

Scope of Work for Concrete Placement at Simms Building in Austin Park

The Town of Skaneateles is located in Onondaga County in New York. It is a gateway community to the Finger Lakes Region. The Town just recently completed construction on a new bathroom building in Austin Park. This facility will accommodate patrons in a seasonal capacity and a pavilion is also located at the site.

Concrete sidewalks and larger concrete pads are proposed for construction at the site where the bathroom building is located. This will provide patrons easier access to the restrooms along with a large area for recreational activities. The concrete is anticipated to be constructed by the end of summer 2020.

Under this project it is expected that the Contractor shall furnish all labor, materials and equipment necessary to construct the concrete pads and sidewalk areas to the grades, of the type and to the limits as shown on the Drawings provided herein. Subbase has been provided for the project areas but compaction and concrete placement will be part the work included with this contract. It is understood that the contractor will be responsible for protecting existing facilities throughout the duration of the concrete install.

Payment for this item shall be made on a unit price per square foot basis. The quantity for which payment will be made shall be the total square footage of concrete installed. Limits have been provided within the accompanied drawings.

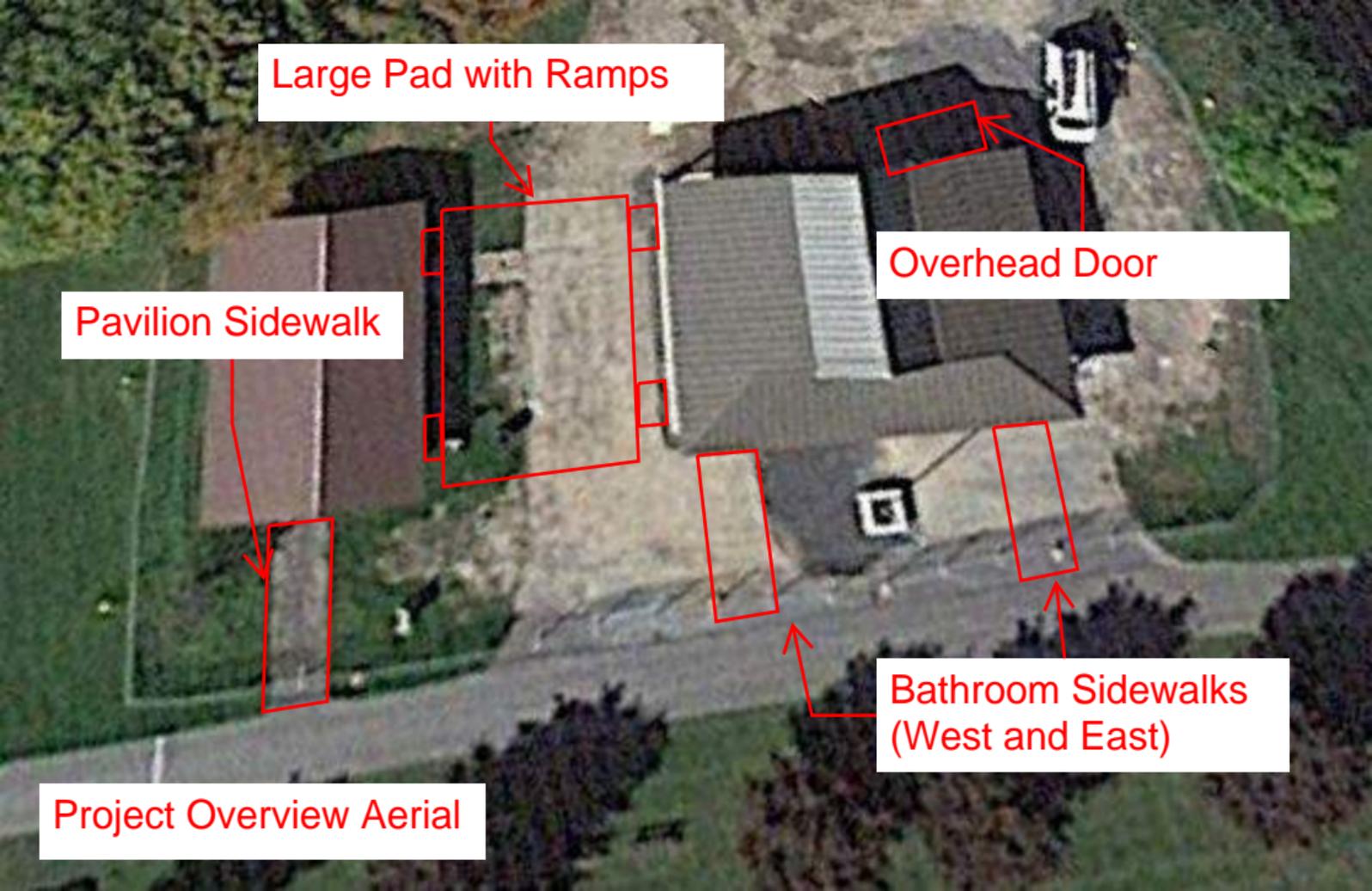
Included in this packet are the following items:

Drawings –

1. Project Overview Aerial
2. Large Pad with Ramps
3. Pavilion Sidewalk
4. West Bathroom Sidewalk
5. East Bathroom Sidewalk
6. Overhead Door Pad
7. Concrete Sidewalk Detail

Specifications –

1. 02228 Compaction
2. 03001 Concrete

An aerial photograph of a large, multi-story building with a complex roof structure. The building is surrounded by greenery and a paved area. Red lines and boxes highlight specific areas of interest. Labels in white boxes with red text point to these areas. The labels include: 'Large Pad with Ramps' pointing to a large, light-colored rectangular area on the roof; 'Overhead Door' pointing to a dark rectangular area on the roof; 'Pavilion Sidewalk' pointing to a narrow path on the left side of the building; 'Bathroom Sidewalks (West and East)' pointing to two narrow paths on the lower part of the building; and 'Project Overview Aerial' at the bottom left.

