7-20.1 Construction Staking Storm Sewer System

Storm sewer system information may be found throughout the plan. Every plan is different. A schedule of the storm sewer will be found in the miscellaneous quantities. The schedules should contain the proposed locations of structures, types of structures, size, length, class of pipes, flow line of pipe elevations, percent of grade for pipe between structures, and grate or rim elevations. Other locations for data may include the plan and profile sheets, the storm sewer plan sheets, typical sections, and construction details.

Construction stakes for storm sewer system must be set and maintained as necessary to achieve the required accuracy and to satisfy the storm sewer contractor's method of operations. The staking contractor must determine that storm sewer pipe outfalls and inlets match existing field elevations and must provide this information to the engineer 14 calendar days before the contractor orders inlets, catch basins, manholes, end-walls, and storm sewer pipes. Figure 1 shows an example plan view and Figure 2 shows an example elevation view of a portion of a storm sewer system.

Figure 1 Example Plan View of Storm Sewer System

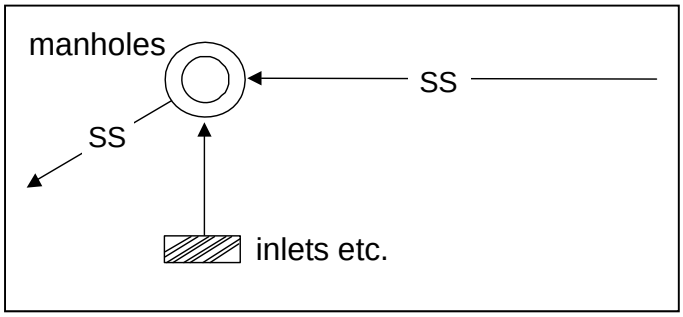
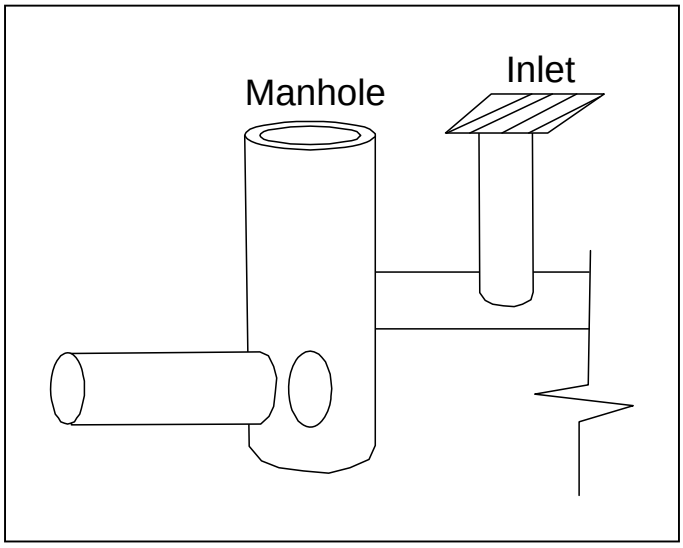


Figure 2 Example Elevation View of Storm Sewer System



7-20.1.1 Suggested Procedure

The staking contractor must always consult with the storm sewer contractor and check with the engineer for changes to the approved plans before doing any staking or grade computations.

The steps to take when staking storm sewer systems are outlined below:

1. Locate information in the approved plan.
   - Miscellaneous quantities
   - Plan and profile sheets

- Storm sewer plan sheets
- Typical sections
- Construction details
- Other

2. Prepare the storm sewer field book. Include the general information as shown in CMM 7-15 and:
   - A layout sketch of the structures as staked
   - Stake locations
   - Distances from stakes to item
   - Benchmarks
   - Grade elevations
   - Other pertinent information
3. Re-establish centerline, if necessary, from control points.
4. Field-locate the structure and the offset distance

   Check that these units are correct in relation to the lane widths and radius locations (radii should already be staked)
5. Set out stakes with respect to centerline. Ensure stakes are stable and visible to other people on the project
6. Grade the stake to approved plan elevations and mark accordingly. Mark with:
   - Structure number
   - Cut or fill to grate flow line (GFL)
   - Cut or fill to discharge (DIS)
   - Station and offset of structure
   - Hub elevation
   - Offset distance and direction from proposed structure to hub
   - Percent (%) of grade from one structure to the next if applicable

7-20.1.2 Examples and Figures

Examples of storm sewer quantities (Figure 3 and Figure 4), plans (Figure 5), stakes (Figure 6), and field notes (Figure 7) are provided.

