TOWN OF WAYLAND
MASSACHUSETTS
01778
BOARD OF APPEALS

TOWN BUILDING
41 COCHITUATE ROAD
TELEPHONE: (508) 358-3600
FAX: (508) 358-3606

ZONING BOARD OF APPEALS APPLICATION FOR HEARING

CASE #_____

LOCATION OF SUBJECT PROPERTY

# Street Name	Map	Parcel	Year Built
412 Commonwealth	49	064B	N/A

ZONING INFORMATION

R30
Zoning District

Overlay District (as applicable)

PASSIVE RECREATION / VACANT
Present Use

TURF FIELD
Proposed Use

	Required	Existing	Proposed
Lot Area			
Lot Coverage			
Frontage			
Building Height			
Front Yard Setbacks			
ROW Setbacks			
Side Yard Setbacks			
Rear Yard Setbacks			
Gross Floor Area	N/A		
% of Increase of Gross Floor Area	N/A	N/A	

Does the proposed project comply with § 193-4 Storm water and Land Disturbance ByLaw? ☒Yes ☐No

OWNER INFORMATION

Name TOWN OF WAYLAND Telephone Number_____

Address 41 COCHITUATE ROAD Email_____

APPLICANT INFORMATION (if different from owner information)

Name_____ Telephone Number_____

Address_____ Email_____

ATTORNEY/AGENT INFORMATION (if applicable)

Name_____ Telephone Number_____

Address_____ Email_____

SPECIFY REQUESTED BOARD ACTION

☒SPECIAL PERMIT ☐VARIANCE ☐OTHER (explain in narrative)

NARRATIVE (describe proposal and include supporting Zoning ByLaw(s))

attached

SIGNS (if applicable) see separate instruction sheet for additional required information

Business Name_____ Telephone Number_____

Address_____ Email_____

Type of Business_____ Hours of Operation_____

APPLICANT TO COMPLETE

I have submitted nine (9) sets, each including the following:

☒Application ☒Certified Plot Plan ☒Schematic Architectural Plans ☐Board of Health Approval

☒Narrative ☒List of Submitted Documents ☐Miscellaneous Additional Information

I hereby request a hearing before the Zoning Board of Appeals with reference to the above application, with supporting documentation submitted, and that the proposed work is authorized by the Owner of Records and I have been authorized by the owner to make this application as the agent. I hereby consent to the Building Commissioner and Zoning Board of Appeals members' entry upon the exterior areas of the premises for the purpose of viewing and inspecting the property, which is the subject of the application.

Authorized Agent/Owner [signature] Date 2/4/2021

OFFICE USE ONLY

Received By _____
Date _____
Fee Paid _____

Comments:

Received and Recorded by the Town Clerk:

[signature] 2-4-202

Signature of Town Clerk

A TRUE COPY ATTEST

[signature]

TOWN CLERK
TOWN OF WAYLAND

SPA FORM A
APPLICANT'S DETERMINATION THAT SITE PLAN REVIEW AND APPROVAL ARE/ARE NOT APPLICABLE

The applicant, by completing this form and *simultaneously* a "Planning Board Confirmation that Site Plan Review and Approval Are Not Applicable" (Form B), hereby makes a determination as to the applicability of site plan approval under the Zoning By-Laws, Section XA, to the proposed activity described herein. As required by the Site Plan Review and Approval Regulations, Section 4.B.1.a, one original and three copies of this completed Form A, together with any accompanying plans and materials, shall be submitted at the Planning Board Office, and one original shall be submitted simultaneously at the Building Commissioner's Office. Either of these offices can provide information, forms, and guidance with this process. One original of this Form A shall also be filed at the Town Clerk's Office at the time of submittal, with a receipt for said filing included as part of the Planning Board submittal. Attach additional materials and the "Supplemental SPA Form A" if desired.

1. Name, address, and telephone number of applicant(s):

   Town of Wayland.

   Louise Miller, Town Administrator 41 Cochituate Road, Wayland, MA 01778

   Phone: (508) 358-7701

2. Name, address, and telephone number of owner(s) of record (if different from applicant):

3. Name, address, and telephone number of design engineer(s)/surveyor(s)/architect(s):

   Weston & Sampson Engineers, Inc.,

   Attn: Brandon Kunkel 85 Devonshire Street, Third Floor, Boston, MA 02109.

   Phone: (617) 412-4480

4. Address, name, title, description, and/or other identification of proposed development/activity sufficient to locate the site on the ground and in the Town's files:

   Loker Conservation and Recreation Area

   412 Commonwealth Road, Wayland, MA 01778.

   Assessors Map/Plat Number: 49. Parcel/Lot Number: 064B

5. a. Will the proposed activity result solely in single or two-family residential, or owner-occupied multi-family, structures or use, or structures or uses accessory thereto? _____NO_____

   b. Is the proposed activity for structures or uses that will be subject solely to Sections IXA, IXB, or IXC of the Zoning By-Laws? _____NO_____

   If the answer to *either* of these two questions is "Yes" the proposed activity is exempt from site plan approval and an "Application for Site Plan Review and Approval" (Form C) is **not** required. If the answer to *both* of these questions is "No" the applicant must answer the following questions:

c. Will the proposed activity add one or more structures to a vacant site? ____NO____

d. Will the proposed activity, together with all increases previously authorized by site plan approval, or, if there is no previous site plan approval, together with all increases since the contruction of the original structure, increase the size of existing structures in total by the amount specified in the table in Section 2.A.2.c. of the Site Plan Review and Approval Regulations? ___NO___

e. Will the proposed activity "substantially alter areas of parking, loading, or vehicular access" as defined in Section 1.C.1. of the Site Plan Review and Approval Regulations? ___YES___

If the answer to *all* of these three questions is "No" the proposed activity is exempt from site plan approval and an "Application for Site Plan Review and Approval" (Form C) **is not required**, and the applicant shall obtain from and submit with this Form A at the Planning Board Office a "Planning Board Confirmation that Site Plan Review and Approval Are Not Applicable" (Form B). If the applicant chooses to proceed with the proposed activity before written Planning Board notification that site plan approval is not applicable, the applicant does so at his/her own risk. If the answer to *any* of these three questions is "Yes" site plan approval is applicable and an "Application for Site Plan Review and Approval" (Form C) **is required**.

6. Building Commissioner's verification, comments, and recommendation to the Planning Board: **On April 1, 2019 Building Commissioner G. Larsen submitted a memorandum to the Zoning Board of Appeals indicating that because the application includes A request for a special permit for illumination (Sports Lighting), that the Zoning Board of Appeals is the board of jurisdiction for the Site Plan Review. See §198-198 603.2**

Memo: https://www.wayland.ma.us/sites/g/files/vyhlif4016/f/pages/comments_from_the_building_commissioner_in_regards_to_spr_special_permit_illuminated_athletic_field.pdf

The Building Commissioner recommends that site plan approval ***IS NOT*** **IS** required.
Signature of Building Commissioner:_____Date:_____

Signature(s) and printed name(s) of applicant(s):
Louise Miller LOUISE MILLER Date: 2/2/2021
TOWN ADMINISTRATOR, TOWN OF WAYLAND Date:
Date:

SUPPLEMENTAL SPA FORM A
SUPPLEMENTAL SITE PLAN INFORMATION

1. Name, address, and telephone number of applicant(s):
   Town of Wayland.
   Louise Miller, Town Administrator 41 Cochituate Road, Wayland, MA 01778
   Phone: (508) 358-7701

2. Name, address, and telephone number of owner(s) of record (if different from applicant):

3. Address, name, title, description, and/or other identification of proposed development/activity sufficient to locate the site on the ground and in the Town's files:
   Loker Conservation and Recreation Area 412 Commonwealth Road, Wayland, MA 01778.
   Assessors Map/Plat Number: 49. Parcel/Lot Number: 064B

4. General information:

   a. Recording information for deed(s) of property (recorded in the South District Middlesex Registry of Deeds and/or Land Court; include copies of deeds):
   Book __31387__, page ___167__; or Land Court Cert. # _____

   b. Zoning district(s), and acreage for each district, in which the site is located:
   Zoning district:_____**R30**_____; Acreage:_____

   c. Information from Assessors Office: **Map #:____49___; Lot #:__064B__**

   d. Description and map of property locus and surrounding properties (include certified list of abutters within 300 feet of property lines of the site, shown on map):

   Loker Conservation and Recreation Area is located at the corner of Commonwealth Road and Rice Road. There is currently a paved access drive at 412 Commonwealth Road that is remnant of the site's previous use as a Dow Chemical company facility. The designated recreation area itself consists of a steeply sloped open field surrounded by wooded areas on all sides. North Pond is located north of the existing designated parking area and West and East Pond are located to the south, on either side of the access drive, north of Commonwealth Road.

   See enclosed Loker Conservation and Recreation Area Locus Map.

5. History of the use of the site:
   a. Past uses, as researched from readily obtainable sources (cite sources):

   This portion of the Loker Conservation and Recreation area land that is planned for redevelopment is about 5 acres of the 28.2 acres owned by the Town of Wayland. There is a deed restriction that the land only be used for conservation and recreation purposes, and specifies "not for the sale, lease, rental or use as a single-family, multi-family, or other type of temporary or permanent residence."

The Dow Chemical facility was built in 1962 and remained until 1989 when it was sold to New England Development Corporation (NED). NED conducted environmental tests and when contaminants were found in the soil and water, it began a "long and complex process to achieve environmental cleanup requirements established by the Massachusetts Contingency Plan, the state regulations that govern investigation and remediation of hazardous waste sites." Dow finished the cleanup process and the Town of Wayland purchased the property in 2000 for $1.7 million dollars.

In March 2000, a Class A-2 Response Action Outcome (RAO) Statement, concluding that a Permanent Solution had been achieved at the Site, was submitted to the MassDEP. Class A means that "remedial work was completed and a level of "no significant risk has been achieved." Class A is further subdivided into four categories where Class A-1 and Class A-2 require no AUL (Activity and Use Limitations). As a Class A-2, the Loker site has no AUL. "Class A-2" means "a permanent solution has been achieved. Contamination has not been reduced to background."

The area planned for redevelopment is defined in previous environmental reports as the area where several former buildings were previously located on-site including a main office building and laboratory building, a cooling tower building, a solvent storage shed, a garage and a small shed. The proposed area for athletic field redevelopment is limited to the area of the main office building on the western portion of the site.
The property has been reviewed by no less than 6 Licensed Site Professionals (LSP), most recently in February 2020.

b. Present use(s): The Site has been vacant for 20 years. Although designated for active recreation, the land is currently used for passive recreation such as dog-walking, hiking, and walking through informal trails located around and through the property's wooded Conservation area. A small parking lot, remnant from Dow, informally accommodates approximately 10 vehicles at the top of the access drive off Commonwealth Road.

c. All zoning variances granted, listed chronologically by case number, with brief description:
N/A

d. All special permits granted, listed chronologically by case number, with brief description:
N/A

e. If any part of the site is protected as a nonconforming use or structure, describe:
N/A

6. **Existing** site characteristics:

a. Total acreage of site (project area): **5.3 acres;** % of total acreage:**18%**

b. Total acreage in Flood Plain District: ____0__; % of total acreage:___0_

c. Total acreage in Aquifer Protection District: ____0__; % of total acreage:____0_

d. Total acreage in Watershed Protection District: ____0__; % of total acreage:____0_

e. Total acreage in wetlands and wetland buffer areas, as defined by MGLA Ch. 131, s. 40:
Wetlands: __0_____; % of total acreage: 0
Buffers: 1.35 acre; % of total acreage: **25.5**

f. Total acreage of legally dedicated open space: **5.3**; % of total acreage: **100**

7. **Existing** and **proposed** site improvements:

a. **Existing** structures, with name and total square footage of footprint and gross floor area of each: **N/A**

Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
GRAND TOTALS: Footprint area:_____; **Gross floor area**:_____

b. **Proposed** structures, with name and total square footage of footprint and gross floor area of each: **N/A**

Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
GRAND TOTALS: Footprint area:_____; **Gross floor area**:_____

c. Total square footage and number of spaces by type of **existing** parking:

Area: 4,400 sf; Spaces: Approx. 10 (undefined)

d. Total square footage and number of spaces by type of **proposed** parking:

Area: 22,820 sf; Spaces: 62 (59 standard, 3 handicap)

e. Describe **existing** and **proposed** materials used for any impermeable surfaces:
Existing: There is currently a deteriorated asphalt pavement access drive at Commonwealth Road that leads to an informal asphalt pavement parking area. There are also abandoned asphalt pavement drives and parking areas remaining on the property. All are remnants from the site's previous use as a Dow Chemical facility. Additionally, an abandoned asphalt drive still remains.
Proposed: The proposed parking area will replace, expand, and provide three (3) ADA compliant parking spaces and 59 standard spaces for a total of 62 parking spaces to support both the new athletic field and the conservation area. An ADA accessible asphalt pavement pathway will connect the parking lot to the new athletic field. For maintenance and emergency vehicular access only, a portion of the abandoned asphalt drive will be replaced with a reduction in width from 22'-0" to 12'-0".

f. Describe **existing** and **proposed** access to the site:

The existing access drive from Commonwealth Road will be refurbished in place including mill and overlay of asphalt pavement, resetting of curb, and adding new curb (approximately 300') to the proposed parking lot. The location of the access drive will not change.

8. Have sewage disposal and drainage impacts been filed with Board of Health? If no, explain, including date to be filed. If yes, attach copy of said filing and summarize said impacts here:

N/A. There are currently no restrooms facilities existing on site and no restroom facilities are being proposed. Other outdoor recreational venues in Wayland utilize seasonal temporary toilets serviced regularly and permitted by the Wayland Health Department.

Signature(s) and printed name(s) of applicant(s):

[signature] LOUISE MILLER Date: 2/2/2021
TOWN ADMINISTRATOR, TOWN OF WAYLAND
_____ Date: _____
_____ Date: _____

Signature(s) and printed name(s) of Owner(s) of record, if different:

_____ Date: _____
_____ Date: _____
_____ Date: _____

SPA FORM C
APPLICATION FOR SITE PLAN REVIEW AND APPROVAL

Application is hereby made for site plan review and approval under the Zoning By-Laws, Section XA. As required by the Site Plan Review and Approval Regulations, Section 4.B.1.b, the applicant shall submit one original and ten copies of this Form C at the Planning Board Office, together with one original and five copies of all plans and other required materials. One copy of this From C shall be filed at the Town Clerk's Office at the time of said submittal, with a receipt for said filing included as part of the Planning Board submittal. The information on this Form C shall be shown on the site plan. Attach additional pages if necessary.

1. Name, address, and telephone number of applicant(s):
   Town of Wayland
   Louise Miller, Town Administrator 41 Cochituate Road, Wayland, MA 01778
   Phone: (508) 358-7701
2. Name, address, and telephone number of owner(s) of record (if different from applicant):
3. Name, address, and telephone number of design engineer(s)/surveyor(s)/architect(s):
   Weston & Sampson Engineers, Inc.,
   Attn: Brandon Kunkel 85 Devonshire Street, Third Floor, Boston, MA 02109.
   Phone: (617) 412-4480
4. Name, title, and/or other identification of proposed development/activity:
   Loker Conservation and Recreation Area, 412 Commonwealth Road, Wayland, MA 01778. Assessors Map/Plat Number: 49. Parcel/Lot Number: 064B
5. Other information:
   a. Recording information for deed(s) of property (recorded in the South District Middlesex Registry of Deeds and/or Land Court; include copies of deeds):
      Book 31387, page 167; or Land Court Cert. # _____
   b. Zoning district(s), and acreage for each district, in which the site is located:
      Zoning district: R30; Acreage: _____
   c. Information from Assessors Office: Map #: 49; Lot #: 064B
   d. Description and map of property locus and surrounding properties (include certified list of abutters within 300 feet of property lines of the site, shown on map):

      Loker Conservation and Recreation Area is located at the corner of Commonwealth Road and Rice Road. There is currently a paved access drive at Commonwealth Road that is

remnant of the site's previous use as a Dow Chemical company facility. The designated recreation area itself consists of a steeply sloped open field surrounded by wooded areas on all sides. North Pond is located north of the existing designated parking area and West and East Pond are located to the south, on either side of the access drive, north of Commonwealth Road.

See Enclosed Loker Conservation and Recreation Area Locus Map

e. Other permits, licenses, approvals, etc. required prior to commencement of construction:

Special permit: **ILLUMINATION**	__Y__
Variance:	__N__
Subdivision approval not required under MGLA Ch. 41, s. 81P:	__N__
Subdivision approval under MGLA Ch. 41, s. 81U:	__N__
Conservation Commission order of conditions:	__Y__
Board of Health construction works permit:	__N__
Massachusetts Environmental Protection Act (MEPA) review:	__N__
Massachusetts Highway Department curb cut permit:	__N__
All other required permits, licenses, approvals, etc.:	

Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____
Type:_____; Issuing authority:_____

e. Describe the timing of all permit, etc. applications listed in paragraph d. above (include copies of all permits already obtained):

Applications have been filed with the Conservation Commission related to Wetlands and Water Resources Protection (Chapter 194) and one for Stormwater and Land Disturbance (Chapter 193). The Conservation Commission held public hearings on this project between August 2, 2018 and April 25, 2019 and (twice) was unable to come to a majority decision. A new application for the Loker project has been made to the Conservation Commission to seek approval and obtain permits before any construction can begin, this is scheduled to be heard in early 2021.

6. History of the use of the site:

a. Past uses, as researched from readily obtainable sources (cite sources):

Redevelopment is about 5 acres of the 28.2 acres owned by the Town of Wayland. There is a deed restriction that the land only be used for conservation and recreation purposes, and specifies "not for the sale, lease, rental or use as a single-family, multi-family, or other type of temporary or permanent residence."

The Dow Chemical facility was built in 1962 and remained until 1989 when it was sold to New England Development Corporation (NED). NED conducted environmental tests and when contaminants were found in the soil and water, it began a "long and complex process to achieve environmental cleanup requirements established by the Massachusetts Contingency Plan, the state regulations that govern investigation and remediation of hazardous waste sites." Dow finished the cleanup process and the Town of Wayland purchased the property in 2000 for $1.7 million dollars.

In March 2000, a Class A-2 Response Action Outcome (RAO) Statement, concluding that a Permanent Solution had been achieved at the Site, was submitted to the MassDEP. Class A means that "remedial work was completed and a level of "no significant risk has been achieved." Class A is further subdivided into four categories where Class A-1 and Class A-2 require no AUL (Activity and Use Limitations). As a Class A-2, the Loker site has no AUL. "Class A-2" means "a permanent solution has been achieved. Contamination has not been reduced to background."

The area planned for redevelopment is defined in previous environmental reports as the area where several former buildings were previously located on-site including a main office building and laboratory building, a cooling tower building, a solvent storage shed, a garage and a small shed. The proposed area for athletic field redevelopment is limited to the area of the main office building on the western portion of the site. The property has been reviewed by no less than six Licensed Site Professionals (LSP), most recently in February 2020.

b. Present use(s):

Although designated for active recreation, the site is currently used for passive recreation The Site has been vacant for 20 years. Although designated for active recreation, the land is currently used for passive recreation such as dog-walking, hiking, and walking through informal trails located around and through the property's wooded Conservation area. A small parking lot, remnant from Dow, informally accommodates approximately 10 vehicles at the top of the access drive off Commonwealth Road.

c. All zoning variances granted, listed chronologically by case number, with brief descriptions of each: **N/A**

d. All special permits granted, listed chronologically by case number, with brief descriptions of each: **N/A**

e. If any part of the site is protected as a nonconforming use or structure, describe: **N/A**

f. If any part of the site is part of an approved subdivision under MGLA Ch. 41, name of subdivision and date of approval:
Name:_____Date of approval: _____

7. **Existing** site characteristics:

a. Total acreage of site (project area): 5.3 acres; % of total acreage: 18.79%

b. Total acreage in Flood Plain District: __0__; % of total acreage: __0_

c. Total acreage in Aquifer Protection District: __0__; % of total acreage: __0_

d. Total acreage in Watershed Protection District: __0__; % of total acreage: __0_

e. Total acreage in wetlands and wetland buffer areas, as defined by MGLA Ch. 131, s. 40:

Wetlands: __0__; % of total acreage: __0_

Buffers: __1.35__;% of total acreage: 22.5

f. Total acreage of legally dedicated open space: 5.3 acres; % of total acreage:100%

8. **Proposed** site characteristics:

a. Total acreage of site (project area): 5.3 acres

b. Total acreage in Flood Plain District: ____0__; % of total acreage:___0_

c. Total acreage in Aquifer Protection District: ____0__; % of total acreage:____0_

d. Total acreage in Watershed Protection District: ____0__; % of total acreage:____0_

e. Total acreage in wetlands and wetland buffer areas, as defined by MGLA Ch. 131, s. 40:
Wetlands: __0__; % of total acreage: 0
Buffers: __1.35__; % of total acreage: 22.5

f. Total acreage of legally dedicated open space: ___5.3_; % of total acreage: 100

9. **Existing** and **proposed** site improvements:

a. **Existing** structures, with name and total square footage of footprint and gross floor area of each:

Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
GRAND TOTALS: **Footprint area**:_____; **Gross floor area**:_____

b. **Proposed** structures, with name and total square footage of footprint and gross floor area of each:

Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
Name:_____;Footprint area:_____; Gross floor area:_____
GRAND TOTALS: **Footprint area**:_____; **Gross floor area**:_____

c. Total square footage and number of spaces by type of **existing** parking:
Area:___4,400sf_____; Spaces: Approx. 10 (undefined)

d. Total square footage and number of spaces by type of **proposed** parking:
Area:___22,820sf_____; Spaces: 62 (59 standard, 3 handicap)

e. Describe **existing** and **proposed** materials used for any impermeable surfaces:

Existing: There is currently a deteriorated asphalt pavement access drive at Commonwealth Road that leads to an informal asphalt pavement parking area. There are

also abandoned asphalt pavement drives and parking areas remaining on the property. All are remnants from the site's previous use as a Dow company facility. Additionally, an abandoned asphalt drive still remains.

Proposed: The proposed parking area will replace, expand, and provide three (3) compliant ADA parking spaces and 59 standard spaces for a total of 62 parking spaces for both the new athletic field and the conservation area. An ADA accessible asphalt pavement pathway will connect the parking lot to the new athletic field. For maintenance and emergency vehicular access only, a portion of the abandoned asphalt drive will be replaced with a reduction in width from 22'-0" to 12'-0".

f. Method of sewage disposal and summary of drainage impacts:

Sewage disposal: **N/A.** The existing site and proposed improvements do not have any sewage disposal implications.

Summary of drainage impacts: A stormwater report was filed with the Conservation Commission as part the Notice of Intent (NOI). The summary of impacts are as follows:

General:
Due to the increased need for town athletic facilities, the Town of Wayland is proposing the installation of a multi-purpose athletic field within the Loker Conservation and Recreation Area. The project includes field installation, field lighting, parking lot, and a stormwater management system. There will be improvements to the existing emergency access road. The goal of this project is to utilize the Loker Conservation and Recreation Area to provide the Town of Wayland with a multi-purpose athletic field. Currently there is existing mowed grass open space on the property. Maximizing the area of the grass open space and expanding only to the limits required by the field and emergency access drive allows sufficient area for the proposed athletic field. There is also an existing parking lot that will also be replaced to allow for additional parking. Additional improvements include field lighting. The existing emergency access road will also be replaced and reduced to allow for service and emergency access only. All other existing miscellaneous paved areas will be removed.

No New Untreated Discharges
The proposed project will create no new untreated discharges. Total impervious area post-development will increase by approximately 6% within the proposed limit of work.

Peak Rate Attenuation
Both existing and proposed conditions were modeled using HydroCAD computer software. The proposed design is such that peak runoff rates do not exceed rates of runoff under existing conditions even in the 100-year storm scenario. For regulatory purposes the existing site condition serves as the benchmark for peak discharges that must not be exceeded under the re-developed condition. Peak discharges are mitigated by using the proposed underground chambers to provide stormwater detention benefit.

To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction. These measures will include compost filter tubes, catch basin protection, and a stabilized construction entrance, as depicted on the site plans.

Recharge

Overall, the site is being redeveloped such that the increase in impervious area under proposed conditions will be minimal in comparison with existing conditions as the site is redeveloped. As such, stormwater recharge has been provided to the maximum extent practicable. Recharge Volume has been calculated based on the amount of impervious area contributing runoff to the underground chambers.

Water Quality

As discussed under Standard 3, this is a redevelopment project. Stormwater Quality treatment is being provide to the maximum extent practicable. Treatment will be provided for the parking lot area, which is where the increased impervious area occurs. Runoff from the existing parking lot area does not presently undergo treatment, but under proposed conditions runoff from this area will be directed through deep sump hooded catch basins and into the underground stormwater chambers. All of the stormwater from impervious areas on the site will undergo treatment to bring TSS levels within regulated limits (>80% removal). During construction of the project, appropriate temporary stormwater BMPs will be used to minimize sedimentation and soil erosion.

Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

The project is a mix of new development and redevelopment. The standards for redeveloped areas have been met to the maximum extent practicable.

Construction Period Pollution Prevention and Erosion and Sediment Control

To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction. These measures will include compost filter tubes, silt fence, catch basin protection, and a stabilized construction entrance.

g. Describe **existing** and **proposed** access to the site:

The existing access drive from Commonwealth Road will be refurbished in place including mill and overlay of asphalt pavement, resetting of curb, and adding new curb (approximately 300') to the proposed parking lot. The location of the access drive will not change.

10. Submit the following written documents and materials:

a. List of and justification for requested waivers: Date rec'd:_____

N/A

b. Drainage calculations: Date rec'd:_____; Waived:_____

See enclosed stormwater report. Revised on 09/10/2018 after peer reviewed by independent third-party.

c. Statement of water resources impacts: Date rec'd:_____; Waived:_____

See enclosed stormwater report.

d. Statement of landscape impacts: Date rec'd:_____; Waived:_____

See enclosed stormwater report for.

e. Statement and report of traffic impacts: Date rec'd:_____; Waived:_____

See enclosed traffic evaluation from October 31, 2018, which was peer reviewed by an independent third-party in November 2018.

f. Statement of waste disposal impacts: Date rec'd:_____; Waived:_____

N/A

g. Receipt from Town Clerk: Date rec'd:_____; Waived:_____

h. Fee: Amount:_____; Date rec'd:_____; Waived:_____

I hereby request site plan approval under the Zoning By-Laws, Section XA:

Signature and printed name of applicant(s):

Louise Miller LOUISE MILLER Date: 2/2/2021
TOWN ADMINISTRATOR, TOWN OF WAYLAND
_____ Date:_____
_____ Date:_____

Signature and printed name of Owner(s) of record, if different:

_____ Date:_____
_____ Date:_____
_____ Date:_____

Form C received by (signature):_____ Date:_____
Printed name:_____

SITE PLAN REVIEW AND APPROVAL

SPA Form B
Planning Board
Confirmation that Site Plan
Approval Is Not Applicable

Name of applicant: TOWN OF WAYLAND

Address of applicant: 412 COMMONWEALTH ROAD

Date of submittal of this Form B: 1/25/2021

The Planning Board, after review of the Applicant's Determination that Site Plan Review and Approval Are/Are Not Applicable (Form A) submitted by the applicant named above, has determined by majority vote that the requirements of the Zoning Bylaws, Article 6, Site Plan Approval, do not apply to the proposed development and/or activities described in said Applicant's Determination that Site Plan Review and Approval Are/Are Not Applicable (Form A).

Signature, Planning Board Chairman/Agent: _____ Date: _____

Confirmatory signature, Chairman: _____

cc: Board of Health
Building Commissioner
Zoning Board of Appeals
Conservation Commission
Town Clerk

TOWN OF WAYLAND
MASSACHUSETTS
01778
BUILDING DEPARTMENT

Geoffrey S. Larsen, CFM
Building Commissioner

TOWN BUILDING
41 COCHITUATE ROAD
TELEPHONE: (508) 358-3600
FAX: (508) 358-3606

Mr. Jonathan Sachs, Chairman ZBA
C/o Building Department
41 Cochituate Road
Wayland MA, 01778

April 1, 2019

Re: 412 Commonwealth Road, ZBA case 18-27, SPR w/special permit, illuminated athletic field.

Dear Board members,

I have reviewed the Town of Wayland Recreation Commission's ZBA application for site plan review that includes a special permit for the illumination of the athletic field (see §198-501.2). I understand that this field is intended for multi-use sport activities.

As the zoning enforcement officer I would offer the following:

1. A Town use, specifically a recreation/park use is permitted by right in a R-30 zoning district though site plan approval is required (see Table of permitted uses, use lines #23 and #37)

2. It is reasonable to determine that the use of the proposed Town owned and operated, illuminated, athletic "turf" field by both Town and private organizations would continue to be defined as a Town use as it relates to zoning (see zoning definitions for both RECREATION/PARK and TOWN §198-104).

3. Because of the applicant's request for a special permit from the ZBA, the board of jurisdiction for site plan review is the ZBA (see §198-198-603.2).

4. Town zoning anticipates that the ZBA shall give due consideration to the Planning Board's 2.26.19 memo and is obliged to submit to the Planning Board in writing "justifications" if the ZBA decision deviates from the Planning Board's findings and recommendations (see §198-604.6 and 604.7).

5. No building permit related to the proposed site work may be issued until all the conditions of a ZBA decision have been satisfied (see §198-205.3).

Respectfully,

Geoffrey S. Larsen
Building Commissioner

Cc: gsL

2019 APR -1 PM 6:54
TOWN OF WAYLAND
BUILDING DEPT.
ZONING DEPT.

85 Devonshire Street, 3rd Floor, Boston, MA 02109
Tel: 617.412.4480

MEMORANDUM

TO: Zoning Board of Appeals

FROM: Brandon Kunkel, Team Leader

DATE: February 26, 2019

SUBJECT: Improvements to Loker Conservation and Recreation Area

By-Law 198-606.2 Compliance

The Town of Wayland and its Recreation Department, like many communities in the Commonwealth of Massachusetts, is currently faced with a deficit of rectangular shaped, multi-use athletic fields and is striving to meet the current and future demands and needs of the Town's sports and recreational programs. As such, Weston & Sampson, in collaboration with the Town of Wayland, is working toward the installation of a new synthetic turf, multipurpose rectangular field within the designated recreational use zone of the Loker Conservation and Recreation Area (the Site) located at 410 Commonwealth Road, to benefit and support the recreational programs. The proposed improvements to the parcel will provide the Town of Wayland's Recreation Department with a new 195 x 300 foot synthetic turf multi-purpose sports and recreation field with lighting and a 62 space parking lot with pedestrian scale lighting to allow for expanded field use during evening hours.

In accordance with Town of Wayland's Planning Board procedures and the Zoning Board of Appeals, Weston & Sampson has identified how the Site complies with the standards and criteria set forth in By-Law 198-501.2, Signs and Exterior Lighting and 198-606.2.1 through 606.2.10, Site Plan Approval as described below.

By Law 198-501.2, Signs and Exterior Lighting

There are four total sports light fixtures being proposed to provide continuous illumination and include shields to completely cut off and diffuse glare beyond that of the property line, including the Commonwealth Road and Rice Road rights-of-way and adjacent abutters. The sport light fixtures are a Total Light Control (TLC) LED system designed by the manufacturer specific to the Loker property. TLC allows for precise control of the optics and allows a high percentage of the light being placed directly onto the field envelope and significantly cut off any impact to the surrounding area beyond the field itself.

A photometric diagram and glare study have been included for the sport light fixtures herein, and to the Planning Board and Zoning Board of Appeals on January 22, 2019 for your reference. You will note, that the photometric indicate a minimal light spill to the greatest extent possible and 0.0-foot candles and no glare casting outside of the property limits. The software used to generate the photometric plan does not account for the dense forest vegetation surrounding the Loker property and we believe this further reduces the potential for seeing the lights when in use. The project will also include 10 total pedestrian walkway, parking lot and roadway fixtures that will provide safety lighting beyond the field footprint. The proposed light fixtures are approximately 20-foot height.

The proponent is seeking a special permit form the Zoning Board of Appeals under provision 198-203 of the Town of Wayland By-laws for the sport light fixtures.

By-law 198-606.21-606.2.10, Site Plan Approval:

Standard (1): Integration into the existing terrain and surrounding landscape.

A. Minimize the use of wetlands, steep slopes, floodplains and hilltops.
   Making use of and optimizing existing topographic constraints and elevation changes throughout the designated recreational zone, the multi-purpose field and parking lot are nestled within the existing site to the greatest extent possible. Attempts have been made to minimize land disturbance and tree removal without impacting wetlands and prevailing steep slopes. The field is located atop an existing knoll on a north/south orientation that allows the field to take advantage of the existing, mostly flat lawn area, that was previously the location of a DOW Company building. The orientation is also optimal for rectangular field sports as it relates to solar glare. The parking lot is located downhill from the field in an area that has previously served as a parking area. While the field is located atop the knoll, it is not advantageous to significantly cut the elevation of the hill as geotechnical findings have confirmed the presence of ledge located at a variety of depths throughout the field limits. Ledge removal would have a negative impact on the project cost and feasibility. In addition, the removal or cutting of the existing hill would substantially increase tree removal beyond beyond the extent needed to construct the field. There are locations throughout the field footprint that will require imported fill material to raise the elevation of the side slopes. In field perimeter locations where it is not feasible to transition to existing elevations without significantly impacting adjacent natural features, including trees, wetlands and designated conservation land, segmental block walls shall be placed to minimize land disturbance and meet existing elevations. This strategy (use of block walls) reduces the extent of work within 100-foot buffer zone and allows the project to remain outside the limits of the 30' No Disturbance Zone.

B. Preserve natural and historic artifacts
   The orientation of the field and parking lot in combination with the proposed design elevations do not impact the known historically sensitive locations throughout the Site. A site plan overlay was generated to show the relationship of site improvements to known or expected artifact locations and this confirmed that there are no impacts. The site plan overlay was submitted to the Planning Board on January 18, 2019. The Town has agreed to provide an Archeologist and Historical Monitor during construction.

C. Maximize the retention of open space.

The compact footprint of both the multi-purpose field and parking lot, in addition to making use of the already developed driveways that exist on site today, minimize the disturbance of open space beyond the footprint of the field and parking lot. It should also be noted that the field will continue to serve as open space from a recreation perspective and the parking area has been developed within areas that were never restored to a naturalized condition following removal of the Dow Chemical building. The proposed parking lot will also serve the greater Town of Wayland community and provide parking for conservation land and trail users.

D. Preserve scenic views

The nestling of the field and parking lot into the natural topography as previously noted, allows for the substantial, well established forest buffer along Commonwealth Road and Rice Road to remain in place as it is today. During the anticipated high use months by recreational programs, typically April through October, the forest surround will provide a thickly vegetated screen to adjacent properties and roads and it is not anticipated that the views will be altered dramatically from the perimeter of the property. Also, many might suggest that interior views will be improved through the removal of invasive vegetation and former Dow Chemical facility remnants and with the planting of considerable new native vegetation.

E. Minimize tree, vegetation and soil removal, blasting and grade change

While a substantial quantity of trees is anticipated to be removed within the project area, every effort was made to minimize tree removal beyond the envelope of work by using segmental block retaining walls and 3:1 slopes that allow for short transitions back to existing elevations. Only 14 total trees scheduled to be removed as part of the site demolition and clearing are greater than 24-inch diameter breast height (dbh).

F. Screen objectionable features from adjacent properties and roadways

As noted in item D above, there are significant and well-established trees and thick understory vegetation buffer that is to remain in place between Commonwealth Road and Rice Road and the designated conservation land. There are four light poles associated with the multi-purpose field that will have fixtured mounted at a 66-foot height above finished grade. We believe that the mature forest, dense understory vegetation and the upward angle of any view corridor from Commonwealth Road, Rice Road and adjacent abutters reduces the potential of a pole to be visually intrusive with glimpses of them available from limited locations during late spring, summer and early fall seasons. In seasons where vegetation may not be as prominent, such as late fall and the winter months, the use of the fields would be reduced or stopped completely given the anticipated programming of the field. The project has made every effort to screen the poles and fixtures from public view and takes advantage of the mature tree buffer that surrounds the field.

Standard (2): Adequate water supply and sewer system.

The proposed project improvements do not require water or sewer service. Portable restroom facilities will be provided on a seasonal schedule by the Recreation Department and serviced through an outside vendor contract, as is done for all recreation playing fields.

Standard (3): Pollution prevention of surface water, groundwater and minimize erosion and sedimentation. Maximize groundwater recharge and prevent any increase in the rate and volume of runoff.

The stormwater design calls for the collection and recharge of groundwater within the limits of the synthetic turf multipurpose field. The field design includes a robust subsurface network of lateral drains, collector pipes and drainage stone. The stone and pipes serve as storage and overflow relief of rainwater during large storm events and tie into a subsurface chamber infiltration system downstream, located below the parking lot. The parking lot utilizes deep sump catch basins to collect and treat stormwater runoff and discharge into the chambers. The chambers will store and mitigate the release of peak flow and stormwater velocity at the existing downstream outfall located at East Pond and West Pond adjacent to Commonwealth Road. Throughout construction, industry standards for erosion and sediment control shall be implemented and maintained by the contractor. The stormwater design for Loker was vetted by an independent third party, whom was engaged by the Town of Wayland's Conservation Commission in the Fall of 2018, as part of the Massachusetts Wetland Protection Act's Notice of Intent application process.

As previously noted, there is the potential for substantial ledge to be encountered in portions of the field and throughout other portions or the site. As such, while the intention is to infiltrate as much stormwater as possible, we believe it is best practice to include the robust network of lateral and collector pipes below the field combined with the subsurface chamber system to protect proposed and existing site features and facilities and to mitigate peak discharge and flow during large storm events as identified in the stormwater design report.

Standard (4): Minimize demands placed on Town services and infrastructure.

The project program does not require sanitary sewer or water services and therefor will not place a demand on the Town's infrastructure. The stormwater design meets the Massachusetts Department of Environmental Protection's guidelines and does connect into the Town's stormwater infrastructure of pipes and outfalls to the existing wetlands located at East Pond and West Pond following treatment. New electrical service is being provided. The power requirements are limited to the field and parking lot light fixtures and this service is being provided by a private utility, not the Town of Wayland. The field user fees will offset the electricity used and not Town of Wayland tax dollars. Highly efficient LED are to be used requiring less energy to operate. The new Loker Conservation and Recreation Area field will also alleviate considerable use demands currently placed on other Recreation Department and Town assets because of the current multi-use field deficit.

Standard (5): Provide safe vehicular and pedestrian movement within the site and adjacent ways.

Within the project limits, a pedestrian sidewalk connection from the parking lot to the field is included within the design. The sidewalk will meet ADA and MAAB requirements with cross slopes no greater than 2% and less than 5% as it traverses the slope from the parking to the field. A pedestrian drop-off zone and stairway are included at the parking lot and this provides a direct and convenient route to the field for users and visitors.

As there is not an existing network of sidewalks at Commonwealth Road or Rice Road, and existing wetland boundaries flank the existing entrance drive, it was deemed ineffective to provide a sidewalk from Commonwealth Road to the parking lot and field. Taking into consideration the traffic demands on Commonwealth Road and the geographic location of the

site itself within the Town, it is unlikely that pedestrians would travel to the site and most users are expected to arrive by vehicle.

A traffic study was performed by Weston & Sampson and vetted by a third-party consultant retained by the Planning Board in December of 2018. As the existing vehicular access to Loker is to remain in place at Commonwealth Road, the projected vehicle trip increase to the site will have negligible impacts to Commonwealth Road and the intersection at Rice Road. The traffic analysis does identify measures that the Town might separately (from this project) consider deploying to improve the overall traffic rating along Commonwealth Road.

Standard (6): Buildings, structures and landscaping shall be in harmony with the prevailing character and scale of the zoning district.

The project does not include a building or structure. The landscaping pallet includes a mix of native deciduous trees, shrubs and a New England conservation ground surface seed mix. The conservation seed mix is hardy and tailored to provide erosion control and wildlife habitat value. The shrubs were selected for their wildlife value also as they will produce small fruits and seeds throughout the year and support the wildlife within and near to the project site and larger parcel.

Standard (7): Electric, telephone, cable television and other utilities on the site to be placed underground.

All infrastructure for the electrical utility will be placed below ground and not impact views or aesthetics of the natural surroundings. Please note, as part of providing power to the site, one new utility pole and mounted transformer will be located at Commonwealth Road and the existing access driveway. The electric power will be "dropped" into the ground at that utility pole and then traverse to the project area to support pedestrian and field sports lighting systems. No other utilities are included within the scope of the project.

Standard (8): Storage areas, machinery, service areas, truck loading areas, utility buildings and structure to be setback and or screened to the extent feasible.

There are no storage buildings or service areas included within the project. The seasonal restrooms will be screened on three sides by an 8-foot height solid wood slat fence. The project does include an open-air field equipment storage component, to stow such things as soccer goals and other sports related equipment. This is located approximately 60-feet away from the Rice Road right-of-way. The 50-foot wide, heavily wooded, conservation easement that separates the project area from Rice Road will screen the storage area from view.

Standard (9): Minimize shadow cast on adjacent properties in residential zoning districts.

As the project does not include any structures it is not anticipated that any shadow cast would be generated onto adjacent properties. The nearest residential abutter located on Thompson Road is approximately 365-feet from the limits of the multi-purpose field footprint within the site.

Standard (10): No unreasonable glare from lighting onto roads and other ways, to the night sky or onto adjacent properties in residential zoning districts.

As noted previously, A photometric diagram and glare study were provided for the sport light fixtures to the Planning Board and Zoning Board of Appeals on January 22, 2019. You may note, that the light fixtures being proposed are Total Light Control (TLC) fixtures and include cut off shields to minimize light spill to the greatest extent possible. The photometric plans indicate 0.0-foot candles and no glare casting outside of the property limits. The software used to generate the photometric plan does not account for the dense forest vegetation surrounding the Loker property and we believe this further reduces the potential for seeing the lights when in use.

Project proponents hope that Zoning Board of Appeals members will concur with the design approaches to this project. We look forward to presenting the project to you on March 26, 2019 and engaging in a productive conversation about the merits and benefits of this project for the Town and its residents.

Please forward any questions or comments in advance of the hearing date, so that we might respond accordingly.

Sincerely,

Brandon Kunkel
Team Leader

Attachments:

- *Sport Light Photometric Plan*
- *Improvement to Loker Conservation and Recreation Area Bidding Documents, dated February 28, 2019*

LTRHD v Sept 2019

Town of Wayland

41 COCHITUATE ROAD
WAYLAND MASSACHUSETTS 01778
www.wayland.ma.us TEL. 508-358-3788

OFFICE STAFF
Bruce Morgan MAA, Director of Assessing
Matthew Lanefski, MAA, Assistant Assessor
Mary-Ann Wohlfarth, Sr. Admin. Coordinator

BOARD OF ASSESSORS
Jayson Brodie, Chair
Zachariah Ventress, Vice Chair
John A. Todd
Molly Upton

WAYLAND ASSESSORS
RCVD 2021 FEB 4 PM12:08

Certification of Abutters

Date of request 1/20/2021

Please plan your submission accordingly. The Assessors' office has 10 business days to certify an abutters list Per MGL Ch. 66, S.10

Address to be certified 418 (414) COMMONWEALTH RD Parcel ID 49 064B (Map/Lot)

Owner's Name (PLEASE PRINT) TOWN OF WAYLAND

Owner's Mailing Address 41 COCHITUATE RD

Name of Applicant (PLEASE PRINT) K. BRENNA Telephone: 68064

41 COCHITUATE ROAD (Mailing Address of Applicant) WAYLAND (City/Town) MA (State) 01778 (Zip)

Signature of Applicant

Reason for List (check one) ☒ Conservation (100ft) ☐ Health ☒ Planning ☒ Zoning (500ft) ☐ Board of Selectmen

****Please check with the Board/Commission for their guidelines regarding the number of feet required for notification. Each Board/Commission has its own regulations for their abutters listing. There's no fee for certification, however the list/s of abutters must be provided by the person or company requesting certification.**

For use by Assessors

This is to certify that at the time of the last assessment for taxation made by the Town of Wayland, the names and addresses are the assessed owners to these parcels.

