

SECTION 11011

BUILDING MAINTENANCE ACCESS EQUIPMENT



For best results, display hidden notes to specifier.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Facade access platforms and hoisting systems.
- B. Glazed roof and wall access platforms and ladders.
- C. Passive restraint systems (lifelines).
- D. Safety tieback anchors.

1.2 RELATED SECTIONS

- A. See other sections for roof assembly, roof coverings, flashings, and facade assemblies.
- B. Division 16 - Electrical: Overload protected power supply, minimum 230 V AC, three phase, 60 HZ, 50 amps; minimum of one weatherproof, twist-lock receptacle.

1.3 REFERENCES

- A. ANSI/ASME A1201.1 - Safety Requirements for Powered Platforms for Building Maintenance; American Society of Mechanical Engineers; 1996.
- B. AA SAS 30 - Specifications for Aluminum Structures; Aluminum Association; 1986.
- C. AISC S342L - Load and Resistance Factor Design Specification for Structural Steel Buildings, including the Commentary; American Institute for Steel Construction; 1993.
- D. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges, including the Commentary; American Institute for Steel Construction; 1992.
- E. ASME A39.1 - Safety Requirements for Window Washers; American Society of Mechanical Engineers; 1995; Addendum 1a, 1996; Addendum 1b, 1997. (out of print)
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 1997.
- G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 1997.
- H. AWS D1.1 - Structural Welding Code - Steel; American Welding Society; 2000.
- I. AWS D1.2 - Structural Welding Code - Aluminum; American Welding Society; 1997.

- J. CAN/CSA-Z91-M90 - Safety Code for Window Cleaning Operations; CSA International Inc.; 1990.
- K. CAN/CSA-Z271-M98 - Safety Code for Suspended Elevated Platforms; CSA International Inc.; 1998.
- L. NFPA 70 - National Electrical Code; National Fire Protection Association; 1999.

1.4 SUBMITTALS

- A. Product Data: For standard manufactured products submit product data describing characteristics.
- B. Pre-Bid Submittal: A least 10 days prior to date set for receipt of bids, submit the following information for the use of bidders on related construction:
 - 1. A statement by manufacturer that the structural supports for equipment and anchorage points are acceptable, or a list of those areas that must be changed to be adequate for the system being proposed.
 - 2. Electrical power requirements, including characteristics and connection points.
- C. System Description: Before beginning design submit an overall system description including the following:
 - 1. List of applicable laws, regulations, and ordinances.
 - 2. List of voluntary standards with which the design will comply.
 - 3. Description of major items of equipment.
 - 4. Electrical power requirements, including characteristics and connection points.
 - 5. Reactions at wheels and tie downs.
 - 6. Weights of major assemblies including platforms.
 - 7. Weights and wheel loads of the carriage unit.
 - 8. A statement by manufacturer that the structural supports for equipment and anchorage points are acceptable, or a list of those areas that must be changed to be adequate for the system being proposed.
 - 9. Manufacturer's evidence of insurance.
- D. Shop Drawings: Before beginning fabrication of equipment, submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.
 - 1. For powered platform systems, show equipment working positions, general arrangement of stage platform, carriage and trolleys, inserts and buttons.
 - 2. Indicate loads imposed on the building structure and curtain wall.
 - 3. Structural calculations prepared and certified by a Licensed Professional Engineer demonstrating design assumptions and method of design.
 - 4. Location and characteristics of electrical connections.
 - 5. Wiring diagrams and labeling of electrical panels.
- E. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- F. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.
- G. Manufacturer's installation instructions.

- H. Manufacturer's field reports.
- I. Installer's certificate of adequacy of installation, upon completion of testing.
- J. Operation and Maintenance Data: Submit data describing operation and maintenance of all equipment installed; include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 1. Include duplicate of instruction plate text.
 - 2. Submit 6 complete sets, bound, neatly labeled and indexed.
 - 3. Provide data in the English language.
 - 4. Furnish lubrication charts, indicating equipment lubrications points, frequency of lubrication required, and type of lubricant for equipment.
 - 5. Include detailed Rescue Plan, including step-by-step instructions and illustrations for rescue during emergency operations.
 - 6. Provide complete listing of replacement parts, including identifying numbers and ordering instructions.
 - 7. Include copies of the warranty documents specified.
 - 8. Provide a sample inspection log for Owner's use in recording inspections; include recommended list of daily, weekly, periodic, and biannual inspections.
- K. Project Record Documents: Submit project record drawings showing actual installed locations and configuration, and record specifications documenting all changes to original design criteria and other specification requirements; include:
 - 1. Wiring Diagrams: "As installed" single line wiring diagrams showing electrical connections of equipment; include legend sheet with cross-references to original drawing identification designations.
 - 2. Warranty.

1.5 QUALITY ASSURANCE

- A. Design Engineer's Qualifications: Professional Engineer registered in state where project is located. Design engineer shall either perform the design, supervise the design, or certify the design if performed by others.
- B. Manufacturer Qualifications: Firm whose main concern and business is solely involved in engineering design, manufacture and installation of power operated window washing units, and who has been actively engaged in this business for not less than 10 years.
 - 1. Capable of providing design engineer services as specified.
 - 2. Capable of providing field service representation during construction, approving acceptable installer and approving installation method.
 - 3. Carrying liability insurance covering products and completed operations in the amount of \$10,000,000.00, to cover failure of equipment.
- C. Installer Qualifications: Manufacturer or other installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project; when requested, submit certificate indicating qualification.
- D. Preinstallation Meeting: Before starting installation conduct a meeting to review project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.

1.7 WARRANTY

- A. Provide manufacturer's warranty for ____ years against defects in materials and installation, executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

1.8 MAINTENANCE

- A. Submit maintenance contract to provide service necessary to maintain safety and compliance with design criteria and applicable regulatory requirements; to be performed under a separate contract.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Acceptable Manufacturer: Tractel Group; 1615 Warden Ave., Scarborough, Ontario, Canada M1R 2T3. ASD. Tel: (416) 298-8822. Fax: (416) 298-1053. www.tractel.com.
- B. Obtain all building maintenance access equipment from a single manufacturer.
- C. Substitutions: No substitutions permitted.

