



March 24, 2011

Ms. Patricia Riley, Chairwoman
Board of Selectmen
Town of Marshfield
870 Moraine Street
Marshfield, MA 02050

Re: Review of Ferry Street/Grove Street Earth Removal Application

Dear Members of the Board of Selectmen:

Woodard and Curran, Inc. (W&C) has performed a second engineering review of the updated project plans and permit application materials provided to us by Grady Consulting, LLC ("Grady") for the excavation and earthwork activities at the Ferry Street/Grove Street project site ("the Site"). We also met with Peter Armstrong and Darren Grady, P.E. at the site on March 8, 2011 to discuss the project plans and our earlier comments submitted in a letter report to the Selectmen dated February 17, 2011.

This second letter report is based on these updated plans and materials, the presentation and discussion by the Applicant at the public hearing held on March xx, 2011, as well as the site meeting referenced above.

We have based our analysis on the following revised/updated plans and documents provided to us:

- Restoration Plan Grove Street, prepared by Grady Consulting, LLC, dated February 29, 2008 and last revised March 21, 2011 (Earth Removal).
- Restoration Plan Grove Street (site detail sheet), prepared by Grady Consulting, LLC, dated February 29, 2008 and last revised March 21, 2011 (Earth Removal).
- Restoration Plan Grove Street (driveway profile and road detail), prepared by Grady Consulting, LLC, dated February 29, 2008 and last revised March 21, 2011 (Earth Removal).
- Site Plan Grove Street, prepared by Grady Consulting, LLC, dated February 29, 2008 and last revised March 21, 2011 (Earth Removal).
- (Phase 1) Phasing Plan Grove Street, prepared by Grady Consulting, LLC, dated March 17, 2010.
- (Phase 2) Phasing Plan Grove Street, prepared by Grady Consulting, LLC, dated March 17, 2010.
- (Phase 3&4) Phasing Plan Grove Street, prepared by Grady Consulting, LLC, dated March 17, 2010.
- Response to Comments letter and associated accompanying information prepared by Grady Consulting, LLC, dated March 21, 2011.

Our findings and recommendations are presented in the following sections of this letter report. Where we have found data gaps or inconsistencies in the information submitted, we have recommended that the Selectmen request additional data or clarification from the Applicant. We have also offered, in certain cases, recommendations to the Selectmen of possible Permit Conditions that may be adopted should the application be approved. The principal findings of our review are organized as follows:

- A. Review of Consistency of Application with Article Twenty;



- B. General Engineering Comments;
- C. Soccer Field Restoration Plans;
- D. Traffic Impacts; and
- E. Potential Aquifer Impacts.

A. Town of Marshfield Article Twenty, Earth Removal Bylaw

This second review continues our assessment of the completeness, sound engineering design, and compliance with the performance standards in the Article Twenty, Earth Removal Bylaw of the revised and updated plans and materials submitted by the Applicant. We state our original comment first, followed by an assessment (*in italics*) of the response provided by Grady. Where we have raised additional comments or recommendations, including recommended permit Conditions where applicable, these are shown in bold typeface.

1. Section 1 states that the removal of topsoil and loam from any land in the Town to any location outside the Town is prohibited under all circumstances.

The Applicant has stated that topsoil shall not be removed from the Site.

2. Sections 4.a & 4.b restrict earth removal operations and the location of earth removal equipment on the Site in terms of set-backs that are required. Applicant should also provide a statement describing planned site excavation operations and construction phasing, types of equipment to be used, its location on the site, and location of worker parking, truck access and idling, storage and lay down areas on the Site to demonstrate that the proposed excavation operations will comply with the By-Law.

