AGENDA

Grand Haven Charter Township Planning Commission
Monday, August 7, 2017 – 7:00 p.m.

I. Call to Order

II. Roll Call

III. Pledge to the Flag

IV. Approval of the July 17, 2017 Meeting Minutes

V. Correspondence

VI. Brief Public Comments & Questions (Limited to 3 minutes)

VII. Old Business
   A. PUD – Regency at Grand Haven – Formal Motion & Report + Revisions

VIII. New Business
   A. Pre-Application Conference – Multiple Family & Mixed Use PUD
   B. Discussion – Zoning Text Amendment – Special Land Uses – Access Management
   C. Discussion – Zoning Text Amendment – Special Land Uses – Accessory Buildings
   D. Appointment of Secretary
   E. Proposed Amendment to Planning Commission Bylaws and Rules

IX. Reports
   A. Attorney's Report
   B. Staff Report
   C. Other

X. Extended Public Comments & Questions (Limited to 4 minutes)

XI. Adjournment

Note: Persons wishing to speak at public hearings, on agenda items, or extended comments, must fill out a "Speakers Form" located on the counter. Completed forms must be submitted to the Zoning Administrator prior to the meeting.

MEETING MINUTES
GRAND HAVEN CHARTER TOWNSHIP
PLANNING COMMISSION
JULY 17, 2017

I. CALL TO ORDER

Cousins called the meeting of the Grand Haven Charter Township Planning Commission to order at 7:00 p.m.

II. ROLL CALL

Members present: Cousins, LaMourie, Taylor, Kieft, Wilson, Chalifoux, and Wagenmaker
Members absent: Reenders
Also present: Community Development Director Fedewa and Attorney Bultje

Without objection, Cousins instructed Fedewa to record the minutes.

III. PLEDGE TO THE FLAG

IV. APPROVAL OF MINUTES

Without objection, the minutes of the June 19, 2017 meeting were approved.

V. CORRESPONDENCE

A. Port Sheldon Township – Master Plan Public Hearing
B. Mark and Karen Yoder – Ehlert Rezoning Application
C. Charles and Peggy Tyler – Deur Special Land Use Application

VI. PUBLIC COMMENTS ON AGENDA ITEMS ONLY – None

VII. PUBLIC HEARINGS

A. Rezoning – R-4 to R-1 – Wood

Wagenmaker recused himself due to a conflict of interest – the applicant may sign a contract with him to construct the dwelling.

Cousins opened the public hearing at 7:04pm.

Fedewa provided an overview through a memorandum dated July 12th.

The applicant, Steve Wood, was present and available to answer questions.

There being no public comments, Cousins closed the hearing at 7:06pm.

Wagenmaker rejoined the Planning Commission.

B. Rezoning – RR to AG – Ehlert

Cousins opened the public hearing at 7:06pm.

Fedewa provided an overview through a memorandum dated July 12th.

The applicant, John Ehlert, was present and available to answer questions.

Fedewa noted that correspondence was received from Mark and Karen Yoder objecting to the application because an agricultural use is not suitable for that area of the Township.

There being no public comments, Cousins closed the hearing at 7:09pm.

C. Special Land Use – Group Day Care – Deur

Cousins opened the public hearing at 7:10pm.

Fedewa provided an overview through a memorandum dated July 12th.

The applicant, Kristine Deur, was present and available to answer questions.

Fedewa noted that correspondence was received from Charles and Peggy Tyler objecting to the application because of shared driveway concerns.

Bultje explained this land use is protected by the State of Michigan and the Michigan Zoning Enabling Act, which outline specific provisions the Township can consider. If all provisions are met, the Township is obligated to approve.

The Commission inquired if this case would be different if a new road, or driveway, was included with the application. Yes, because the Township could then require the new road, or driveway, to meet current standards. However, this site has a legally nonconforming shared driveway.

There being no public comments, Cousins closed the hearing at 7:14pm.

D. Special Land Use – Ag in RR District – Bradley

Cousins opened the public hearing at 7:14pm.

Fedewa provided an overview through a memorandum dated July 13th.

The applicants, Vincent and Linda Bradley, were present and available to answer questions.

Fedewa and Bultje noted that having a dual principal land use—residential and agricultural—will allow the agricultural use to construct more/larger buildings than typically allowed in a residential zoning district.

There being no public comments, Cousins closed the hearing at 7:17pm.

E. Special Land Use – Indoor Exercise Facility in C-1 District – Wilbur

Wilson recused himself due to a conflict of interest – he is the property owner of the subject parcel.

Cousins opened the public hearing at 7:17pm.

Fedewa provided an overview through a memorandum dated July 13th.

The applicant was not present to answer questions, only the property owner.

A brief discussion ensued about possible text amendments to the access management sections of the Special Land Use Chapter.

There being no public comments, Cousins closed the hearing at 7:22pm.

Wilson rejoined the Planning Commission.

F. PUD – Regency at Grand Haven

Cousins opened the public hearing at 7:22pm.

Fedewa provided an overview through a memorandum dated July 14th.

The developers' representatives—Roy Baker of NSA Architects and Scott Peruski of PEA Inc.—were present and available to answer questions.

- Discussed the process of obtaining a Certificate of Need.
- Short-term rehabilitation patients are typically brought from a hospital directly to the facility.

Public comments included:

- Erin Tibaldi – 14906 172nd Avenue, opposes the development:
    - Resided in her home for 20 years, and believes she is the last owner-occupied home in that area.
    - Surrounding developments have changed and impacted her property, and the enjoyment of her property over the years. Including:
        - Losing part of her yard to a county drain
        - Loss of wildlife
    - Described issues with the Piper Lakes and Timber View developments impacting the enjoyment of her property.
    - Would prefer the Regency at Grand Haven developer purchase her land too.

    - Concerned there will be light pollution.
- Bret Lewis of Cherette Group (Piper Lakes developer) – 333 Washington Ave, GH:
    - The Cherette Group is satisfied with the concept of the development, but would prefer the content of the plans be improved:
        - Improve the roofline and building materials to be more cohesive with adjacent developments and continue enhancing the quality of this community.
    - Regarding the internal cross-connection driveway between the two developments, the Cherette Group requests the connection be on the south end of the parking lot rather than the north to reduce non-resident traffic traveling through the Piper Lakes community.
    - Township has requested the watermain be looped between the two projects, but an engineering report must be supplied before they agree to sign a public utility easement.
    - Concerned the parking lot lights along the eastern boundary line will allow light to trespass onto the Piper Lakes property and shine into their largest apartment building that faces west.

A Commissioner noted there is a need for more capacity in short-term rehabilitation facilities.

There being no further public comments, Cousins closed the hearing at 7:38pm.

VIII. OLD BUSINESS

A. Rezoning – R-4 to R-1 – Wood

Wagenmaker recused himself due to a conflict of interest – the applicant may sign a contract with him to construct the dwelling.

The application was discussed by Commissioners and focused on:

- Inquired if this was the same area owned and developed by the DeGroot family—yes.
- Parcel accessed via an easement though, and not utilizing Serenity Court.

> **Motion** by Chalifoux, supported by Wilson, to recommend to the Township Board **approval** of the Wood rezoning application of parcel 70-03-33-300-059 from Multiple Family (R-4) to Single Family (R-1) based on the application meeting applicable rezoning requirements and standards of the Grand Haven Charter Township Zoning Ordinance, Master Plan, and Future Land Use Map. **Which motion carried unanimously**.

Wagenmaker rejoined the Planning Commission.

B. Rezoning – RR to AG – Ehlert

The application was discussed by Commissioners and focused on:

- A single family dwelling could be constructed now in the RR district. However, property owner is not ready to construct a home at this time.
- Confirmed there are a number of other horses nearby the subject parcel.

> **Motion** by Taylor, supported by Chalifoux, to recommend to the Township Board **approval** of the Ehlert rezoning application of parcel 70-07-14-200-039 from Rural Residential (RR) to Agricultural (AG) based on the application meeting applicable rezoning requirements and standards of the Grand Haven Charter Township Zoning Ordinance, Master Plan, and Future Land Use Map. **Which motion carried unanimously**.

C. Special Land Use – Group Day Care – Deur

The application was discussed by Commissioners and focused on:

- Michigan Zoning Enabling Act is specific on what items can be considered.
- Existing private driveway is legally nonconforming, and not an item the State has allowed the local municipality to consider. However, if a new private driveway was requested it would be subject to compliance with the Township's Private Road and Driveways Ordinance.

> **Motion** by LaMourie, supported by Wagenmaker, to **approve** the Special Land Use application to allow Group Day Care Home on 7-acres of property located at 14736 Lakeshore Drive. This approval is based on the application meeting the applicable requirements and standards set forth by the Grand Haven Charter Township Zoning Ordinance and Michigan Zoning Enabling Act. This motion is subject to, and incorporates, the following report. **Which motion carried unanimously**.

REPORT – GROUP DAY CARE

1. This approval is based on the affirmative findings that each of the following standards of Section 19.05 have been fulfilled:
   A. The proposed use is consistent with, and promotes the intent and purpose of this Ordinance.
   B. The proposed use is of such location, size, density, and character as to be compatible with adjacent uses of land and the orderly development of the district in which situated and of adjacent districts.
   C. The proposed use does not have a substantially detrimental effect upon, nor substantially impair the value of, neighborhood property.
   D. The proposed use is reasonably compatible with the natural environment of the subject premises and adjacent premises.

E. The proposed use does not unduly interfere with provision of adequate light or air, nor overcrowd land or cause a severe concentration of population.

F. The proposed use does not interfere or unduly burden water supply facilities, sewage collection and disposal systems, park and recreational facilities, and other public services.

G. The proposed use is such that traffic to, from, and on the premises and the assembly of persons relation to such use will not be hazardous, or inconvenient to the neighborhood, nor unduly conflict with the normal traffic of the neighborhood, considering, among other things: safe and convenient routes for pedestrian traffic, particularly of children, the relationship of the proposed use to main thoroughfares and to streets and intersections, and the general character and intensity of the existing and potential development of the neighborhood.

H. The proposed use is consistent with the health, safety, and welfare of the Township.

2. The application meets the site plan review standards of Section 23.06 of the Zoning Ordinance. Specifically, the Planning Commission finds as follows:

A. The uses proposed will not adversely affect the public health, safety, or welfare. Uses and structures located on the site take into account topography, size of the property, the uses on adjoining property and the relationship and size of buildings to the site. The site will be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this ordinance.

B. Safe, convenient, uncontested, and well defined vehicular and pedestrian circulation is provided for ingress/egress points and within the site. Drives, streets and other circulation routes are designed to promote safe and efficient traffic operations within the site and at ingress/egress points.

C. The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area are planned to provide a safe and efficient circulation system for traffic within the township.

D. Removal or alterations of significant natural features are restricted to those areas which are reasonably necessary to develop the site in accordance with the requirements of this Ordinance. The Planning Commission has required that landscaping, buffers, and/or greenbelts be preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

E. Areas of natural drainage such as swales, wetlands, ponds, or swamps are protected and preserved insofar as practical in their natural state to provide areas for natural habitat, preserve drainage patterns and maintain the natural characteristics of the land.

F. The site plan provides reasonable visual and sound privacy for all dwelling units located therein and adjacent thereto. Landscaping shall be used, as appropriate, to accomplish these purposes.

G. All buildings and groups of buildings are arranged so as to permit necessary emergency vehicle access as requested by the fire department.

H. All streets and driveways are developed in accordance with the Ottawa County Road Commission specifications, as appropriate.

I. Appropriate measures have been taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions have been made to accommodate storm water, prevent erosion and the formation of dust.

J. Exterior lighting is arranged so that it is deflected away from adjacent properties and so it does not interfere with the vision of motorists along adjacent streets, and consists of sharp cut-off fixtures.

K. All loading and unloading areas and outside storage areas, including areas for the storage of trash, which face or are visible from residential districts or public streets, are screened.

L. Entrances and exits are provided at appropriate locations so as to maximize the convenience and safety for persons entering or leaving the site.

M. The site plans conform to all applicable requirements of County, State, Federal, and Township statutes and ordinances.

N. As appropriate, fencing has been required by the Planning Commission around the boundaries of the development to minimize or prevent trespassing or other adverse effects on adjacent lands.

O. The general purposes and spirit of this Ordinance and the Master Plan of the Township are maintained.

D. Special Land Use – Ag in RR District – Bradley

Motion by Kieft, supported by Wilson, to **approve** the Special Land Use application to allow an Agricultural operation in the Rural Residential zoning district on 12.3-acres of property located at 12240 152nd Avenue, Parcel No. 70-07-13-300-020. This approval is based on the application meeting the applicable requirements and standards set forth by the Grand Haven Charter Township Zoning Ordinance. This motion is subject to, and incorporates, the following report. **Which motion carried unanimously**.

REPORT – AGRICULTURE IN RR DISTRICT

1. This approval is based on the affirmative findings that each of the following standards of Section 19.05 have been fulfilled:

   A. The proposed use is consistent with, and promotes the intent and purpose of this Ordinance.

   B. The proposed use is of such location, size, density, and character as to be compatible with adjacent uses of land and the orderly development of the district in which situated and of adjacent districts.

   C. The proposed use does not have a substantially detrimental effect upon, nor substantially impair the value of, neighborhood property.

   D. The proposed use is reasonably compatible with the natural environment of the subject premises and adjacent premises.

   E. The proposed use does not unduly interfere with provision of adequate light or air, nor overcrowd land or cause a severe concentration of population.

   F. The proposed use does not interfere or unduly burden water supply facilities, sewage collection and disposal systems, park and recreational facilities, and other public services.

   G. The proposed use is such that traffic to, from, and on the premises and the assembly of persons relation to such use will not be hazardous, or inconvenient to the neighborhood, nor unduly conflict with the normal traffic of the neighborhood, considering, among other things: safe and convenient routes for pedestrian traffic, particularly of children, the relationship of the proposed use to main thoroughfares and to streets and intersections, and the general character and intensity of the existing and potential development of the neighborhood.

   H. The proposed use is consistent with the health, safety, and welfare of the Township.

2. The application meets the site plan review standards of Section 23.06 of the Zoning Ordinance. Specifically, the Planning Commission finds as follows:

   A. The uses proposed will not adversely affect the public health, safety, or welfare. Uses and structures located on the site take into account topography, size of the property, the uses on adjoining property and the relationship and size of buildings to the site. The site will be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this ordinance.

   B. Safe, convenient, uncontested, and well defined vehicular and pedestrian circulation is provided for ingress/egress points and within the site. Drives, streets and other circulation routes are designed to promote safe and efficient traffic operations within the site and at ingress/egress points.

   C. The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area are planned to provide a safe and efficient circulation system for traffic within the township.

   D. Removal or alterations of significant natural features are restricted to those areas which are reasonably necessary to develop the site in accordance with the requirements of this Ordinance. The Planning Commission has required that landscaping, buffers, and/or greenbelts be preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

   E. Areas of natural drainage such as swales, wetlands, ponds, or swamps are protected and preserved insofar as practical in their natural state to provide areas for natural habitat, preserve drainage patterns and maintain the natural characteristics of the land.

   F. The site plan provides reasonable visual and sound privacy for all dwelling units located therein and adjacent thereto. Landscaping shall be used, as appropriate, to accomplish these purposes.

   G. All buildings and groups of buildings are arranged so as to permit necessary emergency vehicle access as requested by the fire department.

   H. All streets and driveways are developed in accordance with the Ottawa County Road Commission specifications, as appropriate.

   I. Appropriate measures have been taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions have been made to accommodate storm water, prevent erosion and the formation of dust.

   J. Exterior lighting is arranged so that it is deflected away from adjacent properties and so it does not interfere with the vision of motorists along adjacent streets, and consists of sharp cut-off fixtures.

   K. All loading and unloading areas and outside storage areas, including areas for the storage of trash, which face or are visible from residential districts or public streets, are screened.

   L. Entrances and exits are provided at appropriate locations so as to maximize the convenience and safety for persons entering or leaving the site.

   M. The site plans conform to all applicable requirements of County, State, Federal, and Township statutes and ordinances.

   N. As appropriate, fencing has been required by the Planning Commission around the boundaries of the development to minimize or prevent trespassing or other adverse effects on adjacent lands.

O. The general purposes and spirit of this Ordinance and the Master Plan of the Township are maintained.

E. Special Land Use – Indoor Exercise Facility in C-1 District – Wilbur

Wilson recused himself due to a conflict of interest – he is the property owner of the subject parcel.

The application was discussed by Commissioners and focused on:

- There is a need to modify, or remove, certain access management provisions in the Special Land Use Chapter. At times, they discourage the reuse of existing buildings. At times, they also do not apply to a business within a certain land use category, so there is a need for the Commission to have more flexibility on these items.
    - The Commission directed staff to draft a text amendment.
- Unless a traffic study is conducted to justify the eastern driveway it should be closed to comply with the SLU provision and the Robbins Road Sub-Area Plan.
- Glad to see the western driveway is aligned to the adjacent city-owned street.

The property owner, Wilson, indicated he likes and prefers to keep both driveways to enhance circulation when fitness classes begin and end.

> **Motion** by Taylor, supported by Wagenmaker, to **table** the Special Land Use application. **Which motion carried unanimously**.

Wilson rejoined the Planning Commission.

F. PUD – Regency at Grand Haven

The application was discussed by Commissioners and focused on:

- Discussed the proposal of having 2 driveways on Comstock Street. As well as, relocating the internal cross-connection driveway with Piper Lakes closer to Comstock Street in light of the adjacent developer's preference.
- If the watermain is to be looped between the adjacent development and the applicant the Piper Lakes developer would require an engineering report ensuring there would not be an issue with water pressure.
- Confirmed the need to shield the pole-mounted light fixtures from the adjacent development and the street.
- Want to ensure the proposed trees along Comstock Street are tall enough, or setback far enough from the nonmotorized pathway that a user does not have to be concerned they will be "whacked in the head."
- Although state law prohibits a property owner from negatively altering the natural stormwater drainage patterns, the Commission still requests a condition of approval be included that prohibits the applicant from negatively impacting the stormwater

disposition of the area. Particularly as it relates to the adjacent single family residence and their concerns about a greater stormwater impact.

Motion by Kieft, supported by Chalifoux, to direct staff to draft a formal motion and report, which will recommend **conditional approval** of the Regency at Grand Haven PUD application, with those Zoning Ordinance compliance departures which were discussed and will be reflected in the meeting minutes. This will be reviewed and considered for adoption at the next meeting. **Which motion carried unanimously**.

IX. REPORTS

A. Attorney Report – None

B. Staff Report

- The next Zoning Ordinance Update Committee meeting is scheduled for Thursday, August 10th @ 6pm in the Main Conference Room.

C. Other

- Cousins reports the Special Land Use options to allow accessory buildings in front yards was not included on the agenda because of the number of applications. It will be discussed at the next meeting.

X. EXTENDED PUBLIC COMMENTS ON NON-AGENDA ITEMS ONLY – None

XI. ADJOURNMENT

Without objection, the meeting adjourned at 8:28 p.m.

Respectfully submitted,

Stacey Fedewa
Acting Recording Secretary

GRAND HAVEN CHARTER TOWNSHIP

Community Development Memo

DATE: August 2, 2017

TO: Planning Commission

FROM: Stacey Fedewa, Community Development Director

RE: PUD – Regency at Grand Haven – Formal Motion & Report of Findings

BACKGROUND

On July 17th the Planning Commission held a public hearing for the Regency at Grand Haven PUD application. Certain departures were requested by the applicant, which the Commission considered, and made verbal determinations.

The Commission adopted a motion that directs staff to draft a formal motion and report of findings based on the verbal determinations given at the hearing, which would be considered for adoption at the next meeting.

REVISION UPDATE

The developer made all the requested revisions:

- Cross-connection driveway with Piper Lakes moved closer to Comstock Street.
- Side shielding has been added to all pole mounted light fixtures abutting the Piper Lakes apartments and those along Comstock Street to prevent light trespass.
- Sign lighting is now lit from above to downcast the light onto the sign.
- Staff has confirmed the retaining wall heights and setbacks comply with the Ordinance.
- Miscellaneous text boxes and other notations have been added and corrected throughout the plan set.
- A more complete construction schedule has been included as well:

SEQUENCE OF CONSTRUCTION:	
START MONTH & YR.	
AUG. 2017	INSTALL TEMPORARY STONE ACCESS DRIVE AT SITE ACCESS POINT.
AUG. 2017	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, SILT SACKS, ETC. AS NECESSARY.
AUG. 2017	REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE GRADED AND SEEDED.
AUG. 2017	REMOVE ALL PAVEMENT, SIDEWALK, UTILITIES, SIGNS, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE DEMOLITION PLAN.
AUG. 2017	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON-SITE BURN OR BURY PITS ALLOWED.
SEPT. 2017	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE-INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
SEPT. 2017	INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL SILT SACKS AT CATCH BASINS AND YARD DRAINS AS SHOWN.
SEPT. 2017	BEGIN CONSTRUCTION OF BUILDING.
SEPT. 2017	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
MARCH 2018	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. REPAIR SILT SACKS, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
JUNE 2018	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
JUNE 2018	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE-ESTABLISH VEGETATION AS REQUIRED.
AUGUST 2018	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

In an effort to conserve trees—only a limited plan set is being provided to the Planning Commission. It contains the pertinent sheets that were revised.

ADDITIONAL INFORMATION

In addition to providing revised plans, the developer also provided some project narratives. The Stormwater Narrative is provided below, and the other is included with the packet materials.

Stormwater Narrative:

The Ottawa County Water Resources Commissioner has drafted a very stringent and progressive storm water management program that is scheduled to replace the current guidelines.

Although it is not mandatory for developers to follow the program yet, Ciena offered to incorporate the design requirements on their site. The progressive component of the guidelines shift the design focus from rarely occurring 100-year flooding conditions to more frequent 2-year intense rainfall scenarios. The importance of this shift is driven by the MDEQ, and other state and national water resource agencies.

The on-site storm water management system consists of two interconnected "extended detention" basins with permanent pools and a storm water pipe conveyance system. All surface runoff from the proposed developed areas will flow through the conveyance system to the detention basins. A sediment forebay provides primary water quality treatment while the permanent standing water at the bottom of the ponds provide secondary water quality treatment processes.

This ensures that sediment and potential pollutants drop out of suspension and do not enter the public storm sewer system on Comstock or the adjacent county drain.

Lastly, the developer has indicated this facility would be closest to their 2015 Lansing West center. This link can be followed to view the website: http://www.cienahealthcare.com/michigan-facilities/regency-at-lansing-west/. Photographs have also been enclosed.

FORMAL MOTION TO RECOMMEND CONDITIONAL APPROVAL

As directed by the Planning Commission on July 17, 2017 the following motion to recommend conditional approval can be offered:

> **Motion** to recommend to the Township Board **conditional approval** of the Regency at Grand Haven PUD application. This is based on the application meeting the requirements and standards set forth by the Grand Haven Charter Township Zoning Ordinance and Master Plan. The motion is subject to, and incorporates, the following report concerning the Planned Unit Development, including conditions of approval.

Please contact me if this information raises questions.

REPORT

Pursuant to the provisions of the Grand Haven Charter Township (the "Township") Zoning Ordinance (the "Zoning Ordinance"), the following is the report of the Grand Haven Charter Township Planning Commission (the "Planning Commission") concerning an application by Grand Haven Senior Leasing LLC (the "Developer") for approval of a Regency at Grand Haven Planned Unit Development (the "Project" or the "PUD").

The Project will consist of three land uses that constitute a Housing for the Elderly development. This 10.44 acre Project will consist of a one-story 120-bed state-licensed skilled nursing care facility. The Project as recommended for approval is shown on a final site plan (the "Final Site Plan"), including landscaping (the "Final Landscape Plan") and elevation renderings (the "Final Elevations"), last revised 7/31/2017; collectively referred to as the "Documentation," presently on file with the Township.

The purpose of this report is to state the decision of the Planning Commission concerning the Project, the basis for the Planning Commission's recommendation, and the Planning Commission's decision that the Regency at Grand Haven PUD be approved as outlined in this motion. The Developer shall comply with all of the Documentation submitted to the Township for this Project. In granting the approval of the proposed PUD application, the Planning Commission makes the following findings pursuant to Section 17.04.3 of the Zoning Ordinance.

1. The Project meets the site plan review standards of Section 23.06 of the Zoning Ordinance. Specifically, pursuant to Section 23.06.7, the Planning Commission finds as follows:
    A. The uses proposed will not adversely affect the public health, safety, or welfare. Uses and structures located on the site take into account topography, size of the property, the uses on adjoining property and the relationship and size of buildings to the site. The site will be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this Ordinance.
    B. Safe, convenient, uncontested, and well defined vehicular and pedestrian circulation is provided for ingress/egress points and within the site. Drives, streets and other circulation routes are designed to promote safe and efficient traffic operations within the site and at ingress/egress points.
    C. The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area are planned to provide a safe and efficient circulation system for traffic within the Township.
    D. Removal or alterations of significant natural features are restricted to those areas which are reasonably necessary to develop the site in accordance with the requirements of this Ordinance. The Planning Commission has required that landscaping, buffers, and/or greenbelts be preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

E. Areas of natural drainage such as swales, wetlands, ponds, or swamps are protected and preserved insofar as practical in their natural state to provide areas for natural habitat, preserve drainage patterns and maintain the natural characteristics of the land.

F. The site plan provides reasonable visual and sound privacy for all dwelling units located therein and adjacent thereto. Landscaping shall be used, as appropriate, to accomplish these purposes.

G. All buildings and groups of buildings are arranged so as to permit necessary emergency vehicle access as requested by the Fire/Rescue Department.

H. All streets and driveways are developed in accordance with the Ottawa County Road Commission ("OCRC") specifications, as appropriate. In addition, an internal sidewalk system and a non-motorized pathway within the Rosy Mound Drive right-of-way have been included.

I. Appropriate measures have been taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions have been made to accommodate stormwater, prevent erosion and the formation of dust.

J. Exterior lighting is arranged so that it is deflected away from adjacent properties and so it does not interfere with the vision of motorists along adjacent streets, and consists of sharp cut-off fixtures to reduce light pollution and preserve the rural character of the Township.

K. All loading and unloading areas and outside storage areas, including areas for the storage of trash, which face or are visible from residential districts or public streets, are screened.

L. Entrances and exits are provided at appropriate locations so as to maximize the convenience and safety for persons entering or leaving the site.

M. The Documentation conforms to all applicable requirements of County, State, Federal, and Township statutes and ordinances.

N. As appropriate, fencing will be installed around the boundaries of the Project if deemed necessary by either the Township or the Developer to prevent trespassing or other adverse effects on adjacent lands.

O. The general purposes and spirit of the Zoning Ordinance and the Master Plan of the Township are maintained.

2. The Planning Commission finds the Project meets the intent for a PUD, as described in Section 17.01.3 of the Zoning Ordinance. By approving this Project as a PUD, the Township has been able to negotiate various amenities and design characteristics as well as additional restrictions with the Developer, as described in this report, which the Township would not have been able to negotiate if the PUD Chapter of the Zoning Ordinance was not used.

3. Section 17.01.5, and Section 17.02.1.B.1-4 of the Zoning Ordinance, as well as Section 503 of the Michigan Zoning Enabling Act, allow for departures from Zoning Ordinance requirements; these provisions are intended to result in land use development that is substantially consistent with the goals and objectives of the Township Master Plan and the Zoning Ordinance, and consistent with sound planning principles. The Developer requested four departures. The Planning Commission makes the following findings.

A. Section 19.07.28.E – allow a reduced front yard setback.

i. The Planning Commission finds this acceptable because it prevents a significant impact to a regulated wetland at the rear of the property that would otherwise be preserved as dedicated open space. Further, substantial landscaping has been included to reduce the visual mass of the building being closer to the public street.

B. Section 19.07.28.H – allow off-street parking within the front yard.

i. The Planning Commission finds this acceptable because the building and parking lot were moved closer to the public street in order to prevent a significant impact to a regulated wetland at the rear of the property that will otherwise be preserved as dedicated open space.

C. Section 24.02.2 – allow off-street parking within the required side yard.

i. The Planning Commission finds this acceptable because the Section 19.07.28.E establishes a 75-foot setback for nursing and convalescent homes. This setback would prevent parking in both side yards, and require parking in the rear, which would significantly impact a regulated wetland that will otherwise be preserved through the dedicated open space.

D. Section 24.03 – allow a total of 128 parking spaces.

i. The Planning Commission finds this acceptable because the majority of the facility will likely be dedicated to short-term rehabilitation rather than long-term nursing care. Utilizing a dual-use from the parking schedule (convalescent or nursing home at 30% and hospital at 70%) the proposed number of spaces is compliant.

4. Compared to what could have been constructed by right, the Project has been designed to accomplish the following objectives from Section 17.01.4 of the Zoning Ordinance.

A. The Project will encourage the use of land in accordance with its natural character and adaptability;

B. The Project will promote the conservation of natural features and resources;

C. The Project will promote innovation in land use planning and development;

D. The Project will promote the enhancement of housing and commercial employment for the residents of the Township;

E. The Project will promote greater compatibility of design and better use between neighboring properties;

F. The Project will promote more economical and efficient use of the land while providing a harmonious variety of housing choices and community facilities; and

G. The Project will promote the preservation of open space.

5. The Project meets the following qualification requirements of Section 17.02 of the Zoning Ordinance:

A. The Project meets the minimum size of five acres of contiguous land.

B. The PUD design substantially promotes the Intent and Objectives of Section 17.01 of the Zoning Ordinance; it further permits an improved layout of land uses and roadways that could not otherwise be achieved under normal zoning.

C. The Project contains distinct uses relating to the care of residents—short-term rehabilitation therapy, bariatric care, and long-term skilled nursing care.

D. The Project site exhibits significant natural features encompassing more than 25% of the land area, which will be preserved as a result of the PUD plan and includes regulated wetlands.

E. The Project site has distinct physical characteristics which makes compliances with the strict requirements of the Zoning Ordinance impractical.

6. The Planning Commission also finds the Project complies with the general PUD Design Considerations of Section 17.05 of the Zoning Ordinance.

A. The stormwater management system for the Project and the drainage facilities will properly accommodate stormwater on the site, will prevent runoff to adjacent properties, and are consistent with the Township's groundwater protection strategies.

B. The Project will not interfere with or unduly burden the water supply facilities, the sewage collection and disposal systems, or other public services such as school facilities, park and recreation facilities, etc.

C. Utility services within the Project shall be underground. This includes but is not limited to electricity, gas lines, telephone, cable television, public water and sanitary sewer.

D. The internal road system in the Project is designed to limit destruction of existing natural vegetation and to decrease the possibility of erosion.

E. Vehicular circulation, traffic and parking areas have been planned and located to minimize effects on occupants and users of the Project and to minimize hazards to adjacent properties and roadways.

F. Parking requirements for each use have been determined to be in accordance with Chapter 24 (Parking, Loading Space, and Signs).

G. Street lighting will be installed in the same manner as required under the Township's Subdivision Control Ordinance.

H. Buildings in the Project have been sited to protect natural resources. Natural features such as natural grade, trees, vegetation, water bodies and others have been incorporated into the Documentation.

I. Architectural design features visually screen the mechanical and service areas from adjacent properties, public roadways, and other public areas.

J. The exterior walls greater than 50 feet in horizontal length or that can be viewed from a public street contain a combination of architectural features, variety of building materials, and landscaping near the walls.

K. Onsite landscaping abuts the walls so the vegetation combined with architectural features significantly reduce the visual impact of the building mass when viewed from the street.

L. The predominant building materials have been found to be those characteristic of the Township such as brick, native stone, and glass products. Pre-fabricated metal garage-ports and car-ports will include accent materials similar to the main building so as not to dominate the building exterior of the structure.

M. Landscaping, natural features, open space and other site amenities have been located in the Project to be convenient for occupants of, and visitors to, the PUD.

N. The Project is reasonably compatible with the natural environment of the site and the adjacent premises.

O. The Project will not unduly interfere with the provision of adequate light or air; nor will it overcrowd land or cause an unreasonably severe concentration of population.

P. Exterior lighting within the Project complies with Chapter 20A for an LZ 3 zone.

Q. Outside storage of materials shall be screened from view.

R. Signage is compliant with Section 24.13 of the Zoning Ordinance.

S. The Project will not have a substantially detrimental effect upon or substantially impair the value of neighborhood property, as long as all of the standards and conditions of this approval of the Project are satisfied.

T. The Project is in compliance with all applicable Federal, State, County, and local laws and regulations. Any other permits for development that may be required by other agencies shall be available to the Township Board before construction is commenced.

U. A maximum of one driveway or street opening per existing public street frontage has been permitted, with a second driveway being permitted because it adjoins an adjacent development allowing shared access with another use.

V. The Project provides adequate accessibility for residential development with more than 24 dwelling units.

W. The Project satisfies the minimum open space of 20 percent required by the Zoning Ordinance.

X. The open space in the Project is large enough and properly dimensioned to contribute to the purpose and objectives of the PUD.

Y. The open space in the Project consists of contiguous land area which is restricted to non-development uses.

Z. The open space in the Project will remain under common ownership or control.

AA. The open space in the Project is set aside by means of conveyance that satisfies the requirements of Section 17.05.5.G of the Zoning Ordinance.

BB. The Project abuts a multiple family residential PUD district and a woodland and landscaped greenbelt will provide a sufficient obscuring effect and act as a transitional area.

CC. The Project is consistent with the goals and objectives of the Master Land Use Plan. Specifically, it is consistent with the Master Plan designation of the property in question.

7. The Planning Commission also finds the Project shall comply with the below additional conditions as well.

   A. Must obtain permits from all applicable agencies including the OCRC, Ottawa County Water Resources Commissioner, State of Michigan etc. Permits shall be obtained before building permits are issued.

B. The Developer shall enter into a PUD Contract with the Township, which will be drafted by the Township Attorney and approved by the Township Board prior to receiving a building permit.

C. A revised Open Space Conveyance shall be submitted and approved by the Township Attorney prior to the issuance of a building permit.

D. Any violation of the conditions constitutes a violation of the Zoning Ordinance, and in addition to the remedies provided therein, shall be cause for the Township Board to suspend or revoke any zoning or building permit applicable to the Project.

E. The right is reserved by the Township to impose additional conditions if reasonably necessary to achieve the purposes of the Zoning Ordinance.

F. The PUD approval is personal to the Developer and shall not be transferred by the Developer to a third party without the prior written consent of the Township.

G. Except as expressly modified, revised or altered by these conditions the Project shall be acquired, developed, and completed in conformance with the Zoning Ordinance, as amended, and all other applicable Township ordinances.

H. This approval is also conditioned upon the Developer meeting all applicable Federal, State, County and Township laws, rules and ordinances.

I. The Developer shall comply with all of the requirements of the Documentation, specifically including all of the notes contained thereon, and all of the representations made in the written submissions by the Developer to the Township for consideration of the Project.

J. In the event of a conflict between the Documentation and these conditions, these conditions shall control.

8. The Planning Commission finds that the Project complies with the uses permitted for a residential planned unit development, as described in Section 17.07.2.A of the Zoning Ordinance—Housing for the elderly.

CIENA HEALTHCARE

Background

Ciena Healthcare and its affiliated companies (collectively "Ciena") provide and manage healthcare services (skilled and short-term rehabilitation, home health and hospice), supply durable medical equipment and develop healthcare and specialty living environments.

There are 36 Ciena skilled nursing facilities in Michigan with over 5,800 employees. Ciena is in the process of constructing six new skilled nursing facilities in Michigan. The Regency at Grand Haven facility will be developed and managed by Ciena Healthcare.

Ciena is a privately held, for-profit company.

Questions and Answers:

Who will receive services/stay at the facility?

Persons eligible for skilled nursing care must have a physician order for skilled care and be 18 years old; although the facility will primarily provide services to patients and residents over the age of 60. The facility will provide short-term rehabilitation and long-term care.

See terminology attached.

How long do guests typically stay in the facility?

Short term rehabilitation (care that typically includes therapy for patients recovering from medical procedures such as knee and hip replacement, general surgery, etc.) averages a stay of about 1 to 3 weeks. Longer term residents that require assistance with daily living and 24-hour care reside at the facility for an average of 18 months.

Is assisted living provided?

No. All residents and patients require a physician order for skilled nursing services.

Is memory care provided?

Yes, however, there are no current plans to create a dedicated memory unit, yet this may change based on community need.

Is the facility state licensed?

Yes, the facility will be licensed as a skilled nursing facility by the Michigan Dept. of Licensing and Regulatory Affairs (LARA) with 113 beds and subject to the federal and state regulations applicable to nursing facilities, and Medicare and Medicaid providers.

Is a certificate of need required?

Yes. The project has an approved Certificate of Need (CON) for the skilled nursing beds issued by the State of Michigan.

Are there services provided to patients not staying in the facility?

No.

Describe the jobs to be created by this project.

The facility will employ approximately 120-140 employees when the facility is fully operational and resident/patient census has stabilized. Employees will work in 3 shifts.

Terminology

Assisted living

Housing for elderly or disabled people that provides 24-hour supervision, housekeeping and meals. Additional medical services such as nursing care may be available for purchase. Medicare and Medicaid generally do not cover the costs of assisted living care. Assisted living facilities can be licensed or unlicensed by the state. Assisted living facilities are not certified by Medicare or Medicaid.

Skilled nursing care

Provides organized nursing and medical treatments and 24-hour care to residents in addition to assistance with daily living activities, meals and housekeeping. Admission requires a physician's order following a hospital stay and required physician's involvement in directing the care provided by the licensed nursing staff. Skilled nursing facilities are required to be licensed by Michigan law. The costs of skilled nursing are covered by Medicare (for a period of time) and Medicaid eligible residents, if the facility is certified by the Centers for Medicare and Medicaid (CMS). Skilled nursing facilities are surveyed on an annual basis to determine if they are in compliance with a wide-scope of regulations that cover nearly every aspect of the services, environments and staff of a facility.

Short Term Rehabilitation

A short term stay at a skilled nursing facility that includes therapy services or other medical treatment with the goal of discharging the patient back to the previous living arrangement. Typical lengths of stay are between 10-15 days but can be several months.

Memory Care

A distinct form of assisted living or long-term skilled nursing that specifically caters to patients with Alzheimer's disease, dementia and other types of memory problems. Improvement within 2 to 3 months after initial treatment.

Independent Living

A living arrangement for residents (tenants) with ability to be independent that offers certain services such as meals, housekeeping and activities. This is not a licensed product.

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ROO
ADM
ACTIV
CAFE

EXIT
EXIT
CARTS

NuStep

FINAL SITE PLANS FOR

CIENA REGENCY AT GRAND HAVEN

PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T8N, R16W

GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DEVELOPER:

GRAND HAVEN SENIOR LEASING, LLC
4000 TOWN CENTER, SUITE 700
SOUTHFIELD, MI 48075

ARCHITECT:

NSA ARCHITECTS, ENGINEERS, PLANNERS
23761 RESEARCH DRIVE
FARMINGTON HILLS, MI 48335
CONTACT: ROY BAKER, AIA, NCARB
PHONE: (248) 477–2444
EMAIL: RBAKER@NSA–AE.COM

CIVIL ENGINEER:

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BRIGHTON, MI 48116
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FAX: (517) 546–8973
EMAIL: SPERUSKI@PEAINC.COM

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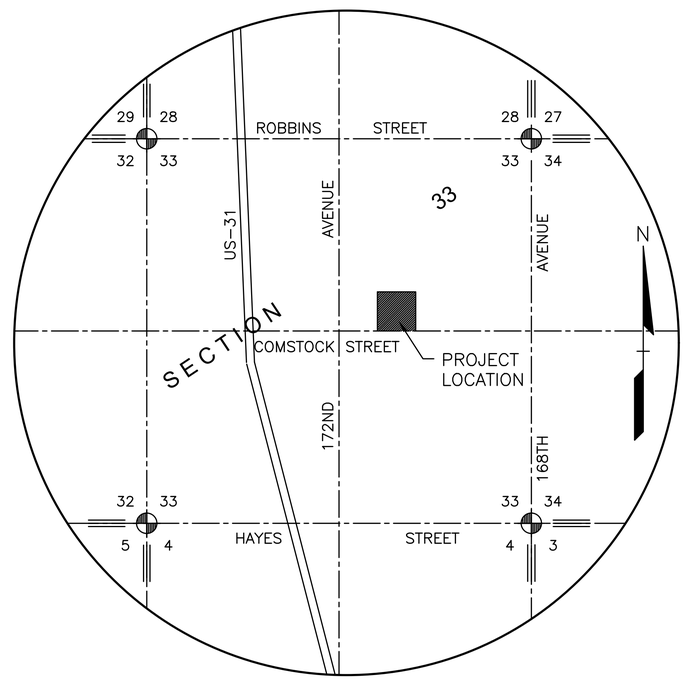
KENNETH WEIKAL LANDSCAPE ARCHITECTURE
33203 BIDDESTONE LANE
FARMINGTON HILLS, MI 48334
CONTACT: KEN WEIKAL
PHONE: (248) 477–3600
CELL: (313) 820–2311



LOCATION MAP
NO SCALE

INDEX OF DRAWINGS:

COVER	COVER SHEET
C–1.0	OVERALL TOPOGRAPHIC SURVEY
C–1.1	TOPOGRAPHIC SURVEY
C–2.0	DEMOLITION PLAN
C–3.0	OVERALL SITE PLAN
C–3.1	DIMENSION AND PAVING PLAN
C–4.0	GRADING PLAN
C–4.1	GRADING DETAIL
C–5.0	SOIL EROSION CONTROL PLAN
C–6.0	UTILITY PLAN
C–6.1	ROOF LEAD PLAN
C–7.0	UTILITY PROFILES
C–8.0	STORM WATER MANAGEMENT PLAN
C–8.1	DRAINAGE AREA PLAN
C–9.0	SITE DETAILS
C–9.1	BARRIER FREE SITE DETAILS
C–10.0	CONSTRUCTION DETAILS
C–10.1	CONSTRUCTION DETAILS
C–10.2	CONSTRUCTION DETAILS

ARCHITECTURAL PLANS BY NSA:

A–100	OVERALL FLOOR PLAN
A–201	EXTERIOR ELEVATIONS
A–202	EXTERIOR ELEVATIONS
A–203	EXTERIOR ELEVATIONS
A–204	EXTERIOR ELEVATIONS
A–205	ARCHITECTURAL SITE PLAN AND SITE DETAILS
A–300	SITE SIGNAGE
E–1	SITE LIGHTING PHOTOMETRICS AND DETAILS

LANDSCAPE PLANS BY HAGENBUCH WEIKAL LANDSCAPE ARCHITECTURE

L–100	COVER SHEET
L–101	HARDSCAPE LAYOUT PLAN
L–102	HARDSCAPE LAYOUT PLAN
L–103	HARDSCAPE LAYOUT PLAN
L–104	HARDSCAPE LAYOUT PLAN
L–301	SITE PLANTING PLAN
L–302	CALCULATIONS, PLANT LISTS & DETAILS
L–310	ENTRANCE PLANS
L–311	WEST INTERIOR COURTYARD PLANS
L–312	EAST INTERIOR COURTYARD PLANS
L–313	EXTERIOR COURTYARD PLANS
L–601	SPECIFICATIONS
L–602	SPECIFICATIONS
L–603	SPECIFICATIONS
L–604	SPECIFICATIONS
L–605	SPECIFICATIONS
L–606	SPECIFICATIONS
L–607	STANDARDS
L–608	STANDARDS

PROJECT NARRATIVE:

GRAND HAVEN SENIOR LEASING, LLC IS PROPOSING TO CONSTRUCT A NEW 120 BED, 73,796 S.F. SKILLED NURSING FACILITY IN GRAND HAVEN TOWNSHIP, EAST OF 172ND AVENUE AT 17049 COMSTOCK STREET. THE 8.25 ACRE PARCEL IS CURRENTLY ZONED AGRICULTURAL AND IS PROPOSED TO BE DEVELOPED UNDER THE TOWNSHIP REQUIREMENTS FOR PUD–RESIDENTIAL.

THE APPLICANT HAS STRIVED TO MEET AS MANY OF THE PUD–RESIDENTIAL REQUIREMENTS IN THE ORDINANCE. BELOW IS A LIST OF DEPARTURES FROM THE ORDINANCE THAT THE APPLICANT IS REQUESTING AS A CONDITION OF APPROVAL OF THIS FINAL SITE PLAN.

1. 19.07.28.E: 75' MINIMUM FRONT SETBACK REQUIREMENT; THE APPLICANT IS REQUESTING A DEPARTURE FROM THE REQUIREMENT (41.43' PROPOSED FRONT SETBACK) DUE TO EXISTING REGULATED WETLANDS IN THE NORTHERN PORTION OF THE SITE. IN ORDER TO MEET THE SETBACK REQUIREMENT, THE APPLICANT WOULD HAVE TO DISTURB AND REMOVE A SIGNIFICANT PORTION THE WETLANDS.

2. 19.07.28.H: OFF–STREET PARKING SHALL BE IN THE SIDE OR REAR YARDS: THE APPLICANT IS REQUESTING TWENTY (23) STANDARD PARKING SPACES AND SIX (6) ACCESSIBLE PARKING SPACES BE ALLOWED IN FRONT OF THE BUILDING. DUE THE PRESENCE OF EXISTING WETLANDS IN THE NORTHERN PORTION OF THE SITE, ESTABLISHING PARKING IN THE REAR OF THE BUILDING WOULD WOULD REQUIRE WETLAND DISTURBANCE AND REMOVAL.

3. 17.05.4.A–B: SITE IS LIMITED TO ONE DRIVEWAY: THE APPLICANT IS REQUESTING TWO DRIVEWAYS BE ALLOWED DUE TO: THE CONFIGURATION OF THE PROPOSED BUILDING, MANEUVERING AREAS REQUIRED FOR DELIVERIES AND EMERGENCY VEHICLES AND THE PRESENCE OF EXISTING WETLANDS THAT HINDER SITE CIRCULATION.

NOT FOR CONSTRUCTION

XREF: S:\PROJECTS\2016\2016–199\DWG\TOPOBASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–BASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–TBLK–16199.DWG

REVISIONS

No.	BY	CHK	DESCRIPTION	DATE
5	SAP	SAP	REV. PER TWP. PC MEETING	7-31-17
4	SAP	SAP	REV. PARCELS & OPEN SPACE	
3	RJ.S	SP	REVISED PER TWP.	6-29-17
2	RJ.S		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60666
LICENSED PROFESSIONAL ENGINEER

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

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FARMINGTON HILLS, MI 48335

COVER SHEET
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

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ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: N/A

DRAWING NUMBER:
COVER

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

BM #2
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 300 FEET WEST OF EAST PARCEL LINE.
ELEV. – 604.33

PROPERTY DESCRIPTION:

(PER GOWER PROFESSIONAL SURVEYING, P.C.)

ORIGINAL PARENT DESCRIPTIONS

PARCEL 1:
Parcel ID: 70–03–33–200–029
The South one–half (S 1/2) of the South one–half (S 1/2) of the Southwest one–quarter (SW 1/4) of the Northeast one–quarter (NE 1/4) of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

PARCEL 2:
Parcel ID: 70–03–33–200–028
The South 1/2 of the North 1/2 of the South 1/2 of the Southwest 1/4 of the Northeast 1/4 of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

LEGEND

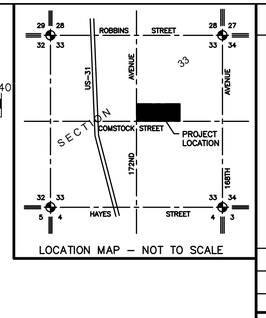
- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

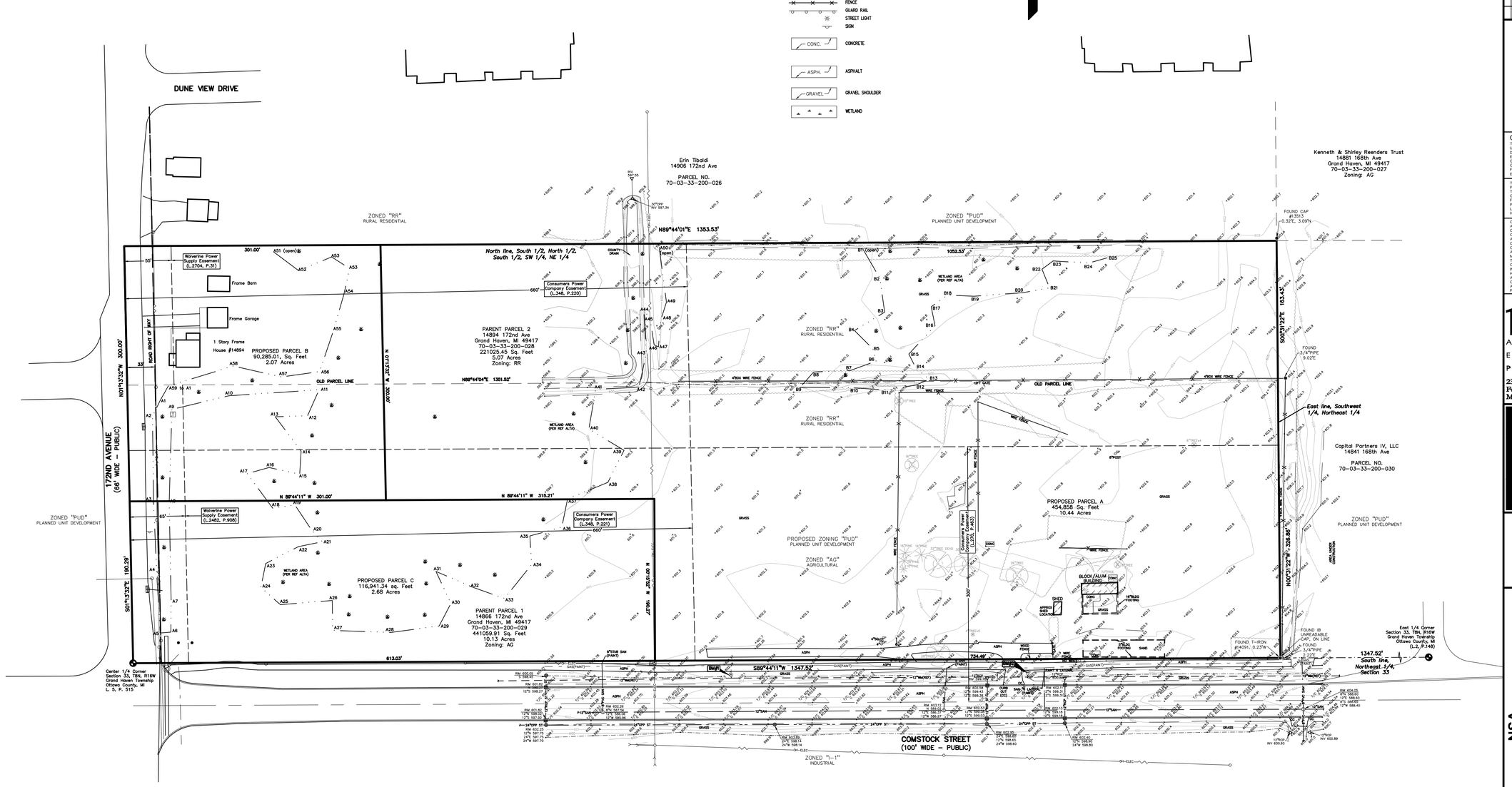
- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- 816.06 SPOT ELEVATION
- 670 CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONC. CONCRETE
- ASPH. ASPHALT
- GRAVEL GRAVEL SHOULDER
- WETLAND

N

GRAPHIC SCALE
–60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.



LOCATION MAP – NOT TO SCALE



NOT FOR CONSTRUCTION

REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016–199\DWG\TOPOBASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–BASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–TBLK–16199.DWG

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	
3	SP		REVISED PLAN	6-29-17
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

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f: 248.689.1044
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FARMINGTON HILLS, MI 48335

OVERALL TOPOGRAPHIC SURVEY
REGENCY AT GRAND HAVEN TWP.

PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	DN.	SP	SUR.	KTR	P.M.	RLS

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ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 60'

DRAWING NUMBER:
C-1.0

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

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(PER GOWER PROFESSIONAL SURVEYING, P.C.)

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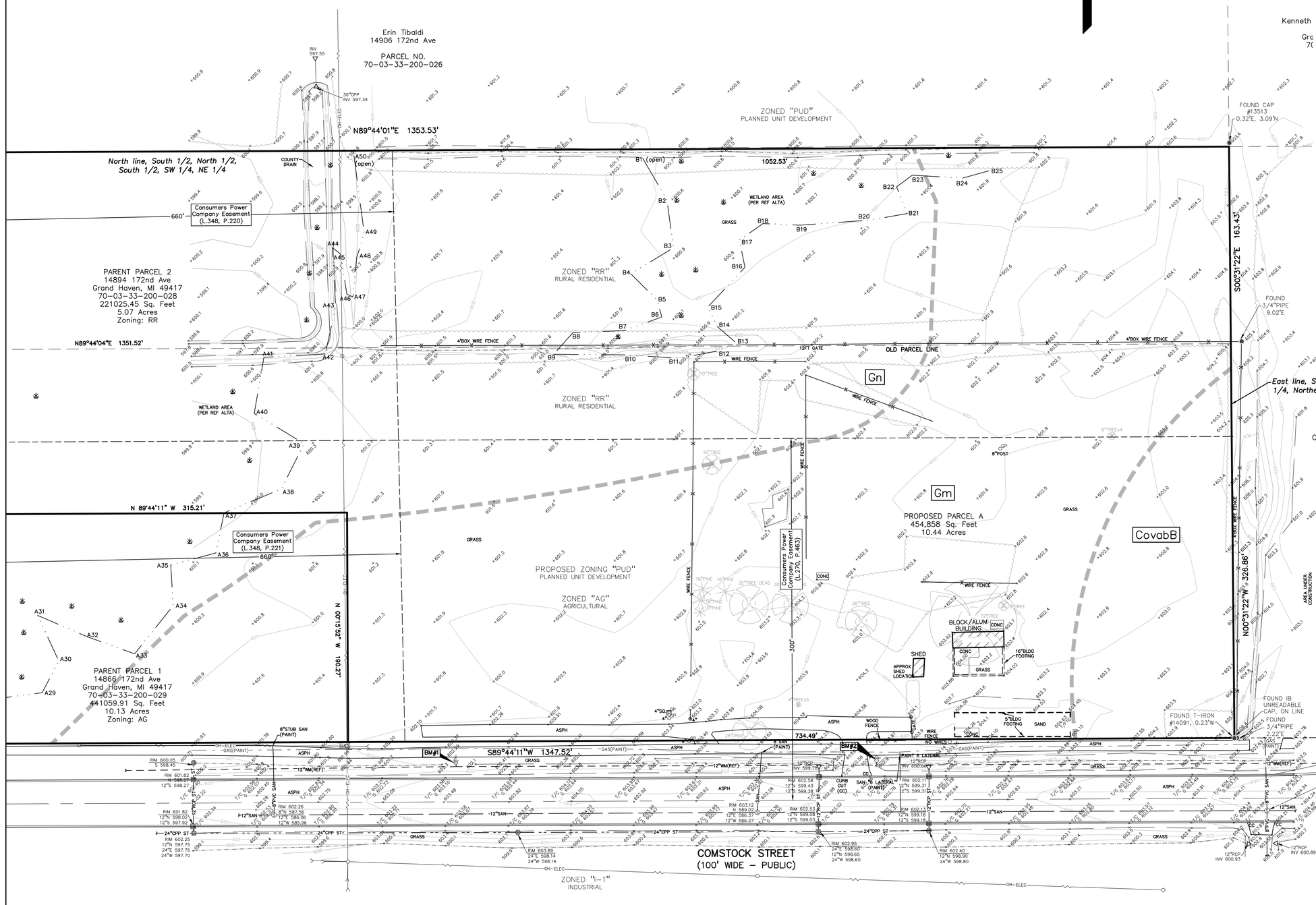
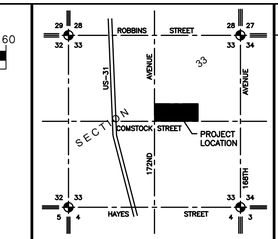
The South one–half (S 1/2) of the South one–half (S 1/2) of the Southwest one–quarter (SW 1/4) of the Northeast one–quarter (NE 1/4) of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

PARCEL 2:
Parcel ID: 70–03–33–200–028
The South 1/2 of the North 1/2 of the South 1/2 of the Southwest 1/4 of the Northeast 1/4 of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

GRAPHIC SCALE
–40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

ON-SITE SOILS:
Gm – GRANBY LOAMY SAND
CovabB – COVERT–PIPESTONE SANDS (0%–6% SLOPES)
Gn – GRANBY FINE SANDY LOAM





LOCATION MAP – NOT TO SCALE

LEGEND

IRON FOUND
IRON SET
NAIL FOUND
NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND
MONUMENT SET
SEC. CORNER FOUND
R RECORDED
M MEASURED
C CALCULATED

EXISTING

OH–ELEC	ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
UG–CATV	UNDERGROUND CABLE TV, CATV PEDESTAL
UG–PHONE	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
UG–ELEC	ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
GAS	GAS MAIN, VALVE & GAS LINE MARKER
W	WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
S	SANITARY SEWER, CLEANOUT & MANHOLE
D	STORM SEWER, CLEANOUT & MANHOLE
C	COMBINED SEWER & MANHOLE
	SQUARE, ROUND & BEEHIVE CATCH BASIN
	POST INDICATOR VALVE
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
M T T	MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
?	UNIDENTIFIED STRUCTURE
816.06	SPOT ELEVATION
670	CONTOUR LINE
	FENCE
	GUARD RAIL
	STREET LIGHT
	SIGN
CONC.	CONCRETE
ASPH.	ASPHALT
GRAVEL	GRAVEL SHOULDER
	WETLAND

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016–199\DWG\TOPOBASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–BASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–TBLK–16199.DWG

REVISIONS

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	
3	SAP		REV. PER PLAN REVIEW	6-29-17
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

CAUTION!!
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TOPOGRAPHIC SURVEY
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	DN.	CK.	SUR.	P.M.	R.L.S.
SP	SP		KTR		

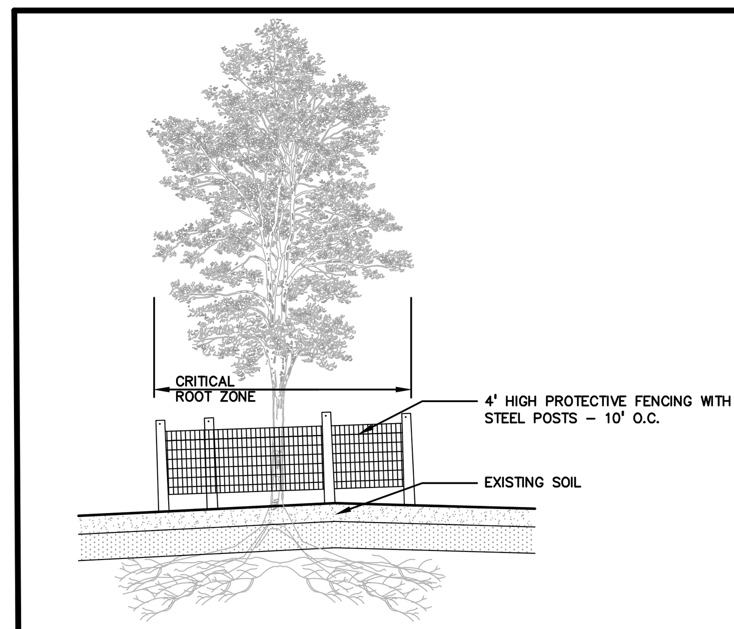
S:\PROJECTS\2016\2016-199 CEDA, GRAND HAVEN, TWP-SAS\dwg\Construction\(C-1) TOPO-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER:
C-1.1



TREE PROTECTION DETAIL
NOT TO SCALE

TREE PROTECTION WILL BE ERECTED PRIOR TO START OF CONSTRUCTION ACTIVITIES AND SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.

NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO REMAIN;INCLUDING, BUT NOT LIMITED TO PLACING SOLVENTS, BUILDING MATERIAL, CONSTRUCTION EQUIPMENT OR SOIL DEPOSITS WITHIN DRIP LINES.

GRADE CHANGES MAY NOT OCCUR WITHIN THE DRIP LINE OF PROTECTED TREES.

DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY DEVICE OR WIRE TO ANY REMAINING TREE.

ALL UTILITY SERVICE REQUESTS MUST INCLUDE NOTIFICATION TO THE INSTALLER THAT PROTECTED TREES MUST BE AVOIDED. ALL TRENCHING SHALL OCCUR OUTSIDE OF THE PROTECTIVE FENCING.

TREES LOCATED ON ADJACENT PROPERTY THAT MAY BE AFFECTED BY CONSTRUCTION ACTIVITIES MUST BE PROTECTED.

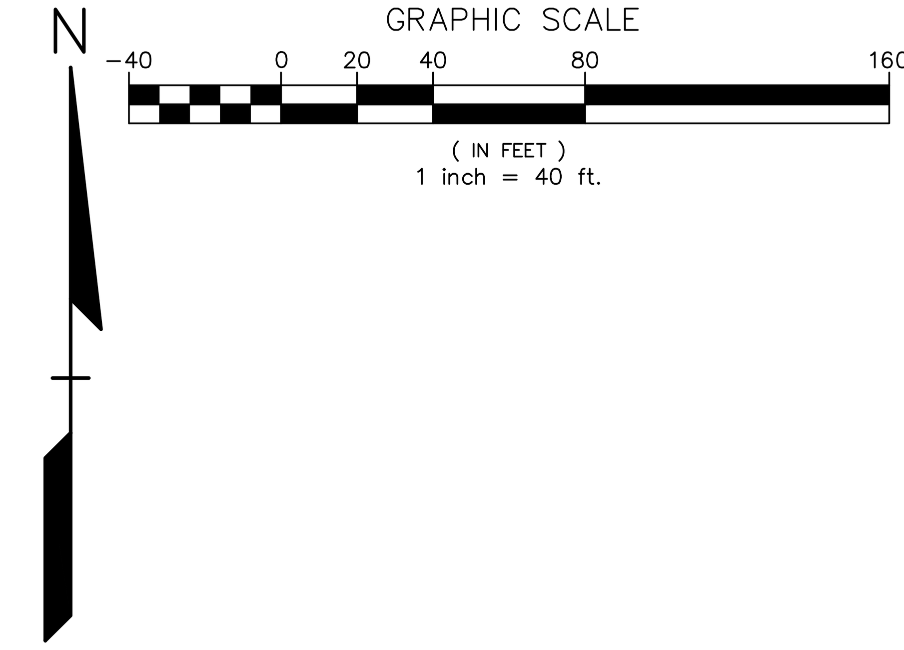
TREES TO BE PRESERVED SHALL BE IDENTIFIED WITH FLAGGING PRIOR TO THE TREE CLEARING OPERATIONS.

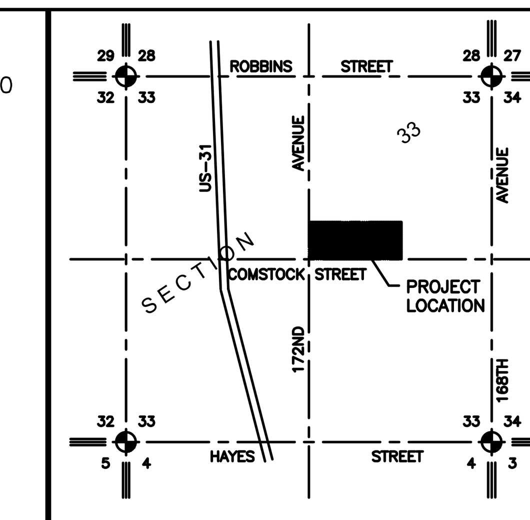
PROVIDE FENCE AROUND CRITICAL ROOT ZONE OF TREE.

FENCE SHALL BE PLACED IN A CIRCLE WITH A RADIUS OF 1' PER 1" DIAMETER OF THE TREE MEASURED AT 4.5' ABOVE GROUND.

DEMOLITION LEGEND:

- ITEM TO BE PROTECTED
- ITEM TO BE REMOVED
- CURB/FENCE REMOVAL
- CONCRETE PAVEMENT AND SIDEWALK REMOVAL
- AREA OR ITEMS TO BE REMOVED
- REMOVE SWALE
- ASPHALT REMOVAL
- TREE REMOVAL
- SAWCUT LINE





LOCATION MAP – NOT TO SCALE

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	
3	RLS		HFES PRELIMINARY	6-29-17
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE
- ASPHALT
- WETLAND

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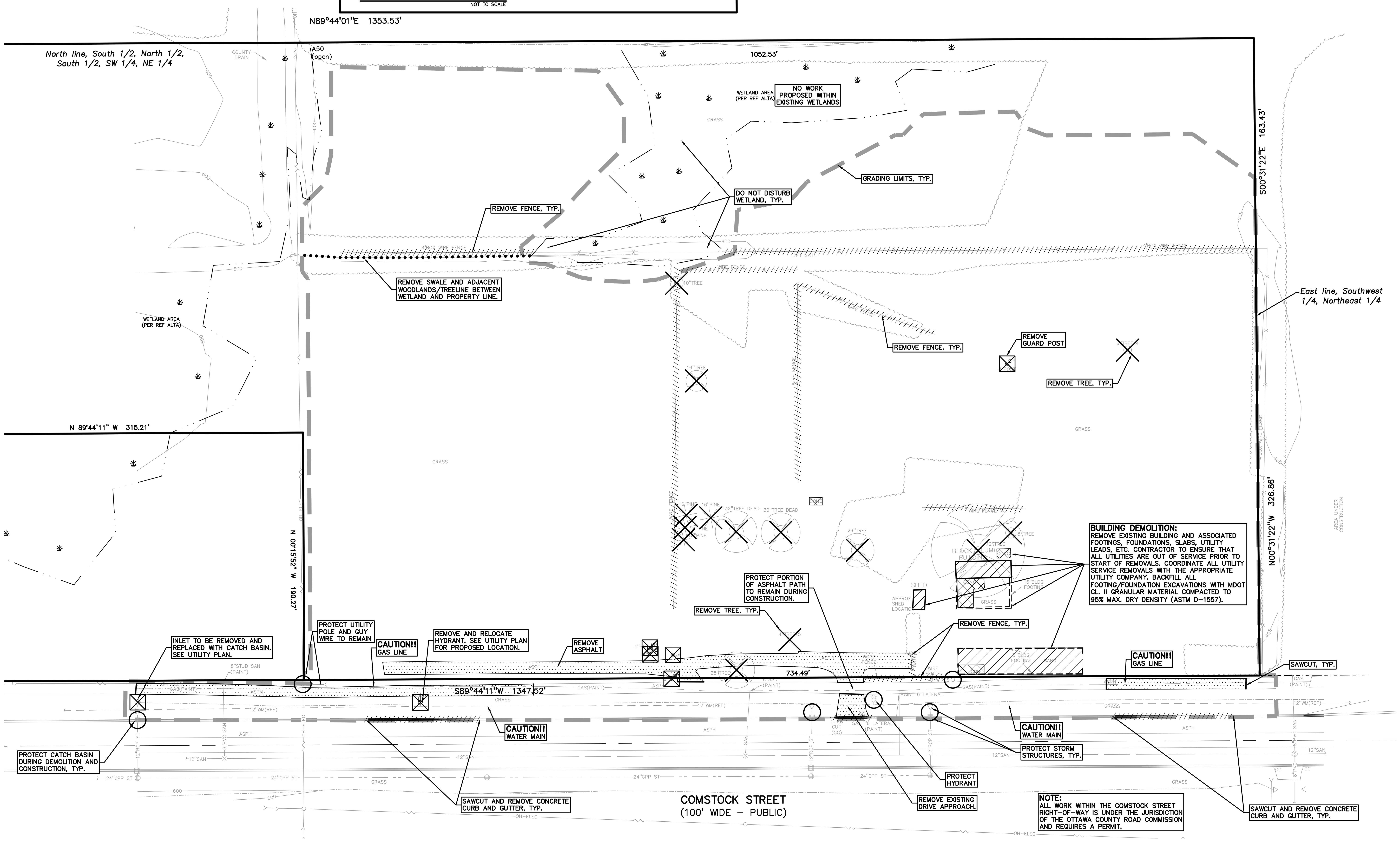

GENERAL DEMOLITION NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT:

1. ALL MATERIAL TO BE REMOVED, WHETHER SPECIFICALLY NOTED IN THE PLANS OR NOT, SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO ON-SITE BURY OR BURN PITS SHALL BE ALLOWED.
2. ALL DEMOLITION WORK SHALL CONFORM TO ALL LOCAL CODES AND ORDINANCES.
3. STAGING/PHASING OF DEMOLITION AND CONSTRUCTION IS TO BE COORDINATED WITH THE OWNER AND THE CONTRACTOR PRIOR TO CONSTRUCTION.
4. SPECIFIC DEMOLITION ITEMS HAVE BEEN INDICATED ON THE PLANS AS A GUIDE TO THE GENERAL SCOPE OF THE WORK. IT IS THE INTENT THAT THESE ITEMS SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR ABOVE AND BELOW GROUND, UNLESS SPECIFICALLY NOTED OTHERWISE, AND THAT DEMOLITION WILL INCLUDE BUT WILL NOT NECESSARILY BE LIMITED TO THESE ITEMS. CONTRACTOR SHALL VISIT SITE TO VERIFY EXISTING CONDITIONS AND EXTENTS OF THE DEMOLITION THAT WILL BE REQUIRED PRIOR TO SUBMITTING A BID.
5. REMOVE ALL STRUCTURES DESIGNATED FOR REMOVAL ACCORDING TO THE DEMOLITION PLAN. THIS INCLUDES FOUNDATIONS, FOOTINGS, FOUNDATION WALLS, FLOOR SLABS, UNDERGROUND UTILITIES, CONCRETE, ASPHALT, TREES, ETC.
6. REFER TO THIS SHEET FOR TREE PROTECTION DETAILS.
7. THE CONTRACTOR SHALL, AS A MINIMUM, PROVIDE TREE PROTECTION FENCING AROUND EXISTING TREES TO BE SAVED THAT ARE WITHIN 15' OF CONSTRUCTION ACTIVITIES AND AS INDICATED IN THE PLANS OR PER LOCAL AGENCY REQUIREMENTS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEAN UP, NOISE, DUST CONTROL, STREET SWEEPING AND HOURS OF OPERATION IN ACCORDANCE WITH THE LOCAL CODES.
9. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BARRICADES, SIGNAGE, MARKINGS, LIGHTS AND OTHER TRAFFIC CONTROL DEVICES TO PROTECT THE WORK ZONE AND SAFELY MAINTAIN TRAFFIC PER AGENCY REQUIREMENTS AND IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) LATEST EDITION.
10. THE CONTRACTOR SHALL CONTACT THE APPROPRIATE UTILITY COMPANIES TO CONFIRM THAT UTILITY LEADS HAVE BEEN TAKEN OUT OF SERVICE PRIOR TO DEMOLITION.
11. ALL BUILDING GAS LEADS, METERS AND ASSOCIATED EQUIPMENT SHALL BE REMOVED AS SHOWN ON THE PLANS. COORDINATE ALL ASSOCIATED WORK WITH THE APPROPRIATE UTILITY COMPANY.
12. REMOVE ALL OVERHEAD AND UNDERGROUND ELECTRICAL LINES WITHIN THE AREA OF CONSTRUCTION AS SHOWN ON THE PLANS. COORDINATE SHUTDOWNS AND REMOVALS WITH DETROIT EDISON OR THE APPROPRIATE UTILITY COMPANY. (NOTE: PHONE AND CABLE T.V. SERVICES MAY ALSO BE LOCATED ON OVERHEAD LINES.)
13. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF SIGNS AND SUPPORTS WITHIN THE WORK AREA, AS NECESSARY TO FACILITATE CONSTRUCTION. SIGNS SHALL BE PROTECTED OR STOCKPILED FOR REUSE AS SPECIFIED IN THE PLANS OR AS REQUIRED BY THE AGENCY OF JURISDICTION. THE CONTRACTOR SHALL REPLACE ANY DAMAGED SIGNS AND SUPPORTS AT NO ADDITIONAL COST TO THE OWNER.
14. THE CONTRACTOR SHALL NOTIFY MISS DIG, THE TOWNSHIP ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

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Michigan 48335

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23761 RESEARCH DRIVE
FARMINGTON HILLS, MI 48335

DEMOLITION PLAN
REGENCY AT GRAND HAVEN TWP.

PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAS\Dwg\Construction\(C-2.0) DEMO-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER:
C-2.0

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
XREF: S:PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-BASE-16199.DWG
XREF: S:PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-TBLK-16199.DWG

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

BM #2
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 300 FEET WEST OF EAST PARCEL LINE.
ELEV. – 604.33

PROPERTY DESCRIPTION:

(PER GOWER PROFESSIONAL SURVEYING, P.C.)

ORIGINAL PARENT DESCRIPTIONS

PARCEL 1:
Parcel ID: 70–03–33–200–029
The South one–half (S 1/2) of the South one–half (S 1/2) of the Southwest one–quarter (SW 1/4) of the Northeast one–quarter (NE 1/4) of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

PARCEL 2:
Parcel ID: 70–03–33–200–028
The South 1/2 of the North 1/2 of the South 1/2 of the Southwest 1/4 of the Northeast 1/4 of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

LEGEND

IRON FOUND
IRON SET
NAIL FOUND
NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND
MONUMENT SET
SEC. CORNER FOUND
R RECORDED
M MEASURED
C CALCULATED

EXISTING / PROPOSED

ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
UNDERGROUND CABLE TV, CATV PEDESTAL
TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
GAS MAIN, VALVE & GAS LINE MARKER
WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
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816.06 SPOT ELEVATION
CONTOUR LINE
FENCE
GUARD RAIL
STREET LIGHT
SIGN
CONC. CONCRETE
ASPH. ASPHALT
WETLAND

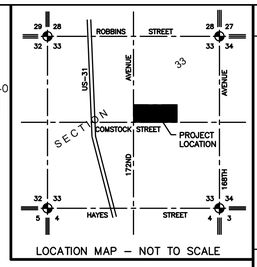
C.O. V.O. 671.21 671 STD DUTY HEAVY DUTY STD DUTY

REFERENCE DRAWINGS

COMSTOCK STREET PLANS — PREIN & NEWHOF, PGS 6–8 OF 13, 2009
PIPER LAKES PLANS — PROGRESSIVE AE, PG. C–201, 2014

N

GRAPHIC SCALE
–60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.



