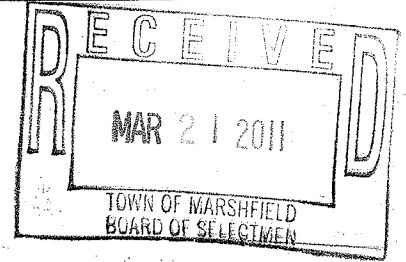


March 21, 2011

Marshfield Board of Selectmen  
870 Moraine Street  
Marshfield, MA 02050



RE: Earth Removal Permit  
Assessors Map G12 Block 29, Lot 02  
Applicant – Marshfield Youth Soccer

Dear Board Members:

I have received a copy of a letter from Daniel Garson, AICP, Woodard & Curran (W&C) to Ms. Patricia Riley, Chairwoman, Board of Selectmen, dated February 17, 2011. Peter Armstrong and I met Daniel Garson and Jeffery Streamns at the project site as discussed at the March 8<sup>th</sup> meeting. We determined that W&C did not receive all the information (both plans and supplemental letters, and calculations) provided by the applicant with the plans. We agreed upon a number of items and the information they need to complete the review of the project. Below are the W&C comments in *italic font* with our responses in normal font:

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. Applicant should provide a statement addressing the removal and reuse of topsoil and loam on the Project Site and that they will comply with this provision of Bylaw.*

The applicant will not remove topsoil and loam from the project site to any location outside of Town as it is stated in the Town's Bylaw. Topsoil and loam will be reused on 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. The plans provided do not show the locations of earth removal equipment and operations onsite, nor do they show the applicable set-backs that must be met. The applicant should provide a revised plan showing set-back limits from public streets and lot lines. 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. Applicant should also provide a description of the method of earth removal, which includes delineation on a plan of the removal areas and associated depths of excavation from each area of Site, estimated quantities (cubic volume) of earth removal from each area of the Site, distance of excavation to street and lot lines, and provisions for onsite vehicular access and vehicle flow patterns.*

Setbacks to the public streets are shown on the Site Plan. The Operation and Maintenance (O&M) Plan – During Construction is attached. No permanent structures (i.e. sheds, trailers, etc.) are proposed on the site with the exception of the proposed electrical enclosure.

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.*

Access to the excavated areas will be adequately posted. A sign detail and their locations have been added to the plan.

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 Operation and Maintenance Plan – During Construction is attached.

*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.*

The watershed map from the drainage calculations is attached.

*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.*

The Operation and Maintenance Plan, Proposed Soccer Fields – Post Construction was previously submitted. Attached is another copy.

*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.*

As discussed during the site visit the watershed maps are attached and show the grading along the northern property line for both existing and post construction conditions.

*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.*

Monitoring wells and groundwater elevations are shown on the plans. Monitoring wells are an accepted practice for determining groundwater elevations for deep water tables. This practice was an acceptable use for both the ZBA and Planning Board. Groundwater elevations are roughly at elevation 44.0. Test holes were not performed in the center of the property because of the depth to water table in this area is between 30 and 50 feet.

*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.*

The proposed slope shown on the plans is 2.5:1 and does not require a fence according to Section 5.n of the Town's Article Twenty.

## **B. General Engineering Comments**

Woodard & Curran reviewed the application 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 Restoration Plan shows spot grades, elevation 59.0 along the northern property line. This grade allows the drainage swales along the northern sides of the soccer field to have sufficient volume to control stormwater on the site. The grading along the northern property line ties into the grades approved by Natural Heritage Endangered Species Program (NHESP) on the adjacent property

*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.*

Silt fence is proposed along the top of slope and along the bottom of slope as the slopes are completed through the construction phases as stated in the O&M Plan – During Construction and shown on the phasing plans.

*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. This should be corrected on the plans by the Applicant.*

The contours have been modified.

*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.*

A permit from the utility company has not been requested at this time.

*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 area of existing pavement will be maintained in its current location as shown on the Pocket Turning Lane Layout on sheet 3 of the Restoration Plan. This is approximately 75-80 feet from the edge of Ferry Street.

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

Volumes and rates of run-off are provided in the Stormwater Report. There is no proposed additional pavement at the Ferry Street Entrance.

