

P5050004-09
December 31, 2020

Erin O'Hare
Environmental and Natural Resources Planner
Town of Wallingford
45 South Main Street
Wallingford, CT 06492

Re: **IWWC #A20-12.1 /932 Northrop Road – Proton International, Inc. - IWWC Review Comments**

Dear Ms. O'Hare:

We are in receipt of your comments dated December 22, 2020. We offer the following responses with your initial comments repeated and our responses following in bold face type.

1) Existing Conditions - sheet C-002

- a) Four (4) Monitoring well locations are indicated. Explain history. Explain how to be handled with the development of the site and moving forward.

The four monitoring wells were installed during the Environmental Phase I and Phase II studies of the site. The wells are used for monitoring groundwater and will be removed at the beginning of construction.

During our meeting with Ms. O'Hare on December 29th, the groundwater elevations were requested and are attached to this letter. Additionally, we have provided test pit information for TP-112 that was performed in the vicinity of the man made drainage swale and indicates groundwater at 10.5 below grade. The location of TP-112 has been added to C-002 and the Test Pit TP-112's log is attached to this letter and has been added to C-302.

- b) Clarify soils information on this sheet indicates soils are from NRCS data, but Sept. 20 memorandum from Tighe & Bond indicates soil augering was, in fact, conducted in the field. Correct information as may be needed. **Soils observed on site were consistent with the NRCS soil classification with the exception of one area which consisted of human transported material. Refer to the updated sheet C-002.**
- c) A watercourse was observed on the site on Dec. 22 that drains the central low-lying area of the property. Flows - possibly from melting snow - were observed entering the Marriot's 24" RCP. In this location the grade drops several feet on other side of the drainageway in this forested area. One-foot of snow cover obscured the observation of this drainage area further "upstream". This feature was omitted from this sheet. Provide.

The man-made drainage swale described above has been added to all sheets for clarity.

- d) Above stream (?) will be observed by this office when snow cover no longer conceals its characteristics. The IWWC is concerned about drainageways or streams that flow and can transport sediment from construction activities - whether they are technically "intermittent watercourses" or not. This feature functions to transport storm flows from two Town catch basins that discharge onto the property and from the rolling topography of the site itself which tilts towards its middle and tilts south. (See more on this topic below.)

So Noted.

2) Site Preparation Plan (i.e. tree clearing) - C-004

- a) Tree clearing is not indicated for an area in the northeast area however this is an area proposed on other sheets for grading and stockpiling. Does this area support no trees currently - or is this an error? Explain or correct.

The northeast area is indicated for tree clearing as shown by the 'limit of tree clearing' line and call out on C-004.

- b) Anti-tracking pad needs to be installed before tree clearing work commences. Provide on this sheet (as well as on E&S sheet).

Anti-Tracking pad and E&S control has been added to C-004 and reference has been added to the Soil Erosion and Sediment Control plans C-501 through C-504.

- c) It appears that the southeastern corner of the site needs silt fencing to protect silty flows from tree clearing disturbances in this area from travelling downgradient onsite and offsite in this corner. Provide indicate that it is to be installed prior to tree work.

Silt fence has been added to the southern and south-eastern portion of the site for tree clearing and E&S Phase 1.

- d) Plan call-out indicates "Protect existing 24" RCP", but the 'protection' needs to be provided and depicted on this sheet, not just a suggestion. Provide and indicate on the sheet that protection measures are to be installed prior to tree work as disturbance of the soil during tree work will generate silty flows immediately and so cannot wait until the next phase of Project to be installed.

The "Protect existing 24" RCP" has been revised to read "Protect existing 24" RCP, see note 3." This protection is to inform the contractor that it is their responsibility to protect existing infrastructure outside the project limit line and to restore any damage to pre-damage conditions. Additional soil erosion and sediment controls have been added to C-004 and C-501 immediately upstream of the existing 24" culvert.

3) "Drainage Swale" & Soils Issues

- a) In memorandum from Raina Volovski, Certified Professional Soils Scientist and Professional Wetlands Scientist, dated 9/20/19, part of the application, a drainage swale in southwest corner was described and was stated to be not an 'intermittent watercourse'. Whether or not it possesses certain characteristics of an 'intermittent watercourse', it needs to be depicted on all plans and called out as a drainage swale or stream or flow path (or something). The depiction should extend from the far

northwestern corner where flows are discharged from a catch basin (located at the intersection of Northrup Road and MacDonald Lane). A portion of this drainage flow swale is depicted on only some of the plans - and not on the Existing Conditions plan. Provide or explain this inconsistency.