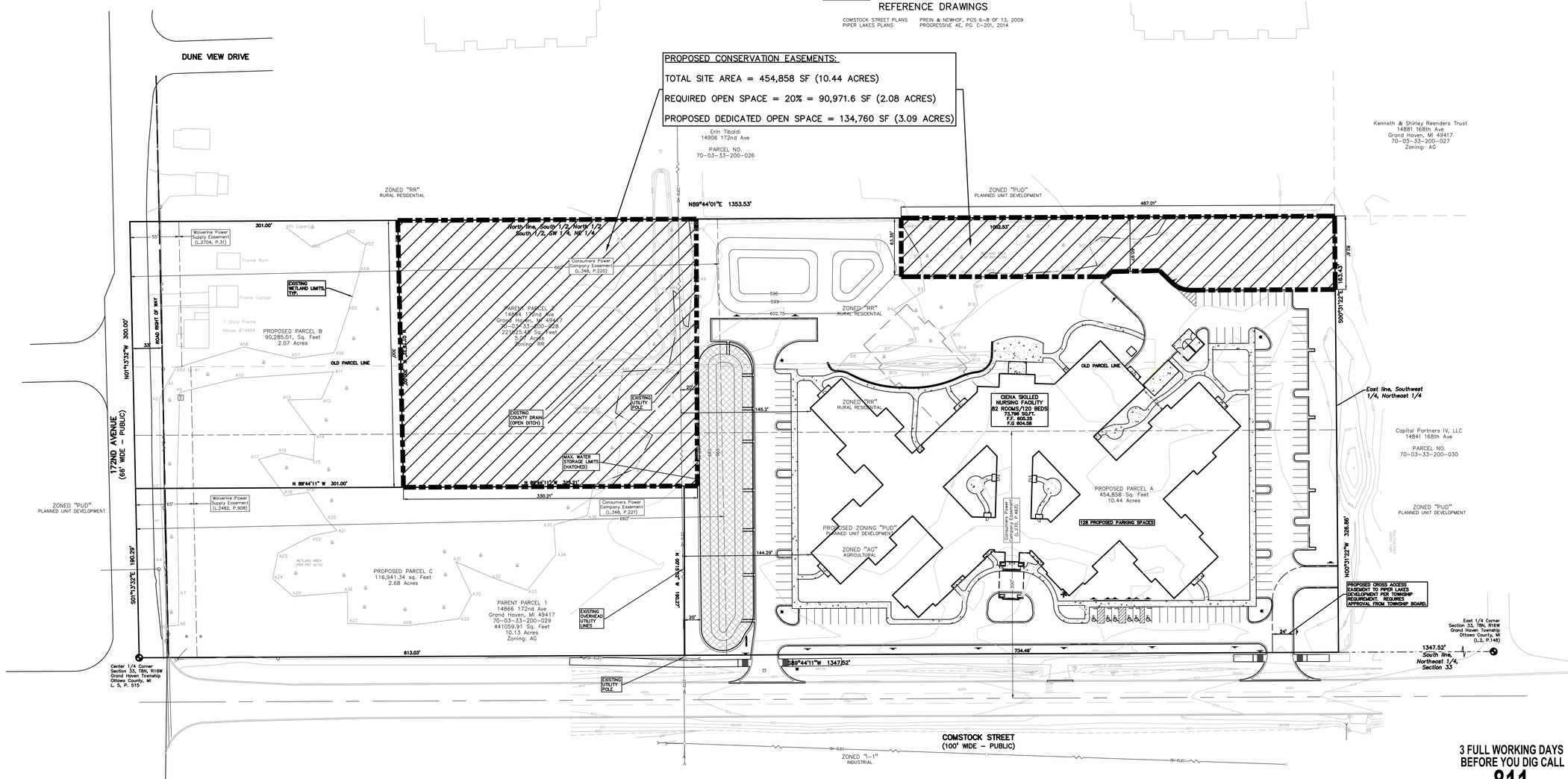
LOCATION MAP – NOT TO SCALE

PROPOSED CONSERVATION EASEMENTS:

TOTAL SITE AREA = 454,858 SF (10.44 ACRES)

REQUIRED OPEN SPACE = 20% = 90,971.6 SF (2.08 ACRES)

PROPOSED DEDICATED OPEN SPACE = 134,760 SF (3.09 ACRES)



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NOT FOR CONSTRUCTION

REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016–199\DWG\TOPOBASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–BASE–16199.DWG
XREF: S:\PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–TBLK–16199.DWG

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	
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REVISIONS

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OVERALL SITE PLAN
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	DN.	CHK.	P.M.
SP	SP	SUR. KTR	RLS

S:\PROJECTS\2016\2016–199 CIENA GRAND HAVEN TWP–SAP\Dwg\Construction\(C–3.0) OVERALL SITE–16199–10.44 acres.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 60'

DRAWING NUMBER:
C-3.0

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

BM #2
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 300 FEET WEST OF EAST PARCEL LINE.
ELEV. – 604.33

GENERAL NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT.

1. ALL DIMENSIONS SHOWN ARE TO BACK OF CURB, FACE OF SIDEWALK, OUTSIDE FACE OF BUILDING, PROPERTY LINE, CENTER OF MANHOLE/CATCH BASIN OR CENTERLINE OF PIPE UNLESS OTHERWISE NOTED.

2. REFER TO SHEETS C–9.0 THROUGH C–10.2 FOR ON–SITE PAVING DETAILS.

3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH GRAND HAVEN TOWNSHIP AND OTTAWA COUNTY CURRENT STANDARDS AND REGULATIONS.

4. THE CONTRACTOR SHALL NOTIFY THE GRAND HAVEN TOWNSHIP ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION 3 BUSINESS DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

5. ANY WORK WITHIN THE COMSTOCK STREET RIGHT–OF–WAY SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE OTTAWA COUNTY ROAD COMMISSION AND SHALL NOT BEGIN UNTIL ALL NECESSARY PERMITS HAVE BEEN ISSUED FOR THE WORK.

6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADJUST THE TOP OF ALL EXISTING AND PROPOSED STRUCTURES (MANHOLES, CATCH BASINS, INLETS, GATE WELLS ETC.) WITHIN GRADED AND /OR PAVED AREAS TO FINAL GRADE SHOWN ON THE PLANS. ALL SUCH ADJUSTMENTS SHALL BE INCIDENTAL TO THE JOB AND WILL NOT BE PAID FOR SEPARATELY.

SIGN LEGEND:

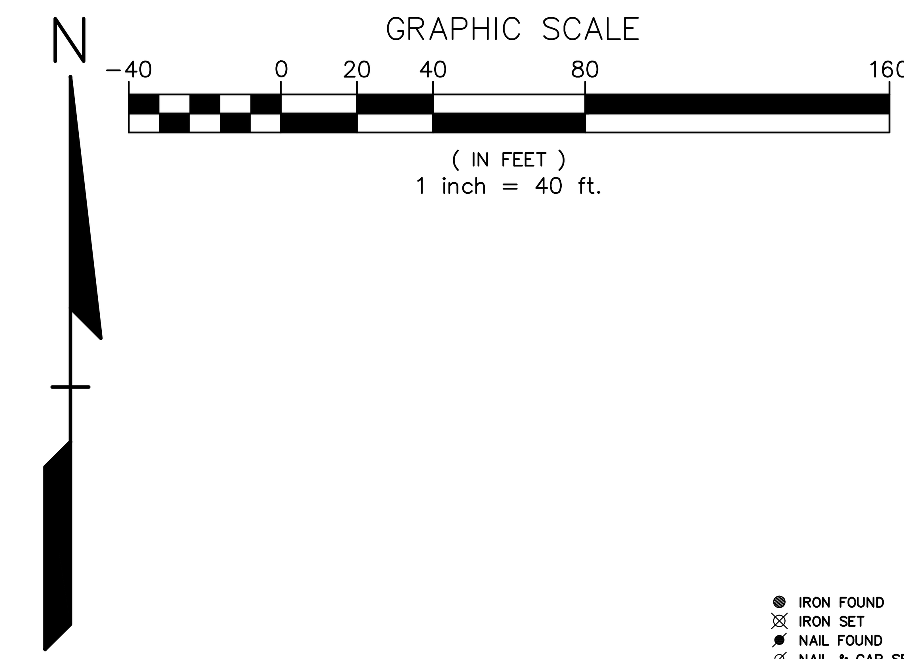
'STOP' SIGN	2
'BARRIER FREE PARKING' SIGN	3
'VAN ACCESSIBLE' SIGN	4
'NO PARKING FIRE LANE'	5

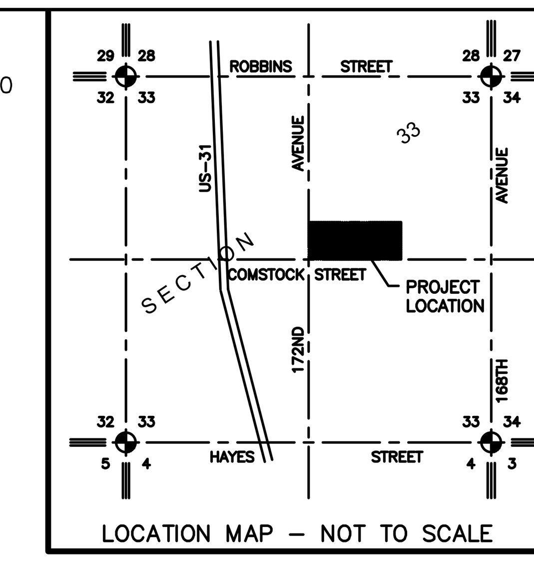
REFER TO SHEET C–9.0 AND C–9.1 FOR SIGN DETAILS

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'	Ⓡ
SIDEWALK RAMP 'TYPE P'	Ⓟ

REFER TO LATEST M.D.O.T. R–28 STANDARD RAMP AND DETECTABLE WARNING DETAILS. REFER TO SHEET C–10.2.

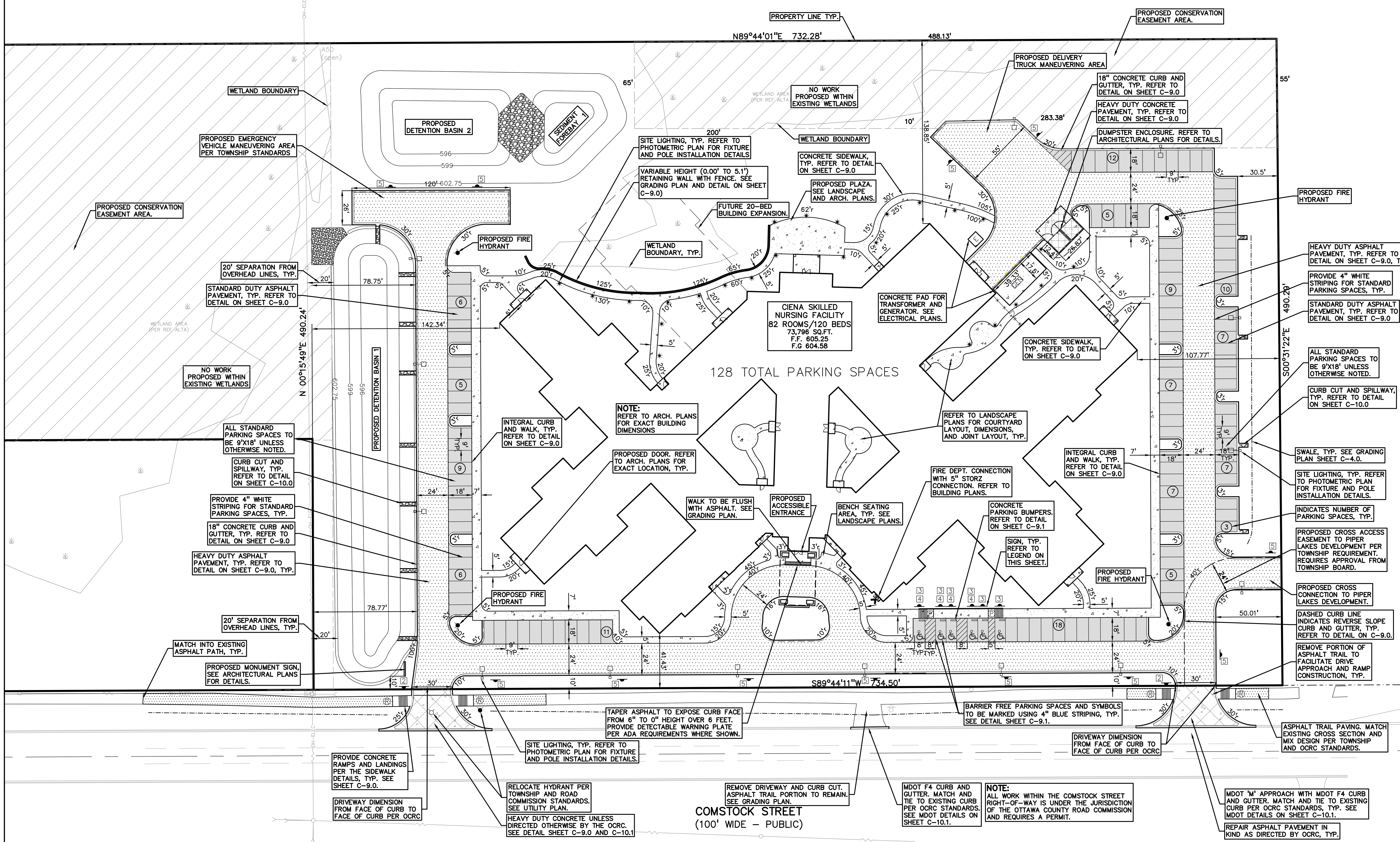




LOCATION MAP – NOT TO SCALE

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	6-29-17
3	RLS		HFES PRELIMINARY	
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS



LEGEND

IRON FOUND	BRASS PLUG SET	SEC. CORNER FOUND
IRON SET	MONUMENT FOUND	R RECORDED
NAIL FOUND	MONUMENT SET	M MEASURED
NAIL & CAP SET		C CALCULATED

EXISTING / PROPOSED

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION (816.06 / 671.21)
- CONTOUR LINE (670 / 671)
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE (CONC.) — STD DUTY / HEAVY DUTY
- ASPHALT (ASPH.) — STD DUTY
- WETLAND

REFERENCE DRAWINGS

COMSTOCK STREET PLANS	PREIN & NEWHOF, PGS 6–8 OF 13, 2009
PIPER LAKES PLANS	PROGRESSIVE AE, PG. C–201, 2014

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60666
LICENSED PROFESSIONAL ENGINEER

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2430 Rochester Ct, Ste 100
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SITE DATA TABLE:

SITE AREA: 10.44 ACRES (454,858 SQ.FT.) NET AND GROSS

ZONING: AG (AGRICULTURAL)

PROPOSED USE: PUD–RESIDENTIAL (CONVALESCENT HOME)

BUILDING INFORMATION:
MAXIMUM ALLOWABLE BUILDING HEIGHT = 35 FEET (2.5 STORIES)
PROPOSED BUILDING HEIGHT = 1 STORY

BUILDING FOOTPRINT AREA = 73,796 SQ.FT.

BUILDING LOT COVERAGE = 16%

SETBACK REQUIREMENTS:

PUD–RESIDENTIAL ZONING DISTRICT:

FRONT SETBACK:	75 FEET REQUIRED	41.43' PROVIDED
SIDE SETBACK TOTAL : (BOTH SIDES)	75 FEET REQUIRED	250.11' PROVIDED
REAR SETBACK:	75 FEET REQUIRED	138.85' PROVIDED
PARKING SETBACK	10 FEET SIDEYARD	10.00' PROVIDED

PARKING CALCULATIONS:
CONVALESCENT/NURSING HOME = 1 SPACE PER 2 BEDS.

CONVALESCENT/NURSING HOME =120 BEDS. 120 BEDS/2 + 20 FUTURE BEDS/2 = 70 SPACES REQUIRED

TOTAL PROPOSED PARKING SPACES = 128 SPACES INC. 6 H/C SPACES ACCOUNTS FOR 87 EMPLOYEES MAXIMUM PER SHIFT

LOADING CALCULATIONS:
LOADING REQUIRED = 1 SPACE

LOADING PROVIDED = 1 SPACE

OPEN SPACE:
MINIMUM OPEN SPACE REQUIRED = 20% (90,971.6 SF)
PROVIDED OPEN SPACE = 29.6% (134,760 SF)

TRANSITION AREA REQUIREMENTS:
TYPE '2' PROVIDED – "WOODLANDS, NATURAL FEATURES OR LANDSCAPE GREENBELT SUFFICIENT TO PROVIDE AN OBSCURING EFFECT.

SITE SOILS INFORMATION:
ACCORDING TO THE USDA NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY FOR THE NURSING HOME SITE CONSISTS OF THE FOLLOWING SOIL TYPES:

Gn – GRANBY FINE SANDY LOAM
Gm – GRANBY LOAMY SAND

PARKING LOT LANDSCAPING: (SF REQUIRED PROVIDED BY TOWNSHIP)

WEST: REQUIRED: 656 SF (4 ISLANDS 150 SF MIN. PER ISLAND)
PROVIDED: 4 ISLANDS; TOTAL 667 SF

EAST: REQUIRED: 990 SF (6 ISLANDS 150 SF MIN. PER ISLAND)
PROVIDED: 9 ISLANDS; TOTAL 1,708 SF

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REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:PROJECTS\2016\2016–199\DWG\TOPOBASE–16199.DWG
XREF: S:PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–BASE–16199.DWG
XREF: S:PROJECTS\2016\2016–199\DWG\CONSTRUCTION\X–TBLK–16199.DWG

NOT FOR CONSTRUCTION

NSA
23761 RESEARCH DRIVE
FARMINGTON HILLS, MI 48335

DIMENSION AND PAVING PLAN
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

S:\PROJECTS\2016\2016–199 CIENA GRAND HAVEN TWP–SAS\Dwg\Construction\(C–3.1) DIM–16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER:
C-3.1

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

BM #2
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 300 FEET WEST OF EAST PARCEL LINE.
ELEV. – 604.33

GENERAL GRADING AND EARTHWORK NOTES:

THESE NOTES APPLY TO ALL CONSTRUCTION ACTIVITIES ON THIS PROJECT

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING TREES AND BRUSH AND REMOVE ALL THAT ARE NECESSARY TO GRADE SITE.
2. ALL GRADES ARE TO TOP OF PAVEMENT OR FINISHED GRADE UNLESS OTHERWISE NOTED.
3. THE STAGING OF CONSTRUCTION ACTIVITIES SHALL OCCUR ONLY WITHIN THE SITE BOUNDARIES. ANY CONSTRUCTION ACTIVITIES OUTSIDE OF THE SITE BOUNDARIES SHALL BE AT THE SOLE RESPONSIBILITY AND RISK OF THE CONTRACTOR.
4. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL MEET THE REQUIREMENTS OF THE GRAND HAVEN TOWNSHIP AND OTTAWA COUNTY. AN EROSION CONTROL PERMIT MUST BE SECURED FROM THE GRAND HAVEN TOWNSHIP PRIOR TO CONSTRUCTION.
5. ALL EARTHWORK AND GRADING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE SOILS INVESTIGATION AND REPORT PREPARED BY SOILS AND STRUCTURES, INC. DATED JANUARY 11, 2016.
6. THE DETENTION BASIN SIDE SLOPES AND ALL SLOPE EXCEEDING 1:4 MUST BE STABILIZED BY SODDING OR BY PLACING A MULCH BLANKET PEGGED IN PLACE OVER SEED.
7. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED OR SODDED IN ACCORDANCE WITH THE LANDSCAPE PLANS. PROVIDE A MINIMUM OF 3" OF TOPSOIL IN THESE AREAS UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL NOTE EXISTING UNDERGROUND UTILITIES WITHIN AND ADJACENT TO THE SITE. BACKFILL FOR EXISTING UTILITY TRENCHES SHALL BE EXAMINED CRITICALLY. ANY TRENCHES FOUND TO HAVE SOFT, UNSTABLE OR UNSUITABLE BACKFILL MATERIAL, IN THE OPINION OF THE GEOTECHNICAL ENGINEER, THAT ARE TO BE WITHIN THE ZONE OF INFLUENCE OF PROPOSED BUILDINGS OR PAVEMENT SHALL BE COMPLETELY EXCAVATED AND BACKFILLED WITH SUITABLE MATERIAL.

SYMBOLS: GRADING

PROPOSED SPOT GRADE ELEVATION. ALL GRADES INDICATED ARE TOP OF PAVEMENT UNLESS OTHERWISE NOTED. ADD 600 TO ALL 3-DIGIT ELEVATIONS TO OBTAIN ACTUAL ELEVATION UNLESS OTHERWISE SHOWN. — 4.50

PROPOSED CONTOUR LINE — 695 —

EARTHWORK BALANCING NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPORTING OR EXPORTING ALL MATERIALS AS REQUIRED TO PROPERLY GRADE THIS PROJECT TO THE FINISHED ELEVATIONS SHOWN ON THE APPROVED PLANS. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION OF CUT AND FILL QUANTITIES AND ALLOW FOR REMOVAL OF EXCESS OR IMPORTATION OF ADDITIONAL MATERIAL AT NO ADDITIONAL COST TO THE OWNER.

SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'

SIDEWALK RAMP 'TYPE P'

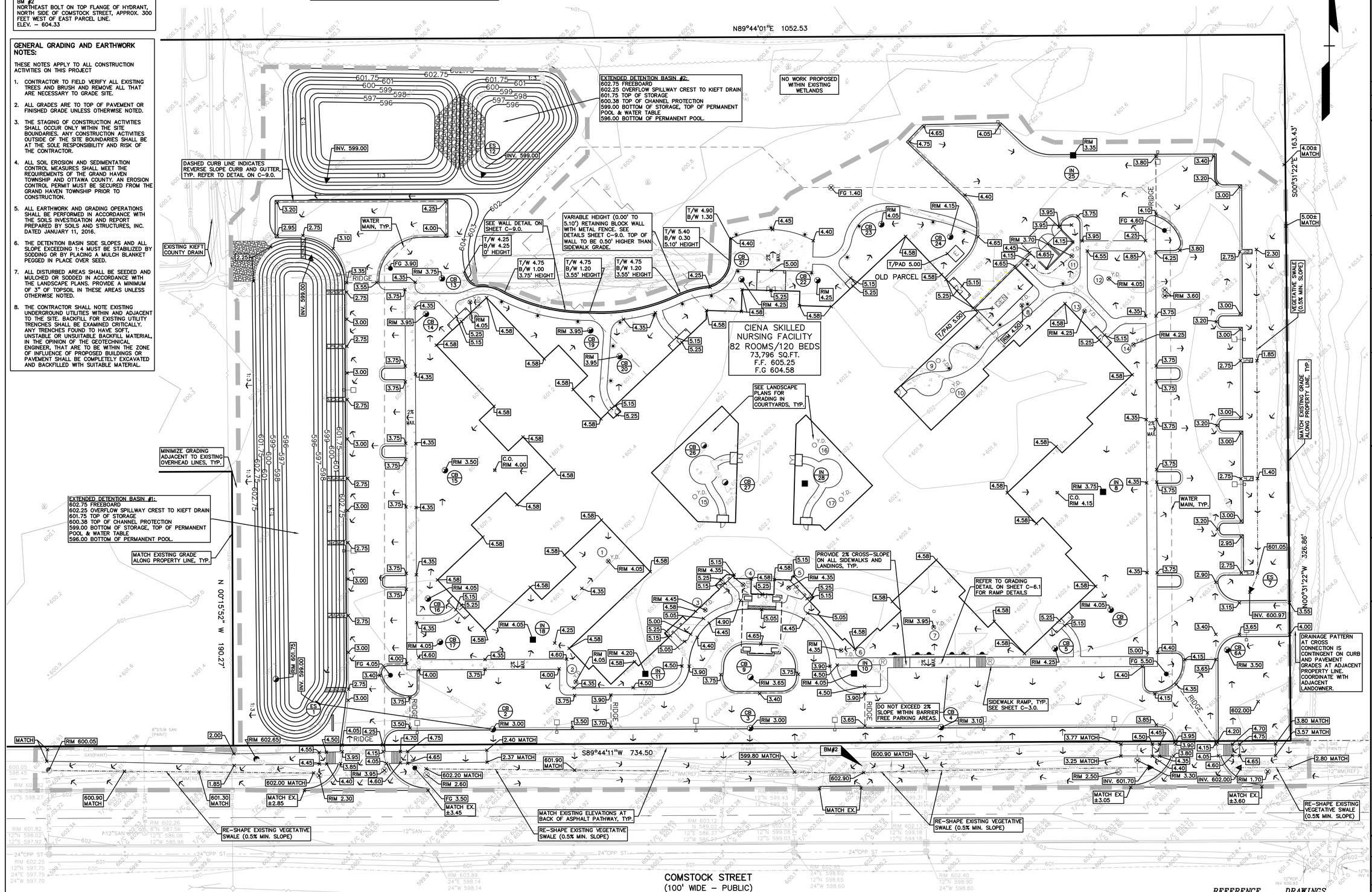
REFER TO LATEST M.D.O.T. R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

SOIL IMPORT NOTE:

SOIL WILL BE IMPORTED TO MEET DESIGN GRADES

GRAPHIC SCALE
–30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

N



NOT FOR CONSTRUCTION

REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-BASE=BASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-TBLK=16199.DWG

No.	BY	CHK	DESCRIPTION	DATE
5	SAP	SAP	REV. PER TWP. PC MEETING	7-31-17
4	SAP	SAP	REV. PARCELS & OPEN SPACE	
3	SAP	RLS	REVISED NAMES	6-29-17
2	RLS	RLS	REVISED PER CONSUMERS	5-10-17
1	SP	SP	REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60656
LICENSED PROFESSIONAL ENGINEER

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GRADING PLAN
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	DN.	SP	SUR.	P.M.	RLS
SP	SP	SP	KTR		

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAP\Dwg\Construction\(C-4.0) GRADING-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 30'

DRAWING NUMBER:
C-4.0

BENCHMARKS
(GPS DERIVED – NAVD88)

BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

BM #2
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 300 FEET WEST OF EAST PARCEL LINE.
ELEV. – 604.33

SYMBOLS: GRADING

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PROPOSED CONTOUR LINE — 695 —

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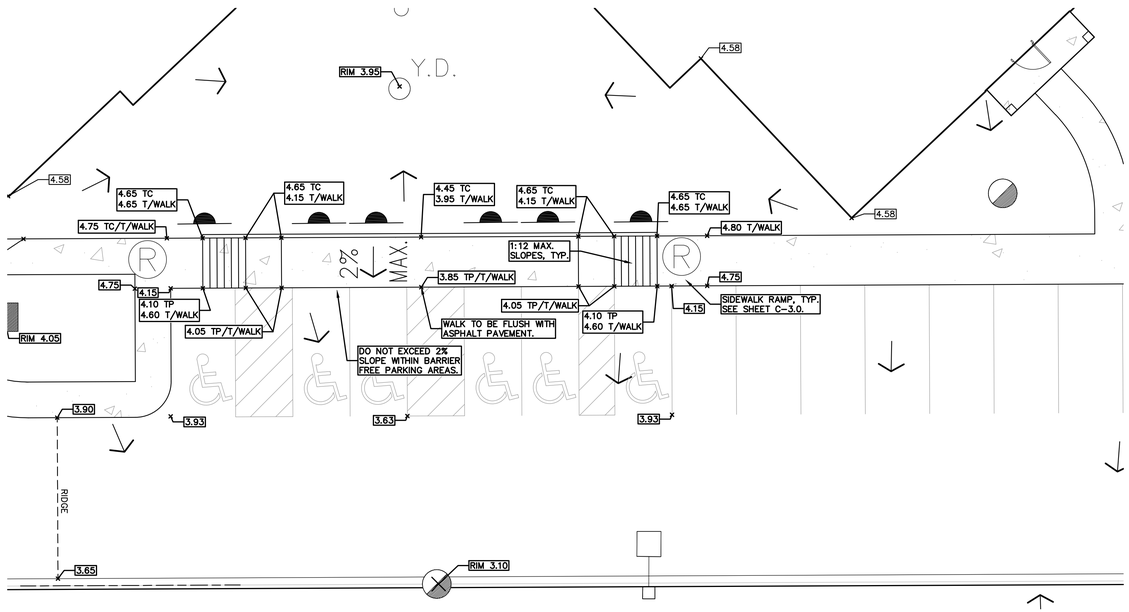
SIDEWALK RAMP LEGEND:

SIDEWALK RAMP 'TYPE R'

REFER TO LATEST M.D.O.T. R-28 STANDARD RAMP AND DETECTABLE WARNING DETAILS

GRAPHIC SCALE
–10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

N



GRADING DETAIL
SCALE 1"=10'

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
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REVISIONS

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
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STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60666
LICENSED PROFESSIONAL ENGINEER

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GRADING DETAIL
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DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

S:\PROJECTS\2016\2016-199 CEDA GRAND HAVEN TWP-SAS\Dwg\Construction\(C-4.0) GRADING-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 10'

DRAWING NUMBER:
C-4.1

PROPERTY DESCRIPTION:

(PER GOWER PROFESSIONAL SURVEYING, P.C.)

ORIGINAL PARENT DESCRIPTIONS

PARCEL 1:
Parcel ID:70-03-33-200-029
The South one-half (S 1/2) of the South one-half (S 1/2) of the Southwest one-quarter (SW 1/4) of the Northeast one-quarter (NE 1/4) of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

PARCEL 2:
Parcel ID: 70-03-33-200-028
The South 1/2 of the North 1/2 of the South 1/2 of the Southwest 1/4 of the Northeast 1/4 of Section 33, Town 8 North, Range 16 West, Grand Haven Township, Ottawa County, Michigan.

SEQUENCE OF CONSTRUCTION:	
START MONTH & YR.	
AUG. 2017	INSTALL TEMPORARY STONE ACCESS DRIVE AT SITE ACCESS POINT.
AUG. 2017	INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES, SILT FENCES, SILT SACKS, ETC. AS NECESSARY.
AUG. 2017	REMOVE ALL VEGETATION, TREES AND BRUSH FROM THE PROPOSED CONSTRUCTION AREA UNLESS MARKED TO REMAIN. STRIP AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE GRADED AND SEEDED.
AUG. 2017	REMOVE ALL PAVEMENT, SIDEWALK, UTILITIES, SIGNS, ETC. AS REQUIRED TO INSTALL THE PROPOSED WORK AS SHOWN ON THE DEMOLITION PLAN.
AUG. 2017	DISPOSE OF ALL EXCESS/UNSUITABLE MATERIALS OFF SITE IN A LEGAL MANNER. NO ON-SITE BURN OR BURY PITS ALLOWED.
SEPT. 2017	ROUGH GRADE SITE. SEED AND MULCH BLANKETS MUST INSTALLED AS SHOWN WITHIN 5 DAYS OF FINAL GRADE. REPAIR AND/OR RE-INSTALL ANY TEMPORARY SOIL EROSION CONTROL MEASURES THAT WERE DAMAGED DURING GRADING OPERATIONS.
SEPT. 2017	INSTALL SITE UTILITIES (STORM SEWER, SANITARY SEWER, WATER MAIN ETC.). INSTALL SILT SACKS AT CATCH BASINS AND YARD DRAINS AS SHOWN.
SEPT. 2017	BEGIN CONSTRUCTION OF BUILDING.
SEPT. 2017	FINE GRADE SITE AND PREPARE FOR SITE PAVING OPERATIONS.
MARCH 2018	INSTALL ALL PAVEMENT, SIDEWALKS, CURBING AS PROPOSED. REPAIR SILT SACKS, SILT FENCE AND ANY OTHER DAMAGED SOIL EROSION CONTROL MEASURES AS NECESSARY.
JUNE 2018	FINAL GRADE, REDISTRIBUTE STOCKPILED TOPSOIL, ESTABLISH VEGETATION AND INSTALL ALL PERMANENT LANDSCAPING IN ALL DISTURBED AREAS NOT BUILT.
JUNE 2018	CLEAN PAVEMENT AND REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES. RE-ESTABLISH VEGETATION AS REQUIRED.
AUGUST 2018	REMOVE SEDIMENTATION CONTROLS ONCE ENTIRE SITE HAS BEEN PERMANENTLY STABILIZED.

N

GRAPHIC SCALE

-40 0 20 40 80 160

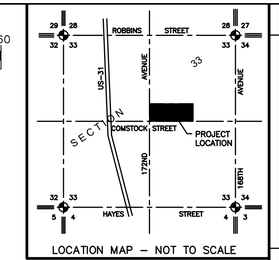
(IN FEET)
1 inch = 40 ft.

ON-SITE SOILS:

Gm – GRANBY LOAMY SAND
CovabB – COVERT-PIPESTONE SANDS (0%-6% SLOPES)
Gn – GRANBY FINE SANDY LOAM

SYMBOLS: EROSION CONTROL

SILT FENCE
SILT SACK (OR EQUIVALENT)
TEMPORARY STONE ACCESS DRIVE



LOCATION MAP – NOT TO SCALE

LEGEND

IRON FOUND
IRON SET
NAIL FOUND
NAIL & CAP SET
BRASS PLUG SET
MONUMENT FOUND
MONUMENT SET
SEC. CORNER FOUND
R RECORDED
M MEASURED
C CALCULATED

EXISTING		PROPOSED
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–UG–CATV–	UNDERGROUND CABLE TV, CATV PEDESTAL	
–UG–PHONE–	TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE	
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	COMBINED SEWER & MANHOLE	
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	POST INDICATOR VALVE	
	WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF	
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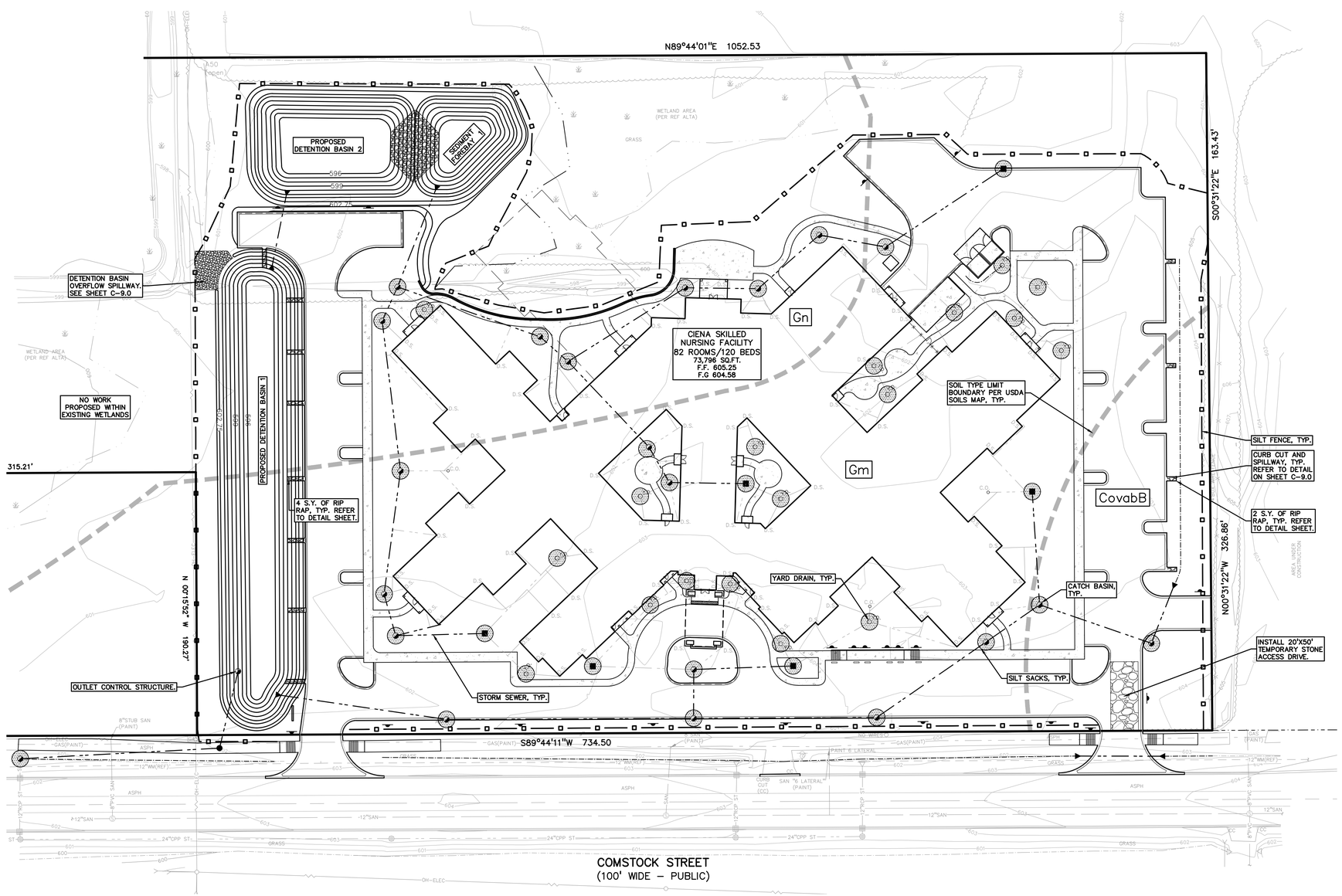
	UNIDENTIFIED STRUCTURE	
816.06 ×	SPOT ELEVATION	× 671.21
670	CONTOUR LINE	671
	FENCE	
	GUARD RAIL	
	STREET LIGHT	
	SIGN	
CONC.	CONCRETE	STD DUTY / HEAVY DUTY
ASPH.	ASPHALT	STD DUTY
	WETLAND	



EROSION CONTROL STANDARDS:

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO STANDARDS AND SPECIFICATIONS OF THE JURISDICTIONAL AGENCY UNDER PART 91 OF ACT 451 OF 1994, AS AMENDED, AND PER THE OTTAWA COUNTY WATER RESOURCES COMMISSION SOIL EROSION ORDINANCE.
2. ALL SOIL EROSION AND SEDIMENTATION CONTROL PLANS AND SPECIFICATIONS INCLUDING EXTENSIONS OF PREVIOUSLY APPROVED PLANS SHALL INCLUDE PROVISIONS FOR EROSION AND SEDIMENTATION CONTROL IN ACCORDANCE WITH, BUT NOT LIMITED TO, THE STANDARDS CONTAINED IN THE "GUIDEBOOK OF BEST MANAGEMENT PRACTICES FOR MICHIGAN WATERSHEDS" PUBLISHED BY THE MDEQ AND "THE FIELD OFFICE TECHNICAL GUIDE" PUBLISHED BY THE USDA/NRCS AND THE MDOT SESC MANUAL.
3. DAILY INSPECTIONS SHALL BE MADE BY CONTRACTOR WHILE WORKING TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY. ALL SOIL EROSION CONTROL PROVISIONS SHALL BE PROPERLY MAINTAINED DURING CONSTRUCTION.
4. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN-MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES, AND PONDS.
5. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT PERMANENT STABILIZATION OF SLOPES, DITCHES, AND OTHER EARTH CHANGE AREAS HAVE BEEN COMPLETED.
6. STAGING THE WORK WILL BE DONE BY THE CONTRACTOR AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH.
7. SOIL EROSION CONTROL PRACTICES WILL BE ESTABLISHED IN EARLY STAGES OF CONSTRUCTION BY THE CONTRACTOR. SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THE SITE.
8. DUST SHALL BE CONTROLLED BY WATERING OR BY OTHER APPROVED MEANS THROUGHOUT ALL CONSTRUCTION OPERATIONS.
9. PERMANENT SOIL EROSION CONTROL MEASURES FOR SLOPES, CHANNELS, DITCHES OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE HAS BEEN COMPLETED OR WHERE SIGNIFICANT EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED WITHIN 5 CALENDAR DAYS. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS ISSUED.
10. THE CONTRACTOR SHALL PRESERVE NATURAL VEGETATION AS MUCH AS POSSIBLE.
11. ANY WORK OUTSIDE OF THE LIMITS OF DISTURBANCE SHALL REQUIRE A SEPARATE GRADING PERMIT.
12. STRAW MULCH BLANKETS ARE TO BE INSTALLED ON DISTURBED SLOPES 1:3 OR STEEPER INCLUDING DITCH BOTTOMS, AND IT MUST BE PEGGED IN PLACE.
13. ALL MUD/DIRT TRACKED ONTO EXISTING COUNTY/CITY ROADS FROM THIS SITE, DUE TO CONSTRUCTION, SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
14. SILT FENCE SHALL BE INSTALLED AND TRENCHED IN A MINIMUM OF SIX INCHES BELOW THE SOIL SURFACE PRIOR TO COMMENCEMENT OF THE SITE WORK.
15. DEWATERING – WATER DISCHARGED FROM A PUMP, SEDIMENT BASIN, OR DIVERSION CHANNEL SHALL NOT BE DISCHARGED IN A MANNER THAT CAUSES EROSION OFF-SITE OR IN THE RECEIVING CHANNEL OR ALLOWS SEDIMENT TO BE DISCHARGED OFF-SITE OR INTO THE RECEIVING CHANNEL.

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS

ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-BASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-TBLK-16199.DWG

No.	BY	CHK	DESCRIPTION	DATE
5	SAP	SAP	REV. PER TWP. PC MEETING	7-31-17
4	SAP	SAP	REV. PARCELS & OPEN SPACE	
3	RLS	RLS	REVISED PER TWP.	6-29-17
2	RLS	RLS	REVISED PER CONSUMERS	5-10-17
1	SP	RLS	REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

STATE OF MICHIGAN
SCOTT A. PERUSKI
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No. 60658
LICENSED PROFESSIONAL ENGINEER

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THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE ACCURACY OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

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SOIL EROSION CONTROL PLAN
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES. SP | DN. SP | SUR. KTR | P.M. RLS

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAS\Dwg\Construction\C-5.0 SESC-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER:
C-5.0

STORM STRUCTURES

Type	No.	Description
CB	2	(4' DIA./2' SUMP) RIM = 603.00 EJIW 5105 FRAME WITH TYPE "M1" GRATE 21" E 599.21 21" W 599.21
CB	3	(4' DIA./2' SUMP) RIM = 603.00 EJIW 5105 FRAME WITH TYPE "M1" GRATE 18" E 599.49 12" N 599.49 21" W 599.49
CB	4	(4' DIA./2' SUMP) RIM = 603.10 EJIW 5105 FRAME WITH TYPE "M1" GRATE 12" NE 599.76 18" W 599.76
CB	5	(4' DIA./2' SUMP) RIM = 604.25 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" NE 600.28 12" SW 600.28
CB	6	(4' DIA./2' SUMP) RIM = 604.05 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" E 600.54 12" N 600.54 12" SW 600.54
CB	6A	(4' DIA./2' SUMP) RIM = 603.50 EJIW 1040 FRAME WITH TYPE "2" GRATE 12" N 600.82 12" W 600.82
IN	8	(2' DIA./2' SUMP) RIM = 603.75 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" S 600.81
CB	9	(4' DIA./2' SUMP) RIM = 603.65 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" E 599.60 12" W 599.60 12" S 599.60
IN	10	(2' DIA./2' SUMP) RIM = 604.05 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" W 599.84
IN	11	(2' DIA./2' SUMP) RIM = 604.20 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" E 599.84
CB	13	(4' DIA./2' SUMP) RIM = 603.75 EJIW 1040 FRAME WITH TYPE "N" GRATE 21" E 599.32 12" SW 599.32 18" N 599.32
CB	14	(4' DIA./2' SUMP) RIM = 603.95 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" S 599.40 12" NE 599.40
CB	15	(4' DIA./2' SUMP) RIM = 603.50 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" S 599.75 12" N 599.75
CB	16	(4' DIA./2' SUMP) RIM = 604.05 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" S 600.04 12" N 600.04
CB	17	(4' DIA./2' SUMP) RIM = 604.05 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" E 600.14 12" N 600.14
IN	18	(2' DIA./2' SUMP) RIM = 604.05 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" W 600.34
CB	19	(4' DIA./2' SUMP) RIM = 603.95 EJIW 1040 FRAME WITH TYPE "N" GRATE 21" SE 599.49 21" W 599.49
CB	20	(4' DIA./2' SUMP) RIM = 603.95 EJIW 1040 FRAME WITH TYPE "N" GRATE 21" NE 599.53 12" SE 599.53 21" NW 599.53
CB	21	(4' DIA./2' SUMP) RIM = 604.25 EJIW 1040 FRAME WITH TYPE "N" GRATE 15" E 599.69 21" SW 599.69
CB	22	(4' DIA./2' SUMP) RIM = 604.25 EJIW 1040 FRAME WITH TYPE "N" GRATE 15" NE 599.82 15" W 599.82
CB	23	(4' DIA./2' SUMP) RIM = 604.05 EJIW 1040 FRAME WITH TYPE "N" GRATE 15" E 599.96 15" SW 599.96
CB	24	(4' DIA./2' SUMP) RIM = 604.15 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" NE 600.08 15" W 600.08
IN	25	(2' DIA./2' SUMP) RIM = 603.35 EJIW 5105 FRAME WITH TYPE "M1" GRATE 12" SW 600.41
CB	26	(4' DIA./2' SUMP) RIM = 603.50 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" SE 599.81 12" NW 599.81
CB	27	(4' DIA./2' SUMP) RIM = 603.65 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" E 599.90 12" NW 599.90
IN	28	(2' DIA./2' SUMP) RIM = 603.65 EJIW 1040 FRAME WITH TYPE "N" GRATE 12" W 600.08
CB	29	(4' DIA./2' SUMP) RIM = 600.45 EJIW 1040 FRAME WITH TYPE "C" GRATE 12" E 598.45
MH	30	(4' DIA./0' SUMP) RIM = 602.65 EJIW 1040 FRAME WITH TYPE "C" COVER 12" N 598.85 12" W 598.85
OC	31	OUTLET STRUCTURE SEE DETAIL SHEET C-10.0

NOTE:
CONTRACTOR TO VERIFY ALL QUANTITIES. ANY DEVIATIONS TO THE PLAN QUANTITIES SHALL BE BROUGHT TO THE ATTENTION OF PEA, INC. FOR VERIFICATION, PRIOR TO BIDDING.

WATER MAIN QUANTITIES:

4" DIWM CLASS 52	159 LF
6" DIWM CLASS 52	176 LF
8" DIWM CLASS 52	1,351 LF
8" GATE VALVE AND WELL	3 EA
12" GATE VALVE AND WELL	4 EA
6" GATE VALVE AND BOX	1 EA
4" GATE VALVE AND BOX	1 EA
8"x12" T.S.V. AND BOX	2 EA
HYD. ASSEMBLY	4 EA
RELOCATED HYD.	1 EA

SANITARY SEWER QUANTITIES:

6" PVC SDR 23.5 PIPE	152 LF

SAND BACKFILL NOTE:
ALL UTILITIES UNDER PAVEMENT OR WITHIN 3' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE M.D.O.T. CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557).

PUBLIC UTILITY EASEMENTS:
ALL WATER MAIN SHALL BE LOCATED IN A 20' WIDE EASEMENT.

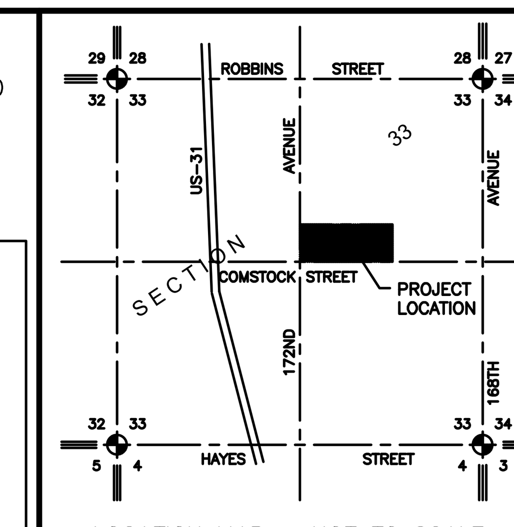
GRAPHIC SCALE
-40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

WATER MAIN STRUCTURE TABLE:

a	HYD. ASSEMBLY F.G. 603.50
b	8" GATE VALVE AND WELL RIM 603.95
c	HYD. ASSEMBLY F.G. 603.80
d	HYD. ASSEMBLY F.G. 603.65
e	8" GATE VALVE AND WELL RIM 601.40
f	HYD. ASSEMBLY F.G. 604.60
g	6" GATE VALVE AND BOX RIM 603.40
h	4" GATE VALVE AND BOX RIM 603.40
i	HYD. ASSEMBLY F.G. 605.00
j	8" GATE VALVE AND WELL RIM 603.30
k	12" GATE VALVE AND WELL RIM 601.70
m	12" GATE VALVE AND WELL RIM 602.30
n	12" GATE VALVE AND WELL RIM 602.60
o	12" GATE VALVE AND WELL RIM 602.50

SANITARY STRUCTURE TABLE:

A	MONITORING MANHOLE 4' DIAMETER RIM 603.90 INV. 596.96



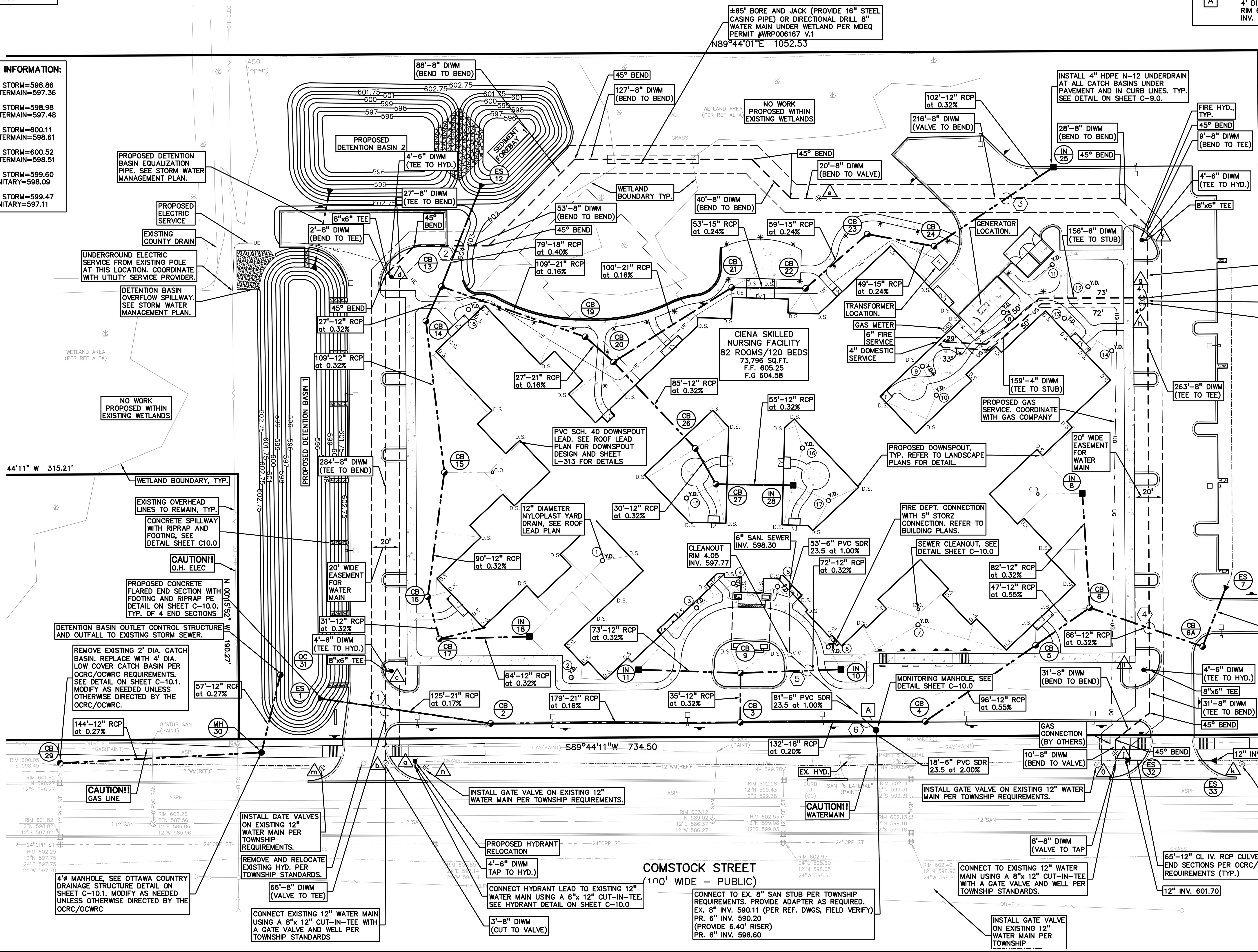
LOCATION MAP - NOT TO SCALE

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	6-29-17
3	RLS		HFES PRELIMINARY	
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

UTILITY CROSSING INFORMATION:

1	BOTTOM OF STORM=598.86 TOP OF WATERMAIN=597.36
2	BOTTOM OF STORM=598.98 TOP OF WATERMAIN=597.48
3	BOTTOM OF STORM=600.11 TOP OF WATERMAIN=598.61
4	BOTTOM OF STORM=600.52 TOP OF WATERMAIN=598.51
5	BOTTOM OF STORM=599.60 TOP OF SANITARY=598.09
6	BOTTOM OF STORM=599.47 TOP OF SANITARY=597.11



LEGEND

IRON FOUND · IRON SET · NAIL FOUND · NAIL & CAP SET · BRASS PLUG SET · MONUMENT FOUND · MONUMENT SET · SEC. CORNER FOUND · R RECORDED · M MEASURED · C CALCULATED

EXISTING / PROPOSED

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYD. VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION (816.06 / 671.21)
- CONTOUR LINE (670 / 671)
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE (STD DUTY / HEAVY DUTY)
- ASPHALT (STD DUTY)
- WETLAND

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60666
LICENSED PROFESSIONAL ENGINEER

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GENERAL UTILITY NOTES:

1. ALL UTILITY LINES, STRUCTURES AND TRENCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS GRAND HAVEN TOWNSHIP.

2. NO PHYSICAL CONNECTION TO THE EXISTING WATER MAIN CAN BE MADE UNTIL ALL NEW WATER MAIN PASSES PRESSURE AND BACTERIOLOGICAL TESTS TO THE SATISFACTION OF GRAND HAVEN TOWNSHIP.

3. REFER TO DETAIL SHEET C-10.0 THROUGH C1-10.2 FOR ADDITIONAL UTILITY DETAILS AND NOTES.

4. ALL WATER MAIN AND FITTINGS SHALL BE DUCTILE IRON, CLASS 52 OR BETTER CEMENT LINED WITH SLIP OR MECHANICAL JOINTS.

5. WATER MAIN SERVICE LEADS SHALL BE TYPE 'K' ANNEALED SEAMLESS COPPER WITH FLARED FITTINGS, UNLESS OTHERWISE NOTED.

6. ALL WATER MAIN SHALL BE PROVIDED WITH 5.5' OF COVER UNLESS OTHERWISE NOTED.

7. ALL FIRE HYDRANTS SHALL BE EJIW #5BR MODEL PER TOWNSHIP STANDARDS.

8. ALL HYDRANTS TO BE A MINIMUM OF 5' FROM BACK OF CURB, TYP.

9. ALL NECESSARY FITTINGS, THRUST BLOCKS, RESTRAINING GLANDS, BLOW OFFS, ETC. FOR WATER MAIN ARE CONSIDERED INCIDENTAL TO THIS PROJECT. THE CONTRACTOR SHALL INSTALL THESE ITEMS AS NECESSARY AND AS REQUIRED BY GRAND HAVEN TOWNSHIP.

10. ALL SANITARY SEWER OR LARGER SHALL BE SDR 23.5 (ASTM D-3034) AND FITTINGS, PIPE JOINTS AT MANHOLE WALLS SHALL BE RES-SEAL, PRESS WEDGE II, OR LOCK JOINT, FLEXIBLE RUBBER MANHOLE JOINTS OR GRAND HAVEN TOWNSHIP APPROVED EQUAL.

11. ALL SANITARY SEWER LEADS SHALL BE 6" DIAMETER UNLESS OTHERWISE APPROVED BY GRAND HAVEN TOWNSHIP.

12. SANITARY LEADS SHALL BE PROVIDED WITH CLEANOUTS EVERY 100 FEET AND AT EVERY BEND AS SHOWN. ALL CLEANOUTS TO BE PROVIDED WITH E.J.I.W. #1565 BOX OR EQUAL.

13. ALL STORM SEWER 12" DIAMETER OR LARGER SHALL BE REINFORCED CONCRETE PIPE (RCP C-76) CLASS IV WITH MODIFIED TONGUE AND GROOVE JOINT WITH RUBBER GASKETS UNLESS SPECIFIED OTHERWISE (ASTM C-443).

14. ALL STORM SEWER LEADS SHALL BE PVC SCHEDULE 40 WITH GLUED JOINTS UNLESS OTHERWISE NOTED.

15. PIPE LENGTHS ARE GIVEN FROM CENTER OF STRUCTURE AND TO END OF FLARED END SECTION UNLESS NOTED OTHERWISE.

16. THE GRAND HAVEN CHARTER TOWNSHIP WATER MAIN AND WASTEWATER SPECIFICATIONS ARE INCORPORATED INTO AND MADE A PART OF THESE PLANS.

STORM SEWER QUANTITIES:

6" UNDERDRAIN (40 LF EA.)	160 LF
4" PVC SCH 40 PIPE	1,200 LF
6" PVC SCH 40 PIPE	1,070 LF
12" RCP CL-IV PIPE	1,296 LF
15" RCP CL-IV PIPE	161 LF
18" RCP CL-IV PIPE	278 LF
21" RCP CL-IV PIPE	544 LF
6" PVC CLEANOUT	2 EA.
12" NYLOPLAST YARD DRAIN	18 EA.
2' DIA. INLET	6 EA.
4' DIA. CATCH BASIN	19 EA.
4' DIA. MANHOLE (ROW)	1 EA.
4' DIA. CATCH BASIN (ROW)	1 EA.
OUTLET CONTROL STRUCTURE	1 EA.
12" RCP END SECTION	1 EA.
18" RCP END SECTION	2 EA.
21" RCP END SECTION	1 EA.

NOT FOR CONSTRUCTION

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UTILITY PLAN
REGENCY AT GRAND HAVEN TWP.

PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES. SP | DN. SP | SUR. KTR | P.M. RLS

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAS\Dwg\Construction\(C-6.0) UTILITY-16199.dwg

ORIGINAL ISSUE DATE: FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER: C-6.0

BENCHMARKS
(GPS DERIVED – NAVD88)

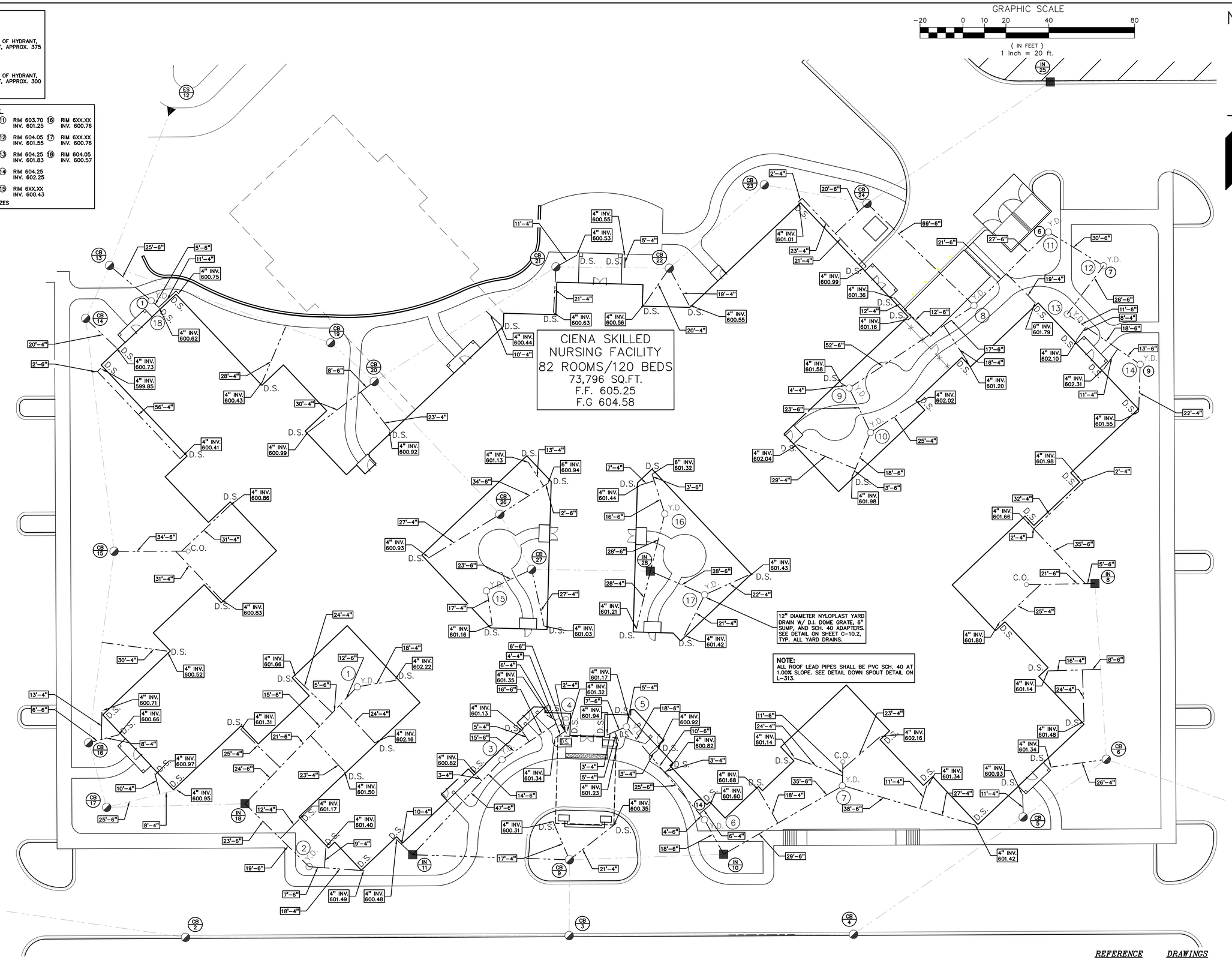
BM #1
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 375 FEET EAST OF 172ND AVENUE.
ELEV. – 603.39

BM #2
NORTHEAST BOLT ON TOP FLANGE OF HYDRANT, NORTH SIDE OF COMSTOCK STREET, APPROX. 300 FEET WEST OF EAST PARCEL LINE.
ELEV. – 604.33

YARD DRAIN STRUCTURE.:

① RIM 604.05 INV. 602.04	⑥ RIM 604.35 INV. 600.42	⑪ RIM 603.70 INV. 601.25	⑯ RIM 6XX.XX INV. 600.76
② RIM 604.05 INV. 601.16	⑦ RIM 603.95 INV. 600.77	⑫ RIM 604.05 INV. 601.55	⑰ RIM 6XX.XX INV. 600.76
③ RIM 604.45 INV. 600.85	⑧ RIM 604.50 INV. 600.77	⑬ RIM 604.25 INV. 601.83	⑱ RIM 604.05 INV. 600.57
④ RIM 604.35 INV. 601.16	⑨ RIM 6XX.XX INV. 601.46	⑭ RIM 604.25 INV. 602.25	
⑤ RIM 604.35 INV. 600.99	⑩ RIM 6XX.XX INV. 601.69	⑮ RIM 6XX.XX INV. 600.43	

SEE ROOF LEAD PLAN FOR PIPE SIZES



NOTE:
ALL ROOF LEAD PIPES SHALL BE PVC SCH. 40 AT 1.00% SLOPE. SEE DETAIL DOWN SPOUT DETAIL ON L-313.

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS

ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-BASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-TBLK-16199.DWG

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	
3	SAP		REVISED PER TWP.	6-29-17
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60666
LICENSED PROFESSIONAL ENGINEER

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ROOF LEAD PLAN
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N. R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	DN.	SUR.	P.M.
SP	SP	KTR	RLS

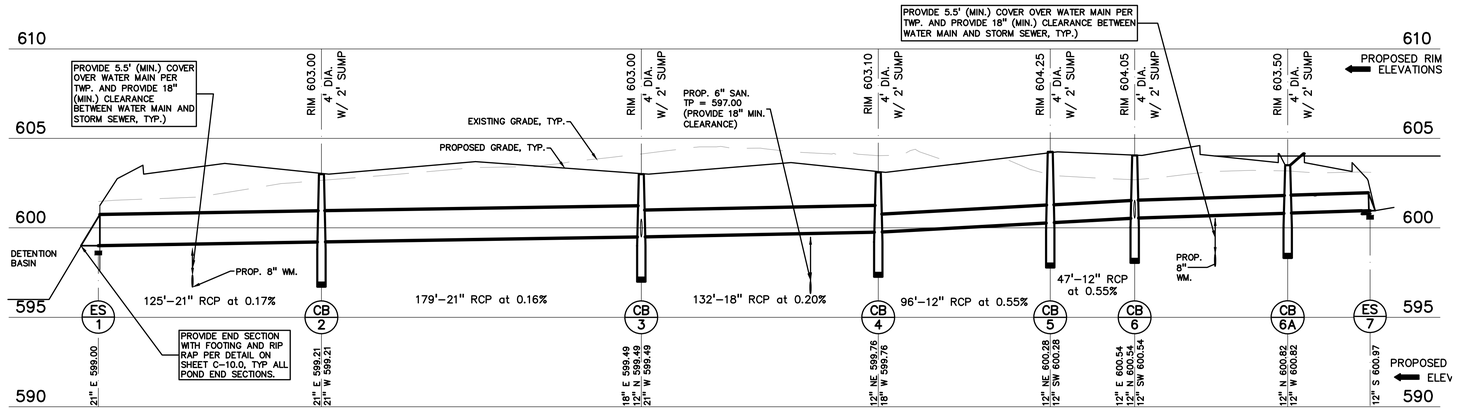
S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAS\Dwg\Construction\(C-6.1) ROOF LEAD-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

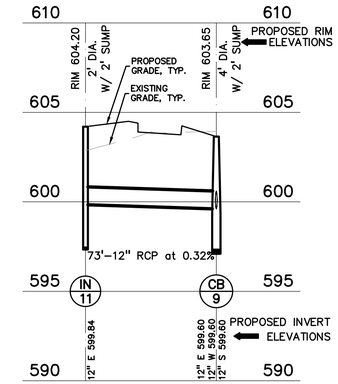
PEA JOB NO. 2016-199

SCALE: 1" = 20'

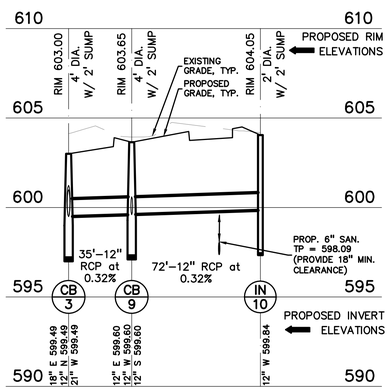
DRAWING NUMBER:
C-6.1



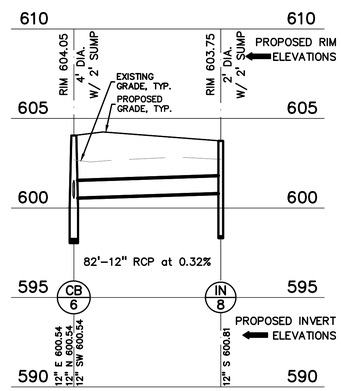
ES1 – ES7 PROFILE



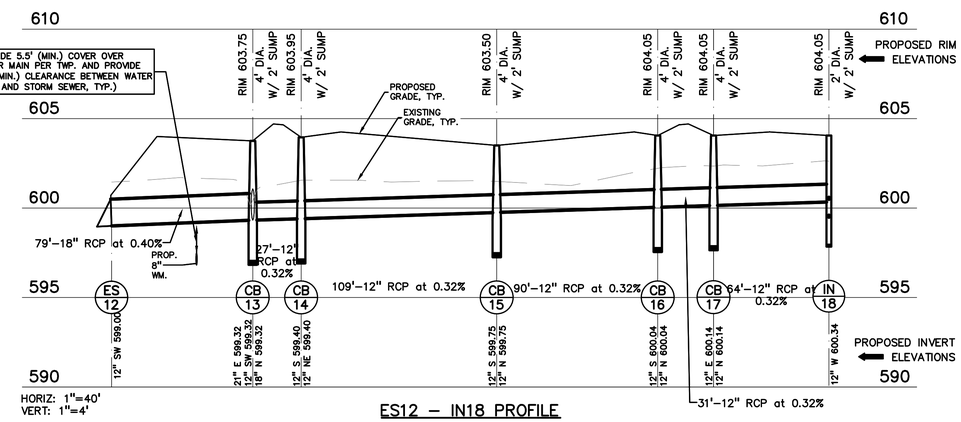
IN11–CB9 PROFILE



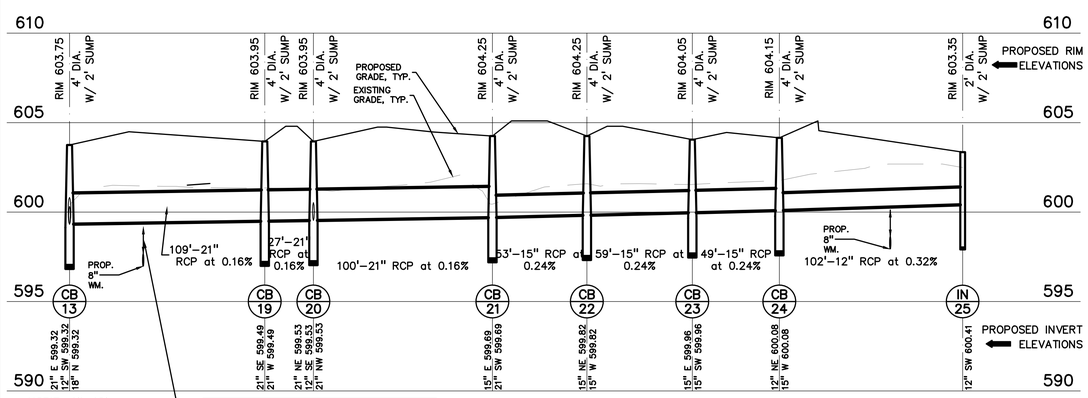
CB3–IN10 PROFILE



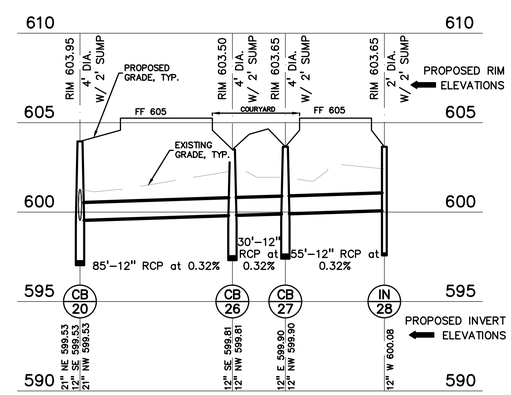
CB6–IN8 PROFILE



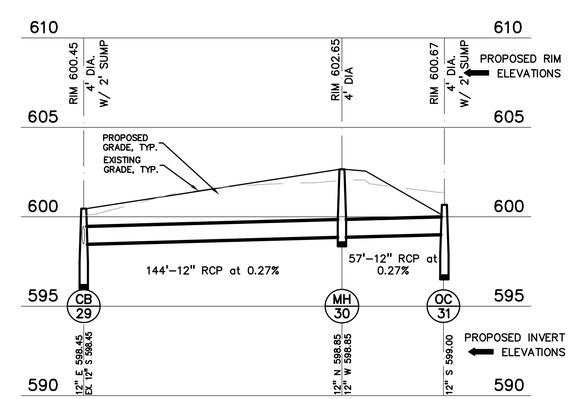
ES12 – IN18 PROFILE



ES13 – IN25 PROFILE



IN28 – CB20 PROFILE



CB29 – CB31 PROFILE

NOT FOR CONSTRUCTION

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2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60656
LICENSED PROFESSIONAL ENGINEER

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UTILITY PROFILES
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GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

S:\PROJECTS\2016\2016-199 DEAN, GRAND HAVEN TWP-SAP\Dwg\Construction\(C-7.0) PROFILES-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER:
C-7.0

OVERALL STORM WATER DESIGN SUMMARY:

THE EXISTING FIELD MEASURED WATER TABLE IS LOCATED AT ELEVATION 599.00±. THE SHALLOW WATER TABLE AND THE RELATIVELY SHALLOW AVAILABLE STORM SEWER OUTLETS REMOVES THE ABILITY TO PROVIDE AND CORRECTLY DESIGN MANY OF THE ACCEPTABLE BMPS WITHOUT EXCESSIVELY FILLING THE SITE AND ALTERING EXISTING DRAINAGE PATTERNS AROUND THE SITE.

AN INITIAL DRY DETENTION BASIN DESIGN WITH MULTIPLE SMALL BMPS THAT PROVIDED PRETREATMENT AND MET WATER QUALITY VOLUMES WAS INITIALLY LAID OUT. BECAUSE THE OCDC REQUIRES 2' VERTICAL CLEARANCE BETWEEN BOTTOMS OF DRY DETENTION BASINS AND THE WATER TABLE, EXCESSIVE SITE FILLING WOULD BE REQUIRED TO MEET 100-YEAR FLOOD VOLUMES AND WOULD PUT THE TOP OF STORAGE AT SIGNIFICANTLY HIGHER ELEVATIONS THAN THE ADJACENT PROPERTIES.

A SECOND DRY DETENTION BASIN WITH AN INFILTRATION BED WAS LAID OUT. TO MAINTAIN A 3' VERTICAL CLEARANCE BETWEEN THE BED AND THE WATER TABLE, THE INFILTRATION BED WOULD BE LOCATED AT 602.00 AND THE BASINS WOULD AGAIN BE ELEVATED TOO HIGH TO MEET FLOOD STORAGE VOLUMES AND REQUIRE EXCESSIVE FILLING.

IN ORDER TO PROVIDE ON-SITE RETENTION FOR THE 2-YEAR CHANNEL PROJECTION VOLUMES (27,506 CFT), THE SITE WOULD AGAIN HAVE TO BE RAISED UP AND THE BASINS WOULD ALMOST DOUBLE IN REQUIRED CAPACITY.

THE FINAL SOLUTION INCLUDES TWO EXTENDED DETENTION BASINS WITH PERMANENT POOLS BETWEEN 599.00 AND 596.00. THE POOLS PROVIDE THE REQUIRED WATER QUALITY AND PRETREATMENT VOLUMES WITHOUT THE NEED TO RAISE THE SITE.