*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 Boulder wall detail has been added to the plan. Construction safety fence and silt fence will be used during construction per the O&M plan – During Construction. Signage details are shown on the plans. The protected viewing areas are areas protected by screens where handicap people can watch a soccer game and be protected from any balls leaving the playing area.

*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 proposed to remove approximately 460,000 cubic yards. A truck trip table and calculations and an O&M Plan Proposed Soccer Fields Post Construction was provided previously and is attached. An O&M Plan –During Construction is attached. Perimeter fencing is not proposed or required for the slopes proposed. Proposed signage is shown on the plans. Erosion controls will be used during the earth removal as stated in the O&M Plan – During Construcion.

*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.*

Procedures for dust control are stated in the attached O&M Plan –During Construction. Mr. Armstrong's intention is to be proactive with dust control from the site rather than find out that there was more dust in the air for one day versus another. W&C is providing additional information on the portable air monitoring stations to determine if they may be applicable for the site, as discussed during our on-site meeting. Problems with the portable air monitoring stations are that there is no way to determine if the dust collected is from an adjacent property or not and there are no thresholds for the amount of dust collected.

*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.

An O&M Plan –During Construction is attached.

### **C. Soccer Field Restoration Plans**

*Woodard & Curran has reviewed the soccer field restoration plans and offers the following comments and recommendations. Our review of the 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.*

Marshfield Youth Soccer has reviewed and approved the field size shown. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer." See response to comment #8.

*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.*

Marshfield Youth Soccer has reviewed and approved the field orientation shown. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

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.*

Marshfield Youth Soccer has reviewed and approved the proposed grades of the field. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

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 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.*

Marshfield Youth Soccer has reviewed and approved the proposed grades of the field. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

The underlying soil on the site is very sandy and has a high infiltration rate and does not require an under drain system as proposed.

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.*

Marshfield Youth Soccer has reviewed and approved the proposed depth of top soil. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District 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.*

A proposed soccer field fertilization program with proposed seed mixture was previously provided and is attached.

*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 spot grade of "59.3" on the south side of the eastern most field has been modified to "60.3"

*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.*

Marshfield Youth Soccer has reviewed and approved the proposed field layout. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

*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.*

Marshfield Youth Soccer has reviewed and approved the proposed field layout. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

*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 on the site.

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

Marshfield Youth Soccer has reviewed and approved the proposed field layout. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

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.*

Marshfield Youth Soccer has reviewed and approved the proposed layout of the irrigation system. The Restoration Plan has been approved by the "Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01" and "Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer."

#### D. Traffic Assessment

*The Earth Removal Permit application submitted by the Applicant does not include any information on the expected truck traffic from the excavation activities and resultant potential traffic impacts at the Project Site. Impacts of construction truck traffic could affect travel along Ferry St. and Grove St. 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. 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. In this project, the large volume of earth removal that is proposed will generate high volumes of truck traffic over a prolonged period, possibly spanning two years or longer. This will create high truck volumes that could adversely affect local traffic patterns, cause significant traffic delays, and create safety concerns for residents, school-children, commuters, and the general public throughout the neighborhoods that this truck traffic will travel on a daily basis.*

A truck trip table and calculations were provided. Proposed truck routes were also provided. Additional copies of both are attached.

*The Applicant is required by the Bylaw, as noted in sections above, to provide a delineation of earth removal areas and excavation depths from each area. This information is not shown on the plans. It is also important that the applicant estimate the number of trucks that will be needed to move the excavated earth and materials, which will require daily truck trips to and from the site. Since each truck carries a typical volume of 10 to 20 cubic yards of material depending on truck size, the total volume of earth to be moved, and the size and number of trucks needed will determine the duration of the excavation period. For example, if the total volume of earth to be removed from the Project Site is 400,000 cubic yards and each truck carries an average volume of 20 yards per one-way trip, this means that there will be 20,000 truck trips during the excavation period. If a contractor can only move 5 to 10 trucks per day (usually determined by distance to final destination of the material, whether trucks will be able to travel during the peak morning and afternoon rush hour times, and length of work day) this means that the duration of the construction period could be six years or longer. This volume of truck traffic and length of construction period warrants, in our opinion, the Applicant engaging a qualified Traffic Engineering firm to prepare a Traffic Study and Traffic Mitigation Plan as part of the Earth Removal application.*

Both proposed and existing contours are shown on the Site Plan. The difference between them represents the depths of excavation. The ends of the proposed lines where they meet existing grade is the extent of the slope and earth removal areas. A truck trip table and calculations were previously provided and are attached.