The swale has been added to all sheets and called out as a "man-made drainage swale."

- b) As Watchaug soils possess a high water of from 18 to 30 inches, provide information how this high-water table condition may affect proposed alteration of land/construction activities in this area, etc. Will dewatering be needed?

Four Monitoring wells were installed on the site to monitor groundwater. Monitoring Well 1 was installed within the Watchaug soil limits. Groundwater was observed in Monitoring Well 1 between 4.12 and 5.59 feet from February to March of 2020. Additionally, a majority of the work within the Watchaug Soils will involve filling to bring the site driveway up to proposed grades. Dewatering is not anticipated to be required.

- c) A copy of the Soils Scientist's Field sketch is typically included as part of the application. Depiction of location of the drainage swale/stream (?) and length of same is of interest. Provide copy of field sketch.

No wetlands or watercourses were identified or delineated during the September 2019 investigation; therefore, no sketch is available. Please refer to existing conditions survey for site characteristics.

- d) Upland Review Area (URA) would be 50-feet surrounding this drainage swale.

The drainage swale is fully detailed in our materials, and will of course be discussed fully with the Commission. However, the swale doesn't contain any of the characteristics of an Intermittent Watercourse as under CGS §22a-38(16) or under the Town's IWWC Regulations §2.1(nn)(p12), and thus doesn't warrant an Upland Review Area.

4) E & S Plan

- a) Anti-tracking pad needs to be installed before tree clearing work commences. Provide.

Anti-tracking pad has been added to C-004 and the construction sequence on C-503 has been revised to clarify the sequence of E&S installation prior to tree clearing.

- b) Catch basin in Northrop Rd. needs to have E&S protection proposed.

A silt sack has been added to the Northrop Road Catch Basin.

- c) Provide hay bales along the bottom of the 'Outlet Weir' for Temporary Sediment Trap #1 to add further protection to flows going offsite in this vicinity.

A haybale barrier has been added along the Outlet Weir from Temporary Sediment Trap 1.



- d) Provide diversion trenches for flows anticipated in vicinity of proposed stockpile area.

Temporary Stone lined swales have been added to direct runoff to Temporary Sediment Trap 2 from the soil stockpile.

- e) Unclear how flows are proposed to enter Temporary Sediment Trap #2 as a berm is indicated all around the trap.

Contours have been revised on C-501 and C-502 to clearly show how runoff will enter Temporary Sediment Trap 2.

- f) Add silt fence protection along north side of the proposed Anti-tracking pad to prevent flows entering the site from the catch basin in Northrup Rd. from entering the Anti-tracking pad area.

Silt fence has been added to the north side of the anti-tracking pad.

- g) Provide hay bales along the bottom of the Outlet Weir for Temporary Sediment Trap #2 to add further protection to flows entering the drainage swale in this vicinity.

A Hay Bayle Barrier has been added along the Outlet Weir for Temporary Sediment Trap 1.

- h) Depict drainage swale/stream on this sheet. It is not shown even in 'swale crossing area* call-out on the plan). Depict it also below (to the west) the TST.

The 'Man-Made Drainage Swale' has been added and labeled on C-501 and C-502.

- i) The proposed 'swale crossing area' is proposed to be treated the same as the construction entrance pad is. After storms this *crossing' will be an issue. At minimum, provide row of hay bale protection all along the south side of the crossing pad.

The 'swale crossing area' has been revised to provide timber construction mats over the swale and haybales have been added to the north and south of the crossing.

- j) Depict new drainage pipes on E&S plan-Phase 2 if, in fact, they would be in by this point in project.

New drainage pipes have added to C-502.

- k) How are drainage swale/stream flows travelling north to south are handled in the jump between E&S Plan 1 and E&S Plan 2 when sand filter bed, pipes, slope area are all installed. This is tricky. Explain, in narrative form, and revise plan if necessary to depict steps.

At the end of Phase 1, the contractor shall begin construction of the on-site 24" culvert. The contractor shall begin at the downstream end of the culvert and work their way north to within 25' of the culvert headwall. The Contractor shall then establish temporary bypass pumping as required complete the remainder of the culvert. Once the culvert is complete, the contractor shall adequately backfill the culvert.

The construction sequences on C-503 has been revised to indicate the sequence of events described above. This has also been called out on C-502 for clarity.