Large Pad with Ramps

Overhead Door

Pavilion Sidewalk

Bathroom Sidewalks
(West and East)

Project Overview Aerial

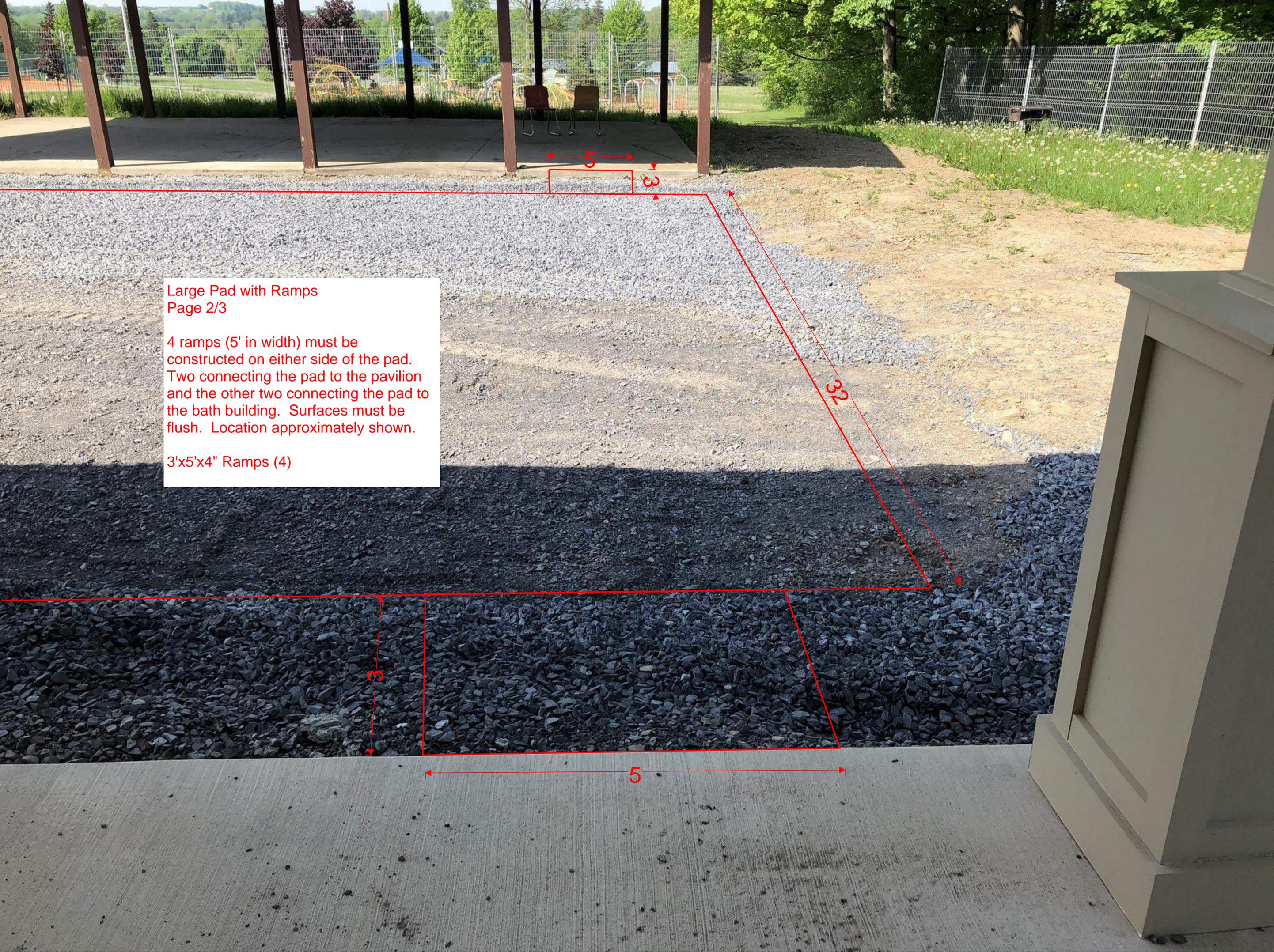


Large Pad with Ramps
Page 1/3
Location approximately shown, pad to be centered between bath building and pavilion. Relief joints every 8'
32'x40'x4" Pad

Large Pad with Ramps
Page 2/3

4 ramps (5' in width) must be constructed on either side of the pad. Two connecting the pad to the pavilion and the other two connecting the pad to the bath building. Surfaces must be flush. Location approximately shown.

3'x5'x4" Ramps (4)





Large Pad with Ramps Alternate View
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Large Pad 32'x40'x4"

4 ramps (5' in width) must be constructed on either side of the pad. Two connecting the pad to the pavilion and the other two connecting the pad to the bath building. Surfaces must be flush. Location approximately shown.