*It is our understanding that as part of the review of the project by the ZBA, the Applicant proposed roadway improvements including a new turning lane on Ferry St. at the entrance to the site access road. Woodard & Curran has not reviewed the proposed intersection improvements; however, as noted above, the detailed Traffic Study that is recommended assessing the impacts of the proposed volume and effects of truck traffic from the project should include the intersection improvements proposed by the Applicant.*

*Among the traffic study topics and information that should be addressed in the Traffic Study are the following:*

- *Total volume of material to be removed from the Project Site (as part of the phased excavation plan requested above) and duration of the construction activities at the site;*
- *Number of truck trips per day and size of trucks;*
- *Truck routing to and from the site;*
- *Analysis of sight distances along Ferry Street and other local roads in the vicinity of the Project Site;*
- *Intersection analysis of local roads in the vicinity of the Site, including the addition of a turning lane proposed by the Applicant;*
- *Existing Level of Service (LOS) along local roads under present conditions and effect of the Project's truck traffic and construction duration on LOS;*
- *Location of schools and school bus stops in the general area of the Site and whether the truck routing and traffic volumes will affect safety of school-children, elderly residents or other pedestrians;*
- *Analysis of the public safety and traffic issues of truck traffic on area recreational sites and users, such as the Bridal Trail grade crossing used by bikers, joggers, and horseback riders;*
- *Roadway widths and turning lanes along Ferry Street and at construction entrance to site and whether additional turning lanes (as proposed by Applicant) can safely be accommodated, as well as whether traffic lights, signage, or police details will also be required given the possible duration of the construction activities over several years; and*
- *Other mitigation measures required to avoid or minimize truck and construction traffic impacts on local roads and traffic through nearby residential areas and commercial centers.*

No comment.

## E. Aquifer Impacts

*Woodard & Curran reviewed the application for compliance with items 4.j and 4.k of the Earth Removal Bylaw, Article Twenty, specifically addressing the requirements to submit "complete information on the depth of excavation and maximum groundwater elevation throughout the entire area proposed to be excavated. Maximum groundwater elevation shall be determined by means of monitoring wells, test pits and soil borings [taken] during the months of March, April or May". And the Bylaw goes on to say "Excavation shall be restricted to those areas which are at elevations ten feet or more above the maximum groundwater elevation" as measured by these tests. The Bylaw also directs that the Selectmen shall find that the proposed operation shall not "have a material adverse effect on the water supply" of the Town. Such water supply impacts can take the form of impacts on water quality or available quantity.*

*This hydrogeological review of the proposed activity considered available information on the proposed excavation activities that can affect the quality or quantity of recharge to the municipal aquifer. We have focused on available information either submitted with this application or previously submitted by the Applicant for other hearings with the intent of noting any data gaps or significant issues that appear not to have been considered by other Town Boards or Departments in their review of this project. The intent is to identify any new or overlooked questions or concerns about possible impacts to the Town's water supply. During this review, Woodard & Curran reviewed the following documents:*

- *Ferry Street Project Restoration Plan, sheets 1 through 3, prepared by Grady Consulting, LLC, dated February 29, 2008 and last revised May 29, 2009.*
- *Ferry Street Project Site Plan, sheet 1 of 1, prepared by Grady Consulting, LLC, dated February 29, 2008 and last revised June 21, 2010.*
- *Application for Earth Removal Permit (page 3) of Peter Armstrong for Marshfield Youth Soccer (dated October 19, 2010).*
- *Partial sections of report from Geoscience, P.O. Box 96 Norwell, MA. 02061 (dated May 6, 2010) titled "Hydrogeological Evaluation, Marshfield Youth Soccer, of Grove Street" –addressed to Daren Grady, P.E. of Grady Consulting, LLC.*
- *A letter dated April 14, 2010 from MA DEP Southeast Regional Office, to Grady Consulting, LLC, regarding "Proposed Earth Removal Located Off Grove Street – MEPA File # 14508".*
- *Letter report by Horsley Whitten Group dated Oct 19, 2007 to Mr. Rod Prococcino, Marshfield Town Engineer regarding Earth Removal Permit application for Grove and Ferry Streets, Marshfield, MA.*
- *Letter report by Horsley Whitten Group dated May 5, 2010 to Mr. Rod Prococcino, Marshfield Town Engineer regarding Earth Removal Permit application for Grove and Ferry Streets, Marshfield, MA.*

