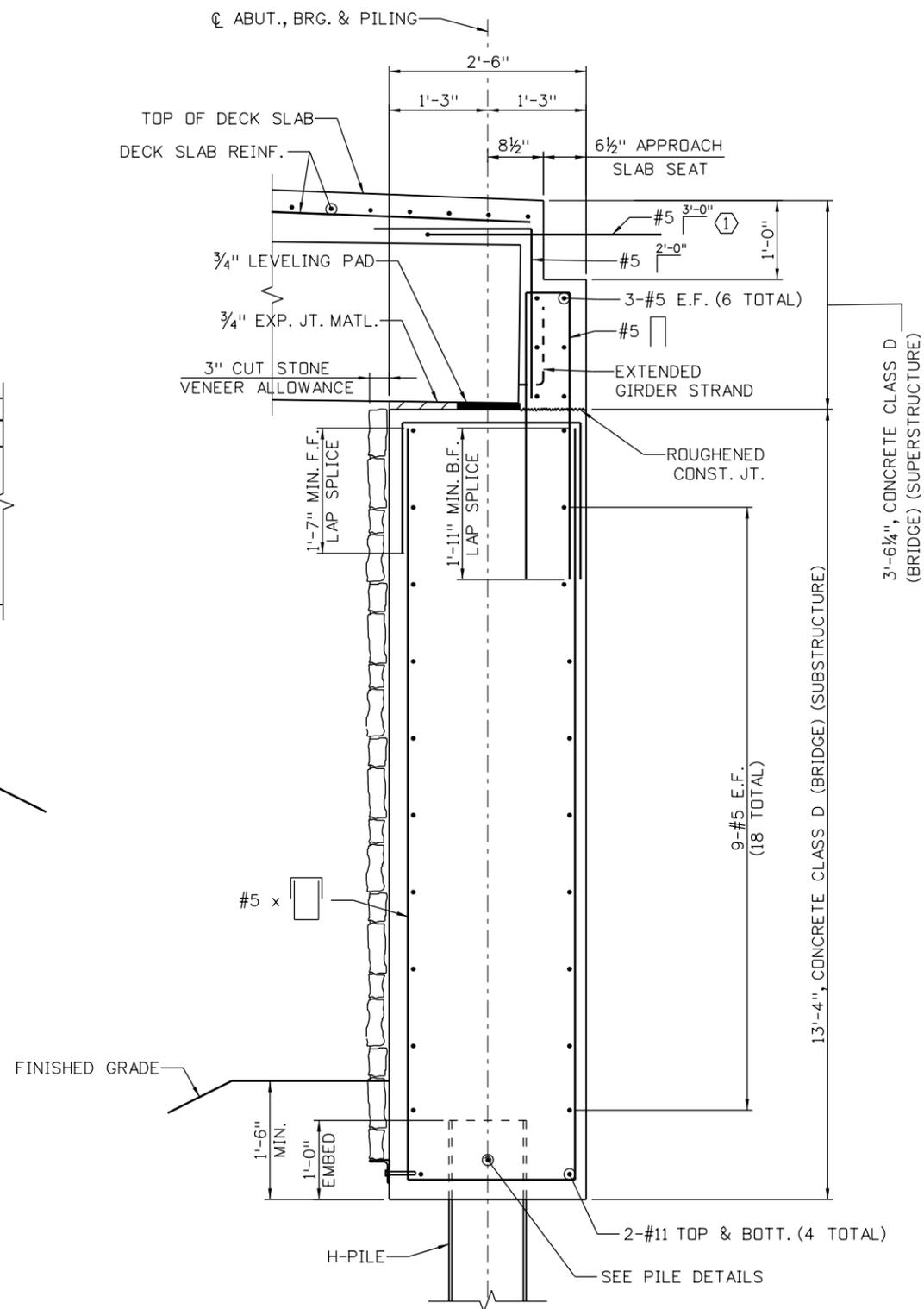
LOGAN MILL ROAD
ABUTMENT 2
DETAILS

PROJECT NO: 4012.SEPT12C39 SHEET NO: 48

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ABUTMENT 1 TYPICAL SECTION
SAME AS ABUTMENT 2 EXCEPT AS SHOWN



ABUTMENT 2 TYPICAL SECTION

NOTES:

1. ROUGHEN TOP OF PILE CAP EVERYWHERE EXCEPT FOR BENEATH LEVELING PAD AND EXPANSION JOINT MATERIAL.
2. ABUTMENT DIAPHRAGM SHALL BE PLACED MONOLITHICALLY WITH THE DECK SLAB.
3. APPROACH SLAB SEAT SHALL BE PARALLEL ROADWAY PROFILE.
4. GROUT SHALL BE SELECTED FROM THE CDOT APPROVED PRODUCTS LIST WITH 5,000 PSI MINIMUM COMPRESSIVE STRENGTH.
5. FOR CUT STONE VENEER DETAILS INCLUDING EMBEDMENTS NOT SHOWN, SEE RETAINING WALL PLANS.
6. FOR EXTENDED STRAND DETAILS, SEE PRESTRESSED CONCRETE BOX SHEET.

KEYNOTES:

- ① EMBED 1'-6". PLACE 1" CLR. TO TOP OF GIRDER. SEE APPROACH SLAB SHEET FOR DETAILS.

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:

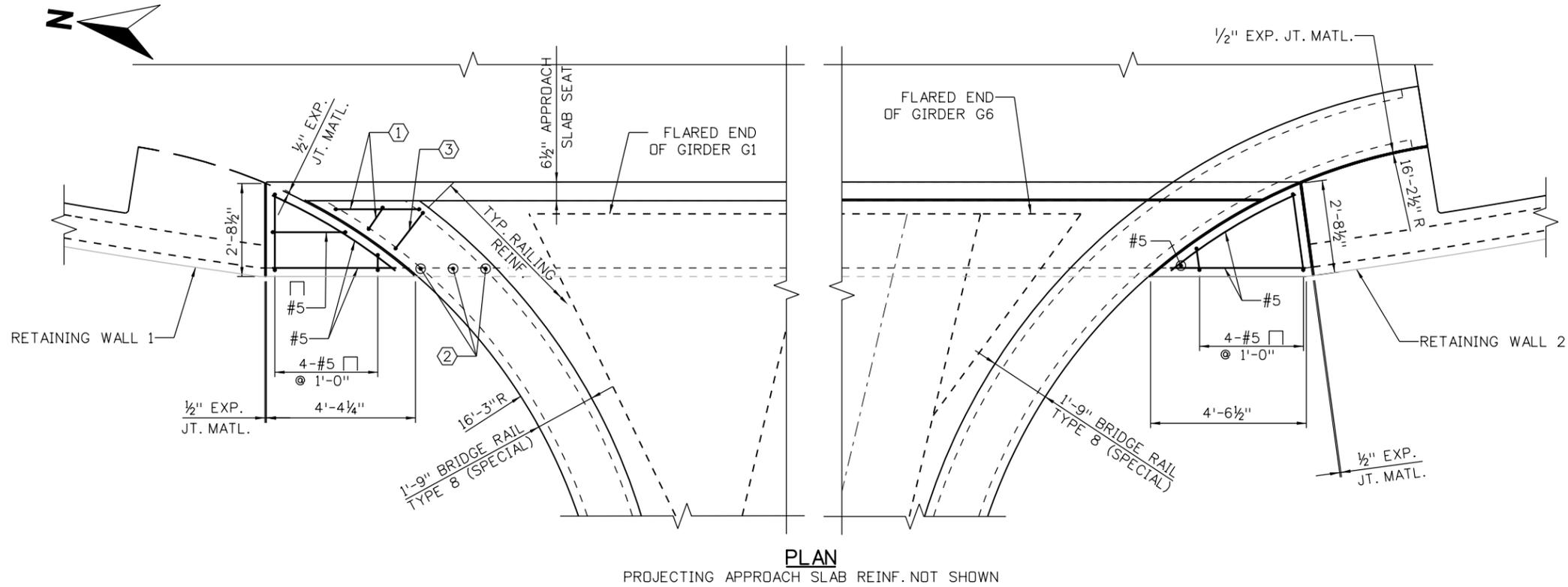


BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

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LOGAN MILL ROAD
ABUTMENT DETAILS
PROJECT NO: 4012.SEPT12C39 SHEET NO: 49

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NOTES:

1. FOR RETAINING WALL DETAILS, SEE WALL PLANS.
2. REINFORCING SCHEME SHOWN FOR SPACING AND ARRANGEMENT. ENGINEER REVIEW AND APPROVAL OF THE REINFORCING STEEL WORKING DRAWINGS IS REQUIRED AND SUPERCEEDS SECTION 105.02(d).

KEYNOTES:

- ① SIZE AND SHAPE SHALL MATCH BRIDGE RAIL. SEE BRIDGE RAIL SHEET FOR DETAILS. REINFORCING SHALL BE PLACED AS SHOWN.
- ② CONTRACTOR SHALL COORDINATE REINFORCING PLAN FOR BRIDGE RAIL AND ABUTMENT DIAPHRAGM SUCH THAT VERTICAL REINFORCEMENT IS PROVIDED ALONG THE FRONT FACE OF THE DIAPHRAGM @ 1'-0" AND BRIDGE RAIL REINFORCMENT IS PROVIDED AS INDICATED ON THE BRIDGE RAIL TYPE 8 (SPECIAL) SHEET.
- ③ BEND LOWER LEG TO FIT OR PROVIDE VERTICAL EMBEDMENT.

PLAN
PROJECTING APPROACH SLAB REINF. NOT SHOWN

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

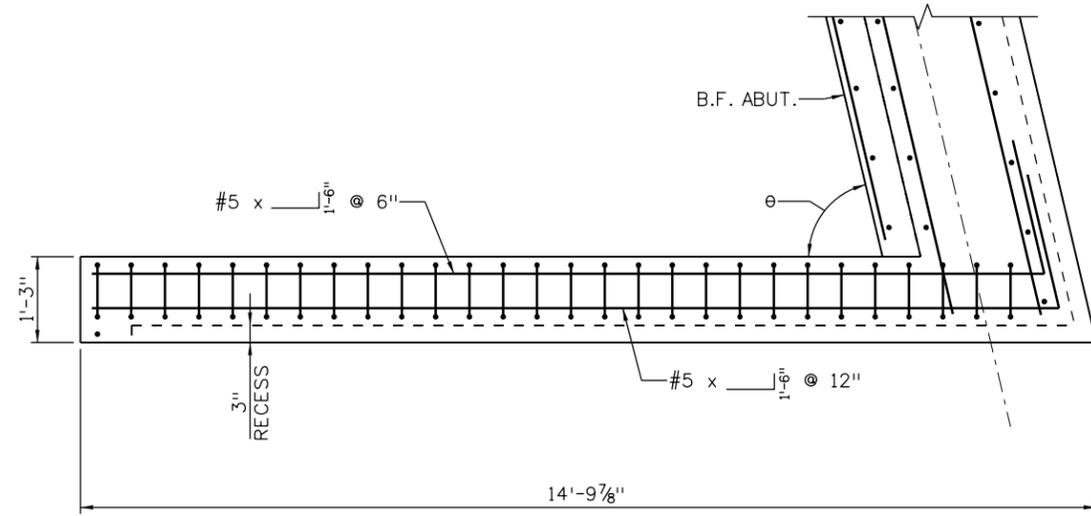
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ENGINEERING DIVISION
 **Michael Baker INTERNATIONAL**

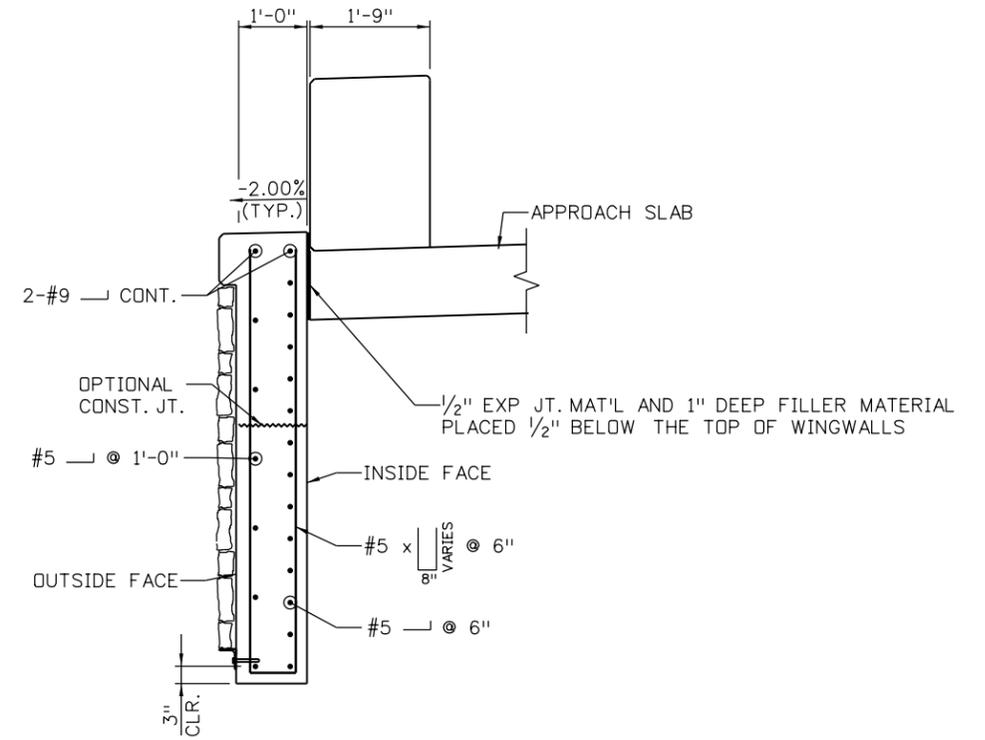
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DLT	BMT		8/16/2016

LOGAN MILL ROAD
ABUTMENT 2 DETAILS
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 50

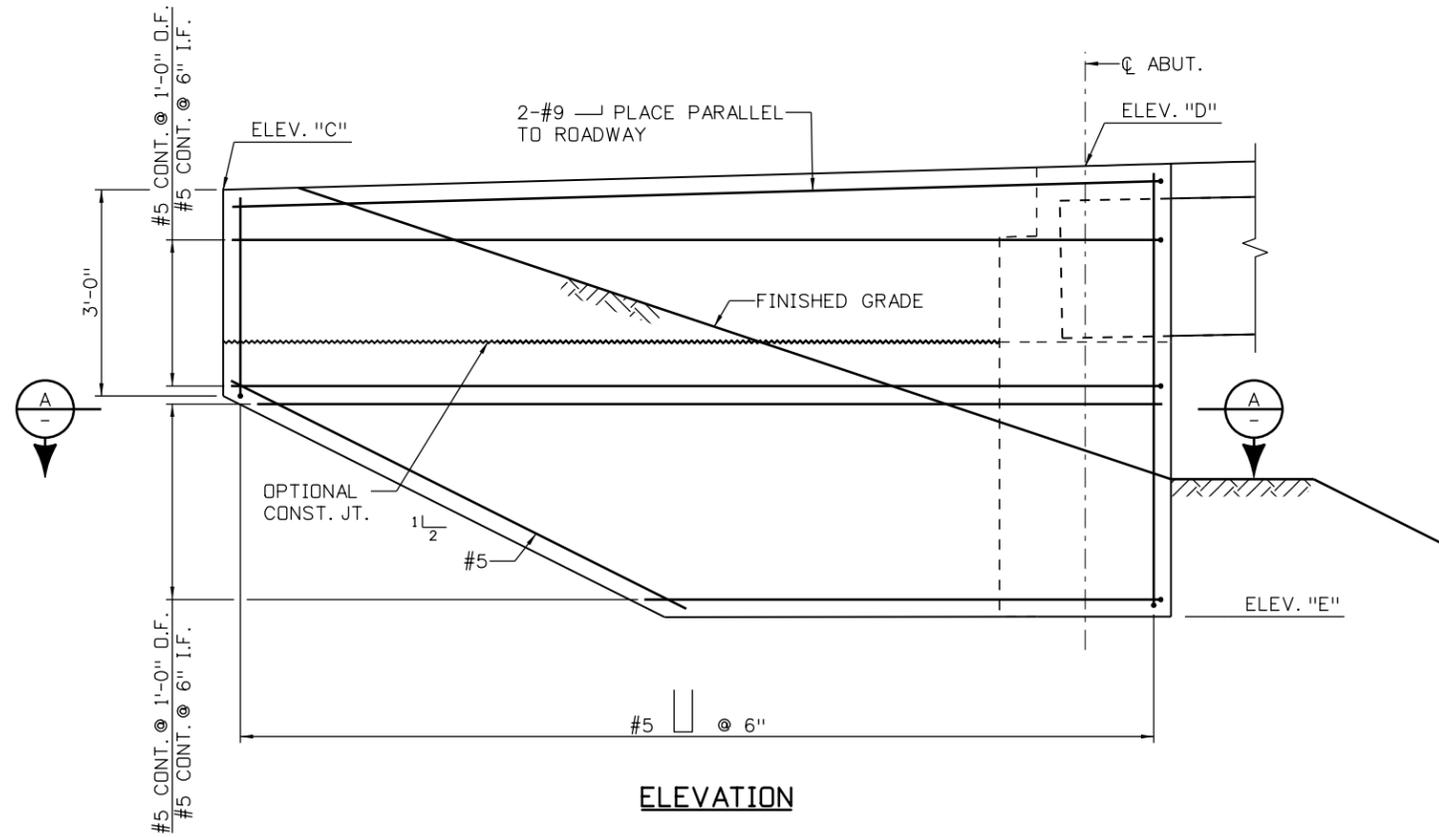
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SECTION **A**



TYPICAL SECTION
FINISHED GRADE NOT SHOWN



ELEVATION

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
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LOGAN MILL ROAD
WINGWALL DETAILS
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 51

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GIRDER SCHEDULE

GIRDER TYPE	SPAN NO.	GIRDER NO.	L (FEET)	W (INCH)	D (INCH)	θ (DEG.)	T _w (INCH)	T _{BM} (INCH)	T _{TM} (INCH)	T _{BE} (INCH)	T _{TE} (INCH)	A _s (SQ. IN.)	DEBONDED STRANDS (PERCENT)	E _{MS} (INCH)	E _E (INCH)	F _J (KIPS)	F _r (KIPS)	CONCRETE STRENGTH		Δ (INCH)	PREDICTED RELEASE CAMBER (INCH)	PREDICTED CAMBER (INCH)
																		f' _a (PSI)	f' _c (PSI)			
B24	1	G1, G4	63.70	70	24	90	6	6	4	6	4	6.510	0	2.25	2.25	1,318	1,130	5,500	7,000	-2.092	2.644	0.989
B24	1	G2, G3	63.70	70	24	90	6	6	4	6	4	6.510	0	2.25	2.25	1,318	1,114	5,500	7,000	-1.727	2.644	1.354

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO

 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

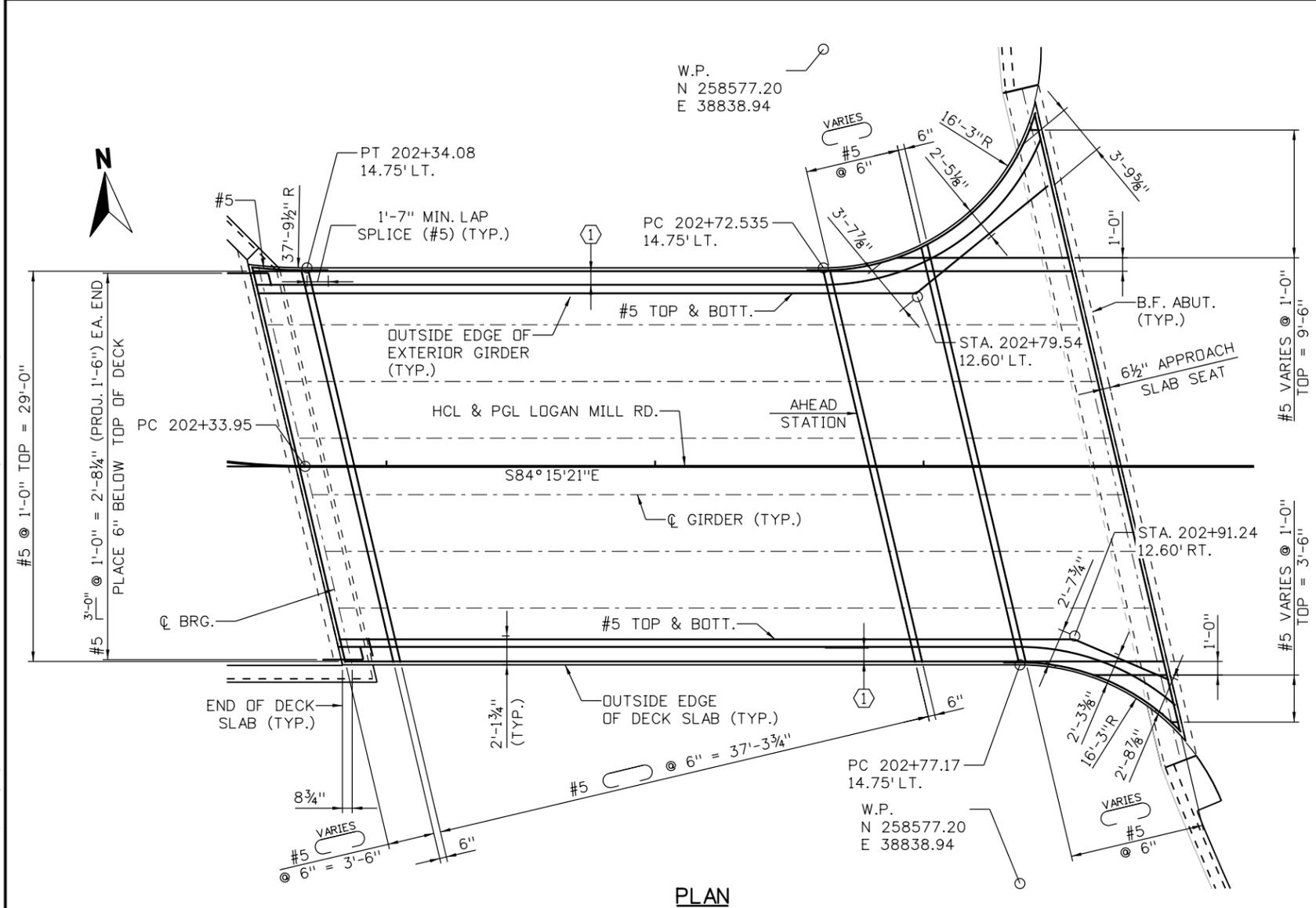
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

 **BOULDER COUNTY TRANSPORTATION DEPARTMENT**
ENGINEERING DIVISION
 **Michael Baker INTERNATIONAL**

DESIGNED: DLT	CAD: BMT	CHECKED:	DATE: 8/16/2016
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LOGAN MILL ROAD
PRESTRESSED CONCRETE BOX (2 OF 2)
 PROJECT NO: 4012.SEPT12C39 SHEET NO: **53**

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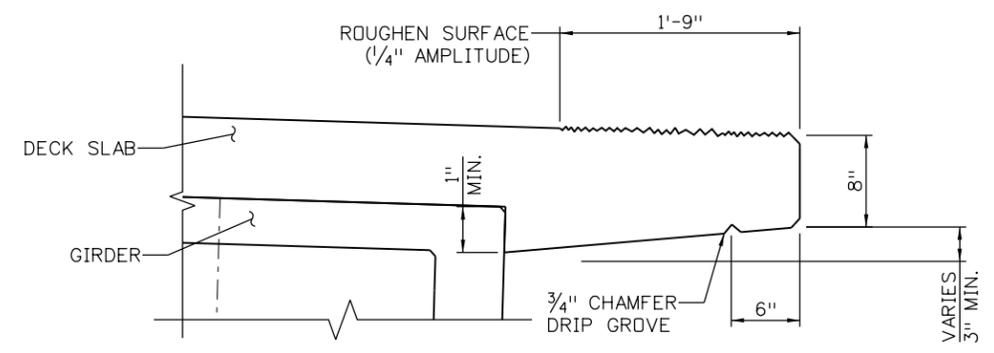
PLAN

NOTES:

1. DECK SLAB SHALL BE CONCRETE CLASS D (BRIDGE).
2. PROJECTING BRIDGE RAIL REINFORCEMENT NOT SHOWN. FOR RAILING DETAILS, SEE BRIDGE RAIL TYPE 8 (SPECIAL) SHEET(S).
3. THE CONTRACTOR MAY ELECT TO SPLICE TOP REINFORCEMENT. ALTERNATE ALL LAP SPLICES.
4. HAUNCH VARIES TO 1" MINIMUM AT \varnothing SPAN.
5. PLACE TRANSVERSE REINFORCING PARALLEL TO \varnothing BRG.
6. SEE CONSTRUCTION LAYOUT FOR DECK RADIAL LOCATIONS.

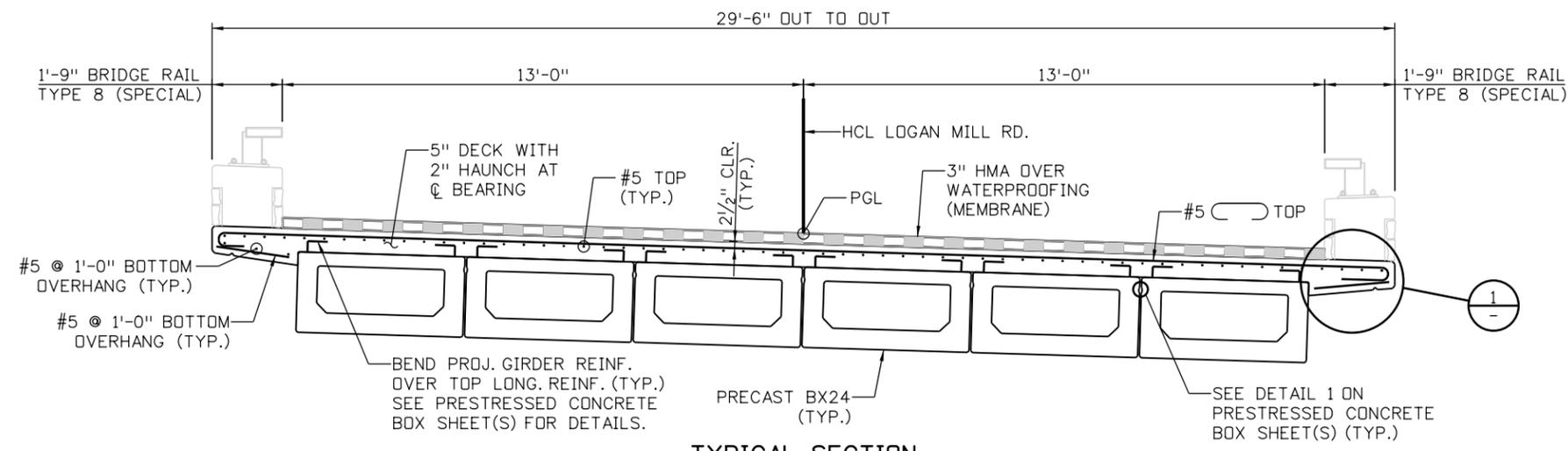
KEYNOTES:

- ① 2-#5 TOP & BOTT. (OVERHANG) RADIAL ALONG VERT. RAIL REINF.



