CONSTRUCTION REDLINE EDITS FOR AS-BUILT PLANS

Contents

CONTENTS **1**
OVERVIEW **2**
STATEMENT OF NEED **2**
ACRONYMS/DEFINITIONS USED IN THIS DOCUMENT **2**
REFERENCES **2**
PROCESS DESCRIPTION AND EXAMPLES **3**
Section I. Redline As-Built Changes to the Plan Sheets 3
Procedure – As-Built Title Page Information 3
Procedure – As-Built Table of Contents Information 4
Procedure – As-Built Notes Information 5
Procedure – As-Built Linear and Level Data Information 6
Procedure – As-Built Control Diagram Information 7
Procedure – As-Built Typical Section Information 8
Procedure – As-Built Road Summaries Information 9
Procedure – As-Built Detail Sheet Information 13
Procedure – As-Built Plan and Profile Information 16
Procedure – As-Built Signing Plans Information 21
Procedure – As-Built Electrical Plans Information 26
Procedure – As-Built Bridge Plan Information 29
Procedure – As-Built Cross Section Information 31

Overview

This document will help guide construction crews through completing accurate redline as-builts in the field prior to submitting the as-builts to the designated person building electronic versions of the as-builts. This document should be taken as a guide and not an all-inclusive set of instructions. There are many aspects to as-built information and unique situations that may not be captured in this document. If further guidance is necessary, please contact your designated as-built specialist, typically the District Engineering Contract Specialist/District Engineering Officer.

Process Guide

Application/Tool(s): NA
Version(s): N/A
Environment: N/A
Released: 7/23/2021 / Revised: 4/16/2026



SUPPORT

Open a Case

Statement of Need

Change is a normal and expected part of the construction process. Changes can be the result of necessary design modifications, differing site conditions, material availability, value engineering and impacts from third parties to name a few. Beyond executing the change in the field, the change needs to be documented to show what was constructed. Construction As-Builts are used to show the finished condition of the work as it was constructed and accepted. Thereafter the drawings are used as a reference, especially for tort claims, to plan for changes, fix repairs or expansion.

Acronyms/Definitions Used in This Document

EPM – Engineering Project Manager
DEO – District Engineering Officer (Engineering Contract Specialist)
NSOP – Not Shown On Plans
QA – QA Suite (Quality Assurance Software Used by MDT)
Jasper – Jasper Reports (Report Software Used by MDT)
MicroStation – Software Used by MDT to Design Projects

References

Electronic Edits for As-Built Plans

Process Description and Examples

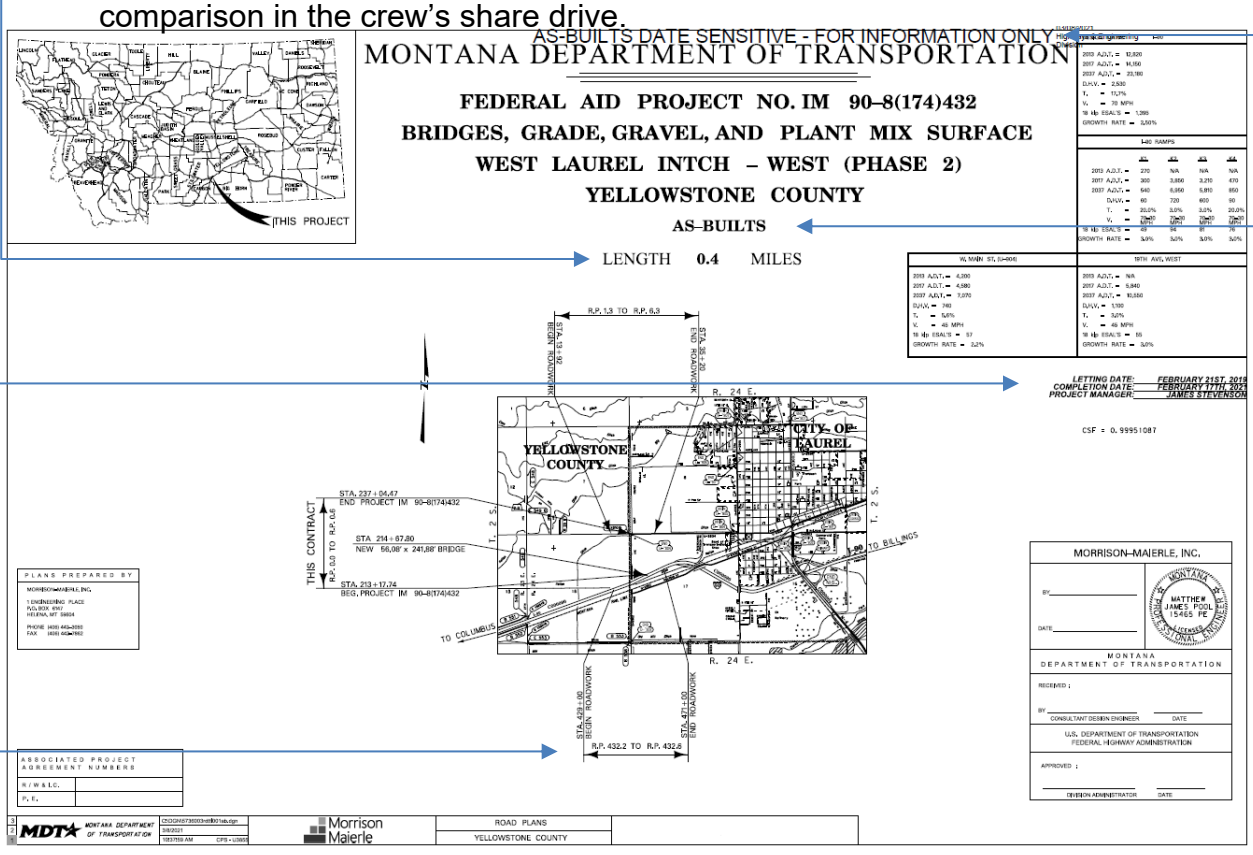
Section I. Redline As-Built Changes to the Plan Sheets

Procedure – As-Built Title Page Information

1. "AS-BUILT" text is to be in the center of the page below the project description. **Note:** This is only on the title page. Depending on the plan sheet type, this text will be located elsewhere. See each specific plan page type throughout this document for details. This is not especially important when redlining plans but must be completed when MicroStation drawings are completed. However, it is useful as a tool to track which sheets you have completed while redlining.
2. This text is added automatically while plotting the plans after completion.
3. If any changes were made to the project limits , those changes need to be documented here.
4. <u>Letting Date:</u> This date can be found in the Special Provisions on the 1st page of the Q&A.

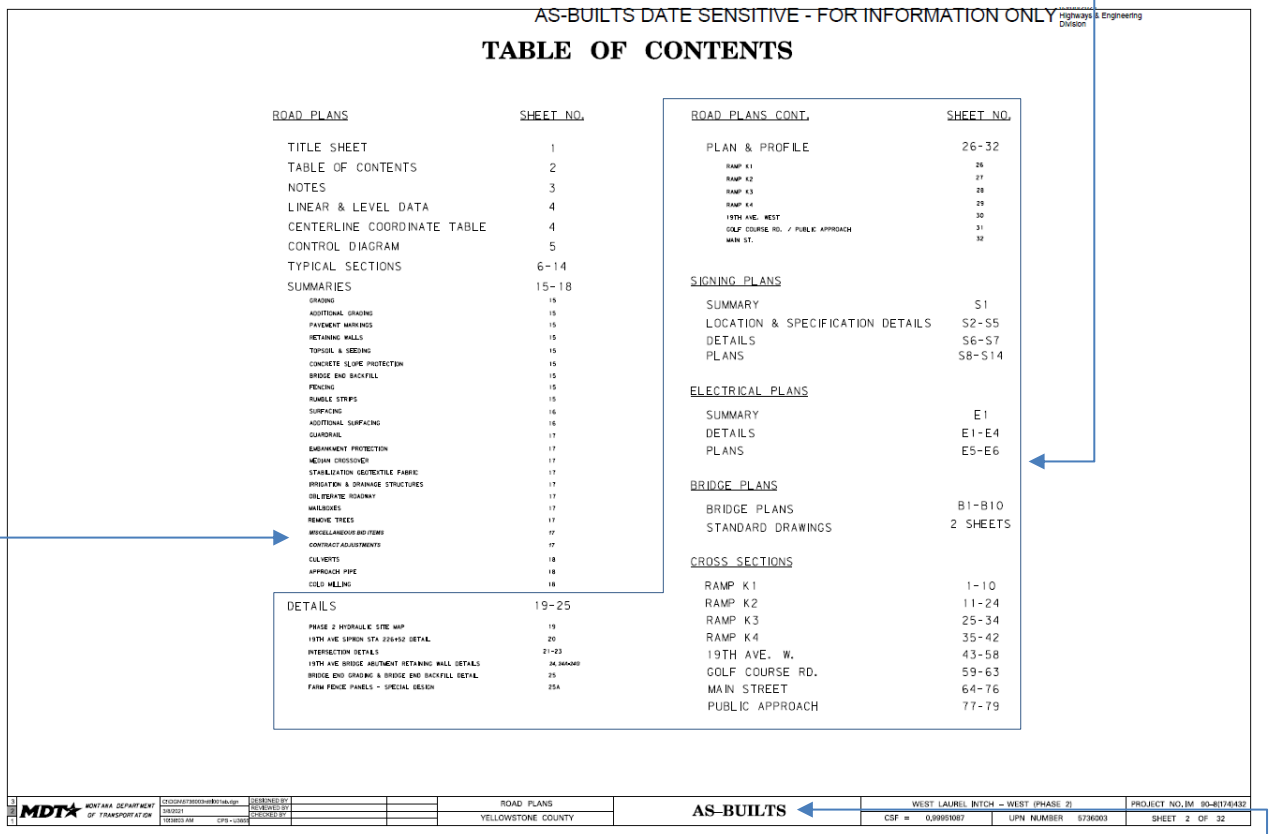
   <u>Completion Date:</u> Date the EPM signs the Final Acceptance CSB_17_2 form.

   <u>Project Manager:</u> The EPM on this project.
5. Update any change to the plan length. This will also be noted on the mileage comparison in the crew's share drive.



Procedure – As-Built Table of Contents Information

1. Add additional summaries that were not originally included in the plans to the "SUMMARIES" section under the TABLE OF CONTENTS. In most cases you will have a Miscellaneous Bid Items Summary and a Contract Adjustments Summary.
2. Add any additional details, plan sheets, or other items that were not included in the original plans in their respective sections.


AS-BUILTS DATE SENSITIVE - FOR INFORMATION ONLY

Highways & Engineering Division

TABLE OF CONTENTS

ROAD PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	3
LINEAR & LEVEL DATA	4
CENTERLINE COORDINATE TABLE	4
CONTROL DIAGRAM	5
TYPICAL SECTIONS	6-14
SUMMARIES	15-18
GRADING	15
ADDITIONAL GRADING	15
PAVEMENT MARKINGS	15
RETAINING WALLS	15
TOPSOIL & SEEDING	15
CONCRETE SLOPE PROTECTION	15
BRIDGE END BACKFILL	15
FENCING	15
RUMBLE STRIPS	15
SURFACING	16
ADDITIONAL SURFACING	16
GUARDRAIL	17
EMBANKMENT PROTECTION	17
MEDIAN CROSSOVER	17
STABILIZATION GEOTEXTILE FABRIC	17
IRRIGATION & DRAINAGE STRUCTURES	17
OBLITERATE ROADWAY	17
MAILBOXES	17
REMOVE TREES	17
MISCELLANEOUS BID ITEMS	17
CONTRACT ADJUSTMENTS	17
CULVERTS	18
APPROACH PIPE	18
COLD MILLING	18
DETAILS	19-25
PHASE 2 HYDRAULIC SITE MAP	19
19TH AVE SPIRON STA 226+52 DETAIL	20
INTERSECTION DETAILS	21-23
19TH AVE BRIDGE ABUTMENT RETAINING WALL DETAILS	24, 24A-24D
BRIDGE END GRADING & BRIDGE END BACKFILL DETAIL	25
FARM FENCE PANELS - SPECIAL DESIGN	25A

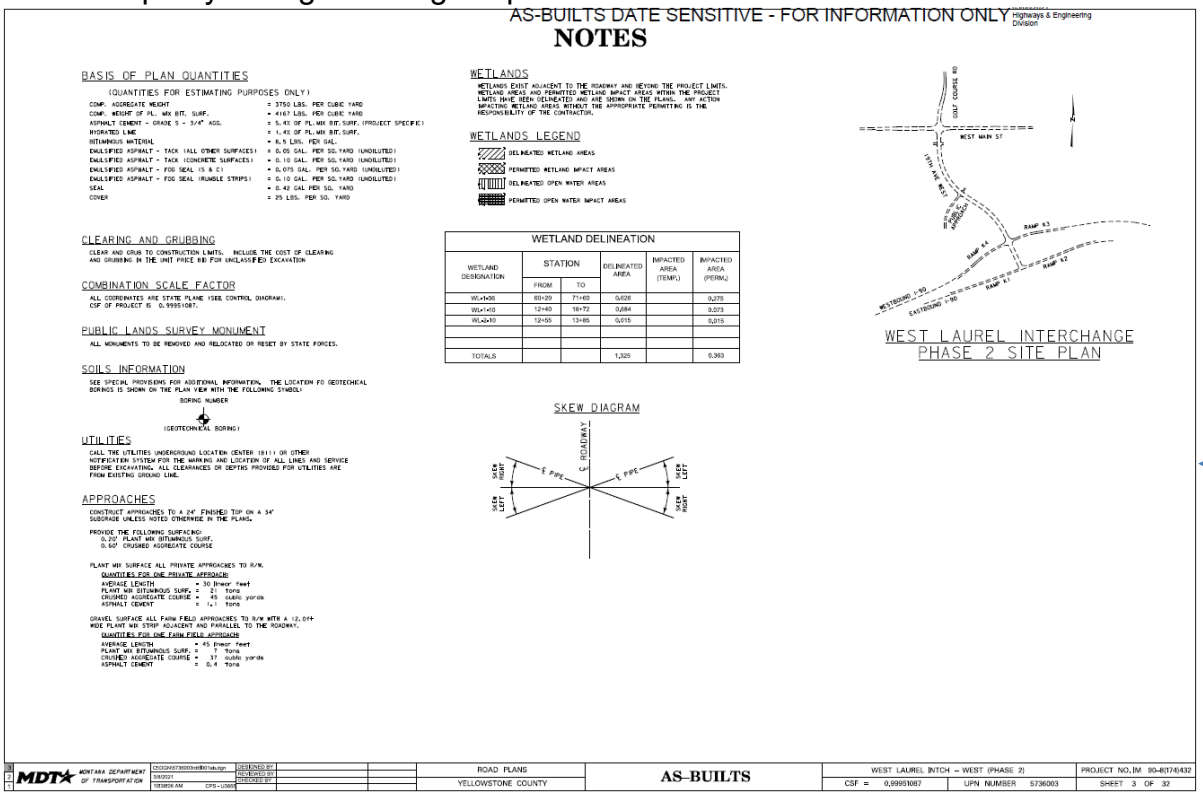
ROAD PLANS CONT.	SHEET NO.
PLAN & PROFILE	26-32
RAMP K1	26
RAMP K2	27
RAMP K3	28
RAMP K4	29
19TH AVE. WEST	30
GOLF COURSE RD. / PUBLIC APPROACH	31
MAIN ST.	32
SIGNING PLANS	
SUMMARY	S1
LOCATION & SPECIFICATION DETAILS	S2-S5
DETAILS	S6-S7
PLANS	S8-S14
ELECTRICAL PLANS	
SUMMARY	E1
DETAILS	E1-E4
PLANS	E5-E6
BRIDGE PLANS	
BRIDGE PLANS	B1-B10
STANDARD DRAWINGS	2 SHEETS
CROSS SECTIONS	
RAMP K1	1-10
RAMP K2	11-24
RAMP K3	25-34
RAMP K4	35-42
19TH AVE. W.	43-58
GOLF COURSE RD.	59-63
MAIN STREET	64-76
PUBLIC APPROACH	77-79

MDT MONTANA DEPARTMENT OF TRANSPORTATION | DESIGNED BY | REVIEWED BY | CHECKED BY | ROAD PLANS | YELLOWSTONE COUNTY | AS-BUILTS | WEST LAUREL INTCH – WEST (PHASE 2) | CSF = 0.99951087 | UPN NUMBER 5736003 | PROJECT NO. IM 90-8(174)432 | SHEET 2 OF 32

3. Place "AS-BUILTS" in the lower title box next to the plans type.
   Note: This will be the same location for all plan sheets except for the title sheet and bridge plan sheets. On older plans (examples later in document), this text box may not be present. These are mostly phased out, but if you come across a set while completing as-builts, place this text in the upper, right corner.

Procedure – As-Built Notes Information

1. Mark up any changes to original plans.



AS-BUILTS DATE SENSITIVE - FOR INFORMATION ONLY

Highways & Engineering Division

NOTES

BASIS OF PLAN QUANTITIES

(QUANTITIES FOR ESTIMATING PURPOSES ONLY)

COMP. AGGREGATE WEIGHT	= 3750 LBS. PER CUBIC YARD
COMP. WEIGHT OF PL. MIX BIT. SURF.	= 4167 LBS. PER CUBIC YARD
ASPHALT CEMENT - GRADE S - 3/4" AGG.	= 5.4% OF PL. MIX BIT. SURF. (PROJECT SPECIFIC)
HYDRATED LIME	= 1.4% OF PL. MIX BIT. SURF.
BITUMINOUS MATERIAL	= 8.5 LBS. PER GAL.
EMULSIFIED ASPHALT - TACK (ALL OTHER SURFACES)	= 0.05 GAL. PER SQ. YARD (UNDILUTED)
EMULSIFIED ASPHALT - TACK (CONCRETE SURFACES)	= 0.10 GAL. PER SQ. YARD (UNDILUTED)
EMULSIFIED ASPHALT - FOG SEAL (S & C)	= 0.075 GAL. PER SQ. YARD (UNDILUTED)
EMULSIFIED ASPHALT - FOG SEAL (RUMBLE STRIPS)	= 0.10 GAL. PER SQ. YARD (UNDILUTED)
SEAL	= 0.42 GAL PER SQ. YARD
COVER	= 25 LBS. PER SQ. YARD

CLEARING AND GRUBBING

CLEAR AND GRUB TO CONSTRUCTION LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN THE UNIT PRICE BID FOR UNCLASSIFIED EXCAVATION

COMBINATION SCALE FACTOR

ALL COORDINATES ARE STATE PLANE (SEE CONTROL DIAGRAM).
CSF OF PROJECT IS 0.99951087.

PUBLIC LANDS SURVEY MONUMENT

ALL MONUMENTS TO BE REMOVED AND RELOCATED OR RESET BY STATE FORCES.

SOILS INFORMATION

SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION. THE LOCATION FO GEOTECHEAL BORINGS IS SHOWN ON THE PLAN VIEW WITH THE FOLLOWING SYMBOL:

BORING NUMBER

(GEOTECHNICAL BORING)

UTILITIES

CALL THE UTILITIES UNDERGROUND LOCATION CENTER (811) OR OTHER NOTIFICATION SYSTEM FOR THE MARKING AND LOCATION OF ALL LINES AND SERVICE BEFORE EXCAVATING. ALL CLEARANCES OR DEPTHS PROVIDED FOR UTILITIES ARE FROM EXISTING GROUND LINE.

APPROACHES

CONSTRUCT APPROACHES TO A 24' FINISHED TOP ON A 34' SUBGRADE UNLESS NOTED OTHERWISE IN THE PLANS.

PROVIDE THE FOLLOWING SURFACING:
0.20' PLANT MIX BITUMINOUS SURF.
0.60' CRUSHED AGGREGATE COURSE

PLANT MIX SURFACE ALL PRIVATE APPROACHES TO R/W.

QUANTITIES FOR ONE PRIVATE APPROACH:

AVERAGE LENGTH	= 30 linear feet	
PLANT MIX BITUMINOUS SURF.	= 21	tons
CRUSHED AGGREGATE COURSE	= 45	cubic yards
ASPHALT CEMENT	= 1.1	tons

GRAVEL SURFACE ALL FARM FIELD APPROACHES TO R/W WITH A 12, 0FT+ WIDE PLANT MIX STRIP ADJACENT AND PARALLEL TO THE ROADWAY.

