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Sustainable Environmental Solutions

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May 20, 2020

Ms. Beth Suedmeyer
Environmental Planner
Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, Massachusetts 01776

Re: Second Peer Review of the Stormwater Management for
Cold Brook Crossing NRROD and SGOD Developments
Sudbury, Massachusetts

Dear Ms. Suedmeyer and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Sudbury Planning Board with this letter report summarizing our second review of the Cold Brook Crossing development. The Project Area includes the former “Melone property” sand & gravel quarry, property owned by the Sudbury Water District and a single-family residential lot. Approximately 15.9 acres of developable land located within the Town of Concord will remain undeveloped according to this application. Approximately 9.9 acres will remain undeveloped as Sudbury Conservation Land and approximately 3.1 acres will remain undeveloped under the Sudbury Water District ownership.

The Applicant is proposing to develop approximately 25.8 acres with two residential components. The Apartments at Cold Brook Crossing project includes 6.2 acres of land to be developed under the Smart Growth Overlay District (SGOD) with 101 rental units housed in two buildings. The Cold Brook Crossing development consists of 19.6 acres with 123 townhouse units as well as a single four-story building with 50 condominium units pursuant to the North Road Residential Overlay District (NRROD).

A small portion of the development, specifically the wastewater treatment facility and surrounding area is located within the 200-foot Riverfront Area of a perennial stream as well as the 100-buffer zone of a jurisdictional wetland resource area and will require an Order of Conditions from the Sudbury Conservation Commission.

This project is considered new development of a previously disturbed site. The plans and calculations were prepared by Civil Design Group, LLC on behalf of Quarry North Road, LLC (Applicant). The proposed project includes the construction of 123 townhomes and three multifamily buildings as well as associated roadways, sidewalks, landscaping, utilities, a wastewater treatment facility, and stormwater management. The proposed stormwater management system consists of permeable pavement, ten subsurface infiltration systems and one infiltration basin to manage and infiltrate the stormwater runoff up to the 100-year storm event from all developed areas of the Project Site. The project is within the jurisdiction of the Sudbury Conservation Commission and is required to file a Notice of Intent.

The following additional documents and plans, were received by HW in response to our initial peer review dated April 17, 2020:

- Letter to Sudbury Planning Board regarding Cold Brook Crossing Stormwater Management Peer Review, Response to Comments, prepared by Civil Design Group, LLC, dated May 19, 2020, (130 pages) including:
 - Attachment 1 – Updated HydroCAD Modeling
 - Attachment 2 – Updated SIS Details
 - Attachment 3 – Test Pit Logs and Location Plan
 - Attachment 4 – Updated Silt Sack Detail
 - Attachment 5 – Updated Stabilized Construction Entrance Detail
 - Attachment 6 – Updated Operation & Maintenance Plan
 - Attachment 7 – Signed Illicit Discharge Statement

Stormwater Review

HW has reviewed the proposed stormwater management design as per the standards listed in the Massachusetts Stormwater Handbook (MSH) dated February 2008 and the Town of Sudbury Stormwater Management Bylaw Regulations (Stormwater Bylaws), revised January 23, 2013.

In accordance with Section 8.0 of the Stormwater Bylaws, this project is required to comply with the performance standards of the MSH. Therefore, we have used the MSH as the basis for organizing our comments. However, in instances where the additional criteria established in Section 8.A.3 of the Stormwater Bylaws requires further recommendations; we have referenced these as well. The following comments correlate to our April 17, 2020 initial stormwater peer review, follow up comments have been provided in **bold** font.

1. *Standard 1: No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*
 - a. The existing site discharges stormwater via overland flow to four separate points of analysis (POA):
 - (1) The wetland resource area located in the Town of Concord,
 - (2) the abutting property to the west,
 - (3) North Road, and
 - (4) the cell tower road.

Under proposed conditions the Applicant has provided stormwater practices to collect, manage, treat and recharge the stormwater within the developed areas of the site. The watershed areas and flow rates that continue to discharge towards the POAs have been reduced under proposed conditions. It does not appear that the proposed stormwater management will cause erosion in the adjacent wetlands.