*The Applicant has provided plans and a statement indicating that no permanent structure (i.e. shed, trailer, etc.) will be sited on the Site, with the exception of an electric enclosure that is not within the side yard setback. The Applicant indicated at the March 8, 2011 meeting that no equipment or vehicles will be stored overnight on the Site with the exception of a "Grizzle Rack" identified on the Phasing Plans. An Operations and Maintenance Plan (O&M) for Construction Activities has been provided by the Applicant. **The material presented in the O&M Plan adequately addresses this issue; however, the construction of a temporary swale during construction should be added to the O&M plan. Parking areas for equipment operators and visitors should also be identified on the Phasing Plans.***

In addition, Woodard & Curran recommends the following Permit Conditions:

- ***Applicant shall submit revised Phasing Plan and O&M Report, as noted above.***
 - ***Inspections of the excavation and earthwork operations shall be performed by the Town on a regularly scheduled basis,***
 - ***Trucks shall not queue or park on local roads in the vicinity of the project and no truck idling with engines running shall be allowed, and***
 - ***No equipment, vehicles or tanks containing fuel or oil shall be stored on the Site or overnight with the exception of a "Grizzle Rack".***
3. Section 4.d states that any access to excavated areas or areas in the process of excavation will be adequately posted. The applicant should identify the security signs to be posted and indicate their locations on the plan.



A security sign detail has been added to the plans. The location of the sign is at the entrance of the facility during earthwork operations. Woodard & Curran recommends that the signs also be posted along the perimeter of earthwork operations and at all access points to the Site.

Woodard & Curran recommends the following Permit Conditions:

- **Warning signs should be posted along the perimeter of the Site during the construction period.**

4. Section 4.f states that adequate provisions are to be made for drainage during and after the completion of excavation operations. According to the plans for soccer fields, stormwater for the site is directed to drainage swales around the perimeter of the soccer fields to promote aquifer recharge. It appears that the Applicant's Stormwater Management Plan and associated drainage calculations were reviewed by the Town previously under the Planning Board review and approval; hence, Woodard & Curran did not review these stormwater design elements. There is no reference, however, on the plans or in the application for Earth Removal Permit to temporary stormwater containment during the excavation of the site, which could pose an environmental and safety issue given the extensive volume of material to be removed over a long period of time. The Applicant should include and show on its plans provisions for managing site drainage during construction activities to ensure the containment and treatment of all stormwater generated on the Site.

The Applicant has provided an Operation and Maintenance (O&M) Plan and Phasing Plans (Phases 1 thru 4). These documents demonstrate that a temporary swale/sedimentation pond shall be constructed to control stormwater run-off generated from earth moving activities. This method of drainage control is acceptable; however, it is recommended that the applicant include this temporary structure in the O&M plan. Inspection and maintenance of the structure should also be added to the plan.

Woodard & Curran recommends the following Permit Condition:

- **Applicant should include the temporary swale/sediment pond noted above in the O&M plan, including inspection and maintenance of this structure. Revised O&M Plan will be submitted to the Selectmen prior to the start of construction.**

The Applicant should also provide a watershed map and clarify grading plans for the subject parcel and also adjoining parcel H12-01-09A. (PA Realty Trust) showing the pre- and post-development conditions on the site. The Earth Removal Permit application and plans show no earth removal or grading occurring on the adjoining parcel, however, the watershed map included in the project drainage report (submitted to the Planning Board) depicts that there will be grading on the abutting parcel (H12-01-09A; PA Realty Trust). The applicant should clarify and confirm whether any grading or earth removal will occur on the adjacent parcel and whether this parcel is included in this project.

Watershed plans have been provided by the Applicant. These new plans indicate that grading will be performed on the adjacent parcel to the north (H12-01-09A, PA Realty Trust) also owned by the Applicant. Work is needed to be performed on this adjacent parcel in order for the soccer fields to be graded as presently depicted on the Restoration Plan. It was noted by the Applicant during the Site Meeting that the work on this adjoining parcel is being done under a permit from the Massachusetts Natural Heritage and Endangered Species Program (NHESP) as part of



habitat restoration. Any modifications to the NHESP plan and permit will require agency approval.

