



Peer Review Comment Form

NO.	SHEET NO.	SECTION	GREEN'S COMMENT	Applicant's RESPONSE	CONFIRMED BY	DATE
Chapter 38 Stormwater						
1	C001 & C101	§38-16.C.2	The linetypes in C101 have callouts identifying the lines but some of the linetypes do not match the linetypes in the legend on C001. For example limit of work is shown as dashed in C101 but dashed dot in the legend on C101. Please revise the plan or legend to make sure all linetypes are consistent between the plan and the legend.	The legend has been revised to coordinate with the linetypes shown on the plan set.		
2	Watershed Plans	§38-16.C.2	The CN value for Dirt Road is 72 for A soils in HydroCAD lookup table. The survey notes this as a "Dirt trail". The Applicant is using a CN of 77. Please explain why CN of 77 is being used instead of 72.	The HydroCAD calculations have been revised to utilize the lower CN value of 72 as requested.		
3	C103/SW Report	§38-17.C.5	The estimated seasonal high groundwater elevation (November to April) should be measured in areas to be used for stormwater retention, detention, or infiltration. The report indicates that the seasonal high groundwater was measured in September from a "nearby well". The wells are noted to be in Acton and Westford but do not provide a distance to the project. Please provide a test pit to confirm the seasonal high groundwater in the location of the proposed infiltration basin.	The Frimpter analysis which we used to obtain probable high groundwater elevations uses wells spread across a large geographic area with similar geologic and topographic settings. In general, a Frimpter analysis predicts higher groundwater elevations than are observed in the field and provides a conservative basis for a stormwater design. We have no objections to conducting stormwater test pits to confirm the results of the Frimpter analysis and request that the requirement to conduct stormwater test pits prior to the start of construction be included as a condition of approval.		
Drainage Plans						
4	C103/C502	MA Stormwater Handbook Vol 2 Chp 2	The MA Stormwater Handbook recommends providing no steeper than 3:1 side slopes for infiltration basins. The plans and details call out for 3:1 grading for the infiltration basin but the western portion of the basin appears to be steeper than 3:1. Please revise.	The western side slope of the infiltration basin has been revised to utilize 3:1 grading.		
5	C103		The proposed equipment and building appear to be set at a lower elevation that FEMA flood elevation. It is not recommended to install new equipment and building within the floodplain. Is the building and equipment designed to accept flooding?	The well building has a proposed finished floor elevation of 229.25 which has been added to the plans, and the design has been revised to relocate the proposed power equipment outside of the floodplain, also at a minimum elevation of 229.25, which places them at least 3 feet above the FEMA floodplain elevation.		
6	C103		Do the cut/fill calculations within the floodplain account for the fill volume of the equipment and building within the floodplain?	The cut/fill calculations have been revised due to grading changes at the location of the well building, the calculations do account for the location of the well building in the floodplain.		
7	C103	MA Stormwater Handbook Vol 2 Chp 2	MA Stormwater Handbook recommends infiltration basins to have a setback distance of 50 feet from any slopes steeper than 15%. It appears this is not met on the west side of the basin. Please revise the grading to meet the recommended setback.	It has been our interpretation of this recommendation that this refers to down gradient slopes greater than 15% so as to minimize the occurrence of breakout on the downhill slope and the chances of destabilizing the slope, although we recognize that the Stormwater Handbook does not differentiate. In this circumstance, we don't believe there are any safety issues having the basin located adjacent to this steep slope and there will be more negative impacts associated with clearing and regrading this hillside. To regrade the hillside to a 3:1 slope, which will still exceed the recommendations in the Handbook, will entail the clearing of an additional 1,300 square feet of woodland which in our opinion far outweighs the benefits of flattening the adjacent slope. We request relief from this requirement.		
8	C503	MA Stormwater Handbook Vol 2 Chp 2	Consider using a trapezoidal shape drainage channel instead of a V shape channel to minimize risk of erosion.	A significant portion of the well access road is located in an easement across property owned by Amazon which limits the footprint of the proposed improvements. As such, there is no additional space available to increase the width of the proposed drainage infrastructure as in several locations, the limit of improvements are located within 1 foot of the easement boundaries. Design measures were taken however to minimize the risk of erosion, the drainage channel is proposed at very shallow slopes with 800 feet of the swale being set at a slope of 0.50% and the remaining 200 feet being set at a slope of 2.50%. Stone check dams were also incorporated into the design to slow velocities in the channel.		
9	C503	MA Stormwater Handbook Vol 2 Chp 2	MA Stormwater Handbook recommends drainage channels to have 3:1 side slopes or flatter to prevent side slope erosion. Please revise side slopes to be 3:1 or flatter for the grass channels.	Please see the answer to comment 8. We request relief from this requirement.		