The Applicant complies with Standard 1.

No further action needed.

2. *Standard 2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.*

The Applicant has designed the proposed stormwater system to manage the 100-year stormwater runoff utilizing various stormwater practices including permeable pavement, an infiltration basin, and subsurface infiltration chambers. HW has the following comments regarding the proposed stormwater design:

- a. There appears to be some inconsistency between the proposed HydroCAD analysis, and the areas illustrated on the Post-Development Watersheds, Figure 4. HW was not able to confirm the watershed areas provided for some of the watershed areas and recommends that the Applicant revisit the watershed plan and HydroCAD model to confirm that the areas modeled are accurate. HW recommends that the Applicant confirm the following areas:

- Subcatchment PR-3B
- Subcatchment PR-3D
- Subcatchment PR-3G
- Subcatchment PR-3I

Furthermore, HW recommends that the Applicant confirm that the following subsurface infiltration systems have been sized to manage the applicable watershed area.

- Pond-SIS-10
- Pond-SIS-7
- Pond-SIS-4
- Pond-SIS-3

The Applicant has reviewed and revised the watershed areas as well as Ponds SIS-3 and SIS-7 as requested. The catchment areas appear accurate and the infiltration systems appear to be adequately sized.

- b. The Applicant has used an exfiltration rate of 8.27 inches per hour (iph) for the infiltration basin and all 10 subsurface infiltration systems. The site has been mapped primarily as hydrologic soil group (HSG) A, in accordance with the Natural Resources Conservation Service (NRCS) soil maps. The test pits included in the Stormwater Management Report were completed in the area of the leaching field. The majority of the 13 test pit logs provided indicate that the subsoil or C horizon is sand, however a few indicate that the C horizon is loamy sand. HW recommends that the Applicant conduct soil test pits in the location of each of the infiltration practices proposed to verify the exfiltration for each individual system. Furthermore, HW recommends that the Applicant utilize the infiltration rate for sandy loam at 2.41 iph were applicable.

The Applicant has conducted additional soil test pits within the footprints of subsurface infiltration systems SIS-3, SIS-4, SIS-5, SIS-6, SIS-7, SIS-8, SIS-9, SIS-10 and Infiltration Basin 1. Regarding SIS1 and SIS 2 the Applicant has noted that the depth of the systems and the existing topography make conducting additional

tests within the footprint below the proposed system difficult at this time and have added a note to the detail requiring additional tests to be conducted during construction. HW has no objection to allowing the tests to be done later with the understanding that if soil with less than an 8.27 iph exfiltration rate is encountered the soil will be replaced. The Applicant has included this requirement in Note 10.1 and 10.2 included on the Subsurface Infiltration System (SIS) Detail provided in Attachment 2.

The Applicant has further added Notes 10.3, 10.4, and 10.5 regarding SIS-3, SIS-7, and SIS-8 and the need to over excavate the soil beneath the systems by 4 feet and replace the soil with sand having an exfiltration rate of 8.27 iph or better. HW has no objection to this methodology for this site.

HW recommends that the Subsurface Infiltration System (SIS) Detail be added to the Site Plans.

- c. In Attachment I, the Applicant has provided an Hydrogeologic Evaluation for Quarry North Road, prepared by GeoHydroCycle, Inc., dated July 30, 2019. In this evaluation, six monitoring wells were drilled and evaluated. A groundwater mounding analysis was done and the estimated seasonal high groundwater (ESHGW) was determined to be between elevations 122.04 and 123.57. The wells are in the area of the leaching field and near the Town Boundary line. HW agrees that the ESHGW on the northern portion of the site is at approximately elevation 123, however no testing has occurred on the southern portion of the site near several proposed stormwater infiltration systems. HW recommends that the Applicant confirm the ESHGW elevation beneath all proposed infiltration systems.

The Applicant has conducted additional soil test pits and has verified that the ESHGW is at least four feet below the bottom of the systems.

