SECTION 02 07 00
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including Instructions to Bidders and General AND Supplementary Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The scope of work under this section includes all labor and incidentals for the:
   1. Removal and disposal of existing flooring.
   2. Removal and disposal of existing metal lockers.
   3. Removal of any other items shown on the drawings or as required to complete the work shown on the drawings.
   4. Disposing of debris
   5. Final cleanup
   6. DO NOT remove any existing materials that are not specific shown to be removed.

1.3 PROTECTION

A. The building shall remain operational throughout the construction.
B. Protect building elements from damage.
C. Protect site improvements from damage.
D. Protect lawns and landscaping from damage.
E. Repair or replace any damage and return to as pre-construction condition.

1.4 QUALITY ASSURANCE

A. The Contractor will take extraordinary care to assure that demolition causes no damage to adjacent construction.

PART 2 – MATERIALS (NOT USED)

PART 3 – EXECUTION

3.1 DEBRIS REMOVAL AND DISPOSAL

A. All debris shall be removed from the construction site and legally disposed. Debris shall be removed from the construction site as demolition operations progress either by truck or dumpster. Debris shall not be allowed to accumulate on or near the construction site. If debris is to be removed from the construction site utilizing dumpsters, debris may be stored in the dumpsters until full. However, full dumpsters shall not be allowed to remain on the site. Dumpster locations shall be approved by the Architect.
B. The use of any and all open flame devices is strictly forbidden on this Project. No smoking will be permitted.
C. Where equipment that might cause a fire is used, keep fire extinguishers ready within 50ft. of the work site for instant use. Users of such equipment shall be instructed in the proper method to prevent fires and to extinguish a fire.

END OF SECTION

SECTION 03 30 00
CAST IN PLACE CONCRETE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast in place concrete, including concrete materials, mix design, placement procedures, and finishes, as required.
B. Scope: Provide all materials, labor, equipment, and appliances required to complete work of this Section, including, but not necessarily limited to, the following:
   1. Floor Slabs

1.3 REFERENCES

A. Codes and Standards: Comply with provisions of the latest editions of the following codes, specifications and standards, except where more stringent requirements are shown or specified:

   1. ASTM..... American Society of Testing and Materials "Listed Standard"
   2. ACI 301..... "Specifications for Structural Concrete for Buildings".
   3. ACI 318..... "Building Code Requirements for Reinforced Concrete".
   4. CRSI..... Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
   5. NJDOT..... New Jersey Department of Transportation "Standard Specifications".

1.4 QUALITY ASSURANCE

A. Concrete Testing Service: Employ, at Contractor's expense, a testing laboratory approved by Architect to design concrete mixes and perform material evaluation tests related to the concrete mixes. Materials and installed work may require testing and retesting, as directed by Architect, at any time during the progress of work. Allow free access to material stockpiles and facilities. Tests, not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, curing compounds, and others as requested by Architect.
B. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design tests as specified.
C. Material Certificates: Provide materials certificates for cement, aggregates, admixtures, reinforcing, welded wire fabric, non-shrink grout, curing compounds and non-slip aggregates. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
D. Concrete Mix Designs: Provide mix designs with strength tests for each class and type of concrete for review by the Architect prior to placement of concrete.

PART 2 – PRODUCTS

2.1 CONCRETE MATERIALS

A. Portland Cement: ANSI/ASTM C 150, Type I, Conforming to Section 914 of NJDOT Standard Specifications.
B. Use one brand of cement throughout project, unless otherwise acceptable to Architect.
C. Aggregates:
    1. Normal Weight Aggregates: ANSI/ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.
    2. Local aggregates not complying with ANSI/ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.

D. Water: Potable.
E. Air-Entraining Admixture: ANSI/ASTM C 260.
F. Products: Subject to compliance with requirements, provide one of the following:
    1. "Air-Mix" or "Perma Air"; Euclid Chemical Co.
    2. "Daravair"; Grace Construction Products.
    3. "MB-VR" or "MB AE 90"; Master Builders.
    4. "Sika AER"; Sika Chemical Corp.

G. Water-Reducing Admixture: ANSI/ASTM C 494, Type A, and contain not more than 0.05% chloride ions. Products: Subject to compliance with requirements, provide one of the following:
    1. "Eucon WR-75"; Euclid Chemical Co.
    2. "WRDA with Hycol"; Grace Construction Products.
    3. "Pozzolith 220N"; "MBL-82" or "Polyheed 997"; Master Builders Inc.
    4. "Plastocrete 161"; Sika Chemical Corp.

H. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G and contain not more than 0.05% chloride ions. Products: Subject to compliance with requirements, provide one of the following:
    1. "Eucon 37"; Euclid Chemical Co.
    2. "Daracem 100"; Grace Construction Products.
    3. "Rheobuild 1000" Master Builders Inc.
    4. "Sikament 86"; Sika Chemical Corp.

I. Non-Corrosive, Non-Chloride Accelerator Admixture: ASTM C 494, Type C or E, and contain no more chloride ions than are present in municipal drinking water. The manufacturer must have long-term test data (at least a year), from an independent testing laboratory, concerning corrosion using an acceptable accelerated corrosion test method such as that using electrical potential measures. Products: Subject to compliance with requirements, provide one of the following:
    1. "Accelguard 80"; Euclid Chemical Co.
    2. "Daraset"; Grace Construction Products.
    3. "Pozzolith NC-534" or " Pozzutec 20"; Master Builders Inc.
    4. "Plastocrete 161FL"; Sika Chemical Corp.

J. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and contain not more than 0.05% chloride ions. Products: Subject to compliance with requirements, provide one of the following:
    1. "Eucon Retarder 75"; Euclid Chemical Co.
    2. "Daratard-17"; Grace Construction Products.
    3. Pozzolith 100XR", "Pozzolith 122R" or "Polyheed RI"; Master Builders Inc.
    4. "Plastiment"; Sika Chemical Co.

K. Calcium chloride, or admixtures containing more than 0.05% chloride ions are not permitted. Thiocyanate-based chemical admixtures shall contribute less than 0.30% thiocyanate ions by weight of cement when the manufacturer's maximum recommended dosage is used. Certification of conformance to the above-mentioned requirements and the chloride content of the admixture will be required from the admixture manufacturer prior to review of mix design.

2.4 RELATED MATERIALS

A. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:
   1. "Eucobar,"; Euclid Chemical Co.
   2. "E-Con"; L&M Construction Chemicals, Inc.
   3. "Confilm"; Master Builders, Inc.
   4. "SikaFilm"; Sika Chemical Corp.

B. Liquid Membrane-Forming Curing and Sealing Compound: Water-based acrylic type, 30% solids content minimum, and have test data from an independent testing laboratory indicating a maximum moisture loss of 0.55 kg per sq m in 72 hours when applied at the coverage rate recommended by the manufacturer. Products offered by manufacturers to comply with the requirements for membrane-forming curing and compounds include the following:
   1. "Super Diamond Clear VOX"; The Euclid Chemical Corp.
   2. "Mastercure 200W"; Master Builders.
   3. "Dress & Seal #30 WB"; L&M Construction Chemicals Inc.

