

MEMORANDUM

TO: Brockton Planning Board

FROM: Shawn M. Martin, PE, CNU-A 

DATE: October 5, 2015

RE: Site Plan Review
Brockton Power LLC Natural Gas Power Plan
Industrial Boulevard, Brockton, MA

At the Planning Board's request, Fuss & O'Neill has reviewed the following electronic copies of documents provided to us by the applicant's engineer, J.K. Holmgren Engineering, Inc. and the Brockton City Solicitor for a Site Plan Review application:

- Application for Site Plan Approval prepared for Brockton Power, LLC by J.K. Holmgren Engineering, Inc. dated May 8, 2015.
- A project narrative entitled "Summary of Proposed Work and Demonstration of Compliance with Site Plan Approval Criteria" prepared by Brockton Power, LLC dated May 2015.
- Drawings entitled "Proposed Natural Gas Power Plan" prepared for Brockton Power Company LLC by J.K. Holmgren Engineering, Inc. dated May 1, 2015 and revised July 6, 2015 (21 sheets).
- Report entitled "Massachusetts Stormwater Management Report and Stormwater Runoff Management Calculations in Support of Site Plan Review for Brockton Power LLC" prepared by J.K. Holmgren Engineering, Inc. dated May 23, 2015 and revised June 4, 2015. Numerous separate electronic documents were included with this package, some of which were not signed or dated. We reviewed the following documents:
 - Unsigned and undated "Massachusetts Stormwater Management Report and Stormwater Runoff Management Calculations in Support of Site Plan Review for Brockton Power LLC" prepared by J.K. Holmgren Engineering, Inc." The document includes DEP stormwater forms, USGS Map, and hydrology calculations for the 2-year design storm event and a portion of the 10-year event. We limited our review of this document to the hydrology calculations, which are sequentially part of the hydrology calculations provided as separate files.
 - Signed letter from J.K. Holmgren Engineering, Inc. dated July 10, 2015. The letter summarizes changes to the hydrologic analysis and an assessment of the potential effects of the Oak Hill Way watershed on proposed Detention Basin #2, which is planned to receive stormwater from an existing 30-inch drain pipe that passes through the project site to wetlands abutting the Salisbury Plan River. There were no maps or

MEMO – Brockton Planning Board
October 5, 2015
Page 2 of 8

calculations provided with the summary to determine whether the assumptions or conclusions are accurate.

Our review has been specifically limited the scope of Site Plan Review requested by the Planning Board under the City of Brockton Zoning Bylaw. We have not evaluated any aspect of the project that pertains to air quality, facility design, and related standards that are under the authority of the Massachusetts Department of Environmental Protection, including any of its affiliated offices, such as the Energy Facilities Siting Board, or any federal agency, such as the Environmental Protection Agency. The review is limited to an evaluation of the documents provided and does not include independent calculations, investigations, a traffic study, or similar services.

We understand the subject site is located within the I-3 Heavy Industrial Zoning District and abuts other I-3 properties to the north and east with frontages on Industrial Boulevard or Oak Hill Way. The site abuts the Salisbury Plain River and properties within the C-2 General Commercial Zone to the east.

Based upon our review of the documents cited above, we have prepared the following comments and recommendations to assist the Planning Board with its decision.

General

1. Describe the types of materials that will be stored on the site and exposed to precipitation.
2. Discuss the potential need for remote fire alarm notification equipment either on or adjacent to the site in Industrial Boulevard.
3. Provide approval from the wastewater treatment facility operator for the proposed improvements related to the reclaimed wastewater use and return water. The City will need to grant a license, or other agreement, with stipulations for the operation and maintenance of the reclaimed water supply system, effluent quality, etc. The proposed supply and return pipes are adequately-sized for the projected average flowrates included in the project narrative.
4. Provide fire flow demand information and performance calculations for the water supply system during fire flows, process water demand, and under conditions when the facility may need to rely entirely upon the public water supply for cooling water.
5. Provide a long-term Operation and Maintenance Plan conforming to Standard 9 of the MA Stormwater Handbook. The plan should be in report format to allow recording in Land Evidence and use at the facility. Revise the maintenance notes on the drawing to be consistent with the MA Stormwater Handbook.
6. Provide a truck turning analysis depicted on a site plan as request by the Fire Department.



