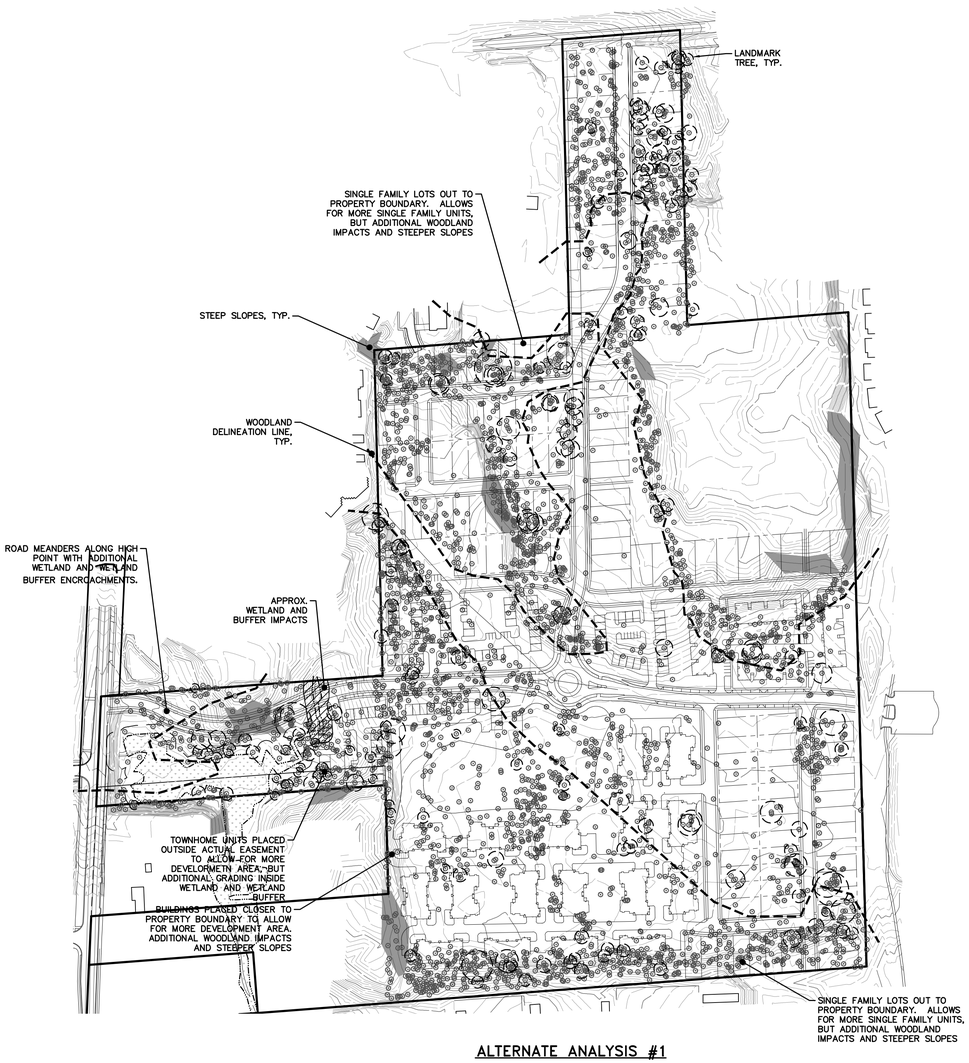
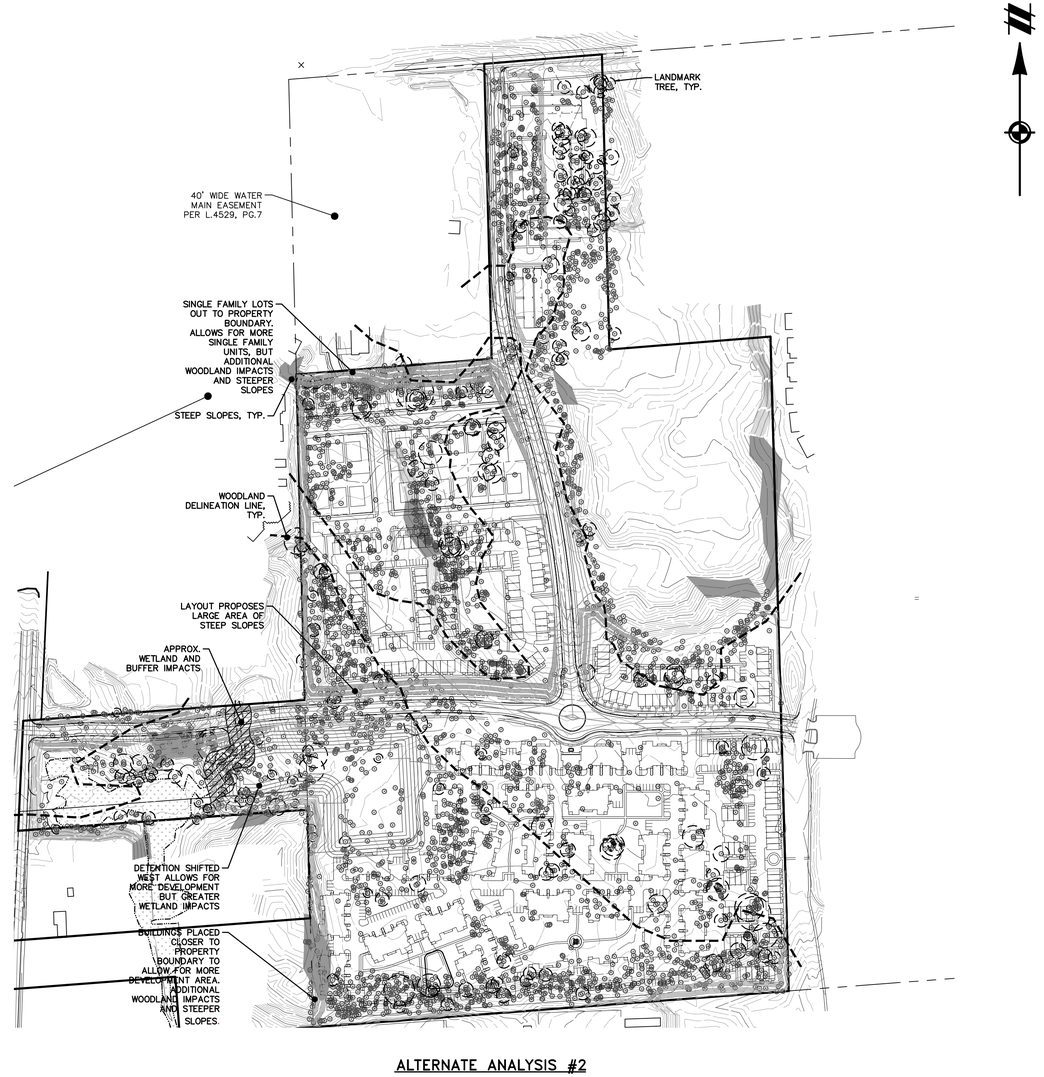



## ALTERNATE ANALYSIS #1

SCENARIO: MAXIMIZE NUMBER OF SINGLE FAMILY LOTS

- APPROXIMATELY .09 AC MORE WETLAND AND BUFFER IMPACT
- UNITS SHOWN DIRECTLY ADJACENT TO PROPERTY LINE
- GREATER EARTH DISTURBANCE AND STEEP SLOPES
- APPROXIMATELY 180 MORE TREES REMOVED (15 ARE LANDMARK TREES)




## ALTERNATE ANALYSIS #2

SCENARIO: MAXIMIZES CENTRAL DEVELOPMENT AREA AND APARTMENT AREA

- APPROXIMATELY .29 AC MORE WETLAND AND BUFFER IMPACTS
- UNITS SHOWN DIRECTLY ADJACENT TO PROPERTY LINE
- GREATER EARTH DISTURBANCE AND STEEP SLOPES
- APPROXIMATELY 145 MORE TREES REMOVED (18 ARE LANDMARK TREES)

811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT: ROBERTSON BROTHERS CO.

# VILLAGE OF ANN ARBOR
# SITE PLAN

ALTERNATE ANALYSIS PLAN

DATE: JUNE 7, 2021

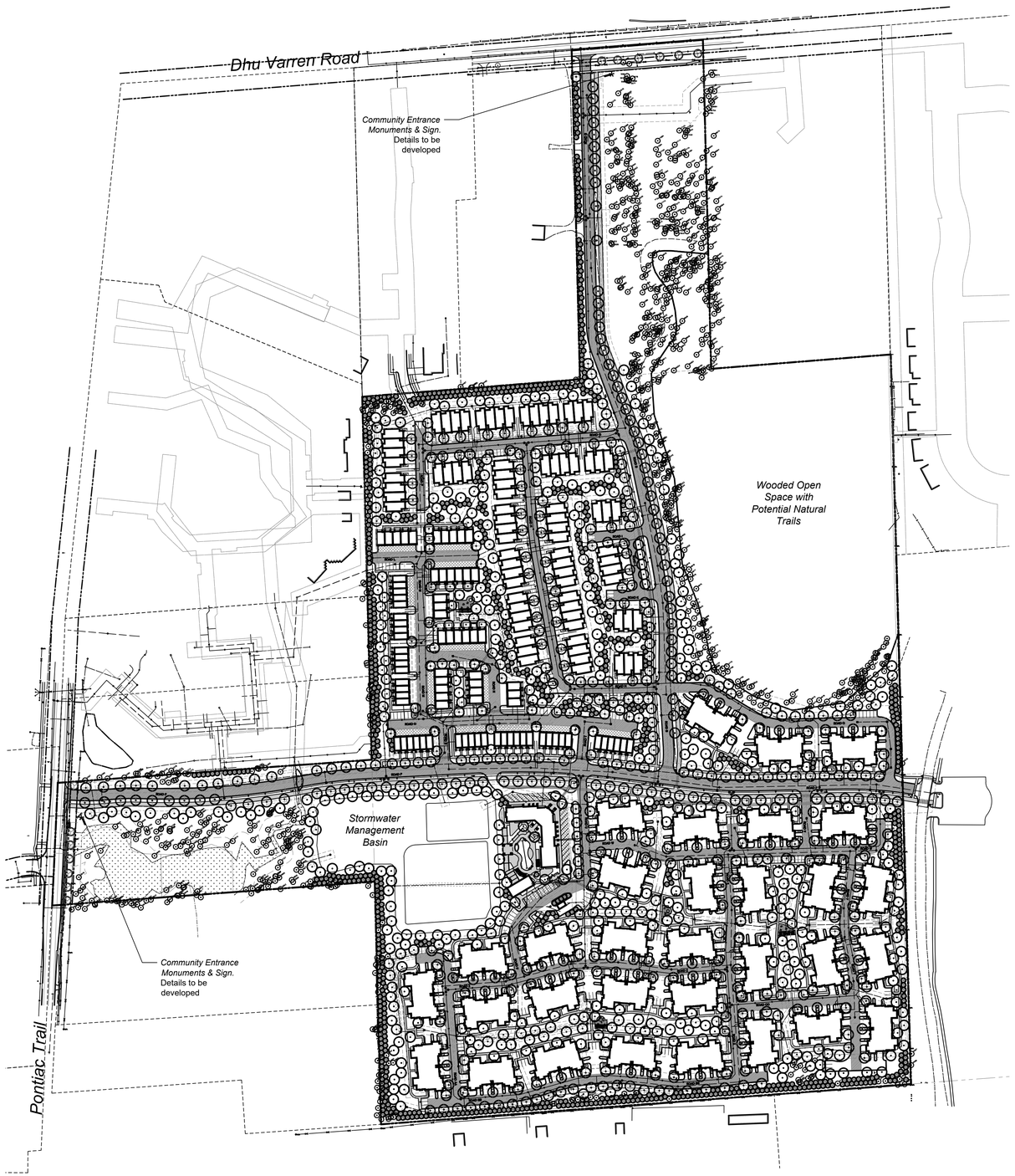
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 100 200
1" = 200 FEET

DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. 31

I:\18002264\CAD\SHEETS\PRELIMINARY\18002264SP-12-ALTSP.DWG, 7/7/2022 9:41 AM, STEVE SILVA




## Landscape Requirements Summary

*Interior Landscape Islands*
Required: Vehicular Use Areas above 3,300 SF shall receive 1 SF of Landscape Area per 20 SF of Vehicular Use Area and 1 Shade Tree per 250 SF of required Landscape Area
Vehicular Use Area: 26,578 SF Total (see Sheets 33-38)
Required: No Vehicular Use Area exceeds 3,300 SF

*Conflicting Land Use Buffers*
Required: Min. 15' Buffer between Vehicular Use Area or Refuse/Recycling Container and Public Park or Land Zoned for Residential
1 Tree per 15 LF of required Buffer
Length off Buffers: 18.5 LF (See Sheet 34 for Buffer location)
Required: 1 Tree
Proposed: 1 Tree

*Street Trees*
Required: 1 Deciduous Tree per 30 LF of street frontage
Street Frontage Total: 13,690 LF
Required: 457 Trees
Proposed: 457 Trees

*Refuse / Recycling Container Screening*
Required: Container shall be screened by min. 6' ht. wall or fence
Proposed: 6' ht. Screen Wall

*Public R.O.W. Street Trees*
Required: 1 Tree per 45 LF of public R.O.W.
Pontiac Trail R.O.W.: 308 LF
Pontiac Trail Required: 7 Trees
Pontiac Trail Proposed: 7 Trees
Dhu Varren R.O.W.: 330 LF
Dhu Varren Required: 8 Trees
Dhu Varren Proposed: 8 Trees (6 Proposed & 2 Existing)

## Woodland Replacement Summary

*Landmark Trees*
Total Trees Surveyed: 182
Total Trees Removed: 114
Total DBH Removed: 2,477.00"
Replacement Required: 1,238.50"

*Woodland Trees*
Total Trees Surveyed: 1,289
Total Trees Removed: 981
Total DBH Removed: 6,749.00"
Replacement Required: 3,375.00"

*Total Replacement Required*
Total DBH Required: 4,613.50"
Total Replacement Provided: 3,993.00"

*Note: It is intended that the remaining 620.50" of required replacement shall be paid into the Ann Arbor Tree Fund at the rate of $200.00 per replacement inch not planted on site. This total amounts to $124,100.00.

## Vehicular Use Areas (VUA) Legend

= Areas Identified as Streets

= Areas Identified as Vehicular Use Areas

*Notes:*
- Areas identified as VUAs meet the definition of Vehicular Use Area as written in the Ann Arbor Code of Ordinances Article VIII: Definitions (see below).
- Areas identified as Streets shall not be considered a part of a VUA per the below definition.
- Areas not designated either as VUA or Street are considered paved areas to facilitate the movement of vehicles between VUAs and Streets, and are not counted as VUAs per the definition.

*Vehicular Use Area Definition per Ann Arbor Unified Development Code*

**Vehicular Use Area**
Any area of 1,200 square feet or more of a property that is not located within an enclosed Structure and that is devoted to a use by or for motor vehicles, including parking (accessory or non-accessory) or storage of Automobiles, trucks or other vehicles, loading areas, service areas and drives. The area within a carport is considered part of the Vehicular Use Area. Any paved area designed to be used solely for access between the street and the Vehicular Use Area shall not be considered part of the Vehicular Use Area.

## General Landscape Notes

- Utility box locations are unknown at this time. Once the box locations are known they will be screened on 3 sides. See detail on Sheet 33.
- Disturbed areas shall be sodded or seeded.
- Landscape areas shall be irrigated.
- Snow shall be stored along streets. Storage shall not include detention areas or landscaped areas.
- Trees shall be planted a min. 5'-8' from utility leads. Trees shall be planted such that a 1:1 trench could be dug to access utility leads.
- Trees shall be planted a min. 10' from Water Main & Sanitary Sewer
- All deciduous trees shall be planted a min. 15' o.c. Evergreen trees shall be planted a min. 12' o.c.
- Trees shall be planted a min. 15' from fire hydrants
- Snow Storage Areas shall be a min. 15' from fire hydrants

Know what's below. Call before you dig.

0 75' 150' 300' 450' 600' 1"= 150'

North

These drawings as instruments of service, remain the property of LAND Design Studio, PLLC.
Any changes, publications or unauthorized use is prohibited unless expressly approved.
© LAND Design Studio, PLLC

design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220

## LEGEND

= Existing Tree To Remain
= Proposed Conflicting Land Use Buffer Tree
= Proposed Private Street & Shared Drive Tree
= Proposed Public R.O.W. Tree
= Proposed Woodland Replacement Deciduous Tree
= Proposed Woodland Replacement Evergreen Tree

STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:
# Overall Landscape Plan

■ project title:
## Village of Ann Arbor

City of Ann Arbor, Michigan

■ prepared for:

Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

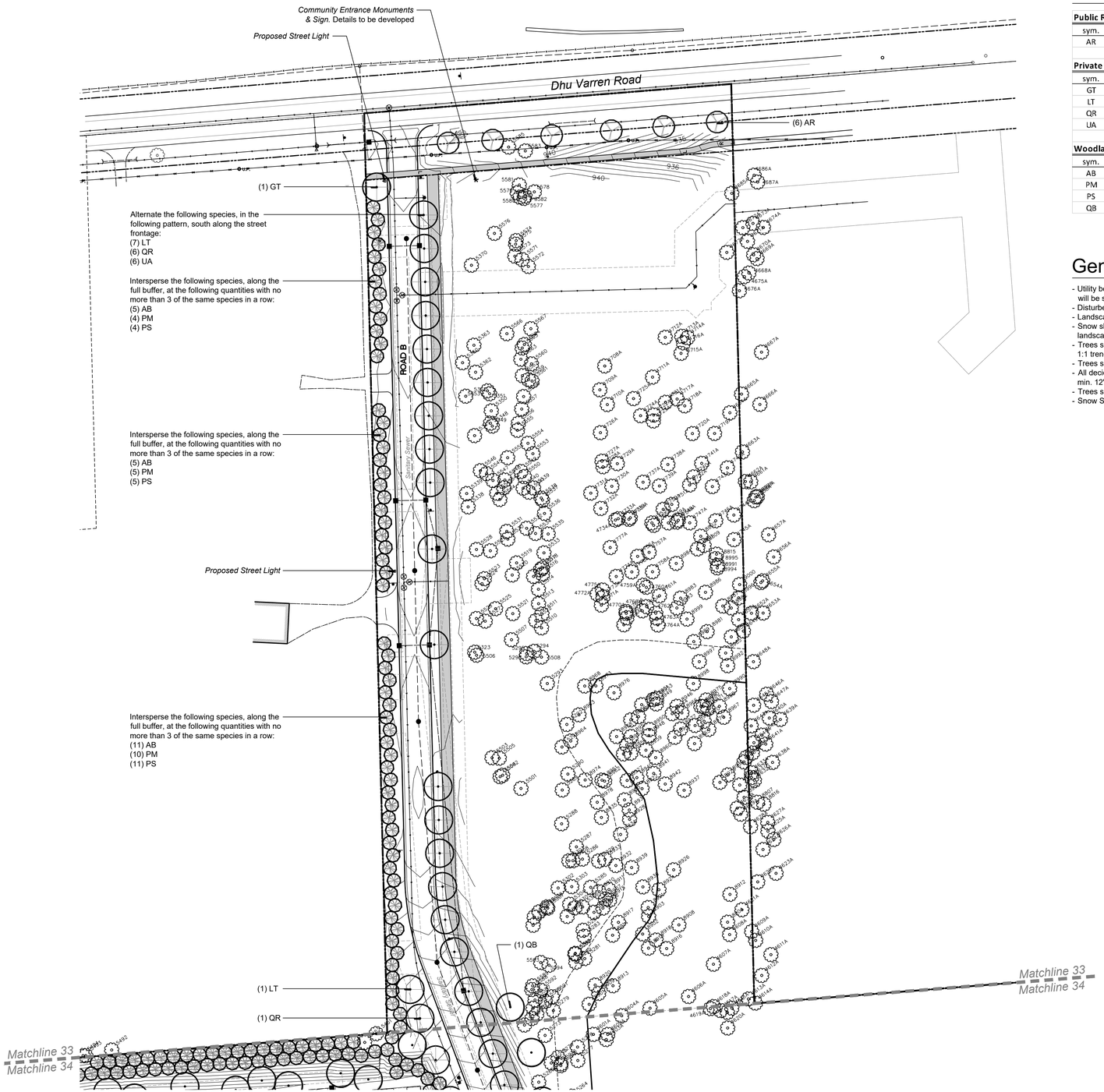
Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |
| ■ drawn by: | ■ checked by: |
| EMJ | WTK |

■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

sheet no.
32




# Plant Schedule This Sheet

**Public R.O.W. Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AR | 6 | *Acer rubrum 'Armstrong'* | Armstrong Red Maple | 2.5" cal. | per plans | B&B |

**Private Street & Shared Drive Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| GT | 1 | *Gleditsia triacanthos* | Honeylocust | 2.5" cal. | per plans | B&B |
| LT | 8 | *Liriodendron tulipifera* | Tulip Tree | 2.5" cal. | per plans | B&B |
| QR | 7 | *Quercus rubra* | Red Oak | 2.5" cal. | per plans | B&B |
| UA | 6 | *Ulmus americana 'Princeton'* | Princeton American Elm | 2.5" cal. | per plans | B&B |

**Woodland Replacement Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AB | 21 | *Abies balsamea* | Balsam Fir | 8' ht. | per plans | B&B |
| PM | 19 | *Picea mariana* | Black Spruce | 8' ht. | per plans | B&B |
| PS | 20 | *Pinus strobus* | White Pine | 8' ht. | per plans | B&B |
| QB | 1 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |

# General Landscape Notes

- Utility box locations are unknown at this time. Once the box locations are known they will be screened on 3 sides. See detail on Sheet 33.
- Disturbed areas shall be sodded or seeded.
- Landscape areas shall be irrigated.
- Snow shall be stored along streets. Storage shall not include detention areas or landscaped areas.
- Trees shall be planted a min. 5'-8' from utility leads. Trees shall be planted such that a 1:1 trench could be dug to access utility leads.
- Trees shall be planted a min. 10' from Water Main & Sanitary Sewer
- All deciduous trees shall be planted a min. 15' o.c. Evergreen trees shall be planted a min. 12' o.c.
- Trees shall be planted a min. 15' from fire hydrants
- Snow Storage Areas shall be a min. 15' from fire hydrants

# LEGEND

- = Existing Tree To Remain
- = Proposed Conflicting Land Use Buffer Tree
- = Proposed Private Street & Shared Drive Tree
- = Proposed Public R.O.W. Tree
- = Proposed Woodland Replacement Deciduous Tree
- = Proposed Woodland Replacement Evergreen Tree


design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220


STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

## Landscape Plan - Area 1

■ project title:

## Village of Ann Arbor

City of Ann Arbor, Michigan

■ prepared for:

Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |
| ■ drawn by: | ■ checked by: |
| EMJ | WTK |

Know what's **below.** **Call** before you dig.

■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

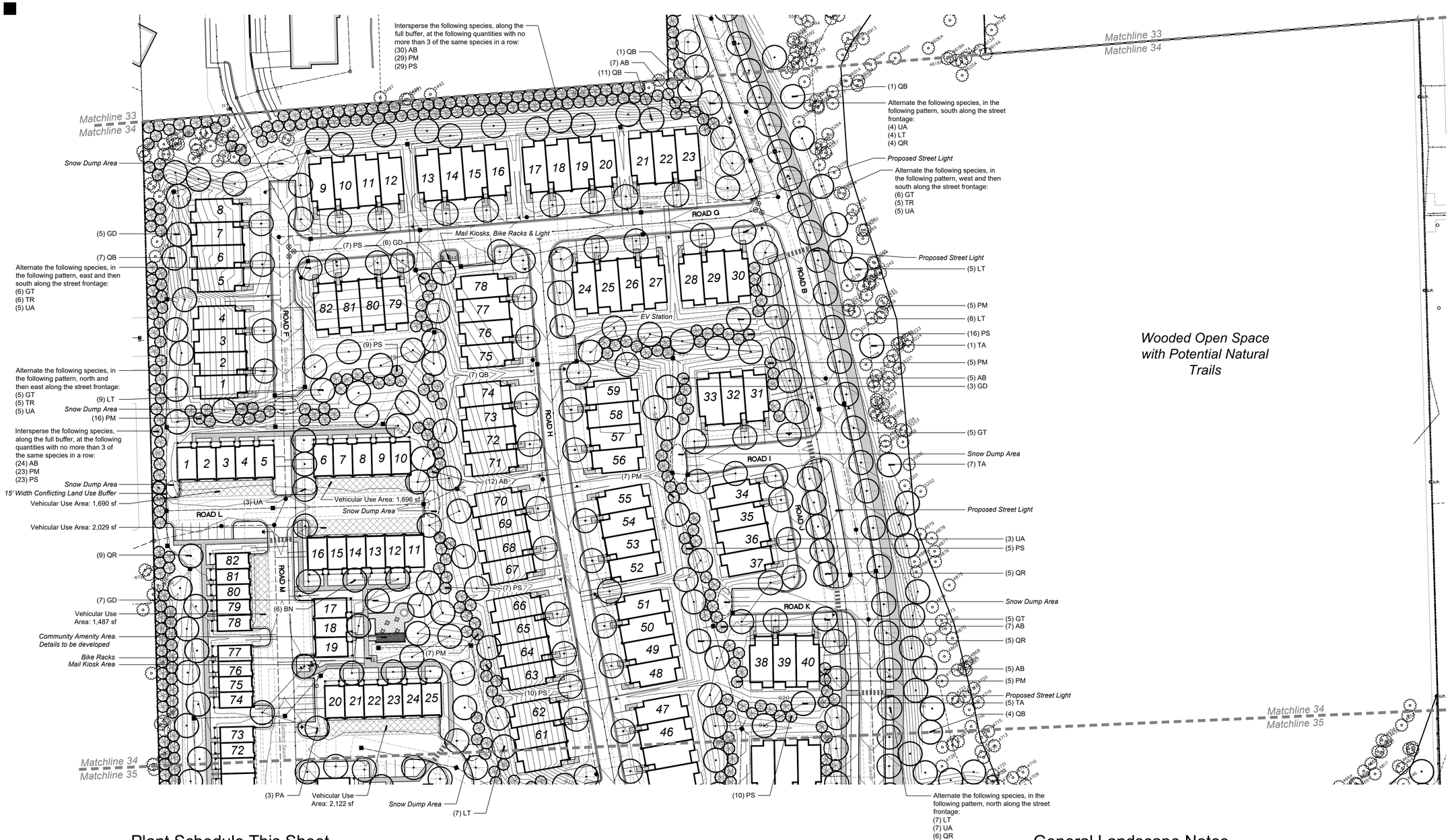
0 25' 50' 100' 150' 200' 1"= 50'

North

sheet no.

33


These drawings as instruments of service, remain the property of LAND Design Studio, PLLC.
Any changes, publications or unauthorized use is prohibited unless expressly approved.
© LAND Design Studio, PLLC




## Plant Schedule This Sheet

**Conflicting Land Use Buffer Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AB | 1 | *Abies balsamea* | Balsam Fir | 8' ht. | per plans | B&B |

**Private Street & Shared Drive Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| GT | 27 | *Gleditsia triacanthos var. Inermis* | Thornless Honeylocust | 2.5" cal. | per plans | B&B |
| LT | 12 | *Liriodendron tulipifera* | Tulip Tree | 2.5" cal. | per plans | B&B |
| PA | 3 | *Platanus x acerifolia 'Exclamation'* | Exclamation London Planetree | 2.5" cal. | per plans | B&B |
| QB | 2 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |
| QR | 10 | *Quercus rubra* | Red Oak | 2.5" cal. | per plans | B&B |
| TR | 16 | *Tilia americana 'Redmond'* | Redmond Linden | 2.5" cal. | per plans | B&B |
| UA | 32 | *Ulmus americana 'Princeton'* | Princeton American Elm | 2.5" cal. | per plans | B&B |

**Woodland Replacement Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AB | 89 | *Abies balsamea* | Balsam Fir | 8' ht. | per plans | B&B |
| BN | 6 | *Betula nigra* | River Birch | 3" cal. | per plans | B&B |
| GD | 21 | *Gymnocladus diocus* | Kentucky Coffeetree | 3" cal. | per plans | B&B |
| LT | 28 | *Liriodendron tulipifera* | Tulip Tree | 3" cal. | per plans | B&B |
| PM | 97 | *Picea mariana* | Black Spruce | 8' ht. | per plans | B&B |
| PS | 116 | *Pinus strobus* | White Pine | 8' ht. | per plans | B&B |
| QB | 29 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |
| QR | 19 | *Quercus rubra* | Red Oak | 3" cal. | per plans | B&B |
| TA | 13 | *Tilia americana* | Basswood | 3" cal. | per plans | B&B |

## General Landscape Notes

- Utility box locations are unknown at this time. Once the box locations are known they will be screened on 3 sides. See detail on Sheet 33.
- Disturbed areas shall be sodded or seeded.
- Landscape areas shall be irrigated.
- Snow shall be stored along streets. Storage shall not include detention areas or landscaped areas.
- Trees shall be planted a min. 5'-8' from utility leads. Trees shall be planted such that a 1:1 trench could be dug to access utility leads.
- Trees shall be planted a min. 10' from Water Main & Sanitary Sewer
- All deciduous trees shall be planted a min. 15' o.c. Evergreen trees shall be planted a min. 12' o.c.
- Trees shall be planted a min. 15' from fire hydrants
- Snow Storage Areas shall be a min. 15' from fire hydrants

These drawings as instruments of service, remain the property of LAND Design Studio, PLLC.
Any changes, publications or unauthorized use is prohibited unless expressly approved.
© LAND Design Studio, PLLC

design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220

## LEGEND

- = Existing Tree To Remain
- = Proposed Conflicting Land Use Buffer Tree
- = Proposed Private Street & Shared Drive Tree
- = Proposed Public R.O.W. Tree
- = Proposed Woodland Replacement Deciduous Tree
- = Proposed Woodland Replacement Evergreen Tree

STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

# Landscape Plan - Area 2

■ project title:

# Village of Ann Arbor

City of Ann Arbor, Michigan

■ prepared for:

Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |

| ■ drawn by: | ■ checked by: |
|---|---|
| EMJ | WTK |

■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

Know what's below. Call before you dig.