C. Bonding and Repair Materials: Bonding Materials: Polyvinyl acetate, rewettable type. Use only in areas not subject to moisture.
   1. "Euco Weld"; Euclid Chemical Co.
   2. "Weldcrete"; Larsen Co.

D. Polymer Patching Mortar: Free-flowing, polymer-modified cementitious coating.
   1. "Euco Thin Coat" or "Verticoat LPL"; Euclid Chemical Co.
   2. "Sikatop 121, 122, or 123"; Sika Chemical Corp.
   3. "Emaco 300, 310, or 350"; Master Builders

E. Bonding Admixture: The compound shall be a latex, non-rewettable type.
   1. "SBR Latex" or "Flex-con"; Euclid Chemical Co.
   2. "Daraweld C"; W. R.Grace.
   3. "MB Primer"; Master Builders.
   4. "SikaLatex" or "SikaLatex R"; Sika Chemical Corp.

F. Moisture Barrier: Provide moisture barrier cover over prepared base material where indicated. Use only materials which are resistant to decay when tested in accordance with ANSI/ASTM E 154, as follows: Polyethylene sheet not less than 8 mils thick. Overlap a minimum of 6 inches at all joints.

G. Joint Filler: Closed cell extruded neoprene gasket conforming to ASTM C509, Grade 4, black.

2.5 PROPORTIONING AND DESIGN OF MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory the trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to Architect. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect. If trial batch mixes

are used, the mix design shall achieve an average compressive strength 1200 psi greater than the specified strength.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
   1. Concrete for Building Construction and Site Improvements: 4,000 psi 28-day compressive strength. Minimum cement content: 600 lbs/cu.yd; Maximum Water/cement ratio: 0.44.

D. 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 Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

E. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in all concrete.

F. Use non-corrosive accelerating admixture in concrete slabs placed at ambient temperatures below 50°F.

G. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits: 2% to 4% air.

H. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.

I. Slump Limits: Proportion and design mixes to result in concrete slump at truck as follows:
   1. Concrete for Slab Infill: Not less than 1" and not more than 4".
   2. Concrete containing HRWR admixture (super plasticizer): Not more than 8" after addition of admixture nor more than 3" prior to addition of admixture.

2.6 CONCRETE MIXES

A. Ready-Mix Concrete: Comply with requirements of ANSI/ASTM C 94. and as herein specified.

B. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water to the batch will not be permitted.

C. Redosage with the specified high-range water reducing admixture may be done with the prior approval of the Architect regarding dosage and time periods.

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

E. When air temperature is between 85°F and 90°F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90°F, reduce mixing and delivery time to 60 minutes.

PART 3 – EXECUTION

3.1 CONCRETE PLACEMENT

A. Pre-placement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

B. General: Comply with ACI 304, and as herein specified.

C. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309 recommended practices.

D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

E. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
F. Bring slab surfaces to correct level with straightedge and strikeoff. Use highway straightedges, bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

3.2 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
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. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by. moisture-retaining cover curing, and by combinations thereof, as herein specified
D. Provide moisture curing by following methods.
E. Keep concrete surface continuously wet by covering with water. Use continuous water-fog spray. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-inch lap over adjacent absorptive covers.
F. Provide moisture-cover curing as follows:
G. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
H. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs as follows:
I. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete
J. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces, by application of appropriate curing method.
L. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.3 MISCELLANEOUS CONCRETE ITEMS

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

3.4 CONCRETE SURFACE REPAIRS

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.
B. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar before bonding compound has dried. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry,

patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spills, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry-pack mortar, or precast cement cone plugs secured in place with bonding agent.

D. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

E. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having required slope.

F. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, as such, include crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with patching compound. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

G. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

H. Repair methods not specified above may be used, subject to acceptance of Architect.

END OF SECTION

SECTION 07 92 00
JOINT SEALERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section Includes:
   1. Provision and installation of joint sealers for new building construction.

B. Scope: Provide all materials, labor, equipment, and appliances required to complete work of this Section, including, but not necessarily limited to, the following:
   1. Cleaning and priming of joints as required by Manufacturer's installation instructions.
   2. Installation of joint sealants at trim to wall joints and fixtures at interior.

1.3 REFERENCES

A. ASTM C 321 - Standard Test Method for Bond Strength of Chemical-Resistant Mortars
B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants

1.4 QUALITY ASSURANCE

A. Performance: Except as otherwise indicated, joint sealers are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, within recognized limitations of wear and aging as indicated for each application. Failures of installed sealers to comply with this requirement will be recognized as failures of materials and workmanship.
B. Applicator Qualifications: Contractor and job foreman must have experience installing sealant.
C. Pre-Installation Compatibility and Adhesion Tests: Contractor shall be responsible for verifying with sealant manufacturer that all sealants to be used are compatible with and will satisfactorily adhere to all substrates. Tests shall be conducted in the field and witnessed by the Architect or Inspection Agency.
D. Adhesion Test: During installation, in the presence of, and when and where directed by the Architect or Inspection Agency, conduct pull test on each joint type. Test is to be performed by slicing across the joint and then cutting both sides of the joint two inches, separating the sealant from the adjoining material. The sealant shall then be pulled in the direction of the joint. The sealant should break rather than separate from the adjoining material.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 61 00.
B. Manufacturer's Technical Data, Guides, and Application Procedures
C. Submit samples illustrating colors.
D. Submit laboratory tests or data validating product compliance with performance criteria specified.
E. Submit a copy of the Manufacturer's warranty.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.
B. Store products in a location protected from freezing, damage, construction activity, precipitation, and direct sunlight in strict accordance with manufacturer's recommendations.

C. Condition products to approximately 60 to 70 degrees F for use in accordance with manufacturer's recommendations.
D. Handle all products with appropriate precautions and care as stated on Material Safety Data Sheet.

1.7 PROJECT CONDITIONS

A. Do not use products under conditions of precipitation or freezing weather. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.
B. Ensure substrate is dry.
C. Protect adjacent work from contamination or damage.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Single Source: All materials, including joint sealers, cleaners, and primers shall be of a single source manufacturer.
B. Acceptable Manufacturers:
    1. Dow Corning
    2. Sika
    3. Tremco
    4. Pecora
    5. United States Gypsum Company
    6. Approved Equal

2.2 MATERIALS

A. Exterior Joints: One-part, low modulus, elastomeric sealant: *DOW CORNING* 790 Silicone Building Sealant, *SIKA* WS290, *TREMCO* Spectrem 1, or approved equal, Conforming to ASTM C-920, Type S, Class 100/50 Grade NS, Use NT, M, G, A, and O.
B. Interior joints and at fixtures: Mildew Resistant Silicone Sealant. One-part, ±25 percent movement – high-modulus, acid-curing, mildew-resistant silicone sealant.
C. Poured Flexible Epoxy Joint Filler: two component 100 percent solids epoxy joint filler with flexible, pourable, self-leveling properties.
    1. Shore A Hardness: 85 plus or minus 5.
    2. Shore D Hardness: 34.
    3. Elongation: 75 percent.
    4. Tensile Strength: 655 pounds per square inch plus or minus 10 pounds per square inch.
    5. Mixing Ratio: 1 to 1 by volume.
    6. Pot Life: 40 to 55 minutes at 75 degrees F.

