GREEN INTERNATIONAL AFFILIATES, INC.
100 AMES POND DRIVE, SUITE 200 TEWKSBURY, MA 01876
T: (978) 923-0400 | WWW.GREENINTL.COM

PROJECT NAME 254-260 AYER ROAD PEER REVIEW
DATE 4/24/2023
UPDATED:
PROJECT NO. 22015.1206

Peer Review Comment Form

NO.	SHEET NO.	SECTION	GREEN'S COMMENT	Applicant's RESPONSE	CONFIRMED BY	DATE
APPLICATION						
1	3	Special Permit Application Submission Requirements	In the application the summary table is checked indicating all of the information has been provided. The summary table on the plans is missing gross floor area, density, trip generation and open space. Please provide this information or why this has been omitted from the summary table.	**Based on a review of the zoning requirements associated with the Business District, the maximum density and open space are not listed zoning items. However, the existing and proposed open space has been added to note 20 on the site plan sheet. The GFA of 50% max for the building requirement is shown on the current table. The trip gen information is provided in the Traffic Impact and Access Study.**		
2	3	Special Permit Application Submission Requirements	Dimensions shall be provided for all driveways. Provide dimension for proposed east exit driveway.	**Additional dimensions have been added to the easterly driveway connection point to Ayer Road.**		
TRAFFIC IMPACT STUDY						
3	3	Existing Conditions	The existing conditions paragraph for Ayer Road (Route 2A/110) states the posted speed limit is 40 miles per hour (mph). Per MassDOT Roadway inventory the posted speed limit is 35 mph. Confirm and update the posted speed limit for Ayer Road.	**This was a typographical error in the report; the posted speed limit should read 45 mph, which is consistent with MassDOT Roadway Inventory (https://gis.massdot.state.ma.us/roadinventory/) on Ayer Road, both east of Willow Road (Measure 76.21 to Measure 76.33) and west of Willow Road (Measure 76.12 to Measure 76.21). Also, we believe the reviewer's comment should read 45 mph, not 35 mph.**		
4	8	Collisions	A Road Safety Audit was conducted for the study intersection. More information regarding the collisions maybe be found and should be included in this section. (https://gis.massdot.state.ma.us/arcgis/rest/services/Roads/RoadSafetyAudits/MapServer/0/22167/attachments/22918)	**GPI is aware of the Road Safety Audit (RSA) previously conducted for the intersection of Ayer Road at Willow Road and Bruce Street, where the primary safety issues were identified as follows: 1) Pavement Markings and Signs; 2) Traffic Signals - Equipment, Timing & Operations; 3) Pavement and Geometry; 4) Access Control; and 5) Pedestrian and Bicyclist Facilities. The overall crash rates and trends noted by GPI are not dissimilar to those presented in the RSA. Further, subsequent to the RSA, full intersecction improvement plans at this location were developed for MassDOT Project 608443 which is set to begin construction in 2023, and addresses pertinent deficiences identifed in the RSA. Accordingly, we feel there is little value for further crash analysis at this location, given the improvements currently underway, and the fact that any past performance and/or crash history of the unimproved intersection will not translate into crash trends at the reconstructed intersection when improvements are completed.**		
5	10	Observed Travel Speeds	Table 3 states the posted speed limit for Ayer Road (Route 2A/110) is 40 miles per hour (mph). Per MassDOT Roadway inventory the posted speed limit is 35 mph. Confirm and update the posted speed limit for Ayer Road.	**Please see prior response to Comment 3.**		
6	11	Sight Distance Summary	The desirable intersection sight distance for the westbound driveway should be 500' per Table 9-7 of AASHTO.	**GPI's calculated value of 530-feet (documented in the TIAS Appendix) is based on a three lane cross-section on the mainline at this location (EB through, WB through, and auxiliary turn lane. Supporting calculations are contained in the Appendix of the TIAS**		
7	13	Trip Generation	Per MassDOT TIA Guidelines, the number of pass-by-trips must not exceed 15% of the adjacent street traffic during the peak hour per ITE's Transportation Impact Analyses for Site Development. This development is currently exceeding with an approximate 30% of adjacent street traffic during the peak hour. Please reduce pass-by-trips such that they do not exceed 15% of the adjacent roadway volume.	**Pass-by trips were drawn proportionally from each movement at the signalized intersection of Ayer Road/Bruce Street/Willow Road, as opposed to drawing exclusively from Ayer Road adjacent to the site. Based on this methodology, no more than 15-percent of any movement was drawn from the intersections as pass-by. Accordingly, GPI stands behind the methodolgy that was utilized.**		