- Letter report by Horsley Whitten Group dated August 24, 2010 to Mr. Rod Prococcino, Town Engineer, regarding groundwater flow directions at former Sylvester Ray demolition landfill at 120 Clay Pit Road in Marshfield.
- Letter report by Grady Consulting, LLC dated March 18, 2010 to Marshfield Planning Board, re: Water Resource Protection Special Permit – Response to March 1, 2010 letter from Paul Halkiotis.

*Based on our review of the available information, we note the following comments and items of concern regarding potential adverse impacts on water quality and quantity from the proposed excavation activity:*

*30. It is a basic concept in aquifer protection that a thicker natural soil cover over an aquifer recharge area is more protective of aquifer water quality. This gives added importance to the recommendation by Woodard & Curran in comment 8, above, regarding requesting an alternative soccer field design that may have lesser excavation depth of earth removal, thereby reducing the potential for adverse impacts to the Town's water supply wells.*

See comment #8.

*31. It appears that all surface water drainage from the Project Site (and possibly from an adjoining parcel apparently also owned by the Applicant) will be infiltrated on the site, including during storms up to the 100-year storm event. According to drainage calculations, this will add approximately 250 gallons per minute (sum of preconstruction runoff) of infiltration to the site in a concentrated location that has not previously experienced this degree of inflow. The potential impact for this new, concentrated recharge volume to raise the groundwater level does not appear to have been considered in site design. In addition to the concentration of natural runoff, irrigation of the fields is proposed and this may add additional elevation to the groundwater levels. The Applicant should analyze this increased rate of infiltration on the site and state whether it can be accommodated without adverse effects to groundwater elevations or water quality. This assessment should also determine whether there might be adverse effects on nearby properties and residences from rising groundwater elevations during spring periods.*

W&C states that "approximately 250 gallons per minute (sum of preconstruction runoff) of infiltration to the site", and later in the same comment states "the potential impact for this new, concentrated recharge volume to raise the groundwater level does not appear to have been considered." The reviewer is unclear to whether they are discussing flow rate or volume. The flow rate mentioned in the comment is the peak rate of the 100-year storm. This rate is only estimated to occur once every one hundred years for a two minute interval.

*32. The proposed finish grades of the site and playing fields will result in a "bowl" effect that captures groundwater runoff flows. Together with the increased groundwater infiltration resulting from the site design, this argues for the need to locate an additional monitoring well in the center of the drainage area between the two main fields. This new well should be used for monitoring groundwater levels, as well as groundwater quality. Item 4.j of the Bylaw stipulates*

*that monitoring wells shall be left in place during the period of the Earth Removal Permit and annual readings during Spring be taken and submitted to the Selectmen. The Bylaw also stipulates that elevation to groundwater be measured across the entire site that will be affected by the proposed excavation; it appears that the applicant has not measured these elevation across the entire site.*

This comment will be addressed under separate cover by Peter Dillon.

*33. The absence of a phased construction plan showing the areas and depths of excavation on the Project Site makes it impossible to know if there is a potential adverse impact to aquifer recharge and groundwater levels from that phase of operations. As noted in comment 2, above, we reiterate the need for the Applicant providing a plan showing the areas of excavation, depth of excavation from each area, and timing and sequence of these activities.*

A phased construction plan is attached.

*34. As noted in the comments above, the proposed internal drainage for the site is a concern for possible impacts on groundwater quality. We did not see any proposed devices or mechanisms to renovate the quality of groundwater recharge in the final Restoration Plan design. Possible impacts to groundwater quality are even less known during the construction phase, since drainage during that period does not seem to have been addressed. The Applicant should provide a plan showing drainage systems that will be installed to manage stormwater runoff, both during construction and finished use of the site. As noted above also, the Applicant should also provide an O&M Plan for maintenance of these drainage structures.*

The Operation and Maintenance Plan – During Construction is attached. An O&M Plan Proposed Soccer Fields Post Construction was previously provided and is attached.