SINCE OUTLET HOLE(S) AT ELEVATION 599.00 WOULD ALREADY BE NEEDED IN THE OUTLET CONTROL STRUCTURE TO REGULATE THE PERMANENT POOL LEVELS, THE HOLES WERE SIZED TO GRADUALLY RELEASE THE 2-YEAR CHANNEL PROJECTION VOLUME OVER THE REQUIRED 24 HOUR DURATION.

A SECOND SET OF HOLES AT ELEVATION 600.38 WILL PROVIDE THE 100-YEAR FLOOD CONTROLLED DISCHARGE PER THE OCDC REQUIREMENTS.

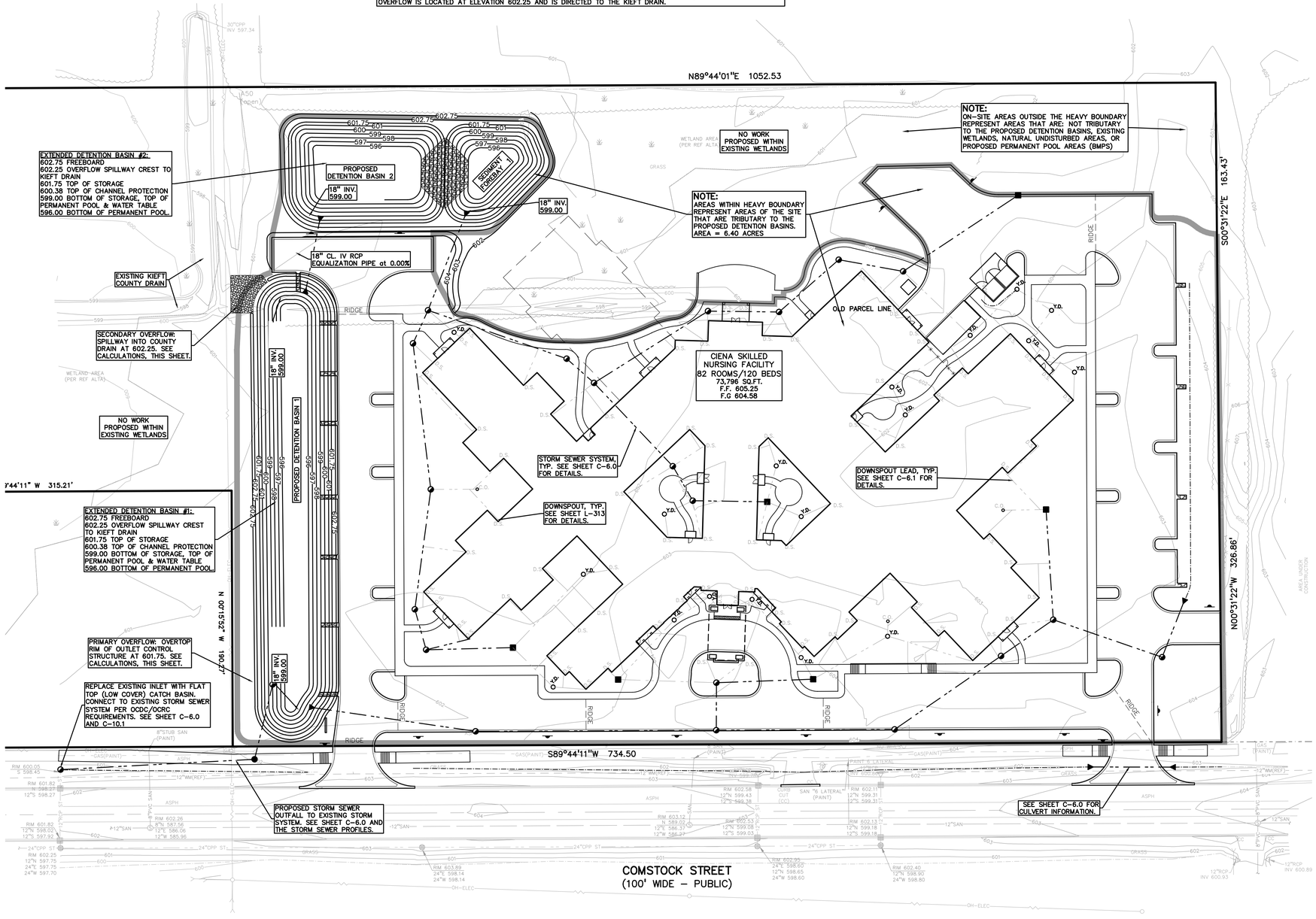
PRIMARY OVERFLOW IS LOCATED AT ELEVATION 601.75 (RIM OF OUTLET CONTROL STRUCTURE), AND A SECONDARY OVERFLOW IS LOCATED AT ELEVATION 602.25 AND IS DIRECTED TO THE KIEFT DRAIN.

GRAPHIC SCALE

−40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

N



DETENTION BASIN CALCULATIONS:

(BASED ON THE NEW RULES OF THE OTTAWA COUNTY DRAIN COMMISSIONER)

Total Disturbed Area, A	=	5.99	acres	100 year Cd:
Developed (Impervious) Areas	=	3.82	acres	C1 = 1.00
Undeveloped (Pervious) Areas	=	2.17	acres	C2 = 0.12 (HSG A)
100-yr Compound Run-off Coefficient, Cd_{100}	=	0.68		
100-yr Allowable Outflow Rate, Qa	=	0.13	cfs/acre	
100-yr Allowable Basin Outflow, Q_{out}	=	0.78	cfs	10-year Cd: C1 = 0.95
10-yr Compound Run-off Coefficient, Cd_{10}	=	0.61		C2 = 0.10 (HSG A)

Detention Volume Required: Peak volume requirement calculated with varied Time durations using 100-year intensities from NOAA 2013 Precipitation data and C factors per new OCDC manual:

1	3	5	6		7
Duration (Td) Hr.	100-year intensity (I_{100})	Inflow Volume Q_{in} = CIA	Allowable Basin Outflow (cfs) = Q_{out}	Q_{in}-Q_{out} (cfs)	Storage Volume (cf) =3600 Td(Q_{in} - Q_{out})
1	2.94	12.00	0.78	11.22	40,395
2	1.83	7.47	0.78	6.69	48,170
3	1.39	5.67	0.78	4.89	52,860
4	1.19	4.86	0.78	4.08	58,725
5	1.02	4.16	0.78	3.38	**60,916**
6	0.85	3.45	0.78	2.67	57,671
7	0.68	2.78	0.78	2.00	50,312

Check time between the peak values:

4.5	1.11	4.51	0.78	3.73	60,445

Detention Volume Required for 100-yr Storm Event = 4.081596878 **60,916** CF

Volume Provided in Detention Basins

Elevation	Basin 1 Surface Area (SF)	Basin 2 Surface Area (SF)	Basin 2 Sediment Forebay	Total Surface Area	Volume (CF)	Total Volume (CF)
601.75	17,447	8,358	4315	30,120	21,483	68,284
601.00	15,804	7,583	3781	27,168	25,274	46,801
600.00	13,663	6,599	3118	23,380	21,527	21,527
599.00	11,578	5,612	2484	19,674		

Storage Volume Provided = **68,284** CF

Permanent Pool Provided in Detention Basins

Elevation	Basin 1 Surface Area (SF)	Basin 2 Surface Area (SF)	Basin 2 Sediment Forebay	Total Surface Area	Volume (CF)	Total Volume (CF)
599.00	9,707	5,035	3,052	17,794	16,047	38,169
598.00	7,678	4,196	2,426	14,300	12,658	22,122
597.00	5,706	3,449	1,861	11,016	9,464	9,464
596.00	3,811	2,733	1,368	7,912		

Water Quality Volume Provided = **38,169** CF

Water Quality Volume (Vwq)

Small Storm Hydrology Method Runoff Coefficient:

		Area:
Pitched Roofs	0.965	1.69
Paving	0.980	2.13
Sandy Soils (HSG A)	0.035	2.17
Rv, Area-weighted volumetric runoff coefficient =		**0.63**

Vwq = A*Rv*1/3630 = 13,777 CF

Pretreatment Required

Vpt=0.15*Vwq 2,066 CF
Sediment Forebay Volume Provided
Between Elev. 601.50 and 599.00
(Above water table) **9,940 CF**

Permanent Pool Size Required

Required Size = 2.5 * Vwq 34,442 CF
Volume Provided in Permanent Pools= 38,169 CF

2-year Channel Protection Calculations

Channel Protection Volume (Vcp) (Runoff Curve Number Method (NRCS)

$V_{cp} = V_{Dpost} - V_{Dpre}$

Assumptions:

Pre Development Condition: Meadow (CN_{pre} =30)

Post Development Condition Pervious: Open Space Good Condition (CN_{perv} =39)

Post Development Condition Impervious: Parking Lot, Roof, Pavement Condition (CN_{imp} =98)

Rainfall For 2 Year, 24 Hour (P) = 2.59 in. 2.59
Rainfall For 100 Year, 24 Hour (P) = 6.9 in. 6.90
2 year Volume Post Development Calculation:
$V_{Dpost} = (Q_{vperv} \times A_{perv} + Q_{vimp} \times A_{imp}) \times 3630$
$Q_{vperv} = (P-.2S)^2 / (P+.8S)$
S = (1000/CN) - 10
S_{perv}= 10.4

Area Impervious Post (#s from deten. Calcs) =	3.82	AC.		
Area Pervious Post (#s from deten. Calcs) =	2.17	AC.		
Area Pervious pre (Total Area) =	5.99	AC.		

	CN_{perv}	CN_{imp}	S_{perv}	S_{imp}	Qvperv	Qvimp	Vt_{pre}	Vt_{post}
Post	39	98	15.64	0.20	0.0192	2.3602		32.889
Pre	30		23.33		0.2029		4.413	

Required Channel Protecton (cf) = **28,476**
Outlet Sizing for Channel Protection :
Q_{cp} = V(cp)/86,400 sec 0.330 CFS
Average Head for Orifice Equation:
Elevation in basin of X(cp) = 600.27
Elevation Difference from X(cp) to X(Bottom) 1.27 FT
h_{hyd} = 2/3 * (elev diff) 0.85 FT
Orifice Area Required
A = Q/(0.62*sqrt(2gh)) 0.0718 SF
Number of Orifice Holes Required
Hole Diameter **1.25"** Hole Area = 0.0085 SF
8.43 HOLES
therefore, use **8 HOLES**
Actual Release Rate Provided by X(Bottom) Orifices for Channel Protection
A(cp) = 0.0682 SF
h_{hyd} = X(cp) - X(bottom) 0.85 FT
Q(cp) = 0.62*A(cp)*sqrt(2gh)) 0.313 CFS
Actual Holding Time
T_{act} = V/Q_{act} 25.293 HR

Extended 100-Year Detention Basin Calculations

100-yr Detention Volume
V(100) = 60,916 CF
Elevation of 100-Year Storm, X(100) = 601.49
Rim Elevation of Outlet Structure = 601.67
Allowable Outflow Rate, Qo = 0.78 CFS
Peak Release Rate Provided by Channel Protection Orifices for 100-yr Storm:
A(cp) = 0.0682 SF
h_{hyd} = X(100) - X(bottom) 2.7 FT
Q(cp) = 0.62*A(cp)*sqrt(2gh)) 0.55 CFS
Q(available) = Qo - Q(cp) = .77- .53 = 0.22 CFS
Maximum Head for Orifice Equation:
Elevation Difference from X(100) to X(cp) 1.40 FT
Orifice Area Required
A = Q/(0.62*sqrt(2gh)) 0.04 SF
Number of Orifice Holes Required
Hole Diameter **1.25"** Hole Area = 0.0085 SF
Holes = A/0.0668 4.49 HOLES
therefore, use **4 HOLES**
Peak Release Rate:
A(100) = # holes * 0.0085 0.0341 SF
Q(100) = 0.62*A*sqrt(2gh)) 0.20 CFS
Qout) = Q(cp) + Q(100) = 0.75 CFS
Q(out) <= Q(allow) **0.75 <= 0.78 OK**

10-yr Primary Overflow:

10-year max. inflow (ES1 & ES12) = 11.18 CFS
Elev. of Crest at Secondary Overflow (Max design High water level) = 602.25
Rim elev. of OCS 3 (Primary Overflow Structure) 601.75
Elevation difference = 0.50 FT
Spillway sizing Q = 2.6LH^(1.5)
L= spillway crest, 4' dia. Rim, circumfrence = 3.14 x Dia. = 12.56 FT
H = head above spillway crest = 0.50
Qprovided= **11.55** CFS

100-yr Secondary Overflow:

100-year max. inflow Q = 6 ac x .68 x 6.28 in/hr 25.6224 CFS
Freeboard elevation = 602.75
Elev. of Crest at Emergency Overflow (Max design High water level) = 602.25
Elevation difference = 0.50 FT
Spillway sizing Q = 2.6LH^(1.5)
L= spillway crest length = 28.00 FT
H = head above spillway crest = 0.50
Qprovided= **25.74** CFS

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REVISIONS

STATE OF MICHIGAN
SCOTT A. PERUSKI
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LICENSED PROFESSIONAL ENGINEER

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STORM WATER MANAGEMENT PLAN
REGENCY AT GRAND HAVEN TWP.

PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES. SP | DN. SP | SUR. KTR | P.M. RLS

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAP\Dwg\Construction\(C-8.0) STM MGT-16199.dwg

ORIGINAL ISSUE DATE: FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER: C-8.0

NOT FOR CONSTRUCTION

REFERENCE DRAWINGS

ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:\PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-BASE-16199.DWG
XREF: S:\PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-TBLK-16199.DWG

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10 YEAR STORM SEWER DESIGN - 2016-199

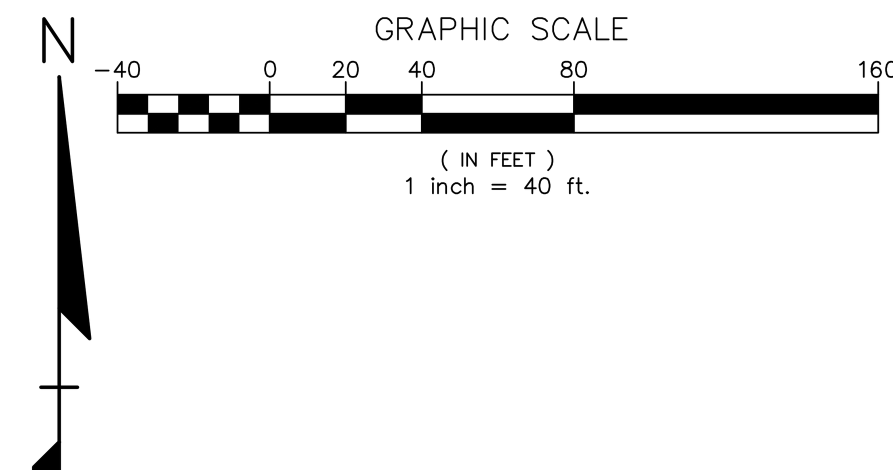
P.E.A., INC.
2430 ROCHESTER COURT
TROY, MI 48083
(248) 689-9090

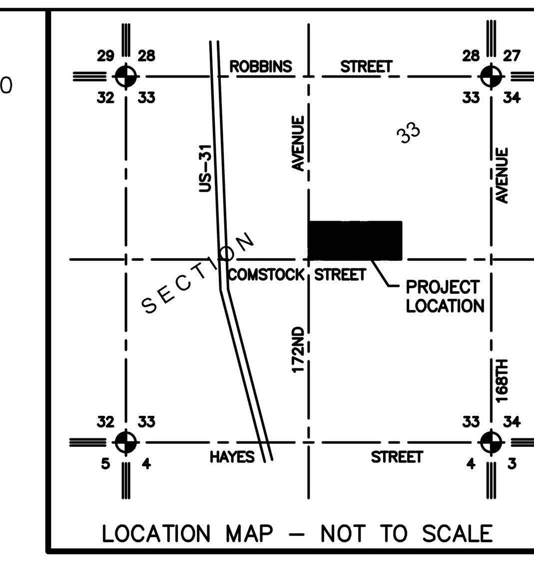
Q = C I A
Q = A x 1.486/n x R^2/3 x S^1/2
$I_{(INITIAL)}$ =3.84 PER OCDC

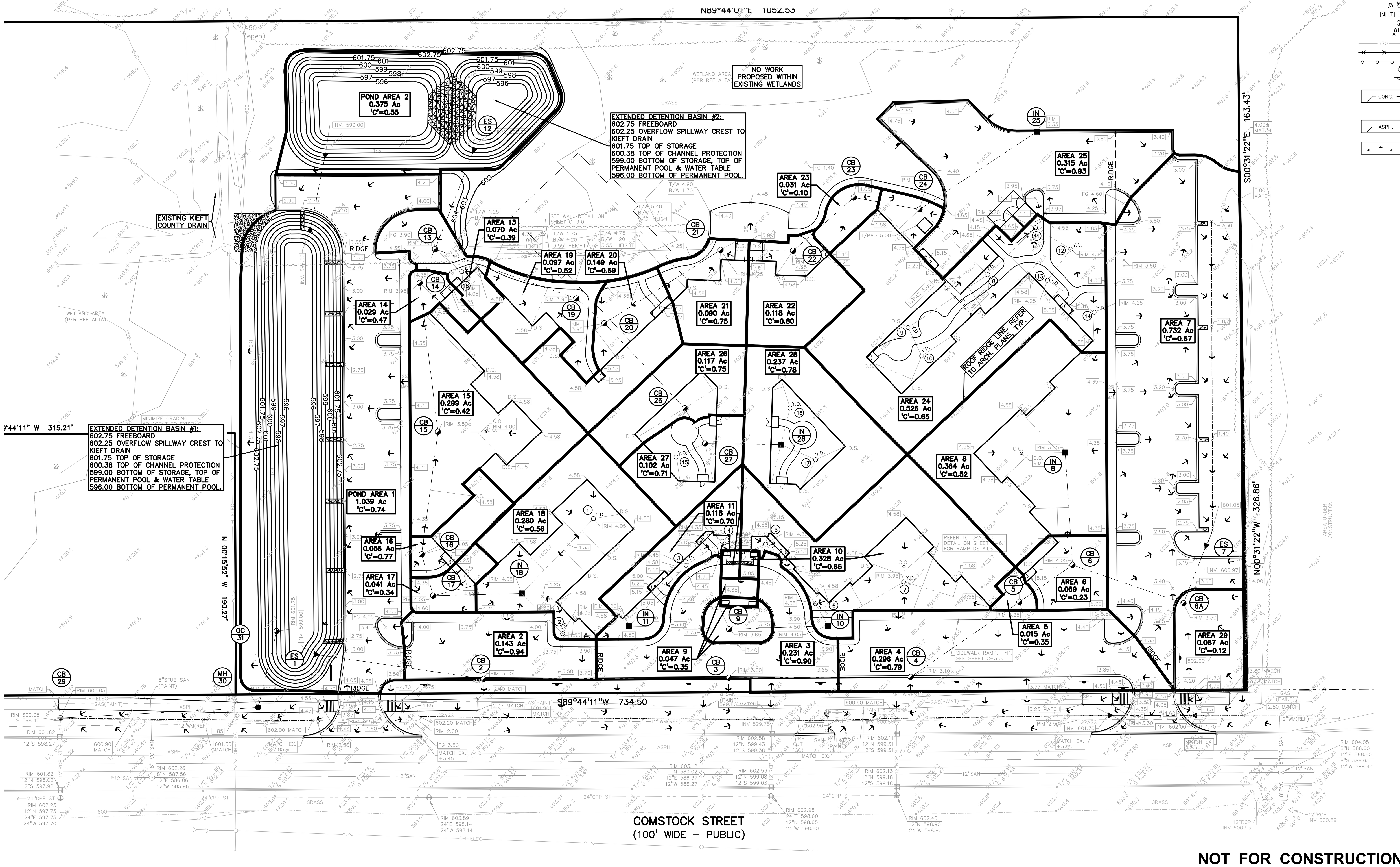
t = 15 MIN.
n1 = 0.010 HDPE & PVC
n2 = 0.013 CONC.

FROM STR TO STR	DRAINAGE AREA #	AREA A (ac.)	COEFF. C	A x C	AREA TOTAL At (ac.)	TOTAL C x A	TIME t (min.)	lateral 1 name	INT. I (in/hr)	FLOW Q (c.f.s.)	PIPE CAP. (c.f.s.)	CAP. > Q	PIPE AREA (sq ft)
7-6A	7	0.732	0.67	0.492	0.732	0.492	15.00		3.84	1.89	2.01	0.13	0.79
6A-6	29	0.087	0.10	0.009	0.087	0.501	15.30		3.77	1.89	2.01	0.12	0.79
6-5	6	0.069	0.23	0.016	1.166	0.707	15.86	8-6	3.69	2.61	2.64	0.03	0.79
5-4	5	0.015	0.35	0.005	1.181	0.712	16.09		3.65	2.60	2.64	0.04	0.79
4-3	4	0.296	0.79	0.234	1.477	0.946	16.57		3.58	3.39	4.69	1.30	1.77
3-2	3	0.231	0.90	0.207	2.202	1.468	17.39	9-3	3.47	5.10	6.33	1.24	2.40
2-1	2	0.143	0.94	0.134	2.345	1.602	18.53		3.33	5.34	6.33	1.00	2.40
18-17	18	0.280	0.56	0.158	0.280	0.158	15.00		3.84	0.61	2.01	1.41	0.79
17-16	17	0.041	0.34	0.014	0.321	0.172	15.42		3.76	0.64	2.01	1.37	0.79
16-15	16	0.056	0.77	0.043	0.377	0.215	15.62		3.72	0.80	2.01	1.21	0.79
15-14	15	0.299	0.42	0.124	0.675	0.339	16.20		3.64	1.23	2.01	0.78	0.79
14-13	14	0.029	0.47	0.013	0.704	0.352	16.91		3.54	1.25	2.01	0.77	0.79
13-12	13	0.070	0.39	0.028	2.555	1.679	17.51	19-13	3.46	5.80	6.64	0.84	1.77
8-6	8	0.364	0.52	0.190	0.364	0.190	15.00		3.84	0.73	2.01	1.29	0.79
25-24	25	0.315	0.93	0.293	0.315	0.293	15.00		3.84	1.13	2.01	0.89	0.79
24-23	24	0.526	0.65	0.343	0.841	0.636	15.66		3.72	2.36	3.16	0.80	1.23
23-22	23	0.031	0.10	0.003	0.872	0.639	15.98		4.27	2.73	3.16	0.43	1.23
22-21	22	0.118	0.80	0.094	0.989	0.733	16.36		4.23	3.10	3.16	0.06	1.23
21-20	21	0.090	0.75	0.068	1.080	0.801	16.70		4.20	3.36	6.33	2.97	2.40
20-19	20	0.149	0.69	0.102	1.684	1.248	17.34	26-20	4.13	5.16	6.33	1.17	2.40
19-13	19	0.097	0.52	0.050	1.781	1.299	17.51		4.12	5.35	6.33	0.99	2.40
28-27	28	0.237	0.78	0.186	0.237	0.186	15.00		3.84	0.71	2.01	1.30	0.79
27-26	27	0.102	0.71	0.072	0.339	0.258	15.19		3.79	0.98	2.01	1.04	0.79
26-20	26	0.117	0.75	0.088	0.456	0.345	15.75		3.70	1.28	2.01	0.73	0.79
10-9	10	0.328	0.66	0.215	0.328	0.215	15.00		3.84	0.83	2.01	1.19	0.79
9-3	9	0.047	0.35	0.017	0.493	0.314	15.23	11-9	3.79	1.19	2.01	0.82	0.79

FROM STR TO STR	PIPE LENGTH (ft)	PIPE DIA. (in.)	PIPE SLOPE (%)	MIN PIPE SLOPE	H.G. SLOPE (%)	VEL. FULL (ft/sec)	TIME FLOW (min.)	H.G. ELEV. UP STREAM	H.G. ELEV. DOWN STREAM	INVERT ELEV. UP STREAM	INVERT ELEV. DOWN STREAM	RIM ELEV. UP STREAM	RIM ELEV. DOWN STREAM	PIPE COVER AT STR. COVER UP	PIPE COVER AT STR. COVER DOWN
7-6A	46	12	0.32	0.32	0.28	2.56	0.30	602.17	602.04	600.97	600.82	0.00	604.05		2.23
6A-6	86	12	0.32	0.32	0.28	2.56	0.56	602.04	601.80	600.82	600.54	603.05	604.05	1.23	2.51
6-5	47	12	0.55	0.32	0.54	3.36	0.23	601.80	601.54	600.54	600.28	604.05	604.25	2.51	2.97
5-4	96	12	0.55	0.32	0.53	3.36	0.48	601.54	601.03	600.28	599.76	604.25	603.10	2.97	2.34
4-3	132	18	0.20	0.19	0.10	2.66	0.83	601.03	600.89	599.76	599.49	603.10	603.00	1.84	2.01
3-2	179	21	0.16	0.15	0.16	2.63	1.13	600.89	600.61	599.49	599.21	603.00	603.00	1.76	2.04
2-1	129	21	0.16	0.15	0.16	2.63	0.82	600.61	600.40	599.21	599.00	603.00	0.00	2.04	
18-17	64	12	0.32	0.32	0.32	2.56	0.42	601.14	600.94	600.34	600.14	604.05	604.05	2.71	2.91
17-16	31	12	0.32	0.32	0.32	2.56	0.20	600.94	600.84	600.14	600.04	604.05	604.05	2.91	3.01
16-15	90	12	0.32	0.32	0.18	2.56	0.58	600.84	600.68	600.04	599.75	604.05	603.50	3.01	2.75
15-14	109	12	0.32	0.32	0.12	2.56	0.71	600.68	600.55	599.75	599.40	603.50	603.95	2.75	3.55
14-13	27	12	0.32	0.32	0.12	2.56	0.18	600.55	600.52	599.40	599.32	603.95	603.75	3.55	3.43
13-12	79	18	0.40	0.19	0.40	3.76	0.35	600.52	600.20	599.32	599.00	603.75	0.00	2.93	
8-6	82	12	0.32	0.32	0.04	2.56	0.53	601.83	601.80	600.81	600.54	603.50	604.05	1.69	2.51
25-24	102	12	0.32	0.32	0.10	2.56	0.66	601.49	601.39	600.41	600.08	603.35	604.15	1.94	3.07
24-23	49	15	0.24	0.24	0.13	2.58	0.32	601.39	601.32	600.08	599.96	604.15	604.05	2.82	2.84
23-22	59	15	0.24	0.24	0.18	2.58	0.38	601.32	601.22	599.96	599.82	604.05	604.25	2.84	3.18
22-21	53	15	0.24	0.24	0.23	2.58	0.34	601.22	601.09	599.82	599.69	604.25	604.25	3.18	3.31
21-20	100	21	0.16	0.15	0.16	2.63	0.63	601.09	600.93	599.69	599.53	604.25	603.95	2.81	2.67
20-19	27	21	0.16	0.15	0.16	2.63	0.17	600.93	600.89	599.53	599.49	603.95	603.95	2.67	2.71
19-13	109	21	0.16	0.15	0.16	2.63	0.69	600.89	600.72	599.49	599.32	603.95	603.75	2.71	2.68
28-27	55	12	0.32	0.32	0.04	2.56	0.36	601.09	601.07	600.08	599.90	603.90	603.90	2.82	3.00
27-26	30	12	0.32	0.32	0.08	2.56	0.19	601.07	601.04	599.90	599.81	603.90	603.75	3.00	2.94
26-20	85	12	0.32	0.32	0.13	2.56	0.55	601.04	600.93	599.81	599.53	603.75	603.95	2.94	3.42
10-9	72	12	0.32	0.32	0.05	2.56	0.47	600.97	600.93	599.84	599.60	604.05	603.65	3.21	3.05
9-3	35	12	0.32	0.32	0.11	2.56	0.23	600.93	600.89	599.60	599.49	603.65	603.00	3.05	2.51







LEGEND

- IRON FOUND
- IRON SET
- NAIL FOUND
- NAIL & CAP SET
- BRASS PLUG SET
- MONUMENT FOUND
- MONUMENT SET
- SEC. CORNER FOUND
- R RECORDED
- M MEASURED
- C CALCULATED

EXISTING / PROPOSED

- ELEC., PHONE OR CABLE TV O.H. LINE, POLE & GUY WIRE
- UNDERGROUND CABLE TV, CATV PEDESTAL
- TELEPHONE U.G. CABLE, PEDESTAL & MANHOLE
- ELECTRIC U.G. CABLE, MANHOLE, METER & HANDHOLE
- GAS MAIN, VALVE & GAS LINE MARKER
- WATERMAIN, HYD., GATE VALVE, TAPPING SLEEVE & VALVE
- SANITARY SEWER, CLEANOUT & MANHOLE
- STORM SEWER, CLEANOUT & MANHOLE
- COMBINED SEWER & MANHOLE
- SQUARE, ROUND & BEEHIVE CATCH BASIN
- POST INDICATOR VALVE
- WATER VALVE BOX/HYDRANT VALVE BOX, SERVICE SHUTOFF
- MAILBOX, TRANSFORMER, IRRIGATION CONTROL VALVE
- UNIDENTIFIED STRUCTURE
- SPOT ELEVATION
- CONTOUR LINE
- FENCE
- GUARD RAIL
- STREET LIGHT
- SIGN
- CONCRETE (STD DUTY / HEAVY DUTY)
- ASPHALT (STD DUTY)
- WETLAND

No.	BY	CHK	DESCRIPTION	DATE
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17
2	RLS		REVISED PER CONSUMERS	5-10-17
3	RLS		HFES PRELIMINARY	6-29-17
4	SAP		REV. PARCELS & OPEN SPACE	
5	SAP		REV. PER TWP. PC MEETING	7-31-17

REVISIONS

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60666
LICENSED PROFESSIONAL ENGINEER

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

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FARMINGTON HILLS, MI 48335

DRAINAGE AREA PLAN
REGENCY AT GRAND HAVEN TWP.

PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAS\Dwg\Construction\(C-8.1) DRAIN AREA-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

SCALE: 1" = 40'

DRAWING NUMBER:
C-8.1

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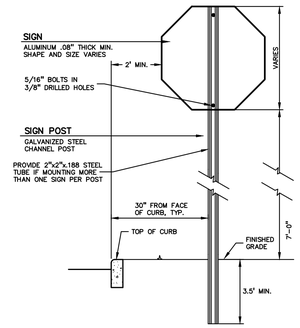
REFERENCE DRAWINGS
ALTA/ACSM LAND TITLE SURVEY BY GPS SURVEYING, DATED 12/24/15
XREF: S:PROJECTS\2016\2016-199\DWG\TOPOBASE-16199.DWG
XREF: S:PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-BASE-16199.DWG
XREF: S:PROJECTS\2016\2016-199\DWG\CONSTRUCTION\X-TBLK-16199.DWG

NOT FOR CONSTRUCTION



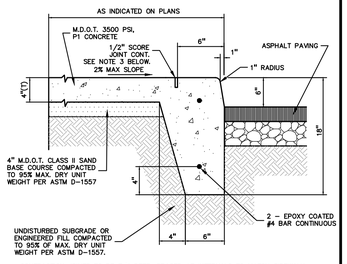
SIGN AND POST INSTALLATION IN LANDSCAPED AREAS
NOT TO SCALE

30" x 30"
WHITE ON RED REFLECTORIZED
7'-0" MOUNTING HEIGHT (R1-1)

STOP SIGN DETAIL
NOT TO SCALE

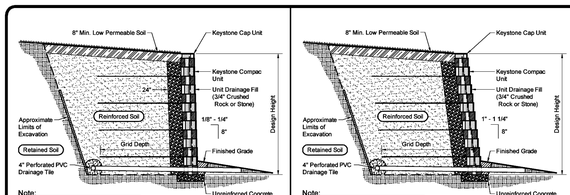
12" x 18"
RED ON WHITE REFLECTORIZED
7'-0" MOUNTING HEIGHT
(LR7-22)

NO PARKING SIGN DETAIL
NOT TO SCALE



CONTRACTION JOINTS TO BE 1/4 DEEP. SPACED AT INTERVALS TO MATCH SIDEWALK WIDTH (SAWCUT). 1/2-INCH PRE-MOLDED FILLER EXPANSION JOINTS WITH JOINT SEALANT SHALL BE PLACED ONLY WHERE SIDEWALK ABUTS A STRUCTURE.

INTEGRAL CURB AND SIDEWALK
NOT TO SCALE



Note:
When site conditions require, wrap drainage tile in 3/4" aggregate and filter fabric with drainage composite or aggregate back drain system, as directed by geotechnical engineer.

Typical Reinforced Wall Section
Compac Unit - Near Vertical Setback

Note:
When site conditions require, wrap drainage tile in 3/4" aggregate and filter fabric with drainage composite or aggregate back drain system, as directed by geotechnical engineer.

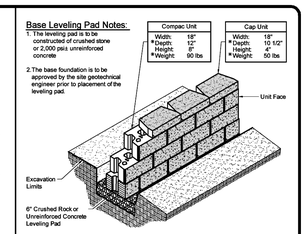
Typical Reinforced Wall Section
Compac Unit - 1" Setback

Typical Gravity Wall Section
Compac Unit - 1" Setback

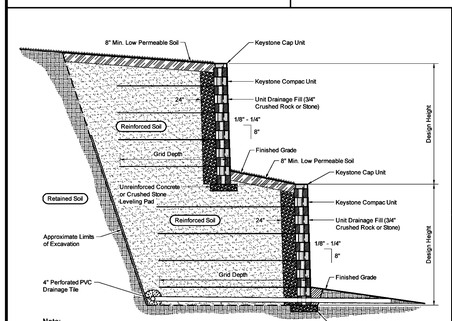
Base Leveling Pad Notes:
1. The leveling pad is to be constructed of crushed stone or 2,000 psi± unreinforced concrete
2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

Compac Unit	
Width:	18"
*Depth:	10"
Height:	4"
*Weight:	90 lbs

Cap Unit	
Width:	18"
*Depth:	10 1/2"
Height:	4"
*Weight:	50 lbs



Compac Unit/Base Pad Isometric Section View
* Dimensions & Weight May Vary by Region



Note:
When site conditions require, wrap drainage tile in 3/4" aggregate and filter fabric with drainage composite or aggregate back drain system, as directed by geotechnical engineer.

Typical Reinforced Tiered Wall Section
Compac Unit - Near Vertical Setback

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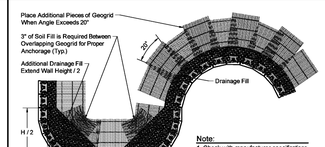
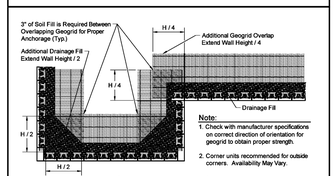


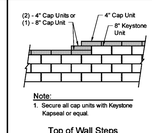
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.

Geogrid Installation on Curves



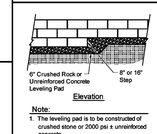
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.
2. Corner units recommended for outside corners. Availability May Vary.

Geogrid Installation at Corners



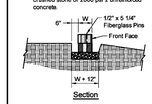
Note:
1. Secure all cap units with Keystone Kapseal or equal.

Top of Wall Steps

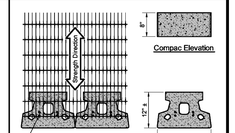


Note:
1. The leveling pad is to be constructed of crushed stone or 2000 psi ± unreinforced concrete.

Elevation



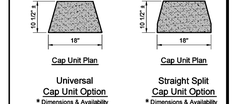
Section
Leveling Pad Detail



Geogrid is to be Placed on Level Backfill and Extended Over the Fiberglass Pins. Place Next Unit Pull Grid Taught and Backfill. Stake as required.

Grid & Pin Connection

Compac Elevation
Compac Plan
Compac Unit
* Dimensions May Vary by Region



Cap Unit Elevation
Cap Unit Elevation
Cap Unit Plan
Cap Unit Plan
Universal Cap Unit Option
* Dimensions & Availability Will Vary by Region
Straight Split Cap Unit Option
* Dimensions & Availability Will Vary by Region

Designed By:	Title:	Date:
RKM	Compac Unit - Straight Face Details	
Checked By: CDM	Project: Keystone Retaining Wall Systems Typical Wall Details	Project No:
Scale: No Scale		Drawing No:

KEYSTONE A CUNTEEN COMPANY
4444 W78th Street
Minneapolis, MN 55435
952-897-1040

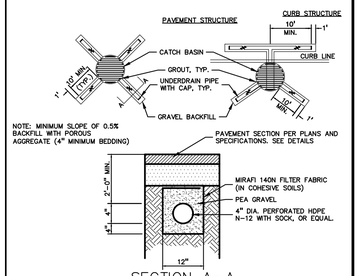
No.	Date	Revision	By

Design is for internal stability of the KEYSTONE wall structure only. External stability, including but not limited to foundation and slope stability is the responsibility of the Owner. The design is based on the assumption that the materials within the retained mass, methods of construction, and quality of materials conform to KEYSTONE's specification for this project.

This drawing is being furnished for this specific project only. Any party accepting this document does so in confidence and agrees that it shall not be duplicated in whole or in part nor disclosed to others without the consent of Keystone Retaining Wall Systems, Inc.

RETAINING WALL DESIGN BY OTHERS (DESIGN/BUILD – AS PART OF BID). REFER TO RETAINING WALL PLANS FOR ADDITIONAL INFORMATION. PROVIDE SHOP DRAWINGS AND STRUCTURAL PLANS AND CALCULATIONS SEALED BY REGISTERED ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

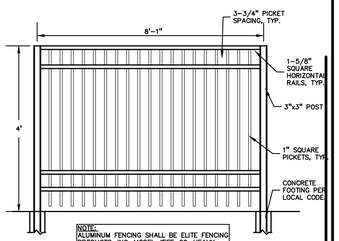
RETAINING WALL SHALL BE COMPAC RETAINING WALL SYSTEMS OR APPROVED EQUAL WITH 4' TALL ALUMINUM FENCE PER DETAIL THIS SHEET.



SECTION A–A

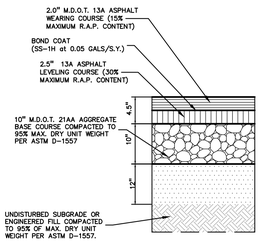
NOTE:
INSTALL 4" DIAMETER PERFORATED HDPE N-12 WITH SOCK, OR EQUAL TO EXTEND 10' FROM STRUCTURE AT ALL CATCH BASINS AS SHOWN ON UTILITY PLAN.

UNDERDRAIN DETAIL
NOT TO SCALE



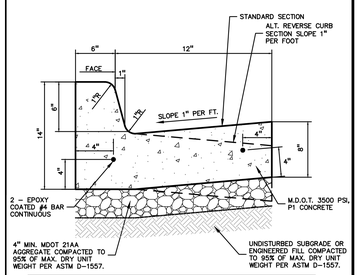
NOTE:
ALUMINUM FENCING SHALL BE ELITE FENCING PRODUCTS, INC. MODEL JEF-20, HEAVY INDUSTRIAL GRADE ALUMINUM FENCING, OR APPROVED EQUAL.

4' ALUMINUM FENCE DETAIL
NOT TO SCALE



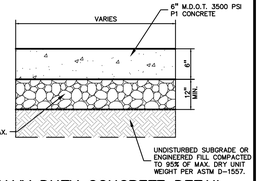
HEAVY DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY)
NOT TO SCALE

NOTE: ALTERNATE REVERSE CURB SECTION TO BE USED ONLY WHEN DRAINING AWAY FROM CURB. SEE PLAN FOR LOCATION.

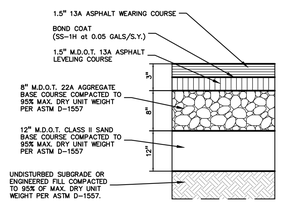


NOTE:
PROVIDE CONTROL JOINTS IN CURB AT 10' O.C. AND AT ALL RADIUS RETURNS. PROVIDE EXPANSION JOINTS AND JOINT SEALANT WHERE CURBS ABUT STRUCTURES.

18"x6" STANDARD CONCRETE CURB AND GUTTER
NOT TO SCALE

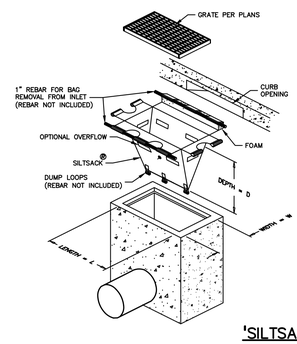


HEAVY DUTY CONCRETE DETAIL
NOT TO SCALE

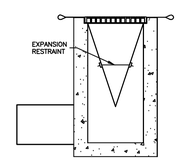


STANDARD DUTY ASPHALT DETAIL
(NOT FOR USE IN THE RIGHT-OF-WAY)
NOT TO SCALE

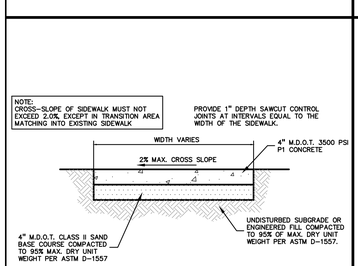
MIX DESIGN NOTE:
REFER TO GEOTECHNICAL REPORT (CALLEN ENGINEERING, INC. JANUARY 11, 2016) REGARDING ASPHALT BINDER RECOMMENDATIONS.



'SILTSACK' DETAIL
NOT TO SCALE



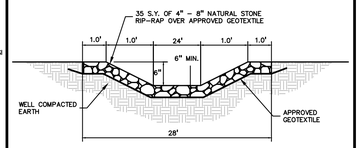
INSTALLATION DETAIL



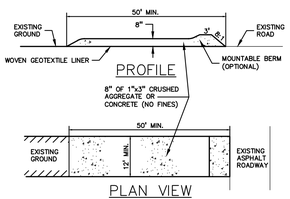
NOTE:
CROSS-SLOPE OF SIDEWALK MUST NOT EXCEED 2.0% EXCEPT IN TRANSITION AREA MATCHING INTO EXISTING SIDEWALK

PROVIDE 1" DEPTH SAWCUT CONTROL JOINTS AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK.

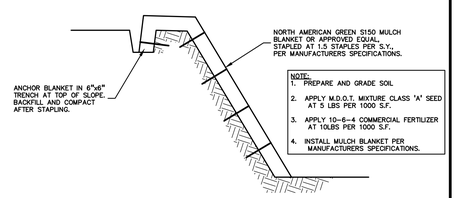
CONCRETE SIDEWALK
NOT TO SCALE



OVERFLOW SPILLWAY DETAIL
NOT TO SCALE

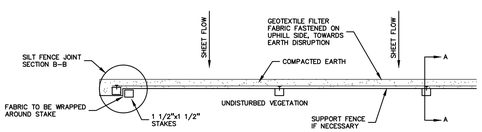


TEMPORARY STONE ACCESS DRIVE
NOT TO SCALE

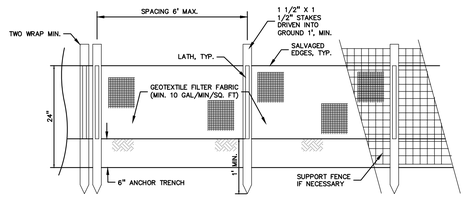


NOTE:
1. PREPARE AND GRADE SOIL
2. APPLY M.D.O.T. MIXTURE CLASS 'A' SEED AT 5 LBS PER 1000 S.F.
3. APPLY 10-6-4 COMMERCIAL FERTILIZER AT 10LBS PER 1000 S.F.
4. INSTALL MULCH BLANKET PER MANUFACTURERS SPECIFICATIONS.

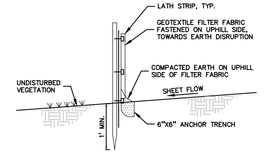
TEMPORARY EROSION BLANKET DETAIL
NOT TO SCALE



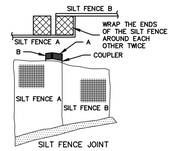
PLAN VIEW



FRONT VIEW



SECTION A–A



SECTION B–B

SILT FENCE DETAIL
NOT TO SCALE

No.	BY	CHK	DESCRIPTION	DATE
5	SAP	SAP	REV. PER TWP. PC MEETING	7-31-17
4	SP	RLS	REV. PARCELS & OPEN SPACE	
3	SP	RLS	REVISED PER TWP.	6-29-17
2	SP	RLS	REVISED PER CONSUMERS	5-10-17
1	SP	RLS	REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

STATE OF MICHIGAN
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No. 60656
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SITE DETAILS
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

S:\PROJECTS\2016\2016-199 CEDAR GRAND HAVEN TWP-SAS\Dwg\Construction\(C-9.0) SITE DETAILS-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

NO SCALE

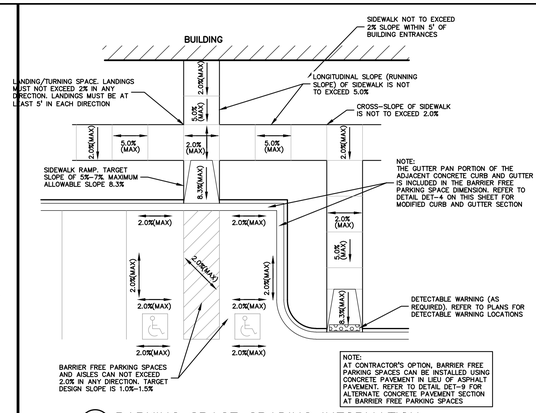
DRAWING NUMBER:
C-9.0

GENERAL BARRIER FREE NOTES:

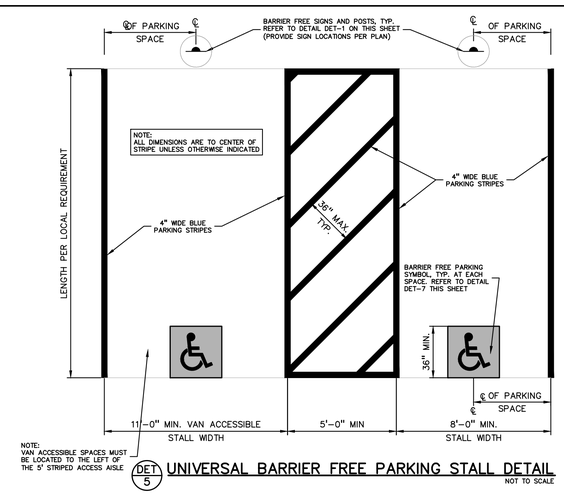
THE FOLLOWING NOTES PROVIDE AN OUTLINE OF SOME OF THE REQUIREMENTS CONTAINED WITHIN THE "STANDARDS FOR ACCESSIBLE DESIGN – AMERICANS WITH DISABILITIES ACT 2010", AND "ACCESSIBLE AND USEABLE BUILDINGS AND FACILITIES", ICC/ANSI A117.1–2009. THE CONTRACTOR IS RESPONSIBLE FOR ALL OF THE REQUIREMENTS PRESENTED WITHIN THESE DOCUMENTS, WHICH ARE AVAILABLE IN FULL UPON REQUEST.

1. AN ACCESSIBLE ROUTE CONSISTS OF WALK SURFACES, CURB RAMPS AND RAMPS. AT LEAST ONE ACCESSIBLE ROUTE SHALL BE PROVIDED WITHIN THE SITE FROM ACCESSIBLE PARKING SPACES, ACCESSIBLE PASSENGER LOADING ZONES, PUBLIC STREETS AND SIDEWALKS, AND PUBLIC TRANSPORTATION STOPS TO THE BUILDING OR FACILITY ENTRANCE THEY SERVE.
2. THE RUNNING SLOPE OF ALL WALKING SURFACES SHALL NOT EXCEED 5% (1:20) AND THE CROSS-SLOPE SHALL NOT EXCEED 2% (1:48).
3. WALKING SURFACES MUST BE LEVEL WITH PERMITTED VERTICAL CHANGES IN LEVEL NOT TO EXCEED 1/4", OR BEVELED CHANGES IN LEVEL NOT TO EXCEED 1/2". REFER TO DETAIL DET–8 THIS SHEET. ANY CHANGE IN LEVEL GREATER THAN 1/2" MUST BE RAMPED.
4. TURNING SPACES ALONG ACCESSIBLE ROUTES MUST BE AT LEAST 5 FEET WIDE IN ALL DIRECTIONS AND NOT EXCEED 2% SLOPE (1:48) IN ANY DIRECTION.
5. ACCESSIBLE ROUTES WILL BE DESIGNED TO BE A MINIMUM OF 5 FEET WIDE. THE MINIMUM CLEAR WIDTH IS 3 FEET.
6. RAMPS ALONG ACCESSIBLE ROUTES WILL HAVE A RUNNING SLOPE GREATER THAN 5% (1:20) AND LESS THAN 8.3% (1:12).
7. THE CROSS–SLOPE OF RAMP RUNS SHALL NOT EXCEED 2% (1:48)
8. THE MINIMUM CLEAR WIDTH OF ANY RAMP IS 36 INCHES.
9. THE MAXIMUM RISE FOR ANY RAMP (NOT INCLUDING CURB RAMPS) SHALL NOT EXCEED 30 INCHES. LANDINGS ARE REQUIRED AT THE TOP AND BOTTOM OF EACH RAMP. LANDINGS SHALL HAVE A CROSS–SLOPE NOT EXCEEDING 2% (1:48), SHALL BE 5 FEET LONG AND AT LEAST AS WIDE AS THE RAMP CLEAR WIDTH. IF THERE IS A CHANGE OF DIRECTION AT A LANDING, THEN THE LANDING MUST BE AT LEAST 5 FEET WIDE AND 5 FEET LONG.
10. HANDRAILS ARE REQUIRED FOR ANY RAMP (NOT INCLUDING CURB RAMPS) WITH A RISE GREATER THAN 6 INCHES. ALL HANDRAILS ARE REQUIRED TO HAVE EDGE PROTECTION UNLESS ADJOINING ANOTHER ACCESS POINT OR IF THE VERTICAL DROP–OFF AT THE EDGE OF THE RAMP DOES NOT EXCEED 1/2" IN 10 FEET. EDGE PROTECTION CAN BE PROVIDED BY MEANS OF A 4" MIN. CURB OR BARRIER.
11. CURB RAMPS ALONG ACCESSIBLE ROUTES SHALL NOT RISE MORE THAN 6 INCHES, NOR BE STEEPER THAN 8.3% (1:12). APPROACHING SLOPES TO THE RAMP CANNOT EXCEED 5%, WHICH INCLUDES SIDEWALKS, PAVEMENT, GUTTERS ETC.
12. IF CURB RAMP SIDES ARE FLARED, THE FLARES SHALL NOT BE STEEPER THAN 10% (1:10).
13. LANDINGS ARE REQUIRED AT THE TOP OF ALL CURB RAMPS. THE CLEAR LENGTH OF THE LANDING SHALL BE A MINIMUM OF 36" AND WILL BE AS WIDE AS THE CURB RAMP.
14. CURB RAMPS SHALL BE LOCATED OR PROTECTED TO PREVENT THEIR OBSTRUCTION BY PARKED VEHICLES.
15. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS.
16. WHERE DETECTABLE WARNING IS REQUIRED AT CURB RAMPS, THE DETECTABLE WARNING SHALL BE 24" MINIMUM IN DEPTH AND SHALL EXTEND THE FULL WIDTH OF THE RAMP. THE DETECTABLE WARNING SHALL BE LOCATED SO THE EDGE NEAREST THE CURB IS 6 INCHES MINIMUM AND 8 INCHES MAXIMUM FROM THE CURB LINE.

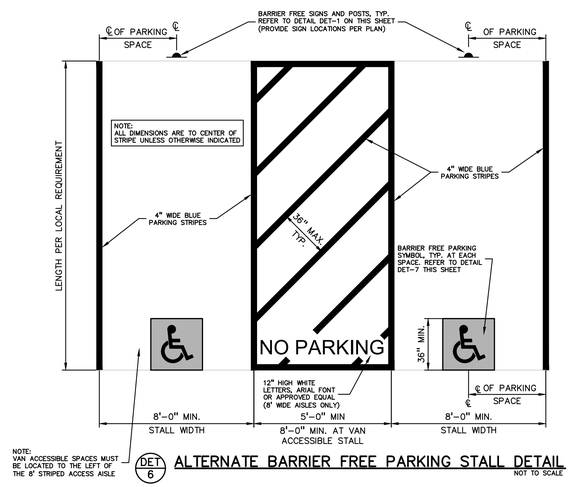
17. ACCESSIBLE PARKING SPACES ON SITE SHALL BE PROVIDED AS REQUIRED IN SECTION 502 OF THE A.D.A. IF THE SITE HAS MORE THAN ONE PARKING *FACILITY*, EACH *FACILITY* IS REQUIRED TO MEET THESE REQUIREMENTS SEPARATELY. THE REQUIRED NUMBER OF SPACES SHALL BE BASED ON THE TOTAL NUMBER OF PARKING SPACES IN EACH PARKING FACILITY ON SITE.
18. FOR EVERY SIX OR FRACTION OF SIX ACCESSIBLE PARKING SPACES, ONE VAN ACCESSIBLE SPACE SHALL BE PROVIDED.
19. ACCESSIBLE PARKING SPACES SHALL BE LOCATED ON THE SHORTEST ACCESSIBLE ROUTE FROM PARKING TO A BUILDING ENTRANCE. IF THERE IS MORE THAN ONE ACCESSIBLE ENTRANCE, PARKING SHALL BE DISPERSED ALONG THE SHORTEST ACCESSIBLE ROUTE TO THE ACCESSIBLE ENTRANCES.
20. BARRIER FREE CAR PARKING SPACES SHALL BE A MINIMUM OF 8 FEET WIDE WITH AN ACCESS AISLE 5 FEET WIDE MINIMUM. VAN ACCESSIBLE PARKING SPACES SHALL BE AT LEAST 11 FEET WIDE WITH A 5' WIDE ACCESS AISLE. VAN ACCESSIBLE SPACES ARE ALSO ACCEPTABLE WITH AN 8 FOOT WIDTH AND 8 FOOT WIDE ACCESS AISLE. THE ACCESS AISLE IN ALL CASES MUST EXTEND THE FULL LENGTH OF THE PARKING SPACE.
21. SURFACE SLOPES WITHIN THE PARKING SPACES AND AISLES SHALL NOT EXCEED 2% (1:48)
22. ACCESSIBLE AREAS INCLUDING PARKING SPACES, AISLES AND PATHWAYS, REQUIRE A MINIMUM VERTICAL CLEARANCE OF 98 INCHES.
23. ACCESSIBLE PARKING SPACES ARE REQUIRED TO BE IDENTIFIED BY SIGNS. THE SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY. VAN PARKING SPACES ARE REQUIRED TO BE DESIGNATED AS "VAN ACCESSIBLE". REFER TO DETAILS ON THIS SHEET.



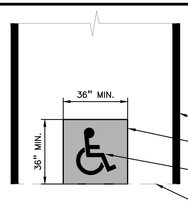
DET 10 PARKING SPACE GRADING INFORMATION
NOT TO SCALE



DET 5 UNIVERSAL BARRIER FREE PARKING STALL DETAIL
NOT TO SCALE

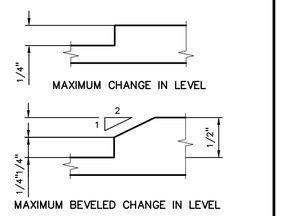


DET 6 ALTERNATE BARRIER FREE PARKING STALL DETAIL
NOT TO SCALE



NOTES:
1. THE BARRIER FREE PARKING SYMBOL SHALL BE LOCATED IN THE CENTER OF THE PARKING SPACE AND ALONG THE EDGE OF THE ADJACENT DRIVE AISLE, TYP.
2. PARKING SYMBOL STRIPING SHALL HAVE A MINIMUM WIDTH OF 2"
3. CONTRACTOR SHALL ADHERE TO LOCAL/STATE JURISDICTIONAL REQUIREMENTS FOR ALL PAINTING WITHIN ACCESSIBLE SPACES.

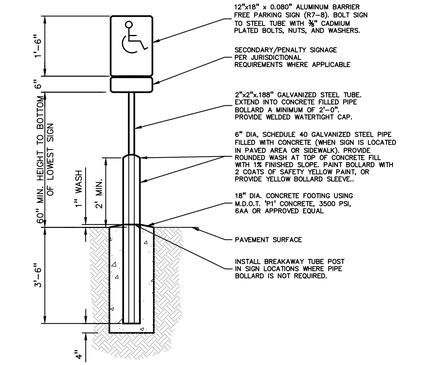
DET 7 BARRIER FREE PARKING SYMBOL DETAIL (INTERNATIONAL SYMBOL OF ACCESSIBILITY)
NOT TO SCALE



DET 8 BARRIER FREE SURFACE CHANGE IN LEVEL TOLERANCE
NOT TO SCALE

BARRIER FREE SIGN NOTES:

1. ONE SIGN IS REQUIRED AT EACH BARRIER FREE PARKING SPACE.
2. ALL SIGNS SHALL COMPLY WITH THE LATEST STANDARDS OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD).
3. WHEN TWO BARRIER FREE PARKING SPACES ARE ADJACENT AND FACING EACH OTHER, TWO SIGNS ARE REQUIRED, BUT CAN BE MOUNTED ON THE SAME POST.
4. SIGN POSTS SHALL BE 2" NOM. SQUARE 14–GAUGE GALVANIZED STEEL TUBE WITH 7/16" HOLES AT 1" CENTERS. POSTS SHALL TELESCOPE INSIDE ANCHOR POSTS A MINIMUM OF 12".
5. ANCHOR POSTS SHALL BE 2.25" NOM. SQUARE 12–GAUGE GALVANIZED STEEL POST, A MINIMUM OF 3 FEET LONG.
6. IF THESE NOTES AND DETAILS CONFLICT WITH LOCAL CODES AND ORDINANCES, THE STRICTER REQUIREMENT SHOULD BE USED.
7. ALTERNATE MATERIALS MAY BE USED IF IN COMPLIANCE WITH A.D.A. GUIDELINES AND LOCAL REQUIREMENTS.



DET 1 BARRIER FREE SIGN AND POST DETAIL
NOT TO SCALE

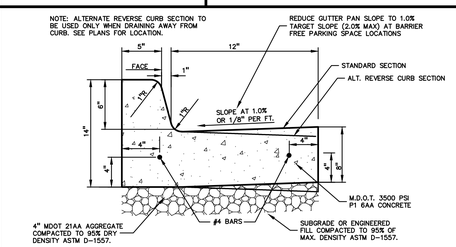
12" x 18" (R7–8)
GREEN BORDER AND LEGEND
WHITE SYMBOL, BLUE BACKGROUND.
REFLECTORIZED

DET 2 BARRIER FREE PARKING SIGN DETAIL
NOT TO SCALE

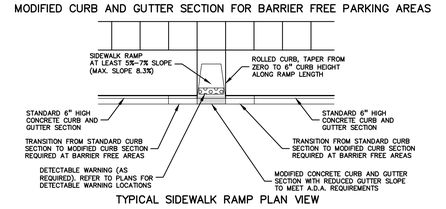
NOTE:
MAY ONLY BE USED AT 11' WIDE SPACES LOCATED ON THE LEFT SIDE OF A 5' WIDE AISLE, OR 8' WIDE SPACES LOCATED TO THE LEFT OF 8' WIDE AISLES

12" x 18" (R7–8 MOD)
GREEN BORDER AND LEGEND
WHITE SYMBOL, BLUE BACKGROUND.
REFLECTORIZED

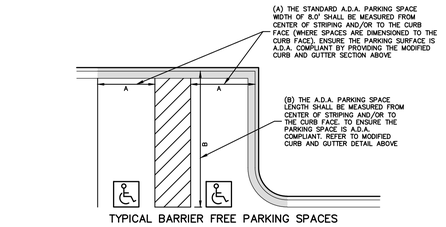
DET 3 VAN ACCESSIBLE PARKING SIGN DETAIL
NOT TO SCALE



MODIFIED CURB AND GUTTER SECTION FOR BARRIER FREE PARKING AREAS



TYPICAL SIDEWALK RAMP PLAN VIEW



TYPICAL BARRIER FREE PARKING SPACES

DET 4 MODIFIED 18"x6" CONCRETE CURB AND GUTTER DETAIL TO BE USED IN BARRIER FREE AREAS
NOT TO SCALE

No.	BY	CHK	DESCRIPTION	DATE
5	SAP	SAP	REV. PER TWP. PC MEETING	7-31-17
4	SAP	SAP	REV. PARCELS & OPEN SPACE	6-29-17
3	SP	RLS	REVISED PER TWP.	5-10-17
2	RLS	RLS	REVISED PER CONSUMERS	4-12-17
1	SP	SP	REVISED SITE PLAN SUBMITTAL	

REVISIONS

STATE OF MICHIGAN
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BARRIER FREE SITE DETAILS
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	SP	DN.	SP	SUR.	KTR	P.M.	RLS

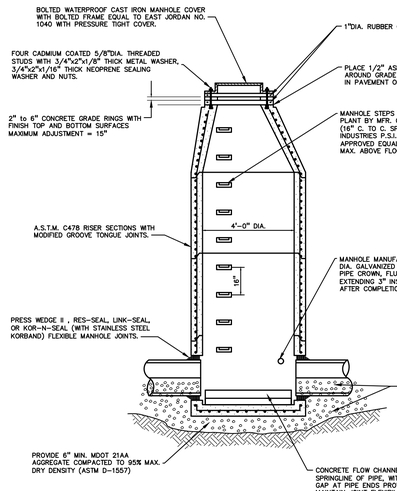
S:\PROJECTS\2016\2016-199 CEDAR GRAND HAVEN TWP-SAS\Dwg\Construction\(C-9.0) SITE DETAILS-181916.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

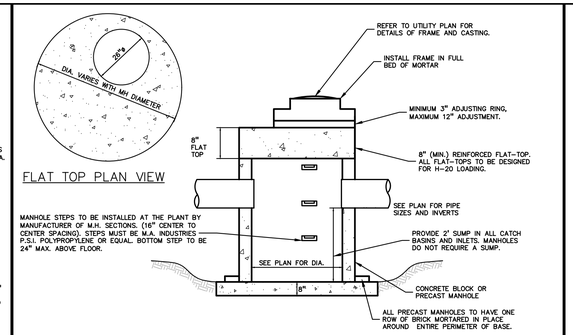
NO SCALE

DRAWING NUMBER:
C-9.1



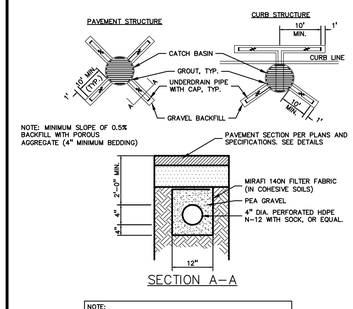
MONITORING MANHOLE DETAIL

NOT TO SCALE



TYPICAL LOW HEAD CATCH BASIN WITH FLAT TOP DETAIL

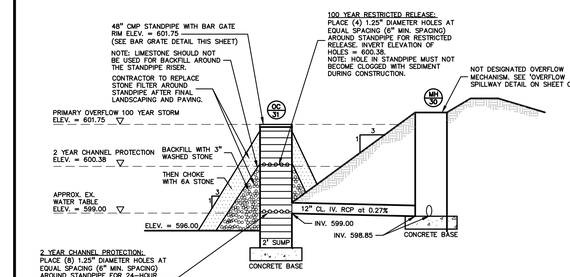
NOT TO SCALE



NOTE:
INSTALL 4" DIAMETER PERFORATED HDPE N-12 WITH SOCK, OR EQUAL TO EXTEND 10' FROM STRUCTURE AT ALL CATCH BASINS AS SHOWN ON UTILITY PLAN.

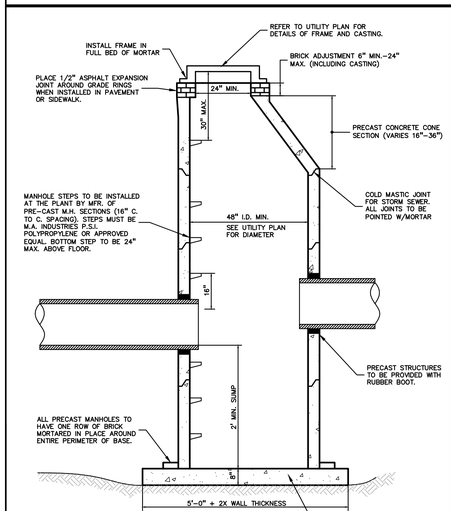
UNDERDRAIN DETAIL

NOT TO SCALE



EXTENDED DETENTION BASIN OUTLET CONTROL STRUCTURE DETAIL

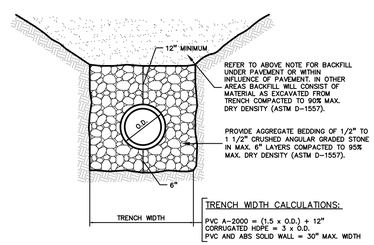
NOT TO SCALE



STANDARD CATCH BASIN DETAIL

NOT TO SCALE

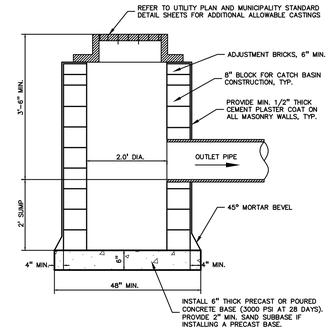
SAND BACKFILL NOTE:
ALL UTILITIES UNDER PAVEMENT OR WITHIN 5' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE M.D.O.T. CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557)



TRENCH WIDTH CALCULATIONS:
PVC A-2000 = (1.5 x O.D.) + 12"
CORRUGATED HDPE = 3 x O.D.
PVC AND ABS SOLID WALL = 30" MAX. WIDTH

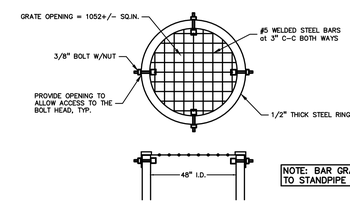
STANDARD PIPE BEDDING FOR FLEXIBLE PIPE

NOT TO SCALE



2' DIA. INLET DETAIL

NOT TO SCALE

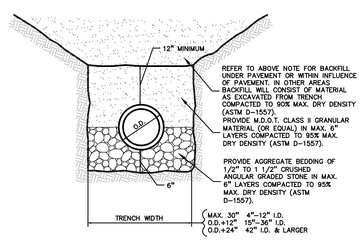


NOTE: BAR GRATE TO BE BOLTED TO STANDPIPE AS SHOWN

BAR GRATE FOR OUTLET CONTROL STRUCTURE

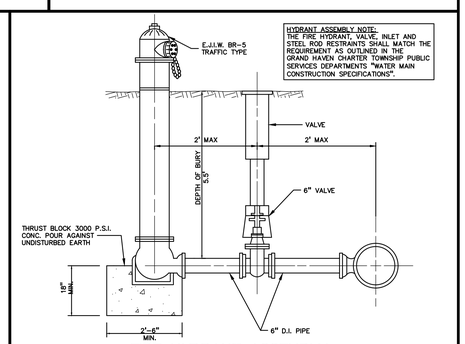
NOT TO SCALE

SAND BACKFILL NOTE:
ALL UTILITIES UNDER PAVEMENT OR WITHIN 5' OF THE EDGE OF PAVEMENT (OR WITHIN THE 45° LINE OF INFLUENCE OF PAVEMENT) SHALL HAVE M.D.O.T. CLASS II GRANULAR BACKFILL COMPACTED TO 95% MAX. DRY DENSITY (ASTM D-1557)



STANDARD PIPE BEDDING FOR RIGID PIPE

NOT TO SCALE

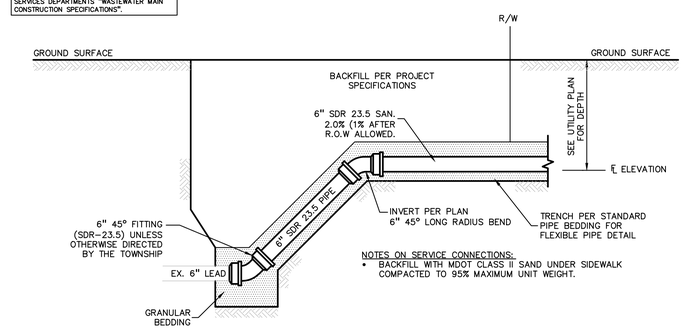


FIRE HYDRANT ASSEMBLY

NOT TO SCALE

NOTE: REFER TO GRAND HAVEN TOWNSHIP PUBLIC SERVICES DEPARTMENT WATER MAIN CONSTRUCTION SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND PIPE RESTRAINTS.

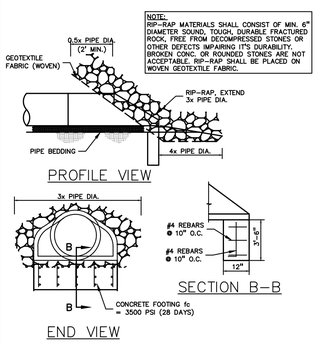
SANITARY SEWER RISER NOTE:
THE SANITARY SEWER RISER SHALL MATCH THE REQUIREMENTS AS OUTLINED IN THE GRAND HAVEN CHARTER TOWNSHIP PUBLIC SERVICES DEPARTMENTS "WASTEWATER MAIN CONSTRUCTION SPECIFICATIONS".



SANITARY SEWER RISER DETAIL

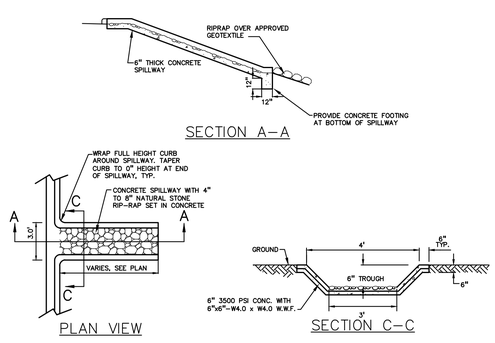
NOT TO SCALE

NOTE:
RIP-RAP MATERIALS SHALL CONSIST OF MIN. 6" DIAMETER SOUND, TOUGH, DURABLE FRACTURED ROCK, FREE FROM DECOMPRESSED STONES OR OTHER DEFECTS IMPAIRING ITS DURABILITY. BROKEN CONC. OR ROUNDED STONES ARE NOT ACCEPTABLE. RIP-RAP SHALL BE PLACED ON WOVEN GEOTEXTILE FABRIC.



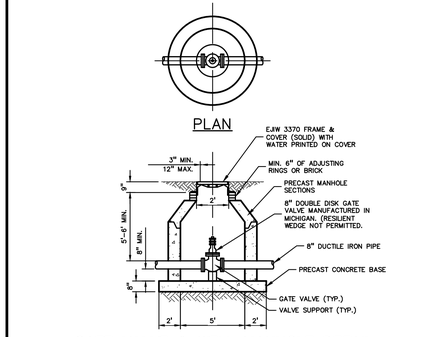
END SECTION WITH FOOTING & RIP-RAP

NOT TO SCALE



CURB CUT AND SPILLWAY DETAIL

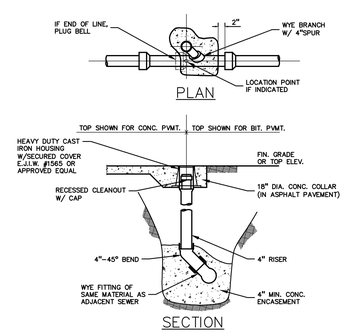
NOT TO SCALE



GATE VALVE & WELL MANHOLE DETAIL (PRECAST CONCRETE)

NOT TO SCALE

NOTE: MANHOLES SHALL BE USED IN LIEU OF VALVE BOXES UNLESS OTHERWISE DIRECTED BY GRAND HAVEN TOWNSHIP.



