CITY OF NORTH RIDGEVILLE
PLANNING COMMISSION

Chairman James Smolik

Vice-Chairwoman Jennifer Swallow
Member Steve Ali

Member Jason R. Jacobs
Council Liaison Bruce F. Abens

7307 Avon Belden Road
North Ridgeville, Ohio 44039
(440) 353-0513

AGENDA

REGULAR MEETING – TUESDAY, NOVEMBER 10, 2020

TO ORDER: 7:00 PM

ROLL CALL:

MINUTES: Regular meeting held Tuesday, August 11, 2020

CORRESPONDENCE:

OLD BUSINESS:

NEW BUSINESS:

APPLICANT: James Martynowski, Osborne Capital Group
7670 Tyler Blvd, Mentor, OH 44060
OWNER: Cook Road Properties
7670 Tyler Blvd, Mentor, OH 44060
REQUEST: Site plan approval to construct a 2,225 square foot single use commercial building
LOCATION: 32435 Cook Rd, North Ridgeville, OH 44039, in a B-3 Commercial District
Permanent Parcel Nos. 07-00-003-102-048 and -049

APPLICANT: K. Hovnanian Meadows Lakes, LLC
3296 Columbia Rd, Richfield, OH 44286
OWNER: Same
REQUEST: Final plat approval of Phase 18 of the Meadow Lakes Subdivision
LOCATION: White Feather Ave North, North Ridgeville, OH 44039, in a PCD District
Permanent Parcel No. 07-00-033-122-003

ADJOURNMENT:

NEXT REGULAR MEETING WILL BE HELD TUESDAY, DECEMBER 8, 2020

NOTICE TO THE PUBLIC

Due to current restrictions associated with the ongoing coronavirus pandemic (COVID-19), physical attendance at the meeting is prohibited. You have two options to view and participate in the meeting:

Join through our YouTube Channel at
www.youtube.com/channel/UCThTaGFRof_AOvxSYAzMNYg

There is a chat feature to type your questions or comments. We encourage you to email comments and questions in advance to Lisa Ciofani at lciofani@nridgeville.org

-OR-

Join through Zoom at https://us02web.zoom.us/j/84397581699
Meeting ID: 843 9758 1699
Or dial in with audio only at +1 646 558 8656

Visit the Planning Commission web site to access the electronic agenda, along with agenda items: www.nridgeville.org/PlanningCommission.aspx

*DON'T FORGET TO **SUBSCRIBE** TO OUR **YOUTUBE CHANNEL** TO TUNE IN TO **ALL CITY PUBLIC MEETINGS!***

NORTH RIDGEVILLE PLANNING COMMISSION
MINUTES OF
REGULAR MEETING – TUESDAY, AUGUST 11, 2020

CALL TO ORDER:

Chairman Smolik called the Planning Commission meeting to order with the Pledge of Allegiance at 7:08 PM.

ROLL CALL:

Present were members Vice-Chairwoman Jennifer Swallow (via Zoom), Member Steve Ali, Council Liaison Bruce Abens (on his way to the meeting when roll was called), and Chairman James Smolik (via Zoom).

Member Jason Jacobs was excused.

Also present were Assistant Law Director Toni Morgan (via Zoom), City Engineer Dan Rodriguez (via Zoom), Assistant Clerk of Council Tara Peet (via Zoom), and Deputy Clerk of Council Lisa Ciofani.

Chairman Smolik announced that, though this was a virtual meeting, in accordance with the State of Ohio, public notice was issued to all abutting residences and was also posted on the City of North Ridgeville website. He stated that the meeting was live streaming to the City of North Ridgeville YouTube channel, which was being monitored for input from the public by the Assistant Clerk of Council Peet. He indicated that members of the Commission will be advised of any comments posted to the YouTube channel.

MINUTES:

Chairman Smolik asked if members had a chance to review the minutes of the regular meeting on Tuesday, July 14, 2020. He asked if there were any corrections. Hearing no corrections, the minutes were received and filed.

CORRESPONDENCE:

None

OLD BUSINESS:

None

NEW BUSINESS:

APPLICANT: Ryan Schulthesis, Root Development & Construction
36097 Westminister Ave., North Ridgeville, OH 44039
OWNER: Root Development & Construction
36097 Westminister Ave., North Ridgeville, OH 44039
REQUEST: Final plat approval for Harvest Pointe Subdivision Phase 2
LOCATION: East side of Root Rd. & South side of Lorain Rd.

Application was read.

Administrative comments were read.

Chairman Smolik stated that the applicant was present. He asked that he state his name and address for the record and describe the project to the Commission.

Ryan Schulthesis, Controller for Root Development & Construction, 36097 Westminister Ave., North Ridgeville, Ohio, 44039, stated they are applying for final plat approval for phase 2 of the Harvest Pointe Development on Root Rd just south of Lorain Rd. Mr. Schulthesis stated they received preliminary approval in February of 2019 for both phase 1 and phase 2. Phase 1 has already been approved so now they are asking for approval for phase 2. Phase 2 includes two additional cluster lots which would be sublots 13 and 14 and then additional single family lots to bring the total in phase 2 to 17. Phase 1 and phase 2 would have a combined total of 29.

Chairman Smolik asked Mr. Schulthesis to repeat which are the cluster lots because the audio cut out when he was talking.

Mr. Schulthesis advised he misstated at first. Sublots 13 and 14 are the cluster lots. According to the density calculation they are allowed 20, so they still remain under the allowable amount. All of phase 1 is also cluster lots so the total number is 14 between phase 1 and phase 2.

Chairman Smolik asked for any questions or comments from the commission. No discussion was offered.

Chairman Smolik asked for any questions or comments from the administration.

Assistant Law Director Morgan stated there were some good questions asked earlier regarding square footage and basements that the YouTube audience might be interested in.

Chairman Smolik asked if everyone could recreate those questions.

Member Ali asked as far as the lots that were there, roughly what square footage are they going to start off at and what will they go up to.

Mr. Schulthesis advised for phase 2 in particular the starting point would be about 2,000 square feet and they do have a ranch plan that is about 1,800 square feet that they would probably offer as well. He envisions most of them being around 2,000 square feet and probably up to around

2,800 or 2,900 square feet. Mr. Schulthesis stated they do envision basements on all of the homes unless the buyer did not want a basement. Buyers do have the option to add a three-car garage on those lots on phase 2.

Member Ali asked what would the price range be.

Mr. Schulthesis stated they haven't quite gotten to that point yet but they woud likely start in the high $300,000's. Phase 1, which is the cluster lots, are starting in mid to low $300,000's. Phase 2 would be bigger, probably more desirable lots, and he envisions being in high $300,000's or starting close to $400,000 potentially in phase 2.

Chairman Smolik stated Block B is mostly wetlands and he assumes that will not be developed in the future.

Mr. Schulthesis confirmed. He advised that is their designated green space as of right now.

Chairman Smolik asked for any questions or comments from administration. No discussion was offered.

Hearing none, Chairman Smolik opened up to discussion for public comment via YouTube.

Deputy Clerk of Council Ciofani advised there are no comments or questions at this time.

Chairman asked for any additional comments or questions from commission.