Certified By: Mary-Ann Wohlfarth Date: 2/9/2021

CC: ☒ Conservation ☐ Health ☒ Planning ☒ Zoning ☐ Board of Selectmen

500 foot Abutters List Report

Wayland, MA
February 02, 2021

Subject Property:

Parcel Number:	49-064B	Mailing Address:	TOWN OF WAYLAND
CAMA Number:	49-064B		41 COCHITUATE RD
Property Address:	414 COMMONWEALTH RD		WAYLAND, MA 01778

Abutters:

Parcel Number:	48-092	Mailing Address:	COOLEY NICHOLAS M CUGINI STACEY T/E
CAMA Number:	48-092		9 THOMPSON ST
Property Address:	9 THOMPSON ST		WAYLAND, MA 01778
Parcel Number:	48-093	Mailing Address:	STACK FAMILY REVOCABLE TRUST LLC
CAMA Number:	48-093		26 RICE ROAD
Property Address:	26 RICE RD		WAYLAND, MA 01778
Parcel Number:	48-094	Mailing Address:	DICARLO LEONARD J JUDITH ANN DICARLO
CAMA Number:	48-094		24 RICE RD
Property Address:	5 ELIZABETH RD		WAYLAND, MA 01778
Parcel Number:	48-094A	Mailing Address:	DICARLO LEONARD J T/E DICARLO TERRI
CAMA Number:	48-094A		7 ELIZABETH RD
Property Address:	7 ELIZABETH RD		WAYLAND, MA 01778
Parcel Number:	48-094B	Mailing Address:	SEBASTIANELLI MARISA LYNN T/E SEBASTIANELLI DAVID CHANDLER
CAMA Number:	48-094B		8 ELIZABETH RD
Property Address:	8 ELIZABETH RD		WAYLAND, MA 01778
Parcel Number:	48-095	Mailing Address:	SPLLAINE ERIN E
CAMA Number:	48-095		28 RICE RD
Property Address:	28 RICE RD		WAYLAND, MA 01778
Parcel Number:	48-095A	Mailing Address:	LI XIANGPING FU YINENG
CAMA Number:	48-095A		30 RICE ROAD
Property Address:	30 RICE RD		WAYLAND, MA 01778
Parcel Number:	48-098	Mailing Address:	TOWN OF WAYLAND CONSERVATION
CAMA Number:	48-098		41 COCHITUATE ROAD
Property Address:	396 COMMONWEALTH RD		WAYLAND, MA 01778
Parcel Number:	48-099	Mailing Address:	YAKHKIND MIKHAIL & VICTORIA TRUSTEES THOMPSON STREET 2
CAMA Number:	48-099		REALITY TRUST
Property Address:	2 THOMPSON ST		2 THOMPSON ST
			WAYLAND, MA 01778
Parcel Number:	48-099A	Mailing Address:	SHEIN, DAVID M.
CAMA Number:	48-099A		AINBINDER, MEREDITH L.
Property Address:	6 THOMPSON ST		6 THOMPSON STREET
			WAYLAND, MA 01778

500 foot Abutters List Report

Wayland, MA
February 02, 2021

Parcel Number:	48-099B	Mailing Address:	LEITAO FAMILY REVOCABLE TRUST
CAMA Number:	48-099B		LEITOA M FERREIRA & MARY
Property Address:	10 THOMPSON ST		CHARLENE
			10 THOMPSON ST
			WAYLAND, MA 01778
Parcel Number:	48-100C	Mailing Address:	EBERLEIN ROBERT EVERLEIN XU JUN
CAMA Number:	48-100C		17 LOKER ST
Property Address:	17 LOKER ST		WAYLAND, MA 01778
Parcel Number:	48-100D	Mailing Address:	POTASHINSKY ROMAN GENDEL IRENE
CAMA Number:	48-100D		T/E
Property Address:	15 LOKER ST		15 LOKER ST
			WAYLAND, MA 01778
Parcel Number:	48-100H	Mailing Address:	BUSA FRANK J C/O FRANK BUSA
CAMA Number:	48-100H		DESIGNS INC
Property Address:	390 COMMONWEALTH RD		12 SMITH HILL RD
			LINCOLN, MA 01773
Parcel Number:	49-056	Mailing Address:	LEI XU PING WANG T/E
CAMA Number:	49-056		31 RICE RD
Property Address:	31 RICE RD		WAYLAND, MA 01778
Parcel Number:	49-057	Mailing Address:	MAGLIONE THOMAS V
CAMA Number:	49-057		29 RICE RD
Property Address:	29 RICE RD		WAYLAND, MA 01778
Parcel Number:	49-064A	Mailing Address:	TOWN OF WAYLAND
CAMA Number:	49-064A		41 COCHITUATE RD
Property Address:	414 COMMONWEALTH RD		WAYLAND, MA 01778
Parcel Number:	52-149	Mailing Address:	QUINN BONNIE QUINN ADAM T/E
CAMA Number:	52-149		389 COMMONWEALTH RD
Property Address:	389 COMMONWEALTH RD		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	SKOLNICK NANCY F TRUSTEE NANCY
CAMA Number:	53-025A		SKOLNICK TRUST U/D/T
Property Address:	100 WILLOWBROOK DR		100 WILLOWBROOK DR
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	FISHMAN MARJORIE
CAMA Number:	53-025B		101 WILLOWBROOK DR
Property Address:	101 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	F DECOTIS, PAUL A.
CAMA Number:	53-025C		1 DECOTIS, LUANN M. R
Property Address:	102 WILLOWBROOK DR		V 102 WILLOWBROOK DR
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	FANGER STEPHANIE
CAMA Number:	53-026A		103 WILLOW BROOK DR
Property Address:	103 WILLOWBROOK DR		WAYLAND, MA 01778

500 foot Abutters List Report

Wayland, MA
February 02, 2021

Parcel Number:	53-CM1	Mailing Address:	DIAZ SYLVIA C
CAMA Number:	53-026B		104 WILLOW BROOK DR
Property Address:	104 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	TORRES JUAN C
CAMA Number:	53-026C		PO BOX 7814
Property Address:	105 WILLOWBROOK DR		PONCE, PR 00732
Parcel Number:	53-CM1	Mailing Address:	FILIPE LEONOR M HINCKLEY LOUIS E T/E
CAMA Number:	53-026D		106 WILLOWBROOK DR
Property Address:	106 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	FLEISCHER, BARBARA R. ALOUST
CAMA Number:	53-027A		FLEISHER, DAVID H.
Property Address:	107 WILLOWBROOK DR		107 WILLOW BROOK DRIVE
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	CLIFFORD REBECCA J
CAMA Number:	53-027B		108 WILLOWBROOK DR
Property Address:	108 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	GUMATAY ROMAN F II GUMATAY BRENDA J
CAMA Number:	53-027C		109 WILLOW BROOK DR
Property Address:	109 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	WEISMAN, LAURENCE O'NEILL, MARY F TRUSTEES
CAMA Number:	53-027D		110 WILLOWBROOK DR
Property Address:	110 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	CHUANG SHIH-MIN
CAMA Number:	53-028A		111 WILLOWBROOK DR
Property Address:	111 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	NEWBERG MARLENE D
CAMA Number:	53-028B		112 WILLOW BROOK DR
Property Address:	112 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	FRANKLIN CAROL
CAMA Number:	53-029A		200 WILLOW BROOK DR
Property Address:	200 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	HATCH THEODORE F JR TRUSTEE THEODORE F HATCH JR TRUST
CAMA Number:	53-029B		201 WILLOWBROOK DR
Property Address:	201 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	PAYNE BURTON S JR PAYNE FELICIA F T/E
CAMA Number:	53-029C		202 WILLOW BROOK DR
Property Address:	202 WILLOWBROOK DR		WAYLAND, MA 01778

500 foot Abutters List Report

Wayland, MA
February 02, 2021

Parcel Number:	53-CM1	Mailing Address:	SAX CAROL A CHUBOY & SAX JOHN TRUSTEES CAROL ANN CHUBOY SAX TRUST
CAMA Number:	53-029D		203 WILLOW BROOK DR
Property Address:	203 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	MENACHEM, MARSHALL MENACHEM, MARJORIE H TRUSTEES
CAMA Number:	53-030A		204 WILLOWBROOK DR
Property Address:	204 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	RUGGIERE LISA A
CAMA Number:	53-030B		205 WILLOWBROOK DR
Property Address:	205 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	SLEEPER, MARTIN E TRUSTEE
CAMA Number:	53-030C		206 WILLOWBROOK DR
Property Address:	206 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	UVEGES GEORGE UVEGES V RENEE
CAMA Number:	53-030D		207 WILLOWBROOK DR
Property Address:	207 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	MARSHALL DAVID F MARSHALL PATRICIA A
CAMA Number:	53-031A		208 WILLOWBROOK DR
Property Address:	208 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	DEANGELIS STEVEN L MAHONEY KERRY L
CAMA Number:	53-031B		209 WILLOWBROOK DR
Property Address:	209 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	GIBBONS JOSEPH N WYNNE STEVEN M
CAMA Number:	53-031C		210 WILLOWBROOK DR
Property Address:	210 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	KHROMOVA SVETLANA
CAMA Number:	53-031D		211 WILLOWBROOK DR
Property Address:	211 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	SYLVETSKY AMY GOODMAN
CAMA Number:	53-032A		212 WILLOWBROOK DR
Property Address:	212 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	JENKINS-CRITIDES JENNIFER
CAMA Number:	53-032B		213 WILLOWBROOK DR
Property Address:	213 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	COHEN ALAN B COHEN HELAINE H T/E
CAMA Number:	53-032C		214 WILLOWBROOK DR
Property Address:	214 WILLOWBROOK DR		WAYLAND, MA 01778

LAR Realty Trust
205 willowbrook Rd
Wayland MA 01778

500 foot Abutters List Report

Wayland, MA
February 02, 2021

Parcel Number:	53-CM1	Mailing Address:	COHEN HOWARD A
CAMA Number:	53-033A		300 WILLOWBROOK DR
Property Address:	300 WILLOWBROOK DR		WAYLAND, MA 01778 ✓
Parcel Number:	53-CM1	Mailing Address:	FILIPE URANIA M TRUSTEE THE
CAMA Number:	53-033B		URANIA M FILIPE LIVING TRUST
Property Address:	301 WILLOWBROOK DR		301 WILLOWBROOK DR ✓
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	TIERNEY JOSEPH W JR LANGLEY
CAMA Number:	53-034A		CHRISTINE T/E
Property Address:	302 WILLOWBROOK DR		302 WILLOWBROOK DR ✓
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	DEITCHMAN SHEILA R Passed 2019
CAMA Number:	53-034B		303 WILLOWBROOK DR no new
Property Address:	303 WILLOWBROOK DR		WAYLAND, MA 01778 owner yet
Parcel Number:	53-CM1	Mailing Address:	GLENN DAVID T GLENN KIM M T/E
CAMA Number:	53-034C		304 WILLOWBROOK DR
Property Address:	304 WILLOWBROOK DR		WAYLAND, MA 01778 ✓
Parcel Number:	53-CM1	Mailing Address:	GHATTAS RAMY
CAMA Number:	53-034D		305 WILLOWBROOK DR
Property Address:	305 WILLOWBROOK DR		WAYLAND, MA 01778 ✓
Parcel Number:	53-CM1	Mailing Address:	SAVEL BARBARA A
CAMA Number:	53-035A		306 WILLOWBROOK DR
Property Address:	306 WILLOWBROOK DR		WAYLAND, MA 01778 ✓
Parcel Number:	53-CM1	Mailing Address:	SALVUCCI PAUL SALVUCCI JUDITH A
CAMA Number:	53-035B		T/E
Property Address:	307 WILLOWBROOK DR		307 WILLOWBROOK DR ✓
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	HSIE CHANG-ER
CAMA Number:	53-035C		308 WILLOWBROOK DR ✓
Property Address:	308 WILLOWBROOK DR		WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	MEHLMAN ELLEN F MEHLMAN
CAMA Number:	53-035D		JONATHAN P T/E
Property Address:	309 WILLOWBROOK DR		309 WILLOWBROOK DR ✓
			WAYLAND, MA 01778
Parcel Number:	53-CM1	Mailing Address:	SWARTZ JODI L CENTURY BANK &
CAMA Number:	53-036A		TRUST CO/CONSUMER LENDING
Property Address:	310 WILLOWBROOK DR		400 MYSTIC AVE ✓
			MEDFORD, MA 02155
Parcel Number:	53-CM1	Mailing Address:	AGNES EILEEN D
CAMA Number:	53-036B		311 WILLOWBROOK DR ✓
Property Address:	311 WILLOWBROOK DR		WAYLAND, MA 01778

500 foot Abutters List Report

Wayland, MA
February 02, 2021

Parcel Number:	53-CM1	Mailing Address:	REILLY NORBERTA J & THOMAS J TRUSTEES NORBETTA J. REILLY 1998 REVOCABLE TRUST 312 WILLOWBROOK DR WAYLAND, MA 01778
CAMA Number:	53-036C		
Property Address:	312 WILLOWBROOK DR		
Parcel Number:	53-CM1	Mailing Address:	ROSSMAN NANCY ROSSMAN RICHARD T/E 313 WILLOWBROOK DR WAYLAND, MA 01778
CAMA Number:	53-036D		
Property Address:	313 WILLOWBROOK DR		
Parcel Number:	53-CM1	Mailing Address:	~~LILIENTHAL JANET L~~ JLL Wayland Realty Trust 314 WILLOWBROOK DR WAYLAND, MA 01778
CAMA Number:	53-037A		
Property Address:	314 WILLOWBROOK DR		
Parcel Number:	53-CM1	Mailing Address:	HINDERHOFER KATHRYN M & JOSEPH J TRUSTEE KATHRYN M HINDERHOFER REVOCABLE TRUST 315 WILLOWBROOK DR WAYLAND, MA 01778
CAMA Number:	53-037B		
Property Address:	315 WILLOWBROOK DR		
Parcel Number:	53-CM1	Mailing Address:	WILLOW BROOK ASSOCIATES LP
CAMA Number:	53-CM1		
Property Address:	415 COMMONWEALTH RD		Condo main
Parcel Number:	94-001	Mailing Address:	COMMONWEALTH OF MASS -- MWRA 100 FIRST AVE CHARLESTOWN NAVY YARD BOSTON, MA 02129
CAMA Number:	94-001		
Property Address:	ACROSS TOWN		

AGNES EILEEN D
311 WILLOWBROOK DR
WAYLAND, MA 01778

BUSA FRANK J
C/O FRANK BUSA DESIGNS IN
12 SMITH HILL RD
LINCOLN, MA 01773

CHUANG SHIH-MIN
111 WILLOWBROOK DR
WAYLAND, MA 01778

CLIFFORD REBECCA J
108 WILLOWBROOK DR
WAYLAND, MA 01778

COHEN ALAN B
COHEN HELAINE H T/E
214 WILLOWBROOK DR
WAYLAND, MA 01778

COHEN HOWARD A
300 WILLOWBROOK DR
WAYLAND, MA 01778

COMMONWEALTH OF MASS -- M
100 FIRST AVE
CHARLESTOWN NAVY YARD
BOSTON, MA 02129

COOLEY NICHOLAS M
CUGINI STACEY T/E
9 THOMPSON ST
WAYLAND, MA 01778

DEANGELIS STEVEN L
MAHONEY KERRY L
209 WILLOWBROOK DR
WAYLAND, MA 01778

DEITCHMAN SHEILA R
303 WILLOWBROOK DR
WAYLAND, MA 01778

DIAZ SYLVIA C
104 WILLOW BROOK DR
WAYLAND, MA 01778

DICARLO LEONARD J
JUDITH ANN DICARLO
24 RICE RD
WAYLAND, MA 01778

DICARLO LEONARD J T/E
DICARLO TERRI
7 ELIZABETH RD
WAYLAND, MA 01778

EBERLEIN ROBERT
EVERLEIN XU JUN
17 LOKER ST
WAYLAND, MA 01778

FANGER STEPHANIE
103 WILLOW BROOK DR
WAYLAND, MA 01778

FERDINAND JENNIFER
102 WILLOW BROOK DR
WAYLAND, MA 01778

FILIPE LEONOR M
HINCKLEY LOUIS E T/E
106 WILLOWBROOK DR
WAYLAND, MA 01778

FILIPE URANIA M TRUSTEE
THE URANIA M FILIPE LIVIN
301 WILLOWBROOK DR
WAYLAND, MA 01778

FISHMAN MARJORIE
101 WILLOWBROOK DR
WAYLAND, MA 01778

FRANKLIN CAROL
200 WILLOW BROOK DR
WAYLAND, MA 01778

GHATTAS RAMY
305 WILLOWBROOK DR
WAYLAND, MA 01778

GIBBONS JOSEPH N
WYNNE STEVEN M
210 WILLOWBROOK DR
WAYLAND, MA 01778

GLENN DAVID T
GLENN KIM M T/E
304 WILLOWBROOK DR
WAYLAND, MA 01778

GUMATAY ROMAN F II
GUMATAY BRENDA J
109 WILLOW BROOK DR
WAYLAND, MA 01778

HATCH THEODORE F JR TRUS
THEODORE F HATCH JR TRUST
201 WILLOWBROOK DR
WAYLAND, MA 01778

HINDERHOFER KATHRYN M & J
KATHRYN M HINDERHOFER REV
315 WILLOWBROOK DR
WAYLAND, MA 01778

HSIE CHANG-ER
308 WILLOWBROOK DR
WAYLAND, MA 01778

HUA SHUI HUANG
6 THOMPSON ST
WAYLAND, MA 01778

JENKINS-CRITIDES JENNIFER
213 WILLOWBROOK DR
WAYLAND, MA 01778

KALOUST KIMBERLY
KALOUST FIORELLA T/E
107 WILLOWBROOK DR
WAYLAND, MA 01778

KHROMOVA SVETLANA
211 WILLOWBROOK DR
WAYLAND, MA 01778

LEI XU
PING WANG T/E
31 RICE RD
WAYLAND, MA 01778

LEITAO FAMILY REVOCABLE T
LEITOA M FERREIRA & MARY
10 THOMPSON ST
WAYLAND, MA 01778

LI XIANGPING
FU YINENG
30 RICE ROAD
WAYLAND, MA 01778

LILIENTHAL JANET L
314 WILLOWBROOK DR
WAYLAND, MA 01778

MAGLIONE THOMAS V
29 RICE RD
WAYLAND, MA 01778

MARSHALL DAVID F
MARSHALL PATRICIA A
208 WILLOWBROOK DR
WAYLAND, MA 01778

MEHLMAN ELLEN F
MEHLMAN JONATHAN P T/E
309 WILLOWBROOK DR
WAYLAND, MA 01778

MENACHEM, MARSHALL
MENACHEM, MARJORIE H TRUS
204 WILLOWBROOK DR
WAYLAND, MA 01778

NEWBERG MARLENE D
112 WILLOW BROOK DR
WAYLAND, MA 01778

PAYNE BURTON S JR
PAYNE FELICIA F T/E
202 WILLOW BROOK DR
WAYLAND, MA 01778

POTASHINSKY ROMAN
GENDEL IRENE T/E
15 LOKER ST
WAYLAND, MA 01778

QUINN BONNIE
QUINN ADAM T/E
389 COMMONWEALTH RD
WAYLAND, MA 01778

REILLY NORBERTA J & THOMA
NORBETTA J. REILLY 1998 R
312 WILLOWBROOK DR
WAYLAND, MA 01778

RICE ROAD DEVELOPMENT, LL
275 PLEASANT ST
WATERTOWN, MA 02472

ROSSMAN NANCY
ROSSMAN RICHARD T/E
313 WILLOWBROOK DR
WAYLAND, MA 01778

RUGGIERE LISA A
205 WILLOWBROOK DR
WAYLAND, MA 01778

SALVUCCI PAUL
SALVUCCI JUDITH A T/E
307 WILLOWBROOK DR
WAYLAND, MA 01778

SAVEL BARBARA A
306 WILLOWBROOK DR
WAYLAND, MA 01778

SAX CAROL A CHUBOY & SAX
CAROL ANN CHUBOY SAX TRUS
203 WILLOW BROOK DR
WAYLAND, MA 01778

SEBASTIANELLI MARISA LYNN
SEBASTIANELLI DAVID CHAND
8 ELIZABETH RD
WAYLAND, MA 01778

SKOLNICK NANCY F TRUSTEE
NANCY SKOLNICK TRUST U/D/
100 WILLOWBROOK DR
WAYLAND, MA 01778

SLEEPER, MARTIN E TRUSTEE
206 WILLOWBROOK DR
WAYLAND, MA 01778

SPLLAINE ERIN E
28 RICE RD
WAYLAND, MA 01778

SWARTZ JODI L
CENTURY BANK & TRUST CO/C
400 MYSTIC AVE
MEDFORD, MA 02155

SYLVETSKY AMY GOODMAN
212 WILLOWBROOK DR
WAYLAND, MA 01778

TIERNEY JOSEPH W JR
LANGLEY CHRISTINE T/E
302 WILLOWBROOK DR
WAYLAND, MA 01778

TORRES JUAN C
PO BOX 7814
PONCE, PR 00732

TOWN OF WAYLAND
CONSERVATION
41 COCHITUATE ROAD
WAYLAND, MA 01778

TOWN OF WAYLAND
41 COCHITUATE RD
WAYLAND, MA 01778

UVEGES GEORGE
UVEGES V RENEE
207 WILLOWBROOK DR
WAYLAND, MA 01778

WEISMAN, LAURENCE
O'NEILL, MARY F TRUSTEES
110 WILLOWBROOK DR
WAYLAND, MA 01778

WILLOW BROOK ASSOCIATES L

,

YAKHKIND MIKHAIL & VICTOR
THOMPSON STREET 2 REALITY
2 THOMPSON ST
WAYLAND, MA 01778

[redacted]

Loker Conservation and Recreation Area Locus Map

Wayland, MA

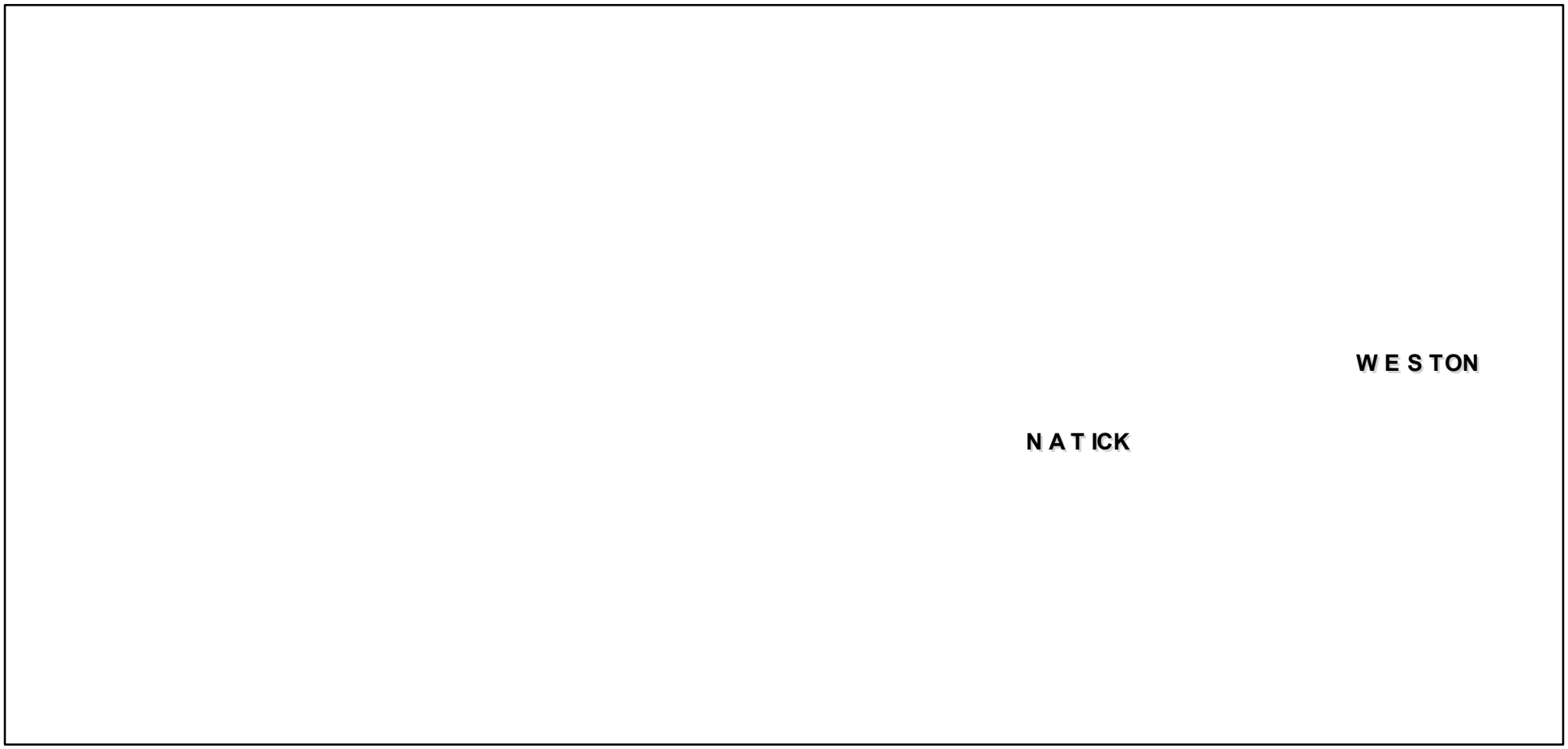
[redacted]

October 30, 2018

1 inch = 1000 Feet

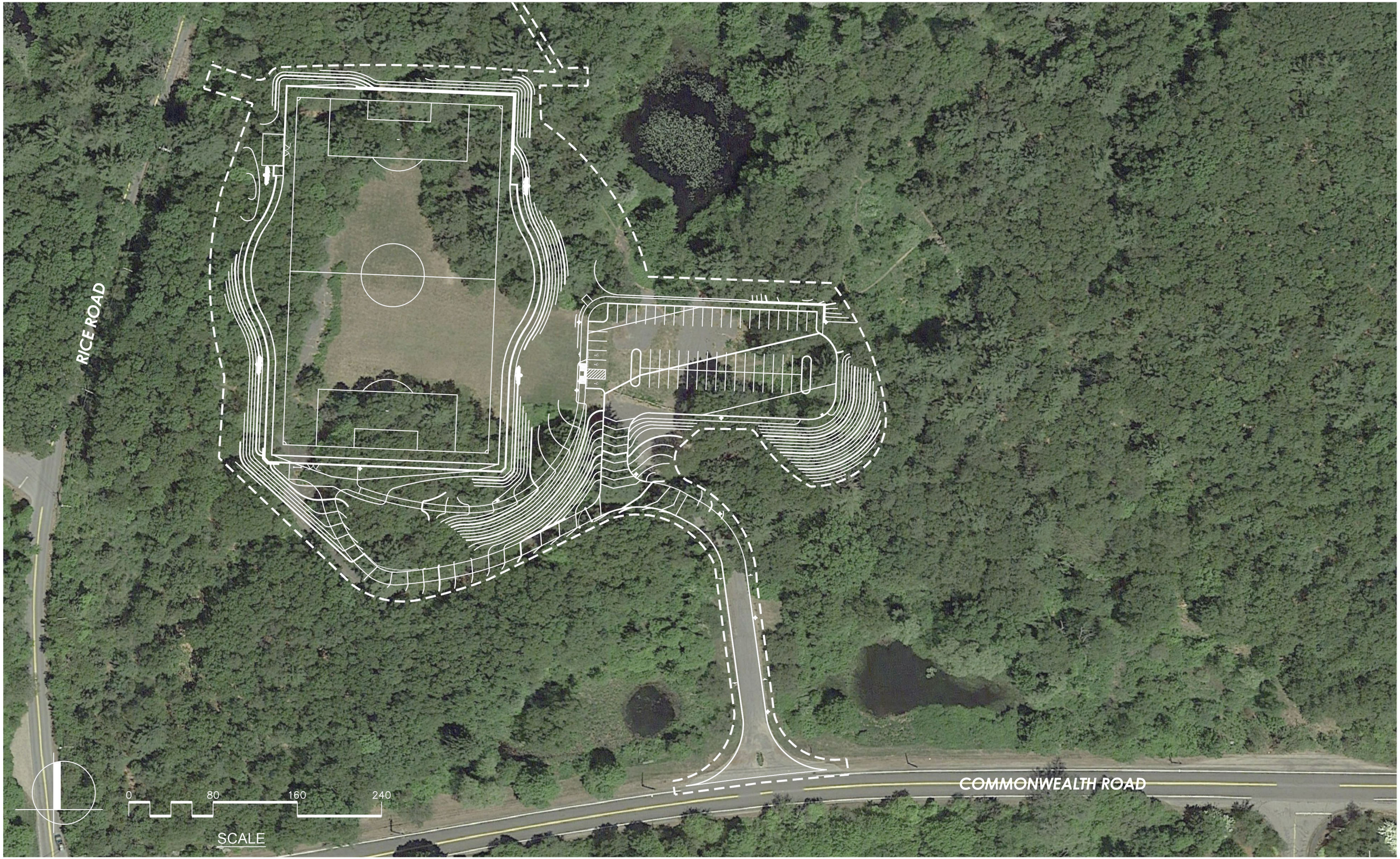
0 1000 2000 3000

www.cai-tech.com



Large Scale
Town Boundary Survey (MassGIS)
Town Line Survey - MASSGIS
Tract Line
Utility
Polygons
Parcel Lines - No Ortho
Sub lots - No Ortho
Sub lots - Ortho

Data shown on this map is provided for planning and informational purposes only. The municipality and CAI Technologies are not responsible for any use for other purposes or misuse or misrepresentation of this map.


RICE ROAD
COMMONWEALTH ROAD
0
80
160
240
SCALE

TOWN OF WAYLAND

IMPROVEMENTS TO
LOKER CONSERVATION AND RECREATION AREA

PREPARED BY:

Weston & Sampson℠

DESIGN STUDIO

85 DEVONSHIRE STREET, 3RD FLOOR
BOSTON, MA 02109
BRANDON KUNKEL
(617) 412-4480

TOWN OF WAYLAND, MASSACHUSETTS

TOWN BUILDING
41 COCHITUATE RD
WAYLAND, MA 01778
BEN KEEFE
PUBLIC BUILDING DIRECTOR
(508) 358-3786

Locus Map

LOKER CONSERVATION AND RECREATION AREA

LOKER CONSERVATION AND RECREATION AREA

LOKER CONSEVATION AND RECREATION AREA
410 COMMONWEALTH RD, WAYLAND, MA 01778

BIDDING DOCUMENTS
IFB #19-1054

FEBRUARY 28, 2019

Prepared By

Weston & Sampson℠

85 Devonshire St, 3rd Floor, Boston, MA 02109
(617) 412-4480 (800) Sampson
www.westonandsampson.com

SHEET INDEX

ADD ALTERNATE NO. 1

UNDER ADD ALTERNATE NO. 1 THE CONTRACTOR SHALL INSTALL THE SPECIFIED SPORTS LIGHTING POLES, FIXTURES, WIRING AND RELATED APPURTENANCES NEEDED TO HAVE A COMPLETE AND FULLY OPERATIONAL SYSTEM. WORK UNDER THE BASE BID SHALL INCLUDE THE INSTALLATION OF AN “EMPTY” SPORTS LIGHTING SYSTEM TO INCLUDE LIGHT POLE FOOTINGS/FOUNDATIONS, UNDERGROUND CONDUITS, HAND HOLES, PULL STRING AND ALL OTHER ELECTRICAL AND LIGHTING SYSTEM COMPONENTS THROUGHOUT THE PROJECT SITE AS INDICATED ON THE PLANS AND AS SPECIFIED.

ADD ALTERNATE NO. 2

UNDER ADD ALTERNATE NO. 2, THE CONTRACTOR SHALL CONSTRUCT THE DESIGNATED CAST IN PLACE CONCRETE STAIR AND HANDRAILS AS INDICATED ON THE PLANS AND AS SPECIFIED.

\\ wse03.local\WSE\Projects\MA\Wayland MA\Wayland High School Athletic Facilities\CAD\G_Current_LOKER\Cover.dwg

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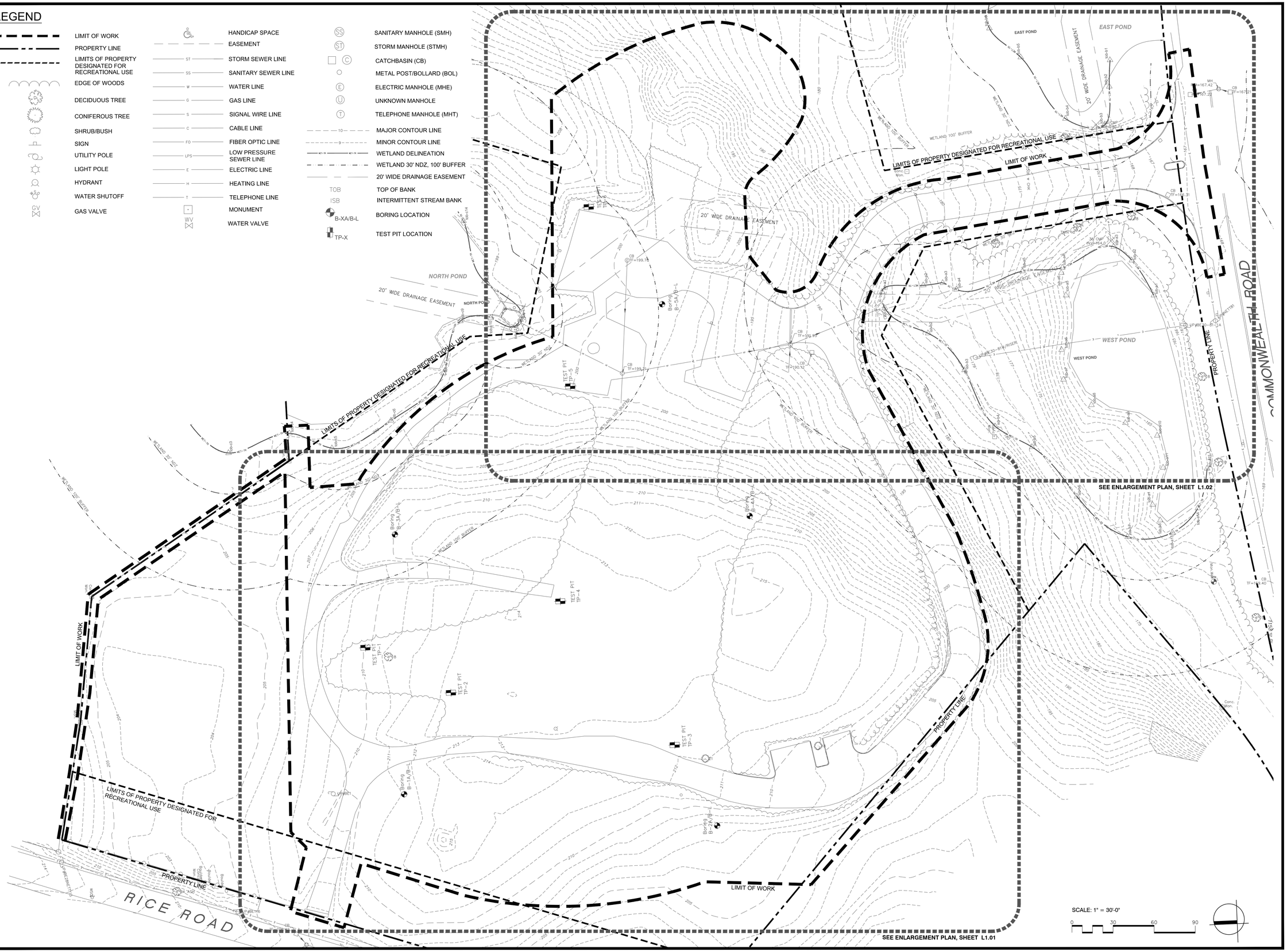
LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- LIMITS OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- EDGE OF WOODS
- DECIDUOUS TREE
- CONIFEROUS TREE
- SHRUB/BUSH
- SIGN
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- WATER SHUTOFF
- GV GAS VALVE
- HANDICAP SPACE
- EASEMENT
- ST STORM SEWER LINE
- SS SANITARY SEWER LINE
- W WATER LINE
- G GAS LINE
- S SIGNAL WIRE LINE
- C CABLE LINE
- FO FIBER OPTIC LINE
- LPS LOW PRESSURE SEWER LINE
- E ELECTRIC LINE
- H HEATING LINE
- T TELEPHONE LINE
- MONUMENT
- WV WATER VALVE
- SS SANITARY MANHOLE (SMH)
- ST STORM MANHOLE (STMH)
- C CATCHBASIN (CB)
- METAL POST/BOLLARD (BOL)
- E ELECTRIC MANHOLE (MHE)
- U UNKNOWN MANHOLE
- T TELEPHONE MANHOLE (MHT)
- 10 MAJOR CONTOUR LINE
- 9 MINOR CONTOUR LINE
- WETLAND DELINEATION
- WETLAND 30' NDZ, 100' BUFFER
- 20' WIDE DRAINAGE EASEMENT
- TOB TOP OF BANK
- ISB INTERMITTENT STREAM BANK
- B-XA/B-L BORING LOCATION
- TP-X TEST PIT LOCATION



Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

410 COMMONWEALTH RD, WAYLAND, MA 01778

Weston & Sampson

85 Devonshire Street,
3rd Floor, Boston, MA 02109
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Approved By:	ERB
W&S Project No:	2180076
W&S File No:	

Drawing Title:

OVERALL EXISTING CONDITIONS PLAN

Sheet Number:

L1.00

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LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- LIMITS OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- EDGE OF WOODS
- DECIDUOUS TREE
- CONIFEROUS TREE
- SHRUB/BUSH
- SIGN
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- WATER SHUTOFF
- GV — GAS VALVE
- WV — WATER VALVE
- MONUMENT
- IRON PIN / IRON ROD
- HANDICAP SPACE
- EASEMENT
- ST — STORM SEWER LINE
- SS — SANITARY SEWER LINE
- W — WATER LINE
- G — GAS LINE
- S — SIGNAL WIRE LINE
- C — CABLE LINE
- FO — FIBER OPTIC LINE
- LPS — LOW PRESSURE SEWER LINE
- E — ELECTRIC LINE
- H — HEATING LINE
- T — TELEPHONE LINE
- SS — SANITARY MANHOLE (SMH)
- ST — STORM MANHOLE (STMH)
- C — CATCHBASIN (CB)
- METAL POST/BOLLARD (BOL)
- E — ELECTRIC MANHOLE (MHE)
- U — UNKNOWN MANHOLE
- T — TELEPHONE MANHOLE (MHT)
- 10 — MAJOR CONTOUR LINE
- 9 — MINOR CONTOUR LINE
- WET–TR — WETLAND DELINEATION
- WETLAND 30' NDZ, 100' BUFFER
- 20' WIDE DRAINAGE EASEMENT
- B-XA/B-L — BORING LOCATION
- TP-X — TEST PIT LOCATION
- TOB — TOP OF BANK
- ISB — INTERMITTENT STREAM BANK

Project:

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Drawing Title:

EXISTING CONDITIONS PLAN ENLARGEMENT

Sheet Number:

L1.01

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LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- LIMITS OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- EDGE OF WOODS
- DECIDUOUS TREE
- CONIFEROUS TREE
- SHRUB/BUSH
- SIGN
- UTILITY POLE
- LIGHT POLE
- HYDRANT
- WATER SHUTOFF
- GAS VALVE
- WATER VALVE
- MONUMENT
- IRON PIN / IRON ROD
- HANDICAP SPACE
- EASEMENT
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- GAS LINE
- SIGNAL WIRE LINE
- CABLE LINE
- FIBER OPTIC LINE
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- MAJOR CONTOUR LINE
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- WETLAND 30' NDZ, 100' BUFFER
- 20' WIDE DRAINAGE EASEMENT
- BORING LOCATION
- TEST PIT LOCATION
- TOP OF BANK
- INTERMITTENT STREAM BANK

Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

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W&S File No:	

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EXISTING CONDITIONS PLAN ENLARGEMENT

Sheet Number:

L1.02

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LEGEND

- PROPERTY LINE
- LIMIT OF WORK
- LIMITS OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- WETLAND DELINEATION
- WETLAND BUFFER
- EROSION AND SEDIMENT CONTROL
- CONSTRUCTION FENCE
- SAW CUT
- TREE PROTECTION
- R&D EXISTING FENCE
- R&S GRANITE CURB
- R&D TRENCH DRAIN
- CAP AND ABANDON UTILITY LINE IN PLACE, TYP.
- R&D FULL DEPTH BITUMINOUS CONCRETE PAVEMENT, TYP.
- MILL TOP COURSE OF BITUMINOUS CONCRETE PAVEMENT, TYP.
- CLEAR & GRUB AND TREE REMOVAL, TYP.
- CONSTRUCTION ENTRANCE
- R&D SITE AMENITIES, TYP.

TYP.	TYPICAL
EX.	EXISTING
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND SALVAGE

CLEAR, GRUB, & TREE REMOVAL TYP.
STOCKPILE AREA
R&D CATCH BASIN, CAP & ABANDON DRAIN LINE IN PLACE
R&D BITUMINOUS CONCRETE PAVEMENT, COMPLETE
REFUELING AREA
R&D JERSEY BARRIERS, TYP
EAST POND
NORTH POND
WEST POND
EROSION AND SEDIMENT CONTROL, TYP. (1 / L7.00)
CONSTRUCTION FENCE, TYP.
CONSTRUCTION ENTRANCE (4 / L7.00)
LIMIT OF PROPERTY DESIGNATED TO RECREATIONAL USE
LIMIT OF WORK
R&S GRANITE CURB
SAWCUT, TYP.
OVERHEAD ELECTRICAL TO REMAIN
R&D GATE POSTS, COMPLETE
SAWCUT
MILL TOP COURSE OF EXISTING BITUMINOUS CONCRETE, 1-1/4" DEPTH, TYP.
R&S GRANITE CURB
R&D TRENCH DRAIN
PROTECT EX. DRAINAGE STRUCTURE TO REMAIN
R&D CATCH BASIN
R&D JERSEY BARRIERS, TYP.
PROTECT EX. DRAINAGE STRUCTURE TO REMAIN
CAP AND ABANDON DRAIN LINE IN PLACE, TYP.
EXISTING TREES TO REMAIN
TREE PROTECTION, TYP. (2 / L7.00)
PROPERTY LINE
COMMONWEALTH ROAD
LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
CLEAR, GRUB, & TREE REMOVAL TYP.
STRIP & STOCKPILE TOPSOIL, TYP.
STOCKPILE AREA
CLEAR, GRUB, & TREE REMOVAL TYP.
EXISTING TREES TO REMAIN
R&D BITUMINOUS CONCRETE PAVEMENT, COMPLETE
CONSTRUCTION FENCE, TYP.
EROSION AND SEDIMENT CONTROL, TYP. (1 / L7.00)
LIMIT OF WORK
R&D TREE, COMPLETE
R&D HYDRANT, COMPLETE. CAP & ABANDON IN PLACE.
R&D LANDSCAPE LIGHTING AND CONDUIT, COMPLETE
R&D GATE POST
PROTECT EXISTING STONE WALL TO REMAIN
TREE PROTECTION, TYP. (2 / L7.00)
R&D EXISTING CHAIN LINK FENCE, COMPLETE, TYP.
R&D UTILITY POLE, COMPLETE
LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
CLEAR, GRUB, & TREE REMOVAL TYP.
R&S GRANITE CURB
LIMIT OF WORK
SAWCUT, TYP.
PROTECT EXISTING ASPHALT PAVEMENT TO REMAIN
PROPERTY LINE
RICE ROAD
TEST PIT TP-1
TEST PIT TP-2
TEST PIT TP-3
TEST PIT TP-4

SCALE: 1" = 30'-0"
0 30 60 90

Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

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OVERALL SITE PREPARATION AND DEMOLITION PLANS

Sheet Number:

L2.00

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LEGEND:

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- LIMIT OF WORK
- VEHICULAR BITUMINOUS CONCRETE PAVEMENT
- BITUMINOUS CONCRETE PAVEMENT - TOP COURSE OVERLAY
- PEDESTRIAN BITUMINOUS CONCRETE PAVEMENT
- CONCRETE PAVEMENT
- COMPACTED DENSE GRADED LEVELING PAD
- VERTICAL GRANITE CURB
- SEGMENTAL BLOCK RETAINING WALL
- 4' HT. BLACK VINYL CHAIN LINK (BVCL) FENCE
- VEHICULAR WOOD GUARDRAIL
- 8' HT. WOOD SLAT SCREEN FENCE
- SPORTS LIGHTING
- PEDESTRIAN LIGHTING

BASE BID:
PEDESTRIAN LIGHTING INCLUDING FOUNDATIONS, POLES, FIXTURES, HANDHOLES, CONDUIT AND WIRING, TYP. SEE ELECTRICAL PLANS
1 / L7.05

BASE BID:
PEDESTRIAN LIGHTING INCLUDING FOUNDATIONS, POLES, FIXTURES, HANDHOLES, CONDUIT AND WIRING, TYP. SEE ELECTRICAL PLANS
1 / L7.05

BASE BID:
NEW UTILITY RISER POLE WITH POLE MOUNTED TRANSFORMERS, REFER TO ELECTRICAL PLANS

PARKING AREA (63 SPACES)

LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE

LIMIT OF WORK

ACCESS DRIVE

EAST POND

WEST POND

NORTH POND

20' WIDE DRAINAGE EASEMENT

WETLAND 100' BUFFER

WETLAND 50' NO-DISTURB

PROPERTY LINE

COMMONWEALTH ROAD

TEAM & SPECTATOR AREA

BASE BID:
LOAM AND SEED DISTURBED AREA WITH CONSERVATION SEED MIX, TYP. SEE SPECIFICATIONS

ALTERNATE #2:
CAST-IN-PLACE CONCRETE STAIR AND HANDRAIL
1 / L7.06

SYNTHETIC TURF FIELD

BASE BID:
PEDESTRIAN LIGHTING INCLUDING FOUNDATIONS, POLES, FIXTURES, HANDHOLES, CONDUIT AND WIRING, TYP. SEE ELECTRICAL PLANS
1 / L7.05

BASE BID:
SPORTS LIGHTING FOUNDATIONS, CONDUIT, WIRING, AND ELECTRICAL SERVICE, TYP. SEE ELECTRICAL PLANS

ALTERNATE #1:
SPORTS LIGHTING POLES AND FIXTURES, TYP. SEE ELECTRICAL PLANS

MAINTENANCE DRIVE

TEST PIT TP-1, TP-2, TP-3

LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE

LIMIT OF WORK

PROPERTY LINE

RICE ROAD

SEE ENLARGEMENT PLAN, SHEET L3.02

SEE ENLARGEMENT PLAN, SHEET L3.01

0 30 60 120

Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

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Drawing Title:

OVERALL SITE PLAN

Sheet Number:

L3.00

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LEGEND:

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- LIMIT OF WORK
- VEHICULAR BITUMINOUS CONCRETE PAVEMENT
- BITUMINOUS CONCRETE PAVEMENT - TOP COURSE OVERLAY
- PEDESTRIAN BITUMINOUS CONCRETE PAVEMENT
- CONCRETE PAVEMENT
- COMPACTED DENSE GRADED LEVELING PAD
- VERTICAL GRANITE CURB
- SEGMENTAL BLOCK RETAINING WALL
- 4' HT. BLACK VINYL CHAIN LINK (BVCL) FENCE
- VEHICULAR WOOD GUARDRAIL
- 8' HT. WOOD SLAT SCREEN FENCE
- SPORTS LIGHTING
- PEDESTRIAN LIGHTING

PARKING AREA (63 SPACES)

TEAM & SPECTATOR AREA

SYNTHETIC TURF FIELD

TEAM & SPECTATOR AREA

ADD ALTERNATE #2:
REFER TO NOTE AT LOWER RIGHT ON THIS SHEET.

1
L7.06

ADD ALTERNATE #2:
REFER TO NOTE AT LOWER RIGHT ON THIS SHEET

LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE

LIMIT OF WORK

ACCESS DRIVE

MAINTENANCE DRIVE

COMMONWEALTH ROAD

RICE ROAD

EAST POND

WEST POND

NORTH POND

20' WIDE DRAINAGE EASEMENT

WETLAND 100' BUFFER

WETLAND 50' NO-DISTURB

PROPERTY LINE

LIMIT OF WORK

LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE

PROPERTY LINE

LIMIT OF WORK

PROPERTY LINE

SEE ENLARGEMENT PLAN, SHEET L3.02

SEE ENLARGEMENT PLAN, SHEET L3.01

ADD ALTERNATE NO. 1

UNDER ADD ALTERNATE NO. 1 THE CONTRACTOR SHALL INSTALL THE SPECIFIED SPORTS LIGHTING POLES, FIXTURES, WIRING AND RELATED APPURTENANCES NEEDED TO HAVE A COMPLETE AND FULLY OPERATIONAL SYSTEM. WORK UNDER THE BASE BID SHALL INCLUDE THE INSTALLATION OF AN “EMPTY” SPORTS LIGHTING SYSTEM TO INCLUDE LIGHT POLE FOOTINGS/FOUNDATIONS, UNDERGROUND CONDUITS, HAND HOLES, PULL STRING AND ALL OTHER ELECTRICAL AND LIGHTING SYSTEM COMPONENTS THROUGHOUT THE PROJECT SITE AS INDICATED ON THE PLANS AND AS SPECIFIED.

ADD ALTERNATE NO. 2

UNDER ADD ALTERNATE NO. 2, THE CONTRACTOR SHALL CONSTRUCT THE DESIGNATED CAST IN PLACE CONCRETE STAIR AND HANDRAILS AS INDICATED ON THE PLANS AND AS SPECIFIED.