8	33	Figure 14 Concept #1/2	Please provide turning movements to show the proposed modifications at the driveway are beneficial for trucks entering/exiting the sight.	**Truck turn plans are provided.**		
9	33	Figure 14 Concept #1/2	Per MUTCD, taper lengths for turning lanes shall be at least 100 feet in urban areas. The addition of the second turn lane decreases the proposed turn lane taper on the MassDOT project. With this change, neither turning lane is compliant with MUTCD standards.	**Understanding the physical constrainsts of the proposed geometric layout, , the Applicant considers providing refuge for WB left-turning vehicles destined to the site a prudent safety measure, as this is the only driveway that will permit entering vehicles (easterly driveway is being converted to exiting only), and the WB left-turn lane will also allow WB through vehicles to continue their travel unimpeded by vehicles waiting to turn left into the site. Further, providing a westbound left-turn lane was discussed on a preliminary basis with MassDOT, and it is understood that they will make the final determination on the adequacy of the proposed geomentric improvements.**		
10	34	Table 8	The Applicant should provide justification for the proposed changes to the study intersections since the operations are expected to worsen or have very minimal improvements.	**The addition of a WB left-turn lane that provides refuge for vehicles entering the site far outweighs any any minor increase in vehicle delay. Further, the WB left-turn maneuver is projected to operate at LOS A under all Build analysis scenarios, and function well below capacity, with negligible queuing.**		
SITE PLAN						
11	General		Both proposed alternatives would require extensive changes to the adjacent MassDOT project which is currently under construction, and would require a MassDOT access permit. The eastern driveway under the MassDOT project is proposed as a two way entrance/exit. This current site plan has the driveway proposed as one-way exiting the gas station. This needs to be coordinated with MassDOT as it will affect proposed signal timing and equipment location. Allowing for two-way access at the east driveway allows vehicles to take left turns into the gas station at the signal instead further down in the road. As previously noted, the addition of a left turn lane into the western driveway would reduce the eastbound left turn storage length at the traffic signal. Please clarify whether any coordination with MassDOT has taken place to discuss these potential changes.	**Based on preliminary discussions at the onset of the project, the "exit only" easterly driveway was preferred by MassDOT for the renovated site. As this proposed plan element and the proposed westbound left-turn at the site's westerly driveway are modifications from MassDOT project 608443, the project team will continue to coordinate with MassDOT officials through the state permitting process.**		

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12	4 Site Plan		Pedestrian signage (W11-2 & W16-7P) should be provided at the proposed crossing within the Gas Station.	**The site plan has been revised to show the applicable pedestrian signage.**		
13	4 Site Plan		The proposed relocated driveway does not match in with the proposed sidewalk/edge of pavement for the MassDOT intersection project. Please provide site plans that show revised driveway radii with proper tie in to the MassDOT project.	**The western driveway has been revised to match the future MassDOT project plans limits.**		
14	4 Site Plan		Please justify the need for the proposed raised mountable concrete island on the western driveway. The island could make turning movements more difficult for trucks entering the site and blocks the existing sidewalk for pedestrians.	**The mountable island was designed to provide a visual deterant for general passenger car traffic while allowing the larger driveway curbcut for access by the fuel delivery and commercial diesel vehichles. It has also been shortened in length to account for pedestrian travel route.**		
15	4 Site Plan	ADA	Please show locations for all detectable warning panels on the plans. There is one detail that shows the detectable warning panel but it is required in other locations such as on the sidewalk between the two accessible parking stalls.	**Detectable warning panels are not required on-site and are shown within the ROW limits only where appropriate. The sidewalk along the building is a flush sidewalk where detectable warning panels would not be warranted.**		
16	4 Site Plan		The snow storage limits are not clear. Snow storage should not be stored in the forebay or infiltration basin. Please revise.	**The snow storage area has been removed from the limits of the infiltration basin and additional limits of snow storage areas have been clarified.**		