3'x5'x4" Ramps (4)

Pavilion Sidewalk
Page 1/1

Location approximately shown

28'x8'x4" Pad

Relief joints every 7'





West Bathroom Sidewalk
Page 1/2

Location approximately shown

25'x5'x4" Pad

Relief joints every 5'



West Bathroom Sidewalk
Page 2/2
Alternate View



East Bathroom Sidewalk
Page 1/2
Location approximately shown
23'x5'x4" Pad
Relief joints every 5'

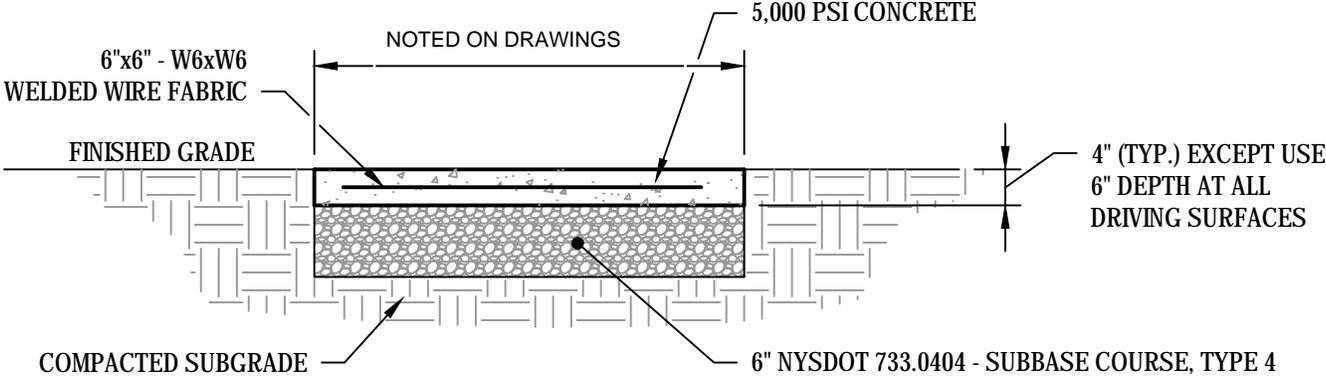


East Bathroom Sidewalk
Page 2/2
Alternate View



Overhead Door Pad
Page 1/1
Location approximately shown
16'x16'x6" Pad
Relief joints every 8'

Generic Town of Skaneateles Concrete Sidewalk Detail



CONCRETE SIDEWALK DETAIL

SCALE: NOT TO SCALE

SECTION 02228

COMPACTION

PART 1 GENERAL

1.01. SECTION INCLUDES

- A. Compaction requirements and test methods.
- B. Compact all subgrades, foundations, embankments, trench backfills, filled and backfilled material as specified.

1.02. REFERENCES

- A. ASTM D698 - Laboratory Compaction of Soil Using Standard Effort
- B. ASTM D1556 - Density of Soil in Place by the Sand-Cone Method
- C. ASTM D1557 - Laboratory Compaction of Soil Using Modified Effort
- D. ASTM D2922 - Density of Soil in Place by Nuclear Methods
- E. ASTM D3017 - Water Content of Soil in Place by Nuclear Methods

1.03. SUBMITTAL

- A. Submit in writing a description of the equipment and methods proposed to be used for compaction.

1.04. QUALITY ASSURANCE

- A. The Contractor shall adopt compaction methods which will produce the degree of compaction specified herein, prevent subsequent settlement, and provide adequate support for the surface treatment, pavement, structure and piping to be placed thereon, or therein, without damage to the new or existing facilities.
- B. The natural subgrade for all footing, mats, slabs-on-grade for structures or pipes shall consist of firm undisturbed natural soil, at the grades shown on the Drawings.
- C. After excavation to subgrade is completed, the subgrade shall be compacted if it consists of loose granular soil or if its surface is disturbed by the teeth of excavating equipment.
 - 1. This compaction shall be limited to that required to compact loose surface material and shall be terminated in the event that it causes disturbance to underlying fine-grained soils, as revealed by weaving or deflection of the subgrade under the compaction equipment.
 - 2. If the subgrade soils consist of saturated fine or silty sands, silts, or clay or varved clays, no compaction shall be applied.

PART 2 PRODUCTS

- ##### 2.01. MATERIALS
- Not used.

PART 3 EXECUTION

3.01. EXAMINATION

- A. Examine spaces to be filled beforehand and remove all unsuitable materials and debris including sheeting, forms, trash, stumps, plant life, etc.
- B. Inspect backfill and fill materials beforehand and remove all roots, vegetation, organic matter, or other foreign debris. Stones larger than 12 inches in any dimension shall also be removed or broken into smaller pieces.
- C. No backfill or fill material shall be placed on frozen ground nor shall the material itself be frozen or contain frozen soil fragments.
- D. Spaces to be filled shall be free from standing water so that placement and compaction of the fill materials can be accomplished in "dry" conditions.

3.02. PREPARATION

- A. Brace walls and slabs of structures to support surcharge loads and construction loads imposed by compaction operations.
- B. Match compaction equipment and methods to the material and location being compacted in order to obtain specified compaction, with consideration of the following guidelines:
 - 1. Vibratory compaction is preferred for dry, granular materials.
 - 2. Hand compaction equipment such as impact rammers, plate or small drum vibrators, or pneumatic buttonhead compactors should be used in confined areas.
 - 3. Hydraulic compaction by ponding or jetting will not be permitted except in unusual conditions, and then only upon written approval by the Town and after a demonstration of effectiveness.
 - 4. Backhoe-mounted hydraulic or vibratory tampers are preferred for compaction of backfill in trenches under pavements over 4 feet in depth. The upper 4 feet shall be compacted as detailed above or with hand-guided or self propelled vibratory compactors or static roller.
 - 5. For plastic pipelines (PVC, PE or PB) do not compact directly over center of pipe until backfill has reached 2 feet above top of pipe.

