



**Montana Department
of Transportation**

CONSTRUCTION MEMO

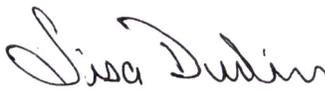
Date Issued: April 6, 2009

Date Effective: April 6, 2009

Related Specifications: N/A

Subject: Mass Diagrams and Shrink/Swell Factors

To: Distribution

From: Lisa Durbin, P.E., 
Construction Administration Services Engineer

This memo is to clarify the required procedures with respect to mass diagrams and shrink/swell data.

As indicated by Paul Ferry in a memo dated July 7, 2008, the designed mass diagram is no longer being included in the contract bid documents. However, it is an essential design tool, and is still being generated on unclassified excavation projects. The mass diagram is also required by construction personnel. It can be obtained either by using the Document Management System, or by downloading it from the Contractor's System on the internet (see attached instructions). The dirt runs and mass diagram are available on the internet for the current month's letting and for three months after the letting.

Accordingly, the shrink/swell data continues to be essential for improving the quality of the designed mass diagrams. Design personnel need to obtain the as-built shrink/swell data from completed projects to use on future designs. The shrink/swell information used by design will never be precise, but the more data they have between Geotechnical personnel and historical construction projects, the better it will be.

Construction personnel can use the Engineering Applications or Microstation to generate the as-built mass diagram. Once complete, there is a generic field in SiteManager (Contract Administration > Contract Records > Projects > Generic Fields) to record the average shrink or swell factor on each project. If the project has variable shrink/swell factors that can not be represented with an average, enter "999" in the generic field to indicate that it varies, and include a Word or Excel document in the Site_Manager share drive (folder 12_Contract_Mtrl) with a table listing the stations and shrink/swell factors. The Construction Summary Report will indicate "Variable – See SM Share Drive" when that occurs.

copies: Engineering Project Managers
 District Construction Engineers
 Kevin Christensen, P.E.
 Construction Engineering Services Bureau
 Paul Ferry, P.E.
 Tim Conway, P.E.
 Suzy Price
 Tim Reardon, Legal
 Helen Varcoe, Internal Audit

Attachment:

http://www.mdt.mt.gov/business/contracting/current_letting.shtml

The screenshot shows the Montana Department of Transportation website. At the top left is the 'mt.gov' logo with the tagline 'Montana's Official State Website'. To the right is a banner image of a snowy road. Below the banner is a green navigation bar with links: 'About MDT', 'Traveler Information', 'Public Involvement', 'Doing Business', 'Publications', and 'Search/Index'. The main content area is divided into two columns. The left column contains several menu sections: 'HIGHWAY CONTRACTORS' (with links like 'Letting Info/Q & A Forum', 'Contractor's List', etc.), 'MCA-MDT TECH COMMITTEE', 'SPECIFICATIONS', 'DESIGN CONSULTANTS', 'SUPPLY & SERVICE VENDORS', and 'SPECIAL CONSIDERATIONS'. The right column is titled 'Current Letting Information' and contains a 'Notice to Contractors' box. The notice states that starting in January 2009, the department will hold two bid lettings each month, with exceptions for October, November, and December. Below the notice, there are three paragraphs of text explaining the on-line bidding process and the contractor's responsibility to review project information. At the bottom of the right column is a list of links, with 'Bid Packages' circled in red.

Montana Department of Transportation

Current Letting Information

Notice to Contractors:

Starting in January 2009, Montana Department of Transportation will be holding two bid lettings each month, with the exception of October, November and December. Please see the revised schedule.

The ability to access this information on-line is not to be construed as an indication that a person or entity is eligible to receive bid proposals or to bid on projects for which bids are being solicited. Official bid proposal documents issued by the Department of Transportation must be used when bidding.

The availability of on-line information does not relieve prospective bidders of their obligation to review and become familiar with the plans, specifications, addenda, bidding requirements, site conditions, and all other relevant project and bidding requirements.

It is the contractor's responsibility to view any clarifications and/or questions and answers that are posted on the **Question & Answer Forum** for any project they may be submitting a bid on as a prime bidder, a subcontractor or a supplier. The information supplied in the forum is subject to change up until 5:00 PM on the day before the scheduled bid letting. The information that is posted at that time will be included in the awarded contract. Always refresh/reload your view when revisiting the forum to be sure you are accessing the most current information.

- Addendum Overview
- As Read Letting List
- Archived Bid Reports (Average Prices/Award Sheets/Bid Tabs)
- Award Sheets
- Bid Packages** | Bid Files | Bid Envelope
- Expedite Software
- Forms
- Invitation for Bid - 100 series | 200 series
- Item List - English
- Item List - Metric
- Advertising/Letting/Award Schedule
- Plan Holders List
- Question & Answer Forum

FTP directory /contract/bid-packages/ at ftp.mdt.mt.gov

[Up to higher level directory](#)