Chairman Smolik opened for a motion.

It was moved by Vice-Chairwoman Swallow and seconded by Ali to approve the request as submitted.

A voice vote was taken and the motion carried.

Yes – 4 No – 0

Chairman Smolik commented to the applicant the paperwork would be sent to him later this week once signatures are done remotely.

ADJOURNMENT:

The meeting was adjourned at 7:18 PM.

James Smolik
Chairman

Lisa M. Ciofani
Deputy Clerk of Council

Tuesday, November 10, 2020
Date Approved

Engineering Fee Paid: $ 1,350.00
Receipt No.: 144578
☒ Cash ☐ Check – Check No.: 001462
(See attached for description of fees.)

Planning Commission & Bldg. Admin. Fees: $ 113.00
Receipt No.: 00009395
☐ Cash ☒ Check – Check No.: 001463
(See attached for description of fees.)

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
REQUEST FOR ACTION

Received: 9-18-20 Date Released to Planning Commission: 9-21-20

Date of Planning Commission Meeting: OCTOBER 13, 2020 *(Unless otherwise notified.)*

APPLICANT INFORMATION AND REQUEST

APPLICANT:	JAMES MARTYNOWSKI	PROPERTY OWNER:	COOK ROAD PROPERTIES
COMPANY NAME:	OSBORNE CAPITAL GROUP	ADDRESS:	7670 TYLER BLVD.
ADDRESS:	7670 TYLER BLVD.	CITY / STATE:	MENTOR, OH ZIP: 44060
CITY / STATE:	MENTOR, OH ZIP: 44060	PHONE NO.:	440-951-2977
PHONE NO.:	216-272-1240	SIGNATURE:	Debra L McFadden
SIGNATURE:	J. P. Martynowski		(Owner's original signature must be submitted with application.)
EMAIL ADDRESS:	JAMES@OSBORNECAPITAL.COM		

Please provide an email address, fax number or mailing address to send Administrative comments in advance of the meeting.

LOCATION OF PROPERTY/ADDRESS: 32435 COOK ROAD
PERMANENT PARCEL NO.: 0700003102048, 0700003102049 **ZONING OF PROPERTY:** B3
ZONING OF ADJACENT PROPERTY TO: NORTH B3 **EAST** B3 **SOUTH** B3 **WEST** B3
DESCRIPTION OF REQUEST: APPROVAL TO CONSTRUCT 2225 S.F. SINGLE USE COMMERCIAL BUILDING.

Have the Planning Commission or Board of Zoning and Building Appeals considered any prior request concerning this property? **Yes** ☒ **No**

If yes, list dates and nature of each: Scheduled at 9/24/2020 BZBA for lot variance requests. TLP

On the attached form, list the current record title owners(s) adjacent to the property of request. Include on this list the record title owner(s) name(s), permanent parcel number(s) and mailing address(es). Adjacent properties shall include those properties bordering to the north, south, east, west, across a street from the property involved and those properties meeting corners of the property involved.

In the event of property transfers, the applicant shall be responsible for providing an updated list of current adjacent record title owner(s) to the office of the Clerk of Council twenty-five days prior to the date of any public hearing when the applicant will appear on the agenda.

PLANNING COMMISSION USE ONLY: ☐ APPROVED ☐ DISAPPROVED

All approvals are conditional until applicant fully meets the requirements of applicable City ordinances enforced by the Chief Building Official, City Engineer, Fire Department and Police Department with respect to safety and design.

☐ Board of Building & Zoning Appeals Approval Required
☐ Conditions as set forth by the Commission on this date are: _____

Date: _____ Signature: _____
(Presiding Officer at Meeting)

Return completed form to Building Dept., 7307 Avon Belden Road, North Ridgeville, Ohio, 44039 after Commission action.

TO BE FILLED OUT BY APPLICANT

I, JAMES MARTYNOWSKI J.P. Martynowski
(Print Name) *(Signature)*

verify that the following are the names, mailing addresses and permanent parcel numbers of the current record title owners adjacent to the property of request for:

Applicant: OSBORNE CAPITAL GROUP, BY JAMES MARTYNOWSKI

Owner: COOK ROAD PROPERTIES

Project Address: 32435 COOK ROAD

THE FOLLOWING INFORMATION MAY BE OBTAINED AT THE LORAIN COUNTY AUDITOR'S OFFICE, ADMINISTRATION BUILDING, 226 MIDDLE AVENUE, ELYRIA, OHIO 44035.
PHONE: 440-329-5207 WEBSITE: WWW.LORAINCOUNTY.COM/AUDITOR

