SECTION 017419 - CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT AND DISPOSAL

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.

B. Section 018113 – Sustainable Design Requirements, for sustainable design goals and submittals.

C. LEED Reference Guide for Building Design and Construction (BD+C), version 4, U.S. Green Building Council.

D. LEED v4.1 Building Design and Construction (BD+C), Getting Started Guide for Beta Participants (Beta Guide), U.S. Green Building Council, issued January 2020.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:
1. Waste Management Goals.
2. Diversion and disposal of demolition and construction waste.
3. Construction and Demolition Waste Management Plan (C+DWM Plan).
4. C+DWM Plan implementation.
5. Requirements and documentation for LEED Certification. The C+DWM Plan is part of the Project LEED Requirements.
6. Appendix A: Sample Construction and Demolition Waste Tracking Log.
7. Appendix B: Construction and Demolition Waste Calculator.

B. Sustainable Design Requirements: The Owner requires the Contractor to implement practices and procedures to meet the Project's environmental performance goals, which include achieving LEED v4 Certification. Refer to Section 018113 - SUSTAINABLE DESIGN REQUIREMENTS for the Project's target certification level and specific LEED requirements. The Contractor shall ensure that the requirements related to the Project's sustainability design goals are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Contractor or their Subcontractors, shall not be allowed if such changes compromise the Project's sustainability goals and LEED certification.

1.3 REFERENCES

A. Abbreviations and Acronyms:
1. ADC: Alternative Daily Cover
2. BD+C: Building Design + Construction
3. C+D: Construction and Demolition
4. C+DWM Plan: Construction and Demolition Waste Management Plan
5. CORR: Certification Institute's Certification of Real Rates
6. CRR: Construction Recycling and Reuse
7. LEED: Leadership in Energy and Environmental Design
8. NC: New Construction
9. USGBC: US Green Building Council

B. Definitions:

1. Alternative Daily Cover (ADC): Cover material other than soil placed on the surface of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging.

2. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

3. Commingled Waste: Waste streams that are combined on the project site and hauled away for sorting into recyclable streams. Commingled Waste is considered as one Diversion Stream unless diversion rates can be provided by the recycling facility for specific materials based on measured quantities. Commingled Waste may be considered as two Diversion Streams provided that all commingled waste is sent to an offsite sorting facility (or facilities) certified by the Recycling Certification Institute or approved equivalent, and the certification period covers the entire time period that waste is generated for the Project and sent to the facility

4. Construction and Demolition Waste: Building and site improvement materials and other solid waste resulting from construction, demolition, remodeling, renovation, or repair operations. Construction waste includes packaging. Hazardous materials, land clearing debris, excavation soil, and landscaping materials are not included.

5. Construction and Demolition Waste Management Plan (C+DWM Plan): A project-specific plan for the collection, separation, handling, transportation, and disposal of waste generated at the construction site, to reduce the amount of waste sent to landfill or incineration.

6. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations. Hazardous materials, land clearing debris, excavation soil, and landscaping materials are not included.

7. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

8. Diversion: To remove, or have removed, from the site for recycling, reuse, salvage, donation, or wood combustion, materials that might otherwise be sent to a landfill or incinerator. Diversion from landfill does not include burning, incinerating, thermally destroying waste, or waste-to-energy processes, except for wood-derived fuel or wood combustion, which is considered diversion.

9. Diversion Rate: The percentage of material by weight that is diverted from landfill or incineration by Recycling, Salvage, Reuse, donation, or combustion (for wood only). The total weight of Recycled, Salvaged, Reused, and donated material, plus combusted wood, is the numerator; the total weight of Construction and Demolition Waste is the denominator. Land clearing debris, excavation soil and landscaping materials, and hazardous waste SHALL NOT be included in total weight of Construction and Demolition Waste for this calculation. ADC and non-wood waste used as incinerator fuel do not count as diversion but must be included in total construction and demolition waste. Diversion Rate is also referred to as ‘Recycling Rate’.

