

PENINSULA TOWNSHIP

13235 Center Road, Traverse City MI 49686

Ph: 231.223.7322 Fax: 231.223.7117

www.peninsulatownship.com

PETER A. CORREIA
SUPERVISOR

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CLERK

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JILL C. BYRON
TRUSTEE

PENELOPE S. ROSI
TRUSTEE

WENDY L. WITKOP
TRUSTEE

PENINSULA TOWNSHIP BOARD

August 23, 2016

7:00 p.m.

Regular Meeting – Different Location

St. Joseph Church, Parish Hall, 12675 Center Rd., Traverse City MI

1. Call to Order
2. Pledge
3. Roll Call
4. Approve Agenda
5. Brief Citizen Comments – for items not on the Agenda
6. Conflict of Interest
7. Business

1. Appoint Clerk to Fill Vacancy
2. The 81 on East Bay – Public Hearing

8. Citizen Comments
9. Board Comments
10. Adjournment

Peninsula Township has several portable hearing devices available for audience members. If you would like to use one, please ask the Clerk.



Monica A. Hoffman CMMC/CMC
Peninsula Township Clerk

Posted: August 17, 2016

Peninsula Township Planning & Zoning Department
13235 Center Road
Traverse City, MI 49686

**SPECIAL USE PERMIT
FINDINGS OF FACT**

**SUP #123, The 81 on East Bay (Planned Unit Development Condominium Subdivision)
August 23, 2016**

PENINSULA TOWNSHIP BOARD

DECISION AND ORDER

Applicant: The 81 Development Company, LLC
Kevin O’Grady, Owner
6978 Dixie Hwy, Suite A
Clarkston MI 48346

Hearing Date: May 18, 2015, June 15, 2015, July 14, 2015, August 11, 2015

PROPERTY DESCRIPTION

Parcel ID#: 28-11-114-001-00; 28-11-114-002-00

RECONSIDERATION UPON REMAND

Per the decision and order (the Court Decision) of Judge Rodgers of the 13th Circuit Court for Grand Traverse County made on January 15, 2016 in case number 2015-31218-AA with respect to The 81 on East Bay Special Use Permit application and the application for Planned Unit Development (the Development), the Peninsula Township Board held a public hearing at a regular meeting on May 10, 2016 at 7:00 PM at the Peninsula Township Hall, 13235 Center Road, Traverse City, MI 49686 to reconsider those issues as specified in the Court Decision.

The Court Decision referred to two conditions set by the Township Board at the Board’s August 11, 2015 hearing, which were condition (1) relating to the Development meeting adequate safety standards for fire protection subject to the Peninsula Township Fire Department review and approval including the provision of an additional egress for emergency purposes at either Trevor Rd or within the Development proper and condition (6) relating to the supplying of detailed grading plans for the review and approval of the Township Engineer.

On page 11 of the Decision regarding condition (1) , the Court stated, “In this case, the location for the additional egress for emergency purposes was undecided at the time the Board voted to approve the SUP/PUD.” Later, in the same paragraph the Court stated, “Similarly, the Board delegated approval of the grading plan to the Township Engineer.” (also see footnote 46 regarding the remanding to the Board of not only the issue of the grading plan and its protection of environmental features, but also the issue of storm water control).

At the bottom of page 11, the Court stated, “Here, the Board did not “independently determine” that the proposed SUP/PUD met the ordinance requirements because it delegated authority to the Fire Department and the Township Engineer to provide approval on certain zoning standards. The Court finds that the Board improperly delegated authority to staff and remands this issue for further consideration consistent with this decision and order.”

A new consideration of these matters involves consideration of the following standards under the Peninsula Township Zoning Ordinance: Section 8.1.3 (1) (c), Section 8.1.3 (3) (d), Section 8.1.3 (3) (h), Section 8.1.3 (3) (i); Section 8.1.3 (3) (j), Section 8.1.3 (3) (k), Section 8.1.3 (3) (n), Section 8.3.3 (7) and Section 7.2.5.

Accordingly, the Board having reconsidered the matters, as ordered by the Court, a public hearing having been held on August 23, 2016 before the Township Board after giving due notice as required by law, the Board having heard the statements of the Applicant and agents, the Board after having considered letters submitted by members of the public and comments by members of the public, the Board having considered 15 Exhibits, and the Board having reached a decision on this matter, states as follows:

Section 8.1.3 (1) General Standards: The Town Board shall review each application for the purpose of determining that each proposed use meets the following standards, and in addition, shall find adequate evidence that each use on the proposed location will:

- Section 8.1.3 (1) (c): Be served adequately by essential facilities and services, such as highways, streets, police, fire protection, drainage structures, refuse disposal, water and sewage facilities, or schools.
- i. **The Board finds that the proposed PUD will incorporate private frontage roads. The engineering and design of these roads have been reviewed and approved by the Township Engineer, Brian Boals, of Gourdie Fraser with respect to grading, drainage patterns and pavement cross-sections. (Exhibits 1 & 11)**
 - ii. **The Board finds the development will be served in part by a community septic facility with other home sites being serving by private, individual septic systems. As with all such systems, review and approval must be obtained from the Grand Traverse County Health Department and, as applicable, for the community septic system, the Michigan Department of Environmental Quality. The Board further finds that Daniel Thorell, M.S., R.S., Environmental Sanitarian for the Grand Traverse County Health Department, has examined the soils within the project area, including soils in the proposed reserve septic field for the community dispersal field as well as for individual units and has determined that the soils are suitable for waste water dispersal. (Exhibit 2 & 13)**
 - iii. **The Board finds that the residential lots will be served by individual wells. The Grand Traverse County Health Department, by and through Daniel R. Thorell, M.S., R.S., Environmental Health Coordinator, examined a test well on the site and determined that based on the test well results approval will be granted for the use of individual wells for the development by the County Health Department. (Exhibit 3)**
 - iv. **The Board finds the development has been reviewed by Brian Boals of Gourdie Fraser engineers, being the Township Engineers, with respect to the requirements of the Peninsula Township Storm Water Control Ordinance determining that storm water calculations for the project have been found to be acceptable with respect to drainage patterns, storm sewer sizing and storm water retention. (Exhibits 1 & 11)**

- v. The Board finds that the County Sheriff has conducted a review of the submitted plans and offered comments. The Sheriff's Department, by and through Lt. Chris Barsheff, has determined that there is nothing objectionable in the submitted site plans within the areas of responsibility of the Sheriff's Department. (Exhibit 4)
- vi. The Board finds that the Peninsula Township Fire Department and an independent consultant on behalf of the applicant have conducted a review of the plan and concur that the site is in compliance with the International Fire Code. (Exhibits 5 & 14)
- vii. The Board finds that the site shall require emergency access signage as specified in Chief Rittenhouse's letter. (Exhibit 5)
- viii. The Board finds that the developer shall be required to supply the proper hose connections for the water supply tank as specified by Chief Rittenhouse. (Exhibit 5)

This standard HAS/HAS NOT been met.

Section 8.1.3 (3) Specific Requirements: In reviewing an impact assessment and site plan, the Planning Commission and the Township Board shall consider the following standards:

- Section 8.1.3 (3) (d): That the plan meets the requirements of Peninsula Township for fire and police protection, water supply, sewage disposal or treatment, storm drainage and other public facilities and services.
- i. The Board finds that the Peninsula Township Fire Department and an independent consultant on behalf of the applicant have conducted a review of the plan and concur that the site is in compliance with the International Fire Code. (Exhibits 5 & 14)
 - ii. The Board finds that the site shall require emergency access signage as specified in Chief Rittenhouse's letter. (Exhibit 5)
 - iii. The Board finds that the developer shall be required to supply the proper hose connections for the water supply tank as specified by Chief Rittenhouse. (Exhibit 5)
 - iv. The Board finds that the County Sheriff has conducted a review of the submitted plans and offered comments. The Sheriff's Department, by and through Lt. Chris Barsheff, has determined that there is nothing objectionable in the submitted site plans within the areas of responsibility of the Sheriff's Department. (Exhibits 1 & 4)
 - v. The Board finds the development has been reviewed by Brian Boals of Gourdie Fraser engineers, being the Township Engineers, with respect to the requirements of the Peninsula

Township Storm Water Control Ordinance determining that storm water calculations for the project have been found to be acceptable with respect to drainage patterns, storm sewer sizing and storm water retention. (Exhibits 1 & 11)

- vi. The Board finds that the Grand Traverse County Soil Erosion and Sedimentation Control Department has reviewed the project and has granted preliminary approval as well as reasonable assurance that the SESC permit will be issued if final drawings for construction are submitted that are consistent with the preliminary approval. (Exhibits 1 & 7)**

- vii. The Board finds that the site plan shall meet all necessary requirements related to the Great Lakes waterfront as mandated by the Michigan Department of Environmental Quality and the Army Corps of Engineers. The applicant has submitted a letter from the Michigan Department of Environmental Quality dated March 5, 2015 showing no permit is required from this agency as it pertains to the dock structure. The applicant has submitted a letter from the Army Corps of Engineers dated July 21, 2015 indicating the project has been reviewed and a permit has been offered. (Exhibits 8, 9 & 13)**

- viii. The Board finds the development will be served in part by a community septic facility with other home sites being serving by private, individual septic systems. As with all such systems, review and approval must be obtained from the Grand Traverse County Health Department and, as applicable, for the community septic system, the Michigan Department of Environmental Quality. The Board further finds that Daniel Thorell, M.S., R.S., Environmental Sanitarian for the Grand Traverse County Health Department, has examined the soils within the project area, including soils in the proposed reserve septic field for the community dispersal field as well as for individual units and has determined that the soils are suitable for waste water dispersal. (Exhibits 2 & 13)**

- ix. The Board finds that the residential lots will be served by individual wells. The Grand Traverse County Health Department, by and through Daniel R. Thorell, M.S., R.S., Environmental Health Coordinator, examined a test well on the site and determined that based on the test well results approval will be granted for the use of individual wells for the development by the County Health Department. (Exhibit 3)**

This standard HAS/HAS NOT been met.

Section 8.1.3 (3) (h): That the soil conditions are suitable for excavation and site preparation, and that organic, wet or other soils which are not suitable for development will either be undisturbed or modified in an acceptable manner.

- i. The Board finds that the Grand Traverse County Soil Erosion and Sedimentation Control Department has reviewed the project and has granted preliminary approval as well as**

reasonable assurance that the SESC permit will be issued if final drawings for construction are submitted that are consistent with the preliminary approval. (Exhibits 1 & 7)

- ii. The engineering and design of these roads have been reviewed and approved by the Township Engineer, Brian Boals, of Gourdie Fraser with respect to grading, drainage patterns and pavement cross-sections. (Exhibits 1 & 11)
- iii. The Board finds that the residential lots will be served by individual wells. The Grand Traverse County Health Department, by and through Daniel R. Thorell, M.S., R.S., Environmental Health Coordinator, examined a test well on the site and determined that based on the test well results approval will be granted for the use of individual wells for the development by the County Health Department. (Exhibit 3)
- iv. The Board finds the development will be served in part by a community septic facility with other home sites being serving by private, individual septic systems. As with all such systems, review and approval must be obtained from the Grand Traverse County Health Department and, as applicable, for the community septic system, the Michigan Department of Environmental Quality. The Board further finds that Daniel Thorell, M.S., R.S., Environmental Sanitarian for the Grand Traverse County Health Department, has examined the soils within the project area, including soils in the proposed reserve septic field for the community dispersal field as well as for individual units and has determined that the soils are suitable for waste water dispersal. (Exhibits 2 & 13)
- v. The Board finds that the applicant has provided a comprehensive review of the site by a qualified environmental consultant, being GEI Consultants of Michigan, P.C. The Board further finds that the reports delineate wetlands which will not be developed and which shall be preserved within the development. (Exhibits 1 & 10)

This standard HAS/HAS NOT been met.

Section 8.1.3 (3) (i): That the proposed development will not cause soil erosion or sedimentation problems.

- i. The Board finds that the Grand Traverse County Soil Erosion and Sedimentation Control Department has reviewed the project and has granted preliminary approval as well as reasonable assurance that the SESC permit will be issued. (Exhibits 1 & 7)
- ii. The Board finds that the Township Engineer of Record has reviewed and approved the proposed grading plans. (Exhibits 1 & 11)
- iii. The Board finds that the applicant has provided a confirmation by a qualified consultant for the wetland delineation shown on the plans. (Exhibit 10)

- iv. **The engineering and design of these roads have been reviewed and approved by the Township Engineer, Brian Boals, of Gourdie Fraser with respect to grading, drainage patterns and pavement cross-sections. (Exhibits 1 & 11)**

This standard HAS/HAS NOT been met.

Section 8.1.3 (3) (j): That the drainage plan for the proposed development is adequate to handle anticipated storm-water runoff, and will not cause undue runoff onto neighboring property or overloading of water courses in the area.

- i. **The engineering and design of these roads have been reviewed and approved by the Township Engineer, Brian Boals, of Gourdie Fraser with respect to grading, drainage patterns and pavement cross-sections. (Exhibits 1 & 11)**

This standard HAS/HAS NOT been met.

Section 8.1.3 (k): That grading or filling will not destroy the character of the property or the surrounding area, and will not adversely affect the adjacent or neighboring properties.

- i. **The Board finds that any form of development is going to cause some disturbance to the site. Regardless, given that development of the parcel is allowed under the Zoning Ordinance under both the R-1A and R-1B Zoning Districts, the PUD as proposed preserves as undeveloped area 54.23 acres as open space. The plan also includes through a small setback, 1500 lineal feet of undeveloped East Grand Traverse Bay waterfront, exclusive of dockage facilities. As such, given the other options available for development, the plan as presented and as developed, will leave areas undisturbed during construction and afterward as depicted on the site plan and at the site, per se. (Planning Commission Exhibits 1, 8, 9, 11, 12, 14, 19.2, 19.3, 19.7, 19.9, 19.10, 20 & 21 and Board Exhibit 3)**
- ii. **The engineering and design of these roads have been reviewed and approved by the Township Engineer, Brian Boals, of Gourdie Fraser with respect to grading, drainage patterns and pavement cross-sections. (Exhibits 1 & 11)**
- iii. **The Board finds that the Grand Traverse County Soil Erosion and Sedimentation Control Department has reviewed the project and has granted preliminary approval as well as reasonable assurance that the SESC permit will be issued. (Exhibits 1 & 7)**
- iv. **The Board finds that the Township Engineer of Record has reviewed and approved the proposed grading plans. (Exhibits 1 & 11)**

Section 8.1.3 (3) (n): That the plan provides for the proper expansion of existing facilities such as public streets, drainage systems and water sewage facilities.

- i. **The engineering and design of these roads have been reviewed and approved by the Township Engineer, Brian Boals, of Gourdie Fraser with respect to grading, drainage patterns and pavement cross-sections. (Exhibits 1 & 11)**
- ii. **The Board finds that the residential lots will be served by individual wells. The Grand Traverse County Health Department, by and through Daniel R. Thorell, M.S., R.S., Environmental Health Coordinator, examined a test well on the site determining that based on the test well results approval will be granted for the use of individual wells for the development. (Exhibit 3)**
- iii. **The Board finds the development has been reviewed by Brian Boals of Gourdie Fraser engineers, being the Township Engineers, with respect to the requirements of the Peninsula Township Storm Water Control Ordinance determining that storm water calculations for the project have been found to be acceptable with respect to drainage patterns, storm sewer sizing and storm water retention. (Exhibits 1 & 11)**
- iv. **The Board finds that the County Sheriff has conducted a review of the submitted plans and offered comments. The Sheriff's Department, by and through Lt. Chris Barsheff, has determined that there is nothing objectionable in the submitted site plans within the areas of responsibility of the Sheriff's Department. (Exhibits 1 & 4)**
- ix. **The Board finds that the Peninsula Township Fire Department and an independent consultant on behalf of the applicant have conducted a review of the plan and concur that the site is in compliance with the International Fire Code. (Exhibits 5 & 14)**
- x. **The Board finds that the site shall require emergency access signage as specified in Chief Rittenhouse's letter. (Exhibit 5)**
- xi. **The Board finds that the developer shall be required to supply the proper hose connections for the water supply tank as specified by Chief Rittenhouse. (Exhibit 5)**

This standard HAS/HAS NOT been met.

Section 8.3.3 (7): The proposed planned unit development shall meet all of the standards and requirements outlined in this Section 8.3 and also Section 8.1 and Article VII.

Section 7.2.5, Stormwater Detention: The Board finds the development has been reviewed by Brian Boals of Gourdie Fraser engineers, being the Township Engineers, with respect to the requirements of the Peninsula Township Storm Water Control Ordinance determining that storm

water calculations for the project have been found to be acceptable with respect to drainage patterns, storm sewer sizing and storm water retention. (Exhibits 1 & 11)

MOTION TO APPROVE/DENY

Motion made by _____, supported by _____ that based upon the specific findings of fact with respect to Sections 8.1.3(1)(c); 8.1.3(3)(d); 8.1.3(3)(h); 8.1.3(3)(i); 8.1.3(3)(j); 8.1.3(3)(k); 8.1.3(3)(n); 8.3.3(7) and 7.2.5 that the applicant has met these standards and in conjunction with the Township's previous approval of this project on August 11, 2015 along with these supplemental findings of fact made at the direction of Judge Rodgers in his Order dated January 15, 2016, all standards have been met and the applicant's request for Special Use Permit to a Planned Unit Development is hereby recommended to be approved.

Ayes:

Nays:

DECISION

Upon Motion, seconded and passed the Board RULED that the Applicant's variance request be ALLOWED / DENIED / TABLED.

TIME PERIOD FOR JUDICIAL REVIEW

MCL 125.3606 provides that any party aggrieved by a decision of the Township Board may appeal that decision to the Circuit Court within thirty (30) days after the Township Board issues its decision in writing signed by the chairperson, if there is a chairperson, or signed by the members of the Township Board, if there is no chairperson, or within twenty-one (21) days after the Township Board approves the minutes at which the decision was made.

DATE DECISION AND ORDER ADOPTED

Date

Chairperson

Date

Vice Chairperson

Date

Secretary

Peninsula Township Planning & Zoning Department
13235 Center Road
Traverse City, MI 49686

**SPECIAL USE PERMIT
EXHIBIT LIST**

SUP #123, The 81 on East Bay (Planned Unit Development Condominium Subdivision)

August 23, 2016

1. The 81 on East Bay – PUD plan set revised 7-8-16 and received 08-16-2016 and Supplemental Information
2. Email and test well data from Daniel Thorell, Grand Traverse County Health Department dated February 18, 2015
3. Email from Daniel Thorell, Grand Traverse County Health Department dated March 10, 2016
4. Letter from Lt. Chris Barsheff, Grand Traverse County Sheriff's Office dated January 15, 2015
5. Letters from Randy Rittenhouse, Chief, Peninsula Fire Department dated August 9, 2016 and August 16, 2016
6. Memorandum from Rob Duranczyk, PS, Grand Traverse County Road Commission dated May 27, 2014
7. Letter from Robert Cooney, Grand Traverse County Prosecuting Attorney dated February 24, 2016
8. Letter from Robyn L Schmidt, Michigan Department of Environmental Quality dated March 5, 2015
9. Letter from Charles M. Simon, United States Department of the Army, Corps of Engineers dated July 21, 2015
10. Wetland Delineation Report prepared by GEI Consultants of Michigan, P.C. dated June 15, 2015
11. Letters from Brian Boals, Gourdie Fraser dated March 8, 2016, March 15, 2016 and August 15, 2016
12. Resolution and Letter from Peninsula Township Board dated March 15, 2016
13. The 81 on East Bay – Supplemental Information dated April 13, 2016
14. Fire Code Compliance Report from Ron Taylor, Nederveld Inc., dated July 26, 2016 and updated August 15, 2016 and Curriculum Vitae
15. Email from Philip Settles dated August 11, 2016 containing an email from Garth Greenan, Grand Traverse County Road Commission dated June 10, 2016

August 16, 2016

Special Use Permit application #123

The 81 on East Bay –an open space preservation community
Supplemental Information

On behalf of the Applicant, we are providing the following additional materials for the scheduled August 23rd Board meeting. These materials are supplemental to the application materials provided to date:

1. Plan sets updated to include an emergency access road from the northwest corner of the 81 on East Bay project site continuing west to Smokey Hollow Road.
2. Email correspondence from the Road Commission stating that the Road Commission has no jurisdiction and no comments to offer with relation to using the existing driveway on Smokey Hollow Road for emergency access to the 81 on East Bay residential development.
3. An independent review for Fire Code Compliance of the proposed emergency access road by Nederveld Forensic Engineering & Fire Investigation consultants.

Grand Traverse County Soil Erosion and Sedimentation Control office was contacted for comments regarding the emergency access road, but none have been received to date.

In conclusion, the Applicant feels that emergency access issues as indicated in the Judge's order as items for the Board to Consider (*see conclusion of Decision Order page 16*) have been completed and are attached here in.

Sincerely,
Mansfield Land Use Consultants on behalf of:

Kevin O'Grady
The 81 Development Company, LLC / Peninsula Township Resident

Petra Kuehnis

Subject: FW: The 81 on East Bay

From: Garth Greenan [<mailto:ggreenan@gtcrc.org>]
Sent: Friday, June 10, 2016 3:55 PM
To: doug@maaeps.com
Subject: The 81 on East Bay

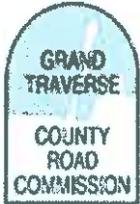
Doug:

I have reviewed the modifications to "The 81 on East Bay" project, specifically, the addition of an emergency access point from an existing drive on Smokey Hollow Road. Since this is only an emergency access point, and therefore no increase in normal traffic, and there will be no work within the County Road Commission ROW, we would have no jurisdiction related to the use of the existing driveway and no comments on the driveway. If you have any further questions, please contact me.

Garth Greenan, P.E.
Traffic Services Supervisor
Grand Traverse County Road Commission
1881 LaFranier Road
Traverse City, MI 49696
www.gtcrc.org

GTCRC Number: 231-922-4848
GTCRC FAX No.: 231-929-1836

Direct Number: 231-922-4849 ext 205
Mobile Number: 231-590-3638



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Version: 2016.0.7639 / Virus Database: 4604/12412 - Release Date: 06/13/16

Both dead end roads in the proposed project are provided with a minimum of a 96' diameter cul-de-sac and meet the requirements of Section D103.4.

One or Two Family Residential Developments, D107.1. Developments of one or two family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads, and shall meet the requirements of Section D104.3.

D104.3 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to, not less than, one-half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

The proposed residential project exceeds 30 dwelling units and therefore requires a second approved fire apparatus access road. The submitted plans indicate a second fire apparatus access road at the north end of the project that connects to Smoky Hollow Road. This apparatus access road meets the requirements of D107.1. The secondary apparatus access road shall be maintained year round and shall be free of obstructions including the accumulation of snow. If the secondary apparatus access road is to be secured with a gate, it shall comply with Section D103.5.

D103.5 Fire Apparatus Access Road Gates. Gates securing the fire apparatus access road shall comply with all of the following criteria:

- 1) The minimum gate width shall be 20'.
- 2) Gates shall be of the swinging or sliding type.
- 3) Construction of gates shall be of materials that allow manual operation by one person.
- 4) Gate components shall be maintained in operative condition at all times and replaced or repaired when defective.
- 5) Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official.
- 6) Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or when a key box containing the keys to the lock is installed at the gate location (Knox padlock).
- 7) Locking device specifications shall be submitted for approval by the fire code official.
- 8) Electric gate operators where provided shall be listed in accordance with UL325.
- 9) Gates intended for automatic operation shall be designed, constructed, and installed to comply with the requirements of ASTM F2200.

The developer of the proposed project shall consult with the fire code official regarding placement of No Parking Fire Lane signs where required including, but not limited to, secondary fire apparatus access road and access to water storage tank. If no parking fire lane signs are required by the fire code official, they shall comply with Section D103.6.

D103.6 Signs. Where required by the fire code official, fire apparatus access roads shall be marked with permanent no parking fire lane signs complying with Figure D103.6. Signs shall have a minimum dimension of 12" wide by 18" high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.

Conclusion

Based on our review and analysis of the proposed residential project, it is our opinion that The 81 on East Bay meets all of the fire code requirements set forth in the International Fire Code 2012 Edition as adopted by Peninsula Township.

The information contained in this report is based on information available at the time that this report was prepared. Nederveld, Inc. reserves the right to amend and/or modify this report if new and/or significant data becomes available that impacts the situation and parameters of this investigation.

Our services were performed using the degree of skill normally exercised by practicing professional individuals in this area and similar locales. No other warranty is either expressed or implied.

The information presented in this report is time dependent, and conditions can change. Reliance on or any use of this report by anyone other than with our client, its successors, and/or assigns, is prohibited and, therefore, not foreseeable to Nederveld, Inc. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.

Sincerely,



Ron Taylor, CFI, CFEL, NFPA FI-II, FPE
Nederveld, Inc.
Investigator

Certified Fire Investigator (CFI)

*Certified by the International Association of
Arson Investigators*

Certified Fire and Explosion Investigator (CFEI)

*Certified by the National Association of Fire
Investigators*

Certified Fire Inspector (NFPA FI-II)

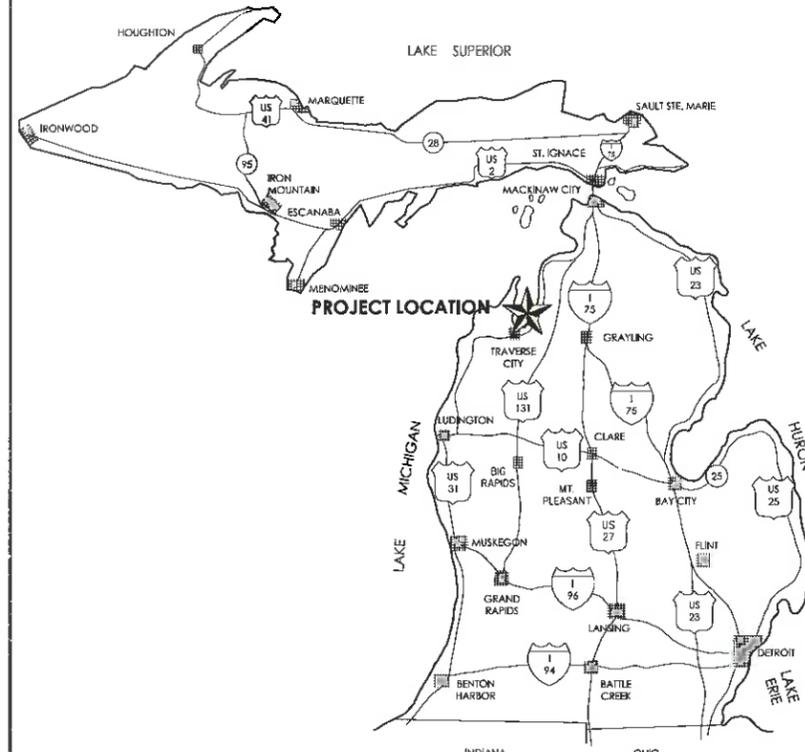
Certified by the National Fire Protection Association



Bruce A. Wiers, PE
Nederveld, Inc.
Senior Forensic Engineer
President

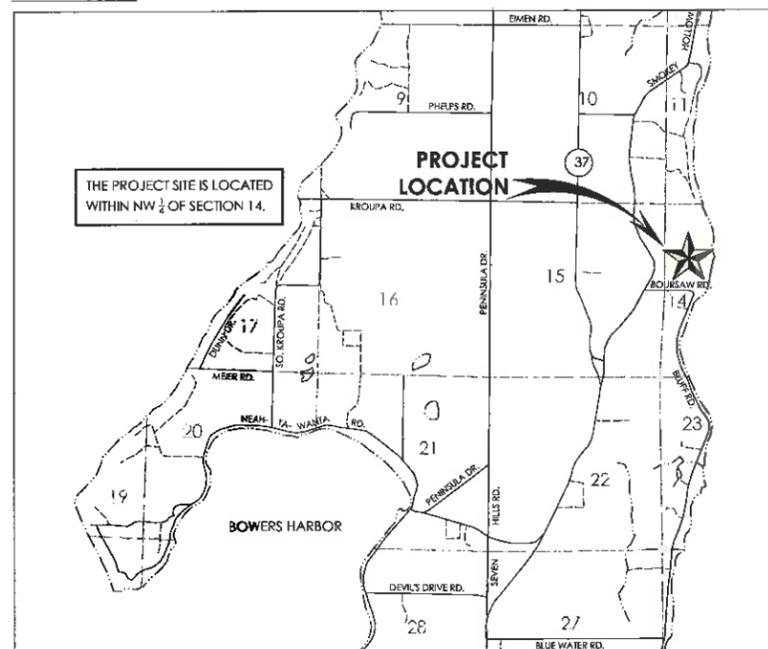
Professional Engineer (PE) – License No. 38288

Licensed by the State of Michigan



MICHIGAN LOCATION MAP

VICINITY MAP



PROJECT AND SITE DATA:

Developer: The 81 Development Company, LLC
6978 Dixie Highway, Suite A
Clarkston, MI 48346
Contact: Kevin O'Grady
Phone: 248-575-3300

Owner: The 81 Development Company, LLC
6978 Dixie Highway, Suite A
Clarkston, MI 48346

Parcel ID: 26-11-114-001-00, 15634 Smokey Hollow Road
26-11-114-002-00, 15636 Bluff Road

Parcel Zoning:
R-1A, Rural and Hill Side
Min. Lot Area: 1 acre
Min. Lot Width: 150'
Setbacks: Front = 30'
Side = 15'
Rear = 30'
Ordinary High Water Mark = 60'

R-1B, Coastal Zone (small area in the SW corner of parcel)
Min. Lot Area: 25,000 s.f.
Min. Lot Width: 100'
Setbacks: Front = 30'
Side = 15'
Rear = 30'
Ordinary High Water Mark = 60'

LEGAL DESCRIPTION AS SURVEYED:
THAT PART OF GOVERNMENT LOT 1, SECTION 14, TOWN 29 NORTH, RANGE 10 WEST, PENINSULA TOWNSHIP, GRAND TRAVERSE COUNTY, MICHIGAN, MORE FULLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE WEST QUARTER CORNER OF SAID SECTION 14; THENCE NORTH 02° 26' 00" EAST ALONG THE WEST LINE OF SAID SECTION 14, 2680.32 FEET TO THE NORTHWEST CORNER OF SAID SECTION 14; THENCE SOUTH 88° 48' 33" EAST ALONG THE NORTH LINE OF SAID SECTION 14, 1100.32 FEET TO A MEANDER CORNER NEAR GRAND TRAVERSE BAY; THENCE ALONG AN INTERMEDIATE TRAVERSE LINE NEAR GRAND TRAVERSE BAY FOR THE NEXT 14 COURSES: THENCE SOUTH 01° 25' 58" WEST, 79.02 FEET; THENCE SOUTH 22° 05' 02" EAST, 518.18 FEET; THENCE SOUTH 18° 55' 47" EAST, 311.18 FEET; THENCE SOUTH 11° 58' 32" EAST, 199.94 FEET; THENCE SOUTH 23° 25' 35" WEST, 93.61 FEET; THENCE SOUTH 04° 27' 27" WEST, 183.95 FEET; THENCE SOUTH 07° 53' 53" EAST, 108.47 FEET; THENCE SOUTH 10° 47' 34" EAST, 202.80 FEET; THENCE SOUTH 30° 26' 26" WEST, 105.07 FEET; THENCE SOUTH 07° 17' 53" WEST, 193.36 FEET; THENCE SOUTH 17° 15' 38" WEST, 118.46 FEET; THENCE SOUTH 02° 04' 42" EAST, 96.58 FEET; THENCE SOUTH 13° 19' 36" WEST, 92.41 FEET; THENCE SOUTH 04° 34' 55" WEST, 110.42 FEET; THENCE LEAVING INTERMEDIATE TRAVERSE LINE NORTH 88° 41' 38" WEST, 204.43 FEET; THENCE SOUTH 28° 47' 55" WEST, 225.55 FEET; THENCE SOUTH 88° 41' 59" EAST, 207.95 FEET TO A POINT NEAR GRAND TRAVERSE BAY; THENCE SOUTH 15° 14' 57" WEST ALONG AN INTERMEDIATE TRAVERSE LINE NEAR GRAND TRAVERSE BAY, 60.08 FEET; THENCE NORTH 42° 20' 10" WEST, 107.35 FEET; THENCE NORTH 88° 41' 59" WEST, 204.40 FEET; THENCE SOUTH 28° 47' 55" WEST, 125.70 FEET TO THE EAST-WEST QUARTER LINE OF SAID SECTION 14; THENCE SOUTH 88° 46' 27" WEST ALONG THE EAST-WEST QUARTER LINE OF SAID SECTION 14, 944.97 FEET TO THE POINT OF BEGINNING. THE SIDELINES EXTEND TO THE WATER'S EDGE OF GRAND TRAVERSE BAY.

STANDARD PLAN LEGEND

DESCRIPTION	EXISTING	PROPOSED
GROUND CONTOUR	605	613
SPOT ELEVATION	613.2	613.50
CONTOUR FROM USGS TOPOGRAPHIC MAP	613.5	613.00
TOP OF CURB ELEVATION	613.0	613.00
PAVEMENT (OR GUTTER FLOW LINE) ELEVATION		613.00
DIRECTION OF SURFACE FLOW		←
DRAINAGE HIGH POINT		HP.
DRAINAGE LOW POINT		LP.
WATER MAIN	—	—
SANITARY FORCE MAIN	—	—
SANITARY SEWER	—	—
STORM SEWER	—	—
GAS MAIN	—	—
OVERHEAD ELECTRIC	—	—
PROPERTY LINE	—	—
TREE LINE	—	—
PINE LINE	—	—
EDGE OF WETLAND	—	—
EDGE OF WATER	—	—
C/L OR DRAINAGE DITCH OR WATER LINE	—	—
SILT FENCE		—
DETENTION BASIN BERM		—
MANHOLE (MH)	○	●
CATCH BASIN (CB)	○	●
CLEAN OUT (CO)	○	○
RISER	○	○
GATE VALVE	⊕	⊕
FIRE HYDRANT ASSEMBLY	⊕	⊕
CURB STOP & BOX	⊕	⊕
POLE, POWER OR ELECTRIC	⊕	⊕
LIGHT POLE	⊕	⊕
SIGN	⊕	⊕
BENCH MARK (BM)	⊕	⊕
U/G UTILITY SIGN	⊕	⊕
GUY ANCHOR	⊕	⊕
DIRECTION OF SURFACE FLOW		←
DRAINAGE HIGH POINT		HP.
DRAINAGE LOW POINT		LP.
SOIL EROSION CONTROL MEASURE (MICHIGAN UNIFIED KEYING SYSTEM)		⊕
P=PERMANENT T=TEMPORARY		
IRON FOUND / IRON SET	○	○
CONCRETE MONUMENT	○	○
GOVERNMENT CORNER	⊕	⊕
NAIL FOUND / NAIL SET	⊕	⊕
RECORD / MEASURED	(R)	(M)
FENCE	—	—
WOOD STAKE	□	□



PUBLIC AGENCIES AND UTILITIES

GRAND TRAVERSE COUNTY DEPARTMENT OF PUBLIC WORKS (DPW)
Manager: John Divozzo
Address: 2650 Lafranier Rd., Traverse City, MI 49686
Telephone: 231-995-6039

GRAND TRAVERSE COUNTY ROAD COMMISSION
Manager: James Cook
Address: 1881 Lafranier Rd., Traverse City, MI 49686
Telephone: 231-922-4848

GRAND TRAVERSE COUNTY SOIL EROSION AND SEDIMENTATION CONTROL
Supervisor: Bruce Remai
Address: 2650 Lafranier Rd., Traverse City, MI 49686
Telephone: 231-995-6042

PENINSULA TOWNSHIP STORMWATER CONTROL ORDINANCE
Planning Director: Michelle Reardon
Telephone: 231-223-7314
Township Engineer: Brian Boals (Gourdie/Fraser)
Telephone: 231-946-5874

CHERRYLAND ELECTRIC COOPERATIVE (ELEC.)
Engineer: Frank Seipker
Address: 5930 US-31 S., Traverse City, MI 49684
Telephone: 231-486-9220

CONSUMERS ENERGY (ELEC.)
Engineer: Chuck Walkonis
Address: 821 Hastings St., Traverse City, MI 49686
Telephone: 231-929-6228

CHARTER COMMUNICATIONS (T.V.)
Manager: Rob Nowak
Address: 701 S. Airport Rd., Traverse City, MI 49686
Telephone: 231-941-3766

POLICE AGENCIES
EMERGENCIES: 911
Michigan State Police: 231-946-4646
Grand Traverse County Sheriff: 231-995-5001
Peninsula Twp. Community Police Officer: 231-223-4525

FIRE DEPARTMENTS
EMERGENCIES: 911
Grand Traverse Metro: 231-947-3000
Grand Traverse Rural: 231-943-9721
Peninsula Township:
Station #1: 231-223-4443
Station #2: 231-947-1293

PLAN INDEX

- C1.0 COVER SHEET
- C1.1 NOTE SHEET
- C1.2 TYPICAL CROSS SECTIONS
- C1.3 CIVIL DETAILS - SEPTIC SYSTEM
- C1.4 CIVIL DETAILS - STORM & SANITARY SEWER
- C1.5 CIVIL DETAILS - SANITARY FORCEMAIN
- C1.6 CIVIL DETAILS - WATER TANK
- C1.7 CIVIL DETAILS - MISC.
- C2.0 EXISTING CONDITIONS & DEMOLITION PLAN
- C2.1 SOILS MAP
- C3.0 SOIL EROSION & SEDIMENTATION CONTROL PLAN
- C4.0 SITE & DIMENSION PLAN
- C4.1 OVERALL SITE PLAN
- C5.0 OVERALL GRADING PLAN
- C6.0 OVERALL UTILITY PLAN
- C6.1 PLAN & PROFILE - P.O.B. TO STA 11+00 (81 AVE.)
- C6.2 PLAN & PROFILE - STA 11+00 TO STA 22+00 (81 AVE.)
- C6.3 PLAN & PROFILE - STA 22+00 TO STA 33+00 (81 AVE.)
- C6.4 PLAN & PROFILE - STA 33+00 TO STA 43+00 (81 AVE.)
- C6.5 PLAN & PROFILE - STA 43+00 TO STA 47+00 (81 AVE.) & COMMONS AREA A
- C6.6 COMMONS AREA A - SANITARY PLAN & PROFILE
- C6.7 PLAN & PROFILE - P.O.B. TO P.O.E. (THE 81 EAST)
- C6.8 PLAN & PROFILE - P.O.B. TO P.O.E. (FIRE LANE)
- L1.0 LANDSCAPE PLAN
- S1.1 WATER STORAGE TANK DESIGN

830 Cambridge Dr., Ste. 201
P.O. Box 4015
Traverse City, MI 49685
Phone: 231-946-9510
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info@mansfield.com

Mansfield
Land Use Consultants

DATE	BY	DESCRIPTION
17/10/2014	dm	Water Storage Tank
18/10/2014	dm	Construction Plan Updates
19/10/2014	dm	Clearance Calculation Updates
21/05/2015	dm	Permit & Insp. Submittals
21/05/2015	dm	Permit & Insp. Submittals
22/05/2015	dm	Permit Submittals
23/05/2015	dm	Construction Plan Updates
23/05/2015	dm	Construction Plan Updates
23/05/2015	dm	How the Road Section

The 81 Development Company, LLC
The 81 on East Bay - PUD
COVER SHEET

Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION

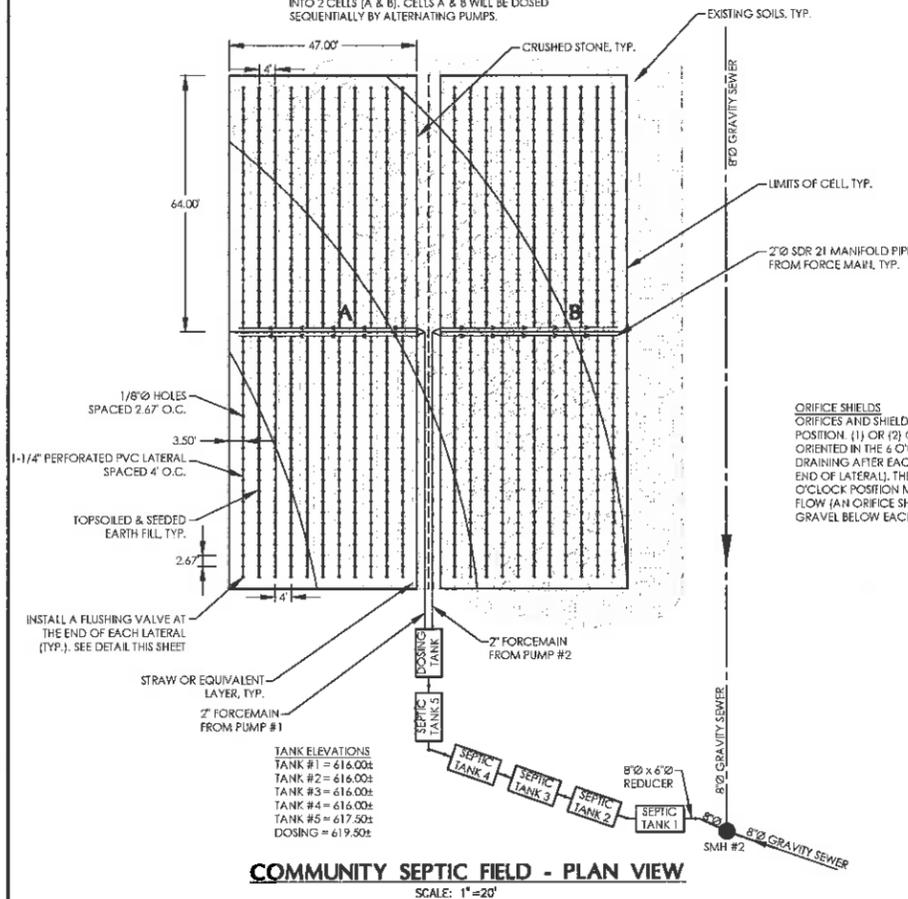
DR: dm
DATE: 03.05.14

14016

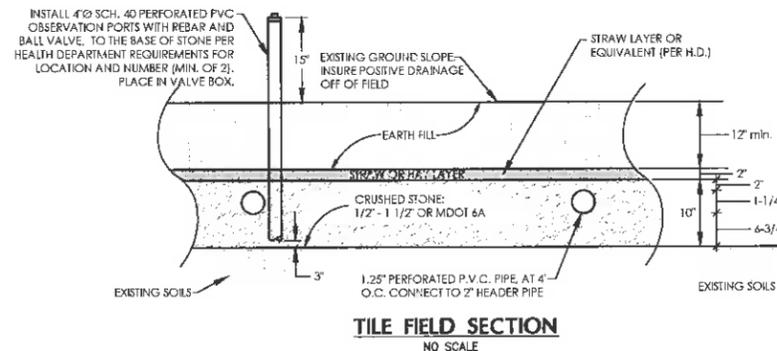
C1.0

The 81 on East Bay - PUD
Peninsula Township, Grand Traverse County, Michigan

NOTE:
THE PROPOSED 12,032 SFT ABSORPTION FIELD IS DIVIDED INTO 2 CELLS (A & B). CELLS A & B WILL BE DOSED SEQUENTIALLY BY ALTERNATING PUMPS.



