

**DIVISION 2
SITEWORK**

02510 CONCRETE

PART 1 – GENERAL

1.1 WORK

- A. Provide all related materials, equipment, and labor required to complete the work specified.
- B. Demolition and removal of existing concrete shall be in accordance with [Section 02050 Demolition](#) and as specified herein.
- C. All excavation, trenching, compaction, backfill, and landscaping shall be as listed in the **Scope** and as specified herein.

1.2 QUALITY OF WORK

- A. Provide experienced, well-trained workers competent to complete the work as specified.
- B. Concrete shall be from manufacturers and suppliers who specialize in concrete products.

1.3 SUBMITTALS

- A. Depending on the **Scope**, a building permit maybe required. **Contractor** is required to obtain all required permits from the City of Milwaukee DCD Development Center (809 N. Broadway, 1st Floor) prior to starting any work.
- B. When concrete work involves paving in publicly owned areas (i.e. driveway aprons, curb cuts, carriage walks, etc.) the **Contractor** shall obtain all required permits and approvals from the City of Milwaukee Department of Public Works prior to starting any work.
- C. **Contractor** shall contact the City of Milwaukee Department of Neighborhood Services at 286-2513 for all necessary inspections prior to pouring concrete.
- D. Supply **Agency** with a copy of the concrete delivery ticket from concrete supplier showing the concrete mix delivered to the job site.
- E. **Contractor** shall, upon request of the **Inspector**, submit manufacturer’s specifications to prove compliance with these **Specifications**.

1.4 PRECONSTRUCTION AND PREPARATION

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
- B. Confirm there is no conflict between this work and work of other trades.
- C. Confirm that the work of other trades that must precede this work has been completed.
- D. At all stairways to porches, service walk steps, stoops, door entrances, etc. confirm finished riser height will be uniform throughout stairway and within code allowed maximum (8 inches).

PART 2 – MATERIALS

2.1 CONCRETE FLAT WORK

- A. Concrete:
 - **Contractor** shall supply ready-mixed concrete in compliance with ASTM C 94.
 - On-site mixed concrete will conform to ASTM C 685.
 - Concrete shall have a 28 day compressive strength as follows:

Walks, steps, garbage can and storage area slabs:	3500 psi
Parking slabs and driveways:	4000 psi
Retaining walls:	4000 psi
Foundations and footings:	3500 psi
Interior slabs	3000 psi
 - No admixtures or curing materials will be allowed unless specifically approved for use by the concrete manufacturer.

- Ready-mixed concrete shall be delivered to the site of the work and be completely discharged from the transporting vehicle within 1-½ hours.
- A. Forms:
- Provide metal or wood formwork for borders and curbs with profiles to match required concrete thickness.
 - Earth forms are not permitted for paving.
 - Formwork shall be installed to replicate layout of the concrete that was removed, in accordance with the **Scope**, and as specified herein.
- B. Concrete reinforcing:
- Use number 10 welded wire mesh, plain type in coiled rolls, unfinished.
 - Use rebar where required, number 3 or larger as required by code.
- C. Aggregate:
- Maximum size is ¾", compacted to 95%.
 - Sub-base aggregate to depth as listed:

Walks, steps, garbage can and storage area slabs:	3 inches
Parking slabs and driveways:	4 inches
Interior slabs	4 inches