10. Diversion Stream: A flow of materials coming from a job site into markets for building materials, comprised of both a Material Category (or mixture of several material categories) and a Diversion Method. A Diversion Stream shall constitute at least five percent (5%), by weight or volume, of total diverted materials for the Project.

    a. Examples of Diversion Streams include source separated materials sent to specific recycling facilities, commingled waste sent to a mixed-waste recycling facility, deconstructed materials sent back to a manufacturer as part of a take-back program, or salvaged materials reused on site.

b. Examples of Material Categories include the following. Each of these material categories below is considered a separate Diversion Stream when separated on site, however multiple materials that are commingled on site are considered one Diversion Stream. Commingled Waste may be considered as two Diversion Streams provided that all commingled waste is sent to an offsite sorting facility (or facilities) certified by the Recycling Certification Institute or approved equivalent, and the certification period covers the entire time period that waste is generated for the Project and sent to the facility.
   1) Metal
   2) Glass
   3) Plastic
   4) Wood
   5) Masonry
   6) Cardboard/paper
   7) Gypsum Board
   8) Ceiling Tile
   9) Carpet

c. Examples of Diversion Methods include:
   1) On-site Separation: Gypsum scrap; metal framing scrap; ceiling tile scrap; carpet scrap
   2) On-site waste diversion: Crushing concrete or asphalt for reuse onsite
   3) Reuse Off-site: Pallets; wood reels; blankets
   4) Salvage
   5) Donations: Tax deductible; non-tax deductible

11. Land Clearing Debris and Soil: Natural materials such as rock, soil, stone and vegetation. Excludes man-made materials even if found on-site pre-construction.

12. Non-Diversion Streams: Materials disposed of via landfills (including Alternative Daily Cover) or incinerators (excluding wood combustion).

13. Onsite Separation: Placing of selected materials in special containers or areas on the Project site to implement disposal in a segregated waste stream, for specialized recycling.

14. Packaging: Materials used for the protection or handling products delivered to the site, but which are not installed as part of the Work. Examples: Wood reels, pallets, blankets.

15. Recyclable: The ability of a product or materials to be recovered at the end of its life cycle and remanufactured into a new product.

16. Recycle (Recycling): Recovery of demolition and construction waste for subsequent processing in preparation for reuse.

17. Return: To send back reusable or unused products to vendors or manufacturers.

18. Reuse: Recovery of demolition or construction waste and subsequent incorporation on site into the Work of this Project.

19. Salvage: Recovery of demolition or construction waste from existing buildings or construction sites and subsequent sale or reuse in another facility.

20. Segregation: To place similar waste materials together for collection in a designated site area, trash bin, or roll-off container.

21. Source Reduction: Strategies minimizing potential waste that is brought to or generated on the site. Examples: Reduced packaging; industry standard dimensioned materials; prefabrication.

22. Waste Stream: Comprised of two major substreams: waste disposed of via landfills or incinerators and waste diverted from disposal through recycling, reuse, salvage, or

donation (i.e., Diversion Stream). Land clearing debris, soil and landscaping materials, and hazardous waste do not qualify as a Waste Stream.

23. Waste-To-Energy: The conversion of non-recyclable waste materials into usable heat and/or fuel through a variety of processes such as combustion (not including the combustion of wood into wood-derived fuel), gasification, pyrolization, anaerobic digestion, and land fill gas.

C. Reference Standards
1. ISO/IEC Guide 65, General Requirements for Bodies Operating Product Certification Systems
2. ISO/IEC 17065, Conformity Assessment – Requirements for Bodies Certifying Products, Processes and Services
3. ISO 14000, Family of Standards

1.4 PERFORMANCE REQUIREMENTS

A. Project Diversion Goal: The Owner has established a goal to achieve total diversion rate of a minimum of seventy five percent (75%) by weight for the total non-hazardous solid waste generated by the Work, including at least four (4) identified Diversion Streams.