ORIFICE SHIELDS
ORIFICES AND SHIELDS SHALL BE ORIENTED IN THE 12 O'CLOCK POSITION. (1) OR (2) ORIFICES ON EACH LATERAL MAY BE ORIENTED IN THE 6 O'CLOCK POSITION TO FACILITATE DRAINING AFTER EACH PUMP CYCLE (LOCATE ON LOWEST END OF LATERAL). THE ORIFICE SHIELDS ORIENTED IN THE 6 O'CLOCK POSITION MUST HAVE A MECHANISM TO BREAK THE FLOW (AN ORIFICE SHIELD THAT DRAINS OR A PAD OF GRAVEL BELOW EACH SHIELD).

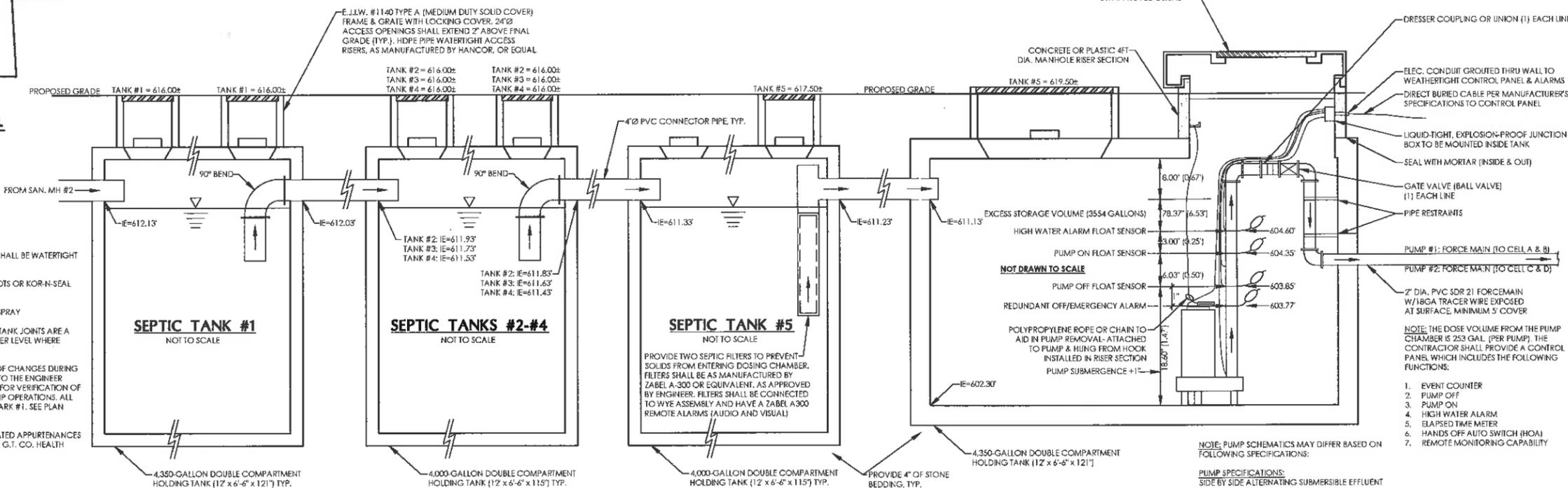
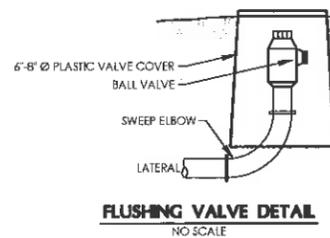


SEPTIC SYSTEM CONSTRUCTION

- ALL CONSTRUCTION MATERIALS AND WORKMANSHIP MUST CONFORM WITH THE GRAND TRAVERSE COUNTY HEALTH DEPARTMENT CURRENT STANDARDS, SPECIFICATIONS AND DETAILS AND THE APPROVED HEALTH DEPARTMENT AND MDEQ PERMITS, UNLESS OTHERWISE APPROVED.
- THE CONTRACTOR SHALL NOTIFY THE ENGINEER 48 HOURS PRIOR TO THE START OF CONSTRUCTION OF THE SEPTIC SYSTEM. THE CONTRACTOR SHALL ISSUE A WORK SCHEDULE TO THE ENGINEER PRIOR TO THE START OF SEPTIC SYSTEM CONSTRUCTION.
- NO CONNECTION RECEIVING STORM WATER OR GROUND WATER SHALL BE MADE TO THE SEPTIC SYSTEM.
- ALL PIPES MUST BE SDR 21 OR EQUIVALENT (FROM DOSING CHAMBER TO ABSORPTION FIELD).
- ALL PIPE JOINTS MUST BE TIGHTLY GLUED & SEALED.
- THE SEPTIC SYSTEM SHALL BE A MINIMUM OF 4' ABOVE EXISTING GROUND WATER WATER TABLE.
- CONTROL PANEL PLACEMENT SHALL BE PER THE OWNER AND SYSTEM MAINTENANCE CONTRACTOR. THE CONSTRUCTION CONTRACTOR IS TO WORK WITH THE PUMP SUPPLIER AND ENGINEER TO INSURE PROPER PUMP AND CHAMBER INTERFACE.
- ALL TANK RISERS SHALL BE INSTALLED WATER TIGHT.
- THE CONTRACTOR SHALL FOLLOW MANUFACTURERS' RECOMMENDATIONS DURING INSTALLATION OF THE PUMP CHAMBER/PUMPS/CONTROL PANEL AND SEPTIC FIELD.
- THE SANITARY SEWER EASEMENT WILL BE THE ACCESS ROUTE FROM 81 AVE. FOR PERMANENT MAINTENANCE OF THE SYSTEM. THE GRAVITY SEWER BELOW THE ACCESS ROUTE SHALL HAVE 100% SAND BACKFILL COMPACTED AT 95% AND A MINIMUM OF 12 FEET WIDE, UP TO THE TOPSOIL GRADE. THE ACCESS ROUTE SHALL HAVE A GRASS SURFACE AND SHALL BE CENTERED WITHIN THE EASEMENT. THE ACCESS ROUTE SHALL BE ABLE TO SUPPORT SEPTIC PUMPING TRUCKS AND SIMILAR MAINTENANCE VEHICLES AND EQUIPMENT.

PUMP SYSTEM COMPONENTS

- PUMP CHAMBER = 4,350 GAL
- DOSE = 253 GAL (PER PUMP)
- DISCHARGE PER ORIFICE = (253 GAL / 506 ORIFICES) = 0.50 GAL/ORIFICE/DOSE
- DISCHARGE PER SFT AREA = (6.016 SFT / 506 ORIFICES) = 11.89 SFT/ORIFICE (11.2 SFT)
- PUMP REQUIREMENTS: 173 GPM @ 27.33' HEAD, 2-2.5 HP AND THE FOLLOWING:
- NON-CLOGGING & NON-JAMMING, DESIGNED SPECIFICALLY FOR THE SPECIFIC PURPOSE OF PUMPING DOMESTIC WASTEWATER EFFLUENT.
- BUILT-IN AUTOMATIC RESET OVERLOAD PROTECTION.
- ANTI-SIPHON VALVE SHALL BE INTEGRAL WITH THE PUMP.
- PROVIDE NON-FOULING LEVEL SENSING CONTROL WITH NO MOVING PARTS IN CONTACT WITH ANY EFFLUENT.
- PROVIDE HIGH LEVEL AUDIBLE AND VISUAL WARNING ALARM FOR HIGH WET WELL LEVEL.
- A BATTERY BACKUP SYSTEM IS RECOMMENDED.
- THE PUMP/PIPING SYSTEM SHALL BE SET UP TO ALLOW FOR FLUSHING OF THE SYSTEM.
- THE PUMP ELECTRICAL SHALL MEET ALL STATE AND LOCAL ELECTRICAL CODES.
- PUMPS AND VALVES SHALL BE FITTED WITH UNIONS, VALVES AND ELECTRICAL CONNECTIONS NECESSARY FOR EASY PUMP REMOVAL AND REPAIR FROM THE GROUND SURFACE.
- THE PUMP CONTROLS SHALL HAVE REMOTE MONITORING CAPABILITIES.



TANK GENERAL NOTES:

- ALL CONCRETE PUMP CHAMBERS AND TANKS SHALL BE WATERTIGHT WITH THE FOLLOWING:
 - CAST-IN-PLACE WITH WATERTIGHT FERROCEMENT BOOTS OR KOR-N-SEAL RUBBER WATERSTOP OR EQUAL.
 - CAST-IN-PLACE WITH WATERPROOFING AGENT.
 - OWNER OPTIONAL: SPRAYED-ON SHEET ROCK SPRAY.
- ALL TANKS SHALL BE INSTALLED SUCH THAT THE TANK JOINTS ARE A MINIMUM OF 1 FOOT ABOVE THE GROUNDWATER LEVEL WHERE POSSIBLE.
- ACTUAL ELEVATIONS MAY VARY AS A RESULT OF CHANGES DURING CONSTRUCTION. CONTRACTOR SHALL SUPPLY TO THE ENGINEER ACTUAL LOCATION WITH ELEVATIONS IN FIELD FOR VERIFICATION OF DOSING VOLUMES, PUMP CONTROLS AND PUMP OPERATIONS. ALL ELEVATIONS ARE REFERENCED FROM BENCH MARK #1. SEE PLAN SHEET FOR THE LOCATION OF BENCH MARK #1.
- DOSING TANK, SEPTIC TANKS AND ALL ASSOCIATED APPURTENANCES SHALL BE PER THE APPROVED PERMIT FROM THE G.T. CO. HEALTH DEPARTMENT AND THE MDEQ.

NOTE: PUMP SCHEMATICS MAY DIFFER BASED ON FOLLOWING SPECIFICATIONS:

PUMP SPECIFICATIONS:
SIDE BY SIDE ALTERNATING SUBMERSIBLE EFFLUENT PUMPS. 173 gpm @ 27.33' HEAD, 2-2.5 HP.

PUMP VALVE SPECIFICATIONS:
4,350 GAL SEPTIC TANK WITH LID OPENING SIZED TO ACCOMMODATE REMOVAL OF PUMPS.

CONTROL PANEL:
CUSTOM BUILT W/LOW WATER REDUNDANT OFF ALARM, LOCK PANEL, EVENT COUNTER, REMOTE MONITORING CAPABILITIES.

830 Cottageview Dr., Ste. 201
P.O. Box 4015
Traverse City, MI 49685
Phone: 231-946-9310
www.mansfield.com
info@mancps.com

Mansfield
Land Use Consultants

REV	DATE	BY	CHK	DESCRIPTION
1	12/28/14	dm	dm	Open Items Construction Update
2	12/28/14	dm	dm	Revised Pump & Tank Schedule
3	12/28/14	dm	dm	Revised Tank Schedule
4	12/28/14	dm	dm	Revised Tank Schedule
5	12/28/14	dm	dm	Revised Tank Schedule
6	12/28/14	dm	dm	Revised Tank Schedule
7	12/28/14	dm	dm	Revised Tank Schedule
8	12/28/14	dm	dm	Revised Tank Schedule
9	12/28/14	dm	dm	Revised Tank Schedule
10	12/28/14	dm	dm	Revised Tank Schedule
11	12/28/14	dm	dm	Revised Tank Schedule
12	12/28/14	dm	dm	Revised Tank Schedule
13	12/28/14	dm	dm	Revised Tank Schedule
14	12/28/14	dm	dm	Revised Tank Schedule
15	12/28/14	dm	dm	Revised Tank Schedule

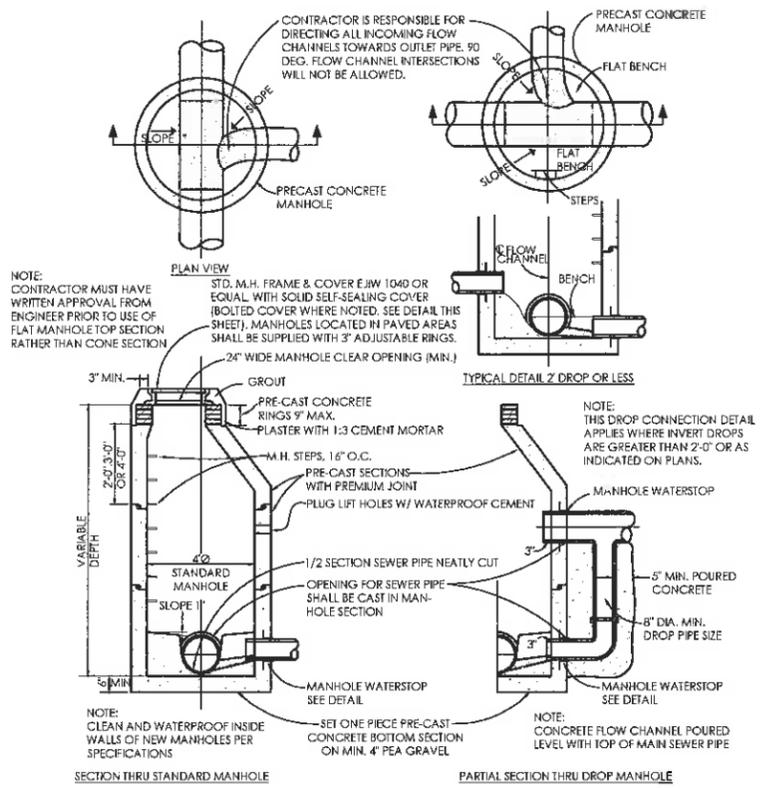
The 81 Development Company, LLC
The 81 on East Bay - PUD
CIVIL DETAILS - SEPTIC SYSTEM
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION

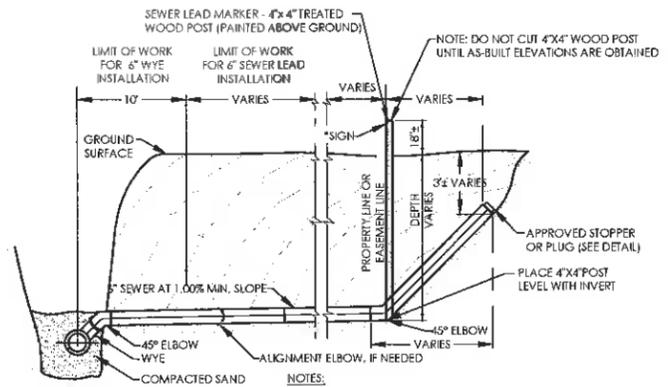
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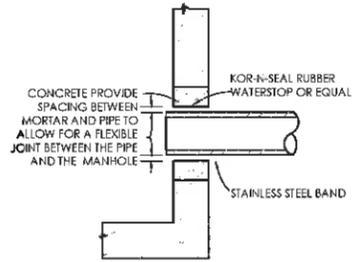
C1.3



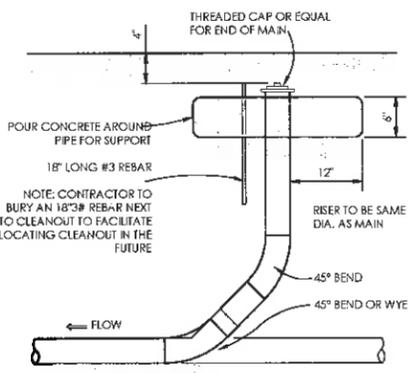
STANDARD SANITARY MANHOLE DETAIL
NO SCALE



WYE AND SEWER LEAD INSTALLATION DETAIL
NO SCALE



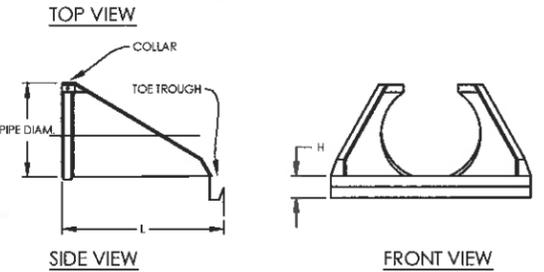
WATERSTOP DETAIL
NO SCALE



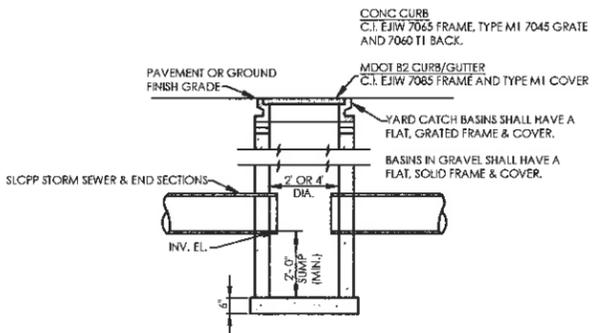
6" OR 8" CLEANOUT DETAIL
NO SCALE

DIMENSIONS

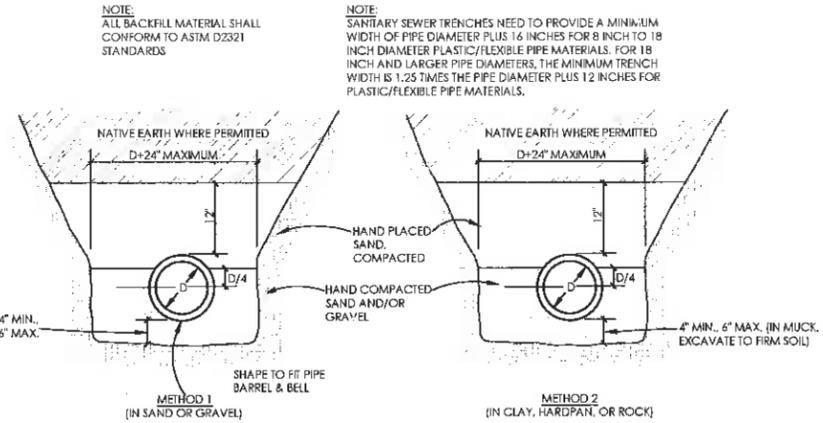
DIAM.	W	L	H
12"	24"	21"	6"
15"	30"	26"	6"
18"	36"	31"	6"
24"	48"	41"	6"
30"	60"	51"	6"



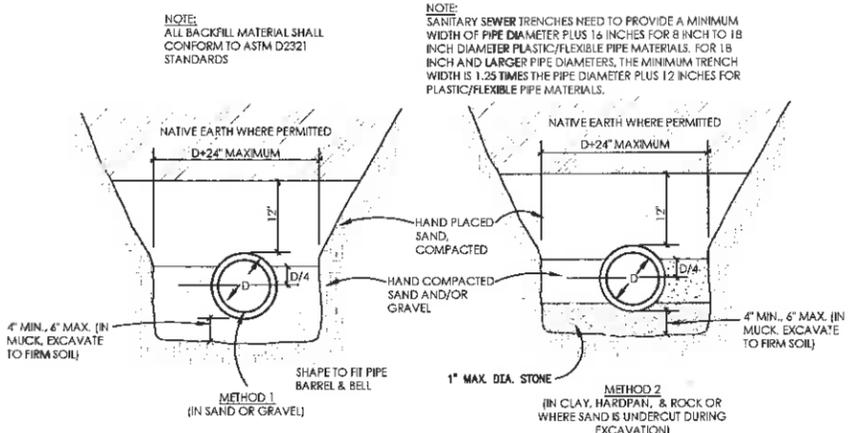
CMP FLARED END SECTION DETAIL
NO SCALE



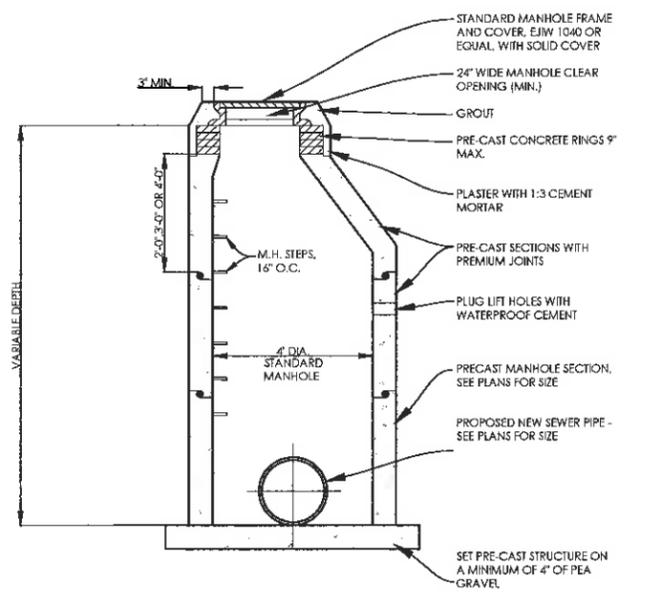
2 OR 4 FT. DIA. CATCH BASIN DETAIL
NO SCALE



PIPE BEDDING - CLASS A DETAIL
NO SCALE



PIPE BEDDING - CLASS B DETAIL
NO SCALE



4 FT. DIA. STORM MANHOLE DETAIL
NO SCALE

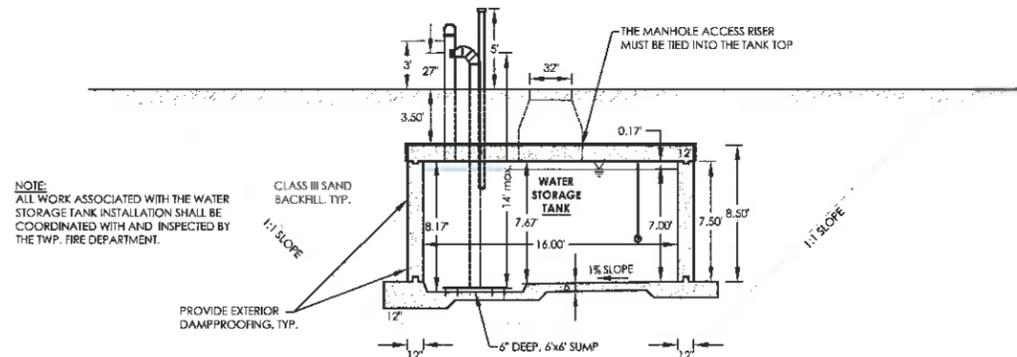
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Phone: 231-946-9310
www.mansfield.com
info@mansfield.com

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Land Use Consultants

REV.	DATE	BY	CHK	DESCRIPTION
1	10/23/14	dm	dm	Open Street Calculations Updated
2	02/09/15	dm	dm	Permit & Ins. Submittal
3	03/14/15	dm	dm	Permit & Ins. Submittal
4	03/23/15	dm	dm	Permit Submittal
5	04/06/15	dm	dm	Construction Plan Updates
6	07/08/15	dm	dm	New Tree Road Access
7	07/28/15	dm	dm	Draft New Tree Road Access Plan & Profile
8	08/26/15	dm	dm	Final Tree Road Access, Storm Water & ELEC Submittal

The 81 Development Company, LLC
The 81 on East Bay - PUD
CIVIL DETAILS - STORM & SANITARY SEWER
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION	
DATE	dm
REV.	dm
DATE	dm
REV.	dm
DATE	03.05.14
NO.:	14016
REV.:	C1.4

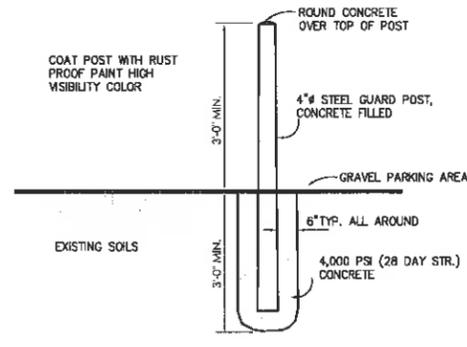


NOTE:
ALL WORK ASSOCIATED WITH THE WATER STORAGE TANK INSTALLATION SHALL BE COORDINATED WITH AND INSPECTED BY THE TWP. FIRE DEPARTMENT.

CLASS III SAND BACKFILL, TYP.

PROVIDE EXTERIOR DAMPROOFING, TYP.

SECTION A-A



COAT POST WITH RUST PROOF PAINT HIGH VISIBILITY COLOR

ROUND CONCRETE OVER TOP OF POST

4" STEEL GUARD POST, CONCRETE FILLED

GRAVEL PARKING AREA

6" TYP. ALL AROUND

4,000 PSI (28 DAY STR.) CONCRETE

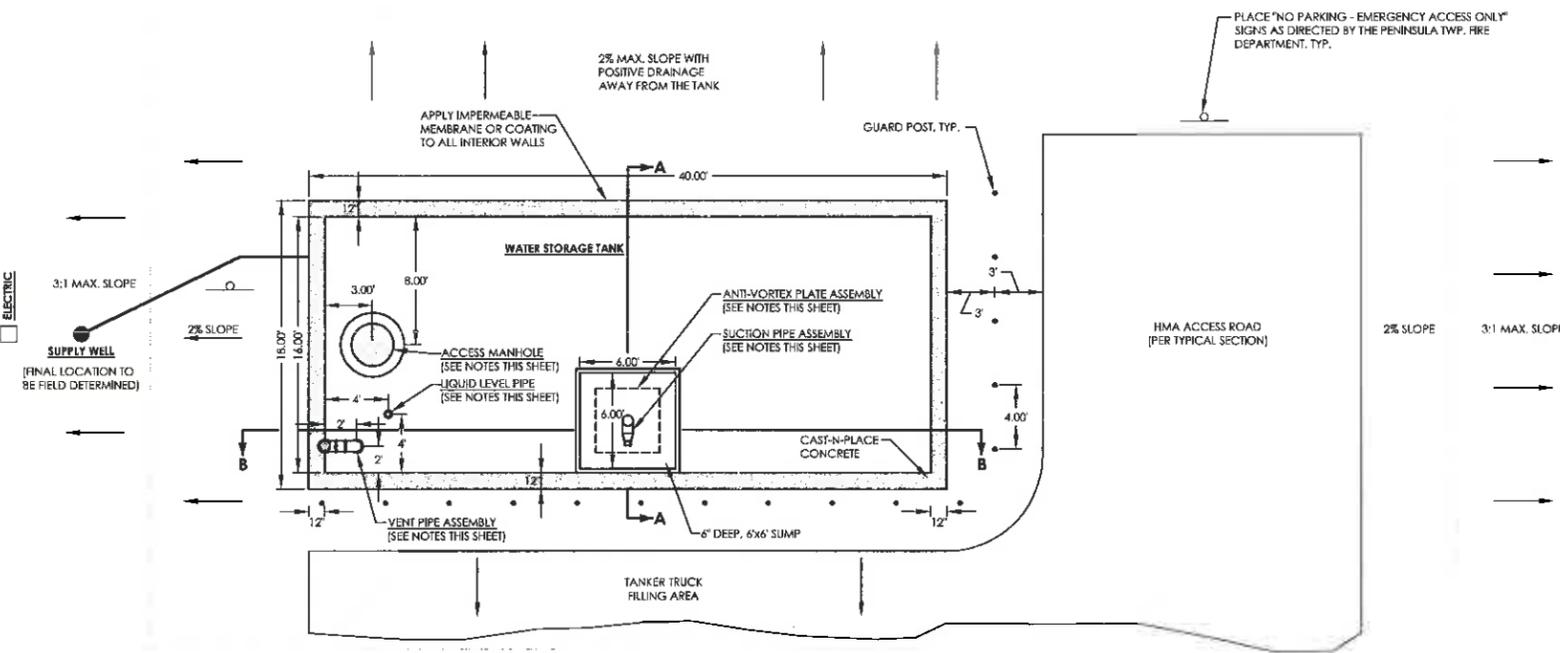
GUARD POST DETAIL

NO SCALE

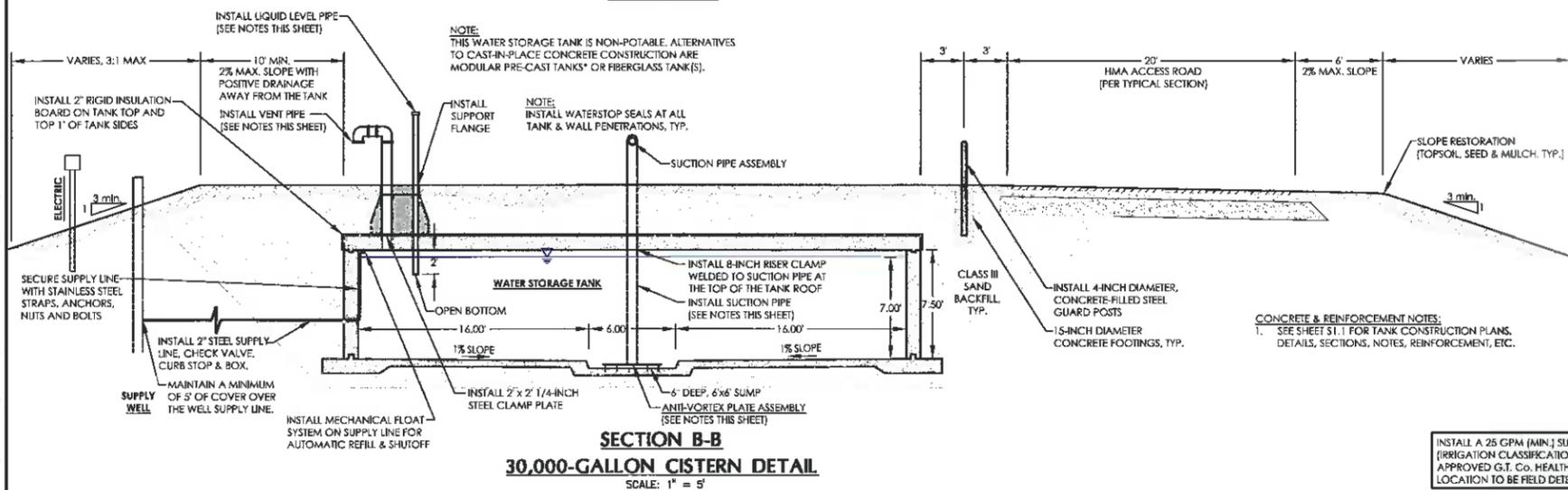
*** MODULAR PRE-CAST TANK CONSTRUCTION NOTES:**

- EACH MODULAR PRE-CAST TANK SHALL HAVE ITS OWN MANHOLE ACCESS PER NOTES THIS SHEET.
- ALL MODULAR PRE-CAST TANKS SHALL BE INTERCONNECTED TO EACH OTHER WITH (2) 1/2" SCHEDULE 40 PVC PIPES WITH INVERTS LOCATED AT THE BOTTOM OF THE WATER STORAGE (6" OFF TANK BOTTOM) AND SEALED WITH FLEXIBLE PIPE SLEEVE CONNECTIONS (TYP.).
- ALL MODULAR PRE-CAST TANKS SHALL BE HAVE INTERCONNECTING VENTS WITH AN 8" SCHEDULE 40 PVC PIPE (HORIZONTAL) WITH INVERTS LOCATED AT 12" BELOW THE TOP OF THE TANK AND SEALED WITH FLEXIBLE PIPE SLEEVE CONNECTIONS (TYP.).
- SUBMIT SHOP DRAWINGS PRIOR TO CONSTRUCTION.

NOTE:
THE CONTRACTOR SHALL INSTALL A FIRE DEPARTMENT APPROVED WATER POINT SIGN FACING 81 AVE. THE TOP OF THE SIGN SHALL BE 6 FEET ABOVE FINISHED GRADE AND FASTENED TO THE POST WITH STAINLESS STEEL NUTS AND BOLTS.



PLAN VIEW



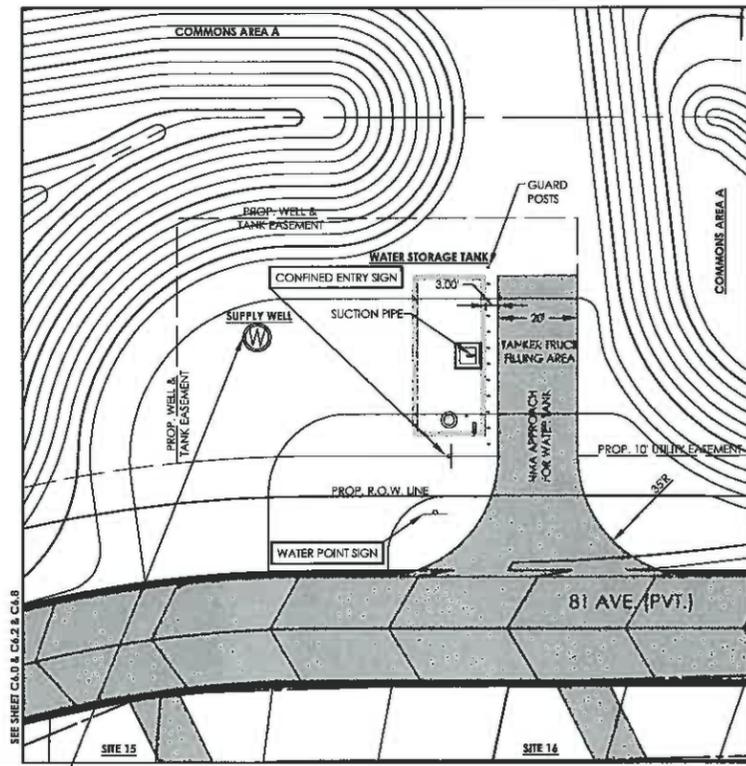
SECTION B-B
30,000-GALLON CISTERN DETAIL
SCALE: 1" = 5'

CONCRETE & REINFORCEMENT NOTES:
1. SEE SHEET S1.1 FOR TANK CONSTRUCTION PLANS, DETAILS, SECTIONS, NOTES, REINFORCEMENT, ETC.

INSTALL A 25 GPM (MIN.) SUPPLY WELL (IRRIGATION CLASSIFICATION) PER THE APPROVED G.T. CO. HEALTH DEPT. PERMIT, LOCATION TO BE FIELD DETERMINED.