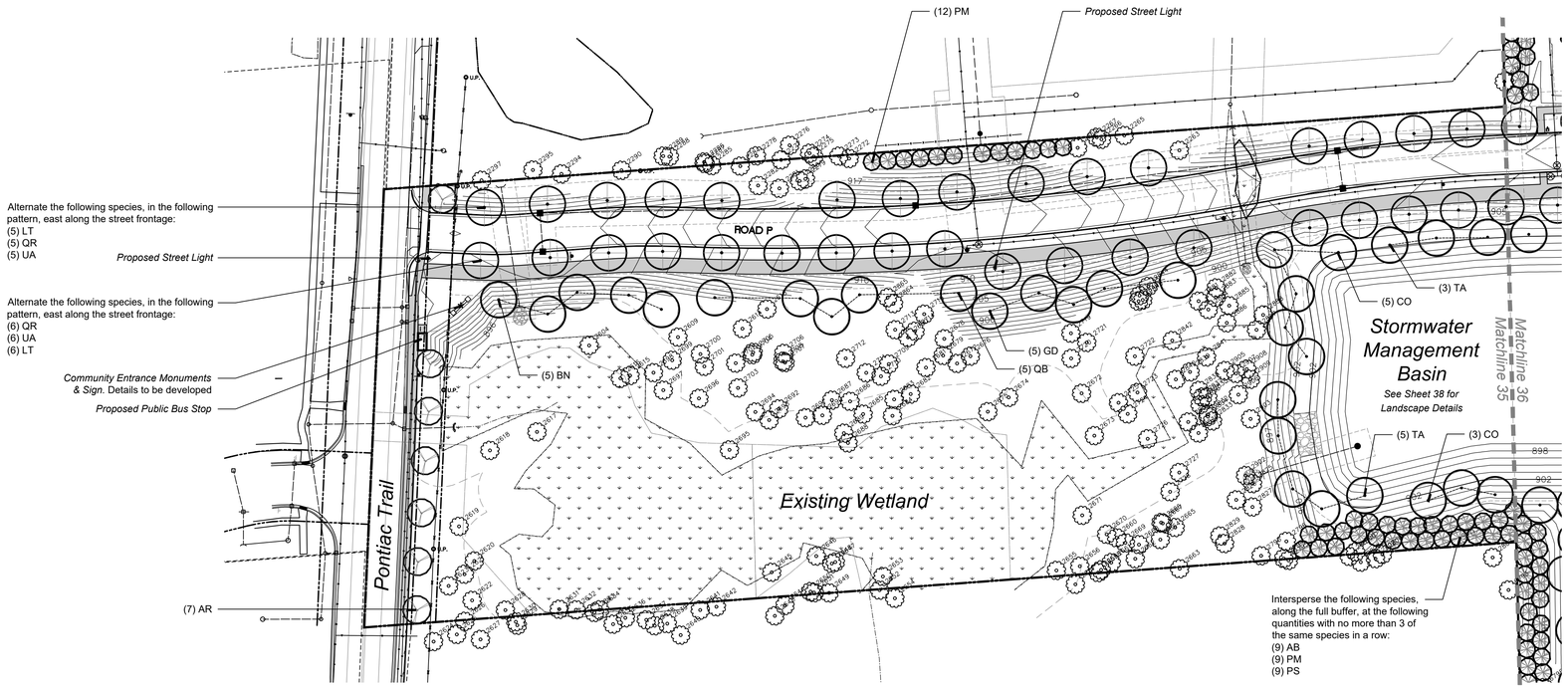
1"= 50'

0 25' 50' 100' 150' 200'

North

sheet no.

34




## Plant Schedule This Sheet

**Private Street & Shared Drive Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| LT | 11 | *Liriodendron tulipifera* | Tulip Tree | 2.5" cal. | per plans | B&B |
| QR | 11 | *Quercus rubra* | Red Oak | 2.5" cal. | per plans | B&B |
| UA | 11 | *Ulmus americana 'Princeton'* | Princeton American Elm | 2.5" cal. | per plans | B&B |

**Public R.O.W. Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AR | 7 | *Acer rubrum 'Armstrong'* | Armstrong Red Maple | 2.5" cal. | per plans | B&B |

**Woodland Replacement Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AB | 9 | *Abies balsamea* | Balsam Fir | 8' ht. | per plans | B&B |
| BN | 5 | *Betula nigra* | River Birch | 3" cal. | per plans | B&B |
| CO | 8 | *Celtis occidentalis* | Hackberry | 3" cal. | per plans | B&B |
| GD | 5 | *Gymnocladus diocus* | Kentucky Coffeetree | 3" cal. | per plans | B&B |
| PM | 21 | *Picea mariana* | Black Spruce | 8' ht. | per plans | B&B |
| PS | 9 | *Pinus strobus* | White Pine | 8' ht. | per plans | B&B |
| QB | 5 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |
| TA | 8 | *Tilia americana* | Basswood | 3" cal. | per plans | B&B |

## General Landscape Notes

- Utility box locations are unknown at this time. Once the box locations are known they will be screened on 3 sides. See detail on Sheet 33.
- Disturbed areas shall be sodded or seeded.
- Landscape areas shall be irrigated.
- Snow shall be stored along streets. Storage shall not include detention areas or landscaped areas.
- Trees shall be planted a min. 5'-8' from utility leads. Trees shall be planted such that a 1:1 trench could be dug to access utility leads.
- Trees shall be planted a min. 10' from Water Main & Sanitary Sewer
- All deciduous trees shall be planted a min. 15' o.c. Evergreen trees shall be planted a min. 12' o.c.
- Trees shall be planted a min. 15' from fire hydrants
- Snow Storage Areas shall be a min. 15' from fire hydrants

These drawings as instruments of service, remain the property of LAND Design Studio, PLLC.
Any changes, publications or unauthorized use is prohibited unless expressly approved.
©LAND Design Studio, PLLC

design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220

## LEGEND

= Existing Tree To Remain
= Proposed Conflicting Land Use Buffer Tree
= Proposed Private Street & Shared Drive Tree
= Proposed Public R.O.W. Tree
= Proposed Woodland Replacement Deciduous Tree
= Proposed Woodland Replacement Evergreen Tree

STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:
Landscape Plan - Area 3

■ project title:
Village of Ann Arbor
City of Ann Arbor, Michigan

■ prepared for:
Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |
| ■ drawn by: | ■ checked by: |
| EMJ | WTK |

Know what's **below.** **Call** before you dig.

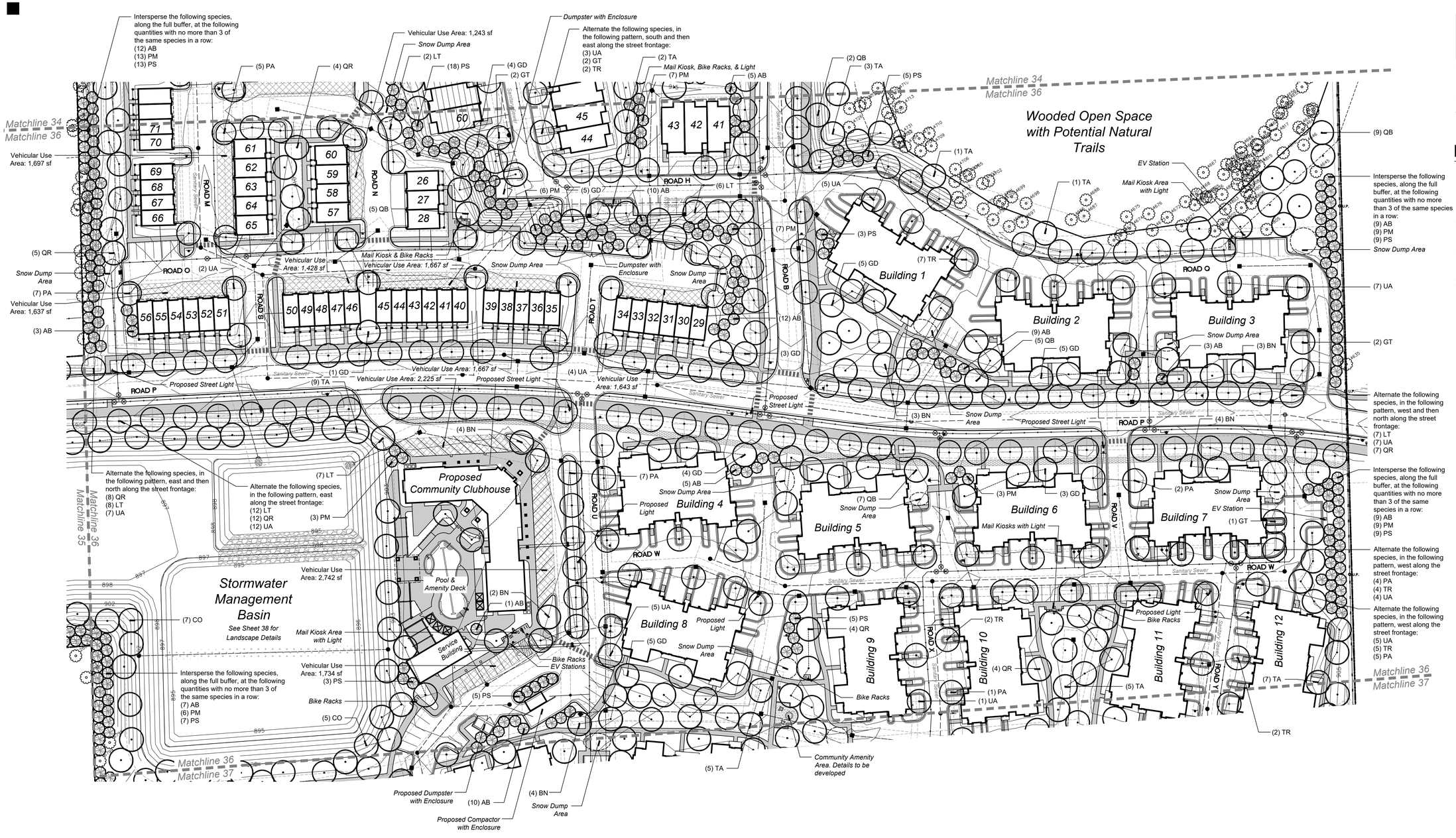
■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

0 25' 50' 100' 150' 200'
1"= 50'

North

sheet no.
35





design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220


## LEGEND

- = Existing Tree To Remain
- = Proposed Conflicting Land Use Buffer Tree
- = Proposed Private Street & Shared Drive Tree
- = Proposed Public R.O.W. Tree
- = Proposed Woodland Replacement Deciduous Tree
- = Proposed Woodland Replacement Evergreen Tree

STATE OF MICHIGAN
WILLIAM T. KREAPS
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

# Landscape Plan - Area 4

■ project title:

## Village of Ann Arbor

City of Ann Arbor, Michigan

■ prepared for:

Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |

| ■ drawn by: | ■ checked by: |
|---|---|
| EMJ | WTK |

## Plant Schedule This Sheet

**Private Street & Shared Drive Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| GD | 2 | *Gymnocladus diocus* | Kentucky Coffeetree | 3" cal. | per plans | B&B |
| GT | 7 | *Gleditsia triacanthos var. Inermis* | Thornless Honeylocust | 2.5" cal. | per plans | B&B |
| LT | 35 | *Liriodendron tulipifera* | Tulip Tree | 2.5" cal. | per plans | B&B |
| PA | 31 | *Platanus x acerifolia 'Exclamation'* | Exclamation London Planetree | 2.5" cal. | per plans | B&B |
| QB | 3 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |
| QR | 27 | *Quercus rubra* | Red Oak | 2.5" cal. | per plans | B&B |
| TR | 22 | *Tilia americana 'Redmond'* | Redmond Linden | 2.5" cal. | per plans | B&B |
| UA | 62 | *Ulmus americana 'Princeton'* | Princeton American Elm | 2.5" cal. | per plans | B&B |

**Woodland Replacement Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AB | 95 | *Abies balsamea* | Balsam Fir | 8' ht. | per plans | B&B |
| BN | 20 | *Betula nigra* | River Birch | 3" cal. | per plans | B&B |
| CO | 12 | *Celtis occidentalis* | Hackberry | 3" cal. | per plans | B&B |
| GD | 33 | *Gymnocladus diocus* | Kentucky Coffeetree | 3" cal. | per plans | B&B |
| LT | 7 | *Liriodendron tulipifera* | Tulip Tree | 3" cal. | per plans | B&B |
| PM | 63 | *Picea mariana* | Black Spruce | 8' ht. | per plans | B&B |
| PS | 77 | *Pinus strobus* | White Pine | 8' ht. | per plans | B&B |
| QB | 25 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |
| QR | 17 | *Quercus rubra* | Red Oak | 3" cal. | per plans | B&B |
| TA | 33 | *Tilia americana* | Basswood | 3" cal. | per plans | B&B |

## General Landscape Notes

- Utility box locations are unknown at this time. Once the box locations are known they will be screened on 3 sides. See detail on Sheet 33.
- Disturbed areas shall be sodded or seeded.
- Landscape areas shall be irrigated.
- Snow shall be stored along streets. Storage shall not include detention areas or landscaped areas.
- Trees shall be planted a min. 5'-8' from utility leads. Trees shall be planted such that a 1:1 trench could be dug to access utility leads.
- Trees shall be planted a min. 10' from Water Main & Sanitary Sewer
- All deciduous trees shall be planted a min. 15' o.c. Evergreen trees shall be planted a min. 12' o.c.
- Trees shall be planted a min. 15' from fire hydrants
- Snow Storage Areas shall be a min. 15' from fire hydrants

Know what's below. Call before you dig.

■ revisions:

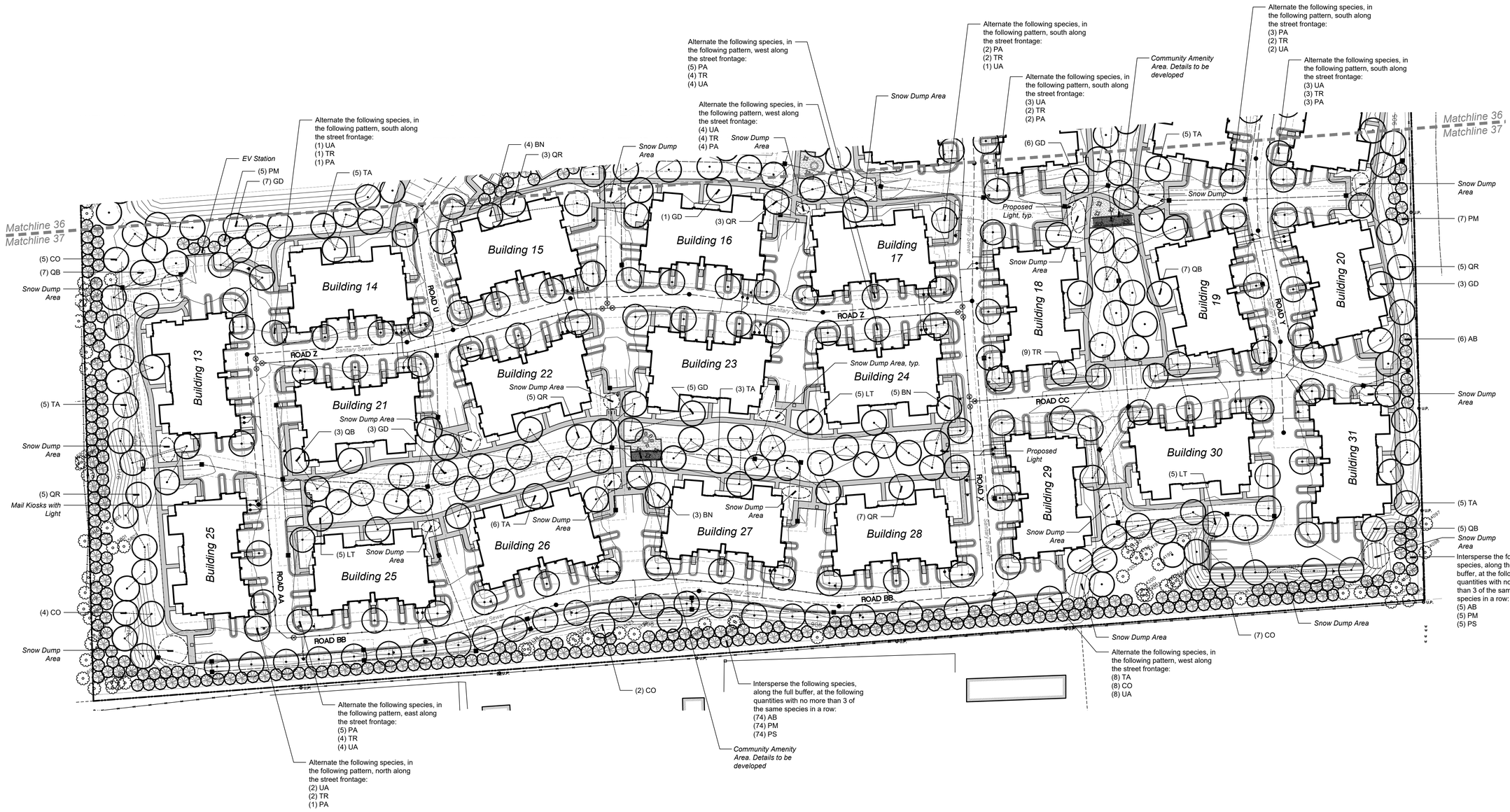
| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

0 25' 50' 100' 150' 200'
1"= 50'

North

sheet no.
36


These drawings as instruments of service, remain the property of LAND Design Studio, PLLC. Any changes, publications or unauthorized use is prohibited unless expressly approved.
© LAND Design Studio, PLLC




design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220

## LEGEND

- = Existing Tree To Remain
- = Proposed Conflicting Land Use Buffer Tree
- = Proposed Private Street & Shared Drive Tree
- = Proposed Public R.O.W. Tree
- = Proposed Woodland Replacement Deciduous Tree
- = Proposed Woodland Replacement Evergreen Tree

STATE OF MICHIGAN
WILLIAM T. KREAPS
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

# Landscape Plan - Area 5

■ project title:

# Village of Ann Arbor

City of Ann Arbor, Michigan

■ prepared for:

Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |
| ■ drawn by: | ■ checked by: |
| EMJ | WTK |

## Plant Schedule This Sheet

**Private Street & Shared Drive Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| CO | 8 | *Celtis occidentalis* | Hackberry | 2.5" cal. | per plans | B&B |
| GD | 2 | *Gymnocladus diocus* | Kentucky Coffeetree | 3" cal. | per plans | B&B |
| PA | 26 | *Platanus x acerifolia 'Exclamation'* | Exclamation London Planetree | 2.5" cal. | per plans | B&B |
| QR | 2 | *Quercus rubra* | Red Oak | 3" cal. | per plans | B&B |
| TA | 8 | *Tilia americana* | Basswood | 2.5" cal. | per plans | B&B |
| TR | 33 | *Tilia americana 'Redmond'* | Redmond Linden | 2.5" cal. | per plans | B&B |
| UA | 32 | *Ulmus americana 'Princeton'* | Princeton American Elm | 2.5" cal. | per plans | B&B |

**Woodland Replacement Trees**

| sym. | qty. | botanical name | common name | size | spacing | root |
|---|---|---|---|---|---|---|
| AB | 85 | *Abies balsamea* | Balsam Fir | 8' ht. | per plans | B&B |
| BN | 12 | *Betula nigra* | River Birch | 3" cal. | per plans | B&B |
| CO | 18 | *Celtis occidentalis* | Hackberry | 3" cal. | per plans | B&B |
| GD | 23 | *Gymnocladus diocus* | Kentucky Coffeetree | 3" cal. | per plans | B&B |
| LT | 15 | *Liriodendron tulipifera* | Tulip Tree | 3" cal. | per plans | B&B |
| PM | 91 | *Picea mariana* | Black Spruce | 8' ht. | per plans | B&B |
| PS | 79 | *Pinus strobus* | White Pine | 8' ht. | per plans | B&B |
| QB | 22 | *Quercus bicolor* | Swamp White Oak | 3" cal. | per plans | B&B |
| QR | 26 | *Quercus rubra* | Red Oak | 3" cal. | per plans | B&B |
| TA | 29 | *Tilia americana* | Basswood | 3" cal. | per plans | B&B |

## General Landscape Notes

- Utility box locations are unknown at this time. Once the box locations are known they will be screened on 3 sides. See detail on Sheet 33.
- Disturbed areas shall be sodded or seeded.
- Landscape areas shall be irrigated.
- Snow shall be stored along streets. Storage shall not include detention areas or landscaped areas.
- Trees shall be planted a min. 5'-8' from utility leads. Trees shall be planted such that a 1:1 trench could be dug to access utility leads.
- Trees shall be planted a min. 10' from Water Main & Sanitary Sewer
- All deciduous trees shall be planted a min. 15' o.c. Evergreen trees shall be planted a min. 12' o.c.
- Trees shall be planted a min. 15' from fire hydrants
- Snow Storage Areas shall be a min. 15' from fire hydrants

Know what's **below.** **Call** before you dig.

■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

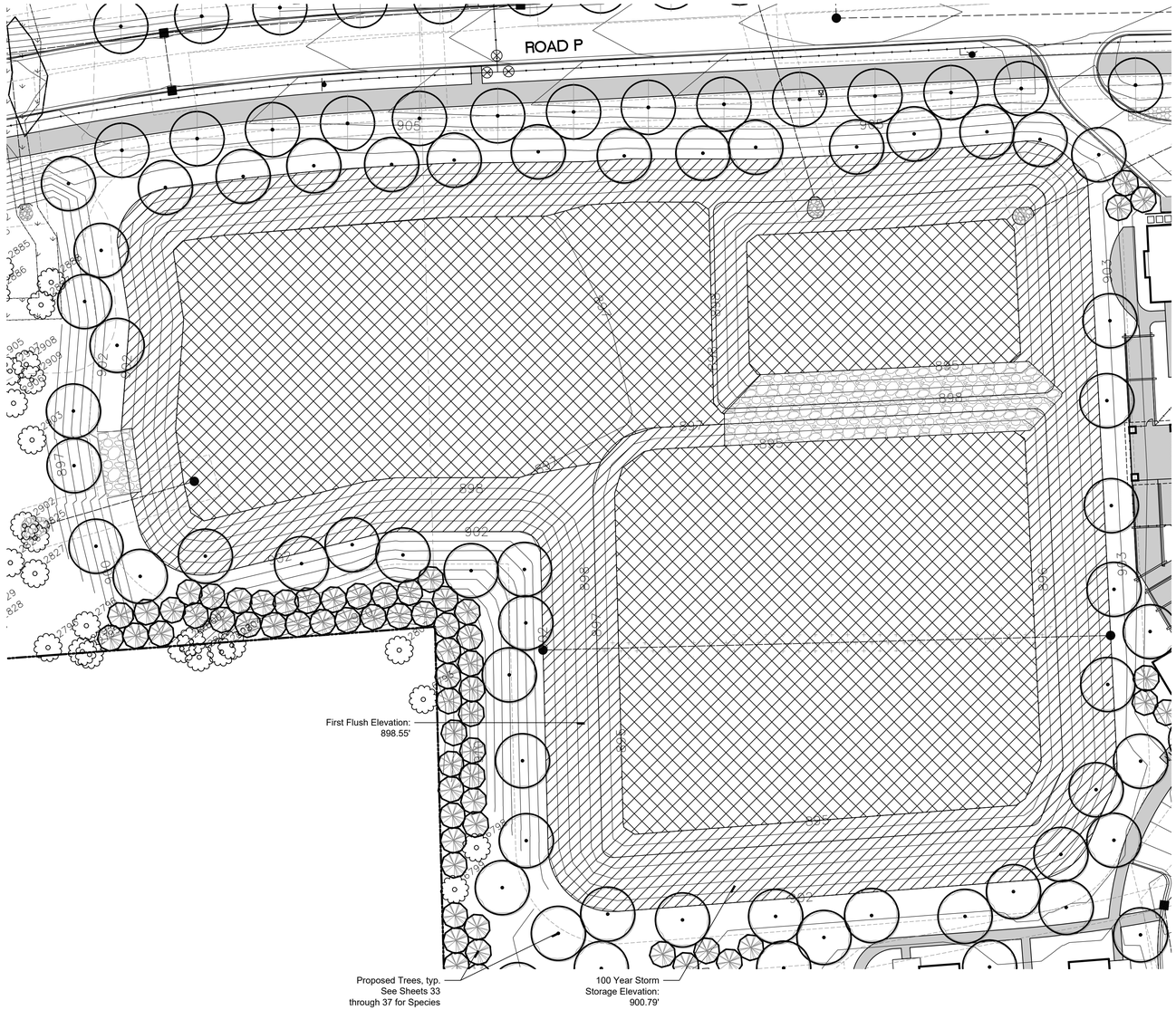
0 25' 50' 100' 150' 200' 1"= 50'

North

sheet no.

37

These drawings as instruments of service, remain the property of LAND Design Studio, PLLC.
Any changes, publications or unauthorized use is prohibited unless expressly approved.
©LAND Design Studio, PLLC




## Infiltration Basin Summary

Slope Zone - 902' to Basin Floor Areas

45,748 s.f.
Application Rate: 40.0 lbs. / Ac.
42.00 lbs. of Storm Water Seed Mix
3"-6" of Composted Organic Material
shall be placed in this area.

Seed Mix available from Nativescape
- www.nativescapellc.com
- 517.456.9696
- info@nativescapellc.com

Wet Meadow Plug Zone - Basin Floor Areas

70,919 s.f. Total
Plug Plant Schedule

**Live Plugs**

| qty. | botanical name | common name | spacing | Root |
|---|---|---|---|---|
| 2,533 | *Acorus americanus* | Sweet Flag | 24" o.c. | Live Plug |
| 2,533 | *Asclepias incarnata* | Swamp Milkweed | 24" o.c. | Live Plug |
| 2,533 | *Campanula americana* | Tall Bellflower | 24" o.c. | Live Plug |
| 2,533 | *Eupatorium maculatum* | Joe Pye Weed | 24" o.c. | Live Plug |
| 2,533 | *Potamogeton pectinatus* | Sago Pondweed | 24" o.c. | Live Plug |
| 2,533 | *Sagittaria latifolia* | Common Arrowhead | 24" o.c. | Live Plug |
| 2,533 | *Silphium terebinthinaceum* | Prairie Dock | 24" o.c. | Live Plug |

Note:
Landscape Contractor shall mix species of plugs together as installation occurs to ensure no area is overwhelmingly one species of plug.