QUANTITIES FOR ONE FARM FIELD APPROACH

AVERAGE LENGTH	= 45 linear feet	
PLANT MIX BITUMINOUS SURF.	= 7	tons
CRUSHED AGGREGATE COURSE	= 37	cubic yards
ASPHALT CEMENT	= 0.4	tons

WETLANDS

WETLANDS EXIST ADJACENT TO THE ROADWAY AND BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PERMITTED WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLAND AREAS WITHOUT THE APPROPRIATE PERMITTING IS THE RESPONSIBILITY OF THE CONTRACTOR.

WETLANDS LEGEND

- DELINEATED WETLAND AREAS
- PERMITTED WETLAND IMPACT AREAS
- DELINEATED OPEN WATER AREAS
- PERMITTED OPEN WATER IMPACT AREAS

WETLAND DELINEATION

WETLAND DESIGNATION	STATION FROM	STATION TO	DELINEATED AREA	IMPACTED AREA (TEMP.)	IMPACTED AREA (PERM.)
WL+1+00	60+20	71+40	0,026		0,275
WL+1+10	12+40	16+72	0,084		0,203
WL+0+10	12+55	13+85	0,015		0,015
TOTALS			1,325		0,393

SKEW DIAGRAM

WEST LAUREL INTERCHANGE
PHASE 2 SITE PLAN

MDT MONTANA DEPARTMENT OF TRANSPORTATION	DESIGNED BY	ROAD PLANS	AS-BUILTS	WEST LAUREL INTCH – WEST (PHASE 2)		PROJECT NO.(M 90-8(174)432
	CHECKED BY	YELLOWSTONE COUNTY		CSF = 0,99951087	UPN NUMBER 5736003	SHEET 3 OF 32

Note: Oftentimes this is included on another page such as the Table of Contents page (example below) but can be its own page, like above, depending on size.

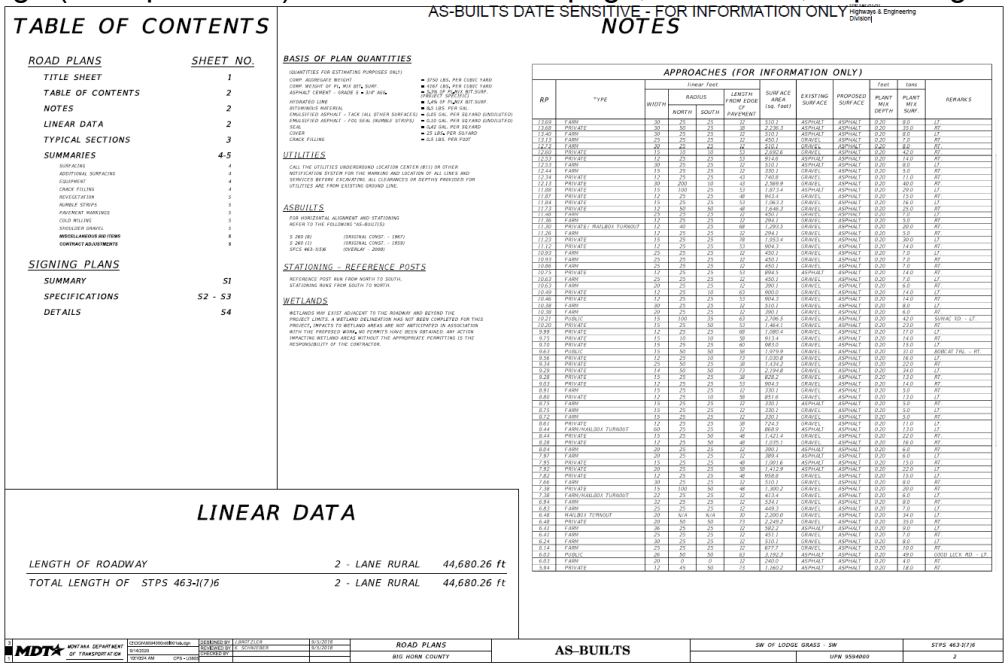


TABLE OF CONTENTS

ROAD PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	2
LINEAR DATA	2
TYPICAL SECTIONS	3
SUMMARIES	4-5
SIGNING PLANS	
SUMMARY	S1
SPECIFICATIONS	S2 - S3
DETAILS	S4

AS-BUILTS DATE SENSITIVE - FOR INFORMATION ONLY

Highways & Engineering Division

NOTES

BASIS OF PLAN QUANTITIES

UTILITIES

AS-BUILTS

STATIONING - REFERENCE POSTS

WETLANDS

APPROACHES (FOR INFORMATION ONLY)

RP	TYPE	Linear Feet WIDTH	RADIUS NORTH	RADIUS SOUTH	LENGTH FROM EDGE OF PAVEMENT	SURFACE AREA (sq. feet)	EXISTING SURFACE	PROPOSED SURFACE	Feet PLANT MIX DEPTH	tons PLANT MIX SURF.	REMARKS
13.69	FARM	30	25	25	32	510.2	ASPHALT	ASPHALT	0.20	83.	LT
13.68	PRIVATE	30	50	25	38	2,280.3	ASPHALT	ASPHALT	0.20	171.0	RT
13.40	FARM	30	25	25	32	510.2	ASPHALT	ASPHALT	0.20	8.0	LT
13.13	FARM	25	25	25	32	450.1	GRAVEL	ASPHALT	0.20	7.0	RT
12.73	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	RT
12.53	PRIVATE	40	50	50	44	3,014.1	GRAVEL	ASPHALT	0.20	22.0	RT
12.53	PRIVATE	12	25	25	53	914.8	ASPHALT	ASPHALT	0.20	14.0	RT
12.53	FARM	30	25	25	32	510.2	ASPHALT	ASPHALT	0.20	8.0	LT
12.44	FARM	15	25	25	32	330.1	GRAVEL	ASPHALT	0.20	5.0	RT
12.34	PRIVATE	12	25	25	43	740.8	GRAVEL	ASPHALT	0.20	11.0	RT
12.13	PRIVATE	30	200	50	43	2,569.9	GRAVEL	ASPHALT	0.20	40.0	LT
11.88	PRIVATE	15	100	25	53	1,871.4	ASPHALT	ASPHALT	0.20	29.0	LT
11.87	PRIVATE	12	25	25	48	943.1	GRAVEL	ASPHALT	0.20	15.0	LT
11.84	PRIVATE	15	25	25	53	1,046.3	GRAVEL	ASPHALT	0.20	16.0	LT
11.49	PRIVATE	12	25	25	48	1,037.7	GRAVEL	ASPHALT	0.20	16.0	LT
11.47	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	LT
11.36	FARM	12	25	25	32	294.1	GRAVEL	ASPHALT	0.20	5.0	RT
11.30	PRIVATE / RAILROAD TURNOUT	12	40	25	68	1,295.5	GRAVEL	ASPHALT	0.20	20.0	RT
11.26	FARM	12	25	25	32	294.1	GRAVEL	ASPHALT	0.20	5.0	RT
11.23	PRIVATE	15	25	25	38	1,053.4	GRAVEL	ASPHALT	0.20	30.0	LT
11.12	PRIVATE	12	25	25	53	904.3	GRAVEL	ASPHALT	0.20	14.0	RT
10.93	FARM	25	25	25	32	450.1	GRAVEL	ASPHALT	0.20	7.0	LT
10.93	FARM	25	25	25	32	450.1	GRAVEL	ASPHALT	0.20	7.0	RT
10.86	FARM	25	25	25	32	450.1	GRAVEL	ASPHALT	0.20	7.0	RT
10.75	PRIVATE	12	25	25	53	894.5	ASPHALT	ASPHALT	0.20	14.0	RT
10.61	FARM	25	25	25	32	450.1	GRAVEL	ASPHALT	0.20	7.0	LT
10.61	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	RT
10.48	PRIVATE	12	25	25	53	904.3	GRAVEL	ASPHALT	0.20	14.0	RT
10.48	PRIVATE	12	25	25	53	904.3	GRAVEL	ASPHALT	0.20	14.0	RT
10.38	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	RT
10.21	PUBLIC	15	100	35	83	2,706.3	GRAVEL	ASPHALT	0.20	42.0	SURVEY TIE – LT
10.20	PRIVATE	15	25	50	53	1,464.1	GRAVEL	ASPHALT	0.20	23.0	RT
9.99	PRIVATE	12	25	25	68	1,080.4	GRAVEL	ASPHALT	0.20	17.0	LT
9.73	PRIVATE	12	30	30	58	913.4	GRAVEL	ASPHALT	0.20	14.0	RT
9.73	PRIVATE	15	25	25	80	981.0	GRAVEL	ASPHALT	0.20	15.0	LT
9.61	PUBLIC	15	50	50	58	1,370.9	GRAVEL	ASPHALT	0.20	21.0	SURVEY TIE – RT
9.38	PRIVATE	12	25	35	73	1,030.8	GRAVEL	ASPHALT	0.20	16.0	LT
9.34	PRIVATE	25	50	50	38	1,439.2	GRAVEL	ASPHALT	0.20	22.0	RT
9.29	PRIVATE	14	50	50	73	2,194.8	GRAVEL	ASPHALT	0.20	34.0	LT
9.28	PRIVATE	15	25	25	38	826.2	GRAVEL	ASPHALT	0.20	13.0	LT
9.03	PRIVATE	12	25	25	53	904.3	GRAVEL	ASPHALT	0.20	14.0	RT
8.80	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	LT
8.80	PRIVATE	12	25	25	58	853.4	GRAVEL	ASPHALT	0.20	13.0	LT
8.73	FARM	12	25	25	32	330.1	GRAVEL	ASPHALT	0.20	5.0	LT
8.73	FARM	15	25	25	32	330.1	GRAVEL	ASPHALT	0.20	5.0	LT
8.72	FARM	15	25	25	32	330.1	GRAVEL	ASPHALT	0.20	5.0	RT
8.63	PRIVATE	12	25	25	58	724.3	GRAVEL	ASPHALT	0.20	11.0	LT
8.44	FARM/RAILROAD TURNOUT	60	25	25	32	868.9	ASPHALT	ASPHALT	0.20	13.0	LT
8.44	PRIVATE	15	25	50	58	1,521.4	ASPHALT	ASPHALT	0.20	22.0	RT
8.38	PRIVATE	12	25	50	48	1,035.1	GRAVEL	ASPHALT	0.20	16.0	RT
8.04	FARM	30	25	25	32	510.2	ASPHALT	ASPHALT	0.20	8.0	RT
7.97	FARM	30	25	25	32	489.4	ASPHALT	ASPHALT	0.20	8.0	LT
7.95	PRIVATE	15	25	25	48	1,001.6	ASPHALT	ASPHALT	0.20	15.0	RT
7.92	PRIVATE	30	25	25	58	1,412.8	ASPHALT	ASPHALT	0.20	22.0	LT
7.82	PRIVATE	12	25	25	48	958.8	GRAVEL	ASPHALT	0.20	15.0	LT
7.66	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	RT
7.38	PRIVATE	15	100	50	48	1,985.2	GRAVEL	ASPHALT	0.20	31.0	LT
7.38	FARM/RAILROAD TURNOUT	12	25	25	32	413.4	GRAVEL	ASPHALT	0.20	6.0	LT
6.83	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	LT
6.83	FARM	25	25	25	32	468.3	GRAVEL	ASPHALT	0.20	7.0	LT
6.48	RAILROAD TURNOUT	30	N/A	N/A	10	2,200.0	GRAVEL	ASPHALT	0.20	34.0	LT
6.46	PRIVATE	30	50	50	73	2,249.2	GRAVEL	ASPHALT	0.20	35.0	RT
6.31	FARM	36	25	25	32	582.2	ASPHALT	ASPHALT	0.20	9.0	LT
6.31	FARM	25	25	25	32	451.1	GRAVEL	ASPHALT	0.20	7.0	RT
6.24	FARM	30	25	25	32	510.2	GRAVEL	ASPHALT	0.20	8.0	LT
6.14	FARM	25	25	25	32	677.3	GRAVEL	ASPHALT	0.20	10.0	RT
6.03	PUBLIC	36	50	50	93	3,192.3	ASPHALT	ASPHALT	0.20	49.0	GOOD LUCK RD – LT
6.03	FARM	30	0	0	32	960.0	ASPHALT	ASPHALT	0.20	15.0	RT
5.94	PRIVATE	12	45	50	73	1,360.2	ASPHALT	ASPHALT	0.20	18.0	RT

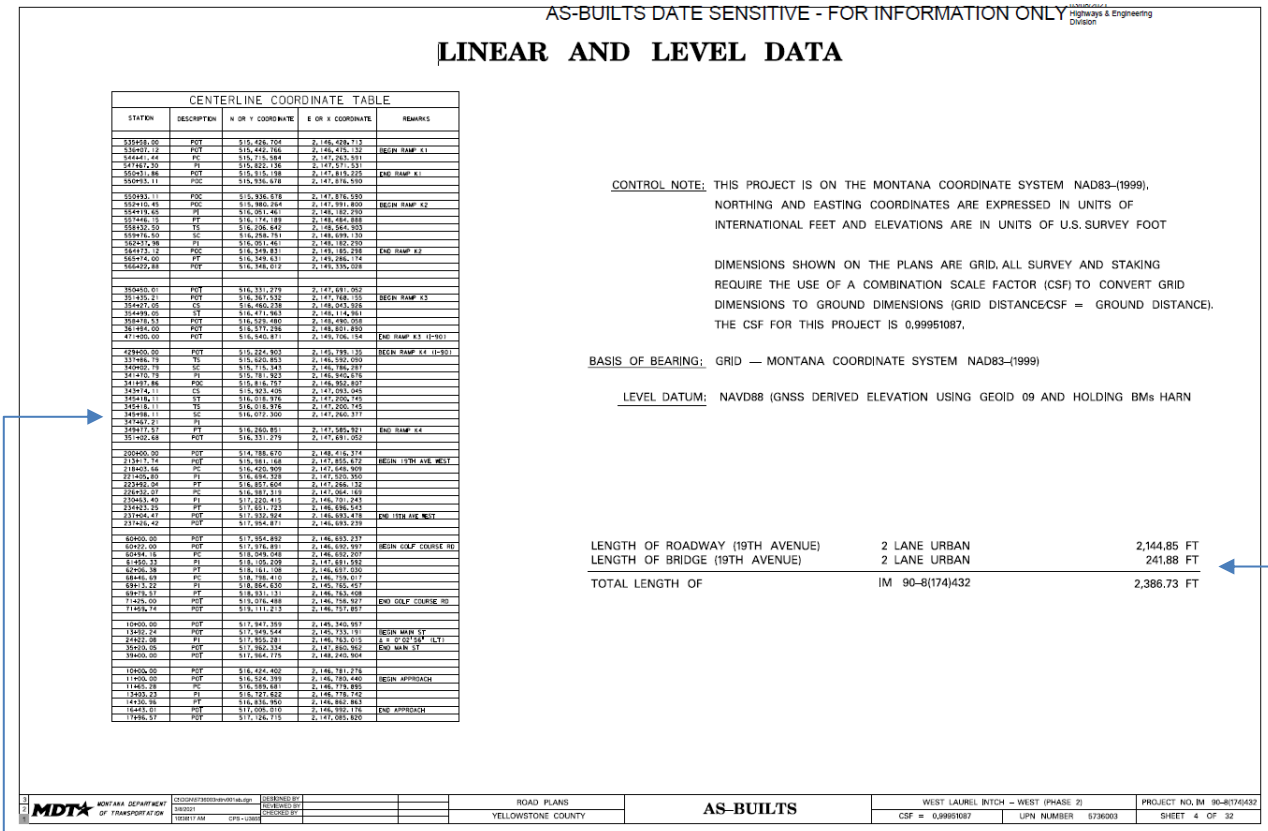
LINEAR DATA

LENGTH OF ROADWAY	2 - LANE RURAL	44,680.26 ft
TOTAL LENGTH OF STPS 463-1(7)6	2 - LANE RURAL	44,680.26 ft

MDT MONTANA DEPARTMENT OF TRANSPORTATION	DESIGNED BY	ROAD PLANS	AS-BUILTS	SW OF LODGE GRASS - SW		STPS 463-1(7)6
	CHECKED BY	BIG HORN COUNTY			UPN 9594000	2

Procedure – As-Built Linear and Level Data Information

1. Any changes to structure or roadway length should be noted in the “LINEAR DATA”. If the project limits changed, this will most likely need updated as well and vice versa.
2. Mark up any changes in the level data in the “LINEAR AND LEVEL DATA” section.



AS-BUILTS DATE SENSITIVE - FOR INFORMATION ONLY

Highways & Engineering Division

LINEAR AND LEVEL DATA

CENTERLINE COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
535+58.00	POT	515, 426.704	2,146,428.713	
536+07.12	POT	515, 442.766	2,146,475.132	BEGIN RAMP K1
544+41.44	PC	515, 715.584	2,147,263.591	
547+87.30	PI	515, 822.136	2,147,571.531	
550+31.86	POT	515, 915.198	2,147,815.225	END RAMP K1
550+53.11	POC	515, 936.578	2,147,836.590	
550+93.11	POC	515, 936.578	2,147,876.590	
552+10.65	POC	515, 980.264	2,147,991.800	BEGIN RAMP K2
554+19.65	PT	516, 051.461	2,148,182.290	
557+46.15	PT	516, 174.189	2,148,484.888	
558+32.50	TS	516, 206.642	2,148,564.903	
559+76.50	SC	516, 258.751	2,148,699.130	
562+37.36	PT	516, 351.461	2,148,182.290	
564+73.12	POC	516, 349.831	2,149,183.298	END RAMP K2
565+74.00	PT	516, 349.631	2,149,286.174	
566+29.88	POT	516, 348.012	2,149,335.028	
350+50.01	POT	516, 331.279	2,147,691.052	
351+35.21	POT	516, 367.532	2,147,768.155	BEGIN RAMP K3
354+27.05	CS	516, 460.238	2,148,093.326	
354+99.05	ST	516, 471.963	2,148,114.961	
358+78.53	POT	516, 529.480	2,148,490.058	
361+84.00	POT	516, 577.296	2,148,801.850	
47+00.00	POT	516, 540.871	2,149,706.154	END RAMP K3 (I-90)
429+00.00	POT	515, 224.903	2,149,799.135	BEGIN RAMP K4 (I-90)
337+86.79	TS	515, 520.853	2,148,592.080	
340+82.79	SC	515, 715.343	2,148,786.287	
341+70.79	PI	515, 781.923	2,148,996.676	
341+97.86	POC	515, 816.757	2,148,852.827	
343+74.11	CS	515, 923.426	2,147,093.045	
345+18.11	ST	516, 018.976	2,147,206.745	
345+18.11	TS	516, 018.976	2,147,200.745	
345+98.11	SC	516, 072.300	2,147,266.377	
347+67.21	PI			
349+17.57	PT	516, 260.851	2,147,585.921	END RAMP K4
35+02.68	POT	516, 331.279	2,147,691.052	
200+00.00	POT	514, 788.670	2,148,416.374	
213+17.74	POT	515, 581.168	2,147,855.672	BEGIN 19TH AVE WEST
218+05.56	PC	516, 420.909	2,147,648.909	
221+05.80	PI	516, 656.328	2,147,520.350	
223+52.04	PT	516, 857.604	2,147,286.132	
226+32.07	PC	516, 987.313	2,147,064.169	
230+43.40	PI	517, 220.415	2,146,721.243	
234+23.25	PT	517, 451.723	2,146,596.543	
237+06.47	POT	517, 532.924	2,146,593.478	END 19TH AVE WEST
237+26.42	POT	517, 954.871	2,146,693.239	
60+00.00	POT	517, 954.892	2,146,693.237	
60+27.00	POT	517, 976.891	2,146,692.997	BEGIN GOLF COURSE RD
60+94.16	PC	518, 049.048	2,146,692.207	
61+50.33	PI	518, 105.209	2,147,691.552	
62+06.38	PT	518, 161.108	2,146,657.030	
68+46.69	PC	518, 788.410	2,146,759.017	
69+13.22	PI	518, 854.530	2,146,760.457	
69+78.57	PT	518, 931.131	2,146,763.408	
71+25.00	POT	519, 076.488	2,146,766.927	END GOLF COURSE RD
71+09.74	POT	519, 111.213	2,146,757.857	
10+00.00	POT	517, 947.359	2,145,340.957	
13+92.24	POT	517, 949.544	2,145,733.191	BEGIN MAIN ST
24+22.08	PI	517, 955.281	2,146,763.015	Δ = 0°02'58" (LT)
35+20.05	POT	517, 952.334	2,147,880.952	END MAIN ST
59+00.00	POT	517, 964.775	2,148,240.904	
10+00.00	POT	516, 424.402	2,146,781.276	
11+00.00	POT	516, 524.399	2,146,780.440	BEGIN APPROACH
11+65.28	PC	516, 589.681	2,146,779.895	
12+93.23	PI	516, 721.822	2,146,778.742	
14+30.96	PT	516, 836.950	2,146,862.863	
15+43.01	POT	517, 005.010	2,146,932.176	END APPROACH
17+98.57	POT	517, 124.715	2,147,085.820	

CONTROL NOTE: THIS PROJECT IS ON THE MONTANA COORDINATE SYSTEM NAD83–(1999), NORTHING AND EASTING COORDINATES ARE EXPRESSED IN UNITS OF INTERNATIONAL FEET AND ELEVATIONS ARE IN UNITS OF U.S. SURVEY FOOT

DIMENSIONS SHOWN ON THE PLANS ARE GRID. ALL SURVEY AND STAKING REQUIRE THE USE OF A COMBINATION SCALE FACTOR (CSF) TO CONVERT GRID DIMENSIONS TO GROUND DIMENSIONS (GRID DISTANCE/CSF = GROUND DISTANCE). THE CSF FOR THIS PROJECT IS 0,99951087.