17	4 Site Plan		Plans should be clearer on the division on the proposed improvements by the Applicant and the proposed improvements by MassDOT.	**The off-site MassDOT work has been changed to red in color to differentiate the limits of MassDOT work and work by the Applicant.**		
18	4 Site Plan		The sidewalk around the building calls for monolithic curb and sidewalk. The detail for this shows no curb reveal. Can you confirm there is no curb reveal? We recommend a curb with a reveal in locations where the sidewalk is not protected by bollards or wheel stops to prevent vehicles from driving on the sidewalk.	**Clarification on limits of curb reveal and flush sidewalks have been added to the plans.**		
19	5 Grading and Drainage Plan		The pipe angles for DMH-6 might not work with a regular size manhole. Please check the angles and constructability of the DMH-6.	**DMH-6 has been relocated to improve the pipe angles for use with a normal 4' diameter manhole.**		
20	5 Grading and Drainage Plan		The flow angle from INF-2 to DMH-6 to DMH-8 is not recommended. Please revise.	**DMH-6 has been relocated and a cleanout added to correct the pipe orientation.**		
21	5 Grading and Drainage Plan		Both invert in and out for DMH-6 are 252.35. Please revise invert out to be lower than invert in to ensure gravity flow.	**The inverts have been revised to provide a 0.1 foot drop within the manhole.**		
22	5 Grading and Drainage Plan	MA Stormwater Handbook Vol 2. Chp. 2.	Per the MA Stormwater Handbook, one soil sample for every 5,000 ft of basin area is recommended, with a minimum of three samples for each infiltration basin. Samples should be taken at the actual location of the proposed infiltration basin so that any localized soil conditions are detected. The test pits are shown on the grading plan where the stormwater bmps are located except for the stormwater infiltration basin. There should be a test pit for the stormwater infiltration basin.	**Based on the limits of the current operational existing development, test pits could not be performed. Confirmatory test pits will be performed prior to construction.**		
23	5 Grading and Drainage Plan	MA Stormwater Handbook Vol 2. Chp. 2.	CB-9 directly discharges to the infiltration basin. CB-9 shall provide pre-treatment before discharging to the infiltration basin.	**Pre-treatment for runoff entering CB-9 is achieved through street sweeping and a deep sump catch basin with hooded outlet. This area is located in a previously developed area (redevelopment) and pretreatment is provided to the maximum extent practicable in accordance with MassDEP standard 7.**		
24	5 Grading and Drainage Plan		The plan shows the infiltration basin overflowing into MassDOT's closed drainage system. The manhole that the overflow ties into a manhole that has 5 pipes please confirm this is constructable. This work should be coordinated with MassDOT.	**The proposed 8" overflow pipe conntects to a proposed 5' diameter manhole within the roadway. The pipe inverts have been analyzed and will be constructable within the 5' structure. GPI will continue to coordinate with MassDOT regarding this drainage connection.**		
25	5 Grading and Drainage Plan		The proposed work in the Ayer road for drainage does not have any invert information shown. Please provide inverts for the connection from the roadway to detention basin at east side of the site to confirm flow from Ayer Road will not discharge to the basin.	**All roadway work in Ayer road is part of the MassDOT roadway improvements and additional plan reference notations have been added to the plans. All MassDOT work is provided in red to identify limits of MassDOT work and work by the Applicant.**		
26	5 Grading and Drainage Plan		There is a proposed catch basin on the northwest driveway. Please coordinate with MassDOT project in this area to revise design of driveway or relocate catch basin out of driveway.	**GPI will continue to coordinate with MassDOT regarding the offsite work and the proposed onsite improvements associated with the re-development project**		
27	5 Grading and Drainage Plan		The inspection ports for the subsurface chamber system are not located on the plan but are included in the details. Please locate them on the plan.	**Inspection ports have been added and labeled as appropriate on the plans. Shop drawings will be provided by the manufacturor prior to construction to confirm final inspection port locations.**		
28	5 Grading and Drainage Plan, 10 Detail Sheet		The detail for eccentric catch basin requires pipe inverts to be more than 3'. All proposed catch basins have inverts 3' or less. CB-5 has an pipe invert 2.05' which is not constructible based on the detail. Please revise inverts or provide a new detail to accommodate the inverts.	**CB-5 has been revised as needed. All other structures that provide less than 3' of cover are noted on the Grading Plan with an asterisk to be constructed with low profile frame, grate and top slabs.**		

