

ADDENDUM NO.: 3

DATE OF ADDENDUM: August 25, 2016

**New Police Facility for
Western Connecticut State University
Danbury, CT
BI – RD– 273**

Original Bid Due Date / Time:

September 7, 2016

1:00pm

Previous Addendums: Addendum #2 dated 8/23/2016, Addendum #1 dated 8/2/2016

TO: Prospective Bid Proposers:

This Addendum forms part of the "Contract Documents" and modifies or clarifies the original "Contract Documents" for this Project dated 7/01/2016. Prospective Bid Proposers shall acknowledge receipt of the total number the Addenda issued for this Project on the space provided on Section 00 41 00 Bid Proposal Form. Failure to do may subject Bid Proposers to disqualification.

The following clarifications are applicable to drawings and specifications for the project referenced above.

Item 1

Contractor RFI: Please provide start and finish date of construction.

Answer: Per section 00 72 13 Paragraph 4.1, the start date shall be the date indicated in the Notice to Proceed from the Owner. Per section 00 11 16, the contract time is 365 calendar days.

Item 2

Contractor RFI: Per spec section 111900 DETENTION EQUIPMENT, please provide approved manufacturer to use.

Answer:

1. GS Company, 7920 Stansbury Road, Baltimore, MD, (401)-284-9549
2. Jails Correctional Products, a division of Fabcor, Inc., Minster, Ohio, (419)-628-4428
3. Southern Steel Company, P.O. Box 2021, San Antonio, TX, (210)-533-1231

Item 3

Contractor RFI: Please confirm that a full time project manager is required for this project.

Answer: Per section 00 72 13 Paragraph 4.9, the Project Manager shall be employed full time on the project.

Item 4

Contractor RFI: The detail drawing numbers on C3.1, C3.2, C3.3 are not labeled on the site plans C2.0, C2.1, C2.2. Please update labels so we know which details apply to where.

Answer: Given the scope of the site work for this project, it should quite clear to a qualified bidder which details will apply.

Item 5

Contractor RFI: Ref. A1.01, Alt #1 Floor Plan. The wall between Water Room 116 and Mechanical 203 is called out as B-2; 8" cmu. Column details A30 & A35/A8.02 show an insulated metal stud wall with 4" cmu veneer. Which is correct?

Answer: The column details are correct. Delete reference to wall type B-2 at this location.

Item 6

ADDENDUM NO.: 3

DATE OF ADDENDUM: August 25, 2016

Contractor RFI: Ref. A1.01, Alt #1 Floor Plan. The wall between Men's Locker 129 and Storage 201 is called out as B-2; 8" cmu, Column details A28 & A33/A8.02 show a metal stud wall with 4" cmu. Which is correct?

Answer: The column details are correct. Delete reference to wall type B-2 at this location.

Item 7

Contractor RFI: Ref. Specification Section 08 06 10. The Opening Schedule calls out head and jamb details H-8 and J-8 for interior aluminum frames 117A and 127A. These details appear to be for an overhead door

Answer: **Revise** details for openings 117A and 127A to be head detail H-9 and jamb detail J-9 as shown on attached sketch SK-1, dated 8-24-16.

Item 8

Contractor RFI: Drawing S1.01 slab on grade "F2", please provide perimeter edge detail.

Answer: The edge of the exterior "F2" slabs on grade should be a "Typical Frost Wall Detail" as shown on Drawing S0.1.

Item 9

Contractor RFI: The finish plan and pattern plan do not match up. For instance: the copy room says VS-1 on the finish plan but calls out SVT-1 and 3 on the pattern plan. There is cpt-1 called out on the finish plan but no CPT-1 on the material legend. which material is this? Also CT-5 is not shown anywhere on the pattern plan but called out on the finish plan.

Answer: In Copy Room 109, VS-1 is the correct floor finish. CPT-1 was deleted from the project. Revise Finish Plan Rooms 112 & 113 floor finish to VS-1. CT-5 is on the Finish Schedule / Legend F0.03 under flooring and the same product is used on walls in elevation 1/2/3/ F2.0. CT-5 is a floor tile that is also used on the walls.

Item 10

Contractor RFI: Please clarify height of Bullet Resistant wall sheeting: dwg 6.04 indicates 8 ft while spec defines 10'6" above floor.

Contractor RFI: pec. Section 13 40 00 Bullet Resistant Protection 1.2 A.5 says height is 8'-0" but 2.6 A.4 says 10'-6". Please advise which is correct

Answer: The bullet resistant sheathing shall extend to 8'-0" aff as indicated on the plans. Revise specification section 13 40 00 paragraph 2.6A4 to read, "install bullet resistant fiberglass to a height of 8'-0" a.f.f. along walls to form continuous bullet resistance between public and police areas. Refer to Drawing A6.04, detail 35 for additional information."

Item 11

Contractor RFI: Please indicate which doors & frames are to be Bullet Resistant (not indicated)

Answer: Sheet A9.01 indicates that door type WD-4 and frame type HMF-2 are bullet resistant. See Door Schedule in the specification for openings that have those door and frame types.

Item 12

Contractor RFI: Please clarify exact depth of excavation or elevation for removal of existing poor soils & replacement with new structural fill - borings indicate both fill areas and loose existing soils - to eliminate confusion and for bidding purpose we need a bottom of excavation depth or elevation, or a quantity of poor soils to be excavated as an allowance

Contractor RFI: The Boxed Note: on Drawing S1.01 calls for all material to be replaced and brought back up with structural fill, but there should be an elevation given for the bottom of that removal to put everyone on a level playing field as far as the bid is concerned. The borings are not consistent enough to enable a definitive depth of removal

ADDENDUM NO.: 3

DATE OF ADDENDUM: August 25, 2016

(from 6.5' to 11'). It should also be depicted on the structural cross sections under the footings and slabs so that no one misses that boxed note.

Answer: Contractor shall include in his bid removal of soils within the footprint of the building and extending laterally outside the building footprint for a distance equal to the depth of fill to an elevation of 375'. Contractor shall then backfill this area with structural fill per the requirements of the specs.