BASIS OF BEARING: GRID — MONTANA COORDINATE SYSTEM NAD83–(1999)

LEVEL DATUM: NAVD88 (GNSS DERIVED ELEVATION USING GEOID 09 AND HOLDING BMs HARN

LENGTH OF ROADWAY (19TH AVENUE)	2 LANE URBAN	2,144,85 FT
LENGTH OF BRIDGE (19TH AVENUE)	2 LANE URBAN	241,88 FT
TOTAL LENGTH OF	IM 90–8(174)432	2,386.73 FT

MDT MONTANA DEPARTMENT OF TRANSPORTATION

DESIGNED BY | REVIEWED BY | CHECKED BY

ROAD PLANS

YELLOWSTONE COUNTY

AS–BUILTS

WEST LAUREL INTCH – WEST (PHASE 2)

CSF = 0,99951087 | UPN NUMBER 5736003

PROJECT NO. IM 90–8(174)432

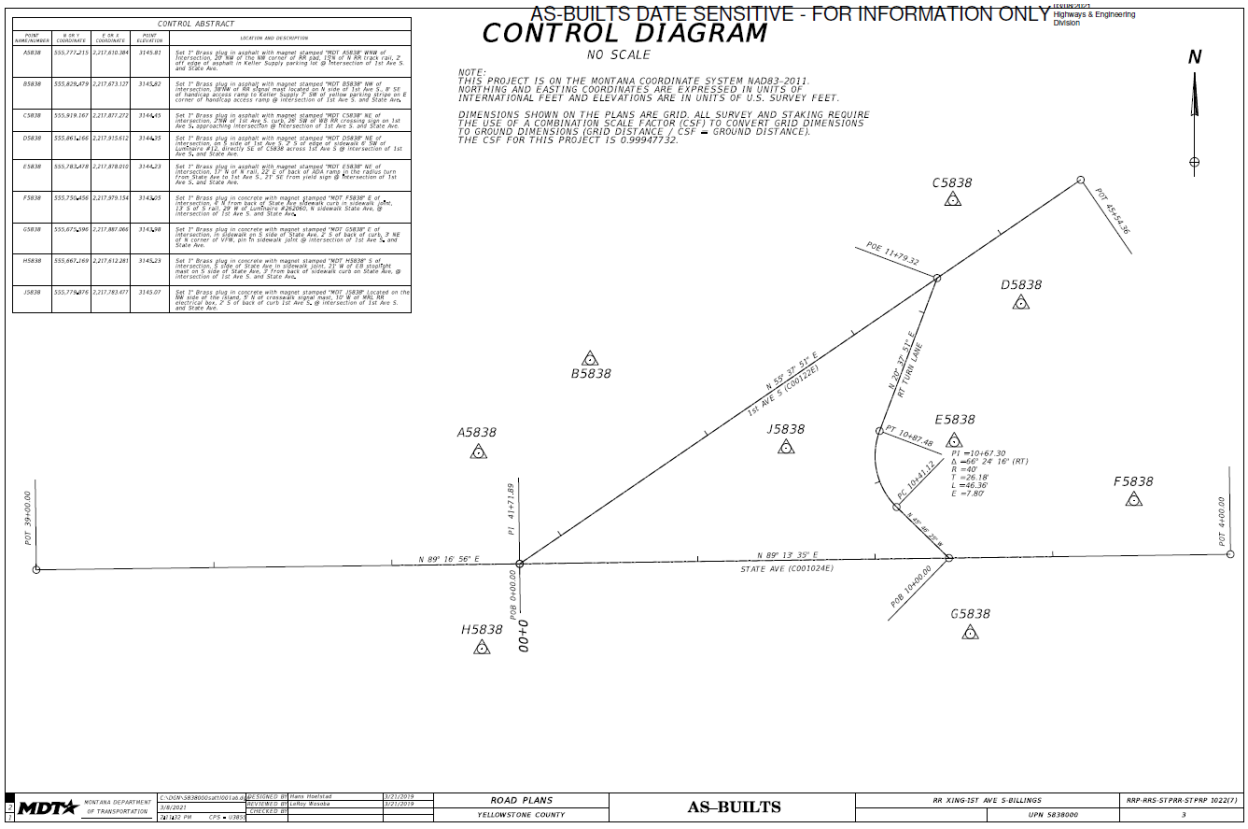
SHEET 4 OF 32

Note: Similar to the “NOTES”, the “LINEAR DATA” may be located on another sheet depending on how the plans were laid out. See example on previous page.

3. If there are any changes to the alignment, update the centerline coordinate table accordingly.

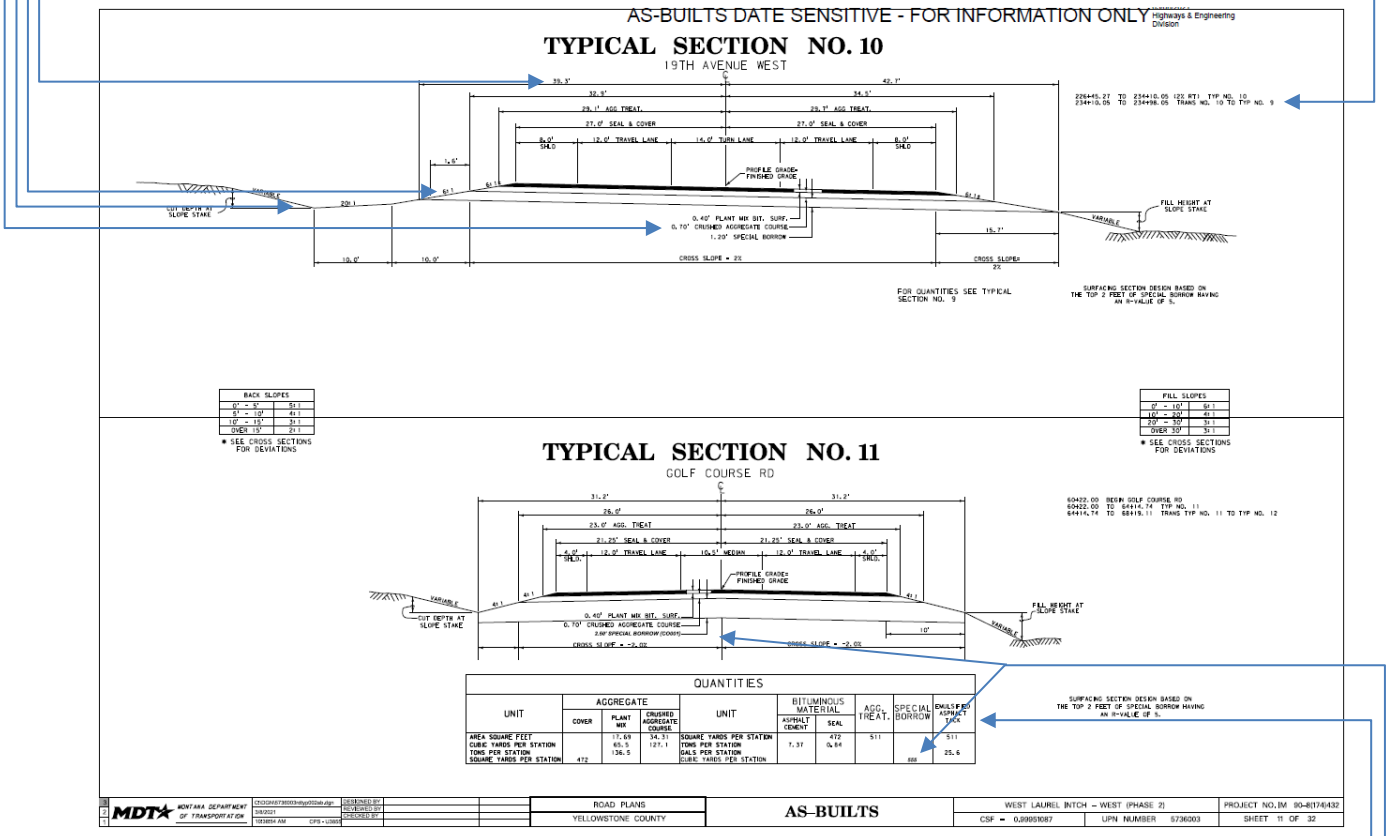
Procedure – As-Built Control Diagram Information

1. Mark any changes to the original plans such as obliterated control points.



Procedure – As-Built Typical Section Information

1. Note any changes to typical sections. These can include:
    a. Stations
    b. Depths
    c. Ditch Lines
    d. Slopes
    e. Widths



2. If any of the widths or depths change, the “QUANTITIES” summary under the typical section should be updated. If no changes were made to the typical sections, updating these to reflect actual placed quantities is not necessary as the information regarding project quantities will be included in the “SURFACING” summary later in the plans.
3. On this project, the special borrow was thickened in this typical section. The thickness was updated as well as the “QUANTITIES” table.

Procedure – As-Built Road Summaries Information

Note: Some plans have Excel summaries that are available on DMS. If you want to edit these instead of on the paper plans, the information will be the same, but the process will be slightly different. Instead of crossing out existing numbers and writing in new ones, information can just be deleted and replaced. Use ***Arial font, bolded, and italicized*** to show what has changed from plan. Editing MicroStation summaries is covered in *Electronic Edits for As Built Plans*.

1. All bid items, including change ordered bid items, must be shown in the as-built's summaries. If any items are not included in existing summaries, these can be placed in a "MISCELLANEOUS BID ITEMS" summary.

MISCELLANEOUS BID ITEMS

ITEM DESCRIPTION	QUANTITY	UNITS	REMARKS
CATEGORY NO 1			
TRAINING PROGRAM	359	HOUR	
ESCROW OF BID DOCUMENTS	1.000	LS	
MISCELLANEOUS WORK	28,319	UNITS	
CONTRACTOR SURVEY AND LAYOUT	1.000	LS	
CRITICAL PATH SCHEDULE	1.000	LS	
MOBILIZATION	1.000	LS	
TEMPORARY EROSION CONTROL - LS	1.000	LS	
TEMPORARY EROSION CONTROL	0	UNITS	ITEM NOT USED
TRAFFIC CONTROL DEVICES CB	230,514	UNITS	
TRAFFIC CONTROL CROSSOVER	2	EACH	
CATEGORY NO 4			
MISCELLANEOUS ITEMS - LS	1.000	LS	CO008
CATEGORY NO 5			
MGS GUARDRAIL	75	LNFT	CO008
REMOVE GUARDRAIL	75	LNFT	CO008
DELIENATOR DES A	1	EACH	CO008

MISCELLANEOUS BID ITEMS

ITEM DESCRIPTION	QUANTITY	UNITS	REMARKS
CATEGORY NO 1			
MISC WORK - CULVERT EXTENSION	2,200	UNITS	EXTENSION OF EXISTING NSOP 18" CULVERT AT 11+60 TO ACCOMMODATE NEW SLOPES
MISC WORK - MESSAGE BOARDS	2,640	UNITS	ADDITIONAL MESSAGE BOARDS
MISC WORK - SHOULDER TOPSOIL	5,025	UNITS	ADDITIONAL TOPSOIL REQUIRED BETWEEN EDGE OF PAVEMENT AND TOP OF SLOPE
MISC WORK - SOIL LIFT	5,568.000	UNITS	WETLAND RESTORATION UTILIZING SOIL LIFTS
MISC ITEMS - LS	0.000	LUMP SUM	SPECIAL PROVISION 23 - OFFICE TRAILER NOT USED
MOBILIZATION	1.000	LUMP SUM	
BMP ADMINISTRATION	1.000	LUMP SUM	
TEMPORARY EROSION CONTROL	0	UNITS	NOT USED
TRAFFIC CONTROL - FIXED	0	UNITS	NOT USED
TRAFFIC CONTROL - FIXED	1.000	LUMP SUM	

Note: Depending on what work was completed with Miscellaneous Work, quantities should be broken out.

2. All contract/item adjustments (QA incentive/deductions, fuel price, liquidated damages, etc.) also need to be included in a summary. This summary is called "CONTRACT ADJUSTMENTS" summary. For reference, these will all be listed in the Summary of Contract Adjustments Jasper report for the contract.

CONTRACT ADJUSTMENTS

ADJUSTMENT TYPE	ADJUSTMENT AMOUNT	UNITS	LINE ITEM DESCRIPTION
NON QA ADJUSTMENT	$ (1,499.00)	TON	HYDRATED LIME
QA CONCRETE	$ 1,467.00	YD³	CONCRETE - CLASS STRUCTURE
QA CONCRETE	$ 3,190.00	YD³	CONCRETE - CLASS STRUCTURE LOW SLUMP
QA CONCRETE	$ 117.00	YD³	FOUNDATION - CONCRETE
QA DENSITY	$ 4,896.00	TON	PLANT MIX SURF GR S - 3/4 IN
QA RIDE SPEC	$ (7,401.00)	TON	PLANT MIX SURF GR S - 3/4 IN
QA VOLUMETRICS	$ 60,158.00	TON	PLANT MIX SURF GR S - 3/4 IN

3. The surfacing summary only requires that totals be entered at the bottom of the summary. If you have separate categories, list each category's total and an accumulated total at the bottom.

SURFACING

STATION FROM	STATION TO	linear feet GROSS	linear feet NET	linear feet +	linear feet -	FOR	tons HYDRATED LIME	AGGREGATE sq yards COVER TYPE 2	AGGREGATE tons PLANT MIX BIT. SURF. GRADE S-3/4"	AGGREGATE cubic yards TRAFFIC GRAVEL	AGGREGATE cubic yards CRUSHED AGG. COURSE	BITUMINOUS MATERIAL tons ASPHALT CEMENT PG 70-28	BITUMINOUS MATERIAL tons SEAL CRS-2P	BITUMINOUS MATERIAL gallons EMULSIFIED ASPHALT TACK	BITUMINOUS MATERIAL sq yards AGG. TREAT	cu yards SPECIAL BORROW- NEAT LINE	REMARKS
213+17,74	225+57,27	1239,53	997,65		241,88	19TH AVE WEST											TYP NO. 9
225+57,27	226+45,27	88,00	88,00			19TH AVE WEST											TRANS. TYP NO. 9 TO TYP NO. 10
226+45,27	234+10,05	764,78	764,78			19TH AVE WEST											TYP NO. 10
234+10,05	234+98,05	88,00	88,00			19TH AVE WEST											TRANS. TYP NO. 10 TO TYP NO. 9
234+98,05	237+04,47	206,42	206,42			19TH AVE WEST											TYP NO. 9
						ADDITIONAL SURFACING											
TOTAL		2,386,73	2,144,85		241,88		181,773	103,494.2	13,361.910	0	17,300.98	709.629	192.350	2,298	0	12,154.33	

4. Summaries requiring more detail include guardrail, fencing, sidewalk, irrigation, drainage structure, and culverts. This is not an all-inclusive list. There may be other items that need just as much detail. A good indicator is if the item is underground. Having a good record of any underground items is important for as-builts. Items such as dig outs that include fabric and/or special borrow should also include location details so they can be marked up accurately on the plan and profile. Items like this give future designers an idea of where problem areas exist. <u>Too much information is better than not enough when dealing with as-builts. When in doubt, include the extra information to ensure drawings are updated accurately in MicroStation.</u>

FENCING

STATION		linear feet				TEMP. FENCE	each				linear feet		REMARKS
		FARM FENCE					FARM FENCE PANEL		FARM FENCE PANEL - SPECIAL DESIGN		FARM GATE		
FROM	TO	TYPE F2M-48WW	TYPE F3M-48WW	TYPE F2M-39WW	TYPE F4M		SINGLE	DOUBLE	SINGLE	DOUBLE	TYPE G2	TYPE G3	
13+01 LT	***70+21 LT***			***1,953***					***11***	***7***		***68***	PANELS GALVANIZED STEEL SET IN CONCRETE TIE TO CROSS FENCE (PARCEL 11)
25+00 RT	***37+42.5 RT***			***1,439***			***11***	***1***					PANELS GALVANIZED STEEL SET IN CONCRETE TIE TO CROSS FENCE (PARCEL 11)
26+29.7 LT	***37+41.9 LT***	***1,833***							***5***	***2***			DOUBLE PANEL GALVANIZED STEEL SET IN CONCRETE (PARCEL 11)
27+80 RT									2			24	2-12' METAL FARM ENTRANCE GATES (PARCEL 11)
67+82 LT									2			24	2-12' METAL FARM ENTRANCE GATES (PARCEL 11)
24+51.75 LT	37+41.90 LT	1,307											TIE TO EXISTING CROSS FENCE (PARCEL 12)
27+39 LT									1				SINGLE PANEL GALVANIZED STEEL SET IN CONCRETE (PARCEL 12)
32+00 LT									1				SINGLE PANEL GALVANIZED STEEL SET IN CONCRETE (PARCEL 12)
36+25 LT									2			20	2-10' METAL FARM ENTRANCE GATES (PARCEL 12)
37+41.90 LT										1			DOUBLE PANEL GALVANIZED STEEL SET IN CONCRETE (PARCEL 12)
60+80.21 RT	24+51.75 LT									1			DOUBLE PANEL GALVANIZED STEEL SET IN CONCRETE (PARCEL 12)
60+80.21 RT	66+50 RT			567					2				TIE TO EXISTING CROSS FENCE (PARCEL 12)
25+00 RT	37+42.50 RT			1,247			3	3					STEEL POST AT 12' SPACING TIED TO SIDE FENCES (PARCEL 10)
36+25 RT							2					24	24' METAL FARM ENTRANCE GATE (PARCEL 10)
68+19.71 RT	69+05.00 RT				85		2						TIE TO EXISTING FENCE (PARCEL 16)
TOTAL		1,307		3,833	85		7	3	15	9		92	

a. Changes to fencing stationing and quantity occurred. New stations and quantities are input in Excel with the font style mentioned above. If these were paper plans and as-builts were done by hand, these would simply be crossed out and the new stations and quantities written beside them.

UTILITY CASINGS

STATION	linear feet		square feet	each	REMARKS
	STEEL CASING		INSULATION % %	END CAP #	
	16"	14" %	2" THK.		
651+50	***114***			2	INSULATION LT.
651+85	***114***			2	INSULATION LT.
680+25	***94***			2	INSULATION LT. & RT.
680+33	***90***			2	INSULATION LT. & RT.
683+91	88			2	INSULATION LT. & RT.
684+04	88			2	INSULATION LT. & RT.
0+55	90			2	ON COONEY ROAD
0+67	90			2	ON COONEY ROAD
SUBTOTAL	**768**			**16**	
TOTAL	**768**			~	

b. Here is an example of an underground item that is not commonly seen on projects. Remember, any changes to or additional underground items need good detail.

