

MODIFICATIONS DURING BIDDING

This Addendum describes revisions to the Bidding Documents issued 04/02/2019.

ACCOMPANYING DOCUMENTS: The following documents accompany this write-up and are a part of this Addendum:

- Project Manual Documents: 000110 – Table of Contents, 042300 – Glass Unit Masonry, 047323 – Calcium Silicate Manufactured Building Stone Masonry, 077200 Roof Accessories, 090010 – Lakeshore Exterior Finish Schedule, CycleGrip MMax Bike Lane Treatment, Stamped Asphalt Generic Specs
- Whole Drawings: T-001, G-002, C-0.0, C-2.0, C-3.0, C-3.1, C-3.2, C-4.1, C-4.2, C-5.0, C-6.1, C-6.2, C-8.0, C-8.1, C-9.1, C-9.6, I-1.0, I-1.1, L-1.0, L1.1 A-101, A-121, A-201, A-202, A-311, A-312, A-313, A-401, A-402, A-403, A-502, A-503, A-601, A-1001, A-1002, A-1003, INT-601, INT-602, MP-101, MP-102, MP-601, PE-10, E-100, E-101, E-201, E-300
- Partial Drawings: NONE
- Additional Documentation: City of Novi Standard Details,
Pre-Bid Meeting Sign-In Sheet,
Pre-Bid meeting answers.

REVISIONS TO PROJECT MANUAL:

ITEM NO. 1 Modified Table of Contents

- a) Added the following Specification Sections to the Table of Contents:
 - 1) Section 042300 – Glass Unit Masonry
 - 2) Section 047323 – Calcium Silicate Manufactured Building Stone Masonry
 - 3) Section 077200 – Roof Accessories
 - 4) Section 090010 – Lakeshore Exterior Finish Schedule
- b) Omitted the following Specification Sections from the Table of Contents:
 - 1) Section 044313.13 – Anchored Stone Masonry Veneer
 - 2) Section 090033 – Stone Tiling
 - 3) Section 230993.11 Sequence of Operations for HVAC DDC

ITEM NO. 2 Added \ Revised the following Project Manual Sections:

- a) Added the Following Specification Sections to the Project Manual:
 - 1) Section 042300 - Glass Unit Masonry
 - 2) Section 047323 – Calcium Silicate Manufactured Building Stone Masonry
 - 3) Section 077200 – Roof Accessories
 - 4) Section 090010 – Lakeshore Exterior Finish Schedule
- b) Revised the following Specification Sections in the Project Manual:
 - 1) Section 011000 - Summary
 - 2) Section 074113.16 – Standing Seam Metal Roof Panels

REVISIONS TO DRAWINGS:

- ITEM NO. 3 Added the following Project Manual Civil Attachments:
- a) Specification CycleGrip MMax Bike Lane Treatment
 - b) Stamped Asphalt Generic Specs
- ITEM NO. 4 REFER TO SHEET T-001 (Re-issued)
- a) Revised table of contents.
 - b) Revised deferred submittals.
- ITEM NO. 5 REFER TO SHEET G-002 (Re-issued)
- a) Clarified building code data.
- ITEM NO. 6 REFER TO SHEET C-0.0 (Re-issued)
- a) Updated with the revision date.
 - b) Updated sheet index.
- ITEM NO. 7 REFER TO SHEET C-2.0 (Re-issued)
- a) Added note regarding coordination of power pole guy wires.
- ITEM NO. 8 REFER TO SHEET C-3.0 (Re-issued)
- a) Added additional dimensions.
- ITEM NO. 9 REFER TO SHEET C-3.1 (Re-issued)
- a) Updated library kiosk slab size.
 - b) Updated equipment enclosure size and location
 - c) Updated site signage.
 - d) Updated light locations and quantities.
 - e) Updated sign locations and quantities.
 - f) Updated ramp quantities.
 - g) Added fence at retaining wall.
 - h) Added slab specification for new pavilion and library kiosk.
- ITEM NO. 10 REFER TO SHEET C-3.2 (Re-issued)
- a) Updated site signage.
 - b) Updated light locations and quantities.
 - c) Added pavement legend.
- ITEM NO. 11 REFER TO SHEET C-4.1 (Re-issued)
- a) Updated grading for bike path at NW corner of site.
 - b) Updated grading around library kiosk.
 - c) Updated grading around equipment enclosure.
- ITEM NO. 12 REFER TO SHEET C-4.2 (Re-issued)
- a) Added grading for overflow spillways from ponds.
- ITEM NO. 13 REFER TO SHEET C-5.0 (Re-issued)
- a) Updated disturbed area for building changes.
 - b) Added wetland impact estimates.

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- ITEM NO. 14 REFER TO SHEET C-6.1 (Re-issued)
- a) Added conduit for kiosk.
 - b) Relocated transformer and power conduit.
 - c) Updated Water Main tables.
- ITEM NO. 15 REFER TO SHEET C-6.2 (Re-issued)
- a) Added callouts for emergency overflow spillways.
- ITEM NO. 16 REFER TO SHEET C-8.0 (Re-issued)
- a) Updated drainage areas.
- ITEM NO. 17 REFER TO SHEET C-8.1 (Re-issued)
- a) Updated pipe calculations.
 - b) Added overflow spillway calculations.
- ITEM NO. 18 REFER TO SHEET C-9.1 (Re-issued)
- a) Removed details conflicting with Novi standard details.
 - b) Consolidated details from C-9.2
- ITEM NO. 19 REFER TO SHEET C-9.6 (Re-issued)
- a) Added additional bike lane sign details.
 - b) Added striping details
 - c) Updated sign installation details.
- ITEM NO. 20 REFER TO SHEET I-1.0 (Issued)
- a) Sheet I-1.0 has been added with this addendum and is included in its entirety.
- ITEM NO. 21 REFER TO SHEET I-1.1 (Issued)
- a) Sheet I-1.1 has been added with this addendum and is included in its entirety.
- ITEM NO. 22 REFER TO SHEET L-1.0 (Re-issued)
- a) Updated landscape around equipment enclosure and library kiosk.
- ITEM NO. 23 REFER TO SHEET L1.1 (Re-issued)
- a) Updated landscape around equipment enclosure and library kiosk.
- ITEM NO. 24 REFER TO CITY STANDARD SHEETS (Re-issued)
- a) Placed Xs over inapplicable details.
- ITEM NO. 25 REFER TO SHEET A-101 (Re-issued)
- a) Sheet A-101 has been revised with this addendum and is included in its entirety.
- ITEM NO. 26 REFER TO SHEET A-111 (Re-issued)
- a) Revised Symbol Legend.
 - b) Revised the Reflected Ceiling Plan.
 - b) Revised detail 2 and 3.
- ITEM NO. 27 REFER TO SHEET A-121 (Re-issued)
- a) Clarified roof slopes.
 - b) Clarified location of exterior walls below.
 - c) Exhaust hoods to be primed and painted to match standing seam roof.
- ITEM NO. 28 REFER TO SHEET A-201 (Re-issued)
- a) Clarified control joint locations
 - b) Clarified location of detail 2/A-502.

- c) Revised Elevation Keynote Legend.
- d) Revised storefront system mullions.
- e) Clarified fiber cement board extents.

ITEM NO. 29 REFER TO SHEET A-202 (Re-issued)

- a) Clarified control joint locations.
- b) Revised Elevation Keynote Legend.
- c) Revised mechanical screen wall location and materials.
- e) Revised storefront system mullions.

ITEM NO. 30 REFER TO SHEET A-301 (Re-issued)

- a) Revised storefront mullions on section 2.

ITEM NO. 31 REFER TO SHEET A-311 (Re-issued)

- a) Clarified all wood blocking on CMU walls is to be treated.
- b) Revised base of wall details at sections 1 and 2.
- c) Removed perimeter insulation from details 3 and 4.
- d) Provided a structural header at detail 4.

ITEM NO. 32 REFER TO SHEET A-312 (Re-issued)

- a) Clarified all wood blocking on CMU wall is to be treated.
- b) Clarified that all CMU wall cavities below grade are to be grouted solid.
- c) Revised section 2 wall assemble note.
- d) Clarified location of continuous vent strips on sections 3 and 4.
- e) Clarified wood sheathing on section 3.
- f) Revised base of wall design on section 5.

ITEM NO. 33 REFER TO SHEET A-313 (Re-issued)

- a) Clarified joint sealant at column cap.
- b) Revised stone anchors at column base, detail 1.
- c) Revised detail 5 base and head designs.

ITEM NO. 34 REFER TO SHEET A-401 (Re-issued)

- a) Revised millwork sizes.

ITEM NO. 35 REFER TO SHEET A-402 (Re-issued)

- a) Revised light location.
- b) Revised millwork sizes.

ITEM NO. 36 REFER TO SHEET A-403 (Re-issued)

- a) Sheet A-403 has been revised with this addendum and is included in its entirety.

ITEM NO. 37 REFER TO SHEET A-411 (Re-issued)

- a) Revised enlarged plan.

ITEM NO. 38 REFER TO SHEET A-412 (Re-issued)

- a) Revised Accessory Schedule.
- b) Clarified fold down bench locations.