01/15/2009 08:59AM	Directory	FEBRUARY 12 2009 LETTING	← Select appropriate letting (bid packages will be posted for 2-3 months after the letting)
12/31/2008 12:00AM	Directory	JANUARY 29 2009 LETTING	
09/26/2008 12:00AM	Directory	RECENT LETTINGS	
10/26/2005 12:00AM	50,027	CLEAR_CACHE.PDF	
01/15/2009 09:06AM	44,639	INVITATION 100 SERIES.PDF	
12/31/2008 12:00AM	53,799	INVITATION 200 SERIES.PDF	
01/15/2009 09:06AM	30,964	ORDER FORM 100 SERIES.PDF	
12/31/2008 12:00AM	31,184	ORDER FORM 200 SERIES.PDF	
06/16/2006 12:00AM	118	REQUEST FOR DBE QUOTES.URL	

FTP directory /contract/bid-packages/_JANUARY_29

[Up to higher level directory](#)

12/31/2008 12:00AM	Directory	201 BAINVILLE E-W	↙ Select desired contract
12/31/2008 12:00AM	Directory	202 LOZEAU-TARKIO SUPERIOR-LAZEAU	
12/31/2008 12:00AM	Directory	203 2003-BIKE-PED FACIL-IMPV GTFLS	

FTP directory /contract/bid-packages/ __JANUARY_29_ at ftp.mdt.mt.gov

[Up to higher level directory](#)

12/30/2008 12:00AM	972,369	RWIS_NEW_INSTALL_MAN_PGS_1-10.PDF	
12/30/2008 12:00AM	2,504,776	RWIS_NEW_INSTALL_MAN_PGS_11-22.PDF	
12/30/2008 12:00AM	1,514,143	RWIS_RPU_INSTALL_MANUAL.PDF	
12/31/2008 12:00AM	52,898	2145EWKVOLUME.TXT	← Earthwork txt file
10/30/2008 12:00AM	190,694	DIRT-RUN.LOG	(see next page)
12/31/2008 12:00AM	79,594	DIRT-RUN.PDF	
12/30/2008 12:00AM	3,233,592	EROSION_CONTROL.PDF	
12/31/2008 12:00AM	113,132	MASS_DIAGRAM.PDF	← Mass Diagram
12/30/2008 12:00AM	21,935,016	PLANS.PDF	
12/30/2008 12:00AM	6,831,741	PLANS_BRIDGE.PDF	
12/30/2008 12:00AM	5,472,361	PLANS_PGS_001-034.PDF	
12/30/2008 12:00AM	6,963,594	PLANS_PGS_035-068.PDF	
12/30/2008 12:00AM	2,673,646	PLANS_SIGNING.PDF	
12/30/2008 12:00AM	7,268,792	PROPOSAL.PDF	
12/30/2008 12:00AM	342,585	SEC-I_SPECIAL_PROVISIONS.PDF	
12/30/2008 12:00AM	5,663,888	SEC-II_LOGS_OF_BORING.PDF	
12/30/2008 12:00AM	505,572	SEC-II_RAILROAD_SPECIALS.PDF	
12/30/2008 12:00AM	234,399	SEC-II_SEEDING_SPEC.PDF	
12/30/2008 12:00AM	1,260,840	SEC-III_STANDARD_PROVISIONS.PDF	
12/30/2008 12:00AM	13,581,360	X_SECTIONS.PDF	
12/30/2008 12:00AM	2,654,045	X_SECTIONS_PGS_001-050.PDF	
12/30/2008 12:00AM	2,778,450	X_SECTIONS_PGS_051-100.PDF	
12/30/2008 12:00AM	2,419,356	X_SECTIONS_PGS_101-150.PDF	
12/30/2008 12:00AM	2,518,321	X_SECTIONS_PGS_151-200.PDF	
12/30/2008 12:00AM	1,921,555	X_SECTIONS_PGS_201-250.PDF	
12/30/2008 12:00AM	1,324,053	X_SECTIONS_PGS_251-283.PDF	

Example Earthwork TXT File

The first column is the station. Typically, the next two columns are the unadjusted volumes and the last two columns are the adjusted volumes. Compare the numbers to the cross section and/or log file to determine which is embankment and which is excavation.

000000000000 1111111111 2222222222 3333333333 4444444444

9+87.01/1	0	0	0	0
10+00.00/1	19	84	25	84
10+20.00/1	31	126	40	126
10+40.00/1	25	124	32	124
10+60.00/1	16	126	20	126
10+74.93/1	6	95	7	95
10+80.00/1	0	64	0	64
11+00.00/1	25	243	32	243
11+20.00/1	61	102	78	102
11+40.00/1	73	93	94	93
11+60.00/1	79	88	100	88
11+80.00/1	73	87	93	87
12+00.00/1	39	153	50	153
12+20.00/1	59	149	75	149
12+40.00/1	95	72	121	72
12+60.00/1	101	61	129	61
12+80.00/1	140	51	179	51
13+00.00/1	180	36	231	36
13+20.00/1	205	23	262	23
13+40.00/1	234	16	300	16
13+60.00/1	272	13	348	13
13+80.00/1	294	10	376	10
14+00.00/1	307	9	393	9
14+20.00/1	299	13	382	13
14+40.00/1	281	20	360	20
14+60.00/1	258	32	330	32
14+80.00/1	255	42	327	42
14+99.39/1	245	44	313	44
15+00.00/1	7	1	9	1
15+20.00/1	219	50	280	50
15+40.00/1	188	71	240	71
15+60.00/1	89	90	114	90