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Stormwater Report						
10	Standard 1: No New Untreated Discharges	MA Stormwater Handbook Standard 1	Standard 1 states there must be no new stormwater conveyances discharging untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. The Applicant has noted that 40% of the impervious area will be treated but the remaining 60% of the impervious area will directly discharge untreated stormwater to the wetlands. The Applicant has considered this 60% of impervious area "de minimis." Based on comments from MassDEP, the "de minimis" categorization is not acceptable. Please provide stormwater treatment so there is no new untreated stormwater discharge to the wetland.	The design has been revised to provide stormwater treatment via a wide, shallow infiltration trench at the head of the access road. Static water readings have been obtained from an observation well located at the proposed well building and they indicate a groundwater elevation which ranges from 219.5 to 220.5 which roughly corresponds to the surface water elevation within the wetland. To maintain adequate separation from groundwater, a 1.5 feet deep excavation, filled with crushed stone is proposed. We request that we be allowed to conduct stormwater test pits to confirm estimated seasonal high groundwater at this location prior to the start of construction as a condition of approval.		
11	Standard 3: Recharge	SW Checklist	It appears that the separation of the bottom of the infiltration basin from seasonal high groundwater is less than 4' and the infiltration BMP is designed to infiltrate more than the 10 year storm. Therefore, a mounding analysis should be provided. Please provide a mounding analysis and check the box in the SW checklist.	The stormwater checklist has been revised and a groundwater mounding analysis has been included in the revised stormwater report.		
12	Soil Analysis	MA Stormwater Handbook Vol 2 Chp 2	MA Stormwater Handbook recommends one soil sample for every 5,000 ft of basin area. Samples should be taken at the actual location of the proposed infiltration basin so that any localized soil conditions are detected. It appears that there have been no soil samples taken in the area of the proposed basin. Please clarify and provide soil analysis.	A soil analysis is typically included when stormwater test pits are conducted, in addition to determining seasonal high groundwater. This information will be obtained once the stormwater test pits are conducted. We request that this be included as a condition of approval prior to the start of construction.		
13	C103/Watershed Plans		The proposed grading has created a depression at station 8+35 south of the proposed road. It appears this area would fill up and overtop onto the roadway. Although, the watershed plans indicate this area discharges away from the roadway. Please revise grading or watershed plans to be consistent.	The watershed plans have been revised to account for the grading at station 8+35.		
14	Watershed Plans/HydroCAD/Soils Map		The NRCS soil boundaries should be shown on the watershed plans for clarity. The HydroCAD calcs indicate all work is within A soils. Please confirm there is no work within the B/D soil area that is shown on the NRCS soil map.	NRCS soil boundaries have been added to the revised watershed plans and calculations have been revised to include areas of B soils in the analysis.		
15	Modelling	MA Stormwater Handbook Vol 2 Chp 2	Grass Channel should be designed to convey the 2- year and 10-year storm event. There should be a minimum 1 foot of freeboard for the 10 year storm. Please provide backup calculations to demonstrate this has been met.	During the 10-year storm event, water depths within the swale reach 0.35-feet from station 0+00 to 8+10 and 0.29-feet from station 8+10 to 10+00 and hydraulic calculations have been included in the revised stormwater report to demonstrate this. Although we are not able to provide 1 foot of freeboard during the 10-year storm event due to space limitations which prevent us from making the swale deeper, we don't believe there will be any negative consequences as a result, and we request relief from this requirement.		
O&M Plan						
16	O&M	Stormwater Checklist/§38-18.B.3	The O&M plan shall include the signature(s) of the owner(s).	Signature(s) of the owner(s) will be provided prior to submitting the O&M plan for recording at the registry.		