2.2 BASIC DESIGN REQUIREMENTS

- A. Building Maintenance Access Equipment: Provide installed equipment that complies with the design requirements specified and the following:
 1. Applicable requirements of U.S. Federal laws and regulations and State and local codes, ordinances and regulations; it is manufacturer's responsibility to determine applicable requirements.
 2. Powered Platforms: OSHA Part 1910, paragraph 1910.66 Power Platforms for Exterior Building Maintenance, latest amendment.
 3. Powered Platforms: ANSI A1201.1 Safety Requirements for Powered Platforms for Exterior Building Maintenance, latest amendment.
 4. CAN/CSA-Z91-M90 - Safety Code for Window Cleaning Operations, latest amendment.
 5. CAN/CSA-Z271-M98 - Safety Code for Suspended Elevated Platforms, latest amendment.
 6. CalOSHA Title 8, State of California Safety and Health Act, Articles 5 and 6.
 7. Lifelines and Anchors: ASME A39.1, Safety Requirements for Window Washers, latest edition.
 8. Structural Components and Anchors:
 - a. Design steel structures in accordance with AISC Load and Resistance Factor Design Specification for Structural Steel Buildings, including Commentary, and

- Code of Standard Practice for Steel Buildings and Bridges, including commentary, latest editions.
 - b. Design aluminum structures in accordance with Aluminum Association Specifications for Aluminum Structures, latest edition.
 - c. Perform welding of steel in accordance with AWS D1.1 Structural Welding Code - Steel, latest edition.
 - d. Perform welding of aluminum in accordance with AWS D1.2 Structural Welding Code - Aluminum, latest edition.
9. Electrical Work: Comply with latest edition of NFPA 70 - National Electric Code, and provide UL listed components.
 10. Where referenced standards, regulatory requirements, and/or specified design requirements conflict, comply with the most stringent requirement regardless of whether it is required by law or not.
 11. Obtain necessary approvals from authorities having jurisdiction.
 12. Material sizes and thickness shown on the drawings are for conceptual design purposes; manufacturer to provide components required to comply with final design.
 13. Design structural assemblies and components with a safety factor of 4 to 1 against failure as a minimum; certify such design.
- B. Instruction Plates: Provide corrosion-resistant metallic plates on equipment, explaining operational maneuvers.
1. Provide instructions in the English language; use diagrams if more illustrative than text.
 2. Etch or print using lifetime process.
 3. Locate instruction plates on each portion of the equipment, such as carriage housing, boom and platform.
 4. Also provided a name plate on the main equipment housing with the following data:
 - a. Name of manufacturer.
 - b. Name or number of model.
 - c. Serial number.
 - d. Maximum load which may be so suspended in pounds and kilograms.
 - e. Year of manufacture.

2.3 MAINTENANCE ACCESS SYSTEMS

- A. Access to Facade: Provide power-operated platform access to all glazed portions of exterior facade.
1. Provide one relocatable platform of length suitable to lifting points, minimum 12 feet (3660 mm) long.
 2. Provide hoisting system that does not require electrical power at platform, with storage of platform on the roof.
 3. Provide hoisting system that does not require manual relocation, re-rigging, or re-installation, with storage of platform on the roof.
 4. Provide two portable davits, permanent anchorages at all davit points, and davit moving devices, with storage of platform on the roof.
 5. Provide permanent anchorages at all required suspension points, with storage of platform on the ground.
 6. Design to allow normal operation at wind velocity up to 25 mph, to allow full hoisting capability at wind velocity up to 50 mph, and to withstand 100 mph wind velocity without damage when in secured stored position; for purpose of wind design, exposed areas subjected to wind pressure shall be total areas of each portion of exposed parts

with no shielding effect of one element by another where distance between elements is 4 times or more than smaller projected area of windward element.

7. Design so that there is continuous contact between platform and structure as platform descends and ascends, with minimum pressure of approximately 10 lb (45 N) against face of building.
 8. Anchorage Locations: As indicated on drawings; where track is required, manufacturer to provide track designed for anchorage points indicated.
- B. Access to Glazed Roof and Interior of Glazed Wall: Provide rolling platform/ladder access to all points of glazed roof/wall, inside and out, allowing cleaning and maintenance without the necessity of walking on glazing or framing members.
1. Provide power operation of platform/ladder.
 2. Design for minimum visual impact when in storage position, both interior and exterior.
 3. On Exterior: Design to allow normal operation at wind velocity up to 25 mph, to allow movement to storage position at wind velocity up to 50 mph, and to withstand 100 mph wind velocity without damage when in storage position; for purpose of wind design, exposed areas subjected to wind pressure shall be total areas of each portion of exposed parts with no shielding effect of one element by another where distance between elements is 4 times or more than smaller projected area of windward element.
 4. Track Locations: As indicated on drawings; manufacturer to provide track designed for anchorage points indicated.
 5. Provide access to platform as indicated on drawings.
- C. Platform Safety Systems: In addition to permanent equipment, provide ___ set(s) of portable lifeline and body harness systems for users of platforms.
- D. Roof Maintenance Lifeline System: Provide permanently installed horizontal lifeline system at _____, to serve maintenance personnel who must move about roof.
1. Provide anchorage system that allows traveling anchor to body harness to pass easily over supports without need to disconnect and reconnect to move along the lifeline.
 2. Provide ___ set(s) of body harness and anchorage cables.