Item 13

Contractor RFI: Please clarify in Evidence # 119 if there are (2) 36 x 42 refrigerated lockers or just one (one is specified as part of the 04AC unit & then another separate unit seems to be specified ?); also 18" locker does not seem to come with a refrigerated section as indicated in the specs (error ?)

Answer: **Revise** section 11 19 16 paragraph 2.2A3a to read "Tiffin Metal Products "model 1808AA""

Item 14

Contractor RFI: Aluminum frame lined with FG- Drawing calls out for natural voice, -is this required?

Contractor RFI: On Drawing A6.04 Detail 32 shows a transactional window with a speaker and natural voice transmission. I was notified by the manufacturer that they will not quote the item with both. Please clarify if we are to carry the speaker or the natural voice

Answer: The Natural Voice feature is required. The manufacturer has confirmed that this is an unusual arrangement for them, but they will fabricate as designed.

Item 15

Contractor RFI: Per drawing C2.0, please provide locations for the detectable warning strip as shown on detail 2 & 7/C3.1. Also the specs and drawing did not specify a manufacturer and make.

Answer: Locations are identified on sheet C-2.0 by the notes "Curb Ramp" and by any change in material from concrete sidewalk to bituminous. See curb ramp detail 3/C3.1 which include detectable warning strips. Manufacturers/Models are as follows:

1. Armor Tile, Cast-in-Place, Williamsville, NY, (800)-682-2525
2. ADA Solutions, Inc., Cast-In-Place, Wilmington, MA, (800)-372-0519
3. StrongGo Industries, LLC, Tek-Way Dome Tiles, Tucson, AZ, (866)-439-3216

Item 16

Contractor RFI: The spec for the hand dryers is contradictory. It looks like it is written for the Sky Systems #3051 and only comes with a 1 year warranty. The XL-SB and the B-778 are not applies to applies to the 3051. First off they are SS or Chrome finish. And the only one of the 3 that comes with a splash guard is the XL-SB. Please provide clarifications?

Answer: **Revise** section 10 28 00 paragraph 2.13 to read:

2.13 ELECTRIC HAND DRYER

A. *Manufacturers:*

1. American Dryer, Extreme Air "Model No. GXT9-SS"
2. Excel Dryer, Inc., "Model XL-SB"
3. Bobrick Washroom Equipment, "Model B-715"

ADDENDUM NO.: 3

DATE OF ADDENDUM: August 25, 2016

B. *Electric High Speed Hand Dryer*

1. *Features:*

Cover: Stainless Steel Satin Finish

Operation Power: 1500 W

Drying Time: Less than 10-15 seconds

Operating Voltage: 110-120 Vac, 50/60Hz.

Circuit Operation: Infrared Automatic, self adjusting

Five Year Warranty

C. *Stainless Steel Sheet, Wall Mounted Splash Guard, size as indicated on drawings*

Item 17

Contractor RFI: Drawing C2.0 shows "Area for 90 gal trash and recycling". Is this area a concrete pad? Please provide dimensions and details.

Answer: This area is not intended to be a concrete pad. This is an area that the Owner would like reserved on the site for their trash bins. There is no specific work required by the contractor other than maintaining an open paved area.

Item 18

Contractor RFI: Drawing C2.0 shows partial concrete walk joint layout plan that included the slab within the canopy area. This canopy slab is also identified as F2 slab in the structural drawing S1.01. Please clarify.

Answer: This canopy slab is to be constructed per the structural drawing details with the exception of the joint layout. Delete the control joint shown on drawing S1.01 for this slab. Refer to drawing C2.0 for the joint layout.

Item 19

Contractor RFI: Drawing detail 6/A6.01 shows concrete slab on metal deck. Please provide location of this concrete slab on deck on the drawings.

Answer: Delete this detail. Masonry wall lateral support shall be per details MT-1 thru MT-4 on sheet S2.05.

Item 20

Contractor RFI: Drawing C2.0 shows Generator Pad on Base Bid to be outside of building. Supplemental Bid shows this generator pad is in the building in Mechanical 203. A Pad detail is shown on drawing S0.1 and 4/E6.01 which looks like a detail for exterior application. Please advise which detail to use also provide detail and dimensions for interior pad application.

Answer: The Base Bid for this project requires an exterior mounted generator on a pad. The location of the pad is shown on the Base Bid Site Plan drawing on sheet C-2.0. The detail for the exterior mounted base bid generator pad is detail 4/E6.01. The Supplemental Bid indicates an interior installation and generator shall be installed on a minimum 12" thick concrete pad reinforced with #4@12" on center, each way, top and bottom. The concrete pad should extend a minimum of 6" beyond the outside face of the generator – typical for all sides.

ADDENDUM NO.: 3

DATE OF ADDENDUM: August 25, 2016

Item 21

Contractor RFI: Are the mobile shelving units, shown on drawing A1.01 in room 119 Evidence in the GC's scope?

Answer: The mobile shelving units, accessories and tracks are not part of this contract. The slab preparation that is shown on the foundation plan note #10, architectural detail 13/A-6.01 and located by dimension on sheet A1.01 is included in the project.

Item 22

Contractor RFI: Spec Section 015000 Computer Software lists Adobe Acrobat XI PDF Writer, Bluebeam and BIM 360 as part of the Productivity Software. Are we required to carry all three of these programs or do we choose one?

Answer: Project requires contractor to furnish Adobe Acrobat XI PDF Writer and BIM 360.

Item 23

Contractor RFI: There is no detail depicting the concrete thickness or base thickness for the Bicycle Pad. Please clarify

Answer: See detail 10/C3.1 for concrete thickness and base thickness. Refer to detail 12/C3.1 for expansion and control joint locations. **ADD** specification section 12 93 13 Bicycle Racks. **ADD** sketch SK-2, dated 8-24-16 for bicycle rack detail.

