THE CITY OF WALTHAM
MASSACHUSETTS

PURCHASING DEPARTMENT

190 Trapelo Rd Improvements, 2023

A D D E N D U M N O. 1 October 16, 2023

CHANGES, CORRECTIONS AND CLARIFICATIONS

The attention of bidders submitting proposals for the above subject project is called to the following addendum to the specifications. The items set forth herein, whether of omission, addition, substitution, or clarification are all to be included in and form a part of the proposal submitted.
THE NUMBER OF THIS ADDENDUM (NO. 1) MUST BE ACKNOWLEDGED ON YOUR BID FORM.

ITEM 1: CLARIFICATION

- The Completion time for this project shall be **270 Days from Notice to Proceed.**

ITEM 2: DELETE AND REPLACE

- **DELETE SECTION 32 14 13 UNIT PAVING -NON-PERMEABLE and REPLACE with attached**
- **DELETE SK-1 DESIGN CLARFICATIONS and REPLACE with attached.**
- **DELETE SK-2 DRAINAGE CLARFICATIONS and REPLACE with attached.**

ITEM 2: ANSWERS TO QUESTIONS

Q1. The "Site Requirements" spec section says the contractor pays for police but the bid form says to carry $10,000 allowance. Will the police details be reimbursed through this allowance?
A1. Police Details will be reimbursed through this allowance.

Q2. The drainage plan has some pipe runs labeled two or three different sizes. Please review and clarify the correct pipe sizes.
A2. - Revised Plan Attached.

Q3. Drawing C-7 shows a drainage basin going off the bottom left side of the page. This is also outside the limit of work shown on other drawings. Is this part of the bid? If it is please provide a plan showing the rest of the work that is cut off.
A3. Revised Plan Attached.

Q4. Some of the details in the drawings are a little different than the details in the "City of Waltham Standard Details" appendix section of the specs. Please confirm we should be using the details on the drawings for bidding purposes.
A4. Whenever there are discrepancies, the City of Waltham Standards shall govern. Carry City of Waltham for bidding purposes.

Q5. The plans call out a "20" high black polished granite seat wall." Can you provide a spec and detail for this?
A5. See SK-1 Design Clarifications.

Q6. Can you clarify the "retaining wall with capping stone and pillars"? The plans say not to exceed 30" in height and a detail on drawing C-12 shows a max height of 21". What are the details on drawing C-11 for that show retaining walls up to 4' and taller than 4' as I don't see these on the layout plans? There are specs for unilock blocks and versa lok-blocks that both appear to be for this 30" and/or 21" tall retaining wall with pillars so do we have the option to choose which one we want to use?
A6. The Memorial area seat wall shall be 21" The retaining wall that is used for soil retention shall be 30" or less, otherwise fencing/guard rail is required per code.

Q7. At the pre-bid it was mentioned that test pits were done in the work area. Can you provide this information to give bidders an idea of the subsurface conditions?
A7. A field test pit was excavated to determine dept of ledge at the top of the memorial area. Ledge was not discovered. Depth of test pit was 6-ft. No additional information is available for soils.

Q8. Demo - Please clarify which trees are to be removed. Trees appear to be circled, but its unclear whether they are to be removed or not since there is no note or anything called out in the legend. There are also some notes for trees to be cleared and pruned on the Trapelo Road line. Please clarify.
A8. All trees that are circled shall be removed. All trees that are 5" caliper or small in the memorial area shall be removed. Remaining trees in the area shall be pruned.

Q9. Electrical – Please indicate the size of the (2) electrical manholes and (1) communication manhole on *Drawing ES-1.1.*
A9. Manholes should be a minimum of 4'x6'x6' precast. Exact dimensions should be coordinated with the respective utility company.

Q10. Electrical – The security gate at the splash pad shows a push button actuator for opening the gate. Please provide more information on wiring required to integrate this. *Drawing ES-1.1.*
A10. The gate will require a 120-volt feed for the operator and control box. The gate should be provided with a keypad and limit switch. Wiring diagrams should be provided from the manufacturer.

Q11.Irrigation – Is a conduit required for all of the irrigation wiring?
A11. **All two-wire cable is to be installed in conduit**

Q12. Irrigation – Please provide make/model/size of backflow enclosure to be installed.

A12. **The backflows should be Watts model 009 Reduced Pressure Zone Assembly Backflow Preventers. They should be the same size as the water line they is on. A spec sheet for the 009 is attached for reference.**

Q13. Irrigation – Does the Backflow need to be heated if the system will be winterized yearly? Will the water meter be going in this same cabinet?
A13. Water meter will be in the same cabinet. Backflow will be removed and winterized.

Q14. Irrigation – Please provide the make/model and location of the Irrigation controller. (not shown on the irrigation plan)
A14. That is shown on sheet I-7 …. Drip edge shall be Rain Bird ESP-LXD with 75 station expansion module. The City standard for Irrigation Controls are Hunter.

Q15. Irrigation – Drawing Pages I-1 & I-6 both state a scale of 1" = 40', however, the scale line indicated 1" = 50'. Please clarify which measurement to use. Assuming 1" = 50" is the desired scale.
A15. **Those sheets are 1"=50'**

Q16. Does the city want to keep the granite curbing that is to be removed.
A16. **Yes, any salvaged granite curbing shall be placed at the construction entrance and CPW will pick them up.**

Q17. Musco lighting is called out in the legend, but no Musco lighting is shown in the plans or specs. Please clarify if Musco lighting is intended for the Project.
A17. **The reference is in the Nesra Standard Legend. There are no Musco lights existing or proposed for this project.**

Q18. The Concrete Culvert located on site has been vandalized with graffiti. Is the intent to clean the culvert to remove the graffiti?
A18. **What is referred to as a Culvert is a Retaining wall. It shall be demolished. The adjacent catch basins and drainage lines shall be removed as well and the line capped. Contractor shall carry demolition of 86-ft long concrete wall, 1-ft thick and 10-ft total height.**

Q19. Where is the Train located on this Project? Is the intent to have it ride around the path around the Mini Golf Course? Please clarify.
A19.Yes, that is correct. The electric train is on wheels and will be driven on the path round the mini golf.

Q20. Will a Hardscape Plan be provided to show which pavers are required in their respective locations? Spec shows Products desired, but no locations are called out.
A20. – See SK-1

Q21. PIP Surfacing – Are all of the Pads located on the outside of the Concrete Walking Track at the Recreation Area to have PIP Surfacing? Of the 7 pads, only 3 show the surface in bold. The others are in grey scale. Please clarify.
A21. **YES, all pads shall have PIP surfacing. Depth in accordance with the equipment fall zones.**

Q22. Please provide clarification on traffic signs. Plans state signage is required but no locations and sign types are indicated.
A22. See SK-1

Q23. Please identify locations for silt sacks to be installed for erosion control measures.
A23. Contractor shall include in the bid installation of 6 silt sacks. Actual locations will be determined in the field.

Q24. The spec calls for certain paints and stains to be used, but it isn't clear what product is to be used in specific locations, making it difficult to for our painters to quantify how much to carry for product and where they are to be applied.
A24. Contractors are to provide the following anti-graffiti coating on all walls. The owner's and engineer's approval is required prior to installation on the Unilock and granite walls. Sherwin-Williams Anti-graffiti Clear #B97C150.

Sherwin-Williams
325 New State Highway Suite 9
Raynham, MA 02767-5467
(508) 821-4010
Or approved equal.

Q25. Fencing – Please provide clarification on fencing. Fence height around playground and splash pad indicates 6' on the drawings and 4' in the spec. Need clarification.
A25. Provide 4-ft for playground and splash pad.