Figure 3 Example Miscellaneous Quantities of Storm Sewer

Reinforced Concrete Pipe, Storm Sewer Class III					
	Structure				Pipe Joint Ties
Station	From No.	To No.	Dia (in.)	Length (Lin. Ft.)	
281+00	64.3	64.0	18	60	-
281+24	64.0	63.0	42	36	-
9+11 STH 73	63.2	63.1	12	22	-
9+15 STH 73	63.3	63.1	12	48	-
9+26 STH 73	63.1	63.0	15	46	-
10+64.5 MILL	63.5	63.4	12	32	-
10+64.5 MILL	63.4	63.0	15	90	-
284+70	63.0	62.0	36	376	-
288+50	62.1	62.0	15	58	-
288+50	62.2	62.0	15	4	-
288+50	62.0	61.0	36	346	-

Figure 4 Example Miscellaneous Quantities of Manholes, Inlets, and Inlet Covers

Manholes, Inlets and Covers						
Station	**Structure Number**	**Location**	**Inlet Type**	**Manhole Type**	**Cover Type**	**Depth (Ft.)**
281+00	64.3	35’ RT	3	-	BS	3.2
284+70	63.0	27’ LT	-	3	J	9.4
9+11 STH 73	63.2	41’± RT	3	-	H LT	2.3
9+11 STH 73	63.3	25.5’ LT	3	-	H RT	2.3
9+26 STH 73	63.1	23’ RT	-	1	H RT	3.3
10+64.5 Mill Ave	63.4	17.5’ RT	3	-	H RT	2.9
10+64.5 Mill Ave	63.5	17.5’ LT	3	-	H LT	2.3
288+50	62.0	27’ LT	-	3	J	7.0
288+50	62.1	34.5’ RT	3	-	H LT	2.6
288+50	62.2	34.5’ LT	3	-	H RT	2.6
291+90	61.2	34.5’ LT	3	-	H RT	2.3
291+90	61.4	34.5’ RT	3	-	H LT	2.3
292+00	61.0	27’ LT	-	3	J	5.0
292+00	61.1	34.5’ LT	3	-	H LT	3.6