Item 24

Contractor RFI: Please show a detail for the proposed Transformer Pad.

Answer: The transformer pad shall be Eversource #SPC P-015.

Item 25

Contractor RFI: The area between the proposed driveway entrances at the public parking area to the right of the proposed police building is confusing as the Topographic Plan labels some "new" concrete walks and some "old" but the layout and materials plan C2.0 has no labeling here at all, please clarify.

Answer: Refer to Drawing C1.0 for the extents of sidewalk demolition. All demolished sidewalks shall be replaced with new to the extents shown on this drawing.

Item 26

DELETE: Specification Section 07 50 00 Membrane Roofing

ADD: Specification Section 07 54 19 Polyvinyl-Chloride (PVC) Roofing

REVISE: Sheet A7.01 Roof Insulation Type Legend per sketch SK-3, dated 8-24-16.

Item 27

Contractor RFI: Regarding the Window Treatments, we see the specification on this. However when reviewing the drawings, the only place that indicates window treatments is the Finish Schedule on F0.03. The WT-1/WT-2 tag does not appear to be on the drawings. Please provide locations for the shades.

Answer: Refer to Specification section 12 21 13 paragraph 2.1A for locations of Window Treatment WT-1 and specification section 12 21 13 paragraph 2.1B for locations of Window Treatment WT-2

Item 28

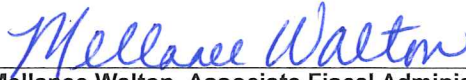
Drawing Attachments: For printing attached drawings, the following sizing guide is given:
Formatted for 8 1/2 x 11: SK-1, SK-2, SK-3, Specification Sections 07 54 19, 12 93 13

ADDENDUM NO.: 3

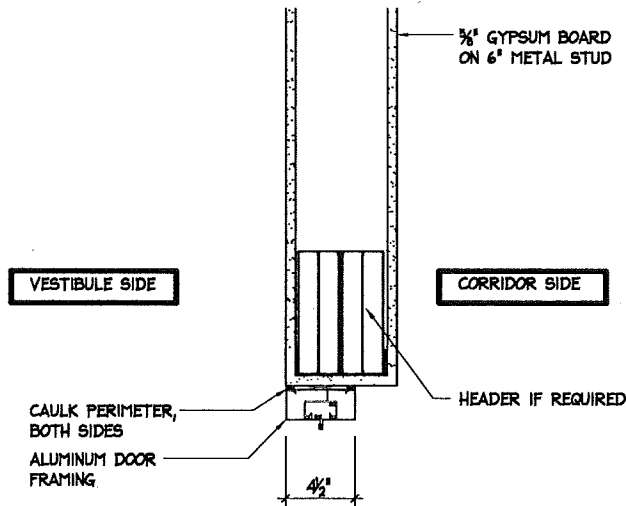
DATE OF ADDENDUM: August 25, 2016

All questions must be in writing (not phone or e-mail) and must be forwarded to the consulting Architect/Engineer (Mark Allen, Jacunski Humes Architects, LLC, 860.828.9223) with copies sent to the DCS Project Manager (Peter Simmons, 860.713.7261) and Construction Manager (Michael Dell'Accio, Arcadis U.S., Inc, 860.503.1520)

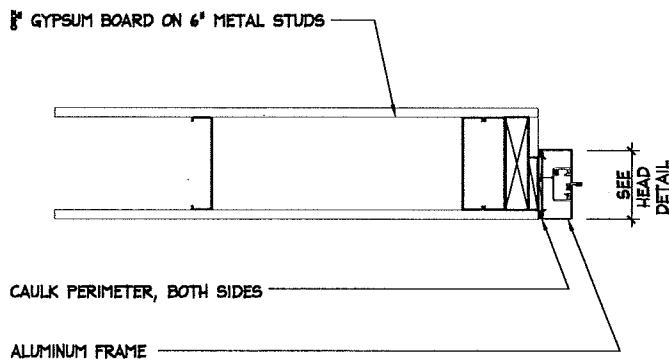
End of Addendum 3



Mellanee Walton, Associate Fiscal Administrative Officer
Department of Administrative Services
On Behalf of the Division of Construction Services



H-9 **HEAD DETAIL**
 SCALE: 1 1/2" = 1'-0"



J-9 **JAMB DETAIL**
 SCALE: 1 1/2" = 1'-0"