WATER STORAGE TANK REQUIREMENTS:

- CAST-IN-PLACE CONCRETE SHALL HAVE A 3,000 PSI 28-DAY COMPRESSIVE STRENGTH. CONCRETE MIX SHALL HAVE A 4" MIN. SLUMP.
- CALCIUM CHLORIDE IS NOT ALLOWED. WINTER PLACEMENT AND CURING SHALL BE ACCORDING TO ACI CODES.
- INTERIOR CONCRETE TANK WALLS SHALL HAVE AN IMPERMEABLE MEMBRANE OR COATING TO PREVENT LEAKAGE OR SEEPAGE.
- SUCTION PIPE ASSEMBLY REQUIREMENTS:
- ALL SUCTION AND FILL PIPING SHALL BE ASTM SCHEDULE 40 STAINLESS STEEL.
- THE SUCTION PIPE SHALL BE 8 INCH DIAMETER AND SHALL BE PLACED AT 6 INCHES ABOVE THE TANK SUMP.
- THE SUCTION PIPE SHALL HAVE AN 8 INCH RISER CLAMP WELDED TO IT AT THE TOP OF THE TANK ROOF.
- THE SUCTION PIPE SHALL HAVE A WATER TIGHT SEAL WHERE IT PENETRATES THE TANK ROOF.
- THE SUCTION PIPE SHALL BE PROPERLY SUPPORTED.
- THE SUCTION PIPE TOP SHALL HAVE AN 8 INCH 45° ELBOW, AN 8 INCH NIPPLE, ANOTHER 8 INCH 45° ELBOW AND AN 8 INCH X 6 INCH ECCENTRIC REDUCER INSTALLED AND WELDED TO CREATE A 90° (PARALLEL TO GRADE) OUTLET.
- THE FINAL PUMPER CONNECTION SHALL BE A 6 INCH NATIONAL HYDRANT THREAD FEMALE FITTING WITH A KNOX LOCKING CAP. THE SUCTION PIPE ASSEMBLY SHALL BE -27" ABOVE THE FINAL GRADE OF THE ADJACENT TANKER TRUCK FILLING AREA. DETERMINATION OF THE FINAL DESIGN FITTINGS AND ADAPTERS SHALL BE COORDINATED WITH THE PENINSULA FIRE DEPARTMENT PRIOR TO INSTALLATION.
- THE BOTTOM OF THE SUCTION PIPE TO PUMPER CONNECTION SHALL NOT EXCEED 14 FEET VERTICAL DISTANCE.
- VENT PIPING REQUIREMENTS:
- ALL VENT PIPING SHALL BE 8 INCH ASTM SCHEDULE 40 PVC WITH GLUED JOINTS.
- THE VENT PIPE SHALL BE SECURED TO THE TOP OF THE TANK BY 1/4 INCH STAINLESS STEEL MEASURING 24" X 24" AND ANCHORED AT FOUR CORNERS.
- THE VENT PIPE SHALL HAVE A WATER TIGHT SEAL WHERE IT PENETRATES THE TANK ROOF.
- THE VENT PIPE TOP SHALL HAVE AN 180° FITTING WITH A LOCKABLE PVC HINGED END CAP, WITH A KNOX PADLOCK (PART #3770) PROVIDED.
- THE VENT PIPE TOP SHOULD BE APPROXIMATELY 36" ABOVE FINAL GRADE.
- WELL SUPPLY PIPE REQUIREMENTS:
- ALL WORK ASSOCIATED WITH THE NON-POTABLE (IRRIGATION) WELL INSTALLATION AND WATER SUPPLY LINE TO THE WATER STORAGE TANK SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS OF THE APPROVED PERMIT FROM THE G.T. CO. HEALTH DEPARTMENT. THE SUPPLY WELL SHOULD PROVIDE A MINIMUM OF 25 GPM TO THE TANK.
- LIQUID LEVEL PIPE:
- ALL LIQUID LEVEL PIPE SHALL BE 3 INCH (MIN.) ASTM SCHEDULE 40 PVC.
- THE LIQUID LEVEL PIPE SHALL BE INSTALLED WITH A LOCKABLE PVC HINGED END CAP FOR LEVEL DETECTION.
- ALL PIPING ABOVE THE TANK ROOF SHALL BE PAINTED FIRE HYDRANT RED AND THE PVC PIPING SHALL BE RATED FOR OUTDOOR USE EXPOSED TO UV LIGHT.
- WHERE MULTIPLE TANKS ARE UTILIZED TO MEET CAPACITY REQUIREMENTS, A MINIMUM OF TWO 12-INCH PIPES SHALL CONNECT THE TANKS NEAR THE BOTTOM TO FACILITATE GRAVITY EQUALIZATION OF WATER LEVEL.
- ALL TANKS SHALL HAVE AN ACCESS MANHOLE FROM THE TANK TOP UP TO FINAL GRADE WITH 32-INCH INSIDE DIAMETER (MIN.) AND AN APPROVED FRAME & COVER CAPABLE OF BEING LOCKED WITH A KNOX PADLOCK #3770. PROVIDE ADJUSTING GRADE RINGS AS NECESSARY.
- THE TANK BACKFILL SHALL BE 3.5 FOOT WITH 2" THICK RIGID INSULATION ON THE TOP OF THE ENTIRE TANK. ALL BACKFILL SHALL EXTEND A MINIMUM OF 10 FEET BEYOND THE EDGE OF THE TANK(S) THEN A MAXIMUM 3:1 SLOPE.
- ALL DISTURBED AREAS SHALL BE RESTORED WITH TOPSOIL, SEED & MULCH.
- THE TANK SUCTION PIPE SHALL BE LOCATED WITHIN 6 FEET AND PARALLEL TO THE FIRE TANKER TRUCK FILLING AREA.
- THE CONTRACTOR SHALL INSTALL FIRE LANE SIGNS AT THE ACCESS GATES AND AS DIRECTED BY THE TOWNSHIP FIRE DEPARTMENT.
- GUARD POSTS:
- GUARD POSTS SHALL BE STEEL WITH A MINIMUM 4 INCH DIAMETER AND CONCRETE FILLED.
- GUARD POST SPACING SHALL BE 4-FOOT MAXIMUM, ON CENTER.
- GUARD POSTS SHALL HAVE A MINIMUM BURY DEPTH OF 3 FEET AND A 1.6 INCH DIAMETER CONCRETE FOOTING.
- GUARD POSTS SHALL BE A MINIMUM OF 3 FEET ABOVE GROUND.
- GUARD POSTS SHALL BE SET A MINIMUM OF 3 FEET FROM THE PROTECTED OBJECT.
- AN APPROVED WATER POINT SIGN SHALL BE INSTALLED FACING THE ROAD FRONTING THE WATER POINT (B1 AVE). THE TOP OF THE SIGN SHALL BE 6 FEET ABOVE GRADE AND FASTENED TO THE POST WITH STAINLESS STEEL NUTS AND BOLTS.
- AN APPROVED CONFINED SPACE ENTRY SIGN SHALL BE INSTALLED IN THE VICINITY OF THE TANK ACCESS MANHOLE(S). THE SIGN SHALL INDICATE "DANGER, FOLLOW CONFINED SPACE ENTRY PROCEDURE BEFORE ENTERING". THE TOP OF THE SIGN SHALL BE 6 FEET ABOVE GRADE AND FASTENED TO THE POST WITH STAINLESS STEEL NUTS AND BOLTS.
- ALL WORK ASSOCIATED WITH THE WATER STORAGE TANK INSTALLATION SHALL BE INSPECTED AND APPROVED BY THE TWP. FIRE DEPARTMENT.
- ANTI-VORTEX PLATE ASSEMBLY:
- THE DISCHARGE OUTLET SHALL BE EQUIPPED WITH AN ASSEMBLY THAT CONTROLS VORTEX FLOW. THE ASSEMBLY SHALL CONSIST OF A HORIZONTAL STAINLESS STEEL PLATE MOUNTED AT THE OUTLET SIX INCHES ABOVE THE BOTTOM OF THE TANK SUMP.
- THE ANTI-VORTEX PLATE SHALL BE 1/4 INCH STAINLESS STEEL AND MEASURE 4 FEET BY 4 FEET. THE PLATE SHALL BE WELDED TO THE SUCTION PIPE AND ANCHORED IN FOUR CORNERS BY A MINIMUM OF 1 INCH THREADED STAINLESS STOCK. TWO SUPPORTS SHALL BE INSTALLED 6-10 INCHES FROM THE SUCTION PIPE AND SHALL BE 1 INCH STAINLESS STOCK.
- ALL WORK SHALL BE IN ACCORDANCE WITH NFPA 22 AND NFPA 1142.



SITE PLAN - WATER STORAGE TANK & WELL

SCALE: 1" = 20'

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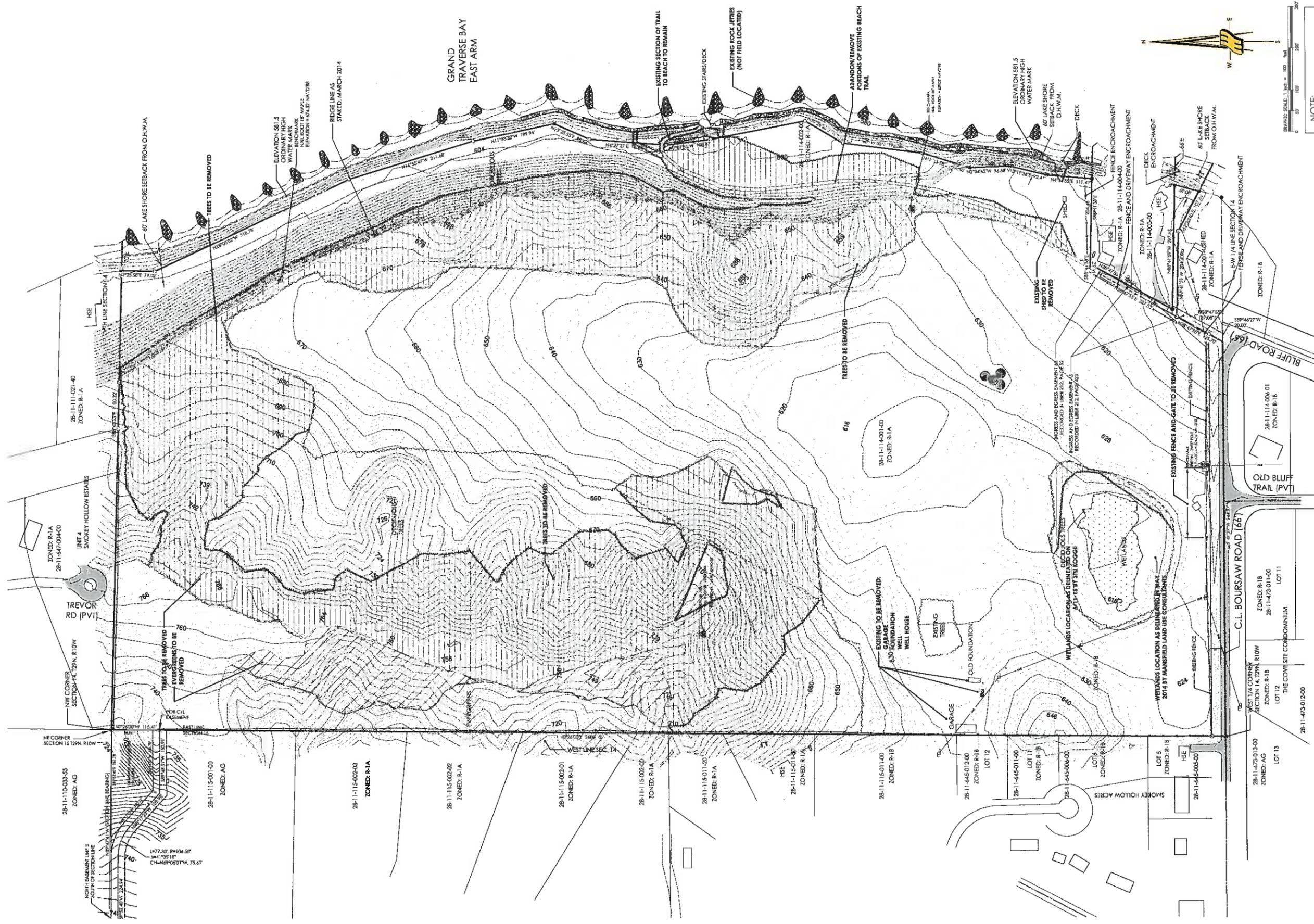
Mansfield
Land Use Consultants

REV.	DATE	BY	CHK	DESCRIPTION
19	10-28-16	dm	dm	Open Space Collaboration Update
20	10-28-16	dm	dm	Permit & Insp. Submittal
21	10-28-16	dm	dm	Permit & Insp. Submittal
22	10-28-16	dm	dm	Permit Submittal
23	10-28-16	dm	dm	Construction Plan Update
24	10-28-16	dm	dm	New Fire Road Access
25	10-28-16	dm	dm	NEW FIRE ROAD ACCESS PLAN & PERMITS
26	10-28-16	dm	dm	Prop. Comp. Easement, Storm Water & ELEC. Easement

The 81 Development Company, LLC
The 81 on East Bay - PUD
CIVIL DETAILS - WATER TANK
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION
14016
C1.6

15/03/2014 10:11:03 AM 14016.dwg (2014.03.11.10.11.03 AM) - AutoCAD 2014



NOTE:
FOR SURROUNDING PARCEL
1. INFORMATION, SEE NOTES SHEET

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NO.	DATE	BY	CHKD.	DESCRIPTION
1	10/25/14	dm	dm	Open Space Calculation Update
2	10/27/14	dm	dm	Final E. Two Submittals
3	10/27/14	dm	dm	Final E. Two Submittals
4	10/27/14	dm	dm	Final E. Two Submittals
5	10/27/14	dm	dm	Final E. Two Submittals
6	10/27/14	dm	dm	Final E. Two Submittals
7	10/27/14	dm	dm	Final E. Two Submittals
8	10/27/14	dm	dm	Final E. Two Submittals
9	10/27/14	dm	dm	Final E. Two Submittals
10	10/27/14	dm	dm	Final E. Two Submittals

The 81 Development Company, LLC
The 81 on East Bay - PUD
EXISTING CONDITIONS & DEMOLITION PLAN
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION

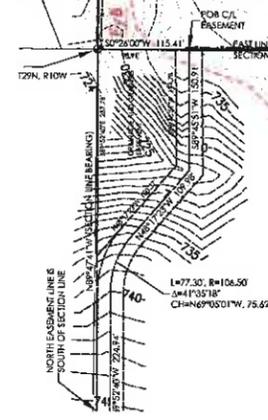
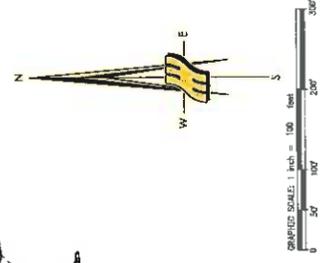
14016

C2.0

USDA SOILS DATA

TYPE	MAP UNIT NAME	AOI Ac.	AOI %	TYPE	MAP UNIT NAME	AOI Ac.	AOI %
EmA	EAST-LAKE-MANCELONA LOAMY SANDS 0-2% SLOPES	15.4	13.5%	MaA	MANCELONA GRAVELLY SANDY LOAM, 0-2% SLOPES	7.5	6.5%
FmB	EAST-LAKE-MANCELONA LOAMY SANDS, 2-6% SLOPES	1.1	1.0%	MaC	MANCELONA GRAVELLY SANDY LOAM, 6-12% SLOPES	2.9	2.6%
EyB	EMMET SANDY LOAM 2-6% SLOPES	1.4	1.2%	MaC2	MANCELONA GRAVELLY SANDY LOAM, 6-12% SLOPES, MOD. ERODED	9.2	8.0%
KaE2	KALKASKA LOAMY SAND 18-25% SLOPES, MOD. ERODED	0.9	0.8%	Mk	ADRIAN MUCK, 0-1% SLOPES	1.2	1.0%
Lk6	LEELANAU-KALKASKA LOAMY SANDS, 2-6% SLOPES	4.3	3.7%	RcB	RICHTER LOAMS, 0-6% SLOPES, OVERWASH	9.6	8.3%
LkD2	LEELANAU-KALKASKA LOAMY SANDS, 18-25% SLOPES	8.0	7.0%				
LkE2	LEELANAU-KALKASKA LOAMY SANDS, 25-45% SLOPES	8.3	7.2%				
LkF	LEELANAU-KALKASKA LOAMY SANDS, 2-6% SLOPES	17.1	14.8%				
LkF2	LEELANAU-KALKASKA LOAMY SANDS, 2-6% SLOPES	12.7	11.0%				

GRAND TRAVERSE BAY EAST ARM



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Mansfield

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NO.	DATE	BY	CHKD.	REV.	DESCRIPTION
1	10/28/14	AM	AM	1	Open Space Construction Windows
2	10/28/14	AM	AM	2	Final 1/4" Scale, 1/8" Contour
3	10/28/14	AM	AM	3	Final 1/4" Scale, 1/8" Contour
4	10/28/14	AM	AM	4	Final 1/4" Scale, 1/8" Contour
5	10/28/14	AM	AM	5	Final 1/4" Scale, 1/8" Contour
6	10/28/14	AM	AM	6	Final 1/4" Scale, 1/8" Contour
7	10/28/14	AM	AM	7	Final 1/4" Scale, 1/8" Contour
8	10/28/14	AM	AM	8	Final 1/4" Scale, 1/8" Contour
9	10/28/14	AM	AM	9	Final 1/4" Scale, 1/8" Contour
10	10/28/14	AM	AM	10	Final 1/4" Scale, 1/8" Contour

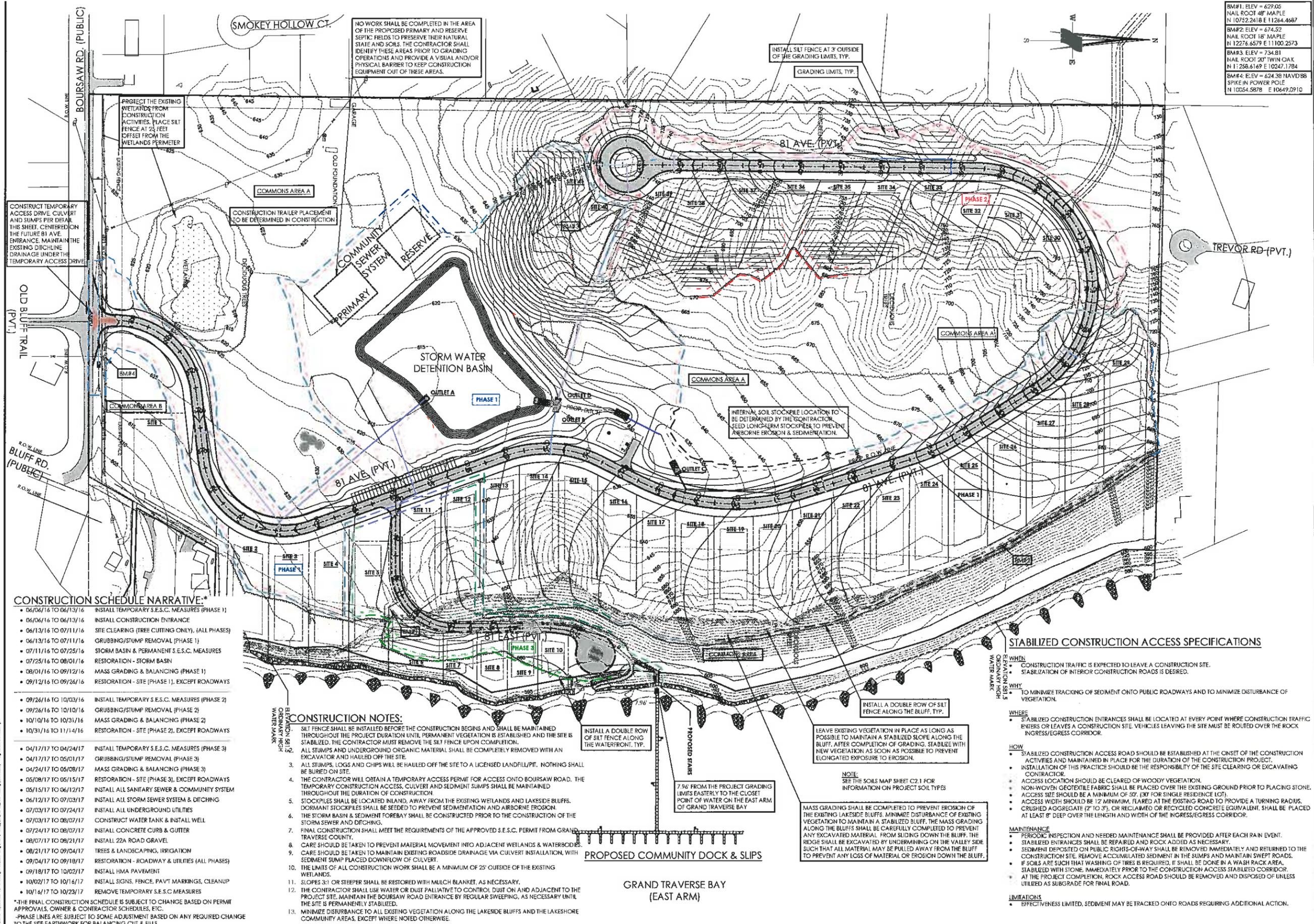
The 81 Development Company, LLC
 The 81 on East Bay - PUD
 SOILS MAP
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION

14016

C2.1

Mansfield Consultants, Inc. 14016 East Bay - PUD - SOILS MAP - Section 14, Town 29 North, Range 10 West, Peninsula Twp., Grand Traverse County, Michigan. Date: 10/28/14.



BM#1: ELEV = 629.05 NAIL ROOT 48" MAPLE N 10752.2418 E 11264.4687
BM#2: ELEV = 674.52 NAIL ROOT 18" MAPLE N 12276.6575 E 11100.2573
BM#3: ELEV = 734.81 NAIL ROOT 20" TWIN OAK N 11258.6169 E 10247.1784
BM#4: ELEV = 624.38 NAVD88 SPIKE IN POWER POLE N 10554.5878 E 10649.0910

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CONSTRUCT TEMPORARY ACCESS DRIVE, CULVERT AND SUMPS PER DETAIL THIS SHEET, CENTERED ON THE FUTURE 81 AVE. ENTRANCE. MAINTAIN THE EXISTING DITCHLINE DRAINAGE UNDER THE TEMPORARY ACCESS DRIVE.

PROTECT THE EXISTING WETLANDS FROM CONSTRUCTION ACTIVITIES. PLACE SILT FENCE AT 25 FEET OFFSET FROM THE WETLANDS PERIMETER.

NO WORK SHALL BE COMPLETED IN THE AREA OF THE PROPOSED PRIMARY AND RESERVE SEPTIC FIELDS TO PRESERVE THEIR NATURAL STATE AND SOILS. THE CONTRACTOR SHALL IDENTIFY THESE AREAS PRIOR TO GRADING OPERATIONS AND PROVIDE A VISUAL AND/OR PHYSICAL BARRIER TO KEEP CONSTRUCTION EQUIPMENT OUT OF THESE AREAS.

INSTALL SILT FENCE AT 3' OUTSIDE OF THE GRADING LIMITS, TYP.

CONSTRUCTION TRAILER PLACEMENT TO BE DETERMINED IN CONSTRUCTION.

INTERNAL SOIL STOCKPILE LOCATION TO BE DETERMINED BY THE CONTRACTOR. SEED LONG-TERM STOCKPILES TO PREVENT AIRBORNE EROSION & SEDIMENTATION.

CONSTRUCTION SCHEDULE NARRATIVE:

- 06/06/16 TO 06/13/16 INSTALL TEMPORARY S.E.S.C. MEASURES (PHASE 1)
- 06/06/16 TO 06/13/16 INSTALL CONSTRUCTION ENTRANCE
- 06/13/16 TO 07/11/16 SITE CLEARING (TREE CUTTING ONLY), (ALL PHASES)
- 06/13/16 TO 07/11/16 GRUBBING/STUMP REMOVAL (PHASE 1)
- 07/11/16 TO 07/25/16 STORM BASIN & PERMANENT S.E.S.C. MEASURES
- 07/25/16 TO 08/01/16 RESTORATION - STORM BASIN
- 08/01/16 TO 09/12/16 MASS GRADING & BALANCING (PHASE 1)
- 09/12/16 TO 09/26/16 RESTORATION - SITE (PHASE 1), EXCEPT ROADWAYS
- 09/26/16 TO 10/03/16 INSTALL TEMPORARY S.E.S.C. MEASURES (PHASE 2)
- 09/26/16 TO 10/10/16 GRUBBING/STUMP REMOVAL (PHASE 2)
- 10/10/16 TO 10/31/16 MASS GRADING & BALANCING (PHASE 2)
- 10/31/16 TO 11/14/16 RESTORATION - SITE (PHASE 2), EXCEPT ROADWAYS
- 04/17/17 TO 04/24/17 INSTALL TEMPORARY S.E.S.C. MEASURES (PHASE 3)
- 04/17/17 TO 05/01/17 GRUBBING/STUMP REMOVAL (PHASE 3)
- 04/24/17 TO 05/08/17 MASS GRADING & BALANCING (PHASE 3)
- 05/08/17 TO 05/15/17 RESTORATION - SITE (PHASE 3), EXCEPT ROADWAYS
- 05/15/17 TO 06/12/17 INSTALL ALL SANITARY SEWER & COMMUNITY SYSTEM
- 06/12/17 TO 07/03/17 INSTALL ALL STORM SEWER SYSTEM & DITCHING
- 07/03/17 TO 07/24/17 INSTALL ALL UNDERGROUND UTILITIES
- 07/03/17 TO 08/07/17 CONSTRUCT WATER TANK & INSTALL WELL
- 07/24/17 TO 08/07/17 INSTALL CONCRETE CURB & GUTTER
- 08/07/17 TO 08/21/17 INSTALL 22A ROAD GRAVEL
- 08/21/17 TO 09/04/17 TREES & LANDSCAPING, IRRIGATION
- 09/04/17 TO 09/18/17 RESTORATION - ROADWAY & UTILITIES (ALL PHASES)
- 09/18/17 TO 10/02/17 INSTALL HMA PAVEMENT
- 10/02/17 TO 10/14/17 INSTALL SIGNS, FENCE, PAVT MARKINGS, CLEANUP
- 10/14/17 TO 10/23/17 REMOVE TEMPORARY S.E.S.C. MEASURES

*THE FINAL CONSTRUCTION SCHEDULE IS SUBJECT TO CHANGE BASED ON PERMIT APPROVALS, OWNER & CONTRACTOR SCHEDULES, ETC.
-PHASE LINES ARE SUBJECT TO SOME ADJUSTMENT BASED ON ANY REQUIRED CHANGE TO THE SITE EARTHWORK FOR BALANCING CUT & FILLS.

CONSTRUCTION NOTES:

- SILT FENCE SHALL BE INSTALLED BEFORE THE CONSTRUCTION BEGINS AND SHALL BE MAINTAINED THROUGHOUT THE PROJECT DURATION UNTIL PERMANENT VEGETATION IS ESTABLISHED AND THE SITE IS STABILIZED. THE CONTRACTOR MUST REMOVE THE SILT FENCE UPON COMPLETION.
- ALL STUMPS AND UNDERGROUND ORGANIC MATERIAL SHALL BE COMPLETELY REMOVED WITH AN EXCAVATOR AND HAULED OFF THE SITE.
- ALL STUMPS, LOGS AND CHIPS WILL BE HAULED OFF THE SITE TO A LICENSED LANDFILL/PIT. NOTHING SHALL BE BURIED ON SITE.
- THE CONTRACTOR WILL OBTAIN A TEMPORARY ACCESS PERMIT FOR ACCESS ONTO BOURSAW ROAD. THE TEMPORARY CONSTRUCTION ACCESS, CULVERT AND SEDIMENT SUMPS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.
- STOCKPILES SHALL BE LOCATED INLAND, AWAY FROM THE EXISTING WETLANDS AND LAKESIDE BLUFFS. DORMANT STOCKPILES SHALL BE SEED TO PREVENT SEDIMENTATION AND AIRBORNE EROSION.
- THE STORM BASIN & SEDIMENT FOREBAY SHALL BE CONSTRUCTED PRIOR TO THE CONSTRUCTION OF THE STORM SEWER AND DITCHING.
- FINAL CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE APPROVED S.E.S.C. PERMIT FROM GRAND TRAVERSE COUNTY.
- CARE SHOULD BE TAKEN TO PREVENT MATERIAL MOVEMENT INTO ADJACENT WETLANDS & WATERBODIES.
- CARE SHOULD BE TAKEN TO MAINTAIN EXISTING ROADSIDE DRAINAGE VIA CULVERT INSTALLATION, WITH SEDIMENT SUMP PLACED DOWNFLOW OF CULVERT.
- THE LIMITS OF ALL CONSTRUCTION WORK SHALL BE A MINIMUM OF 25' OUTSIDE OF THE EXISTING WETLANDS.
- SLOPES 3:1 OR STEEPER SHALL BE RESTORED WITH MULCH BLANKET, AS NECESSARY.
- THE CONTRACTOR SHALL USE WATER OR DUST PALLIATIVE TO CONTROL DUST ON AND ADJACENT TO THE PROJECT SITE, MAINTAIN THE BOURSAW ROAD ENTRANCE BY REGULAR SWEEPING, AS NECESSARY UNTIL THE SITE IS PERMANENTLY STABILIZED.
- MINIMIZE DISTURBANCE TO ALL EXISTING VEGETATION ALONG THE LAKESIDE BLUFFS AND THE LAKESHORE COMMUNITY AREAS, EXCEPT WHERE NOTED OTHERWISE.

PROPOSED COMMUNITY DOCK & SLIPS

GRAND TRAVERSE BAY (EAST ARM)

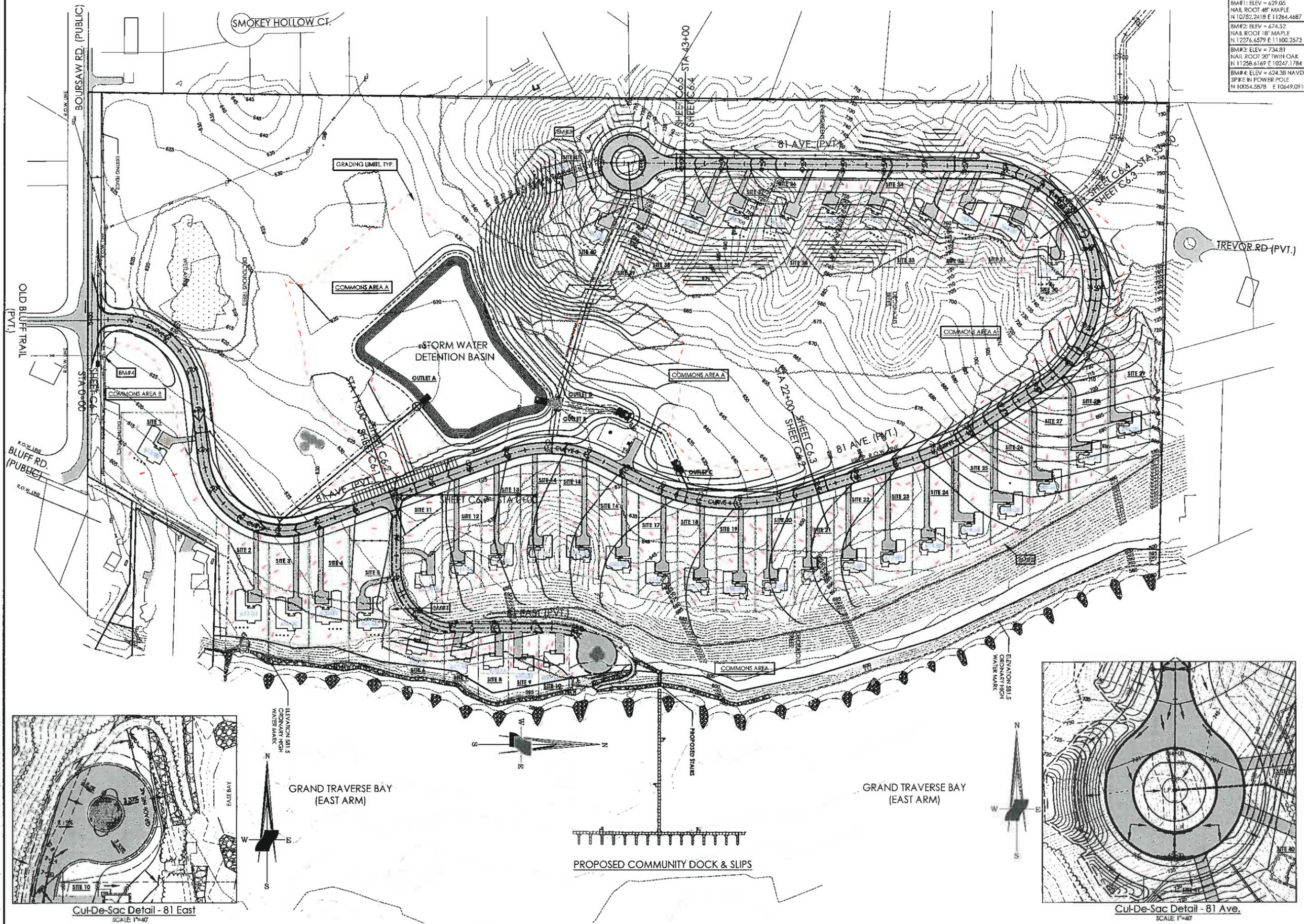
STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS

- WHEN**
- CONSTRUCTION TRAFFIC IS EXPECTED TO LEAVE A CONSTRUCTION SITE. STABILIZATION OF INTERIOR CONSTRUCTION ROADS IS DESIRED.
- WHY**
- TO MINIMIZE TRACKING OF SEDIMENT ONTO PUBLIC ROADWAYS AND TO MINIMIZE DISTURBANCE OF VEGETATION.
- WHERE**
- STABILIZED CONSTRUCTION ENTRANCES SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST BE ROUTED OVER THE ROCK INGRESS/EGRESS CORRIDOR.
- HOW**
- STABILIZED CONSTRUCTION ACCESS ROAD SHOULD BE ESTABLISHED AT THE ONSET OF THE CONSTRUCTION ACTIVITIES AND MAINTAINED IN PLACE FOR THE DURATION OF THE CONSTRUCTION PROJECT.
 - INSTALLATION OF THIS PRACTICE SHOULD BE THE RESPONSIBILITY OF THE SITE CLEARING OR EXCAVATING CONTRACTOR.
 - ACCESS LOCATION SHOULD BE CLEARED OF WOODY VEGETATION.
 - NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE.
 - ACCESS SIZE SHOULD BE A MINIMUM OF 50' WID (ROCK SINGLE RESERVE WIDTH).
 - ACCESS WIDTH SHOULD BE 12' MINIMUM, FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
 - CRUSHED AGGREGATE (2" TO 3"), OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT, SHALL BE PLACED AT LEAST 8" DEEP OVER THE LENGTH AND WIDTH OF THE INGRESS/EGRESS CORRIDOR.
- MAINTENANCE**
- PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.
 - STABILIZED ENTRANCES SHALL BE REPAIRED AND ROCK ADDED AS NECESSARY.
 - SEDIMENT DEPOSITED ON PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY AND RETURNED TO THE CONSTRUCTION SITE. REMOVE ACCUMULATED SEDIMENT IN THE SUMPS AND MAINTAIN SWEEPED ROADS.
 - IF SOILS ARE SUCH THAT WASHING OF TIRES IS REQUIRED, IT SHALL BE DONE IN A WASH RACK AREA, STABILIZED WITH STONE, IMMEDIATELY PRIOR TO THE CONSTRUCTION ACCESS STABILIZED CORRIDOR.
 - AT THE PROJECT COMPLETION, ROCK ACCESS ROAD SHOULD BE REMOVED AND DISPOSED OF UNLESS UTILIZED AS SUBGRADE FOR FINAL ROAD.
- LIMITATIONS**
- EFFECTIVENESS LIMITED, SEDIMENT MAY BE TRACKED ONTO ROADS REQUIRING ADDITIONAL ACTION.

The 81 Development Company, LLC
The 81 on East Bay - PUD
Soil Erosion & Sedimentation Control Plan
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

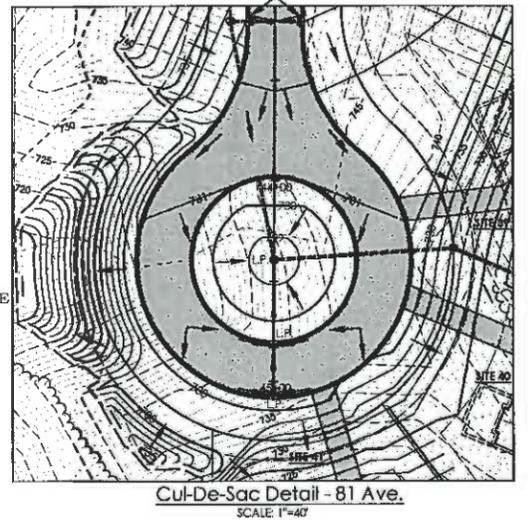
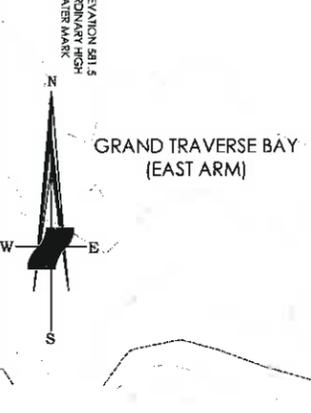
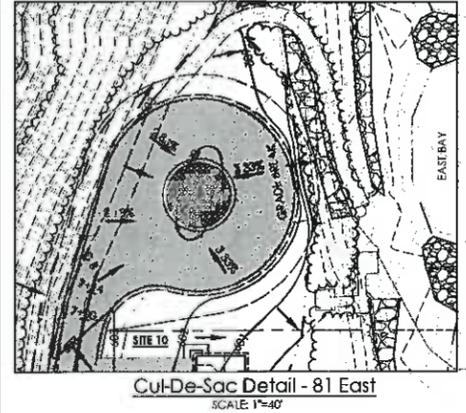
SCALE: 1"=100' H

CONSTRUCTION
14016
C3.0



BM#1: ELEV = 629.05
 NAIL ROOT 48" MAPLE
 N 10752.2418 E 11264.4687
 BM#2: ELEV = 674.52
 NAIL ROOT 18" MAPLE
 N 12276.6579 E 11100.2573
 BM#3: ELEV = 734.81
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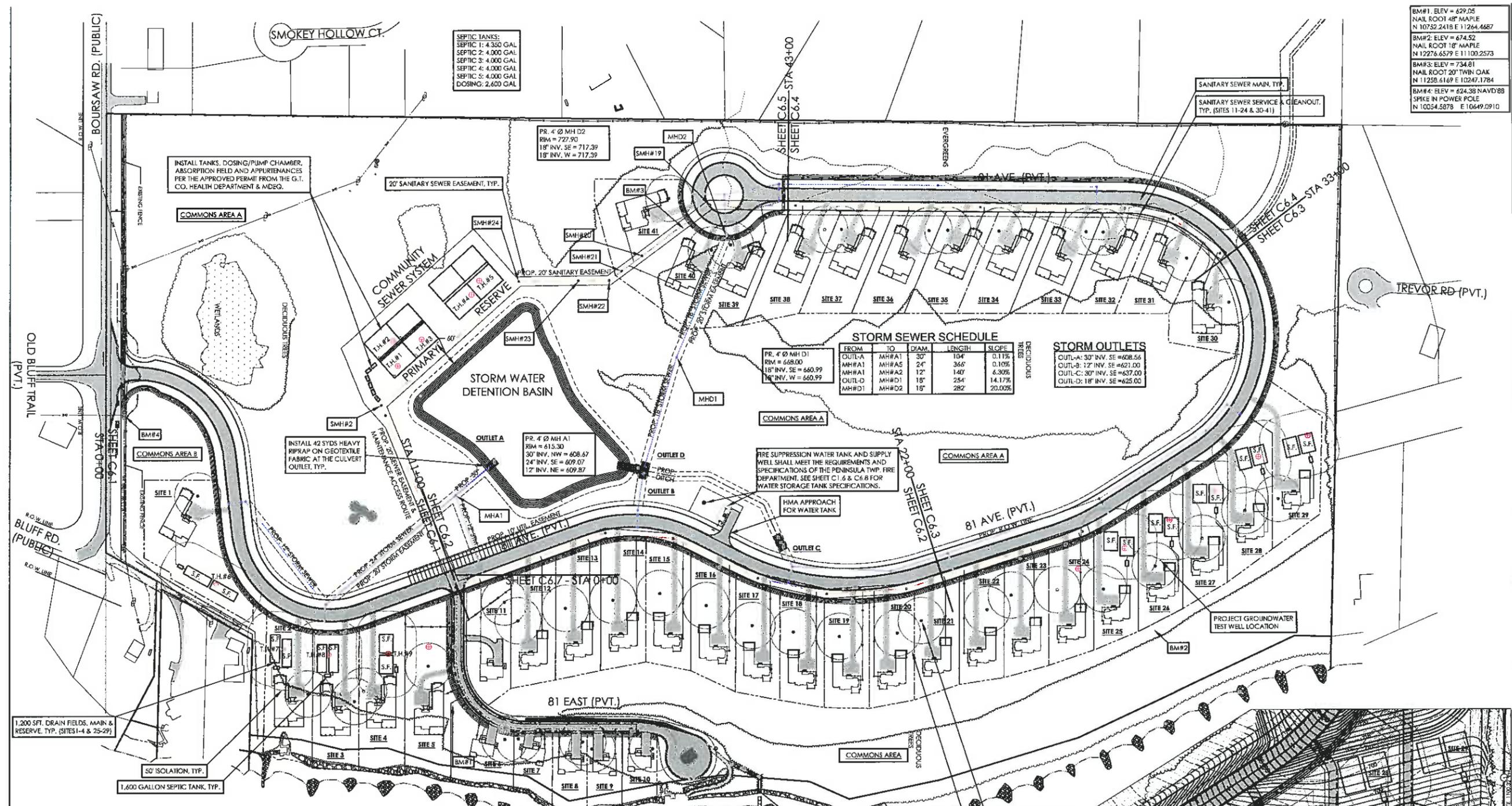


NO.	DATE	BY	CHK	REV	DESCRIPTION
1	03/05/14	dim	mm	dim	Open Review Calculation Update
2	03/05/14	dim	mm	dim	Final & Sign. Submittal
3	03/11/14	dim	mm	dim	Final & Sign. Submittal
4	03/28/14	dim	mm	dim	Final Submittal
5	04/08/14	dim	mm	dim	Construction Plan Update
6	07/08/14	dim	mm	dim	New Final Road Access
7	07/28/14	dim	mm	dim	DETAILED HIGH PILE ROAD ACCESS PLAN & PROFILE
8	08/29/14	dim	mm	dim	Final High Pile Road Access Plan & Profile

The 81 Development Company, LLC
 The 81 on East Bay - PUD
 OVERALL GRADING PLAN
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

SCALE: 1"=100' H
CONSTRUCTION
 14016
 C5.0

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SEPTIC TANKS:
 SEPTIC 1: 4,350 GAL
 SEPTIC 2: 4,000 GAL
 SEPTIC 3: 4,000 GAL
 SEPTIC 4: 4,000 GAL
 SEPTIC 5: 4,000 GAL
 DOSING: 2,600 GAL

INSTALL TANKS, DOSING/PUMP CHAMBER, ABSORPTION FIELD AND APPURTENANCES PER THE APPROVED PERMIT FROM THE G.T. CO. HEALTH DEPARTMENT & MDEQ.

