

**SECTION 11 82 31.1
AUGER EXTERIOR COMPACTOR**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. ANSI Z245.2 - American National Standard for Equipment Technology and Operations for Wastes and Recyclable Materials — Stationary Compactors - Safety Requirements for Installation, Maintenance, Operation, Modification and Repair; 2013.
- B. UL 4 - Armored Cable; Current Edition, Including All Revisions.

1.02 SECTION INCLUDES

- A. All General Requirements, materials and products for Auger Exterior Compactors.

1.03 REFERENCE STANDARDS

- A. [ANSI Z245.2](#) - American National Standard for Stationary Compactors -- Safety Requirements for Installation, Maintenance, and Operation; 2008.
- B. [UL 4](#) - Armored Cable; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 33 00 – Submittal Procedures, for submittal procedures.
- B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.
- C. Shop Drawings: Indicate plans for each unit or groups of units, elevations with model number, overall dimensions; construction, and anchorage details.
- D. All Auger Exterior Compactors supplied must also be provided with the following SUBMISSIONS: Shop drawings; Demonstration class; and Instructions:
 - 1. Shop drawing of control panel assembly and wiring diagram
 - 2. Shop drawing of power pack assembly and electrical system
 - 3. Comprehensive electrical wiring diagram, including internal panel and all field wiring from the source of supply to external equipment
 - 4. Laminated instructions showing operation of the Auger Exterior Compactor, bilingual, in both English and Spanish.
 - 5. A minimum 1hour demonstration for employees, including complete instructions for proper operation and maintenance.
 - 6. Periodic maintenance and lubrication chart
 - 7. Complete set of all mechanical and electrical drawings and schematics in accordance with JIC standards.
 - 8. Troubleshooting guide containing a list of symptoms, probable cause, and remedy for each malfunction
 - 9. Complete parts list, with manufacturer's item number, part number, manufacturer's description, and quantity required for each system.
 - 10. Shop drawing of Container with the lift pocket dimension conforming to New York City Department of Sanitation and NYCHA standard dimensions, with the loading fork centered in the pocket dimensions.
 - 11. All instructions and maintenance schedules shall be delivered to the Development Superintendent.

1.05 GENERAL

- A. Auger Exterior Compactor shall be installed as per the manufacturer's recommendations and specifications.
- B. All equipment provided shall be standard models having been reviewed and rated by National Solid Waste Management Institute/WASTEC and proven to perform in a superior manner.

Equipment must conform to the ANSI Z245.2 Compactor Safety Standard and to all other applicable ANSI and OSHA safety standards.

- C. All electrical work performed under this Section shall be under the supervision of an individual who has a Master Electrician's License issued by the City of New York pursuant to title B of Chapter 30 of the Administrative Code. The contractor shall prepare, file and submit all electrical work with the Electrical Inspection Unit of the NYC Department of Buildings. The contractor shall obtain the necessary permits, approvals and certificates of compliance issued by the Agency and deliver such to the Authority prior to submitting any request for payment for such work. An inspection of all electrical work shall be properly filed by the Contractor with the DoB Electrical Inspection Unit and Certificates of Inspection shall be supplied to the Authority when the work is completed.
- D. All material and labor required to install the electrical system as indicated on the Drawings and as specified herein, complete and ready for operation, shall be in complete accordance with and approved by the New York City DoB Electrical Inspection Unit.
- E. All equipment and all wiring shall be installed in strict accordance with all laws and with the rules, regulations and requirements of the municipal and other public agencies having jurisdiction and with those of the National Board of Fire Underwriters. Any items or requirements herein, which conflict with such rules, regulations and requirements, shall be referred to the Authority for decision.
- F. Any discrepancies between the specifications and Contract Drawings shall be discussed with the Authority before bidding.
- G. The Contractor shall notify the Project Superintendent at least 72 hours prior to the intended commencement of work.
- H. Drawings are generally diagrammatic and indicate the work to be installed. The Contractor shall harmonize the work of the several trades so that all work may be installed in the most direct and workmanlike manner and so that interference between piping; ducts, plumbing system, architectural, landscape and structural features will be avoided. In case of interference, the Landscape Architect will decide which work is to be relocated regardless of which was first installed.
- I. Where Drawings and Specifications conflict with the Law or Codes, the Law shall be followed, but where Drawings and Specifications are over and above the requirements of the Law, the Drawings and Specifications shall be followed.
- J. Unless otherwise specified, all equipment and materials furnished and installed under this Contract shall be new and of the latest model or design.
- K. All equipment requiring insulation in order to obviate danger to life or property shall be thoroughly insulated by the Contractor at his expense. Wires, conductors and other movable equipment shall be placed in such locations and in such a manner as will prevent unauthorized persons from handling or tampering with them. Ladders, guards, etc. shall not be left unattended in the work area.
- L. The Contractor shall carefully investigate the structural and finish conditions affecting all his work and arrange all his work accordingly to furnish such fittings, panel boards, etc. as may be required to meet such conditions.
- M. All items shall include everything necessary for a complete and functioning installation.
- N. Contractors are to sign the contractor's log upon arrival at the project, notify the project supervisors of the scope and location of work planned for the day, and before leaving, advise them of any condition which might adversely affect the tenants.

