Town of Needham, Massachusetts

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Salt Shed Project Feasibility Report and Schematic Design

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Needham Salt Shed Project

Executive Summary

Weston & Sampson is providing this executive summary for the Salt Shed Project Feasibility Study and Schematic Design. In general, the project entailed the assessment of four sites located on or adjacent to the Town's Recycling and Transfer Station (RTS) located at 1407 Central Avenue, for the suitability of the construction of a new salt shed storage structure, along with supporting functions. In addition, the work included the assessment of the various types of salt shed structures available to determine the most appropriate structure type for the Town, as described further below.

Initial Investigations and Program Assessment

Work on the project started with a series of meetings to develop an understanding of the preliminary program space and functional requirements. This process was initiated by having a series of program related questions answered by the Town, which are provided in Appendix A, followed by several meetings to further refine the Town's requirements. In general, the following initial program requirements were identified:

- Storage capacity of 5,000 tons of salt and 300 tons of sand
- Provide a covered area for truck loading operations
- Accommodate storage of 3,000 gallons of liquid de-icing chemicals with appropriate spray and distribution system
- Provide covered canopy storage for snow fighting equipment including plows, trucks and sand/salt spreader bodies
- Provide a +/- 800 square foot pre-fabricated operations building to accommodate snow fighting personnel and support functions

Work also included the review of existing site plans and reports.

Site Alternatives Assessment

Following the development of the initial program requirements several potential sites were assessed to determine the most appropriate location for the new facility. The following initial sites were identified:

- Compost Area
- Materials Handling Area
- Eastern "7-Acres" Site
- Transfer Station "Seam Site"

The Compost Area was ruled out early in the process due to several factors which include the lack of a viable alternative location for this operation which needs to be maintained, DEP permitting issues with the landfill cap in this area, and proximity to wetlands. The Materials Handling Area was also ruled out early in the process because there is no other viable alternative location for this operation, which also needs to be maintained on site. The results of these findings, along with additional details, were presented to the Permanent Public Building Committee (PPBC) on April 30th, a copy of which is provided in Appendix B.

The Eastern Site and the Transfer Station Seam Site were retained for further analysis. Due to the known presence of wetlands on the Eastern Site, Weston & Sampson had the wetlands in this area flagged by a wetland scientist, and then had the wetland flag locations surveyed. Additional details regarding the wetlands delineation, along with the Department of Environmental Protection forms required by 310 CMR 10.55, are included in Appendix C. In addition to wetlands delineation, Weston & Sampson also prepared Environmental Receptor, Human Impact, and Solid Waste Facility Maps using the Massachusetts GIS Data Base, a copy of which are included in Appendix D.

Using the new wetland limits that were identified, a site development alternative was developed for the Eastern Site which minimized impacts to the 100 foot wetland buffer zone, as shown in Appendix E. As shown in this figure, there are steep grades present at the site and numerous bedrock outcrops were observed throughout the site. Based on the site grading and presence of bedrock, it was estimated that up to 16,000 cubic yards of bedrock may need to be removed from the site which could cost on the order of $800,000 or more to remove. In addition to ledge removal costs associated with this alternative, there would also be wetland permitting requirements, noise issues with the neighbors, a potential zoning variance, and truck traffic congestion at the site entrance that would all need to be addressed. For these reasons, the Eastern Site was not considered for further evaluation.

The Seam Site was selected as the preferred development site for the project, and was further assessed. The benefits of this site include the following:

- Greater distance from abutting residential properties
- Pre-existing road is largely independent of the RTS operations
- Greater distance from wetlands (no wetland permitting requirements)
- Pre-disturbed site
- Lower cost to develop

The results of this assessment and the selection of the seam site were also addressed in our April 30th PPBC meeting included in Appendix B.

Weston & Sampson also prepared a preliminary zoning analysis, which is included in Appendix F. As indicated in this zoning analysis, the site has a maximum allowable building height of 40 feet, and it is anticipated that the required structure height will be approximately 45 feet, and a variance will be required. In addition, because the project will involve the construction of over 10,000 SF of gross floor

area, the project will likely be classified as a Major Project which will require a Special Permit from the Planning and Design Review Boards, along with Site Plan Review. Also, because the site is located on a transfer station, it is anticipated that a BWP SW07 Modification to a Large Handling Facility Permit will need to be obtained from the Department of Environmental Protection (DEP).

Weston & Sampson also prepared a preliminary building code review, which is also included in Appendix F. As indicated in this review, fire suppression systems are not typically required for salt sheds, however this should be verified with the Town's Fire Department.

Site Development Alternatives and Cost Estimates

Through a series of working meetings with the Town seven development alternatives were prepared and assessed along with the preparation of several cost estimates for the Seam Site to help guide the decision making process. Site plans for the seven alternatives for the Seam Site are provided in Appendix G, and it was determined that alternative number seven was the preferred alternative.