## Infiltration Basin Seed Mix

Nativescape
Native Landscapes n Ecological Solutions
517-456-9696
info@nativescapellc.com

Detention Basin Mix

This mix contains at least (10) of the Flowers, (4) of the Grasses & Sedges.

| Common Name | Scientific Name | #/acre | Quantity* |
|---|---|---|---|
| **Temporary Grasses** | **50%** | **20** | |
| Seed Oats | *Avena sativa* | 14.0 | 14.70 lbs |
| Annual Rye | *Lolium multiflorum* | 6.0 | 6.30 lbs |
| **Native Grasses** | **30%** | **12** | |
| Big Bluestem Grass | *Andropogon gerardii* | 3.0 | 3.15 lbs |
| Fringed Sedge | *Carex crinita* | 0.5 | 0.53 lbs |
| Fox Sedge | *Carex vulpinoidea* | 0.5 | 0.53 lbs |
| Canada Wild Rye | *Elymus canadensis* | 3.5 | 3.66 lbs |
| Dark Green Bulrush | *Scirpus atrovirens* | 1.0 | 1.05 lbs |
| Indian Grass | *Sorghastrum nutans* | 3.0 | 3.15 lbs |
| Prairie Cord Grass | *Spartina pectinata* | 0.5 | 0.53 lbs |
| **Native Wildflowers** | **20%** | **8** | |
| Calico Aster | *Aster lateriflolius* | 0.2 | 0.21 lbs |
| New England Aster | *Aster novae-angliae* | 0.3 | 0.32 lbs |
| Pale Indian Plantain | *Cacalia atriplicifolia* | 0.2 | 0.21 lbs |
| Turtlehead | *Chelone glabra* | 0.2 | 0.21 lbs |
| Joepye Weed | *Eupatorium maculatum* | 0.3 | 0.32 lbs |
| Boneset | *Eupatorium perfoliatum* | 0.2 | 0.21 lbs |
| Ox Eye Sunflower | *Heliopsis helianthoides* | 0.6 | 0.63 lbs |
| Dense Blazingstar | *Liatris spicata* | 0.3 | 0.32 lbs |
| Cardinal Flower | *Lobelia cardinalis* | 0.2 | 0.21 lbs |
| Great Blue Lobelia | *Lobelia siphilitica* | 0.2 | 0.21 lbs |
| Yellow Coneflower | *Ratibida pinnata* | 1.8 | 1.88 lbs |
| Black-eyed Susan | *Rudbeckia hirta* | 2.0 | 2.10 lbs |
| Green-headed Coneflower | *Rudbeckia laciniata* | 0.2 | 0.21 lbs |
| Stiff Goldenrod | *Solidago rigida* | 0.2 | 0.21 lbs |
| Ohio Goldenrod | *Solidago ohioensis* | 0.2 | 0.21 lbs |
| Riddell's Goldenrod | *Solidago riddellii* | 0.2 | 0.21 lbs |
| Blue Vervain | *Verbena hastata* | 0.5 | 0.52 lbs |
| Culver's Root | *Veronicastrum virginicum* | 0.2 | 0.21 lbs |
| Ironweed | *Vernonia gigantea* | 0.2 | 0.21 lbs |
| **Total Pounds Per Acre** | **40 lbs** | | 42.00 lbs |

Note:
Notify Seed Supplier that *Silphium perfoliatum* (Cupplant) cannot be used in the specified seed mix due to being a Threatened Species

*Quantities are determined by availability of seed at the time of ordering and are subject to change. Species shown in the table, with the exception of *Silphium perfoliatum*, will not change

## Infiltration Basin Notes

No chemicals are allowed in Stormwater Features or Buffer Zones with the following exception: Invasive species may be treated with chemicals by a certified applicator. Mowing is allowed only twice a year.

Soils must be amended with a composted organic material. Soils must be free of construction debris and subsoils. Soils must contain 20%-30% compost.

At the time of plant and seed delivery, a WCWRC Landscape Reviewer must be present. The quantity and species delivered will be reviewed on site. Contact Catie Wytychakc at wytychakc@washtenaw.org or 734.222.6813 to coordinate.

These drawings as instruments of service, remain the property of LAND Design Studio, PLLC.
Any changes, publications or unauthorized use is prohibited unless expressly approved.
© LAND Design Studio, PLLC

design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220

## LEGEND

= Existing Tree To Remain
= Proposed Conflicting Land Use Buffer Tree
= Proposed Private Street & Shared Drive Tree
= Proposed Public R.O.W. Tree
= Proposed Woodland Replacement Deciduous Tree
= Proposed Woodland Replacement Evergreen Tree

STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:
Stormwater Basin Landscape

■ project title:
Village of Ann Arbor

City of Ann Arbor, Michigan

■ prepared for:
Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |
| ■ drawn by: | ■ checked by: |
| EMJ | WTK |

Know what's **below.**
**Call** before you dig.

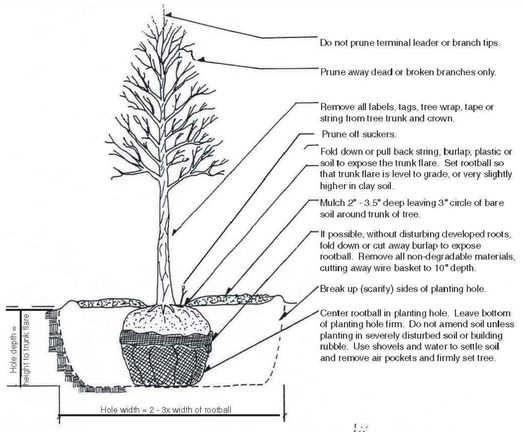
■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

0 15' 30' 60' 90' 120'
1"= 30'

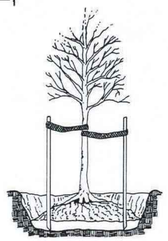
North

sheet no.
38




*Do not* stake unless in heavy clay soil, windy conditions, 3" or greater diameter tree trunk or large crown. If staking is needed due to these conditions:

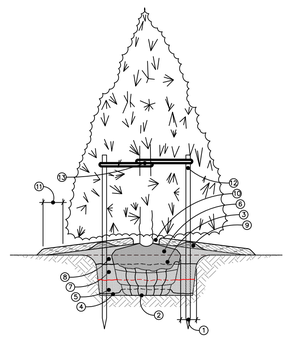
- Stake with 2 x 2 hardwood stakes, or approved equal, driven 6" - 8" outside of rootball.
- Loosely stake tree trunk to allow for trunk flexing.
- Stake trees just *below* first branch with 2" - 3" wide belt-like, nylon or plastic straps (2 per tree on opposite sides of tree, connect from tree to stake horizontally. *Do not* use rope or wire through a hose.)
- Remove all staking materials after 1 year.



## TREE PLANTING DETAIL

SCALE: NO SCALE

*Original: Dr. Bonnie Appleton, Virginia Polytechnic Institute and State University, modified by the Michigan Department of Natural Resources, Forest Management Division, and the City of Ann Arbor.*



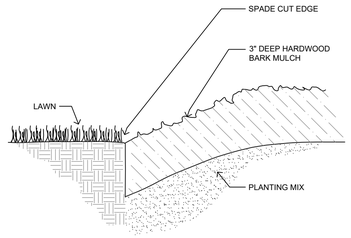

INSTALLATION NOTES:

1. DIG PLANT POCKET 12" WIDER THAN EDGE OF ROOTBALL.
2. THOROUGHLY COMPACT BOTTOM OF PLANT POCKET.
3. REMOVE ALL TWINE FROM TOP OF ROOTBALL. EXAMINE TRUNK COLLAR & REMOVE EXCESS SOIL FROM TOP OF ROOTBALL DOWN TO THE UPPER LEVEL OF THE ROOT SYSTEM. SET ROOTBALL WITH TOP 1/8 OF BALL ABOVE FINISH GRADE.
4. PLACE BACKFILL UNDER & ALONGSIDE BASE OF BALL TO STRAIGHTEN TREE. THOROUGHLY COMPACT TO FILL ALL VOIDS.
5. BACKFILL PLANT POCKET 1/3 WITH PLANTING MIX CONSISTING OF 50 % TOPSOIL & 50 % NATIVE SOIL & COMPACT THOROUGHLY. ASSURING TREE IS STILL STRAIGHT.
6. BEFORE CONTINUING WITH BACKFILL, REMOVE TOP WIRE LOOPS, OR BEND DOWN UNTIL THEY TOUCH SIDE OF BALL. REMOVE EXCESS BURLAP.
7. BACKFILL PLANT POCKET SECOND 1/3 WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT.
8. BACKFILL PLANT POCKET LAST 1/3 WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING TREE IS STILL STRAIGHT. SLOPE GRADE AWAY FROM TREE.
9. IF PLANTED IN NON-IRRIGATED AREAS, FORM A SAUCER WITH SOIL AT OUTSIDE EDGE OF ROOTBALL.
10. SHREDDED BARK MULCH, 3" DEPTH. MULCH TO BE NATURAL IN COLOR. LEAVE 2-3" RING EXPOSED AT BASE OF TRUNK.
11. MULCH RINGS TO BE CONSISTENT WITH PLANT TYPE/SIZE THROUGHOUT PROJECT & SHOULD EXTEND 6" BEYOND LOWEST BRANCH OF EVERGREEN TREES.
12. MINIMUM 2"x2"x60" HARDWOOD STAKES TO EXTEND INTO UNDISTURBED SOIL UNDER PLANT POCKET. STAKE LOCATIONS PER TREE TO BE CONSISTENT THROUGHOUT PROJECT.
13. 1" WIDE BELT LIKE NYLON, PLASTIC, OR OTHER ACCEPTABLE MATERIAL, NO WIRE OR HOSE TO BE USE TO GUY TREES. TWO (2) GUYS PER TREE.

## Evergreen Tree Planting Detail - 10' Ht. and Under

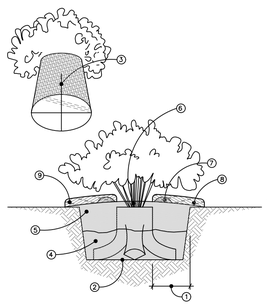
©2022 LANDSCAPE MANAGEMENT SOLUTIONS

Scale: NTS




## Spade Cut Edging Detail

NTS



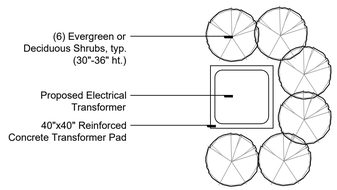

INSTALLATION NOTES:

1. DIG PLANT POCKET 6" WIDER THAN EDGE OF ROOTBALL.
2. THOROUGHLY COMPACT BOTTOM OF PLANT POCKET.
3. REMOVE PLANT FROM CONTAINER AND EXAMINE ROOTMASS. IF ROOTMASS IS LOOSE, INTEGRATE PLANT ROOTS & POTTING MEDIA WITH PLANTING MIX. IF A ROOTBOUND CONDITIONS EXISTS, DISRUPT THE ROOTMASS BY CUTTING THROUGH BOTTOM HALF OF ROOTMASS. ROTATE ROOTMASS 90° AND CUT AGAIN, FORMING FOUR (4) LOBES. SPREAD THE FOUR LOBES DISTRUPTING ROOTMASS AND INTEGRATE PLANT ROOTS & POTTING MEADIA WITH PLANTING MIX. PLACE PLANT IN POCKET SLIGHTLY ABOVE GRADE.
4. BACKFILL PLANT POCKET 1/2 WITH PLANTING MIX CONSISTING OF 50 % TOPSOIL & 50 % NATIVE SOIL, ASSURING SHRUB IS STRAIGHT.
5. BACK FILL REMAINING 1/2 OF PLANT POCKET WITH PLANTING MIX & COMPACT THOROUGHLY, ASSURING SHRUB IS STILL STRAIGHT.
6. SPREAD 1" OF PLANTING MIX OVER TOP OF CONTAINER ROOTBALL. SLOPE GRADE AWAY FROM SHRUB.
7. IF PLANTED IN NON-IRRIGATED AREAS, FORM A SAUCER WITH SOIL AT OUTSIDE EDGE OF ROOTBALL.
8. SHREDDED BARK MULCH, 3" DEPTH. MULCH TO BE NATURAL IN COLOR. LEAVE 1-2" RING EXPOSED AT BASE OF PLANT.
9. IF NOT PLANTED WITHIN A LANDSCAPE BED, MULCH RINGS TO BE CONSISTENT IN SIZE WITH PLANT TYPE/SIZE THROUGHOUT PROJECT.

## Shrub Planting Detail - Container

©2022 LANDSCAPE MANAGEMENT SOLUTIONS

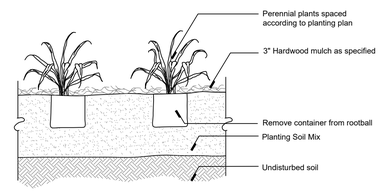
Scale: NTS




*Notes:
- Transformer Pad shall be screened on a minimum of three sides
- Actual Pad and Plant Locations shall be determined in the field, based on actual construction, orientation, and desired screening

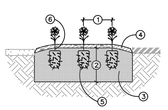
## Optional Transformer Screening Detail

Scale: ¼" = 1'




## Perennial Planting Detail

NTS




INSTALLATION NOTES:

1. SEE DRAWING FOR PLANT SPACING.
2. EXCAVATE BED TO A MINIMUM 6" DEPTH. BACKFILL WITH PREPARED PLANTING MIX.
3. PLANTING MIX TO CONSIST OF 50% TOPSOIL & 50% LEAF COMPOST.
4. SHREDDED BARK MULCH, 1" DEPTH. MULCH TO BE NATURAL IN COLOR.
5. REMOVE ALL CONTAINERS. IF ROOTBOUND, DISRUPT ROOT PLUG TO LOOSEN ROOT MASS.
6. PLANT THE ANNUAL OR GROUND COVER PLANT THROUGH THE MULCH INTO THE PLANTING MIX ASSURING THAT PLANTING MIX COVERS ENTIRE ROOT MASS OF PLANT.

## Annual & Ground Cover Planting Detail

©2022 LANDSCAPE MANAGEMENT SOLUTIONS

Scale: NTS

These drawings as instruments of service, remain the property of LAND Design Studio, PLLC. Any changes, publications or unauthorized use is prohibited unless expressly approved.
©LAND Design Studio, PLLC

## Landscape Notes

1. **Tree stakes, guy wires and tree wrap shall be removed after one year.**
2. **All trees shall be planted no closer than 15' to fire hydrants.**
3. **All plant material shall be true to name and free from physical damage and wind burn.**
4. **Plants shall be full, well-branched, and in a healthy, vigorous growing condition.**
5. **Plants shall be watered before and after planting is complete.**
6. **All trees must be staked, fertilized, and mulched and shall be guaranteed to exhibit a normal growth cycle for at least one (1) full year following planting.**
7. **All material shall conform to the guidelines established in the most recent edition of the American Standard for Nursery Stock.**
8. **Provide clean backfill soil, using material stockpiled on site. Soil shall be screened and free of any debris, foreign material, or stone.**
9. **"Agriform" tabs or similar slow-release fertilizer shall be added to the planting pits before being backfilled.**
10. **Amended planting mix shall consist of 1/3 screened topsoil, 1/3 sand, and 1/3 peat.**
11. **All plantings shall be mulched with shredded hardwood bark, spread to a minimum depth of 3". Mulch is to be free from debris and foreign material and shall contain no pieces of inconsistent size.**
12. **The Landscape Contractor shall be responsible for all work shown on the landscape drawings and specifications.**
13. **No substitutions or changes of location, or plant types shall be made without the approval of the Landscape Architect or Owner's representative.**
14. **The Landscape Architect shall be notified of any discrepancies between the plans and field conditions prior to installation.**
15. **The Landscape Contractor shall be responsible for maintaining all plant material in a vertical condition throughout the guaranteed period.**
16. **The Landscape Architect shall have the right at any stage of the installation to reject any work or material that does not meet the requirements of the plan and specifications, if requested by the owner.**
17. **The Contractor shall be responsible for checking plant quantities to ensure quantities on drawings and plant list are the same. In the event of a discrepancy, the quantities on the plans shall prevail.**
18. **The Landscape Contractor shall seed and mulch or sod (as indicated on plans) all areas disturbed during construction, throughout the contract limits.**
19. **A pre-emergent weed control agent, "Preen" or equal, shall be applied uniformly to all planting beds prior to mulching.**
20. **The Developer and Landscape Architect reserve the right to change location of plant material and alter plant species/variety at the time of installation based upon availability and quantity of material as well as site conditions. Materials will be of similar size, appearance and growth habit. All species deviations from the approved site plan must be approved by the City of Ann Arbor in writing prior to installation.**
21. **All Lawn areas shall be Seeded or Sodded**




## Decorative Mailbox - 4 Parcel CBU

Scale: NTS

Manufacturer: Salsbury Industries
18300 Central Avenue
Carson, CA 90746
800.624.5269
www.mailboxes.com
Model: 4 Parcel Lockers
3304BLK-U
Black
Quantity: 8 Total




## Decorative Mailbox - 8 Gang CBU

Scale: NTS

Manufacturer: Salsbury Industries
18300 Central Avenue
Carson, CA 90746
800.624.5269
www.mailboxes.com
Model: CBU 8 Doors & 2 Parcel Lockers
3308BLK-U
Black
Quantity: 2 Total




## Decorative Mailbox - 16 Gang CBU

Scale: NTS

Manufacturer: Salsbury Industries
18300 Central Avenue
Carson, CA 90746
800.624.5269
www.mailboxes.com
Model: CBU 16 Doors & 2 Parcel Lockers
3316BLK-U
Black
Quantity: 23 Total




## Decorative Mailbox - 12 Gang CBU

Scale: NTS

Manufacturer: Salsbury Industries
18300 Central Avenue
Carson, CA 90746
800.624.5269
www.mailboxes.com
Model: CBU 12 Doors & 1 Parcel Lockers
3312BLK-U
Black
Quantity: 10 Total

## City of Ann Arbor Notes

**Continuing Care**
**Landscaping shall be kept in neat, orderly, and healthy growing condition, free from debris and refuse. All landscape material shall be maintained by a regular program or mowing, watering, weeding, feeding, and pruning. Pruning shall be minimal at the time of installation, only to remove dead or diseased branches. Subsequent pruning shall assure proper maturation of plants to achieve their approved purpose.**

**Replenishment**
**All dead or diseased plant material shall be removed and replaced within six (6) months after it dies, or in the next planting season, whichever occurs first.**

**Watering**
**This shall be accomplished by installation of an underground irrigation system to provide water for the landscape areas specified on the landscape plan.**

**Clay Soils**
**Construct earth bed to required grade and trim. Prior to placement of topsoil or compost, harrow all earth beds to a minimum of 3" depth.**

**Fertilizer**
**Beyond initial fertilization, all future fertilizer applications shall not contain phosphorus.**

design studio
LAND
landscape architecture / land planning

750 Forest Ave. - Suite 101
Birmingham, MI 48009
T:: 248.594.3220

## LEGEND

STATE OF MICHIGAN
WILLIAM T. KREAGER
LANDSCAPE ARCHITECT
No. 1177
LICENSED LANDSCAPE ARCHITECT

■ sheet title:

**Landscape Details & Notes**

■ project title:

**Village of Ann Arbor**

City of Ann Arbor, Michigan

■ prepared for:

Robertson Brothers Co.
6905 Telegraph Rd. - Suite 200
Bloomfield Hills, MI 48301

Phone: 248.657.4968

DTN Management Company
2502 Lake Lansing Rd.
Lansing, MI 48912

Phone: 517.371.5300

| ■ job number: | ■ date: |
|---|---|
| 18004 | 06.01.2021 |
| ■ drawn by: | ■ checked by: |
| EMJ | WTK |

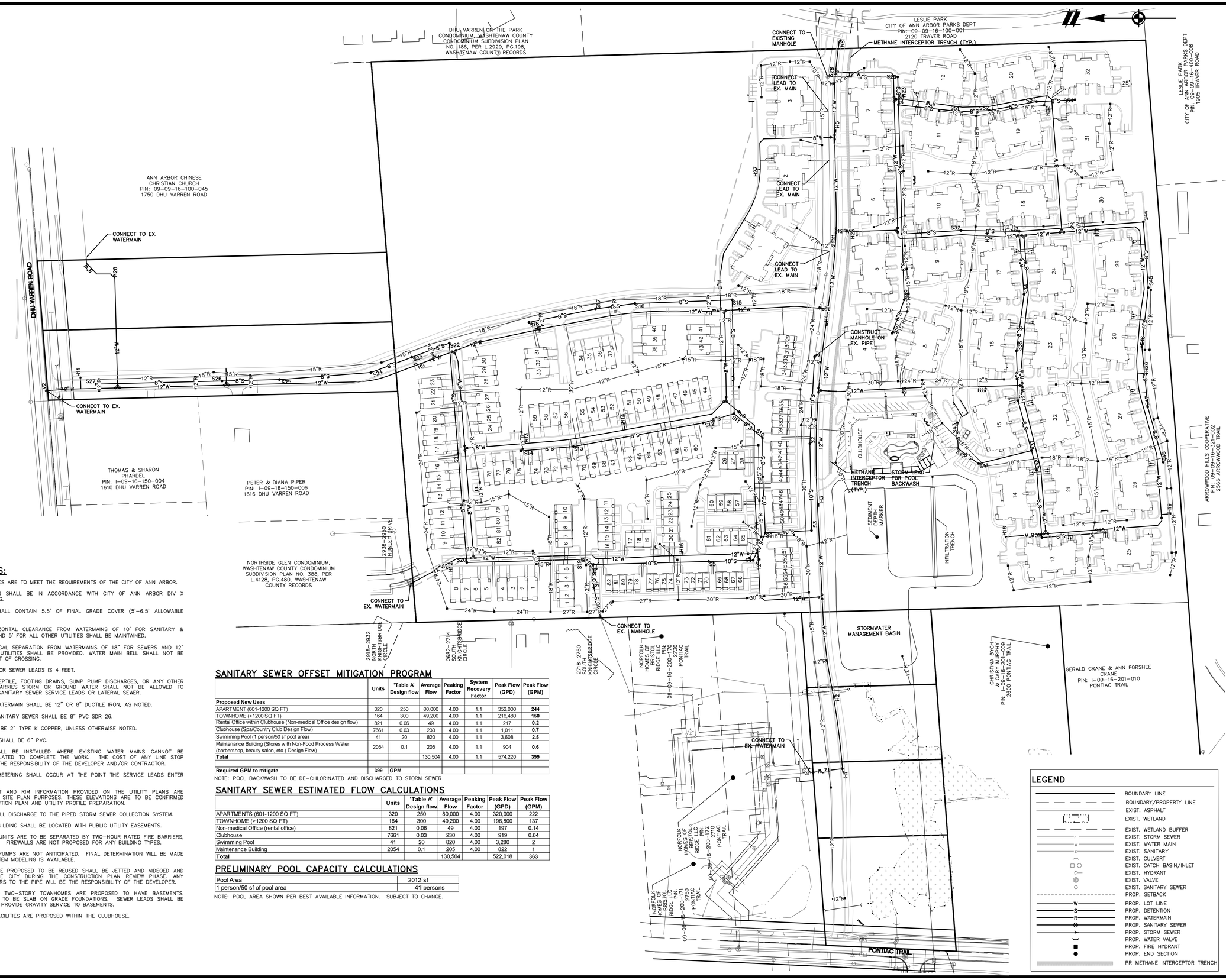
811
Know what's **below.**
**Call** before you dig.

■ revisions:

| | |
|---|---|
| 10.11.2021 | Per Municipal Review |
| 01.20.2022 | Per Municipal Review |
| 03.31.2022 | Per Municipal Review |
| 06.15.2022 | Per Municipal Review |

sheet no.

39




## UTILITY NOTES:

1. PROPOSED UTILITIES ARE TO MEET THE REQUIREMENTS OF THE CITY OF ANN ARBOR.
2. UTILITY TRENCHES SHALL BE IN ACCORDANCE WITH CITY OF ANN ARBOR DIV X STANDARD DETAILS.
3. WATER LEADS SHALL CONTAIN 5.5' OF FINAL GRADE COVER (5'-6.5' ALLOWABLE TOLERANCE).
4. A MINIMUM HORIZONTAL CLEARANCE FROM WATERMAINS OF 10' FOR SANITARY & STORM SEWERS AND 5' FOR ALL OTHER UTILITIES SHALL BE MAINTAINED.
5. A MINIMUM VERTICAL SEPARATION FROM WATERMAINS OF 18" FOR SEWERS AND 12" FOR ALL OTHER UTILITIES SHALL BE PROVIDED. WATER MAIN BELL SHALL NOT BE LOCATED AT POINT OF CROSSING.
6. MINIMUM COVER FOR SEWER LEADS IS 4 FEET.
7. DOWNSPOUTS, WEEPTILE, FOOTING DRAINS, SUMP PUMP DISCHARGES, OR ANY OTHER CONDUIT THAT CARRIES STORM OR GROUND WATER SHALL NOT BE ALLOWED TO DISCHARGE INTO SANITARY SEWER SERVICE LEADS OR LATERAL SEWER.
8. ALL PROPOSED WATERMAIN SHALL BE 12" OR 8" DUCTILE IRON, AS NOTED.
9. ALL PROPOSED SANITARY SEWER SHALL BE 8" PVC SDR 26.
10. WATER LEADS TO BE 2" TYPE K COPPER, UNLESS OTHERWISE NOTED.
11. SANITARY LEADS SHALL BE 6" PVC.
12. LINE STOPS SHALL BE INSTALLED WHERE EXISTING WATER MAINS CANNOT BE SUFFICIENTLY ISOLATED TO COMPLETE THE WORK. THE COST OF ANY LINE STOP INSTALLATION IS THE RESPONSIBILITY OF THE DEVELOPER AND/OR CONTRACTOR.
13. WATER SERVICE METERING SHALL OCCUR AT THE POINT THE SERVICE LEADS ENTER THE BUILDINGS.
14. PROPOSED INVERT AND RIM INFORMATION PROVIDED ON THE UTILITY PLANS ARE PRELIMINARY FOR SITE PLAN PURPOSES. THESE ELEVATIONS ARE TO BE CONFIRMED DURING CONSTRUCTION PLAN AND UTILITY PROFILE PREPARATION.
15. SUMP PUMPS SHALL DISCHARGE TO THE PIPED STORM SEWER COLLECTION SYSTEM.
16. NO PART OF A BUILDING SHALL BE LOCATED WITH PUBLIC UTILITY EASEMENTS.
17. THE TOWNHOUSE UNITS ARE TO BE SEPARATED BY TWO-HOUR RATED FIRE BARRIERS, NOT A FIREWALLS. FIREWALLS ARE NOT PROPOSED FOR ANY BUILDING TYPES.
18. WATER BOOSTER PUMPS ARE NOT ANTICIPATED. FINAL DETERMINATION WILL BE MADE ONCE WATER SYSTEM MODELING IS AVAILABLE.
19. ANY EXISTING PIPE PROPOSED TO BE REUSED SHALL BE JETTED AND VIDEOED AND REVIEWED BY THE CITY DURING THE CONSTRUCTION PLAN REVIEW PHASE. ANY NECESSARY REPAIRS TO THE PIPE WILL BE THE RESPONSIBILITY OF THE DEVELOPER.
20. THE EIGHTY TWO TWO-STORY TOWNHOMES ARE PROPOSED TO HAVE BASEMENTS. OTHER BUILDINGS TO BE SLAB ON GRADE FOUNDATIONS. SEWER LEADS SHALL BE DEEP ENOUGH TO PROVIDE GRAVITY SERVICE TO BASEMENTS.
21. NO SHOWERING FACILITIES ARE PROPOSED WITHIN THE CLUBHOUSE.

## SANITARY SEWER OFFSET MITIGATION PROGRAM

| | Units | 'Table A' Design flow | Average Flow | Peaking Factor | System Recovery Factor | Peak Flow (GPD) | Peak Flow (GPM) |
|---|---|---|---|---|---|---|---|
| **Proposed New Uses** | | | | | | | |
| APARTMENT (601-1200 SQ FT) | 320 | 250 | 80,000 | 4.00 | 1.1 | 352,000 | **244** |
| TOWNHOME (>1200 SQ FT) | 164 | 300 | 49,200 | 4.00 | 1.1 | 216,480 | **150** |
| Rental Office within Clubhouse (Non-medical Office design flow) | 821 | 0.06 | 49 | 4.00 | 1.1 | 217 | **0.2** |
| Clubhouse (Spa/Country Club Design Flow) | 7661 | 0.03 | 230 | 4.00 | 1.1 | 1,011 | **0.7** |
| Swimming Pool (1 person/50 sf pool area) | 41 | 20 | 820 | 4.00 | 1.1 | 3,608 | **2.5** |
| Maintenance Building (Stores with Non-Food Process Water (barbershop, beauty salon, etc.) Design Flow) | 2054 | 0.1 | 205 | 4.00 | 1.1 | 904 | **0.6** |
| **Total** | | | 130,504 | 4.00 | 1.1 | 574,220 | **399** |
| | | | | | | | |
| **Required GPM to mitigate** | **399** | **GPM** | | | | | |

NOTE: POOL BACKWASH TO BE DE-CHLORINATED AND DISCHARGED TO STORM SEWER

## SANITARY SEWER ESTIMATED FLOW CALCULATIONS

| | Units | 'Table A' Design flow | Average Flow | Peaking Factor | Peak Flow (GPD) | Peak Flow (GPM) |
|---|---|---|---|---|---|---|
| APARTMENTS (601-1200 SQ FT) | 320 | 250 | 80,000 | 4.00 | 320,000 | 222 |
| TOWNHOME (>1200 SQ FT) | 164 | 300 | 49,200 | 4.00 | 196,800 | 137 |
| Non-medical Office (rental office) | 821 | 0.06 | 49 | 4.00 | 197 | 0.14 |
| Clubhouse | 7661 | 0.03 | 230 | 4.00 | 919 | 0.64 |
| Swimming Pool | 41 | 20 | 820 | 4.00 | 3,280 | 2 |
| Maintenance Building | 2054 | 0.1 | 205 | 4.00 | 822 | 1 |
| **Total** | | | 130,504 | | 522,018 | **363** |

## PRELIMINARY POOL CAPACITY CALCULATIONS

| | | |
|---|---|---|
| Pool Area | 2012 | sf |
| 1 person/50 sf of pool area | **41** | persons |

NOTE: POOL AREA SHOWN PER BEST AVAILABLE INFORMATION. SUBJECT TO CHANGE.