2.3 ACCESSORIES

A. Primer: As required by sealant manufacturer.
B. Joint Cleaner: Non-corrosive and non-staining type recommended by sealant manufacturer and compatible with joint forming materials.
C. Backer Rod: Bi-cell polyethylene rod designed for use with cold-applied joint sealants for on-grade or below-grade applications.
    1. Comply with ASTM C 1330 Type B.
    2. Size required for joint design.

D. Bond Breaker: Pressure-sensitive tape polyethylene or Teflon recommended by sealant manufacturer.
E. Masking Tape: Pressure-sensitive paper tape.

2.4 COLOR

A. Sealant Colors: Selected by Architect from manufacturer's master color system.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect all areas involved in work to establish extent of work, access, and need for protection of surrounding construction and public spaces.
B. Conduct pre-application inspection of site verification with an authorized manufacturer's representative.

3.2 PREPARATION

A. Remove loose materials and foreign matter which impair adhesion of joint filler.
B. Clean joints by grinding, sandblasting, or wire brushing to expose a sound surface free of contamination and laitance.
C. Ensure structurally sound surfaces, dry, clean, free of dirt, moisture, loose particles, oil, grease, asphalt, tar, paint, wax, rust, waterproofing, curing and parting compounds, membrane materials, and other foreign matter.
D. Prime the bond line using Prime Coat where required by the sealant manufacturer installation instructions or as required for proper adhesion, allowing a minimum of one hour drying and cure time before installing sealant. Primer should be within shelf life and poured from containers onto rags, or into applicator bottles that can be poured onto rags. If brushes are used, primer should be poured a small amount at a time into another open container to avoid contaminating primer and to minimize primer being exposed too long. Pour out no more than can be applied in 30 minutes. If primer becomes cloudy or contaminated, discard. Prime no more substrate than can be sealed in one day or shift.
E. Where the possibility of joint filler staining of adjacent areas or materials exists, mask joints prior to application.
    1. Do not remove masking tape before joints have been tooled and initial cure of joint filler has taken place.
    2. Work stained due to failure of proper masking precautions will not be accepted.

3.3 INSTALLATION

A. Solvent clean aluminum and any other non-porous surfaces with recommended solvent using the "Two Cloth Cleaning Method".
B. Apply primer according to manufacturer's instructions.
C. Back-Up Material:
    1. Install backer rod using blunt or rounded tools to assure uniform depth (+/- 1/8") without puncturing or twisting. Bi cell rod shall be a minimum 25% and maximum 50% oversized. Install bond breaker tape in shallow joints.
    2. Install polyethylene joint filler in joints wider than 1/4 inch (6 mm) to back-up material per manufacturer's recommendations.

D. Bond Breaker: Install bond-breaker strip in joint to be sealed on top of back-up material to prevent adhesion of sealant to back-up material; install per manufacturer's recommendations.
E. Sealant:

    1. Mask or protect adjacent areas that are not to receive sealant.
    2. Apply sealant in joints using a pressure gun with nozzle cut to appropriate size. Deposit sealant in a uniform and continuous bead with no gaps or air pockets.

3. Tool joints to require configuration with a blunt instrument as soon as possible after installation, but before sealant begins to skin over. Remove all masking materials immediately after tooling.
4. Apply materials only within manufacturer's specified application life period. Discard sealant after application life is expired or if prescribed application period has elapsed.

F. Joints shall have a minimum width to depth ratio of 2:1. Finished joint cross section shall have an hourglass shape.

3.4 CLEANING

A. Remove uncured sealant and joint filler with Reducer 990, xylene, toluene, or MEK. Remove cured sealant and joint filler by razor, scraping, or mechanically.
B. Remove all debris related to application of sealants from job site in accordance with all applicable regulations for hazardous waste disposal.

3.5 SCHEDULE OF JOINT SEALERS

A. Interior Applications:
   1. Sealant: Mildew Resistant Silicone Sealant.
   2. Applications: Interior joints and at fixtures.

END OF SECTION

SECTION 09 29 00
GYPSUM BOARD

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. The work under this section includes the supply, installation, and finishing of gypsum board assemblies including light gauge metal framing systems.

1.3 JOB CONDITIONS

A. Maintain a uniform temperature of not less than 50 degrees F in the structure for at least 48 hours prior to, during and following the application of gypsum board and joint treatment materials.

PART 2 – PRODUCTS

A. Wallboard
   1. Wallboard: Unless otherwise indicated, all gypsum board shall be 1/2" thick standard tapered-edge board, moisture-resistant, 48" wide in lengths as required to eliminate end-joint corners, conforming to ASTM C-36.

B. Fasteners
   1. Gypsum board to studs: Self-drilling Type "S" Phillips head drywall screws, galvanized 1 inch long for single layer; 1-5/8" long for double layer.
   2. Metal studs and channels: Self-drilling Type "S-12" Phillips head screws, 1 inch long or two (2) fillet welds at each intersection of jamb stud and jamb anchor clip.

C. Accessories
   1. Corner Beads: Wallboard corner bead, galvanized 1-1/8" x 1-1/8" for crimped application for single layer application; 1-1/4" x 1-1/4" for double layer application.
   2. Casing Beads: No. 200 galvanized for finishing with joint compound, except where otherwise shown or required.

D. Tapes and Compounds

   Tape shall be standard reinforcing tape for all gypsum board, application as recommended by the gypsum board manufacturer, except at moisture-resistant wallboard at external corner applications, use "Multi-Flex" corner beads. Use tape at intersections of vertical gypsum wallboard and ceiling construction.

E. Steel studs and runners: Steel studs fabricated from galvanized steel complying with the following specifications:
   1. 3 5/8" web, 25 gauge studs with 1 3/8" flange and 5/16" return lip.
   2. Track: 3 5/8" web, 20 gauge with 1 1/4" flange. Unless otherwise noted on drawings.
   3. Flat Straps: 2" x 20 gauge
   4. Tie Wire 18 gauge galvanized tie wire.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Stud System Erection

1. Attach steel runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c. Position studs vertically, with open side facing in same direction, engaging floor and ceiling runners, and spaced 16" o.c. When necessary, splice studs with 8" nested lap and two positive attachments per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Anchor all studs for shelf-walls and those adjacent to door and window frames, partition intersections, corners and free-standing furring to ceiling and floor runner flanges with screws. Securely anchor studs to jamb and head anchors of door frames by bolt or screw attachment. Over metal door place horizontally a cut-to-length section of runner, with a web-flange bend at each end, and secure to strut-studs with two screws in each bent web. Position a cut-to-length stud (extending to ceiling runner) at vertical panel joints over door frame header.

B. Gypsum Panel Erection

1. Vertical Surfaces: Apply gypsum panels (vertically or horizontally). Position all edges over studs for vertical application; all ends over studs for horizontal application. Use practical maximum lengths to minimize end joints. Fit ends and edges closely, but not forced together. Stagger joints on opposite side of partition. For single-layer vertical application of gypsum panels, space screws 12" on center in field of panels and 8" on center staggered along vertical abutting edges. For horizontal panel application, space screws 12" on center in field and along abutting end joints. Refer to specific requirements for firerated assemblies designated on drawings.