The estimated cost for the full program assuming a High Arch Gambrel type structure and a Fabric type structure was prepared for comparison purposes. A cost estimate for a dome style structure was not prepared, as it was decided early on that this style of salt shed structure would not fit with the site constraints and operational needs. The cost estimate for the full program with a High Arch Gambrel type structure was estimated at approximately $2.3 M and the full program cost assuming a Fabric Type Structure was approximately $2.2M.

Weston & Sampson performed a comparative analysis of the High Arch Gambrel structure versus the Fabric type structure, and as discussed with the Town it was decided that the High Arch Gambrel structure was the preferred building type for the following reasons:

- More durable building
- Longer warranty (30 year on roof vs. 10 year on fabric)
- Better suited for installing attached canopy structures
- Relatively small cost differential (about $100K)
- Increased footprint required for a fabric structure

As discussed during the working meetings and the April 30th PPBC meeting, the cost for the full program of about $2.3M described above exceeded the $1.5 M budget for the project. In order to further assess the program and costs, the cost estimate for the various project components were broken out to identify what core components could fit within the $1.5M budget, including soft costs, and what components would require funding beyond the $1.5M limit. Through this process it was identified that 3,500 tons of salt storage could be provided along with the necessary site development and soft costs for the $1.5M budget, and it was agreed that this would meet the Town's salt storage and loading needs.

It was also agreed that due to budget constraints, that the amount of canopy area be scaled back to 2,400 SF from the original plan of 10,800 SF, and that this canopy would be listed as a bid alternate under the project. In addition, the Town will dispose of non-contaminated excess fill generated during the work and will provide structural fill for the project by processing/re-using existing on-site soils, to meet structural fill requirements. Also, to further reduce costs, the Operations Building was removed from the project at this time, with possible installation at a later date. Copies of selected cost estimates that were prepared during the alternatives selection process are included in Appendix H, and copies of minutes from selected meetings are included in Appendix I.

Preliminary Subgrade Assessment and Additional Costs

Following the establishment of the building location, type, and general size/layout, test pits were performed in the proposed development area to assess subgrade conditions. The test pit results, which are summarized in a memorandum dated May 24, 2012 in Appendix J, indicate that fill materials are present on site at depths ranging from approximately 6.5 feet to over 14 feet deep, which was the excavation limit of the backhoe being used to excavate the test pits. As described in the May 24th memorandum, the non-native fill material that was encountered is not suitable for supporting building foundations due to the potential for variable rates of compression and decomposition of organic materials that were encountered. It was observed that bedrock was present in two of the test pits at depths of approximately 6 to 8 feet below grade.

Following the test pitting program, borings were performed on site to further assess the fill materials and the depth to bedrock. The results of this boring program are summarized in a memorandum dated June 7, 2012, which is also included in Appendix J. As indicated in this June 7th memorandum, bedrock was encountered beneath the fill materials at depths ranging from approximately 11 feet to 15 feet below grade. In addition, at one boring location, a strong petroleum odor was encountered approximately eight feet below grade and an approximate reading of 2,000 parts per million was obtained from the soil using a photo-ionization detector (PID). This elevated PID reading along with the petroleum odor, indicate that the soil in this area is likely to be impacted with petroleum. Lower PID readings were also obtained at the other boring locations, along with a slight petroleum odor, indicating that lightly petroleum impacted soils may be present at these locations.

Following the review of several alternatives with the Town, it was decided that a rammed aggregate pier (RAP) supported foundation would be used to extend down through the compressible fill materials to the firm undisturbed bedrock below. In addition, it was also decided for preliminary budgeting purposes, to assume that all impacted soil to be removed from the site would need to be tested and transported to an in-state landfill for disposal purposes.

Based on preliminary analysis, it is estimated that a RAP foundation system will add approximately $250,000 to the base project cost. In addition, handling and removal of petroleum impacted soil from the site could add approximately $165,000 to $400,000 which would include the anticipated soil and

groundwater sampling and assessment, removal and disposal of impacted soil, along with the necessary support documentation that is required in accordance with the Massachusetts Contingency Plan. Additional details regarding the environmental costs are included in a memorandum in Appendix K.

Adding the foundation and environmental requirements to the project gives a total project cost of approximately $1,915,000 - $2,150,000. If it is decided to include the end mounted canopy, additional funding in the amount of $96,000 should be allocated, as shown in Appendix H.

Please note that the budgetary figures being provided are preliminary figures only for initial planning purposes. These figures will be further assessed during the final design phase of the project. Due to the unknowns at this time involved with the environmental work, and because the final design has not yet been completed, it is recommended that the higher end of this range be used for initial budgeting purposes. Funding would then only be used as needed as the project progresses.