Q26. Fencing – Where the perimeter fencing at mini golf meets the playground fencing/splash pad fencing, the heights are unclear. Is this transition to be 4' or 6'?
A26. 6-ft for Mini Golf.

Q27 Fencing – specs call out for Decorative Fence **GMBH.** What does GMBH stand for?
A27 GMBH is the corporate definition for LEGI. It has nothing to do with the product. This is a model number. Waive mesh is required for this project. We are informed that B or Lite fence posts will not work with the waive top, contractor to provide R type posts. Full description of the model is

RP-Suno-R+K fence model. For additional information contact:

Mary Cutchin, President
Outerspace Landscape Furnishings
7533 Draper Avenue
La Jolla Ca 92037
cell 858 729 3888

or approved equal.

Q28 Fencing Can you provide more information on the LEGI / Decorative fence? The specification is leaving it open ended for the City to choose a style during the submittal process. There are many different styles with different costs.

A28

See A27 and photo below:

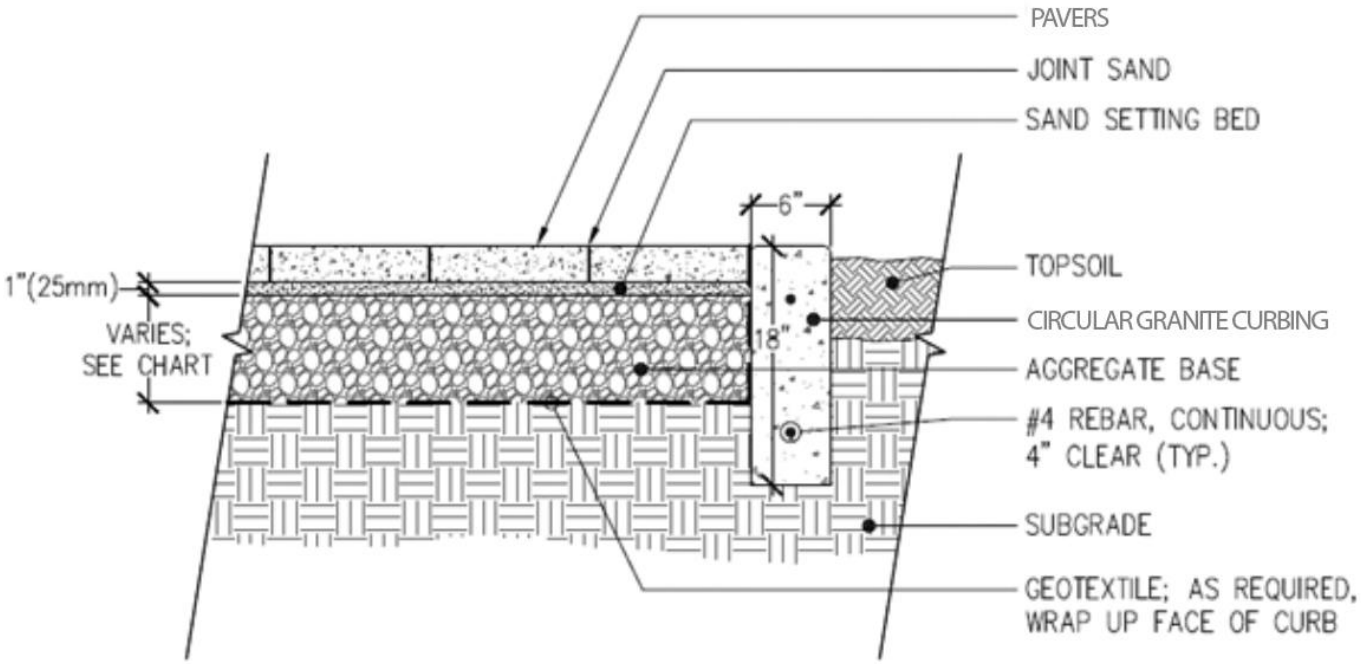
Gates are shown as 8-ft opening. Please revise to 12-ft opening total to allow for emergency access.

Q28 What is the post spacing on the rope and post fence?

A28 **10-ft maximum.**

SECTION 32 14 13

UNIT PAVING – NON-PERMEABLE



COMMERCIAL USE	MINIMUM BASE THICKNESS
MEMORIAL AREAS	12"

PART 1 GENERAL

1.01 SUMMARY

A. Section includes the following:
1. Concrete Pavers
2. Joint Sand
3. Setting Bed Sand
4. Base Aggregate
5. Subbase Aggregate

1.02 REFERENCES

A. ASTM International, latest edition:
1. C 33, Standard Specification for Concrete Aggregates.
2. C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

3. C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
4. C 144 Standard Specifications for Aggregate for Masonry Mortar.
5. D 448, Standard Classification for Sizes of Aggregate for Road and Bridge Construction.
6. C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
7. C 979, Standard Specification for Pigments for Integrally Colored Concrete.
8. D 698 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5 lb (24.4 N) Rammer and 12 in. (305 mm) drop.
9. D 1557 Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10-lb (44.5 N) Rammer and 18 in. (457 mm) drop.
10. C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units
11. D 2940 Graded Aggregate Material for Bases or Subbases for Highways or Airports.
12. D 4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
13. D 4533, Standard Test Method for Index Trapezoidal Tearing Strength of Geotextiles
14. D 4833, Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
15. D 4491, Standard Test Method for Water Permeability of Geotextiles by Permittivity
16. D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile

1.03 *SUBMITTALS*

A. Concrete Pavers:

1. Samples for verification: Three representative full-size samples of each paver type, thickness, color and finish that indicate the range of color variation and texture expected upon project completion.
2. Accepted samples become the standard of acceptance for the product produced.
3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.
4. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

B. Joint and Setting Bed Sand:

1. Provide three representative one-pound samples in containers of Joint Sand materials.

2. Provide three representative one-pound samples in containers of Setting Bed Sand materials.

3. Test results from an independent testing laboratory for sieve analysis per ASTM C 136 conforming to the grading requirements of ASTM C 144.

C. Polymeric Joint Sand:

1. POLYBIND G2 by Alliance – Add Oxford Grey Color, or approved equal.

2. Test results from an independent testing laboratory for sieve analysis per ASTM C 136 conforming to the grading requirements of ASTM C 144.

3. Samples for Initial Selection: Provide three representative samples in containers of Polymeric Joint Sand material, cured and dried, for color selection.

4. Samples for Verification: Provide three one-pound samples in containers of Polymeric Joint Sand.

D. Base and Subbase Aggregate:

1. Test results from an independent testing laboratory for sieve analysis per ASTM C 136.

E. Paving Installation Contractor:

1. Job references from a minimum of three projects similar in size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.

1.04 QUALITY ASSURANCE

A. Utilize a Manufacturer having at least ten years of experience manufacturing concrete pavers on projects of similar nature or project size.

B. Source Limitations:

1. Obtain Concrete Pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.

2. Obtain Joint and Setting Bed Sands from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.

3. Obtain Polymeric Joint Sand from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.

C. Paving Contractor Qualifications:

1. Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.

D. Mockups:

1. Install a 5 ft x 5 ft paver area per each paving pattern.

2. Use this area to determine surcharge of the Setting Bed Sand layer, joint sizes, lines, laying pattern(s) and levelness. This area will serve as the standard by which the workmanship will be judged.

3. Subject to acceptance by owner, mock-up may be retained as part of finished work.

4. If mock-up is not retained, remove and dispose legally.

1.05 *DELIVERY, STORAGE & HANDLING*

A. In accordance with Conditions of the Contract and Division 1 Product Requirement Section.

B. Deliver Concrete Pavers in manufacturer's original, unopened and undamaged container packaging with identification labels intact.

1. Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.