MEMO – Brockton Planning Board

October 5, 2015

Page 3 of 8

Site Plans

1. All drawings must be signed and sealed by the appropriate professional engineer, land surveyor, or landscape architect.
2. Sheet C-4: Relocate parking bay containing ADA spaces easterly to align crossing area with walkway. Provide a crosswalk eight to ten feet in width and an ADA ramp on the opposite side of the road. Reduce the driveway width to 24 feet along the parking bay, consistent with the driveway width east of this location, to improve pedestrian safety while crossing the driveway. Include ADA ramps and detectable warning devices along accessible routes and provide both ramp and sign details. Include end islands where parking bays abut driveways to minimize potential conflicts and a protected area for pedestrians, including spaces allocated at the south end of the power plant building.
3. Sheet C-4: Increase the width of the ADA spaces from eight feet to nine feet (Section 27-53).
4. Sheet C-4: Show the locations of designated loading areas (Section 27-53).
5. Sheet C-4: Provide sidewalks along anticipated pedestrian routes for employees to plant entrances.
6. Sheet C-4: The proposed driveway and parking area is presumed to be bituminous concrete pavement as shown on the detail on Sheet C-14. However, labels were not found on the site plan.
7. Sheet C-4: Specify the types and intended use of the gates at the west entrance, which seem to create a “holding area” between them. The gate nearest the street may cause queuing in Industrial Boulevard if it is used for access. A gate is not shown at the east entrance, but seems necessary to maintain plant security and would likely include card access capability. Any gate at this entrance should be placed interior to the site to provide vehicles a queuing area while passing through the gate to avoid blocking any portion of Industrial Boulevard.
8. Sheet C-4: Provide security lighting at the entrance gates. Will the gates and other areas of the facility be monitored on CCTV?
9. Sheets C-4: Site distance appears to be partially obstructed at Industrial Boulevard from the proposed fence. Evaluate the sight distance from the site. The rhododendrons will require maintenance to avoid future obstructions.
10. Sheet C-4: Provide a greater separation between the gate and driveway east of the electrical yard
11. Sheet C-4: Show any solid waste and recycling facilities on the site with covering and enclosure.
12. Sheet C-4: No access is depicted to the gas compressor building. Will maintenance or operations personnel or vehicles require access?
13. Sheet C-4: Describe the proposed use of the concrete aprons adjacent to the Water Treatment Building and between the Pump House Building and Heat Recovery System Generator.
14. Sheets C-4, C-5, and C-6: The security fence does not enclose the site to the west. Provide fencing to prevent unauthorized access.
15. Sheets C-4, C-5, and C-6: Door entrances and pedestrian access to the buildings are generally conflicted with vehicle driveways or are very narrow (e.g. south end of the power plant building).
16. Sheets C-4, C-5, C-6, C-7, C-8, C-9, C-10, and C-11: Show the limits of clearing on the Layout and Materials Plan, Grading, Drainage & Utility Plan, Sediment and Erosion Control Plan, and Water Supply Plan.