- l) The treatment proposed for flows in the last 90 feet before exiting the property to the Marriot 24" culvert is unclear, as follows:

- i) Is just grass proposed through here? Uncertain if that suffices. Explain.

A grass swale is proposed from the end of the driveway culvert to the entrance of the existing 24" culvert. We have performed an analysis of the swale and ConnDOT Class C Turf Establishment is sufficient for the expected flows. Additionally, proposed drainage swales will be covered with Erosion Control Blankets during turf establishment.

- ii) It's unclear what happens to flows in final grading on the 3:1 slope area proposed to the southwest side of building area. Do they find their way into the unmarked low swale-type area here? What keeps these flows from travelling further to the southwest? Clarify.

Flows from the 3:1 slope area will travel to the swale and ultimately the 24" culvert. Flow will not continue to the south west as the grade climbs towards Northrop Road. The existing 24" culvert is located at the lowest point in the site with grades sloping towards the culvert.

- iii) Provide a call-out with a name of some kind for this stretch of swale type area.

The swale called out has been added to C-301 and C-501.

- iv) Proposed silt fencing appears to stop 15 feet shy. Extend it here in order to afford protection of Maniot's inlet. Also, address the small, missed area on the west side here near inlet. Provide depiction.

The silt fence and haybale lines have been revised to clearly show both controls.

5) Stormwater Plan -C-301

- a) Unclear where the 'infiltration basin' and 'stone-lined spillway' (both on Detail sheet C-705) are depicted on some plan sheet. Clarify. If not called-out but, in fact, depicted, provide a 'call-out'.

C-705 has been revised to remove the stone-lined spillway detail.

- b) Proposed storm flow pipe along southern side of building near property line discharges to unidentified 'swale' at a right angle to the pre-formed scour hole there. Concern it will over-shoot the scour hole due to the right-angled turn flows must make.

Drainage Manhole (DMH-03) has been moved to the North West to reduce the angle of the outlet pipe and the proposed swale.

- c) Detail shows an 'endwall'. Is there one proposed for this pipe outlet vicinity by southern property line? Or does Detail reflect the one in north near stockpile area?

The detail has been revised to call the structure a 'Headwall'. The Headwall is the entrance of the on-site 24" culvert.

- d) Proposed "Headwall" called-out north of driveway: is there a Detail drawing for this element? If not, provide.

Headwall detail has been added to C-705.

- e) The Headwall 'call-out' indicator is on the north side here. Is headwall on north or south of scour hole and inlet in this vicinity? Correct indicator, accordingly.

The Headwall is located south of the scour hole. The call out on C-301 has been revised.

6) Drainage Offsite

- a) Apparently no "Right to drain" exists to discharge flows from the subject site into Marriott's 24" culvert located at the property line (which was installed for the development of that property). In the conferences held, this issue was discussed. The Project Attorney is requested to provide a statement to the effect that no "right to drain" or other provisions are now appropriate or legally required to put in place, if that is the case. This office needs clarification how silty construction flows can be discharged to another property as proposed without any language to address this proposed possible occurrence.

We contacted Marriott in November, shortly after our initial meeting. They were very receptive about giving an express easement, as well as about the proposed treatment center. See email thread beginning 11/25/2020, attached. The express easement will be recorded once it is signed. Until then, E&S measures will protect the culvert and the Marriott property during construction. Notably, after construction has been completed, peak flow and volumetric runoff through the pipe will be decreased.

Marriott installed the 24" pipe during initial construction in the late 1980s. Records as to its purpose have not been preserved. In that the pipe was required by zoning at that time, and that it obviously is intended to address runoff from our property, rights to its use and maintenance are certainly evident by implication.

- b) As silty discharge is anticipated to be introduced to Marriott's 24" culvert during the subject site's Construction Phase, this office is requesting that the Applicant provide E&S control measures at the discharge location for these flows offsite and monitoring of conditions periodically at that discharge location during the subject site's Construction Phase.

As stated above, the project will install E&S controls to prevent sediment from entering the 24" culvert on the southern property line. We will monitor the culvert as directed by your office.

- c) The vigilant monitoring of the location of the inlet area to Marriott's 24" culvert with restoration/replacement of E&S measures as may be needed will be suggested as a Condition of Approval.

So Noted.

7) Site Plan Sheet

- a) Fence crossing of swale was provided in Detail sheet, but provide location of same called out on appropriate plan sheet, e.g. "Site Plan".