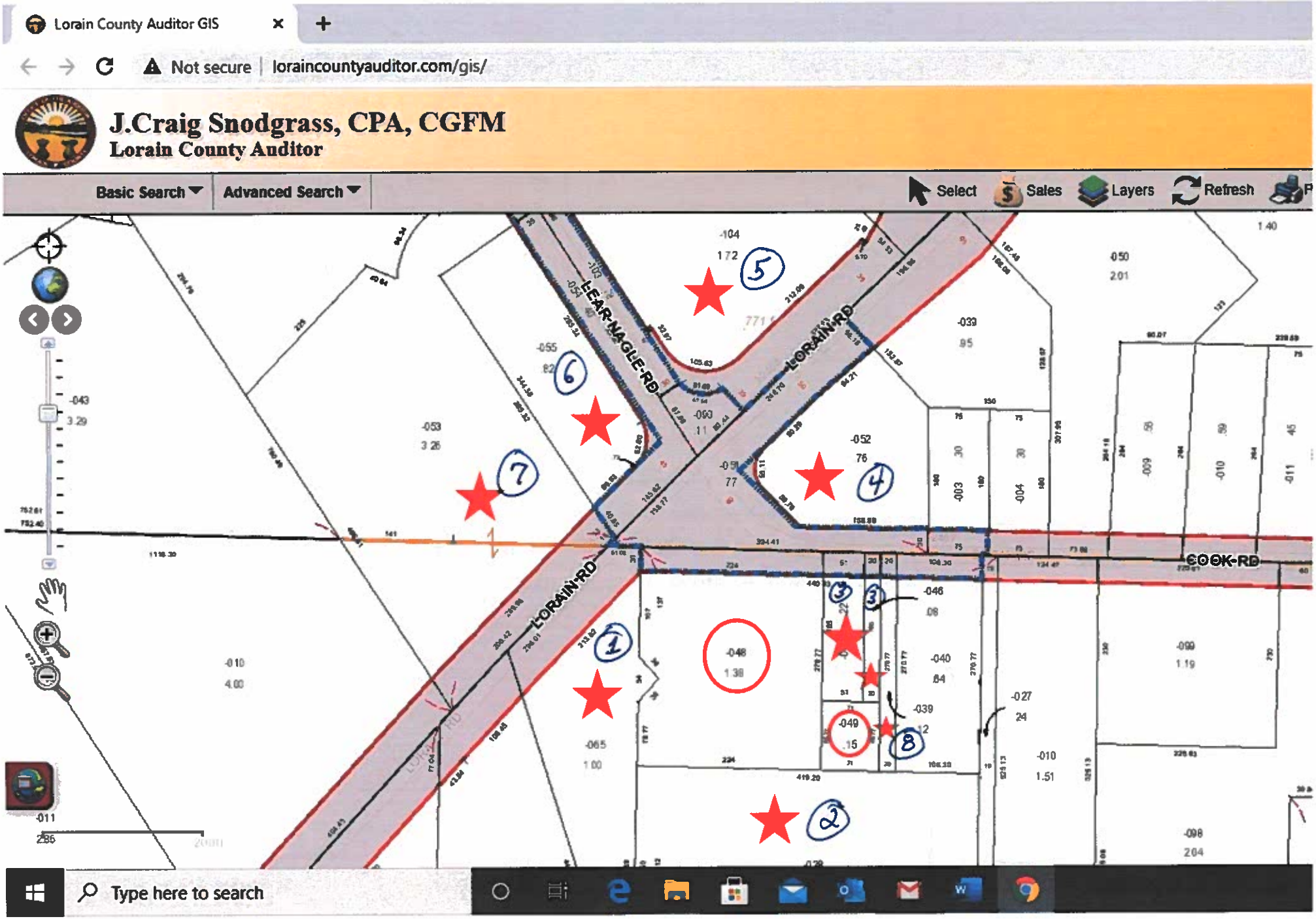
	ADJACENT PROPERTY OWNER / ADDRESS	PARCEL NUMBER
✓1	JTL HOLDINGS LLC 32499 LORAIN RD. NORTH RIDGEVILLE, OH 44039	07000031020065
✓2	HRITCU, STELIAN + HRITCU, LIVIA M. 28370 NANDINA DR., NORTH OLMSTED, OH. 44070	07000031020028
✓3	BOBKOB 32425 LLC 4343 THORNRIDGE CIR., CLEVELAND, OH 44135	✓07000031020045 ~~07000031020046~~
✓4	SLABAUGH, JERRY JOSEPH TRUSTEE + SLABAUGH, BARBARA TRUSTEE PO. BOX 385 ALLENTOWN, PA. 18105-0385	07000041100S2
✓5	RINI REALTY COMPANY AN OHIO CORPORATION 3700 SIXTH AVE., ALTOONA, PA. 16602	07000041108104
✓6	HURRICANE LASER WASH LLC 5655 E. MISTIC BAY BLVD. MARBLEHEAD, OH. 43440	07000041109055
✓7	MCDONALDS REAL ESTATE COMPANY C/O STEPHEN PAYNE 22535 LORAIN RD. FAIRVIEW PARK, OH 44126	07000041109053
8	~~WEBERBRO PROPERTIES LLC~~ ~~34381 FORTUNE CT., NORTH RIDGEVILLE, OH. 44039~~	~~07000031020039~~
✓9	MUNSON ROAD PROPERTIES 7670 TYLER BLVD. MENTOR, OH. 44060	07000031020049
10		

SEE REVERSE SIDE FOR ADDITIONAL LISTINGS.

OFFICE USE ONLY

CBO Verification By: Date / Time Stamp:

BZA / PC Verification By:


Lorain County Auditor GIS
Not secure | loraincountyauditor.com/gis/
J.Craig Snodgrass, CPA, CGFM
Lorain County Auditor
Basic Search
Advanced Search
Select
Sales
Layers
Refresh
LEAR-NAGLE-RD
LORAIN-RD
COOK-RD
Type here to search

DOC ID ----> 201706703904

DATE	DOCUMENT ID	DESCRIPTION	FILING	EXPED	PENALTY	CERT	COPY
03/09/2017	201706703904	LIMITED LIABILITY COMPANY - AMENDMENT (LAM)	50.00	0.00	0.00	0.00	0.00

Receipt

This is not a bill. Please do not remit payment.

MUNSON ROAD PROPERTIES, LLC
DEB MCFADDEN
7670 TYLER BLVD.
MENTOR, OH 44060

STATE OF OHIO
CERTIFICATE

Ohio Secretary of State, Jon Husted

2048822

It is hereby certified that the Secretary of State of Ohio has custody of the business records for

COOK ROAD PROPERTIES, LLC

and, that said business records show the filing and recording of:

Document(s)	Document No(s):
LIMITED LIABILITY COMPANY - AMENDMENT	**201706703904**

Effective Date: 03/06/2017

United States of America
State of Ohio
Office of the Secretary of State

Witness my hand and the seal of the Secretary of State at Columbus, Ohio this 9th day of March, A.D. 2017.

Jon Husted

Ohio Secretary of State

DOC ID ----> 201706703904

Form 543A Prescribed by:

JON HUSTED
OHIO SECRETARY OF STATE

Toll Free: (877) SOS-FILE (877-767-3453)
Central Ohio: (614) 466-3910
www.OhioSecretaryofState.gov
busserv@OhioSecretaryofState.gov
File online or for more information: www.OHBusinessCentral.com

Mail this form to one of the following:

Regular Filing (non expedite)
P.O. Box 1329
Columbus, OH 43216

Expedite Filing (Two business day processing time. Requires an additional $100.00)
P.O. Box 1390
Columbus, OH 43216

2017 MAR -6 AM 8:46

Domestic Limited Liability Company Certificate of Amendment or Restatement
Filing Fee: $50

(CHECK ONLY ONE (1) BOX)

(1) Domestic Limited Liability Company

☒ Amendment (129-LAM)

09/16/2011
Date of Formation

(2) Domestic Limited Liability Company

☐ Restatement (142-LRA)

Date of Formation

The undersigned authorized representative of:

Munson Road Properties, LLC
Name of limited liability company

2048822
Registration Number

If box (1) Amendment is checked, only complete sections that apply. If box (2) Restatement is checked, all sections below must be completed.

The name of said limited liability company shall be:

Cook Road Properties, LLC

Name must include one of the following words or abbreviations: "limited liability company," "limited," "LLC," "L.L.C.," "ltd." or "ltd"

This limited liability company shall exist for a period of:

Period of Existence

Purpose

By signing and submitting this form to the Ohio Secretary of State, the undersigned hereby certifies that he or she has the requisite authority to execute this document.

Required
Must be signed by a member, manager or other representative.

If authorized representative is an individual, then they must sign in the "signature" box and print their name in the "Print Name" box.

If authorized representative is a business entity, not an individual, then please print the business name in the "signature" box, an authorized representative of the business entity must sign in the "By" box and print their name in the "Print Name" box.

Debra L McFadden
Signature

Authorized Agent
By (if applicable)

Debra L. McFadden
Print Name

Signature

By (if applicable)

Print Name

Signature

By (if applicable)

Print Name

TMS Engineers, Inc.
Transportation Management Services
2112 Case Parkway South, #7 • Twinsburg, Ohio 44087
www.TMSEngineers.com

September 17, 2020

Ms. James Martynowski
Osborne Capital Group
7670 Tyler Boulevard
Mentor, ohio 44060

Re: Proposed Starbucks
City of North Ridgeville, Ohio
Trip Generation Analysis

Dear James,

TMS Engineers, Inc. has performed the following trip generation analysis for a proposed Starbucks which is to be located on the southeast corner of the Lorain Road / Cook Road intersection in the City of North Ridgeville, Ohio (see **Location Map, Figure 1**). The purpose of this trip generation analysis is to estimate the amount of traffic that will be generated by the proposed Starbucks. The proposed site plan can be seen in **Figure 2**. The following are the results of our trip generation analysis.