Figure 5 Example Storm Sewer Plan

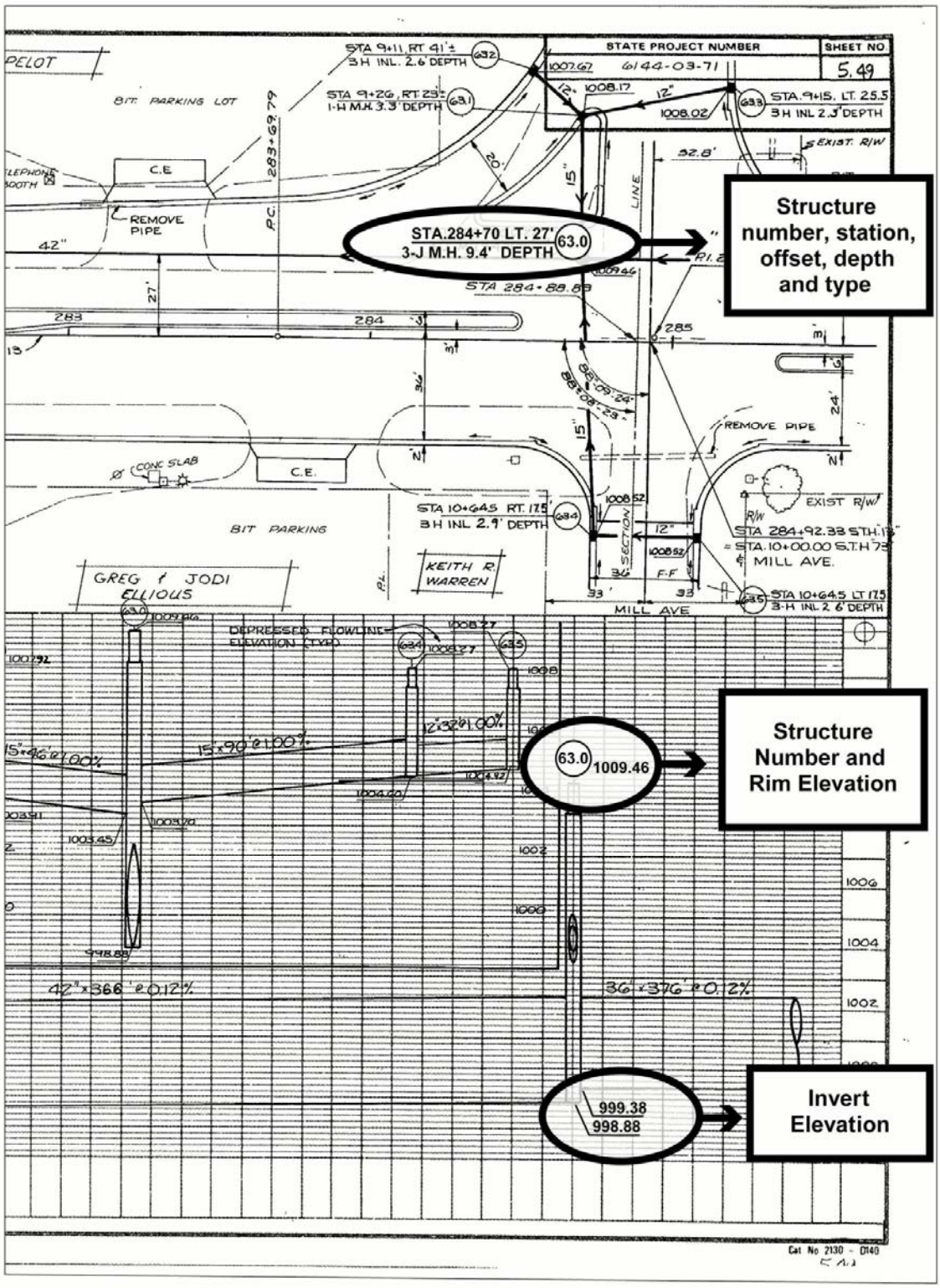


Figure 6 Storm Sewer Stakes

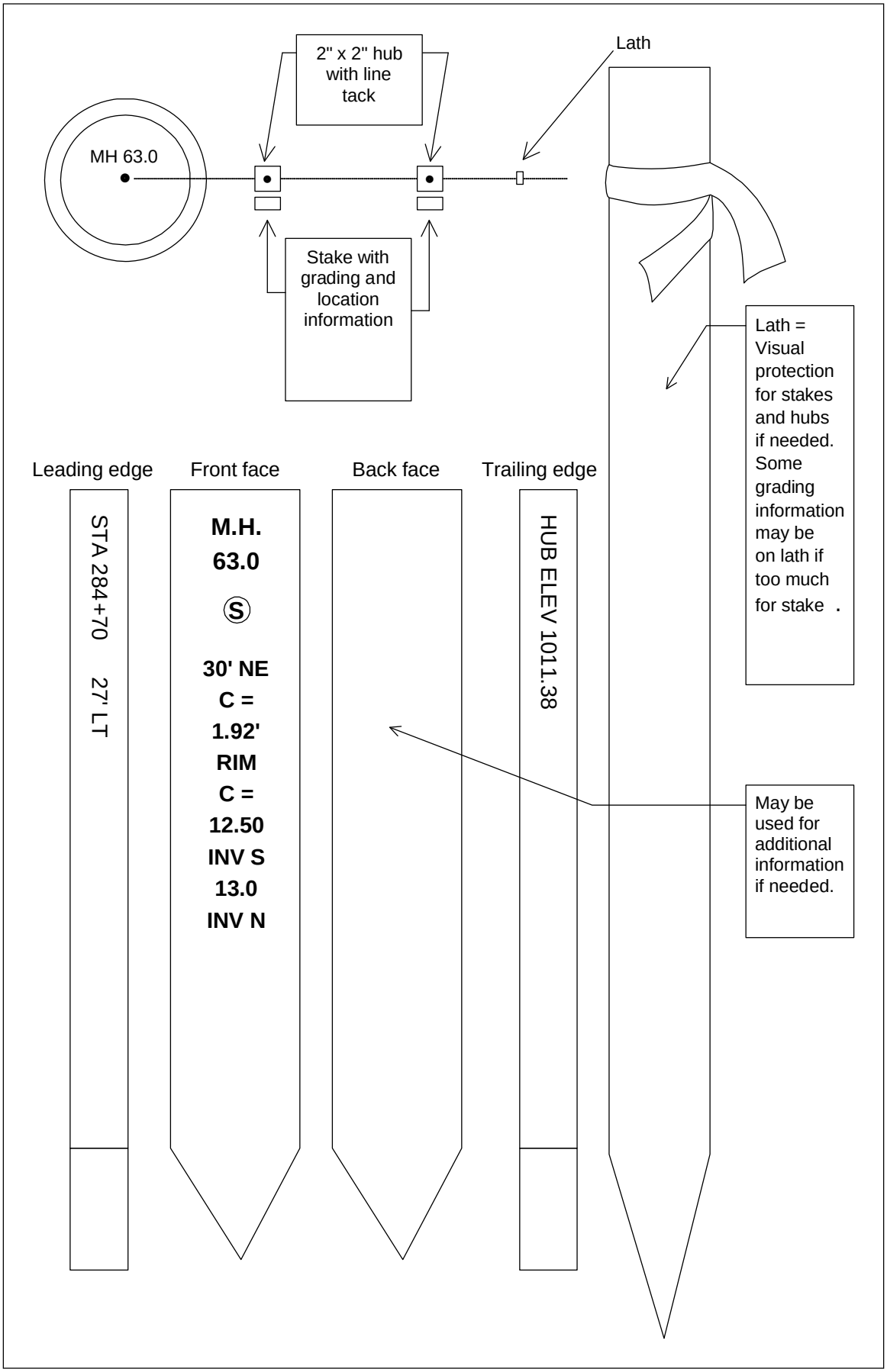


Figure 7 Example Storm Sewer Staking Field Notes