1.06 DELIVERABLES (NOT USED)

1.07 WARRANTY

- A. A warranty for the Auger Exterior Compactor, covering parts and labor, shall be provided for one year, from the date of acceptance.

PART 2 PRODUCTS

2.01 HEAVY-DUTY INDUSTRIAL AUGER EXTERIOR COMPACTOR

- A. Physical Characteristics:
 - 1. Rated Capacity: Standard Hopper Rated for 8 Cu. Yd.
 - 2. Charge Opening: 80" x 75"
 - 3. Horse Power: 40 HP
 - 4. Auger RPM: 7.5 RPM
 - 5. Machine Base Weight: 16,200 lbs.
 - 6. Base Machine Dimensions: 121-1/4" x 99-1/8" x 104"
 - 7. Power Requirements: 208V, 3phase, 4 wire, 200 amps
 - 8. Machine Construction: Full Box Channel Frame Construction, 1-1/4" Thick Back Wall, with 2-1/2" Thick Stabilization Ring (48" Diameter), with Eight (8) 1-1/4" Vertical Gussets, Auger Floor 3/8" Thick; Cross Under Structure 4" Tube Steel
 - 9. Large Bolt-On Footpads for Weight Distribution
- B. Auger Specifications
 - 1. Shaft: Single Piece, Solid Steel Alloy, Precision CNC Machined, Tapered Steel Shaft Design. The Auger shall be 98" in length, with a 8" solid steel shaft.
 - 2. Flights: Proprietary Forward Rake Cast Alloy Steel with 2-1/2" Thick Lip & Integrated 5" Thick Compaction Flight
 - 3. Flight Leading Edge & Push Flight Hard Faced to 57-62 Rc and Ground to Smooth Finish Integrated Bearing Shield Housing provides protections for bearings and seals
- C. Patented Bearing Support System (Patent No. US 9815636)
 - 1. Two (2) High Load Capacity Solid-Lube Spherical Roller Bearings
 - 2. Bearing Seal System: Steel Labyrinth Grease Pack System with Triple Lip Seals
 - 3. Full Box Frame Bearing Support Precision Line Bored After Weldment Complete
- D. Auger Drive Specifications
 - 1. Machine Drive: Electromechanical, High Shock, Cycloidal Drive, Electromechanical continuous duty cycloid reducer, 500% shock loading, integrated 40 HP, TEFC electric motor
 - 2. Drive Compartment: Totally Sealed floor pan
 - 3. Chain: Ultimate Rating 9,000 lb. capacity, 140,000 lb. ultimate strength, Pre-baked lubricated chain
 - 4. PLC Controlled Auto Lubrication System for Chain (Proprietary) 4 Liters
 - 5. PLC Controlled Auto Lubrication System for Bearing and Grease Purge through Seal Protection System (Proprietary) 4 Liters
- E. Electrical Controls
 - 1. Control Panel: Type 4 IEC, UL Listed Construction
 - 2. PLC Controls: Allen Bradley PLC -
 - a. Bin Near Full Indicator
 - b. Bin Full Indicator, Key Lock Start
 - c. Reverse Switch, Mushroom Stop Switch
 - d. Adjustable Run Time, IEC Push Buttons ("START", "RESET", "REVERSE", and "E STOP")
 - e. Key Lock Switch ("ON & OFF) Indicator Lights
 - f. 24V Control Transformer
 - g. Positive Push Button Control
 - h. Anti-Jam Auto-Reverse
- F. Paint
 - 1. PREP: Remove all scale with Shot Blast and finish sand all surfaces
 - 2. FINISH: Standard Epoxy Based Primer & Polyurethane Finish Coat
 - 3. STANDARD COLOR: Meeting NYC DoS Specification