It appears that the Applicant has not provided an Operation and Maintenance (O&M) Plan for stormwater devices shown in the soccer field Restoration Plan, nor is there an O&M Plan for any drainage devices necessary during construction activities. If an O&M Plan has not been submitted by the applicant and reviewed by the Town, it should be provided now. This Plan should outline the work to be performed by the applicant to inspect and maintain the stormwater devices and controls that will be built, both during construction activities and after the site had been restored and used for soccer play fields.

Woodard & Curran has reviewed the post-construction Operation & Maintenance Plan pertaining to the operations and maintenance of the soccer fields and recommends additional information provided in the document. These items are not specified under the Earth Removal Bylaw, but in our opinion will improve the long-term condition and performance of the fields. It is not known, however, whether this O&M responsibility is with the Applicant or with Marshfield Youth Soccer.

Woodard & Curran recommends the following Permit Condition:

- **Provide aeration & seeding procedures in O&M Plan consistent with “best management practices” (BMP) for natural turf soccer fields.**
- **Provide additional detail in O&M Plan for irrigation, specifically how many inches of water should be applied and how frequently, based on the specific properties of the field soils and moisture content levels. Include method to monitor/gauge whether overwatering is occurring.**
- **Under lawn cutting in O&M Plan, provide a schedule that indicates the ideal mowing height based on seasonal conditions.**

5. Section 4.g states that lateral support, such as retaining walls, shall be maintained for all adjacent properties. On the property to the north, listed as PA Realty Trust, the development plans do not depict existing contours and the proposed contours do not tie into existing grades along this property line. The Applicant should provide more detailed topography for its plans in this area and, if lateral supports are required, they should be identified and depicted on plans.

The Phasing and Watershed Plans indicate that grading will be performed on the adjacent parcel (H12-01-09A, PA Realty Trust) in order for the soccer fields to be graded as presently depicted on the Restoration Plan. No retaining wall structures are proposed.

6. Section 4.j states that the maximum groundwater elevation shall be determined by means of monitoring wells, test pits and soil borings across all affected areas of Site during the months of March, April, or May. Excavation shall be restricted to those areas that are at elevations ten feet or more above the maximum groundwater elevation, as determined by the testing conducted under the provisions of this sub-paragraph.

The test holes provided are not located at the lowest proposed points on the site, or in the location of the stormwater swales where water is expected to collect. They are located west of the proposed development. Woodard & Curran recommends performing additional tests within the soccer fields to determine the maximum groundwater elevations and the soil drainage characteristics in these areas, which will be more relevant to the intent of the Bylaw to provide adequate separation between the excavation activities on the surface and the aquifer below. If this data already exists, Applicant should provide it to the Selectmen.

The applicant states that monitoring wells were not installed in the center of the development (~118.0') due to the depth that they would need to be installed to reach the



groundwater elevation (~44.0'). Woodard and Curran recommends that an exploratory well be installed during Phase 1 of the project at the center of the Site to confirm groundwater elevations prior to the start of Phase 2.

Applicant's Engineer stated in their response to comments letter that Peter Dillon, their hydrogeologist, will respond to comments pertaining to aquifer protection and impacts. No written response from the Applicant's hydrogeologist has been received by W&C; however, based on a discussion with W&C's hydrogeologist, Peter Dillon indicated that he would be providing written comments pertaining to Aquifer Protection. Until we receive these comments and can review them, we believe that the previous comments made in our February 17, 2011 letter report are still valid and warrant a response.

7. Section 5.n requires a substantial fence enclosing the excavation or quarry areas where any excavation or quarry will extend under original ground level or will have a depth of ten feet or more and create a slope of more than one foot in two feet. Such fence shall be located ten feet or more from the edge of the excavation or quarry, and shall be at least six feet in height. The plans submitted do not show the placement of fencing around excavation areas, and only show fencing for the finished playing fields; however, this future fencing doesn't meet the Bylaw standard for safety and set-backs during excavation. For additional safety measures, and as per the Bylaw, it is recommended that perimeter safety fencing be employed during earthwork operations and shown on the plans, especially due to the significant depth of proposed excavation close to 60 feet in some areas.