SEWER CLEANOUT

NOT TO SCALE

No.	BY	CHK	DESCRIPTION	DATE
5	SAP	SAP	REV. PER TWP. PC MEETING	7-31-17
4	SAP	SAP	REV. PARCELS & OPEN SPACE	
3	RLS	RLS	REVISED PER TWP.	6-29-17
2	RLS	SP	REVISED PER CONSUMERS	5-10-17
1	SP	SP	REVISED SITE PLAN SUBMITTAL	4-12-17

REVISIONS

STATE OF MICHIGAN
SCOTT A. PERUSKI
ENGINEER
No. 60668
LICENSED PROFESSIONAL ENGINEER

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CONSTRUCTION DETAILS
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES.	DN.	CK.	SUR.	P.M.
SP	SP	SP	KTR	RLS

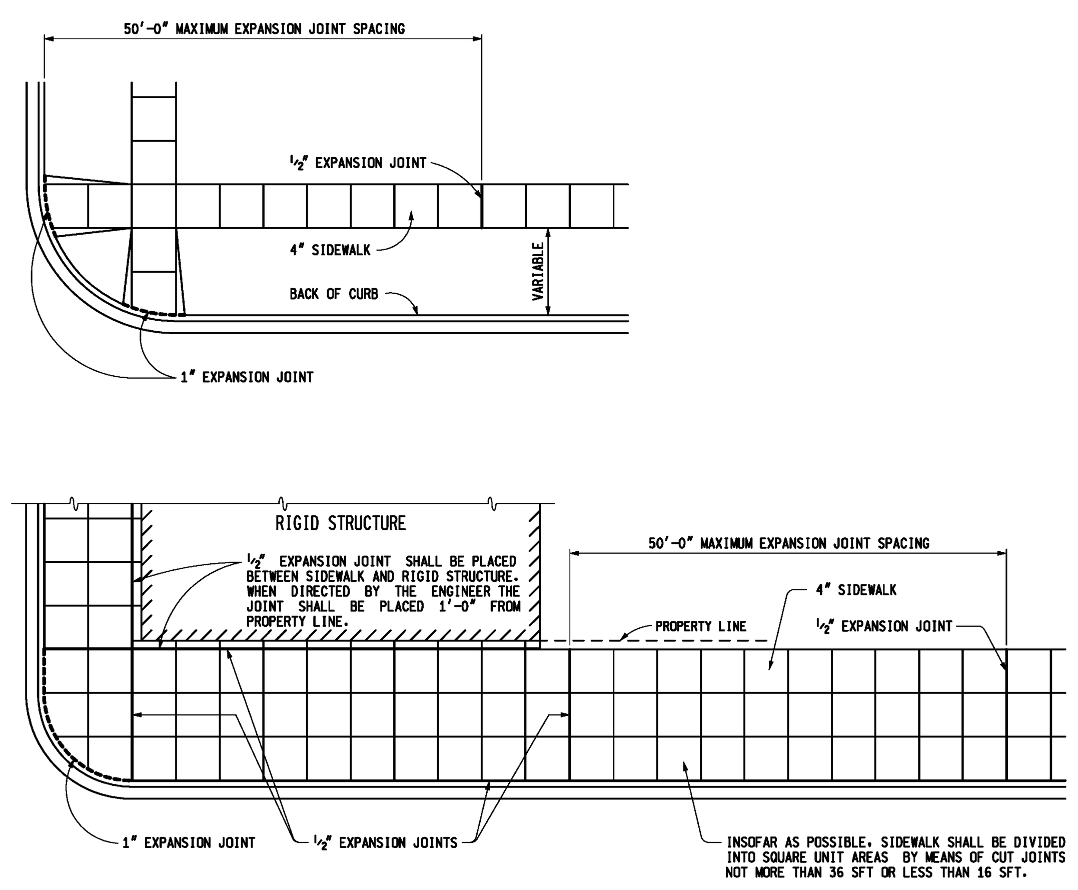
S:\PROJECTS\2016\2016-199 DCM GRAND HAVEN TWP-SAS\Dwg\Construction\C-10.0 CONST DETAILS-161199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

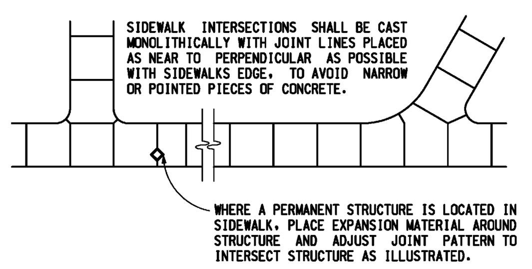
PEA JOB NO. 2016-199

NO SCALE

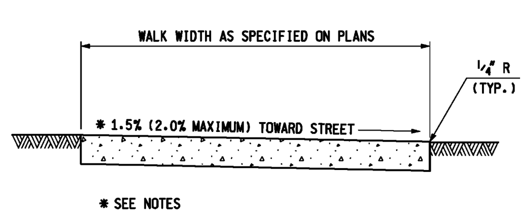
DRAWING NUMBER:
C-10.0



LOCATION OF JOINTS IN CONCRETE SIDEWALK



TYPICAL SIDEWALK JOINT LAYOUTS



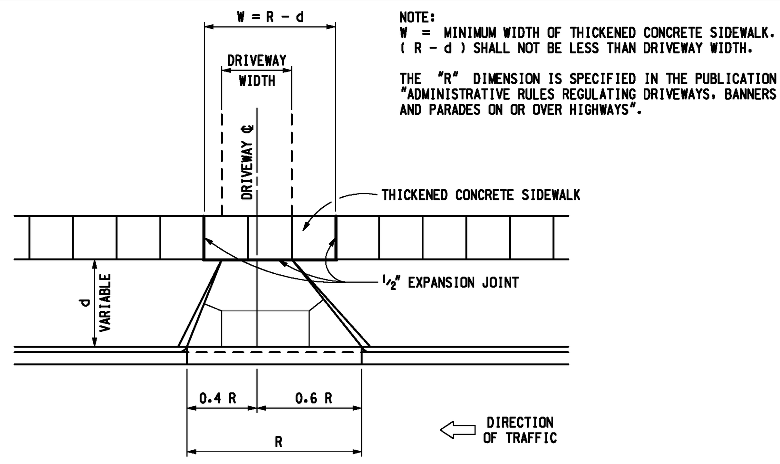
4" CONCRETE SIDEWALK

MDOT — PREPARED BY DESIGN DIVISION — DRAWN BY: B.L.T. — CHECKED BY: W.K.P.
DEPARTMENT DIRECTOR Kirk T. Steudle
APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES
APPROVED BY: DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT

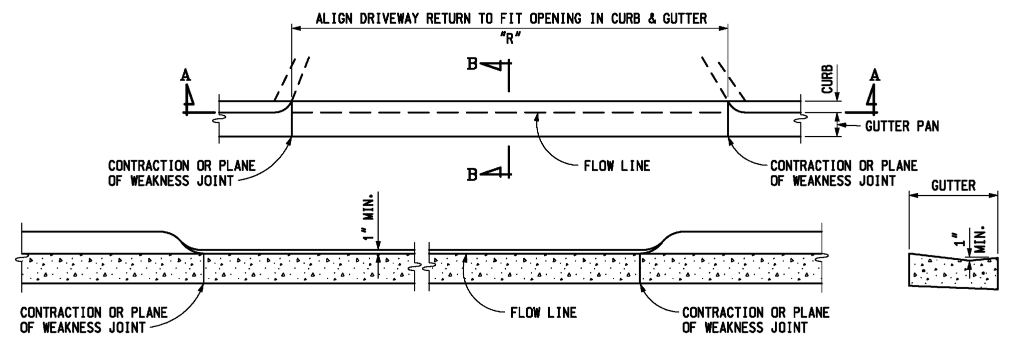
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK
9-30-2014 F.H.W.A. APPROVAL | 7-1-2014 PLAN DATE | R-29-I | SHEET 1 OF 4

NOTE:
W = MINIMUM WIDTH OF THICKENED CONCRETE SIDEWALK. (R - d) SHALL NOT BE LESS THAN DRIVEWAY WIDTH.

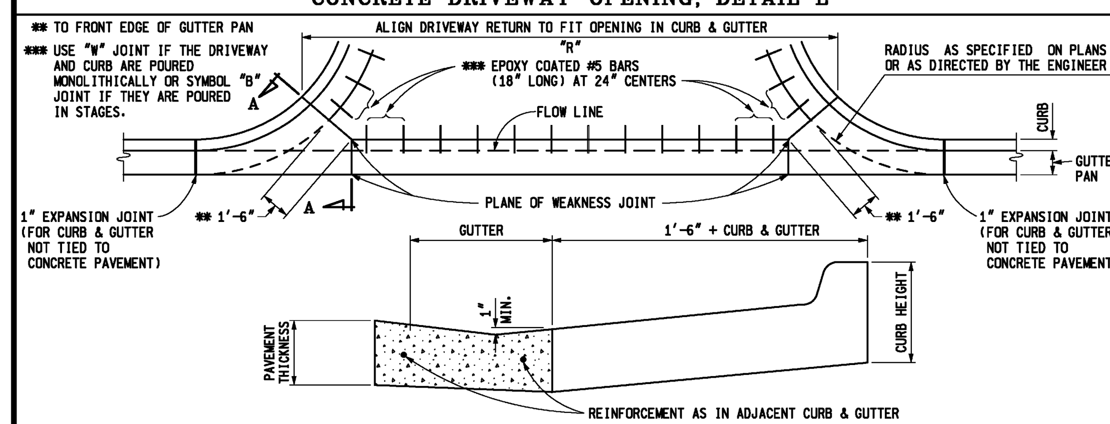
THE "R" DIMENSION IS SPECIFIED IN THE PUBLICATION "ADMINISTRATIVE RULES REGULATING DRIVEWAYS, BANNERS AND PARADES ON OR OVER HIGHWAYS".



CONCRETE DRIVEWAY OPENING LAYOUT



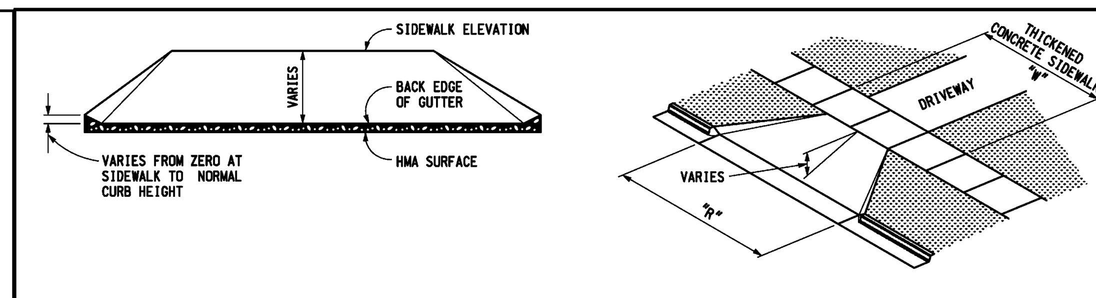
CONCRETE DRIVEWAY OPENING, DETAIL L



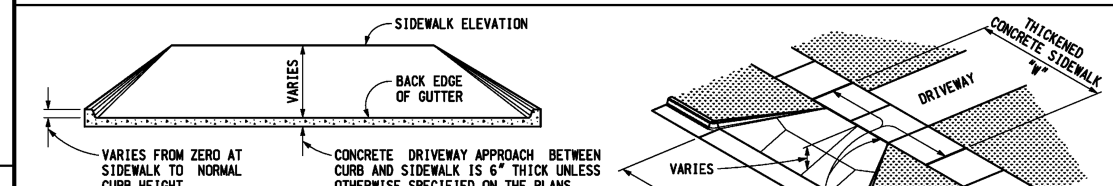
CONCRETE DRIVEWAY OPENING, DETAIL M

NOTE:
FOR ROADWAYS WITH CONCRETE PAVEMENTS, LONGITUDINAL LANE TIES WILL BE CONTINUOUS THROUGH THE DRIVEWAY OPENING AND THE SPACING OF THE #5 BARS IN CONCRETE DRIVEWAYS SHALL BE ADJUSTED TO AVOID CONFLICT WITH THE LONGITUDINAL LANE TIES.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK
9-30-2014 F.H.W.A. APPROVAL | 7-1-2014 PLAN DATE | R-29-I | SHEET 2 OF 4



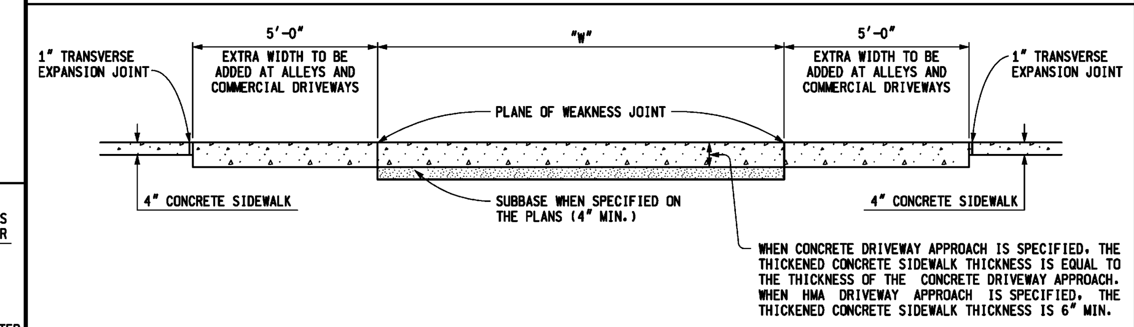
HMA DRIVEWAY APPROACH
(TO BE USED WITH DETAIL L)



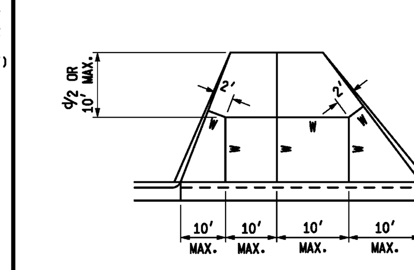
NOTES:
MONOLITHIC CURB IS INCLUDED IN THE CONCRETE DRIVEWAY APPROACH QUANTITY.

REINFORCEMENT IS NOT REQUIRED UNLESS SPECIFIED ON THE PLANS. WHEN REINFORCEMENT IS SPECIFIED, SEE CHART ON THIS SHEET.

CONCRETE DRIVEWAY APPROACH
(TO BE USED WITH DETAIL L OR M)



THICKENED CONCRETE SIDEWALK



ADJUST DRIVEWAY JOINTS AS NEEDED TO ALIGN WITH ANY COINCIDING TRANSVERSE PAVEMENT JOINTS.

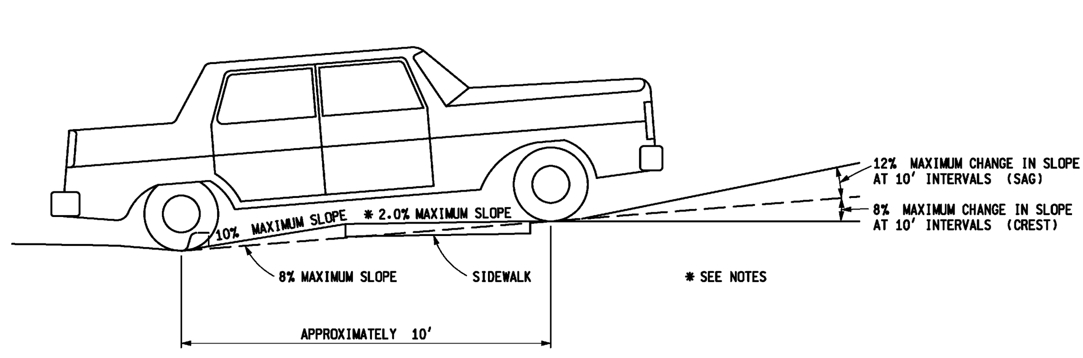
JOINT LAYOUT IS AS INDICATED OR AS DIRECTED BY THE ENGINEER.

INTERMEDIATE DRIVEWAY JOINT DETAILS

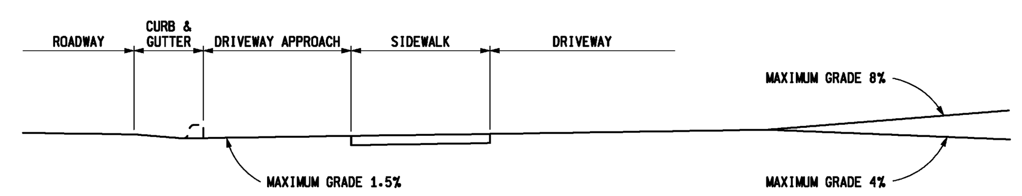
REINFORCEMENT FOR CONCRETE DRIVEWAYS

CONCRETE DRIVEWAY THICKNESS	WIRE SIZE (6" x 6" MESH)	AVERAGE WEIGHT (LBS/100 SFT)
LESS THAN 8"	W1.4	21
	W2.9	42
8" OR GREATER	USE WIRE FABRIC REINFORCEMENT SPECIFIED ON STANDARD PLAN R-37-SERIES	

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK
9-30-2014 F.H.W.A. APPROVAL | 7-1-2014 PLAN DATE | R-29-I | SHEET 3 OF 4



LOW VOLUME COMMERCIAL OR RESIDENTIAL DRIVEWAY SLOPES



COMMERCIAL DRIVEWAY PROFILE FOR MAJOR TRAFFIC GENERATORS

NOTES:

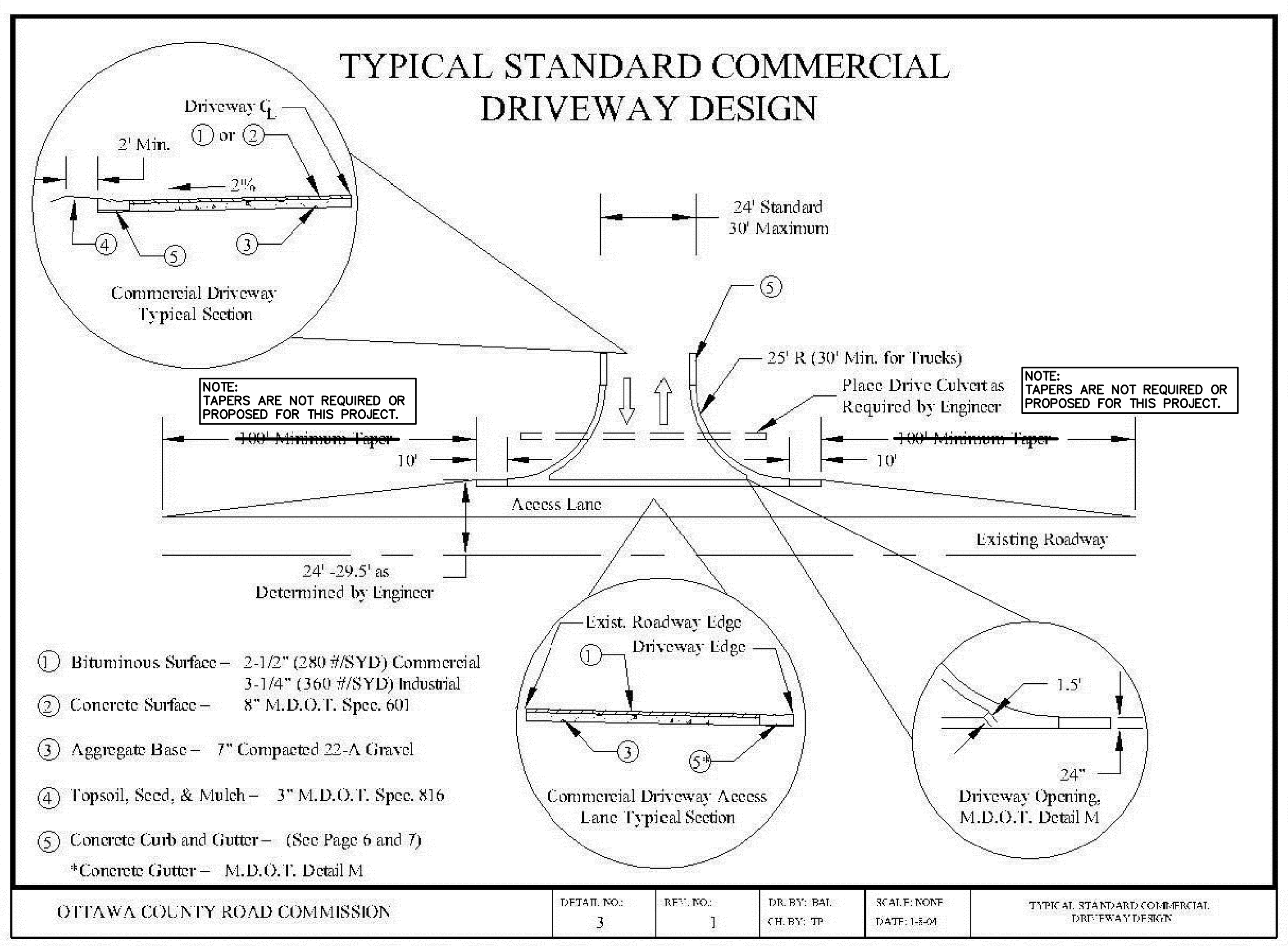
FOR DRIVEWAY DESIGN REFER ALSO TO "ADMINISTRATIVE RULES REGULATING DRIVEWAYS, BANNERS, AND PARADES ON OR OVER HIGHWAYS" AND GEOMETRIC DESIGN G-680-SERIES, COMMERCIAL DRIVEWAYS.

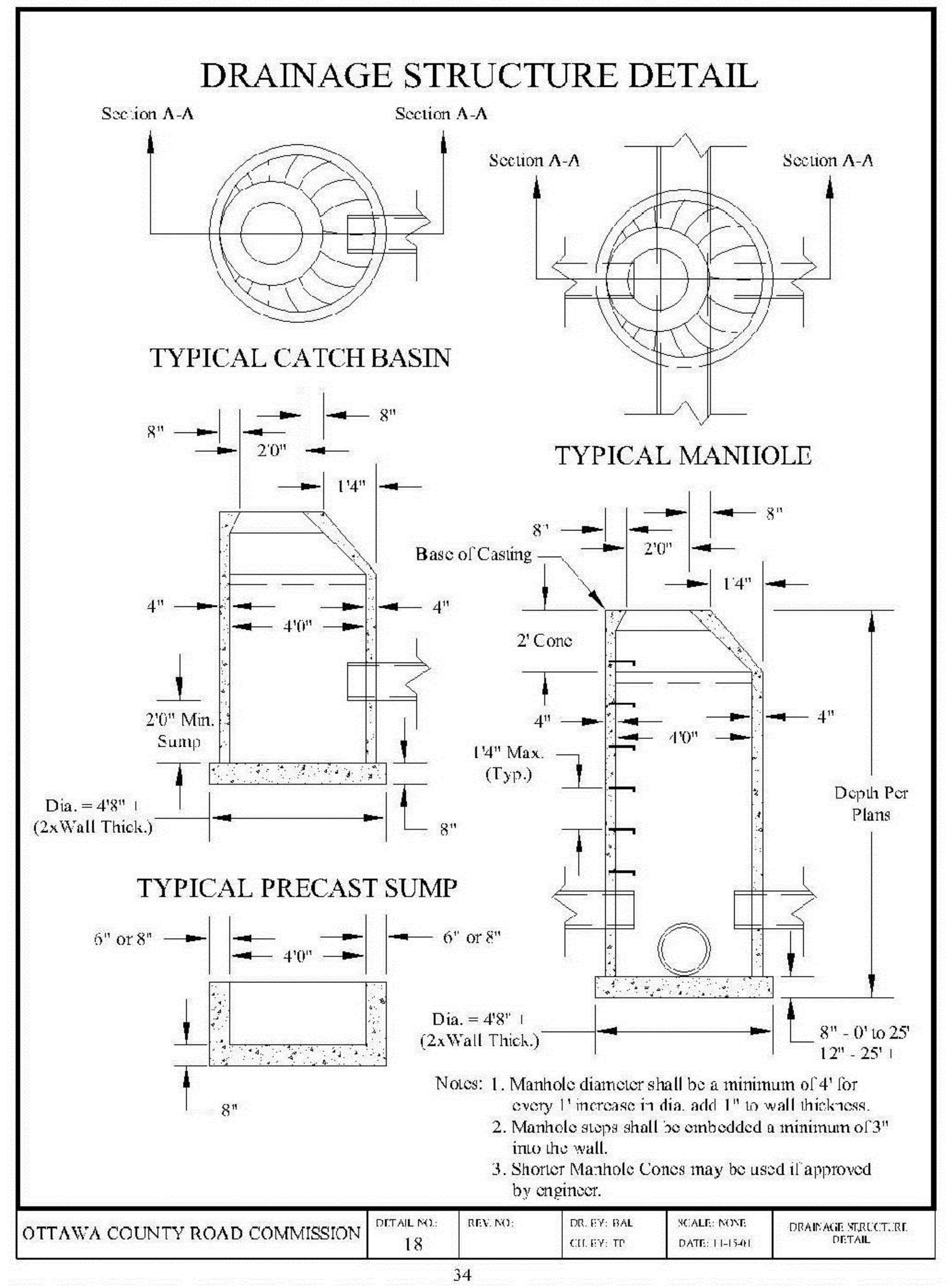
FOR CURB AND GUTTER DETAILS, SEE STANDARD PLAN R-30-SERIES.

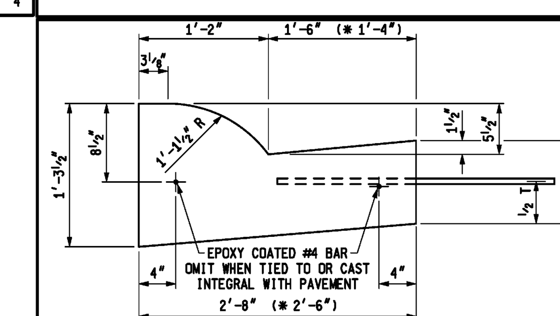
TRANSVERSE SIDEWALK SLOPES ARE TYPICALLY 1.5% (2.0% MAXIMUM). IN ORDER TO MEET SITE CONDITIONS, IF THE TRANSVERSE SLOPE IS REQUIRED TO BE LESS THAN 1.5%, LONGITUDINAL DRAINAGE MUST BE PROVIDED.

WHEN SETTING GRADES FOR COMMERCIAL DRIVES, THE TYPES OF VEHICLES USING THE DRIVE SHOULD BE CONSIDERED.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK
9-30-2014 F.H.W.A. APPROVAL | 7-1-2014 PLAN DATE | R-29-I | SHEET 4 OF 4



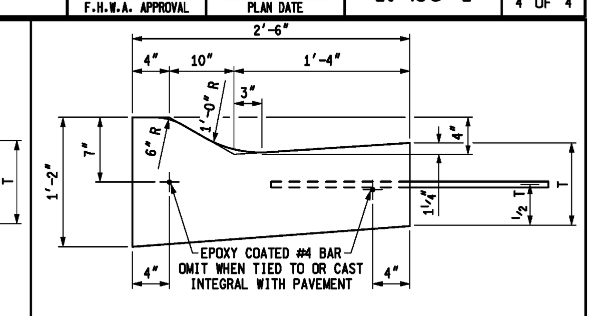




(* GUTTER PAN WIDTH MAY BE REDUCED WHEN APPROVED BY THE ENGINEER)

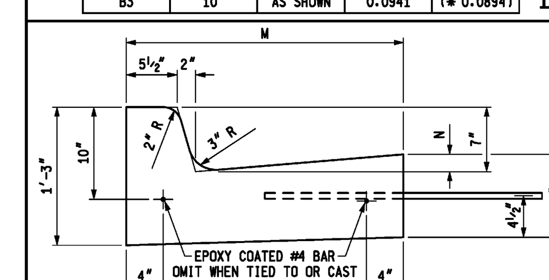
DETAIL	DIMENSION T	LANE TIES	CONCRETE CYD / LFT	CONCRETE CYD / LFT
B1	9"	AS SHOWN	0.0900	(* 0.0855)
B2	9"	OMITTED	0.0900	(* 0.0855)
B3	10"	AS SHOWN	0.0941	(* 0.0894)

B



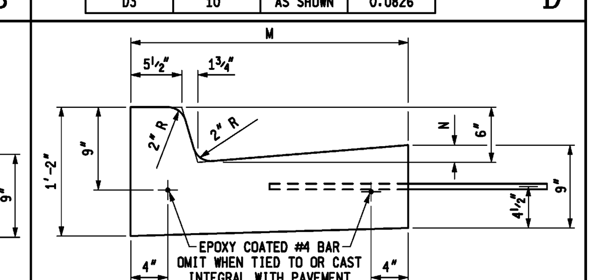
DETAIL	DIMENSION T	LANE TIES	CONCRETE CYD / LFT
D1	9"	AS SHOWN	0.0788
D2	9"	OMITTED	0.0788
D3	10"	AS SHOWN	0.0826

D



DETAIL	DIMENSION M	DIMENSION N	LANE TIES	CONCRETE CYD / LFT
C1	1'-6"	⅞"	AS SHOWN	0.0506
C2	1'-6"	⅞"	OMITTED	0.0506
C3	2'-0"	1⅜"	AS SHOWN	0.0632
C4	2'-0"	1⅜"	OMITTED	0.0632
C5	2'-6"	1⅞"	AS SHOWN	0.0757
C6	2'-6"	1⅞"	OMITTED	0.0757

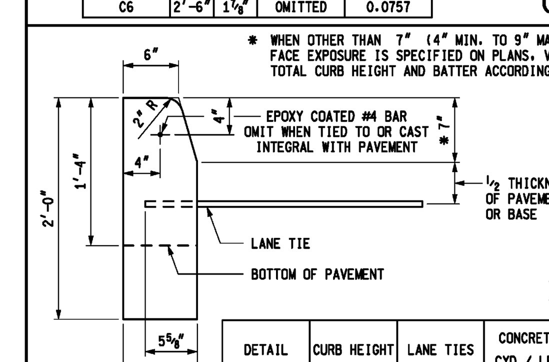
C



DETAIL	DIMENSION M	DIMENSION N	LANE TIES	CONCRETE CYD / LFT
F1	1'-6"	⅞"	AS SHOWN	0.0484
F2	1'-6"	⅞"	OMITTED	0.0484
F3	2'-0"	1⅜"	AS SHOWN	0.0610
F4	2'-0"	1⅜"	OMITTED	0.0610
F5	2'-6"	1⅞"	AS SHOWN	0.0737
F6	2'-6"	1⅞"	OMITTED	0.0737

F

* WHEN OTHER THAN 7" (4" MIN. TO 9" MAX.) FACE EXPOSURE IS SPECIFIED ON PLANS, VARY TOTAL CURB HEIGHT AND BATTER ACCORDINGLY



DETAIL	CURB HEIGHT	LANE TIES	CONCRETE CYD / LFT
E1	1'-4"	AS SHOWN	0.0310
E2	1'-4"	OMITTED	0.0310
E4	2'-0"	OMITTED	0.0477

E

MDOT — PREPARED BY DESIGN DIVISION — DRAWN BY: B.L.T. — CHECKED BY: W.K.P.
DEPARTMENT DIRECTOR Kirk T. Steudle
APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES
APPROVED BY: DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
CONCRETE CURB AND CONCRETE CURB & GUTTER
9-30-2014 F.H.W.A. APPROVAL | 2-6-2014 PLAN DATE | R-30-G | SHEET 1 OF 2

REVISIONS

No.	BY	CHK	DESCRIPTION	DATE
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17
2	RLS		REVISED PER CONSUMERS	5-10-17
3	RLS		HFES PRELIMINARY	6-29-17
4	SAP		REV. PARCELS & OPEN SPACE	
5	SAP		REV. PER TWP. PC MEETING	7-31-17

STATE OF MICHIGAN — SCOTT A. PERUSKI — ENGINEER — No. 60666 — LICENSED PROFESSIONAL ENGINEER

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FARMINGTON HILLS, MI 48335

CONSTRUCTION DETAILS
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES. SP | DN. SP | SUR. KTR | P.M. RLS

S:\PROJECTS\2016\2016-199 CIENA GRAND HAVEN TWP-SAS\Dwg\Construction\(C-10.0) CONST DETAILS-16199.dwg

ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

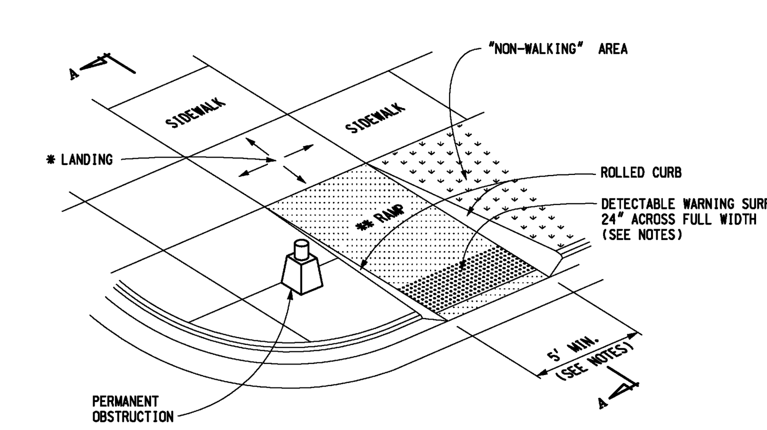
PEA JOB NO. 2016-199

NO SCALE

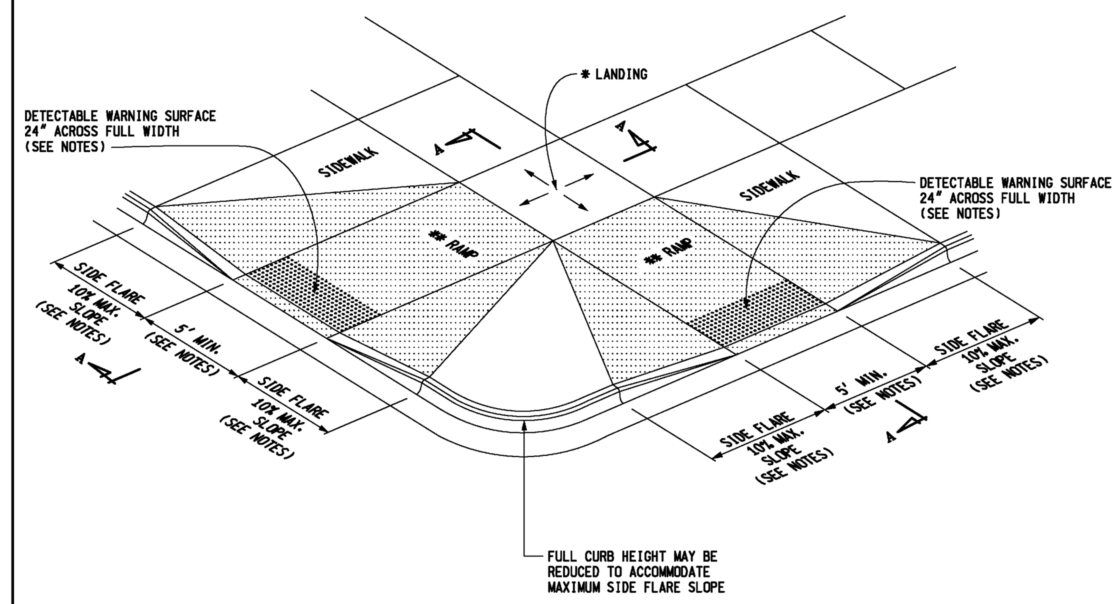
DRAWING NUMBER:
C-10.1

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE R
(ROLLED SIDES)

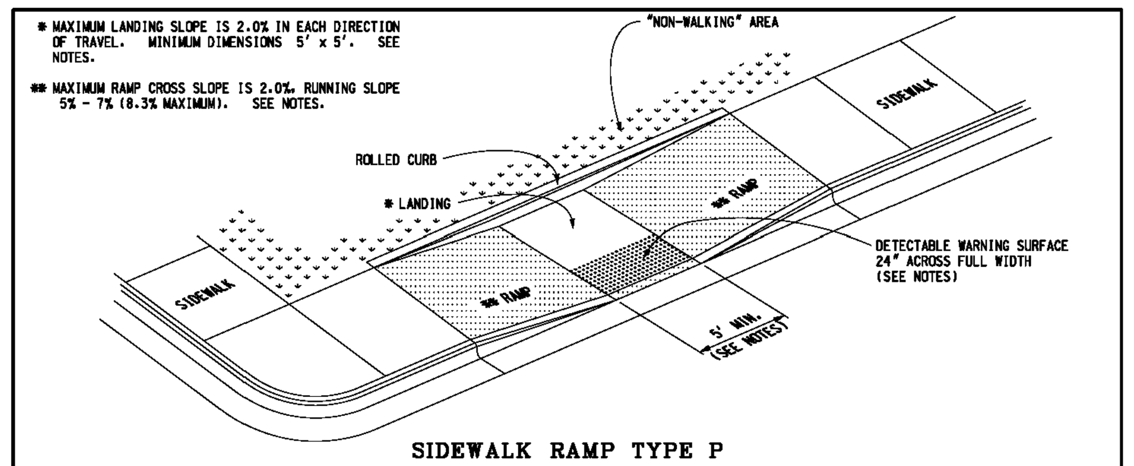


SIDEWALK RAMP TYPE F
(FLARED SIDES, TWO RAMPS SHOWN)

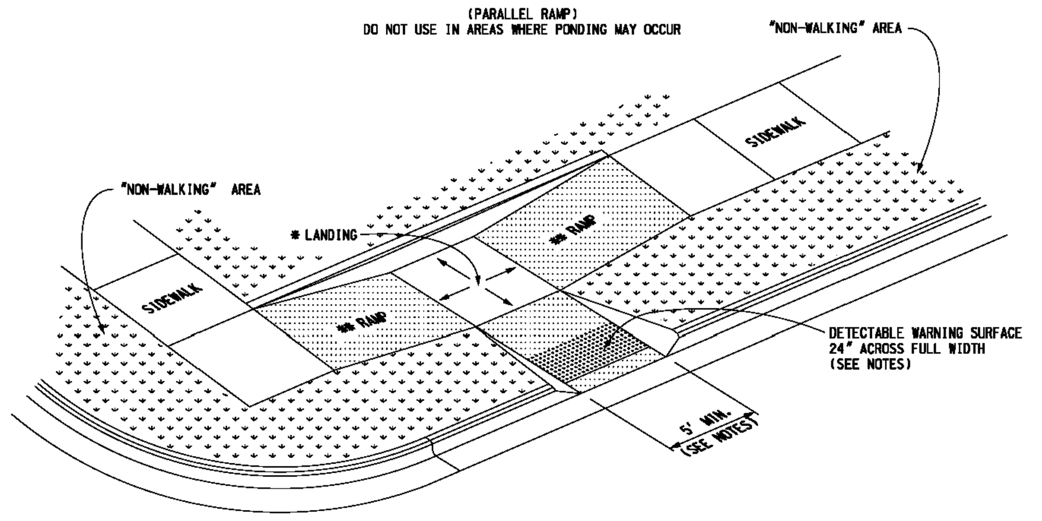
MDOT	DEPARTMENT DIRECTOR Kirk T. Steudle	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR
PREPARED BY DESIGN DIVISION	APPROVED BY: DIRECTOR, BUREAU OF FIELD SERVICES	SIDEWALK RAMP AND DETECTABLE WARNING DETAILS
DRAWN BY: B.L.T. CHECKED BY: W.K.P.	APPROVED BY: DIRECTOR, BUREAU OF DEVELOPMENT	F.H.W.A. APPROVAL / 3-15-2016 PLAN DATE / R-28-J / SHEET 1 OF 7

* MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL. MINIMUM DIMENSIONS 5' x 5'. SEE NOTES.

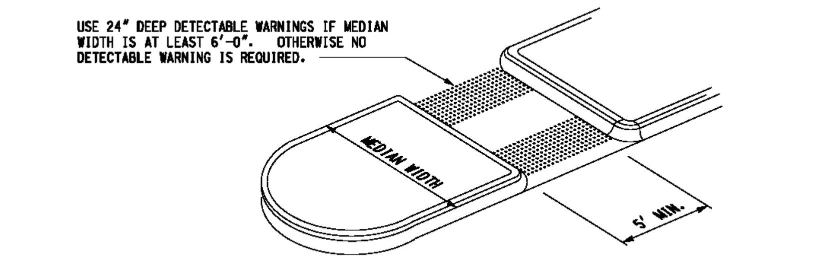
** MAXIMUM RAMP CROSS SLOPE IS 2.0%. RUNNING SLOPE 5% - 7% (8.3% MAXIMUM). SEE NOTES.



SIDEWALK RAMP TYPE P
(PARALLEL RAMP)
DO NOT USE IN AREAS WHERE PONDING MAY OCCUR

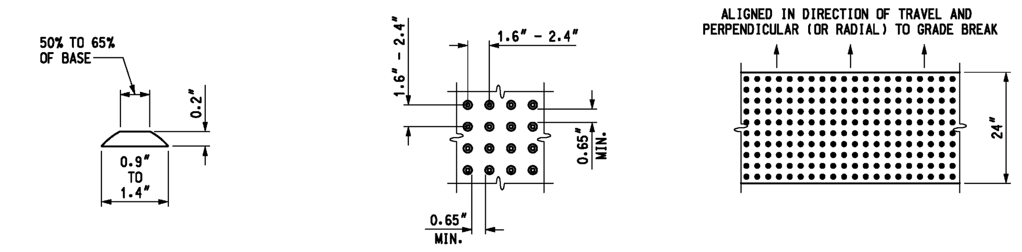


SIDEWALK RAMP TYPE C
(COMBINATION RAMP)



SIDEWALK RAMP TYPE M
(MEDIAN ISLAND)

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR			
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS			
F.H.W.A. APPROVAL	3-15-2016 PLAN DATE	R-28-J	SHEET 3 OF 7



DOME SECTION — DOME SPACING — DOME ALIGNMENT

DETECTABLE WARNING DETAILS

NOTES:

DETAILS SPECIFIED ON THIS PLAN APPLY TO ALL CONSTRUCTION, RECONSTRUCTION, OR ALTERATION OF STREETS, CURBS, OR SIDEWALKS IN THE PUBLIC RIGHT OF WAY.

SIDEWALK RAMPS ARE TO BE LOCATED AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

RAMPS SHALL BE PROVIDED AT ALL CORNERS OF AN INTERSECTION WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MARKED AND/OR SIGNALIZED MID-BLOCK CROSSINGS.

SURFACE TEXTURE OF THE RAMP SHALL BE THAT OBTAINED BY A COARSE BROOMING, TRANSVERSE TO THE RUNNING SLOPE.

SIDEWALK SHALL BE RAMPED WHERE THE DRIVEWAY CURB IS EXTENDED ACROSS THE WALK.

CARE SHALL BE TAKEN TO ASSURE A UNIFORM GRADE ON THE RAMP. WHERE CONDITIONS PERMIT, IT IS DESIRABLE THAT THE SLOPE OF THE RAMP BE IN ONLY ONE DIRECTION, PARALLEL TO THE DIRECTION OF TRAVEL.

RAMP WIDTH SHALL BE INCREASED, IF NECESSARY, TO ACCOMMODATE SIDEWALK SNOW REMOVAL EQUIPMENT NORMALLY USED BY THE MUNICIPALITY.

WHEN 5' MINIMUM WIDTHS ARE NOT FEASIBLE, RAMP WIDTH MAY BE REDUCED TO NOT LESS THAN 4' AND LANDINGS TO NOT LESS THAN 4' x 4'.

DETECTABLE WARNING SURFACE COVERAGE IS 24" MINIMUM IN THE DIRECTION OF RAMP/PATH TRAVEL AND THE FULL WIDTH OF THE RAMP/PATH OPENING EXCLUDING CURBED OR FLARED CURB TRANSITION AREAS. A BORDER OFFSET NOT GREATER THAN 2" MEASURED ALONG THE EDGES OF THE DETECTABLE WARNING IS ALLOWABLE. FOR RADIAL CURB THE OFFSET IS MEASURED FROM THE ENDS OF THE RADIUS.

FOR NEW ROADWAY CONSTRUCTION, THE RAMP CROSS SLOPE MAY NOT EXCEED 2.0%. FOR ALTERATIONS TO EXISTING ROADWAYS, THE CROSS SLOPE MAY BE TRANSITIONED TO MEET AN EXISTING ROADWAY GRADE. THE CROSS SLOPE TRANSITION SHALL BE APPLIED UNIFORMLY OVER THE FULL LENGTH OF THE RAMP.

THE MAXIMUM RUNNING SLOPE OF 8.3% IS RELATIVE TO A FLAT (0%) REFERENCE. HOWEVER, IT SHALL NOT REQUIRE ANY RAMP OR SERIES OF RAMPS TO EXCEED 15 FEET IN LENGTH.

DRAINAGE STRUCTURES SHOULD NOT BE PLACED IN LINE WITH RAMPS. THE LOCATION OF THE RAMP SHOULD TAKE PRECEDENCE OVER THE LOCATION OF THE DRAINAGE STRUCTURE. WHERE EXISTING DRAINAGE STRUCTURES ARE LOCATED IN THE RAMP PATH OF TRAVEL, USE A MANUFACTURER'S ADA COMPLIANT GRATE. OPENINGS SHALL NOT BE GREATER THAN ½". ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE DOMINANT DIRECTION OF TRAVEL.

TRANSITION THE GUTTER PAN CROSS SECTION SUCH THAT THE COUNTER SLOPE IN THE DIRECTION OF RAMP TRAVEL IS NOT GREATER THAN 5.0%. MAINTAIN THE NORMAL GUTTER PAN CROSS SECTION ACROSS DRAINAGE STRUCTURES.

THE TOP OF THE JOINT FILLER FOR ALL RAMP TYPES SHALL BE FLUSH WITH THE ADJACENT CONCRETE.

CROSSWALK AND STOP LINE MARKINGS, IF USED, SHALL BE SO LOCATED AS TO STOP TRAFFIC SHORT OF RAMP CROSSINGS. SPECIFIC DETAILS FOR MARKING APPLICATIONS ARE GIVEN IN THE "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

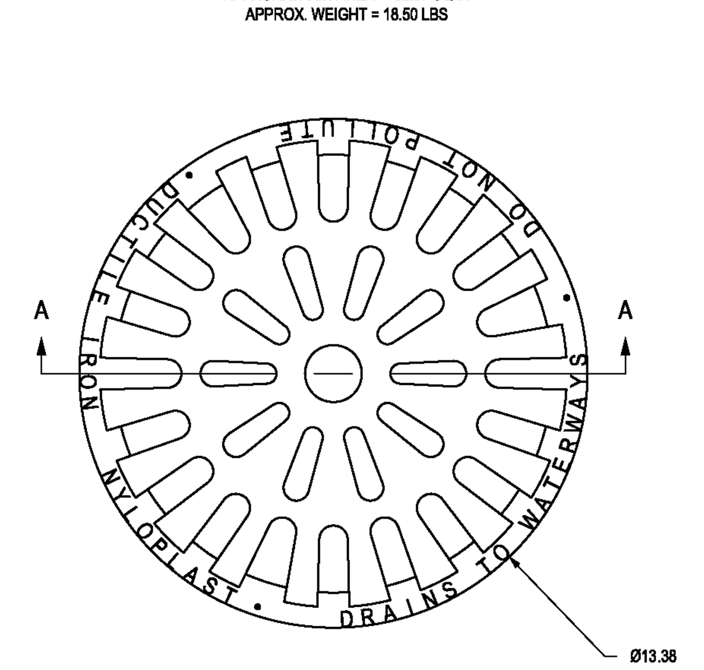
FLARED SIDES WITH A SLOPE OF 10% MAXIMUM, MEASURED ALONG THE ROADSIDE CURB LINE, SHALL BE PROVIDED WHERE AN UNOBSTRUCTED CIRCULATION PATH LATERALLY CROSSES THE SIDEWALK RAMP. FLARED SIDES ARE NOT REQUIRED WHERE THE RAMP IS BORDERED BY LANDSCAPING, UNPAVED SURFACE OR PERMANENT FIXED OBJECTS. WHERE THEY ARE NOT REQUIRED, FLARED SIDES CAN BE CONSIDERED IN ORDER TO AVOID SHARP CURB RETURNS AT RAMP OPENINGS.

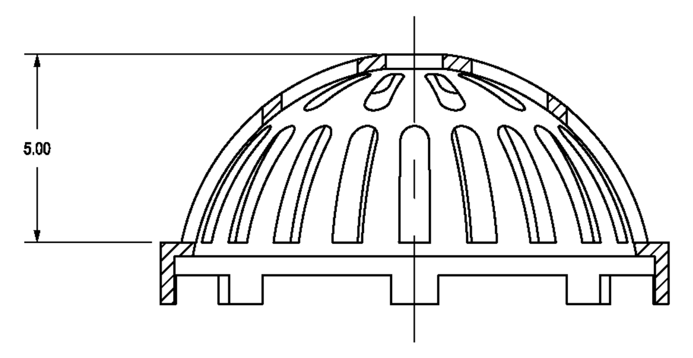
DETECTABLE WARNING PLATES MUST BE INSTALLED USING FABRICATED OR FIELD CUT UNITS CAST AND/OR ANCHORED IN THE PAVEMENT TO RESIST SHIFTING OR HEAVING.

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT STANDARD PLAN FOR			
SIDEWALK RAMP AND DETECTABLE WARNING DETAILS			
F.H.W.A. APPROVAL	3-15-2016 PLAN DATE	R-28-J	SHEET 7 OF 7

1299CGD

APPROX. DRAIN AREA = 82.87 SQ IN
APPROX. WEIGHT = 18.50 LBS





SECTION A-A

DIMENSIONS ARE FOR REFERENCE ONLY
ACTUAL DIMENSIONS MAY VARY
DIMENSIONS ARE IN INCHES
QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05
PAINT: CASTINGS ARE FURNISHED WITH A BLACK PAINT
LOCKING DEVICE AVAILABLE UPON REQUEST

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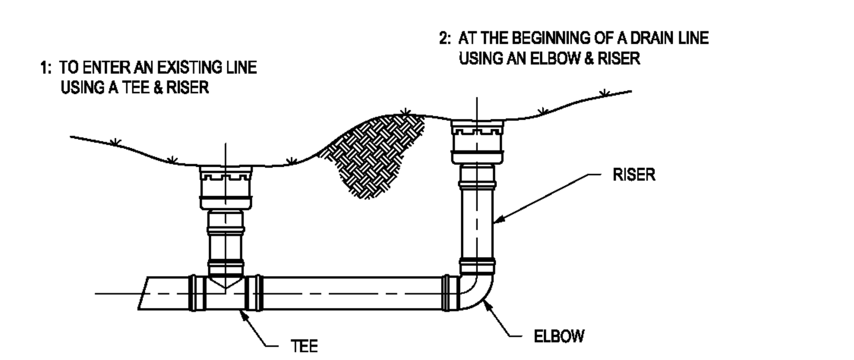
DRAWN BY EBC	MATERIAL DUCTILE IRON	Nyloplast 3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com
DATE 3-6-06		
REVISED BY EBC	PROJECT NO./NAME	TITLE 12 IN DOME GRATE
DATE 3-10-11		
DWG SIZE A	SCALE 1:4 SHEET 1 OF 1	DWG NO. 7001-110-206 REV D

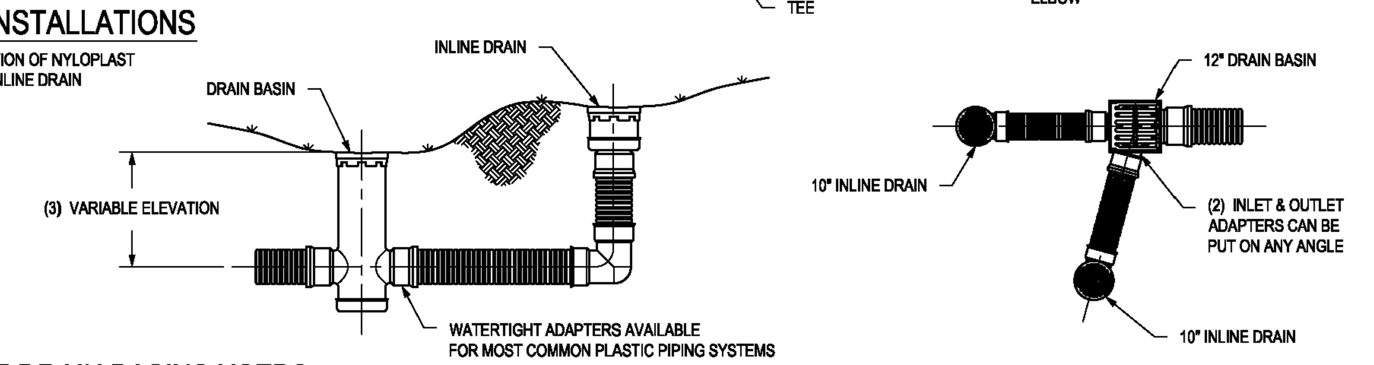
WHEN ARE INLINE DRAINS USED?

2708AG _ _ X
2710AG _ _ X
2712AG _ _ X
2715AG _ _ X
2718AG _ _ X
2724AG _ _ X
2730AG _ _ X



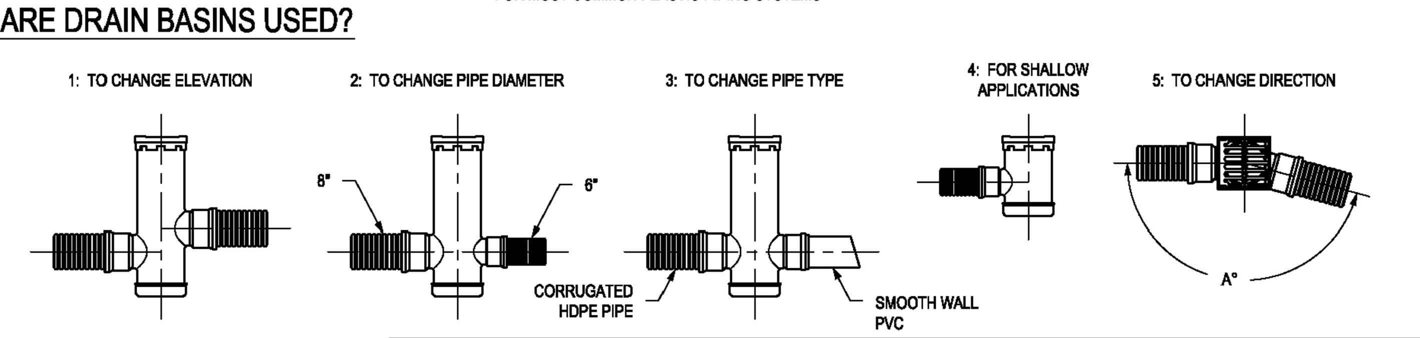
TYPICAL INSTALLATIONS

TYPICAL INSTALLATION OF NYLOPLAST DRAIN BASIN AND INLINE DRAIN



WHEN ARE DRAIN BASINS USED?

2808AG _ _ X
2810AG _ _ X
2812AG _ _ X
2815AG _ _ X
2818AG _ _ X
2824AG _ _ X
2830AG _ _ X



1 - STRUCTURES & ADAPTERS AVAILABLE IN SIZES 8" - 30"
2 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°, TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS SEE DRAWING NO. 7001-110-065

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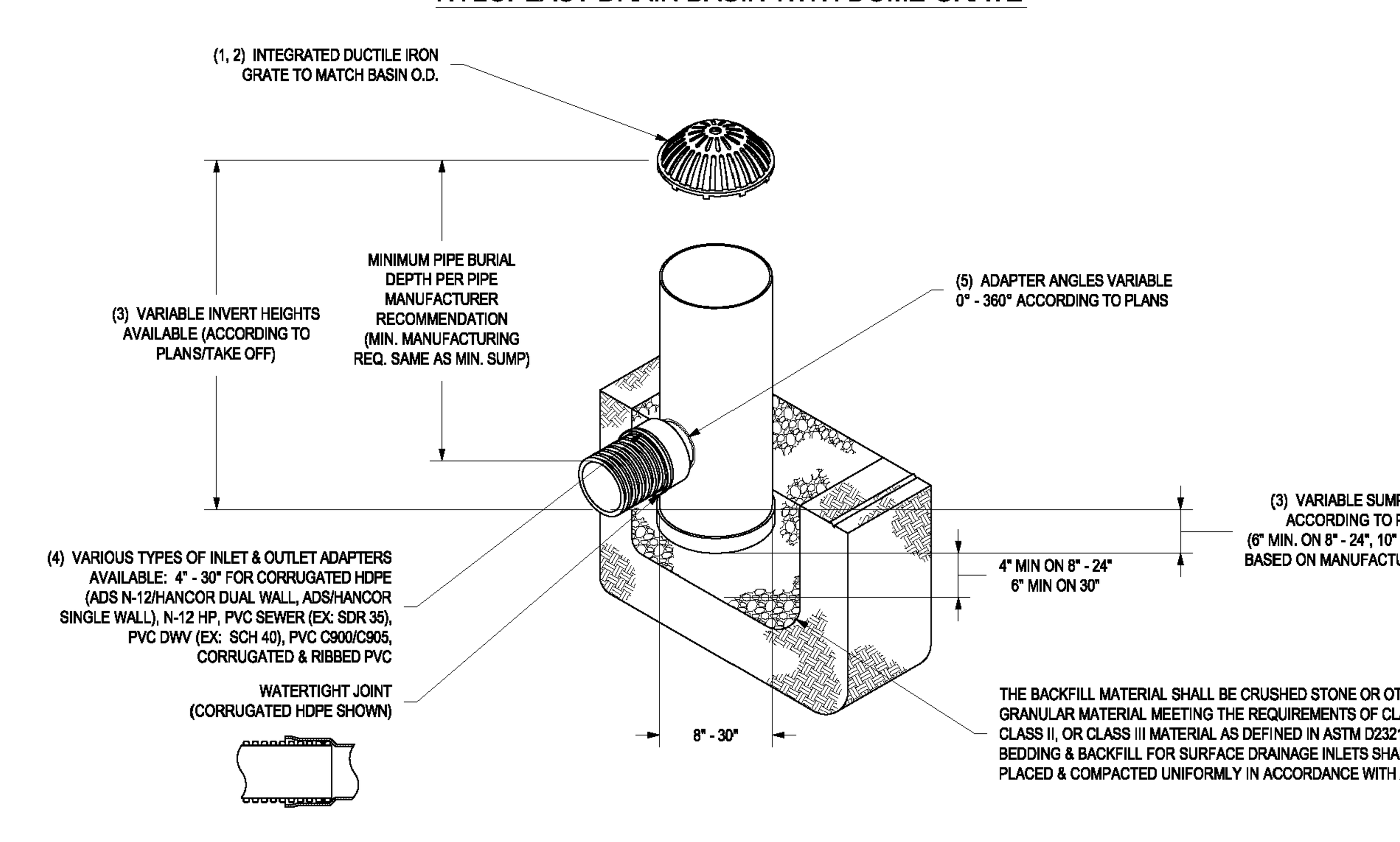
DRAWN BY AWA	MATERIAL	Nyloplast 3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com
DATE 8-10-00		
REVISED BY EBC	PROJECT NO./NAME	TITLE 8 IN - 30 IN TYPICAL INSTALLATION OPTIONS
DATE 1-6-10		
DWG SIZE A	SCALE 1:40 SHEET 1 OF 1	DWG NO. 7001-110-042 REV D

NYLOPLAST DRAIN BASIN WITH DOME GRATE



1 - 8" - 30" DOME GRATES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2 - 8" & 10" DOME GRATES FIT ONTO THE DRAIN BASINS WITH THE USE OF A PVC BODY TOP. SEE DRAWING NO. 7001-110-045.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS. SEE DRAWING NO. 7001-110-065.
4 - DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS N-12/HANCOR DUAL WALL), N-12 HP, & PVC SEWER (4" - 24").
5 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE DRAWING NO. 7001-110-012.
6 - 8" - 30" DOME GRATES HAVE NO LOAD RATING.

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DRAWN BY EBC	MATERIAL	Nyloplast 3130 VERONA AVE BUFORD, GA 30518 PHN (770) 932-2443 FAX (770) 932-2490 www.nyloplast-us.com
DATE 03-25-10		
REVISED BY NMH	PROJECT NO./NAME	TITLE DRAIN BASIN WITH DOME GRATE QUICK SPEC INSTALLATION DETAIL
DATE 03-11-16		
DWG SIZE A	SCALE 1:40 SHEET 1 OF 1	DWG NO. 7001-110-397 REV D

REVISIONS

No.	BY	CHK	DESCRIPTION	DATE
5	SAP		REV. PER TWP. PC MEETING	7-31-17
4	SAP		REV. PARCELS & OPEN SPACE	
3	RLS		HFES PRELIMINARY	6-29-17
2	RLS		REVISED PER CONSUMERS	5-10-17
1	SP		REVISED SITE PLAN SUBMITTAL	4-12-17

STATE OF MICHIGAN — SCOTT A. PERUSKI ENGINEER No. 60666 — LICENSED PROFESSIONAL ENGINEER

CAUTION!!
THE LOCATIONS AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

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23761 RESEARCH DRIVE
FARMINGTON HILLS, MI 48335

CONSTRUCTION DETAILS
REGENCY AT GRAND HAVEN TWP.
PART OF THE SW 1/4 OF THE NE 1/4 SECTION 33, T.8N, R.16W
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

DES. SP	DN. SP	SUR. KTR	P.M. RLS

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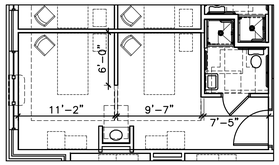
ORIGINAL ISSUE DATE:
FEBRUARY 7, 2017

PEA JOB NO. 2016-199

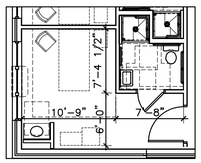
NO SCALE

DRAWING NUMBER:
C-10.2



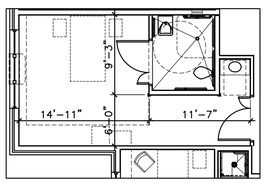
TYPICAL SEMI-PRIVATE ROOM

SCALE: NTS



TYPICAL PRIVATE ROOM

SCALE: NTS



TYPICAL BARIATRIC ROOM

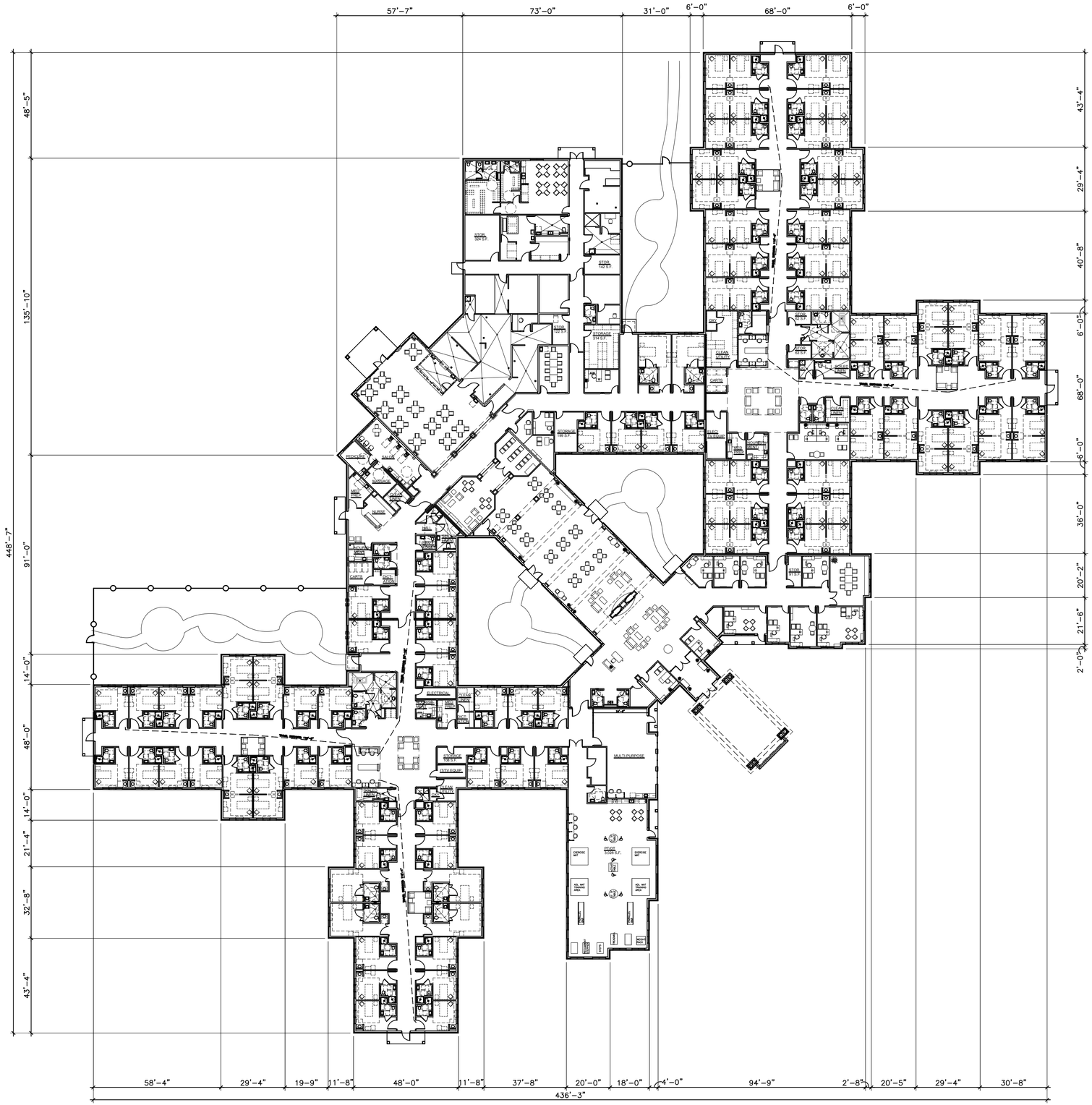
SCALE: NTS

BUILDING SQUARE FOOTAGE

TOTAL BUILDING AREA: 73,796 SF

38 PRIVATE ROOMS:	38 BEDS
6 PRIVATE BARIATRIC ROOMS:	6 BEDS
38 SEMI-PRIVATE ROOMS:	76 BEDS
TOTAL:	120 BEDS

PRIVATE ROOM: GROSS: +/-246 SQ.FT. (+/-238 NET SQ.FT.)
BARIATRIC ROOM: GROSS: +/-382 SQ.FT. (+/-359 NET SQ.FT.)
SEMI-PRIVATE ROOM: GROSS: +/-382 SQ.FT. (+/-370 NET SQ.FT.)



OVERALL FLOOR PLAN

SCALE: NTS

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Client:
GRAND HAVEN
SENIOR LEASING,
L.L.C.
SOUTHFIELD MICHIGAN

Project Title:
REGENCY AT
GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN SUBMITTAL
04-12-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV.Per TWP PC MEETING

Drawn: Designed:
Checked: Approved:

CAD Drawing File:

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Project Number: 216212.00

Sheet Title:
OVERALL FLOOR PLAN

Sheet Number: A-100

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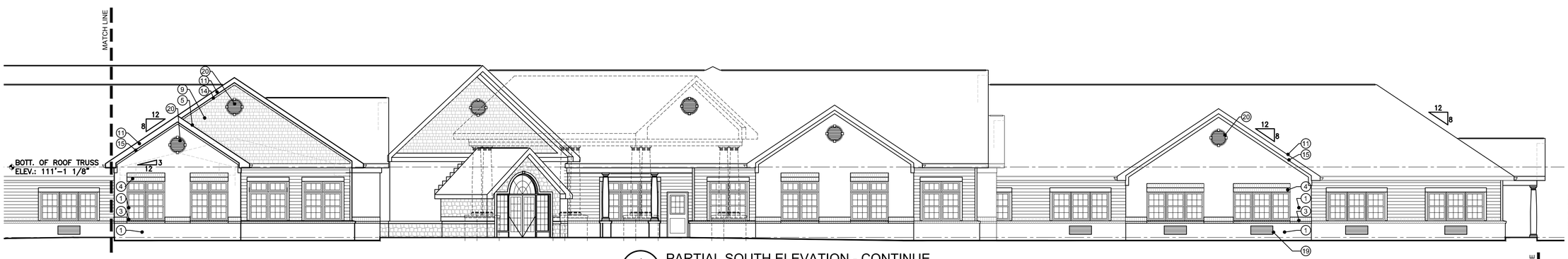
EXTERIOR MATERIAL CALCULATION

ELEVATION	BRICK/STONE	SIDING/CEDAR
SOUTH ELEVATION	60%	40%
EAST ELEVATION	72%	28%

ELEVATION KEYNOTES

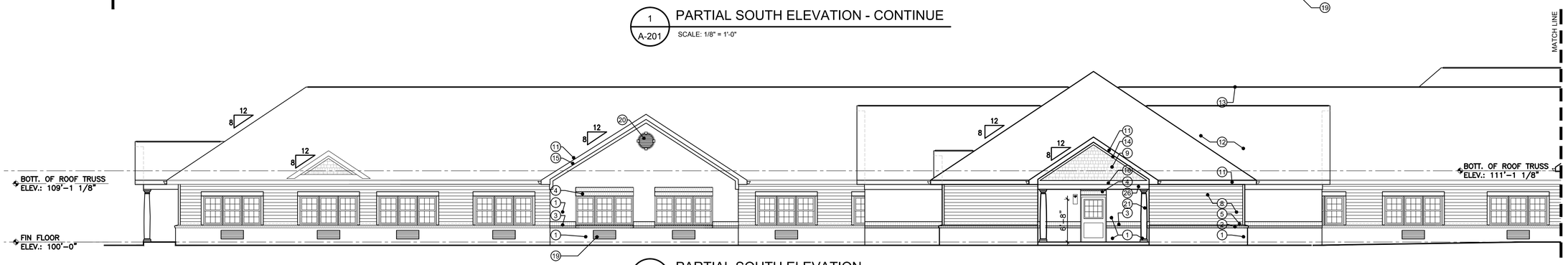
1. BRICK VENEER
2. BRICK ROWLOCK SILL (AND/OR BRICK VERTICAL ROWLOCK)
3. SOLDIER COURSE – ACCENT COLOR
4. DOUBLE SOLDIER COURSE – ACCENT COLOR
5. FLASHING
6. FAUX STONE VENEER
7. PRE–CAST CONC. SILL/WATER BAND
8. VINYL SIDING 1 (HORIZ. SIDING)
9. VINYL SIDING 2 (SHAKE SIDING)
10. VINYL CORNER TRIM (INSIDE & OUTSIDE – MATCH SIDING COLOR)
11. ALUMINUM CLAD FASCIA OR RAKE
12. ROOF SHINGLES
13. CONTINUOUS RIDGE VENT
14. 1x4 CELLULAR PVC TRIM BD.
15. 1x6 CELLULAR PVC TRIM BD.
16. 1x8 CELLULAR PVC TRIM BD.
17. 1x10 CELLULAR PVC TRIM BD.
18. 4" FAUX STONE TRIM SURROUND
19. PTAC UNIT
20. PREMANUFACTURED 30" RND. DECORATIVE LOUVER
21. PREMANUFACTURED 10" OR 18" RND. COLUMN COVER
22. RAKED CONTROL JOINT
23. KNOX BOX – LOCATION PER FIRE DEPARTMENT
24. FIRE DEPARTMENT CONNECTION
25. ALUMINUM GUTTERS AND DOWNSPOUTS
26. ALUMINUM CLAD FRIEZE
27. FAUX LIMESTONE SURROUND, KEY STONE AND SILL

NOTE:
CONTROL JOINTS @ 20'–0" O.C. MAX.



1 / A-201 PARTIAL SOUTH ELEVATION - CONTINUE

SCALE: 1/8" = 1'-0"



1 / A-201 PARTIAL SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

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STATE OF MICHIGAN
ROY GEORGE BAKER
ARCHITECT
NO. 18796
LICENSED ARCHITECT

Client:

GRAND HAVEN
SENIOR LEASING,
L.L.C.

SOUTHFIELD MICHIGAN

Project Title:

REGENCY AT
GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

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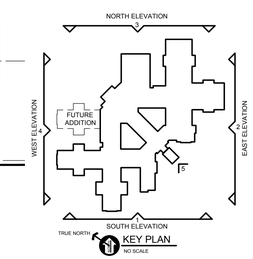

Drawn: Designed:

Checked: Approved:

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Project Number: 216212.00

Sheet Title:

EXTERIOR
ELEVATIONS

Sheet Number: A-201

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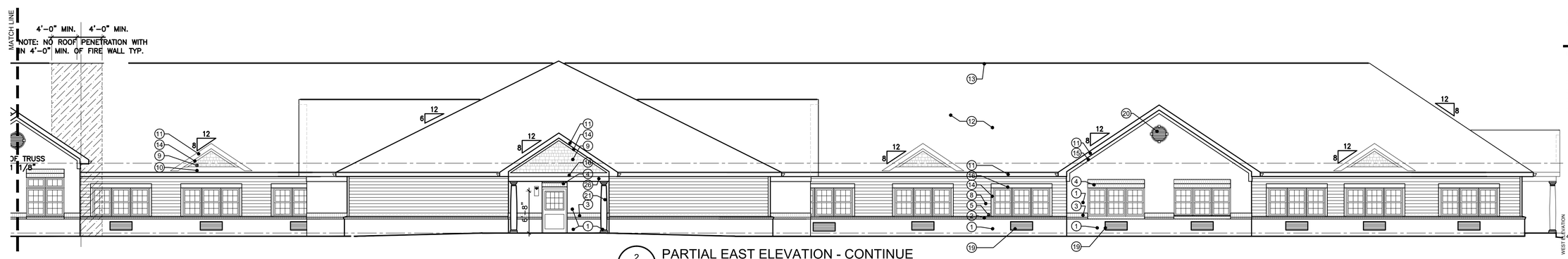
EXTERIOR MATERIAL CALCULATION

ELEVATION	BRICK/STONE	SIDING/CEDAR
SOUTH ELEVATION	60%	40%
EAST ELEVATION	72%	28%

ELEVATION KEYNOTES

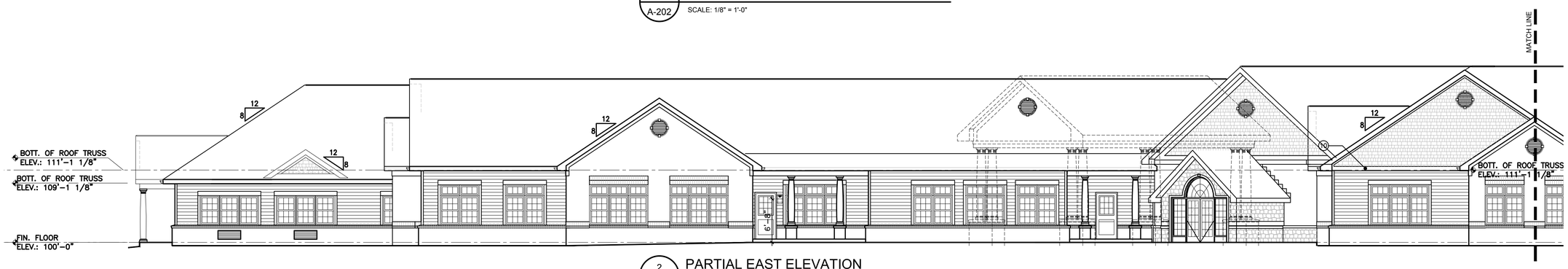
1. BRICK VENEER
2. BRICK ROWLOCK SILL (AND/OR BRICK VERTICAL ROWLOCK)
3. SOLDIER COURSE – ACCENT COLOR
4. DOUBLE SOLDIER COURSE – ACCENT COLOR
5. FLASHING
6. FAUX STONE VENEER
7. PRE–CAST CONC. SILL/WATER BAND
8. VINYL SIDING 1 (HORIZ. SIDING)
9. VINYL SIDING 2 (SHAKE SIDING)
10. VINYL CORNER TRIM (INSIDE & OUTSIDE – MATCH SIDING COLOR)
11. ALUMINUM CLAD FASCIA OR RAKE
12. ROOF SHINGLES
13. CONTINUOUS RIDGE VENT
14. 1x4 CELLULAR PVC TRIM BD.
15. 1x6 CELLULAR PVC TRIM BD.
16. 1x8 CELLULAR PVC TRIM BD.
17. 1x10 CELLULAR PVC TRIM BD.
18. 4" FAUX STONE TRIM SURROUND
19. PTAC UNIT
20. PREMANUFACTURED 30" RND. DECORATIVE LOUVER
21. PREMANUFACTURED 10" OR 18" RND. COLUMN COVER
22. RAKED CONTROL JOINT
23. KNOX BOX – LOCATION PER FIRE DEPARTMENT
24. FIRE DEPARTMENT CONNECTION
25. ALUMINUM GUTTERS AND DOWNSPOUTS
26. ALUMINUM CLAD FRIEZE
27. FAUX LIMESTONE SURROUND, KEY STONE AND SILL

NOTE:
CONTROL JOINTS @ 20'–0" O.C. MAX.