JH
 JACUNSKI HUMES
 ARCHITECTS, LLC

15 MASSIRIO DRIVE
 SUITE 101
 BERLIN, CT 06037
 TEL 860-828-9221
 FAX 860-828-9223

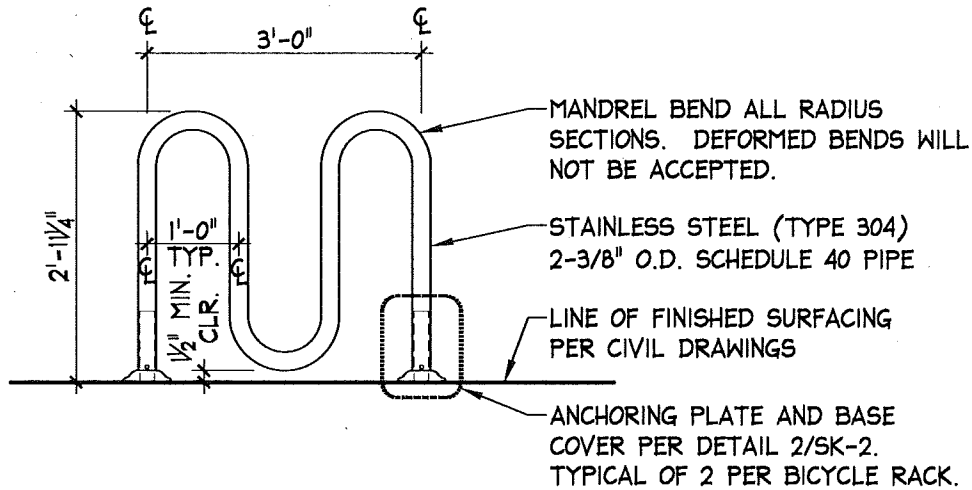
*NEW POLICE FACILITY FOR
 WESTERN CONNECTICUT STATE UNIVERSITY*

181 WHITE STREET

DANBURY, CONNECTICUT

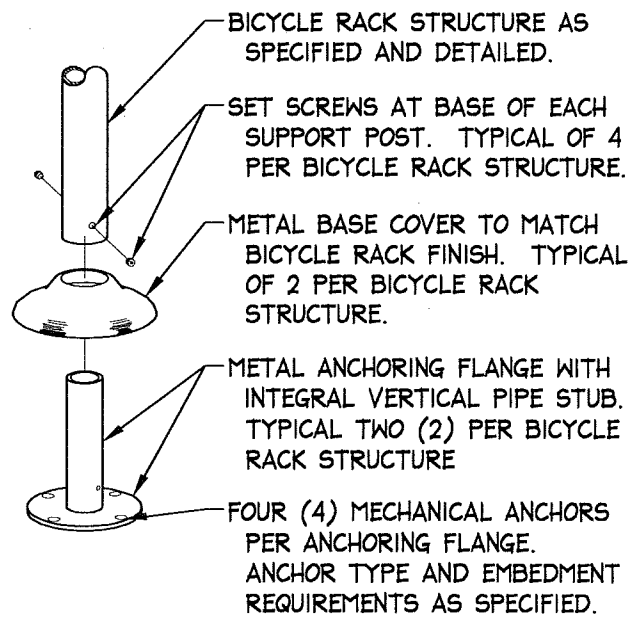
*DOOR
 DETAILS
 H-9 AND
 J-9*

PROJ. NO. JHA1316	DRAWING NO.
SCALE: 1" = 1'-0"	SK-1
DATE: AUG. 24, 2016	



1 BICYCLE RACK ELEVATION

SCALE: 1/2" = 1'-0"



2 BICYCLE RACK ANCHORING ISOMETRIC

SCALE: 1" = 1'-0"

JHI
JACUNSKI HUMES
ARCHITECTS, LLC

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181 WHITE STREET

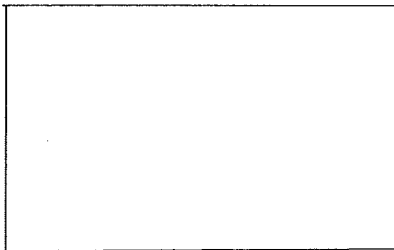
DANBURY, CONNECTICUT

*BICYCLE
RACK
INSTALLATION
DETAIL*

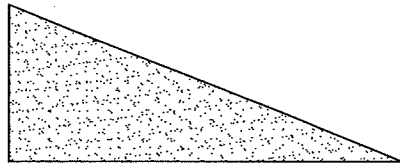
PROJ. NO. JHA1316	DRAWING NO.
SCALE: AS NOTED	SK-2
DATE: AUG. 24, 2016	

NOTE: ROOF STRUCTURE PITCHED AT $\frac{1}{4}$ " PER FOOT SLOPE MINIMUM.

ROOF INSULATION TYPE LEGEND:



NEW FULLY ADHERED PVC MEMBRANE ROOF OVER NEW 1/2" COVER BOARD OVER 2 LAYERS OF 2" RIGID INSULATION OVER SLOPED METAL DECK



TAPERED INSULATION CRICKET: 1/8" PER FOOT - IN PLACE BELOW TOP LAYER COVER BOARD

TYPICAL NOTES:

1. VERIFY IN THE FIELD EXACT QUANTITY OF PENETRATIONS, EQUIPMENT CURBS, PLUMBING VENTS, AND ELECTRICAL CONDUITS/ PIPING, PENETRATIONS E.TC.
2. SEE NOT KEYED TYPICAL DETAILS # 2 AND #19

JH
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ARCHITECTS, LLC

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WESTERN CONNECTICUT STATE UNIVERSITY*

181 WHITE STREET

DANBURY, CONNECTICUT

*ROOF
INSULATION
LEGEND
REVISION*

PROJ. NO. JHA1316	DRAWING NO.
SCALE: NONE	SK-3
DATE: AUG. 24, 2016	

07 54 19 – PVC ROOFING & RELATED WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Notice to Bidders, The State generated form: "The General Conditions of the Contract for Construction – For Design-Bid-Build," the Supplementary Conditions and Division 1, General Requirements, are a part of this Section and shall be binding on the Contractor and/or Subcontractor who performs this work. Note also all Addenda..

1.2 SCOPE OF WORK

- A. This section includes all labor, materials, equipment and appliances required to furnish and install the following work and related items as shown on the Drawings and in accordance with good roofing practice:
 - 1. The preparation of metal roof decks to receive new roofing as hereinafter specified.
 - 2. Single ply PVC fully adhered membrane roofing on designated roof areas.
 - 3. Flat stock insulation and or tapered insulation and crickets.
 - 4. Membrane base flashing throughout.
 - 5. Flashing for roof drains and vent piping.
 - 6. Gravel stop, gutters, downspouts and miscellaneous forms.
 - 7. Copper flashing as detailed, designated or required.
 - 8. Roof accessories including; traffic pads.
- B. Related Work:
 - 1. Section 06 10 53 – "Miscellaneous Carpentry", for wood blocking related to roofing, blocking, and curbs as indicated on the drawings.
 - 2. Roof drains and drainage piping / insulation by Division 22.

1.3 APPROVALS AND CERTIFICATES

- A. Examine and carefully review the Specifications and Drawings with the manufacturer of the materials and systems, and deliver the following written certificates prior to approval.
- B. Certificate from the roofing materials manufacturer that he has carefully reviewed and is in conformance with the Contract Documents as they are applicable to his roofing system that the roofing information and details indicated and specified, including flashing accessories, are acceptable and in conformance with his system.
- C. Prior to final payment, submit written certification in a form acceptable to the Owner, that all material and workmanship in connection with this Section has been furnished and installed in complete conformance with these Specifications and the approved manufacturer's requirements.
- D. Installing contractor to complete and submit **FM Global, Checklist for Roofing System, form X2688** to Architect.