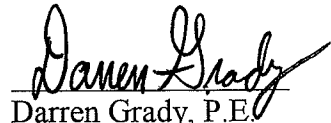
*35. The regional groundwater flow velocity has been estimated in previous reviews, based on appropriate analytical calculations; however, the available data we reviewed does not indicate that the actual travel time for groundwater from the site to the nearest public water supply well has been calculated or modeled. The Applicant should provide this information in order to evaluate the need for an emergency response plan for the site given the high infiltration rate and bowl-shaped design of the finished use.*

A spill response plan has been created and coordinated with Marshfield Fire Department.

If you have any questions please do not hesitate to call.

Sincerely,

GRADY CONSULTING, L.L.C.

A handwritten signature in black ink, appearing to read "Darren Grady", is written over a horizontal line.

Darren Grady, P.E.  
Project Engineer

Enc.

Peter Armstrong  
Woodard & Curran

---



**OPERATION AND MAINTENANCE PLAN  
PROPOSED SOCCER FIELDS – DURING CONSTRUCTION**

Marshfield Youth Soccer  
c/o Peter Armstrong  
44 Allerton Road  
Marshfield, MA 02050

**Owner:**

Peter Armstrong  
44 Allerton Road  
Marshfield, MA 02050  
Contact: Peter Armstrong (781) 710-3046

**Party Responsible for Operation and Maintenance:**

Peter Armstrong  
44 Allerton Road  
Marshfield, MA 02050  
Contact: Peter Armstrong (781) 710-3046

**Source of Funding:**

Operation and Maintenance of the site during construction will be the responsibility of the property owner to include its successor and/or assigns, as the same may appear on record with the appropriate register of deeds.

**During Construction:**

Contractor shall keep copies of the following documents on-site during operation:

- Zoning Board of Appeals - Grant of Special Permit Denial of Variance Grant of Site Plan Case #09-01
- Planning Board - Special Permit Certificate of Action Water Resource Protection District Marshfield Youth Soccer.

Construction activities shall occur Monday through Friday between 7:00 a.m. and 4:30 p.m. for earth removal and soccer field construction. Contractor shall secure the site between the hours of 3:30 p.m. and 4:30 p.m. on a daily basis. Construction activities shall follow the sequence below:

- Install gates, and “Keep Out – Danger” signs.
- Construct temporary earth berm
- Construct crushed stone apron(s) and access drive for earth removal
- Remove stumps from site

- Stockpile loam on-site
- Excavation will start at the west end property line and move in an easterly direction down to rough grade level as shown on the phasing plans.
- Earth removal equipment shall consist of loaders, excavators, trucks and grizzle rack.
- Stabilize slopes as excavation proceed easterly
- Construct proposed pocket turning lane on Ferry Street and soccer field access drive
- Install water supply and irrigation system
- Install monitoring wells
- Remove temporary earth berm and earth removal access drive
- Prepare subgrade for soccer fields, swales, and parking area
- Install loam at finish grades
- Install processed gravel and finished driveway and parking surfaces.
- Install fencing along parking area and protective viewing areas

Stabilized crushed stone construction entrances shall be placed at the entrances and shall consist an area of atleast 15-feet wide by 50' feet long and 6-inches deep of 1½" to 2" stone.

Hauling of earth material shall be through the existing Marshfield DPW salt shed area to Clay Pit Road.

Equipment fueling and maintenance shall be performed off the site.

Equipment storage will be off-site.

Parking for workers will be off-site.

The Owner will use orange safety fencing in the immediate vicinity of the area being excavated

The Owner shall be responsible to secure the site with gates

During dry periods where dust is created by construction activities the following control measures should be implemented.

- Sprinkling – The contractor may sprinkle the ground along haul roads and traffic areas until moist.

- Vegetative cover – Areas that are not expected to be disturbed regularly may be stabilized with vegetative cover.
- Mulch/wood chips – Mulching and/or wood chips can be used as a quick and effective means of dust control in recently disturbed areas.
- The Owner shall inspect access area on a regular basis. Sweeping shall be performed as necessary.

On-site crushing or manufacturing of crushed stone materials will not be conducted on-site.

Bull horns or other air driven horns shall not be used on site.

