SPECIFICATIONS

DIVISION 1—GENERAL REQUIREMENTS

DIVISION 5—METALS

PART 1. GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

A. The completed Work will provide the City with repairs and reinforcement of concrete block walls at 6 corner locations along the east wall of the ASP Biosolids Composting Bunkers at Brady Road (BRRMF) Composting Facility.

1. General
   The work will include:

   1. Mobilization and Demobilization to site: at Brady Road composting facility

   2. Structural
   a) Removal and Replacement of 3 rows of concrete blocks on North wall of ASP Bunker 4 (approximately 43 blocks. Place at staging area on north side of biofilter approximately 30 meters north of Bunker 4. These precast concrete blocks weigh approximately 2000 kgs and require a special lifting clamp and mobile crane or crane truck to move these precast blocks.
   b) Remove 20 blocks currently sitting inside Bunker 4 – Place at staging area on north side of biofilter approximately 30 meters north of Bunker 4. These are precast concrete blocks weigh approximately 2000 kgs and require a special lifting clamp and mobile crane or crane truck to move these precast blocks
   c) Replace and realign approximately 20 concrete blocks at conveyor discharge hopper on north side of Biosolids mixing / receiving building
   d) Additional replacement of 20 precast concrete blocks only if required on site.
   e) Fabricate and install stainless steel plate reinforcement plates anchored to existing concrete Armtec blocks at 6 corner locations as shown on Drawings:
   1-0400B-S0001-001-00
   1-0400B-S0002-001-02
   1-0400B-S0003-001-02

   3. Process Mechanical
      a) Repair and relocate existing sprinkler piping 750mm lower along south wall of biofilter (joint north wall of Bunker 4

Part 1. General

1.01 RELATED WORK AT SITE

A. General:

1. Other work that is either directly or indirectly related to scheduled performance of the Work under these Contract Documents, listed henceforth, is anticipated to be performed at site by others.

2. Coordinate the Work of these Contract Documents with work of others as specified in General Conditions.

3. Include sequencing constraints specified herein as a part of progress schedule.

4. The Contractor will not have exclusive use of the site. The Contractor shall coordinate activities with others and minimize disruptions where possible.

5. Where access requires relocation for installation of Works, the Contractor shall Construct suitable all weather detours as required.

6. The Contractor shall note that Brady Road Resource Management Facility will be in use during the construction period. The Contractor shall provide all reasonable assistance to City's operations personnel to provide safe secure access to operational facilities.

7. The City will remove Biosolids Compost material from existing concrete bunker walls and floor at the six corner locations that require steel plate reinforcing

1.02 FACILITY OPERATIONS

1. Continuous operation of City's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified. In the event of conflict between construction activities and facility operations, facility operations have priority unless otherwise specified.

2. Do not proceed with Work affecting a facility's operation without obtaining City's and Contract Administrator's advance approval of the need for and duration of such Work.

1.03 ADJACENT FACILITIES AND PROPERTIES

1. Examination:

1) After Effective Date of the Agreement and before Work at site is started, Contractor, Contract Administrator, and City Landfill operations shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations

2) Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions The Contract Administrator will record and provide documentation of observation made on examination inspections.

1.04 CITY CONTACT PERSON:

City of Winnipeg, Verden Jeancart
Telephone number: 204-986-5310.

PART 1. GENERAL

1.01 SUBMITTALS
A. Informational Submittals:
1. Submit prior to application for final payment.
a. Record Drawings: As required in General Conditions.
b. Approved Shop Drawings and Samples: As required in the General Conditions.
c. Releases or Waivers of Liens and Claims: As required in General Conditions.
d. Releases from Agreements
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1.02 RECORD DOCUMENTS
A. Quality Assurance:
1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record drawings.
2. Accuracy of Records:
a. Coordinate changes within record documents, making legible and accurate entries on each sheet of drawings and other documents where such entry is required to show change.
b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.
2. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
3. Prior to submitting each request for progress payment, request Contract Administrator's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by Contract Administrator to recommend whole or any part of Contractor's Application for Payment, either partial or final.

PART 2. PRODUCTS (NOT USED)

PART 3. EXECUTION
3.01 MAINTENANCE OF RECORD DOCUMENTS
A. General:
1. Promptly following commencement of Contract Times, secure from Contract Administrator at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.
2. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.

3. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded.
B. Preservation:
1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
2. Make documents and Samples available at all times for observation by Contract Administrator.

C. Making Entries on Drawings:
1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.
a. Color Coding:
1) Green when showing information deleted from Drawings.
2) Red when showing information added to Drawings.
3) Blue and circled in blue to show notes.
2. Date entries.
3. Call attention to entry by "cloud" drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction,

3.02 FINAL CLEANING
A. At completion of the Work or of a part thereof and immediately prior to Contractor's request for Certificate of Substantial Performance; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire site or parts thereof, as applicable.

1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to City and Contract Administrator.
2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.

PART 1. GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:
1. CAN/CSA-S16 Limit States Design of Steel Structures.
2. ASTM A36 Standard Specification for Carbon Structural Steel.
3. ASTM A48 Standard Specification for Gray Iron Castings.
4. ASTM A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
5. A108 Standard Specification for Steel Bars, Carbon and Alloy, Cold-Finished.
6. ASTM A123/A, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. ASTM A193 Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High Pressure Service and other Special Purpose Applications.
9. ASTM A194 Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
ASTM A307 Standard Specification for Carbon Steel Bolts and Studs, 60000 psi Tensile Strength.
11. ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
12. ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts.
13. ASTM A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
14. A786 Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
15. A793 Standard Specification for Rolled Floor Plate, Stainless Steel.
16. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
17. B308 Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.
18. ASTM F436 Standard Specification for Hardened Steel Washers.
19. ASTM F468 Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.
20. National Building Code of Canada (NBCC) 2010

1.02 SUBMITTALS

A. Action Submittals

1. Shop Drawings:

a. Metal fabrications, including welding and fastener information.

b. Specific instructions for concrete anchor installation, including drilled hole size, preparation, placement, procedures, and instructions for safe handling of anchoring systems.

c. Shop drawings and calculations to bear the seal of a professional engineer licensed in the Province of Manitoba stating that anchor bolts have been designed to support and resist structural loads as per NBCC 2010.

d. Anchor bolt calculations to indicate minimum embedment depth and minimum concrete edge distance requirements to resist anticipated tensile and shear loads.

f. Shop drawings showing dimensions for custom made stainless steel sump and catch basin baskets.

B. Informational Submittals:

1. Concrete Drilled Anchors:

a. Manufacturer's product description and installation procedures.

b. Current test data or ICC Evaluation Report.

c. Adhesive Anchor Installer Certification.

2. Passivation method for stainless steel members.

3. Hot-Dip Galvanizing: Certificate of compliance signed by galvanizer, with description of material processed and ASTM standard used for coating.

1.03 QUALITY ASSURANCE

A. Qualifications:

1. Adhesive Anchor Installers: Trained and certified by manufacturer.

2. Galvanized Coating Applicator: Company specializing in hot-dip galvanizing after fabrication and following procedures of Quality Assurance Manual of the American Galvanizers Association.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Insofar as practical, factory assemble items specified herein. Assemblies that due to necessity have to be shipped unassembled shall be packaged and tagged in manner that will protect materials from damage and will facilitate identification and field assembly.
B. Package stainless steel items in a manner to provide protection from carbon impregnation.
C. Protect painted coatings and hot-dip galvanized finishes from damage due to metal banding and rough handling. Use padded slings and straps.
D. Store fabricated items in dry area, not in direct contact with ground.

PART 2. PART 2 PRODUCTS

2.01 GENERAL
A. For hot-dip galvanized steel that is exposed to view and does not receive paint, limit the combined phosphorus and silicon content to 0.04 percent. For steels that require a minimum of 0.15 percent silicon (such as plates over 1.5 inches thick for A36 steel), limit the maximum silicon content to 0.21 percent and the phosphorous content to 0.03 percent.
B. Unless otherwise indicated, meet the following requirements

Item ASTM Reference
Steel Shapes and Plates, except W-Shapes A36/A36M
Steel W-Shapes A992
Steel Pipe A501 or A53/ A53M, Type E or S, Grade B
Structural Steel Tubing A500, Grade B
Stainless Steel:
Bars and Angles A276, AISI Type 316 (316L for welded connections)