3.03. FIELD QUALITY CONTROL

- A. Material Testing
 - 1. The Town reserves the right to order testing of materials at any time during the work.
 - 2. The Contractor shall aid the Town in obtaining representative material samples to be used in testing if required.
- B. Compaction Testing
 - 1. The Town reserves the right to order the qualified independent testing laboratory to conduct in-place density tests of compacted lifts.

- C. Alternate Methods of Compaction - The Contractor may employ alternate methods of compaction if the desired degree of compaction can be successfully demonstrated to the Town's satisfaction.
- D. Select Material - On-Site
 - 1. Should the contractor require anymore select material they will contact the Town for this.

END OF SECTION

SECTION 03001

CONCRETE

PART 1 GENERAL

1.01. SECTION INCLUDES

- A. Products
- B. Execution

1.02. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Concrete Institute (ACI)

| | |
|-----------|--|
| ACI 201.1 | Guide for Conducting a Visual Inspection of Concrete in Service |
| ACI 211.1 | Selecting Proportions for Normal, Heavyweight, and Mass Concrete |
| ACI 301 | Specifications for Structural Concrete |
| ACI 302.1 | Guide for Concrete Floor and Slab Construction |
| ACI 304 | Measuring, Mixing, Transporting and Placing Concrete |
| ACI 305 | Hot Weather Concreting |
| ACI 306 | Cold Weather Concreting |
| ACI 308 | Guide to Curing Concrete |
| ACI 309 | Guide for Consolidation of Concrete |
| ACI 315 | Details and Detailing of Concrete Reinforcement |
| ACI 315R | Manual of Towing and Placing Drawings for Reinforced Concrete Structures |
| ACI 318 | Building Code Requirements for Structural Concrete |
| ACI 347 | Recommended Practice for Concrete Formwork |
| ACI 350 | Code Requirements for Environmental Towing Concrete Structures |

B. American Society for Testing and Materials (ASTM)

| | |
|-----------|---|
| ASTM A185 | Steel Welded Wire Reinforcement, Plain, for Concrete |
| ASTM A497 | Steel Welded Wire Reinforcement, Deformed, for Concrete |
| ASTM A615 | Deformed and Plain Billet Steel Bars for Concrete Reinforcement |
| ASTM C31 | Making and Curing Concrete Test Specimens in the Field |
| ASTM C33 | Concrete Aggregates |
| ASTM C39 | Compressive Strength of Cylindrical Concrete Specimens |
| ASTM C88 | Soundness of Aggregates |
| ASTM C94 | Ready-Mixed Concrete |
| ASTM C136 | Sieve Analysis of Fine and Coarse Aggregates |
| ASTM C143 | Test Method for Slump of Hydraulic-Cement Concrete |
| ASTM C150 | Portland Cement |

| | |
|-----------|--|
| ASTM C172 | Sampling Freshly Mixed concrete |
| ASTM C231 | Air Content of Freshly Mixed Concrete by the Pressure Method |
| ASTM C260 | Air-Entraining Admixtures for Concrete |
| ASTM C309 | Liquid Membrane Forming Compounds for Curing Concrete |
| ASTM C494 | Chemical Admixtures for Concrete |
| ASTM C595 | Specification for Blended Hydraulic Cements |
| ASTM C618 | Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete |
| ASTM C989 | Ground Granulated Blast-Furnace Slag for Use in Concrete |

1.03. SUBMITTALS

- A. Submit Concrete Mix Designs - Concrete mixes used on this project shall be either established mixes verified by "Field Test Data" or new custom laboratory designed "Trial Mixtures." Requirements for either option are as follows.

All data shall be dated within the last 12 months. Partial submittal will not be reviewed.

1. List amount and sources of mix ingredients:

- a. Cement.
- b. Pozzolans (fly ash and slag).
- c. Fine aggregate.
- d. Coarse aggregate.
- e. Water.
- f. Admixtures (including fibers).

2. Strength Test Reports - The average strengths shall be higher than the required average compressive strengths (f'_{cr}) as per ACI 301, paragraph 4.2.3.3.

- B. Reinforcing Steel – 6" square wire mesh
- C. Submit catalog cuts for non-shrink grout.
- D. Submit catalog cuts for chemical adhesive system used to install dowels and threaded anchor bolts into hardened concrete and masonry.
- E. Submit catalog cuts for joint filler and sealant.
- F. Submit catalog cut for slab sealer.
- G. Submit catalog cuts for waterstops and waterstop accessories, clearly indicating which item(s) are to be used.
- H. Submit catalog cut for dampproofing or waterproofing as required by individual sections.
- I. Submit special requests for embedment of conduit, etc. Reference restrictions in Part 3 of this specification.

1.04. COORDINATION

- A. Coordinate all concrete placements with work indicated in all specifications and on all drawings provided.

- B. Coordinate the installation of all cast-in (embedded) items (i.e., grating frames, access hatches, anchor rods, etc.) prior to start of concrete placement. Post-installation of cast-in (embedded) items will not be allowed.
- C. Coordinate all concrete placements with testing and inspection requirements specified herein.

1.05. QUALITY ASSURANCE

- A. Bar Identification and Mill Test Reports - All reinforcing bars shall have the manufacturer's mill marking rolled into the bar which shall indicate the producer, size, type, and grade.
- B. Concrete testing shall be performed prior to and during placement.