C. Accessory Application

1. Joint System: Finish all face panel joints and internal angles with a U.S.G. Joint System installed according to manufacturer's directions. Spot exposed fasteners on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto panel faces and sanded smooth.
2. Laminating Adhesive: Spread to provide 1/2" adhesive beads, 4-1/2" on center for full sheet lamination. For strip lamination, apply adhesive in vertical strips of four 1/2" beads 1-1/2" to 2" on center. Space strips 24" on center.
3. Corner Beads: Reinforce all vertical and horizontal exterior corners with corner beads fastened with 9/16" rosin coated staples 9" on center on both flanges along entire length of bead.
4. Metal Trim: Where assembly terminates against masonry or other dissimilar material, apply metal trim over panel edge and fasten with screws or 9/16" rosin coated staples 12" on center.
5. Screws: Power drive at least 1/8" from edges or ends of panels to provide uniform dimple 1/32" deep.

D. Joint Finishing

1. For joint treatment, use joint compound and topping compound confirming to ASTM C-475 as recommended by gypsum wallboard manufacturer. At acoustical type partitions, do not install joint finishing compound until all acoustical sealing has been completed. Joint and corner finishing at wallboard to wallboard joints and corners shall, in general, not cover or conceal acoustical sealant, except as may be otherwise specifically called for on the drawings.
2. At conventional joints, a uniform thin layer of joint compound approximately 4" wide shall be applied over each joint. Tape shall be centered over the joint and embedded continuously into the compound leaving sufficient compound under the tape to provide proper bond. Allow compound to dry thoroughly, a minimum of 24 hours between coats.
3. At internal corners, fold tape lengthwise through the middle and fit neatly into corner. Tape shall be covered with compound spread evenly over and slightly beyond the tapered edge of board and feathered at edges. When dry, cover the second coat of compound forming a smooth, uniform, slight crown over the joint, feathered slightly beyond preceding coat.
4. Dimples at screw heads shall receive three coats of compound.

5. Flanges of metal corner beads shall be concealed by at least two coats of compound, which when finished, shall extend approximately 8" from exposed nosing.
6. Each coat shall be sanded as necessary after compound has dried. Using topping compound for finishing coats. Final coat after sanding shall leave the gypsum wallboard and treated areas smooth with joints concealed from view in the finished work. Care shall be taken not to scuff the paper surface of the wallboard when sanding.
7. All edges and corners shall be left square, all surfaces plane, plumb, straight and true and ready for painting or other finish.
8. Tape all joints in wallboard.

E. Patching
1. Defects or damage in the gypsum wallboard surface shall be repaired or replaced before final surface treatments or painting operations are started. The resulting repaired area shall be flat, true and plumb with adjacent surfaces and shall have a smooth surface ready for decoration.
2. Patch all gypsum board work cut for work of other trades.

END OF SECTION

SECTION 09 30 00
CERAMIC TILE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including Instructions to Bidders and General and Supplementary Conditions, and Division One Specification Sections, apply to this Section.

1.2 SUMMARY

A. The work under this Section includes the supply and installation of:
   1. Tile backer board (cementitious backer units)
   2. Floor and wall tile
   3. Base tile
   4. Marble thresholds

1.3 REFERENCES

A. Comply with provisions of the latest editions of the following specifications and standards, except where more stringent requirements are shown or specified:
   1. Tile Council of America, Inc. (TCA) "Handbook for Ceramic Tile Installation", Latest Edition. TCA 127- Latest Edition "Recommended Specifications for Ceramic Tile"
   2. American National Standards Institute (ANSI) A108 Latest Edition

1.4 RELATED WORK

A. Sealants for expansion and control joints are specified in Section 07 92 00.

1.5 QUALITY ASSURANCE

A. Single manufacturer: Provide materials obtained from one source for each type and color of tile, grout and setting materials.
B. Proprietary Materials: Handle, store, mix and apply proprietary setting and grouting materials in compliance with manufacturer's instructions.

1.6 SUBMITTALS

A. Product data: Submit manufacturer's technical information and installation instructions for materials required.
B. Samples: For initial selection of colors, submit manufacturer's color charts consisting of actual tiles or sections of tiles showing full range of colors available, for each type of tile specified. Include samples of grout and accessories requiring color selection.

1.7 PRODUCT HANDLING

A. Deliver packaged materials and store in original containers with seals unbroken and labels intact until time of use, in accordance with manufacturer's instructions.

1.8 JOB CONDITIONS

A. Maintain environmental conditions and protect work during and after installation in accordance with referenced standards and manufacturer's printed recommendations.

1.9 EXTRA STOCK

A. Supply 2% of the total quantity of the tile but not less than 25 square feet, used in clean marked cartons of Owner's use.

PART 2 – PRODUCTS

2.1 TILE PRODUCTS

A. Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types, compositions, and grades of tile indicated.
B. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
C. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with products and materials indicated for setting and grouting.
D. Colors, Textures, and Patterns: As selected by Architect from full range of standard colors, textures, and patterns for products of type indicated.
E. Provide tile trim and accessories that match color and finish of adjoining flat tile unless noted otherwise.
F. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.
G. Mounting: Where factory-mounted tile is required, provide back-face or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.
H. Ceramic Wall Tile
    1. Grade: ANSI A137.1 2012
    2. Water Absorption per ASTM C373 = <.20% percent
    3. Breaking Strength per ASTM C648 = >350 lbf
    4. Bond Strength per ASTM C482 = >200 psi
    5. Chemical Resistance per ASTM 650 = Class B
    6. Scratch Hardness per Mohs Scale = 7
    7. Size: to match existing
    8. Finish: Polished
    9. Color: To be selected by NCHA.
    10. Base: Matching cove base units; 5 inches high, flat top.

I. Ceramic Floor Tile
    1. Grade: ANSI A137.1 2012
    2. Water Absorption per ASTM C373 = <.20% percent
    3. Breaking Strength per ASTM C648 = >350 lbf
    4. Bond Strength per ASTM C482 = >200 psi
    5. Chemical Resistance per ASTM 650 = Class B
    6. Scratch Hardness per Mohs Scale = 7
    7. Size: to match existing
    8. Finish: Unpolished
    9. Color: To be selected by NCHA.
    10. Static Coefficient of Friction = 0.60 minimum, ASTM C 1028
    11. Wet Dynamic Coefficient of Friction Range = 0.50 to 0.60

J. Marble thresholds: Provide sound Group "A" type marble threshold of profiles as detailed on the drawings with an abrasive hardness of not less than 10.0, when tested in accordance with ASTM C 241. Unless otherwise indicated, furnish white marble for thresholds.

K. Trim and special shapes: Rounded external corners, and trim shapes at head, jamb, and sills of openings, of same material and finish as field tile, shall include:
   1. Base: Sanitary cove units.
   2. Cap: Surfaced-bullnose or bullnose cap.
   3. External Corners: Bullnose shapes, with radius of not less than 3/4", unless otherwise shown.
   4. Internal Corners: Field-butted square, except use square corner, combination angle and stretcher type cap.

L. Cementitious Backer Units: Cementitious composition with glass fiber reinforcement. Product specifically manufactured as substrate material for application of ceramic tile in wet areas.
   1. Comply with ANSI A118.9.
   2. Thickness: 1/2 inch minimum.
   3. Fasteners: Corrosion resistant type required by board manufacturer for securing units.
   4. Joint Reinforcement Tape: 2 inch nominal width. Polymer coated fiberglass mesh of type recommended by board manufacturer.