DETAIL 1

RIGHT OVERHANG SHOWN, LEFT OVERHANG SIMILAR



TYPICAL SECTION
LOOKING AHEAD STATION

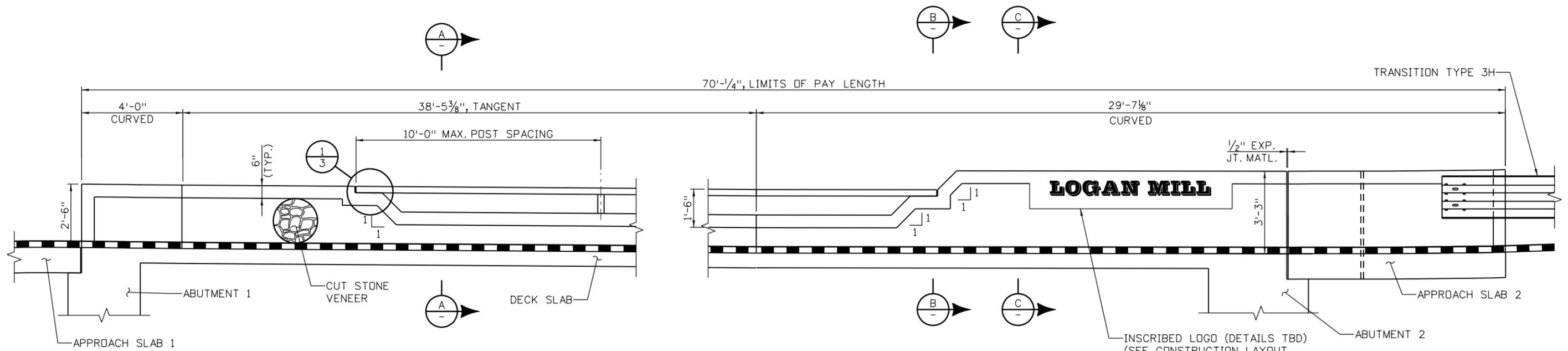
90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD SUPERSTRUCTURE DETAILS</p>
		REVISIONS:					DLT	BMT		



Michael Baker INTERNATIONAL

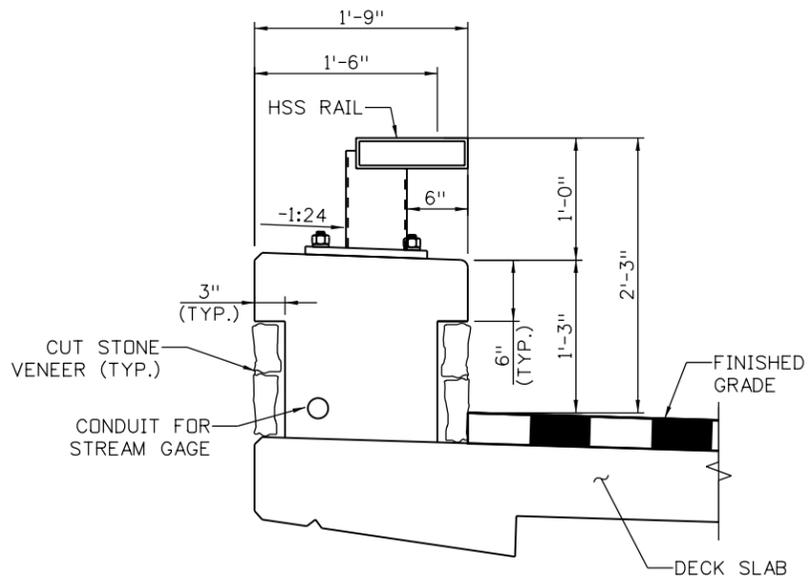
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DATE: 8/16/2016

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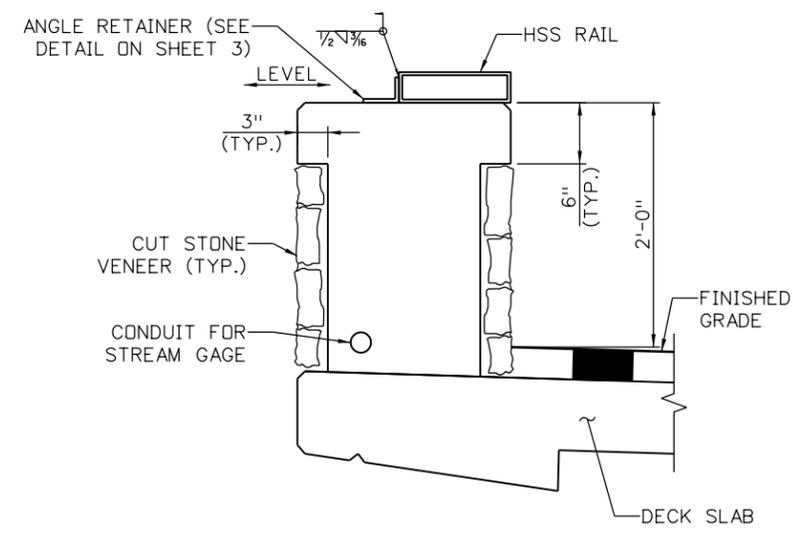


LEFT BRIDGE RAIL ELEVATION
TAKEN AT F.F. BRIDGE RAIL

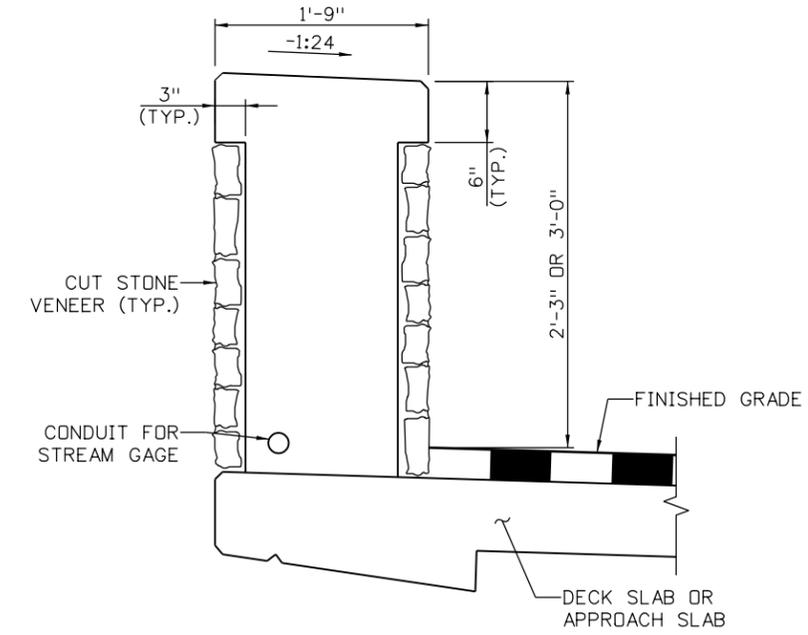
- NOTES:**
1. SEE CONSTRUCTION LAYOUT FOR CONDUIT LOCATIONS AND LIMITS
 2. PLACE CONDUIT ALONG OUTSIDE EDGE OF DECK. TIE TO STIRRUPS.



TYPICAL SECTION (A/2)



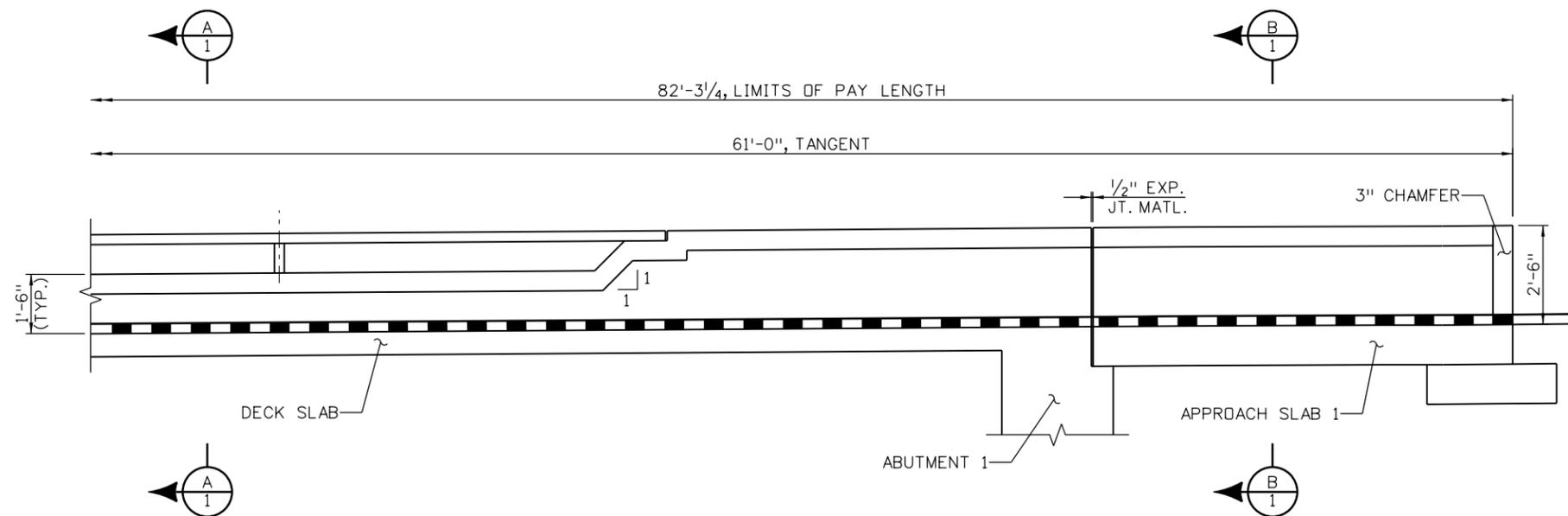
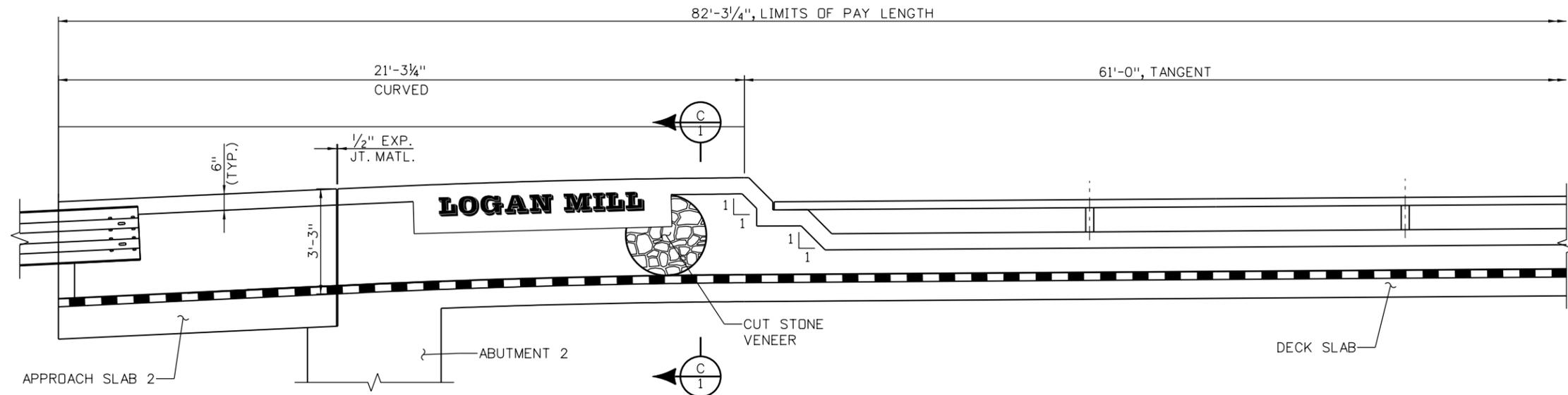
RAIL TERMINAL SECTION (B/2)
SAME AS TYPICAL SECTION EXCEPT AS SHOWN



PARAPET SECTION (C/2)

90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD BRIDGE RAIL TYPE 8 (SPECIAL) (1 OF 3)</p>	PROJECT NO: 4012.SEPT12C39 SHEET NO: 55
							DLT	BMT		8/16/2016		

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RIGHT BRIDGE RAIL ELEVATION
TAKEN AT F.F. BRIDGE RAIL

NOTES:

1. SAME AS LEFT BRIDGE RAIL EXCEPT AS NOTED
2. SEE CONSTRUCTION LAYOUT FOR CONDUIT LOCATIONS AND LIMITS.
3. FOR CUT STONE VENEER DETAILS, SEE RETAINING WALL ARCHITECTURAL DETAILS.

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO

 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

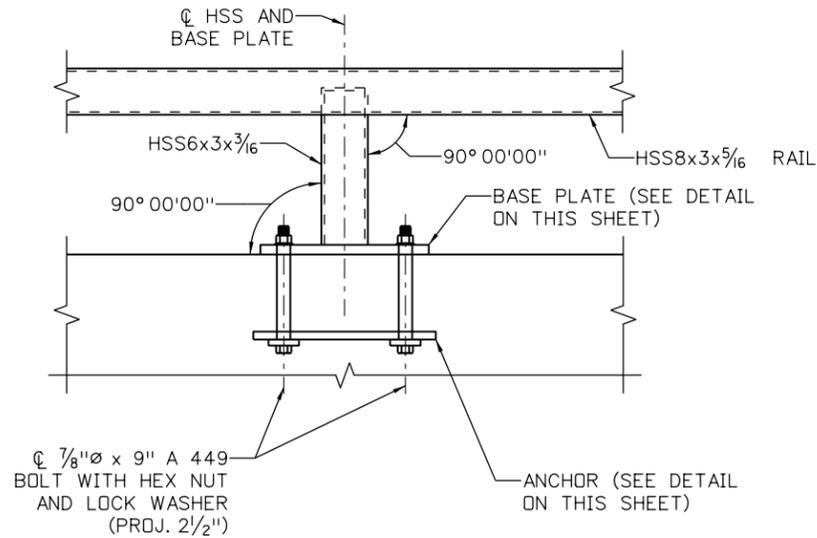


BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

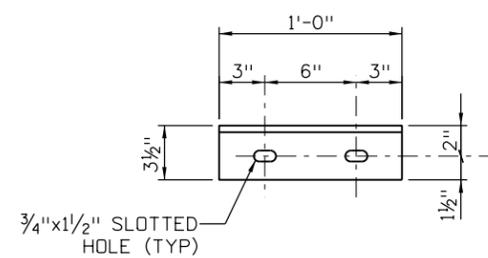
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LOGAN MILL ROAD
BRIDGE RAIL TYPE 8
(SPECIAL) (2 OF 3)
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 56

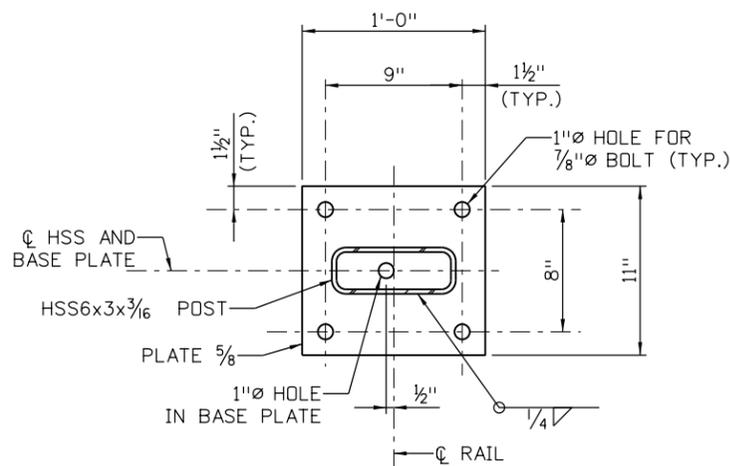
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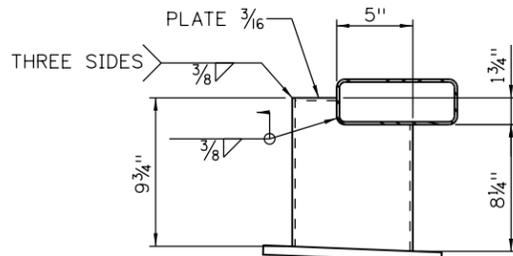
DETAIL A



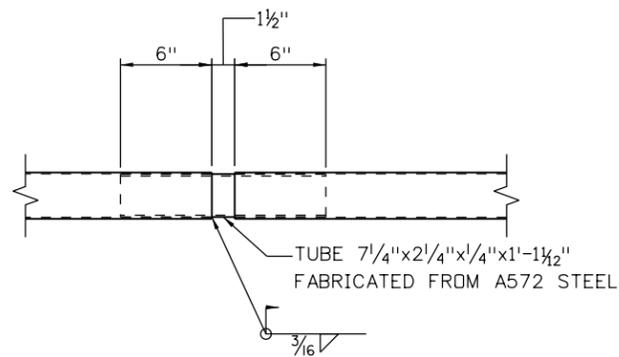
ANGLE PLAN



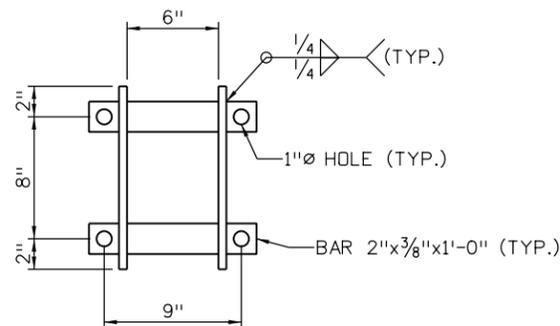
BASE PLATE DETAIL



POST SIDE VIEW



RAIL SPLICE DETAIL
LOCATE SPLICE 2'-6" FROM POST



ANCHOR DETAIL

NOTES:

1. ALL TUBES SHALL BE FABRICATED FROM ASTM A 500 GRADE B. BASE PLATES SHALL BE FABRICATED FROM ASTM A 36 STEEL.
2. THE ABOVE MATERIAL SHALL BE PAINTED AFTER FABRICATION IN ACCORDANCE WITH SECTION 509 OF THE STANDARD SPECIFICATIONS. THE COLOR SHALL BE XXX, EQUIVALENT TO FEDERAL STANDARD 595B COLOR NO. XXX. ALL ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 509. CONCRETE, REINFORCING STEEL, AND STRUCTURAL STEEL ELEMENTS SHALL CONFORM TO THE REQUIREMENTS OF SECTIONS 601, 602, AND 509, RESPECTIVELY.
3. POST ANCHOR, ENCASED IN CONCRETE, SHALL BE ASTM A 36 OR AASHTO M 169 STEEL AND NEED NOT BE GALVANIZED.
4. THE TUBES SHALL BE SHOP BENT OR FABRICATED TO FIT HORIZONTAL CURVE WHEN RADIUS IS LESS THAN 2,400 FEET.
5. TUBES SHALL BE CONTINUOUS OVER NOT LESS THAN THREE POSTS. NO WELDED BUTT SPLICES WILL BE ALLOWED IN THE TUBE SECTIONS.
6. THE CENTERLINE OF THE POSTS SHALL BE A 2'-6" MINIMUM AND 7'-4" MAXIMUM FROM THE CENTERLINE OF THE TUBE EXPANSION SPLICE, MEASURED ALONG THE CENTERLINE OF POSTS.
7. ALL BOLTS THAT HAVE LOCK WASHERS SHALL BE TIGHTENED TO SNUG ONLY.
8. POSTS SHALL BE PERPENDICULAR TO THE LONGITUDINAL ROADWAY GRADE. ONE OR MORE 10'-0" POST SPACINGS MAY BE REDUCED (7'-10" MIN.) IN ORDER TO MAINTAIN EQUAL SPACINGS.
9. PAYMENT WILL BE MADE UNDER ITEM 606, BRIDGE RAIL TYPE 8 (SPECIAL) FOR ALL POSTS, RAILS, ANCHORS, BASE PLATES, ANCHOR BOLTS, NUTS, WASHERS, END PLATES, CURB CONCRETE (CLASS D), AND CURB REINFORCING STEEL.
10. WELDING SHALL BE IN ACCORDANCE WITH ANSI/ AASHTO/ AWS D1.1.
11. PRIOR TO FABRICATION OF THIS ITEM, THREE SETS OF WORKING DRAWINGS WHICH COMPLY WITH THE REQUIREMENTS OF SECTION 105, SHALL BE SUBMITTED FOR INFORMATION ONLY.

STRUCTURAL STEEL:

AASHTO M-183 (ASTM A-36)	F _y = 36,000 PSI
COLD FORMED ASTM A-500 GRADE B	F _y = 46,000 PSI
AASHTO M 223 (ASTM A-572) GRADE 50	F _y = 50,000 PSI

FOR INFORMATION ONLY

DESCRIPTION	UNIT	PER LIN. FT.
STRUCTURAL STEEL	LB.	100
CONCRETE CLASS D (BRIDGE)	CU.YD.	0.1
REINFORCING STEEL (EPOXY COATED)	LB.	37.5

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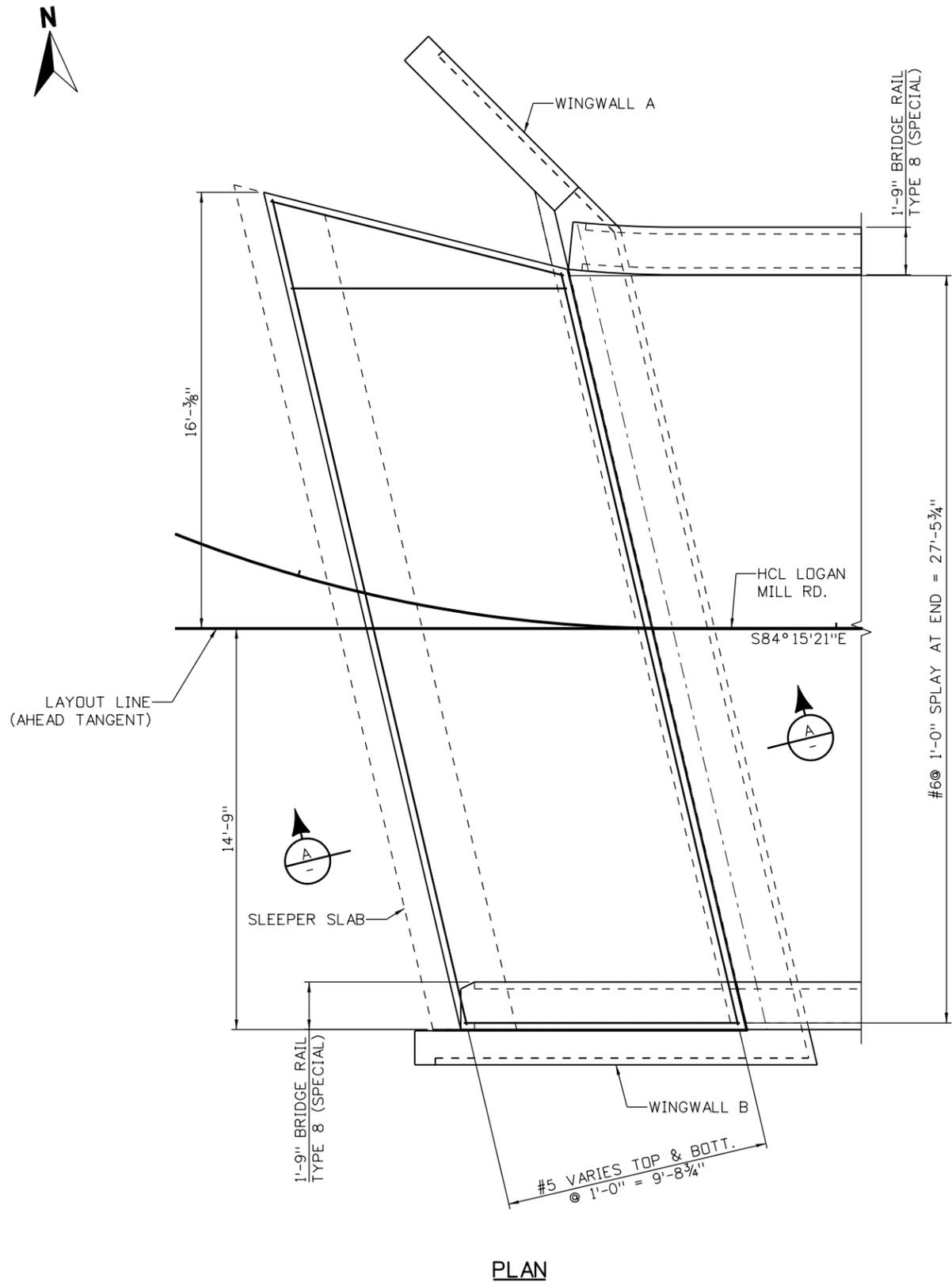
REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL
DESIGNED: DLT CAD: BMT CHECKED: DATE: 8/16/2016

LOGAN MILL ROAD
BRIDGE RAIL TYPE 8
(SPECIAL) (3 OF 3)
PROJECT NO: 4012.SEPT12C39 SHEET NO: 57

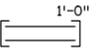
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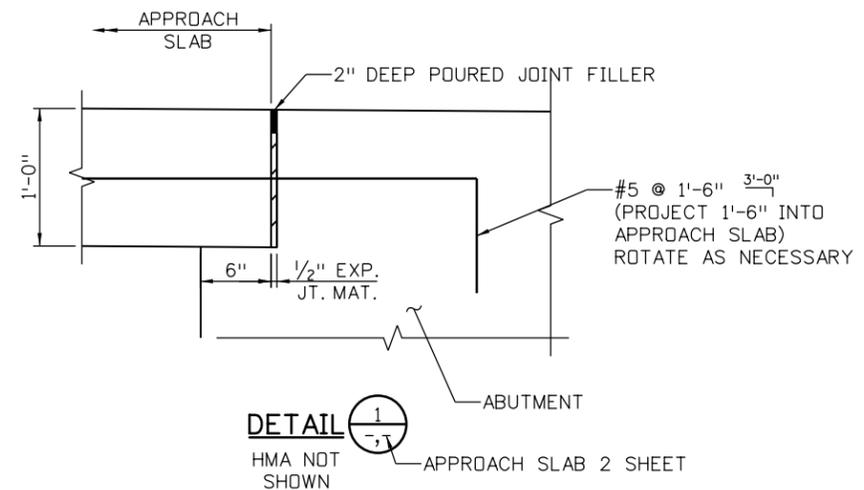
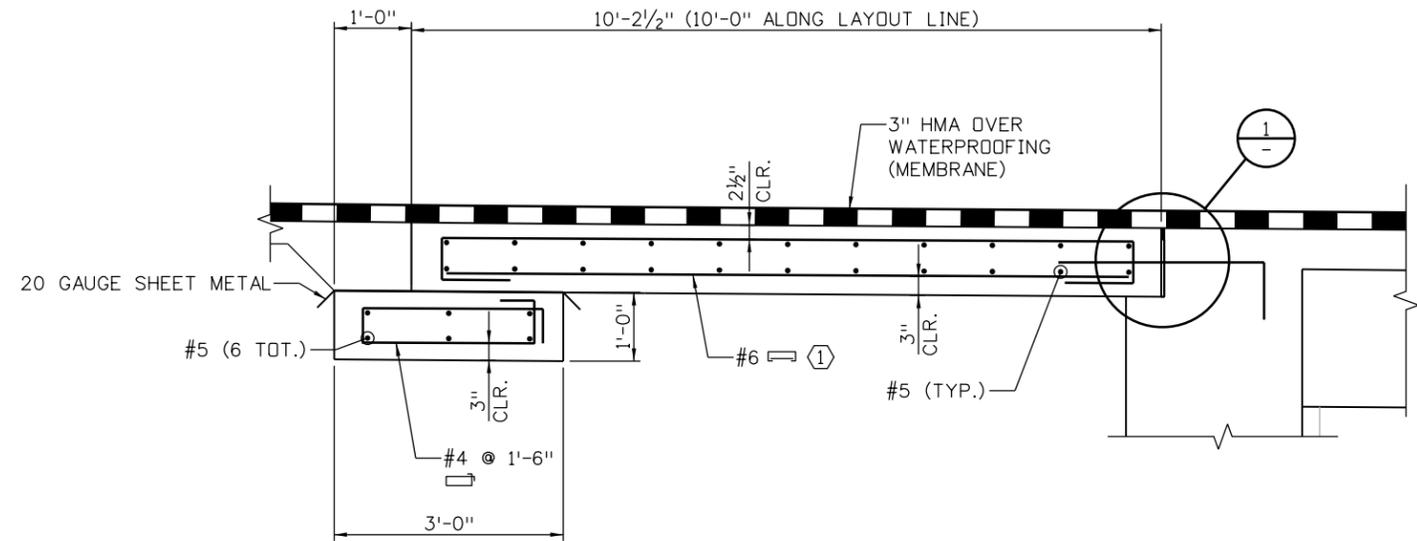


NOTES:

1. APPROACH SLAB CONCRETE SHALL BE CONCRETE CLASS D (BRIDGE).
2. PROJECTING BRIDGE RAIL REINFORCEMENT NOT SHOWN. FOR RAILING DETAILS, SEE BRIDGE RAIL TYPE 8 (SPECIAL) SHEETS.
3. SEE CONSTRUCTION LAYOUT FOR LIMITS OF APPROACH SLAB.
4. 20 GAUGE SHEET METAL SHALL BE INCLUDED WITH ITEM 601 CONCRETE CLASS D (BRIDGE).