Trucks used for hauling shall utilize the looped access drive in a counter clockwise direction, as shown on the phasing plans. The looped access drive will minimize the need for the trucks to back up and trigger the backup beepers.

To minimize noise trucks waiting in queue will not idle.

The five existing monitoring wells shall be maintained during construction. Groundwater levels shall be monitored throughout construction.

All exposed soils shall be stabilized as soon as practical. Seed mixes shall only be applied during appropriate periods as recommended by the seed supplier, typically May 1 to October 15.

Once the site is prepared and the slopes are stabilized in place, it should be maintained in accordance with the procedures described in the post-construction Operations and Maintenance Plan.

**OPERATION AND MAINTENANCE PLAN  
PROPOSED SOCCER FIELDS – POST CONSTRUCTION**

Marshfield Youth Soccer

P.O. Box 623

Marshfield, MA 02050

**Owner:**

Marshfield Youth Soccer

P.O. Box 623

Marshfield, MA 02050

Contact: Kevin Cantwell, President (781) 837-6653

**Party Responsible for Operation and Maintenance:**

Marshfield Youth Soccer

P.O. Box 623

Marshfield, MA 02050

Contact: Kevin Cantwell, President (781) 837-6653

**Source of Funding:**

After construction the property ownership shall be transferred to Marshfield Youth Soccer in accordance with the most recent purchase and sales agreement. Operation and Maintenance of the site after construction will be the responsibility of the Marshfield Youth Soccer and include its successor and/or assigns, as the same may appear on record with the appropriate register of deeds.

**Operation:**

Soccer games, practices, and use of field shall be scheduled and coordinated through Marshfield Youth Soccer.

Scheduling use of fields shall be done in a manner to minimize traffic congestion between the ends and beginnings of games.

Gates shall be locked on a daily basis when the fields are not being maintained or used.

**Maintenance:**

Fertilizers shall applied to the soccer fields in accordance with the yearly fertilizer program (see attached) Any changes to the fertilizer program shall be approved by Town of Marshfield.

Water for irrigation shall be supplied to through the irrigation system on an as needed basis. Water shall be supplied by the Town of Marshfield and paid for by Marshfield Youth Soccer. The irrigation system shall be emptied during the winter months to prevent damage from freezing.

Lawn cutting will be performed on an as needed basis. Cutting areas shall include the fields and swales. Any grass clippings that are collected through raking, sweeping, bagging, will be removed and disposed of off-site. The slopes on the East, West, and South sides of the field will not be mowed.

Trash receptacles shall be provided for both soccer fields. Trash receptacles shall be maintained and emptied on as needed to basis to maintain a clean and friendly environment.

Field striping shall be reapplied on an as needed basis. Equipment for striping shall be stored off site.

Equipment storage (nets, field paint, lawn equipment, etc.) shall be stored off-site.

## **PROPOSED SOCCER FIELD - FERTILIZATION PROGRAM**

Application Period: Spring & Fall

Fertilizer Type: Lesco 25-3-10 with weedkiller

Application Rate: 4 lbs/1000 s.f.

Application Coverage: 3.2 acres (Soccer fields only)

Notes: The site consists of 10 acres total. 6.8 acres will not be fertilized. The upper slopes on the East, West, and South sides of the field will not be mowed. The swales between and on south sides of the fields will be mowed regularly. The parking lot will have a processed gravel finish.

LESCO INC., 1301 E. 9TH STREET, CLEVELAND, OH 44114

Product: PARK & ATHLETIC MIXTURE

LOT NUMBER: M123-10-50

Item: 001689

| % PURITY | COMPONENT                     | % GERM | ORIGIN |
|----------|-------------------------------|--------|--------|
| 33.09    | GREENVILLE PERENNIAL RYEGRASS | 80     | OR     |
| 32.82    | FOX FIRE CREEPING RED FESCUE  | 80     | OR     |
| 32.30    | SHAMROCK KENTUCKY BLUEGRASS   | 85     | WA     |