2. Deliver Concrete Pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.

3. Unload Concrete Pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.

C. Store and protect materials free from mud, dirt and other foreign materials.

D. Prevent Joint and Setting Bed Sand from exposure to rainfall or removal by wind with secure, waterproof covering.

E. Store Polymeric Joint Sand on elevated platforms, under a cover and/or in a dry location.

1.06 *PROJECT/SITE CONDITIONS*

A. Environmental Requirements:

1. Install Concrete Pavers only on unfrozen and dry Setting Bed Sand.

2. Install Setting Bed Sand only on unfrozen and dry Base or Subbase Aggregate materials.

3. Install Base or Subbase Aggregates only over unfrozen subgrade.

4. Install Setting Bed Sand or Concrete Pavers when no heavy rain or snowfall are forecast within 24 hours.

B. Weather Limitations for Polymeric Jointing Sand:

1. Install Polymeric Joint Sand only when ambient temperature is above 40°F (5°C), under dry conditions with no rain forecast for 24 hours and when surface of pavement is completely dry.

1.07 *CONCRETE PAVER OVERAGE AND ATTIC STOCK*

A. Provide a minimum of 5% additional material for overage to be used during construction.

B. Contractor to provide 100 square feet of each product and size used to Owner for maintenance and repair. Furnish Pavers from the same production run as installed materials.

C. Manufacture to supply maintenance and reinstatement manuals for Concrete Paver units.

PART 2 PRODUCTS

2.01 *CONCRETE PAVERS*

A. Basis-of-Design Product: The Concrete Paver shapes are based on:

1. As manufactured by:

Unilock
35 Commerce Drive,
Uxbridge MA

Contact: Ashley Allard-LaCroix,
Tel: 508-277-4413
Email: Ashley.Allard-LaCroix@unilock.com

2. Pavers:

a. Paver Finish: FACE-MIX manufacturing process. **NOTE: All FACE-MIX specified below shall be: Premier Smooth Finish.**

b. Exterior Circle: Holland Premier, Smooth Finish | Fossil Color*

1. 4x8 6cm

c. Interior Circle: Premier, Smooth Finish | Steel Mountain Color*

1. Size: 4x8 6cm

* Colors to be finalized by Owner during submittal process at no additional cost.

3. Or Approved Equal

4. The above listed acceptable manufacturer/supplier does not disqualify other substitute manufacturers/suppliers seeking approval. Substitute manufacturers/suppliers must submit literature on the specified product(s) to the Engineer for review and receive approval from the Engineer 5 days prior to the bid date.

5. The above listed as an acceptable manufacturer/supplier does not exclude the contractor from meeting the specifications outlined.

B. Product requirements:

1. Concrete Paver for Exterior Circle: Holland Premier

a. Finish:

1. Smooth (Premier)

b. Color: Fossil Color

c. Edge: CHAMFERED

d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.

1. 4x8 6cm

Note: Imperial dimensions are nominal equivalents to the metric dimensions.

2. Concrete Paver for Interior Circle: Artline Format (Artline 7pc Format)

a. Finish:

1. Use FACE-MIX Manufacturing Process: Premier, Smooth Finish

b. Color: Steel Mountain Color

c. Edge: Chamfer

d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.

1. Size: Artline 7pc 7 size format.

Note: Imperial dimensions are nominal equivalents to the metric dimensions.

C. Exterior Seat Wall with Pillars

1. Main Wall Fascia:

a. U CARA Fascia, or Approved Equal

b. Size: 6" x 18 ½" x 2 3/8"

c. Finish: Premier Smooth Finish

d. Color: Opal Color

e. Note: Contractor is responsible for:

i. Using closed end fascia panels when needed.

ii. Using closed end backer blocks when needed.

2. Wall Accent Fascia for Banding:

a. U CARA Fascia, or Approved Equal

b. Size: 6" x 18 ½" x 2 3/8"

c. Finish: Premier Smooth, FACE-MIX manufacturing process.

d. Color: Midnight Charcoal

e. Note: Contractor is responsible for:

i. Using closed end fascia panels when needed.

ii. Using closed end backer blocks when needed.

3. Wall Coping:

a. Universal Coping

b. Color: Midnight Charcoal

4. Universal Base Unit:

a. Positioning of universal base, when using small back block, run the universal base at its 19" long with a 14" depth. Using the larger backer, rotate Universal base and run 14" long with a 19" depth.

b. Length and depth of the universal base MUST be consistent for the full length of the wall.

5. Walls Submittals and Details to be stamped by a Structural Engineer.

D. Provide pavers meeting the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Efflorescence is not a cause for rejection.

1. Average compressive strength 8000 psi (55MPa) with no individual unit under 7,200 psi (50 MPa).

2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.

3. Conforming to ASTM C 1645 when tested for freeze-thaw requirements.

4. Height tolerances +/- 3.2 mm (1/8 in).

E. Accept only pigments in concrete pavers conforming to ASTM C 979.

Note: ACI Report No. 212.3R provides guidance on the use of pigments.

E. Maximum allowable breakage of product is 5%.

2.02 *JOINT SAND*

A. Provide natural Joint Sand as follows:

1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

2. Do not use limestone screenings, stone dust, or sand for the Joint Sand material that does not conform to conform to the grading requirements of ASTM C 33.

3. Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

4. Gradation as shown in Table 1 below:

TABLE 1 – JOINT SAND
GRADATION REQUIREMENTS FOR JOINT SAND

ASTM C 144		
Sieve Size	**Natural Sand Percent Passing**	**Manufactured Sand Percent Passing**
No. 4 (4.75 mm)	100	100
No. 8 (2.36 mm)	95 to 100	95 to 100
No. 16 (1.18 mm)	70 to 100	70 to 100
No. 30 (0.600 mm)	40 to 75	40 to 75
No. 50 (0.300 mm)	10 to 30	20 to 40
No. 100 (0.150 mm)	2 to 15	10 to 25
No. 200 (0.075)	0 to 1	0 to 10

2.03 *POLYMERIC JOINT SAND*

A. Provide Polymeric Joint Sand as manufactured by:

1. POLYBIND G2, by Alliance, Or Approved Equal

   a. Product Type: Dry mix, contains polymeric binding agent, activated with water.

   b. Color: Oxford Grey Color

2. Techniseal Next Gel Sand, HP Grey

   a. Product Type: Dry mix, contains polymeric binding agent, activated with water.

   b. Color: HP Grey

B. Provide Polymeric Joint Sand meeting the minimum material and physical properties as follows:

1. Compression Strength: proven resistance to compression of 550 PSI after drying for 7 days under controlled conditions (73°F (23°C) at 50% humidity).

   a. Test sand sample shape: cylinder (2” (5 cm) dia. X 4” (10 cm) high).

2. Gradation as shown Table 1 above.

2.04 *SETTING BED SAND*

A. Provide Setting Bed Sand as follows:

1. Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

2. Do not use limestone screenings, stone dust, or sand material that does not conform to conform to the grading requirements of ASTM C 33.

3. Do not use mason sand or sand conforming to ASTM C 144.

4. Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

5. Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 2 below:

TABLE 2 – SETTING BED SAND
GRADATION REQUIREMENTS FOR SETTING BED SAND

ASTM C 33	
Sieve Size	**Percent Passing**
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

Note: Coarser sand than that specified in Table 1 above may be used for joint sand including C 33 material as shown in Table 2. Use material where the largest sieve size easily enters the smallest joints. For example, if the smallest paver joints are 2 mm wide, use sand 2 mm and smaller in particle size. If C 33 sand is used for joint sand, extra effort may be required in sweeping material and compacting the pavers in order to completely fill the joints.