KEYNOTES:

- ① CONTRACTOR MAY ELECT TO USE 



90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



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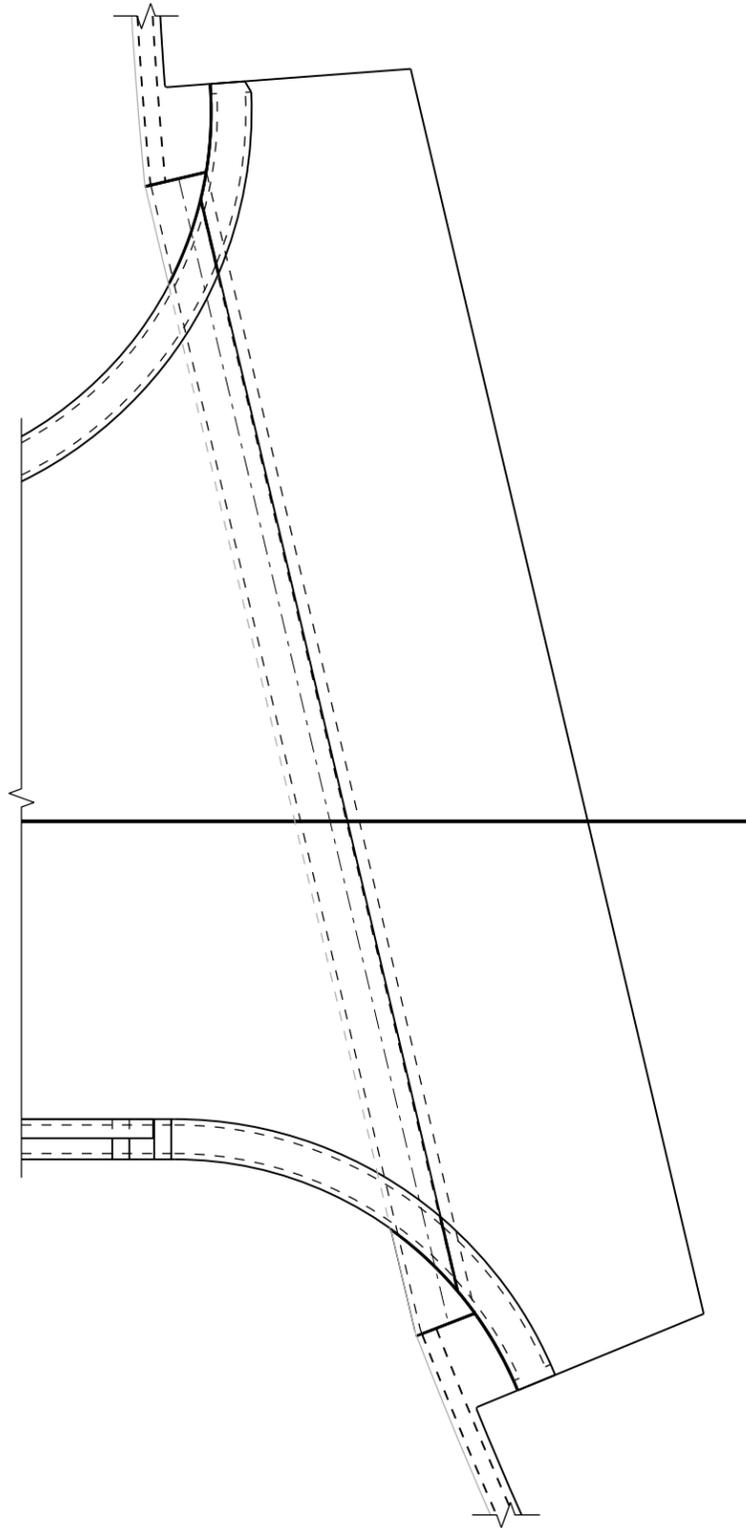


BOULDER COUNTY TRANSPORTATION DEPARTMENT
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LOGAN MILL ROAD
APPROACH SLAB 1
PROJECT NO: 4012.SEPT12C39 SHEET NO: 58

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PLAN
SCALE:

NOTES:

1. APPROACH SLAB CONCRETE SHALL BE CONCRETE CLASS D (BRIDGE).
2. PROJECTING BRIDGE RAIL REINFORCEMENT NOT SHOWN. FOR RAILING DETAILS, SEE BRIDGE RAIL TYPE 8 (SPECIAL) SHEETS.
3. SEE CONSTRUCTION LAYOUT FOR LIMITS OF APPROACH SLAB.
4. 20 GAUGE SHEET METAL SHALL BE INCLUDED WITH ITEM 601 CONCRETE CLASS D (BRIDGE).

KEYNOTES:

① CONTRACTOR MAY ELECT TO USE 

90% SET



CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



**BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION**

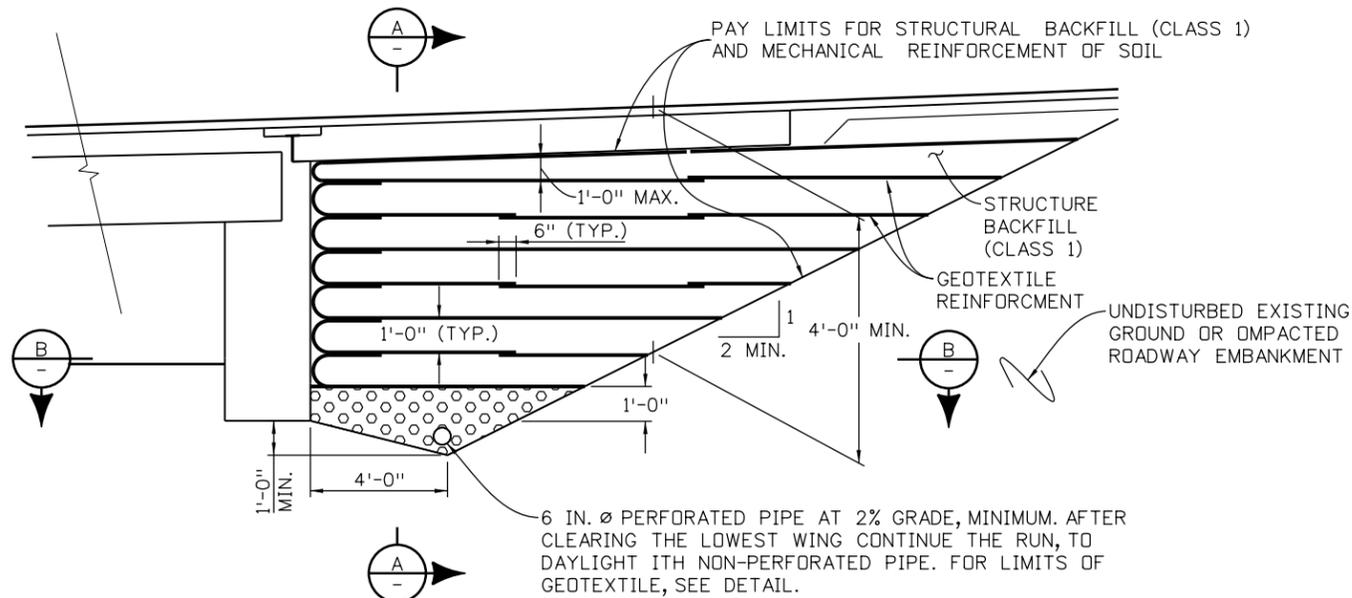
**Michael Baker
INTERNATIONAL**

DESIGNED: DLT	CAD: BMT	CHECKED:	DATE: 8/16/2016
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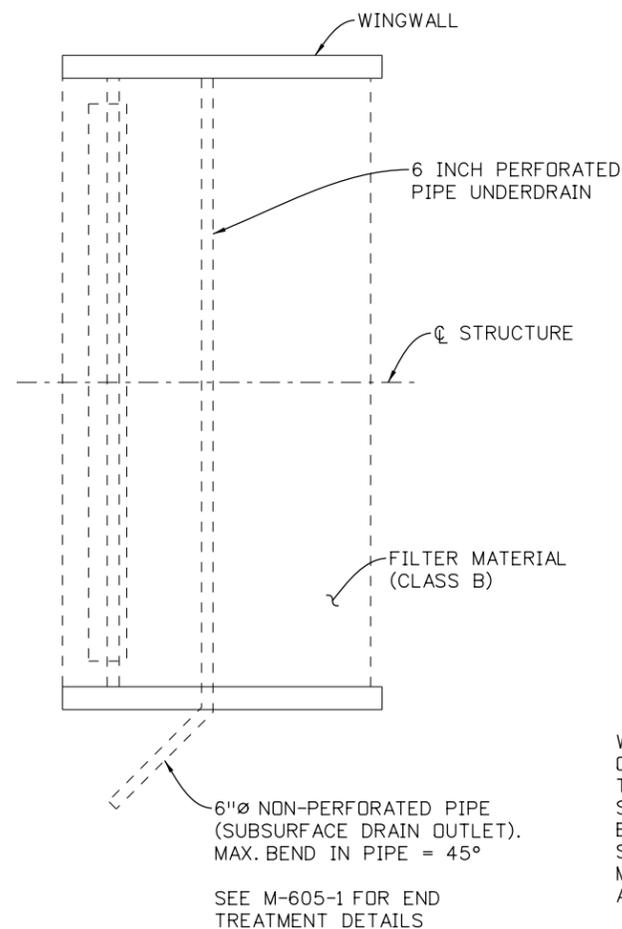
LOGAN MILL ROAD
APPROACH SLAB 2

PROJECT NO: 4012.SEPT12C39 SHEET NO: 59

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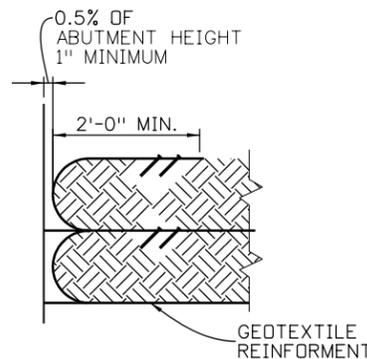


SECTION PERPENDICULAR TO ABUTMENT



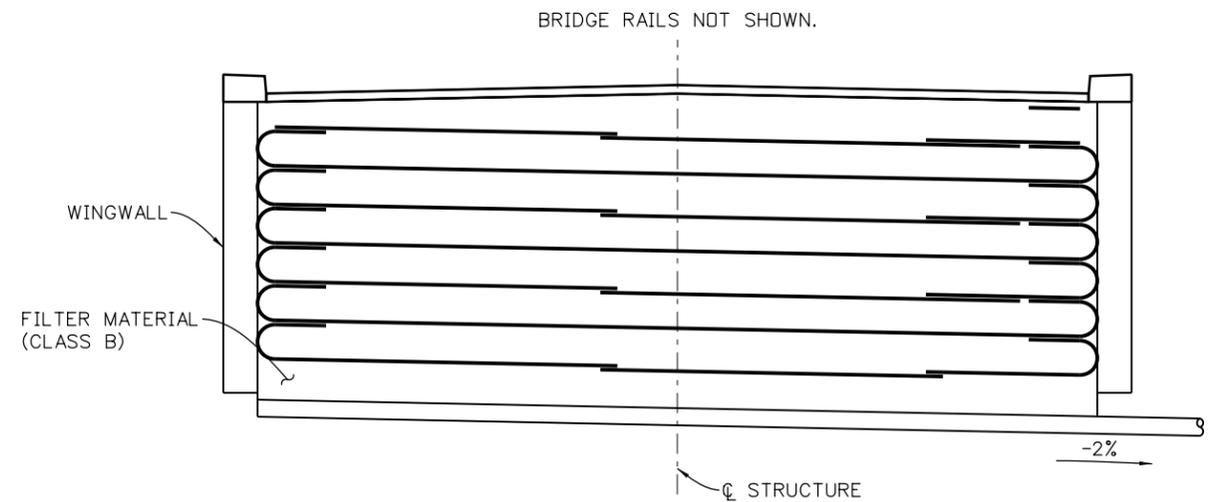
SECTION B

FOR STEEL STRUCTURES LONGER THAN 300' WITHOUT EXPANSION DEVICES BETWEEN ABUTMENTS AND FOR ABUTMENTS GREATER THAN 12' HIGH, PROVIDE GAP BETWEEN THE ABUTMENT AND BACKFILL. THE GAP WIDTH SHALL BE AT LEAST 0.5% OF THE ABUTMENT HEIGHT, 1" MINIMUM. SEE GAP DETAIL 1 AND 2. DO NOT PROVIDE THIS GAP AT BOTTOM 2 NOR THE TOP 2 LAYERS OF REINFORCED SOIL.

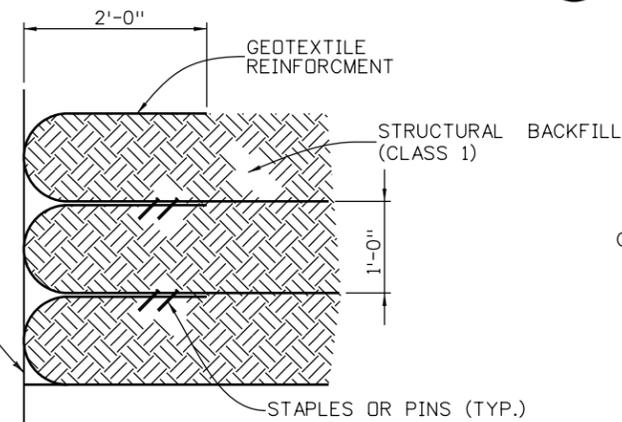


GAP DETAIL STEP 2

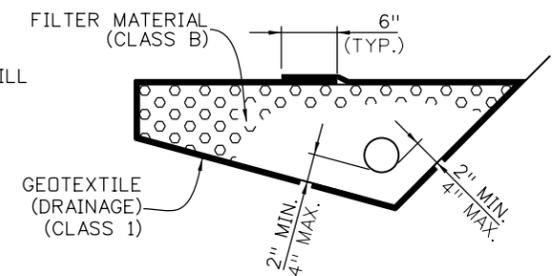
WHEN REQUIRED, THE GEOTEXTILE REINFORCEMENT WRAP AT BACK FACE OF ABUTMENT SHALL BE TEMPORARILY HUNG WITH A SPACER BOARD AND TACK STRIP. AFTER REACHING A TOTAL OF 1'-0" COMPACTED LIFT, THE TACK STRIP SHALL BE REMOVED AND TEXTILE REINFORCEMENT SHALL BE PULLED BACK SLACK FREE WITH ITS END ANCHORED TO SOIL UNDERNEATH WITH STAPLE OR PINS BEFORE THE SPACER BOARD IS PULLED. ANY ALTERNATE METHOD TO MAINTAIN THE MINIMUM GAP BETWEEN ABUTMENT CONCRETE AND REINFORCED SOIL MAY BE PROPOSED TO THE ENGINEER FOR APPROVAL.



SECTION A



WRAP DETAIL



6 INCH PERFORATED PIPE UNDERDRAIN

6 INCH PERFORATED PIPE UNDERDRAIN INCLUDES ALL FILTER MATERIAL (CLASS B) AND GEOTEXTILE (DRAINAGE) (CLASS 1) SURROUNDING THE FILTER MATERIAL (CLASS B).

NOTES:

GEOTEXTILE REINFORCEMENT SHALL BE WOVEN FABRIC WITH A MINIMUM AVERAGE ROLL VALUE OF 4800 LB/FT FOR INSTALLATIONS WITH A GAP AND 2400 LB/FT FOR INSTALLATIONS WITHOUT A GAP BASED ON ASTM D4595.

GEOTEXTILE REINFORCEMENT SHALL BE PLACED BY ALTERNATING MACHINE DIRECTION (MD) WITH CROSS MACHINE DIRECTION (XD) FROM LAYER TO LAYER.

THE GEOTEXTILE REINFORCEMENT WRAP AT BACK FACE OF ABUTMENT SHALL BE PULLED BACK SLACK FREE WITH ITS END ANCHORED TO SOIL UNDERNEATH WITH STAPLES OR PINS.

MINIMUM SPLICE OF ALL GEOFABRIC SHALL CONSIST OF 6" OF OVERLAP.

PAYMENT FOR ALL WORK ITEMS SHOWN WILL BE MADE UNDER ITEM 206 MECHANICAL REINFORCEMENT OF SOIL (CY) AND ITEM 206 STRUCTURE BACKFILL (CLASS 1) (CY) AND SHALL INCLUDE THE COST FOR 6 INCH Ø PERFORATED PIPE UNDERDRAIN AND SUBSURFACE DRAIN OUTLET (6 INCH Ø NONPERFORATED PIPE).

INSTALLATION OF PIPE UNDERDRAIN AND SUBSURFACE DRAIN OUTLET WILL CONFORM TO THE CONSTRUCTION REQUIREMENTS OF SECTION 605.03 AND 605.06, RESPECTIVELY.

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
 Michael Baker INTERNATIONAL
 DESIGNED: DLT CAD: JRM CHECKED: DATE: 8/16/2016

LOGAN MILL ROAD
MECHANICALLY STABILIZED BACKFILL
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 60

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HORIZONTAL CONTROL LINE

BENT LINE DESCRIPTION	STATION	OFFSET	FINISHED GRADE ELEVATION	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
BEGIN AS1						
BF A1						
CL BRG A1						
CL BRG A2						
BF A2						
END AS2						

CL GIRDER 1

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								

CL GIRDER 2

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								

CL GIRDER 3

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								

CL GIRDER 4

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								

CL GIRDER 5

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								

CL GIRDER 6

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								

NOTES:

1. FOR NOTES AND LEGEND, SEE SHEET 2.

90% SET	 CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION 	DESIGNED:	CAD:	CHECKED:	DATE:	LOGAN MILL ROAD BRIDGE DECK ELEVATIONS (1 OF 2) PROJECT NO: 4012.SEPT12C39 SHEET NO: 61
							DLT	BMT		8/16/2016	

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LEFT EDGE OF SLAB

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
BF AS1								
F-1								
F-2								
F-3								
BF A1								
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								
BF A2								
F-1								
F-2								
F-3								
BF AS2								

LEFT CURB FLOWLINE

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
BF AS1								
F-1								
F-2								
F-3								
BF A1								
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								
BF A2								
F-1								
F-2								
F-3								
BF AS2								

LEGEND:

90% SET



CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED: DLT	CAD: BMT	CHECKED:	DATE: 8/16/2016
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LOGAN MILL ROAD
BRIDGE DECK ELEVATIONS
(2 OF 2)

PROJECT NO: 4012.SEPT12C39 SHEET NO: 62

RIGHT CURB FLOWLINE

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
BF AS1								
F-1								
F-2								
F-3								
BF A1								
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								
BF A2								
F-1								
F-2								
F-3								
BF AS2								

RIGHT EDGE OF SLAB

BENT LINE DESCRIPTION	STATION	OFFSET	TOP OF DECK ELEVATION	DEAD LOAD DEFLECTION	TOP OF DECK ELEV + DL	PROJECT COORDINATES NORTHING	EASTING	ROADWAY CRS-SLP
BF AS1								
F-1								
F-2								
F-3								
BF A1								
CL BRG A1								
F-1								
F-2								
F-3								
F-4								
F-5								
F-6								
F-7								
F-8								
F-9								
CL BRG A2								
BF A2								
F-1								
F-2								
F-3								
BF AS2								

NOTES:

1. POSITIVE ROADWAY CROSS-SLOPE IS UPWARDS FROM PROFILE GRADE.
2. STATIONS, COORDINATES, OFFSETS, AND LENGTHS DEFINE THE STRUCTURE IN A TWO DIMENSIONAL HORIZONTAL PLANE. ELEVATIONS DEFINE THE FINAL GRADE OF THE FINISHED CONCRETE DECK UNLESS NOTED OTHERWISE. FABRICATION OF STRUCTURAL COMPONENTS THROUGH THE DIRECT USE OF THIS INFORMATION IS NOT INTENDED OR ADVISABLE.
3. TOP OF DECK ELEVATIONS ARE 3 INCHES BELOW FINISHED GRADE.
4. FOR DECK LOAD DEFLECTION DATA, SEE PRECAST CONCRETE BOX SHEET(S).
5. FOR ALIGNMENT AND CROSS-SLOPE DATA, SEE GENERAL LAYOUT SHEET(S).

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GENERAL NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2011 AND THE PROJECT SPECIAL PROVISIONS.

ALL WORK IN AND AROUND CREEKS, DITCHES, OR IRRIGATION CANALS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 107 AND 108 OF THE PROJECT SPECIFICATIONS. REFER TO THESE SECTIONS FOR CONTROL OF WATER AND CONSTRUCTION LIMITATIONS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION.

STATIONS, ELEVATIONS, AND DIMENSIONS CONTAINED IN THESE PLANS ARE CALCULATED FROM A RECENT FIELD SURVEY. THE CONTRACTOR SHALL VERIFY ALL DEPENDENT DIMENSIONS IN THE FIELD BEFORE ORDERING OR FABRICATING ANY MATERIAL.

ALL LONGITUDINAL AND TRANSVERSE DIMENSIONS ARE MEASURED HORIZONTALLY AND DO NOT INCLUDE ANY CORRECTIONS FOR GRADE.

THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO AT 811 (1-800-922-1987) AT LEAST 3 DAYS (2 DAYS NOT INCLUDING THE DAY OF NOTIFICATION) PRIOR TO ANY EXCAVATION OR OTHER EARTHWORK.

EXCEPT AS SHOWN IN THE PLANS, STRUCTURE EXCAVATION AND BACKFILL SHALL BE IN ACCORDANCE WITH CDDT STANDARD PLAN NO. M-206-1.

ALL ACRONYMS AND ABBREVIATIONS ARE CONSISTENT WITH CDDT STANDARD PLAN NO. M-100-2, UNLESS NOTED OTHERWISE.

FOR ROADWAY GEOMETRICS, REMOVALS, UTILITY INFORMATION, AND SIGN DETAILS, REFER TO ROADWAY PLANS.

FOR FINISHED GRADING REFER TO DRAINAGE PLANS.

GEOTECHNICAL INFORMATION AND RECOMMENDATIONS CAN BE FOUND IN THE DRAFT FINAL GEOTECHNICAL INVESTIGATION REPORT, 1602 GOLD RUN TO SALINA JUNCTION, BOULDER, COLORADO, DATED APRIL 12, 2016.

REINFORCED CONCRETE NOTES

A CUT STONE VENEER FINISH WILL BE REQUIRED, AS SHOWN ON THE PLANS, ON EXPOSED CONCRETE SURFACES. THESE FINISHES ARE TO BE SELECTED FROM TEST PANELS PROVIDED BY THE CONTRACTOR.

THE FINAL FINISH FOR THE SURFACES OF CURBS SHALL BE CLASS 2. ALL OTHER EXPOSED CONCRETE SURFACES SHALL RECEIVE A CLASS 1 FINAL FINISH TO ONE FOOT BELOW FINISHED GRADE, UNLESS NOTED OTHERWISE.

EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 3/4 INCH, UNLESS NOTED OTHERWISE.

EXPANSION JOINT MATERIAL SHALL MEET AASHTO SPECIFICATION M213.

ANY CONSTRUCTION JOINTS NOT SHOWN ON THE PLANS MAY BE CONSTRUCTED ONLY IF APPROVED IN WRITING BY THE ENGINEER.

ROUGHENED CONSTRUCTION JOINTS REQUIRE THE CONCRETE SURFACE TO BE EVENLY ROUGHENED TO A MINIMUM AMPLITUDE OF 1/4 INCH.

CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED BEFORE FRESH CONCRETE IS PLACED.

GRADE 60 REINFORCING STEEL IS REQUIRED.

ALL REINFORCING SHALL BE EPOXY COATED UNLESS OTHERWISE NOTED. (N) DENOTES NON-COATED REINFORCING.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR EPOXY COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER OR LESS THAN 3" OF LATERAL COVER.

BAR SIZE	#4	#5	#6	#7	#8	#9	#10	#11
SPLICE LENGTH FOR CLASS B OR D CONCRETE	1'-3"	1'-7"	2'-5"	2'-10"	3'-8"	4'-8"	5'-11"	7'-3"

WHEN THE CONTRACTOR ELECTS TO SUBSTITUTE EPOXY COATED REINFORCEMENT FOR NON-COATED REINFORCING BARS, THE MINIMUM LAP SPLICE SHALL BE AS DESCRIBED ABOVE.

THE FOLLOWING TABLE GIVES THE MINIMUM LAP SPLICE LENGTH FOR NON-COATED REINFORCING BARS PLACED IN ACCORDANCE WITH SUBSECTION 602.06. THESE SPLICE LENGTHS SHALL BE INCREASED BY 25% FOR BARS SPACED AT LESS THAN 6" ON CENTER OR LESS THAN 3" OF LATERAL COVER.

BAR SIZE	#4 (N)	#5 (N)	#6 (N)	#7 (N)	#8 (N)	#9 (N)	#10 (N)	#11 (N)
SPLICE LENGTH FOR CLASS B OR D CONCRETE	1'-1"	1'-4"	1'-7"	1'-11"	2'-6"	3'-1"	3'-11"	4'-10"

THE ABOVE SPLICE LENGTHS SHALL BE INCREASED BY 20% FOR 3 BAR BUNDLES AND 33% FOR 4 BAR BUNDLES.

INDEX OF DRAWINGS:

63-64	GENERAL INFORMATION
65-66	GENERAL LAYOUT RETAINING WALL 1
67-68	GENERAL LAYOUT RETAINING WALL 2
69	ENGINEERING GEOLOGY RETAINING WALL 1
70	ENGINEERING GEOLOGY RETAINING WALL 2
71	ARCHITECTURAL DETAILS
72-75	SOILDER PILE WALL DETAILS
76	SOILDER PILE WALL EXCAVATION AND BACKFILL

ABBREVIATIONS:

ACRONYMS AND ABBREVIATIONS CONFORM TO CDDT STANDARD PLAN NO. M-100-2, UNLESS OTHERWISE NOTED.

- B.F. = BACK FACE
- EMBED. = EMBEDMENT
- F.F. = FRONT FACE
- PAR. = PARALLEL
- PERP. = PERPENDICULAR

RETAINING WALL DESCRIPTIONS:

RETAINING WALL 1:

- CANTILEVER NON-GRAVITY WALL (SOLDIER PILE WALL)
- FOURMILE CANYON CREEK LT.