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29	5 Grading and Drainage Plan	MA Stormwater Handbook Vol 2. Chp. 2.	Oil/water separator should not bypass the 2 year storm or smaller. The HydroCAD model shows DMH-9, which is the bypass, having an outflow for the 2 year storm. Please revise so the bypass DMH-9 is utilized for storms larger than the 2 year storm.	**The drainage design has been revised to include two 2,000 gallon oil/water separators which will each accommodate the 2-year design storm without bypassing the structure.**		
30	6 Utility Plan		The sewer disposal system at southeast side of the site is located under proposed curb and no detail has been provided. Please confirm there are no conflict with sewer disposal system and curb.	**The proposed sewage disposal system is currently in the design phase and will be submitted to the Board of Health for review and approval.**		
31	6 Utility Plan		Sewer inverts should be shown for drainage crossings at northwest side of the site. Confirm sewer forcemain does not have sags and has positive pitch.	**The proposed sewage disposal system is currently in the design phase and will be submitted to the Board of Health for review and approval. The site plans and inverts will be adjusted as necessary to ensure that there are no conflicts once the septic design is completed.**		
32	6 Utility Plan		The proposed water service does not have callouts for size and material. Please provide.	**Note 17 has been added to the Utility Plan regarding the sizing of on-site utilities and the water service size has been clarified on the plan view.**		
33	6 Utility Plan		Can shutoff valves be provided for the drainage system so in the event of a spill it can be contained and not discharge into MassDOT's drainage system or infiltrate into the ground?	**Shut off valves do not appear to be warranted on this development. Positive limiting barriers (spill containment grooves) around the fuel islands, oil hoods on catch basin outlets, two large 2,000-gallon oil/water separator units, First Defense "hydrodynamic" separators and a lined sediment forebay have all been incorporated into the stormwater system design. All of the chosen BMP's provide the ability to store potential spills on-site and allow fuels/oils to be removed prior to discharge downstream. Coupled with the stormwater O&M plan providing inspection & maintenance schedules, the chosen BMPs will ensure on-site spill containment without discharge to the MassDOT drainage system or into the ground.**		
33	7 Erosion and Sediment Plan	§38-17.C.5.	A delineation and number of square feet of the land area to be disturbed shall be added to the plans.	**The total area of land disturbance note, currently shown on the Grading and Drainage Plan, has been added to the Erosion and Sediment Control Plan.**		
34	7 Erosion and Sediment Plan		The parcel north of Ayer road do not have erosion control measures shown. Please revise.	**Erosion controls have been added to this area.**		
35	8 Landscape Plan	ADA	It appears there is a sidewalk from Ayer Road to the crosswalk within the site. The sidewalk is hatch as proposed landscape stone with weed barrier. Is this material ADA compliant? This sidewalk should be ADA complaint. Please revise.	**The hatch pattern on the Landscaping Plan has been revised to eliminate confusion between the bituminous sidewalk and the landscape stone**		
36	12 Detail Plan	H-20 Loading	The detail for the slotted drain does not indicate loading requirement. Will the slotted drain be sized for H-20 loading?	**The slotted drain is designed by the manufacturer to accommodate H-20 loading using 16 gauge aluminum pipe. The manufacturer cut sheet is attached to this response and the detail has been revised to include loading information.**		
ZONING BYLAWS						
37		§173-18.C.	The proposed work requires major topographic changes and removal of existing trees . We defer to the board if there are any issues with the tree removal proposed.	**As discussed and acknowledged with the Planning Board at the 4/6/23 meeting, due to the elevation change across the site, tree removal is necessary to the extents shown on the site plans.**		
38		§173-18.D.	Adequate access to each structure for fire and service equipment shall be provided. Confirm this has been reviewed and coordinated with the Littleton Fire Department.	**360-degree access is provided throughout the site and continued review and discussions with Town Staff are ongoing.**		
39		§173-32.B.13	As per Motor vehicle service station with retail store, the required parking space is 12 space for 12 fueling location and 120 spaces for the retail area (one space per 50 square feet of gross floor area). Please clarify if parking requirement has been met.	**The parking was discussed with Town Staff during an initial project development phases in November 2022, and was reduced to limit impervious coverage on-site, consistent with the initial discussions with Town staff. Proposed parking is appropriate based on the site and historic gas station developments of this size.**		