2.4 MANUFACTURED UNITS AND EQUIPMENT

- A. Platform-Powered Platforms: _____.
- B. Roof-Powered Platforms: Type "F" four wire roof powered platform.
- C. Roof Powered Hoisting System: Tractel Roof Car system.
1. Machine: Provide equipment housing, twin-Tirak hoists, rope storage reelers on platform, hydraulic power pack, hydraulic cylinder, control panel, Magtron remote control system, counterweights, suspension jib, power transversing system, power supply cable reeler, safety features, and tiedowns.
 2. Restraint System: Provide stabilization anchorage.
 3. Provide telephone communication system between roof car and _____.
 4. Provide platform mounted wind anemometer and gauge.
- D. Lifelines:
1. Fall Protection System: Tractel "Travsafe" System.
 2. Body Harness and Equipment: Safety harnesses with "Fallstop" shock absorbing lanyard.
- E. Safety Tieback Anchors:

1. Ultimate Load Capacity: 5000 lb (2268 kg).
2. Ultimate Load Capacity: 5400 lb (2449 kg).
3. Roof Deck Mounted Type: U-bar.
4. Roof Deck Mounted Type: Domed.
5. Roof Deck Mounted Type: Flush mounted.
6. Wall Mounted Type: _____.
7. Material: Aluminum.
8. Material: Hot-dipped galvanized steel.
9. Material: Stainless steel.
10. New Concrete Structure: Anchor bolt cage cast into concrete.
11. New Steel Structure: Welded to structural members.
12. Existing Concrete Structure: Bolted through slab or other structural members.
13. Existing Concrete Structure: Adhesive attached to slab or other structural members.
14. Existing Steel Structure: Clamped to structural members.
15. Existing Steel Structure: Bolted to structural members.

2.5 MATERIALS

- A. Components Exposed to Weather: Aluminum or aluminum alloy, stainless steel, or hot-dipped galvanized structural steel. Do not use carbon steel unless galvanized after fabrication. Separate dissimilar metals to prevent electrolytic action.
- B. Bolts: ASTM A 325 or A 307.
- C. Connectors: Stainless steel unless otherwise noted.
- D. Platform Casters, Rollers, and Other Components in Contact with Facade: Non-marking and scuff resistant material.
- E. Exterior Painted Finish: Two coats of machinery enamel, over primer compatible with substrate; color: As directed by Architect.

2.6 SOURCE QUALITY CONTROL

- A. Obtain and submit mill test reports on wire suspension rope and metals used in the manufacture of load supporting equipment and devices.
- B. Perform welding using certified welders; examine all welds using non-destructive testing.
- C. Arrange for and perform all testing required by authorities having jurisdiction; obtain all approvals required.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install to comply with all specified design requirements and regulatory requirements.
- B. Install in accordance with manufacturer's instructions.
- C. Touch up damaged galvanized surfaces with zinc-rich cold galvanizing compound.

3.2 SYSTEM STARTUP AND COMMISSIONING

- A. Start up and operate equipment for entire cycle of normal mode, including storage.
- B. Arrange for inspections, tests, and approvals required by authorities having jurisdiction; provide personnel to assist as required.
- C. If independent testing agency inspections or tests are required by authorities having jurisdiction, arrange and pay for such inspections or tests; notify authorities in time to arrange attendance; submit copies of test reports to Owner.
- D. Obtain any necessary approvals as required by governing regulatory agencies.
- E. Provide installer's certificate of adequacy of installation and testing.
- F. Demonstrate operation to Owner's personnel.

3.3 INSTRUCTION OF OWNER'S PERSONNEL

- A. Owner will designate personnel to receive instruction.
- B. Instruct Owner's personnel in operation and maintenance of installed units.
 - 1. Instruction will take place at project location on dates designated by Owner.
 - 2. Provide manufacturer's authorized representative to conduct training, minimum of two man-days.
 - 3. Provide prepared operation and maintenance data for use during instruction.
- C. Provide training attendance certificate for each person completing training.

END OF SECTION

SECTION 11015 – WINDOW WASHING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Facade access platforms and hoisting systems.
 - 2. Glazed roof and wall access platforms and ladders.
 - 3. Passive restraint systems (lifelines).
 - 4. Safety tieback anchors.
- B. Related Sections include the following:
 - 1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations and anchor-bolt installation.
 - 2. Division 7 Section "Garden Roof System"

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. General: Provide a complete, integrated set of mutually dependent components and assemblies that form a system capable of withstanding loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Include framing and accessories complying with requirements indicated, including those in this Article.
- B. Design: Design window washing systems to comply with the following:
 - 1. Applicable requirements of U.S. Federal laws and regulations and State and local codes, ordinances and regulations; it is manufacturer's responsibility to determine applicable requirements.
 - 2. Powered platforms:
 - a. OSHA Part 1910, paragraph 1910.66 Power Platforms for Exterior Building Maintenance, latest amendment.
 - b. ANSI A1201.1 Safety Requirements for Powered Platforms for Exterior Building Maintenance, latest amendment.
 - 3. Lifelines and anchors: ASME A39.1, Safety Requirements for Window Washers, latest edition.
 - 4. Structural components and anchors:
 - a. Design steel structures in accordance with AISC Load and Resistance Factor Design Specification for Structural Steel Buildings, including Commentary, and Code of Standard Practice for Steel Buildings and Bridges, including commentary, latest editions.
 - b. Design aluminum structures in accordance with Aluminum Association Specifications for Aluminum Structures, latest edition.
 - c. Design structural assemblies and components with a safety factor of 4 to 1 against failure as a minimum; certify such design.
- C. Electrical Work: Comply with latest edition of NFPA 70 - National Electric Code, and provide UL listed components.
- D. Where referenced standards, regulatory requirements, and/or specified design requirements conflict, comply with the most stringent requirement regardless of whether it is required by law or not.
- E. Obtain necessary approvals from authorities having jurisdiction.
- F. Seismic Performance: Design and engineer window washing systems capable of withstanding the effects of earthquake motions determined according to The International Building Code.

1.4 SUBMITTALS

- A. Description of System: Include the following:
 - 1. List of applicable laws, regulations, and ordinances.
 - 2. List of voluntary standards with which the design will comply.
 - 3. Description of major items of equipment.
 - 4. Electrical power requirements, including characteristics and connection points.
 - 5. Reactions at wheels and tie downs.
 - 6. Weights of major assemblies including platforms.
 - 7. Weights and wheel loads of the carriage unit.
 - 8. A statement by manufacturer that the structural supports for equipment and anchorage points are acceptable, or a list of those areas that must be changed to be adequate for the system being proposed.