2.05 *BASE AGGREGATE*

A. Provide Base Aggregate materials conforming to ASTM D 2940 and gradation requirements as presented in Table 3.

TABLE 3
BASE AGGREGATE
GRADATION REQUIREMENTS

ASTM D 2940	
Sieve Size	**Percent Passing**

2 in (50 mm)	100
1-1/2 in (37.5 mm)	95 to 100
3/4 in (19 mm)	70 to 92
3/8 in (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (600 µm)	12 to 25
No. 200 (75 µm)	0 to 8*

* In order to prevent damage by frost heaving, it may be necessary to limit the percentages of material passing the No. 200 sieve to less than shown in the tables.

2.06 *SUBBASE*

A. Contractor to Provide Subbase Aggregate as designed per the Structural Engineer.

B. See table gradation requirements.

2.07 *GEOTEXTILE*

A. Provide Geotextile material conforming to the following performance characteristics, measured per the test methods referenced:

1. 4 oz., nonwoven needle punched geotextile composed of 100% polypropylene staple fibers that are inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids.

2. Grab Tensile Strength: ASTM D 4632: 115 lbs.

3. Grab Tensile Elongation: ASTM D 4632: 50%

4. Trapezoidal Tear: ASTM D 4533: 50 lbs.

5. Puncture: ASTM D 4833: 65 lbs.

6. Apparent Opening Size: ASTM D 4751: 0.212 mm, 70 U.S. Sieve

7. Permittivity: ASTM D 4491: 2.0 sec -1

8. Flow Rate: ASTM D 4491: 140 gal/min/s.f.

B. As supplied by Unilock- 35 Commerce Dr, Uxbridge MA, or approved equal.

C. Contact Ashley Allard-LaCroix (508-277-4413 ashley.allard-lacroix@unilock.com)

1. Mirafi – 140N, Or Approved Equal

2.08 *EDGE RESTRAINTS*

A. Granite Stone with Radius Edge Restraint to be supplied and installed as indicated in details.

2.09 *ACCESSORIES*

A. Paver Cleaners for Efflorescence:

1. Supplier: Unilock – 35 Commerce Dr, Uxbridge MA, or Approved Equal.

Contact: Ashley Allard-LaCroix (508-277-4413 ashley.allard-lacroix@unilock.com)

PART 3 EXECUTION

3.01 *EXAMINATION*

A. Examine areas indicated to receive paving for compliance with requirements for installation tolerances and other conditions affecting performance for the following items before placing the Concrete Pavers.

1. Verify that subgrade preparation, compacted density and elevations conform to specified requirements.

2. Verify that Geotextiles have been placed according to drawings and specifications.

3. Verify that the Base and Subbase Aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.

4. Contractor to provide written density test results for soil subgrade, Base and Subbase Aggregate materials to the Owner and Engineer.

5. Verify location, type, and elevations of edge restraints, concrete curbing, concrete collars around utility structures, and drainage inlets.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Beginning of Bedding Sand and Concrete Paver installation signifies acceptance of Base and edge restraints.

3.02 *PREPARATION*

A. Verify that the subgrade soil is free from standing water.

C. Stockpile Setting Bed Sand, Joint Sand, Base and Subbase Aggregate materials such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.

D. Remove any excess thickness of soil applied over the excavated soil subgrade to trap sediment from adjacent construction activities before placing the Geotextile and Subbase Aggregate materials.

E. Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all Geotextile, Joint Sand, Setting Bed Sand, Base and Subbase Aggregate materials contaminated with sediment with clean materials.

F. Complete all subdrainage of underground services within the pavement area in conjunction with subgrade preparation and before the commencement of Base or Subbase Aggregate construction.

F. Prevent to damage underdrain pipes, overflow pipes, observation wells, or inlets and other drainage appurtenances during installation. Report all damage immediately.

G. Compact soil subgrade uniformly to at least 95 percent of Standard Proctor Density per ASTM D 698 for pedestrian areas. Compact soil subgrade uniformly to at least 98 percent Modified Proctor per ASTM D 1557 for vehicular areas. Stabilization of the subgrade and/or base material may be necessary with weak or saturated subgrade soils.

H. Backfill all service trenches within the pavement area to the sub- grade level with approved material placed in uniform lifts not exceeding 4 in. (100 mm) loose thickness. Compact each lift to at least 100 percent Standard Proctor Density as specified in ASTM D 698.

I. Trim the subgrade to within 0 to ½ in. (0 to 13mm) of the specified grades. Do not deviate the surface of the prepared subgrade by more than 3/8 in. (10mm) from the bottom edge of a 39 in. (1m) straight edge laid in any direction.

J. Proof-roll prepared subgrade according to requirements in Division 31 Section "Earth Moving" to identify soft pockets and areas of excess yielding. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting and replace with compacted backfill or fill as directed by the Engineer.

K. Do not proceed with further pavement construction, under any circumstances, until the subgrade has been inspected by the Architect/Engineer.

Note: Base compaction of the subgrade soil shall be performed. Contractor to inspect subgrade preparations, elevations and conduct density tests for conformance to specifications.

3.03 *INSTALLATION*

A. EDGE RESTRAINTS

1. Provide concrete edge restraints as indicated.

a. Install job-built concrete edge restraints to comply with requirements in Division 3 Section "Cast-in-Place Concrete."

b. Provide concrete edge restraint along the perimeter of all paving as indicated. Install the face of the concrete edge restraint, where it abuts pavers vertical down to the subbase.

c. Construct concrete edge restraint to dimensions and level specified and support on a compacted subbase not less than 6 in (150 mm) thick.

B. GEOTEXTILES

1. Provide separation geotextile on bottom and sides of prepared soil subgrade. Secure in place to prevent wrinkling or folding from equipment tires and tracks.

2. Overlap ends and edges a minimum of 18 in. (450 mm) in the direction of drainage.

C. BASE AND SUBBASE AGGREGATE

1. Provide the Subbase Aggregate in uniform lifts not exceeding 6 in., (150 mm) loose thickness and compact to at least 100 percent Standard Proctor Density as per ASTM D 698.

2. Compact the Subbase Aggregate material with at **least three (3) passes** in the vibratory mode then at **least three (3)** in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.

3. Tolerance: Do not exceed the specified surface grade of the compacted Subbase Aggregate material more than ±3/4 in. (20 mm) over a 10 ft. (3 m) long straightedge laid in any direction.

4. Provide the Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Subbase Aggregate (or Subgrade) material and compact to at least 100 percent Standard Proctor Density as per ASTM D 698.

5. Compact the Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.

6. Tolerance: Do not exceed the specified surface grade of the compacted Base Aggregate material more than ±3/8 in. (10 mm) over a 10 ft. (3 m) long straightedge laid in any direction.

7. Compact and grade the upper surface of the base sufficiently to prevent infiltration of the bedding sand into the base both during construction and throughout its service life. Blend segregated areas of the granular base by the

application of crushed fines that have been watered and compacted into the surface.

D. SETTING BED SAND

1. Provide, spread and screed Setting Bed Sand evenly over the compacted Base Aggregate course.

   a. Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.

   b. Screed only the area which can be covered by pavers in one day.

   c. Do not use Setting Bed Sand material to fill depressions in the base surface.

2. Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.

3. Screed Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards. Maintain in a loose condition slightly ahead of the paving units and fully protect against incidental compaction following screeding. Loosen compacted sand by rain or screeded sand left overnight before further paving units are placed.
4. Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.

E. CONCRETE PAVERS

1. Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

2. Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures. (Color variation occurs with all concrete products. This phenomenon is influenced by a variety of factors, e.g. moisture content, curing conditions, different aggregates and, most commonly, from different production runs. By installing from a minimum of three (3) bundles simultaneously, variation in color is dispersed and blended throughout the project).

3. Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.

4. Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.

5. Use string lines or chalk lines on Setting Bed Sand to hold all pattern lines true.

6. Set paver surface elevation a minimum of 3 mm (1/8 inch) to a maximum of 6 mm (1/4 inch) above adjacent drainage inlets, concrete collars or channels (provided the change in slope does not impede or alter the drainage or direction of flow).

7. Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.

    a. When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

8. Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

9. Prevent joint (bond) lines from shifting more than ±1/2 in. (±13 mm) over 50 ft. (15 m) from string lines.

10. Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

11. Cut Concrete Pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

12. Prevent all traffic on installed Concrete Pavers until Joint Sand has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint Sand material.

13. Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

    a. After edge pavers are installed and there is a completed surface or before surface is exposed to rain.

    b. Compact installed Concrete Pavers to within 6 feet (2 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed Sand from becoming disturbed.

14. Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.

15. Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint Sand material.

F. JOINT SAND

1. Provide, spread and sweep dry Joint Sand into joints immediately after vibrating pavers into Setting Bed Sand course until full. Vibrate pavers and add Joint Sand material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.

2. Leave all work to within 3 ft. (1 m) of the laying face fully compacted with sand-filled joints at the completion of each day.

3. Remove excess Joint Sand broom clean from surface when installation is complete.

4. Polymeric Joint Sand

   a. Install Polymeric Joint Sand per manufacturers recommended instructions.

   b. Polymeric Sand to be: POLYBIND G2 by Alliance – Add Oxford Grey Color, or approved equal.

3.04 *FIELD QUALITY CONTROL*

A. Verify final elevations for conformance to the drawings after sweeping the surface clean.

1. Prevent final Concrete Paver finished grade elevations from deviating more than ±3/8 in. (±10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.

B. Lippage: Paver-to-Paver Lippage:

1. No greater than 1.5 mm (1/16 inch) difference in height between adjacent pavers.

3.05 *REPAIRING, CLEANING, AND SEALING*

A. Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

B. Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.

1. Clean Concrete Pavers in accordance with the manufacturer's written recommendations.

2. Note: Contractor to responsible for purchasing and using commercially available cleaners to remove efflorescence deposits. Contractor shall strictly adhere to manufacturer recommendations to ensure pavers are not damaged during this cleaning process.

C. Wall Sealant for Unilock, or approved equal, Walls Only:

1. One sample product of each shall be ordered by the Contractor. Contractor to stain a 2ft x 2ft sample section of non-visible wall **before full sealant is applied**. **Owner and Engineer to be notified for visual inspection and approval of selected sealant.**

2. Engineer to provide selected product via the submittal process.

3. Sealants:

a. SEK Surebond SB-1300 Natural look, water-based, or approved equal.

b. Alliance Gator Natural look Signature series, or approved equal.

3.06 *PROTECTION*

A. Protect completed work from damage due to subsequent construction activity on the site.

END OF SECTION

REVISED ADDENDUM 1

STAND ALONG WALL - UNILOCK WITH SPILLERS AND COPING STONE. HEIGHT =21"

GRANITE SEAT WALL HEIGHT = 21" POLISHED FINISH ROUNDED EDGES

MEMORIAL SIGNS (TYP.)

NRB1 - 225 VICTOR STANLEY CURVED ORNAMENTAL BENCH WITH BACK REST. TYPICAL.

4X6 6CM PREMIER SMOOTH FINISH FOSSIL COLOR

ARTLINE FORMAT PREMIER SMOOTH FINISH STEEL MOUNTAIN COLOR

DO NOT ENTER SIGNS

VERSA-LOK WALL WITH PILLARS AND COPING STONE OR APPROVED EQUAL. MAXIMUM HEIGHT OF 30"

STOP SIGN

PARK SIGNS

ONE WAY SIGN

ADA PARKING SIGNS PAINTED SPACES AND SYMBOLS

STOP SIGN

PAINTED NO PARKING DROP OFF AREA

PIP SURFACING

REVISE GATES TO PROVIDE TWO 12-FT WIDE (TOTAL) DOUBLE SWING GATE AND ONE 4-FT WIDE PEDESTRIAN GATE.

PUSH BUTTON ACTIVATOR SHALL BE PROVIDED FOR THE SINGLE PEDESTRIAN GATES.

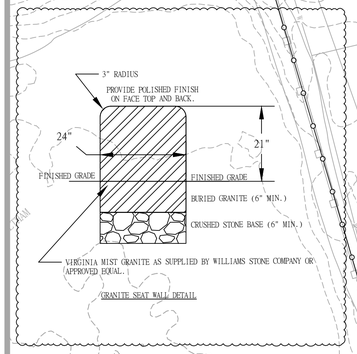
ONE WAY SIGN

ADA PARKING SIGNS PAINTED SPACES AND SYMBOLS

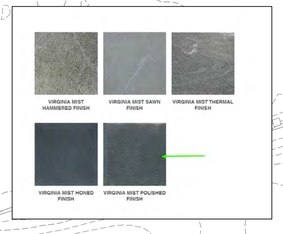
DO NOT ENTER SIGN

PAINTED CROSS WALKS AND DIRECTIONAL ARROWS (TYP.)

PICK-UP AND DROP-OFF ONLY. DO PARKING



GRANITE SEAT WALL DETAIL



NOTE:

1. CONTRACTOR TO PROVIDE THREE ADDITIONAL SIGNS OF EACH KIND.

A. ADA PARKING
B. STOP SIGN
C. DO NOT ENTER SIGN
D. ONE WAY SIGN
E. NO PARKING DROP OS SIGN.

2. BID PRICE SHALL BE ALL INCLUSIVE OF INSTALLATION. IF SIGNS ARE NOT INSTALLED THEY SHALL BE PROVIDED TO THE CITY.

3. CONTRACTOR SHALL PROVIDE ALL PAVEMENT STRIPING INCLUDING BUT NOT LIMITED TO CROSSWALKS, DIRECTIONAL ARROWS, ADA STRIPING ETC.

4. CONTRACTOR SHALL PROVIDE AND INSTALL ALL OTHER SIGNS AS MAY BE NOTED ON THE LAYOUT AND MATERIALS PLAN.

0 40 80 120

1"=40'-0"

NESRA ENGINEERING
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170 BUNGAY ROAD
NORTH ATTLEBORO
MASSACHUSETTS 02760
MA RI NH ME FL

COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER

PROJECT

FERNALD PROPERTY IMPROVEMENTS PROJECT
200 TRAPELO ROAD,
WALTHAM, MA 02452

CLIENT

CITY OF WALTHAM
610 MAIN ST
WALTHAM, MA 02452

NO.	REVISION	DATE

SCALE - AS NOTED
DATE - 10/13/23

PROFESSIONAL SEAL

CLARIFICATION PLAN

SK-1

REVISED ADDENDUM 1

PROVIDE NEW 12" WATER MAIN FROM THE VAULT AS SHOWN. EXISTING WATER METER TO REMAIN. CONTRACTOR TO VERIFY EXACT DEPTH AND LOCATION OF WATER MAIN PRIOR TO INSTALLATION AT NO ADDITIONAL COST. (TYP.)

OPTION 1 OF PAVER COLORS SELECTIONS AND DRAWINGS SECTION IN SPECIFICATIONS.

OPTION 1 OF PAVER COLORS SELECTIONS AND DRAWINGS SECTION IN SPECIFICATIONS.