INSTALL 42 SYDS HEAVY RIPRAP ON GEOTEXTILE FABRIC AT THE CULVERT OUTLET, TYP.

PR. 4" Ø MH A1
 RIM = 615.30
 30" INV. NW = 608.67
 24" INV. SE = 609.07
 12" INV. NE = 609.87

FROM	TO	DIAM.	LENGTH	SLOPE	REMARKS
OUTLET A	MHH#1	30"	104'	0.11%	
MHH#1	MHH#5	24"	366'	0.10%	
MHH#1	MHH#2	12"	140'	6.30%	
OUTLET D	MHH#1	18"	254'	14.17%	
MHH#1	MHH#2	18"	282'	20.00%	

STORM OUTLETS
 OUTLET-A: 30" INV. SE = 608.58
 OUTLET-B: 12" INV. SE = 621.00
 OUTLET-C: 30" INV. SE = 637.00
 OUTLET-D: 18" INV. SE = 625.00

FIRE SUPPRESSION WATER TANK AND SUPPLY WELL SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS OF THE PENINSULA TWP. FIRE DEPARTMENT. SEE SHEET C.1 & C.8 FOR WATER STORAGE TANK SPECIFICATIONS.

SOIL BORING LOGS: COMMUNITY

TEST HOLE #1 0'-16" 16'-102"	(PRIMARY) SANDY LOAM TOPSOIL LOAMY SAND W/SANDY LOAM INCLUSIONS NO GROUND WATER
TEST HOLE #2 0'-12" 12'-102"	(PRIMARY) SANDY LOAM TOPSOIL LOAMY SAND W/SANDY LOAM INCLUSIONS NO GROUND WATER
TEST HOLE #3 0'-12" 12'-30" 30'-80" 80'-96"	(PRIMARY) SANDY LOAM TOPSOIL LOAMY SAND MEDIUM SAND SANDY LOAM NO GROUND WATER
TEST HOLE #4 0'-12" 12'-42" 42'-96"	(RESERVE) SANDY LOAM TOPSOIL LOAMY SAND SANDY LOAM W/CLAY LOAM INCLUSIONS NO GROUND WATER
TEST HOLE #5 0'-12" 12'-24" 24'-108"	(RESERVE) SANDY LOAM TOPSOIL LOAMY SAND SANDY LOAM NO GROUND WATER

SOIL BORING LOGS: LOTS 1-4

TEST HOLE #6 0'-10" 10'-16" 16'-96" 96'-108"	(LOT 1) SANDY LOAM TOPSOIL LOAMY SAND MEDIUM SAND CLAY NO GROUND WATER
TEST HOLE #7 0'-16" 16'-30" 30'-66" 66'-78" 78'-102" 102'-114"	(LOT 2) SANDY LOAM TOPSOIL LOAMY SAND MEDIUM SAND SANDY LOAM MEDIUM SAND SANDY LOAM NO GROUND WATER
TEST HOLE #8 0'-10" 10'-36" 36'-108"	(LOT 3) SANDY LOAM TOPSOIL LOAMY SAND LOAMY SAND NO GROUND WATER
TEST HOLE #9 0'-9" 9'-45" 45'-78" 78'-120"	(LOT 4) SANDY LOAM TOPSOIL LOAMY SAND SANDY LOAM COMPACTED SANDY LOAM NO GROUND WATER

SOIL BORING LOGS: LOTS 5, 24-26

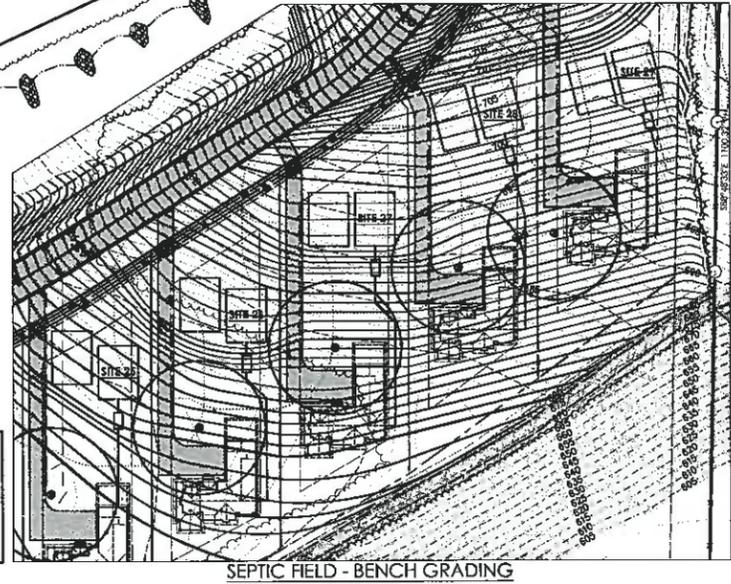
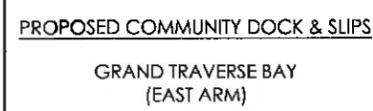
TEST HOLE #10 0'-10" 10'-54" 54'-102" 102'-216"	(LOT 5) TOPSOIL LOAMY SAND SANDY CLAY/LOAMY GRAVEL CEMENTED SANDY LOAM NO GROUND WATER
TEST HOLE #11 0'-6" 6'-24" 24'-102" 102'-120"	(LOT 24) TOPSOIL SANDY LOAM LOAMY SAND LOAMY SAND W/SANDY LOAM INCLUSIONS NO GROUND WATER
TEST HOLE #12 0'-12" 12'-108"	(LOT 25) TOPSOIL SAND W/ SOME LOAM NO GROUND WATER
TEST HOLE #13 0'-4" 4'-14" 14'-30" 30'-54" 54'-60" 60'-96" 96'-120"	(LOT 26) TOPSOIL SANDY FILL HISTORICAL TOPSOIL LOAMY SAND CLAY LOAMY SAND LOAMY SAND LIGHT NO GROUND WATER

SOIL BORING LOGS: LOTS 27-29

TEST HOLE #14 0'-8" 8'-32" 32'-120"	(LOT 27) TOPSOIL LOAMY SAND SAND NO GROUND WATER
TEST HOLE #15 0'-5" 5'-66" 66'-108"	(LOT 28) TOPSOIL LOAMY SAND SAND NO GROUND WATER
TEST HOLE #16 0'-10" 10'-66" 66'-114"	(LOT 29) TOPSOIL LOAMY SAND GRAVEL AND LOAMY SAND NO GROUND WATER

INFILTRATION STORM BASIN:
 DRAINAGE AREA = 50.26 ACRES
 DESIGN STORAGE VOLUME = 370,444 CFT
 DESIGN HIGH WATER LEVEL = 611.87
 DESIGN BOTTOM ELEVATION = 608.00
 DESIGN TOP ELEVATION = 613.00
 DESIGN MAXIMUM DEPTH = 3.97 FT

SEPTIC FIELD CONSTRUCTION:
 ALL PROPOSED SEPTIC FIELD LOCATIONS FOR BOTH THE PRIMARY AND RESERVE FIELDS SHALL BE PREPARED DURING THE MASS-GRADING OPERATIONS AND SHALL HAVE SUITABLE SLOPES FOR THE FUTURE CONSTRUCTION OF THE SEPTIC FIELDS. ALL BACKFILL MATERIAL IN THE LOCATION OF THESE SEPTIC FIELDS MUST MEET THE 2NS SPECIFICATION. SEE THE SEPTIC FIELD - BENCH GRADING DETAIL THIS SHEET.



BM#1: ELEV = 629.05
 NAIL ROOT 48" MAPLE
 N 10752 2418 E 11264.4687
 BM#2: ELEV = 674.52
 NAIL ROOT 18" MAPLE
 N 12276.6579 E 11100.2573
 BM#3: ELEV = 734.81
 NAIL ROOT 20" TWIN OAK
 N 11258.6169 E 10247.1784
 BM#4: ELEV = 624.38 NAVD'88
 SPIKE IN POWER POLE
 N 10054.5878 E 10649.0910

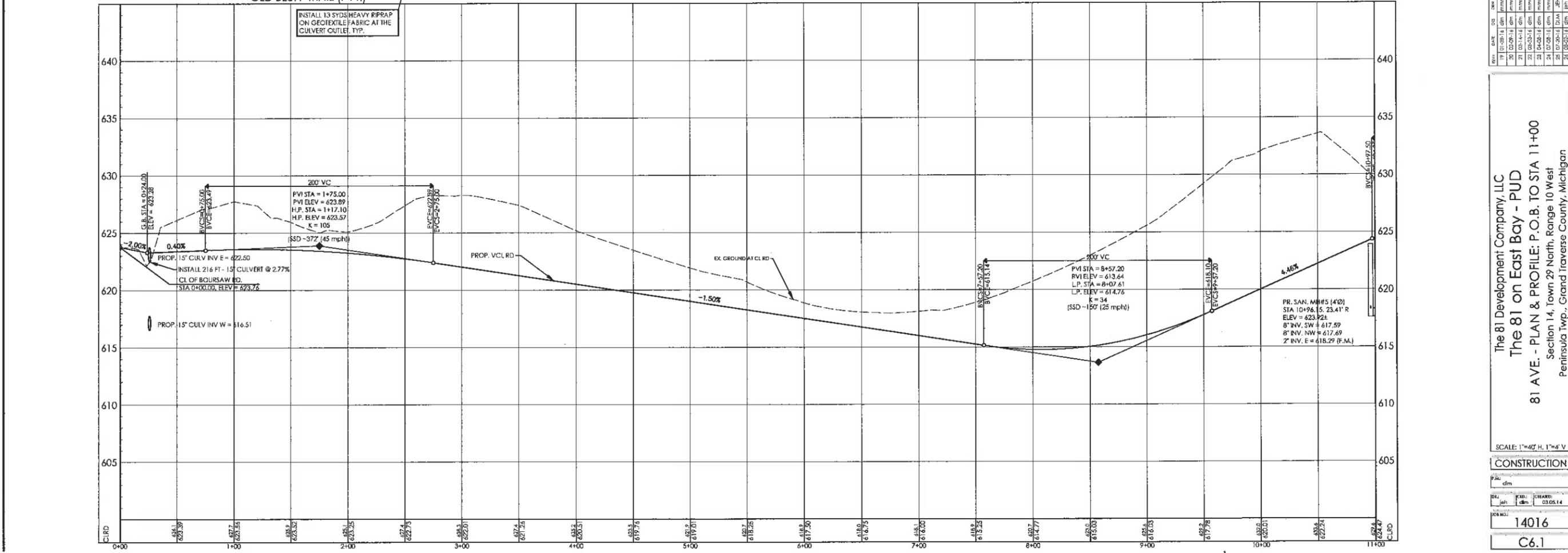
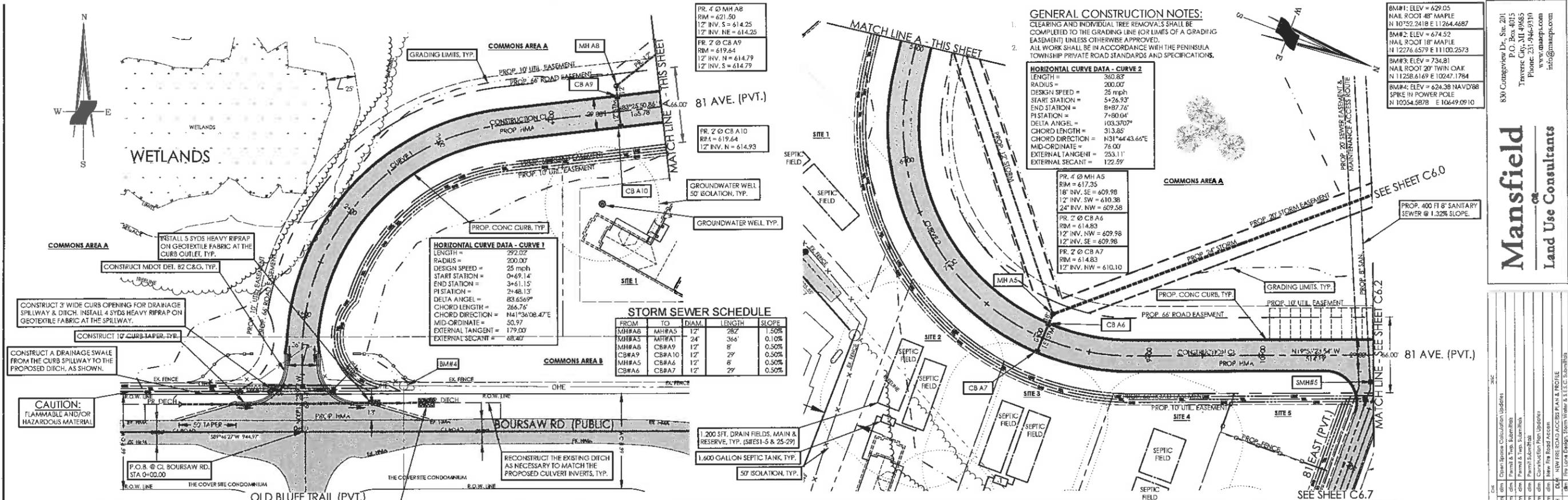
830 Comptech Dr., Ste. 201
 P.O. Box 4015
 Traverse City, MI 49685
 Phone: 231-946-9310
 www.mansfield.com
 info@mansfield.com

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REV	DATE	BY	CHK	DESCRIPTION
19	10/28/14	cm	mm	Open Space Consolidation Update
20	10/29/14	cm	mm	Permit E. Wp. Layouts
21	10/29/14	cm	mm	Permit E. Wp. Layouts
22	10/29/14	cm	mm	Permit E. Wp. Layouts
23	10/29/14	cm	mm	Construction Plan Updates
24	10/29/14	cm	mm	New Fire Road Access
25	10/29/14	cm	mm	NEW FIRE ROAD ACCESS PLAN & PROFILE
26	10/29/14	cm	mm	NEW FIRE ROAD ACCESS PLAN & PROFILE
27	10/29/14	cm	mm	NEW FIRE ROAD ACCESS PLAN & PROFILE

The 81 development Company, LLC
 The 81 on East Bay - PUD
 OVERALL UTILITY PLAN
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

SCALE: 1"=100' H
 CONSTRUCTION
 14016
 C6.0



14016
 C6.1
 03/05/14
 14016
 C6.1
 03/05/14

GENERAL CONSTRUCTION NOTES:
 1. CLEARING AND INDIVIDUAL TREE REMOVALS SHALL BE COMPLETED TO THE GRADING LINE (OR LIMITS OF A GRADING EASEMENT) UNLESS OTHERWISE APPROVED.
 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE PENINSULA TOWNSHIP PRIVATE ROAD STANDARDS AND SPECIFICATIONS.

HORIZONTAL CURVE DATA - CURVE 1
 LENGTH = 292.02
 RADIUS = 200.00
 DESIGN SPEED = 25 mph
 START STATION = 0+69.14
 END STATION = 3+61.15
 PISTATION = 2+148.13
 DELTA ANGLE = 83.6569°
 CHORD LENGTH = 266.76
 CHORD DIRECTION = N41°56'08.47"E
 MID-ORDINATE = 50.91
 EXTERNAL TANGENT = 179.00
 EXTERNAL SECANT = 68.40

HORIZONTAL CURVE DATA - CURVE 2
 LENGTH = 300.00
 RADIUS = 200.00
 DESIGN SPEED = 25 mph
 START STATION = 5+26.93
 END STATION = 8+87.76
 PISTATION = 7+80.04
 DELTA ANGLE = 103.5707°
 CHORD LENGTH = 313.85
 CHORD DIRECTION = N31°44'43.66"E
 MID-ORDINATE = 76.00
 EXTERNAL TANGENT = 253.11
 EXTERNAL SECANT = 122.59

STORM SEWER SCHEDULE

FROM	TO	DIAM.	LENGTH	SLOPE
MH#A8	MH#A5	12"	282'	1.50%
MH#A8	MH#A7	24"	366'	0.10%
MH#A8	CB#A9	12"	8'	0.50%
MH#A5	CB#A10	12"	29'	0.50%
MH#A5	CB#A6	12"	8'	0.50%
CB#A6	CB#A7	12"	29'	0.50%

BM#1: ELEV = 629.05
 NAIL ROOT 48" MAPLE
 N 10°52'24.18" E 11264.4687
 BM#2: ELEV = 674.52
 NAIL ROOT 18" MAPLE
 N 122°26'55.79" E 11100.2573
 BM#3: ELEV = 734.81
 NAIL ROOT 20" WHITE OAK
 N 11°28'6.169" E 10247.1784
 BM#4: ELEV = 624.28 NAVD88
 SPICE W/ POWER POLE
 N 102°54.5878" E 10649.0910

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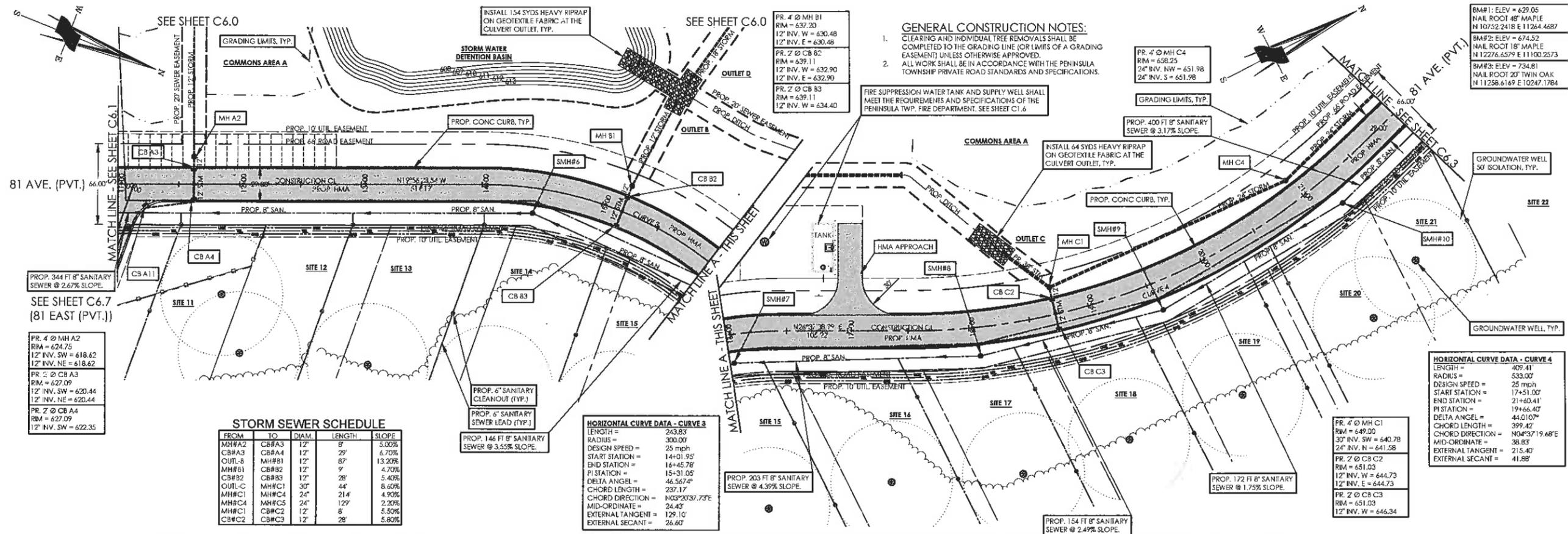
REV.	DATE	BY	CHK.	DESCRIPTION
19	10/28/14	dm	mm	Clear Issues Calculation Updates
20	02/09/14	dm	mm	Perms & Ins. Submittal
21	03/11/14	dm	mm	Perms & Ins. Submittal
22	03/20/14	dm	mm	Perms & Ins. Submittal
23	04/08/14	dm	mm	Construction Plan Updates
24	07/08/14	dm	mm	New Fire Road Access
25	07/20/14	dm	mm	DEP New Fire Road Access Plan & Profile
26	08/20/14	dm	mm	DEP New Fire Road Access Plan & Profile

The 81 Development Company, LLC
 The 81 on East Bay - PUD
 81 AVE. - PLAN & PROFILE: P.O.B. TO STA 11+00
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

SCALE: 1"=40' H, 1"=4' V

CONSTRUCTION

14016
 C6.1
 03/05/14



GENERAL CONSTRUCTION NOTES:
 1. CLEARING AND INDIVIDUAL TREE REMOVALS SHALL BE COMPLETED TO THE GRADING LINE (OR LIMITS OF A GRADING EASEMENT) UNLESS OTHERWISE APPROVED.
 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE PENNSILVA TOWNSHIP PRIVATE ROAD STANDARDS AND SPECIFICATIONS.

PR. 4" Ø MH A2
 RIM = 624.75
 12" INV. SW = 618.42
 12" INV. NE = 618.62

PR. 2" Ø CB A3
 RIM = 627.09
 12" INV. SW = 620.44
 12" INV. NE = 620.44

PR. 2" Ø CB A4
 RIM = 627.09
 12" INV. SW = 622.35

STORM SEWER SCHEDULE

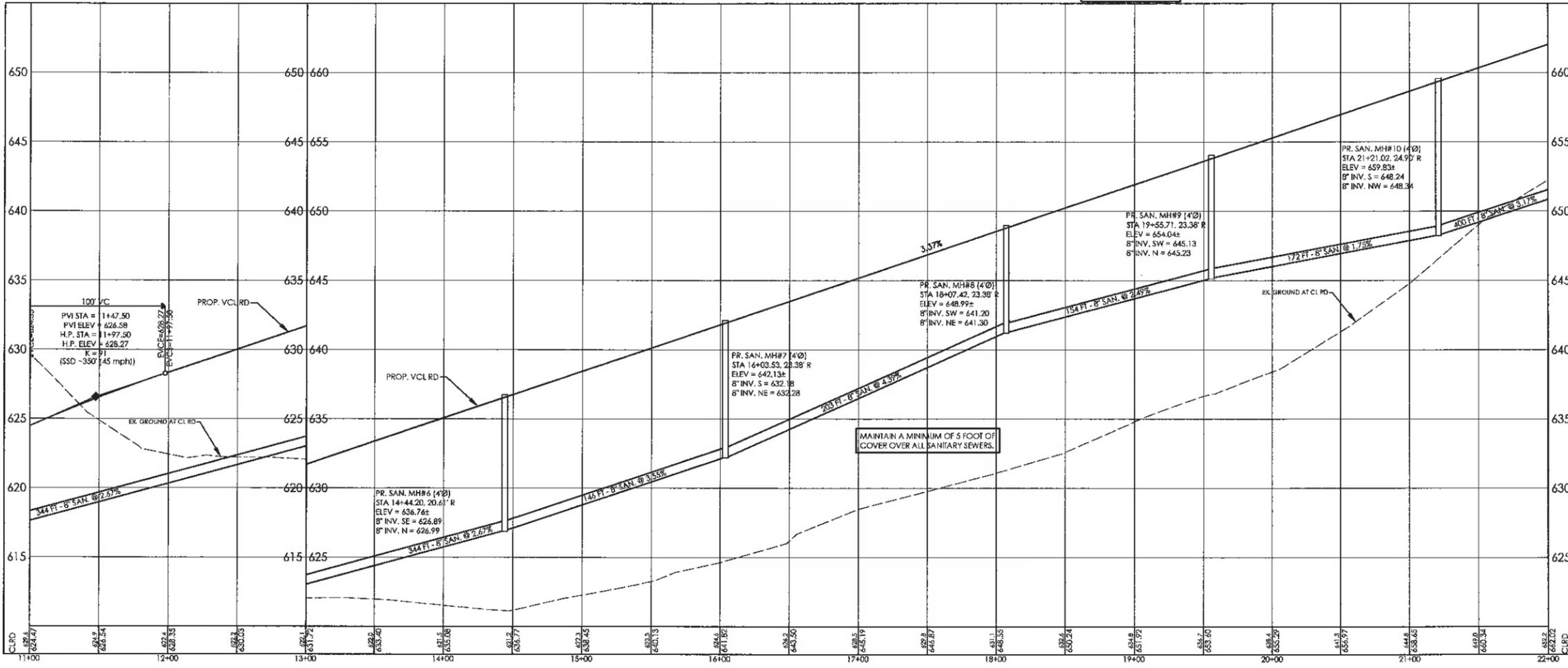
FROM	TO	DIAM.	LENGTH	SLOPE
MH#A2	CB#A3	12"	8'	5.00%
CB#A3	CB#A4	12"	29'	6.70%
OUTL-B	MH#B1	12"	87'	13.20%
MH#B1	CB#B2	12"	9'	4.70%
CB#B2	CB#B3	12"	28'	5.40%
OUTL-C	MH#C1	30"	44'	8.60%
MH#C1	MH#C4	24"	214'	4.90%
MH#C4	MH#C5	24"	129'	2.20%
MH#C1	CB#C2	12"	8'	5.50%
CB#C2	CB#C3	12"	28'	5.80%

HORIZONTAL CURVE DATA - CURVE 3

LENGTH = 243.83
 RADIUS = 300.00'
 DESIGN SPEED = 25 mph
 START STATION = 14+01.95'
 END STATION = 14+45.78'
 PI STATION = 15+23.87'
 DELTA ANGLE = 44.5674°
 CHORD LENGTH = 237.17'
 CHORD DIRECTION = N03°23'37.73"E
 MID-ORDINATE = 24.43'
 EXTERNAL TANGENT = 129.10'
 EXTERNAL SECANT = 26.60'

HORIZONTAL CURVE DATA - CURVE 4

LENGTH = 409.41'
 RADIUS = 533.00'
 DESIGN SPEED = 25 mph
 START STATION = 17+51.00'
 END STATION = 21+60.41'
 PI STATION = 19+66.40'
 DELTA ANGLE = 44.0107°
 CHORD LENGTH = 399.42'
 CHORD DIRECTION = N04°37'19.68"E
 MID-ORDINATE = 38.83'
 EXTERNAL TANGENT = 215.40'
 EXTERNAL SECANT = 41.88'



839 Conger Ave., Dr., Ste. 201
 P.O. Box 4015
 Traverse City, MI 49685
 Phone: 231-946-9310
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 info@mansfield.com

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REVISIONS

NO.	DATE	BY	DESCRIPTION
1	03/05/14	dm	Issue for Review
2	03/05/14	dm	Issue for Review
3	03/05/14	dm	Issue for Review
4	03/05/14	dm	Issue for Review
5	03/05/14	dm	Issue for Review
6	03/05/14	dm	Issue for Review
7	03/05/14	dm	Issue for Review
8	03/05/14	dm	Issue for Review
9	03/05/14	dm	Issue for Review
10	03/05/14	dm	Issue for Review
11	03/05/14	dm	Issue for Review
12	03/05/14	dm	Issue for Review
13	03/05/14	dm	Issue for Review
14	03/05/14	dm	Issue for Review
15	03/05/14	dm	Issue for Review
16	03/05/14	dm	Issue for Review
17	03/05/14	dm	Issue for Review
18	03/05/14	dm	Issue for Review
19	03/05/14	dm	Issue for Review
20	03/05/14	dm	Issue for Review
21	03/05/14	dm	Issue for Review
22	03/05/14	dm	Issue for Review
23	03/05/14	dm	Issue for Review
24	03/05/14	dm	Issue for Review
25	03/05/14	dm	Issue for Review

The 81 Development Company, LLC
 The 81 on East Bay - PUD
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

81 AVE. - PLAN & PROFILE: STA 11+00 TO STA 22+00

SCALE: 1"=40' H, 1"=4' V

CONSTRUCTION

14016

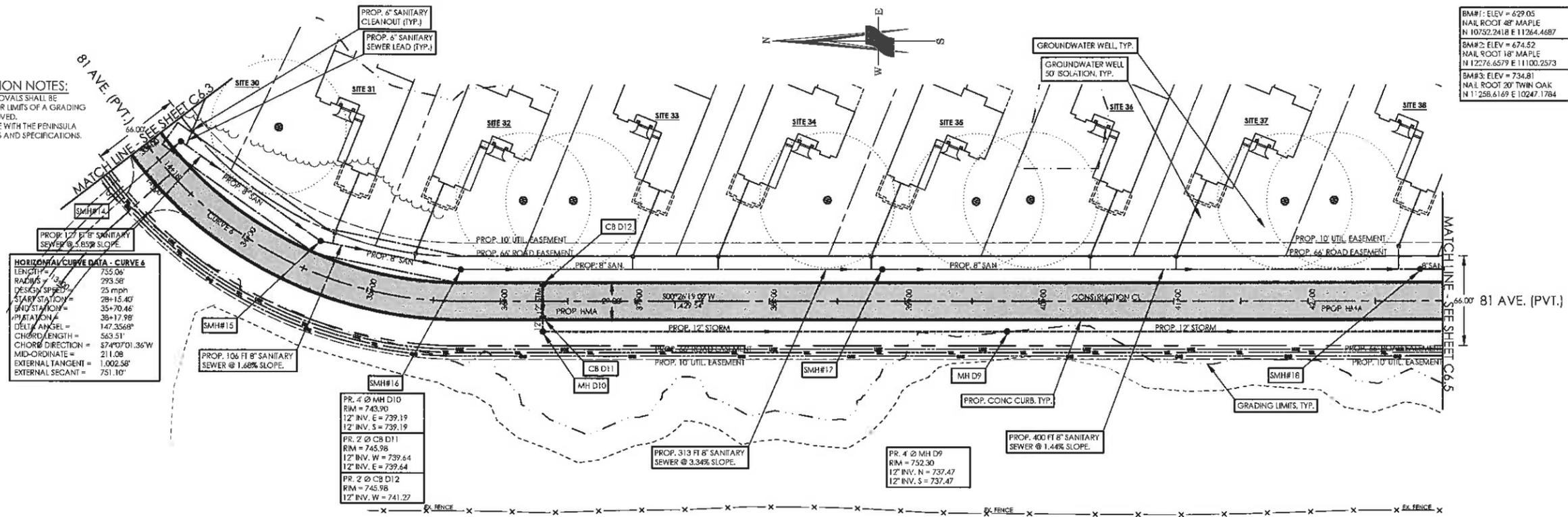
C6.2

GENERAL CONSTRUCTION NOTES:

- CLEARING AND INDIVIDUAL TREE REMOVALS SHALL BE COMPLETED TO THE GRADING LINE (OR LIMITS OF A GRADING EASEMENT) UNLESS OTHERWISE APPROVED.
- ALL WORK SHALL BE IN ACCORDANCE WITH THE PENINSULA TOWNSHIP PRIVATE ROAD STANDARDS AND SPECIFICATIONS.

HORIZONTAL CURVE DATA - CURVE 6

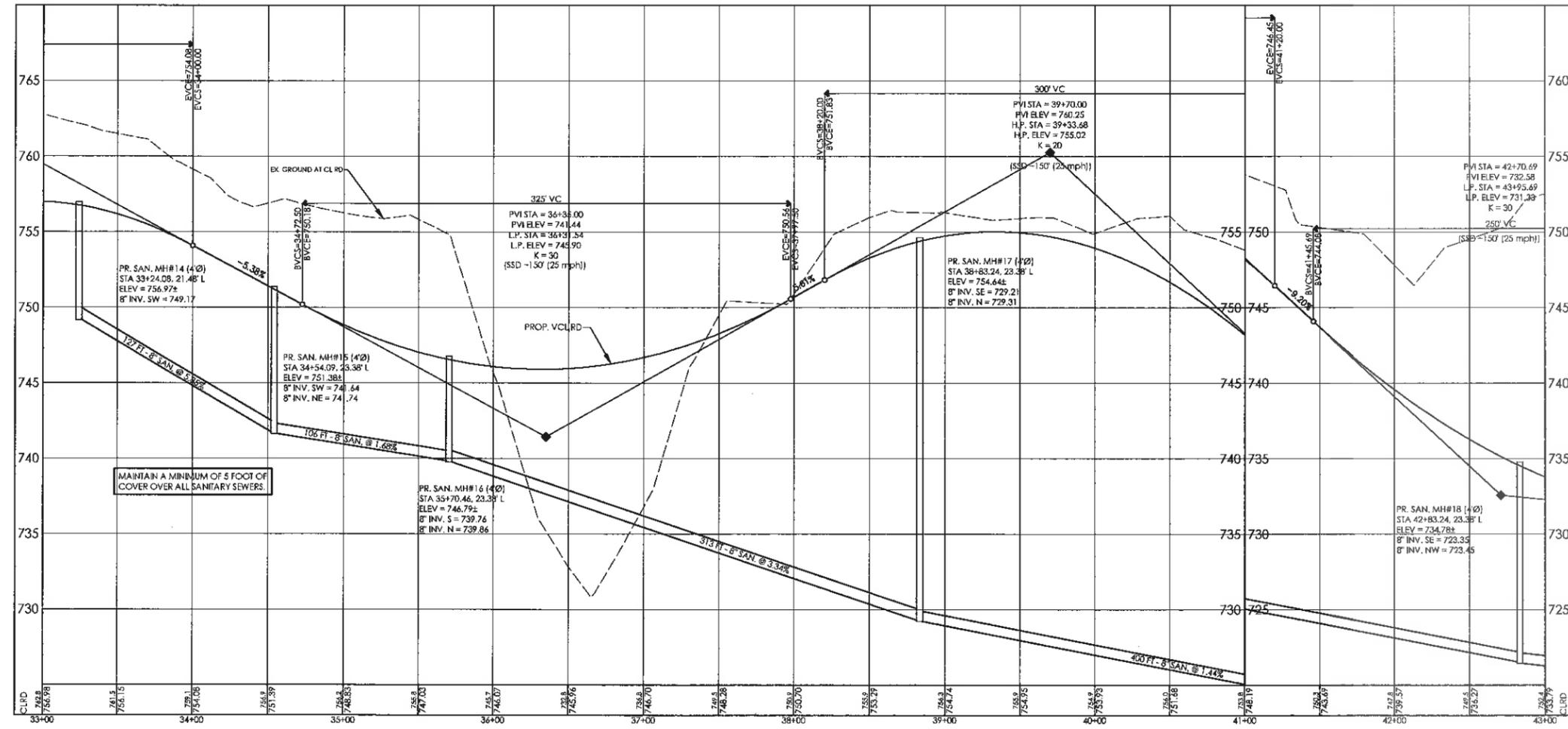
LENGTH	755.06'
RADIUS	293.38'
DESIGN SPEED	25 mph
START STATION	28+15.40'
END STATION	35+70.46'
PI STATION	31+92.93'
DELTA ANGLE	147.3568°
CHORD LENGTH	563.51'
CHORD BEARING	S74°07'01.36"W
MID-CURVATURE	211.08'
EXTERNAL TANGENT	1,002.58'
EXTERNAL SECANT	751.10'



BM#1: ELEV = 629.05
NAIL ROOT 48" MAPLE
N 107°52.2418 E 11264.4687
BM#2: ELEV = 674.52
NAIL ROOT 18" MAPLE
N 122°16.6579 E 11100.2573
BM#3: ELEV = 734.81
NAIL ROOT 20" TWN OAK
N 112°58.6169 E 10247.1784

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P.O. Box 4015
Traverse City, MI 49685
Phone: 231-946-9310
www.mansfield.com
info@mansfield.com

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MAINTAIN A MINIMUM OF 5 FOOT OF COVER OVER ALL SANITARY SEWERS.