2.2 MORTAR

A. Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following manufacturers.
   1. Custom Building Products, Seal Beach, CA
   2. Laticrete International, Inc., Bethany, CT
   3. Mapei Corporation, Deerfield, FL
   4. Approved equal

B. Thin Set Beds
   1. Portland Cement With Latex Additive; Thin-Set
   2. Description: Latex additive and site mixed Portland cement mortar. Complying with ANSI A118.4.
   3. Acceptable Products:
      a. CustomCrete Latex Mortar Admix with site mixed Mortar or CreteMix Mortar by Custom Building Products.
      b. 4237 Latex Thin set Mortar Additive by Laticrete.
      c. Mapei Keracrete System consisting of KER 303 Latex mixed with 1:1 sand/cement blend.
      d. Approved equal

2.3 GROUT

A. Grout: for floor and wall tile
   1. Ready-to-use grout with color-coated quartz
   2. Description: Professional-grade, ready-to-use specialty grout for precision commercial and residential installations with porcelain, ceramic and natural-stone tiles. Stain and chemical resistant. Must meet or exceed ANSI A118.3 and A118.6 tests.
   3. Acceptable Products:
      a. Mapei Flexcolor CQ
      b. Laticrete Spectralock PRO Premium Grout.
      c. Custom Building Products Fusion Pro #115
      d. Approved equal

PART 3 – EXECUTION

3.1 TILE INSTALLATION STANDARDS

A. ANSI Standards: Comply with applicable requirements of the ANSI Standard Specifications as applicable for tile material and mortar.
B. TCA Standards: Comply with applicable requirements and specifications regarding installation contained in the "Handbook for Ceramic Tile Installation".

3.2 INSTALLATION

A. Extent: Extend tile work into recesses and under and behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
B. Installing Tile: Accurately form intersections and return elements. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so that plates, collars, or covers overlap tile.
C. Placement methods: Install work of this Section using setting beds as shown or required. If not otherwise indicated, use Portland cement mortar where thickness and substrate permit.
D. Jointing pattern: Unless otherwise shown, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.
E. Expansion and control joints: Provide openings for joints where shown and to comply with details, or if not shown and detailed, to comply with recommendations in TCA "Handbook for Ceramic Tile Installation". Sealant work is specified in Section 07 92 00. Utilize sealant, not grout, at all interior corners where tiles abut.
F. Tile Backer Board Installation: Install tile backer board with 1" Type "S" screws at 12" on center at support and at edges. Tape joints with fiberglass mesh and Thin-Set.

3.3 CLEANING AND PROTECTION

A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so that they are free of foreign matter, in accordance with manufacturer's printed instructions.
B. Finished tile work: Leave finished installation clean and free of cracked, chipped, broken, unbonded or otherwise defective tile work.
C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with Kraft paper or other heavy covering during construction period to prevent damage and wear.
   1. Prohibit foot and wheel traffic from using tiled floors for at least 3 days after grouting is completed.
   2. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 09 70 50
URETHANE CEMENT COMPOSITION FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including Instructions to Bidders, General and supplementary Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

A. Work of this Section includes all labor, materials, equipment, and services necessary to complete the urethane cement (mortar) composition flooring and integral base as scheduled on the drawings and/or specified herein.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Division 1 Specification Sections.
B. Product Data: Submit manufacturer's technical data, application instructions and general recommendations for the urethane cement composition flooring specified herein.
C. Samples for initial selection purposes in form of sample of red, gray or natural pigmented coating.
D. Material certificates signed by manufacturer certifying that the urethane cement composition flooring supplied for the project complies with requirements specified herein.
E. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.
F. Contractor Certification: Submit a letter from the primary materials manufacturer certifying that the installing contractor has been properly trained in the application of the materials being installed, is acceptable to the materials manufacturer, with a record of successful in-service performance.

1. Engage an installer who employs only persons trained and approved by the resinous flooring manufacturer for applying resinous flooring systems specified.
2. Engage an installer who is certified in writing by the resinous flooring manufacturer as a factory trained applicator qualified to apply the specified resinous flooring system.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer or applicator that has specialized in installing resinous flooring types similar to that required for this Project and who is acceptable to manufacturer of primary materials.
B. Single-Source Responsibility: Obtain urethane cement composition flooring materials, including primers, resins, hardening agents, and finish or sealing coats, from a single manufacturer. Provide secondary materials, including patching and fill materials, joint sealant, accessory items, and repair materials of a type and from a source recommended by the manufacturer of the primary materials
C. Qualified Materials: Request for material approvals for any products other than the specified products must be submitted to the architect two weeks prior to the bid, including complete application specification, physical characteristics, and chemical resistance data. Any request after this date will not be accepted. Failure of performance requires immediate removal and replacement of unapproved substituted material with those originally specified at no cost to the owner, architect, construction manager, or general contractor.
D. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set the standard of quality for materials and installation.

1. Apply all components of the specified resinous flooring system at the specified thickness and finished in the texture and color as selected. Apply a minimum 100 square feet area to simulate the actual installation characteristics. Include areas that demonstrate the finished cove base, joint detailing, terminations or any other special conditions.
2. Simulate finished lighting conditions for Architects review of mockups.
3. Approved mockups may become part of the completed work if undisturbed at the time of substantial completion.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.
B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Comply with urethane cement composition flooring manufacturer's directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation, and other conditions required to execute and protect Work.
B. Lighting: Permanent lighting will be in place and working before installing resinous flooring.
C. Moisture Vapor Transmission: Perform Calcium Chloride test in conformance to ASTM F1869 or In Situ relative humidity test conforming to ASTM F2170 to determine moisture vapor emission levels prior to application of any component of the flooring system. Do not install flooring over substrate with MVT emission levels in excess of 22 lbs. per 24-hour period over a 1000 square foot area or with a relative humidity in excess of 98%. Notify the architect immediately if MVT or rh levels exceed these levels.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Troweled urethane cement composition flooring with UV stable urethane cement topcoat.

2.2 ACCESSORIES

A. Marble Thresholds: ASTM C 503/C 503M, with a minimum abrasion resistance of 12 according to ASTM C 1353 or ASTM C 241/C 241M and with honed finish.
   1. Description: Uniform, fine-to medium-grained white stone with gray veining. Beveled edge as required to comply with dimensional requirements for changes in level per ICC/ANSI A117.1 and as detailed on the drawings.
   2. Threshold shall extend full length of opening and shall be of width as required to match the thickness of the wall or door frame at the opening.