1.4 PROCEDURE AND SEQUENCE

- A. Contractor will prosecute the work diligently and maintain a full crew of competent men on the job full time for each consecutive day that weather permits.
- B. The Contractor will legally dispose of all roofing material and all construction debris at the end of each working day.
- C. On a daily basis, this Contractor will clean up the outside of the building, carefully removing all roofing related construction, debris, insulation, etc.

1.5 GUARANTEE

- A. Roofing Contractor's Warranty: The roofing subcontractor shall supply the State of Connecticut with a minimum two-year workmanship warranty. In the event any work related to the roofing, flashing, or metalwork is found to be defective within two years of substantial completion, the roofing contractor shall remove and replace such at no additional cost to the State of Connecticut. A copy of the signed roofing contractor's warranty shall be sent to the roofing system's manufacturer. The duration of the Roofing Contractor's two-year warranty shall run concurrent with the roofing system's manufacturer's 25-year warranty.
- B. Roofing Systems Manufacturer's Warranty: The roofing manufacturer shall guarantee roof areas to be in a watertight condition, for a period of 25 years, from the date of final acceptance of the roofing system. The warranty shall be a 25-year no dollar limit, non-prorated total system labor and material warranty, for wind speeds up to 90 miles per hour. Total system warranty shall include all roofing materials, related components and accessories including, but not limited to the substrate board, vapor retarder, insulation board, cover board, roofing membrane, membrane flashings, fasteners, adhesives and termination metals and roof drain assemblies. The manufacturer shall repair defects in materials and workmanship as promptly after observation as weather and site conditions permit.

PART 2 - PRODUCTS

2.1 MEMBRANE ROOFING AND RELATED WORK

A. MATERIALS

1. Except as herein specified, materials shall conform to ASTM or Federal Specifications. All materials must be clearly labeled with all pertinent information. Materials delivered in bulk equipment shall be accompanied by a certification by the roofing system material manufacturer. All materials for use in membrane roofing, roof insulation, and flashing system, must be manufactured by, or approved by, the approved roofing material manufacturer for use in his system.
2. FULLY ADHERED PVC ROOFING
 - a. Carlisle Sure-Flex PVC PMANI80, FM Global Roofnav 345904-0-0, with a twenty five (25) year full No Dollar Limit (NDL) Gold Seal Warrantee as manufactured by Carlisle SynTec, Carlisle, PA. Color to be selected from manufacturer's standard colors.
 - b. Basis of Design shall be Sika Sarnafil® G410 fiberglass reinforced pvc membrane with a lacquer coating with a twenty five (25) year full No Dollar Limit (NDL) system warranty. FM Global Roofnav 388253-0-0. Membrane shall conform to ASTM D4434-96 (or latest revision), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II, Grade I. Manufactured, membrane shall conform to the following physical properties: Thickness to be 72 mil as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA. Color to be selected from manufacturer's standard colors.
 - c. Johns Manville PVC-72 Mil/Min., FM Global Roofnav 311961-0-0, with a twenty five (25) year full No Dollar Limit (NDL) Peak Advantage Warranty as manufactured by Johns Manville, Denver, CO. Color to be selected from manufacturer's standard colors.
3. BONDING ADHESIVE shall be Sarnacol 2170 Adhesive, a solvent-based reactivating-type adhesive used to attach the membrane to the substrate, either horizontally or vertically, as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
4. FLASHING shall be Sarnafil G410 Membrane, a fiberglass reinforced membrane adhered to approved substrate using Sarnacol adhesive as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.

5. ROOF BOARD shall be a DensDeck Prime 1/2" siliconized gypsum, fire-tested hardboard with fiberglass-mat facers, in a 4 ft. x 8 ft. board size as manufactured by Georgia-Pacific Gypsum, LLC.
6. TAPERED INSULATION shall be rigid closed cell polyisocyanurate insulation board with coated glass facers Sarnatherm CG Tapered – 25 psi as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA. Submit detailed roof insulation plan for approval. Insulation to be tapered at 1/4" per linear foot with a minimum thickness of 1/2" at low point. Tapered insulation crickets to be tapered at 1/4" per linear foot (in-place slope).
7. SARNACOL 2164 ADHESIVE, A low odor, VOC compliant, single component, low-rise urethane foam used to attach insulation to approved compatible substrates.
8. INSULATION PLATE shall be Sarnaplate-HD/CD used with Sarnafastener-HD to attach insulation boards to the roof deck. Sarnaplate-HD/CD is a 3 inch (75 mm) round stamping of SAE 1010 steel with an AZ 55 Galvalume coating as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
9. FASTENERS shall be Sarnafastener-HD a #14 corrosion-resistant fastener used with Sarnaplate-HD/CD, Sarnastop or Sarnabar to attach insulation to metal roof deck. Sarnafastener-HD has a shank diameter of 0.190 inch (4.8 mm), a thread diameter of 0.245 inch (6.2 mm) and a #3 Phillips drive head with a diameter of 0.435 inch (11 mm) as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
10. TERMINATION BAR shall be Sarnabar a heavy-duty, 14 gauge, galvanized or stainless, roll-formed steel bar used to attach membrane to the roof deck. The formed steel is pre-punched with holes every 1 inch (25 mm) on center to allow various Sarnafastener spacing options as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
11. SARNACORD a 5/32 inch (4 mm) diameter, red-colored, flexible thermoplastic extrusion that is welded to the top surface of the Sarnafil membrane and against the side of the Sarnabar, used to hold the membrane in position as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
12. SARNASTOP an extruded aluminum, low-profile bar used with certain Sarnafasteners to attach to the roof deck or to walls/curbs at terminations, penetrations and at incline changes of the substrate. Sarnastop is a 1 inch (25 mm) wide, flat aluminum bar 1/8 inch (3 mm) thick that has predrilled holes every 6 inches (152 mm) on center as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
13. GRAVEL STOP, FASCIA and COPINGS shall be Sarnaclad, a PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Sarnaclad is a 25 gauge, G90 galvanized metal sheet with a 20 mil (1 mm) unsupported Sarnafil membrane laminated on one side. The dimensions of Sarnaclad are 4 ft. x 8 ft. (1.2 m x 2.4 m) or 4 ft. x 10 ft. (1.2 m x 3.0m) as manufactured by Sika Sarnafil, Inc., 100 Dan Road, Canton, MA.
14. SARNAVAP – 10 shall be a 10 mil (0.25 mm) thick polyethylene vapor barrier/air barrier. Sarnavap-10 is supplied in a folded panel that is rolled onto a core. The core width is 5 feet (1.5 m). When unrolled off the core and unfolded, the sheet dimensions are 20 feet (6.9 m) wide by 100 feet (33 m) long. Consult Product Data Sheet for additional information.
15. COPPER shall be 20 oz., cold rolled cornice temp. ASTM B-152. Submit samples for scupper, etc.
16. SOLDER shall be 50% virgin pig lead and 50% block tin, ASTM B-32.
17. FLUX shall be non-acid paste form.