- B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for manufactured components:

- C. Shop Drawings: For the following system components. Include plans, elevations, sections, details, and attachments to other Work.
 - 1. For installed components indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 2. For powered platform systems, show equipment working positions, general arrangement of stage platform, carriage and trolleys, inserts and buttons.
 - 3. Indicate loads imposed on the building structure and curtain wall.
 - 4. Location and characteristics of electrical connections.

- D. Wiring Diagrams: Provide wiring diagrams of equipment, parts list with pictorial data.
 - 1. Indicate as installed single line wiring diagrams, showing electrical connections of equipment.
 - 2. Provide legend sheet containing the following information.
 - a. Name and symbol of each relay, switch, and other electrical apparatus.
 - b. Location of switches, relays, contacts, and other electrical apparatus.

- E. Product Certificates: Signed by manufacturer, verifying that products furnished comply with requirements.
 - 1. Letter of design certification: Signed and sealed by a qualified professional engineer. Include the following:
 - a. Name and location of Project.
 - b. Name of manufacturer.
 - c. Name of Contractor.
 - d. Governing building code and year of edition.
 - e. Design loads: Include dead load, collateral loads, deflection, wind loads/speeds and exposure, seismic zone or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
 - f. Load combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.

- F. Quality Assurance Submittals:
 - 1. Welding Certificates: Copies of certificates for welding procedures and personnel.
 - 2. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements. Include evidence of manufacturing experience.
 - 3. Qualification data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience.
 - a. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
 - 4. Warranties: Copy of sample warranty.

- G. Contract Closeout Submittals:
 - 1. Operation and maintenance data: Submit data describing operation and maintenance of all equipment installed; include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
 - a. Include duplicate of instruction plate text.

- b. Furnish lubrication charts, indicating equipment lubrications points, frequency of lubrication required, and type of lubricant for equipment.
 - c. Include detailed rescue plan, including step-by-step instructions and illustrations for rescue during emergency operations.
 - d. Provide complete listing of replacement parts, including identifying numbers and ordering instructions.
 - e. Provide a sample inspection log for Owner's use in recording inspections; include recommended list of daily, weekly, periodic, and biannual inspections.
2. Record Documents: Submit record drawings showing actual installed locations and configuration, and record specification documenting all changes to original design criteria and other specification requirements, including the following:
- a. Wiring diagrams: "As installed" single line wiring diagrams showing electrical connections of equipment; include legend sheet with cross-references to original drawing identification designations.
3. Warranty.

1.5 QUALITY ASSURANCE

- A. Installer's Qualifications: An experienced installer who has specialized in installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated.
 - 1. Engineering services are defined as those performed for installations of metal building systems that are similar to those indicated for this Project in material, design, and extent.
- C. Manufacturer Qualifications: A firm experienced in the design and manufacturing of systems similar to those indicated for this Project and with a 5-year record of successful in-service performance.
 - 1. Engineering responsibility: Preparation of Shop Drawings, testing program development, test result interpretation, and comprehensive engineering analysis by a qualified professional engineer.
- D. Source Limitations: Obtain each type of component through one source from a single manufacturer.
- E. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel"; and AWS D1.2, "Structural Welding Code--Aluminum."
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
- G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
 - 1. Review methods and procedures related to window washing systems including, but not limited to, the following:
 - a. Inspect and discuss condition of preparatory work performed by other trades.
 - b. Review structural load limitations.
 - c. Review and finalize construction schedule and verify availability of materials, Erector's personnel, equipment, and facilities needed to make progress and avoid delays.
 - d. Review required testing, inspecting, and certifying procedures.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components and other manufactured items so as not to be damaged or deformed.
- B. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight and ventilated covering.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify building conditions dependent of which window washing system is dependent upon for installation.
 - 1. Indicate measurements on Shop Drawings.
 - 2. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 3. Established dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating window washing systems without field measurements.
 - a. Coordinate anchor-bolt installation to ensure that actual anchorage dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate size and location of casting of anchor-bolt inserts into concrete.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

1.9 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace defective and unsafe materials or workmanship within specified warranty period.
 - 1. Warranty period: Three years from date of Substantial Completion.

1.10 SYSTEM STARTUP AND COMMISSIONING

- A. Coordinate with Division 1 Section "General Commission Requirements."
- B. Start up and operate equipment for entire cycle of normal mode, including storage.
- C. Arrange for inspections, tests, and approvals required by Owner.
 - 1. Provide personnel to assist as required.
- D. Arrange and pay for inspections and tests as required to demonstrate to Owner systems is operating properly.
 - 1. Notify Owner 72 hours prior to testing and inspections.
 - 2. Submit copies of test reports.

1.11 MAINTENANCE

- A. Furnish maintenance service for equipment specified in this Section for a period of 12 months after Date of Substantial Completion.
 - 1. Maintenance service shall be performed by equipment manufacturer, and not transferred to any agent or subcontractor.
 - 2. Maintenance service is in addition to and not instead of warranties specified in Contract Documents.
- B. Maintenance service shall be performed by technicians trained by equipment manufacturer, and shall include not less than monthly inspections of the installation, including the following.
 - 1. Necessary adjustments, lubrication, cleaning, and supplies and parts to maintain equipment in original operational condition.
 - a. Use replacement parts and supplies produced by manufacturer of original equipment.

- C. Maintenance service shall be provided within the following time periods for type of service as determined by Owner.
 - 1. Non-emergency service: Within 24 hours of telephone call by Owner.
 - 2. Emergency service: Within 2 hours of telephone call by Owner.
- D. Maintenance service shall include whatever measures are necessary to maintain equipment in original operational condition, including the following.
 - 1. 24 hour per day service, including weekends and holidays.
 - 2. Overtime service rates.
 - 3. Travel expenses

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Tractel Group.