0 30 60 120

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OVERALL SITE PLAN

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L3.00

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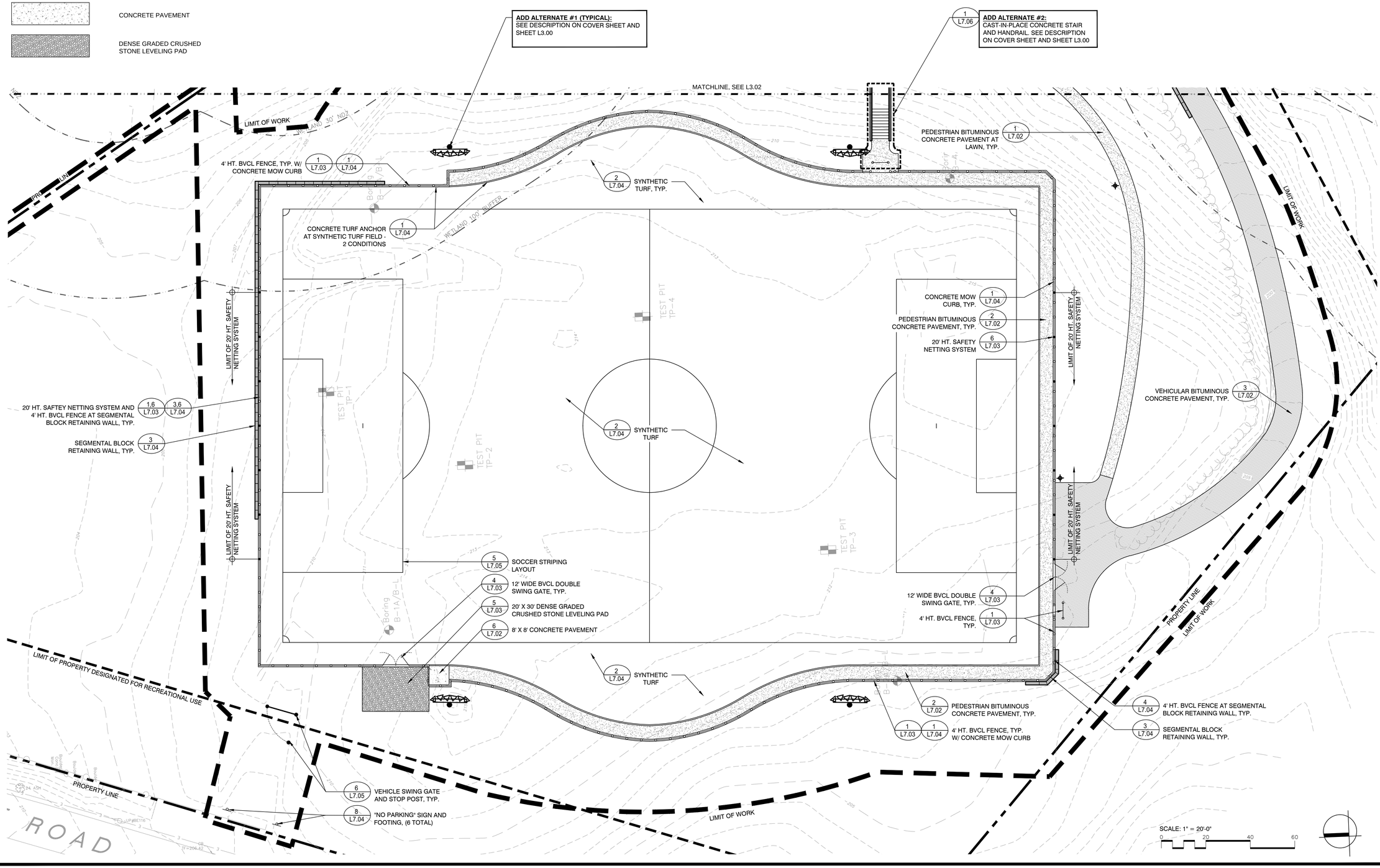
LEGEND:

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- LIMIT OF WORK
- VEHICULAR BITUMINOUS CONCRETE PAVEMENT
- PEDESTRIAN BITUMINOUS CONCRETE PAVEMENT
- CONCRETE PAVEMENT
- DENSE GRADED CRUSHED STONE LEVELING PAD
- 4' HT. BLACK VINYL CHAIN LINK (BVCL) FENCE
- SEGMENTAL BLOCK RETAINING WALL
- GUARDRAIL
- SPORTS LIGHTING
- PEDESTRIAN LIGHTING
- 20' HT. SAFETY NETTING SYSTEM



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Drawing Title:

MATERIALS PLAN ENLARGEMENT

Sheet Number:

L3.01

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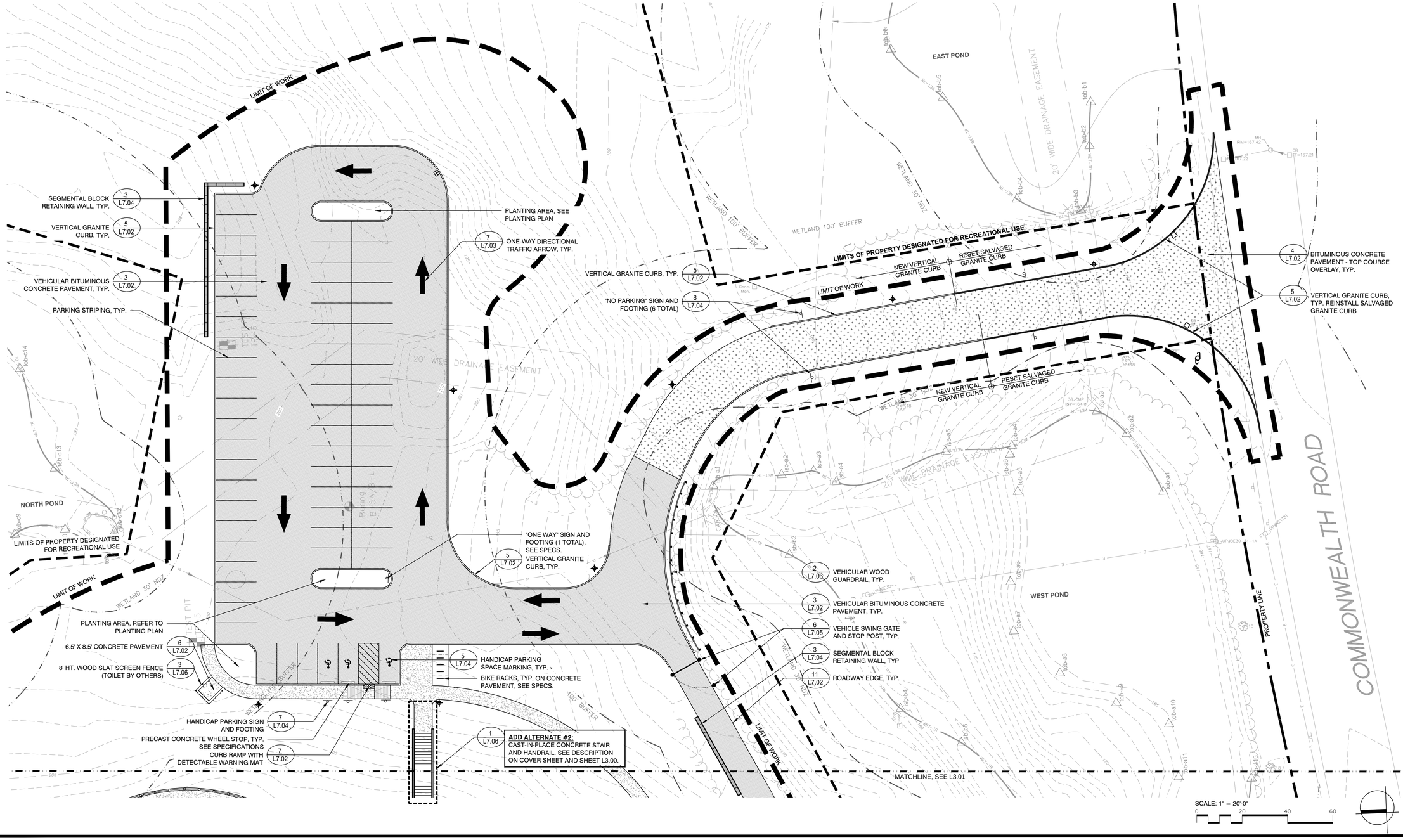
LEGEND:

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- LIMIT OF WORK
- VEHICULAR BITUMINOUS CONCRETE PAVEMENT
- BITUMINOUS CONCRETE PAVEMENT - TOP COURSE OVERLAY
- PEDESTRIAN BITUMINOUS CONCRETE PAVEMENT
- CONCRETE PAVEMENT
- SEGMENTAL BLOCK RETAINING WALL
- VERTICAL GRANITE CURB
- PEDESTRIAN LIGHTING
- VEHICULAR WOOD GUARDRAIL
- 8' HT. WOOD SLAT SCREEN FENCE



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MATERIALS PLAN ENLARGEMENT

Sheet Number:

L3.02

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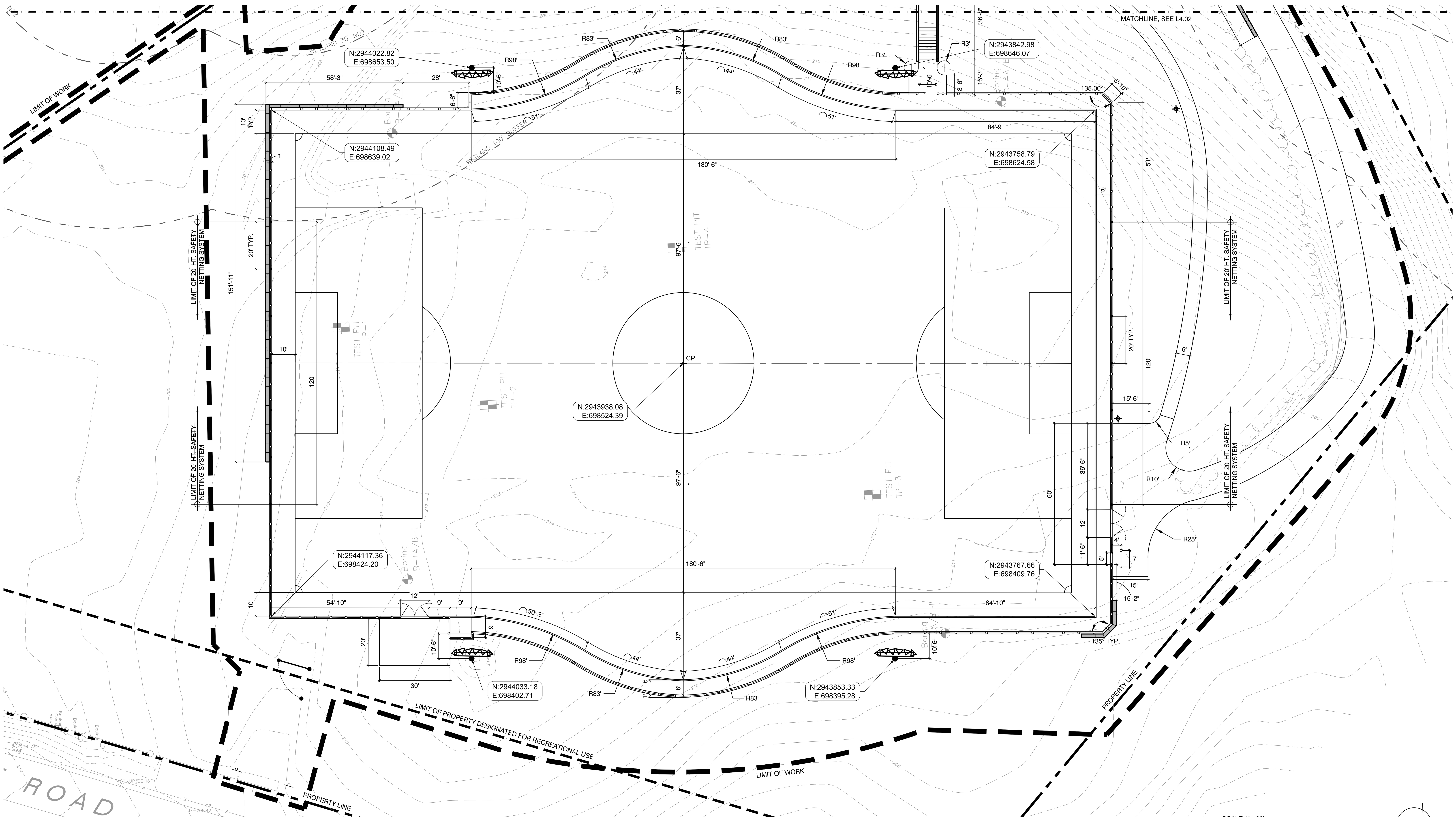
LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- CP — CENTER POINT
- R3' — RADIUS DIMENSION
- 5' — TYP. DIMENSION
- 9' — TYP. ARC DIMENSION



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LAYOUT PLANS ENLARGEMENT

Sheet Number:
L4.01

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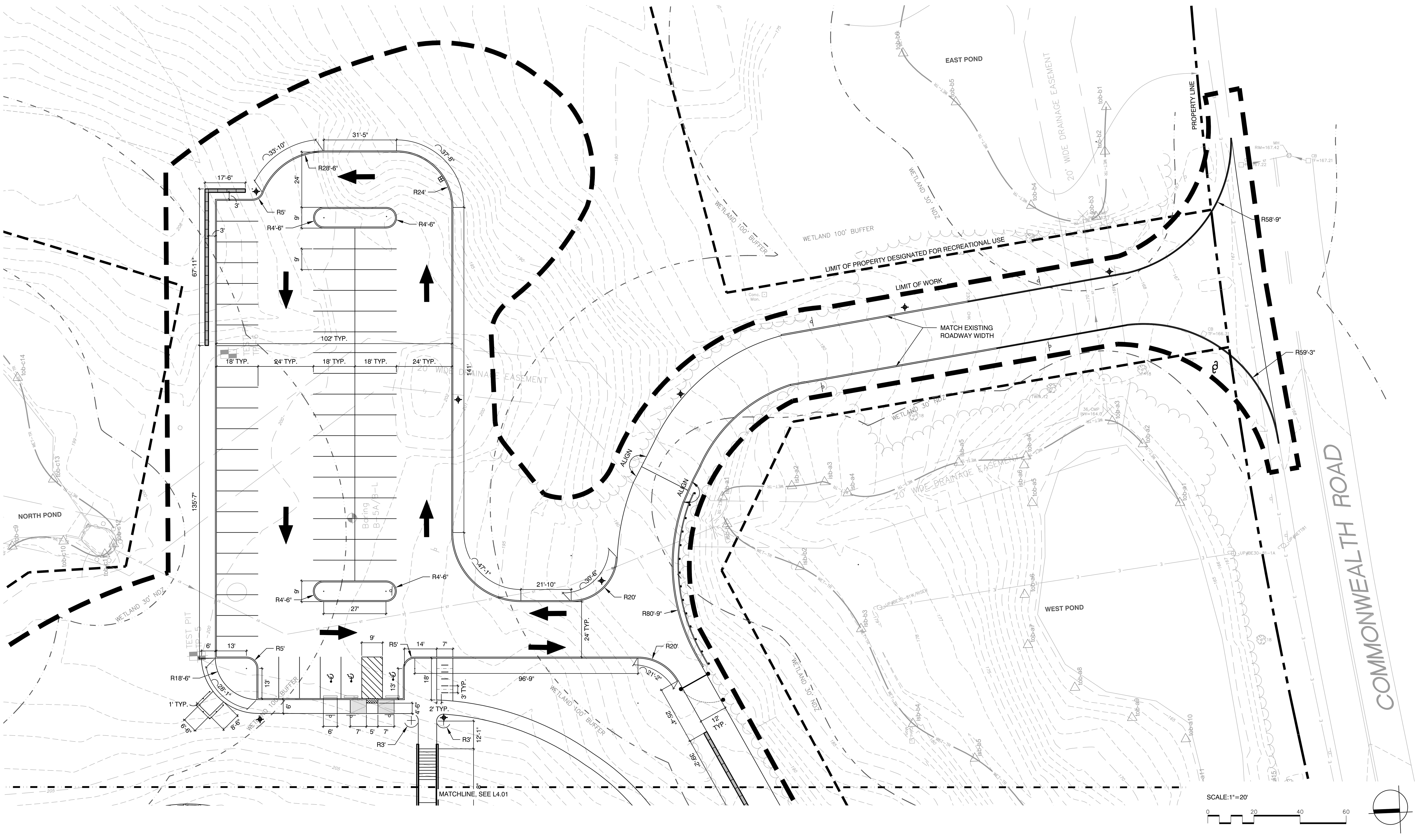
LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- MATCHLINE
- R3' RADIUS DIMENSION
- 5' TYP. DIMENSION
- 9' TYP. ARC DIMENSION
- CP CENTER POINT



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LAYOUT PLANS ENLARGEMENT

Sheet Number:

L4.02

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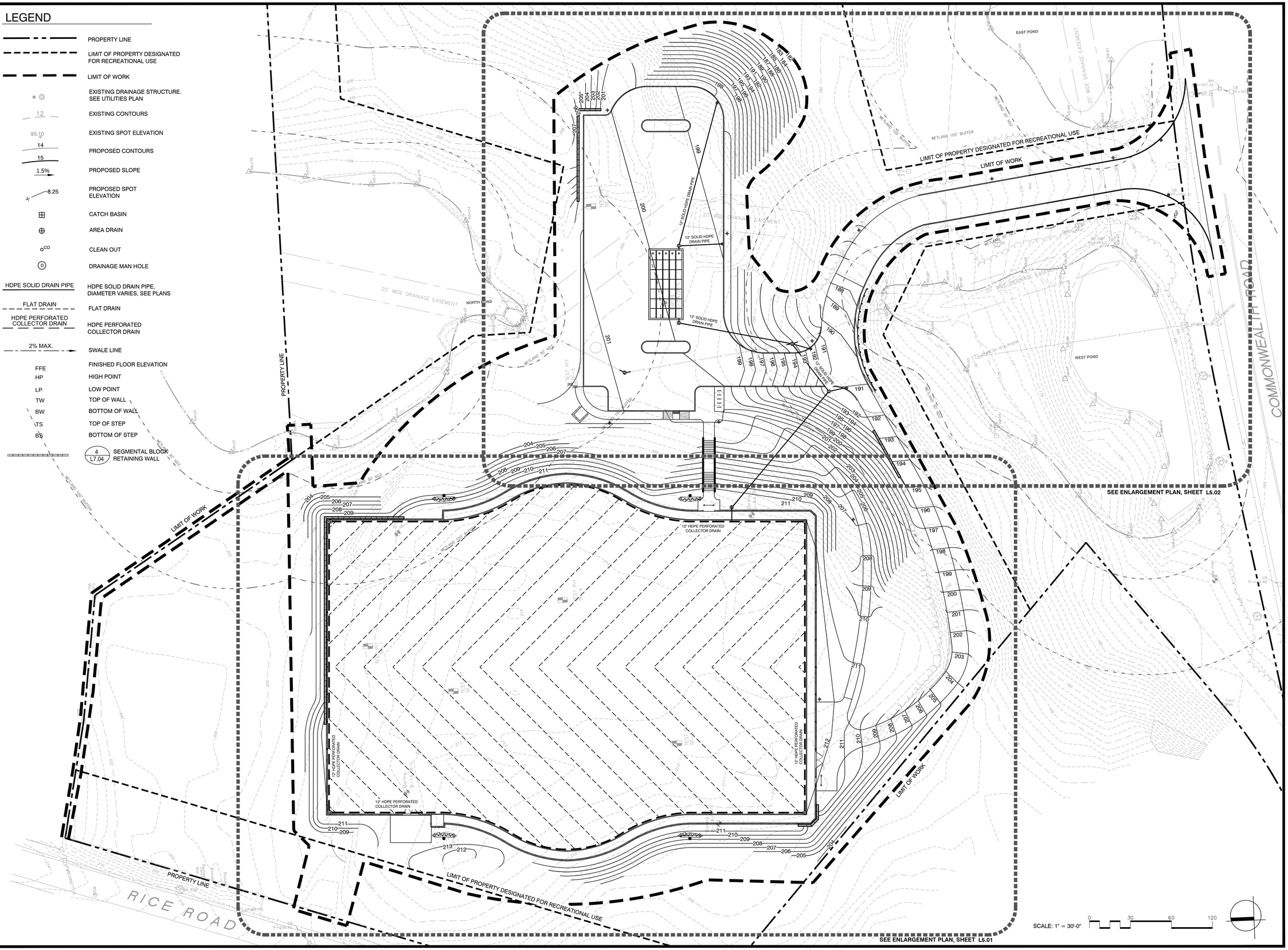
LEGEND

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- LIMIT OF WORK
- EXISTING DRAINAGE STRUCTURE. SEE UTILITIES PLAN
- 12 — EXISTING CONTOURS
- 95.10 + — EXISTING SPOT ELEVATION
- 14 — PROPOSED CONTOURS
- 15 — PROPOSED SLOPE
- 1.5% →
- 8.25 — PROPOSED SPOT ELEVATION
- CATCH BASIN
- AREA DRAIN
- CO — CLEAN OUT
- D — DRAINAGE MAN HOLE
- HDPE SOLID DRAIN PIPE — HDPE SOLID DRAIN PIPE, DIAMETER VARIES, SEE PLANS
- FLAT DRAIN — FLAT DRAIN
- HDPE PERFORATED COLLECTOR DRAIN — HDPE PERFORATED COLLECTOR DRAIN
- 2% MAX. → — SWALE LINE
- FFE — FINISHED FLOOR ELEVATION
- HP — HIGH POINT
- LP — LOW POINT
- TW — TOP OF WALL
- BW — BOTTOM OF WALL
- TS — TOP OF STEP
- BS — BOTTOM OF STEP
- 4 / L7.04 — SEGMENTAL BLOCK RETAINING WALL



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Drawing Title:

OVERALL GRADING, DRAINAGE & UTILITY PLANS

Sheet Number:

L5.00

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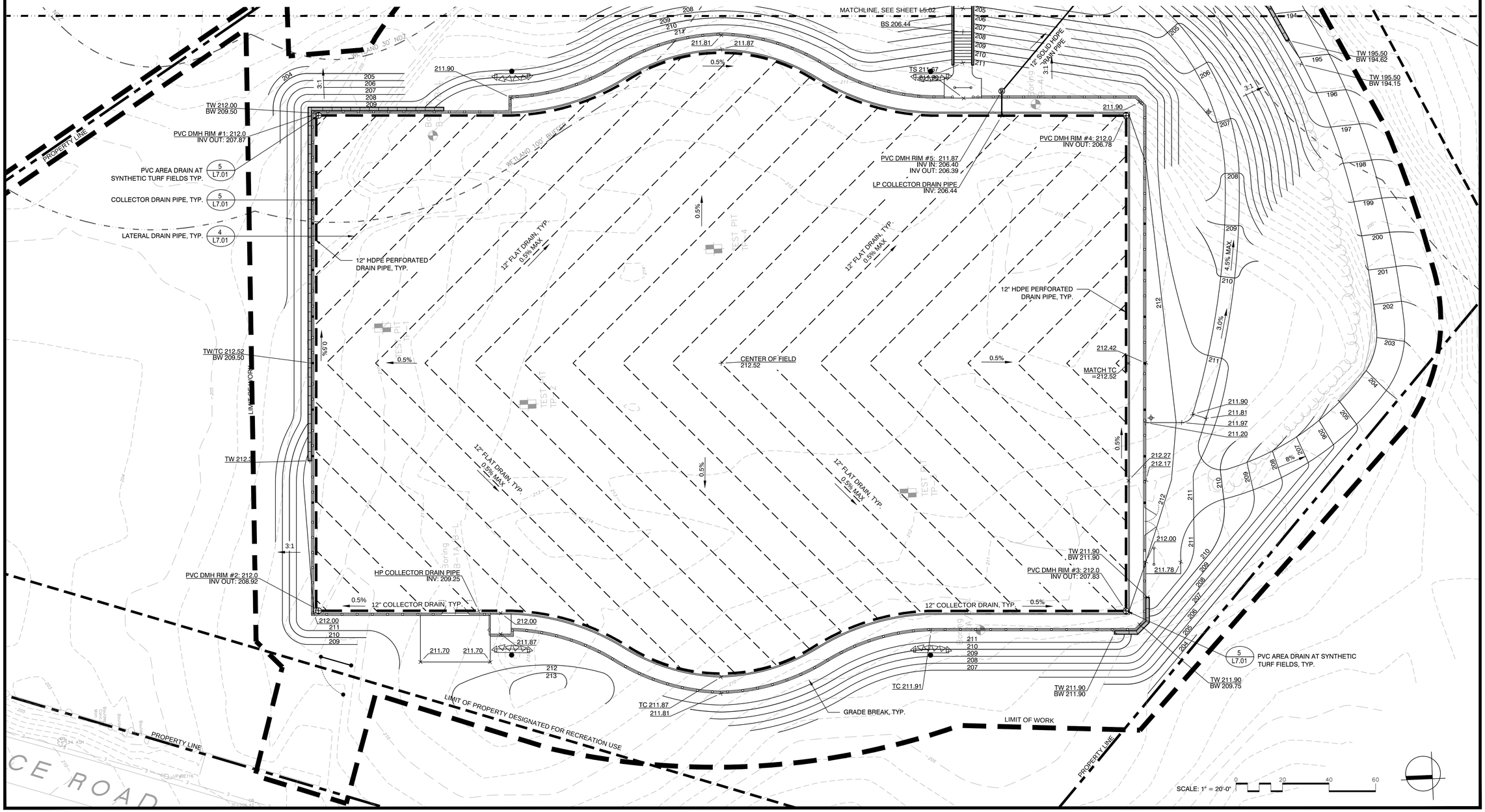
LEGEND

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- MATCHLINE
- LIMIT OF WORK
- EXISTING DRAINAGE STRUCTURE. SEE UTILITIES PLAN
- EXISTING CONTOURS (12)
- EXISTING SPOT ELEVATION (95.10)
- PROPOSED CONTOURS (14, 15)
- PROPOSED SLOPE (1.5%)
- PROPOSED SPOT ELEVATION (8.25)
- CATCH BASIN
- PVC AREA DRAIN
- DRAINAGE MAN HOLE
- HDPE SOLID DRAIN PIPE — HDPE SOLID DRAIN PIPE, DIAMETER VARIES
- 2% MAX. — SWALE LINE
- FFE — FINISHED FLOOR ELEVATION
- HP — HIGH POINT
- LP — LOW POINT
- TW — TOP OF WALL
- BW — BOTTOM OF WALL
- TS — TOP OF STEP
- BS — BOTTOM OF STEP
- SEGMENTAL BLOCK RETAINING WALL



Project:

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Drawing Title:

GRADING, DRAINAGE & UTILITY ENLARGEMENT PLANS

Sheet Number:

L5.01

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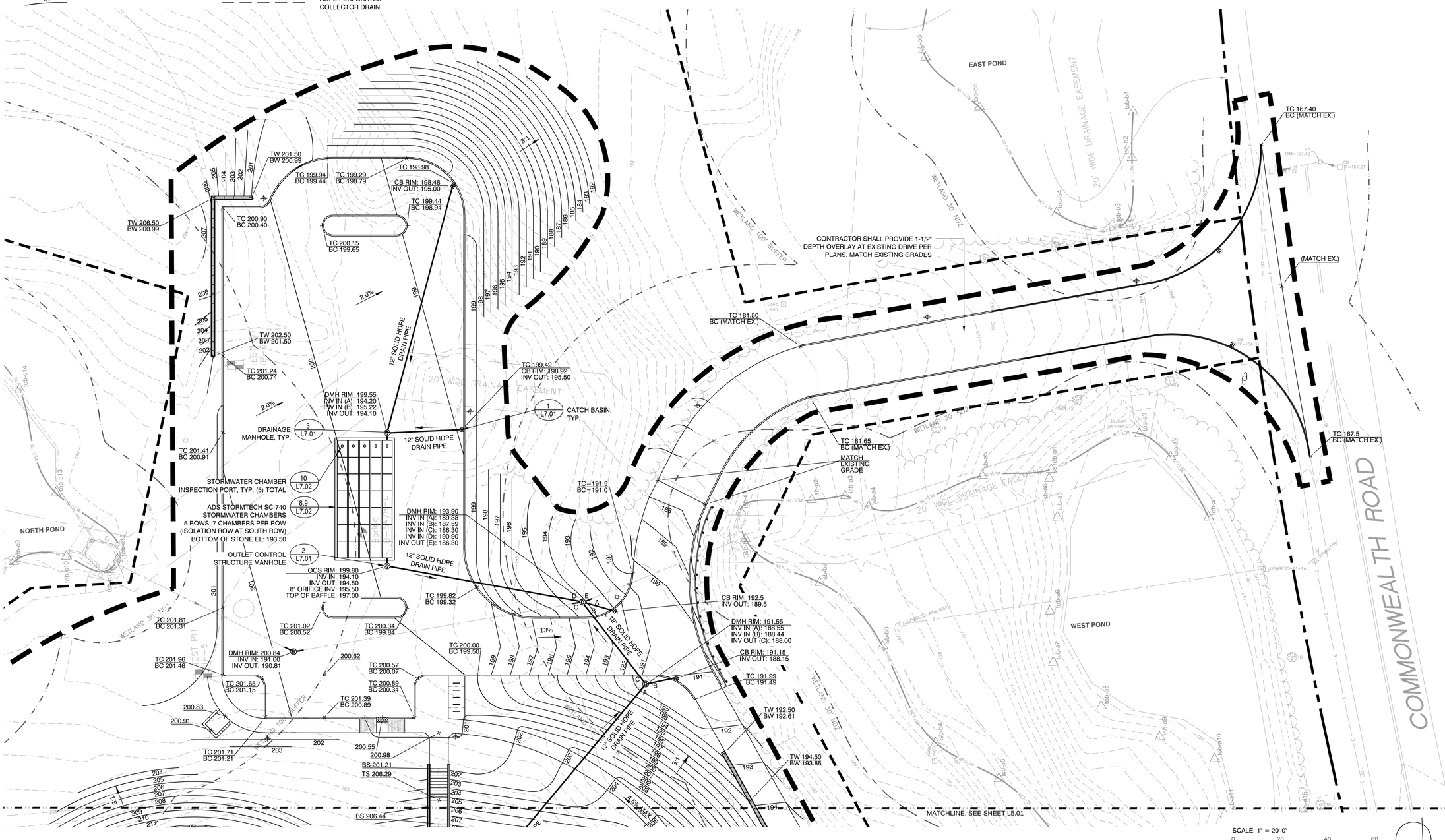
LEGEND

- PROPERTY LINE
- LIMIT OF PROPERTY DESIGNATED FOR RECREATIONAL USE
- LIMIT OF WORK
- MATCHLINE
- EXISTING DRAINAGE STRUCTURE. SEE UTILITIES PLAN
- EXISTING CONTOURS (12)
- EXISTING SPOT ELEVATION (95.10)
- PROPOSED CONTOURS (14 / 15)
- 2% MAX. — SWALE LINE
- 1.5% — PROPOSED SLOPE
- 8.25 — PROPOSED SPOT ELEVATION
- CATCH BASIN
- PVC AREA DRAIN
- DRAINAGE MAN HOLE
- HDPE SOLID DRAIN PIPE — HDPE SOLID DRAIN PIPE, DIAMETER VARIES
- FLAT DRAIN — FLAT DRAIN
- HDPE PERFORATED COLLECTOR DRAIN — HDPE PERFORATED COLLECTOR DRAIN

FFE	FINISHED FLOOR ELEVATION
HP	HIGH POINT
LP	LOW POINT
TW	TOP OF WALL
BW	BOTTOM OF WALL
TS	TOP OF STEP
BS	BOTTOM OF STEP



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GRADING, DRAINAGE & UTILITY ENLARGEMENT PLANS

Sheet Number:

L5.02

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PLANTING SCHEDULE

TREES					
ABRV.	QTY	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
AR	17	ACER RUBRUM	RED MAPLE	2'-2.5" CAL.	B&B
AC	8	ACER SACCHARUM	SUGAR MAPLE	2'-2.5" CAL.	B&B
QA	13	QUERCUS ALBA	WHITE OAK	2'-2.5" CAL.	B&B
QR	28	QUERCUS RUBRA	RED OAK	2'-2.5" CAL.	B&B
QV	16	QUERCUS VELUTINA	BLACK OAK	2'-2.5" CAL.	B&B
SHRUBS					
ABRV.	QTY	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
AA	10	ARONIA ARBUTIFOLIA	RED CHOKEBERRY	#3 CONT.	
ME	5	ARONIA MELANOCARPA	BLACK CHOKEBERRY	#3 CONT.	
CA	7	CLETHRA ALNIFOLIA	SWEET PEPPER BUSH	#3 CONT.	
HV	7	HAMEMALIS VIRGINIANA	WITCH HAZEL	#3 CONT.	
IG	14	ILEX GLABRA 'SHAMROCK'	INKBERRY 'SHAMROCK'	#3 CONT.	
IV	10	ILEX VERTICILLATA	WINTERBERRY	#3 CONT.	
MP	16	MYRICA PENSYLVANICA	BAYBERRY	#3 CONT.	
RA	46	RHUS AROMATICA 'GRO-LOW'	FRAGRANT SUMAC 'GRO-LOW'	#3 CONT.	
SS	18	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'	LITTLE BLUESTEM	#3 CONT.	
VD	6	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	#3 CONT.	

LEGEND:

PROPERTY LINE

LIMIT OF WORK

WETLAND DELINEATION

WETLAND BUFFER

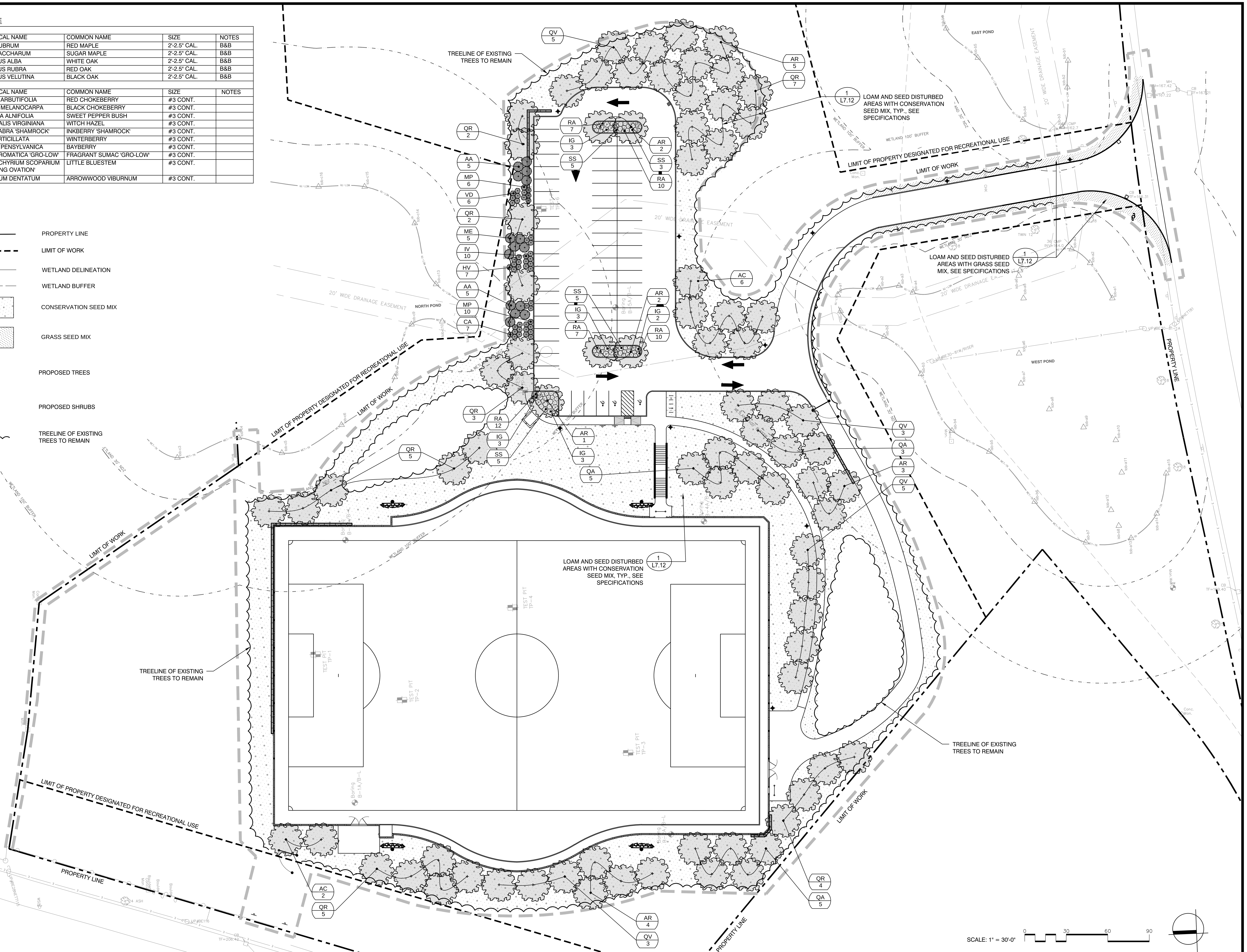
CONSERVATION SEED MIX

GRASS SEED MIX

PROPOSED TREES

PROPOSED SHRUBS

TREELINE OF EXISTING TREES TO REMAIN



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OVERALL PLANTING PLAN

Sheet Number:

L6.00

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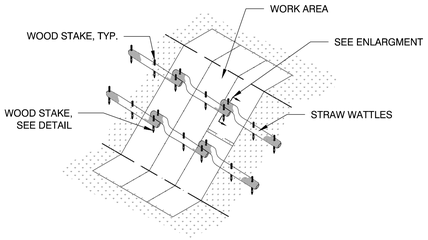
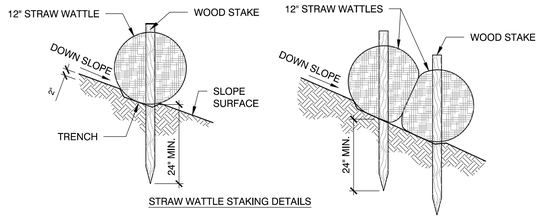
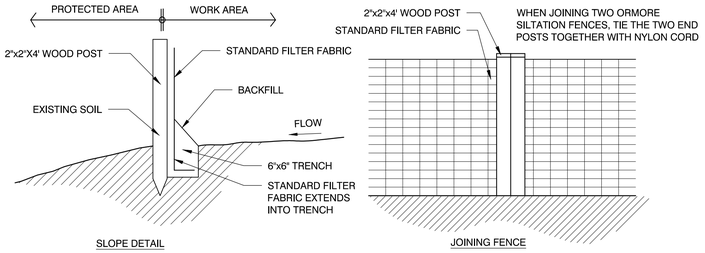


STRAW WATTLE LAYOUT ON SLOPE



STRAW WATTLE STAKING DETAILS

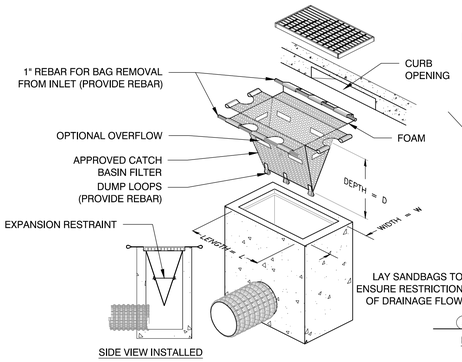


SLOPE DETAIL

JOINING FENCE

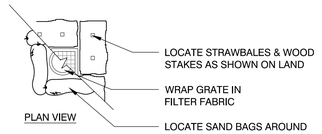
1 EROSION AND SEDIMENT CONTROL

SCALE: NTS



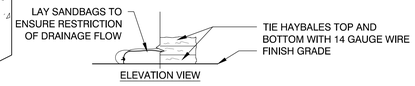
SIDE VIEW INSTALLED

NOTE:
1. HAYBALE/SANDBAG PROTECTION OR CATCH BASIN FILTER FOR PAVED AREAS SHALL BE PROVIDED FOR ALL DRAINAGE STRUCTURES WITHIN THE LIMIT OF WORK AND ANY STRUCTURES OUTSIDE THE PROJECT TERMINII THAT ARE AFFECTED BY CONSTRUCTION.



PLAN VIEW

INSTALLATION IN PAVED AREAS

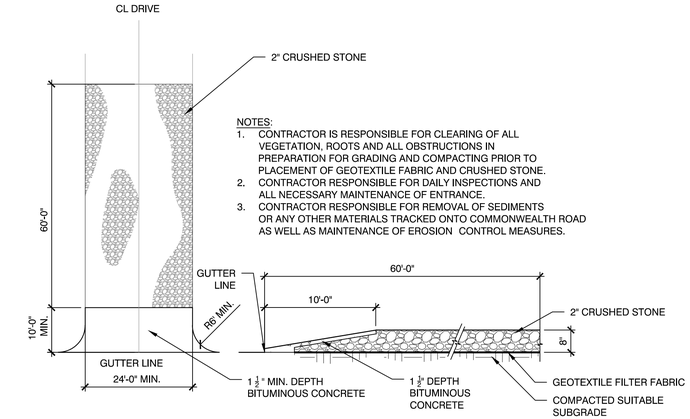


ELEVATION VIEW

INSTALLATION IN GRASS AREAS

3 INLET SEDIMENT CONTROL

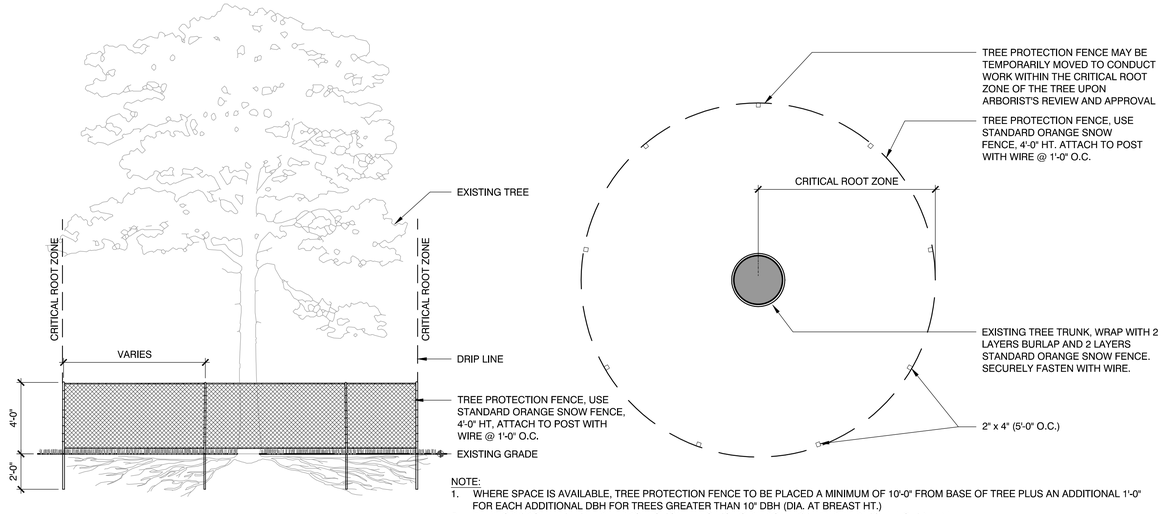
SCALE: NTS



NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR CLEARING OF ALL VEGETATION, ROOTS AND ALL OBSTRUCTIONS IN PREPARATION FOR GRADING AND COMPACTING PRIOR TO PLACEMENT OF GEOTEXTILE FABRIC AND CRUSHED STONE.
2. CONTRACTOR RESPONSIBLE FOR DAILY INSPECTIONS AND ALL NECESSARY MAINTENANCE OF ENTRANCE.
3. CONTRACTOR RESPONSIBLE FOR REMOVAL OF SEDIMENTS OR ANY OTHER MATERIALS TRACKED ONTO COMMONWEALTH ROAD AS WELL AS MAINTENANCE OF EROSION CONTROL MEASURES.

4 CONSTRUCTION ENTRANCE TRACTION PAD

SCALE: NTS



NOTE:
1. WHERE SPACE IS AVAILABLE, TREE PROTECTION FENCE TO BE PLACED A MINIMUM OF 10'-0" FROM BASE OF TREE PLUS AN ADDITIONAL 1'-0" FOR EACH ADDITIONAL DBH FOR TREES GREATER THAN 10" DBH (DIA. AT BREAST HT.)
2. ALL WORK DONE WITHIN TREE PROTECTION FENCE IS TO BE DONE BY HAND AND LIGHT EQUIPMENT.
3. ROOTS EXPOSED DURING EXCAVATION SHALL BE NEATLY CUT AND COVERED WITH SOIL IMMEDIATELY.
4. FOR TREES THAT OCCUR IN GROUPS PROVIDE TREE PROTECTION FENCE AROUND ENTIRE AREA. SEE PLAN FOR LOCATIONS.
5. MAINTAIN FENCE PROTECTION IN SOUND CONDITION FOR THE DURATION OF CONSTRUCTION.
6. A CERTIFIED ARBORIST SHALL DELINEATE LIMIT OF TREE PROTECTION FENCE AS THEY RELATE TO THE LIMITS OF THE CRITICAL ROOT ZONE.
7. CRITICAL ROOT ZONE TO BE PROTECTED. ALL WORK NECESSARY WITHIN THE CRITICAL ROOT ZONE SHALL BE PERFORMED BY HAND.

2 TREE PROTECTION

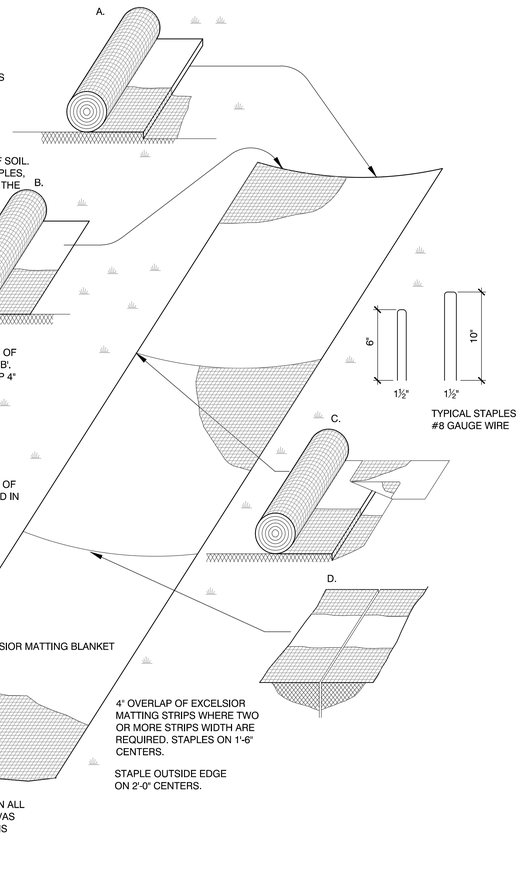
SCALE: NTS

A. BURY THE TOP END OF EXCELSIOR MATTING STRIPS MINIMUM 6".

B. TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 6" SPACING 4" DOWN FROM THE TRENCH.

C. OVERLAP-BURY UPPER END OF LOWER STRIP AS IN 'A' AND 'B', OVERLAP END OF TOP STRIP 4" AND STAPLE.

D. EROSION STOP-FOLD EDGE OF EXCELSIOR MATTING BURIED IN SILT TRENCH AND TAMPED; DOUBLE ROW OF STAPLES.



NOTE:
1. JUTE NETTING TO BE USED ON ALL SLOPES GREATER THAN 4H:1VAS INDICATED ON GRADING PLANS

5 EROSION CONTROL BLANKET

SCALE: NTS

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IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

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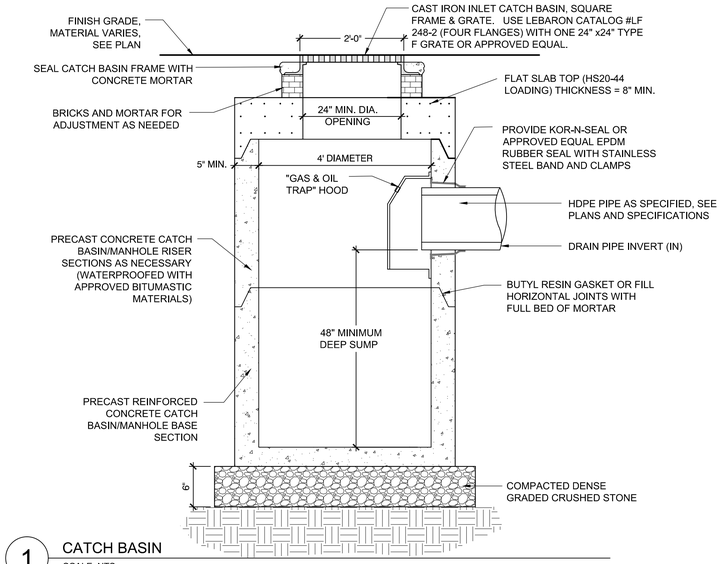
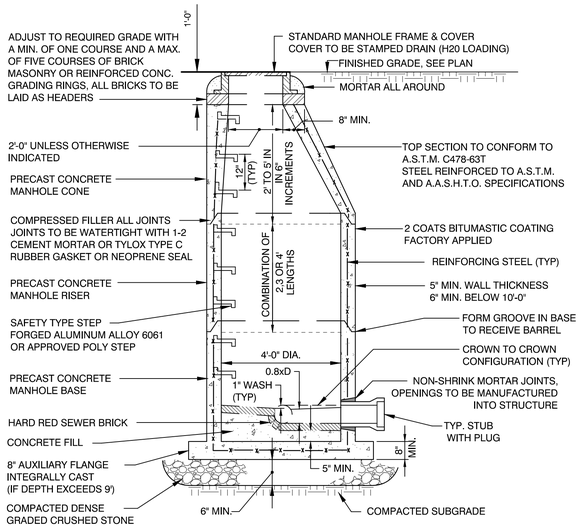


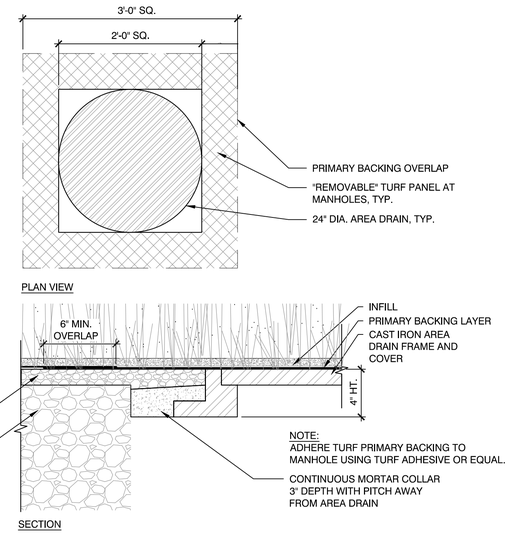
1 CATCH BASIN

SCALE: NTS

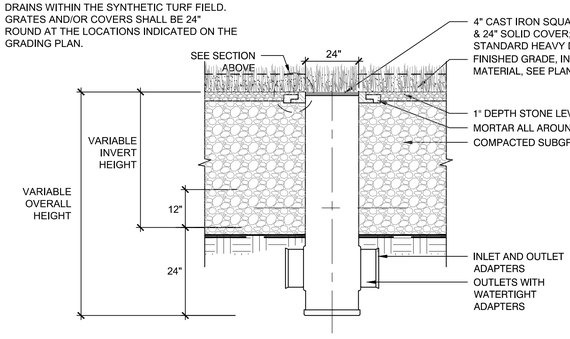


3 DRAINAGE MANHOLE

SCALE: NTS

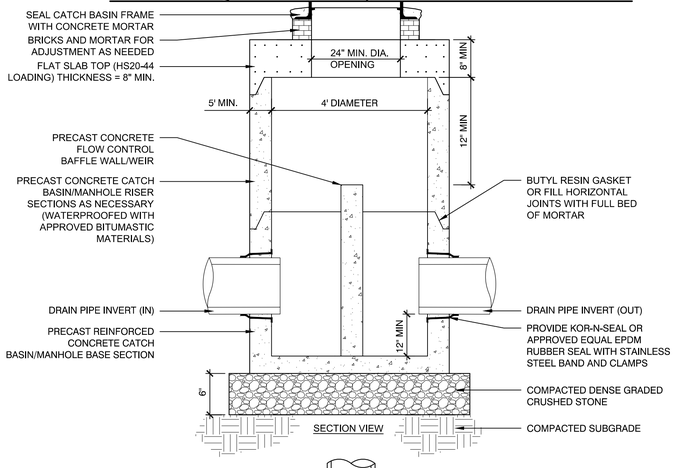


NOTES:
1. 24" MIN SUMP IS REQUIRED AT ALL AREA DRAINS WITHIN THE SYNTHETIC TURF FIELD.
2. GRATES AND/OR COVERS SHALL BE 24" ROUND AT THE LOCATIONS INDICATED ON THE GRADING PLAN.