Trip Generation

The calculation of future traffic requires an estimate of traffic the development will generate after construction. The most widely accepted method of determining the amount of traffic that a proposed development will generate is to compare the proposed site with existing facilities of the same use. This estimate is typically expressed as a trip rate. In order to estimate traffic for the Starbucks, a trip rate was calculated using data and procedures found in the Institute of Transportation Engineers (ITE) **"Trip Generation" Manual, Tenth Edition**. The Coffee / Donut Shop With Drive-Through Window **(ITE Code 937)** land use will be used.

A copy of the trip generation worksheets for the Starbucks can be seen in the attached **Figure 3**.

Proposed Trip Generation Calculations

Based on the trip generation analysis described on the previous page, the table below shows the estimated generated traffic during the AM and PM peak hour for the proposed building based upon the national averages considering gross square footage of the building.

ITE TRIP GENERATION		Square Footage	TRIP ENDS			
ITE Code	Description		Weekday Peak Hour Between 7-9 AM (Enter/Exit)		Weekday Peak Hour Between 4-6 PM(Enter/Exit)	
937	Coffee / Donut Shop With Drive-Thru	2,226	101	97	48	49
Trip Totals			198		97	

The previous table shows that the proposed Starbucks is expected to generate a total of 198 trips in the AM peak hour and 97 trips in the PM peak hour.

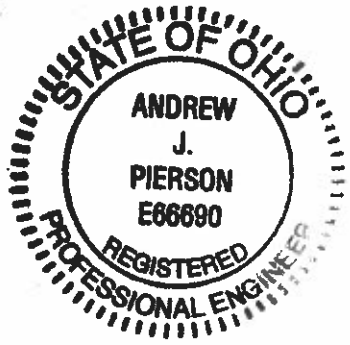
If you have any questions or need additional information, please do not hesitate to contact me.

Very truly yours,

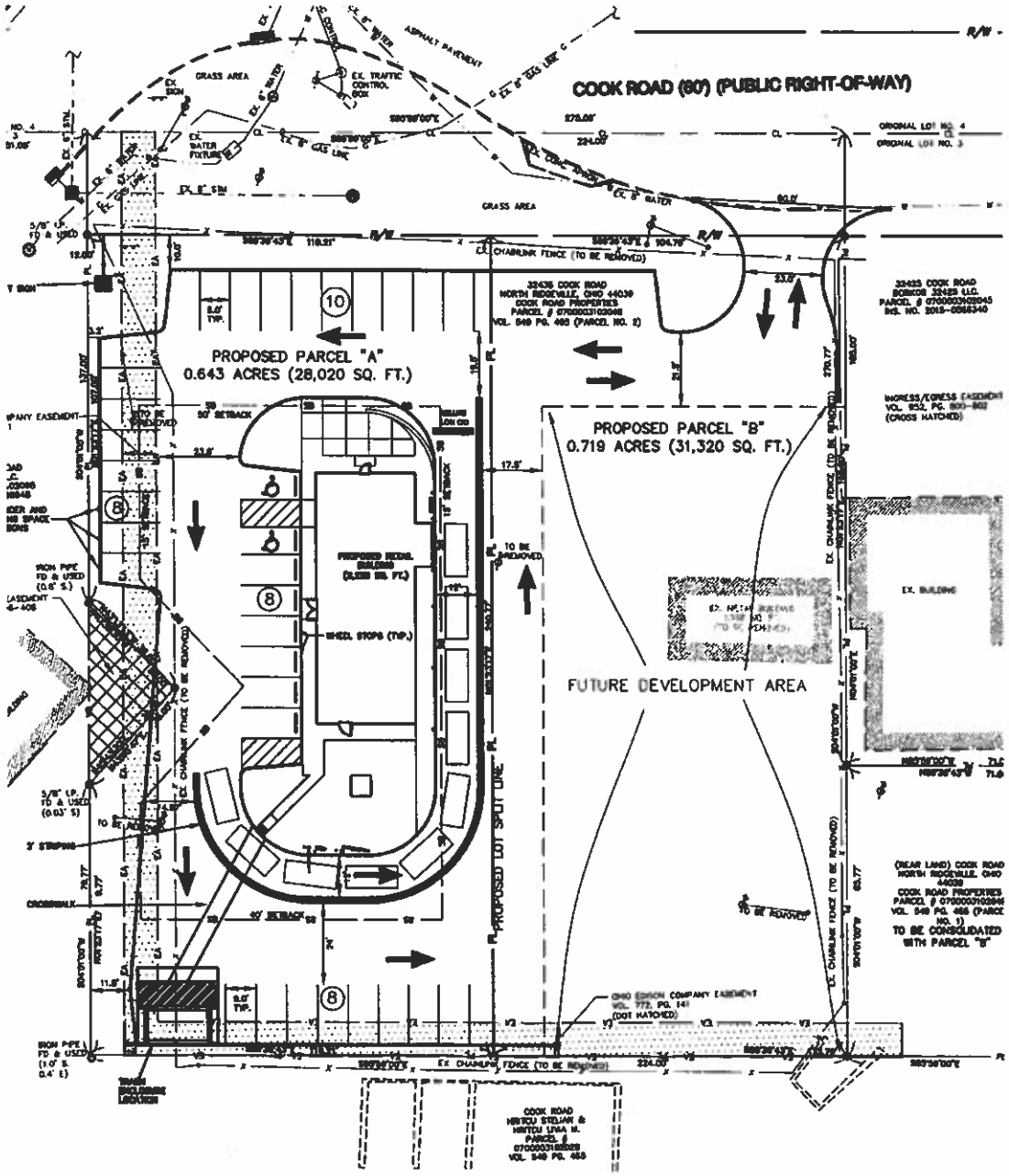
TMS Engineers, Inc.

Andrew Pierson, P.E.
Senior Traffic Engineer

Attachments



TMS Engineers, Inc. Transportation Management Services 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	Proposed Starbucks North Ridgeville, Ohio Trip Generation Analysis	Location Map	Figure 1 Attachment



NOT TO SCALE

TMS Engineers, Inc. Transportation Management Services 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	**Proposed Starbucks** **North Ridgeville, Ohio** **Trip Generation Analysis**	**Site Plan**	**Figure 2** **Attachment**

Coffee/Donut Shop with Drive-Through Window

ITE Code = 937

Date: 9/17/2020

Trip Generation based on: Size of Analysis Area: 2.226 1,000 Sq Ft

1,000 Square Feet Gross Floor Area	Average Rate	Standard Deviation	Adjustment Factor	Driveway Volume
Average Weekday 2-way Volume	820.38	**	1.00	1826
Weekday Peak Hour of Adjacent Street Traffic				
7-9 AM Peak Hour Enter	45.38	0.00	1.00	101
7-9 AM Peak Hour Exit	43.61	0.00	1.00	97
7-9 AM Peak Hour Total	88.99	48.19	1.00	198
4-6 PM Peak Hour Enter	21.69	0.00	1.00	48
4-6 PM Peak Hour Exit	22.14	0.00	1.00	49
4-6 PM Peak Hour Total	43.38	18.88	1.00	97

The above rates were calculated from the equations shown below:

Average Weekday 2-way Volume — *Not Given – Use ITE Rates*

Peak Hour of Adjacent Street Traffic

7-9 AM Peak Hour Total — *Not Given – Use ITE Rates* — Enter 0.51, Exit 0.49

4-6 PM Peak Hour Total — *Not Given – Use ITE Rates* — Enter 0.50, Exit 0.50

Source: Institute of Transportation Engineers
Trip Generation Manual, 10th Edition, September 2017

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS	
Name of Applicant:	James Martynowski
Name of Owner:	Cook Road Properties
Date Submitted for Consideration:	9-18-20
Date to Return to Planning Commission:	9-21-20
Regarding: Starbucks – 32435 Cook Road	

RECOMMENDATIONS:

Provide copy of cross access easement to City of North Ridgeville.