ITEM NO. 39 REFER TO SHEET A-502 (Re-issued)

- a) Clarified masonry anchor locations on details 1 and 2.
- b) Clarified fiber cement board vertical rail locations on details 1, 2, 5, and 7.
- c) Revised base of wall detail 3.
- e) Revised lintel detail 4 and 8.

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- f) Revised wall detail 5.
 - g) Added typical control joint detail 6.
 - h) Revised detail 13.
- ITEM NO. 40 REFER TO SHEET A-503 (Re-issued)
- a) Revised detail 4.
 - b) Clarified fiber cement board vertical rail location on detail 10.
 - c) Revised detail 13.
- ITEM NO. 41 REFER TO SHEET A-601 (Re-issued)
- a) Sheet A-601 has been revised with this addendum and is included in its entirety
- ITEM NO. 42 REFER TO SHEET A-1001 (Re-issued)
- a) Revised masonry type to "dry-block."
- ITEM NO. 43 REFER TO SHEET A-1002 (Re-issued)
- a) Revised overhead door track on details 1 and 6.
- ITEM NO. 44 REFER TO SHEET A-1003 (Re-issued)
- a) Revised General Notes.
- ITEM NO. 45 REFER TO SHEET INT-601 (Re-issued)
- a) Sheet INT-601 has been revised with this addendum and is included in its entirety
- ITEM NO. 46 REFER TO SHEET INT-602 (Re-issued)
- a) Sheet I-602 has been revised with this addendum and is included in its entirety
- ITEM NO. 47 REFER TO SHEET S-100 (Re-issued)
- a) Revised top of footing elevations.
 - b) Added Note "C"
 - c) Added deck footings.
 - d) Revised slab at glass wall.
- ITEM NO. 48 REFER TO SHEET S-101 (Re-issued)
- a) Added Lintel framing plan,
 - b) Revised deck framing plan.
- ITEM NO. 49 REFER TO SHEET S-102 (Re-issued)
- a) Added Notes 1 – 3.
 - b) Revised Glu-Lam beam schedule.
 - c) Revised lintels and headers.
 - d) Revised plan dimensions.
 - c) Revise roof framing at north and south ends.
- ITEM NO. 50 REFER TO SHEET S-200 (Re-issued)
- a) Revised General notes.
- ITEM NO. 51 REFER TO SHEET S-201 (Re-issued)
- a) Revised Lintel schedule.
 - b) Revised bearing plate schedule.
 - c) Revised detail 1.
 - d) Added detail 6.
- ITEM NO. 52 REFER TO SHEET S-202 (Re-issued)
- a) Revised detail 2.

- ITEM NO. 53 REFER TO SHEET S-203 (Re-issued)
a) Revised details 1 and 2.
b) Added details 2, 3, 4, and 5.
- ITEM NO. 54 REFER TO SHEET S-300 (Re-issued)
a) Revised all details.
- ITEM NO. 55 REFER TO SHEET S-301 (Re-issued)
a) Revised details 1 and 2.
b) Added details 4, 5, 6, and 7.
- ITEM NO. 56 REFER TO SHEET S-302 (Re-issued)
a) Revised all details.
- ITEM NO. 57 REFER TO SHEET MP-101 (Re-issued)
a) Gas meter has been relocated
- ITEM NO. 58 REFER TO SHEET MP-102 (Re-issued)
a) FD has been added for the Family Toilet A110
- ITEM NO. 59 REFER TO SHEET MP-601 (Re-issued)
a) Hose bibb (HB-1) has been eliminated from the plumbing schedule
b) Lavatory (LAV-1 and LAV-3) faucet model has been revised.
- ITEM NO. 60 REFER TO SHEET PE-10 (Issued)
a) Sheet PE-10 is included in its entirety.
- ITEM NO. 61 REFER TO SHEET E-100 (Re-issued)
a) Added power to library kiosk, see keynote 9.
b) Added low voltage conduit to pavilion.
c) Added Alternate #1 to add conduit to bathroom shed building, see keynote 8.
- ITEM NO. 62 REFER TO SHEET E-101 (Re-issued)
a) Adjusted layout of electrical equipment as indicated.
b) Removed dryer/faucet in family toilets and revised to standard hard-wired faucet. Keynote 6 removed.
c) Added note concerning recessed conduits and coordination drawings required in Camp room.
- ITEM NO. 63 REFER TO SHEET E-201 (Re-issued)
a) Added note concerning recessed conduits and coordination drawings required in Camp room.
- ITEM NO. 64 REFER TO SHEET E-300 (Re-issued)
a) Revised panel schedules of include circuits for library kiosk.

ADDITIONAL DOCUMENTATION:

Pre- Bid Meeting minutes with sign in sheets.

Important Dates:

Last day for questions	04-17-2019	
Bids Due	04-26-2019	2:00 PM
Target Bid Award date	05-20-19	
Construction to begin as soon as possible		
Substantial Completion	12-01-2019	

Pre-Bid Meeting Questions and Answers:

There is no prevailing wage requirement.

Permits for trade inspections such as building, plumbing, mechanical, and electrical must be pulled. City fees will be waived. Special Inspection fees will not be waived.

Mountain bike trails should remain open during construction.

END OF ADDENDUM WRITE-UP

Prepared by:
NSA Architects, Engineers, Planners

Michael Shuell, RA, LEED-AP
Senior Project Architect

**CITY OF NOVI
SIGN-IN SHEET FOR MANDATORY PRE-BID MEETING FOR
LAKESHORE PARK**

Pre-bid meeting 4/9/19 10:00 am
Bids due 4/26/19 2:00 pm

Company Name	Address	Representative name	Phone Number
GRAHAM CONSTRUCTION CORP.	MAEVANS@GRAHAMCONSTRUCTION.NET SABINAH, MI	MIKE EVANS	231-675-0473
Robert Perez-Electrical Sales/Project Manager The DM Burr Group robertperez@dmburr.com 810-241-7301 cell			
EVANGELISTA CORP	MARK@EVANGELISTACORPORATION.COM	MARK EVANGELISTA	2488880400 2484866426 FAX
Anglin Civil	Cody@AnglinCivil.com	Cody Blunt	8 248-397-4200
STONE-Work by Gulyas	bob@stoneworkus.com	BOB Gulyas	248-330-3783
DeAngelis Diamond	DAVID@DEANGELISDIAMOND.COM	DAVE KAVACIK	248-864-0007
WE OSVAGWU	ije@brixcorporation.com	Brix Corporation	313-965-0000
DANNY CHEE	DCHEE@BRIXCORPORATION.COM	Brix Corporation	313-965-0000
Polymath Development	scott@polymath-development.com	Scott Brown	248-219-2696
Hard Rock Stone Works	mark@hardrockstoneworks.com	MARK SITERLET	248-376-2662

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Company Name	Address	Representative name	Phone Number
NRC Construction	37800 Hills tech Farmington Hills, MI 48331	Jason Schuchard	248-442-1187
UNITED LAWNSCAPE	42170 VAN DYKE WASHINGTON, MI 48094	LAURA BORTH	586-752-5000
DeMARIA	45500 Grand River Ave Novi, MI	Michael Phillips	248-992-2301
Brenca	26709 Schoenherr rd Warren, MI 48089	Dan Birko	586-758-6000
DeAngelis Diamond	39555 Orchard Hill Novi, MI 48375	Jon Tracy	248-765-4173
STEEL EQUIP. CO. CONTRACTORS GROUP	5639 AUBURN RD JICA MI 48317	RICK CEDRONI	586-254-7778
BEZUBO, INC	20814 11 MILE RD ST CLAIR SHORES 48081	KENT BROVGHMAN	586 495 3200
MICHIGAN AUTOMATIC SPRINKLER	4350 PINEVIEW DR JUSTICE COMMENCE TWP, 48390	MICHAEL BENNETT	(248) 669-1100
Axiom Construction Services Group, LLC	7789 E. M-36 Whitmore Lake, MI 48189	Deid Mougabi dmougabi@axiomcsgllc.com	248-763-8948

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LAKESHORE PARK**

Pre-bid meeting 4/9/19 10:00 am
Bids due 4/26/19 2:00 pm

Company Name	Address	Representative name	Phone Number
LASALLE INC	30375 Northwestern Hwy Farmington Hills MI 48334	Kew Perko Kew Perko	734 394-0650
Schafer Construction Inc	150 N 1ST ST, Ste 100 Brighton, MI 48116	Matt Vetter	248 767.0512
DCC Construction	9100 Lapeer Rd Davison MI 48123	Charlie Yorkes	810-658-4322
CROSS RENOVATION, INC. KBAF	34133 SCHOOLCRAFT, MI	KOFI BASHIR	(313)405-2806

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SIGN-IN SHEET FOR MANDATORY PRE-BID MEETING FOR
LAKESHORE PARK**

Pre-bid meeting 4/9/19 10:00 am
Bids due 4/26/19 2:00 pm

Company Name	Address	Representative name	Phone Number
Cross Renovation			
Cross Renovation	34133 Schubel Craft	Julian Guerra	(313)-590-6298
THE DAILEY COMPANY	179 NORTH POINTE DR. LAKE ORION, MI	SCOTT WHEELER SWheeler@daileyco.com	248-364-2600x20