2.2 MATERIALS

- A. Components Exposed to Weather: Aluminum, Type 316 stainless steel, or G-90 hot-dipped galvanized structural steel containing not less than 27 percent recycled steel.
 - 1. Do not use carbon steel unless galvanized after fabrication.
 - 2. Separate dissimilar metals to prevent electrolytic action.
- B. Bolts: ASTM A 325 or A 307.
 - 1. Finish: Hot dipped galvanized.
- C. Connectors: Stainless steel.
- D. Platform Casters, Rollers, and Other Components in Contact with Facade: Non-marking and scuff resistant material.
- E. Exterior Painted Finish: 2 coats of machinery enamel, over primer compatible with substrate.
 - 1. Color: As directed by Architect.

2.3 COMPONENTS

- A. Facade Access Systems: Provide power-operated platform access to all glazed portions of exterior facade as indicated on Drawings.
 - 1. Provide permanent anchorages at all required suspension points, with storage of platform on the ground.
 - 2. Design system to allow normal operation at wind velocity up to 25 miles per hour, to allow full hoisting capability at wind velocity up to 50 miles per hour, and to withstand 120 miles per hour wind velocity without damage when in secured stored position.
 - a. For purpose of wind design, exposed areas subjected to wind pressure shall be total areas of each portion of exposed parts with no shielding effect of one element by another where distance between elements is 4 times or more than smaller projected area of windward element.
 - 3. Design system so that there is continuous contact between platform and structure as platform descends and ascends, with minimum pressure of approximately 10 pounds against face of building.
 - 4. Anchorage locations: As indicated on Drawings.
 - a. Where track is required, manufacturer to provide track designed for anchorage points indicated.

- B. Safety Tieback Anchors:
1. Ultimate load capacity: 5,400 pounds.
 2. Roof deck mounted type:
 - a. U-bar.
 - b. Flush mounted.
 3. Material: Type 316 stainless steel.
 4. Anchorage system:
 - a. Concrete structure: Anchor bolt cage cast into concrete.
 - b. Steel structure: Welded to structural steel.
- C. Stage Platform (Alternate No. 20.)
1. Live load capacity: 500 pounds.
 2. Construction: Extruded aluminium, with the back and sides permanently enclosed to a height of 42 inches using perforated aluminium.
 3. Deck: Extruded aluminium with slip resistant surface, with 6 inch high toe-guard on all sides.
 4. Fasteners are cadmium plated and are fitted with self-locking nuts.
 5. End sections shall be capable of being attached together by removing the centre sections of the stage to accommodate all required stage lengths to perform all stage service drops around the building perimeter.
 - a. Provide wheels or casters on all platform sections.
 6. Hoisting unit:
 - a. 2 traction type safety hoists, mounted in a protective housing.
 - 1) Provide load-sensitive roller system that locks cable to the main sheave to prevent slippage.
 - 2) Drum drive: Worm and planetary gearset.
 - 3) Overspeed device: Designed to grab the support cable, cut the power and apply the main brake in case of an overspeed condition occurring.
 - 4) Provide elapsed time meters to assist in proper maintenance scheduling.
 - 5) Provide micro switch to cut off power supply to the motor during manual operation.
 - b. Provide separate storage drum for the suspension cables for each hoist unit to eliminate wire ropes from hanging below the stage platform or coiling on the deck of the stage platform.
 7. Water tanks: Provide 2 removable polyethylene type tanks, equipped with a drain tap.
 8. Fire extinguisher: Provide 1 attached to stage platform
 9. Guides and rollers: Non-marking, with stainless steel shafts, as required to accommodate building requirements.
 10. Hoisting cables: Galvanized steel, 2 primary and 2 secondary, with a safety factor of 10.
 11. Lanyards: Provide tie-in lanyards for intermittent stabilisation of each of the platform's suspension ropes complete with stainless steel quick connect" devices for attachment to the building anchors.
 - a. Lanyards shall be galvanized cable, with a means of adjustment for length.
 - b. Lanyards shall be 1-piece and stored around the platform fair leads.
 12. Safety dog line: Provide horizontal galvanized wire rope safety (static) line at the rear guardrail level of the stage platform for the attachment of the lanyards from the worker's fall protection equipment.
 - a. Secure line to structural member of the platform's deck at both ends.
 - 1) Rope clips are not acceptable.
 13. Wind anemometer: Platform mounted for monitoring the wind velocity during platform use.
 - a. Readings shall be in miles per hour and operating power shall be from internal turbine or 9-volt battery as a minimum.
 - b. Products: Provide from one of the following:
 - 1) Davis Instruments Mfg. Co. Inc.
 - 2) Science Associates Incorporated
 - 3) Texas Electronics Inc.
 14. Controls: Provide the following.
 - a. Key-operated on-off switch with reset button and red pilot light.
 - b. Constant pressure push buttons for stage platform travel.
 - c. Red mushroom style emergency stop button.

15. Safety features:
 - a. Limit switches to control upper limit of travel.
 - b. Lower obstruction detectors to stop downward travel after contacting an obstruction from below.
 - c. Manual controlled lowering system.
 - d. Tilt switch to maintain stage near a constant level condition.
 - e. Slack cable and overload detector to stop movement should a slack cable or overload condition occur.
 - f. Holders for hand held transceiver sets.

2.4 ACCESSORIES

- A. Instruction Plates: Provide corrosion-resistant metallic plates on equipment, explaining operational maneuvers.
 1. Provide instructions in the English and Spanish languages.
 - a. Use diagrams to supplement text.
 2. Etch or print using lifetime process.
 3. Locate instruction plates on each portion of the equipment, such as carriage housing, boom and platform.
 4. Provided a name plate on the main equipment housing, including the following data:
 - a. Name of manufacturer.
 - b. Name or number of model.
 - c. Serial number.
 - d. Maximum load which may be so suspended in pounds and kilograms.
 - e. Year of manufacture.

2.5 FABRICATION

- A. Design components and field connections required for erection to permit easy assembly and disassembly.
 1. Fabricate components in a manner that once assembled in the shop, they may be disassembled, repackaged, and reassembled in the field.
 2. Fabricate to produce clean, smooth cuts and bends.
 - a. Punch holes of proper size, shape, and location.
 - b. Cold-formed members shall be free of cracks, tears, and ruptures.
- B. Shop-fabricate components with baseplates, bearing plates, stiffeners, and other plates required for installation.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of metal building system.
 1. For the record, prepare written report listing conditions detrimental to performance of work.
 2. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before installation proceeds, survey elevations and locations of concrete and steel attachment points, baseplates, and anchor bolts to receive window washing systems.