Check with Ohio Edison to see what is allowed in their easement, such as parking or trash enclosure.

All else appears zoning code compliant.

(use additional sheets if necessary)

Department Head Signature & Title: CBO

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 12-13-2005.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter. (Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS	
Name of Applicant:	James Martynowski, Osborne Capital Group 7670 Tyler Blvd, Mentor, OH 44060
Name of Owner:	Cook Road Properties 7670 Tyler Blvd, Mentor, OH 44060
Date of Planning Commission Meeting:	Tuesday, October 13, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 01, 2020

Regarding: Site plan approval to construct a 2,225 square foot single use commercial building; located at 32435 Cook Rd, in a B-3 Commercial District

Permanent Parcel Nos. 07-00-003-102-048 and -049

Recommendations:

At Dunkin we are experiencing a traffic issue on Lorain Road when the drive-up window gets busy. Four to five cars will stack up EB on Lorain road because the length of the drive up lane is not long enough to handle business when at peak volume.

(Use additional sheets if necessary.)

Department Head Signature: POLICE CHIEF MIKE FREEMAN **Title:** [Select Title...]

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

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CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS	
Name of Applicant:	James Martynowski, Osborne Capital Group 7670 Tyler Blvd, Mentor, OH 44060
Name of Owner:	Cook Road Properties 7670 Tyler Blvd, Mentor, OH 44060
Date of Planning Commission Meeting:	Tuesday, October 13, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 01, 2020

Regarding: Site plan approval to construct a 2,225 square foot single use commercial building; located at 32435 Cook Rd, in a B-3 Commercial District

Permanent Parcel Nos. 07-00-003-102-048 and -049

Recommendations:

Please contact Asst. Chief Mike Uhnak to discuss the following code requirements of the Ohio Fire Code and Chapter 16 Fire Prevention of the Codified Ordinance of North Ridgeville.
North Ridgeville Fire Department
Fire Prevention
(440)653-6362

1-OFC Rule 5 Fire Service Features.

Section 503 Fire Access Roads

Secdtion 506 Key Boxes

Section 507 Fire Protection Water Supply

2-OFC Rule 33 Fire Safety During Construction And Demolition.

3-NFPA 241 Standard For Safeguarding Construction, Alteration, And Demolition Operations.

4-NFPA 25 Standard for the Inspection, Testing, and Maintenance of Water Base Fire Protection Systems.

5-Chapter 16 Fire Prevention NR Ordinance.

Thanks for your cooperation.

(Use additional sheets if necessary.)

Department Head Signature: _____ **Title:** Fire Chief

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

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CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS	
Name of Applicant:	James Martynowski, Osborne Capital Group 7670 Tyler Blvd, Mentor, OH 44060
Name of Owner:	Cook Road Properties 7670 Tyler Blvd, Mentor, OH 44060
Date of Planning Commission Meeting:	Tuesday, November 10, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 29, 2020

Regarding: Site plan approval to construct a 2,225 square foot single use commercial building; located at 32435 Cook Rd, in a B-3 Commercial District

Permanent Parcel Nos. 07-00-003-102-048 and -049

Recommendations:

After reviewing the site plan location and traffic study I firmly support the approval to construct a 2,225 square foot commercial building at 32435 Cook Road for the purpose of opening a Starbucks in the City of North Ridgeville.

(Use additional sheets if necessary.)

Department Head Signature: _____ **Title:** **Safety-Service Director**

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS

Name of Applicant:	James Martynowski, Osborne Capital Group 7670 Tyler Blvd, Mentor, OH 44060
Name of Owner:	Cook Road Properties 7670 Tyler Blvd, Mentor, OH 44060
Date of Planning Commission Meeting:	Tuesday, October 13, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 01, 2020

Regarding: Site plan approval to construct a 2,225 square foot single use commercial building; located at 32435 Cook Rd, in a B-3 Commercial District

Permanent Parcel Nos. 07-00-003-102-048 and -049

Recommendations:

As one of the most frequently requested businesses, I'm happy to have Starbucks interested in our city. The BZA approved the variances that they needed to be located at their parcel. While there may be some concerns about traffic, there is room to stack many cars on the property before reaching Cook Road. A traffic study is being conducted and they will have to follow those recommendations from the study. I look forward to welcoming Starbucks to our community!

(Use additional sheets if necessary.)

Department Head Signature: _____ **Title:** Mayor

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

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(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS

Name of Applicant:	James Martynowski, Osborne Capital Group 7670 Tyler Blvd, Mentor, OH 44060
Name of Owner:	Cook Road Properties 7670 Tyler Blvd, Mentor, OH 44060
Date of Planning Commission Meeting:	Tuesday, October 13, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 01, 2020

Regarding: Site plan approval to construct a 2,225 square foot single use commercial building; located at 32435 Cook Rd, in a B-3 Commercial District

Permanent Parcel Nos. 07-00-003-102-048 and -049

Recommendations:

1. A traffic impact study is required per City of North Ridgeville Codified Ordinance 1210.06 for new commercial developments unless the peak hour trips to the development are less than or equal to 150. Calculations need to be provided by a licensed professional traffic engineer.
2. Complete detailed improvement plans and storm water management calculations need to be provided to the Engineering Department for review.
3. Contact must be made with James Brewer, Chief Resident Project Representative, to discuss water backflow requirements.
4. A tree planting plan is required per City of North Ridgeville Codified Ordinance 1032.09 for commercial developments seeking to build or expand.

(Use additional sheets if necessary.)

Department Head Signature: Daniel Rodell **Title:** City Engineer

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS

Name of Applicant:	James Martynowski, Osborne Capital Group 7670 Tyler Blvd, Mentor, OH 44060
Name of Owner:	Cook Road Properties 7670 Tyler Blvd, Mentor, OH 44060
Date of Planning Commission Meeting:	Tuesday, November 10, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 29, 2020

Regarding: Site plan approval to construct a 2,225 square foot single use commercial building; located at 32435 Cook Rd, in a B-3 Commercial District

Permanent Parcel Nos. 07-00-003-102-048 and -049

Recommendations:

No comments at this time.

(Use additional sheets if necessary.)