- d. The Applicant provided a HydroCAD analysis that included a Weighted Q runoff method. This is in lieu of the standard weighted composite curve number method. The Weighted Q method tends to improve runoff accuracy but is not common. HW has no objection to this method.

No further comment needed.

- e. SIS-6 includes a riser that allows the stormwater to overtop the system into a grass depression directly above it. The depression will contain stormwater during the larger storm events. HW recommends that the Applicant provide an additional detail clarifying how the riser is connected to the subsurface system.

The Applicant has provided a detail titled SIS-6 Section A-A which clarifies the connection between the riser and the chambers. HW recommends that this detail be added to the Site Plans.

- f. The Applicant has utilized a curve number for brush assuming "fair" conditions for existing and proposed conditions. Standard engineering practice is to utilize a "good" surface for existing conditions. HW recommends that the Applicant adjust the curve number for brush or provide a justification for the use of "fair".

The Applicant has provided justification for its use of “fair” surface conditions including a photo of the gravel pit. HW finds the justification reasonable. No further comment.

- g. The Applicant provided a Subsurface Infiltration System (SIS) detail on Sheet 29 of the Site plans. The SIS detail does not indicate the width of stone to be placed around the system. HW recommends that the Applicant add the width of stone required to the detail.

The Applicant has revised the detail titled Subsurface Infiltration System (SIS) Detail and has added the width of stone to be placed around the system. As previously noted, HW recommends that this detail be added to the Site Plans.

- 3. *Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.*

- a. In accordance with the MSH Volume 2, Chapter 2, Page 97 a minimum of two test pits or borings should be conducted for each infiltration system. HW recommends that additional test pits be conducted within the footprint of each infiltration practice.

As noted previously, the Applicant has conducted additional test pits within the footprints of the various infiltration practices. Please refer to comment 2.b.

- b. The bottom of subsurface infiltration system #9 (SIS-9) is set at elevation 126. Assuming that the ESHGW is at elevation 123 for the entire property, SIS-9 does not have the required 4 feet of separation between the bottom of the system and the ESHGW. HW recommends that the Applicant confirm the ESHGW beneath SIS-9 and if necessary, provide a mounding analysis in accordance with the MSH Volume 3, Chapter 1, page 28.

The Applicant has conducted additional test pits and has confirmed that the ESHGW elevation is greater than 4 feet beneath each of the proposed infiltration practices, including SIS-9. No further comment.

- c. The Applicant has proposed 11 infiltration practices with the intention that it will retain up to and including the 100-year storm event for the entire development.

No further comment needed.

As designed the Applicant complies with Standard 3.

- 4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1.0-inch of volume from the impervious area for water quality.*

- a. The Applicant has proposed a stormwater management system that consists of deep sump catch basins and proprietary water quality units prior to discharging to an infiltration system. The treatment train will provide the required 44% TSS removal prior to discharging to an infiltration system and provide the 80% TSS removal overall.


No further comment needed.

- b. The Applicant has proposed porous pavement within the drive aisle and parking area associated with Building #1 and Building #2 of the SGOD development. The permeable pavement will collect sediment and infiltrate the stormwater providing the required 80%

TSS removal. HW agrees that porous pavement is an acceptable surface material in this area, however routine maintenance will be critical for continuous stormwater management.

During the virtual public hearing on April 29, 2020, Stephen Garvin, P.E., Chair of the Planning Board raised the concern of using permeable pavement within a Zone II as noted in the MSH Volume 2, Chapter 2, page 118. The Applicant reached out to MassDEP, specifically Lealdon Langley, Director of the Division of Watershed Management for clarification on this issue. There were a series of emails received between May 11, 2020 and May 15, 2020 with the subject matter being, “Porous Pavement-DEP Stormwater Handbook clarification.”

Porous Pavement



Description: Porous pavement is a paved surface with a higher than normal percentage of air voids to allow water to pass through it and infiltrate into the subsoil. This porous surface replaces traditional pavement, allowing parking lot, driveway, and roadway runoff to infiltrate directly into the soil and receive water quality treatment. All permeable paving systems consist of a durable, load-bearing, pervious surface overlying a stone bed that stores rainwater before it infiltrates into the underlying soil. Permeable paving techniques include porous asphalt, pervious concrete, paving stones, and manufactured “grass pavers” made of concrete or plastic. Permeable paving may be used for walkways, patios, plazas, driveways, parking stalls, and overflow parking areas.