2 / A-202 PARTIAL EAST ELEVATION - CONTINUE

SCALE: 1/8" = 1'-0"



2 / A-202 PARTIAL EAST ELEVATION

SCALE: 1/8" = 1'-0"

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NO. 8176
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SOUTHFIELD MICHIGAN

Project Title:

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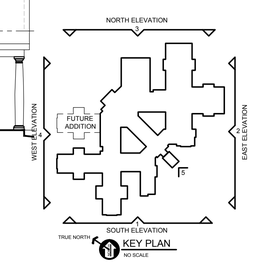
GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN SUBMITTAL
04-12-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV.Per TWP PC MEETING



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CAD Drawing File:

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Project Number: 216212.00

Sheet Title:

EXTERIOR
ELEVATIONS

Sheet Number: A-202

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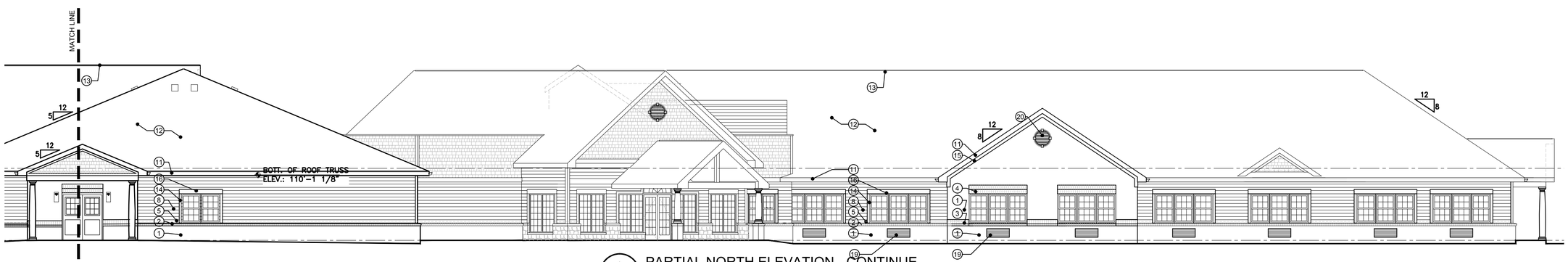
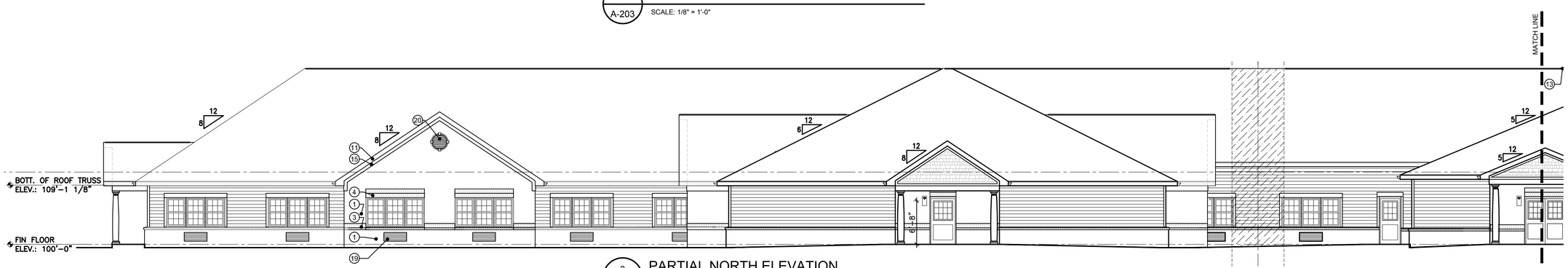
ELEVATION KEYNOTES

1. BRICK VENEER
2. BRICK ROWLOCK SILL (AND/OR BRICK VERTICAL ROWLOCK)
3. SOLDIER COURSE – ACCENT COLOR
4. DOUBLE SOLDIER COURSE – ACCENT COLOR
5. FLASHING
6. FAUX STONE VENEER
7. PRE–CAST CONC. SILL/WATER BAND
8. VINYL SIDING 1 (HORIZ. SIDING)
9. VINYL SIDING 2 (SHAKE SIDING)
10. VINYL CORNER TRIM (INSIDE & OUTSIDE – MATCH SIDING COLOR)
11. ALUMINUM CLAD FASCIA OR RAKE
12. ROOF SHINGLES
13. CONTINUOUS RIDGE VENT
14. 1x4 CELLULAR PVC TRIM BD.
15. 1x6 CELLULAR PVC TRIM BD.
16. 1x8 CELLULAR PVC TRIM BD.
17. 1x10 CELLULAR PVC TRIM BD.
18. 4" FAUX STONE TRIM SURROUND
19. PTAC UNIT
20. PREMANUFACTURED 30" RND. DECORATIVE LOUVER
21. PREMANUFACTURED 10" OR 18" RND. COLUMN COVER
22. RAKED CONTROL JOINT
23. KNOX BOX – LOCATION PER FIRE DEPARTMENT
24. FIRE DEPARTMENT CONNECTION
25. ALUMINUM GUTTERS AND DOWNSPOUTS
26. ALUMINUM CLAD FRIEZE
27. FAUX LIMESTONE SURROUND, KEY STONE AND SILL

NOTE:
CONTROL JOINTS @ 20'–0" O.C. MAX.



3 / A-203 PARTIAL NORTH ELEVATION - CONTINUE
SCALE: 1/8" = 1'-0"



3 / A-203 PARTIAL NORTH ELEVATION
SCALE: 1/8" = 1'-0"

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ARCHITECT
NO. 46746
LICENSED ARCHITECT

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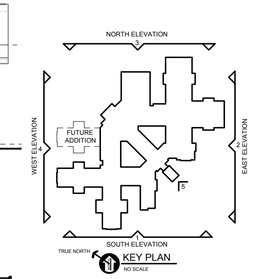
SOUTHFIELD MICHIGAN

Project Title:
REGENCY AT GRAND HAVEN
GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN SUBMITTAL
04-12-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV.Per TWP PC MEETING



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Project Number: 216212.00

Sheet Title:
EXTERIOR ELEVATIONS

Sheet Number: A-203

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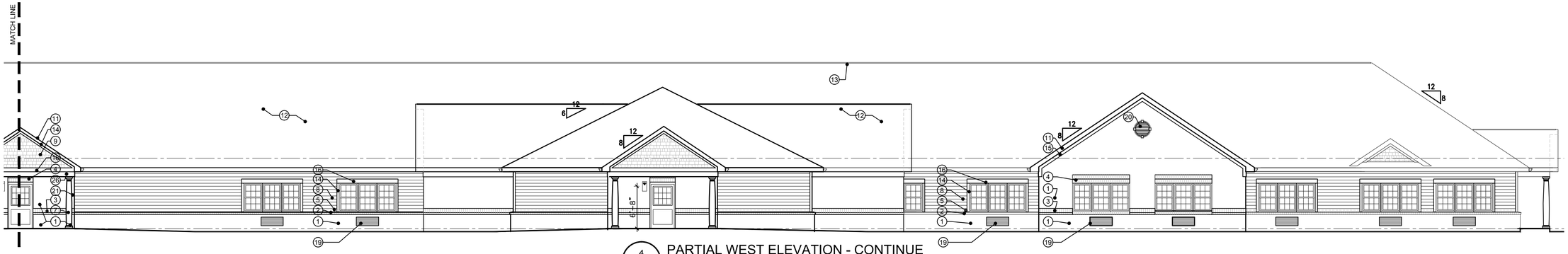
ELEVATION KEYNOTES

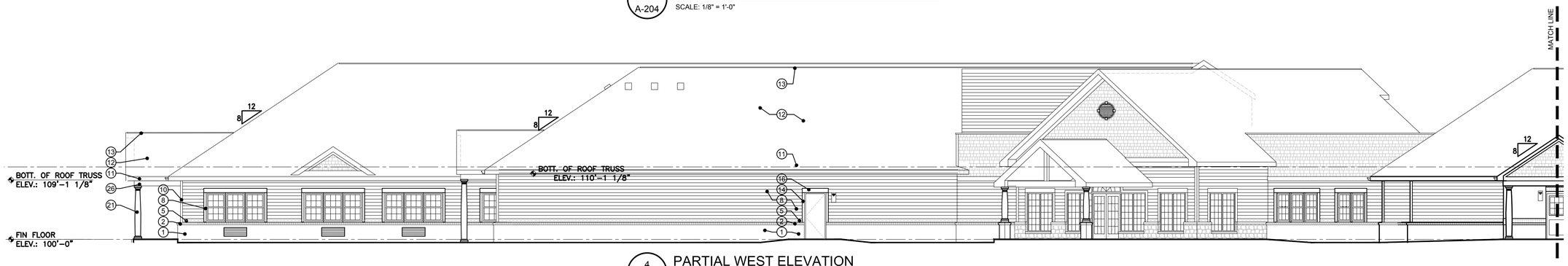
1. BRICK VENEER
2. BRICK ROWLOCK SILL (AND/OR BRICK VERTICAL ROWLOCK)
3. SOLDIER COURSE – ACCENT COLOR
4. DOUBLE SOLDIER COURSE – ACCENT COLOR
5. FLASHING
6. FAUX STONE VENEER
7. PRE–CAST CONC. SILL/WATER BAND
8. VINYL SIDING 1 (HORIZ. SIDING)
9. VINYL SIDING 2 (SHAKE SIDING)
10. VINYL CORNER TRIM (INSIDE & OUTSIDE – MATCH SIDING COLOR)
11. ALUMINUM CLAD FASCIA OR RAKE
12. ROOF SHINGLES
13. CONTINUOUS RIDGE VENT
14. 1x4 CELLULAR PVC TRIM BD.
15. 1x6 CELLULAR PVC TRIM BD.
16. 1x8 CELLULAR PVC TRIM BD.
17. 1x10 CELLULAR PVC TRIM BD.
18. 4" FAUX STONE TRIM SURROUND
19. PTAC UNIT
20. PREMANUFACTURED 30" RND. DECORATIVE LOUVER
21. PREMANUFACTURED 10" OR 18" RND. COLUMN COVER
22. RAKED CONTROL JOINT
23. KNOX BOX – LOCATION PER FIRE DEPARTMENT
24. FIRE DEPARTMENT CONNECTION
25. ALUMINUM GUTTERS AND DOWNSPOUTS
26. ALUMINUM CLAD FRIEZE
27. FAUX LIMESTONE SURROUND, KEY STONE AND SILL

NOTE:
CONTROL JOINTS @ 20'–0" O.C. MAX.



4 / A-204 PARTIAL WEST ELEVATION - CONTINUE

SCALE: 1/8" = 1'-0"



4 / A-204 PARTIAL WEST ELEVATION

SCALE: 1/8" = 1'-0"

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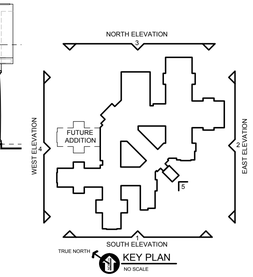

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Sheet Title:

EXTERIOR
ELEVATIONS

Sheet Number: A-204

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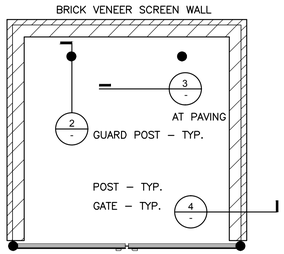
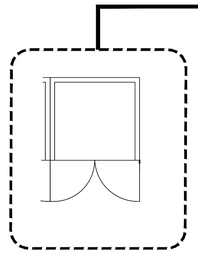


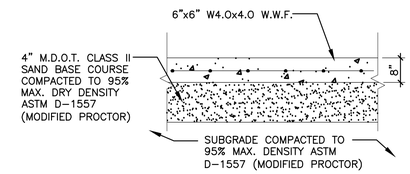
DUMPSTER ENCLOSURE PLAN

SCALE: 1/4" = 1'-0"



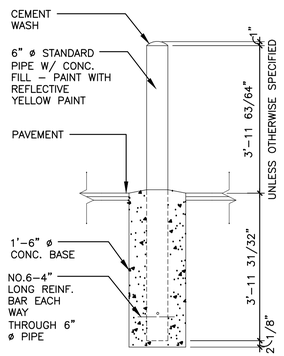
ENLARGED DUMPSTER ENCLOSURE

SCALE: N.T.S.



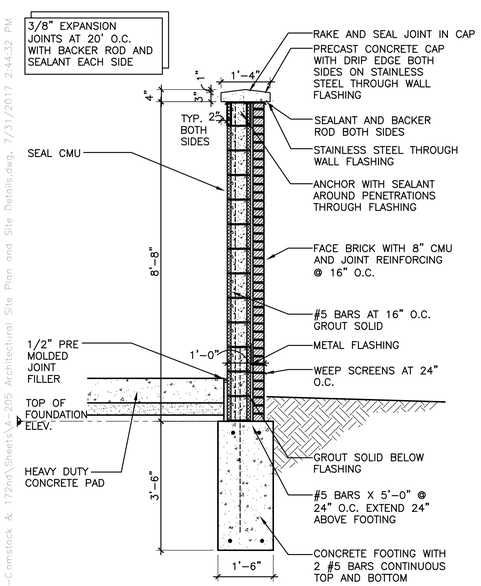
3 HEAVY DUTY CONCRETE PAD DETAIL@ DUMPSTER ENCLOSURE

SCALE: 1/2" = 1'-0"



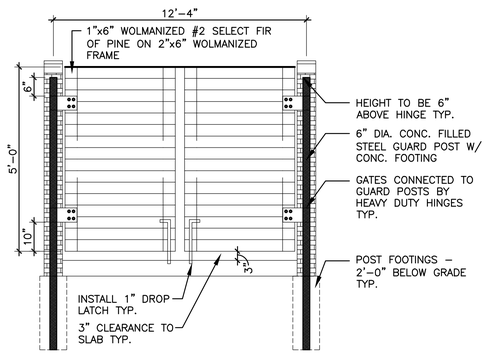
2 6" DIA. GUARDPOST DETAIL

SCALE: 1/2" = 1'-0"



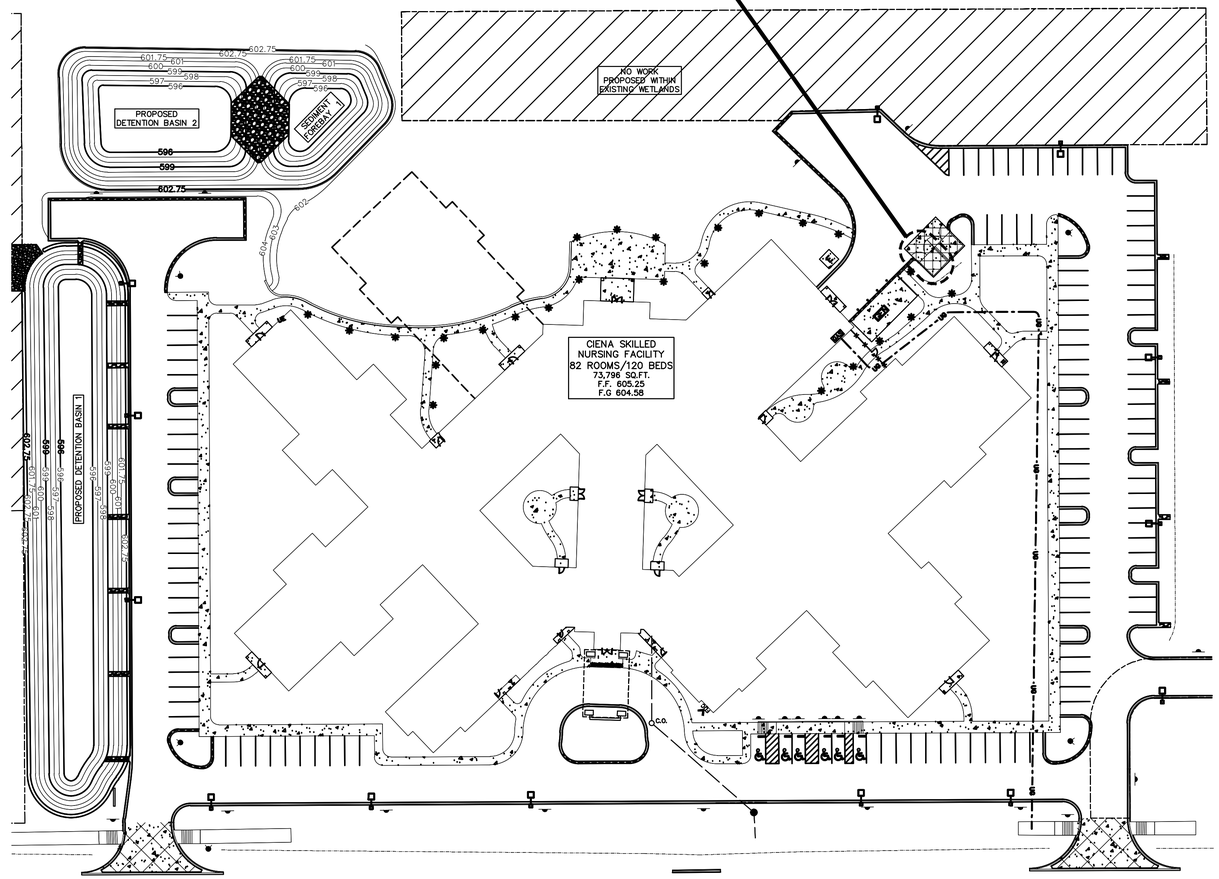
4 DUMPSTER ENCLOSURE GATE DETAIL

SCALE: 1/2" = 1'-0"



1 DUMPSTER ENCLOSURE GATE - TYP.

SCALE: 1/2" = 1'-0"



ARCHITECTURAL SITE PLAN

SCALE: N.T.S.

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05-03-17	SITE APPROVAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV.Per TWP PC MEETING

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Sheet Title:
ARCHITECTURAL SITE PLAN AND SITE DETAILS

Sheet Number: A-205

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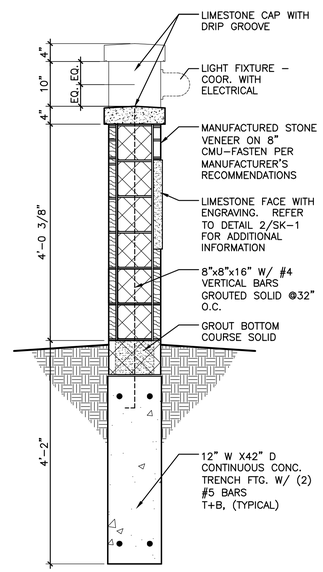
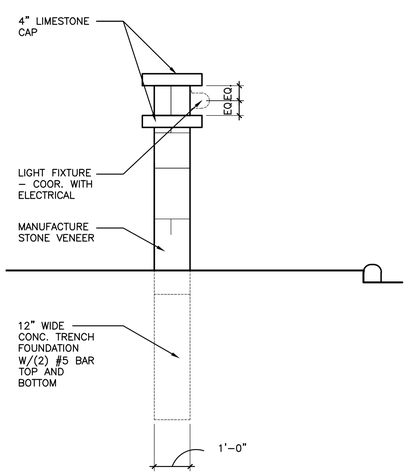


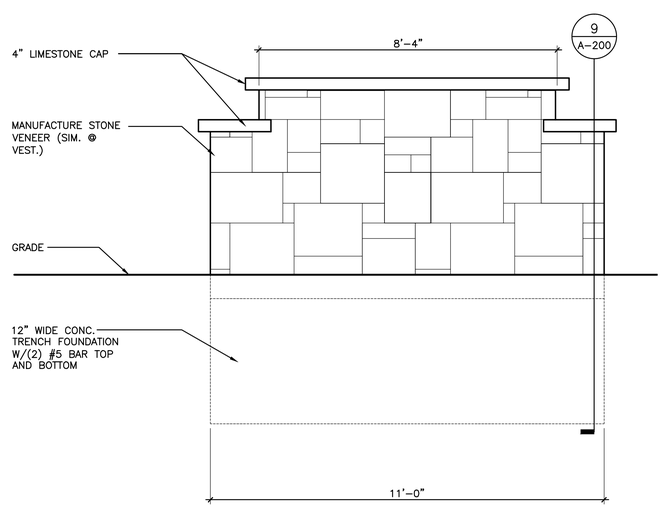
4 / A-300 SITE SIGNAGE - SECTION

SCALE: 3/4



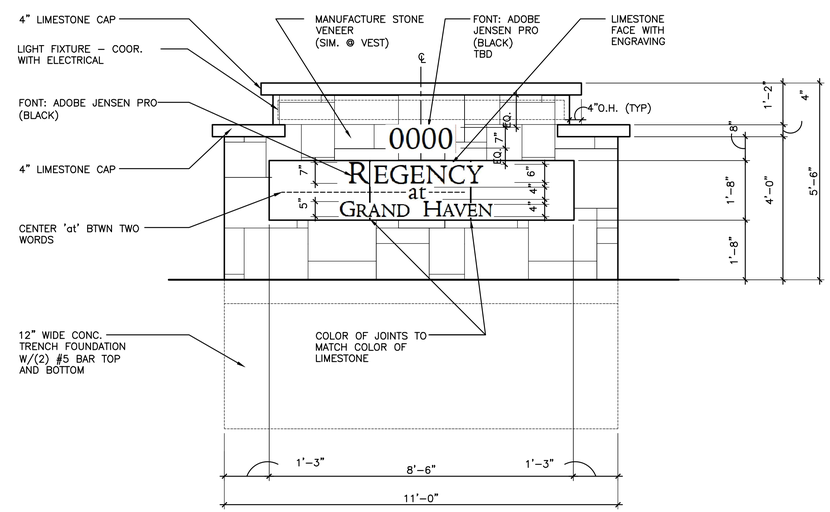
3 / A-300 SITE SIGNAGE - SIDE ELEVATION

SCALE: 1/2" = 1'-0"



2 / A-300 SITE SIGNAGE - BACK ELEVATION

SCALE: 1/2" = 1'-0"



1 / A-300 SITE SIGNAGE - FRONT ELEVATION

SCALE: 1/2" = 1'-0"

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SOUTHFIELD MICHIGAN

Project Title:
REGENCY AT GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN SUBMITTAL
04-12-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
07-31-17	REV.Per TWP PC MEETING

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Sheet Title:
SITE SIGNAGE

Sheet Number: A-300

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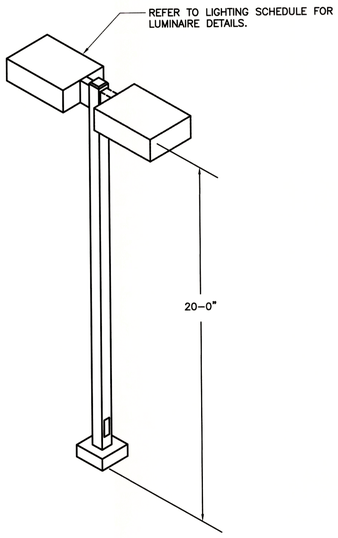
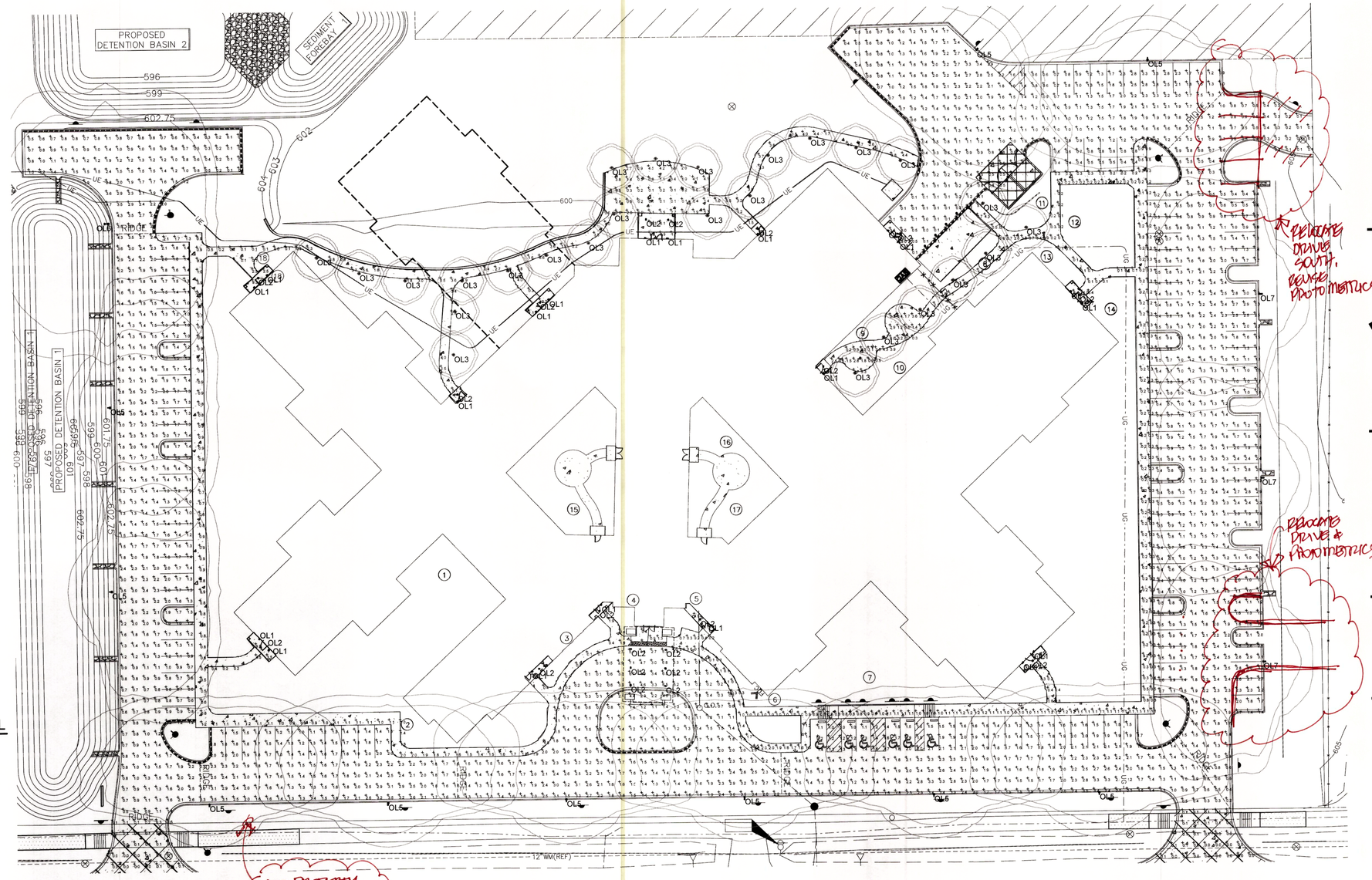


1 E1 PARKING LOT/ROADWAY POLE DETAIL

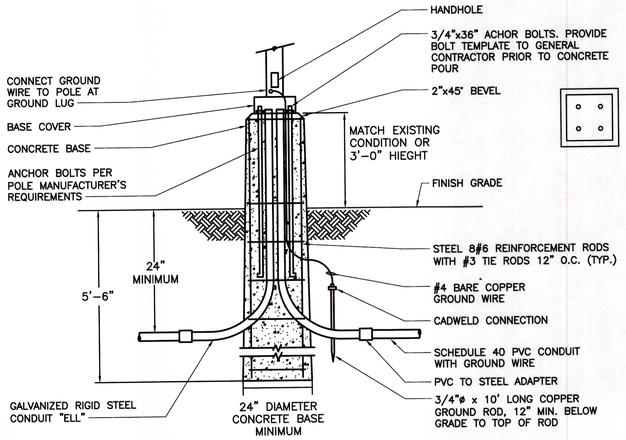
SCALE: NTS



NORTH

PHOTOMETRIC SITE PLAN

SCALE: NTS



2 E1 PARKING LOT/ROADWAY POLE BASE DETAIL

SCALE: NTS

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
EAST SIDEWALK	+	1.2 fc	13.0 fc	0.1 fc	130.0:1	12.0:1
PARKING LOT	+	1.5 fc	9.0 fc	0.0 fc	N/A	N/A
WEST SIDEWALK	+	1.9 fc	13.6 fc	0.0 fc	N/A	N/A

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	OL1	20	VISA LIGHTING	OW1200	Wall Mount Up Light (AT PORCHES)	LED 3500K 80CRI -H	1	OW1200-L35K-H.ies	772	0.9	20.4
	OL2	20	Lithonia Lighting	LDN6 35/10 LO6AR LSS	6IN LDN, 3500K, 1000LM, 80CRI, CLEAR, SEMI-SPECULAR REFLECTOR (PROCESSED)	LED	1	LDN6_35_10_LO6AR_LSS.ies	1028	0.9	12.75
	OL3	26	Hydrel	3100 8COB 40K SYM 250mA	9"DIA. X 36"H. LED BOLLARD DIFFUSED LENS	NICHIA 30K LED COB LAMP	1	3100_8COB_40K_SYM_250mA.ies	1318	0.9	72.35
	OL5	10	Lithonia Lighting	DSX0 LED 40C 1000 40K T4M MVOLT HS	DSX0 LED with 40 LEDs @1000 mA , 4000K, Type 4 Medium Optics with HOUSE-SIDE SHIELD	LED	1	DSX0_LED_40C_1000_40K_T4M_MVOLT_HS.ies	11704	0.9	138
	OL6	1	Lithonia Lighting	DSX0 LED 40C 1000 40K T4M MVOLT HS	DSX0 LED with 40 LEDs @1000 mA , 4000K, Type 4 Medium Optics with HOUSE-SIDE SHIELD	LED	1	DSX0_LED_40C_1000_40K_T4M_MVOLT_HS.ies	11704	0.9	276
	OL7	3	Lithonia Lighting	DSX0 LED 40C 1000 40K TFTM MVOLT HS	DSX0 LED with 40 LEDs @1000 mA , 4000K, Type Forward Throw Medium Optics with HOUSE-SIDE SHIELD	LED	1	DSX0_LED_40C_1000_40K_TFTM_MVOLT_HS.ies	12055	0.9	138

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Client:

GRAND HAVEN SENIOR LEASING, L.L.C.

SOUTHFIELD MICHIGAN

Project Title:

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GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN SUBMITTAL
04-12-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
7/31/17	INTERIM PHOTOMETRICS RESUBMITTAL.

Drawn: Designed:

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Project Number: 216212.00

Sheet Title:

SITE LIGHTING PHOTOMETRICS AND DETAILS

Sheet Number: E-1

REGENCY AT GRAND HAVEN

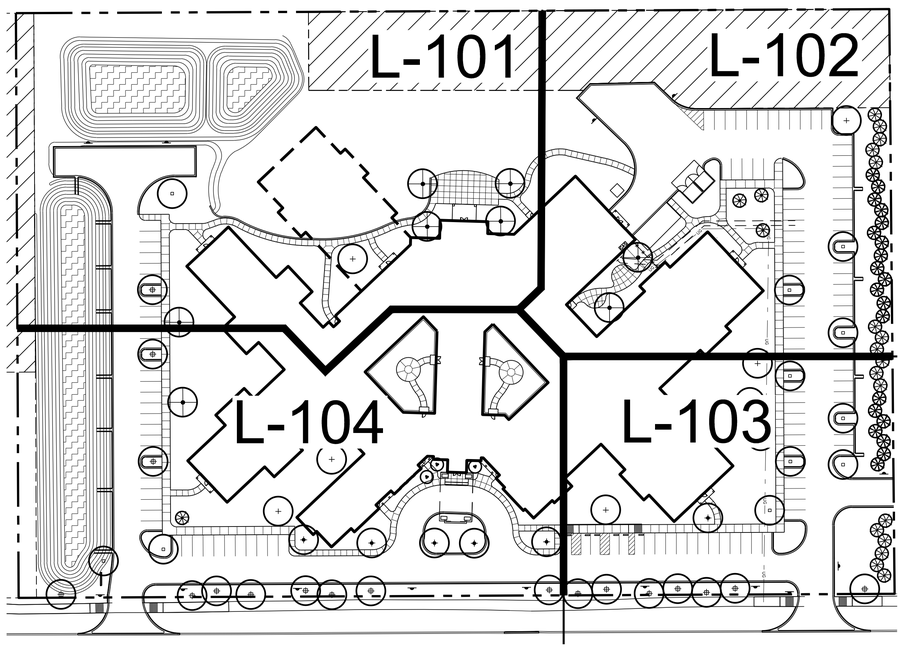
GRAND HAVEN TOWNSHIP
MICHIGAN

FINAL SITE PLAN APPROVAL

OWNER
GRAND HAVEN SENIOR LEASING L.L.C
SOUTHFIELD, MICHIGAN
248.386.0300

LANDSCAPE ARCHITECT:
HAGENBUCH WEIKAL LANDSCAPE ARCHITECTURE
33203 BIDDESTONE LANE
FARMINGTON HILLS, MI 48334
248.477.3600 OFFICE

SITE MASTER PLAN



NORTH
SCALE 1" = 60'

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CONSULTANTS

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Client:
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248.386.0300
248.386.0314 (fax)

Project Title:
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GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

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STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:
Checked: Approved:

CAD Drawing File:

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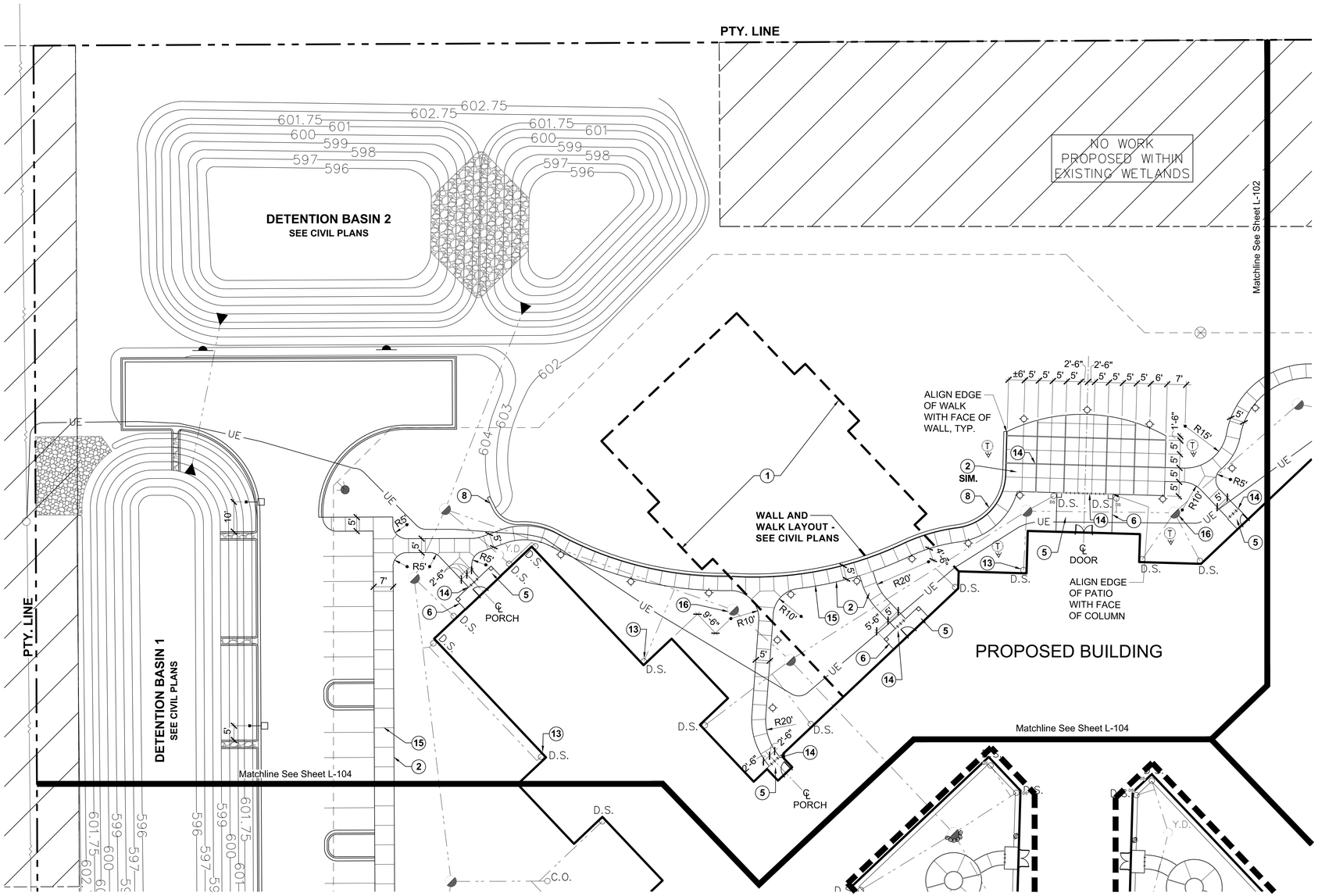
Project Number: 216212.00

Sheet Title:
COVER SHEET

Sheet Number: L-100



1 / L-101 HARDSCAPE LAYOUT PLAN

SCALE 1" = 20'

NORTH

NOTE KEY: (2)

1. FUTURE BUILDING EXPANSION
2. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
3. EXISTING WALKING TRAIL
4. BARRIER FREE SIGN – SEE CIVIL PLANS
5. CONCRETE PORCH – SEE ARCH. PLANS
6. OVERHEAD CANOPY – SEE ARCH. PLANS
7. GENERATOR / TRANSFORMER – SEE ARCH. PLANS
8. WALL – SEE CIVIL PLANS
9. DUMPSTER AREA – SEE ARCH. PLANS
10. "NO MOW" AREA SIGN – SEE DETAIL 6/L-302
11. 3" DEEP CONTINUOUS MULCH BED
12. PROJECT SIGN – SEE ARCH. PLANS
13. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
14. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
15. CONTROL JOINT – SEE CIVIL PLANS
16. DRAINAGE STRUCTURE – SEE CIVIL PLANS
17. WINDOW CLEAR ZONE – NO TREES
18. CLEAR SIGHT DISTANCE TRIANGLE

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

- UPLIGHT – SEE 2/L-102 & 1/L-302 ALSO SEE SITE ELECTRICAL PLANS.
- DUPLEX OUTLET – SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT

NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

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Sheet Title:

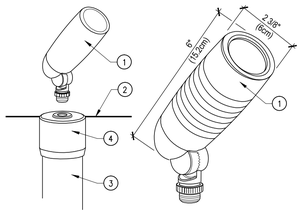
HARDSCAPE LAYOUT PLAN

Sheet Number: L-101

1. BLACK LED FIXTURE
2. FINISH GRADE
3. RAB "MIGHTY POST" 19" PVC WITH PVC CAP MODEL: MP19B COLOR : BLACK
4. RAB "MIGHTY POST" CAP

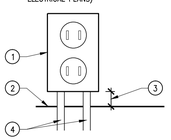
RAB
LFLED5YB
LED FLOODLIGHT
5W
COLOR TEMP:
3000K (WARM)

HTTPS://WWW.RABWEB.COM/PRODUCT.PHP?PRODUCT=LFLED5YB
HTTPS://WWW.RABWEB.COM/PRODUCT.PHP?PRODUCT=MP19B

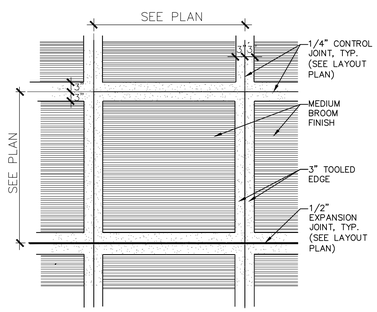


2 L01.01 UPLIGHT DETAIL - SCHEMATIC
NOT TO SCALE

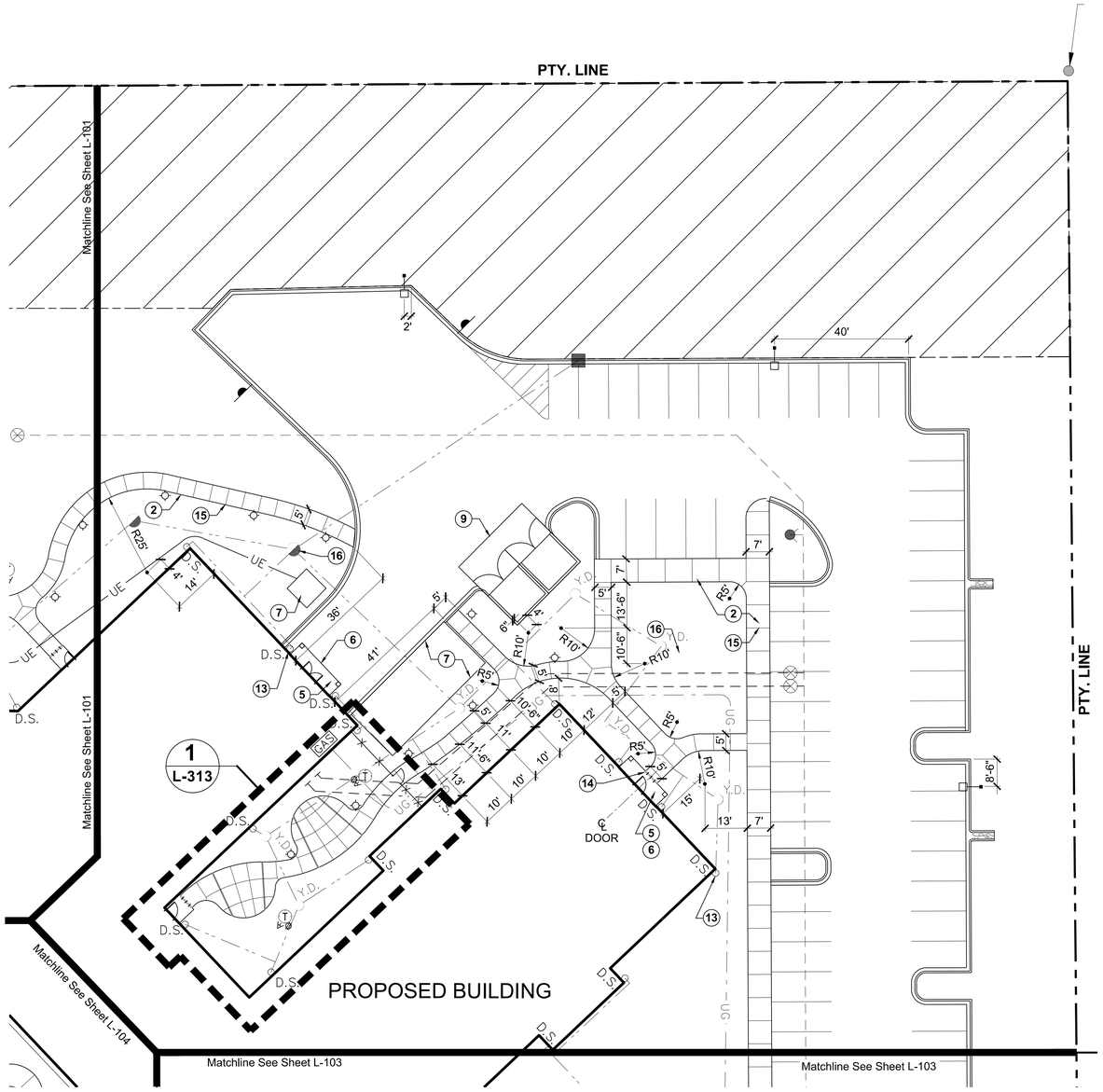
1. WATERPROOF DUPLEX OUTLET PER CODE
2. FINISH GRADE
3. INSTALL AS LOW AS POSSIBLE TO FINISH GRADE, MEETING CODE
4. ELECTRICAL CONDUIT (SEE ELECTRICAL PLANS)



3 L01.01 DUPLEX OUTLET
NOT TO SCALE



4 L03.11 'WINDOW PANE' - CONCRETE PANELS
NOT TO SCALE



1 L-102 HARDSCAPE LAYOUT PLAN
SCALE 1" = 20'
NORTH

NOTE KEY:

1. FUTURE BUILDING EXPANSION
2. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
3. EXISTING WALKING TRAIL
4. BARRIER FREE SIGN – SEE CIVIL PLANS
5. CONCRETE PORCH – SEE ARCH. PLANS
6. OVERHEAD CANOPY – SEE ARCH. PLANS
7. GENERATOR / TRANSFORMER – SEE ARCH. PLANS
8. WALL – SEE CIVIL PLANS
9. DUMPSTER AREA – SEE ARCH. PLANS
10. "NO MOW" AREA SIGN – SEE DETAIL 6/L-302
11. 3" DEEP CONTINUOUS MULCH BED
12. PROJECT SIGN – SEE ARCH. PLANS
13. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
14. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
15. CONTROL JOINT – SEE CIVIL PLANS
16. DRAINAGE STRUCTURE – SEE CIVIL PLANS
17. WINDOW CLEAR ZONE – NO TREES
18. CLEAR SIGHT DISTANCE TRIANGLE

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

- UPLIGHT – SEE 2/L-102 & 1/L-302 ALSO SEE SITE ELECTRICAL PLANS.
- DUPLEX OUTLET – SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT

NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

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No. 1022
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Drawn: Designed:
Checked: Approved:

CAD Drawing File:

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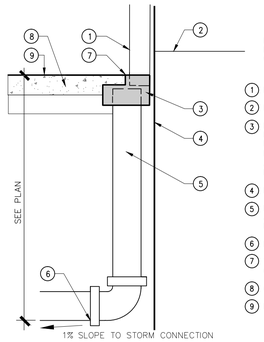
Project Number: 216212.00

Sheet Title:

HARDSCAPE
LAYOUT PLAN

Sheet Number: L-102

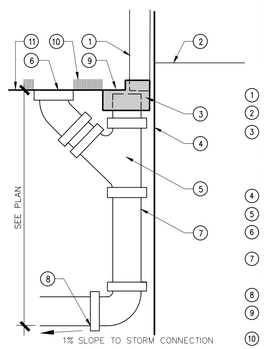


DOWNSPOUT BOOT:
MODEL SKU: PVC -0344 FROM GUTTERWORKS.COM OR APPROVED EQUAL

1. DOWNSPOUT, SEE ARCH. PLANS
2. FINISHED FLOOR
3. DOWNSPOUT BOOT: MODEL: SKU PVC-0344 FROM GUTTERWORKS.COM OR APPROVED EQUAL - (SUBMIT SAMPLE FOR APPROVAL) VERIFY DOWNSPOUT AND FITTING SIZE
4. BUILDING WALL
5. PVC PIPE TO DRAIN SYSTEM BUTT AGAINST FOUNDATION WALL - SEE CIVIL PLANS
6. INVERT - SEE CIVIL PLANS
7. TOP OF BOOT TO BE FLUSH WITH TOP OF CONCRETE
8. CONCRETE PAVEMENT
9. FINISH GRADE

2 / L01.01 DOWNSPOUT CONNECTOR IN CONCRETE

NOT TO SCALE



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MODEL SKU: PVC -0344 FROM GUTTERWORKS.COM OR APPROVED EQUAL

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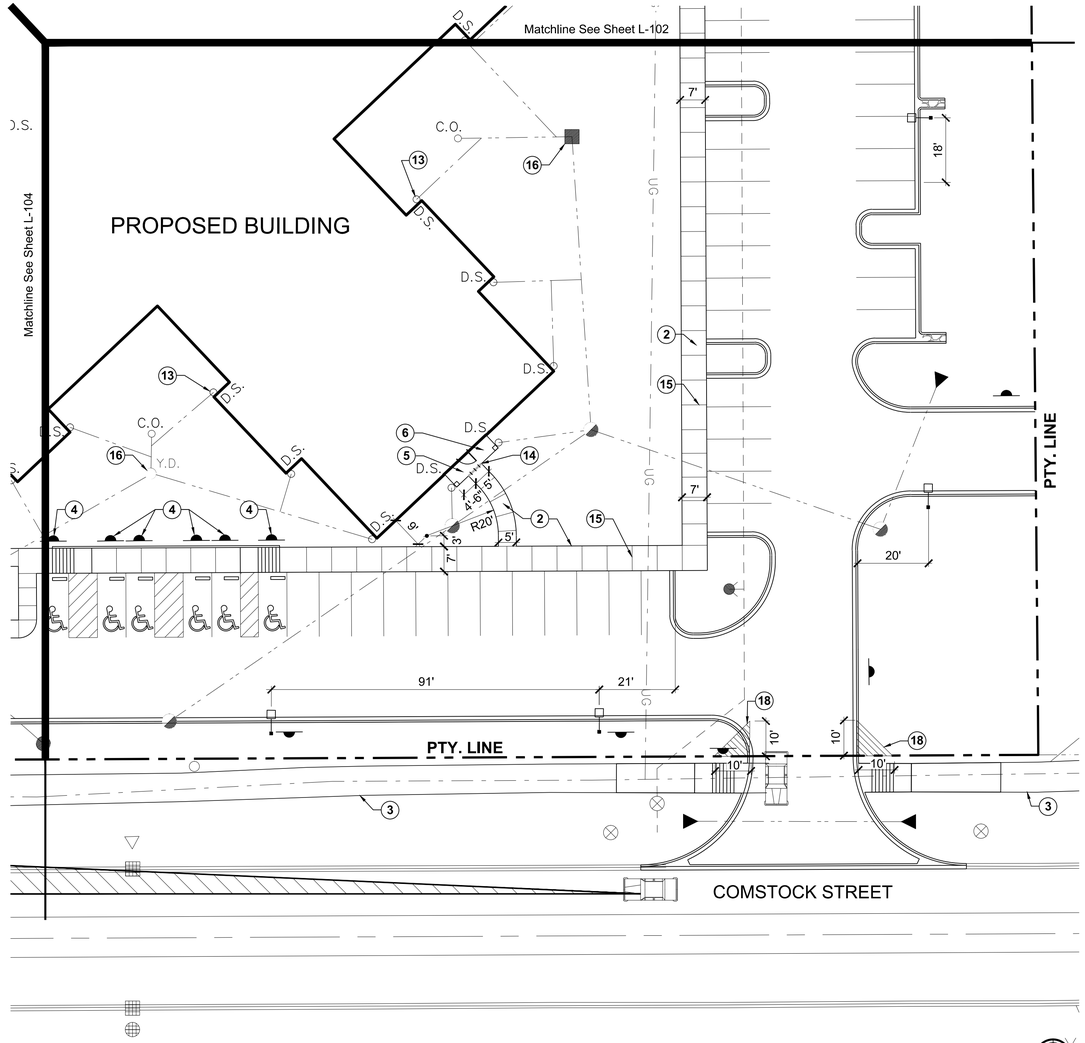
3. DOWNSPOUT BOOT: MODEL: SKU PVC-0344 FROM GUTTERWORKS.COM OR APPROVED EQUAL - (SUBMIT SAMPLE FOR APPROVAL) VERIFY DOWNSPOUT AND FITTING SIZE
4. BUILDING WALL
5. 45 DEGREE FITTING FOR CLEAN-OUT
6. CLEAN-OUT WITH CAP - FLUSH WITH FINISH GRADE
7. PVC PIPE TO DRAIN SYSTEM BUTT AGAINST FOUNDATION WALL - SEE CIVIL PLANS
8. INVERT - SEE CIVIL PLANS
9. TOP OF BOOT TO BE FLUSH WITH FINISH GRADE
10. LANDSCAPE AREA
11. FINISH GRADE

3 / L01.01 DOWNSPOUT CONNECTOR IN LANDSCAPE AREA

NOT TO SCALE



1 / L-103 HARDSCAPE LAYOUT PLAN

SCALE 1" = 20'

NORTH

NOTE KEY:

1. FUTURE BUILDING EXPANSION
2. NEW CONCRETE SIDEWALK - SEE CIVIL PLANS
3. EXISTING WALKING TRAIL
4. BARRIER FREE SIGN - SEE CIVIL PLANS
5. CONCRETE PORCH - SEE ARCH. PLANS
6. OVERHEAD CANOPY - SEE ARCH. PLANS
7. GENERATOR / TRANSFORMER - SEE ARCH. PLANS
8. WALL - SEE CIVIL PLANS
9. DUMPSTER AREA - SEE ARCH. PLANS
10. "NO MOW" AREA SIGN - SEE DETAIL 6/L-302
11. 3" DEEP CONTINUOUS MULCH BED
12. PROJECT SIGN - SEE ARCH. PLANS
13. DOWNSPOUT - SEE DETAILS 2 & 3 /L-103
14. EXP JOINT W/ SEALANT - NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. - THICKEN CONC WALK TO ACCEPT DOWEL - SEE CIVIL PLANS FOR DETAIL
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16. DRAINAGE STRUCTURE - SEE CIVIL PLANS
17. WINDOW CLEAR ZONE - NO TREES
18. CLEAR SIGHT DISTANCE TRIANGLE

GENERAL LAYOUT NOTES:

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2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
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   4' WD. SIDEWALK - 20' O.C. TYP.
   3' WD. SIDEWALK - 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK - 6' X 6' PANEL
   5' WD. SIDEWALK - 5' X 5' PANEL
   4' WD. SIDEWALK - 4' X 4' PANEL
   3' WD. SIDEWALK - 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
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12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

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- DUPLEX OUTLET - SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT - SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE - 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT

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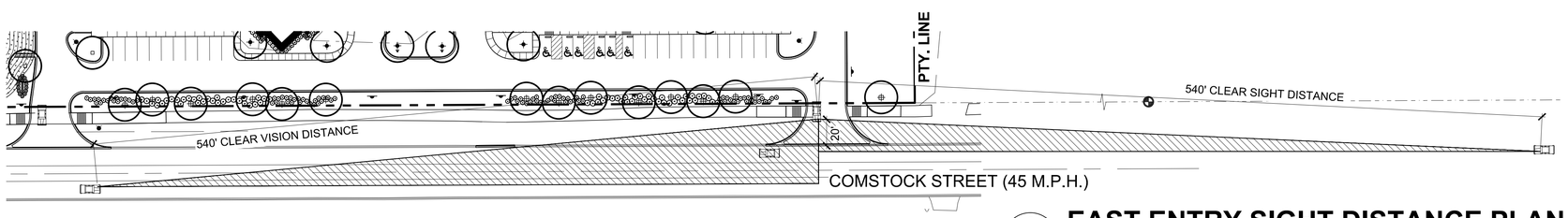

4 / L-103 EAST ENTRY SIGHT DISTANCE PLAN

SCALE 1" = 50'

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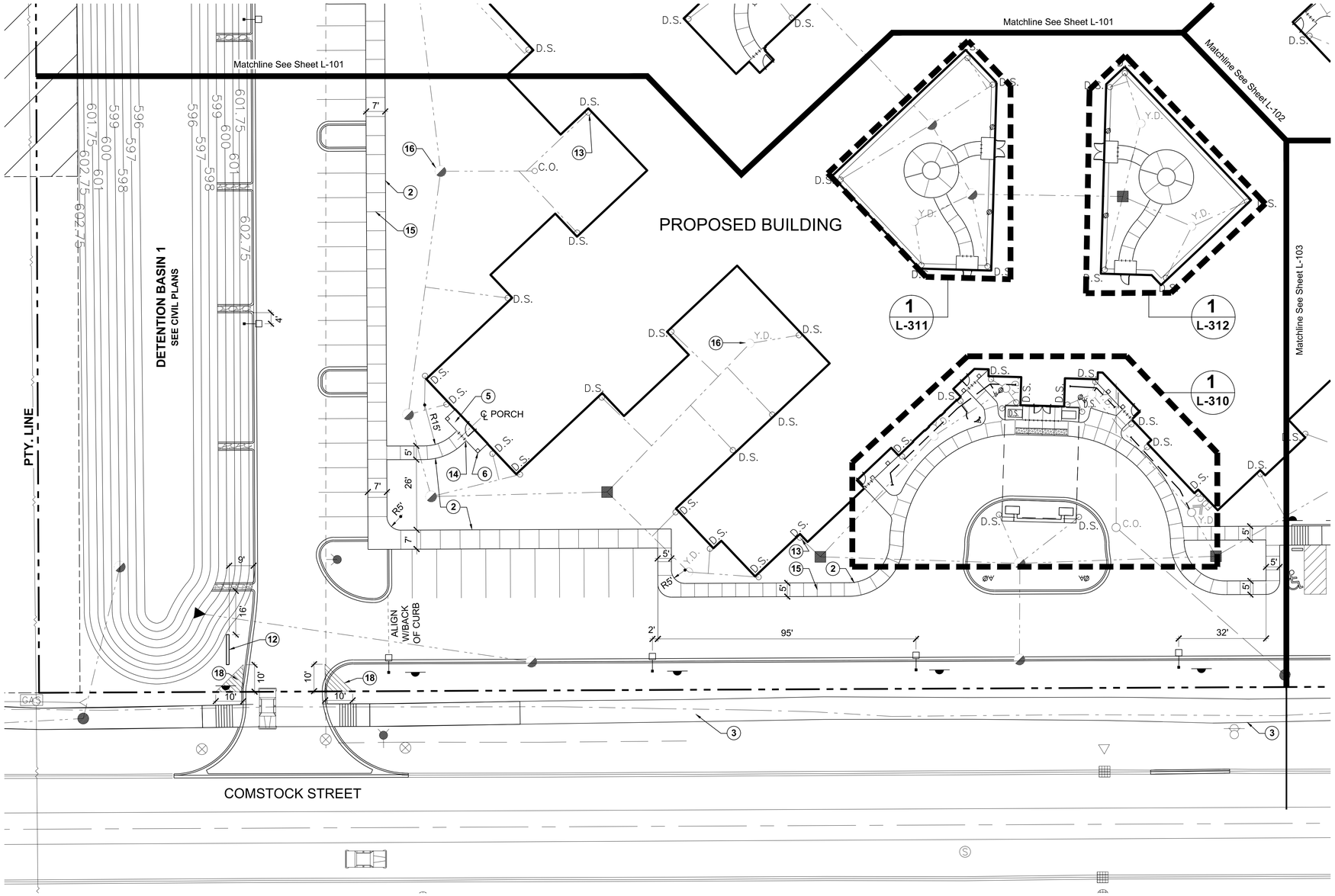
HARDSCAPE LAYOUT PLAN

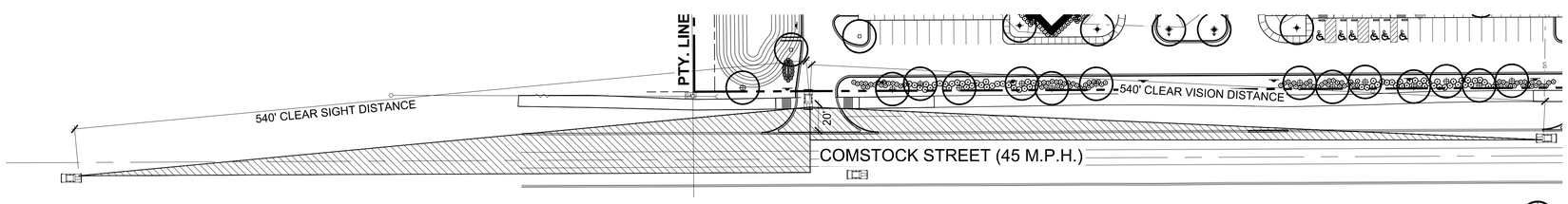
Sheet Number: L-103



1 L-104 HARDSCAPE LAYOUT PLAN

SCALE 1" = 20'

NORTH



2 L-104 WEST ENTRY SIGHT DISTANCE PLAN

SCALE 1" = 50'

NORTH

NOTE KEY:

1. FUTURE BUILDING EXPANSION
2. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
3. EXISTING WALKING TRAIL
4. BARRIER FREE SIGN – SEE CIVIL PLANS
5. CONCRETE PORCH – SEE ARCH. PLANS
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12. PROJECT SIGN – SEE ARCH. PLANS
13. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
14. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
15. CONTROL JOINT – SEE CIVIL PLANS
16. DRAINAGE STRUCTURE – SEE CIVIL PLANS
17. WINDOW CLEAR ZONE – NO TREES
18. CLEAR SIGHT DISTANCE TRIANGLE

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

- UPLIGHT – SEE 2/L-102 & 1/L-302 ALSO SEE SITE ELECTRICAL PLANS.
- DUPLEX OUTLET – SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT

NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

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Project Title:

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GRAND HAVEN TWP. MICHIGAN

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STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:

Checked: Approved:

CAD Drawing File:

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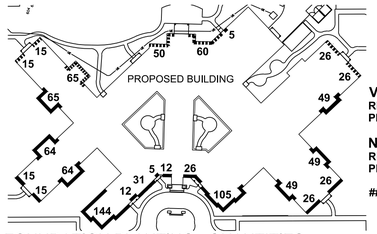
Project Number: 216212.00

Sheet Title:

HARDSCAPE LAYOUT PLAN

Sheet Number: L-104

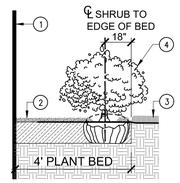


VISIBLE FROM ROAD
REQUIRED: 570 LF
PROVIDED: 757 LF

NOT VISIBLE FROM ROAD
REQUIRED: 240 LF
PROVIDED: 262 LF

= LF OF FOUNDATION PLANTED

3 L-301 FOUNDATION PLANTING - QUANTITIES
SCALE 1" = 100'



1. FACE OF BUILDING
2. MULCH
3. LAWN AREA OR PLANT BED
4. SHRUB

2 L-301 SINGLE ROW - FOUNDATION PLANTING
NOT TO SCALE

BASIN SEED KEY:

- **UZM - UPLAND ZONE SEED MIX** - SEE L-302
- **BSM - BASIN SLOPE MIX** - SEE L-302
- **BBM - BASIN BOTTOM SEED MIX** - SEE L-302

INCLUDE S150 EROSION CONTROL BLANKET ENTIRE AREA - SEE L-302

NOTE KEY: (2)

1. FUTURE BUILDING EXPANSION
2. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
3. EXISTING WALKING TRAIL
4. BARRIER FREE SIGN – SEE CIVIL PLANS
5. CONCRETE PORCH – SEE ARCH. PLANS
6. OVERHEAD CANOPY – SEE ARCH. PLANS
7. GENERATOR / TRANSFORMER – SEE ARCH. PLANS
8. WALL – SEE CIVIL PLANS
9. DUMPSTER AREA – SEE ARCH. PLANS
10. "NO MOW" AREA SIGN – SEE DETAIL 6/L-302
11. 3" DEEP CONTINUOUS MULCH BED
12. PROJECT SIGN – SEE ARCH. PLANS
13. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
14. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
15. CONTROL JOINT – SEE CIVIL PLANS
16. DRAINAGE STRUCTURE – SEE CIVIL PLANS
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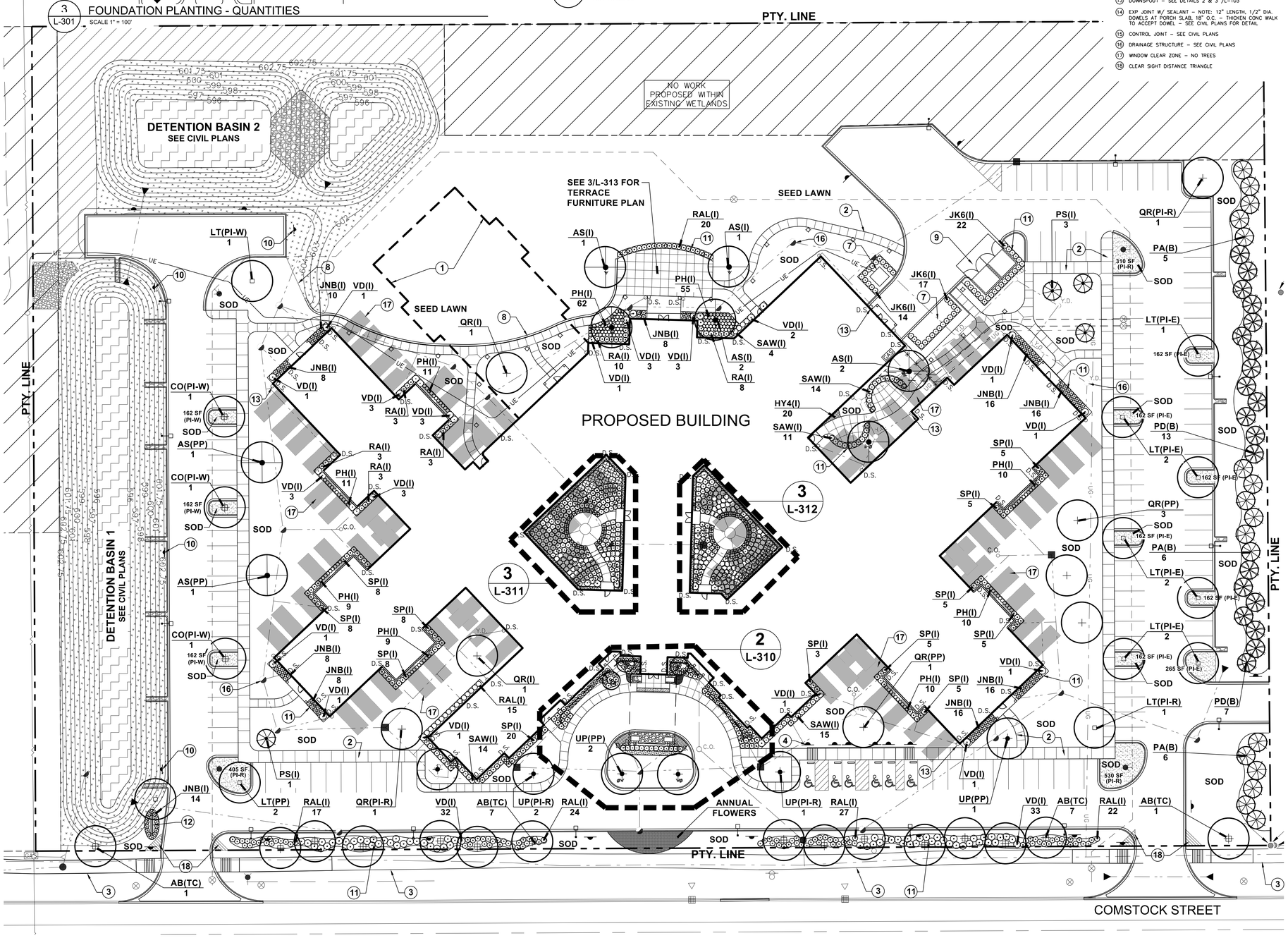
18. CLEAR SIGHT DISTANCE TRIANGLE



SEE SHEETS L-103 & L-104 FOR EAST & WEST ENTRY, COMSTOCK STREET CLEAR VIEW TRIANGLE

1 L-101 **SITE PLANTING PLAN**
SCALE 1" = 30'

NORTH

GENERAL PLANTING NOTES:

(A) ALL TREES TO HAVE CLAY OR LOAM BALLS, TREES WITH SAND BALLS WILL BE REJECTED.

(B) ALL SINGLE STEM SHADE TREES TO HAVE STRAIGHT TRUNKS AND SYMMETRICAL CROWNS.

(C) ALL SINGLE TRUNK SHADE TREES TO HAVE A CENTRAL LEADER, TREES WITH FORKED OR IRREGULAR TRUNKS WILL NOT BE ACCEPTED.

(D) ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.

(E) ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.

(F) NO MACHINERY IS TO BE USED WITHIN THE DRIPLINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN DRIPLINE OF EXISTING TREES.

(G) ALL TREE LOCATIONS SHALL BE STAKED BY LANDSCAPE CONTRACTOR AND ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF THE PLANT MATERIAL.

(H) IT IS MANDATORY THAT POSITIVE DRAINAGE IS PROVIDED AWAY FROM ALL BUILDINGS, WALKS AND PAVED AREAS.

(I) ALL PLANTING BEDS SHALL RECEIVE SHREDDED BARK MULCH. SEE PLANTING DETAILS FOR DEPTHS.

(J) SEE SPECIFICATIONS FOR ADDITIONAL COMMENTS, REQUIREMENTS, PLANTING PROCEDURES AND WARRANTY STANDARDS.

LAWNS:

ALL PROPOSED LAWN AREAS TO BE IRRIGATED SOD.

LAWN RESTORATION

RESTORE ALL DISTURBED AREAS WITH 2" TOPSOIL AND SEED LAWN WITH STRAW MULCH, UNLESS OTHERWISE NOTED.

TOPSOIL

CONTRACTOR TO TILL OR DISK SUBGRADE TO 6" DEPTH AND INSTALL 4" COMPACTED DEPTH TOPSOIL IN ALL LAWN AREAS – FROM ONSITE STOCKPILE OR PROVIDED TO COMPLETE THE PROJECT

PLANT MIX

EXCAVATE PLANT BEDS TO DEPTH SHOWN ON DETAILS – DISPOSE OF SPOILS OFF SITE.

PLANTING BEDS TO RECEIVE MIXTURE OF 70% LOAM TOPSOIL, 10% COMPOST, 20% SAND;

ADDITIONALLY – HAND TILL INTO EVERY 150 SQ. FT. BED AREA:

(1) 6 CU. FT. BALE ORGANIC COMPOST

(1) 40 LB BAG COMPOSTED POULTRY MANURE "CHICK MAGIC" 5-3-2 WWW.CHICKMAGIC.NET (262)495-6220

(1) 5 LB BAG SHEMINS 13-13-13 MULTI PURPOSE FERTILIZER

HAND TILL INTO BED TO MINIMUM DEPTH OF 12"

MULCH

MULCH TO BE DOUBLE SHREDDED HARDWOOD BARK MULCH

NO GROUND WOOD PALETTE MULCH PERMITTED

PLANT BEDS

ALL PLANT BEDS TO BE FULLY EXCAVATED TO DEPTH SHOWN ON DETAILS AND AREAS SHOWN ON PLANS, AND TO RECEIVE CONTINUOUS PLANT MIX AS SPECIFIED (NOT INDIVIDUAL PLANT HOLES)

LANDSCAPE EDGING

ALL LANDSCAPE EDGES ARE SHOVEL CUT

PLANT SPACING

FILL BED WITH PLANTS SPECIFIED. KEEP PLANTS AWAY FROM BUILDING 12" MATURE SIZE

WATERING

CONTRACTOR RESPONSIBLE FOR MONITORING THE WATERING OF ALL PLANTINGS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD.

PLANTINGS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE ONE REQUIRED REPLACEMENT PLANT AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

CONTRACTOR IS ALSO RESPONSIBLE FOR MONITORING THE WATERING OF ALL NEWLY PLANTED LAWN AREAS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD. NEWLY PLANTED LAWN AREAS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE REQUIRED REPLACEMENT TO ESTABLISH A HEALTHY FULL DENSE LAWN AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

IRRIGATION SYSTEM

PROVIDE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM. PROVIDE SHOP DRAWING INCLUDING SEPARATE ZONES FOR LAWNS, SHRUBS, PERENNIALS AND ANNUAL FLOWERS. INCLUDE QUICK COUPLERS FOR HAND WATERING AREAS IF NECESSARY. SUBMIT SHOP DRAWING TO LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.

PLANTING KEY:

TREE SYMBOL
TREE TYPE KEY
FAS — PLANT LIST-SEE SHEET L-302; PLANTING DETAILS-SEE SHEET L-302
QUANTITY

LEGEND

WINDOW CLEAR ZONE – NO TREES PERMITTED

530 SF (PI-R) — PARKING LOT LANDSCAPE AREA, WITH QUANTITY

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Drawn: Designed:

Checked: Approved:

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Project Number: 216212.00

Sheet Title:

SITE PLANTING PLAN

Sheet Number: L-301

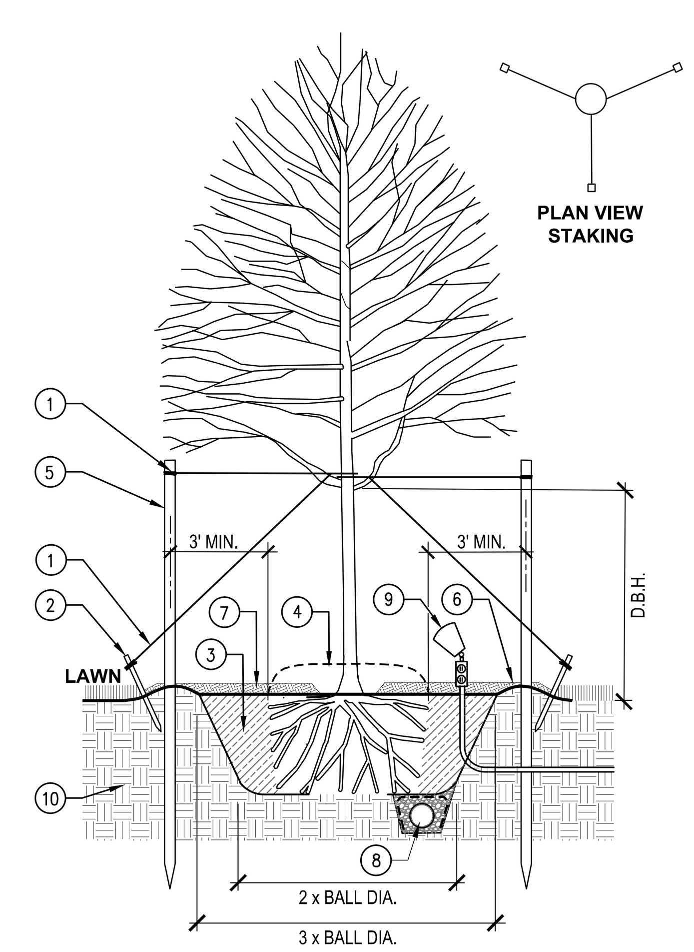
STAKE ALL TREES UNDER 4"
GUY ALL TREES 4" AND OVER

PRUNE ONLY TO REMOVE BROKEN OR DAMAGED BRANCHES

PLANT SO THAT TOP OF ROOT FLARE IS EVEN WITH THE FINISHED GRADE

NEVER CUT LEADER

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH



1. 'ARBORTIE' NYLON STRAPS

STAKE ABOVE FIRST BRANCHES OR AS NECESSARY FOR FIRM SUPPORT

2. FOR TREES OVER 4" CAL., (3) 2"X4"X24" PRESS. TREATED STAKES TOP OF STAKE 6" ABOVE GROUND
3. AMEND SOIL PER SPECIFICATION REQUIREMENTS, WATER AND TAMP TO REMOVE AIR POCKETS
4. REMOVE ±4"–8" OF SOIL FROM TOP OF ROOT BALL TO EXPOSE ROOT FLARE. SOIL CAN BE USED IN PLANT MIX. REMOVE ALL OF BASKET AND BURLAP
5. HARDWOOD STAKES (3) STAKES 2"X2" DRIVEN (MIN. 18") FIRMLY INTO SUBGRADE PRIOR TO BACKFILLING. REMOVE AFTER 1 YEAR
6. FORM SAUCER 3" HT. AT EDGE OF PLANT PIT
7. 3" MULCH, LEAVE 3" CIRCLE OF BARE SOIL AT TRUNK
8. WASHED PEASTONE, WRAPPED IN NON–WOVEN FILTER FABRIC, WITH 4" DIA. FLEXIBLE PERFORATED PIPE FABRIC COVERED, SEE PLAN FOR LOCATIONS – CONNECT TO STORM SYSTEM
9. DUPLEX PLUG AND UP LIGHT IN TREE RING 6" FROM EDGE OF BALL – SEE 2 & 3/L–102 AND SITE ELEC. PLANS
10. UNDISTURBED SUBSOIL

1 DECIDUOUS TREE PLANTING WITH UPLIGHT & DRAINTILE

NOT TO SCALE

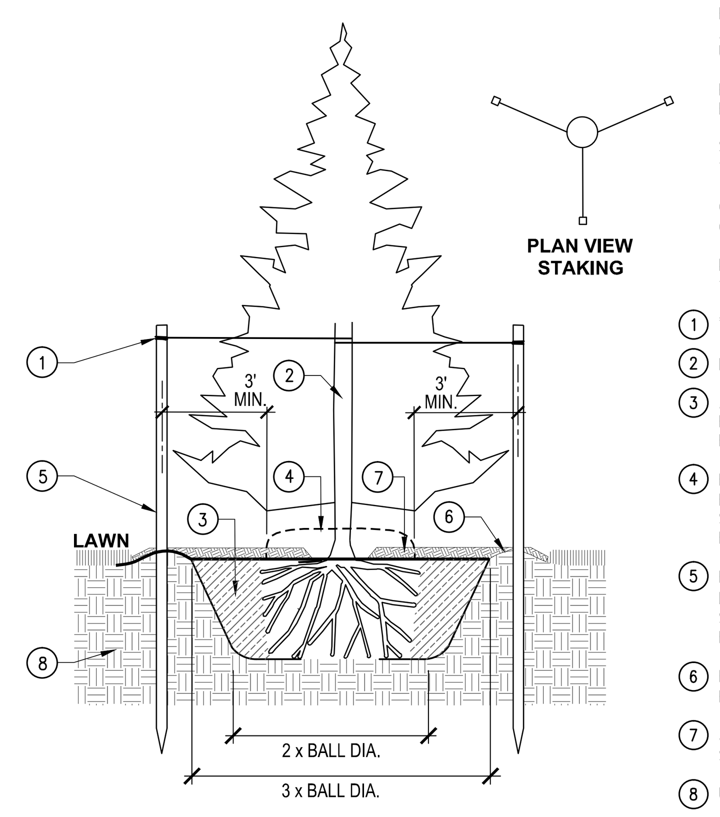
REMOVE ALL TAGS, STRINGS, PLASTICS AND OTHER MATERIALS WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING

PLANT SO THAT TOP OF ROOT FLARE IS EVEN WITH THE FINISHED GRADE

STAKE ALL EVERGREEN TREES UNDER 12' HT.