Department Head Signature: _____ **Title:** **Assistant Fire Chief**

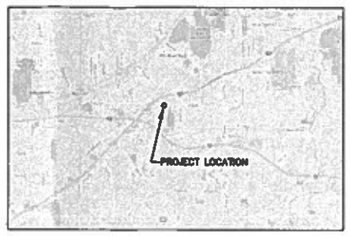
Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

PRELIMINARY SITE PLAN
FOR
NORTH RIDGEVILLE STARBUCKS

SITUATED IN THE CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN AND STATE OF OHIO AND KNOWN AS BEING PART OF ORIGINAL RIDGEVILLE TOWNSHIP LOT NO. 3
PP#'S 07-00-003-102-049 & 07-00-003-102-048



LEGEND OF SYMBOLS:

Storm Manhole	Gas Meter
Sanitary Manhole	Cleanout
Catch Basins	AC Condensor Unit
Telephone Manhole	Light Pole
Fire Hydrant	Guy Wire
Water Valve	Utility Pole
Hydrant Shut Off Valve	Yard Light
Water Meter	
Water Standpipe	
Sprinkler Valve	
Centerline	
Right-of-Way	
Gas Line	
Water Line	
Telephone Line	
Storm Sewer	
Sanitary Sewer	
Sanitary Sewer	

ZONING NOTES:

ALL SUBJECT PROPERTIES FALL WITH IN THE NORTH RIDGEVILLE B-3 HIGHWAY COMMERCIAL DISTRICT

1268.03 BUILDING HEIGHT

– NO BUILDING OR STRUCTURE IN A B-3 HIGHWAY COMMERCIAL DISTRICT SHALL EXCEED SIXTY-FIVE FEET IN HEIGHT

1268.04 LOT AND YARD REQUIREMENTS

(A) REQUIRED LOT AREA AND WIDTH: EACH BUILDING, USE OR STRUCTURE PERMITTED IN B-3 HIHGWAY COMMERICAL DISTRICT SHAL BE LOCATED ON A LOT HAVING AN AREA OF NOT LESS THAN ONE ACRE AND A WIDTH OF NOT LESS THAN 150 FEET, UNLESS OTHERWISE PERMITTED BY THIS ZONING CODE

(B) REQUIRED YARDS:
- (1) FRONT YARD SETBACK=NOT LESS THAN 50'
- (2) REAR YARD SETBACK=NOT LESS THAN 40'
- (3) SIDE YARD SETBACK=NOT LESS THAN 15' EACH SIDE
- (4) BUFFER STRIPS: A NATURAL LANDSCAPED BUFFER NO LESS THAN 10 FEET WIDE AND A 5' FENCE WHEN REQUIRED BY THE PLANNING COMMISSION

1268.05 LOT COVERAGE

– BUILDINGS, TOGETHER WITH ACCESSORY USE, IN A B-3 HIGHWAY COMMERICAL DISTRICT, SHALL COVER NOT MORE THAN TWENTY-FIVE PERCENT OF THE ARE OF THE LOT, EXCEPT AS OTHERWISE PROVIDED IN THE ZOING CODE

1268.07 OFF STREET PARKING

–ESTABLISHMENTS FOR THE SALE AND CONSUMPTION ON THE PREMISES OF ALCOHOLIC BEVERAGES, FOOD OR REFRESHMENTS: ONE PARKING SPACE FOR EACH 100 SQUARE FEET OF FLOOR AREA, PLUS ONE PARKING SPACE FOR EACH FOUR EMPLOYEES,

NORTH

SCALE IN FEET (HORIZONTAL) 40 20 0 20
SCALE IN FEET (VERTICAL) 2 1 0 1

STATE OF OHIO
RYAN A. SNEZEK
NO. 8495
REGISTERED
PROFESSIONAL SURVEYOR

NO.	DESCRIPTION	DATE	BY
6.			
5.			
4.			
3.			
2.			
1.			

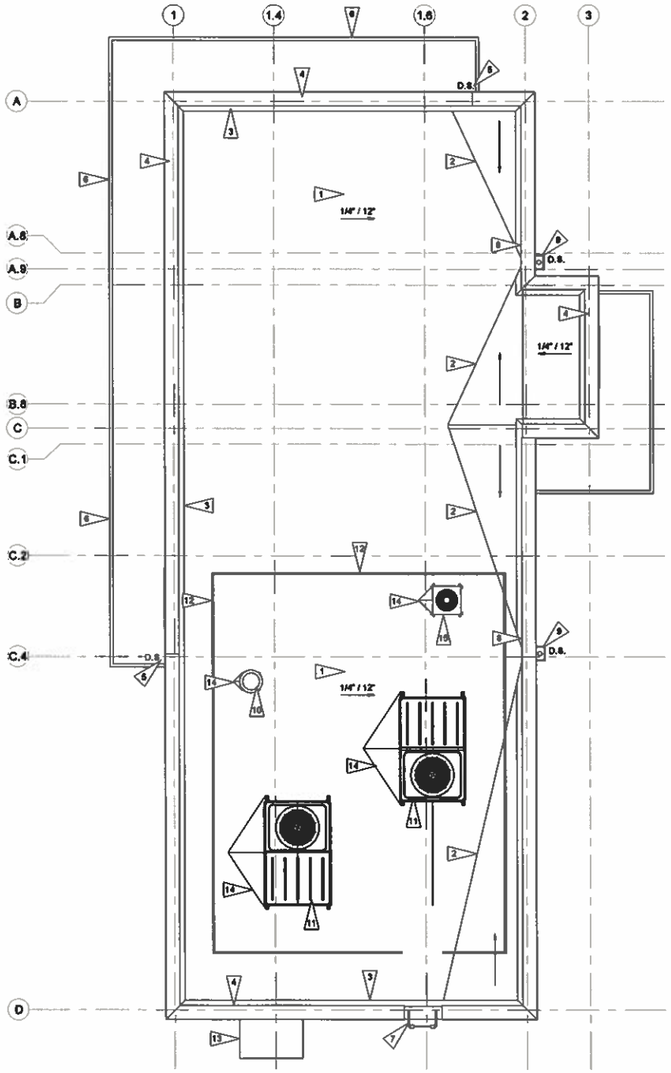
REVISIONS

STEPHEN HOVANCSEK & ASSOCIATES, INC.
CONSULTING ENGINEERS AND PLANNERS
TWO MERIT DRIVE
RICHMOND HEIGHTS, OHIO 44143
PH: (216) 731-6255 FAX: (216) 731-4483