18. ASPHALTIC PRIMER shall be conforming to ASTM D41-41.

2.2 ROOFING ACCESSORIES

- A. METAL FLASHING shall be cold rolled copper 20 oz., or as noted on the drawings.
1. Exposed edges shall be doubled back ½" to conceal edge and provide stiffness.
 2. End joints shall be lapped 2" and soldered.
 3. Cap flashing is required in connection with base flashing at all intersections of pitched vertical or horizontal surfaces. Bottom edge to have ½" folded edge and overlap base flashing 2" minimum. Note all special flashing conditions as shown in details.
 4. Caulk all flashings set into masonry.
- B. GRAVEL STOP, FASCIA and COPINGS shall be Sarnaclad, a PVC-coated, heat-weldable sheet metal 25 gauge, G90 galvanized metal sheet with a 20 mil unsupported Sarnafil membrane laminated on one side.
1. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sarnafil. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Applicator's expense.
 2. Sarnaclad metal flashings shall be formed and installed per the Detail Drawings.
 - a. All metal flashings/fascias shall be fastened into solid wood nailers with two rows of 1 ¼" (min.) galvanized flat head annular ring nails, 3 inches on center staggered ½". Fasteners shall penetrate the nailer a minimum of 1 inch. All Continuous cleats for edge metal shall be fastened into solid wood nailers with one row of 1 ¼" (min.) galvanized flat head annular ring nails, 6 inches on center.
 - b. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
 3. Adjacent sheets of Sarnaclad shall be spaced 1/4 inch apart. The joint shall be covered with 2 inch wide aluminum tape. A 4 inch minimum wide strip of Sarnafil flashing membrane shall be hot-air welded over the joint.
 4. Factory fabricate all metal components to the maximum extent possible. All trim and flashing, whether factory formed or not, shall exhibit clear, sharp, straight and uniform bends. Hem all exposed edges or flashings.
 5. Form flashing components from full single width sheet. Provide shop fabricated, mitered corners, joined using closed end pop rivets and joint sealant.
 6. Fabricate roofing and related sheet metal work in accordance with approved shop drawings and applicable standard.
 7. Provide linear sheet metal items in minimum 10'-0" sections except as otherwise noted. Form flashing using single pieces for the full width. Provide shop fabricated mitered and joined corners where required.
- C. GUTTERS, SCUPPERS, DOWNSPOUTS AND STRAINERS
1. Fabricate and install gutters and downspouts using steel sheet metal 24 gauge, Zinc-Coated Steel Sheet with Kynar 500 finish as detailed on the drawings.

2. Supply all necessary accessories, including sealant, downspout hangers, and anchors.
3. Install downspouts in a secure, rigid manner. Connect to existing subsurface drainage system, providing any necessary transition boots.
4. Strainers shall be dome shaped, deigned to fit into the top of the downspout. Strainers shall be fabricated from heavy gauge wire.

2.3 TRAFFIC WALKWAY PADS

- A. **TRAFFIC WALKWAY PADS:** Provide and install where shown on the drawings Sarnatred Walkway. Roofing membrane to receive Sarnatred Walkway shall be clean and dry. Place chalk lines on deck sheet to indicate location of Walkway. Apply a continuous coat of Sarnacol 2170 adhesive to the deck sheet and the back of Walkway in accordance with Sarnafil's technical requirements and press Walkway into place with a water-filled, foam-covered lawn roller. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the Walkway to the Sarnafil deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies. Important: Check all existing deck membrane seams that are to be covered by Walkway with rounded screwdriver and re-weld any inconsistencies before Walkway installation. Do not run Walkway over Sarnabars.

2.4 ROOF ACCESS HATCH

- A. **ROOF ACCESS HATCH:** Furnish and install where indicated on drawings, aluminum roof scuttles to match existing openings as manufactured by The Bilco Company, New Haven, CT. Cover shall be 11 gauge aluminum with 3" beaded flange, neatly welded. Insulation shall be glass fiber 1" thickness fully covered and protected by a metal liner, 18 gauge aluminum. Furnish and install Ladder Safety Post Model LU-1, as manufactured by The Bilco Company, New Haven, CT. The ladder safety post shall be pre-assembled from the manufacturer and installed to fit existing ladder rungs. All mounting hardware shall be Type 316 stainless steel. Factory finish shall be black enamel steel. Manufacturer shall provide a 25-year warranty against defects in material and workmanship.

PART 3 - EXECUTION

3.1 MEMBRANE ROOFING APPLICATION

A. PROCEDURE AND SEQUENCE

1. Contractor will prosecute the work diligently and maintain a full crew of competent men on the job full time for each consecutive day that weather permits.
2. On a daily basis, the Contractor will clean up the interior and exterior of the building, carefully removing all dirt, dust, debris, insulation, etc.