## LEGEND

- BOUNDARY LINE
- BOUNDARY/PROPERTY LINE
- EXIST. ASPHALT
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PR METHANE INTERCEPTOR TRENCH

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.

VILLAGE OF ANN ARBOR
**SITE PLAN**

OVERALL UTILITY PLAN

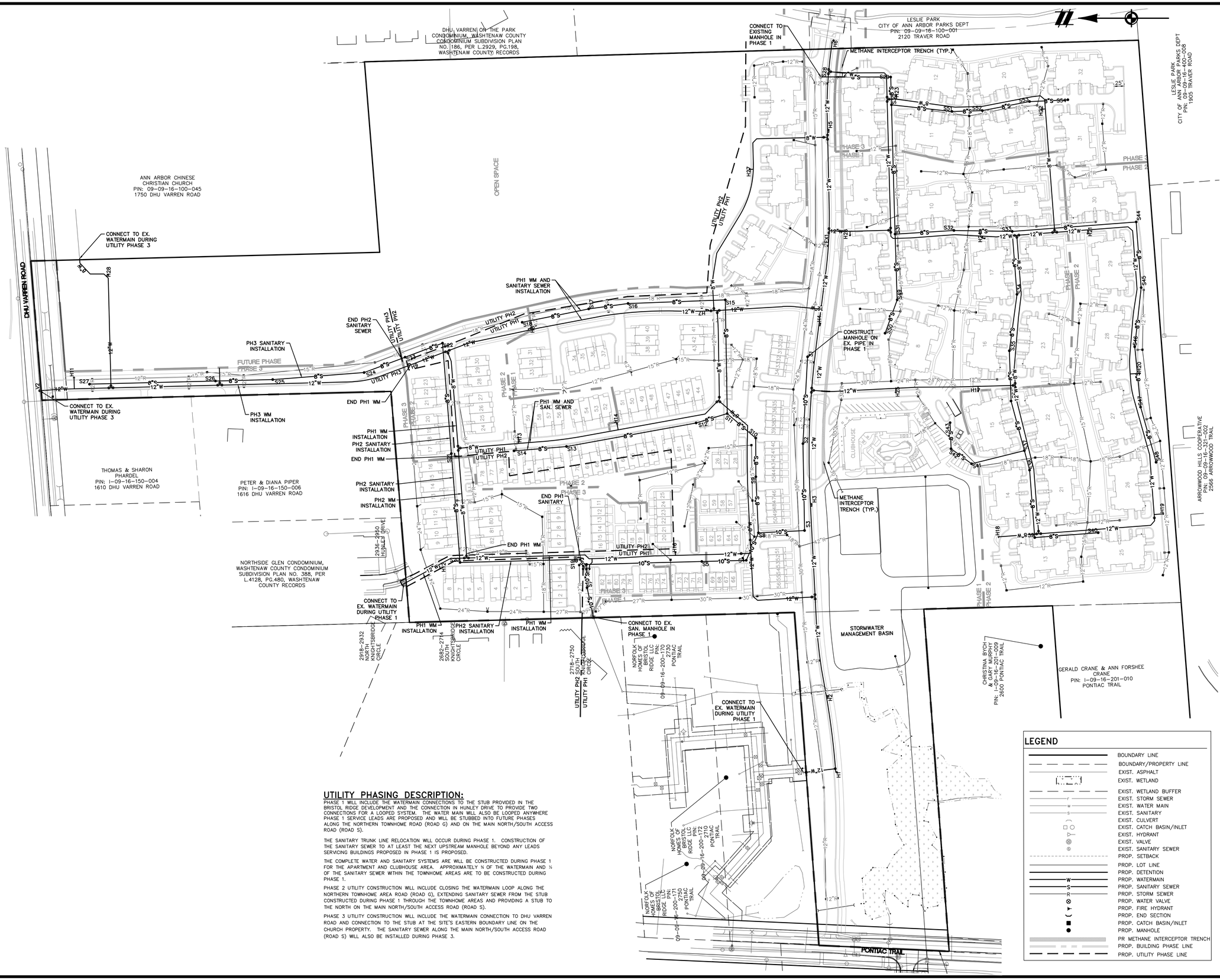
DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 50 100
1" = 100 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. 40

C:\ATWELL\18002264\CAD\SITE\SITE PLAN\18002264SP-SITE PLAN.DWG 7/12/2022 9:14 AM KYLE SILES




## UTILITY PHASING DESCRIPTION:

PHASE 1 WILL INCLUDE THE WATERMAIN CONNECTIONS TO THE STUB PROVIDED IN THE BRISTOL RIDGE DEVELOPMENT AND THE CONNECTION IN HUNLEY DRIVE TO PROVIDE TWO CONNECTIONS FOR A LOOPED SYSTEM. THE WATER MAIN WILL ALSO BE LOOPED ANYWHERE PHASE 1 SERVICE LEADS ARE PROPOSED AND WILL BE STUBBED INTO FUTURE PHASES ALONG THE NORTHERN TOWNHOME ROAD (ROAD G) AND ON THE MAIN NORTH/SOUTH ACCESS ROAD (ROAD S).

THE SANITARY TRUNK LINE RELOCATION WILL OCCUR DURING PHASE 1. CONSTRUCTION OF THE SANITARY SEWER TO AT LEAST THE NEXT UPSTREAM MANHOLE BEYOND ANY LEADS SERVICING BUILDINGS PROPOSED IN PHASE 1 IS PROPOSED.

THE COMPLETE WATER AND SANITARY SYSTEMS ARE WILL BE CONSTRUCTED DURING PHASE 1 FOR THE APARTMENT AND CLUBHOUSE AREA. APPROXIMATELY ¼ OF THE WATERMAIN AND ½ OF THE SANITARY SEWER WITHIN THE TOWNHOME AREAS ARE TO BE CONSTRUCTED DURING PHASE 1.

PHASE 2 UTILITY CONSTRUCTION WILL INCLUDE CLOSING THE WATERMAIN LOOP ALONG THE NORTHERN TOWNHOME AREA ROAD (ROAD G), EXTENDING SANITARY SEWER FROM THE STUB CONSTRUCTED DURING PHASE 1 THROUGH THE TOWNHOME AREAS AND PROVIDING A STUB TO THE NORTH ON THE MAIN NORTH/SOUTH ACCESS ROAD (ROAD S).

PHASE 3 UTILITY CONSTRUCTION WILL INCLUDE THE WATERMAIN CONNECTION TO DHU VARREN ROAD AND CONNECTION TO THE STUB AT THE SITE'S EASTERN BOUNDARY LINE ON THE CHURCH PROPERTY. THE SANITARY SEWER ALONG THE MAIN NORTH/SOUTH ACCESS ROAD (ROAD S) WILL ALSO BE INSTALLED DURING PHASE 3.

## LEGEND

- BOUNDARY LINE
- BOUNDARY/PROPERTY LINE
- EXIST. ASPHALT
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PR METHANE INTERCEPTOR TRENCH
- PROP. BUILDING PHASE LINE
- PROP. UTILITY PHASE LINE

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN

# UTILITY PHASING PLAN

DATE
JUNE 7, 2021

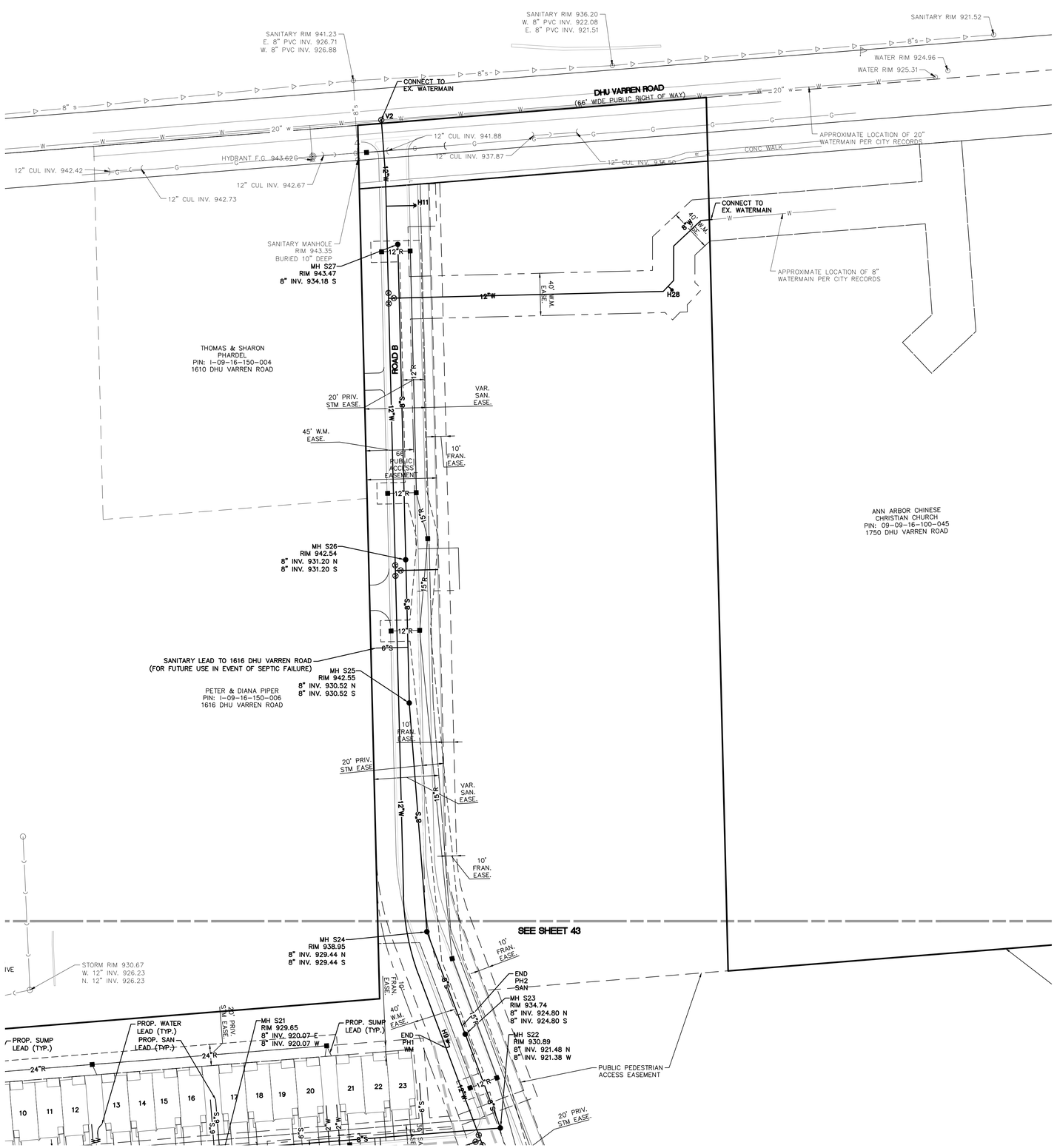
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

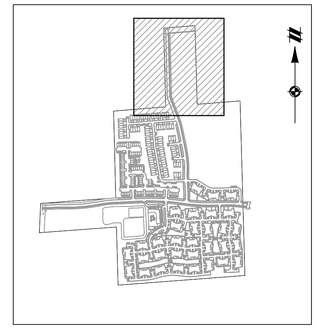
REVISIONS

SCALE 0 50 100
1" = 100 FEET

DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. 41

I:\18002264\CAD\PLAN SETS\SITE PREPARATION\18002264P-SC-SU-PHASING.DWG 7/7/2022 8:43 AM STEVE SELK



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- MATCHLINE
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. ACCESS EASEMENT
- PROP. STORM EASEMENT
- PROP. SANITARY EASEMENT
- PROP. WATER EASEMENT
- EX. WETLAND BUFFER
- PROP. FRANCHISE EASEMENT
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE

Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
UTILITY PLAN – AREA 1

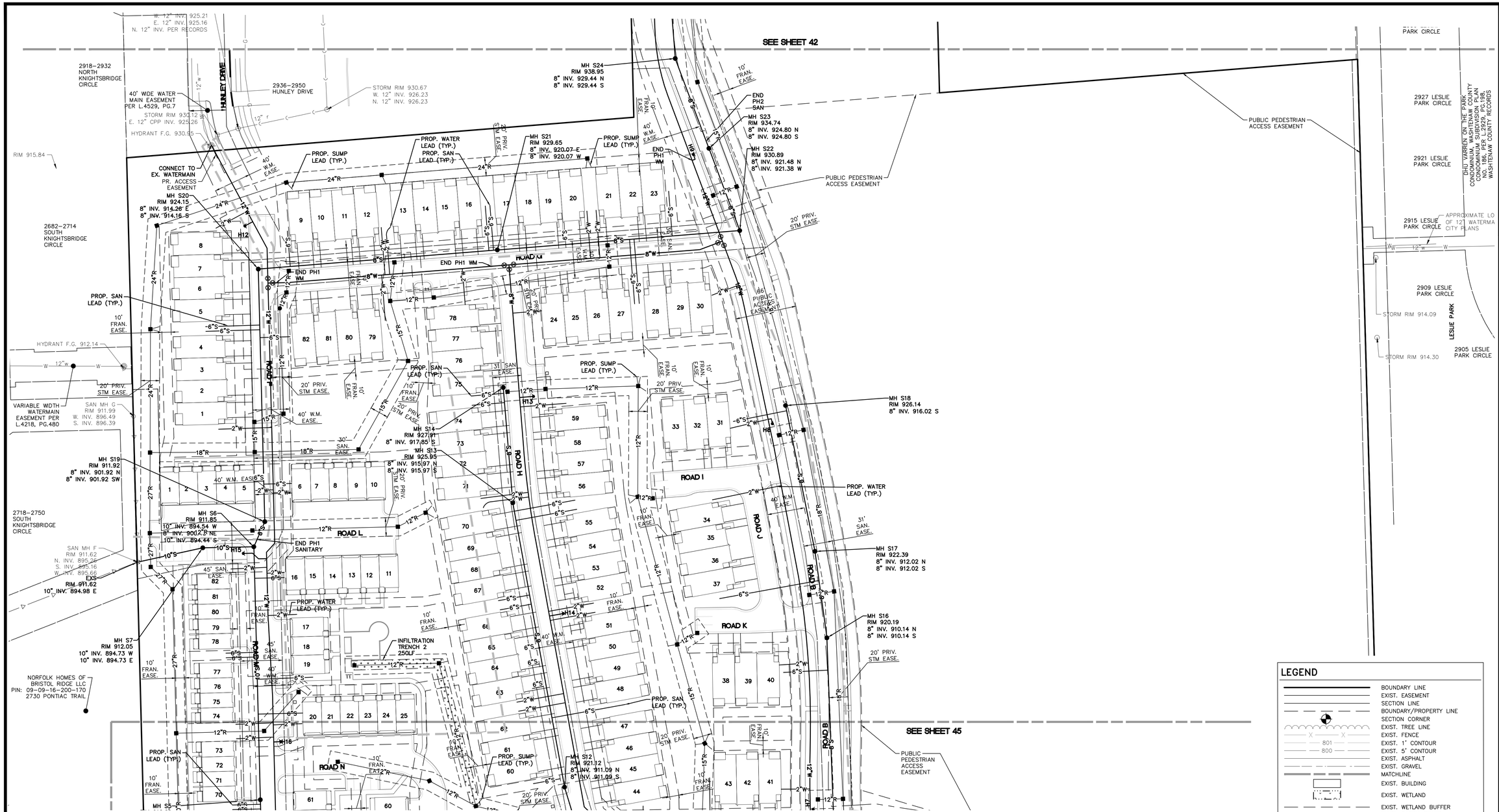
DATE
JUNE 7, 2021

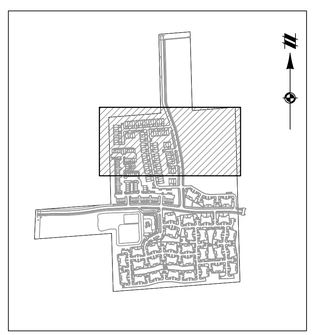
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET
DR. SK CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO.
42

K:\ANN\2018\18002264\CAD\SHEETS\SITE\18002264-SHT-SITE.DWG 7/12/2022 9:43 AM STEVE SOLIS



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- MATCHLINE
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. ACCESS EASEMENT
- PROP. STORM EASEMENT
- PROP. SANITARY EASEMENT
- PROP. WATER EASEMENT
- EX. WETLAND BUFFER
- PROP. FRANCHISE EASEMENT
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
UTILITY PLAN – AREA 2

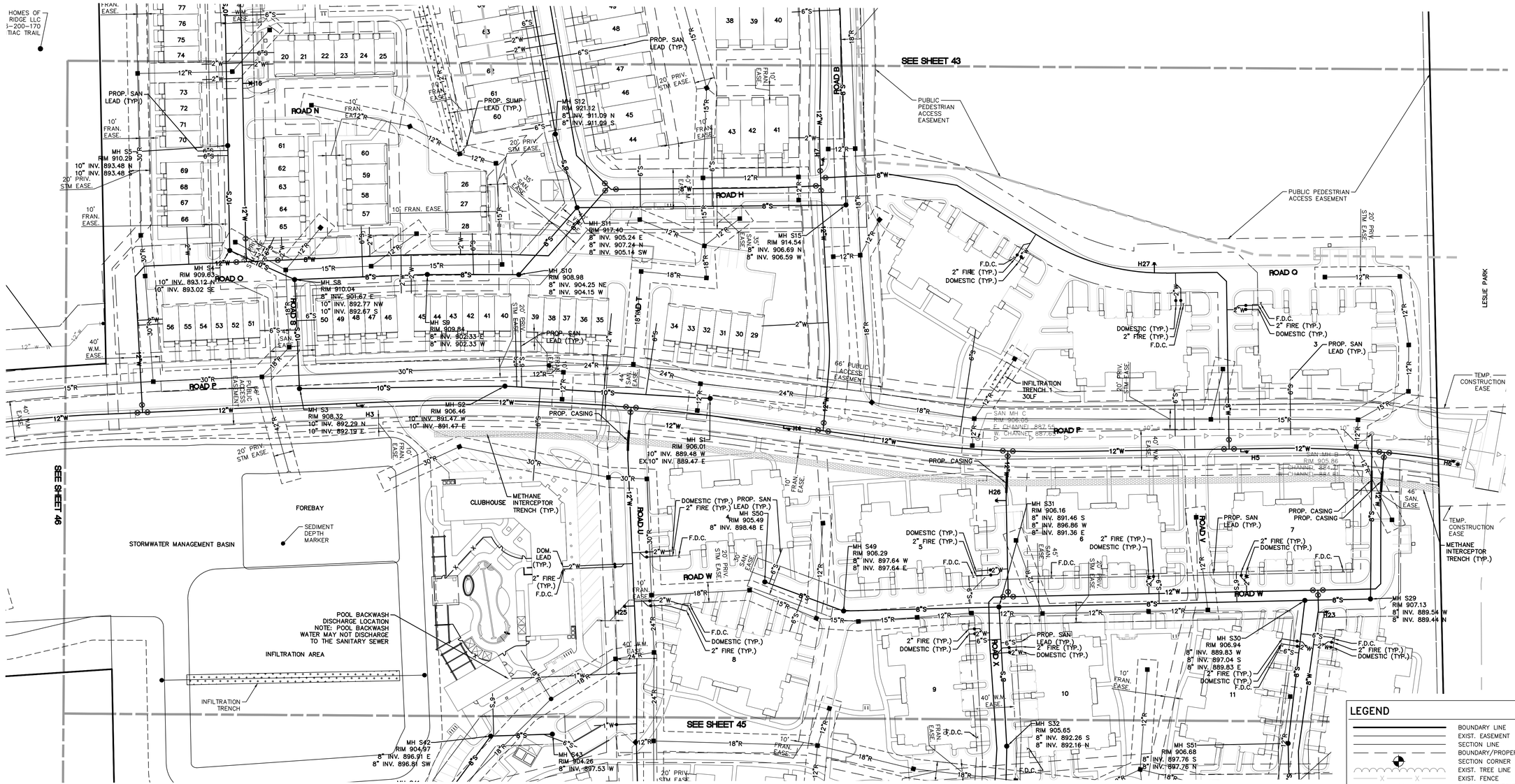
DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

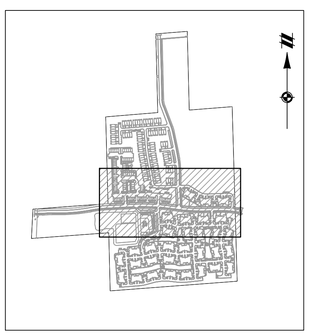
REVISIONS

SCALE 0 25 50
1" = 50 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. 43

K:\ANN2022\CAD\PLANSET\ATWELL SITE SETS\ATWELL PRELIMINARY SITE SETS.DWG, 7/12/2022 9:44 AM, STEVE SICA




NOTE: ANY EXISTING SANITARY PIPE PROPOSED TO BE REUSED SHALL BE JETTED, VIDEOED AND REVIEWED BY THE CITY DURING THE CONSTRUCTION PLAN REVIEW PHASE. ANY NECESSARY REPAIRS TO THE PIPE WILL BE THE RESPONSIBILITY OF THE DEVELOPER.



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- MATCHLINE
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. ACCESS EASEMENT
- PROP. STORM EASEMENT
- PROP. SANITARY EASEMENT
- PROP. WATER EASEMENT
- EX. WETLAND BUFFER
- PROP. FRANCHISE EASEMENT
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
UTILITY PLAN – AREA 3

DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO.
44

I:\18002264\CAD\PLAN SETS\SITE PREL\18002264_SITE.DWG 7/27/2022 8:44 AM STEVE SILK

SEE SHEET 46

SEE SHEET 44

FOREBAY

SEDIMENT DEPTH MARKER

STORMWATER MANAGEMENT BASIN

METHANE INTERCEPTOR TRENCH (TYP.)

CLUBHOUSE

DOM. LEAD (TYP.)

2" FIRE (TYP.) F.D.C.

POOL BACKWASH DISCHARGE LOCATION
NOTE: POOL BACKWASH WATER MAY NOT DISCHARGE TO THE SANITARY SEWER

INFILTRATION AREA

INFILTRATION TRENCH

INFILTRATION TRENCH 4 240LF

INFILTRATION TRENCH 3 82LF

INFILTRATION TRENCH 5 185LF

MH S42
RIM 904.97
8" INV. 896.91 E
8" INV. 896.81 SW

MH S41
RIM 903.14
8" INV. 896.55 NE
8" INV. 896.41 S

MH S40
RIM 904.01
8" INV. 898.30 N

MH S39
RIM 904.24
8" INV. 896.80 S
8" INV. 896.70 E

MH S38
RIM 902.86
8" INV. 895.90 W
8" INV. 895.90 E

MH S37
RIM 902.98
8" INV. 895.66 W
8" INV. 895.76 N
8" INV. 895.66 E

MH S43
RIM 904.26
8" INV. 897.53 W

MH S50
RIM 905.49
8" INV. 898.48 E

MH S49
RIM 906.29
8" INV. 897.64 W
8" INV. 897.64 E

MH S31
RIM 906.16
8" INV. 891.46 S
8" INV. 896.86 W
8" INV. 891.36 E

MH S30
RIM 906.94
8" INV. 889.83 W
8" INV. 897.04 S
8" INV. 889.83 E

MH S29
RIM 907.13
8" INV. 889.54 W
8" INV. 889.44 N

MH S32
RIM 905.65
8" INV. 892.26 S
8" INV. 892.16 N

MH S51
RIM 906.68
8" INV. 897.76 S
8" INV. 897.76 N

MH S52
RIM 906.74
8" INV. 898.12 S
8" INV. 898.12 N

MH S53
RIM 906.73
8" INV. 898.68 S
8" INV. 898.68 N

MH S54
RIM 906.60
8" INV. 899.60 N

MH S33
RIM 906.93
8" INV. 892.94 S
8" INV. 893.04 W
8" INV. 892.94 N

MH S34
RIM 905.77
8" INV. 893.79 W
8" INV. 893.79 E

MH S35
RIM 904.75
8" INV. 894.46 W
8" INV. 894.46 E

MH S36
RIM 903.84
8" INV. 895.06 W
8" INV. 895.06 E

MH S47
RIM 904.21
8" INV. 896.72 W
8" INV. 896.72 E

MH S46
RIM 904.55
8" INV. 896.00 W
8" INV. 896.00 E

MH S45
RIM 905.39
8" INV. 895.30 W
8" INV. 895.30 E

MH S44
RIM 906.89
8" INV. 894.52 W
8" INV. 894.42 N

MH S48
RIM 904.01
8" INV. 898.06 E

STORM RIM 902.29

ROAD U
ROAD W
ROAD X
ROAD Y
ROAD Z
ROAD AA
ROAD BB
ROAD CC

H26 H25 H23 H24 H22 H18 H17 H20 H21 H19

PROP. SAN LEAD (TYP.)
PROP. CASING
PROP. CASING

TEMP. CONSTRUCTION EASE

METHANE INTERCEPTOR TRENCH (TYP.)