Table of Contents

	Title Page
000110	Table of Contents; Document Set
<u>BIDDING REQUIREMENTS and CONTRACT CONDITIONS</u>	
001113	Advertisement For Bids
002113	Instructions To Bidders <ul style="list-style-type: none"> •AIA A 701-2018 Instruction to Bidders Draft
002213	Supplementary Instructions To Bidders
002513	Prebid Meetings
002600	Procurement Substitution Procedures <ul style="list-style-type: none"> • Procurement Substitution Form
003113	Preliminary Schedules
003119	Existing Condition Information
003132	Geotechnical Data <ul style="list-style-type: none"> • Geotechnical Investigation
003143	Permit Application
004113	Bid Form – Stipulated Sum (Single Prime Contract) <ul style="list-style-type: none"> • AIA-A101-2017 Standard Form Of Agreement Between Owner And Contractor Draft • AIA-A201-2017 General Conditions For The Contract For Construction Draft
004313	Bid Security Forms <ul style="list-style-type: none"> • City of Novi Bond Forms
004321	Allowance Form
004322	Unit Prices Form
004323	Alternates Form
004373	Proposed Schedule Of Values Form
004393	Bid Submittal Checklist
005100	Notice of Award
006000	Project Forms

SPECIFICATIONS

SECT. NO. SECTION TITLE

DIVISION 01 – GENERAL REQUIREMENTS

011000	Summary
012100	Allowances
012200	Unit Prices
012300	Alternates
012500	Substitution Procedures <ul style="list-style-type: none"> • Substitution Request Form
012600	Contract Modification Procedures
012900	Payment Procedures
013100	Project Management And Coordination

013200	Construction Progress Documentation
013233	Photograph Documentation
013300	Submittal Procedures
013301	Submittal Routing Transmittal
014000	Quality Requirements
014200	References
015000	Temporary Facilities And Controls
016000	Product Requirements
017300	Execution
017419	Construction Waste Management And Disposal
017700	Closeout Procedures
017823	Operation And Maintenance Data
017839	Project Record Documents
017900	Demonstration And Training

DIVISION 02 - DEMOLITION

024116	Structure Demolition
024119	Selective Demolition

DIVISION 03 - CONCRETE

033000	Cast-In-Place Concrete
033300	Architectural Concrete

DIVISION 04 - MASONRY

042200	Concrete Unit Masonry
042300	Glass Unit Masonry
044313.13	Anchored Stone Masonry Veneer
047200	Cast Stone Masonry
047323	Calcium Silicate Manufactured Building Stone Masonry

DIVISION 05 - METALS

051200	Structural Steel Framing
051213	Architecturally Exposed Structural Steel Framing
055000	Metal Fabrications
057313	Glazed Decorative Metal Railings

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

061053	Miscellaneous Rough Carpentry
061516	Wood Roof Decking
061533	Wood Patio Decking
061600	Sheathing
061753	Shop-Fabricated Wood Trusses
061800	Glued-Laminated Construction
062013	Exterior Finish Carpentry
062023	Interior Finish Carpentry
064116	Plastic-Laminate-Faced Architectural Cabinets
064600	Wood Trim

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

- 072100 Thermal Insulation
- 072500 Weather Barriers
- 972726 Fluid-Applied Membrane Air Barriers
- 073113 Asphalt Shingles
- 074113.16 Standing-Seam Metal Roof Panels
- 074646 Fiber-Cement Siding
- 076200 Sheet Metal Flashing And Trim
- 077200 Roof Accessories**
- 077253 Snow Guards
- 079200 Joint Sealants

DIVISION 08 - OPENINGS

- 081113 Hollow Metal Doors And Frames
- 083113 Access Doors And Frames
- 083613 Sectional Doors
- 084113 Aluminum-Framed Entrances And Storefronts
- 087100 Door Hardware
- 088000 Glazing
- 089517 Soffit Vents

DIVISION 09 - FINISHES

- 090010 Lakeshore Exterior Finish Schedule**
- 092900 Gypsum Board
- 093013 Ceramic Tiling
- ~~093033 Stone Tiling~~
- 095423 Linear Metal Ceilings
- 096513 Resilient Base and Accessories
- 096519 Resilient Tile Flooring
- 096813 Tile Carpeting
- 099113 Exterior Painting
- 099123 Interior Painting
- 099300 Staining And Transparent Finishing

DIVISION 10 - SPECIALTIES

- 101100 Visual Display Units
- 101423.16 Room-Identification Panel Signage
- 102113.14 Stainless-Steel Toilet Compartments
- 102800 Toilet, Bath, And Laundry Accessories
- 104413 Fire Extinguisher Cabinets
- 104416 Fire Extinguishers
- 107516 Ground-Set Flagpoles

DIVISION 11 - EQUIPMENT

- 114000 Foodservice Equipment

DIVISION 12 - FURNISHINGS

- 123661.16 Solid Surfacing Countertops
- 123661.19 Quartz Agglomerate Countertops

DIVISION 13 - SPECIAL CONSTRUCTION

- 131250 Pre-engineered Wood Building Systems

DIVISION 21 - FIRE SUPPRESSION

- 210518 Escutcheons For Fire-Suppression Piping
- 210523 General-Duty Valves for Fire Protection Piping
- 210529 Hangers and Supports For Fire Suppression Piping And Equipment
- 210553 Identification For Fire Suppression Piping And Equipment
- 211119 Fire Department Connections
- 211316 Dry-Pipe Sprinkler Systems

DIVISION 22 - PLUMBING

- 220517 Sleeves And Sleeve Seals For Plumbing Piping
- 220518 Escutcheons For Plumbing Piping
- 220523.12 Ball Valves For Plumbing Piping
- 220523.14 Check Valves For Plumbing Piping
- 220523.15 Gate Valves For Plumbing Piping
- 220529 Hangers And Supports For Plumbing Piping And Equipment
- 220553 Identification For Plumbing Piping And Equipment
- 220719 Plumbing Piping Insulation
- 221116 Domestic Water Piping
- 221119 Domestic Water Piping Specialties
- 221316 Sanitary Waste And Vent Piping
- 221319 Sanitary Waste Piping Specialties
- 221319.13 Sanitary Drains
- 221423 Storm Drainage Piping Specialties
- 223400 Fuel-Fired Domestic Water Heaters
- 224213.13 Commercial Water Closets
- 224213.16 Commercial Urinals
- 224216.13 Commercial Lavatories
- 224216.16 Commercial Sinks
- 224713 Drinking Fountains

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

- 230513 Common Motor Requirements For HVAC Equipment
- 230523.16 Plug Valves For HVAC Piping
- 230593 Testing, Adjusting, And Balancing For HVAC
- 230713 Duct Insulation
- 230993.11 Sequence Of Operations For HVAC-DDC**
- 231123 Facility Natural-Gas Piping
- 233113 Metal Ducts
- 233300 Air Duct Accessories
- 233346 Flexible Ducts
- 233416 Centrifugal HVAC Fans
- 233600 Air Terminal Units
- 233713.13 Air Diffusers
- 233713.23 Registers And Grilles
- 235123 Gas Vents
- 237416.11 Packages, Small-Capacity Rooftop Air-Conditioning Units
- 238126 Split-System Air-Conditioners
- 038239.13 Cabinet Unit Heaters

038239.16 Propeller Unit Heaters

323133 Plastic Fences and Gates

DIVISION 26 – ELECTRICAL – PROVIDED BY ETS

260000 Electrical Specifications Cover - ETS
260501 Electrical Demolition
260519 Conductors and Cables
260526 Grounding And Bonding
260529 Hangers And Supports
260534 Conduit
260537 Boxes
260553 Identification For Electrical Systems
260923 Lighting Control Devices
262100 Electrical Service Entrance
262416 Panelboards
262717 Equipment Wiring
262726 Wiring Devices
262818 Enclosed Switches
265100 Interior Lighting
265600 Exterior Lighting

DIVISION 27 - COMMUNICATIONS

270500 Common Work Results For Communications
270526 Grounding and Bonding For Communications
Systems
270528 Pathways For Communications Systems
270544 Sleeves And Sleeve Seals For Communication
Pathways And Cabling
271300 Communications Backbone Cabling

**DIVISION 28 - ELECTRONIC SAFETY AND
SECURITY**

280513 Conductors And Cables For Electronic Safety
And Security
280526 Grounding And Bonding For Electronic
Safety And Security
280528 Pathways for Electronic Safety And Security
280544 Sleeves And Sleeve Seals For Electronic
Safety And Security
281300 Access Control Software And Database
Management
281500 Access Control Hardware Devices
281000 Video Surveillance
283100 Intrusion Detection
284600 Fire Detection And Alarm - ETS

DIVISION 31 - EARTHWORK

311000 Site Clearing
312000 Earth Moving
312319 Dewatering
313116 Termite Control
315000 Excavation Support and Protection

DIVISION 32 – EXTERIOR IMPROVEMENTS

323119 Decorative Metal Fences and Gates

DOCUMENT SET

The Drawings that accompany this Project Manual and with it form the Document Set are identified by the same Architect Project No. as this Project Manual. The individual drawings are listed on the Drawing Cover Sheet.