3.2 INSTALLATION

- A. Install window washing systems in accordance with manufacturer's written instructions.
- B. Align and adjust components before permanently fastening.
 - 1. Level and plumb individual members of structure.
- C. Install components true to line, level, plumb, rigid, and secure.
 - 1. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts.
- D. Installation Tolerances:
 - 1. Maximum variation from plumb: 1/4 inch per story, non-cumulative.
 - 2. Maximum offset from true alignment: 1/4 inch.
 - 3. Maximum misalignment of adjacent members: 1/16 inch.

3.3 FIELD QUALITY CONTROL

- A. Formal final inspection of the completed Work shall be made with manufacturer's representative and Architect present.
 - 1. Submit written report summarizing results of manufacturer's inspection.

3.4 ADJUSTING

- A. Adjust installed components and safety devices for smooth and balanced operation.

3.5 CLEANING AND PROTECTION

- A. Touchup Painting: Immediately after installation, clean, prepare, and prime or reprime welds, bolted connections, and abraded surfaces of prime-painted primary and secondary framing, accessories, and bearing plates.
 - 1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
 - 2. Apply compatible primer of same type as shop primer used on adjacent surfaces.
- B. Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

3.6 DEMONSTRATING

- A. Comply with Division 1 Section "Demonstrating and Training."
- B. Demonstrate operation and maintenance of window washing systems to Owner, using manufacturer's authorized representatives.
 - 1. Demonstrating shall consist of two 8 hour training session covering each component of system.
- C. Instruct Owner of the following:
 - 1. Proper use, operation, and maintenance of equipment.
 - 2. Emergency provisions, including access and procedures to be followed in checking for source of operational failures or malfunctions.

3.7 SCHEDULE

- A. Provide the following components, and as indicated on Drawing
1. 21 each Davit pedestals.
 2. 4 each Roof mounted safety tie back anchors.
 3. 4 each Wall mounted safety tie-back anchors.
 4. 6 each Portable davit sockets.
 5. 6 each Portable davit arms.
 6. 3 each Portable davit raising winches.
 7. 1 each Portable davit raising winch.
 8. 10 each Permanent outrigger bases
 9. 5 each Permanent crank-out outriggers
 10. 1 each Permanent davit base and pedestal assembly.
 11. 3 each Permanent davit arms.

END OF SECTION 11015

SECTION 11160 - LOADING DOCK EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Dock lift.
 - 2. Dock bumpers.
- B. Related Sections include the following:
 - 1. Division 5 Section "Metal Fabrications" for curb angles at edges of recessed pits and loading dock platform edge channels.

1.3 DEFINITIONS

- A. Operating Range: Maximum amount of travel above and below the loading dock level.
- B. Working Range: Recommended amount of travel above and below the loading dock level for which loading and unloading operations can take place.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, rated capacities, operating characteristics, furnished specialties, accessories, dimensions of individual components and profiles, and finishes.
- B. Recycled content certification: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and post-industrial recycled content by weight for each Product specified under this Section.
- C. Local/regional source certification: Manufacturer or fabricator's certificate indicating location, and distance in miles from the Project Site, of each Product's final assembly, extraction, harvesting, or recovery prior to shipment to the Project Site.
- D. Shop Drawings: Show fabrication and installation details.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
- E. Quality Assurance Submittals:
 - 1. Maintenance Data: For loading dock equipment to include in maintenance manuals.
 - 2. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
 - 1. Maintenance proximity: Not more than 2 hours' normal travel time from Installer's place of business to Project site.
- B. Source Limitations: Obtain each type of loading dock equipment through one source from a single manufacturer.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Indicate measurements on Shop Drawings.
 - 1. Established dimensions: Where field measurements cannot be made without delaying the Work, establish recessed pit dimensions slopes of driveways and heights of loading docks and proceed with fabricating loading dock equipment without field measurements.
 - 2. Coordinate loading dock construction to ensure that actual dimensions correspond to established dimensions.

1.7 COORDINATION

- A. Coordinate installation of anchorages for loading dock equipment.
 - 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.
 - 2. Deliver such items to Project site in time for installation.
- B. Recessed Loading Dock Equipment: Coordinate size and location of pits to ensure proper clearances and operation of equipment.
 - 1. Concrete, reinforcement, and formwork requirements.
- C. Electrical Requirements: Coordinate wiring requirements and current characteristics of loading dock equipment with building electrical system.
 - 1. See Division 16 Sections.

1.8 WARRANTY

- A. Special Warranty for Dock Lifts: Manufacturer's standard form in which manufacturer agrees to repair or replace dock-lift components that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including cracked or broken structural support members and load-bearing welds.
 - b. Deck plate failures including cracked plate or permanent deformation in excess of 1/4 inch between deck supports.
 - c. Faulty operation of operators or hardware.
 - 2. Warranty period for structural assembly: 10 years from date of Substantial Completion.
 - 3. Warranty shall be for unlimited usage of the lift for the specified rated capacity over the term of the warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM 36/A 36M, containing not less than 28 percent recycled steel.
- B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from steel plate complying with ASTM A 572/A 572M, Grade 55, containing not less than 28 percent recycled steel.
- C. Steel Tubing: ASTM A 500, cold formed, containing not less than 28 percent recycled steel.
- D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.2 DOCK BUMPERS

- A. Laminated-Tread Bumpers: Fabricated from multiple, uniformly thick plies cut from fabric-reinforced rubber tires.
1. Laminate plies under pressure on not less than two 3/4-inch- diameter, steel supporting rods that are welded at one end to 1/4-inch- thick, structural-steel end angle and secured with a nut and angle at the other end.
 2. Fabricate angles with predrilled anchor holes and sized to provide not less than 1 inch of tread plies extending beyond the face of closure angles.
 3. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified:
 - a. Advance Lifts, Inc.
 - b. Blue Giant.
 - c. Kelley Company, Inc.; a United Dominion Company.
 - d. Pentalift Equipment Corporation.
 - e. Poweramp Systems, Inc.
 - f. Rite-Hite Corporation.
 - g. Serco; a United Dominion Company.