2.3 PROPERTIES

A. Colors: As indicated, or if not otherwise indicated, as selected by Architect from manufacturer's standard colors.
B. Physical Properties:
C. Provide flooring system that meet or exceed the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.
   1. Compressive Strength (ASTM C579) ..... 8,100 psi
   2. Thermal Distortion (350°F Emersion).....Passes

3. Tensile Strength (ASTM C307)..... 1,000 psi
4. Flexural Strength (ASTM C580)..... 2,000 psi
5. Thermal Co-Efficient of Thermal Expansion (ASTM C531)..... 1.5x105
6. Density (ASTM C905) 130 lbs/ft3
7. Water Absorption (MIL PRF-3134).....0.64%
8. Surface Hardness (ASTM D2240) .....85- 90 Durometer "D"
9. Abrasion Resistance (ASTM D1044) .....0.0 gr.
10. Adhesion (ASTM D4541).....>400 psi (100% failure in concrete)
11. Flammability-Critical Radiant Flux (ASTM E648) Greater than 1.07 watts/cm2
12. Resistance to Fungal Growth (ASTM G21) .....Passes Rating 1

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine the areas and conditions where the urethane cement composition flooring is to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Architect.
B. Moisture Test: Perform moisture test in conformance with ASTM F 1869 and ASTM F 2170.

3.2 PREPARATION

A. Substrate: Remove existing floor finish and perform preparation and cleaning procedures according to flooring manufacturer's instructions for particular substrate conditions involved, Provide clean, dry, and neutral substrate for flooring application.
B. Concrete Surfaces: Shot-blast, or power scarify as required to obtain optimum bond of flooring to concrete. Remove sufficient material to provide a sound surface free of laitance, glaze, efflorescence, and any bond-inhibiting curing compounds or form release agents. Remove grease, oil, and other penetrating contaminate. Prepare substrate in accordance with SSPC SP 13. Repair damaged and deteriorated concrete to acceptable condition. Leave surface free of dust, dirt, laitance, and efflorescence.
C. Provide keyway in existing or new concrete floor slab at 4" to 6" from face of wall at all walls and the perimeter of columns in accordance with manufacturer's instructions.
D. Materials: Mix resin hardener and aggregate as required and prepare materials according to flooring system manufacturer's instructions.

3.3 APPLICATION

A.. General: Apply each component of urethane cement composition flooring system according to manufacturer's directions to produce a uniform monolithic flooring surface of thickness indicated.
B. Body Coat: Over prepared surface, Screed mortar mix at nominal 3/16" – ¼"-inch thickness as specified. Allow material flow out and begin to settle. Back roll with a spike roller or looped roller as appropriate to distribute material to a smooth even finish.
C. Broadcast Aggregate: Broadcast selected size and type of slip resistant aggregate into the wet Body Coat. Apply to s even distribution and texture, allow to cure.
D. Remove Excess Aggregate: Remove all loose or unsound aggregate from the cured surface. Vacuum up all dust and fine particles from the surface, remove any ridge lines and detail all imperfection in the textured surface.
E. Apply the UV stable urethane cement topcoat in the selected color as recommended to produce a surface matching the submittal sample and project mock-up samples.
F. Cove Base: Apply cove base mix to wall surfaces at locations shown to form cove base height extending to the top of the 8" concrete base wall block, as detailed on the drawings. Follow

manufacturer's printed instructions and details including taping, mixing, troweling, and sanding, of cove base.

3.4 CURING, PROTECTION AND CLEANING

A. Cure urethane cement composition flooring materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process. Close application area for a minimum of 24 hours prior to application of any floor protection or foot traffic.

END OF SECTION

SECTION 09 90 00
PAINTING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including Instructions to Bidders, General and Supplementary Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Scope: The work of this Section includes the preparation painting and finishing of interior and exterior exposed items and surfaces throughout project, except as otherwise indicated. The work also includes field painting of exposed steel and iron connectors.

B. Work Not Included: The following categories of work are not included as part of field applied finish work, or are included in other sections of these specifications:

1. Shop priming: Unless otherwise specified, shop priming of ferrous items is included under various sections for structural steel; miscellaneous metal, hollow metal work and similar items. Also for fabricated components such as architectural woodwork, wood casework, and shop fabricated or factory built mechanical and electrical equipment or accessories.
2. Pre-finished or factory items: Unless otherwise indicated, do not include painting when factory finishing or installer finishing is specified for such items.
3. Concealed surfaces: Unless otherwise indicated, painting is not required on surfaces in concealed areas and generally inaccessible areas, foundation spaces, furred areas, pipe spaces, duct shafts and the like.
4. Finished metal surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials.
5. Operating parts and labels: Moving parts of operating units, mechanical and electrical parts such as valve and damper operators, linkages, sinkages, sensing devices, and motor and fan shafts will not require finish painting unless otherwise indicated.

1.3 SUBMITTALS

Product Data: Submit manufacturer's technical information including paint label analysis and application instructions for each material proposed for use. Provide MSD sheets for all products.

1.4 DELIVERY AND STORAGE

Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following:

1. Name and title of material
2. Fed. Spec. number, if applicable
3. Manufacturer's stock number and date of manufacturer
4. Manufacturer's name
5. Contents by volume, for major pigment and vehicle constituents
6. Thinning instructions
7. Application instructions
8. Color name and number

1.5 JOB CONDITIONS

A. Environmental Conditions:
   9. Apply water based paints only when temperatures are between 50 and 90 degrees F., unless otherwise permitted by paint manufacturer's printed instructions.
   10. Apply solvent thinned paints only when temperature of surface to be painted and surrounding air temperatures are between 45 and 95 degrees F., unless otherwise permitted by paint manufacturer's printed instructions.

B. Weather factors: Do not paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions. painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and within temperature limits specified by manufacturer during application and drying periods.

PART 2 – PRODUCTS

2.1 COLORS AND FINISHES

A. General:
   1. Paint colors shall be as directed by Architect.
   2. Surfaces treatments and finishes shall be as scheduled.

B. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated. Lead content in pigment is limited to contain not more than 0.5% lead, as lead metal based on the total non-volatile (dry film) of paint by weight.
C. Paint Coordination: Provide finish coats which are compatible with prime coats used. Provide barrier coats over incompatible primers and remove and reprime as required. Notify Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.
D. Single Manufacturer: Provide undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

2.2 PROPRIETARY NAMES

A. Proprietary names: When used to designate colors or materials are not intended to imply that products of named manufacturers are required to exclusion of equivalent products of other manufacturers.
B. Federal Specifications: Are used to establish minimum acceptable quality for paint materials. Provide written certification from paint manufacturer that materials provided meet or exceed these minimums.
C. Substitutions: Manufacturer's products which comply with coating qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to the Architect. Furnish material data and manufacturer's certificate of performance to Architect for any proposed substitutions.

2.3 MATERIALS

A. Interior Metal Primer (galvanized): Acrylic Latex undercoat, equal to SW: DTM Acrylic primer/finish, B66W1.
B. Interior Metal Finish: Acrylic Latex gloss, equal to SW: DTM Acrylic Coating, B66 series.
C. Interior Wall Finish (Toilet Rooms, Locker Rooms, and Shower Areas):
   1. Epoxy Finish: SW - Water-Based Catalyzed Epoxy, Semi-Gloss
   2. Approved equal by BM, PP, or Approved Equal

PART 3 – EXECUTION

3.1 INSPECTION

A. General: Applicator must examine areas and conditions under which painting work is to be applied and notify Contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

B. Surface Conditions: Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces or conditions otherwise detrimental to formation of a durable paint film.

3.2 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified for each particular substrate condition.