Shapes A276, AISI Type 304 (304L for welded connections)
Steel Plate, Sheet, and Strip A240/A240M, AISI Type 316 (316L for welded connections)
Bolts, Threaded Rods, Anchor Bolts,
and Anchor, Studs
F593, AISI Type 316, Condition CW
Nuts F594, AISI Type 3 16, Condition CW
Steel Bolts and Nuts:
Carbon Steel A307 bolts, with A563 nuts
High-Strength A325, Type 1 bolts, with A563 nuts
Anchor Bolts and Rods F1554, Grade 55, with weldability supplement S1
Eyebolts A489
Threaded Rods A36/A36M
Flat Washers (Unhardened) F844
Flat and Beveled Washers (Hardened) F436

Item ASTM Reference
Thrust Ties for Pipe:
Threaded Rods A 193/A193M, Grade B7
Nuts A 194/A194M, Grade 2H
Plate A283/A283M, Grade D
Welded Anchor Studs A108, Grades C-1010 through C- 1020
Aluminum Plates and Structural Shapes B209 and B308/B308M, Alloy 6061-T6
Aluminum Bolts and Nuts F468, Alloy 2024-T4
Cast Iron A48, Class 35

C. Bolts, Washers, and Nuts: Use stainless steel, hot-dip galvanized steel , zinc-plated steel, and aluminum material types as indicated in Fastener Schedule at end of this section.

2.02 CONCRETE DRILLED ANCHORS
A. General:
1. AISI Type 316 stainless, hot-dip galvanized, or zinc-plated steel, as shown in Fastener Schedule at end of this section.
2. Current evaluation and acceptance reports by ICC or other similar code organization.
B. Wedge Anchors:
1. Manufacturers and Products:
a. ITW Construction Products Ramset/Red Head, TruboIt Wedge Anchor.
b. Hilti, Inc., Kwik-Bolt-3 (KB-3) Anchor.
c. Powers Rawl, Power-Stud Anchor.
d. Simpson Strong-Tie Co., Inc., Wedge-All Anchor.
e. Wej-It Corp., ANKRtite Wedge Anchor.
f. U.S. Anchor, Kingpin Wedge Anchor.
C. Expansion Anchors:
1. Self-drilling anchors, snap-off or flush type, zinc-plated.
2. Nondrilling Anchors: Flush type for use with zinc-plated or stainless steel bolt, or stud type with projecting threaded stud.
3. Manufacturers and Products:
a. ITW Construction Products Ramset/Red Head, Multi-Set II Drop-In and Self Drill Anchor.
b. Hilti, Inc ., Hilti HDI Drop-In Anchor.
c. Powers Rawl, Steel Drop-In Anchor.
d. Simpson Strong-Tie Co., Inc., Drop-In Anchor.

D. Adhesive Anchors:
1. Threaded Rod:
a. ASTM F593 stainless steel threaded rod, diameter as shown on Drawings.
b. Length as required, to provide minimum depth of embedment.
c. Clean and free of grease, oil, or other deleterious material.
d. For hollow-unit masonry, provide galvanized or stainless steel wire cloth screen tube to fit threaded rod.
2. Adhesive:
a. Two-component designed to be used in adverse freeze/thaw environments, with gray color after mixing.
b. Cure Temperature, Pot Life, and Workability: Compatible for intended use and environmental conditions.
c. Nonsag, with selected viscosity base on installation temperature and overhead application where applicable.
3. Packaging and Storage:
a. Disposable, self-contained cartridge system capable of dispensing both components in the proper mixing ratio and fitting into a manually or pneumatically operated caulking gun.
b. Store adhesive cartridges on pallets or shelving in covered storage area, in accordance with manufacturer's written instructions.
c. Cartridge Markings: Include manufacturer's name, product name, material type, batch or serial number, and adhesive expiration date.
d. Dispose of cartridges if shelf life has expired.
4. Manufacturers and Products:
a. ITW Construction Products Ramset/Red Head, Epcon Ceramic 6 Epoxy or A7 Adhesive Anchor System. (Use only Epcon A7 Adhesive System for hollow masonry.)
b. Hilti, Inc., HIT Doweling Anchor System, HIT HY 150 (HIT HY 20 for hollow masonry).
d. Simpson Strong-Tie Co., Inc., Epoxy-Tie Adhesive ET or Acrylic-Tie Adhesive. (Use only Acrylic-Tie Adhesive for temperatures below 4°C.)
e. Covert Operations, Inc., CIA-Gel 7000 Epoxy Anchors.
f. U.S. Anchor, Ultrabond I.
g. Unitex, Pro-Poxy 300 and Pro-Poxy 300 Fast Epoxy Adhesive Anchors.

