SECTION 02516

SANDBLASTED CONCRETE WALKS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Construct concrete sidewalks within the City of Belle Meade right-of-way.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Comply with local governing regulations if more stringent than herein specified.

B. Work to be performed by installer who has completed installation similar in material, design and extent to that indicated for this project, and whose work has resulted in construction with a record of successful performance.

1.3 JOB CONDITIONS

A. Traffic Control: Maintain access for vehicular access to residences.

B. Utilize barricades, warning signals and warning lights as required. If police officers are required at anytime during the construction, contractor needs to work with the City of Belle Meade police force. Off duty officers can be hired for this purpose. Their cost should be included in the bid.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Forms: Steel, wood or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal alignment until removal. Use straight forms, free of distortion and defects.

1. Use flexible spring steel forms or laminated boards to form radium bends as required.

B. Coat forms for non-staining form release that will not discolor or deface surface of concrete.

C. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 40. Cut bars true to length with ends square and free of burs.

2.2 CONCRETE MIX AND DESIGN

A. Use one brand of cement throughout the project as supplied either by Nadine Ready Mix, Nashville, TN (VU Sidewalk Mix #835) or Metro Ready Mix, Nashville, TN (VU Sidewalk Mix #44)

1. Mixture to be composed of the following:
    a. Portland Cement: Type 1 470 lbs/cy
    b. Rive Sand: 1300 lbs/cy
    c. Stone: (Brown river gravel 2@ or less), 1600 lbs/cy
    d. Water: 240/cy
    e. ¾" fibermesh: 1.5 lbs/cy
    f. Fly Ash: 70lbs/cy

2. Owner to approve sample.

B. Design mix to produce normal-weight concrete consisting of Portland cement, aggregate, water-reducing or high-range water reducing as mixture (super-plasticizer), air-entraining admixture and water to produce the following properties:

1. Compressive Strength: 3500 psi, minimum at 28 days.
2. Slump Range: 3" for concrete

C. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Owner, Laboratory test data for revised mix design and strength results must be submitted to and accepted by Owner before using in work.

D. Admixtures

1. Use water-reducing admixture in all concrete.
2. Use accelerating admixture in concrete slabs placed in ambient temperatures below 50° F (10°C)
3. Use air-entering admixture in all concrete. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits:
    a. Concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure: 6% to 8% for maximum ¾" aggregate.
4. Use admixtures for water reducing and set-control in strict compliance with manufacturer's directions.

5. Slump limits: Proportion and design mixes to result in concrete slump at low point of placement as follows:
   a. Ramps and Sloping Surfaces: Not more than 3".
6. Polypropylene Fibers: Use 1.5 pounds of fibers per cubic yard of concrete. Introduce the fibers into the concrete mix per the manufacturer's recommendations.

2.3 CONCRETE MIXING

A. All concrete to be supplied by I.M.I Ready Mix or Metro Ready Mix Concrete, Inc.

B. Job-Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of one cubic yard or similar capacity, continue mixing at least 1-12 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cubic yard increase minimum 1-12 minutes of mixing time by 15 seconds for each additional cubic yard or fraction thereof.

C. Job site mixing shall be allowed for minor applications only.

D. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.

   1. Maximum of 2 gallons of water per cubic yard may be added to the batch of material of insufficient slump.

E. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

F. When air temperature is between 86°F (30°C) and 90° F (32°C) reduce mixing and delivery time from 1 ½ hours to 75 minutes, and when air temperature is above 90° F (32°C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXCAVATION

3.1 Layout walk system and receive owner's approval before proceeding. When excavating, avoid tearing tree roots. Saw cut any tree roots that interfere with walk layout. Excavate 10 inches. In areas where tree roots are extensive, Owner may direct Contractor to install walks above existing grade to avoid excavation.

3.2 SURFACE PREPARATION

A. Remove loose material from compacted base surface immediately before placing concrete.

B. Proof roll prepared base surface to check for unstable areas and need for additional compaction. Spread 4” gravel base and proof-roll before placing 4” concrete.

3.3 PREPARATION OF FORM SURFACES

A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer’s directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer’s instructions.

C. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.4 FORM WORK

A. Form Setting:

1. Place and secure forms to correct locations, dimensions and profiles.

2. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

3. Construct forms sufficiently tight to prevent mortar leakage. Lock form section to be free from ply or movement in any direction.

4. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

5. Provide chamfers at all exposed concrete edges.

6. Apply form release agent to form surfaces in accordance with the manufacturer’s printed instructions, before placing reinforcing and embedded items.

B. Grade and Alignment:

1. Check and correct the alignment and grade elevation of the forms immediately before placing the concrete.

2. When any form has been disturbed or any grade has become unstable, reset and recheck the form.

3.5 REINFORCEMENT

A. Ensure all reinforcing is clean, and free of rust, scale, oil, dirt or other materials which may reduce bonding.

B. Have required bends made in the shop without heat.

C. Place reinforcement in accordance with approved shop drawings.

D. Interrupt reinforcement at expansion joints.

E. Support reinforcing with precast concrete blocks, metal chairs or other method approved by the Engineer. Supporting with gravel, brick or wood blocks is not permitted.

3.6 GENERAL CONCRETE PLACEMENT

A. Place concrete in accordance with ACI 301. When central or transit mixed concrete is used, place the mixture where it will require as little rehandling as possible.

B. Keep forms and subgrade moist during concrete placement.

C. Ensure reinforcement, embedded items and formed joints are not disturbed during concrete placement.

D. Do not allow concrete to free fall more than 3 feet.

E. Distribute and spread concrete as soon as possible. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

F. Thoroughly work concrete with suitable tools to remove coarse aggregate from the surface and to place mortar against the form. Work concrete to produce a smooth finish, free of air pockets, water pockets and honeycombs.

G. Consolidate concrete against and along the faces of all forms and along the full length and on both sides of all joint assemblies with a suitable mechanical vibrator. Do not permit the vibrator to come in contact with forms, joint assemblies or subgrade. Do not over vibrate concrete or use the vibrator to transport or flow concrete.

3.7 JOINTS

A. Pre-placement Inspection: It shall be the responsibility of the contractor to notify Landscape Architect at least 24 hours prior to the placement of any joints.

B. General: Construction expansion and weakened-plane construction joints true-to-line with face perpendicular to surface of concrete. Construction transverse joints at right angles to the centerline, unless otherwise indicated.

C. When joining existing structures, place transverse joints to align with previously placed joints, unless otherwise indicated.

D. Expansion Joints: Provide 2” bituminous felt joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.

E. Locate expansion joints at 30’ o.c., unless otherwise indicated.

F. Extend joint fillers full-width and depth of joint, and not less than 2” or more than 1” below finished surface where joint sealer is indicated. If no joint sealer, place top of joint filler flush with finished concrete surface.

G. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.

H. Protect top edge of joint filler during concrete placement with a metal cap or other temporary material. Remove protection after concrete has been placed on both sides of joint.

3.8 CONCRETE FINISHING

A. After striking-off and consolidating concrete, smooth surface by screeding and bull floating, Use hand methods only where mechanical floating is not possible. Adjust floating to compact surface and produce uniform texture, working gravel below the finish surface.

B. After floating, test surface for trueness with 10’ straight-edge. Distribute concrete as required to remove surface irregularities, and refloat repaired area to provide a continuous smooth surface.

C. Work edges and formed joints with an edging tool, and round to 2” radius, unless otherwise indicated. Eliminate tool marks on concrete surface.

D. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace area or sections with major defects, as directed by Landscape Architect. Rub surfaces with a magnesium hand float, sealing all holes and smoothing the surface.

3.9 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

C. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

D. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by membrane curing, and by combinations thereof, as herein specified.

E. Provide moist curing by following methods:

1. Keep concrete surface continuously wet by covering with water.

2. Continuous water-fog spray.

3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4” lap over adjacent absorptive covers.

F. Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-remaining cover (polyethylene- coated burlap waterproof paper, polyethylene film) for curing concrete, placed in widest practicable with sides and ends lapped at least 3” and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproofing tape.

G. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces exposed to heating by the sun or to wind by keeping forms wet in place for the full curing period or until forms can be safely removed. If forms are removed, continue curing by methods specified above, as applicable till the end of the full curing period.

3.10 FINISH

A. For finish, sandblast concrete at 7 to 10 days.

B. Test panel is to be sandblasted while Landscape Architect is present on site. Landscape Architect will choose the finish that will be acceptable. Notify Landscape Architect no later than 3 days prior to sandblasting. Finish to match walk installed on Lynwood Terrace between Lynwood Blvd and Lynwood Blvd.

3.11 REPAIRS AND PROTECTIONS

A. Replace broken or defective concrete, as directed by Landscape Architect.

B. Drill test cores where directed by Landscape Architect, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy resin grout.

C. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material just prior to final inspection.

3.12 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. If testing is required, it shall be at Owner’s expense as directed by Owner. All defective materials shall be removed and replaced at Contractor’s expense and at no cost to Owner.

3.13 TOPSOIL BACKFILLING AND LAWN REPAIR

A. All new walk edges and disturbed areas resulting from construction shall be backfilled with topsoil by contractor.

B. All new walk edges shall be seeded with Fescue.

END OF SECTION 02516

SECTION 31 11 00 – CLEARING AND GRUBBING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Clearing, grubbing, removal and disposal of vegetation, rocks, roots and debris within the limits of the work except objects designated on the drawings to remain.
B. Preserve from injury or defacement all vegetation and objects to remain.

1.02 RELATED WORK

A. Section 31 22 19.13-1 Spreading and Grading Topsoil

1.03 LIMITS OF WORK

A. Construction area established by drawings.

1.04 PROTECTION

A. Protect bench marks and existing structures, roads, sidewalks, paving and curbs against damage from vehicular or foot traffic.

PART 3 – EXECUTION

3.01 PREPARATION

A. Maintain bench marks, monuments and other reference points. Re-establish if disturbed or destroyed at no cost to Owner.

3.02 CLEARING AND GRUBBING

A. Clear and grub areas required for access to site and execution of the work. Remove all stumps and roots within limits of grubbing to the depths below.

3.03 PRUNING

A. If trees, shrubs or other perennial growth are damaged in the course of Work of this Contract, contact the Owner immediately. Remedial measures shall be coordinated with theOwner.

3.04 DEBRIS REMOVAL

A. Promptly remove cleared debris from site.
B. Do not burn or bury materials on site.

3.05 REPAIRS

A. Should utilities to remain or other physical property be damaged by work of this Section, repair damage at Contractors expense.
B. Backfill all excavations opened as a result of the work of this Section.

END OF SECTION

SECTION 31 22 19.13 – SPREADING AND GRADING TOPSOIL

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Place finish grade and compact top soil.

1.02 RELATED WORK

A. Section 32 01 90.33: Tree and Shrub Preservation
B. Section 32 90 00 Planting

1.03 PROTECTION

A. Prevent damage to existing trees to remain, bench marks, pavement, walls, piers and all site features, and utility lines. Correct damage at no cost to the Owner.

1.04 QUALITY ASSURANCE

A. The Owner shall employ a qualified testing laboratory to observe this work and make tests required.
B. Have topsoil tested and approved before it is moved to the project site.

C. Topsoil shall be free of live Bermuda grass roots, stones and roots over 1 inch diameter and other foreign matter. Use topsoil stockpiled on site if conforming to these requirements. If inadequate topsoil exists on site, contractor will be responsible for providing additional topsoil.

PART 3 – EXECUTION

3.01 PLACING TOPSOIL

A. Place along sides of walls and all disturbed areas.
B. Use topsoil in relatively dry state. Place during dry weather:
C. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of sub-grades.
D. Remove stone, roots, grass, weeds, debris and other foreign material while spreading.
E. Lightly compact placed topsoil to extent required to prevent settlement.

3.02 CLEAN-UP

A. Upon completion of work of this Section, clean up and leave area free of debris, excess material, and equipment.
B. Any excess earth shall be removed from the area by the contractor, who shall properly dispose of the material.

END OF SECTION