Woodard & Curran concurs with the Applicant's statement that a perimeter fence around the finished site is not required per Article Twenty based on the side slopes shown in the revised plans. As recommended by W&C, the Applicant has provided a silt fence to be installed along the perimeter of the site at the top of slope during earthwork operations, which will act as a visual barrier and is consistent with the intent of our original comment to provide a safety barrier during construction activities.

B. General Engineering Comments

Woodard & Curran reviewed the revised plans and documents for general engineering design elements and Best Management Practices and offers the following comments and recommendations to the Board for consideration.

8. There is a significant amount of earth removal and cut proposed at the Site, in some areas close to 60 feet deep. This creates a considerable "bowl" effect and other site issues that require significant additional engineering design and safety measures in order to manage the side-slopes, drainage, and finished grading of the restoration plan. Woodard & Curran recommends that the Applicant consider leveling out the ground at a higher elevation with less cut and reduced earth removal, possibly stepping the fields such that they would increase in grade in the west to east direction. This may result in a greater available playing surface and significantly less earth removal, while achieving the same finished restoration design for soccer fields.

As stated in section 6.a of the Earth Removal Bylaw, we recommend that the Applicant provide an analysis of this alternative excavation plan showing if it can be done and, if so, what the finished site elevations are compared to the proposed deeper cuts under the present plan. If this alternative is not technically feasible, Applicant should explain why it cannot be achieved.

The Applicant indicated in the public hearing and at the Site Meeting that the elevation of the soccer fields and depths of excavation being proposed for the Earth Removal Permit were dictated by the separate restoration plan and permit approved by the Natural Heritage



and Endangered Species Program (NHESP) for the adjacent property to the north, also owned by the Applicant (H12-01-09A, PA Realty Trust). It is not clear, however, whether the excavation project grades and depth of excavation were the determining factor in the earthwork at the adjoining parcel. It is our opinion that the grades and slopes on the adjacent parcel approved by NHESP can be modified to achieve a compatible alternate soccer field design plan that has significantly less depth of excavation, while maintaining a soccer layout that is equal to or better than the current plan. This change to the adjacent parcel's plan, however, would require review and approval by NHESP.

It is our opinion that given the potential adverse impacts to the aquifer from the large volume and depth of excavation presently proposed by Applicant, as well as the significant reduction in the duration of construction activity and number of trucks if a reduced excavation plan were developed, such a plan could be approved by NHESP since it can be argued that this would result in less impacts and greater environmental benefits that are in the long--term interests of habitat improvement and preservation.

W&C believes that an alternate excavation plan could be designed that reduces the excavation depths proposed by approximately 15 to 20 feet in the deepest area of the site to the south where about 60 feet are proposed to be removed. An alternate schematic plan could be prepared to show the feasibility of such a reduced excavation.

Woodard & Curran recommends the following:

- *Applicant prepare and submit to Selectmen an alternate site plan showing excavation depths reduced by 15-20 feet along the southern and eastern sides of the Site where the deepest cuts are proposed. This alternate plan should also show the finished grades along the adjacent parcel to the north that is being restored for habitat. In addition, an alternate Restoration Plan showing the soccer fields resulting from this change/reduction in excavation grades should be provided.*

9. The plans do not show erosion and sediment control measures necessary to avoid environmental impacts during construction. This includes a mitigation plan depicting placement of silt fences, slope stabilization measures on steep slopes greater than 3:1, protective measures to minimize spreading dirt onto public roadways at the construction entrance, and other erosion and sedimentation control measures to be applied both pre-and post-construction as part of Best Management Practices. A temporary proposed crushed stone apron is shown on the plans, but this does not appear to line up with the proposed truck access driveway during construction.