GUY ALL EVERGREEN TREES 12' HT. AND OVER

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH



1. 'ARBORTIE' NYLON STRAPS
2. NEVER CUT LEADER
3. AMEND SOIL PER SPECIFICATION REQUIREMENTS, WATER AND TAMP TO REMOVE AIR POCKETS
4. REMOVE ±4"–8" OF SOIL FROM TOP OF ROOT BALL TO EXPOSE ROOT FLARE. SOIL CAN BE USED IN PLANT MIX. REMOVE ALL OF BASKET AND BURLAP
5. HARDWOOD STAKES (3) STAKES 2"X2" DRIVEN (MIN. 18") FIRMLY INTO SUBGRADE PRIOR TO BACKFILLING. REMOVE AFTER 1 YEAR
6. FORM SOIL SAUCER 3" HT., AT EDGE OF PLANT PIT
7. 3" MULCH, LEAVE 3" CIRCLE OF BARE SOIL AT TRUNK
8. UNDISTURBED SUBSOIL

2 EVERGREEN TREE PLANTING

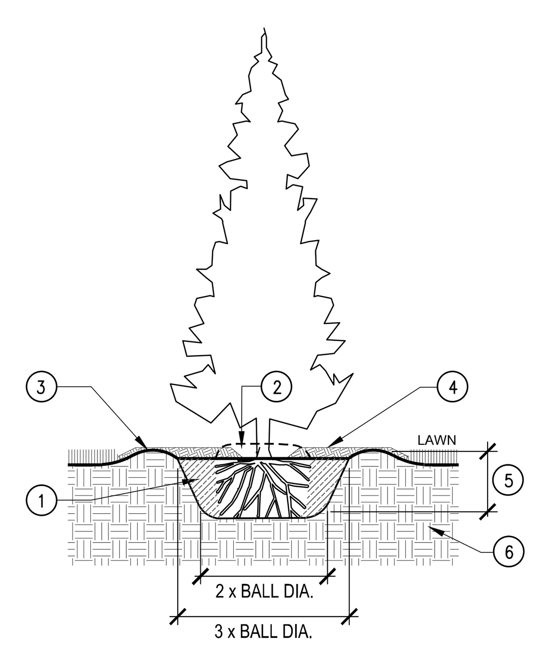
NOT TO SCALE

PRUNE BRANCHES TO THIN OR MATCH, RETAIN NORMAL PLANT SHAPE.

SHRUBS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS THEY BORE TO ORIGINAL GRADE

REMOVE ALL FIBER, PLASTIC OR METAL CONTAINERS

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH



1. AMEND SOIL PER SPECIFICATION REQUIREMENTS, WATER AND TAMP TO REMOVE AIR POCKETS
2. REMOVE ±4"–8" OF SOIL FROM TOP OF ROOT BALL TO EXPOSE ROOT FLARE. SOIL CAN BE USED IN PLANT MIX. REMOVE TOP 2/3 OF BASKET AND BURLAP
3. FORM SAUCER 3" HT. AT EDGE OF PLANT PIT
4. 3" MULCH, LEAVE 3" CIRCLE OF BARE SOIL AT TRUNK
5. 12" MIN. OR DEPTH OF ROOT BALL
6. UNDISTURBED SUBSOIL

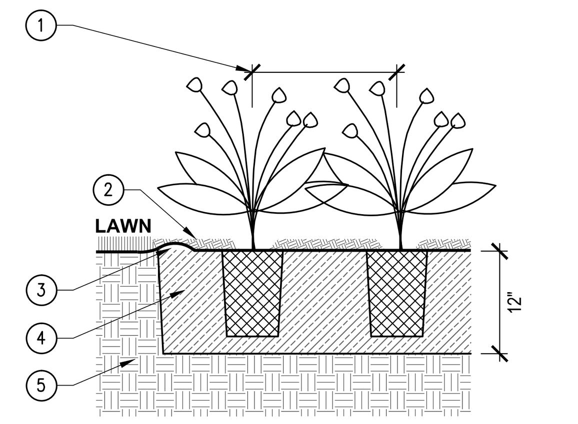
3 TALL SHRUB PLANTING

NOT TO SCALE

CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION

REMOVE ALL FIBER, PLASTIC OR METAL CONTAINERS

KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH



1. IRREGULAR PLANT SPACING
2. 1–1/2" DEPTH DOUBLE PROCESSED SHREDDED BARK MULCH
3. MOUND TO FORM SAUCER – FORM SOIL SAUCER WITH 3" HT. CONTINUOUS RIM – SEE PLAN
4. EXCAVATE EXISTING SOIL 12" DEEP FILL WITH PLANT MIX (SEE SPECS.)
5. UNDISTURBED SUBGRADE

4 PERENNIAL / GROUNDCOVER PLANTING DETAIL

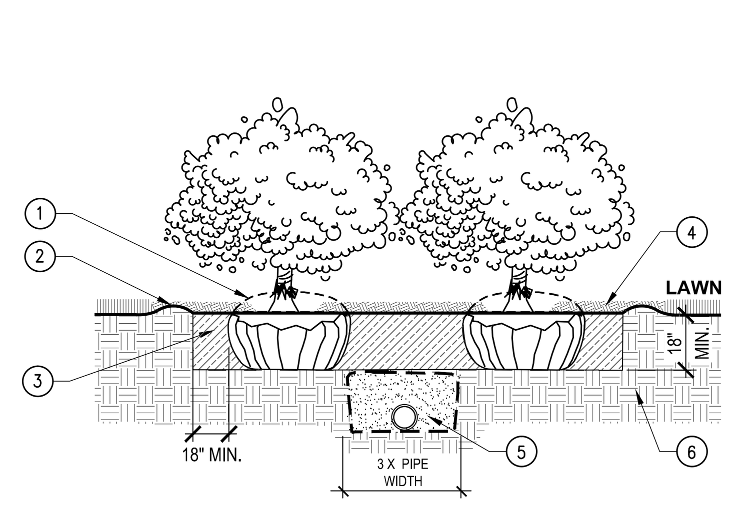
NOT TO SCALE

PRUNE BRANCHES TO THIN OR MATCH, RETAIN NORMAL PLANT SHAPE. PRUNE DEAD BRANCHES

SHRUBS SHALL BEAR THE SAME RELATIONSHIP TO FINISH GRADE AS THEY BORE TO ORIGINAL GRADE.

REMOVE ALL FIBER, PLASTIC OR METAL CONTAINERS.

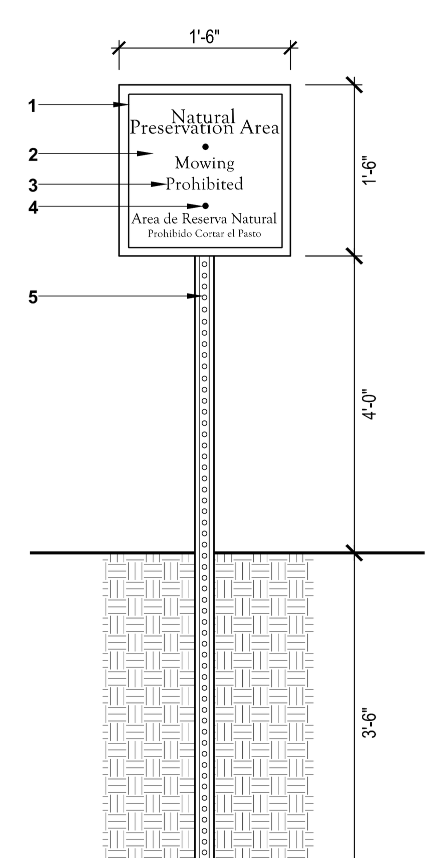
KNIFE SLIT SIDE OF ROOT BALL 6 TIMES, 1" DEEP EACH



1. REMOVE TOP 2/3 OF BURLAP FROM ROOTBALL
2. MOUND TO FORM SAUCER – FORM SOIL SAUCER WITH 3" HT. CONTINUOUS RIM
3. SPECIFIED PLANTING MIX – WATER & TAMP TO REMOVE AIR POCKETS – 12" MIN. DEPTH OR DEPTH OF ROOT BALL.
4. 3" DEPTH MULCH – 6" BARE AT TRUNK – DO NOT BURY CROWN OF PLANT
5. WASHED PEASTONE IN MAX. 12" LIFTS, WRAPPED IN NON–WOVEN FILTER FABRIC, COMPACTED TO 98% MOD. PROCTOR, WITH 4" FLEXIBLE PERFORATED PIPE FABRIC COVERED, SEE PLAN FOR LOCATIONS – CONNECT TO STORM SYSTEM
6. UNDISTURBED SUBSOIL

5 SHRUB BED PLANTING DETAIL

NOT TO SCALE

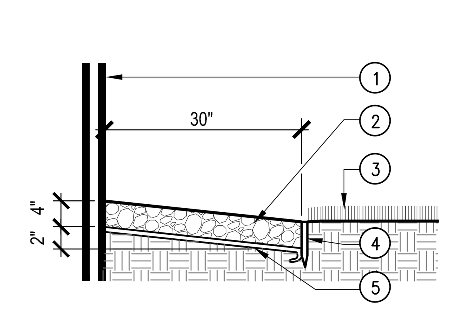


1. MARKER BORDER. COLOR TO BE WHITE
2. ALUMINUM MARKER PANEL. .063 FACE WITH VINYL COPY/DIGITAL PRINT. FROG GREEN – SUBMIT SAMPLE
3. MARKER LETTERING. COLOR – WHITE
4. 5/16" STAINLESS BOLTS, WASHERS AND LOCKNUTS
5. GREEN U–CHANNEL POST DRIVEN INTO VIRGIN SOIL

NOTES:
1. INSTALL MARKER PER MANUF. REC. SUBMIT FULL SHOP DRAWINGS INCLUDING MANUF. TECHNIQUES, FASTENERS, COLOR SAMPLES AND FONT SIZES FOR APPROVAL PRIOR TO FABRICATION.
2. LETTER SIZES TO BE DETERMINED BY MARKER MANUF.
3. ALL COLORS TO BE CONFIRMED BY OWNER PRIOR TO FABRICATION.
4. MARKER LOCATION TO BE FIELD VERIFIED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
5. BACK OF MARKER TO BE BARE ALUMINUM
6. NO MOW SIGNS TO BE PLACED AROUND THE STORMWATER BASIN, RAIN GARDENS, AND AT THE SOD EDGE ON THE NORTH END OF THE DISTURBANCE LIMITS AT 100' INTERVALS MAX. OR PER LANDSCAPE ARCHITECT. ALL LOCATIONS TO BE STAKED AND FIELD VERIFIED BY LANDSCAPE ARCHITECT

6 / L-301 NATURE AREA - "NO MOW" MARKER

NOT TO SCALE



1. FACE OF BUILDING
2. 4" DEEP, 2" EGGSTONE MULCH
3. LAWN AREA OR PLANT BED
4. 4" RYERSON BLACK STEEL EDGING
5. TYPAR FILTER / WEED BARRIER

7 / L-311 STONE MAINTENANCE STRIP DETAIL COURTYARDS ONLY

NOT TO SCALE

UPLAND ZONE SEED MIX (UZM)

Low-profile Prairie Seed Mix

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses:		
Bouteloua curtipendula	Side Oats Grama	16.00
Carex spp.	Prairie Carex Mix	4.00
Elymus canadensis	Canada Wild Rye	32.00
Koeleria cristata	June Grass	1.00
Panicum virgatum	Switch Grass	1.00
Schizachyrium scoparium	Little Bluestem	36.00
	Total	**90.00**
Temporary Cover:		
Avena sativa	Common Oat	360.00
Lolium multiflorum	Annual Rye	100.00
	Total	**460.00**
Forbs:		
Amorpha canescens	Lead Plant	0.50
Anemone cylindrica	ThimbleWeed	0.50
Asclepias syriaca	Common Milkweed	2.00
Asclepias tuberosa	Butterfly MilkWeed	2.00
Aster ericoides	Heath Aster	0.25
Aster laevis	Smooth Blue Aster	1.00
Aster novae-angliae	New England Aster	0.50
Baptisia lactea	White Wild Indigo	2.00
Chamaecrista fasciculata	Partridge Pea	12.00
Coreopsis lanceolata	Sand Coreopsis	5.00
Coreopsis palmata	Prairie Coreopsis	1.00
Dalea candida	White Prairie Clover	1.50
Dalea purpurea	Purple Prairie Clover	1.50
Desmanthus illinoensis	Illinois Sensitive Plant	3.00
Echinacea purpurea	Broad-Leaved Purple Coneflower	7.00
Eryngium yuccifolium	Rattlesnake Master	3.00
Lespedeza capitata	Round-Head Bush Clover	2.00
Liatris aspera	Rough Blazing Star	0.50
Lupinus perennis	Wild Lupine	4.00
Monarda fistulosa	Wild Bergamot	0.75
Parthenium integrifolium	Wild Quinine	1.00
Penstemon digitalis	Foxglove Beard Tongue	0.50
Penstemon hirsutus	Hairy Beard Tongue	0.50
Pycnanthemum virginianum	Common Mountain Mint	1.00
Ratibida pinnata	Yellow Coneflower	4.00
Rudbeckia hirta	Black-Eyed Susan	5.00
Rudbeckia subtomentosa	Sweet Black-Eyed Susan	1.00
Silphium terebinthinaceum	Prairie Dock	0.50
Solidago rigida	Stiff Goldenrod	1.00
Solidago speciosa	Showy Goldenrod	0.50
Tradescantia ohiensis	Common Spiderwort	0.75
Verbena stricta	Hoary Vervain	1.00
Vernonia spp.	Ironweed (Various Mix)	1.75
Veronicastrum virginianum	Culvers Root	0.25
	Total	**68.75**

NATIVE SEEDING MAINTENANCE

DURING THE FIRST GROWING SEASON, NATIVE AREAS SHOULD BE MOWED A MINIMUM OF FOUR TIMES TO HEIGHT OF ABOUT 4"–6" WHEN THE GROWTH REACHES 10"–12". SELECTIVE HERBICIDE APPLICATIONS OR HAND PULLING MAY BE NEEDED TO CONTROL UNWANTED WEED POPULATIONS. IF A MOWER CANNOT BE SET HIGH ENOUGH, A STRING TRIMMER MAY BE USED.

DURING THE SECOND GROWING SEASON, NATIVE AREAS SHOULD BE MOWED A MINIMUM OF TWO TIMES TO HEIGHT OF ABOUT 8" WHEN THE GROWTH REACHES 10"–18". SELECTIVE HERBICIDE APPLICATIONS OR HAND PULLING MAY BE NEEDED TO CONTROL UNWANTED WEED POPULATIONS.

BY THE SECOND GROWING SEASON IT SHOULD BE APPARENT IF SOME AREAS NEED RESEEDING. RESEED OR OVERSEED AS NEEDED TO PROVIDE FOR FULL COVERAGE.

LONG TERM MANAGEMENT MAY INCLUDE PRESCRIBED BURNING, MOWING, HAND PULLING, AND SELECTIVE HERBICIDE APPLICATIONS. IF BURNING IS NOT ALLOWED OR FEASIBLE, THE PLANTING MAY BE MOWED TO A SHORT HEIGHT AND THE CLIPPINGS REMOVED IN THE EARLY SPRING BEFORE GROUND NESTING BIRDS BEGIN NESTING.

BASIN SLOPE SEED MIX (BSM)

Slope Stabilization Seed Mix

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses:		
Andropogon gerardii	Big Bluestem	48.00
Bouteloua curtipendula	Side-Oats Grama	16.00
Carex spp.	Prairie Sedge Mix	4.00
Elymus canadensis	Canada Wild Rye	32.00
Elymus virginicus	Virginia Wild Rye	24.00
Panicum virgatum	Switch Grass	12.00
Schizachyrium scoparium	Little Bluestem	32.00
Sorghastrum nutans	Indian Grass	32.00
	Total	**200.00**
Temporary Cover:		
Avena sativa	Common Oat	512.00
Lolium multiflorum	Annual Rye	240.00
	Total	**752.00**

BASIN BOTTOM SEED MIX (BBM)

Stormwater Seed Mix

Botanical Name	Common Name	PLS Ounces/Acre
Permanent Grasses/Sedges/Rushes:		
Carex crisatella	Crested Oval Sedge	2.00
Carex lurida	Bottlebrush Sedge	3.00
Carex vulpinoidea	Brown Fox Sedge	6.00
Elymus virginicus	Virginia Wild Rye	13.50
Glyceria striata	Fowl Manna Grass	1.25
Juncus effusus	Common Rush	2.00
Leersia oryzoides	Rice Cut Grass	1.00
Panicum virgatum	Switch Grass	2.00
Scirpus atrovirens	Dark Green Rush	2.00
Scirpus cypernus	Wool Grass	1.00
Scirpus fluviatilis	River Bulrush	0.25
Scirpus validus	Great Bulrush	3.00
	Total	**37.00**
Temporary Cover:		
Avena sativa	Common Oat	360.00
Lolium multiflorum	Annual Rye	100.00
	Total	**460.00**
Forbs & Shrubs:		
Alisma spp.	Water Plantain (Various Mix)	4.25
Asclepias incarnata	Swamp Milkweed	1.50
Aster novae-angliae	New England Aster	1.50
Bidens spp.	Bidens (Various Mix)	2.00
Helenium autumnale	Sneezeweed	2.00
Iris virginica	Blue Flag	4.00
Lycopus americanus	Common Water Horehound	0.25
Mimulus ringens	Monkey Flower	1.00
Penthorum sedoides	Ditch Stonecrop	0.50
Polygonum spp.	Pinkweed (Various Mix)	4.00
Rudbeckia subtomentosa	Sweet Black-Eyed Susan	1.00
Rudbeckia triloba	Brown-Eyed Susan	1.50
Sagittaria latifolia	Common Arrowhead	1.00
Senna hebacarpa	Wild Senna	1.00
Solidago riddelli	Riddell's Goldenrod	0.50
Thalictrum dasycarpum	Purple Meadow Rue	2.00
	Total	**28.00**

SEED MIX NOTES

1. THE SEED MIXES SHALL BE APPLIED AT THE SPECIFIED RATE OF FOR EACH MIX.
2. MUST BE INSTALLED TO MANUFACTURER SPECIFICATION AND REQUIREMENTS.

MANUFACTURER: CARDNO NATIVE PLANT NURSERY
128 SUNSET DRIVE
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FAX: 574–586–2718
EMAIL: NURSERYSALES@CARDNO.COM
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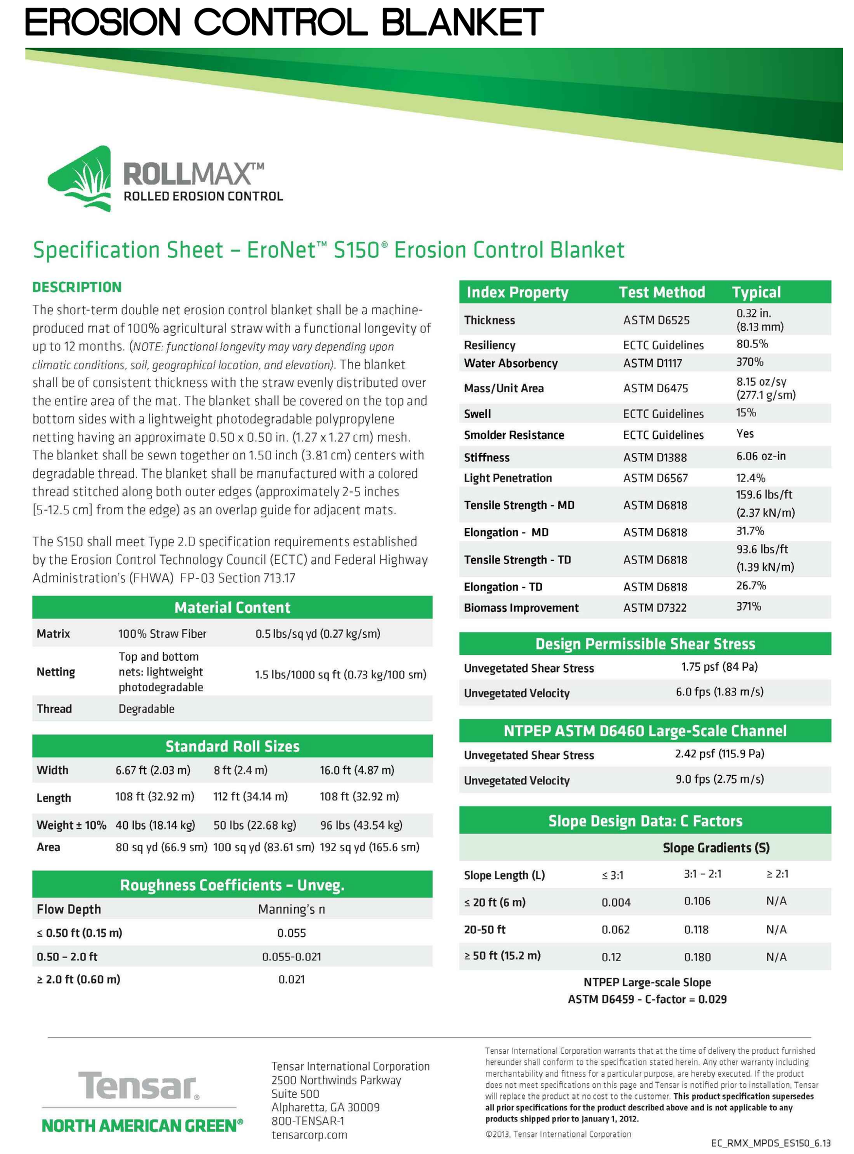
WWW.CARDNONATIVEPLANTNURSERY.COM

EROSION CONTROL BLANKET


ROLLMAX™ ROLLED EROSION CONTROL

Specification Sheet – EroNet™ S150® Erosion Control Blanket

DESCRIPTION

The short-term double net erosion control blanket shall be a machine-produced mat of 100% agricultural straw with a functional longevity of up to 12 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with a lightweight photodegradable polypropylene netting having an approximate 0.50 x 0.50 in. (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

The S150 shall meet Type 2.D specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.17

Material Content

Matrix	100% Straw Fiber	0.5 lbs/sq yd (0.27 kg/sm)
Netting	Top and bottom nets: lightweight photodegradable	1.5 lbs/1000 sq ft (0.73 kg/100 sm)
Thread	Degradable	

Standard Roll Sizes

Width	6.67 ft (2.03 m)	8 ft (2.4 m)	16.0 ft (4.87 m)
Length	108 ft (32.92 m)	112 ft (34.14 m)	108 ft (32.92 m)
Weight ± 10%	40 lbs (18.14 kg)	50 lbs (22.68 kg)	96 lbs (43.54 kg)
Area	80 sq yd (66.9 sm)	100 sq yd (83.61 sm)	192 sq yd (165.6 sm)

Roughness Coefficients – Unveg.

Flow Depth	Manning's n
≤ 0.50 ft (0.15 m)	0.055
0.50 – 2.0 ft	0.055-0.021
≥ 2.0 ft (0.60 m)	0.021

Index Property	Test Method	Typical
Thickness	ASTM D6525	0.32 in. (8.13 mm)
Resiliency	ECTC Guidelines	80.5%
Water Absorbency	ASTM D1117	370%
Mass/Unit Area	ASTM D6475	8.15 oz/sy (277.1 g/sm)
Swell	ECTC Guidelines	15%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.06 oz-in
Light Penetration	ASTM D6567	12.4%
Tensile Strength - MD	ASTM D6818	159.6 lbs/ft (2.37 kN/m)
Elongation - MD	ASTM D6818	31.7%
Tensile Strength - TD	ASTM D6818	93.6 lbs/ft (1.39 kN/m)
Elongation - TD	ASTM D6818	26.7%
Biomass Improvement	ASTM D7322	371%

Design Permissible Shear Stress

Unvegetated Shear Stress	1.75 psf (84 Pa)
Unvegetated Velocity	6.0 fps (1.83 m/s)

NTPEP ASTM D6460 Large-Scale Channel

Unvegetated Shear Stress	2.42 psf (115.9 Pa)
Unvegetated Velocity	9.0 fps (2.75 m/s)

Slope Design Data: C Factors

	Slope Gradients (S)		
Slope Length (L)	≤ 3:1	3:1 – 2:1	≥ 2:1
≤ 20 ft (6 m)	0.004	0.106	N/A
20-50 ft	0.062	0.118	N/A
≥ 50 ft (15.2 m)	0.12	0.180	N/A

NTPEP Large-scale Slope
ASTM D6459 - C-factor = 0.029

Tensar. NORTH AMERICAN GREEN®

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Suite 500
Alpharetta, GA 30009
800-TENSAR-1
tensarcorp.com

Tensar International Corporation warrants that at the time of delivery the product furnished hereunder shall conform to the specification stated herein. Any other warranty including merchantability and fitness for a particular purpose, are hereby executed. If the product does not meet specifications on this page and Tensar is notified prior to installation, Tensar will replace the product at no cost to the customer. **This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to January 1, 2012.**
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EC_RMX_MPDS_ES150_6.13

LANDSCAPE CALCULATIONS:

(PP) PARKING LOT - PERIMETER REQUIREMENTS

TOTAL PARKING LOT R.O.W. FRONTAGE:	**321 LF**
TREES REQ. (1 TREE / 30 LF):	11 TREES
TREES PROVIDED:	**11 TREES**

(PI) PARKING LOT - INTERIOR REQUIREMENTS

(PI-W) WEST PARKING LOT

26 SPACES x 270 SF = 7,020 SF / 15 SF =	468 SF REQUIRED
AREA = TO (3) SPACES (18' LONG x 9' WD.) =	**468 SF PROVIDED**
WEST P. LOT TREES REQ. (468 SF / 150 SF):	4 TREES
WEST P. LOT TREES PROVIDED:	**4 TREES**

(PI-E) EAST PARKING LOT

55 SPACES x 270 SF = 14,850 SF / 15 SF =	990 SF REQUIRED
AREA = TO (6) SPACES (18' LONG x 9' WD.) = PLUS LARGER ISLAND	**1,237 SF PROVIDED**
EAST P. LOT TREES REQ. (990 SF / 150 SF):	7 TREES
EAST P. LOT TREES PROVIDED:	**7 TREES**

(PI-R) REMAINDER PARKING LOTS

46 SPACES x 270 SF = 12,420 SF / 15 SF =	828 SF REQUIRED
PARKING LOT ISLAND AREA =	**1,245 SF PROVIDED**
REMAINDER P. LOT TREES REQ. (828 SF / 150 SF):	6 TREES
REMAINDER P. LOT TREES PROVIDED:	**6 TREES**

(TC) TRAIL CANOPY TREES

TREES REQUIRED:	0 TREES
TREES PROVIDED:	**16 TREES**

(B) BUFFER TREES

EVERGREEN TREES REQUIRED:	SOLID SCREEN
EVERGREEN TREES PROVIDED:	**37 TREES**

PLANT LIST - PARKING LOT PERIMETER (PP)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
2	AS	**Sugar Maple** *Acer saccharum*	3" Cal.	B&B
2	LT	**Tulip Tree** *Liriodendron tulipifera*	3" Cal.	B&B
4	QR	**Northern Red Oak - Heavy** *Quercus rubra*	3" Cal.	B&B
3	UP	**Princeton Elm** *Ulmus americana 'Princeton'*	3" Cal	B&B

PLANT LIST - PARKING LOT INTERIOR (PI-W)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
3	CO	**Hackberry** *Celtis occidentalis*	3" Cal.	B&B
1	LT	**Tulip Tree** *Liriodendron tulipifera*	3" Cal.	B&B

PLANT LIST - PARKING LOT INTERIOR (PI-E)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
7	LT	**Tulip Tree** *Liriodendron tulipifera*	3" Cal.	B&B

PLANT LIST - PARKING LOT INTERIOR (PI-R)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
1	LT	**Tulip Tree** *Liriodendron tulipifera*	3" Cal.	B&B
2	QR	**Northern Red Oak - Heavy** *Quercus rubra*	3" Cal.	B&B
3	UP	**Princeton Elm** *Ulmus americana 'Princeton'*	3" Cal	B&B

PLANT LIST - TRAIL CANOPY (TC)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
16	AB	**Autumn Blaze Maple** *Acer x. fremanii 'Autumn Blaze'*	3" Cal.	B&B

PLANT LIST - BUFFER (B)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
17	PA	**Norway Spruce** *Picea Abies*	7' Ht.	B&B
20	PD	**Black Hills Spruce** *Picea g. 'Densata'*	7' Ht.	B&B

PLANT LIST - INTERIOR (I)

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
6	AS	**Sugar Maple** *Acer saccharum*	3" Cal.	B&B
2	QR	**Northern Red Oak - Heavy** *Quercus rubra*	3" Cal.	B&B
4	PS	**White pine** *Pinus strobus*	8'Ht.	B&B
3	AL8	**Serviceberry** *Amelanchier laevis*	8' Ht. multi	B&B
53	JK6	**Ketler Juniper** *J. 'Ketlerii'*	6' Ht.	B&B
187	JNB	**New Blue Tams Juniper** *Juniperus t. 'New Blue'*	24" Spr.	Cont.
30	RA	**Gro-low Fragrant Sumac** *Rhus aromatica'Gro-low'*	24" Ht.	Cont.
138	RAL	**Alpine Currant** *Ribes alpinum*	30" Ht. Full	B&B
79	SAW	**Anthony Waterer Spirea** *Spirea 'Anthony Waterer'*	24" Ht.	Cont.
119	SP	**Little Princess Spirea** *Spirea japonica 'Little Princess'*	24" Ht.	Cont.
97	VD	**Arrowood Viburnum** *Viburnum l. 'Mohican'*	36" Ht.	BB
20	HY4	**Stella D'Oro Daylilies** *Hemerocallis 'Stella D'Oro'*	3 Fan min.	Cont.
100	VIN	**Annual Vinca** *Catharansus rosens*	48/Flat	Cont.
16	MS	**Slender Maiden Grass** *Miscanthus sin. 'Gracillimus'*	1 Gal.	Cont.
219	PA	**Dwarf Fountain Grass** *Pennisetum a. 'Hameln'*	1 Gal.	Cont.

NOTE:

CONTRACTOR TO VERIFY ALL PLANT QUANTITIES WHEN SUBMITTING PROPOSAL FORM.

BIDS WILL NOT BE CONSIDERED IF NOT ON THE PROVIDED PROPOSAL FORM

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Client:

GRAND HAVEN SENIOR LEASING, L.L.C.
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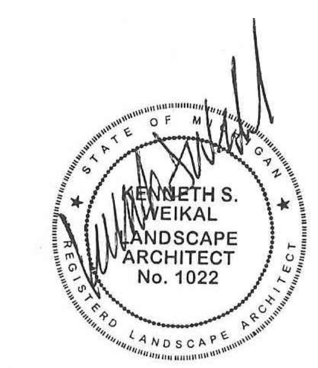
Project Title:

REGENCY AT GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN APPROVAL
04-13-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV. PER TWP PC MEETING



Drawn: Designed:

Checked: Approved:

CAD Drawing File:

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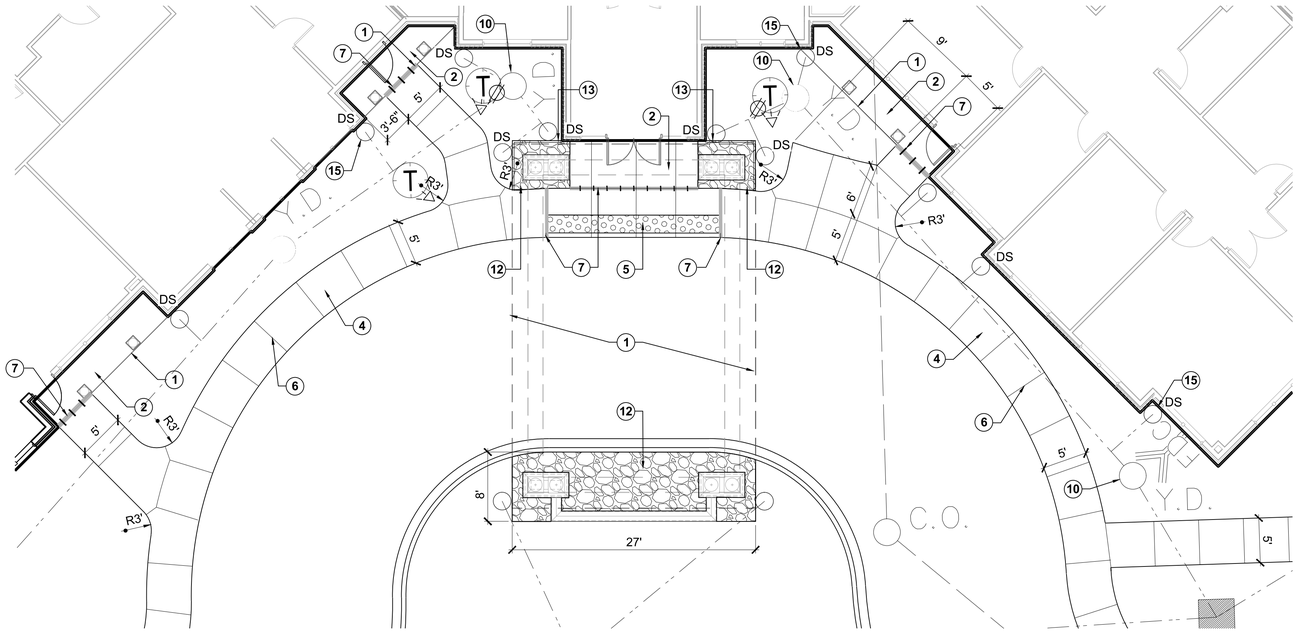
Project Number: 216212.00

Sheet Title:

CALCULATIONS, PLANT LISTS & DETAILS

Sheet Number: L-302

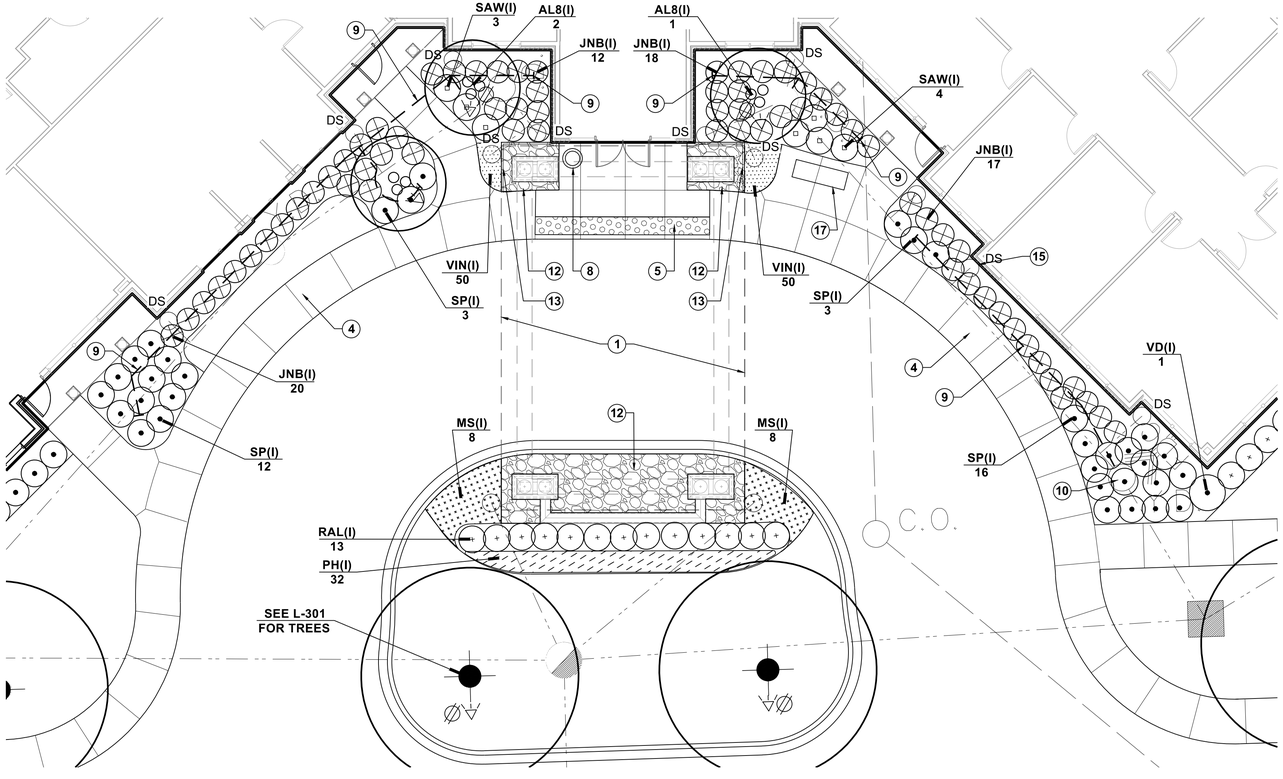


1 ENTRANCE LAYOUT PLAN

L-101

SCALE 1/8" = 1'-0"

NORTH



2 ENTRANCE PLANTING PLAN

L-301

SCALE 1/8" = 1'-0"

NORTH

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

- UPLIGHT – SEE 2/L-102 & 1/L-302 ALSO SEE SITE ELECTRICAL PLANS.
- DUPLEX OUTLET – SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT

NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

NOTE KEY: 2

1. OVERHEAD CANOPY – SEE ARCH. PLANS
2. CONCRETE PORCH – SEE ARCH. PLANS
3. WINDOW CLEAR VIEW ZONE – NO TREES
4. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
5. DETECTABLE WARNING STRIP – SEE CIVIL PLANS
6. CONTROL JOINT – SEE CIVIL PLANS
7. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
8. 4" CONC. WITH 3" "PICTURE FRAME" TOOLED EDGE, HEAVY BROOM FINISH. NOTE DIRECTION – SEE 4/L-102
9. 4" FLEXIBLE, PERFORATED, FABRIC COVERED PVC DRAINTILE – CONNECT TO STORM SYSTEM – SEE 5/L-302
10. DRAINAGE STRUCTURE – SEE CIVIL PLANS
11. METAL FENCE – SEE 4/L-313
12. 2" DIA. EGGSTONE, 4" DEEP OVER TYPAR FABRIC
13. 4" HT. BLACK STEEL EDGING
14. STONE MAINTENANCE STRIP – SEE 7/L-302
15. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
16. DUPLEX OUTLET ON SIDE OF BUILDING – SEE 3/L-102
17. BENCH – SEE SITE FURNITURE SCHEDULE 5/L-313
18. TRASH RECEPTACLE – SEE SITE FURNITURE SCHEDULE 5/L-313
19. UMBRELLA TABLE & CHAIRS – SEE SITE FURNITURE SCHEDULE 5/L-313

GENERAL PLANTING NOTES:

- (A) ALL TREES TO HAVE CLAY OR LOAM BALLS, TREES WITH SAND BALLS WILL BE REJECTED.
- (B) ALL SINGLE STEM SHADE TREES TO HAVE STRAIGHT TRUNKS AND SYMMETRICAL CROWNS.
- (C) ALL SINGLE TRUNK SHADE TREES TO HAVE A CENTRAL LEADER, TREES WITH FORKED OR IRREGULAR TRUNKS WILL NOT BE ACCEPTED.
- (D) ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.
- (E) ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.
- (F) NO MACHINERY IS TO BE USED WITHIN THE DRIPLINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN DRIPLINE OF EXISTING TREES.
- (G) ALL TREE LOCATIONS SHALL BE STAKED BY LANDSCAPE CONTRACTOR AND ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF THE PLANT MATERIAL.
- (H) IT IS MANDATORY THAT POSITIVE DRAINAGE IS PROVIDED AWAY FROM ALL BUILDINGS, WALKS AND PAVED AREAS.
- (I) ALL PLANTING BEDS SHALL RECEIVE SHREDDED BARK MULCH. SEE PLANTING DETAILS FOR DEPTHS.
- (J) SEE SPECIFICATIONS FOR ADDITIONAL COMMENTS, REQUIREMENTS, PLANTING PROCEDURES AND WARRANTY STANDARDS.

PLANT MIX

EXCAVATE PLANT BEDS TO DEPTH SHOWN ON DETAILS – DISPOSE OF SPOILS OFF SITE.

PLANTING BEDS TO RECEIVE MIXTURE OF 70% LOAM TOPSOIL, 10% COMPOST, 20% SAND;

ADDITIONALLY – HAND TILL INTO EVERY 150 SQ. FT. BED AREA:

(1) 6 CU. FT. BALE ORGANIC COMPOST

(1) 40 LB BAG COMPOSTED POULTRY MANURE "CHICK MAGIC" 5-3-2 WWW.CHICKMAGIC.NET (262)495-6220

(1) 5 LB BAG SHEMINS 13-13-13 MULTI PURPOSE FERTILIZER

HAND TILL INTO BED TO MINIMUM DEPTH OF 12"

PLANT BEDS

ALL PLANT BEDS TO BE FULLY EXCAVATED TO DEPTH SHOWN ON DETAILS AND AREAS SHOWN ON PLANS, AND TO RECEIVE CONTINUOUS PLANT MIX AS SPECIFIED (NOT INDIVIDUAL PLANT HOLES)

PLANTING KEY:

- TREE SYMBOL
- TREE TYPE KEY
- FA2 — PLANT LIST-SEE SHEET L-302; PLANTING DETAILS-SEE SHEET L-302
- QUANTITY

MULCH

MULCH TO BE DOUBLE SHREDDED HARDWOOD BARK MULCH

NO GROUND WOOD PALETTE MULCH PERMITTED

TOPSOIL

CONTRACTOR TO TILL OR DISK SUBGRADE TO 6" DEPTH AND INSTALL 4" COMPACTED DEPTH TOPSOIL IN ALL LAWN AREAS – FROM ONSITE STOCKPILE OR PROVIDED TO COMPLETE THE PROJECT

LANDSCAPE EDGING

ALL LANDSCAPE EDGES ARE SHOVEL CUT

PLANT SPACING

FILL BED WITH PLANTS SPECIFIED. KEEP PLANTS AWAY FROM BUILDING 12" MATURE SIZE

WATERING

CONTRACTOR RESPONSIBLE FOR MONITORING THE WATERING OF ALL PLANTINGS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD.

PLANTINGS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE ONE REQUIRED REPLACEMENT PLANT AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

CONTRACTOR IS ALSO RESPONSIBLE FOR MONITORING THE WATERING OF ALL NEWLY PLANTED LAWN AREAS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD. NEWLY PLANTED LAWN AREAS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE REQUIRED REPLACEMENT TO ESTABLISH A HEALTHY FULL DENSE LAWN AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

LAWNS:

ALL PROPOSED LAWN AREAS TO BE IRRIGATED SOD.

IRRIGATION SYSTEM

PROVIDE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM. PROVIDE SHOP DRAWING INCLUDING SEPARATE ZONES FOR LAWNS, SHRUBS, PERENNIALS AND ANNUAL FLOWERS. INCLUDE QUICK COUPLERS FOR HAND WATERING AREAS IF NECESSARY. SUBMIT SHOP DRAWING TO LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.

NOTE:

CONTRACTOR TO VERIFY ALL PLANT QUANTITIES WHEN SUBMITTING PROPOSAL FORM.

BIDS WILL NOT BE CONSIDERED IF NOT ON THE PROVIDED PROPOSAL FORM

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Project Title:

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11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN APPROVAL
04-13-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV. PER TWP PC MEETING

STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:

Checked: Approved:

CAD Drawing File:

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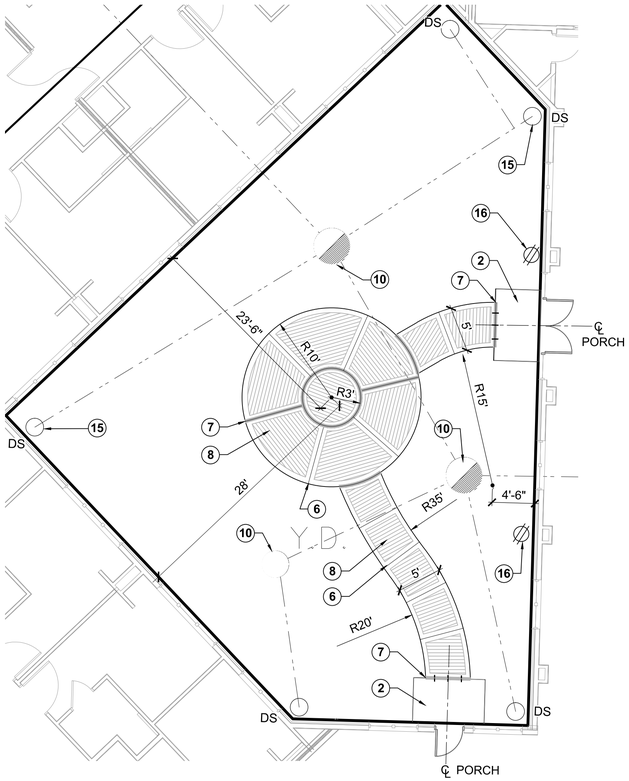
Project Number: 216212.00

Sheet Title:

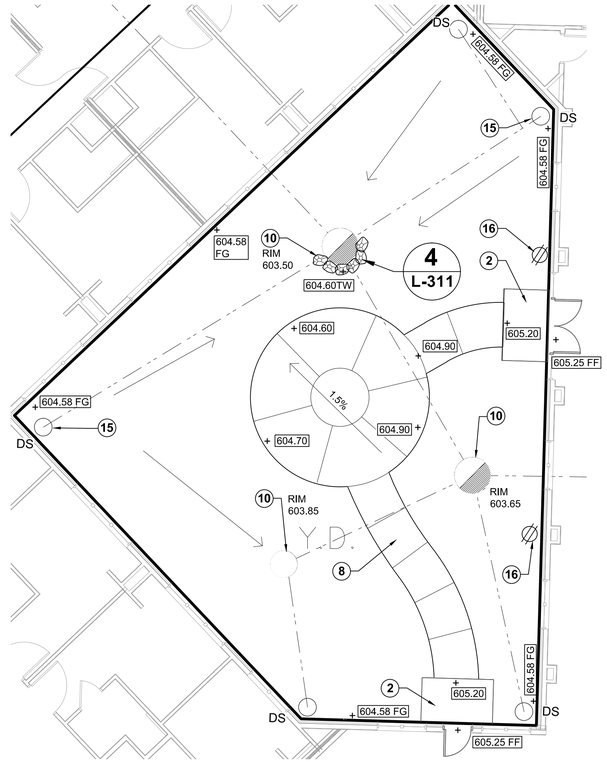
ENTRANCE PLANS

Sheet Number: L-310



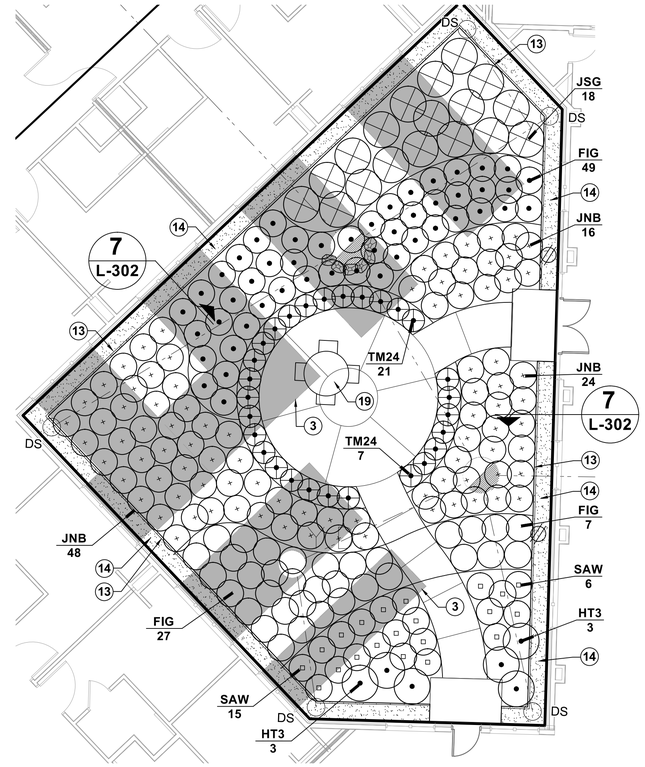
WEST INTERIOR COURTYARD
1 L-101 LAYOUT PLAN
SCALE 1/8" = 1'-0"

NORTH



WEST INTERIOR COURTYARD
2 L-101 GRADING PLAN
SCALE 1/8" = 1'-0"

NORTH



WEST INTERIOR COURTYARD
3 L-301 PLANTING PLAN
SCALE 1/8" = 1'-0"

NORTH

NOTE KEY: 2

1. OVERHEAD CANOPY – SEE ARCH. PLANS
2. CONCRETE PORCH – SEE ARCH. PLANS
3. WINDOW CLEAR VIEW ZONE – NO TREES
4. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
5. DETECTABLE WARNING STRIP – SEE CIVIL PLANS
6. CONTROL JOINT – SEE CIVIL PLANS
7. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
8. 4" CONC. WITH 3" "PICTURE FRAME" TOOLED EDGE, HEAVY BROOM FINISH. NOTE DIRECTION – SEE 4/L-102
9. 4" FLEXIBLE, PERFORATED, FABRIC COVERED PVC DRAINTILE – CONNECT TO STORM SYSTEM – SEE 5/L-302
10. DRAINAGE STRUCTURE – SEE CIVIL PLANS
11. METAL FENCE – SEE 4/L-313
12. 2" DIA. EGGSTONE, 4" DEEP OVER TYPAR FABRIC
13. 4" HT. BLACK STEEL EDGING
14. STONE MAINTENANCE STRIP – SEE 7/L-302
15. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
16. DUPLEX OUTLET ON SIDE OF BUILDING – SEE 3/L-102
17. BENCH – SEE SITE FURNITURE SCHEDULE 5/L-313
18. TRASH RECEPTACLE – SEE SITE FURNITURE SCHEDULE 5/L-313
19. UMBRELLA TABLE & CHAIRS – SEE SITE FURNITURE SCHEDULE 5/L-313

WINDOW CLEAR ZONE

NO TREES PERMITTED

NOTE:
EXCAVATE ENTIRE INTERIOR COURTYARDS AND INSTALL 18" MIN. PLANT MIX, TYP.

NOTE:
CONTRACTOR TO VERIFY ALL PLANT QUANTITIES WHEN SUBMITTING PROPOSAL FORM.

BIDS WILL NOT BE CONSIDERED IF NOT ON THE PROVIDED PROPOSAL FORM

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6" WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWSE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWSE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

- UPLIGHT – SEE 2/L-102 & 1/L-302 ALSO SEE SITE ELECTRICAL PLANS.
- DUPLEX OUTLET – SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT
- NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

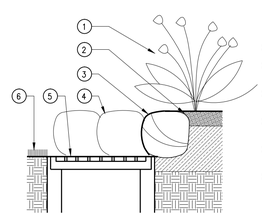
GENERAL GRADING NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. PROVIDE 2% MINIMUM DRAINAGE AWAY FROM BUILDINGS, TYP.
3. PROVIDE 1% MINIMUM DRAINAGE ON ALL WALKS.
4. DO NOT SCALE PRINTS.
5. CONTRACTOR TO CONTACT CIVIL ENGINEER AND LANDSCAPE ARCHITECT WITH ANY DISCREPANCIES BETWEEN GRADES SHOWN AND ACTUAL GRADES ON SITE. DO NOT MAKE ADJUSTMENTS WITHOUT APPROVAL OF THE CIVIL ENGINEER AND/ OR THE LANDSCAPE ARCHITECT.
6. SEE CIVIL ENGINEERING DRAWINGS FOR UTILITY STRUCTURE LOCATIONS.
7. ALL TOP OF CURB ELEVATIONS SHOWN ARE FROM, OR CALCULATED BASED ON THE CIVIL ENGINEERING DRAWINGS.
8. SEE CIVIL ENGINEERING DRAWINGS FOR GRADING AND PAVEMENT ELEVATIONS FOR ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.

CONTRACTOR TO VERIFY ALL CATCH BASIN RIMS AND INVERTS WITH CIVIL PLANS

GRADING KEY:

+ 84.20	PROPOSED GRADES
FF	FINISH FLOOR
FG	FINISH GRADE
TC	TOP OF CURB
TP	TOP OF PAVEMENT
TW	TOP OF WALL
DS	DOWNSPOUT
←	SLOPE DIRECTION ARROW
— —	4" PERF. FABRIC COVERED DRAIN TILE – SEE 1/L-302



1. PLANTING AREA
2. FINISH GRADE – PLANTING AREA
3. 18" DIA. BOULDERS AROUND DRAIN – SEE PLAN
4. 18" DIA. BOULDER AROUND DRAIN, BEYOND
5. CATCH BASIN / INLET – SEE CIVIL PLANS
6. FINISH GRADE – LAWN AREA

4 L-311 DRAINAGE STRUCTURE BOULDER EDGE DETAIL

NOT TO SCALE

GENERAL PLANTING NOTES:

A. ALL TREES TO HAVE CLAY OR LOAM BALLS, TREES WITH SAND BALLS WILL BE REJECTED.

B. ALL SINGLE STEM SHADE TREES TO HAVE STRAIGHT TRUNKS AND SYMMETRICAL CROWNS.

C. ALL SINGLE TRUNK SHADE TREES TO HAVE A CENTRAL LEADER, TREES WITH FORKED OR IRREGULAR TRUNKS WILL NOT BE ACCEPTED.

D. ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.

E. ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.

F. NO MACHINERY IS TO BE USED WITHIN THE DRIPLINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN DRIPLINE OF EXISTING TREES.

G. ALL TREE LOCATIONS SHALL BE STAKED BY LANDSCAPE CONTRACTOR AND ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF THE PLANT MATERIAL.

H. IT IS MANDATORY THAT POSITIVE DRAINAGE IS PROVIDED AWAY FROM ALL BUILDINGS, WALKS AND PAVED AREAS.

I. ALL PLANTING BEDS SHALL RECEIVE SHREDDED BARK MULCH. SEE PLANTING DETAILS FOR DEPTHS.

J. SEE SPECIFICATIONS FOR ADDITIONAL COMMENTS, REQUIREMENTS, PLANTING PROCEDURES AND WARRANTY STANDARDS.

WATERING

CONTRACTOR RESPONSIBLE FOR MONITORING THE WATERING OF ALL PLANTINGS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD.

PLANTINGS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE ONE REQUIRED REPLACEMENT PLANT AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

CONTRACTOR IS ALSO RESPONSIBLE FOR MONITORING THE WATERING OF ALL NEWLY PLANTED LAWN AREAS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD. NEWLY PLANTED LAWN AREAS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE REQUIRED REPLACEMENT TO ESTABLISH A HEALTHY FULL DENSE LAWN AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

IRRIGATION SYSTEM

PROVIDE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM. PROVIDE SHOP DRAWING INCLUDING SEPARATE ZONES FOR LAWNS, SHRUBS, PERENNIALS AND ANNUAL FLOWERS. INCLUDE QUICK COUPLERS FOR HAND WATERING AREAS IF NECESSARY. SUBMIT SHOP DRAWING TO LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.

PLANT MIX

EXCAVATE PLANT BEDS TO DEPTH SHOWN ON DETAILS – DISPOSE OF SPOILS OFF SITE.

PLANTING BEDS TO RECEIVE MIXTURE OF 70% LOAM TOPSOIL, 10% COMPOST, 20% SAND;

ADDITIONALLY – HAND TILL INTO EVERY 150 SQ. FT. BED AREA:

(1) 6 CU. FT. BALE ORGANIC COMPOST

(1) 40 LB BAG COMPOSTED POULTRY MANURE "CHICK MAGIC" 5-3-2 WWW.CHICKMAGIC.NET (262)495-6220

(1) 5 LB BAG SHEMINS 13-13-13 MULTI PURPOSE FERTILIZER

HAND TILL INTO BED TO MINIMUM DEPTH OF 12"

MULCH

MULCH TO BE DOUBLE SHREDDED HARDWOOD BARK MULCH

NO GROUND WOOD PALETTE MULCH PERMITTED

TOPSOIL

CONTRACTOR TO TILL OR DISK SUBGRADE TO 6" DEPTH AND INSTALL 4" COMPACTED DEPTH TOPSOIL IN ALL LAWN AREAS – FROM ONSITE STOCKPILE OR PROVIDED TO COMPLETE THE PROJECT

LAWNS:

ALL PROPOSED LAWN AREAS TO BE IRRIGATED SOD.

LANDSCAPE EDGING

ALL LANDSCAPE EDGES ARE SHOVEL CUT

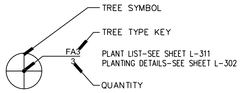
PLANT SPACING

FILL BED WITH PLANTS SPECIFIED. KEEP PLANTS AWAY FROM BUILDING 12" MATURE SIZE

PLANT BEDS

ALL PLANT BEDS TO BE FULLY EXCAVATED TO DEPTH SHOWN ON DETAILS AND AREAS SHOWN ON PLANS, AND TO RECEIVE CONTINUOUS PLANT MIX AS SPECIFIED (NOT INDIVIDUAL PLANT HOLES)

PLANTING KEY:



PLANT LIST - WEST INTERIOR

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
83	FIG	Forsythia 'Gold Tide' *Forsythia x. 'Courtasol'*	30" Spr.	Cont.
6	HT3	Summer Hydrangea *Hydrangea tardiva*	3' Ht.	B&B
88	JNB	New Blue Tams Juniper *Juniperus t. 'New Blue'*	24" Spr.	Cont.
18	JSG	Sea Green Juniper *Juniperus 'Sea Green'*	24" Spr.	Cont.
21	SAW	Anthony Waterer Spirea *Spirea 'Anthony Waterer'*	24" Ht.	Cont.
28	TM24	Dense Yew *Taxus x. m. 'Densiformis'*	24" Ht.	B&B

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LANDSCAPE ARCHITECTURE

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33203 BIDDESTONE LANE, FARMINGTON HILLS, MI 48334

Client:

GRAND HAVEN SENIOR LEASING, L.L.C.

SOUTHFIELD MICHIGAN
248.386.0300

248.386.0314 (fax)

Project Title:

REGENCY AT GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN APPROVAL
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06-16-17	HFES PRELIMINARY
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07-31-17	REV. PER TWP PC MEETING

Drawn: Designed:

Checked: Approved:

CAD Drawing File:

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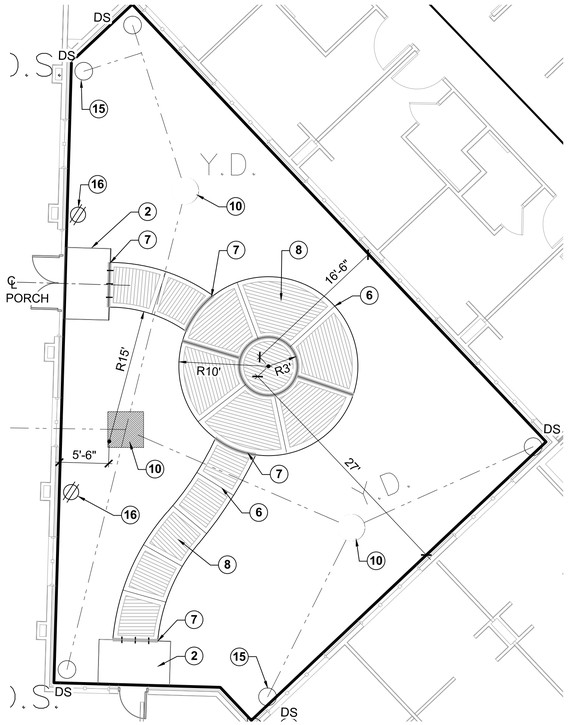
Project Number: 216212.00

Sheet Title:

WEST INTERIOR COURTYARD PLANS

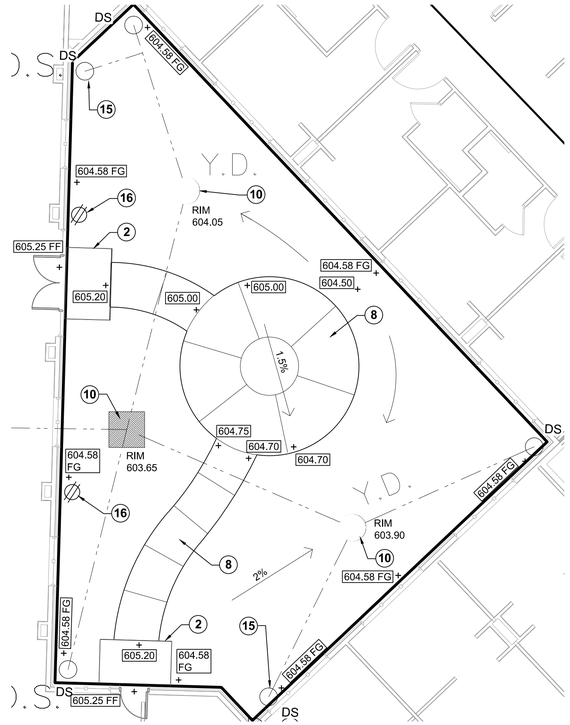
Sheet Number: L-311



1 L-101 EAST INTERIOR COURTYARD LAYOUT PLAN

SCALE 1/8" = 1'-0"

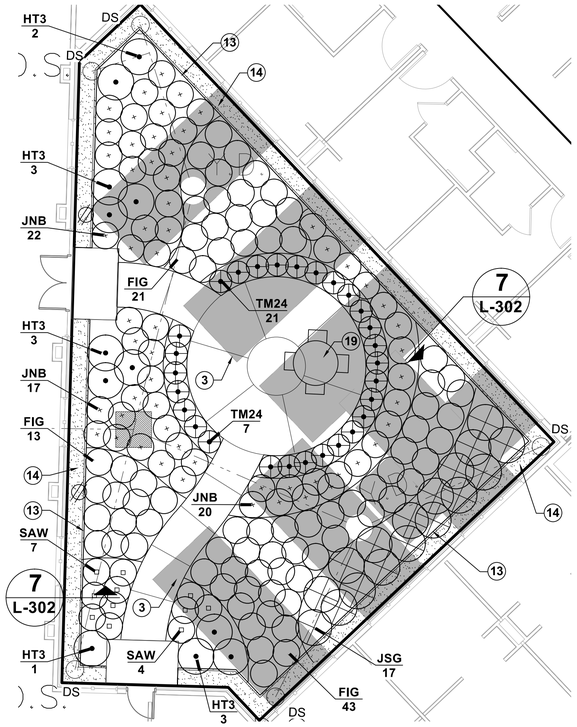
NORTH



2 L-101 EAST INTERIOR COURTYARD GRADING PLAN

SCALE 1/8" = 1'-0"

NORTH



3 L-301 EAST INTERIOR COURTYARD PLANTING PLAN

SCALE 1/8" = 1'-0"

NORTH

NOTE KEY: (2)

1. OVERHEAD CANOPY – SEE ARCH. PLANS
2. CONCRETE PORCH – SEE ARCH. PLANS
3. WINDOW CLEAR VIEW ZONE – NO TREES
4. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
5. DETECTABLE WARNING STRIP – SEE CIVIL PLANS
6. CONTROL JOINT – SEE CIVIL PLANS
7. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
8. 4" CONC. WITH 3" "PICTURE FRAME" TOOLED EDGE, HEAVY BROOM FINISH. NOTE DIRECTION – SEE 4/L-102
9. 4" FLEXIBLE, PERFORATED, FABRIC COVERED PVC DRAINTILE – CONNECT TO STORM SYSTEM – SEE 5/L-302
10. DRAINAGE STRUCTURE – SEE CIVIL PLANS
11. METAL FENCE – SEE 4/L-313
12. 2" DIA. EGGSTONE, 4" DEEP OVER TYPAR FABRIC
13. 4" HT. BLACK STEEL EDGING
14. STONE MAINTENANCE STRIP – SEE 7/L-302
15. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
16. DUPLEX OUTLET ON SIDE OF BUILDING – SEE 3/L-102
17. BENCH – SEE SITE FURNITURE SCHEDULE 5/L-313
18. TRASH RECEPTACLE – SEE SITE FURNITURE SCHEDULE 5/L-313
19. UMBRELLA TABLE & CHAIRS – SEE SITE FURNITURE SCHEDULE 5/L-313

WINDOW CLEAR ZONE

NO TREES PERMITTED

NOTE:
EXCAVATE ENTIRE INTERIOR COURTYARDS AND INSTALL 18" MIN. PLANT MIX, TYP.

NOTE:
CONTRACTOR TO VERIFY ALL PLANT QUANTITIES WHEN SUBMITTING PROPOSAL FORM.

BIDS WILL NOT BE CONSIDERED IF NOT ON THE PROVIDED PROPOSAL FORM

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6" WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

UPLIGHT – SEE 2/L-102 & 1/L-302
ALSO SEE SITE ELECTRICAL PLANS.

DUPLEX OUTLET –
SEE 3/L-102 & SITE ELEC. PLANS

BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS

LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS

LOCATION OF TREE / FOCUS OF UPLIGHT

NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

GENERAL GRADING NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. PROVIDE 2% MINIMUM DRAINAGE AWAY FROM BUILDINGS, TYP.
3. PROVIDE 1% MINIMUM DRAINAGE ON ALL WALKS.
4. DO NOT SCALE PRINTS.
5. CONTRACTOR TO CONTACT CIVIL ENGINEER AND LANDSCAPE ARCHITECT WITH ANY DISCREPANCIES BETWEEN GRADES SHOWN AND ACTUAL GRADES ON SITE. DO NOT MAKE ADJUSTMENTS WITHOUT APPROVAL OF THE CIVIL ENGINEER AND/ OR THE LANDSCAPE ARCHITECT.
6. SEE CIVIL ENGINEERING DRAWINGS FOR UTILITY STRUCTURE LOCATIONS.
7. ALL TOP OF CURB ELEVATIONS SHOWN ARE FROM, OR CALCULATED BASED ON THE CIVIL ENGINEERING DRAWINGS.
8. SEE CIVIL ENGINEERING DRAWINGS FOR GRADING AND PAVEMENT ELEVATIONS FOR ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.

CONTRACTOR TO VERIFY ALL CATCH BASIN RIMS AND INVERTS WITH CIVIL PLANS

GRADING KEY:

+ 84.20	PROPOSED GRADES
FF	FINISH FLOOR
FG	FINISH GRADE
TC	TOP OF CURB
TP	TOP OF PAVEMENT
TW	TOP OF WALL
DS	DOWNSPOUT
←	SLOPE DIRECTION ARROW
— —	4" PERF. FABRIC COVERED DRAIN TILE – SEE 1/L-302

GENERAL PLANTING NOTES:

(A) ALL TREES TO HAVE CLAY OR LOAM BALLS, TREES WITH SAND BALLS WILL BE REJECTED.

(B) ALL SINGLE STEM SHADE TREES TO HAVE STRAIGHT TRUNKS AND SYMMETRICAL CROWNS.

(C) ALL SINGLE TRUNK SHADE TREES TO HAVE A CENTRAL LEADER, TREES WITH FORKED OR IRREGULAR TRUNKS WILL NOT BE ACCEPTED.

(D) ALL MULTI-STEM TREES SHALL BE HEAVILY BRANCHED AND HAVE SYMMETRICAL CROWNS. ONE SIDED TREES OR THOSE WITH THIN OR OPEN CROWNS SHALL NOT BE ACCEPTED.

(E) ALL EVERGREEN TREES SHALL BE HEAVILY BRANCHED AND FULL TO THE GROUND, SYMMETRICAL IN SHAPE AND NOT SHEARED FOR THE LAST FIVE GROWING SEASONS.

(F) NO MACHINERY IS TO BE USED WITHIN THE DRIPLINE OF EXISTING TREES. HAND GRADE ALL LAWN AREAS WITHIN DRIPLINE OF EXISTING TREES.

(G) ALL TREE LOCATIONS SHALL BE STAKED BY LANDSCAPE CONTRACTOR AND ARE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION OF THE PLANT MATERIAL.

(H) IT IS MANDATORY THAT POSITIVE DRAINAGE IS PROVIDED AWAY FROM ALL BUILDINGS, WALKS AND PAVED AREAS.

(I) ALL PLANTING BEDS SHALL RECEIVE SHREDDED BARK MULCH. SEE PLANTING DETAILS FOR DEPTHS.

(J) SEE SPECIFICATIONS FOR ADDITIONAL COMMENTS, REQUIREMENTS, PLANTING PROCEDURES AND WARRANTY STANDARDS.

WATERING

CONTRACTOR RESPONSIBLE FOR MONITORING THE WATERING OF ALL PLANTINGS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD.

PLANTINGS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE ONE REQUIRED REPLACEMENT PLANT AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

CONTRACTOR IS ALSO RESPONSIBLE FOR MONITORING THE WATERING OF ALL NEWLY PLANTED LAWN AREAS FOR ONE YEAR FROM THE START OF THE WARRANTY PERIOD. NEWLY PLANTED LAWN AREAS THAT PERISH DUE TO LACK OF WATER, OR TOO MUCH WATER, DO NOT QUALIFY AS THE REQUIRED REPLACEMENT TO ESTABLISH A HEALTHY FULL DENSE LAWN AS STATED IN THE SPECIFICATION, AND SHALL BE REPLACED AT NO COST TO THE OWNER.

IRRIGATION SYSTEM

PROVIDE UNDERGROUND AUTOMATIC IRRIGATION SYSTEM. PROVIDE SHOP DRAWING INCLUDING SEPARATE ZONES FOR LAWNS, SHRUBS, PERENNIALS AND ANNUAL FLOWERS. INCLUDE QUICK COUPLERS FOR HAND WATERING AREAS IF NECESSARY. SUBMIT SHOP DRAWING TO LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL.

PLANT MIX

EXCAVATE PLANT BEDS TO DEPTH SHOWN ON DETAILS – DISPOSE OF SPOILS OFF SITE.

PLANTING BEDS TO RECEIVE MIXTURE OF 70% LOAM TOPSOIL, 10% COMPOST, 20% SAND;

ADDITIONALLY – HAND TILL INTO EVERY 150 SQ. FT. BED AREA:

(1) 6 CU. FT. BALE ORGANIC COMPOST

(1) 40 LB BAG COMPOSTED POULTRY MANURE "CHICK MAGIC" 5-3-2 WWW.CHICKMAGIC.NET (262)495-6220

(1) 5 LB BAG SHEMINS 13-13-13 MULTI PURPOSE FERTILIZER

HAND TILL INTO BED TO MINIMUM DEPTH OF 12"

MULCH

MULCH TO BE DOUBLE SHREDDED HARDWOOD BARK MULCH

NO GROUND WOOD PALETTE MULCH PERMITTED

TOPSOIL

CONTRACTOR TO TILL OR DISK SUBGRADE TO 6" DEPTH AND INSTALL 4" COMPACTED DEPTH TOPSOIL IN ALL LAWN AREAS – FROM ONSITE STOCKPILE OR PROVIDED TO COMPLETE THE PROJECT

LAWNS:

ALL PROPOSED LAWN AREAS TO BE IRRIGATED SOD.

