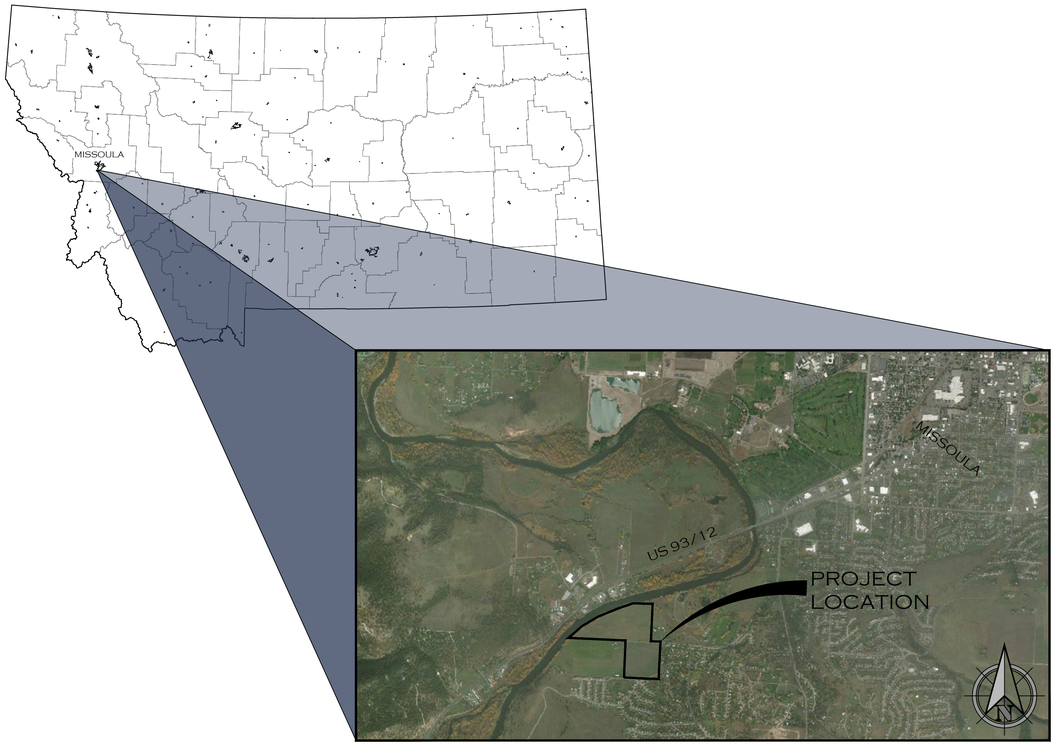
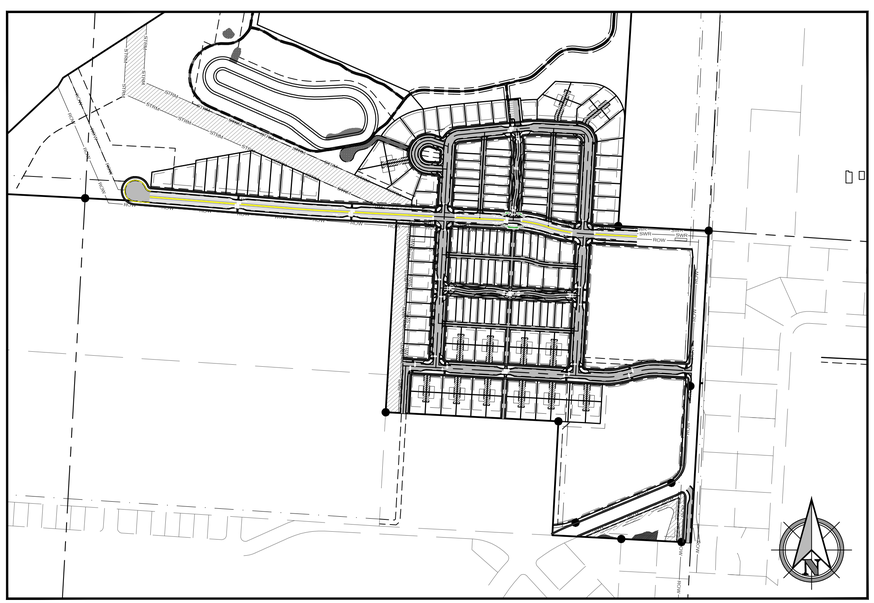


VICINITY MAP
NOT TO SCALE



PROJECT MAP
NOT TO SCALE

Know what's below.
Call before you dig.

PRELIMINARY CONSTRUCTION PLANS FOR

RIVERFRONT TRAILS

PHASE I & II PUBLIC INFRASTRUCTURE

MISSOULA, MONTANA

JULY 2022

NOTE: THESE CONSTRUCTION DOCUMENTS ARE PRELIMINARY AND ARE INTENDED FOR PROJECT PLANNING AND BUDGETING PURPOSES ONLY. THESE PLANS REMAIN SUBJECT TO REVIEW UNDER THE CITY OF MISSOULA SUBDIVISION REGULATIONS AND PUBLIC WORKS STANDARDS. THE FOLLOWING ITEMS ARE EXCLUDED FROM THIS PRICING SET, PENDING AGENCY REVIEW OF THE PLANS:

1. SIGNAGE AND STRIPING PLAN AND DETAILS
2. ACCESSIBILITY (ADA) GRADING DETAILS
3. STORMWATER PRETREATMENT AND ENGINEERED WETLAND DETAILS
4. BOULEVARD LANDSCAPING PLAN AND DETAILS
5. STORMWATER POLLUTION PREVENTION PLAN

INDEX OF CIVIL SHEETS

SHEET NO.	TITLE	SHEET NO.	TITLE
C0.0	COVER SHEET	C5.0	OVERALL WATER MAIN EXTENSION PLAN
C0.1	GENERAL NOTES	C5.1	WATER MAIN A PLAN & PROFILE STA. 10+00 TO 14+00
C1.0	EXISTING CONDITIONS	C5.2	WATER MAIN A PLAN & PROFILE STA. 14+00 TO 18+70
C1.1	DEMOLITION PLAN - NORTH	C5.3	WATER MAIN B PLAN & PROFILE STA. 20+00 TO 23+40
C1.2	DEMOLITON PLAN - SOUTH	C5.4	WATER MAIN B PLAN & PROFILE STA. 23+40 TO 26+90
C2.0	OVERALL SITE & PHASING PLAN	C5.5	WATER MAIN B PLAN & PROFILE STA. 26+90 TO 29+70
C3.0	DRAGO LANE PLAN & PROFILE STA. 0+00 TO 4+50	C5.6	WATER MAIN C PLAN & PROFILE STA. 30+00 TO 34+00
C3.1	DRAGO LANE PLAN & PROFILE STA. 4+50 TO 9+00	C5.7	WATER MAIN C PLAN & PROFILE STA. 34+00 TO 38+00
C3.2	DRAGO LANE PLAN & PROFILE STA. 9+00 TO 12+60	C5.8	WATER MAIN C PLAN & PROFILE STA. 38+00 TO 41+80
C3.3	OLD BITTERROOT ROAD PLAN & PROFILE STA. 0+00 TO 4+50	C5.9	WATER MAIN D PLAN & PROFILE STA. 45+00 TO 48+80
C3.4	OLD BITTERROOT ROAD PLAN & PROFILE STA. 4+50 TO 9+00	C5.10	WATER MAIN D PLAN & PROFILE STA. 48+80 TO 52+60
C3.5	OLD BITTERROOT ROAD PLAN & PROFILE STA. 9+00 TO 13+50	C5.11	WATER MAIN D PLAN & PROFILE STA. 52+60 TO 56+40
C3.6	OLD BITTERROOT ROAD PLAN & PROFILE STA. 13+50 TO 18+00	C5.12	WATER MAIN D PLAN & PROFILE STA. 56+40 TO 60+20
C3.7	OLD BITTERROOT ROAD PLAN & PROFILE STA. 18+00 TO 22+50	C5.13	WATER MAIN D PLAN & PROFILE STA. 60+20 TO 64+00
C3.8	OLD BITTERROOT ROAD PLAN & PROFILE STA. 22+50 TO 25+00	C5.14	WATER MAIN D PLAN & PROFILE STA. 64+00 TO 67+80
C3.9	NAOMI LANE PLAN & PROFILE STA. 0+00 TO 4+50	C5.15	WATER MAIN D PLAN & PROFILE STA. 67+80 TO 70+80
C3.10	NAOMI LANE PLAN & PROFILE STA. 4+50 TO 9+00	C5.16	WATER MAIN E PLAN & PROFILE STA. 75+00 TO 78+00
C3.11	TOLLEY LANE PLAN & PROFILE STA. 9+00 TO 13+50	C5.17	WATER MAIN E PLAN & PROFILE STA. 78+00 TO 81+10
C3.12	TOLLEY LANE PLAN & PROFILE STA. 13+50 TO 18+00	C5.18	WATER MAIN F PLAN & PROFILE STA. 85+00 TO 88+50
C3.13	RIVERFRONT PLACE PLAN & PROFILE STA. 18+00 TO 22+50	C5.19	WATER MAIN F PLAN & PROFILE STA. 88+50 TO 92+00
C3.14	RIVERFRONT PLACE PLAN & PROFILE STA. 22+50 TO 26+00	C5.20	WATER MAIN G PLAN & PROFILE
C3.15	ANDERS WAY PLAN & PROFILE STA. 0+00 TO 3+00	C5.21	WATER MAIN H PLAN & PROFILE
C3.16	ANDERS WAY PLAN & PROFILE STA. 3+00 TO 6+00	C5.22	WATER MAIN I PLAN & PROFILE
C3.17	MEYERS WAY PLAN & PROFILE	C6.0	OVERALL STORM DRAINAGE PLAN
C3.18	CASSIDY COURT PLAN & PROFILE	C6.1	STORM MAIN A PLAN & PROFILE STA. 0+00 TO 4+50
C3.19	ALLEY A PLAN & PROFILE STA. 0+00 TO 3+00	C6.2	STORM MAIN A PLAN & PROFILE STA. 4+50 TO 9+00
C3.20	ALLEY A PLAN & PROFILE STA. 3+00 TO 6+00	C6.3	STORM MAIN A PLAN & PROFILE STA. 9+00 TO 13+50
C3.21	ALLEY B PLAN & PROFILE STA. 0+00 TO 3+00	C6.4	STORM MAIN A PLAN & PROFILE STA. 13+50 TO 15+50
C3.22	ALLEY B PLAN & PROFILE STA. 3+00 TO 6+00	C6.5	STORM MAIN B PLAN & PROFILE
C3.23	ALLEY C PLAN & PROFILE	C6.6	STORM MAIN I PLAN & PROFILE STA. 0+00 TO 3+50
C3.24	ALLEY D PLAN & PROFILE	C6.7	STORM MAIN I PLAN & PROFILE STA. 3+50 TO 6+25
C3.25	GUSTUSON ROAD HALF-STREET PLAN & PROFILE	C6.8	STORM MAIN F PLAN & PROFILE STA. 0+00 TO 3+50
C3.26	SHORT COURT PLANS - A	C6.9	STORM MAIN F PLAN & PROFILE STA. 3+50 TO 7+25
C3.27	SHORT COURT PLANS - B	C6.10	STORM MAIN E PLAN & PROFILE STA. 0+00 TO 5+00
C3.28	SHORT COURT PLANS - C	C6.11	STORM MAIN E PLAN & PROFILE STA. 5+00 TO 8+85
C3.29	SHORT COURT PLANS - D	C6.12	STORMWATER WETLAND PLAN
C4.0	OVERALL SANITARY SEWER PLAN	C6.13	GROUNDWATER TESTING
C4.1	SEWER MAIN A PLAN & PROFILE STA. 0+00 TO 4+50	C7.0	TYPICAL ROADWAY SECTIONS
C4.2	SEWER MAIN A PLAN & PROFILE STA. 4+50 TO 7+20	C7.1	ROADWAY SECTION DETAILS
C4.3	SEWER MAIN B PLAN & PROFILE STA. 8+00 TO 11+50	C7.2	TYPICAL SHORT COURT LAYOUT
C4.4	SEWER MAIN B PLAN & PROFILE STA. 11+50 TO 16+02	C7.3	SANITARY SEWER DETAILS
C4.5	SEWER MAIN C PLAN & PROFILE	C7.4	WATER DISTRIBUTION DETAILS
C4.6	SEWER MAIN D PLAN & PROFILE STA. 21+00 TO 24+00	C7.5	STORM DRAINAGE DETAILS
C4.7	SEWER MAIN D PLAN & PROFILE STA. 24+00 TO 26+54	C7.6	LOWER MILLER CREEK CORRIDOR ROAD SECTIONS
C4.8	SEWER MAIN E PLAN & PROFILE	C8.0	LANDSCAPING AND MAINTENANCE PLAN
C4.9	SEWER MAIN F PLAN & PROFILE	C8.1	LANDSCAPING PLAN DETAILS
C4.10	SEWER MAIN G PLAN & PROFILE	C8.2	TRAIL PLAN
C4.11	SEWER MAIN H PLAN & PROFILE STA. 35+00 TO 38+00	C9.0	STORMWATER POLLUTION PREVENTION PLAN
C4.12	SEWER MAIN H PLAN & PROFILE STA. 38+00 TO 40+83	C9.1	STORMWATER POLLUTION PREVENTION PLAN NOTES
C4.13	SEWER MAIN I PLAN & PROFILE	C9.2	STORMWATER POLLUTION PREVENTION PLAN DETAILS
C4.14	SEWER MAIN J PLAN & PROFILE		

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

RIVERFRONT TRAILS

MISSOULA MONTANA

COVER SHEET

C0.0

COVER.DWG PLOTTED BY: MATT HAMMERSTEIN ON JUL/22/2022

CIVIL CONSTRUCTION NOTES:

1. ALL CONSTRUCTION WORK ON THIS PROJECT SHALL BE COMPLETED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (7TH ED. AS MODIFIED), MISSOULA CITY PUBLIC WORKS STANDARDS AND SPECIFICATIONS MANUAL(MCPWSS), AND THESE CONTRACT DOCUMENTS.
2. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OSHA SAFETY STANDARDS.
3. THE CONTRACTOR'S OPERATIONS SHALL BE CONFINED WITHIN THE PROJECT LIMITS. MATERIALS AND EQUIPMENT SHALL BE STORED ON THE PROJECT SITE WHERE APPROVED BY THE OWNER. IT SHALL BE UNDERSTOOD THAT THE RESPONSIBILITY FOR PROTECTION AND SAFEKEEPING OF EQUIPMENT AND MATERIALS ON OR NEAR THE SITE WILL BE ENTIRELY THAT OF THE CONTRACTOR AND THAT NO CLAIM SHALL BE MADE AGAINST THE OWNER BY REASON OF ANY ACT OF AN EMPLOYEE OR TRESPASSER.
4. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO CONSTRUCTION. ANY DISCREPANCIES FOUND ARE TO BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO THE COMMENCEMENT OR CONTINUATION OF CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE CITY, 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 24 HOURS IN ADVANCE OF SPECIFIC INSPECTION NEEDS DURING THE COURSE OF THE PROJECT. ALL WORK SHALL BE PERFORMED DURING NORMAL WORKING HOURS AND SUBJECT TO THE AVAILABILITY OF AN INSPECTOR AND APPROVED BY THE ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL PUBLIC AND PRIVATE PROPERTY INSOFAR AS IT MAY BE AFFECTED BY THESE OPERATIONS. ALL COSTS FOR PROTECTING, REMOVING, AND RESTORING EXISTING IMPROVEMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
7. CONTRACTOR SHALL CONTACT "UTILITY NOTIFICATION CENTER" (811) AT LEAST THREE (3) WORKING DAYS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO SCHEDULE THE MARKING OF EXISTING UTILITY LOCATIONS.
8. THE LOCATION, DEPTH, AND SIZE OF THE EXISTING UTILITIES SHOWN ON THESE PLANS IS APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, DEPTH, AND SIZE OF THE UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING FACILITIES DUE TO FAILURE TO LOCATE OR PROPERLY PROVIDE PROTECTION WHEN LOCATION IS KNOWN.
9. THE CONTRACTOR SHALL COORDINATE ALL UTILITY SERVICE CONNECTIONS TO THE BUILDINGS WITH THE ARCHITECTURAL AND MECHANICAL PLANS.
10. LOCATION OF SITE UTILITIES SHALL BE VERIFIED BY THE GENERAL CONTRACTOR AND THE UTILITY COMPANY PROVIDING SERVICE. ANY PROPOSED ADJUSTMENTS TO DRY UTILITY LOCATIONS SHALL BE COORDINATED WITH UTILITY COMPANY PROVIDING SERVICE.
11. GENERAL CONTRACTOR SHALL HAVE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER ANY UTILITY SYSTEM PRIOR TO INSTALLATION.
12. REFER TO MECHANICAL PLANS FOR LOCATION OF SEWER, DOMESTIC WATER, FIRE, IRRIGATION, AND ROOF DRAIN CONNECTIONS (AS APPLICABLE).
13. THE CONTRACTOR SHALL UTILIZE COMPACTION EQUIPMENT SUITABLE FOR THE SOIL TYPES AND SURFACE MATERIALS ENCOUNTERED ON THE PROJECT.
14. THE CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING VALVE BOXES, CURB BOXES, AND MANHOLES TO FINAL GRADE UPON COMPLETION OF ALL CONSTRUCTION. ANY BOXES OR MANHOLES DAMAGED OR OTHERWISE DISTURBED BY THE CONTRACTOR OR A SUBCONTRACTOR SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR. THIS WORK SHALL BE INCIDENTAL TO THE PROJECT, AND SEPARATE PAYMENT WILL NOT BE MADE.
15. NO UTILITY EXCAVATION SHALL BE PERFORMED ON THE SITE PRIOR TO ISSUANCE OF APPLICABLE EXCAVATION PERMITS BY THE CITY OF MISSOULA.
16. CONTRACTOR IS RESPONSIBLE FOR CREATING, FILING, AND ABIDING BY A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND NOTICE OF INTENT (NOI) APPROVED BY THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY (MDEQ) OR THE CITY OF MISSOULA AS APPROPRIATE.
17. REFER TO LORENZEN SOIL MECHANICS GEOTECHNICAL REPORT FOR IMPORTED SUBBASE CHARACTERISTICS.
18. CITY OF MISSOULA CONSTRUCTION HOURS ARE 7 A.M. TO 7 P.M. MONDAY THROUGH FRIDAY. WORK SHALL NOT OCCUR OUTSIDE THESE HOURS WITHOUT CITY COUNCIL APPROVAL.
19. CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPLICABLE PERMITS FROM THE CITY OF MISSOULA PRIOR TO COMMENCEMENT OF ANY SURFACE OR UTILITY WORK. THIS INCLUDES RIGHT-OF-WAY PERMITS FOR ANY CURB AND SIDEWALK CONSTRUCTION, AND A PAVING PERMIT FOR STREETS, ALLEYS, OR DRIVEWAYS.

GENERAL CIVIL NOTES:

1. ANY MONUMENTS OR PROPERTY CORNERS DISTURBED DURING CONSTRUCTION SHALL BE REPLACED BY A PROFESSIONAL LAND SURVEYOR (PLS) REGISTERED IN THE STATE OF MONTANA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIRING SAID PLS.
2. A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH THE GENERAL CONTRACTOR, SITE SUBCONTRACTORS, CITY WATER AND SEWER REPRESENTATIVES, AND WOITH ENGINEERING, INC., PRIOR TO THE START OF CONSTRUCTION.
3. STANDARD SYMBOLS AND LINE TYPES ARE SHOWN IN THE LEGEND. SOME SYMBOLS OR LINE TYPES SHOWN MAY NOT BE SHOWN ON THE PLANS.
4. IN GENERAL, EXISTING STRUCTURES AND FACILITIES ARE NOTED AS "EXISTING" AND ARE SHOWN IN SHADED LINE WEIGHTS. NEW STRUCTURES OR FACILITIES ARE SHOWN IN HEAVY LINE WEIGHTS.

SANITARY SEWER CONSTRUCTION NOTES:

1. THE GRAVITY SEWER MAIN FOR THIS PROJECT SHALL BE ASTM D3034 SDR-35 PVC PIPE AND SHALL BE INSTALLED WITH TYPE 'A' TRENCH COMPACTION.
2. SANITARY SEWER SEWER SERVICE LINES SHALL BE 6"Ø SCHEDULE 40 PVC PIPE AND SHALL BE INSTALLED WITH TYPE 'A' TRENCH COMPACTION.
3. SERVICE CONNECTIONS TO EXISTING SEWER MAINS SHALL BE TAPPED AT THE CONTRACTOR'S EXPENSE, AND PREDCO FAST FIT SADDLES OR APPROVED EQUAL SHALL BE USED. WHEN THE SEWER MAIN AND SEWER SERVICE ARE INSTALLED WITHIN THE SAME DEVELOPMENT PHASE, IN-LINE TEES SHALL BE PROVIDED FOR THE SERVICE LINES. TEES SHALL BE ROLLED TO A 45 DEGREE ANGLE.
4. MAINTAIN MINIMUM18-INCH VERTICAL AND 10-FOOT HORIZONTAL EDGE-TO-EDGE SEPARATION BETWEEN SANITARY SEWER AND WATER MAINS.
5. MAINTAIN MINIMUM COVER DEPTH OF 6 FEET OVER SANITARY SEWER MAIN AND SANITARY SERVICE LINES.
6. WHERE APPLICABLE, PATCH EXISTING ASPHALT AFTER INSTALLATION OF SANITARY SEWER SERVICES. ALL PATCHES SHALL BE CRACK SEALED.
7. A CITY OF MISSOULA PERMIT IS REQUIRED FOR EACH SEWER SERVICE LINE CONNECTION TO MAIN SEWER.
8. PLEASE REFER TO PROJECT SPECIFICATIONS SECTION 02730 - SANITARY SEWER COLLECTION SYSTEM SECTION 3.4, AND MISSOULA CITY PUBLIC WORKS STANDARDS AND SPECIFICATIONS MANUAL FOR TESTING REQUIREMENTS.
10. IN CASES WHERE HIGH GROUND WATER IS ENCOUNTERED DURING CONSTRUCTION THE CONTRACTOR IS TO ABIDE BY THE REQUIREMENTS SPECIFIED IN MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS AND MISSOULA WATER STANDARD SPECIFICATIONS AS WELL AS CONTACT THE ENGINEER IMMEDIATELY UPON DISCOVERY OF GROUND WATER AT THE TRENCH BOTTOM.

WATER CONSTRUCTION NOTES:

20. REFER TO MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL 2010, MISSOULA CITY PUBLIC WORKS STANDARDS AND SPECIFICATIONS MANUAL, AND MISSOULA WATER STANDARD SPECIFICATIONS.
21. MAINTAIN MINIMUM BURY/COVER DEPTH OF 6 FEET OVER WATER MAIN AND WATER SERVICE LINES. BURY / COVER DEPTH CALLOUTS IN THE PLANS ARE TO TOP OF PIPE.
22. MAINTAIN MINIMUM 18-INCH VERTICAL AND 10-FOOT HORIZONTAL EDGE-TO-EDGE SEPARATION BETWEEN WATER AND SANITARY SEWER MAINS.
23. WATER MAINS FOR THIS PROJECT SHALL BE AWWA C151 DUCTILE IRON PIPE.
24. WATER MAIN FITTINGS SHALL BE AWWA C110 CAST IRON OR AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
25. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
26. THE WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE FOR 1" AND 2" SERVICES AND DUCTILE IRON OR AWWA C900 PVC FOR 4" AND LARGER SERVICES.
27. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
28. WHERE APPLICABLE, PATCH EXISTING ASPHALT AFTER INSTALLATION OF WATER SERVICES. ALL PATCHES SHALL BE CRACK SEALED.
29. WATER SERVICES SHALL BE EQUIPPED WITH BACKFLOW PREVENTION DEVICES INSTALLED IN ACCORDANCE WITH THE CITY OF MISSOULA BACKFLOW PROGRAM, AND SHALL PROVIDE ADEQUATE DRAINAGE IN THE EVENT OF DISCHARGE FROM THE BACKFLOW PREVENTER.
30. THERE SHALL BE A MINIMUM OF FIVE PIPE DIAMETERS UPSTREAM OF EACH METER AND THREE PIPE DIAMETERS DOWNSTREAM OF EACH METER OF STRAIGHT PIPE WITH NO VALVES, TEES, OR APPURTENANCES.
31. INSTALL TRACER WIRE ON ALL WATER MAINS. REFER TO PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL, 2010 AND ALL AMENDMENTS THERETO FOR TRACER WIRE SPECIFICATIONS.
32. REFER TO PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL, 2010 AND ALL AMENDMENTS THERETO FOR WAX TAPE SPECIFICATIONS.
13. REFER TO PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL, 2010 AND ALL AMENDMENTS THERETO FOR POLYETHYLENE WRAP SPECIFICATIONS. ALL BURIED DUCTILE IRON PIPE AND HYDRANT COMPONENTS MUST BE WRAPPED IN POLYETHYLENE ENCASEMENT.
14. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TAP AND TIE-IN FEES REQUIRED.
15. WATER METERS TO BE INSTALLED IN ACCORDANCE TO MISSOULA WATER COMMERCIAL METER REQUIREMENTS.
16. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
17. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.
18. PLEASE REFER TO PROJECT SPECIFICATIONS SECTION 02660 - WATER DISTRIBUTION, SECTION 3.4 FOR TESTING AND DISINFECTION REQUIREMENTS.
19. WATER UTILITY CONTACT: CITY OF MISSOULA WATER
20. IN CASES WHERE HIGH GROUND WATER IS ENCOUNTERED DURING CONSTRUCTION THE CONTRACTOR SHALL ABIDE BY THE REQUIREMENTS SPECIFIED IN MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS AND MISSOULA WATER STANDARD SPECIFICATIONS AS WELL AS CONTACT THE ENGINEER IMMEDIATELY UPON DISCOVERY OF GROUND WATER AT THE TRENCH BOTTOM.
21. CONTRACTOR TO ASSURE THAT GASKETS MEET THE PROJECT SPECIFICATIONS AND MANUFACTURERS STANDARD FOR USE IN POTABLE WATER SYSTEMS AND ARE INSTALLED TO ENSURE WATERTIGHT CONSTRUCTION.

ABBREVIATIONS:

Ø	DIAMETER
BOP	BOTTOM OF PIPE
CB	CATCH BASIN
C/L	CENTERLINE
COM, C.O.M.	CITY OF MISSOULA
CMP	CORRUGATED METAL PIPE
CP	CONTROL POINT
EG	EXISTING GRADE
EL, ELEV	ELEVATION
EX, EXIST	EXISTING
FF, FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE
FL	FLANGE
MJ	MECHANICAL JOINT
GV	GATE VALVE
HP	HIGH POINT
IE	INVERT ELEVATION
LAY	LAYDOWN CURB
LF	LINEAL FEET
LP	LOW POINT
MIN	MINIMUM
MH	MANHOLE
PD	PANEL DRAIN
PP	PERFORATED PIPE
PT	POINT
R	RADIUS
RECP, RECPs	ROLLED EROSION CONTROL PRODUCTS
S	SLOPE
SD	STORM DRAIN
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FEET
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
STA	STATION
SW	SIDEWALK
TBC	TOP BACK OF CURB
TYP	TYPICAL
W/	WITH
XING	CROSSING

DRAWING REFERENCE

(#/#.#) DETAIL NUMBER FOUND ON SHEET

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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RIVERFRONT TRAILS
MISSOULA MONTANA

GENERAL NOTES

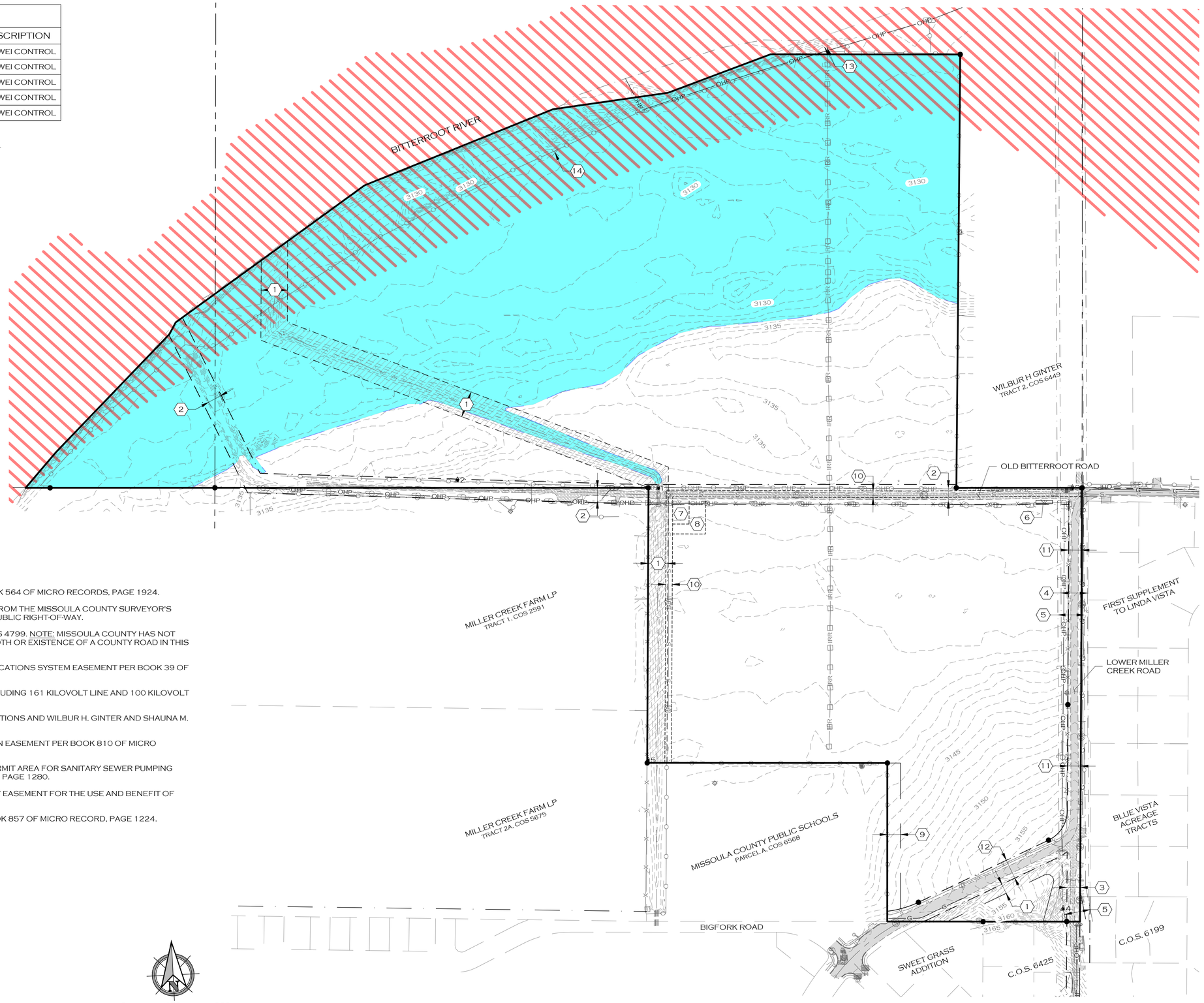
CO.1

GENERAL NOTES.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	970263.47	825334.96	3137.21	OPC WEI CONTROL
2	970319.22	824727.35	3138.75	OPC WEI CONTROL
3	970198.84	826589.49	3137.04	OPC WEI CONTROL
4	968925.59	826494.85	3168.53	OPC WEI CONTROL
5	969440.49	825260.95	3140.40	OPC WEI CONTROL

LEGEND

- SECTION LINE
- EXTERIOR PARCEL BOUNDARY
- ADJOININING PARCEL BOUNDARY
- EXISTING RIGHT-OF-WAY
- EXISTING STORM DRAIN EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING OVERHEAD POWER AND COMMUNICATIONS EASEMENT
- FOUND MONUMENT
- EXISTING ASPHALT ROAD
- EXISTING GRAVEL ROAD
- EXISTING CONCRETE/SIDEWALK
- EXISTING ROAD CENTERLINE
- EXISTING DITCH
- EXISTING EDGE OF WATER
- EXISTING BARBWIRE FENCE
- EXISTING CHAINLINK FENCE
- EXISTING OVERHEAD POWER
- EXISTING POWER POLE
- EXISTING LIGHT POLE
- EXISTING JUNCTION BOX
- EXISTING ELECTRIC METER
- EXISTING GUY ANCHOR
- EXISTING BURIED FIBER
- EXISTING BURIED FIBER VAULT
- EXISTING TELEPHONE PEDESTAL
- EXISTING BURIED GAS
- EXISTING SANITARY SEWER
- EXISTING MANHOLE - SANITARY SEWER
- EXISTING IRRIGATION LINE
- EXISTING WATER VALVE
- EXISTING WELL
- EXISTING MANHOLE - WATER
- EXISTING IRRIGATION CONTROL VALVE
- EXISTING POST
- EXISTING MAILBOX
- REGULATORY FLOODWAY
- 100 YEAR FLOODPLAIN (ZONE AE)



KEY NOTES:

1. EXISTING PUBLIC STORM DRAINAGE EASEMENT PER BOOK 564 OF MICRO RECORDS, PAGE 1924.
2. OLD BITTERROOT ROAD AS DESCRIBED BY AN OPINION FROM THE MISSOULA COUNTY SURVEYOR'S OFFICE; DATED OCTOBER 30, 1992. EXISTING 40' WIDE PUBLIC RIGHT-OF-WAY.
3. 40' WIDE PUBLIC ROAD RIGHT-OF-WAY AS SHOWN ON COS 4799. NOTE: MISSOULA COUNTY HAS NOT COME TO A CONCLUSIVE DETERMINATION AS TO THE WIDTH OR EXISTENCE OF A COUNTY ROAD IN THIS AREA.
4. 80' 100 KILOVOLT ELECTRIC POWER LINE AND COMMUNICATIONS SYSTEM EASEMENT PER BOOK 39 OF MICRO RECORDS, PAGE 1430.
5. 80' DOUBLE CIRCUIT ELECTRIC TRANSMISSION LINE INCLUDING 161 KILOVOLT LINE AND 100 KILOVOLT LINE PER BOOK 42 OF MICRO RECORDS, PAGE 1096.
6. EASEMENT AGREEMENT BETWEEN US WEST COMMUNICATIONS AND WILBUR H. GINTER AND SHAUNA M. GINTER PER BOOK 443 OF MICRO RECORDS, PAGE 686.
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10. EXISTING 20' WIDE SANITARY SEWER EASEMENT PER BOOK 857 OF MICRO RECORD, PAGE 1224.
11. 40' PUBLIC ROAD RIGHT-OF-WAY
12. 60' PUBLIC ROAD RIGHT-OF-WAY
13. EXISTING IRRIGATION SYSTEM PUMP STATION.
14. EXISTING 8" STEEL CATHODIC PIPE CASING.

0 150 300
IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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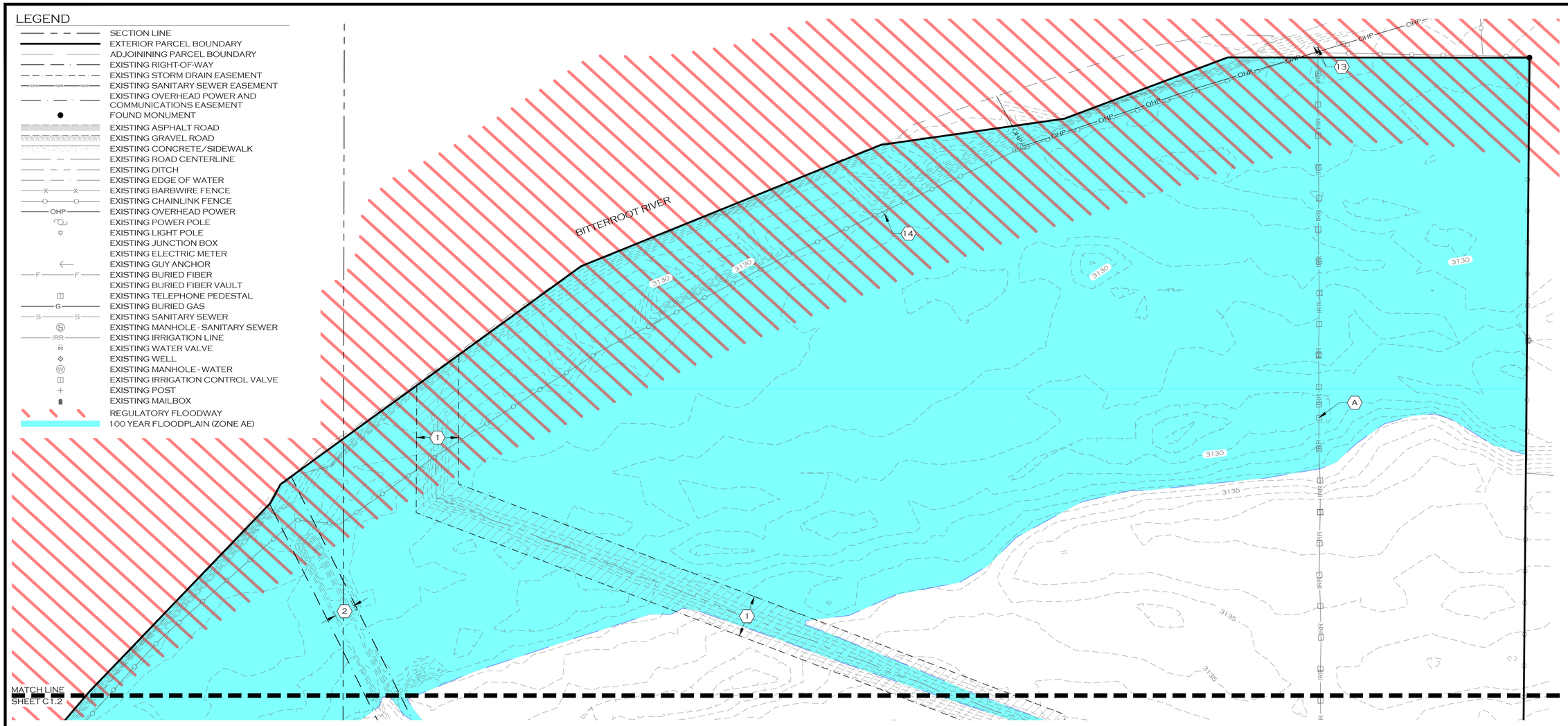
RIVERFRONT TRAILS
MISSOULA MONTANA
EXISTING CONDITIONS

C1.0

EXISTING CONDITIONS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

LEGEND

- SECTION LINE
- EXTERIOR PARCEL BOUNDARY
- ADJOININING PARCEL BOUNDARY
- EXISTING RIGHT-OF-WAY
- EXISTING STORM DRAIN EASEMENT
- EXISTING SANITARY SEWER EASEMENT
- EXISTING OVERHEAD POWER AND COMMUNICATIONS EASEMENT
- FOUND MONUMENT
- EXISTING ASPHALT ROAD
- EXISTING GRAVEL ROAD
- EXISTING CONCRETE/SIDEWALK
- EXISTING ROAD CENTERLINE
- EXISTING DITCH
- EXISTING EDGE OF WATER
- EXISTING BARBWIRE FENCE
- EXISTING CHAINLINK FENCE
- OHP — EXISTING OVERHEAD POWER
- EXISTING POWER POLE
- EXISTING LIGHT POLE
- EXISTING JUNCTION BOX
- EXISTING ELECTRIC METER
- EXISTING GUY ANCHOR
- F — EXISTING BURIED FIBER
- EXISTING BURIED FIBER VAULT
- EXISTING TELEPHONE PEDESTAL
- G — EXISTING BURIED GAS
- S — EXISTING SANITARY SEWER
- EXISTING MANHOLE - SANITARY SEWER
- IRR — EXISTING IRRIGATION LINE
- EXISTING WATER VALVE
- EXISTING WELL
- EXISTING MANHOLE - WATER
- EXISTING IRRIGATION CONTROL VALVE
- EXISTING POST
- EXISTING MAILBOX
- REGULATORY FLOODWAY
- 100 YEAR FLOODPLAIN (ZONE AE)



0 100 200
IN FEET

KEY NOTES:

1. EXISTING PUBLIC STORM DRAINAGE EASEMENT PER BOOK 564 OF MICRO RECORDS, PAGE 1924.
2. OLD BITTERROOT ROAD AS DESCRIBED BY AN OPINION FROM THE MISSOULA COUNTY SURVEYOR'S OFFICE; DATED OCTOBER 30, 1992. EXISTING 40' WIDE PUBLIC RIGHT-OF-WAY.
3. 40' WIDE PUBLIC ROAD RIGHT-OF-WAY AS SHOWN ON COS 4799. NOTE: MISSOULA COUNTY HAS NOT COME TO A CONCLUSIVE DETERMINATION AS TO THE WIDTH OR EXISTENCE OF A COUNTY ROAD IN THIS AREA.
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14. EXISTING 8" STEEL CATHODIC PIPE CASING

DEMOLITION KEY NOTES:

A. REMOVE EXISTING IRRIGATION SYSTEM

COLOR VERIFICATION
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PRELIMINARY

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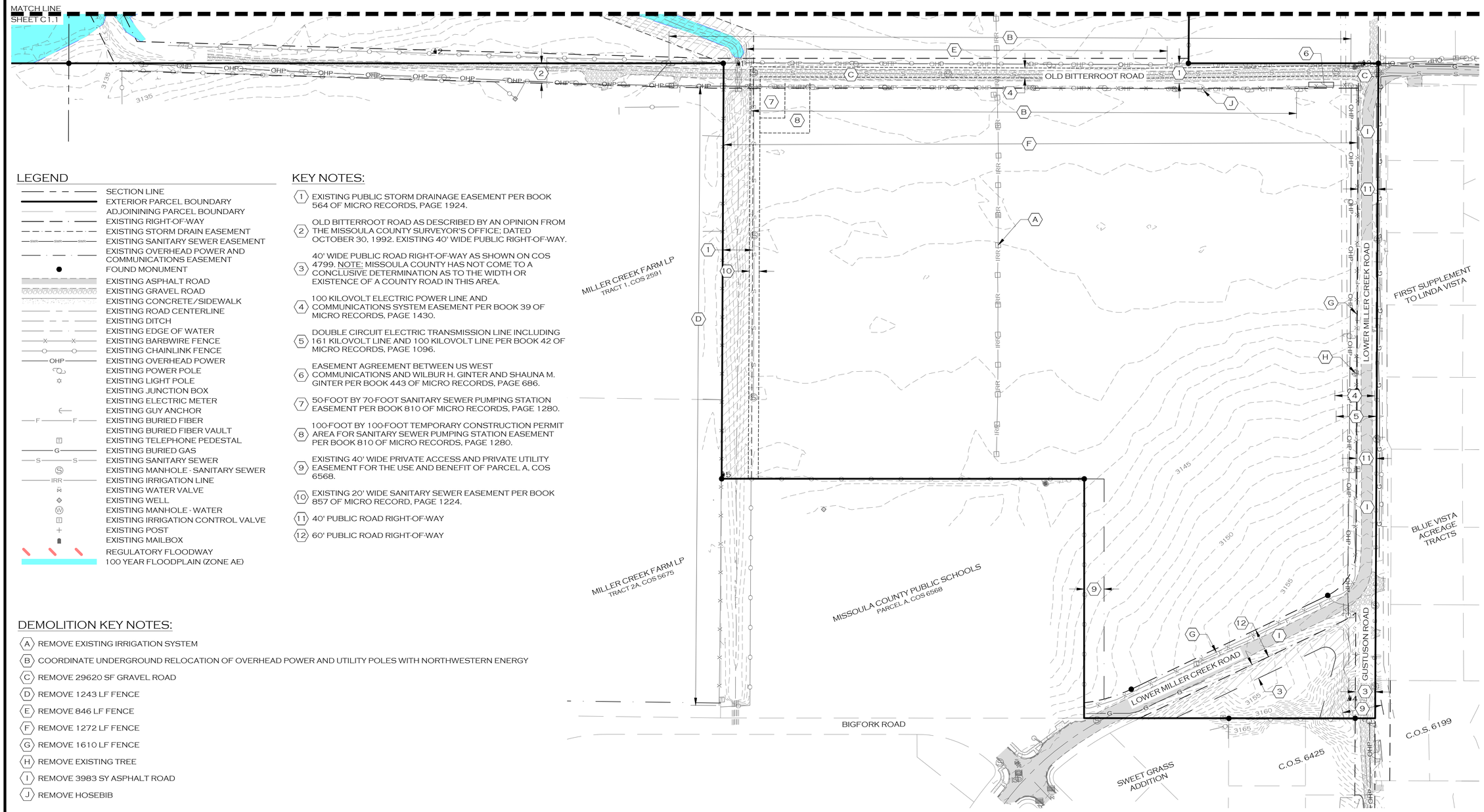
RIVERFRONT TRAILS
MISSOULA MONTANA

DEMOLITION PLAN - NORTH

C1.1

EXISTING CONDITIONS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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11. 40' PUBLIC ROAD RIGHT-OF-WAY
12. 60' PUBLIC ROAD RIGHT-OF-WAY

DEMOLITION KEY NOTES:

- A. REMOVE EXISTING IRRIGATION SYSTEM
- B. COORDINATE UNDERGROUND RELOCATION OF OVERHEAD POWER AND UTILITY POLES WITH NORTHWESTERN ENERGY
- C. REMOVE 29620 SF GRAVEL ROAD
- D. REMOVE 1243 LF FENCE
- E. REMOVE 846 LF FENCE
- F. REMOVE 1272 LF FENCE
- G. REMOVE 1610 LF FENCE
- H. REMOVE EXISTING TREE
- I. REMOVE 3983 SY ASPHALT ROAD
- J. REMOVE HOSEBIB

PRELIMINARY

0 100 200
IN FEET

COLOR VERIFICATION
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JOB #:	2101
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DATE:	7/21/2022

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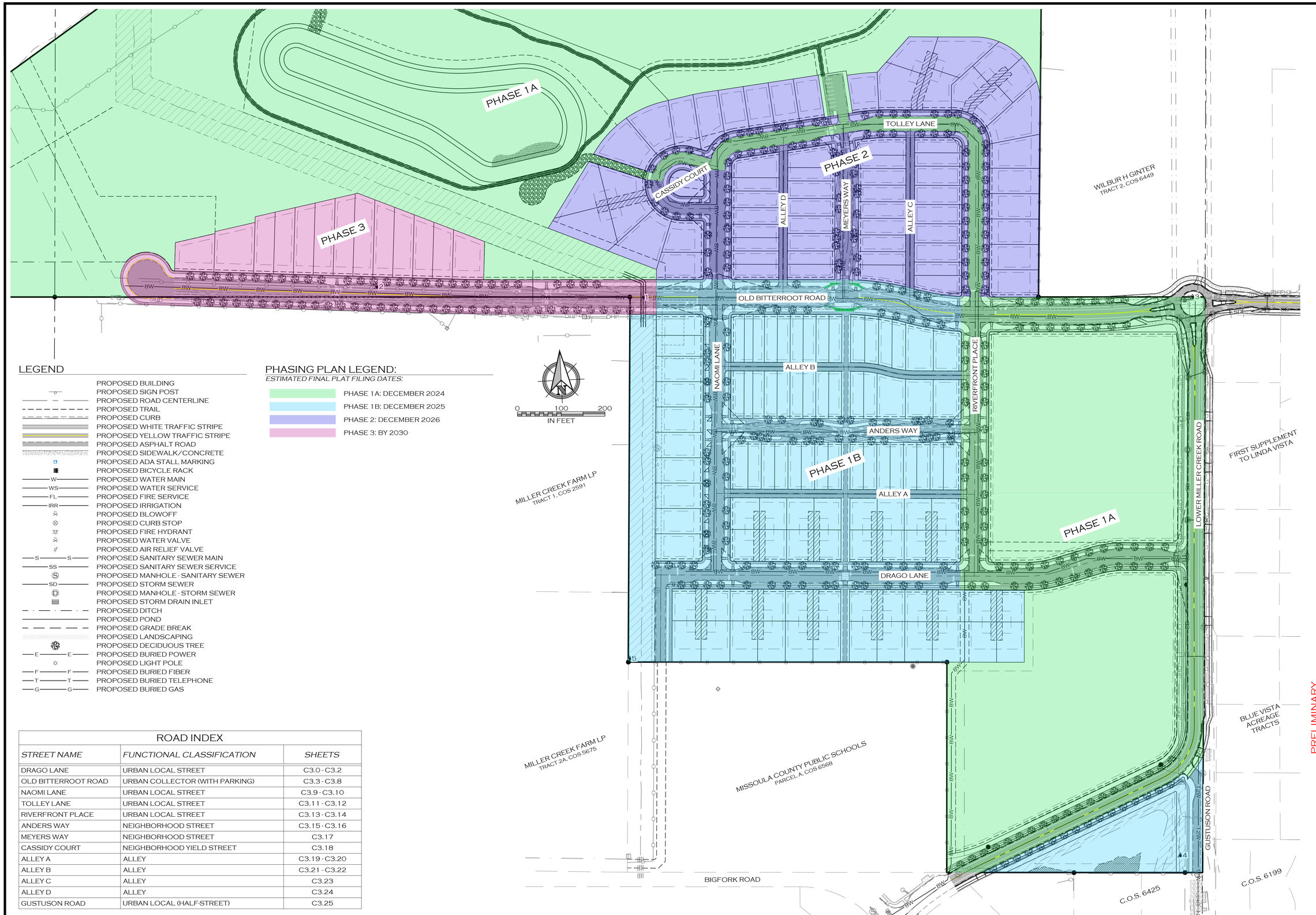
RIVERFRONT TRAILS
MISSOULA MONTANA
DEMOLITON PLAN - SOUTH

C1.2

EXISTING CONDITIONS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
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- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PHASING PLAN LEGEND:

ESTIMATED FINAL PLAT FILING DATES:

- PHASE 1A: DECEMBER 2024
- PHASE 1B: DECEMBER 2025
- PHASE 2: DECEMBER 2026
- PHASE 3: BY 2030

ROAD INDEX

STREET NAME	*FUNCTIONAL CLASSIFICATION*	*SHEETS*
DRAGO LANE	URBAN LOCAL STREET	C3.0 - C3.2
OLD BITTERROOT ROAD	URBAN COLLECTOR (WITH PARKING)	C3.3 - C3.8
NAOMI LANE	URBAN LOCAL STREET	C3.9 - C3.10
TOLLEY LANE	URBAN LOCAL STREET	C3.11 - C3.12
RIVERFRONT PLACE	URBAN LOCAL STREET	C3.13 - C3.14
ANDERS WAY	NEIGHBORHOOD STREET	C3.15 - C3.16
MEYERS WAY	NEIGHBORHOOD STREET	C3.17
CASSIDY COURT	NEIGHBORHOOD YIELD STREET	C3.18
ALLEY A	ALLEY	C3.19 - C3.20
ALLEY B	ALLEY	C3.21 - C3.22
ALLEY C	ALLEY	C3.23
ALLEY D	ALLEY	C3.24
GUSTUSON ROAD	URBAN LOCAL (HALF-STREET)	C3.25

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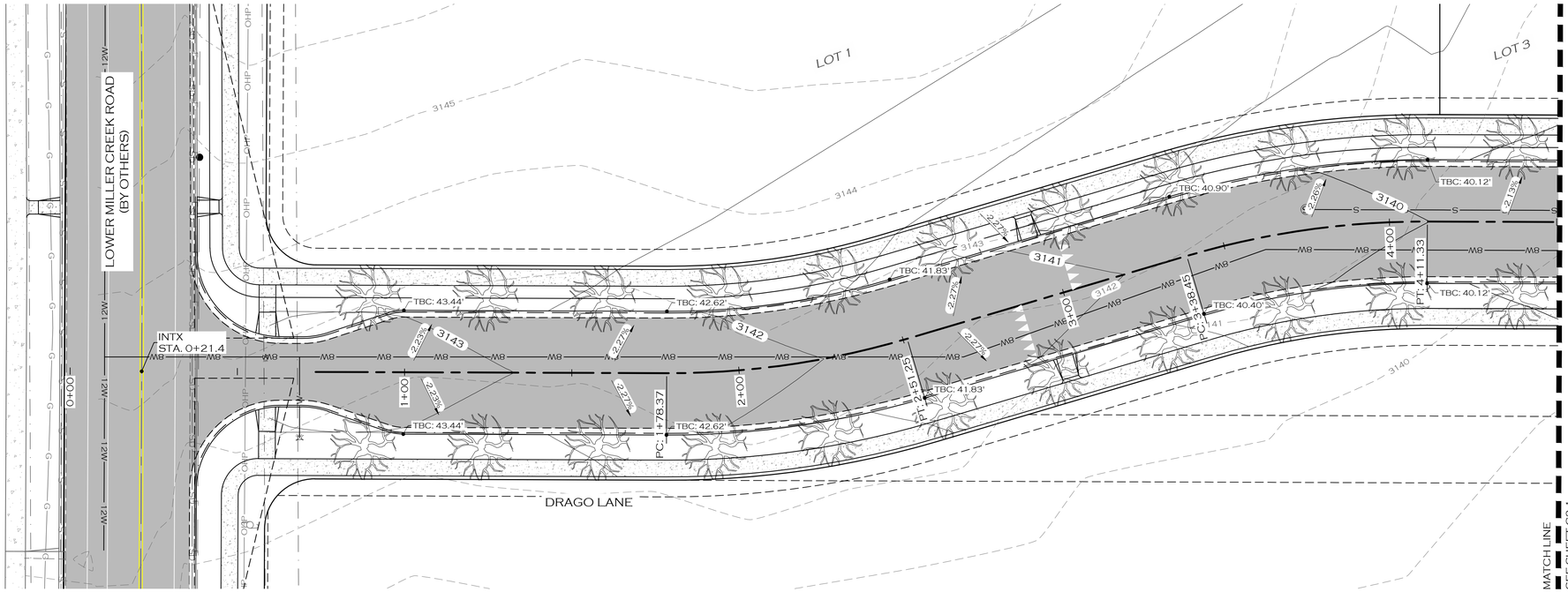
RIVERFRONT TRAILS

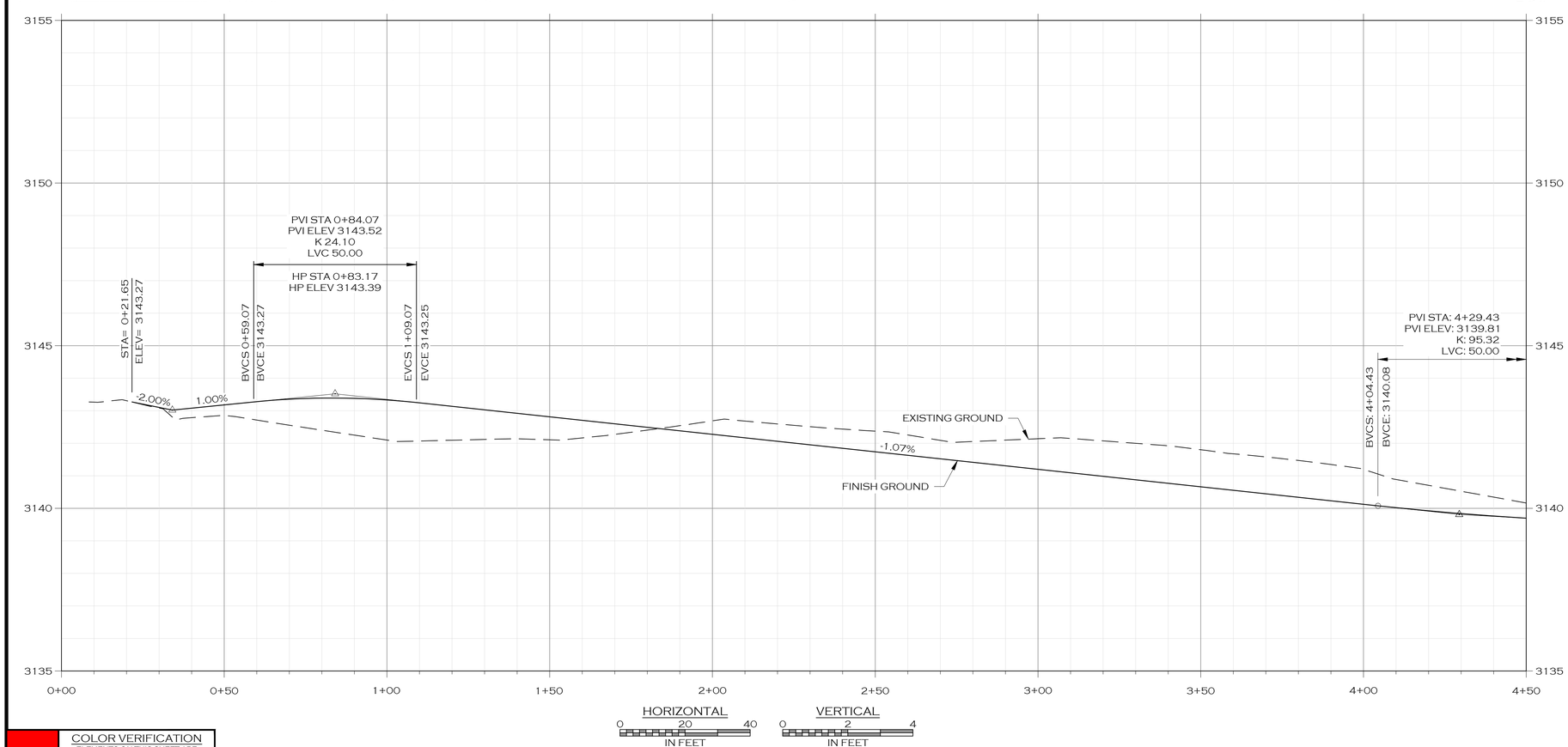
MISSOULA MONTANA

OVERALL SITE & PHASING PLAN

C2.0

SITE PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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IN FEET

NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

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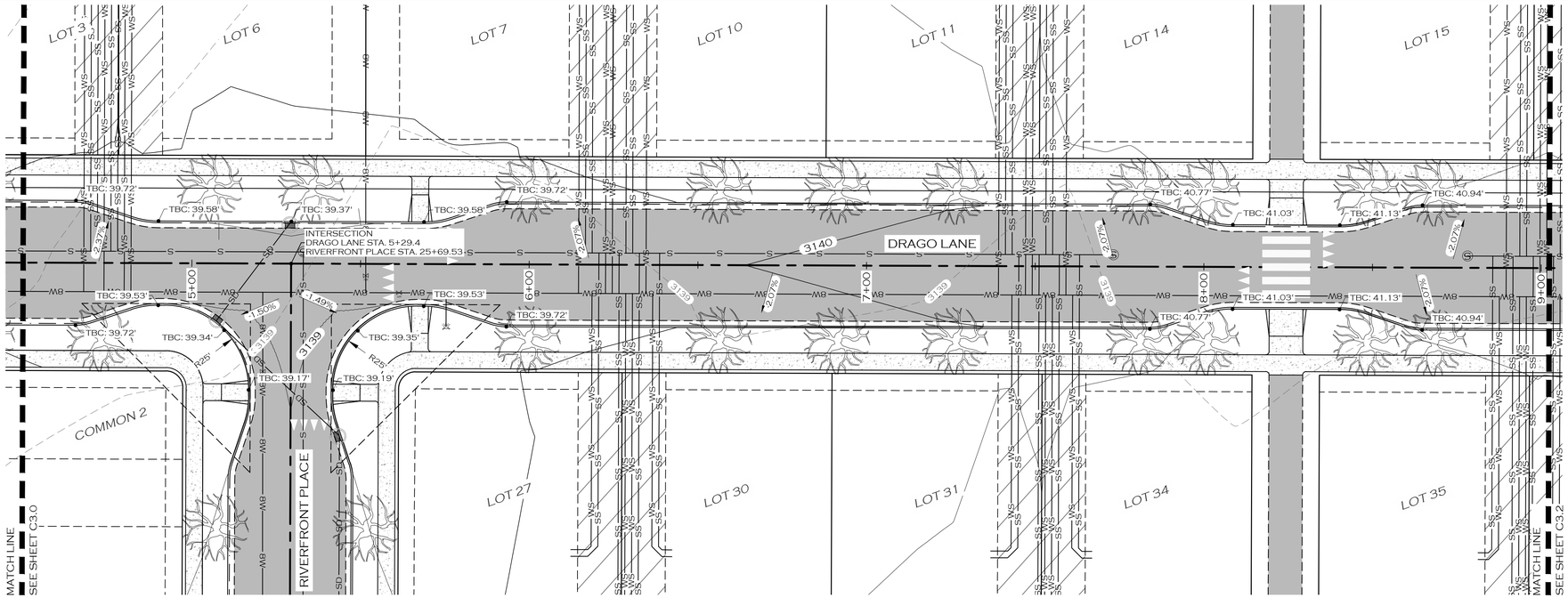
RIVERFRONT TRAILS
MISSOULA MONTANA

DRAGO LANE PLAN & PROFILE STA. 0+00 TO 4+50

C3.0

RD DRAGO LANE 0+00 TO 4+50.DWG PLOTTED BY MATT HAMMERSTEIN ON JUL 22, 2022



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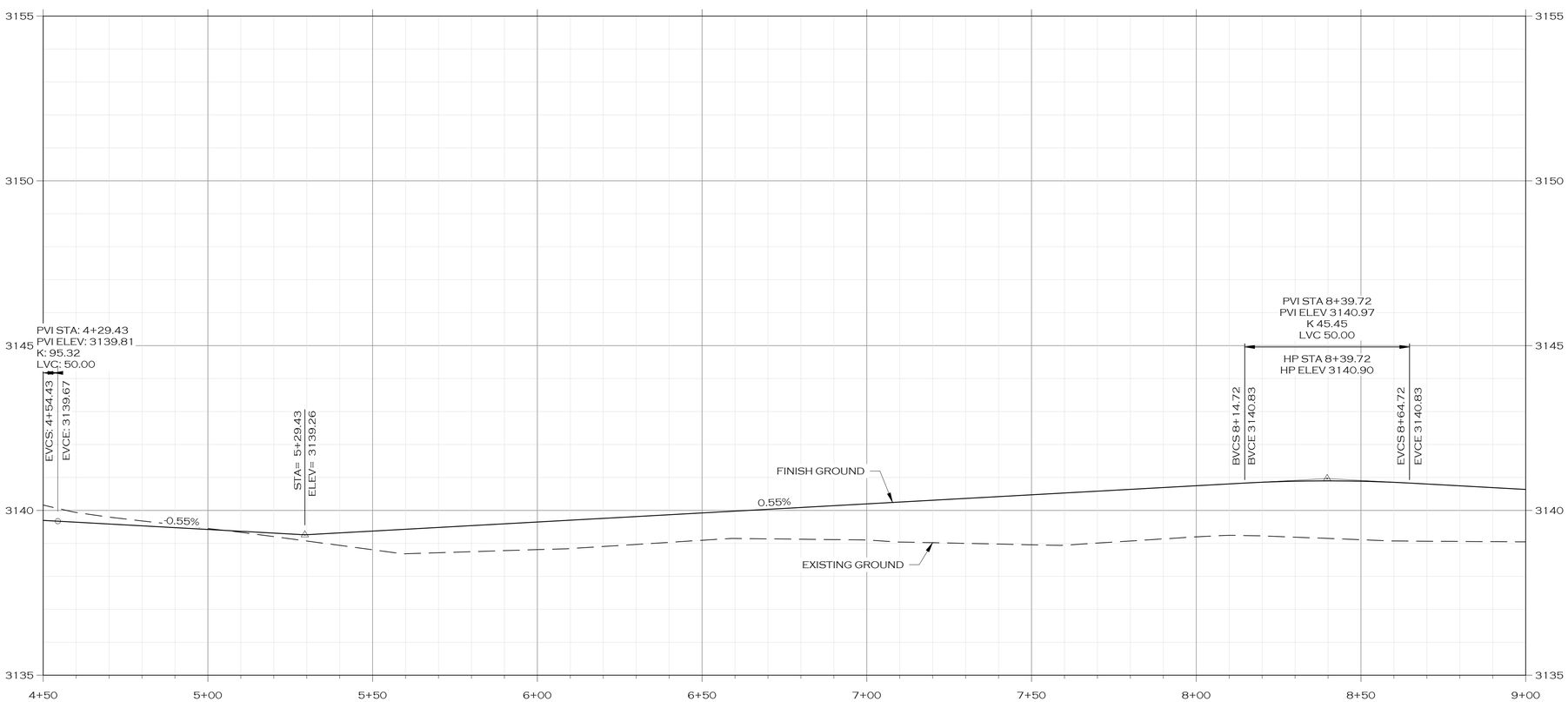

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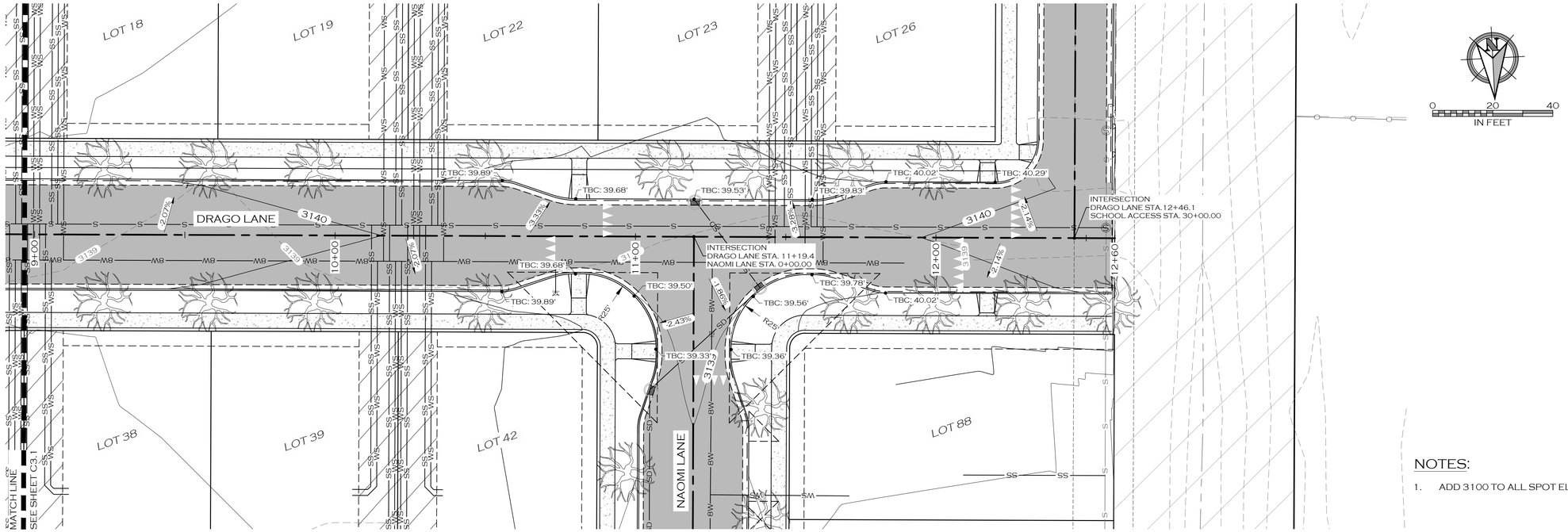
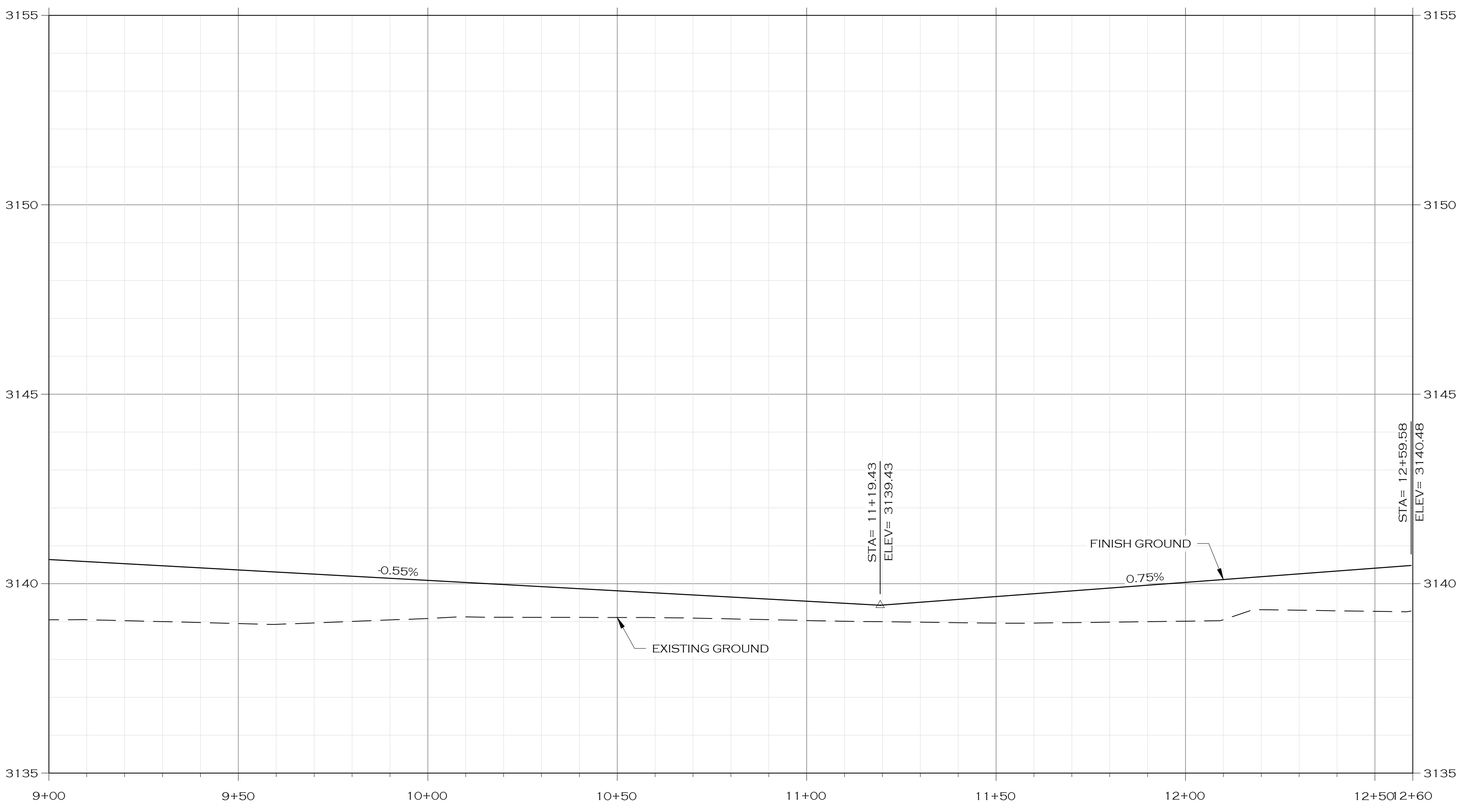
RIVERFRONT TRAILS
MISSOULA MONTANA

DRAGO LANE PLAN & PROFILE STA. 4+50 TO 9+00

C3.1

RD DRAGO LANE 4+50 TO 9+00.DWG PLOTTED BY MATT HAMMERSTEIN ON JUL 22, 2022





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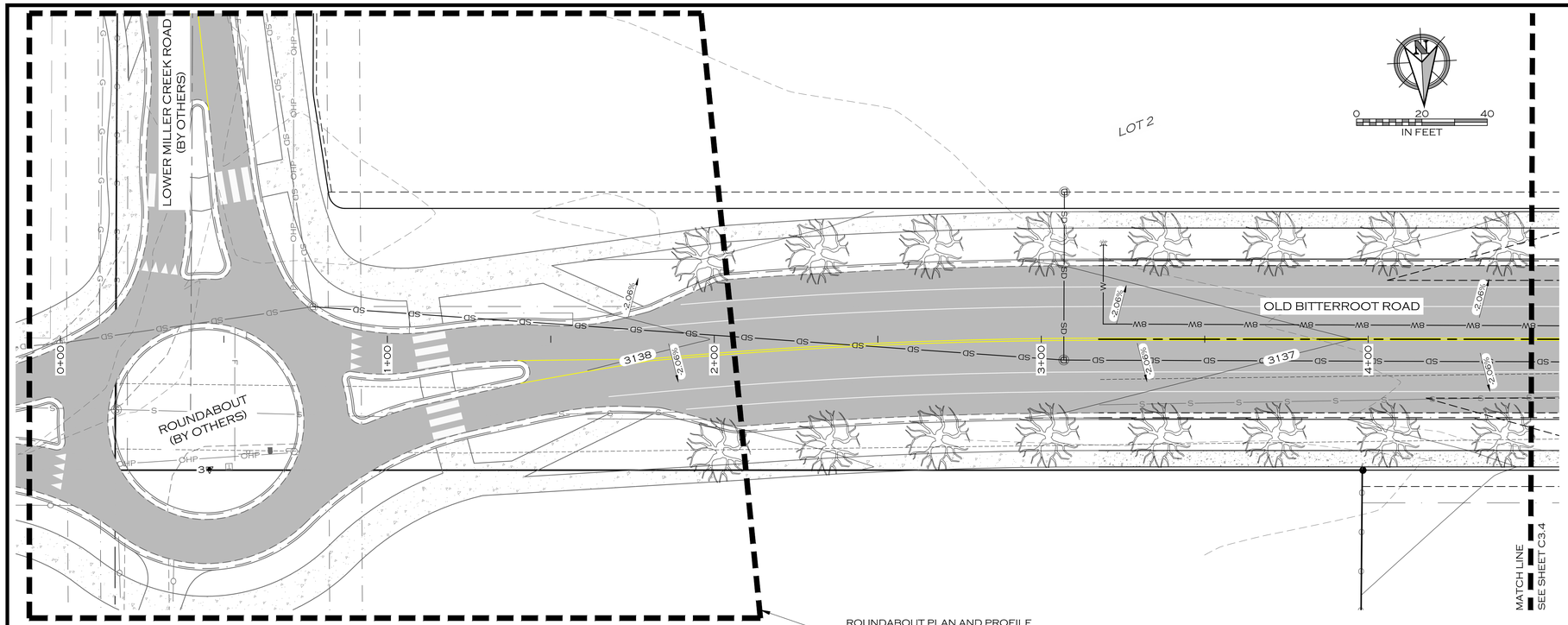
RIVERFRONT TRAILS
MISSOULA MONTANA

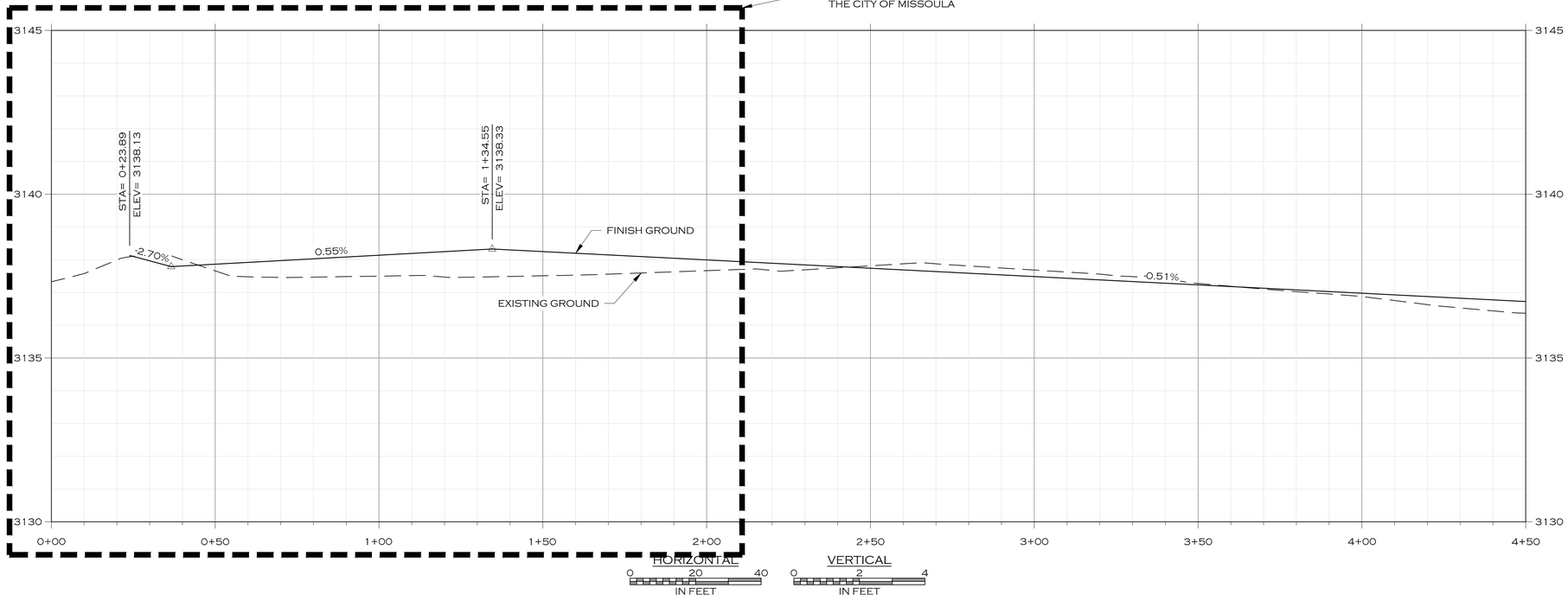
DRAGO LANE PLAN & PROFILE STA. 9+00 TO 12+60

C3.2

RD DRAGO LANE 9+00 TO 12+60.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



ROUNDABOUT PLAN AND PROFILE TIE-IN TO BE COORDINATED WITH THE CITY OF MISSOULA



LEGEND

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- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
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- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
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- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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PRELIMINARY

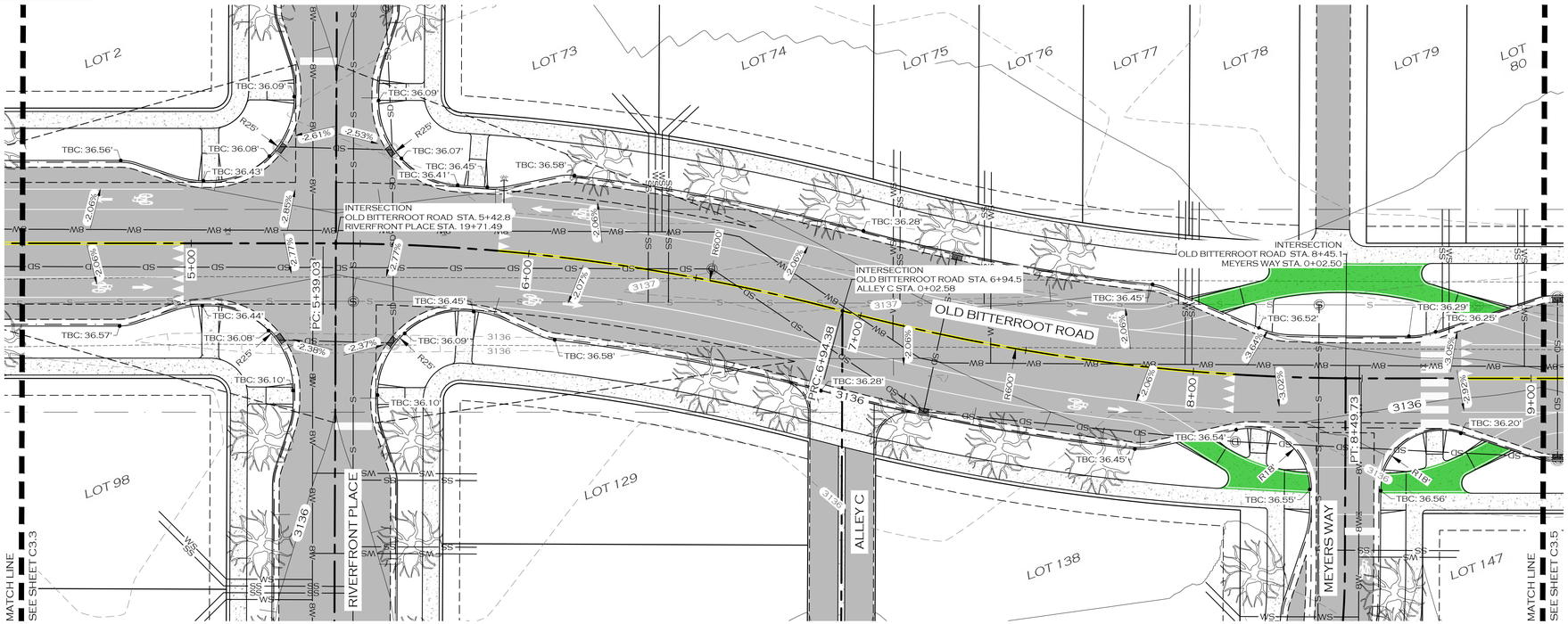
RIVERFRONT TRAILS

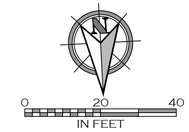
MISSOULA MONTANA

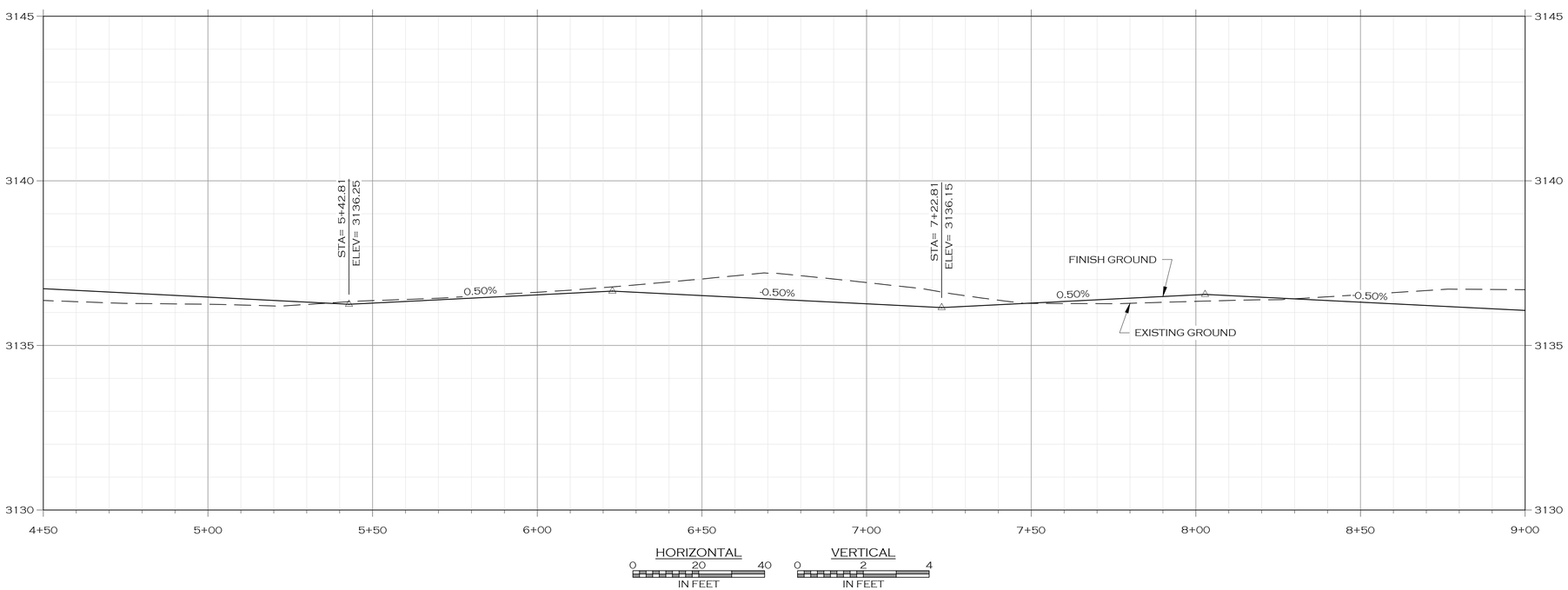
OLD BITTERROOT ROAD PLAN & PROFILE STA. 0+00 TO 4+50

C3.3

RD-OLD BITTERROOT 0+00 TO 4+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022







NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
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PRELIMINARY

COLOR VERIFICATION
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JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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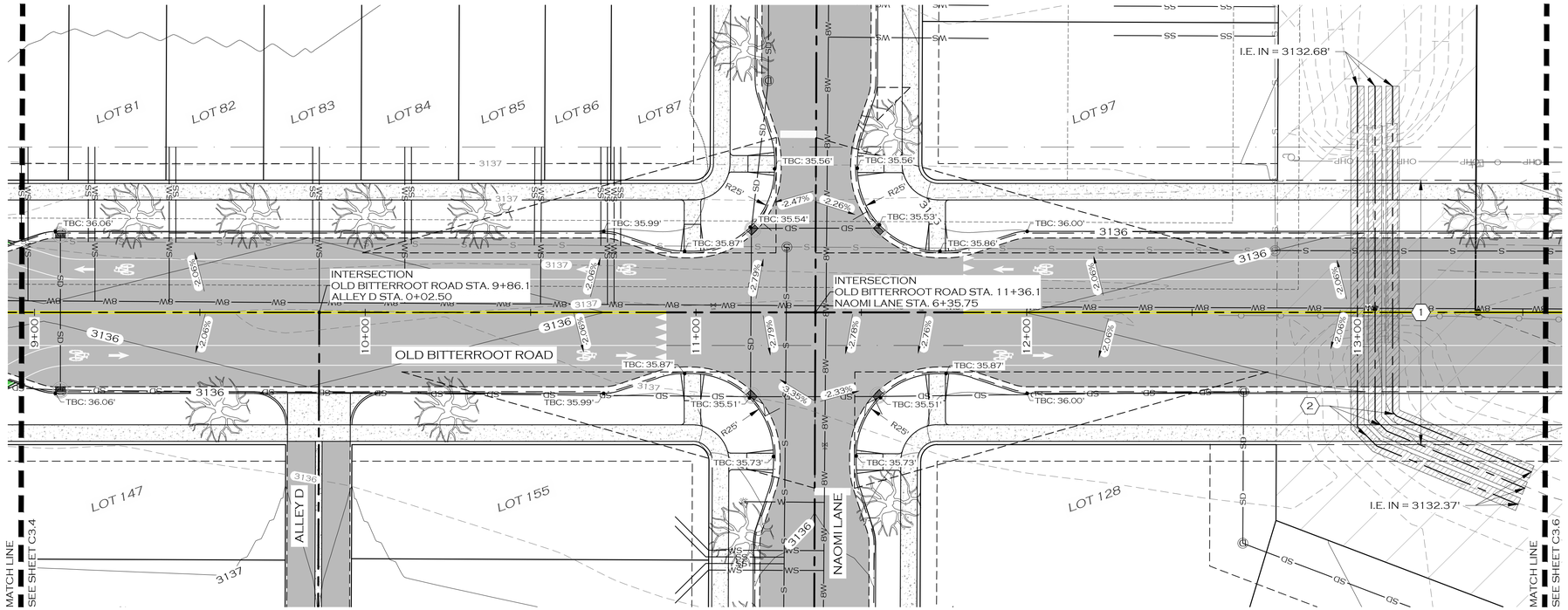
RIVERFRONT TRAILS
MISSOULA MONTANA

OLD BITTERROOT ROAD PLAN & PROFILE STA. 4+50 TO 9+00

C3.4

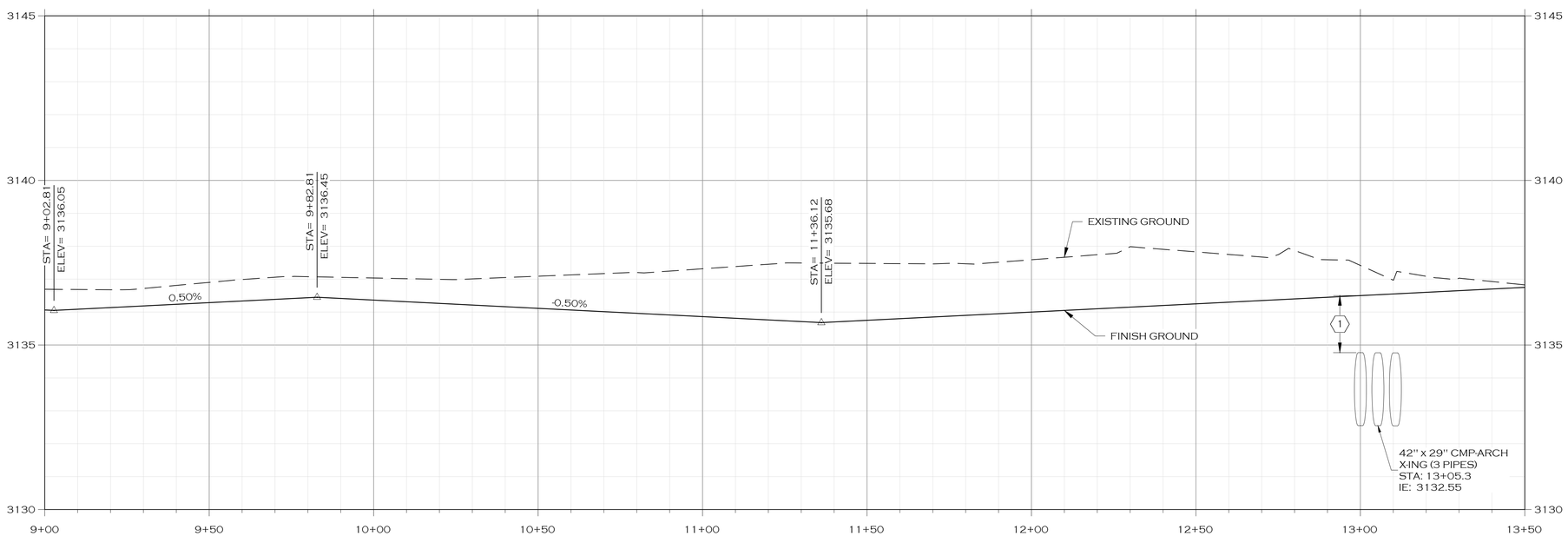
R:\OLD BITERRROOT 4+50 TO 9+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



0 20 40
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM 1' COVER DEPTH OVER CORRUGATED METAL ARCH PIPE CULVERT. COVER DEPTH IN ASPHALT AREAS INCLUDES ONLY THE BASE ROCK SECTIONS AND MUST EXCLUDE THE ASPHALT SECTION.
2. INSTALL 42" x 29" CORRUGATED METAL ARCH PIPE CULVERT AT CONSTANT GRADE BETWEEN INVERT ELEVATIONS SHOWN. BENDS SHALL BE MANUFACTURED 65° 3-PIECE ELBOWS.