Verification of Document Set: Verify that the Document Set transmitted is complete. Compare Drawings received with lists. Documents in the Project Manual, except standard pre-printed Documents, are terminated with "END OF ..." statement.

The Document Set will include additional Documents, if any, that are issued in conjunction with addenda and bulletins.

Documents to Bidders: Bidders will receive access to the NSA FTP site for down-loading PDF's Project Manual and Drawings for their use related to this project.

END OF TABLE OF CONTENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Special Project Requirements
- ~~3-4.~~ Work by Owner.
- ~~4-5.~~ Access to site.
- ~~5-6.~~ Coordination with occupants.
- ~~6-7.~~ Work restrictions.
- ~~7-8.~~ Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: Lakeshore Park.

1. Project Location: 601 South Lake Drive, Novi, Michigan 48375.

B. Owner: City of Novi, .45175 Ten Mile Road, Novi, Michigan 48375.

1. Owner's Representative: Brandon McCullough, Facilities Manager, 248-347-0532.

C. Architect: NSA Architects, Engineers, Planners, 23761 Research Drive, Farmington Hills, Michigan 48335.

1. Architect's Representative: Brandon Kritzman, Senior Project Manager, 248-477-2309.

D. Architect's Consultants: Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. PEA, Inc: Survey, Soil Borings, Geotechnical Engineers, Civil Engineers, Landscape Architects.
 - a. PEA Representative: Burke Jenkins, Project Manager, 248-689-9090.
2. Shymanski & Associates, L.L.C.: Structural Engineers.
 - a. Shymanski Representative: Ted Shymanski, 734-855-4810.
3. ETS Engineering: Electrical Engineers.

a. ETS Representative: Brian Wilt, 248-744-0360.

E. Web-Based Project Software: Project software administered by Contractor will be used for purposes of managing communication and documents during the construction stage.

1. See Section 013100 "Project Management and Coordination." for requirements for establishing administering and using web-based Project software.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Approximately 6,250 square foot fully-sprinkled community building with meeting rooms, toilet rooms, storage and exterior spaces in addition to asphalt parking and drives, concrete walks, new picnic pavilion, storage garage addition to existing toilet room building, and associated grading and landscape, and other Work indicated in the Contract Documents including all building finishes.
2. Project also includes full MEP including power, lighting, HVAC, plumbing and piping, controls, and including door hardware access systems.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 SPECIAL PROJECT REQUIREMENTS

A. All Special Inspections as required by Chapter 17 of the 2015 Michigan Building Code are the responsibility of the Contractor. All costs incurred for Special Inspectors and any related required testing services are the responsibility of the Contractor and are a part of this Contract.

B. Winter Conditions are not anticipated to be a part of this project. Winter conditions due to delays caused by the Contractor, and all related costs, will be the responsibility of the Contractor.

C. Permit fees for trades and subcontractors and all aspects reviewed by the City **directly** will be waived. However, costs for review consultants that are a part of the City's Plan Review and construction process, and all related costs, are the responsibility of the Contractor and are a part of this Contract.

1.51.6 WORK BY OWNER

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Subsequent Work: Owner will perform the following additional work at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory Work under this Contract.

1. Installation of Playground Equipment.

1.61.7 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Confine construction operations to area within boundaries of erosion control.
 - 2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule construction to minimize downtime of driveways and entrances by construction operations.
- C. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1-71.8 COORDINATION WITH OCCUPANTS

- A. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 - 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
 - 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 - 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1-81.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7 a.m. to 7 p.m., Monday through Friday, unless otherwise indicated.
 - 1. Weekend Hours: None.
 - 2. Early Morning Hours: None.
 - 3. Hours for Utility Shutdowns: 9 a.m. to 5 p.m., Monday through Friday, unless otherwise arranged with Owner.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner not less than 10 calendar days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.

- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Restricted Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.

1-91.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 042300 - GLASS UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Glass block set in mortar.

1.3 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate completion of glass unit masonry assemblies so sealants can be installed immediately after mortar has attained final set.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
- C. Shop Drawings: Show fabrication and installation details for glass unit masonry, including vertical and horizontal coursing, anchors, reinforcement, and expansion strips.
- D. Samples for Initial Selection: Manufacturer's actual glass-block units and joint materials involving color selection.
- E. Samples for Verification: Glass-block units and joint materials involving color selection.
- F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store glass block in unopened cartons on elevated platforms, under cover, and in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied.

- B. Store glass-block grid materials in unopened cartons in an enclosed, dry location.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Proceed with installation of glass unit masonry assemblies only when ambient and material temperatures are 40 deg F (5 deg C) or higher.
 - 1. Maintain temperature in installation areas at 40 deg F (5 deg C) or above for 48 hours after installing.
 - 2. Do not install sealants when ambient and substrate temperatures are outside limits permitted by sealant manufacturer or when joint substrates are wet.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass Block: Obtain glass block from single source from single manufacturer.
- B. Source Limitations for Accessory Materials: Obtain each cementitious material and admixture through single source from single manufacturer and each aggregate from single source or producer.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glass-block grid systems, including attachment to building construction.
- B. Structural Performance: Glass-block grid systems, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Loads: As indicated on the Structural Drawings.

2.3 GLASS BLOCK

- A. Hollow Glass Block: Hollow units made from transparent glass, with manufacturer's standard edge coating.
- B. Manufacturers: Subject to compliance with requirements, provide glass block products from one of the following acceptable manufacturers and distributors:
 - 1. J. Weck GmbH & Co. KG; distributed by Glass Blocks Unlimited.

2. Mulia, Inc.; Distributed by Glass Blocks Unlimited.
3. Seves; distributed by Glass Block Warehouse, LC.
4. Vetroarredo Sediver S.p.A.; distributed by International Product Supply.
5. WGS Westerwald Glasstein GmbH Solaris Glass Glasstein; distributed by Glass Blocks Unlimited.

C. Glass Block:

1. Glass Color: Colorless.
2. Pattern: Smooth, undistorted inner and outer faces.
3. Edge-Coating Color: As selected by Architect from manufacturer's full range.
 - a. Provide one color throughout for each pattern indicated.
4. Square-Block Size: 7-3/4 inches (197 mm) square by 3-1/8 inches (79 mm) thick.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or Type II. Provide natural color or white cement as required to produce mortar color indicated.
 1. Where joints are indicated to be raked out and pointed, gray cement may be used for setting mortar.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C91/C91M.
 1. Manufacturers: Subject to compliance with requirements, provide masonry cement products from one of the following acceptable manufacturers:
 - a. Cemex S.A.B. de C.V.
 - b. Essroc
 - c. Holcim US Inc.
 - d. Lafarge North America, Inc.
 - e. Lehigh Hanson Heidelberg Cement Group
- E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C979/C979M. Use only pigments with a record of satisfactory performance in masonry mortar.
- F. Aggregate: ASTM C144, with 100 percent passing No. 8 (2.36-mm) sieve.
 1. For pointing mortar and joints narrower than 1/4 inch (6 mm), use aggregate graded with 100 percent passing No. 16 (1.18-mm) sieve.
 2. White Aggregates: Natural white sand or crushed white stone.
 3. Colored Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- G. Water-Repellent Admixture: Liquid polymeric water-repellent mortar admixture that does not reduce flexural bond strength of mortar.

1. Manufacturers: Subject to compliance with requirements, provide water repellant products to be used in all single wythe construction from one of the following acceptable manufacturers:
 - a. ACM Industries
 - b. BASF Corporation
 - c. GCP Applied Technologies, Inc.

H. Water: Potable.

2.5 GLASS UNIT MASONRY ACCESSORIES

- A. Panel Reinforcement: Ladder-type units, butt welded, not lapped and welded; complying with ASTM A951/A951M in straight lengths of not less than 10 feet (3 m), and as follows:
 1. Exterior Walls: Hot-dip galvanized, carbon or Stainless-steel wire.
 2. Wire Size: W1.7 or 0.148-inch (3.8-mm) diameter.
 3. Width: 2 inches (50 mm).
 4. Spacing of Cross Rods: Not more than 16 inches (407 mm) apart.
- B. Panel Anchors: Glass-block manufacturer's standard perforated steel strips, 0.0359 inch (0.9 mm) by 1-3/4 inches (44 mm) wide by 24 inches (600 mm) long, hot-dip galvanized after fabrication to comply with ASTM A153/A153M.
- C. Fasteners, General: Unless otherwise indicated, provide Type 304 or Type 316 stainless-steel fasteners at exterior walls and zinc-plated fasteners with coating complying with ASTM B633, Class Fe/Zn 5, at interior walls. Select fasteners for type, grade, and class required.
- D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193.
- E. Asphalt Emulsion: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M or ASTM D1227.
- F. Mineral-Fiber Expansion Strips: Comply with requirements of fire-rated assembly listing and glass-block manufacturer.
 1. Use for fire-rated assemblies.
- G. Plastic-Foam Expansion Strips: Polyethylene foam complying with requirements of glass-block manufacturer; 3/8 inch (9 mm) thick by 3-1/2 inches (89 mm) wide.
 1. Use plastic-foam expansion strips for non-fire-rated assemblies.
- H. Sealants: Manufacturer's standard elastomeric sealants of base polymer and characteristics indicated below that comply with applicable requirements in Section 079200 "Joint Sealants."
 1. Silicone, non-staining, S, NS, 50, NT.
 2. Urethane, S, NS, 25, NT.
- I. Sealant Accessories: Provide sealant accessories, including primers, bond-breaker tape, and cylindrical sealant backing, that comply with applicable requirements in Section 079200 "Joint Sealants."