LANDSCAPE EDGING

ALL LANDSCAPE EDGES ARE SHOVEL CUT

PLANT SPACING

FILL BED WITH PLANTS SPECIFIED. KEEP PLANTS AWAY FROM BUILDING 12" MATURE SIZE

PLANT BEDS

ALL PLANT BEDS TO BE FULLY EXCAVATED TO DEPTH SHOWN ON DETAILS AND AREAS SHOWN ON PLANS, AND TO RECEIVE CONTINUOUS PLANT MIX AS SPECIFIED (NOT INDIVIDUAL PLANT HOLES)

PLANTING KEY:

TREE SYMBOL
TREE TYPE KEY
FA3
PLANT LIST–SEE SHEET L-312
PLANTING DETAILS–SEE SHEET L-302
QUANTITY

PLANT LIST - EAST INTERIOR

QUAN.	KEY	COMMON/ BOTANICAL NAME	SIZE	SPEC.
77	FIG	Forsythia 'Gold Tide' *Forsythia x. 'Courtasol'*	30" Spr.	Cont.
12	HT3	Summer Hydrangea *Hydrangea tardiva*	3' Ht.	B&B
59	JNB	New Blue Tams Juniper *Juniperus t. 'New Blue'*	24" Spr.	Cont.
17	JSG	Sea Green Juniper *Juniperus 'Sea Green'*	24" Spr.	Cont.
11	SAW	Anthony Waterer Spirea *Spirea 'Anthony Waterer'*	24" Ht.	Cont.
28	TM24	Dense Yew *Taxus x. m. 'Densiformis'*	24" Ht.	B&B

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Project Title:

REGENCY AT GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
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STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:

Checked: Approved:

CAD Drawing File:

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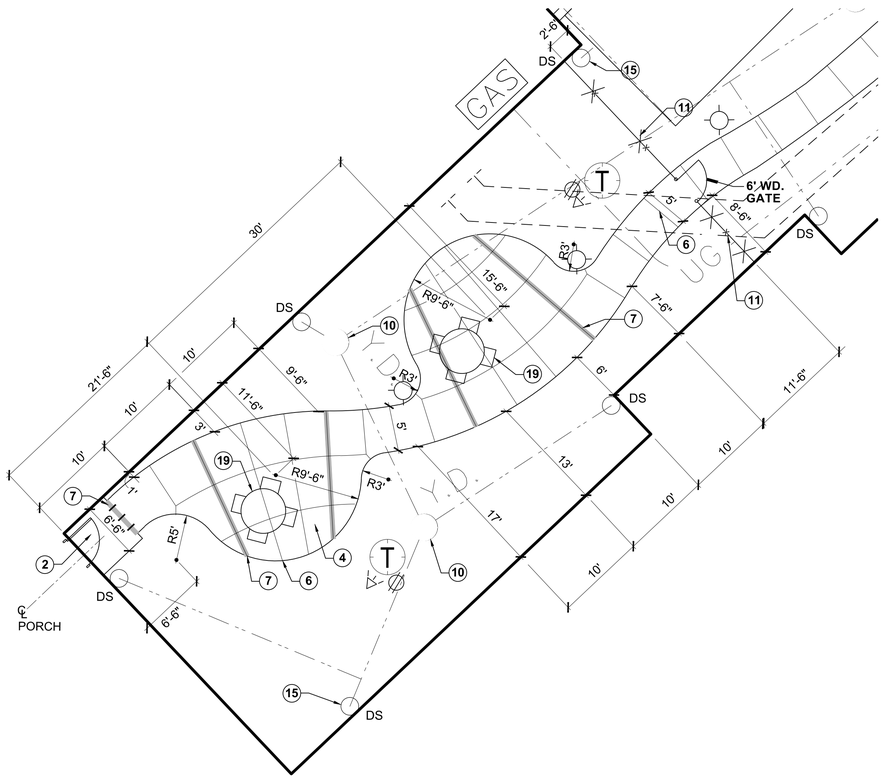
Project Number: 216212.00

Sheet Title:

EAST INTERIOR COURTYARD PLANS

Sheet Number: L-312

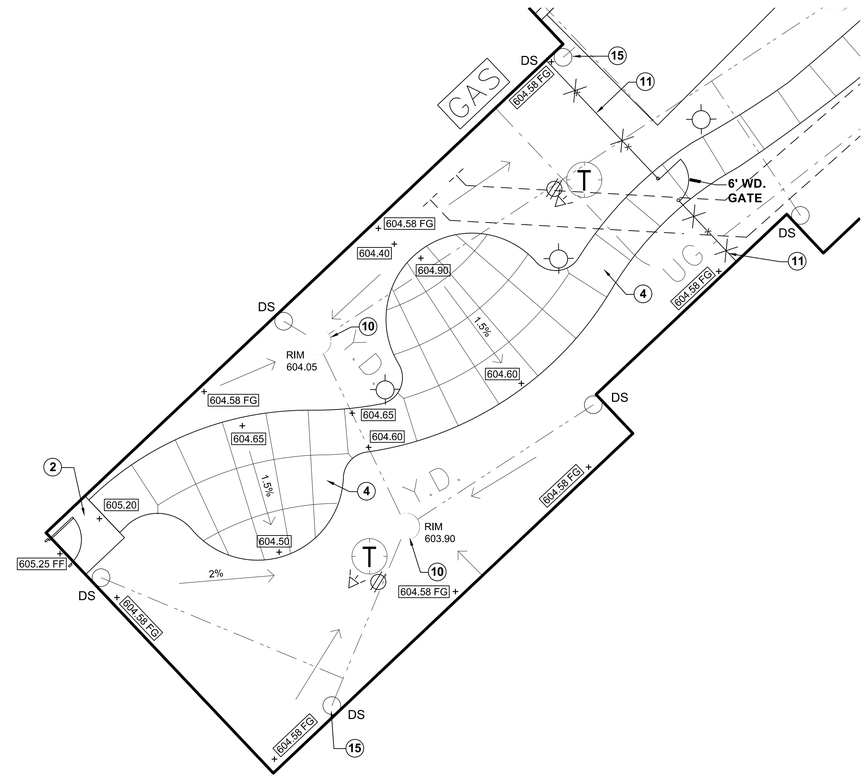


1 EXTERIOR COURTYARD LAYOUT PLAN

L-101

SCALE 1/8" = 1'-0"

NORTH



2 EXTERIOR COURTYARD GRADING PLAN

L-101

SCALE 1/8" = 1'-0"

NORTH

NOTE KEY: (2)

1. OVERHEAD CANOPY – SEE ARCH. PLANS
2. CONCRETE PORCH – SEE ARCH. PLANS
3. WINDOW CLEAR VIEW ZONE – NO TREES
4. NEW CONCRETE SIDEWALK – SEE CIVIL PLANS
5. DETECTABLE WARNING STRIP – SEE CIVIL PLANS
6. CONTROL JOINT – SEE CIVIL PLANS
7. EXP JOINT W/ SEALANT – NOTE: 12" LENGTH, 1/2" DIA. DOWELS AT PORCH SLAB, 18" O.C. – THICKEN CONC WALK TO ACCEPT DOWEL – SEE CIVIL PLANS FOR DETAIL
8. 4" CONC. WITH 3" "PICTURE FRAME" TOOLED EDGE, HEAVY BROOM FINISH. NOTE DIRECTION – SEE 4/L-102
9. 4" FLEXIBLE, PERFORATED, FABRIC COVERED PVC DRAINTILE – CONNECT TO STORM SYSTEM – SEE 5/L-302
10. DRAINAGE STRUCTURE – SEE CIVIL PLANS
11. METAL FENCE – SEE 4/L-313
12. 2" DIA. EGGSTONE, 4" DEEP OVER TYPAR FABRIC
13. 4" HT. BLACK STEEL EDGING
14. STONE MAINTENANCE STRIP – SEE 7/L-302
15. DOWNSPOUT – SEE DETAILS 2 & 3 /L-103
16. DUPLEX OUTLET ON SIDE OF BUILDING – SEE 3/L-102
17. BENCH – SEE SITE FURNITURE SCHEDULE 5/L-313
18. TRASH RECEPTACLE – SEE SITE FURNITURE SCHEDULE 5/L-313
19. UMBRELLA TABLE & CHAIRS – SEE SITE FURNITURE SCHEDULE 5/L-313

GENERAL GRADING NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. PROVIDE 2% MINIMUM DRAINAGE AWAY FROM BUILDINGS, TYP.
3. PROVIDE 1% MINIMUM DRAINAGE ON ALL WALKS.
4. DO NOT SCALE PRINTS.
5. CONTRACTOR TO CONTACT CIVIL ENGINEER AND LANDSCAPE ARCHITECT WITH ANY DISCREPANCIES BETWEEN GRADES SHOWN AND ACTUAL GRADES ON SITE. DO NOT MAKE ADJUSTMENTS WITHOUT APPROVAL OF THE CIVIL ENGINEER AND/ OR THE LANDSCAPE ARCHITECT.
6. SEE CIVIL ENGINEERING DRAWINGS FOR UTILITY STRUCTURE LOCATIONS.
7. ALL TOP OF CURB ELEVATIONS SHOWN ARE FROM, OR CALCULATED BASED ON THE CIVIL ENGINEERING DRAWINGS.
8. SEE CIVIL ENGINEERING DRAWINGS FOR GRADING AND PAVEMENT ELEVATIONS FOR ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.

CONTRACTOR TO VERIFY ALL CATCH BASIN RIMS AND INVERTS WITH CIVIL PLANS

GRADING KEY:

+ 84.20	PROPOSED GRADES
FF	FINISH FLOOR
FG	FINISH GRADE
TC	TOP OF CURB
TP	TOP OF PAVEMENT
TW	TOP OF WALL
DS	DOWNSPOUT
←	SLOPE DIRECTION ARROW
— —	4" PERF. FABRIC COVERED DRAIN TILE – SEE 1/L-302

GENERAL LAYOUT NOTES:

1. IF DISCREPANCIES OCCUR WITHIN PLAN SETS, CONTACT CIVIL ENGINEER, ARCHITECT AND LANDSCAPE ARCHITECT BEFORE PROCEEDING.
2. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET BUILDING PORCHES, TYPICAL.
3. INSTALL 1/2" EXPANSION JOINT WHERE CONCRETE WALKS MEET CURBS, TYP.
4. EXPANSION JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 18' O.C. TYP.
   5' WD. SIDEWALK – 20' O.C. TYP.
   4' WD. SIDEWALK – 20' O.C. TYP.
   3' WD. SIDEWALK – 18' O.C. TYP.
5. CONTROL JOINTS IN CONCRETE SIDEWALKS:
   6' WD. SIDEWALK – 6' X 6' PANEL
   5' WD. SIDEWALK – 5' X 5' PANEL
   4' WD. SIDEWALK – 4' X 4' PANEL
   3' WD. SIDEWALK – 3' X 3' PANEL
6. DO NOT SCALE PRINTS.
7. ALL ANGLES ASSUMED TO BE 90 DEGREES UNLESS OTHERWISE NOTED.
8. CONCRETE AND ASPHALT WALKS TO MEET PORCHES FLUSH (NO STEP) UNLESS OTHERWISE NOTED.
9. SEE CIVIL ENGINEERING DRAWINGS FOR LAYOUT OF ALL ROADS, CURBS, BUILDINGS, UTILITIES, ETC.
10. ALL RADII ON CONCRETE AND ASPHALT SIDEWALKS TO BE 5' R. UNLESS OTHERWISE NOTED.
11. TOP AND BOTTOM OF RETAINING WALLS – SEE GRADING PLANS.
12. ALL DIMENSIONS TO BACK OF CURB UNLESS OTHERWISE NOTED.
13. ALL DIMENSIONS FOR RETAINING WALLS TO BOTTOM COURSE OF WALL.

LIGHT KEY:

- UPLIGHT – SEE 2/L-102 & 1/L-302 ALSO SEE SITE ELECTRICAL PLANS.
- DUPLEX OUTLET – SEE 3/L-102 & SITE ELEC. PLANS
- BOLLARD LIGHT – SITE ELEC. PLANS FOR DETAILS AND LOCATIONS
- LIGHT POLE – 3' OFF BACK OF CURB, 2' OFF BACK OF SIDEWALK. SEE SITE ELEC. PLANS
- LOCATION OF TREE / FOCUS OF UPLIGHT

NOTE: LANDSCAPE ARCHITECT TO APPROVE ALL STAKED LOCATIONS FOR LIGHTS, UPLIGHTS AND DUPLEX OUTLETS PRIOR TO WIRING AND INSTALLATION

5 L-313 SITE FURNITURE SCHEDULE

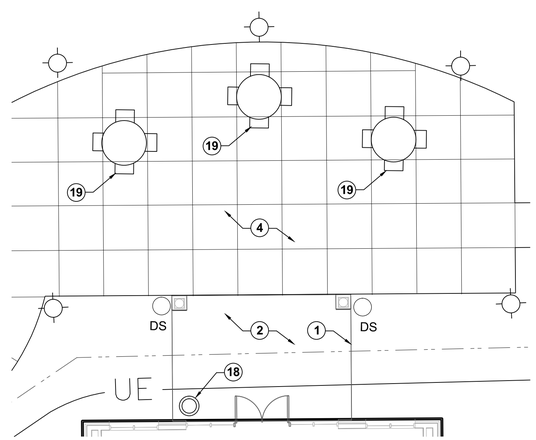
SITE BENCH: -- 1 TOTAL
"WELLSPRING" 72" LENGTH X 19" HEIGHT
COLOR BLACK POWDERCOAT
ANCHOR TO PAVING WITH BRASS SURFACE MOUNT
MANUF.: LANDSCAPE FORMS:
800.430.6209 – 269.381.0396

TRASH RECEPTACLE: -- 2 TOTAL
"WELLSPRING" 22" SQ. X 31.5" HT.
COLOR BLACK POWDERCOAT
ANCHOR TO PAVING WITH BRASS SURFACE MOUNT
MANUF.: LANDSCAPE FORMS:
800.430.6209 – 269.381.0396

DINING CHAIRS: -- 28 TOTAL
"WELLSPRING" DINING CHAIRS
34" HT., 23" X 22.5" X 19" HT. SEAT WITH ARMS
COLOR BLACK POWDERCOAT
ANCHOR TO PAVING WITH BRASS SURFACE MOUNT
MANUF.: LANDSCAPE FORMS:
800.430.6209 – 269.381.0396

DINING TABLE: -- 7 TOTAL
"WELLSPRING" DINING TABLE TO ACCEPT UMBRELLA
48" DIA., 30" HT., OPENING TO ACCEPT 1.5" FREE STANDING UMBRELLA
COLOR BLACK POWDERCOAT
ANCHOR TO PAVING WITH BRASS SURFACE MOUNT
MANUF.: LANDSCAPE FORMS:
800.430.6209 – 269.381.0396

TABLE UMBRELLA: -- 7 TOTAL
"EQUINOX" UMBRELLA
FOREST GREEN, PLAIN EDGE
MANUF.: LANDSCAPE FORMS:
800.430.6209 – 269.381.0396

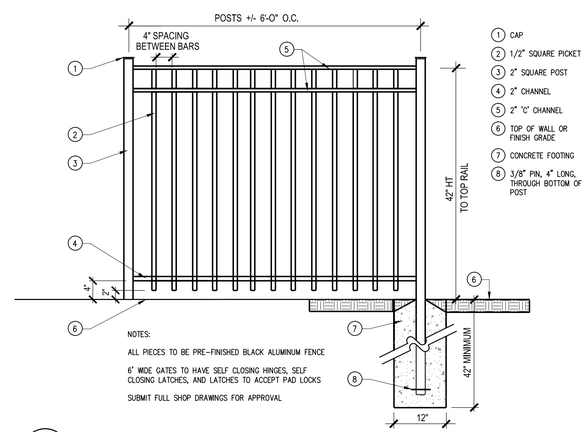


3 TERRACE FURNITURE PLAN

L-101

SCALE 1/8" = 1'-0"

NORTH



4 L-313 42" METAL FENCE

NOT TO SCALE

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STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:

Checked: Approved:

CAD Drawing File:

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NSA Architects, Engineers, Planners

Project Number: 216212.00

Sheet Title:

EXTERIOR COURTYARD PLANS

Sheet Number: L-313

SECTION 329113 - SOIL PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes planting soils specified by composition of the mixes.

B. Related Requirements:
1. Section 311000 "Site Clearing" for topsoil tripping and stockpiling.
2. Section 329200 "Turf and Grasses" for placing planting soil for turf and grasses.
3. Section 329300 "Plants" for placing planting soil for plantings.

1.3 ALLOWANCES

A. Preconstruction and field quality-control testing are part of testing and inspecting allowance.

1.4 DEFINITIONS

A. AAPFCO: Association of American Plant Food Control Officials.

B. Backfill: The earth used to replace or the act of replacing earth in an excavation. This can be amended or un-amended soil as indicated.

C. CEC: Cation exchange capacity.

D. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

E. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.

F. Imported Soil: Soil that is transported to Project site for use.

G. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.

H. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.

I. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.

J. Organic Matter: The total of organic materials in soil exclusive of un-decayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."

K. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified as specified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

L. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.

M. SSSA: Soil Science Society of America.

N. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

O. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.

P. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil"; but in disturbed areas such as urban environments, the surface soil can be subsoil.

Q. USCC: U.S. Composting Council.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Include recommendations for application and use.
2. Include test data substantiating that products comply with requirements.
3. Include sieve analyses for aggregate materials.
4. Material Certificates: For each type of imported soil and soil amendment and fertilizer before delivery to the site, according to the following:
   a. Manufacturer's qualified testing agency's certified analysis of standard products.
   b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
   c. Analysis of nonstandard materials, by a qualified testing agency, made according to SSSA methods, where applicable.

B. Samples: For each bulk-supplied material, 1-quart volume of each in sealed containers labeled with content, source, and date obtained. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of composition, color, and texture.

1.7 INFORMATION SUBMITTALS

A. Qualification Data: For each testing agency.

B. Preconstruction Test Reports: For preconstruction soil analyses specified in "preconstruction Testing" Article.

C. Field quality-control reports.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent, state-operated, or university-operated laboratory; experienced in soil science, soil testing, and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in types of tests to be performed.
1. Laboratories: Subject to compliance with requirements, provide testing by the following and submit test agency name, address and telephone number.
2. Multiple Laboratories: At Contractor's option, work may be divided among qualified testing laboratories specializing in physical testing, chemical testing, and fertility testing.

1.9 PRECONSTRUCTION TESTING

A. Preconstruction Soil Analyses: For each un-amended soil type, perform testing on soil samples and furnish soil analysis and a written report containing soil-amendment and fertilizer recommendations by a qualified testing agency performing the testing according to "Soil-Sampling Requirements" and "Testing Requirements" articles.
1. Have testing agency identify and label samples and test reports according to sample collection and labeling requirements.

1.10 SOIL -SAMPLING REQUIREMENTS

A. General: Extract soil samples according to requirements in this article.

B. Sample Collection and Labeling: Have samples taken and labeled by Contractor
1. Number and Location of Samples: Minimum of three representative soil samples from top soil stock pile for each soil to be used or amended for landscaping purposes.
2. Division of Samples: Split each sample into two, equal parts. Send half to the testing agency and half to Owner for its records.
3. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.

1.11 TESTING REQUIREMENTS

A. General: Perform tests on soil samples according to requirements in this article.

B. Physical Testing:
1. Soil Texture: Soil-particle, size-distribution analysis by one of the following methods according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods":
   a. Sieving Method: Report sand-gradation percentages for very coarse, coarse, medium, fine, and very fine sand; and fragment-gradation (gravel) percentages for fine, medium, and coarse fragments; according to USDA sand and fragment sizes.
   b. Hydrometer Method: Report percentages of sand, silt, and clay.
2. Total Porosity: Calculate using particle density and bulk density according to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
3. Water Retention: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods."
4. Saturated Hydraulic Conductivity: According to SSSA's "Methods of Soil Analysis - Part 1-Physical and Mineralogical Methods"; at 85% compaction according to ASTM D 698 (Standard Proctor).

C. Chemical Testing:
1. CEC: Analysis by sodium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."
2. Clay Mineralogy: Analysis and estimated percentage of expandable clay minerals using CEC by ammonium saturation at pH 7 according to SSSA's "Methods of Soil Analysis - Part 1- Physical and Mineralogical Methods."
3. Metals Hazardous to Human Health: Test for presence and quantities of RCRA metals including aluminum, arsenic, barium, copper, cadmium, chromium, cobalt, lead, lithium, and vanadium. If RCRA metals are present, include recommendations for corrective action.
4. Phytotoxicity: Test for plant-available concentrations of phytotoxic minerals including aluminum, arsenic, barium, cadmium, chlorides, chromium, cobalt, copper, lead, lithium, mercury, nickel, selenium, silver, sodium, strontium, tin, titanium, vanadium, and zinc.

D. Fertility Testing:
1. Percentage of organic matter.
2. CEC, calcium percent of CEC, and magnesium percent of CEC.
3. Soil reaction (acidity/alkalinity pH value).
4. Buffered acidity or alkalinity.
5. Nitrogen ppm.
6. Phosphorous ppm.
7. Potassium ppm.
8. Manganese ppm.
9. Manganese-availability ppm.
10. Zinc ppm.
11. Zinc availability ppm.
12. Copper ppm.
13. Sodium ppm
14. Soluble-salts ppm.
15. Presence and quantities of problem materials including salts and metals cited in the Standard protocol. If such problem materials are present, provide additional recommendations for corrective action.
16. Other deleterious materials, including their characteristics and content of each.

E. Organic-Matter Content: Organic-Matter Content: Analysis using loss-by-ignition method according to SSSA's "Methods of Soil Analysis - Part 3- Chemical Methods."

F. Recommendations: Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated to produce satisfactory planting soil suitable for healthy, viable plants indicated. Include, at a minimum, recommendations for nitrogen, phosphorous, and potassium fertilization, and for micronutrients.
1. Fertilizers and Soil Amendment Rates: State recommendations in weight per 1000 sq. ft. for 6-inch depth of soil in lawn areas and 12" deep in plant beds.
2. Soil Reaction: State the recommended liming rates for raising pH or sulfur for lowering pH according to the buffered acidity or buffered alkalinity in weight per 1000 sq. ft. for 6-inch depth of soil in lawn areas and 12" deep in plant beds.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with State and Federal laws if applicable.

B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Do not move or handle materials when they are wet or frozen.
4. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

PART 2 - PRODUCTS

2.1 MATERIALS

Regional Materials: Imported soil, manufactured planting soil and soil amendments and fertilizers shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

2.2 PLANTING SOILS SPECIFIED BY COMPOSITION

A. General: Soil amendments, fertilizers, and rates of application specified in this article are guidelines that may need revision based on testing laboratory's recommendations after preconstruction soil analyses are performed.

B. Planting Soil Type for trees and shrubs - sheet L01.09: Existing, on-site surface soil, with the duff layer, if any, retained and stockpiled on-site; modified to produce viable planting soil. Blend existing, on-site surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
1. Ratio of Loose Compost to Soil: 1:4 by volume.
2. Ratio of Loose Peat to Soil: 1:4 by volume.
3. Weight of Lime: per soil report
4. Weight of Sulfur: per soil report
5. Weight of "Drimanure" per manufacturers recommendations
6. Weight of Slow-Release Fertilizer: Shemins 13-13-13 per manufacturers recommendations.

C. Planting-Soil Type for trees and shrubs: Onsite or Imported, naturally formed soil from off-site sources and consisting of loam soil according to USDA textures; and modified to produce viable planting soil.
1. Sources: Take imported, un-amended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep; not from marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants including, but not limited to, quack grass, Johnson grass, poison ivy, nut sedge, nimble will, Canada thistle, bindweed, bent grass, wild garlic, ground ivy, perennial sorrel, and brome grass.
2. Additional Properties of Imported Soil before Amending: Soil reaction of pH 6.0 to 7.5 and minimum of 6 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
3. Unacceptable Properties: Clean soil of the following:
   a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
   b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 2 percent by dry weight of the imported soil.
   c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand exceeding 2 inches any dimension.
4. Amended Soil Composition: Blend imported, un-amended soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
   a. Ratio of Loose Compost to Soil 1:4 by volume.
   b. Ratio of Loose Sphagnum Peat to Soil: 1:4 by volume
   c. Weight of Lime: per soil report
   d. Weight of Sulfur: per soil report
   e. Weight of "Drimanure" - per manufacturers recommendations
   f. Weight of Slow Release Fertilizer: Shemins 13-13-13 per manufacturer's recommendations.

D. Planting-Soil Type for perennials - sheet L01.09: Manufactured soil consisting of manufacturer's basic sandy loam according to USDA textures, blended in a manufacturing facility with sand, stabilized organic soil amendments, and other materials to produce viable planting soil.
1. Additional Properties of Manufacturer's Basic Soil before Amending: Soil reaction of pH 6 to 7.5 and minimum of 6 percent organic-matter content, friable, and with sufficient structure to give good tilth and aeration.
2. Unacceptable Properties: Manufactured soil shall not contain the following:
   a. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
   b. Unsuitable Materials: Stones, roots, plants, sod, clay lumps, and pockets of coarse sand that exceed a combined maximum of 2 percent by dry weight of the manufactured soil.
   c. Large Materials: Stones, clods, roots, clay lumps, and pockets of coarse sand not acceptable.
3. Blend manufacturer's basic soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:
   a. Ratio of Loose Compost/sphagnum peat 50%/50% to Soil: 1:2 by volume.
   b. Volume of Sand: 1:4 by volume
   c. Volume of Loam topsoil: 1:4 by volume
   d. Weight of Lime: per soil report
   e. Weight of Sulfur: per soil report
   f. Weight of "Drimanure" - per manufacturers recommendations
   g. Weight of Slow-Release Fertilizer: Shemins 13-13-13 per manufacturers recommendations

2.3 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
1. Class: T, with a minimum of 99 percent passing through a No. 8 sieve and a minimum of 75 percent passing through a No. 60 sieve.
2. Class: O, with a minimum of 95 percent passing through a No. 8 sieve and a minimum of 55 percent passing through a No. 60 sieve.
3. Form: Provide lime in form of ground dolomitic limestone

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent elemental sulfur, with a minimum of 99 percent passing through a No. 6 sieve and a maximum of 10 percent passing through a No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Sand: Clean, washed, natural or manufactured, free of toxic materials, and according to ASTM C 33/C 33M.

2.4 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter produced by composting feedstock, and bearing USCC's "Seal of Testing Assurance," and as follows:
1. Feedstock: Limited to vegetative material leaves. May not include sewage sludge. May not include animal waste
2. Reaction: pH of 5.5 to 7.5
3. Soluble-Salt Concentration: Less than 4%
4. Moisture Content: 35 to 55 percent by weight.
5. Organic-Matter Content: 50 to 60 percent of dry weight.
6. Particle Size: Minimum of 98 percent passing through a 1-inch sieve.

2.5 FERTILIZERS

A. Commercial Fertilizers:
1. "Drimanure" composted poultry manure
2. Shemins 13-13-13

PART 3 - EXECUTION

3.1 GENERAL

A. Place planting soil and fertilizers according to requirements in other Specification Sections.

B. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil.

C. Proceed with placement only after unsatisfactory conditions have been corrected.

3.2 PREPARATION OF UNAMENDED, ON-SITE SOIL BEFORE AMENDING

A. Excavation: Excavate soil from plant beds to a depth of 12" inches or depth of root balls and stockpile until amended.

B. Unacceptable Materials: Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.

C. Unsuitable Materials: Clean soil to contain a maximum of 2 percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand.

D. Screening: Pass un-amended soil through a 2-inch sieve to remove large materials.

3.3 PLACING AND MIXING PLANTING SOIL OVER EXPOSED SUBGRADE

A. General: Apply and mix un-amended soil with amendments on-site to produce required planting soil. Do not apply materials or till if existing soil or sub grade is frozen, muddy, or excessively wet.

B. Sub grade Preparation: Plant beds-till sub grade to a minimum depth of 4 inches. Remove stones larger than 1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property. Lawn areas -till sub grade to a minimum depth of 4 inches Remove stones larger than 1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
1. Apply, add soil amendments, and mix approximately half the thickness of un-amended soil over prepared, loosened sub grade according to "Mixing" Paragraph below. Mix thoroughly into top 2 inches of sub grade. Spread remainder of planting soil.

C. Mixing: Plant beds - spread amended soil to total depth 12 inches (or as shown on planting details) or depth of root balls but not less than required to meet finish grades after mixing with amendments and natural settlement. Lawn areas - spread amended soil to total depth 4 inches but not less than required to meet finish grades after mixing with amendments and natural settlement. Do not spread if soil or sub grade is frozen, muddy, or excessively wet.

SECTION 329113 - SOIL PREPARATION continued next page

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Project Title:
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GRAND HAVEN TWP. MICHIGAN

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1. Amendments: Apply soil amendments except compost and fertilizer, if required, evenly on surface, and thoroughly blend them with un-amended soil to produce planting soil.
   a. Mix lime or sulfur with dry soil before mixing fertilizer.
   b. Mix fertilizer with planting soil no more than seven days before planting.
2. Lifts: Apply and mix un-amended soil and amendments in lifts not exceeding 6 inches in loose depth for material compacted by hand-operated tampers.

D. Compaction: Compact each blended lift of planting soil to 75 to 82 of maximum Standard Proctor density according to ASTM D 698 and tested in-place.

E. Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.4 PROTECTION

A. Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:
   1. Storage of construction materials, debris, or excavated material.
   2. Parking vehicles or equipment.
   3. Vehicle traffic.
   4. Foot traffic.
   5. Erection of sheds or structures.
   6. Impoundment of water.
   7. Excavation or other digging unless otherwise indicated.

B. If planting soil or sub grade is over compacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the sub grade as directed by Landscape Architect and replace contaminated planting soil with new planting soil.

3.5 CLEANING

A. Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition.

B. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated.
   1. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

END OF SECTION
329113 SOIL PREPARATION

SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Seeding.
   2. Hydroseeding.
   3. Sodding.
   4. Plugging.
   5. Sprigging.
   6. Meadow grasses and wildflowers.
   7. Turf renovation.
   8. Erosion-control material(s).
   9. Grass paving.

B. Related Requirements:
   1. Section 329300 "Plants" for trees, shrubs, ground covers, and other plants as well as border edgings and mow strips.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. ONLY Organic solutions may be implemented.

C. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. Pests include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

D. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" and drawing designations for planting soils.

E. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 PRE-INSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
   1. Certification of each seed mixture for turfgrass/ sod. Include identification of source and name and telephone number of supplier.

C. Product Certificates: For fertilizers, from manufacturer.

D. Pesticides: Product label and manufacturer's application instructions specific to Project - ONLY Organic permitted.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of turf and meadows during a calendar year. Submit before expiration of required maintenance periods.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf and meadow establishment.
   1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
   2. Experience: Five years experience in turf installation in addition to requirements in Section 014000 "Quality Requirements."
   3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   4. Personnel Certifications: Installer's personnel assigned to the Work shall have certification in one of the following categories from the Professional Landcare Network:
      a. Landscape Industry Certified Technician - Exterior.
      b. Landscape Industry Certified Lawncare Manager.
      c. Landscape Industry Certified Lawncare Technician.
   5. Pesticide Applicator: State licensed, commercial.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

C. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
   2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
   3. Accompany each delivery of bulk materials with appropriate certificates.

1.9 FIELD CONDITIONS

A. Planting Restrictions: Seed Lawn - Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion -
   1. Spring Planting: April - June 1
   2. Fall Planting: August 15 - October 15

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

PART **2 - PRODUCTS**

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

B. Seeded Lawn Species:

Irrigated Lawn Seed Mixture proportioned by volume as indicated below:

Seed Type	Proportion	Purity	Germination
Kentucky Bluegrass	50%	90%	75%
Annual Ryegrass	20%	95%	80%
Penn Lawn Fescue	30%	95%	80%

No noxious weed seeds permitted.
Fertilizer for Irrigated Lawn 12-12-12.

Non-Irrigated Lawn Seed Mixture proportioned by volume as indicated below:

Seed Type	Proportion	Purity	Germination
Pennfine Perennial Rye	20%	90%	90%
Kentucky 28# Common Bluegrass	20%	90%	90%
Penn Lawn Fescue	60%	90%	85%

2.2 TURFGRASS SOD

A. Turfgrass Sod: An "approved" nursery grown blend of improved Kentucky Bluegrass varities.

B. Turfgrass Species: Sod containing Common Bermudagrass, Quackgrass, Johnsongrass, Poison ivy, Nutsedge, Nimblewill, Canada Thistle, Timothy, Bentgrass, Wild Garlic, Ground Ivy, Pernnial Sorrel or Bramegrass weeds will not be acceptable.

C. Turfgrass Species: Sod of grass species as follows, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 weed seed:
   1. Provide well rooted, healthy sod, free of diseases, nematodes and soil borne insects. Provide sod uniform in color, leaf texture, density and free of weeds, undesirable grasses, stones, roots, thatch and extraneous material; viable and capable of growth and development when planted.

D. Wildflower Seed: Fresh, clean, and dry new seed, of mixed species as follows:
   1. See plans for seed mix

E. Native-Grass Seed: Fresh, clean, and dry new seed, of mixed species as follows:
   1. See plans for seed mix

F. Seed Carrier: Inert material or clean sharp sand

2.3 FERTILIZERS

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

2.4 MULCHES

A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

D. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

2.5 PESTICIDES

A. General: Organic ONLY - submit manufacturer documentation for approval.

2.6 EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: North American Green S150 or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   3. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
   1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
   2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation."

B. Placing Planting Soil: Place and mix planting soil in place over exposed subgrade
   1. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.

C. Fill cells of erosion-control mat with planting soil and compact before planting.

D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.

E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph.
   1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   2. Do not use wet seed or seed that is moldy or otherwise damaged.
   3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 300 lb/acre

C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:4 with erosion-control fiber mesh installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where indicated on Drawings; install and anchor according to manufacturer's written instructions.

F. Protect seeded areas with slopes not exceeding 1:10 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
   1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

G. Protect seeded areas from hot, dry weather or drying winds by applying straw within 1 hour after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 1/4 inch.

3.6 HYDROSEEDING

A. Hydroseeding: not acceptable

3.7 SODDING

Time limit and option in first paragraph below are requirements of TPI's "Guideline Specifications to Turfgrass Sodding."

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to soil or sod during installation. Tamp and roll lightly to ensure contact with soil, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
   1. Lay sod across slopes exceeding 1:3.
   2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than two anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.8 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
   1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
   2. Install new planting soil as required.
   3. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

C. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

D. Mow, dethatch, core aerate, and rake existing turf.

E. Remove weeds before seeding. Where weeds are extensive, apply organic herbicides as required. Do not use pre-emergence herbicides.

F. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

G. Till stripped, bare, and compacted areas thoroughly to a soil depth of 4 inches.

H. Apply initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades.
   1. Initial Fertilizer: Commercial fertilizer and Slow-release fertilizer applied according to manufacturer's recommendations.

J. Apply seed and protect with straw mulch as required for new turf.

K. Water newly planted areas and keep moist until new turf is established.

SECTION 329200 - TURF AND GRASSES continued next page

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3.9 TURF MAINTENANCE

A. General: Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches
1. An irrigation system will be installed prior to sodding. Locate, protect and maintain the irrigation system during sodding operations. Repair irrigation system components damaged during sodding operations at this Sub-contractor's expense.
2. When lawn reaches 3" in height it shall be cut to 2" in height. Natural areas shall not be cut.
3. The Owner assumes cutting responsibilities following the Acceptance of Installation of the seeded lawn.

3.10 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:
1. Satisfactory Seeded Turf: Establish dense lawn of permanent grasses, free from lumps and depressions. Any area failing to show uniform germination to be reseeded; continue until dense lawn established. Damage to seeded area resulting from erosion to be repaired by Sub Contractor. Scattered bare spots over 5% not allowed. In event Sub Contractor does not establish dense lawn during first germination period, return to project to re-fertilize and reseed to establish dense lawn. Should the seeded lawn become largely weeds after germination, Sub Contractor responsible to kill the weeds and reseed the proposed lawn areas to produce a dense turf, as specified.
2. Satisfactory Sodded Turf: Establish dense lawn, free from lumps and depressions - a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints and bare areas.

B. Use specified materials to reestablish turf that does not comply with requirements, and continue maintenance until turf is satisfactory.

3.11 MEADOW

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph.
1. Before sowing, mix seed with seed carrier at a ratio of not less than two parts seed carrier to one part seed.
2. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
3. Do not use wet seed or seed that is moldy or otherwise damaged.

B. Sow seed at a total rate - see sheet L01.09 Seed Mixes.

C. Brush seed into top 1/16 inch of soil, roll lightly, and water with fine spray.

D. Protect seeded areas from hot, dry weather or drying winds by applying straw within 1 hour after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 1/4 inch.

E. Water newly planted areas and keep moist until meadow is established.

3.12 MEADOW MAINTENANCE

A. Maintain and establish meadow by watering, weeding, mowing, trimming, replanting, and performing other operations as required to establish a healthy, viable meadow. Roll, regrade, and replant bare or eroded areas and remulch. Provide materials and installation the same as those used in the original installation.
1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and meadow damaged or lost in areas of subsidence.
2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
3. 3. Apply treatments as required to keep meadow and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and meadow-watering equipment to convey water from sources and to keep meadow uniformly moist.
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water meadow with fine spray at a minimum rate of 1/2 inch.

3.13 PESTICIDE APPLICATION

A. Apply ORGANIC pesticides and other chemical products and biological control agents according to requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Herbicides (ORGANIC Selective and Nonselective): Apply organic solution only as necessary to treat already-germinated weeds and according to manufacturer's written recommendations.

3.14 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove non-degradable erosion-control measures after grass establishment period.

3.15 MAINTENANCE SERVICE

A. Turf Maintenance Service: The Owner assumes cutting responsibilities following the Acceptance of Installation of the seeded lawn.

B. Meadow Maintenance Service: The Owner assumes maintenance responsibilities following the Acceptance of Installation of the seeded Meadow.

END OF SECTION
329200 TURF AND GRASSES

SECTION 329300 - PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Plants.
2. Tree-watering devices.

B. Related Requirements:
1. Section 329200 "Turf and Grasses" for turf (lawn) and meadow planting, and erosion-control materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with a ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required or as noted on plans; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required or as noted on plans.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than the minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

G. Finish Grade: Elevation of finished surface of planting soil.

H. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. ONLY organic permitted - submit manufacturer documentation.

I. Planting Area: Areas to be planted.

J. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Section 329113 "Soil Preparation" for drawing designations for planting soils.

K. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

L. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

M. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

N. Subgrade: The surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

1.4 COORDINATION

A. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Meeting: Conduct Meeting at Project site.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.
1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Plant Photographs is selection at the source is considered not possible by the Landscape Architect: Include color photographs in digital 3- by 5-inch format of each required species and size of plant material as it will be furnished to Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

B. Samples for Verification: For each of the following:
1. Trees and Shrubs: Provide "specimen" plants with a special height, shape or character of growth. Landscape Subcontractor to tag specimen trees or shrubs at the source of supply. The Landscape Subcontractor shall inspect and select all plant material at source prior to Landscape Architect's approval. Landscape Subcontractor shall accompany Landscape Architect on final selection trip. The Landscape Architect will inspect specimen selections for suitability and adaptability to selected location. When specimen plants cannot be purchased locally, provide sufficient photographs of the proposed specimen plants for approval.
2. Organic / Compost Mulch: 1-pint volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
3. Proprietary Root-Ball-Stabilization Device: One unit.
4. Slow-Release, Tree-Watering Device: One unit of each size required.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:
2. Manufacturer's certified analysis of standard products.
3. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Pesticides and Herbicides: Product label and manufacturer's application instructions specific to Project - ONLY organic permitted.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before expiration of required maintenance periods.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of plants.
1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience - Five years' experience in landscape installation.
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
   a. Landscape Industry Certified Technician - Exterior.
   b. Landscape Industry Certified Horticultural Technician.
5. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.
1. Selection of plants purchased under allowances is made by Architect, who tags plants at their place of growth before they are prepared for transplanting.

C. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.
1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches (150 mm) above the root flare for trees up to 4-inch (100-mm) caliper size, and 12 inches (300 mm) above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

D. Plant Material Observation: Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
1. Notify Architect of sources of planting materials seven days in advance of delivery to site.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws if applicable.

B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk materials with appropriate certificates.

C. Deliver bare-root stock plants within 24 hours of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.

G. Apply anti-desiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

H. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

I. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
1. Heel-in bare-root stock. Soak roots that are in less than moist condition in water for two hours. Reject plants with dry roots.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly wet condition.

1.11 FIELD CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion. Evergreen material: Plant evergreen materials between September 1 and October 15 or in spring before new growth begins. If project requirements require planting at other times, plants shall be sprayed with anti-desiccant prior to planting operations. Deciduous material: Plant deciduous materials in a dormant condition. If deciduous trees are planted in leaf, they shall be sprayed with anti-desiccant prior to planting operation.

C. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

A. ACCEPTANCE OF INSTALLATION.
1. At the completion of all landscape installation, or pre-approved portions thereof, the Landscape Subcontractor shall request in writing an inspection for Acceptance of Installation in which the Landscape Subcontractor, Landscape Architect, and General Contractor's Representative shall be present. After this inspection a punch list will be issued by the Landscape Architect. Upon completion of all punch list items, the Landscape Architect and/or General Contractor's Representative shall re-inspect the project and issue a written statement of Acceptance of Installation and establish the beginning of the Project Warranty Period. At the time of acceptance all plant material shall be vigorous health.

2. It is the responsibility of the Landscape Subcontractor to make the above written request for inspection of installation in a timely fashion. If there is plant material loss prior to the Landscape Subcontractor's written request for inspection of installation, the Landscape Contractor shall make all replacements of this dead material at no additional cost. These replacements are not considered to be the required one (1) replacement of dead plant material by the Landscape Subcontractor during the one (1) year project warranty period, as outlined below.

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GRAND HAVEN

GRAND HAVEN TWP. MICHIGAN

Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
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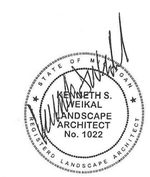
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV. PER TWP PC MEETING



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CAD Drawing File:

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SPECIFICATIONS

Sheet Number: L-603

3. Landscape work may be inspected for acceptance in parts agreeable to General Contractor's Representative and Landscape Architect provided work offered for inspection is complete, including maintenance as required
4. For work to be inspected for partial acceptance, the Landscape Subcontractor shall provide a drawing outlining work completed and supply a written statement requesting acceptance of this work completed to date

B. PROJECT WARRANTY
1. The Project Warranty Period begins upon written Acceptance of the Project Installation by Landscape Architect and General Contractor's Representative.
2. The Landscape Subcontractor shall guarantee trees, shrubs, ground cover beds and seeded or sodded areas through construction and for a period of one (1) year after date of Acceptance of Installation against defects including death and unsatisfactory growth, except for defects resulting from neglect, abuse or damage by others or unusual phenomena or incidents which are beyond Landscape Subcontractor's control.

C. MAINTENANCE DURING ONE (1) YEAR PROJECT WARRANTY
1. To insure guarantee standards, the following maintenance procedures for trees, shrubs, and ground covers shall be executed during construction and for the full Project Warranty Period.

a. Landscape Subcontractor shall be responsible for only one (1) replacement of any plant materials during the one (1) year Project Warranty Period. These include those which are dead or in the opinion of the Landscape Architect are in an unhealthy or unsightly condition, or having lost natural shape, resulting from dieback, excessive pruning or inadequate or improper maintenance as part of the guarantee. Prior to any replacements, Landscape Subcontractor shall review individual plants in question with Landscape Architect to determine reason for plant demise.

b. The Landscape Subcontractor shall guarantee trees, shrubs, ground cover beds and seeded or sodded areas through construction and for a period of one (1) year after date of Acceptance of Installation against defects including death and unsatisfactory growth, except for defects resulting from neglect, abuse or damage by others or unusual phenomena or incidents which are beyond Landscape Subcontractor's control.

c. Costs for replacements are assumed part of bid quotations and therefore will not result in an additional cost to General Contractor or Landscape Architect.

d. Areas damaged as a result of replacement operation are to be restored by Landscape Subcontractor at no cost to the General Contractor or Landscape Architect.

e. The Landscape Subcontractor shall be responsible for watering all plantings in non-irrigated areas through the warranty period. Landscape contractor responsible to monitoring the irrigation system. Landscape Subcontractor shall keep guy straps taut, raise tree balls which settle, furnish and apply sprays as necessary to keep the plantings free of disease and insects until the end of the warranty period.

f. Remove and replace trees, shrubs or other plants found to be dead or in unhealthy condition. Remove rejected plants and materials promptly. Make replacements during the following normal planting schedule. Replace trees and shrubs which are in doubt, unless, in opinion of Landscape Architect it is advisable to extend Project Warranty Period for full growing season. Remove all stakes, guy straps, tree wrap paper, dead twigs and branches from tree and plant materials at the end of this warranty period. Repair all lawns or bed areas disturbed by plant replacement operations.

g. Landscape contractor responsible to keep all beds weed free during the one (1) year project warranty.

h. The Landscape contractor shall apply anti-desiccants on evergreen trees and evergreen shrub beds within 150' of major streets and drives no later than December 1, during the one (1) year project warranty.

D. MAINTENANCE OF SEEDED LAWN AREAS
1. The Landscape Subcontractor shall maintain seeded lawn areas including watering, fertilizing, weeding, and chemical applications until establish a dense lawn of permanent grasses, free from lumps and depressions or any bare spots, none of which is larger than one (1) foot of area up to a maximum of 3% of the total seeded lawn area. Any part of the seeded lawn that fails to show a uniform growth and/or germination shall be reseeded until a dense cover is established, regardless of what season the seed was installed.
2. Where shown on drawings, the Landscape Subcontractor shall cut of the lawn until Acceptance of Installation is granted. When lawn reaches 3" in height it shall be cut to 2" in height. Natural areas shall not be cut.
3. The Owner assumes cutting responsibilities following the Acceptance of Installation of the seeded lawn.
4. At conclusion of Project Warranty Period and after receiving Written Final Acceptance by General Contractor's representative and Landscape Architect, the Owner shall assume all seeded lawn maintenance responsibilities.

A. MAINTENANCE OF SODDED LAWN AREAS
1. Maintain sodded lawn areas, including watering, fertilizing, spot weeding, application of organic solutions (herbicides, fungicides, insecticides) and re-sodding until a full, uniform, smooth stand of sod is knitted to topsoil, and accepted by the Landscape Architect or his representative.
2. Water sod thoroughly, as required to establish proper rooting.
3. Repair, rework, and resod all areas that have washed out or are eroded. Replace undesirable or dead areas with new sod. Remove stakes on slopes sod areas.
4. Mow lawn areas as soon as sod has rooted sufficiently and knitted to the topsoil. Cut back to 2" height. Not more than 40% of grass leaf shall be removed at any single mowing. Excess clipping to be removed by the Landscape Subcontractor. Subcontractor is responsible for all mowing until Acceptance of Installation is granted.
5. The Owner assumes mowing responsibilities following the Acceptance of Installation of the sodded lawn.
6. At conclusion of Project Warranty Period and after receiving Written Final Acceptance by General Contractor's representative and Landscape Architect, the Owner shall assume all sodded lawn maintenance responsibilities

F. FINAL ACCEPTANCE UPON CONCLUSION OF THE WARRANTY PERIOD
1. At the conclusion of the Project Warranty Period, the contractor shall prune all dead twigs and branches from the plant material, an remove all support straps and stakes, and rake mulch area smooth.
2. At the conclusion of the Project Warranty Period the Landscape Subcontractor shall request a project inspection for final acceptance in which the Landscape Contractor, Landscape Architect and Owner's Representative shall be present. After this inspection, a punch list will be issued by the Landscape Architect. Upon completion of all punch list items, the Landscape Architect and the Owner's Representative shall re-inspect the project and issue a Written Statement of Final Acceptance.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots are unacceptable.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant.

E. If formal arrangements or consecutive order of plants is indicated on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals, Biennials and Perennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

2.2 FERTILIZERS

A. See soil preparation.

2.3 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
1. Type: Double Shredded hardwood
2. Color: Natural.

B. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through a 1-inch (25-mm) sieve; soluble-salt content of 2 to 5 dS/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
1. Organic Matter Content: 50 to 60 < percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

2.4 PESTICIDES

A. General: Organic only - submit manufacturer documentation.

2.5 TREE-STABILIZATION MATERIALS

A. Trunk-Stabilization Materials:
1. Upright and Guy Stakes: Rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.
2. Guying/Staking strap - 3/4" Arbortie nylon strap (NO WIRE AND HOSE PERMITTED)

2.6 TREE-WATERING DEVICES

A. Watering Pipe: PVC pipe 4 inches (100 mm) in diameter, site-cut to length as required, and with snug-fitting removable cap.

B. Slow-Release Watering Device - non irrigated areas: Standard product manufactured for drip irrigation of plants and emptying its water contents over an extended time period two hours, two weeks manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.
1. Products: Subject to compliance with requirements, provide the following:
a. Gator Bags
2. Color: green

2.7 MISCELLANEOUS PRODUCTS

A. Anti-desiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

B. Burlap: Non-synthetic, biodegradable.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants, with Installer present, for compliance with requirements and conditions affecting installation and performance of the Work.
1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Verify that plants and vehicles loaded with plants can travel to planting locations with adequate overhead clearance.
3. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable or which is dusty.

B. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

3.3 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement and mix planting soil according to Section 329113 "Soil Preparation."

B. Placing Planting Soil: Place and mix planting soil in-place over exposed sub-grade

C. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.
1. Excavate planting pits with sides sloping inward at a 60-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
2. Excavate approximately three times as wide as ball diameter for and potted stock.
3. Excavate - see planting details.
4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
5. Maintain angles of repose of adjacent materials to ensure stability. Do not excavate sub-grades of adjacent paving, structures, hardscapes, or other new or existing improvements.
6. Maintain supervision of excavations during working hours.
7. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
8. If drain tile is indicated on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Backfill Soil: topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

C. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

D. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Balled and Burlapped Stock: Set each plant plumb and in center of planting pit or trench with root flare 2 inches (50 mm) above adjacent finish grades.
1. Backfill: Place planting soil mix according to Section 329113 "Soil Preparation."
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Balled and Potted and Container-Grown Stock: Set each plant plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
1. Backfill: Place planting soil mix according to Section 329113 "Soil Preparation."
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

3.6 MECHANIZED TREE-SPADE PLANTING

A. Not to be used.

3.7 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.

C. Do not apply pruning paint to wounds.

3.8 TREE STABILIZATION

A. Trunk Stabilization by Upright Staking and Tying: Install trunk stabilization as follows unless otherwise indicated:
1. See planting details.

B. Trunk Stabilization by Staking and Guying: Install trunk stabilization as follows unless otherwise indicated on Drawings
1. See planting details.

3.9 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines per drawings in irregular mass patterns

B. Place planting soil mix according to Section 329113 "Soil Preparation."

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that minimally disturbs the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.10 PLANTING AREA MULCHING

A. Completely cover area to be mulched, with double shredded bark mulch - see typical planting details for depths.

3.11 INSTALLING SLOW-RELEASE WATERING DEVICE - NON IRRIGATED AREAS

A. Provide one device for each tree.

B. Place device on top of the mulch at base of tree stem and fill with water according to manufacturer's written instructions.

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Sheet Number: L-604

3.12 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.13 PESTICIDE APPLICATION

A. Apply organic pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations only with approval from the Landscape Architect

B. Pre-Emergent Herbicides (Selective and Nonselective): Not to be used.

C. Post-Emergent Herbicides (Selective and Nonselective): Organic only, to be used.

3.14 REPAIR AND REPLACEMENT

A. General: Repair or replace existing or new trees and other plants that are damaged by construction operations, in a manner approved by Architect.
1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours, if approved.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Remove and replace trees that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.
1. Provide new trees of same size as those being replaced for each tree

3.15 CLEANING AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

C. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. During installation remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

E. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.16 MAINTENANCE SERVICE

A. See Warranty section above.
1. Warranty Period: 12 months from date of Acceptance of Installation

END OF SECTION
329300 PLANTS

SECTION 328400 - PLANTING IRRIGATION

USE THIS SPECIFICATION AS GUIDELINE FOR IRRIGATION SYSTEM - SUBMIT IRRIGATION SHOP DRAWINGS FOR REVIEW

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to the Bidding and Contract Requirements and General and Supplemental Requirements, which are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, materials, supplies, equipment, tools, and transportation, and perform all operations in connection with and reasonably incidental to the complete installation of the irrigation system, and guarantee/warranty as shown on the drawings, the installation details, and as specified herein. The system shall be constructed to grades and conform to areas and locations as shown on the drawings. Removal and or restoration of existing improvements, excavation and back-fill, and all other work in accordance with plans and specifications are required.

B. Extent of irrigation system work is shown on drawings and by provisions of this section.

C. Sprinkler lines shown on the drawing are essentially diagrammatic. Spacing of the sprinkler heads or quick coupling valves are shown on the drawing and shall be exceeded only with the permission of the Owner's authorized representative.

D. Items of work specifically included are:
1. Procurement of all applicable licenses, permits and fees.
2. Coordination of all utilities.
3. Connection of electrical power supply to the irrigation control system.
4. Connection of water source/supply to the irrigation system.
5. Maintenance period.
6. Sleeving for irrigation pipe and wire.
7. Providing project record (as-built plans) to ownership

1.3 RELATED WORK

A. Division 32- Exterior Improvements
1. Section 329113 Soil Preparation
2. Section 329200 Turf and Grasses
3. Section 329300 Plants

1.4 QUALITY ASSURANCE

A. The "Contractor" shall maintain continuously a competent superintendent, satisfactory to the Owner, with authority to act for him in all matters pertaining to the work.

B. The "Contractor" shall coordinate his work with the other trades.

C. The "Contractor" shall confine his operations to the area to be improved and to the areas allotted him by the Owner's representative for material and equipment storage.

D. The 'Contractor" shall have a minimum of 5 years experience installing irrigation systems of comparable size and complexity.

1.5 SUBMITTALS

A. Submit samples under provisions of Section 01300-Submittals.

B. Materials List: Include backflow device, valves, valve boxes, sprinklers, controller, rain sensors, wire, wire connectors, pipe, fittings and clamps to be used on the project prior to purchasing materials. Quantities of material need not be included.

C. Manufacturer's Data: Submit manufacturer's catalog cuts, specifications, and operating instructions for equipment shown on the materials list.

D. Shop Drawings: Upon irrigation system acceptance, submit written operating and maintenance instructions. Provide format and contents as directed by the Landscape Architect. Include instruction sheets and parts lists for all operating equipment.

E. Project Record (As-Built) Drawings
1. Submit record drawings under provisions of Section 017000 - "Contractor" Closeout, Record Documents.
2. Record pipe and wiring network alterations. Record work that is installed differently than shown on the construction drawings. Record which valve operates which area by "clouding" or encircling the area and placing the correct valve number and controller identification nearby. Record accurate reference dimensions, measured from at least two permanent reference points, of each irrigation system valve, each controller or control unit, each sleeve end, each stub-out for future pipe or wiring connections, and other irrigation components enclosed within a valve box. Place all dimensions and notes on the same page as the drawing. Use arrows and legends when needed.
3. Before construction completion, obtain from the engineer/landscape architect/owner's representative an AutoCAD file copy of the drawings. Using AutoCAD, duplicate information contained on the project drawings maintained on site. Label each sheet "Record Drawings". Completion of the record drawings will be a prerequisite for the review at the completion of the irrigation system installation.

1.6 RULES AND REGULATIONS

A. Work and materials shall be in accordance with the latest edition of the National Electric Code, the Uniform Plumbing Code as published by the Western Plumbing Officials Association, and applicable laws and regulations of the governing authorities.

B. When the When the contract documents call for materials or construction of a better quality or larger size than required by the above-mentioned rules and regulations, provide the quality and size required by the contract documents.

C. If quantities are provided either in these specifications or on the drawings, these quantities are provided for information only. It is the "Contractor's" responsibility to determine the actual quantities of all material, equipment, and supplies required by the project and to complete an independent estimate of quantities and wastage

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver irrigation system components in manufacturer's original undamaged and unopened containers with labels intact and legible.

B. Deliver plastic piping in bundles, packaged to provide adequate protection of pipe ends either threaded or plain.

C. Store and handle materials to prevent damage and deterioration.

D. Provide secure, locked storage for valves, sprinkler heads and similar components that cannot be immediately replaced, to prevent installation delays.

1.8 CODES AND STANDARDS

A. The entire installation shall fully comply with all local and state laws and ordinances and with all established codes applicable thereto.

B. Any permits for the installation or construction of the work included under this contract which are required by any of the legally constituted authorities having jurisdiction, shall be obtained and paid for by the "Contractor", each at the proper time. He shall also arrange for and pay all costs concerning any inspections and examinations required by these authorities.

C. In all cases where inspection of the sprinkler system work is required and/or where portions of the work are specified to be performed under the direction and/or inspection of the Owner's authorized representative, the "Contractor" shall notify the Owner's authorized representative at least 24 hours in advance of the time and such inspection and/or direction is required.

D. Any necessary re-excavation or alterations to the system needed because of failure of the "Contractor" to have the required inspections shall be performed at the "Contractor's" own expense.

1.9 TESTING

A. Notify he engineer/landscape architect / owner's representative three days in advance of testing.

B. Pipelines jointed with rubber gaskets or threaded connections may be subjected to a pressure test at any time after partial completion of backfill. Pipelines jointed with solvent-welded PVC joints shall be allowed to cure at least 24 hours before testing.

C. Subsections of mainline pipe may be tested independently, subject to the review of the engineer/landscape architect/owner's representative.

D. Furnish clean, clear water, pumps, labor, fittings, and equipment necessary to conduct tests or retests.

E. Volumetric Leakage Test:
1. Cap riser of mainline components for volumetric pressure tests. Backfill to prevent pipe from moving under pressure. Expose coupling and fitting.
2. Purge all air from the pipeline before test.
3. Subject mainline pipe to the anticipated operating pressure of 100 PSI for two hours. Maintain constant pressure. The amount of additional water pumped in during the test shall not exceed 1.24 gallon per 100 joints of 3-inch diameter pipe and 1.6 gallons per 100 joint of 4-inch diameter pipe. Replace defective pipe, fitting, joint, valve, or appurtenance. Repeat the test until the pipe passes test.
4. Cement or caulking to seal leaks is prohibited.

F. Operational Test:
1. Activate each remote control valve in sequence from controller. The engineer/landscape architect/owner's representative will visually observe operation, water application patterns, and leakage.
2. Replace defective remote control valve, solenoid, wiring, or appurtenance to correct operational deficiencies.
3. Replace, adjust, or move water emission devices to correct operational or coverage deficiencies.
4. Replace defective pipe, fitting, joint, valve, sprinkler, or appurtenance to correct leakage problems. Cement or caulking to seal leaks is prohibited.
5. Repeat test(s) until each zone passes all tests.
6. Repeat tests, replace components, and correct deficiencies at no additional cost to the owner.

1.10 CONSTRUCTION REVIEW

A. The purpose of on-site reviews by the engineer/landscape architect/owner's representative is to periodically observe the work in progress, the "Contractor's" interpretation of the construction documents, and to address questions with regard to the installation.

B. Scheduled reviews such as those for irrigation system layout or testing must be scheduled with the engineer/landscape architect's/owner's representative as required by these specifications.

C. Impromptu reviews may occur at any time during the project.

D. A review will occur at the completion of the irrigation system installation and project record (as-built) drawing submittal.

1.11 GUARANTEE/WARRANTY AND REPLACEMENT

A. It shall be the "Contractor's" responsibility to ensure and guarantee satisfactory operation of the entire system and the workmanship and restoration of the area. The entire system shall be guaranteed to be complete and perfect in every detail for a period of one year from the date of its final acceptance and he hereby agrees to repair or replace any such defects occurring within that year, free of expense to the Owner. If final acceptance is not given the "contractor" will continue to be responsible for and maintain the irrigation system until acceptance is granted.

B. Minor maintenance and adjustment shall be by the Owner.

C. For a period of one year from commencement of the formal maintenance period, fill and repair depressions or settling more than one-quarter (¼"). Restore landscape or structural features damaged by the settlement of irrigation trenches or excavation. Repair damage to the premises caused by a defective item.

D. Make repairs within seven (7) days of notification from the engineer/landscape architect/owner's representative.

E. Contract documents govern replacements identically as with new work. Make replacements at no additional cost to the contract price.

F. Guarantee/ warranty applies to originally installed materials, equipment, and replacements made during the guarantee/warranty period.

1.12 WINTERIZATION AND SPRING START-UP

A. Coordinate the winterization and start-up with the landscape maintenance personal.

B. "Contractor" shall winterize the system each year as part of this contract throughout the warranty period and until final acceptance is granted. "Contractor" will provide written instructions to the Owner for future service and maintenance.

C. Return to the site during the subsequent spring season and demonstrate to the Owner the proper procedures for the system start-up, operation and maintenance. Repair any damage caused in improper winterization at no additional cost to the owner.

D. After completion, testing and acceptance of the system, the "Contractor" will instruct the Owner's personnel in the operation and maintenance of the system.

PART 2 - MATERIALS

2.1 GENERAL

A. Use materials that are new and without flaws or defects of any type, and which are the best of their class and kind. All material overages at the completion of the installation are the property of the "Contractor" and are to be removed from the site.

2.2 SUBSTITUTIONS

A. The Contractor shall use materials as specified. Material other than specified will be permitted only after written application by the "Contractor" and written approval by the Landscape Architect. Substitutions will only be allowed when in the best interest of the Owner.

2.3 SLEEVING

A. Install separate sleeve beneath paved areas to route each run of irrigation pipe or wiring bundle.
1. Sleeving material beneath pedestrian pavements shall be PVC Class 160 pipe with solvent welded joints.
2. Sleeving beneath drives and streets shall be PVC Class 160 pipe with solvent welded joints.
3. Sleeving diameter: equal to twice that of the pipe or wiring bundle.

2.4 PIPE AND FITTINGS

A. Mainline Pipe and Fittings:
1. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting the requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with an integral belled end.
2. Use Class 160, SDR-26, rated at 160 PSI, conforming to the dimensions and tolerances established by ASTM Standard D2241. Use PVC pipe rated at higher pressures than Class 160 in the case of small nominal diameters that are not manufactured in Class 160.
3. Use rubber-gasketed pipe equipped with Reiber Gasket System for mainline pipe with a nominal diameter greater than 3-inches. Use rubber-gasketed deep bell ductile iron fitting conforming to ASTM A-536 and ASTM F-477. Use lubricant approved by the pipe manufacturer. Size slip fitting socket taper to permit a dry unsoftened pipe end to be inserted no more than halfway into the socket. Saddle and cross fittings are not permitted. Use male adapters for plastic to metal connections. Hand Tighten male adapters plus one turn with a strap wrench.
4. Use solvent weld pipe for mainline pipe with a nominal diameter less than or equal to 3-inches or where a pipe connection occurs in a sleeve. Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standard D2466 and D1784. Use primer approved by the pipe manufacturer. Solvent cement to conform to ASTM Standard D2564.
5. Provide pipe homogeneous throughout and free from visible cracks, holes, foreign materials, blisters wrinkles and dents.
6. Provide pipe continuously and permanently marked with manufacturer's name or trademark, size schedule and type of pipe working pressure at 73 degrees F. and (NSF) approval.
7. Pipe sizes referenced in the construction documents are minimum sizes, and may be increased at the option of the "Contractor".
8. All pipes damaged or rejected because of defects shall be removed from the site at the time of said rejection.

B. Lateral Pipe and Fittings
1. All sprinkler laterals pipe downstream from the zone valves, sized 2" and smaller shall be flexible non-toxic polyethylene (PE) pipe. Use SDR-11.5, PE23, rated at PSI that is National Sanitation Foundation (NSF) approved, conforming to ASTM Standard D2239. Use Type 1, PVC insert fitting conforming to ASTM Standard D2609 designed for use with flexible polyethylene (PE) pipe. Use stainless steel worm gear clamps (including stainless steel screw) to join pipe and fittings. Pipe larger than 2" shall be rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting the requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with an integral belled end suitable for solvent welding.
2. Use Class 160, SDR-26, rated at 160 PSI, conforming to the dimensions and tolerances established by ASTM Standard D2241. Use solvent weld pipe for lateral pipe. Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standards D2466 and D1784 for PVC pipe. Use primer approved by the pipe manufacturer and purple in color. Solvent cement to conform to ASTM Standard D2564, of a type approved by the pipe manufacturer appropriate to weather conditions.
3. For drip irrigation laterals downstream of zone control valves, use UV radiation resistant polyethylene pipe manufactured from prime Union Carbide or a Union Carbide licensee with a minimum of 2% carbon black. Use PVC/compression line fittings compatible with the drip lateral pipe. Use tubing stakes or landscape fabric staples to hold aboveground pipe in place.

C. Specialized Pipe and Fittings:
1. All above grade pipe shall be copper pipe: Use Type "M" rigid conforming to ASTM Standard B88. Use wrought copper or cast bronze fitting, soldered or threaded per the installation details. Use 95% tin and 5% antimony solder.
2. Galvanized steel pipe: Use Schedule 40 conforming to ASTM Standard A120. Use galvanized, threaded, standard weight malleable iron fittings.
3. Ductile iron pipe: Use Class 50 conforming to ANSI A21.51. Use a minimum of Class 53 thickness pipe for flanged piping. Use mechanical joints conforming to ANSI A21.10 and ANSI A21.11 (AWWA C111) or flanged fittings conforming to ANSI/AWWA C110 and ANSI B16.1 (125#).
4. Use a dielectric union wherever a copper-based metal (copper, brass, and bronze) is joined to an iron-based metal (iron, galvanized steel, and stainless steel).
5. Low- Density Polyethylene Hose:
   a. Use pipe specifically intended for use as a flexible swing joint.
      Inside diameter: 0.490 ± 0.010 inch.
      Wall thickness: 0.100 ± 0.010 inch.
      Color: Black
   b. Use spiral barb fittings supplied by the same manufacturer as the hose.
6. Assemblies calling for threaded pipe connections shall use PVC Schedule 80 nipples and PVC Schedule 40 threaded fittings.
7. Joint sealant: Use only Teflon-type tape or Teflon-based paste pipe joint sealant on plastic threads. Use non-hardening, nontoxic pipe joint sealant formulated for use on water-carrying pipes on metal threaded connections.

D. Thrust Blocks:
1. Use thrust blocks for fitting on pipe greater than or equal to 3-inch diameter or any diameter rubber gasket pipe.
2. Use 3,000 PSI concrete.
3. Use 2-mil plastic.
4. Use No. 4 re-bars wrapped or painted with asphalt tar based mastic coating.

2.5 MAINLINE COMPONENTS

A. Main System Shutoff Valve: per local practice and in compliance with local code.

B. Winterization Assembly: per local practice and in compliance with the local code.

SECTION 328400 - PLANTING IRRIGATION continued next page

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Date:	Issued for:
11-11-16	PRE-APPLICATION SUBMITTAL
02-03-17	FINAL SITE PLAN APPROVAL
04-13-17	REVISED SITE PLAN SUBMITTAL
06-16-17	HFES PRELIMINARY
06-29-17	REVISED SITE PLAN SUBMITTAL
07-31-17	REV. PER TWP PC MEETING

STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:
Checked: Approved:

CAD Drawing File:
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Project Number: 216212.00

Sheet Title:
SPECIFICATIONS

Sheet Number: L-605

C. Backflow Prevention Assembly: as presented in the installation details.

D. Isolation Gate Valve Assembly: as presented in the installation details. Install a separate valve box over a 3-inch depth of ¾-inch gravel for each assembly.

E. Quick Coupling Valve Assembly: double swing joint arrangements as presented in the installation details.

2.6 SPRINKLER AND BUBBLER IRRIGATION COMPONENTS

A. Remote Control Valve (RCV) Assembly for Sprinkler and Bubbler Laterals: as presented in the installation details. Use 3M DBY wire connectors to join control wires to solenoid valves. Install a separate valve box over a 3" depth of ¾" gravel for each assembly.

B. Sprinkler Assembly: as presented in the drawings and installation details. When required use the sprinkler manufacturer's pressure compensating screens (ex. Rain Bird PCS) to achieve 30 PSI operating conditions on each sprinkler and to control excessive operating pressures.

C. Bubbler Assembly: as presented in the drawings and installation details.

2.7 CONTROL SYSTEM COMPONENTS

A. Irrigation Controller Unit:
1. As presented in the drawing and installation details.
2. Lighting protection: Provide 8-foot copper-clad grounding rod at controller location (when specified).
3. Wire markers: Pre-numbered or labeled with indelible non-fading ink, made of permanent, non-fading material.

B. Control Wire:
1. Use American Wire Gage (AWG) No. 14 solid copper, Type UF or PE cable, UL approved for direct underground burial from the controller unit to each remote valve.
2. Color: Use white for common ground wire. Use red colors for control wires. Spare control wires shall be marked or labeled different from that of the active control wire. Wire color shall be continuous over its entire length.
3. Splices: Use 3M DBY-R wire connector with waterproof sealant. Wire connector to be of plastic construction.

C. Instrumentation:
1. As presented in the drawing and installation details.
2. When required provide, install and test an anemometer for irrigation shutdowns at user-present wind velocity thresholds, soil moisture monitoring to override irrigation in the event of high soil moisture levels, and a temperature sensor to prevent irrigation when temperatures drop below a user-preset threshold.
3. Provide a rain sensor to prevent irrigation during or immediately after rainfall events.

D. Power Wire:
1. Electric wire from the power source to satellite control unit shall be solid or stranded copper, Type UF single-conductor cable, UL approved for direct underground burial. Power wires shall be black, white, and green in color. Size as presented in the drawings. The "Contractor" is responsible for verifying that the power wire sizes shown on the drawings are compatible and adequate for the control system being used.
2. Splices: Use 3M DBY-R connectors'
3. Conduit: PVC Schedule 40.

2.8 OTHER COMPONENTS

A. Tools and Spare Parts: Provide operating keys, servicing tools, test equipment, spare parts, and other items indicated in the general notes of the drawings.

B. Other Materials: Provide imported fill material as required to complete this work. Provide other materials or equipment shown on the drawings or installation details, which are part of the irrigation system, although such items may not have been referenced in these specifications.

PART 3 - EXECUTION

3.1 INSPECTION AND REVIEWS

A. Site Inspections:
1. The bidder acknowledges that he has examined the site, plans and specifications, and the submission of a proposal shall be considered evidence that examination has been made.
2. Verify construction site conditions and note irregularities affecting work of this section. It shall be the contracting installer's responsibility to report to the Owner's authorized representative any deviations between drawings, specifications and the site.
   Failure to do so before the installing of equipment and resulting in replacing and/or relocation of equipment shall be done at the "Contractor's" expense.
3. Examine final grades and installation conditions. Do not start irrigation system work until unsatisfactory conditions are corrected.
4. Beginning work of this section implies acceptance of existing conditions.

B. Utility Locations:
1. The exact location of all existing utilities and structures and underground utilities are not indicated on the drawings; their locations shall be determined by the "Contractor", and he shall conduct his work so as to prevent interruption of service or damage to them.
2. Arrange for and coordinate with local authorities the location of all underground utilities.
3. Repair any underground utilities damaged during construction. Make repairs at no additional cost above the contract price.
4. The "Contractor" shall protect existing structures and utility services and be responsible for their replacement if damaged by him.
5. The "Contractor" shall be responsible to verify onsite water pressure when applicable prior to construction. The "Contactor" is responsible to remedy any water pressure discrepancy discovered at their expense if the discrepancy is not reported prior to construction.

C. Irrigation System Layout Review:
1. Irrigation system layout review will occur after the staking has been completed unless specifically waived by the Landscape Architect. Notify the engineer/landscape architect/ owner's representative one-week in advance of review.
2. The engineer/landscape architect/owner's representative at this review will identify modifications.

3.2 LAYOUT OF WORK

A. Stake out the irrigation system. Items staked include: sprinklers, pipe, control valves, manual drains, quick coupling valves, backflow preventer, controller, and isolation valves.

B. Install all mainline pipe and mainline components inside of project property lines.

C. Minor adjustments in system layout will be permitted to clear existing fixed obstructions. Final system layout shall be acceptable to the Landscape Architect.

3.3 EXCAVATION, TRENCHING, AND BACKFILLING

A. Excavating shall be considered unclassified and shall include all materials encountered, except materials that cannot be excavated by normal mechanical means.

B. Excavate to permit the pipes to be laid at the intended elevations and to permit work space for installing connections and fittings.

C. Minimum cover (distance from top of pipe or control wire to finish grade):
1. 14-inch over mainline pipe and over electrical conduit.
2. 6-inch over control wire.
3. 10-inch over lateral pipe to sprinklers and bubblers and over manifold pipe to drip system zone control valves.
4. 8-inch over drip in turf or paved areas downstream of drip system zone control valves.
5. 3-inch minimum mulch cover over drip lateral pipe in planting beds downstream of drip system zone control valves.
6. PVC UV radiation-resistant lateral pipe shall be installed directly on the soils surface.

D. PVC or PE lateral pipes may be pulled into the soil using a vibratory plow device specifically manufactured for pipe pulling. Minimum burial depths equals minimum cover listed above provided soil moisture content and other conditions are suitable to allow for full depth of bury with a minimum of stretching and scraping of the pipe. Landscape Architect reserves the right to determine suitability or conditions.

E. Backfill only after lines have been reviewed and tested.

F. Excavated material is generally satisfactory for backfill. Backfill shall be free from rubbish, vegetable matter, and stones larger than 2 inches in maximum dimension. Remove material not suitable for backfill. Backfill placed next to pipe shall be free of sharp objects, which may damage the pipe.

G. Backfill unsleeved pipe by depositing the backfill material equally on both sides of the pipe in 6-inch layers and compacting each layer to 90% Standard Proctor Density, ASTM D698-78. Use of water for compaction, "puddling," will not be permitted.

H. Enclose pipe and wiring beneath roadways, walks, curbs, etc., in sleeves. Minimum compaction of backfill for sleeves shall be 95% Standard Proctor Density, ASTM D698-78. Use of water for compaction, "puddling", will not be permitted.

I. Dress backfilled areas to original grade. Incorporate excess backfill into existing site grades.

J. Where utilities conflict with irrigation trenching and pipe work, contact the engineer / landscape architect / owner's representative for trench depth adjustments.

K. Provide approved fine grained earth fill or sand to point 4" above the top of pipe, where soil conditions are rocky or otherwise objectionable.

L. Excavate trenches and install piping and backfill during the same working day. Do not leave open trenches or partially filled trenches open overnight.

3.4 SLEEVING AND BORING

A. Install sleeving at a depth that permits the encased pipe or wiring to remain at the specified burial depth.

B. Extend sleeve ends six inches beyond the edge of the paved surface. Cover pipe ends and mark with stakes. Mark concrete with a chiseled "X" at sleeve end and locations.