PART 2 PRODUCTS

2.01. FORMWORK

- A. Form materials shall be wood, plywood, or steel in good condition. Worn or warped forms will not be accepted.
- B. Chamfer forming strips for exposed edges of concrete.
 - 1. Exposed edges and outside corners of concrete shall be formed with 3/4-inch by 3/4-inch chamfer forming strips.
 - 2. Downstream side of weir plates shall be formed with 3-inch by 3-inch chamber forming strips.
 - 3. Flexible urethane rubber reveal strips shall be used to form chamfers on curved walls.

2.02. REINFORCING STEEL

- A. Deformed Reinforcing Bars - ASTM A615, Grade 60.
- B. Threaded rebar splicing system shall be a fabricated assembly with a mechanical splice capable of developing 125 percent of the specified yield strength (75 ksi for Grade 60 bars).

Use Barsplice Products, Inc. "BPI Barsplicer System," ERICO "Lenton Form Saver," Dayton Superior "Threaded Splicing Systems," or equal.
- C. Expansion joint dowel and sleeve system shall consist of a deformed or smooth dowel provided with a close fitting sleeve of plastic, or of steel pipe or conduit.
- D. Welded Wire Reinforcement (WWR)- ASTM A185 for plain wire or A497 for deformed wire, supplied in flat sheets only.
- E. Bar Supports and Bolsters
 - 1. Bar supports and bolsters shall be a non-bleeding and non-staining material where concrete surfaces remain exposed. Plastic, plastic tipped, or stainless steel bar supports shall be used for this purpose.
 - 2. Bar supports bearing on grade, insulation, or fill material shall be continuous runner type supplied with continuous welded on plates, or minimum 4,000 psi precast concrete blocks specifically cast for this intended use to assure proper support of reinforcement. Individual high chair supports will not be considered adequate.

The use of pavers, brick, or concrete masonry units (CMU) to support reinforcement shall not be permitted.

2.03. CONCRETE

A. Concrete Classes and Their Use

Mix A - All general uses not otherwise specified or provided for below.

Mix C - Concrete fill topping (not exposed to flowing water) and pipe supports and encasements.

Mix D - Concrete thrust blocks (below grade).

Mix E - Sidewalks, curbs, gutters, bench walls, exterior slabs, temporary paving.

| Mix | 28-Day Compressive Strength (psi) | Coarse Aggregate Size per ASTM C33 | Minimum Total Cementitious Content (lbs/CY) | Maximum Water/Cement Ratio (w/c) ⁽¹⁾ | Air Content % ⁽²⁾ | Maximum Water-Soluble Chloride Ion (CL ⁻) |
|-----|-----------------------------------|------------------------------------|---|---|------------------------------|---|
| A | 4,500 | #57 | 575 | 0.42 | 6.0 | 0.30 |
| C | 4,000 | #7 | 550 | 0.44 | 7.0 | 0.30 |
| D | 3,000 | #57 | 450 | 0.50 | -- | -- |
| E | 5,000 | #57 | 600 | 0.40 | 6.0 | 0.15 |

(1) These maximum water/cement ratios shall be considered for selection of supplier's mix designs. The water/cement ratio specified in the approved mix designs shall be the maximum used in production.

(2) Tolerance for air content is $\pm 1\frac{1}{2}$ percent.

B. All concrete exposed to weather or freezing temperatures shall be air-entrained as specified in the above chart.

C. Without plasticizers, concrete slump for flatwork shall not exceed 3 inches. Wall concrete, columns, deep beams, and other vertical placements (without plasticizers) shall be placed with a maximum slump of 4 inches.

D. Concrete with superplasticizer shall be designed for a target slump of 6 inches. Mixed concrete with a slump greater than 7 inches shall not be placed on this project.

2.04. MATERIALS

A. Cement shall be Portland cement Type I or Type II and shall conform to ASTM C150.

B. Pozzolans

1. Fly ash shall meet the requirements of ASTM C618 Class F, except as modified below:

a. Loss of Ignition, Maximum - 5.0 percent.

b. Maximum Retained on #325 Sieve - 30 percent.

A blend of Portland cement and fly ash shall be between 15 to 25 percent of total

cementitious content.

2. Blastfurnace slag shall meet the requirements of ASTM C989 and be specifically manufactured to produce higher concrete strengths and provide greater resistance to chloride penetration and sulfate attack.

A blend of Portland cement and ground iron blastfurnace slag shall contain no more than 50 percent slag. The resulting blend of cementitious material shall meet the requirements of ASTM C595.

C. Aggregates

1. Fine Aggregate (Sand)
 - a. Natural or manufactured siliceous sand.
 - b. Quantity of deleterious substances as approved by State DOT or as limited by Table 1 of ASTM C33.
 - c. Graded within the limits of ASTM C33.
2. Coarse Aggregate
 - a. Crushed stone or crushed gravel.
 - b. Quantity of deleterious substances as approved by State DOT or as limited by Table 3 of ASTM C33 for Class 4S aggregates.
 - c. Graded within the limits of ASTM C33.
3. Five cycle soundness tests for fine and coarse aggregates shall meet the requirements of ASTM C33.