B. Project Diversion Goal: The Owner has established a goal to achieve total diversion rate of a minimum of seventy five percent (75%) by weight or volume for the total non-hazardous solid waste generated by the renovation and demolition Work.

C. Alternative Daily Cover (ADC) must be accounted for in the waste diversion calculations, but for the purposes of LEED Certification, does not qualify as material diverted from disposal.

D. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

E. Diversion Requirements: Salvage, recycle, or reuse as much non-hazardous construction waste as possible. Diversion shall include, but not be limited to, the following waste categories as applicable to the Project:

1. Demolition Waste:
   a. Asphalt paving.
   b. Concrete.
   c. Concrete reinforcing steel.
   d. Brick.
   e. Concrete masonry units.
   f. Clean dimensional wood, trim, paneling, plywood, and oriented strand board.
   g. Structural and miscellaneous steel.
   h. Rough hardware.
   i. Roofing materials.
   j. Insulation.
   k. Doors and frames.
   l. Door hardware.
   m. Windows.
   n. Glass and Glazing.
   o. Metal studs.
   p. Gypsum board.
   q. Acoustical tile and panels.

r. Carpet and Carpet pad.
s. Flooring materials.
t. Demountable partitions.
u. Casework.
v. Plumbing fixtures.
w. Piping.
x. Supports and hangers.
y. Electrical conduit.
z. Supports and hangers.
aa. Valves.
bb. Sprinklers.
cc. Mechanical equipment.
dd. Refrigerants.
ee. Electrical conduit.
ff. Copper wiring.
gg. Lighting fixtures.
hh. Lamps.
ii. Ballasts.
jj. Electrical devices.
kk. Switchgear and panelboards.
ll. Transformers.

2. Construction Waste:
   a. Masonry and CMU.
   b. Lumber.
   c. Wood sheet materials.
   d. Wood trim.
   e. Metals.
   f. Roofing.
   g. Insulation.
   h. Carpet and pad.
   i. Gypsum board.
   j. Piping.
   k. Electrical conduit.
   l. Packaging: Regardless of diversion goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
      1) Paper.
      2) Cardboard.
      3) Boxes.
      4) Plastic sheet and film.
      5) Polystyrene packaging.
      6) Wood crates.
      7) Plastic pails.
   m. Waste generated by on-site workers, such as plastic and metal beverage containers.

F. Hazardous Waste: Take appropriate measures for safe collection, storage and disposal of hazardous waste (e.g. batteries, mercury-containing lamps, e-waste), in accordance with all applicable law, codes, and standards.

1.5 SUBMITTALS

A. General: Submit the following according to Conditions of the Construction Contract and Division 01 Specification Sections. Quantities shall be indicated using weight (lbs. or tons) throughout the duration of the Project.

B. Construction and Demolition Waste Management Plan (C+DWM Plan): Within 30 days of date established for the Notice to Proceed, submit for approval a detailed C+DWM Plan in accordance with the following requirements:

1. Project Diversion Goal, as outlined in this Section.
2. Identify responsible parties for C+DWM Plan implementation.
3. Waste Identification: Identify Material Categories targeted for diversion, but at a minimum five.
4. For each Material Category, identify Diversion Method, including but not limited to:
   a. On-site Separated
   b. Commingled
   c. Re-Use: Wood pallets; Wooden reels; Blankets
   d. Salvage (when applicable)
   e. Sale or Donation (when applicable)
5. List all Diversion Streams applicable to the Project, but at a minimum four (4).
6. Describe Project-specific means and methods by which waste generated by the Project will be diverted or disposed:
   a. Materials Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including whether waste will be segregated on-site or commingled and separated off-site, means by which recyclable materials will be protected from contamination, sizes of containers, container labeling procedures, and designated location where materials separation will be performed.
   b. Describe source reduction strategies to reduce the quantity of C+D waste generated by the Project (e.g., take back of reusable material packaging, such as wood reels, pallets, or blankets).
   c. Waste Hauling Procedures:
      1) Identify names, addresses, and telephone numbers or all Waste Haulers which will be hauling waste materials for the Project.
      2) Provide sample waste hauler contract, including waste reporting structure; sample waste report; responsible parties; contact information; and chain of communication.
   d. Sorting and Recycling Facility Procedures:
      1) Identify names, addresses, and telephone numbers of all sorting, recycling, and disposal facilities which will be accepting waste materials for the Project.
      2) For facilities that will be accepting commingled waste materials for the Project, identify the local or state authority that regulates the facility. Identify if the facility is certified by the Recycling Certification Institute or approved equivalent that meets the Sorting and Recycling Facility Qualifications, as described in this Section.
      3) Describe how all sorting, recycling, and disposal facilities will process waste materials for the Project. Visual inspection is not an acceptable method of evaluation for determining diversion rate of commingled waste streams.
   e. Salvage, Sale and Donation Procedures:
      1) Identify names, addresses, and telephone numbers of all individuals and organizations which will be accepting waste materials for the Project.
      2) For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
   f. Landfill and Incineration Facility Procedures:
      1) Indicate how and where materials will be disposed of.
      2) Include name, address, and telephone number of each landfill and incinerator facility. Distinguish between wood and non-wood waste sent to incinerator.

g. Other Disposal Procedures: Account for and describe disposal method for all other waste materials, including those that will not contribute to diversion from landfill. Non-recyclable waste should be distinguished from non-diverted waste that cannot be included in Diversion Rate calculation, including:
   1) Land clearing debris
   2) Excavation soil and rock
   3) Hazardous Materials (provide summary of materials and identify safe removal and disposal strategies for each material)

7. Kick-off meeting and additional meetings as required informing Subcontracted Trades of requirements, and monitoring their progress towards the Project goals.
8. Waste Reduction Tracking and Documentation: Describe Project-specific means and methods by which diverted or disposed waste generated by the Project will be tracked for reporting.
   a. Retain waste hauler reports.
   b. Retain tickets or receipts for all waste disposal at landfill facilities.
   c. Record estimated weight of materials that are reused or salvaged.
   d. Retain receipts and record estimated weight of materials that are donated or sold.
9. C+D Waste Estimates: Estimate expected diversion rates for each material stream applicable to the Project.

C. Waste Hauler(s) C+D Progress Report: The Waste Hauler(s) shall submit progress reports to the Contractor on a monthly basis. The Waste Hauler(s) C+D Progress Report shall include the following information for the time period covered:
1. The names of all Waste Streams per the C+DWM Plan. This includes Diversion Streams and Non-Diversion streams.
2. The name and address of the sorting, recycling, or disposal facility for each Waste Stream.
3. Weight for each Waste Stream.
4. Total weight of waste.

D. Contractor C+D Progress Report: The Contractor shall submit progress reports to the Owner on a monthly basis prior to application for payment. Contractor shall track demolition and construction waste diversion throughout the project and maintain documentation of materials and disposal methods. Progress Reports shall include the following information for the time period covered:
1. Compiled information from all Waste Haulers for all Waste Streams into a single report.
2. Updated Construction & Demolition Waste Tracking Log (see Appendices of this Section) for all waste hauled from site, identifying:
   a. Date of pick-up by Waste Hauler
   b. Waste Hauler Name
   c. Gross Total quantity, measured by weight, of demolition and construction waste hauled from the Project site during the period.
   d. Quantity of materials disposed of in landfills or incineration facilities as a percentage of total waste during the period.
   e. Quantity of materials, measured by weight, diverted by methods of recycling, reuse, salvage, and/or donations during the period. Include breakdown of diverted waste for major material types, including but not limited to:
      1) Asphalt
      2) Cardboard and Papers
      3) Carpet and Pad
      4) Gypsum Board
      5) Wood
      6) Commingled Waste
      7) Metals

8) Glass
9) Masonry
10) Vinyl
11) Concrete
12) Plastic
13) Ceiling Tile

f. Quantity of land clearing debris, excavation soil, and hazardous material (if applicable). Note that these materials shall be reported but excluded from Waste Diversion Calculations.

g. Diverted waste as a percentage of total waste, for the period and cumulative for the project-to-date.