To avoid tracking excess dirt and debris off the site, we recommend a construction entrance for the truck access road. The Board should also consider as a permit condition requiring regularly scheduled street sweeping (weekly or more frequently depending on the volume of truck traffic) at the truck entrance and along Ferry Street.

The O&M plan submitted by the applicant addresses Woodard and Curran's erosion and sedimentation control concerns.

Woodard & Curran recommends the following Permit Condition:

- ***Applicant is required to perform regularly scheduled street sweeping activities at the truck entrance and along Ferry Street and Grove Street for the duration of the construction period.***



10. The proposed contours adjacent to the stone trench to the south of the eastern field do not appear to tie-in to existing conditions correctly. The Applicant should correct this on the plans.

These plan changes have been addressed by Applicant.

11. The plans show a proposed electrical enclosure, but no source of the electrical connection is shown. Please depict the source and direction of electrical connection to the site.

The Applicant has indicated that the source of the electrical feed to the utility enclosure has not been coordinated with the local utility company at this time (no permit sought). As a condition of approval, the Applicant should finalize this aspect of the design prior to the start of the Restoration Phase (Phase 3). Plans indicating method of transmission, above or below grade, and direction should be provided to the Board for their review and approval.

Woodard & Curran recommends the following Permit Condition:

- **Applicant shall provide the Selectmen with a final design showing the electrical feed to the utility enclosure prior to the start of Restoration Phase.**

12. The plans show an existing bituminous concrete driveway having an entrance to Ferry Street in the same location as the proposed Site entrance. The applicant should clarify the location of transition of the roadway material from pavement to stone.

The Applicant has addressed this comment by stating that existing pavement limits at the entrance from Ferry Street will remain in the current configuration. No additional pavement will be provided.

13. Please provide volumes and rates of run-off onto the playing fields, as well as off-site onto Ferry Street.

Since there will be no additional pavement proposed at the entrance of Ferry Street, Woodard & Curran's concern relative to stormwater run-off in this location has been addressed.

14. The following design details are not shown and should be provided: Stone wall located in northwest corner of the site; construction fencing around perimeter of the Site; safety and other required signage. Clarification is also needed of what is intended by the "viewing area" shown on the plans and is there only one such area?

A retaining wall detail has been added to the project plans and the Applicant has indicated the purpose of the "viewing area". Woodard & Curran's concerns have been addressed.

15. In order to complete a thorough review of the project, it is recommended that the Applicant provide the Selectmen with following additional information:

- Estimated quantities (cubic volume) of earth removal from each area of the site with plans showing the depth of earth removal from each area.
- Estimated number of trucks and average truck carrying volume to be used during earth removal and duration of earth removal activities (based on avg. truck size).
- Plans showing erosion and sedimentation control measures and devices to be installed during construction.
- Items listed in Article Twenty, section 5, Site Plans, including descriptions and plans addressing method of earth removal, repair and cleaning of streets used by trucks during removal activities, and operational safety measures such as perimeter fencing.
- Excavation equipment types and its location on the site.
- Operation and Maintenance Plan for stormwater devices.



- Perimeter safety features, such as fencing and signage, to be employed during earthwork operations.

The applicant has revised the estimate of truck traffic and provided a range of daily truck trips from a low of 20 trucks per day to a high of 60 trucks. The new estimate of 20 trucks per day exiting the Site will result in a total project duration of about 4 years and 17,700 total truck trips over this time. This is, in our opinion, a more realistic number of truck trips to use in projecting traffic effects and potential adverse impacts to local roadways and travel. It is still our opinion that a Traffic Study is warranted to analyze the potential for adverse impacts from truck traffic from the project.

The applicant has provided an adequate O&M Plan as documented in Comment #2 .