B. MEMBRANE ROOFING APPLICATION

1. GENERAL

Membrane roofing, and flat stock / tapered insulation will be applied over metal roof decks. The entire roofing and insulation systems, once begun, shall be completed daily, including flashing.

All Materials subject to damage by exposure to the weather shall be stored free off the ground or deck on pallets and, when not in use, shall be kept completely covered with watertight coverings to prevent the intrusion of moisture.

The Contractor shall carefully examine the existing substrates prior to installing new roofing. Any areas of the substrates judged to be unserviceable shall be brought to the attention of the Architect.

2. APPLICATION OVER METAL DECK

- a. Examine metal deck substrate prior to installation of new roofing. Thoroughly clean substrate of all debris and any loosely attached residue. Carefully note that the Contractor is responsible for all interior and exterior cleaning resulting from roofing operations.
- b. Insulation shall be installed according to insulation manufacturer's instructions. Insulation shall be neatly cut to fit around penetrations and projections. Install tapered insulation in accordance with insulation manufacturer's shop drawings. Install tapered insulation around drains creating a drain sump. Do not install more insulation board than can be covered with Sarnafil membrane by the end of the day or the onset of inclement weather. Use at least 2 layers of insulation when the total insulation thickness exceeds 2-1/2 inches (64 mm). Stagger joints at least 12 inches (0.3 m) between layers.
- c. Insulation shall be mechanically fastened to the deck with approved fasteners and plates at a rate according to the insulation manufacturer's, FM's and Sarnafil's recommendations for fastening rates and patterns. The quantity and locations of the fasteners and plates shall also cause the insulation boards to rest evenly on the roof deck/substrate so that there are no significant and avoidable air spaces between the boards and the substrate. Each insulation board shall be installed tightly against the adjacent boards on all sides.
- d. Fasteners are to be installed consistently in accordance with fastener manufacturer's recommendations. Fasteners are to have minimum penetration into structural deck recommended by the fastener manufacturer and Sarnafil. Use fastener tools with a depth locator and torque-limiting attachment as recommended or supplied by fastener manufacturer to ensure proper installation.
- e. Over the properly installed and prepared substrate surface, Sarnacol 2170 adhesive shall be applied using solvent-resistant 3/4 inch (19 mm) nap paint rollers. The adhesive shall be applied to the substrate at a rate according to Sarnafil requirements. The adhesive shall be applied in smooth, even coating with no gaps, globs, puddles or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be coated with adhesive. The first layer of adhesive shall be allowed to dry completely prior to installing the membrane.
- f. When the adhesive on the substrate is dry, the Sarnafil roof membrane is unrolled. Adjacent sheets shall be overlapped 3 inches (75 mm). Once in place, one-half of the sheet's length shall be turned back and the underside shall be coated with Sarnacol 2170 adhesive at a rate of 1/2 gallon per 100 ft² (0.2 liters/m²). When the membrane adhesive has dried slightly to produce strings when touched with a dry finger, the coated membrane shall be rolled onto the previously-coated substrate being careful to avoid wrinkles. Do not allow adhesive on the underside of the Sarnafil membrane to dry completely. The amount of membrane that can be coated with adhesive before rolling into substrate will be determined by ambient temperature, humidity and crew. The bonded sheet shall be pressed firmly in place with a water-filled, foam-covered lawn roller by frequent rolling in two directions. The remaining un-bonded half of the sheet shall be folded back and the procedure repeated.
 - 1) The Applicator shall count the amount of pails of adhesive used per area per day to verify conformance to the specified adhesive rate.
 - 2) No adhesive shall be applied in seam areas. All membrane shall be applied in the same manner.
- g. The installed system must comply in all respects with the Factory Mutual FM I-90 design parameters and comply with UL class A classification.

C. HOT-AIR WELDING OF SEAM OVERLAPS

1. GENERAL

- a. All seams shall be hot-air welded. Seam overlaps should be 3 inches (75 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details.
- b. Welding equipment shall be provided by or approved by Sarnafil. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Sarnafil Technical Representative prior to welding.
- c. All membrane to be welded shall be clean and dry.

2. HAND-WELDING

- a. Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.
- b. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
- c. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow," the hand roller is positioned perpendicular to the nozzle and pressed lightly. For straight seams, the 1-1/2 inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the 3/4 inch (20 mm) wide nozzle shall be used.

3. MACHINE WELDING

- a. Machine welded seams are achieved by the use of Sarnafil's automatic welding equipment. When using this equipment, Sarnafil's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated off the generator.
- b. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

4. QUALITY CONTROL OF WELDED SEAMS

- a. The Applicator shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Applicator to locations as directed by the Owner's Representative or Sarnafil's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Applicator at no extra cost to the Owner.

D. MEMBRANE FLASHINGS

1. GENERAL

- a. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the Owner's Representative and Sarnafil. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Applicator's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.

2. Sarnacol Adhesive for Membrane Flashings

- a. Over the properly installed and prepared flashing substrate, Sarnacol adhesive shall be applied according to instructions found on the Product Data Sheet. The Sarnacol adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
 - b. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.
3. Install Sarnastop/Sarnabar/Sarnacord according to the Detail Drawings with approved fasteners into the structural deck at the base of parapets, walls and curbs. Sarnastop is required by Sarnafil at the base of all tapered edge strips and at transitions, peaks, and valleys according to Sarnafil's details.
 4. Sarnafil's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by Sarnafil prior to installation.
 5. All flashings shall extend a minimum of 8 inches (0.2 m) above roofing level unless otherwise accepted in writing by the Owner's Representative and Sarnafil Technical Department.
 6. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the Sarnafil membrane.
 7. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Sarnastop at 6-8 inches on center.
 8. Sarnafil flashings shall be terminated according to Sarnafil recommended details.
 9. All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult Sarnafil Technical Department for securement methods.