SUBGRADE STABILIZATION *					
STATION		cubic yards		square yard	REMARKS
		UNCL. EXC.	SPECIAL BORROW - NEAT LINE	STABILIZATION GEOTEXTILE - HIGH SURVIVABILITY	
FROM	TO				
612+00.00 RT.	518+50.00 RT.		750.00		
606+52	***608+57***		***197.41***	***296.1***	CL. AND LT.
607+17	***608+27***		***81.48***	***122.2***	LT.
608+57	***612+49***		***653.33***	***653.3***	CL. AND LT.
610+52	***612+83***		***323.33***	***485.0***	***CL AND LT***
612+49	***612+65***		***16.52***		***No Fabrice***
612+45	***612+81***		***26.67***	***40.0***	CL.
613+27	***615+71***		***271.11***	***406.7***	CL AND LT.
613+35	***613+81***		***54.52***	***81.8***	CL.
618+11	***617+76***		***38.89***	***58.3***	LT.
619+63	***623+13***		***207.41***	***311.1***	CL AND LT.
622+90	***623+45***		***55.56***	***83.3***	***CL AND LT***
610+50.00 RT.	620+50.00 RT.		600.00	***2200.3***	***GEOTEXTILE - 614+77 to 620+50 RT.***
623+50.00 RT.	542+00.00 RT.		632.00		
642+00.00 RT.	548+00.00 RT.	731	1,709.00		
648+00.00 RT.	552+00.00 RT.		727.00		
652+94.21 RT.	555+03.43 RT.			***587.4***	DOWNSTREAM BERM
658+28	***658+69***		***24.30***	***36.4***	RT.
666+50	***666+81***		***34.44***	***51.7***	RT.
667+50	***668+14***		***33.19***	***49.8***	RT.
671+50	***670+80***		***77.78***	***116.7***	LT.
671+50	***672+51***		***112.22***	***168.3***	LT.
672+00	***672+15***		***16.67***	***25.0***	RT.
679+00	***679+50***		***38.52***		***No Fabric***
679+95	***682+35***		***133.33***		***No Fabric***
681+00	***681+08***		***7.10***		***No Fabric***
681+00	***681+50***		***55.56***	***83.3***	***RT.***
681+00	***680+60***		***44.44***	***66.7***	***RT.***
681+10	***681+80***		***77.78***	***116.7***	***CL AND RT.***
681+50	***683+87***		***263.33***	***395.0***	***LT.***
683+42	***683+60***		***20.00***	***30.0***	***RT.***
683+78	***684+00***		***24.44***	***36.7***	***RT.***
696+16	***697+10***		***52.22***	***156.7***	***LT.***
697+00	***698+06***		***117.78***	***176.7***	***CL AND LT.***
697+10	***698+86***		***195.56***	***293.3***	***CL. AND LT.***
700+86	***702+92***		***228.89***	***343.3***	***CL AND LT.***
701+89	***705+04***		***350.00***	***525.0***	***LT.***
0+50.00	4+25.00	569	1,697.00	***2855.3***	COONEY ROAD
631+09 LT.				***283.1***	***9 x 4 RCB***
649+22 LT.				***636.5***	***14 x 4 RCB***
TOTAL		~	9,986.78	11,779.7	

c. There were many changes to the subgrade stabilization. All changes and additions to this should be marked up to ensure they are drawn in the plan and profile accurately.

APPROACH PIPE (INCLUDED IN CULVERT SUMMARY RECAP)

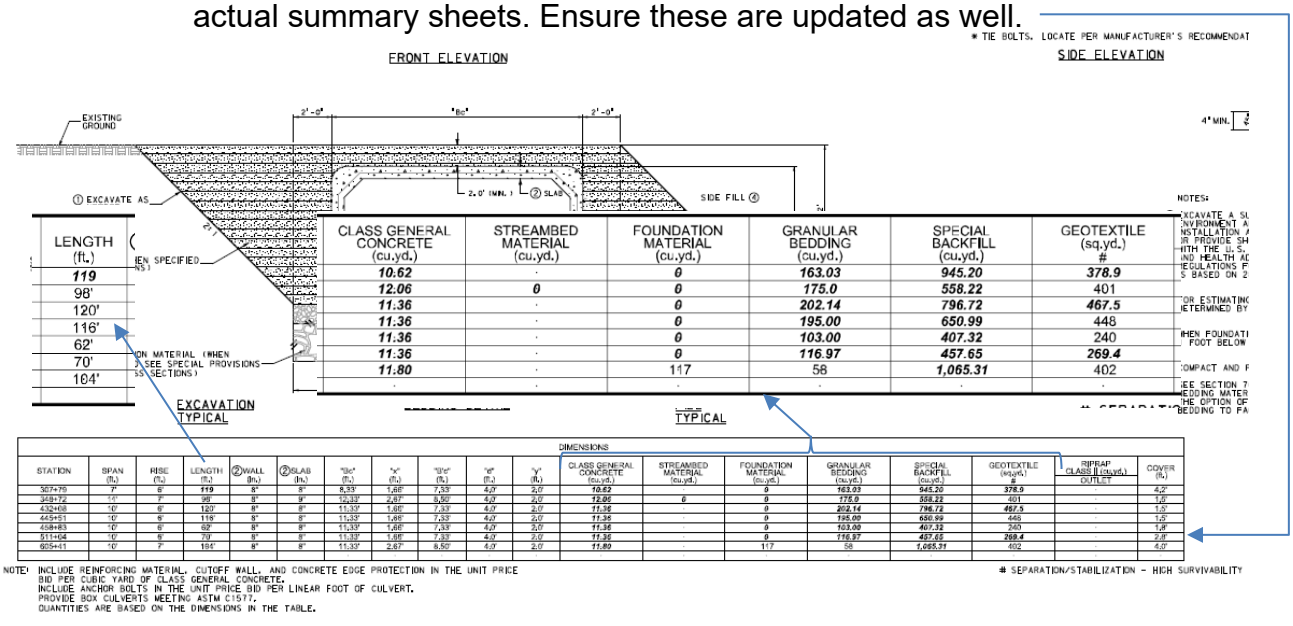
STATION	BASIC BID ITEMS linear feet: CULVERT PIPE in	LENGTH OF PIPE	REMOVE CULVERT	PIPE OPTIONS in: CONCRETE - CLASS 3	STEEL - 2 2/3 x 1/2 CORR. 0.064 THK. #	ALUMINIUM - 2 2/3 x 1/2 CORR. 0.060 THK.	CORRU-GATED POLY-ETHYLENE PIPE	END SECTIONS: LEFT	RIGHT	linear feet: HEIGHT OF COVER	SKEW ANGLE	CULVERT IN PL. in x ft	REMARKS
274+89	18	66	***49***		18			FETS	FETS	1.4		15 x 48.7 CMP	RT. DITCH
274+91	15	42	***18***	15 IRR				SQUARE	SQUARE	0.6		15 x 18.4 RCP	RCP IRR. LT BEYOND R/W LINE
274+91	18	56	***36***		18			FETS	FETS	1.0		18 x 36.1 CMP	LT. DITCH
282+92	***15***	***40***	***20***	***15 IRR***				***SQUARE***	***SQUARE***				***LT.***
287+82	18	60	***32***		18			FETS	FETS	2.7		15 x 32.2 CMP	LT. DITCH
287+92	18	62	***33***		18			FETS	FETS	2.8		18 x 33.0 CMP	RT. DITCH
307+15			***32***									24 x 31.5 CMP	RT.
315+50	***18***	***80***			***18***			***FETS***	***FETS***				***RT.***
325+50	18	40	***40***		18			FETS	FETS	1.1			RT.
326+09			***28***									15 x 27.9 RCP	LT.
334+95	18	52	***32***		18			FETS	FETS	2.1		18 x 32.1 CMP	RT.
335+73	18	40			18			FETS	FETS	1.0			LT.
340+85	18	60	***39***		18			FETS	FETS	4.1		18 x 39.4 CMP	RT.
TOTAL	~	~	***359***	~	~	~	~	~	~	~	~	~	

CULVERT SUMMARY RECAP

BASIC BID	linear feet: NEW PIPE (TOTAL)	REMOVE PIPE CULVERT	cubic yards: FOUNDATION MATERIAL	GRANULAR BEDDING MATERIAL	CLASS GENERAL CONCRETE	RANDOM RIPRAP CLASS 1	square yards: STABILIZATION GEOTEXTILE
15" RCP IRR	***82***						
18" DR	***516***						
24" DR	***528***						
24" RCP IRR.	178						
24" RCP SIPHON	532						
30" RCP IRR.	100						
7' x 3' RCB	258						
84" DR	174						
TOTAL	~	***1,528***	***377.42***	***264.30***	18.40	~	***1,324.3***

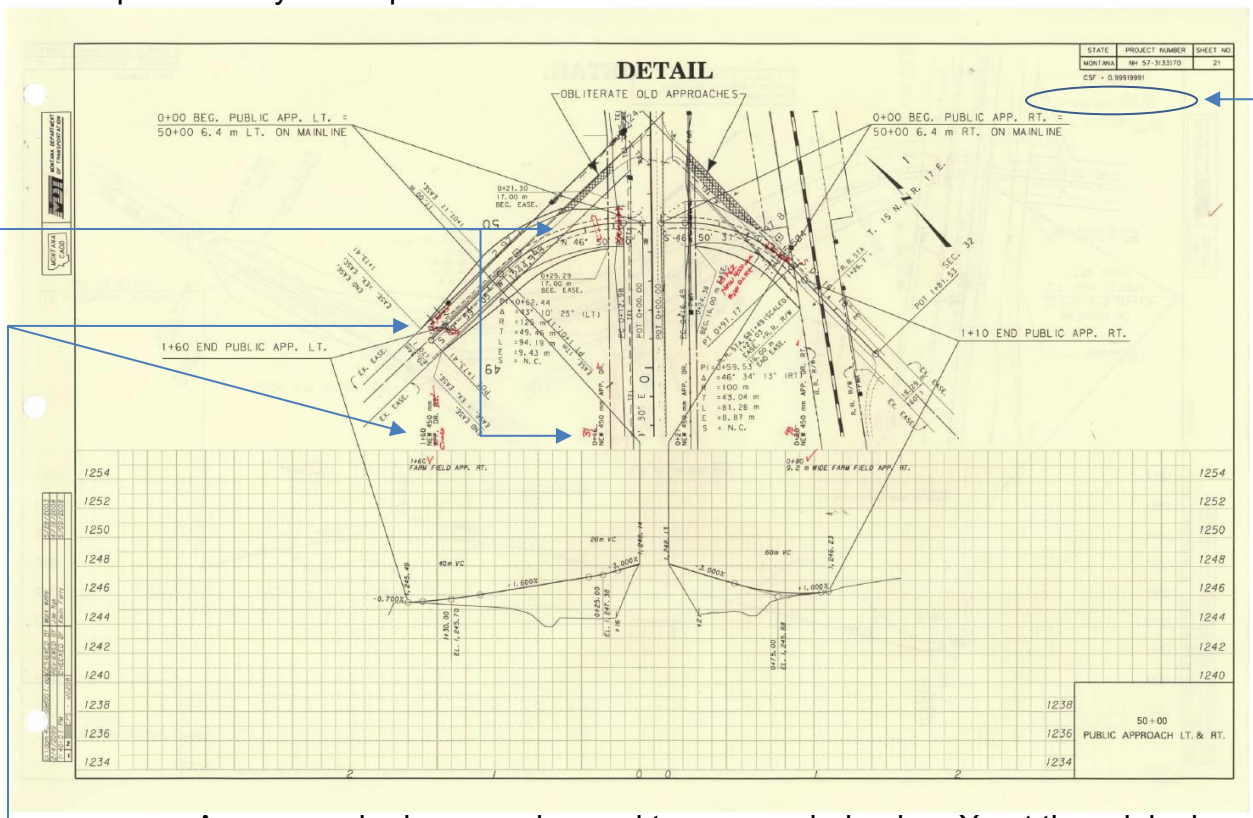
d. When completing approach pipe and culvert summaries, only include the option of pipe that was installed. Cross out or delete the other options that were not used. Remember to also update the "CULVERT SUMMARY RECAP" with totals from the other culvert summaries.

e. There are sometimes summaries included on other sheets outside of the actual summary sheets. Ensure these are updated as well.



Procedure – As-Built Detail Sheet Information

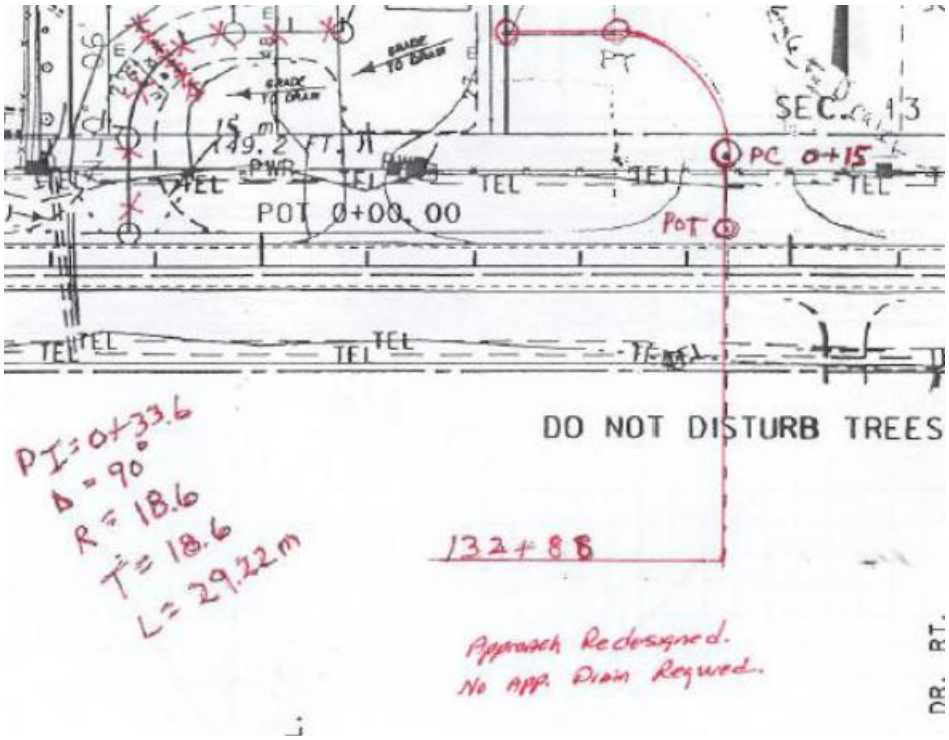
1. Take time to go through each sheet and ensure all changes to plan are marked up accurately. Examples:



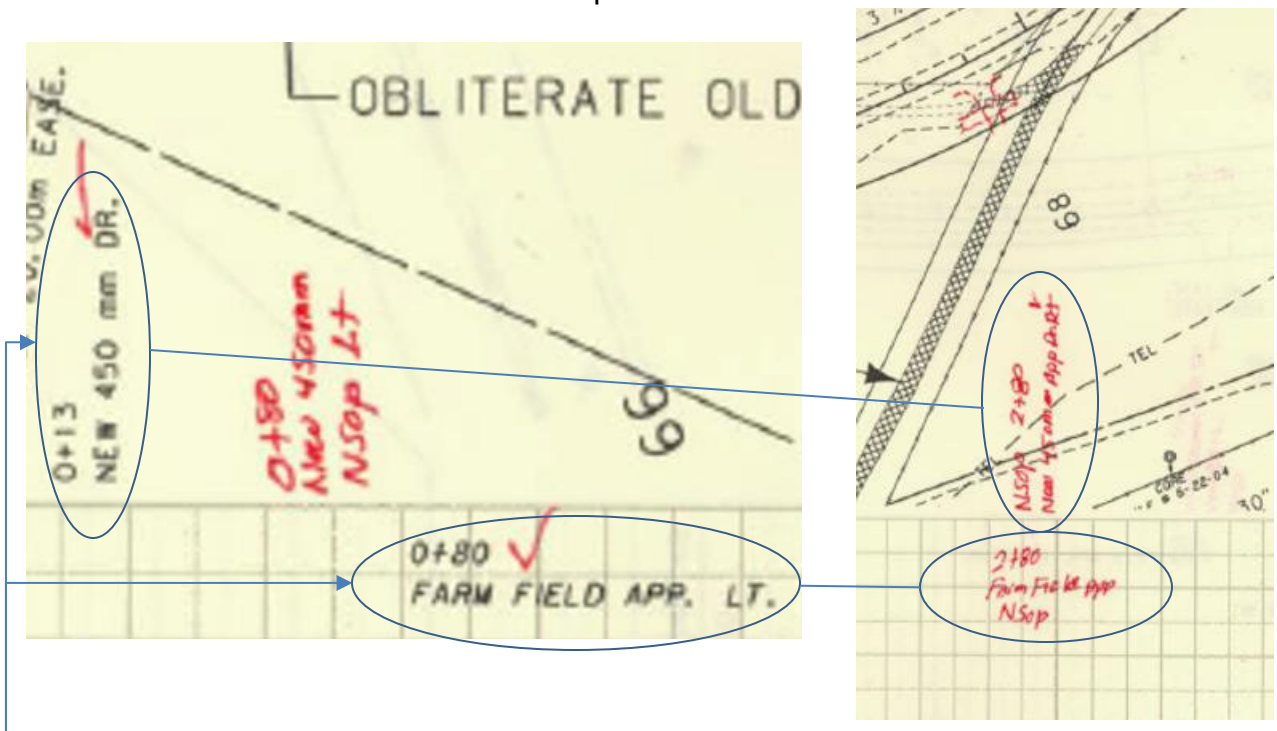
a. An approach pipe was changed to a cross drain pipe. X out the original pipe that was not placed and draw in the new pipe. Remember to update the note above the profile view. Add the new pipe length to this as well.
b. Approach drains were moved from plan stationing. Mark up in the same manner.

Note: This is an example of the older plan sheets that do not include the lower title box. If you do have plan sheets like this, add “AS-BUILTS” to the upper, right corner.

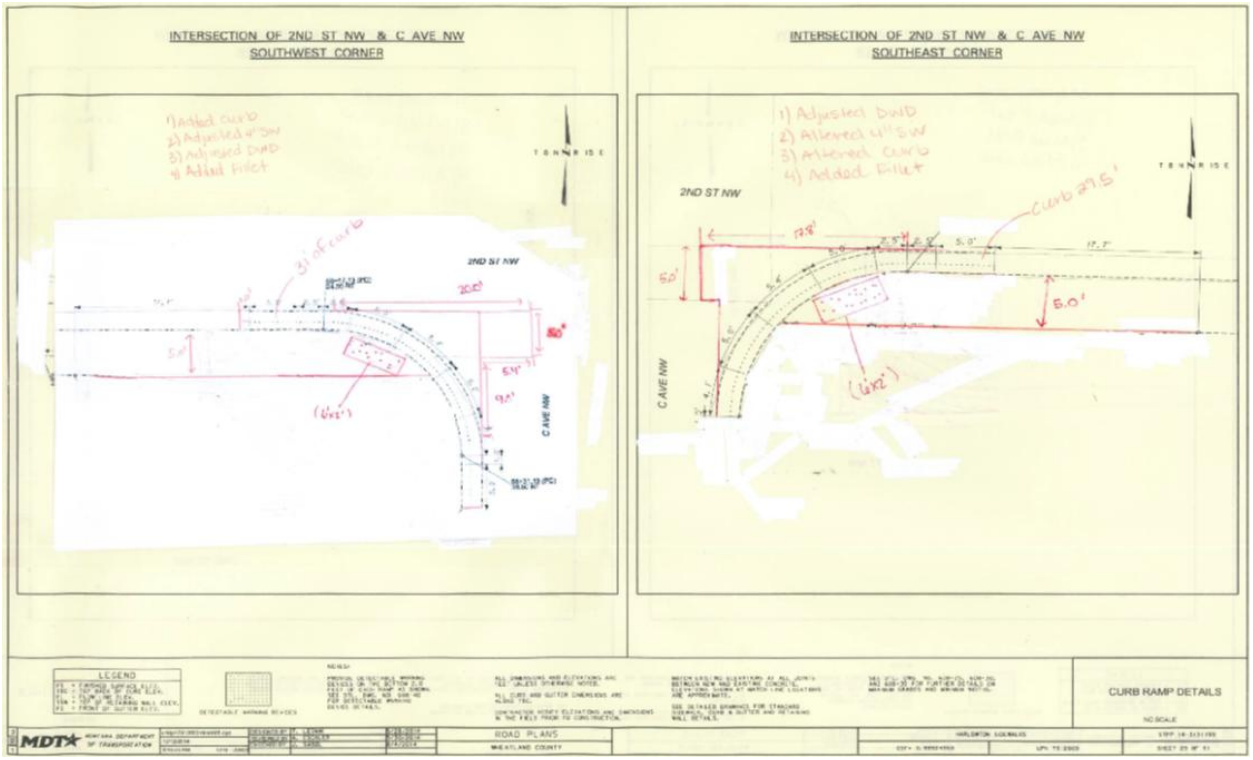
Note: If a station change occurred but was less than 5’, drawing the new pipe or other item is not necessary. Just update the stationing.