Ability to meet specific standards

Standard	Description
2 - Peak Flow	Provides peak flow attenuation for small storms.
3 - Recharge	Provides groundwater recharge.
4 - TSS Removal	80% TSS Removal credit if storage bed is sized to hold 1/2-inch or 1-inch Water Quality Volume, and designed to drain within 72 hours.
5 - Higher Pollutant Loading	Not suitable.
6 - Discharges near or to Critical Areas	Not suitable especially within Zone IIs or Zone As of public water supplies.
7 - Redevelopment	Suitable.

Advantages/Benefits:

- Reduce stormwater runoff volume from paved surfaces
- Reduce peak discharge rates.
- Increase recharge through infiltration.
- Reduce pollutant transport through direct infiltration.
- Can last for decades in cold climates if properly designed, installed, and maintained
- Improved site landscaping benefits (grass pavers only)
- Can be used as a retrofit when parking lots are replaced.

Disadvantages/Limitations:

- Prone to clogging so aggressive maintenance with jet washing and vacuum street sweepers is required.
- No winter sanding is allowed.
- Winter road salt and deicer runoff concern near drinking water supplies for both porous pavements and impervious pavements.
- Soils need to have a permeability of at least 0.17 inches per hour.
- Special care is needed to avoid compacting underlying parent soils.

Pollutant Removal Efficiencies

• Total Suspended Solids (TSS)	80%
• Nutrients (Nitrogen, phosphorus)	Insufficient data
• Metals (copper, lead, zinc, cadmium)	Insufficient data
• Pathogens (coliform, e coli)	Insufficient data

Structural BMPs - Volume 2 | Chapter 2 page 118

HW was copied on these emails and it is our understanding that MassDEP considers the note on page 118 of the MSH to be a scrivener’s error and should have read Zone I. Mr. Langley stated that, “when new impervious surfaces are created in Zone II, stormwater infiltration practices are **REQUIRED** to be provided within the Zone II on site.” And that “Infiltration basins, infiltration trenches and subsurface infiltrators, all explicitly allowed by the Stormwater Handbook within Zone II, provide similar treatment and recharge as porous pavements.” Mr. Langley also acknowledged that “porous pavement maintenance remains an area of concern” and “As with infiltration systems, providing pretreatment and a system that provides for shutdown and containment that is activated immediately

after the spill occurs is required.” “To minimize contamination, cleaning of porous pavements on a regular basis is advised, as well as routine monitoring and promptly addressing any spills.”

Volume 2, Chapter 2, Page 122 of the MSH details the recommended maintenance for porous pavement, including minimizing salt use, no winter sanding, and cleaning the surface on a monthly basis using vacuum sweeping machines. The Applicant has provided an Operation and Maintenance Plan & Long-Term Pollution Prevention Plan for the Apartments at Cold Brook Crossing & Cold Brook Crossing, revised May 15, 2020. The inspection and maintenance listed under Porous Pavement appears consistent with the requirements listed in the MSH.

HW recommends that if the Planning Board determines that the use of porous pavement is allowable for this development a reference to the Operation and Maintenance Plan & Long-Term Pollution Prevention Plan is including in the decision.

As designed the Applicant complies with Standard 4.

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*

- a. The proposed development is not considered a LUHPPL, therefore Standard 5 is not applicable. No further comment is needed.

No further comment needed.

6. *Standard 6 is related to projects with stormwater discharging into a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply.*

- a. A portion of the project site is located within a Zone I Wellhead Protection area. There are no offsite discharges allowed in this area. Based on the current grading and drainage plan submitted, there are no discharges from the site to this area.

No further comment needed.