2.6 MORTAR MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, or antifreeze compounds unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar.
 - 2. For mortar in exterior panels, use water-repellent admixture according to admixture manufacturer's written instructions.
 - 3. For pointing mortar in exterior panels, use water-repellent admixture according to admixture manufacturer's written instructions.
 - 4. Limit cementitious materials in mortar to portland cement and lime.
- B. Mortar for Glass Unit Masonry Assemblies: Comply with ASTM C270, Proportion Specification for Type S mortar.
 - 1. Combine and thoroughly mix cementitious materials, water, and aggregates in a mechanical batch mixer unless otherwise indicated. Mix mortar to produce a stiff but workable consistency that is drier than mortar for brick or concrete masonry. Discard mortar when it has reached initial set.
- C. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.
 - 1. Pigments shall not exceed 10 percent of Portland cement by weight.
 - 2. Pigments shall not exceed 5 percent of masonry cement by weight.
 - 3. Mix to match Architect's sample.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine sills, jambs, and heads surrounding glass unit masonry assemblies, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLING GLASS BLOCK WITH MORTAR

- A. Apply a heavy coat of asphalt emulsion to sill and adhere expansion strips to jambs and heads with asphalt emulsion. Allow asphalt emulsion to dry before placing mortar. Trim expansion strips to width required to fit glass block and to full lengths of heads and jambs.
- B. Set glass block with completely filled bed and head joints, with no furrowing, accurately spaced and coordinated with other construction. Maintain 3/8-inch (10-mm) exposed joint widths unless otherwise indicated.
- C. Install panel anchors at locations indicated and in same horizontal joints where panel reinforcement occurs. Extend panel anchors at least 12 inches (300 mm) into joints, and bend within expansion joints at edges of panels and across the head. Attach panel anchors as follows:
 - 1. For in-place unit masonry assemblies and concrete, attach panel anchors with 1/4-inch- (6-mm-) diameter, bolt-size post-installed anchors, two per panel anchor.

2. For new unit masonry assemblies, embed other ends of panel anchors, after bending portions crossing expansion joint, in horizontal mortar joints closest in elevation to joints in glass unit masonry assemblies containing panel anchors.
- D. Use rubber mallet to tap units into position. Do not use steel tools, and do not allow units to come into contact with metal accessories and frames.
- E. Use plastic spacers or temporary wedges in mortar joints to produce uniform joint widths and to prevent mortar from being squeezed out of joints.
 1. If temporary wedges are used, remove them after mortar has set and fill voids with mortar.
- F. Keep expansion joints free of mortar.
- G. Rake out joints indicated to be pointed to a uniform depth sufficient to accommodate pointing material, but not less than joint width.
 1. If temporary wedges are used, remove them before raking out and pointing joints.
 2. Point joints at both faces of exterior panels with mortar.
 3. Point joints at both faces of exterior and interior panels with sealant.
- H. Point joints with mortar by filling raked joints and voids. Place and compact pointing mortar in layers not more than 3/8 inch (10 mm) thick. Compact each layer thoroughly and allow to become thumbprint hard before applying next layer.
 1. Tool exposed joints slightly concave when pointing mortar is thumbprint hard. Use a smooth plastic jointer larger than joint width.
- I. Clean glass unit masonry assemblies as work progresses. Remove mortar fins and smears immediately, using a clean, wet sponge or a scrub brush with stiff fiber bristles. Do not use harsh cleaners, acids, abrasives, steel wool, or wire brushes when removing mortar or cleaning glass unit masonry assemblies.
- J. Construction Tolerances: Set glass block to comply with the following tolerances:
 1. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/8 inch in 10 feet (3 mm in 3 m).
 2. Variation from Level: For bed joints and other conspicuous lines, do not exceed 1/8 inch in 10 feet (3 mm in 3 m).
 3. Variation of Location in Plan: For location of elements in plan, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm).
 4. Variation in Mortar-Joint Thickness: Do not vary from joint thickness indicated by more than plus or minus 1/16 inch (1.5 mm).
 5. For faces of adjacent exposed units, do not vary from flush alignment by more than 1/16 inch (1.5 mm).

3.3 CLEANING

- A. On surfaces adjacent to glass unit masonry assemblies, remove mortar, sealants, and other residue resulting from glass-block installation, in a manner approved by manufacturers of materials involved.
- B. Remove excess sealants with commercial solvents according to sealant manufacturer's written instructions. Exercise care not to damage sealant in joints.

- C. Perform final cleaning of glass unit masonry assemblies when surface is not exposed to direct sunlight. Start at top of panel using generous amounts of clean water. Remove water with clean, dry, soft cloths; change cloths frequently to eliminate dried mortar particles and aggregate.

END OF SECTION 042300

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SECTION 04 73 23 - CALCIUM SILICATE MANUFACTURED BUILDING STONE MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Calcium silicate building stone units.

1.2 RELATED SECTIONS

- A. Section 04 22 00 – Concrete Unit Masonry.
- B. Section 04 72 00 - Cast Stone Masonry.
- C. Section 05 50 00 - Metal Fabrications (loose steel lintels).
- D. Section 07 92 00 – Joint Sealants.

1.3 REFERENCES

- A. TMS 402 /ACI 530 /ASCE 5, latest edition, Building Code Requirements for Masonry Structures.
- B. TMS 602 / ACI 530.1 /ASCE 6, latest edition, Specifications for Masonry Structures.
- C. ASTM C73 latest edition: Standard Specification for Calcium Silicate Face Brick.

1.4 SAMPLES

- A. Submit samples as specified in Section 01 33 00, Submittal Procedures.
- B. Samples: Three full size samples, illustrating color and texture.

1.5 TEST REPORTS

- A. Submit test reports as specified in Section 01 33 00, Submittal Procedures.
- B. Test Reports: test results prepared by an independent testing agency, indicating tested material characteristics as part of a source quality control program, current within the past five (5) years.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: manufacturer having sufficient plant facilities to produce the shapes, quantities and size of Products required in accordance with the project schedule.

- B. Installer: Company or person specializing in similar stone commercial masonry work with 10 years documented experience.
- C. Mock-up: Supply sufficient quantity of full size calcium silicate building stone units for use in constructing mock-up panel on site, approximately 4 ft. wide X 6 ft. high and for approval of the Architect prior to commencing stone work.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00, Product Requirements.
- B. Deliver calcium silicate building stone units in protective film. Prevent damage to units.
- C. Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.
- D. Store units in a manner designed to prevent damage and staining of units.
- E. Stack units on timbers or platforms at least 3 inches above grade.
- F. Place polyethylene or other plastic film between wood and other finished surfaces of units when stored for extended periods of time.
- G. Cover stored units with protective enclosure if exposed to weather.
- H. Do not use salt or calcium-chloride to remove ice from masonry surfaces.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Refer to manufacturer technical specifications and documented recommendations.
- B. Conform to requirements of ACI 530.1/ASCE 6/TMS 602, Specifications for Masonry Structures, PART 1.8.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers of calcium silicate building stone units having Products considered acceptable for use:
 - 1. Arriscraft International, as distributed by Glen-Gary.
- B. Substitution Procedures: refer to Section 01 25 00, Substitution Procedures.

2.2 MATERIALS

- A. Design Basis Stone Units: Citadel® Building Stone by Arriscraft International and distributed by Glen-Gary.

- B. Calcium Silicate Building Stone Units: to ASTM C73, Grade SW; solid units that have been pressure formed and autoclaved; special shapes as indicated; four - size configuration; approximately as follows:
 - 1. Modular Sizes:
 - a. CIT23: 2-3/8" high, 3-5/8" bed, random lengths.
 - b. CIT36: 3-13/16" high, 3-5/8" bed, random lengths.
 - c. CIT52: 5-1/4" high, 3-1/2" bed, random lengths.
 - d. CIT81: 8-1/8" high, 3-1/2" bed, random lengths.
 - 2. Texture: tumbled finish on exposed faces and ends.
 - 3. Color: Infinity with Oynx color as selected by Architect and as indicated in the Material Finish Schedule.
 - 4. Mortar: 1:1:6 Portland cement-hydrated lime-sand mix, as specified in Section 04 22 00, Concrete Unit Masonry.
- D. Grout: maximum 6,500 psi at 28 days, as specified in Section 04 22 00, Concrete Unit Masonry.
- E. Wall Ties and Anchorages: as specified in Section 04 22 00, Concrete Unit Masonry. Use only stainless steel anchors and ties for stone work.
- F. Joint Sealants and Backer Rods: non-staining type, as specified in Section 07 92 00, Joint Sealants.
- G. Flashing, Vents, and Masonry Accessories: as specified in Section 04 22 00, Concrete Unit Masonry.