- G. Accessories
 - 1. Standard Enclosed Island Guide, Wheel Stops
 - 2. Odor Neutralizer

2.02 CONTAINER SPECIFICATIONS

- A. XHD Roll off containers w/ 40 CY capacity
- B. Supplier of Auger Exterior Compactor unit shall be one of the following three model numbers and manufacturers:
- C. Komar Industries, Inc., 4425 Marketing Place, Groveport, Ohio 43125, Tel: (614)-836-2366. www.komarindustries.com Model No. EM-40-G
- D. Sani-Tech, Tel: 800-467-7336, www.sanitech.net Model No.. ST4060/40
- E. Marathon, P.O. Box 1798, Vernon, Alabama, 35592, Tel: 800-269-7237, www.marathonequipment.com Model No. AST-440
- F. or an equal product.
- G. Items included in the above named models shall include:
 - 1. Weather cover on the deck-mounted power unit
 - 2. A lockable box on the remote control pendent-with a hasp to accept a NYCHA-provided lock
 - 3. Container shall be painted as per NYC DOS Specifications and must have the Development name stenciled on both upper, vertical sides of the Container in eight (8) inch letters. Development name and numbers shall be field painted with White Paint.
 - 4. Low oil level indicator with auto shut off safety switch
 - 5. Odor Neutralizer
- H. New York City Housing Authority Requirements
 - 1. CONTAINER DUMPER: An integral electrically-powered, dumping mechanism shall be provided to facilitate the mechanical loading of refuse into the charging hopper of the Auger Exterior Compactor. A hopper extension (3-sided) shall be provided integral with the Auger Exterior Compactor to prevent spillage of the refuse during the loading operation. The lifting arms and dumping mechanism shall be integral with the Auger Exterior Compactor. A dumper cart shall be provided.
 - 2. Remote Control Station: Provide a remote control station and adequate cable wiring and piping required to permit operator to energize Auger Exterior Compactor from within sight of loading point.
 - 3. Control Panel: Components shall be housed in a NEMA 3R electrical enclosure mounted together with a motor starter and control power transformer. The control panel shall perform all the necessary control functions of the Auger Exterior Compactor according to factory programmed operation logic. The control panel shall be configured to include a UL-listed, FCC Class/A approved, solid-state microprocessor based programmable logic control card (PLC). NOTE: Contractor shall clearly label the location of the power source, with regard to building address, so the circuit can be identified and shut off before any service is performed.
 - 4. A key operated switch shall be provided to prevent unauthorized use of the Auger Exterior Compactor. The key switch shall be designed so that the key can only be removed in the OFF position.
 - 5. Dumper Cart: A dumper cart shall be included with the Auger Exterior Compactor unit, of the size as shown on the detail drawing and have a capacity of 2 cubic yards. It shall be fabricated with one side measuring 6 inches for easy loading of garbage. It shall not have any container lids. Metal component specifications are as follows; Cart side-10 gauge steel; Pocket-7gauge steel; Cart floor-7 gauge steel; Crossmember-C3 channel, 3.5#; Gusset-7 gauge steel.
 - 6. Power unit shall be mounted on the side of the Auger Exterior Compactor unit and shall be provided with a steel "Weather Guard" to protect it from the weather.

7. Manufacturer shall comply with all requirements. Acceptance of Auger Exterior Compactor is subject to inspection by NYC Department of Sanitation official and NYCHA Compliance Officer upon delivery to jobsite. Contractor shall provide 7-day advance notification regarding delivery date. If the supplied unit does not conform to all requirements, as determined solely by the NYCHA Compliance Officer, the Auger Exterior Compactor shall be removed by the manufacturer and replaced with a conforming unit at no extra cost to NYCHA.
8. Container shall be painted as per NEW YORK CITY DEPARTMENT OF SANITATION SPECIFICATION FOR THE PURCHASE OF ROLL-ON ROLL-OFF SELF-COMPACTING CONTAINER, D.S. 224, REVISED JANUARY 11, 2005 and must have the Development name stenciled on both upper, vertical sides of the detachable container in eight (8) inch letters. Development name shall be painted with White Paint.