6 PVC DMH AT SYNTHETIC TURF FIELDS

SCALE: NTS

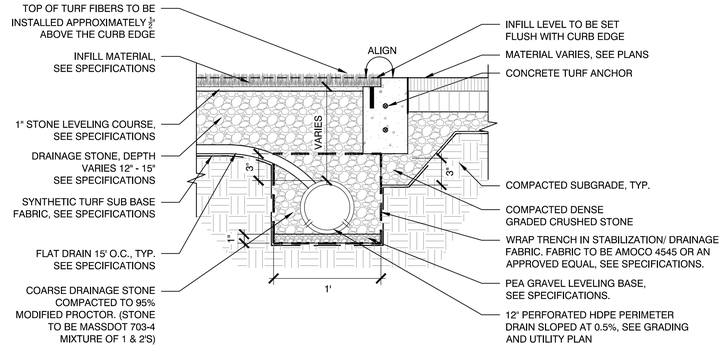


2 OUTLET CONTROL STRUCTURE MANHOLE

SCALE: NTS

4 DRAINAGE TRENCH

SCALE: NTS



NOTES:
1. FLAT DRAIN TO BE DIRECTLY CONNECTED TO PERIMETER DRAIN. PROVIDE MANUFACTURED FITTINGS TO MAKE THE CONNECTION AS REQUIRED AND APPROVED BY THE OWNERS REPRESENTATIVE.
2. CONCRETE CURB TO BE 4,500 PSI AT 28 DAYS (AIR CONTENT 6% +/- 1%) (COARSE AGGREGATE ASTM C-33 SIZE #57)

5 COLLECTOR DRAIN

SCALE: NTS

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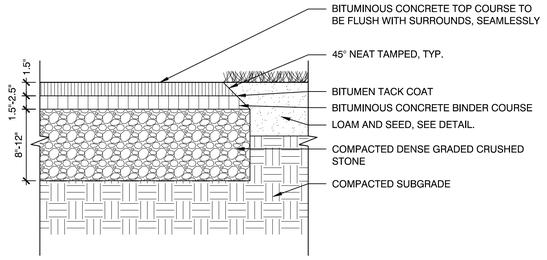
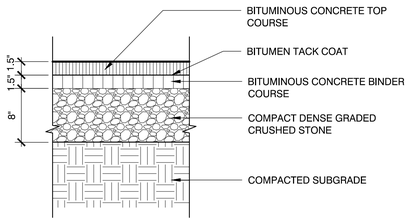


1 BITUMINOUS CONCRETE AT LAWN

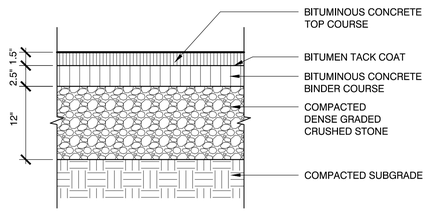
SCALE: NTS



NOTES:
1. CONTRACTOR TO PROVIDE SMOOTH TRANSITION WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT.

2 PEDESTRIAN BITUMINOUS CONCRETE PAVEMENT

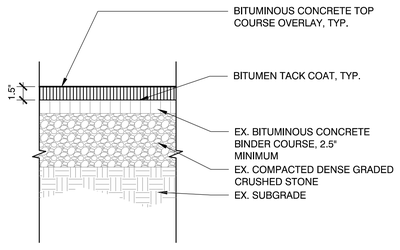
SCALE: NTS



NOTES:
1. CONTRACTOR TO PROVIDE SMOOTH TRANSITION WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT, TYP.

3 VEHICULAR BITUMINOUS CONCRETE PAVEMENT

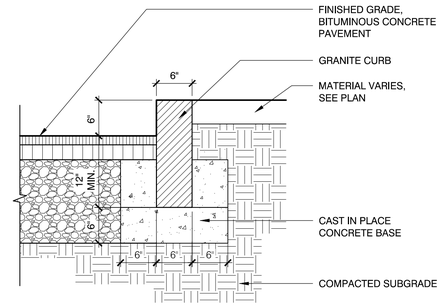
SCALE:NTS



NOTES:
1. CONTRACTOR TO PROVIDE SMOOTH TRANSITION WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT, TYP.

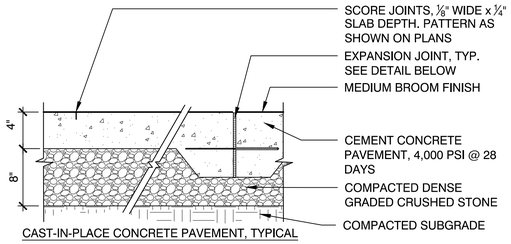
4 BITUMINOUS CONCRETE PAVEMENT - TOP COURSE OVERLAY

SCALE: NTS

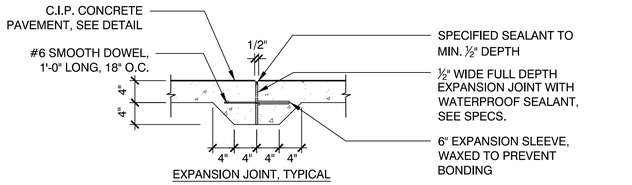


5 VERTICAL GRANITE CURB

SCALE: NTS



CAST-IN-PLACE CONCRETE PAVEMENT, TYPICAL



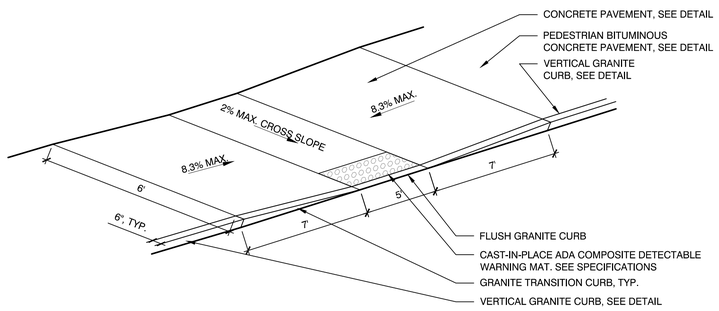
EXPANSION JOINT, TYPICAL

EXPANSION JOINT INSTALLATION NOTES:

1. DOWEL IS TYPICAL AT ALL EXPANSION JOINTS (18" O.C.) WITHIN CONCRETE PAVING AND BETWEEN NEW CONCRETE PAVING AND EXISTING CONCRETE PAVING TO REMAIN.
2. DELETE EXPANSION SLEEVE AND DOWEL WHERE JOINT ABUTS WALL, CURBS, OR OTHER VERTICAL SURFACES, UNLESS OTHERWISE NOTED.
3. EXPANSION JOINTS MAX. 25'-0" O.C. UNLESS SHOWN OTHERWISE.
4. EXPANSIONS JOINTS SHALL BE PLACED WHERE NEW CEMENT CONCRETE PAVEMENT MEETS EXISTING PAVEMENT OR WALLS TO REMAIN.
5. ALL EXPANSION JOINTS SHALL BE SAW CUT.

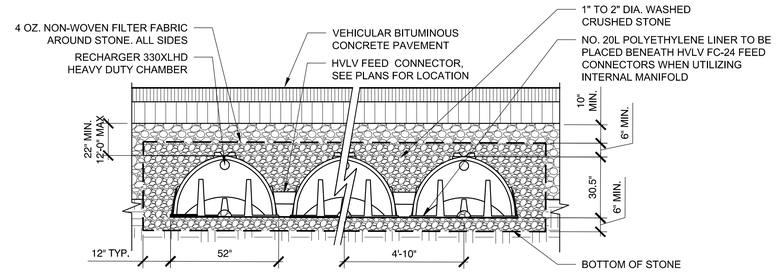
6 CONCRETE PAVEMENT

SCALE: NTS



7 CURB RAMP WITH DETECTABLE WARNING MAT

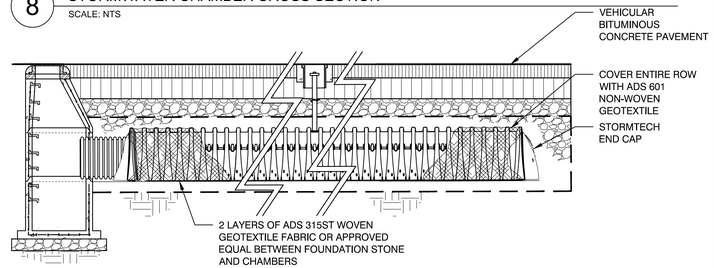
SCALE: NTS



NOTES:
1. STORAGE PROVIDED = SEE PLANS.
2. CHAMBER SHALL BE INSTALLED PER MANUFACTURER'S REQUIREMENTS.
3. USE 330XLHD HEAVY DUTY FOR TRAFFIC AND/OR H-25 APPLICATIONS OR APPROVED EQUAL. SEE SPECIFICATIONS.
4. ALL UNITS SHALL BE MARKED WITH A COLOR STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.
5. ALL CHAMBERS MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.
6. PROVIDE ONE 6" INSPECTION PORT ON THE END OF EACH ROW PER MANUFACTURER DETAILS.

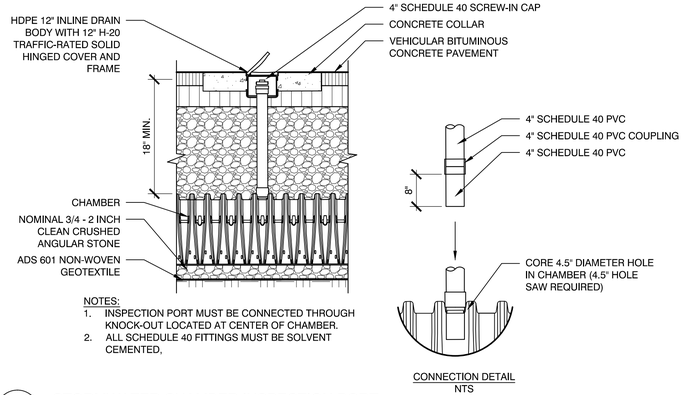
8 STORMWATER CHAMBER CROSS SECTION

SCALE: NTS



9 STORMWATER CHAMBER ISOLATION ROW

SCALE: NTS

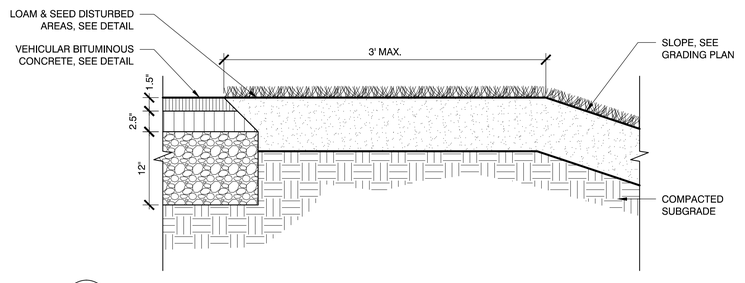


NOTES:
1. INSPECTION PORT MUST BE CONNECTED THROUGH KNOCK-OUT LOCATED AT CENTER OF CHAMBER.
2. ALL SCHEDULE 40 FITTINGS MUST BE SOLVENT CEMENTED,

CONNECTION DETAIL
NTS

10 STORMWATER CHAMBER INSPECTION PORT

SCALE: NTS



11 ROADWAY EDGE

SCALE: NTS

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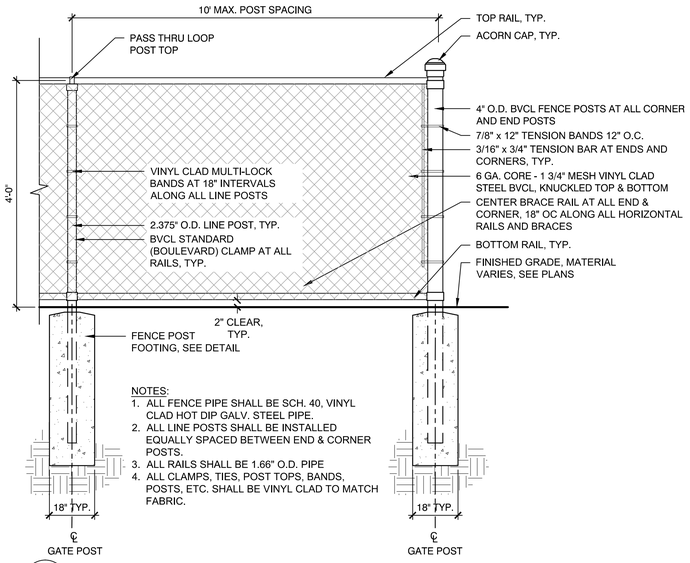
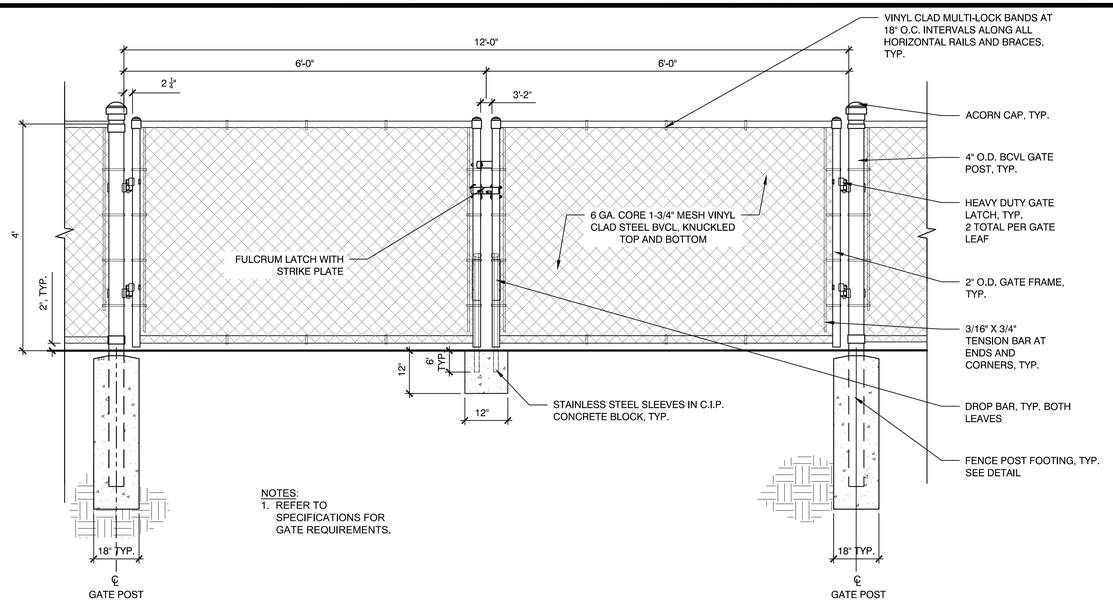


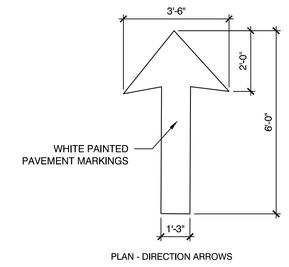
1 4' HT. BLACK VINYL CHAIN LINK (BVCL) FENCE

SCALE: NTS



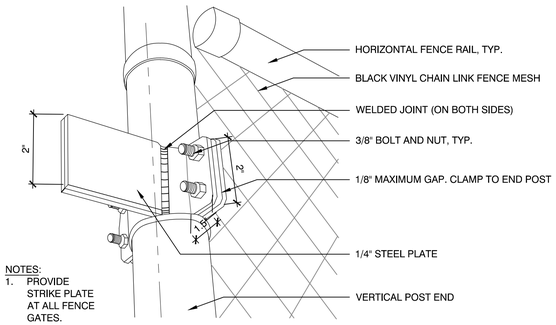
4 12' WIDE BLACK VINYL CHAIN LINK (BVCL) FENCE DOUBLE SWING GATE

SCALE: NTS



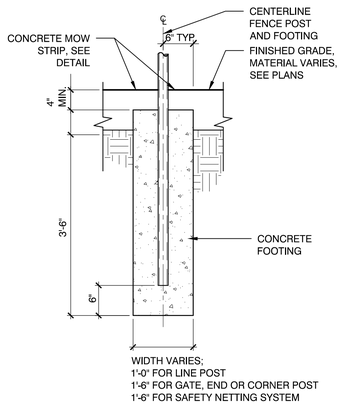
7 ONE-WAY DIRECTIONAL TRAFFIC ARROW

SCALE: NTS



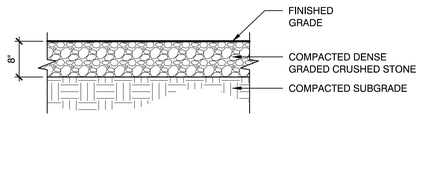
2 STRIKE PLATE

SCALE: NTS



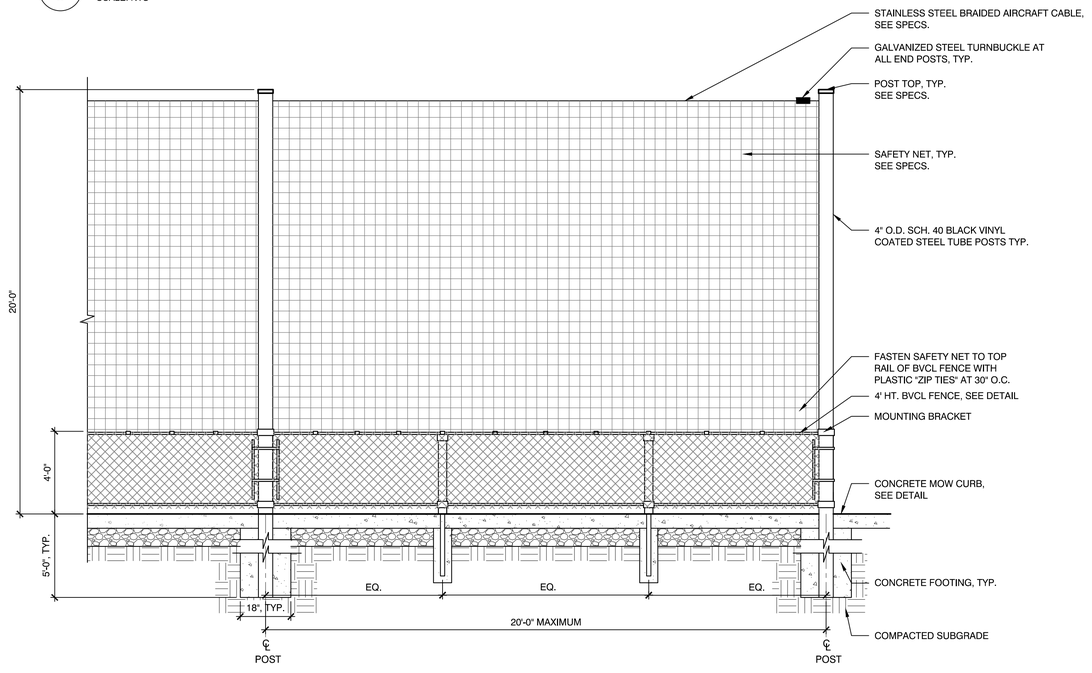
3 FENCE POST FOOTING

SCALE: NTS



5 DENSE GRADED CRUSHED STONE LEVELING PAD

SCALE: NTS



6 20' HT. SAFETY NETTING SYSTEM

SCALE: NTS

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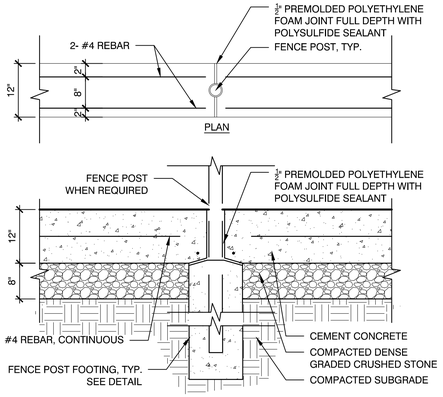
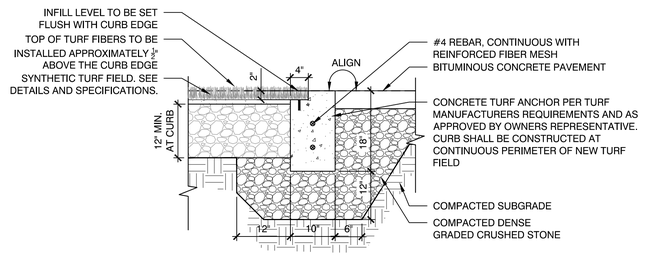


CONCRETE MOW CURB

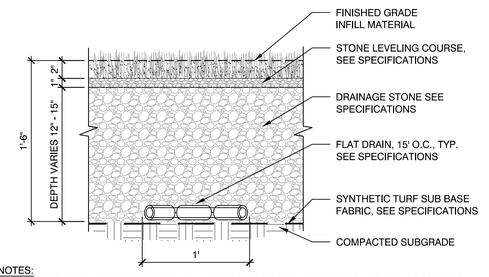
NOTES:
1. MOW CURB CORNERS SHALL BE SQUARE AT ADJACENT SURFACE MATERIAL TO ENSURE SMOOTH INTERFACE BETWEEN MATERIALS.
2. MOW CURB CORNERS ADJACENT TO PLANTING BED OR LAWN AREAS WILL HAVE ¾" CHAMFER.
3. CONTRACTOR SHALL PROVIDE ¾" PREMOLDED POLYETHYLENE FOAM EXPANSION JOIN, FULL DEPTH WITH SILICONE SEALANT EVERY 30' O.C. UNLESS OTHERWISE NOTED.



NOTES:
1. CONTRACTOR TO PROVIDE CONTROL JOINTS (PREFORMED OR SAWCUT) 10' O.C. MIN. ½" DEEP
2. CONTRACTOR TO PROVIDE EXPANSION JOINTS EVERY 40' O.C.
3. CONCRETE CURB TO BE 4,500 PSI AT 28 DAYS (AIR CONTENT 6% +/- 1%) (COARSE AGGREGATE ASTM C-33 SIZE #57)

1 CONCRETE TURF ANCHOR AT SYNTHETIC TURF FIELD - 2 CONDITIONS

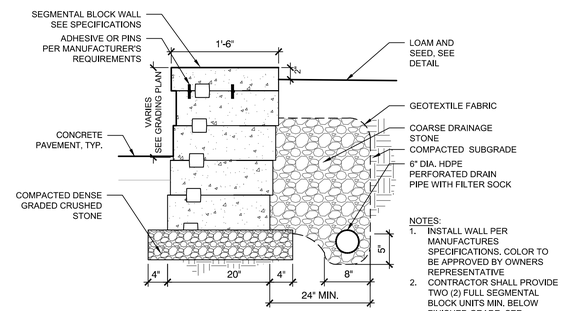
SCALE: NTS



NOTES:
1. SUBGRADE ELEVATIONS TO FOLLOW SAME SLOPE AS FINISHED SURFACE ELEVATIONS WITHIN TURF LIMITS.
2. ABSOLUTELY NO SUBSTITUTIONS SHALL BE ALLOWED FOR BOTH THE STONE LEVELING COURSE AND DRAINAGE STONE WITHOUT A WRITTEN AND SIGNED DOCUMENT DIRECTLY FROM THE TURF MANUFACTURER. DOCUMENT SHALL STATE: THE MATERIAL IS AN ACCEPTABLE MATERIAL TO BE USED DIRECTLY UNDER THEIR TURF FIELD FABRIC AND THAT THE SUBSTITUTION MATERIAL PROVIDES THE SAME CHARACTERISTICS (DRAINAGE, STRUCTURAL INTEGRITY, PLAYABILITY, ETC.) AS THE MATERIALS SPECIFIED. FAILURE TO PROVIDE SUCH A DOCUMENT SHALL BE AT THE RISK AND COST OF THE CONTRACTOR.

2 SYNTHETIC TURF

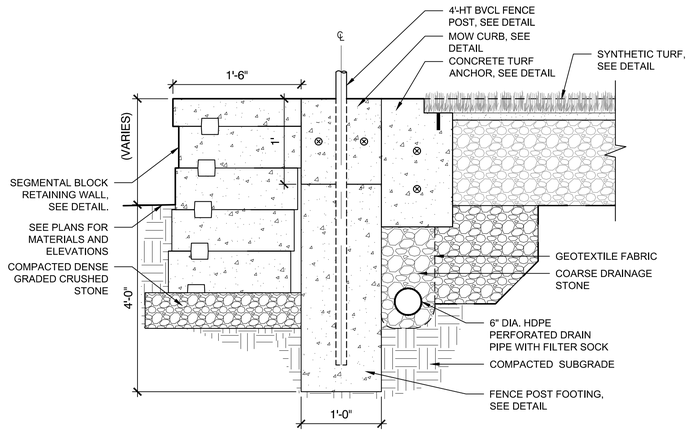
SCALE: NTS



NOTES:
1. INSTALL WALL PER MANUFACTURES SPECIFICATIONS. COLOR TO BE APPROVED BY OWNERS REPRESENTATIVE
2. CONTRACTOR SHALL PROVIDE TWO (2) FULL SEGMENTAL BLOCK UNITS MIN. BELOW FINISHED GRADE. SEE GRADING PLAN.

3 SEGMENTAL BLOCK RETAINING WALL

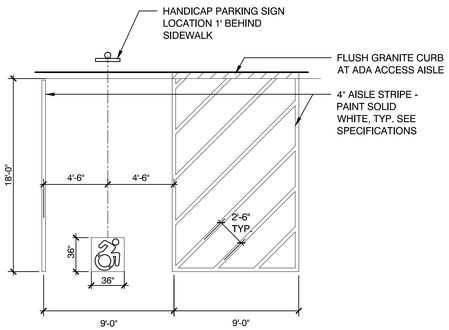
SCALE: NTS



NOTES:
1. INSTALL WALL PER MANUFACTURES SPECIFICATIONS. COLOR TO BE APPROVED BY OWNERS REPRESENTATIVE
2. CONTRACTOR SHALL PROVIDE TWO (2) FULL SEGMENTAL BLOCK UNITS MIN. BELOW FINISHED GRADE. SEE GRADING PLAN.

4 BVCL FENCE POST AT SEGMENTAL BLOCK RETAINING WALL

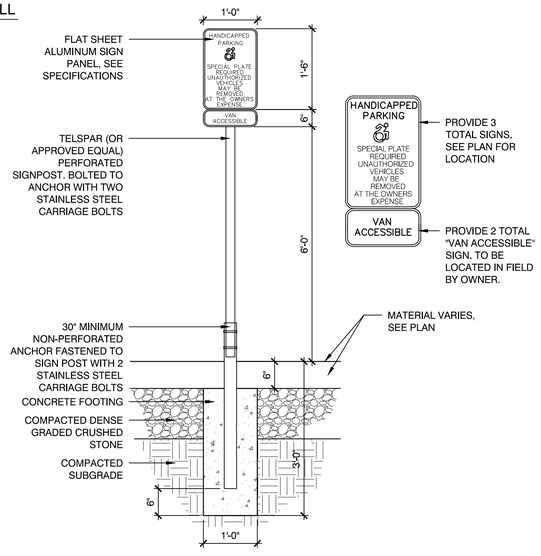
SCALE: NTS



NOTES:
1. SEE SPECIFICATIONS FOR ALL PAVEMENT MARKINGS.
2. UNIVERSAL WHITE PAINTED ADA SYMBOL PLACED IN A BLUE PAINTED FIELD.

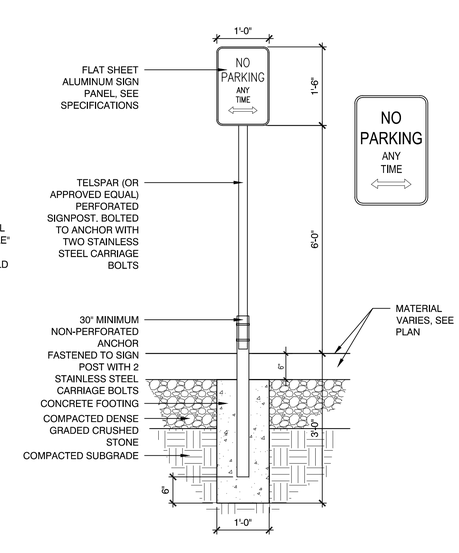
5 HANDICAP PARKING SPACE MARKING

SCALE: NTS



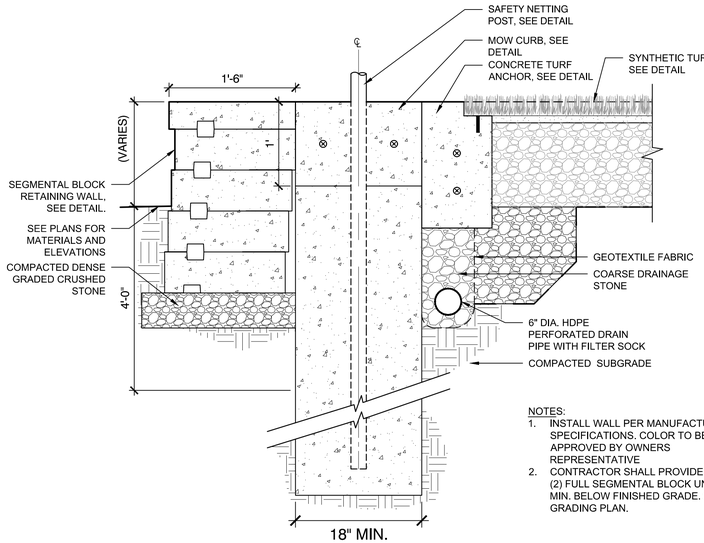
7 HANDICAP PARKING SIGN AND FOOTING

SCALE: NTS



8 "NO PARKING" SIGN AND FOOTING

SCALE: NTS



NOTES:
1. INSTALL WALL PER MANUFACTURES SPECIFICATIONS. COLOR TO BE APPROVED BY OWNERS REPRESENTATIVE
2. CONTRACTOR SHALL PROVIDE TWO (2) FULL SEGMENTAL BLOCK UNITS MIN. BELOW FINISHED GRADE. SEE GRADING PLAN.

6 SAFETY NETTING POST AT SEGMENTAL BLOCK RETAINING WALL

SCALE: NTS

Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

410 COMMONWEALTH RD, WAYLAND, MA 01778

Weston & Sampson
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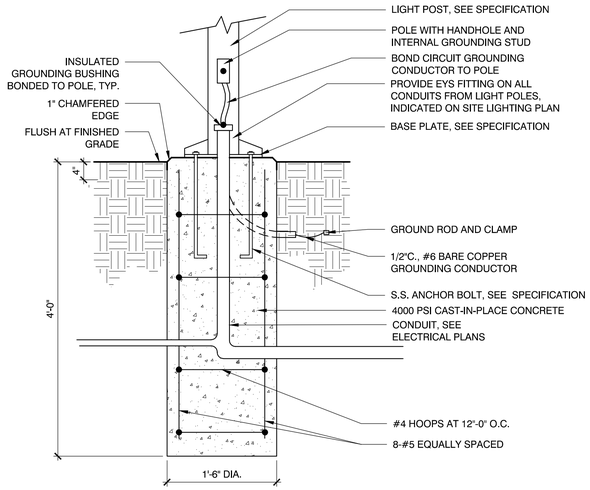
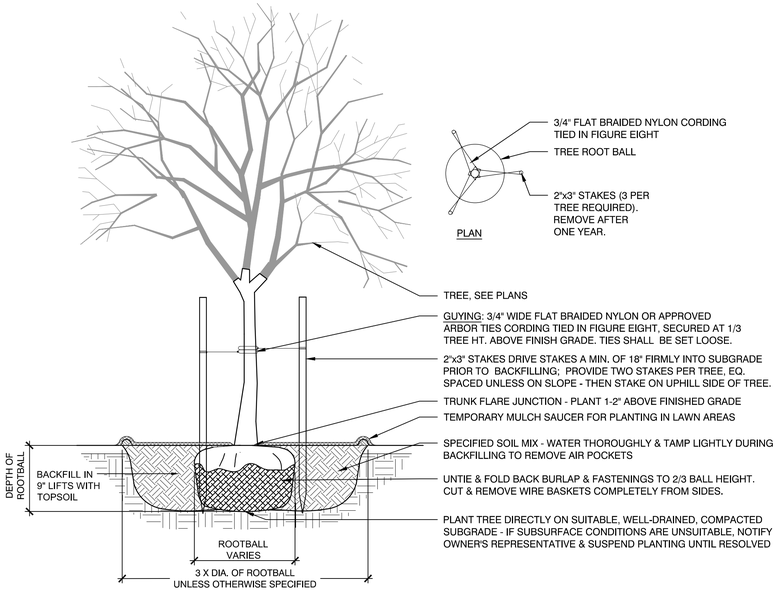


NOTES:

1. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR. ALL EXCAVATION, BACKFILL, & CONCRETE SHALL BE BY GENERAL CONTRACTOR.
2. REFER TO SPECIFICATIONS FOR MATERIALS.

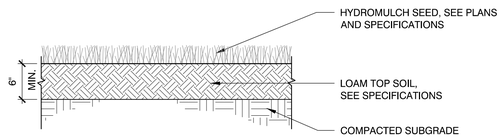
1 BASE BID: PEDESTRIAN LIGHTING AND FOOTING

SCALE: NTS



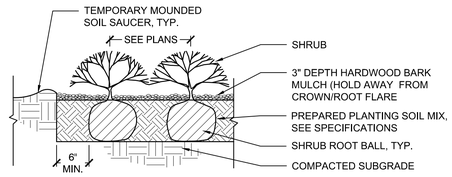
2 TREE STAKING AND PLANTING

SCALE: NTS



3 LOAM AND SEED

SCALE: NTS

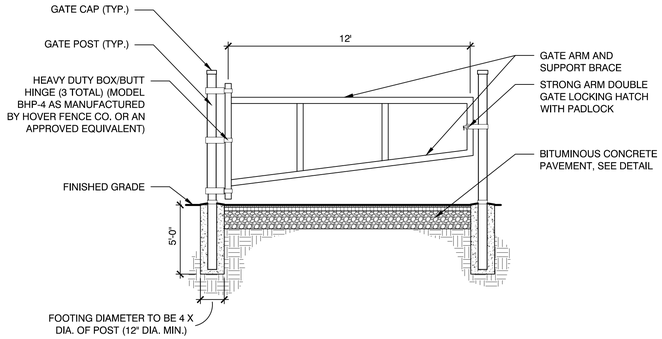


NOTES:

1. ALL MULCH MUST BE DARK IN COLOR. PROVIDE SAMPLE PRIOR TO INSTALLATION TO BE APPROVED BY OWNER'S REPRESENTATIVE.

4 SHRUB PLANTING

SCALE: NTS



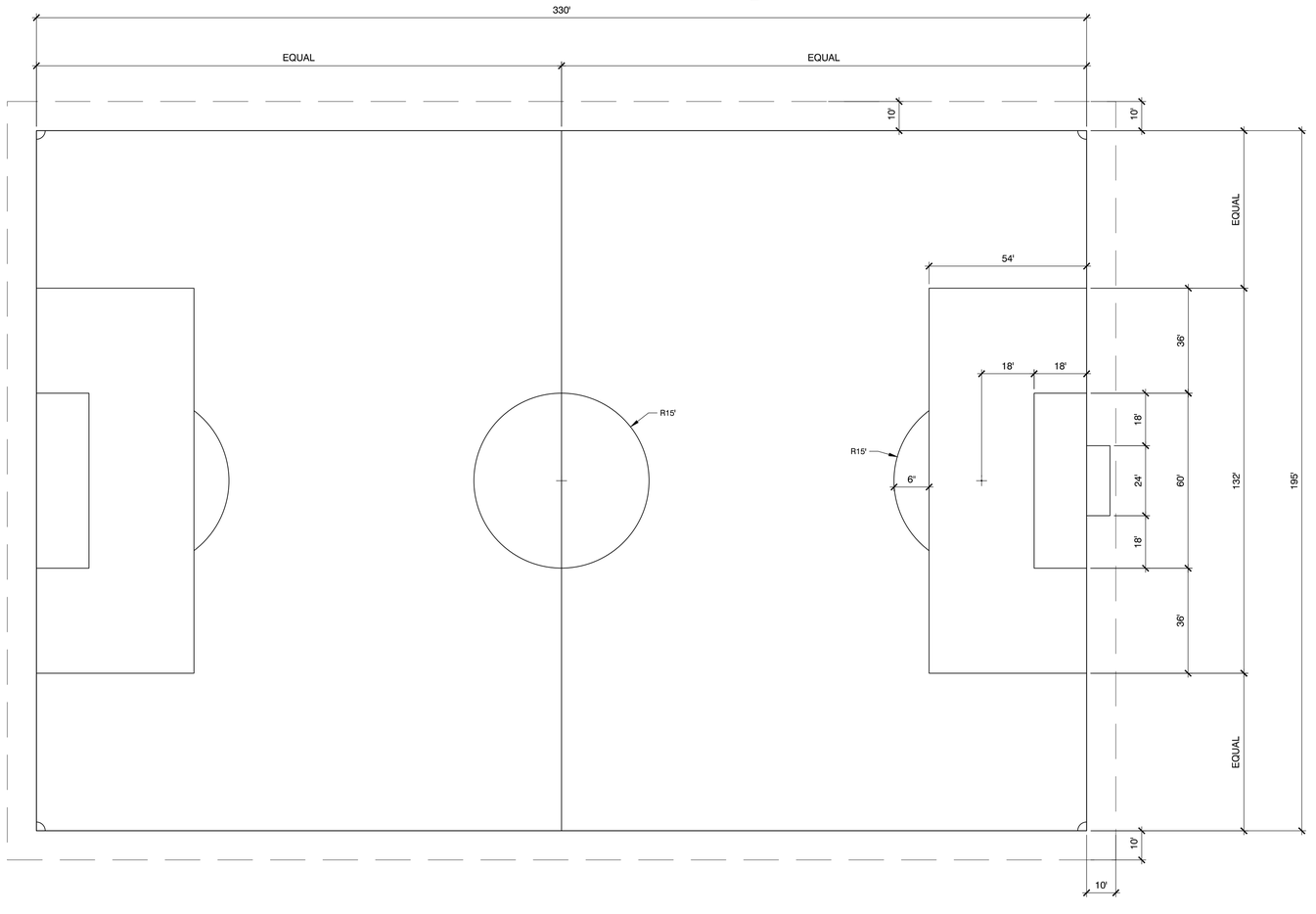
POSTS:
SCHEDULE 40 GALVANIZED STEEL, SIX (6) INCH DIA.
GATE ARM AND SUPPORT BRACE:
SCHEDULE 40 GALVANIZED STEEL FOUR (4) INCH DIA.
HARDWARE:
HEAVY DUTY GALVANIZED STEEL
CONCRETE FOOTING:
NORMAL WEIGHT CONCRETE AIR ENTRAINED WITH NOT LESS THAN 4,500 PSI COMPRESSIVE STRENGTH (28 DAYS), THREE (3) INCH SLUMP, AND ONE (1) INCH MAXIMUM SIZE AGGREGATE.

NOTES:

1. THE CONTRACTOR SHALL PROVIDE ALL GATE COMPONENTS, HARDWARE, ETC. FOR THE COMPLETE INSTALLATION OF THE NEW GATE. INSTALL IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN RECOMMENDATIONS AND SPECIFICATIONS. ALL MATERIALS SHALL BE HEAVY DUTY RATED AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION. ALL HARDWARE SHALL INSTALLED SO THAT THE GATE IS STRUCTURALLY SOUND AND DOES NOT SAG IN THE OPEN AND/OR CLOSED POSITION. COORDINATE LAYOUT AND LOCATION IN THE FIELD WITH THE ENGINEER PRIOR TO INSTALLATION.

6 VEHICLE SWING GATE

SCALE: NTS



5 SOCCER STRIPING LAYOUT

SCALE: NTS

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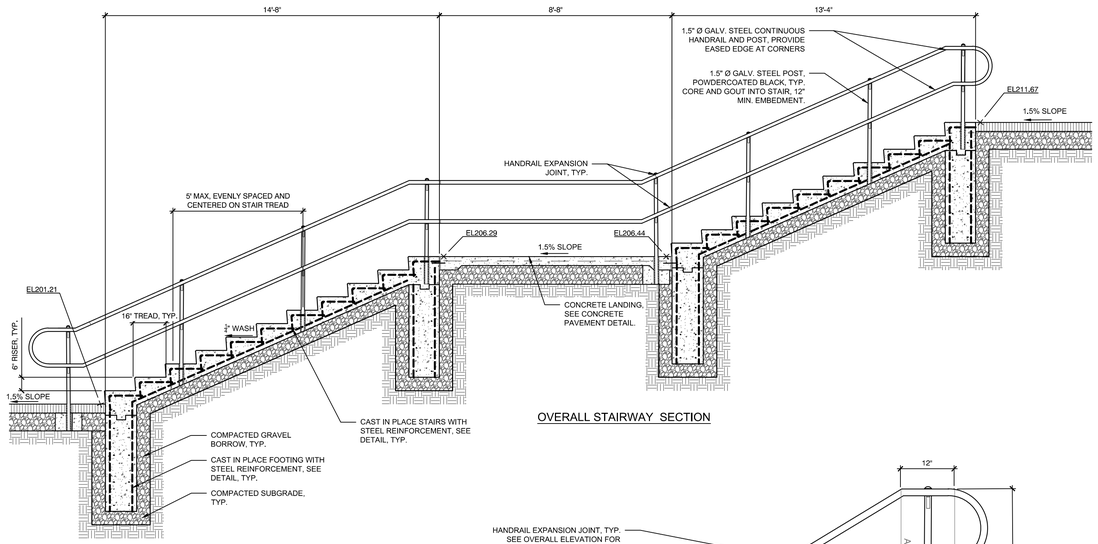
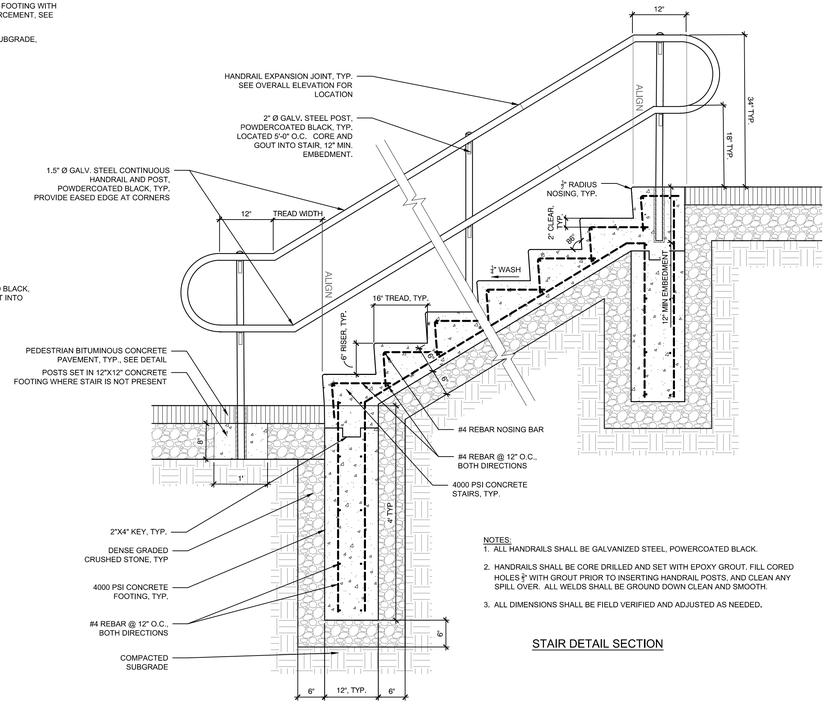


OVERALL STAIRWAY SECTION

HANDRAIL SECTION

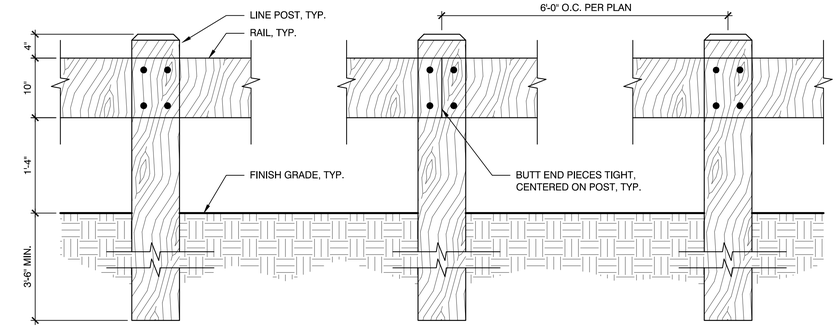
NOTES:
1. VERTICAL POSTS SHALL BE SET @ 5' MAXIMUM, EVENLY SPACED AND ALONG THE HORIZONTAL RAIL AND CENTERED ON TREADS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS.
2. CONTRACTOR SHALL SUBMIT LARGE SCALE SHOP DRAWINGS OF HANDRAILS AND ALL NECESSARY HARDWARE PER SPECIFICATIONS



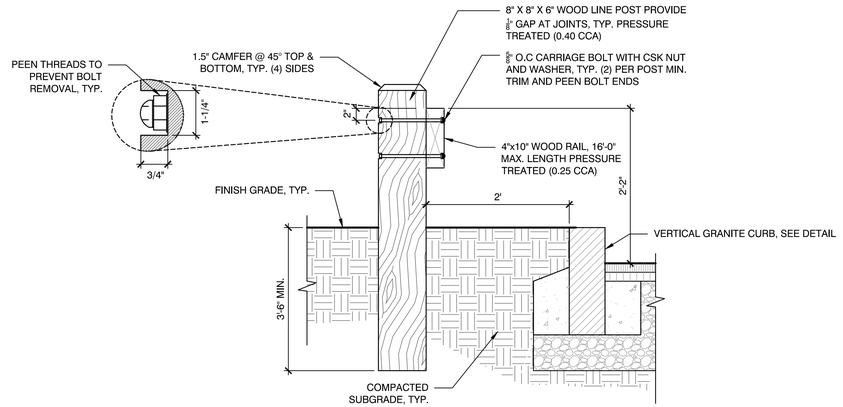
NOTES:
1. ALL HANDRAILS SHALL BE GALVANIZED STEEL, POWERCOATED BLACK.
2. HANDRAILS SHALL BE CORE DRILLED AND SET WITH EPOXY GROUT. FILL CORED HOLES 5/8" WITH GROUT PRIOR TO INSERTING HANDRAIL POSTS, AND CLEAN ANY SPILL OVER. ALL WELDS SHALL BE GROUND DOWN CLEAN AND SMOOTH.
3. ALL DIMENSIONS SHALL BE FIELD VERIFIED AND ADJUSTED AS NEEDED.