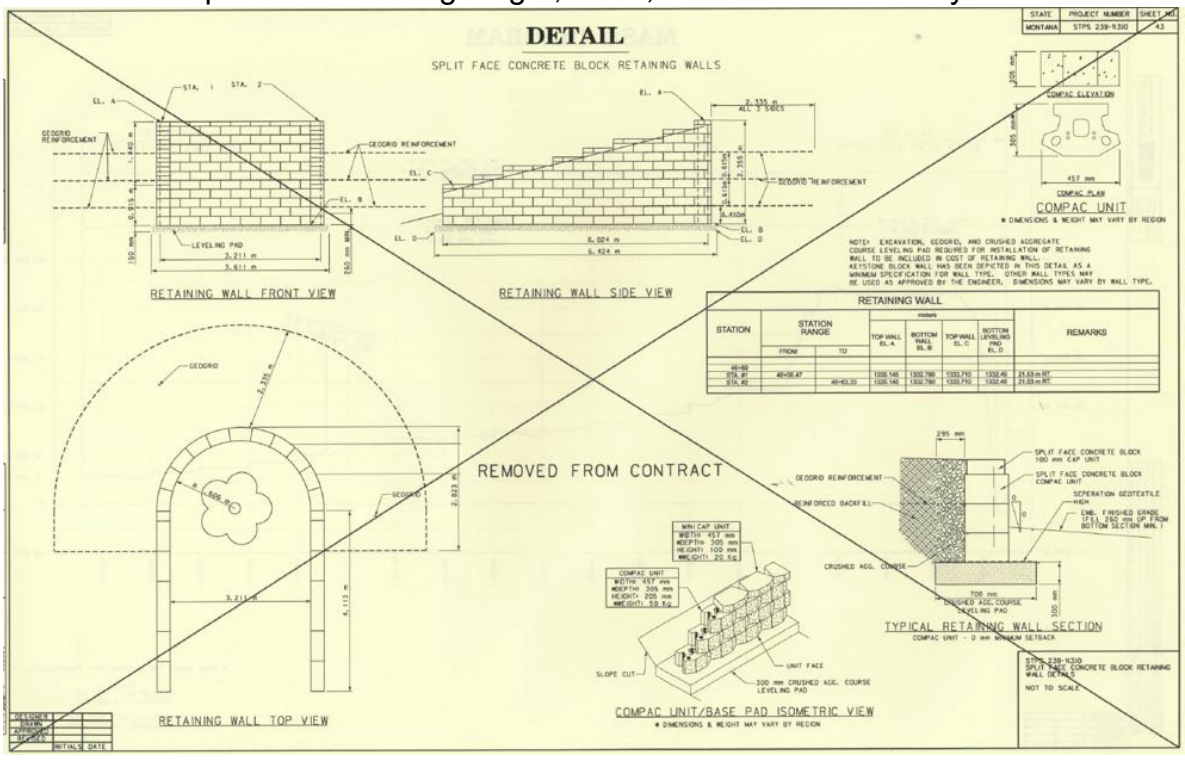
c. A large approach was completely redesigned, and a pipe was omitted. Provide as much detail as possible.



d. An approach and pipe were added. Follow the same criteria as the designer did.



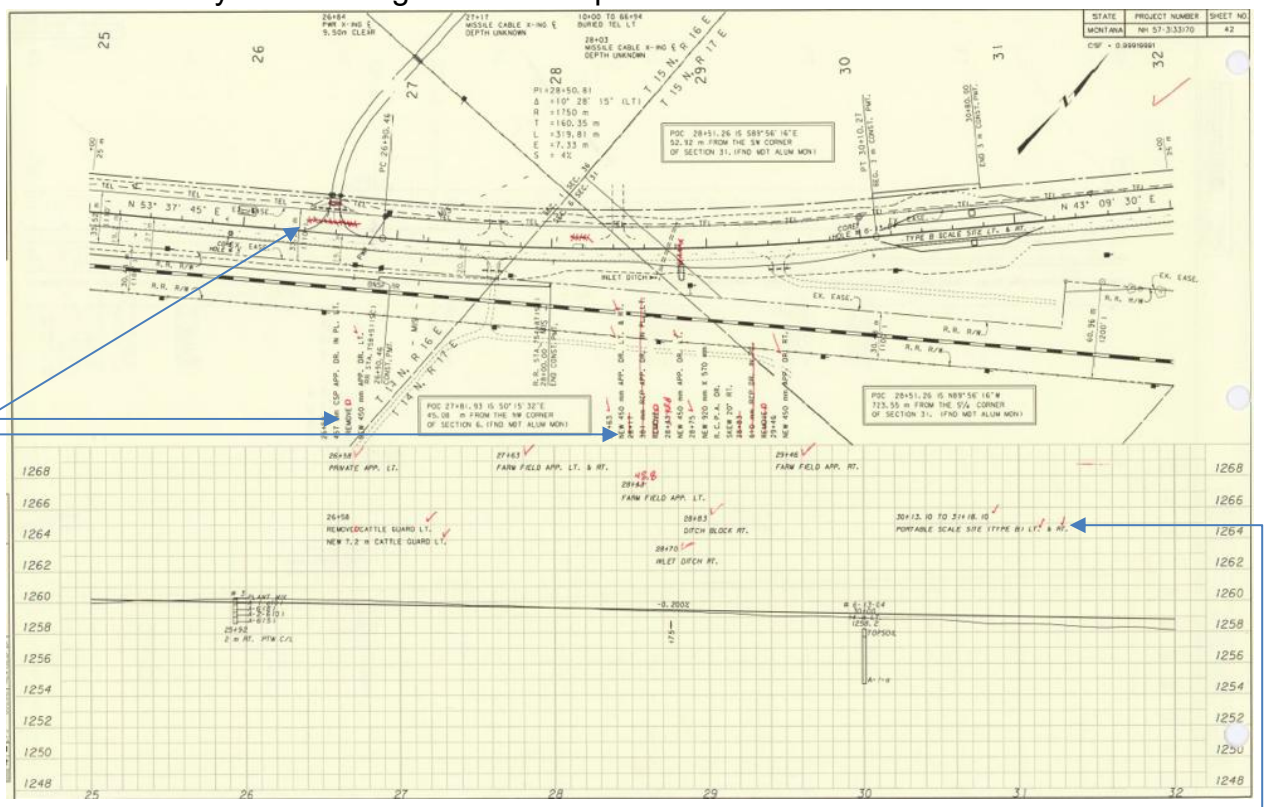
e. Changes to Curb, Gutter and Sidewalk occurred. Provide as much detail as possible including length, width, and radii if necessary.



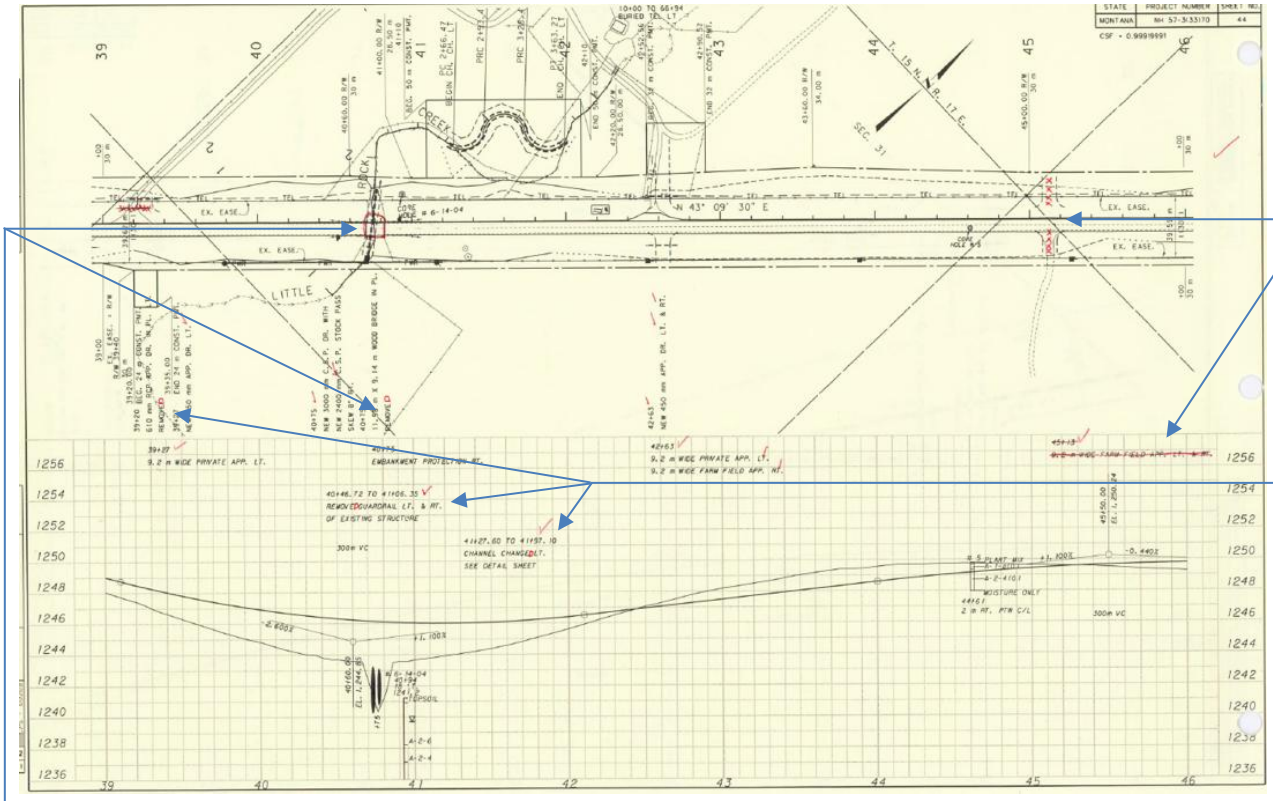
f. If you have details or other plan sheets that were not used, place an X through the specific detail or entire sheet.

Procedure – As-Built Plan and Profile Information

1. Plan and profile sheets are typically the most comprehensive and usually contain the most information in a road plan set. Take time to go through these sheet by sheet and update any changes. Ensure all callouts are correctly updated. Some sheets may have many changes while others have none. The important aspect is accuracy and thoroughness. Examples:



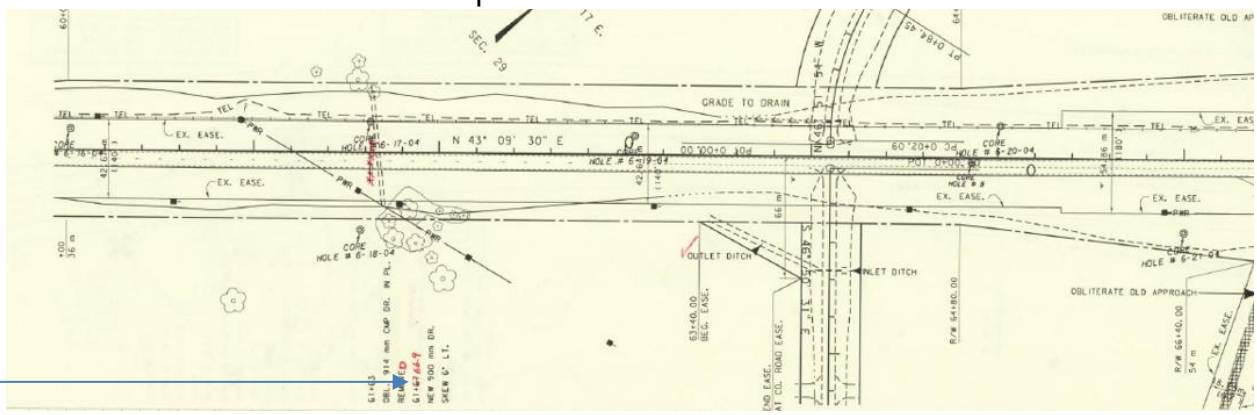
   a. If there are items planned for removal but are not there to be removed in the field, draw a line through the entire description and x out the item on the plan view.
   b. Any items that are removed per plan, add a “d” to the end of the “remove” (removed) and x out the item on the sheet.
   c. It is helpful to mark the unchanged items with a check so there is no question whether they were installed to plan. Ensure there is no conflicting information as this can complicate the as-built process when the DEO is building electronic as-builts from the crew’s redlined plans.



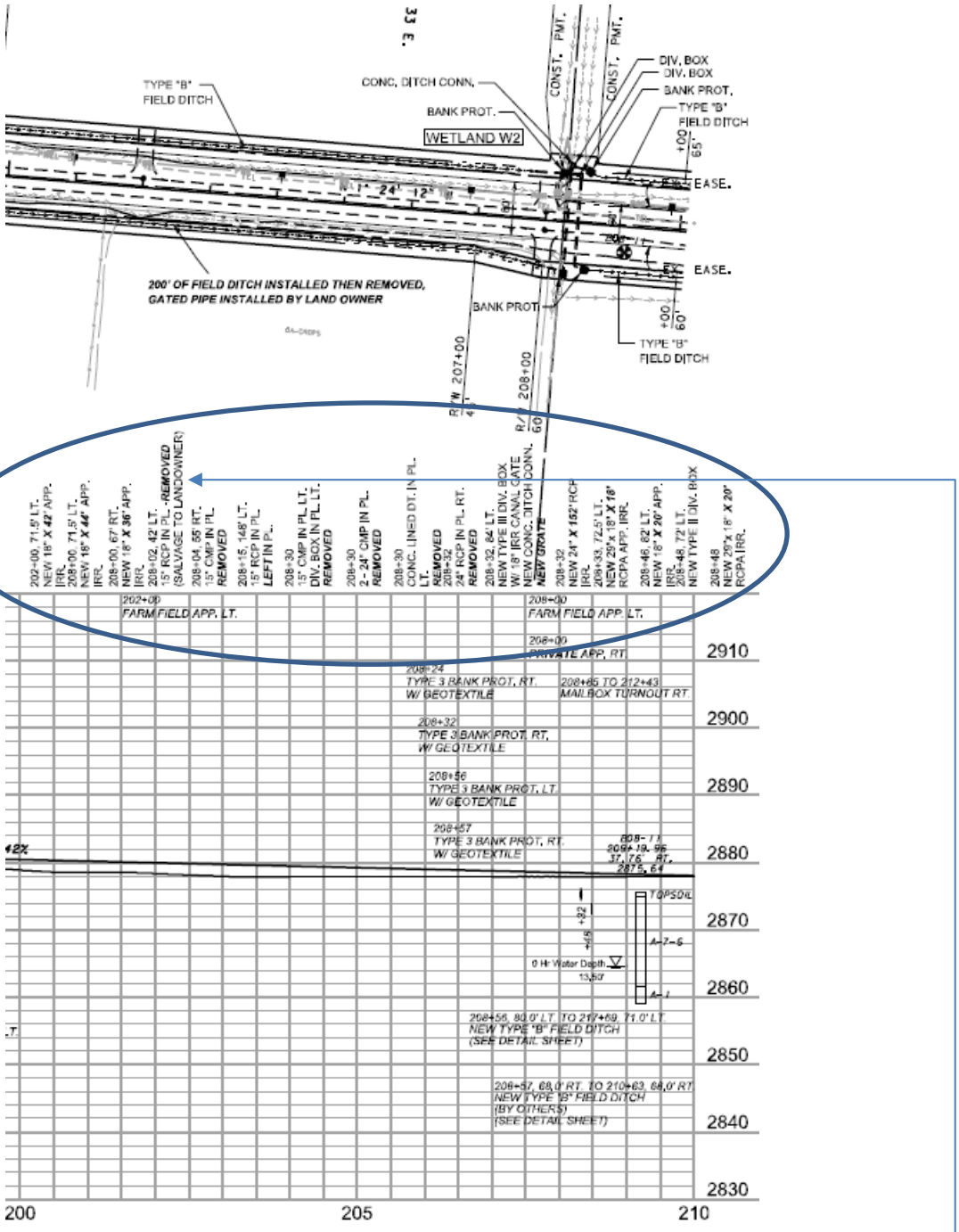
d. A bridge was removed and is outlined in red. Items like this can just have an X placed through them and the “remove” changed to “removed”.

e. Remember to change all text to past tense.

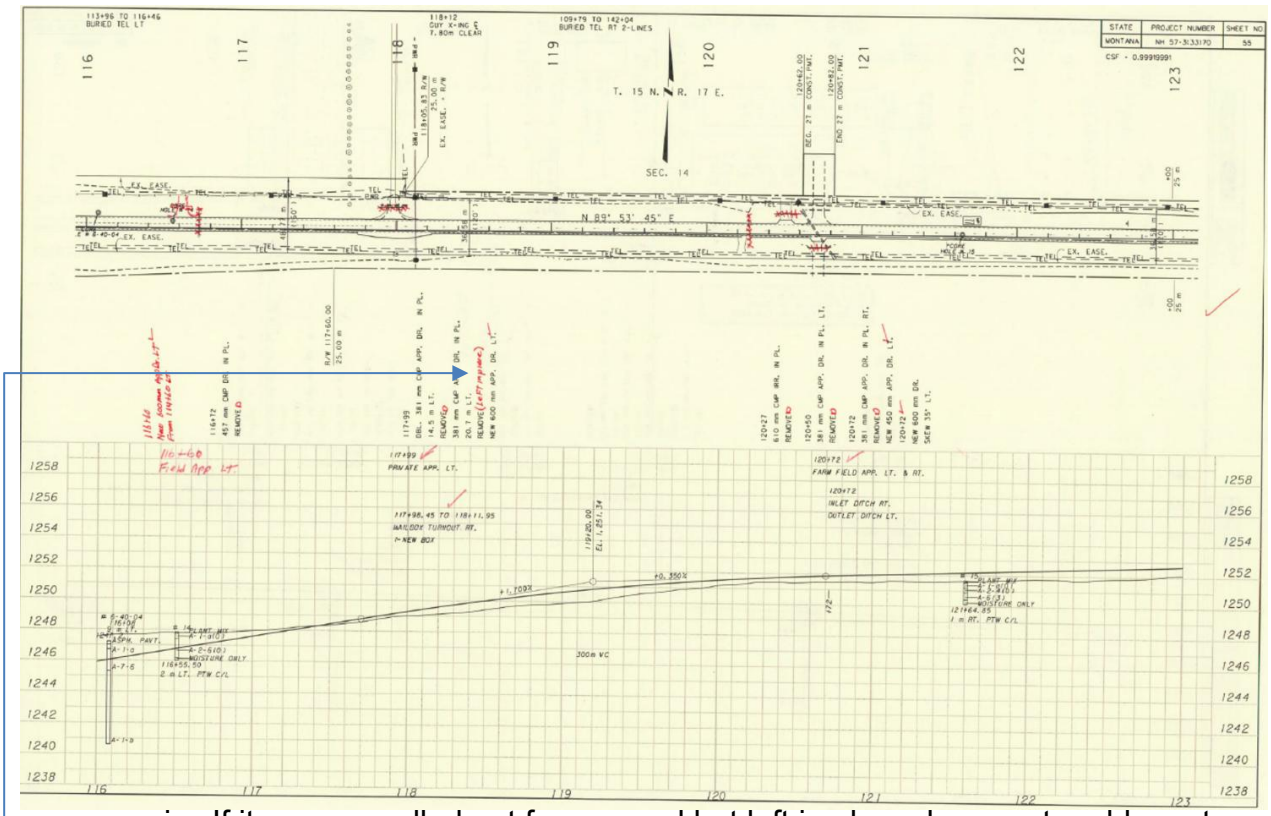
f. These farm field approaches were not installed. X out the approaches and cross out the description.