E. Adhesive Threaded Inserts:
1. Stainless steel, internally threaded insert.
2. Manufacturer and Product: Hilti, Inc, HI S-R Insert with HIT HY 15O adhesive.

2.03 SOURCE QUALITY CONTROL
A. Visually inspect all fabrication welds and correct any deficiencies.
1. Steel: AWS D1.1, Section 6 and Table 6.1, Visual Inspection Acceptance Criteria.
2. Aluminum: AWS D1.2.
3. Stainless Steel: AWS D1.6.

PART 3. EXECUTION
3.01 INSTALLATION OF METAL FABRICATIONS
A. General:
1. Install metal fabrications plumb or level, accurately fitted, free from distortion or defects.
2. Install rigid, substantial, and neat in appearance.
3. Install manufactured products in accordance with manufacturer's recommendations.
4. Obtain Contract Aministrator approval prior to field cutting steel members or making adjustments not scheduled.
5. For aluminum and stainless steel items, and exterior locations, use stainless steel anchors.
6. Tolerances: CAN/CSA S16.

3.02 CONCRETE DRILLED ANCHORS
A. Begin installation only after concrete or masonry to receive anchors has attained design strength.
B. Install in accordance with manufacturer's instructions.

C. Provide minimum embedment, edge distance, and spacing as follows, unless indicated otherwise by anchor manufacturer's instructions or shown otherwise on Drawings:

Anchor Type	Min. Embedment (bolt diameters)	Min Edge Distance (bolt diameters)	Mill Spacing (bolt diameters)
Wedge	9	6	12
Expansion	4	6	12
Adhesive	9	9	13.5

D. Use only drill type and bit type and diameter recommended by anchor manufacturer. Clean hole of debris and dust with brush and compressed air.
E. When embedded steel or rebar is encountered in the drill path, slant drill to clear obstruction. If drill must be slanted more than 10 degrees to clear obstruction, notify Contract Administrator for direction on how to proceed.

F. Adhesive Anchors:
1. Do not install adhesive anchors when temperature of concrete is below 4°C (-4°C for Simpson Strong-Tie Acrylic-Tie Adhesive) or above 38°C.
2. Remove any standing water from hole with oil free compressed air. Inside surface of hole shall be dry where required by manufacturer's instructions.
3. For hollow-unit masonry, install screen tube in accordance with manufacturer's instructions.
4. Do not disturb anchor during recommended curing time.
5. Do not exceed maximum torque as specified in manufacturer's instructions.

3.03 ELECTROLYTIC PROTECTION

A. Stainless Steel:
1. During handling and installation, take necessary precautions to prevent carbon impregnation of stainless steel members.
2. After installation, visually inspect stainless steel surfaces for evidence of iron rust, oil, paint, and other forms of contamination.
3. Remove contamination in accordance with requirements of ASTM A380 and ASTM A967.
4. Brushes used to remove foreign substances shall utilize only stainless steel or nonmetallic bristles.
5. After treatment, visually inspect surfaces for compliance

3.09 FASTENER SCHEDULE

A. Unless indicated otherwise on the Drawings, provide fasteners as follows:

Service Use and Location	Product	Remarks
1. Anchor Bolts cast into concrete for structural steel, Metal fabrications and Castings	Stainless steel headed anchor bolts	
2. Drilled Anchors for Metal Components to Cast-In Place Concrete	Adhesive stainless steel anchors	
3. All others	Stainless steel anchors and fasteners	

B. Anti seizing Lubricant: Use on all stainless steel threads.

C. Do not use adhesive anchors to support fire-resistive construction or where ambient temperature will exceed 49°C.