LEGEND

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- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
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- PROPOSED CURB
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PRELIMINARY

COLOR VERIFICATION
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JOB #:	2101
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QA:	KTS
DATE:	7/21/2022

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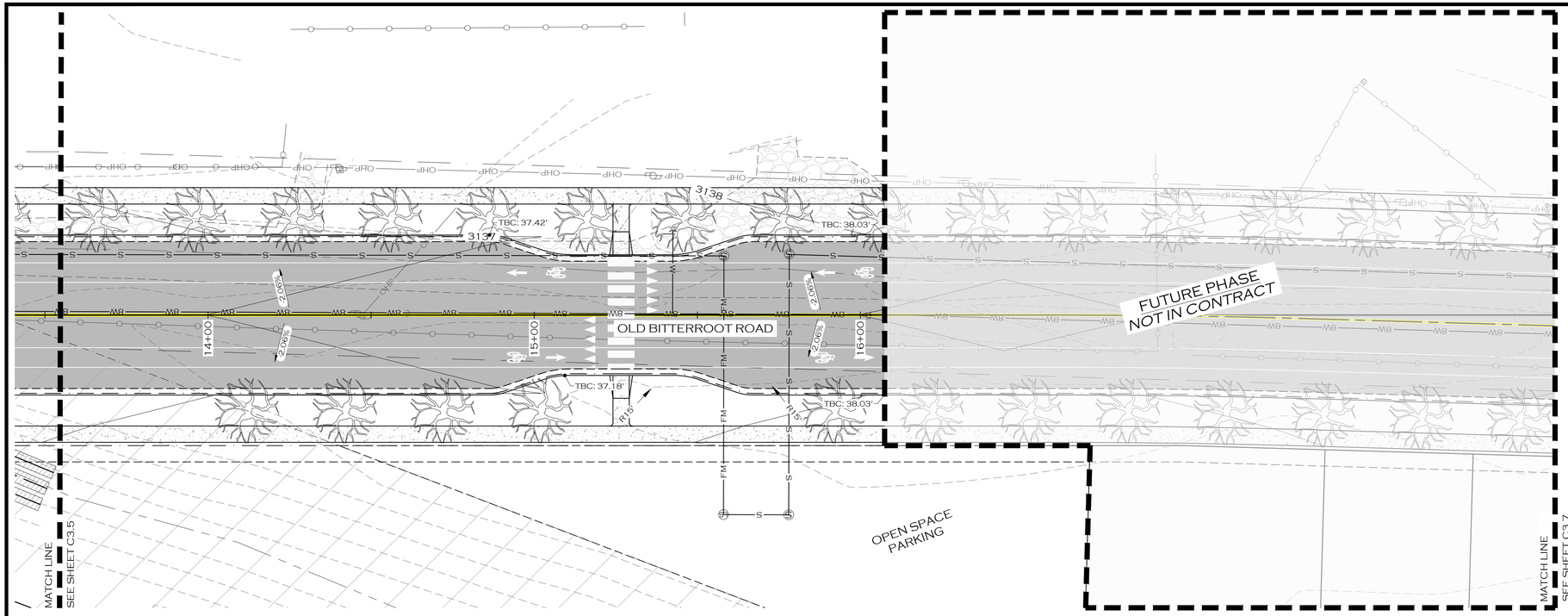
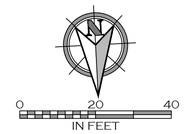
RIVERFRONT TRAILS
MISSOULA MONTANA

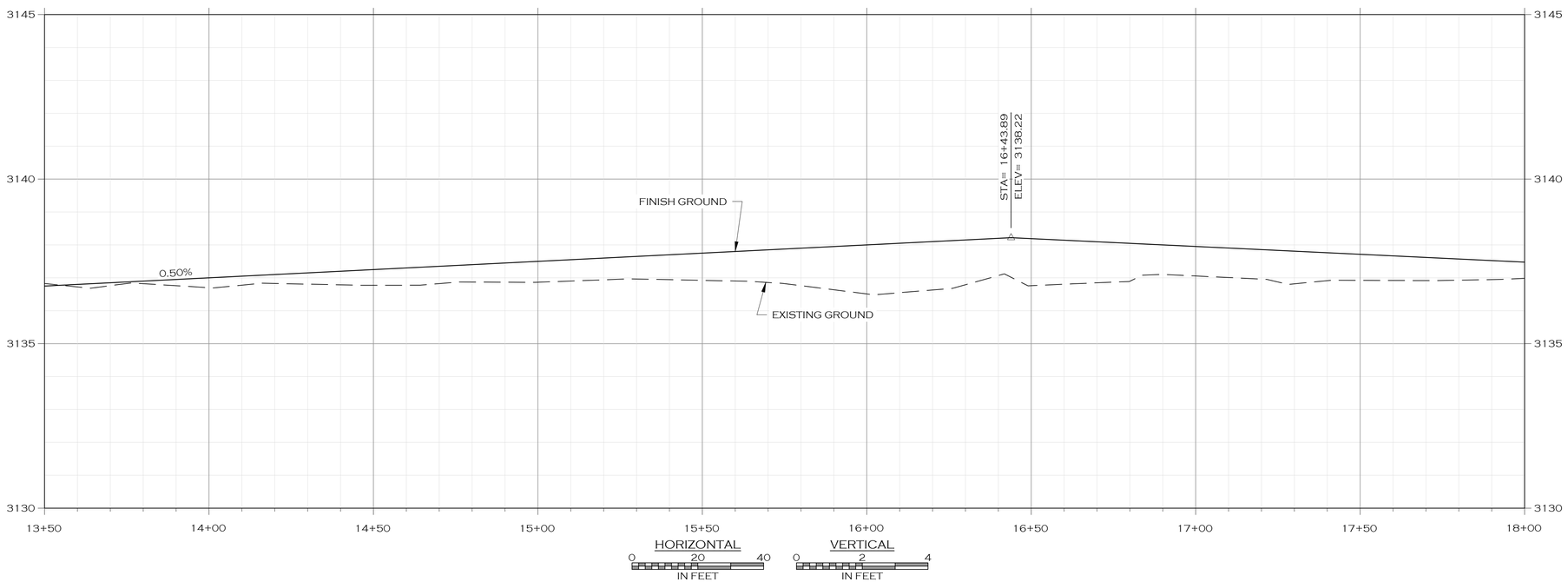
OLD BITTERROOT ROAD PLAN & PROFILE STA. 9+00 TO 13+50

C3.5

RD\OLD BITERROOT 9+00 TO 13+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022







NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

LEGEND

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PRELIMINARY

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DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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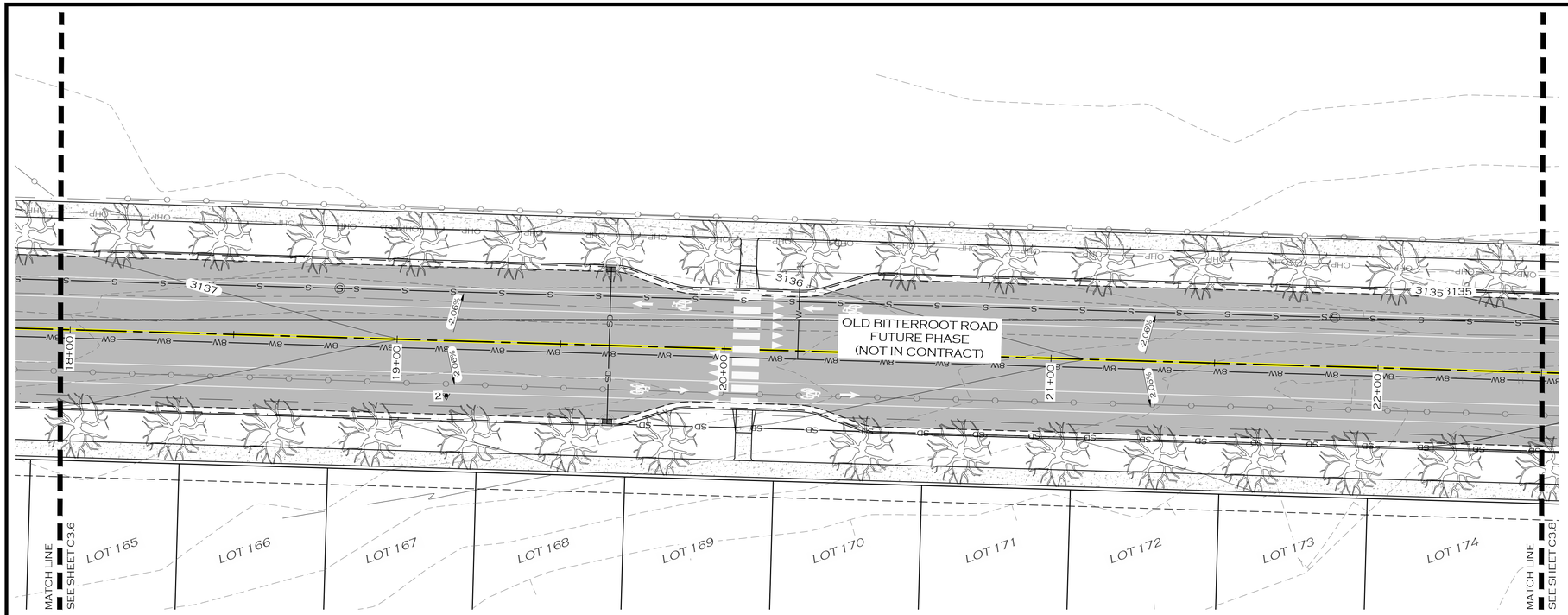
RIVERFRONT TRAILS
MISSOULA MONTANA

OLD BITTERROOT ROAD PLAN & PROFILE STA. 13+50 TO 18+00

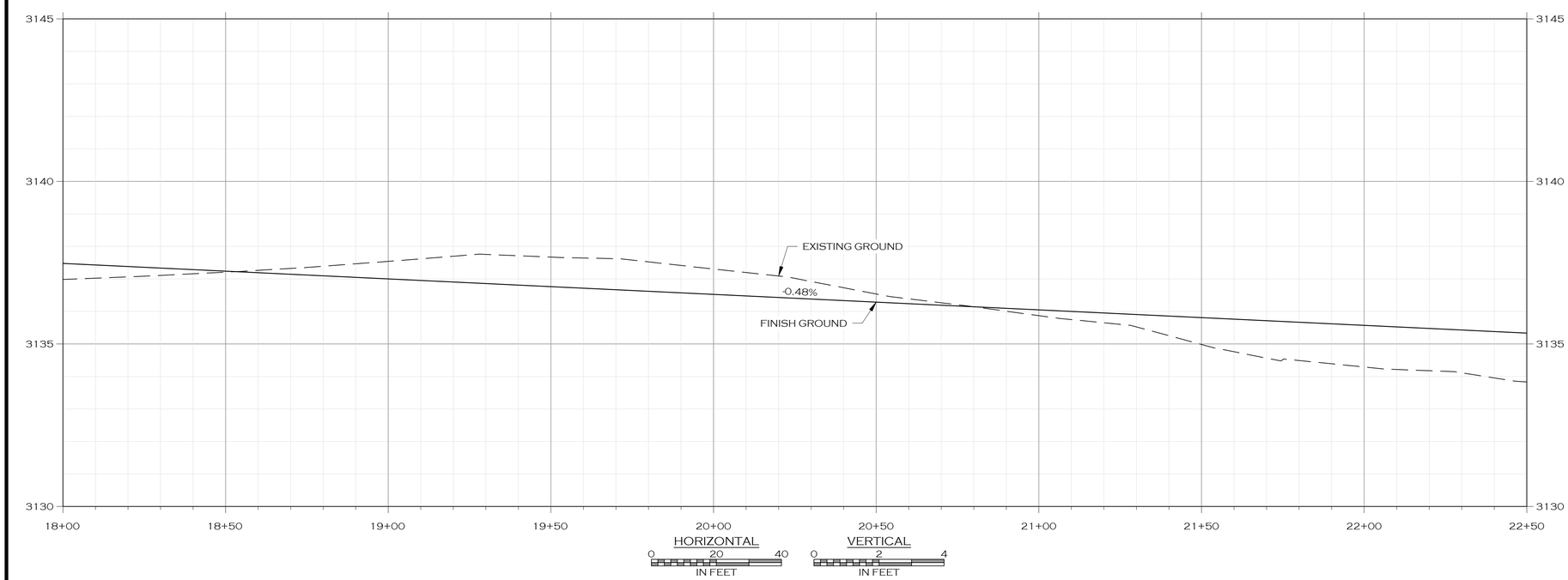
C3.6

R:\OLD BITTERROOT 13+50 TO 18+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



LEGEND

- PROPOSED BUILDING
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PRELIMINARY

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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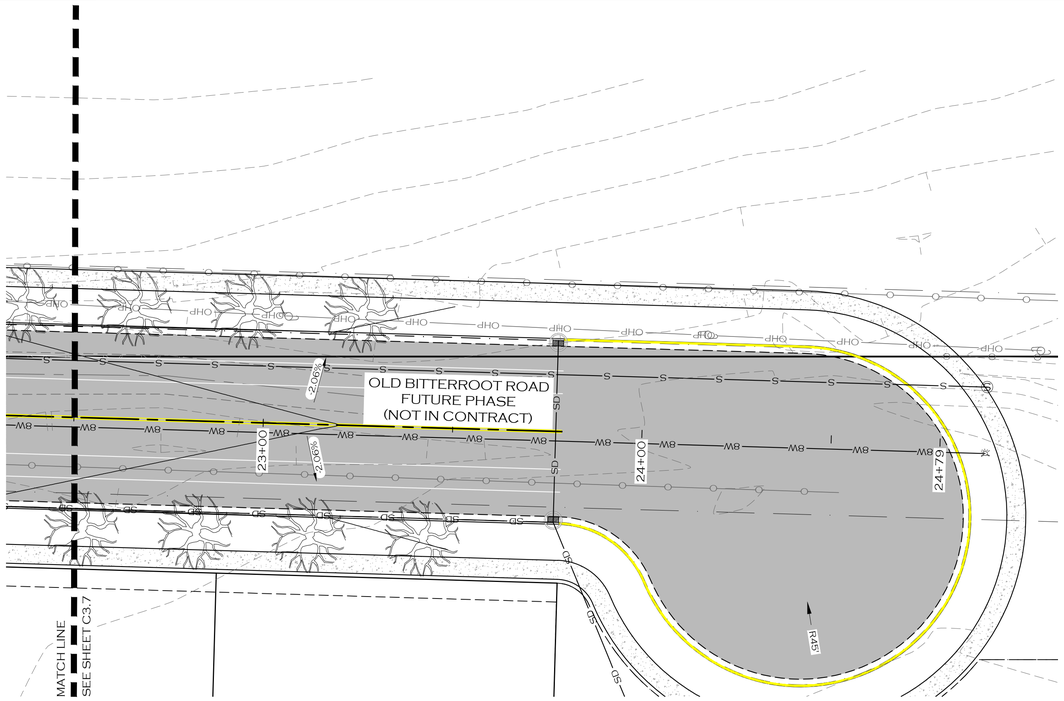
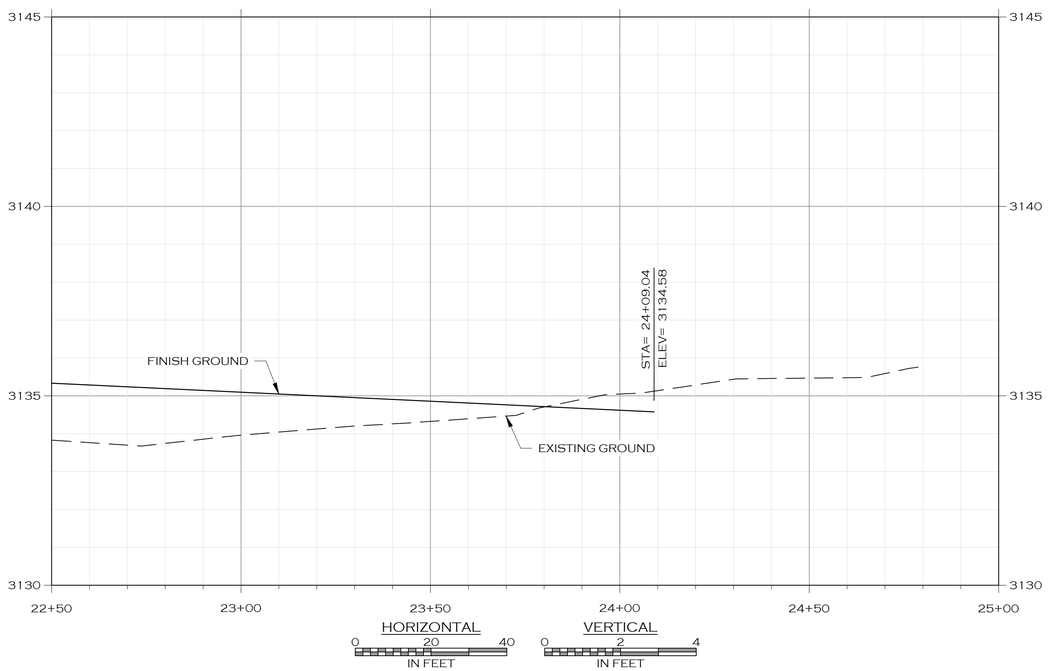
RIVERFRONT TRAILS
MISSOULA MONTANA

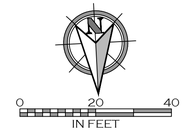
OLD BITTERROOT ROAD PLAN & PROFILE STA. 18+00 TO 22+50

C3.7

RD OLD BITTERROOT 18+00 TO 22+50.DWG PLOTTED BY: MATT HAMMERSTEIN ON JUL/22/2022







LEGEND

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NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

COLOR VERIFICATION
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PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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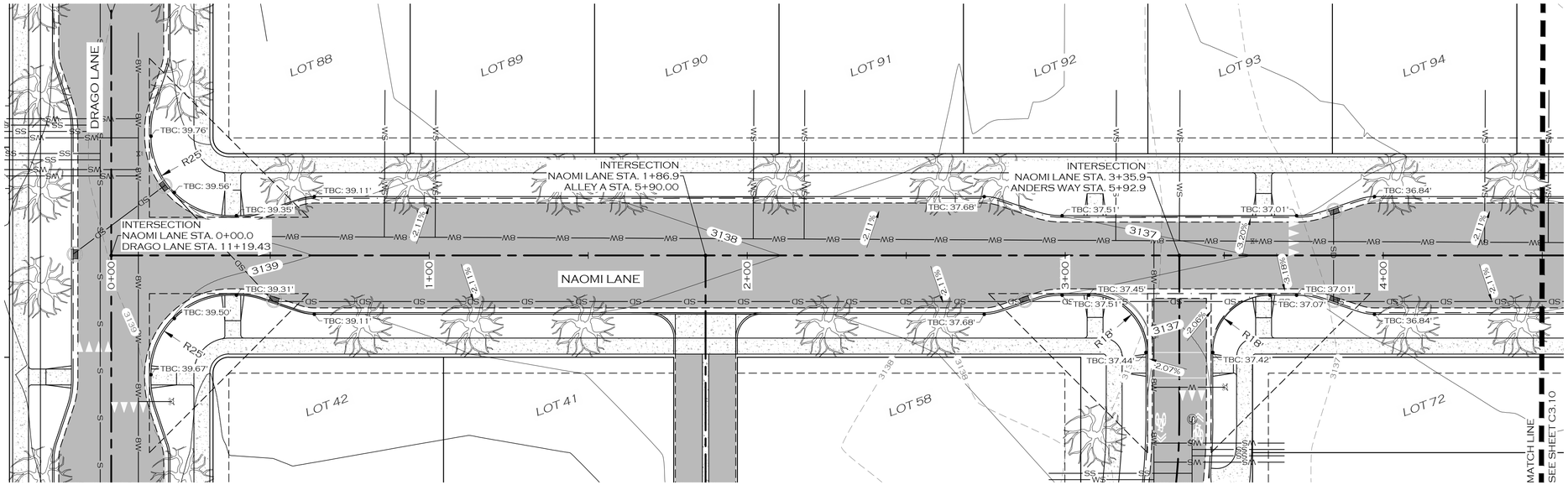
RIVERFRONT TRAILS
MISSOULA MONTANA

OLD BITTERROOT ROAD PLAN & PROFILE STA. 22+50 TO 25+00

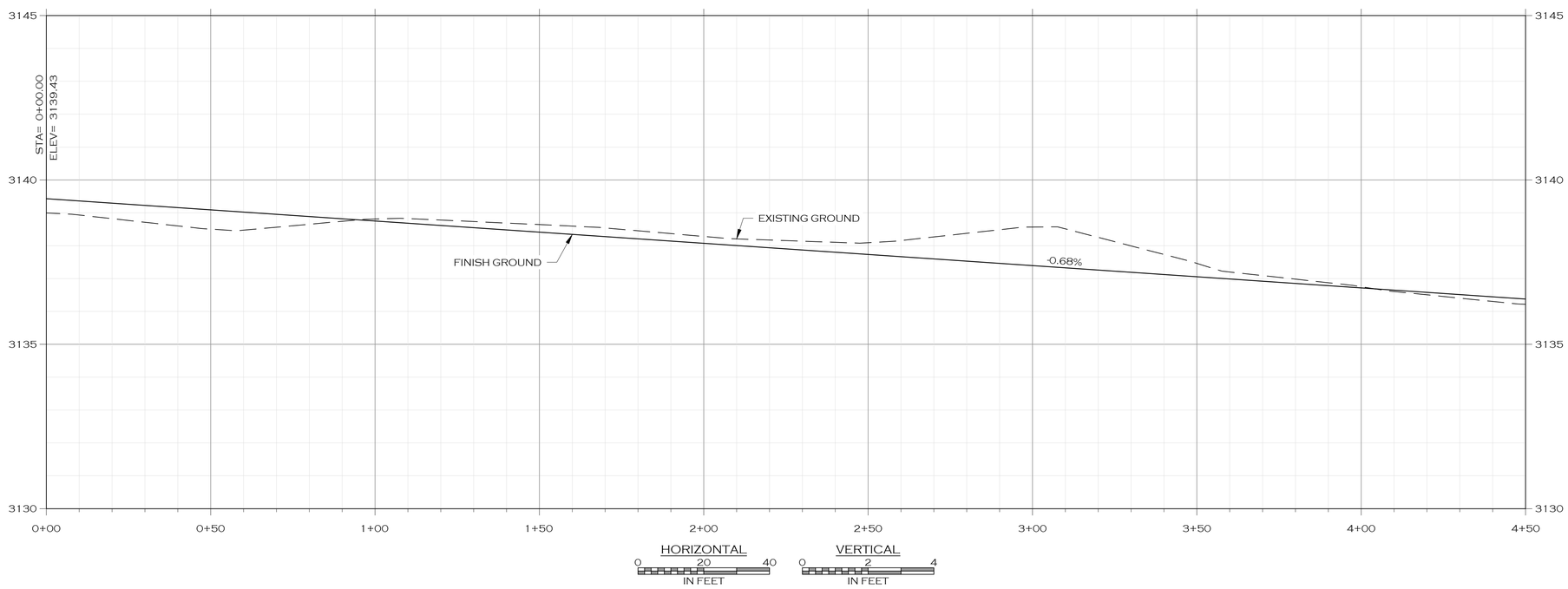
C3.8

R:\OLD BITTERROOT 22+50 TO 25+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



LEGEND

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PRELIMINARY

COLOR VERIFICATION
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JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

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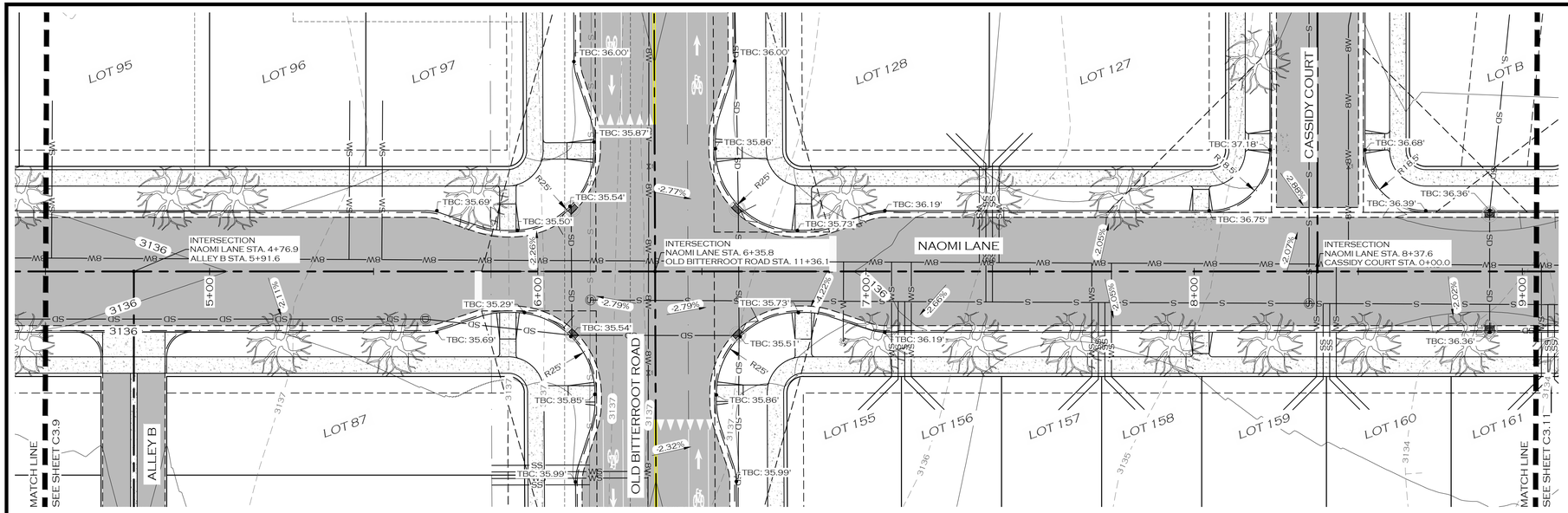
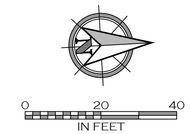
RIVERFRONT TRAILS
MISSOULA MONTANA

NAOMI LANE PLAN & PROFILE STA. 0+00 TO 4+50

C3.9

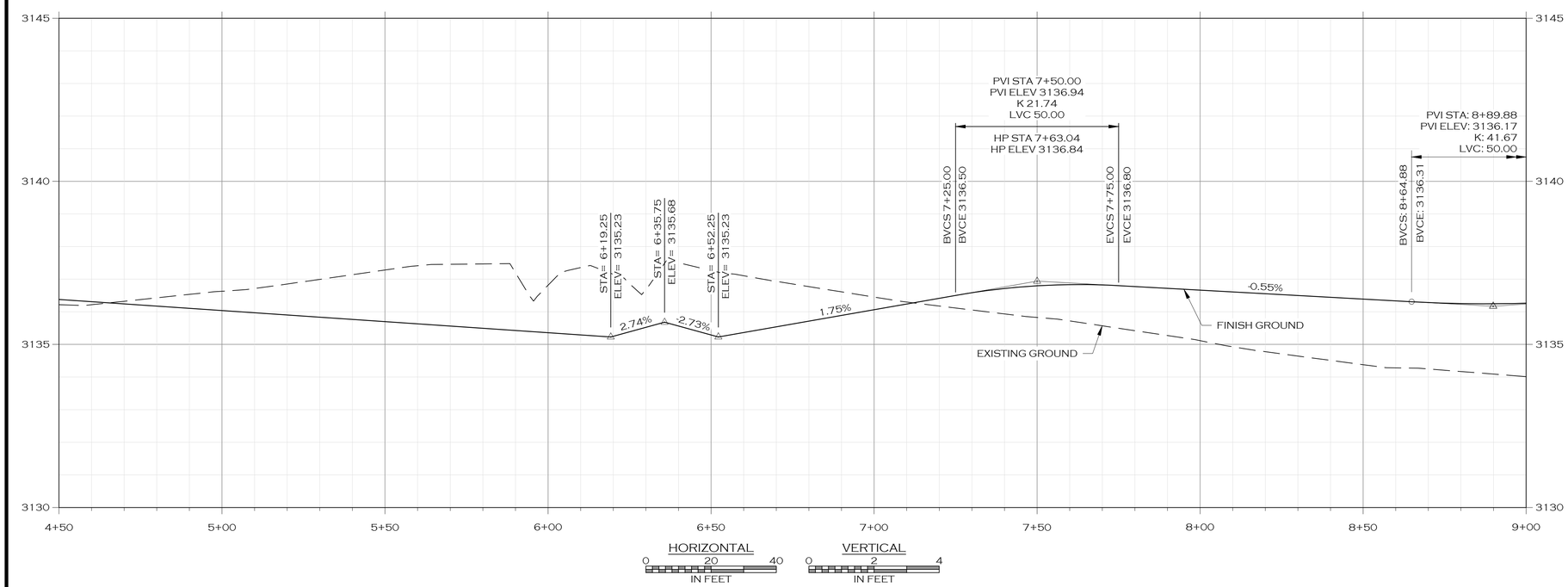
RD:NAOMI LANE 0+00 TO 4+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



LEGEND

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- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
- PROPOSED POND
- PROPOSED GRADE BREAK
- PROPOSED LANDSCAPING
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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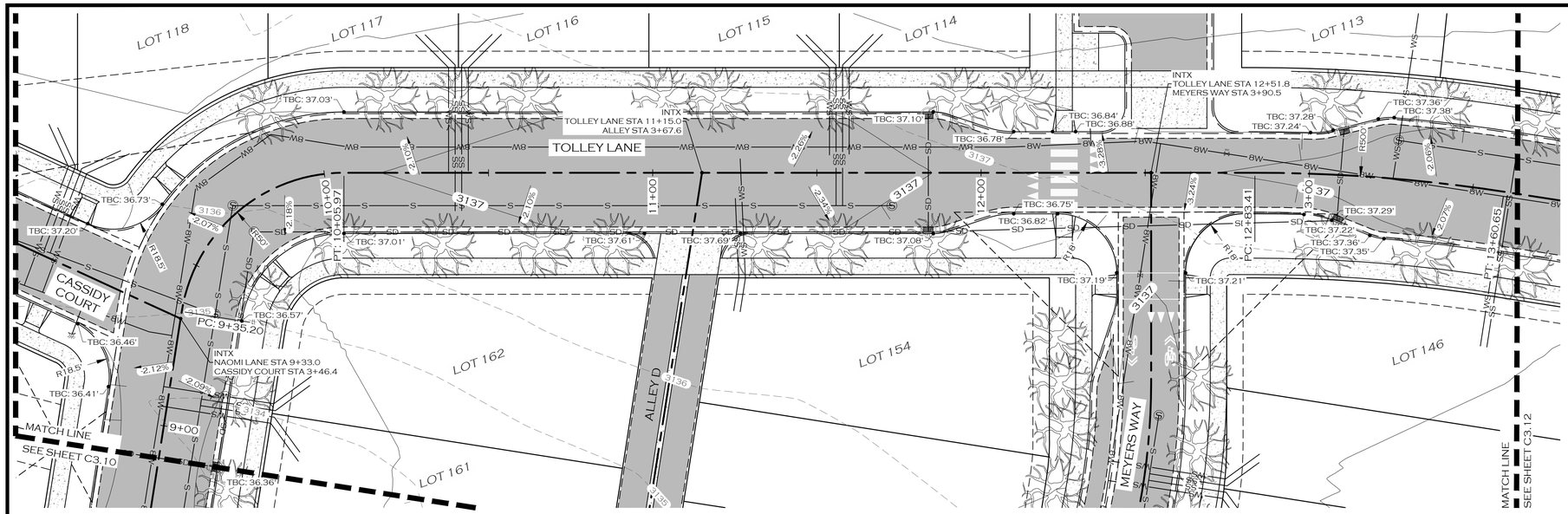
RIVERFRONT TRAILS
MISSOULA MONTANA

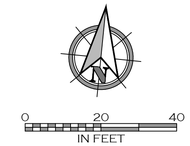
NAOMI LANE PLAN & PROFILE STA. 4+50 TO 9+00

C3.10

RD:NAOMI LANE 4+50 TO 9+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

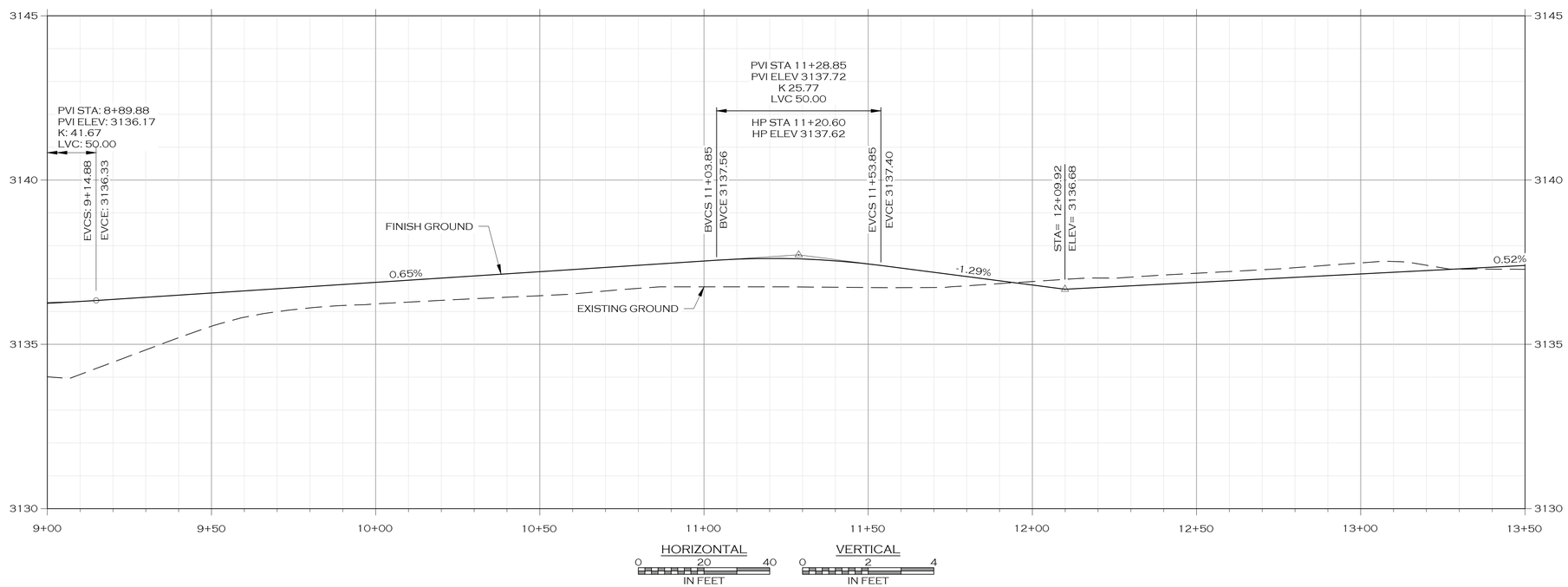
COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
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- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
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- PROPOSED MANHOLE - STORM SEWER
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- PROPOSED POND
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- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PRELIMINARY

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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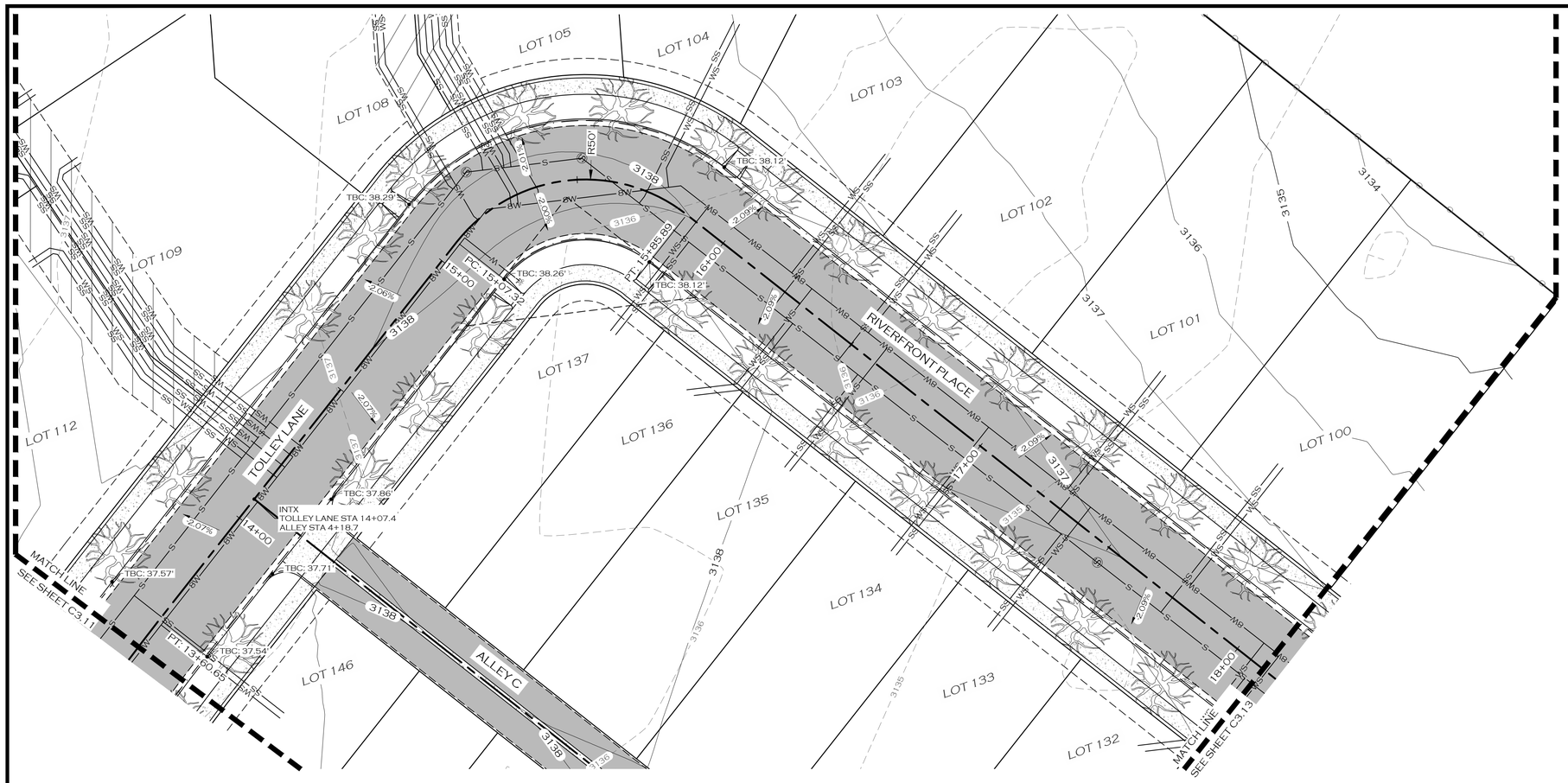
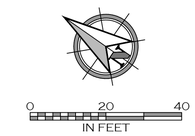
RIVERFRONT TRAILS
MISSOULA MONTANA

TOLLEY LANE PLAN & PROFILE STA. 9+00 TO 13+50

C3.11

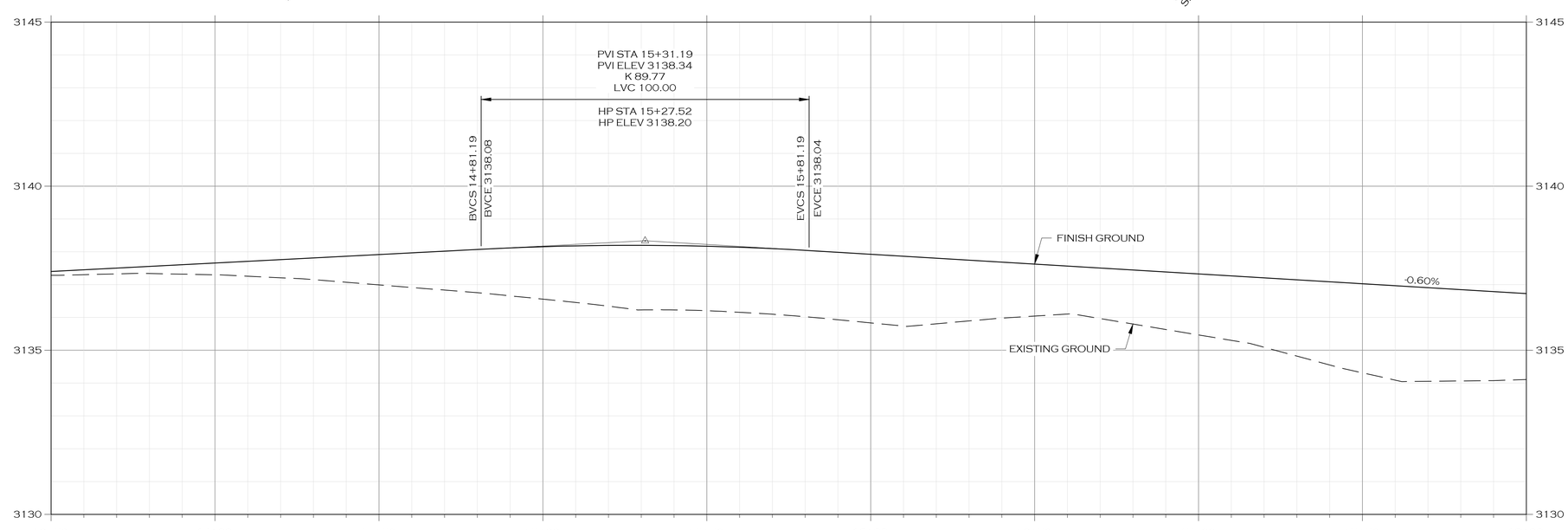
RD:TOLLEY LANE 9+00 TO 13+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 2 4 IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
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- PROPOSED BLOWOFF
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- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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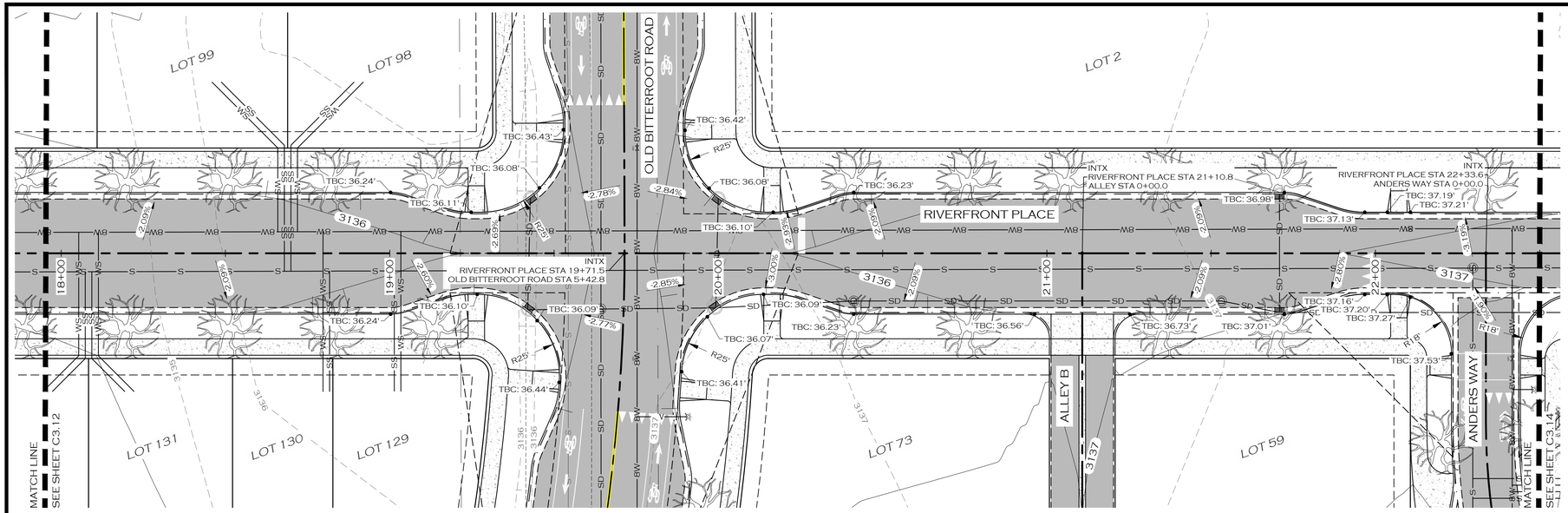
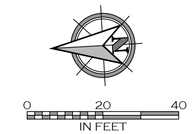
RIVERFRONT TRAILS
MISSOULA MONTANA

TOLLEY LANE PLAN & PROFILE STA. 13+50 TO 18+00

C3.12

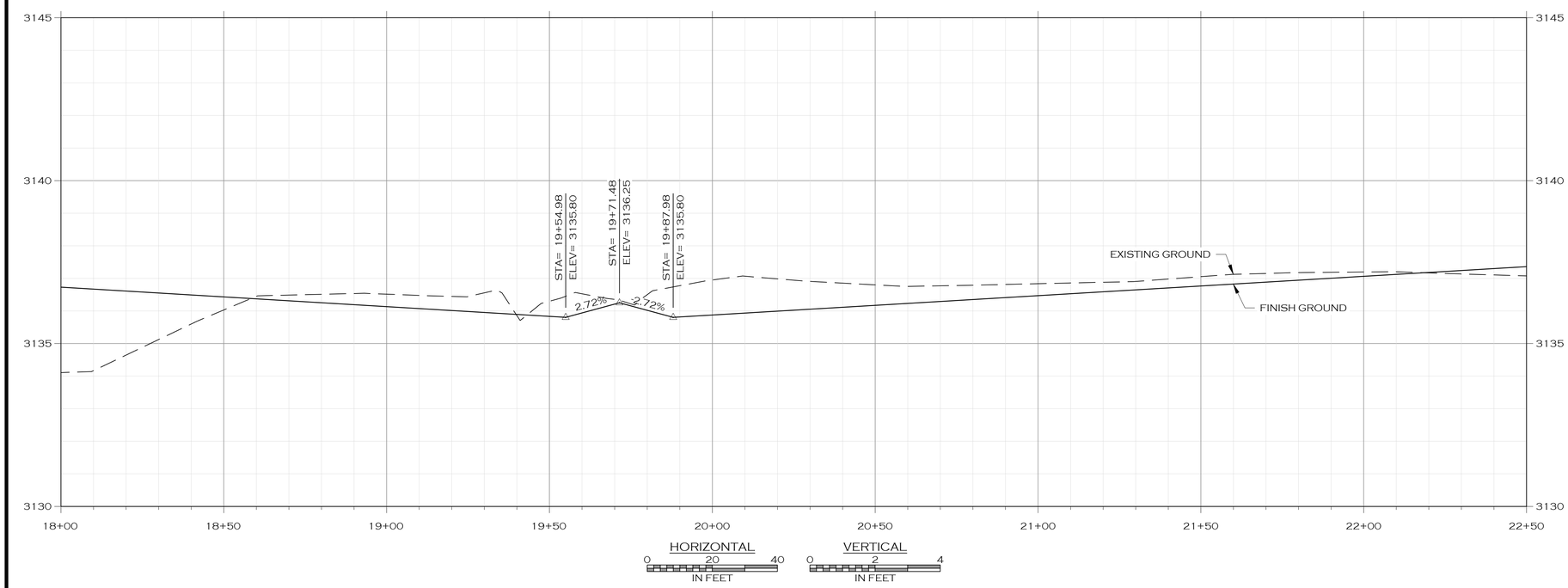
RD-TOLLEY LANE 13+50 TO 18+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
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- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DATE	DESCRIPTION

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RIVERFRONT TRAILS

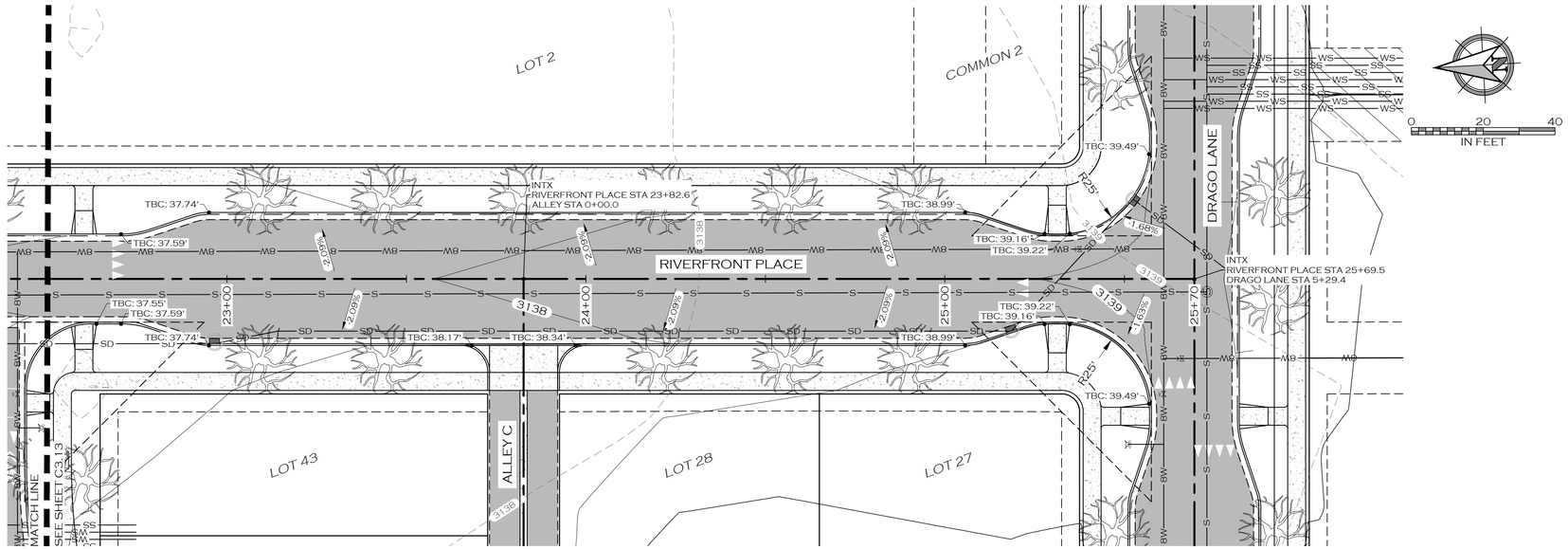
MISSOULA MONTANA

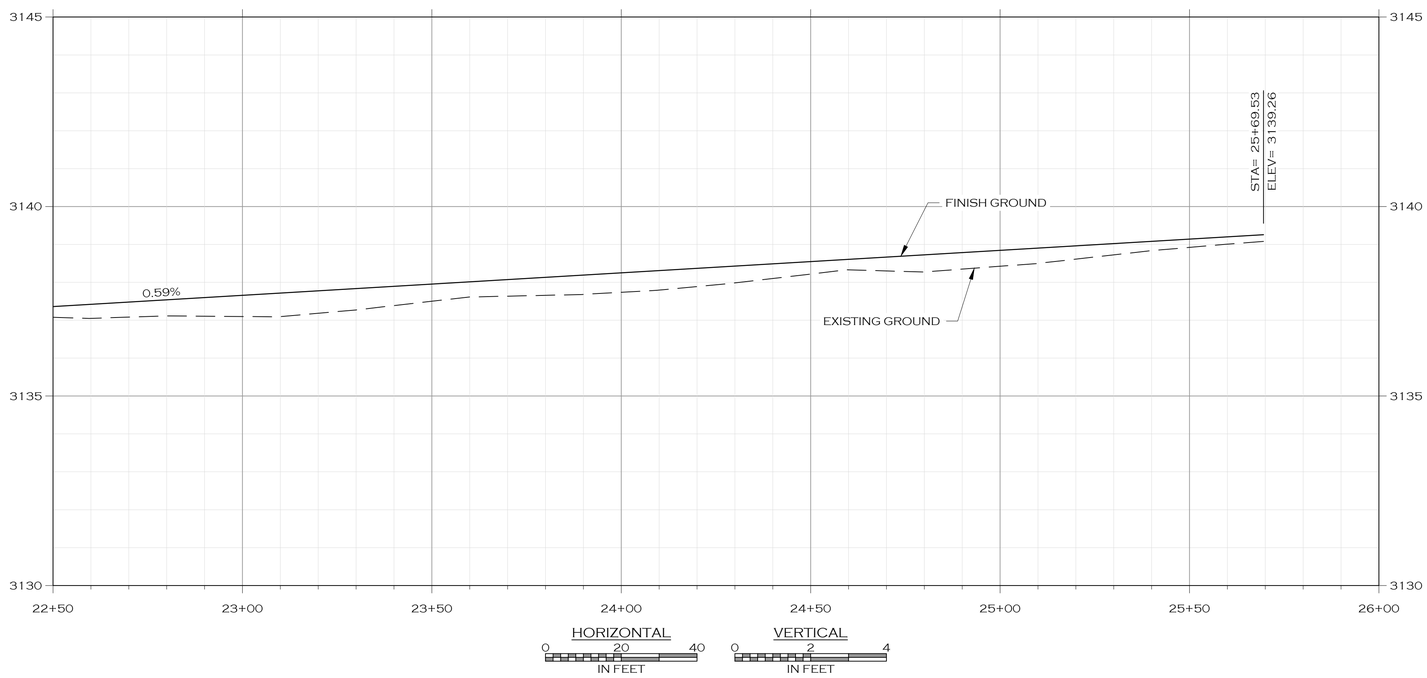
RIVERFRONT PLACE PLAN & PROFILE STA. 18+00 TO 22+50

C3.13

RD-RIVERFRONT PLACE 18+00 TO 22+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
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- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PRELIMINARY

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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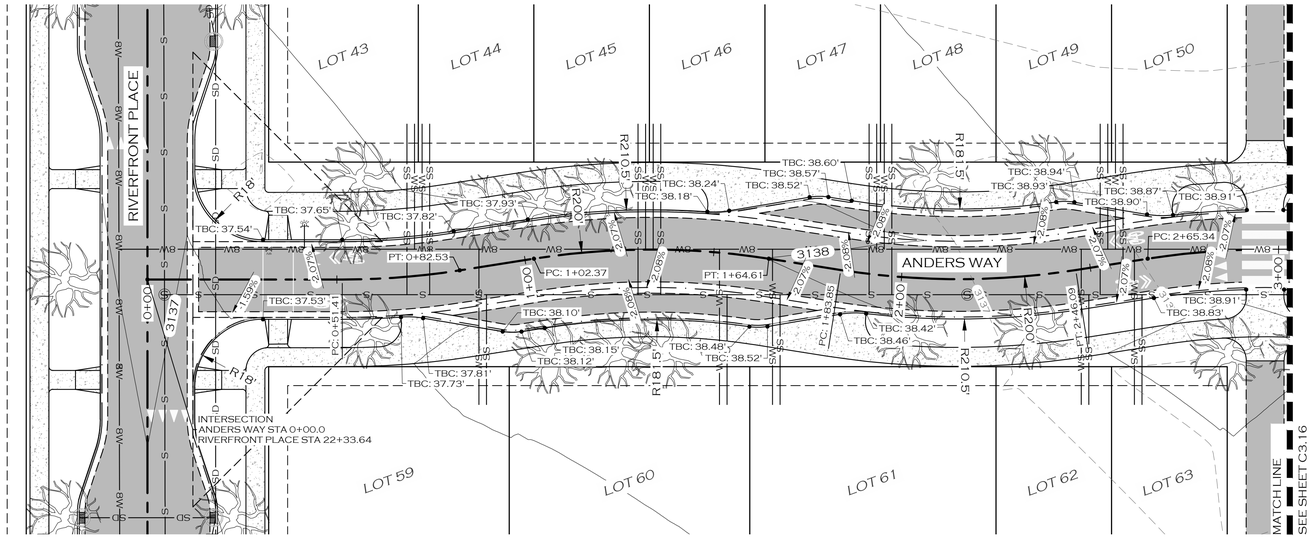
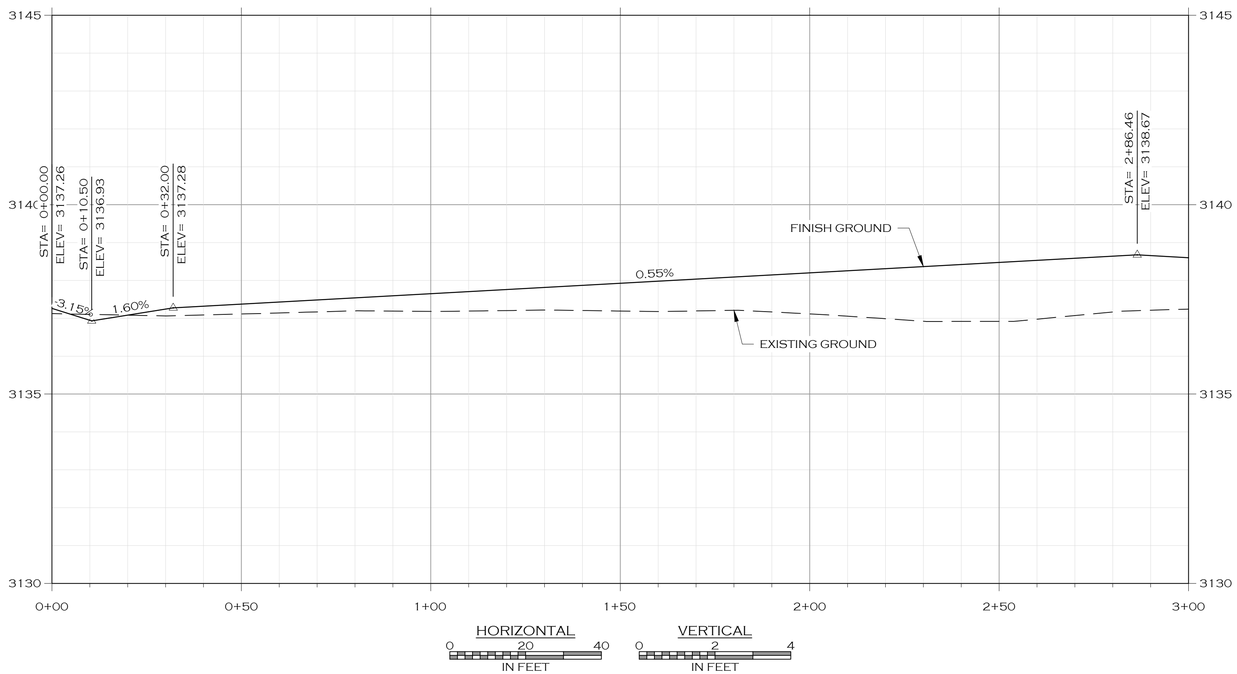
RIVERFRONT TRAILS
MISSOULA MONTANA

RIVERFRONT PLACE PLAN & PROFILE STA. 22+50 TO 26+00

C3.14

RD-RIVERFRONT PLACE 22+50 TO 26+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
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- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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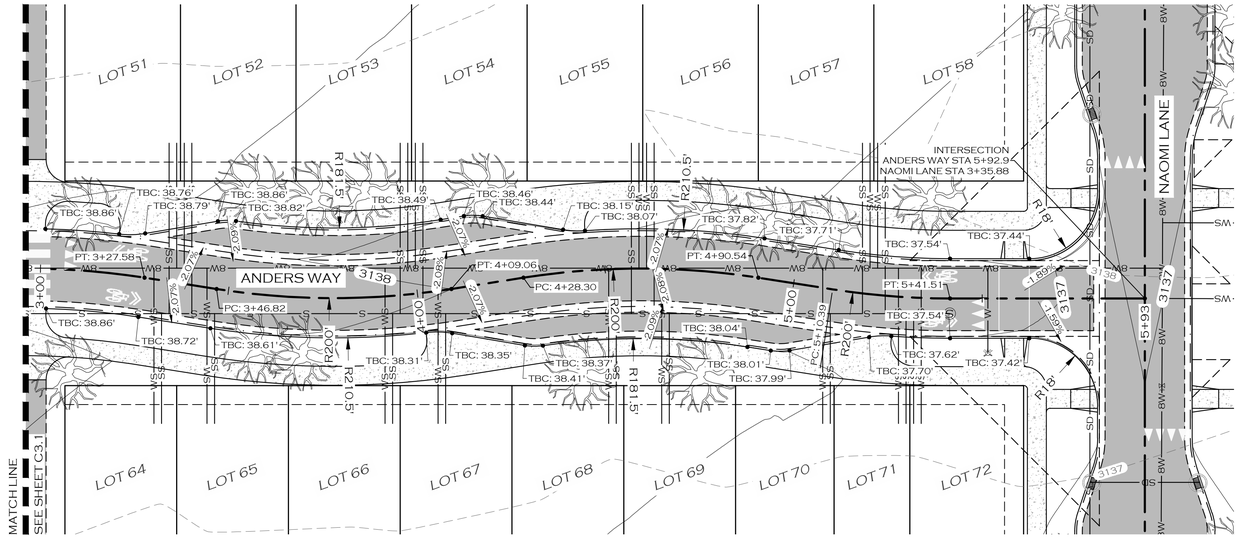
RIVERFRONT TRAILS
MISSOULA MONTANA

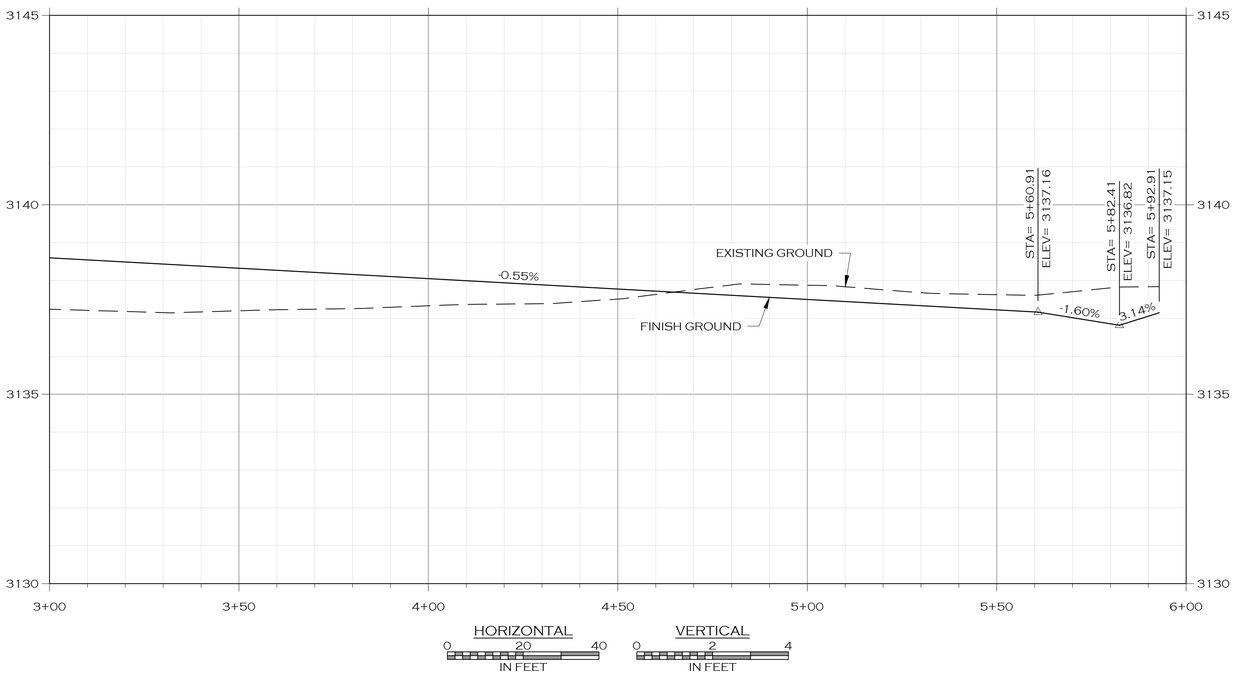
ANDERS WAY PLAN & PROFILE STA. 0+00 TO 3+00

C3.15

RD-ANDERS WAY.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





0 20 40
IN FEET

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
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- G — PROPOSED BURIED GAS

NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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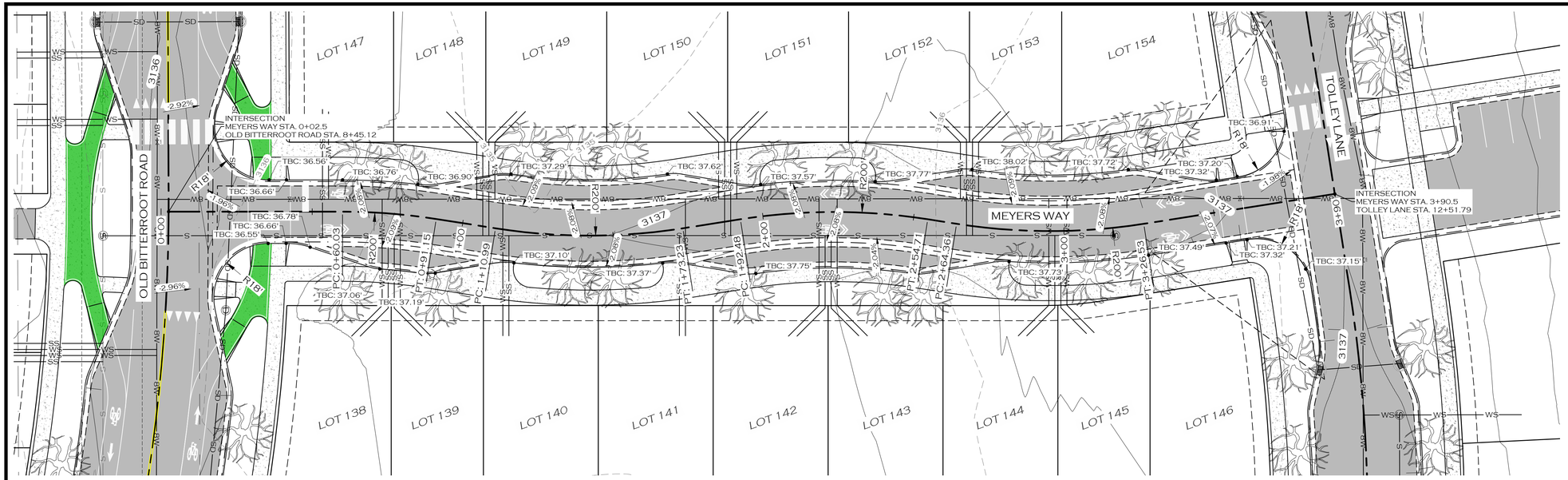
RIVERFRONT TRAILS
MISSOULA MONTANA

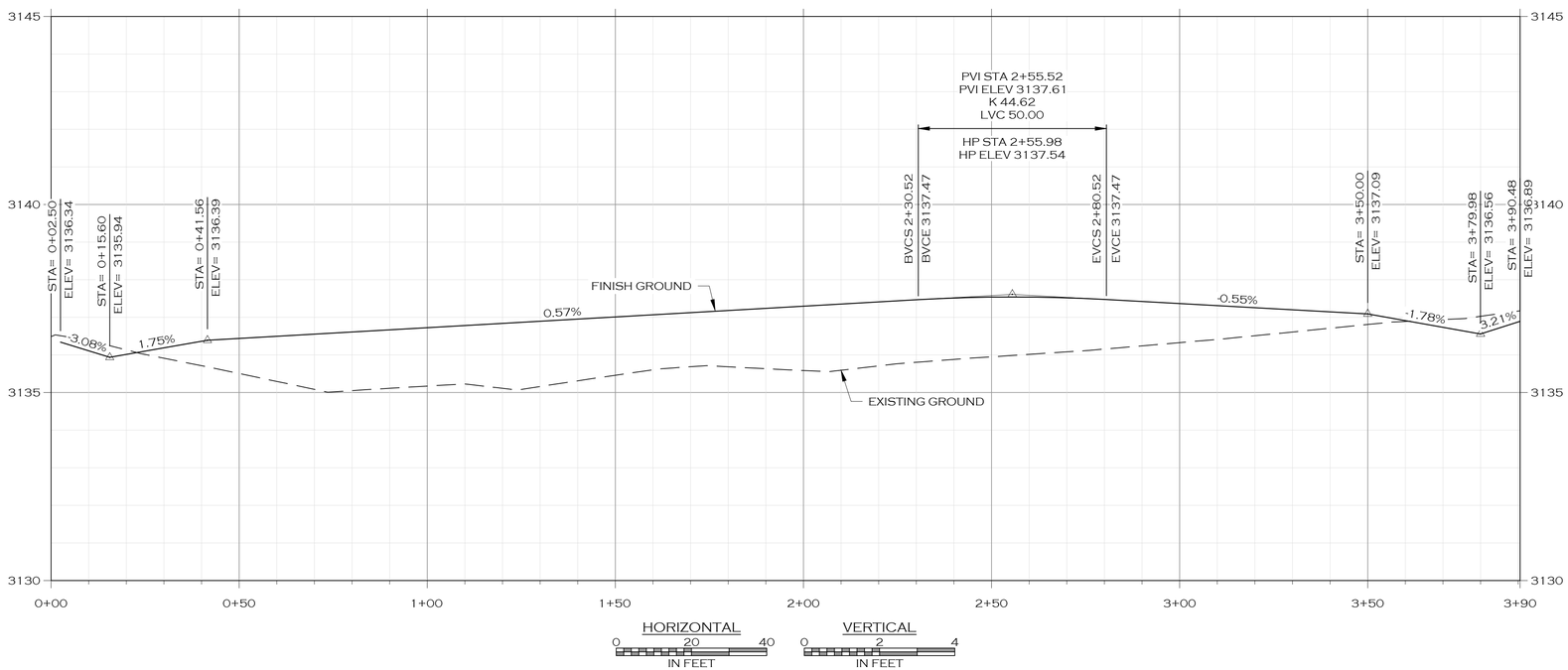
ANDERS WAY PLAN & PROFILE STA. 3+00 TO 6+00

C3.16

RD:ANDERS WAY.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
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NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

PRELIMINARY

COLOR VERIFICATION
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JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DATE	DESCRIPTION

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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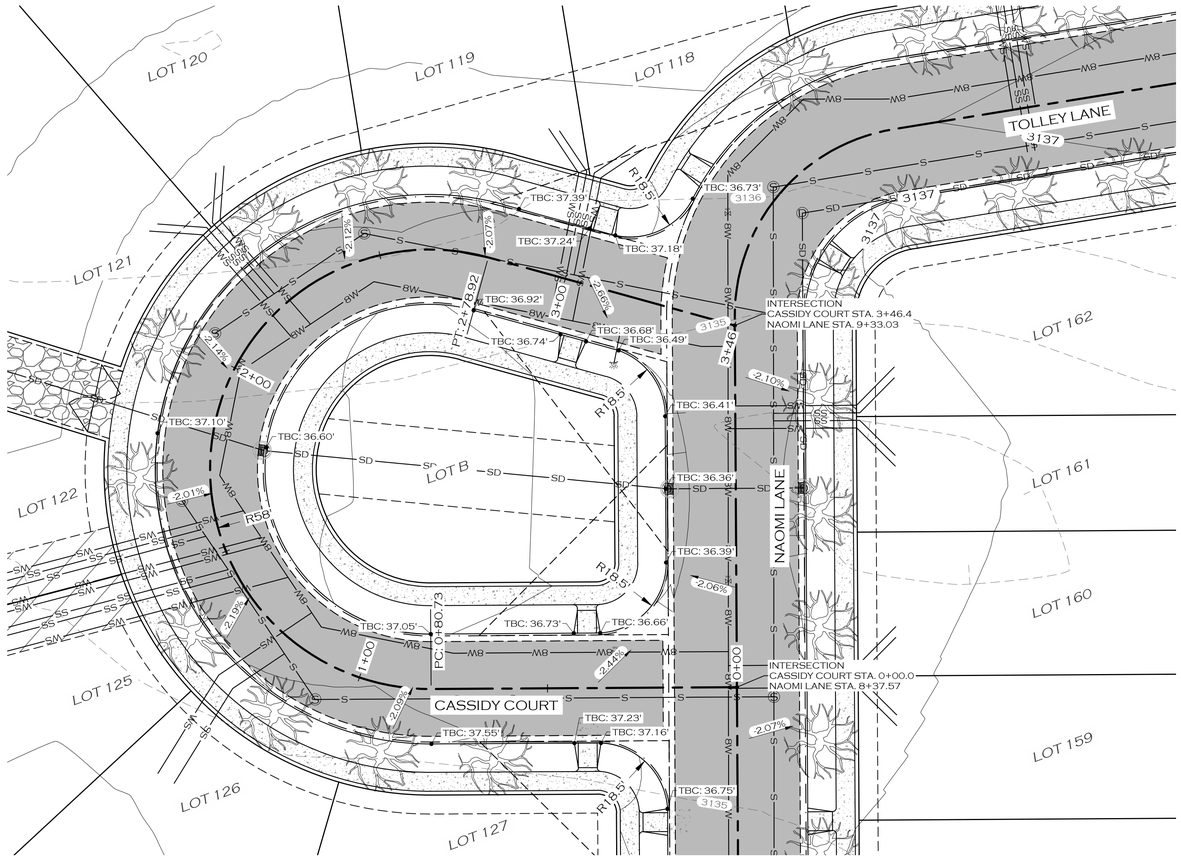
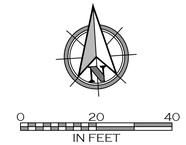
RIVERFRONT TRAILS
MISSOULA MONTANA
MEYERS WAY PLAN & PROFILE

C3.17

RD-MEYERS WAY.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
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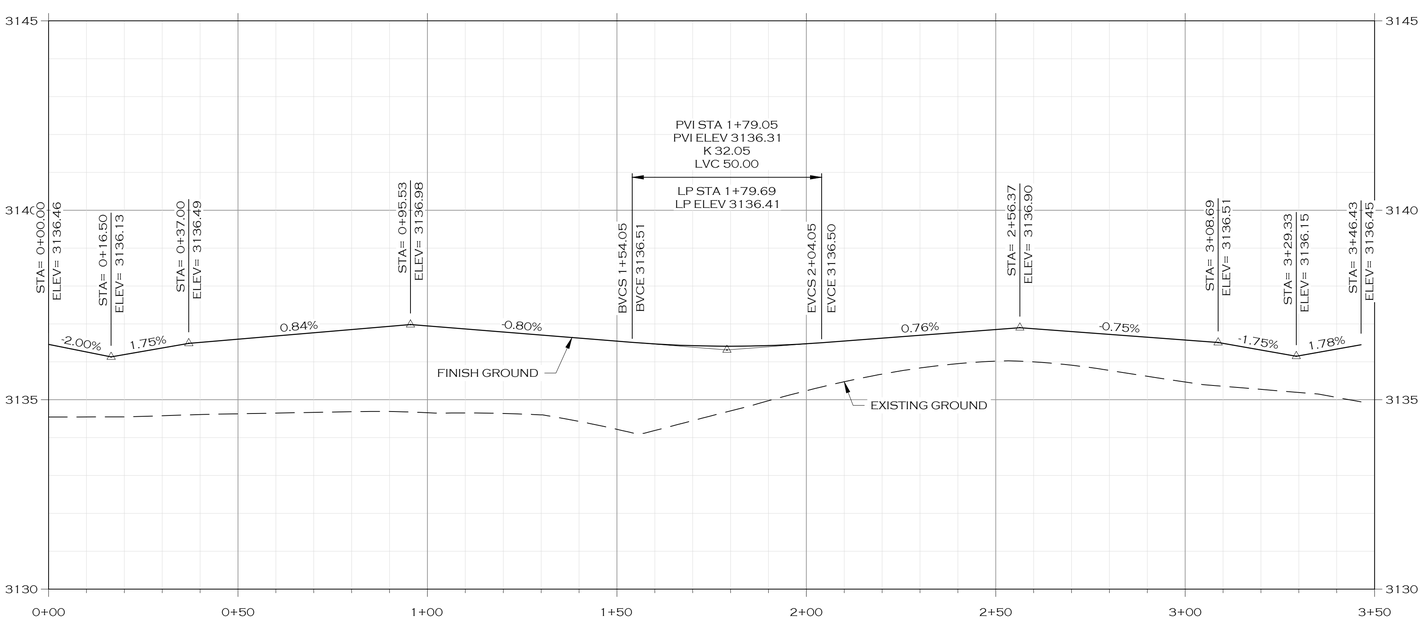
- F — F — PROPOSED BURIED FIBER
- T — T — PROPOSED BURIED TELEPHONE
- G — G — PROPOSED BURIED GAS

NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 2 4 IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

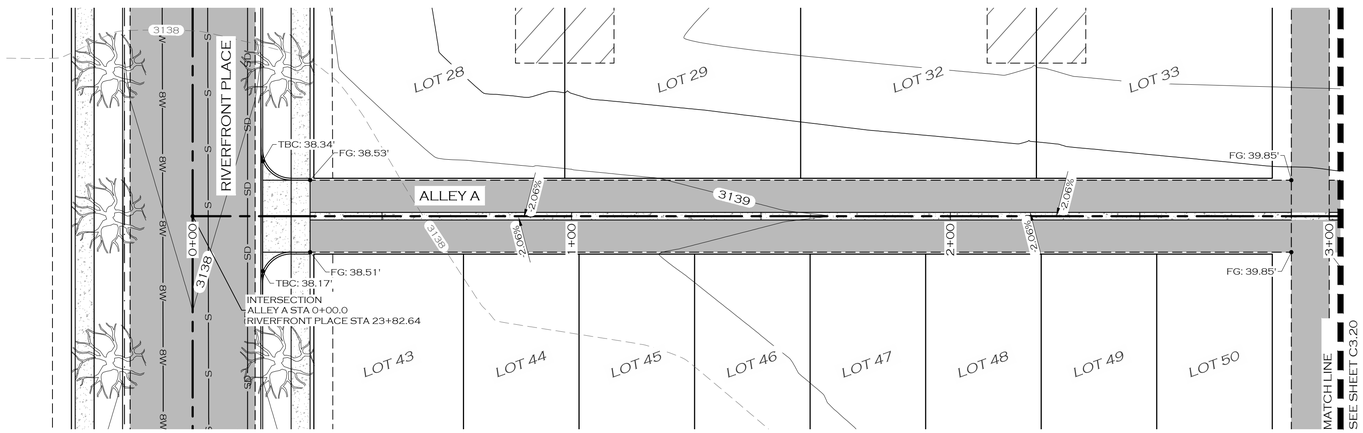
RIVERFRONT TRAILS

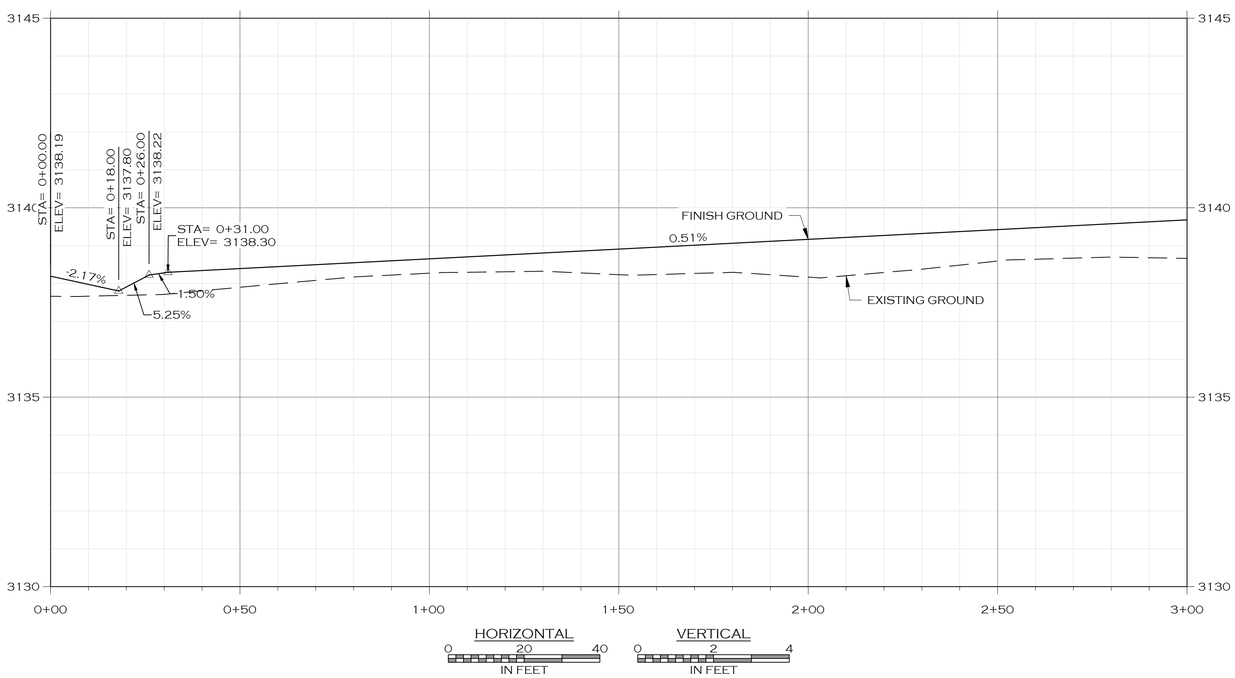
MISSOULA MONTANA

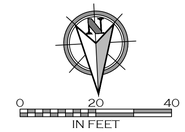
CASSIDY COURT PLAN & PROFILE

C3.18

RD-CASSIDY COURT.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022







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NOTES:

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PRELIMINARY

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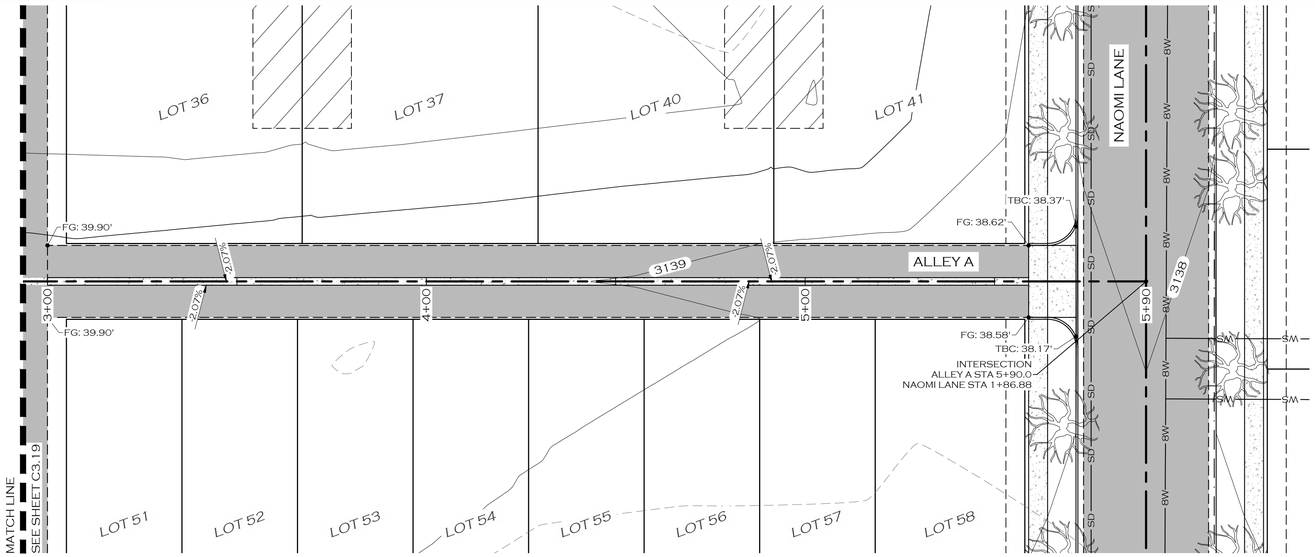
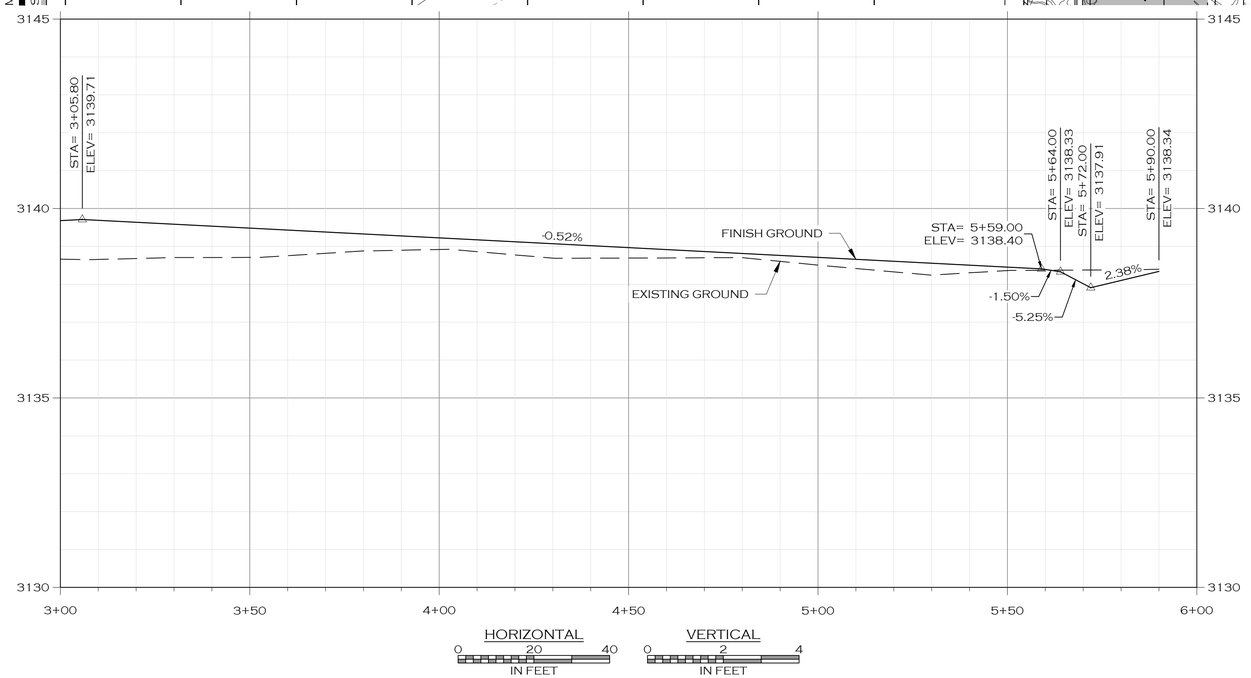
RIVERFRONT TRAILS
MISSOULA MONTANA

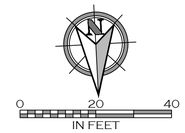
ALLEY A PLAN & PROFILE STA. 0+00 TO 3+00

C3.19

RD-ALLEY A 0+00 TO 3+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022







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PRELIMINARY

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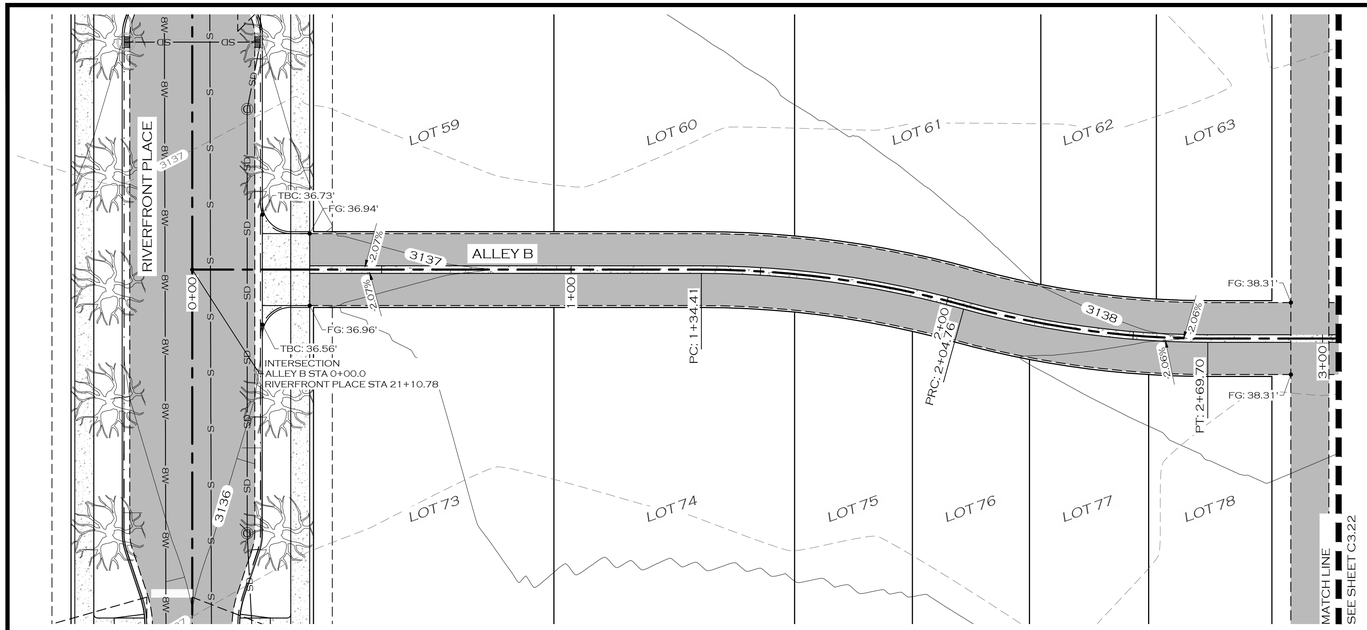
RIVERFRONT TRAILS
MISSOULA MONTANA

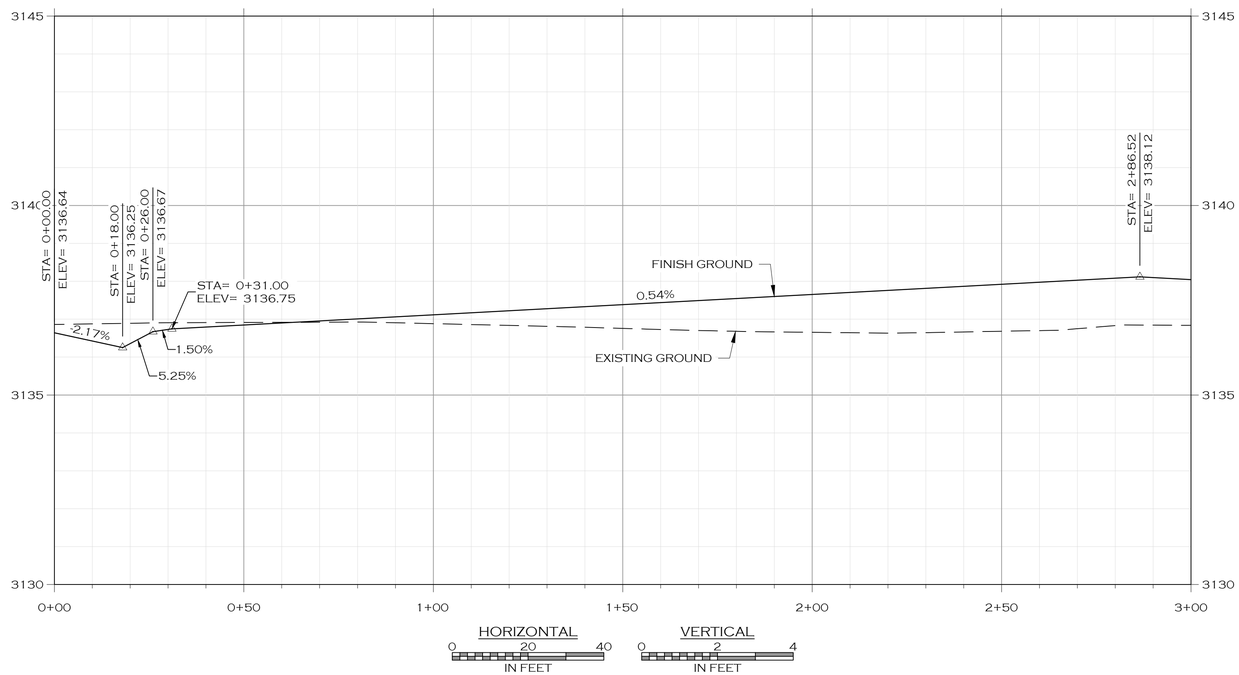
ALLEY A PLAN & PROFILE STA. 3+00 TO 6+00

C3.20

RD-ALLEY A 3+00 TO 6+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





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NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS

PRELIMINARY

JOB #:	2101
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RIVERFRONT TRAILS
MISSOULA MONTANA

ALLEY B PLAN & PROFILE STA. 0+00 TO 3+00

C3.21

RD-ALLEY B 0+00 TO 3+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
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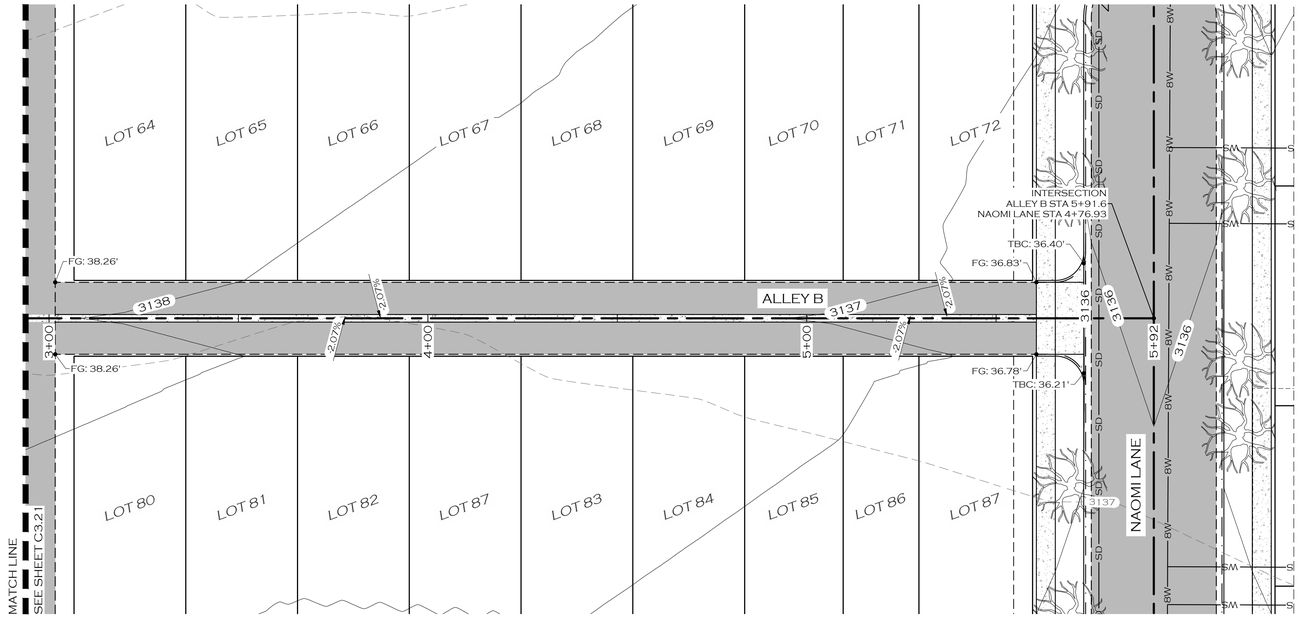

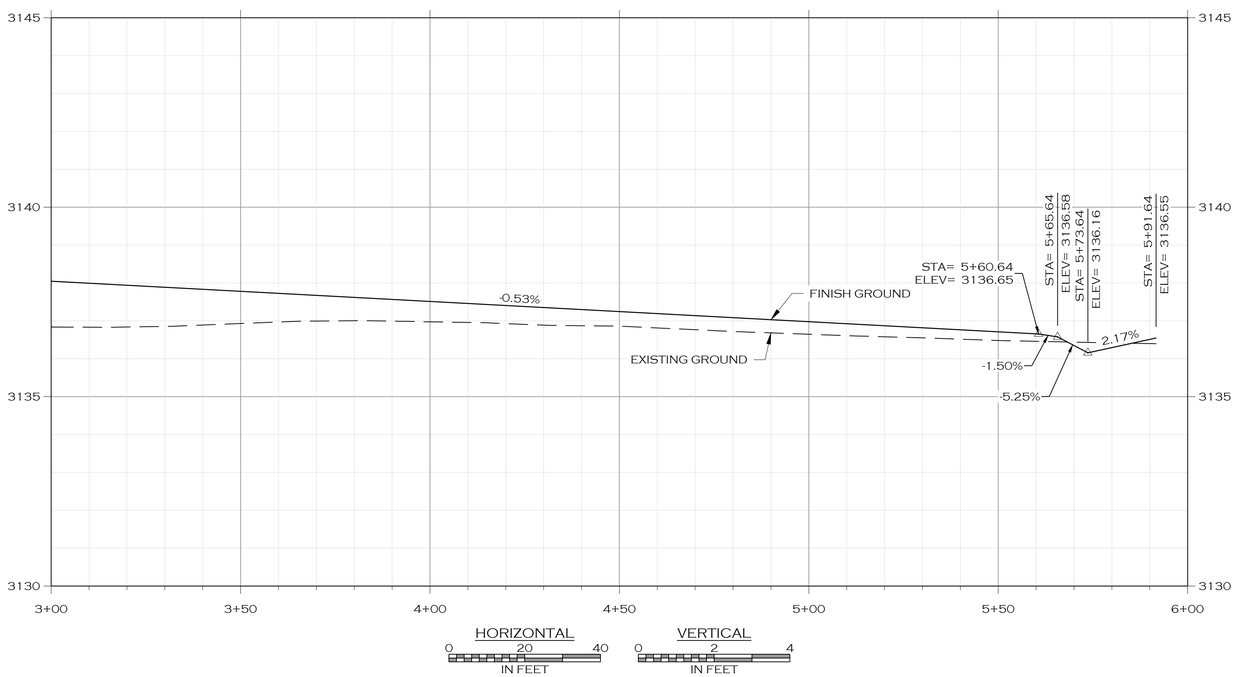

0 20 40
IN FEET

LEGEND

- PROPOSED BUILDING
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NOTES:

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PRELIMINARY

JOB #:	2101
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RIVERFRONT TRAILS
MISSOULA MONTANA

ALLEY B PLAN & PROFILE STA. 3+00 TO 6+00

C3.22

RD ALLEY B 3+00 TO 6+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
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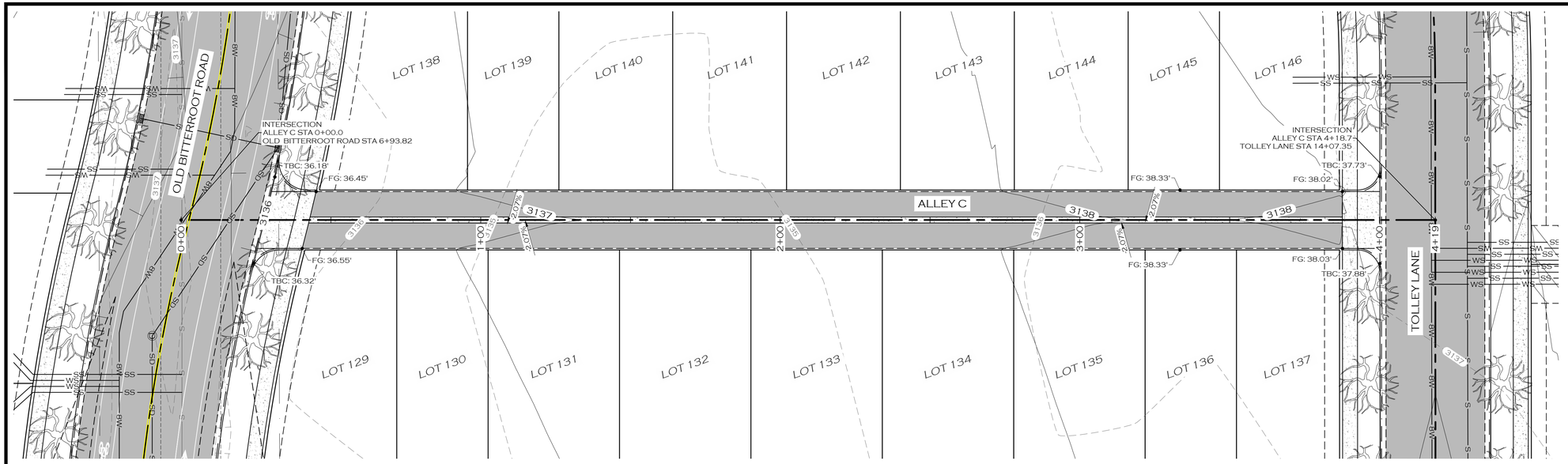

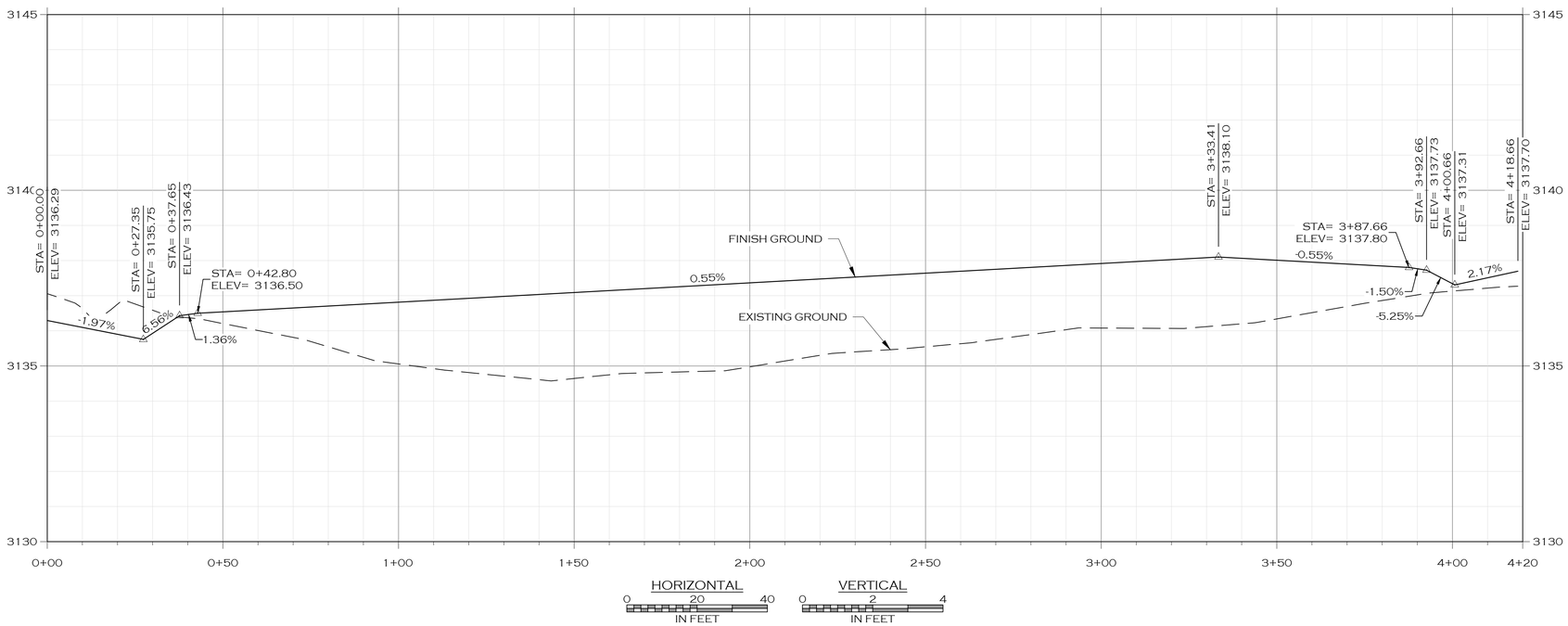

LEGEND

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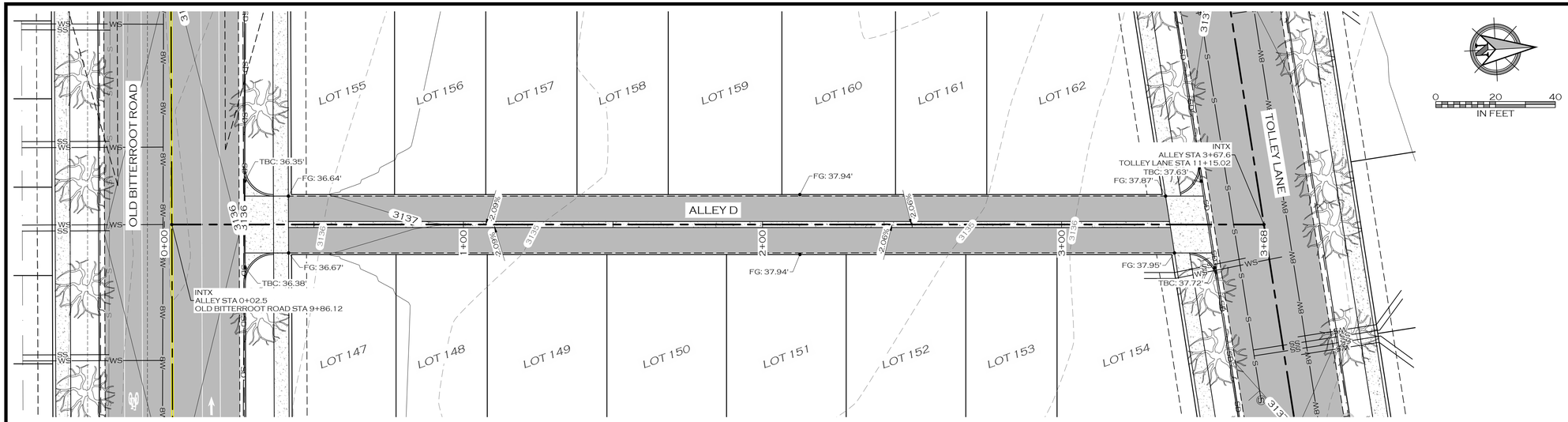
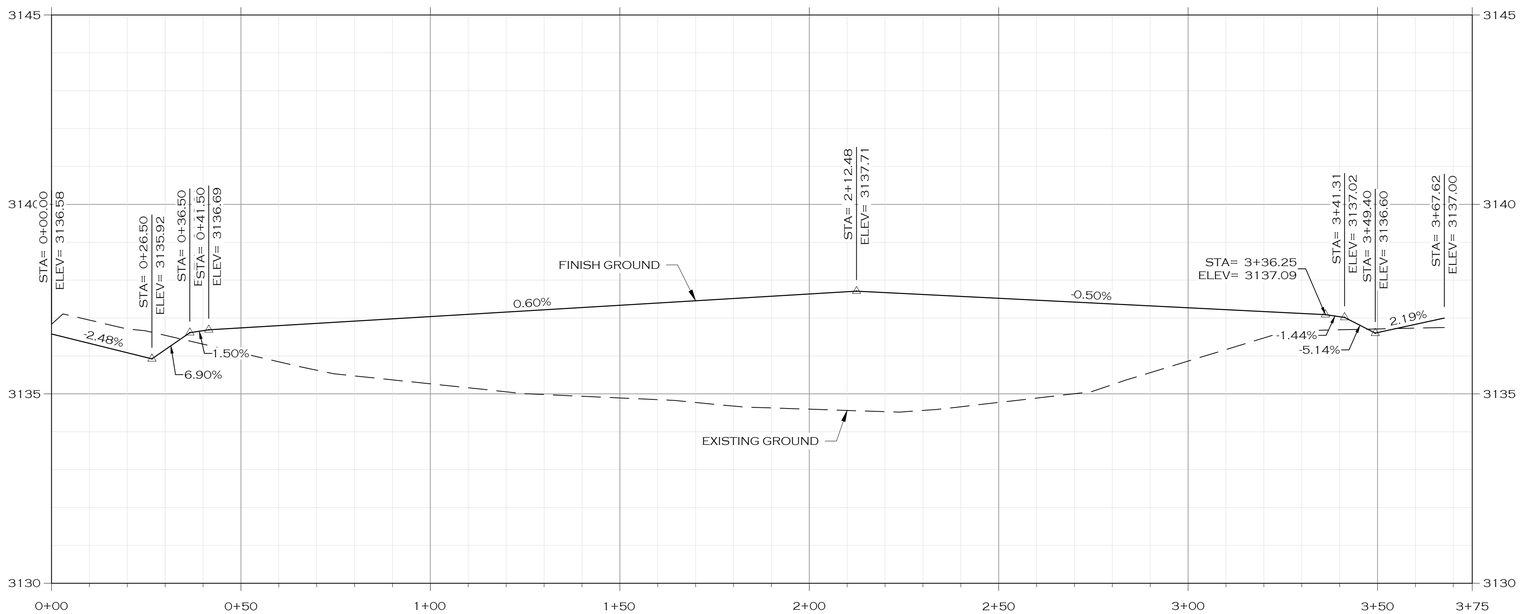
RIVERFRONT TRAILS
MISSOULA MONTANA
ALLEY C PLAN & PROFILE

C3.23

RD:ALLEY C.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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NOTES:

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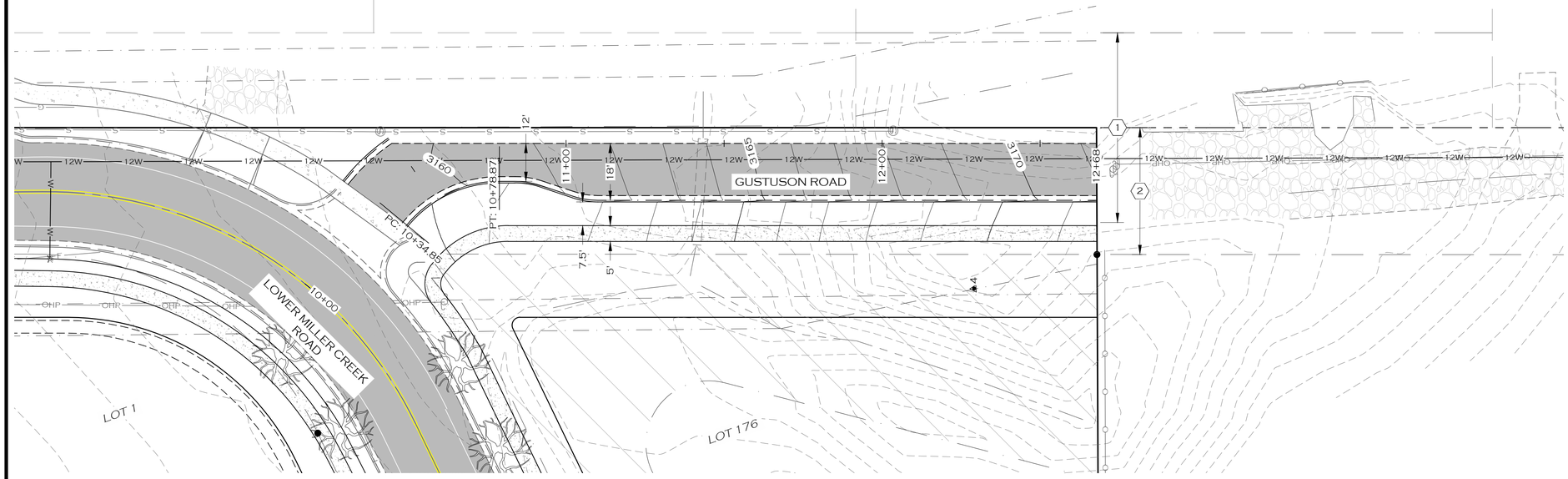
PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA

ALLEY D PLAN & PROFILE

C3.24

RD ALLEY D.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022



KEY NOTES:

1. 60' WIDE PUBLIC ROAD AS SHOWN ON COS 5554 AS "BOOK 1 ROAD" AND AS SHOWN ON COS 6199 AS "ROAD BOOK 1 MISSOULA COUNTY RECORDS"
2. 40' WIDE COUNTY ROAD AS DEPICTED ON SWEET GRASS ADDITION AT MALONEY RANCH - PHASE 1 AS "ROAD BOOK 1 OF MISSOULA COUNTY RECORDS"

NOTES:

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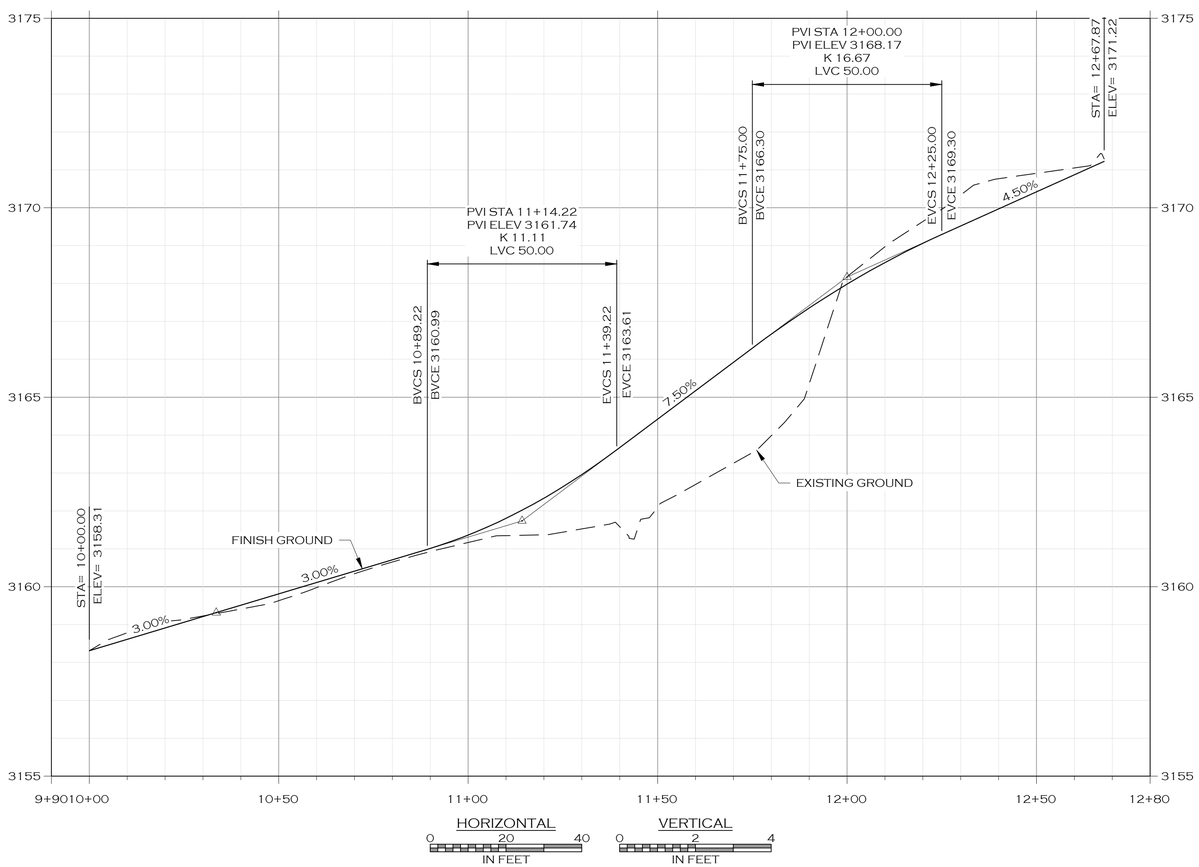

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- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
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- PROPOSED LANDSCAPING
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

PRELIMINARY

COLOR VERIFICATION
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JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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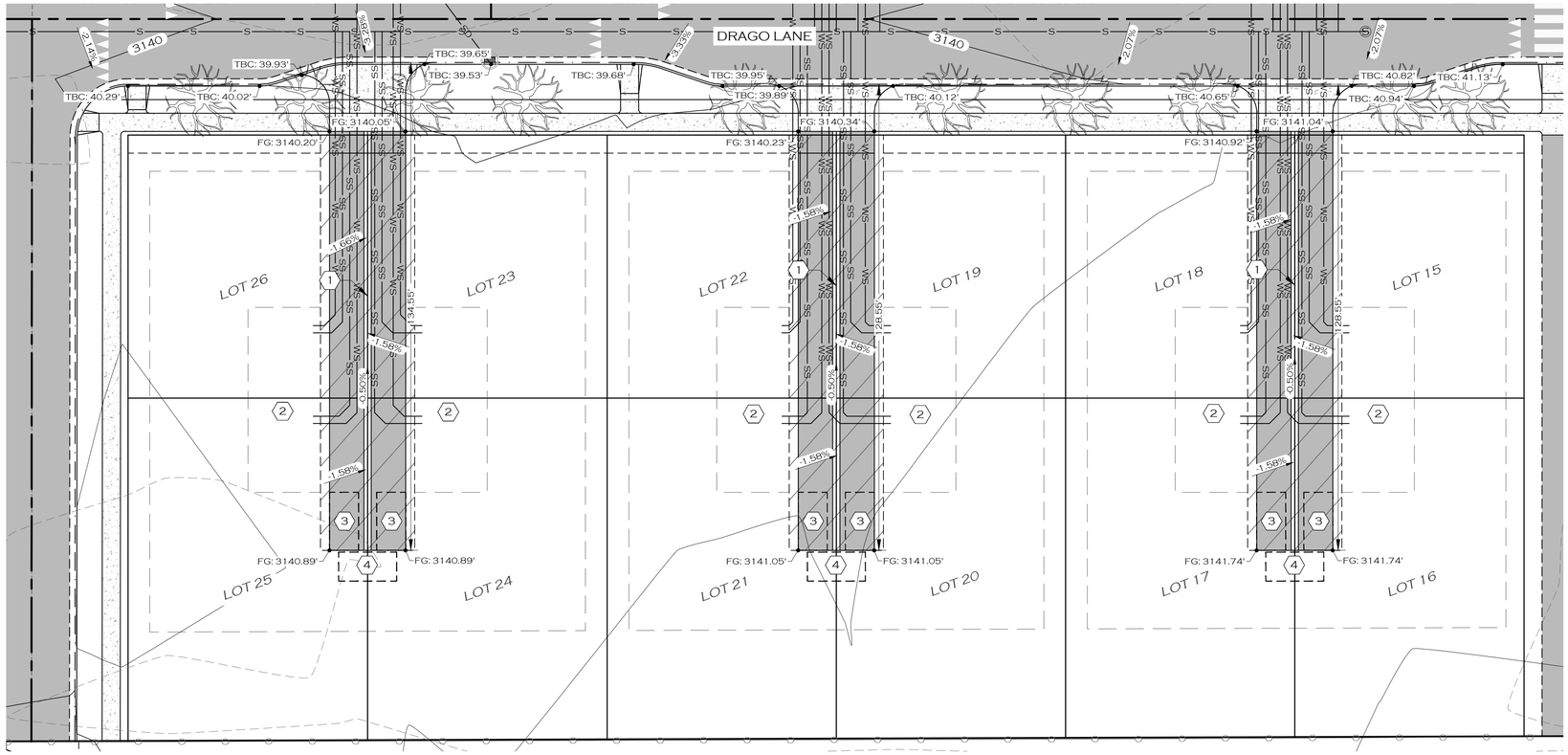
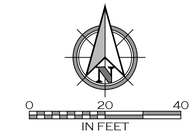
RIVERFRONT TRAILS
MISSOULA MONTANA

GUSTUSON ROAD HALF-STREET PLAN & PROFILE

C3.25

RD-GUSTUSON.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22 2022





KEY NOTES:

1. INSTALL 2' CONCRETE COVE GUTTER
2. PARKING AREA IN FRONT OF GARAGE SHALL SLOPE TO COVE GUTTER (BY OTHERS)
3. 16' x 8' OVERFLOW PARKING SPACE (0.5 REQUIRED PER DWELLING UNIT)
4. SNOW STORAGE AREA PER MISSOULA MUNICIPAL CODE 12.22

NOTES:

1. ADD 3100 TO ALL SPOT ELEVATION CALLOUTS
2. PROVIDE "NO PARKING" SIGNS IN LOCATIONS SPECIFIED ON SHEET C7.2.

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
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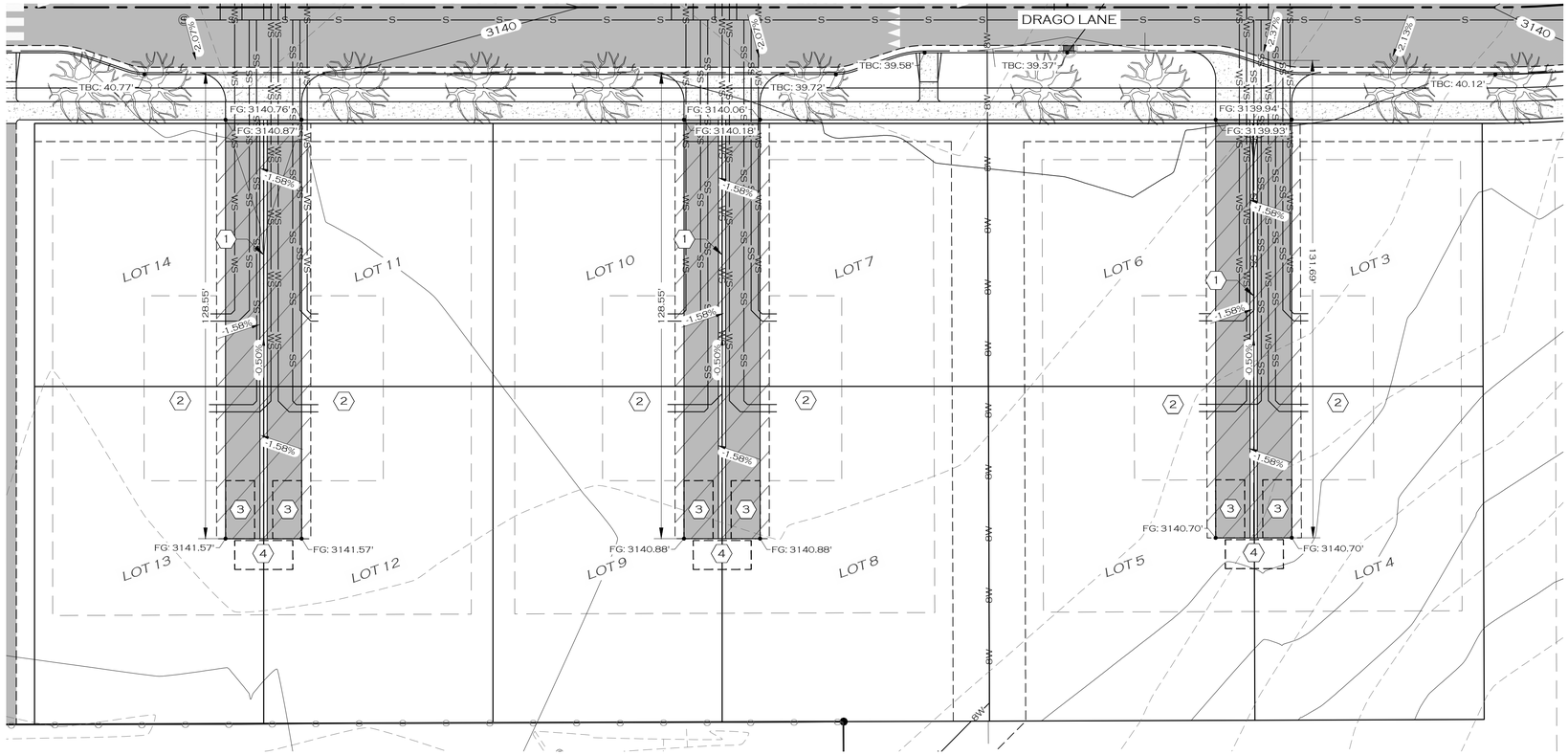
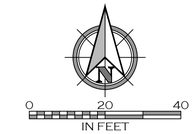
RIVERFRONT TRAILS
MISSOULA MONTANA

SHORT COURT GRADING PLANS - A

C3.26

SHORT COURT GRADING PLANS - A.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022





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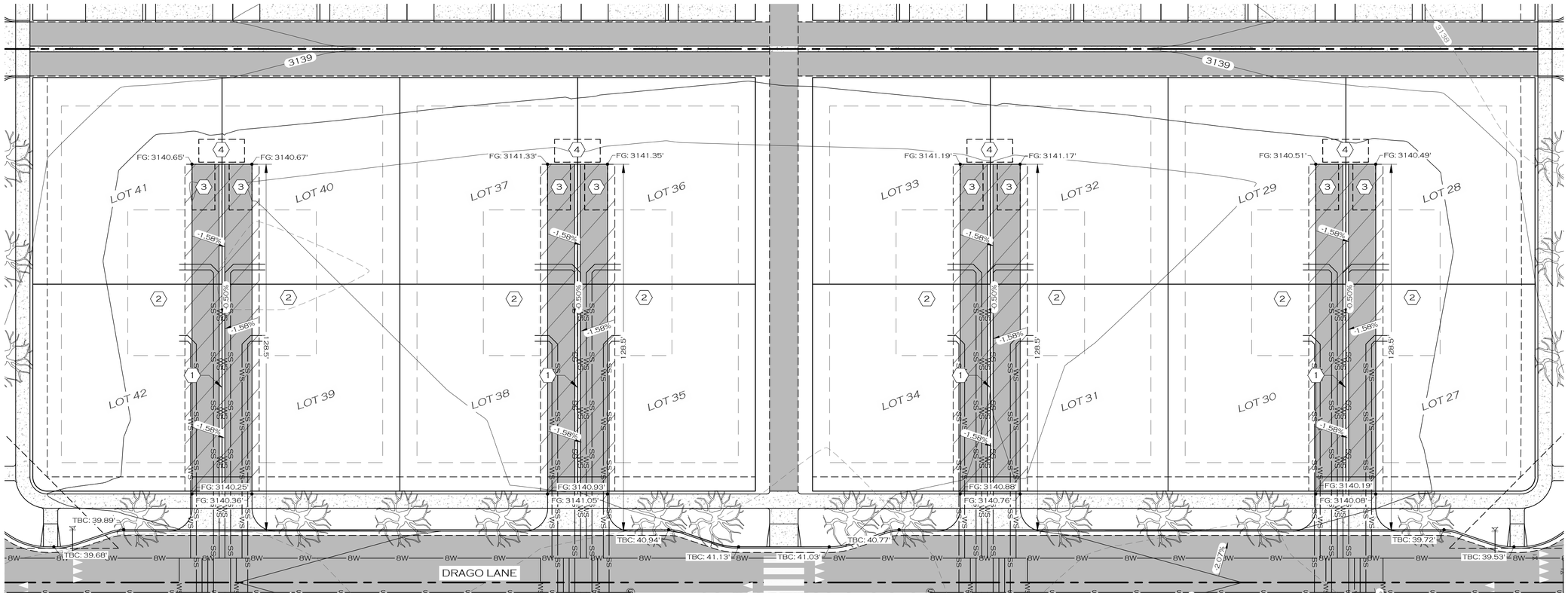
RIVERFRONT TRAILS
MISSOULA MONTANA

SHORT COURT GRADING PLANS - B

C3.27

SHORT COURT GRADING PLANS - B.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

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0 20 40
IN FEET

KEY NOTES:

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PRELIMINARY

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QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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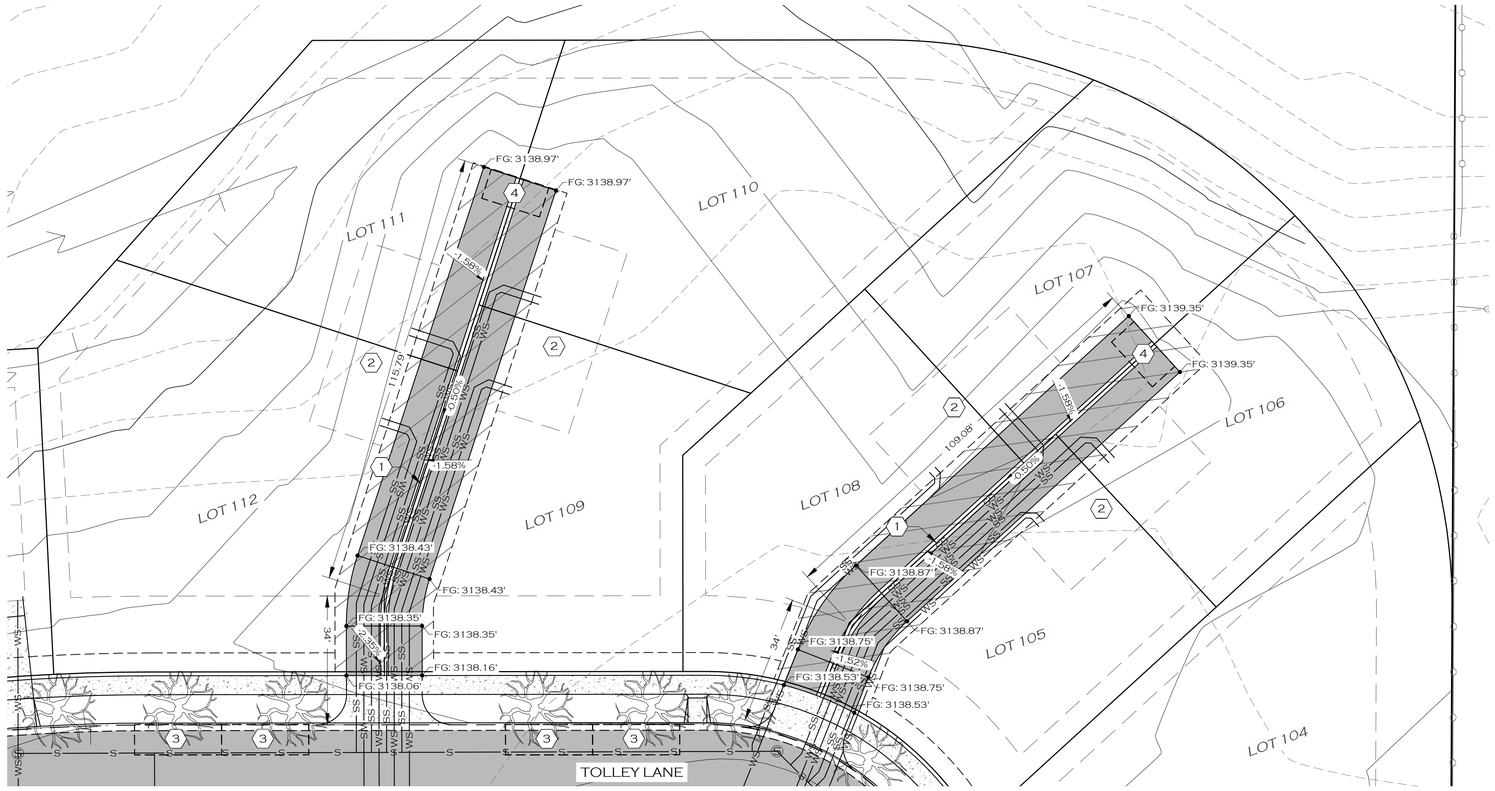
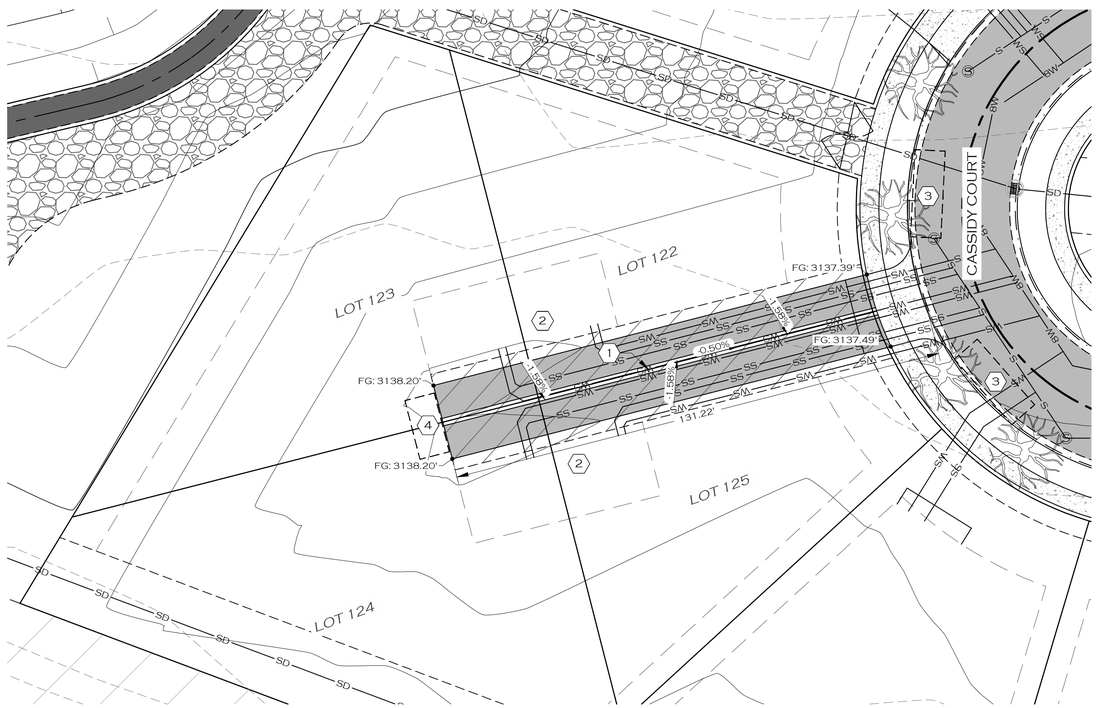
RIVERFRONT TRAILS
MISSOULA MONTANA

SHORT COURT GRADING PLANS - C

C3.28

SHORT COURT GRADING PLANS - C.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022





LEGEND

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0 20 40
IN FEET

KEY NOTES:

1. INSTALL 2' CONCRETE COVE GUTTER
2. PARKING AREA IN FRONT OF GARAGE SHALL SLOPE TO COVE GUTTER (BY OTHERS)
3. 23' x 8' OVERFLOW PARKING SPACE (0.5 REQUIRED PER DWELLING UNIT)
4. SNOW STORAGE AREA PER MISSOULA MUNICIPAL CODE 12.22

NOTES:

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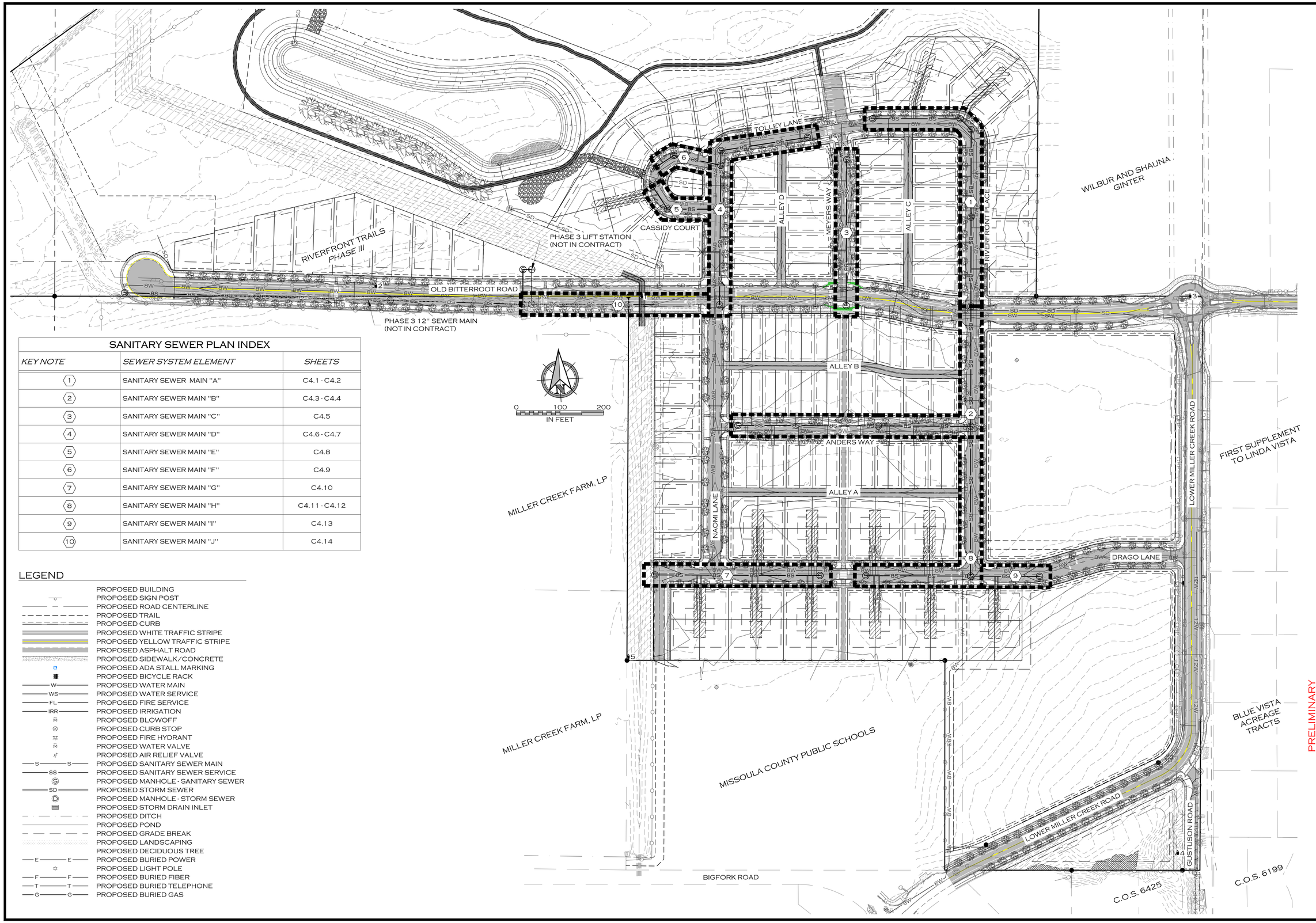
RIVERFRONT TRAILS
MISSOULA MONTANA

SHORT COURT GRADING PLANS - D

C3.29

SHORT COURT GRADING PLANS - D.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



SANITARY SEWER PLAN INDEX

KEY NOTE	SEWER SYSTEM ELEMENT	SHEETS
1	SANITARY SEWER MAIN "A"	C4.1 - C4.2
2	SANITARY SEWER MAIN "B"	C4.3 - C4.4
3	SANITARY SEWER MAIN "C"	C4.5
4	SANITARY SEWER MAIN "D"	C4.6 - C4.7
5	SANITARY SEWER MAIN "E"	C4.8
6	SANITARY SEWER MAIN "F"	C4.9
7	SANITARY SEWER MAIN "G"	C4.10
8	SANITARY SEWER MAIN "H"	C4.11 - C4.12
9	SANITARY SEWER MAIN "I"	C4.13
10	SANITARY SEWER MAIN "J"	C4.14

LEGEND

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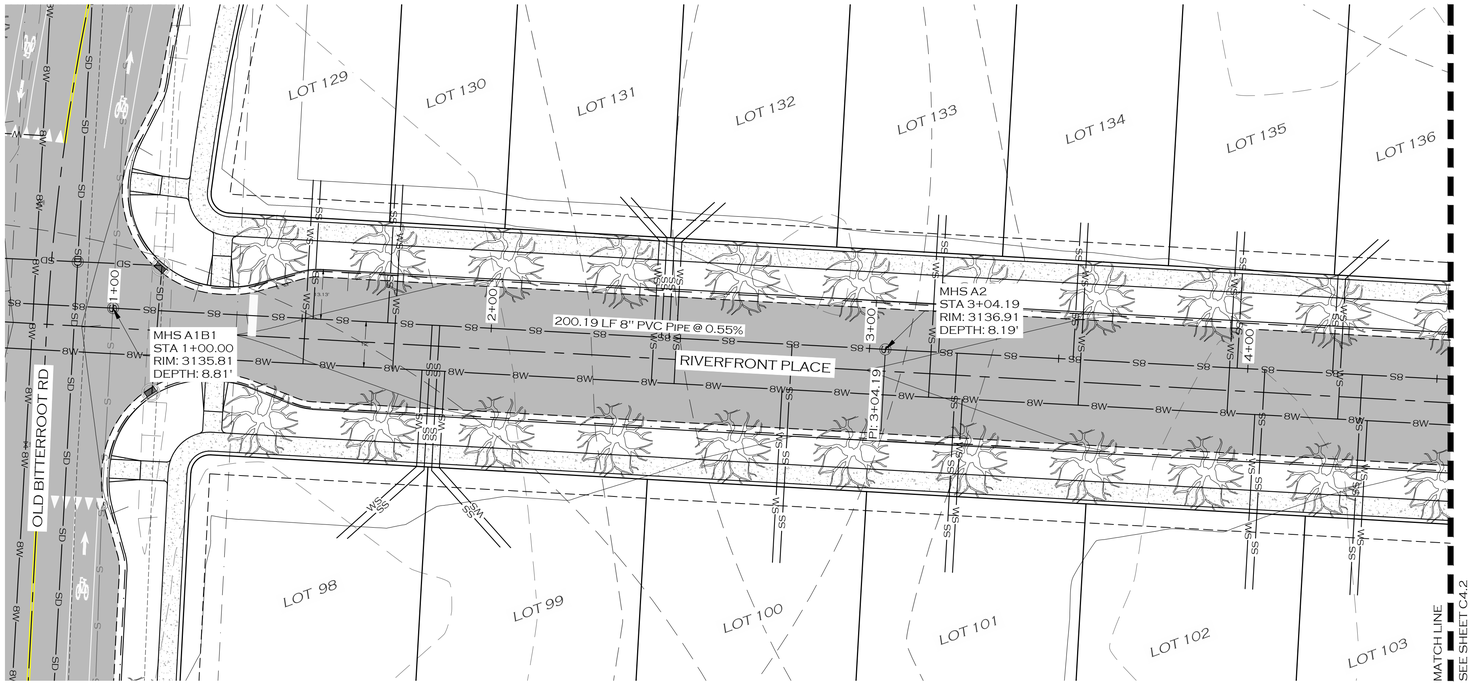
RIVERFRONT TRAILS

MISSOULA MONTANA

OVERALL SANITARY SEWER PLAN

C4.0

OVERALL SANITARY SEWER MAIN EXTENSION PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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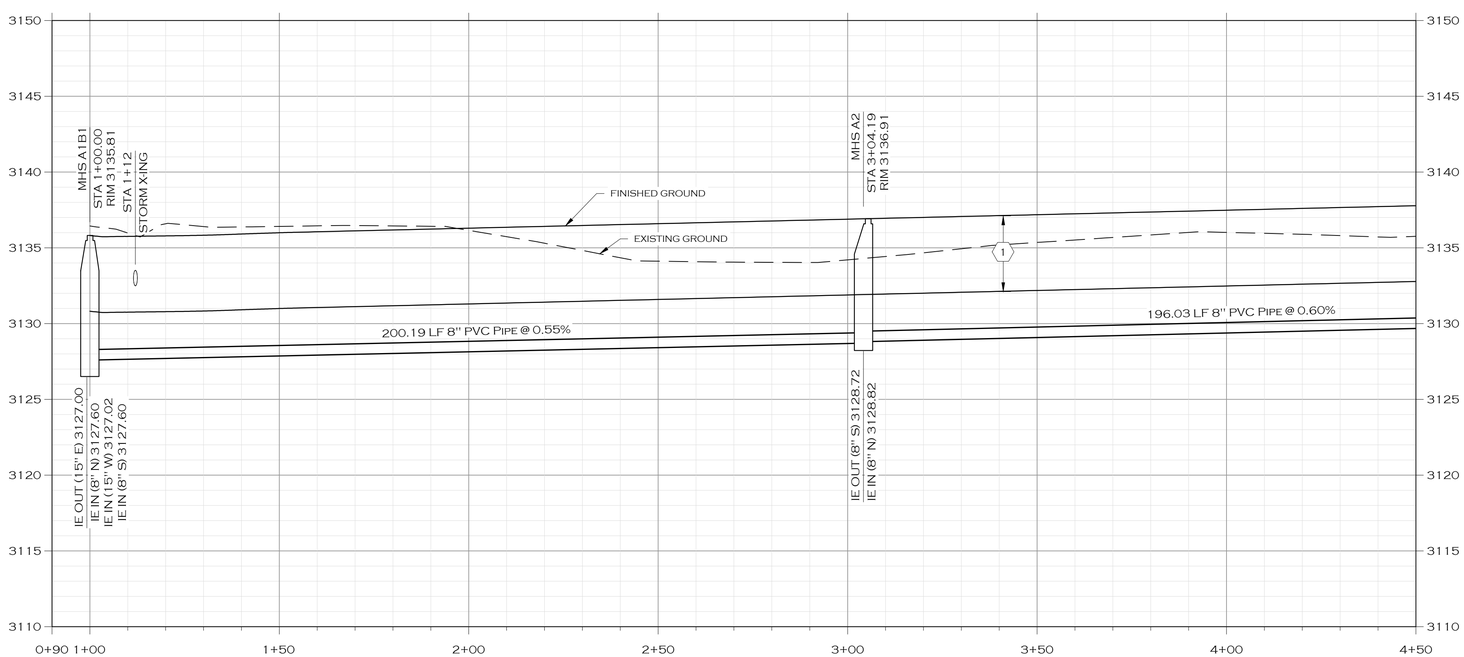
IN FEET



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

LENGEND

- PROPOSED BUILDING
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KEY NOTES

1. MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS

NOTES

1. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 10 FEET AND VERTICAL SEPARATION OF 18 INCHES BETWEEN ALL SANITARY SEWER AND WATER MAINS.
2. SEWER SERVICE STUBS SHALL STOP 5 FEET INSIDE THE PROPERTY LINE.
3. PROTECT EXISTING UTILITIES DURING CONSTRUCTION ACTIVITIES.

PRELIMINARY

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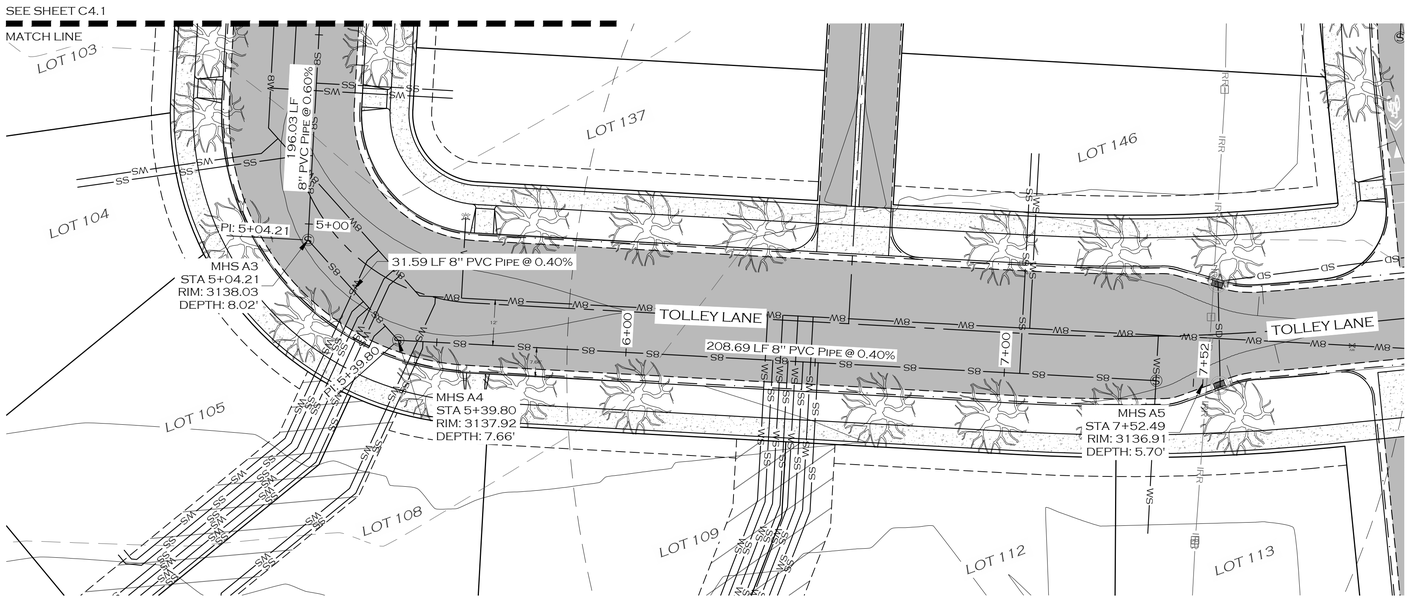
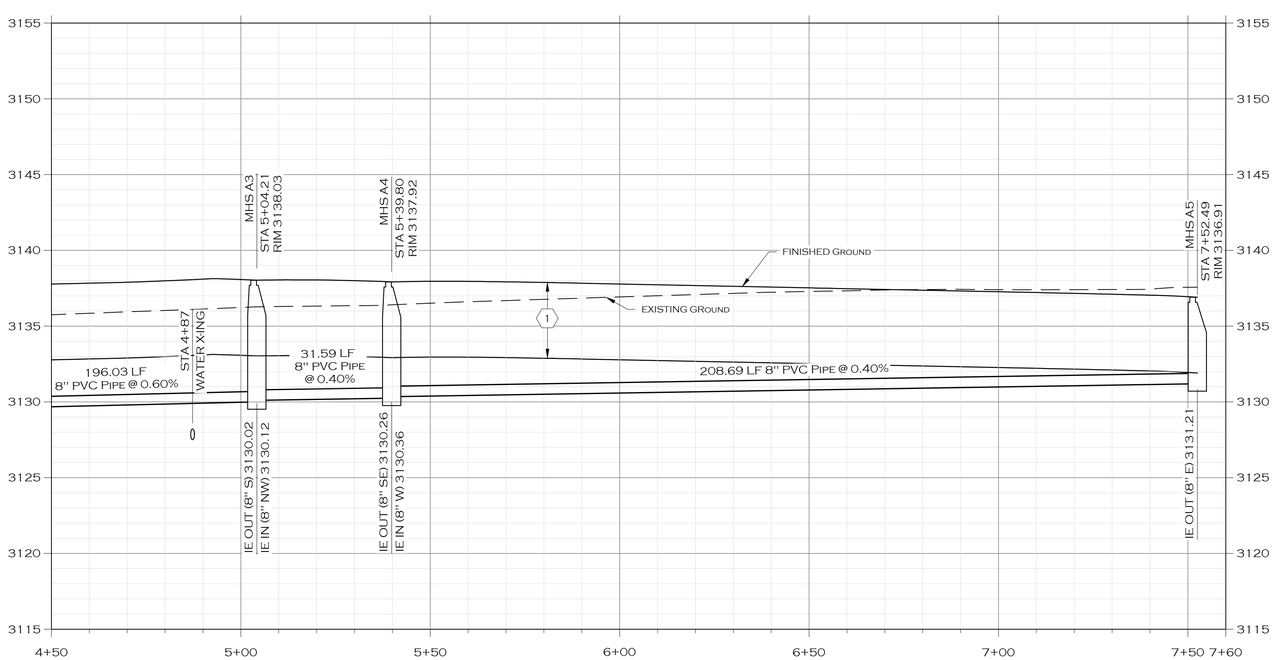
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN A PLAN & PROFILE STA. 0+00 TO 4+50

C4.1

SEWER A 0+00 TO 4+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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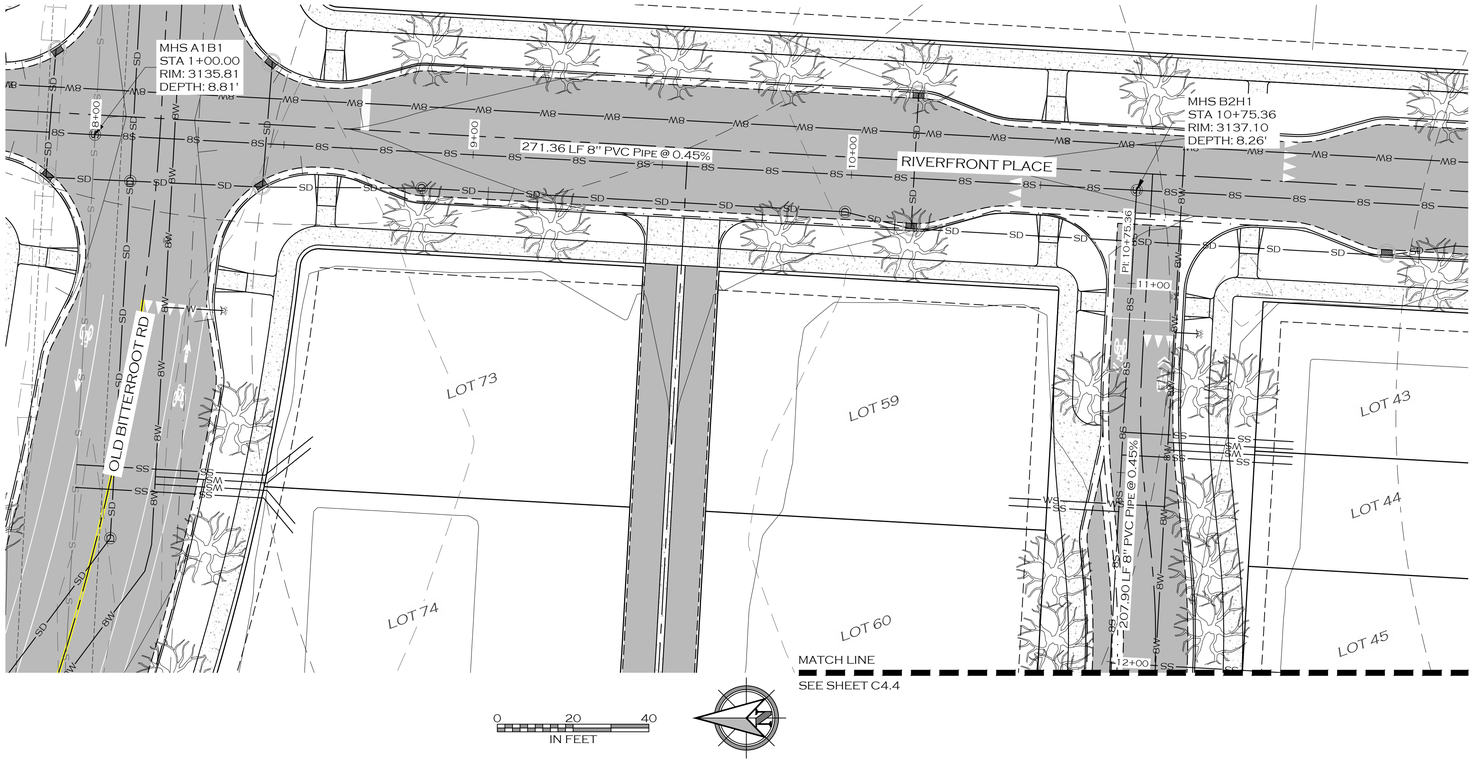
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN A PLAN & PROFILE STA. 4+50 TO 7+20

C4.2

SEWER A 4+50 TO 7+52.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



KEY NOTES

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
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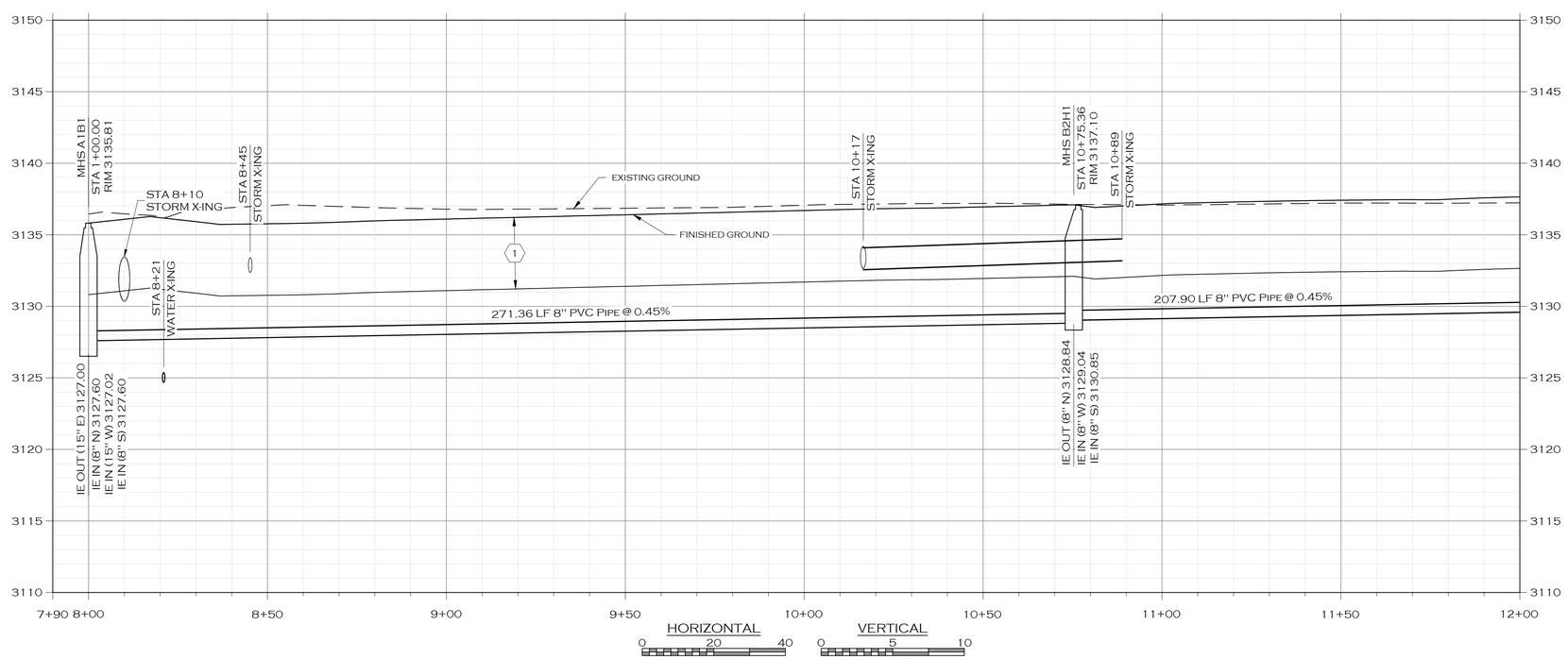
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

KEY NOTES

1. MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS



NOTES

1. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 10 FEET AND VERTICAL SEPARATION OF 18 INCHES BETWEEN ALL SANITARY SEWER AND WATER MAINS.
2. SEWER SERVICE STUBS SHALL STOP 5 FEET INSIDE THE PROPERTY LINE.
3. PROTECT EXISTING UTILITIES DURING CONSTRUCTION ACTIVITIES.

PRELIMINARY

JOB #:	2101
DRAWN:	LJJ
DESIGN:	LJJ
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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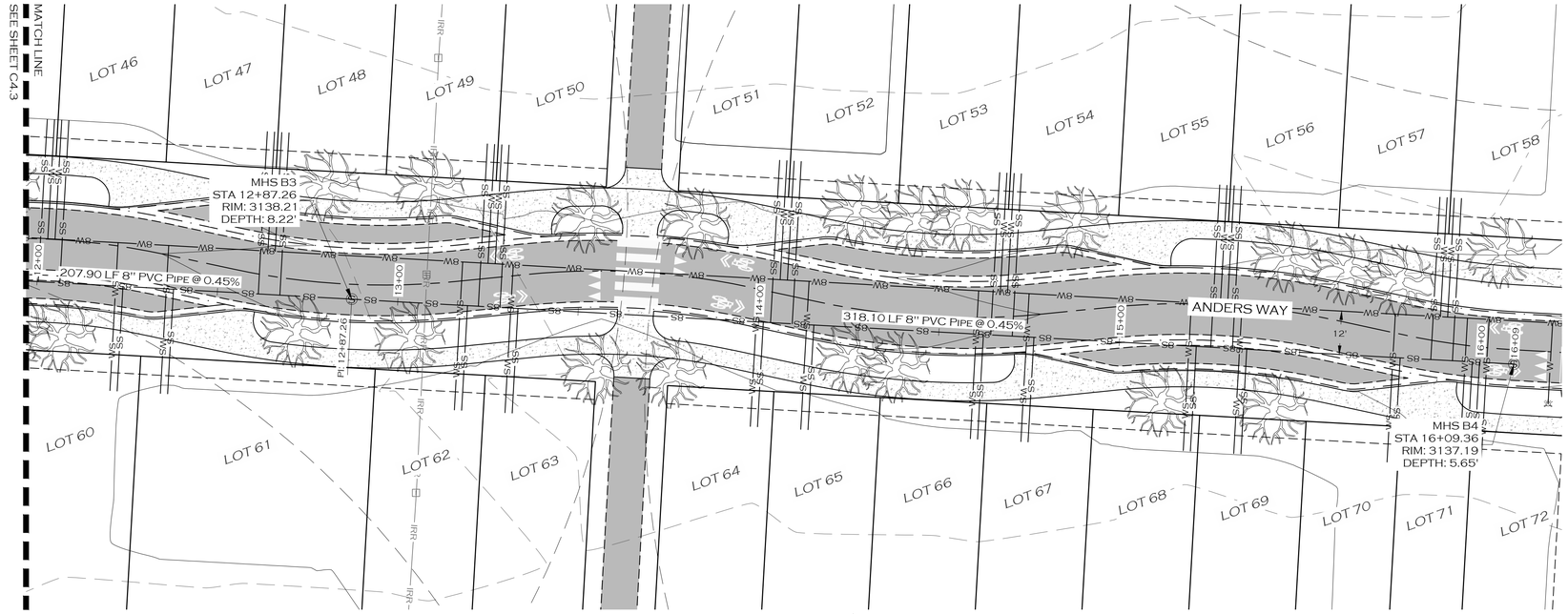
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN B PLAN & PROFILE STA. 8+00 TO 11+50

C4.3

SEWER B 8+00 TO 11+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022



KEY NOTES

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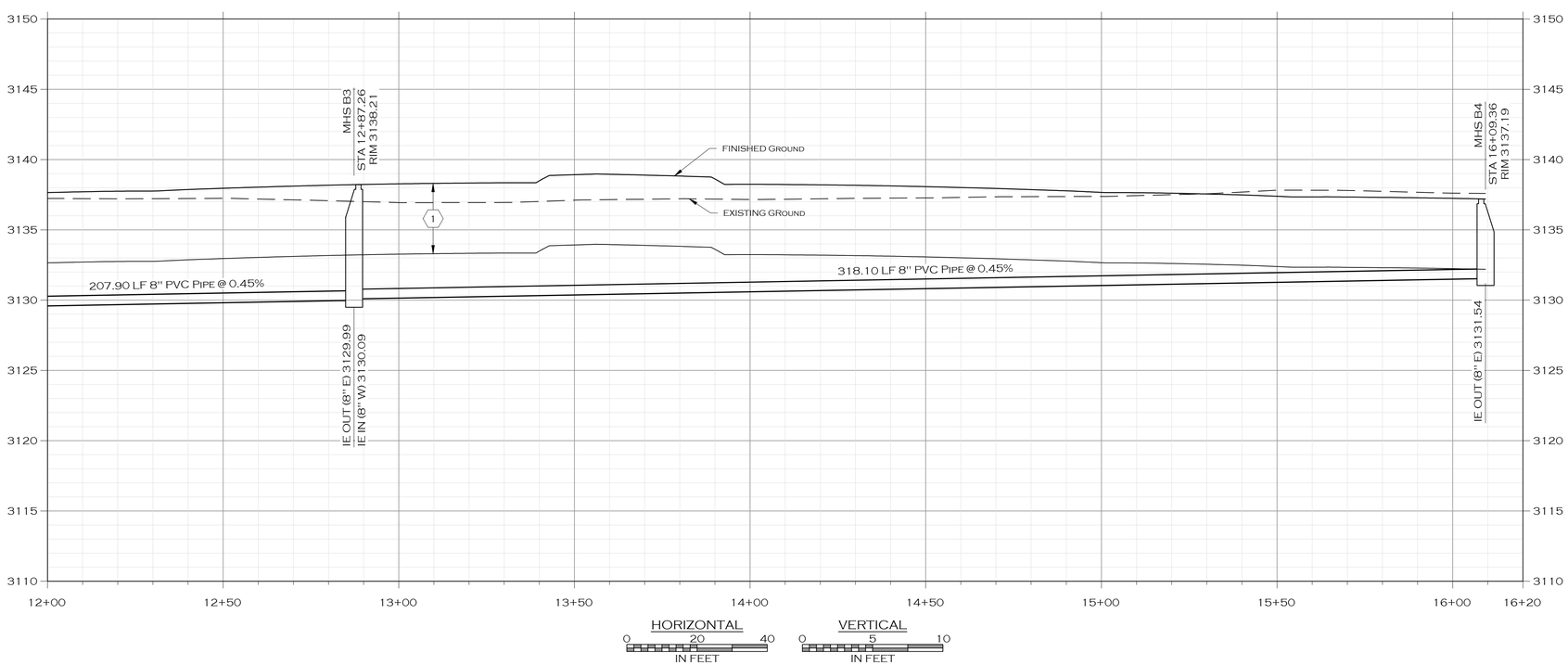
KEY NOTES

(1) MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS



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PRELIMINARY

JOB #:	2101
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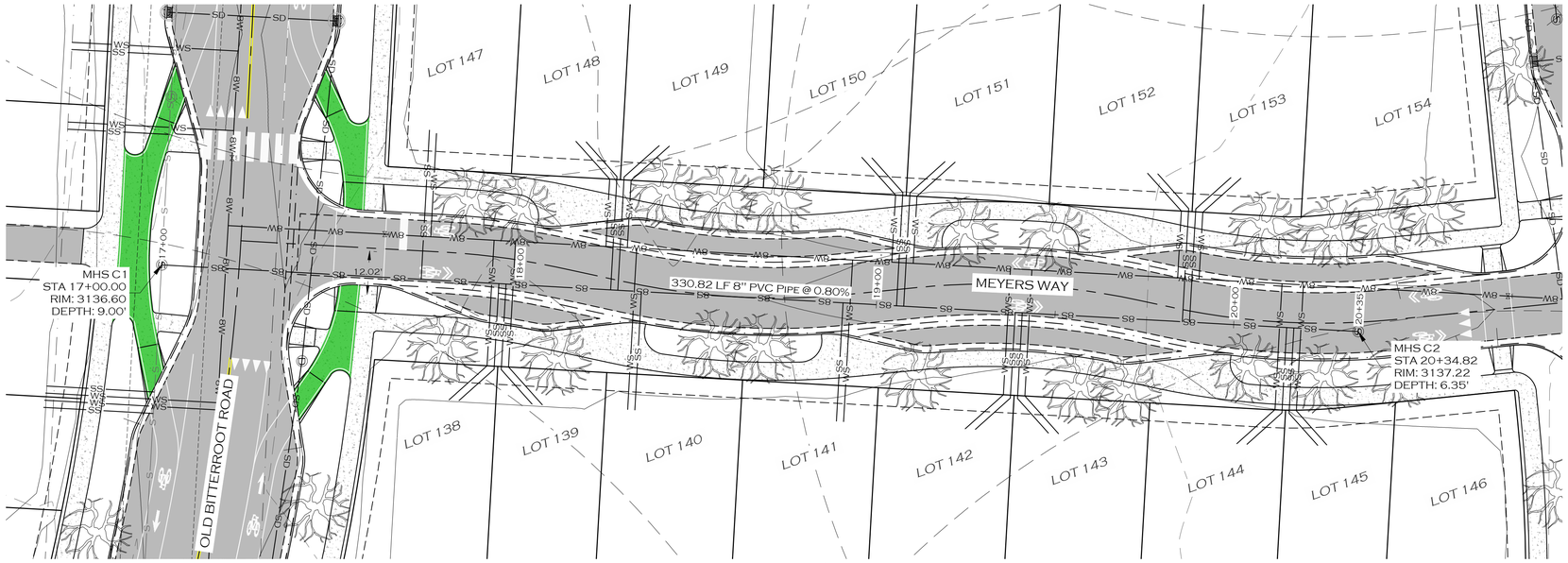
RIVERFRONT TRAILS

MISSOULA MONTANA

SEWER MAIN B PLAN & PROFILE STA. 11+50 TO 16+02

C4.4

SEWER B 11+50 TO 16+02.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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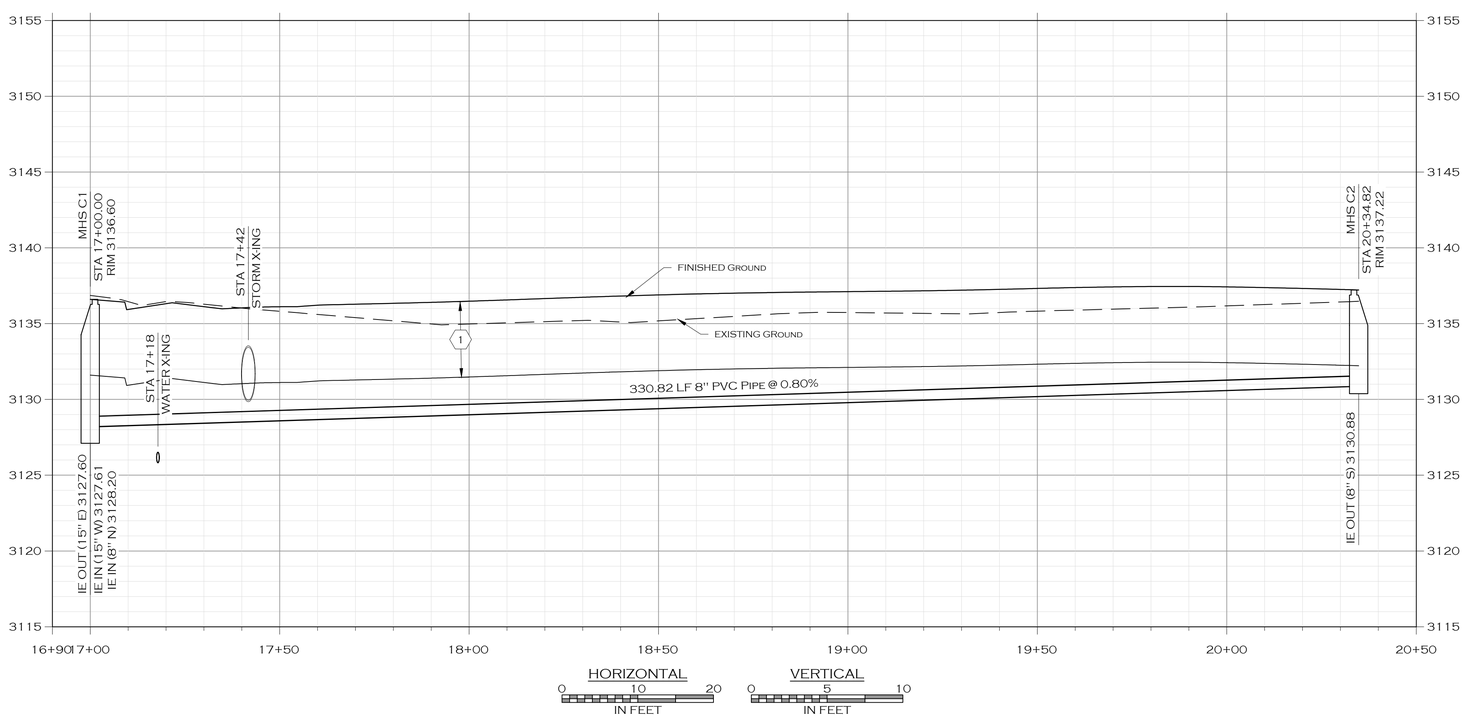
- G — PROPOSED BURIED GAS

KEY NOTES

1. MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS



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PRELIMINARY

JOB #:	2101
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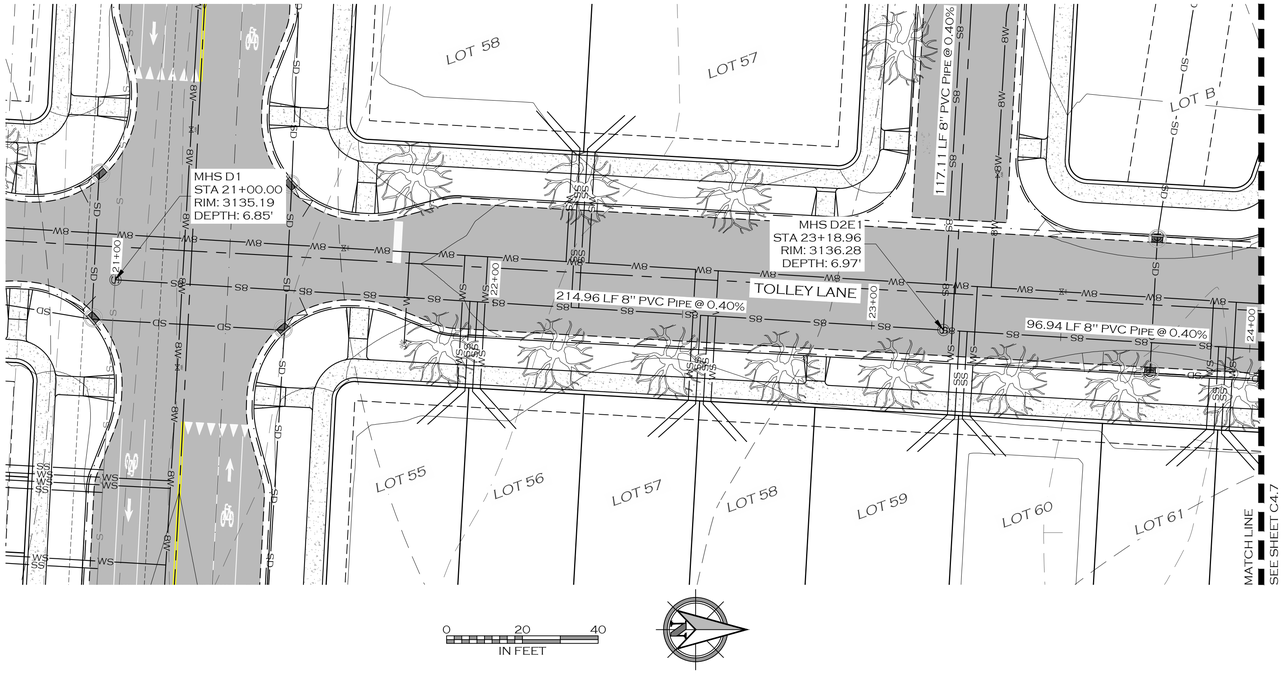
RIVERFRONT TRAILS

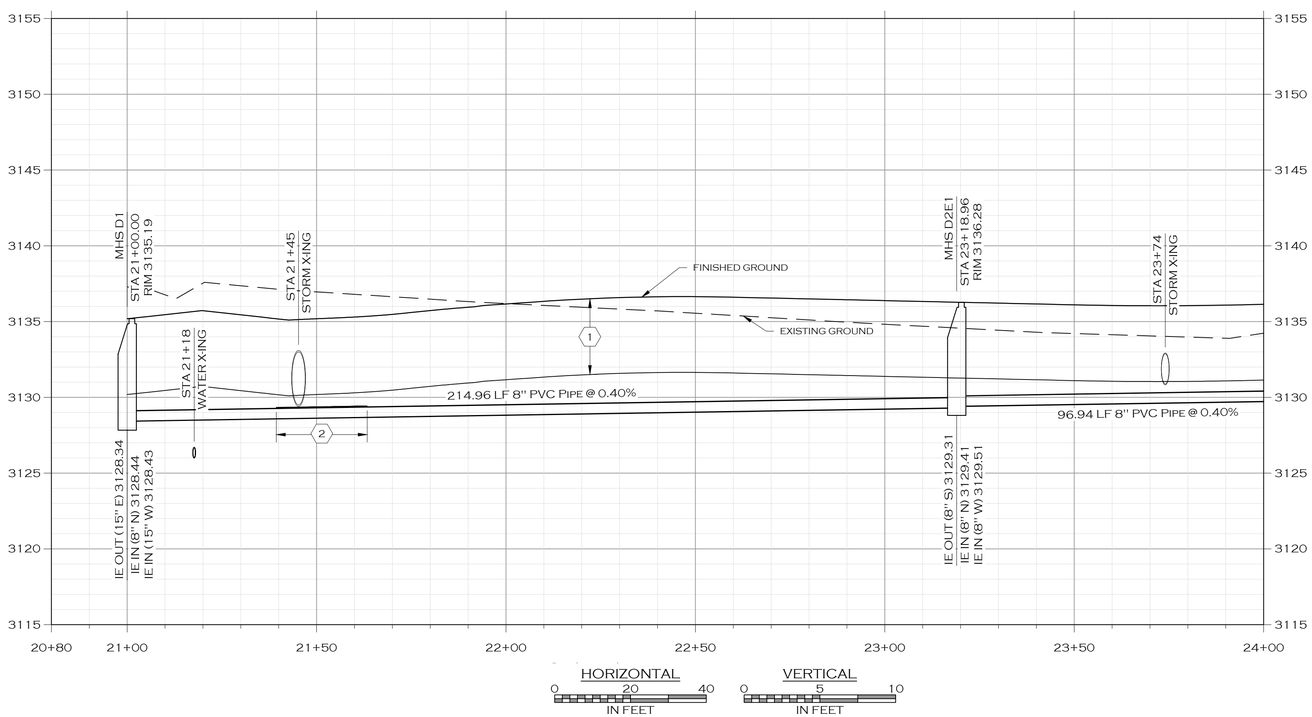
MISSOULA MONTANA

SEWER MAIN C PLAN & PROFILE

C4.5

SEWER C 17+00 TO 21+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022





KEY NOTES

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KEY NOTES

1. MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS
2. PROVIDE BLUEBOARD INSULATION OVER SANITARY SEWER MAIN.

NOTES

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3. PROTECT EXISTING UTILITIES DURING CONSTRUCTION ACTIVITIES.