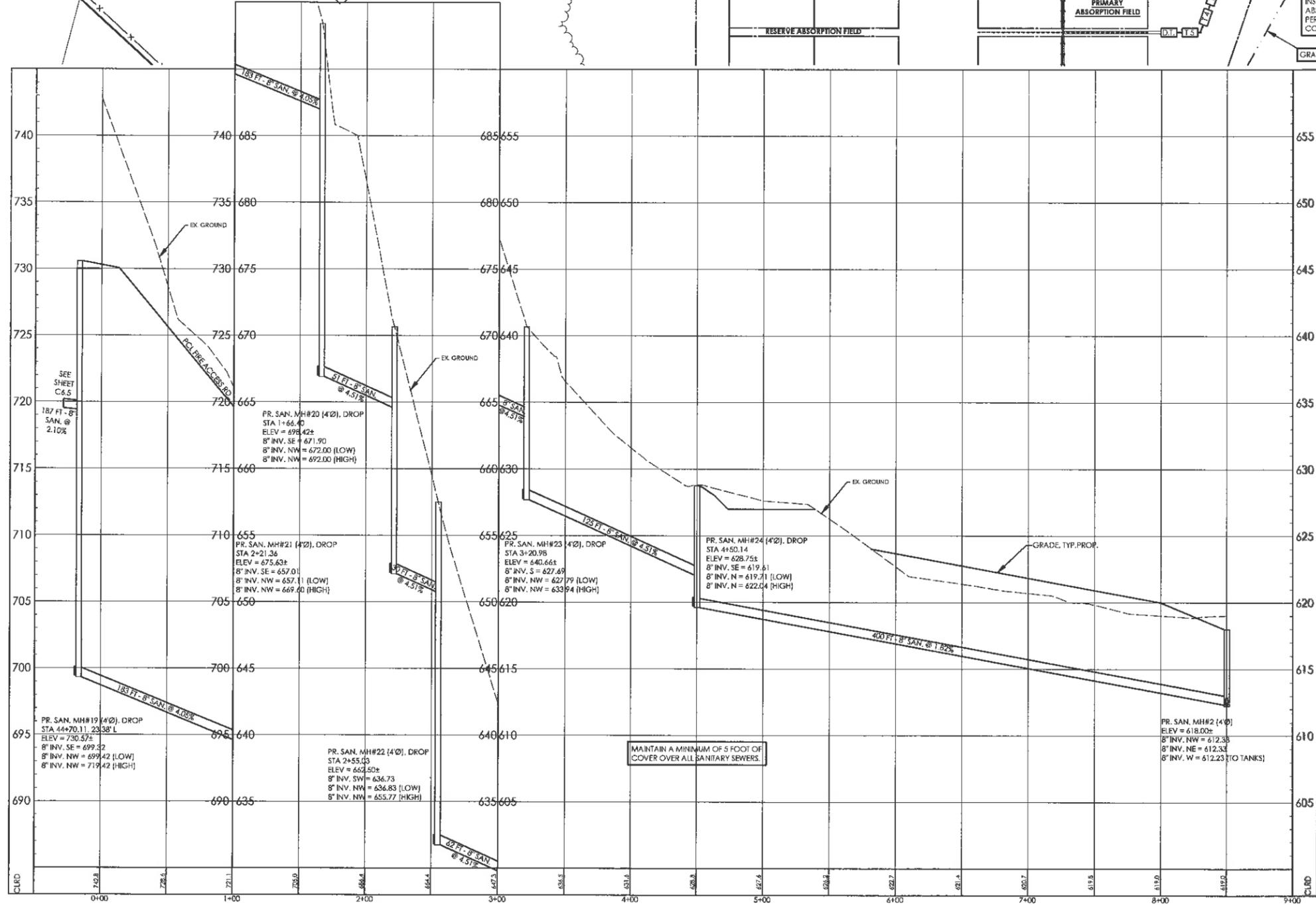
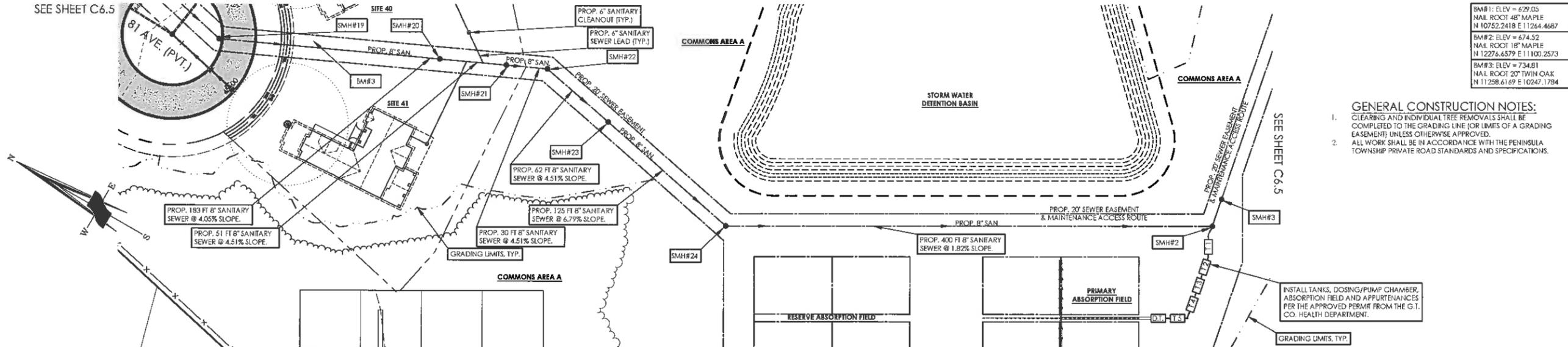
REV	DATE	BY	CHK	DESCRIPTION
1	03/06/14	dlm	dlm	Open Space Calculation Update
2	03/06/14	dlm	dlm	Permit & Temp. Submittal
3	03/06/14	dlm	dlm	Permit & Temp. Submittal
4	03/06/14	dlm	dlm	Permit & Temp. Submittal
5	03/06/14	dlm	dlm	Permit & Temp. Submittal
6	03/06/14	dlm	dlm	Permit & Temp. Submittal
7	03/06/14	dlm	dlm	Permit & Temp. Submittal
8	03/06/14	dlm	dlm	Permit & Temp. Submittal
9	03/06/14	dlm	dlm	Permit & Temp. Submittal
10	03/06/14	dlm	dlm	Permit & Temp. Submittal
11	03/06/14	dlm	dlm	Permit & Temp. Submittal
12	03/06/14	dlm	dlm	Permit & Temp. Submittal
13	03/06/14	dlm	dlm	Permit & Temp. Submittal
14	03/06/14	dlm	dlm	Permit & Temp. Submittal
15	03/06/14	dlm	dlm	Permit & Temp. Submittal
16	03/06/14	dlm	dlm	Permit & Temp. Submittal
17	03/06/14	dlm	dlm	Permit & Temp. Submittal
18	03/06/14	dlm	dlm	Permit & Temp. Submittal
19	03/06/14	dlm	dlm	Permit & Temp. Submittal
20	03/06/14	dlm	dlm	Permit & Temp. Submittal
21	03/06/14	dlm	dlm	Permit & Temp. Submittal
22	03/06/14	dlm	dlm	Permit & Temp. Submittal
23	03/06/14	dlm	dlm	Permit & Temp. Submittal
24	03/06/14	dlm	dlm	Permit & Temp. Submittal
25	03/06/14	dlm	dlm	Permit & Temp. Submittal
26	03/06/14	dlm	dlm	Permit & Temp. Submittal
27	03/06/14	dlm	dlm	Permit & Temp. Submittal
28	03/06/14	dlm	dlm	Permit & Temp. Submittal
29	03/06/14	dlm	dlm	Permit & Temp. Submittal
30	03/06/14	dlm	dlm	Permit & Temp. Submittal

The 81 Development Company, LLC
The 81 on East Bay - PUD
81 AVE. - PLAN & PROFILE: STA 33+00 TO STA 43+00
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

SCALE 1"=40' H, 1"=4' V
CONSTRUCTION
14016
C6.4

P:\Land Use\81014 - 81 on East Bay\81014_Plan_Profile.dwg (2/14/14) Aug 16, 2014 11:11:11 AM

SEE SHEET C6.5



830 Cottageview Dr., Ste. 201
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 Traverse City, MI 49685
 Phone: 231-946-9310
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REV.	DATE	BY	CHK.	DESCRIPTION
1	10/26/14	SM	SM	CHANGING COORDINATES UPDATE
2	03/08/14	SM	SM	PERMIT & TANK SUBMITTAL
3	03/11/14	SM	SM	PERMIT & TANK SUBMITTAL
4	03/03/14	SM	SM	PERMIT SUBMITTAL
5	03/03/14	SM	SM	CONSTRUCTION PER. UPDATE
6	03/03/14	SM	SM	CONSTRUCTION PER. UPDATE
7	03/03/14	SM	SM	CONSTRUCTION PER. UPDATE
8	03/03/14	SM	SM	CONSTRUCTION PER. UPDATE
9	03/03/14	SM	SM	CONSTRUCTION PER. UPDATE
10	03/03/14	SM	SM	CONSTRUCTION PER. UPDATE

The 81 Development Company, LLC
 The 81 on East Bay - PUD
 COMMONS AREA A - SANITARY PLAN & PROFILE
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

SCALE: 1"=40' H, 1"=40' V

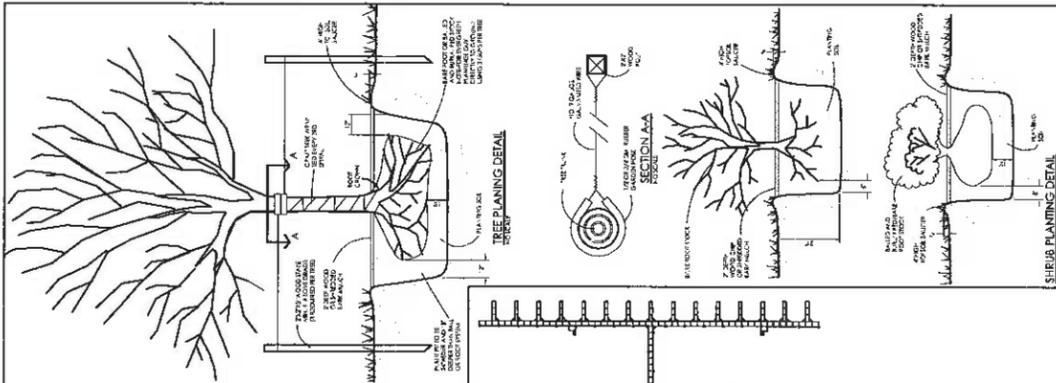
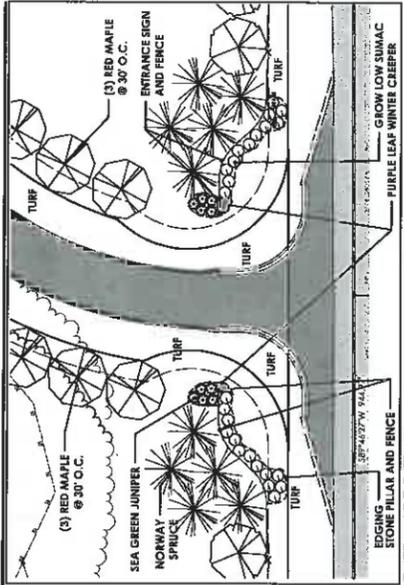
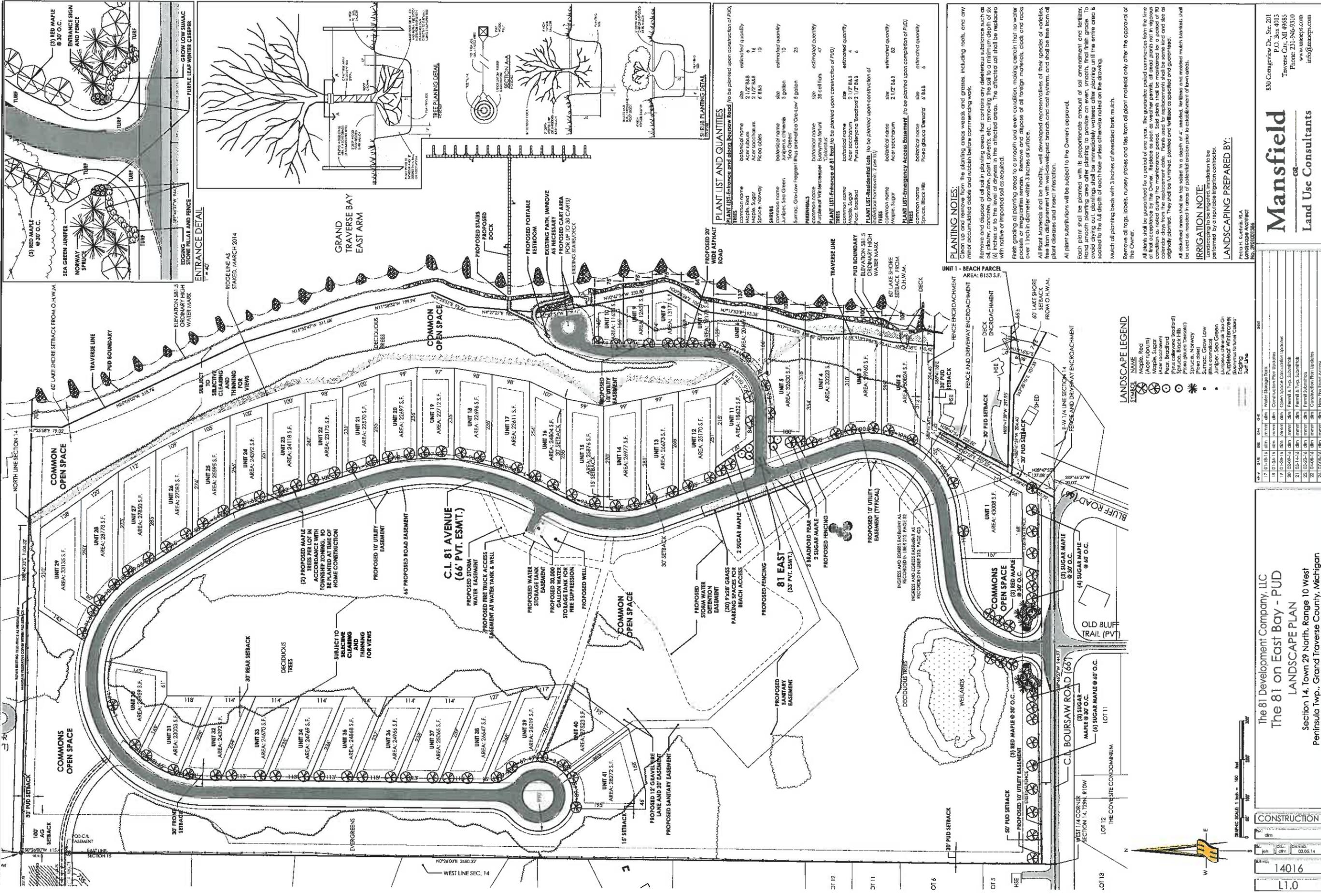
CONSTRUCTION

DATE: 03.06.14

NO. 14016

C6.6

P:\Mansfield\2014\14016\14016 SANITARY PLAN & PROFILE.dwg (14016 SANITARY PLAN & PROFILE) - Aug 12, 2014 10:17:26 AM - 16



PLANT LIST AND QUANTITIES

PLANT LIST - Entrance and along Boursaw Road (to be planted upon construction of PUD)

Common Name	Botanical Name	Size	Estimated Quantity
Red Maple	Acer rubrum	2 1/2" B&B	6
Sea Green Juniper	Juniperus Sea Green	2 1/2" B&B	6
Norway Spruce	Picea abies	2 1/2" B&B	10

PLANT LIST - Entrance of 81 East (to be planted upon construction of PUD)

Common Name	Botanical Name	Size	Estimated Quantity
Red Maple	Acer rubrum	2 1/2" B&B	4
Sea Green Juniper	Juniperus Sea Green	2 1/2" B&B	4

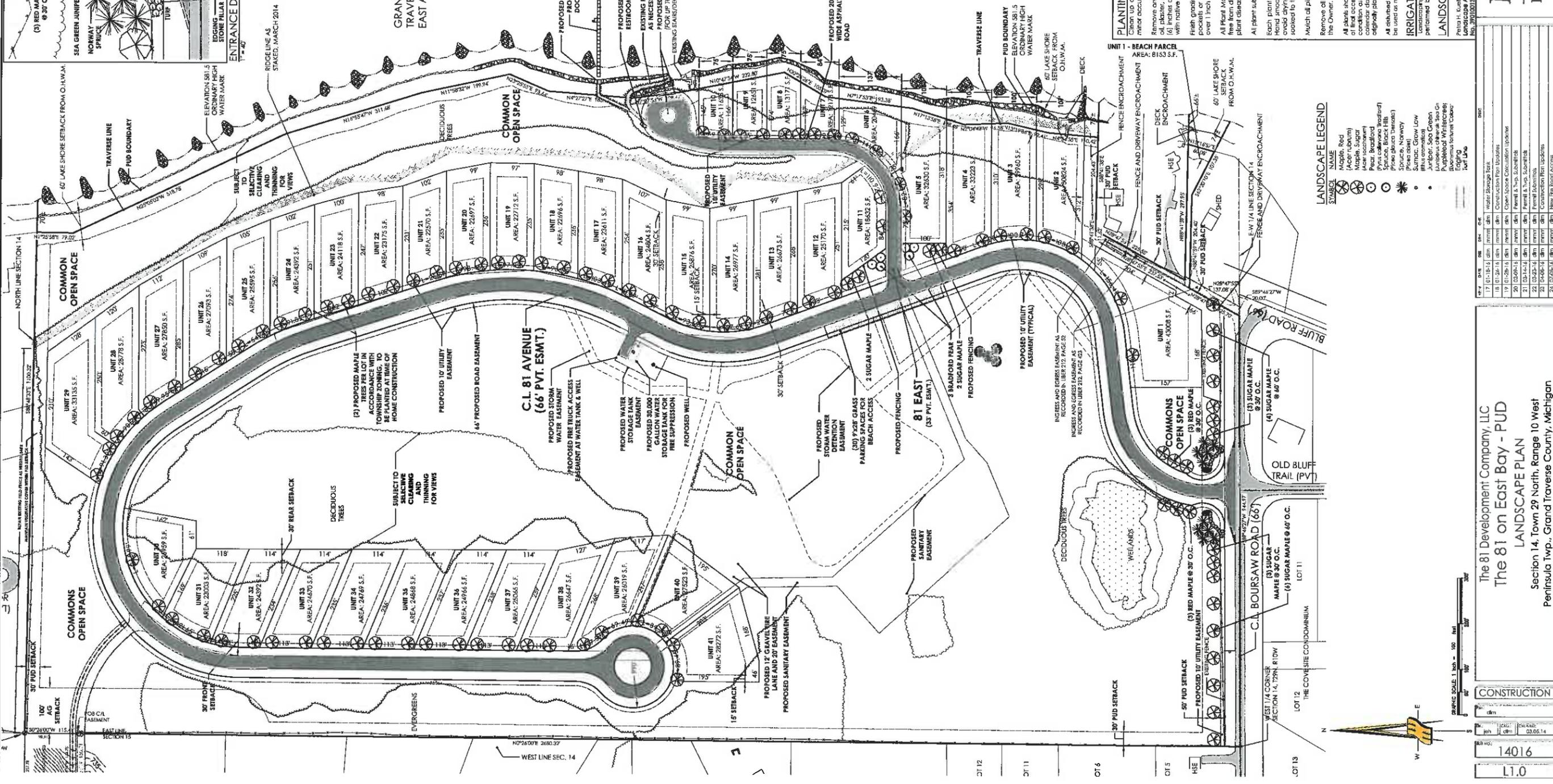
PLANT LIST - Residential Lots (to be planted upon construction of PUD)

Common Name	Botanical Name	Size	Estimated Quantity
Red Maple	Acer rubrum	2 1/2" B&B	82
Sea Green Juniper	Juniperus Sea Green	2 1/2" B&B	6

PLANTING NOTES:
 1. All plants shall be planted with the following areas, weeding and grasses, including roots, and any minor accumulated debris and rubbish before commencing work.
 2. Remove and dispose of all soil in planting areas that contains any deleterious substance such as oil, plaster, concrete, gasoline, paint, solvents, etc., removing the soil to a minimum depth of six (6) inches or to the level of dryness in the affected areas. The affected soil shall be replaced with native or imported soil as required.
 3. Finish grading of planting areas to a smooth and even condition, making certain that no water pockets or irregularities remain. Remove and dispose of all foreign materials, clods, and rocks over 1 inch in diameter within 3 inches of surface.
 4. All trees and shrubs shall be healthy, well developed representatives of their species of varieties. Free from defects such as withered, developed branch and root systems, and shall be free from all plant diseases and insect infestation.
 5. All plant substitutions will be subject to the Owner's approval.
 6. Each plant shall be planted with its proportionate amount of soil amendment and fertilizer, and shall be watered and mulched immediately after planting. The entire area shall be soaked to the full depth of each hole unless otherwise noted on the drawing.
 7. Mulch all planting beds with 3 inches of shredded bark mulch.
 8. Remove all logs, stumps, nursery stakes and ties from all plant material only after the approval of the Owner.
 9. All plants shall be guaranteed for a period of one year. The guarantee period commences from the time of final acceptance by the Owner. Replace as soon as weather permits, all dead plants not in vigorous condition at the end of the guarantee period. Dead plants shall be replaced by a plant of the same or similar species and shall be guaranteed for a period of one year. The guarantee period commences from the time of final acceptance by the Owner. All plants shall be guaranteed for a period of one year and shall be replaced as soon as weather permits. They shall be furnished, planted and fertilized as specified and guaranteed.
 10. All shrubs shall be top soiled to a depth of 4" (medium, fertilized and mulched much bark mulch shall be used on needed fractions of potential erosion prior to installation of them).

IRRIGATION NOTE:
 1. Irrigation shall be installed in accordance with the specifications of a reputable irrigation contractor.
 2. The irrigation system shall be installed in accordance with the specifications of a reputable irrigation contractor.

LANDSCAPING PREPARED BY:
 Peter H. Gumbel, RIA
 Landscape Architect
 No. 270100180



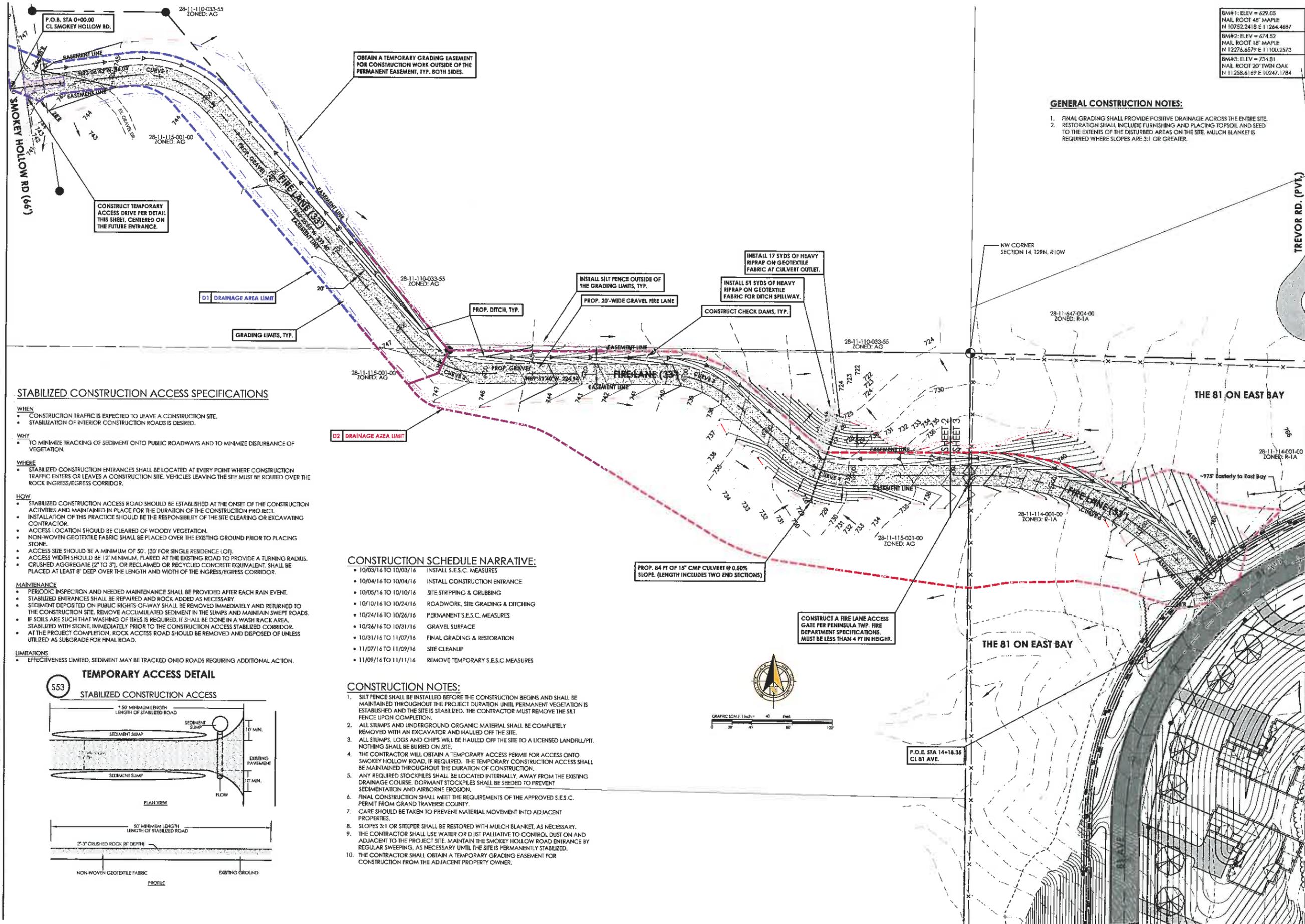
CONSTRUCTION

14016

L.T.O.

The 81 Development Company, LLC
The 81 on East Bay - PUD
LANDSCAPE PLAN
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

830 Cottageview Dr., Ste. 201
 P.O. Box 4113
 Traverse City, MI 49783
 Phone: 231-946-9310
 www.mansfield.com
 info@mansfield.com



BM#1: ELEV = 629.05
 NAIL ROOT 4" MAPLE
 N 10752.2418 E 11264.4687
 BM#2: ELEV = 674.52
 NAIL ROOT 18" MAPLE
 N 12276.6579 E 11100.2573
 BM#3: ELEV = 734.91
 NAIL ROOT 20" TWIN OAK
 N 11258.6159 E 10247.1784

GENERAL CONSTRUCTION NOTES:

1. FINAL GRADING SHALL PROVIDE POSITIVE DRAINAGE ACROSS THE ENTIRE SITE.
2. RESTORATION SHALL INCLUDE FURNISHING AND PLACING TOPSOIL AND SEED TO THE EXTENTS OF THE DISTURBED AREAS ON THE SITE. MULCH BLANKET IS REQUIRED WHERE SLOPES ARE 3:1 OR GREATER.

Mansfield
 Land Use Consultants

830 Comptroller Dr., Ste. 201
 P.O. Box 4015
 Traverse City, MI 49685
 Phone: 231-946-9310
 www.mansfield.com
 info@mansfield.com

STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS

- WHEN**
- CONSTRUCTION TRAFFIC IS EXPECTED TO LEAVE A CONSTRUCTION SITE.
 - STABILIZATION OF INTERIOR CONSTRUCTION ROADS IS DESIRED.
- WHY**
- TO MINIMIZE TRACKING OF SEDIMENT ONTO PUBLIC ROADWAYS AND TO MINIMIZE DISTURBANCE OF VEGETATION.
- WHERE**
- STABILIZED CONSTRUCTION ENTRANCES SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST BE ROUTED OVER THE ROCK INGRESS/EGRESS CORRIDOR.
- HOW**
- STABILIZED CONSTRUCTION ACCESS ROAD SHOULD BE ESTABLISHED AT THE ONSET OF THE CONSTRUCTION ACTIVITIES AND MAINTAINED IN PLACE FOR THE DURATION OF THE CONSTRUCTION PROJECT.
 - INSTALLATION OF THIS PRACTICE SHOULD BE THE RESPONSIBILITY OF THE SITE CLEARING OR EXCAVATING CONTRACTOR.
 - ACCESS LOCATION SHOULD BE CLEARED OF WOODY VEGETATION.
 - NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE.
 - ACCESS SIZE SHOULD BE A MINIMUM OF 50' (30' FOR SINGLE RESIDENCE LOT).
 - ACCESS WIDTH SHOULD BE 12' MINIMUM, FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
 - CRUSHED AGGREGATE (2" TO 3"), OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT, SHALL BE PLACED AT LEAST 8" DEEP OVER THE LENGTH AND WIDTH OF THE INGRESS/EGRESS CORRIDOR.
- MAINTENANCE**
- PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.
 - STABILIZED ENTRANCES SHALL BE REPAIRED AND ROCK ADDED AS NECESSARY.
 - SEDIMENT DEPOSITED ON PUBLIC RIGHTS-OF-WAY SHALL BE REMOVED IMMEDIATELY AND RETURNED TO THE CONSTRUCTION SITE. REMOVE ACCUMULATED SEDIMENT IN THE SUMPS AND MAINTAIN SWEEPED ROADS.
 - IF SOILS ARE SUCH THAT WASHING OF TIRES IS REQUIRED, IT SHALL BE DONE IN A WASH RACK AREA, STABILIZED WITH STONE, IMMEDIATELY PRIOR TO THE CONSTRUCTION ACCESS STABILIZED CORRIDOR.
 - AT THE PROJECT COMPLETION, ROCK ACCESS ROAD SHOULD BE REMOVED AND DISPOSED OF UNLESS UTILIZED AS SUBGRADE FOR FINAL ROAD.
- LIMITATIONS**
- EFFECTIVENESS LIMITED. SEDIMENT MAY BE TRACKED ONTO ROADS REQUIRING ADDITIONAL ACTION.

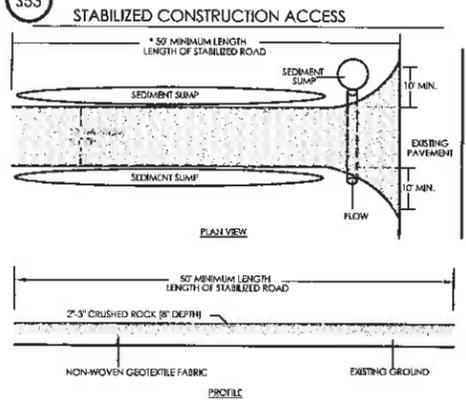
CONSTRUCTION SCHEDULE NARRATIVE:

- 10/03/16 TO 10/03/16 INSTALL S.E.S.C. MEASURES
- 10/04/16 TO 10/04/16 INSTALL CONSTRUCTION ENTRANCE
- 10/05/16 TO 10/10/16 SITE STRIPPING & GRUBBING
- 10/10/16 TO 10/24/16 ROADWORK, SITE GRADING & DITCHING
- 10/24/16 TO 10/26/16 PERMANENT S.E.S.C. MEASURES
- 10/26/16 TO 10/31/16 GRAVEL SURFACE
- 10/31/16 TO 11/07/16 FINAL GRADING & RESTORATION
- 11/07/16 TO 11/09/16 SITE CLEANUP
- 11/09/16 TO 11/11/16 REMOVE TEMPORARY S.E.S.C. MEASURES

CONSTRUCTION NOTES:

1. SILT FENCE SHALL BE INSTALLED BEFORE THE CONSTRUCTION BEGINS AND SHALL BE MAINTAINED THROUGHOUT THE PROJECT DURATION UNTIL PERMANENT VEGETATION IS ESTABLISHED AND THE SITE IS STABILIZED. THE CONTRACTOR MUST REMOVE THE SILT FENCE UPON COMPLETION.
2. ALL STUMPS AND UNDERGROUND ORGANIC MATERIAL SHALL BE COMPLETELY REMOVED WITH AN EXCAVATOR AND HAULED OFF THE SITE.
3. ALL STUMPS, LOGS AND CHIPS WILL BE HAULED OFF THE SITE TO A LICENSED LANDFILL/PIT. NOTHING SHALL BE BURIED ON SITE.
4. THE CONTRACTOR WILL OBTAIN A TEMPORARY ACCESS PERMIT FOR ACCESS ONTO SMOKEY HOLLOW ROAD, IF REQUIRED. THE TEMPORARY CONSTRUCTION ACCESS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION.
5. ANY REQUIRED STOCKPILES SHALL BE LOCATED INTERNALLY, AWAY FROM THE EXISTING DRAINAGE COURSE. DORMANT STOCKPILES SHALL BE SEED TO PREVENT SEDIMENTATION AND AIRBORNE EROSION.
6. FINAL CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE APPROVED S.E.S.C. PERMIT FROM GRAND TRAVERSE COUNTY.
7. CARE SHOULD BE TAKEN TO PREVENT MATERIAL MOVEMENT INTO ADJACENT PROPERTIES.
8. SLOPES 3:1 OR STEEPER SHALL BE RESTORED WITH MULCH BLANKET, AS NECESSARY.
9. THE CONTRACTOR SHALL USE WATER OR DUST PALLIATIVE TO CONTROL DUST ON AND ADJACENT TO THE PROJECT SITE. MAINTAIN THE SMOKEY HOLLOW ROAD ENTRANCE BY REGULAR SWEEPING, AS NECESSARY UNTIL THE SITE IS PERMANENTLY STABILIZED.
10. THE CONTRACTOR SHALL OBTAIN A TEMPORARY GRADING EASEMENT FOR CONSTRUCTION FROM THE ADJACENT PROPERTY OWNER.

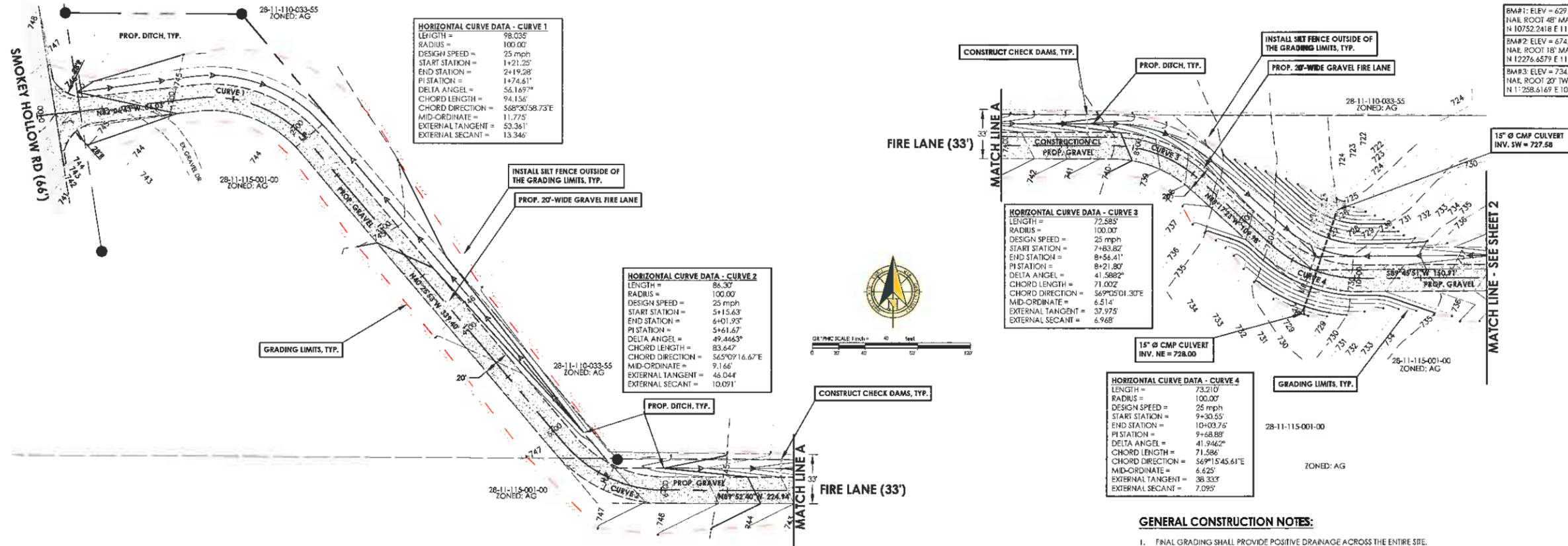
TEMPORARY ACCESS DETAIL



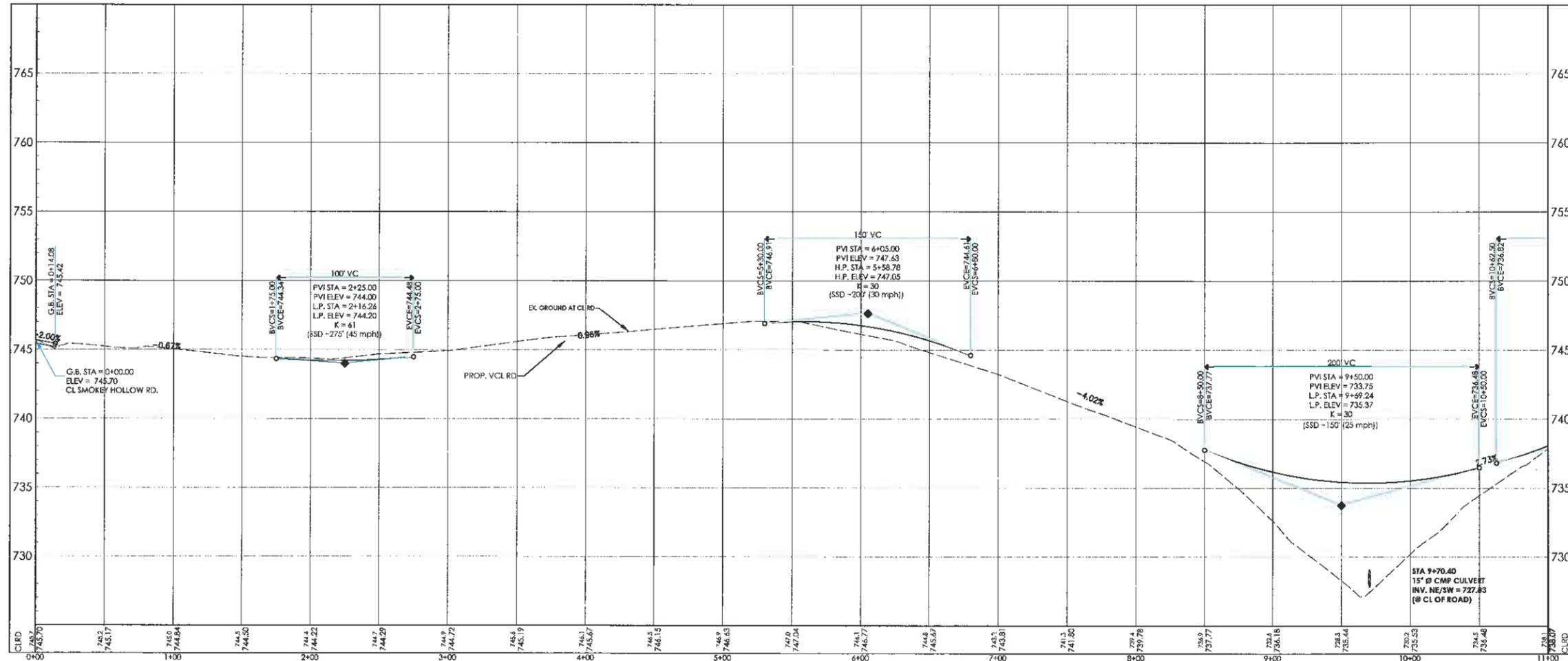
The 81 Development Company, LLC
 The 81 on East Bay - PUD
FIRE LANE: OVERALL SITE, S.E.S.C. & DRAINAGE PLANS
 Section 14, Town 29 North, Range 10 West
 Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION
 14016
 1 of 3

P:\land\proj\81 on East Bay\81 on East Bay\81 on East Bay.dwg (R:\land\proj\81 on East Bay\81 on East Bay.dwg) 4/20/16 11:17:00 AM



- GENERAL CONSTRUCTION NOTES:**
- FINAL GRADING SHALL PROVIDE POSITIVE DRAINAGE ACROSS THE ENTIRE SITE.
 - RESTORATION SHALL INCLUDE FURNISHING AND PLACING TOPSOIL AND SEED TO THE EXTENTS OF THE DISTURBED AREAS ON THE SITE. MULCH BLANKET IS REQUIRED WHERE SLOPES ARE 3:1 OR GREATER.