E. Waste Hauler(s) Sorting Facility Reports: For each waste receiving facility, the Waste Haulers shall provide Sorting Facility Data on sorting facility letterhead to the Contractor each calendar year:

1. Name and address of sorting facility.
2. State regulation, license and license number under which the facility operates.
3. End-use information for each Diversion Stream. Provide the following:
   a. Receiver Information– Facility/Party receiving material from the Sorting Facility
   b. End Product Information– How material is used by the Receiver (e.g. manufactured into water bottles, used as feedstock for new steel products).
4. If mixed construction and demolition (C+D) waste will be commingled on-site and diverted off-site, provide the following:
   a. Verification of Diversion Rate: Provide project-specific and/or facility-wide diversion rates in accordance with the following:
      1) Project-Specific: On Sorting Facility letterhead, provide project-specific monthly summaries of diversion rates from each waste receiving facility for each Diversion Stream the facility accepts, including statement that visual inspection was not used to estimate weights of Project Diversion Streams. ADC must be listed as a separate line item on the report under the category of non-diverted waste.
      2) Facility-Wide: On Sorting Facility letterhead, provide facility-wide aggregated annual averaged diversion rates, average percentage of ADC produced by the facility, and provide documentation that the facility's method of recording and calculating these rates is regulated by a local or state government authority. The facility-wide aggregated annual averaged diversion rate shall include ADC under the category of non-diverted waste.
   b. Third-party Certification of Diversion Rate: If the sorting facility has third-party verified facility-wide diversion rates according to Recycling Certification Institute's Certification of Real Rates (CORR) Protocol or approved equivalent in accordance with the Sorting and Recycling Facility Qualifications as described in this Section, provide documentation of the independent third-party certification.

F. Contractor Sorting Facility Report: The Contractor shall provide Sorting Facility Reports for each sorting facility once annually to Owner. If multiple waste haulers or receiving facilities are utilized on the Project, then the Contractor shall aggregate individual reports on an annual basis.

G. Waste Management Records: Contractor shall maintain the following records and provide to Owner upon request.

1. Recycling and Processing Facility Records: Document receipt and acceptance of recyclable waste by licensed recycling and processing facilities. Include legible copies of on-site logs, manifests, weight tickets, receipts, and invoices.
2. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include legible copies of manifests, weight tickets, receipts, and invoices.
3. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and charitable organizations. Indicate whether organization is tax exempt.
4. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

H. Qualification Data: For Waste Management Coordinator, submit data within 30 days of date established for the Notice to Proceed confirming compliance with Waste Management Coordinator Qualifications.

I. Refrigerant Recovery Report: Submit as refrigerant recovery activities are completed on site, if applicable:
1. Qualification Data for refrigerant recovery technician, indicating Refrigerant Recovery Technician Qualifications are met.
2. Statement of Refrigerant Recovery:
   a. Date refrigerant was recovered.
   b. Statement that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations, signed by refrigerant recovery technician responsible for recovering refrigerant.
   c. Name, address and telephone number of refrigerant technician.

1.6 CLOSEOUT SUBMITTALS

A. Provide final approved C+DWM Plan and summary table indicating site-separated waste, by diverted material type, that indicates the total percentage of construction waste diverted from landfill and the identified Diversion Streams prior to request for Substantial Completion.