PART 3 – CONSTRUCTION

3.1 SITEWORK PREPARATION

- A. Remove and dispose of existing concrete as indicated in the **Scope**.
- B. Provide demolition materials, barriers, protective covers, etc. to complete the work assigned.
- C. All demolition work shall be in accordance with [Section 02050 Demolition](#).
- D. Install lead-based paint containment measures per [Section 01810 Lead Dust Hazards](#) and as specified herein when demolition will disturb painted or otherwise coated surfaces.
- E. **Contractor** shall take all necessary precautions to minimize damage to surrounding yard and landscaping.
- F. Examine site conditions and correct any conditions detrimental to the work.
- Do not do work when new paving might be harmed by rain, snow or low temperatures.
 - Concrete shall be protected from frost or rapid drying.
 - Concrete shall not be placed on frozen ground or when temperature is below 32 degrees Fahrenheit or will be below 32 degrees within 72 hours.
 - Verify that all necessary sub-grade preparation is completed.
 - Keep area free of scraps, trash, and organic matter.
- G. Install related work before concrete pour, and protect from damage.
- Formwork
 - Anchors
 - Baseplates
 - Inserts
 - Bolts
 - Expansion joints
 - Sleeves for bollards and fence posts
 - Utility boxes
 - Drains
 - Electrical conduit or boxes
 - Pipe and plumbing
 - Separation joints
 - Headers/screeds
- H. **Contractor** shall make all repairs necessary to restore owner's property and any adjacent properties damaged as a result of the contractor's work.

3.2 EXCAVATION

- A. Excavate areas as listed in the **Scope**, [Section 02200 Excavation, Grading and Backfill](#) and as specified herein.
- B. **Contractor** is responsible for contacting the building construction inspector for all applicable inspections and approvals prior to pouring concrete.

3.3 AGGREGATE

- A. Install aggregate to specified depth.
 - Granular shall be clean mineral aggregate.
- B. Compact aggregate as specified in [Section 02200 Excavation, Grading and Backfill](#) and as specified herein.

3.4 FORMS

- A. Construct forms to the exact sizes, shapes, lines and dimensions as listed in the **Scope** or specified herein.
 - Construct and brace forms to maintain work in correct line, proper grade height, and pitch.
 - Install screed boards at correct height for paving thickness.
 - Construct forms for all exposed concrete surfaces with smooth faced materials to provide continuous, straight, smooth surfaces.
 - Furnish forms in the largest practicable sizes to minimize the number of joints.
 - Secure forms against dislocation during concrete pour.
 - Forms shall be of sufficient thickness and strength to withstand pressure of newly placed concrete without excessive and objectionable bow or deflection.
 - Design and build forms to adequately and safely support vertical and lateral loads that might be applied.
 - Provide form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces or impede the wetting of surfaces to be cured with water.
 - Provide form work sufficiently tight to prevent leakage of cement during concrete placement.
 - Provide for all openings, offsets, sinkages, keyway recesses, moldings, reglets, chamfers, blocking, bulkheads, anchorages, inserts, and other features.
 - Avoid small or angular concrete paving sections, or install extra reinforcing to prevent cracking.
- B. Formwork shall be installed to duplicate as closely as possible the size and configuration of original concrete footprint as listed in the **Scope**, and as specified herein.
- C. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
 - Form work not supporting concrete may be removed after cumulatively curing at not less than 50 degrees Fahrenheit for at least 24 hours after placing concrete, providing that concrete is sufficiently hard to not be damaged by form removal operation.
 - Other formwork may not be removed in less than 14 days or until concrete has attained design minimum 28-day compressive strength.
 - After removal of forms restore finish grade as outlined in [Section 02200 Excavation, Grading and Backfill](#).
 - Finish grading shall be flush with top of the slab, providing for proper drainage and eliminating any trip hazards.
- D. Side forms of footings may be omitted and concrete placed directly against excavation provided an additional one (1) inch of concrete is added to each side of the minimum required footing size.

3.5 CONCRETE PLACEMENT

- A. Provide protection (i.e. plastic, plywood sheets, etc.) to ensure nearby walls, buildings, porches, doors, windows, etc. are not sprayed or splashed with concrete during pour or subsequent concrete finishing work.
- B. Verify concrete supplier mix is certified for proportions.
 - Don't allow trucks to wait beyond the time limits before pour.
 - Don't allow unauthorized watering; do not over-water.
 - Don't permit segregation.
 - Verify that visual slump is correct.
 - Do compaction, consolidation, and vibration as required.
 - Deposit concrete continuously or as to avoid placing concrete on or adjacent to concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section.
- C. Provide movement and relief joints in locations, depths, and widths as detailed;
 - At contact of pavement with other work.
 - For thermal expansion/contraction.
 - To control movement and settlement cracks.
 - At breaks in the construction sequence.
 - Make joint lines straight and uniform.