17. Sheet C-7: Relocate the proposed hydrant at the northwest corner of the power plant building beyond the curb line.
18. Sheet C-7: Relocate the proposed hydrants away from the curves of the four primary corners of the perimeter driveway to ensure firefighting equipment does not obstruct access during a fire emergency response. Obtain approval from the Brockton Fire Department for any modifications.
19. Sheet C-7: Discuss the potential need for remote fire department connections with the Brockton Fire Department where proximity to certain buildings may pose a greater risk to firefighters during a response. It appears paved access to the Fire Department Connections has been provided as request by the Fire Department. Include a note on the plans requiring maintenance of clear access and snow removal.
20. Sheet C-7: A label to the left of the Infiltration Trench system specifies an elevation of 74.00 for the pipes, which conflicts the label at the system and in the detail on Sheet C-15.
21. Sheet C-7: Describe the intent of the propose 12-inch water main in Industrial Boulevard. An existing 10-inch main is also shown. Is it the intent to replace the 10-inch main north of the site? If so, connect the 12-inch main the easterly leg of the 10-inch main that connects into Oak Hill Way. Otherwise, loop the 12-inch main and connect into the water main in Oak Hill Way.
22. Sheet C-7: The power plant is the only structure with proposed water services, which includes a one-inch domestic service and a pipe of unspecified diameter. However, many of the buildings show fire department connections. Show the water pipe interconnections to each of the buildings that will require water service (i.e., domestic, fire protection, or makeup water for cooling purposes).
23. Sheet C-7: The water main conflicts with the 24-inch drain south of the Service/Fire Water Tank.
24. Sheet C-7: Provide at least three feet of separation between the reclaimed water supply and return lines and the drain pipe along the road to the north of the Circulating Water Pumps.
25. Sheet C-7: Appendices E and G in the drainage report reference a proposed Stormceptor device upstream of the Infiltration Trench. We were unable to locate the device on the plan. The detail for the Infiltration Trench on Sheet C-15 indicates a drain manhole at the system inlet.
26. Sheet C-7: Include proposed grading in the western driveway.
27. Sheet C-7 and C-11: Include a note prohibiting snow storage over the Infiltration Trench or in the extended detention basins.
28. Sheets C-9 and C-10: The Water Supply Plan should be renamed “Reclaimed Non-Contact Cooling Water Supply” or similar description consistent with the function of the utility.
29. Sheet C-11: Include provisions for construction equipment fueling (e.g. designated location) and controlling construction waste materials and trash, spill response procedures, and storage of hazardous materials in a secured location with appropriate labels on the storage container to aid in identification during spill response.
30. Sheet C-11: Sheet C-11: Include sediment barriers and construction fencing around the Infiltration Trench to prevent sedimentation or damage during construction.
31. Sheet C-11: Provide inlet protection for catch basins within paved areas.
32. Sheet C-11: Provide sediment barriers around soil stockpiles during construction and around the basins following the cleaning and conversion from sedimentation basins to detention basins.
33. Sheet C-11: Provide temporary seeding requirements to avoid long-term soil exposure.

MEMO – Brockton Planning Board

October 5, 2015

Page 5 of 8

34. Sheet C-11: The stockade fence line type appears to indicate a perimeter sediment barrier. Clarify the boundary of the barrier on the plan.
35. Sheet C-12: The preservation of existing woods and proposed plantings for parking areas, screening and buffer areas appear adequate to meet the zoning requirements, including at least 5% green space coverage on the site. If the area to the west of the site will not be fenced (the plans do not show a fence), species that achieve greater tolerance to deer browse should be selected. Yews and azaleas are extremely attractive to deer and would ultimately not provide evergreen screening if they are repeatedly damaged. Boxwood, Inkberry, and Pieris are possible evergreen substitutes.
36. Sheet C-12: Roses have begun to experience disease issues. Consider ornamental grasses, potentilla, spirea and some native perennials for use as flowering shrubs.
37. Sheet C-12: Some of the plant quantities listed on the plan, such as white fir, do not agree with those listed in the landscape schedule.
38. Sheet C-12: A seed mix has been specified for the detention basins, but no seed mix is specified for the remainder of the disturbed areas. Avoid Kentucky Bluegrass, which has relatively high maintenance and water needs. A tall or fine fescue might be best as the predominant species in the proposed mix. With the many sloped areas on the site, another grass mix may be warranted that could be mown less than the fine lawn areas and would germinate quickly to provide stabilization.
39. Sheet C-12: Provide planting details. Ensure the proposed three-inch mulch layer does not come in contact with bark of trees or shrubs.
40. Sheet C-13: Specify a minimum catch basin sump depth of 4x the pipe diameter or specify the depth for catch basins requiring greater than four feet (e.g. DCB #1).
41. Sheets C-13, 14, 15, and 16: Provide details of the proposed site lighting fixtures, including building and structure-mounted fixtures, and a photometric plan to evaluate potential lighting detrimental effects beyond the industrial and commercial uses abutting the site (Section 27-88(g)).
42. Sheet C-15: Provide bedding below the pipes in the Infiltration Trench according to the manufacturer's specifications.
43. Sheet C-15: Provide inspection ports for the Infiltration Trench.
44. Sheet C-17: The layout of the northeast corner of the site is not consistent with the other drawings.
45. Sheets C-18, C-19, C-20, and C-21: The proposed improvements are difficult to distinguish from existing conditions. Submit revised prints with improved legibility.