RETAINING WALL 2:

- CANTILEVER NON-GRAVITY WALL (SOLDIER PILE WALL)
- FOURMILE CANYON CREEK LT.
- PEDESTRIAN RAILING (STEEL) (SPECIAL)

90% SET	 <p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	 <p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD GENERAL INFORMATION (1 OF 2)</p> <p>PROJECT NO: 4012.SEPT12C39 SHEET NO: 63</p>
						DLT	BMT		8/16/2016	

brett.terrell 6/4/16 PM 8/16/2016 pm \\DCP\APP\libr.mbakercorp.com\p\prod\Documents\Projects\Akewood\Office\Boulder\County_Emergency_Transportation\T07\08_Sheet_Files\06_Structures\06N\Walls\139423_WALL_02.dgn

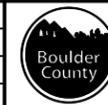
SUMMARY OF APPROXIMATE QUANTITIES:

ITEM	DESCRIPTION	UNIT	RETAINING WALL 1	RETAINING WALL 2	TOTALS
206	STRUCTURE EXCAVATION	CY	15	67	82
503	DRILLED CAISSON (24 INCH)	LF	327	721	1,048
509	STRUCTURAL STEEL	LB	26,566	56,368	82,934
601	CONCRETE CLASS D (WALL)	CY	13.5	56.6	70.1
601	CUT STONE VENEER	SF	464	2,290	2,754
602	REINFORCING STEEL	LB	2,014	8,484	10,498

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

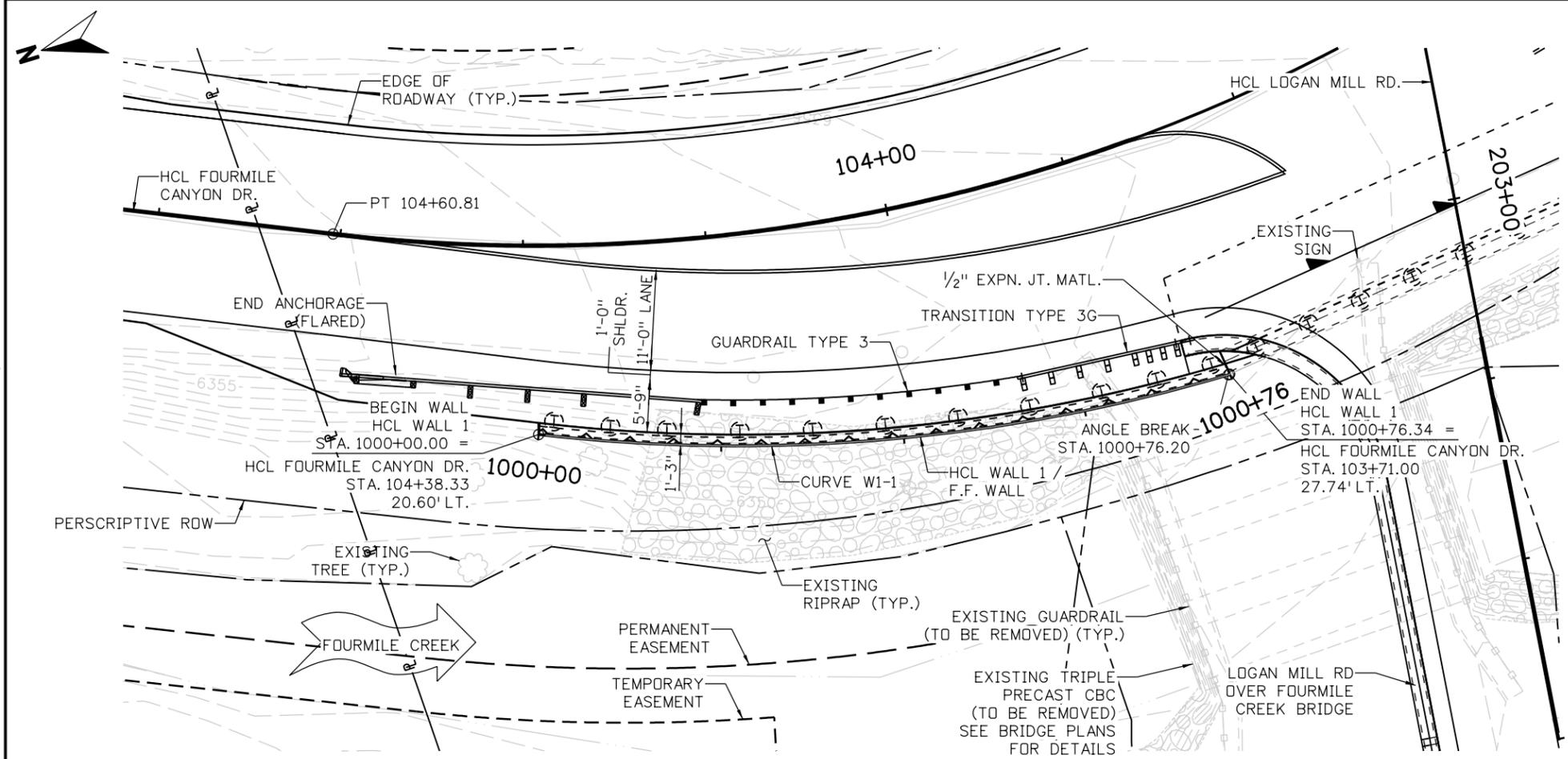


**BOULDER COUNTY TRANSPORTATION DEPARTMENT
 ENGINEERING DIVISION**

 DESIGNED: **DLT** CAD: **BMT** CHECKED: DATE: **8/16/2016**

LOGAN MILL ROAD
**GENERAL INFORMATION
 (2 OF 2)**
 PROJECT NO: 4012.SEPT12C39 SHEET NO: **64**

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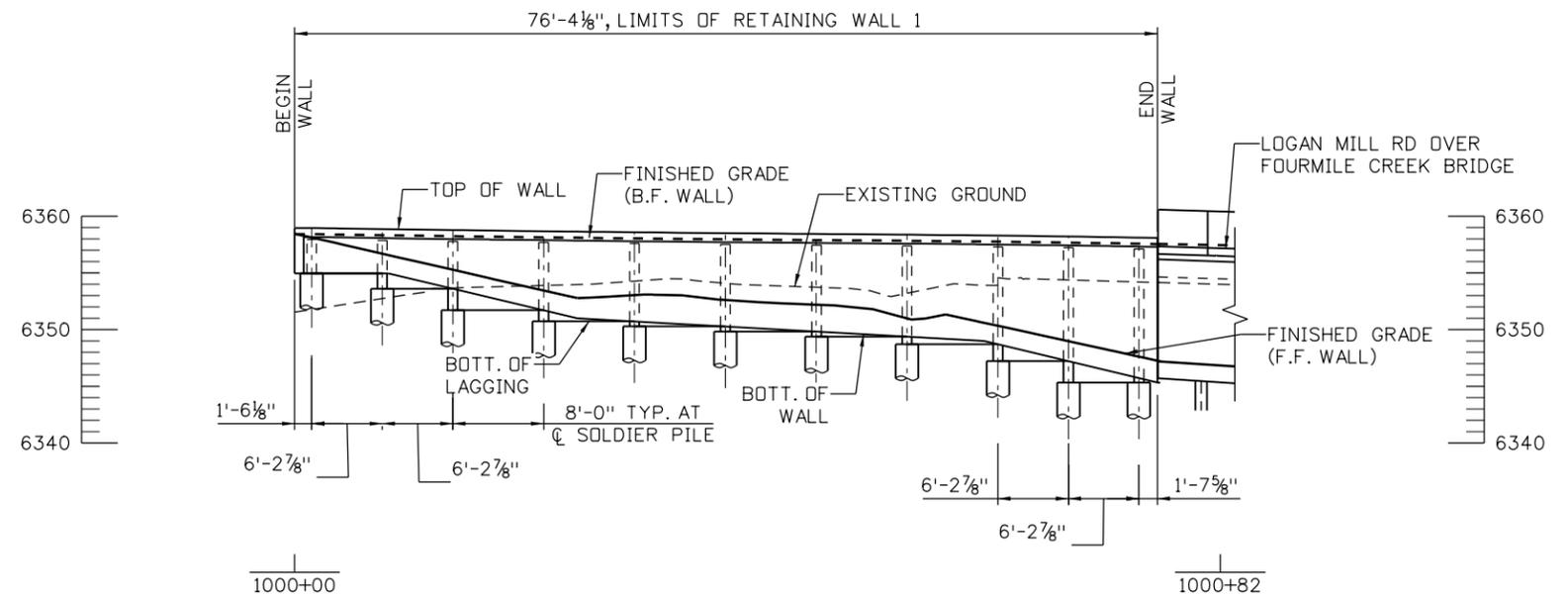
PLAN

NOTES:

- FOR ALIGNMENT INFORMATION, FINISHED GRADING AND GUARDRAIL DETAILS, REFER TO ROADWAY PLANS.
- WALL SHALL BE CONSTRUCTED FROM THE TOP-DOWN. THE CONTRACTOR SHALL NOT DISTURB EXISTING GROUND, EXCEPT AS NECESSARY TO INSTALL FOUNDATIONS AND COMPLETE FINISHED GRADING.
- GEOTECHNICAL INFORMATION AND RECOMMENDATIONS CAN BE FOUND IN THE GEOTECHNICAL AND PAVEMENT INVESTIGATION REPORT, LOGAN MILL ROAD BRIDGE OVER FOURMILE CREEK, DATED JULY, 2014.
- SOLDIER PILES SHALL BE PRE-DRILLED IN ACCORDANCE WITH SECTION 503.02.
- SEE BRIDGE PLANS FOR BRIDGE DETAILS.

CURVE W1-1 DATA

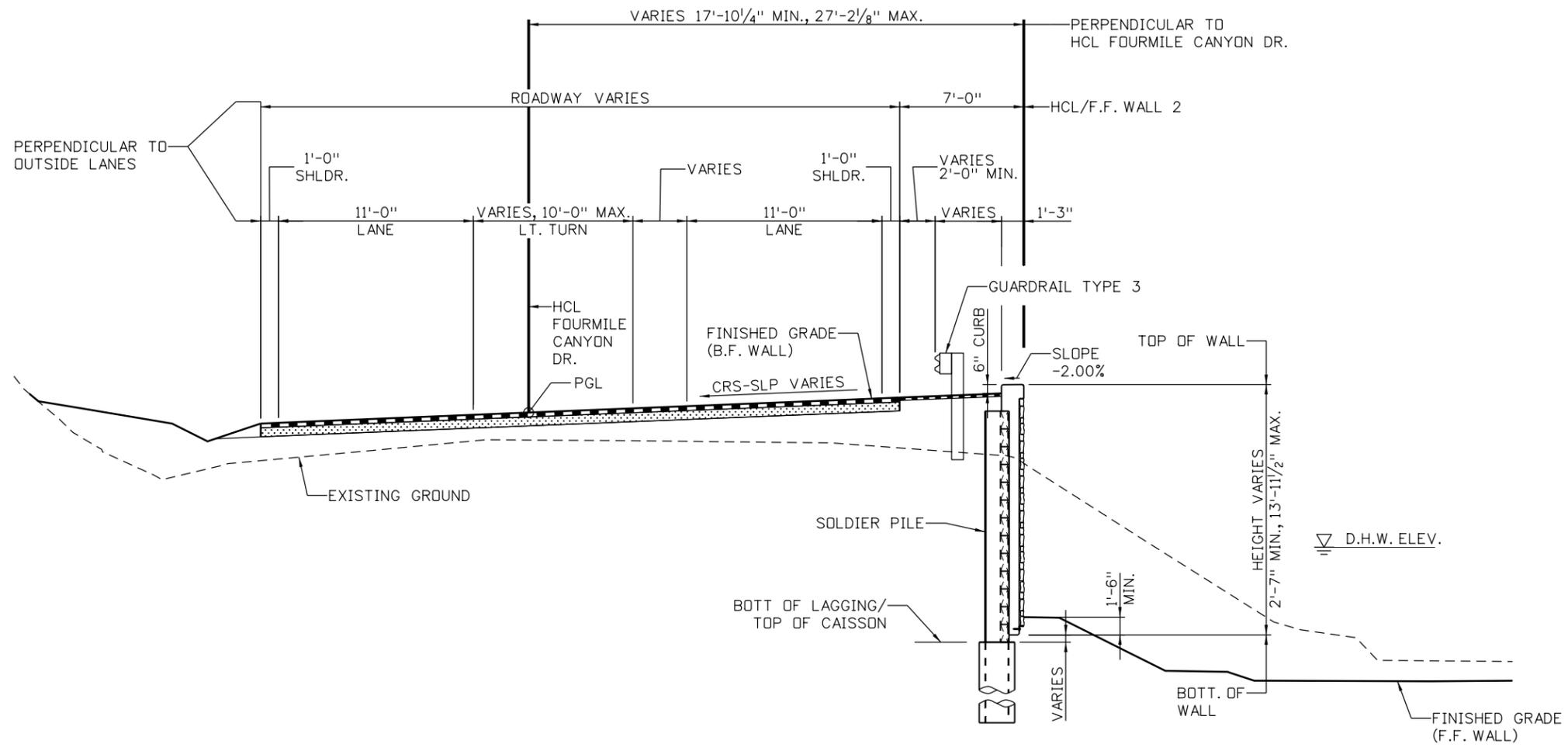
$\Delta = 23^\circ 43'10''$ LT
 $R = 190.00'$
 $L = 78.66'$
 $T = 39.90'$
 $PI 1000+39.90$
 $N 258610.21$
 $E 38851.54$



ELEVATION
TAKEN AT HCL WALL 1 / F.F. WALL

90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD RETAINING WALL 1 GENERAL LAYOUT (1 OF 2)</p> <p>PROJECT NO: 4012.SEPT12C39 SHEET NO: 65</p>
						DLT	BMT		8/16/2016	

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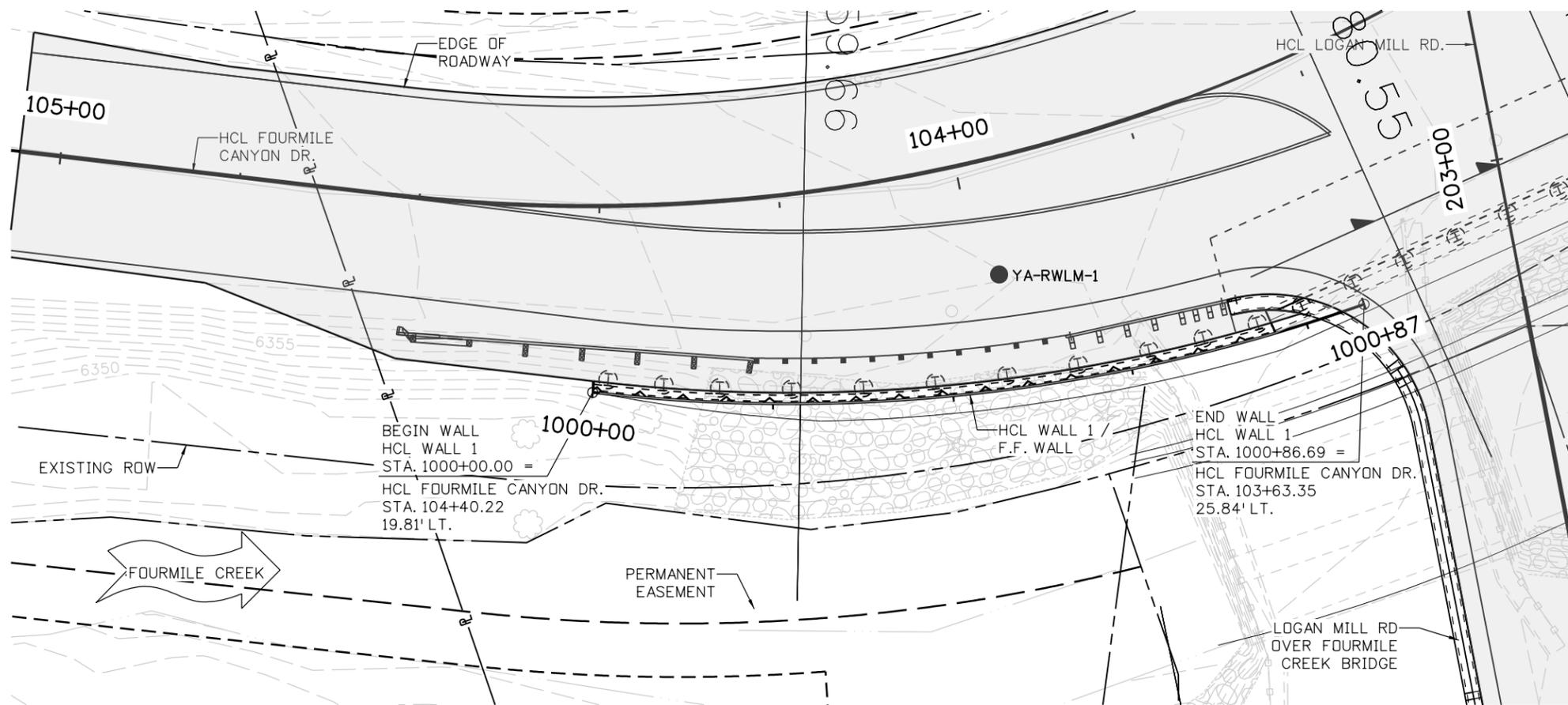


- KEYNOTES:**
- ① ZERO OFFSET FROM EDGE OF SHOULDER.
 - ② CUT STONE VENEER DETAILS TBD INCLUDING THICKNESS ALLOWANCE WHICH MAY MODIFY PLAN LIMITS AND RELATIVE DISTANCE BETWEEN ELEMENTS.

TYPICAL SECTION
 LOOKING AHEAD STATION HCL WALL 2
 LAGGING NOT SHOWN

90% SET	 <small>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</small>	NO.	DATE	REVISION DESCRIPTION:	 BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION Michael Baker INTERNATIONAL	DESIGNED:	CAD:	CHECKED:	DATE:	LOGAN MILL ROAD RETAINING WALL 2 GENERAL LAYOUT (2 OF 2) <small>PROJECT NO: 4012.SEPT12C39 SHEET NO: 68</small>
						DLT	BMT	8/16/2016		

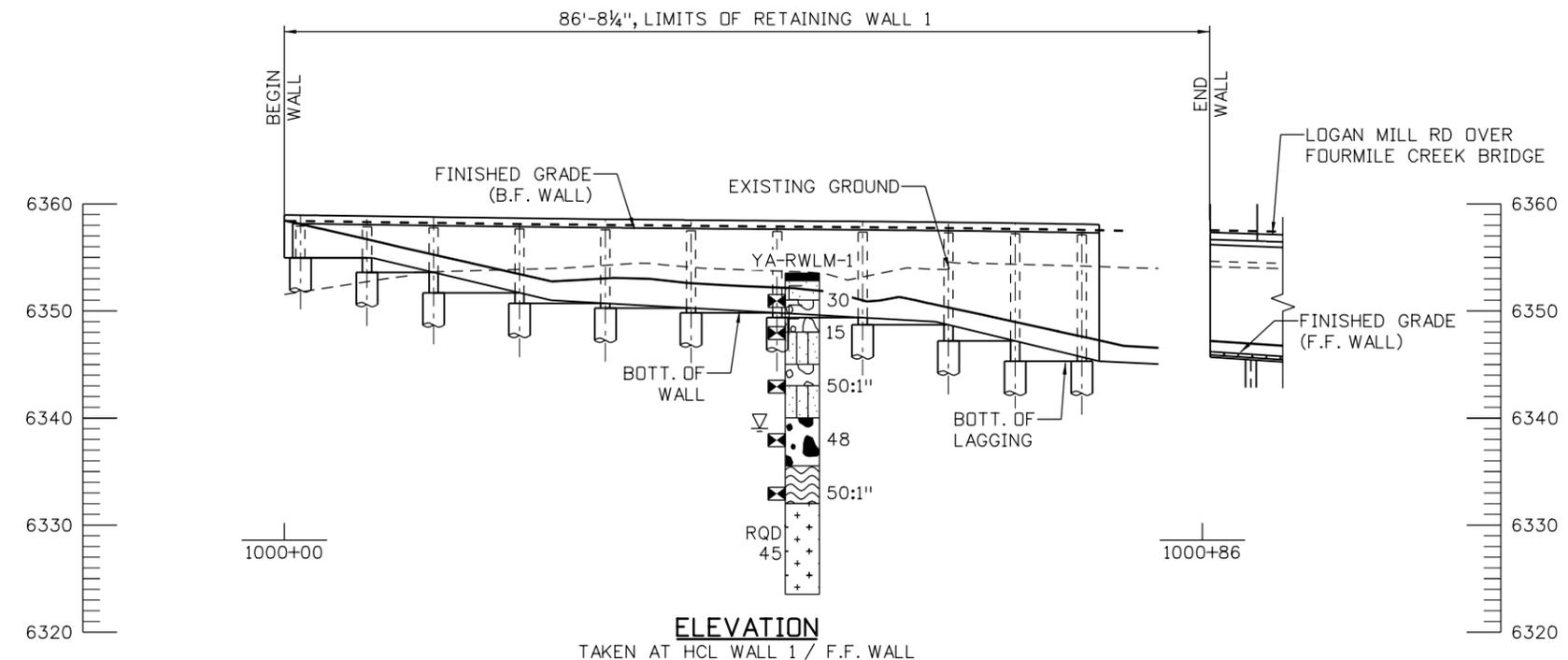
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PLAN

● APPROXIMATE BORING LOCATION

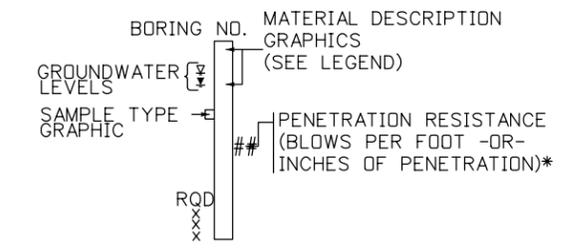
- ASPHALT
- USCS SILTY SAND
- WEATHERED BEDROCK
- FILL WITH SAND AS MAJOR SOIL
- USCS POORLY-GRADED GRAVEL
- GRANITE
- FILL WITH GRAVEL AS MAJOR SOIL
- USCS WELL-GRADED GRAVEL



ELEVATION

TAKEN AT HCL WALL 1 / F.F. WALL

TYPICAL BOREHOLE LOG



*E.G. A VALUE OF 50/3 OR 50:3 INDICATES THAT 50 BLOWS WERE APPLIED TO THE SAMPLER, WITH A PENETRATION OF 3 INCHES.

Yeh and Associates, Inc.
Consulting Engineers & Scientists

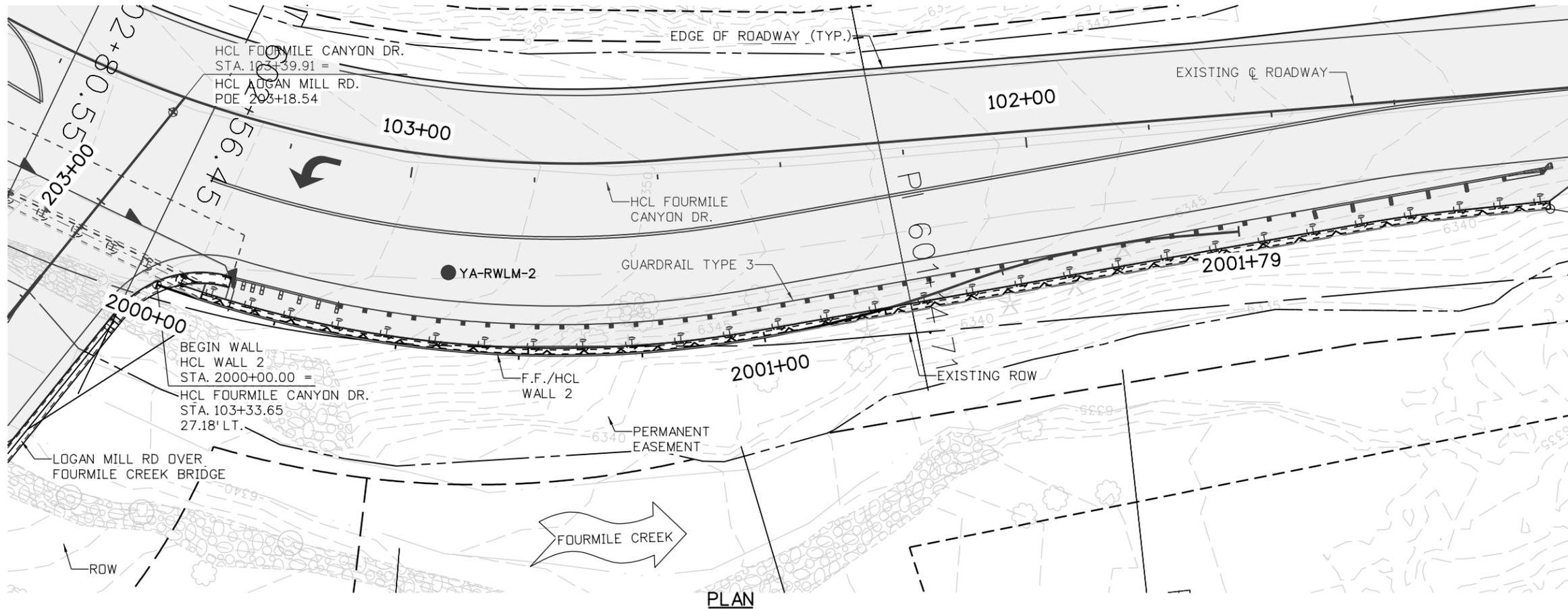
90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL
DESIGNED: SCS
CAD: MJW
CHECKED: [blank]
DATE: 8/16/2016

LOGAN MILL ROAD
RETAINING WALL 1
ENGINEERING GEOLOGY
PROJECT NO: 4012.SEPT12C39
SHEET NO: 69

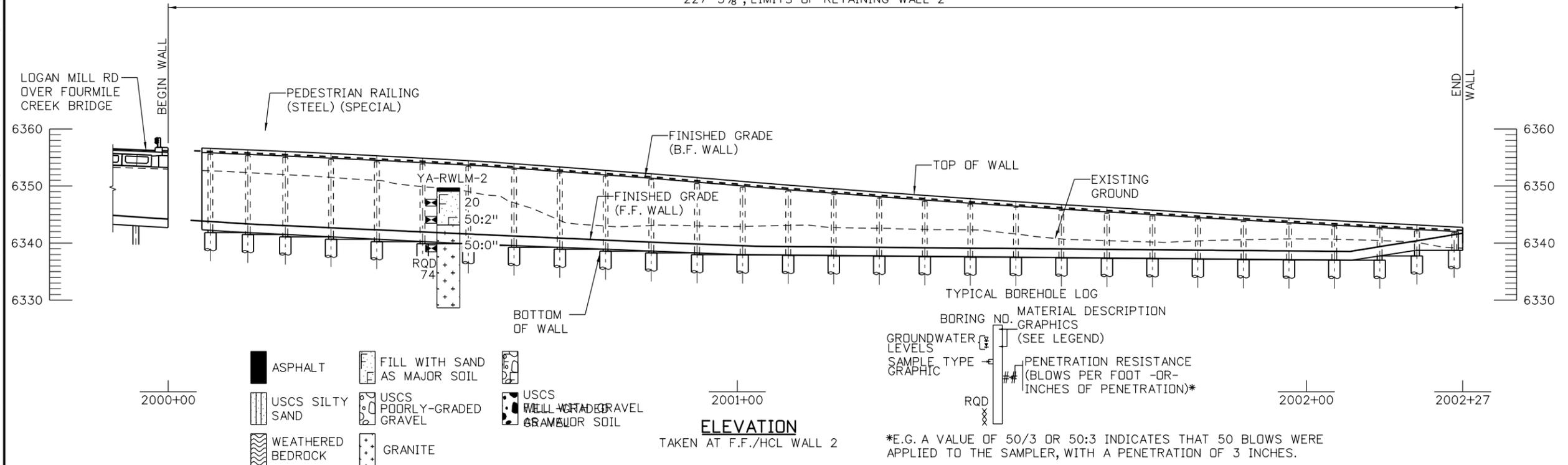


END WALL
HCL WALL 2
STA. 2002+27.49
HCL FOURMILE CANYON DR.
STA. 101+45.00
13.57' LT

PLAN

● APPROXIMATE BORING LOCATION

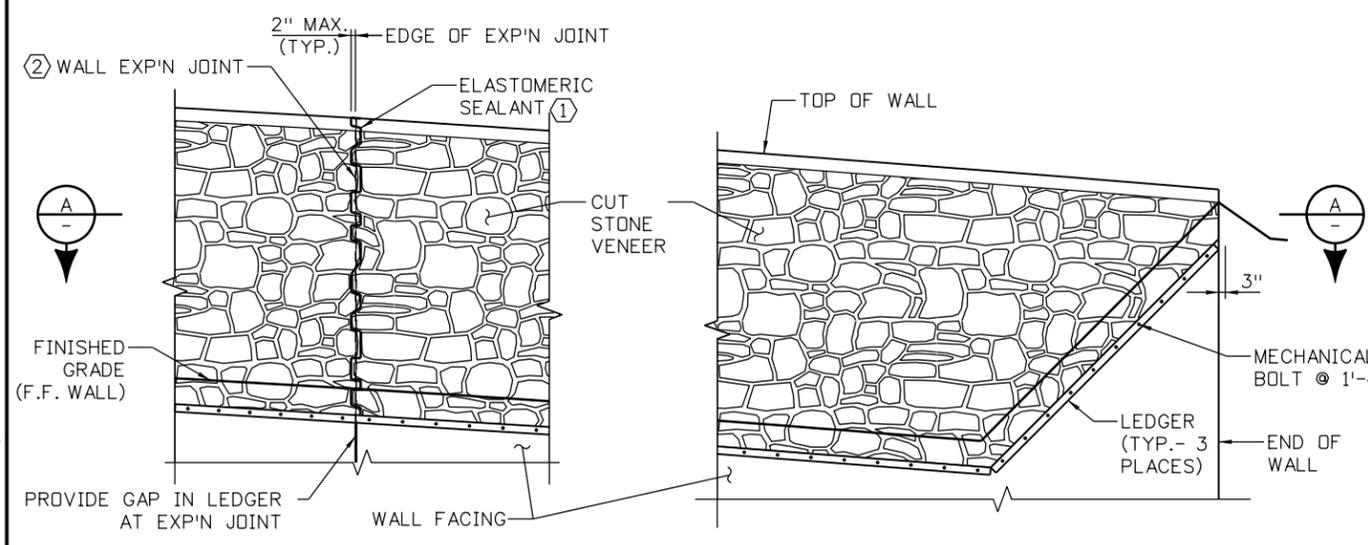
227'-5 7/8", LIMITS OF RETAINING WALL 2



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NO.	DATE	REVISION DESCRIPTION:

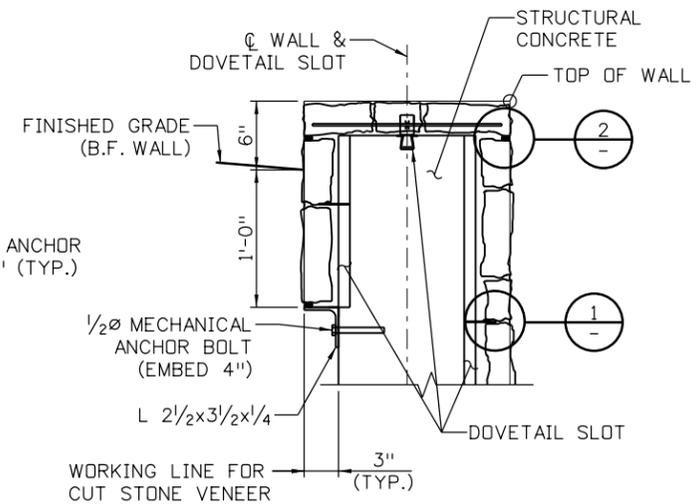
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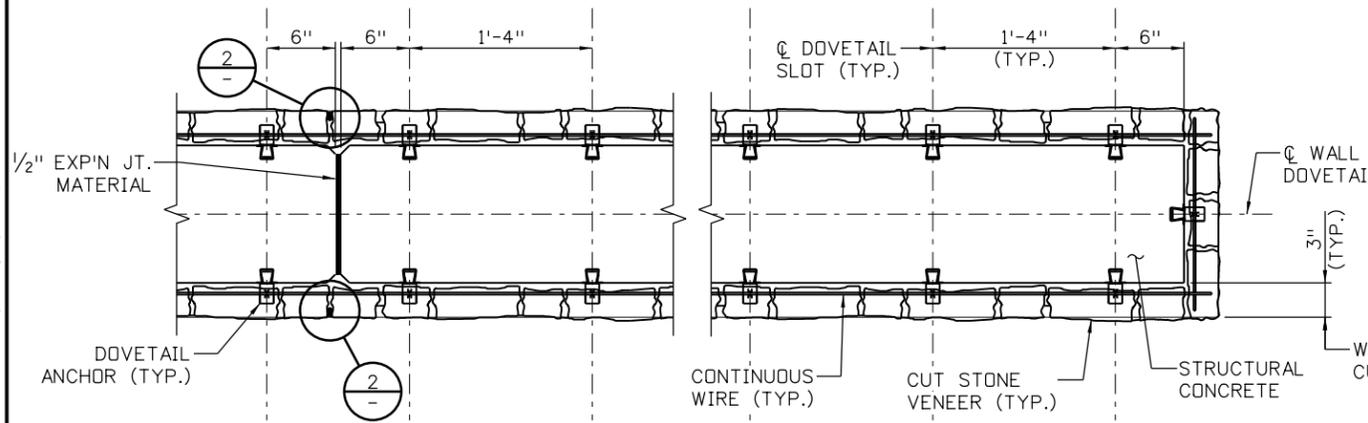
AT EXPANSION JOINT
SEE GENERAL LAYOUT FOR LOCATION

