

SECTION 33 05 17

ADJUST MISCELLANEOUS STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Adjustment of utility structures.
 - 2. Installation of adjustment rings, seals, and castings.
- B. Related Sections:
 - 1. Section 33 10 00 – Water Utilities
 - 2. Section 33 31 00 – Sanitary Utility Sewer Piping
 - 3. Section 33 40 00 – Storm Drainage Utilities

1.02 REFERENCES

- A. North Dakota Department of Transportation “Standard Specifications for Road and Bridge Construction”
 - 1. Section 722 – Manholes, Catch Basins, and Inlets
- B. American Society of Testing Materials (ASTM):
 - 1. A48 – Specification for Gray Iron Casting.
 - 2. C6 – Specification for Normal Finishing Hydrating Lime (Mortar).
 - 3. C141 – Specification for Hydraulic Hydrated Lime for Structural Purposes (Mortar).
 - 4. C150 – Specification for Portland Cement (Concrete Rings/Mortar).
 - 5. C923 – Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Materials.

1.03 DEFINITIONS

- A. Adjust Frame and Ring Casting: A change in rim elevation accomplished for manholes or catch basins through the addition or removal of adjustment rings only. Adjustment does not include the addition or removal of sections from the structure.
- B. Adjust Valve Box: A change in elevation of the top of the valve box accomplished through the raising or lowering of the existing top section of the valve box only. Adjustment does not include the addition or removal of sections from the valve box.

- C. Remove and Replace Adjustment Rings: The process of removing the existing concrete adjustment rings from an existing structure and placing new rings on manholes and catch basins.

1.04 SEQUENCING AND SCHEDULING

- A. On bituminous streets, Contractor shall raise all sanitary and storm manholes as well as gate valves in the fall after base course of bituminous is paved. Top of casting shall be lower than the pavement to ensure they are not hit by the snow plow.
- B. Final adjustment will be made the following spring when wear course is paved. Steel drop in adjustment rings may be used for final adjustment.

PART 2 PRODUCTS

2.01 ADJUSTING RING

- A. Concrete
 1. Size to match cone or opening in top slab.
 2. Concrete Compressing Strength: Minimum 3,000 psi.
 3. Reinforcing: Single hoop 8-gauge steel wire.
 4. Thickness: Minimum 2 inches, maximum 4 inches.

2.02 ADHESION MATERIALS

- A. Ram-Nek material, or approved equal.
- B. Mortar
 1. Standard Portland Cement: Type I, ASTM C150
 2. Normal Finishing Hydrated Lime: ASTM C6
 3. Hydraulic Hydrated Lime for Structural Purposes: ASTM C141
 4. Mix Proportions: 1-part cement to 3-parts mortar sand; lime may be added to mixture: maximum amount 15 percent by volume.

2.03 EXTERNAL SEALS

- A. External Seals Approved Manufacturer: Infra-Shield, or approved equal.
 1. Multiple section seal system.
 2. Top section made of neoprene rubber.
 3. All other sections made of EPDM rubber; 60 mil minimum thickness, 8 inches minimum height for extension sections.
 4. Mastic: ASCO ST-30, BIDCO C56, or approved equal.

2.04 CASTINGS

- A. Manhole, Catch Basin Frames, and Covers.
 - 1. Requirement: ASTM A48.
 - 2. Material: Class 35 cast iron. Best grade. Free from injurious defects and flaws.
 - 3. Finish Preparation: Sandblast.
 - 4. Machine cover and frame contact surface for non-rocking protection.
 - 5. Type and Style: Per details on Drawing.

PART 3 EXECUTION

3.01 GENERAL

- A. The frame shall be raised or lowered to match the street or gutter.
- B. Protect existing structures from damage.
- C. Prevent sand, concrete, or any other debris from entering the structures.

3.02 PREPARATION

- A. Notify Utility Owners to field mark their utility locations.

3.03 ADJUST FRAME AND RING CASTING

- A. Remove all dirt, debris, dust, and other deleterious material from surface prior to placement of first adjusting ring.
- B. Concrete Adjusting Ring
 - 1. Mortar on top and bottom surfaces of all concrete adjusting rings; between surface of top slab or cone and bottom ring; between surface of top ring and casting; on entire surface of area of ring with no gaps.
 - a. Mortar Thickness: $\frac{1}{4}$ to $\frac{1}{2}$ inch.
 - 2. No shims of any material allowed.
 - 3. Required cross slope of casting to be achieved by varying thickness of mortar.
 - 4. Wipe clean all excess mortar from the joints inside all rings and frame.
 - 5. Remove all mortar spills from the structure.
 - 6. Minimum of 2, maximum of 5 adjusting rings allowed.
 - 7. Use a 6-inch ring where applicable.
- C. HDPE Adjusting Ring
 - 1. HDPE Adjusting Rings may be used in lieu of Concrete Adjusting Rings.
 - 2. Required cross slope of casting to be achieved by using varying sloped adjustment rings.
 - 3. No shims of any material allowed.

4. HDPE Adjusting Rings shall be adhered with mastic material from the manufacturer.

3.04 INSTALLATION OF EXTERNAL/INTERNAL SEAL SYSTEM

A. Infra-Shield Type (External Seal)

1. Remove all dirt, debris, dust, and other deleterious material from surfaces of structure, rings and casting prior to installation of seal system.
2. System to be installed per manufacturer's recommendation.
3. Secure bottom section to top slab or cone, top section to casting flange with mastic.
4. Minimum of 2-inches overlap required between top and bottom sections of seal system.
 - a. If minimum overlap is not achieved, extension section(s) must be inserted between the top and bottom sections until 2-inches overlap at all seams between all sections of the seal system is achieved.
5. Secure all seams between sections with mastic.
 - a. Mastic to be installed continuously around entire perimeter of section with no gaps.

3.05 FIELD QUALITY CONTROL

- A. For adjustments made within bituminous surfaced areas, any settlements of the bituminous surface greater than 3/8 inch below the rim of the adjustment structure will require removal and replacement of the bituminous surfacing at the Contractor's expense.
- B. Secure manholes and structures immediately after completion or before suspension of operations at the end of working with castings or suitable alternative device.
- C. Adjust Manholes (3/8 to 1/2) inch below grade prior to placing the final wear course. Thoroughly tamp material around manhole.
- D. Catch basin casting shall be lowered a minimum of 1 inch below flow line of curb.
- E. Adjust frame upward with standard concrete adjustment rings of the same size as the cone or slab opening. Place each adjustment ring and frame in a full mortar bed. Adjusting rings needed to raise the casting to grade shall be incidental to the adjustment pay item.
- F. Adjust frame downward by removing the necessary number of adjustment rings from the structure and resetting the frame in a full mortar bed to grade.