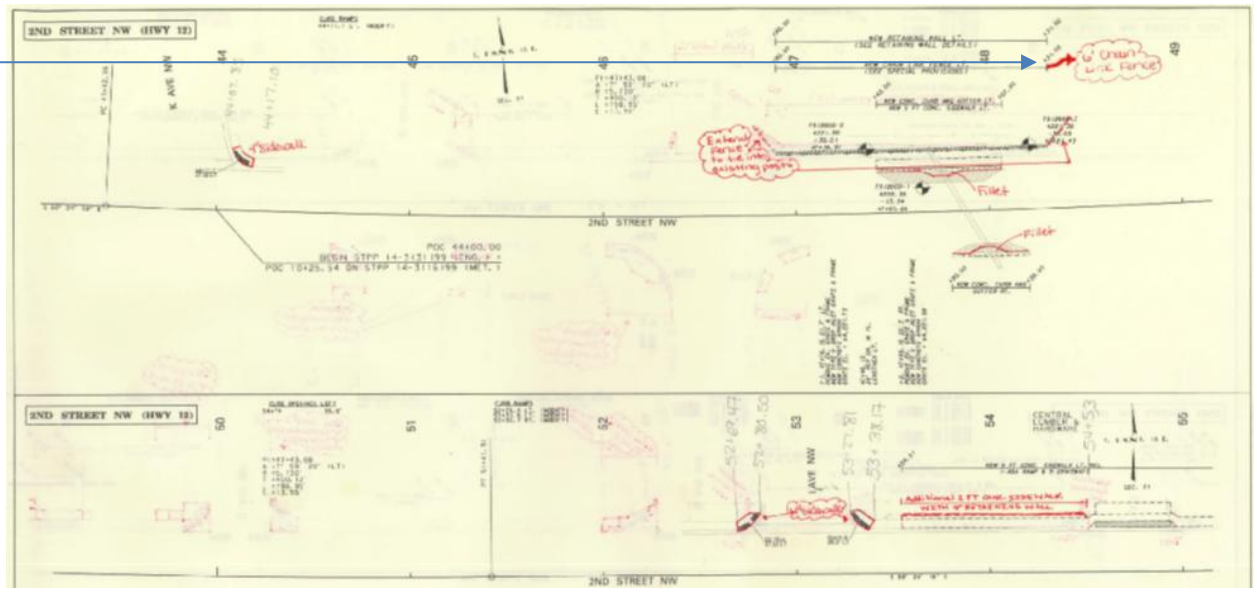
g. A slight change was made to the stationing. Only the text needs to be corrected in instances like this.



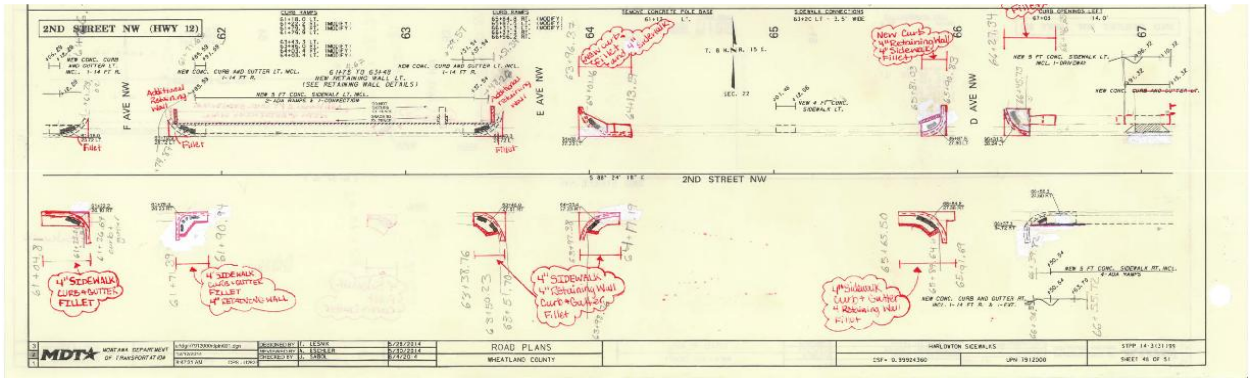
h. This plan sheet has a lot of pipes. Ensure you go through each pipe and mark up any changes and changing all text to past tense. While doing this, add the pipe lengths. This sheet was completed in MicroStation, so the removed pipes were deleted, and the pipe lengths added in the text. When doing redlines, simply X out the removed pipes as mentioned before and add the pipe length next to the description above the profile view.
Note: The "SALVAGE" should have been changed to "***SALVAGED***"



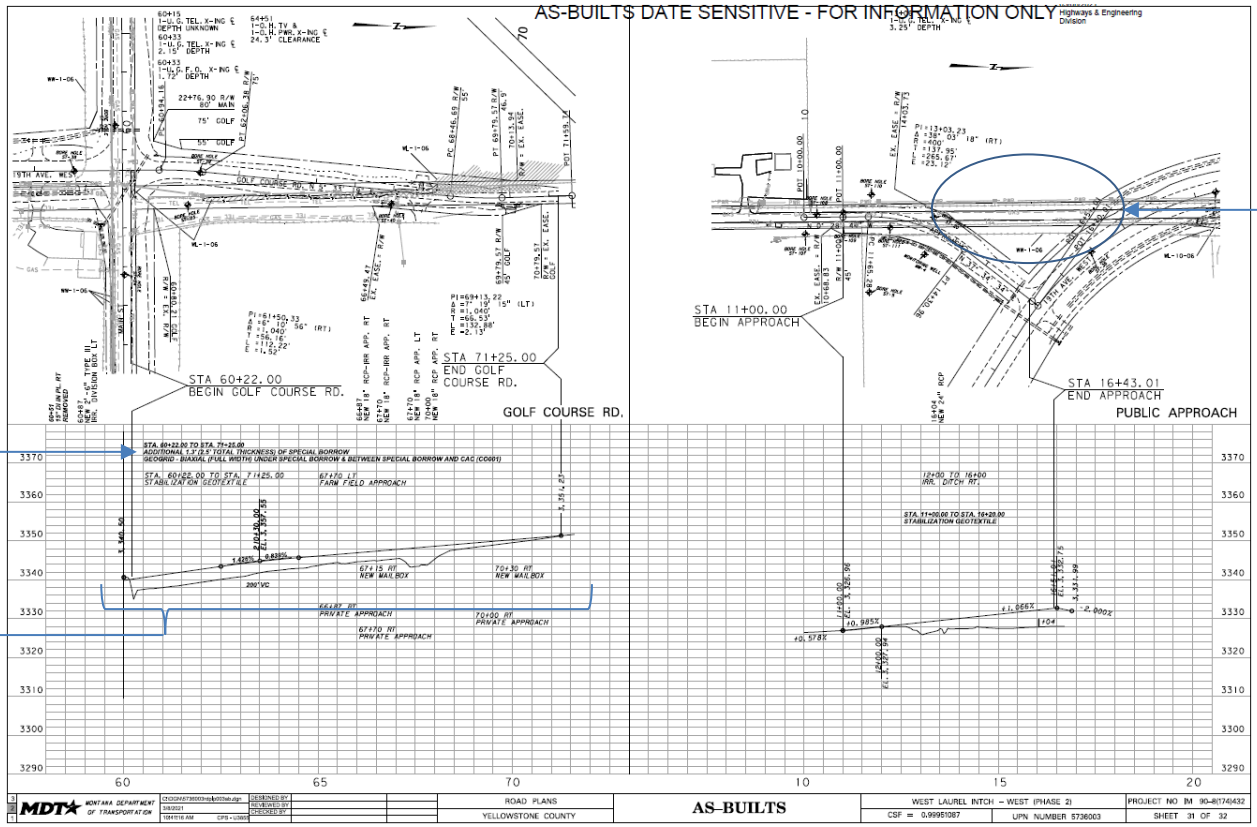
i. If items are called out for removal but left in place, be sure to add a note so these items are not deleted when the MicroStation drawings are edited.



j. Be sure to mark up all changes including fencing and guardrail.



k. Include any changes to curb, gutter, and sidewalk including stationing changes and detectable warning device location changes. Specific lengths and widths are shown in more detail in their respective detail sheets.



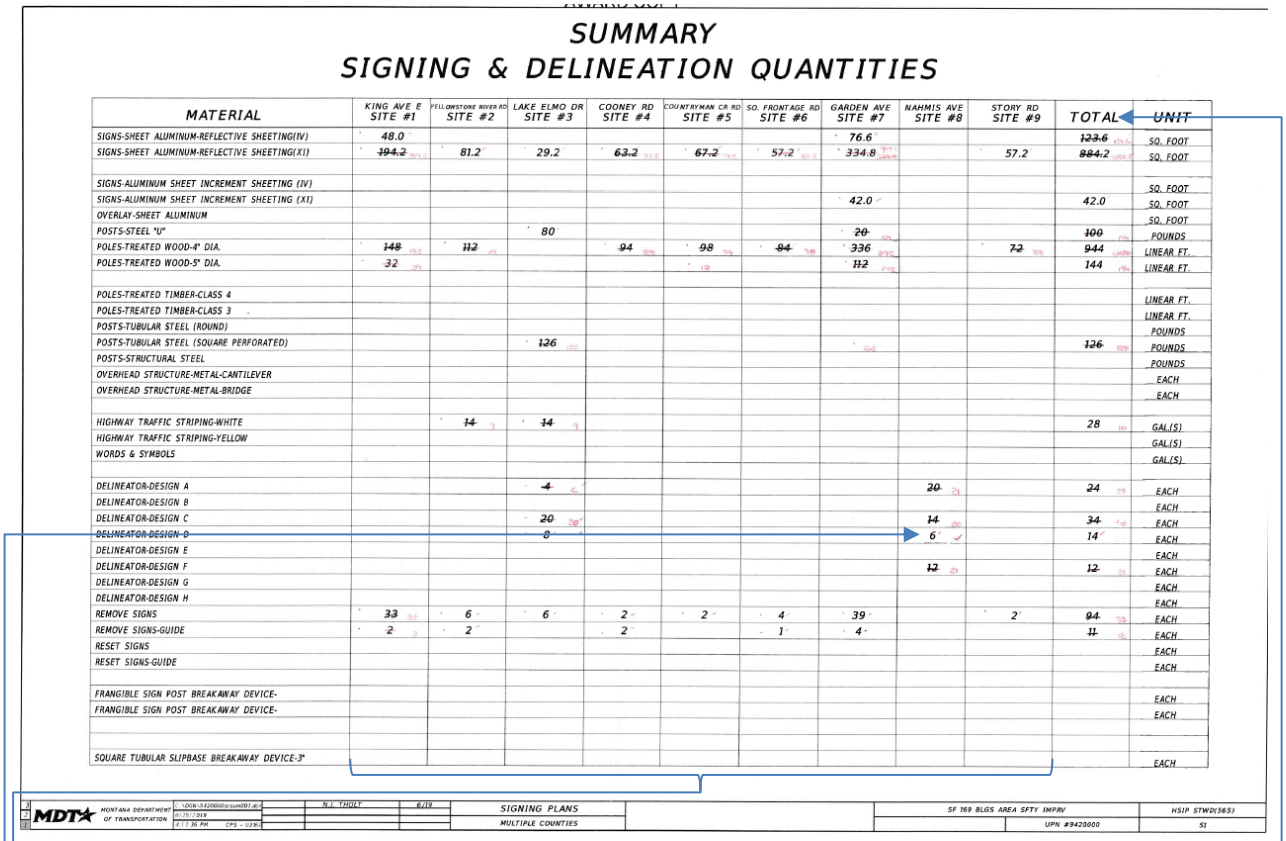
l. Any grade changes that occur need to be documented. Be specific as to what the grade change was and where from/to it occurred.

m. Additional geogrid/geotextile, special borrow, etc. should be noted on the plan and profile as well.

n. Obliterated alignments are completely removed while editing in MicroStation. When marking these up on existing plans, X out the alignments that have been obliterated.

Procedure – As-Built Signing Plans Information

1. Update the summaries to reflect project quantities and information. Signing summaries are typically broke up into two sections, “SIGNING AND DELINEATION QUANTITIES” and “SIGN LOCATION AND SPECIFICATIONS”. The former is a grand total for each bid item on the project. This usually only contains one column for totals. On some projects with multiple locations, each location will be broken out and then a total is included on the far right. The project used below is an example of this. If separate locations are broken out, ensure totals for each location are updated as well as the total for the entire project. The latter shows the specifics for each sign. Every change to any sign should be marked here.

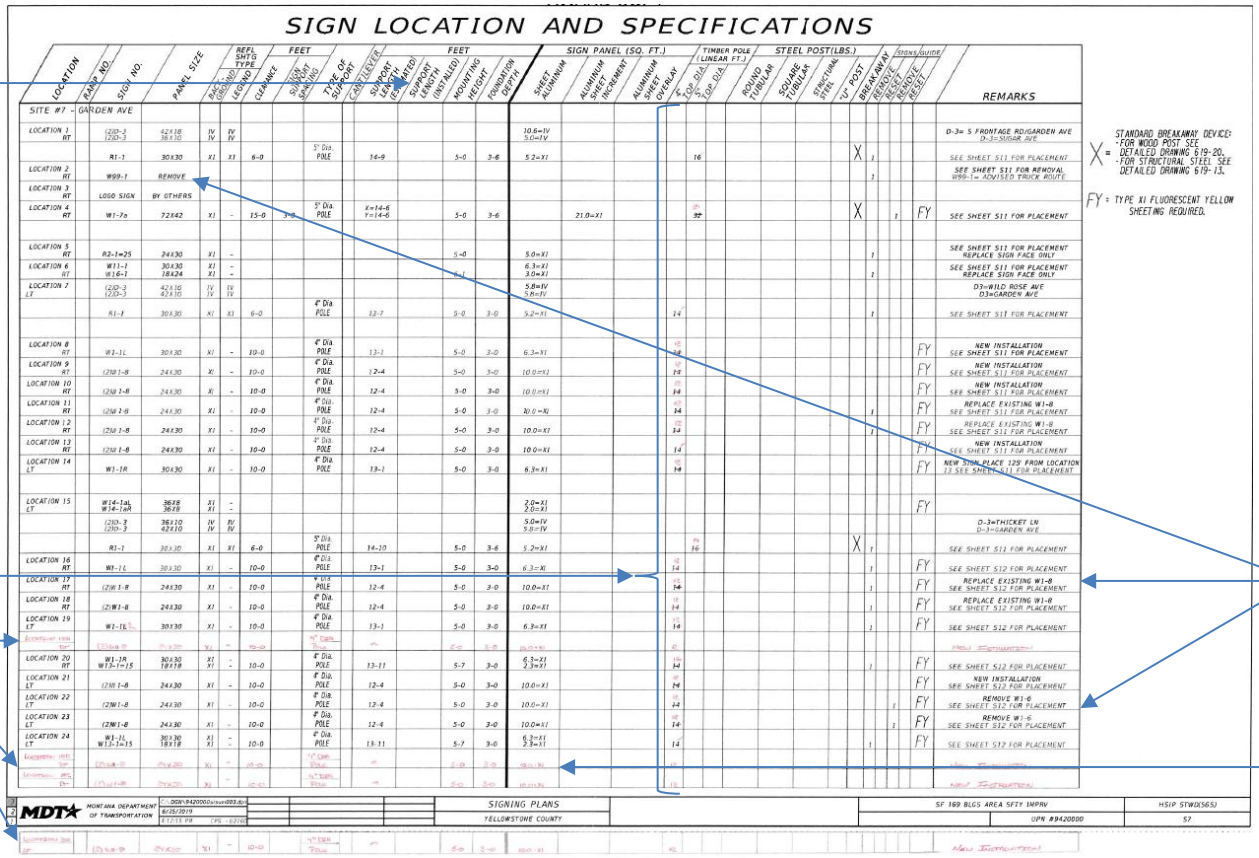


SUMMARY
SIGNING & DELINEATION QUANTITIES

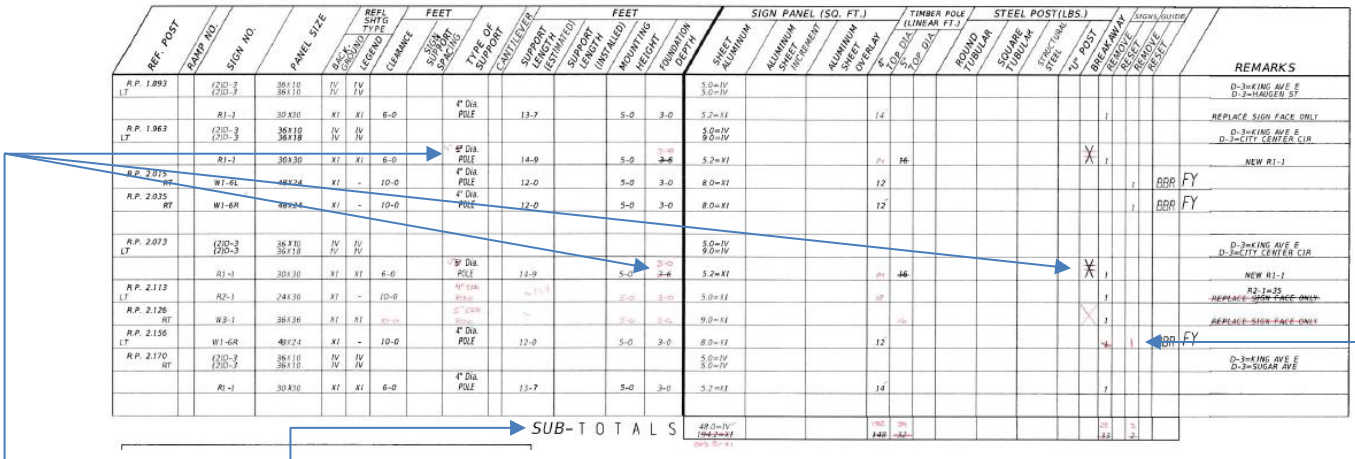
MATERIAL	KING AVE E SITE #1	YELLOWSTONE RIVER RD SITE #2	LAKE ELMO DR SITE #3	COONEY RD SITE #4	COUNTRYMAN CR RD SITE #5	SO. FRONTAGE RD SITE #6	GARDEN AVE SITE #7	NAHMIS AVE SITE #8	STORY RD SITE #9	TOTAL	UNIT
SIGNS-SHEET ALUMINUM-REFLECTIVE SHEETING(IV)	~~48.0~~						~~76.6~~			~~123.6~~	SQ. FOOT
SIGNS-SHEET ALUMINUM-REFLECTIVE SHEETING(XI)	~~194.2~~	81.2	29.2	~~63.2~~	~~67.2~~	~~57.2~~	~~334.8~~		57.2	~~884.2~~	SQ. FOOT
SIGNS-ALUMINUM SHEET INCREMENT SHEETING (IV)											SQ. FOOT
SIGNS-ALUMINUM SHEET INCREMENT SHEETING (XI)							42.0			42.0	SQ. FOOT
OVERLAY-SHEET ALUMINUM											SQ. FOOT
POSTS-STEEL "U"			80				~~20~~			~~100~~	POUNDS
POLES-TREATED WOOD-4" DIA.	~~148~~	~~112~~		~~94~~	~~98~~	~~84~~	~~336~~		~~72~~	~~944~~	LINEAR FT.
POLES-TREATED WOOD-5" DIA.	~~32~~						~~112~~			144	LINEAR FT.
POLES-TREATED TIMBER-CLASS 4											LINEAR FT.
POLES-TREATED TIMBER-CLASS 3											LINEAR FT.
POSTS-TUBULAR STEEL (ROUND)											POUNDS
POSTS-TUBULAR STEEL (SQUARE PERFORATED)			~~126~~							~~126~~	POUNDS
POSTS-STRUCTURAL STEEL											POUNDS
OVERHEAD STRUCTURE-METAL-CANTILEVER											EACH
OVERHEAD STRUCTURE-METAL-BRIDGE											EACH
HIGHWAY TRAFFIC STRIPING-WHITE		~~14~~	~~14~~							28	GAL(S)
HIGHWAY TRAFFIC STRIPING-YELLOW											GAL(S)
WORDS & SYMBOLS											GAL(S)
DELINEATOR-DESIGN A			~~4~~					20		~~24~~	EACH
DELINEATOR-DESIGN B											EACH
DELINEATOR-DESIGN C			~~20~~					~~14~~		~~34~~	EACH
DELINEATOR-DESIGN D			~~8~~					6		14	EACH
DELINEATOR-DESIGN E											EACH
DELINEATOR-DESIGN F								~~12~~		~~12~~	EACH
DELINEATOR-DESIGN G											EACH
DELINEATOR-DESIGN H											EACH
REMOVE SIGNS	~~33~~	6	6	2	2	4	39		2	~~94~~	EACH
REMOVE SIGNS-GUIDE	~~2~~	2		2		1	4			~~11~~	EACH
RESET SIGNS											EACH
RESET SIGNS-GUIDE											EACH
FRANGIBLE SIGN POST BREAKAWAY DEVICE-											EACH
FRANGIBLE SIGN POST BREAKAWAY DEVICE-											EACH
SQUARE TUBULAR SLIPBASE BREAKAWAY DEVICE-3"											EACH

MDT MONTANA DEPARTMENT OF TRANSPORTATION | N.J. THOLT | 6/19 | SIGNING PLANS MULTIPLE COUNTIES | SF 169 BLGS AREA SFTY IMPRV UPN #9420000 | HSIP STWD(565) 51

a. On this project, multiple locations are broken out in their own separate column. Ensure to update each site’s total for each bid item.
b. Once each location is updated, update the project total in its respective column. Most projects will only have this column.
c. Check marks next to items that match plan are helpful when trying to determine if there were any changes to a total or item.



d. Several signs were added. Include all information for each sign following the same criteria as the designer.
e. Update the post length to match the placed quantity (calculated on signing spreadsheet).
   Note: The “SUPPORT LENGTH (INSTALLED)” is optional but if this is filled out, this should be the actual length of the post (Ex.: Wood posts are rounded to the next 2’ of length for placed quantity, but a 14’ paid post may only be 12.5’. This column would have the 12.5’ while the “TIMBER POLE (LINEAR FT.)” column would contain the 14’).
f. Ensure the type of sheeting is noted and in its correct column.
g. Remember to change any text to past tense (“REMOVE” to “REMOVED”, “REPLACE” to “REPLACED”, etc.). This was missed while completing these as-builts. Doing this helps make it easy to know a sign was removed or replaced according to plan.



h. Several posts were changed/added. Be sure to update the pole size, move/add the quantity to the correct column, foundation depths, and add any changes to or additions/omissions of breakaways if applicable.

i. One “REMOVE SIGNS” was changed to a “REMOVE GUIDE”. Update each quantity as seen above.