AT END OF WALL

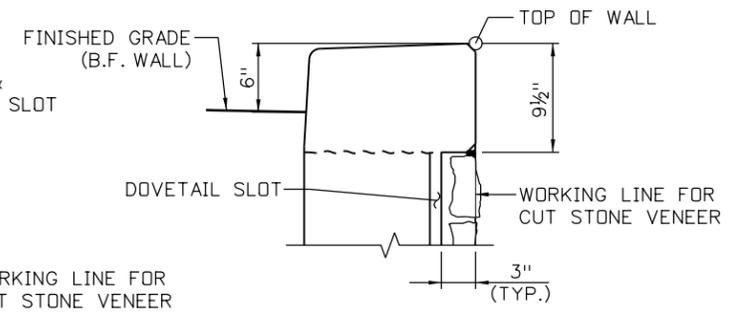
TYPICAL ELEVATION



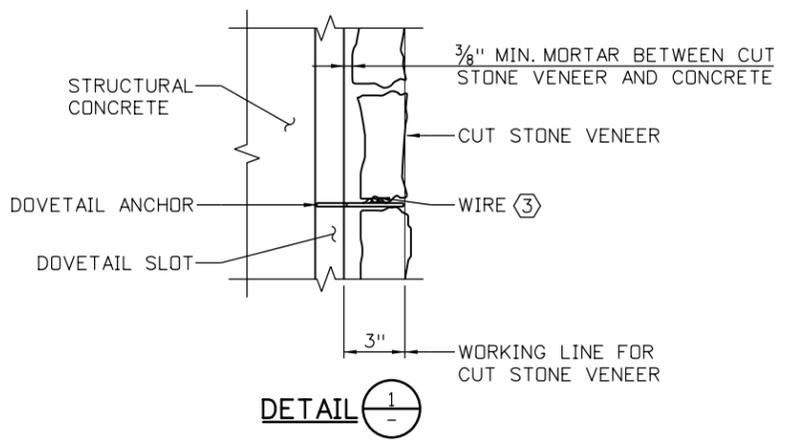
CUT STONE VENEER TYPICAL SECTION
WALL 1 VENEER LIMITS DO NOT EXTEND TO B.F. WALL



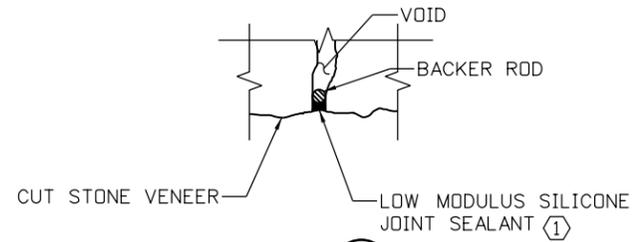
SECTION A



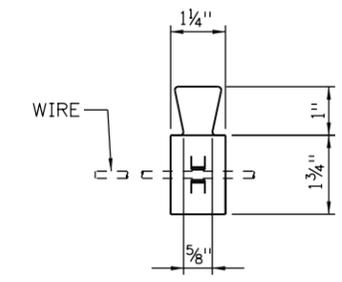
CUT STONE VENEER TYPICAL SECTION
WALL 1 VENEER LIMITS DO NOT EXTEND TO B.F. WALL



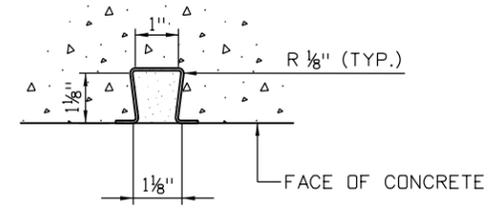
DETAIL 1



DETAIL 2



DOVETAIL ANCHOR AND WIRE



DOVETAIL SLOT

ANCHORAGE DETAIL
PLAN VIEW

NOTES:

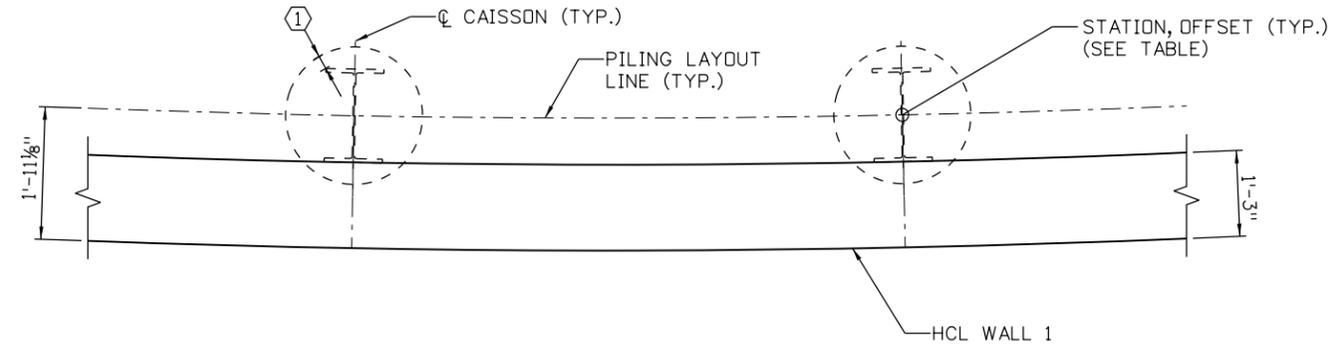
- CUT STONE VENEER SHALL BE DAKOTA TOP ROCK AS SUPPLIED BY ELDORADO STONE OR APPROVED EQUAL AND PLACED A RANDOM PATTERN.
- DOVETAIL SLOTS SHALL BE TYPE 305 AS MANUFACTURED BY HOHMANN & BARNARD, INC., OR APPROVED EQUAL. THEY SHALL BE 22 GAGE HOT-DIPPED GALVANIZED STEEL, AND HAVE A THROAT OPENING WIDTH OF 5/8".
- THE DOVETAIL ANCHORS SHALL BE 303 SV - SEISMIC-NOTCH AS MANUFACTURED BY HOHMANN & BARNARD, INC., OR AN APPROVED EQUAL. MATERIAL FOR DOVETAIL ANCHORS SHALL BE 3/32" THICK HOT-DIPPED GALVANIZED STEEL.
- WIRE SHALL BE 9 GAGE PLAIN COLD-DRAWN STEEL WIRE CONFORMING TO ASTM A82. WIRE SHALL BE MILL GALVANIZED CONFORMING TO ASTM A153.
- CONCRETE SURFACES SHALL BE PREPARED IN ACCORDANCE WITH SUPPLIER'S RECOMMENDATION PRIOR TO INSTALLATION OF CUT STONE VENEER.
- MORTAR JOINTS SHALL BE 1/2" MAXIMUM THICKNESS UNLESS SHOWN OTHERWISE.
- ALL WORK NECESSARY FOR THE INSTALLATION OF CUT STONE VENEER, INCLUDING SURFACE PREPARATION, DOVETAIL SLOTS, WIRE TIES, STONE, CAP STONE, MORTAR AND MISC. HARDWARE, SHALL BE INCLUDED IN ITEM 601 CUT STONE VENEER.
- CUT STONE VENEER SHALL BE ANCHORED TO THE WALL CONCRETE BY MEANS OF WIRE TIES PLACED IN DOVETAIL SLOTS, AS SHOWN. ALTERNATIVE METHODS OF ANCHORING THE STONE VENEER MAY BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- REINFORCING STEEL IN STRUCTURAL CONCRETE NOT SHOWN.
- VENEER LIMITS EXTEND TO 1'-0" MINIMUM BELOW FINISHED GRADE ON ALL EXPOSED CONCRETE SURFACES.

KEYNOTES:

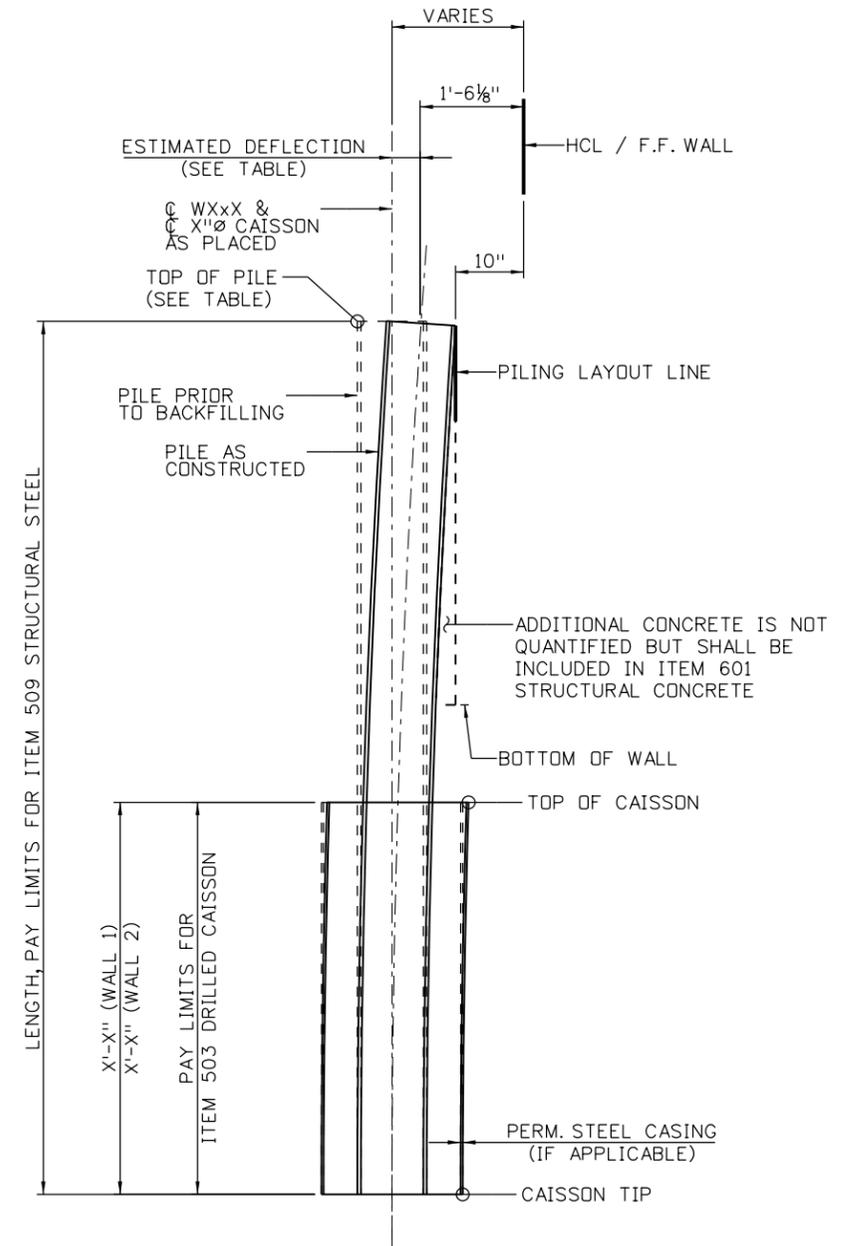
- TOOL SEALANT TO A ROUNDED SURFACE AND THE REQUIRED DIMENSIONS SHOWN. COLOR TO MATCH MORTAR JOINTS.
- VENEER PATTERN SHALL NOT BE BROKEN WITH A VERTICAL JOINT AT WALL EXPANSION JOINT. PROVIDE EXPANSION JOINT IN VENEER FOLLOWING GROUT LINE AS SHOWN.
- FIELD BEND WIRE SO THAT TAILS ARE EMBEDDED IN THE MIDDLE OF MORTAR BED. 1" MIN. CLR. FROM STRUCTURAL CONCRETE.

90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD CUT STONE VENEER DETAILS</p> <p>PROJECT NO: 4012.SEPT12C39 SHEET NO: 71</p>
						DLT	BMT		8/16/2016	

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FOUNDATION LAYOUT - PLAN
WALL 1 SHOWN, WALL 2 SIMILAR



SOLDIER PILE DETAIL
N.T.S.

NOTES:

1. PERMANENT STEEL CASING SHALL BE A MINIMUM OF X" THICK.
2. PERMANENT STEEL CASING SHALL BE INCLUDED IN ITEM 503 DRILLED CAISSON.
3. TEMPORARY CASING MAY BE REQUIRED TO PREVENT CAVING OF GRANULAR SOILS AND/OR TO REDUCE TO INTRUSION OF GROUND WATER. TEMPORARY CASING AND DEWATERING SHALL BE INCLUDED IN ITEM 503 DRILLED CAISSON.
4. DRILLED CAISSON CONCRETE SHALL BE CONCRETE CLASS BZ.

KEYNOTES:

- ① X" CLEAR PER PLAN.
1 1/2" MINIMUM CLEAR.

90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p> <p>Michael Baker INTERNATIONAL</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD SOLDIER PILE WALL DETAILS (1 OF 4)</p>
							DLT	BMT		8/16/2016	

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WALL 1 SOLDIER PILE DATA TABLE

DRILLED CAISSON NUMBER	NORTHING	EASTING	HCL WALL 1		HCL FOURMILE CANYON DR.		ESTIMATED TOP OF WALL DEFLECTION	EST. C CAISSON PLACEMENT OFFSET FROM WALL HCL	EXISTING GROUND ELEVATION AT C CAISSON	TOP OF PILE ELEV.	AS-BUILT PILE TIP ELEV.
			STATION AT C CAISSON	PLAN OFFSET AT C CAISSON	STATION AT C CAISSON	PLAN OFFSET AT C CAISSON					
DC 1	263,683.37	53,436.80	1000+01.51	-1.50 FT. LT.	103+56.75	-9.75 FT. LT.				6356.90	
DC 2	263,686.16	53,444.22	1000+07.75	-1.50 FT. LT.	103+48.94	-9.75 FT. LT.				6356.89	
DC 3	263,688.21	53,451.88	1000+13.99	-1.50 FT. LT.	103+41.12	-9.75 FT. LT.				6356.85	
DC 4	263,689.48	53,459.71	1000+22.03	-1.50 FT. LT.	103+33.30	-9.75 FT. LT.				6356.80	
DC 5	263,689.97	53,467.63	1000+30.07	-1.50 FT. LT.	103+25.48	-9.75 FT. LT.				6356.75	
DC 6	263,689.80	53,475.59	1000+38.11	-1.50 FT. LT.	103+17.66	-9.75 FT. LT.				6356.69	
DC 7	263,689.56	53,483.59	1000+46.15	-1.50 FT. LT.	103+09.84	-9.75 FT. LT.				6356.64	
DC 8	263,689.32	53,491.59	1000+54.19	-1.50 FT. LT.	103+01.75	-9.75 FT. LT.				6354.84	
DC 9	263,689.08	53,499.58	1000+62.23	-1.50 FT. LT.	102+93.52	-9.75 FT. LT.				6354.77	
DC 10	263,688.84	53,507.58	1000+68.47	-1.50 FT. LT.	102+85.29	-9.75 FT. LT.				6354.71	
DC 11	263,688.60	53,515.58	1000+74.71	-1.50 FT. LT.	102+77.06	-9.75 FT. LT.				6354.64	

RETAINING WALL 2 SOLDIER PILE DATA TABLE

DRILLED CAISSON NUMBER	NORTHING	EASTING	HCL WALL		HCL FOURMILE CANYON DR.		ESTIMATED TOP OF WALL DEFLECTION	EST. C CAISSON PLACEMENT OFFSET FROM WALL HCL	EXISTING GROUND ELEVATION AT C CAISSON	TOP OF PILE ELEV.	AS-BUILT PILE TIP ELEV.
			STATION AT C CAISSON	PLAN OFFSET AT C CAISSON	STATION AT C CAISSON	PLAN OFFSET AT C CAISSON					
DC 1	264,631.10	53,274.46	2000+01.37	-1.50 FT. LT.	204+45.08	-9.75 FT. LT.				6353.71	
DC 2	264,623.40	53,272.34	2000+09.38	-1.50 FT. LT.	204+37.28	-9.75 FT. LT.				6353.56	
DC 3	264,615.66	53,270.37	2000+17.40	-1.50 FT. LT.	204+29.49	-9.75 FT. LT.				6353.40	
DC 4	264,607.89	53,268.55	2000+25.42	-1.50 FT. LT.	204+21.69	-9.75 FT. LT.				6353.19	
DC 5	264,600.08	53,266.88	2000+33.43	-1.50 FT. LT.	204+13.89	-9.75 FT. LT.				6352.97	
DC 6	264,592.24	53,265.36	2000+41.45	-1.50 FT. LT.	204+06.10	-9.75 FT. LT.				6352.74	
DC 7	264,584.37	53,263.99	2000+49.46	-1.50 FT. LT.	203+98.30	-9.75 FT. LT.				6352.50	
DC 8	264,576.47	53,262.78	2000+57.48	-1.50 FT. LT.	203+90.50	-9.75 FT. LT.				6352.22	
DC 9	264,568.56	53,261.73	2000+65.50	-1.50 FT. LT.	203+82.71	-9.75 FT. LT.				6351.85	
DC 10	264,560.71	53,260.83	2000+73.42	-1.50 FT. LT.	203+75.00	-9.75 FT. LT.				6351.48	
DC 11	264,552.67	53,260.08	2000+81.53	-1.50 FT. LT.	203+67.11	-9.75 FT. LT.				6351.10	
DC 12	264,544.70	53,259.49	2000+89.55	-1.50 FT. LT.	203+59.31	-9.75 FT. LT.				6349.80	
DC 13	264,536.73	53,259.05	2000+97.56	-1.50 FT. LT.	203+51.52	-9.75 FT. LT.				6349.37	
DC 14	264,528.75	53,258.77	2001+05.58	-1.50 FT. LT.	203+43.72	-9.75 FT. LT.				6348.95	
DC 15	264,520.76	53,258.64	2001+13.59	-1.50 FT. LT.	203+35.92	-9.75 FT. LT.				6348.54	
DC 16	264,512.77	53,258.67	2001+21.61	-1.50 FT. LT.	203+28.13	-9.75 FT. LT.				6348.14	
DC 17	264,504.79	53,258.86	2001+29.63	-1.50 FT. LT.	203+20.33	-9.75 FT. LT.				6347.75	
DC 18	264,552.67	53,260.08	2000+81.53	-1.50 FT. LT.	203+67.11	-9.75 FT. LT.				6347.36	
DC 19	264,544.70	53,259.49	2000+89.55	-1.50 FT. LT.	203+59.31	-9.75 FT. LT.				6346.97	
DC 20	264,536.73	53,259.05	2000+97.56	-1.50 FT. LT.	203+51.52	-9.75 FT. LT.				6346.59	
DC 21	264,528.75	53,258.77	2001+05.58	-1.50 FT. LT.	203+43.72	-9.75 FT. LT.				6346.22	
DC 22	264,520.76	53,258.64	2001+13.59	-1.50 FT. LT.	203+35.92	-9.75 FT. LT.				6345.87	
DC 23	264,512.77	53,258.67	2001+21.61	-1.50 FT. LT.	203+28.13	-9.75 FT. LT.				6345.53	
DC 24	264,504.79	53,258.86	2001+29.63	-1.50 FT. LT.	203+20.33	-9.75 FT. LT.				6345.20	
DC 25	264,536.73	53,259.05	2000+97.56	-1.50 FT. LT.	203+51.52	-9.75 FT. LT.				6344.89	
DC 26	264,528.75	53,258.77	2001+05.58	-1.50 FT. LT.	203+43.72	-9.75 FT. LT.				6344.58	
DC 27	264,520.76	53,258.64	2001+13.59	-1.50 FT. LT.	203+35.92	-9.75 FT. LT.				6344.27	
DC 28	264,512.77	53,258.67	2001+21.61	-1.50 FT. LT.	203+28.13	-9.75 FT. LT.				6344.01	
DC 29	264,504.79	53,258.86	2001+29.63	-1.50 FT. LT.	203+20.33	-9.75 FT. LT.				6343.76	

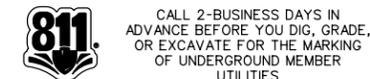
NOTES:

- TOP AND BOTTOM OF CAISSONS SHALL BE SET BY THE CONTRACTOR AS REQUIRED FOR LAGGING NEEDS. SEE SOLDIER PILE WALL SHEET (1 OF 3) FOR MINIMUM CAISSON LENGTHS. THE CONTRACTOR SHALL INCLUDE THIS INFORMATION WITH THE SHORING/ LAGGING WORKING DRAWINGS.
- FOR PURPOSES OF ESTIMATING STEEL PILE LENGTHS, THE CAISSON TIP ELEVATION IS GENERICALLY ASSUMED AS 16 FEET (WALL 1) AND 27 FEET (WALL 2) BELOW BOTTOM OF WALL. ACTUAL DIMENSIONS VARY AS DEFINED ABOVE.
- ESTIMATED DEFLECTIONS ARE APPROXIMATE AND MAY VARY DEPENDING ON BACKFILL EQUIPMENT AND PROCEDURE.

KEYNOTES:

- ① ESTIMATED DEFLECTION = 0.5% "H".
- ② ESTIMATED DEFLECTION = 1.0% "H".

90% SET



NO.	DATE	REVISION DESCRIPTION:

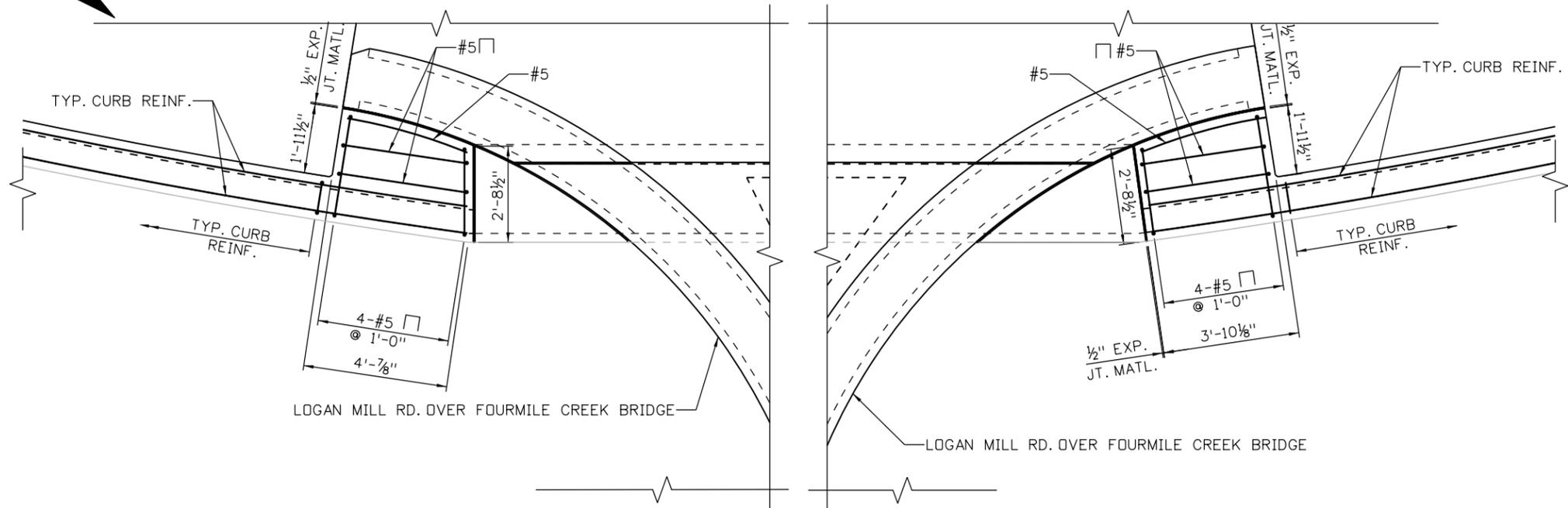


BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED: DLT	CAD: BMT	CHECKED:	DATE: 8/16/2016
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LOGAN MILL ROAD
SOLDIER PILE WALL DETAILS
 (2 OF 4)
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 73

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RETAINING WALL 1

RETAINING WALL 2

PLAN

NOTES:

1. FOR RETAINING WALL DETAILS, SEE WALL PLANS.
2. REINFORCING SCHEME SHOWN FOR SPACING AND ARRANGEMENT. ENGINEER REVIEW AND APPROVAL OF THE REINFORCING STEEL WORKING DRAWINGS IS REQUIRED AND SUPERCEEDS SECTION 105.02(d).

KEYNOTES:

- ① SIZE AND SHAPE SHALL MATCH BRIDGE RAIL. SEE BRIDGE RAIL SHEET FOR DETAILS. REINFORCING SHALL BE PLACED AS SHOWN.
- ② CONTRACTOR SHALL COORDINATE REINFORCING PLAN FOR BRIDGE RAIL AND ABUTMENT DIAPHRAGM SUCH THAT VERTICAL REINFORCEMENT IS PROVIDED ALONG THE FRONT FACE OF THE DIAPHRAGM @ 1'-0" AND BRIDGE RAIL REINFORCMENT IS PROVIDED AS INDICATED ON THE BRIDGE RAIL TYPE 8 (SPECIAL) SHEET.
- ③ BEND LOWER LEG TO FIT OR PROVIDE VERTICAL EMBEDMENT.