6-FT Ø PRECAST CONC. OUTLET CONTROL STRUCTURE (2) OUTLET DEVICE IS RECTANGULAR OPENING ON THE VERTICAL PLAIN 12" WIDE 2" HIGH PROVIDE METAL GRATE/TRASH RACK.INV. = 177.00
EMERGENCY SPILLWAY (24" X 24" GRATE ON TOP)
RIM=178.75
INV. OUT (12" RCP)=175.20

4-FT Ø PRECAST CONC. CB
RIM=177.80
INV. OUT (12" RCP)=174.00

3-FT WIDE 2-FT DEEP STONE DIAPHRAGM. PROVIDE 2-FT WIDE CURB OPENING 30-FT ON CENTER FOR WATER FLOW.

4-FT Ø PRECAST CONC. CB
RIM=178.75
INV. OUT (12" RCP)=175.75

4-FT Ø PRECAST CONC. CB
RIM=178.9
INV. OUT (12" RCP)=175.75

6-FT Ø PRECAST CONC. DMH
RIM=178.75
INV. IN (12" RCP A)=175.30
INV. IN (12" RCP B)=175.45
INV. IN (12" RCP C)=175.25
OUT (18" RCP)=173.95

PROVIDE TWO TWO GATE VALVES FOR 12" MAIN

12"X 4" ANCHOR TEE, GATE VALVE, 4" CLDI WATER LINE AND REDUCER TO 3" PROVIDE 2" METER AND BACKFLOW PREVENTER AND IRRIGATION CABINET.

5-FT WIDE 2-FT DEEP STONE DIAPHRAGM. PROVIDE 2-FT WIDE CURB OPENING 30-FT ON CENTER FOR WATER FLOW.

6-FT Ø PRECAST CONC. DMH
RIM=181.20
IN (18" RCP)=172.90
INV. IN (24" RCP)=174.75
INV. OUT (36" RCP)=171.05

6-FT Ø PRECAST CONC. OUTLET CONTROL STRUCTURE (1) PER DETAILS. OUTLET DEVICE IS RECTANGULAR OPENING ON THE VERTICAL PLAIN 38" WIDE 2" HIGH PROVIDE METAL GRATE/TRASH RACK.INV. = 177.00
EMERGENCY OVERFLOW (24"X24" GRATE ON TOP)
RIM=178.75
INV. OUT (12" RCP)=175.50

6-FT Ø PRECAST CONC. DMH RIM=178.00
INV. IN (12" RCP FROM CB. TYP. OF 4)=172.80
INV. OUT (18" RCP)=170.80

6-FT Ø PRECAST CONC. DMH
RIM=182.80
INV. IN (18" RCP)=178.00
INV. IN (12" RCP)=178.00
INV. OUT (24" RCP)=176.00

4-FT Ø PRECAST CONC. CB
RIM=182.50
INV. OUT (12" RCP)=179.00

TOTAL LENGTH OF CHANNEL FROM INVERT TO END IS 200-FT

PROVIDE POSITIVE GRADE WITH A 12 FT WIDE CHANNEL. PROVIDE RIP-RAP CHECK DAMS 25-FT ON CENTER. (MIN. OF 3)

36" RCP
INV.=170.35
PROVIDE FLARED END OUTLET AND RIP-RAP

INVERT PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER) PROVIDE A REDUCER AS NECESSARY TO MAKE THE CONNECTION.

RAIN DIVERTER (SEE SPECIFICATIONS)
INV. IN (10" SDR21)=169.33
A. INV. OUT DRAIN (4" SDR 21)=169.33
B. OUT SEWER (10" SDR 21)=168.92

8"X 4" ANCHOR TEE, GATE VALVE, 4" WATER LINE FOR SPLASH PAD. PROVIDE ENCLOSURE WITH METER, BACK FLOW PREVENTER AND 3/4" IRRIGATION LINE FOR QUICK COUPLER VALVES.

8"X 6" ANCHOR TEE, GATE VALVE, 6" CLDI WATER LINE AND HYDRANT.

8" CLDI WATER MAIN.

6-FT Ø PRECAST CONC. DMH
RIM=178.00
INV. IN (18" RCP)=167.55
INV. IN (12" RCP)=171.52
OUT (18" RCP)=164.95

12"X 8" ANCHOR TEE, GATE VALVE AND NEW 8" CLDI WATER MAIN.

REPLACE EXISTING HYDRANT.

EXTEND 12" WATER MAIN TO END OF NEW ROADWAY CONSTRUCTION. CONTRACTOR TO VERIFY EXACT DEPTH AND LOCATION OF WATER MAIN PRIOR TO INSTALLATION AT NO ADDITIONAL COST. (TYP.)

12" CLDI WATER MAIN.

END 12" WATER MAIN OUTSIDE OF NEW PAVEMENT. PROVIDE GATE VALVE.

12"X 6" ANCHOR TEE, GATE VALVE, 6" CLDI WATER LINE AND HYDRANT.

6-FT Ø PRECAST CONC. CB WITH DOUBLE GRATE
RIM=182.80
INV. OUT (18" RCP)=179.00

18" RCP
INV.=164.00
PROVIDE FLARED END OUTLET AND F

FLARED END OUTLET
18" RCP INV. =159.
PROVIDE METAL RACK
ACCESS.

6-FT Ø PRECAST CON
STRUCTURE. (3)
PRIMARY OUTLET INV
OUTLET CONTROL STR
(INV.=160.50) RECT
VERTICAL PLANE 10"
METAL GRATE/TRASH

18" RCP
INV.=164.50
PROVIDE FLARED EN

¾" TYPE K COPPER LINE TO HAND HOLE W
QUICK COUPLER VALVE. (TYP. OF TWO)

6-FT Ø PRECAST CONC. DMH
RIM=178.00
INV. IN (12" RCP)=169.75
INV. IN (15" RCP)=169.75
OUT (18" RCP)=164.95

4-FT Ø PRECAST CONC. CB
RIM=174.80
INV. OUT (12" RCP)=170.35

6-FT Ø PRECAST SMH
RIM=178.0
INV. IN (TWO 8" SDR21)=175.10
INV. OUT (10" SDR 21)=175.00

¾" TYPE K COPPER LINE TO HAND HOLE WIT
QUICK COUPLER VALVE. (TYP. OF TWO)

6-FT Ø PRECAST CONC. CB WITH DOUBLE GRATES
RIM=174.85
INV. OUT (15" RCP)=170.35

0 30 60 90
1"=30'-0"

NESRA ENGINEERING
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NORTH ATTLEBORO
MASSACHUSETTS 02760
MA RI NH ME FL

COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER

PROJECT

FERNALD PROPERTY
IMPROVEMENTS PROJECT
200 TRAPELO ROAD,
WALTHAM, MA 02452

CLIENT

CITY OF WALTHAM
610 MAIN ST
WALTHAM, MA 02452

NO.	REVISION	DATE
2.	REVISE UTILITY LINES PER CITY ENGINEERING.	9/20/23
1.	REVISE DRAINAGE PER CITY'S REQUEST	9/11/23

SCALE - AS NOTED
DATE - 7/27/23

PROFESSIONAL SEAL

DRAINAGE CLARIFICATIONS

SK-2

Engineering Specification

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

Series 009

Reduced Pressure Zone Assemblies

¼" – 2"

⚠ WARNING

It is illegal to use this product in any plumbing system providing water for human consumption, such as drinking or dishwashing, in the United States. Before installing standard material product, consult your local water authority, building and plumbing codes.

Series 009 Reduced Pressure Zone assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. Specifically, the series protects drinking water supplies from dangerous cross-connections in accordance with national plumbing codes and water authority requirements for non-potable service applications such as irrigation, fireline, or industrial processing.

The series features two in-line, independent check valves, captured springs, and replaceable check seats with an intermediate relief valve. Its compact modular design facilitates maintenance and assembly access. Sizes 1/4" to 1" shutoffs have tee handles.