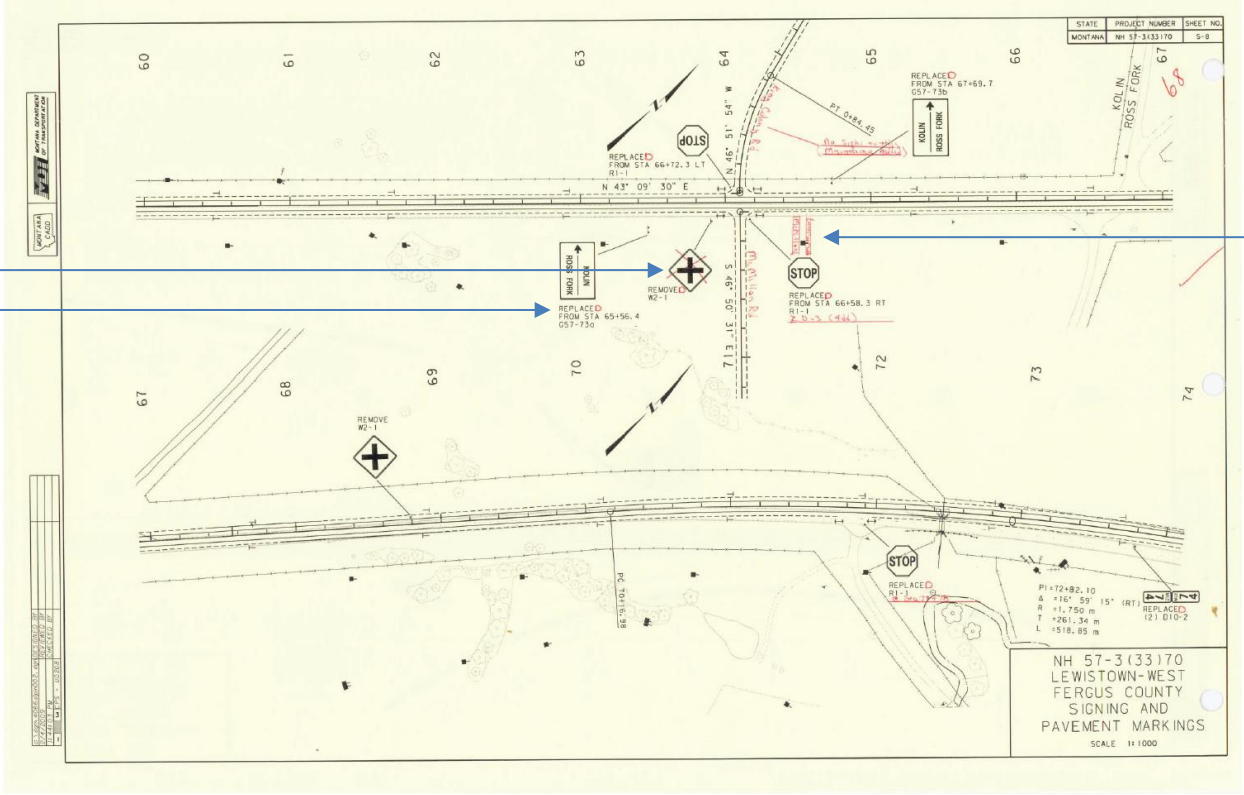
j. Remember to update the “SUB-TOTALS” row with the total quantity for each item.

k. Update the delineator summaries with totals.

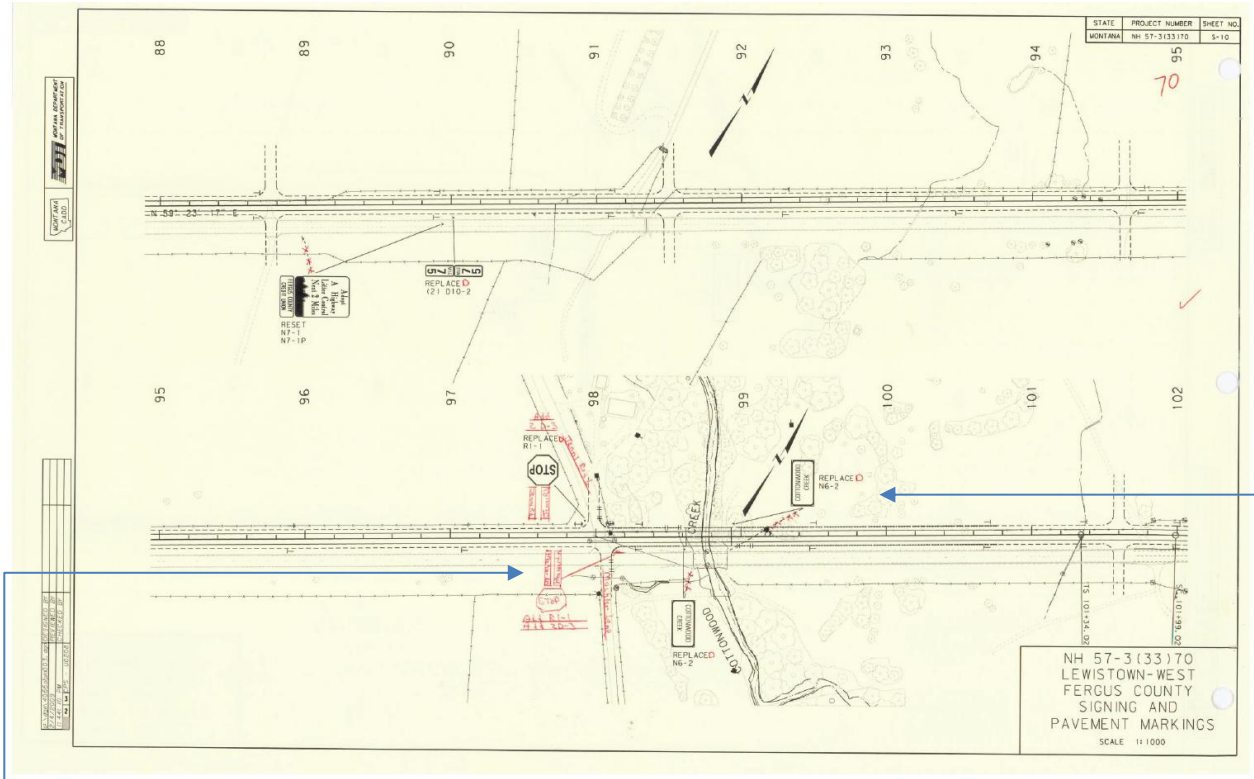
DELINEATION TABLE		
⊣	DESIGN "A"	247
⊢⊣	DESIGN "D"	6

PANEL DELIN. LEGEND		
⊣	PANEL DES "A"	27
⊢⊣	PANEL DES "F"	28

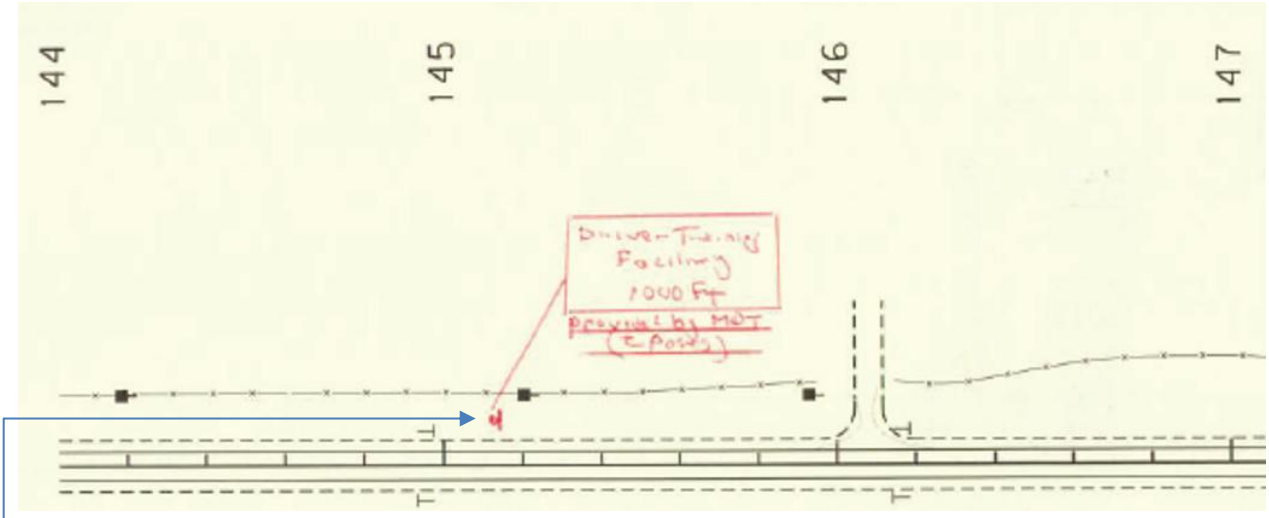
2. Update the signing plan view to reflect the as-built project. Signing plans usually include locations and descriptions of each sign and what is being done at that location such as remove, reset, replace, etc.



a. Change text to past tense. (Signs that have a remove called out, change to “REMOVED”). Again, this makes it easy to determine if a sign was installed, removed, reset, etc. according to plan.
b. Signs that are removed should have a red X placed through them.
c. If NSOP signs are added, include the sign number and station. If it is a generic sign such as a stop sign(R1-1), no further information is needed. If it is a sign that includes custom print such as street signs(D-3), include what the sign says (legend) so it can be added in MicroStation.



d. New signs were added. Be sure to include the sign number and legend.
e. When a sign is being replaced there are typically 2 lines on the plans. One to the old location and one to the new. When redlining these, X out the old location line. Also remember to add a “D” to “REPLACE”.

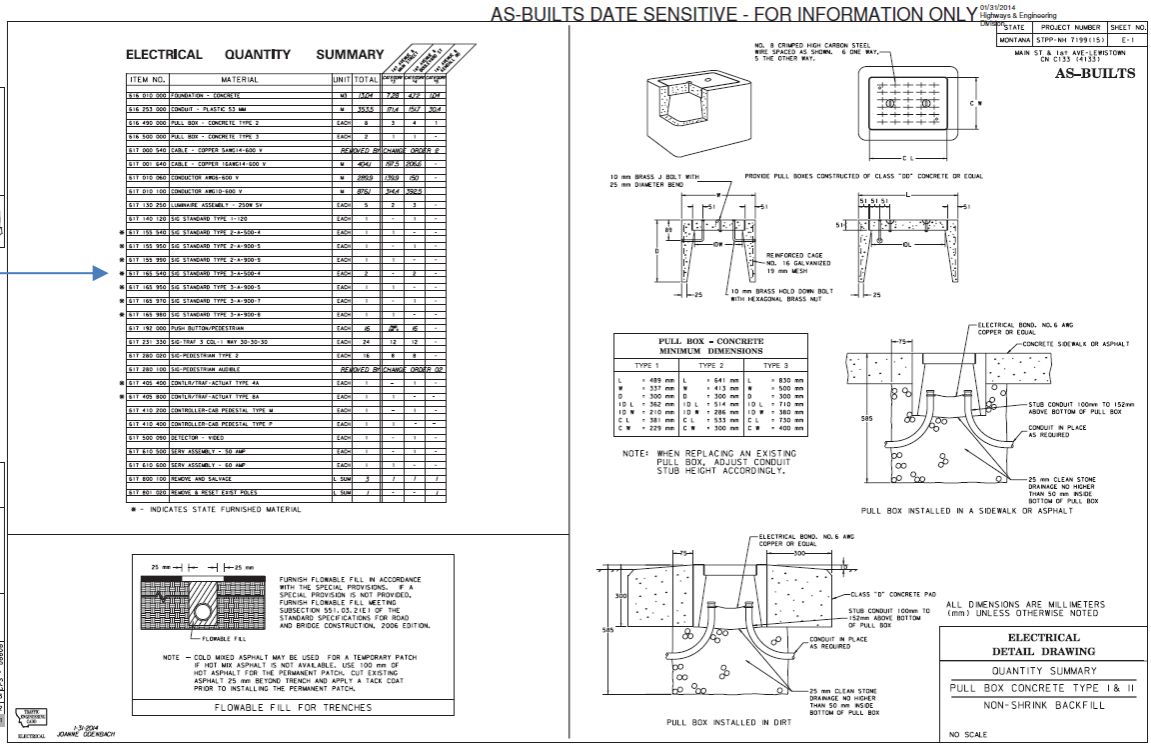


f. When adding NSOP signs, pay attention to the way they are drawn in. The small circle is the post, and the line represents the sign face. Make sure the sign is facing the correct direction so there is no confusion.

Procedure – As-Built Electrical Plans Information

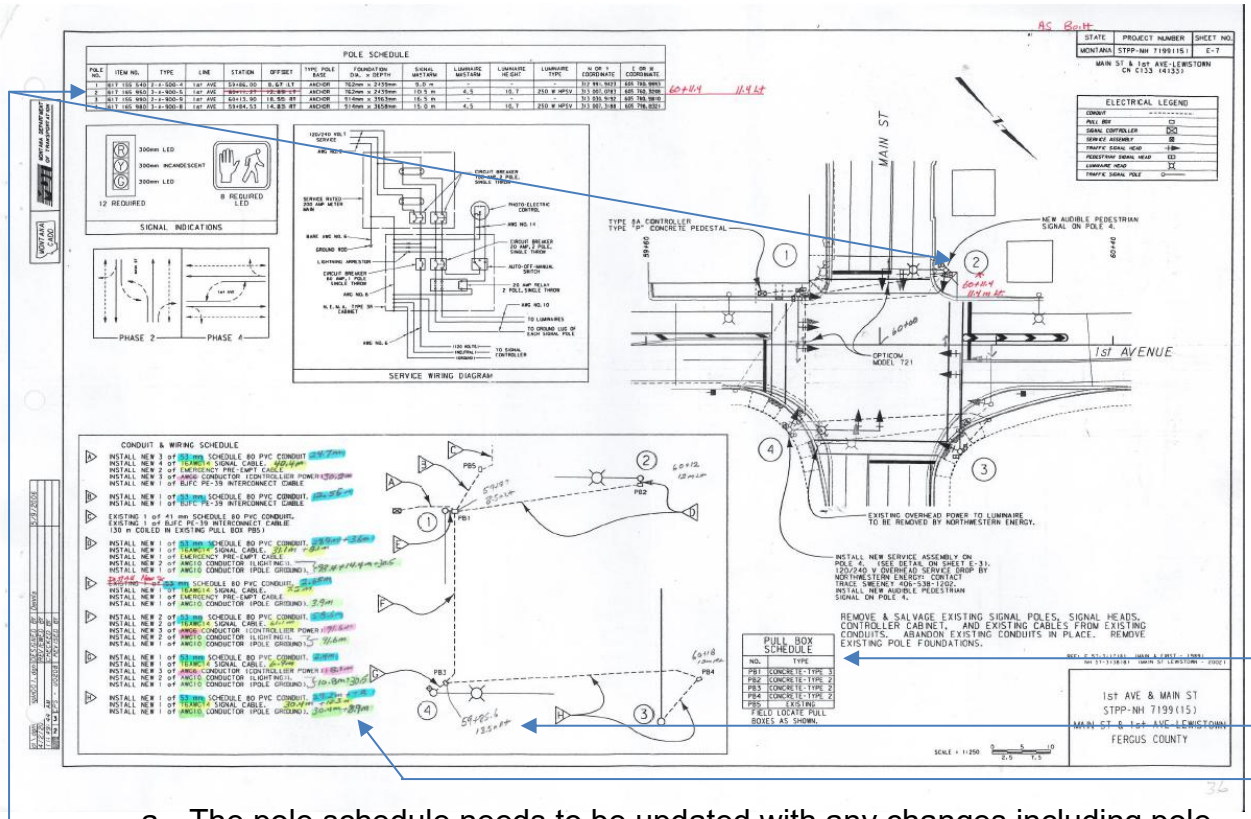
Note: Electrical as-builts need to be very accurate. Most electrical is underground and MDT designs all of the electrical plans for projects in-house. Accurate as-builts are crucial to the success of projects being designed in the future as well as maintenance after electrical systems are installed.