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO

 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:

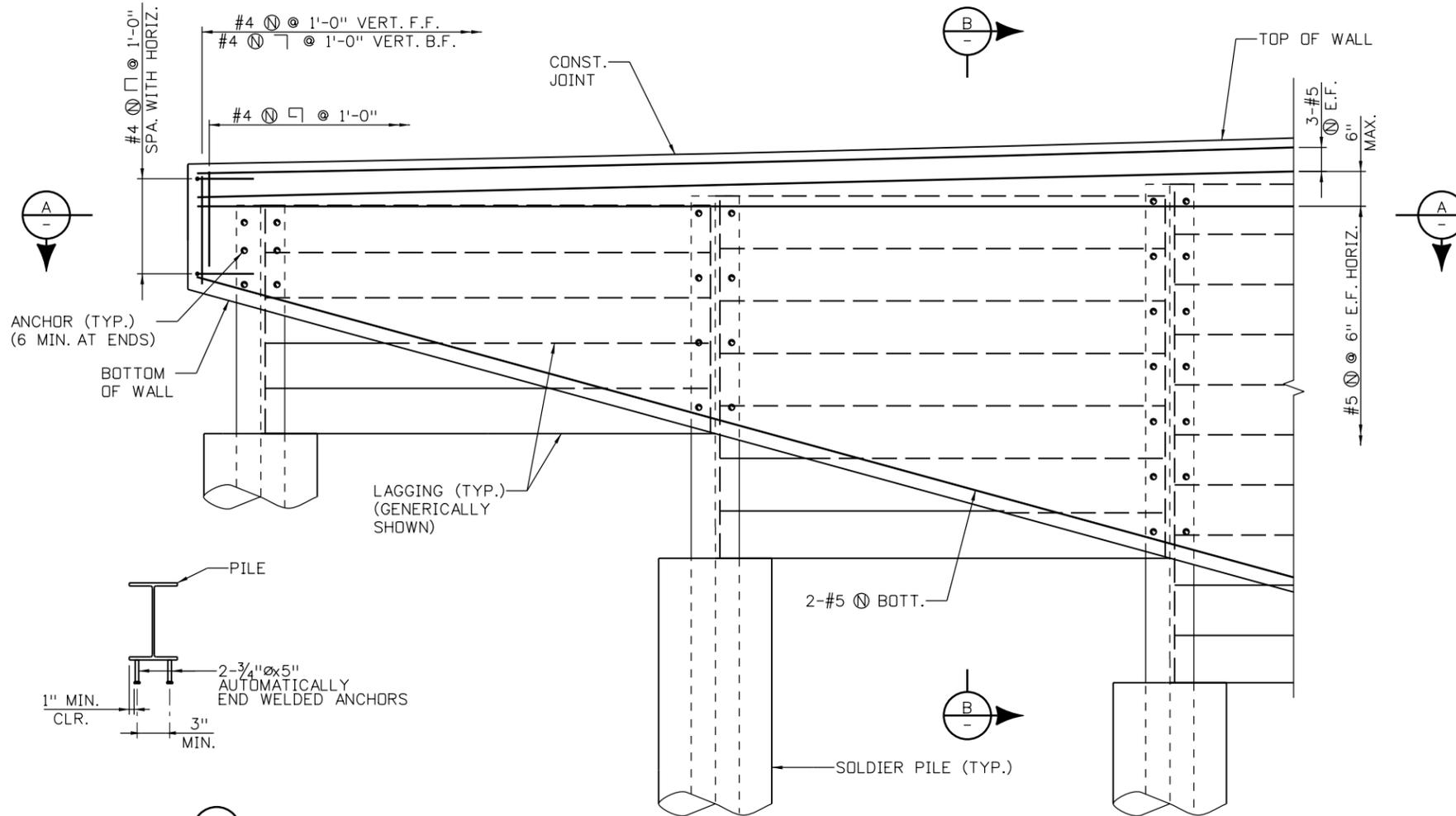


BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

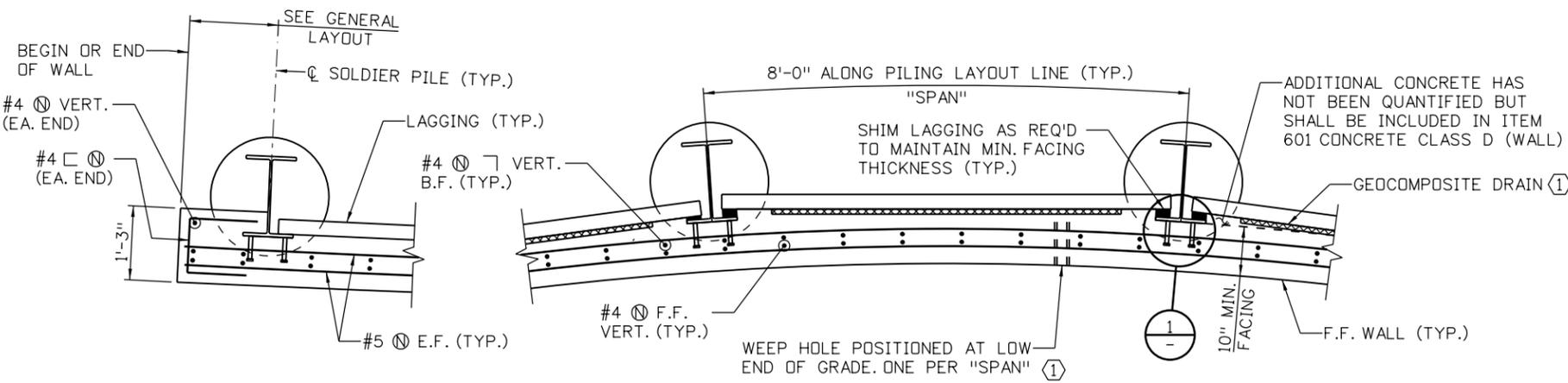
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LOGAN MILL ROAD
SOLDIER PILE WALL DETAILS
 (3 OF 4)
 PROJECT NO: 4012.SEPT12C39 SHEET NO: 74

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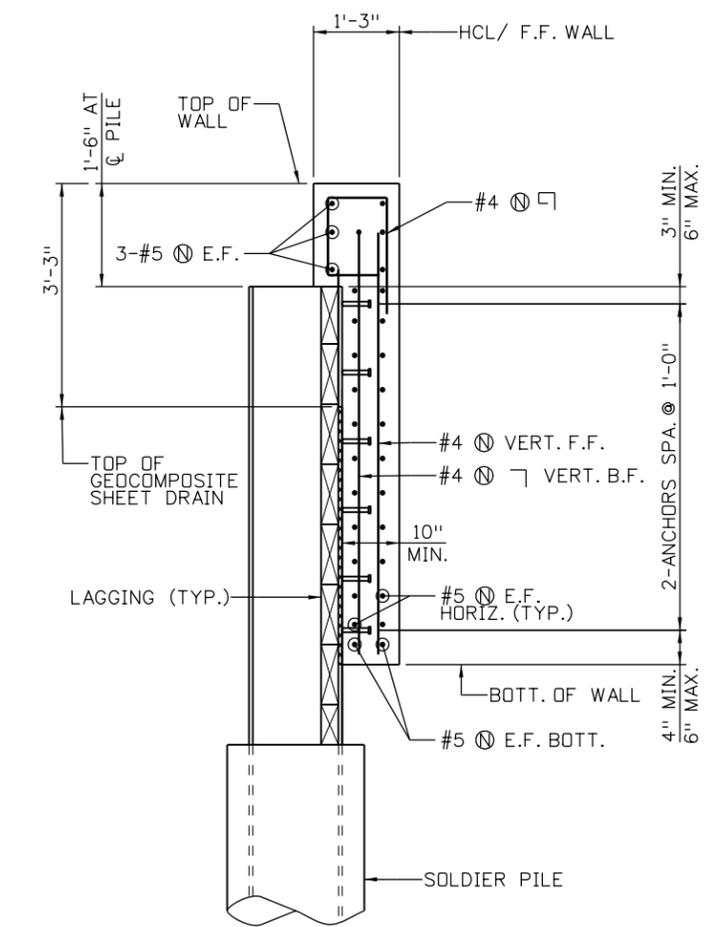


PARTIAL ELEVATION
WALL 2 SHOWN, WALL 1 SIMILAR
WEEP HOLES NOT SHOWN



PARTIAL SECTION
WALL 2 SHOWN, WALL 1 SIMILAR

- NOTES:**
1. FACING CONCRETE SHALL BE CONCRETE CLASS D (WALL).
 2. WEEP HOLES SHALL BE 2 INCH DIAMETER PVC PIPE, POSITIONED ±3 INCHES ABOVE FINISHED GRADE (F.F.WALL). PROVIDE 1 INCH CLEAR TO REINFORCING.
 3. ALL ELEMENTS ASSOCIATED WITH LAGGING, GEOCOMPOSITE SHEET DRAIN, AND PVC PIPE SHALL BE INCLUDED IN ITEM 601 CONCRETE CLASS D (WALL).
 4. FOR ARCHITECTURAL TREATMENTS, REFER TO GENERAL LAYOUT SHEETS.
 5. LAGGING SHALL BE DESIGNED BY THE CONTRACTOR.
 6. F.F. WALL SHALL BE PLUMB. SEE SOLDIER PILE DETAIL FOR ADDITIONAL CONCRETE QUANTITIES NOT SHOWN.

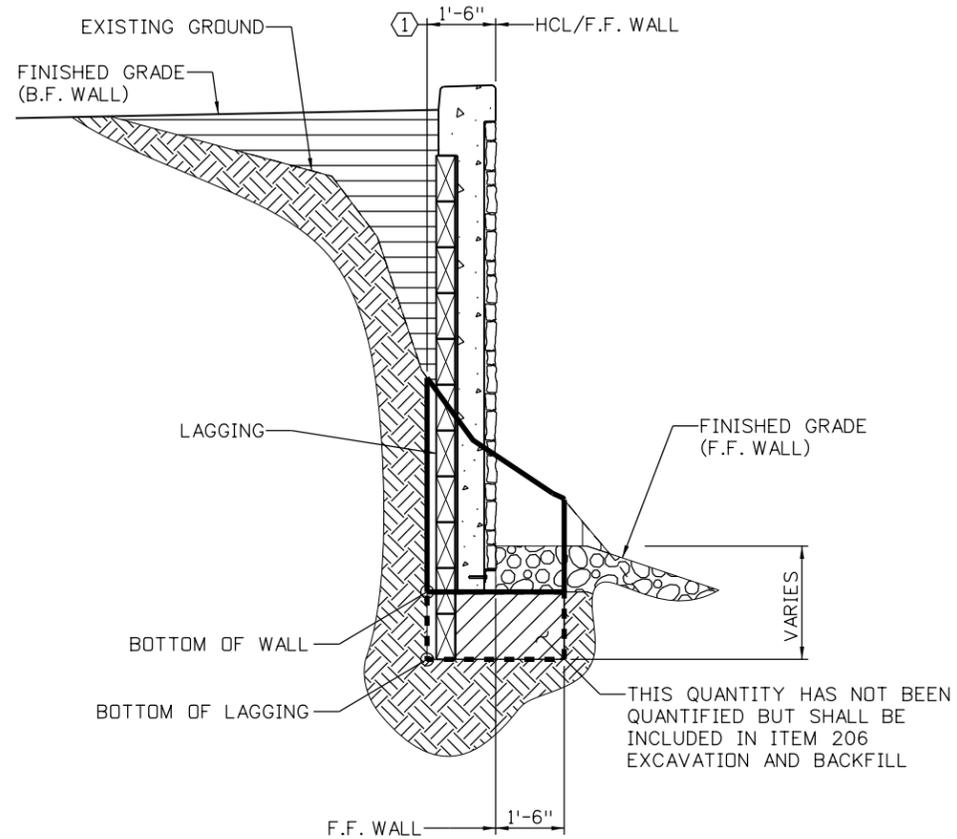


TYPICAL SECTION
WEEP HOLES NOT SHOWN

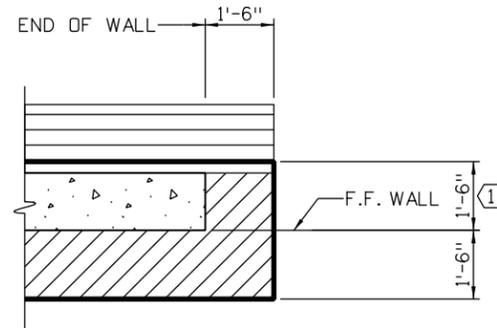
- KEYNOTES:**
- ① DRAINAGE NOT REQUIRED WHERE WALL HEIGHT "H" IS LESS THAN 6'-0".

90% SET	<p>CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	NO.	DATE	REVISION DESCRIPTION:	<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p>	DESIGNED:	CAD:	CHECKED:	DATE:	<p>LOGAN MILL ROAD SOLDIER PILE WALL DETAILS (4 OF 4)</p>
		REVISIONS:					DLT	BMT		

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TYPICAL SECTION
WALL 1 SHOWN, WALL 2 SIMILAR



PLAN - END OF RETAINING WALL DETAIL
TAKEN AT FINISHED GRADE

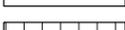
NOTES:

1. THIS SHEET GIVES THE MINIMUM EXTENT OF EARTHWORK. THE CONTRACTOR MAY ELECT TO EXTEND THE STRUCTURE EXCAVATION AND STRUCTURE BACKFILL BEYOND THE LIMITS SHOWN. ANY ADDITIONAL EXCAVATION BEHIND THE WALL SHALL BE BACKFILLED WITH STRUCTURE BACKFILL (FLOW-FILL). ANY ADDITIONAL EXCAVATION IN FRONT OF THE WALL SHALL BE BACKFILLED WITH STRUCTURE BACKFILL (CLASS 2). ANY ADDITIONAL EXCAVATION OR BACKFILL BEYOND THE LIMITS SHOWN ON THIS SHEET WILL BE TAKEN ON BY THE CONTRACTOR AND WILL NOT BE MEASURED OR PAID FOR.
2. EXCAVATION AND BACKFILL IN THE DRILLED HOLE OF THE CAISSON SHALL NOT BE PAID FOR SEPARATELY BUT INCLUDED IN ITEM 503 DRILLED CAISSON.
3. FOR DRAINAGE DETAILS, SEE SOLDIER PILE WALL DETAILS SHEETS.

KEYNOTES:

- ① DIMENSION SHOWN IS USED FOR QUANTITY PURPOSES ONLY.

LEGEND:

-  PAY LIMITS OF STRUCTURE EXCAVATION
-  LIMITS OF STRUCTURE BACKFILL (CLASS 2)
-  SEE ROADWAY PLANS
-  LIMITS OF UNCLASSIFIED EXCAVATION (QUANTIFIED WITH ROADWAY PLANS)
-  CONCRETE
-  EARTH
-  RIP RAP (QUANTIFIED WITH ROADWAY PLANS)

90% SET

CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES



REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



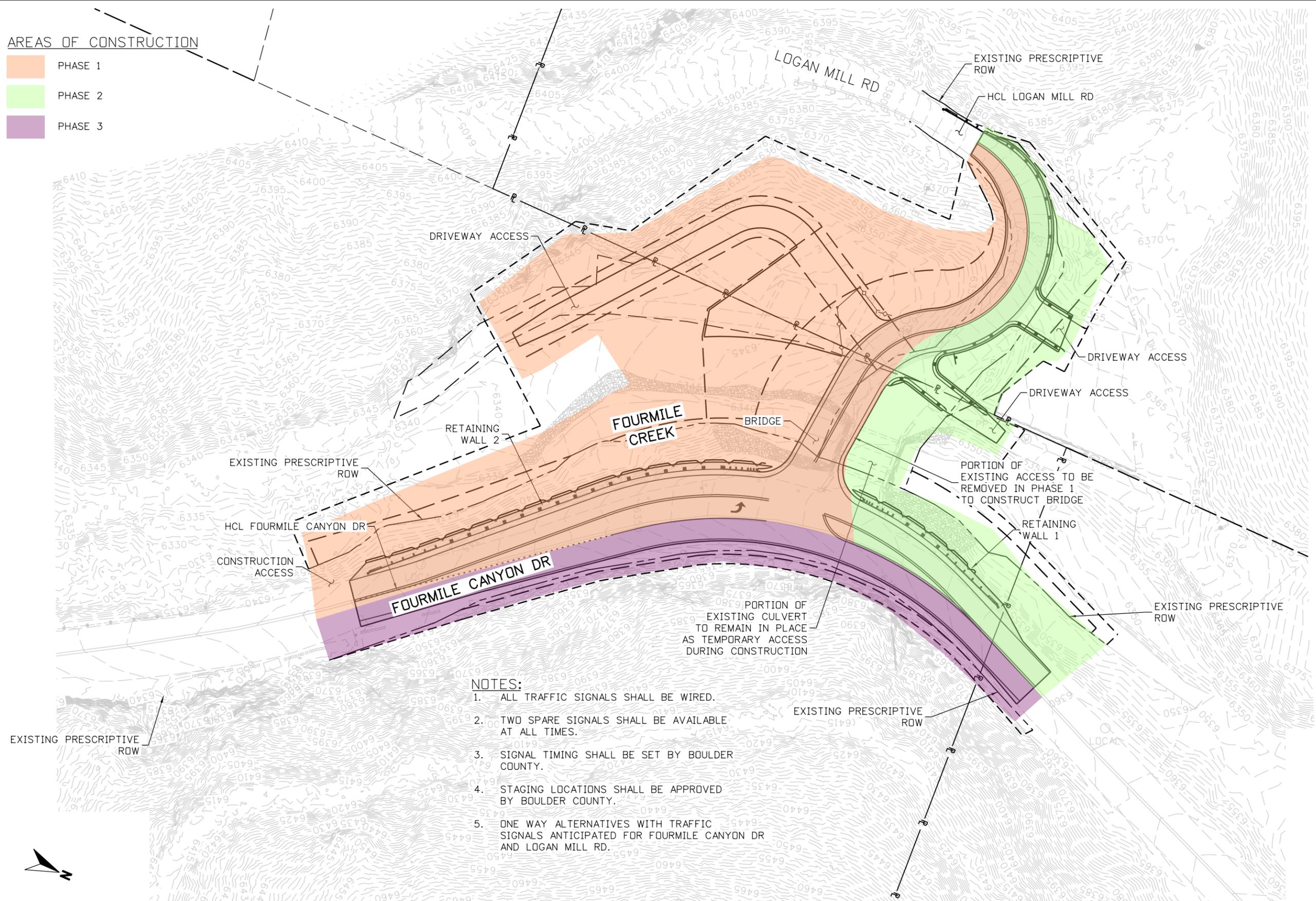
BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
DLT	BMT		8/16/2016

LOGAN MILL ROAD
SOLDIER PILE WALL EXCAVATION AND BACKFILL
PROJECT NO: 4012.SEPT12C39 SHEET NO: 76

AREAS OF CONSTRUCTION

- PHASE 1
- PHASE 2
- PHASE 3



NOTES:

1. ALL TRAFFIC SIGNALS SHALL BE WIRED.
2. TWO SPARE SIGNALS SHALL BE AVAILABLE AT ALL TIMES.
3. SIGNAL TIMING SHALL BE SET BY BOULDER COUNTY.
4. STAGING LOCATIONS SHALL BE APPROVED BY BOULDER COUNTY.
5. ONE WAY ALTERNATIVES WITH TRAFFIC SIGNALS ANTICIPATED FOR FOURMILE CANYON DR AND LOGAN MILL RD.

EXISTING PRESCRIPTIVE ROW

EXISTING PRESCRIPTIVE ROW

EXISTING PRESCRIPTIVE ROW



90% SET



CALL UTILITY NOTIFICATION CENTER OF COLORADO
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

REVISIONS:	NO.	DATE	REVISION DESCRIPTION:



BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION
Michael Baker INTERNATIONAL

DESIGNED:	CAD:	CHECKED:	DATE:
JLW	JLW	JPZ	08/16/16

LOGAN MILL ROAD
SUGGESTED CONSTRUCTION PHASING
PROJECT NO: 4012.SEPT12C39 SHEET NO: 77

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1. SITE DESCRIPTION

The Contractor shall comply with all CDOT contractual requirements and all requirements associated with the CDPS-SCP on this project. The SWMP Administrator shall update to reflect current project site conditions.

- A. **PROJECT SITE LOCATION:** The project is located within unincorporated Boulder County at the intersection of Logan Mill Road and Fourmile Canyon Drive. The bridge is 3.9 miles north of the intersection of Fourmile Canyon Drive and Boulder County Drive, west of Boulder, CO.
- B. **PROJECT SITE DESCRIPTION:** Boulder County is conducting permanent repairs and improvements for flood damaged areas in response to the September 2013 flood event. During the flood, the Logan Mill Bridge was washed-out and a temporary crossing was installed. The Logan Mill Road Bridge Construction project will replace the existing temporary crossing and includes roadway improvements to Logan Mill Drive and Fourmile Canyon Drive. The bridge replacement includes two 11-foot lanes with a 2-foot shoulder and the bridge will convey the 25-year storm events. The new bridge will raise the profile of Logan Mill and Fourmile Canyon Drive and require 400 LF of Fourmile Canyon Drive and 250 LF of Logan Mill Road to be replaced. Existing Fourmile Canyon Drive is a paved corridor with a 24-foot wide roadway section. Logan Mill Road drive is not paved. The roadways are located in the Fourmile Creek watershed and are characterized by low-density residential development. The improvements on Fourmile Canyon Drive include a 24-foot wide typical roadway section consisting of a paved roadway with two 11-foot lanes and two 1-foot shoulders. The existing bus stop is removed and replaced with a left turn lane from Fourmile Canyon Drive onto Logan Mill Road. The improvements on Logan Mill Road include a 24-foot wide typical roadway section consisting of paved roadway with two 11-foot lanes and 1-foot shoulders. Roadside drainage is incorporated in order to convey runoff in from Logan Mill Road and the drainage gulch located northwest of the project. The ditches and culverts outfall to Fourmile Canyon Creek. The bridge and stream stabilization is located within the FEMA Regulatory Floodplains and Floodway. The stream stabilization will encompass a new low flow channel with rock cross vanes, a wall along Fourmile Canyon Drive, riprap, root wads, and is designed to eliminate any adverse impacts to insurable structures. The wall along Fourmile Canyon Drive replaces existing unstable slopes and protects Fourmile Canyon Drive from future erosion. Additional improvements include providing a platform for a new fire water siphon, regrading driveways, and installation of guardrail. Design considerations include careful evaluation of residential, environmental and aesthetic impacts to keep the natural beauty of the canyon intact as much as possible, within reason.

C. **PROPOSED SEQUENCING FOR MAJOR CONSTRUCTION ACTIVITIES:** Construction of the project will come in phases, as laid out by the contractor. The existing driveway to the southwest of the project will be used as a staging area. Sequencing for the construction of the project shall include the following steps; clearing and grubbing, walls, culverts, bridge, roadway, grading, guardrail, scour pools, riprap, and stabilization with seeding and planting native plants. All traffic phasing and planning before, during and after the completion of the project shall be coordinated with Boulder County and managed by the contractor. Activities throughout the construction will be determined by the contractor and are subject to change.

- D. **ACRES OF DISTURBANCE:**
 1. Total area of construction site (LOC (PERMITTED AREA)): 1.7 acres
 2. Total area of proposed disturbance (LDA): 1.6 acres
 3. Total area of seeding: 0.5 acres
 4. Total area of impervious surface: 0.5 acres
 5. Total area of NEW impervious surface: 0.2 acres

- E. **EXISTING SOIL DATA**
 1. FcF, Fern Cliff - Allens Park - rock outcrop complex, 15 to 60 percent slopes
 2. JrF, Juget - Rock outcrop complex, 9 to 55 percent slopes

F. **EXISTING VEGETATION, INCLUDING PERCENT COVER:**
 During design the SWMP Administrator for Design in consultation with the Engineer will determine if the SWMP Administrator for Design or the SWMP Administrator will conduct the Vegetation Transects as outlined in Chapter 4.11.2 of the Erosion Control and Stormwater Quality Guide.

Pre-Construction Date of survey: May 2015 %Density: 60
 Description of existing vegetation: Elevations within the project area range from 6,330 ft to 6,403 ft msl. Dominant trees and shrubs within the project area includes Ponderosa pine (Pinus ponderosa), plains cottonwood (Populus deltoids), and species of willow (Salix sp.). Common herbaceous vegetation within the project area included downy brome (Bromus tectorum), western wheatgrass (Pascopyrum smithii), bull thistle (Cirsium vulgare), reed canarygrass (Phalaris arundinacea), field horstail (Equisetum arvense), dandelion (Taraxacum officinale), and white clover (Trifolium repens). Existing vegetation makes up approximately 60% of the existing ground cover within the project area.
 Map or table showing transect locations in SWMP notebook tab 17:

Post-Construction Date of survey: _____ %Density: _____
 Description of existing vegetation: _____ **Date of CDPS-SCP Closure:** _____
 Map or table showing transect locations in SWMP notebook tab 17:

G. **POTENTIAL POLLUTANTS SOURCES:** See First Construction Activities under Potential Pollutant Sources. The SWMP Administrator shall prepare a list of all potential pollutants and their locations in accordance with subsection 107.25.

- H. **RECEIVING WATER:**
 1. Outfall locations: See Drainage Plans for size, type and location of pipes throughout the project.
 2. Names of receiving water(s) on site: Roadside ditch, Fourmile Creek
 3. Ultimate receiving water: Fourmile Creek
 4. Horizontal distance nearest water of the state is from project: Fourmile creek runs through the project under Logan Mill Bridge

- I. **NON-STORMWATER DISCHARGES:**
 - ALLOWABLE:
 1. Groundwater and stormwater dewatering: Discharges to the ground of water from construction dewatering activities may be authorized provided that:
 - a. the source is groundwater and/or groundwater combined with stormwater that does not contain pollutants
 - b. the source and BMPs/Control Measures are identified in the SWMP
 - c. discharges do not leave the site as surface runoff or to surface waters
 - d. The contractor shall protect all work areas and facilities from water at all times. Areas and facilities subject to flooding, regardless of the source of water, shall be promptly dewatered and restored at no cost to the owner. This shall include removal of any debris caused by flooding. Any dewatering shall be done in accordance with Subsection 107.25

- CONTAMINATED:
 2. If discharges do not meet the above criteria a separate CDPS permit shall be obtained by the Contractor from the CDPHE. See standard special provision 250 Hazardous Waste and Contaminated Water.

2. SITE MAP COMPONENTS:

- Pre-construction
 - A. **PROJECT CONSTRUCTION POTENTIAL SITE BOUNDARIES** – See SWMP plan
 - B. **ALL AREAS OF GROUND SURFACE DISTURBANCE** - See SWMP plan
 - C. **AREAS OF CUT AND FILL** - See SWMP plan
 - D. **LOCATION OF ALL STRUCTURAL BMPs/CONTROL MEASURES IDENTIFIED IN THE SWMP** - See SWMP plan

90% SET	<p style="font-size: 8px;">CALL UTILITY NOTIFICATION CENTER OF COLORADO CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES</p>	<table border="1" style="font-size: 8px;"> <tr><th>REVISIONS:</th><th>NO.</th><th>DATE</th><th>REVISION DESCRIPTION:</th></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>	REVISIONS:	NO.	DATE	REVISION DESCRIPTION:									<p>BOULDER COUNTY TRANSPORTATION DEPARTMENT ENGINEERING DIVISION</p>	<p>Michael Baker INTERNATIONAL</p>	<table border="1" style="font-size: 8px;"> <tr><th>DESIGNED:</th><th>CAD:</th><th>CHECKED:</th><th>DATE:</th></tr> <tr><td>JLW</td><td>EMR</td><td>JPZ</td><td>08/16/16</td></tr> </table>	DESIGNED:	CAD:	CHECKED:	DATE:	JLW	EMR	JPZ	08/16/16	<p>LOGAN MILL ROAD SWMP PLANS - GENERAL (SHEET 1 OF 8)</p> <p style="font-size: 8px;">PROJECT NO: 4012.SEPT12C39 SHEET NO: 78</p>
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E. LOCATION OF NON-STRUCTURAL BMPs/CONTROL MEASURES AS APPLICABLE IN THE SWMP - See SWMP plan

F. SPRINGS, STREAMS, WETLANDS AND OTHER SURFACE WATER - See SWMP plan

G. PROTECTION OF TREES, SHRUBS, CULTURAL RESOURCES AND MATURE VEGETATION - See SWMP plan

H. AREAS USED FOR STORING AND STOCKPILING OF MATERIALS, STAGING AREAS (field trailer, fueling, etc.) and BATCH PLANTS - See SWMP plan

3. SWMP ADMINISTRATOR:

A. SWMP ADMINISTRATOR FOR DESIGN:

Name/Title	Contact Information
Joe Zufall, PE	720-479-3179, JZufall@mbakerintl.com

B. SWMP ADMINISTRATOR FOR CONSTRUCTION: (As defined in Subsection 208) The Contractor shall designate a SWMP Administrator for Construction upon ownership of the SWMP. The SWMP Administrator shall become the owner/operator and assume responsibility for all design changes to the SWMP implementation and maintenance in accordance to 208.03. The SWMP Administrator shall be responsible for implementing, maintaining and revising SWMP, including the title and contact information. The activities and responsibilities of the SWMP administrator shall address all aspects of the projects SWMP. (Update the information below for each new SWMP Administrator) (Copy of TECS Certification must also be included in the SWMP Notebook.)

Name/Title	Contact Information	Certification #	Start Date	Engineer Approval

C. EROSION CONTROL INSPECTOR: (As defined in Subsection 208) The Contractor may designate an Erosion Control Inspector. The Erosion Control Inspector shall complete duties in accordance with subsection 208.03 (c) (Copy of TECS Certification must also be included in the SWMP Notebook.)

Name/Title	Contact Information	Certification #	Start Date	Engineer Approval

4. STORMWATER MANAGEMENT CONTROLS FIRST CONSTRUCTION ACTIVITIES

THE CONTRACTOR SHALL PERFORM THE FOLLOWING:

A. POTENTIAL POLLUTANT SOURCES

Evaluate, identify, locate and describe all potential sources of pollutants at the site in accordance with subsection 107.25, CDPS-SCP and place in the SWMP notebook. All BMPs/Control Measures related to potential pollutants shall be shown on the SWMP site map by the Contractor's SWMP Administrator.

B. OFFSITE DRAINAGE (RUN ON WATER)

1. Describe and record BMPs/Control Measures on the SWMP site map that have been implemented to address off site run-on water in accordance with subsection 208.03.

C. VEHICLE TRACKING PAD/VEHICLE TRACKING CONTROL

1. BMPs/Control Measures shall be implemented in accordance with subsection 208.04.

D. PERIMETER CONTROL

1. Perimeter control shall be established as the first item on the SWMP to prevent the potential for pollutants leaving the construction site boundaries, entering the stormwater drainage system, or discharging to state waters.
2. Perimeter control may consist of vegetation buffers, berms, silt fence, erosion logs, existing landforms, or other BMPs/Control Measures as approved.
3. Perimeter control shall be in accordance with subsection 208.04

5. DURING CONSTRUCTION

RESPONSIBILITIES OF THE SWMP ADMINISTRATOR DURING CONSTRUCTION

The SWMP should be considered a "living document" that is continuously reviewed and modified. During construction, the following items shall be added, updated, or amended as needed by the SWMP Administrator in accordance with subsection 208.

During construction, indicate how items that have not been addressed during design are being handled in construction. If items are covered in the template or other sections of the SWMP notebook indicate below what section the discussion takes place.

A. STOCKPILE MANAGEMENT: Shall be done in accordance with subsection 107.25 and 208.07

B. CONCRETE WASHOUT: Concrete wash out water or waste from field laboratories and paving equipment shall be contained in accordance with subsection 208.05.