2.3 DOCK LIFTS

- A. General: Scissors-type hydraulic dock lift of capacity, size, and construction indicated; complete with controls, safety devices, and accessories required.
1. Quality standard: MH 29.1, "Safety Requirements for Industrial Scissors Lifts."
 2. Capacity: 8,000 pounds.
 3. Size: 72 inches wide by 96 inches long.
 4. Travel: 60 inches.
 5. Lift speed: 13 feet per minute.
 6. Hydraulic operating system: Self-contained, electric, hydraulic power unit for raising and lowering lift; of size, type, and operation needed for capacity of lift indicated; controlled from a remotely located push-button station.
 - a. Power unit: Consisting of continuous-duty motor, 1,750 rpm, high-pressure gear pump, valve manifold, oil-line filters, and 15 gallon oil reservoir.
 - 1) Equip manifold with relief valve, check valve, pressure-compensated flow-control valve, and solenoid valve and with provisions for lowering lift manually if power fails.
 - 2) Equip reservoir, valve manifold, and pressure line with oil-line filters.
 - 3) Provide hydraulic hoses complying with SAE-100R2.
 - b. Cylinders: Equip lift with not less than two heavy-duty, high-pressure, hydraulic, ram-type cylinders.
 - 1) Rams shall be manufacturer's standard, either direct-displacement plunger or rod-and-piston type with positive internal stops.
 - 2) Cylinder rods shall be chrome plated and polished.
 - 3) Rate of descent protection: Pressure compensated flow control or hydraulic velocity fuse to limit down speed for each cylinder.
 - c. Remote-control station: Multibutton keyed control station with emergency stop switch.
 - 1) Controller shall consist of magnetic motor starter with 3-pole adjustable overloads and 24-volt control transformer with 4-amp, fused secondary prewired to terminal strips and enclosed in NEMA ICS 6, Type 12 box.
 - 2) Upper-travel-limit switch: Equip unit with manufacturer's standard, adjustable, upper-travel-limit switch.
 7. Construction: Fabricate lift from structural-steel shapes rigidly welded and reinforced for maximum strength, safety, and stability.
 - a. Design assembly to withstand deformation during both operating and stored phases of service.
 - b. Provide mounting brackets and removable lifting eyes for ease of installation.
 - c. Platform: Fabricate platform from heavy steel plate with beveled toe guards on all four sides to comply with requirements of MH 29.1.
 - d. Hinged bridge: Hinged, throw-over bridge bolted to full-length, heavy-duty, piano-type hinge welded to toe guard at end of platform.
 - 1) Provide bridge complete with heavy-duty lifting chains.

- 2) Chamfer edge of bridge to minimize obstructing wheels of material-handling vehicles.
 - e. Scissors mechanism: Fabricate leg members from heavy, steel-formed tube or plate members to provide maximum strength and rigidity.
 - f. Bearings: Pivot points with permanently lubricated antifriction bushings or sealed ball-bearings for minimum maintenance.
 - g. Removable handrails: Equip lift with handrails on two sides of platform with a single, removable chain across each end.
 - 1) Handrails shall be 42 inches high with midrail and 4-inch- high kick plate at bottom. Mount rail sockets flush with platform surface.
 - h. Maintenance leg: Removable, safety maintenance leg or hinged, safety maintenance bars.
 - i. Toe protection: Along entire unprotected side of lifts; painted yellow with black stripes to comply with ANSI Z535.1.
8. Products: Subject to compliance with requirements, provide the following:
- a. Kelley Atlantic Ltd: ED-5000 Series.
 - b. Other manufacturers offering products that may be incorporated into the Work are the following:
 - 1) Advance Lifts, Inc.
 - 2) Blue Giant.
 - 3) Pentalift Equipment Corporation.
 - 4) Poweramp Systems, Inc.
 - 5) Rite-Hite Corporation.
 - 6) Serco; a United Dominion Company.

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish loading dock equipment after assembly and testing.
- C. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
 - 1. ASTM A 123/A 123M for iron and steel loading dock equipment.
 - 2. ASTM A 153/A 153M for iron and steel hardware for loading dock equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of loading dock equipment.
- B. Examine roughing-in for electrical systems for loading dock equipment to verify actual locations of connections before equipment installation.
- C. Examine walls and floors of pits for suitable conditions where recessed loading dock equipment is to be installed.
 - 1. Pits shall be plumb and square and properly sloped for drainage from back to front of loading dock.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate size and location of loading dock equipment indicated to be attached to or recessed into concrete or masonry, and furnish anchoring devices with templates, diagrams, and instructions for their installation.
- B. Set curb angles in concrete edges of dock lift recessed pits with tops flush with loading platform.
 - 1. Fit exposed connections together to form hairline joints.

- C. Clean recessed pits of debris.

3.3 INSTALLATION

- A. General: Install loading dock equipment, including motors, pumps, control stations, wiring, safety devices, and accessories as required for a complete installation.
 - 1. Rough-in electrical connections according to requirements specified in Division 16.
- B. Dock Bumpers: Attach dock bumpers to face of loading dock in a manner that complies with requirements indicated for spacing, arrangement, and position relative to top of platform and anchorage.
 - 1. Bolted attachment: Attach dock bumpers to preset anchor bolts embedded in concrete or to cast-in-place inserts or threaded studs welded to embedded-steel plates or angles.
 - a. If preset anchor bolts, cast-in-place inserts, or threaded studs welded to embedded-steel plates or angles are not provided, attach dock bumpers by drilling and anchoring with expansion anchors and bolts.
- C. Dock Lifts: Attach dock lifts securely to loading platform and surface of driveway.