- b. The project site is also located within a Zone II Interim Wellhead Protection Area. The Applicant has proposed site improvements that treat the one inch Water Quality Volume and has proposed stormwater practices such as deep sump catch basins, water quality units, and subsurface infiltration chambers, which are all appropriate BMPs for a Zone II Interim Wellhead Protection Area per the MSH.

Additionally, the Applicant has identified proposed source controls and pollution prevention measures in the submission. These proposed measures appear to achieve the 44% TSS pretreatment requirement and the 1” water quality requirement as provided in Table CA3 Standard 6, page 19.

The Applicant appears to be in compliance with Standard 6.

No further comment.

7. *Standard 7 is related to projects considered Redevelopment.*

- a. The proposed project is considered a new development and is required to fully meet the

Massachusetts Stormwater Standards. Standard 7 is not applicable. No further comment is needed.

No further comment.

8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.*

The Applicant has provided an Erosion Control Plan on Sheet 5 of the plan set and erosion control details on Sheet 26.

- a. HW recommends that, if applicable, the Applicant provide inlet protection on every catch basin within 100 feet of the construction entrance. Furthermore, HW recommends that inlet protection is provided on each proposed catch basin when the grate is installed.

The Applicant has provided a revised Typical Silt Sack Detail noting the placement of silt sacks as recommended. HW recommends that this detail be added to the Site Plans.

- b. The site plans reviewed by HW did not include extensive erosion control locations. HW recommends that the Applicant provide full erosion control plans with typical construction practices including the location of stockpiles for review and approval by the Town of Sudbury.

The Applicant is amenable to providing the Town with a copy of the SWPPP prior to construction. HW recommends that this be considered by the Planning Board as a condition of approval.

- c. HW recommends that the Applicant extend the length of the construction entrance to at least 75 feet.

The Applicant has provided a revised Typical Stabilized Construction Entrance Detail noting the longer length as requested. HW recommends that this detail be added to the Site Plans.

- d. HW recommends that the Applicant provide additional notes regarding the avoidance of heavy equipment over the infiltration chambers areas.

The Applicant has revised the detail titled Subsurface Infiltration System (SIS) Detail and has added Note 9 regarding delineating the infiltration systems to avoid compaction by heavy equipment. As previously noted, HW recommends that this detail be added to the Site Plans

- e. The Applicant has noted that a Stormwater Pollution Prevention Plan (SWPPP) has not been completed but will be prior to construction activities commencing on the project. HW recommends that the Applicant provide the SWPPP to the Town of Sudbury a minimum of 14 days prior to land disturbance for review.

The Applicant is amenable to providing the Town with a copy of the SWPPP prior to construction. HW recommends that this be considered by the Planning Board as a condition of approval.

9. *Standard 9 requires a Long Term Operation and Maintenance (O & M) Plan to be provided.*

- a. The Applicant has included a Long Term Operation and Maintenance (O&M) Plan in the

submission including checklists for maintenance. HW recommends that the Applicant confirm who the responsible party will be prior to acceptance by the Town.

The Operation and Maintenance Plan & Long-Term Pollution Prevention Plan states that the property owner will be responsible for the ongoing maintenance. No further comment.

- b. HW recommends that the Applicant provide a simple stormwater practice location map as part of the Long Term O&M Plan.

The Applicant has included the stormwater practice location map as requested. No further comment.

10. *Standard 10 requires an Illicit Discharge Compliance Statement be provided.*

- a. The Applicant has provided an Illicit Discharge Compliance Statement in the O&M Plan. HW recommends that an Illicit Discharge Compliance Statement signed by the owner be submitted to the Sudbury Conservation Commission prior to any land disturbance.

The Applicant has included a signed Illicit Discharge Compliance Statement as requested. No further comment.

Conclusions

HW is satisfied that the Applicant has responded adequately to our comments. HW recommends that the Applicant update the Site Plans with the notes and details provided in its response. The Applicant is advised that provision of these comments does not relieve him/her of the responsibility to comply with all Town of Sudbury Codes and Bylaws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Carter Bernardo at 857-263-8193 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.



Janet Carter Bernardo, P.E.
Senior Project Manager