2.3 FABRICATION TOLERANCES

- A. Fabricate calcium silicate building stone units to a tolerance of plus or minus 1/8".

2.4 SOURCE QUALITY CONTROL

- A. Test calcium silicate building stone units as specified in Section 01 40 00, Quality Requirements.
- B. Test compressive strength and absorption from specimens selected at random from plant production.

PART 3- EXECUTION

3.1 EXAMINATION

- A. Verify site conditions are ready to receive work.
- B. Inspect materials for fit and finish prior to installation. Do not set unacceptable units.
- C. Beginning of installation means acceptance of existing conditions.

3.2 CUTTING MASONRY UNITS

- A. Cut masonry units to length with a masonry splitter.
- B. Dress split end to match face when exposed in wall.

3.3 WETTING MASONRY UNITS

- A. Where the ambient air temperature exceeds 100°F or exceeds 90°F with a wind velocity greater than 8 mph, pre-wet building stone units.
- B. Lay wetted units when surface dry.

3.4 COURSING

- A. Place masonry to lines and levels indicated and to match pattern advertised by the manufacturer.
- B. Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.
- C. Lay building stone units in random bond pattern, to the following percentage ratio, described from smallest to largest sized units: 20:20:40:20.
- D. Maintain mortar joint thickness of 1/2 inch.
- E. Tool joints by compacting the surface when thumbprint hard, to a concave finish.

3.5 PLACING AND BONDING

- A. Lay masonry in full bed of mortar, properly jointed with other work. Buttering corners of joints, and deep or excessive furrowing of mortar joints, control joints and other joints are not permitted.
- B. Fully bond intersections, and external corners.
- C. Provide control joints, aligning with back up masonry CMU joints and as detailed on the Drawings.
- C. Do not adjust masonry units after laying. Where resetting of masonry is required, remove, clean units and reset in new mortar.
- D. Install loose steel lintels as scheduled. See Structural Drawings and Details.
- E. Install wall ties and anchorages as specified Section 04 22 00, Concrete Unit Masonry.
- F. Install flashings, vents, and masonry accessories as specified in Section 04 22 00, Concrete Unit Masonry.
- G. Construct movement joints as specified in Section 04 22 00, Concrete Unit Masonry.

3.6 SITE TOLERANCES

- A. Erect masonry within the tolerances described in TMS 602 /ACI 530.1 /ASCE 6, Specifications for Masonry Structures, PART 3.3G.

3.7 FIELD QUALITY CONTROL

- A. Perform inspection and testing as specified in Section 01 40 00, Quality Requirements.
- B. Architect Inspection: Architect will inspect installed masonry and reject masonry that is chipped, cracked, or blemished (streaked, stained or otherwise damaged), as described below.
 - 1. Masonry will be inspected to be free of cracks or other blemishes on the finished face or front edges of the masonry units exceeding 3/8 inch or that can be seen from a distance of 10 feet.
 - 2. Units shall exhibit a texture approximately equal to the approved sample when viewed under diffused daylight illumination at a 20 foot distance.
 - 3. Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under diffused daylight illumination from a 20 foot distance.
 - 4. Efflorescence may be a cause for rejection.
- C. Make good the rejected masonry as directed by Architect.

3.8 ADJUSTING AND CLEANING

- A. Clean masonry units as specified in Section 04 22 00, Concrete Unit Masonry.
- B. Clean a 12 square foot area of wall designated by Architect, one-half of mock-up panel, as directed below and leave for one week. If no harmful effects appear, all objectionable stains removed and after mortar has set and cured, clean masonry as follows:
 - 1. Protect windows, sills, doors, trim and other work from damage.
 - 2. Remove large particles with stiff fiber brushes without damaging surface.
 - 3. Saturate masonry with clean water and flush off loose mortar and dirt.
 - 4. Dilute cleaning agent with clean water in controlled proportions.
 - 5. Apply solution to pre-soaked wall surface using soft-bristled brush.
 - 6. Thoroughly rinse cleaning solution and residue from wall surface.
- C. Use alternative cleaning solutions and methods for difficult to clean masonry only after consultation with masonry unit manufacturer.

3.9 PROTECTION

- A. Protect units from damage resulting from subsequent construction operations.
- B. Use protection materials and methods which will not stain or damage units.
- C. Remove protection materials upon Substantial Completion, or when risk of damage is no longer present.

END OF SECTION 04 73 23

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SECTION 074113.16 - STANDING-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes standing-seam metal roof panels.
- B. Related Sections:
 - 1. Section 077253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.

1.3 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review structural loading limitations of deck, purlins and rafters during and after roofing.
 - 6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
 - 7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 8. Review temporary protection requirements for metal panel systems during and after installation.
 - 9. Review procedures for repair of metal panels damaged after installation.
 - 10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.
- C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.
 - 1. Include similar Samples of trim and accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof area and eave, including fascia, as shown on Drawings; approximately 48 inches square by full thickness, including attachments, underlayment, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.
- E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
 - 3. Deflection Limits: For wind loads, no greater than 1/240 of the span.

- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 or ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..

- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 1646 or ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft..

- D. Hydrostatic-Head Resistance: No water penetration when tested according to ASTM E 2140.

- E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
 - 1. Uplift Rating: UL 90.

- F. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - 1. Fire/Windstorm Classification: Class 1A- ~~120~~ 90.
 - 2. Hail Resistance: SH.

- G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
 - 1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1637.
- B. Integral-Standing-Seam Metal Roof Panels: Formed with integral symmetrical ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for non-sequential installation by mechanically attaching panels to supports using concealed clips and seam cap located under one side of panels and lapping and interconnecting side edges of adjacent panels.
1. Design Basis: The Garland Company, “R-Mer Span.”
 2. Other Manufacturers: Subject to compliance with requirements, provide products by one of the other following manufacturers:
 - a. Morin - A Kingspan Group Company.
 - b. Petersen Aluminum Corporation.
 3. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 0.0~~25~~ 32-inch (22 gauge) minimum.
 - b. Exterior Finish: Three-coat fluoropolymer.
 - c. Color: Match Architect's samples.
 4. Clips: One-piece fixed to accommodate thermal movement.
 - a. Material: 0.028-inch- nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.
 5. Panel Coverage: 18 inches.
 6. Panel Height: 2.0 inches.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D 1970.
 3. Design Basis: The Garland Company, “R-Mer Seal.”
 - ~~3-4.~~ Other Manufacturers: Subject to compliance with requirements, provide compatible roof products by one of the following other acceptable manufacturers:
 - a. Carlisle Residential; a division of Carlisle Construction Materials.
 - b. GCP Applied Technologies Inc. (formerly Grace Construction Products).
 - c. Owens Corning.
- B. Felt Underlayment: ASTM D 226/D 22M, Type II (No. 30), asphalt-saturated organic felts.
- C. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.4 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Sub-framing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.
- E. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot-long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.
- F. Panel Fasteners: Self-tapping screws designed to withstand design loads.
- G. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish.
 - 1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.
 - 2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.5 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
 - 3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 - 5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 - 6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Steel Panels and Accessories:
 - 1. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 - 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 - 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install sub-framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Extend underlayment into gutter trough. Roll laps with roller. Cover underlayment within 14 days.
 - 1. Apply over the entire roof surface.
- B. Felt Underlayment: Apply at locations indicated, in shingle fashion to shed water, and with lapped joints of not less than 2 inches.
 - 1. Apply over the entire roof surface.
- C. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.
- D. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

3.4 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal panel work proceeds.
 - 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 - 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 - 1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- C. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- E. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
 - 1. Install clips to supports with self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 - 3. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
 - 4. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend in writing by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

- F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
 - 1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
 - 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- H. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
- I. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
 - 1. Connect downspouts to underground drainage system indicated.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074113.16

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SECTION 077200 – ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Roof curbs not furnished by mechanical trades.

1.3 QUALITY ASSURANCE

- A. Sheet Metal Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers listed in other Part 2 articles.

2.2 METAL MATERIALS

- A. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 coated.

2.3 ROOF CURBS

- A. Roof Curbs: Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including appropriate loads and other construction to be supported on roof curbs. Fabricate with welded or sealed mechanical corner joints, and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported. Coordinate curb type with metal standing seam roof and for watertight installation.

1. Manufacturers: Subject to compliance with requirements, provide products from one of the following acceptable manufacturers:
 - a. Custom Curb, Inc.
 - b. Loren Cook Company.
 - c. Pate Company (The).
 - d. Roof Products, Inc.
 - e. ThyCurb; Div. of Thybar Corporation.
2. Material: Galvanized steel sheet, 0.052 inch thick, unless otherwise indicated.
3. Liner: Same material as curb, of manufacturer's standard thickness and finish.
4. Factory install wood nailers at tops of curbs. Configure to accommodate field installed insulation
5. Curb height may be determined by adding thickness of roof insulation and minimum base flashing height recommended by roofing membrane manufacturer. Fabricate units to minimum height of 12 inches (short side) from top of deck, unless otherwise indicated.
6. Provide water diverter cricket on side of curb that obstructs water flow.
7. Seal watertight to standing seam roof installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Install roof accessories to fit and flash watertight to substrates and to result in watertight performance.
- C. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
 1. For accessories installed on sloped roofs, accessories shall conform to the longitudinal and/or cross slopes of roof so that roof curbs are plumb and top is level after installation.
- D. Seal joints with butyl sealant as required by manufacturer of roof accessories.
- E. Clean hatches and curbs and remove any related debris from roof upon completion of the Work.