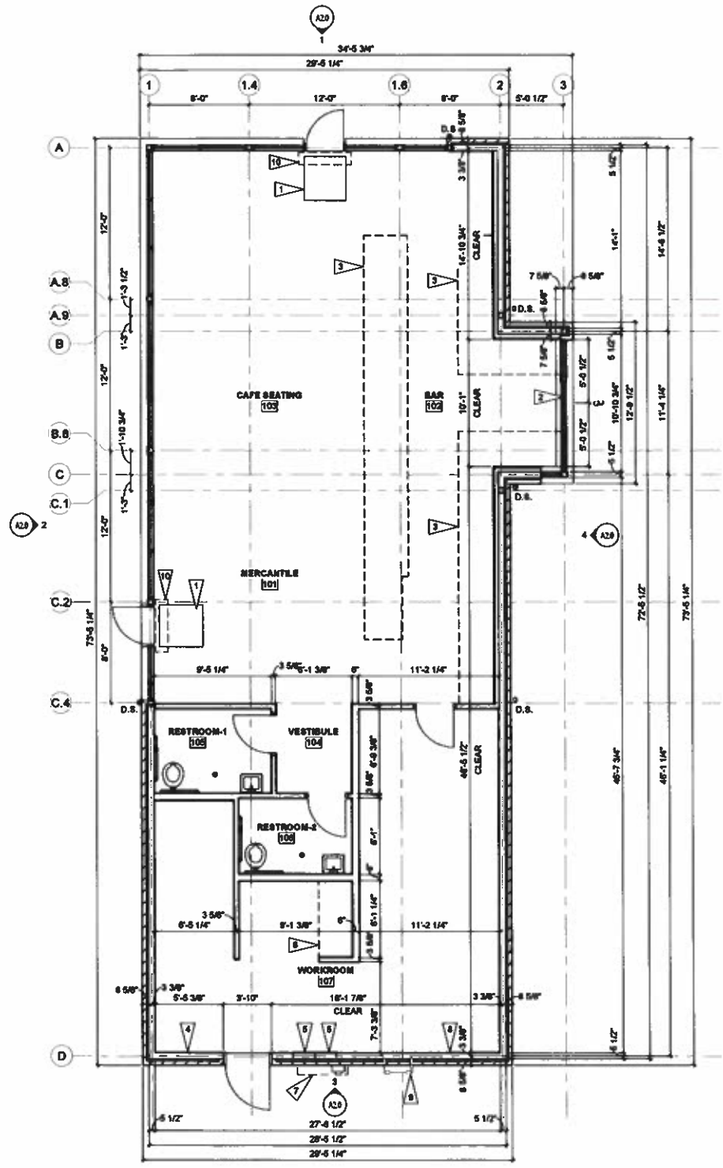
NORTH RIDGEVILLE, OHIO
PRELIMINARY SITE PLAN FOR NORTH RIDGEVILLE STARBUCKS

DATE: 6/30/2020
JOB No. 20-157

1 OF 1



2 PLAN ROOF
3/16" = 1'-0"



1 PLAN BUILDING FLOOR
3/16" = 1'-0"

FLAG NOTES - BUILDING FLOOR PLAN

1. SLAB RECESSED FOR WALK-OFF-MAT, DEPENDENT ON WHETHER FLOOR TILE IS INSTALLED
2. READY ACCESS DRIVE THRU WINDOW AND AIR CURTAIN
3. BAR WITH KITCHEN EQUIPMENT. COOLER. POS STATION
4. WATER SERVICE ENTRY POINT
5. RECESSED ELECTRICAL PANEL
6. STRUCTURAL SHELF FOR WATER HEATER ABOVE
7. EXTERIOR ELECTRICAL METER AND CT CABINET LOCATION
8. DATA ENTRY POINT
9. ROOF LADDER ABOVE
10. AIR CURTAIN INSTALLED ABOVE

FLAG NOTES - ROOF PLAN

1. 60 MIL. MECHANICALLY ATTACHED WHITE TPO ROOFING MEMBRANE (OVER TAPERED INSULATION WHERE INDICATED) ON 4" POLYISO INSULATION ON EXTERIOR GRADE OSB SHEATHING OVER ROOF JOISTS/TRUSSES (REFER TO STRUCTURAL DRAWINGS). SLOPE STRUCTURE TOWARDS ROOF DRAINS / GUTTERS AND MAINTAIN 1/4" / 1'-0" MIN. SLOPE.
2. TAPERED INSULATION WHERE INDICATED BY HATCH, SLOPE 1/4" / 1'-0" MIN. TOWARDS ROOF DRAINS / GUTTERS.
3. 6x6 RIGID INSULATION ROOF CANT.
4. PREFINISHED MATTE BLACK METAL COPING.
5. 3x4 PREFINISHED ALUMINUM HEAVY-DUTY COMMERCIAL GRADE DOWNSPOUT.
6. CUSTOM METAL CANOPY WITH C-STEEL POWDER-COATED FASCIA AND EXTERIOR WOOD CLADDING AT UNDERSIDE. SLOPED TO BUILDING.
7. EXTERIOR STEEL ROOF LADDER TO BE SHOP GALVANIZED, SHOP PRIMED AND FIELD PAINTED.
8. OVERFLOW DRAIN DISCHARGE OUTLET THROUGH LOWER PORTION OF WALL. SEE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
9. ROOF SCUPPER AND CONDUCTOR HEAD.
10. EXHAUST VENT KIT THROUGH ROOF. SEE MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.
11. ROOF TOP UNIT ON ROOF CURB.
12. MECHANICAL EQUIPMENT SCREEN, ROOFSCREEN ROTOLOCK, SQUARE BASE. SC3 FRAME. COLOR: MATTE BLACK
13. AWNING OVER SERVICE DOOR, PROJECT A MINIMUM OF 4'-0" FROM BUILDING FACE, FINISH: BLACK
14. ROOF CRICKET SLOPE AT 1/4" PER 1'-0".
15. ICE MACHINE CONDENSER

N
3/16" = 1'-0"
0 6" 9" 12" 16"

STATE OF OHIO
CHARLES A. GRAY
15351
REGISTERED ARCHITECT

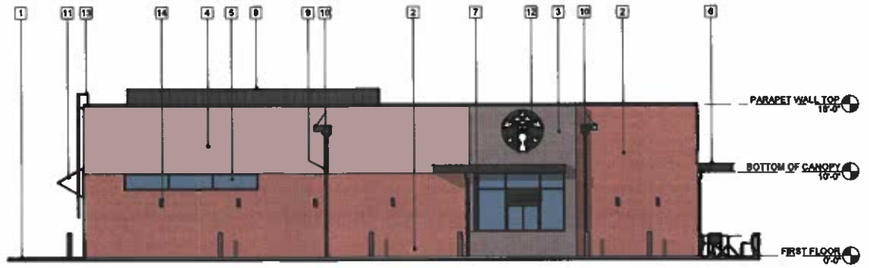
REVISIONS

MANN - PARSONS - GRAY
ARCHITECTS
phone 330.666.5770
fax 330.666.8812
3880 Embassy Parkway
Fairlawn, OH 44333
mpg-architects.com

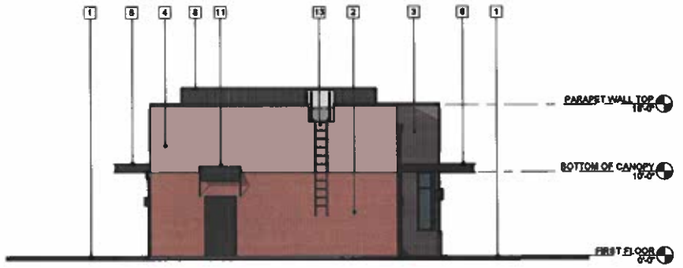
FLOOR AND ROOF PLAN
PROJECT #: 20320
DATE: SEPTEMBER 15, 2020