PRELIMINARY

JOB #:	2101
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DATE:	7/21/2022

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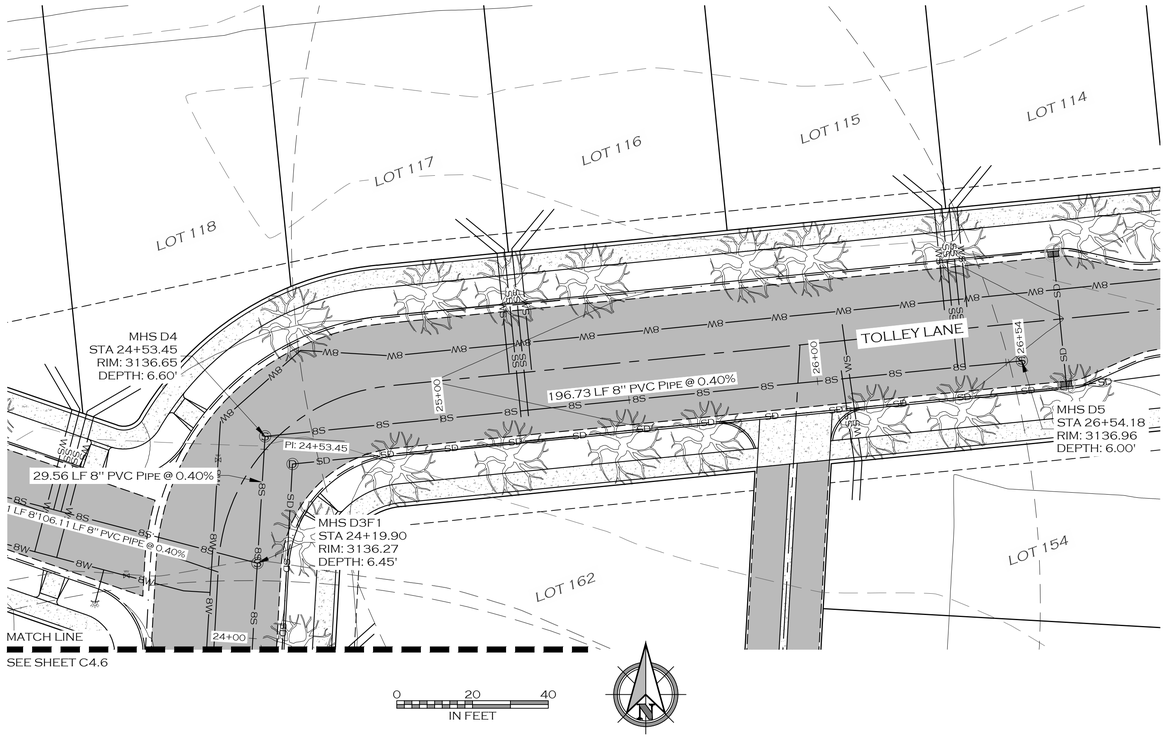
RIVERFRONT TRAILS

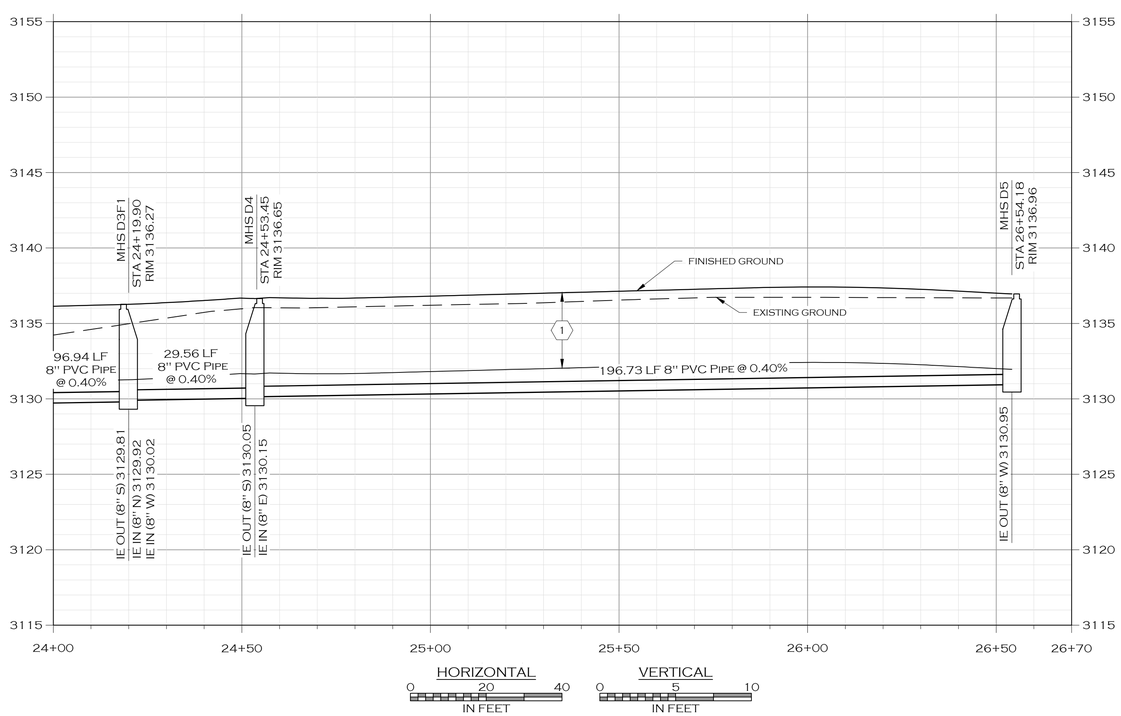
MISSOULA MONTANA

SEWER MAIN D PLAN & PROFILE STA. 21+00 TO 24+00

C4.6

SEWER D 21+00 TO 24+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022





KEY NOTES

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KEY NOTES

1. MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS

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PRELIMINARY

JOB #:	2101
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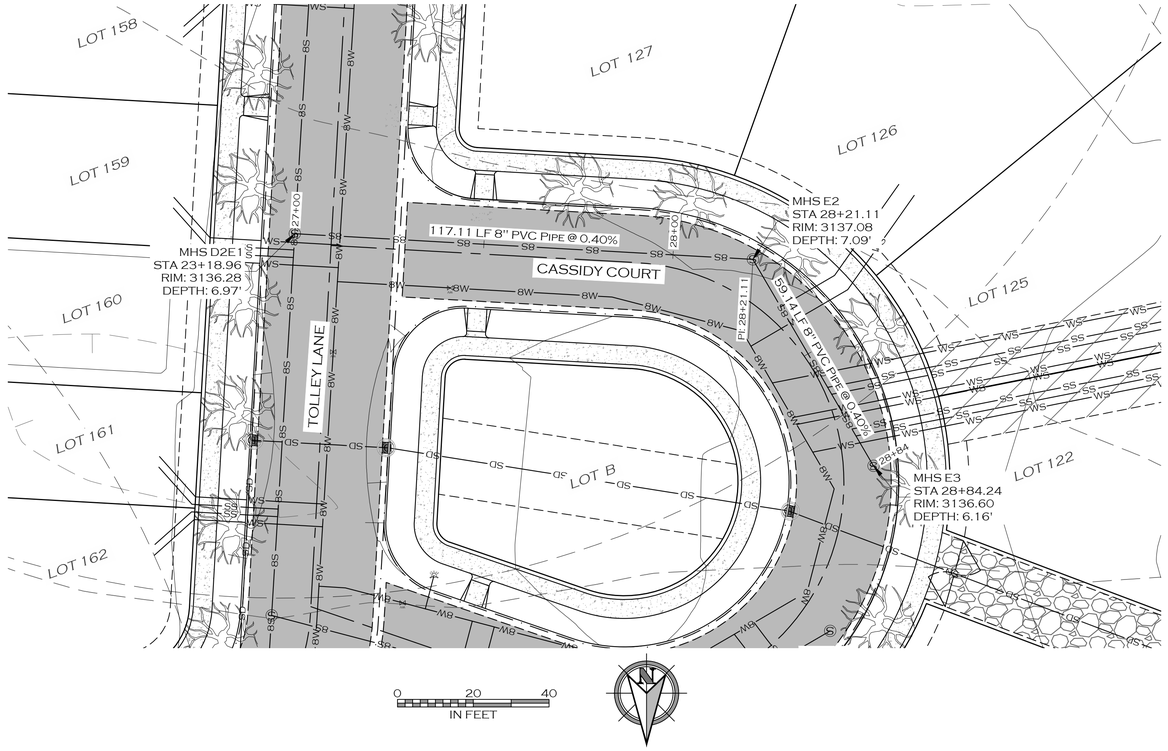
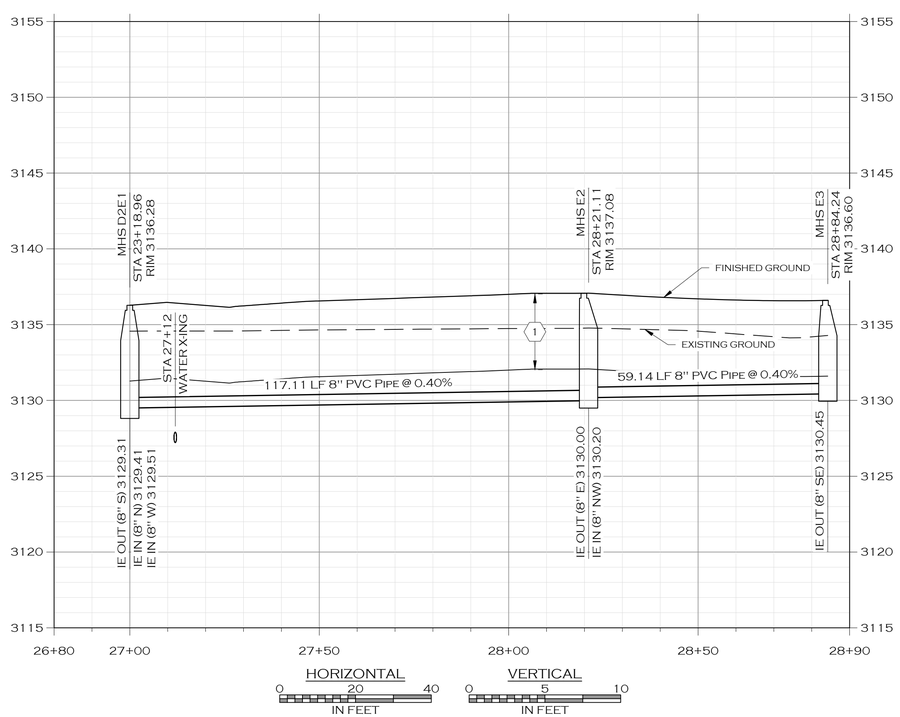
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN D PLAN & PROFILE STA. 24+00 TO 26+54

C4.7

SEWER D 24+00 TO 26+54.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022





KEY NOTES

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KEY NOTES

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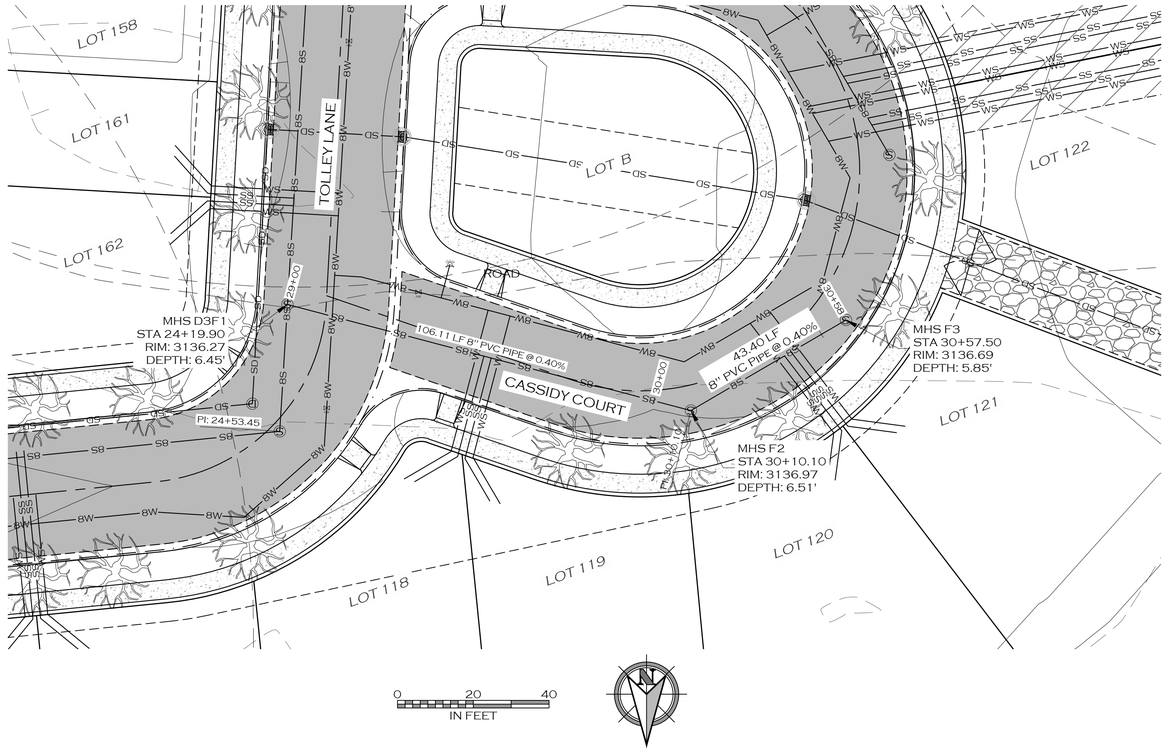
RIVERFRONT TRAILS

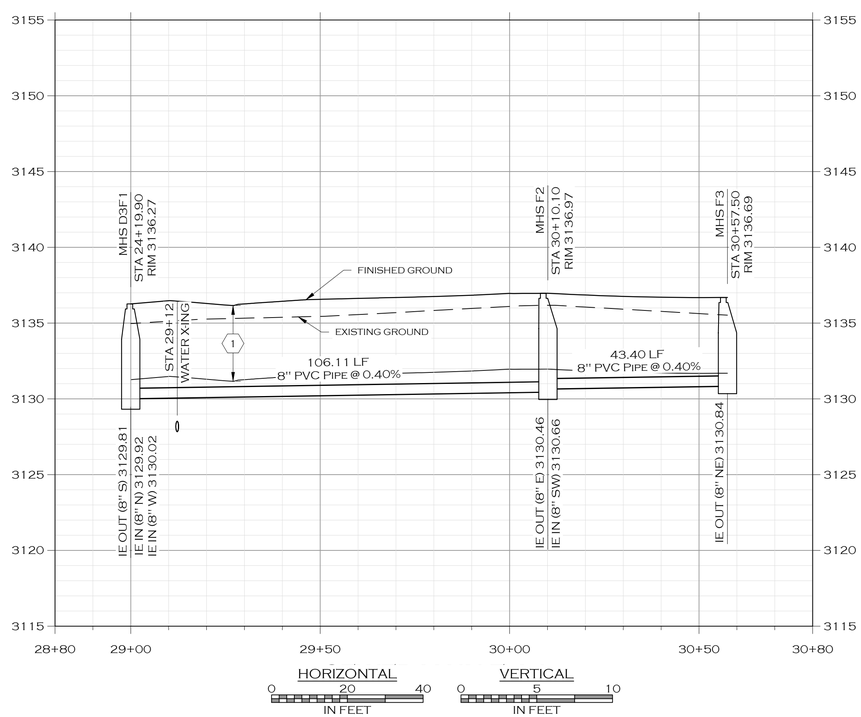
MISSOULA MONTANA

SEWER MAIN E PLAN & PROFILE

C4.8

SEWER E 27+00 TO 28+84.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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KEY NOTES

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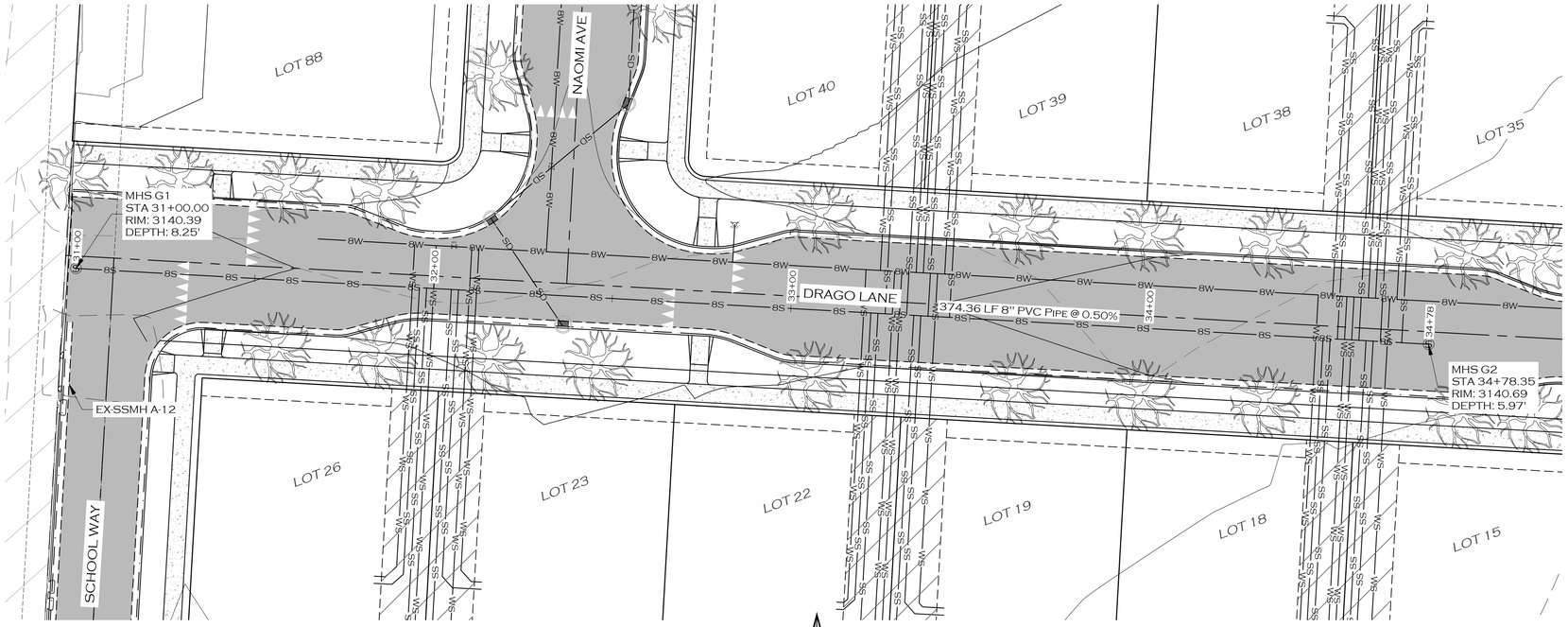
RIVERFRONT TRAILS

MISSOULA MONTANA

SEWER MAIN F PLAN & PROFILE

C4.9

SEWER F 29+00 TO 30+58.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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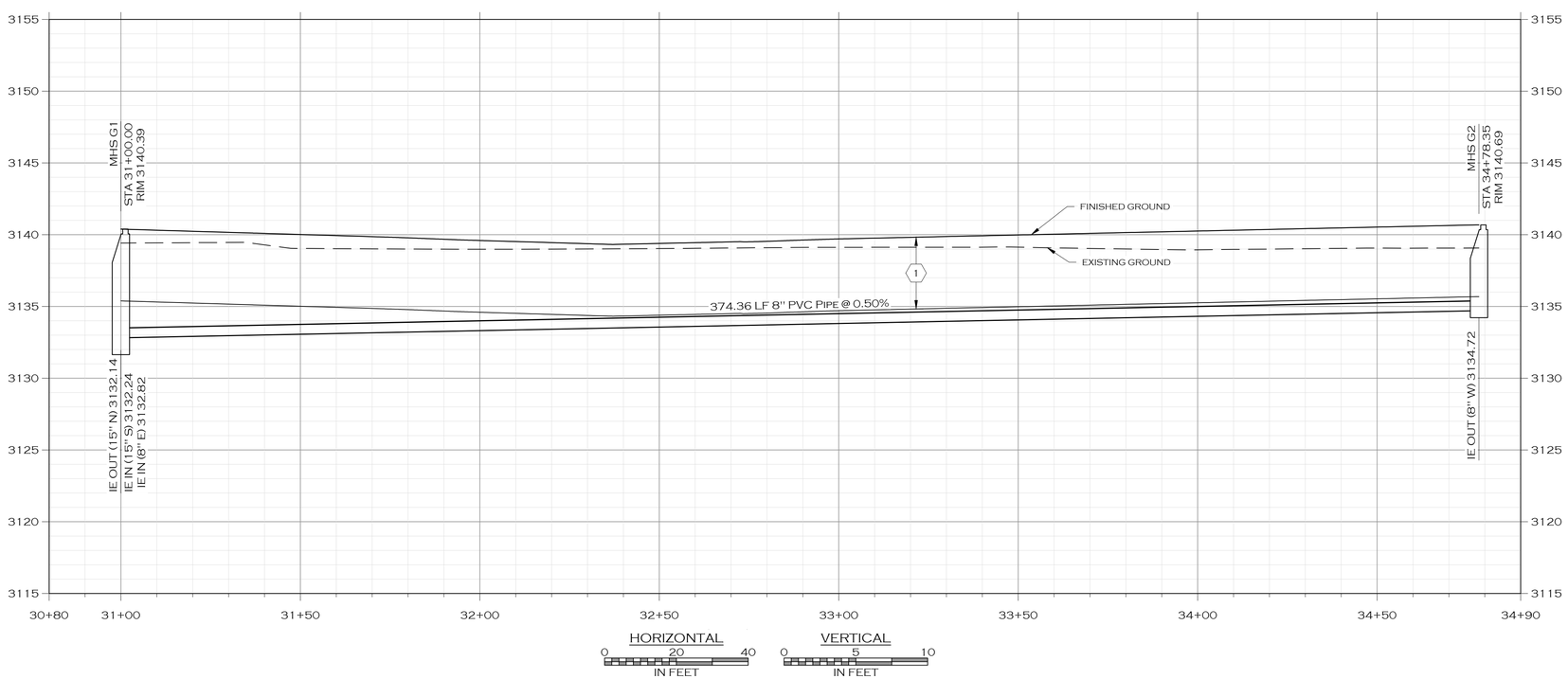
KEY NOTES

1. MAINTAIN 5 FEET OF COVER MINIMUM ON NON-INSULATED SANITARY SEWER MAINS



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PRELIMINARY

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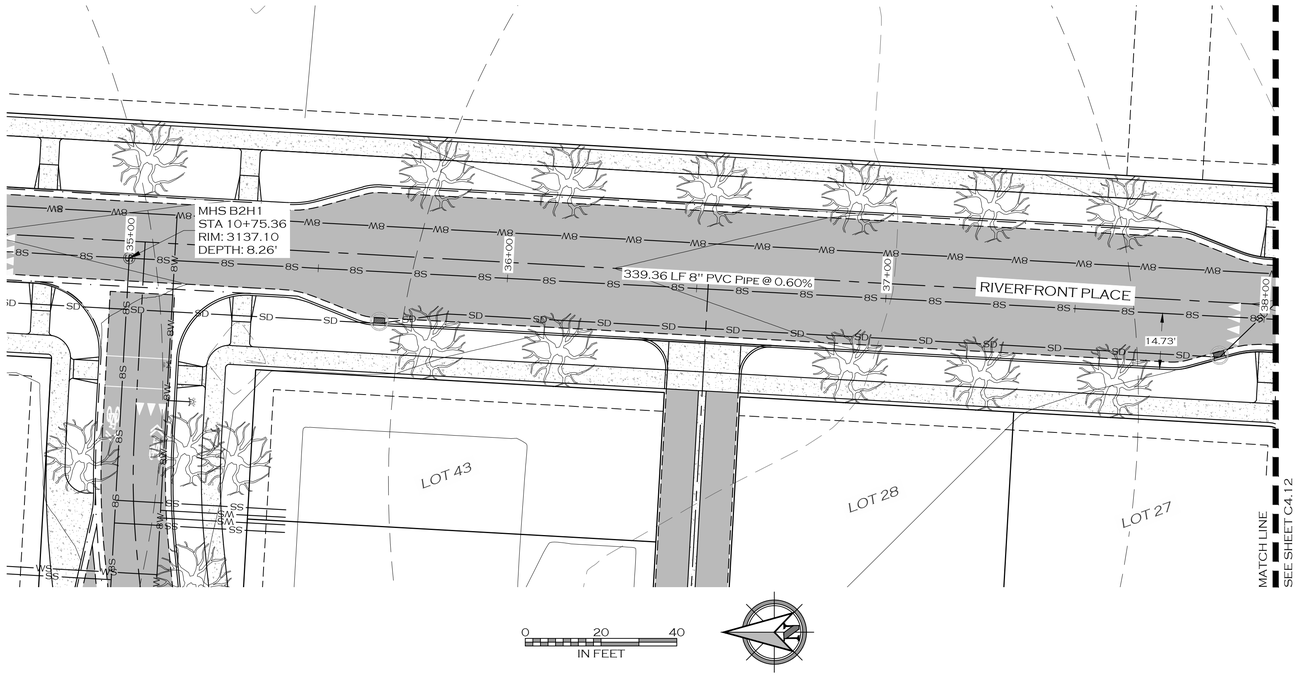
RIVERFRONT TRAILS

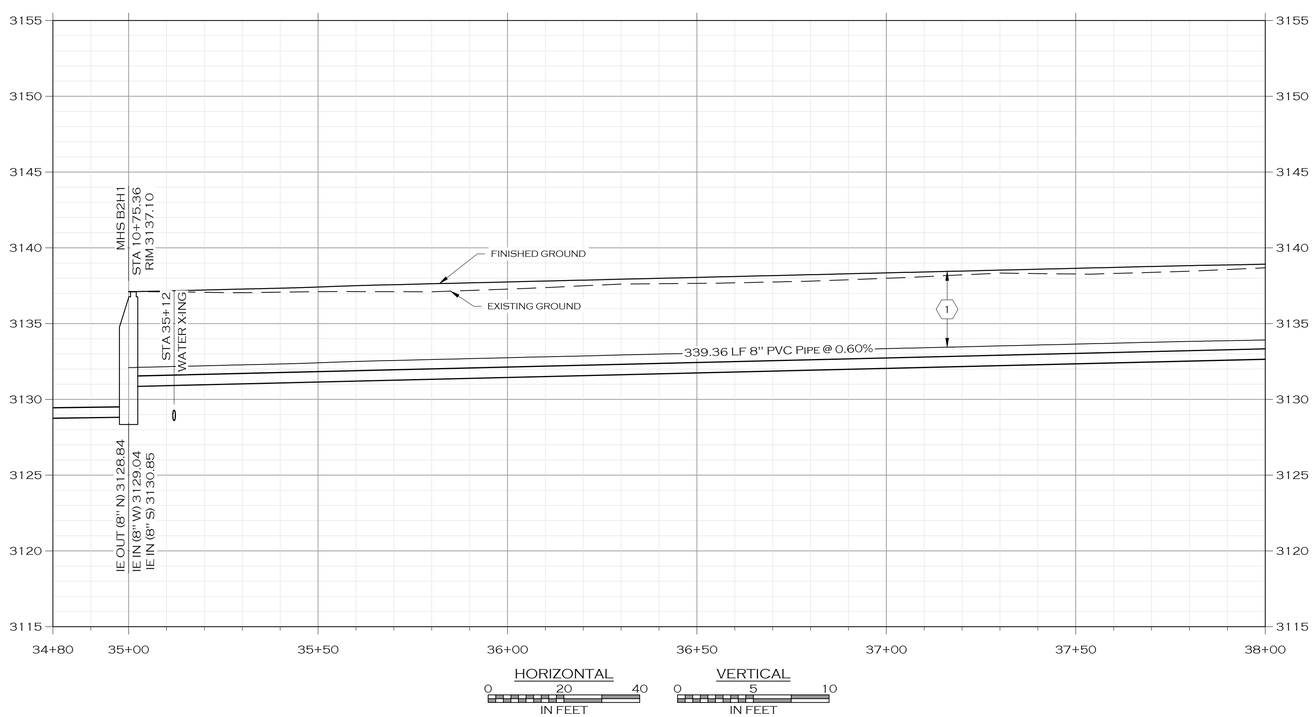
MISSOULA MONTANA

SEWER MAIN G PLAN & PROFILE

C4.10

SEWER G 31+00 TO 34+78.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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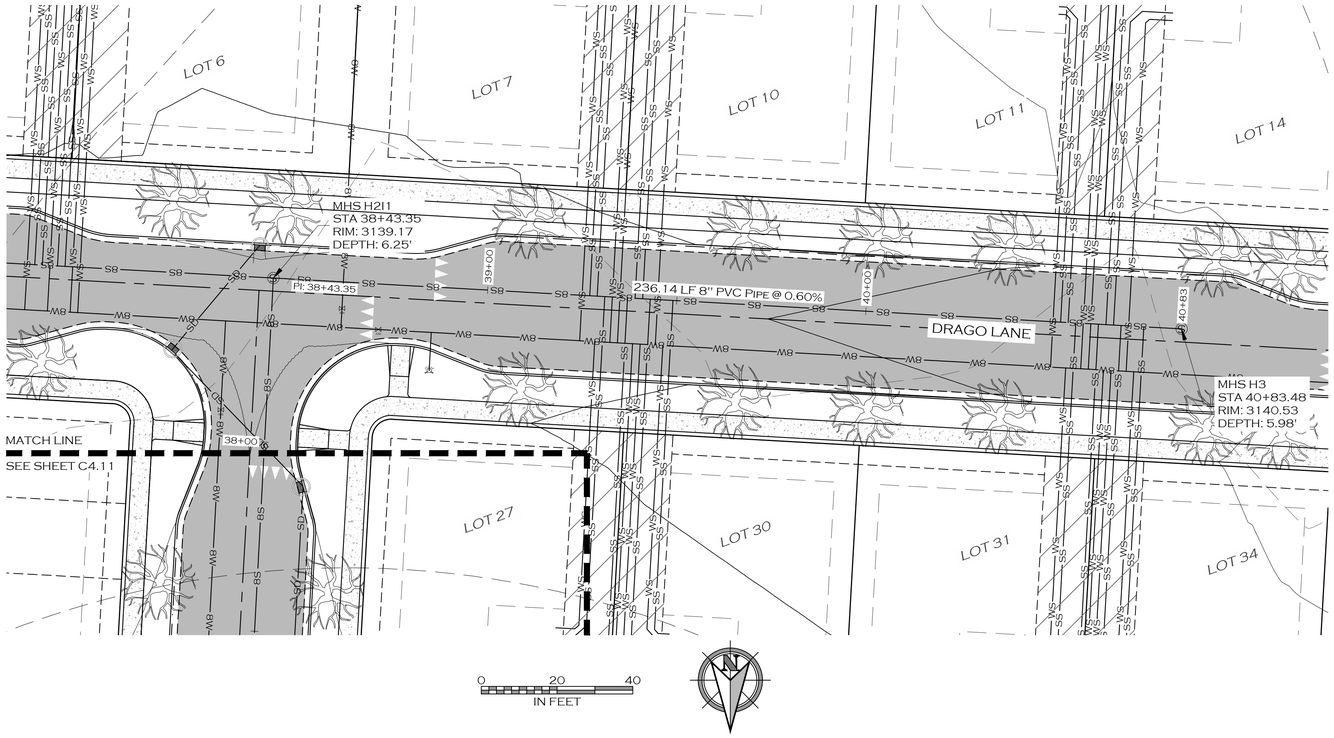
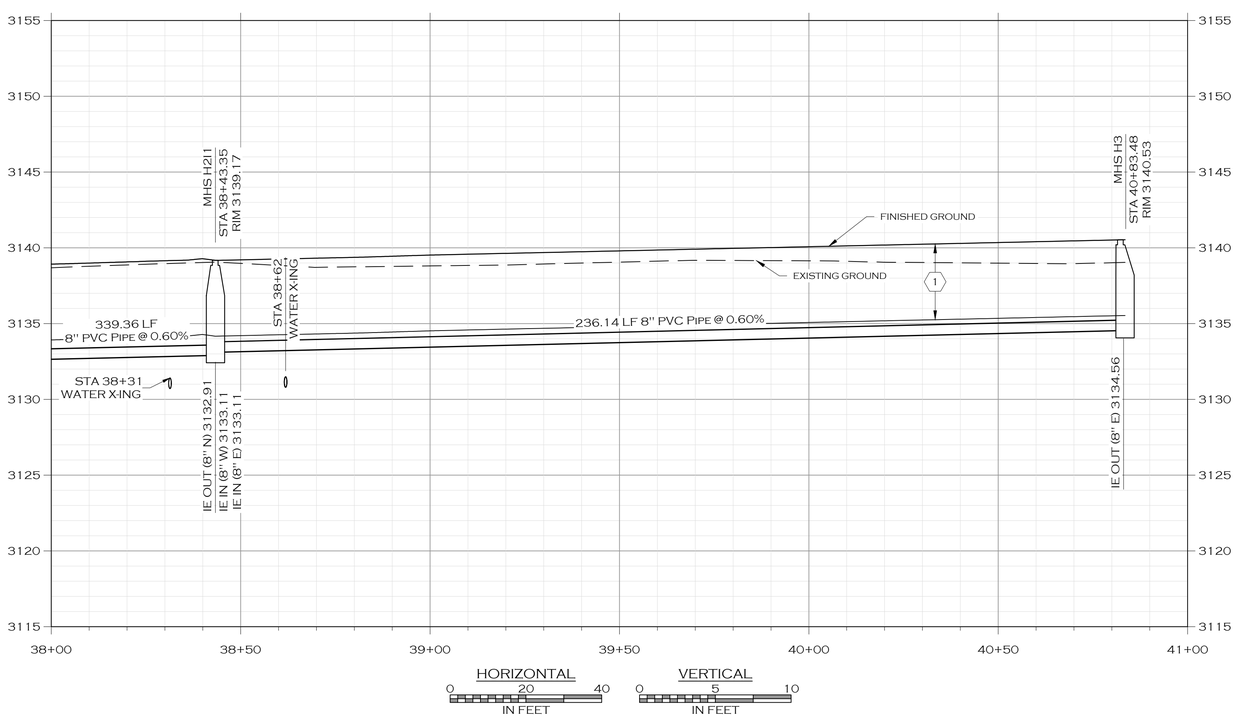
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN H PLAN & PROFILE STA. 35+00 TO 38+00

C4.11

SEWER H 35+00 TO 38+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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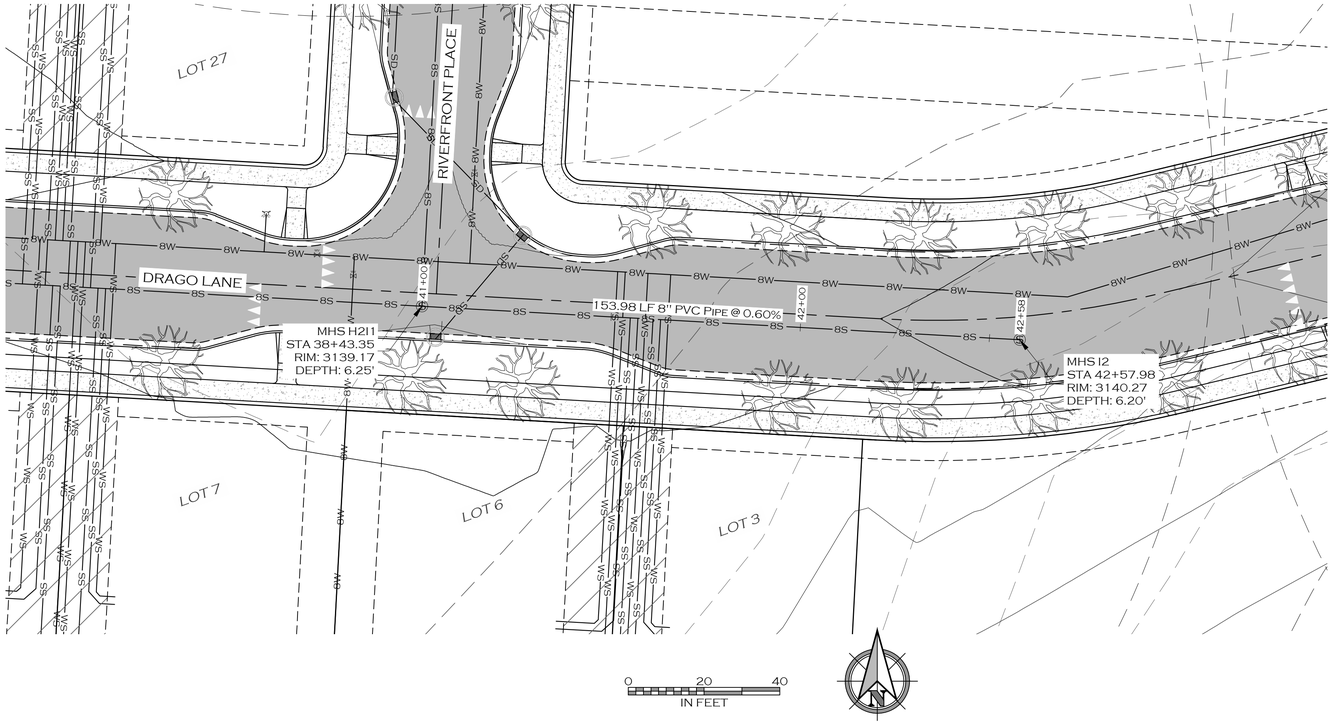
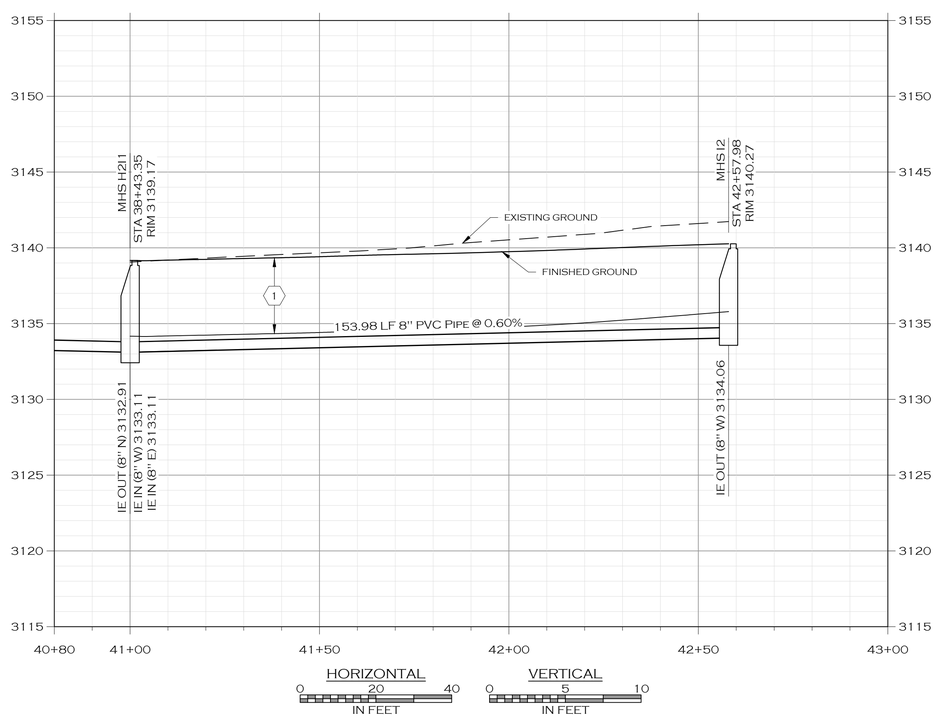
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN H PLAN & PROFILE STA. 38+00 TO 40+83

C4.12

SEWER H 38+00 TO 40+83.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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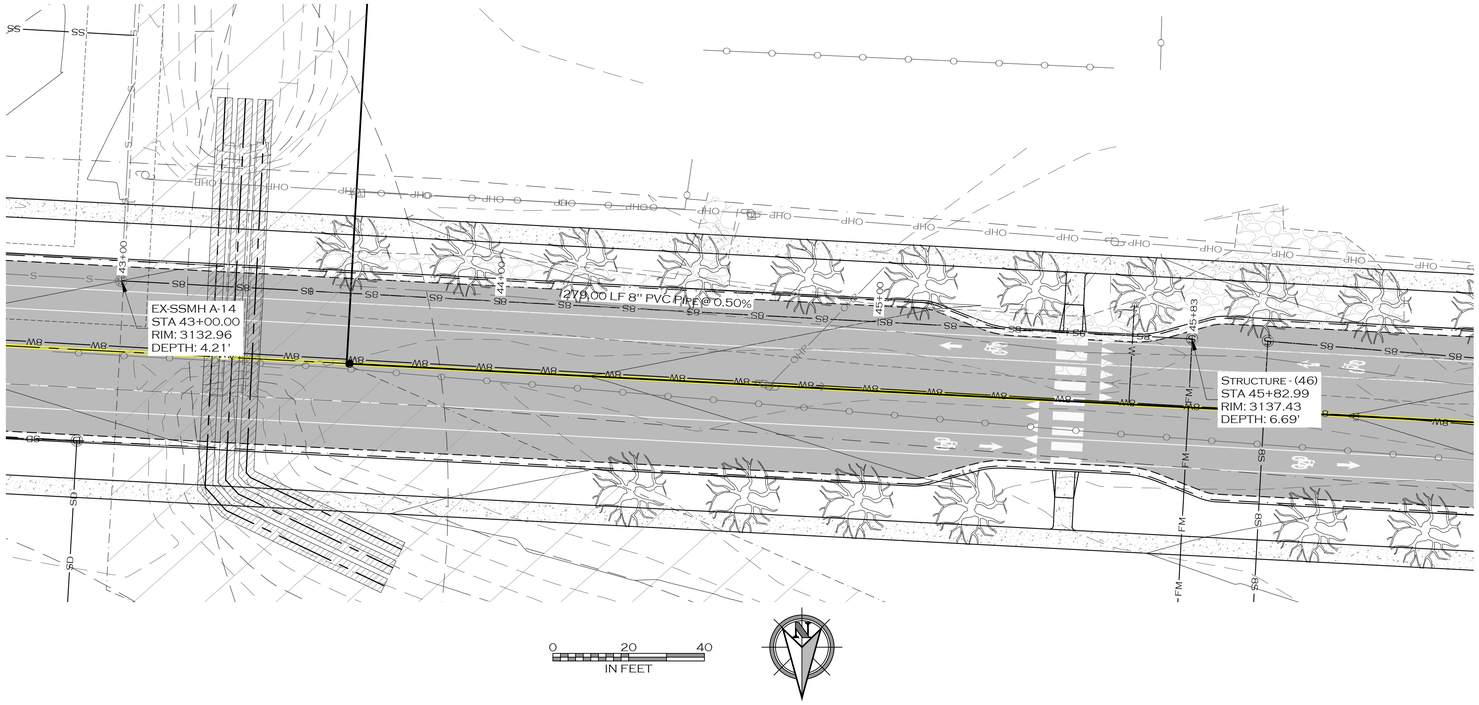
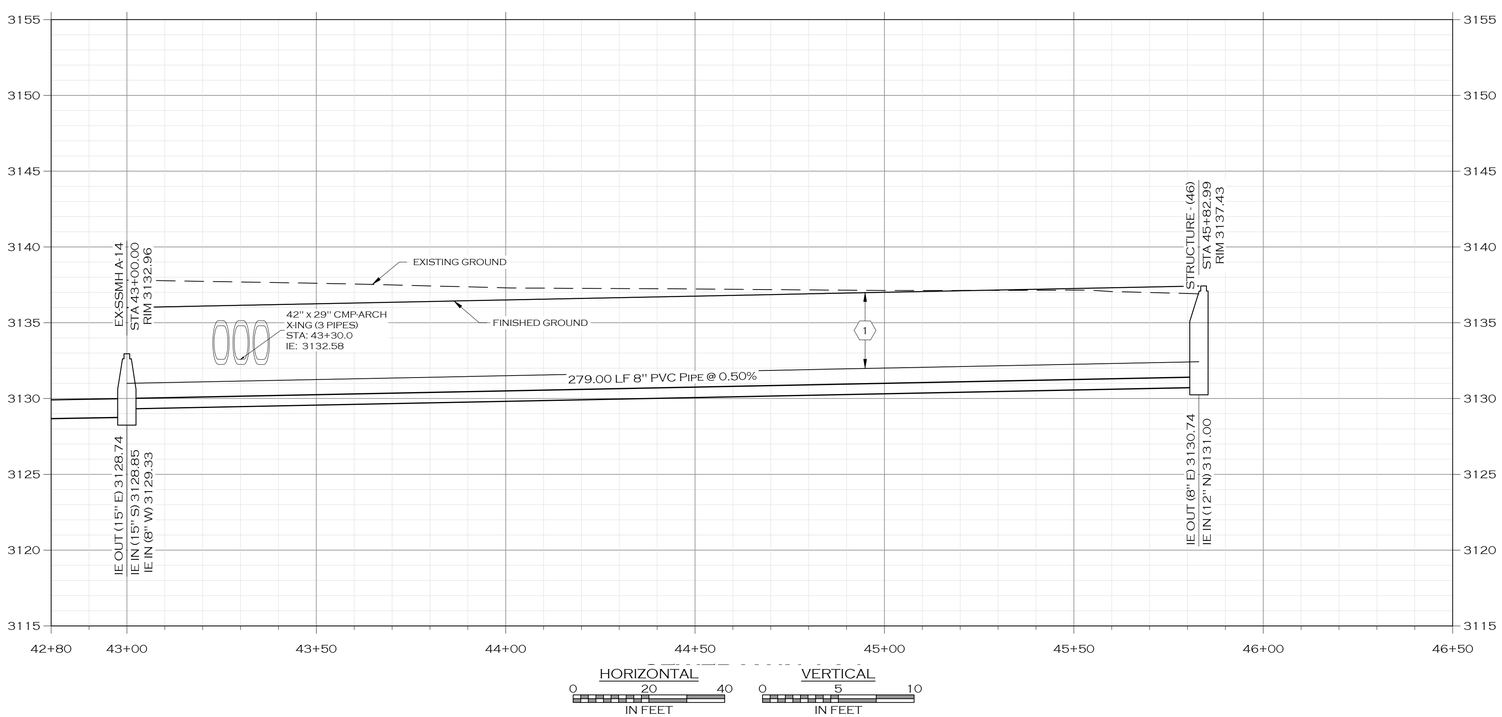
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN I PLAN & PROFILE

C4.13

SEWER I 41+00 TO 42+58.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





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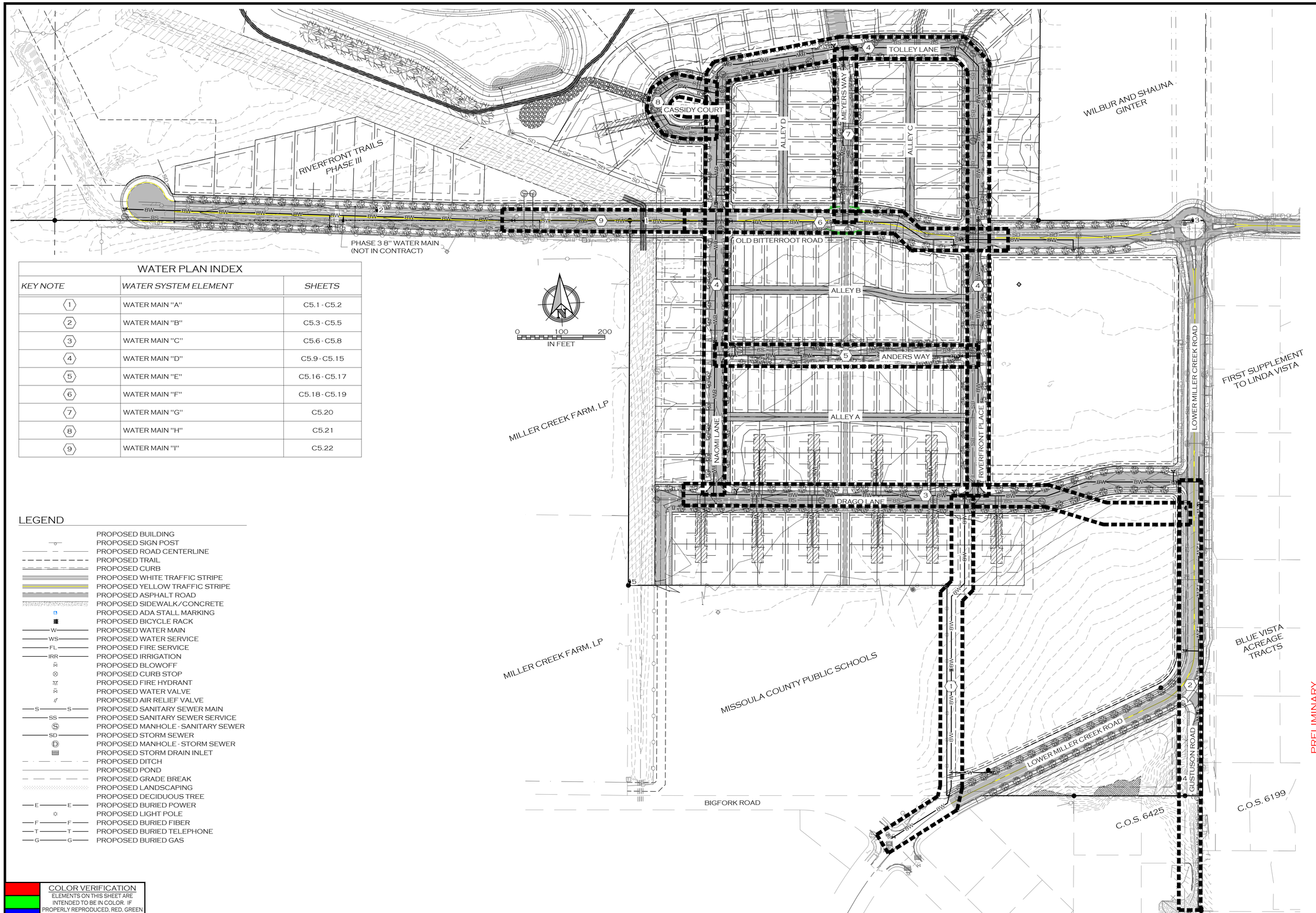
RIVERFRONT TRAILS
MISSOULA MONTANA

SEWER MAIN J PLAN & PROFILE

C4.14

SEWER MAIN J PLAN & PROFILE.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



WATER PLAN INDEX

KEY NOTE	WATER SYSTEM ELEMENT	SHEETS
1	WATER MAIN "A"	C5.1 - C5.2
2	WATER MAIN "B"	C5.3 - C5.5
3	WATER MAIN "C"	C5.6 - C5.8
4	WATER MAIN "D"	C5.9 - C5.15
5	WATER MAIN "E"	C5.16 - C5.17
6	WATER MAIN "F"	C5.18 - C5.19
7	WATER MAIN "G"	C5.20
8	WATER MAIN "H"	C5.21
9	WATER MAIN "I"	C5.22

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COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

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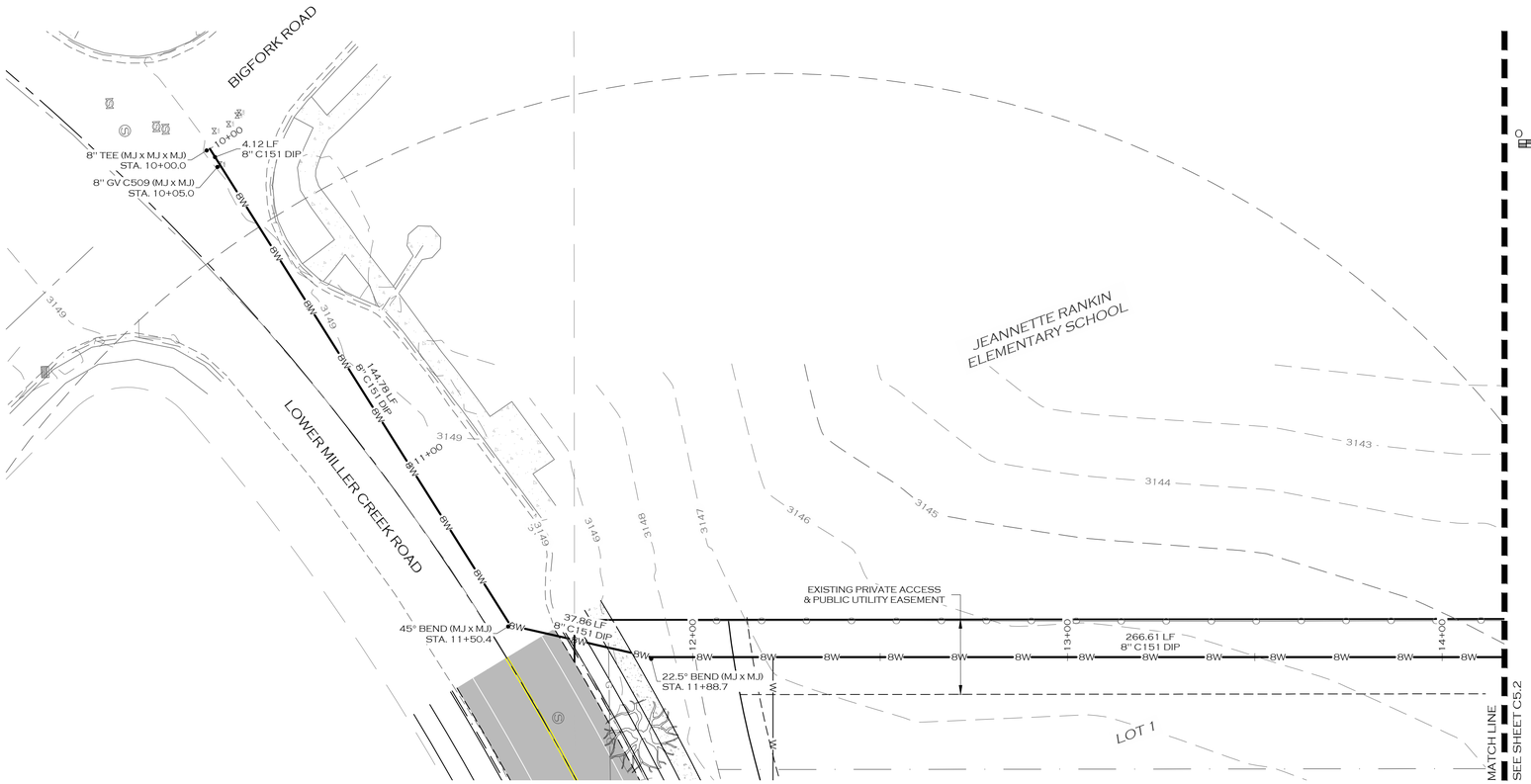
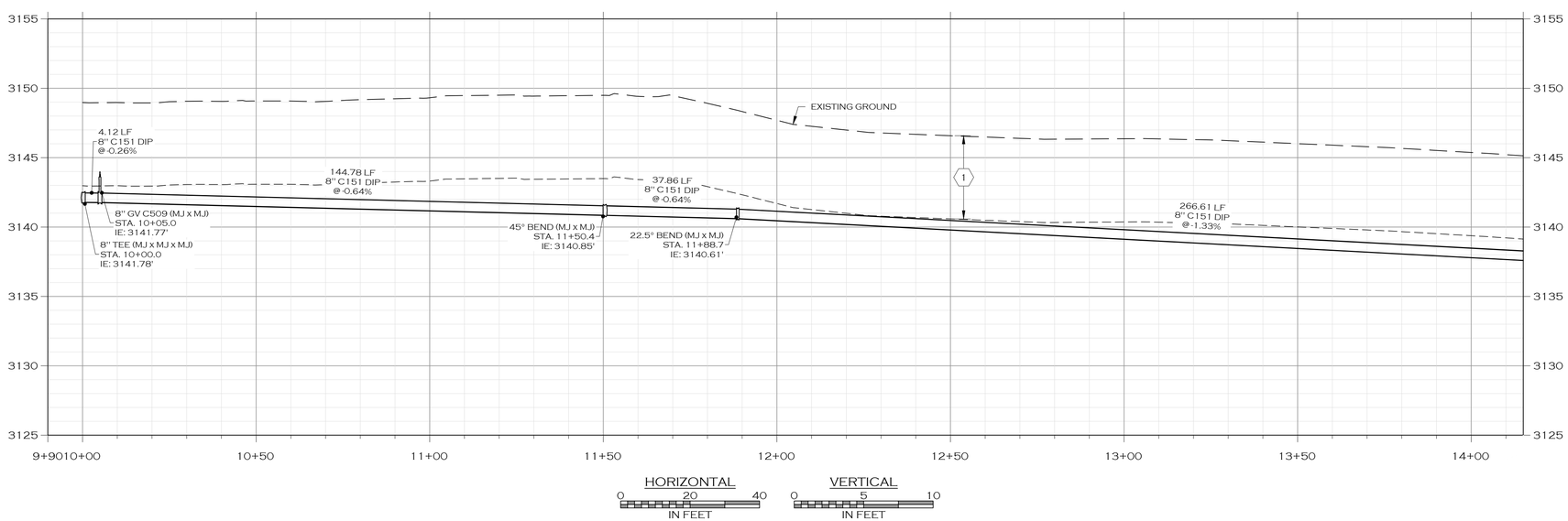
RIVERFRONT TRAILS
MISSOULA MONTANA
OVERALL WATER MAIN EXTENSION PLAN

C5.0

OVERALL WATER MAIN EXTENSION PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022





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KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
4. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
6. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
8. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.

PRELIMINARY

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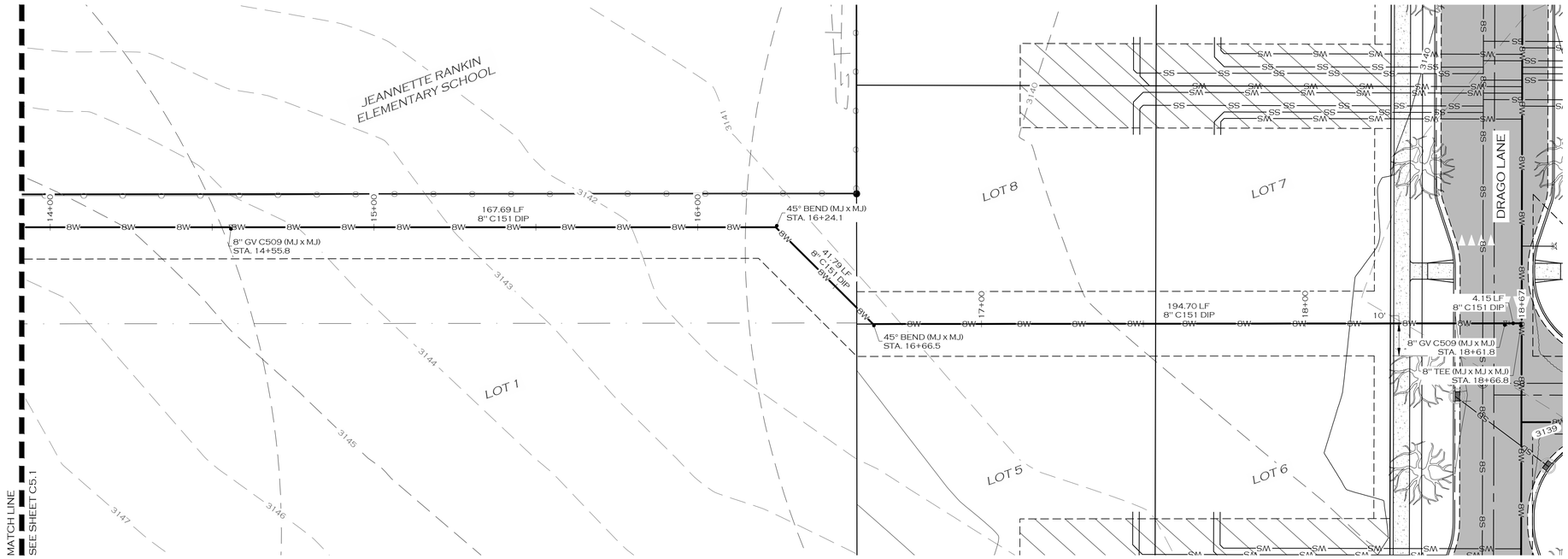
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN A PLAN & PROFILE STA. 10+00 TO 14+00

C5.1

WATER MAIN A STA. 10+00 TO 14+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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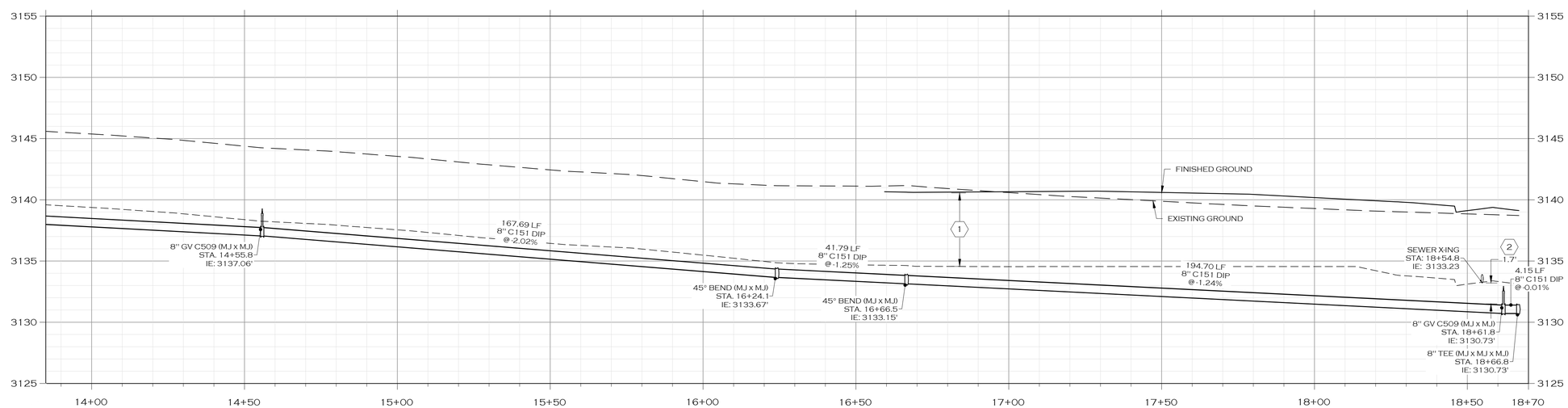
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
4. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
6. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
8. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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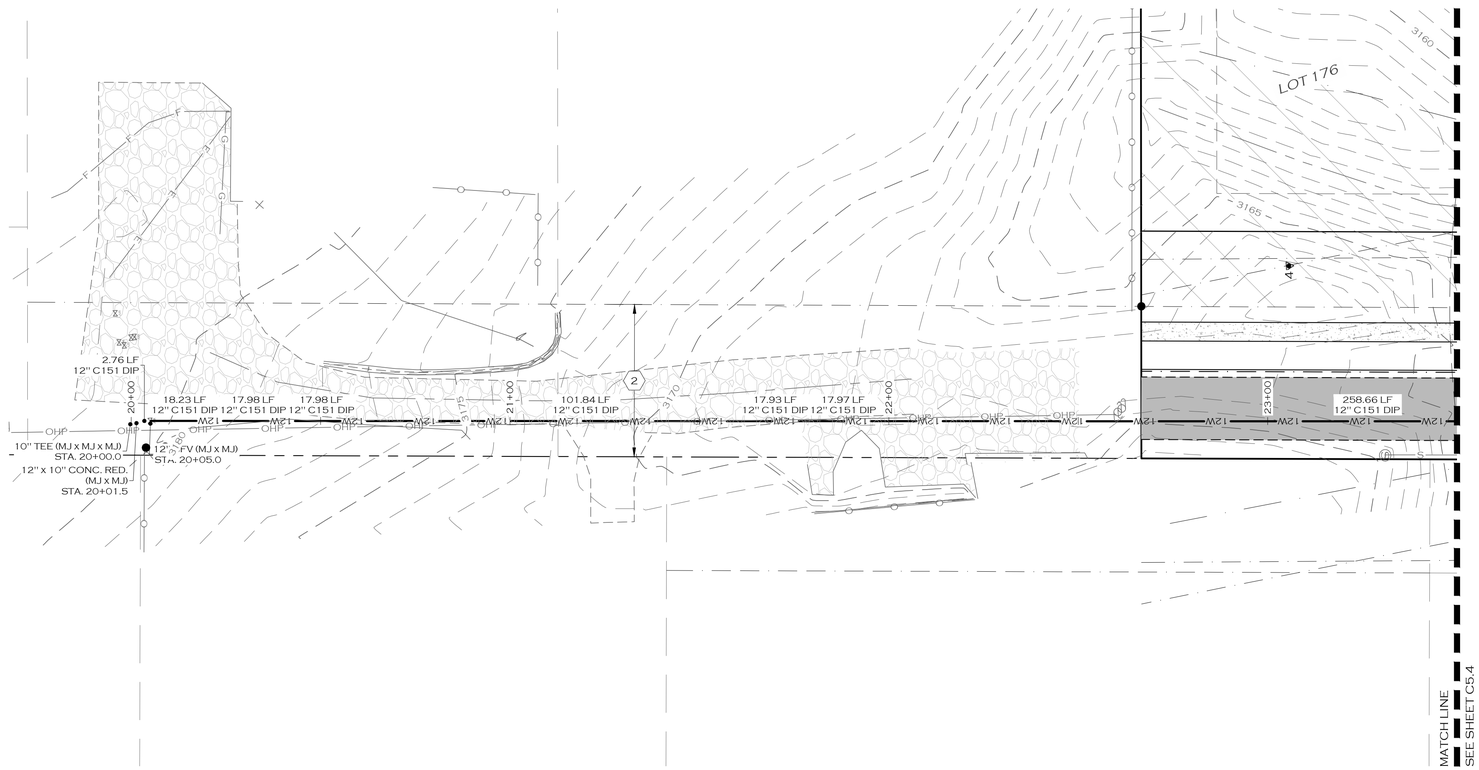
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN A PLAN & PROFILE STA. 14+00 TO 18+70

C5.2

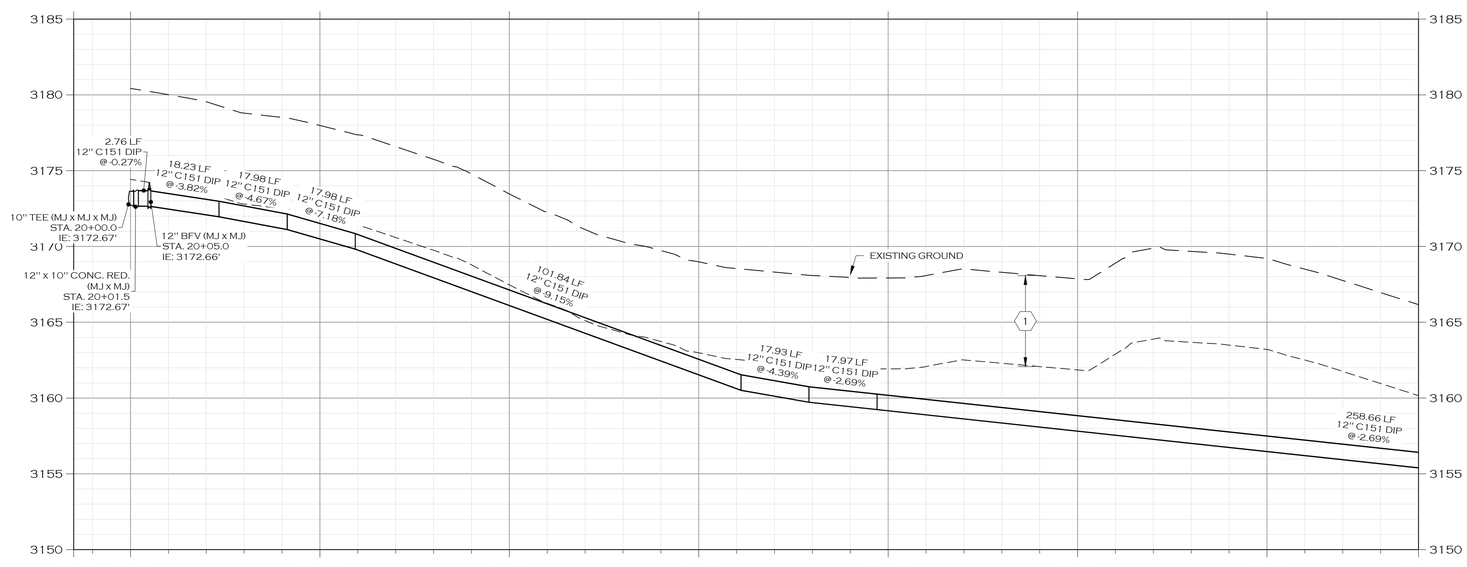
WATER MAIN A STA. 14+00 TO 18+70.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
- PROPOSED POND
- PROPOSED GRADE BREAK
- PROPOSED LANDSCAPING
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. 40' WIDE COUNTY ROAD AS DEPICTED ON SWEET GRASS ADDITION AT MALONEY RANCH - PHASE I AS "ROAD BOOK 1 OF MISSOULA COUNTY RECORDS"

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
4. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
6. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
8. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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PRELIMINARY

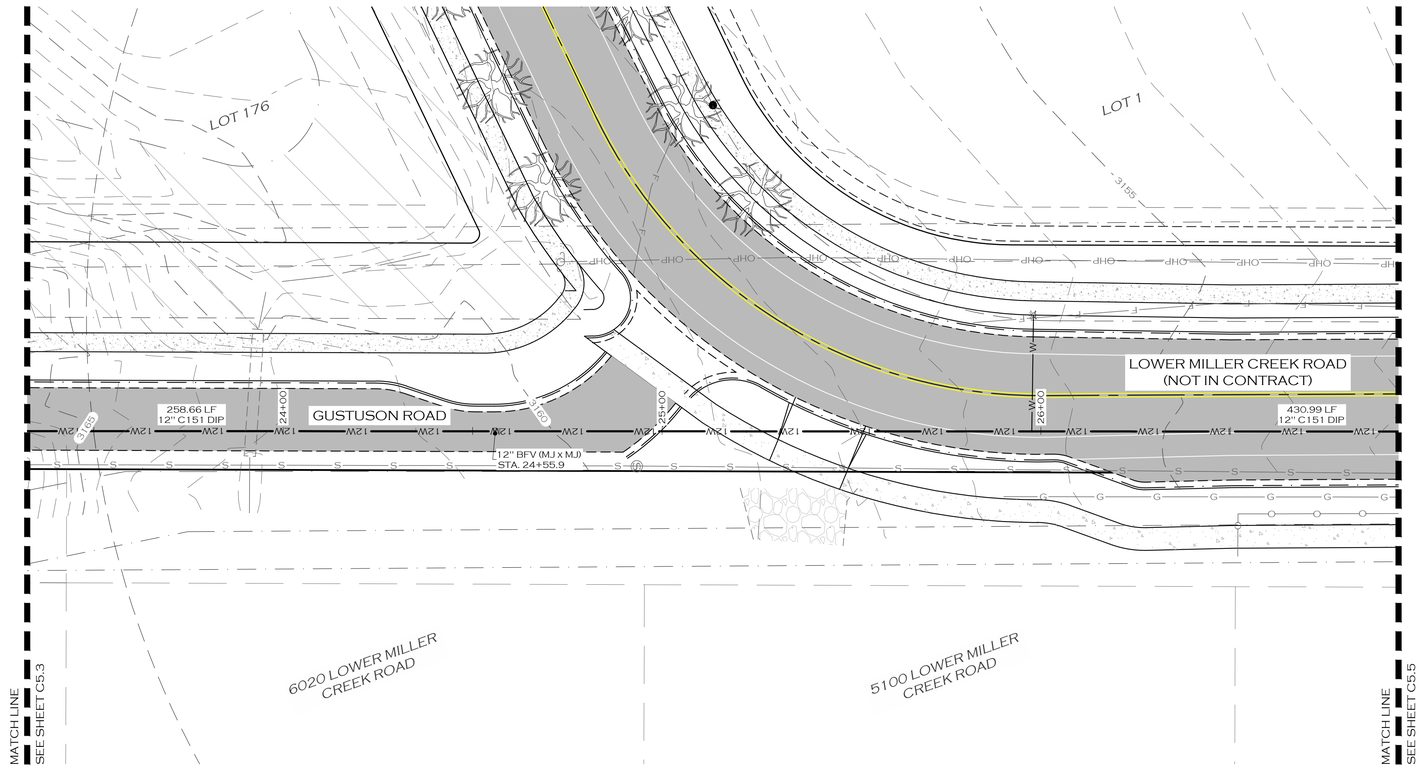
RIVERFRONT TRAILS

MISSOULA MONTANA

WATER MAIN B PLAN & PROFILE STA. 20+00 TO 23+40

C5.3

WATER MAIN B STA. 20+00 TO 23+40.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
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- PROPOSED BLOWOFF
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- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
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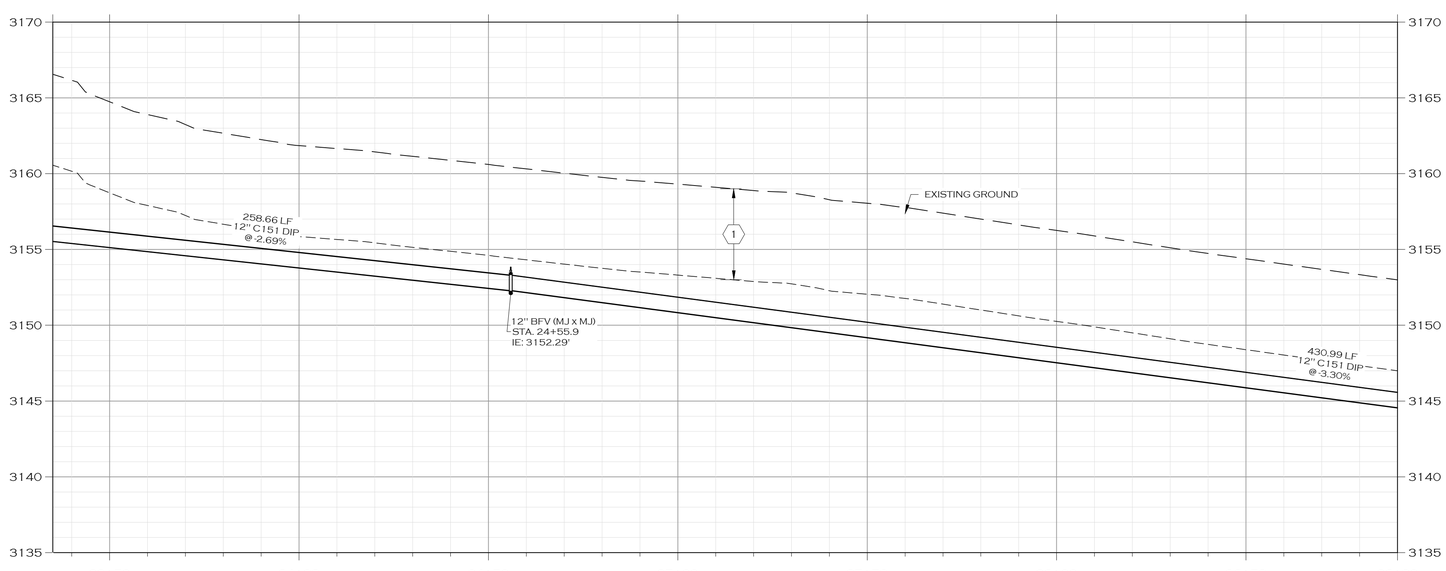
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
4. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
6. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
8. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
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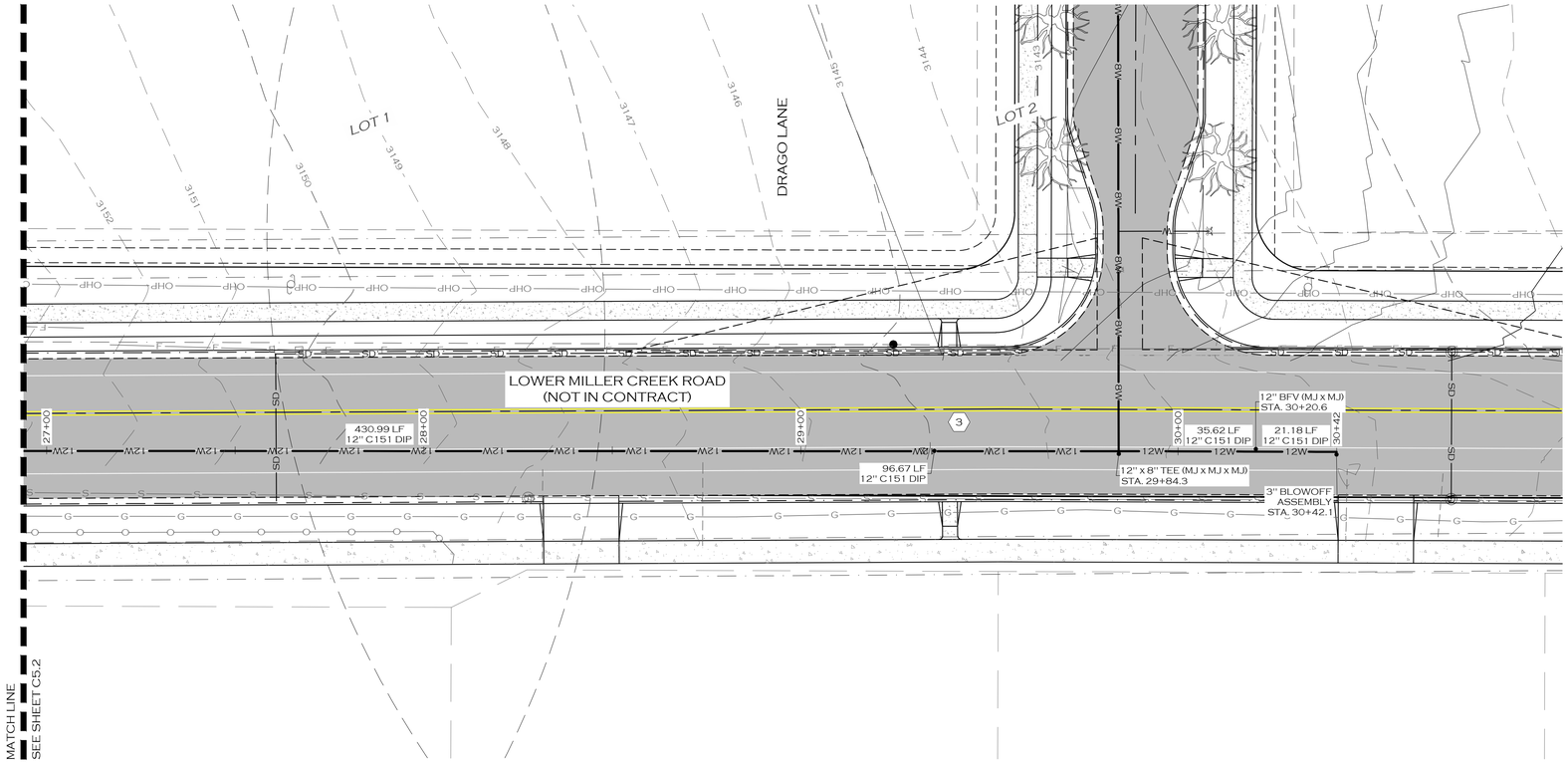
PRELIMINARY