LESLIE PARK
CITY OF ANN ARBOR PARKS DEPT
PIN: 09-09-16-100-001
1111 N. TRAVER RD (AD)

LESLIE PARK

LESLIE PARK
CITY OF ANN ARBOR PARKS DEPT
PIN: 09-09-16-400-008
1905 TRAVER ROAD

ARROWWOOD HILLS COOPERATIVE
PIN: 09-09-16-321-002
2566 ARROWWOOD TRAIL

GERALD CRANE & ANN FORSHEE CRANE
PIN: 09-09-16-201-040
PONTIAC TRAIL

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- MATCHLINE
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. ACCESS EASEMENT
- PROP. STORM EASEMENT
- PROP. SANITARY EASEMENT
- PROP. WATER EASEMENT
- EX. WETLAND BUFFER
- PROP. FRANCHISE EASEMENT
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE

KEY MAP
1" = 750 FEET

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN

UTILITY PLAN – AREA 4

DATE
JUNE 7, 2021

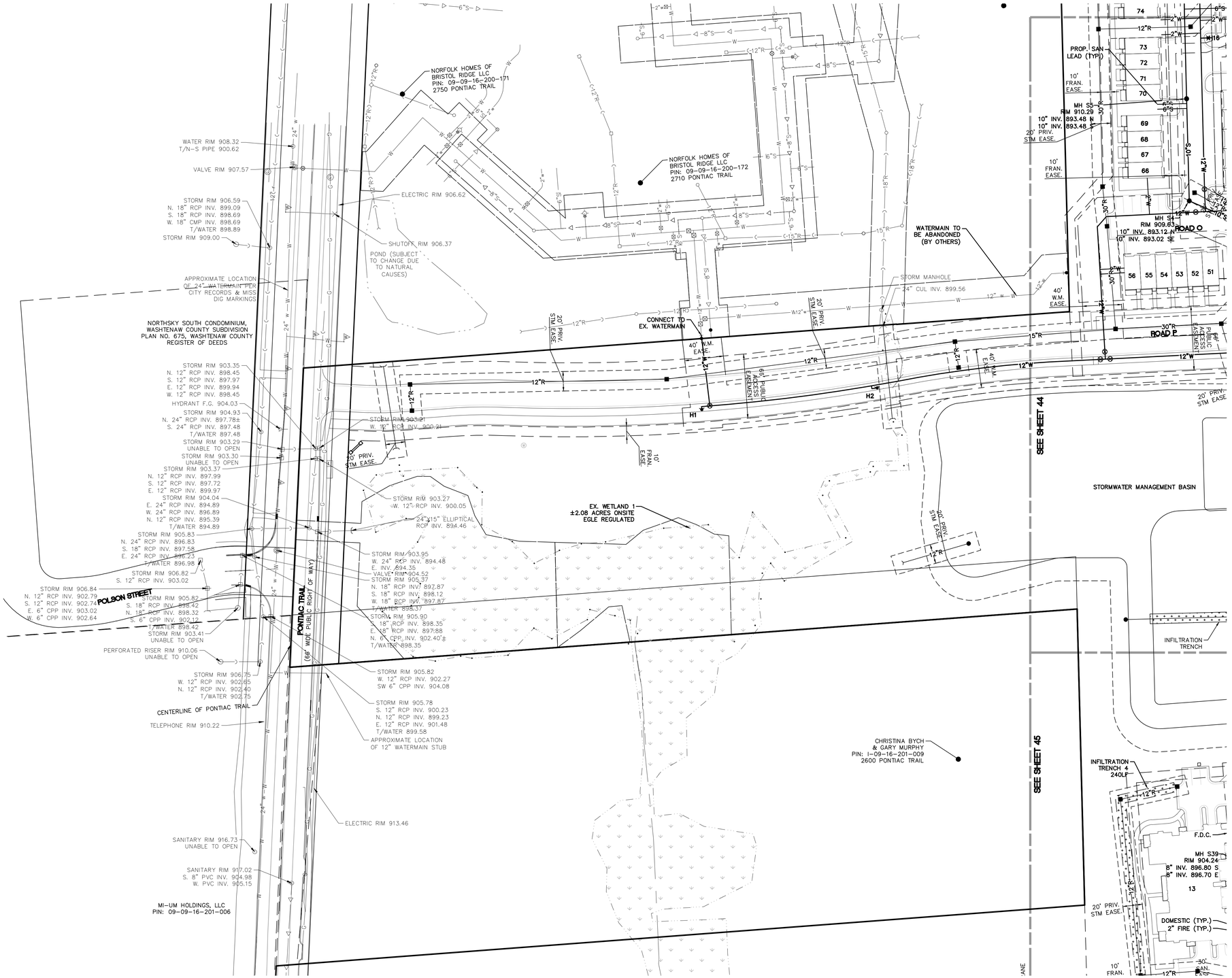
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

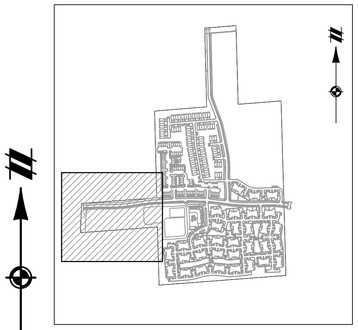
REVISIONS

SCALE 0 25 50
1" = 50 FEET

| | |
|---|---|
| DR. | SK |
| CH. | SS |
| P.M. | MB |
| BOOK | NA |
| JOB | 18002264 |
| SHEET NO. | 45 |

I:\18002264\CAD\PLOT\18002264-SP-UTIL PLAN.DWG 7/12/2022 11:44 AM STACY SILVA



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- MATCHLINE
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- EXIST. STORM SEWER
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. SETBACK
- PROP. ACCESS EASEMENT
- PROP. STORM EASEMENT
- PROP. SANITARY EASEMENT
- PROP. WATER EASEMENT
- EX. WETLAND BUFFER
- PROP. FRANCHISE EASEMENT
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE

Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN

UTILITY PLAN – AREA 5

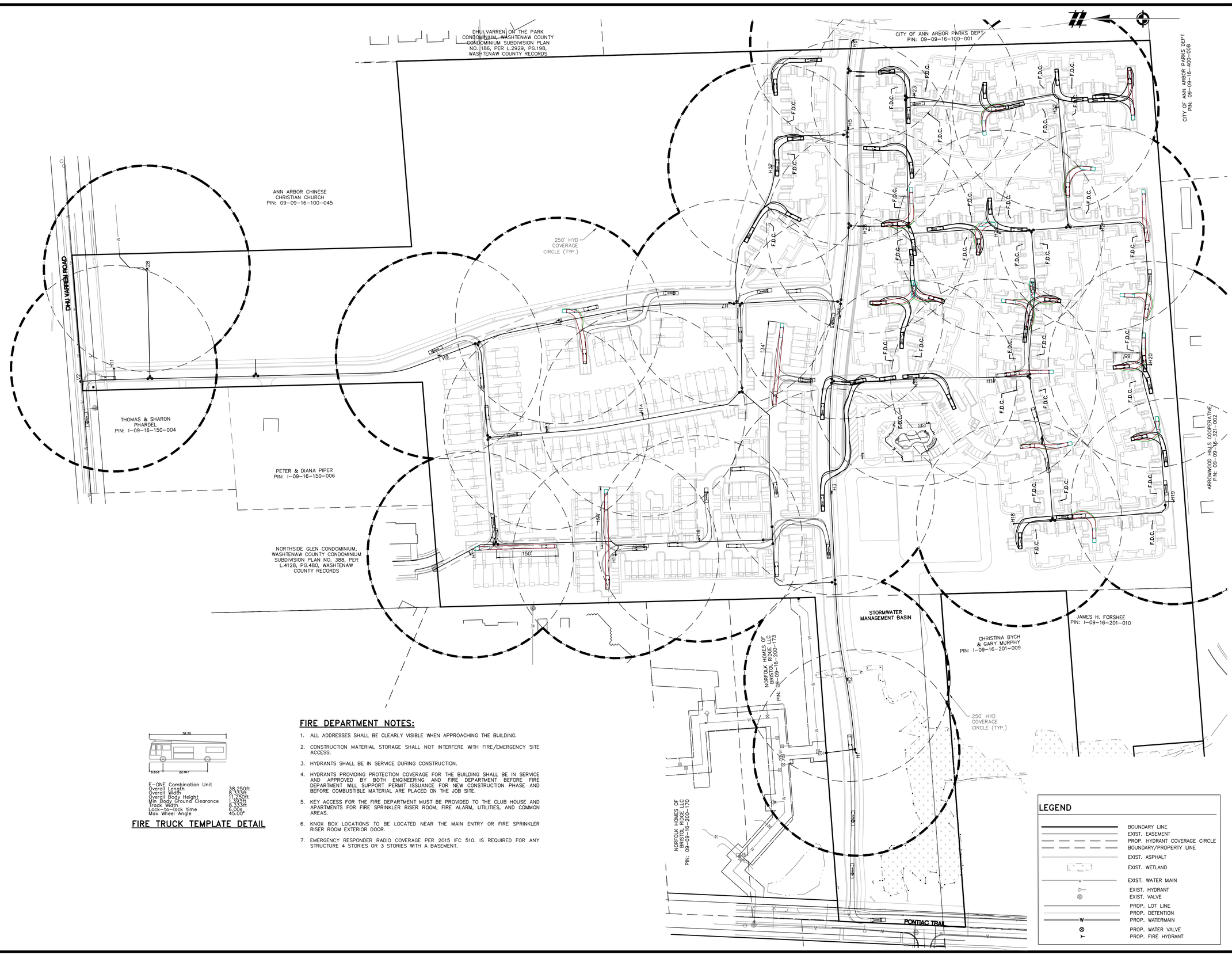
DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. 46

J:\18002264\CAD\PLAN SETS\SITE PROGRAM\18002264SP-SE-ULOW 7/7/2022 9:44 AM STEVE SELK







| | |
|---|---|
| E-ONE Combination Unit | |
| Overall Length | 38.250ft |
| Overall Width | 8.333ft |
| Overall Body Height | 11.250ft |
| Min Body Ground Clearance | 1.167ft |
| Track Width | 8.333ft |
| Lock-to-lock time | 5.00s |
| Max Wheel Angle | 45.00° |

## FIRE TRUCK TEMPLATE DETAIL

## FIRE DEPARTMENT NOTES:

1. ALL ADDRESSES SHALL BE CLEARLY VISIBLE WHEN APPROACHING THE BUILDING.
2. CONSTRUCTION MATERIAL STORAGE SHALL NOT INTERFERE WITH FIRE/EMERGENCY SITE ACCESS.
3. HYDRANTS SHALL BE IN SERVICE DURING CONSTRUCTION.
4. HYDRANTS PROVIDING PROTECTION COVERAGE FOR THE BUILDING SHALL BE IN SERVICE AND APPROVED BY BOTH ENGINEERING AND FIRE DEPARTMENT BEFORE FIRE DEPARTMENT WILL SUPPORT PERMIT ISSUANCE FOR NEW CONSTRUCTION PHASE AND BEFORE COMBUSTIBLE MATERIAL ARE PLACED ON THE JOB SITE.
5. KEY ACCESS FOR THE FIRE DEPARTMENT MUST BE PROVIDED TO THE CLUB HOUSE AND APARTMENTS FOR FIRE SPRINKLER RISER ROOM, FIRE ALARM, UTILITIES, AND COMMON AREAS.
6. KNOX BOX LOCATIONS TO BE LOCATED NEAR THE MAIN ENTRY OR FIRE SPRINKLER RISER ROOM EXTERIOR DOOR.
7. EMERGENCY RESPONDER RADIO COVERAGE PER 2015 IFC 510. IS REQUIRED FOR ANY STRUCTURE 4 STORIES OR 3 STORIES WITH A BASEMENT.

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- PROP. HYDRANT COVERAGE CIRCLE
- BOUNDARY/PROPERTY LINE
- EXIST. ASPHALT
- EXIST. WETLAND
- EXIST. WATER MAIN
- EXIST. HYDRANT
- EXIST. VALVE
- PROP. LOT LINE
- PROP. DETENTION
- PROP. WATERMAIN
- PROP. WATER VALVE
- PROP. FIRE HYDRANT

Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.

# VILLAGE OF ANN ARBOR
# SITE PLAN
## FIRE PROTECTION PLAN

DATE
JUNE 7, 2021

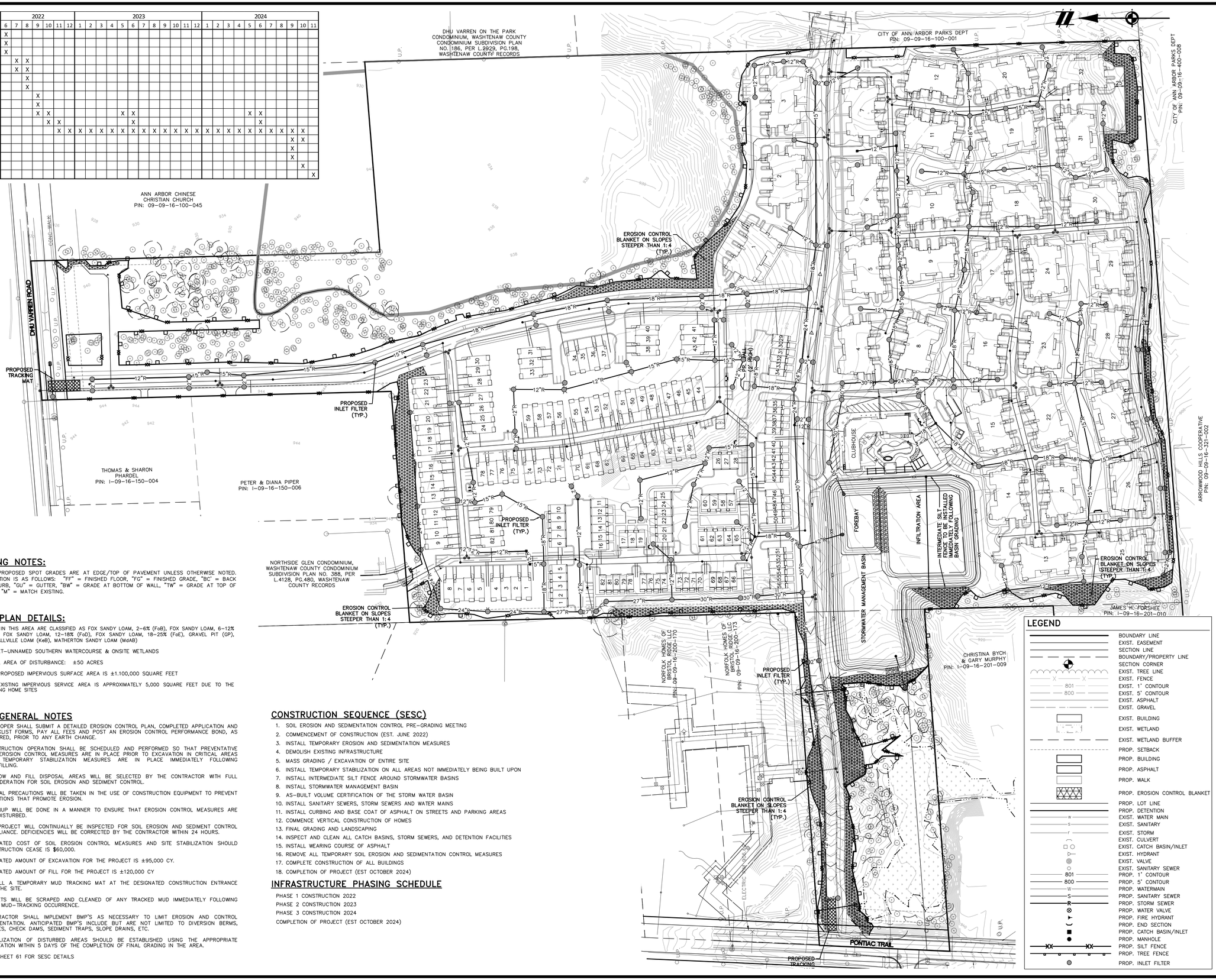
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 50 100
1" = 100 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. 47

J:\18002264\CAD\PLAN SETS\SITE PROGRAM\18002264SP-SITE.DWG 7/12/2022 8:44 AM STEVE SILLS

| | CONSTRUCTION TASK | 2022 | | | | | | 2023 | | | | | | | | | | | | 2024 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 1 | SESC Pre-Grading Meeting | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Commence Construction | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | Install Temporary SESC Measures | X | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Demolition of Existing Infrastructure | | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Mass Grading / Excavation of Entire Site | | X | X | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | Temporary Stabilization | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | Install Intermediate SESC Measures | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | Install Stormwater Management Basin | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | As-built Volume Certification of Basin | | | | X | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | Install underground utilities | | | | X | X | | | | | | | | X | X | | | | | | | | | | | X | X | | | | |
| 11 | Install curbing and base coat pavement | | | | | X | X | | | | | | | | X | | | | | | | | | | | | X | | | | |
| 12 | Construct Buildings | | | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| 13 | Final Grading and Landscaping | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | X | |
| 14 | Inspect and Clean Stormwater System | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | |
| 15 | Install wearing course pavement | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | | |
| 16 | Remove Temporary SESC Measures | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X | |
| 17 | Project Completion | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | X |




## GRADING NOTES:

1. ALL PROPOSED SPOT GRADES ARE AT EDGE/TOP OF PAVEMENT UNLESS OTHERWISE NOTED. NOTATION IS AS FOLLOWS: "FF" = FINISHED FLOOR, "FG" = FINISHED GRADE, "BC" = BACK OF CURB, "GU" = GUTTER, "BW" = GRADE AT BOTTOM OF WALL, "TW" = GRADE AT TOP OF WALL "M" = MATCH EXISTING.

## SESC PLAN DETAILS:

1. SOILS IN THIS AREA ARE CLASSIFIED AS FOX SANDY LOAM, 2-6% (FoB), FOX SANDY LOAM, 6-12% (FoC), FOX SANDY LOAM, 12-18% (FoD), FOX SANDY LOAM, 18-25% (FoE), GRAVEL PIT (GP), KENDALLVILLE LOAM (KeB), MATHERTON SANDY LOAM (MdAB)
2. OUTLET-UNNAMED SOUTHERN WATERCOURSE & ONSITE WETLANDS
3. TOTAL AREA OF DISTURBANCE: ±50 ACRES
4. THE PROPOSED IMPERVIOUS SURFACE AREA IS ±1,100,000 SQUARE FEET
5. THE EXISTING IMPERVIOUS SERVICE AREA IS APPROXIMATELY 5,000 SQUARE FEET DUE TO THE EXISTING HOME SITES

## SESC GENERAL NOTES

1. DEVELOPER SHALL SUBMIT A DETAILED EROSION CONTROL PLAN, COMPLETED APPLICATION AND CHECKLIST FORMS, PAY ALL FEES AND POST AN EROSION CONTROL PERFORMANCE BOND, AS REQUIRED, PRIOR TO ANY EARTH CHANGE.
2. CONSTRUCTION OPERATION SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE SOIL EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION IN CRITICAL AREAS AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING.
3. BORROW AND FILL DISPOSAL AREAS WILL BE SELECTED BY THE CONTRACTOR WITH FULL CONSIDERATION FOR SOIL EROSION AND SEDIMENT CONTROL.
4. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
5. CLEANUP WILL BE DONE IN A MANNER TO ENSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.
6. THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENT CONTROL COMPLIANCE. DEFICIENCIES WILL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS.
7. ESTIMATED COST OF SOIL EROSION CONTROL MEASURES AND SITE STABILIZATION SHOULD CONSTRUCTION CEASE IS $60,000.
8. ESTIMATED AMOUNT OF EXCAVATION FOR THE PROJECT IS ±95,000 CY.
9. ESTIMATED AMOUNT OF FILL FOR THE PROJECT IS ±120,000 CY
10. INSTALL A TEMPORARY MUD TRACKING MAT AT THE DESIGNATED CONSTRUCTION ENTRANCE FOR THE SITE.
11. STREETS WILL BE SCRAPED AND CLEANED OF ANY TRACKED MUD IMMEDIATELY FOLLOWING EACH MUD-TRACKING OCCURRENCE.
12. CONTRACTOR SHALL IMPLEMENT BMP'S AS NECESSARY TO LIMIT EROSION AND CONTROL SEDIMENTATION. ANTICIPATED BMP'S INCLUDE BUT ARE NOT LIMITED TO DIVERSION BERMS, SWALES, CHECK DAMS, SEDIMENT TRAPS, SLOPE DRAINS, ETC.
13. STABILIZATION OF DISTURBED AREAS SHOULD BE ESTABLISHED USING THE APPROPRIATE VEGETATION WITHIN 5 DAYS OF THE COMPLETION OF FINAL GRADING IN THE AREA.
14. SEE SHEET 61 FOR SESC DETAILS

## CONSTRUCTION SEQUENCE (SESC)

1. SOIL EROSION AND SEDIMENTATION CONTROL PRE-GRADING MEETING
2. COMMENCEMENT OF CONSTRUCTION (EST. JUNE 2022)
3. INSTALL TEMPORARY EROSION AND SEDIMENTATION MEASURES
4. DEMOLISH EXISTING INFRASTRUCTURE
5. MASS GRADING / EXCAVATION OF ENTIRE SITE
6. INSTALL TEMPORARY STABILIZATION ON ALL AREAS NOT IMMEDIATELY BEING BUILT UPON
7. INSTALL INTERMEDIATE SILT FENCE AROUND STORMWATER BASINS
8. INSTALL STORMWATER MANAGEMENT BASIN
9. AS-BUILT VOLUME CERTIFICATION OF THE STORM WATER BASIN
10. INSTALL SANITARY SEWERS, STORM SEWERS AND WATER MAINS
11. INSTALL CURBING AND BASE COAT OF ASPHALT ON STREETS AND PARKING AREAS
12. COMMENCE VERTICAL CONSTRUCTION OF HOMES
13. FINAL GRADING AND LANDSCAPING
14. INSPECT AND CLEAN ALL CATCH BASINS, STORM SEWERS, AND DETENTION FACILITIES
15. INSTALL WEARING COURSE OF ASPHALT
16. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES
17. COMPLETE CONSTRUCTION OF ALL BUILDINGS
18. COMPLETION OF PROJECT (EST OCTOBER 2024)

## INFRASTRUCTURE PHASING SCHEDULE

PHASE 1 CONSTRUCTION 2022
PHASE 2 CONSTRUCTION 2023
PHASE 3 CONSTRUCTION 2024
COMPLETION OF PROJECT (EST OCTOBER 2024)

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- 801 EXIST. 1' CONTOUR
- 800 EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. EROSION CONTROL BLANKET
- PROP. LOT LINE
- PROP. DETENTION
- W EXIST. WATER MAIN
- S EXIST. SANITARY
- r EXIST. STORM
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- 801 PROP. 1' CONTOUR
- 800 PROP. 5' CONTOUR
- W PROP. WATERMAIN
- S PROP. SANITARY SEWER
- R PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- XX PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR

# SITE PLAN
## OVERALL GRADING & SESC PLAN

DATE
JUNE 7, 2021

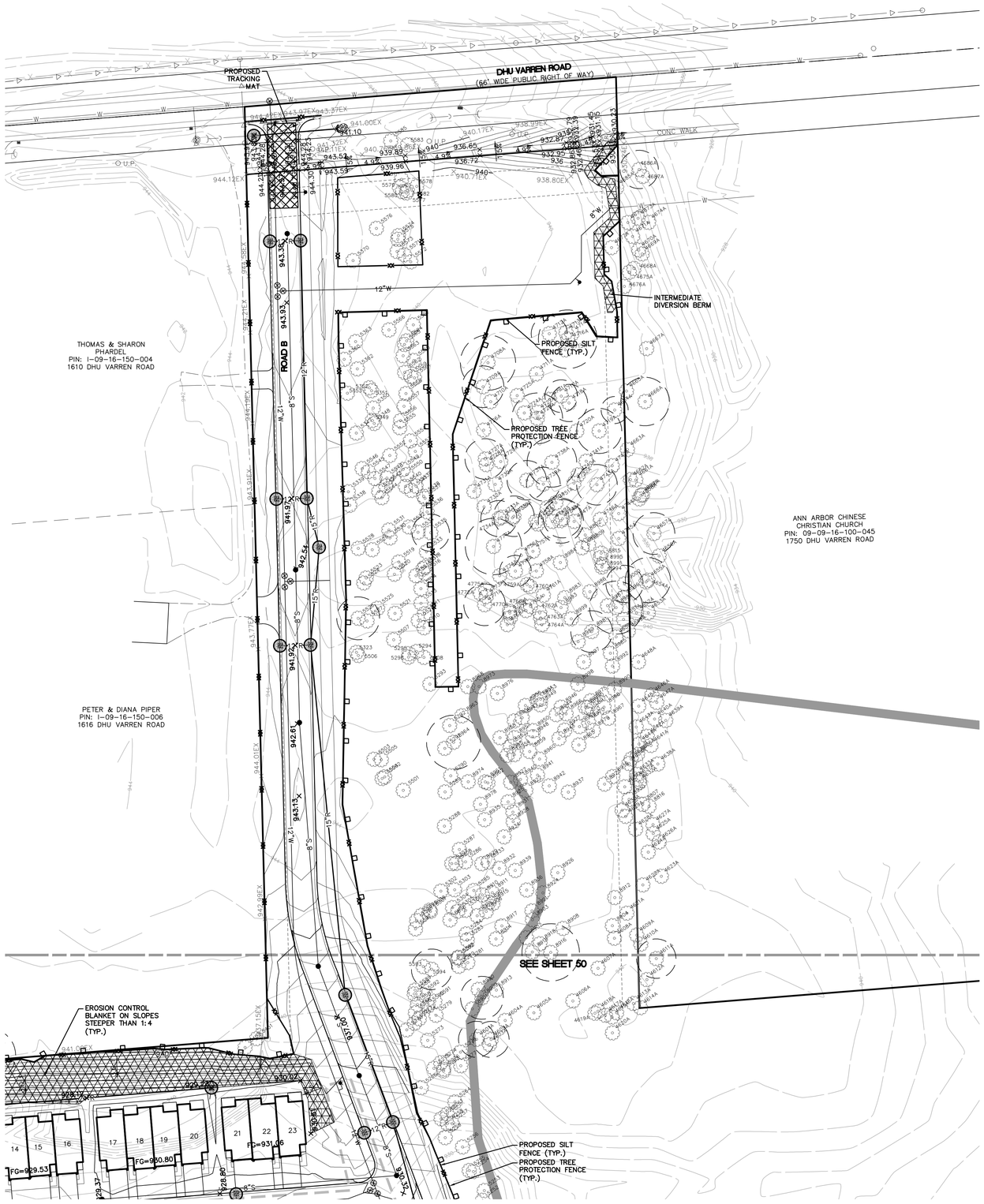
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

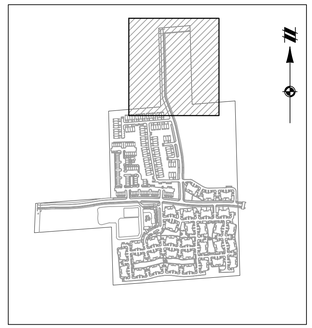
REVISIONS

SCALE 0 50 100
1" = 100 FEET

| | |
|---|---|
| DR. | SK |
| CH. | SS |
| P.M. | MB |
| BOOK | NA |
| JOB | 18002264 |
| SHEET NO. | 48 |

C:\ATWELL\2018\18002264\CAD\PLAN SETS\SITE PRELIMINARY\18002264SP-01 SESC.DWG 7/12/2022 9:16 AM PETER SILLS



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- MATCHLINE
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. EROSION CONTROL BLANKET
- PROP. LOT LINE
- PROP. DETENTION
- PROP. 1' CONTOUR
- PROP. 5' CONTOUR
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. STORM
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

811
Know what's **below.**
**Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
GRADING & SESC PLAN – AREA 1

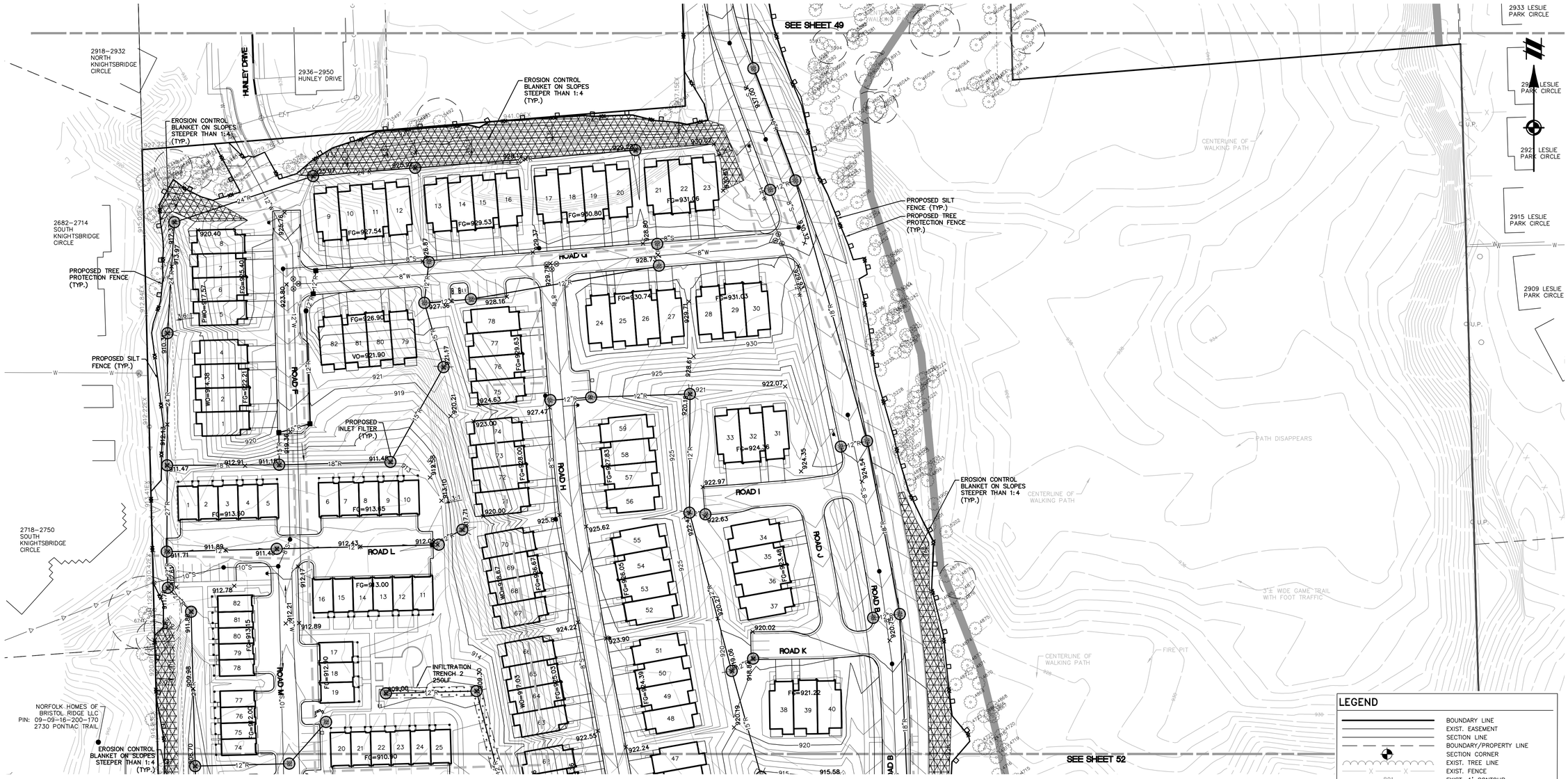
DATE
JUNE 7, 2021

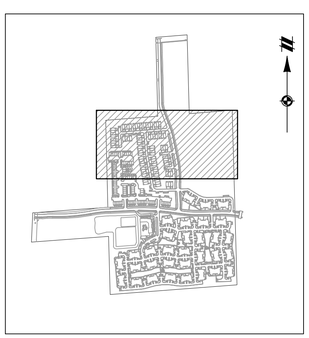
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET

| | |
|---|---|
| DR. SK | CH. SS |
| P.M. MB | |
| BOOK NA | |
| JOB 18002264 | |
| SHEET NO. 49 | |



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- MATCHLINE
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. EROSION CONTROL BLANKET
- PROP. LOT LINE
- PROP. DETENTION
- PROP. 1' CONTOUR
- PROP. 5' CONTOUR
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. STORM
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
GRADING & SESC PLAN – AREA 2