C-101 has been revised to call out the location of the fence crossing the drainage swale.

8) Stormwater Management Maintenance Plan

- a) Stormwater Management Maintenance Plan was provided in Engineering Report along with sample reporting forms. Revise to include inspection for the area immediately in front of the 24" culvert opening located on the property line (or explain that this is addressed therein).

The Stormwater Management Maintenance Plan has been revised to include inspection of the 24" culvert inlet on the south property line.

- b) Provide a copy of revised plan in free-standing format for the IWWC file.

A revised free-standing Stormwater Management Maintenance Plan is attached to this letter for your records.

9) Landscape Notes- Sheet C-602

- a) In 'Restoration Plan' for denuded knoll area:

- i) 125 replacement trees are proposed, roughly 60% red maple and 40% red oak. Has anyone determined that this represents what is currently growing there? Request to provide more diversity in this forest unless that proves to be the case.

The plan has been modified to include additional species diversity. Reforestation areas will include 30% Red Maple, 30% Red Oak, 20% Yellow Birch and 20% American Beech.

- ii) Are there no shrubs growing there currently - or are they all invasive species currently? Provide proposed native shrubs as appropriate or typical for such a forest.

C-601 has been revised to include the planting of 250-1 gallon container grown shrubs in random pattern 250 to be placed by the landscape architect during construction. Species mix shall be: 45 - Silky Dogwood, 45 - Grey Dogwood, 40 - Arrow Wood Viburnum, 40 - American Filbert, 40 - Sweet Fern and 40 - Hobblebush Viburnum.

- iii) How do you proposed to keep invasive plants from colonizing this suddenly exposed sunny area that will exist between the saplings and grass proposed to be planted?

The ground surface is proposed to be hydroseeded and planted with a mix of native grasses, forbs and shrubs to provide cover while the trees become established. Additionally, the following note has been added to C-601: 'Reforestation area shall be monitored and maintained for a period of 3 years after the completion of construction. Maintenance shall include the removal invasive species from the understory.'

- b) Unclear why island of plantings located to southwest of proposed driveway entrance area is called-out as a "Restoration Area" as it is not. Correct label.

So noted. This area has been re-labelled to call out the plantings and not reference it as a restoration area.

- c) 'Groundcover Schedule' - replace Vinca minor ground cover with another species as this is a known invasive plant species.

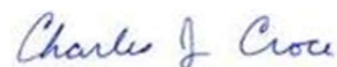
Vinca minor is not listed as "Invasive" or "potentially invasive" on the Connecticut Invasive Plants Council list of invasive plants. Vinca does not propagate by seed nor is it spread via birds (there is no fruit to speak of).

Very truly yours,

TIGHE & BOND, INC.



Andrew White, PE, ENV SP
Project Manager



Charles J. Croce, PE
Vice President

Enclosures

Copy: Jim Loughlin (w/encl)
Peter Carbone (w/ encl)

J:\P\5050 Proton International\004 Northrop Road Facility - Civil\Project Management\Correspondence\2020_12-22 IWWC staff comments\2021_12-30 Response to E. O'Hare.docx

TABLE X
Groundwater Elevation Summary
Proton International
932 Northrop Road
Wallingford, CT

Well ID	Elevation (ft)	Elevation (ft)	Construction			Well Installation Date	Well Destroyed Date	Well Screen Interval			February 2020		March 2020	
	Top of PVC Casing	Ground Surface	Standpipe Height (ft)	Total Well Depth (ft)	Casing Material			Depth (ft)	Screen Length (ft)	Media Screened	Depth to Groundwater (ft)	Groundwater Elevation	Depth to Groundwater (ft)	Groundwater Elevation
MW-1	353.7	NM	2.83	12	2-inch PVC	2/12/2020	-----	2-12	10	Overburden	6.95	346.75	8.42	345.28
MW-2	349.4	NM	2.57	13	2-inch PVC	2/12/2020	-----	3-13	10	Overburden	4.80	344.60	6.24	343.16
MW-3	359.4	NM	2.58	35	2-inch PVC	2/13/2020	-----	25-35	10	Bedrock	16.31	343.09	15.60	343.80
MW-4	362.6	NM	2.33	33	2-inch PVC	2/13/2020	-----	23-33	10	Bedrock	16.26	346.34	18.47	344.13

- Not Sampled

Channel Flow (Q) = 9.86cfs (calculated by Hydraflow Storm Sewers)