Schematic Design Drawings

Using the preferred alternative, Alternate No. 7, schematic design drawings were prepared. These drawings include a conceptual layout and drainage plan, building cross sections, building elevations, and details, and are included in Figures 1 through 5.

Chapter 90 Funding

The Town has been in discussions with the State regarding the use of Chapter 90 funding. At this time it is anticipated that the main salt shed and canopy structure will be eligible for Chapter 90 funding, and it is also possible that the paved approach aprons and other site development/drainage features will also be covered. It is not yet known if the pile foundation system or the handling of impacted soils will be covered, and this will be further assessed with the State by the Town.

Schedule

The following schedule for the project is anticipated:

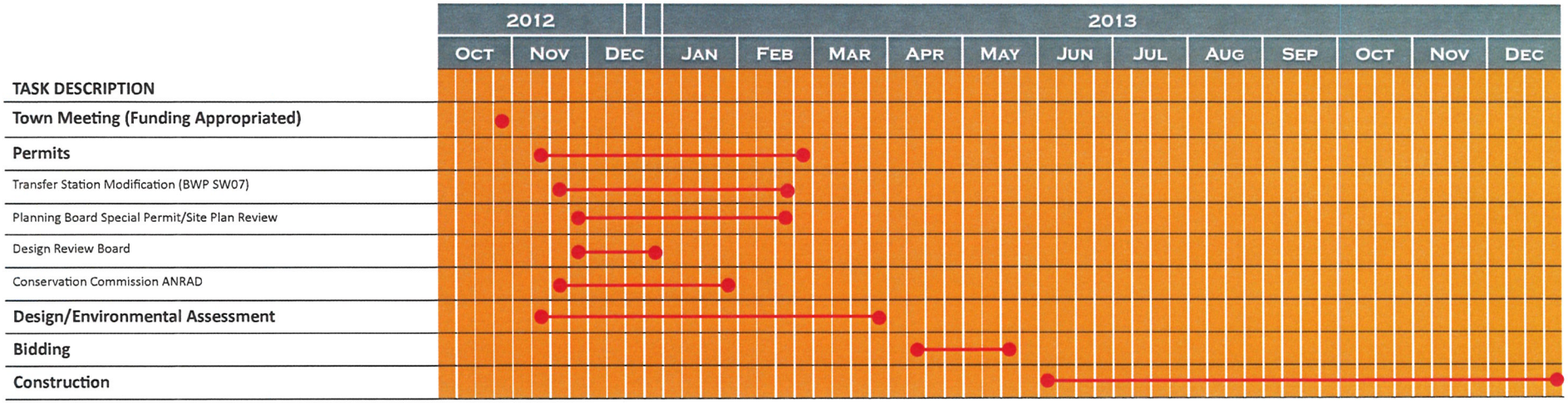
- Complete Schematic Design — August 10, 2012
- Town Meeting (funding appropriated) — October 29, 2012
- Submit Permit Applications (see note below) — November 2012
- Obtain Permits (see note below) — February 2012
- Design Complete/Start Bidding — March 2013
- Start Construction — June 2013
- Construction Complete — December 2013

A milestone schedule is also attached for reference. In addition, based on recent discussions with the Town, it may be decided to have the environmental work funded under a separate warrant article, and performed in advance of the salt shed project. If remediation is extensive, the salt shed project may be delayed, and an alternate schedule will be established.

Note that during the design process several permits will need to be obtained, as discussed above, which include:

- Transfer Station Modification Permit (BWP SW 07), which is obtained from the DEPs solid Waste Group and has a review period of about 3 months, which is comprised of an initial Administrative Review (24 day review period) followed by a Technical Review (72 day review period). If necessary, a second technical review could be required by the DEP, however we would work closely with DEP to help avoid this.
- A Zoning variance for the structure height of 45 feet will be needed. The variance would need to be obtained from the Town's Board of Appeals. As discussed with the Town, it is our understanding that this process is addressed through the Special Permitting process described below.
- Planning Board Special Permit/Site Plan Review for Major Project (greater than 10,000SF) will also be needed in accordance with Section 7.4.4 of the Zoning By-Laws. Note that this section indicates that the structure height variance would need to be secured in advance of filing the Site Plan Review application, however as discussed with the Town we understand that the height variance can be addressed concurrently/through the Special Permit process. The Planning Board has a 75 day review time frame.
- Review and approval will also be needed by the Design Review Board.
- Note that the permitting process should be verified by the Town reviewing authorities, and it is assumed that the permits can be filed, processed simultaneously, and obtained within approximately 3 months.

Needham Salt Shed Project
Draft Schedule



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