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40		§173-32.C.3	Parking lots for eight or more cars shall be screened from any abutting residential use or public way by a four-foot width of densely planted shrubs or a fence of not less than four feet in height. Please confirm this has been met along the public way and along the abutting residential use.	**Based on the discussions with the Planning Board at the 4/6/23 meeting, a 6' tall solid stockade fence has been added along the western property boundary to provide a buffer to the residential use. Additionally, a section of fencing has been added along the eastern property in the vicinity of the proposed above ground stormwater basin. Low growth plantings are proposed along the public way to ensure adequate vehicular sight distance and visibility for the general public and customers.**		
Aquifer and Water Resource District Special Permit						
41		§173-62.D.3	The project requires evidence of approval by the board of health for their wastewater redesign. Their narrative notes it is pending approval. We recommend that board of health approval of the wastewater system is a condition of approval.	**Comment acknowledged**		
42		§ 173-63.E	Monitoring wells shall be constructed onsite; a monitoring schedule will be determined by the Planning Board in consultation with the Littleton Water Department. We recommend that the number and location of these monitoring wells be coordinated with the Town of Littleton Water Department.	**The Applicant and GPI met with representatives from the Littleton Water Dept on 4/13/23 to outline the location of monitoring wells and the plans have been updated accordingly to show four groundwater monitoring wells.**		
STORMWATER REPORT						
43	Pre/Post Development Drainage Plan	§38-17.C.6.	The Applicant is required to add the existing and proposed ground surfaces with runoff coefficient for each on a site plan.	**Ground surfaces and runoff coefficients have been added to the plans as required.**		
44	Post Development Drainage Plan/HydroCAD		CB-9 directly discharges to the infiltration basin but is included in 100S which does not discharge to the basin. There is no subcatchment discharging to CB-9 in HydroCAD. Please revise.	**The proposed subcatchment areas have been revised to include contributing area for CB-9.**		
45	Oil/Water Separator	MA Stormwater Handbook Vol 2. Chp. 2.	For gas stations, automobile maintenance and service areas, and other areas where large volumes of petroleum and oil are handled, the MA stormwater handbook recommends adding coalescing plates to increase the effectiveness of the device.	**Based on the overall design including positive limiting barriers (spill containment grooves) around the fuel islands, oil hoods on catch basin outlets, two large 2,000-gallon oil/water separator units, First Defense "hydrodynamic" separators and a lined sediment forebay, coalescing plates do not appear to be warranted for this site.**		
46	HydroCAD		A minimum Tc of 6 minutes should be used in HydroCAD. Please revise.	**The Tc has been revised to utilize a minimum of 6 minutes.**		
47	HydroCAD		On recent past projects the Conservation Commission requested the use of NOAA Atlas 14 rainfall data. The Applicant is using NRCC rainfall data. Please use the most conservative rainfall data.	**The drainage design has been updated to include the use of NOAA Atlas 14 rainfall data.**		
48	HydroCAD		HydroCAD model for 1P Above ground basin has two outlets modeled but only one outlet is shown on the plans. The plans are missing the 24" x 24" orifice/grate outlet control structure modeled in HydroCAD. Please revise the plans or the HydroCAD model to be consistent.	**The 24"x24" orifice/grate outlet represents the rim of CB-9. It is included in the model of the above ground basin since it is in the lowest grate elevation within the pipe network.**		
49	HydroCAD		HydroCAD model for INF-1 models the isolator row with an infiltration rate. The isolator row should be treated like a forebay and not modeled in HydroCAD. The isolator row pretreats the system collecting sediment which will clog the voids and will not infiltrate like the rest of the underground chamber system. Please revise.	**Based on information provided by the manufacturer, the isolator row does provide pretreatment prior to runoff entering the other chamber rows and may ultimately become partially clogged with sediment. However, because the isolator row is constructed with geotextile layers wrapped around the chamber, sediment cannot get to the voids in the stone or underlying soil. Sediment is isolated on the geotextile and contained within the open volume of the chamber arch, therfore, the infiltration capacity of underlying crushed stone and soil beneath the isolator row is maintained.**		