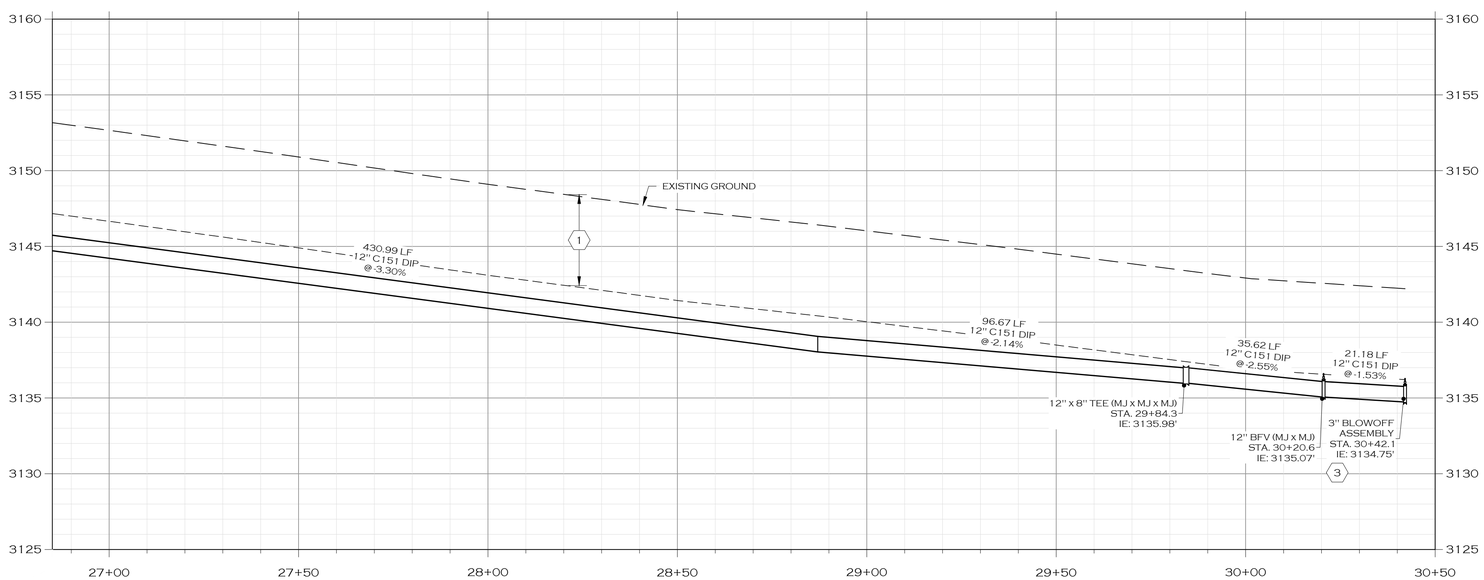
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN B PLAN & PROFILE STA. 23+40 TO 26+90

C5.4

WATER MAIN B STA. 23+40 TO 26+90.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18'' VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. INSTALL TYPICAL BLOW-OFF ASSEMBLY IN ACCORDANCE WITH CITY OF MISSOULA STD-409.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
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LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
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- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET

PRELIMINARY

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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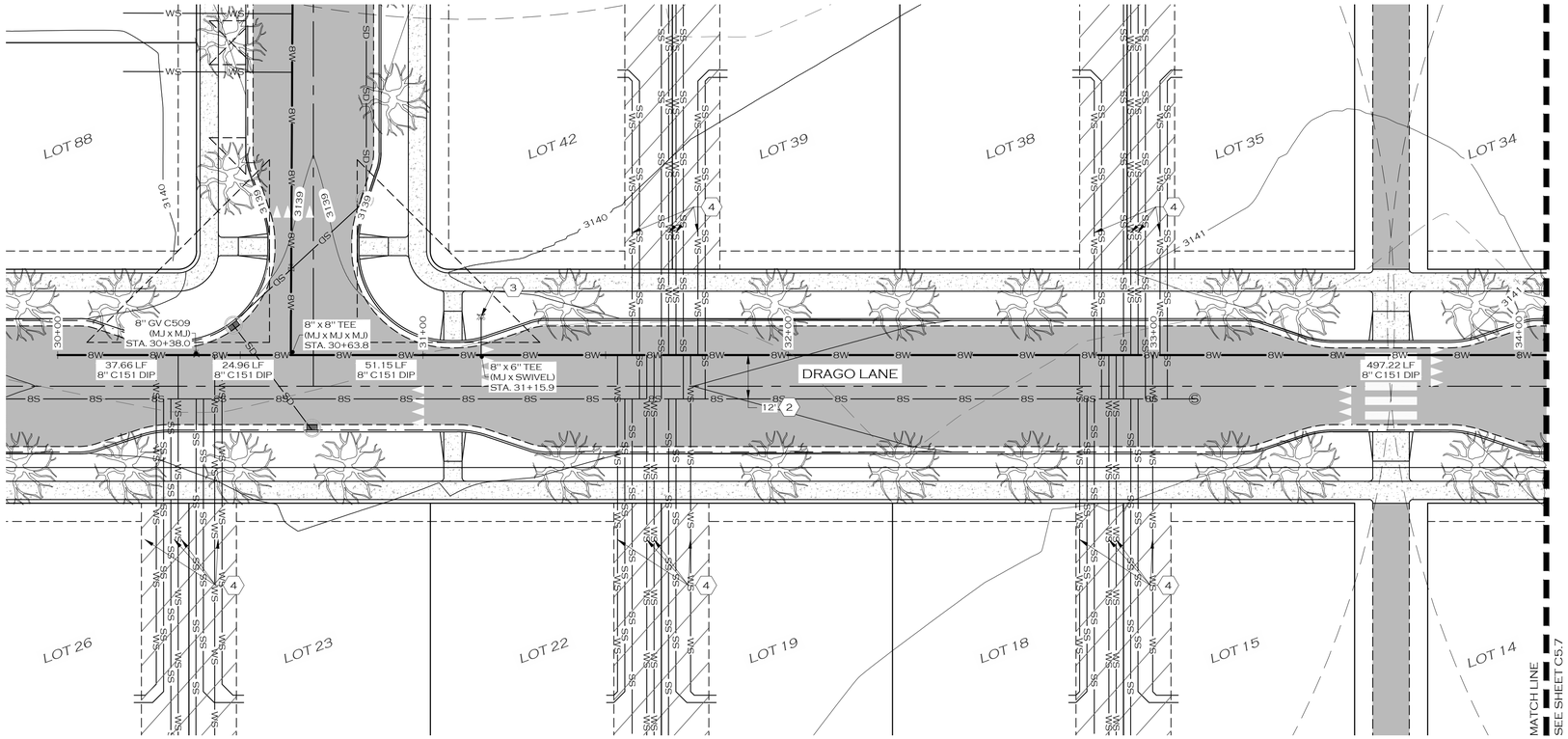
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN B PLAN & PROFILE STA. 26+90 TO 30+50

C5.5

WATER MAIN B STA. 26+90 TO 29+70.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/ 22/ 2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
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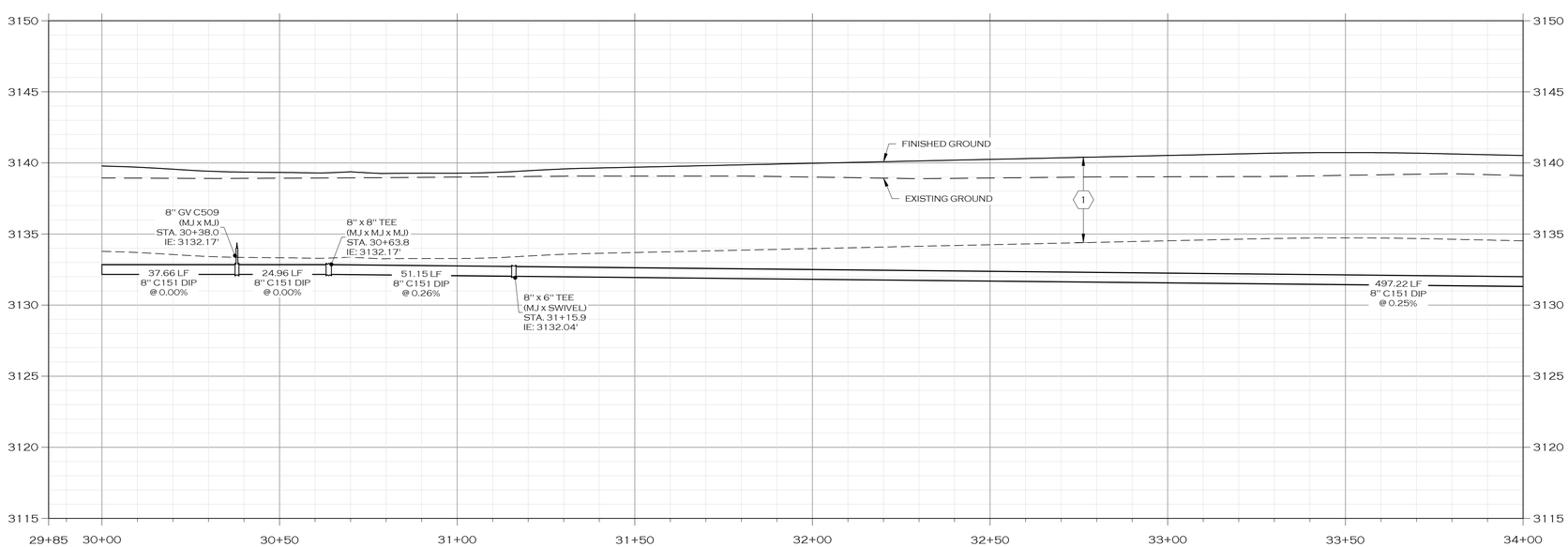
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

PRELIMINARY

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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ENGINEERS & SURVEYORS
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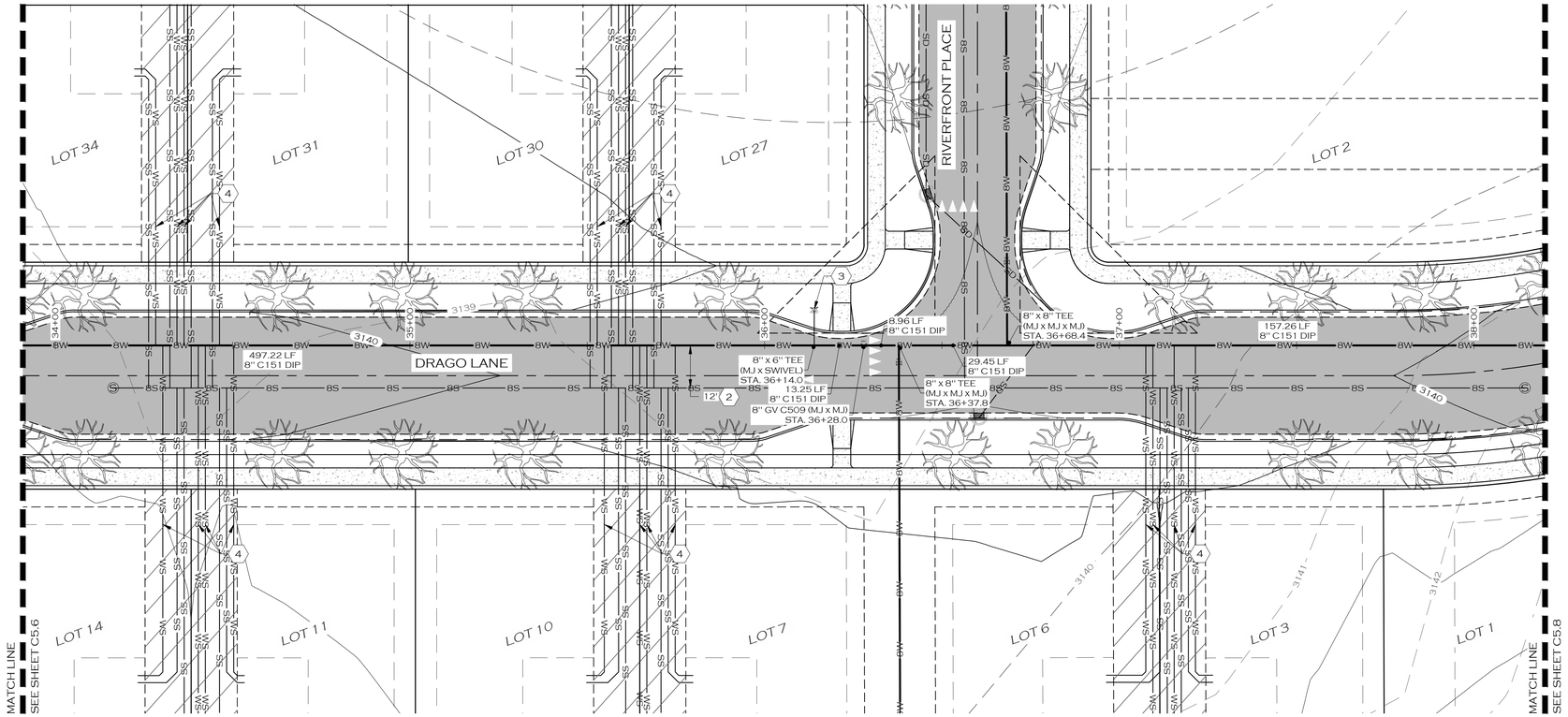
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN C PLAN & PROFILE STA. 30+00 TO 34+00

C5.6

WATER MAIN C STA. 30+00 TO 34+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
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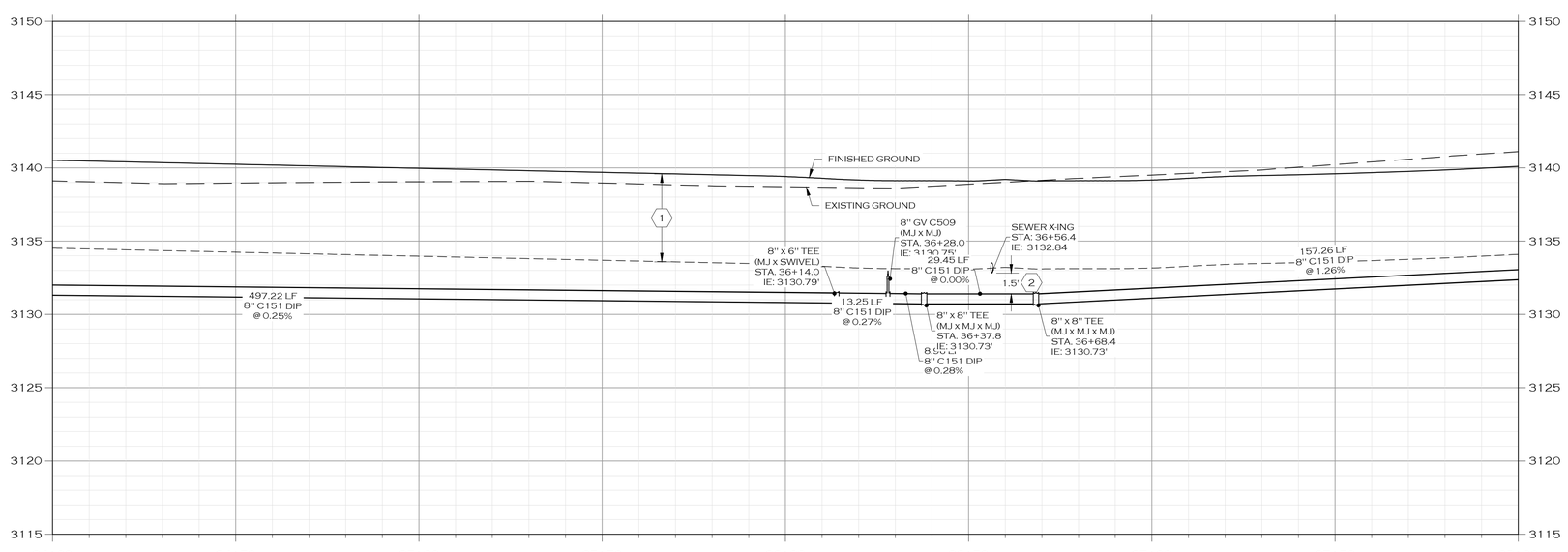
- G — PROPOSED BURIED GAS

0 20 40
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

PRELIMINARY

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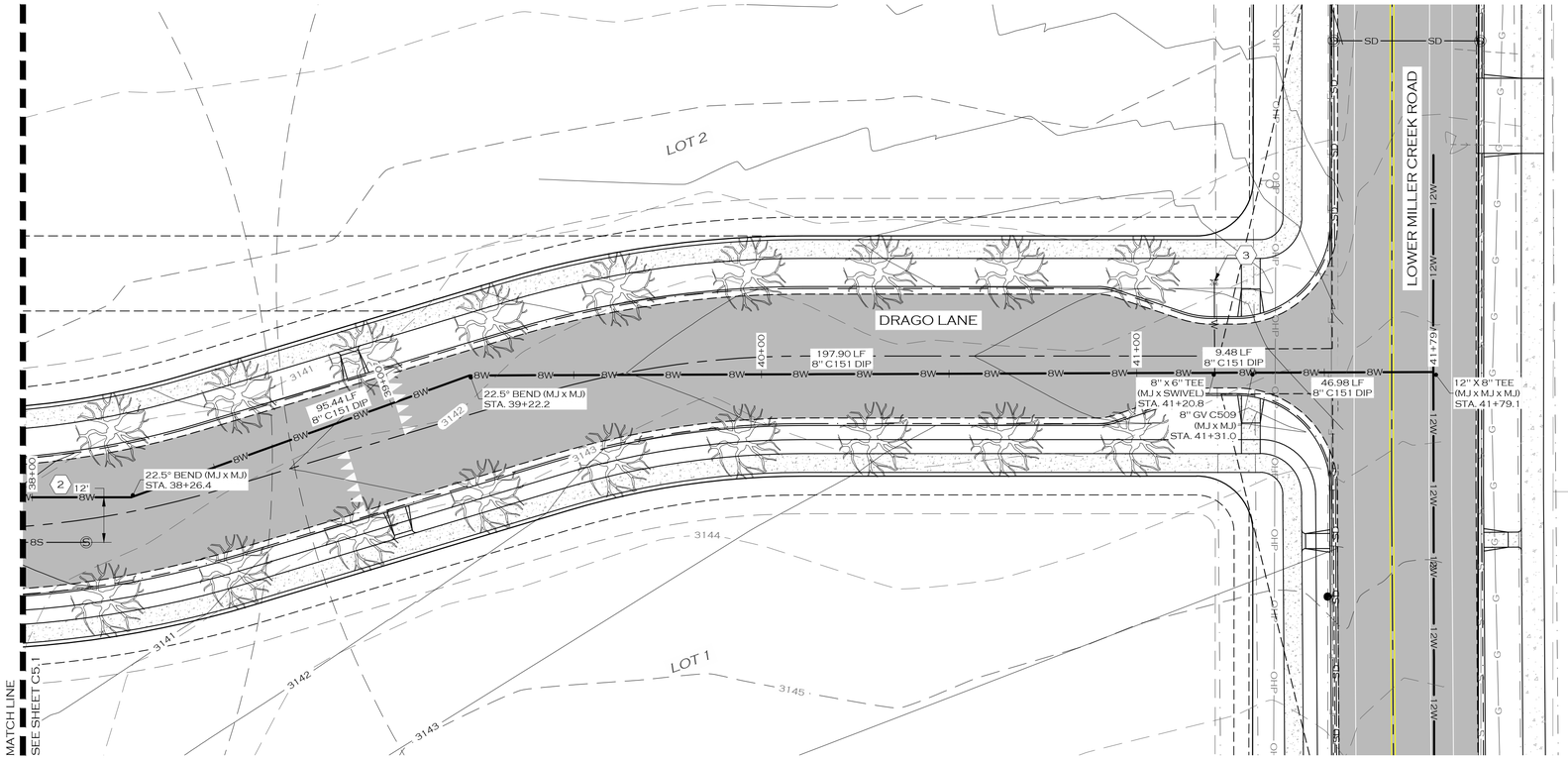
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN C PLAN & PROFILE STA. 34+00 TO 38+00

C5.7

WATER MAIN C STA. 34+00 TO 38+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
- PROPOSED POND
- PROPOSED GRADE BREAK
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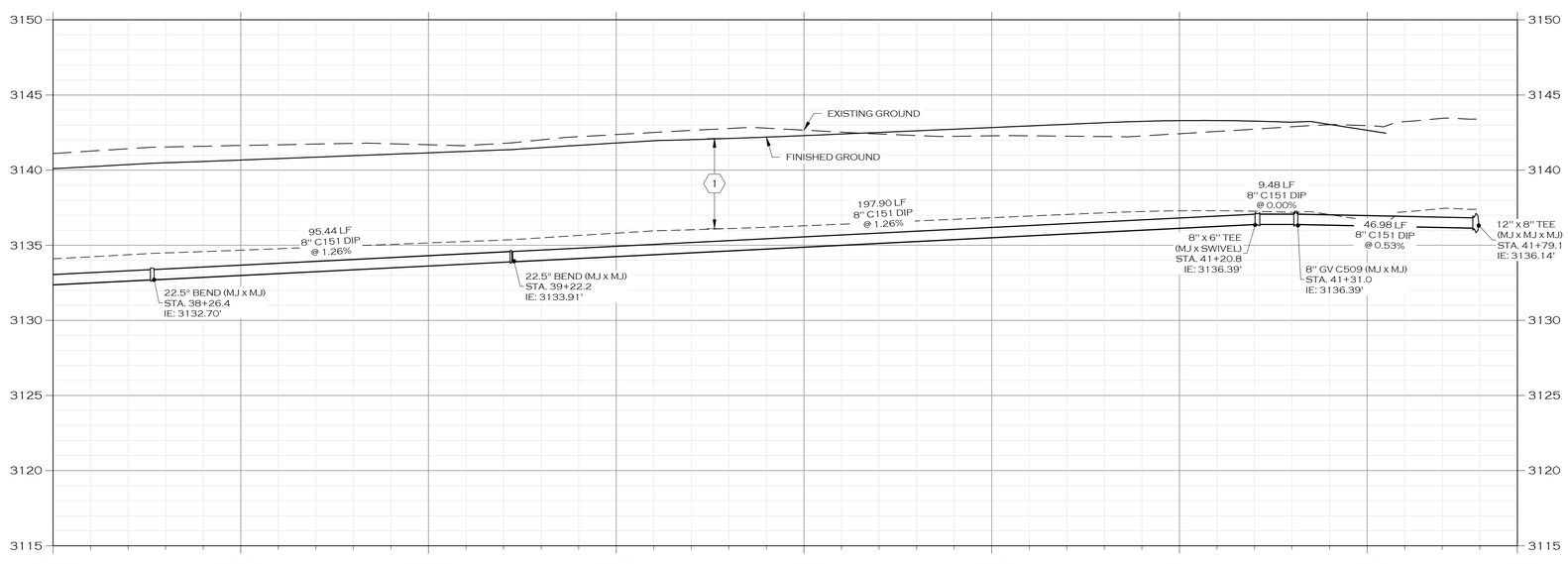
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
4. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
6. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
8. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
405 3RD STREET NW, SUITE 205 • GREAT FALLS, MT 59404 • 406-761-1955
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PRELIMINARY

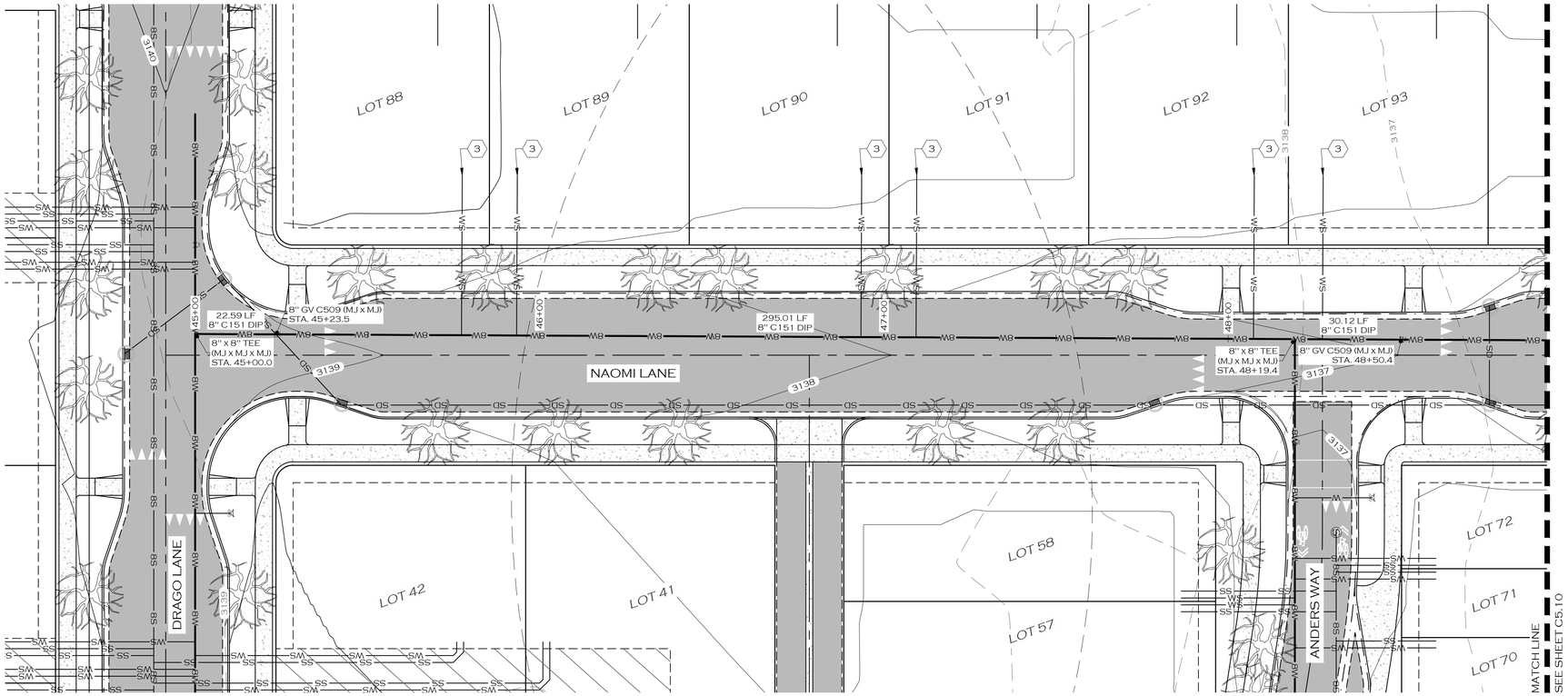
RIVERFRONT TRAILS

MISSOULA MONTANA

WATER MAIN C PLAN & PROFILE STA. 38+00 TO 41+80

C5.8

WATER MAIN C STA. 38+00 TO 41+80.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
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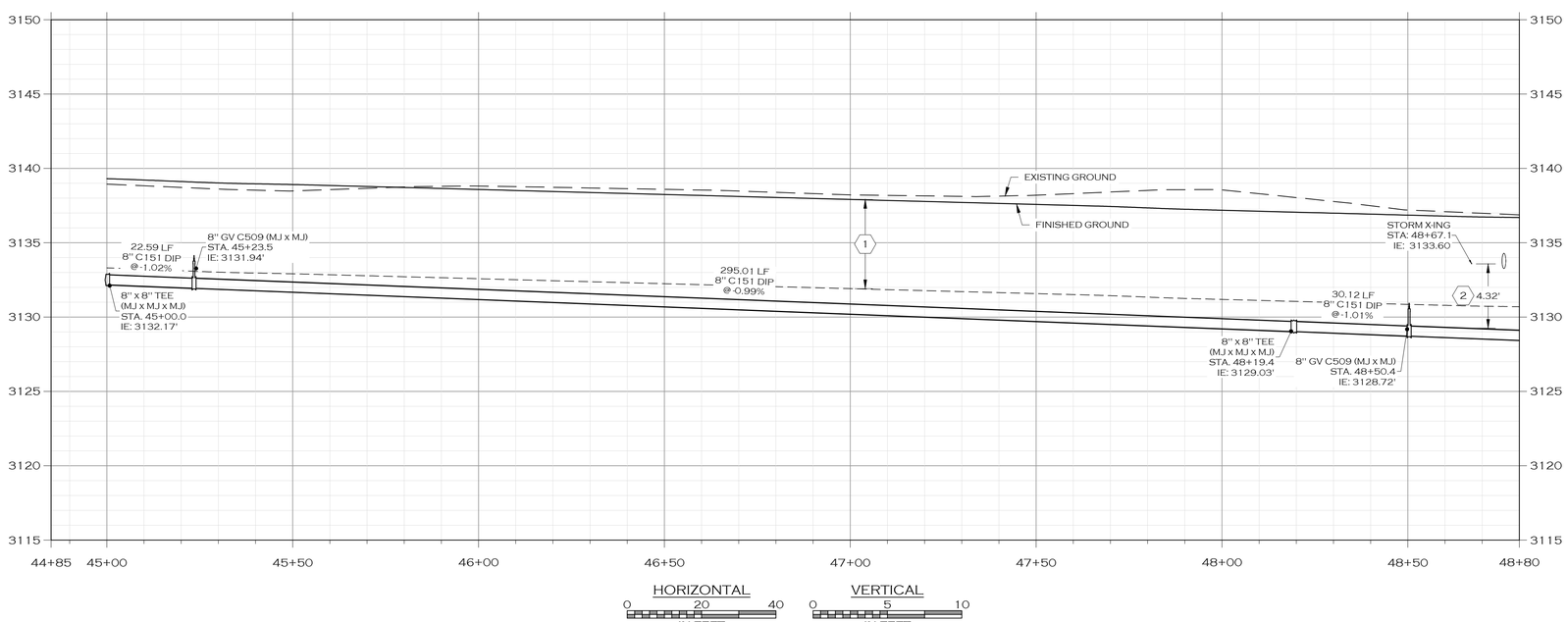
0 20 40
IN FEET



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
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COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

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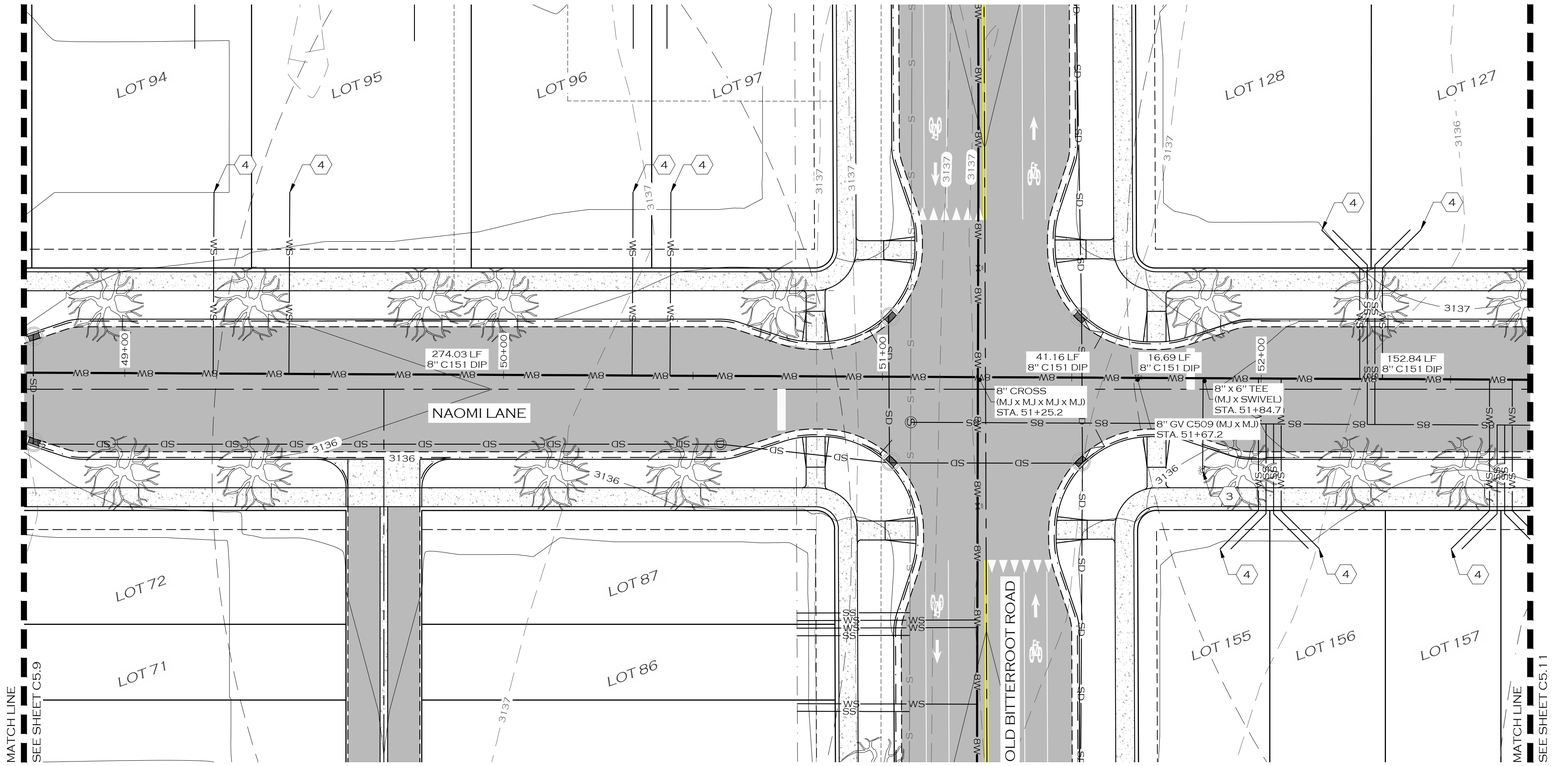
PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 45+00 TO 48+80

C5.9

WATER MAIN D STA. 45+00 TO 48+80.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

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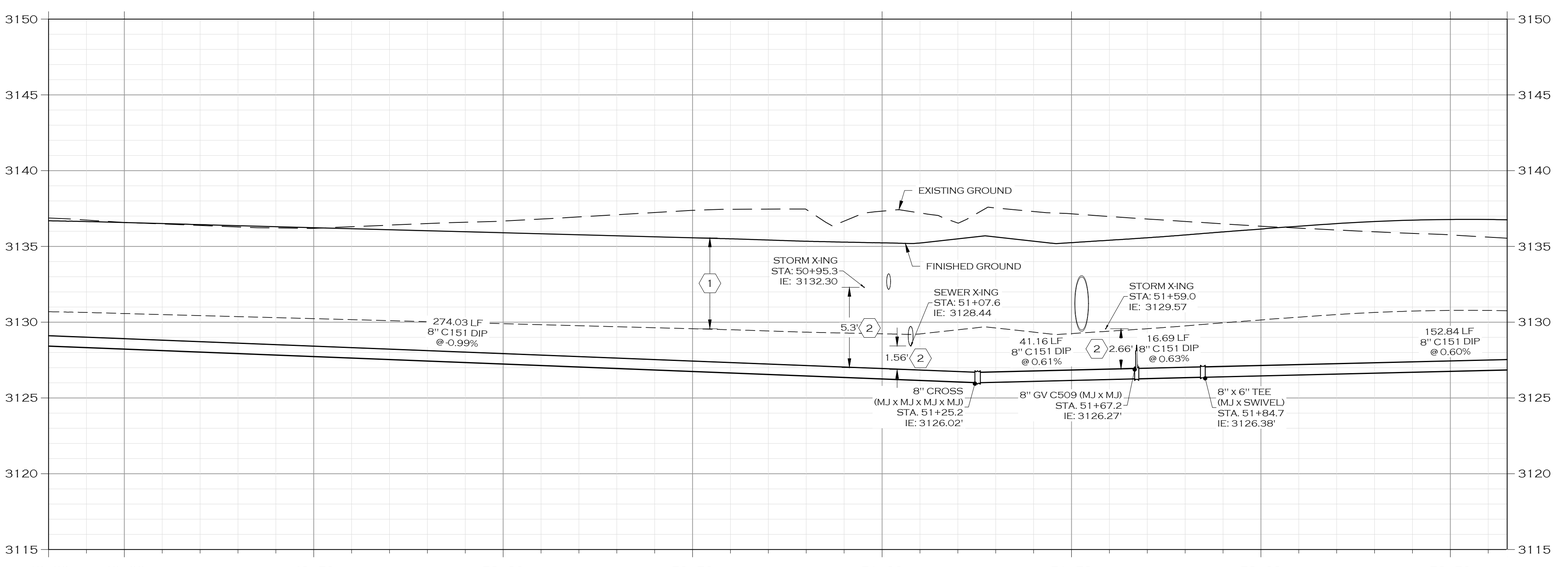
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
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COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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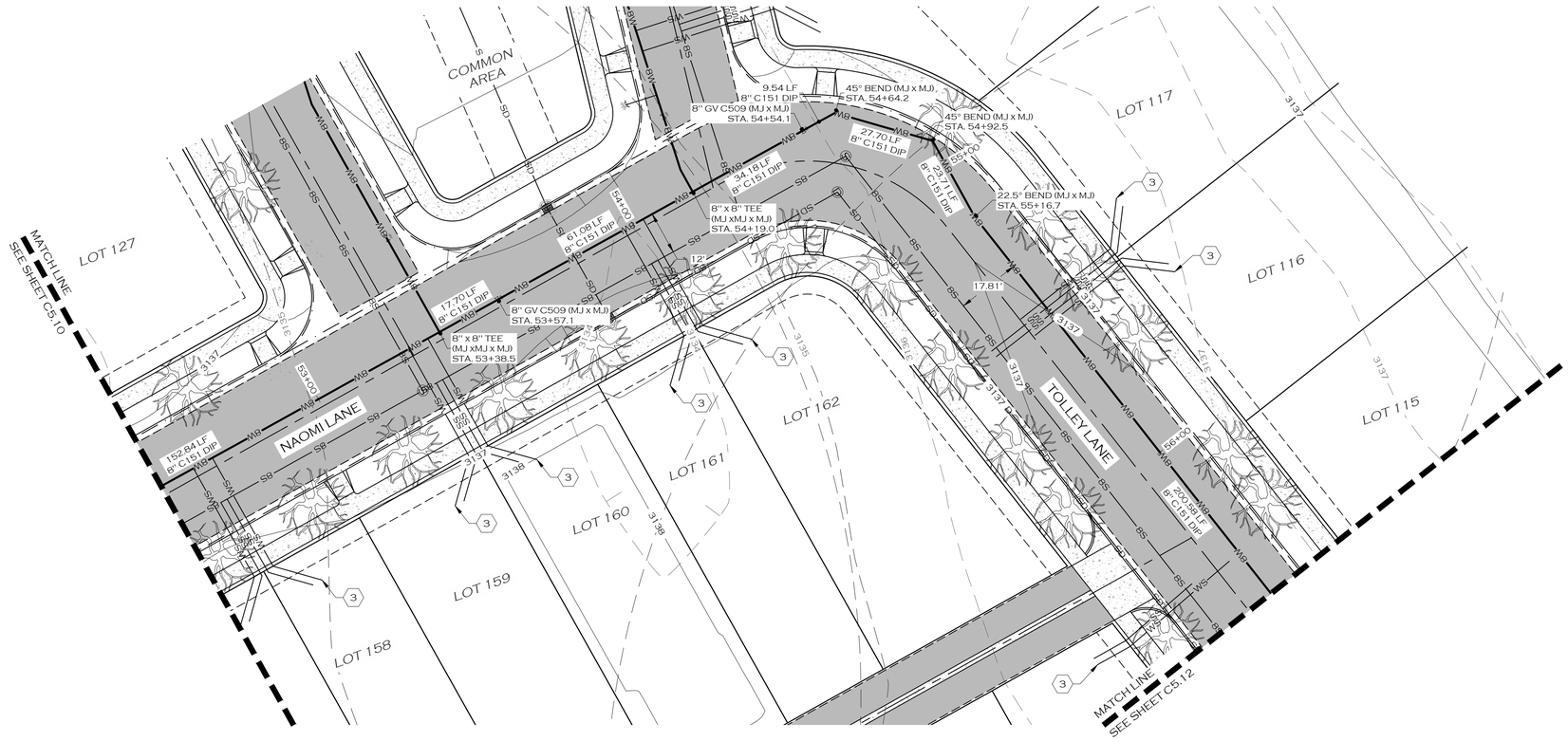
PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 48+80 TO 52+60

C5.10

WATER MAIN D STA. 48+80 TO 52+60.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
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- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
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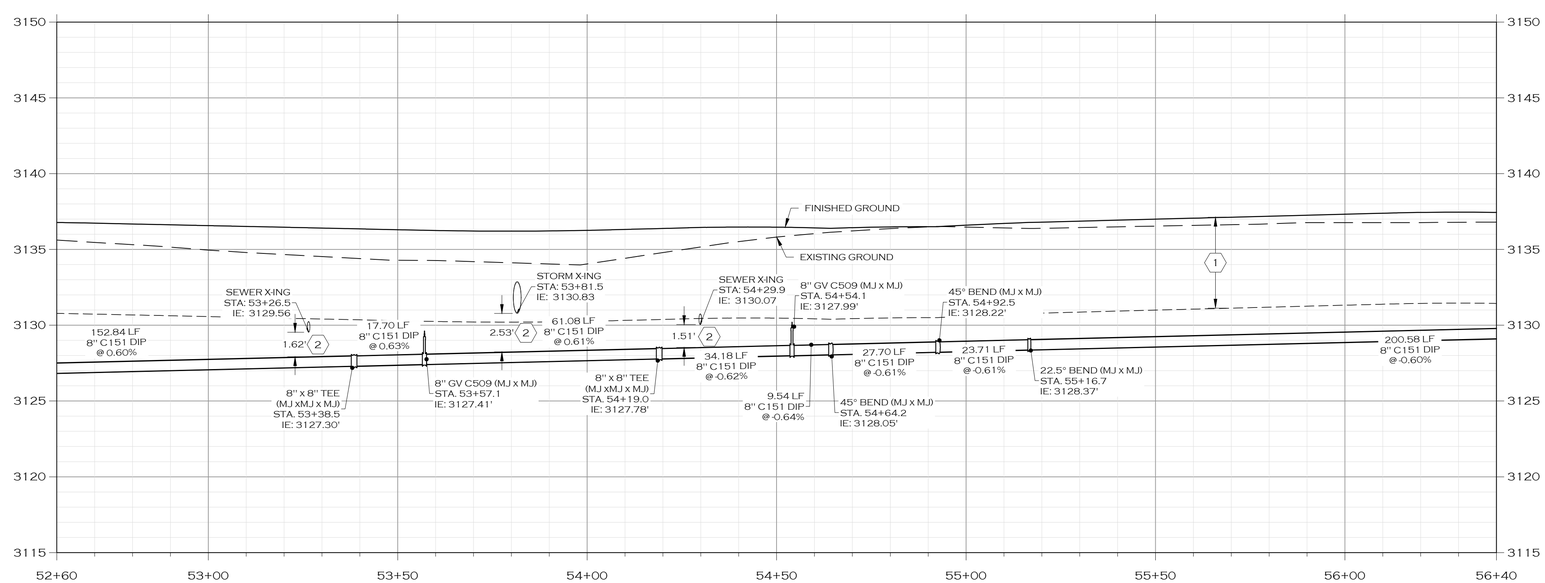

HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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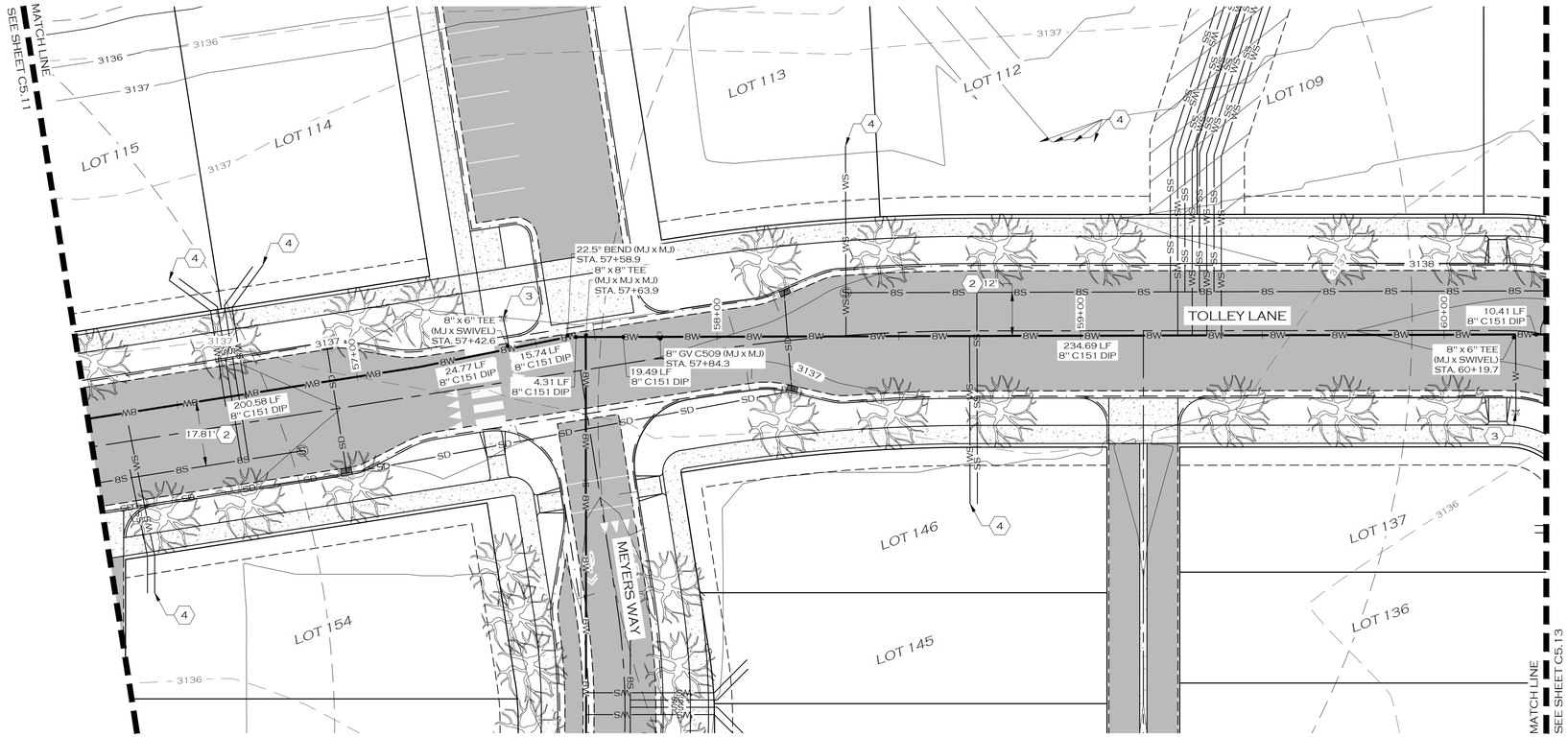
PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 52+60 TO 56+40

C5.11

WATER MAIN D STA. 52+60 TO 56+40.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

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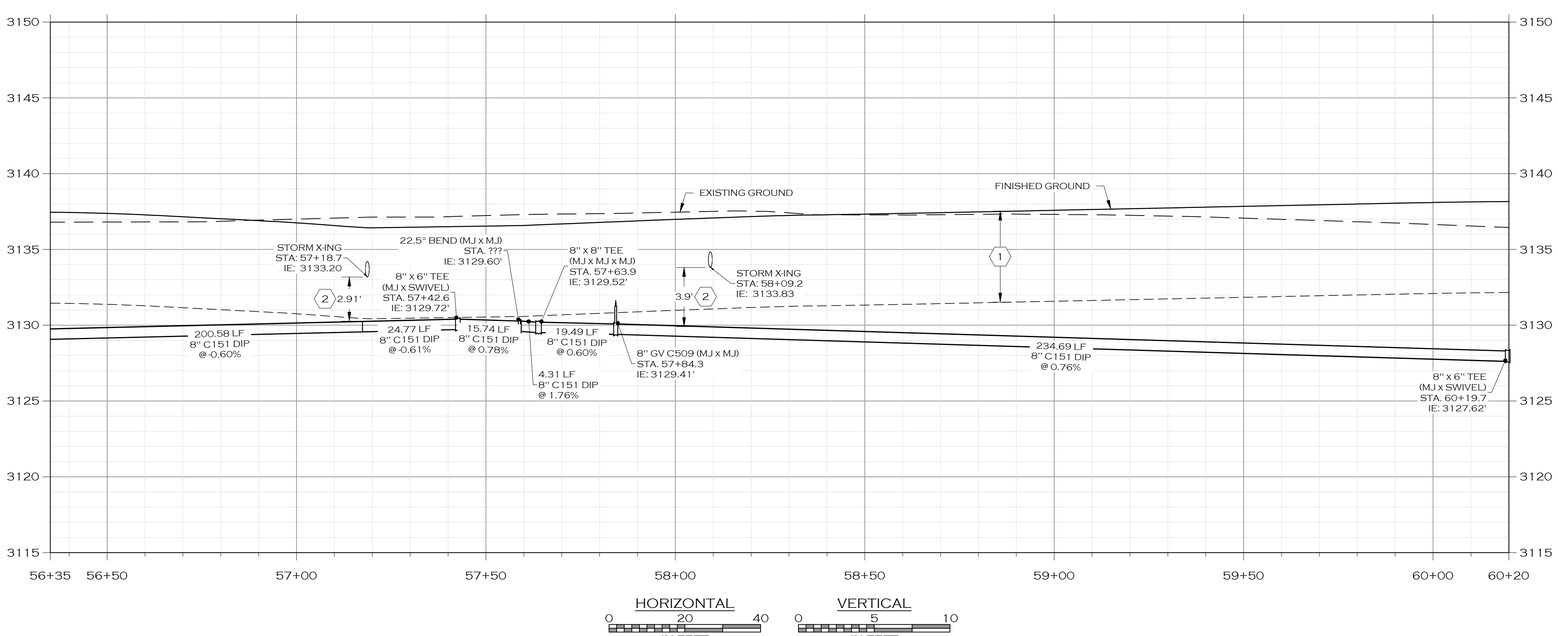
0 20 40
IN FEET



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
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COLOR VERIFICATION
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JOB #:	2101
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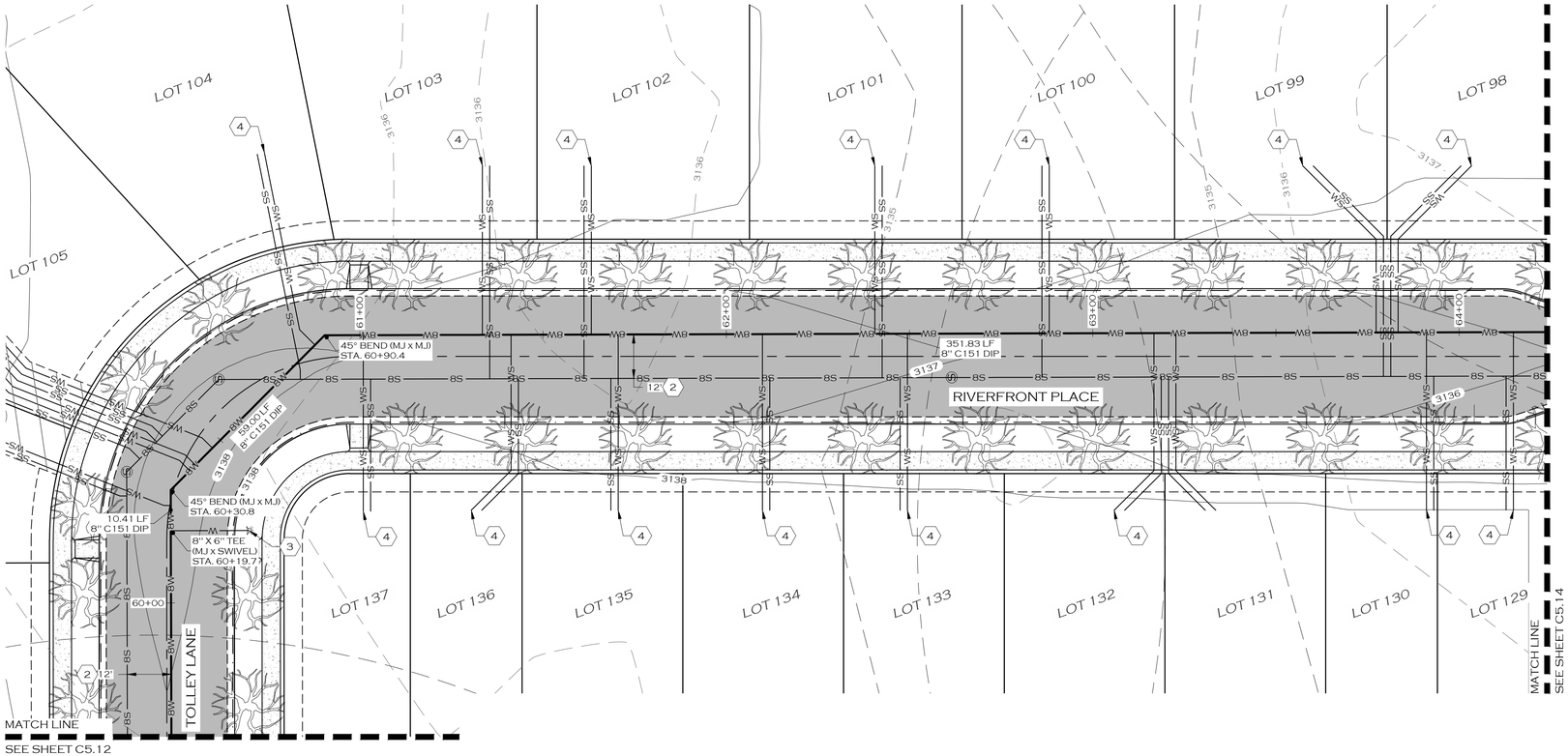
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 56+40 TO 60+20

C5.12

WATER MAIN D STA. 56+40 TO 60+20.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
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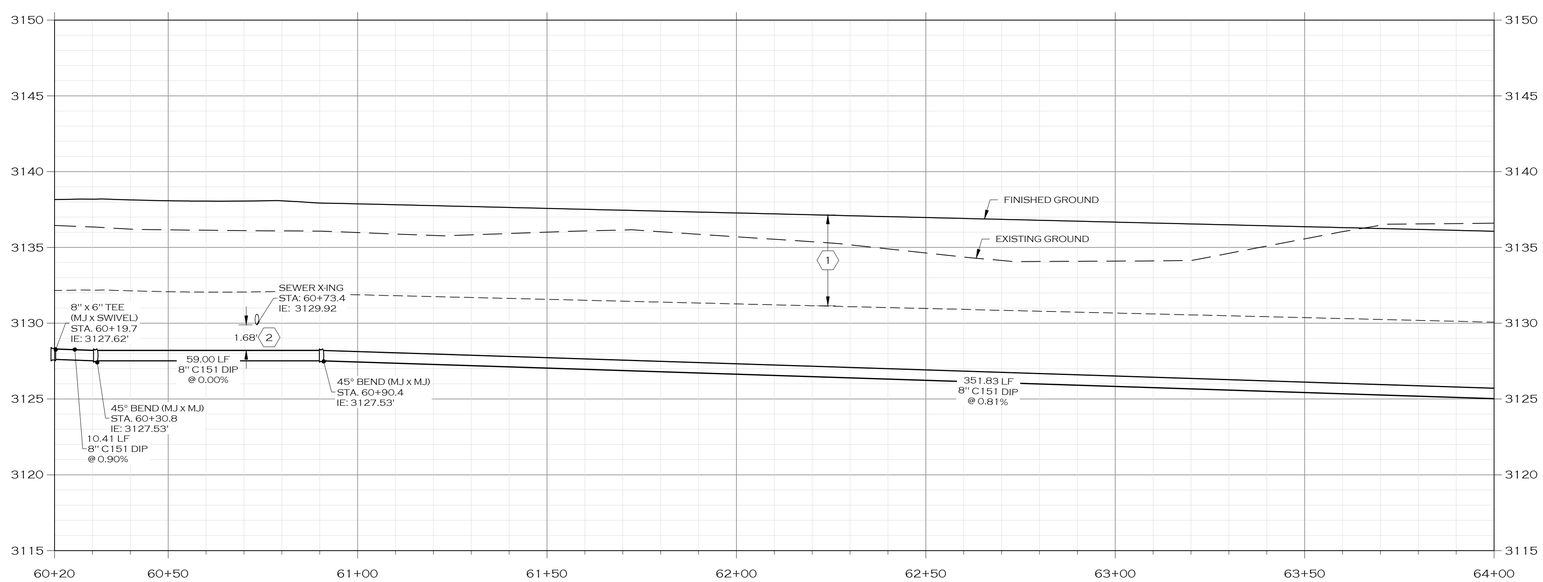
- PROPOSED GRADE BREAK
- PROPOSED LANDSCAPING
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
4. TEST TAPS FOR DISINFECTION TESTING OF WATER SYSTEM SHALL BE LOCATED A MAXIMUM OF 400' APART.
5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
6. ENSURE THAT ALL VALVE BOXES HAVE SUFFICIENT LENGTH TO MAINTAIN THE REQUIRED MINIMUM COVER OVER WATER MAIN LINES.
7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
8. ALL FITTINGS, INCLUDING BENDS EQUAL TO OR GREATER THAN TWENTY-TWO AND ONE-HALF (22.5°) DEGREES, SHALL BE THRUST BLOCKED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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ENGINEERS & SURVEYORS
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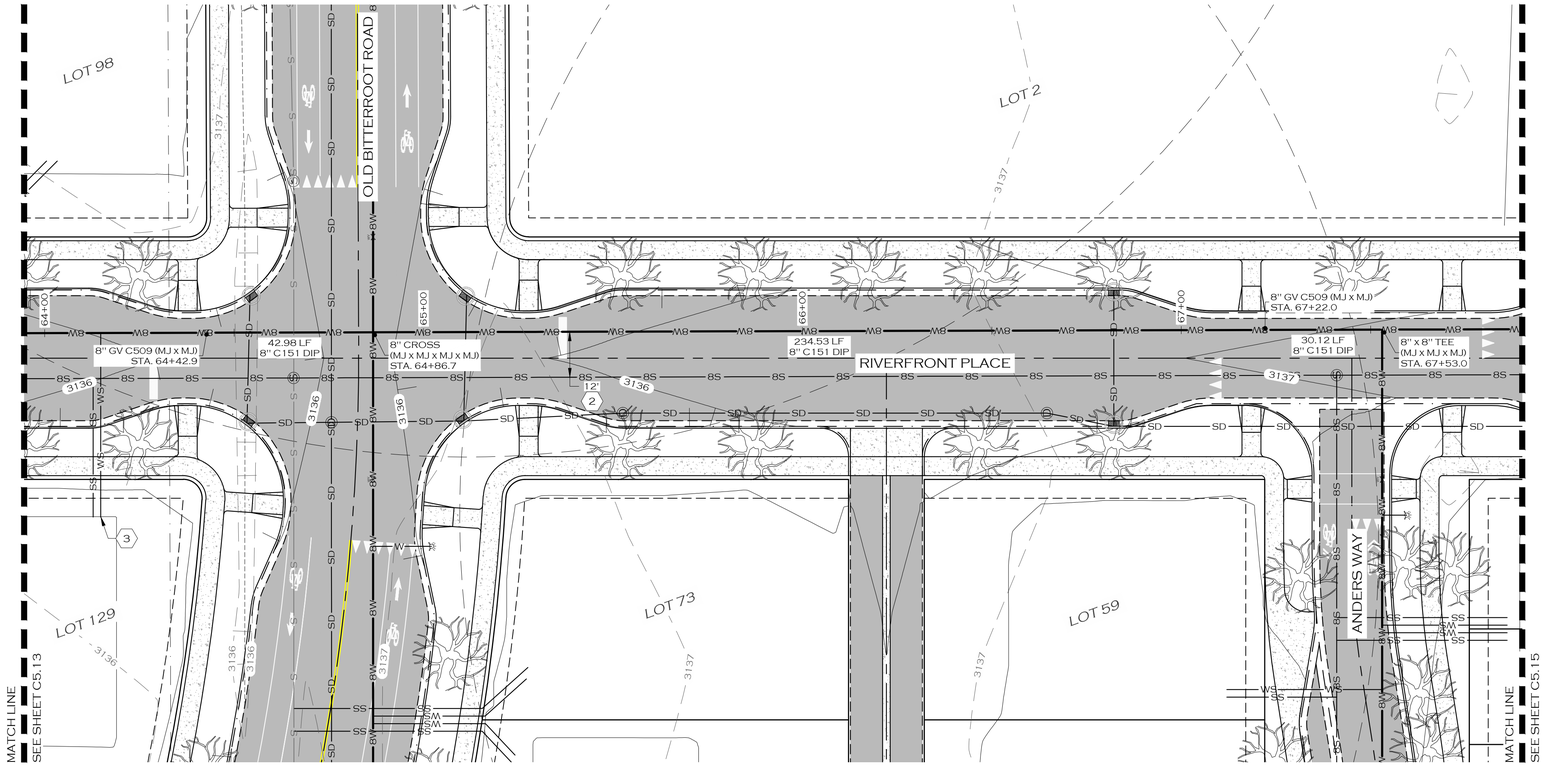
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 60+20 TO 64+00

C5.13

WATER MAIN D STA. 60+20 TO 64+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
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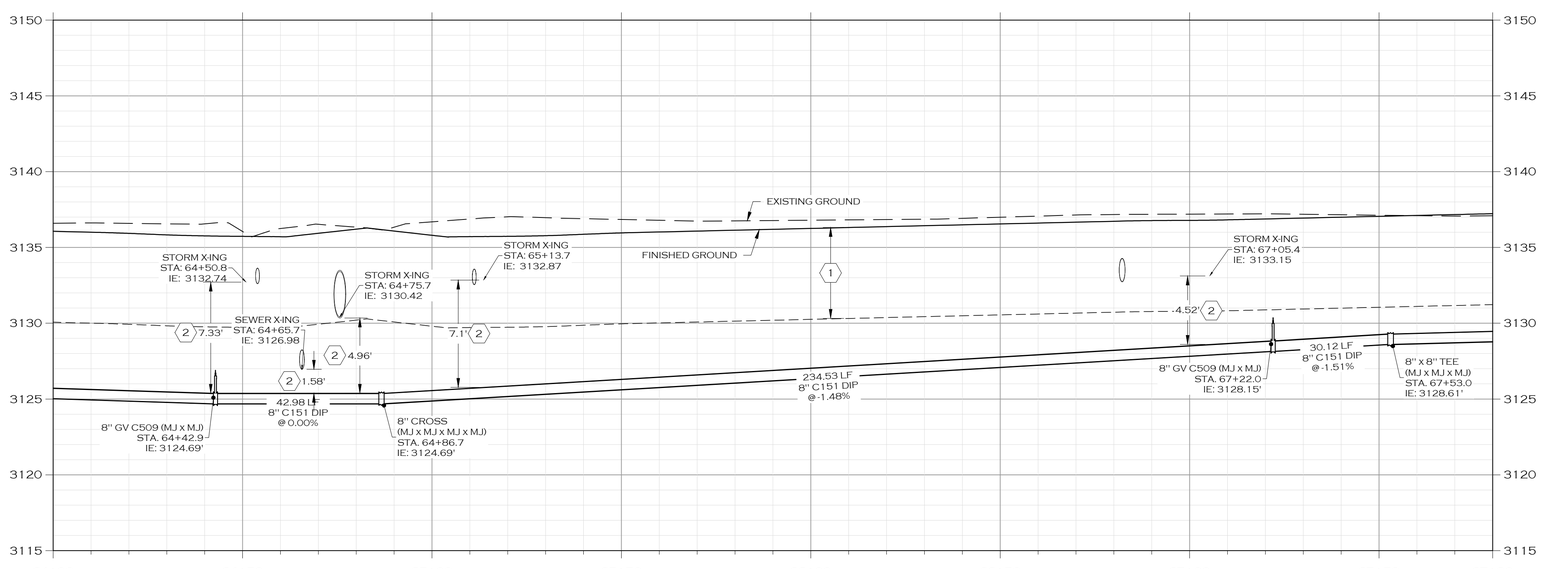
- G — PROPOSED BURIED GAS

0 20 40
IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

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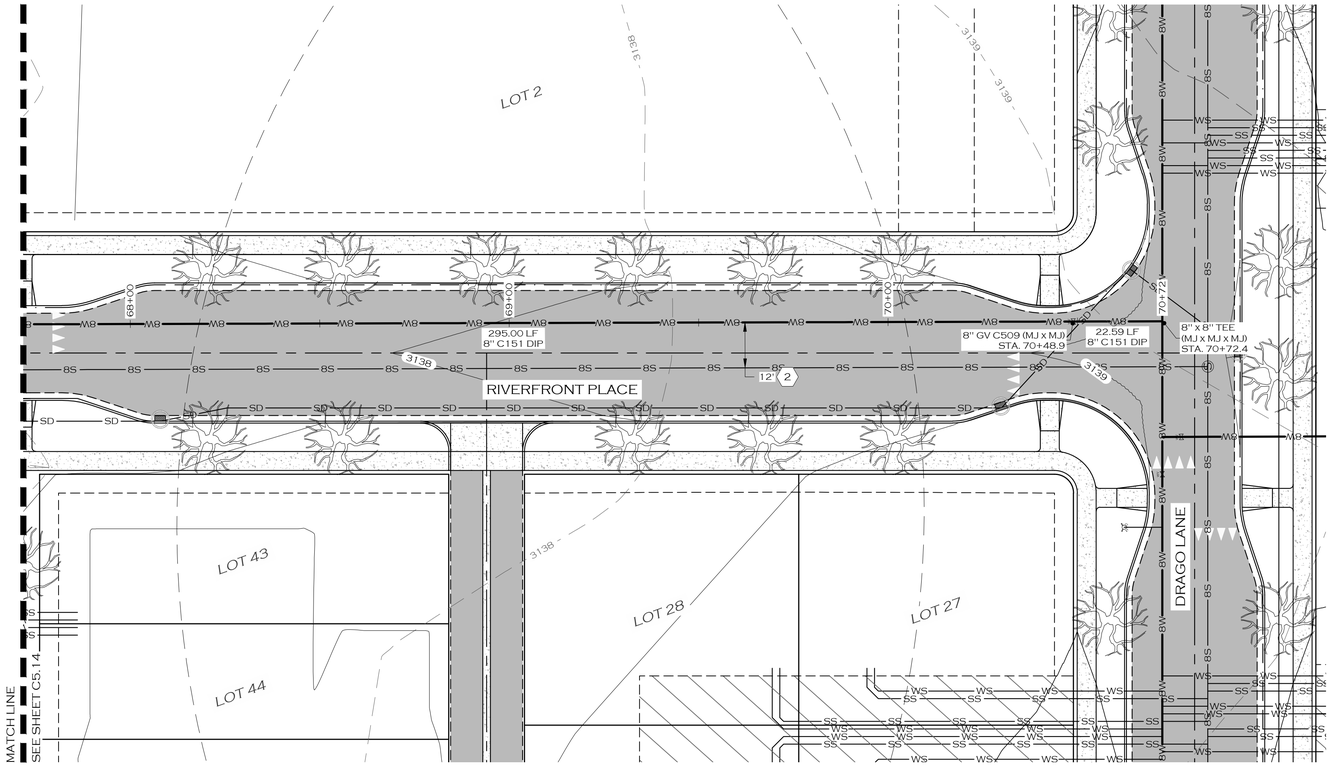
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 64+00 TO 67+80

C5.14

WATER MAIN D STA. 64+00 TO 67+80.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
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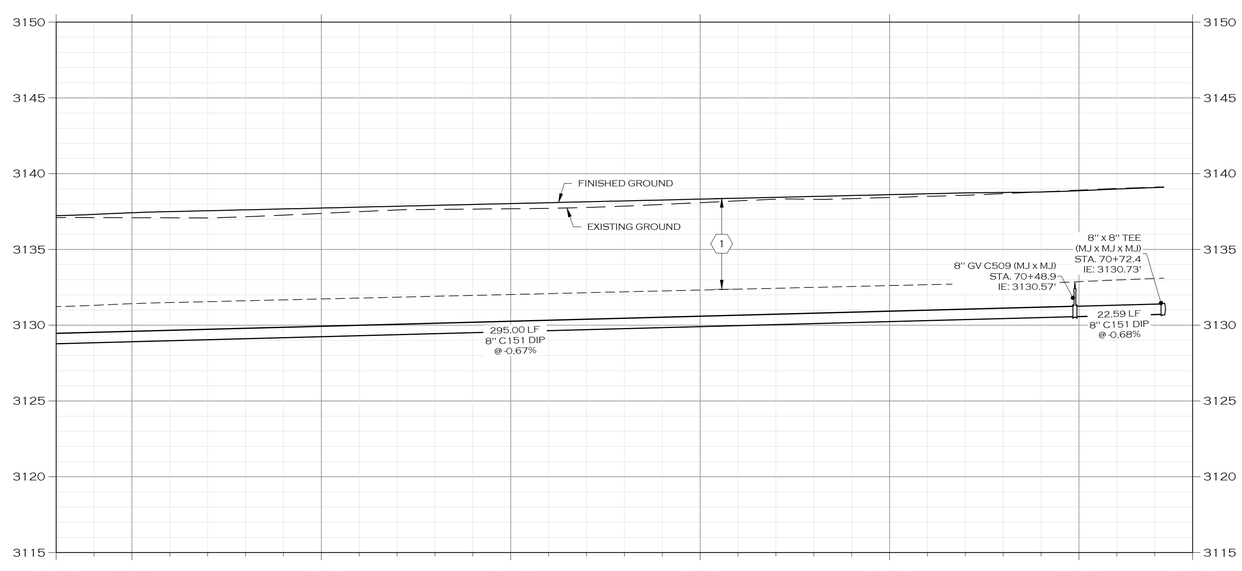
- G — PROPOSED BURIED GAS

0 20 40
IN FEET



HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.

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5. RESIDENTIAL WATER SERVICE LINES FOR THIS PROJECT SHALL BE CLASS 250 POLYETHYLENE PIPE.
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COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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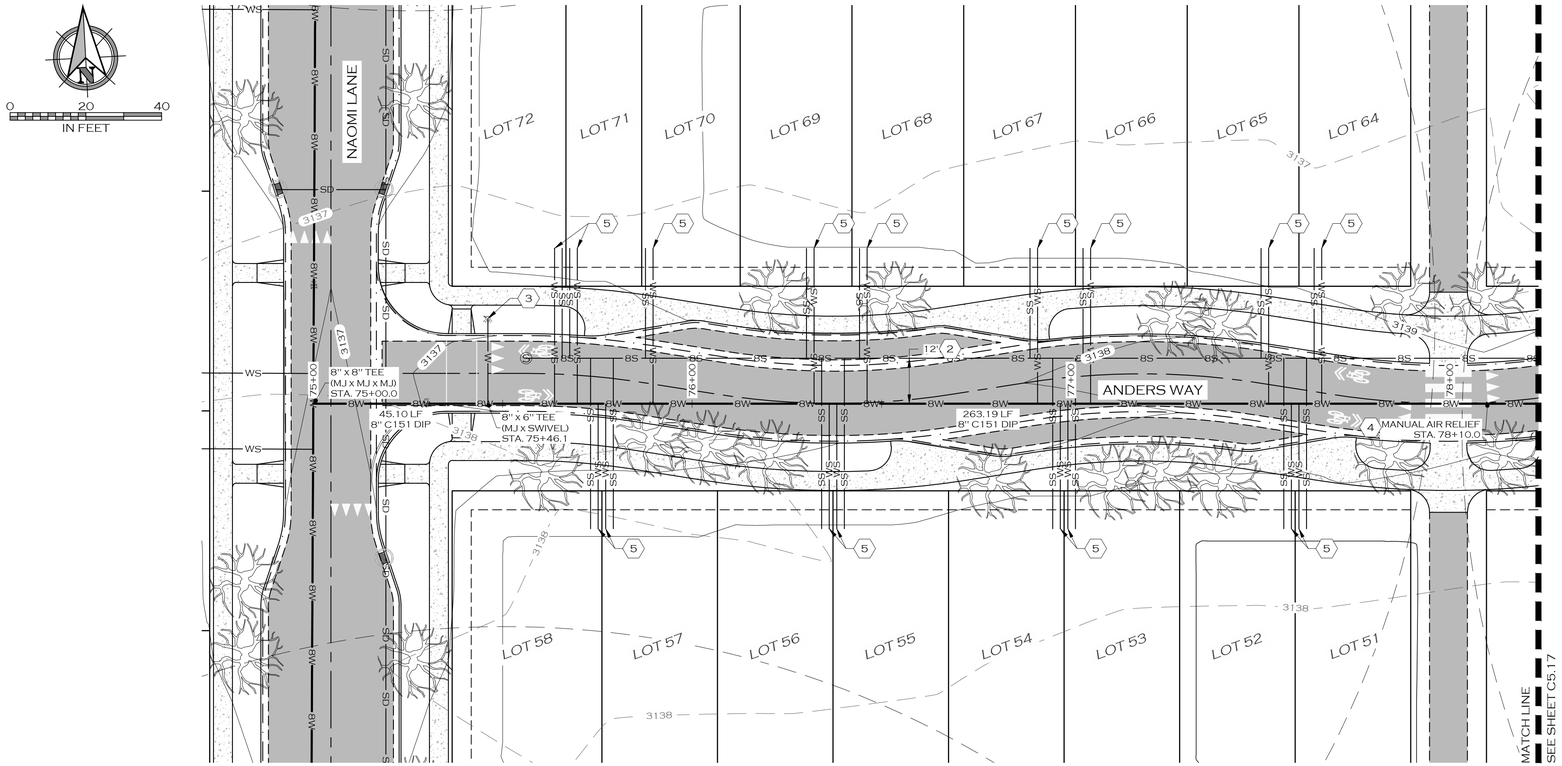
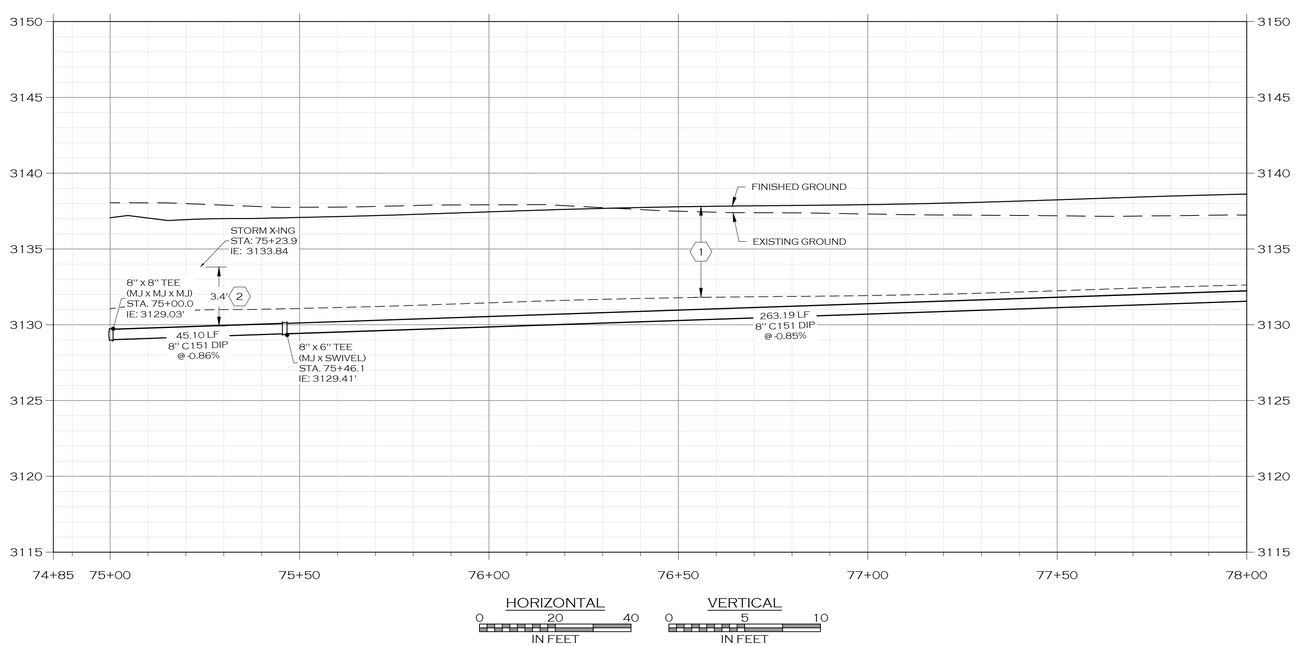
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN D PLAN & PROFILE STA. 67+80 TO 70+80

C5.15

WATER MAIN D STA 67+80 TO 70+80.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
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- G — PROPOSED BURIED GAS

KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. INSTALL 1" MANUAL AIR RELIEF ASSEMBLY IN ACCORDANCE WITH CITY OF MISSOULA STD-410.
5. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

1. PROFILE IS MODELED USING PIPE WITH 18 LF STICKS AND A MAXIMUM DEFLECTION OF 2°. CONTRACTOR SHALL NOT EXCEED 2° DEFLECTION, OR 3.49% TOTAL GRADE CHANGE AT JOINTS.
2. NEW OPEN-TRENCHED WATER MAINS FOR THIS PROJECT SHALL BE CLASS 350 DUCTILE IRON RESTRAINED-JOINT PIPE IN ACCORDANCE WITH AWWA C151.
3. WATER MAIN FITTINGS SHALL BE AWWA C153 DUCTILE IRON. JOINTS SHALL BE AWWA C111 DUCTILE IRON.
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7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
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COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
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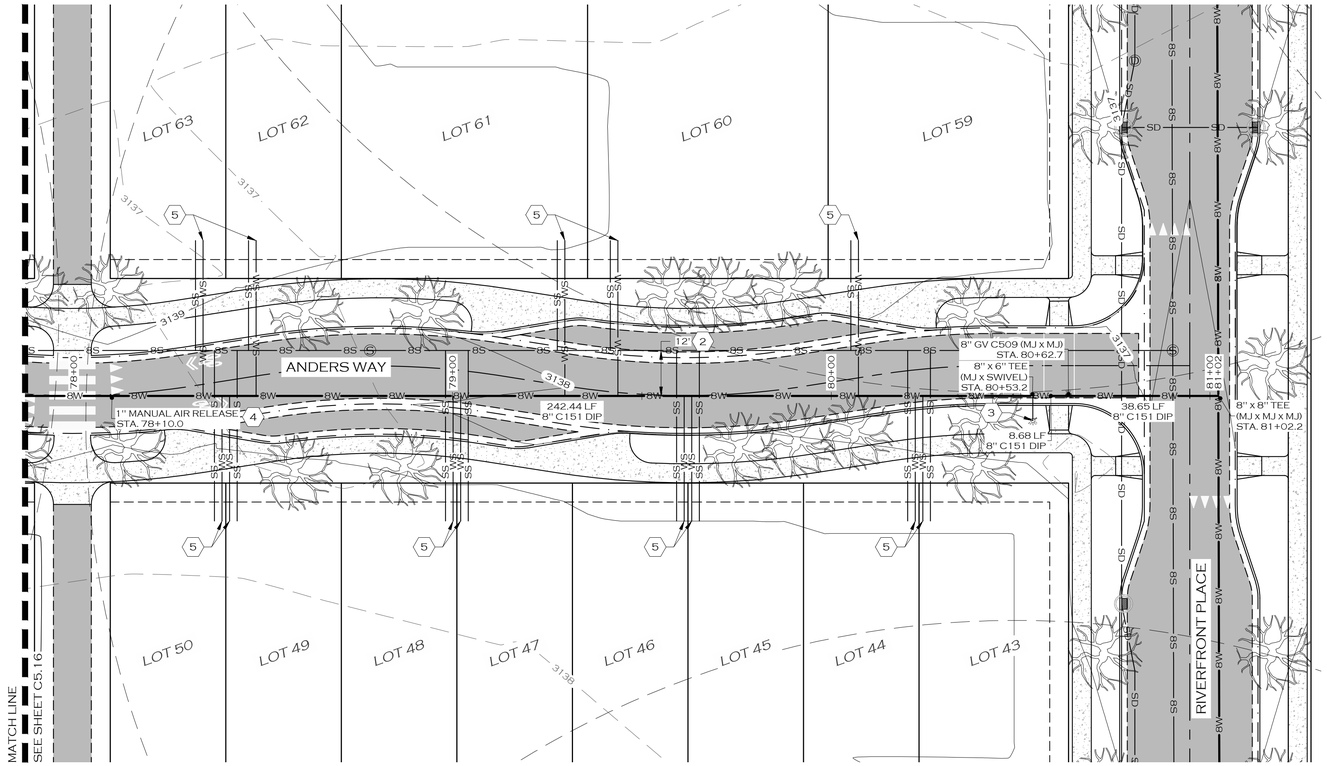
PRELIMINARY

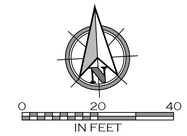
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN E PLAN & PROFILE STA. 75+00 TO 78+00

C5.16

WATER MAIN E STA. 75+00 TO 78+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
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KEY NOTES:

1. MAINTAIN MINIMUM COVER DEPTH OF 6' ABOVE TOP OF PIPE.
2. MAINTAIN MIMIMUM 10' HORIZONTAL AND 18" VERTICAL EDGE-TO-EDGE SEPARATION BETWEEN NEW WATER MAIN PIPING AND SANITARY SEWER MAIN PIPING.
3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. INSTALL 1" MANUAL AIR RELIEF ASSEMBLY IN ACCORDANCE WITH CITY OF MISSOULA STD-410.
5. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

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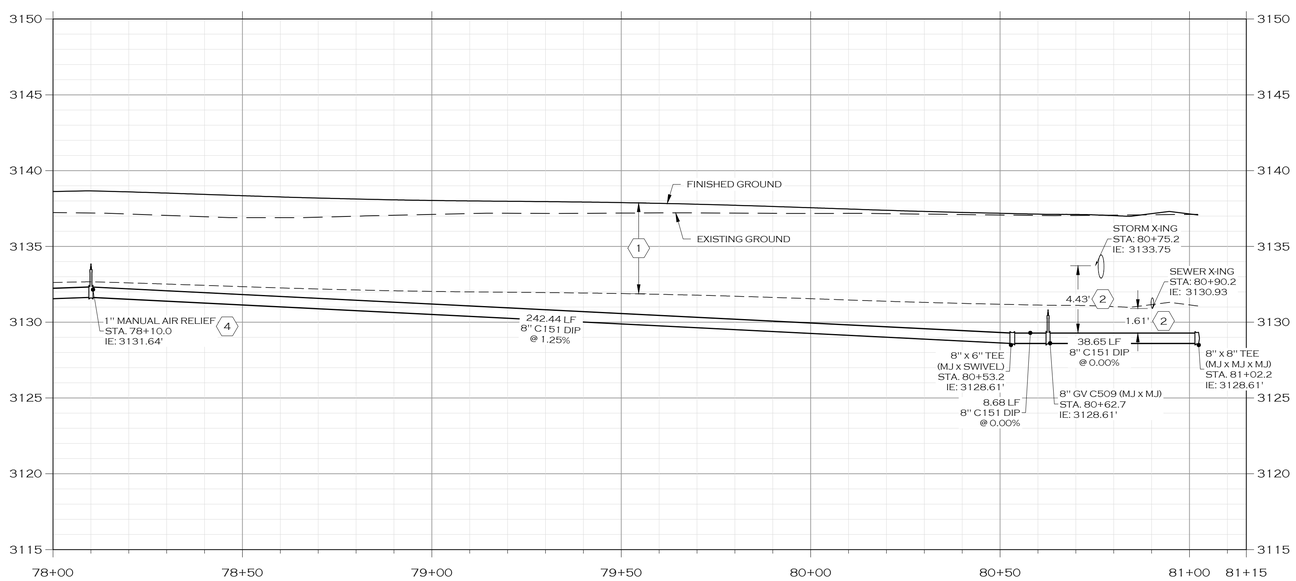

HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
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DATE:	7/21/2022