1. Related work: Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified under other sections of the work.
2. Items not scheduled: Paint exposed surfaces whether or not colors are designated in "schedules" except where natural finish of material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint same as adjacent similar materials or areas. If color or finish is not designated, Architect will select these from standard colors available for materials systems specified.
3. Remove hardware and hardware accessories, machined surfaces, plates, lighting fixtures and similar in-place items not to be finished painted or, provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
4. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly painted surfaces.
5. Do not paint over any Code required labels, such as Underwriters' Laboratory, Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.

B. Wood: Clean wood surfaces to be painted of dirt, oil or other foreign substances with scrappers, mineral spirits and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view and dust off. Scrape and clean small, dry seasoned knobs and apply a thin coat of white shellac or other recommended knot sealer before application of priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. And paper smooth when dry.

C. Ferrous Metals: Clean ferrous surfaces which are not galvanized or shop coated, of oil, dirt, and loose mill scale and other foreign substances by solvent or mechanical cleaning.

D. Galvanized surfaces: Clean free of oil and surface contaminants with non-petroleum based solvent.

3.3 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with manufacturer's directions. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.

3.4 APPLICATION

A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Apply additional coats when undercoats, stains or other conditions show through final coats of paint, until paint film is of uniform finish, color and appearance. Insure that surfaces including, edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat before installation of equipment.
3. Finish interior doors on tops, bottoms, and side edges same as faces, unless otherwise indicated.
4. Sand lightly between each succeeding coat of enamel or varnish.

B. Scheduling Painting: Apply first coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration. Allow sufficient time between coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause lifting or loss of adhesion of the undercoat.

C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or recommended by coating manufacturer.

D. Prime Coats: Apply prime coat of material which is required to be painted or finished and which has not been prime coated by others. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas.

E. Pigmented (opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, "holidays", spotting, laps, brush marks, runs, sags, and other surface imperfections will not be acceptable.

3.5 CLEAN-UP AND PROTECTION

A. Clean-up: During progress of work, remove from size discarded paint materials, rubbish, cans and rags at the end of each day's work. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scrapping. Use care not to scratch or damage finished surfaces.

B. Protection: Protect work of other trades, whether to be painted or not., against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting as acceptable to the Architect and at no additional charge to the Owner.

C. Completion: At the completion of the work of other trades, touch-up and restore all damaged or defaced painted surfaces.

3.6 GUARANTEE

Refinish any areas where finishes have failed within one (1) year from date of acceptance by the Owner. Failure from vandalism, abnormal structural movement, or other causes not inherent in the finish system except normal wear and maintenance will not be considered failure of the finish.

3.7 PAINT FOR TOUCH-UP

Provide one (1) gallon of each type and color paint or finish used for touch-up.

END OF SECTION

SECTION 10 51 14
METAL LOCKERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of the Contract, including Instructions to Bidders, General Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

The work under this Section includes the supply and installation of single-tier lockers and locker room benches as herein specified and as shown on the drawings.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for metal locker units.
B. Samples: Submit color samples on squares of same metal to be used for fabrication of lockers.
C. Shop Drawings: Submit shop drawings for metal lockers, verifying dimensions affecting locker installations. Show lockers in detail, method of installation, fillers, trim, base and accessories. Include locker numbering sequence information.

1.4 JOB CONDITIONS

A. Do not deliver metal lockers until building is enclosed and ready for locker installation. Protect from damage during delivery, handling, storage, and installation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Lincora, Inc.
B. Tiffin Metal Products "Infinity" Series.
C. Hausmann Industries
D. Penco Products Inc.
E. Or approved equal

2.2 MATERIALS

A. Sheet Steel: Mild cold-rolled and leveled steel, free from buckle, scale and surface imperfections.
B. Fasteners: Cadmium, zinc or nickel plated steel; exposed bolt heads, slotless type; self-locking nuts or locker washers for nuts on moving parts.
C. Equipment: Hooks and hang rods of cadmium-plated steel or case aluminum.

2.3 FABRICATION, GENERAL

A. Dimensions: Lockers shall be two door units 36" wide by 24" deep by 72" high. Lockers shall have a fixed shelf and a coat rod.
B. Construction: Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make all exposed metal edges safe to touch. Weld frame members together to form rigid, one-piece structure. Weld, bolt or rivet other joints and connections as standard with manufacturer. Grind exposed welds flush. Do not expose bolts or rivet heads on fronts of locker doors or frames.

C. Door Frames: 16 gauge formed face channel with a continuous vertical door strike integral with the frame on both sides of the door opening. Cross frame members shall be 16 gauge channels
D. Body: The body of the locker shall be fabricated of 24 gauge sheets. Tops bottoms and shelves shall be flanged on all sides. Backs shall be flanged on two sides.
E. Doors shall be fabricated from 18 gauge steel, with a formed full channel shape on all sides. Vented as shown on the drawings.
F. Base: Bases shall be fabricated from 16 gauge steel.
G. Finishing: Chemically pre-treat metal with a degreasing and phosphatizing process. Apply baked-on enamel finish to all surfaces, exposed and concealed, except plates and non-ferrous metal.
H. Color: Provide locker units in color(s) as shown on drawings, or if not shown, as selected by Architect from manufacturer's standards. Unless otherwise indicated, concealed parts may be manufacturer's standard neutral color.
I. Reinforcing: Provide extra bracing or reinforcing on inside of doors.
J. Hinges: Heavy-duty, not less than 0.050" thick steel, full-loop 5-knuckle, tight pin, 2" high. Weld to inside of frame and secure to door with not less than 2 factory-installed fasteners which are completely concealed and tamperproof when door is closed. Provide at least 3 hinges for each door
K. Latching: Provide three-point latching device, engaging frame at top, bottom and jamb, with chromium plated turn handle having provisions for padlock.

2.4 LOCKER ACCESSORIES

A. Equipment: Furnish each locker with a hat shelf, hang rod and not less than 2 single-spring wall hooks
B. Number Plates: Manufacturer's standard etched, embossed, or stamped, non-ferrous metal number plates with numerals not less than 3/8" high. Number lockers in sequence as directed by Architect. Attach plates to each locker door, near top, centered, with at least 2 fasteners of same finish as number plate.
C. Continuous Metal Base: Minimum 16-gage cold-rolled steel, fabricated in lengths as long as practicable to enclose base of lockers without additional fastening devices. Factory-finish metal base to match lockers.
D. Filler Panels: Provide filler and scribe panels where indicated or as required to fill space between walls and lockers, of not less than 16-gage steel sheet, factory-fabricated and finished to match locker units.
E. Electrical Kit: Modular power supply including USB and Type-A plug type.
F. Removable Boot Tray: 2-Piece metal tray to allow for collection of moisture and debris from footwear.
G. Base Drawer Unit: Heavy duty external base drawer, 24" in depth, extending 12" from locker base.
    1. Hardwood Bench Top to be installed atop 12" extension.

H. Shelving:
    1. One (1) heavy duty full width metal shelf with adjustable height.
    2. One (1) heavy duty full width half-depth shelf with adjustable height.