OTHER INGREDIENTS

0.34 OTHER CROP SEEDS  
1.45 INERT MATTER  
0.00 WEED SEED

NOXIOUS WEEDS:  
NONE FOUND

DATE TESTED: 01/10

IN CA/MN/NY/NH/NJ/OH/PA/SELL BY: 04/11

NET WEIGHT: 50 LBS

SHIP TO: LESCO

MM  
AMS 635

## TRUCK TRIP TABLE AND CALCULATIONS

| 460,000 yds  | 460,000 yds  | 460,000 yds  | 460,000 yds  |
|--|--|--|--|
| 20 Trucks/day LIMIT<br>26 yds/Truck                      | 30 Trucks/day LIMIT<br>26 yds/Truck                      | 40 Trucks/day LIMIT<br>26 yds/Truck                        | 60 Trucks/day LIMIT<br>26 yds/Truck                      |
| 20<br><u>x26</u><br>520 yds/day                          | 30<br><u>x26</u><br>780 yds/day                          | 40<br><u>x26</u><br>1040 yds/day                           | 60<br><u>x26</u><br>1560 yds/day                         |
| <u>460000 ÷ 520</u><br>885 days required                 | <u>460000 ÷ 780</u><br>590 days required                 | <u>460000 ÷ 1040</u><br>442 days required                  | <u>460000 ÷ 1560</u><br>295 days required                |
| 250 Truck days / year                                    | 250 Truck days / year                                    | 250 Truck days / year                                      | 250 Truck days / year                                    |
| <u>885 ÷ 250</u><br>3.5 years minimum<br>4 years maximum | <u>590 ÷ 250</u><br>2.4 years minimum<br>3 years maximum | <u>443 ÷ 250</u><br>1.8 years minimum<br>2.5 years maximum | <u>295 ÷ 250</u><br>1.2 years minimum<br>2 years maximum |

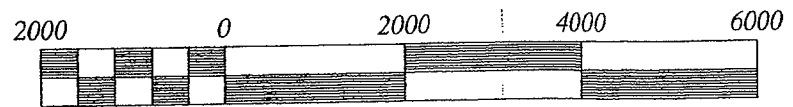
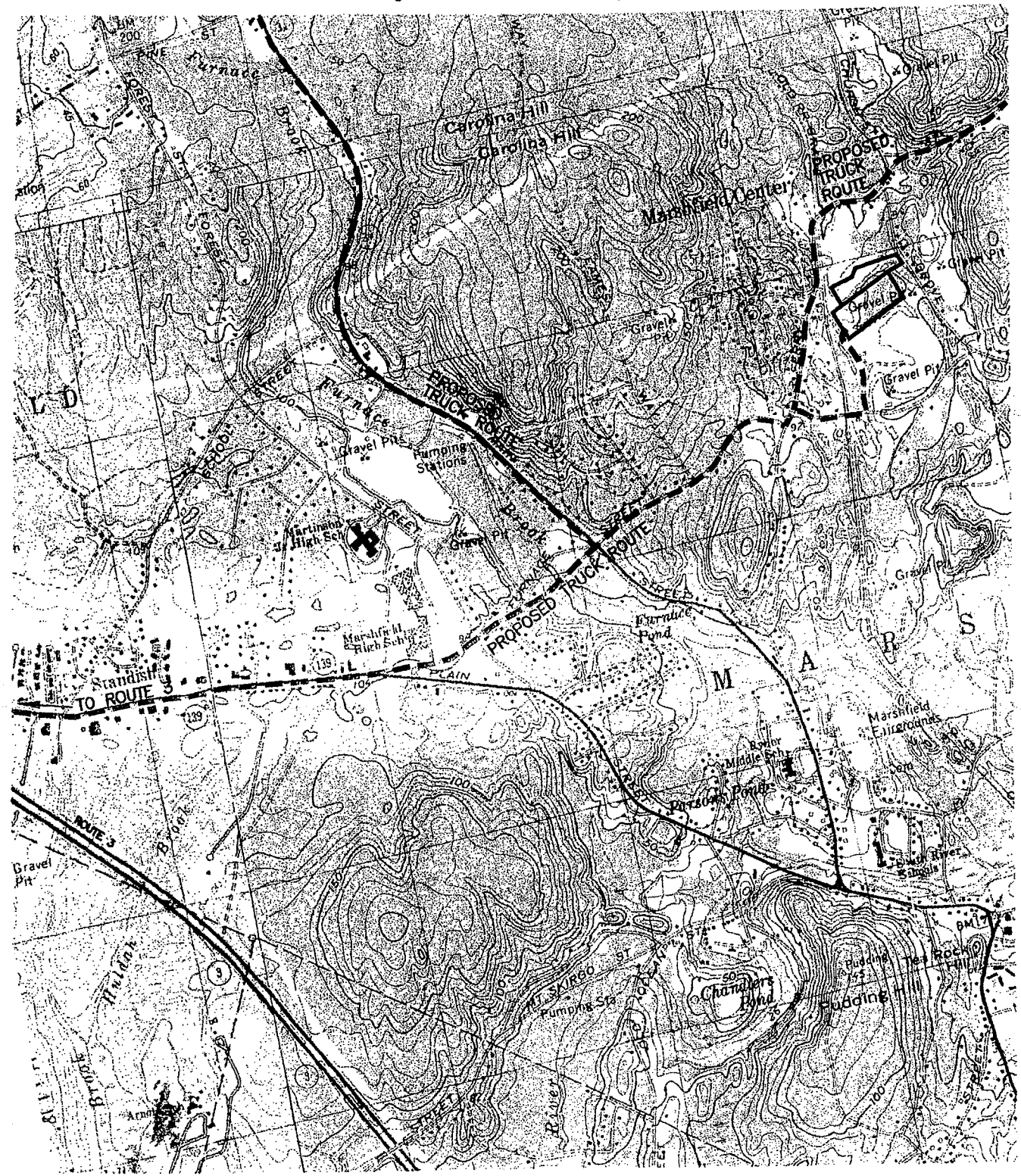
\* 250 Truck days based on 5 days/week throughout the year with the exception of 10 weekday holidays where trucking will not occur.