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PRELIMINARY

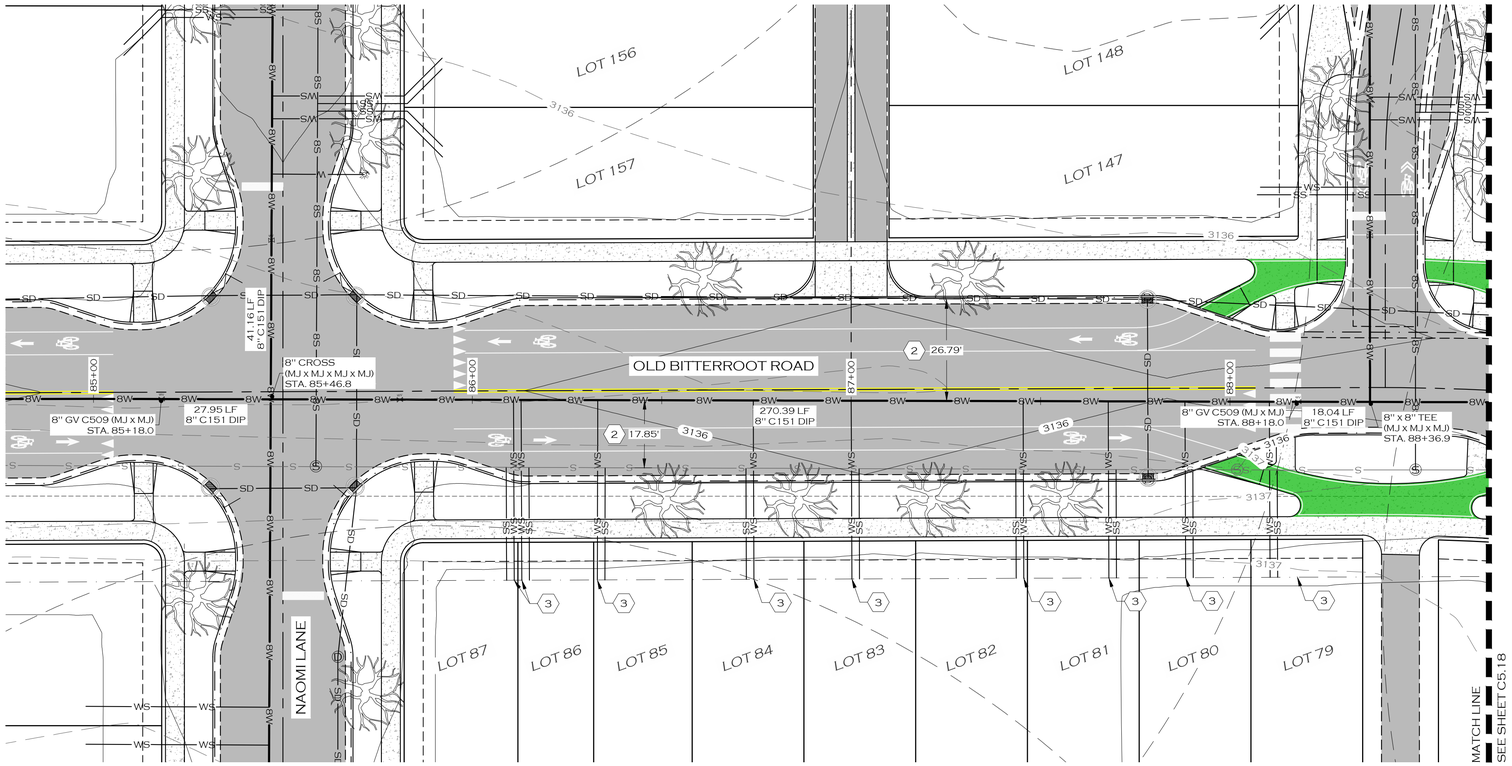
RIVERFRONT TRAILS

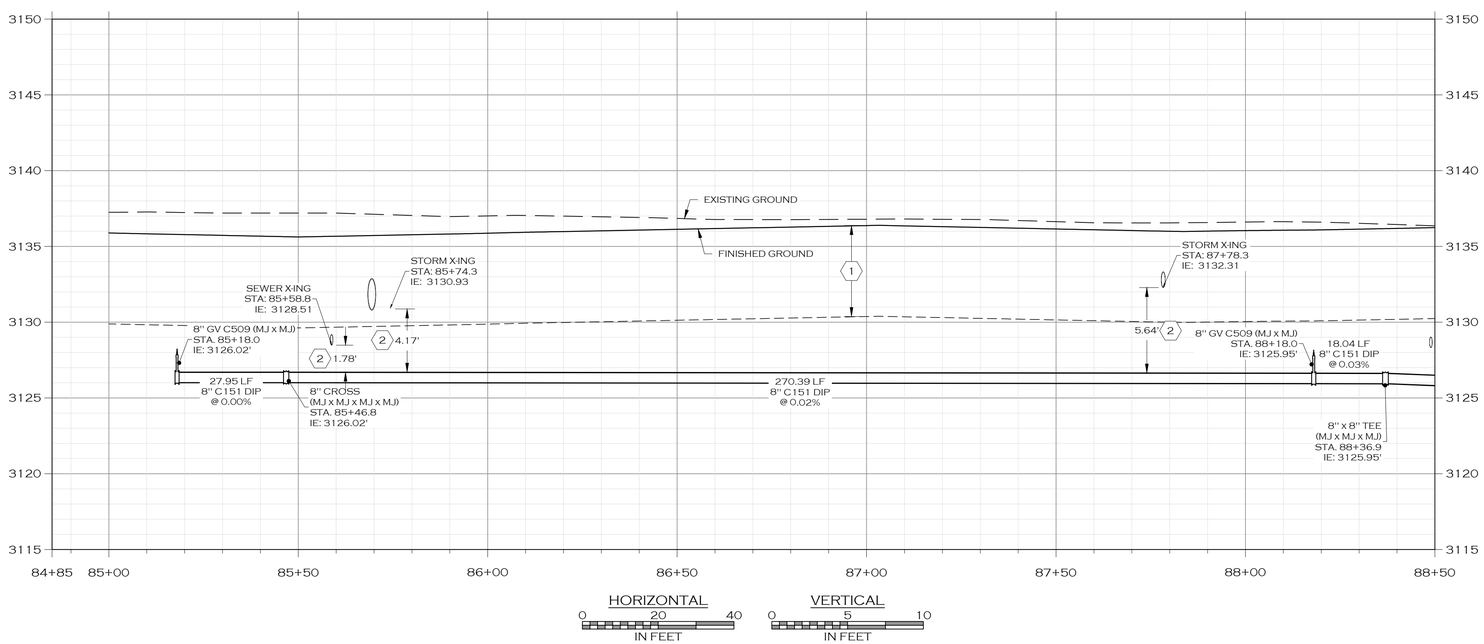
MISSOULA MONTANA

WATER MAIN E PLAN & PROFILE STA. 78+00 TO 81+10

C5.17

WATER MAIN E STA. 78+00 TO 81+10.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

- PROPOSED BUILDING
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N

0 20 40
IN FEET

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3. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

NOTES:

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7. THRUST BLOCKS ARE NOT SHOWN ON THE DRAWINGS. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT WELDED, GROOVED END, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
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COLOR VERIFICATION
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JOB #:	2101
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DATE:	7/21/2022

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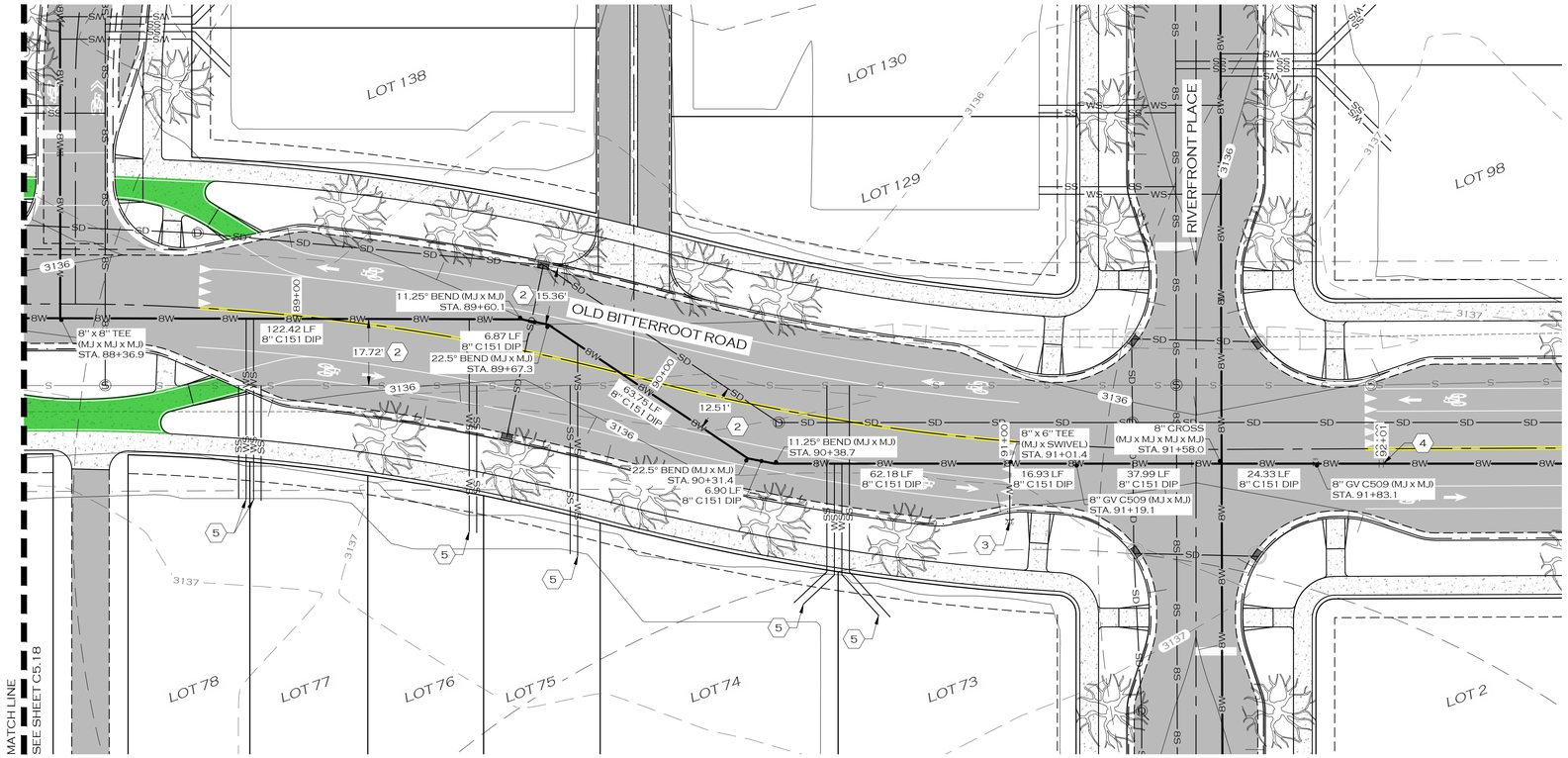
PRELIMINARY

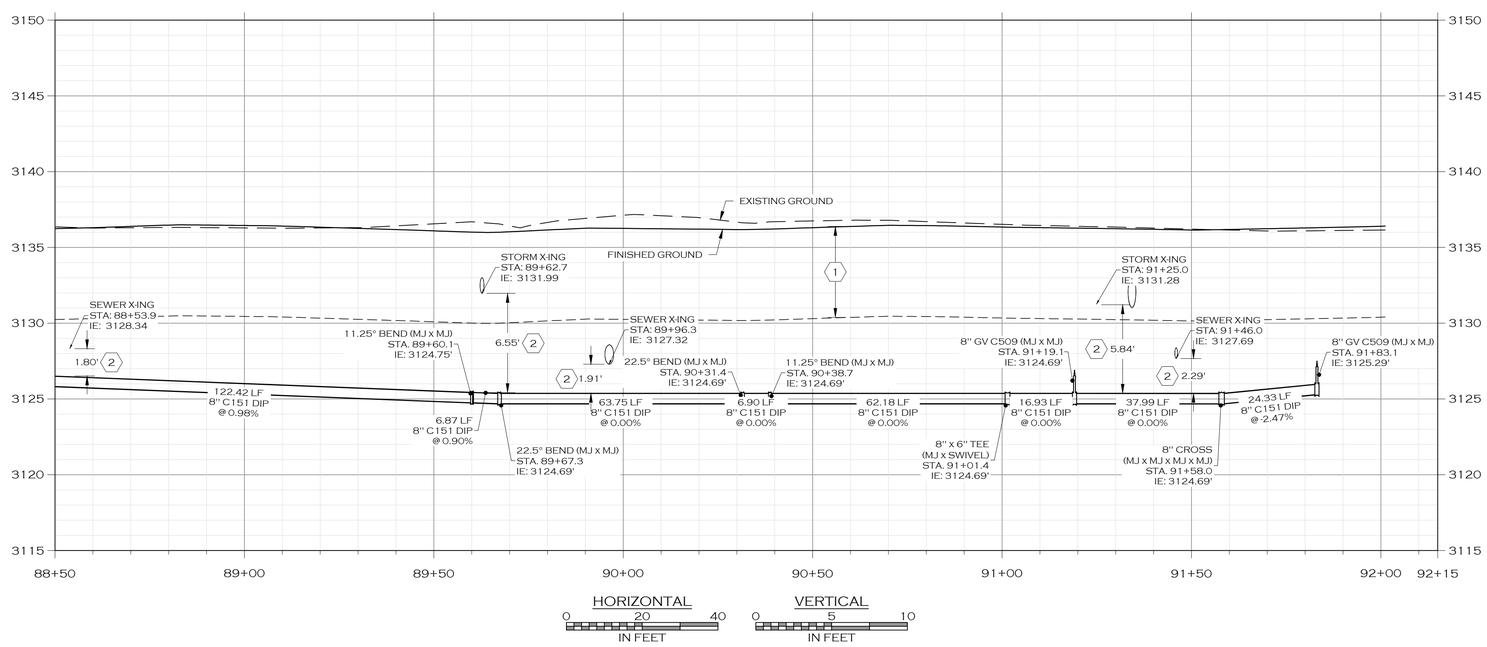
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN F PLAN & PROFILE STA. 85+00 TO 88+50

C5.18

WATER MAIN F STA. 85+00 TO 88+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

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- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
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3. PROVIDE AND INSTALL NEW FIRE HYDRANT IN ACCORDANCE WITH CITY OF MISSOULA STD-408.
4. INSTALL TYPICAL BLOW-OFF ASSEMBLY IN ACCORDANCE WITH CITY OF MISSOULA STD-409.
5. CONSTRUCT TYPICAL RESIDENTIAL WATER SERVICE STUB PER CITY OF MISSOULA STD-404B.

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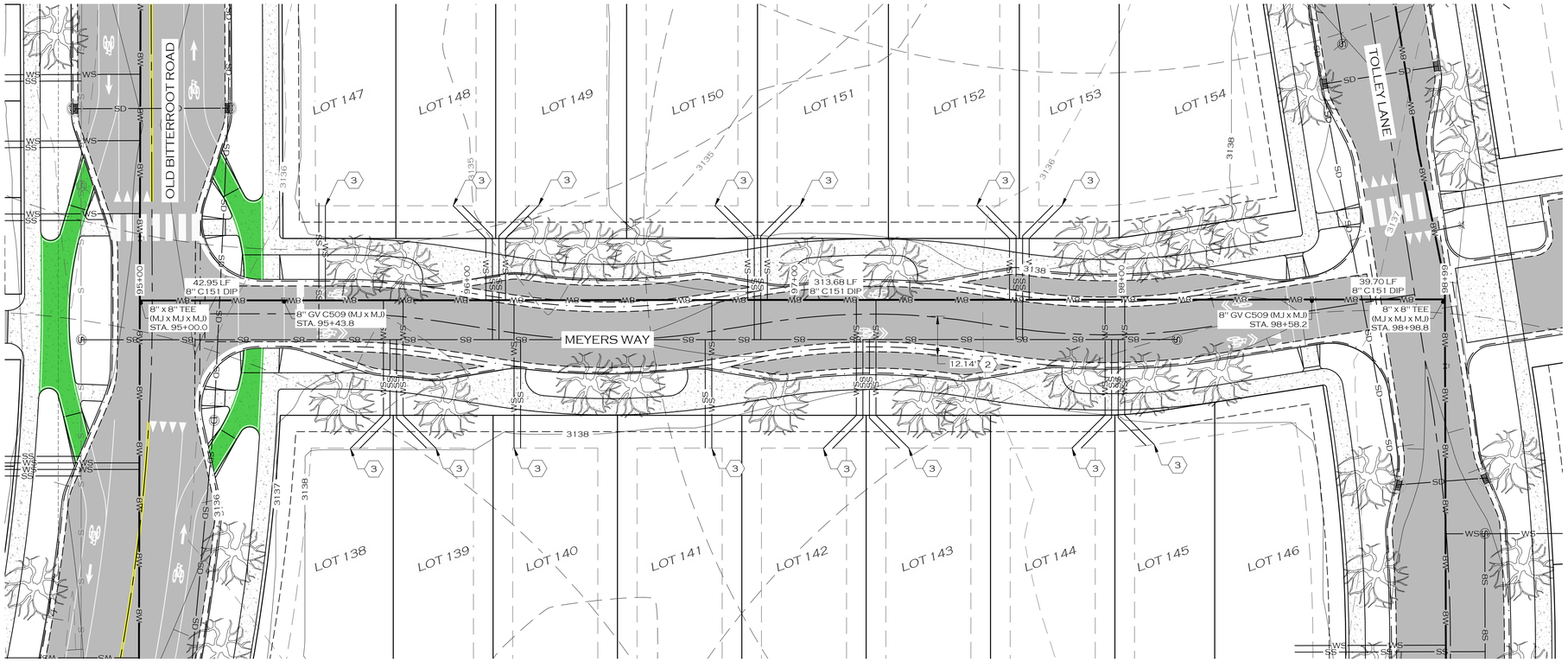
PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN F PLAN & PROFILE STA. 88+50 TO 92+00

C5.19

WATER MAIN F STA. 88+50 TO 92+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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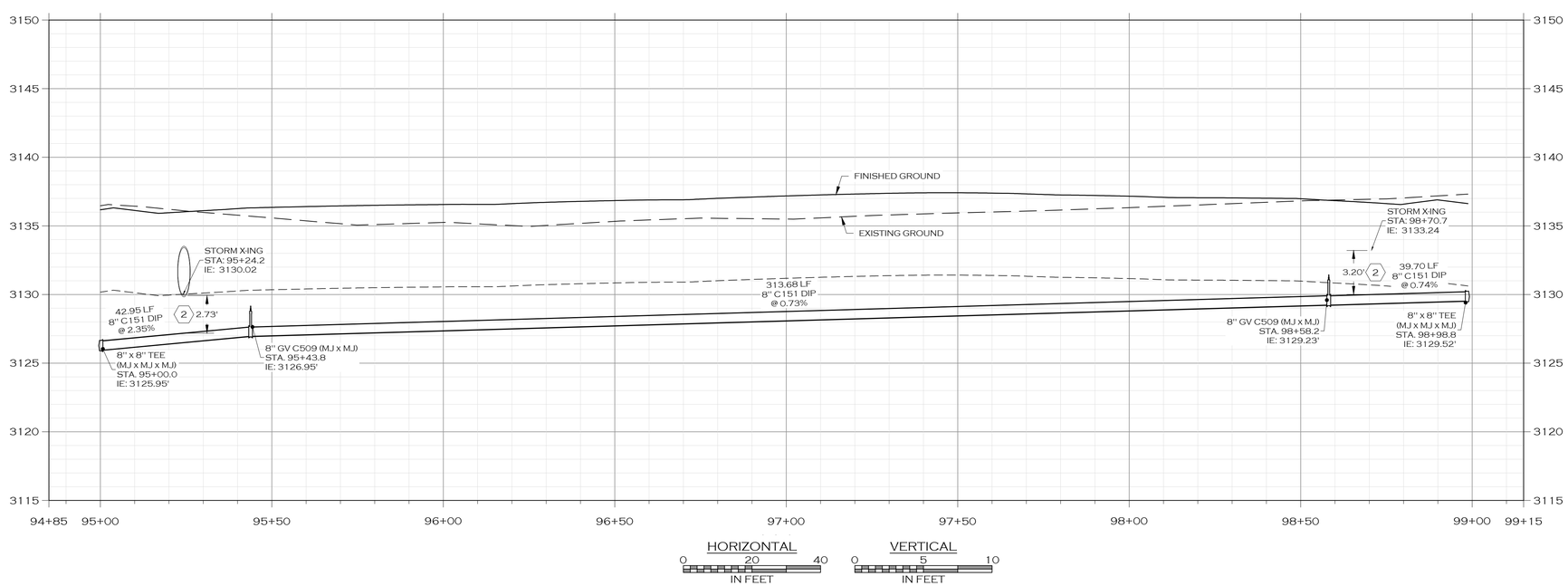

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PRELIMINARY

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JOB #:	2101
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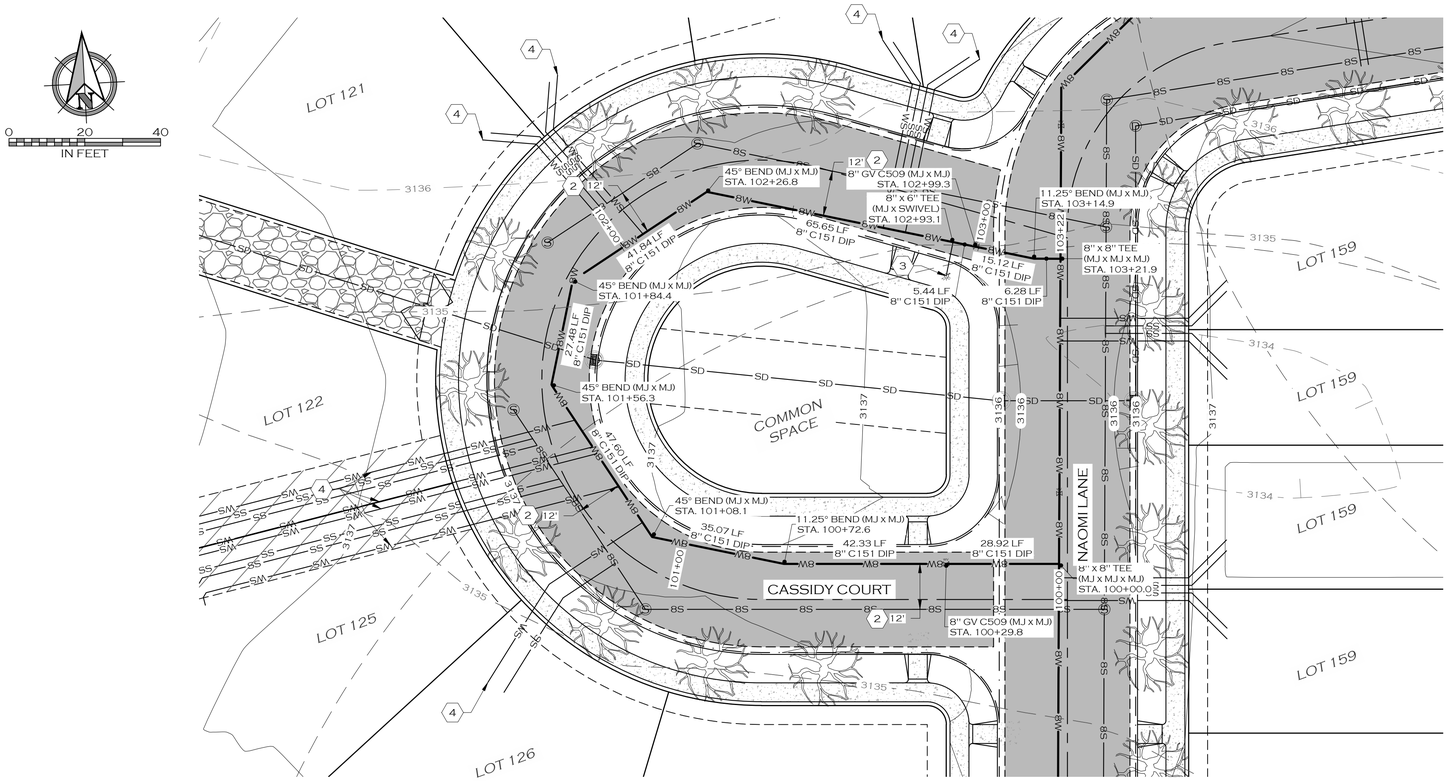
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN G PLAN & PROFILE

C5.20

WATER MAIN G PLAN & PROFILE.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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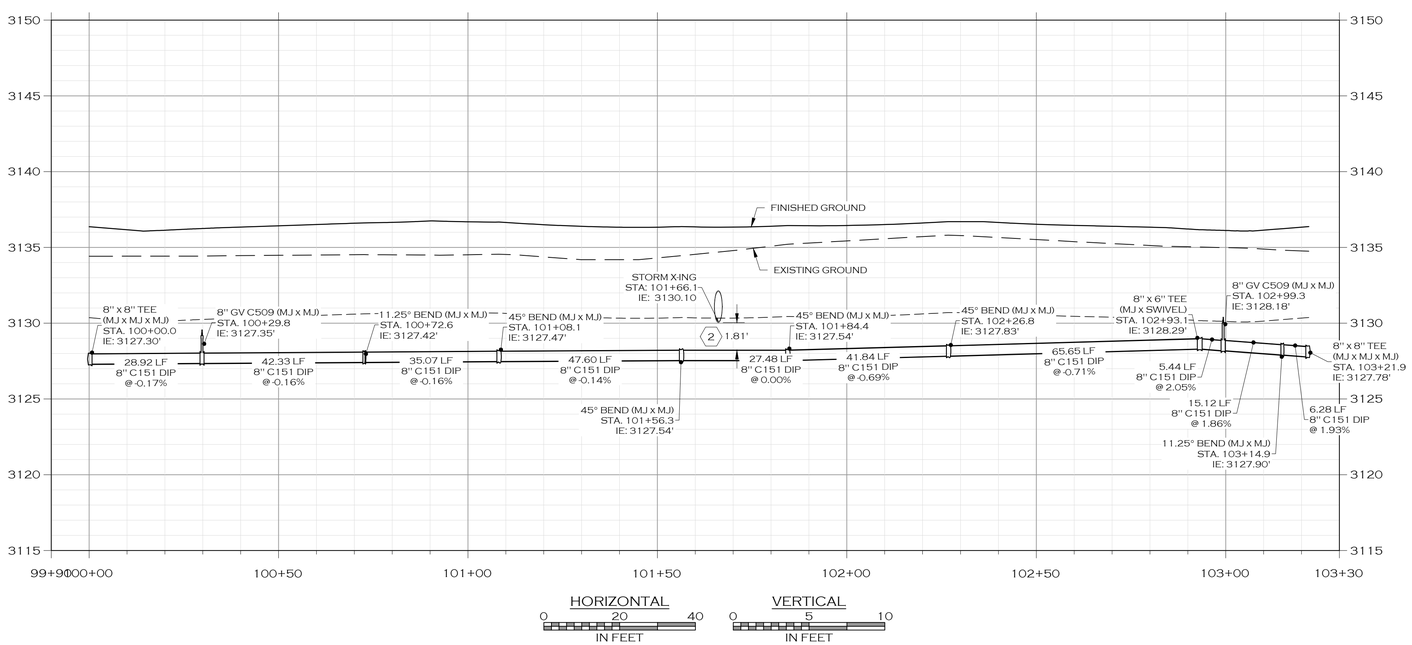

HORIZONTAL 0 20 40 IN FEET

VERTICAL 0 5 10 IN FEET

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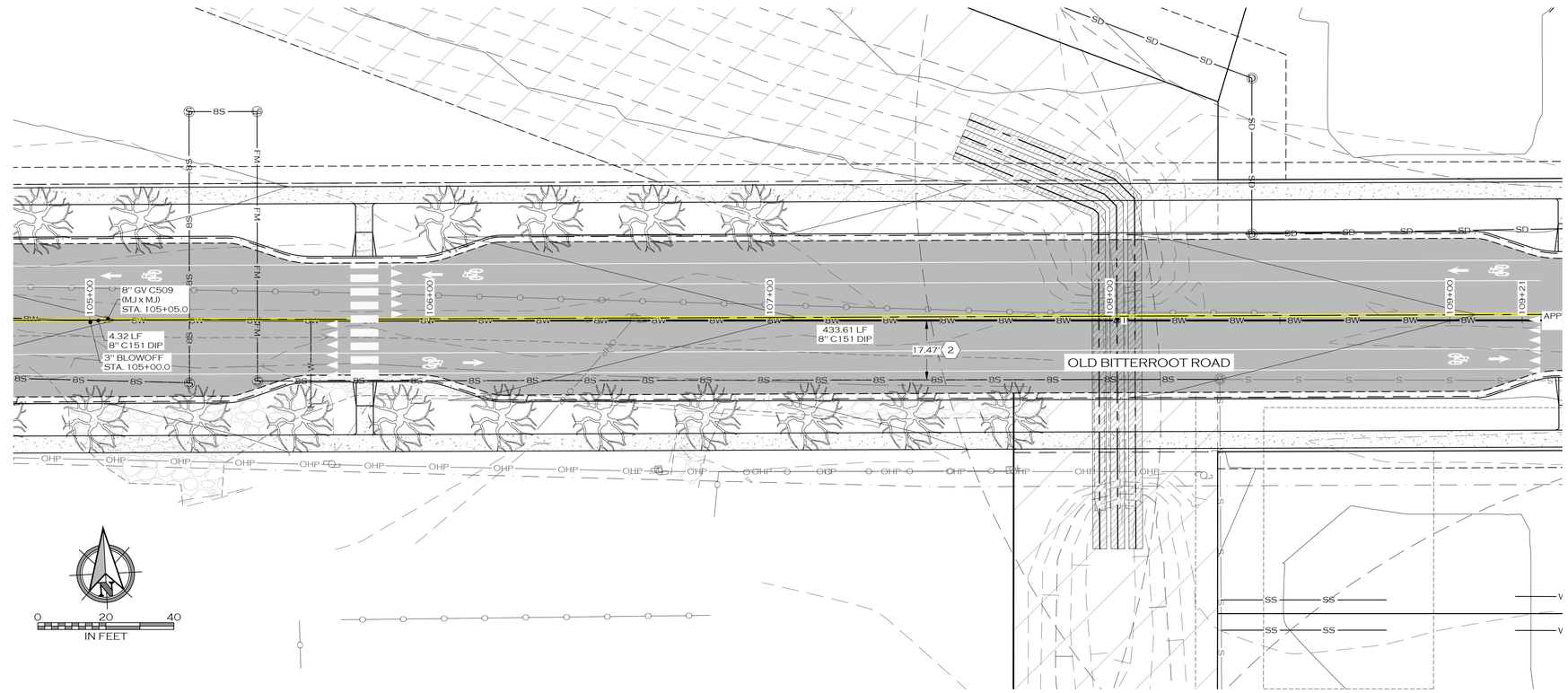
RIVERFRONT TRAILS

MISSOULA MONTANA

WATER MAIN H PLAN & PROFILE

C5.21

WATER MAIN H PLAN & PROFILE.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



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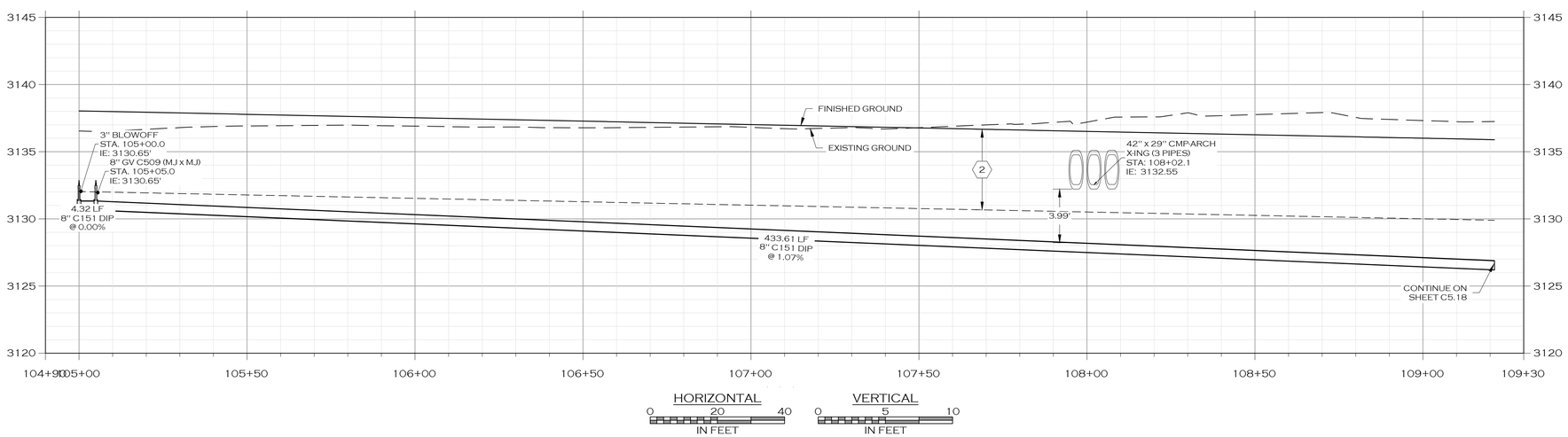

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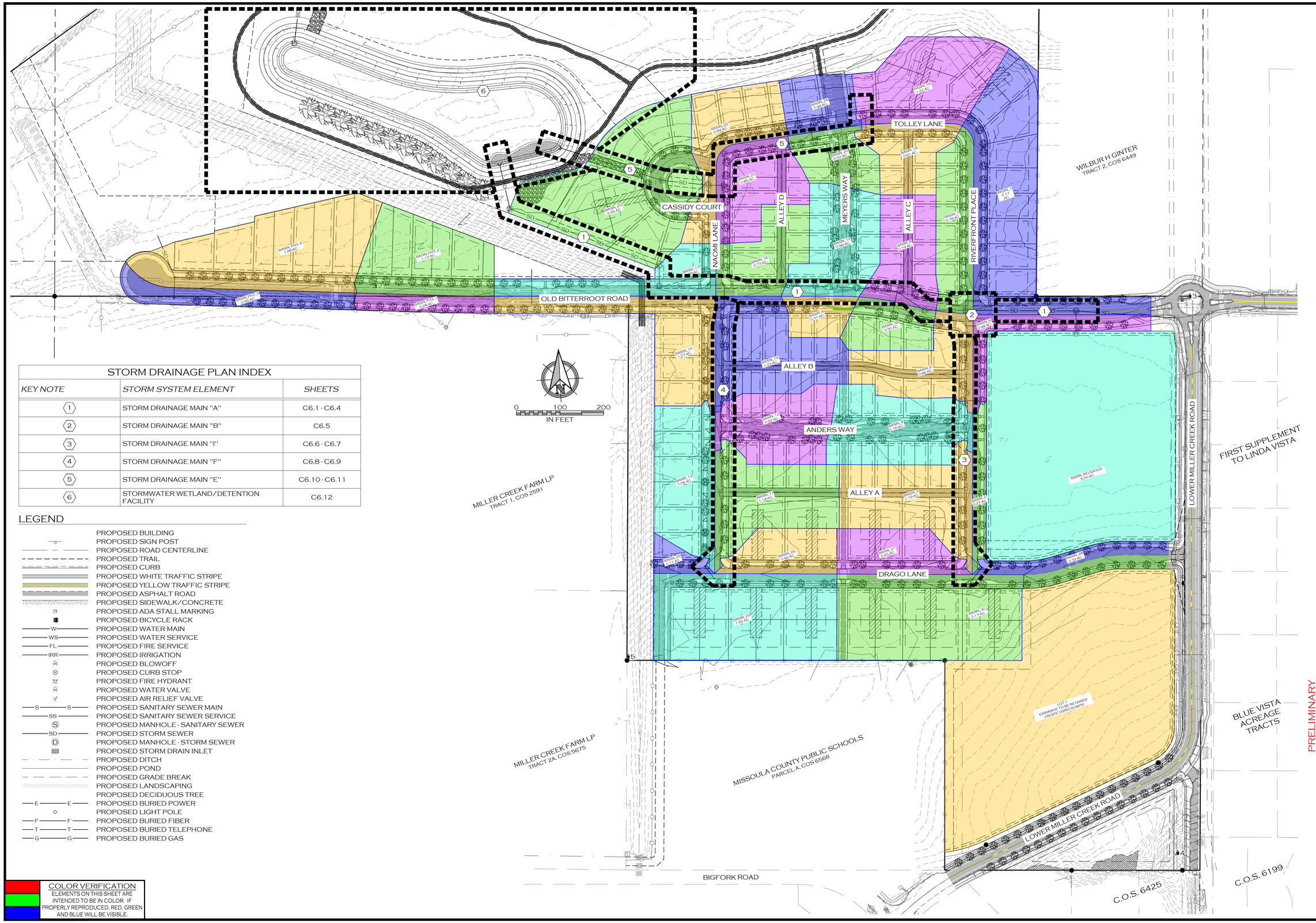
RIVERFRONT TRAILS
MISSOULA MONTANA

WATER MAIN I PLAN & PROFILE

C5.22

WATER MAIN I PLAN & PROFILE.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



STORM DRAINAGE PLAN INDEX

KEY NOTE	STORM SYSTEM ELEMENT	SHEETS
1	STORM DRAINAGE MAIN "A"	C6.1 - C6.4
2	STORM DRAINAGE MAIN "B"	C6.5
3	STORM DRAINAGE MAIN "I"	C6.6 - C6.7
4	STORM DRAINAGE MAIN "F"	C6.8 - C6.9
5	STORM DRAINAGE MAIN "E"	C6.10 - C6.11
6	STORMWATER WETLAND/DETENTION FACILITY	C6.12

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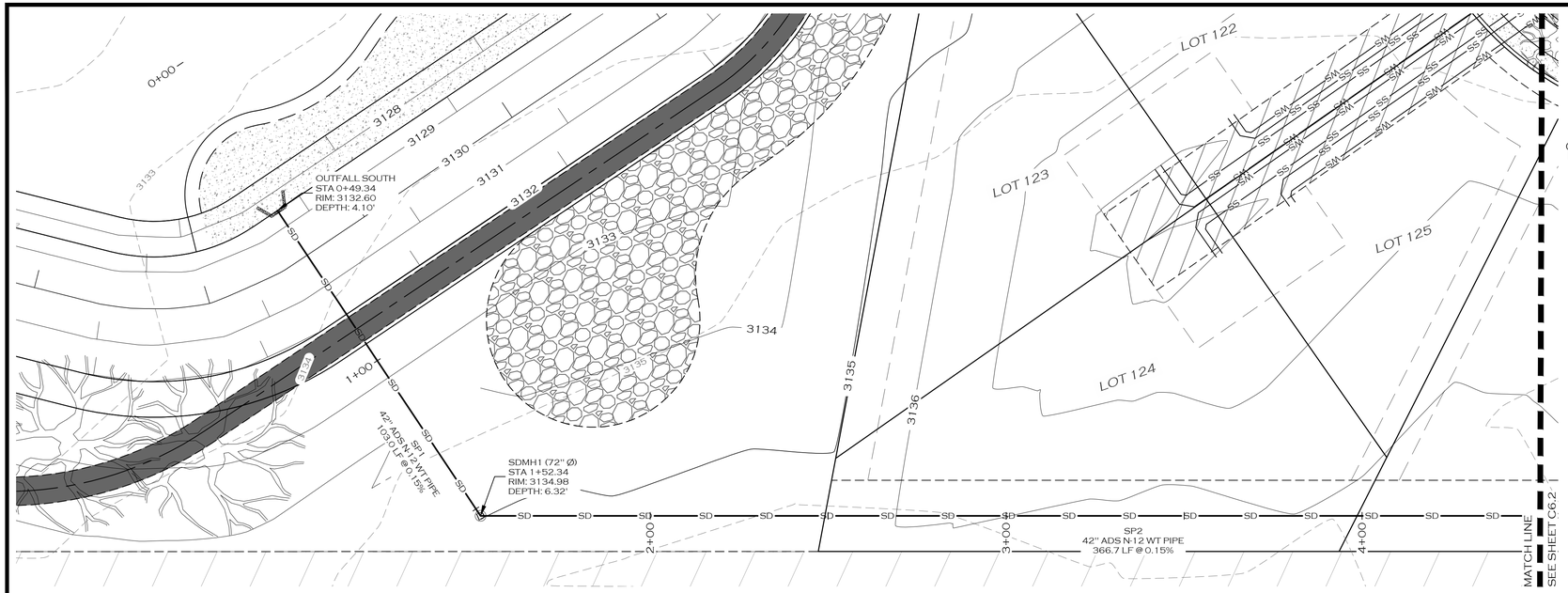
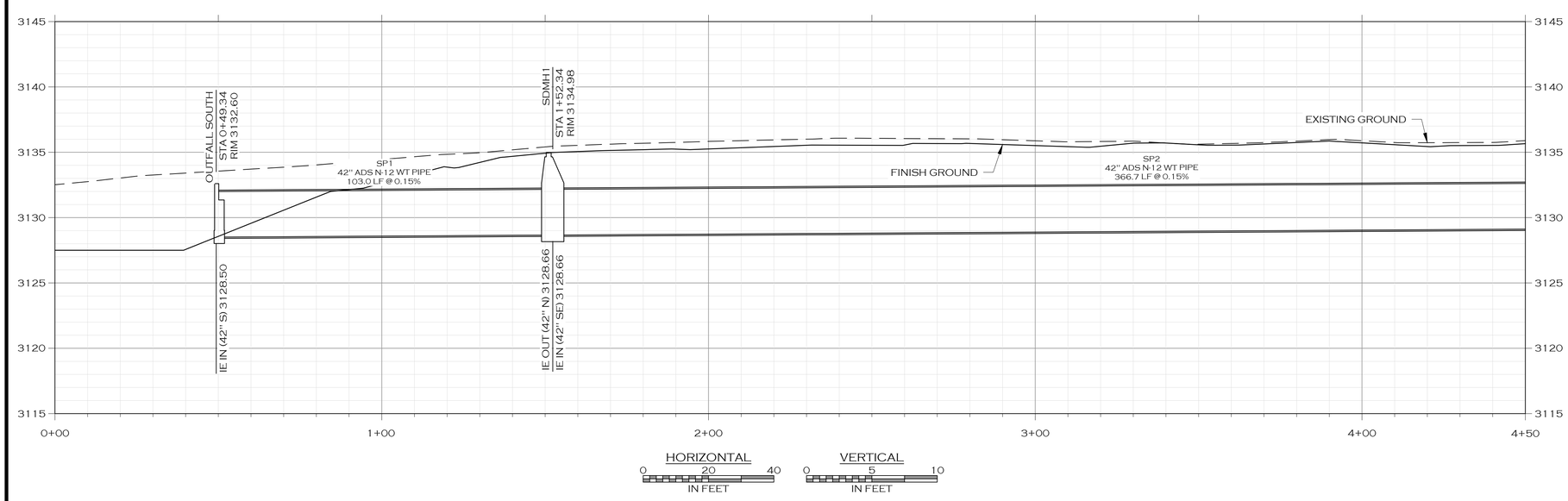
RIVERFRONT TRAILS
MISSOULA MONTANA

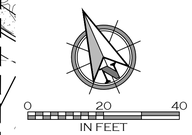
OVERALL STORM DRAINAGE PLAN

C6.0

OVERALL STORM PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022







LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
- PROPOSED POND
- PROPOSED GRADE BREAK
- PROPOSED LANDSCAPING
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

RIVERFRONT TRAILS

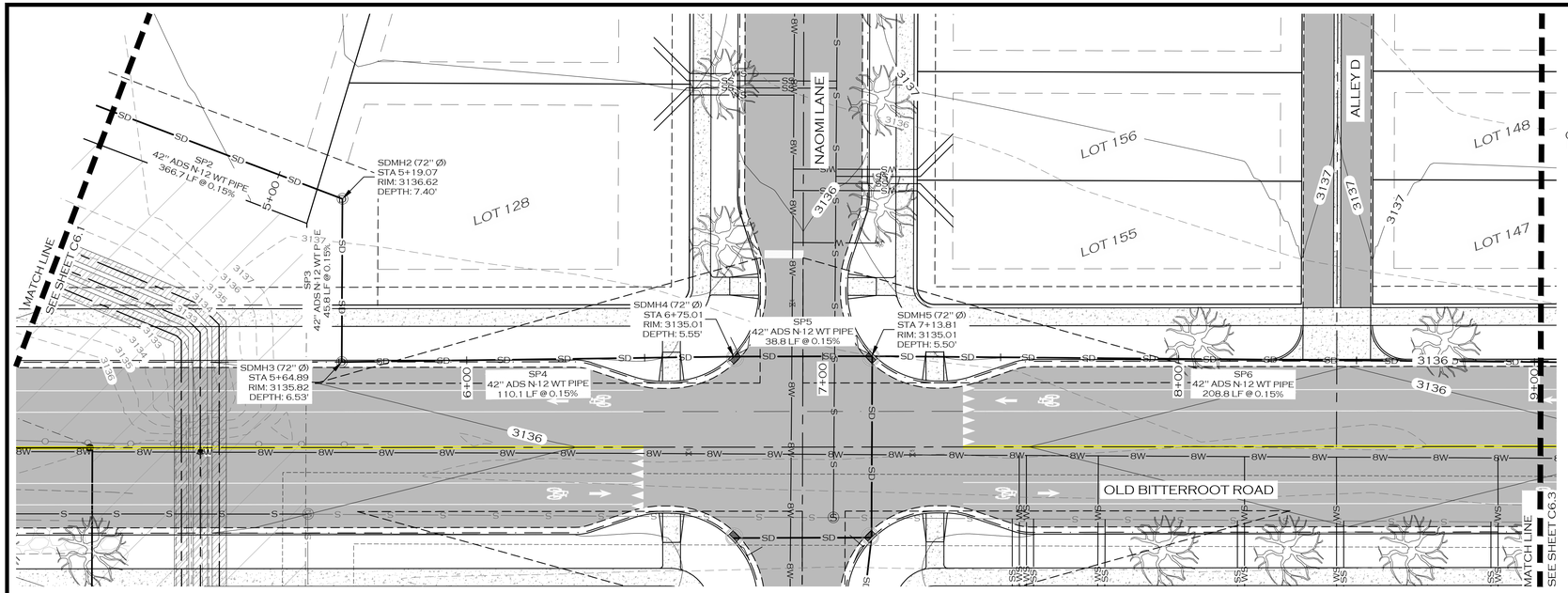
MISSOULA MONTANA

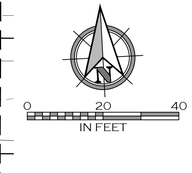
STORM MAIN A PLAN & PROFILE STA. 0+00 TO 4+50

C6.1

STRM A 0+00 TO 4+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
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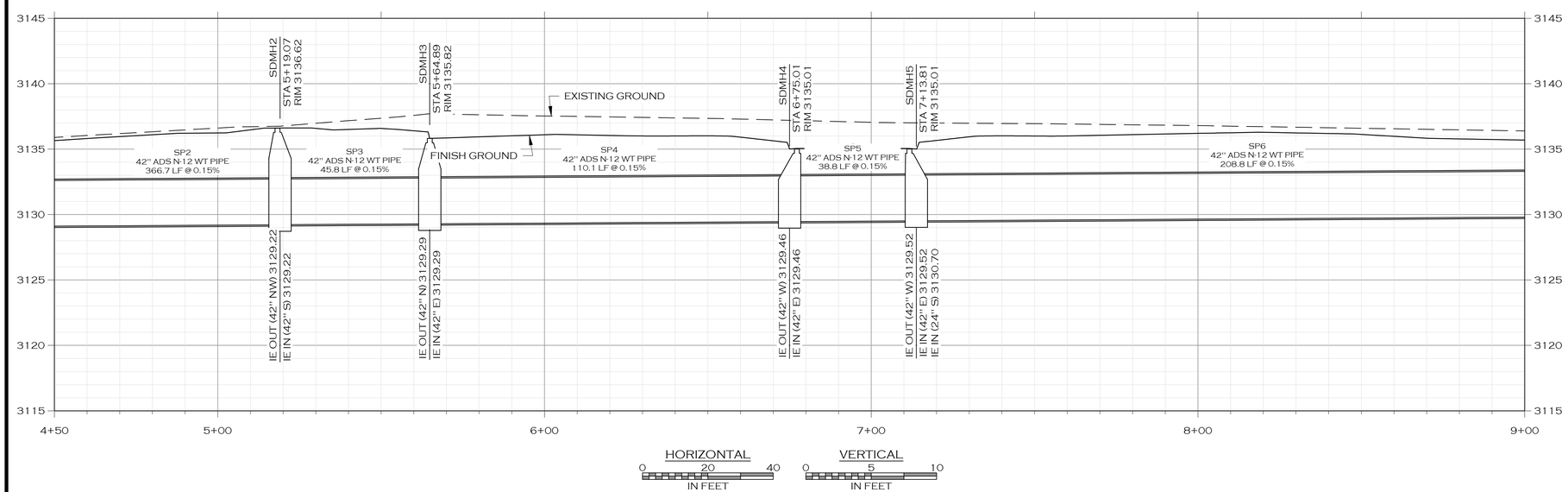
- G — PROPOSED BURIED GAS



HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

RIVERFRONT TRAILS

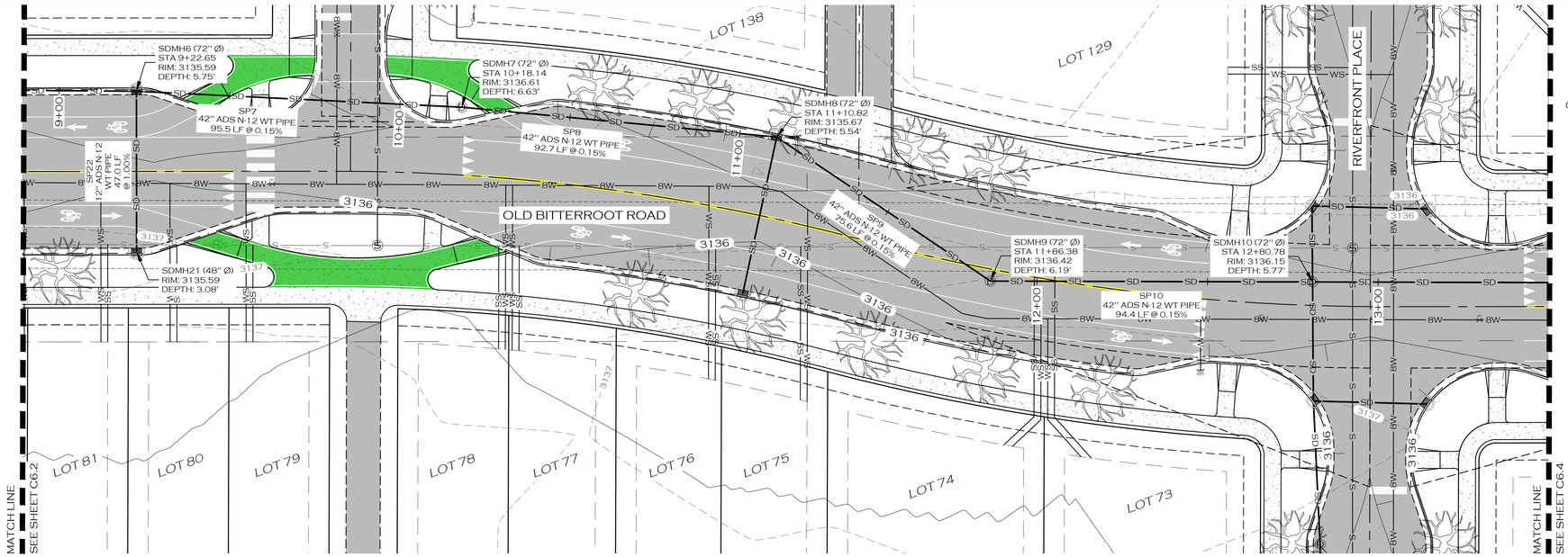
MISSOULA MONTANA

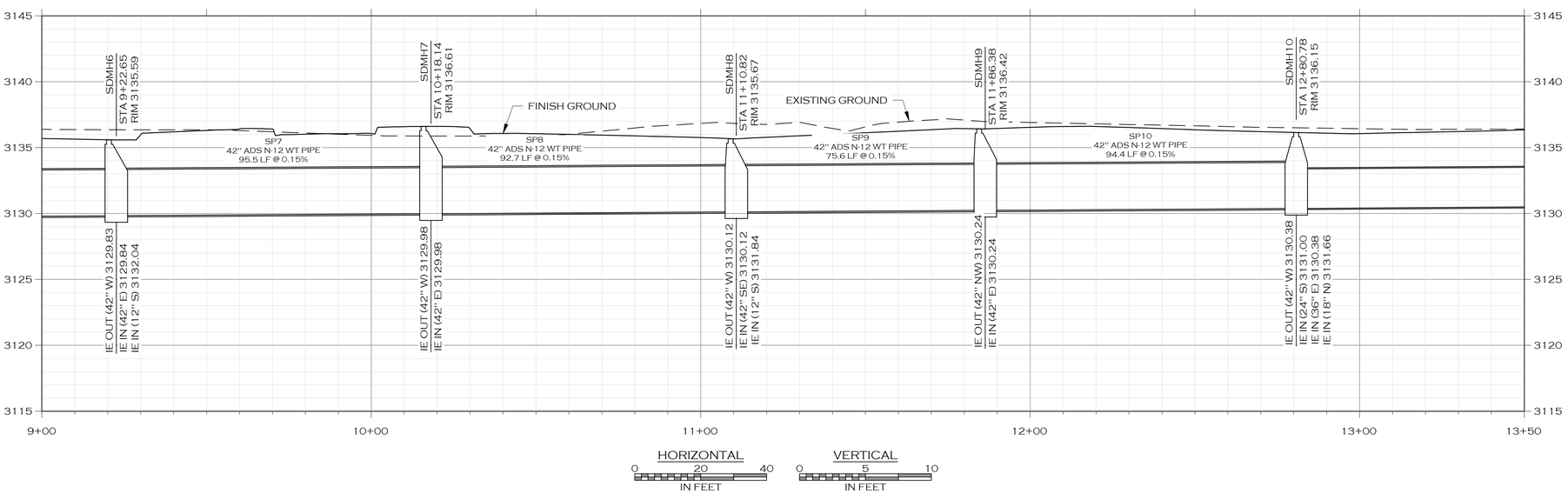
STORM MAIN A PLAN & PROFILE STA. 4+50 TO 9+00

C6.2

STRM A 4+50 TO 9+00.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





HORIZONTAL
0 20 40
IN FEET

VERTICAL
0 5 10
IN FEET

0 20 40
IN FEET

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
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PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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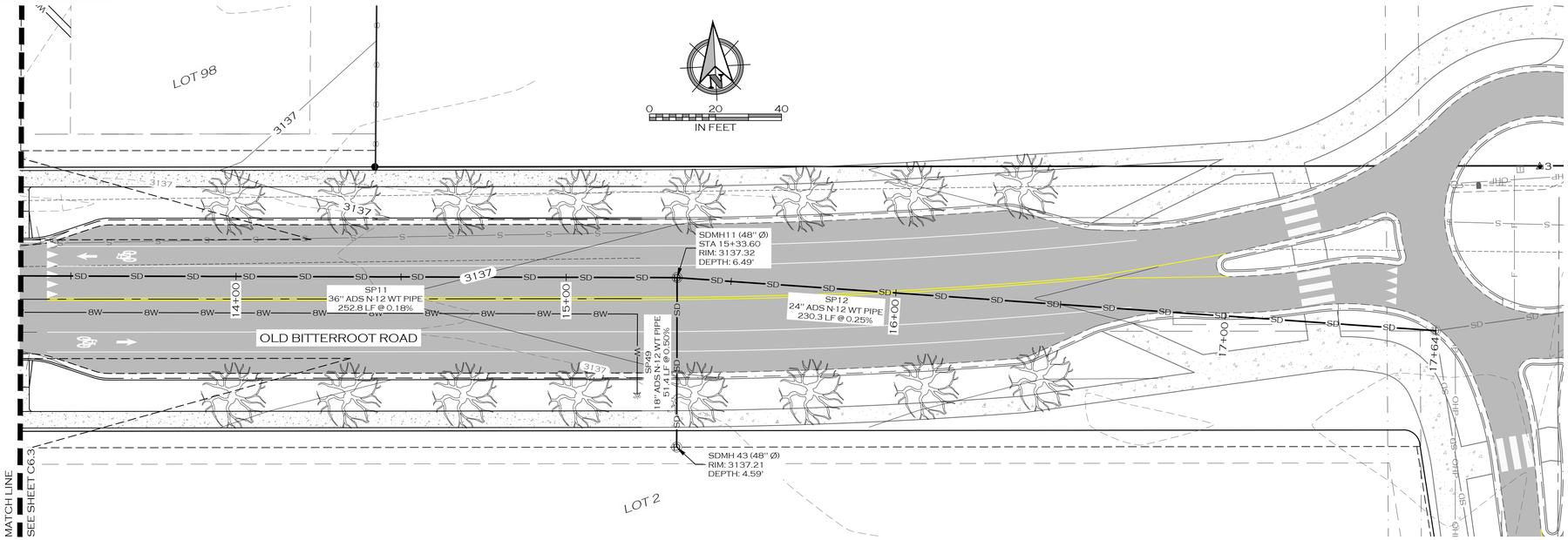
RIVERFRONT TRAILS
MISSOULA MONTANA

STORM MAIN A PLAN & PROFILE STA. 9+00 TO 13+50

C6.3

STRM A 9+00 TO 13+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.



LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
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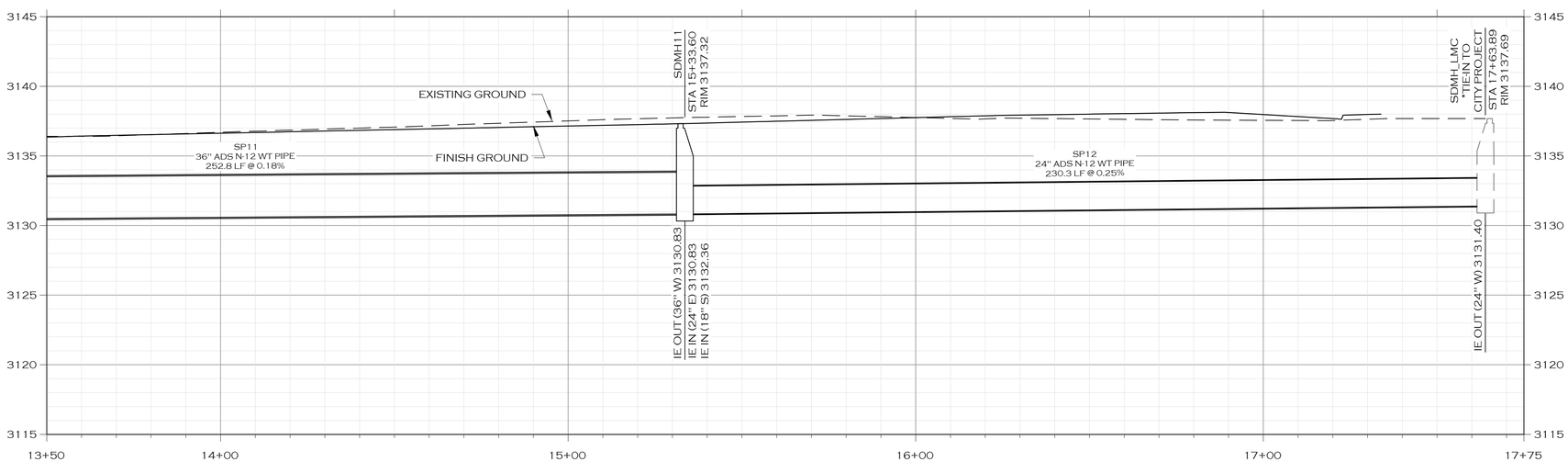

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DATE	DESCRIPTION

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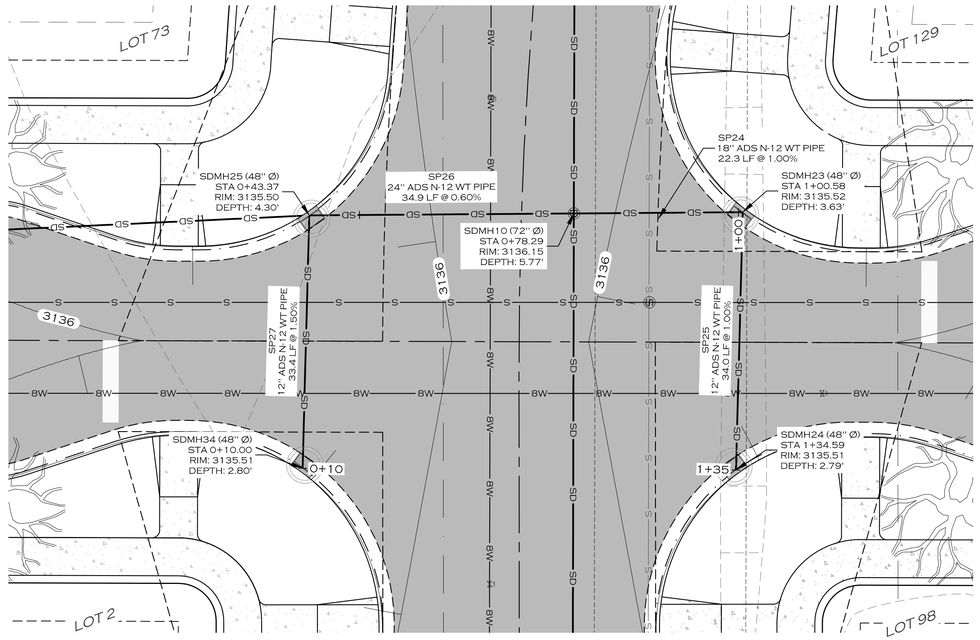
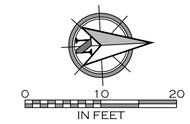
RIVERFRONT TRAILS
MISSOULA MONTANA

STORM MAIN A PLAN & PROFILE STA. 13+50 TO 15+50

C6.4

STRM A 13+50 TO 15+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





LEGEND

- PROPOSED BUILDING
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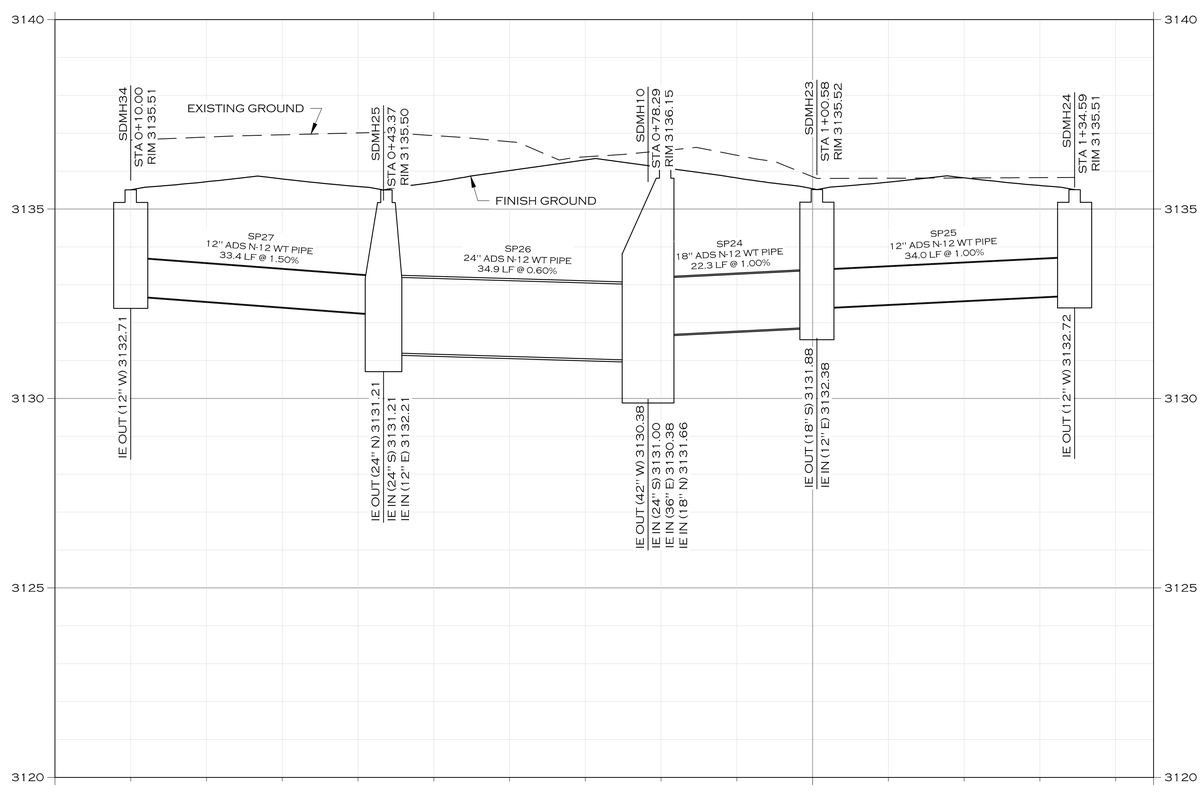

HORIZONTAL: 0 10 20 IN FEET

VERTICAL: 0 5 10 IN FEET

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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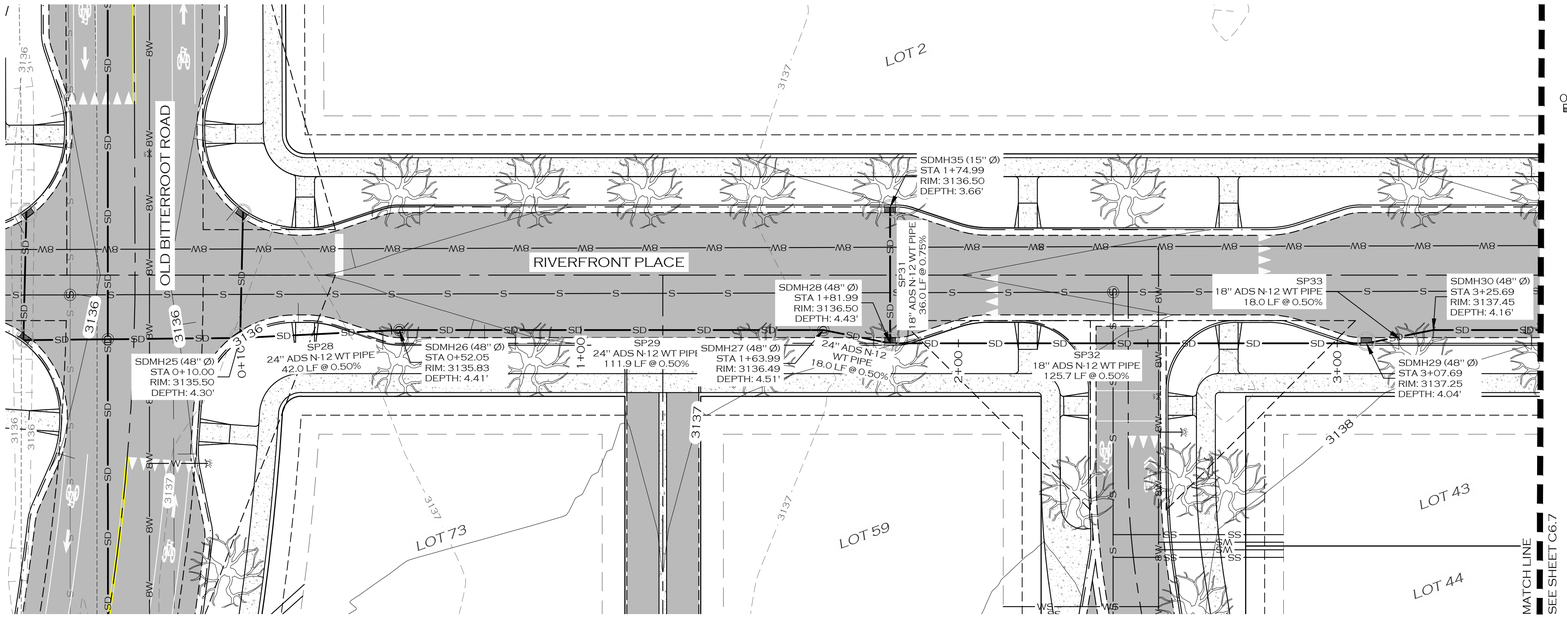
RIVERFRONT TRAILS

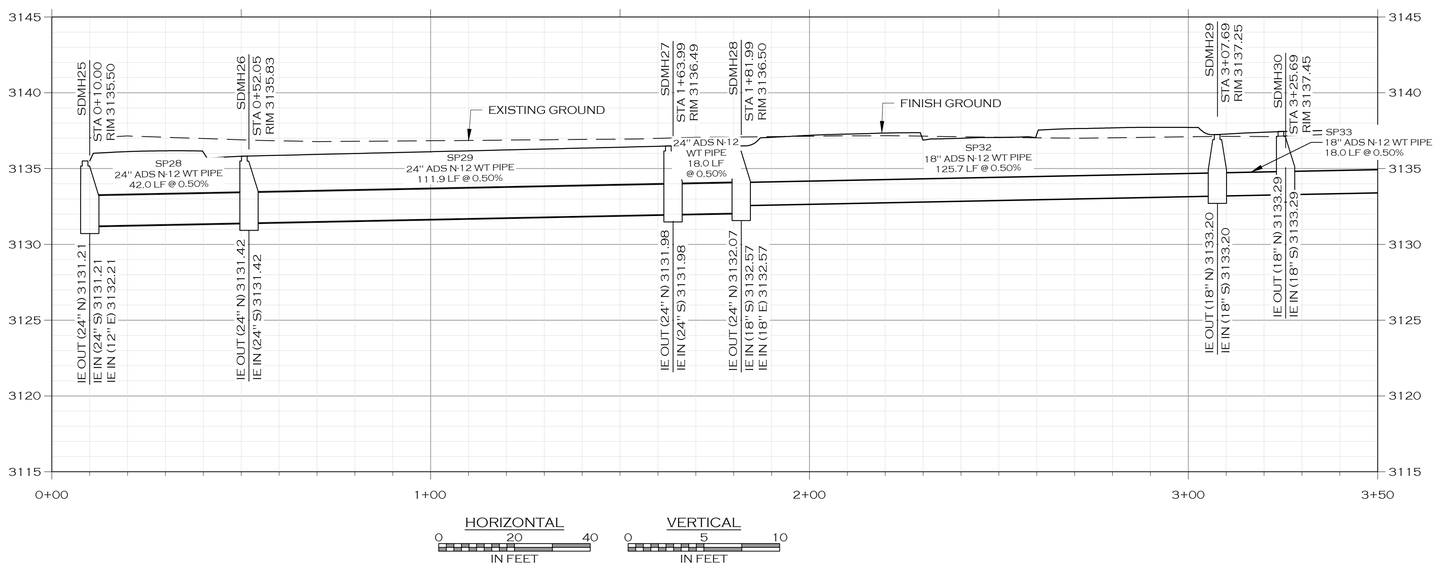
MISSOULA MONTANA

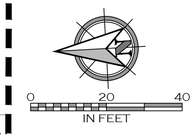
STORM MAIN B PLAN & PROFILE

C6.5

STRM B 0+00 TO 1+75.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022







LEGEND

- PROPOSED BUILDING
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- PROPOSED TRAIL
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JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

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PRELIMINARY

RIVERFRONT TRAILS

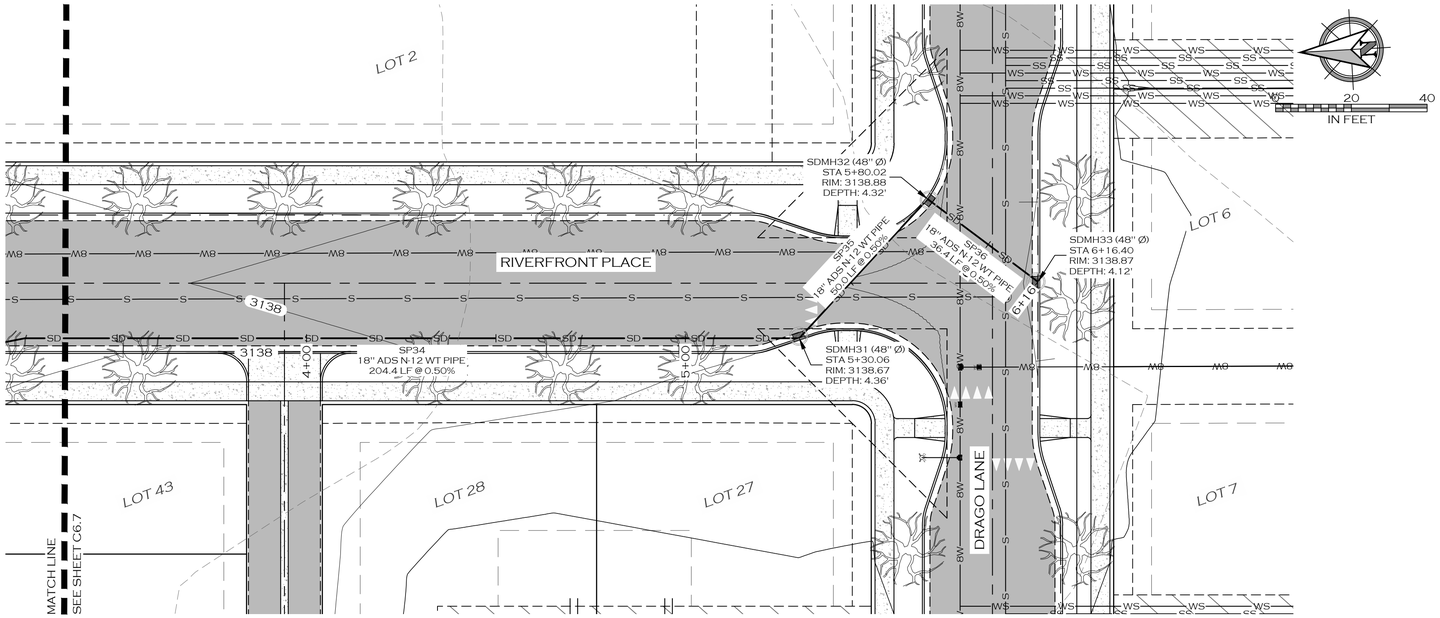
MISSOULA MONTANA

STORM MAIN I PLAN & PROFILE STA. 0+00 TO 3+50

C6.6

STORM MAIN I PLAN & PROFILE STA. 0+00 TO 3+50.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.



LEGEND

- PROPOSED BUILDING
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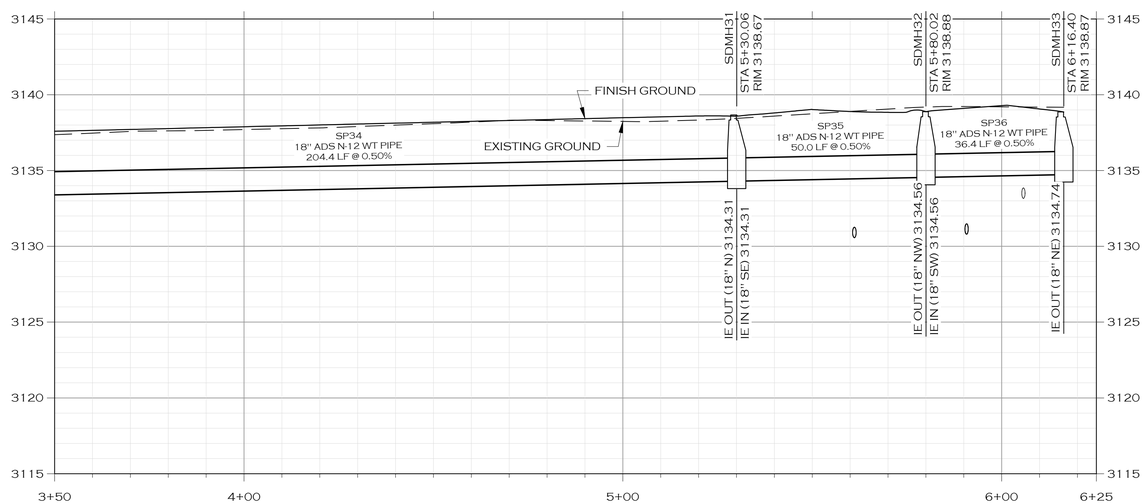

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

RIVERFRONT TRAILS

MISSOULA MONTANA

STORM MAIN I PLAN & PROFILE STA.3+50 TO 6+50

C6.7

STRM I 3+50 TO END.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
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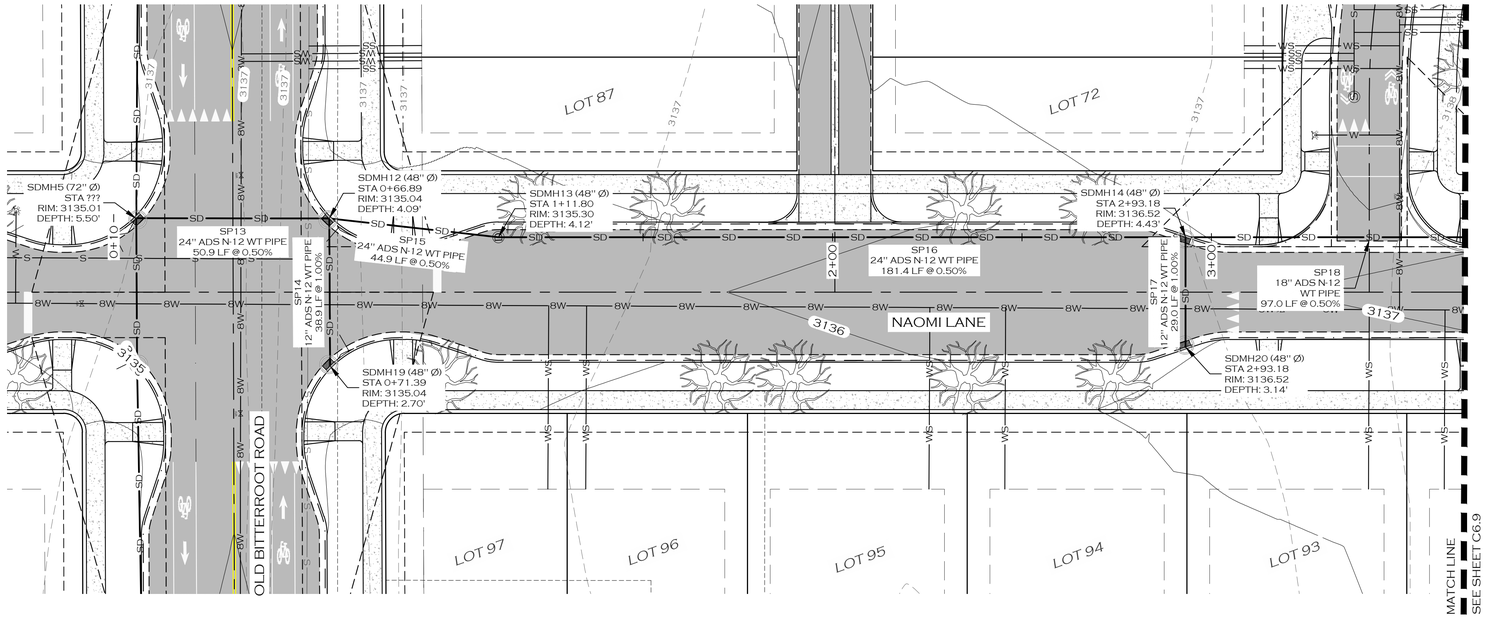

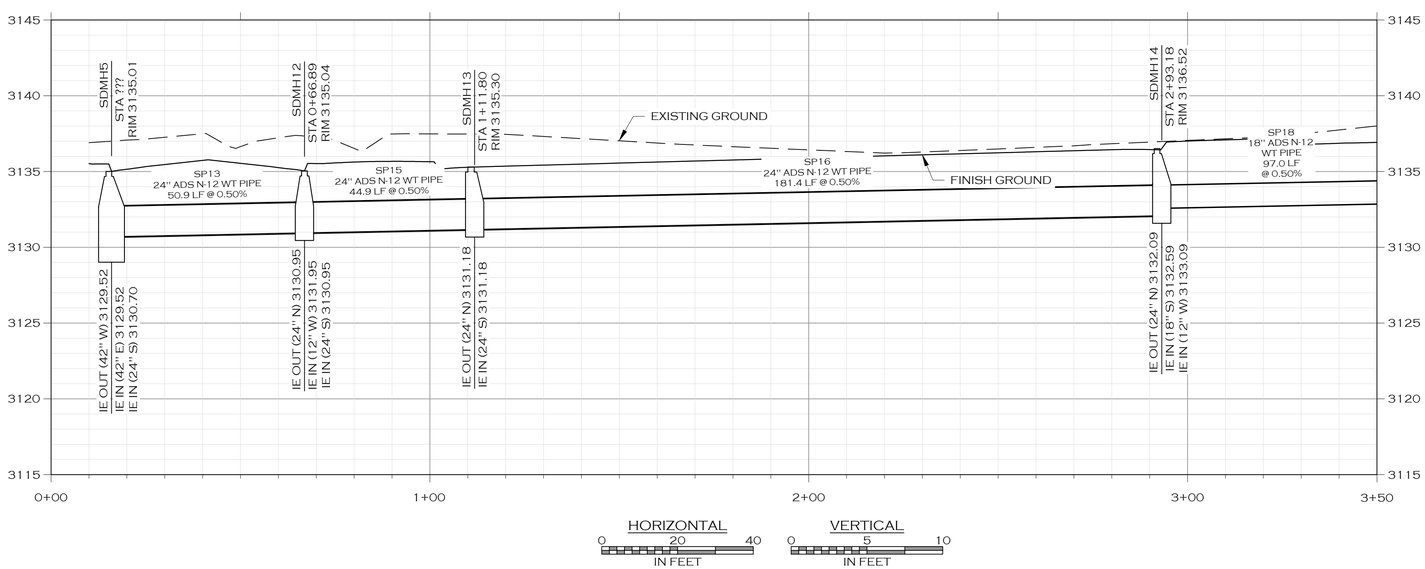

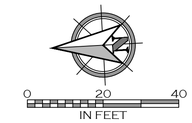

LEGEND

- PROPOSED BUILDING
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- PROPOSED TRAIL
- PROPOSED CURB
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- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
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- PROPOSED BICYCLE RACK
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- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

RIVERFRONT TRAILS

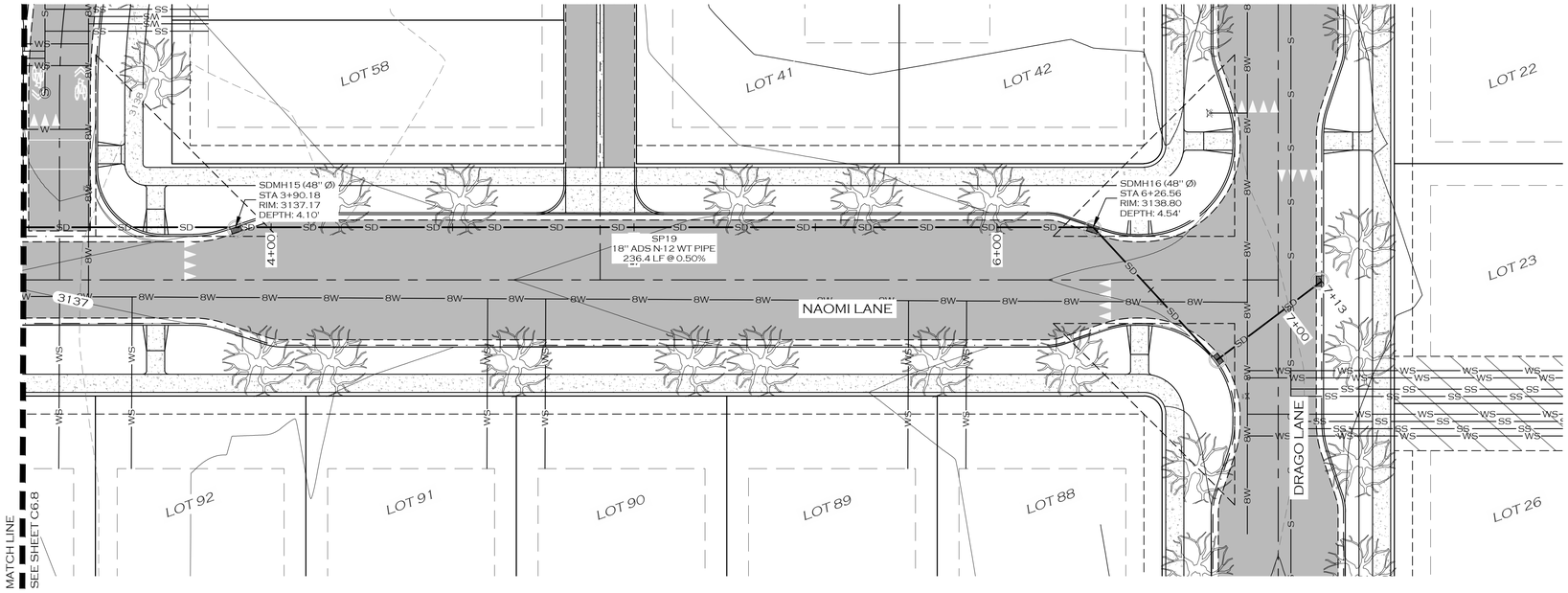
MISSOULA MONTANA

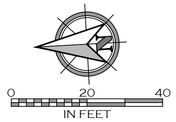
STORM MAIN F PLAN & PROFILE STA. 0+00 TO 3+50

C6.8

STORM MAIN F PLAN & PROFILE.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.





LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
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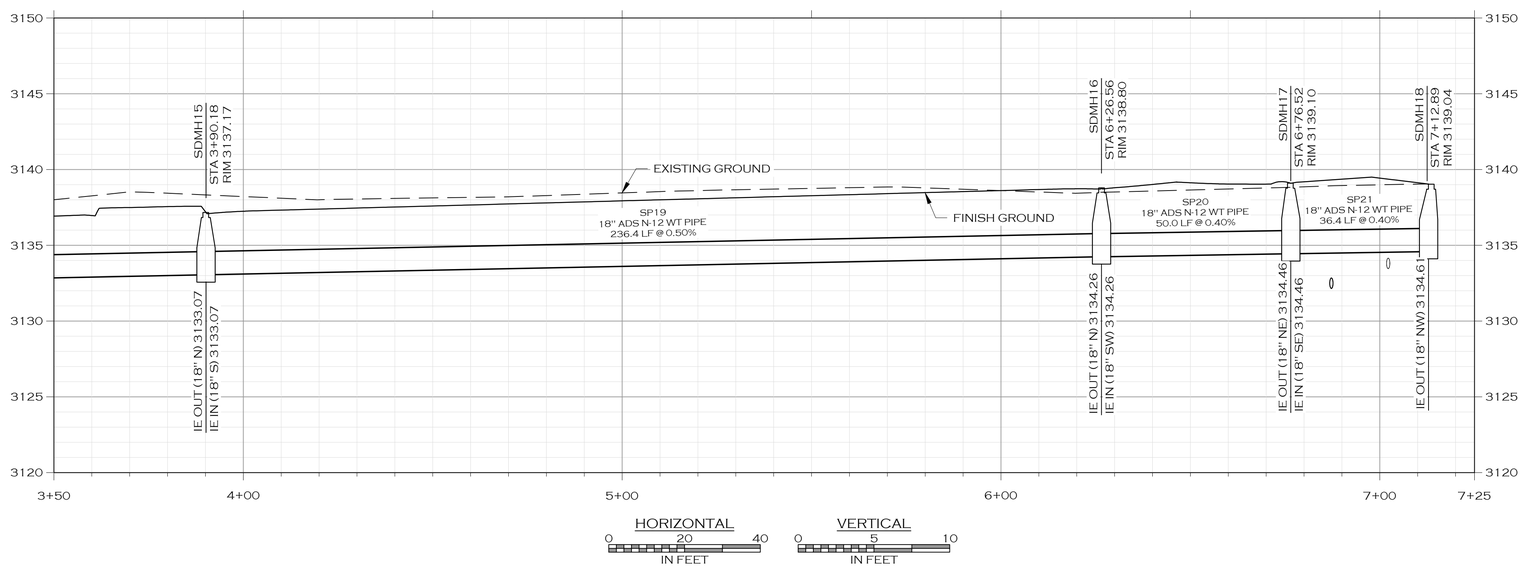

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DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

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PRELIMINARY

RIVERFRONT TRAILS

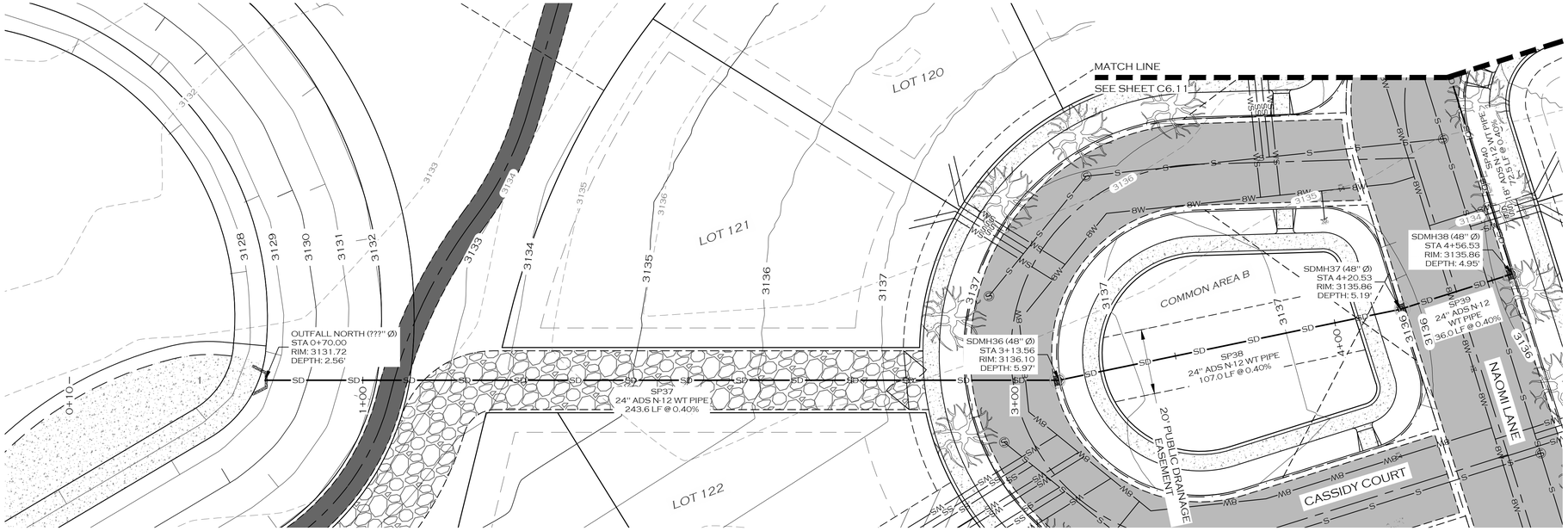
MISSOULA MONTANA

STORM MAIN F PLAN & PROFILE STA. 3+50 TO 7+25

C6.9

STORM MAIN F PLAN & PROFILE STA. 3+50 TO 7+25.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.



0 20 40
IN FEET

LEGEND

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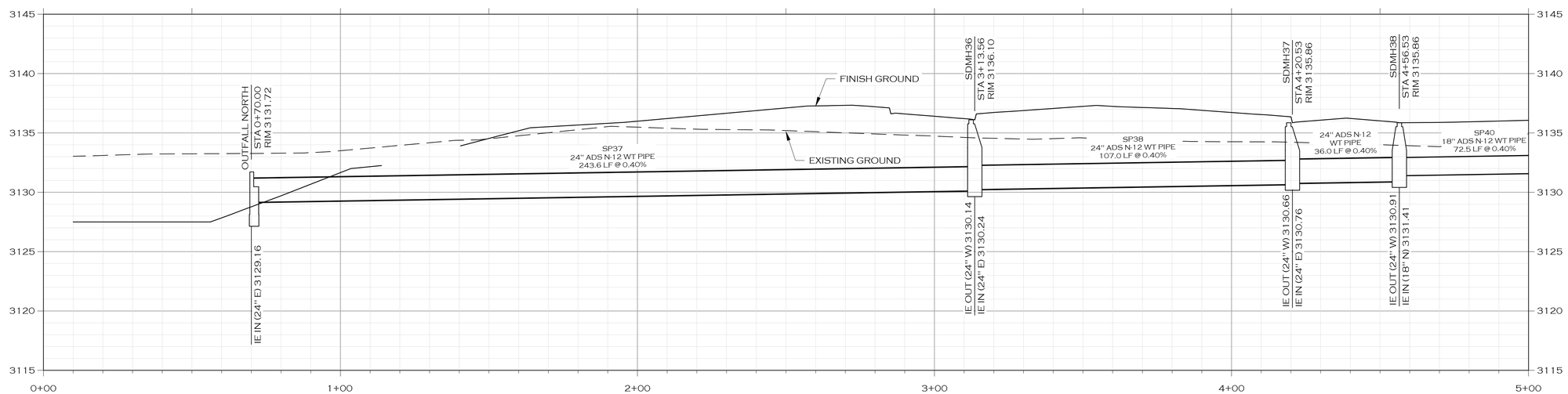

HORIZONTAL: 0 20 40 IN FEET

VERTICAL: 0 5 10 IN FEET

PRELIMINARY

JOB #:	2101
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DATE:	7/21/2022

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RIVERFRONT TRAILS
MISSOULA MONTANA

STORM MAIN E PLAN & PROFILE STA. 0+00 TO 5+00

C6.10

STRM E PNP.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

COLOR VERIFICATION
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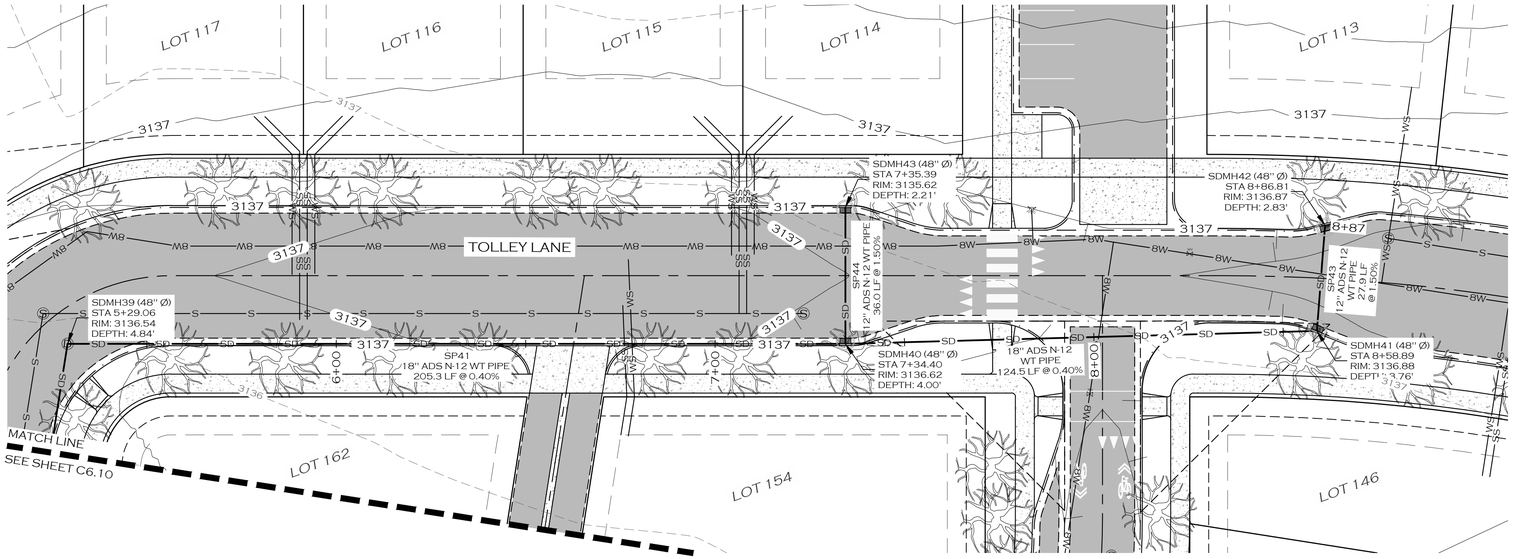

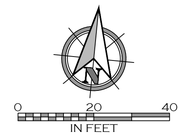

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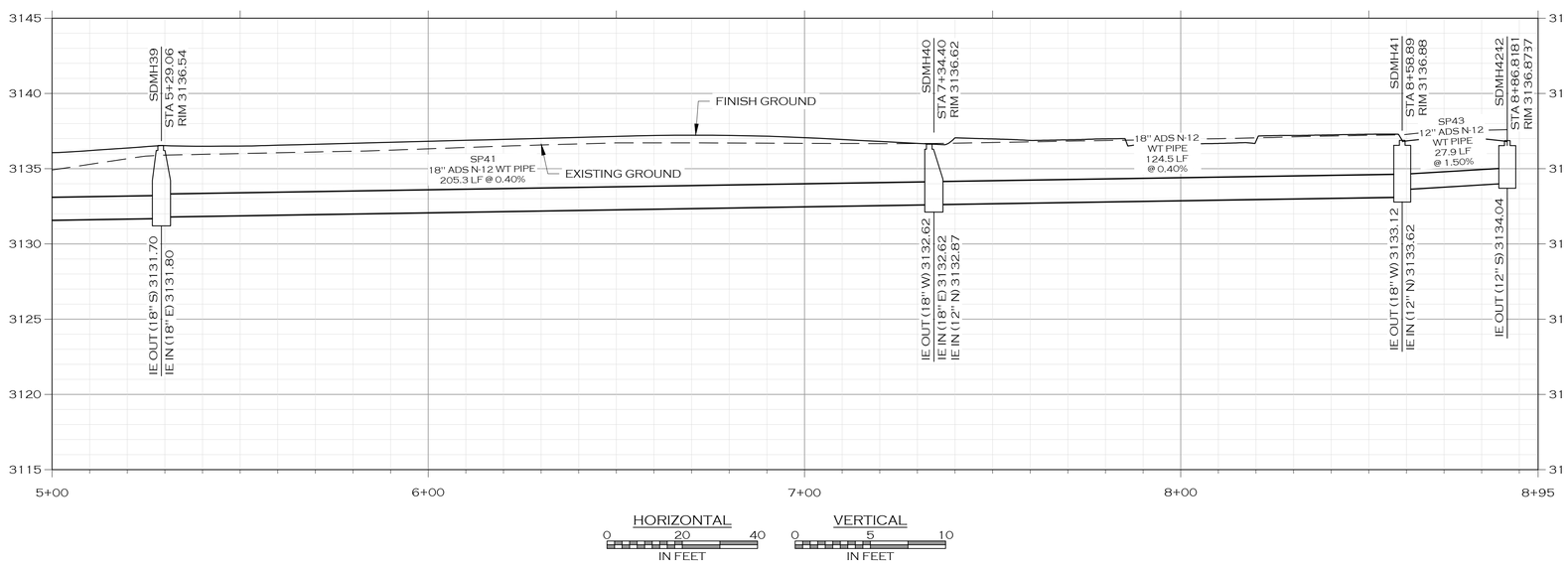

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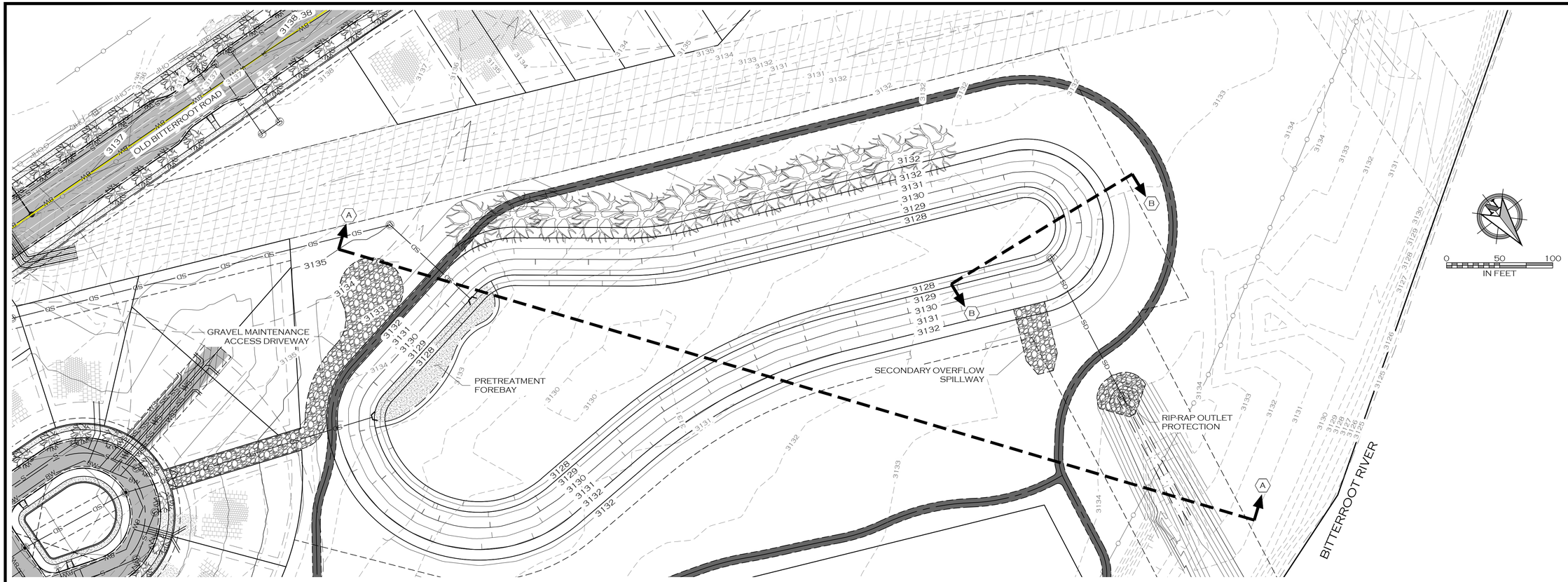
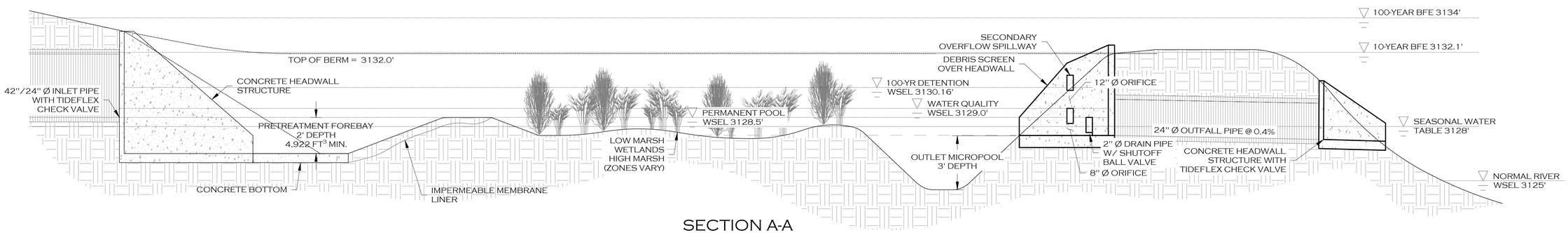
RIVERFRONT TRAILS
MISSOULA MONTANA

STORM MAIN E PLAN & PROFILE STA. 5+00 TO 8+85

C6.11

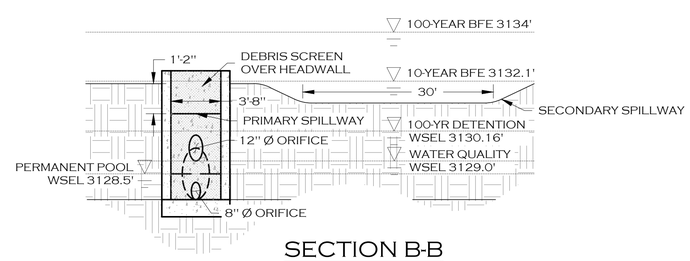
STORM MAIN E PLAN & PROFILE STA. 5+00 TO 8+85.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022





SECTION A-A

NOT TO SCALE



SECTION B-B

NOT TO SCALE

COLOR VERIFICATION
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PRELIMINARY

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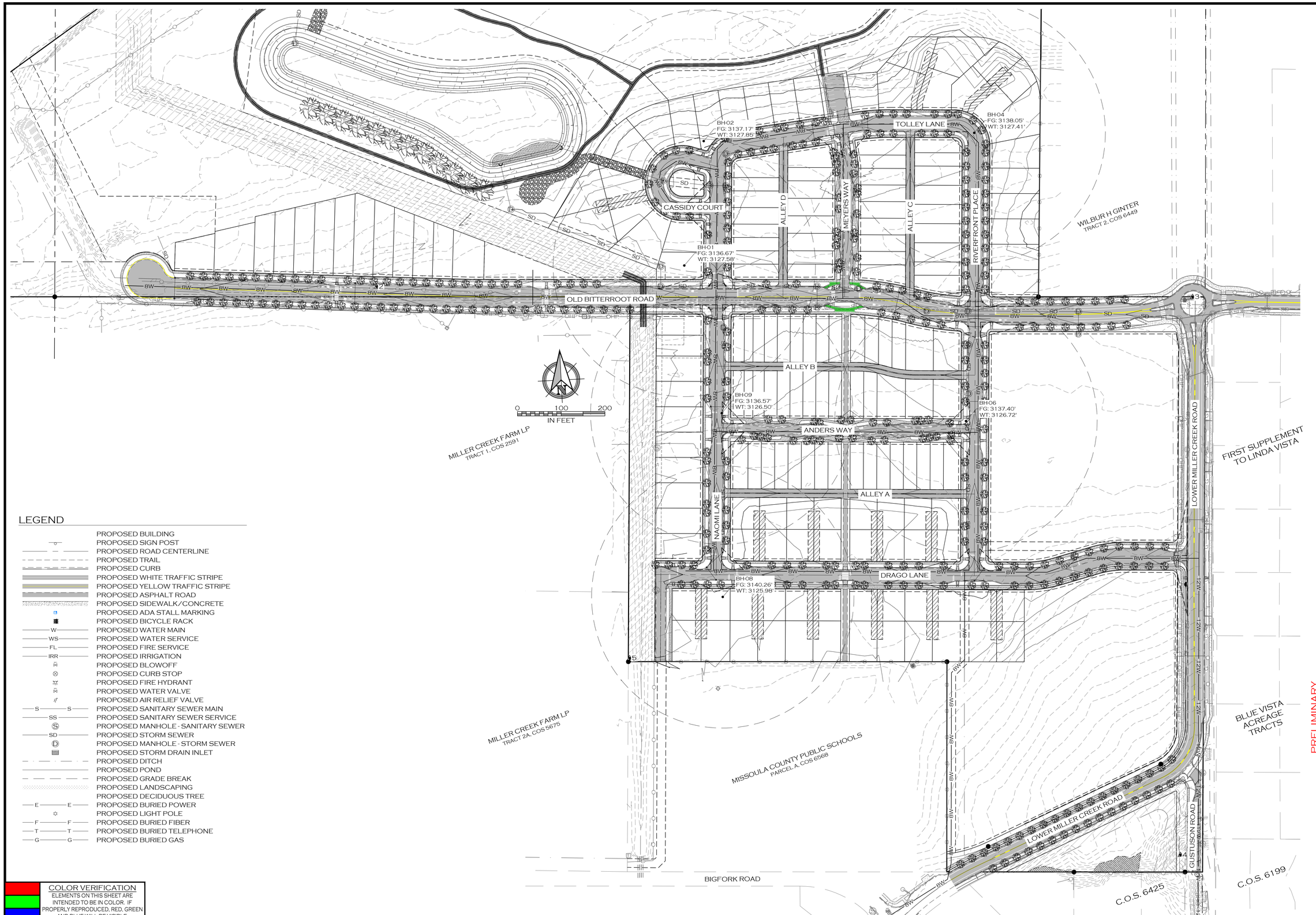
RIVERFRONT TRAILS
MISSOULA MONTANA

STORMWATER WETLAND PLAN

C6.12

STORMWATER WETLAND PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022



LEGEND

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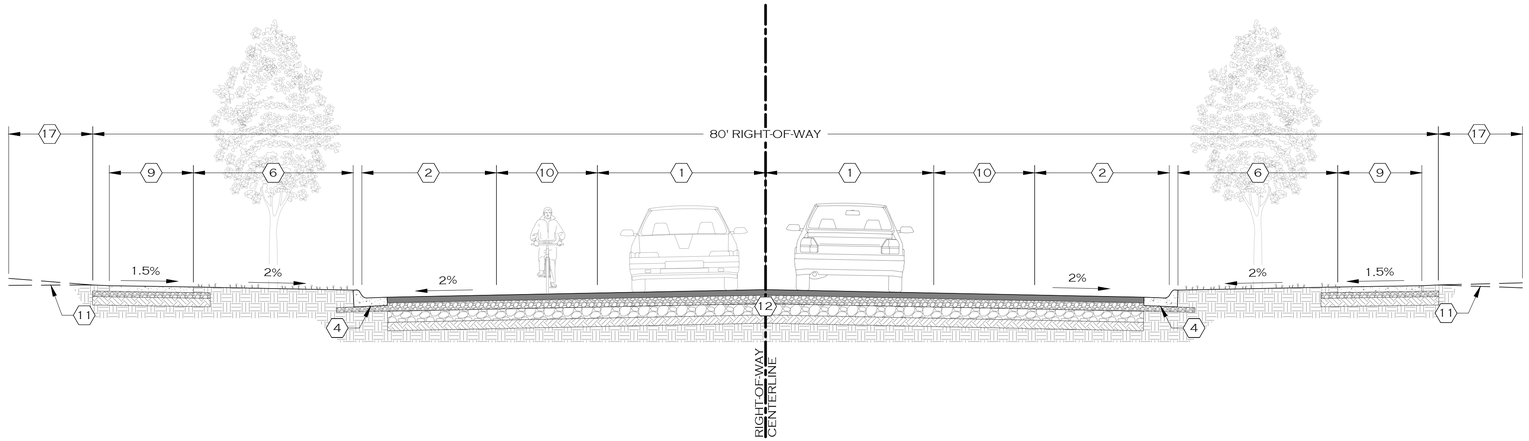
RIVERFRONT TRAILS
MISSOULA MONTANA
GROUNDWATER TESTING

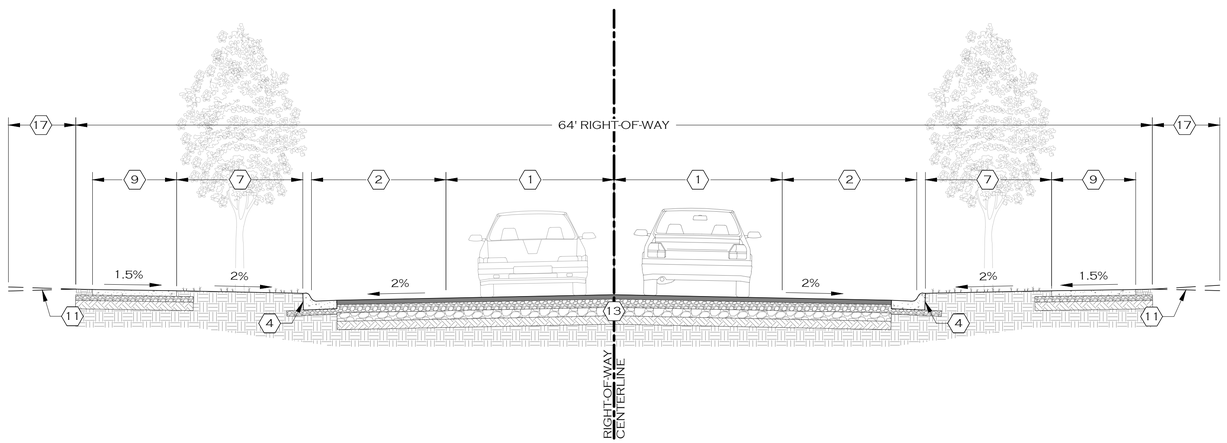
C6.13

GROUNDWATER TESTING.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022

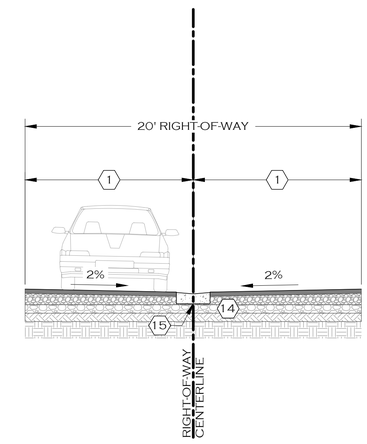


URBAN COLLECTOR (WITH PARKING)

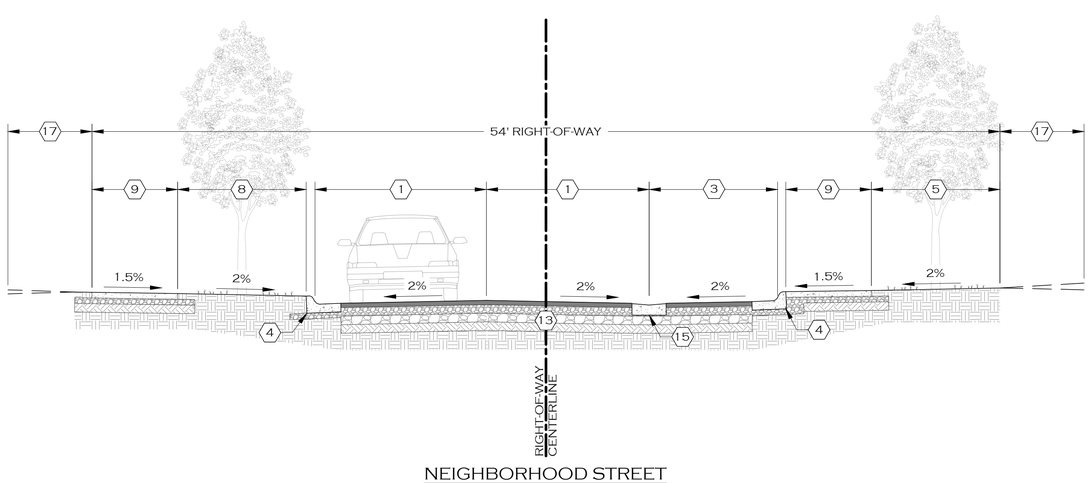
OLD BITTERROOT ROAD



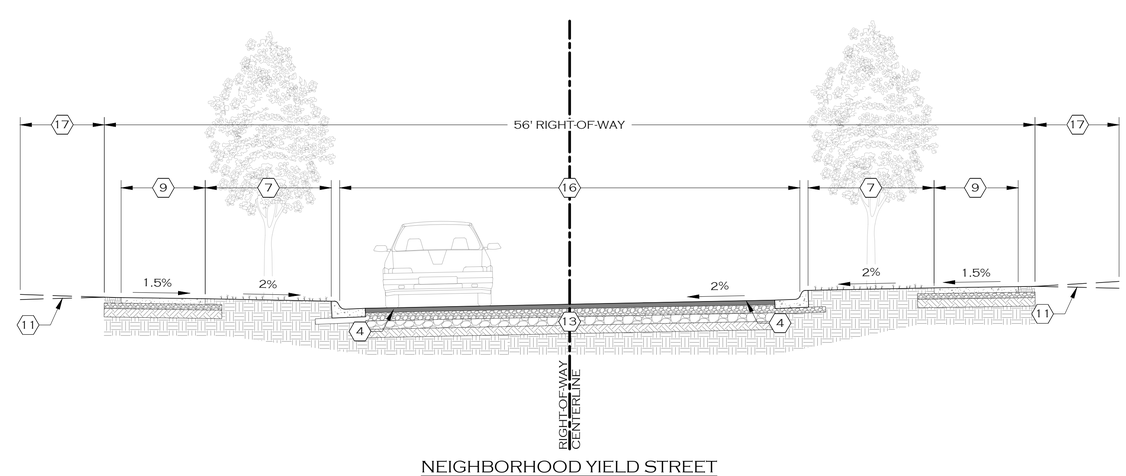
URBAN LOCAL STREET



ALLEY



NEIGHBORHOOD STREET



NEIGHBORHOOD YIELD STREET

KEY NOTES:

1. 10' WIDE VEHICLE TRAVEL LANE
2. 8' WIDE PARALLEL PARKING LANE
3. 8' WIDE PARALLEL PARKING POCKET; ALTERNATING SIDES PER SITE PLAN
4. 0.5' CURB; TYPICAL L-TYPE CURB AND GUTTER PER CITY OF MISSOULA STD-740
5. LANDSCAPING; WIDTH AND ALTERNATING SIDES PER SITE PLAN
6. 9.5' WIDE BOULEVARD. INSTALL APPROVED CLASS II MEDIUM STATURE TREES AS SPECIFIED IN 'STREET TREES FOR MISSOULA AND A GUIDE TO THEIR SELECTION, PLANTING, AND LONG-TERM CARE" (MISSOULA CITY COUNCIL RESOLUTION NO. 7891, JULY 28, 2014)
7. 7.5' WIDE BOULEVARD. INSTALL APPROVED CLASS II MEDIUM STATURE TREES AS SPECIFIED IN 'STREET TREES FOR MISSOULA AND A GUIDE TO THEIR SELECTION, PLANTING, AND LONG-TERM CARE" (MISSOULA CITY COUNCIL RESOLUTION NO. 7891, JULY 28, 2014)
8. BOULEVARD WIDTH VARIES PER SITE PLAN. WOONERF TREES AND LANDSCAPING TO BE INSTALLED IN ACCORDANCE WITH THE WOONERF PLAN
9. 5' WIDE SIDEWALK PER CITY OF MISSOULA STD-752
10. 6' WIDE BIKE LANE
11. GRADE TO EXISTING AT 15% MAXIMUM SLOPE
12. ASPHALT PAVING SECTION FOR COLLECTOR STREETS WITH CBR 10 PER CITY OF MISSOULA STD-704
13. ASPHALT PAVING SECTION FOR LOCAL RESIDENTIAL STREETS WITH CBR 10 PER CITY OF MISSOULA STD-703
14. INVERT-GRADED ALLEY PAVING SECTION PER CITY OF MISSOULA STD-706
15. TYPICAL 3' VALLEY GUTTER PER CITY OF MISSOULA STD-745
16. 28' PAVEMENT WIDTH - TWO TRAVEL LANES AND ONE PARALLEL PARKING LANE
17. 5' PUBLIC UTILITY EASEMENT; LOCATIONS PER PLAT OF RIVERFRONT TRAILS

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PRELIMINARY

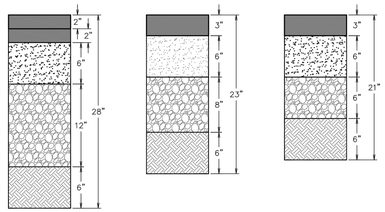
RIVERFRONT TRAILS

MISSOULA MONTANA

TYPICAL ROADWAY SECTIONS

C7.0

LOWER MILLER CREEK CORRIDOR ROAD SECTIONS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

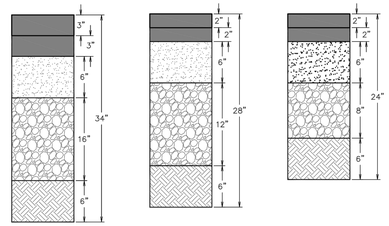


POOR SUBGRADE	MEDIUM SUBGRADE	GOOD SUBGRADE
CBR 5–9	CBR 10–19	CBR 20+
SOIL WHICH BECOMES SOFT AND PLASTIC WHEN WET. INCLUDED ARE THOSE SOILS HAVING APPRECIABLE AMOUNTS OF CLAY AND FINE SILT. ALSO, AREAS WHERE SUBSURFACE MOISTURE CREATES APPRECIABLE SETTLEMENT AND FROST PROBLEMS.	SOIL WHICH RETAINS A MODERATE DEGREE OF FIRMNESS UNDER ADVERSE MOISTURE CONDITIONS. INCLUDED ARE SUCH SOILS AS LOAMS, SILTY SANDS AND SAND–GRAVELS CONTAINING MODERATE AMOUNTS OF CLAY AND FINE SILT.	SOIL WHICH RETAINS SUBSTANTIAL AMOUNTS OF THEIR LOAD SUPPORTING CAPACITY WHEN WET. INCLUDED ARE THE CLEAN SANDS AND SAND GRAVELS AND THOSE FREE OF DETRIMENTAL AMOUNTS OF PLASTIC MATERIALS.
ASPHALT CONCRETE TWO 2" LIFTS	ASPHALT CONCRETE ONE 3" LIFT	ASPHALT CONCRETE ONE 3" LIFT
BASE 6" OF CRUSHED 3/4" MINUS	BASE 6" OF CRUSHED 3/4" MINUS	BASE 6" OF CRUSHED 3/4" MINUS
SUB BASE 12" OF CRUSHED 3" MINUS	SUB BASE 8" OF CRUSHED 3" MINUS	SUB BASE 6" OF CRUSHED 3" MINUS
SUB GRADE TOP 6"	SUB GRADE TOP 6"	SUB GRADE TOP 6"

GENERAL NOTES:

1. ALL QUANTITIES/VALUES ARE MINIMUM REQUIREMENTS.
2. BASE, SUB BASE, AND SUB GRADE MUST BE COMPACTED TO 95% PROCTOR DENSITY.
3. TWELVE (12") INCHES OF MATERIAL DEPTH TO BE PLACED IN TWO (2) SIX (6") INCH LIFTS.
4. EIGHT (8") INCHES OF MATERIAL DEPTH TO BE PLACED IN TWO (2) FOUR (4") INCH LIFTS.
5. GEOTEXTILE FABRIC MAY BE REQUIRED/USED IN CERTAIN DESIGNS.
6. ALTERNATE SECTION DESIGNS REQUIRE SUBMITTAL OF CBR FOR THE DEVELOPED AREA.

MISSOULA Engineering Division | Asphalt Paving Section Local Residential Street | Approved By City Engineer Kevin J. Slovarp | Adopted: 04/09/1973 Revised: 02/08/2008 | STD - 703

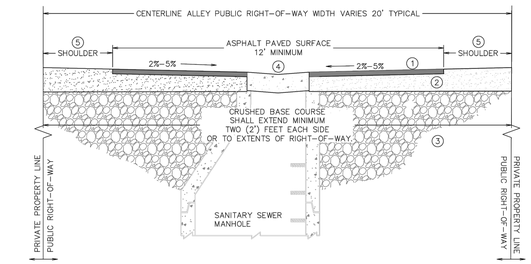


POOR SUBGRADE	MEDIUM SUBGRADE	GOOD SUBGRADE
CBR 5–9	CBR 10–19	CBR 20+
SOIL WHICH BECOMES SOFT AND PLASTIC WHEN WET. INCLUDED ARE THOSE SOILS HAVING APPRECIABLE AMOUNTS OF CLAY AND FINE SILT. ALSO, AREAS WHERE SUBSURFACE MOISTURE CREATES APPRECIABLE SETTLEMENT AND FROST PROBLEMS.	SOIL WHICH RETAINS A MODERATE DEGREE OF FIRMNESS UNDER ADVERSE MOISTURE CONDITIONS. INCLUDED ARE SUCH SOILS AS LOAMS, SILTY SANDS AND SAND–GRAVELS CONTAINING MODERATE AMOUNTS OF CLAY AND FINE SILT.	SOIL WHICH RETAINS SUBSTANTIAL AMOUNTS OF THEIR LOAD SUPPORTING CAPACITY WHEN WET. INCLUDED ARE THE CLEAN SANDS AND SAND GRAVELS AND THOSE FREE OF DETRIMENTAL AMOUNTS OF PLASTIC MATERIALS.
ASPHALT CONCRETE TWO 2" LIFTS	ASPHALT CONCRETE ONE 3" LIFT	ASPHALT CONCRETE ONE 3" LIFT
BASE 6" OF CRUSHED 3/4" MINUS	BASE 6" OF CRUSHED 3/4" MINUS	BASE 6" OF CRUSHED 3/4" MINUS
SUB BASE 12" OF CRUSHED 3" MINUS	SUB BASE 8" OF CRUSHED 3" MINUS	SUB BASE 6" OF CRUSHED 3" MINUS
SUB GRADE TOP 6"	SUB GRADE TOP 6"	SUB GRADE TOP 6"

GENERAL NOTES:

1. ALL QUANTITIES/VALUES ARE MINIMUM REQUIREMENTS.
2. BASE, SUB BASE, AND SUB GRADE MUST BE COMPACTED TO 95% PROCTOR DENSITY.
3. TWELVE (12") INCHES OF MATERIAL DEPTH TO BE PLACED IN TWO (2) SIX (6") INCH LIFTS.
4. EIGHT (8") INCHES OF MATERIAL DEPTH TO BE PLACED IN TWO (2) FOUR (4") INCH LIFTS.
5. GEOTEXTILE FABRIC MAY BE REQUIRED/USED IN CERTAIN DESIGNS.
6. ALTERNATE SECTION DESIGNS REQUIRE SUBMITTAL OF CBR FOR THE DEVELOPED AREA.

MISSOULA Engineering Division | Asphalt Paving Section Collector/Arterial Street | Approved By City Engineer Kevin J. Slovarp | Adopted: 04/09/1973 Revised: 02/08/2008 | STD - 704



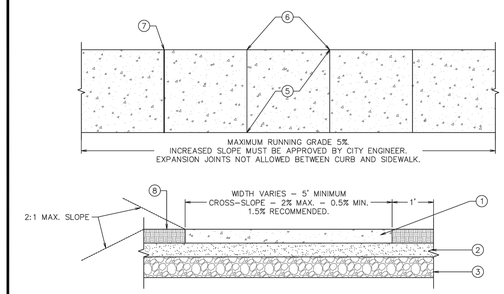
KEYED NOTES:

1. ASPHALT SURFACE; MINIMUM TWO (2") INCHES (3" AS REQUIRED BY CITY ENGINEER) THICKNESS HOT MIX ASPHALT (TYPICAL) COMPACTED TO A MINIMUM NINETY–FIVE (95%) PERCENT PROCTOR DENSITY OR OTHER MATERIAL AS APPROVED / REQUIRED BY THE CITY ENGINEER.
2. SELECT CRUSHED BASE COURSE; MINIMUM SIX (6") INCHES, PLACED IN TWO (2) LIFTS OF THREE (3") INCHES MAXIMUM THICKNESS EACH LIFT, OF THREE–QUARTERS (3/4") INCH MINUS CRUSHED BASE COURSE MATERIAL AS PER MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS (MPWSS) COMPACTED TO A MINIMUM NINETY–FIVE (95%) PERCENT PROCTOR DENSITY. CRUSHED BASE COURSE MATERIAL SHALL EXTEND PAST THE EDGE OF ALLEY ASPHALT CONCRETE PAVEMENT, AND UP TO THE HEIGHT OF THE ADJACENT ASPHALT AS SHOWN ABOVE, UNLESS OTHERWISE APPROVED/REQUIRED BY THE CITY ENGINEER.
3. SUB GRADE COURSE; MINIMUM SIX (6") INCHES OF THE EXISTING UNDISTURBED SUB GRADE COURSE MATERIAL SHALL BE COMPACTED TO A MINIMUM NINETY–FIVE (95%) PERCENT PROCTOR DENSITY OR OTHER DEPTH/THICKNESS AS APPROVED/REQUIRED BY THE CITY ENGINEER.
4. PROVIDE 2' COVE GUTTER AND APPROPRIATE INLET STRUCTURES FOR SUMPS AS REQUIRED BY DESIGN.
5. WHERE PAVING IS NOT TO THE EXTENTS OF THE RIGHT–OF–WAY, SHOULDERS SHALL BE PROVIDED FLUSH WITH THE TOP OF ADJACENT ASPHALT. TYPICAL SHOULDER IS TWO (2') FEET WIDE.

GENERAL NOTES:

1. ALLEY ASPHALT PAVEMENT SHALL BE TWELVE (12') FEET WIDE MINIMUM AND SHALL BE CONSTRUCTED ON THE CENTERLINE OF THE ALLEY PUBLIC RIGHT–OF–WAY, AS SHOWN ABOVE, UNLESS OTHERWISE APPROVED/REQUIRED BY THE CITY ENGINEER
2. ALLEY ASPHALT PAVEMENT SHALL BE CONSTRUCTED WITH A MINIMUM TWO (2%) AND MAXIMUM FIVE (5%) PERCENT INVERTED PRISM, AS SHOWN ABOVE, UNLESS OTHERWISE APPROVED/REQUIRED BY THE CITY ENGINEER.
3. ANY/ALL EXISTING UTILITY APPURTENANCES, INCLUDING BUT NOT LIMITED TO; SANITARY SEWER MANHOLES, STORM WATER SEWER MANHOLES, VALVE BOXES, ETCETERA, SHALL BE SET, RAISED OR ADJUSTED TO BE FLUSH ON GRADE.

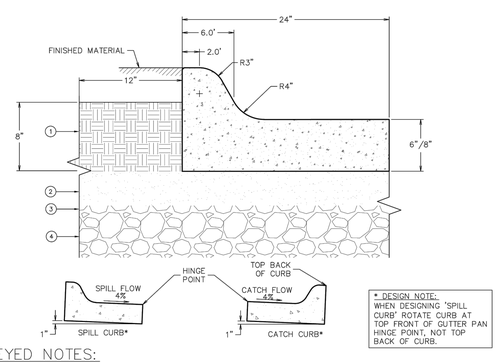
MISSOULA Engineering Division | Alley Paving - Invert Graded | Approved By City Engineer Kevin J. Slovarp | Adopted: 02/15/2011 Revised: 06/27/2017 | STD - 706



KEYED NOTES:

1. MINIMUM OF FOUR (4") INCHES OF CONCRETE SIDEWALK (TYPICAL), MINIMUM SIX (6") INCHES CONCRETE SIDEWALK THROUGH RESIDENTIAL DRIVEWAY OR MINIMUM EIGHT (8") INCHES CONCRETE SIDEWALK THROUGH COMMERCIAL DRIVEWAY OR ON ADA RAMPS PER STD DWGS.
2. MINIMUM OF FOUR (4") INCHES OF BASE SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
3. MINIMUM OF SIX (6") INCHES OF SUB GRADE SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
4. CITY ENGINEER MAY REQUIRE ADDITIONAL BASE, DEPENDING ON SUB GRADE MATERIAL.
5. CONTRACTION JOINTS SHALL FORM AS NEAR A SQUARE PANEL AS POSSIBLE. NO SINGLE PANEL SHALL EXCEED TEN (10') FEET ON ANY SIDE. LONGITUDINAL JOINTS REQUIRED IF SIDEWALK WIDTH EXCEEDS TEN (10') FEET.
6. CONTRACTION JOINTS SHALL BE ONE–FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
7. EXPANSION JOINTS OF ONE–HALF (1/2") INCH THICK MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
   7.1. EVERY FIFTY (50') FEET OF UNINTERRUPTED SIDEWALK.
   7.2. P.C.S AND P.T.S OF CURVES.
   7.3. GRADE BREAKS.
   7.4. RESIDENTIAL DRIVEWAYS SIX (6") INCH DEEP MASTIC SHALL BE INSTALLED AT THE TOP OF THE TRANSITION ON BOTH SIDES AND SHALL BE PINNED IN PLACE BEFORE POURING.
   7.5. COMMERCIAL DRIVEWAYS EIGHT (8") INCH DEEP MASTIC SHALL BE INSTALLED AT THE TOP OF THE TRANSITION ON BOTH SIDES AND SHALL BE PINNED IN PLACE BEFORE POURING.
   7.6. AT OTHER LOCATIONS AS SPECIFIED BY CITY ENGINEERING DIVISION.
   7.7. ALL EXPANSION JOINTS SHALL BE PLACED FLUSH OR JUST BELOW TOP FINISHED SURFACE OF SIDEWALK.
   7.8. ALL EXPANSION JOINTS SHALL BE FULL DEPTH, FULL WIDTH AND SECURED IN PLACE BEFORE THE FORMS WILL BE APPROVED.
8. FINISHED SURFACE – 12" MINIMUM SHOULDER UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
9. FINISHED SIDEWALK SURFACE SHALL HAVE MEDIUM–TO–HEAVY BROOM TEXTURE.
10. NO SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL OF FORM PLACEMENT BY CITY ENGINEERING DIVISION.
11. CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY STANDARD SPECIFICATIONS FOR M–4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
12. CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.

MISSOULA Engineering Division | Typical Sidewalk Section | Approved By City Engineer Kevin J. Slovarp | Adopted: 02/29/1996 Revised: 03/22/2017 | STD - 752



* DESIGN NOTE:
WHEN DESIGNING "SPILL CURB" ROTATE CURB AT TOP FRONT OF GUTTER PAN HINGE POINT, NOT TOP BACK OF CURB.

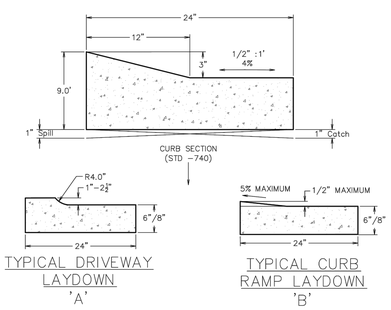
KEYED NOTES:

1. FILL MATERIAL: MINIMUM OF EIGHT (8") INCHES OF FILL MATERIAL COMPACTED TO 95% PROCTOR DENSITY BEHIND CURB. SEE STD–141 FOR SIDEWALK SECTION IF APPLICABLE.
2. BASE: MINIMUM OF FOUR (4") INCHES OF BASE SHALL BE COMPACTED TO 95% PROCTOR DENSITY. EXTEND 1' FOOT BEHIND CURB.
3. BASE: CITY ENGINEER MAY REQUIRE ADDITIONAL BASE, DEPENDING ON ADEQUACY OF SUB GRADE MATERIAL BASED ON A CBR.
4. SUB GRADE: MINIMUM OF SIX (6") INCHES OF SUB GRADE SHALL BE COMPACTED TO 95% PROCTOR DENSITY. EXTEND 1' FOOT BEHIND CURB.

GENERAL NOTES:

1. CONTRACTION JOINTS SHALL BE PLACED EVERY TEN (10') FEET AND SHALL BE ONE–FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
2. EXPANSION JOINTS OF ONE–HALF (1/2") INCH MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
   2.1 P.C.S AND P.T.S OF CURVES WHERE RADII ARE THIRTY (30') FEET OR LESS.
   2.2 GRADE BREAKS.
   2.3 NO CLOSER THAN FOUR (4') FEET ON EITHER SIDE OF A DRAINAGE STRUCTURE.
   2.4 AT OTHER LOCATIONS AS SPECIFIED BY CITY ENGINEER.
3. MINIMUM GUTTER FLOW LINE SHALL BE FOUR–TENTHS (0.4%) PERCENT SLOPE.
4. NO CURB OR SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL OF FORM PLACEMENT BY CITY ENGINEERING DIVISION.
5. "L" TYPE CURB IS SUITABLE FOR USE AS LANDSCAPE RETAINING CURB AND MAY BE POURED WITH SIDEWALK UPON APPROVAL.
6. CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY SPECIFICATIONS FOR M–4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
7. THE CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.
8. NOT FOR USE IN NEW ROAD CONSTRUCTION.

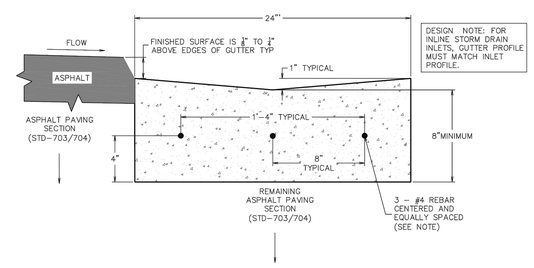
MISSOULA Engineering Division | Typical "L" Type Curb/Gutter Section | Approved By City Engineer Kevin J. Slovarp | Adopted: 01/30/1980 Revised: 03/15/2017 | STD - 740



GENERAL NOTES:

1. SEE CITY OF MISSOULA STD–121 FOR BASE, SUB BASE, AND FILL SPECIFICATIONS.
2. TYPICAL MODIFIED "L" TYPE CURB AND GUTTER SECTION SHALL BE MINIMUM OF SIX (6") INCHES DEPTH (THROUGHOUT GUTTER SECTION) PORTLAND CEMENT CONCRETE POURED MINIMUM TWO (2') FEET WIDE WITH A THREE (3") INCH DEPRESSION (COVE) THROUGH THE CENTER AS SHOWN ABOVE.
3. CONTRACTION JOINTS SHALL BE PLACED EVERY TEN (10') FEET AND SHALL BE ONE–FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
4. EXPANSION JOINTS OF ONE–HALF (1/2") INCH MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
   4.1. P.C.S AND P.T.S OF CURVES.
   4.2. GRADE BREAKS.
   4.3. NO CLOSER THAN FOUR (4') FEET ON EITHER SIDE OF A DRAINAGE STRUCTURE, BUT NOT REQUIRED OR RECOMMENCED.
   4.4. AT OTHER LOCATIONS AS SPECIFIED BY CITY ENGINEER.
   4.5. EXPANSION JOINTS MAY BE ELIMINATED FOR EXTRUDED CURB EXCEPT P.C.S AND P.T.S WITH APPROVAL OF CITY ENGINEER.
5. NO CURB OR SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL OF FORM PLACEMENT BY CITY ENGINEERING DIVISION.
6. MINIMUM GUTTER FLOW LINE SHALL BE FOUR–TENTHS (0.4%) PERCENT SLOPE.
7. CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY STANDARD SPECIFICATIONS FOR M–4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
8. RESIDENTIAL DRIVEWAY LAYDOWN MAY BE SAW CUT.
9. COMMERCIAL DRIVEWAY LAYDOWN CAN NOT BE SAW CUT AND SHALL BE REMOVED AND RE–POURED.
11. CURB RAMP LAYDOWN CAN NOT BE SAW CUT AND SHALL BE REMOVED AND RE–POURED.
12. CURB RAMP LAYDOWN CAN NOT EXCEED FIVE (5%) PERCENT GRADE OR ONE–HALF (1/2") INCH RISE FROM CURB FLOW LINE.
13. THE CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.

MISSOULA Engineering Division | Modified "L" Type Curb/Gutter Section | Approved By City Engineer Kevin J. Slovarp | Adopted: 04/18/1974 Revised: 03/20/2017 | STD - 741

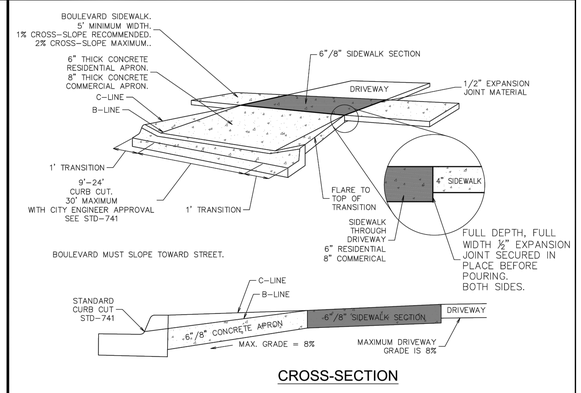


DESIGN NOTE: FOR INLINE STORM DRAIN INLETS, GUTTER PROFILE MUST MATCH INLET PROFILE.

GENERAL NOTES:

1. TYPICAL 2' COVE GUTTER SECTION SHALL BE MINIMUM OF EIGHT (8") INCHES DEPTH (THROUGHOUT COVE GUTTER SECTION) PORTLAND CEMENT CONCRETE POURED TWO (2') FEET WIDE WITH A ONE (1") INCH DEPRESSION (VALLEY) THROUGH THE CENTER AS SHOWN ABOVE.
2. CONTRACTION JOINTS SHALL BE PLACED EVERY TEN (10') FEET AND SHALL BE ONE–FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
3. EXPANSION JOINTS OF ONE–HALF (1/2") INCH MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
   3.1. P.C.S AND P.T.S OF CURVES.
   3.2. GRADE BREAKS.
   3.3. NO CLOSER THAN FOUR (4') FEET ON EITHER SIDE OF A DRAINAGE STRUCTURE, BUT NOT REQUIRED OR RECOMMENDED.
   3.4. AT OTHER LOCATIONS AS SPECIFIED BY CITY ENGINEER.
   3.5. EXPANSION JOINTS MAY BE ELIMINATED FOR EXTRUDED CURB WITH APPROVAL OF CITY ENGINEER.
4. REINFORCING BAR (REBAR) SHALL BE #4 (1/2") EPOXY COATED, THREE (3) EACH, EQUALLY SPACED (EIGHT (8") INCHES TYPICAL) WITH A MINIMUM THREE (3") INCHES) OF CONCRETE COVER. REINFORCING BAR (REBAR) SHALL BE PLACED AND SUPPORTED WITH APPROVED REBAR SUPPORTS.
7. MINIMUM GUTTER FLOW LINE SHALL BE FIVE–TENTHS (0.5%) PERCENT SLOPE.
8. NO CURB OR SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL OF FORM PLACEMENT BY CITY ENGINEERING DIVISION.
9. CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY STANDARD SPECIFICATIONS FOR M–4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
10. CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.

MISSOULA Engineering Division | Typical 2' Valley Gutter Section | Approved By City Engineer Kevin J. Slovarp | Adopted: 08/01/1986 Revised: 09/03/2020 | STD - 745



CROSS-SECTION

GENERAL NOTES:

1. RESIDENTIAL CURB CUT IS 9' TO 12' WIDE FOR SINGLE GARAGE.
2. MAXIMUM RESIDENTIAL CURB CUT IS 24' WIDE FOR DOUBLE GARAGE..
3. COMMERCIAL CURB CAN NOT BE SAW CUT, MUST BE REMOVED AND RE–POURED..
4. APRON AND SIDEWALK MUST BE POURED SEPARATELY.
5. SIDEWALK AND APRON THROUGH RESIDENTIAL (SINGLE FAMILY AND DUPLEX) DRIVEWAY MUST BE SIX (6") INCHES MINIMUM THICKNESS.
6. SIDEWALK AND APRON THROUGH MULTI–FAMILY (TRI–PLEX AND LARGER), COMMERCIAL OR INDUSTRIAL DRIVEWAYS MUST BE EIGHT (8") INCHES MINIMUM THICKNESS.
7. SEE STANDARD DRAWING STD–772 FOR ALTERNATIVE SIDEWALK/DRIVEWAY ADA REQUIREMENTS THROUGH DRIVEWAY.
8. ADDITIONAL EXPANSION JOINT MATERIAL MAY BE REQUIRED BY CITY ENGINEER.

BEDDING UNDER APRON MUST MEET SPECIFICATIONS FOR CONCRETE SIDEWALK PER STD–752
9. FOR EXISTING BOULEVARD RETROFIT, NEW SIDEWALK REPLACEMENT SECTION SHALL EXTEND TO NEAREST FULL SIDEWALK PANELS.

MISSOULA Engineering Division | Standard Driveway Opening for Boulevard Sidewalk 25 Parking Spaces or Less | Approved By City Engineer Kevin J. Slovarp | Adopted: 04/09/1973 Revised: 04/04/2017 | STD - 771

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

WOITH ENGINEERING, INC.
ENGINEERS & SURVEYORS
405 3RD STREET NW, SUITE 206 • GREAT FALLS, MT 59404 • 406-761-1955
3880 O'LEARY STREET, SUITE A • MISSOULA, MT 59808 • 406-203-9565
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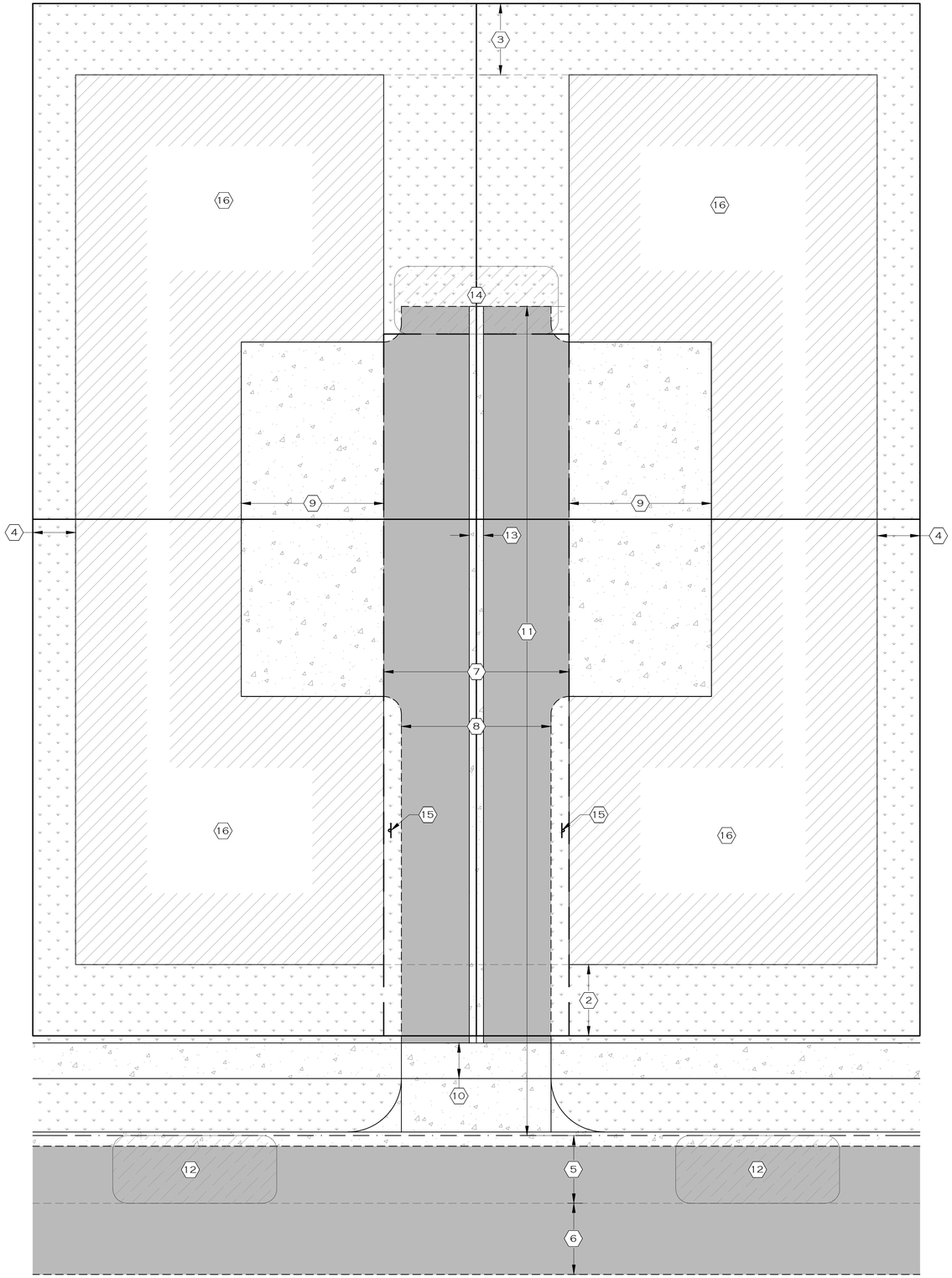
RIVERFRONT TRAILS
MISSOULA MONTANA
ROADWAY SECTION DETAILS

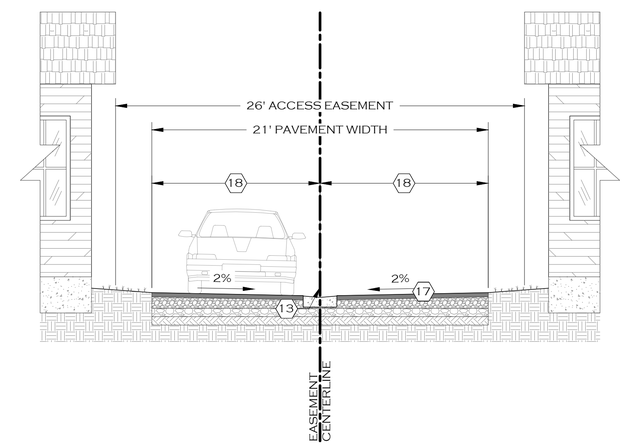
C7.1

DETAIL-ROADWAY.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



KEY NOTES:

1. PROPERTY BOUNDARY
2. 10' FRONT SETBACK
3. 10' REAR SETBACK
4. 6' SIDE SETBACK (10' STREET SIDE SETBACK)
5. 8' WIDE PARKING LANE
6. 10' WIDE TRAVEL LANE
7. 26' WIDE PUBLIC ACCESS AND UTILITY EASEMENT
8. 21' DRIVEWAY WIDTH
9. 20' DEEP PARKING PAD; TEXTURED CONCRETE SURFACING
10. VEHICLE ENTRANCE POINT WITH TEXTURED CONCRETE SIDEWALK CROSSING
11. 150' MAXIMUM LENGTH OF PUBLIC ACCESS AND UTILITY EASEMENT
12. 8' x 23' ON-STREET PARALLEL OVERFLOW PARKING SPACE
13. TYPICAL 2' VALLEY GUTTER PER CITY OF MISSOULA STANDARD DRAWING STD-745
14. SNOW STORAGE AREA PER MISSOULA MUNICIPAL CODE 12.22
15. MUTCD R7-1D "NO PARKING ANY TIME" SIGN
16. BUILDING FOOTPRINT
17. INVERT-GRADED ALLEY PAVING SECTION PER CITY OF MISSOULA STD-706
18. 10' WIDE VEHICLE TRAVEL LANE AND 0.5' BUFFER



PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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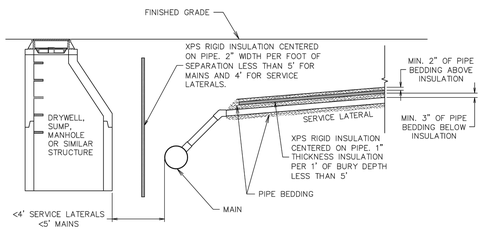
RIVERFRONT TRAILS

MISSOULA MONTANA

TYPICAL SHORT COURT LAYOUT

C7.2

DETAIL-SHORT COURT.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



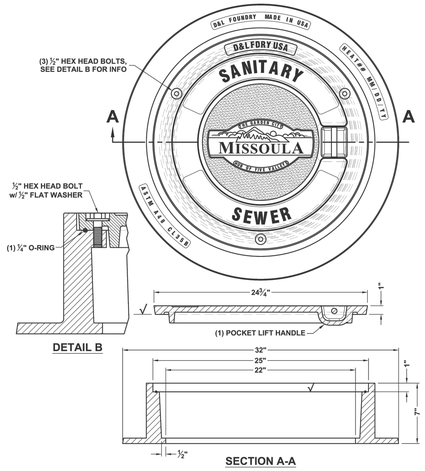
GENERAL NOTES:

1. INSULATION IS REQUIRED WHEN A SANITARY SEWER PIPE IS LESS THAN 4 FEET FOR A SERVICE LATERAL, AND LESS THAN 5 FEET FOR A SEWER MAIN, FROM FINISHED GRADE, A DRYWELL SUMP, IRRIGATION PIPE OR ANY STRUCTURE THAT HAS THE POTENTIAL TO TRANSFER COLD OR PROMOTE FREEZING.
2. PROVIDE ONE-INCH OF INSULATION THICKNESS, EQUIVALENT TO AN R-VALUE OF 5, PER FOOT OF MISSING COVER OR VOID SPACE LESS THAN FIVE FEET. PROVIDE TWO-INCHES OF INSULATION THICKNESS, EQUIVALENT TO AN R-VALUE OF 10, PER FOOT OF HORIZONTAL SEPARATION LESS THAN 5-FEET FOR MAINS AND 4-FEET FOR SERVICE LATERALS
3. USE A HIGH DENSITY, RIGID INSULATION WITH 35 PSI OR GREATER RATING.

December 2021

MISSOULA Engineering Division	Sanitary Sewer Service and Main Insulation Requirements		
	Approved By Utility Project Manager – Ross Mollenhauer, PE	Adopted: 09/28/2020 Revised: 07/23/2021	STD - 500

EJCO 3777Z1/AGS, D&L A-1171 LOCKABLE OR APPROVED EQUIVALENT

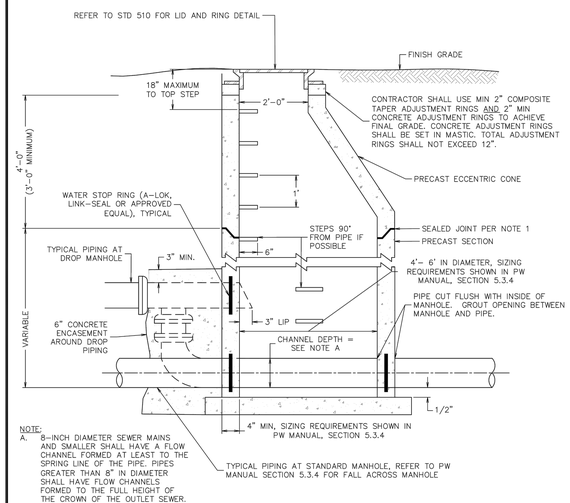


GENERAL NOTES:

1. D&L FOUNDRY A-1171 BOLT DOWN, WATER TIGHT LIDS ARE REQUIRED FOR ALL CITY-OWNED AND PRIVATELY-OWNED MANHOLES. PRIVATELY OWNED MANHOLES SHALL BE TEXTURED SLIP RESISTANT LID WITHOUT CITY LOGO AND LABELED WITH THE WORDS "SANITARY SEWER".
2. PROVIDE LIDS AND RINGS THAT MEET AASHTO 306 HS20 LOADING RATING OR HIGHER.
3. COMPOSITE TAPERED GRADE RINGS SHALL BE USED TO MATCH FRAME & GRATE TO THE CURB LINE CROSS SLOPE AND RUNNING SLOPE OR STREET CROSS SLOPE AND RUNNING SLOPE WHERE NOT IN CONCRETE.
4. A 4-INCH MANHOLE RING MAY BE USED IN LIEU OF A 7-INCH RING ONLY WITH PRIOR APPROVAL FROM CITY ENGINEERING.

December 2021

MISSOULA Engineering Division	Sanitary Sewer Lid		
	Approved By Utility Project Manager – Ross Mollenhauer, PE	Adopted: 09/28/2020 Revised: 10/22/2021	STD - 510

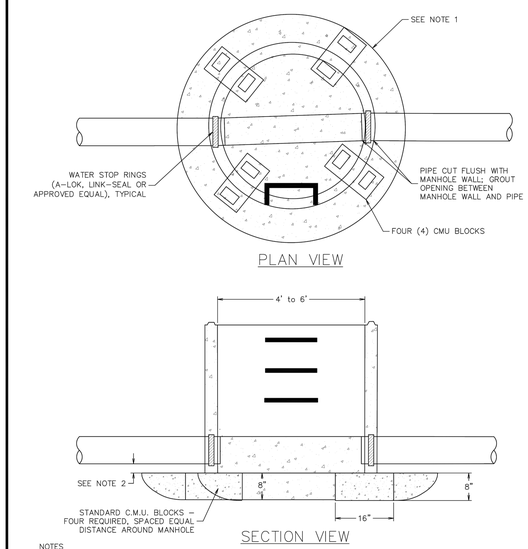


NOTE:
A. 8-INCH DIAMETER SEWER MAINS AND SMALLER SHALL HAVE A FLOW CHANNEL FORMED AT LEAST TO THE SPRING LINE OF THE PIPE. PIPES GREATER THAN 8" IN DIAMETER SHALL HAVE FLOW CHANNELS FORMED TO THE FULL HEIGHT OF THE CROWN OF THE OUTLET SEWER.

GENERAL NOTES:
1. ALL JOINTS BETWEEN MANHOLE SECTIONS, ADJUSTING RINGS, MANHOLE RING AND TOP SECTION, SHALL BE WATERTIGHT. JOINTING MATERIAL SHALL BE "CONSEAL" OR EQUAL.
2. CONCRETE FOR DROP STRUCTURES SHALL BE FORMED.
3. FLAT-TOP BARREL SHALL BE USED WHEN DISTANCE FROM TOP OF PIPE TO RIM IS LESS THAN 5-FEET.
4. BOLT-DOWN LIDS WILL BE REQUIRED AS PER STD 510. DUSTPANS ARE NOT REQUIRED WITH BOLT-DOWN LIDS.
5. ADDITIONAL FLEX-JOINTS MAY BE INSTALLED WITHIN 2-3 FEET OF MANHOLE WHERE NECESSARY.

December 2021

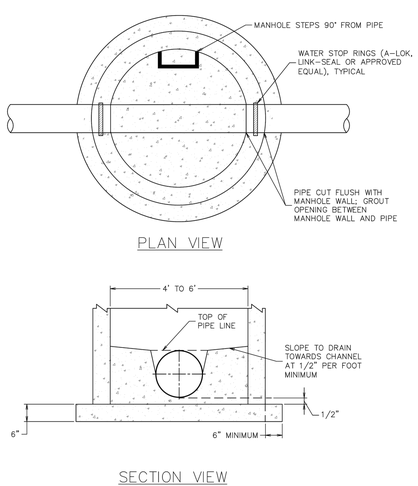
MISSOULA Engineering Division	Sanitary Sewer Manhole (Sheet 1 of 3)		
	Approved By City Engineer for Utilities Ross Mollenhauer, PE	Adopted: 09/28/2020 Revised: 03/25/2021	STD - 512-1



NOTES
1. BASE AND FILL CONCRETE MAY BE POURED MONOLITHICALLY.
2. ONE-HALF (1/2") INCH SPACING MAY BE OMITTED WHEN BASE AND FILL CONCRETE ARE POURED MONOLITHICALLY.

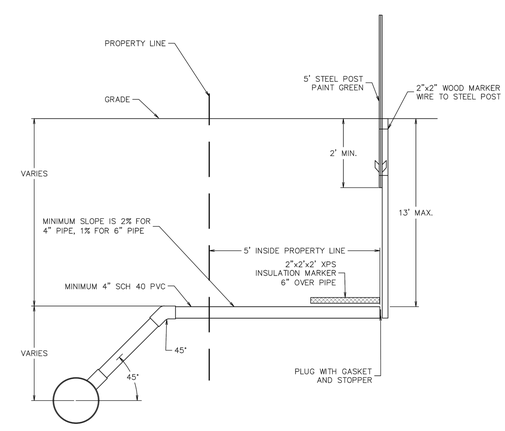
December 2021

MISSOULA Engineering Division	Sanitary Sewer Manhole - Dog House Base (Sheet 2 of 3)		
	Approved By City Engineer for Utilities Ross Mollenhauer, PE	Adopted: 09/28/2020 Revised: 03/25/2021	STD - 512-2



December 2021

MISSOULA Engineering Division	Sanitary Sewer Manhole - Precast Base (Sheet 3 of 3)		
	Approved By City Engineer for Utilities Ross Mollenhauer, PE	Adopted: 09/28/2020 Revised: 03/25/2021	STD - 512-3



GENERAL NOTES:

1. MAXIMUM LINE DEPTH IS 13'. DEVIATIONS MAY BE ALLOWED BY CITY ENGINEERING.
2. CONNECTIONS TO EXISTING SEWER MAINS SHALL BE TAPPED AT THE CONTRACTORS EXPENSE, AND PREDCO FAST FIT SADDLES OR APPROVED EQUAL SHALL BE USED. WHEN THE SEWER MAIN AND SEWER SERVICE LATERALS ARE INSTALLED UNDER ONE CONTRACT, IN-LINE TEES ONLY SHALL SHALL BE PROVIDED FOR THE SERVICE LATERALS. TEES SHALL BE ROLLED TO A 45 DEGREE ANGLE.
3. AN EXCAVATION PERMIT IS REQUIRED FOR EACH STUB.
4. SEWER SERVICE STUBS SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR AS SPECIFIED BY CITY ENGINEERING.
5. IN ORDER TO KEEP SERVICE LINES DEEP ENOUGH TO SERVE EACH HOME AND PASS UNDER WATER MAINS, A 22 DEGREE FITTING MAY BE ALLOWED BY THE CITY ENGINEER AT THE SEWER MAIN TAP.
6. ALL COMMERCIAL SERVICE STUBS SHALL BE 6" MINIMUM DIAMETER.
7. ALL SINGLE DWELLING UNIT SERVICE STUBS SHALL BE 4" MINIMUM DIAMETER.

December 2021

MISSOULA Engineering Division	Standard Sewer Service Stub		
	Approved By Utility Project Manager – Ross Mollenhauer, PE	Revised: 09/28/2020	STD - 520

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DATE	DESCRIPTION

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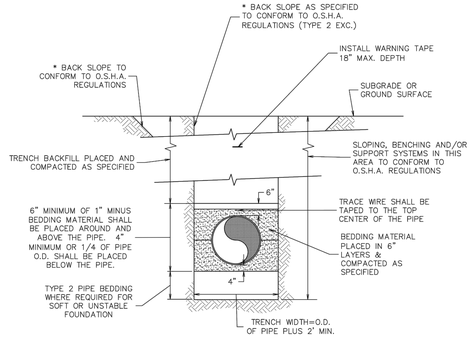
RIVERFRONT TRAILS
MISSOULA MONTANA

SANITARY SEWER DETAILS

C7.3

SANITARY SEWER DETAILS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022



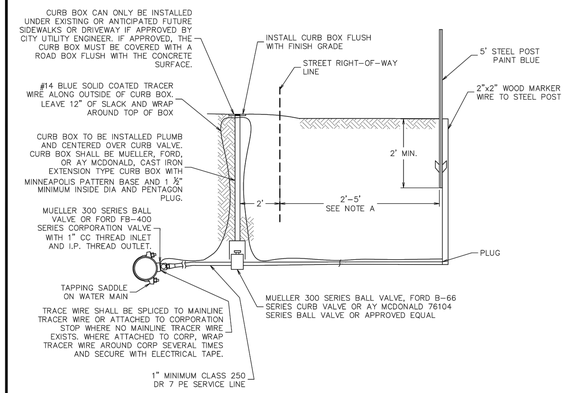
* SEE O.S.H.A. CONSTRUCTION STANDARDS FOR EXCAVATIONS, SECTION 1926, SUBPART P.

NOTE:

CASING PIPE (IF ANY) INSTALLED BY TRENCH CONSTRUCTION METHODS SHALL BE BEDDED AS SHOWN IN THIS DETAIL.

December 2021

MISSOULA Engineering Division | Typical Utility Trench Detail | Approved By Utilities Engineer Logan McInnis, PE | Revised: 09/28/2020 | STD - 401

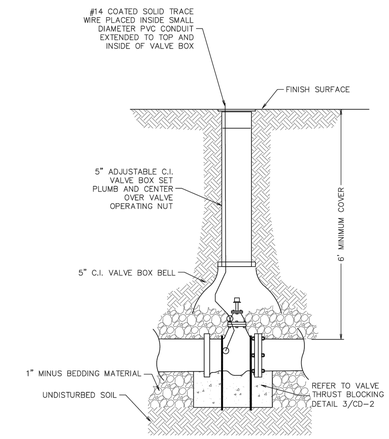


NOTE:
A. WHERE THERE IS A UTILITY EASEMENT ADJACENT TO THE RIGHT-OF-WAY, METER PIT CAN BE LOCATED 2' ON THE HOUSE SIDE OF THE EASEMENT.

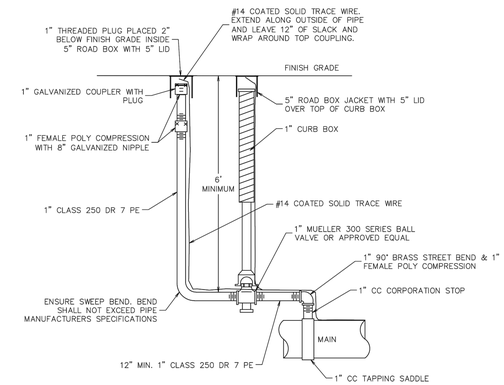
GENERAL NOTES:

1. WATER SERVICES SHALL BE BURIED A MINIMUM OF 6' DEEP.
2. FOR WATER SERVICES STUBS LARGER THAN 2" SEE CITY STANDARD DETAIL STD-413.
3. IF PROPERTY DOES NOT FRONT A STREET WITH A WATER MAIN, CONTACT CITY FOR SPECIFIC REQUIREMENTS RELATED TO EASEMENTS.
4. SERVICE LINE SHALL END AT WOOD POST. NO ABOVE GROUND WHIPS ALLOWED. IT IS THE INSTALLER'S RESPONSIBILITY TO REMOVE AIR FROM THE SERVICE LINES AS NECESSARY.
5. WATER SERVICE STUBS SHALL BE INSTALLED WHERE SHOWN ON THE DRAWINGS OR AS SPECIFIED BY CITY ENGINEERING.

MISSOULA Engineering Division | Typical Residential Water Service Stub Detail | Approved By Utilities Engineer Logan McInnis, PE | Revised: 09/28/2020 | STD - 404B



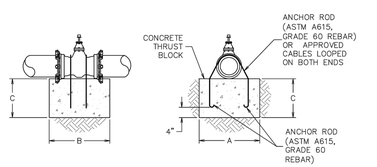
MISSOULA Engineering Division | Valve Detail | Approved By Utilities Engineer Logan McInnis, PE | Revised: 09/28/2020 | STD - 405



NOTES:

1. WHERE AIR RELIEF VALVES (ARVs) ARE IDENTIFIED ON THE PLANS AS TEMPORARY, TRACER WIRE IS NOT REQUIRED AND ALL MATERIALS CAN BE SALVAGED AFTER THE CORP IS CLOSED, THE LINE IS CAPPED WITH A BRASS CAP AND FITTINGS ARE WRAPPED IN 10-MIL TAPE..

MISSOULA Engineering Division | Manual Air Relief Detail | Approved By Utilities Engineer Logan McInnis, PE | Revised: 09/28/2020 | STD - 410



NOTES:

1. DIAGRAM DEPICTS GATE VALVES ONLY, VALVES 12 INCH AND LARGER TO BE BUTTERFLY, AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS WITH BLOCKS CENTERED UNDER LOAD BEARING PORTION OF VALVE.
2. STEEL CABLE (3/4" MINIMUM DIA. OR AS APPROVED BY THE ENGINEER) W/ANCHOR BOLTS MAY BE SUBSTITUTED FOR ANCHOR ROD.

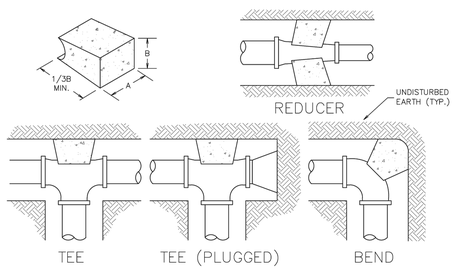
STANDARD THRUST BLOCK DIMENSIONS

ANCHOR ROD SIZE	VALVE SIZE	100 PSI			150 PSI			200 PSI			250 PSI			300 PSI	
		"A"	"B"	"C"	"A"	"B"	"C"	"A"	"B"	"C"	"A"	"B"	"C"	"A"	"B"
3/4"	6" & 8"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
3/4"	10"	2'-0"	2'-0"	2'-0"	2'-6"	2'-6"	2'-0"	2'-9"	2'-6"	2'-6"	3'-0"	3'-0"	3'-0"	3'-7"	3'-0"
3/4"	12"	2'-3"	2'-0"	2'-0"	3'-0"	3'-0"	2'-8"	3'-5"	3'-0"	3'-0"	4'-3"	3'-0"	3'-0"	5'-1"	3'-0"
1"	14"	2'-3"	2'-0"	2'-4"	3'-5"	3'-0"	3'-0"	4'-6"	3'-0"	3'-0"	4'-0"	4'-0"	4'-0"	4'-9"	4'-0"
1 1/8"	16"	3'-0"	3'-0"	2'-11"	4'-4"	3'-0"	3'-0"	4'-1"	4'-0"	4'-0"	5'-1"	4'-0"	4'-0"	6'-1"	4'-0"
1 1/4"	18"	3'-8"	3'-0"	3'-0"	5'-5"	3'-0"	3'-0"	5'-1"	4'-0"	4'-0"	6'-4"	4'-0"	4'-0"	5'-9"	5'-0"
1 3/8"	24"	4'-4"	4'-0"	4'-0"	6'-5"	4'-0"	4'-0"	6'-6"	5'-0"	5'-0"	6'-5"	6'-0"	6'-0"	7'-8"	6'-0"

NOTE: PRESSURES SHOWN ABOVE ARE MAXIMUM WORKING PRESSURE IN SYSTEM.

December 2021

MISSOULA Engineering Division | Valve Thrust Blocking Detail | Approved By Utilities Engineer Logan McInnis, PE | Adopted: 09/28/2020 Revised: 02/04/2021 | STD - 406



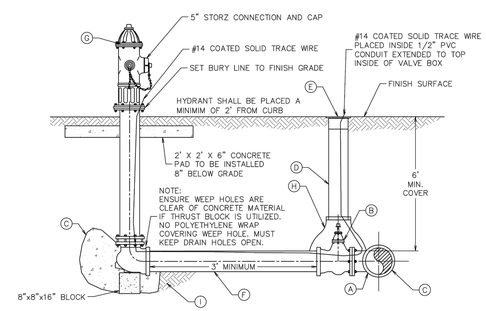
DIMENSIONS FOR THRUST BLOCKING

FITTING SIZES	TEES & PLUGS		90° BEND		45° BEND & WYES		REDUCERS & 22 1/2" BEND	
	A	B	A	B	A	B	A	B
4" & 6"	2'-0"	1'-11"	2'-5"	2'-2"	1'-10"	1'-7"	1'-9"	0'-10"
8"	2'-8"	2'-6"	3'-2"	3'-0"	2'-5"	2'-1"	1'-9"	1'-6"
10"	4'-0"	3'-3"	4'-0"	3'-10"	3'-0"	2'-9"	2'-2"	1'-11"
12"	4'-0"	3'-10"	4'-8"	4'-8"	3'-8"	3'-3"	2'-7"	2'-3"
16"	4'-6"	4'-0"	5'-0"	4'-8"	4'-0"	3'-0"	3'-0"	2'-6"
20"	5'-0"	5'-0"	7'-0"	5'-0"	4'-6"	4'-0"	3'-0"	3'-0"
24"	6'-10"	5'-0"	10'-0"	5'-0"	5'-8"	4'-6"	3'-8"	3'-8"

NOTES:

1. THIS TABLE IS BASED ON 2000 PSF SOIL BEARING PRESSURE AND 150 PSI MAIN PRESSURE.
2. WRAP ALL FITTINGS WITH POLYETHLENE PRIOR TO PLACING CONCRETE.

MISSOULA Engineering Division | Thrust Block Detail | Approved By Utilities Engineer Logan McInnis, PE | Revised: 09/28/2020 | STD - 407



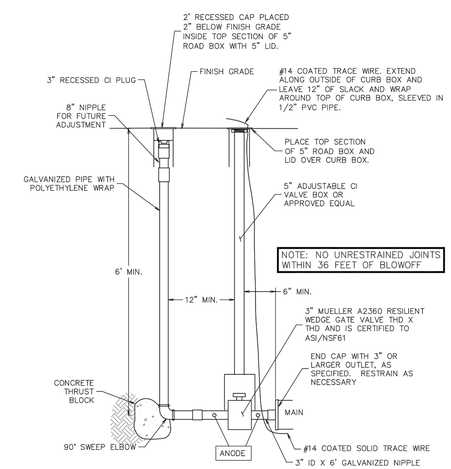
NOTES:

1. DUCTILE IRON PIPE, INCLUDING HYDRANT BARREL, SHALL BE WRAPPED WITH 8 MIL POLYETHYLENE.
2. IF MAIN IS BELOW OR ABOVE STANDARD DEPTH, USE BENDS AS REQUIRED TO INSURE THAT HYDRANT IS PLACED ABOVE GRADE AS SHOWN. PLACE BENDS BETWEEN HYDRANT VALVE & MAIN TO RAISE VALVE TO NORMAL DEPTH WHEN MAIN IS BELOW DEPTH SHOWN.
3. ALL JOINTS ON HYDRANT LEADS SHALL BE RESTRAINED.
4. HYDRANT EXTENSIONS WILL ONLY BE ALLOWED WITH WRITTEN PERMISSION FROM MISSOULA WATER.

A	APPROPRIATE SIZE X 6" SWIVEL OR MJ TEE AS REQUIRED.
B	6" MJ GATE VALVE--MUELLER OR APPROVED EQUAL
C	CONCRETE THRUST BLOCK IN ADDITION TO MEGALUG OR TIE-BOLT RESTRAINTS.
D	5" ADJUSTABLE C.I. VALVE BOX
E	5" VALVE BOX LID
F	6" DUCTILE IRON PIPE WITH #14 COATED SOLID TRACE WIRE
G	6" MUELLER CENTURION HYDRANT ASSEMBLY--MJ OR FLANGED (AS REQUIRED)
H	5" C.I. VALVE BOX BELL
I	PROVIDE IN ALL SOILS 1/2YD MIN. OF 3/4" CRUSHED ROCK. IN CLAY SOILS, PROVIDE 1 YD MIN.