STAIR DETAIL SECTION

1 CAST IN PLACE CONCRETE STAIRS
SCALE: NTS

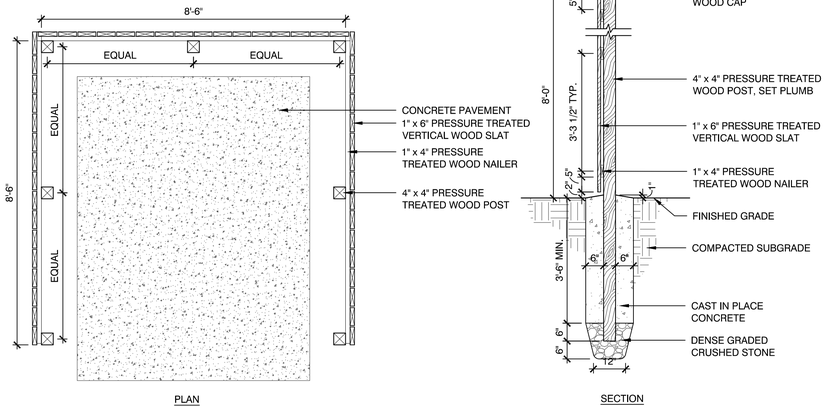


TYPICAL RAILING ELEVATION



RAILING SECTION AT BACK OF CURB

2 VEHICULAR WOOD GUARDRAIL
SCALE: NTS



PLAN

SECTION

3 WOOD SLAT SCREEN FENCE
SCALE: NTS

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ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AC	ALTERNATING CURRENT
A	AMPERE
ATC	AUTOMATIC TEMPERATURE CONTROLS
ATS	AUTOMATIC TRANSFER SWITCH
BKR	BREAKER
C	CONDUIT
CKT	CIRCUIT
CB	CIRCUIT BREAKER
EC	ELECTRICAL CONTRACTOR
EMT	ELECTRIC METALLIC TUBING
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EF	EXHAUST FAN
FL	FLOOR
FLA	FULL LOAD AMPERE
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HOA	HAND OFF AUTOMATIC
HP	HORSEPOWER
IG	ISOLATED GROUND
JB	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
MC	MECHANICAL CONTRACTOR
MTD	MOUNTED
MTG	MOUNTING
NMC	NON-METALLIC CONDUIT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PNL	PANELBOARD
PH	PHASE
PVC	POLYVINYL CHLORIDE CONDUIT
RSC	RIGID GALVANIZED STEEL CONDUIT
SF	SUPPLY FAN
SS	SAFETY SWITCH
TEL	TELEPHONE
TRF	TRANSFORMER
V	VOLTS
W	WATTS OR WIRE
WP	WEATHERPROOF
4WSN	4-WIRE SOLID NEUTRAL

RECEPTACLE ABBREVIATIONS

GFI	GROUND FAULT CIRCUIT INTERUPTER, PERSONAL PROTECTION
WP	WEATHERPROOF RECEPTACLE WITH COVERPLATE LISTED FOR WET LOCATION WITH AN ATTACHMENT PLUG INSERTED.

ELECTRICAL LEGEND

1,3 LP1B	HOMERUN TO PANELBOARD, NUMBER OF TICKS INDICATES NUMBER OF #12 AWG CONDUCTORS CONTAINED IN RACEWAY. TWO (2) #12 AWG SHALL NOT BE INDICATED BY TICKS, NUMERALS 1 AND 3 INDICATE CIRCUITS IN PANELBOARD. RACEWAYS LARGER THAN 1/2" AND CONDUCTORS LARGER THAN #12 AWG SHALL BE INDICATED ON THE DRAWINGS. PROVIDE AN INSULATED GREEN GROUND WIRE IN ALL RACEWAYS MINIMUM SIZE TO BE #12AWG.
	RACEWAY RUN ABOVE GROUND
	RACEWAY RUN UNDERGROUND
PB	PULL BOX. TYPE AS NOTED ON THE DRAWINGS OR AS REQUIRED BY N.E.C.
	DUPLEX CONVENIENCE OUTLET RATED 20A, 125V, U-SLOT GROUNDED TYPE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER LINE. ALL OTHER MOUNTING HEIGHTS SHALL BE AS NOTED ADJACENT TO THE SYMBOL. REFER TO RECEPTACLE ABBREVIATIONS FOR SPECIAL PURPOSE RECEPTACLES.
S_a	SINGLE POLE SWITCH (120/277V) MOUNTED 4'-0" ABOVE FINISHED FLOOR. ALL OTHER MOUNTING HEIGHTS SHALL BE AS NOTED ON THE DRAWINGS. "a" SUBSCRIPT DENOTES CIRCUITS CONTROLLED.
T1	SPORTS LIGHT POLE - 'T1' INDICATES POLE NUMBER
	PEDESTRIAN LIGHT FIXTURE
PHH	HAND HOLE "PHH" POWER HAND HOLE "CHH" COMMUNICATIONS HAND HOLE

GENERAL NOTES

1. DRAWINGS ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION, MOUNTING HEIGHTS, SIZE OF EQUIPMENT AND ROUTING OF RACEWAYS SHALL BE COORDINATED AND DETERMINED IN THE FIELD.
2. ALL STRAIGHT FEEDER, BRANCH CIRCUIT AND AUXILIARY SYSTEM CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES TO LIMIT THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 150 FEET. EXACT SIZES OF PULL BOXES AND LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ELECTRICAL CONTRACTOR.
3. SLEEVES ARE TO BE UTILIZED FOR PASSAGE OF CONDUITS THROUGH FLOORS OR WALLS. CONDUITS AND BOXES ARE TO BE SUPPORTED BY THE USE OF PRESET FASTENERS INSTALLED IN FLOORS, WALLS OR COLUMNS. CONDUITS AND BOXES ARE TO BE INSTALLED CONCEALED IN MASONRY WALLS AND ABOVE HUNG CEILINGS. ALL SLEEVES ARE TO BE SEALED WITH APPROVED FIRE STOPPING SEALANT.
4. WORK SHALL CONFORM TO THE MASSACHUSETTS ELECTRICAL CODE, MASSACHUSETTS BUILDING CODE, NFPA AND REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION.
5. THE WORD "CONTRACTOR" AS USED IN THE "ELECTRICAL WORK" SHALL MEAN THE ELECTRICAL SUBCONTRACTOR.
6. CONTRACTOR SHALL PAY FOR ALL PERMITS, INSURANCE AND TESTS, AND SHALL PROVIDE LABOR AND MATERIAL TO COMPLETE THE ELECTRICAL WORK SHOWN.
7. CONTRACTOR SHALL PAY ELECTRIC UTILITY COMPANY BACK CHARGES. UTILITY BACK CHARGES ARE $11,863.
8. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL COORDINATION WITH THE UTILITY.
9. EXCEPT AS OTHERWISE NOTED, THE ELECTRICAL WORK SHALL INCLUDE DEMOLITION, PANELBOARDS, CIRCUIT BREAKERS, FEEDERS, WIRING, RACEWAYS, LIGHTING FIXTURES, DEVICES, SAFETY SWITCHES, TRANSFORMERS AND CONNECTION NECESSARY TO OPERATE MOTORS AND OTHER EQUIPMENT.
10. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY LIGHTING AND POWER AND THE GENERAL CONTRACTOR SHALL PAY ALL ENERGY CHARGES.
11. DURING CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL KEEP HIS PORTION OF THE WORK NEAT, CLEAN AND ORDERLY.
12. ALL SYSTEMS SHALL BE TESTED FOR SHORT CIRCUIT AND GROUNDS PRIOR TO ENERGIZING AND ANY DEFECTS SHALL BE CORRECTED.
13. ALL CUTTING AND PATCHING REQUIRED FOR ELECTRICAL WORK SHALL BE INCLUDED AS PART OF THIS SECTION.
14. COMPLETE SHOP DRAWINGS SHALL BE SUBMITTED FOR ELECTRICAL EQUIPMENT. WHERE SPECIFIED ELECTRICAL EQUIPMENT IS SUBSTITUTED, THE ELECTRICAL CONTRACTOR SHALL SUBMIT COMPLETE SPECIFICATIONS ON THE SUBSTITUTE AS WELL AS THE ITEM ORIGINALLY SPECIFIED.
15. MATERIALS SHALL BE SPECIFICATION GRADE AND UL LISTED.
16. WHERE MATERIAL IS CALLED OUT IN THE LEGEND BY MANUFACTURER, TYPE OR CATALOG NUMBER, SUCH DESIGNATIONS ARE TO ESTABLISH STANDARDS OR DESIRED QUALITY. ACCEPTANCE OR REJECTIONS OF PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER.
17. WORK SHALL BE COORDINATED WITH THAT OF OTHER TRADES TO ELIMINATE INTERFERENCES.
18. EXACT LOCATIONS OF MECHANICAL EQUIPMENT, DEVICES, ETC. SHALL BE VERIFIED WITH THE GENERAL CONTRACTOR PRIOR TO ROUGHING FOR SAME.
19. ELECTRICAL CONTRACTOR SHALL OBTAIN SHOP DRAWINGS/SPECIFICATIONS OF ALL EQUIPMENT FROM THE GENERAL CONTRACTOR PRIOR TO PURCHASING AND INSTALLING ELECTRICAL EQUIPMENT FOR SAME. NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN ACTUAL EQUIPMENT INSTALLED AND CONTRACT DOCUMENTS.
20. ELECTRICAL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF WHICH SYSTEM IS PUT INTO SERVICE.
21. WORK SHALL BE GROUNDED IN ACCORDANCE WITH CODE REQUIREMENTS. COMPLETE EQUIPMENT (INSULATED GREEN WIRE) GROUNDING SYSTEM SHALL BE INSTALLED.
22. PANELBOARDS SHALL BE DEAD FRONT, THERMAL MAGNETIC BOLT-ON CIRCUIT BREAKER TYPE, DESIGNED FOR SURFACE OR FLUSH MOUNTING AS INDICATED ON PLAN, AND HAVING CONNECTIONS TO 120/208 OR 277/480 VOLT, 3 PHASE, 4 WIRE SERVICE. ALL BUS BARS SHALL BE COPPER. CABINETS SHALL BE MADE OF CODE GAUGE GALVANIZED SHEET STEEL, WITH A MINIMUM OF 4 INCH GUTTERS, DOOR IN DOOR CONSTRUCTION, LOCKED DOOR, AND FLUSH HINGES. TYPEWRITTEN INDEX SHALL BE MOUNTED ON DOOR INSIDE TRANSPARENT COVER INDICATING LOAD SERVED. PANELS SHALL INCLUDE SEPARATE EQUIPMENT GROUND BUS.
23. PANELBOARDS, DISCONNECT SWITCHES, AND CONTROLLERS SHALL HAVE NAMEPLATES OF BLACK LAMINATED PLASTIC WITH ENGRAVED WHITE LETTERS, SECURED WITH SELF-TAPPING SCREWS.
24. CONNECTIONS AT MOTORS SHALL BE MADE WITH 18" LENGTH OF 1/2 INCH FLEXIBLE LIQUID TIGHT CONDUIT.
25. CONTRACTOR SHALL PHASE BALANCE PANELBOARDS IN THE FIELD. LOAD ON EACH PHASE SHALL BE BALANCED WITHIN 10% OF EACH OTHER.
26. TOGGLE SWITCHES SHALL BE OF THE SINGLE POLE A.C. QUIET TOGGLE TYPE FOR MOUNTING IN A SINGLE-GANG SPACING. TOGGLE SWITCHES SHALL BE FULLY RATED 20 AMPERES AT 120/277 VOLT.
27. DUPLEX WALL RECEPTACLES SHALL BE 2 POLE, 3 WIRE, GROUNDING TYPE 20 AMPERE, 125 VOLT WITH METAL PLASTER EARS. RECEPTACLES SHALL BE NEMA STANDARD CONFIGURATION 5-20R.
28. FUSED OR UNFUSED SAFETY SWITCHES SHALL BE TOTALLY ENCLOSED, HEAVY DUTY TYPE. SWITCHES SHALL HAVE VOLTAGE, HORSEPOWER AND AMPERE RATING SUITABLE FOR THE APPLICATION. PROVIDE NUMBER OF POLES AS REQUIRED. SWITCHES LOCATED EXTERIOR TO THE BUILDING OR IN DAMP/WET LOCATIONS SHALL BE IN A NEMA 3R ENCLOSURE.
29. FUSES SHALL BE DUAL ELEMENT, TIME DELAY TYPE, AS MANUFACURED BY BUSSMAN, RELIANCE OR APPROVED EQUAL.
30. FURNISH AND INSTALL SLEEVES IN FLOORS, BEAMS, WALLS, ETC. REQUIRED FOR INSTALLING THIS WORK.
31. CONDUIT PASSING THROUGH FIRE RATED WALLS AND FLOORS SHALL BE PROVIDED WITH ALL NECESSARY MATERIALS TO ENSURE THAT THE FIRE RATED INTEGRITY IS MAINTAINED.
32. LFEEDER TAPS WILL NOT BE ALLOWED IN PANELBOARD GUTTERS.
33. CONTRACTOR SHALL CHECK EXISTING CONDITIONS TO DETERMINE EXACT EXTENT OF WORK TO BE PERFORMED PRIOR TO BIDDING. DIMENSIONS RELEVANT TO EXISTING WORK SHALL BE VERIFIED IN THE FIELD.
34. IN AREAS NOT AFFECTED BY THIS RENOVATION, THIS SUBCONTRACTOR SHALL MAINTAIN CONTINUITY OF ELECTRIC SERVICE.
35. WHERE CONNECTIONS ARE MADE IN EXISTING PANELS, THE PANEL INDEX SHALL BE REVISED TO INDICATE THE NEW LOADS SERVED. NEW CIRCUIT BREAKERS ADDED TO EXISTING PANELS SHALL BE THE SAME FRAME SIZE, VOLTAGE RATING AND INTERRUPTING CAPACITY AS EXISTING PANEL AND CIRCUIT BREAKERS.
36. ELECTRICAL SHUTDOWN SHALL BE AT A TIME AND DATE APPROVED BY THE OWNER.
37. PROVIDE AS-BUILT "CADD" DRAWINGS AT THE COMPLETION OF THE PROJECT.

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ROBERT F. McALEER
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No. 48017
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ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES

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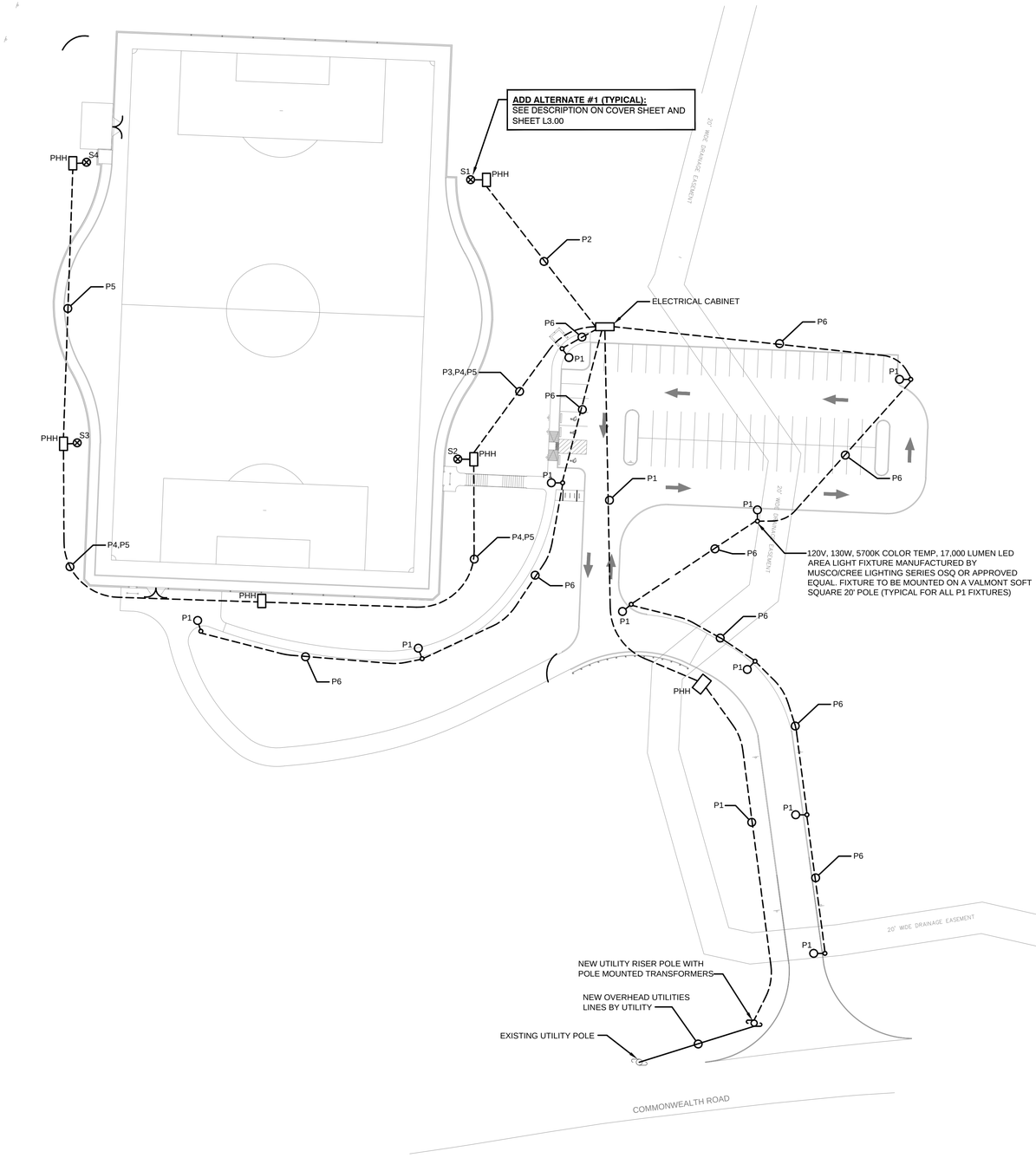

ELECTRICAL SITE PLAN

SCALE: 1" = 40'-0"

40 20 0 40 80

SCALE: 1"=40'

CONDUIT & WIRING SCHEDULE

CONDUIT	FEEDER	FROM	CONTACTOR NUMBER	TO	FIXTURES	LOAD	CONTACTOR SIZE	REMARKS
P1	2"C., 4#1 & 1#4GND	UTILITY TRANSFORMER	-	PANEL PPH2	-	100A	-	UNDERGROUND
P2	2"C., 3#10 & 1#10GND	MUSCO LIGHTING CONTROL CABINET NO.3 IN ELECTRICAL CABINET	C1	FIXTURE S1	6 @ 1150W	6.9 KW	30A	
P3	2"C., 3#10 & 1#10GND	MUSCO LIGHTING CONTROL CABINET NO.3 IN ELECTRICAL CABINET	C2	FIXTURE S2	6 @ 1150W	6.9 KW	30A	
P4	1"C., 3#8 & 1#8GND	MUSCO LIGHTING CONTROL CABINET NO.3 IN ELECTRICAL CABINET	C3	FIXTURE S3	6 @ 1150W	6.9 KW	30A	
P5	2"C., 3#8 & 1#8GND	MUSCO LIGHTING CONTROL CABINET NO.3 IN ELECTRICAL CABINET	C4	FIXTURE S4	6 @ 1150W	6.9 KW	30A	
P6	2"C., 2#6 & 1#8GND	PANEL PPL2 IN ELECTRICAL CABINET	-	PARKING LOT LIGHTING	-	-	-	VIA NEW TIME CLOCK ELECTRICAL CABINET

DRAWING NOTES:

1. REFER TO DRAWING E0.01 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR DOWNSIZING FEEDERS AT ELECTRICAL DEVICES FOR CONNECTION IN FIELD. FEEDERS HAVE BEEN OVERSIZED FOR VOLTAGE DROP.
3. THE CONTRACTOR SHALL FURNISH & INSTALL A HANDHOLE AT EACH LIGHT POLE BASE FOR TRANSITIONING TO LIGHT POLE RISER CONDUIT. RUN CONDUIT UP POLE APPROXIMATELY 10' TO LIGHT POLE JUNCTION BOX. ADDITIONAL HANDHOLES SHALL BE INSTALLED AS REQUIRED TO FACILITATE THE INSTALLATION OF WIRING. HANDHOLES SHALL NOT BE INSTALLED ON FIELD.

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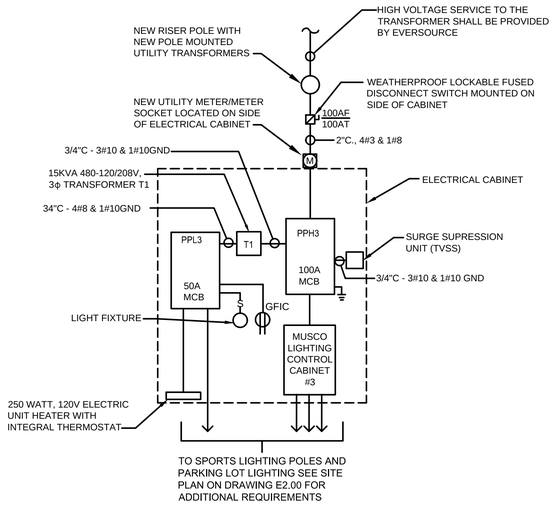
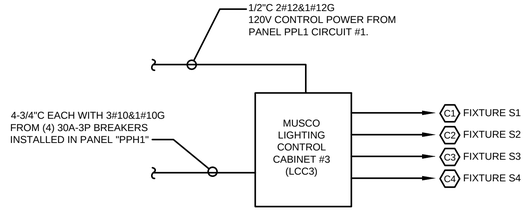


ELECTRICAL ONE LINE DIAGRAM – LOKER

NOT TO SCALE



NOTES:

1. TYPICAL FOR CONTACTORS C1 THROUGH C4, CONTRACTOR SHALL RUN CONDUIT AND WIRING AS INDICATED IN SCHEDULE FROM EACH CONTACTOR TO DESIGNATED LIGHTING POLE. CONTRACTOR SHALL RUN CONDUIT TO 10'-0" AFG FOR CONNECTION TO POLE MOUNTED LIGHTING CONNECTION BOX.

SPORTS LIGHTING CONTROL CABINET DIAGRAM – LOKER

NOT TO SCALE

PANELBOARD SCHEDULE - LOKER

DESIGNATION: PPH3 | S.C. RATING: 22,000A RMS SYM. | REMARKS: SERVICE ENTRANCE RATED
LOCATION: ELECTRICAL CABINET | SERVICE: 277 480V, 3 , 4W
RATING: 100 AMPS | MOUNTING: SURFACE
MAIN: 100 MCB

CKT. NO.	LOAD DESIGNATION	BREAKER TRIP	BREAKER POLE	PHASE A B C	BREAKER POLE	BREAKER TRIP	LOAD DESIGNATION	CKT. NO.
1	-	-				-	-	2
3	FIXTURE POLE S1/CONTACTOR C1	30				30	FIXTURE POLE S2/CONTACTOR C2	4
5	-	-				-	-	6
7	-	-				-	-	8
9	FIXTURE POLE S3/CONTACTOR C3	30				30	FIXTURE POLE TS/CONTACTOR C4	10
11	-	-				-	-	12
13	-	-				20	SPARE	14
15	15KVA CABINET TRANSFORMER	50				20	SPARE	16
17	-	-				20	SPARE	18
19	SPARE	20				20	SPARE	20
21	SPARE	20				20	SPARE	22
23	SPARE	20				20	SPARE	24
25	SPARE	20				20	SPARE	26
27	SPARE	20				20	SPARE	28
29	SPARE	20				20	SPARE	30

PANELBOARD SCHEDULE - LOKER

DESIGNATION: PPL3 | S.C. RATING: 10,000A RMS SYM. | REMARKS:
LOCATION: ELECTRICAL CABINET | SERVICE: 120 208V, 3 , 4W
RATING: 100 AMPS | MOUNTING: SURFACE
MAIN: 50A MCB

CKT. NO.	LOAD DESIGNATION	BREAKER TRIP	BREAKER POLE	PHASE A B C	BREAKER POLE	BREAKER TRIP	LOAD DESIGNATION	CKT. NO.
1	LIGHTING IN ELECTRICAL CABINET	20				20	ELECTRIC HEATER IN ELECTRICAL CABINET	2
3	RECEPTACLE IN ELECTRICAL CABINET	20				20	PARKING LOT LIGHTING	4
5	SPARE	20				20	SPARE	6
7	SPARE	20				20	SPARE	8
9	SPARE	20				20	SPARE	10
11	SPARE	20				20	SPARE	12

Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

410 COMMONWEALTH RD, WAYLAND, MA 01778

Weston & Sampson
85 Devonshire Street,
3rd Floor, Boston, MA 02109
617.412.4480 800.SAMPSON
www.westonandsampson.com

Consultants:

Revisions:

No.	Date	Description

Seal:

COMMONWEALTH OF MASSACHUSETTS
ROBERT F. McALEER
ELECTRICAL
No. 48017
REGISTERED
PROFESSIONAL ENGINEER

Issued For:

BIDDING DOCUMENTS

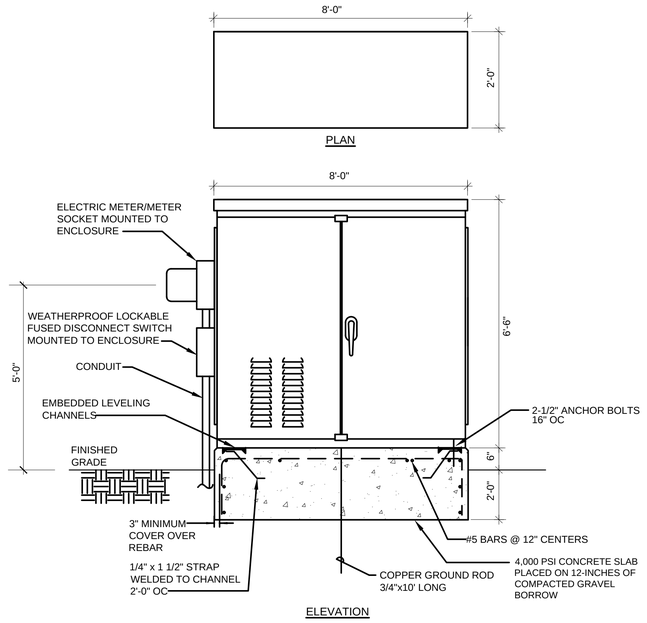
Scale:	AS SHOWN
Date:	FEBRUARY 28, 2019
Drawn By:	DNM
Reviewed By:	RFM
Approved By:	RFM
W&S Project No:	2180076
W&S File No:	

Drawing Title:

ELECTRICAL ONE LINE DIAGRAMS AND SCHEDULES

Sheet Number:

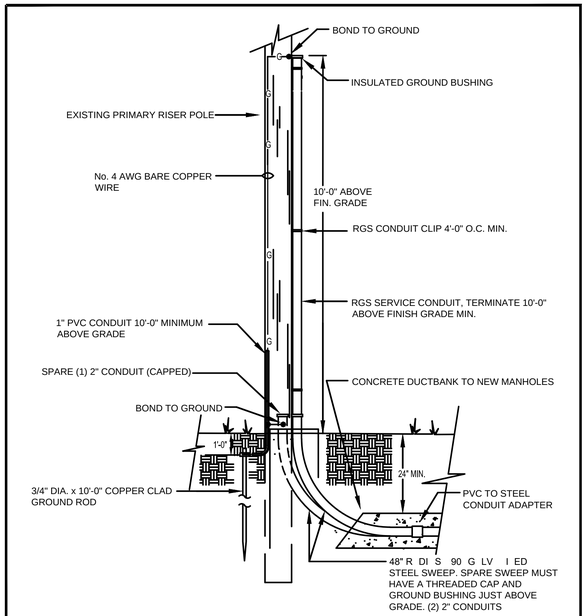
E2.00



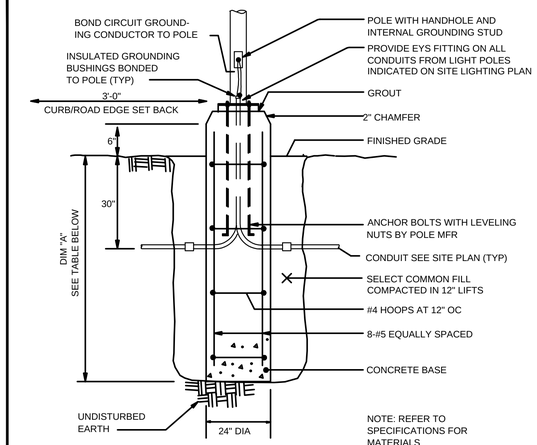
NOTES:

1. CONTRACTOR SHALL COORDINATE WITH THE EXACT CABINET SIZE WITH ALL MANUFACTURER EQUIPMENT SIZES PRIOR TO SUBMITTING THE CABINET FOR APPROVAL. PROVIDE A SCALED DRAWING SHOWING ALL EQUIPMENT.

1	PAD MOUTNED ELECTRICAL CABINET DETAIL	NO SCALE



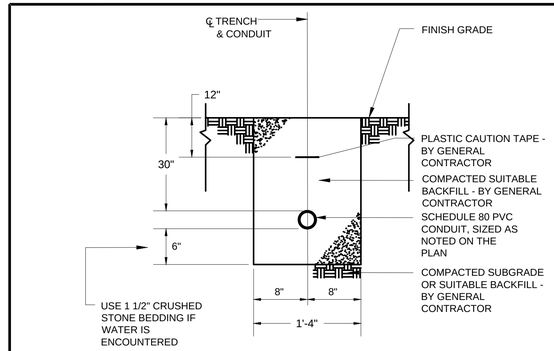
2	TYPICAL RISER POLE DETAIL	NO SCALE



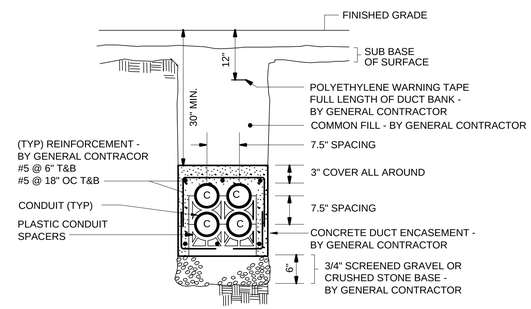
POLE HEIGHT	DIMENSION "A"
10'-0"	4'-6"
20'-0"	4'-6"
30'-0"	6'-6"
40'-0"	6'-6"

NOTE:
ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR. ALL EXCAVATION, BACKFILL & CONCRETE SHALL BE BY GENERAL CONTRACTOR

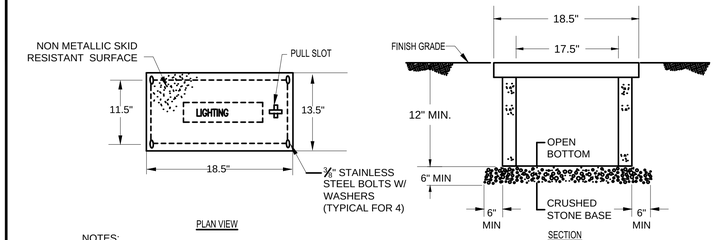
4	TYPICAL LIGHT POLE BASE DETAIL	NO SCALE



2	TYPICAL DIRECT BURIED DUCTBANK DETAIL	NO SCALE



3	TYPICAL CONCRETE ENCASED DUCTBANK DETAIL	NO SCALE

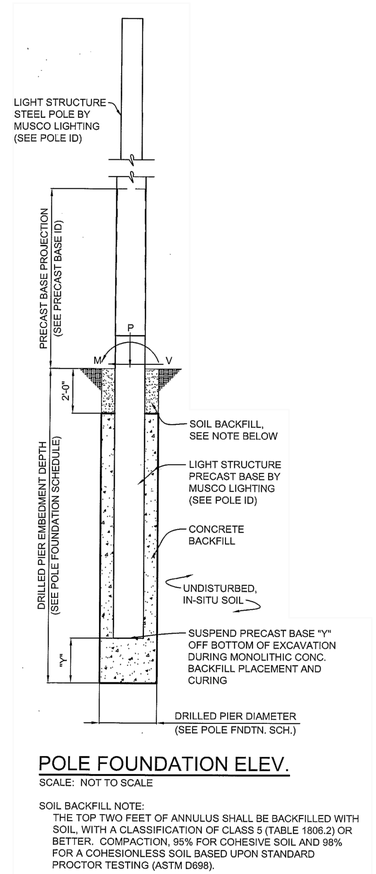


NOTES:

1. THIS HANDHOLE IS INTENDED FOR NON-DELIBERATE VEHICULAR TRAFFIC ONLY.

2. HANDHOLE SHALL BE PREFABRICATED POLYMER CONCRETE AGGREGATE EQUAL TO QUAZITE OR EQUAL PRE CAST CONCRETE CONSTRUCTION.

5	PREFABRICATED HANDHOLE "HH" DETAIL	NO SCALE



POLE FOUNDATION ELEV.
SCALE: NOT TO SCALE

SOIL BACKFILL NOTE:
THE TOP TWO FEET OF ANNULUS SHALL BE BACKFILLED WITH SOIL, WITH A CLASSIFICATION OF CLASS 5 (TABLE 1806.2) OR BETTER. COMPACTION, 95% FOR COHESIVE SOIL AND 98% FOR A COHESIONLESS SOIL BASED UPON STANDARD PROCTOR TESTING (ASTM D698).

1	SPORTS LIGHT POLE BASE DETAIL	NO SCALE

Project:

IMPROVEMENTS TO LOKER CONSERVATION AND RECREATION AREA

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WAYLAND, MA 01778

Weston & Sampson
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3rd Floor, Boston, MA 02109
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Revisions:

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COMMONWEALTH OF MASSACHUSETTS
ROBERT F. McALEER ELECTRICAL No. 48017 REGISTERED PROFESSIONAL ENGINEER

Issued For:

BIDDING DOCUMENTS

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Drawn By:	DNM
Reviewed By:	RFM
Approved By:	RFM
W&S Project No:	2180076
W&S File No:	

Drawing Title:

ELECTRICAL DETAILS

Sheet Number:

E3.00

Loker Soccer Field

Wayland,MA

Lighting System

Pole / Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
S1-S4	70'	70'	6	TLC-LED-1150	6.90 kW	A
4			***24***		***27.60 kW***	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Soccer	27.6 kW	24

Fixture Type Summary

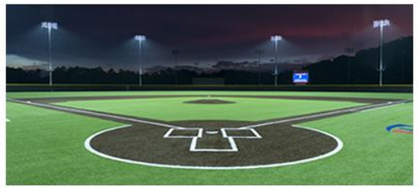
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1150	LED 5700K - 75 CRI	1150W	121,000	>81,000	>81,000	>81,000	24

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Property Line	Horizontal	0.01	0	0.46	0.00		A	24
Property Line	Max Candela (by Fixture)	330	0	15109	0.00		A	24
Property Line	Max Vertical Illuminance Metric	0.02	0	0.95	0.00		A	24
Soccer	Horizontal Illuminance	36.6	23	45	1.99	1.59	A	24
Zero Grid	Horizontal	0.04	0	3	0.00		A	24
Zero Grid	Max Candela (by Fixture)	1111	0	72360	0.00		A	24
Zero Grid	Max Vert Illuminance (by Light Bank)	0.06	0	4	0.00		A	24

From Hometown to Professional



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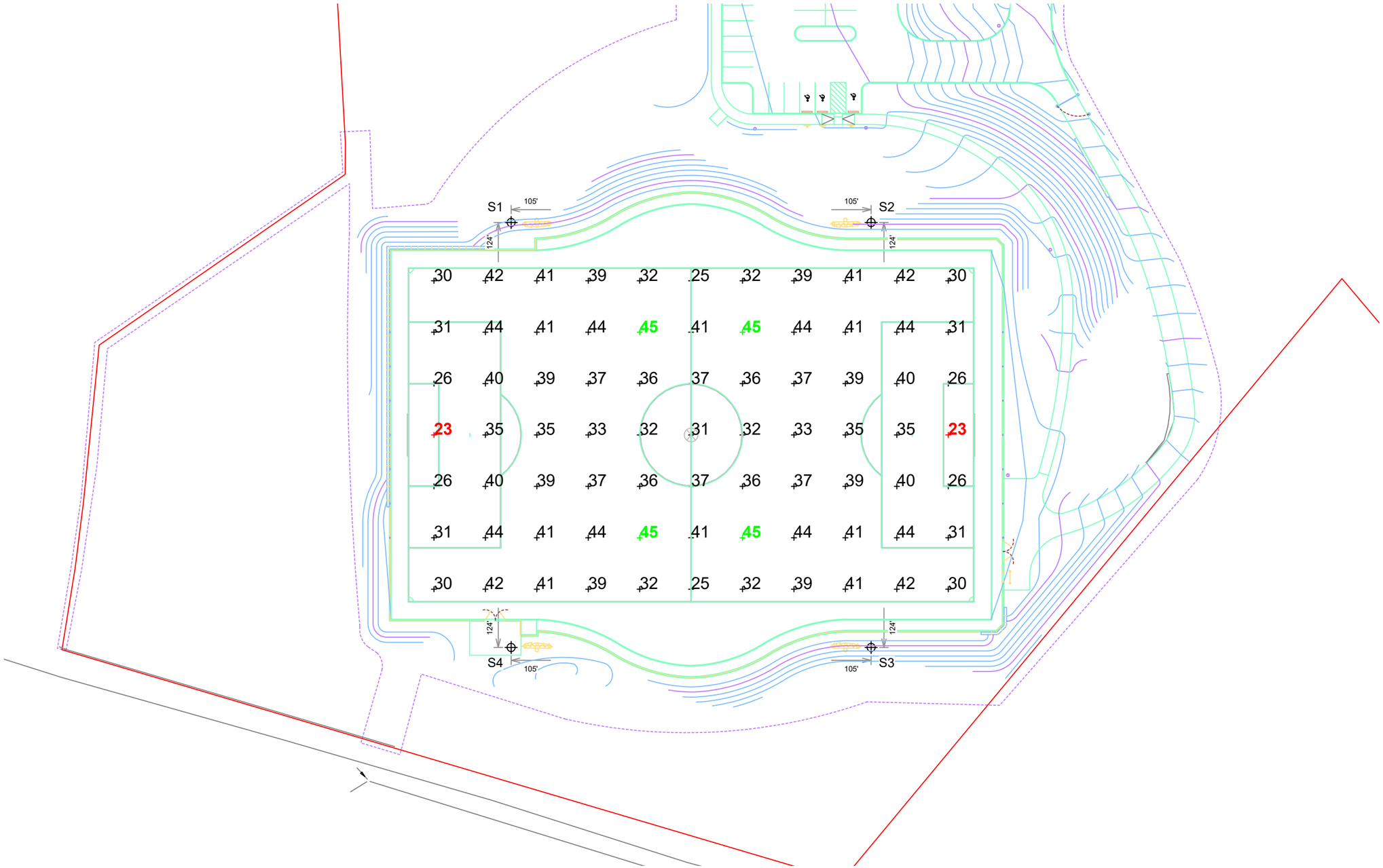
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Soccer**
Size:	330' x 195'
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	36.64
Maximum:	45
Minimum:	23
Avg / Min:	1.61
Guaranteed Max / Min:	**2.5**
Max / Min:	1.99
UG (adjacent pts):	1.67
CU:	0.88
No. of Points:	77

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

ENGINEERED DESIGN By: Markie Roake • File #191248AR1 • 21-Jan-19

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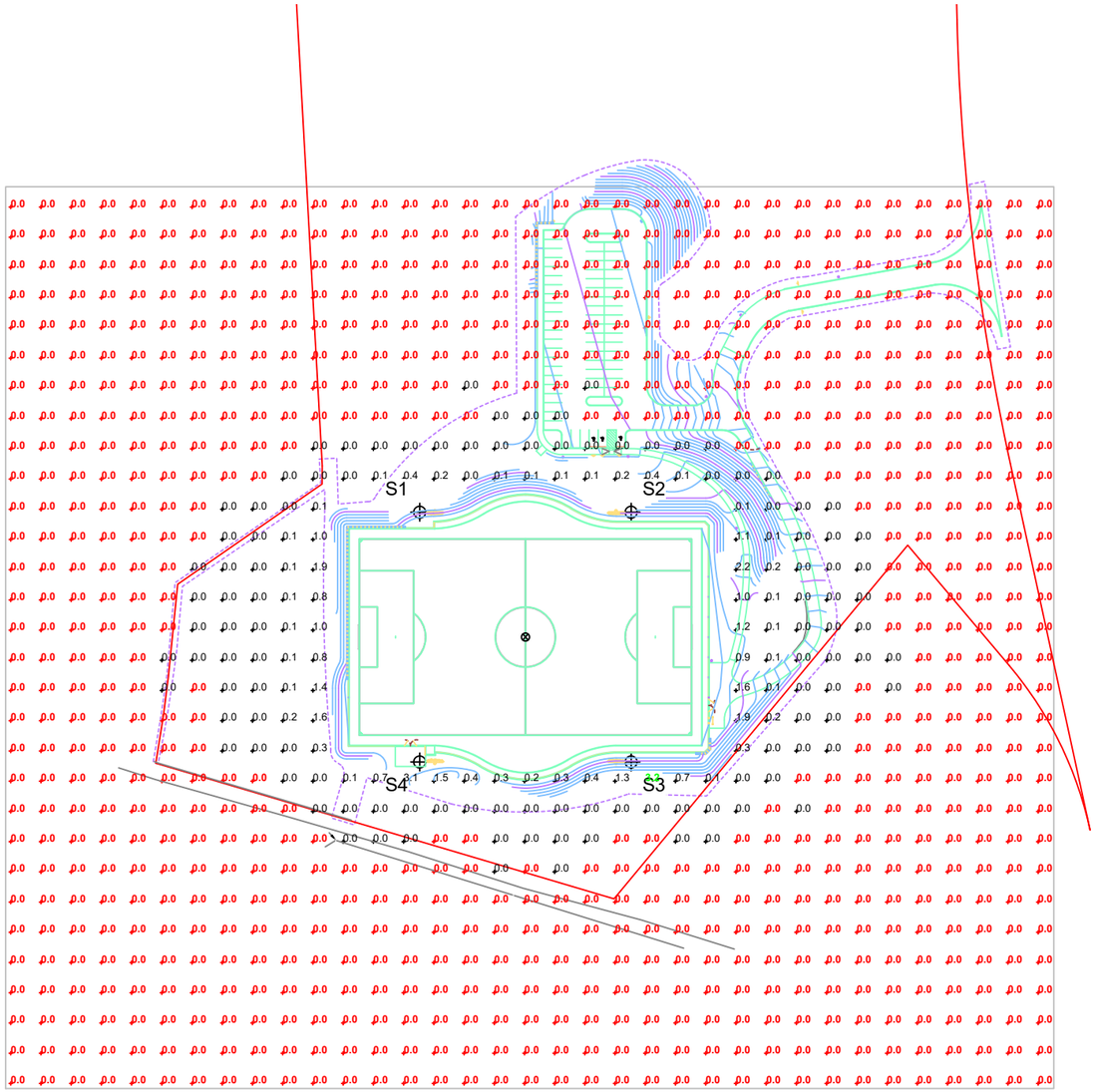
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 150

0' 150' 300'

ENGINEERED DESIGN By: Markie Roake • File #191248AR1 • 21-Jan-19

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Zero Grid**
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**0.04**
Maximum:	3
Minimum:	0
Avg / Min:	-
Max / Min:	**-**
UG (adjacent pts):	2391.19
CU:	0.01
No. of Points:	933

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

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Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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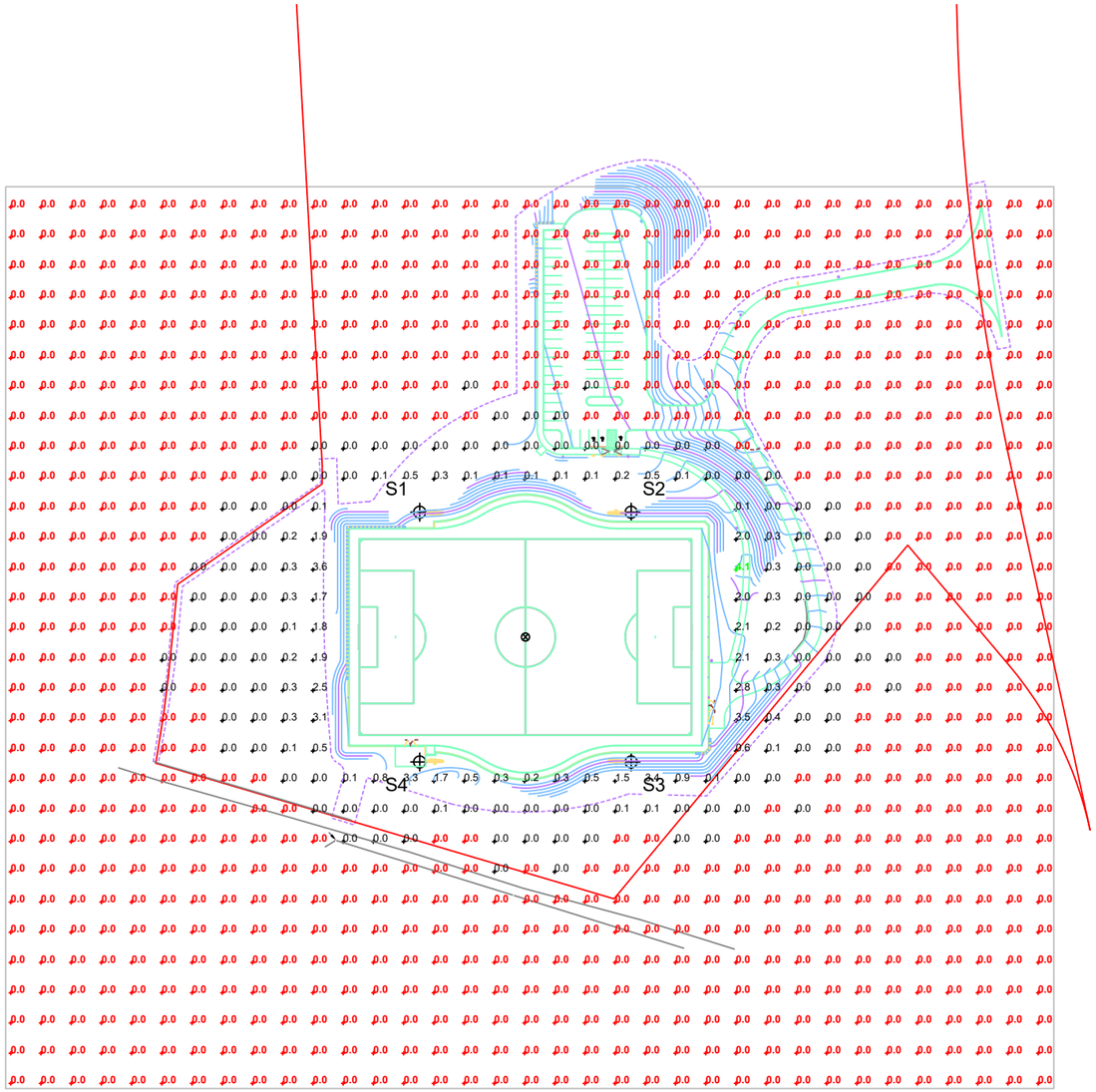
EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 150

0' 150' 300'

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Zero Grid**
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED MAX VERTICAL FOOTCANDLES

	Entire Grid
Scan Average:	**0.06**
Maximum:	4
Minimum:	0
Avg / Min:	-
Max / Min:	**-**
UG (adjacent pts):	1928.78
CU:	0.01
No. of Points:	933