2.03 POWER UNIT

- A. The power unit shall be a 40 horse power unit common with Auger Exterior Compactor with a push button for the dumper cart mechanism only. The Power Unit shall also be equipped with a safety switch, which is capable of disabling the power unit in an emergency.
 1. ODOR NEUTRALIZER - Non-chemical
 - a. The odor neutralizer shall be one of the following two model numbers:
 - 1) Sonozaire, Model 630A- NY, Sonozaire Division, 3102 E Fifth Street, Tyler, TX 75701, tel: 800-323-2115, fax: 903-581-6178, email: sonozaire@cbi.com, www.sonozaire.com
 - 2) Envirozone Air Purifier, Model 600, Enviro Equipment Sales Ltd., PO Box 71, Rhineback, NY 12572, Tel: 516-354-1212, fax: 516-354-2434 as manufactured by Howe-Baker Engineers, Inc., Tyler, Texas, or approved equal.
 - 3) It shall use generated ozone to neutralize odors and convert oxygen in the ambient air to generate ozone by the Corona Discharge Method. The odor neutralizer shall have a 12 hour timer option included.
 - b. The odor neutralizer shall be completely self-contained in operation, requiring only electrical power and ambient air, i.e., it shall not require cooling water or additional supporting systems or apparatus to operate. It shall be equipped with glass insulator tubes, which are easily removable for periodic maintenance.
 - c. The odor neutralizer shall be capable of operating continuously, or turned on or off at any time without requiring any adjustments. The output control shall be capable of being pre-set or adjusted at any time or at any desired level. The odor neutralizer shall be designed to operate in a safe manner and shall incorporate safety interlocks that cause the neutralizer to shut down when the assembly cover is opened.
 - d. Flex hosing (bell type end) fabricated of 2-1/2" PVC material shall be used to connect the odor neutralizer to the refuse compactor container. A 2-1/2" diameter steel pipe stub, three inches long, shall be welded to an opening in the container at a height of at least 7'- 0" high. A flexible PVC hose shall come out of the top of the odor neutralizer cabinet and shall have a length sufficient to reach the refuse compactor. There shall be a PVC sleeve extending 6 inches from the enclosure to attach the flex hose.
 - e. The odor neutralizer shall have physical dimensions of 36" x 24" x 14" and a weight of approx. 100 lbs. The housing for the unit shall form a weather-tight enclosure as per NEMA 1 specifications, and shall be fabricated of welded aluminum construction, 1/16-inch thick minimum. All mounting and fastening hardware shall be made of non-corroding stainless steel or aluminum.
 - f. The odor neutralizer shall have electrical requirements of 120v, single phase, 60 Hz with a power consumption of 260 watts. The unit shall have a fault circuit with visual indicators of any faults on the control panel. The indicators shall have individual pilot lights for each of the following conditions: White = normal -indicates that the door neutralizer is energized and the on/off switch is in the on position; Red = Service - indicates that the incoming power has tripped the reset circuit breaker. The unit shall

have a Reset Circuit Breaker, a panel mounted device that enables the operator to reset and energize the odor neutralizer in the event of a power overload, and switches that prevent the odor neutralizer from operating with the switch in the "off" position. This will cause the neutralizer to stop instantaneously when the switch is placed in the "off" position.

2.04 DISCONNECT SWITCH AND POWER OUTLET

- A. A licensed Electrical Contractor shall provide a disconnect switch for the 208v, 3-phase power as well as the duplex outlet (115v, 3 prong, grounded female). Contractor shall position and install conduit for electrical connections before the concrete pavement is poured. The electrical "stub-up" shall be placed as per manufacturer's specifications and instructions.
- B. Three-phase electrical supply power (208v, 3 phase, 4 wire, 200 amps) shall be run to the unit via suitable electrical conduit and wiring to provide adequate power for the electrical power unit. All wiring to be in accordance with all applicable codes. Electrical power shall be routed via fused disconnect switch terminated at the motor starter panel of the electric power unit.
- C. Single-phase electrical supply power 115 volt, 60 Hz, 15 AMP terminating in a 3-prong, grounded female outlet suitable for outdoor use shall be provided to the unit.

2.05 FORMED STEEL PLATE WEAR STRIP

- A. The formed steel plate wear strips and guides shall be of sizes, materials and installation methods indicated by the Manufacturer's specifications and drawings. All four wheels of the Auger Exterior Compactor shall rest firmly on the wear strips.