2.5 LOCKER ROOM BENCHES

A. Standard Pedestal Mounted Benches: Manufacturer's standard units with laminated hardwood tops approximately 9-9 1/2" wide by 1 1/4" thick, in lengths as indicated. Furnish steel pedestal supports not more than 6'-0" o.c., with provisions for concealed fastening to floor and securing to bench. Furnish all anchorages. Apply manufacturer's standard clear coating to bench tops and baked enamel finish to pedestals.
B. Accessible Benches: Manufacturer's standard units with solid hardwood maple tops measuring 42" x 20" and 1 1/4" thick. All sides and corners shall be radiused. Furnish steel wall mounting brackets with provisions for concealed fastening to the wall and securing to bench. Furnish all anchorages. Apply manufacturer's standard clear coating to bench tops and baked enamel finish to pedestals. Coordinate with rough framing to assure adequate blocking as required by the bench manufacturer, is provided for fastening of the wall mounting brackets.

PART 3 – EXECUTION

3.1 PREPARATION

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication of special components, when possible, to ensure proper fitting of work. However, allow for adjustment and fitting of trim and filler panels wherever taking of field measurements before fabrication might delay work.

3.2 INSTALLATION

A. Install metal lockers at allocations shown in accordance with manufacturer's instructions for plumb, level, rigid and flush installation. Carefully scribe fillers to adjacent construction.
C. Space fastenings about 48" o.c. unless otherwise recommended by manufacturer and apply through back-up reinforcing plates where necessary to avoid metal distortion; conceal fasteners insofar as possible.
D. Install trim, metal base, and metal filler panels where indicated, using concealed fasteners to provide flush, hairline joints against adjacent surfaces.
E. Install benches to comply with manufacturer's instructions.

3.3 ADJUST AND CLEAN

A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices are operating properly.
B. Touch up marred finishes. Replace units which cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION

SECTION 22 00 10
BASIC PLUMBING REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

Drawings and General Provisions of the Contract, including Instructions to Bidders and General Conditions, and Division One Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Provide new sanitary drain pipes from each floor drain, connecting to existing sanitary system.
   2. Provide excavation, backfill, compaction and repair of surfaces to match existing required for plumbing work.

1.3 The Plumbing Work shall be as specified in the following specification Sections:

22 13 16	Sanitary Piping

1.4 RELATED WORK

Division 1	General Requirements
Division 3	Concrete
Division 9	Finishes

1.5 WORK IN CONNECTION WITH OTHER DIVISIONS OF WORK

A. Electrical Work: The Contractor under this Division of the contract shall furnish all plumbing equipment requiring electrical connections that are required for the completion of the electrical work for installation and wiring as outlined in Division 26. All equipment in piping shall be furnished and installed under Division 21 and connected as described in Division 26. Under Division 26 work, the contractor shall furnish all conduit, wiring, disconnect switches and any appurtenances required to make systems operate as intended. The Contractor shall furnish approved detailed wiring diagrams for the plumbing equipment furnished in Division 22 and furnish to Division 26 responsible trades for installation of electrical connections to equipment and shall be responsible for verification as to the correctness of their work.

B. HVAC Work: Coordinate new piping to give precedence to installation on new fire protection piping and HVAC piping and ductwork, and Electrical work. Coordinate with Division 23 and 26 work all other Divisions in this Specification.

1.6 TEMPORARY FACILITIES, UTILITIES AND SERVICES

A. Provide temporary facilities as called for in Division 1 of the General Requirements of the contract.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall perform all work in accordance with terms of contract and schedules in accordance with related documents listed in Part 1 of this section.

B. The Contractor shall perform all work as specified in Division 22 and shown on the drawings and coordinate with other trades.
C. The Contractor shall provide all necessary material, labor and equipment to complete this work.
D. Provide the excavation, backfill, and compaction required for Plumbing work in accordance with Division 31.

3.2 CALIBRATION AND ADJUSTMENT

A. Provide testing, calibration and adjustments, cleaning, disinfecting, and placing in operation all new plumbing piping, fixtures and equipment.

END OF SECTION

SECTION 22 13 16
SANITARY AND VENT PIPING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

Drawings and General Provisions of the Contract, including Instructions to Bidders and General Conditions, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the following:
   1. Sanitary sewer and vent piping system
   2. Drains and Cleanouts

1.3 REFERENCES

A. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40
B. ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
C. ASTM D2729 - Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
D. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings

1.4 SUBMITTALS

A. Submit under provisions of Section 22 00 10 and Division 1.
B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturer's catalog information. Indicate valve data and ratings.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.
B. Record actual locations of valves.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 1.
B. Maintenance Data: Include installation instructions, spare parts lists, and location map.

1.7 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body.
B. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
B. Installer: Company specializing in performing the work of this section with minimum three years documented experience.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.10 ENVIRONMENTAL REQUIREMENTS

Do not install underground piping when bedding is wet or frozen.

PART 2 – PRODUCTS

2.1 SANITARY AND VENT PIPING AND DRAINAGE PIPING

A. PVC Pipe and Fittings: ASTM D2665-97a.
   1. Fittings: PVC.
   2. Joints: ASTM F656-96a solvent primer and ASTM D2564-96a solvent weld cement.
   3. Provide joints between different piping materials both using externally clamped coupling joint with an elastomeric gasket, corrosion resistant shield, and clamps with corrosion resistant clamping screws. For example, stainless steel floor drawn to PVC sanitary drawn pipe.

2.2 FLOOR DRAINS, FIXTURE SUPPORTS, AND CLEANOUTS

A. See Drawings for number of cleanouts, supports, and drains.
B. Interior Unfinished Accessible Areas (CO): Caulked or threaded type. Provide on bottom of all stacks and where shown on the Drawings. Provide round chrome cleanout covers when cleanout is installed inside wall.
C. Provide 5" deep traps on all drains and waterless trap seal all shower or floor drains.
D. ANSI A112.21.1 - Floor Drains.
E. Manufacturers: J.R. Smith, Wade, Josam, or approved equal.

2.3 WATERLESS TRAP SEALS

A. Waterless trap seals shall be tested and certified to be ASSE1072 standard for ANSI/ASME A112.6.3.
B. Manufacturers: JR Smith, Green Drain, Sure-Seal, Pro-Vent, or approved equal.

PART 3 – EXECUTION

3.1 EXAMINATION

Verify that excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

A. Ream pipe and tube ends. Remove burrs.
B. Remove scale and dirt, on inside and outside, before assembly.
C. Prepare piping connections to equipment with flanges or unions.
D. Coordinate cutting and forming floor construction to receive drains to required invert elevations, coordinate with Division 3.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Route piping in orderly manner and maintain gradient.

C. Floor Drains shall be coordinated to be set flush with floors and in accordance with pitch of floors shown on the Architectural Drawings.
D. Provide 5" deep traps on all drains and waterless trap seal all shower or floor drains.
E. Insulate and heat tape all sanitary drains exposed in the crawl space.
F. Connect sanitary building drain to sanitary pipe to septic tank outside the building.
G. This Contractor shall perform all excavation, clean fill around pipes and backfilling and compaction required to install the plumbing work. Excavation, backfill, and compaction shall be performed as specified in Division 31.

3.4 ERECTION TOLERANCES

A. Establish invert elevations, slopes for sanitary pipes drainage to 1/4 inch per foot minimum for pipes less than 3" diameter and a minimum slope of 1/8" per foot for 4" pipe or greater. Maintain gradients unless otherwise noted on the drawings.
B. Slope sanitary pipes toward building sanitary drain.

END OF SECTION