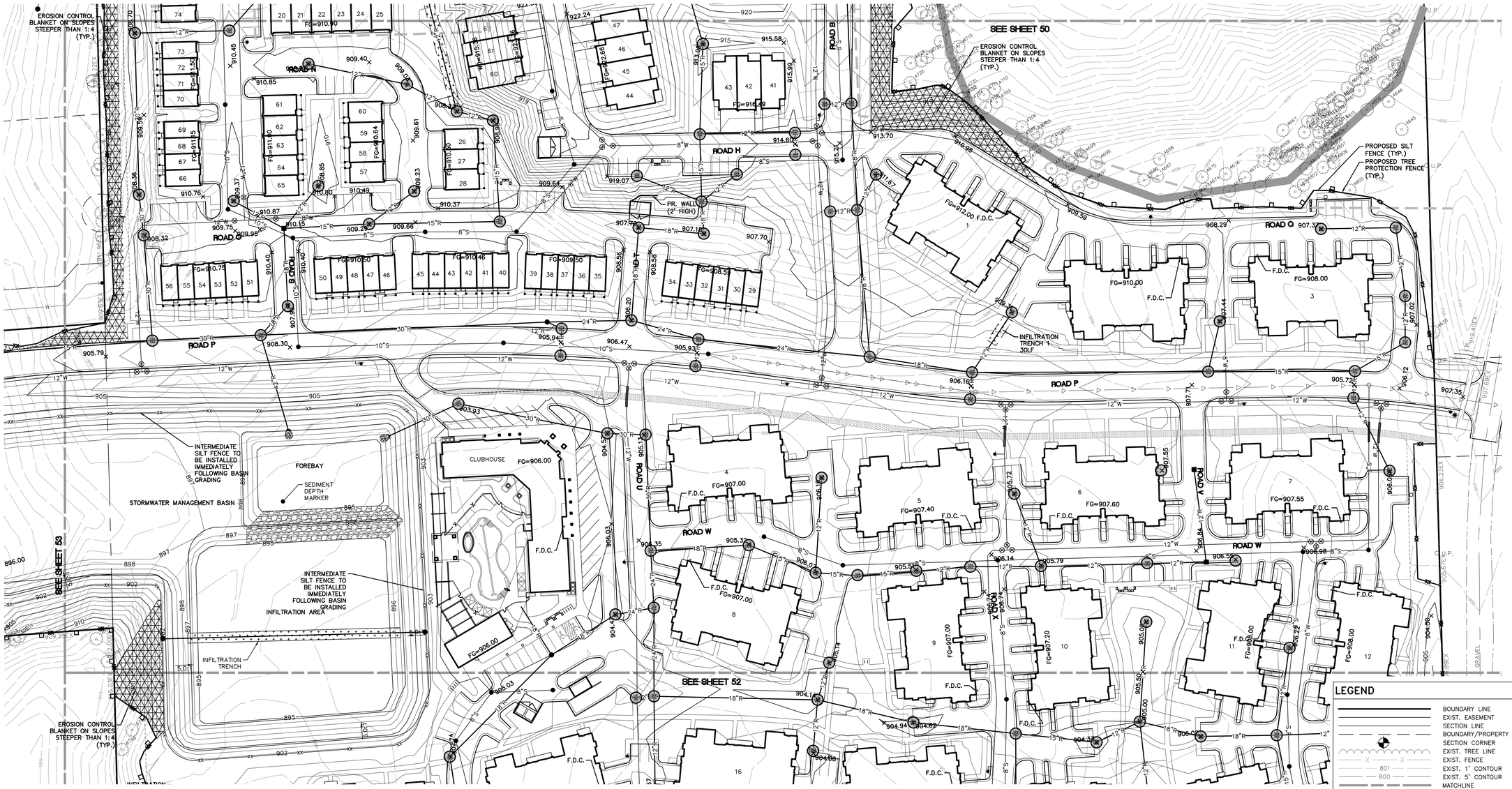
DATE
JUNE 7, 2021

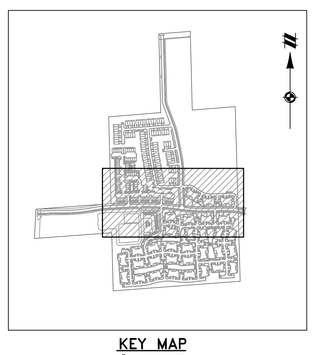
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET

| | |
|---|---|
| DR. SK | CH. SS |
| P.M. MB | |
| BOOK NA | |
| JOB 18002264 | |
| SHEET NO. 50 | |



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- MATCHLINE
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. EROSION CONTROL BLANKET
- PROP. LOT LINE
- PROP. DETENTION
- PROP. 1' CONTOUR
- PROP. 5' CONTOUR
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. STORM
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

Know what's below. Call before you dig.
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
**SITE PLAN**
GRADING & SESC PLAN – AREA 3

DATE
JUNE 7, 2021

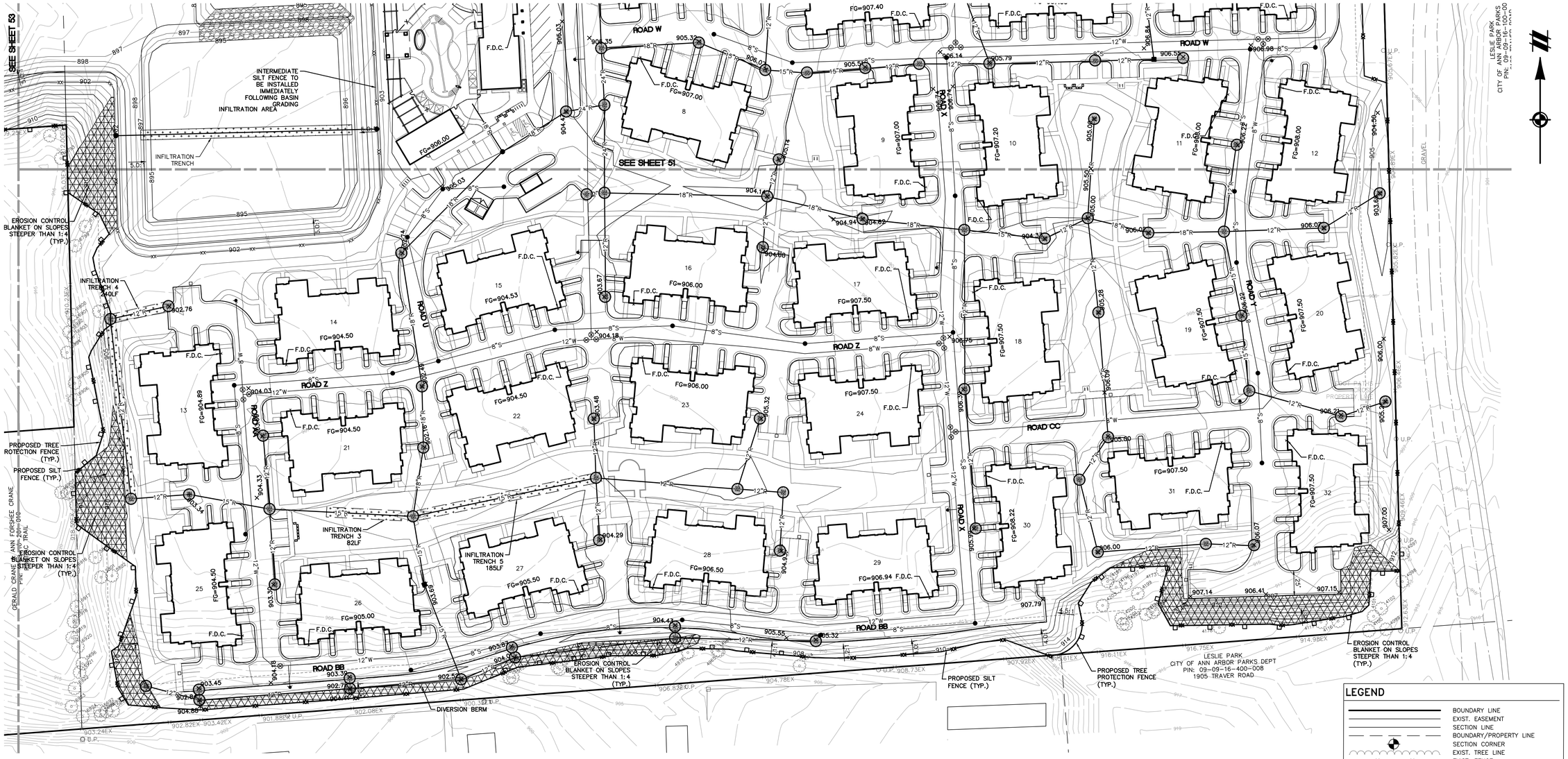
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

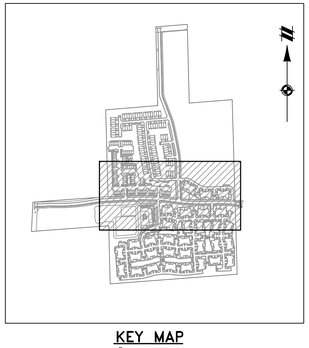
REVISIONS

SCALE 0 25 50
1" = 50 FEET

| | |
|---|---|
| DR. | SK |
| CH. | SS |
| P.M. | MB |
| BOOK | NA |
| JOB | 18002264 |
| SHEET NO. | 51 |

N:\18002264\CAD\PLANSET\PRELIMINARY SITE\SITE PRELIMINARY SITE PLAN.DWG 7/12/2022 8:41 AM STEVE SOLLS



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- MATCHLINE
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. EROSION CONTROL BLANKET
- PROP. LOT LINE
- PROP. DETENTION
- PROP. 1' CONTOUR
- PROP. 5' CONTOUR
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. STORM
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

811
Know what's **below.**
**Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT ©2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
GRADING & SESC PLAN – AREA 4

DATE
JUNE 7, 2021

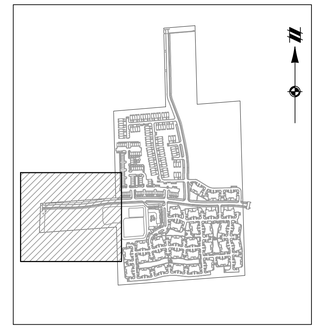
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET

| | |
|---|---|
| DR. SK | CH. SS |
| P.M. MB | |
| BOOK NA | |
| JOB 18002264 | |
| SHEET NO. 52 | |



KEY MAP
1" = 750 FEET

## LEGEND

| | |
|---|---|
| | BOUNDARY LINE |
| | EXIST. EASEMENT |
| | SECTION LINE |
| | BOUNDARY/PROPERTY LINE |
| | SECTION CORNER |
| | EXIST. TREE LINE |
| | EXIST. FENCE |
| 801 | EXIST. 1' CONTOUR |
| 800 | EXIST. 5' CONTOUR |
| | MATCHLINE |
| | EXIST. ASPHALT |
| | EXIST. GRAVEL |
| | EXIST. BUILDING |
| | EXIST. WETLAND |
| | EXIST. WETLAND BUFFER |
| | PROP. SETBACK |
| | PROP. BUILDING |
| | PROP. ASPHALT |
| | PROP. WALK |
| | PROP. EROSION CONTROL BLANKET |
| | PROP. LOT LINE |
| | PROP. DETENTION |
| 801 | PROP. 1' CONTOUR |
| 800 | PROP. 5' CONTOUR |
| w | EXIST. WATER MAIN |
| s | EXIST. SANITARY |
| r | EXIST. STORM |
| | EXIST. CULVERT |
| | EXIST. CATCH BASIN/INLET |
| | EXIST. HYDRANT |
| | EXIST. VALVE |
| | EXIST. SANITARY SEWER |
| W | PROP. WATERMAIN |
| S | PROP. SANITARY SEWER |
| R | PROP. STORM SEWER |
| | PROP. WATER VALVE |
| | PROP. FIRE HYDRANT |
| | PROP. END SECTION |
| | PROP. CATCH BASIN/INLET |
| | PROP. MANHOLE |
| XX | PROP. SILT FENCE |
| | PROP. TREE FENCE |
| | PROP. INLET FILTER |

811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
GRADING & SESC PLAN – AREA 5

DATE
JUNE 7, 2021

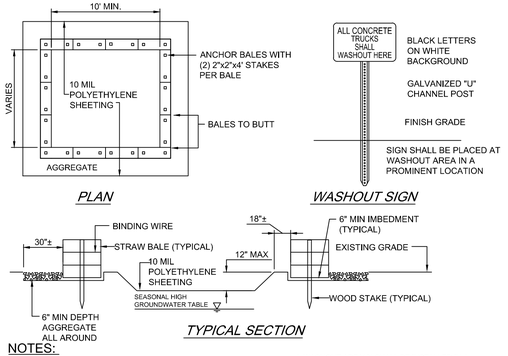
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 25 50
1" = 50 FEET

| | |
|---|---|
| DR. SK | CH. SS |
| P.M. MB | |
| BOOK NA | |
| JOB 18002264 | |
| SHEET NO. 53 | |


DIXBORO ROAD
DIXBORO ROAD
DIXBORO ROAD

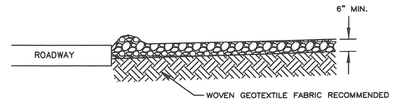



NOTES:

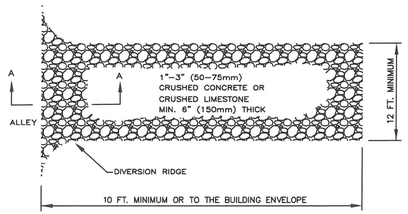
1. CONTAINMENT MUST BE STRUCTURALLY SOUND AND LEAK FREE AND CONTAIN ALL LIQUID WASTES.
2. CONTAINMENT DEVICES MUST BE OF SUFFICIENT QUANTITY OR VOLUME TO COMPLETELY CONTAIN THE LIQUID WASTES GENERATED.
3. WASHOUT MUST BE CLEANED OR NEW FACILITIES CONSTRUCTED AND READY TO USE ONCE ASHOUT IS 75% FULL.
4. WASHOUT AREA(S) SHALL BE INSTALLED IN A LOCATION EASILY ACCESSIBLE BY CONCRETE TRUCKS.
5. ONE OR MORE AREAS MAY BE INSTALLED ON THE CONSTRUCTION SITE AND MAY BE RELOCATED AS CONSTRUCTION PROGRESSES.
6. AT LEAST WEEKLY REMOVE ACCUMULATION OF SAND AND AGGREGATE AND DISPOSE OF PROPERLY.

## CONCRETE WASHOUT AREA

NO SCALE



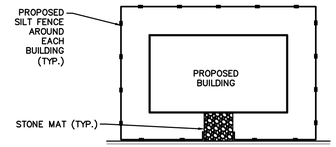

## CROSS SECTION A–A




## PLAN VIEW

## TEMPORARY STONE TRACKING MAT

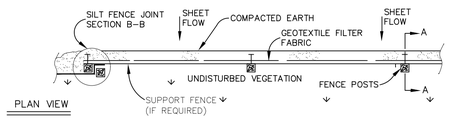
NO SCALE

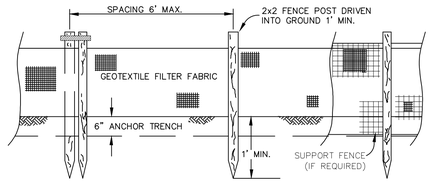


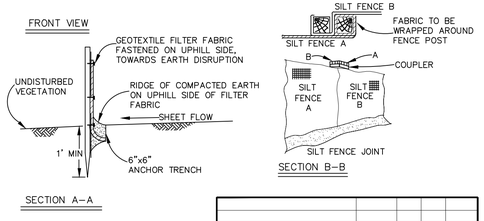

1. INSTALL STONE MUD MAT AT EACH BUILDING
2. INSTALL SILT FENCE SURROUND BUILDING SITE
3. MAINTAIN SILT FENCE AND TRACKING MAT IN FUNCTIONING CONDITION THROUGHOUT CONSTRUCTION
4. STABILIZE GROUND BEFORE REMOVING SILT FENCE
5. REFER TO PLANS FOR ADDITIONAL SOIL EROSION CONTROL MEASURES

## TYPICAL BUILDING S.E.S.C. EXHIBIT

NO SCALE




| REVISIONS | REV. NO. | DR.BY | CH. BY | DATE |
|---|---|---|---|---|
| | | | | |

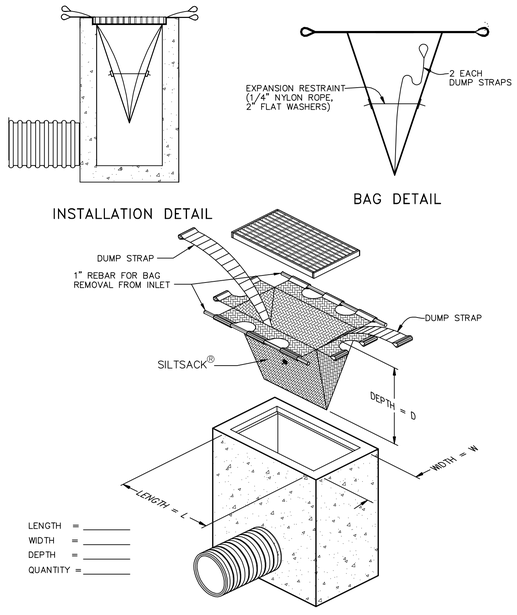
PUBLIC SERVICES DEPARTMENT
CITY OF ANN ARBOR

SILT FENCE

| DR. BY DF/SMJ | CH. BY CSS/DF | DRAWING NO. |
|---|---|---|
| SCALE NONE | DATE 11-6-92 | SD-EC-3 |
| INCH | | SHEET NO. ____ OF ____ |

## SILT FENCE DETAIL

NO SCALE




## SILT SACK INLET FILTER

NO SCALE

| TASKS | COMPONENTS | | | | | SCHEDULE | Annual Cost |
|---|---|---|---|---|---|---|---|
| | Storm Sewer System | Ditches and Swales | Outflow Control Structure | Pond Outlet & Rip-Rap | Detention/ Infiltration Basins | | |
| Inspect for sediment, floatables, and debris | X | X | X | | X | Semi-Annually | $ 600.00 |
| Removal of sediment, floatables, and debris | X | X | X | | X | As Needed | $ 1,400.00 |
| Inspection for erosion | | X | X | X | X | Quarterly | $ 300.00 |
| Re-establish permanent vegetation on eroded slopes | | X | X | X | X | As needed | $ 500.00 |
| Replacement of stone | | X | X | X | | As Needed | $ 700.00 |
| Mowing | | X | | | | 1-2 times per year | $ 400.00 |
| Inspect Stormwater system components during wet weather and compare to as-built plans | X | X | X | X | X | Semi-Annually | $ 400.00 |
| Make adjustments as determined by annual inspection | X | X | X | X | X | As needed | $ 500.00 |
| | | | | | | Total Cost= | $ 4,800.00 |

*Note: Stormwater maintenance is the responsibility of the home owners association.*
*NOTE: "As Needed" refers to when sediment has accumulated to a maximum of one foot depth, visually apparent debris exists, or if either of the stormwater management basins do not drain within 48-72 hours after a rain event*
*NOTE: No chemicals are allowed in stormwater features or buffer zones with the following exception:*
*Invasive species may be treated with chemicals by a certified applicator.*
*NOTE: The Infiltaration basin shall be inspected following storms of 1" or more.*

## PERMANENT STORM WATER MAINTENANCE TASKS, SCHEDULE, & BUDGET

DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF THE STORMWATER SYSTEM, POST CONSTRUCTION THE HOMEOWNERS ASSOCIATION WILL BE RESPONSIBLE.

| TASKS | COMPONENTS | | | | | | | SCHEDULE |
|---|---|---|---|---|---|---|---|---|
| | Storm Sewer System | Catch Basin Inlet Filters | Silt Fence | Ditches and Swales | Outflow Control Structure | Rip-Rap | Detention/ Infiltration Basins | |
| Inspect for sediment, floatables, and debris | X | X | X | X | X | X | X | Weekly / Within 24 hrs after a Rain Event |
| Removal of sediment, floatables, and debris | X | X | X | X | X | X | X | As Needed |
| Inspection for erosion | | | | X | X | X | X | Weekly / Within 24 hrs after a Rain Event |
| Re-establish permanent vegetation on eroded slopes | | | | X | X | X | X | As needed |
| Replacement of stone | | | | | X | | | At turnover |

*NOTE: "As Needed" refers to when sediment has accumulated to a maximum of one foot depth and/or visually apparent debris exists*

## STORM WATER MAINTENANCE TASKS AND SCHEDULE DURING CONSTRUCTION

DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF THE STORMWATER SYSTEM


Know what's below. Call before you dig.
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC



ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000


SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
**SITE PLAN**

SESC NOTES & DETAILS

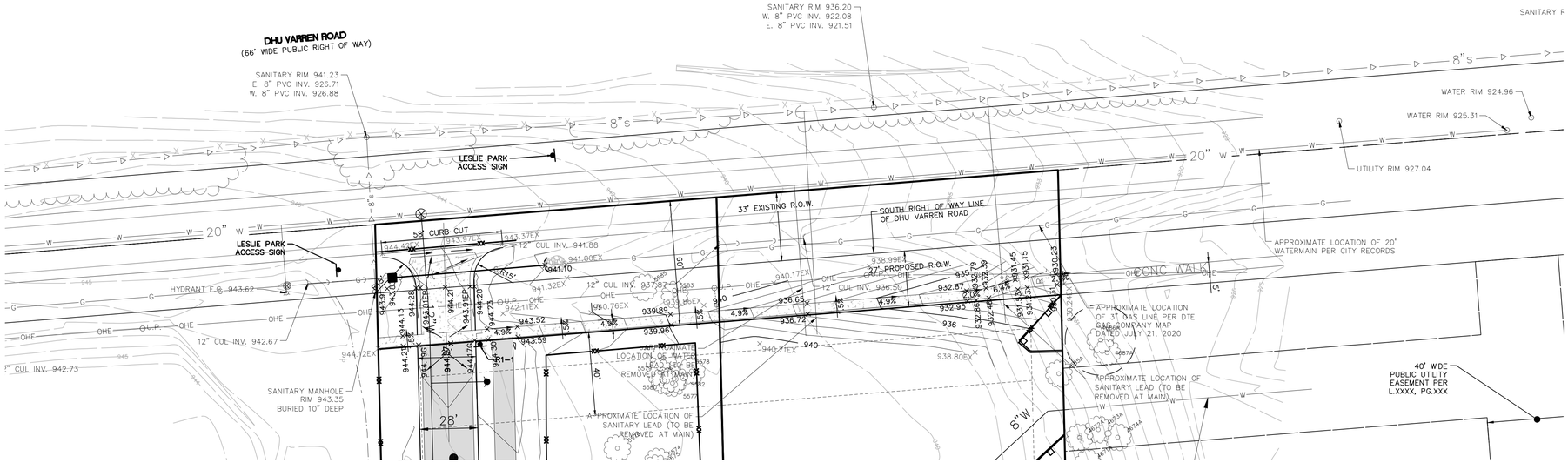
DATE
JUNE 7, 2021

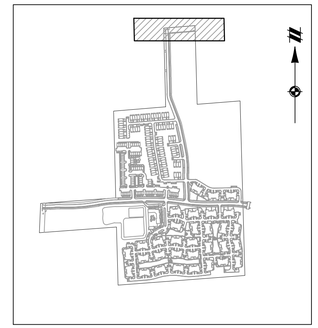
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 50 100
1" = 100 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO.
55


C:\1 WORKSPACE\JOBS\18002264\CAD\SESC\SESC_PROJMANAGEMENT.DWG 7/7/2022 9:48 AM STEVE GILLIS



KEY MAP
1" = 750 FEET

## LEGEND

| | |
|---|---|
| | BOUNDARY LINE |
| | EXIST. EASEMENT |
| | SECTION LINE |
| | BOUNDARY/PROPERTY LINE |
| | SECTION CORNER |
| | EXIST. TREE LINE |
| | EXIST. FENCE |
| 801 | EXIST. 1' CONTOUR |
| 800 | EXIST. 5' CONTOUR |
| W | EXIST. WATER MAIN |
| S | EXIST. SANITARY |
| r | EXIST. STORM |
| | EXIST. CULVERT |
| | EXIST. CATCH BASIN/INLET |
| | EXIST. HYDRANT |
| | EXIST. VALVE |
| | EXIST. SANITARY SEWER |
| | EXIST. ASPHALT |
| | EXIST. GRAVEL |
| | EXIST. BUILDING |
| | EXIST. WETLAND |
| | EXIST. WETLAND BUFFER |
| | PROP. SETBACK |
| | PROP. BUILDING |
| | PROP. ASPHALT |
| | PROP. WALK |
| | PROP. EROSION CONTROL BLANKET |
| | PROP. LOT LINE |
| | PROP. DETENTION |
| 801 | PROP. 1' CONTOUR |
| 800 | PROP. 5' CONTOUR |
| W | PROP. WATERMAIN |
| S | PROP. SANITARY SEWER |
| R | PROP. STORM SEWER |
| | PROP. WATER VALVE |
| | PROP. FIRE HYDRANT |
| | PROP. END SECTION |
| | PROP. CATCH BASIN/INLET |
| | PROP. MANHOLE |
| XX | PROP. SILT FENCE |
| | PROP. TREE FENCE |
| | PROP. INLET FILTER |