B. LEED v4 Construction and Demolition Waste Calculator. At the completion of waste management activities for the Project and prior to final application for payment, the Contractor shall provide a completed LEED v4 Excel Calculator to the Owner summarizing the final diversion and disposal quantities for LEED documentation purposes.
1. A copy of the LEED v4 Construction and Demolition Waste Calculator can be downloaded from: https://www.usgbc.org/resources/construction-and-demolition-waste-calculator . A sample is provided in the Appendices of this Section.
2. The LEED v4 Construction and Demolition Waste Calculator shall include:
   a. Material description and material type for each material stream.
   b. Cumulative waste for each material stream, measured by weight, for Project to date.
   c. Average percentage of ADC produced by the sorting facility receiving commingled waste stream.
   d. Cumulative diverted waste for each material stream, measured by weight.
   e. Percent of each material stream diverted.
   f. Cumulative quantity of each material stream sent to landfill, measured by weight.
   g. Cumulative diverted waste as a percentage of total waste.
   h. Gross Total quantity of demolition and construction waste generated on site.
   i. Gross Total quantity of demolition and construction waste diverted from landfill.
   j. Total number of material streams tracked for the Project.
   k. Calculations may be performed using either weight (lbs. or tons), however the method shall be consistent throughout the duration of the Project.

3. Name and location of the recycling or disposal facility that accepted each material.

C. Waste Hauler(s) Final C+D Report:
1. Submit to Contractor prior to request for Substantial Completion.
2. Include following information covering the entire time period for Waste Hauler's scope of work:
a. The names of the Waste Streams per the C+DWM Plan.
b. The name of the sorting or disposal facility for each Waste Stream.
c. Sorting Facility Report for each disposal facility.
d. Weight for each Waste Stream.
e. Total quantity of waste, measured by weight.
f. Final Diversion (Recycling) Rate
3. Provide backup documentation concurrent with the Waste Hauler's Final C+D Report:
a. Recycling and Processing Facility Records: Document receipt and acceptance of recyclable waste by licensed recycling and processing facilities. Include legible copies of on-site logs, manifests, weight tickets, receipts, and invoices.
b. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include legible copies of manifests, weight tickets, receipts, and invoices.
c. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and charitable organizations. Indicate whether organization is tax exempt.
d. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

D. Contractor Final C+D Report:
1. Compile Waste Hauler(s) Final C+D Reports into a single Final Project C+D Report.
2. Submit following Substantial Completion and prior to final Application for Payment. The final date of submission will be set by the Owner.
3. Copies of annual Waste Hauler's Sorting Facility Reports, covering entire Project time period.

1.7 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements, that employs a LEED-Accredited Professional, certified by the USGBC, as waste management coordinator. Waste management coordinator may also serve as the Contractor's LEED coordinator.

B. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

C. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Sorting and Recycling Facility Qualifications:
1. Each commingled recycling facility must be regulated by a local or state authority.
2. To count commingled waste as two Diversion Streams, each facility must meet one of the following qualification compliance options:
a. CORR Certification: Facility has received the Recycling Certification Institute's Certification of Real Rates (CORR), and the certification period covers the entire time period that waste is generated for the Project and sent to the facility.