PERCENT LOSS

| | MAGNESIUM SULFATE | SODIUM SULFATE |
|---------------------------------|-------------------|----------------|
| Fine aggregate ⁽¹⁾ | 15 | 10 |
| Coarse aggregate ⁽²⁾ | 18 | 12 |

- (1) If provided results of soundness tests exceed these limits, it would be acceptable to provide a certified letter attesting to the favorable performance of the fine aggregates as outlined in ASTM C33, Article 8.
 - (2) Soundness tests for coarse aggregates do not need to be provided if they are approved by State DOT for use with concrete. Submit verification of such.
4. Source of fine and coarse aggregates shall not have a history pertaining to alkali-aggregate reactivity. In the event that aggregate source with potential alkali-aggregate reactivity is unavoidable, at least two of the following measures shall be taken to minimize this reaction:
 - a. Provide low alkali cement (<0.60 percent alkalies).
 - b. Use lithium-based additives.
 - c. Test aggregates to show non-reactive.

- d. Use fly ash (minimum 20 percent content) or slag.
- D. Mixing Water - Clear and potable.
- E. Acceleration admixtures are only allowed to shorten cold weather protection periods.

2.05. ADMIXTURES

- A. General - Admixtures other than those specified may only be used after written approval by the Town.
- B. Admixtures shall be as manufactured by BASF Chemical Company; Sika Corporation; Euclid Chemical Company; W.R. Grace, Inc.; or equal.
- C. Air Entrainment Admixture - All concrete requiring air entrainment shall contain an air entrainment admixture meeting the requirements of ASTM C260.
- D. Water Reducing Admixture - All concrete shall contain a water reducing admixture that meets the requirements of ASTM C494 Type A (water reducing) or Type F (superplasticizer). This admixture shall not contain chlorides.
- E. Retarding Admixture - If air temperatures are expected to exceed 85 degrees F during the placement and/or finishing of any flatwork, a retarding admixture shall be used that meets the requirements of ASTM C494 Type D.
- F. Evaporation Reducer - For all concrete flatwork during hot and/or windy weather conditions, apply to freshly placed concrete prior to finishing. Use BASF Chemical Company "Confilm," L&M Construction Chemicals "E-Con," Conspec (by Dayton Superior) "Aquafilm," or equal.
- G. Acceleration admixture shall meet the requirements of ASTM C494, Type C, and shall not contain calcium chloride. Acceleration admixture is only allowed for cold weather concrete conditions.

2.06. OTHER PRODUCTS

- A. Bonding Agent - When placing freshly-mixed concrete against existing hardened concrete, use a corrosion inhibiting, non-vapor barrier, extended open time bonding compound.

Use Sika Corporation "Armatec 110 EpoCem," Euclid Chemical Company "Duralprep A.C.," Larsen Products Corporation "Weld-Crete," or equal.
- B. Liquid curing compound shall only be used during cold weather conditions and curing of foundation wall strip footings. When allowed, use a dissipating, VOC-compliant, water-based membrane forming with fugitive dye, conforming to ASTM C309, Type 1-D. Curing compound shall be applied at twice the manufacturer's recommended application rate.
- C. Slab sealer shall be Sika Corporation "Sikagard 701W," Euclid Chemical Company "Euco-Gard 100," BASF Chemical Company "Enviroseal 20," or equal.
- D. For expansion joints, use PVC 9-inch by 3/8-inch ribbed center bulb (nominal 1 inch in diameter) waterstop.
- E. Where new concrete is cast against hardened concrete:
 - 1. Provide a premolded 1-inch by 3/4 inch bentonite self-adhering waterstop strip which expands on contact with water, applied with primer adhesive. The bentonite waterstop material shall meet the requirements of ASTM D217. Waterstop and adhesive shall be "Waterstop-RX" and "CetSeal" by CETCO Building Materials

Group; "Swellstop" and "Swellstop Primer" by Greenstreak; or equal.

- F. Expansion and isolation joint filler shall be preformed, closed cell, high grade polyethylene or non-extruding PVC, such as "Expansion Joint Filler" by BASF Chemical Company; "Plastic Expansion Board" by Westec Barrier Technologies; "Deck-O-Foam" by W.R. Meadows, Inc.; or equal.
 - 1. Joint fillers shall be held back for sealants.
 - 2. The joint filler shall be compatible as a back-up material, with regard to thesealant not bonding to or being stained by the backup.
- G. Wall dampproofing shall be a heavy duty fibrated asphalt emulsion per ASTM D1227, Type II applied over an asphalt primer per ASTM D41.
- H. Non-Shrink Grout - Shall be a fluid or flowable non-gas liberating cement base product which is manufactured premixed, requiring only the addition of water at the job site. All components shall be inorganic. Non-shrink grout (mixed as a plastic state) shall have a minimum compressive strength of 5,000 psi in seven days and 7000 psi in 28 days.
- I. After material sources have been established and approved, these sources shall not be changed for the duration of the project.

PART 3 EXECUTION

3.01. FORMS

- A. Earth cut forms shall not be used; all footings, base slabs, etc., shall be formed.
- B. Contractor is responsible for design and bracing of all forms for strength, integrity, and to produce the desired tolerances and finishes.

