

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

SECTION 32 16 13 – CURBS AND SIDEWALKS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation and placement of combination portland cement concrete curb and gutter.
- B. Preparation and placement of portland cement concrete curb.
- C. Preparation and placement of portland cement concrete sidewalk.

1.02 RELATED SECTIONS

- A. Division 1 Specification Sections.
- B. Specification Section 31 12 00 – SITE CLEARING
- C. Specification Section 31 20 00 – EARTHWORK
- D. Specification Section 32 12 00 – FLEXIBLE PAVING
- E. Specification Section 32 17 23 – PAVEMENT MARKINGS
- F. Construction Drawings

1.03 REFERENCE STANDARDS

- A. American Concrete Institute (ACI) latest edition
 - 1. 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
 - 2. 304R Guide for Measuring, Mixing, Transporting, and Placing Concrete
 - 3. 305R Hot Weather Concreting
 - 4. 306R Standard Specification for Cold Weather Concreting
 - 5. 308 Standard Practice for Curing Concrete
- B. American Standards for Testing and Materials (ASTM) latest edition
 - 1. A185 Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
 - 2. A615 Deformed and Plain Billet-Steel for Concrete Reinforcement
 - 3. C33 Concrete Aggregates

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

4. C78 Method for Flexural Strength Concrete (Using Simple Beam with Third-point Loading)
 5. C94 Ready-Mixed Concrete
 6. C143 Method for Slump of Hydraulic Cement Concrete
 7. C150 Portland Cement
 8. C171 Sheet Material for Curing Concrete
 9. C231 Air-Content of Freshly Mixed Concrete by the Pressure Method
 10. C260 Air-Entraining Admixtures for Concrete
 11. C309 Liquid Membrane-Forming Compounds for Curing Concrete
 12. C494 Chemical Admixtures for Concrete
 13. D994 Preformed Expansion Joint Filler for Concrete (Bituminous)
 14. D1190 Concrete Joint Sealer, Hot Poured, Elastic Type
 15. D1751 Performed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
 16. D2628 Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
- C. Washington State Department of Transportation, Latest Edition
1. Standard Specifications for Road, Bridge & Municipal Construction
 2. Standard Plans for Road, Bridge & Municipal Construction

1.04 QUALITY ASSURANCE

- A. Establish and maintain required lines and elevations.
- B. Check surface areas at intervals necessary to eliminate ponding areas. Remove and replace unacceptable work as directed by Owner.

1.05 SUBMITTALS

- A. Submit materials certificate which materials producer and Contractor, certifying that materials comply with, or exceed, requirements specified herein to the Engineering Consultant of Record and the independent testing laboratory for review and approval for the following items:

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

- B. Within 7 calendar days after receipt of Notice-to-Proceed, submit for approval, certified laboratory test data or manufacturers certificates and data for the following items:
 - 1. Portland cement concrete mix
 - 2. Aggregate gradations
 - 3. Prefomed expansion joint filler
 - 4. Field molded/poured sealant
 - 5. Dowel bars
 - 6. Expansion sleeves
 - 7. Tie bars
 - 8. Reinforcing steel bars
 - 9. Welded wire fabric
 - 10. Air entraining admixtures
 - 11. Water-reducing and set-retarding admixtures (if used)

1.06 PROJECT CONDITIONS

- A. Maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

PART 2 PRODUCTS

2.01 FORMS

- A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. Forms shall be of depth equal to depth of curbing or sidewalk, and so designed as to permit secure fastening together at tops. Coat forms with nonstaining type of coating that will not discolor or deface surface of concrete.

2.02 REINFORCING

- A. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, ASTM A 185. Furnish in flat sheets.
- B. Reinforcing Steel: Deformed steel bars, ASTM A 615, Grade 60.

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

- C. Dowel Bars: Shall conform to ASTM A615, grade 60, and plain steel bars.
- D. Joint Backup Rods: Shall be CCEVA Rod 100 by E-Poxy Industrials, Inc., Sealtight BACKER ROPE by W.R. Meadows, Inc. or approved equal.

2.03 CONCRETE AND ADMIXTURES

- A. Portland Cement: Shall conform to ASTM C150, Type I
- B. Aggregate: Shall conform to ASTM C33.
- C. Water: Shall be clean and potable
- D. Air Entraining Mixture: Shall conform to ASTM C260 (Sika AER by Sika Corporation, Air Mix by the Euclid Chemical Corporation or approved equal).
- E. Curing Compound: Shall conform to ASTM C309 (Hydrocide by Sonneborn of Rexnord Chemical Products, Inc., and Polyseal 4 in 1 by Chem Masters Corporation or approved equal).

2.04 MISCELLANEOUS MATERIALS

- A. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D994, D1751, D2628; FS HH-F-341, Type II, Class A or approved equal.
- B. Joint Sealants: Conforming to ASTM D1190, non-priming, pourable, self-leveling polyurethane. Acceptable sealants are Sonneborn "Sonolastic Paving Joint Sealant", Sonneborn "Sonomeric CT 1 Sealant", Sonneborn "Sonomeric CT 2 Sealant", Mameco "Vulken 245", or Woodmont Products "Chem-Caulk" or approved equal.