C. SAW CUTTING: Shall be done in accordance with subsection 107.25, 208.04, 208.05

D. STREET SWEEPING: Shall be done in accordance with subsection 208.04

6. INSPECTIONS

A. Inspections shall be in accordance with subsection 208.03 (c).

7. BMP/CONTROL MEASURE MAINTENANCE

A. Maintenance shall be in accordance with subsection 208.04 (f).

8. RECORD KEEPING

A. Records shall be kept in accordance with subsection 208.03 (d).

9. INTERIM AND PERMANENT STABILIZATION

A. SEEDING PLAN

Soil preparation, soil conditioning or topsoil, seeding (native), mulching (weed free) and mulch tackifier will be required for an estimated 0.5 acres of disturbed area within the right-of-way limits which are not surfaced. The following types and rates shall be used:

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B. **SEEDING APPLICATION:** Drill seed 0.25 inch to 0.5 inch into the soil. In small areas not accessible to a drill, hand broadcast or hydroseed at double the rate and rake 0.25 inch to 0.5 inch into the soil per subsection 212.

C. **MULCHING APPLICATION:** Apply a minimum of 2 tons of certified weed free hay or 2 1/2 tons of certified weed free straw per acre and in accordance with Section 213, and mechanically crimp it into the soil in combination with an organic mulch tackifier.

1. Prior to winter shutdown or the summer seeding window closure: Uncompleted slopes shall be mulched with 2 tons of mulching (weed free) per acre, mechanically crimped into the topsoil in combination with an organic mulch tackifier per subsections 208 and 213.

D. **SPECIAL REQUIREMENTS:**

1. Due to high failure rates, hydroseeding will not be allowed for permanent stabilization.

E. **SOIL CONDITIONING AND FERTILIZER REQUIREMENTS:** Minimum requirements for all disturbances to receive seeding (native).

Soil conditioner paid for as Item 212- Soil Conditioning (Acre)		
Biological nutrient organic based fertilizer (lbs/acre)*	Humate (lbs/acre)	Compost (cys/acre) 1/2 inch depth
300	200	65

*Biological nutrient shall not exceed 8-8-8 (N-P-K). Humate based material shall be in accordance to Standard Special Provision 212 and compost shall be in accordance to Standard Special Provision 212.

BMP Matrix:

1. M-Standards have been included along with standard BMP narratives. If a Non-Standard BMP will be used or the standard narrative does not apply, the SWMP Administrator shall write a Non-Standard BMP narrative, place an "X" in the column and complete a Non-Standard BMP Specification and Narrative for the SWMP notebook.
2. The SWMP Administrator shall place an "X" in the column In Use on Site when the BMP/Control Measure has been installed.
3. Place an "X" in the column BMP/Control Measure to be located by SWMP Administrator if the SWMP Administrator shall locate the BMP/Control Measure during construction. These BMP/Control Measures are not currently located on SWMP Plans but are anticipated to be used during construction (i.e. Vehicle Tracking Pad, Batch Plants, etc.). The SWMP Administrator shall locate these prior to or during construction and reflect on SWMP Map.
4. Place an "X" in the column Installation BMP/Control Measure Pre-Construction if the BMP/Control Measure is to be installed prior to construction activity.

F. **SOIL RETENTION COVERING:** On slopes and ditches requiring a blanket or turf reinforcement mat (trm), the blanket/trm shall be placed in lieu of mulch and mulch tackifier and placed after seeding (native). See SWMP site map for blanket/trm locations.

G. **RESEEDING OPERATIONS/CORRECTIVE STABILIZATION**

Prior to partial acceptance.

1. All seeded areas shall be reviewed during the 14 day inspections by the SWMP Administrator and or Erosion Control Inspector for bare soils caused by surface or wind erosion. Bare areas caused by surface or gully erosion, blown away mulch, etc. shall be re-graded, seeded, and have the designated mulching applied as necessary, at no additional cost to the project.

10. PRIOR TO PROJECT FINAL ACCEPTANCE

- A. Partial Acceptance shall be in accordance with subsection 107.25 (d), 208.10 and 214.04 at the Partial Acceptance of the project, it shall be determined by the SWMP Administrator and the Engineer which temporary BMPs/Control Measures shall remain until 70% revegetation is established or which shall be removed.
- B. At the end of the project, all ditch checks shall either consist of temporary erosion logs (or equivalent) or permanent rip-rap.
- C. All storm drains shall be cleaned prior to the Final Acceptance of the project. Work shall be included in 202 Clean Culvert.

11. NARRATIVES:

- A. **ADDITIONAL BMPS/CONTROL MEASURES AND NARRATIVES:**
BMP/Control Measure details and narratives not covered by the SWMP or Standard Plan M-208, M-216 shall be added to the SWMP notebook by the SWMP Administrator.

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Riparian Seed Mix

Type	Common Name	Scientific Name	Variety	Seeds per Pound	Seeds per Square Foot	Pounds of Pure Live Seed/Acre
Graminoids	Indian ricegrass	Acnatherum hymenoides	Paloma	141,000	3.9	1.2
	Sidecoats grama	Bouteloua curtipendula	Butte or Pierre	191,000	5.3	1.2
	Blue grama	Bouteloua gracilis	Birds Eye, Alma or Lovington	825,000	11.4	0.6
	Slender wheatgrass	Elymus trachycaulus	White River or San Luis	159,000	4.4	1.2
	Idaho fescue	Festuca idahoensis	Winchester	450,000	8.3	0.8
	Fowlmannagrass	Glyceria striata	-	180,000	8.3	2.0
	Needle and thread	Hesperostipa comata	-	115,000	5.3	2.0
	Prairie junegrass	Koeleria macrantha	-	2.3 million	5.3	0.1
	Baltic rush	Juncus balticus	-	10.9 million	25.0	0.1
	Torrey's rush	Juncus torreyi	-	12.3 million	28.2	0.1
	Green needlegrass	Nassella viridula	Cucharas or Lodorm	181,000	4.2	1.0
	Western wheatgrass	Pascopyrum smithii	Arriba	110,000	10.1	4.0
	Fowlbluegrass	Poa palustris	-	3.2 million	7.3	0.1
	Sanberg bluegrass	Poa secunda	Sims Mesa or High Plains	1 million	6.9	0.3
	Bluebunch wheatgrass	Pseudoroegneria spicata	P7	140,000	6.4	2.0
	Little Bluestem	Schizachyrium scoparium	Pastura, Cimarron, or Camper	260,000	6.0	1.0
Prairie cordgrass	Spartina pectinata	-	197,000	4.5	1.0	
Forbs	Common yarrow	Achillea millefolium	-	2.7 million	6.2	0.1
	Rocky Mountain bcc plant	Cleome serrulata	-	66,000	3.0	2.0
	Golden tickseed	Coreopsis tinctoria	-	1.4 million	3.2	0.1
	Blanketflower	Gaillardia aristata	Meriweather	132,000	1.5	0.5
	Showy goldeneye	Heliomeris multiflora	-	1 million	2.3	0.1
	Rocky Mountain penstemon	Penstemon strictus	Bandera	490,000	2.2	0.2
American vetch	Vicia americana	-	33,000	0.8	1.0	
Bulk	Rice hulls	-	-	-	2.3	
				Total	170.0	25.0

* See Fourmile Canyon Creek Stream Restoration Plans for riparian seed mix notes.

Foothills Seed Mix

Common Name	Species Name	Variety	% of Mix	#PLS/Acre
Side Oats Grama	Bouteloua curtipendula	Vaughn	10%	1.82
Blue Grama	Bouteloua grailis	Native, Alma or Hachita	15%	0.63
Slender Wheatgrass	Elymus trachycaulus	San Luis	20%	4.38
Junegrass	Koeleria macrantha	Native	10%	0.15
Western Wheatgrass	Pascopyrum smithii	Arriba	10%	3.17
Western Wheatgrass	Pascopyrum smithii	Native	10%	3.17
Switchgrass	Panicum virgatum	Blackwell or Nebraska 28	7%	0.63
Little Bluestem	Schizachyrium scoparium	Cimarron or Pastura	8%	1.07
Green Needlegrass	Stipa viridula	Lodorm or Native	10%	1.93

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STRUCTURAL BMPs/Control Measures that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:

APPLICATION, BMP/CONTROL MEASURE	NARRATIVE	M-STANDARD/NON-STANDARD	IN USE ON SITE	BMP/CONTROL MEASURE TO BE LOCATED BY SWMP ADMINISTRATOR	INSTALLATION BMP/CONTROL MEASURE PRE-CONSTRUCTION	BMP/CONTROL MEASURE PHASING		
						FIRST/INITIAL CONSTRUCTION ACTIVITIES	INTERIM CONSTRUCTION ACTIVITIES	PERMANENT STABILIZATION
PROTECTION OF EXISTING TREES/LANDSCAPING <i>Fence (plastic)</i>	Fence (plastic) shall be used in areas indicated in the plans to prevent encroachment of construction traffic and sediment for the protection of mature trees and/or existing landscaping prior to start of construction disturbances.					X	X	
CULVERT INLET/OUTLET PROTECTION <i>Erosion logs, aggregate bags</i>	Placed at mouth of culvert inlets and over top of culvert at inlet and outlet where disturbance may be occurring adjacent to pipe to prevent sediment laden water from entering pipe or drainage. Place prior to start of construction disturbances.	M-208				X	X	X
TYPE C, TYPE D AND TYPE 13 PROTECTION <i>Erosion logs, aggregate bags, erosion bales</i>	Placed around inlet grate or slope and ditch paving to prevent sediment from entering inlet. Place prior to start of construction disturbances.	M-208				X	X	X
STOCKPILE PROTECTION <i>Temporary berm, erosion logs, aggregate bags*</i>	Placed within specified distance, in accordance with subsection 208.06, from toe to contain sediment around stockpile. *Aggregate bags are easily moved and replaced for access during the work day. Place prior to start of stock pile, increase control as stock pile increases size.	M-208					X	
TOE OF FILL PROTECTION <i>Erosion logs, temporary berm, silt fence, topsoil windrow*</i>	Place prior to slope/embankment work to capture sediment and protect and delineate undisturbed areas. *Can be used to stockpile topsoil for salvage.	M-208				X	X	
PERIMETER CONTROL <i>Erosion logs, silt fence, temporary berm, topsoil windrow*</i>	Placed prior to construction commencing to address potential run-on water from off site, and to divert around disturbed area. *Can be used to stockpile topsoil for salvage.	M-208				X	X	
SEDIMENT CONTROL/SLOPE CONTROL <i>Silt fence, erosion logs</i>	Placed on the contour of a slope to contain and slow down construction runoff. Place prior to start of construction disturbances.	M-208				X	X	
OUTLET PROTECTION <i>Riprap, or approved other</i>	Material placed as energy dissipater to prevent erosion at outlet structure.						X	X
CONCRETE WASHOUT <i>In-ground or fabricated</i>	Construction control, used for waste management of concrete and concrete equipment cleaning. Place prior to start of concrete activities.	M-208				X	X	
VEHICLE TRACKING PAD	Source control, placed to prevent tracking of sediment from disturbed area to offsite surface. Place prior to start of construction disturbances.	M-208				X	X	
SWEEPING	Source control, used to remove sediment tracked onto paved surfaces and to prevent sediment from entering drainage system. Sweep daily and at the end of the construction shift as needed. Kick brooms shall not be permitted.					X	X	
DEWATERING <i>(Contractor is responsible for obtaining a permit from Colorado Department of Health and Environment.)</i>	Shall be done in such a manner to prevent potential pollutants from entering state waters.					X	X	

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NON-STRUCTURAL BMPs/Control Measures that may be potentially used on the project for erosion and sediment control; practices may include, but are not limited to:
 Erosion control devices are used to limit the amount of soil loss on site
 Sediment control devices are designed to capture sediment on the project site.
 Construction controls are BMPs/Control Measures related to construction access and staging.
 BMP/Control Measure locations are indicated on the SWMP site map.

APPLICATION, BMP/CONTROL MEASURE	NARRATIVE	M-STANDARD	IN USE ON SITE	BMP/CONTROL MEASURE TO BE LOCATED BY SWMP ADMINISTRATOR	INSTALLATION BMP/CONTROL MEASURE PRE-CONSTRUCTION	BMP/CONTROL MEASURE PHASING		
						FIRST/INITIAL CONSTRUCTION ACTIVITIES	INTERIM CONSTRUCTION ACTIVITIES	PERMANENT STABILIZATION
TOPSOIL MANAGEMENT STOCKPILE/SALVAGE Windrow or stockpile	Prior to embankment work commencing, existing topsoil shall be scraped to a depth of 4 inches, and placed in stockpiles or windrows. Upon completion of slope work/final grading (less 4 inches), topsoil shall be evenly distributed over embankment to a depth of 4 inches.					X	X	
SURFACE ROUGHENING / GRADING TECHNIQUES Blading, Backhoe, Dozing, Combination Loader	Temporary stabilization of disturbance and to minimize wind and erosion.						X	
MULCH/MULCH TACKIFIER	Temporary or Final Stabilization placed as a surface cover for erosion control and or seeding establishment. To be installed as temporary surface cover when work is temporarily halted and as approved by the Engineer						X	X
SEEDING PERMANENT (NATIVE)	Final Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas.							X
SOIL RETENTION BLANKET (SRB)	Final Stabilization of disturbance and to reduce runoff and control erosion on disturbed areas.	M-216					X	X

12. TABULATION OF STORMWATER QUANTITIES

- A. BMP/Control Measure sediment removal and disposal shall be paid for as: 208 Removal and Disposal of Sediment (Equipment) and 208 Removal and Disposal of Sediment (Labor). All other BMP/Control Measure maintenance shall be included in the cost of the BMP/Control Measure.
- B. Establishment of seeded areas shall be paid for as: 212 Seeding (native). This shall include mowing, weed control, reseeding/mulch/tackifier.

Spec.	Pay Item	Description	Pay Unit	Initial Const.	Interim Const.	Permanent Stabilization	*Total Quantity
PSP	207-00205	Topsoil	CY				400
SSP	208-00002	Erosion Log Type 1 (12 inch)	LF				815
SSP	208-00020	Silt Fence	LF				90
SSP	208-00045	Concrete Washout Structure	Each				1
SSP	208-00070	Vehicle Tracking Pad	Each				2
SSP	208-00103	Removal and Disposal of Sediment (Labor)	Hour				10
SSP	208-00105	Removal and Disposal of Sediment (Equipment)	Hour				10

Spec.	Pay Item	Description	Pay Unit	Initial Const.	Interim Const.	Permanent Stabilization	*Total Quantity
SSP	208-00207	Erosion Control Management (ECM)	Day				90
SSP	208-00106	Sweeping (Sediment Removal)	Hour				90
SSP	212-00006	Seeding (Native)	Acre				.5
SSP	212-00032	Soil Conditioning	Acre				.5
SSP	212-00100	Tree Retention and Protection	LS				1
SSP	213-00004	Mulching (Weed Free Straw)	Acre				.5
SSP	213-00061	Mulch Tackifier	LB				99
SSP	216-00201	Soil Retention Blanket (Straw/Coconut) (Biodegradable Class 1)	SY				1470
PSP	217-00020	Herbicide Treatment	Hour				4
PSP	700-70380	Erosion Control	FA				1

*It is anticipated that additional BMPs/Control Measures and BMP/Control Measure quantities not shown on the SWMP Site Maps shall be required on the project for unforeseen conditions and replacement of items that are

beyond their useful service life, see subsection 208.03 and 208.04. **Quantities for all BMPs/Control Measures shown above are estimated, and have been increased for unforeseen conditions and normal BMP/Control Measure life expectancy.** Quantities shall be adjusted according to the conditions encountered in the field as directed and approved by the Engineer. Payment shall be for the actual work completed and material used.

13. BIOLOGIC IMPACTS

A. ENVIRONMENTAL IMPACTS:

1. Wetland Impacts: YES NO
2. Stream Impacts: YES NO
3. Threatened and Endangered Species: No
4. If YES to any of the above items, are any permits required or additional actions needed (404, etc.)
404 permit

14. NOTES

- A. See CDOT M-208-1 for all BMP names and details.
- B. See drainage plans for details of permanent drainage facilities.
- C. All BMP's are during construction unless otherwise noted.
- D. Vehicle tracking pad shall be installed at all site access points. Staging area concrete washout structures (CWS) shall be installed at all staging areas.
- E. All disturbed areas within the limits of disturbed area shall be surfaced roughened, seeded, and mulched upon completion of final grade.
- F. Surface roughening shall be in accordance with CDOT Standard Specification 208.05. Payment for surface roughening shall be included in the cost of the earthwork item and no separate payment shall be made.
- G. See SWMP Standard note Sheets for additional information regarding the implementation of all structural and non-structural BMP's.
- H. All existing inlets and proposed/newly constructed inlets in project area shall have erosion log (12") inlet protection for the duration of the project or until taken out of service, or as directed by the Project Engineer.
- I. All BMP's shall be constructed per M-208-1.

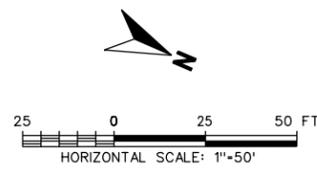
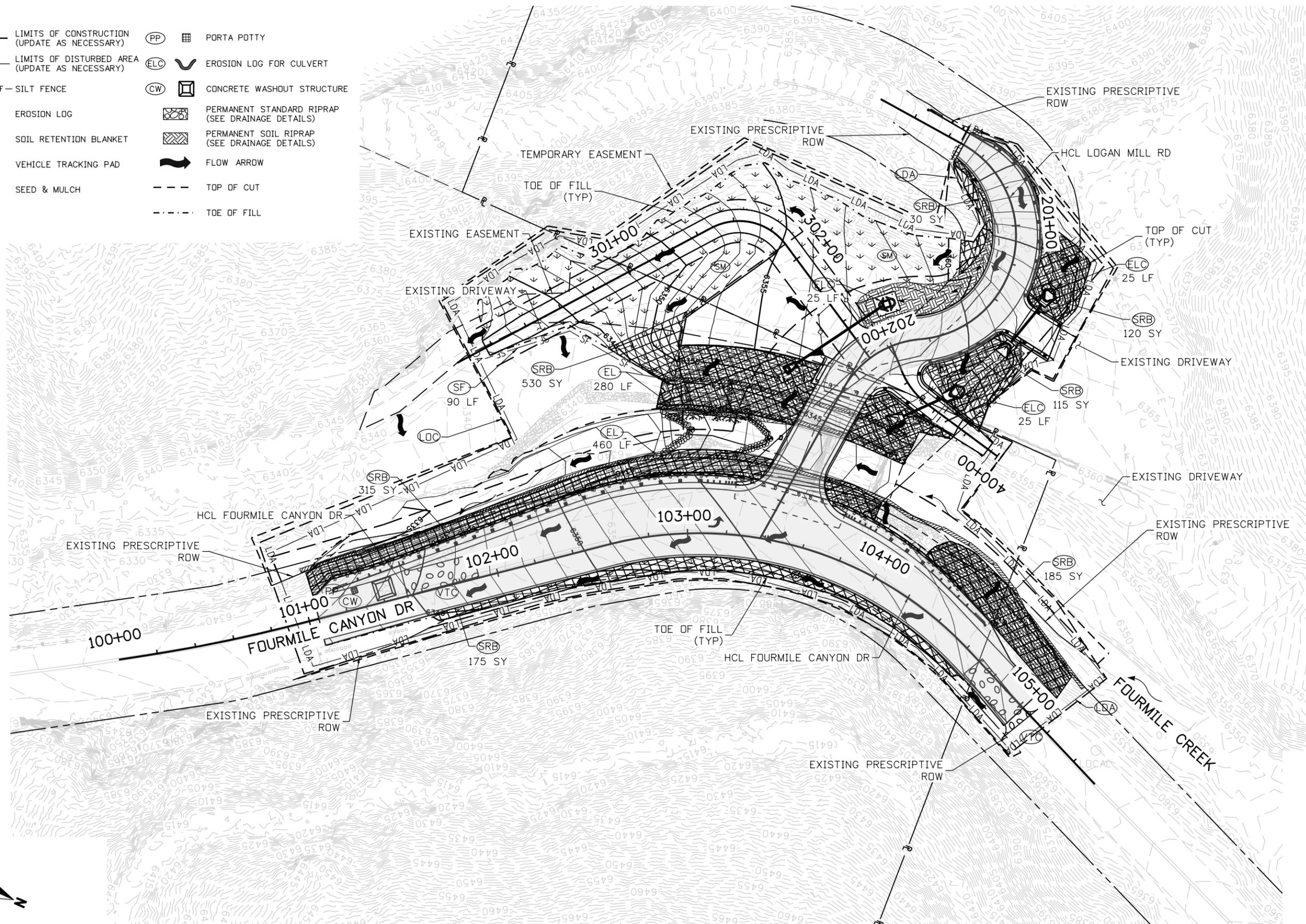
Soil Retention Blanket (SRB) shall be at minimum of the type and class noted on the plans.

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LEGEND

- (LOC) ——— LIMITS OF CONSTRUCTION (UPDATE AS NECESSARY)
- (LDA) —LDA— LIMITS OF DISTURBED AREA (UPDATE AS NECESSARY)
- (SF) -SF— SF— SILT FENCE
- (EL)  EROSION LOG
- (SRB)  SOIL RETENTION BLANKET
- (VTC)  VEHICLE TRACKING PAD
- (SM)  SEED & MULCH
- (PP)  PORTA POTTY
- (ELC)  EROSION LOG FOR CULVERT
- (CW)  CONCRETE WASHOUT STRUCTURE
-  PERMANENT STANDARD RIPRAP (SEE DRAINAGE DETAILS)
-  PERMANENT SOIL RIPRAP (SEE DRAINAGE DETAILS)
-  FLOW ARROW
- — — — — TOP OF CUT
- - - - - TOE OF FILL



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BOULDER COUNTY TRANSPORTATION DEPARTMENT
ENGINEERING DIVISION

 **Michael Baker INTERNATIONAL**

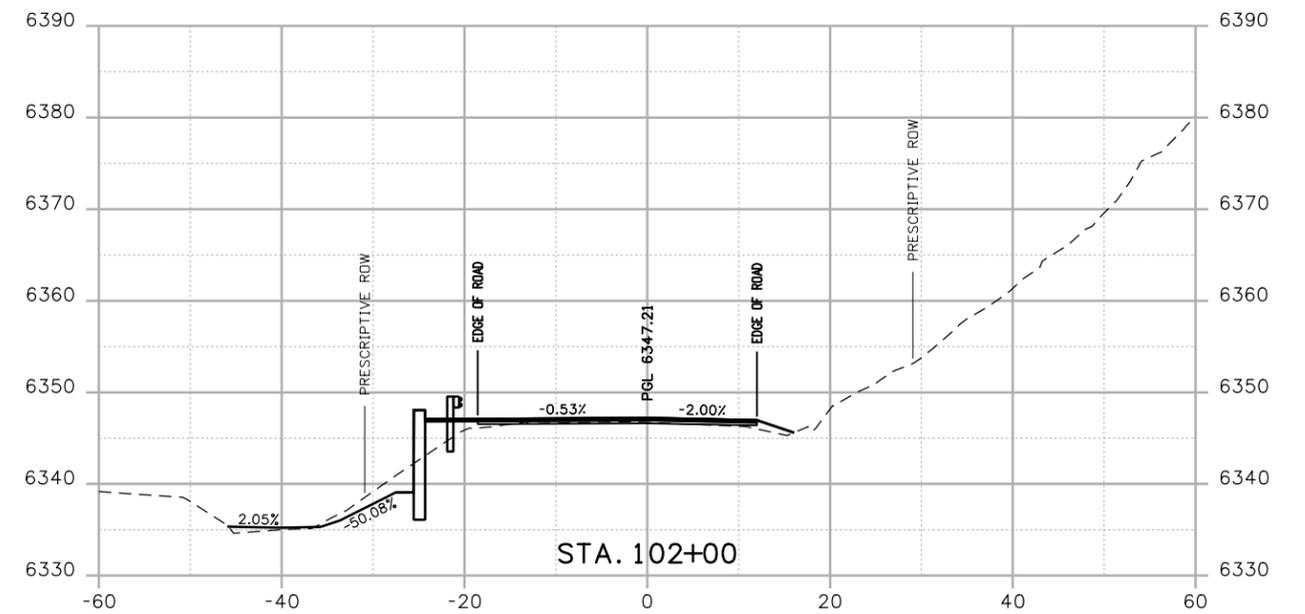
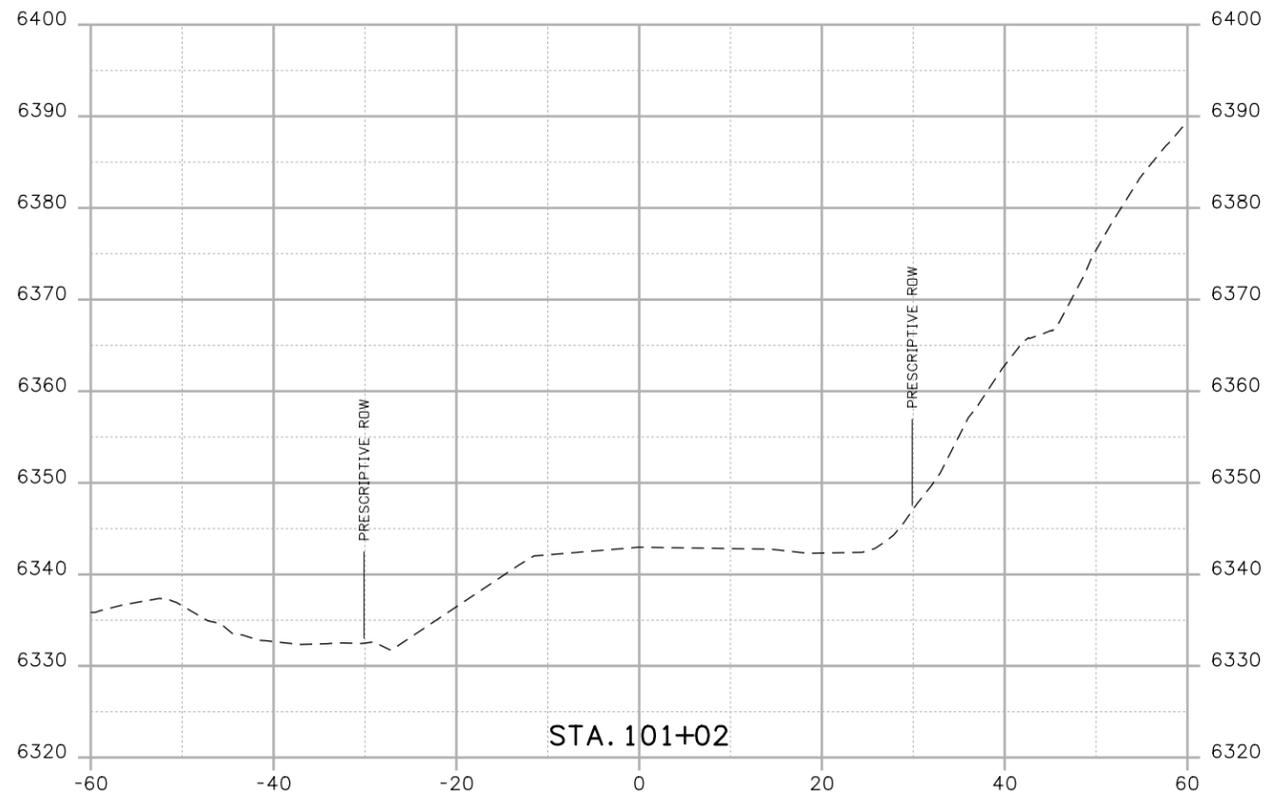
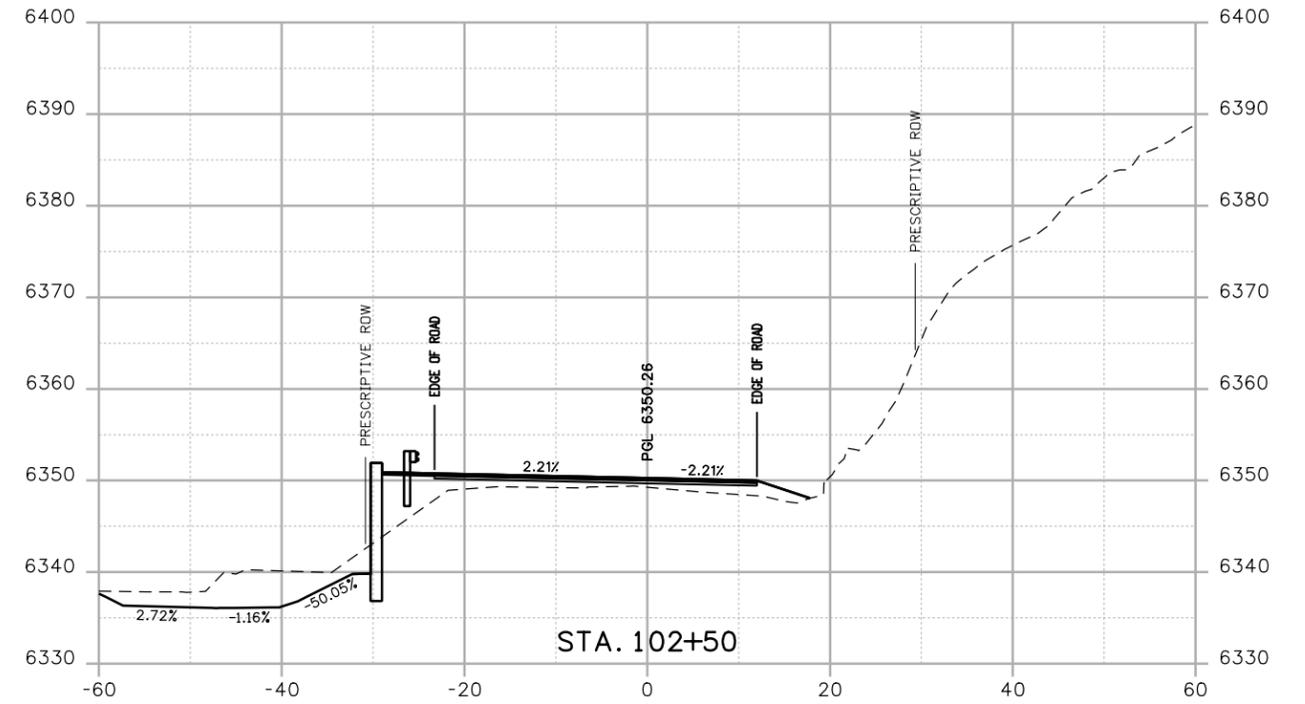
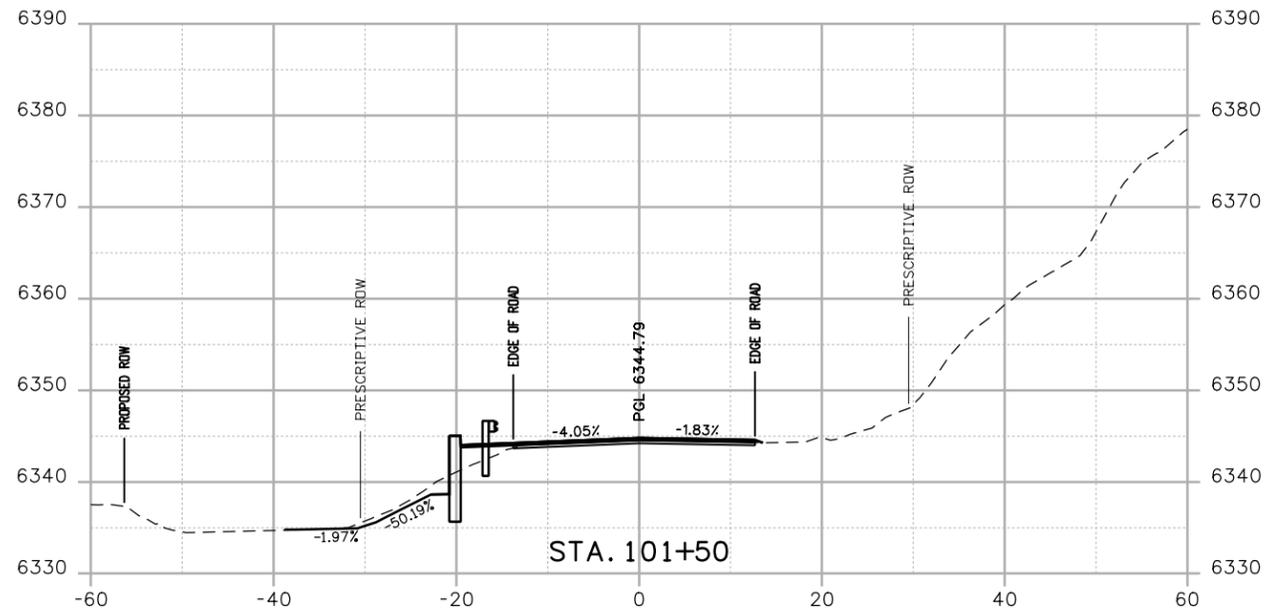
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LOGAN MILL ROAD SWMP PLAN (SHEET 8 OF 8)