3.02. TOLERANCES FOR FORMED SURFACES

- A. Tolerances apply to concrete dimensions only, not to positioning of reinforcing steel or cast-in/embedded items.

| | |
|---|------------------------|
| 1. Variation from plumb: | |
| a. In the lines and surfaces of columns, piers, walls, and other vertical members: | 1/4 inch |
| b. For exposed corners of walls and columns, construction/ control joint grooves, and other conspicuous vertical lines: | 1/4 inch |
| 2. Variation from level or from grades specified: | |
| a. In slab soffits, ceilings and beam soffits, measured before removal of supporting shores: | 1/4 inch |
| b. In exposed lintels, sills, parapets, grooves, tops of walls, slab edges, and other conspicuous horizontal lines: | 1/4 inch |
| 3. Variation of the linear [building lines] [lines of structures] from position in plan and related position of columns, walls, and partitions: | 1/2 inch |
| 4. Variation in the sizes and location of sleeves, floor openings, and wall openings: | ±1/4 inch |
| 5. Variation in [cross-sectional dimensions of columns and beams and in the] thickness of slabs and walls: | -1/4 inch +1/2 inch |
| 6. Footings and thickened edges of slabs: | |

| | |
|--|------------------------|
| a. Variations in dimensions in plan: | -1/2 inch +2 inches |
| b. Misplacement or eccentricity: | |
| • 2 percent of the footing width in the direction of misplacement but not more than 2 inches | |
| c. Thickness: | |
| • Decrease in specified thickness | 5 percent |
| • Increase in specified thickness. No limit but increased thickness must be maintained for minimum 5 feet 0 inch length | |
| 7. Stairs | |
| a. Treads shall be level and true and top surfaces shall not vary more than 1/8 inch from side to side or back to front. | |
| b. Riser heights shall not vary more than 3/8 inch in height on any run of stairs. | |
| c. Tread depths shall not vary more than 3/8 inch in height on any run of stairs. | |

3.03. CONCRETE COVER

- A. Clear concrete cover not indicated on Drawings shall conform to ACI 318 and ACI 350, as applicable. However, in no case shall the clear cover be less than 1-1/2 inches.
- B. Contrary to the practice permitted by CRSI, the use of brick or CMU block supports for reinforcement shall not be permitted. Only special made wire bar supports or special cast, precast concrete blocks shall be allowed.
- C. All metal and plastic bar supports bearing on grade shall have continuous runners to prevent settlement during construction activities.

3.04. CLEANING

- A. Prior to concrete deposition, reinforcing steel shall be free from mortar, mud, loose mill and rust scale, grease, oil or any other coatings, including ice, that would destroy or reduce bond with the concrete.

3.05. PREPARATION, MIXING, AND HANDLING OF CONCRETE

- A. Batch Plant Requirements - Measurement of materials at the batch plant shall be in accordance with ASTM C94.
- B. Mixing Methods - All concrete shall be ready mixed to meet the requirements of ASTM C94.

3.06. EMBEDMENTS IN CONCRETE

- A. Install and secure all cast-in components in accordance with manufacturer's recommendations, prior to concrete placement.
- B. Embed no pipes other than electrical conduit in structural concrete.

Obtain approval from Town for any variation from the following requirements unless shown on the Drawings.

3.07. CONCRETE PLACEMENT

- A. Concrete shall be placed in accordance with ACI 304 and ACI 318.
- B. Concrete shall be placed and vibrated in lifts not exceeding 30 inches.

- C. Curing and protection of the concrete shall begin immediately after completion of the finishing operation.

3.08. FORM REMOVAL

- A. The Contractor shall assume full responsibility for the strength of all components from which forms are removed.
- B. Forms and supports shall remain undisturbed until the concrete has attained sufficient strength to support its own weight in addition to any anticipated loads (temporary or permanent) that may be placed upon it during subsequent work. In no event shall forms be loosened or removed prior to 24 hours' wet cure time. Re shore at midspan where necessary.
- C. Residue of the form release agent shall be completely cleaned off the concrete surface.

3.09. FINISHING

- A. Slab Finishes - The finish of all slabs and top of walls shall be described below:
 - 1. Type A - Floated Finish - After the concrete has been placed, consolidated, struck off, and leveled, the concrete shall not be worked further until ready for floating. Preferably a magnesium float will be used.

Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, planeness of surface shall be checked with a 10 foot straightedge.

If water has been brought to the surface by the rough floating operation, additional floating shall not proceed until this water has evaporated.

The slab is further floated, with all high spots cut down and all low spots filled during this procedure. The slab shall be finish floated to a uniform sandy texture.
 - 2. Type B - Troweled Finish - The surface shall first receive a Type A floated finish. It shall then be power troweled and finally hand troweled for thorough consolidation. Additional trowelings shall be done by hand after the surface has hardened sufficiently. The final troweling shall produce a ringing sound as the trowel is moved over the surface.

The finished surface shall be essentially free of trowel marks, uniform in texture and appearance.

Apply only a light troweled finish on tank base slabs or if the area is to receive a chemical-resistant finish (CRF).
 - 3. Type C - Broom Finish - First, finish the concrete with a Type A floated finish. The concrete shall be given a transverse scored texture by drawing a coarse broom across the surface, perpendicular to the line of travel along the walking surface.
 - 4. Type D - Concrete Floor Sealer - All concrete surfaces identified in the Finish Schedule, not scheduled to receive other coatings or coverings, shall be sealed as follows:
 - a. Prior to applying floor sealer, thoroughly clean the concrete surface.
 - 1) At new concrete floors, remove all dirt, oil, grease, and other foreign matter with caustics and detergents.
 - 2) At existing concrete floors, the concrete shall first be cleaned using

an abrasive brush-off blast, followed by caustics and detergents as needed.

- b. Thoroughly rinse and apply two coats of sealer in accordance with manufacturer's recommendations.
 - 1) At new concrete floors, the first coating shall be applied as soon as possible after finishing and curing. The second coating shall be applied near project completion after installation of all equipment and piping and after completion of other related construction activities.
 - 2) At existing concrete floors, apply the first coating as soon as possible after the floor is cleaned. Apply the second coating near project completion after installation of all equipment and piping and after completion of other related construction activities.