2.05 MIX DESIGN AND TESTING

- A. Mix concrete and deliver in accordance with ASTM C94.
- B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following:
 - 1. Compressive Strength: 3,000 psi, minimum at 28 days, unless otherwise indicated on Construction Drawings.
 - 2. Slump Range: 2"-4" for hand placed concrete, 1-1/4" to 3" for machine placed (slipform) concrete
 - 3. Air Entrainment: 5 to 8 percent

PART 3 EXECUTION

3.01 PREPARATION

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

- A. Proofroll prepared base material surface to check for unstable areas. Begin paving work only after unsuitable areas have been corrected and are ready to receive paving.
- B. Remove loose material from compacted base material surface to produce firm, smooth surface immediately before placing concrete.

3.02 INSTALLATION

- A. Form Construction
 - 1. Set forms to required grades and lines, rigidly braced and secured.
 - 2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place minimum of 24 hours after concrete placement.
 - 3. Check completed formwork for grade and alignment to following tolerances:
 - (a) Top of forms not more than 1/8-inch in 10'-0"
 - (b) Vertical face on longitudinal axis, not more than 1/4-inch in 10'-0"
 - 4. Clean forms after each use and coat with form release agent as often as required to ensure separation from concrete without damage.
- B. Reinforcement: Fasten reinforcing bars or welded wire fabric (if required) accurately and securely in place with suitable supports and ties. Remove from reinforcement all dirt, oil, loose mill scale, rust, and other substances that will prevent proper bonding of the concrete to the reinforcement.
- C. Concrete Placement
 - 1. Concrete may be mixed and placed when the air temperature in the shade and away from artificial heat is a minimum of 35 degrees F and rising. Hot and cold weather concreting shall be in accordance with ACI 305R and 306R, respectively.
 - 2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until set at required finish elevation and alignment.
 - 3. Place concrete using methods that prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of reinforcing, dowels, and joint devices.

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 1/2 hour, place construction joint. Automatic machine may be used for curb and gutter placement. Machine placement shall be at required cross section, line, grade, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified herein.

D. Joint Construction

1. Contraction Joints: Construct concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, in uniform sections of length specified on Construction Drawings. Form joints between sections either by steel templates, 1/8-inch in thickness, of length equal to width of curb and gutter, and with depth which will penetrate at least 2-inches below surface of curb and gutter; or with 3/4-inch thick performed expansion joint filler cut to exact cross section of curb and gutter; or by sawing to depth of at least 2-inches while concrete is between 4 and 24 hours old. If steel templates are used, they shall be left in place until concrete has set enough to hold it's shape, but shall be removed while forms are still in place.
2. Longitudinal Construction Joints: Tie concrete curb or combination concrete curb and gutter, where specified on Construction Drawings, to concrete pavement with 1/2-inch round deformed reinforcement bars of length and spacing shown on Construction Drawings.
3. Transverse Expansion Joints: Concrete curb, combination concrete curb and gutter, or concrete sidewalk shall have filler cut to exact cross section of curb, gutter, or sidewalk. Joints shall be similar to type of expansion joint used in adjacent pavement.

- E. Joint Fillers: Extend joint fillers full-width and depth of joint, and not less than 1/2-inch or more than 1-inch below finished surface where joint sealer is indicated. Furnish joint fillers in 1-piece lengths for full width being placed, wherever possible. Where more than 1 length is required, lace or clip joint filler sections together.

- F. Joint Sealants: Seal joints with approved exterior pavement joint sealants. Install in accordance with manufacturer's recommendations.

3.03 CONCRETE FINISHING

- A. After striking off and consolidating concrete, smooth surface by screeding and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10'-0" straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.

RESTAURANT UTILITIES PROJECT

TULALIP, WASHINGTON

- B. Work edges of sidewalks, gutters, back top edge of curb, and formed joints with edging tool, rounding edge to 1/2-inch radius. Eliminate tool marks on concrete surface. After completion of floating and trowelling, when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
 - 1. Curbs, gutters, and sidewalks: Broom finish by drawing fine-hair broom across surface perpendicular to flow of traffic. Repeat operation as necessary to produce fine line texture.
- C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up minor honeycombed areas. Remove and replace areas or sections with major defects, as directed Owner.
- D. Protect and cure finished concrete paving using acceptable moist-curing methods, more particularly described in "water-curing" section of ACI 308.

3.04 BACKFILL

- A. After concrete has set sufficiently, spaces on either side of concrete curb, combination concrete curb and gutter, or concrete sidewalk shall be refilled to required elevation with suitable material compacted in accordance with Section 023000.

3.05 CLEANING AND ADJUSTING

- A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.
- B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.

END OF SECTION 32 16 13