END OF SECTION 077200

EXTERIOR FINISHES

<i>Item</i>	<i>Manufacturer</i>	<i>Series/Size</i>	<i>Color</i>
Metal Standing Seam Roof	Garland	R-Mer Span (22 ga.)	# 155 Olive Metallic
Stone	Citadel Building Stone from Glen Gary	Match Sample Board and Manufacturer Bond Pattern	Infinity with Onyx
Stone Header/ Lintel	Cast Stone	8" High	Limestone color accessories to match Stone
Stone Sill	Cast Stone	4" High	Limestone color accessories to match Stone
Cement Fiber Fascia and Trim Board	James Hardie	See Drawings	Autumn Tan Woodstock Brown
Caulking	See Spec	See Spec	Match Adjacent
Aluminum Entrances, Storefront and Window Frames	Kawneer Design Basis	Trifab 2" x 4 1/2"	Champagne
Hollow Metal Doors/Frames	See Spec	See Spec	PT-2
Glass	See Spec	Low E Insulating	Crystal Gray
PTAC Units	See Spec		TBD
Gutters and Downspouts	See Spec		PT-2
Wood Columns	See Spec		Dark Brown (Maple)
Tongue and Groove Wood Ceiling	See Spec		Light Oak
Pre-Engineered Glu Lam Wood, Decking & Columns at Site Pavilion	Engineered Wood Structures	See Stain Spec	Match Building Colors
Cement Fiber Soffit	James Hardie	Vented – Smooth	Autumn Tan
Deck Boards	Trex	See Drawings and Spec	Lava Rock
All Colors are to be verified/approved/coordinated by the Owner based on actual samples in field prior to ordering.			

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CycleGrip® MMAX SPECIFICATION Methyl Methacrylate Bike Lane Treatment

1. **USE:** CycleGrip® MMAX is a specialized bike lane treatment system that combines state-of-the-art Methyl Methacrylate resins with hardwearing aggregate and premium pigments to deliver an extremely durable, highly visible and color stable lane delineation treatment that meets the non-slip requirements needed for cyclists.

CycleGrip® MMAX shall be used to delineate bike lanes and increase bicycle lane presence in applications such as, but not limited to, corridor treatment along the length of a bike lane or cycle track especially at areas where bicycle and vehicular conflict are expected and added safety is needed.

1.1. CycleGrip® MMAX is only available through Ennis-Flint, or an authorized distributor of Ennis-Flint.

2. **MATERIAL:** Materials used to create CycleGrip® MMAX shall consist of CycleGrip® MMAX Resin, CycleGrip® MMAX Aggregate and catalyst.

2.1. CycleGrip® MMAX resin.

2.1.1. CycleGrip® MMAX resin shall have the following properties:

Density	12.85 +/- .15	Lbs/Gal
Tensile	>2000 psi	ASTM D638
Elongation	>70%	ASTM D638
Flash Point	>10°C	ASTM D1310

2.1.2. CycleGrip® MMAX resin shall be pigmented to meet the following color coordinates:

2.1.2.1. Daytime chromaticity:

1		2		3		4	
X	y	x	y	x	y	x	y
0.230	0.754	0.266	0.500	0.367	0.500	0.444	0.555

The daytime luminance factor (Y) shall be at least 20, but no more than 35.

2.1.2.2. Nighttime chromaticity:

1		2		3		4	
X	y	x	y	x	y	x	y
0.230	0.754	0.336	0.540	0.450	0.500	0.479	0.520

- 2.2. CycleGrip® MMAX aggregate shall be provided by the manufacturer and will have a hardness of 9 on the Mohs scale. Aggregate shall be a neutral, light color that will not affect the color of the finished product, and will have a mesh sizing of 24 Grit.

- 2.3. Catalyst shall come in a powder form and be supplied in bulk at the maximum usage rate of 0.51 +/- 0.2 lbs (.23 +/- .09 kg) per pail of resin.

3. **APPLICATION EQUIPMENT:**

- 3.1. Squeegees shall be designed for heavy duty usage and sourced locally.
- 3.2. Rollers shall be medium nap in texture and require a roller cage and handle.
- 3.3. Drill shall be high speed, high torque capable of supplying enough power to thoroughly mix CycleGrip® MMAX additives when paired with a paint mixing paddle.

4. **APPLICATION:**

- 4.1. Pre-conditions. Aged surfaces containing reflective cracking should be repaired, or it should be expected that reflective cracking may re-appear.

CycleGrip® MMAX SPECIFICATION

Methyl Methacrylate Bike Lane Treatment

- 4.2. Surface preparation.** Clean the intended application area thoroughly. All loose particles, dirt, sand dust, etc. must be removed. Broom and use a power blower or compressed air. The surface must be clean, dry and free of all dust, oil, debris and any other material that might interfere with the bond between CycleGrip® MMAX and surface to be treated.
- 4.2.1. Concrete:** All curing compounds shall be completely removed from concrete surfaces prior to installation by shot blasting or grinding. Existing concrete surfaces shall be wire brushed, but may require shot blasting or grinding dependent on condition.
- 4.2.2. Chemical contaminants:** Clean areas containing chemical contaminants such as vehicle fluids, using a degreasing solution, and ensure removal of contaminants and degreasing solution well in advance of the application.
- 4.2.3. Obstacles:** Pavement markings that are to be left in place, utilities, drainage structures, curbs and any other structure within or adjacent to the treatment location shall be masked to protect from application. Existing pavement markings conflicting with the surface treatment should be removed by grinding or water blasting. Extra care should be taken to thoroughly remove the dust and debris caused from grinding.
- 4.3. Mixing.** Catalyst quantity shall be based on ambient and pavement temperature and must be mixed very thoroughly at specified rates and into materials listed in the materials mixing guide. Material shall mix to approximately 2.79 gallons (10.55 liters) and weigh approximately 52 lbs (23.6 kg).

MATERIALS MIXING GUIDE

CycleGrip® MMAX resin		2 (7.6)	gallons (liters)
CycleGrip® MMAX aggregate		25.7 (11.7)	lbs (kg)
Catalyst	< 70°F / 18°C	12 (.365)	fl. oz. (liters)
	70-90°F / 18-32°C	6 (.185)	fl. oz. (liters)
	> 90°F / 32°C	3 (.09)	fl. oz. (liters)

- 4.4. Installation.** CycleGrip® MMAX shall immediately be poured on to pavement and distributed at 45-50 sq. ft. per pail using a squeegee. Trowels can be used where a squeegee is not effective. Use roller to back roll CycleGrip® MMAX to remove working lines and create a consistent, anti-slip texture. Remove masking as material gels, but before it cures.
- 4.5. Opening to traffic.** CycleGrip® MMAX must be 100% cured, which will be a hardened solid state, before traffic is permitted. Curing typically takes 30-60 minutes and is based on temperature and amount of catalyst added.

5. PERFORMANCE PROPERTIES:

- 5.1.** CycleGrip® MMAX will have the following performance properties:

Density	18.5 +/- 0.5	Lbs / Gallon
Solids	>99%	D2205
Build Thickness	90 +/-10	Mils
VOC	<100	Grams/Liter
Pot Life	~15min	AASHTO T237
Skid	>60	ASTM E303
Hardness	50-60	ASTM D2240
Water Absorption	<0.25%	ASTM D570

6. PACKAGING:

- 6.1.** CycleGrip® MMAX resin must be supplied in compliant metal pails that have a UN1A2Y1.9/100 rating.
- 6.2.** CycleGrip® MMAX Aggregate must be supplied in 25.5 +/- 0.5 lbs. (11.7 +/- .23 kg) pre-packaged bags or pails.

- 7. TECHNICAL SERVICES:** Shall be available from the manufacturer upon request.

Stamped Asphalt Generic Specification

1.0 GENERAL

1.1 Summary

This generic specification refers to stamping a pattern into the asphalt surface and applying a colored surface coating treatment. The pattern and color of the stamped asphalt shall be specified on the project drawings.

1.2 Related Sections

- Section 1.0 General
- Section 2.0 Asphalt Stamping
- Section 3.0 Coating Composition and Performance Characteristics
- Section 4.0 Delivery, Storage and Handling
- Section 5.0 Surface Preparation
- Section 6.0 Coating Application
- Section 7.0 Coating Thickness
- Section 8.0 Applicator Training
- Section 9.0 Samples and Mockups
- Section 10.0 Field Quality Control

2.0 Asphalt Stamping

2.1 Hot Mix Asphalt (HMA)

New asphalt must be placed to meet local required specifications. Compaction density must be met prior applying the asphalt stamps.

Existing asphalt must contain sufficient surface binder (asphalt cement) to allow a pliable surface when heated.