The Phasing Plans provided in this package address part of our comments made previously; however, there is still a lack of description on the number and types of excavation equipment to be used (i.e., loaders, graders, back hoes, etc.) and the locations on the Site where this equipment will be staged or where storage and lay down areas will be located. Applicant has stated that no equipment will be stored overnight on the Site; this should be made a condition of the permit.

Woodard & Curran recommends the following Permit Condition:

- ***No construction equipment, vehicles or tanks containing oil or gasoline with the exception of a “Grizzle Rack”, shall be stored overnight on the site.***
- ***Applicant shall also submit a description to Selectmen of the sequence of earth removal within each phase of work areas, including where equipment will be staged during operations.***

16. Applicant should also identify what plans they have to monitor air quality during the extensive excavation and earth moving activities proposed and whether portable air monitoring stations will be employed onsite for duration of the construction period. Applicant should also address what procedures will be employed for dust control and what measures will be used to address and eliminate significant dust when it occurs.

Woodard & Curran recommends the following Permit Condition:

- ***Applicant shall prepare a Dust Monitoring Plan and Program to be carried out for the duration of the construction period. The details of such a program are provided in Attachment 1.***

17. Applicant should also address potential adverse noise impacts in terms of operations of construction equipment and trucks during the earth removal phase of the project. Specifically, Applicant should provide information on the following noise elements of the project:

- identify where earth moving and excavation equipment will operate on the site during the various phases of construction;
- identify the duration in years of the construction period;
- identify if and where rock-crushing equipment will be located onsite and the sound levels of this equipment (in weighted dBA values) and distance of this equipment from the abutting property lines, as well as distances to nearest sensitive receptors (such as residences, businesses, schools, nursing homes, recreation areas, etc.);



- identify whether truck and equipment noise, such as back-up safety beepers, will impact nearby residences or other off-site users;
- identify what will be the days and hours of operation of construction equipment on the site;
- identify when construction equipment, including trucks, will be allowed to start their operations (i.e., turn on engines) at the site and whether trucks idling while waiting to enter the site or while loading will be allowed to run their engines; and
- identify what noise mitigation measures will be employed to minimize any adverse noise impacts to abutting property owners.

The Phasing and O&M plans address most of the comments made, with the exception of noise impacts to abutting residences, prohibition of truck idling, and what noise mitigation measures will be employed.

Woodard & Curran recommends the following Permit Condition:

- ***No truck idling with engines running is allowed on the Site or for trucks queuing to enter the site.***
- ***Prior to start of construction, Applicant will identify all abutting residences and the distances from these residences to the work areas (Phases 1 thru 4) of the project. Applicant will propose to Selectmen additional noise mitigation measures to be employed to reduce the disturbance of construction equipment noise on these residences.***

C. Soccer Field Restoration Plans

Woodard & Curran has reviewed the soccer field restoration plans and offers the following comments and recommendations. Our review of eth plans is based on design standards for playing fields contained in Sports Fields: A Manual for Design, Construction, and Maintenance by Puhalla, Krans, and Goatley, 1999.

18. The soccer field dimensions of 210 ft. x 330 ft. meet High School and Junior High School minimum requirements; however, the Applicant should consider increasing the field width to 225 ft. for maximize flexibility and usage for youth play. Reducing the depth of cuts and volume of earth removal, as was recommended in item #8 above, may allow this increased size to be accommodated. The Applicant should evaluate this alternative to determine its technical feasibility.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field size depicted on the plans, as well as NHESP approval for the grades at the adjoining parcel. However, it is our engineering opinion that if the grades and toe of slope location on the adjoining parcel are modified to allow the raising of the elevations of the soccer fields, an improved soccer field layout could be achieved (see comment #8). This change would also result in greater protection of the aquifer, as well as reduced impacts of construction and truck traffic.

19. The preferred orientation for soccer fields is North-South based on the position of the sun in the sky. The current design includes soccer field orientation of East-West, which could result in problems to players on the eastern ends of fields directly facing the sun.