1. Update the electrical summary with totals for the project.

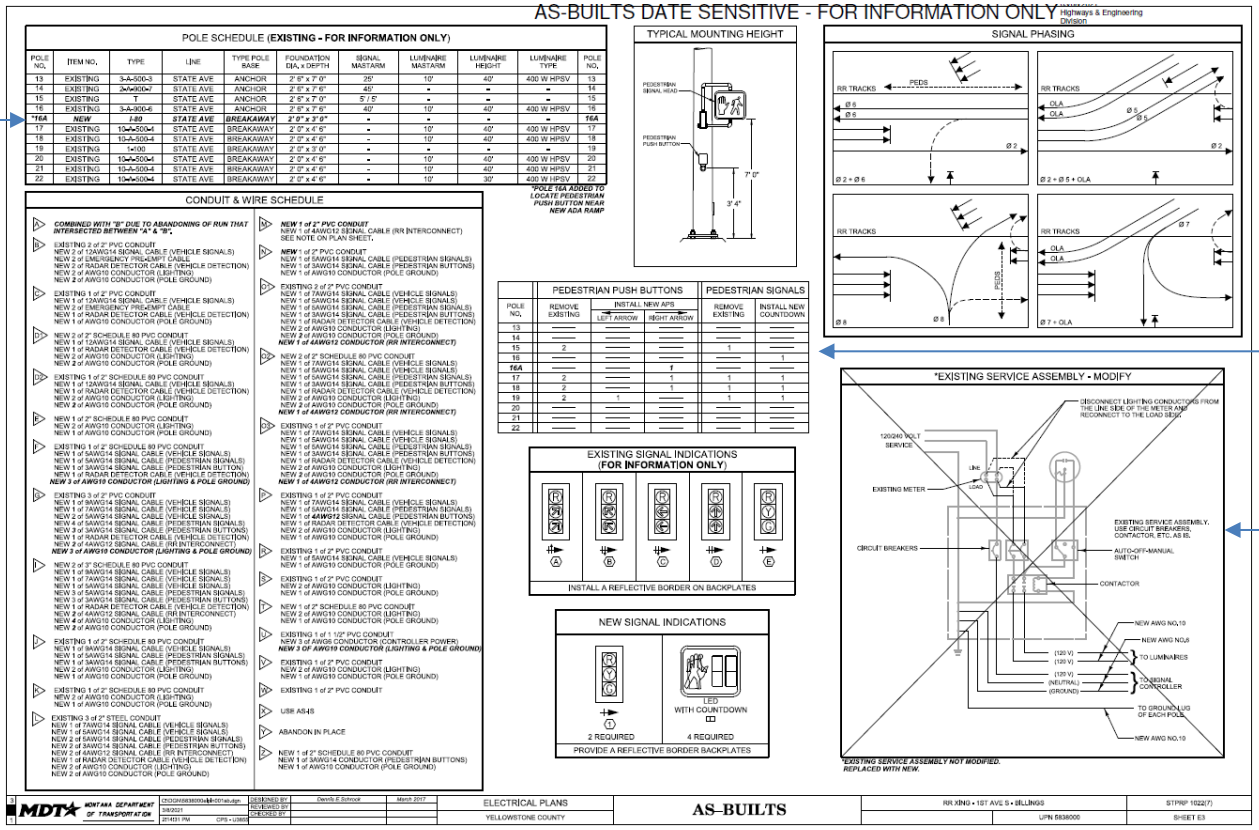


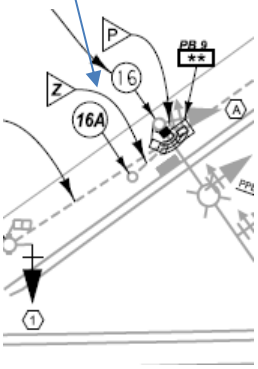
a. Electrical summaries only require totals for the project. This summary was edited in MicroStation. If redlining a summary, simply cross out the original quantity and write in the correct quantity.

2. Update the electrical plan sheets to reflect any field changes.



a. The pole schedule needs to be updated with any changes including pole types, luminaires, locations, etc. On this set, the station and offset were changed. Also note location changes in the plan view.
b. In the conduit and wiring schedule, the person completing these redlines added a length for each run. This is not required but is helpful. On some projects this may not work since the letters may be used multiple times on the same sheet and can get cramped trying to fit it all in but can be noted next to each run in the diagram. Any changes to wiring or conduit including type or amount needs to be shown here.
c. Pull box stations and offsets need to be included for as-builts. Conduit/wire routing locations should also be updated if they are different than plan location. This is typically just pull box to pull box but any variance between needs to be marked up. This person marked a station and offset for each pull box making it very easy for the person completing the MicroStation drawings to update any that were moved from plan.
d. The pull box schedule also needs to be updated to reflect any changes made in the field. Some recent plans have come out that do not include these and do not label pull boxes. Add or update these as necessary.





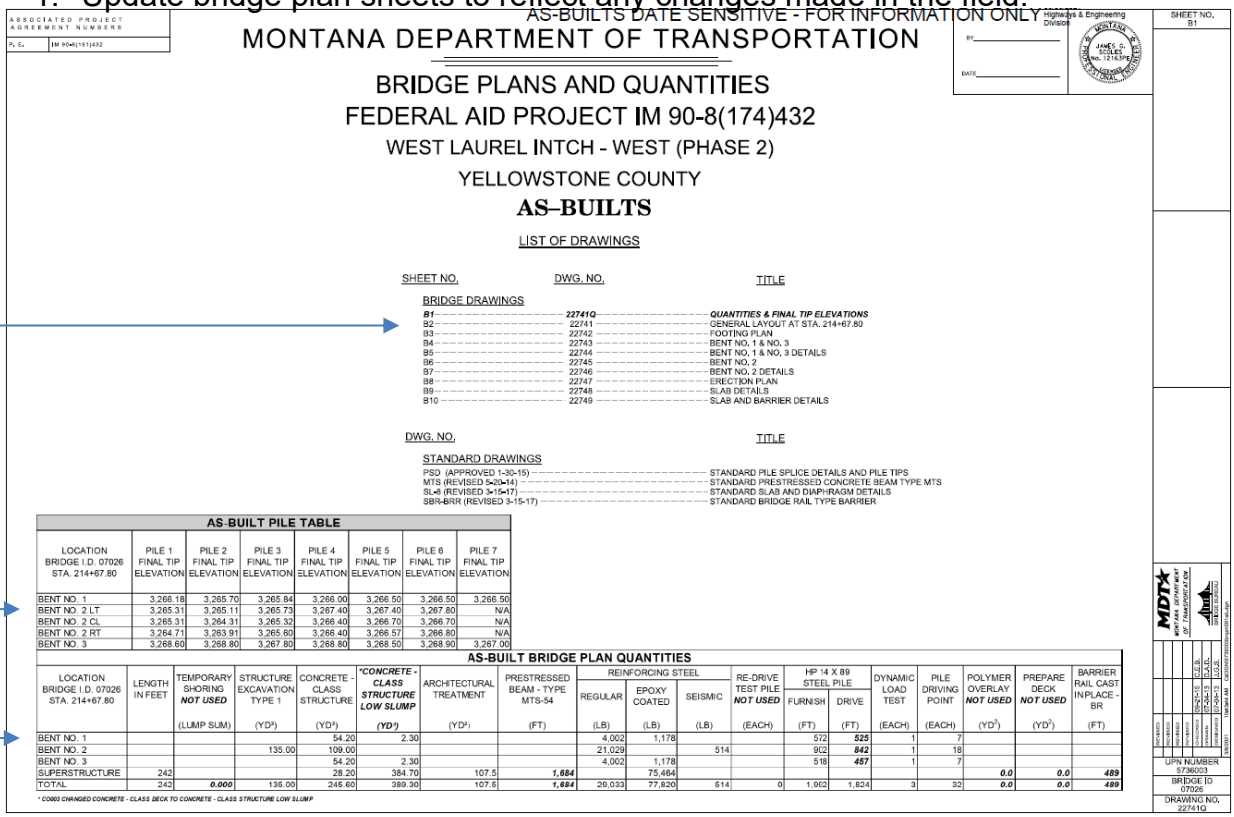
e. Again, accuracy is incredibly important when dealing with electrical as-builts. The new pole (16A) was added and paid under agreed price as there were no bid items for poles on this project. All poles were originally planned to be used as-is. Items like this can easily be missed or forgotten as they are not under their normal bid item when creating redline drawings and checking them against an item work report. Change order items can be just as easily missed as they are often input as lump sum and simply called “MISCELLANEOUS ITEMS – LS” with no indication of the work being done unless you actually read the change order. Check and recheck miscellaneous work /change order items to make sure items like this are not missed. Be sure to update the plan view to reflect these changes including wiring and pole.

f. Update any details that were changed or not used. Place an X through the drawing if it was not used.

g. Update pedestrian push button and signal schedules.

Procedure – As-Built Bridge Plan Information

1. Update bridge plan sheets to reflect any changes made in the field.



AS-BUILTS DATE SENSITIVE - FOR INFORMATION ONLY

MONTANA DEPARTMENT OF TRANSPORTATION

BRIDGE PLANS AND QUANTITIES
FEDERAL AID PROJECT IM 90-8(174)432
WEST LAUREL INTCH - WEST (PHASE 2)
YELLOWSTONE COUNTY
AS–BUILTS

LIST OF DRAWINGS

SHEET NO.	DWG. NO.	TITLE
BRIDGE DRAWINGS		
B1	22741Q	QUANTITIES & FINAL TIP ELEVATIONS
B2	22741	GENERAL LAYOUT AT STA. 214+67.80
B3	22742	FOOTING PLAN
B4	22743	BENT NO. 1 & NO. 3
B5	22744	BENT NO. 1 & NO. 3 DETAILS
B6	22745	BENT NO. 2
B7	22746	BENT NO. 2 DETAILS
B8	22747	ERECTION PLAN
B9	22748	SLAB DETAILS
B10	22749	SLAB AND BARRIER DETAILS

DWG. NO.	TITLE
STANDARD DRAWINGS	
PSD (APPROVED 1-30-15)	STANDARD PILE SPLICE DETAILS AND PILE TIPS
MTS (REVISED 5-20-14)	STANDARD PRESTRESSED CONCRETE BEAM TYPE MTS
SL-8 (REVISED 3-15-17)	STANDARD SLAB AND DIAPHRAGM DETAILS
SBR-BRR (REVISED 3-15-17)	STANDARD BRIDGE RAIL TYPE BARRIER

AS-BUILT PILE TABLE

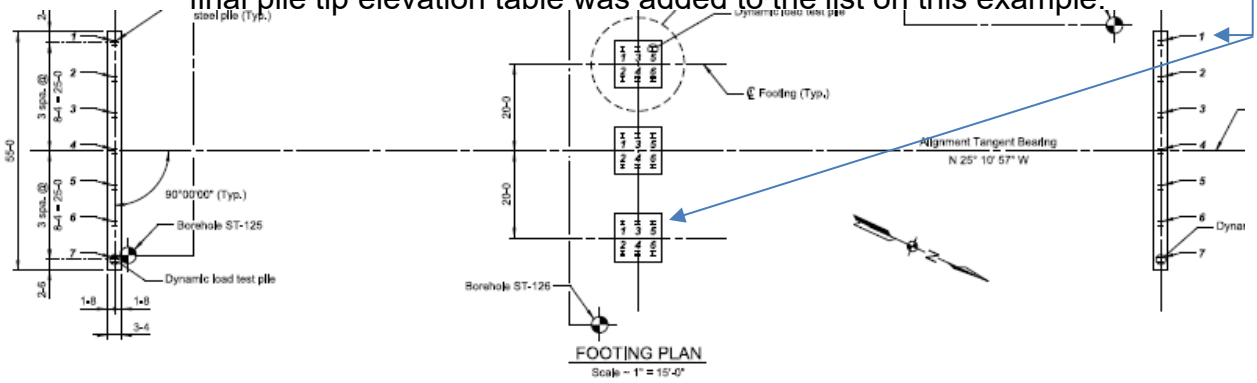
LOCATION BRIDGE I.D. 07026 STA. 214+67.80	PILE 1 FINAL TIP ELEVATION	PILE 2 FINAL TIP ELEVATION	PILE 3 FINAL TIP ELEVATION	PILE 4 FINAL TIP ELEVATION	PILE 5 FINAL TIP ELEVATION	PILE 6 FINAL TIP ELEVATION	PILE 7 FINAL TIP ELEVATION
BENT NO. 1	3,266.18	3,265.70	3,265.84	3,266.00	3,266.50	3,266.50	3,266.50
BENT NO. 2 LT	3,265.31	3,265.11	3,265.73	3,267.40	3,267.40	3,267.80	N/A
BENT NO. 2 CL	3,265.31	3,264.31	3,265.32	3,266.40	3,266.70	3,266.70	N/A
BENT NO. 2 RT	3,264.71	3,263.91	3,265.60	3,266.40	3,266.57	3,266.80	N/A
BENT NO. 3	3,268.60	3,268.80	3,267.80	3,268.80	3,268.50	3,268.90	3,267.00

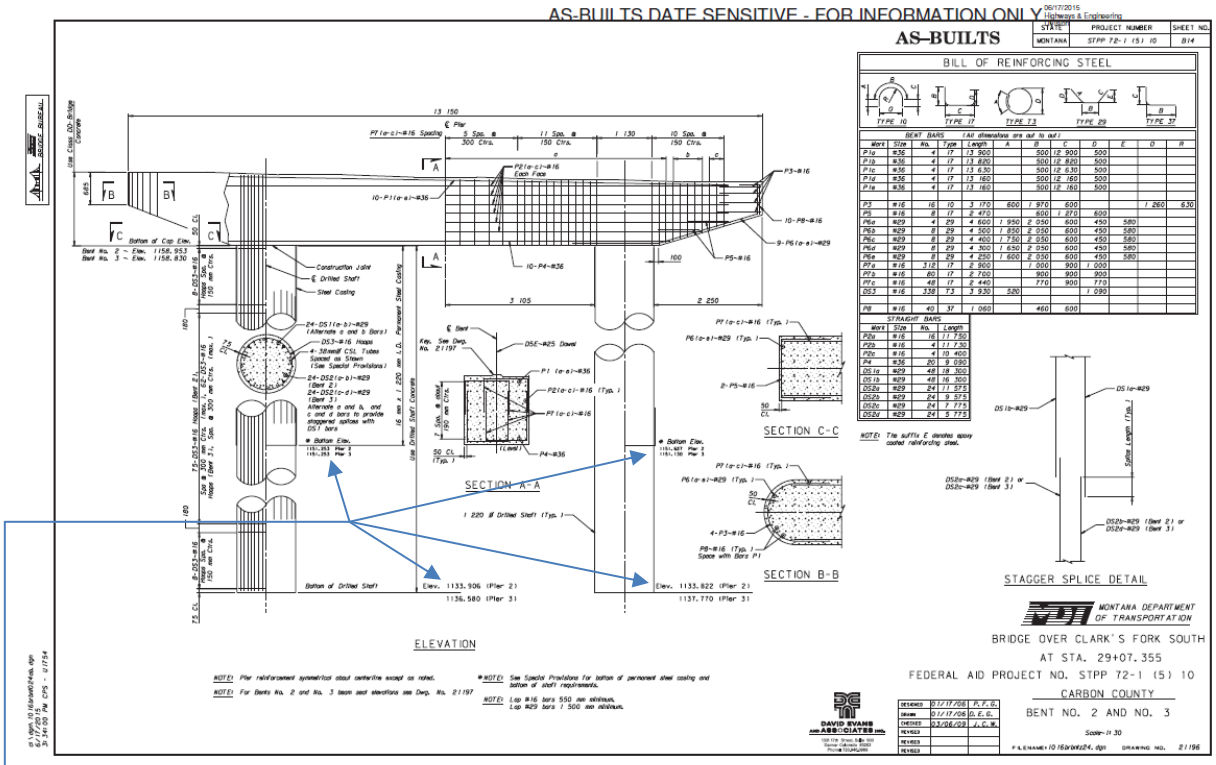
AS-BUILT BRIDGE PLAN QUANTITIES

LOCATION BRIDGE I.D. 07026 STA. 214+67.80	LENGTH IN FEET	TEMPORARY SHORING *NOT USED*	STRUCTURE EXCAVATION TYPE 1	CONCRETE - CLASS STRUCTURE	*"CONCRETE - CLASS STRUCTURE LOW SLUMP*	ARCHITECTURAL TREATMENT	PRESTRESSED BEAM - TYPE MTS-54	REINFORCING STEEL			RE-DRIVE TEST PILE *NOT USED*	HP 14 X 89 STEEL PILE		DYNAMIC LOAD TEST	PILE DRIVING POINT	POLYMER OVERLAY *NOT USED*	PREPARE DECK *NOT USED*	BARRIER RAIL CAST IN PLACE - BR
								REGULAR	EPOXY COATED	SEISMIC		FURNISH	DRIVE					
		(LUMP SUM)	(YD³)	(YD³)	*(YD³)*	(YD³)	(FT)	(LB)	(LB)	(LB)	(EACH)	(FT)	(FT)	(EACH)	(EACH)	(YD³)	(YD³)	(FT)
BENT NO. 1				54.20	2.30			4,002	1,178			572	*525*	1	7			
BENT NO. 2			135.00	109.00				21,029		514		902	*842*	1	18			
BENT NO. 3				54.20	2.30			4,002	1,178			518	*457*	1	7			
SUPERSTRUCTURE	242			28.20	384.70	107.5	*1,684*		75,464							*0.0*	*0.0*	*489*
TOTAL	242	*0.000*	135.00	245.60	389.30	107.5	*1,684*	26,033	77,820	514	0	1,992	1,824	3	32	*0.0*	*0.0*	*489*

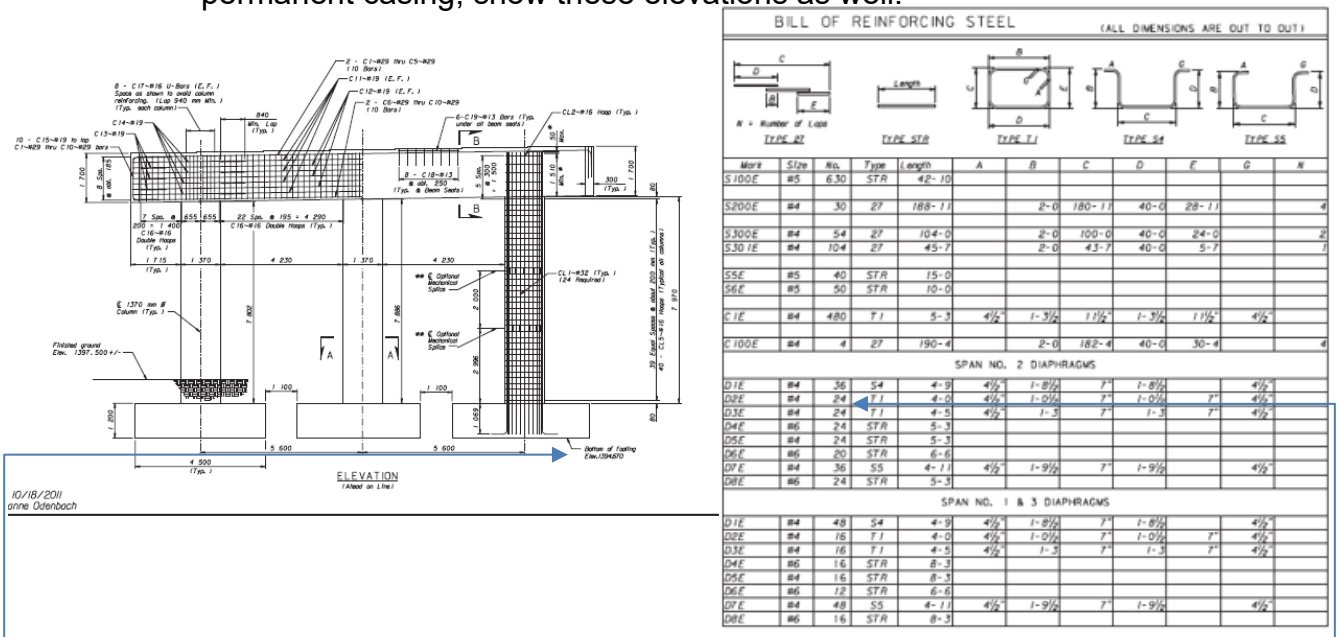
* C0003 CHANGED CONCRETE - CLASS DECK TO CONCRETE - CLASS STRUCTURE LOW SLUMP

   a. Update the bridge quantity summary. This is labeled as “ESTIMATED BRIDGE PLAN QUANTITIES”. Once the quantities are updated, this will be labeled as “AS-BUILT BRIDGE PLAN QUANTITIES”.
   b. Final pile tip elevations need to be included on bridge as-builts. These can be added on the title page or on the page depicting pile driving information (typically the footing plan sheet). Label the piles to correspond with the pile tip elevation table.
   c. Update the “LIST OF DRAWINGS” if anything is added or changed. The final pile tip elevation table was added to the list on this example.





d. Drilled shaft elevations need to be shown on the as-builts. If there is a permanent casing, show these elevations as well.



e. Mark up any changes to sheets. The footing elevation was changed in the field. If marking up by hand, just X out the existing and write in the new.

f. Rebar was changed in this “BILL OF REINFORCING STEEL”.

Note: Bridges are typically built very close if not virtually identical to plan, but any changes need to be noted accurately.

Procedure – As-Built Cross Section Information

1. Cross Sections are <u>not</u> required for as-builts.