3.4 ADJUSTING AND CLEANING

- A. Adjust loading dock equipment for proper, safe, efficient operation.
- B. Test dock lifts for vertical travel within operating range indicated.
- C. Restore marred, abraded surfaces to their original condition.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain loading dock equipment. Refer to Division 1 Section "Project Closeout."

END OF SECTION 11160

SECTION 11451 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Microwave oven.
 - 2. Refrigerator/freezer.
 - 3. Dishwasher.
 - 4. Ice makers.

1.3 SUBMITTALS

- A. Product Data: For each appliance type required indicating compliance with requirements. Include complete operating and maintenance instructions for each appliance.
- B. Quality Assurance Submittals:
 - 1. Recycled content certification: Manufacturer's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and post-industrial recycled content by weight for each Product specified under this Section.
 - 2. Local/regional source certification: Manufacturer or fabricator's certificate indicating location, and distance in miles from the Project Site, of each Product's final assembly, extraction, harvesting, or recovery prior to shipment to the Project Site.
- C. Source Limitations: Obtain residential appliances through one source from a single manufacturer.
 - 1. Provide products from the same manufacturer for each type of appliance required.
- D. Electrical Appliances: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.
- E. UL and NEMA Compliance: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
- F. AHAM Standards: Provide appliances that comply with the following AHAM standards:
 - 1. Refrigerators and Freezers: Total volume and shelf area ratings certified according to ANSI/AHAM HRF-1.
- G. Energy Ratings: Provide residential appliances that carry labels indicating energy-cost analysis (estimated annual operating costs) and efficiency information as required by the Federal Trade Commission.

1.4 DELIVERY

- A. Deliver appliances only after utility rough-in is complete and construction in the spaces to receive appliances is substantially complete and ready for installation.

1.5 WARRANTIES

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranties: Written warranties, executed by manufacturer of each appliance specified agreeing to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.
 - 1. Microwave oven: 10-year limited warranty for in-home service on defects in the magnetron tube.
 - 2. Refrigerator/freezer: 5-year limited warranty on the sealed refrigeration system.
 - 3. Dishwasher: 10-year warranty against deterioration of tub and door liner.
 - 4. Ice maker:
 - a. 3-year entire unit.
 - b. 5-year for evaporator
 - c. 5-year for compressor.

PART 2 - PRODUCTS

2.1 RESIDENTIAL APPLIANCES

- A. Microwave Oven:
 - 1. Type: Built-in.
 - 2. Width: Nominal 27 inches.
 - 3. Capacity: 1.4 cubic feet.
 - 4. Power: 900 watts.
 - 5. Controls: Solid-state, electronic, touch type.
 - 6. Clock type: Digital.
 - 7. Front panel finish: Stainless-steel.
 - 8. Provide unit with the following:
 - a. Microwave cooking.
 - b. Convection cooking.
 - c. Removable turntable.
 - d. Drop-down door.
 - 9. Electrical requirement: 120 volt single phase, 60Hz.
 - 10. Products: Subject to compliance with requirements, provide the following:
 - a. KitchenAid: Model KBHC179JSS.
- B. Top-Mount Refrigerator/Freezer:
 - 1. Type: Freestanding, frost-free, two-door, top-mount freezer refrigerator/freezer.
 - 2. Refrigerator storage capacity: 21.5 cubic feet total interior refrigerator volume measured according to ANSI/AHAM HRF-1 and certified by AHAM.
 - a. Fresh food compartment volume: 15.1 cubic feet.
 - b. Freezer compartment volume: 6.4 cubic feet.
 - 3. Energy consumption: Energy Star qualified.
 - 4. Temperature controls: Separate temperature controls for each compartment.
 - 5. Front panel finish: Stainless-steel door fronts.
 - 6. Provide the following:
 - a. Interior light in fresh food compartment.
 - b. Interior filtered water dispenser.
 - c. Humidity controlled crispers.
 - d. Adjustable glass shelves.
 - 7. Interior light in freezer compartment.
 - 8. Electrical requirement: 120 volt single phase, 60Hz.
 - 9. Products: Subject to compliance with requirements, provide the following:
 - a. KitchenAid: Model KTRC22EKSS.

- C. Dishwasher:
 - 1. Type: Automatic, built-in, under-the-counter dishwasher; sized to replace 24-inch base cabinet; operable at water pressures from 15 to 120 pounds per square inch.
 - 2. Tub and door liner: Stainless steel.
 - 3. Operation: 3 wash cycles with hot-air and heat-off drying cycle options.
 - 4. Controls: Solid-state, electronic, press-to-start type, fully integrated.
 - 5. Energy consumption: Energy Star qualified.
 - 6. Front panel finish: Stainless-steel.
 - 7. Provide the following:
 - a. Removable silverware basket.
 - b. Sound-absorbing exterior insulation blanket around tub and back.
 - c. Hard food disposer.
 - 8. Electrical requirement: 120 volt single phase, 60Hz.
 - 9. Products: Subject to compliance with requirements, provide the following:
 - a. KitchenAid: Model KUDI01FKSS.

- D. Ice Makers:
 - 1. Production capacity: 214 pound per 24 hours at water temperature of 70 degrees F.
 - 2. Storage capacity: 250 pounds.
 - 3. Energy consumption:
 - a. 9.2 KWH per 100 pounds of ice production.
 - b. 29.9 gallons of water per 100 pounds of ice production.
 - 4. Electrical requirement: 115-volt single phase, 60Hz.
 - 5. Products: Subject to compliance with requirements, provide the following:
 - a. Hoshizaki America, Inc.: Model KML-200MAE with B-250 storage bin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for plumbing, mechanical, and electrical services, with Installer present, to verify actual locations of services before residential appliance installation.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Utilities: Refer to Divisions 15 and 16 for plumbing and electrical requirements.

3.3 ADJUSTING AND CLEANING

- A. Test each item of residential appliances to verify proper operation.
 - 1. Make necessary adjustments.
- B. Verify that accessories required have been furnished and installed.
- C. Remove packing material from residential appliances and leave units in clean condition, ready for operation.

END OF SECTION 11451