811
Know what's **below.**
**Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
SITE PLAN
DHU VARREN ROAD FRONTAGE

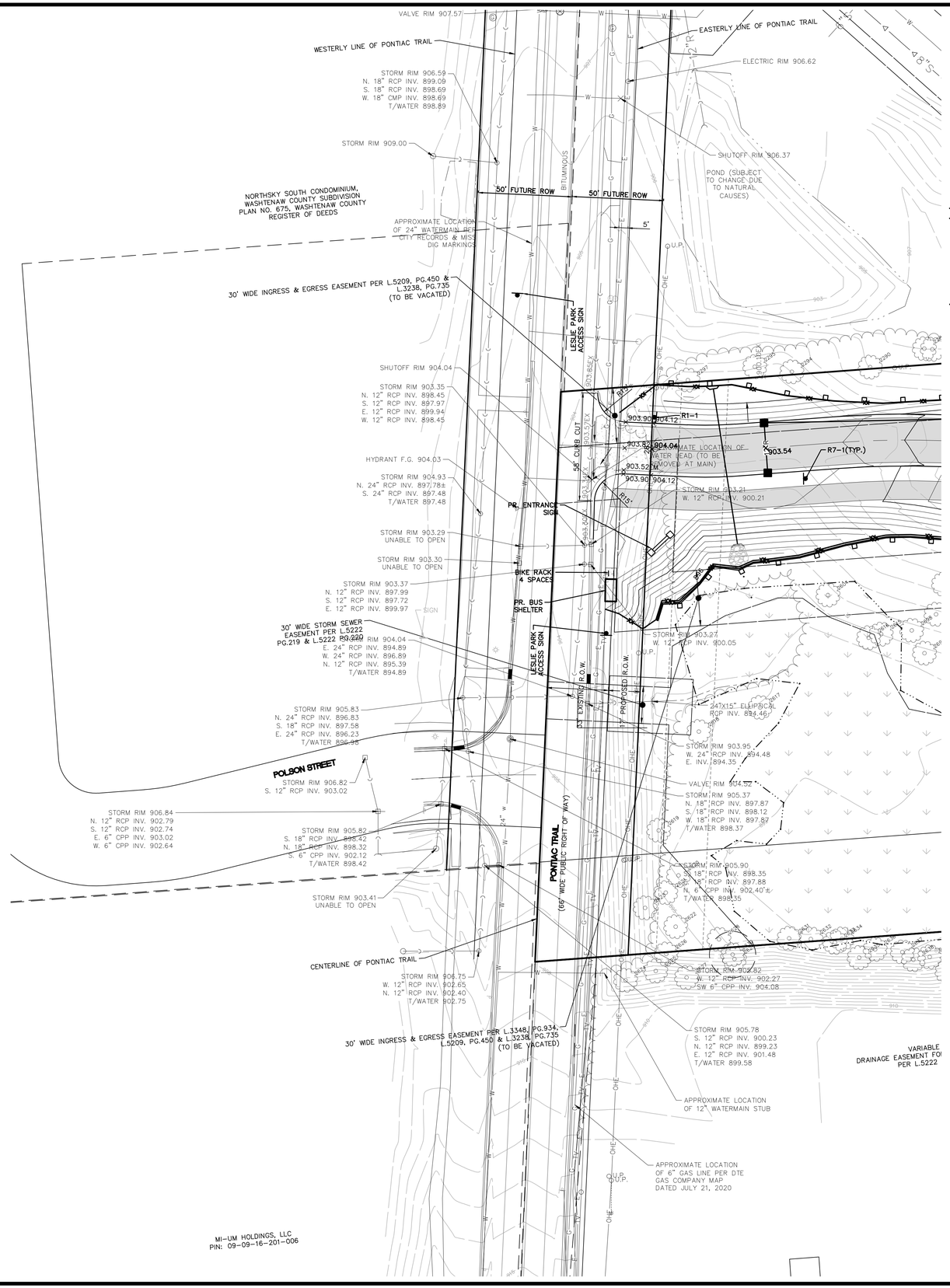
DATE
JUNE 7, 2021

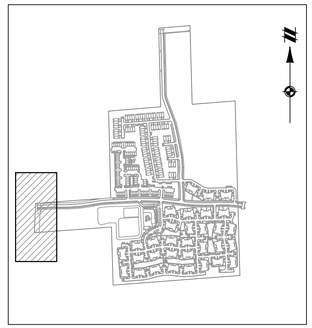
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 15 30
1" = 30 FEET

| | |
|---|---|
| DR. SK | CH. SS |
| P.M. MB | |
| BOOK NA | |
| JOB 18002264 | |
| SHEET NO. 56 | |



KEY MAP
1" = 750 FEET

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- EXIST. 1' CONTOUR
- EXIST. 5' CONTOUR
- EXIST. WATER MAIN
- EXIST. SANITARY
- EXIST. STORM
- EXIST. CULVERT
- EXIST. CATCH BASIN/INLET
- EXIST. HYDRANT
- EXIST. VALVE
- EXIST. SANITARY SEWER
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. EROSION CONTROL BLANKET
- PROP. LOT LINE
- PROP. DETENTION
- PROP. 1' CONTOUR
- PROP. 5' CONTOUR
- PROP. WATERMAIN
- PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER VALVE
- PROP. FIRE HYDRANT
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

811
Know what's **below.**
**Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.

VILLAGE OF ANN ARBOR
**SITE PLAN**

PONTIAC TRAIL FRONTAGE

DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

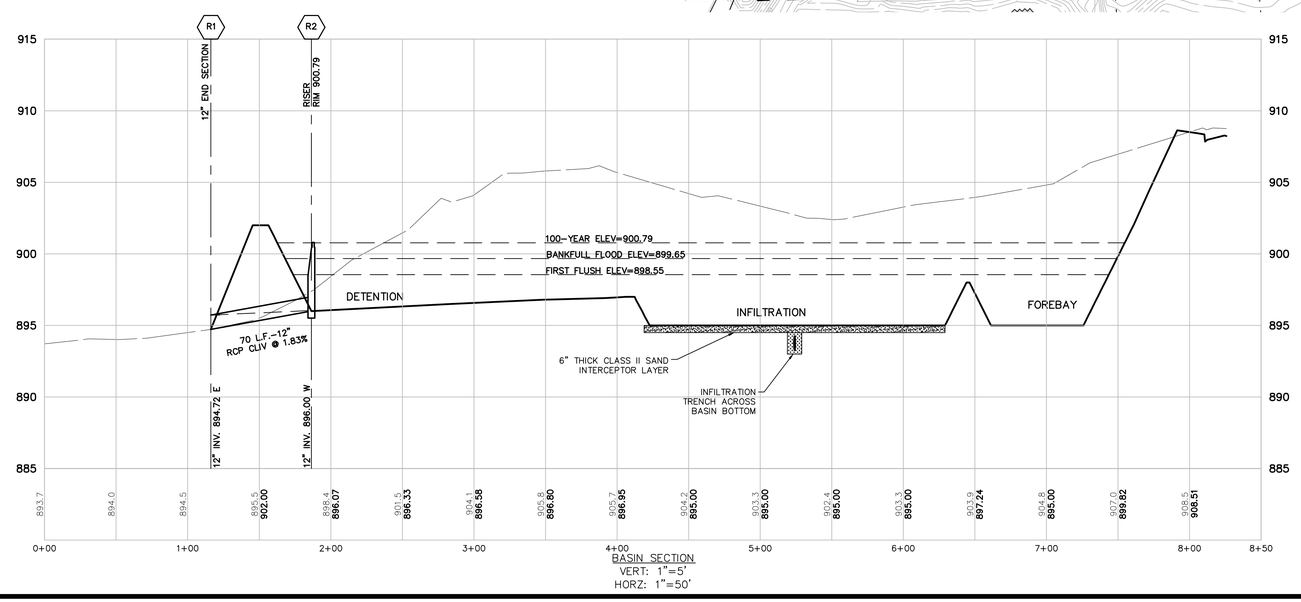
SCALE 0 15 30
1" = 30 FEET
DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO.
57

I:\18000s\18002264\CAD\PLAN SETS\SITE PREPARATION\SITE PLAN.dwg 7/12/2022 8:50 AM STEVE SKOLA




## STORMWATER MANAGEMENT NOTES:

1. INFILTRATION IS REQUIRED FOR THE FIRST FLUSH STORM EVENT AND DETENTION IS REQUIRED FOR THE 100 YEAR STORM EVENT IN ACCORDANCE WITH CITY OF ANN ARBOR CODE OF ORDINANCES 5:655.2.(B).(I). INFILTRATION IS BEING PROVIDED IN ACCORDANCE WITH WCWRC STANDARDS UTILIZING THE INFILTRATION BASIN AND INFILTRATION TRENCHES BEST MANAGEMENT PRACTICES.
2. THE SITE SOILS AT THE DEPTH OF PROPOSED INFILTRATION CONSISTS PRE-DOMINANTLY OF NATURAL GRANULAR SANDY SOILS. INFILTRATION TESTING WAS PROVIDED IN ACCORDANCE WITH WCWRC PROCEDURE ON APRIL 7, 2021.
3. REFER TO THE STORMWATER CALCULATIONS ON SHEET 59 AND GEOTECHNICAL INVESTIGATION REPORT PROVIDED BY SME, JOB #079760.02, DATED 12/21/19 AND THE INFILTRATION EVALUATION REPORT PROVIDED BY SME JOB #84695.02, DATED MAY 6, 2021. SOIL BORING AND TEST PIT LOCATIONS SHOWN IN THESE PLANS PER THE ABOVE REFERENCED REPORTS.




BASIN SECTION
VERT: 1"=5'
HORZ: 1"=50'

## LEGEND

- BOUNDARY LINE
- EXIST. EASEMENT
- SECTION LINE
- BOUNDARY/PROPERTY LINE
- SECTION CORNER
- EXIST. TREE LINE
- EXIST. FENCE
- 801 EXIST. 1' CONTOUR
- 800 EXIST. 5' CONTOUR
- EXIST. ASPHALT
- EXIST. GRAVEL
- EXIST. BUILDING
- EXIST. WETLAND
- EXIST. WETLAND BUFFER
- PROP. SETBACK
- PROP. BUILDING
- PROP. ASPHALT
- PROP. WALK
- PROP. LOT LINE
- PROP. DETENTION
- 801 PROP. 1' CONTOUR
- 800 PROP. 5' CONTOUR
- 12"R PROP. STORM SEWER
- PROP. END SECTION
- PROP. CATCH BASIN/INLET
- PROP. MANHOLE
- PROP. SILT FENCE
- PROP. TREE FENCE
- PROP. INLET FILTER

811 Know what's **below.** **Call** before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
**SITE PLAN**

STORMWATER MANAGEMENT PLAN

DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 50 100
1" = 100 FEET
DR. SK CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO.
58

P:\18002264\CAD\PLAN SETS\SITE PREP\MAIN\18002264SP-SITE.DWG 7/7/2022 9:53:16 AM STEVE SLAS

# STORMWATER DETENTION AND INFILTRATION CALCULATIONS:

**W1** Determining Post-Development Cover Types, Areas, Curve Numbers and runoff coefficients

Total Contributing Drainage Area = 61.24 Acres

Rational Method Variables

| Cover Type | Soil Type | Area (sf) | Area (ac) | Runoff Coef | (c)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B | 1,139,257 | 26.15 | 0.95 | 1,082,294 |
| Water Surfaces | B | 115,434 | 2.65 | 1.00 | 115,434 |
| Developed Open Space, Good Condition | B | 1,413,070 | 32.44 | 0.30 | 423,921 |
| | | | | Total - Sum (c)(Area) = | 1,621,649 |
| | | | | Area Total (sf)= | 2,667,761 |
| | | | | Weighted C-Sum(c)(Area)/Sum(ac) or Sum(sf)= | **0.61** |

NRCS Variables

| Pervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Developed Open Space, Good Condition | B | 1,413,070 | 32.44 | 61 | 86,197,297 |
| | | | Total - Sum (CN)(Area) = | | 86,197,297 |
| | | | Area Total - Sum(ac) of Sum(sf)= | | 1,413,070 |
| | | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | **61** |

NRCS Variables

| Impervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B | 1,139,257 | 26.15 | 98 | 111,647,182 |
| Impervious, Ponds | B | 115,434 | 2.65 | 98 | 11,312,532 |
| | | | Total - Sum (CN)(Area) = | | 122,959,714 |
| | | | Area Total - Sum(ac) of Sum(sf)= | | 1,254,691 |
| | | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | **98** |

**W2** First Flush Runoff Calculations (Vff)

A. Vff = (1") (1/12) (43560/1) (C) AC = **135,604** cf

**W3** Predevelopment Bankfull Runoff Calculations (Vbf-pre)

A. 2 year/24 hour storm event P = 2.35 in
B. Pervious Cover CN *(Meadow)* CN = 61
C. S = (1000/CN ) -10 S = 6.39 in
D. Q = (P-0.25)^2/(P+0.8S) Q = 0.15 in
E. Pervious Cover Area Area = 2,667,761 sf
F. $V_{bf\ pre}$ = Q(1/12)Area $V_{bf\ pre}$ = **34,181** cf

**W4** Pervious Cover Post-development Bankfull Runoff Calculations (Vbf-per-post)

A. 2 year/24 hour storm event P = 2.35 in
B. Pervious Cover CN CN = 61
C. S = (1000/CN ) -10 S = 6.39 in
D. Q = (P-0.25)^2/(P+0.8S) Q = 0.15 in
E. Pervious Cover Area Area = 1,413,070 sf
F. $V_{bf\text{-}per\text{-}post}$ = Q(1/12)Area $V_{bf\text{-}per\text{-}post}$ = **18,105** cf

**W5** Impervious Cover Post-development Bankfull Runoff Calculations (Vbf-imp-post)

A. 2 year/24 hour storm event P = 2.35 in
B. Impervious Cover CN CN = 98
C. S = (1000/CN ) -10 S = 0.20 in
D. Q = (P-0.25)^2/(P+0.8S) Q = 2.12 in
E. Impervious Cover Area Area = 1,254,691 sf
F. $V_{bf\text{-}imp\text{-}post}$ = Q(1/12)Area $V_{bf\text{-}imp\text{-}post}$ = **221,837** cf

**W6** Pervious Cover Post-development 100-year Storm Runoff Calculations (V100-per-post)

A. 100 year storm event P = 5.11 in
B. Pervious Cover CN CN = 61
C. S = (1000/CN ) -10 S = 6.39 in
D. Q = (P-0.25)^2/(P+0.8S) Q = 1.44 in
E. Pervious Cover Area Area = 1,413,070 sf
F. $V_{100\text{-}imp\text{-}post}$ = Q(1/12)Area $V_{100\text{-}imp\text{-}post}$ = **169,054** cf

**W7** Impervious Cover Post-development 100-year Storm Runoff Calculations (V100-imp-post)

A. 100 year storm event P = 5.11 in
B. Pervious Cover CN CN = 98
C. S = (1000/CN ) -10 S = 0.20 in
D. Q = (P-0.25)^2/(P+0.8S) Q = 4.87 in
E. Pervious Cover Area Area = 1,254,691 sf
F. $V_{100\text{-}imp\text{-}post}$ = Q(1/12)Area $V_{100\text{-}imp\text{-}post}$ = **509,509** cf

**W8** Determine Time of Concentration (Tc-hrs)

User specified; use 25 minutes from storm sewer calcs

Time of Concentration = 0.42 hr

**W9** Runoff Summary & Onsite Infiltration Requirement

A. Runoff Summary from Previous Worksheets

| | | | |
|---|---|---|---|
| $V_{ff}$ = | **135,604** | **cf*** | |
| $V_{bf\ pre}$ = | 34,181 | cf | |
| $V_{bf\text{-}per\text{-}post}$ = | 18,105 | cf | **Total BF Volume ($V_{bf\text{-}post}$)** 239,942 cf |
| $V_{bf\text{-}imp\text{-}post}$ = | 221,837 | cf | |
| $V_{100\text{-}per\text{-}post}$ = | 169,054 | cf | **Total 100-year Volume ($V_{100}$)** 678,563 cf |
| $V_{100\text{-}imp\text{-}post}$ = | 509,509 | cf | |
| Bankfull Volume Difference = | **205,761** | **cf*** | |

B. Determine Onsite Infiltration Requirement

| | | |
|---|---|---|
| $V_{bf\text{-}post}$ = | 239,942 | cf |
| $V_{bf\text{-}pre}$ = | 34,181 | cf |

Onsite Infiltration Requirement ($V_{inf}$) = 205,761 cf

**W10** Detention / Retention Requirement

| | | | |
|---|---|---|---|
| A. | $Q_o$ = 238.6 ($T_c$) ^ -0.82 | 489.15 | cfs/in-mi^2 |
| B. | Total Site Area | 61.24 | ac |
| C. | $Q_{100}$ = $Q_{100\text{-}per}$ + $Q_{100\text{-}imp}$ | 6.31 | in |
| D. | Peak Flow (PF) = ($Q_o$-$Q_{100}$-A)/640 | 295.280 | cfs |
| E. | Delta = PF - 0.15A | 286.094 | cfs |
| F. | $V_{det}$ = (Delta/PF) x $V_{100}$ Calculated Detention (unadjusted) = | 657,453 | cf |

**W11** Determine Applicable BMPs and Associated Volume Credits

| Proposed BMP | Area (ft²) | Storage Depth (ft) | Storage Volume (ft³) Soil (30% voids) | Storage Volume (ft³) Surface | Ave. Design Infil. Rate (in/hr)* | Infil. During Storm (ft³) | Total Volume Reduction (ft³) |
|---|---|---|---|---|---|---|---|
| Infiltration Basin | 37,297 | 2.00 | - | 74,593 | 10 | 186,483 | 261,077 |
| Infiltration Trench 1* | 300 | 1.50 | 135 | - | 10 | 1,500 | 1,635 |
| Infiltration Trench 2* | 2,500 | 1.50 | 1,125 | - | 4 | 4,938 | 6,063 |
| Infiltration Trench 3* | 820 | 1.50 | 369 | - | 10 | 4,100 | 4,469 |
| Infiltration Trench 4* | 2,400 | 1.50 | 1080 | - | 10 | 12,000 | 8,505 |
| Infiltration Trench 5* | 1,850 | 1.50 | 833 | - | 10 | 9,250 | 10,083 |

*see individual infiltration calculations for details

Total Volume Reduction Credit by Proposed Structural BMP (Vred) = **291,830** cf

| Proposed BMP | Ave. Design Infil. Rate (ft/hr)* | Volume Rate (cf/hr) | Estimated Drawdown Time (hrs) |
|---|---|---|---|
| Infiltration Basin | 0.8333 | 31,081 | 2.40 |

**W13** Infiltration / Detention Summary

| | | |
|---|---|---|
| Total BMP Credits Required per WCWRC Rules: | 205,761 | cf |
| Total BMP Credits Provided: | 291,830 | cf |
| Difference: | 86,069 | cf |
| % Deficiency: | 0.0% | |
| Volume Penalty (prorated up to 20% based on BMP deficiency): | **0.0%** | |
| Detention Volume adjusted for BMP credits, $V_{adj}$ | 365,623 | cf |
| Detention Volume + Penalty, $V_{req}$ | **365,623** | **cf** |

**DET** Detention Basin Summary

| Elevation | Surface Area (SF) | Depth (FT) | Forebay Only Volume (CF) | Detention Basin Only Volume (CF) | Cumulative Volume (CF) | First Flush Zff | Bank Full Zbf | 100-Year Z100 |
|---|---|---|---|---|---|---|---|---|
| 895.00 | 33,540 | 0.0 | | 0 | | | | |
| 896.00 | 37,235 | 1.0 | | 35,388 | | | | |
| 897.00 | 41,115 | 1.0 | | 39,175 | | | | |
| Zo 896.00 | 0 | | | 0 | | 135,604 | 239,942 | 365,623 |
| 897.00 | 23,765 | 1.0 | 11,215 | 11,883 | 23,098 | - | - | - |
| 898.00 | 76,990 | 1.0 | 13,523 | 50,378 | 86,998 | - | - | - |
| 899.00 | 99,340 | 1.0 | - | 88,165 | 175,163 | 898.55 | - | - |
| 900.00 | 106,590 | 1.0 | - | 102,965 | 278,128 | - | 899.63 | - |
| 901.00 | 114,000 | 1.0 | - | 110,295 | 388,423 | - | - | 900.79 |
| 902.00 | 121,565 | 1.0 | - | 117,783 | 506,205 | - | - | - |
| | | | | | **Design Elevations:** | **898.55** | **899.65** | **900.79** |

Total Basin Volume Provided to EL 902 = = 506,205 cf
Freeboard Provided = Top of Bank - Z100 = 1.21 ft
Bankfull Pond Area = Area @ Zbf = 2.66 ac

**FOREBAY** Forebay Summary

Required Volume (Vfb)=0.05*$V_{det}$ **32,873** cf

Forebay Geometry

| Elevation | Surface Area (SF) | Depth (FT) | Incremental Volume (CF) | Cumulative Volume (CF) | 5% Forebay |
|---|---|---|---|---|---|
| 895 | 8,105 | 0 | | 0 | 32,873 |
| 896 | 10,110 | 1.0 | 9,108 | 9,108 | - |
| 897 | 12,320 | 1.0 | 11,215 | 20,323 | - |
| 898 | 14,725 | 1.0 | 13,523 | 33,845 | 897.93 |
| | | | | | - |
| | | | | **Design Elevation:** | **897.95** |

**OUTLET** Outlet Control Structure Sizing

**1. Standpipe outlet holes sizing - "first flush" runoff**
*First Flush infiltrates therefore no holes*

**2. Standpipe outlet holes sizing - "Bankfull flood" discharge**
*Bankfull infiltrates therefore no holes*

**3. Standpipe outlet holes sizing - "100-yr flood" discharge**

| | | | |
|---|---|---|---|
| Q100 = Qa | Q100 = | 9.19 | cfs |
| Total Required Detention Volume | Vrem= | 365,623 | cf |
| Time to release volume | T= | 50 | Hr |
| Required Flow rate = Qrem | Qrem= | 2.03 | cfs |
| hff = ( Z100-Zo) | hff = | 4.79 | ft |
| A = Qrem /( .62 x sqrt(2*32.2*h)) | A(required) = | 0.19 | sf |
| Selected Orifice Diameter = | | **1.75** | **in** |
| Area of each orifice = | | 0.0167 | sf |
| Number of orifice holes required = | = | **11** | **holes at elev. 896.00** |

Check that the actual flow rate does not exceed the allowable flow rate

| | | | |
|---|---|---|---|
| Qmax=(.62 x #100 holes x sqrt(2 x 32.2 x (X100-Xo)) = | | 2.001 | **cfs** **O.K.** |

Check "100-yr discharge" holes discharge release time

| | | | |
|---|---|---|---|
| h100(ave) = 2/3 x (X100 - Xo) = | h100(ave) = | 3.19 | **ft** |
| Q100 = A x 0.62 x #100 holes x sqrt(2 x 32.2 x h) = | Q100(ave) = | 1.634 | **cfs** |
| Total Required Detention Volume | Vrem = | 365,623 | **cf** |
| T100 = Tbf + [(Vrem)/(Qboth+Q100ave)) = | T100 = | 62.2 | **hrs** **O.K.** |

**4. Riser Outlet Pipe Design**
*Outlet pipe designed to handle the remaining flow after infiltration*

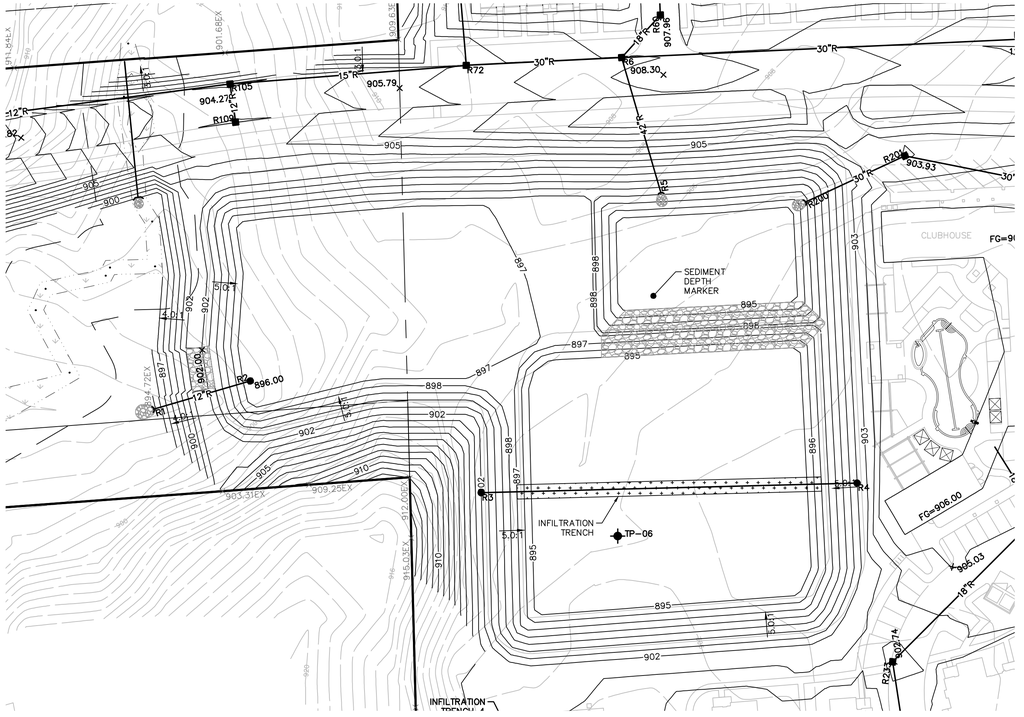
| | | | |
|---|---|---|---|
| Remaining flow rate = Qrem | Q = | 2.03 | cfs |
| Choose outflow pipe diameter = | d = | **12** | **in** |
| Choose outflow pipe slope = | S = | **0.44** | **%** |
| Assume roughness factor | n = | 0.013 | |
| Flow velocity at 100-yr restricted flow (Mannings) = | V = | 3.01 | fps |
| Design Pipe Capacity = | = | 2.36 | cfs OK |

**5. Basin Overflow Weir (design to convey 10-year unrestricted flow)**

| | | | |
|---|---|---|---|
| Drainage Area, A = | | 61.24 | ac |
| C-Factor (C) = | | 0.61 | |
| Time of Conc. (T) = | | 20 | min |
| Intensity (I) | | 3.89 | in/hr I = 175/(T+25) |
| Design Flow (Q) = | | 160.0 | cfs, per storm sewer calcs |
| Weir Coefficient (C)= | | 3.367 | |
| Bottom of Weir (min. 0.25 ft above Z100) = | | **901.04** | |
| Top of Bank | | **902.0** | |
| Height of Weir (Ht) = | | 0.96 | |
| Min. Length of Weir, L = Q/(C x H^(3/2)) | | **51.0** | ft |

## PRE-DEVELOPMENT CN TABLE

| Soil Class | Acres | CN | CNxA | |
|---|---|---|---|---|
| A | | 30 | 0 | |
| B | 61.24 | 61 | 3736 | |
| C | 0.00 | 71 | 0 | |
| D | 0.00 | 78 | 0 | Overall CN |
| Total | 61.24 | | 3736 | 61 |



# INFILTRATION TRENCH #1 CALCULATIONS:

**W1** Determining Post-Development Cover Types, Areas, Curve Numbers and runoff coefficients

Total Contributing Drainage Area = 0.70 Acres

Rational Method Variables

| Cover Type | Soil Type | Area (sf) | Area (ac) | Runoff Coef | (c)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B & C | 15,500 | 0.36 | 0.95 | 14,725 |
| Water Surfaces | B & C | 0 | 0.00 | 1.00 | 0 |
| Developed Open Space, Good Condition | B | 0 | 0.00 | 0.30 | 0 |
| Developed Open Space, Good Condition | C | 14,876 | 0.34 | 0.35 | 5,207 |
| | | | 0.70 | | |
| | | | | Total - Sum (c )(Area) = | 19,932 |
| | | | | Area Total (sf)= | 30,376 |
| | | | Weighted C-Sum(c )(Area)/Sum(ac) or Sum(sf)= | | **0.66** |

NRCS Variables

| Pervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Developed open space | B | 0 | 0.00 | 61 | 0 |
| Developed open space | C | 14,876 | 0.34 | 74 | 1,100,809 |
| | | | 0.00 | | 0 |
| | | | 0.00 | | 0 |
| | | | 0.34 | | |
| | | Total - Sum (CN)(Area) = | | | 1,100,809 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 14,876 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **74** |

NRCS Variables

| Impervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | C | 15,500 | 0.36 | 98 | 1,519,000 |
| Impervious, Ponds | C | 0 | 0.00 | 98 | 0 |
| | | | 0.00 | | 0 |
| | | | 0.36 | | |
| | | Total - Sum (CN)(Area) = | | | 1,519,000 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 15,500 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **98** |

**W6** Pervious Cover Post-development 100-year Storm Runoff Calculations (V100-per-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 74 | |
| C. | S = (1000/CN ) -10 | S = | 3.51 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 2.45 | in |
| E. | Pervious Cover Area | Area = | 14,876 | sf |
| F. | $V_{100\text{-inp-post}}$ = Q(1/12)Area | $V_{100\text{-inp-post}}$ = | **3,040** | cf |

**W7** Impervious Cover Post-development 100-year Storm Runoff Calculations (V100-imp-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 98 | |
| C. | S = (1000/CN ) -10 | S = | 0.20 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 4.87 | in |
| E. | Pervious Cover Area | Area = | 15,500 | sf |
| F. | $V_{100\text{-imp-post}}$ = Q(1/12)Area | $V_{100\text{-imp-post}}$ = | **6,294** | cf |

**W8** Determine Time of Concentration (Tc-hrs)

User specified; assume 20 minutes

Total Time of Concentration (hrs) = 0.33

**W9** Runoff Summary & Onsite Infiltration Requirement

| | | |
|---|---|---|
| $V_{100\text{-per-post}}$ = | 3,040 cf | **Total 100-year Volume ($V_{100}$)** |
| $V_{100\text{-imp-post}}$ = | 6,294 cf | 9,334 cf |

**W11** Determine Applicable BMPs and Associated Volume Credits

| Proposed BMP | Area (ft²) | Storage Depth (ft) | Storage Volume (ft³) | | Ave. Design Infil. Rate (in/hr)* | Infil. During Storm (ft³) | Potential Volume Reduction (ft³) | Actual Reduction (cf)** |
|---|---|---|---|---|---|---|---|---|
| | | | Soil (30% voids) | Surface | | | | |
| Infiltration Trench 1 | 300 | 1.50 | 135 | 0 | 10 | 1500 | 1,635 | 1,635 |