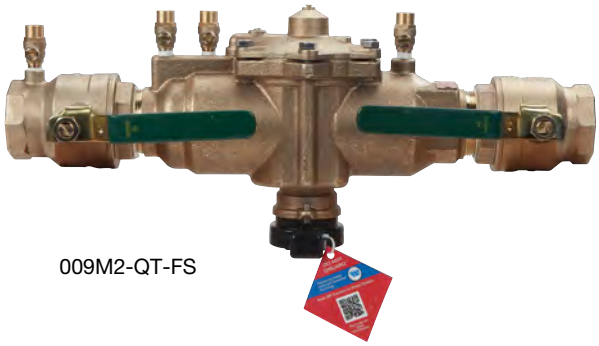
Series 009 assemblies of sizes ½" to 2" include a flood sensor to detect excessive water discharges from the relief valve. The sensor is installed on the assembly exterior and does not alter assembly functions or certifications. The sensor relays a signal that triggers notification to facility who can take corrective action, thus avoiding the possibility of ruinous flooding and costly damage.

NOTICE

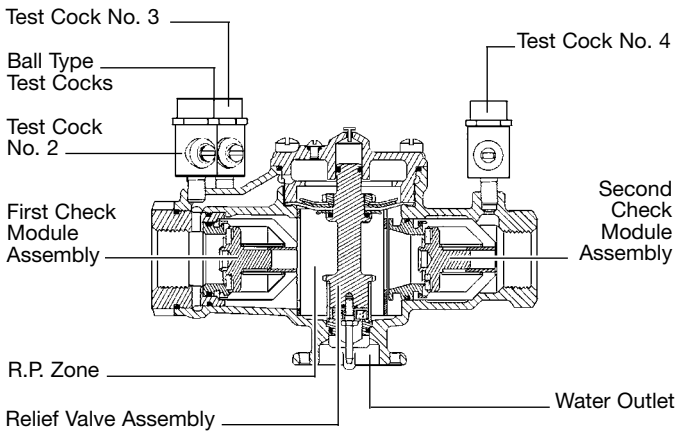
An add-on connection kit is required to activate the flood sensor. Without the connection kit, the sensor is a passive component that has no communication with any other device. (For more information, download RP/IS-009.)

Features

- Single access cover and modular check construction for ease of maintenance
- Top entry to all internals for immediate accessibility
- Captured springs for safe maintenance
- Internal relief valve for reduced installation clearances
- Replaceable seats for economical repair
- Bronze body construction for durability (1/4" – 2")
- Ball valve test cocks — screwdriver slotted (1/4" – 2")
- Large body passages provides low pressure drop
- Compact, space saving design
- No special tools required for servicing
- Sensor on the relief valve for flood detection (1/2" – 2")



009M2-QT-FS



NOTICE

Use of the flood sensor does not replace the need to comply with all required instructions, codes, and regulations related to installation, operation, and maintenance of this product, including the need to provide proper drainage in the event of a discharge.

Watts® is not responsible for the failure of alerts due to connectivity or power issues.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

Inquire with governing authorities for local installation requirements.

WATTS®

Specification

A Reduced Pressure Zone assembly shall be installed at each potential health hazard location to prevent backflow due to backsiphonage and/or backpressure. The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access bronze cover secured with stainless steel bolts. The assembly shall also include two resilient seated isolation valves, four resilient seated test cocks, and an air gap drain fitting. The assembly shall meet the requirements of USC; ASSE Std. 1013; AWWA Std. C511-92; CSA B64.4. Shall be a Watts® Series 009, and shall include a sensor on the relief valve for flood detection.

Model/Option

Prefix:

U	– Union connections (For more information download ES-U009 at watts.com.)

Suffix:

AQT	– Elbow fittings for 360° rotation (3⁄4" – 2")
FS	– Flood detection sensor (½" – 2")
HC	– 21⁄2" Inlet/outlet fire hydrant fitting (2")
LF	– Without shutoff valves
PC	– Internal polymer coating
QT	– Quarter-turn ball valves
S	– Bronze strainer
SH	– Stainless steel ball valve handles

Materials

Bronze body construction, silicone rubber disc material in the first and second check plus the relief valve. Replaceable polymer check seats for first and second checks. Removable relief valve seats. Stainless steel cover bolts.

Standardly furnished with NPT body connections. For optional bronze union inlet and outlet connections, specify prefix U (½" – 2"). Series 009QT furnished with quarter turn, full port, resilient seated, bronze ball valve shutoffs.

Pressure / Temperature

Suitable for supply pressure up to 175 psi (12.1 bar)
Water temperature: 33°F – 180°F (0.5°C – 75°C)

Standards

USC

ASSE No. 1013

AWWA C511-92

CSA B64.4

IAPMO File No. 1563

Approvals

USC-FCCCHR

ASSE, AWWA, CSA, IAPMO

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California

UL Classified ¾" – 2"
(LF models only except 009M3LF)

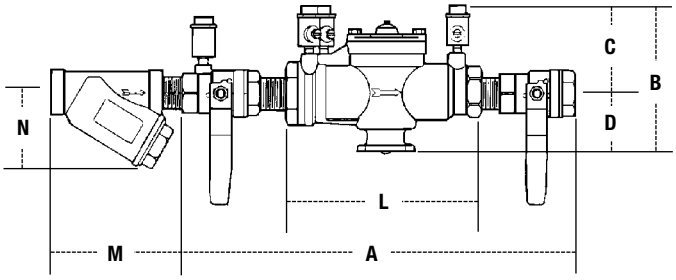
Insulated Enclosure

The WattsBox insulated enclosure is available for Series 009. For more information download ES-WB at watts.com.

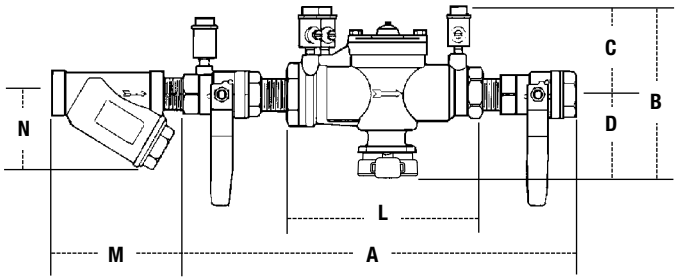
Dimensions — Weight

Call customer service if you need assistance with technical details.

¼" – ⅜"



½" – 2"



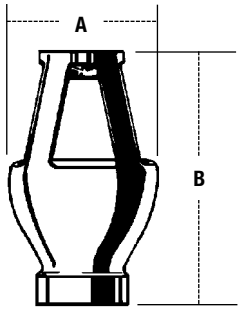
MODEL	DIMENSIONS (APPROX.)										STRAINER DIMENSIONS				WEIGHT	
	A		B		C		D		L		M		N			
in.	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
1/4	10	250	4⅝	117	3⅜	86	1¼	32	5½	140	2⅜	60	2½	64	5	2
⅜	10	250	4⅝	117	3⅜	86	1¼	32	5½	140	2⅜	60	2½	64	5	2
1/2	10	250	5⅞	149	3⅜	86	2½	64	5½	140	2¾	70	2¼	57	5	2
3/4	10¾	273	6¼	159	3½	89	2¾	70	6¾	171	3 3/16	81	2¾	70	6	3
1	14½	368	6¼	159	3	76	3¼	83	9½	241	3¾	95	3	76	12	5
1¼	17⅜	441	6¾	169	3½	89	3¼	83	11⅜	289	4 7/16	113	3½	89	15	6
1½	17⅞	454	6¾	169	3½	89	3¼	83	11⅛	283	4⅞	124	4	102	16	7
2	21⅜	543	8¾	222	4½	114	4¼	108	13½	343	5 15/16	151	5	127	30	13