# GRADY CONSULTING, L.L.C.

◆ Registered Professional Civil Engineers ◆



Scale 1" = 2000'

# **Land Use: 488**

## **Soccer Complex**

### **Description**

Soccer complexes are outdoor parks that are used for non-professional soccer games. They may consist of one or more fields, and the size of each field within the land use may vary to accommodate games for different age groups. Ancillary amenities may include a fitness trail, activities shelter, aquatic center, picnic grounds, basketball and tennis courts and a playground.

### **Additional Data**

***Caution should be used when applying these data. Peaking at soccer complexes typically occurred in time periods shorter than one hour. These peaking periods may have durations of 10 to 15 minutes.***

One study noted that ridesharing was common for teams traveling to out-of-town matches.

The sites were surveyed in the 1990s in Indiana and Washington.

***To assist in the future analysis of this land use, it is important to collect driveway counts in 10-minute intervals.***

### **Source Numbers**

377, 519, 565

## Land Use: 488

### Soccer Complex

#### *Independent Variables with One Observation*

The following trip generation data are for independent variables with only one observation. This information is shown in this table only; there are no related plots for these data.

Users are cautioned to use data with care because of the small sample size.

| <u>Independent Variable</u> | <u>Trip<br/>Generation<br/>Rate</u> | <u>Size of<br/>Independent<br/>Variable</u> | <u>Number<br/>of<br/>Studies</u> | <u>Directional Distribution</u> |
|-----------------------------|-------------------------------------|---|----------------------------------|---------------------------------|
| <b>Fields</b>               |                                     |   |                                  |                                 |
| Saturday                    | 117.43                              | 7   | 1                                | 50% entering, 50% exiting       |

## SPILL RESPONSE PLAN

ASSESSORS LOT G12-29-02

- Four spill kits shall be kept on site at all times throughout the project duration. The spill kits shall contain:
  - A Plastic, removalable top, 55-gallon drum filled with absorbent rags
  - drain pans.
  - Kits shall labeled "EMERGENCY SPILL KIT" and have contact telephone number for the contractor
- Two spill kits shall be located at the access end of the site.
- Two spill kits shall be located in the vicinity of the excavation as work progresses.
- Spill kits shall be inspected on a monthly basis. Inspections shall ensure that the rags and drain pans are dry and free from contaminants. Rags shall be replaced and the drain pans shall be cleaned as needed.

INSPECTOR:

Procedure:

1. Contain spill and stop source of spill
2. Contact first responder
3. Contact second responder

FIRST RESPONDER: MARSHFIELD FIRE DEPARTMENT (781)837-1315

SECOND RESPONDER: PETER ARMSTRONG (781)710-3046

DEP EMERGENCY RESPONSE 1-(888)-304-1133