50	HydroCAD		For the 10 year storms, the HydroCAD model has warnings that storage is being exceeded. Please revise or provide an explanation on why the warning is acceptable.	**The revised HydroCAD analysis indicates "exceeded" warnings for a few structures during the 10-year design storm. These warnings indicate a tailwater condition within the drainage system, however, none of the catch basin rim elevations are exceeded indicating that the system is functioning and the warning is acceptable.**		

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51	HydroCAD		The breakdown for the HydroCAD model was not submitted for storms other than the 10 year storm. The HydroCAD model shall be submitted for the 2, 10, 25, and 100 year storms. If the HydroCAD model has additional warnings for larger storm events please revise or provide an explanation on the warning is acceptable.	**Additional storm events have been provided as requested. The warning messages shown during the 25-year and 100-year storms are similar to the 10-year storm and no catch basin rims or basin flood elevations are exceeded. Therefore, the warnings are acceptable. A phase-in depth of 0.01 is utilized for each infiltration BMP in an effort to reduce/eliminate warnings and the smallest possible "dt" of 0.01 hours is being used to achieve the most accurate analysis possible.**		
52	SW checklist		No disturbance to any wetland resource areas is not checked. Please confirm there will be no disturbance to wetland resource areas.	**No wetland resources are located onsite and therefore no disturbance to wetland resource areas. The checklist has been updated accordingly.**		
53	SW checklist		It notes that the all of the impervious area on site is not discharging to an infiltration bmp. Therefore, a capture area adjustment calculation should be performed to confirm the recharge requirement has been met. Please revise recharge calcs to include a capture area adjustment.	**The proposed infiltration BMPs collectively receive runoff from 83,898 sf of the 89,311 sf of total on-site impervious area (94.0%) which is sufficient to achieve the annual groundwater recharge volume stated in the report.**		
54	Drawdown Calcs		INF-1 and INF-2 uses an infiltration rate of 2.41 in/hr in HydroCAD but uses 8.27 in/hr in the drawdown calculations. Please revise to use 2.41 to match the HydroCAD model.	**The Hydrocad and drawdown calculations have been revised to utilize 8.27 in/hr as the design infiltration rate per the test pit findings of sand and gravel.**		
55	First Defense		Provide back up water quality flow calculations to confirm correct size/model has been chosen.	**Water quality calculations have been prepared by the manufacturer and are included in the revised Stormwater Management Report.**		
56	Pretreatment Calculation	MA Stormwater Manual Vol. 2. Ch. 2	Pretreatment calculations are missing for forebay, isolator row, and crushed stone apron. These act as forebays and the Applicant should provide calculations showing they hold a minimum of 0.1 inch/impervious to pretreat the water quality volume.	**Sizing calculations for the proposed sediment forebay and isolator row have been added to the revised Stormwater Management Report. The crushed stone aprons are utilized as energy disappators and are sized in accordance with the worksheets included in Appendix G of the revised report.**		
57	Pretreatment Calculation	MA Stormwater Manual Vol. 2. Ch. 2	How was the oil/water separator size determined? Back up calculations conforming to the MA stormwater Handbook should be provided.	**The sizing of the Oil/Water Separator units is shown in the detail for the units and found under Note 4 of the detall within the current plan set.**		
58	Geotech/Haz report		A geotechnical/hazardous material report was not submitted. Since the site is an existing gas station with underground tanks, has the site been analyzed for contaminated soils? If the soils are contaminated infiltration practices are not allowed. Please confirm.	**A geotechnical/hazardous material report is in the process of being completed. Once finalized, the Applicant will work with the design engineers to determine impacts to the overall stormwater design and adjust accordingly.**		
O&M Plan						
59	O&M	MA Stormwater Manual Vol. 2. Ch. 2	The O&M plan did not mention the sediment forebay. The sediment forebay needs to be inspected monthly and cleaned four times a year and when sediment depth is between 3 to 6 feet.	**The O&M Plan has been updated as requested.**		
60	LTPPP	LTPPP	Long term pollution prevention plan should describe what needs to be done if there is a spill.	**Additional information has been provided in the LTPPP**		
61	O&M	38-18.B.3.	The O&M plan shall be signed by the owner.	**The O&M will be signed by the owner/operator prior to commencement of construction activities.**		