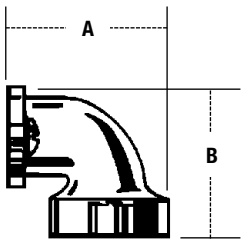
Suffix HC – Fire Hydrant Fittings dimension 'A' = 25"

Air Gaps and Elbows

MODEL	SIZE	DRAIN OUTLET		DIMENSIONS				WEIGHT	
	For 909, 009, and 993			A		B			
		in.	*mm*	*in.*	*mm*	*in.*	*mm*	*lb*	*kg*
909AGA	¼"–½" 009,	½	13	2⅜	60	3⅛	79	0.625	0.28
	¾" 009M2/M3								
909AGC	¾"–1" 009/909,	1	25	3¼	83	4⅞	124	1.5	0.68
	1"–1½" 009M2								
909AGF	1¼"–2" 009M1, 1¼"–3" 009/909, 2" 009M2, 4"–6" 993	2	51	4⅜	111	6¾	171	3.25	1.47
909AGK	4"–6" 909, 8"–10" 909M1	3	76	6⅜	162	9⅝	244	6.25	2.83
909AGM	8"–10" 909	4	102	7⅜	187	11¼	286	15.5	7.03
909ELA	¼"–½" 009, ¾" 009M2/M3	–	–	–	–	–	–	–	–
909ELC	¾"–1" 009/909	–	–	2⅜	60	2⅜	60	0.38	0.17
909ELF*	1¼"-2" 009M1, 1¼"–2" 009/909, 2" 009M2, 4"–6" 993	–	–	3⅝	92	3⅝	92	2	0.91
909ELH* Vertical	2½"–3" 009/909	–	–	–	–	–	–	–	–

* Epoxy coated



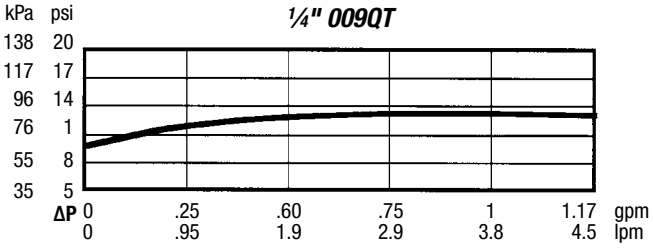


Capacity

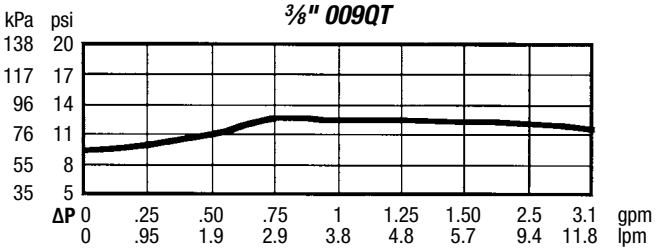
Performance as established by an independent testing laboratory.

The asterisk (*) indicates typical maximum system flow rate (7.5 ft/s, 2.3 m/s).

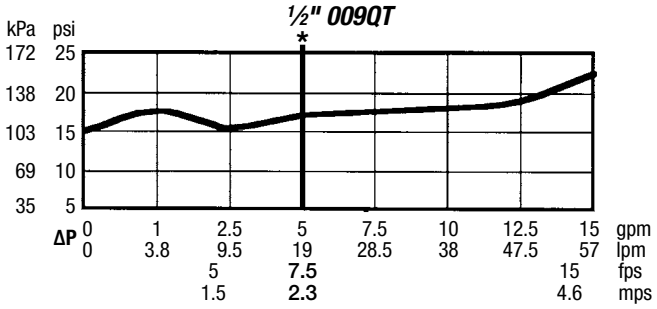
¼" 009QT



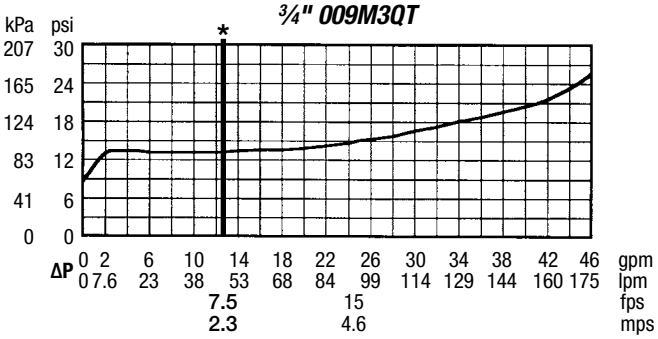
⅜" 009QT



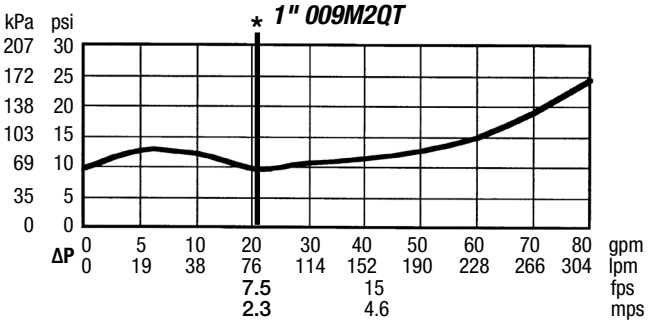
½" 009QT



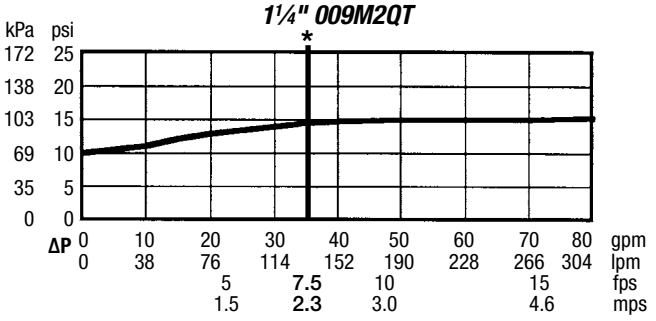
¾" 009M3QT



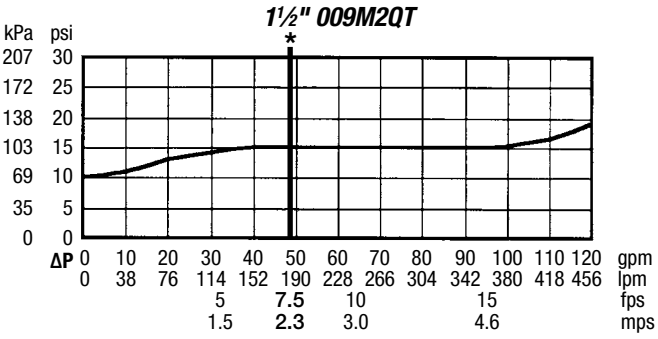
1" 009M2QT



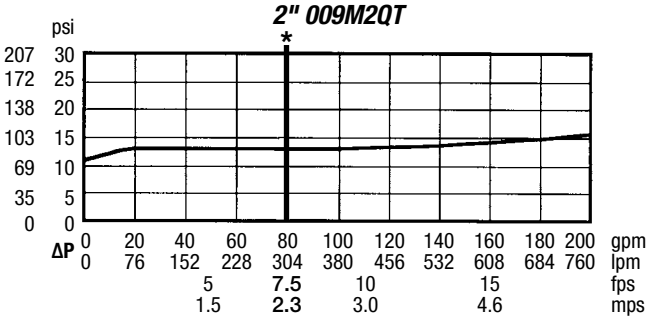
1¼" 009M2QT



1½" 009M2QT



2" 009M2QT



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