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

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Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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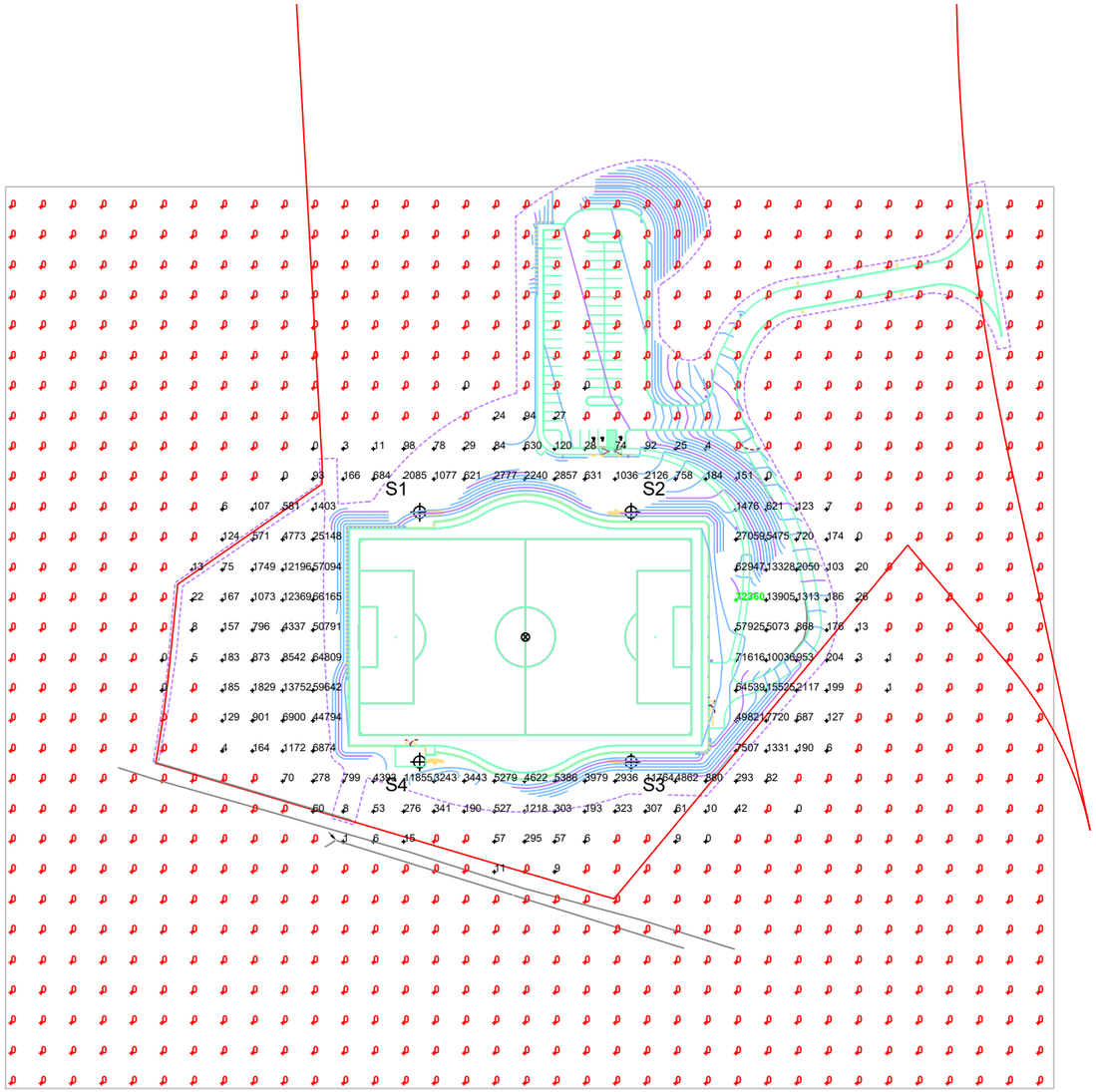
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 150

0' 150' 300'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Zero Grid**
Spacing:	30.0' x 30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED CANDELA (PER FIXTURE)

	Entire Grid
Scan Average:	**1110.90**
Maximum:	72360
Minimum:	0
Avg / Min:	-
Max / Min:	**-**
UG (adjacent pts):	6264.35
CU:	0.01
No. of Points:	933

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

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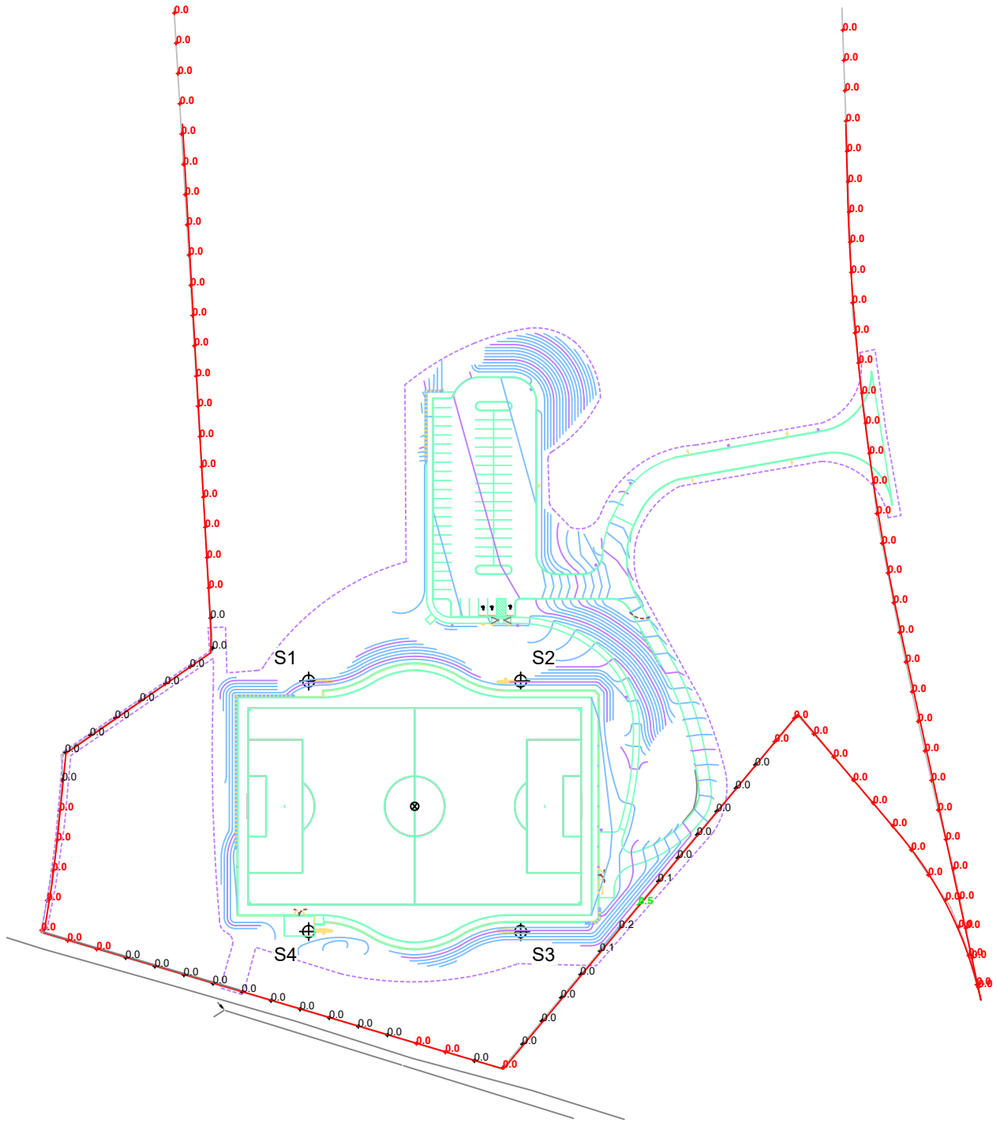
EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 150

0' 150' 300'

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Property Line**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**0.0085**
Maximum:	0.46
Minimum:	0.00
No. of Points:	109

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

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Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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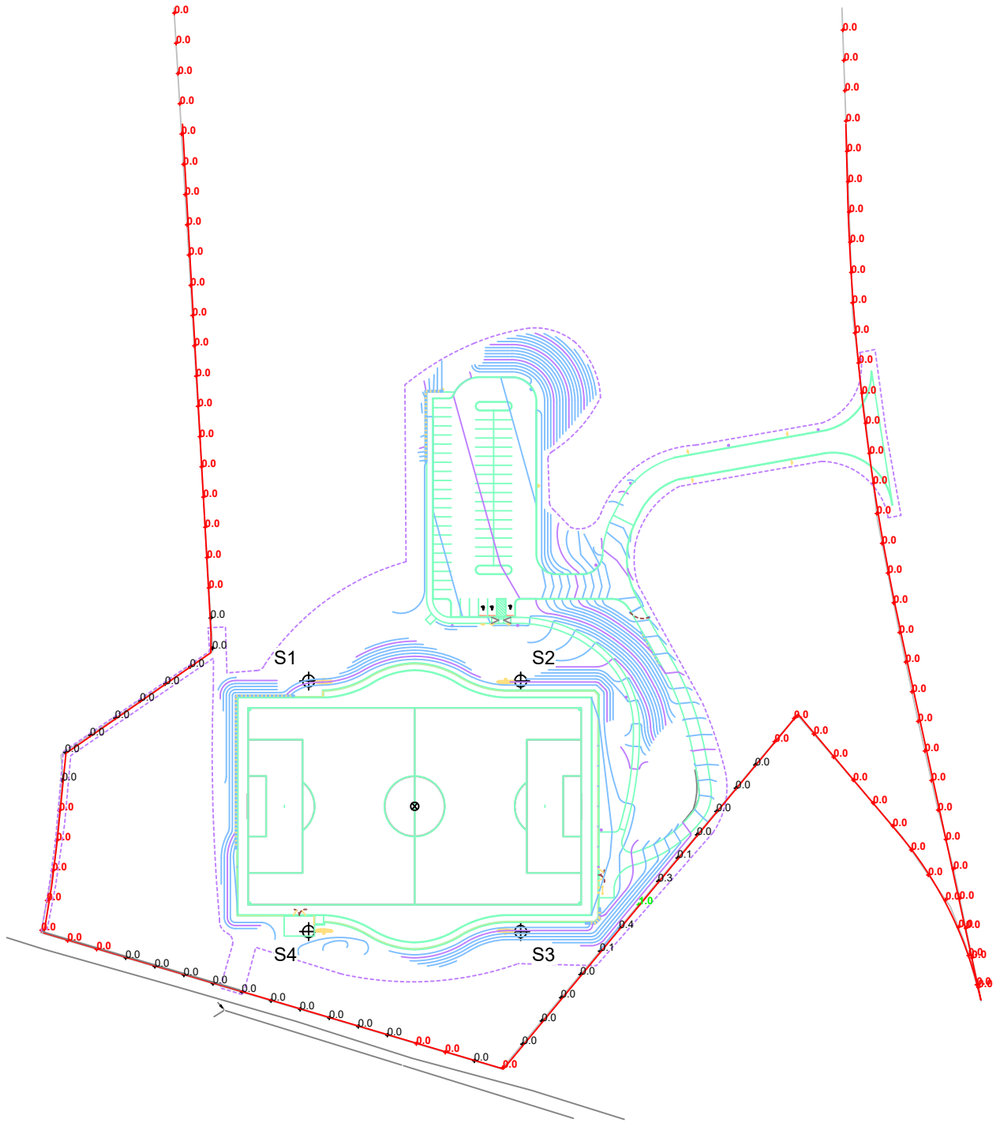
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 150

0' 150' 300'

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Property Line**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED MAX VERTICAL FOOTCANDLES

	Entire Grid
Scan Average:	**0.0172**
Maximum:	0.95
Minimum:	0.00
No. of Points:	109

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

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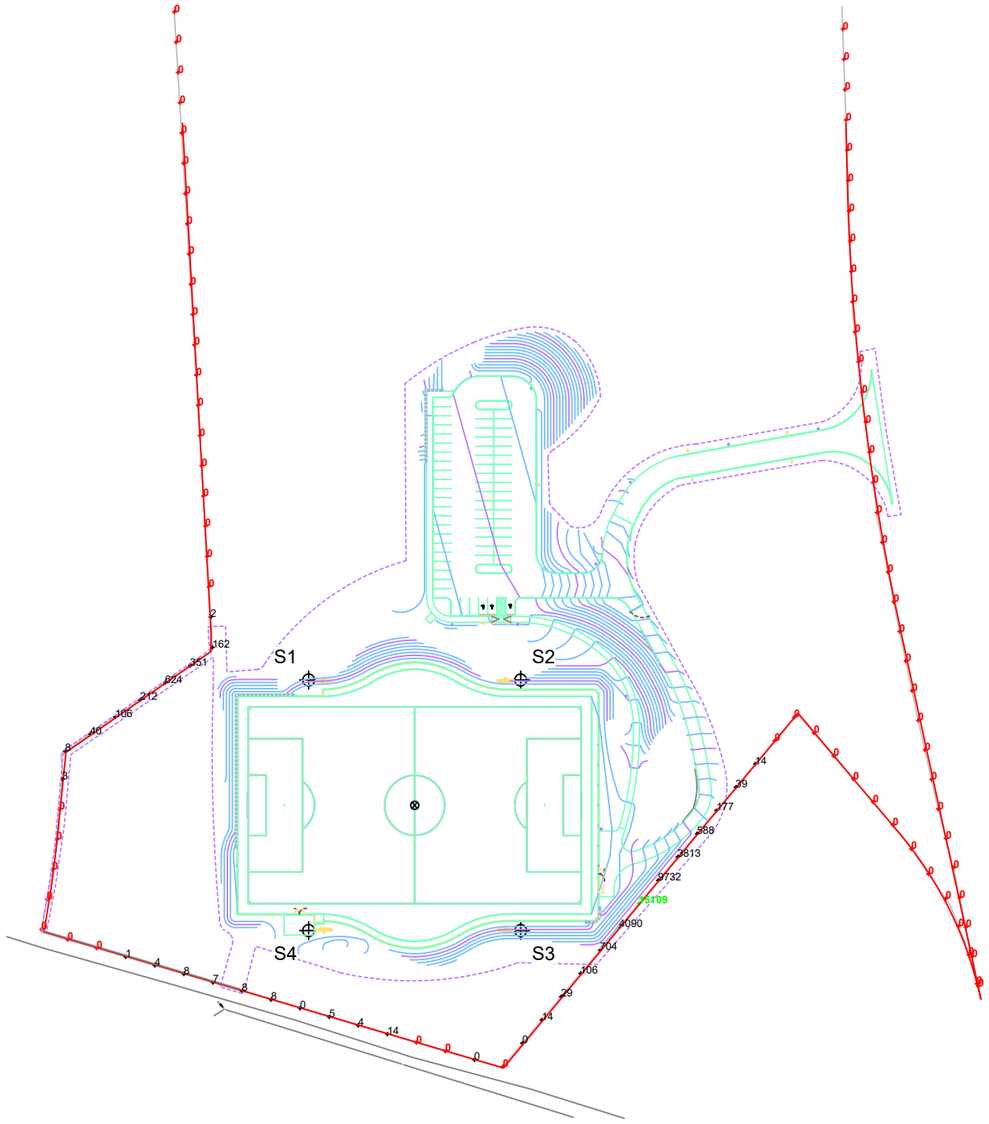
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6	6	0
4	TOTALS					24	24	0



SCALE IN FEET 1 : 150

0' 150' 300'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Loker Soccer Field

Wayland,MA

GRID SUMMARY

Name:	**Property Line**
Spacing:	30.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED CANDELA (PER FIXTURE)

	Entire Grid
Scan Average:	**330.0715**
Maximum:	15108.77
Minimum:	0.00
No. of Points:	109

LUMINAIRE INFORMATION

Color / CRI:	5700K - 75 CRI
Luminaire Output:	121,000 lumens
No. of Luminaires:	**24**
Total Load:	27.6 kW

Lumen Maintenance

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
TLC-LED-1150	>81,000	>81,000	>81,000

Reported per TM-21-11. See luminaire datasheet for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

ENGINEERED DESIGN By: Markie Roake • File #191248AR1 • 21-Jan-19

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Loker Soccer Field

Wayland,MA

EQUIPMENT LAYOUT

INCLUDES:
· Soccer

Electrical System Requirements: Refer to Amperage Draw Chart and/or the **"Musco Control System Summary"** for electrical sizing.

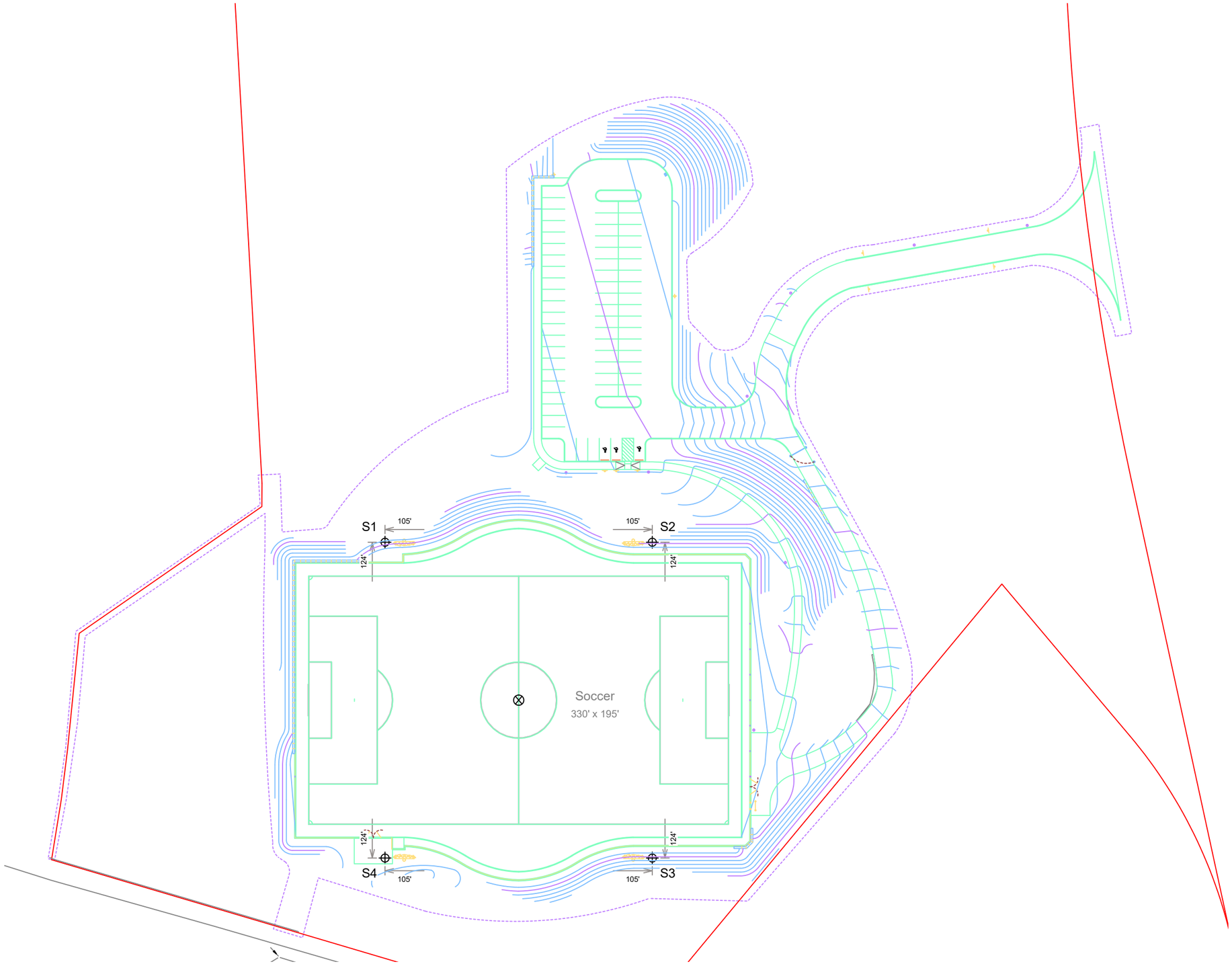
Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
4	S1-S4	70'	-4'	66'	TLC-LED-1150	6
4	TOTALS					24

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1150	6.8	6.5	5.9	5.1	4.1	3.7	3.0



SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Loker Soccer Field

Wayland,MA

GLARE IMPACT

Summary

Map indicates the maximum candela an observer would see when facing the brightest light source from any direction.

A well-designed lighting system controls light to provide maximum useful on-field illumination with minimal destructive off-site glare.

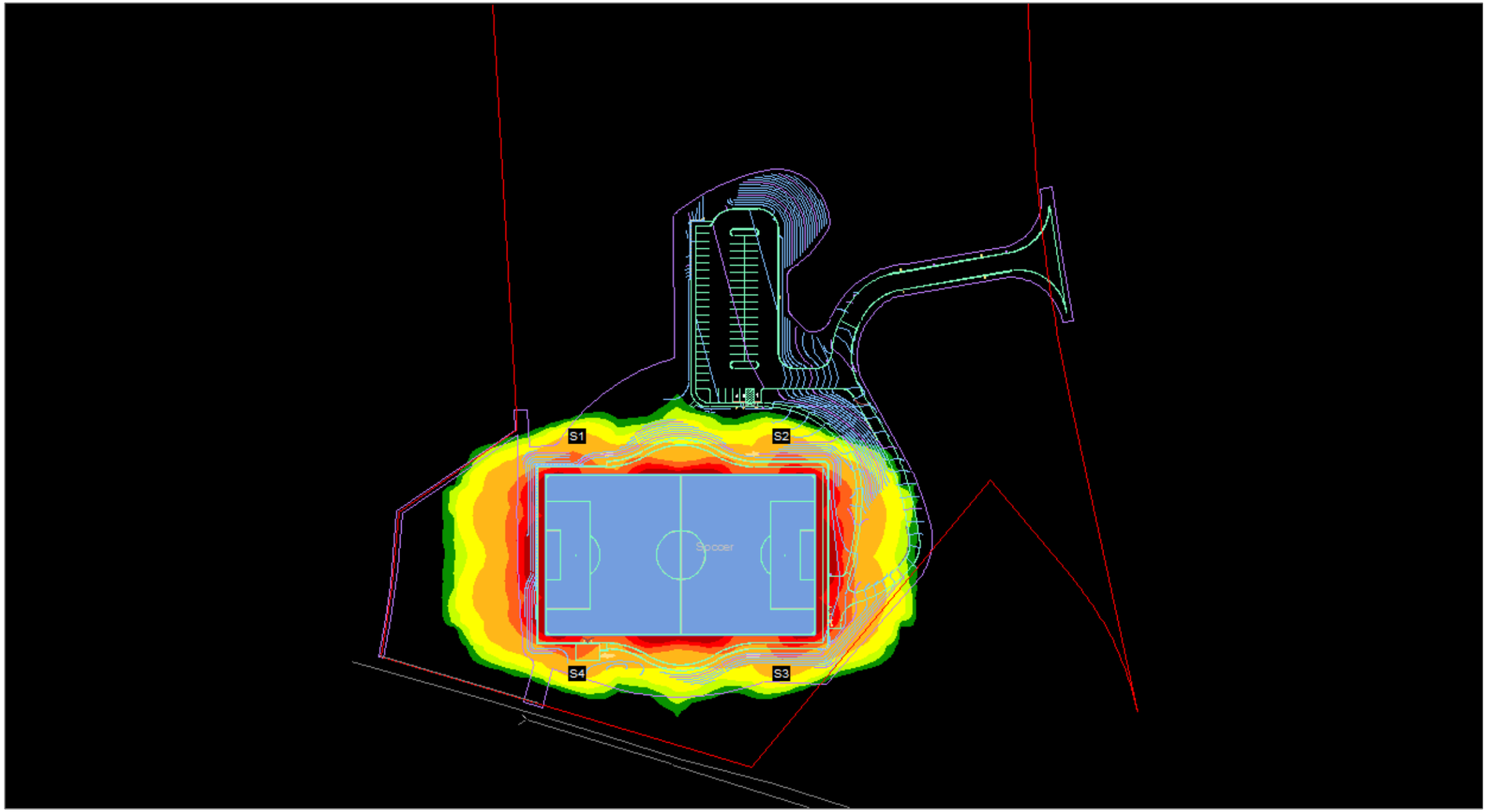
GLARE

Candela Levels

High Glare: 150,000 or more candela
Should only occur on or very near the lit area where the light source is in direct view. Care must be taken to minimize high glare zones.

Significant Glare: 25,000 to 75,000 candela
Equivalent to high beam headlights of a car.

Minimal to No Glare: 500 or less candela
Equivalent to 100W incandescent light bulb.



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TOWN OF WAYLAND
MASSACHUSETTS
01778
PLANNING DEPARTMENT

Sarkis Sarkisian
Wayland Town Planner

TOWN BUILDING
41 COCHITUATE ROAD
TELEPHONE: (508) 358-3778
FAX: (508) 358-4036

Date: February 26, 2019

To: Zoning Board of Appeals

From: Planning Board

Re: Loker Recreation Project – Comments on Site Plan Review Application

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As you know, before the Wayland Recreation Commission initially filed a site plan review application with the Planning Board for a proposed athletic field project at the Loker Recreational Area, 412 Commonwealth Road (the "Project"). The Planning Board held a hearing on November 27, 2018.

The Planning Board voted to retain TEC to review the traffic study that was submitted with the site plan review application. TEC's review of the traffic study included a review of existing conditions, future transportation infrastructure projections, assessment of potential impacts, and review of the existing sight distances. The traffic volumes from the Project are not anticipated to impact the overall intersection operations of Oak Street and Route 30. The Planning Board recommends that TEC's report be entered into the ZBA's record.

At the conclusion of the hearing, the Planning Board discussed the application and made the following findings of fact and recommendations for further action:

1. Provide a set of stairs from the parking lot directly to the field area.
2. Consider an alternate layout(s) of the proposed parking lot with angle parking for the first row of the parking lot. This may be an opportunity to save a group of trees.
3. Provide greater detail on the driveway and emergency access road from Rice Road.
4. Provide a plan sheet(s) of the Project showing proposed improvements overlaid on existing conditions.
5. Provide a detail of the lighting plan (pole details, photometric plans, etc.).
6. Clarify how crumb rubber under the proposed field will be contained and collected.
7. Provide details on the concrete pad and fencing for the proposed porta johns.
8. The Board stressed the importance of collecting groundwater elevation and soils data in the location of the proposed drainage infiltration system below the parking lot to ensure adequate soils and separation to groundwater. This was also noted by the Wayland

Board of Health.

9. Provide a guardrail at the rounding curve of the access road to the parking lot. Consider widening this entrance road and providing lighting for safety purposes.

On December 11, 2018 a Technical Land Use meeting was held with Wayland Department Heads. The participants at the meeting discussed the fact that §198-501.2 of the Zoning Bylaw states that: *"Illumination of athletic fields, golf courses, and tennis courts is permitted when a special permit is issued by the Zoning Board of Appeals under the provision of §198-203".* Section 603.1.1 states: *"The Planning Board shall administer Site Plan Approval (SPA) whenever this Zoning Bylaw does not also require a special permit and/or variance."* Since the Loker Field Project includes field lighting, the ZBA is the board of jurisdiction (and not the Planning Board) for purposes of administering site plan review. See §198-603.2.

On January 8, 2019 the Planning Board voted to accept the Recreation Commission's withdrawal of the application for the Loker Field Project. The Commission subsequently filed an application for Site Plan Approval with the Zoning Board of Appeals.

On January 22, 2019 the Planning Board reviewed updated plans from the Recreation Commission, which addressed many of the concerns raised during the November hearing. To fulfill its obligation to provide input to the ZBA, the Planning Board has the following additional comments on the proposed Project:

1. The Planning Board is concerned with the lack of available pedestrian and bicycle modes of networks in the Project area. Although no accommodations are currently provided along Commonwealth Road, future pedestrian accommodations may be constructed at a later date. A sidewalk along Rice Road would also enhance pedestrian and bicycle access to the Project. The Town Planner provided a presentation for sidewalks in the project area that are on the five-year Capital plan. The Planning Board requested that the Commission work with the Town Planner to enhance access to the Site, including from the Aqueduct, as well as informing pedestrians with signage.

2. The Board of Health recommended that conditions be imposed on the site plan approval decision to address the potential situation if the abandoned septic system distribution area from the historic uses of the Project site is encountered during excavation or construction. Planning Board recommends that the ZBA solicit input directly from the Health Director on this issue.

3. The Northwest corner of the field is close to, and will be visible from, Rice Road. The Board is concerned that parents of children who will use the field may be tempted to pull off of Rice Road at this location to drop off or pick up their children. This is not a safe location for a drop-off/loading area, and the Commission should propose conditions to prevent such occurrences.

4. There has been a lot of discussion and concern regarding the number of trees that will be removed for this project. We understand that a tree mitigation plan is being considered by the Conservation Commission and the Recreation Commission. The Planning Board recommends that any memorandum of understanding regarding tree planting become part of the ZBA's decision. Trees should be replaced on site to the extent feasible and

practicable (as opposed to replacing them in other locations, or donating funds to a tree bank).

5. The Board recommends that the ZBA require an independent review of the historical site contamination on the Project site and the remediation activities that were performed by contractors for the former owner, Dow Chemical. The Town should consider retaining a Licensed Site Professional (who hasn't previously been involved in the site) to review the remediation files and provide a professional opinion as to whether the proposed athletic field construction and operation presents any risks to public health, particularly to children, given the historical use of the site.

6. The Board suggested that the Commission consider upgrading the catch basins at the bottom of the access drive at Route 30 to provide pre-treatment before runoff is discharged into the adjacent ponds. Increased use of this access drive will likely increase the pollutant load into these ponds unless mitigation is provided through stormwater BMP's. The Board deferred review of the Project's drainage system to the Conservation Commission given that the Project is within its jurisdiction under the Wetlands Protection Act and Wetlands Bylaw. The Board understands that the Conservation Commission is utilizing the peer review services of the BSC Group in connection with the Commission's review of the Notice of Intent filed by the Recreation Commission on August 10, 2018.

7. Proposed Condition: During construction, all local, state and federal laws and regulations shall be followed regarding noise, vibration, concussion, dust and blocking Town ways. At all times the Commission shall use reasonable means to minimize inconvenience to the residents in the area. All trucks transporting earth materials of any type to and/or from the site shall be covered in compliance with state law. Any debris or materials that fall from such trucks onto public ways shall be removed and cleaned up promptly.

8. The Planning Board recommends that lighting installations be designed to provide the minimum illumination necessary to facilitate the use of the site. The Board urges the Zoning Board of Appeals not to allow any light trespass upon adjacent properties or onto the right-of-way of Rice Road.

9. The Commission should prepare a post-completion monitoring assessment, which would include stadium lighting, spot trip generation and parking demand data for a typical recreational event during the weekday evening and Saturday morning/midday peak period. The assessment should be prepared within 6 months following the first recreational event scheduled for the proposed field.

10. The Commission should have the responsibility of maintaining the parking lot and replacing landscaping as indicated on the plans if such landscaping does not survive. The Commission should ensure that the site remain clear of debris, trash, and any equipment used in connection with any field activity on the site

11. Proposed Condition: The ZBA's Site Plan Approval is contingent on there being no interference from any historic soil or groundwater contamination, including but not limited to the discovery or exposure of any contaminated soils or water during excavation or construction. If contamination is encountered, the Commission shall immediately stop work and retain a Massachusetts Licensed Site Professional to provide a professional opinion and consulting services to ensure compliance with the Massachusetts Contingency Plan, General Laws Chapter 21E.

Further, the ZBA shall re-open the public hearing on the site plan review application to consider any changes to its Site Plan Approval decision to reflect the new information on the Site conditions.

12. The Applicant shall work closely with the Board of Health to ensure that all issues related to past land uses of the property associated with the former Dow Chemical facility have been addressed and the property is safe for recreational use.

The Planning Board thanks the Zoning Board of Appeals for providing this opportunity to comment on the subject application.

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TheEngineeringCorp.com

Mr. Sarkis Sarkisian
Director of Planning
Town of Wayland
41 Cochituate Road
Wayland, Massachusetts 01778

December 3, 2018

Ref. T0737.11

Re: Transportation Engineering Peer Review
Loker Field Development – Wayland, Massachusetts

Dear Sarkisian:

On behalf of the Town of Wayland, TEC, Inc. (TEC) has reviewed documents as part of the transportation engineering peer review of a Site Plan application for the proposed redevelopment of the Loker Conservation and Recreation Area along the northerly side of Commonwealth Road in Wayland, Massachusetts. The project proposes to provide one recreational field with 50 parking spaces at the site while maintaining the existing site access/egress along Commonwealth Road.

The following documents were received as part of our review:

- *Traffic Evaluation – Loker Recreation Area – Wayland, Massachusetts*; prepared by Weston & Sampson; October 31, 2018;
- *Improvements to Loker Conservation and Recreation Area – Wayland, Massachusetts (Site Development Plans)*; prepared by Weston & Sampson; September 17, 2018

TEC completed a review of these documents for the Town of Wayland, and the following provides a summary of the comments that we compiled during our review:

Transportation Impact Assessment

1.) The Traffic Evaluation presents a study area extending along Commonwealth Road from Rice Road to the west to Willowbrook Drive to the east. As the level of site trip generation is considered to be low, the study area as presented is adequate to assess project impacts. No response required.

2.) The Traffic Evaluation does not present information related to sight distance at the unsignalized study area intersections. On Tuesday, November 27, 2018, TEC staff visited the site to provide observations and measurements related to both the stopping sight distance (SSD) and intersection sight distance (ISD) at the existing Loker Conservation and Recreation Area Driveway. These measurements were an

approximation as vegetation was non-existent at the time of measurement. Tables 1 and 2 provide a summary of TEC's evaluation of SSD and ISD, respectively:

Table 1 – Existing Stopping Sight Distance Measurements

Approach / Direction	Measured Stopping Sight Distance	AASHTO Recommended Maximum Design Speed [a]	Sufficient for Typical Operating Speed?
Commonwealth Road @ Loker Driveway:			
Commonwealth Rd eastbound	950 FEET	>80 MPH	Yes
Commonwealth Rd westbound	760 FEET	71 MPH	Yes

[a] Defines maximum design speed of roadway based on AASHTO calculations correlating to measured stopping sight distance.

Table 2 – Existing Intersection Sight Distance Measurements

Approach / Direction	Measured Stopping Sight Distance	AASHTO Calculated Maximum Design Speed [a]	Sufficient for Typical Operating Speed?
Commonwealth Road @ Loker Driveway:			
Loker Driveway Looking West	>1,000 FEET	>80 MPH	Yes
Loker Driveway Looking East	710 FEET	64 MPH	Yes

[a] Defines maximum design speed of roadway based on AASHTO calculations correlating to measured stopping sight distance.

As noted in Tables 1 and 2, the SSD and ISD approaching the Loker Conservation and Recreation Area Driveway is sufficient for speeds in excess of 60 miles per hour (MPH) which is well above the observed operating speeds of the roadway under prevailing conditions and well in excess of the documented Massachusetts Department of Transportation (MassDOT) Speed Regulation which establishes a posted speed limit of 40 MPH.

3.) The TIA reports that traffic counts were conducted while public schools were in session on March 24th and March 28th. The Applicant utilized no seasonal adjustment factor as March traffic-volumes in the vicinity are generally above average-month conditions. TEC concurs with this adjustment of traffic volumes. No response required.

4.) The Traffic Evaluation has not provided a safety analysis indicating crash history, geometric deficiencies, etc. within the study area. The Applicant should provide documentation of crash history and other traffic safety related issues/deficiencies at the intersections and subject roadways, if applicable.

Weston & Sampson Response: We do not believe this information is applicable.

5.) The Traffic Evaluation provides no appendix materials for the 2% annual growth rate as assessed. The Applicant shall provide these materials.

Weston & Sampson Response: Weston & Sampson will provide updated traffic analysis report that includes 2% annual growth as assessed.

6.) The Applicant has provided an evaluation of the existing year (2018) and opening year (2019) conditions. It is industry standard within Massachusetts to provide a minimum 5-year design horizon to evaluate traffic operations for a non-state review project. The Applicant should revise the Traffic Evaluation to evaluate traffic volumes and impact analyses based on a 5-year design horizon (2023).

Weston & Sampson Response: Weston & Sampson will provide an updated traffic analysis report that includes an impact analysis based on a 5-year design horizon.

7.) The Applicant has estimated the site generated trips based on empirical data provided by the Town of Wayland's Recreation Department which estimates negligible impact during the weekday morning peak hour, 62 new vehicle trips during the weekday evening peak hour, and 90 new vehicle trips during the Saturday midday peak hour. TEC generally concurs with the methodology utilized by the Applicant; however, no supporting materials or calculations are provided as part of the Traffic Evaluation. The Applicant shall provide this information.

Weston & Sampson Response: The anticipated Loker Field program and use hours is included.

8.) The vehicular traffic generated by the proposed project was distributed onto the adjacent roadway system based upon the population centers within the Town, existing traffic patterns, and the surrounding roadway network. This methodology should be acceptable if the fields are to be restricted for use by the Town. The Applicant should coordinate with the Town to determine whether the proposed recreational field could be utilized by other surrounding communities; such as Weston or Natick which are in extremely close proximity to the fields. If so, the distribution of traffic in/out of the driveway may change significantly.

Weston & Sampson Response: The Town of Wayland's Recreation Department will issue field permits to users for organized use of the field. Town use has highest priority.

9.) There is a discrepancy in balancing on the Site Traffic Volumes network (Figure 6). It appears that the site generated trips were imported based on calculations that rounded up/down values which were unbalanced upward or downward to match from intersection to intersection. This occurs in several locations; such as 36 vehicles turning right-out of Loker during the weekday evening peak; but 37 vehicles entering the signalized intersection. This should be corrected.

Weston & Sampson Response: Weston & Sampson will update the Site Traffic Volumes Network (Figure 6).

10.) TEC does concur with the *Highway Capacity Manual 2010* (*HCM 2010*) methodology as presented in the development of the capacity and queue analysis results. However, *HCM 2010* methodology states that the peak hour factor parameter should be assessed on an intersection basis, not approach basis. The Applicant should correct this methodology although TEC agrees that this will have minimal effect on the result of the capacity and queue analysis.

Weston & Sampson Response: Weston & Sampson will update the methodology.

11.) The capacity and queue analysis worksheets as provided by the Applicant do not provide

information related to geometry and signal timings. The Applicant should provide the worksheets for "Lanes, Volumes, and Timings" in addition to the materials provided.

Weston & Sampson Response: This scope of work was not requested by the Town to be included in the submitted traffic impact analysis.

12.) The Traffic Evaluation, nor the capacity and queue analysis, do not provide any information for whether the signal timings at the Commonwealth Road / Rice Road / Oak Street intersection will be adjusted as part of the project. Although the over-capacity movements are not directly related to new Loker Conservation and Recreation Area traffic, the additional traffic volumes at the intersection do impact the overall intersection operations. At a minimum, signal timings at the intersection of Commonwealth Road / Rice Road / Oak Street should be optimized to partially mitigate the project's impact.

Weston & Sampson Response: The Town is aware that timing may need to be adjusted and amenable to doing so following the opening of the Loker project.

13.) The comments as noted above may result in modifications to the results of the capacity and queue analysis and therefore TEC has not provided direct comment on the analysis as presented at this time. TEC reserves the right to provide additional comments upon completion of the peer review comment responses.

Weston & Sampson Response: No response required.

Site Development Plans

14.) The Applicant should provide turning templates showing the ability of refuse vehicles and Town of Wayland fire apparatus to access, circulate, and egress the site through the circulation pattern of the internal roadway without leaving the paved surface. Currently, no dumpster enclosure is apparent on the Site Development Plans.

Weston & Sampson Response: Weston & Sampson can provide turning templates for DPW maintenance vehicles, emergency vehicles and typical service vehicles if revised layout is approved.

15.) The Applicant should coordinate with the Town of Wayland Fire Department for preferred locations of fire lanes (if needed), confirmation of hydrant locations, and sign requirements for fire lanes within the site.

Weston & Sampson Response: It is Weston & Sampson's understanding the Wayland Fire Department has seen the plans however, Weston & Sampson has not yet received formal comments from the Planning Board on behalf of Wayland Fire Department.

16.) The Site Development Plans seem to indicate that the raised median at the end of the driveway is to be retained. This should be confirmed by the Applicant.

Weston & Sampson Response: This is confirmed. The median at the entrance driveway is to be removed.

17.) Chapter 198 - Section 506.7.1 of the Town of Wayland Zoning Bylaws indicate that for all off-street parking facilities that are not enclosed within a building or structure, 10% of the parking facility shall be landscaped. The Applicant should investigate opportunities to increase the landscaped area within the parking field on-site.

Weston & Sampson Response: Additional tree plantings have been provided as part of the Conservation Commission application approval. See Sheet L6.00-Overall Planting Plan, dated November 26, 2018.

18.) Chapter 198 - Section 506.7.1 of the Town of Wayland Zoning Bylaws indicate that off-street parking facilities of 10 or more spaces, bicycle racks facilitating locking, shall be provided to accommodate one bicycle per 10 parking spaces. The Site Development Plans as provided do not currently depict any bicycle storage accommodations on-site. The Applicant should evaluate an opportunity to provide bicycle storage accommodations on-site where applicable.

Weston & Sampson Response: Bicycle racks will be provided.

19.) Chapter 198 - Section 506.7.1 of the Town of Wayland Zoning Bylaws indicate that 90-degree parking stalls shall be minimum 18.5-feet in length. Parking stalls as depicted on the Site Development Plans are described as 18.0-feet in length. The Applicant shall address the stall length to meet Town standards.

Weston & Sampson Response: Per a collaborative meeting with the PMBC and the Town Planner, the parking lot alignment shall include a consideration of angles parking. See Sheet L5.00-OVERALL GRADING DRAINAGE & UTILIY PLAN, dated January 18, 2019.

20.) The Site Development Plans as provided depict an on-site sidewalk network along one side of the parking field and connecting to the playing field. There is no sidewalk provided connecting the site to Commonwealth Road. Although no accommodations are currently provided along Commonwealth Road, the Applicant should evaluate an opportunity to provide pedestrian connectivity to Commonwealth Road where future pedestrian accommodations may be constructed at a later date.

Weston & Sampson Response: Pedestrian connectivity is not to be provided to Commonwealth Road at this time and not within the current scope of work.

21.) The pedestrian path between the parking field and the recreational field at some locations is designed at up to an 18% grade. ADA / AAB standards limit pedestrian walkways to 5.0%. The Applicant shall evaluate opportunities to provide a ramp system to decrease the running slope.

Weston & Sampson Response: Per Sheets L5.00 and L5.01-GRADING, DRAINAGE & UTILITY PLANS, dated September 17, 2018, the maximum slope of the ADA accessible route walkway from the parking lot to the field is 4.5%. This complies with ADA standards.

22.) The Site Developments Plans as provided do not include construction details for accessible ramps. These may be included on a page not provided to TEC. The Applicant shall confirm that accessible ramps are compliant to Massachusetts Architectural Access Board (AAB) and Americans with Disabilities Act (ADA) standards.

The current ramp depicted between the handicap parking stalls is dimensioned with 7-foot transition lengths on both the low-side and high-side. For the high-side transition, the length should be calculated to provide no more than a 7.5% ±0.5% transition slope.

Weston & Sampson Response: Accessible ramp detail is identified on Sheet L7.02-CONSTRUCTION DETAILS, dated September 17, 2018, Detail 7-CURB RAMP AND DETECTABLE WARNING MAT

23.) The Applicant shall provide a dedicated plan for all snow storage to be designated as part of the project, if applicable based on winter / non-winter scheduling of events on site.

Weston & Sampson Response: It is Weston & Sampson's understanding that Loker Field is not to be utilized during winter months. No recreational events are intended to be scheduled at this time.

Please do not hesitate to contact me directly if you have any questions concerning our peer review at 978-794-1792. Thank you for your consideration.

Sincerely,
TEC, Inc.
*"**T**he **E**ngineering **C**orporation"*

Samuel W. Gregorio, P.E., PTOE
Senior Traffic Engineer

Projected Sample Schedule of Field Use for a proposed Turf Field at Loker

Please note all traffic is assumed to be vehicular, it would be atypical for users to arrive on foot or by school bus based on this projection.

A sample Weekday and Weekend Day for each season based on a combination of factors listed below:

- to maximize usage, this represents a very full schedule of in-Town use
- schedule is mirroring current WHS turf usage (outside of WPS athletics)
- consideration for field permits that are typically requested by Wayland users but denied due to lack of grass field space
- includes what a turf would potentially allow the Town to offer in **new** Recreation programming.
- All permits issued would include appropriate buffer between users relative to the size and type of use, to ease traffic
- The lines highlighted in red are an aggressive/maximum weekend summer projection;

Weekday during the Spring	Sample Monday	March 15 to June 30	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
9:00am-10:30am	Womens Bootcamp	24	25
1:00pm-2:00pm	Intro Teeball	12	13
4:00pm-5:00pm	U-12 Boys Soccer	24	10
5:30pm-7:00pm	Girls Lacrosse	24	10
7:15pm-8:45pm	Men's Adult Soccer	30	30

Typical Weekend during the Spring	Sample Saturday	March 15 to June 30	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
8:00am-9:30am	Youth Soccer 9v9 (2)	45	45
9:30am-11:00am	Youth Soccer 9v9 (2)	45	45
11:00am-12:30pm	Youth Soccer 11v11	36	45
12:30pm-2:30pm	Youth Lacrosse	45	45
2:30pm-4:30pm	Youth Lacrosse	45	45
4:30pm-5:30pm	Youth Soccer 11v11	45	45
5:30pm-7:00pm	Girls Lacrosse	36	36
7:15pm-8:45pm	Men's Adult Soccer	30	30
8:45pm-10:00pm	Adult Football	50	55

Typical Weekday during the Summer	Sample Wednesday	July 1 to Aug 24	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
8:00am-4:00pm	Sports Camp	50	8
4:00pm-6:00pm	Lessons	12	10
6:30pm-8:00pm	Adult Womens Soccer	30	30
8:00pm-10:00pm	Adult Lacrosse	30	30

Typical Weekend during the Summer	Sample Sunday	July 1 to Aug 24	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
8:00am-9:30am* included buffer	Club Soccer	16	10
9:30am-11:00am* included buffer	Club Soccer	16	10
11:00am-12:30pm* included buffer	Youth Soccer	45	45
12:30pm-2:30pm* included buffer	Youth Lacrosse	45	45
2:30pm-4:30pm* included buffer	Captains Practices	20	16

Typical Weekday during the Fall	Sample Tuesday	Aug 24 to Nov 15	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
9:00am-10:30am	Womens Bootcamp	24	25
1:00pm-2:00pm	Pre-K Soccer	12	13
4:00pm-5:00pm	U-12 Boys Soccer	30	6
5:30pm-7:00pm	Youth Flag Football	16	12
7:15pm-8:45pm	Men's Adult Soccer	36	40

Typical Weekend during the Fall	Sample Sunday	Aug 24 to Nov 15	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
8:00am-9:30am	Adult Soccer 11v11	30	30
9:30am-11:00am	Adult Soccer 11v11	30	40
11:00am-2:00pm	Youth Football	45	50
2:00pm-4:30pm	Youth Football	45	50
4:30pm-5:30pm	Youth Soccer	45	45
5:30pm-7:00pm	Youth Soccer	36	36
7:15pm-8:45pm	Men's Adult Soccer	30	30
8:45pm-10:00pm	Adult Frisbee	18	18

Typical Weekend during the Winter		November 15 to March 1	
Time Period	**Group**	**Trips (Drop Off)**	**Trips (Cars Parked at Site)**
No Significant Use Anticipated			

Weston & Sampson
100 Foxborough Blvd., Suite 250, Foxborough, MA 02035
Tel: 508.698.3034

TECHNICAL MEMORANDUM

TO: Paul Brinkman, Town Engineer

FROM: Lisa Slonus, PE, PTOE

DATE: October 31, 2018

SUBJECT: Traffic Evaluation
Loker Recreation Area
Wayland, MA

cc: G. Bolinger, B. Kunkel

As requested, Weston & Sampson has performed a traffic evaluation for the proposed recreation turf field at the Loker Recreation Area located along Commonwealth Road in Wayland, MA. The site driveway is located along Commonwealth Road about 600' east of Oak Street and Rice Road. A location map is attached, see Figure 1. An aerial of existing roadway conditions is also provided, see Figure 2 attached. The site, formerly occupied by a chemical company, was purchased by the Town and rehabbed as a recreation and conservation area. The Town has proposed to provide one recreational field with 50 parking spaces at this site. Access to existing trails and conservation areas will remain. Site access is proposed via the existing site driveway located on Commonwealth Road (Route 30). For the purposes of this evaluation, it is assumed that the field will be open for use in the year 2019.

This memorandum summarizes the efforts of the traffic assessment, which included field reconnaissance, a traffic-counting program, development of site generated traffic volumes, and operational analysis of the following Commonwealth Road intersections:

- Oak Street and Rice Road (signalized)
- Willowbrook Drive (unsignalized)
- Site Driveway (unsignalized)

Intersection analysis was conducted for the 2018 Existing conditions, 2019 No Build conditions, and 2019 Build conditions. The purpose of this analysis is to determine the traffic impact, if any, related to the new turf field site traffic volumes on the operational characteristics of Commonwealth Road (Route 30).

Existing Traffic Volumes

A traffic-counting program was conducted in March 2018, while schools were in session. Specifically automatic traffic recorder (ATR) counts were performed along Commonwealth Road and captured hourly, directional, typical weekday volumes and weekend volumes. Intersection turning movement counts (TMCs) were also conducted for the weekday evening commuter period (between 4 and 6PM) and Saturday morning and midday (8AM to 2PM) Because this site is not considered a weekday morning peak hour generator (between 7-9AM), TMC's were not performed during this period. The ATR and TMC results are attached. Based on MassDOT seasonal adjustment factors, these March traffic volumes are representative of average traffic volumes.

