

## SECTION 32 13 13

### CONCRETE STREET REPAIRS

#### PART 1 GENERAL

##### 1.01 SUMMARY

###### A. Section Includes:

1. Removal and Replacement of concrete at the intersection of 12<sup>th</sup> Street and 14 1/2 Avenue North.

##### 1.02 REFERENCES

###### A. North Dakota Department of Transportation “Standard Specifications for Road and Bridge Construction” 2008 Edition, As Revised

1. Section 550 – Portland Cement Concrete Pavement
2. Section 802 – Portland Cement Concrete
3. Section 808 – Concrete Admixtures
4. Section 810 – Concrete Curing Materials
5. Section 816 – Aggregates
6. Section 820 – Fly Ash
7. Section 826 – Joint Materials
8. Section 836 – Reinforcing Steel

###### B. American Society of Testing Materials (ASTM)

1. C33 – Standard Specification for Concrete Aggregates
2. C150 – Standard Specification for Portland Cement
3. C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
4. C390 – Standard Specification for Liquid Membrane-Forming Compounds for Curing concrete.
5. A615 – Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
6. D6690 – Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

##### 1.03 SUBMITTALS

###### A. Submittals shall conform to Section 01 33 00.

###### B. Contractor shall provide submittals on the following items:

1. Concrete Mix Design
2. Joint Filler/Sealer
3. Fly Ash Certification (if used).
4. Steel Reinforcing Certification and shop drawings from the manufacturer.

#### 1.04 QUALITY ASSURANCE

- A. The Contractor shall hire an independent testing laboratory approved by the Engineer for test concrete.
- B. Concrete Cylinders for Strength Tests shall be made for each day of placement and for every 100 Cubic Yards of Concrete placed. Cylinders shall be cast according to the following schedule.
  - 1. 1 cylinder for 3 day break
  - 2. 1 cylinder for 7 day break
  - 3. 1 cylinder for 28 day break
  - 4. Contractor may choose to cast more cylinders at Contractor's expense.
- C. Concrete slump test shall be done in the field to determine slump of concrete. The slump tests shall be done according to the following schedule:
  - 1. 1 test per 50 Cubic Yards of Concrete place or 1 per day, whichever is greater.
- D. Concrete air test shall be done in accordance with ASTM C231. Air testing shall be done according to the following schedule:
  - 1. 1 test per 50 Cubic Yards of Concrete place or 1 per day, whichever is greater.
  - 2. If air content does not meet Specifications, remove batch from Work and dispose off Site.
- E. Concrete temperature shall be taken from each truck.

#### 1.05 SEQUENCING AND SCHEDULING

- A. No work to begin until traffic control is in place.
- B. Road can be closed at the intersection of 12<sup>th</sup> Street North and 14 1/2 Avenue North.

### **PART 2 PRODUCTS**

#### 2.01 CONCRETE

- A. Concrete to conform to NDDOT Spec 802, except as modified below:
  - 1. Contractor shall submit an AE-3 concrete mix design for approval.
  - 2. Max fly ash in cementitious material is 20 percent.
  - 4. Water cement ratio of 0.38 max.
  - 5. A non-calcium chloride based accelerator conforming to AASHTO M 194 not to exceed 3 percent.

6. 28 day compressive strength of 4,000 psi.

2.02 AGGREGATE

A. Fine Aggregate

1. Conform to NDDOT Spec Section 816.01

B. Coarse Aggregate

1. Conform to NDDOT Spec Section 816.02, aggregate size number 3.

2.03 WATER

A. Water for concrete shall be clean potable water, free of contaminants.

2.04 FLY ASH

A. Fly Ash will be permitted for use up to a maximum of 20 percent by weight.

2.05 ADMIXTURES

A. Air Entrainment

1. Conform to ASTM C260

2. Air entrainment shall be targeted for 6 percent with a range of 5 – 8 percent.

B. Chemical Admixtures

1. Conform to AASHTO M 194

2.06 REINFORCING STEEL

A. Conform to NDDOT Spec Section 836.

2.07 CONCRETE CURING MATERIALS

A. Conform to NDDOT Spec Section 550.04 K.3.

2.08 JOINTING MATERIAL

A. Conform to NDDOT Spec Section 826.02A, Hot Applied Joint Sealant, Type 1.

B. Silicone Sealants shall conform to NDDOT Spec Section 826.02 B, Type 5.

C. Jointing material shall be gray in color.

## **PART 3 EXECUTION**

### **3.01 TRAFFIC CONTROL**

- A. See Section 01 50 00 for Traffic Control Requirements.
- B. Traffic Control shall be installed prior to the start of construction.

### **3.02 CONCRETE REMOVALS**

- A. Removal of existing PCC Pavement shall be accomplished without sawing into or spalling the adjacent pavement or curb and gutter.
  - 1. Existing pavement or curb and gutter that is damaged outside of the work limits will be replaced to limits determined by the Engineer. This work shall be done by the Contractor at no additional cost to the City.
- B. Concrete shall be cut at removal limits. Concrete shall be removed full depth.
  - 1. Existing aggregate base material shall be compacted prior to placing new concrete.
  - 2. Import additional aggregate base if needed to supplement any aggregate base lost during removals.

### **3.03 PLACEMENT OF REINFORCING STEEL**

- A. Concrete reinforcement shall be placed as shown on the plans.
- B. Drilled holes into the existing pavement for tie bars and deformed bars must be cleaned with compressed air prior to applying epoxy resin adhesive.
  - 1. The diameter of the drilled hole shall be as recommended by the epoxy manufacturer.
  - 2. Compressed air device must be capable of reaching to the back of the drilled hole to ensure all debris and loose material is removed prior to epoxy injection.
  - 3. Drilled holes shall be filled with epoxy resin 1/3 to 1/2 full, or as recommended by the manufacturer, prior to insertion of the bars.
  - 4. Each bar shall be rotated during installation to ensure complete bonding occurs.
  - 5. Bar insertion by the dipping method will not be allowed.
- C. Rebar to be supported by chairs at mid depth of slab.

### **3.04 CONCRETE PLACEMENT**

- A. Concrete shall be placed in a continuous operation.

B. If the elapsed time between loads during concrete placement exceeds 45 minutes, a transverse construction joint shall be installed.

C. Concrete shall be vibrated during placement.

### 3.05 CONCRETE SURFACE FINISH

A. Concrete finish shall be as described below.

1. Surface finish shall be by artificial grass drags or a broom pulled longitudinally in a line perpendicular to the slab centerline.

### 3.06 CONCRETE JOINTS

A. Expansion Joints shall be installed as shown in the drawings.

1. Pre-Molded expansion material shall be cut to the same shape as that of the surfaces being joined.
2. Before sealing each joint shall be thoroughly cleaned of all dust, concrete scale, and other foreign material and blown out with compressed air.

B. Contraction joints to be sawn at no more than 12 foot intervals.

1. Depth of sawed joints shall be a minimum of 1.5 inches but no deeper than within 0.5 inches of the reinforcing steel.
2. Sawn contraction joints shall be installed within 24 hours of termination the moist cure.
3. Joints shall be blown out with compressed air immediately before installing silicone sealant.

### 3.07 TRAFFIC CONTROL

A. Refer to section 01 50 00 and plans for traffic control requirements.