Stormwater Management

In general, the design utilizes a fairly conservative approach to estimating stormwater runoff and providing both pre-treatment and final treatment. Examples include using higher runoff curve numbers for crushed stone and providing redundant pre-treatment practices (proprietary hydrodynamic separators and sediment forebays) for discharges to the extended detention basins. In addition, an existing 30-inch storm drain that currently discharges untreated runoff to the wetland bordering the Salisbury Plain River will be treated under post-development conditions through a proprietary hydrodynamic separator, sediment forebay, and extended detention basin.

The pre-treatment provided exceeds the standards for both highly-permeable soils and Land Uses with Higher Potential Pollutant Loads (LUHPPL). The calculations used conservative total suspended solids (TSS) removal rates by excluding street sweeping (typically 10% removal credit and a requirement of the operation and maintenance plan), excluding the forebays (25% removal), and using a lower removal rate of 25% for the proprietary hydrodynamic separators (many manufacturer's claim 80%-90% removal rates though 50% is typically accepted).

1. A Sheet C-9 referenced in the Executive Summary of the report as "BLSF Restoration Plan" was not included for our review. Unless otherwise directed, we have assumed this document was approved under DEP's Superseding Order of Conditions.
2. Specify the soil preparation for the crushed stone yard material (e.g., stripping of topsoil, organic material, etc. and placement of any structural fill materials). Provide a section detail, if needed.
3. Tc lengths of 50 feet are relatively short for the predominantly open surfaces of the site under pre-development conditions. This would tend to underestimate the peak flow attenuation required under post-development conditions.
4. The existing topography depicted on the pre-development watershed doesn't match the existing topography on the post-development map or the Existing Conditions Power Plant Site Sheet C-3.
5. The western portion of pre-development subwatershed S-1 should be included in subwatershed S-2 based upon topography. However, this area is accounted for in the post-development calculations and would result in a more conservative basin design.
6. It appears land east of the site and west of Oak Hill Way should be included in pre-development Subwatersheds S-1, S-2, and S-3.
7. Use Manning's $n = 0.012$ for storm drain design calculations. The calculations use 0.011 for concrete and 0.010 for HDPE. The HDPE pipe manufacturer recommends 0.012 for design. Concrete pipe, when new, can be rated at 0.011, but is typically designed with $n = 0.012$ or 0.013.
8. Detention Basin #1: The outlet control structure orifices do not match the quantity, orientation, or sizes specified on Sheet C-15.
9. Detention Basin #1: The bottom surface area is listed as zero square feet in the model.
10. Detention Basin #1: The capacity of the pipe from the outlet structure is exceeded during the 10-year storm event. Ensure sufficient capacity for the basin's design storm event.
11. Detention Basin #2: The outlet control structure orifices do not match the quantity, orientation, or sizes specified on Sheet C-15.
12. Detention Basin #2: Increase the access width to the outlet structure to at least 15 feet.
13. Detention Basins #1 and #2: Provide emergency spillways. Consider alternative orifice types (e.g. rectangular or multi-stage rectangular weir in lieu of the circular orifices to simplify construction. Provide low-flow channels in the extended detention basins to the low-flow orifices of the outlet structures. Protect the low-flow orifices with trash racks that extend from the face of the structure to prevent clogging with debris.
14. Detention Basins #1 and #2: The pipes discharging to the basins don't appear to include tailwater conditions, which would affect upstream pipe network performance.