Channel Characteristics

Section Type	Trapezoidal
Bottom Width	4.0
Side Slopes	3:1
Total Depth	1
Longitudinal Slope	2.00%
Manning's Roughness	0.02

Flow depth	0.47 ft	(calculated by Hydraflow Express)
Velocity	3.55 ft/s	(calculated by Hydraflow Express)

Channel Lining Material Turf Establishment and C125BN Erosion Control Blanket (ECB)

Permissible Shear Stress 2.35 lb/ft² (unvegitated shear stress with C125BN ECB)

$$\begin{aligned} \text{Max Shear Stress} &= \gamma * \text{depth} * \text{Slope} \\ \gamma &= 62.4 \text{ lb/ft}^3 \\ \text{Max Shear Stress} &= 62.4 * 0.47 * .02 \\ &= 0.59 \text{ lb/ft}^2 \end{aligned}$$

$0.59 \text{ lb/ft}^2 \text{ (max shear Stress)} < 2.35 \text{ lb/ft}^2 \text{ (permissible shear stress)}$

Note: Channel has been designed in accordance with the Section 7.6 of the Connecticut Department of Transportation Drainage Manual



ROLLMAX™
ROLLED EROSION CONTROL

Specification Sheet

BioNet® C125BN™ Erosion Control Blanket

DESCRIPTION

The long-term double net erosion control blanket shall be a machine-produced mat of 100% coconut fiber with a functional longevity of up to 24 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the coconut evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with 100% biodegradable woven natural organic fiber netting. The netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the the twisted machine strands (commonly referred to as Leno weave) to form an approximate 0.50 x 1.0 in (1.27 x 2.54 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

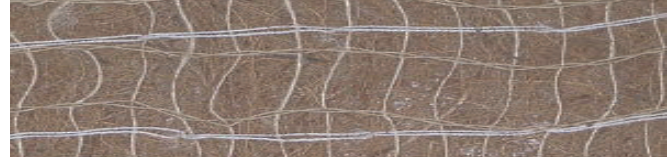
The C125BN shall meet Type 4 specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.17

Material Content

Component	Material	Quantity
Matrix	100% Coconut Fiber	0.5 lbs/sq yd (0.27 kg/sm)
	Leno Woven 100% biodegradable jute	9.3 lbs/1000 sq ft (4.5 kg/100 sm)
Netting	100% Biodegradable jute	7.7 lb/1000 sq ft (3.76 kg/100 sm)
	Biodegradable	

Standard Roll Sizes

Property	Leno weave top only	Leno weave top and bottom
Width	6.67 (2.03 m)	8.0 ft (2.4 m)
Length	108 ft (32.92 m)	112 ft (34.14 m)
Weight ± 10%	52.22 lbs (23.69 kg)	65.25 lbs (29.61 kg)
Area	80 sq yd (66.9 sm)	100 sq yd (83.61 sm)



Index Property	Test Method	Typical
Thickness	ASTM D6525	0.23 in. (5.84 mm)
Resiliency	ECTC Guidelines	85%
Water Absorbency	ASTM D1117	365%
Mass/Unit Area	ASTM 6475	9.79 oz/sy (333 g/sm)
Swell	ECTC Guidelines	40%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	0.11 oz-in
Light Penetration	ASTM D6567	16.2%
Tensile Strength - MD	ASTM D6818	206.4 lbs/ft (3.06 kN/m)
Elongation - MD	ASTM D6818	15.3%
Tensile Strength - TD	ASTM D6818	145.2 lbs/ft (2.15 kN/m)
Elongation - TD	ASTM D6818	12.9%
Biomass Improvement	ASTM 7322	473%

Design Permissible Shear Stress

Unvegetated Shear Stress	2.35 psf (112 Pa)
Unvegetated Velocity	10.0 fps (3.05 m/s)

Slope Design Data: C Factors

Slope Length (L)	Slope Gradients (S)		
	≤ 3:1	3:1 - 2:1	≥ 2:1
≤ 20 ft (6 m)	0.0001	0.018	0.050
20-50 ft	0.003	0.040	0.060
≥ 50 ft (15.2 m)	0.007	0.070	0.070

Roughness Coefficients - Unveg.

Flow Depth	Manning's n
≤ 0.50 ft (0.15 m)	0.022
0.50 - 2.0 ft	0.022-0.014
≥ 2.0 ft (0.60 m)	0.014



Western Green
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