2.06 ELECTRICAL CONNECTIONS

A. WIRE AND CABLES

- 1. Furnish and install all wire and cable to conform to the latest requirements of the "Electrical Code of the City of New York", "Insulated Power Cable Engineer Association" and "Underwriters Laboratories". All wire and cable shall be copper and conform to the following:
 - a. All branch circuits and feeders shall be THWN copper.
 - b. The minimum wire size for all new branch circuits shall be as per the National Electric Codes.
 - c. Underground wire shall be type THWN, approved for use in conduits, designed for a wet corrosive atmosphere, and sized as indicated on Contract Drawings or in the Specifications.
 - d. Wherever new conductors or extensions to existing conductors are required (whether inside or outside the building), they shall be furnished and installed by the Contractor.
 - e. Splices in conductors shall be soldered and taped, or approved solderless connectors shall be used.
 - f. The work shall include the cleaning out of conduits and pull boxes, removal of all dirt, water, etc., making all splices or connections at which new conductors terminate.
 - g. Where wire insulation types, as specified, are not available, the Contractor shall furnish other approved types, provided the NYC Electrical Code allowances for conduit fill are not exceeded. There shall be no additional cost to the Authority for this substitution.
 - h. Unless otherwise specified, all wire shall be solid.

B. CONDUIT

- 1. The Contractor shall furnish and install conduits as required. If sizes are not indicated or mentioned, conduits shall be sized to accommodate the required quantity and gauge wire for the specific application and as per New York City Electrical Code. All conduits, underground and on/within the building shall be no less than 2" nominal size.

C. Underground Conduit

- 1. All conduits installed underground shall be no less than 2" nominal size. Conduits shall be adequately sized to accept the required wire size and quantity. The work shall include all

necessary excavation, foundations, drilling, back filling and restoration of disturbed areas to their original condition.

2. Conduit shall be laid in a uniform manner, properly spaced and graded without traps so that all condensation will drain into the nearest box.
 3. All conduits for underground installation shall be installed in trenches not less than 24" below final grade.
 4. During construction, proper support and protection shall be provided to prevent injury to conduit and all ends shall be closed to prevent water and foreign matter from entering the conduit system.
 5. Conduit end shall extend above concrete foundation at least 2" but not more than 8" and be grouted.
 6. All conduits for installation underground or in concrete shall be standard weight, butt-welded, rigid steel, heavy wall. The entire interior surfaces of conduit and fittings shall be epoxy coated. Conduit and fittings shall be hot-dipped galvanized with hot-dipped threads.
 7. All conduits for installations underground or in concrete shall be 40 MIL (0.404) PVC coated rigid galvanized. The conduit shall be joined with screw couplings. The joints shall be made up so that ends butt together. Conduit shall be free from blisters, cracks, or injurious defects and shall be reamed at each end. All bends are to be free from kinks and be of such curvature as to permit the drawing in of cable without injury. Conduit shall have standard pipe taper threads, clean-cut, straight and true. The threads shall be protected during transit and installation and shall be of sufficient length to permit the proper coupling connection. Long running threads will not be permitted on any part of the work. When necessary, the Contractor shall use three piece (Erickson) coupling or approved equal. PVC coated conduit system is manufactured by Robroy Industries - Plastic Bond, Perma-Cote rigid steel conduit, and Ocal 2 rigid steel conduit by Occidental Coating Co. is considered acceptable. Conduit shall comply with Federal Specification WW-C581, latest revision.
 8. Three-piece couplings, when used, shall be covered with four layers of lapped plastic electrical tape which shall extend over the coupling for a distance of one pipe diameter or 2", whichever is less, and each layer including the final one, shall be completely coated with an air dry vinyl chloride touch-up compound.
- D. Conduit for Installation on Building Exterior (as required)
1. The Conduit and fittings shall be as specified in the paragraph for "PVC coated rigid galvanized conduit"
 2. Conduit shall be installed on the surface of the masonry ceilings or walls and fastened thereto with one hole, steel straps, expansion shield anchors 10-24 round head machine screws or 3/16" toggle bolts or other means approved by the Authority.
 3. Conduit shall be installed parallel or perpendicular to adjacent walls. Vertical runs shall be plumbed. All bends are to be of equal radius throughout and be free of kinks and flattening. Offsets and saddles shall not exceed 7". Conduit shall be bent to conform to the surface upon which it is fastened. Fastening supports shall not be used to spring conduit to contour of surfaces.
 4. Ninety-degree bends around external corners are not to be used. They shall be made with the use of malleable iron threaded type conduit bodies, type LB or approved equal.
- E. Conduit Installation within Building Structure
1. Conduit shall be installed on the surface of the masonry ceilings or walls and fastened thereto with one hole, steel straps, expansion shield anchors 10-24 round head machine screws or 3/16" toggle bolts or other means approved by the Authority.
 2. Conduit shall be installed parallel or perpendicular to adjacent walls. Vertical runs shall be plumbed. All bends are to be of equal radius throughout and be free of kinks and flattening. Offsets and saddles shall not exceed 7". Conduit shall be bent to conform to the surface upon which it is fastened. Fastening supports shall not be used to spring conduit to contour of surfaces.