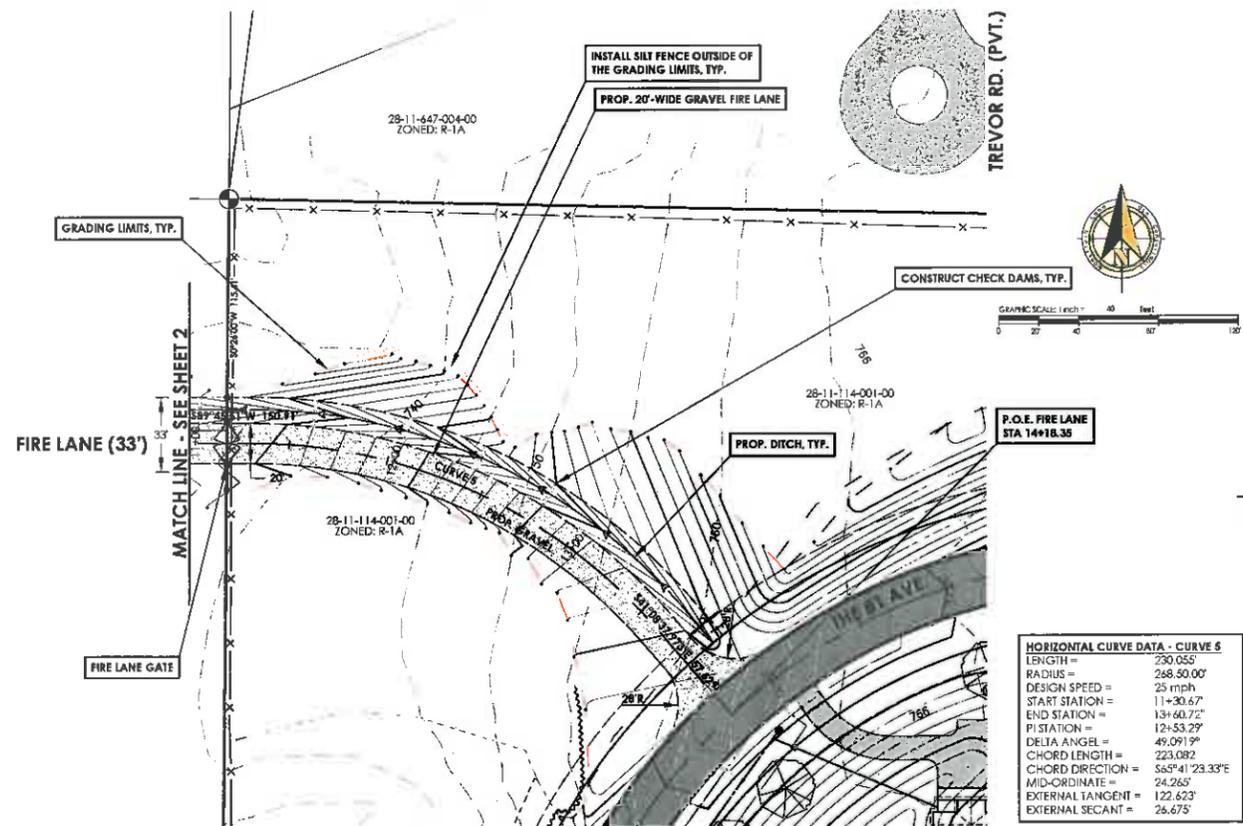
BM#1: ELEV = 629.05	NAL ROOT 48' MAPLE
N 10752.2418 E 11264.4687	
BM#2: ELEV = 674.52	NAL ROOT 18' MAPLE
N 12276.6579 E 11100.2573	
BM#3: ELEV = 734.81	NAL ROOT 20' TWIN OAK
N 11258.6169 E 10247.1784	

Mansfield
Land Use Consultants

REV.	DATE	BY	CHK	DESCRIPTION
1	10/26/16	dm	dm	Open Space Calculation Update
2	10/26/16	dm	dm	Final EIR, Title, Submittals
3	10/26/16	dm	dm	Final EIR, Title, Submittals
4	10/26/16	dm	dm	Final EIR, Title, Submittals
5	10/26/16	dm	dm	Final EIR, Title, Submittals
6	10/26/16	dm	dm	Final EIR, Title, Submittals
7	10/26/16	dm	dm	Final EIR, Title, Submittals
8	10/26/16	dm	dm	Final EIR, Title, Submittals
9	10/26/16	dm	dm	Final EIR, Title, Submittals
10	10/26/16	dm	dm	Final EIR, Title, Submittals

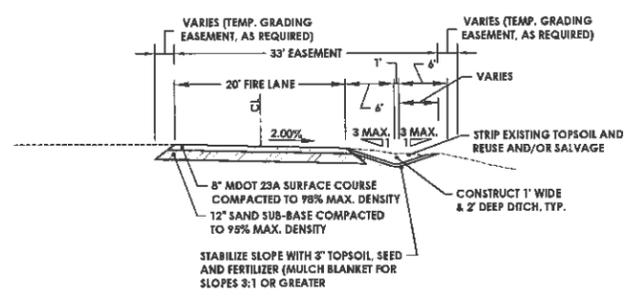
The 81 Development Company, LLC
The 81 on East Bay - PUD
FIRE LANE - PLAN & PROFILE: P.O.B. TO STA 11+00
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

P:\land\march2016 - 40 - Janssen\Submittals\81onEastBay\81onEastBay_PUD\81onEastBay_PUD_Plan_Profile_P.O.B.to_11+00.dwg (14/08/2016 10:28:38 AM) - Aug 23, 2016 10:28:38 AM

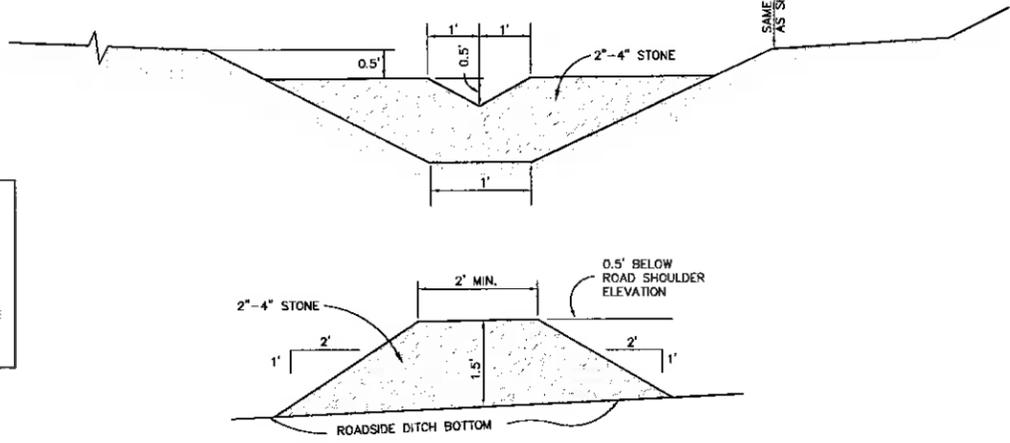


HORIZONTAL CURVE DATA - CURVE 5

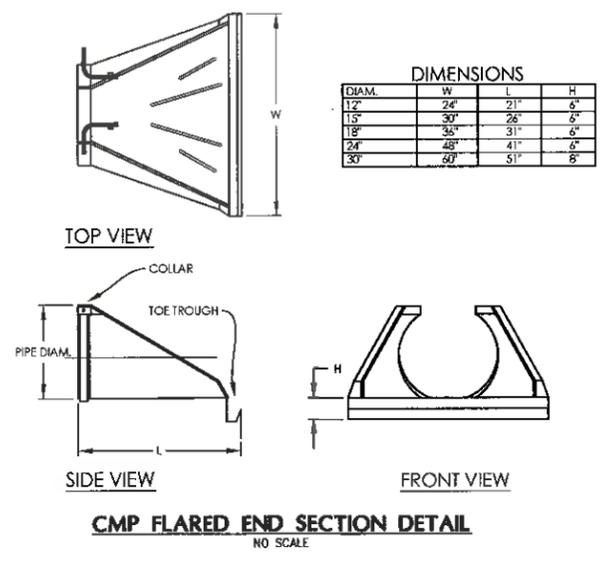
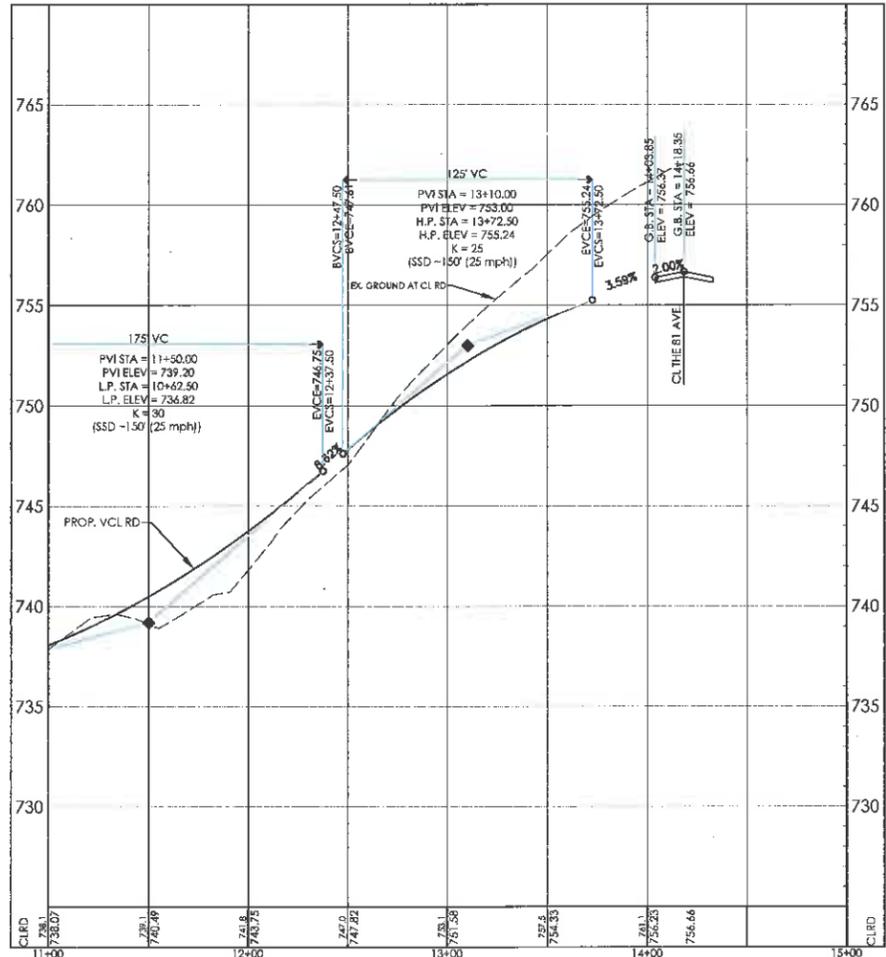
LENGTH =	230.055'
RADIUS =	268.50 00'
DESIGN SPEED =	25 mph
START STATION =	11+32.67'
END STATION =	13+62.72'
PI STATION =	12+53.29'
DELTA ANGLE =	49.091 29°
CHORD LENGTH =	223.082'
CHORD DIRECTION =	S65°41'23.33"E
MID-ORDINATE =	24.265'
EXTERNAL TANGENT =	122.623'
EXTERNAL SECANT =	26.675'



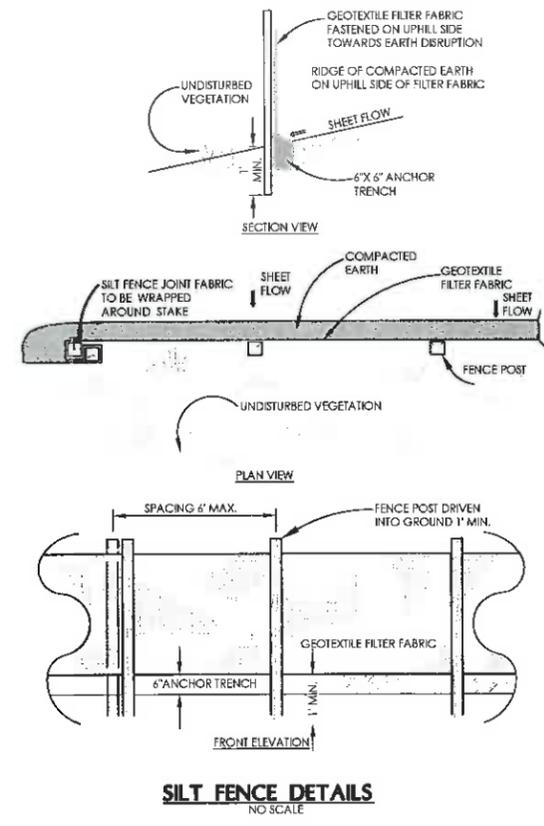
FIRE ACCESS SECTION
NO SCALE



STONE CHECK DAM
NO SCALE



CMP FLARED END SECTION DETAIL
NO SCALE



SILT FENCE DETAILS
NO SCALE

GENERAL CONSTRUCTION NOTES:

1. FINAL GRADING SHALL PROVIDE POSITIVE DRAINAGE ACROSS THE ENTIRE SITE. RESTORATION SHALL INCLUDE FURNISHING AND PLACING TOPSOIL AND SEED TO THE EXTENTS OF THE DISTURBED AREAS ON THE SITE. MULCH BLANKET IS REQUIRED WHERE SLOPES ARE 3:1 OR GREATER.

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830 Cottageview Dr., Ste. 201
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www.mansfield.com
info@mansfield.com

Mansfield
Land Use Consultants

REV	DATE	BY	CHK	DESCRIPTION
17	07/20/14	dlm	mm	Open Source Circulation Updates
18	08/04/14	dlm	mm	Final & Two Submittals
19	08/11/14	dlm	mm	Final & Two Submittals
20	08/11/14	dlm	mm	Final Submittal
21	08/25/14	dlm	mm	Construction Plan Updates
22	08/25/14	dlm	mm	New Fire Road Access
23	09/25/14	dlm	mm	NEW FIRE ROAD ACCESS PLAN & PROFILE
24	09/25/14	dlm	mm	Final Design, Storm Water & E.C.C. Stormwater
25	09/25/14	dlm	mm	
26	09/25/14	dlm	mm	

The 81 Development Company, LLC
The 81 on East Bay - PUD
FIRE LANE - PLAN/PROFILE: STA 11+00 TO P.O.E.
Section 14, Town 29 North, Range 10 West
Peninsula Twp., Grand Traverse County, Michigan

CONSTRUCTION	
NO.	dlm
DATE	03.05.14
NO.	14016
3 of 3	

Jim Hirschenberger

From: Daniel Thorell <dthorell@gtchd.org>
Sent: Wednesday, February 18, 2015 1:15 PM
To: Michelle Reardon
Cc: Jim Hirschenberger
Subject: Status of the "81 on East Bay" site condominium development

Michelle

I know that a meeting is forthcoming regarding this proposed site-condo and wanted to give you a status update in regards to the review by the Grand Traverse County Health Department. Soils evaluations were done with Jim Hirschenberger of Mansfield and Associates on January 16th. Test holes were excavated in the proposed initial and reserve areas for the community dispersal field and also on units 1-4 where individual onsite wastewater systems are proposed. Soils were suitable for wastewater dispersal. Once the community system design is completed, it will be submitted to the GTCHD and DEQ for review. The system will require a septic permit from GTCHD and a part 41 permit from DEQ.

A test well permit has been issued for a well to be drilled on unit 21 for the purpose of evaluating water quality and quantity for individual units in the development. Once the well is complete, the well log, analytical results, and aquifer pump test results will be submitted to GTCHD for review.

If you have any questions, please contact me.

Daniel R. Thorell, M.S., R.S.
Environmental Sanitarian
Grand Traverse County Health Department
Environmental Health Division
2650 LaFranier Rd
Traverse City, MI 49686

231.995.6021

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4125 Cedar Run Rd., Suite B
 Traverse City, MI 49684
 Phone 231-946-6767
 Fax 231-946-8741
 www.sosanalytical.com

COMPANY: CLUFF WELL DRILLING
 NAME: THE 81 DEVELOPMENT CO
 PROJECT NO:
 WSSN:
 WELL PERMIT:
 TAX ID:
 LOCATION:
 TRAVERSE CITY
 MI
 COUNTY: GRAND TRAVERSE
 TWP: PENINSULA

SOS PROJECT NO: 150907
 SAMPLED BY: MIKE
 DATE SAMPLED: 3/25/2015
 TIME SAMPLED: 10:15 AM
 SAMPLE MATRIX: DRINKING WATER
 DATE RECEIVED: 3/25/2015
 TIME RECEIVED: 10:55 AM

SM9223 COLIFORM BACTERIA - PRESENCE/ABSENCE

<u>No:</u>	<u>SAMPLE RESULT</u>	<u>Drinking Water Reg Limit(MCL)</u>	<u>ANALYST</u>	<u>Date Completed</u>
SAMPLE ID: WELL 1			KMJ	3/26/2015
TOTAL COLIFORM BACTERIA	ABSENT	ABSENT		
E. coli BACTERIA	ABSENT	ABSENT		

MCL = MAXIMUM CONTAMINANT LEVEL

APPROVED BY: Shanna Shea
 SHANNA SHEA
 LAB MANAGER

Michelle Reardon

From: Daniel Thorell <dthorell@gtchd.org>
Sent: Thursday, March 10, 2016 3:18 PM
To: Michelle Reardon
Cc: Jim Hirschenberger
Subject: Status of test well at "81 on East Bay"

Michelle

The test well was drilled to a depth of 323 feet and has penetrated significant protective overburden. The aquifer pump test was satisfactory with sufficient yield. The water sample results indicated that all parameters tested below regulatory limits. Therefore, the test well results will allow approval of the use of individual wells for the development. The minimum well depth will be 320 feet at the elevation of the test well.

Please let me know if you have any questions.

Daniel R. Thorell, M.S., R.S.
Environmental Health Coordinator
Grand Traverse County Health Department
Environmental Health Division
2650 LaFranier Rd
Traverse City, MI 49686

231.995.6021

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Water Well And Pump Record

Completion is required under authority of Part 127 Act 368 PA 1978.



Port ID:

Failure to comply is a misdemeanor.

No: 28111400100		Permit No: 36670		County: Grand Traverse		Township: Peninsula		
Well ID: 28000015074				Town/Range:	Section:	Well Status:	WSSN:	Source ID/Well No:
				29N 10W	14	Active		
Elevation:				Distance and Direction from Road Intersection:				
Latitude: 44.91964				N SIDE OF BOURSAW ROAD, LOT 21				
Longitude: -85.49102				Well Owner: THE 81 DEVELOPMENT CO.				
Method of Collection: GPS Std Positioning Svc SA Off				Well Address:		Owner Address:		
				LOT 21 BOURSAW ROAD TRAVERSE CITY, MI 49686		6978 DIXIE HWY CALRKSTON , MI 48346		

Drilling Method: Rotary		Well Use: Test well		Pump Installed: No	
Well Depth: 323.00 ft.		Date Completed: 3/5/2015		Pressure Tank Installed: No	
Well Type: New		Height: 2.00 ft. above grade		Pressure Relief Valve Installed: No	
Casing Type: PVC plastic		Casing Joint: Solvent welded/glued			
Casing Fitting: None					
Diameter: 5.00 in. to 318.00 ft. depth SDR: 21.00					
Borehole: 8.50 in. to 323.00 ft. depth					

Static Water Level: 92.00 ft. Below Grade		Yield Test Method: Air		Formation Description		Thickness	Depth to Bottom
Well Yield Test:		Pumping level 108.00 ft. after 4.00 hrs. at 25 GPM		Clay & Gravel		46.00	46.00
				Clay		5.00	51.00
				Sand		11.00	62.00
				Clay		5.00	67.00
				Sand & Gravel		91.00	158.00
				Clay		122.00	280.00
				Clay		36.00	316.00
				Sand		7.00	323.00

Screen Installed: Yes		Filter Packed: Yes	
Screen Diameter: 3.00 in.		Blank: 2.00 ft. Above	
Screen Material Type: Stainless steel-wire wrapped			
Slot	Length	Set Between	
12.00	5.00 ft.	318.00 ft. and 323.00 ft.	
Fittings: Neoprene packer			

Well Grouted: Yes		Grouting Method: Grout pipe outside casing	
Grouting Material	Bags	Additives	Depth
Bentonite slurry	28.00	None	0.00 ft. to 313.00 ft.

Wellhead Completion: Pitless adapter

Nearest Source of Possible Contamination:		
Type	Distance	Direction
None		

Geology Remarks:
280' = HARD CLAY 316' = RED CLAY

Drilling Machine Operator Name: MIKE KILINSKI
Employment: Employee

Contractor Type: Water Well Drilling Contractor Reg No: 28-2187
Business Name: Cluff Well Drilling Company
Business Address: 6222 E. Traverse Hwy., Traverse City, MI, 49684

Water Well Contractor's Certification
This well/pump was constructed under my supervision and I hereby certify that the work complies with Part 127 Act 368 PA 1978 and the well code.

Signature of Registered Contractor _____ Date _____

General Remarks:
Other Remarks:



GRAND TRAVERSE COUNTY SHERIFF'S OFFICE
Thomas J. Bensley, Sheriff • Nathan Alger, Undersheriff

Administration

851 Woodmere Avenue, Traverse City, MI 49686-3349 • (231) 995-5000 • FAX (231) 995-5010

Corrections

320 Washington Street, Traverse City, MI 49684-2583 • (231) 922-4530 • FAX (231) 922-4415

January 22, 2015

Peninsula Township Planning Commission
13235 Center Road
Traverse City, MI 49686

On January 12, 2015 the Grand Traverse County Sheriff's Office received site plan copies and a description for a proposed 81 +/- parcel development to be located at the intersection of Boursaw Road and Bluff Road in Peninsula Township. The documents were received from Mansfield Land Use Consultants of 830 Cottageview Drive, Suite 201, TC, MI 49685. After reviewing the site plans and the site itself for traffic, safety and security concerns this department finds the following:

- We see nothing objectionable in the submitted site plans within the areas of the responsibility of the Sheriff's Department.
- Nothing in the site plan appears pertinent to the responsibilities of the Sheriff's Department.
- There is insufficient information for our agency to comment.
- The following deficiencies or recommendations in the site plan are noted:

Referred to the Peninsula Township Planning Commission on:
January 22, 2015

Sincerely,

Thomas Bensley, SHERIFF
by;

Lt. Chris Barsheff



Peninsula Township Fire Department

August 9th, 2016

Michelle L. Reardon
Director of Planning & Zoning
13235 Center Road
Traverse City, MI 49686
planner@peninsulatownship.com

RE: 81 PUD Site review

Dear Michelle:

After reviewing the site plan revision #25 and dated 7.20.16 for the above referenced project, I have only minor concerns at this time. My review included the 2012 National Fire Code standards that apply to this project including Fire Apparatus Road, Gates, Signage, Marinas, and water supply as follows:

- The marina will have 30 slips but will not have a fuel dispensary on location or electricity. I have no concerns.
- The emergency access road meets the required 20' width, the elevation does not exceed a 10% grade, and will be able to sustain up to 75,000 pounds. A requirement that the road is maintained to avoid wash outs and be kept plowed during the winter months should be included in approval by the Township.
- The signage proposed on the plans is incomplete. I will required proper signage at the Water Tank location (No parking – Emergency Access Only)
- The gates proposed on the plans meet all applicable standards
- Both roads end with CUL-DE-SAC'S that will be manageable to turn emergency vehicle's around in case of an emergency.
- The 30,000 gallon water supply tank is sufficient for this project and I will discuss with the developer the proper hose connections for use with the Peninsula Township Fire Dept. equipment.

Please make me aware of any new plan changes. If you have any further questions or concerns feel free to contact me.

Randy Rittenhouse Fire Chief
Peninsula Township Fire Department

Peninsula Township Fire Department

August 16th, 2016

Michelle L. Reardon
Director of Planning & Zoning
13235 Center Road
Traverse City, MI 49686
planner@peninsulatownship.com

RE: 81 PUD Site review – further clarification

Dear Michelle:

You have requested further clarification regarding the Fire Code as it applies to the above referenced residential development. Please accept this information as an addendum to my report dated August 9, 2016 and attach it accordingly. I have included the sections of the Code that apply to this review and have removed sections that do not apply to make this information more readable.

Chapter 5 of the Fire Code applied to fire apparatus access roads and water supply, Appendix D applies to fire apparatus roads, gates, signage etc.

503.1 Where required. Fire apparatus access roads shall be provided and maintained in accordance with Sections 503.1.1 through 503.1.3.

503.1.1 Buildings and facilities. *Approved* fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an *approved* route around the exterior of the building or facility.

503.1.2 Additional access. The *fire code official* is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access. 503.1.3 High-piled storage. Fire department vehicle access to buildings used for *high-piled combustible storage* shall comply with the applicable provisions of Chapter 32.

503.2 Specifications. Fire apparatus access roads shall be installed and arranged in accordance with Sections 503.2.1 through 503.2.8.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for *approved* security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

503.2.2 Authority. The *fire code official* shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.

503.2.3 Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all weather driving capabilities.

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be determined by the *fire code official*.

503.2.5 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) in length shall be provided with an *approved* area for turning around fire apparatus.

503.2.7 Grade. The grade of the fire apparatus access road shall be within the limits established by the *fire code official* based on the fire department's apparatus.

503.2.8 Angles of approach and departure. The angles of approach and departure for fire apparatus access roads shall be within the limits established by the *fire code official* based on the fire department's apparatus.

503.3 Marking. Where required by the *fire code official*, *approved* signs or other *approved* notices or markings that include the words NO PARKING-FIRE LANE shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. The means by which *fire lanes* are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility.

503.4 Obstruction of fire apparatus access roads. Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 503.2.1 shall be maintained at all times.

503.5 Required gates or barricades. The *fire code official* is authorized to require the installation and maintenance of gates or other *approved* barricades across fire apparatus access roads, trails or other accessways, not including public streets, alleys or highways. Electric gate operators, where provided, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F2200.

506.1.1 Locks. An *approved* lock shall be installed on gates or similar barriers when required by the *fire code official*.

507.1 Required water supply. An *approved* water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

507.2 Type of water supply. A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

507.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.

507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an *approved* method.

507.4 Water supply test. The *fire code official* shall be notified prior to the water supply test. Water supply tests shall be witnessed by the *fire code official* or *approved* documentation of the test shall be provided to the *fire code official* prior to final approval of the water supply system.

507.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:

1. Private fire hydrants (all types): Inspection annually and after each operation; flow test and maintenance annually.
2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years.
3. Fire service main piping strainers: Inspection and maintenance after each use.

APPENDIX D FIRE APPARATUS ACCESS ROADS

D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an *approved* fire apparatus access road with an asphalt, concrete or other *approved* driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade. Exception: Grades steeper than 10 percent as *approved* by the fire chief.

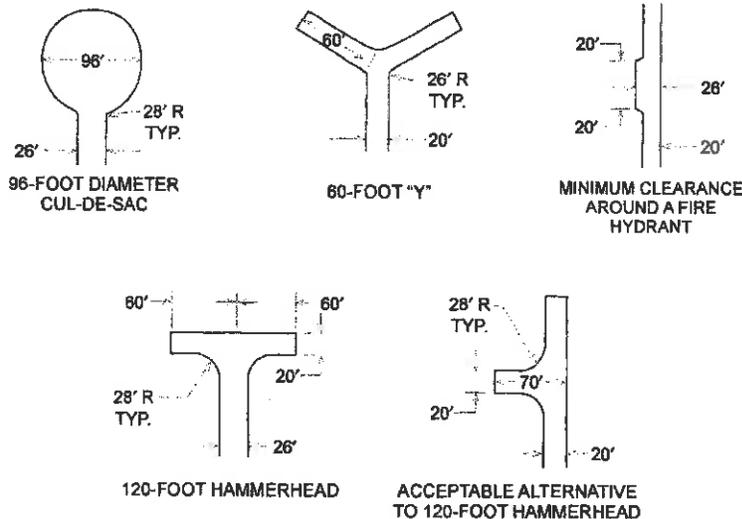
D103.3 Turning radius. The minimum turning radius shall be determined by the *fire code official*.

D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) shall be provided with width and turnaround provisions in accordance with Table D103.4.

**TABLE D103.4
REQUIREMENTS FOR DEAD-END
FIRE APPARATUS ACCESS ROADS**

LENGTH (feet)	WIDTH (feet)	TURNAROUNDS REQUIRED
0-150	20	None required
151-500	20	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure D103.1
501-750	26	120-foot Hammerhead, 60-foot "Y" or 96-foot diameter cul-de-sac in accordance with Figure D103.1
Over 750		Special approval required

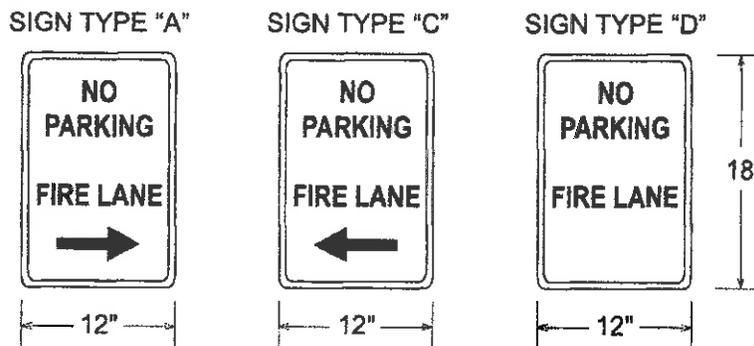
For SI: 1 foot = 304.8 mm.



D103.5 Fire apparatus access road gates. Gates securing the fire apparatus access roads shall comply with all of the following criteria:

1. The minimum gate width shall be 20 feet (6096 mm).
2. Gates shall be of the swinging or sliding type.
3. Construction of gates shall be of materials that allow manual operation by one *person*.
4. Gate components shall be maintained in an operative condition at all times and replaced or repaired when defective.
6. Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or when a key box containing the key(s) to the lock is installed at the gate location.
7. Locking device specifications shall be submitted for approval by the *fire code official*.

D103.6 Signs. Where required by the *fire code official*, fire apparatus access roads shall be marked with permanent NO PARKING-FIRE LANE signs complying with Figure D103.6. Signs shall have a minimum dimension of 12 inches (305 mm) wide by 18 inches (457 mm) high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.



**FIGURE D103.6
FIRE LANE SIGNS**

D103.6.1 Roads 20 to 26 feet in width. Fire lane signs as specified in Section D103.6 shall be posted on both sides of fire apparatus access roads that are 20 to 26 feet wide (6096 to 7925 mm). 450

D107 .1 One- or two-family dwelling residential developments.

Developments of one- or two-family *dwelling units* where the number of *dwelling units* exceeds 30 shall be provided 1 with two separate and *approved* fire apparatus access roads, and shall meet the requirements of Section D104.3.

Chapter 36 of the Fire Code applies to Marinas

3601.2 Plans and approvals. Plans for marina fire protection facilities shall be *approved* prior to installation. The work shall be subject to final inspection and approval after installation.

3603.1 Combustible debris. Combustible debris and rubbish shall not be deposited or accumulated on land beneath marina structures, piers or wharves.

3603.2 Sources of ignition. Open-flame devices used for lighting or decoration on the exterior of a vessel, float, pier or wharf shall be *approved*.

3603.3 Flammable or combustible liquid spills. Spills of flammable or *combustible liquids* at or upon the water shall be reported immediately to the fire department or jurisdictional authorities.

3603.4 Rubbish containers. Metal containers with tight-fitting or self-closing lids shall be provided for the temporary storage of combustible trash or rubbish.

3603.7 Slip identification. Slips and mooring spaces shall be individually identified by an *approved* numeric or alphabetic designator. Space designators shall be posted at the space. Signs indicating the space designators located on finger piers and floats shall be posted at the base of all piers, finger piers, floats and finger floats.

3604.4 Portable fire extinguishers. One portable fire extinguisher of the ordinary (moderate) hazard type shall be provided at each required standpipe hose connection. Additional portable fire extinguishers, suitable for the hazards involved, shall be provided and maintained in accordance with Section 906.

3604.5 Communications. A telephone not requiring a coin to operate or other *approved*, clearly identified means to notify the fire department shall be provided on the site in a location *approved* by the *fire code official*

Appendix B of the Fire Code applies to water supply.

B101.1 Scope. The procedure for determining fire-flow requirements for buildings or portions of buildings hereafter constructed shall be in accordance with this appendix. This appendix does not apply to structures other than buildings.

B103.1 Decreases. The fire chief is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.3 Areas without water supply systems. For information regarding water supplies for fire-fighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the *fire code official* is authorized to utilize NFPA 1142 or the *International Wildland Urban Interface Code*.

My review and comments dated August 9, 2016 are based on my review of the 2012 International Fire Code as it applies to this development, and after review of Ron Taylor's report, I concur with his conclusions.

Randy Rittenhouse Fire Chief
Peninsula Township Fire Department



Memorandum

1881 LaFranier Road
Traverse City, Michigan
49696

Phone (231) 922-4848
Fax (231) 929-1836

Date: May 27, 2014
To: Jim Hirschenberger, P.E. -- Mansfield Land Use Consultants
From: Rob Duranczyk, P.S., - Surveyor Grand Traverse County Road Commission
Copy: Jim Cook, Manager, Jim Johnson, P.E., County Highway Engineer
Garth Greenan, P.E., Traffic Services Supervisor
Ms. Judy Robinson, Owner/Developer
Subject: Conceptual Land Development Review of "The 81 on East Bay - PUD" in
Sec. 14, T29N, R10W, Peninsula Township, Grand Traverse County

The Grand Traverse County Road Commission staff has received and reviewed the conceptual Land Development Review submittal application for the above named development plan. Please note the following comments, questions and recommendations:

1. The staff of the Grand Traverse County Road Commission has no objections to the conceptual plans as they have been submitted; however, additional local agency submittals and reviews may require engineering changes by the Consultant to the proposed development, subjecting the development to future Grand Traverse County Road Commission comments.
2. At present, the driveway permit submitted to the Grand Traverse County Road Commission cannot be processed until preliminary approval for the development has been approved by Peninsula Township.

If you have any questions regarding this Land Development Review, please feel free to contact me at 231.922.4848.

Regards,

Rob Duranczyk, PS - Surveyor
Grand Traverse County Road Commission
1881 LaFranier Road
Traverse City, MI 49686-9811



**ROBERT A. COONEY
PROSECUTING ATTORNEY**

324 COURT STREET
TRAVERSE CITY, MICHIGAN 49684-9958
(231) 922-4600 • FAX (231) 922-4698

February 24, 2016

Mr. Joseph Quandt
412 South Union Street
Traverse City, MI 49684

RE: Preliminary Review #23414 for approval of proposed "The 81 on East Bay" residential PUD, Parcel 28-11-114-001-00 & 28-11-114-003-00 Peninsula Township, Grand Traverse County, Michigan

Dear Mr. Quandt:

Per your letter of February 2, 2016, I have communicated with the Soil Erosion and Sedimentation Division of Grand Traverse County relating to reasonable assurance of issuing a permit for the above identified parcels.

A Preliminary Review was conducted on January 22, 2015 and a letter stating the Soil Erosion Department findings was sent (attached). While the County cannot guarantee that a permit will be issued, we can provide reasonable assurance that it will be issued if final drawings for construction are submitted that are consistent with the preliminary approval.

Respectfully,


Robert Cooney
Grand Traverse County
Prosecuting Attorney

Enclosure

pc: Jean Derenzy, Deputy Director Planning and Development
Bruce Remai, Building Official



COPY

GRAND TRAVERSE COUNTY
SOIL EROSION - SEDIMENTATION CONTROL DEPARTMENT
2650 LAFRANIER ROAD
TRAVERSE CITY, MICHIGAN 49886
FAX (231) 995-6052 TEL (231) 995-6042

January 23, 2015

Mansfield Land Use Consultants
Jim Hirschenberger
830 Cottageview Dr., Suite 201
Traverse City, MI 49685

RE: Preliminary Review # 23414 for approval of proposed "The 81 on East Bay" residential PUD, Parcel 28-11-114-001-00 & 28-11-114-002-00 Peninsula Township, Grand Traverse County, Michigan

Dear Sirs:

This office has reviewed the submitted plans prepared by Mansfield Land Use Consultants, Job Number 14016, dated 03-05-14. We also field checked the parcel on January 22, 2015 and compared it to the proposed development plans.

The site has steep wooded slopes on the West, North and East. There is a nearly vertical, wooded bluff which drops to water level in East Bay. The center of the site has gently rolling slopes which slope to the west. The soils map indicates mostly Leelanau sands on the steeper slopes and where the residential lots are proposed. Those sandy soils will provide good infiltration rates. The proposed "common area" contains Richter loams which provide less infiltration, but are not planned to be used for lots or required infiltration. The drainage basin is proposed to be located in East Lake Mancelona loamy sands which will also provide adequate drainage. It should be noted that wetlands exist in the south west side of the site. A 25 foot buffer is required to protect it.

A grading and stabilization plan will be required from the contractor prior to grading the steep slopes near the bluff. It will need to demonstrate that the undisturbed bluff will be protected and that the graded area will be adequately stabilized to prevent erosion. This office recommends a double row of silt fence where silt fence is indicated on the site plan. In addition, individual lot grading will need to carefully follow the submitted plan so that storm water and soil will not be directed onto neighboring lots.

A permit from MI DEQ will be required to install the dock and boat slips in the water. Any additional work below the Ordinary High Water Mark will also need to be included in the MI DEQ permit. A construction schedule, surety and a statement designating the entity that will be responsible for maintenance of permanent SESC measures will also be required prior to issuance of a soil erosion control permit by this office.

Based on the above comments and the Construction Notes in the submitted site plan, this office grants conceptual approval for the development as proposed.

If you have any questions or concerns regarding this decision please feel free to contact me at 231-995-6042

Respectfully,

Gwendolyn Zagore
Grand Traverse County Soil Erosion Inspector



RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY
CADILLAC DISTRICT OFFICE



DAN WYANT
DIRECTOR

March 5, 2015

The 81 Development Co., LLC
c/o Mr. Kevin O'Grady
6978 Dixie Hwy, Suite A
Clarkston, Michigan 48346

Dear Mr. O'Grady:

SUBJECT: DEQ File Number 15-28-0004-P
Property Tax ID#: 28-11-114-002-00 Boursaw Road, Traverse City, Michigan
T29N, R10W, Section 14; Peninsula Township, Grand Traverse County

The Department of Environmental Quality's (DEQ), Water Resources Division has completed the review of your application and plans filed with this office for your proposed marina project. The review indicates that the proposed project does not require a permit under Part 325, Great Lakes Submerged Lands, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) for this dockage on East Grand Traverse Bay. Accordingly, your file has been closed and no further action will be taken.

This letter does not obviate the necessity of obtaining permits under the provisions of Part 91, Soil Erosion and Sedimentation Control, of the NREPA, or permits from other governmental units.

If you have any questions, please feel free to contact me at this office by e-mail at SchmidtR1@michigan.gov or at the phone number below.

Sincerely,

Robyn L. Schmidt
Water Resources Division
231-383-5952

cc: Ms. Petra Kuehins, Mansfield Land Use Consultants- via e-mail
Peninsula Township- via e-mail
Grand Traverse County CEA- via e-mail
Ms. April Champion, USACE, Detroit- via e-mail



DEPARTMENT OF THE ARMY
DETROIT DISTRICT, CORPS OF ENGINEERS
477 MICHIGAN AVENUE ROOM 603
DETROIT MI 48226-2550

July 21, 2015

REPLY TO
ATTENTION OF:

Engineering & Technical Services
Regulatory Office
File No. LRE-1998-560130-S15

Petra Kuehins
Mansfield Land Use Consultants
Agent for: The 81 Development Company, LLC
830 Cottageview Drive – Suite 201
Traverse City, Michigan 49685

Dear Ms. Kuehins:

We are writing in response to your request for a Department of the Army permit. Enclosed are two copies of an initial proffered permit for your signature.

Also enclosed with this letter is a document titled "Notification of Appeals Process," which outlines your options regarding the initial proffered permit. If you accept the permit, sign and return both complete permits. Your special attention is invited to the Special Conditions. Please read these and all other permit conditions before signing. Your signature constitutes your specific agreement to all terms and conditions of the permit. If you accept the initial proffered permit, you do not need to sign or submit the appeals form. Whether you elect to sign the permits or return the appeals document, your response is required within 60 days from the date of this letter.

If you sign the permits, we require a fee of \$100.00 prior to final action on your permit request. Please make your check or money order payable to FAO, USAED, Detroit, and submit it together with both of your signed permits (including all pages and drawings) to our office. Upon receipt, the District Engineer or his designee is authorized to issue the permit on behalf of the Secretary of the Army by countersigning the draft permits. If issued, we will return one of the countersigned permits to you.

The work subject to this permit will occur in a navigable water of the United States. The Detroit District, U.S. Army Corps of Engineers has previously made a determination of jurisdiction (JD) for the navigable waters within the geographic area under the Detroit District's regulatory authority and posted a copy of the approved JD for those waters online at:

<http://www.lre.usace.army.mil/Portals/69/docs/regulatory/PDFs/GENSEC10.pdf>. If you are not in agreement with this approved JD, you can make an administrative appeal under 33 CFR 331. We have enclosed a form entitled Notification of Administrative Appeals Options and Process and Request for Appeal, describing all of your appeals options regarding this approved JD. If you elect to return the appeals document, your response is required within 60 days from the date of this letter. Please contact us if you have questions on our appeals process and/or wish to have us provide you with a copy of our approved JD.

Should you have any questions on this matter, please contact Kristi DeFoe at the above address, by E-Mail at Kristi.M.DeFoe@usace.army.mil, or by telephone at 313-226-7718. In all communications, please refer to File Number LRE-1998-560130-S15.

We are interested in your thoughts and opinions concerning your experience with the Detroit District, Corps of Engineers Regulatory Program. If you are interested in letting us know how we are doing, you can complete an electronic Customer Service Survey from our web site at: http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0. Alternatively, you may contact us and request a paper copy of the survey that you may complete and return to us by mail or fax. Thank you for taking the time to complete the survey, we appreciate your feedback.