The peak hours experienced along Commonwealth Road was 5 to 6PM during the weekday evening commuter peak period, and 11:45 AM to 12:45 PM during the Saturday morning/midday. The existing peak hour traffic volumes are summarized in Figure 3, attached.

No Build Traffic Volumes

The field is anticipated to open for use in 2019. As a base for comparison to determine traffic impact, if any, of the proposed development on the surrounding roadway network, future traffic conditions for the year 2019 "no-build" conditions were developed. Specifically, the existing traffic volumes were increased by background growth. Background traffic volume growth represents the increase in traffic volumes over the course of time, unrelated to the proposed project. Growth occurs from developments within the immediate study vicinity, as well as regional traffic growth due to development and population increase outside the immediate vicinity of the project site. Based on discussions with the Town, there are no proposed/approved developments of significant size within the evaluation area. A conservative 2% background growth rate for one year was applied to the existing traffic volumes. The year 2019 No Build Traffic Volumes are summarized in Figure 4.

Site Traffic

Projected site traffic volumes were developed for the study periods based on anticipated field use. The anticipated field use was based on a sample programming schedule provided by the Town's Recreation Department. The programming schedule takes into account current Wayland High School turf field use, field permits that are typically requested and denied due to lack of available field space in Town, and programming that could be introduced with a second turf field. During the weekday PM peak hour, the site is anticipated to generate a total of 62 trips (24 in/ 38 out) and 90 total trips (45 in / 45 out) during the Saturday peak hour.

The distribution of site traffic was developed based on population centers within the Town, surrounding roadway network, existing traffic patterns, and the site location (within the southeastern corner of the Town). The majority of the site traffic is anticipated to be oriented to and from the west via Commonwealth Road and the Commonwealth Road at Oak Street and Rice Road intersection. A small percentage of site traffic is anticipated to be oriented to and from the east via Commonwealth Road. Some of this anticipated westbound Commonwealth Road traffic is due to by-pass traffic from Rice Road to Mainstone Road, turning right onto Commonwealth Road. Figure 5 summarizes the trip distribution for buses and employee vehicles.

Figure 6 illustrates the site generated traffic volumes distributed through the evaluation intersections and at the site driveway.

Build Traffic Volumes

The site traffic volumes (Figure 4) were superimposed on the no build traffic volumes (Figure 5) to represent the traffic expected in the area after opening of the turf field. The build traffic volumes are summarized in Figure 7.

Operational Analysis and Results

The evaluation intersections were analyzed based on the Existing, No Build, and Build traffic conditions for the weekday PM and Saturday midday peak hours based on methodologies described in the attached, EXPLANATION OF INTERSECTION ANALYSIS METHODOLOGIES. The level of service (LOS) and capacity (v/c ratio) are summarized in Table 1 and the 95th percentile queues are summarized in Table 2. The analysis results are attached.

In summary, the signalized intersection of Commonwealth Road at Oak Street and Rice Road is currently operating at an overall LOS of F during the weekday PM peak hour, and will continue to operate at LOS F given the no build and build conditions. The movements/approaches contributing to this LOS are the Oak Street NB left/though movement and the Rice Road SB approach. The site traffic volumes will not impact operations of the NB left/through movement, no site traffic volumes will be added to this movement and the movement is using the maximum green time permitted by the signal timing. Delay will increase for the Rice Road SB approach, however, increases to queueing will be negligible.

In addition, we performed a similar analysis at the Willowbrook Development driveway at its intersection with Commonwealth Road. The analysis indicated that site traffic has negligible impact on the Commonwealth Road at Willowbrook Drive intersection. The LOS, capacity, and queues at critical movements at this unsignalized intersection remain unchanged with the increase of site traffic through the intersection. The critical movements at the site driveway will operate at acceptable LOS and minimal queues.

Table 1. Level of Service (Capacity) Summary						
Intersection / Approach	2018 Existing		2019 No Build		2019 Build	
	PM	SAT	PM	SAT	PM	SAT
Commonwealth Rd at Oak Street and Rice Rd:						
Commonwealth Rd EB: Left/Through/Right	B (0.77)	B (0.75)	B (0.78)	B (0.75)	C (0.79)	C (0.78)
Commonwealth Rd WB: Left	B (0.65)	A (0.28)	B (0.67)	A (0.29)	B (0.70)	A (0.31)
Through/Right	B (0.67)	A (0.44)	B (0.67)	A (0.45)	B (0.70)	A (0.48)
Oak St NB: Left/Through	F (2.15)	C (0.80)	F (2.23)	C (0.64)	F (2.20)	C (0.63)
Right	C (0.48)	B (0.32)	C (0.50)	B (0.33)	D (0.51)	B (0.35)
Rice Rd SB: Left/Through/Right	D (0.82)	C (0.54)	E (0.85)	C (0.74)	F (0.99)	D (0.83)
Overall Intersection:	F	B	F	B	F	B
Commonwealth Rd at Site Driveway[1]:						
Commonwealth Rd EB: Left	-	-	-	-	B (0.04)	A (0.05)
Loker Driveway SB: Left/Right	-	-	-	-	D (0.20)	B (0.11)
Commonwealth Rd at Willowbrook Dr[1]:						
Commonwealth Rd WB: Left	A (0.01)	A (0.01)	A (0.01)	A (0.01)	A (0.01)	A (0.01)
Willowbrook Dr NB: Left/Right	E (0.14)	C (0.07)	E (0.15)	C (0.08)	E (0.15)	C (0.08)

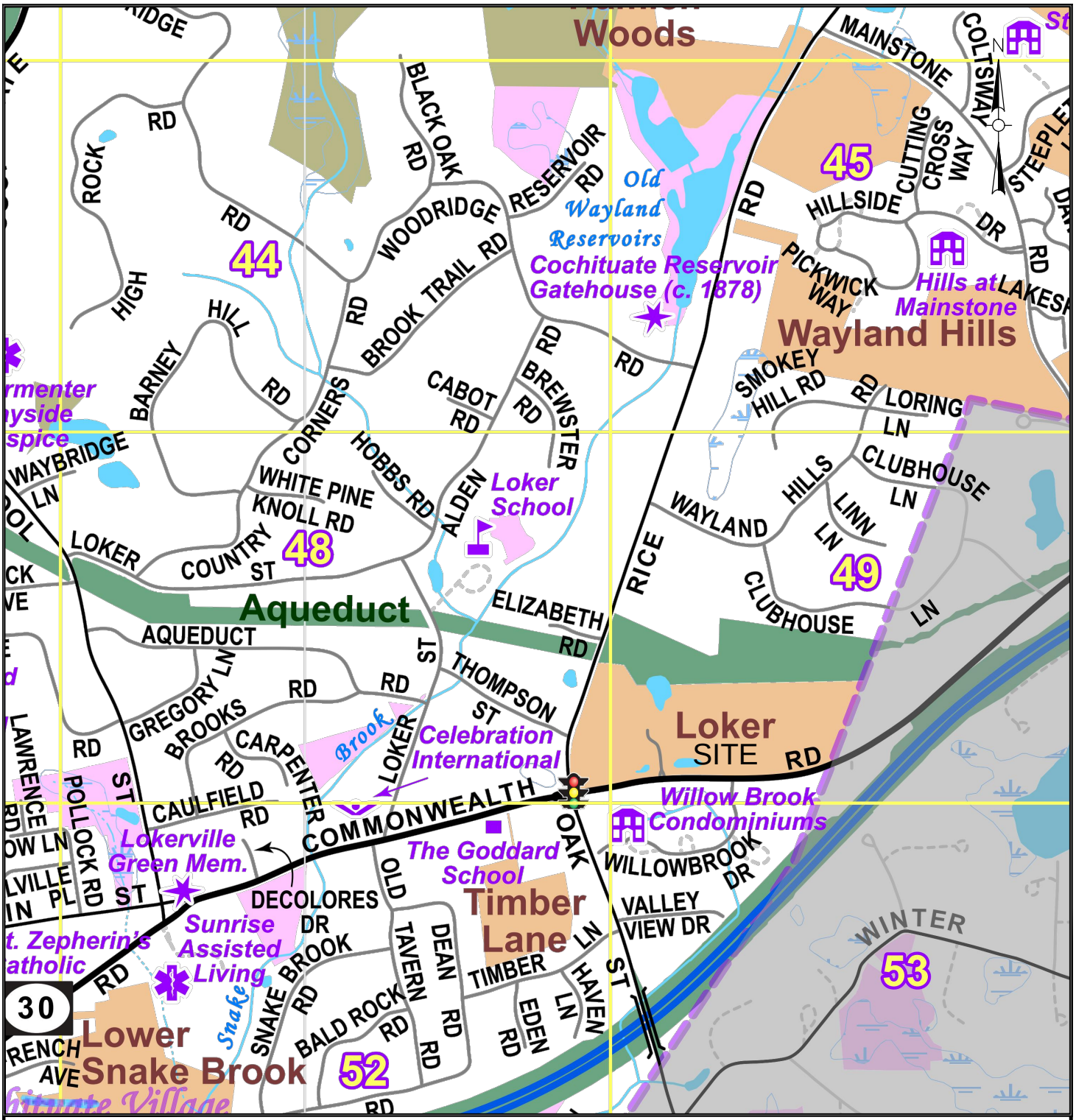
[1] Unsignalized intersection, results provided for critical movements only.

Table 2. 95th Percentile Queue Summary, feet								
Intersection / Approach	Available Storage	2018 Existing		2019 No Build		2019 Build	
		PM	SAT	PM	SAT	PM	SAT
Commonwealth Rd at Oak Street and Rice Rd:							
Commonwealth Rd EB: Left/Through/Right		375	325	375	325	400	350
Commonwealth Rd WB: Left	75	125	50	125	50	125	50
Through/Right	580+	400	150	400	150	450	175
Oak St NB: Left/Through		575	150	575	175	575	175
Right	100	100	50	100	50	100	50
Rice Rd SB: Left/Through/Right		175	100	200	100	225	100
Commonwealth Rd at Site Driveway[1]:							
Commonwealth Rd EB: Left	n/a	-	-	-	-	25	25
Loker Driveway SB: Left/Right	200+	-	-	-	-	25	25
Commonwealth Rd at Willowbrook Dr[1]:							
Commonwealth Rd WB: Left	n/a	0	0	0	0	0	0
Willow Brook Dr NB: Left/Right	250	25	25	25	25	25	25

[1] Unsignalized intersection, results provided for critical movements only.

ATTACHMENTS

FIGURES



SCALE: 1"=1000'

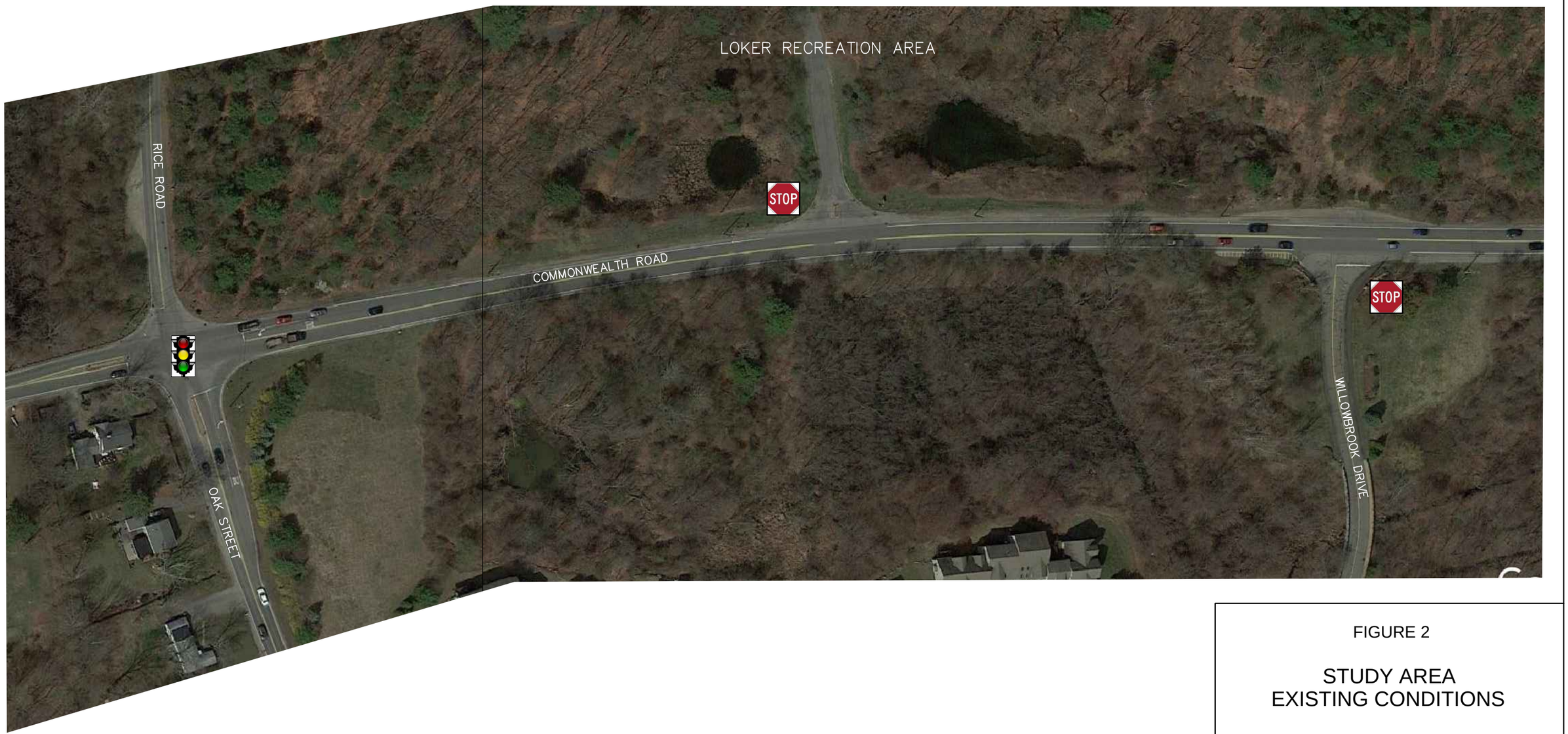
FIGURE 1

LOCATION MAP

LOKER RECREATION FIELD
WAYLAND, MA

Weston & Sampson

N



SCALE: 1"=100'

0 100' 200' 300'

FIGURE 2

STUDY AREA
EXISTING CONDITIONS

WAYLAND, MA

Weston & Sampson℠

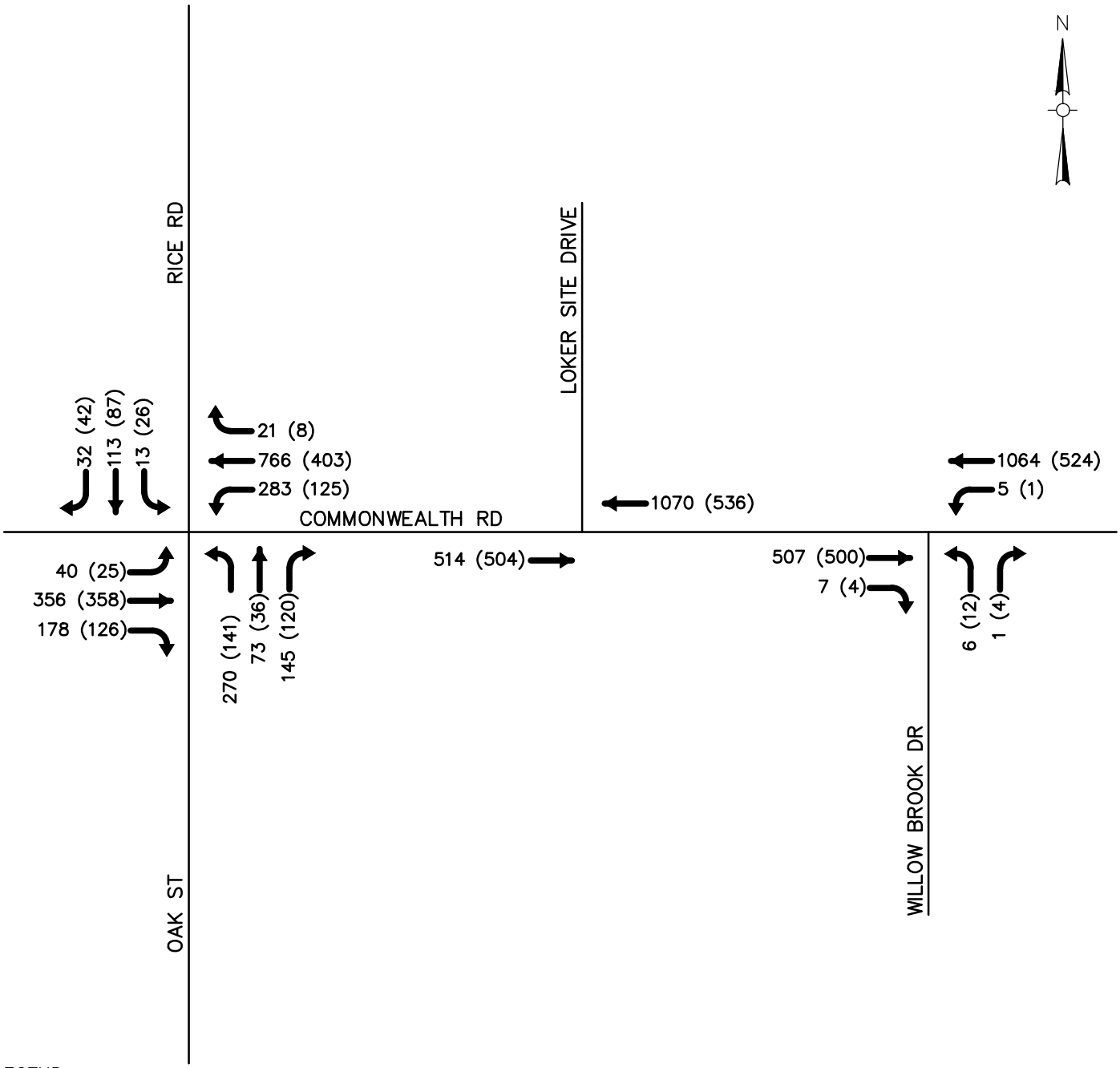


FIGURE 3

2018 EXISTING PEAK HOUR TRAFFIC VOLUMES

LOKER RECREATION AREA
WAYLAND, MA

Weston & Sampson℠

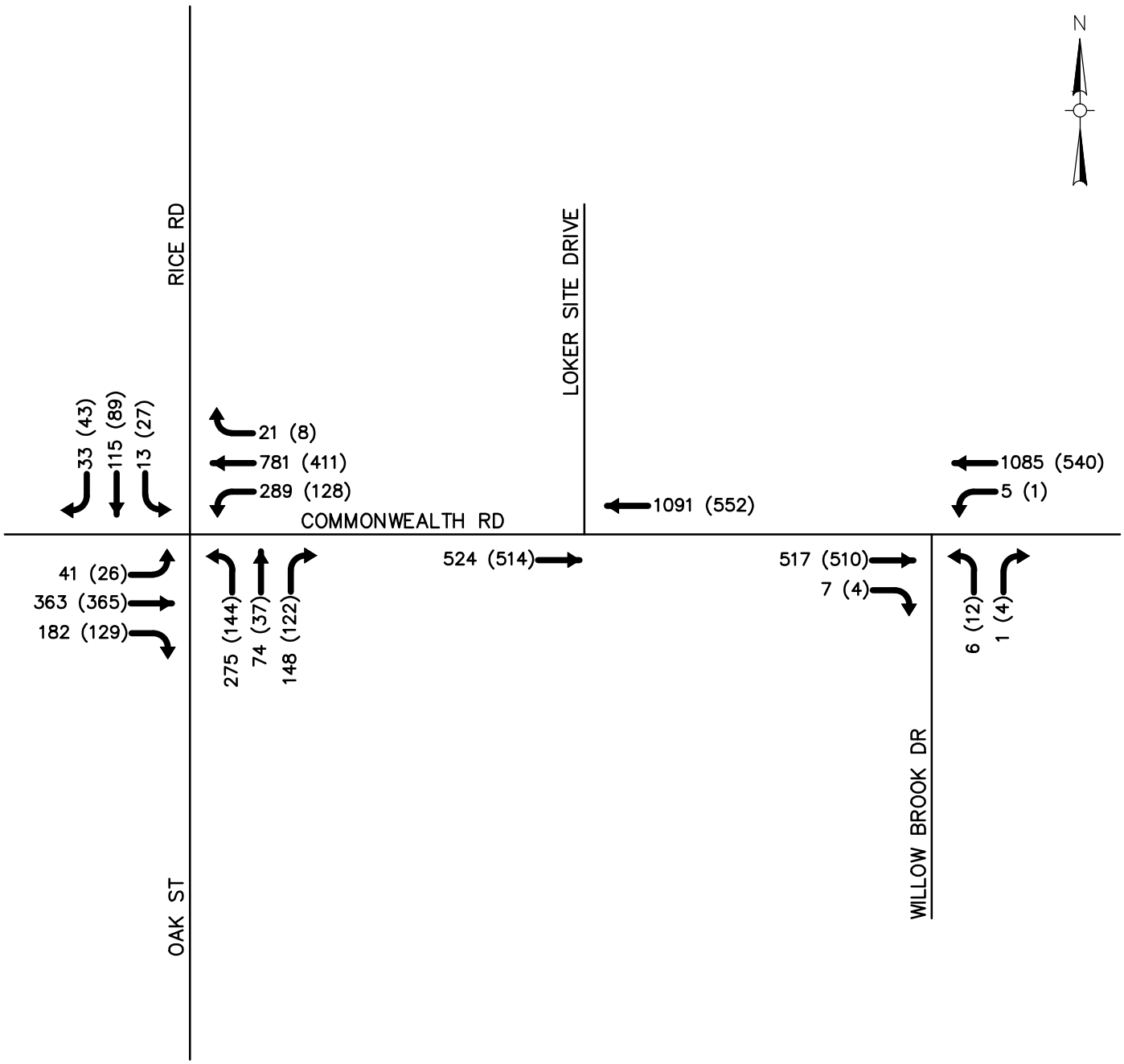


FIGURE 4

2019 NO BUILD
PEAK HOUR TRAFFIC VOLUMES

LOKER RECREATION AREA
WAYLAND, MA

Weston & Sampson℠

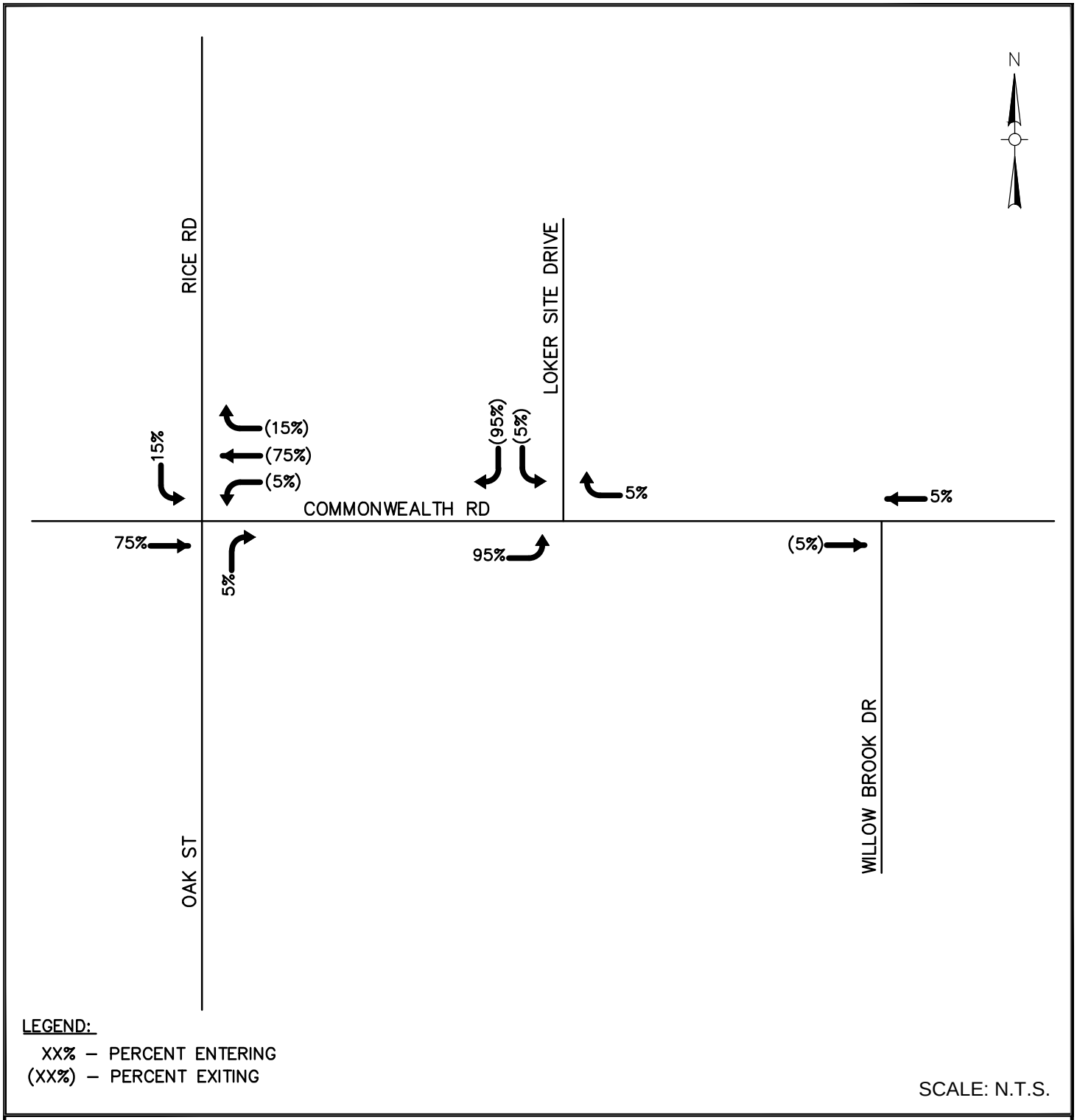


FIGURE 5

TRIP DISTRIBUTION

LOKER RECREATION AREA
WAYLAND, MA

Weston & Sampson℠

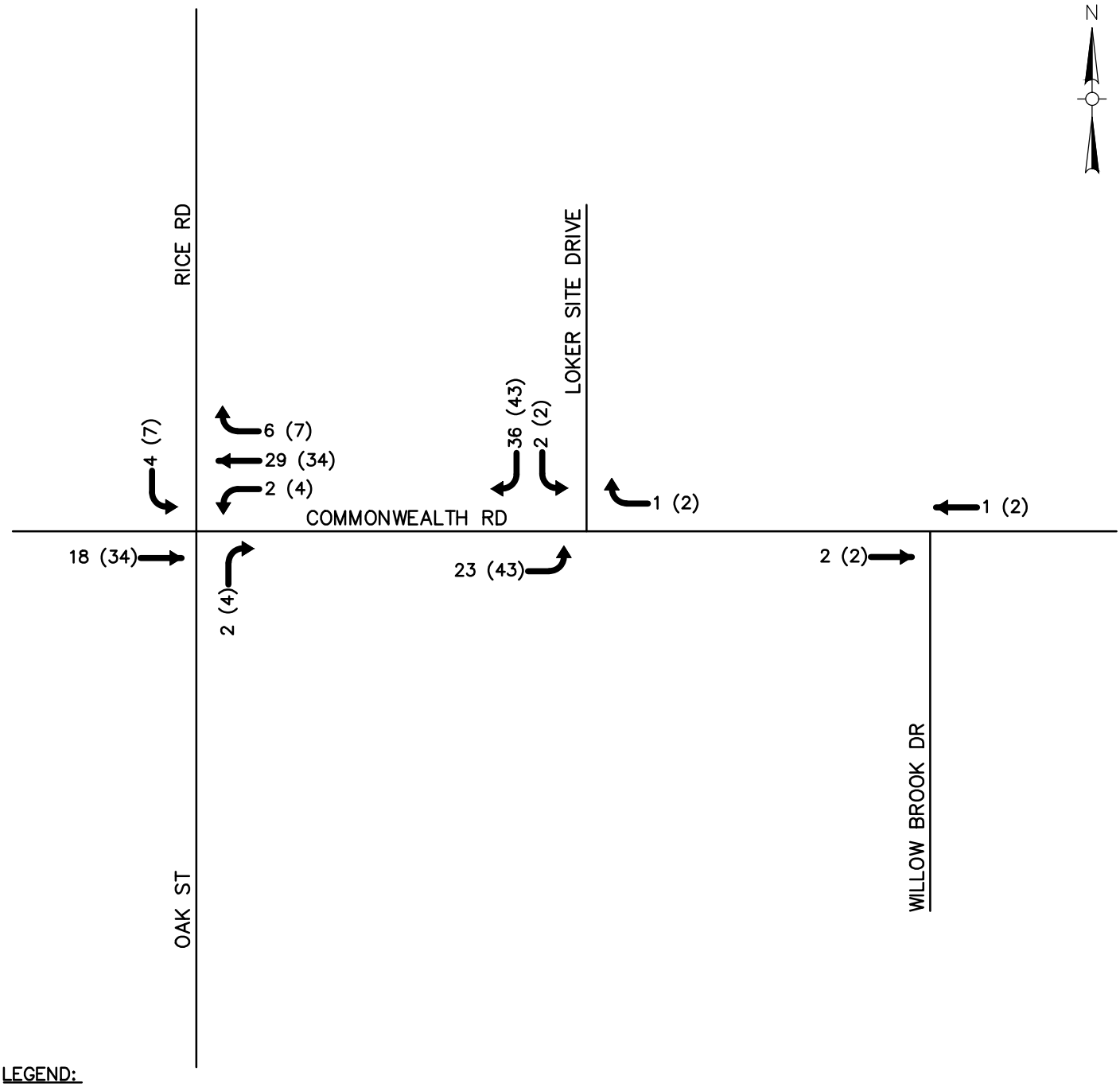


FIGURE 6

SITE TRAFFIC VOLUMES

LOKER RECREATION AREA
WAYLAND, MA

Weston & Sampson℠

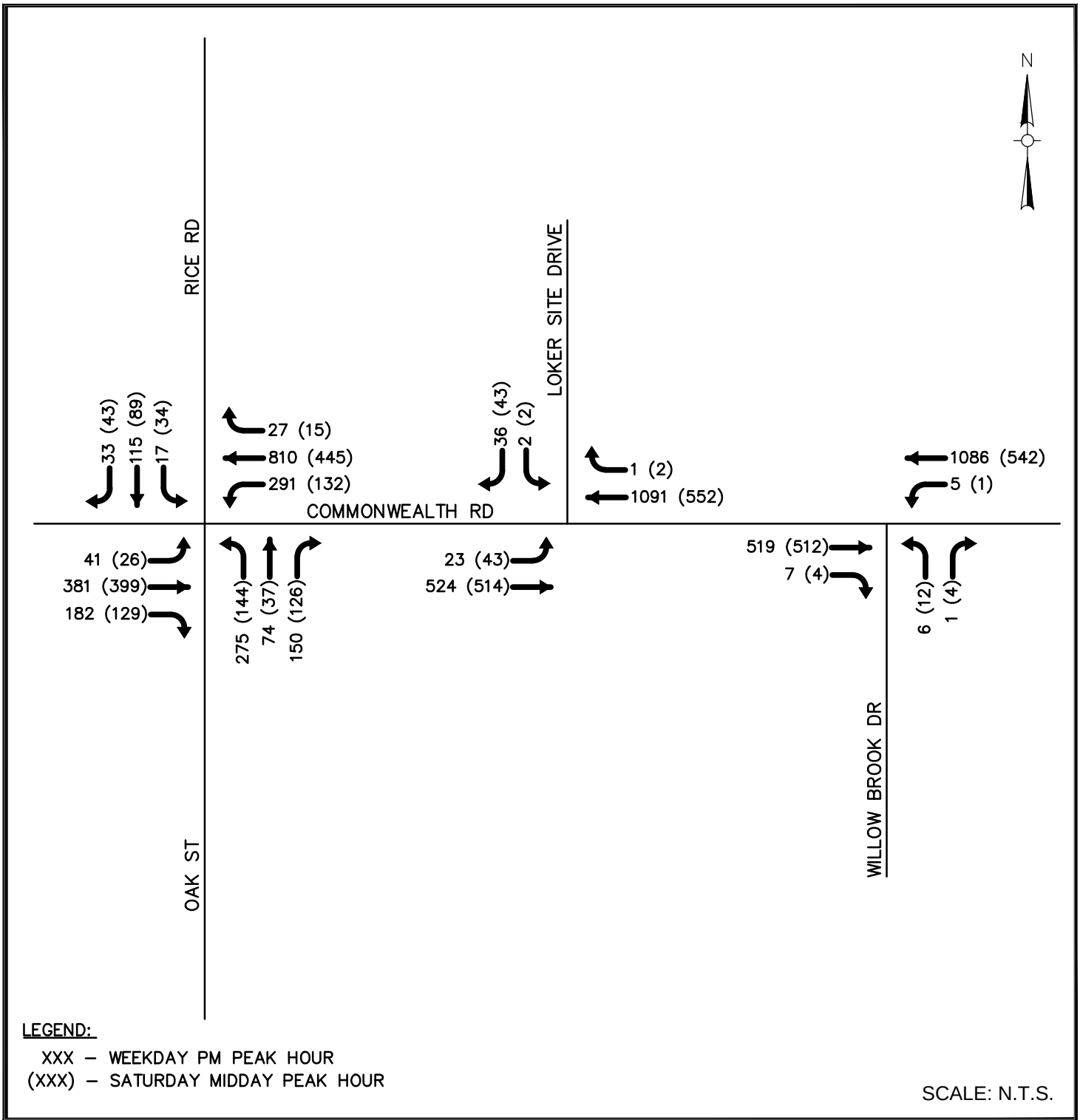


FIGURE 7

YEAR 2023 BUILD
PEAK HOUR TRAFFIC VOLUMES

LOKER RECREATION AREA
WAYLAND, MA

Weston & Sampson℠

TRAFFIC COUNTS

Accurate Counts

978-664-2565

Location : Commonwealth Avenue
Location : West of Willow Brook Drive
City/State: Wayland, MA

80076VL1

Start	3/19/2018		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	*	*	*	*	*	*	37	55	39	60	38	58
01:00	*	*	*	*	*	*	*	*	*	*	13	39	23	37	18	38
02:00	*	*	*	*	*	*	*	*	*	*	9	19	9	22	9	20
03:00	*	*	*	*	*	*	*	*	*	*	5	10	9	7	7	8
04:00	*	*	*	*	*	*	*	*	*	*	15	8	17	5	16	6
05:00	*	*	*	*	*	*	*	*	*	*	31	20	19	15	25	18
06:00	*	*	*	*	*	*	*	*	*	*	109	51	60	41	84	46
07:00	*	*	*	*	*	*	*	*	*	*	193	140	98	77	146	108
08:00	*	*	*	*	*	*	*	*	*	*	277	187	178	138	228	162
09:00	*	*	*	*	*	*	*	*	*	*	343	331	288	240	316	286
10:00	*	*	*	*	*	*	*	*	*	*	406	385	358	315	382	350
11:00	*	*	*	*	*	*	*	*	*	*	**453**	**485**	**365**	**395**	**409**	**440**
12:00 PM	*	*	*	*	*	*	*	*	*	*	471	521	422	497	446	509
01:00	*	*	*	*	*	*	*	*	*	*	470	511	420	**517**	445	**514**
02:00	*	*	*	*	*	*	*	*	*	*	479	**525**	392	498	436	512
03:00	*	*	*	*	*	*	*	*	*	*	**503**	502	384	458	444	480
04:00	*	*	*	*	*	*	*	*	*	*	423	416	**461**	403	442	410
05:00	*	*	*	*	*	*	*	*	*	*	449	421	445	342	**447**	382
06:00	*	*	*	*	*	*	*	*	*	*	361	292	347	253	354	272
07:00	*	*	*	*	*	*	*	*	*	*	269	255	222	213	246	234
08:00	*	*	*	*	*	*	*	*	*	*	202	195	158	177	180	186
09:00	*	*	*	*	*	*	*	*	*	*	196	158	104	151	150	154
10:00	*	*	*	*	*	*	*	*	*	*	128	161	60	72	94	116
11:00	*	*	*	*	*	*	*	*	*	*	76	102	37	41	56	72
Lane	0	0	0	0	0	0	0	0	0	0	5918	5789	4915	4974	5418	5381
Day	0		0		0		0		0		11707		9889		10799	
AM Peak	-	-	-	-	-	-	-	-	-	-	11:00	11:00	11:00	11:00	11:00	11:00
Vol.	-	-	-	-	-	-	-	-	-	-	453	485	365	395	409	440
PM Peak	-	-	-	-	-	-	-	-	-	-	15:00	14:00	16:00	13:00	17:00	13:00
Vol.	-	-	-	-	-	-	-	-	-	-	503	525	461	517	447	514

Accurate Counts

978-664-2565

Location : Commonwealth Avenue
Location : West of Willow Brook Drive
City/State: Wayland, MA

80076VL1

Start	3/26/2018		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	13	19	10	32	12	30	*	*	*	*	*	*	*	*	12	27
01:00	8	12	7	10	9	9	*	*	*	*	*	*	*	*	8	10
02:00	8	5	3	3	2	8	*	*	*	*	*	*	*	*	4	5
03:00	10	5	11	4	8	8	*	*	*	*	*	*	*	*	10	6
04:00	31	9	26	9	27	7	*	*	*	*	*	*	*	*	28	8
05:00	163	47	171	52	173	48	*	*	*	*	*	*	*	*	169	49
06:00	706	163	752	165	729	178	*	*	*	*	*	*	*	*	729	169
07:00	**1063**	309	**1051**	322	**1052**	309	*	*	*	*	*	*	*	*	**1055**	313
08:00	911	**425**	1029	411	928	**437**	*	*	*	*	*	*	*	*	956	**424**
09:00	698	358	748	396	677	409	*	*	*	*	*	*	*	*	708	388
10:00	417	351	619	389	478	346	*	*	*	*	*	*	*	*	505	362
11:00	373	360	386	**414**	484	425	*	*	*	*	*	*	*	*	414	400
12:00 PM	379	413	398	411	472	472	*	*	*	*	*	*	*	*	416	432
01:00	395	383	429	445	425	513	*	*	*	*	*	*	*	*	416	447
02:00	436	487	**472**	584	465	575	*	*	*	*	*	*	*	*	458	549
03:00	419	799	436	880	448	862	*	*	*	*	*	*	*	*	434	847
04:00	412	1010	393	**1102**	425	**1030**	*	*	*	*	*	*	*	*	410	1047
05:00	**542**	**1069**	457	1093	**487**	1028	*	*	*	*	*	*	*	*	**495**	**1063**
06:00	491	819	410	844	441	867	*	*	*	*	*	*	*	*	447	843
07:00	280	463	284	444	237	471	*	*	*	*	*	*	*	*	267	459
08:00	185	236	184	242	206	308	*	*	*	*	*	*	*	*	192	262
09:00	147	150	159	181	166	166	*	*	*	*	*	*	*	*	157	166
10:00	66	98	71	103	78	127	*	*	*	*	*	*	*	*	72	109
11:00	30	45	43	76	30	69	*	*	*	*	*	*	*	*	34	63
Lane	8183	8035	8549	8612	8459	8702	0	0	0	0	0	0	0	0	8396	8448
Day	16218		17161		17161		0		0		0		0		16844	
AM Peak	07:00	08:00	07:00	11:00	07:00	08:00	-	-	-	-	-	-	-	-	07:00	08:00
Vol.	1063	425	1051	414	1052	437	-	-	-	-	-	-	-	-	1055	424
PM Peak	17:00	17:00	14:00	16:00	17:00	16:00	-	-	-	-	-	-	-	-	17:00	17:00
Vol.	542	1069	472	1102	487	1030	-	-	-	-	-	-	-	-	495	1063

Comb. Total	16218	17161	17161	0	0	11707	9889	27643
ADT	ADT 14,427	AADT 14,427						

Accurate Counts

978-664-2565

N/S Street : Rice Road / Oak Street
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 18007601
Site Code : 18007601
Start Date : 3/28/2018
Page No : 1

Groups Printed- Cars - Trucks

	Rice Rd From North			Commonwealth Ave From East			Oak St From South			Commonwealth Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
04:00 PM	2	29	7	67	179	3	64	15	37	9	61	41	514
04:15 PM	5	25	7	72	198	7	67	16	42	5	69	33	546
04:30 PM	2	36	6	69	176	6	51	18	40	6	82	33	525
04:45 PM	5	34	12	82	173	3	52	21	28	11	74	38	533
Total	14	124	32	290	726	19	234	70	147	31	286	145	2118
05:00 PM	0	19	6	85	176	2	72	20	50	11	81	48	570
05:15 PM	5	37	11	77	192	3	68	14	38	12	76	38	571
05:30 PM	6	28	8	58	178	10	64	17	30	7	113	55	574
05:45 PM	2	29	7	56	200	5	67	22	27	10	86	37	548
Total	13	113	32	276	746	20	271	73	145	40	356	178	2263
Grand Total	27	237	64	566	1472	39	505	143	292	71	642	323	4381
Apprch %	8.2	72.3	19.5	27.3	70.9	1.9	53.7	15.2	31.1	6.9	62	31.2	
Total %	0.6	5.4	1.5	12.9	33.6	0.9	11.5	3.3	6.7	1.6	14.7	7.4	
Cars	27	236	64	565	1469	39	503	142	292	71	641	319	4368
% Cars	100	99.6	100	99.8	99.8	100	99.6	99.3	100	100	99.8	98.8	99.7
Trucks	0	1	0	1	3	0	2	1	0	0	1	4	13
% Trucks	0	0.4	0	0.2	0.2	0	0.4	0.7	0	0	0.2	1.2	0.3

Accurate Counts

978-664-2565

N/S Street : Rice Road / Oak Street
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 18007601
Site Code : 18007601
Start Date : 3/28/2018

	Rice Rd From North				Commonwealth Ave From East				Oak St From South				Commonwealth Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	19	6	25	**85**	176	2	263	**72**	20	**50**	**142**	11	81	48	140	570
05:15 PM	5	**37**	**11**	**53**	77	192	3	**272**	68	14	38	120	**12**	76	38	126	571
05:30 PM	**6**	28	8	42	58	178	**10**	246	64	17	30	111	7	**113**	**55**	**175**	**574**
05:45 PM	2	29	7	38	56	**200**	5	261	67	**22**	27	116	10	86	37	133	548
Total Volume	13	113	32	158	276	746	20	1042	271	73	145	489	40	356	178	574	2263
% App. Total	8.2	71.5	20.3		26.5	71.6	1.9		55.4	14.9	29.7		7	62	31		
PHF	.542	.764	.727	.745	.812	.933	.500	.958	.941	.830	.725	.861	.833	.788	.809	.820	.986
Cars	13	113	32	158	276	744	20	1040	270	73	145	488	40	356	176	572	2258
% Cars	100	100	100	100	100	99.7	100	99.8	99.6	100	100	99.8	100	100	98.9	99.7	99.8
Trucks	0	0	0	0	0	2	0	2	1	0	0	1	0	0	2	2	5
% Trucks	0	0	0	0	0	0.3	0	0.2	0.4	0	0	0.2	0	0	1.1	0.3	0.2

Accurate Counts

978-664-2565

N/S Street : Rice Road / Oak Street
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 180076S1
Site Code : 180076S1
Start Date : 3/24/2018

Groups Printed- Cars - Trucks

	Rice Rd From North			Commonwealth Ave From East			Oak St From South			Commonwealth Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
08:00 AM	1	7	6	11	27	2	16	4	11	6	38	17	146
08:15 AM	4	14	8	10	36	1	12	8	14	4	44	20	175
08:30 AM	1	15	4	10	30	0	20	6	19	3	57	22	187
08:45 AM	3	21	8	16	43	1	18	3	21	5	63	20	222
Total	9	57	26	47	136	4	66	21	65	18	202	79	730
09:00 AM	2	7	8	16	43	2	26	7	30	6	56	28	231
09:15 AM	4	14	8	20	65	1	24	4	22	3	54	26	245
09:30 AM	5	16	10	20	70	0	30	2	21	8	53	25	260
09:45 AM	4	18	11	19	78	2	36	8	24	1	72	28	301
Total	15	55	37	75	256	5	116	21	97	18	235	107	1037
10:00 AM	5	17	7	24	78	0	42	12	19	7	61	23	295
10:15 AM	5	18	9	22	72	2	32	5	26	5	60	29	285
10:30 AM	6	6	4	20	62	1	34	8	23	7	84	24	279
10:45 AM	8	20	12	22	81	3	40	6	25	10	91	27	345
Total	24	61	32	88	293	6	148	31	93	29	296	103	1204
11:00 AM	8	12	11	30	91	4	26	13	18	8	88	30	339

Accurate Counts

978-664-2565

N/S Street : Rice Road / Oak Street
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 180076S1
Site Code : 180076S1
Start Date : 3/24/2018

Groups Printed- Cars - Trucks

	Rice Rd From North			Commonwealth Ave From East			Oak St From South			Commonwealth Ave From West			
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Int. Total
11:15 AM	6	22	11	18	105	2	51	11	31	7	77	29	370
11:30 AM	5	17	14	22	81	1	35	6	27	9	68	33	318
11:45 AM	4	21	10	25	101	3	33	8	34	3	96	35	373
Total	23	72	46	95	378	10	145	38	110	27	329	127	1400
12:00 PM	6	15	10	38	101	1	26	10	31	7	87	38	370
12:15 PM	5	24	8	35	91	1	49	8	27	10	80	33	371
12:30 PM	11	27	14	23	96	3	33	10	28	5	95	20	365
12:45 PM	6	17	8	39	95	1	31	11	31	7	73	32	351
Total	28	83	40	135	383	6	139	39	117	29	335	123	1457
01:00 PM	4	23	8	29	91	3	34	8	28	4	92	33	357
01:15 PM	2	21	10	24	96	4	38	3	24	10	103	23	358
01:30 PM	4	12	11	29	104	1	25	17	24	8	87	26	348
01:45 PM	1	24	21	30	99	1	49	15	24	4	82	22	372
Total	11	80	50	112	390	9	146	43	100	26	364	104	1435
Grand Total	110	408	231	552	1836	40	760	193	582	147	1761	643	7263
Apprch %	14.7	54.5	30.8	22.7	75.6	1.6	49.5	12.6	37.9	5.8	69	25.2	
Total %	1.5	5.6	3.2	7.6	25.3	0.6	10.5	2.7	8	2	24.2	8.9	
Cars	110	408	231	550	1833	39	760	193	581	146	1758	642	7251
% Cars	100	100	100	99.6	99.8	97.5	100	100	99.8	99.3	99.8	99.8	99.8
Trucks	0	0	0	2	3	1	0	0	1	1	3	1	12
% Trucks	0	0	0	0.4	0.2	2.5	0	0	0.2	0.7	0.2	0.2	0.2

Accurate Counts

978-664-2565

N/S Street : Rice Road / Oak Street
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 180076S1
Site Code : 180076S1
Start Date : 3/24/2018
Page No : 3

	Rice Rd From North				Commonwealth Ave From East				Oak St From South				Commonwealth Ave From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:45 AM																	
11:45 AM	4	21	10	35	25	**101**	**3**	129	33	8	**34**	75	3	**96**	35	**134**	**373**
12:00 PM	6	15	10	31	**38**	101	1	**140**	26	**10**	31	67	7	87	**38**	132	370
12:15 PM	5	24	8	37	35	91	1	127	**49**	8	27	**84**	**10**	80	33	123	371
12:30 PM	**11**	**27**	**14**	**52**	23	96	3	122	33	10	28	71	5	95	20	120	365
Total Volume	26	87	42	155	121	389	8	518	141	36	120	297	25	358	126	509	1479
% App. Total	16.8	56.1	27.1		23.4	75.1	1.5		47.5	12.1	40.4		4.9	70.3	24.8		
PHF	.591	.806	.750	.745	.796	.963	.667	.925	.719	.900	.882	.884	.625	.932	.829	.950	.991
Cars	26	87	42	155	121	388	8	517	141	36	120	297	25	358	126	509	1478
% Cars	100	100	100	100	100	99.7	100	99.8	100	100	100	100	100	100	100	100	99.9
Trucks	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Trucks	0	0	0	0	0	0.3	0	0.2	0	0	0	0	0	0	0	0	0.1