3.2 SHEET METAL WORK

A. WORKMANSHIP

1. Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:
 - a. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
 - b. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - latest issue.
2. Surfaces to be covered with sheet metal shall be cleaned of dirt, rubbish and other foreign material before sheet metal work is started. All projecting nails shall be driven flush.
3. Edges of copper sheet metal to be soldered shall be tinned on both sides for a width of not less than 1½".
4. Soldering shall be done with well-heated coppers to thoroughly heat sheet and completely sweat solder through full width of seam. When soldering copper, brush a liberal amount of flux into seam.
5. All sheet metal work shall be of watertight and weather tight construction lines, arises and angles shall be sharp and true. Plane surfaces shall be free from waves and buckles.
6. Copper shall be separated from other metal, except lead, by saturated fabric.

7. Provide for thermal expansion of all exposed sheet metal work exceeding 15'-0" running length, except as otherwise indicated. Flashing and trim, 10'-0" maximum spacing, and located 2'-0" from corners and intersections. Ample provisions shall be made for expansion and contraction.
8. Take special care in the fabrication, handling and installation of pre-finished work to avoid damage to finish. Remove protective film from each unit after installation. Touch up minor defects to match factory finish. Replace excessively damaged material as determined by Architect.
9. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 inch.
10. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches on center into the wood nailer or masonry wall.
11. Counter flashings shall overlap base flashings at least 4 inches (100 mm).
12. Hook strips shall extend past wood nailers over wall surfaces by 1-1/2 inch minimum and shall be securely sealed from air entry.

3.3 COORDINATION OF ROOF DRAINS

- A. Coordinate with Division 22 for installation of new roof drains / overflow roof drains in locations with structural support framing.
- B. Accurately position and level new drain bowls. Flash all drains with minimum 30" square, 4-lb. lead sheet set in mastic. Prime top surface before flashing. Attached to drain flashing ring and make absolutely watertight with the roofing. Mechanically fasten sump pan to existing roof deck. Membrane plies, lead sheet, and flash-in plies must extend under clamping ring. Structural steel frames are to be provided at all drain openings as detailed on the drawings.
- C. Division 22 to install new piping and hangars to connect new roof drains to storm water drain system.
- D. Division 22 to insulate underside of all roof drain bowls. Insulate all horizontal runs of roof drain piping.
- E. This Contractor shall insure that all roof drains are free flowing and water tight prior to the completion of the project.

3.4 REMOVAL OF RUBBISH

- A. The Subcontractors shall clean up their own waste periodically and legally dispose of it off the job site.
- B. Dust chutes shall be erected and used for removal of rubbish and debris.
- C. This Contractor shall provide all necessary trash removal containers. The cost of rubbish removal and containers and their disposal shall be borne by this Contractor and or Subcontractor.

END OF SECTION 07 50 00

12 93 13 BICYCLE RACKS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes: providing metal bicycle racks where indicated on the drawings.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Concrete Paving, Section 32 13 13.

1.2 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product Data: Manufacturer's data for each type of bicycle rack indicated. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, field assembly requirements and installation details.
- C. Manufacturer's installation instructions for information only.

1.3 QUALITY ASSURANCE

- A. Manufacturer shall have a minimum of five years experience in the manufacturing of metal bicycle racks of the type specified for this Project.
- B. Source Limitations: Obtain each type of bicycle rack through one source from a single manufacturer.
- C. Codes and Standards: Comply with all local building codes.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in factory packages with factory labels attached.
- B. Cover and protect material in transit and at job site. Damaged or defaced material will be rejected and replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. STEEL and IRON
 - 1. Plates, Shapes and Bars: ASTM A36/A 36M.
 - 2. Steel Pipe: Standard weight steel pipe complying with ASTM A53, or electric-resistance-welded pipe complying with ASTM A135.
 - 3. Steel Tubing: Cold-formed steel tubing complying with ASTM A500.
 - 4. Stainless Steel Pipe: Standard weight stainless steel pipe complying with ASTM A312 Type 304
 - 5. Steel Sheet: Commercial steel sheet complying with ASTM A1011.
- B. CONCRETE
 - 1. Concrete for foundations: 2500 psi minimum, complying with Section 32 13 13.

2.2 FABRICATION

- A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines and angles. Separate metals from dissimilar materials to prevent electrolytic action.
- B. Pipes and Tubes: Form simple and compound curves by bending members to jigs to produce uniform curvature for each repetitive configuration required, maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking or otherwise deforming exposed surfaces or components.

2.3 BICYCLE RACKS CONSTRUCTION

- A. Capacity: 5 Bicycles
- B. Overall Height (above ground): Nominal 3 feet
- C. Overall Length: Nominal 3 feet 2 inches

INSTALLATION

- 1. Installation: Surface Flange Mount

FINISH

- 1. Hot-dipped galvanizing after fabrication
- 2. Color to be black

MATERIAL

- 1. Steel,
- 2. Pipe OD: Minimum 2.375"
- 3. Pipe Wall Thickness: 0.154"

SECURITY

- 1. Security: Designed to lock wheel and frame

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas and conditions with installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances and other conditions affecting performance or work
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.
- B. Provide forms where required due to unstable soil conditions and for perimeter of pipe base at grade. Secure and brace forms and bicycle rack in position to prevent displacement during concreting. Protect portion of posts above footing from concrete splatter.
- C. Place concrete immediately after mixing. Consolidate concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use non-staining curing compound. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.3 INSTALLATION

- A. Comply with manufacturer's written installation instructions, shop drawings, and specifications unless more stringent requirements are indicated.
- B. Install bicycle rack posts plumb, level and square with other work and at the height recommended by the manufacturer.

3.4 FIELD QUALITY CONTROL

- A. Verify that bicycle racks are installed in accordance with manufacturer's instructions.

3.5 CLEANING and PROTECTION

- A. After installation, clean soiled surfaces according to manufacturer's written instructions. Protect bicycle racks from damage until acceptance by Owner.

END OF SECTION 12 93 13