Sincerely,



Charles M. Simon
Chief, Permit Evaluation Western Branch
Regulatory Office

Enclosures

Wetland Delineation Report

**Boursaw Road, Peninsula Township
Grand Traverse County
Michigan**

Prepared For:

Mr. Kevin O'Grady
Insight Building Company
6978 Dixie Highway, Suite A
Clarkston, Michigan 48346

Prepared by:

GEI Consultants of Michigan, P.C.
6666 Bunker Hill Road
Williamsburg, Michigan 49690
517-525-3882



June 15, 2015

Wetland Delineation and Assessment Report

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Figure 1: Site Location Map

Figure 2: Wetland Delineation Map

APPENDICES:

Appendix A: USACE/MDEQ Wetland Determination Data Forms

Appendix B: Representative Photographs

1.0 INTRODUCTION

At the request of Mr. Kevin O'Grady of Insight Building Company, with appreciation to Jim Hirschenberger, P.E. of Mansfield Land Use Consultants, GEI Consultants of Michigan, P.C. (GEI) conducted a wetland delineation and assessment of wetlands associated with property located north of Boursaw Road, Section 14, Peninsula Township, Grand Traverse County, Michigan. The purpose for the delineation was to determine presence or absence of wetlands in the southern portions of the development property (just north of Boursaw Road) and if present to delineate and map/survey the boundaries of these wetlands.

2.0 METHODS

A wetland area was identified on the subject property and was delineated in accordance with recent changes to Part 303 of NREPA using the United States Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual and the Northeast and Northcentral Regional Supplement. This methodology has been adopted by the Michigan Department of Environmental Quality (MDEQ) and includes investigation and analysis of vegetation, soils, and hydrology.

A dominance of wetland rated plants, soils with field indicators of hydric soils coupled with visual signs of hydrology at the surface or within the soil profile were used to confirm the presence of, or the development of, wetlands. A dominance of upland rated plants, soils lacking field indicators of hydric soils and/or visual signs of hydrology were used to confirm the presence of upland surrounding the delineated wetlands.

Wetland boundaries were flagged and sequentially numbered in the field using pink flagging tape. Wetland boundaries were surveyed using a Trimble sub-meter global positioning system (GPS). USACE wetland data forms for the Northeast and Northcentral Region were completed to document wetland boundaries and to provide an understanding of the wetland parameters (soils, plants and hydrology) associated with the delineated wetland/upland boundary.

3.0 RESULTS AND DISCUSSION

On June 8, 2015 GEI identified, delineated, and mapped a wetland complex located in the southern portion of the project development. Figure 2 shows the location and configuration of the wetland/upland boundaries. MDEQ/USACE Wetland Data forms documenting the delineated wetland boundaries for the wetland complex are provided in

Appendix A. Representative photographs of the wetland/upland data points are provided in Appendix B¹.

The wetland complex is identified by the United States Fish and Wildlife Service National Wetland Inventory map as a palustrine forested wetland, dominated by broad-leaf deciduous woody vegetation, which is seasonally flooded. GEI concurs with this classification and further offers that this forested wetland complex also contains a wide variety of scrub shrub and emergent wetland vegetation interspersed beneath this forested wetland canopy.

The two dominant tree species identified within both the tree overstory and the shrub stratum of this forested wetland complex are trembling aspen (*Populus tremuloides*) and green ash (*Fraxinus pennsylvanica*). Within the herbaceous stratum of this wetland complex several forested (woodland) species were prevalent and included, but not limited to, sensitive fern (*Onoclea sensibilis*), white avens (*Geum canadense*), poison ivy (*Toxicodendron radicans*), and numerous sedge species (*Carex intumescens*, *C. stricta*, *C. gracillima*, *C. scoparia*, *C. lupulina*). Representative photographs of the wetland are provided in Appendix B.

The upland edges of this wetland complex were dominated by a couple of upland rated violet species which are facultative upland-related; specifically Canadian white violet (*V. canadensis*) and Downy yellow violet (*V. pubescens*). Mixed in with these species was also burdock (*Arctium minus*), greater enchanter's nightshade (*Circaea lutetiana*), and herb Robert (*Geranium robertianum*).

4.0 CONCLUSIONS AND RECOMMENDATIONS

It is GEI's professional opinion that the wetland associated with the southern end of this development is regulated by the MDEQ pursuant to Part 303 of NREPA since it is located within 1,000 linear feet of Lake Michigan (waters influenced by the Great Lakes). The USACE would also regulate this wetland since it is within 1,500 linear feet of the Great Lakes (navigable Waters of the U.S.) pursuant to Section 404 of the Clean Water Act of 1972. A permit is needed from both agencies for any proposed dredging, filling, draining or maintained use or development of this wetland. A permit from these agencies would not be required if none of the aforementioned activities are proposed within this wetland. Please note, both agencies utilize the same permit application form.

A permit pursuant to Part 91, Soil Erosion and Sedimentation Control, of NREPA, administered by Grand Traverse County will be required for any earth change activities in excess of 1 acre in size or which are located within 500 feet of the ordinary high water

¹ Additional photographs of the area were taken but are not presented in Appendix A due to the larger number of photographs taken and to which only representative photographs of the project area are provided in the Appendix A. The additional photographs are available upon request.

mark of Lake Michigan. No other defined streams or watercourses were identified within the southern portions of this property (north of Boursaw Road).

FIGURES

Figure 1: Site Location Map

Figure 2: Wetland Delineation Map



V:\Marshfield_Land_Use_Contract\1507990_Pensacola_Township_Property\GIS\MKLDP-g2_Delineation.mxd
Service Layer Credits: Source: Esri; Digitizer: Globe; GeoEye; Earthstar Geographics; CNES/Airbus DS; USDA; USGS;
AEX; GeoEye; AeroGRID; IGN; IGP; swisstopo; and the GIS User Community

June, 2015

APPENDICES

Appendix A

USACE Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: BOURSAW ROAD City/County: PENINSULA TWP Sampling Date: 6/8/15
 Applicant/Owner: KEVIN O'GARAY - INCHIT BROS. CO. State: MI Sampling Point: DPA1
 Investigator(s): S. KOGSE, PWS Section, Township, Range: SECTION 14 OF PENINSULA TWP
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONCAVE Slope (%): 0
 Subregion (LRR or MLRA): L Lat: 44.913978 Long: -85.492845 Datum: NAD83
 Soil Map Unit Name: ADREN MUCK NWI classification: PFO2C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation N Soil N or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes No
 Are Vegetation N Soil N or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)		

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required, check all that apply)		
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input checked="" type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input checked="" type="checkbox"/> Microtopographic Relief (D4)
		<input type="checkbox"/> FAC-Neutral Test (D5)
Field Observations:		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available.		
Remarks: <u>WATER STAINED LEAVES, HUMMOCKED GROUND</u> <u>FIELD AS4 ADJACENT TO DATA POINT</u>		

VEGETATION - Use scientific names of plants.

Sampling Point: DP01

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>
2. <u>Ulmus americana</u>	<u>5</u>	<u>YES</u>	<u>FACW</u>
3.			
4.			
5.			
6.			
7.			
<u>10</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>20</u>	<u>YES</u>	<u>FAC</u>
2.			
3.			
4.			
5.			
6.			
7.			
<u>20</u> = Total Cover			
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Geum canadense</u>	<u>15</u>	<u>YES</u>	<u>FAC</u>
2. <u>Fragaria pennsylvanica</u>	<u>15</u>	<u>YES</u>	<u>FACW</u>
3. <u>Symphoricarpos rose-analyse</u>	<u>3</u>		<u>FACW</u>
4. <u>Carex stricta</u>	<u>5</u>		<u>FACW</u>
5. <u>Carex scoparia</u>	<u>3</u>		<u>FACW</u>
6. <u>Carex intumescens</u>	<u>5</u>		<u>FACW</u>
7. <u>Potentilla quinquelobis</u>	<u>1</u>		<u>FACW</u>
8. <u>Carex gracillima</u>	<u>2</u>		<u>FACW</u>
9. <u>Rumex crispus</u>	<u>2</u>		<u>FACW</u>
10.			
11.			
12.			
<u>51</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. <u>Ø</u>			
3.			
4.			
<u>Ø</u> = Total Cover			

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by:
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0'
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
 Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
 Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
 Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
 Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: BOURSAW ROAD City/County: PENINSULA TWP, GTC Sampling Date: 6/8/15
 Applicant/Owner: KEVIN O'GRADY - INSIGHT BROS CO State: MI Sampling Point: DP#2
 Investigator(s): S. KACIE, PWS Section, Township, Range: SECTION 14 OF PENINSULA TWP
 Landform (hillslope, terrace, etc.): TERRACE Local relief (concave, convex, none): CONVEX Slope (%): 0-1
 Subregion (LRR or MLRA): L Lat: 44.913936 Long: -85.492835 Datum: NAUGO
 Soil Map Unit Name: ADRIAN MUCK NWI classification: PFOIC
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland?	Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>	If yes, optional Wetland Site ID: <u> </u>	
Wetland Hydrology Present?	Yes <u> </u> No <u>X</u>		
Remarks: (Explain alternative procedures here or in a separate report.)			

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required, check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B8)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Crayfish Burrows (C6)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surfaces (C7)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> Microtopographic Relief (D4)	
		<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes <u> </u> No <u>X</u>	Depth (inches):	
Water Table Present?	Yes <u> </u> No <u>X</u>	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes <u> </u> No <u>X</u>	Depth (inches):	
			Wetland Hydrology Present? Yes <u> </u> No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			

VEGETATION - Use scientific names of plants.

Sampling Point D02

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>
2.			
3.			
4.			
5.			
6.			
7.			
<u>5</u> = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Populus tremuloides</u>	<u>5</u>	<u>YES</u>	<u>FAC</u>
2. <u>Lonicera tatarica</u>	<u>5</u>	<u>YES</u>	<u>FACU</u>
3.			
4.			
5.			
6.			
7.			
<u>10</u> = Total Cover			
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Viola canadensis</u>	<u>40</u>	<u>YES</u>	<u>FACU</u>
2. <u>Viola pubescens</u>	<u>20</u>	<u>YES</u>	<u>FACU</u>
3. <u>Galium robertianum</u>	<u>5</u>		<u>UPL</u>
4. <u>Toxicodendron radicans</u>	<u>2</u>		<u>FAC</u>
5. <u>Festuca arundinacea</u>	<u>5</u>		<u>FACU</u>
6. <u>Pharusis arundinacea</u>	<u>10</u>		<u>FACU</u>
7. <u>Bromus inermis</u>	<u>5</u>		<u>FACU</u>
8. <u>Circaea lutetiana</u>	<u>5</u>		<u>FACU</u>
9.			
10.			
11.			
12.			
<u>92</u> = Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
<u>0</u> = Total Cover			

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:
 Total % Cover of: 5 Multiply by:
 OBL species 0 x 1 = 0
 FACW species 10 x 2 = 20
 FAC species 12 x 3 = 36
 FACU species 80 x 4 = 320
 UPL species 5 x 5 = 25
 Column Totals: 107 (A) 401 (B)
 Prevalence Index = B/A = > 3.0

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤ 3.0
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:
 Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
 Sapling/shrub - Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.
 Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
 Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes No

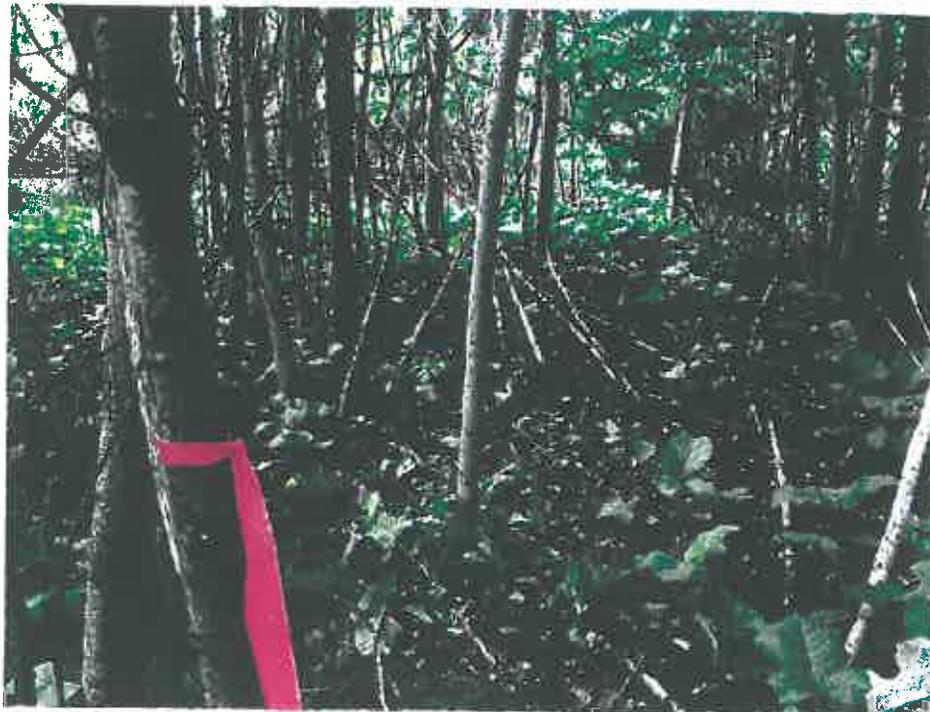
Remarks: (Include photo numbers here or on a separate sheet.)

Appendix B

Representative Photographs



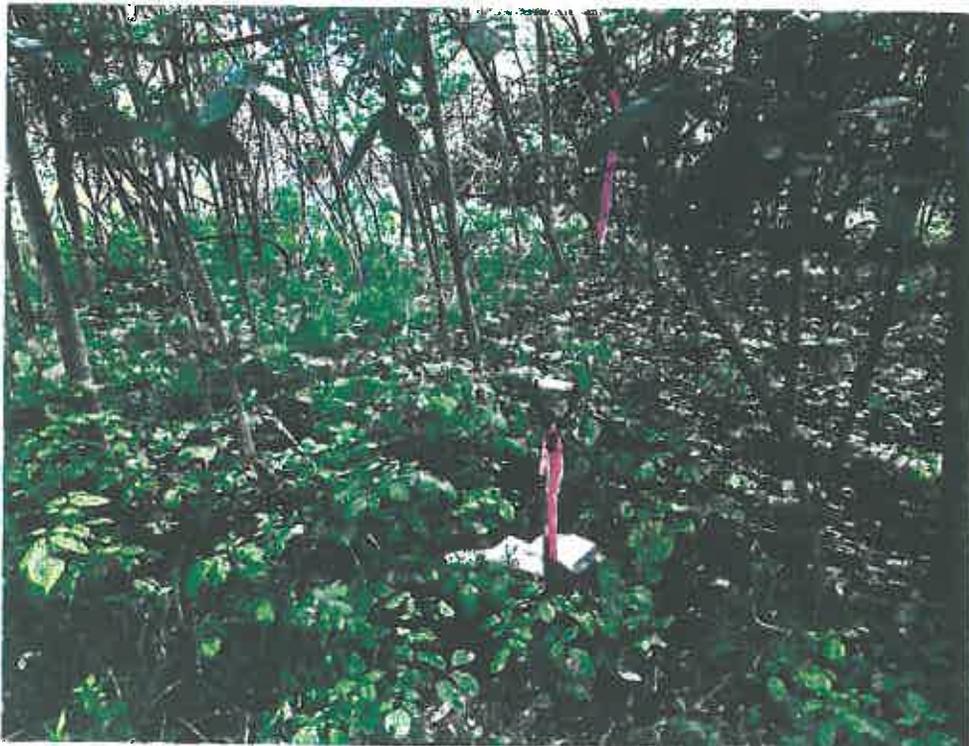
Photograph No. 1 – View east along the northern upland/wetland boundary of the forested wetland complex



Photograph No. 2 – View northwest along the northeastern upland/wetland boundary of the forested wetland complex. Note: Mix of common burdock (*Arctium minus*) and curly dock (*Rumex crispus*) within the delineated wetland areas.



Photograph No. 3 – View north from the southern upland/wetland boundary of the forested wetland complex.



Photograph No. 4 – View north at wetland data point (DP01) located north of flag A54.



Photograph No. 5 – View south at upland data point (DP02) located south of flag A54.



**Photograph No. 6 – Soil profile of DP02 (which was similar to DP01).
Note: Restrictive layer at 12-13" below ground surface and *V. canadensis*
and *V. pubescens* blanketing the ground.**

Petra Kuehins

From: Jim Hirschenberger <jimh@maaeps.com>
Sent: Monday, June 15, 2015 4:19 PM
To: 'Joseph E. Quandt'; 'Petra Kuehins'
Cc: 'Doug Mansfield'; 'Kevin O'Grady'
Subject: RE: 81 on EB finding of facts

The report is coming this week, but not yet. The following is from an email that Stu sent to me.....

"It went well. Out there from 830am-1230pm for delineation, mapping, and data forms/plant lists
There were some old wetland flags. For the most part my line (the current most accurate line that is) had boundaries
downslope from the old ones (less wetland acreage than prior delineation)
Key to dropping line down was predominance by two violet species that were FACU whereas most untrained eyes
would play it safe and call unknown violets (Viola spp) wetland rated"

FACU means facultative upland. These species are generally found in upland areas and not in wetland areas. That's the
main difference between delineations. Ours was more conservative.

Thank You,
Jim Hirschenberger, P.E.
Mansfield Land Use Consultants
Ph: (231) 946-9310 ext. 1007

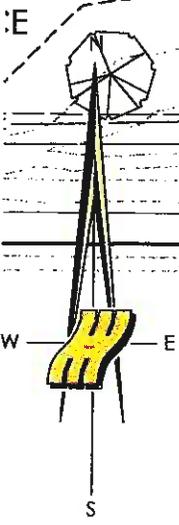
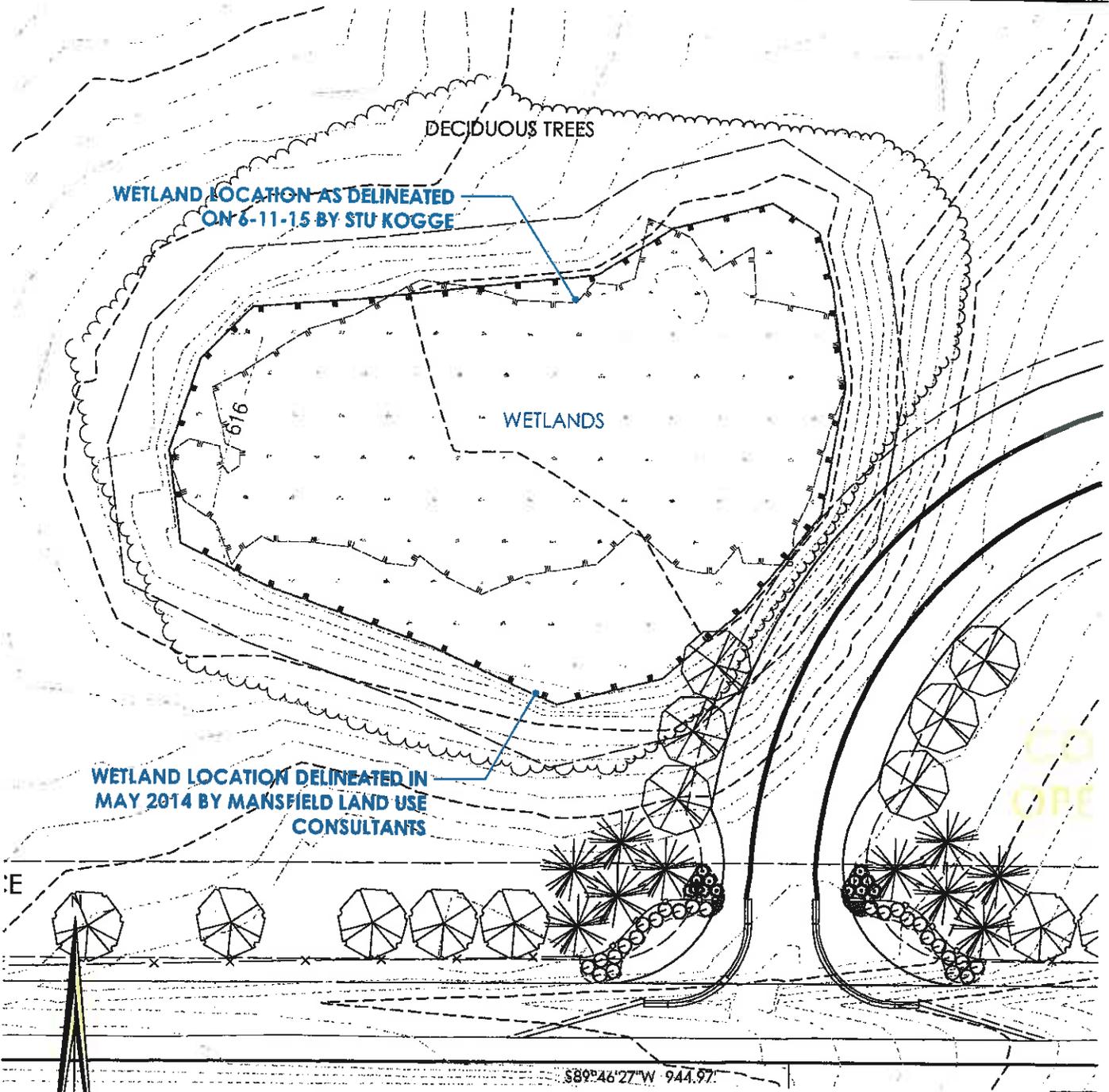
From: Joseph E. Quandt [mailto:jequandt@krlawtc.com]
Sent: Monday, June 15, 2015 4:03 PM
To: Petra Kuehins
Cc: 'Doug Mansfield'; 'Kevin O'Grady'; 'Jim Hirschenberger'
Subject: RE: 81 on EB finding of facts

Thanks. Does he have a letter report stating his findings and why they may differ from Mike's original?

From: Petra Kuehins [mailto:petrak@maaeps.com]
Sent: Monday, June 15, 2015 4:01 PM
To: Joseph E. Quandt
Cc: 'Doug Mansfield'; 'Kevin O'Grady'; 'Jim Hirschenberger'
Subject: RE: 81 on EB finding of facts

Attached is the over lay of Stu Kogge's wetland delineation onto the current delineation.

From: Petra Kuehins [mailto:petrak@maaeps.com]
Sent: Monday, June 15, 2015 3:57 PM
To: 'Joseph E. Quandt'
'Doug Mansfield'; 'Kevin O'Grady'; 'Jim Hirschenberger'
Subject: RE: 81 on EB finding of facts



Mansfield Land Use Consultants 830 Cottageview Dr., Ste. 201 P.O. Box 4015 Traverse City, MI 49685 Phone: 231-946-9310 www.mnaeps.com info@mnaeps.com	The 81 Development Company, LLC	DRN:mmm CKD:phk
	The 81 on East Bay - PUD Wetland Delineation	
	Peninsula Township, Grand Traverse County, Michigan	
	6.15.15 14016 SHT 1 OF 1	

March 8, 2016

Michelle L. Reardon
Director of Planning & Zoning
13235 Center Road
Traverse City, MI 49686
planner@peninsulatownship.com

RE: The 81 on East Bay
Revised Site Plan Review

Dear Michelle:

We have reviewed the revised site plan and design information submitted on February 15, 2016 by the Applicant for the referenced project. We offer the following comments for consideration and conditions regarding final approval of the plans.

General

1. The Applicant should provide to the Township any comments or permit status updates from the MDEQ and/or Army Corps of Engineers regarding the proposed pier and dock system.
2. Open space calculations have been reviewed via electronic drawings provided by the Applicant's Consultant. Based upon our review, we concur with the areas and open space calculations reported by the Consultant.
3. Storm water calculations for the project have been previously reviewed, and found to be acceptable with respect to drainage patterns, storm sewer sizing and storm water retention provided.
4. The private road designs in the current plans appear to be consistent with that provided for previous reviews. We find the designs to be acceptable with respect to grading, drainage patterns, and pavement cross-section.

Site Grading

1. We have reviewed the additional grading details provided and find the current designs to be consistent with the discussions contained in the geotechnical engineer correspondence dated June 15, 2015 as it relates to overall slope

stability. As noted by the geotechnical engineers, there will be earth related considerations unique to each site such as placement of engineered fill, and foundation designs beneath structures for Lots 6 through 10. As such it is recommended that geotechnical conditions be reviewed for each unit prior to placement of structures.

2. The additional grading information provided for each building site has been reviewed for Lots 1 through 41. In general, we find the grading concepts to be acceptable. At this time the additional details have been provided on separate small format sheets for each site. In our opinion, this information should be incorporated into the overall project plan set.

Detailed cross-sections have been provided and reviewed for the more critical Lots 6 through 10. The overall concept being proposed for these lots is to establish moderately sloped driveways to The 81 East through the use of fill slopes and multi-level structures. In our opinion, the grading proposed for these lots is feasible. However, as noted in Comment 1 of this section, final designs for placement of structures on these lots should include further detailed geotechnical studies for construction of fill slopes, structure foundation designs, permanent erosion control measures, and maintenance of slopes.

3. Although they appear to be consistent with the existing topography and proposed surrounding conditions, additional grading detail and confirmed drainage patterns should be provided for the cul-de-sacs at the end of The 81 Ave., and The 81 East.

The Applicant should revise the plans and add information based upon the above comments for final review and approval. Please do not hesitate to contact me with any questions regarding this review.

Respectfully Submitted,
GOURDIE-FRASER



Brian M. Boals, PE
Project Manager

March 15, 2016

Michelle L. Reardon
Director of Planning & Zoning
13235 Center Road
Traverse City, MI 49686
planner@peninsulatownship.com

RE: The 81 on East Bay
Revised Site Plan Review

Dear Michelle:

In follow up to our March 8, 2016 review of the site plan for the above referenced project, we have received additional plan revisions for review. A revised site grading sheet has been provided in accordance with Site Grading Comments 2 & 3 from our previous review. Item 2 requested that grading details for the 41 lots/building sites be incorporated into the overall plan set, and Item 3 requested additional grading details for the two roadway cul-de-sacs.

At this time we find the revised grading plan and additional information for the cul-de-sacs to be acceptable, with the intended site grading and drainage patterns for the roadways and building sites communicated sufficiently on the plan set.

By way of this letter we recommend engineering approval for the plans as reviewed. Please do not hesitate to contact me with any questions regarding this review.

Respectfully Submitted,
GOURDIE-FRASER



Brian M. Boals, PE
Project Manager

August 15, 2016

Michelle L. Reardon
Director of Planning & Zoning
13235 Center Road
Traverse City, MI 49686
planner@peninsulatownship.com

RE: The 81 on East Bay
Engineering Plan Review & Review of New Fire Lane

Dear Michelle:

We have reviewed the alternate fire lane design plans submitted by the Applicant's consultant. This newly proposed lane extends from Smokey Hollow Road across adjacent property and is to connect with 81 Avenue near the northwest corner of the site. It is our understanding from follow questions to the consultant that this alternate fire lane will take the place of the previous design which showed a lane connecting the cul-de-sac with 81 Avenue near the proposed water tank.

We find that the design for the alternate fire lane as presented is consistent with the requirements of the Township Private Road Ordinance with respect to alignment, grading and drainage and we can recommend engineering plan approval for the improvement. However, it is our understanding that temporary and permanent easements still must be executed and recorded prior to construction. We also note that sufficiency of the proposed fire lane and arrangements for its future access/maintenance must be acceptable to the Township Fire Department.

Assuming no other changes have been made to the project plans as previously reviewed, our recommendation for engineering plan approval remains in place in accordance with our March 15, 2016 review letter.

Please do not hesitate to contact me with any questions regarding this review.

Respectfully Submitted,
GOURDIE-FRASER


Brian M. Boals, PE
Project Manager

**PENINSULA TOWNSHIP
RESOLUTION DECLINING RESPONSIBILITY FOR OPERATION
AND MAINTENANCE OF SEWERAGE SYSTEM FOR THE 81 DEVELOPMENT PUD**

Resolution No. 2016-03-15 #1

At a regular meeting of the Peninsula Township Board, Grand Traverse County, Michigan held in the Peninsula Township Hall, located in Peninsula Township, Michigan on March 15, 2016.

PRESENT: Correia, Weatherholt, Byron, Avery, Rosi, Witkop

ABSENT: Hoffman

The following resolution was made by Avery and seconded by Byron, to-wit

Recitals

WHEREAS, under State law a developer of a subdivision, site condominium or other development utilizing a common waste water disposal system must submit to the MDEQ an application for a Part 41 waste water disposal; and

WHEREAS, part of the application requires a resolution and letter on the part of the Township to either accept or decline responsibility for this system in the event that the permittee fails to maintain the system consistent with MCL 324.3109(3).

Resolution

NOW, THEREFORE, BE IT RESOLVED that:

The Peninsula Township Board hereby declines to accept any responsibility for the system being installed on property located at 15634 Smokey Hollow Road and 15636 Bluff Road totaling 82.62 acres and having tax id numbers of 28-11-114-001-00 and 28-11-114-002-00, respectively (hereinafter "The Property").

BE IT FURTHER RESOLVED that:

The Peninsula Township Board authorizes a letter to be issued on Peninsula Township letterhead and signed by the Township Supervisor and the Township Clerk stating that it is the intent of Peninsula Township by and through its board not to accept such responsibility for any community or singular waste water system on the property and that such letter is required on the part of the owner of The 81, being The 81 Development Co., LLC with respect to its application to the MDEQ for a Part 41 waste

water disposal system of the Natural Resources and Environmental Protection Act (NREPA), MCL 324.4101 *et seq.*

This Resolution shall become effective on the date it is adopted.

YES: Correia, Weatherholt, Byron, Avery, Rosi, Witkop

NO: _____

RESOLUTION DECLARED ADOPTED.

PENINSULA TOWNSHIP

By: 
Pete Correia, Supervisor

I, the undersigned, the Clerk of the Township of Peninsula, Grand Traverse County, Michigan, do hereby certify that the foregoing is a true and complete copy of certain proceedings taken by said municipality at its regular meeting held on March 15, 2016, relative to adoption of the resolution therein set forth; that said meeting was conducted and public notice of said meeting was given pursuant to and in full compliance with the Open Meetings Act, being Act 267, Public Acts of Michigan, 1976, and that the minutes of said meeting were kept and will be or have been made available as required by said Act.

Dated: March 15, 2016

Monica A. Hoffman, Clerk

Peninsula Township

13235 Center Road

Traverse City MI 49686

To whom it may concern:

Please be advised that at a meeting held on March 15, 2016 at the Peninsula Township Hall in Peninsula Township, Grand Traverse County, Michigan, located at 13235 Center Road, Traverse City, Michigan 49686, that the Peninsula Township Board passed a resolution to not assume any responsibility for the operation and maintenance for an onsite sewerage system as defined and regulated under Part 41, *Sewerage Systems*, under the Natural Resources and Environmental Protection Act (NREPA), MCL 324.4101 *et seq.* in accordance with Section 3109 of Part 31, Water Resources Protection, of the NREPA, MCL 324.3101 *et seq.* for a certain condominium subdivision and planned unit development in Peninsula Township on property located at 15634 Smokey Hollow Road and 15636 Bluff Road totaling 82.63 acres to be constructed and operated by The 81 Development Co., LLC and The 81 on East Bay Property Owners Association, Inc. The reason for the declination is that it is not Peninsula Township's intent to assume any liability for the operation and maintenance of the proposed sewerage system.



By: Pete Correia, Supervisor
Peninsula Township



By: Monica Hoffman, Clerk
Peninsula Township

Dated: March 15, 2016

April 13, 2016

Special Use Permit application #123

The 81 on East Bay –an open space preservation community
Supplemental Information

The conclusion of Judge Rodgers Decision and Order on the Appeal of the 81 on East Bay project listed four outstanding issues to be delegated to the Peninsula Township Fire department and Township Engineer for review and approval. Offered below is a summary of the completed issue items:

1. Peninsula Township Fire Department Chief Ronk provided a letter dated February 24th, 2016 in which is stated that “the Peninsula Fire Department approves the plans as submitted. In addition, Chief Ronk has supplied an additional communication dated April 9th, 2016 which more clearly states the approval of the location and functionality of the emergency access road.
(please see attached letters from Chief Ronk)
2. and 3. The Township Engineer has provided a letter dated March 15th, 2016 recommending engineering approval of the proposed grading and stormwater management as provided by the 81 on East Bay project.
(please refer to the attached letter from Brian Boals, P.E. of GFA)
4. Grand Traverse County Soil Erosion and Sedimentation Control office has provided a letter dated January 23rd, 2015 granting conceptual approval for the development. Application for final SESC permitting was submitted on April 5th, 2016, and will most likely be issued prior to the May 10th Board meeting. In addition, the sites proximity to East Bay will require State oversight under MDEQ National Pollution Discharge Elimination System (NPDES) during construction, which requires weekly reports of site conditions. In all practicality, there will be both County and State oversight of earthwork conducted on the site during construction.
(please refer to the to the attached letters and application)

As an additional update, it is our understanding that the Township is interested in the progress of State and Local permitting of the community drainfield. Permit applications were submitted to Grand Traverse County Health Department and the State of Michigan DEQ on March 28th, 2016.

In conclusion, the applicant feels that all 4 issues listed on the Judge’s order as items for the Board to Consider (*see conclusion of Decision Order page 16*) have been completed and are attached here in.

Sincerely,
Mansfield Land Use Consultants on behalf of:

Kevin O’Grady
The 81 Development Company, LLC / Peninsula Township Resident

Jim Hirschenberger P.E.
Mansfield Land Use Consultants

The 81 on the East Bay

Jim,

After my review of your latest drawings and detailed description of the water storage tank (*system*) planned for **The 81 on the East Bay** development, I offer the following...

The list of concerns that the Fire Department brought forward during a joint meeting with representatives from Mansfield Land Consultants and the Owner/Developer, conducted on January 21, 2016 at the offices of Kuhn Rogers PLC... all appear to have been fully addressed. The redesign of the slope of the bottom of the tank, specific language identifying the exclusive use of stainless steel piping, brackets, etc. in the assembly of the tank components, confined space warning signage, as well as the addition of a vehicle access pad directly adjacent to the tank, for the positioning of fire apparatus assigned to drafting water from the tank, were all included in the latest drawings and tank requirements. With that being the case... The Peninsula Fire Department approves the plans as submitted.

Language was also included that directs the Owner's chosen construction company to coordinate the component(s) and installation of the tank "system" with representatives from the Peninsula Fire Department. This will bring the involved parties in contact with each other during the actual construction process which reduces the potential of the project being completed without consensus between the parties, which is ultimately the desired outcome.

I would like to compliment your firm and the Owner/Developer representatives for addressing these technical issues concerning the design and installation of the tank system early on in the planning process. The preliminary work that's been done to this point, should set the course for a successful (tank installation) project.



Steve Ronk

Peninsula Fire Department
February 24, 2016

Jim Hirschenberger P.E.
Mansfield Land Use Consultants

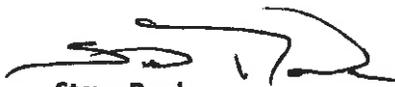
The 81 on the East Bay

Jim, Petra...

Per your phone request for additional clarification regarding the Emergency Access Road for the 81 on the East Bay project, I submit the following.

As outlined in the project approval documents with Peninsula Township, two options were presented. First option was a gated emergency access road connecting with Trevor Road... the second option would be an emergency access road connecting the cul-de-sac at the end of 81 Avenue with 81 Avenue near the underground water storage tank, thus "looping" 81 Avenue with a gated emergency access road.

With the Trevor road connector option off the table... the second option, to connect 81 Avenue with an emergency access road (from the cul-de-sac to the underground storage tank) meets the approval of and is acceptable to the Peninsula Fire Department. This statement is only meant to further support any and all documents previously agreed to, between Peninsula Township and the developer(s) of the project.



Steve Ronk
Peninsula Fire Department
April 9, 2016

March 15, 2016

Michelle L. Reardon
Director of Planning & Zoning
13235 Center Road
Traverse City, MI 49686
planner@peninsulatownship.com

RE: The 81 on East Bay
Revised Site Plan Review

Dear Michelle:

In follow up to our March 8, 2016 review of the site plan for the above referenced project, we have received additional plan revisions for review. A revised site grading sheet has been provided in accordance with Site Grading Comments 2 & 3 from our previous review. Item 2 requested that grading details for the 41 lots/building sites be incorporated into the overall plan set, and Item 3 requested additional grading details for the two roadway cul-de-sacs.

At this time we find the revised grading plan and additional information for the cul-de-sacs to be acceptable, with the intended site grading and drainage patterns for the roadways and building sites communicated sufficiently on the plan set.

By way of this letter we recommend engineering approval for the plans as reviewed. Please do not hesitate to contact me with any questions regarding this review.

Respectfully Submitted,
GOURDIE-FRASER



Brian M. Boals, PE
Project Manager



GRAND TRAVERSE COUNTY
SOIL EROSION – SEDIMENTATION CONTROL DEPARTMENT
2650 LAFRANIER ROAD
TRAVERSE CITY, MICHIGAN 49686
FAX (231) 995-6052 TEL (231) 995-6042

January 23, 2015

Mansfield Land Use Consultants
Jim Hirschenberger
830 Cottageview Dr., Suite 201
Traverse City, MI 49685

RE: Preliminary Review # 23414 for approval of proposed "The 81 on East Bay" residential PUD, Parcel 28-11-114-001-00 & 28-11-114-002-00 Peninsula Township, Grand Traverse County, Michigan

Dear Sirs:

This office has reviewed the submitted plans prepared by Mansfield Land Use Consultants, Job Number 14016, dated 03-05-14. We also field checked the parcel on January 22, 2015 and compared it to the proposed development plans.

The site has steep wooded slopes on the West, North and East. There is a nearly vertical, wooded bluff which drops to water level in East Bay. The center of the site has gently rolling slopes which slope to the west. The soils map indicates mostly Leelanau sands on the steeper slopes and where the residential lots are proposed. Those sandy soils will provide good infiltration rates. The proposed "common area" contains Richter loams which provide less infiltration, but are not planned to be used for lots or required infiltration. The drainage basin is proposed to be located in East Lake Mancelona loamy sands which will also provide adequate drainage. It should be noted that wetlands exist in the south west side of the site. A 25 foot buffer is required to protect it.

A grading and stabilization plan will be required from the contractor prior to grading the steep slopes near the bluff. It will need to demonstrate that the undisturbed bluff will be protected and that the graded area will be adequately stabilized to prevent erosion. This office recommends a double row of silt fence where silt fence is indicated on the site plan. In addition, individual lot grading will need to carefully follow the submitted plan so that storm water and soil will not be directed onto neighboring lots.

A permit from MI DEQ will be required to install the dock and boat slips in the water. Any additional work below the Ordinary High Water Mark will also need to be included in the MI DEQ permit. A construction schedule, surety and a statement designating the entity that will be responsible for maintenance of permanent SESC measures will also be required prior to issuance of a soil erosion control permit by this office.

Based on the above comments and the Construction Notes in the submitted site plan, this office grants conceptual approval for the development as proposed.

If you have any questions or concerns regarding this decision please feel free to contact me at 231-995-6042

Respectfully,

A handwritten signature in cursive script that reads "Gwendolyn Zagore".