The Applicant has stated that Marshfield Youth Soccer has approved the field layout and orientation depicted on the plans. This recommendation will improve the play of the fields and should be considered by Marshfield Youth Soccer in its final acceptance of these plans.



20. The preferred grading for soccer fields should include a high point down the centerline of the field lengthwise, and to crown the field towards the sidelines. This is done to facilitate drainage away from the middle third of the field and away from the goals where players congregate, and is based on accepted design standards for playing fields. The current design does not meet this grading standard since the high point is shown down the centerline of the field widthwise and crowned toward the goal lines. The current proposed scenario will promote drainage towards the ends of the field and the goals, the portions of the field with the highest amount of play creating poor playing conditions due to wear and tear of the playing surface during and after rain events. This will result in increased wear on the playing surface and maintenance requirements, as well as safety concerns for players slipping in wet conditions.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field-grading scheme depicted on the plans. However, it is our engineering opinion that the grading could be modified with modest effort to meet our concerns relative to drainage improvements.

21. The slope of the field as shown is 1%. This is relatively flat and would be sufficient if the design proposed an under-drainage system, which is not shown in the plans submitted. Without an under-drain system, there is likelihood that the fields will not drain sufficiently after rain events, thereby creating problems for turf maintenance and longevity, as well as player safety, based on the design standards referenced above.

The Applicant should consider providing an under-drain system consisting of flat drains overlaid with sand and spaced approximately 5 ft. to 20 ft. apart. The Applicant should also consider the drainage characteristics of the fields as presently designed and what is the soil profile of the finished field and how quickly will the fields drain after a rain event.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field-grading scheme depicted on the project plans. It is our engineering opinion that the slopes on the field could be modified with modest effort to promote better field drainage.

22. The proposed topsoil (i.e., root zone) depth should be increased to a minimum of 6 in. but 9 in. is the preferred soil depth to better establish and maintain grass vegetation and to meet standard natural athletic field root zone depths.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the depth of topsoil depicted on the project plans. It is our engineering opinion that the depth be increased to a minimum of 9 in. to better establish and maintain grass vegetation with less maintenance cost over the long term to Marshfield Youth Soccer.

23. The Applicant should provide a proposed seed mixture and application frequency appropriate for athletic field applications proposed for the soccer fields.

The seed mixture provided meets Woodard and Curran's concern and is adequate for this installation.

24. The current grading design appears to indicate that runoff from the surrounding areas will enter the surface of the soccer fields. The plans should be revised to eliminate any runoff from entering the surface of the soccer fields and instead be directed to low points just outside the corners of the fields. As noted above, this is both a player safety and field maintenance/longevity issue.

The grading along the edge of the field has been modified to meet our concern.

25. Protective netting is not shown on plans and should be installed between the two soccer field goal lines and also between the western soccer field and the parking lot.



The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field design. Woodard & Curran recommends that netting be installed as previously noted.

26. Gates should be installed at certain points within the limits of the proposed fencing in order to allow access to areas where balls may be kicked over the fences and out of play.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field design. Woodard & Curran recommends that gates be installed as previously noted

27. The Applicant should identify on the plans the drop curb locations for ADA access paths to the fields and reference placement of signage and road markings designating these provisions.

Curbing is not proposed in the project plans; therefore, this addresses our concern about curb ramps.

28. The Applicant should consider including amenities to the final plan, including seating areas, equipment storage shed, and walkways surrounding the fields.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field design.

29. Applicant's Restoration Plan shows a large number of closely spaced sprinkler heads as part of the irrigation system within the play areas of the soccer fields. Applicant should identify whether an Irrigation Engineer experienced in playing field design evaluated this plan and Irrigation Engineer should assess whether fewer spray heads (perhaps of larger size providing greater coverage) could be utilized instead across the play areas in order to minimize the possibility of damage to heads from play or children tripping on heads.