B. Finish Schedules

TABLE 03001-1 – SLAB (HORIZONTAL) FINISHES

| | |
|--------|---|
| Type A | Floated Finish - At tops of walls and footings, for surfaces intended to receive roofing or tile, and for surfaces to receive a Type C broom finish. |
| Type B | Troweled Finish - For interior floors intended as walking surfaces, flow channels, tankage, and all areas where in contact with liquids (including bench walls). For all horizontal surfaces (including slabs and concrete toppings) not indicated to receive other finish. Apply a light troweled finish for surfaces to receive a chemical-resistant finish (CRF) and for tankage base slabs and concrete toppings. |
| Type C | Broom Finish - For sidewalks, exterior slabs and platforms, stair treads, landings, exterior and interior pedestrian ramps, loading docks, and other exterior walking surfaces. |
| Type D | Concrete Floor Sealer - For interior and exterior exposed to view slabs, garage floors, pump/equipment room floors, sidewalks, stair treads, landings, etc. , including driveway aprons. |

3.10. CURING AND PROTECTION

- A. All freshly placed concrete shall be protected from adverse weather elements, and from defacement. As soon as the concrete has been placed and horizontal top surfaces have received their required finish, provision shall be made for providing sufficient water for hydration and preventing loss of moisture from the concrete for at least a seven-day period.
- B. For the first 24 hours after concrete finishing, no work shall commence nor shall any material be placed on the newly cast concrete.
- C. Interruptions, not to exceed a total of four hours are permitted for the purpose of layout or other required construction needs as long as the surface is not allowed to completely dry. Be prepared to spray the exposed surface every 15 to 30 minutes.
- D. Slabs and Other Flatwork
 - 1. After finishing and immediately after the concrete surface has hardened enough to prevent dilution of the cement paste, spray the surface with water to provide continuous moist curing for at least the first 24 hours.

2. After the initial 24-hour period, soak with water and cover for an additional six days with waterproof paper or white polyethylene blankets. Wet burlap coverings may be used if the burlap is kept wet by continuous sprinkling with water. Lap the cover material at least 12 inches, covering the top and sides of the concrete.
 3. If cover material is not used, the concrete surfaces shall be kept continuously wet by spraying or other approved methods.
- E. In hot weather conditions (defined in ACI 305), provide curing procedures as outlined above along with additional provisions required by ACI 305.
- F. In cold weather conditions (defined in ACI 306) where heated enclosures are provided and when continuous moist curing of walls and slabs is not practical, use liquid membrane forming curing compounds with fugitive dye, applied at twice the manufacturer's standard rate of application.

3.11. SEALING OF CONCRETE

- A. The concrete surfaces identified in the Finish Schedule shall be sealed as follows:
1. The first coating shall be applied as soon as possible after finishing and curing, and the second coating shall be applied near project completion after installation of all equipment and piping and after completion of other related construction activities.
 2. Apply sealer in accordance with manufacturer's recommendations.

3.12. TESTING FOR QUALITY ASSURANCE

- A. The Town reserves the right to order testing of materials at any time during the work.
- B. The Contractor shall hire and pay for the services of an independent testing laboratory to perform the testing for quality assurance.
- C. This testing shall consist of calculation of w/c ratio; measuring slump; air content; and tests for the compressive strength. Four 6-inch diameter cylinders shall be made with 1 cylinder to be tested at 7 days, 2 cylinders to be tested at 28 days, and 1 cylinder to be tested at 56 days if the 28-day strengths are inadequate. These test results will be used by the Contractor to assist his control of quality.
- D. The Contractor shall schedule and provide 48 hours' notice to the independent testing laboratory. The Contractor shall provide free access to work and cooperate with the testing laboratory.
- E. In general, testing shall be required for each placement in excess of 5 cubic yards.
- F. Copies of all test reports shall be mailed directly to the Town by the testing laboratory as soon as they become available.
- G. The Contractor shall accept all test results reported by the testing laboratory. Any disputed results shall be validated by an independent testing laboratory hired by the Contractor at their expense.

3.13. REPAIR OF CONCRETE

- A. Areas of concrete in which cracking, spalling, or other signs of deterioration develop during initial curing or thereafter until the end of the guarantee period shall be removed and

replaced, or repaired in accordance with this Article.

- B. Excessive surface cracking in concrete slabs as defined herein shall receive a penetrating epoxy resin sealer to seal the cracks.

Excessive cracking shall be defined as areas containing "craze cracking" or "map cracking" as defined by ACI 201.1. In the event that excessive cracking occurs in isolated areas of a given concrete slab, sealer could only be required in the area of the cracks bounded by construction or control joints pending Town approval.

Surface preparations, priming, mixing, application and finishing shall be in accordance with the manufacturer's recommendations.

Epoxy resin penetrating sealer shall be "Sikadur 55 SLV" by Sika Corporation, or equal. Contractor shall submit a suitable remedial product and installation procedures to the Town for approval.

- C. All spalled, weakened, damaged or disintegrated concrete and areas of honeycombing shall be removed to sound concrete.

For spalled or honeycombing areas involving depths generally less than 3 inches, utilize a polymer-modified cementitious repair mortar, such as Sika Corporation "Sikatop 122 or 123," Euclid Chemical Company "Verticoat," BASF Construction Chemicals "HB2 Repair Mortar," or equal.

Surface preparation, mixing, priming and application shall be in conformance with manufacturer's recommendations.

END OF SECTION