2.2 Stamping the Asphalt

Using flexible templates, stamp the pattern into the asphalt using a vibratory plate compactor. Stamping can be performed on a freshly placed asphalt surface when the asphalt is still pliable or into an existing asphalt

surface. An existing asphalt surface must be heated using an infrared heating apparatus insuring not to heat the surface above 325°F (163°C) Use slow cycled heat to ensure the surface does not burn. The surface should be heated to a depth of at least ¾" to ensure compaction (not crushing of the aggregate) below the template.

3.0 Coating Composition and Performance Characteristics

This section covers the composition, handling and application characteristics for the Stamped Asphalt Coating System. Coatings used with this surfacing system must meet the minimum characteristic and performance properties described below.

3.1 Asphalt Coating (Tint Base)

Material Composition and Application Characteristics

Table: 1

Characteristics	Requirement
Resin	waterborne latex
% Solids by weight	> 80%
% Solids by volume	> 65%
Weight per gallon	13.5 lbs/gal
% non-reactive fillers	< 40%
% calcined bauxite aggregate	>15%
Volatile Organic Compounds	< 75 g/l or 1/4lb/gal
Boiling Range	147° - 477°F
Vapor Density	Heavier than air
Liquid Density	1.5 – 1.7 kg/l @ 20°C
Flashpoint ASTM D 3278	>201°F
Flashpoint ASTM D 3278	>201°F
Hazardous Ingredients	none
Viscosity @ 70°F (20°C)	100-110 kU
Mix Ratio (Coating : LiquidTint) gal/pints	5gal: 1pint
Dry mil thickness per coat	20 to 25 mils
Number of coats to achieve rec. thickness	3 coats

Performance Requirements

Table: 2

Test	Requirement
Dry Time (to re-coat) @ 50°F (10°C).....	50 min
Dry Time (to re-coat) @ 90°F (32°C).....	30 min
85% Cure (to permit traffic) @ 50°F (10°C).....	6 to 8 hours
85% Cure (to permit traffic) @ 90°F (32°C).....	2 to 4 hours
ASTM 2486 Scrub Resistance (30 dry mils)..... Applied as per manufacturers specifications.....	5000 cycles to max loss of 50% coating thickness
Dry mil build thickness per coat	20 to 25 mils
Temp. limits for service (of cured material)	-35°F to 145°F
Friction using a locked wheeled tester at 30 mph	>45 FN30R
Friction using a locked wheeled tester at 30 mph	>40 FN30R
Pedestrian Friction ASTM E303 British Pendulum.....	>70 BPN

3.2 Liquid Tint (coloring system)

The coloring system "Liquid Tint" shall consist of no less than 95% pure inorganic iron oxide pigments in a water base liquid carrier. Pigment particle size (fineness) must pass 95% minus 325 mesh. Liquid Tint must be alkali resistant, water insoluble, inert, light resistant, inorganic, and lime-proof.

3.3 Primer

Primer shall be water based 100% acrylic waterborne

Material Composition, Handling and Application Characteristics

Table: 3

Characteristics	Requirement
Resin	waterborne latex
% Solids by weight	> 30%
% Solids by volume	> 29%
Weight per gallon	8.5 lbs/gal
% non-reactive fillers	< 0%
Volatile Organic Compounds	< 45 g/l or 1/10lb/gal
Boiling Range	147° - 477°F
Vapor Density	Heavier than air
Flashpoint ASTM D 3278	>201°F
Flashpoint ASTM D 3278	>201°F
Hazardous Ingredients	none
Viscosity @ 70°F (20°C)	44> kU
Mix Ratio (Primer : Water)	1 primer : 1 water
Dry mil thickness per coat	1 to 2 mils
# of prime coats to achieve rec. thickness	1 coat

Performance Requirements

Table:4

Test	Requirement
Dry Time (to re-coat) @ 50°F (10°C).....	50 min
Dry Time (to re-coat) @ 90°F (32°C).....	30 min
ASTM 2486 Scrub Resistance (3 wet mils).....	500 cycles
Dry mil build thickness per coat	1 to 2 mils
Temp. limits for service (of cured material)	-35°F to 145°F

4.0 Delivery, Storage and Handling

4.1 Packaging and Labeling

All coating products shall be packed in standard closed containers. Each container of separately packaged component shall be clearly and durably labeled to indicate the date of manufacture, manufacturer's batch number, quantity, color, component identification and designated name or formula specification number together with special instructions.

4.2 Delivery, Storage and Handling

Coating products shall be delivered to the site in sealed containers that plainly show the designated name, batch number, color, date of manufacturer, and name of the manufacturer. Store the material on site in enclosures, out of direct sunlight in a warm, ventilated and dry area at room temperature; do not allow coating to freeze. Care shall be taken in handling of coating containers to prevent puncture, inappropriate opening or other action, which may lead to product contamination. No materials that are past the coating manufacturer's recommended shelf life shall be used without the approval of the coating manufacturer.

5.0 Surface Preparation

5.1 Cleaning

Broom using mechanical brooming device, or stiff bristle hand broom. Scrape and blow fine sand and debris off of surface. Pressure washing may be necessary to remove bonded debris. Use a non-solvent based degreaser to remove stains. Spray degreaser on stained area and let stand for 15 minutes. Using a stiff broom or brush, agitate the stained area to remove stain and rinse with water. Repeat this procedure on severe stains. Thoroughly rinse the area and let dry for 24 hours.

5.2 Repair Damaged Asphalt

Damaged and cracked asphalt shall be repaired by heating damaged area until the asphalt cement is in a liquid state (ensuring asphalt does not exceed 375° F), turning over and mixing in new fresh asphalt if necessary to ensure repair is level with adjacent area. Infrared type heating mechanisms are the recommended tool for this procedure.

5.3 Preparation of New Asphalt

New asphalt surfaces shall be allowed to cool after final compaction roll to less than 140° F before applying coating. Asphalt mix design shall specified by a qualified Pavement Engineer and shall be designed for the purpose of the application.

6.0 Coating Application

6.1 Environmental Conditions

Surfaces should be dry for at least 24 hours prior to applying Stamped Asphalt coatings. 50°F and rising, is the recommended minimum air and surface temperature. The temperature of the asphalt surface must be at least 5°F above the dew point temperature during and after applying coating. Coating application must be complete at least two hours before sunset to allow for proper cure.

6.2 Masking

Mask all adjacent areas using paint-grade masking tape. Use duct taped on concrete and asphalt surfaces. Building paper extended a minimum of 48 inches beyond the edge of coated area is required to prevent over-spray of coatings onto adjacent areas.

6.3 Spray Equipment

Spray texture gun (Graco RTX1500 TexSpayer).
or Benron "EZ-TEX DX" sprayers.

The coating manufacturer shall approve spray gun settings and alternative spray equipment.

6.3 Mixing Base Coat

Contractor to follow latest mixing techniques provided by the manufacturer.

7.0 Coating Thickness

7.1 Standard Thickness. The applied thickness of the coating shall be determined according to the application as noted in table 5. The owner may specify a greater thickness if so desired.

Required Film Thickness

Table: 5

Application	Film Thickness
Prime Coat where applicable	5 wet mils (1 dry mil)
First coat	25 wet mils (20 dry mils)
Second coat	30 wet mils (25 dry mils)
Third coat	30 wet mils (25 dry mils)
Seal Coat where applicable	5 wet mils (1 dry mil)

8.0 Applicator Training

8.1 The Applicator shall be approved by the manufacture for the application being applied. The Applicator shall have lead personnel on the project that have been trained by the manufacturer within the past 12 months of starting the project. At least one of these trained personnel shall be on site at all times during the application.

9.0 Samples and Mockups

9.1 Samples shall be provided to the owner (or owners representative) for approval prior to tender closing.

Samples shall display the following:

1. Brick or stone Pattern
2. Brick or stone color
3. Variations of the above if requested

Coating samples and mockups, are to be applied to an asphalt surface covering a 96" x 96" area.

Approval of color and pattern to be provided in writing to the bidding contractor no less than 7 days prior to bid closing.

Approved samples and mockups to be held by owner for future onsite verification.

10.0 Field Quality Control

- 10.1 The contractor for work under this section shall maintain a quality control program specifically to verify compliance with this specification. A daily log shall be kept to record actions in the field.
- 10.2 This log shall include the following information;
1. Surface preparation start date and time
 2. Photos of surface prior to start of preparation
 3. Close up photos of crack repair (before and after) if applicable
 4. Ambient temperature start and end of each day
 5. Relative humidity start and end of each day
 6. Substrate surface temperature start and end of each day
 7. Photos of surface after application of each coat

Note:

On projects larger than 1,000 square feet, break project into areas of approximately 1,000 square feet for the purpose of photo taking and record keeping. Number these areas and record the respective numbers on scaled drawing.

- 10.3 Dry film thickness shall be confirmed by the owner (or owners representative) on site, during the application process.

Method:

2" x 4" lengths of duct-tape (or 2" x 4" thin plastic, glass or metal plates) shall be secured to the substrate that will receive coating. The tape will be randomly placed averaging one tape per 300 sq ft. These tapes shall be pre-marked (on the adhesive side) with location matching a marked, scaled drawing. The tape shall be removed within 1 hour after the final coat has been applied. These samples shall be kept by the owner (or owners representative) for future verification of dry film thickness (if verification becomes necessary).