MEMO – Brockton Planning Board

October 5, 2015

Page 7 of 8

15. Detention Basins #1 and #2: The soil test pit results suggest the basins provide less than the two feet minimum groundwater separation. Two feet is recommended due the land use and proximity to the river.
16. Detention Basins #1 and #2: Relocate the spill containment gate valves from the basin inlets to an area that allows access and operation during inclement weather. Large gate valves can be very difficult to operate without mechanical equipment and require compatible pipe materials. Slide gates installed within manholes can achieve the similar results and protection.
17. Infiltration Trench: The elevations in the model do not match the detail on Sheet C-15. The model excluded flow through the outlet pipe connection to DMH #11.
18. Infiltration Trench: The elevations of the inlet pipe match the pipe network of the detail on Sheet C-15, which will create a tailwater condition that hasn't been included in the calculations.
19. Infiltration Trench: Include more detailed notes on the drawings regarding the removal of fill materials and replacement with suitable soils.
20. Upon making revisions to the calculations where required above, provide a revised pre- and post-development summary table of peak flow rates and average runoff volumes to each design point.

Traffic

1. Provide the professional background of the preparer of the traffic assessment.
2. Construction Traffic:
 - a. Based on the analysis submitted in Section 1 of the Site Plan application narrative, more than 200 workers are expected to be working on the site during peak levels of construction activity. Most, if not all, of these workers are expected to arrive between 6:00 and 7:00 AM, prior to the typical peak in weekday morning commuter traffic. Similarly, these workers are expected to leave the site between 2:00 and 4:00 PM, prior to peak levels of afternoon commuter traffic. Based on the high number of left turning vehicles expected from Sargent's Way onto Main Street when the workers leave the site in the afternoon, delays for that movement are expected to increase to undesirable levels.

The study mentions that signal timing changes may be implemented to ease this congestion, but does not make specific timing revision recommendations or evaluate the potential for improvement these changes could make. If signal timing revisions can be effective in reducing the congestion, making these changes would be advisable. However, care should be taken to revise the timings back to either the previous timings or a new timing arrangement that takes into account post-construction conditions.

The traffic peaks associated with the construction workers is anticipated to occur over a short duration within each working day. In addition, the increased activity will be cease once construction is complete. Therefore, permanent infrastructure improvements to reduce the impact of this traffic are not suggested.

MEMO – Brockton Planning Board

October 5, 2015

Page 8 of 8

- b. The applicant should submit a traffic management plan for the construction phase of the project to mitigate the effects of construction traffic on local streets. The plan should be approved by the Planning Board following the review and recommendations of the Brockton Fire and Police Departments. Some suggestions to minimize construction operation impacts on surrounding properties include:
 - i. Propose timing changes to the Sargent's Way/Main Street signal to be implemented during peak periods on construction worker arrival/departure from the site.
 - ii. All materials and vehicles associated with the construction, including worker vehicles, delivery vehicles, materials, and equipment, should be placed on the site or at an authorized location and not within public streets. Further, common vehicle paths should be temporarily or permanently paved as soon as feasible to reduce dust and debris from migrating or being tracked onto adjacent sites or streets.
3. Post-Construction Operational Traffic:
- a. Once the facility opens, less than 10 employees are anticipated to be on-site at any given time, with occasional material deliveries. We anticipate minimal traffic impacts during plant operation.
 - b. The facility will have two access points off a section of Industrial Boulevard that is yet to be constructed. One driveway will be on the outside of the curve that will be formed along Industrial Boulevard near the northwest corner of the property, which will be gated. The other will be slightly east of the curve, which appears to be the planned primary access for employees. There is little vegetation in the vicinity of the curve, the area is relatively flat, and the road is expected to have low travel speeds and low traffic volumes. Therefore, we anticipate that sight distance from either driveway will not be limited if the fence and gate are placed at an appropriate location.
 - c. Pedestrian facilities, beyond those provided to connect the two parking areas to the main power plant building, are not proposed. Given the proposed use of the property and the uses of adjacent properties within walking distance of the site, pedestrian demand in the vicinity of the site is expected to be minimal.
 - d. The Industrial Boulevard cul-de-sac turnaround should be evaluated for potential removal and restoration along with reconstruction of a modified entrance to the F.W. Webb property.

Please contact me at (800) 286-2469 ext. 4564 if you have any questions regarding this review.

c: Katherine McNamara Feodoroff, Senior Assistant City Solicitor