Gwendolyn Zagore
Grand Traverse County Soil Erosion Inspector



**ROBERT A. COONEY
PROSECUTING ATTORNEY**

324 COURT STREET
TRAVERSE CITY, MICHIGAN 49684-9958
(231) 922-4600 • FAX (231) 922-4698

February 24, 2016

Mr. Joseph Quandt
412 South Union Street
Traverse City, MI 49684

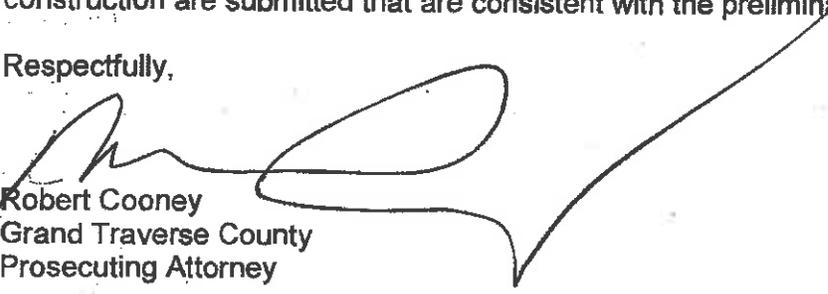
RE: Preliminary Review #23414 for approval of proposed "The 81 on East Bay" residential PUD, Parcel 28-11-114-001-00 & 28-11-114-003-00 Peninsula Township, Grand Traverse County, Michigan

Dear Mr. Quandt:

Per your letter of February 2, 2016, I have communicated with the Soil Erosion and Sedimentation Division of Grand Traverse County relating to reasonable assurance of issuing a permit for the above identified parcels.

A Preliminary Review was conducted on January 22, 2015 and a letter stating the Soil Erosion Department findings was sent (attached). While the County cannot guarantee that a permit will be issued, we can provide reasonable assurance that it will be issued if final drawings for construction are submitted that are consistent with the preliminary approval.

Respectfully,



Robert Cooney
Grand Traverse County
Prosecuting Attorney

Enclosure

pc: Jean Derenzy, Deputy Director Planning and Development
Bruce Remai, Building Official



Mansfield

Land Use Consultants

April 5, 2016

Bruce Remai
Grand Traverse County S.E.S.C.
Public Services Building
2650 Lafranier Road
Traverse City, MI 49686

RE: The 81 on East Bay, Peninsula Twp., Grand Traverse County
S.E.S.C. Permit Application

Dear Bruce,

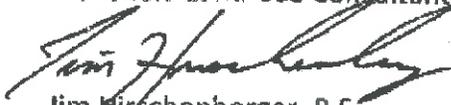
On behalf of The 81 Development Company, LLC, please find the following documents enclosed for your review and comments for the Soil Erosion & Sedimentation Control permit application for The 81 on East Bay - PUD in Peninsula Twp., Grand Traverse County, Michigan:

1. (2) sets of the signed/sealed applicable plans
2. (1) copy of the S.E.S.C. permit application
3. (1) copy of the Letter of Agency
4. (1) Permit fee check payable to Grand Traverse County
5. Construction Schedule (see plan sheet C3.0)

The 81 on East Bay is a residential development of 41 sites. Construction is proposed to begin in early summer of 2016. We understand that the contractor will be responsible for a surety bond, as determined by your office. Peninsula Twp. has requested that evidence of permit approval be submitted to their office by April 13, 2016. We would appreciate your offices assistance in hitting that deadline.

If you have any questions, please feel free to call me at (231) 946-9310 ext. 1007. Thank you for your assistance.

Sincerely,
Mansfield Land Use Consultants



Jim Hirschenberger, P.E.
Project Engineer
Enclosures:

P:\Land Projects\2014\14016 Insight Builders\Permitting\GT Co SESC\16 04 05 County Submittal\16 04 05_Ltr GTCoSESC_14016.docx

GRAND TRAVERSE COUNTY SOIL EROSION -
 SEDIMENTATION CONTROL DEPARTMENT
 2650 LAFRANIER ROAD
 TRAVERSE CITY, MICHIGAN 49686
 PHONE: (231) 995-6042 FAX: (231) 995-6048

Permit #:
 Date Applied:
 Expiration:
 Receipt #:

PERMIT APPLICATION

PART 91, SOIL EROSION & SEDIMENTATION CONTROL OF ACT 451 OF 1994
 AS AMENDED GTC SOIL EROSION

APPLICANT: Owner Developer Contractor Engineer Other

Name: Mansfield Land Use Consultants		Address: 830 Cottageview Dr, Ste 201	
City: Traverse City	State: MI	Zip: 49685	Phone: 231-946-9310

SITE LOCATION INFORMATION: NOTE - TWO COMPLETE SET OF PLANS MUST BE ATTACHED

Township: Peninsula	Section: 14	Town: 29N	Range: 10W	Subdivision: The 81 on East Bay (proposed)	Lot #: na
Address: 15634 Smokey Hollow Rd & 15636 Bluff Rd			City: Traverse City		
State: MI	Zip: 49686	Property Tax #: 28-11-114-001-00 & 28-11-114-002-00			

PROPOSED EARTH CHANGE:

Type of Change: Grading to construct residential PUD, roads, utilities, storm basin, clearing.	Size of Earth Change: 41 ac
MDEQ Permit # (If Applicable):	Permit Fee: \$3,967
Excavation Start Date: June 2016	Date to be Completed: June 2017

***Make Checks Payable to GTC**

REASON FOR PERMIT:
SOM PA 451, PART 91 REQUIREMENTS

- Within 500' of Lake or Stream
- Estimated Distance to lake or Stream: ~ 100'
- Name of Water Body: Grand Traverse Bay (East Bay)
- Acreage (Soil Disturbance of 1 Acre or More)

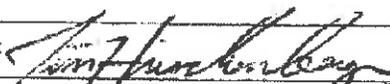
GTC SESC REQUIREMENTS

- Commercial Site
- Within 100' of Protected Wetlands
- Slopes of 10% or Greater
- Heavy Clay Soils
- Township Required / Development Required
- Drain Easement on Site / Within a Drainage District

PARTIES RESPONSIBLE FOR EARTH CHANGE:

Name of <u>Property Owner</u> of Record: The 81 Development Company, LLC		Cell Phone: (248) 505-5558	
Mailing Address: 6978 Dixie Hwy, Ste A		Email: kjoinsight@gmail.com	
City: Clarkston	State: MI	Zip: 48346	Phone: 248-575-3300
Person "On-Site" Responsible for Earth Change:		Cell Phone: (231) 218-0739	
Company Name: Alpers Excavating, Inc		Email: info@alpersexcavating.com	
Mailing Address: 16 South West Silver Lake Rd			
City: Traverse City	State: MI	Zip: 49685	Phone: 231-943-4710

I (we) affirm that the above information is accurate and that I (we) will conduct the above described earth change in accordance with Part 91, Soil Erosion & Sedimentation Control, of the Natural Resource and Environmental Protection Act, Act 451 of the Public Acts of 1994, and/or the 2003 Grand Traverse County Soil Erosion Ordinance, its corresponding rules, applicable local ordinances and the agreements accompanying this application, and that I (we) have been notified and understand that the aforementioned ordinances are more restrictive than Part 91 of the N.R.E.P.A..

Owner's Signature:	Print Name:	Date:
Designated Agent's Signature: 	Print Name: Jim Hirschenberger	Date: 4/5/16

* The Landowner is responsible for the maintenance of all permanent SESC measures.
 ** Designated Agent must have a written statement from landowner authorizing him/her to secure a permit in the landowner's name.

COMMENCEMENT OF WORK PRIOR TO RECEIVING THE APPROVED PERMIT is a municipal or state civil infraction that may subject you to a fine of not more than \$2,500.00. Knowingly violating the Soil Erosion and Sedimentation Control Act, of 1994 PA 451, as amended or knowingly making a false statement on the permit application or a soil erosion or sedimentation control plan may subject you to a civil fine of not more than \$10,000.00 for each day of the violation. In addition, knowingly violating section 9112 or 9117, relating to a determination that the work undertaken does not conform to a permit or plan or adversely affects adjacent land or waters, may be responsible for a civil fine of not less than \$2,500.00 nor more than \$25,000.00 for each day of the violation.

PERMIT PROCEDURES

In accordance with Part 91 of Act 451 of 1994, as amended, and/or the GTC Ordinance #25 of 2003 and their corresponding General Rules, the undersigned herewith makes application for a permit to undertake a proposed earth change. Permit requirements will be as follows:

1. A person proposing to undertake an earth change shall submit an application for a state prescribed permit to the appropriate enforcing agency. In land development, the application shall be submitted by the landowner or their designated agent (a person who has written authorization from the landowner to sign the application and secure a permit in the landowner's name), whoever is responsible for the earth change.
2. The application shall be accompanied by a soil erosion and sedimentation control plan and any other document with the appropriate enforcing agency may require.
3. The soil erosion and sedimentation control plan shall be reviewed and approved by a person designated by the county or local enforcing agency who is trained and experienced in soil erosion and sedimentation control techniques.
4. The appropriate enforcing agency shall approve, disapprove or require modification of an application for an earth change permit within 30 calendar days following receipt of the application. Notification of disapproval shall be made by certified mail with the reasons for disapproval and conditions required for approval.
5. A state prescribed application form shall be provided to the applicant by the county or local enforcing agency.
6. A state prescribed permit shall be used by each county for local enforcing agency and shall include any additional provisions that may be required by the county or local enforcing agency. The permit shall be available on the site of the earth change for inspection.
7. Upon a determination that an applicant has met all the requirements of Part 91 and the promulgated rules, and the local ordinance, if applicable, the appropriate enforcing agency shall issue a permit for the proposed earth change.
8. An "authorized public agency" is exempt from obtaining a permit from a county or local enforcing agency, but shall notify the county or local enforcing agency of each proposed earth change.
9. When an earth change is under the jurisdiction of 2 or more local or county enforcing agencies, the person must obtain coverage in each jurisdiction, unless there is an interlocal agreement.

January 14, 2016

**Re: The 81 on East Bay
Letter of Agency**

To whom it may concern,

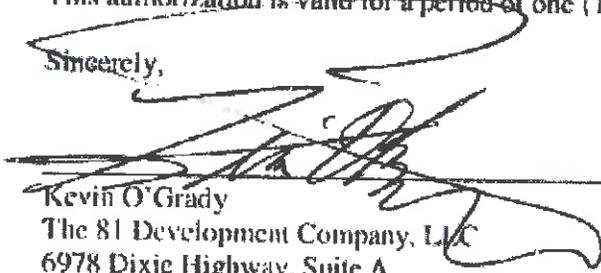
The purpose of this letter is to acknowledge that Mansfield Land Use Consultants is authorized to work as my agent with regards to planning and engineering services relating to regulatory agency reviews and permitting for the proposed *The 81 on East Bay* Residential Planned Unit Development located on Boursaw Road on the Old Mission Peninsula, Traverse City, Michigan.

Mansfield Land Use Consultants contact information is as follows:

Doug Mansfield, President
830 Cottageview Drive, Suite 201
Traverse City, MI 49684
doug@mancps.com
(231) 218-5560

This authorization is valid for a period of one (1) year from the date of signature.

Sincerely,



Kevin O'Grady
The 81 Development Company, LLC
6978 Dixie Highway, Suite A
Clarkston, MI 48346
(248) 575-3300

1/14/16
date



FIRE CODE COMPLIANCE REPORT

To: Mr. Doug Mansfield **From:** Mr. Ron Taylor, CFI, CFEI, NFPA FI-II, FPE
Company: Mansfield Land Use Consultants **Date:** July 26, 2016
Email: doug@maaeps.com **Pages:** 3

Re: Nederveld File Number: 16801862
The 81 on East Bay, Peninsula Township, MI

Dear Mr. Mansfield,

Per your July 12, 2016 request, we are providing a report of our findings regarding fire code requirements for a proposed 41 site residential development located in Peninsula Township, Grand Traverse County, MI, known as The 81 on East Bay – PUD. We have completed a review and analysis of the site plans for the aforementioned project utilizing the 2012 edition of the International Fire Code (IFC) as adopted by Peninsula Township. The following code sections from the International Fire Code apply to the proposed project:

Fire Flow Requirements for Buildings, Section B103 Modifications B103.3. Areas without Water Supply Systems. For information regarding water supplies for firefighting purposes in rural and suburban areas in which adequate and reliable water supply systems do not exist, the fire code official is authorized to utilize NFPA 1142 or the International Wildland Urban Interface Code.

A 30,000-gallon water storage tank is proposed for this project and meets the requirements of Section B103.3. The developer shall consult with the fire code official to determine the type of hose connections required for use by the Peninsula Township Fire Department and if locking caps (Knox caps) will be required.

Fire Apparatus Access Roads, Section D102 Required Access, D102.1. Access and Loading. Facilities, buildings, or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an approved fire apparatus access road with an asphalt, concrete, or other approved driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds.

The road system for the proposed project meets the requirements of Section D102.1.

D103.2 Grade. Fire Apparatus Access Roads shall not exceed 10% in grade.

The road system for the proposed project does not exceed 10% and is in compliance with Section D103.2.

D103.3 Turning Radius. The minimum turning radius shall be determined by the fire code official.

Turning radiuses in the proposed project are at least 28' and meet the requirements of Section D103.3.

D103.4 Dead Ends. Dead end fire apparatus access roads in excess of 150' shall be provided with width and turnaround provisions in accordance with Table D103.4.

Both dead end roads in the proposed project are provided with a minimum of a 96' diameter cul-de-sac and meet the requirements of Section D103.4.

One or Two Family Residential Developments, D107.1. Developments of one or two family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads, and shall meet the requirements of Section D104.3.

D104.3 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to, not less than, one-half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

The proposed residential project exceeds 30 dwelling units and therefore requires a second approved fire apparatus access road. The submitted plans indicate a second fire apparatus access road at the north end of the project that connects to Smoky Hollow Road. This apparatus access road meets the requirements of D107.1. The secondary apparatus access road shall be maintained year round and shall be free of obstructions including the accumulation of snow. If the secondary apparatus access road is to be secured with a gate, it shall comply with Section D103.5.

D103.5 Fire Apparatus Access Road Gates. Gates securing the fire apparatus access road shall comply with all of the following criteria:

- 1) The minimum gate width shall be 20'.
- 2) Gates shall be of the swinging or sliding type.
- 3) Construction of gates shall be of materials that allow manual operation by one person.
- 4) Gate components shall be maintained in operative condition at all times and replaced or repaired when defective.
- 5) Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official.
- 6) Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or when a key box containing the keys to the lock is installed at the gate location (Knox padlock).
- 7) Locking device specifications shall be submitted for approval by the fire code official.
- 8) Electric gate operators where provided shall be listed in accordance with UL325.
- 9) Gates intended for automatic operation shall be designed, constructed, and installed to comply with the requirements of ASTM F2200.

The developer of the proposed project shall consult with the fire code official regarding placement of No Parking Fire Lane signs where required including, but not limited to, secondary fire apparatus access road and access to water storage tank. If no parking fire lane signs are required by the fire code official, they shall comply with Section D103.6.

D103.6 Signs. Where required by the fire code official, fire apparatus access roads shall be marked with permanent no parking fire lane signs complying with Figure D103.6. Signs shall have a minimum dimension of 12" wide by 18" high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.

Conclusion

Based on our review and analysis of the proposed residential project, it is our opinion that The 81 on East Bay meets all of the fire code requirements set forth in the International Fire Code 2012 Edition as adopted by Peninsula Township.

The information contained in this report is based on information available at the time that this report was prepared. Nederveld, Inc. reserves the right to amend and/or modify this report if new and/or significant data becomes available that impacts the situation and parameters of this investigation.

Our services were performed using the degree of skill normally exercised by practicing professional individuals in this area and similar locales. No other warranty is either expressed or implied.

The information presented in this report is time dependent, and conditions can change. Reliance on or any use of this report by anyone other than with our client, its successors, and/or assigns, is prohibited and, therefore, not foreseeable to Nederveld, Inc. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.

Sincerely,



Ron Taylor, CFI, CFEI, NFPA FI-II, FPE
Nederveld, Inc.
Investigator

Certified Fire Investigator (CFI)

*Certified by the International Association of
Arson Investigators*

Certified Fire and Explosion Investigator (CFEI)

*Certified by the National Association of Fire
Investigators*

Certified Fire Inspector (NFPA FI-II)

Certified by the National Fire Protection Association



Bruce A. Wiers, PE
Nederveld, Inc.
Senior Forensic Engineer
President

Professional Engineer (PE) – License No. 38288

Licensed by the State of Michigan

The road system for the proposed project meets the requirements of Section D102.1.

D103.2 Grade. Fire Apparatus Access Roads shall not exceed 10% in grade.

The road system for the proposed project does not exceed 10% and is in compliance with Section D103.2.

D103.3 Turning Radius. The minimum turning radius shall be determined by the fire code official. The International Fire Code requires turning radius of fire apparatus access roads be determined by the fire code official due to the large variation of equipment used by fire departments. Each fire department must assess the specific abilities of its vehicles to set a minimum turning radius.

Turning radiuses in the proposed project are at least 28' and, based on my experience and knowledge of fire apparatus in Grand Traverse County, 28' should accommodate fire apparatus responding to this development in an emergency. The developer shall confirm with the Peninsula Township fire code official that 28' is adequate and will satisfy the requirements of Section D103.3.

D103.4 Dead Ends. Dead end fire apparatus access roads in excess of 150' shall be provided with width and turnaround provisions in accordance with Table D103.4.

Both dead end roads in the proposed project are provided with a cul-de-sac per the requirements of Section D103.4. The developer shall confirm with the Peninsula Township fire code official that the cul-de-sacs will meet the fire department's needs or if a hammerhead or "Y" turnaround would be needed.

One or Two Family Residential Developments, D107.1. Developments of one or two family dwellings where the number of dwelling units exceeds 30 shall be provided with two separate and approved fire apparatus access roads, and shall meet the requirements of Section D104.3.

D104.3 Remoteness. Where two fire apparatus access roads are required, they shall be placed a distance apart equal to, not less than, one-half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

The proposed residential project exceeds 30 dwelling units and, therefore, requires a second approved fire apparatus access road. The submitted plans indicate a second fire apparatus access road at the north end of the project that connects to Smoky Hollow Road. The primary reason for multiple access roads is to ensure that if one access road is blocked or otherwise unavailable, another will allow access to the fire department, law enforcement, and EMS. When more than one access road is required, they need to be separated by enough distance to avoid a situation where both would be blocked or unavailable simply because they are too close to one another.

The proposed emergency apparatus access road is located approximately 2000' to the north of the main entrance drive (measured in a straight line). The remoteness of the proposed emergency access road will prevent both access roads from being blocked.

The apparatus access road meets the requirements of D107.1. The secondary apparatus access road shall be maintained year round and shall be free of obstructions including the accumulation of snow. If the secondary apparatus access road is to be secured with a gate, it shall comply with Section D103.5.

D103.5 Fire Apparatus Access Road Gates. Gates securing the fire apparatus access road shall comply with all of the following criteria:

- 1) The minimum gate width shall be 20'.
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- 3) Construction of gates shall be of materials that allow manual operation by one person.
- 4) Gate components shall be maintained in operative condition at all times and replaced or repaired when defective.

- 5) Electric gates shall be equipped with a means of opening the gate by fire department personnel for emergency access. Emergency opening devices shall be approved by the fire code official.
- 6) Manual opening gates shall not be locked with a padlock or chain and padlock unless they are capable of being opened by means of forcible entry tools or when a key box containing the keys to the lock is installed at the gate location (Knox padlock).
- 7) Locking device specifications shall be submitted for approval by the fire code official.
- 8) Electric gate operators where provided shall be listed in accordance with UL325.
- 9) Gates intended for automatic operation shall be designed, constructed, and installed to comply with the requirements of ASTM F2200.

The developer of the proposed project shall consult with the fire code official regarding placement of No Parking Fire Lane signs where required including, but not limited to, secondary fire apparatus access road and access to water storage tank. If no parking fire lane signs are required by the fire code official, they shall comply with Section D103.6.

D103.6 Signs. Where required by the fire code official, fire apparatus access roads shall be marked with permanent no parking fire lane signs complying with Figure D103.6. Signs shall have a minimum dimension of 12" wide by 18" high and have red letters on a white reflective background. Signs shall be posted on one or both sides of the fire apparatus road as required by Section D103.6.1 or D103.6.2.

Conclusion

Based on our review and analysis of the proposed residential project, it is our opinion that The 81 on East Bay meets all of the fire code requirements set forth in the International Fire Code 2012 Edition as adopted by Peninsula Township.

The information contained in this report is based on information available at the time that this report was prepared. Nederveld, Inc. reserves the right to amend and/or modify this report if new and/or significant data becomes available that impacts the situation and parameters of this investigation.

Our services were performed using the degree of skill normally exercised by practicing professional individuals in this area and similar locales. No other warranty is either expressed or implied.

The information presented in this report is time dependent, and conditions can change. Reliance on or any use of this report by anyone other than with our client, its successors, and/or assigns, is prohibited and, therefore, not foreseeable to Nederveld, Inc. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.

Sincerely,



Ron Taylor, CFI, CFEI, NFPA FI-II, FPE
Nederveld, Inc.
Investigator

Certified Fire Investigator (CFI)

Certified by the International Association of Arson Investigators

Certified Fire and Explosion Investigator (CFEI)

Certified by the National Association of Fire Investigators

Certified Fire Inspector (NFPA FI-II)

Certified by the National Fire Protection Association



Bruce A. Wiers, PE
Nederveld, Inc.
Senior Forensic Engineer
President

Professional Engineer (PE) – License No. 38288

Licensed by the State of Michigan



Nederveld Inc.
Phone: 800.222.1868
rtaylor@nederveld.com

Ronald Taylor, IAAI - CFI

Fire Investigation Expertise

Fire and Explosion Investigation

Over 15 years experience with fire and explosion origin and cause investigations for commercial, industrial, residential, vehicle and product fires as well as fire code inspections for new and existing commercial structures. Experience with arson, subrogation, and fatal fires as well as complete investigations from initial site inspections, scene measurement, interviewing, evidence collection, evidence storage, laboratory inspections and leading or attending multi-party inspections.

Qualifications and Training:

- International Association of Arson Investigators International Training Conference, April 2016, Tested – Orlando FL
- 66th Annual Michigan Fire Inspectors Society Fall Educational Seminar – kitchen hood cleaning, hoarding, fire and electrical safety of CSST gas piping systems, September 2015
- Michigan State Police Fire Investigation Unit In-Service Training, burn cells, thermometry, fire dynamics, fire investigation, fire analysis, electricity & electrical systems, Tested – August 2015
- International Association of Arson Investigators International Training Conference, May 2014, Tested – Las Vegas, NV
- International Association of Arson Investigators International Training Conference, May 2013, Tested – Orlando, FL
- International Association of Arson Investigators 63rd Annual Training Conference, April 2012, Tested – Dover Downs, Delaware
- Effective Investigation and Testimony, International Association of Arson Investigators, January 2012, Tested
- Michigan Fire Inspectors Society Fall Educational Seminar, September 2011
- International Association of Arson Investigators Arc Mapping Basics, May 2011, Tested – CFITrainer.Net
- International Association of Arson Investigators 62nd Annual Training Conference, May 2011, Tested – Las Vegas, NV
- International Association of Arson Investigators 61st Annual Training Conference, May 2010, Tested – Orlando, FL
- Asbestos and Lead Awareness, MIOSHA Training Institute, March 2010, Tested – Gaylord, MI
- National Association of Fire Investigators Certified Vehicle Fire Investigator, September 2009, Tested – Lexington, KY
- Michigan Arson Prevention Committee/Michigan Chapter IAAI Regional Training Seminar, January 2009
- Public Agency Training Council Fire/Arson Fatality Fire Scene Investigation, December 2008, Tested – Burton, MI
- Michigan State Police Fire Investigation II School, March 2008, Tested – Tustin, MI
- Michigan State Police Vehicle Fire Investigation School, October 2007, Tested – Tustin, MI
- National Fire Protection Association Certified Fire Inspector II, July 2007, Tested – Traverse City, MI

- National Association of Fire Investigators Certified Fire and Explosion Investigator, June 2007, Tested – Holland, MI
- Michigan State Police Fire Investigation 1 School, April 2007, Tested – Tustin, MI
- International Association of Arson Investigators Expert Witness Courtroom Testimony, March 2007, Tested – Troy, MI
- International Code Council, Certified Fire Inspector II, October 2006, Tested – Lansing, MI
- International Code Council, Certified Fire Inspector I and Certified Plans Examiner, June 2006, Tested – Lansing, MI
- Public Agency Training Council Arson Scene Search Course, June 2006
- Public Agency Training Council Fire Pattern Recognition & Identification Course, August 2005
- National Fire Academy Fire Cause and Determination for Company Officers, February 2005, Tested – Emmetsburg, MD
- Michigan Arson Prevention Committee NFPA 921 Seminar Proper Protocol for Subrogation, November 2004
- Public Agency Training Council Electrical Fire/Arson Investigation Course, October 2004
- Michigan Arson Prevention Committee Modular/Mobile Home Fire Investigation Course, June 2004, Tested – Tustin, MI
- U.S. Department of Homeland Security Emergency Response to Terrorism: Train the Trainer, March 2004, Tested – Lansing, MI
- International Association of Arson Investigators, Michigan Chapter, Vehicle Fire and Arson Investigation Course, October 2003
- Public Agency Training Council Kinesic Interview Course, September 2003
- Oakland County Association of Arson Investigators Arson and Fire Investigation Course, May 2003
- Fire Findings Investigation of Gas and Electrical Appliance Fires, April 2003, Tested – Benton Harbor, MI
- International Association of Arson Investigators, Michigan Chapter, Regional Arson Seminar, March 2003
- State of Michigan, Department of State Police, State Certified Instructor, February 2002, Tested – Traverse City, MI
- State of Michigan, Department of State Police, Fire Officer III, October 2001
- Michigan Propane Gas Association Handling Propane Gas Emergencies, August 2001
- State of Michigan, Department of State Police, Clandestine Drug Lab Awareness, August 2001, Tested – Traverse City, MI
- State of Michigan, Department of Consumer & Industry Services State Certified Fire Inspector, January 2001, Tested – West Branch, MI
- National Fire Protection Association, Certified Fire Inspector 1, December 2000, Tested – West Branch, MI
- State of Michigan, Department of State Police, Fire Officer II, March 1999, Tested – Traverse City, MI
- National Fire Academy Arson Detection for the First Responder, October 1998, Tested – Traverse City, MI
- State of Michigan, Department of State Police, Fire Officer I, July 1998, Tested – Traverse City, MI
- State of Michigan, Department of State Police, Building Construction Principles, May 1998
- State of Michigan, Department of State Police, Hazmat First Responder Operations, March 1997, Tested – Traverse City, MI



- State of Michigan, Department of State Police, Fire Fighter 1 & 2, March 1997, Tested – Traverse City, MI
- Michigan State Police Fire Investigation School and Grand Traverse Rural Fire Department, Live Burn Fire Training, more than 20 fires including one and two-story structures, balloon frame and modular/mobile structures from 1995 to present

Education

High School Diploma
Kingsley Area High School
June 1989

Licenses & Certifications

CFI - Certified Fire Investigator, Certified by the International Association of Arson Investigators
CFEI - Certified Fire and Explosion Investigator, Certified by the National Association of Fire Investigators
CVFI - Certified Vehicle Fire Investigator, Certified by the National Association of Fire Investigators
Certified Fire Inspector, Certified by the State of Michigan
State Certified Instructor, Certified by the State of Michigan
Certified Fire Inspector I & II, Certified by the National Fire Protection Association
CFPE - Certified Fire Plan Examiner, Certified by the National Fire Protection Association

Employment History

Fire Investigator
Nederveld Inc., Grand Rapids, MI
2009 – Present

Responsibilities include fire origin and cause investigations in the northern Michigan region for explosions, fatal fires, commercial, industrial, residential, vehicle and product fires.

Captain/Fire Inspector/Plans Examiner/Fire Investigator
Grand Traverse Rural Fire Department, Traverse City, MI
2001 – 2010

Responsibilities include origin and cause investigations as well as conducting fire inspections of new and existing commercial structures and building and fire protection plan reviews of new projects.

Firefighter/EMT
Blair Emergency Services, Traverse City, MI
1999 – 2003

Responsibilities included emergency response for fire suppression, vehicle extrication, medical and trauma incidents and assistance with fire investigations.

Service Technician
Northern Fire and Safety, Traverse City, MI
1997 – 2001

Responsibilities included servicing fire protection systems and fire extinguishers, generating ancillary sales of safety products, providing product training and conducting public education demonstrations to groups.

Captain/Firefighter/EMT

Grand Traverse Rural Fire Department, Traverse City, MI

1995 – 2010

Responsibilities include investigating fires in the county as well as supervising volunteer personnel in training and on emergency scenes, responding to fire incidents, motor vehicle accidents, medical emergencies and hazardous materials.

Assistant Manager and ASE/State Certified Mechanic

Tuffy Auto Service Center, Traverse City, MI

1992 – 1997

Responsibilities included repair of motor vehicles, supervising employees, maintaining customer service and managing shop in the absence of the manager.

Professional Affiliations

Member: International Association of Arson Investigators, Michigan Chapter

Member: International Association of Arson Investigators

Member: National Association of Fire Investigators

Member: Michigan Fire Inspector Society

Educational Presentations and Instruction

April 2016

Instructor for the Michigan State Police Basic Fire Investigation School - NFPA 921 & 1033

September 2015

Instructor – Accidental, Incendiary and Undetermined Fires - Western Loss Association Conference – Live fires in burn cells

August 2015

Instructor – Fire Origin and Cause at Tri-County Fire Inspector Conference

July 2015

Subject Matter Expert for Michigan State Police Fire Investigation Pro Board Validation

April 2015

Instructor/Evaluator for the Michigan State Police Basic Fire Investigation School – Evaluated students while conducting origin/cause of burned structure

March 2015

Instructor for the Michigan State Police Basic Fire Investigation School - NFPA 921 & NFPA 1033

Spring 2014

Instructor for the Tri-County Fire Inspectors Class, Grand Rapids, MI

April 2013

Detection of Arson and Suspicious Fires

Presenter for Michigan State Police and Firefighters Training Council

Expert Witness Experience

March 2007
International Association of Arson Investigators Expert Witness Courtroom Testimony Course
Three days of extensive training on fire origin and cause expert witness testimony. Students are given a case before class and testify as an expert in a courtroom with attorneys and judges participating in the questioning and cross-examination.

Depositions

June 2016
Philadelphia Indemnity Insurance Company aso Watermark Management Group LLC vs Deborah Galea
Expert Witness for the defense
Kalkaska County Circuit Court # 15-11857-NZ

September 2013
The Cincinnati Insurance Company a/s/o Hal and Jacquie Katterman vs Becker Ulman Construction, Inc. and Wolverine Insulation, LLC
Expert Witness for the defense
Eastern District of Michigan, United States District Court # 2:12-CV-13185

February 2013
State Farm Fire and Casualty Company, and State farm Mutual Automobile Insurance Company a/s/o Steven Drayer vs Scott Canfield dba Scotty's Auto & Performance
Expert Witness for the defense
Ingham County Circuit Court # 12-1258-NZ

June 2012
Mason Argue and Lisa Argue vs Home-Owners Insurance Company
Expert Witness for the defense
Leelanau County Circuit Court # 12-8709-CK

Trials

February 2013
Mason Argue and Lisa Argue vs Home-Owners Insurance Company
Expert Witness for the defense
Leelanau County Circuit Court # 12-8709-CK

September 2010
Timothy and Karen Fouch vs Farmers Mutual Insurance Company
Expert Witness for the defense
Grand Traverse County Circuit Court # 09-2699-CP

July 2004
People vs Joseph Charles Leveque, Jr.
Expert Witness for the prosecution
Grand Traverse County Judicial District Court # 03-G142318-SM

Michelle Reardon

From: Philip Settles <psettles@bsb.tc>
Sent: Thursday, August 11, 2016 11:03 AM
To: Michelle Reardon
Cc: James G. Young; Doug Mansfield; Kevin O'Grady
Subject: FW: The 81 on East Bay

Michelle,

I sent you an e-mail back on June 10 and recited Garth Greenan, GT Road Commission's e-mail, re the emergency access road, without ever forwarding. Accordingly I am now forwarding Mr. Greenan's e-mail letter which Doug Mansfield forwarded to me earlier. Doug may have already provided, but I wanted to make sure you have it,

Philip A. Settles
Brott, Settles & Brott, P.C.
5168 US 31 North, P.O. Box 300
Acme, MI 49610
231-938-1000

From: Doug Mansfield [mailto:doug@maaeps.com]
Sent: Monday, June 13, 2016 8:34 AM
To: 'Kevin O'Grady'; 'Philip Settles'
Subject: FW: The 81 on East Bay

FYI

Douglas L. Mansfield
President

Mansfield Land Use Consultants
Planners - Civil Engineers - Surveyors

830 Cottageview Drive
Suite 201
P.O. Box 4015
Traverse City, Mi. 49685

office: (231) 946-9310 ext. 1000
cell: (231) 218-5560
fax: (231) 946-8926
email: doug@maaeps.com

From: Garth Greenan [mailto:ggreenan@gtcrc.org]
Sent: Friday, June 10, 2016 3:55 PM
To: doug@maaeps.com
Subject: The 81 on East Bay

Doug:

I have reviewed the modifications to "The 81 on East Bay" project, specifically, the addition of an emergency access point from an existing drive on Smokey Hollow Road. Since this is only an emergency access point, and therefore no increase in normal traffic, and there will be no work within the County Road Commission ROW, we would have no jurisdiction related to the use of the existing driveway and no comments on the driveway. If you have any further questions, please contact me.

Garth Greenan, P.E.

Traffic Services Supervisor

Grand Traverse County Road Commission

1881 LaFranier Road

Traverse City, MI 49696

www.gtcrc.org

GTCRC Number: 231-922-4848

GTCRC FAX No.: 231-929-1836

Direct Number: 231-922-4849 ext 205

Mobile Number: 231-590-3638



No virus found in this message.

Checked by AVG - www.avg.com

Version: 2016.0.7639 / Virus Database: 4604/12412 - Release Date: 06/13/16

SESC PERMIT

Under the provisions of PART 91, SOIL EROSION & SEDIMENTATION CONTROL ACT (SESC) (1994 PA 451 as amended) and/or GRAND TRAVERSE COUNTY SESC ORDINANCE, as amended.

GRAND TRAVERSE COUNTY
SOIL EROSION & SEDIMENTATION
2650 LAFRANIER RD
TRAVERSE CITY MI 49686
Phone # (231) 995-6042

Permit #: 24013
Sensitivity: 4
Type: RESIDENT
Issued: 5/09/2016
Expires: 5/09/2017
Fee: 3,967
Receipt #: 38459
Applied: 4/08/2016

Owner:
THE 81 DEVELOPMENT COMPANY, LLC
6978 DIXIE HWY
CLARKSTON MI 48346

Contractor/On-Site responsible person:
ALPERS EXCAVATING
16 S WEST SILVER LAKE RD
TRAVERSE CITY MI 49685

DEQ Permit #: NOC PENDING Issue Date:
Credit/Surety Amount: 80,000.00 Expires: 5/06/2017

Authority is hereby granted to make the following earth changes:

GRADING TO CONSTRUCT RESIDENTIAL PUD, ROADS, UTILITIES, STORM BASIN
CLEARING; AMEND TO ADD FIRE LANE

Located at: 15634 SMOKEY HOLLOW RD 15636 BLUFF RD
In PENINSULA Twp, Sect 14 Town 29N Range 10W Lot # Block
Sub: THE 81 ON EAST BAY
Property Tax #: 28 - 11 - 114 - 001 - 00

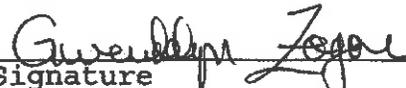
Permit Conditions:

1. The permitted activity shall be completed in accordance with the approved plans and specifications, and the following general conditions.
2. This permit does not waive the necessity for obtaining all other required federal, state, or local permits.
3. Permittee shall notify the permitting agency within one week after completing the permitted activity or one week prior to the permit expiration date, whichever comes first.

General Conditions:

In accordance with Rule 1709 promulgated under the authority of Part 91, Soil Erosion and Sedimentation Control, of the natural Resources and Environmental Protection act, 1994 PA 451, as amended, and in addition to the information on the attached plan(s) and special conditions, the following general conditions apply to the earth change authorized by this permit.

- Design, construct, and complete the earth change in a manner that limits the exposed area of disturbed land for the shortest period of time.


Signature

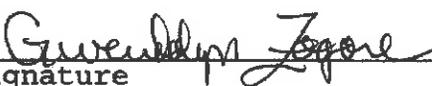
THIS PERMIT ALONG WITH THE SITE PLAN MUST BE POSTED AT THE PROJECT SITE
Continued on Next Page

- Remove sediment caused by accelerated soil erosion from runoff water before it leaves the site of the earth change.
- Temporary or permanent control measures shall be designed and installed to convey water around, through, or from the earth change at a non-erosive velocity.
- Install temporary soil erosion and sedimentation control measures before or upon commencement of the earth change activity and maintain the measures on a daily basis. Remove temporary soil erosion and sedimentation control measures after permanent soil erosion measures are in place and the area is stabilized. (Stabilized means the establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.)
- Complete permanent soil erosion control measures for the earth change within five calendar days after final grading or upon completion of the final earth change. If it is not possible to permanently stabilize the earth change, then maintain temporary soil erosion and sedimentation control measures until permanent soil erosion control measures are in place and the area is stabilized.

Specific Conditions:

This permit is approved according to the site plan received on April 8, 2016 and revised on May 3, 2016 from Mansfield Land Use Consultants Job No:14016 with the following requirements:

1. Follow all prescribed Soil Erosion and Sedimentation Control measures on page C3.0 of the revised site plan.
2. Phasing must be followed according to the schedule. Each phase must be stabilized as described before moving to the next phase. Any change in the schedule must be approved by this office.
3. Install silt fence according to the site plan, properly trenched in 6 inches deep and end stakes wrapped. Double rows are required as specified. Silt fences must be inspected regularly. It is imperative to inspect all fences during and after spring snow melt.
4. Construct all storm ditches/swales with no greater than 3:1 slopes and stabilize as shown on page C1.2.
5. The storm water detention basin must be stabilized with erosion control blankets as indicated. All outlets must be stabilized with rock rip rap as shown in the engineered site plan.
6. Construct wooden stairs as shown. Stabilize all disturbed areas around the post holes with woody mulch or other non-erosive ground cover.
7. Any vegetation must be established and show significant growth in order to final this permit.
8. Construct stone construction entrance as shown.
Do not allow sediment to be tracked onto the street. If tracking does occur, sweep the street at the end of the work day.
9. Install a culvert in the road ditch under the entryway. The ends of the culvert must be stabilized so that erosion does not occur in the road ditch.
10. The storm water operator, licensed by the MI DEQ, must submit


Signature

Continued from Previous Page
SESC PERMIT

Permit 24013

weekly reports to the County Enforcing Agent.

11. Submit a copy of the MI DEQ Notice of Coverage to this office.

12. The engineer of record must submit a letter of certification stating that the project is built according to the site plan in order to final this permit.

13. PERMIT, GREEN CARD & SITE PLAN MUST BE POSTED AT THE PROJECT SITE AT ALL TIMES UNTIL PERMIT HAS FINAL APPROVAL FROM THIS OFFICE

AMEND 08/12/16 FIRE LANE ACCESS FROM SMOKEY HOLLOW RD

1. Install silt fence as shown on the amended site plan submitted from Mansfield Land Use Consultants Job No: 14016.

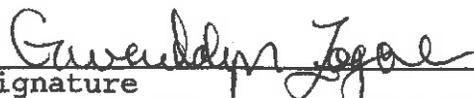
2. Install mats on ditches as shown on the engineered site plan.

3. Check dams should be installed immediately upon shaping the ditches

4. Install rip rap at outlets as shown.

5. Install stone construction entrance to prevent tracking onto Smokey Hollow Rd. If tracking does occur, the road must be swept by the end of the day.

6. All vegetation must be re-established and this road completely stabilized in order to final the permit.


Signature

THIS PERMIT ALONG WITH THE SITE PLAN MUST BE POSTED AT THE PROJECT SITE