The Applicant has stated that Marshfield Youth Soccer and other Boards have approved the field design. Woodard & Curran recommends that an Irrigation Engineer experienced in playing field design evaluate this plan prior to the start of construction.

D. Traffic Assessment

The Earth Removal Permit application submitted by the Applicant does not include any information on the potential traffic impacts from the large-scale excavation activities proposed at the project Site. As was noted in our February 17, 2011 letter report, adverse impacts of construction truck traffic could affect travel along Ferry St., Grove St. and other local roads in the immediate vicinity of the Project Site, as well as along local roads and neighborhoods in Marshfield through which truck traffic will travel on a daily basis to and from the Project Site. W&C recommended that a Traffic Study be done examining the effects of project truck traffic on local roads, as well as roadway level of service (LOS), sight distances, roadway geometry, intersection analysis, and the Applicant's proposed roadway improvement of a new turning lane on Ferry St. at the entrance to the site access road. To date, Applicant has not provided a Traffic Study.

As stated in item 4.k of Article Twenty, Earth Removal Bylaw, a project shall not be injurious or dangerous to the public health and safety; and as stated in item 5.k, Applicant is responsible for the "proper provision for vehicular traffic, service roads, control of entrances and exists to highways". Both of these provisions require the Applicant to address whether the project has adequately analyzed traffic impacts from its project and provided necessary traffic mitigation measures to avoid or minimize such impacts. Additionally, as noted in the DPW letter dated March 1, 2011 there is concern about the effects of heavy truck traffic on the condition of local roadways.

In response to comments made at the public hearing and during the site meeting with the Applicant and Grady on March 8, 2011, Applicant agreed to revise its truck traffic estimates based on a more 'conservative' (or slower) loading time for trucks leaving the Site. This new information was provided



and shows a range of daily truck trips from a low of 20 trucks per day to a high of 60 trucks. The result of the 20 trucks per day exiting the Site during the construction period will be a total project duration of about 4 years and 17,700 total truck trips over this time period. This is, in our opinion, a more realistic number of truck trips to use in projecting traffic effects and potential adverse impacts to local roadways and travel. It is noted, however, that the calculation done by Grady does not account for any work delays due to rain or winter weather, but such delays would be largely insignificant over the course of the four years of construction activities generating truck travel.

The project will create high truck volumes that could adversely affect local traffic patterns, cause significant traffic delays, and create safety concerns for residents, schoolchildren, commuters, and the general public throughout the neighborhoods that this truck traffic will travel on a daily basis. Due to the high volumes of truck traffic generated over a prolonged time spanning up to four years or longer, we recommend that a Traffic Study be performed. The roadway engineering, safety and traffic flow topics to be addressed in this study are the same as listed in our February 17, 2011 report.

E. Aquifer Impacts

W&C's senior hydrogeologist, Cary Parsons, spoke by telephone on March 23, 2011 with the Applicant's hydrogeologist, Peter Dillon, regarding W&C's comments pertaining to aquifer protection. Both Mr. Dillon and Mr. Grady indicated that he would prepare written responses to our comments pertaining to Aquifer Protection. As of the date of this letter report, we have not received a written response from Mr. Dillon to our original comments. Until we receive these comments and can review them, our original comments in the February 17, 2011 letter report remain a concern that has not been addressed.

I would note that the Site Meeting with the Applicant and Engineer held on March 8, 2011 was very productive and addressed many of the comments made in our first letter report. There remain a lesser number of comments, some of which we believe are significant, that have not been fully addressed, which we have noted in bold typeface in the section above. I will attend the next scheduled public hearing of the Selectmen to present our findings and answer questions.

Sincerely,

WOODARD & CURRAN INC.

A handwritten signature in black ink that reads "Daniel Garson".

Daniel Garson, AICP
Senior Vice President

DG/cc
224197.00

cc: Rocco Longo, Town Administrator
Robert L. Marzelli, Esq, Town Counsel