C. Bore for sleeves under obstructions that cannot be removed. Employ equipment and methods designed for horizontal boring.

3.5 ASSEMBLING PIPE AND FITTING

A. General:
1. Keep pipe free from dirt and pipe scale. Cut pipe ends square and debur. Clean pipe ends.
2. Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.
3. All mainline and continuously pressurized pipe is to be installed using open trenches. Lateral pipe may be installed "Plowing" if soil conditions permit, and soils do not contain gravel, rock, construction debris, or other potential damaging material.
4. Trenches may be curved to change direction or avoid obstructions within the limits of the curvature of the pipe. Minimum radii of curvature are 25 feet for 2-inches diameter pipe and 100 feet for 2 ½, 3, and 4-inch diameter pipe. All curvature results from the bending of the pipe lengths. No deflection will be allowed at a pipe joint.

B. Mainline and Fittings:
1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC Rubber-Gasketed Pipe:
   a. Use pipe lubricant. Join pipe in the manner recommended by manufacturer and in accordance with accepted industry practices.
   b. Epoxy-coated steel fittings shall not be struck with a metallic tool. Cushion blows with a wood block or similar shock absorber.
3. PVC Solvent Weld Pipe:
   a. Use a primer and solvent cement. Join pipe in a manner recommended by the manufacturer and in accordance with accepted industry practices.
   b. Cure for 30 minutes before handling and 24 hours before allowing water in pipe.
   c. Snake pipe from side to side within the trench.
   d. Fittings: the uses of cross type fittings or saddle-tees are not permitted.
   e. Install thrust blocks on the mainline pipe work in accordance with pipe manufacturer's written instructions.

C. Lateral Pipe and Fittings:
1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC Solvent Weld Pipe:
   a. Use primer and solvent cement. Join pipe in the manner recommended by the manufacturer and in accordance with accepted industry practices.
   b. Cure for 30 minutes before handling and 24 hours before allowing water in the pipe.
   c. Snake pipe from side to side within the trench.
3. Polyethylene (PE) Pipe:
   a. Join pipe in the manner recommended by manufacturer and in accordance with accepted industry practices.
   b. Snake pipe from side to side within the trench.
   c. Double clamp pipe 1-1/2" diameter and larger.
4. UV Radiation-Resistant Polyethylene Pipe:
   a. Join pipe in the manner recommended by the manufacturer and in accordance with accepted industry practices.
   b. Snake pipe side to side within the trench, on the soil surface, and hold in place with the tubing stakes or landscape fabric staples spaced every five feet. Pipe is not to compressed or crimped by the stake or staple or other construction activity.
5. The use of cross type fittings and/or saddle tees are not permitted.

D. Specialized Pipe and Fitting:
1. Copper Pipe:
   a. Buff surface to be joined to a bright finish. Coat with solder flux.
   b. Solder so that a continuous bead shows around the joint circumference.
2. Galvanized Steel Pipe:
   a. Join pipe in the manner recommended by manufacturer and in accordance with accepted industry practices.
   b. Use factory-made threads whenever possible. Field-cut threads will be permitted only where necessary. Cut threads on axis using clean, sharp dies.
   c. Apply Teflon-type tape or pipe joint compound to the male threads only.
3. Ductile Iron Pipe:
   a. Join pipe in the manner recommended by manufacturer and in accordance with accepted industry practices.
   b. Insert dielectric union wherever a copper-based metal (copper, brass, bronze) and an iron-based metal (iron, galvanized steel, and stainless steel) are joined.
4. Low-Density Polyethylene Hose: Install per manufacturer's recommendations.
5. PVC Threaded Connections:
   a. Use only factory-formed threads. Field-cut threads are not permitted.
   b. Use only Teflon-type tape or Teflon-based paste.
6. Threaded Connections:
   a. When connection is plastic to metal, the plastic component shall have male threads and the metal component shall have female threads.
   b. Make metal-to-metal, threaded connections with Teflon-type tape or pipe joint compound applied to the male threads only.

E. Thrust Blocks:
1. Use cast-in-place concrete bearing against undisturbed soil.
2. Size, orientation, and placement shall be as shown on the installation details.
3. Wrap fitting with plastic to protect bolts, joint, and fitting from concrete.
4. Install re-bar with mastic coating as shown on the installation details.

3.6 INSTALLATION OF MAINLINE COMPONENTS

A. Main System Shut Off Valve: Install where indicated on the drawing.

B. Winterization Assembly: Install where indicated on the drawing.

C. Backflow Prevention Assembly: Install where indicated on the drawing. Install assembly so that its elevation, orientation, access, and drainage conform to the manufacturer's recommendations and all applicable health codes.

D. Quick Coupling Valve Assembly: Install where indicated on the drawings.

E. Manual Drain Valve Assembly: Install where indicated on the drawings and at other low points in the mainline piping.

3.7 INSTALLATION OF SPRINKLER AND IRRIGATION COMPONENTS:

A. Remote Control Valve (RCV) Assembly for Sprinkler and Bubbler Laterals:
1. Flush mainline before installation of RCV assembly.
2. Install where indicated on the drawing. Wire connectors and waterproof sealant shall be used to connect control wires to remote control valve wire. Install connectors and sealant per the manufacturer's recommendations.
3. Install only one RCV to a valve box. Locate valve box at least 12 inches from and align with nearby walls and edges of paved areas. Group RCV assemblies together where practical. Arrange grouped valve boxes in rectangular patterns. Allow at least 12 inches between valve boxes.
4. Adjust RCV to regulate the downstream operating pressure.
5. Attach ID tag with controller station number to control wiring.

B. Sprinkler Assembly:
1. Flush lateral pipe before installing sprinkler assembly.
2. Install per the installation details at locations shown on the drawings
3. Locate rotor sprinklers 6 inches from adjacent walls, fences, or edges of paved areas.
4. Locate spray sprinklers 3 inches from adjacent walls, fences, or edges of paved areas.
5. Install sprinklers perpendicular to the finish grade.
6. Supply appropriate nozzle or adjust arc of coverage of each sprinkler for best performance.
7. Adjust the radius of throw of each sprinkler for best performance.

C. Bubbler Assembly:
1. Flush lateral pipe before installing bubbler assembly.
2. Install bubbler assembly per the installation details at locations shown on the drawings.
3. Adjust the output flow of each bubbler for performance.

3.8 INSTALLATION OF CONTROL SYSTEM COMPONENTS:

A. Irrigation Controller Unit:
1. The location of the controller unit as depicted on the drawings is approximate; the engineer/landscape architect/owner's representative will determine the exact site location during sprinkler layout review.
2. Lighting protection: Drive 8-foot copper-clad grounding rod into the soil. If rock prevents driving, bury at least four feet deep. Use one rod for each controller. Connect controller to ground rod with AWG No. 10 solid conductor copper wire. Secure wire to grounding rod with brass or bronze clamp. Locate the connection in a separate valve box (when specified).
3. Attach wire markers to the ends of control wires inside the controller unit housing. Label wires with the identification numbers (see drawings) of the remote control valve to which the control wire is connected.
4. Install a 120-volt, 15-amp switched and grounded 3-prong receptacle with GFIC inside the controller unit housing.
5. Connect control wires to the corresponding controller terminal.

B. Control Wire:
1. Bundle control wires where two or more are in the same trench. Bundle with pipe wrapping tape at 10-foot intervals.
2. Control wiring may be chiseled into the soil using a vibratory plow device specifically manufactured for pie pulling and wire installation. Appropriate chisel must be used so that wire is fed into a chute on the chisel, and wire is not subject to pulling tension. Minimum burial depth must equal minimum cover previously listed.
3. Provide a 24-inch excess length of wire in an 8-inch diameter loop at each 90-degree change of direction, at both ends of sleeves and at 100-foot intervals along continuous runs of wiring. Do not tie wiring loop. Coil 24-inch length of wire within each remote control valve box.
4. Install common ground wire and one control wire for each remote control valve. Multiple valves on a single control wire are not permitted.
5. If a control wire must be spliced, make splice with wire connectors and waterproof sealant, installed per the manufacturer's instructions. Locate splice in a valve box that contains an irrigation valve assembly, or in a separate 6-inch round valve box.
6. Use same procedure for connection to valves as for in-line splices.
7. Unless noted on plans, install wire parallel with and below PVC mainline pipe.
8. Protect wire not installed with PVC mainline pipe with a continuous run of warning tape placed in the backfill six inches above the wiring.

C. Instrumentation:
1. Install sensor per the installation details and manufacturer's recommendations. Install at locations shown on the drawings.
2. Install electrical connections between central control unit components and sensors per manufacturer's recommendations.

D. Power Wire:
1. Route power wire as directed on plans. Install with a minimum number of field splices. If a power wire must be spliced, make splice with recommended connector, installed per manufacturer's recommendations. Locate all splices in a separate 10-inch round valve box. Coil 2 feet of wire in valve box.
2. All power wire shall be laid in trenches. The use of a vibratory plow is not permitted.
3. Green wire shall be used as the common ground wire from power source to all satellites.
4. Carefully backfill around power wire to avoid damage to wire insulation or wire connectors.
5. Unless noted on plans, install wire parallel with and below mainline pipe. Install wire 2 inches below top of PVC mainline pipe.
6. Encase wire not installed with PVC mainline pipe in electrical conduit with a continuous run of warning tape placed in the backfill, 6 inches above wiring.

3.9 INSTALLATION OF OTHER COMPONENTS:

A. Tools and Spare Parts: Prior to the review at completion of construction, supply to the owner operating keys, servicing tools, spare parts, test equipment, and any other items indicated in general notes on the drawings. Provide at least (2) quick coupling keys and hose adapters.
1. Other Materials: Install other materials or equipment shown on the drawings or installation details which are part of the irrigation system, even though such items may not have been referenced in these specifications.

3.10 MAINTENANCE:

A. Upon completion of construction and review by the engineer/landscape architect/owner's representative, maintain irrigation system for duration of 30 calendar days. Make periodic examinations and adjustments to irrigation system components to achieve the most desirable application of water.

B. Following completion of the "Contractor's" maintenance period, the owner will be responsible for maintaining the system in working order during the remainder of the guarantee /warranty period, for performing necessary minor maintenance, for trimming around sprinklers, for protecting against vandalism, and for preventing damage after the landscape maintenance operation.

3.11 ACCEPTANCE

A. Instruct the Owner's designated personnel in the operation of the system, including adjustment of sprinklers, controller(s), valves, pump controls, and moisture sensing controls.

3.12 CLEANING

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soils, debris and equipment. Repair damage resulting from sprinkler system installation.

END OF SECTION
328400 PLANTING IRRIGATION

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Client:
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Project Title:
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GRAND HAVEN TWP. MICHIGAN

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STATE OF MICHIGAN
KENNETH S. WEIKAL
LANDSCAPE ARCHITECT
No. 1022
REGISTERED LANDSCAPE ARCHITECT

Drawn: Designed:
Checked: Approved:

CAD Drawing File:
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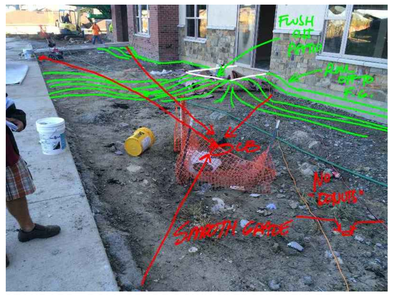
Project Number: 216212.00

Sheet Title:
SPECIFICATIONS

Sheet Number: L-606

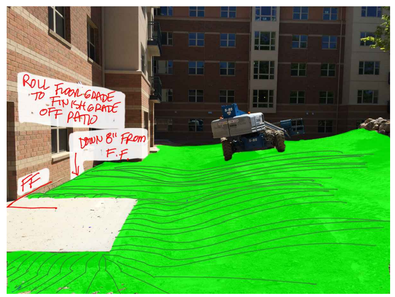
PRIOR TO TOPSOIL BEING INSTALLED IN LAWN AREAS



STANDARD - ROLL GRADE DOWN 8" FROM PATIO TO FINISH GRADE ALONG BUILDING. INSTALL SOIL FOR SMOOTH SHEET DRAINAGE ACROSS LAWN TO RIM OF CATCH BASIN

1 LANDSCAPE GRADING STANDARD

PRIOR TO TOPSOIL BEING INSTALLED IN LAWN AREAS



STANDARD - ROLL GRADE DOWN 8" FROM PATIO TO FINISH GRADE ALONG BUILDING. INSTALL SOIL FOR SMOOTH SHEET DRAINAGE ACROSS LAWN TO SWALES. FINISH GRADE ALONG BUILDING TO BE 8" BELOW FINISH FLOOR OR AS SHOWN ON CIVIL PLANS.

2 LANDSCAPE GRADING STANDARD

NOT STANDARD / NOT ACCEPTABLE - FLAT GRADE IN LAWN AREA, THEN DROPPING ABRUPTLY AT CATCH BASIN

STANDARD - FROM BUILDING OR WALK, PROVIDE A SMOOTH EVEN 2% MINIMUM GRADE TO THE RIM OF THE DRAIN INLET OR CATCH BASIN

3 LANDSCAPE GRADING STANDARD

NOT STANDARD - FINISH GRADE TO BE FLUSH WITH EDGE OF WALKS AT LAWN AND PLANTING BED AREAS, TO AVOID TRIP HAZARD FOR RESIDENTS AND VISITORS

4 LANDSCAPE GRADING STANDARD

NOT STANDARD - FINISH GRADE TO BE 8" BELOW FINISH FLOOR OR AS SHOWN ON CIVIL PLANS

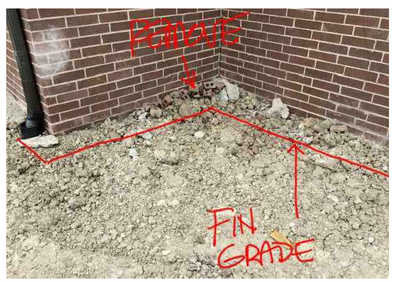
5 LANDSCAPE GRADING STANDARD

STANDARD - EXCAVATE COMPACTED CONSTRUCTION SOIL FROM PLANTING BED AREAS, TO DEPTH STATED ON PLANTING DETAILS, IN PREPARATION FOR PLANT M IX INSTALLATION.

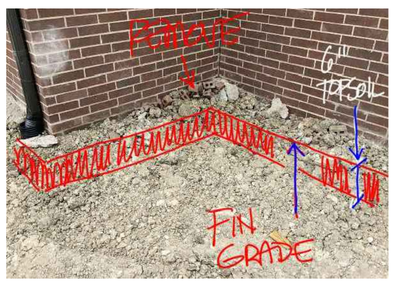
6 LANDSCAPE GRADING STANDARD

STANDARD - EXCAVATE COMPACTED CONSTRUCTION SOIL FROM PLANTING BED AREAS, TO DEPTH STATED ON PLANTING DETAILS, IN PREPARATION FOR PLANT MIX INSTALLATION.

7 LANDSCAPE GRADING STANDARD



NOT STANDARD - SOIL TOO HIGH ALONG BUILDING - EXCAVATE COMPACTED CONSTRUCTION SOIL FROM PLANTING BED AREAS AND LAWNS,TO CORRECT SUB-GRADE IN PREPARATION FOR 4" DEEP TOPSOIL IN LAWN AREAS AND 12" DEEP PLANT MIX IN PLANTING BEDS. FINISH GRADES NOTED ON CIVIL PLANS.



STANDARD - FINISH GRADE TO BE 8" BELOW FINISH FLOOR OR AS SHOWN ON CIVIL PLANS. EXCAVATE COMPACTED CONSTRUCTION SOIL FROM PLANTING BED AREAS AND LAWNS TO SUB-GRADE, IN PREPARATION FOR 4" DEEP TOPSOIL IN LAWN AREAS AND 12" DEEP PLANT MIX IN PLANTING BEDS.

8 LANDSCAPE GRADING STANDARD

NOT STANDARD - TOO MUCH COMPACTED CONSTRUCTION SOIL IN BEDS.

STANDARD - EXCAVATE COMPACTED CONSTRUCTION SOIL FROM PLANTING BED AREAS IN PREPARATION FOR 12" DEEP PLANT MIX IN PLANTING BEDS. FINISH GRADE TO BE 8" BELOW FINISH FLOOR OR AS SHOWN ON CIVIL PLANS

9 LANDSCAPE GRADING STANDARD

NOT STANDARD - TOO MUCH COMPACTED CONSTRUCTION SOIL IN BEDS.

STANDARD - EXCAVATE COMPACTED CONSTRUCTION SOIL FROM PLANTING BED AREAS IN PREPARATION FOR 12" DEEP PLANT MIX IN PLANTING BEDS. FINISH GRADE TO BE 8" BELOW FINISH FLOOR OR AS SHOWN ON CIVIL PLANS

10 LANDSCAPE GRADING STANDARD

NOT STANDARD - IRRIGATION VALVE LIDS TO BE FLUSH WITH ADJACENT LAWN AREAS

11 LANDSCAPE GRADING STANDARD

NOT STANDARD - METAL EDGING TO BE FLUSH WITH ADJACENT LAWN AREAS

12 LANDSCAPE GRADING STANDARD

LANDSCAPE GRADING STANDARDS

THESE IMAGES ARE A VISUAL REPRESENTATION OF THE DESIGN INTENT AND REQUIREMENTS GIVEN IN THE PLANS AND SPECIFICATIONS

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Project Number: 216212.00

Sheet Title: STANDARDS

Sheet Number: L-607

NOT STANDARD - NO MULCH VOLCANOES!!! - THIS CREATES ROT ON THE TRUNK AND KILLS THE TREE. INSTALL TREE PER DETAILS.

STANDARD - SOIL REMOVED FROM ROOT FLARE - TREE AT PROPER GRADE, MULCH DEPTH PER PLANTING DETAILS, LOW SAUCER 3" MAXIMUM HEIGHT.

1 LANDSCAPE PLANTING STANDARD

NOT STANDARD - NO MULCH VOLCANOES!!! - THIS CREATES ROT ON THE TRUNK AND KILLS THE TREE. INSTALL TREE PER DETAILS.

STANDARD - SOIL REMOVED FROM ROOT FLARE - TREE AT PROPER GRADE, MULCH DEPTH PER PLANTING DETAILS, LOW SAUCER 3" MAXIMUM HEIGHT.

2 LANDSCAPE PLANTING STANDARD

NOT STANDARD - NO MULCH VOLCANOES!!! - THIS CREATES ROT ON THE TRUNK AND KILLS THE TREE. INSTALL TREE PER DETAILS.

3 LANDSCAPE PLANTING STANDARD

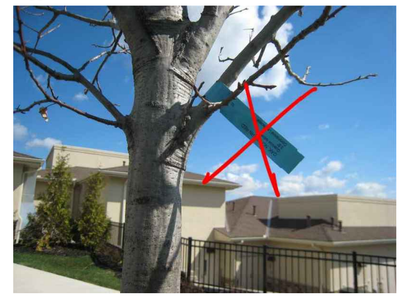
NOT STANDARD - DO NOT BURY TOPS OF SHRUBS IN MULCH!! THIS CREATES ROT ON THE TRUNK AND KILLS THE SHRUB. INSTALL PLANT PER DETAILS.

4 LANDSCAPE PLANTING STANDARD

STANDARD - SOIL REMOVED FROM ROOT FLARE - TREE AT PROPER GRADE, MULCH DEPTH PER PLANTING DETAILS, LOW SAUCER 3" MAXIMUM HEIGHT.

STANDARD - SOIL REMOVED FROM ROOT FLARE - TREE AT PROPER GRADE, MULCH DEPTH PER PLANTING DETAILS, LOW SAUCER 3" MAXIMUM HEIGHT.

9 LANDSCAPE PLANTING STANDARD



NOT STANDARD - REMOVE TAGS AND LABELS, TRIM OFF DEAD TWIGS AND BRANCHES

10 LANDSCAPE PLANTING STANDARD

LANDSCAPE STANDARDS

THESE IMAGES ARE A VISUAL REPRESENTATION OF THE DESIGN INTENT AND REQUIREMENTS GIVEN IN THE PLANS AND SPECIFICATIONS

NOT STANDARD - DOWNSPOUT BOOT TOO HIGH, SHOWING ABOVE GRADE

STANDARD - TOP OF DOWNSPOUT BOOT FLUSH WITH FINISH GRADE

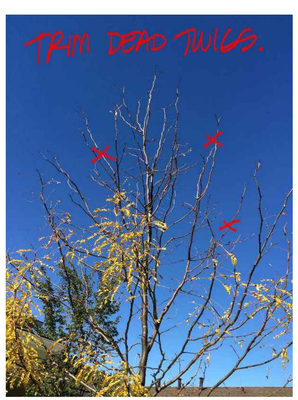
11 DOWNSPOUT STANDARDS

NOT STANDARD - INCORRECT JOINTING ON CONCRETE WALKS

NOT STANDARD - CONCRETE WALKS WITH INCORRECT JOINTING THAT WILL CRACK, AND CAUSE A TRIP HAZARD FOR RESIDENTS AND VISITORS

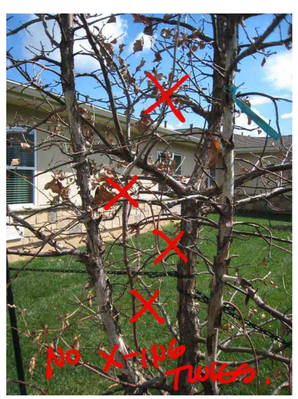
STANDARD - INSTALL CONCRETE WALKS WITH CORRECT JOINTING PER LAYOUT PLANS

12 STANDARDS FOR WALKS



NOT STANDARD - TRIM OFF DEAD TWIGS AND BRANCHES

5 LANDSCAPE PLANTING STD.



NOT STANDARD - TRIM OFF CROSSING TWIGS AND BRANCHES

6 LANDSCAPE PLANTING STD.

NOT STANDARD - TRIM OFF CROSSING TWIGS AND BRANCHES

7 LANDSCAPE PLANTING STD.

NOT STANDARD - CROOKED PLANTS. INSTALL TREES AND SHRUBS PLUMB, AND DO NOT BURY TRUNKS WITH EXCESSIVE MULCH

8 LANDSCAPE PLANTING STD.

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Project Number: 216212.00

Sheet Title:
STANDARDS

Sheet Number: L-608

GRAND HAVEN CHARTER TOWNSHIP

Community Development Memo

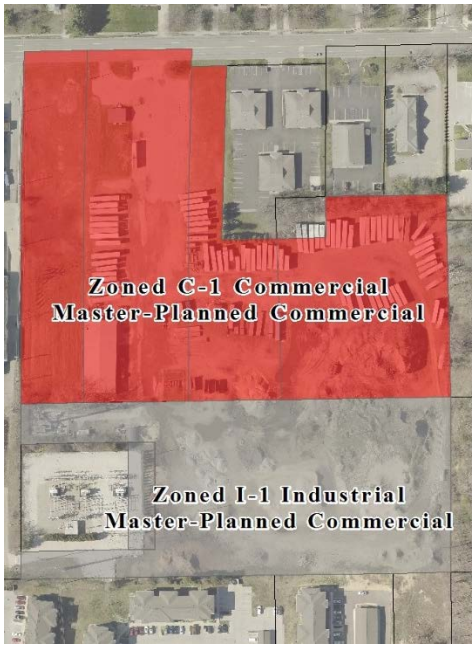
DATE: August 1, 2017

TO: Planning Commission

FROM: Stacey Fedewa, Community Development Director

RE: Pre-Application Presentation – Multi Family Mixed-Use PUD

BACKGROUND



Chad Bush, the owner of the Tysman empire is interested in redeveloping the land located at 17114 Robbins Road that contains the current landscape and trucking business. The portfolio for this business ranges from storage units, to residential developments, to retail developments—among others.

This property is comprised of 5 parcels totaling 13.6-acres and is part of the Robbins Road Sub-Area found in the Master Plan. 4 of these parcels are zoned C-1 Commercial and the remaining 5-acre parcel is zoned I-1 Industrial.

PROPOSED DEVELOPMENT CONCEPT

The property owner is proposing to develop this area into a Mixed-Use PUD that would include 5 apartment buildings totaling 129 units with a clubhouse, pool, and enclosed garages. In addition, 3 storage unit buildings are proposed.

It should be noted—general warehousing and storage is only permitted in the I-1 zoning district, and 5-acres of this land could be developed as such. However, the owner is proposing a Mixed-Use PUD to construct storage units in a more logical location.

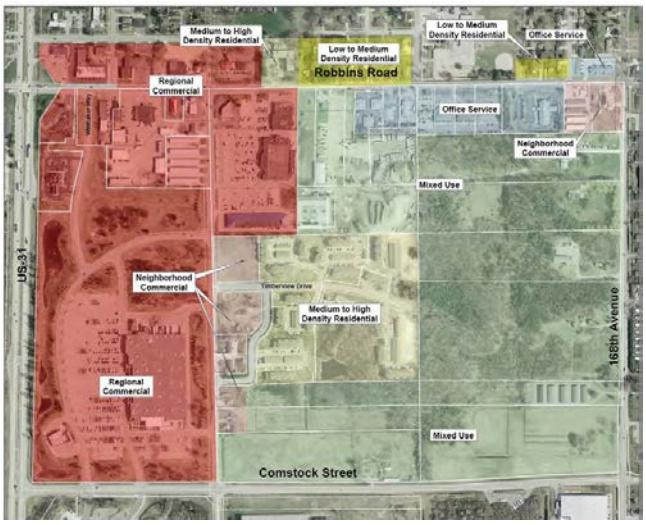
Ideally, the owner would also like to work with a non-profit organization to dedicate one or more of the buildings to people with disabilities. Providing accessible dwellings is an important goal of the owner. Lastly, the owner indicated the proposed apartment buildings would be modeled after the adjacent Timber View apartments to promote a cohesive aesthetic. The storage units would also have a similar color-scheme with stone-like attributes to support the surrounding character.

DEVELOPER'S NARRATIVE

The proposed development will consist of approximately 130 apartment units, 26,000 sf of storage space, and 2 acres of commercial lots for future development. The property is currently zoned for commercial and industrial uses but the proposal will include residential apartments on the portion of property that abuts Timberview Apartments, directly to the south. The storage and residential property will be a Mixed Use PUD meeting both the requirement of not more than 30% of the property as non-residential and including 20% open space in the residential area. The commercial lot on Robbins Rd is current zoned commercial and contains an office building and will be excluded from the PUD.

This project will re-develop a property in the Robbins Rd Corridor that currently has an electrical substation, cell tower and landscaping business into a plan that is a better fit with the master plan. The storage component isn't included in the master plan but a portion of the property is currently zoned industrial and allowed under the current zoning. The proposal moves the storage in front of the cell tower and will provide screening for the cell tower and electrical substation. The storage will also have a new commercial use property in front of it as well as standard landscape screening to help conceal the buildings.

ROBBINS ROAD SUB-AREA



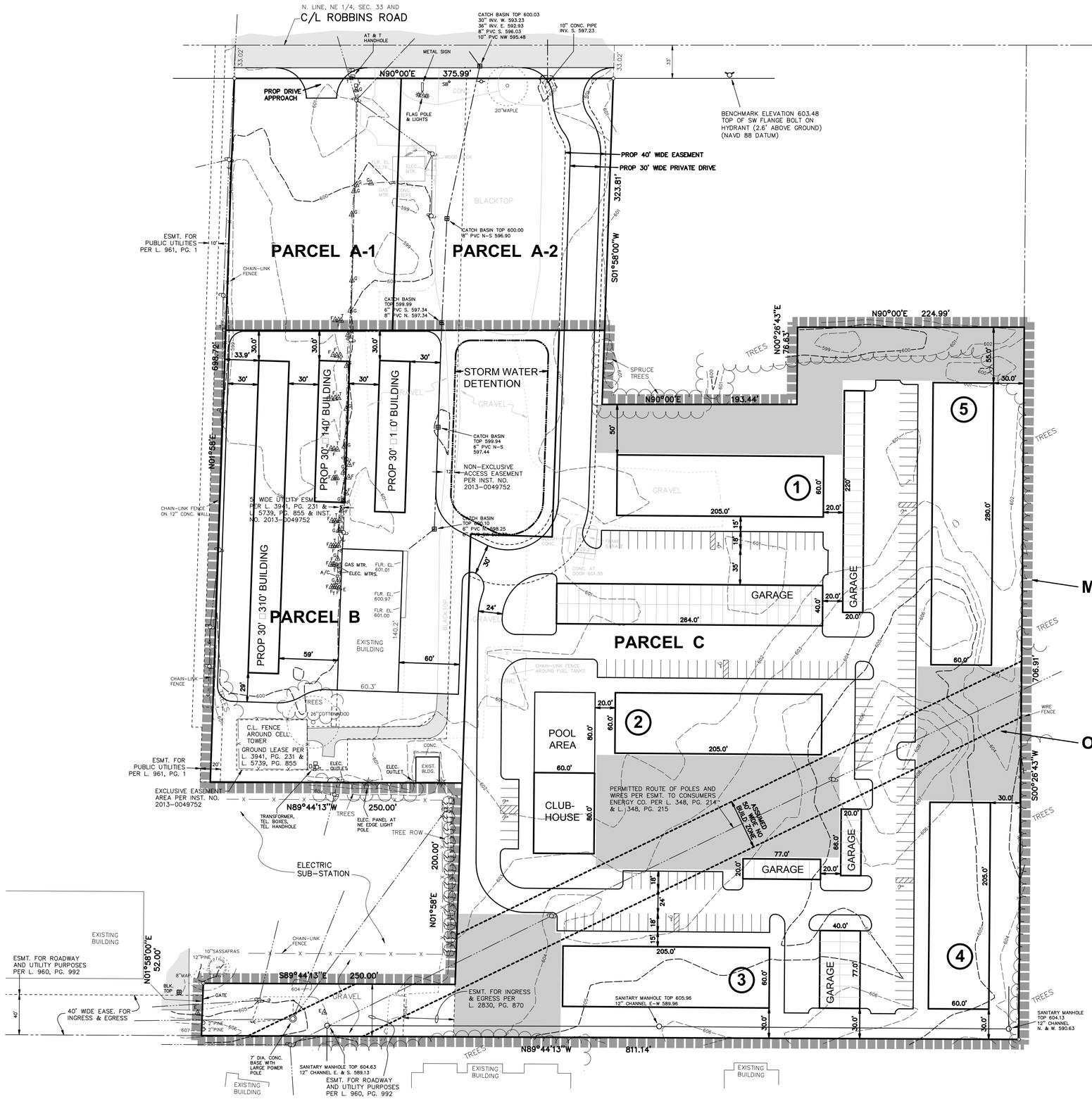
The Future Land Use map and Robbins Road Sub-Area plan are generally cohesive. The Sub-Area plan identifies a "mixed-use" for a large area that encompasses all the subject-land. A "mixed-use" is not a future land use on the Township map, so the Planning Commission has flexibility to allow a mixed-use residential, storage unit, future commercial development in this area.

Specifically, the Sub-Area Plan identifies the Mixed Use category as, "land uses should include a blend of single and multiple-family residential, office, and regional and neighborhood-serving commercial, either integrated horizontally across the Sub-Area or vertically within buildings."

It goes on to say, "lot sizes, densities and residential types should vary and allow a compact design form." As such, staff encouraged the owner to consider implementing some of the "missing middle" housing types to support the one of the Traditional Neighborhood Development goals of the Sub-Area Plan.

PURPOSE OF PRE-APPLICATION PRESENTATION

At a pre-application presentation, the Planning Commission and property owner shall have an opportunity to exchange information and provide guidance that will assist in the preparation of materials. Also, it is noted that **no formal action will be taken, nor will statements made be considered legally binding commitments**.



LAND USE SUMMARY :

PARCEL A-1 □ A-2	= 2.16 ACRES
CURRENT □ONING	= C-1
PROPOSED USE	= COMMERCIAL
PARCEL B □PART OF PUD□	= 2.□6 ACRES
CURRENT □ONING	= C-1 □ I-1
PROPOSED USE	= SELF STORAGE
PARCEL C □PART OF PUD□	= □.□0 ACRES
CURRENT □ONING	= C-1 □ I-1
PROPOSED USE	= MULTI FAMILY □APARTMENTS□

MULTI FAMILY SUMMARY :

BUILDING 1	= 24 UNITS	= 24 OPEN SPACES
		= 24 GARAGE SPACES
BUILDING 2	= 24 UNITS	= 24 OPEN SPACES
		= 24 GARAGE SPACES
BUILDING 3	= 24 UNITS	= 34 OPEN SPACES
		= 14 GARAGE SPACES
BUILDING 4	= 24 UNITS	= 3□ OPEN SPACES
		= 13 GARAGE SPACES
BUILDING □	= 33 UNITS	= 46 OPEN SPACES
		= 20 GARAGE SPACES
		= 163 OPEN SPACES
		= □□GARAGE SPACES
TOTALS	= 12□ UNITS	= 2□□TOTAL SPACES
		□2 PER UNIT□
CLUB HOUSE	= 4□00 S.F.	= 7 OPEN SPACES
PARKING TOTAL		= 26□SPACES
		□INCLUDING 7 BARRIER FREE□
OPEN SPACE □PARCEL C ONLY□		= 1.77 ACRES / □.□0 ACRES = 20.□□

NONRESIDENTIAL USES □PARCEL B□ = 2.□6 ACRES
TOTAL PUD □PARCELS B □ C□ = 11.46 ACRES
2.□6 / 11.46 = 2□.□□

SCALE: 1" = 50'
1' CONTOUR INTERVAL

LEGEND

- = IRON STAKE FOUND
- = IRON STAKE SET
- = UTILITY POLE & GUY WIRE
- = LIGHT POLE
- = SIGN
- = HYDRANT
- = WATERMAIN VALVE
- = CATCH BASIN
- = MANHOLE
- = BURIED FIBER OPTIC MARKER
- = BURIED GAS LINE MARKER
- = BURIED ELECTRIC MARKER
- = BURIED TELEPHONE MARKER
- = MAILBOX
- = TELEPHONE BOX
- = FENCE LINE
- = OVERHEAD WIRES

MIXED USE PUD
17114 ROBBINS ROAD

FOR: TYSMAN COMPANIES
ATTN: CHAD D. BUSH
17114 ROBBINS ROAD
GRAND HAVEN, MI 49417

IN: PART OF THE NE 1/4, SECTION 33, T8N, R16W,
GRAND HAVEN TOWNSHIP, OTTAWA COUNTY, MICHIGAN

REVISIONS:

08-01-17 REV FOR PLANNING
COMMISSION SUBMITTAL (mk)
07-19-17 REV PER OWNER (mk)

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DRAWN BY:	JJS	FILE NO.:	171380E
APPROVED BY:	BMF	SHEET	1 OF 1
DATE:	06/09/2017		

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GRAND HAVEN CHARTER TOWNSHIP

Community Development Memo

DATE: August 2, 2017

TO: Planning Commission

FROM: Stacey Fedewa, Community Development Director

RE: Special Land Uses – Access Management Provisions

BACKGROUND

At the July 17th Planning Commission meeting staff was directed to review the Special Land Use chapter and identify access management provisions that may hindering the reuse of existing properties.

Specifically, provisions related to distance requirements if a property is adjacent to an intersection or driveway; as well as those related to limiting the number of driveways and if the Planning Commission has any discretion on the matter.

INITIAL FINDINGS

Staff determined that 29 of 51 *(or 57%)* Special Land Uses have the specified access management provisions.

Inconsistent Method of Measurement

The method to measure the separation between access points, intersections, and driveways is inconsistent. For example:

- Measured from centerline of intersection or driveway.
- Measured from nearest right-of-way line to nearest edge of access point.
- Measured from nearest edge of driveway to nearest edge of access point.
- Measured from nearest part of intersection or driveway along property line to other non-residential driveway.
- Measured from drive or curb opening to intersection.

- Measured from nearest part of intersection or driveway for any other main building to nearest part of the access point.
- Measured from any part of the intersection or driveway to nearest part of the access point.

A couple of these provisions specify the measurements should be taken on the same side of the street, which leads staff to believe the provisions that don't specify the side of the street need to include both sides of the street when performing these measurements.

Inconsistent Separation Requirements

The SLU provisions would typically specify a required separation distance between the subject-property's driveway and nearby intersections and/or driveways. However, the distances vary from 50' – 200' of separation for intersections and between 50' – 100' for driveways.

Often, the same provision specified different minimum separations for intersections and driveways, or not specify a distance for driveways at all. For example:

Special Land Use (SLU)	Intersection Distance	Driveway Distance
Indoor Recreation, Exercise, and Athletic Facilities	200	
Outdoor Commercial Recreation Facilities	150	
Bus Terminals	100	100
Child Care of Day Care Centers	100	
Churches	100	
Construction Material Storage & Contractor's Operation	100	
Drive-Thru Eating Establishment	100	100
Gasoline and Petroleum Storage	100	75
Motor Vehicle Sales Establishment	100	75
Ready-Mix Concrete and Asphalt Plants	100	100
Storage Yard for Machinery, Trucks, or Equipment	100	
Wholesale Businesses	100	100
Vehicle Wash Establishments	100	100
Youth Centers	100	
Gasoline Stations	75	50
Hotels and Motels	75	75
Lumber Yards	75	75
Motor Freight, Truck, and Warehousing Businesses	75	75
Motor Vehicle Repair Garages	75	75
Public or Parochial Schools, Libraries & Other Municipal Uses	75	75
Greenhouses and Nurseries	50	50
Multiple Family Dwellings	50	50

Private Clubs	50	50
Cemeteries and Mausoleums		
Colleges		
Golf Courses and Other Outdoor Recreation Uses		
Nursing or Convalescent Homes		
Public or Private Campgrounds		
Recycling Stations		

Based on the land use staff found it odd that certain uses had a separation requirement, while a more intense use did not—a church with a 100' separation requirement, but no separation requirement for colleges, nursing homes, or recycling stations. Additionally, at this juncture, staff is unable to determine if these separations are appropriate for the land use.

Paved Road Requirement

The next provision staff reviewed was if the use needed to have access on a paved road. This also varied quite a bit:

Special Land Use (SLU)	Must be Paved?	Specific Road Type
Indoor Recreation, Exercise, and Athletic Facilities	Silent	
Outdoor Commercial Recreation Facilities	Y	
Bus Terminals	Y	County Primary
Child Care of Day Care Centers	Y	County Road
Churches	Y	County Road
Construction Material Storage & Contractor's Operation	Silent	
Drive-Thru Eating Establishment	Y	
Gasoline and Petroleum Storage	Silent	
Motor Vehicle Sales Establishment	Y	
Ready-Mix Concrete and Asphalt Plants	Y	
Storage Yard for Machinery, Trucks, or Equipment	Y	
Wholesale Businesses	Y	County Primary
Vehicle Wash Establishments	Y	
Youth Centers	Y	Public Street
Gasoline Stations	Y	
Hotels and Motels	Y	
Lumber Yards	Y	
Motor Freight, Truck, and Warehousing Businesses	Y	County Primary
Motor Vehicle Repair Garages	Y	
Public or Parochial Schools, Libraries & Other Municipal Uses	Y	

Greenhouses and Nurseries	Silent	
Multiple Family Dwellings	Y	
Private Clubs	Y	
Cemeteries and Mausoleums	Y	Public Street
Colleges	Silent	County Primary and/or All Season
Golf Courses and Other Outdoor Recreation Uses	Y	
Nursing or Convalescent Homes	Y	
Public or Private Campgrounds	Y	
Recycling Stations	Y	All-Weather Road, not Residential or Collector-Type Roads

Oddly enough, some of these uses were inconsistent about paved roads. Typically there was an initial paved road requirement, and the last provision for most uses described the basic infrastructure requirements—paved road, natural gas, municipal water, sanitary sewer, etc. However, staff found that one use may not be required to front on a paved road, but then the minimum infrastructure would say it must be paved. This is causing confusion.

Sanitary Sewer Requirement

Dovetailing off the standard infrastructure clause found in many of the special land uses—staff found more oddities with the sanitary sewer requirement. Some of the uses that are required to have sanitary sewer do not make sense, especially when compared against a more intense land use.

Special Land Use (SLU)	Sanitary Sewer Required?
Indoor Recreation, Exercise, and Athletic Facilities	
Outdoor Commercial Recreation Facilities	
Bus Terminals	Y
Child Care of Day Care Centers	
Churches	
Construction Material Storage & Contractor's Operation	
Drive-Thru Eating Establishment	Y
Gasoline and Petroleum Storage	
Motor Vehicle Sales Establishment	Y
Ready-Mix Concrete and Asphalt Plants	Y
Storage Yard for Machinery, Trucks, or Equipment	
Wholesale Businesses	
Vehicle Wash Establishments	Y
Youth Centers	

Gasoline Stations	Y
Hotels and Motels	Y
Lumber Yards	
Motor Freight, Truck, and Warehousing Businesses	
Motor Vehicle Repair Garages	Y
Public or Parochial Schools, Libraries & Other Municipal Uses	
Greenhouses and Nurseries	
Multiple Family Dwellings	Y
Private Clubs	
Cemeteries and Mausoleums	
Colleges	
Golf Courses and Other Outdoor Recreation Uses	
Nursing or Convalescent Homes	Y
Public or Private Campgrounds	
Recycling Stations	

What makes this even more interesting is that each underlying zoning district also establishes a minimum infrastructure requirement in its Statement of Purpose. Districts R-3, R-3.5, R-4, SP, C-1, I-1, and I-1A are all required to have be connected to sanitary sewer as a basic requirement of the district.

Confusion is created by mismatching the sanitary sewer requirement. For example, the following Special Land Uses are only permitted in a zoning district that has an underlying requirement of being connected to sanitary sewer, but the SLU provisions are either silent or add a caveat that sewer is only required if it's available.

Special Land Use (SLU)	**Permitted SLU Zoning Districts**	**SLU Sewer Requirement**
Cemeteries and Mausoleums	C-1	Silent
Construction Material Storage & Contractor's Operation	I-1	Silent
Gasoline and Petroleum Storage	I-1	Silent
Indoor Recreation, Exercise, and Athletic Facilities	C-1, I-1A	Silent
Lumber Yards	C-1, I-1, I-1A	If Available
Motor Freight, Truck, and Warehousing Businesses	I-1, I-1A	If Available
Outdoor Commercial Recreation Facilities	C-1	If Available
Private Clubs	R-4	If Available
Recycling Stations	I-1	Silent
Storage Yard for Machinery, Trucks, or Equipment	I-1	Silent
Wholesale Businesses	C-1	If Available
Youth Centers	SP, C-1	If Available
Colleges	SP, C-1	Silent

The Public Services Director indicated they would only require sanitary sewer for business that allowed the public to patron. Uses such as Contractors Material Storage, Gasoline and Petroleum Storage, Storage Yard for Machinery, and Recycling Stations that only have a limited number of employees on site do not need a connection to sanitary sewer from the Directors perspective.

OTHER INTERESTING FINDINGS

Campgrounds

By far the most interesting (*and comical*) discovery was Section 19.07.33.E regarding Public or Private Campgrounds. This provision reads, "recreational units are not permitted in the campground." The definition of a Recreational Unit is, "a tent or vehicular-type structure, primarily designed as temporary living quarters for recreational, camping, or travel use. A tent means a collapsible shelter of canvas or other fabric stretched and sustained by poles and used for camping outdoors. Recreation unit includes a recreation vehicle which either has its own motive power or is mounted on or drawn by another vehicle which is self powered."

Perhaps the intention was to preclude Recreation Vehicles or Equipment, which is defined as, "a vehicle or equipment intended for temporary or period use for recreational or leisure pursuits. Such vehicles shall include boats, airplanes, special purpose automobiles, floats, rafts, trailers, snowmobiles, camping or travel trailers, motorized homes, detachable travel equipment of the type adaptable to light trucks, and other equipment or vehicles of a similar nature." Unfortunately, this definition still includes camping equipment.

It is unclear what the intention of this provision is because camping usually includes the use of other recreation amenities, so staff recommends removing this provision entirely.

Gasoline Stations & Repair Garages

Both Gasoline Stations and Motor Vehicle Repair Garages include this clause about determining the number of curb openings:

<u>Gasoline Stations</u>

No more than 1 curb opening shall be permitted for every 75-feet of frontage (or major fraction thereof) along any street, with a maximum of 1 per street when located on a corner lot, and 1 for any other street.

Couple that provision with the access management requirement of prohibiting any drive or curb opening within 75-feet of an intersection, or within 100-feet of a residential district property line, or within 50-feet of any other non-residential drive the Township may be precluding a driveway altogether given the right circumstances.

Obviously, a business needs a driveway, so under the right circumstances the applicant would also be required to pursue a variance because the ordinance does not give the Planning Commission any discretion to correct this type of situation that could occur as a result of these SLU provisions.

Conversely, the provisions do not establish a maximum number of driveways. This SLU established a minimum lot width of 200-feet, so under perfect conditions the property is automatically allowed to have 3 curb openings. This appears counterintuitive considering the strong access management provisions found throughout the rest of the Ordinance.

Motor Vehicle Repair Garages

No more than 1 curb opening shall be permitted for every 100-feet of frontage (or major fraction thereof) along any street, with a maximum of 1 per street when located on a corner lot, and 2 for any other street.

Couple that provision with the access management requirement of prohibiting any drive or curb opening within 75-feet of an intersection, or within 50-feet of a residential district property line, or within 75-feet of any other drive the Township may be precluding a driveway altogether given the right circumstances.

Minimum Lot Area, Width, Setbacks

Out of the 29 SLUs that staff reviewed, 23 of them establish a larger minimum lot size, minimum lot width, and minimum building setbacks that are greater than the underlying zoning district. In many cases this is valid, but some appear to be excessive.

Special Land Use (SLU)	Min Lot Area (Acres)	Min Lot Width (Feet)	Min Setbacks (Feet)
Gasoline Stations	1	200	60 75*
Indoor Recreation, Exercise and Athletic Facilities	1		
Hotels and Motels	2	150	
Motor Vehicle Sales Establishment	2	200	100*
Storage Yard for Machinery, Trucks, or Equipment	2	200	
Churches	3	165	
Outdoor Commercial Recreation Facilities	3	200	100
Wholesale Businesses	3	200	75 150*
Cemeteries and Mausoleums	3		50
Bus Terminals	3		75
Motor Freight, Truck, and Warehousing Businesses	3		75 150*
Public or Private Campgrounds	5	330	
Ready-Mix Concrete and Asphalt Plants	5		2 x I-1 300*
Recycling Stations	5		500*
Public or Parochial Schools, Libraries, and Other Municipal Uses and Structures	2 – Non-School 10 – Elementary 20 – Middle 30 - High	200	100 bldg 200 field
Golf Courses and Other Outdoor Recreation Uses	40 – Reg. Course		100

	20 – Par 3 Style		
Multiple Family Dwellings	6,000 sqft/unit		
Construction Material Storage & Contractor's Operation		200	
Drive-thru Eating/Fast Food Establishment			75
Motor Vehicle Repair Garages			75
Nursing or Convalescent Homes			75
Gasoline and Petroleum Storage			200*
Lumber Yards			200*

* This additional setback requirement is only if it abuts a residential use or district line.

To put this into context—if a Recycling Station was bound on 3 sides by a residential zoning district and therefore has a 500-foot setback for the rear yard and each side yard, and 75-feet for the typical I-1 front yard setback then the true minimum lot size the Township has required is actually over 13-acres, which does not taken into account the actual buildings that would be on site.

Other questions to consider:

- Does a church need a minimum of 3-acres?
- Does a wholesale business need a minimum of 3 acres? Similarly, does this use need such a large setback when typically, all the goods are wholly enclosed within a building?

Group Day Care Home

As a follow-up to the July 17th meeting that included a Special Land Use application to expand a family day care home into a group day care home. One of the provisions found in the SLU Chapter is the standard infrastructure clause. This clause is not described in the Michigan Zoning Enabling Act and must be removed. Thus, staff will include this change in the draft of the Zoning Text Amendment Ordinance that will be forthcoming.

NEXT STEP

Given the extent of the provisions found that need consideration, staff is requesting the Planning Commission provide direction.

- Should the separation distances from intersections and driveways just have a clause added that gives the Planning Commission discretion to reduce or remove the requirement? Then have the Zoning Ordinance Update Committee address the specifics of each use?
- Should staff revise the separation distances and provide a uniform number and method of measuring the separation distance?
- Should staff remove these access management provisions entirely to encourage the reuse of the existing properties, and then have the Update Committee address the topic in the new ordinance?

GRAND HAVEN CHARTER TOWNSHIP

Community Development Memo

DATE: August 1, 2017

TO: Planning Commission

FROM: Stacey Fedewa, Community Development Director

RE: Accessory Buildings in Front Yards

BACKGROUND

Over the last few months the Township has begun discussing the possibility of creating an avenue to allow accessory buildings within front yards. Staff contacted numerous communities and received a response from 9 municipalities.

REGULATIONS FROM OTHER COMMUNITIES

Georgetown Township, Ottawa County

Require applicants to submit a ZBA application to request a variance. However, the Township did attempt to draft language to create an avenue for accessory buildings in front yards, but found the language was too ambiguous, and therefore too challenging to craft. That said, the predominant requirements would have been—large lots, dwellings with a significant distance from the street, and landscape screening.

The Township chose to continue the route of ZBA variances.

Otisco Township, Ionia County

Only permitted if a variance is granted from the ZBA.

Spring Lake Township, Ottawa County

Require applicants to submit a ZBA application to request a variance.

The Township specifically chose not to amend their ordinances to create an avenue for accessory buildings to be located within front yards regardless of lot size, location, and density.

Park Township, Ottawa County

Park Township has taken a unique and unconventional approach to this subject. Their ZBA was regularly approving variances to allow accessory buildings within front yards and getting quite creative in their affirmative findings for each standard.

In response, it appears their ZBA created an avenue to authorize a "departure" from the regulations as an "administrative approval." Specifically, the following standards have been added for this subject:

> The Zoning Board of Appeals may authorize one or more accessory buildings in excess of the square footage limitations or in excess of the height limitations as an administrative approval. In considering such a request the Zoning Board of Appeals shall consider the following standards:
>
> 1. The area and/or height of the accessory building in relation to the size of the lot on which it is to be placed;
> 2. The area and/or height of the accessory building in relation to the principal building on the lot on which the accessory building is going to be placed;
> 3. The location of the accessory building in relation to other buildings on adjoining lots and in relation to the principal building on the lot;
> 4. Whether or not the accessory building will affect light and air circulation of any adjoining property; and
> 5. Whether the accessory building will adversely affect the view of any adjoining property.

Cannon Township, Kent County

Accessory buildings are permitted in the front yard if it is setback at least 200-feet from the front lot line.

Plainfield Township, Kent County

Accessory buildings are allowed to be in the front yard of waterfront lots. In addition, they're allowed in the front yard of non-waterfront lots under the following conditions:

- Only allowed to occur in 3 zoning districts—R-1, Rural Estate, and Rural Preserve.
- The accessory building must be able to meet the zoning district setbacks of 60-feet from front lot line, and 25-feet from side lot line.

Thornapple Township, Barry County

Accessory buildings are allowed to be in the front yard if the following conditions are met:

- Must be zoned Rural Residential or Rural Estates
- Accessory buildings < 200 square feet and not permanently attached:
    - Cannot be located within the required front yard setback area.
    - Not subject to side and rear setback requirements.
- Accessory buildings > 200 square feet and permanently attached:
    - Dwelling and accessory building must be setback at least 200-feet from the road right-of-way.
    - Shall be setback 10-feet from side lot line.
    - If unable to meet the 200-foot setback requirement a Special Land Use (SLU) can be pursued:
        - Cannot be within the required front yard setback area;
        - Planning Commission must consider the standard SLU findings (*i.e., the report of findings*);
        - Building must be compatible in appearance with the dwelling on the property, and the dwellings in the area. Compatibility includes:
            - Exterior colors
            - Materials
            - Roof pitch
            - Window coverage
            - Landscaping
            - Other features of the structure and site

City of Grand Haven, Ottawa County

Accessory buildings are permitted in front yards as long as it is not located within the required front yard setback area. Other requirements include (*this covers all zoning districts*):

- An accessory building greater than the footprint of the principal building can be permitted as an SLU.
    - Lots < 1 acre: accessory building floor area cannot exceed principal building floor area by more than 50% (*e.g., a 2,000 sqft house could allow a 3,000 sqft accessory building*).
    - All zoning districts other than industrial are subject to the following SLU provision:
        - 1 acre < 5 acres: accessory building floor area cannot exceed principal building floor area by more than 100%.
        - > 5 acres: accessory building floor area cannot exceed principal building floor area by more than 200%.
    - Industrial parcels over 1 acre in size do not have any limitations on the number of size of accessory buildings. The buildings are only subject to the zoning district setback requirements.
- The standard accessory building requirements are:
    - Size
        - Accessory buildings cannot exceed the footprint of the principal building (*unless the SLU option described above is pursued*).
        - Certain zoning districts cannot exceed 1,000 sqft of accessory building footprint.
        - Accessory buildings cannot occupy more than 25% of the rear yard in certain zoning districts.
    - Location
        - Cannot be within the required front yard area or corner front setback area.
        - Accessory building < 20-feet in height must be setback at least 3-feet from the interior side and rear lot lines. Additionally, eaves and other overhangs must be setback at least 2-feet from the same lot lines.
        - Accessory buildings > 20-feet in height must meet the same setbacks as those required by the zoning district for principal buildings.
        - Detached accessory buildings shall be setback at least 6-feet from the principal building.

Vergennes Township, Kent County

The Township's ZBA used to issue numerous variances to allow accessory buildings in front yards. That practice lead to new language being added to the zoning ordinance. Accessory buildings are permitted in the front yard if the following conditions are met:

- Property is zoned Agriculture, and building is used for the same purpose.

- For all other zoning districts:
    - Accessory building must be setback at least 150-feet.
    - If there is less than 150-feet the building can still be in the front yard if it is within 75-feet of the principal building.
    - Must be constructed with similar exterior materials and similar design and roof pitch with the principal building, and cannot exceed 16-feet in height or the height of the principal building, whichever is taller.
- Accessory buildings must comply with the setbacks for the zoning district.
- The R-2 and R-3 zoning districts do not allow an accessory building to exceed 900 sqft.
- If none of the above conditions can be met the applicant may pursue an SLU. The Planning Commission must consider:
    - Size, location, and intended use of the accessory building to ensure it is consistent with adjoining properties.
    - Extraordinary or exception circumstances or conditions applying to the property which limit the applicant's ability to otherwise comply, such as topography and other developmental limitations.
    - Whether the proposed building will affect the views, light, and air circulation of any adjoining buildings or properties.

Lastly, it should be noted this Township never allows a minor accessory building (*i.e., ≤ 200 sqft*) within the front yard. They are always required to be in a side or rear yard and be setback at least 5-feet.

WHAT ABOUT US?

If the Planning Commission determines it wants to proceed with adding a Special Land Use option to construct an accessory building within the front yard, staff recommends the following items be incorporated:

1. Establish a minimum lot size.
2. Establish a minimum setback for the accessory building from the front lot line.
3. Establish a minimum setback for the accessory building from the dwelling and other lot lines.
4. Limit the height of the accessory building to the same height as the house, or one that is shorter.
5. Require the accessory building to be compatible with the dwelling:

a. Exterior colors
b. Building materials
c. Roof pitch
d. Window coverage

6. Identify the various ways a property would be eligible for an SLU rather than a variance:
    a. Saving mature trees
    b. Reducing impervious surface
    c. Etc.

7. Require screening along the wall(s), or near the street. Screening should consist of evergreens that are a minimum of 6-feet tall at time of planting.

Other provisions the Commission could consider:

- Establish a minimum/maximum building size that is allowed to be within the front yard.
- Determine that a certain number of mature trees must be saved in order to be approved.
    - Specify what the minimum caliper size is for a tree to be considered mature.
- Create a formal set of stipulations that are added to the SLU permit that would protect the basis of the approval. For example, any trees considered to be mature at the time of approval shall not be removed unless it is dead, diseased, dying, or poses an imminent risk.
- If reducing impervious surface is one of the Township's goals in allowing this SLU perhaps a maximum amount of concrete or asphalt should be established to ensure that goal is protected.

WHAT'S NEXT?

The Planning Commission will need to discuss if accessory buildings should be allowed in front yards as a Special Land Use. If so, some general guidance on what regulations should be incorporated. This will give staff and the Zoning Ordinance Update Committee some clearer direction on how to proceed.

Keep in mind, this Special Land Use would not be added to the zoning ordinance immediately. Rather, it would be incorporated into the new zoning ordinance that is expected to be adopted next year.

GRAND HAVEN CHARTER TOWNSHIP

Community Development Memo

DATE: August 2, 2017

TO: Planning Commission

FROM: Stacey Fedewa, Community Development Director

RE: Appointment of a New Secretary

BACKGROUND

The Secretary position has recently opened with the resignation of Robertson. Therefore, a new Secretary must be appointed to fill the vacancy.

SAMPLE MOTION

Motion to nominate, and appoint, *(name)* as the Planning Commission Secretary.

Please contact me prior to the meeting with questions or concerns.

GRAND HAVEN CHARTER TOWNSHIP

Community Development Memo

DATE: August 2, 2017

TO: Planning Commission

FROM: Stacey Fedewa, Community Development Director

RE: Revision to the Planning Commission Bylaws

BACKGROUND

The Planning Commissions Bylaws and Rules have not been updated since June 2009. Staff recommends a few revisions. The major revision is described below and the remainder are shown in the proposed bylaws.

Add a new clause that explains if a Commissioner is also an applicant, the Commissioner shall utilize a representative to speak on behalf of the project. This would avoid any appearance of impropriety.

Given the number of Commissioners that pull a wide range of permits the addition of this clause will continue to protect the integrity of the Grand Haven Charter Township Planning Commission.

REQUIREMENTS

In order to approve a Bylaw amendment, the Planning Commission is required to receive the proposed revisions at least 4 days prior to the meeting. Additionally, the Bylaws must be approved by a two-thirds vote of the Planning Commissioners appointed and serving, which will require 6 votes to approve in order for the amendments to take effect.

SAMPLE MOTION

Motion to approve the Planning Commission Bylaws and Rules as amended.

Please contact me with questions or concerns.

BYLAWS AND RULES
OF THE
GRAND HAVEN CHARTER TOWNSHIP PLANNING COMMISSION

SECTION I

PURPOSE

The members of the Grand Haven Charter Township Planning Commission are appointed by the Township Board and are charged with the responsibility of implementing the philosophy of the master plan pursuant to the provisions of the Michigan Zoning Enabling Act (*Act 110 of the Public Acts of 2006, as amended*) and Michigan Planning Enabling Act (*Act 33 of the Public Acts of 2008, as amended*). The Planning Commission may establish rules and bylaws to govern its operations. These Bylaws and Rules are to be read in a manner consistent with state law and township ordinance or administrative policies, and any provision herein deemed inconsistent with state law shall be struck and the remainder of the Bylaws and Rules shall remain in full force and effect.

SECTION II

ORGANIZATION

2.1 MEMBERSHIP AND QUORUM.

The Planning Commission shall total nine (9) members, appointed by the Supervisor and approved by a majority vote of the members of the Township Board elected and serving. The Commission members should represent a wide array of interests in the community without the political considerations that influence elected officials. A quorum of the Planning Commission shall be five (5) members. All but one (1) member shall be qualified electors of the Township. One (1) member of the Township Board shall be a member of the Planning Commission. Members of the Planning Commission shall continue to hold office until their successors are appointed.

2.2 FIDUCIARY DUTIES.

All members must recognize their fiduciary duty to the Township. While the Planning Commissioners are representative of different constituencies within the Township, they shall endeavor to promote the general public good rather than special interests. No Planning Commissioner shall release information exempted by the Freedom of Information Act. Any such breach shall be considered a cause for removal.

2.3 ATTENDANCE.

Regular attendance of members is essential if the Planning Commission is to effectively discharge its responsibilities and advisory role. If a member is unable to attend a Planning Commission or committee meeting, the member should contact the Township Staff or Chairperson by 5 p.m. of the day preceding the meeting and advise them of the reason for the absence. Failure to notify the Planning Department or the Chairperson of the reason for absence will result in the absence being declared "unexcused." The Planning Commission or committee shall also have the discretion, despite utilization of the notice and reporting provisions herein, to declare the absence "unexcused." Three (3) unexcused absences or

six (6) total absences of a member from Planning Commission meetings during any twelve (12) month period shall be reported to the Township Board and may be "cause" for that Board's removal of the member.

2.4 COMPENSATION.

Planning Commissioners will be paid a per diem as established by the Township Board for each Planning Commission meeting or committee meeting attended.

Planning Commissioners are encouraged to attend training seminars and will be paid for their attendance pursuant to the Township's Administrative Policies. Training is considered to be an important aspect of a Commissioner's responsibility. Members are asked to report all training that they attend to Township staff for inclusion in the Annual Report. *(Training may include seminars offered through a Commissioner's work if it is related to planning, zoning, or general development issues.)* A Commissioner's training record may be used by the Board in evaluating an application for reappointment.

Planning Commissioners may be reimbursed for actual, reasonable and necessary expenses incurred in the discharge of their duties, including the inspection of sites being considered by the Planning Commission. No such reimbursement shall be paid without appropriate receipt or mileage statement. Each Planning Commissioner or member shall be responsible for procuring and presenting such back-up documentation to staff who shall collect and preserve such documentation.

SECTION III

OPERATIONS

3.1 MEETINGS.

The Planning Commission will hold regular meetings on the first and third Mondays of each month. At the 1st meeting in January, the Planning Commission shall select from its membership a Chairperson, Vice-Chairperson and Secretary. The Planning Commission may also use a recording secretary who is not a member of the Planning Commission.

At the organizational meeting, a schedule of regular meetings for the year shall be established, including the organizational meeting for the following January. This schedule shall include the date, time and meeting location. The above regular meetings may be adjourned, canceled or rescheduled by the Chairperson for cause.

State law provides that special meetings to discuss particular topics may be called by the Chairperson or by a written request signed by two (2) Planning Commissioners and filed with the Secretary. Special meetings of the Commission will require forty-eight (48) hours notice to all Planning Commissioners of the meeting date, time, location and topic. No business except that related to the topic may be conducted at the special meeting.

Each Planning Commissioner shall be responsible for keeping the Secretary appr~~a~~ised the Commissioner's current address and telephone number and if such information is utilized, no defect in notice will be recognized.

No Planning Commission action shall be official unless it occurs upon a proper vote at a properly convened meeting or unless it is ratified by a proper vote at a subsequent, properly convened meeting.

"Properly convened meeting" refers to a Planning Commission meeting where a majority of the appointed members are present, and which was the subject of forty-eight (48) hours prior written notice to each member or diligent prior attempts to reach each member telephonically.

"Proper vote" refers to a polling of the Planning Commissioners of the Planning Commission at a properly convened meeting which results, unless otherwise specified in these bylaws, in a majority of those members present and voting in support of a motion or resolution. A motion which receives an equal number of votes both for and against the motion will be deemed to have failed.

3.2 OFFICERS.

The Officers of the Planning Commission shall consist of the Chairperson, Vice-Chairperson, and Secretary and shall be elected for a one year term by a proper vote at the organizational meeting.

Officers shall exercise functions including but not limited to those described below:

A. Chairperson: Shall preside at the meetings of the Planning Commission, serve as its spokesperson and signatory and coordinate its activities.

B. Vice Chairperson: Shall exercise the powers of the Chairperson when the Chairperson is unavailable.

C. Secretary: Shall be responsible for arranging meetings, and recording and distributing the minutes of each meeting, and for carrying on the normal administrative duties necessary to the Planning Commission's functions. Upon approval of the Planning Commission, the details of these duties may be delegated to non-Commission members or other Commission members.

1. Minutes: The Secretary shall be responsible for a permanent record of the minutes of each meeting and shall have them recorded in suitable permanent records.

2. Correspondence: The Secretary shall be responsible for the issuance of formal written correspondence with other groups or persons, as directed by the Planning Commission. All communications, petitions, reports, or other written materials received by the Secretary shall be brought to the attention of the Planning Commission.

3. Attendance: The Secretary shall be responsible for maintaining an attendance record for each Planning Commission member and report those records annually to the Planning Commission for inclusion in the Annual Report to the Township Board.

4. Notices: The Secretary shall issue such notices as may be required by the Planning Commission.

5. Annual Report: The Secretary shall draft an Annual Report for consideration by the Planning Commission. This report shall contain, at a minimum, the following:

   a. The attendance record of each Commissioner, including both excused and unexcused absences;

   b. The training record of each Commissioner;

   c. The Committee(s), if any, that each Commissioner served;

   d. A breakdown of the actions taken by the Planning Commission pursuant to the following:

      i. Zoning applications by category;

      ii. Special land use applications;

      iii. Planned Unit Developments;

      iv. Site plans;

      v. Subdivision;

      vi. Site Condominiums; and,

      vii. Any other action deemed noteworthy.

3.3 COMMITTEES.

The Planning Commission may establish such standing committees, special committees and task forces as it deems necessary. Such committees and task forces shall be advisory only in authority and shall not exercise the powers of the Planning Commission.

Standing committee members must be members of the Planning Commission. Members of special committees or task forces need not be members of the Planning Commission. Any special committee or task force established shall be required to file a written report of its activities upon the completion of its assigned task. Special committees or task forces shall be dissolved upon presentation of a final report. The Planning Commission may dissolve any special committee or task force it establishes, at any time. The Chairperson shall make committee and task force appointments subject to the approval of the Planning Commission upon a proper vote. Each committee or task force shall elect a chairperson from its membership.

3.4 RULES OF ORDER.

Except as otherwise provided herein, members shall have the following rights and duties.

A. When a Commissioner wishes to speak, the Commissioner shall be recognized by and shall address the Chairperson.

B. When two (2) or more Commissioners wish to speak at the same time, then the Chairperson shall decide who is to speak first.

C. When a Commissioner is speaking on any question before the Planning Commission, the Commissioner shall not be interrupted except to be called to order by the Chairperson.

D. When a Commissioner is called to order by the Chairperson, the Commissioner shall immediately suspend the Commissioner's address except to register an appeal. The Planning Commission, if appealed to, shall decide the question upon a proper vote. If there is no appeal, the ruling of the Chairperson shall be final.

E. The Chairperson shall vote on all questions decided by yea and nay except on an appeal from the Chairperson's own decision. The Chairperson is not required to vote last. When a yea and nay vote is taken, every Commissioner present shall vote or note any abstention.

F. All members have a fiduciary responsibility to vote on all motions, unless an abstention is allowed pursuant to law.

G. Planning Commission members shall declare a Conflict of Interest when:

1. a relative *(i.e. a spouse, child, parent, grandparent, grandchild, aunt, uncle, niece, or nephew including any in-~~low~~ law or step relationship of the described types)* is an applicant or is formally associated with an applicant before the Planning Commission;

2. the Planning Commission member has a business or financial interest in the property involved in the request, or has a business or financial interest in the applicant's company, agency, or association;

3. the Planning Commission member owns or has a financial interest in neighboring property (*for purposes of this section, a neighboring property shall include any property falling within the notification radius for the proposed development, as required by the Zoning Ordinance, or other applicable Ordinance, or Michigan Zoning Enabling Act*); or

4. there is a reasonable appearance of a conflict of interest, as determined by the Planning Commission member declaring such conflict.

H. Each member of the Commission shall avoid conflicts of interest and incompatibility of offices. As used here, a conflict of interest shall at a minimum

include, but not necessarily be limited to, the following:

1. Issuing, deliberating on, voting on, or reviewing a case concerning the Commission member;

2. Issuing, deliberating on, voting on, or reviewing a case concerning work on land owned by the Commission member, or which is adjacent to land owned by the Commission member, or whose statutory notice area under the Michigan Zoning Enabling Act includes land owned by the Commission member;

3. Issuing, deliberating on, voting on, or reviewing a case involving a corporation, company, partnership, or any other entity in which the Commission member is a part owner, or any other relationship where the Commission member may stand to have a financial gain or loss;

4. Issuing, deliberating on, voting on, or reviewing a case which results in a pecuniary benefit to the Commission member;

5. Issuing, deliberating on, voting on, or reviewing a case concerning the Commission member's spouse, children, step-children, grandchildren, parents, brothers, sisters, grandparents, parents in-law, grandparents in-law, or members of the Commission member's household;

6. Issuing, deliberating on, voting on, or reviewing a case where the Commission member's employee or employer is:

   a. an applicant or agent for an applicant, or

   b. has a direct interest in the outcome.

I. If a Planning Commission member is an applicant, either as an individual, corporation, company, partnership, or any other entity in which the member is a part owner, the Commissioner shall be required to have a representative speak on their behalf to avoid any appearance of impropriety.

3.5 ORDER OF BUSINESS.

Regular meetings of the Planning Commission shall follow an order of business structured as follows:

A. Call to Order by Chairperson

B. Roll Call

C. Approval of Minutes of Previous Meeting

D. Presentation of ~~Communications~~Correspondence

E. Brief Public Comments ~~on Non-Agenda Items~~

F. Public Hearings

G. Old Business

H. New Business

I. Reports

J. Extended Public Comments

K. Adjournment

Planning Commission meetings are meetings in public; the meetings are not meetings with the public. The Planning Commission shall ensure that the decision making process always occurs in public.

Public participation shall require that each individual identify the individual's name and address and speak to the Chairperson in an orderly fashion. The Chairperson may set reasonable limits upon public participation, subject to reversal by a proper vote of the Planning Commission.

3.6 PUBLIC HEARINGS.

The following rules of procedure shall apply to public hearings held by the Planning Commission:

A. Chairperson opens the public hearing and announces subject.

B. Chairperson summarizes the procedures/rules to be followed during the hearing.

C. Township Staff/Planner/Engineer/other consultants present their report and recommendation.

D. Applicant presents the main points of the application.

E. Persons wishing to speak during the public hearing are recognized.

F. Chairperson closes the public hearing.

To ensure that everyone has the opportunity to speak, the Chairperson may elect to limit the time permitted for each person to speak, except that the applicant may be permitted such time as the Chairperson allows. The Chairperson may also elect to allow persons to speak only once, until all persons have had the opportunity to speak, at which time the Chairperson, in the Chairperson's discretion, may permit additional comments.

All comments by the public, staff, and the Planning Commission shall be directed to the Chairperson.

3.7 RECORDS.

The records of the Planning Commission shall be considered public records subject to potential disclosure under the Freedom of Information Act, MCL 15.231 et seq. The Township Superintendent/Manager is responsible to respond to requests for information, unless otherwise directed by the Township Board.

3.8 MANDATORY DUTIES.

A. The Planning Commission shall perform the mandatory duties specified by statute. Some specific duties include the following:

1. The Planning Commission is responsible to make, adopt and maintain the Township's Master Land Use Plan, including maps, and the necessary descriptive materials.

2. The Planning Commission shall make reasonable restrictions on land that conforms with the Master Plan and provide for the best interests of the health, safety and general welfare of the Township's residents.

3. The Planning Commission shall make recommendations to the Township Board with regard to amendments to the Zoning Ordinance.

4. The Planning Commission shall review and take action on all site plans required by the Zoning Ordinance.

5. The Planning Commission shall annually prepare a capital improvements program of public structures and improvements, unless that duty is performed by the Township Board.

B. All decisions by the Planning Commission should be based upon the Master Plan, the standards contained within the Zoning Ordinance and the specific facts applicable.

C. The Planning Commission shall be assisted by the Township staff and such consultants as it may deem necessary, including, but not limited to, those for Planning, Engineering, and Legal assistance, in the performance of the duties of the Planning Commission.

D. The Superintendent/Manager, Community Development Director, and Consultants shall be responsible for the professional and administrative work in coordinating the functions of the Planning Commission.

E. The Superintendent/Manager and/or Community Development Director shall:

1. Supervise and review the work of Consultants and Township staff.

2. Accept applications for matters to be reviewed by the Planning Commission and ensure that such applications are complete.

3. Forward application materials to the Planning Commission at least four (4) days prior to the meeting at which such matters will be considered.

4. Inform the Planning Commission of administrative and enforcement actions taken on behalf of the Township related to the Zoning Ordinance, or other appropriate Ordinance.

F. Consultants shall perform the following duties, as directed by the Planning Commission, Township Board, or Township staff:

1. Attend Planning Commission meetings.

2. Consult with the Planning Commission, Superintendent/Manager, Community Development Director, and other Township officials concerning interpretation, procedural questions, and other matters arising from the Zoning Ordinance.

3. Prepare amendments to the Zoning Ordinance as directed by the Planning Commission.

4. Prepare and forward to the Superintendent/Manager and/or Community Development Director written reviews and recommendations, if appropriate, for requests and development proposals to be considered by the Planning Commission.

5. Meet with applicants, their representatives, and/or Township officials, as needed to properly perform project reviews.

6. Perform other duties as directed by the Township.

3.9 MASTER PLAN.

The Planning Commission may adopt the Plan in total or in parts corresponding to major geographical or topical sections. Approval of the Plan or any part shall require a proper vote of a majority of the members appointed and serving. An approving resolution must refer expressly to any maps, charts, plats or descriptive material intended to be part of the Plan and such supplementary material must be signed by the Chairperson as a notation of its inclusion in the Plan.

3.10 PLANNING COMMISSION REVIEW.

Once a Master Plan or a part thereof has been approved and certified, the Planning Commission must furnish its advice and recommendations regarding zoning matters to the Township Board in a prudent and responsible manner. The Planning Commission shall in general work toward the implementation of the Master Plan, unless conditions upon which the Master Plan is adopted have significantly changed.

SECTION IV

FISCAL ADMINISTRATION

4.1 BUDGET.

The Planning Commission may prepare a detailed budget for submission to the Township Board for approval, revision or rejection.

The Planning Commission shall work within the fiscal administration and budgetary policies and procedures established by the Township Board.

The Planning Commission staff shall inform the Planning Commission Chairperson if there arises a need for additional funds.

SECTION V

ADOPTION AND AMENDMENTS

5.1 These Bylaws and Rules shall be adopted and become operative when approved by two-thirds of the Planning Commissioners appointed and serving. These Bylaws and Rules may be amended at any time provided the Planning Commissioners have been provided with a written copy of the proposed amendments at least four (4) days prior to a meeting at which the amendments will be considered. Adoption of any amendment will require approval of two-thirds of the Planning Commissioners appointed and serving.

ATTESTATION

We, the Chairperson and Secretary of the Grand Haven Charter Township Planning Commission, certify that on August 7, 2017,~~June 1, 2009,~~ the Planning Commission duly approved these Bylaws and Rules.

_____

Chairperson, Bill Cousins

_____

Secretary