** Per Geotechnical Investigation by SME. 10 in/hr maximum per Rules*

*** Minimum of the calculated potential reduction and the 100-year storm volume over the tributary area. See W11A.*

Total Volume Reduction Credit by Proposed Structural BMPs (Vinf) = **1,635** cf

**W11A** Infiltration Loading Ratios and Storage Volume Drawdown Times

| Proposed BMP | 100-yr Contributing Runoff (cf)* | Tributary Area (sf) | Overall Loading Ratio | Imperv. Area (sf) | Impervious Loading Ratio | Drawdown Time (hrs) |
|---|---|---|---|---|---|---|
| #1: Infiltration Basin (TP-08) | 9,334 | 30,376 | 101.3 | 15,500 | 51.7 | 0.54 |

# INFILTRATION TRENCH #2 CALCULATIONS:

**W1** Determining Post-Development Cover Types, Areas, Curve Numbers and runoff coefficients

Total Contributing Drainage Area = 0.84 Acres

Rational Method Variables

| Cover Type | Soil Type | Area (sf) | Area (ac) | Runoff Coef | (c)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B & C | 10,530 | 0.24 | 0.95 | 10,004 |
| Water Surfaces | B & C | 0 | 0.00 | 1.00 | 0 |
| Developed Open Space, Good Condition | B | 0 | 0.00 | 0.30 | 0 |
| Developed Open Space, Good Condition | C | 26,204 | 0.60 | 0.35 | 9,172 |
| | | | 0.84 | | |
| | | | | Total - Sum (c )(Area) = | 19,175 |
| | | | | Area Total (sf)= | 36,734 |
| | | | Weighted C-Sum(c )(Area)/Sum(ac) or Sum(sf)= | | **0.52** |

NRCS Variables

| Pervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Developed open space | B | 0 | 0.00 | 61 | 0 |
| Developed open space | C | 26,204 | 0.60 | 74 | 1,939,117 |
| | | | 0.00 | | 0 |
| | | | 0.00 | | 0 |
| | | | 0.60 | | |
| | | Total - Sum (CN)(Area) = | | | 1,939,117 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 26,204 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **74** |

NRCS Variables

| Impervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | C | 10,530 | 0.24 | 98 | 1,031,940 |
| Impervious, Ponds | C | 0 | 0.00 | 98 | 0 |
| | | | 0.00 | | 0 |
| | | | 0.24 | | |
| | | Total - Sum (CN)(Area) = | | | 1,031,940 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 10,530 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **98** |

**W6** Pervious Cover Post-development 100-year Storm Runoff Calculations (V100-per-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 74 | |
| C. | S = (1000/CN ) -10 | S = | 3.51 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 2.45 | in |
| E. | Pervious Cover Area | Area = | 26,204 | sf |
| F. | $V_{100\text{-inp-post}}$ = Q(1/12)Area | $V_{100\text{-inp-post}}$ = | **5,355** | cf |

**W7** Impervious Cover Post-development 100-year Storm Runoff Calculations (V100-imp-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 98 | |
| C. | S = (1000/CN ) -10 | S = | 0.20 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 4.87 | in |
| E. | Pervious Cover Area | Area = | 10,530 | sf |
| F. | $V_{100\text{-imp-post}}$ = Q(1/12)Area | $V_{100\text{-imp-post}}$ = | **4,276** | cf |

**W8** Determine Time of Concentration (Tc-hrs)

User specified; assume 20 minutes

Total Time of Concentration (hrs) = 0.33

**W9** Runoff Summary & Onsite Infiltration Requirement

| | | |
|---|---|---|
| $V_{100\text{-per-post}}$ = | 5,355 cf | **Total 100-year Volume ($V_{100}$)** |
| $V_{100\text{-imp-post}}$ = | 4,276 cf | 9,631 cf |

**W11** Determine Applicable BMPs and Associated Volume Credits

| Proposed BMP | Area (ft²) | Storage Depth (ft) | Storage Volume (ft³) | | Ave. Design Infil. Rate (in/hr)* | Infil. During Storm (ft³) | Potential Volume Reduction (ft³) | Actual Reduction (cf)** |
|---|---|---|---|---|---|---|---|---|
| | | | Soil (30% voids) | Surface | | | | |
| Infiltration Trench 2 | 2,500 | 1.50 | 1,125 | 0 | 3.95 | 4937.5 | 6,063 | 6,063 |

** Per TP-02 of Geotechnical Investigation by SME. Includes a factor of safety of 2.*

*** Minimum of the calculated potential reduction and the 100-year storm volume over the tributary area. See W11A.*

Total Volume Reduction Credit by Proposed Structural BMPs (Vinf) = **6,063** cf

**W11A** Infiltration Loading Ratios and Storage Volume Drawdown Times

| Proposed BMP | 100-yr Contributing Runoff (cf)* | Tributary Area (sf) | Overall Loading Ratio | Imperv. Area (sf) | Impervious Loading Ratio | Drawdown Time (hrs) |
|---|---|---|---|---|---|---|
| #1: Infiltration Basin (TP-02) | 9,631 | 36,734 | 14.7 | 10,530 | 4.2 | 1.37 |

# INFILTRATION TRENCH #3 CALCULATIONS:

**W1** Determining Post-Development Cover Types, Areas, Curve Numbers and runoff coefficients

Total Contributing Drainage Area = 1.03 Acres

Rational Method Variables

| Cover Type | Soil Type | Area (sf) | Area (ac) | Runoff Coef | (c)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B & C | 26,530 | 0.61 | 0.95 | 25,204 |
| Water Surfaces | B & C | 0 | 0.00 | 1.00 | 0 |
| Developed Open Space, Good Condition | B | 0 | 0.00 | 0.30 | 0 |
| Developed Open Space, Good Condition | C | 18,288 | 0.42 | 0.35 | 6,401 |
| | | | 1.03 | | |
| | | | | Total - Sum (c )(Area) = | 31,604 |
| | | | | Area Total (sf)= | 44,818 |
| | | | Weighted C-Sum(c )(Area)/Sum(ac) or Sum(sf)= | | **0.71** |

NRCS Variables

| Pervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Developed open space | B | 0 | 0.00 | 61 | 0 |
| Developed open space | C | 18,288 | 0.42 | 74 | 1,353,287 |
| | | | 0.00 | | 0 |
| | | | 0.00 | | 0 |
| | | | 0.42 | | |
| | | Total - Sum (CN)(Area) = | | | 1,353,287 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 18,288 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **74** |

NRCS Variables

| Impervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | C | 26,530 | 0.61 | 98 | 2,599,940 |
| Impervious, Ponds | C | 0 | 0.00 | 98 | 0 |
| | | | 0.00 | | 0 |
| | | | 0.61 | | |
| | | Total - Sum (CN)(Area) = | | | 2,599,940 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 26,530 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **98** |

**W6** Pervious Cover Post-development 100-year Storm Runoff Calculations (V100-per-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 74 | |
| C. | S = (1000/CN ) -10 | S = | 3.51 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 2.45 | in |
| E. | Pervious Cover Area | Area = | 26,530 | sf |
| F. | $V_{100\text{-inp-post}}$ = Q(1/12)Area | $V_{100\text{-inp-post}}$ = | **10,773** | cf |

**W7** Impervious Cover Post-development 100-year Storm Runoff Calculations (V100-imp-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 98 | |
| C. | S = (1000/CN ) -10 | S = | 0.20 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 4.87 | in |
| E. | Pervious Cover Area | Area = | 26,530 | sf |
| F. | $V_{100\text{-imp-post}}$ = Q(1/12)Area | $V_{100\text{-imp-post}}$ = | **10,773** | cf |

**W8** Determine Time of Concentration (Tc-hrs)

User specified; assume 20 minutes

Total Time of Concentration (hrs) = 0.33

**W9** Runoff Summary & Onsite Infiltration Requirement

| | | |
|---|---|---|
| $V_{100\text{-per-post}}$ = | 3,737 cf | **Total 100-year Volume ($V_{100}$)** |
| $V_{100\text{-imp-post}}$ = | 10,773 cf | 14,511 cf |

**W11** Determine Applicable BMPs and Associated Volume Credits

| Proposed BMP | Area (ft²) | Storage Depth (ft) | Storage Volume (ft³) | | Ave. Design Infil. Rate (in/hr)* | Infil. During Storm (ft³) | Potential Volume Reduction (ft³) | Actual Reduction (cf)** |
|---|---|---|---|---|---|---|---|---|
| | | | Soil (30% voids) | Surface | | | | |
| Infiltration Trench 3 | 820 | 1.50 | 369 | 0 | 10 | 4100 | 4,469 | 4,469 |

** Per Geotechnical Investigation by SME. 10 in/hr maximum per Rules.*

*** Minimum of the calculated potential reduction and the 100-year storm volume over the tributary area. See W11A.*

Total Volume Reduction Credit by Proposed Structural BMPs (Vinf) = **4,469** cf

**W11A** Infiltration Loading Ratios and Storage Volume Drawdown Times

| Proposed BMP | 100-yr Contributing Runoff (cf)* | Tributary Area (sf) | Overall Loading Ratio | Imperv. Area (sf) | Impervious Loading Ratio | Drawdown Time (hrs) |
|---|---|---|---|---|---|---|
| #1: Infiltration Basin (TP-13) | 14,511 | 44,818 | 54.7 | 26,530 | 32.4 | 0.54 |

# INFILTRATION TRENCH #4 CALCULATIONS:

**W1** Determining Post-Development Cover Types, Areas, Curve Numbers and runoff coefficients

Total Contributing Drainage Area = 0.75 Acres

Rational Method Variables

| Cover Type | Soil Type | Area (sf) | Area (ac) | Runoff Coef | (c)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B & C | 9,268 | 0.21 | 0.95 | 8,805 |
| Water Surfaces | B & C | 0 | 0.00 | 1.00 | 0 |
| Developed Open Space, Good Condition | B | 0 | 0.00 | 0.30 | 0 |
| Developed Open Space, Good Condition | C | 23,199 | 0.53 | 0.35 | 8,120 |
| | | | 0.75 | | |
| | | | | Total - Sum (c )(Area) = | 16,924 |
| | | | | Area Total (sf)= | 32,467 |
| | | | Weighted C-Sum(c )(Area)/Sum(ac) or Sum(sf)= | | **0.52** |

NRCS Variables

| Pervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Developed open space | B | 0 | 0.00 | 61 | 0 |
| Developed open space | C | 23,199 | 0.53 | 74 | 1,716,737 |
| | | | 0.00 | | 0 |
| | | | 0.00 | | 0 |
| | | | 0.53 | | |
| | | Total - Sum (CN)(Area) = | | | 1,716,737 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 23,199 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **74** |

NRCS Variables

| Impervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | C | 9,268 | 0.21 | 98 | 908,264 |
| Impervious, Ponds | C | 0 | 0.00 | 98 | 0 |
| | | | 0.00 | | 0 |
| | | | 0.21 | | |
| | | Total - Sum (CN)(Area) = | | | 908,264 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 9,268 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **98** |

**W6** Pervious Cover Post-development 100-year Storm Runoff Calculations (V100-per-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 74 | |
| C. | S = (1000/CN ) -10 | S = | 3.51 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 2.45 | in |
| E. | Pervious Cover Area | Area = | 23,199 | sf |
| F. | $V_{100\text{-inp-post}}$ = Q(1/12)Area | $V_{100\text{-inp-post}}$ = | **4,741** | cf |

**W7** Impervious Cover Post-development 100-year Storm Runoff Calculations (V100-imp-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 98 | |
| C. | S = (1000/CN ) -10 | S = | 0.20 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 4.87 | in |
| E. | Pervious Cover Area | Area = | 9,268 | sf |
| F. | $V_{100\text{-imp-post}}$ = Q(1/12)Area | $V_{100\text{-imp-post}}$ = | **3,764** | cf |

**W8** Determine Time of Concentration (Tc-hrs)

User specified; assume 20 minutes

Total Time of Concentration (hrs) = 0.33

**W9** Runoff Summary & Onsite Infiltration Requirement

| | | |
|---|---|---|
| $V_{100\text{-per-post}}$ = | 4,741 cf | **Total 100-year Volume ($V_{100}$)** |
| $V_{100\text{-imp-post}}$ = | 3,764 cf | 8,505 cf |

**W11** Determine Applicable BMPs and Associated Volume Credits

| Proposed BMP | Area (ft²) | Storage Depth (ft) | Storage Volume (ft³) | | Ave. Design Infil. Rate (in/hr)* | Infil. During Storm (ft³) | Potential Volume Reduction (ft³) | Actual Reduction (cf)** |
|---|---|---|---|---|---|---|---|---|
| | | | Soil (30% voids) | Surface | | | | |
| Infiltration Trench 4 | 2,400 | 1.50 | 1,080 | 0 | 10 | 12000 | 13,080 | 8,505 |

** Per Geotechnical Investigation by SME. 10 in/hr maximum per Rules.*

*** Minimum of the calculated potential reduction and the 100-year storm volume over the tributary area. See W11A.*

Total Volume Reduction Credit by Proposed Structural BMPs (Vinf) = **8,505** cf

**W11A** Infiltration Loading Ratios and Storage Volume Drawdown Times

| Proposed BMP | 100-yr Contributing Runoff (cf)* | Tributary Area (sf) | Overall Loading Ratio | Imperv. Area (sf) | Impervious Loading Ratio | Drawdown Time (hrs) |
|---|---|---|---|---|---|---|
| #1: Infiltration Basin (TP-12) | 8,505 | 32,467 | 13.5 | 9,268 | 3.9 | 0.54 |

# INFILTRATION TRENCH #5 CALCULATIONS:

**W1** Determining Post-Development Cover Types, Areas, Curve Numbers and runoff coefficients

Total Contributing Drainage Area = 1.60 Acres

Rational Method Variables

| Cover Type | Soil Type | Area (sf) | Area (ac) | Runoff Coef | (c)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | B & C | 33,533 | 0.77 | 0.95 | 31,856 |
| Water Surfaces | B & C | 0 | 0.00 | 1.00 | 0 |
| Developed Open Space, Good Condition | B | 0 | 0.00 | 0.30 | 0 |
| Developed Open Space, Good Condition | C | 36,353 | 0.83 | 0.35 | 12,723 |
| | | | 1.60 | | |
| | | | | Total - Sum (c )(Area) = | 44,580 |
| | | | | Area Total (sf)= | 69,886 |
| | | | Weighted C-Sum(c )(Area)/Sum(ac) or Sum(sf)= | | **0.64** |

NRCS Variables

| Pervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Developed open space | B | 0 | 0.00 | 61 | 0 |
| Developed open space | C | 36,353 | 0.83 | 74 | 2,690,088 |
| | | | 0.00 | | 0 |
| | | | 0.00 | | 0 |
| | | | 0.83 | | |
| | | Total - Sum (CN)(Area) = | | | 2,690,088 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 36,353 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **74** |

NRCS Variables

| Impervious Cover Type | Soil Type | Area (sf) | Area (ac) | Curve Number | (CN)(Area) |
|---|---|---|---|---|---|
| Paved Parking Lots, roofs, driveways | C | 33,533 | 0.77 | 98 | 3,286,234 |
| Impervious, Ponds | C | 0 | 0.00 | 98 | 0 |
| | | | 0.00 | | 0 |
| | | | 0.77 | | |
| | | Total - Sum (CN)(Area) = | | | 3,286,234 |
| | | Area Total - Sum(ac) of Sum(sf)= | | | 33,533 |
| | | Weighted CN-Sum(CN)(Area)/Sum(ac) or Sum(sf)= | | | **98** |

**W6** Pervious Cover Post-development 100-year Storm Runoff Calculations (V100-per-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 74 | |
| C. | S = (1000/CN ) -10 | S = | 3.51 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 2.45 | in |
| E. | Pervious Cover Area | Area = | 36,353 | sf |
| F. | $V_{100\text{-inp-post}}$ = Q(1/12)Area | $V_{100\text{-inp-post}}$ = | **7,429** | cf |

**W7** Impervious Cover Post-development 100-year Storm Runoff Calculations (V100-imp-post)

| | | | | |
|---|---|---|---|---|
| A. | 100 year storm event | P = | 5.11 | in |
| B. | Pervious Cover CN | CN = | 98 | |
| C. | S = (1000/CN ) -10 | S = | 0.20 | in |
| D. | Q = (P-0.2S)^2/(P+0.8S) | Q = | 4.87 | in |
| E. | Pervious Cover Area | Area = | 33,533 | sf |
| F. | $V_{100\text{-imp-post}}$ = Q(1/12)Area | $V_{100\text{-imp-post}}$ = | **13,617** | cf |

**W8** Determine Time of Concentration (Tc-hrs)

User specified; assume 20 minutes

Total Time of Concentration (hrs) = 0.33

**W9** Runoff Summary & Onsite Infiltration Requirement

| | | |
|---|---|---|
| $V_{100\text{-per-post}}$ = | 7,429 cf | **Total 100-year Volume ($V_{100}$)** |
| $V_{100\text{-imp-post}}$ = | 13,617 cf | 21,046 cf |

**W11** Determine Applicable BMPs and Associated Volume Credits

| Proposed BMP | Area (ft²) | Storage Depth (ft) | Storage Volume (ft³) | | Ave. Design Infil. Rate (in/hr)* | Infil. During Storm (ft³) | Potential Volume Reduction (ft³) | Actual Reduction (cf)** |
|---|---|---|---|---|---|---|---|---|
| | | | Soil (30% voids) | Surface | | | | |
| Infiltration Trench 5 | 1,850 | 1.50 | 833 | 0 | 10 | 9250 | 10,083 | 10,083 |

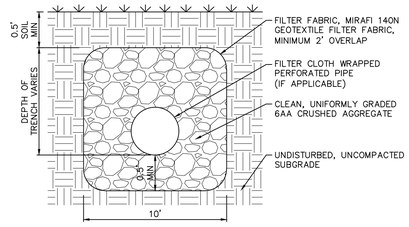
** Per Geotechnical Investigation by SME. 10 in/hr maximum per Rules.*

*** Minimum of the calculated potential reduction and the 100 year storm volume over the tributary area. See W11A.*

Total Volume Reduction Credit by Proposed Structural BMPs (Vinf) = **10,083** cf

**W11A** Infiltration Loading Ratios and Storage Volume Drawdown Times

| Proposed BMP | 100-yr Contributing Runoff (cf)* | Tributary Area (sf) | Overall Loading Ratio | Imperv. Area (sf) | Impervious Loading Ratio | Drawdown Time (hrs) |
|---|---|---|---|---|---|---|
| #1: Infiltration Basin (TP-13 | 21,046 | 69,886 | 37.8 | 33,533 | 18.1 | 0.54 |




## INFILTRATION TRENCH DETAIL

NO SCALE


811 Know what's below. Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC



ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MI 48076
248.447.2000


SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.

VILLAGE OF ANN ARBOR
**SITE PLAN**

INFILTRATION TRENCH CALCULATIONS

DATE
JUNE 7, 2021

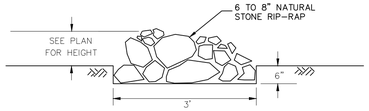
2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

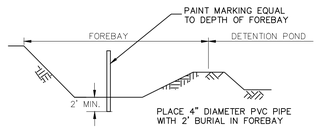
SCALE 0 -- --
NO SCALE

DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO. **60**

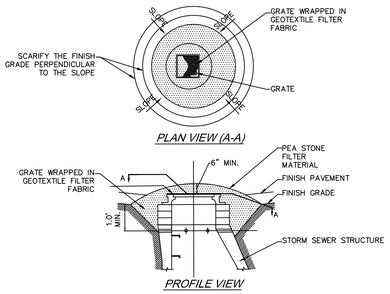

C:\ATWELL\18002264 - 2021 SITE PLAN\Civil\18002264P-Site 3D.dwg, 7/7/2022 8:37:38 AM, STEVE SKILLS



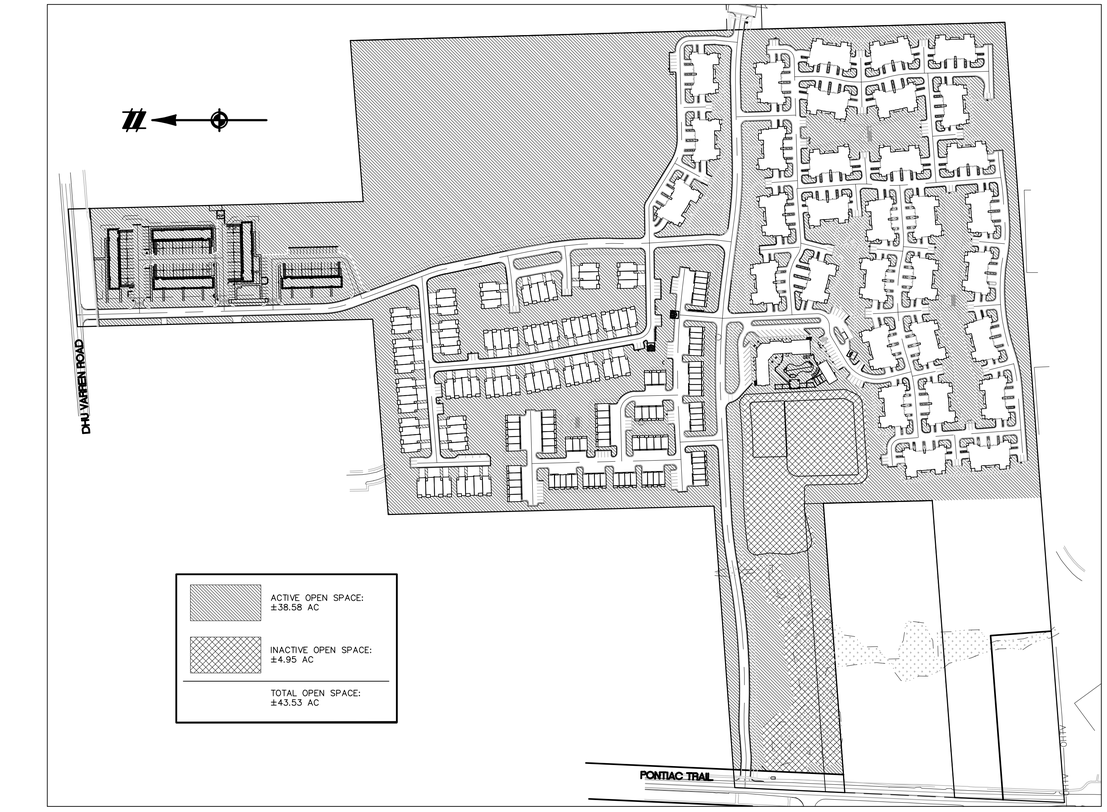

## SEDIMENT FOREBAY RIP-RAP BARRIER DETAIL
NO SCALE




## SEDIMENT FOREBAY MARKER DETAIL
NO SCALE

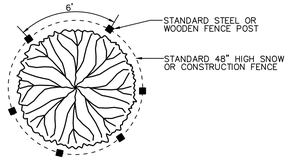



## LOW POINT INLET FILTER
NO SCALE




## OPEN SPACE DELINEATION PLAN
SCALE: 1" = 200 FEET

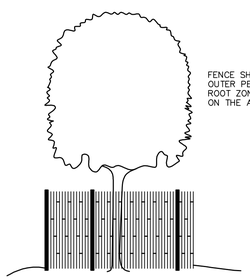
PLAN



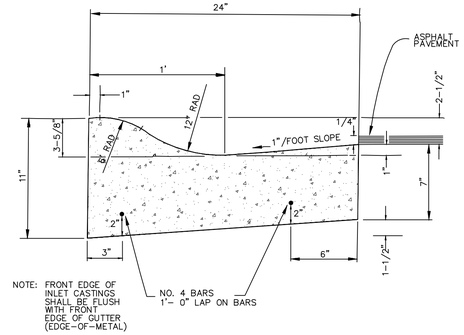

TREE PROTECTION NOTES:

1. ALL TREES TO BE REMOVED WILL BE IDENTIFIED BY RED FLAGGING.
2. TREE PROTECTION FENCING IS TO BE ERECTED PRIOR TO ANY EARTHWORK OR CONSTRUCTION AND IS TO REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
3. ALL DEBRIS, FILL, EQUIPMENT OR MATERIAL IS TO BE KEPT CLEAR OF AREA WITHIN PROTECTIVE FENCE. NO CLEANING OF EQUIPMENT,OR MATERIAL OR STORAGE OR DISPOSAL OF ANY MATERIAL WITHIN THE DRIP LINE OF ANY TREES TO BE SAVED.

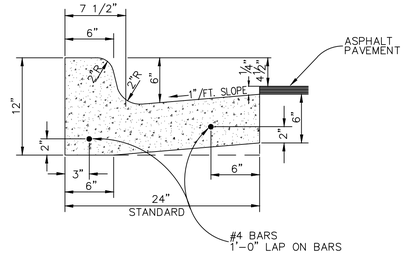
ELEVATION



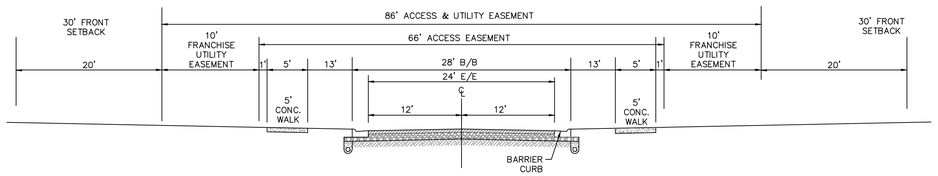

## TREE PROTECTION FENCE DETAIL
NO SCALE



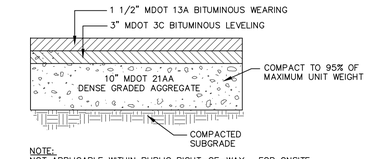

## MOUNTABLE CURB AND GUTTER DETAIL
NOT TO SCALE




## BARRIER CURB AND GUTTER DETIAL
NOT TO SCALE

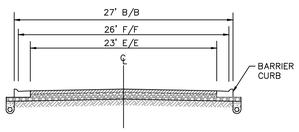



## COLLECTOR ROAD SECTION
NOT TO SCALE

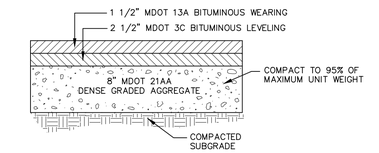



NOTE:
NOT APPLICABLE WITHIN PUBLIC RIGHT-OF-WAY. FOR ONSITE USE ONLY. PAVEMENT WITHIN THE RIGHT OF WAY SHALL CONFORM TO CITY OF ANN ARBOR STANDARDS.

## COLLECTOR ROAD PAVING SECTION
NO SCALE

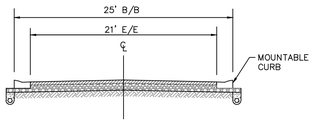



## 3-STORY TOWNHOME ROAD SECTION
NOT TO SCALE




NOTE:
NOT APPLICABLE WITHIN PUBLIC RIGHT-OF-WAY. FOR ONSITE USE ONLY. PAVEMENT WITHIN THE RIGHT OF WAY SHALL CONFORM TO CITY OF ANN ARBOR STANDARDS.

## TOWNHOME, APARTMENT AND PARKING AREA PAVING SECTION
NO SCALE




## 2-STORY TOWNHOME AND APARTMENT ROAD SECTION
NOT TO SCALE

811
Know what's below.
Call before you dig.
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NOTICE:
CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR; NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

COPYRIGHT © 2022 ATWELL LLC NO REPRODUCTION SHALL BE MADE WITHOUT THE PRIOR WRITTEN CONSENT OF ATWELL LLC

ATWELL
866.850.4200 www.atwell-group.com
TWO TOWNE SQUARE, SUITE 700
SOUTHFIELD, MICHIGAN 48076
248.447.2000

SECTION 16
TOWN 2 SOUTH, RANGE 6 EAST
ANN ARBOR TOWNSHIP
WASHTENAW COUNTY, MICHIGAN

CLIENT
ROBERTSON BROTHERS CO.
VILLAGE OF ANN ARBOR
**SITE PLAN**

STANDARD DETAILS 1

DATE
JUNE 7, 2021

2021-10-11 PER CITY AND WCWRC
2022-01-19 PER CITY AND WCWRC
2022-03-31 PER CITY AND WCWRC
2022-06-06 PER CITY
2022-06-16 PER CITY
2022-06-17 REV. PHOTOMETRICS
2022-07-12 PER CITY

REVISIONS

SCALE 0 — — —
NO SCALE

DR. SK | CH. SS
P.M. MB
BOOK NA
JOB 18002264
SHEET NO.
61

N:\18002264\CAD\CIVIL\SHEETS\PRELIMINARY\18002264SP-SB-STDNG 7/12/2022 8:57 AM STEVE SILS