- Coordinate and align sawn joint work with other work.
- D. Concrete shall be placed in accordance with the **Scope** as specified herein.
- Walks: 4 inch thick with control joints 5'-0" on center. Width of walks shall be as indicated in **Scope**. Concrete may be poured on undisturbed soil. If soil is disturbed provide 3" thick compacted sand or gravel aggregate.
 - Parking slabs/driveways: 4 inch thick with control joints every 400 square feet. Wire mesh reinforcement required.
 - Interior slabs on grade: 4 inch thick with control joints every 400 square feet. Wire mesh reinforcement and vapor barrier required.
 - Steps and stoops: Minimum of 4 inch thick with control joints at building and at walks and slabs surrounding the steps or stoop. Step treads shall be uniform in rise and run with rounded nosings. Maximum riser height is 8 inches and minimum tread size is 9 inches. In addition all treads and risers shall conform to the following formula, 2 risers heights + 1 tread length = 24 to 25 inches. Treads to receive fine broom finish.
 - Footings shall be placed on undisturbed soil, free of organic material at a depth of 4 feet below grade, sized and reinforced as required by building code.
 - Retaining walls shall be designed to sustain required loads. Concrete shall be vibrated during placement. Retaining walls in excess of 3' in height or longer than 24' in length shall include plastic drain tile inside the perimeter of the wall with 6" of gravel above the drain tile. Bleeders shall be provided for drain tile installations.
- E. Finished concrete flat work shall be free of depressions or low spots to prevent the pooling of water. Concrete shall be pitched 1/8" per foot to shed water.

3.6 CURING

A. Curing

- Start curing procedures promptly after pour, to protect concrete from premature drying.
- Control curing methods, covers, and wetting, with special attention to weather conditions.
- Use proper wet spray or moist curing methods as required and as appropriate to weather.
- Where formwork is exposed to sun, maintain moisture on formwork until removal.

3.7 FINISHING

A. Match up finish work to adjacent or nearby surfaces at:

- Joints.
- Edges.
- Corners.

B. Joints:

- Coordinate sawn joints, to keep all joints straight and continuous.
- Keep joint lines uniform and free of damage.
- Do not make any cuts in finished concrete that might affect structural integrity or strength.

C. Floating, troweling, and special finishes shall be as indicated on the **Scope** or as specified herein.

- A medium broom finish across traffic path is required for exterior concrete work such as sidewalks, patios, driveways, driveway aprons, etc.
- Troweled finish is required for interior concrete floors in basements, enclosures, or living areas.
- A non-slip finish for steps, landings, platforms, and ramps.
- Do not begin floating until bleed water is gone.
- Do not over-trowel.
- Do not dust cement to expedite troweling start time.
- Remove any marks left by finishing tools.

3.8 PROTECTION AND COMPLETION

A. Curing, protection, and sealing:

- Protect concrete from heat or cold, to maintain temperature between 50 and 70 degrees Fahrenheit.
- Protect concrete from inclement weather or running water.
- Protect concrete from damage caused by construction equipment.
- Protect concrete from shock.

- Protect concrete from movement or vibration.
- Protect concrete from load stress.
- Protect fresh slab work from foot or traffic damage.
- Seal concrete surfaces as recommended by concrete supplier.

3.9 REPAIR AND CLEANUP

- A. Repair or replace work not in compliance with the **Scope** or these **Specifications**.
 - Repairs shall be made at the direction of the **Inspector**.
 - Repairs shall be made at the **Contractor's** expense.
- B. Clean work surfaces, and completely remove debris and excess material from site.
 - **Contractor** is responsible for cleaning, removing, and repairing any surfaces sprayed or splashed with concrete, or otherwise damaged as a result of the **Contractor's** work.
- C. Backfill as indicated on the **Scope** and as specified in [Section 02200 Excavation, Grading, and Backfill](#).
- D. Landscape disturbed areas as indicated in the **Scope** and as specified in [Section 02900 Landscaping](#).

END OF SECTION – 02510 CONCRETE