b. Approved-Equivalent: Facility's average recycling rates for co-mingled waste streams are certified by qualified third-party organizations, and meet minimum program requirements:
   1) The third-party certification organization follows guidelines for environmental claims and third-party oversight, including ISO/IEC Guide 65 or ISO/IEC 17065 and relevant portions of the ISO 14000 Family of Standards.
   2) The third-party certification organization continuously monitors "certified" facilities to ensure that the facilities are operating legally and meeting the minimum program requirements for facility certification and recycling rates.
   3) The third-party certification organization shall certify to a protocol that was developed on a consensus basis for recycling facility diversion rates that is not in a draft or pilot program.
   4) The methodology for calculating facility recycling rates must be:
      a) Developed with construction and demolition recycling industry stakeholders and be specific to the construction and demolition recycling industry;
      b) Based on a methodology that is applicable across broad regions (i.e. nationally); and
      c) A published and publicly available standard.
   5) Data submitted by the facilities to the certification organization in support of the recycling rate is audited. The audit includes, at a minimum: the evaluation of recyclables sales records, verification of facility sales into commodity markets, monitoring off-site movement of materials, and a review of the facilities' customers weight tags information.
   6) Facilities submit data to the certification organization that supports the recycling rate, such as a mass balance recycling rate (tons in/tons out) for a twelve-month period, or quarterly sorts completed and verified by an independent third-party entity.
   7) Breakdown of materials (by type and by weight), including analysis of supporting data relating to amounts (in tons) and types of materials received and processed at the facility.
   8) At a minimum, the third-party certifying organization conducts an on-site visit of the Facility for the first-year certification, with subsequent site visits occurring at least once every two (2) years, unless additional visits are deemed necessary by the certification organization. The site visit will examine:
      a) How materials enter, are measured, deposited, processed/sorted and exit facility.
      b) Conduct interviews with key personnel and discuss how materials are managed after they leave the site.
      c) Confirm equipment types and capacity.
      d) Observe and verify load/materials sorting and accuracy.
      e) Verify use and accuracy of scales including calibration frequency.
   9) Diversion rates shall adhere to these requirements:
      a) Measurements must be based on weight (not volume), using scales.
      b) Recycling rates must be available on a website and viewable by the general public.
      c) Methodology for calculating diversion and recycling rates must be publicly available and applicable to national or country-level accounting standards for construction and demolition waste recycling facilities.
   10) Facility recycling data submitted to certification program will be analyzed for recycling rates using a mass balance formula or quarterly sorts completed and verified by an in-dependent third-party entity.
   11) Final recycling rate will include overall facility recycling rate with and without ADC/Beneficial Reuse, and will include separate recycling rates by material

type as well as combined average including wood derived fuel/bio-fuel separate from other waste to energy or incineration end-markets.

E. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section for “Project Management and Coordination”. Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

F. Project Meetings: Waste management plans and implementation shall be discussed at the following meetings:

1. Pre-demolition meeting.
2. Pre-construction meeting.
3. Regular job-site meetings.
4. Sub-contractor job-site coordination meetings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with operation, termination, and removal requirements in Division 01 Section for Temporary Facilities and Controls.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute C+DWM Plan to all impacted parties within three (3) days of submittal return.
2. Distribute C+DWM Plan to entities when they first begin work on-site. Review plan procedures and locations established for diversion and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold. Provide labeling in multiple languages as needed to enable proper communication and understanding.
2. Comply with Division 01 Section for Temporary Facilities and Controls for requirements to control dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted to be stored on Project site.

C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area off-site.
5. Protect items from damage during transport and storage.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

F. Plumbing Fixtures: Separate by type and size.

G. Lighting Fixtures: Separate lamps by type and protect from breakage.

H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical. At a minimum, four (4) Diversion Streams are required.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

1. Pulverize concrete to maximum 1-1/2-inch size.
2. Crush concrete and screen to comply with requirements in Division 31 Section related to Earth Moving for use as satisfactory soil for fill or subbase.

C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.

1. Pulverize masonry to maximum 3/4-inch size.
2. Clean and stack undamaged, whole masonry units on wood pallets.

D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

E. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

F. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

G. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.

H. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.

1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

I. Carpet Tile: Remove debris, trash, and adhesive.

1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.

J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

K. Lighting Fixtures: Separate lamps by type and protect from breakage.

L. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

M. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

N. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
   a. Comply with requirements in Division 32 Section related to Plantings for use of clean sawdust as organic mulch.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

2. Comply with requirements in Division 32 Section related to Plantings for use of clean ground gypsum board as inorganic soil amendment.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

D. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.

3.7 APPENDICES

A. APPENDIX A-017419 – SAMPLE CONSTRUCTION AND DEMOLITION WASTE TRACKING FORM

B. APPENDIX B-017419 – SAMPLE LEED V4 CONSTRUCTION AND DEMOLITION WASTE CALCULATOR

- END OF SECTION 017419 -