Accurate Counts

978-664-2565

N/S Street : Willow Brook Drive
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 18007602
Site Code : 18007602
Start Date : 3/28/2018
Page No : 1

Groups Printed- Cars - Trucks

	Commonwealth Ave From East		Willow Brook Dr From South		Commonwealth Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
04:00 PM	1	264	3	1	104	1	374
04:15 PM	1	277	1	0	112	3	394
04:30 PM	2	244	2	0	119	0	367
04:45 PM	0	263	2	0	108	3	376
Total	4	1048	8	1	443	7	1511
05:00 PM	1	271	0	0	121	2	395
05:15 PM	3	265	1	0	128	0	397
05:30 PM	1	265	3	1	150	2	422
05:45 PM	1	253	2	0	107	0	363
Total	6	1054	6	1	506	4	1577
Grand Total	10	2102	14	2	949	11	3088
Apprch %	0.5	99.5	87.5	12.5	98.9	1.1	
Total %	0.3	68.1	0.5	0.1	30.7	0.4	
Cars	10	2099	14	2	948	11	3084
% Cars	100	99.9	100	100	99.9	100	99.9
Trucks	0	3	0	0	1	0	4
% Trucks	0	0.1	0	0	0.1	0	0.1

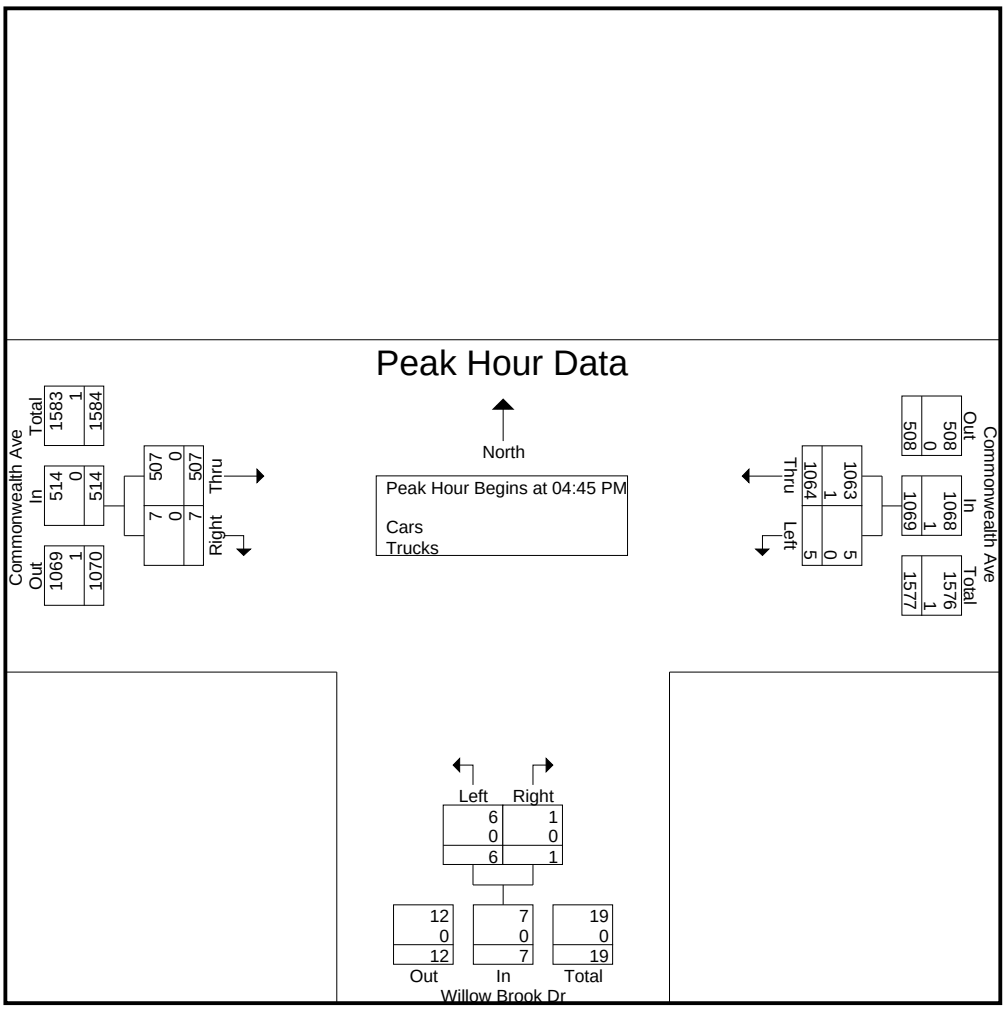
Accurate Counts

978-664-2565

N/S Street : Willow Brook Drive
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 18007602
Site Code : 18007602
Start Date : 3/28/2018
Page No : 2

	Commonwealth Ave From East			Willow Brook Dr From South			Commonwealth Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	263	263	2	0	2	108	**3**	111	376
05:00 PM	1	**271**	**272**	0	0	0	121	2	123	395
05:15 PM	**3**	265	268	1	0	1	128	0	128	397
05:30 PM	1	265	266	**3**	**1**	**4**	**150**	2	**152**	**422**
Total Volume	5	1064	1069	6	1	7	507	7	514	1590
% App. Total	0.5	99.5		85.7	14.3		98.6	1.4		
PHF	.417	.982	.983	.500	.250	.438	.845	.583	.845	.942
Cars	5	1063	1068	6	1	7	507	7	514	1589
% Cars	100	99.9	99.9	100	100	100	100	100	100	99.9
Trucks	0	1	1	0	0	0	0	0	0	1
% Trucks	0	0.1	0.1	0	0	0	0	0	0	0.1



Accurate Counts

978-664-2565

N/S Street : Willow Brook Drive
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 180076S2
Site Code : 18007602
Start Date : 3/24/2018

Groups Printed- Cars

	Commonwealth Ave From East		Willow Brook Dr From South		Commonwealth Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
08:00 AM	0	37	3	0	47	2	89
08:15 AM	0	43	4	1	60	1	109
08:30 AM	0	39	1	1	77	2	120
08:45 AM	0	58	0	0	82	1	141
Total	0	177	8	2	266	6	459
09:00 AM	1	56	2	1	89	0	149
09:15 AM	0	89	1	0	76	1	167
09:30 AM	1	86	4	0	74	4	169
09:45 AM	0	90	2	1	98	1	192
Total	2	321	9	2	337	6	677
10:00 AM	0	106	2	2	83	1	194
10:15 AM	1	94	1	0	87	1	184
10:30 AM	1	77	4	1	110	4	197
10:45 AM	0	100	3	1	119	0	223
Total	2	377	10	4	399	6	798
11:00 AM	0	135	1	0	114	3	253
11:15 AM	0	114	0	2	106	3	225
11:30 AM	1	114	0	0	99	1	215
11:45 AM	0	134	3	1	132	1	271
Total	1	497	4	3	451	8	964
12:00 PM	0	140	3	1	124	2	270
12:15 PM	0	122	3	0	107	0	232
12:30 PM	0	127	3	2	134	1	267
12:45 PM	1	141	1	1	108	4	256
Total	1	530	10	4	473	7	1025

Accurate Counts

978-664-2565

N/S Street : Willow Brook Drive
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 180076S2
Site Code : 18007602
Start Date : 3/24/2018

Groups Printed- Cars

	Commonwealth Ave From East		Willow Brook Dr From South		Commonwealth Ave From West		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
01:00 PM	0	125	2	0	134	1	262
01:15 PM	0	125	1	0	121	5	252
01:30 PM	0	142	2	0	118	1	263
01:45 PM	2	130	2	1	106	1	242
Total	2	522	7	1	479	8	1019
Grand Total	8	2424	48	16	2405	41	4942
Apprch %	0.3	99.7	75	25	98.3	1.7	
Total %	0.2	49	1	0.3	48.7	0.8	

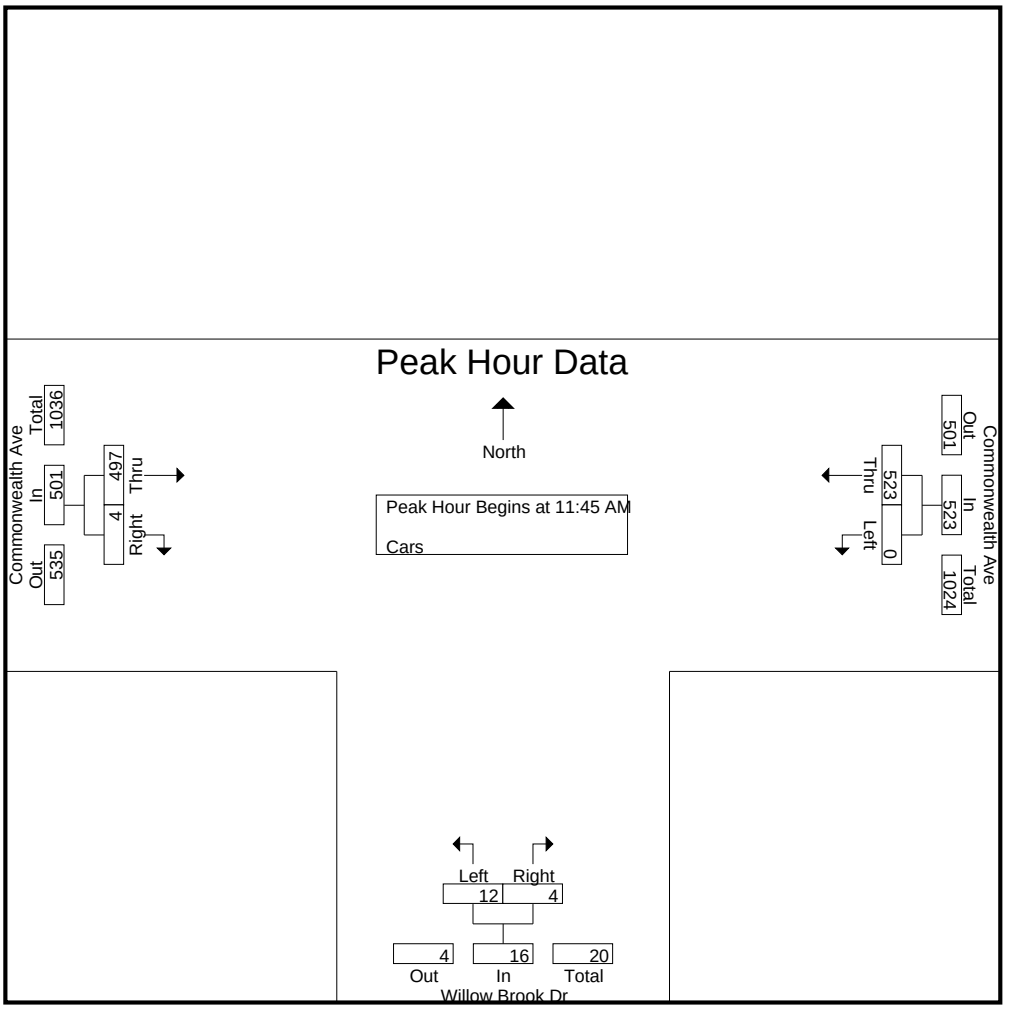
Accurate Counts

978-664-2565

N/S Street : Willow Brook Drive
E/W Street : Commonwealth Avenue
City/State : Wayland, MA
Weather : Clear

File Name : 180076S2
Site Code : 18007602
Start Date : 3/24/2018
Page No : 7

	Commonwealth Ave From East			Willow Brook Dr From South			Commonwealth Ave From West			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:45 AM										
11:45 AM	0	134	134	**3**	1	4	132	1	133	**271**
12:00 PM	0	**140**	**140**	3	1	4	124	**2**	126	270
12:15 PM	0	122	122	3	0	3	107	0	107	232
12:30 PM	0	127	127	3	**2**	**5**	**134**	1	**135**	267
Total Volume	0	523	523	12	4	16	497	4	501	1040
% App. Total	0	100		75	25		99.2	0.8		
PHF	.000	.934	.934	1.00	.500	.800	.927	.500	.928	.959



ANALYSIS

Methodology

EXPLANATION OF INTERSECTION ANALYSIS METHODOLOGIES

Operational analyses of the study intersection were completed using procedures in the Transportation Research Board's *Highway Capacity Manual, 2010 (HCM 2010)*. This is the usual methodology for the analysis of traffic conditions. The software program *Synchro 9* by TrafficWare (a nationally recognized computer software package for analyzing capacities, Levels of Service, and queueing) was used to perform the actual capacity and queue analyses.

Operating conditions at intersections are evaluated in terms of Levels of Service (LOS). LOS are letter grades, LOS A being the best and LOS F being the worst, quantified by average control delay. Control delay includes the amount of time a driver experiences being stopped at the intersection, as well as, start-up lost time, and time moving up in the queue at the intersection.

For signalized intersections, the LOS is reported for the entire intersection, as well as, for each approach and individual movements. The HCM 2010 LOS criteria for signalized intersections is summarized below:

HCM 2010 Signalized Intersection LOS Criteria	
LOS	Control Delay (seconds per vehicle)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

LOS A through D are generally considered to be adequate peak hour operations at a signalized intersection. LOS E and F are typically incurred when one or more movements at the intersection are operating over capacity. When the volume to capacity ration (v/c) is equal to or greater than 1.0, LOS is also considered F.

For two-way STOP controlled unsignalized intersections, the LOS is evaluated for the minor street approach(es) and for the left turns from the major street. The major street through and right turning traffic is assumed to have no delay since the movement is free-flow with no traffic control. At all-way STOP controlled intersections, LOS is reported similar to signalized intersections. That is, for the intersection as a whole, as well as for each approach and individual movements.

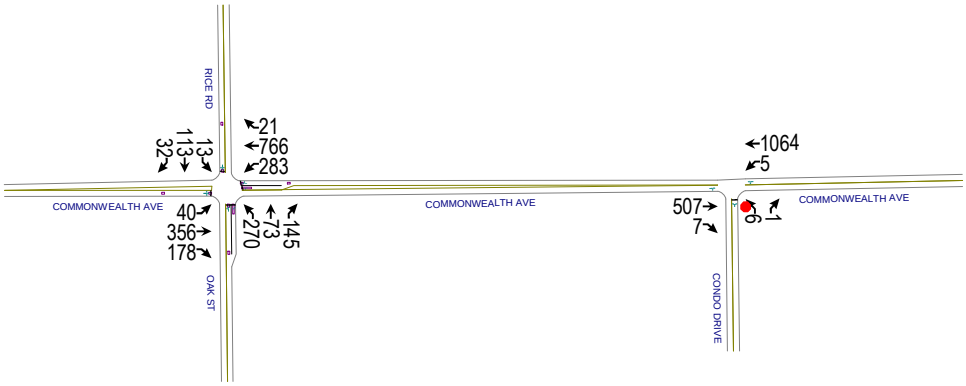
The HCM 2010 LOS criteria for unsignalized intersections is summarized below:

HCM 2010 Unsignalized Intersection LOS Criteria	
LOS	Control Delay (seconds per vehicle)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Inadequate Levels of Service for minor street approaches to unsignalized intersections is not uncommon, as the major street traffic flow is continuous. When the volume to capacity ration (v/c) is equal to or greater than 1.0, LOS is also considered F.

Synchro output also includes 50th percentile (or average) queue lengths, as well as, 95th percentile queues (occurring 5 percent of the time or less). Calculations for these queues take into account rate of arriving vehicles, red time (at signalized intersections), saturation flow rate, lane arrangement and lane usage. The 95th percentile queue is the queue length that would be experienced by 5 percent of stopped vehicles at non-signalized intersections, or during 5 percent of signal cycles at a signalized intersection. The 95th percentile queue is often used to determine storage needs for auxiliary lanes, while the 50th percentile queue is more representative of what the average motorist will experience.

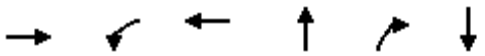
Existing Conditions


RICE RD
21
766
283
13
113
32
COMMONWEALTH AVE
40
356
178
OAK ST
73
270
145
COMMONWEALTH AVE
1064
5
507
7
6
1
CONDO DRIVE
COMMONWEALTH AVE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	356	178	283	766	21	270	73	145	13	113	32
Future Volume (veh/h)	40	356	178	283	766	21	270	73	145	13	113	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1806	1881	1900	1900	1881	1806	1900	1881	1900
Adj Flow Rate, veh/h	49	434	217	295	798	22	314	85	169	17	151	43
Adj No. of Lanes	0	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.82	0.82	0.82	0.96	0.96	0.96	0.86	0.86	0.86	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	82	556	267	453	1197	33	161	24	351	44	169	43
Arrive On Green	0.52	0.52	0.52	0.08	0.66	0.66	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	74	1070	514	1720	1822	50	384	104	1535	0	738	189
Grp Volume(v), veh/h	700	0	0	295	0	820	399	0	169	211	0	0
Grp Sat Flow(s),veh/h/ln	1658	0	0	1720	0	1872	488	0	1535	928	0	0
Q Serve(g_s), s	14.2	0.0	0.0	6.8	0.0	23.4	0.0	0.0	8.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	29.6	0.0	0.0	6.8	0.0	23.4	20.0	0.0	8.3	20.0	0.0	0.0
Prop In Lane	0.07		0.31	1.00		0.03	0.79		1.00	0.08		0.20
Lane Grp Cap(c), veh/h	905	0	0	453	0	1230	185	0	351	257	0	0
V/C Ratio(X)	0.77	0.00	0.00	0.65	0.00	0.67	2.15	0.00	0.48	0.82	0.00	0.00
Avail Cap(c_a), veh/h	1134	0	0	453	0	1499	185	0	351	257	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	8.1	0.0	9.2	37.7	0.0	29.2	30.0	0.0	0.0
Incr Delay (d2), s/veh	2.6	0.0	0.0	3.3	0.0	0.8	537.2	0.0	4.7	24.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	0.0	0.0	3.5	0.0	12.1	32.1	0.0	4.0	6.2	0.0	0.0
LnGrp Delay(d),s/veh	19.5	0.0	0.0	11.3	0.0	10.0	574.9	0.0	33.9	54.7	0.0	0.0
LnGrp LOS	B			B		B	F		C	D		
Approach Vol, veh/h		700			1115			568			211	
Approach Delay, s/veh		19.5			10.4			413.9			54.7	
Approach LOS		B			B			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6		8
Phs Duration (G+Y+Rc), s		25.0	12.0	50.4		25.0		62.4
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0		5.0
Max Green Setting (Gmax), s		20.0	7.0	58.0		20.0		70.0
Max Q Clear Time (g_c+I1), s		22.0	8.8	31.6		22.0		25.4
Green Ext Time (p_c), s		0.0	0.0	13.8		0.0		17.5

Intersection Summary	
HCM 2010 Ctrl Delay	104.8
HCM 2010 LOS	F



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	700	295	820	399	169	211
v/c Ratio	0.88	0.75	0.75	1.62	0.39	0.64
Control Delay	30.4	20.4	15.1	324.7	17.6	39.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	20.4	15.1	324.7	17.6	39.9
Queue Length 50th (ft)	287	60	256	~297	30	90
Queue Length 95th (ft)	360	#102	382	#552	95	164
Internal Link Dist (ft)	362		938	307		286
Turn Bay Length (ft)		75			100	
Base Capacity (vph)	1185	394	1501	246	428	330
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.75	0.55	1.62	0.39	0.64

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

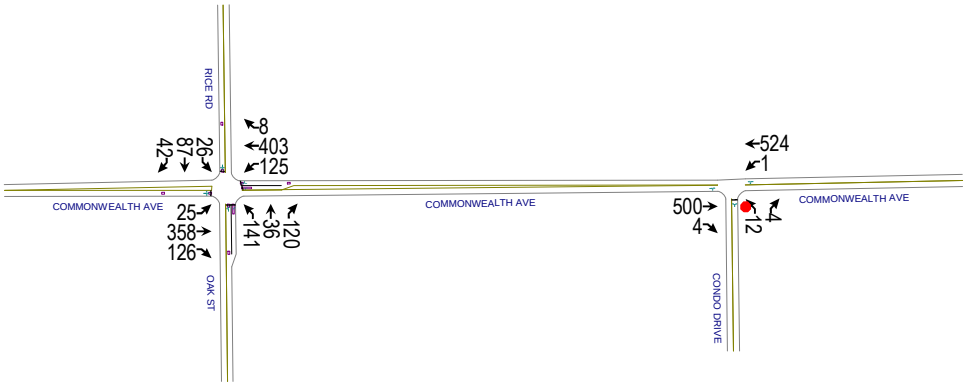
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	507	7	5	1064	6	1
Future Vol, veh/h	507	7	5	1064	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	98	98	44	44
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	596	8	5	1086	14	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	605	0	1697	601
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	1096	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	973	-	102	500
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	320	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	973	-	101	500
Mov Cap-2 Maneuver	-	-	-	-	101	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	316	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	41.6
HCM LOS			E

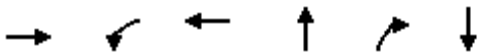
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	114	-	-	973	-
HCM Lane V/C Ratio	0.14	-	-	0.005	-
HCM Control Delay (s)	41.6	-	-	8.7	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-


RICE RD
COMMONWEALTH AVE
COMMONWEALTH AVE
COMMONWEALTH AVE
OAK ST
CONDO DRIVE
8
403
125
42
87
26
25
358
126
141
36
120
524
1
500
4
4
12

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	358	126	125	403	8	141	36	120	26	87	42
Future Volume (veh/h)	25	358	126	125	403	8	141	36	120	26	87	42
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1806	1881	1900	1900	1881	1806	1900	1881	1900
Adj Flow Rate, veh/h	26	377	133	136	438	9	160	41	136	35	116	56
Adj No. of Lanes	0	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.88	0.88	0.88	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	84	474	161	483	993	20	309	66	423	93	207	83
Arrive On Green	0.37	0.37	0.37	0.08	0.54	0.54	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	40	1287	438	1720	1837	38	688	241	1535	57	750	299
Grp Volume(v), veh/h	536	0	0	136	0	447	201	0	136	207	0	0
Grp Sat Flow(s),veh/h/ln	1764	0	0	1720	0	1875	929	0	1535	1106	0	0
Q Serve(g_s), s	4.4	0.0	0.0	2.4	0.0	7.8	0.0	0.0	3.8	0.8	0.0	0.0
Cycle Q Clear(g_c), s	14.8	0.0	0.0	2.4	0.0	7.8	12.3	0.0	3.8	12.7	0.0	0.0
Prop In Lane	0.05		0.25	1.00		0.02	0.80		1.00	0.17		0.27
Lane Grp Cap(c), veh/h	719	0	0	483	0	1013	375	0	423	382	0	0
V/C Ratio(X)	0.75	0.00	0.00	0.28	0.00	0.44	0.54	0.00	0.32	0.54	0.00	0.00
Avail Cap(c_a), veh/h	813	0	0	567	0	1206	375	0	423	382	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.5	0.0	0.0	7.8	0.0	7.5	18.4	0.0	15.7	16.4	0.0	0.0
Incr Delay (d2), s/veh	3.3	0.0	0.0	0.3	0.0	0.3	5.4	0.0	2.0	5.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.8	0.0	0.0	1.1	0.0	4.1	3.4	0.0	1.8	3.1	0.0	0.0
LnGrp Delay(d),s/veh	18.8	0.0	0.0	8.1	0.0	7.8	23.8	0.0	17.7	21.9	0.0	0.0
LnGrp LOS	B			A		A	C		B	C		
Approach Vol, veh/h		536			583			337			207	
Approach Delay, s/veh		18.8			7.9			21.3			21.9	
Approach LOS		B			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6		8
Phs Duration (G+Y+Rc), s		20.0	9.4	25.0		20.0		34.4
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0		5.0
Max Green Setting (Gmax), s		15.0	7.0	23.0		15.0		35.0
Max Q Clear Time (g_c+I1), s		14.3	4.4	16.8		14.7		9.8
Green Ext Time (p_c), s		0.2	0.1	3.2		0.1		7.3

Intersection Summary	
HCM 2010 Ctrl Delay	15.9
HCM 2010 LOS	B



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	536	136	447	201	136	207
v/c Ratio	0.82	0.36	0.49	0.60	0.27	0.43
Control Delay	28.0	8.6	9.5	29.9	5.8	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.0	8.6	9.5	29.9	5.8	19.4
Queue Length 50th (ft)	154	20	79	66	0	54
Queue Length 95th (ft)	#306	40	134	#147	34	86
Internal Link Dist (ft)	362		938	307		286
Turn Bay Length (ft)		75			100	
Base Capacity (vph)	789	389	1171	337	509	482
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.35	0.38	0.60	0.27	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.3

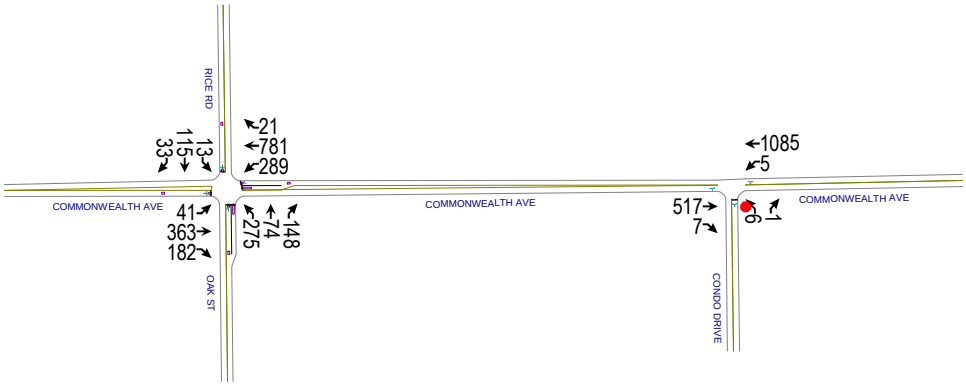
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	500	4	1	524	12	4
Future Vol, veh/h	500	4	1	524	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	94	94	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	538	4	1	557	15	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	542	0	1100	540
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	560	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1027	-	235	542
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	572	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1027	-	235	542
Mov Cap-2 Maneuver	-	-	-	-	235	-
Stage 1	-	-	-	-	584	-
Stage 2	-	-	-	-	571	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	274	-	-	1027	-
HCM Lane V/C Ratio	0.073	-	-	0.001	-
HCM Control Delay (s)	19.2	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

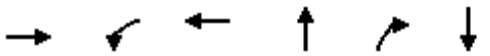
No Build Conditions


RICE RD
21
781
289
13
115
33
COMMONWEALTH AVE
41
363
182
OAK ST
275
74
148
COMMONWEALTH AVE
1085
5
517
7
6
1
COMMONWEALTH AVE
CONDO DRIVE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	363	182	289	781	21	275	74	148	13	115	33
Future Volume (veh/h)	41	363	182	289	781	21	275	74	148	13	115	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1806	1881	1900	1900	1881	1806	1900	1881	1900
Adj Flow Rate, veh/h	50	443	222	301	814	22	320	86	172	17	153	44
Adj No. of Lanes	0	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.82	0.82	0.82	0.96	0.96	0.96	0.86	0.86	0.86	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	82	561	270	446	1207	33	159	23	346	44	165	43
Arrive On Green	0.53	0.53	0.53	0.08	0.66	0.66	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	74	1066	513	1720	1823	49	383	103	1535	0	733	190
Grp Volume(v), veh/h	715	0	0	301	0	836	406	0	172	214	0	0
Grp Sat Flow(s),veh/h/ln	1654	0	0	1720	0	1872	486	0	1535	922	0	0
Q Serve(g_s), s	15.4	0.0	0.0	7.0	0.0	24.2	0.0	0.0	8.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	30.9	0.0	0.0	7.0	0.0	24.2	20.0	0.0	8.7	20.0	0.0	0.0
Prop In Lane	0.07		0.31	1.00		0.03	0.79		1.00	0.08		0.21
Lane Grp Cap(c), veh/h	914	0	0	446	0	1239	182	0	346	252	0	0
V/C Ratio(X)	0.78	0.00	0.00	0.67	0.00	0.67	2.23	0.00	0.50	0.85	0.00	0.00
Avail Cap(c_a), veh/h	1116	0	0	446	0	1478	182	0	346	252	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	8.3	0.0	9.2	38.3	0.0	30.0	30.7	0.0	0.0
Incr Delay (d2), s/veh	3.0	0.0	0.0	4.0	0.0	1.0	570.3	0.0	5.0	28.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.1	0.0	0.0	3.7	0.0	12.6	33.3	0.0	4.1	6.6	0.0	0.0
LnGrp Delay(d),s/veh	19.9	0.0	0.0	12.3	0.0	10.1	608.6	0.0	35.0	59.2	0.0	0.0
LnGrp LOS	B			B		B	F		C	E		
Approach Vol, veh/h		715			1137			578			214	
Approach Delay, s/veh		19.9			10.7			437.9			59.2	
Approach LOS		B			B			F			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6		8
Phs Duration (G+Y+Rc), s		25.0	12.0	51.7		25.0		63.7
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0		5.0
Max Green Setting (Gmax), s		20.0	7.0	58.0		20.0		70.0
Max Q Clear Time (g_c+I1), s		22.0	9.0	32.9		22.0		26.2
Green Ext Time (p_c), s		0.0	0.0	13.8		0.0		18.0

Intersection Summary	
HCM 2010 Ctrl Delay	110.5
HCM 2010 LOS	F



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	715	301	836	406	172	214
v/c Ratio	0.88	0.77	0.76	1.71	0.41	0.69
Control Delay	31.3	21.8	15.4	360.5	18.2	43.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	21.8	15.4	360.5	18.2	43.4
Queue Length 50th (ft)	299	62	266	~314	32	95
Queue Length 95th (ft)	374	#110	396	#564	98	#181
Internal Link Dist (ft)	362		938	307		286
Turn Bay Length (ft)		75			100	
Base Capacity (vph)	1168	393	1487	238	424	312
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.77	0.56	1.71	0.41	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

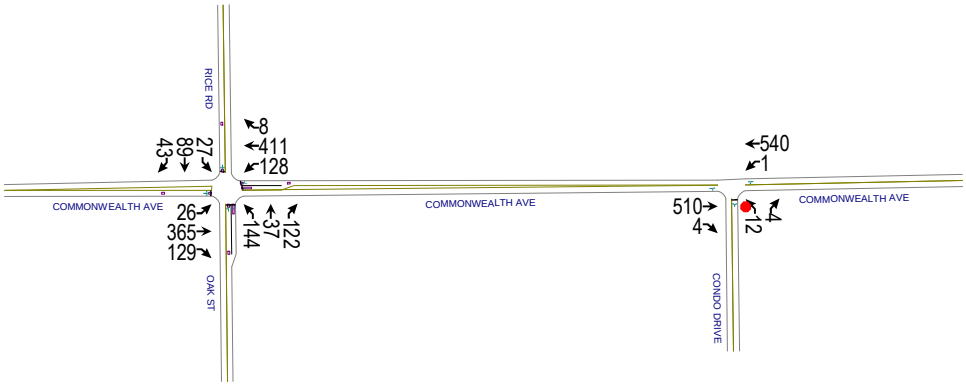
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	517	7	5	1085	6	1
Future Vol, veh/h	517	7	5	1085	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	98	98	44	44
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	608	8	5	1107	14	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	616	0	1729	612
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	1117	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	964	-	97	493
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	313	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	964	-	96	493
Mov Cap-2 Maneuver	-	-	-	-	96	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	309	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	44
HCM LOS			E

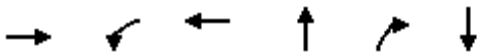
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	108	-	-	964	-
HCM Lane V/C Ratio	0.147	-	-	0.005	-
HCM Control Delay (s)	44	-	-	8.8	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-


RICE RD
COMMONWEALTH AVE
COMMONWEALTH AVE
COMMONWEALTH AVE
OAK ST
CONDO DRIVE
8
411
128
27
89
43
26
365
129
37
144
122
540
1
510
4
4
12

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	365	129	128	411	8	144	37	122	27	89	43
Future Volume (veh/h)	26	365	129	128	411	8	144	37	122	27	89	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1806	1881	1900	1900	1881	1806	1900	1881	1900
Adj Flow Rate, veh/h	27	384	136	139	447	9	164	42	139	36	119	57
Adj No. of Lanes	0	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.88	0.88	0.88	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	84	477	163	479	999	20	266	56	420	77	152	56
Arrive On Green	0.37	0.37	0.37	0.08	0.54	0.54	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	41	1283	438	1720	1838	37	541	203	1535	0	555	204
Grp Volume(v), veh/h	547	0	0	139	0	456	206	0	139	212	0	0
Grp Sat Flow(s),veh/h/ln	1763	0	0	1720	0	1875	744	0	1535	760	0	0
Q Serve(g_s), s	4.8	0.0	0.0	2.5	0.0	8.0	0.0	0.0	4.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.3	0.0	0.0	2.5	0.0	8.0	15.0	0.0	4.0	15.0	0.0	0.0
Prop In Lane	0.05		0.25	1.00		0.02	0.80		1.00	0.17		0.27
Lane Grp Cap(c), veh/h	725	0	0	479	0	1019	322	0	420	285	0	0
V/C Ratio(X)	0.75	0.00	0.00	0.29	0.00	0.45	0.64	0.00	0.33	0.74	0.00	0.00
Avail Cap(c_a), veh/h	807	0	0	561	0	1198	322	0	420	285	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.5	0.0	0.0	7.8	0.0	7.5	19.6	0.0	15.9	17.1	0.0	0.0
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.3	0.0	0.3	9.4	0.0	2.1	16.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	0.0	0.0	1.2	0.0	4.1	3.9	0.0	1.9	3.9	0.0	0.0
LnGrp Delay(d),s/veh	19.2	0.0	0.0	8.1	0.0	7.8	29.0	0.0	18.0	33.2	0.0	0.0
LnGrp LOS	B			A		A	C		B	C		
Approach Vol, veh/h		547			595			345			212	
Approach Delay, s/veh		19.2			7.9			24.6			33.2	
Approach LOS		B			A			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6		8
Phs Duration (G+Y+Rc), s		20.0	9.4	25.4		20.0		34.8
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0		5.0
Max Green Setting (Gmax), s		15.0	7.0	23.0		15.0		35.0
Max Q Clear Time (g_c+I1), s		17.0	4.5	17.3		17.0		10.0
Green Ext Time (p_c), s		0.0	0.1	3.1		0.0		7.5

Intersection Summary	
HCM 2010 Ctrl Delay	18.1
HCM 2010 LOS	B



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	547	139	456	206	139	212
v/c Ratio	0.84	0.37	0.50	0.62	0.27	0.44
Control Delay	29.0	8.7	9.6	31.4	5.8	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	8.7	9.6	31.4	5.8	19.8
Queue Length 50th (ft)	159	20	81	68	0	56
Queue Length 95th (ft)	#317	41	138	#153	34	88
Internal Link Dist (ft)	362		938	307		286
Turn Bay Length (ft)		75			100	
Base Capacity (vph)	783	388	1165	331	509	478
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.36	0.39	0.62	0.27	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.3

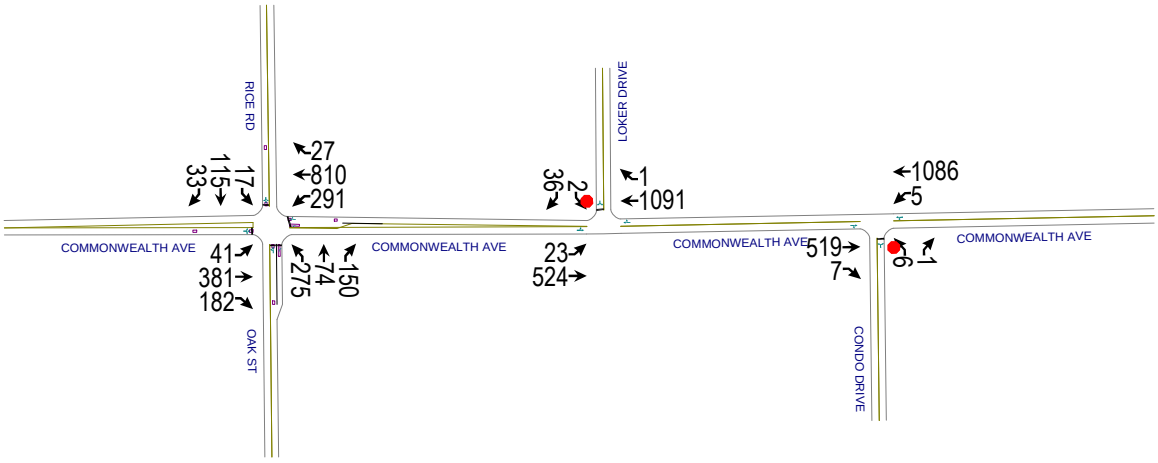
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	510	4	1	540	12	4
Future Vol, veh/h	510	4	1	540	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	94	94	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	548	4	1	574	15	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	553	0	1128	551
Stage 1	-	-	-	-	551	-
Stage 2	-	-	-	-	577	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1017	-	226	534
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	562	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1017	-	226	534
Mov Cap-2 Maneuver	-	-	-	-	226	-
Stage 1	-	-	-	-	577	-
Stage 2	-	-	-	-	561	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	264	-	-	1017	-
HCM Lane V/C Ratio	0.076	-	-	0.001	-
HCM Control Delay (s)	19.8	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

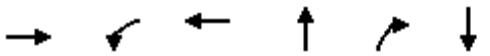
Build Conditions


RICE RD
LOKER DRIVE
COMMONWEALTH AVE
COMMONWEALTH AVE
COMMONWEALTH AVE
COMMONWEALTH AVE
OAK ST
CONDO DRIVE
27
810
291
17
115
33
41
381
182
275
74
150
2
36
1
1091
23
524
1086
5
519
7
6
1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	381	182	291	810	27	275	74	150	17	115	33
Future Volume (veh/h)	41	381	182	291	810	27	275	74	150	17	115	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1806	1881	1900	1900	1881	1806	1900	1881	1900
Adj Flow Rate, veh/h	50	465	222	303	844	28	320	86	174	23	153	44
Adj No. of Lanes	0	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.82	0.82	0.82	0.96	0.96	0.96	0.86	0.86	0.86	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	81	580	267	436	1211	40	160	24	339	44	142	36
Arrive On Green	0.54	0.54	0.54	0.08	0.67	0.67	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	72	1083	498	1720	1811	60	404	109	1535	0	645	161
Grp Volume(v), veh/h	737	0	0	303	0	872	406	0	174	220	0	0
Grp Sat Flow(s),veh/h/ln	1653	0	0	1720	0	1871	513	0	1535	806	0	0
Q Serve(g_s), s	16.7	0.0	0.0	7.0	0.0	26.2	0.0	0.0	9.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	32.7	0.0	0.0	7.0	0.0	26.2	20.0	0.0	9.0	20.0	0.0	0.0
Prop In Lane	0.07		0.30	1.00		0.03	0.79		1.00	0.10		0.20
Lane Grp Cap(c), veh/h	929	0	0	436	0	1251	184	0	339	222	0	0
V/C Ratio(X)	0.79	0.00	0.00	0.70	0.00	0.70	2.20	0.00	0.51	0.99	0.00	0.00
Avail Cap(c_a), veh/h	1095	0	0	436	0	1446	184	0	339	222	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.9	0.0	0.0	8.7	0.0	9.3	39.1	0.0	31.0	32.7	0.0	0.0
Incr Delay (d2), s/veh	3.5	0.0	0.0	4.8	0.0	1.2	558.2	0.0	5.5	58.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.8	0.0	0.0	3.8	0.0	13.8	33.1	0.0	4.3	9.0	0.0	0.0
LnGrp Delay(d),s/veh	20.4	0.0	0.0	13.5	0.0	10.5	597.4	0.0	36.4	90.8	0.0	0.0
LnGrp LOS	C			B		B	F		D	F		
Approach Vol, veh/h		737			1175			580			220	
Approach Delay, s/veh		20.4			11.3			429.1			90.8	
Approach LOS		C			B			F			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6		8
Phs Duration (G+Y+Rc), s		25.0	12.0	53.5		25.0		65.5
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0		5.0
Max Green Setting (Gmax), s		20.0	7.0	58.0		20.0		70.0
Max Q Clear Time (g_c+I1), s		22.0	9.0	34.7		22.0		28.2
Green Ext Time (p_c), s		0.0	0.0	13.9		0.0		18.9

Intersection Summary	
HCM 2010 Ctrl Delay	109.6
HCM 2010 LOS	F



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	737	303	872	406	174	220
v/c Ratio	0.90	0.77	0.78	1.79	0.42	0.83
Control Delay	32.5	22.4	16.2	397.0	18.7	59.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	22.4	16.2	397.0	18.7	59.9
Queue Length 50th (ft)	319	62	289	~329	34	107
Queue Length 95th (ft)	398	#116	435	#567	99	#214
Internal Link Dist (ft)	362		580	307		286
Turn Bay Length (ft)		75			100	
Base Capacity (vph)	1138	391	1459	227	418	264
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.77	0.60	1.79	0.42	0.83

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	524	1091	1	2	36
Future Vol, veh/h	23	524	1091	1	2	36
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	25	570	1186	1	2	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1187	0	-	0	1806	1186
Stage 1	-	-	-	-	1186	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	588	-	-	-	87	230
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	536	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	588	-	-	-	82	230
Mov Cap-2 Maneuver	-	-	-	-	82	-
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	503	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	26.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	588	-	-	-	210
HCM Lane V/C Ratio	0.043	-	-	-	0.197
HCM Control Delay (s)	11.4	0	-	-	26.3
HCM Lane LOS	B	A	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

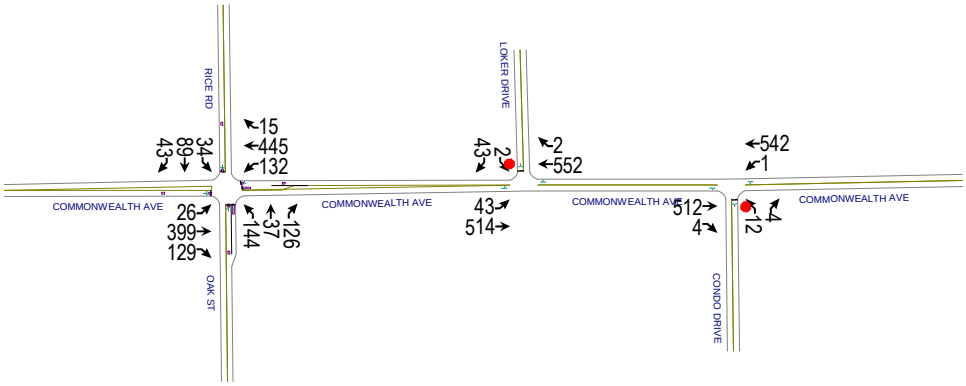
Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	519	7	5	1086	6	1
Future Vol, veh/h	519	7	5	1086	6	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	98	98	44	44
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	611	8	5	1108	14	2

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	619	0	1733	615
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	1118	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	961	-	97	491
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	312	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	961	-	96	491
Mov Cap-2 Maneuver	-	-	-	-	96	-
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	308	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	44
HCM LOS			E

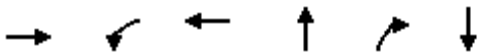
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	108	-	-	961	-
HCM Lane V/C Ratio	0.147	-	-	0.005	-
HCM Control Delay (s)	44	-	-	8.8	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-


RICE RD
LOKER DRIVE
CONDO DRIVE
OAK ST
COMMONWEALTH AVE
COMMONWEALTH AVE
COMMONWEALTH AVE
COMMONWEALTH AVE
15
445
132
43
89
34
26
399
129
37
144
126
43
2
2
552
43
514
542
1
512
4
4
12

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	399	129	132	445	15	144	37	126	34	89	43
Future Volume (veh/h)	26	399	129	132	445	15	144	37	126	34	89	43
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1881	1900	1806	1881	1900	1900	1881	1806	1900	1881	1900
Adj Flow Rate, veh/h	27	420	136	143	484	16	164	42	143	45	119	57
Adj No. of Lanes	0	1	0	1	1	0	0	1	1	0	1	0
Peak Hour Factor	0.95	0.95	0.95	0.92	0.92	0.92	0.88	0.88	0.88	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	82	503	158	462	1000	33	268	56	413	79	137	48
Arrive On Green	0.38	0.38	0.38	0.08	0.55	0.55	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	39	1316	412	1720	1811	60	567	210	1535	6	511	180
Grp Volume(v), veh/h	583	0	0	143	0	500	206	0	143	221	0	0
Grp Sat Flow(s),veh/h/ln	1767	0	0	1720	0	1871	777	0	1535	698	0	0
Q Serve(g_s), s	5.8	0.0	0.0	2.5	0.0	9.1	0.0	0.0	4.2	0.3	0.0	0.0
Cycle Q Clear(g_c), s	16.8	0.0	0.0	2.5	0.0	9.1	14.7	0.0	4.2	15.0	0.0	0.0
Prop In Lane	0.05		0.23	1.00		0.03	0.80		1.00	0.20		0.26
Lane Grp Cap(c), veh/h	744	0	0	462	0	1033	325	0	413	265	0	0
V/C Ratio(X)	0.78	0.00	0.00	0.31	0.00	0.48	0.63	0.00	0.35	0.83	0.00	0.00
Avail Cap(c_a), veh/h	794	0	0	540	0	1173	325	0	413	265	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.7	0.0	0.0	7.7	0.0	7.6	19.9	0.0	16.5	18.0	0.0	0.0
Incr Delay (d2), s/veh	4.9	0.0	0.0	0.4	0.0	0.4	9.1	0.0	2.3	25.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.1	0.0	0.0	1.2	0.0	4.7	3.9	0.0	2.0	5.2	0.0	0.0
LnGrp Delay(d),s/veh	20.6	0.0	0.0	8.0	0.0	8.0	29.1	0.0	18.8	43.4	0.0	0.0
LnGrp LOS	C			A		A	C		B	D		
Approach Vol, veh/h		583			643			349			221	
Approach Delay, s/veh		20.6			8.0			24.8			43.4	
Approach LOS		C			A			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6		8
Phs Duration (G+Y+Rc), s		20.0	9.5	26.4		20.0		35.8
Change Period (Y+Rc), s		5.0	5.0	5.0		5.0		5.0
Max Green Setting (Gmax), s		15.0	7.0	23.0		15.0		35.0
Max Q Clear Time (g_c+I1), s		16.7	4.5	18.8		17.0		11.1
Green Ext Time (p_c), s		0.0	0.1	2.6		0.0		8.1

Intersection Summary	
HCM 2010 Ctrl Delay	19.7
HCM 2010 LOS	B



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	583	143	500	206	143	221
v/c Ratio	0.86	0.38	0.53	0.65	0.28	0.48
Control Delay	31.4	8.9	10.1	33.5	5.8	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	8.9	10.1	33.5	5.8	21.0
Queue Length 50th (ft)	176	21	91	68	0	60
Queue Length 95th (ft)	#350	42	156	#156	35	93
Internal Link Dist (ft)	362		580	307		286
Turn Bay Length (ft)		75			100	
Base Capacity (vph)	769	382	1139	316	504	459
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.37	0.44	0.65	0.28	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	43	514	552	2	2	43
Future Vol, veh/h	43	514	552	2	2	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	559	600	2	2	47

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	602	0	-	0	1253	601
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	652	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	975	-	-	-	190	500
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	518	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	975	-	-	-	177	500
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	482	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	975	-	-	-	462
HCM Lane V/C Ratio	0.048	-	-	-	0.106
HCM Control Delay (s)	8.9	0	-	-	13.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	512	4	1	542	12	4
Future Vol, veh/h	512	4	1	542	12	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	94	94	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	551	4	1	577	15	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	555	0	1132	553
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	579	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1015	-	225	533
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	560	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1015	-	225	533
Mov Cap-2 Maneuver	-	-	-	-	225	-
Stage 1	-	-	-	-	576	-
Stage 2	-	-	-	-	559	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	263	-	-	1015	-
HCM Lane V/C Ratio	0.076	-	-	0.001	-
HCM Control Delay (s)	19.8	-	-	8.6	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

PARKING COMPARISON

Recreation Sites Similar to Loker Rec Area (non-school sites)	# of Parking Spaces	Description
Alpine Soccer Field	23	Single 11v11 field, with small Tee Ball field, Playground
Cochituate Ball Park	43	Two Softball Diamonds, Basketball Court, Playground
Oxbow Meadows Field	55	Single 11v11 field with walking trails
Loker Turf Project (proposed)	63	Single 11v11 Turf Field, walking trails
Town Building Field / Back Lot	91	Single 11v11 Footprint, 1 Baseball Diamond, 1 Playground, Town Hall