December 2021

MISSOULA Engineering Division | Hydrant Detail | Approved By Utilities Engineer Logan McInnis, PE | Adopted: 09/28/2020 Revised: 12/17/2020 | STD - 408



PRELIMINARY

December 2021

MISSOULA Engineering Division | Typical Blow-Off Assembly | Approved By Utilities Engineer Logan McInnis, PE | Adopted: 09/28/2020 Revised: 02/04/2021 | STD - 409

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DATE	DESCRIPTION

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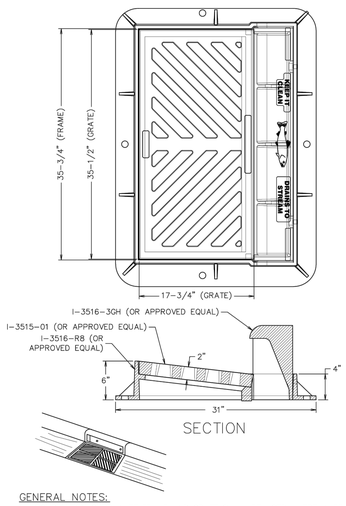
RIVERFRONT TRAILS
MISSOULA MONTANA
WATER DISTRIBUTION DETAILS

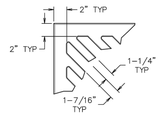
C7.4

WATER DISTRIBUTION DETAILS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

D&L 3516/EJIW 7030 OR APPROVED EQUIVALENT



SECTION



GRATE OPENING DETAIL

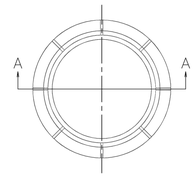
GENERAL NOTES:

1. COMBINATION CURB INLET FRAME AND GRATE SHALL BE USED WHERE INLET OR DRY WELL IS LOCATED IN TYPICAL "L" TYPE CURB & GUTTER (STD-740).
2. DUE TO PROVISIONS IN THE INTERMODAL SURFACE TRANSPORTATION ACT, VENDORS MUST AUTHENTICATE U.S. ORIGIN OF CASTINGS FOR FEDERALLY FUNDED PROJECTS.
3. VANED GRATE (D&L I-3517-02 OR APPROVED EQUAL) SHALL BE USED WHEN SLOPE EXCEEDS 5%
3. PROVIDE LIDS AND RINGS THAT MEET AASHTO 306 H20 LOADING RATING OR HIGHER.
4. ANGLED GRADE RINGS SHALL BE USED TO MATCH LID TO CROSS SLOPE AND RUNNING SLOPE OF THE ROAD.
5. GRATE SHALL MATCH RUNNING SLOPE OF STREET.
6. GROUT BOLT SLOTS LOCATED IN THE CURB LINE.

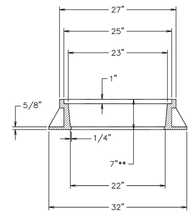
MISSOULA Engineering Division	36" COMBINATION CURB INLET FRAME & GRATE	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 600

EJIW / 3777 OR APPROVED EQUIVALENT

MANHOLE RING



TOP VIEW



SECTION A–A

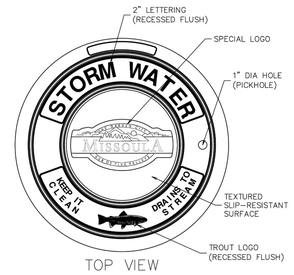
GENERAL NOTES:

1. DUE TO PROVISIONS IN THE INTERMODAL SURFACE TRANSPORTATION ACT, VENDORS MUST AUTHENTICATE U.S. ORIGIN OF CASTINGS FOR FEDERALLY FUNDED PROJECTS.
2. PROVIDE LIDS AND RINGS THAT MEET AASHTO 306 H20 LOADING RATING OR HIGHER.
5. 4-INCH MANHOLE RING MAY BE USED IN LIEU OF A 7" RING ONLY WITH PRIOR APPROVAL FROM CITY ENGINEERING.

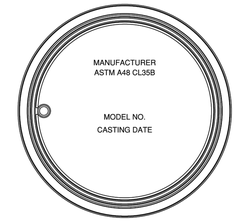
USE ONLY APPROVED COVERS:
STD-604B STORM WATER SOLID LID MANHOLE COVER
STD-604C AREA DRAIN GRATE
STD-604D ADA AREA DRAIN GRATE

MISSOULA Engineering Division	Storm Water Ring	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 604A

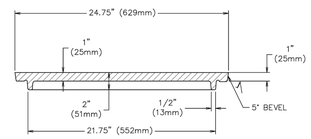
EJIW 3777-M / D&L A-1171 OR APPROVED EQUIVALENT



TOP VIEW



BOTTOM VIEW



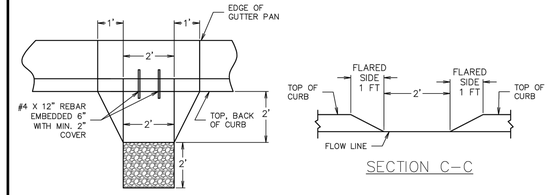
SECTION

√ MACHINED SURFACE

GENERAL NOTES:

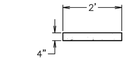
1. FOR CITY-OWNED INFRASTRUCTURE ONLY. FOR PRIVATE STRUCTURES WITHIN THE RIGHT-OF-WAY PROVIDE A TEXTURED SLIP RESISTANT LID WITHOUT CITY LOGO – MUST HAVE "STORM WATER" ON LID.
2. DUE TO PROVISIONS IN THE INTERMODAL SURFACE TRANSPORTATION ACT, VENDORS MUST AUTHENTICATE U.S. ORIGIN OF CASTINGS FOR FEDERALLY FUNDED PROJECTS.
3. PROVIDE LIDS AND RINGS THAT MEET AASHTO 306 H20 LOADING RATING OR HIGHER.
4. ANGLED GRADE RINGS SHALL BE USED TO MATCH LID TO CROSS SLOPE AND RUNNING SLOPE OF THE ROAD.
5. SEE STD-604A FOR STANDARD MANHOLE RING SPECIFICATIONS.
6. WHEN LOCATED WHERE MANHOLE MAY BECOME PRESSURIZED USE STD-605, "STORM WATER LOCKABLE LID AND FRAME".

MISSOULA Engineering Division	Storm Water Solid Lid	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 604B

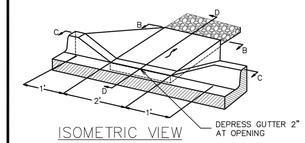


PLAN VIEW

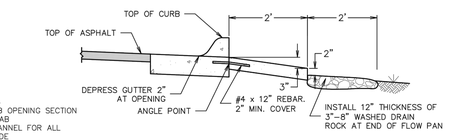
SECTION C–C



SECTION B–B



ISOMETRIC VIEW



SECTION D–D

GENERAL NOTES:

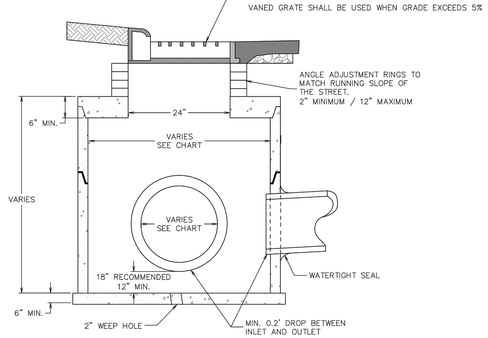
1. POUR ENTIRE CURB OPENING SECTION AS MONOLITHIC SLAB
2. PROVIDE FLOW CHANNEL FOR ALL OPENINGS ON GRADE
3. SEE STANDARD DRAWING STD-740 "TYPICAL "L" CURB/GUTTER SECTION" FOR CURB/GUTTER SPECIFICATIONS

MISSOULA Engineering Division	Curb Opening	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 607

USE ONLY APPROVED COMPONENTS:

STD-600 36" COMBINATION CURB INLET FRAME & GRATE
STD-601 24" COMBINATION CURB INLET FRAME & GRATE

VANED GRATE SHALL BE USED WHEN GRADE EXCEEDS 5%



GENERAL NOTES:

1. CATCH BASINS PIPED TO DRY WELLS (STD-616) ARE ENCOURAGED AS A PRE-TREATMENT METHOD OR TO AVOID UTILITY CONFLICTS.

MANHOLE-TO-PIPE DATA TABLE

MANHOLE DIA.	WALL THICKNESS	PIPE DIA >	PIPE DIA ≤
2'-6"	0'-3 1/2"	---	12"*
4'-0"	0'-5"	---	18"
5'-0"	0'-6"	18"	24"
6'-0"	0'-7"	24"	54"
JUNCTION BOX	---	54"	---

*SINGLE PIPE ONLY. MAXIMUM DEPTH 6 FT.
MINIMUM PIPE SIZE FOR PUBLIC MAINS/LATERALS = 12"

MISSOULA Engineering Division	Standard Catch Basin	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 614

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

DESCRIPTION	DATE

WOITH ENGINEERING, INC.
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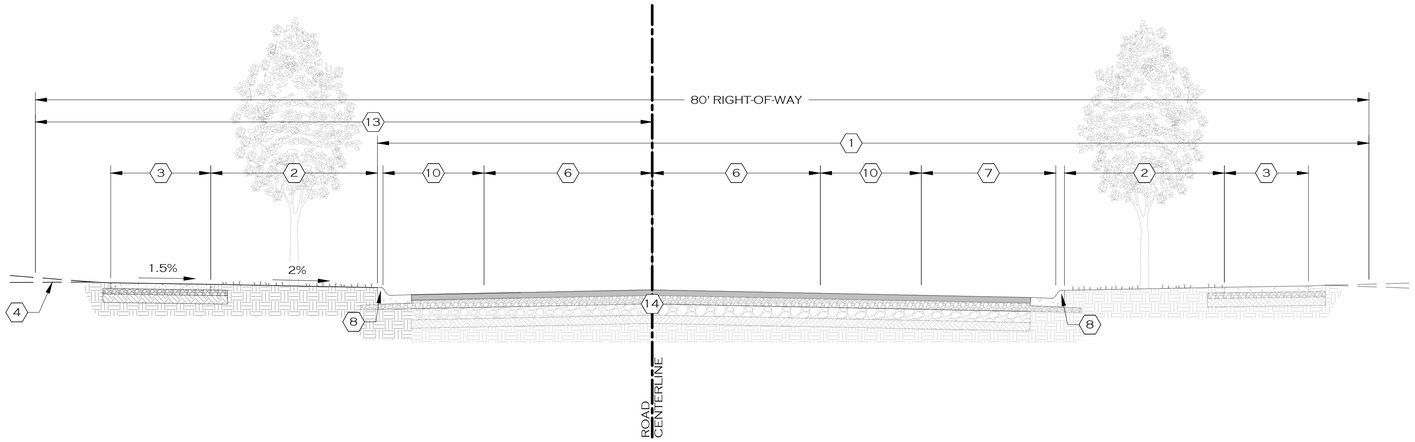
RIVERFRONT TRAILS
MISSOULA MONTANA

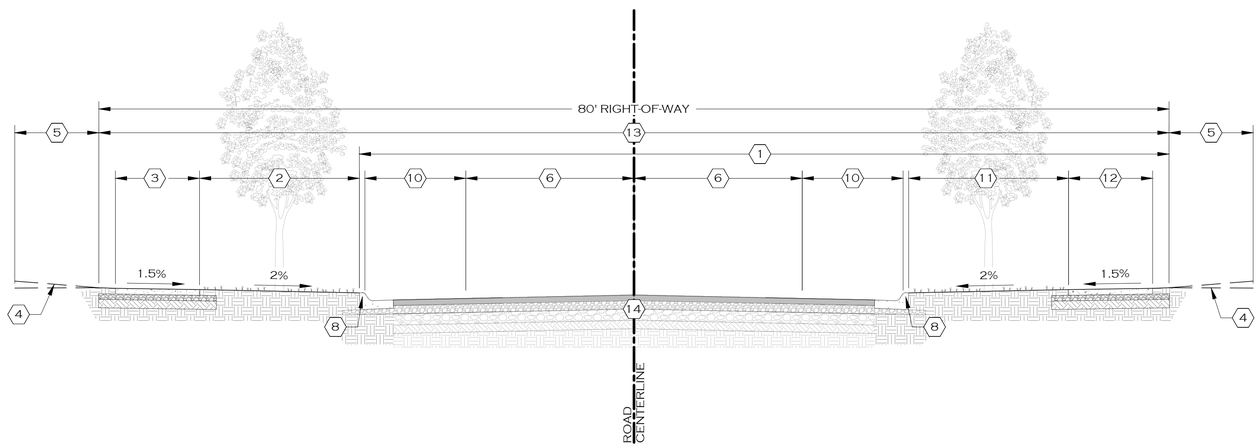
STORM DRAINAGE DETAILS

C7.5

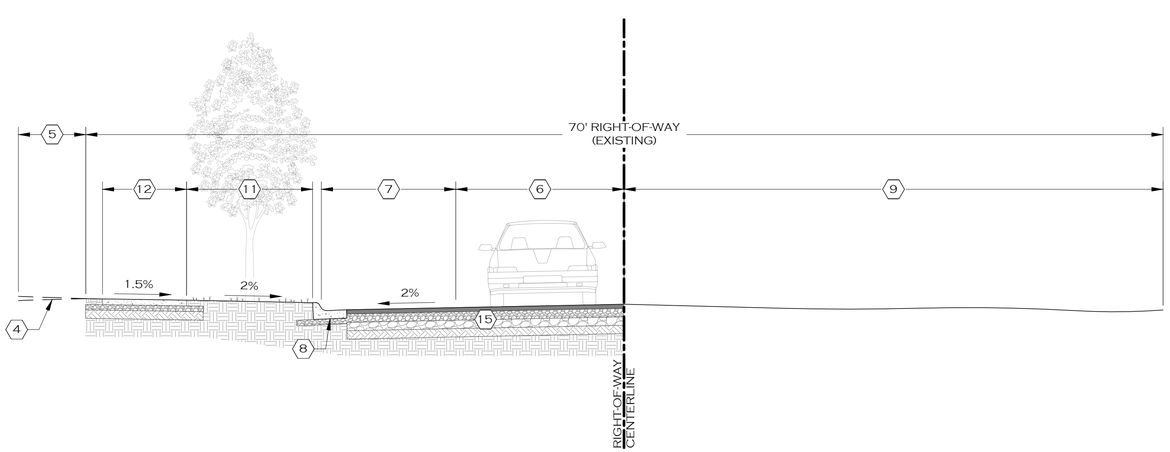
STORM DRAINAGE DETAILS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



MINOR ARTERIAL
LOWER MILLER CREEK ROAD
(NORTH-SOUTH SECTION)



MINOR ARTERIAL
LOWER MILLER CREEK ROAD
(EAST-WEST SECTION)



URBAN LOCAL STREET
GUSTUSON ROAD HALF-STREET IMPROVEMENTS

KEY NOTES:

1. INFRASTRUCTURE TO BE INSTALLED AS PART OF CITY PROJECT.
2. 10' WIDE BOULEVARD.
3. 6' WIDE SIDEWALK PER CITY OF MISSOULA STD-752
4. GRADE TO EXISTING AT 15% MAXIMUM SLOPE
5. 5' PUBLIC UTILITY EASEMENT; LOCATIONS PER PLAT OF RIVERFRONT TRAILS
6. 10' WIDE VEHICLE TRAVEL LANE
7. 8' WIDE PARALLEL PARKING LANE
8. 0.5' CURB; TYPICAL L-TYPE CURB AND GUTTER PER CITY OF MISSOULA STD-740
9. EXISTING INFRASTRUCTURE TO REMAIN. FUTURE HALF-STREET IMPROVEMENTS.
10. 6' WIDE BIKE LANE
11. 7' WIDE BOULEVARD
12. 5' WIDE SIDEWALK
13. LOWER MILLER CREEK ROAD IMPROVEMENTS REQUIRED FOR RIVERFRONT TRAILS SUBDIVISION. THE SUBDIVIDER SHALL BE DIRECTLY RESPONSIBLE FOR DESIGN AND INSTALLATION OF INFRASTRUCTURE OUTSIDE THE CITY PROJECT LIMITS. INFRASTRUCTURE WITHIN CITY PROJECT LIMITS MAY BE INSTALLED VIA COST-SHARING AGREEMENT WITH THE CITY.
14. 4" THICK ASPHALT PAVEMENT SECTION. INSTALL BASE COURSES PER CITY OF MISSOULA STD-704 FOR URBAN COLLECTOR STREETS WITH CBR 10, SHEET C7.2.
15. 3" THICK ASPHALT PAVEMENT SECTION. INSTALL BASE COURSES PER CITY OF MISSOULA STD-703 FOR LOCAL RESIDENTIAL STREETS WITH CBR 10, SHEET C7.2.

JOB #:	2101
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PRELIMINARY

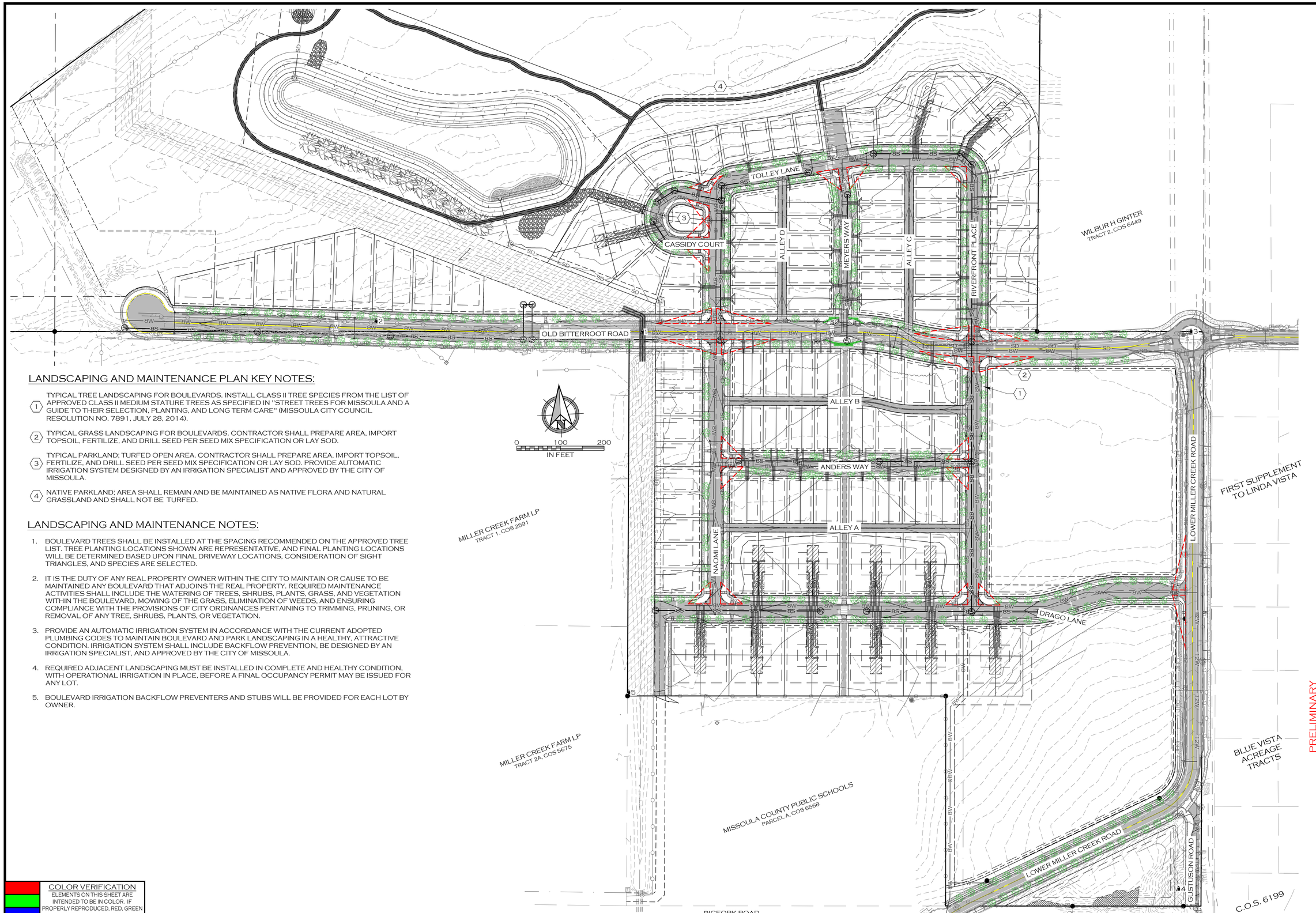
RIVERFRONT TRAILS

MISSOULA MONTANA

LOWER MILLER CREEK CORRIDOR ROAD SECTIONS

C7.6

LOWER MILLER CREEK CORRIDOR ROAD SECTIONS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



PRELIMINARY

LANDSCAPING AND MAINTENANCE PLAN KEY NOTES:

1. TYPICAL TREE LANDSCAPING FOR BOULEVARDS. INSTALL CLASS II TREE SPECIES FROM THE LIST OF APPROVED CLASS II MEDIUM STATURE TREES AS SPECIFIED IN "STREET TREES FOR MISSOULA AND A GUIDE TO THEIR SELECTION, PLANTING, AND LONG TERM CARE" (MISSOULA CITY COUNCIL RESOLUTION NO. 7891, JULY 28, 2014).
2. TYPICAL GRASS LANDSCAPING FOR BOULEVARDS. CONTRACTOR SHALL PREPARE AREA, IMPORT TOPSOIL, FERTILIZE, AND DRILL SEED PER SEED MIX SPECIFICATION OR LAY SOD.
3. TYPICAL PARKLAND; TURFED OPEN AREA. CONTRACTOR SHALL PREPARE AREA, IMPORT TOPSOIL, FERTILIZE, AND DRILL SEED PER SEED MIX SPECIFICATION OR LAY SOD. PROVIDE AUTOMATIC IRRIGATION SYSTEM DESIGNED BY AN IRRIGATION SPECIALIST AND APPROVED BY THE CITY OF MISSOULA.
4. NATIVE PARKLAND; AREA SHALL REMAIN AND BE MAINTAINED AS NATIVE FLORA AND NATURAL GRASSLAND AND SHALL NOT BE TURFED.

LANDSCAPING AND MAINTENANCE NOTES:

1. BOULEVARD TREES SHALL BE INSTALLED AT THE SPACING RECOMMENDED ON THE APPROVED TREE LIST. TREE PLANTING LOCATIONS SHOWN ARE REPRESENTATIVE, AND FINAL PLANTING LOCATIONS WILL BE DETERMINED BASED UPON FINAL DRIVEWAY LOCATIONS, CONSIDERATION OF SIGHT TRIANGLES, AND SPECIES ARE SELECTED.
2. IT IS THE DUTY OF ANY REAL PROPERTY OWNER WITHIN THE CITY TO MAINTAIN OR CAUSE TO BE MAINTAINED ANY BOULEVARD THAT ADJOINS THE REAL PROPERTY. REQUIRED MAINTENANCE ACTIVITIES SHALL INCLUDE THE WATERING OF TREES, SHRUBS, PLANTS, GRASS, AND VEGETATION WITHIN THE BOULEVARD, MOWING OF THE GRASS, ELIMINATION OF WEEDS, AND ENSURING COMPLIANCE WITH THE PROVISIONS OF CITY ORDINANCES PERTAINING TO TRIMMING, PRUNING, OR REMOVAL OF ANY TREE, SHRUBS, PLANTS, OR VEGETATION.
3. PROVIDE AN AUTOMATIC IRRIGATION SYSTEM IN ACCORDANCE WITH THE CURRENT ADOPTED PLUMBING CODES TO MAINTAIN BOULEVARD AND PARK LANDSCAPING IN A HEALTHY, ATTRACTIVE CONDITION. IRRIGATION SYSTEM SHALL INCLUDE BACKFLOW PREVENTION, BE DESIGNED BY AN IRRIGATION SPECIALIST, AND APPROVED BY THE CITY OF MISSOULA.
4. REQUIRED ADJACENT LANDSCAPING MUST BE INSTALLED IN COMPLETE AND HEALTHY CONDITION, WITH OPERATIONAL IRRIGATION IN PLACE, BEFORE A FINAL OCCUPANCY PERMIT MAY BE ISSUED FOR ANY LOT.
5. BOULEVARD IRRIGATION BACKFLOW PREVENTERS AND STUBS WILL BE PROVIDED FOR EACH LOT BY OWNER.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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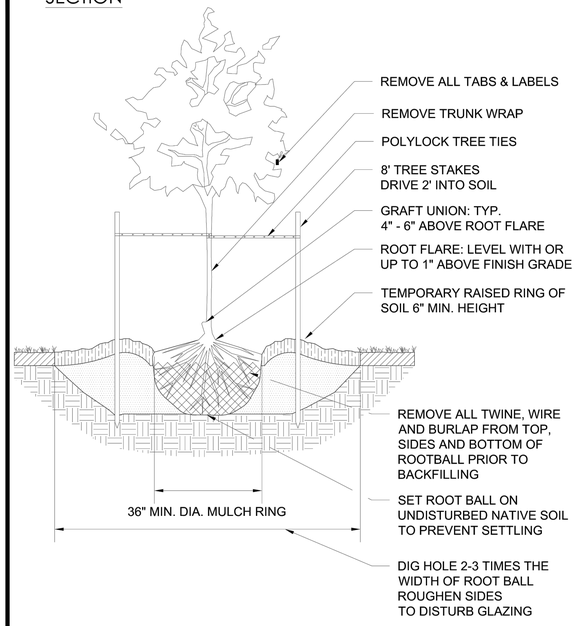
RIVERFRONT TRAILS
MISSOULA MONTANA
LANDSCAPING AND MAINTENANCE PLAN

C8.0

LANDSCAPING AND MAINTENANCE PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022

SECTION



MISSOULA Parks and Rec. Dept.

BALL AND BURLAP TREE PLANTING DETAIL

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-101

NOTES:

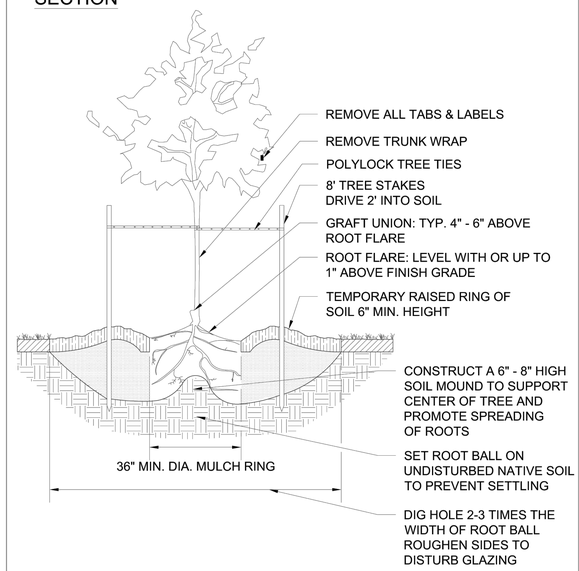
1. Plant material must meet the minimum acceptable standard set by the American Association of Nurserymen's American Standard of Nursery Stock: ANSI Z60.1. Broken, damaged, diseased, or substandard stock are prohibited from being planted in the public right-of-way and will be rejected.
2. Only class I (small growing) trees are permitted to be planted under or within fifteen (15') of overhead utility lines.
3. Prune only broken or damaged branches. Do not apply fertilizer at time of planting.
4. The root flare is the point where the top most structural root emerges from the trunk. The depth of the root ball shall be measured from the root flare to the bottom of the root ball. Handle B&B plants carefully when transferring to planting hole. Lift or carry by holding the root ball, not the trunk.
5. Remove any excess soil from the top of the root ball to expose the root flare. Place tree in planting hole with root flare level with or up to 1" above finish grade.
6. Remove all wire baskets and rope from root ball. Be careful to keep the root ball intact.
7. Remove all burlap from the root ball. Be careful to keep root ball intact.
8. Straighten, cut and remove any circling roots.
9. Backfill planting hole 2/3 full with existing soil, settle with water, continue to fill with soil, water again. Water thoroughly after installation to eliminate air pockets.
10. Construct a temporary raised ring of soil at edge of root ball to contain water. Remove or breach before winter.
11. Construct mulch ring with a minimum 36" diameter to a depth of 2" - 4"; leave 3" bare ground between mulch and tree trunk.
12. Set stakes parallel to prevailing wind and outside of root ball. Ties must be 1" wide minimum, flexible belt-like strapping. Do not use rope or wire. Do not over-tighten around tree. Ties should be tight enough to support the tree while allowing it to sway. Remove stakes and ties within one year after installation.
13. Trees benefit when irrigated separately from turf. Water new trees during summer months to a depth of 12" - 18" once per week (about 5 gallons of water per caliper inch) for the first 3 growing seasons. During periods of drought, new trees my need more frequent watering.

MISSOULA Parks and Rec. Dept.

BALL AND BURLAP TREE PLANTING NOTES

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-101

SECTION



MISSOULA Parks and Rec. Dept.

BARE ROOT TREE PLANTING DETAIL

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-101-2

NOTES:

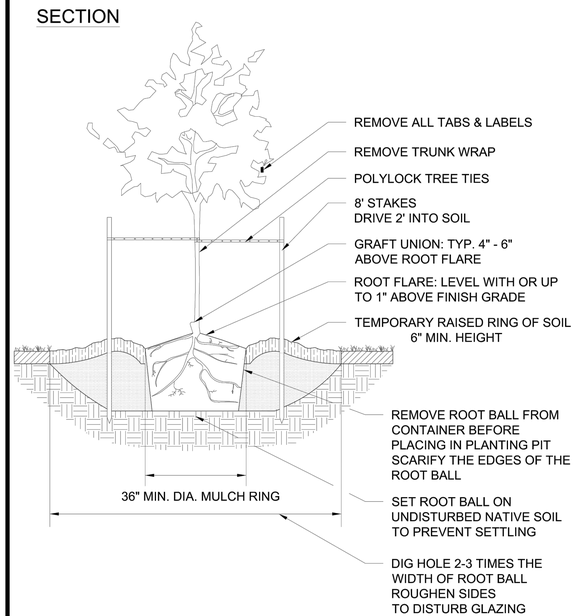
1. Plant material must meet the minimum acceptable standard set by the America Association of Nurserymen's American Standard of Nursery Stock: ANSI Z60.1. Broken, damaged, diseased, or substandard stock are prohibited from being planted in the public right-of-way and will be rejected.
2. Only class I (small growing) trees are permitted to be planted under or within fifteen (15') of overhead utility lines.
3. Prune only broken or damaged branches. Do not apply fertilizer at time of planting.
4. The root flare is the point where the top most structural root emerges from the trunk. The depth of the root ball shall be measured from the root flare to the bottom of the lowest root(s). Handle roots carefully when transferring to planing hole.
5. Remove all packing material from roots.
6. Plant root flare level with or up to 1" above finish grade.
7. Straighten, cut and remove any circling roots. Construct a mound of soil 6" - 8" high to support center of tree. Spread roots over mound, extending in a radial pattern from the trunk, distributing them evenly in the planting hole.
8. Backfill planting hole 2/3 full with existing soil, settle with water, continue to fill with soil, water again. Water thoroughly after installation to eliminate air pockets.
9. Construct a temporary raised ring of soil at edge of root ball to contain water. Remove or breach before winter.
10. Construct mulch ring with minimum 36" diameter to a depth of 2" - 4"; leave 3" of bare ground between mulch and tree trunk.
11. Set stakes parallel to prevailing wind and outside of root ball. Ties must be 1" wide minimum, flexible belt-like strapping. Do not use rope or wire. Do not over-tighten around tree. Ties should be tight enough to support the tree while allowing it to sway. Remove stakes and ties within one year after installation.
12. Trees benefit when irrigated separately from turf. Water new trees during summer months to a depth of 12" - 18" once per week (about 5 gallons of water per caliper inch) for the first 3 growing seasons. During periods of drought, new trees my need more frequent watering.

MISSOULA Parks and Rec. Dept.

BARE ROOT TREE PLANTING NOTES

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-101-2

SECTION



MISSOULA Parks and Rec. Dept.

CONTAINER TREE PLANTING DETAIL

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-101-3

NOTES:

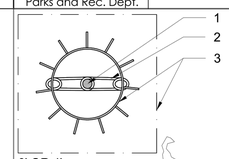
1. Plant material must meet the minimum acceptable standard set by the American Association of Nurserymen's American Standard of Nursery Stock: ANSI Z60.1. Broken, damaged, diseased, or substandard stock are prohibited from being planted in the public right-of-way and will be rejected.
2. Only class I (small growing) trees are permitted to be planted under or within fifteen (15') of overhead utility lines.
3. Prune only broken or damaged branches. Do not apply fertilizer at time of planting.
4. The root flare is the point where the top most structural root emerges from the trunk. The depth of the root ball shall be measured from the root flare to the bottom of the ball. Handle container plants carefully when transferring to planting hole. Lift or carry by holding the root ball, not the trunk.
5. Remove any excess soil from the top of the root ball to expose the root flare. Place tree in planting hole with root flare level with or up to 1" above finish grade.
6. Remove container from root ball. Be careful to keep the root ball intact.
7. Straighten, cut and remove any circling roots.
8. Backfill planting hole 2/3 full with existing soil, settle with water, continue to fill with soil, water again. Water thoroughly after installation to eliminate air pockets.
9. Construct a temporary raised ring of soil at edge of root ball to contain water. Remove or breach before winter.
10. Construct mulch ring with minimum 36" diameter to a depth of 2" - 4"; leave 3" of bare ground between mulch and tree trunk.
11. Set stakes parallel to prevailing wind and outside of root ball. Ties must be 1" wide minimum, flexible belt-like strapping. Do not use rope or wire. Do not over-tighten around tree. Ties should be tight enough to support the tree while allowing it to sway. Remove stakes and ties within one year after installation.
12. Trees benefit when irrigated separately from turf. Water new trees during summer months to a depth of 12" - 18" once per week (about 5 gallons of water per caliper inch) for the first 3 growing seasons. During periods of drought, new trees my need more frequent watering.

MISSOULA Parks and Rec. Dept.

CONTAINER TREE PLANTING NOTES

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-101-3

PLAN



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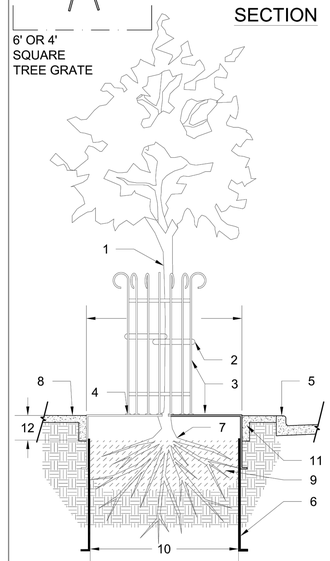

NOTES:

1. Tree as per City of Missoula Parks & Rec. standards for selecting & planting landscape street trees
2. ¾" polylock tree ties, (2)
3. NEENAH R-8713, 180 deg. square 60" or 48" tree grate with tree guard, reference plan for construction details
4. Steel flange 2" x 3" pre-drilled to accept 2" x ½" through bolt
5. Curb / Gutter or other approved equal
6. Root control barrier by "Deep Root Corp" or approved equal. 12" depth adjacent to sidewalks and 18" depth adjacent to curbs
7. First roots shall be visible at top of rootball. Set top of rootball 1" above finish grade to adjust for setteling.
8. Sidewalk
9. Backfill mix as per specifications or soil report
10. Planting pit shall be the width of the tree well and no deeper than the root ball. Scarify sides & bottom of planting pit.
11. Concrete edge to retain subgrade 4" thick minimum
12. Finish planter grade 7" below top of tree grate

MISSOULA Parks and Rec. Dept.

TREE GRATE & TREE GUARD DETAIL

Approved by Parks & Rec. Design Mgr. Neil Miner | Drawn by: GLS | Checked by: CB | Adopted: | PR-102

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

	DESCRIPTION	DATE
1	DATUM ADJUSTMENT	5/17/2021

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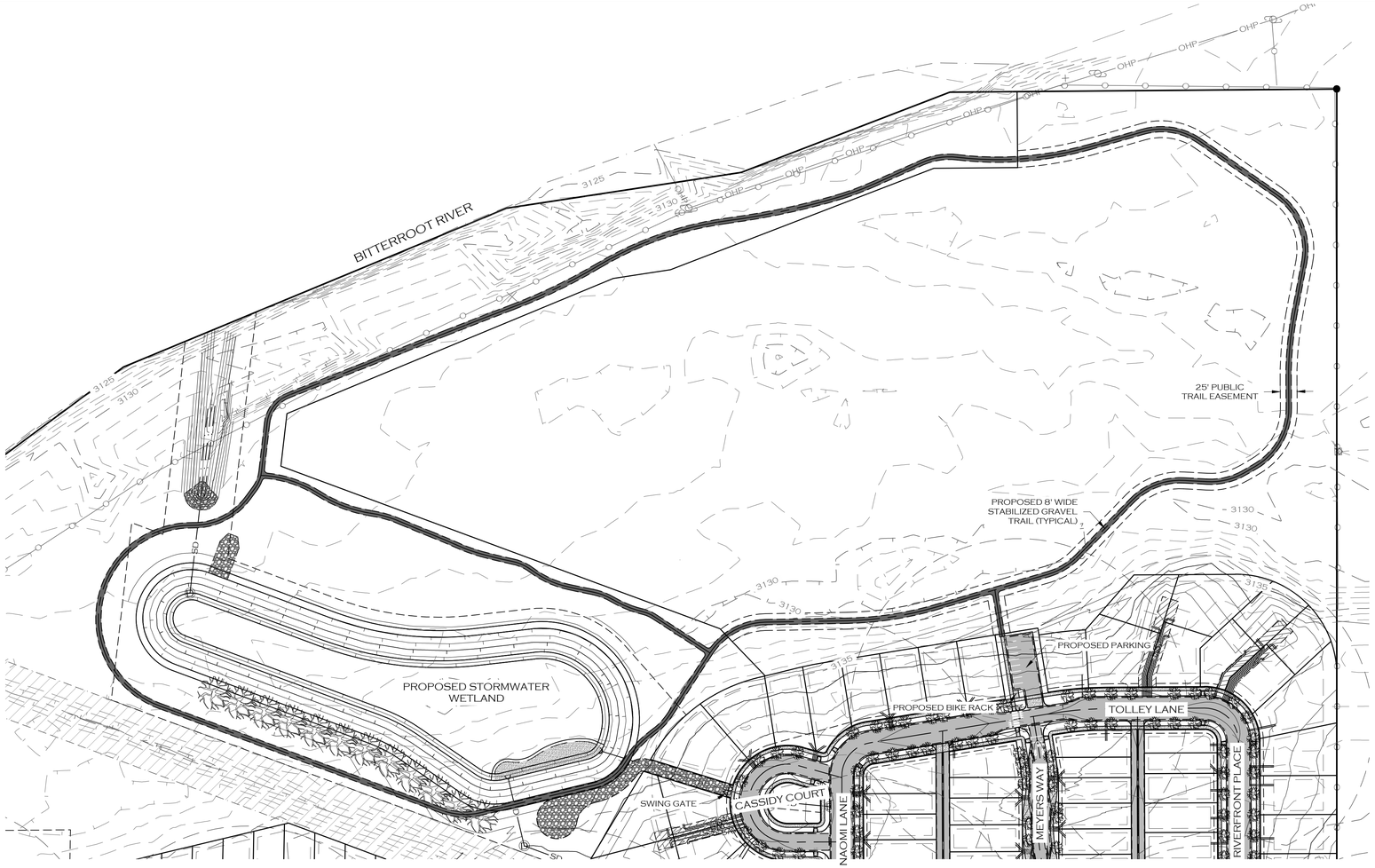
RIVERFRONT TRAILS

MISSOULA MONTANA

LANDSCAPING PLAN DETAILS

C8.1

LANDSCAPING PLAN DETAILS.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022



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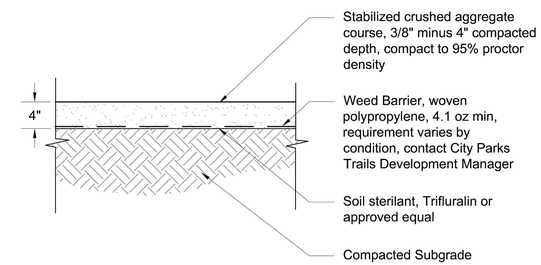

NOTES:

1. Refer to part 5, section 2 of Missoula Parks and Recreation Design Manual for gravel trail notes, aggregate gradation, and stabilizer specifications.
2. Use psyllium stabilizer from Stabilizer Solutions, Polypavement, or approved equal.
3. Thoroughly mix stabilizer into aggregate per manufacturer's recommendations.

MISSOULA Parks and Rec. Dept.	STABILIZED TRAIL DETAIL		PR-122-2
	Approved by Parks & Rec. Design Mgr. Neil Miner	Drawn by: PM Checked by: CB Adopted:	

0 100 200
IN FEET

LEGEND

- PROPOSED BUILDING
- PROPOSED SIGN POST
- PROPOSED ROAD CENTERLINE
- PROPOSED TRAIL
- PROPOSED CURB
- PROPOSED WHITE TRAFFIC STRIPE
- PROPOSED YELLOW TRAFFIC STRIPE
- PROPOSED ASPHALT ROAD
- PROPOSED SIDEWALK/CONCRETE
- PROPOSED ADA STALL MARKING
- PROPOSED BICYCLE RACK
- W — PROPOSED WATER MAIN
- WS — PROPOSED WATER SERVICE
- FL — PROPOSED FIRE SERVICE
- IRR — PROPOSED IRRIGATION
- PROPOSED BLOWOFF
- PROPOSED CURB STOP
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED AIR RELIEF VALVE
- S — PROPOSED SANITARY SEWER MAIN
- SS — PROPOSED SANITARY SEWER SERVICE
- PROPOSED MANHOLE - SANITARY SEWER
- SD — PROPOSED STORM SEWER
- PROPOSED MANHOLE - STORM SEWER
- PROPOSED STORM DRAIN INLET
- PROPOSED DITCH
- PROPOSED POND
- PROPOSED GRADE BREAK
- PROPOSED LANDSCAPING
- PROPOSED DECIDUOUS TREE
- E — PROPOSED BURIED POWER
- PROPOSED LIGHT POLE
- F — PROPOSED BURIED FIBER
- T — PROPOSED BURIED TELEPHONE
- G — PROPOSED BURIED GAS

NOTES:

1. TOTAL TRAIL LENGTH: 5,297 FEET
2. TRAILS SHALL HAVE A WIDTH OF EIGHT FEET AND BE BUILT TO THE SPECIFICATIONS FOR STABILIZED TRAILS IN PART 5, SECTION 2 OF THE CITY OF MISSOULA PARKS AND RECREATION DESIGN MANUAL (2018 EDITION).
3. TRAILS SHALL FOLLOW THE NATURAL GROUND CONTOURS TO THE GREATEST EXTENT POSSIBLE.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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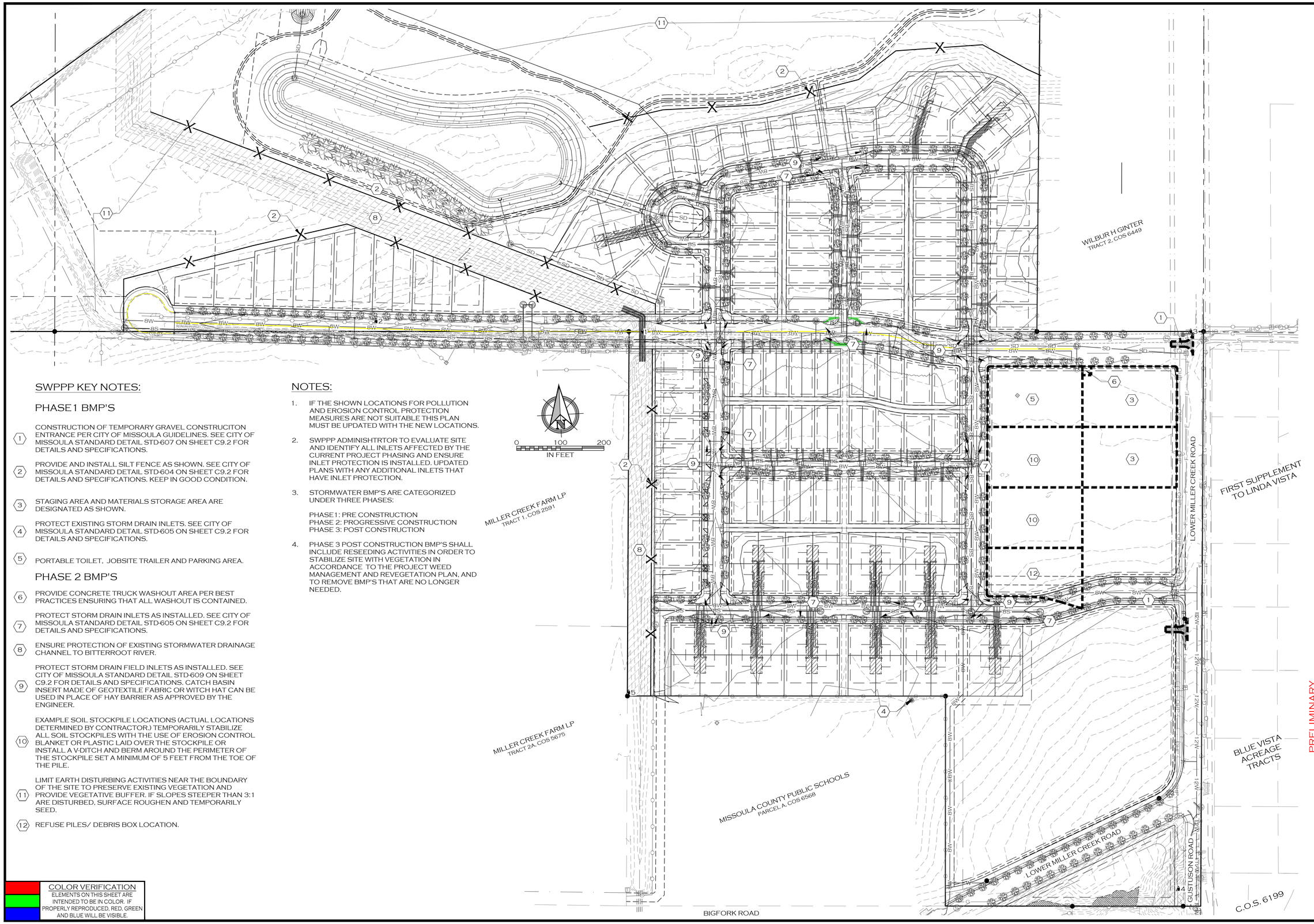
PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA

TRAIL PLAN

C8.2

TRAIL PLAN.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022



SWPPP KEY NOTES:

PHASE 1 BMP'S

1. CONSTRUCTION OF TEMPORARY GRAVEL CONSTRUCITON ENTRANCE PER CITY OF MISSOULA GUIDELINES. SEE CITY OF MISSOULA STANDARD DETAIL STD-607 ON SHEET C9.2 FOR DETAILS AND SPECIFICATIONS.
2. PROVIDE AND INSTALL SILT FENCE AS SHOWN. SEE CITY OF MISSOULA STANDARD DETAIL STD-604 ON SHEET C9.2 FOR DETAILS AND SPECIFICATIONS. KEEP IN GOOD CONDITION.
3. STAGING AREA AND MATERIALS STORAGE AREA ARE DESIGNATED AS SHOWN.
4. PROTECT EXISTING STORM DRAIN INLETS. SEE CITY OF MISSOULA STANDARD DETAIL STD-605 ON SHEET C9.2 FOR DETAILS AND SPECIFICATIONS.
5. PORTABLE TOILET, JOBSITE TRAILER AND PARKING AREA.

PHASE 2 BMP'S

6. PROVIDE CONCRETE TRUCK WASHOUT AREA PER BEST PRACTICES ENSURING THAT ALL WASHOUT IS CONTAINED.
7. PROTECT STORM DRAIN INLETS AS INSTALLED. SEE CITY OF MISSOULA STANDARD DETAIL STD-605 ON SHEET C9.2 FOR DETAILS AND SPECIFICATIONS.
8. ENSURE PROTECTION OF EXISTING STORMWATER DRAINAGE CHANNEL TO BITTERROOT RIVER.
9. PROTECT STORM DRAIN FIELD INLETS AS INSTALLED. SEE CITY OF MISSOULA STANDARD DETAIL STD-609 ON SHEET C9.2 FOR DETAILS AND SPECIFICATIONS. CATCH BASIN INSERT MADE OF GEOTEXTILE FABRIC OR WITCH HAT CAN BE USED IN PLACE OF HAY BARRIER AS APPROVED BY THE ENGINEER.
10. EXAMPLE SOIL STOCKPILE LOCATIONS (ACTUAL LOCATIONS DETERMINED BY CONTRACTOR.) TEMPORARILY STABILIZE ALL SOIL STOCKPILES WITH THE USE OF EROSION CONTROL BLANKET OR PLASTIC LAID OVER THE STOCKPILE OR INSTALL A V-DITCH AND BERM AROUND THE PERIMETER OF THE STOCKPILE SET A MINIMUM OF 5 FEET FROM THE TOE OF THE PILE.
11. LIMIT EARTH DISTURBING ACTIVITIES NEAR THE BOUNDARY OF THE SITE TO PRESERVE EXISTING VEGETATION AND PROVIDE VEGETATIVE BUFFER. IF SLOPES STEEPER THAN 3:1 ARE DISTURBED, SURFACE ROUGHEN AND TEMPORARILY SEED.
12. REFUSE PILES/ DEBRIS BOX LOCATION.

NOTES:

1. IF THE SHOWN LOCATIONS FOR POLLUTION AND EROSION CONTROL PROTECTION MEASURES ARE NOT SUITABLE THIS PLAN MUST BE UPDATED WITH THE NEW LOCATIONS.
2. SWPPP ADMINISHTRTOR TO EVALUATE SITE AND IDENTIFY ALL INLETS AFFECTED BY THE CURRENT PROJECT PHASING AND ENSURE INLET PROTECTION IS INSTALLED. UPDATED PLANS WITH ANY ADDITIONAL INLETS THAT HAVE INLET PROTECTION.
3. STORMWATER BMP'S ARE CATEGORIZED UNDER THREE PHASES:

   PHASE 1: PRE CONSTRUCTION
   PHASE 2: PROGRESSIVE CONSTRUCTION
   PHASE 3: POST CONSTRUCTION
4. PHASE 3 POST CONSTRUCTION BMP'S SHALL INCLUDE RESEEDING ACTIVITIES IN ORDER TO STABILIZE SITE WITH VEGETATION IN ACCORDANCE TO THE PROJECT WEED MANAGEMENT AND REVEGETATION PLAN, AND TO REMOVE BMP'S THAT ARE NO LONGER NEEDED.

COLOR VERIFICATION
ELEMENTS ON THIS SHEET ARE INTENDED TO BE IN COLOR. IF PROPERLY REPRODUCED, RED, GREEN AND BLUE WILL BE VISIBLE.

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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PRELIMINARY

RIVERFRONT TRAILS
MISSOULA MONTANA
STORMWATER POLLUTION PREVENTION PLAN

C9.0

SWPPP.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022

EROSION CONTROL AND MAINTENANCE NOTES:

1. SWPPP TO BE FILED WITH MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY BY GENERAL CONTRACTOR.
2. NOTICE OF INTENT (NOI), SWPPP PACKET, AND NOI CONFIRMATION LETTER MUST BE SUBMITTED TO THE CITY OF MISSOULA IN ORDER TO OBTAIN A CITY STORM WATER PERMIT.
3. NOTICE OF TERMINATION (NOT) AND NOT CONFIRMATION LETTER MUST BE SUBMITTED TO CITY OF MISSOULA UPON FINAL STABILIZATION TO CLOST OUT CITY PERMIT.
4. THE GENERAL CONTRACTOR MUST STRICTLY ADHERE TO THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) DURING CONSTRUCTION OPERATIONS.
5. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED FROM CITY OF MISSOULA.
6. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL PERIMETER EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
7. ALL EXPOSED AREAS SHALL BE SEEDED AS SPECIFIED WITHIN 14 DAYS OF FINAL GRADING.
8. SHOULD CONSTRUCTION STOP FOR LONGER THAN 14 DAYS, THE SITE SHALL BE SEEDED AS SPECIFIED.
9. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSPECTED ONCE EVERY SEVEN (7) DAYS AND WITHIN 24 HOURS OF A RAINFALL EXCEEDING 0.5 INCHES DURING A 24-HOUR PERIOD OR MORE FREQUENTLY IF REQUIRED BY GOVERNING NPDES GENERAL PERMIT. ALL MAINTENANCE REQUIRED BY INSPECTION SHALL COMMENCE WITHIN 24 HOURS AND BE COMPLETED WITHIN 48 HOURS OF REPORT.
10. THIS PLAN SHALL NOT BE CONSIDERED ALL INCLUSIVE AS THE GENERAL CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SOIL SEDIMENT FROM LEAVING THE SITE.
11. GENERAL CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
12. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY ON SITE INSPECTION.
13. GENERAL CONTRACTOR SHALL ESTABLISH PERMANENT SOIL STABILIZATION.
14. ON SITE DUST CONTROL SHALL BE ACCOMPLISHED BY USING WATER. APPLICATION OF WATER MAY BE REQUIRED MULTIPLE TIMES PER DAY DURING CONSTRUCTION ACTIVITY.
15. AN UP-TO-DATE SWPPP PACKET WITH SWPPP INSPECTION RECORDS SHALL BE PROVIDED TO THE ENGINEER TO PROVIDE TO THE CITY AT TIME OF AS-BUILTS. SWPPP PERMITTEE RESPONSIBLE FOR PROVIDED NOT AND NOT CONFIRMATION FROM DEQ TO CITY TO CLOSE OUT CITY STORM WATER PERMIT.
16. CONTRACTOR TO PERFORM CLEARING AND EARTH-MOVING ACTIVITIES ONLY DURING DRY WEATHER. MEASURES TO ENSURE ADEQUATE EROSION PREVENTION AND SEDIMENT CONTROL SHALL BE INSTALLED PRIOR TO EARTH-MOVING ACTIVITIES AND CONSTRUCTION.
17. MEASURES TO ENSURE ADEQUATE EROSION PREVENTION AND SEDIMENT CONTROL ARE REQUIRED YEAR-ROUND. STABILIZE DENUDED AREAS AND MAINTAIN EROSION PREVENTION MEASURES CONTINUOUSLY BETWEEN FROM MARCH 1 THROUGH NOVEMBER 1.
18. USE SEDIMENT CONTROLS OR FILTRATION TO REMOVE SEDIMENT WHEN DEWATERING SITE AND OBTAIN FEDERAL AND STATE PERMITS, AS NECESSARY.
19. LIMIT CONSTRUCTION ACCESS ROUTES TO STABILIZED, DESIGNATED ACCESS POINTS.
20. AVOID TRACKING DIRT OR OTHER MATERIALS OFF SITE; CLEAN OFF-SITE PAVED AREAS AND SIDEWALKS USING DRY SWEEPING METHODS.
21. TRAIN AND PROVIDE INSTRUCTION TO ALL EMPLOYEES AND SUBCONTRACTORS REGARDING THE CURRENT VERSION OF THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY FIELD GUIDE FOR BEST MANAGEMENT PRACTICES.
22. PLACEMENT OF EROSION PREVENTION MATERIALS AT ALL LOCATIONS SPECIFIED ON THE SWPPP IS REQUIRED ON WEEKENDS AND DURING RAIN EVENTS.
23. THE AREAS DELINEATED ON THE PLANS FOR PARKING, GRUBBING, STORAGE, ECT., SHALL NOT BE ENLARGED OR "RUN OVER".
24. CONSTRUCTION SITES ARE REQUIRED TO HAVE EROSION PREVENTION AND SEDIMENT CONTROL MATERIALS ON SITE DURING THE "OFF-SEASON".
25. EROSION PREVENTION AND SEDIMENT CONTROL MATERIALS SHALL BE STORED ON SITE.
26. TREE PROTECTION SHALL BE IN PLACE BEFORE ANY DEMOLITION, GRADING, EXCAVATING, OR GRUBBING IF NECESSARY.

POLLUTION CONTROL NOTES:

1. ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS, THAT OCCUR DURING SITE CONSTRUCTION SHALL BE STORED, HANDLED, AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER. NO MATERIALS SHALL BE STORED ON THE STREET
2. COVER, CONTAINMENT, AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS AND NON-INERT WASTES PRESENT ON THE SITE.
3. MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAINAGE, SOLVENT AND DE-GREASING CLEANING ACTIVITIES, AND OTHER ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO THE GROUND OR INTO STORMWATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. EMERGENCY REPAIRS MAY BE PERFORMED ON SITE USING TEMPORARY PLASTIC PLACED BENEATH, AND IF RAINING, OVER THE VEHICLE.
4. CONTROL AND PREVENT THE DISCHARGE OF ALL POTENTIAL POLLUTANTS, INCLUDING PAVEMENT CUTTING WASTES, PAINTS, CONCRETE, PETROLEUM PRODUCTS, CHEMICALS, WASH WATER, OR SEDIMENTS, AND NON-STORM WATER DISCHARGES TO STORM DRAINS AND WATERCOURSES.
5. AVOID CLEANING, FUELING, OR MAINTAINING VEHICLES ON SITE, EXCEPT IN A DESIGNATED AREA WHERE WASH WATER IS CONTAINED AND TREATED. LIMIT AND TIME APPLICATIONS OF PESTICIDES AND FERTILIZERS TO PREVENT POLLUTED RUNOFF.

POINT OF CONTACT:

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BEST MANAGEMENT PRACTICE NOTES

INFORMATION PROVIDED TAKEN FROM THE EPA STORMWATER MENU OF BMP'S

SILT FENCE

PURPOSE AND DESCRIPTION

THE PURPOSE OF A SILT FENCE IS TO RETAIN THE SOIL ON DISTURBED LAND, SUCH AS A CONSTRUCTION SITE, UNTIL THE ACTIVITIES DISTURBING THE LAND ARE SUFFICIENTLY COMPLETED TO ALLOW REVEGETATION AND PERMANENT SOIL STABILIZATION TO BEGIN. KEEPING THE SOIL ON A CONSTRUCTION SITE, RATHER THAN LETTING IT BE WASHED OFF INTO NATURAL WATER BODIES (E.G., STREAMS, RIVERS, PONDS, LAKES, ESTUARIES) PREVENTS THE DEGRADATION OF AQUATIC HABITATS AND SILTATION OF HARBOR CHANNELS. AND NOT LETTING SOIL WASH OFF ONTO ROADS, WHICH READILY TRANSPORT IT TO STORM SEWERS, AVOIDS HAVING SEWERS CLOGGED WITH SEDIMENT. THE COST OF INSTALLING SILT FENCES ON A WATERSHED'S CONSTRUCTION SITES IS CONSIDERABLY LESS THAN THE COSTS ASSOCIATED WITH LOSING AQUATIC SPECIES, DREDGING NAVIGATION CHANNELS, AND CLEANING SEDIMENT OUT OF MUNICIPAL STORM SEWERS.
A SILT FENCE IS A TEMPORARY SEDIMENT BARRIER MADE OF POROUS FABRIC, IT'S HELD UP BY WOODEN OR METAL PORTS DRIVEN INTO THE GROUND, SO IT'S INEXPENSIVE AND RELATIVELY EASY TO REMOVE. THE FABRIC PONDS SEDIMENT-LADEN STORMWATER RUNOFF, CAUSING SEDIMENT TO BE RETAINED BY THE SETTLING PROCESSES. A SINGLE 100 FOOT (FT) RUN OF SILT FENCE MAY HOLD 50 TONS OF SEDIMENT IN PLACE. MOST CONSTRUCTION SITES TODAY DO HAVE SILT FENCES. BUT MANY DO NOT WORK EFFECTIVELY BECAUSE THEY ARE NOT WELL DESIGNED, INSTALLED, OR MAINTAINED. THE FOCUS OF THIS FACT SHEET IS-HOW TO MAKE SILT FENCES WORK.

DESIGN

THE THREE PRINCIPAL ASPECTS OF SILT FENCE DESIGN ARE: PROPER PLACEMENT OF FENCING, ADEQUATE AMOUNT OF FENCING, AND APPROPRIATE MATERIALS.

PROPER PLACEMENT OF FENCING

PLACEMENT IS IMPORTANT BECAUSE WHERE A FENCE STARTS, RUNS, AND ENDS IS CRITICAL TO ITS EFFECTIVENESS. IMPROPER PLACEMENT CAN MAKE THE FENCE A COMPLETE WASTE OF MONEY. ANALYZE THE CONSTRUCTION SITE'S CONTOURS TO DETERMINE THE PROPER PLACEMENT. SEGMENT THE SITE INTO MANAGEABLE SEDIMENT STORAGE AREAS FOR USING MULTIPLE SILT FENCE RUNS. THE DRAINAGE AREA ABOVE ANY FENCE SHOULD USUALLY NOT EXCEED A QUARTER OF AN ACRE. WATER FLOWING OVER THE TOP OF A FENCE DURING A NORMAL RAINFALL INDICATES THE DRAINAGE AREA IS TOO LARGE. AVOID LONG RUNS OF SILT FENCE BECAUSE THEY CONCENTRATE THE WATER IN A SMALL AREA WHERE IT WILL EASILY OVERFLOW THE FENCE.

INTAKE FILTER

DESCRIPTION

STORM DRAIN INLET PROTECTION MEASURES PREVENT COIL AND DEBRIS FROM ENTERING STORM DRAIN DROP INLETS. THESE MEASURES ARE USUALLY TEMPORARY AND ARE IMPLEMENTED BEFORE A SITE IS DISTURBED.

THERE ARE SEVERAL TYPES OF INLET PROTECTION:

EXCAVATION AROUND THE PERIMETER OF THE DROP INLET: EXCAVATING A SMALL AREA AROUND AN INLET CREATES A SETTLING POOL THAT REMOVES SEDIMENTS AS WATER IN RELEASED SLOWLY INTO THE INLET THROUGH SMALL HOLES PROTECTED BY GRAVEL AND FILTER FABRIC.

FABRIC BARRIERS AROUND INLET ENTRANCES: ERECTING A BARRIER MADE OF POROUS FABRIC AROUND AN INLET CREATES A SHIELD AGAINST SEDIMENT WHILE ALLOWING WATER TO FLOW INTO THE DRAIN. THIS BARRIER SLOWS RUNOFF WHILE CATCHING SOIL AND OTHER DEBRIS AT THE DRAIN INLET.

BLOCK AND GRAVEL PROTECTION: STANDARD CONCRETE BLOCKS AND GRAVEL CAN BE USED TO FORM A BARRIER TO SEDIMENTS THAT PERMITS WATER RUNOFF TO FLOW THROUGH SELECT BLOCKS LAID SIDEWAYS.

SANDBAGS CAN ALSO BE USED TO CREATE TEMPORARY SEDIMENT BARRIERS AT INLETS. FOR PERMANENT INLET PROTECTION AFTER THE SURROUNDING AREA HAS BEEN STABILIZED, DOD CAN BE INSTALLED. THIS PERMANENT MEASURE IS AN AESTHETICALLY PLEASING WAY TO FLOW STORMWATER NEAR DROP INLET ENTRANCES AND TO REMOVE SEDIMENTS AND OTHER POLLUTANTS FROM RUNOFF.

APPLICABILITY

ALL TEMPORARY INLET PROTECTION SHOULD HAVE A DRAINAGE AREA NO GREATER THAN 1 ACRE PER INLET. TEMPORARY CONTROLS SHOULD BE CONSTRUCTED BEFORE THE SURROUNDING LANDSCAPE IS DISTURBED. EXCAVATED DROP INLET PROTECTION AND BLOCK AND GRAVEL INLET PROTECTION ARE APPLICABLE TO AREAS OF HIGH FLOW, WHERE DRAIN OVERFLOW IS EXPECTED. FABRIC BARRIERS ARE RECOMMENDED FOR SMALLER, FLATTER DRAINAGE AREAS (SLOPES LESS THAN 5 PERCENT LEADING TO THE DRAIN). TEMPORARY DROP INLET CONTROL MEASURES ARE OFTEN USED IN SEQUENCE OR WITH OTHER EROSION CONTROL TECHNIQUES.

SITING AND DESIGN CONSIDERATIONS

WITH THE EXCEPTION OF SOD DROP INLET PROTECTION, INSTALL THESE CONTROLS BEFORE ANY SOIL DISTURBANCE IN THE DRAINAGE AREA. EXCAVATE AROUND DROP INLETS AT LEAST 1 FOOT DEEP (2 FEET MAXIMUM), EXCAVATING A VOLUME OF AT LEAST 35 YD^3 PER ACRE DISTURBED. SIDE SLOPES LEADING TO THE INLET SHOULD BE NO STEEPER THAN 2:1. DESIGN THE SHAPE OF THE EXCAVATED AREA SUCH THAT THE DIMENSIONS FIT THE AREA FROM WHICH STORMWATER IS EXPECTED TO DRAIN. FOR EXAMPLE, THE LONGEST SIDE OF AN EXCAVATED AREA SHOULD BE ALONG THE SIDE OF THE INLET EXPECTED TO DRAIN THE LARGEST AREA.

STAKE FABRIC INLET PROTECTION CLOSE TO THE INLET TO PREVENT OVERFLOW ONTO UNPROTECTED SOILS. STAKES SHOULD BE AT LEAST 3 FEET LONG AND SPACED NO MORE THAN 3 FEET APART. CONSTRUCT A FRAME FOR FABRIC SUPPORT DURING OVERFLOW PERIODS, AND BURY IT AT LEAST 1 FOOT BELOW THE SOIL SURFACE. IT SHOULD RISE TO A HEIGHT NO GREATER THAN 1.5 FEET ABOVE THE GROUND. THE TOP OF THE FRAME AND FABRIC SHOULD BE BELOW THE DOWNSLOPE GROUND ELEVATION TO KEEP RUNOFF FROM BYPASSING THE INLET.

BLOCK AND GRAVEL INLET BARRIERS SHOULD BE AT LEAST 1 FOOT HIGH (2 FEET MAXIMUM). DO NOT USE MORTAR. LAY THE BOTTOM ROW OF BLOCKS AT LEAST 2 INCHES BELOW THE SOIL SURFACE, FLUSH AGAINST THE DRAIN FOR STABILITY. PLACE ONE BLOCK IN THE BOTTOM ROW ON EACH SIDE OF THE INLET ON ITS SIDE TO ALLOW DRAINAGE. PLACE 1/2-INCH WIRE MESH OVER ALL BLOCK OPENINGS TO PREVENT GRAVEL FROM ENTERING THE INLET. PLACE GRAVEL (3/4 TO 1/2 INCH IN DIAMETER) OUTSIDE THE BLOCK STRUCTURE AT A SLOPE NO GREATER THAN 2:1.

DO NOT CONSIDER SOD INLET PROTECTION UNTIL THE ENTIRE SURROUNDING DRAINAGE AREA IS STABILIZED. LAY THE SOD SO THAT IT EXTENDS AT LEAST 4 FEET FROM THE INLET IN EACH DIRECTION TO FORM A CONTINUOUS MAT AROUND THE INLET. LAY THE SOD STRIPS PERPENDICULAR TO THE DIRECTION OF FLOWS. STAGGER THEM SO THAT THE STRIP ENDS ARE NOT ALIGNED. THE SLOPE OF THE SODDED AREA SHOULD NOT BE STEEPER THAN 4:1 APPROACHING THE DROP INLET.

LIMITATIONS

TO INCREASE THE EFFECTIVENESS OF THESE PRACTICES, USE THEM WITH OTHER MEASURES, SUCH AS SMALL IMPOUNDMENTS OR SEDIMENT TRAPS (USEPA, 1992). IN GENERAL, STORMWATER INLET PROTECTION MEASURES ARE PRACTICAL FOR AREAS RECEIVING RELATIVELY CLEAN RUNOFF THAT IS NOT HEAVILY LADEN WITH SEDIMENT, THEY ARE DESIGNED TO HANDLE DRAINAGE FROM AREAS LESS THAN 1 ACRE (CASQA, 2003). TO PREVENT CLOGGING , STORM DRAIN CONTROL STRUCTURES MUST BE MAINTAINED FREQUENTLY. IF SEDIMENT AND OTHER DEBRIS CLOG THE WATER INTAKE, DROP INLET CONTROL MEASURES CAN ACTUALLY CAUSE EROSION IN UNPROTECTED AREAS.

MAINTENANCE CONSIDERATIONS

CHECK ALL TEMPORARY CONTROL MEASURES AFTER EACH STORM EVENT. TO MAINTAIN THE CAPACITY OF THE SETTLING POOLS, REMOVE ACCUMULATED SEDIMENT FROM THE AREA AROUND THE DROP INLET (EXCAVATED AREA, AREA AROUND FABRIC BARRIER OR BLOCK STRUCTURE) WHEN THE CAPACITY IS REDUCED BY HALF. REMOVE ADDITIONAL DEBRIS FROM THE SHALLOW POOLS PERIODICALLY. THE WEEP HOLES IN EXCAVATED AREAS AROUND INLETS CAN BECOME CLOGGED, PREVENTING WATER FROM DRAINING OUT OF THE POOLS. IF THAT HAPPENS, IT MIGHT BE DIFFICULT AND COSTLY TO UNCLOG THE INTAKE.

STABILIZED CONSTRUCTION ENTRANCE

DESCRIPTION

THE PURPOSE OF STABILIZING ENTRANCES TO A CONSTRUCTION SITE IS TO MINIMIZE THE AMOUNT OF SEDIMENT LEAVING THE AREA AS MUD AND SEDIMENT ATTACHED TO VEHICLES. INSTALLING A PAD OF GRAVEL OVER FILTER CLOTH WHERE CONSTRUCTION TRAFFIC LEAVES A SITE CAN HELP STABILIZE A CONSTRUCTION ENTRANCE. AS A VEHICLE DRIVES OVER THE PAD, THE PAD REMOVES MUD AND SEDIMENT FROM THE WHEELS AND REDUCES SOIL TRANSPORT OFF THE SITE. THE FILTER CLOTH SEPARATES THE GRAVEL FROM THE SOIL BELOW, KEEPING THE GRAVEL FROM BEING GROUND INTO THE COIL. THE FABRIC ALSO REDUCES THE AMOUNT OF RUTTING CAUSED BY VEHICLE TIRES. IT SPREADS THE VEHICLE'S WEIGHT OVER A SOIL AREA LARGER THAN THE TIRE WIDTH.

IN ADDITION TO USING A GRAVEL PAD, A VEHICLE WASHING STATION CAN BE ESTABLISHED AT THE SITE ENTRANCE. USING WASH STATIONS ROUTINELY CAN REMOVE A LOT OF SEDIMENT FROM VEHICLES BEFORE THEY LEAVE THE SITE. DIVERTING RUNOFF FROM VEHICLE WASHING STATIONS INTO A SEDIMENT TRAP HELPS TO MAKE SURE THE SEDIMENT FROM VEHICLES STAYS ONSITE AND IS HANDLED PROPERLY.

APPLICABILITY

TYPICALLY, STABILIZED CONSTRUCTION ENTRANCES ARE INSTALLED WHERE CONSTRUCTION TRAFFIC LEAVES OR ENTERS AN EXISTING PAVED ROAD. BUT SITE ENTRANCE STABILIZATION SHOULD BE EXTENDED TO ANY ROADWAY OR ENTRANCE WHERE VEHICLES ENTER OR LEAVE THE SITE. FROM A PUBLIC RELATIONS POINT OF VIEW, STABILIZING CONSTRUCTION SITE ENTRANCES CAN BE WORTH THE EFFORT. IF THE SITE ENTRANCE IS THE MOST NOTICEABLE PART OF A CONSTRUCTION SITE, STABILIZING THE ENTRANCE CAN IMPROVE BOTH THE APPEARANCE AND THE PUBLIC PERCEPTION OF THE CONSTRUCTION PROJECT.

SITING AND DESIGN CONSIDERATIONS

STABILIZE ALL ENTRANCES TO A SITE BEFORE CONSTRUCTION AND FURTHER SITE DISTURBANCE BEGIN. MAKE SURE THE STABILIZED SITE ENTRANCES ARE LONG AND WIDE ENOUGH TO ALLOW THE LARGEST CONSTRUCTION VEHICLE THAT WILL ENTER THE SITE TO FIT THROUGH WITH ROOM TO SPARE. IF MANY VEHICLES ARE EXPECTED TO USE AN ENTRANCE IN ANY ONE DAY, MAKE THE SITE ENTRANCE WIDE ENOUGH FOR TWO VEHICLES TO PASS AT THE SAME TIME WITH ROOM ON EITHER SIDE OF EACH VEHICLE. IF A SITE ENTRANCE LEADS TO A PAVED ROAD, MAKE THE END OF THE ENTRANCE FLARED SO THAT LONG VEHICLES DO NOT LEAVE THE STABILIZED AREA WHEN THEY TURN ONTO OR OFF THE PAVED ROADWAY. IF A CONSTRUCTION SITE ENTRANCE CROSSES A STREAM, SWALE, OR OTHER DEPRESSION, PROVIDE A BRIDGE OR CULVERT TO PREVENT EROSION FROM UNPROTECTED BANKS. MAKE SURE STONE AND GRAVEL USED TO STABILIZE THE CONSTRUCTION SITE ENTRANCE ARE LARGE ENOUGH SO THAT THEY ARE NOT CARRIED OFFSITE BY VEHICLES. AVOID SHARP-EDGED STONE TO REDUCE THE POSSIBILITY OF PUNCTURING TIRES. INSTALL STONE OR GRAVEL AT A DEPTH OF AT LEAST 6 INCHES FOR THE ENTIRE LENGTH AND WIDTH OF THE STABILIZED CONSTRUCTION ENTRANCE.

LIMITATIONS

ALTHOUGH STABILIZING A CONSTRUCTION ENTRANCE REDUCES THE AMOUNT OF SEDIMENT LEAVING A SITE, SOME SOIL MIGHT STILL BE DEPOSITED FROM VEHICLE TIRES ONTO PAVED SURFACES. TO FURTHER REDUCE THE CHANCE OF THESE SEDIMENTS POLLUTING STORMWATER RUNOFF, SWEEP THE PAVED AREA ADJACENT TO THE STABILIZED SITE ENTRANCE. FOR SITES THAT USE WASH STATIONS, A RELIABLE WATER SOURCE TO WASH VEHICLES BEFORE LEAVING. THE SITE MIGHT NOT BE INITIALLY AVAILABLE. WATER MIGHT HAVE TO BE TRUCKED TO THE SITE AT ADDITIONAL COST.

MAINTENANCE CONSIDERATIONS

MAINTAIN STABILIZATION OF THE SITE ENTRANCES UNTIL THE REST OF THE CONSTRUCTION SITE HAS BEEN FULLY STABILIZED. YOU MIGHT NEED TO ADD STONE AND GRAVEL PERIODICALLY TO EACH STABILIZED CONSTRUCTION SITE ENTRANCE TO KEEP THE ENTRANCE EFFECTIVE. SWEEP UP SOIL TRACKED OFFSITE IMMEDIATELY FOR PROPER DISPOSAL. FOR SITES WITH WASH RACKS AT EACH SITE ENTRANCE, CONSTRUCT SEDIMENT TRAPS AND MAINTAIN THEM FOR THE LIFE OF THE PROJECT. PERIODICALLY REMOVE SEDIMENT FROM THE TRAPS TO MAKE SURE THEY KEEP WORKING.

EFFECTIVENESS

STABILIZING CONSTRUCTION ENTRANCES TO PREVENT SEDIMENT TRANSPORT OFFSITE IS EFFECTIVE ONLY IF ALL THE ENTRANCES TO THE SITE ARE STABILIZED AND MAINTAINED. STABILIZING THE SITE ENTRANCES MIGHT NOT BE VERY EFFECTIVE UNLESS A WASH RACK IS INSTALLED AND ROUTINELY USED (CORISH, 1995). THIS CAN BE PROBLEMATIC FOR SITES WITH MULTIPLE ENTRANCES AND HIGH VEHICLE TRAFFIC.

PRELIMINARY

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

#	DESCRIPTION	DATE

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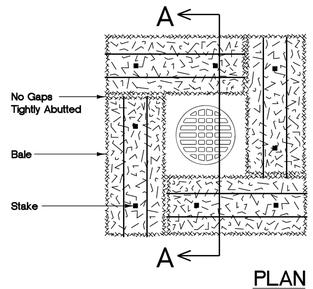
RIVERFRONT TRAILS
MISSOULA MONTANA
STORMWATER POLLUTION PREVENTION PLAN NOTES

C9.1

SWPPP.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL 22, 2022

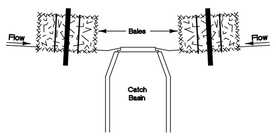


PLAN

NOTES:

1. Bales are to be placed 4' in the soil, tightly abutting with no gaps, staked and backfilled around the entire outside perimeter.

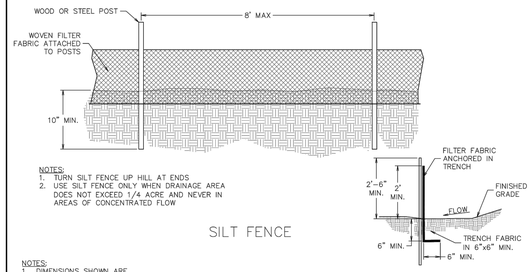
2. Not recommended for receiving concentrated flows, such as streets or highway medians.



SECTION A-A

Digital Standard Drawings and other maps are available on the City website: http://www.ci.missoula.mt.us/publicworks/gis_maps.htm

MISSOULA Engineering Division	Straw Bale Sediment Control at Field Catch Basins		
	Approved By City Engineer R. Steven King	Adopted: 01/01/2005 Revised:	STD - 609

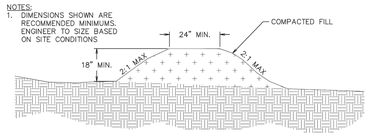


NOTES:
1. TURN SILT FENCE UP HILL AT ENDS
2. USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW

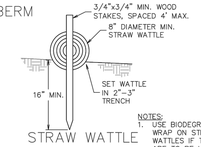
SILT FENCE

DETAIL

NOTES:
1. DIMENSIONS SHOWN ARE RECOMMENDED MINIMUMS. ENGINEER TO SIZE BASED ON SITE CONDITIONS



COMPACTED EARTHEN BERM



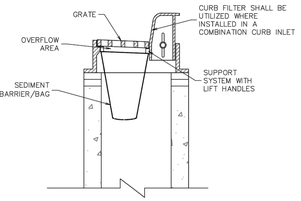
STRAW WATTLE

NOTES:
1. USE BIODEGRADABLE WRAP ON STRAW WATTLES IF THEY ARE TO BE LEFT IN PLACE.

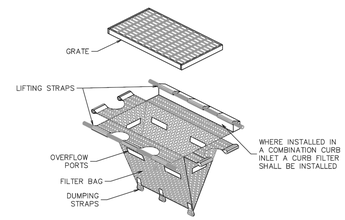
GENERAL NOTES:

1. PRESERVING EXISTING VEGETATION SHALL BE USED AS THE PRIMARY PERIMETER CONTROL.
2. PERIMETER CONTROL BMPs SHALL BE INSTALLED BEFORE ANY EARTH REMOVAL OR EXCAVATION TAKES PLACE.
3. INSTALL PERIMETER CONTROL BMPs PARALLEL TO CONTOUR LINES.
4. FOLLOW MANUFACTURER'S INSTRUCTIONS TO OVERLAP THE SILT FENCE AND WATTLES AT JUNCTIONS.
5. ALL TEMPORARY BMP'S TO BE REMOVED AT FINAL STABILIZATION.

MISSOULA Engineering Division	Perimeter Control		
	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 652



SECTION

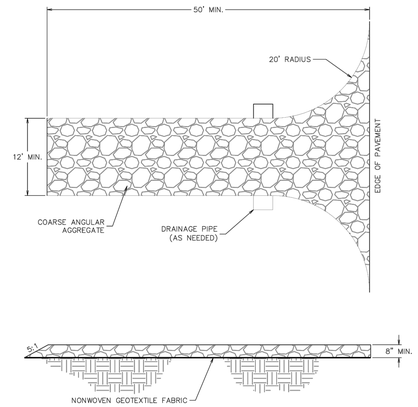


INSTALLATION

GENERAL NOTES:

1. INLET PROTECTION SHALL BE USED AS A "LAST RESORT" BMP. CARE SHALL BE TAKEN TO MINIMIZE SEDIMENT LADEN STORM WATER FROM REACHING INLETS/DRY WELLS
2. INLET PROTECTION SHALL BE INSPECTED REGULARLY AND AFTER STORM EVENTS. IF UNIT IS MORE THAN 1/3 FULL OF ACCUMULATED SEDIMENT, THE UNIT MUST BE EMPTIED.
5. ALL TEMPORARY BMP'S TO BE REMOVED AT FINAL STABILIZATION.

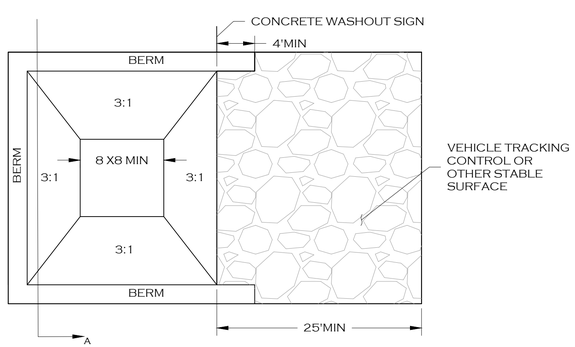
MISSOULA Engineering Division	Inlet Protection		
	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 651



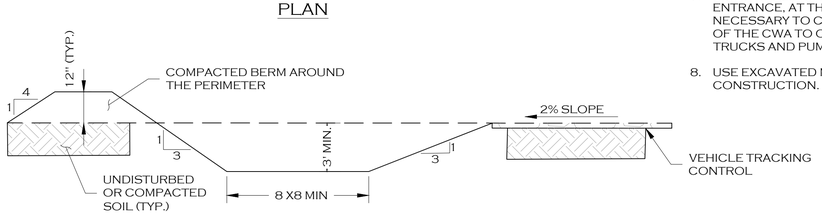
GENERAL NOTES:

1. A TEMPORARY GRAVEL CONSTRUCTION ENTRANCE SHALL BE LOCATED AT POINTS OF VEHICULAR EGRESS ON A CONSTRUCTION SITE TO LIMIT THE AMOUNT OF SEDIMENT TRANSPORTED ONTO PUBLIC ROADS BY VEHICLES.
2. REMOVE AND REPLACE AGGREGATE WHEN VOIDS BECOME FILLED.
3. SWEEP AND REMOVE SEDIMENT TRACKED ONTO PAVED SURFACES.
4. PROPERLY GRADE INGRESS/EGRESS POINTS TO PREVENT RUNOFF FROM LEAVING THE SITE.
5. CONSIDER THE USE OF RUMBLE PADS, FODs, OR CATTLE GUARDS IN COMBINATION WITH THE GRAVEL CONSTRUCTION ENTRANCE TO IMPROVE EFFECTIVENESS

MISSOULA Engineering Division	Temporary Gravel Construction Entrance		
	Approved By Utility Engineer Andy Schultz, PE	Revised: 09/28/2020	STD - 650



PLAN



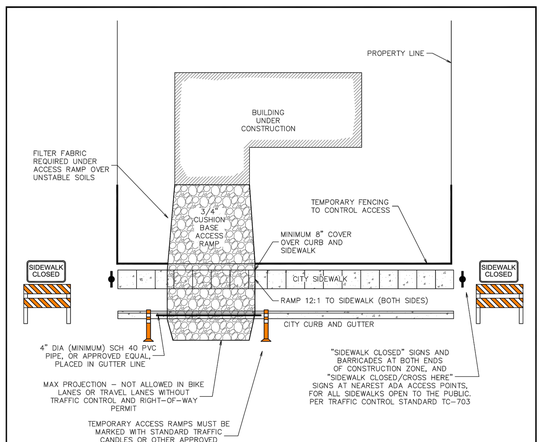
SECTION A

NOTES:

1. SEE PLAN VIEW FOR LOCATION OF CWA
2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.
3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE
4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.
5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.
6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.
7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

CONCRETE WASHOUT AREA (CWA) 1

SCALE:N.T.S.



NOTES:

1. TEMPORARY RAMP REQUIRED TO ACCESS ALL BARE LAND BUILDING CONSTRUCTION SITES BEFORE BEGINNING CONSTRUCTION.
2. RAMP MUST BE CONSTRUCTED OF CRUSHED 3/4" MINUS AGGREGATE AND MUST CONFORM TO MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS.
3. FILTER FABRIC MUST BE PLACED UNDER TEMPORARY RAMP IF UNSTABLE SOIL IS PRESENT ON SITE, OR BY DIRECTION OF CITY INSPECTOR.
4. FOUR INCH (4") DIA. (MINIMUM) SCH. 40 OR APPROVED EQUAL, MUST BE PLACED IN GUTTER TO MAINTAIN DRAINAGE.
5. TEMPORARY FENCING OR OTHER PHYSICAL BARRIER ERECTED TO LIMIT ACCESS TO TEMPORARY RAMP ONLY.
6. MORE THAN ONE TEMPORARY ACCESS RAMP MAY BE INSTALLED IF NEEDED.
7. REQUIRED MITIGATION: CONTRACTOR IS REQUIRED TO CLEAN UP MUD, DIRT, DUST, DEBRIS, ETC. FROM PUBLIC RIGHTS-OF-WAY INCLUDING BUT NOT LIMITED TO CURB & GUTTER, SIDEWALKS, STREETS, ALLEYS, SUMPS – AS APPLICABLE AND AT END OF TEMPORARY ACCESS.

MISSOULA Engineering Division	Temporary Access to Construction Sites		
	Approved By City Engineer Kevin J. Slovarp	Adopted: 03/09/2006 Revised: 06/22/2017	STD - 200

JOB #:	2101
DRAWN:	MOH
DESIGN:	MOH
QA:	KTS
DATE:	7/21/2022

DATE	DESCRIPTION

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PRELIMINARY

RIVERFRONT TRAILS

MISSOULA MONTANA

STORMWATER POLLUTION PREVENTION PLAN DETAILS

C9.2

SWPPP.DWG PLOTTED BY:MATT HAMMERSTEIN ON JUL/22/2022