PROJECT NO: 4012.SEPT12C39 SHEET NO: 85

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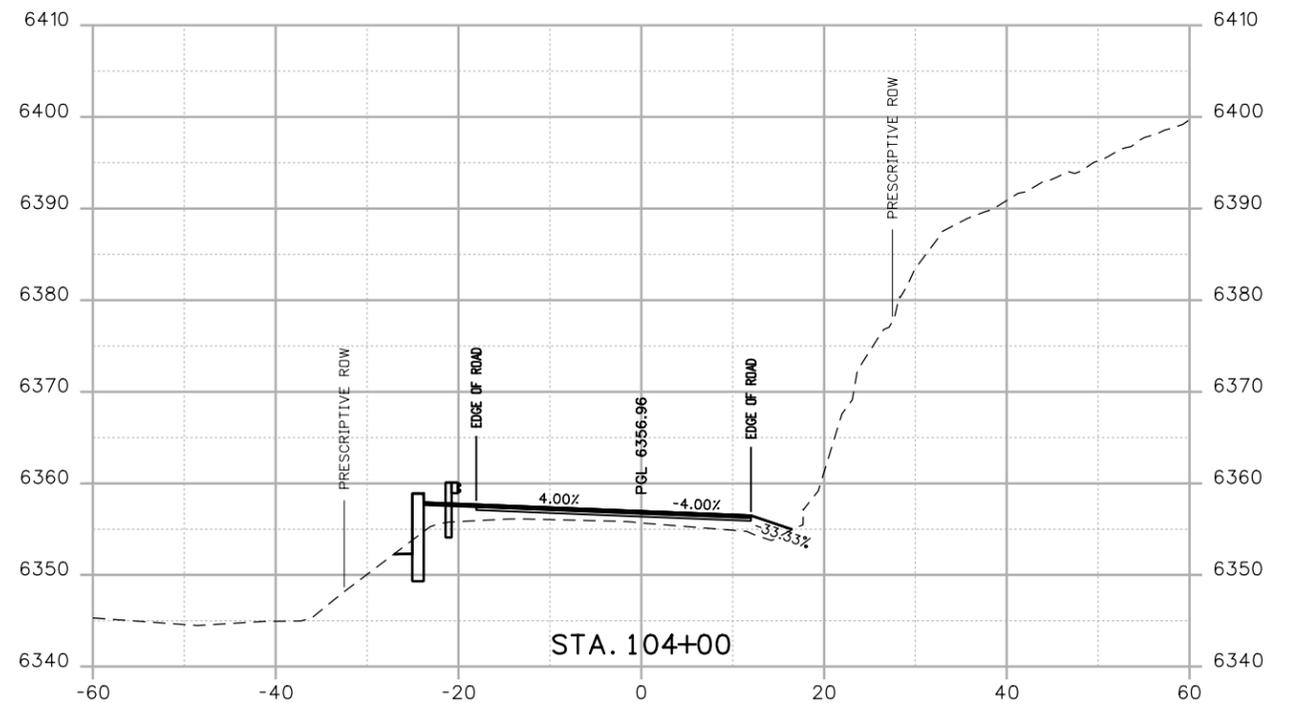
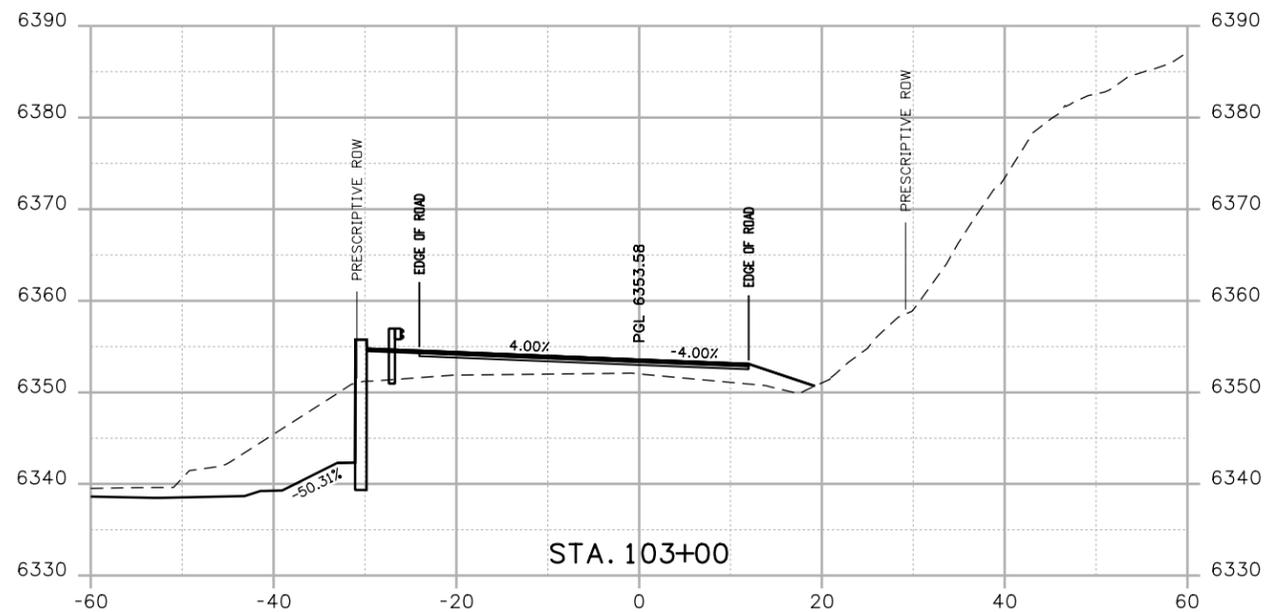
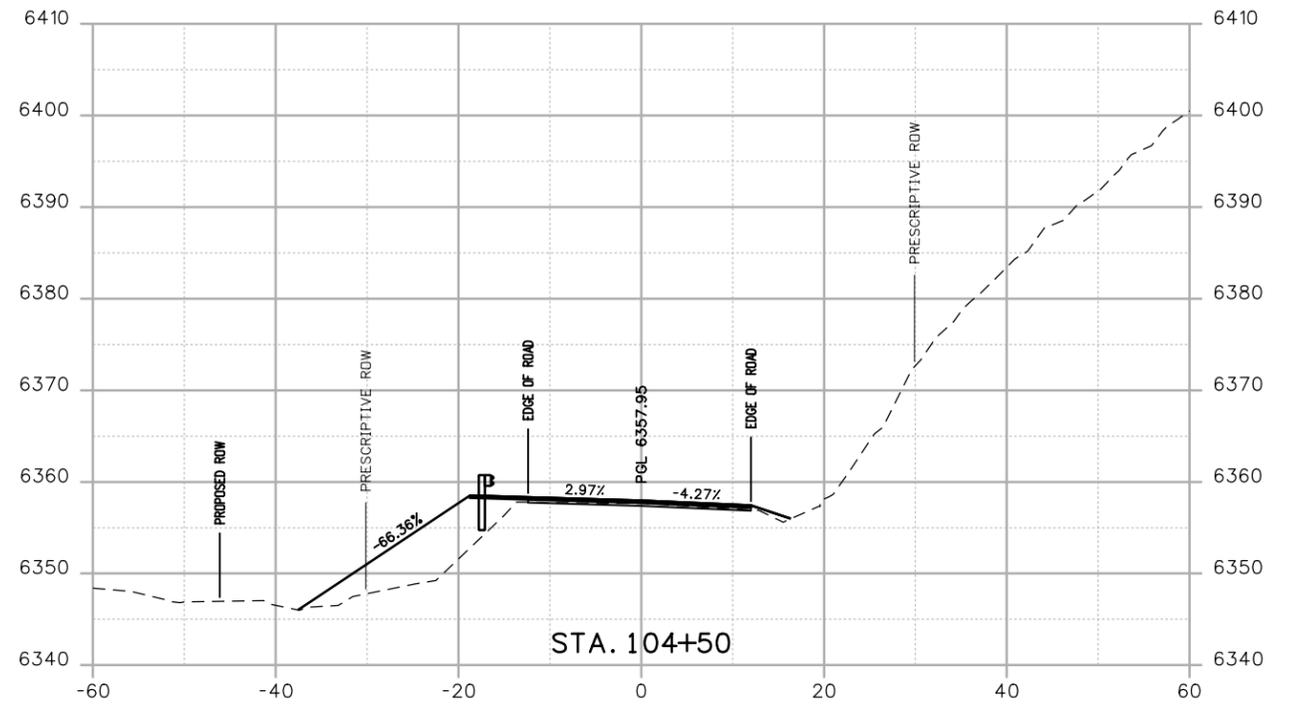
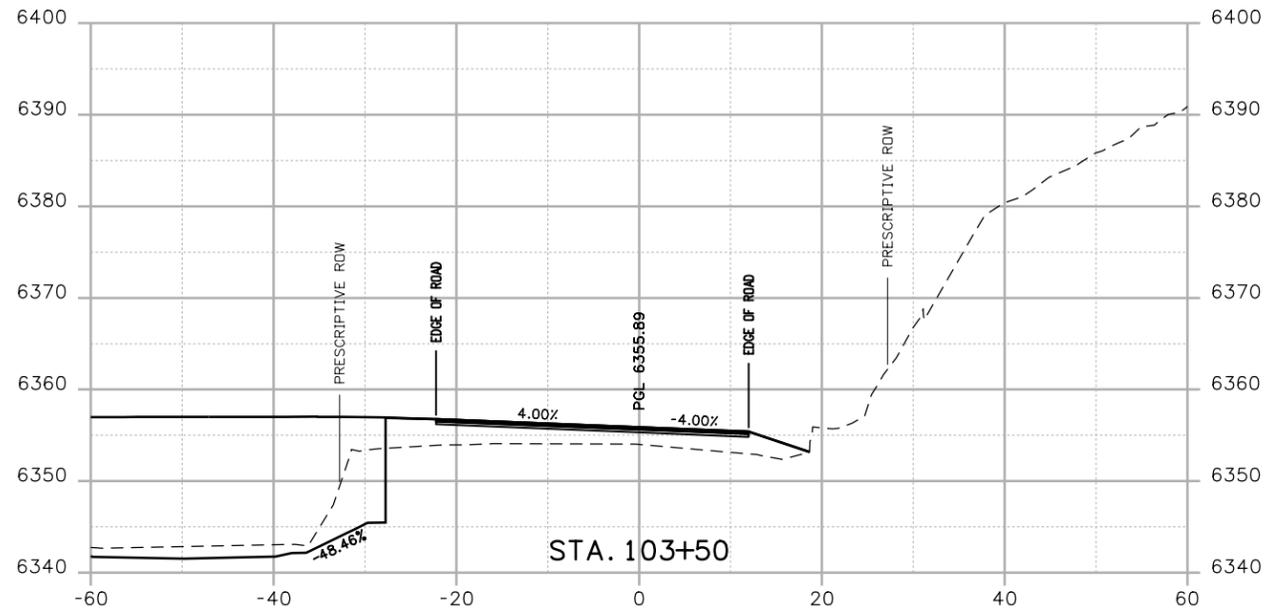
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							<small>JLW</small> <small>EAV</small> <small>JPZ</small> 08/16/16				

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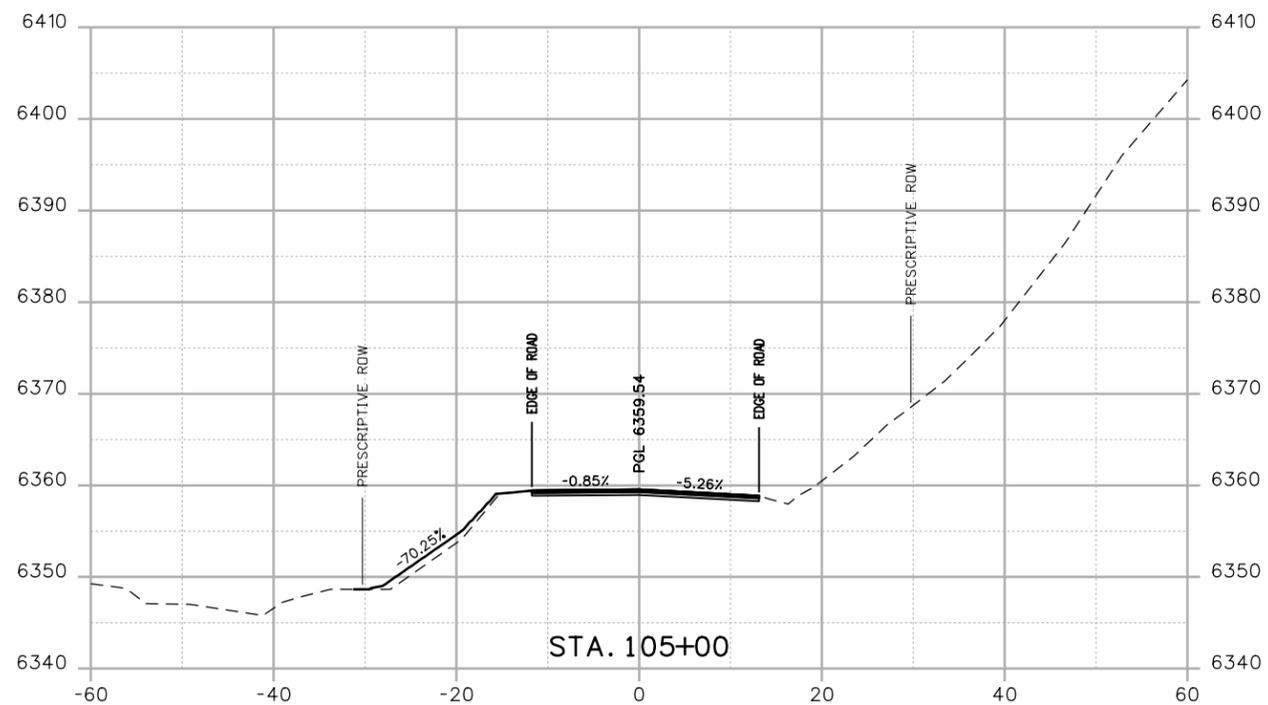
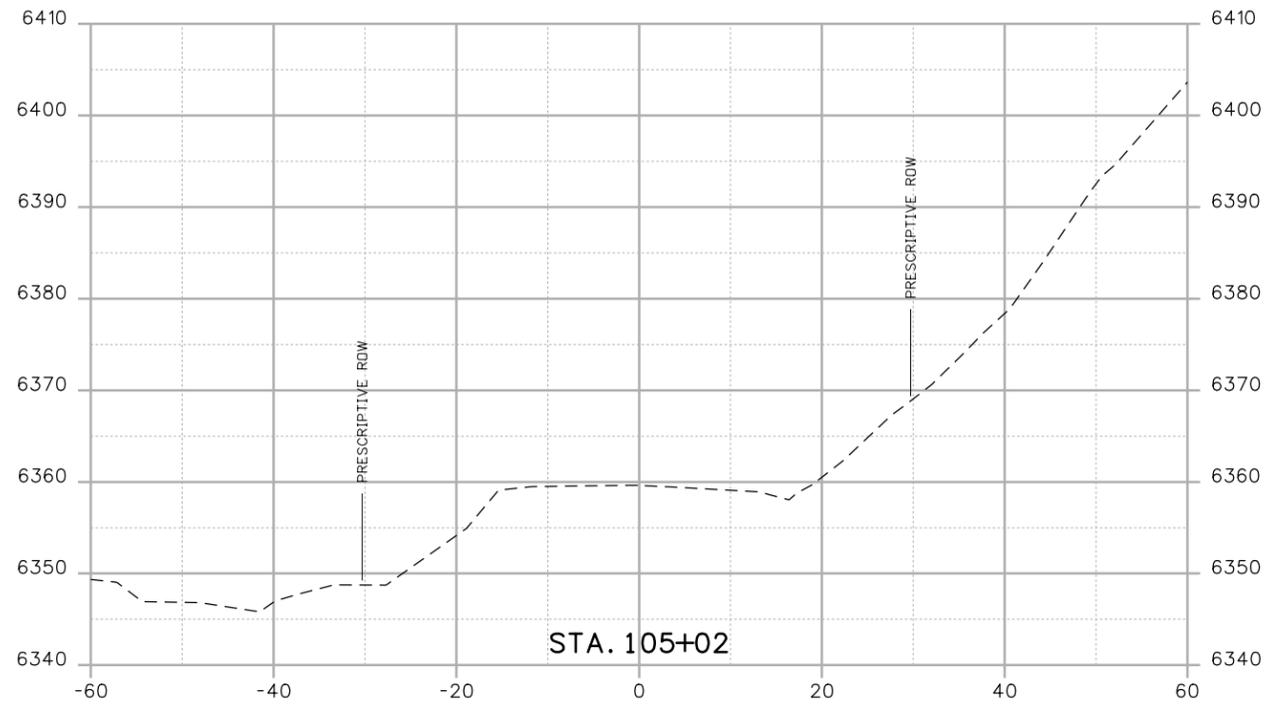
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LOGAN MILL ROAD
CROSS SECTIONS
 FOURMILE CANYON DR
 PROJECT NO: 4012.SEPT12C39 SHEET NO: X2

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 CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES

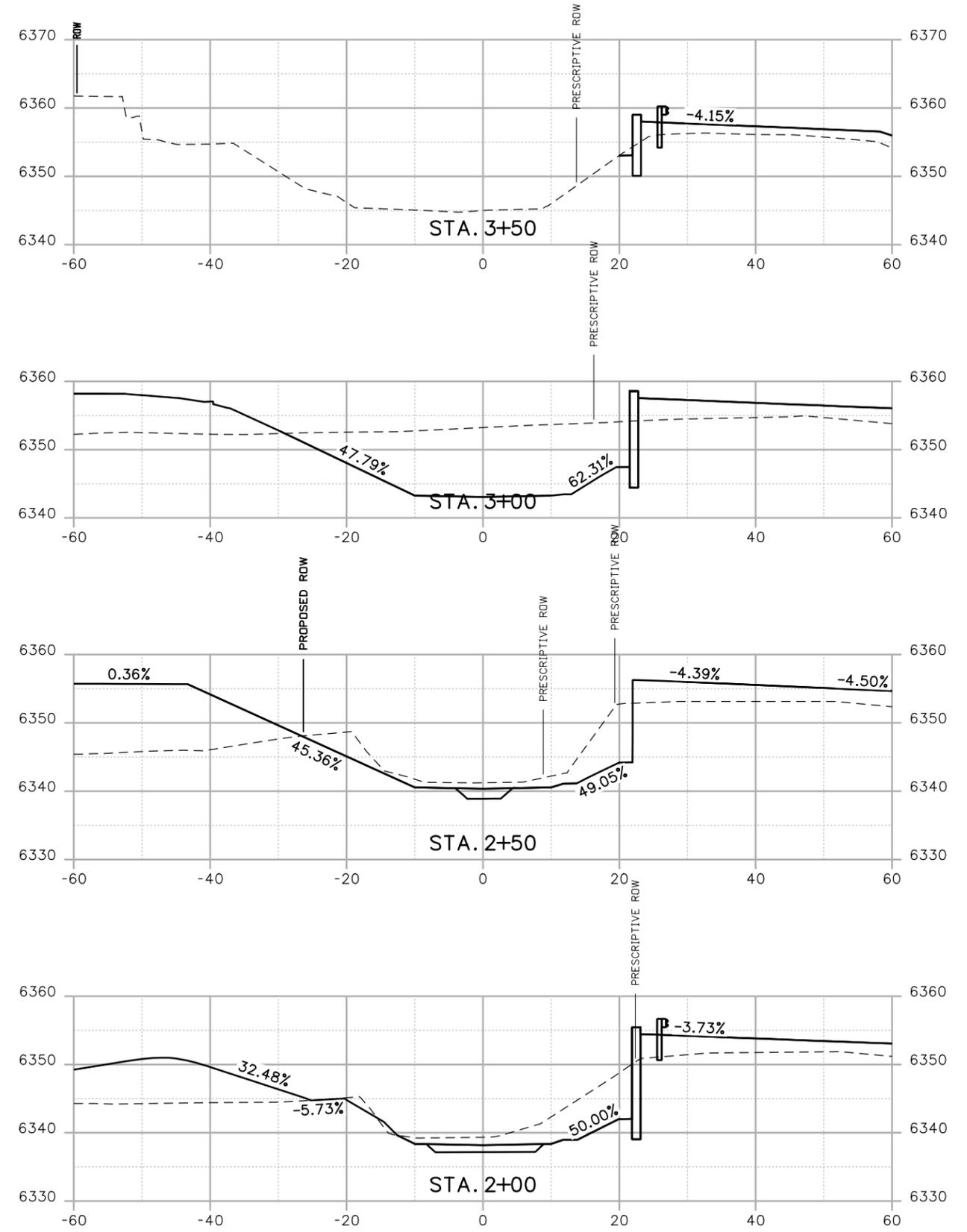
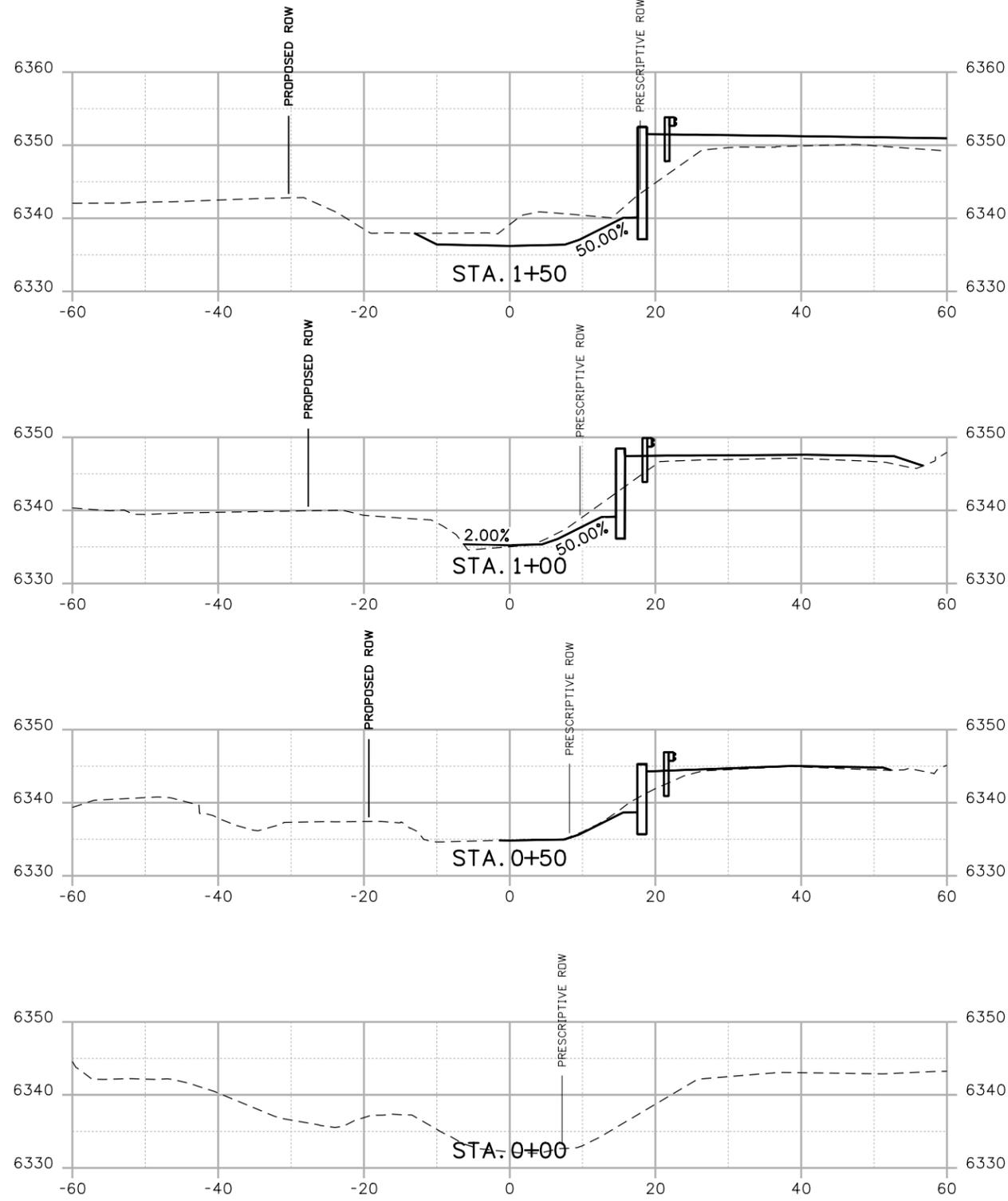
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LOGAN MILL ROAD
CROSS SECTIONS
 FOURMILE CANYON DR
 PROJECT NO: 4012.SEPT12C39 SHEET NO: X3

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							BMC	EAV	JPZ	08/16/16	