3. Offsets shall be used where conduit enters outlet, junction boxes, or distribution panels and shall be fastened thereto with malleable iron lock nuts and bushings.
 4. Ninety-degree bends around external corners are not to be used. They shall be made with the use of malleable iron threaded type conduit bodies, type LB or approved equal.
 5. Adjustable extension boxes or collars shall be used to extend existing flush mounted junction or outlet boxes.
 6. All conduit and accessories installed inside buildings, unless otherwise noted, shall be galvanized heavy wall rigid steel or IMC in the tank rooms, pump rooms, boiler rooms, public spaces and corridors, and EMT in the remaining spaces.
- F. FUSES AND GROUNDING
1. All fuses and grounding shall be in accordance with the New York City DoB Electrical Inspection Unit.
 2. A decal shall be affixed to the power unit enclosure that states the location of fuses and the building from which power source is obtained.

2.07 MATERIALS

- A. All materials supplied under this contract shall be new, of the latest model and design. In addition, all electrical components shall be UL listed and approved for use in New York City by the DoB Electrical Inspection Unit. The Contractor shall supply the Auger Exterior Compactor Unit as shown on the Drawings. Each Unit shall include the following:
1. Auger Unit, including detachable Roll-Off Container with rear door.
 2. Dumper Cart
 3. Side Dumper unit
 4. Power Unit, mounted on the Auger Unit, with Safety Switch
 5. Odor Neutralizer
 6. Formed Steel Plate Wear Strips (sets)
 7. Warranty
 8. Electrical Connections

PART 3 EXECUTION

3.01 INSTALLATION

- A. The Contractor shall furnish and install all components necessary for the Auger Exterior Compactor to be fully operational.
- B. Prior to the delivery of the Auger Exterior Compactor, all walls, fences, curbs, gates, and locks called for in the area shall be installed and operational. This is to ensure the safety and security of the Auger Exterior Compactor and its area.
- C. The Contractor shall furnish and install all necessary wiring, conduit, etc. to ensure that the new Auger Exterior Compactor unit is operational. The Contractor shall be responsible to assure that the installations are in compliance with the City of New York Building Department Codes.
- D. The supplier shall be responsible for conducting a demonstration that will educate project staff of the proper use of the Auger Exterior Compactor. The demonstration shall be a minimum of one hour in duration, and shall enable all development staff to practice the operation of the system. This demonstration shall be performed after the unit is installed and fully operational.
- E. Contractor shall ascertain the location of all electrical cables, all conduits, all utility lines, oil tanks and supply lines, so that proper precaution may be taken not to disturb or damage any subsurface improvements. In the event any are uncovered, the Contractor shall promptly notify the Authority who shall arrange to relocate the equipment. Failure to follow this procedure places upon the Contractor the responsibility of making, at his own expense, all the requisite repairs to damaged utility lines resulting from work hereunder.
- F. All plantings in the way of excavations shall be removed and replaced by development personnel. The Contractor shall notify the development superintendent one (1) week in advance of excavation work.

- G. The Contractor shall provide all necessary labor and equipment to excavate trenches for underground conduits. Excavation below required depth shall be refilled with sand or gravel and firmly compacted. Electrical conduit shall be installed two (2) feet below grade.
- H. Width of all trenches shall be sufficient to properly install the conduits. Trenches dug near trees shall be no closer to tree than six (6') feet away plus one (1') foot for every one (1") inch of tree caliper. Caliper measurement shall be made twelve (12") above grade.
- I. Where conduits are laid under the locations of walkways, driveways, hard surface areas or street improvements, backfill shall be thoroughly compacted - tamping in layers not more than 4" in thickness.
- J. Sidewalks, walls, and pavement shall be restored with material equal to that of the adjacent sidewalks, walls, or pavement. This work shall be restored as soon as practicable. Should the walkway to be restored be of cement, concrete composition, or other type, made up in flag or slab fashion, the Contractor shall be required to restore said flag or slab in whole.
- K. Openings in foundation walls shall be grouted and/or filled with concrete to the full depth of the wall. All openings shall be made watertight by parging on the outside with mastic.

END OF SECTION 11 82 31.1