STARBUCKS NORTH RIDGEVILLE
32435 COOK ROAD
NORTH RIDGEVILLE, OHIO 44039

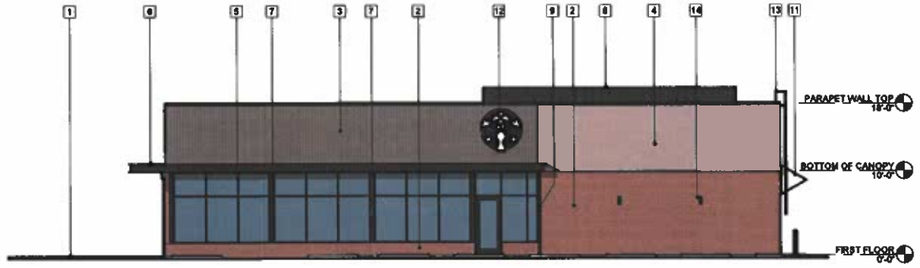
A1.0
1 OF 3



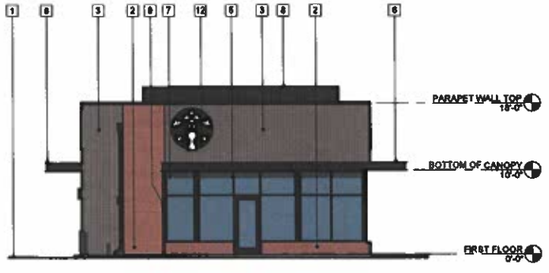
4 ELEVATION EAST
1/8" = 1'-0"



3 ELEVATION SOUTH
1/8" = 1'-0"



2 ELEVATION WEST
1/8" = 1'-0"



1 ELEVATION NORTH
1/8" = 1'-0"

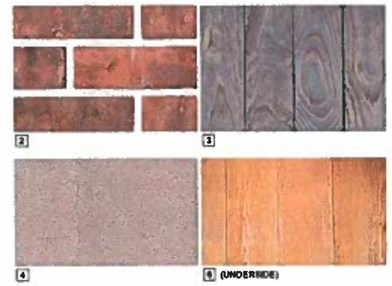
GENERAL NOTES - ELEVATIONS

1. VERIFY ALL DIMENSIONED CONDITIONS IN THE FIELD. WHEN DIMENSIONS AND/OR CONDITIONS AS INDICATED ON THE DRAWINGS CONFLICT WITH ACTUAL, CONTACT THE ARCHITECT FOR CLARIFICATION.
2. REFER TO STRUCTURAL DETAILS FOR PROPER REINFORCEMENT OF MASONRY AT ALL WINDOW AND DOOR OPENINGS. TYPICAL.
3. REFER TO STRUCTURAL DETAILS FOR TYPICAL EXPANSION AND CONTROL JOINT CONSTRUCTION.

FLAG NOTES - EXTERIOR ELEVATIONS

1. APPROXIMATE FINISHED GRADE.
2. BRICK VENEER - MUTUAL MATERIALS, CASCADE SPICE, RUNNING BOND. SM610 AMBER COLORED MORTAR.
3. ACCOYA WOOD SIDING, NICHIHA, T&G
4. EIFS, DRYVIT, COLOR: 133 - DRIFTWOOD
5. STOREFRONT, MATTE BLACK FINISH
6. CANOPY, MATTE BLACK FINISH TO MATCH STOREFRONT. UNDERSIDE WOOD CLADDING, IDENTITY WOOD PRODUCTS, 1000 - LIGHT BROWN/ BEIGE WITH DARK LOWLIGHTS, 1/16" REVEAL.
7. COLUMN WRAPPED TO MATCH STOREFRONT SYSTEM
8. MECHANICAL EQUIPMENT SCREEN, ROOFSCREEN ROTOLOCK, SQUARE BASE, SC3 FRAME, COLOR: MATTE BLACK
9. 3x4 PREFINISHED ALUMINUM HEAVY-DUTY COMMERCIAL GRADE DOWNSPOUT.
10. ROOF CONDUCTOR HEAD AND ADJACENT OVERFLOW
11. AWNING OVER SERVICE DOOR, PROJECT A MINIMUM OF 4'-0" FROM BUILDING FACE. FINISH: BLACK
12. 60" DIAMETER ILLUMINATED DISC SIGNAGE
13. ROOF ACCESS LADDER
14. CYLINDRICAL WALL SCONCE, FINISH: MATTE BLACK

PALETTE C



STATE OF OHIO
REGISTERED ARCHITECT
CHARLES A. GRAY
19361

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fax 330.668.8812
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EXTERIOR ELEVATIONS & PERSPECTIVES

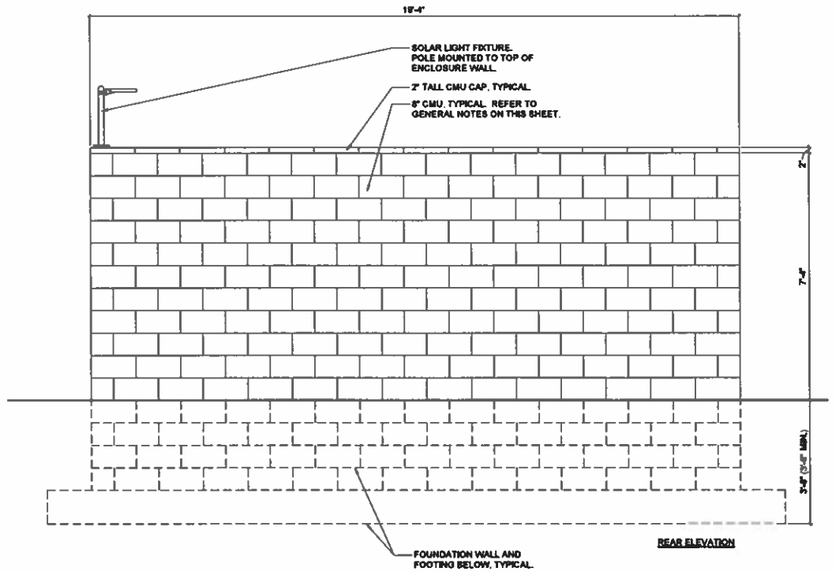
PROJECT #: 20320
DATE: SEPTEMBER 15, 2020

STARBUCKS NORTH RIDGEVILLE
32435 COOK ROAD
NORTH RIDGEVILLE, OHIO 44039

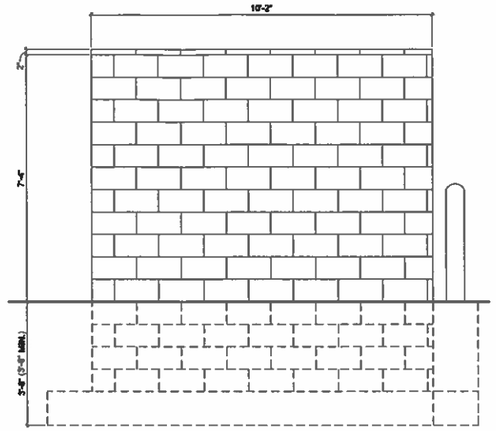
A2.0

GENERAL EXTERIOR FINISH NOTES:

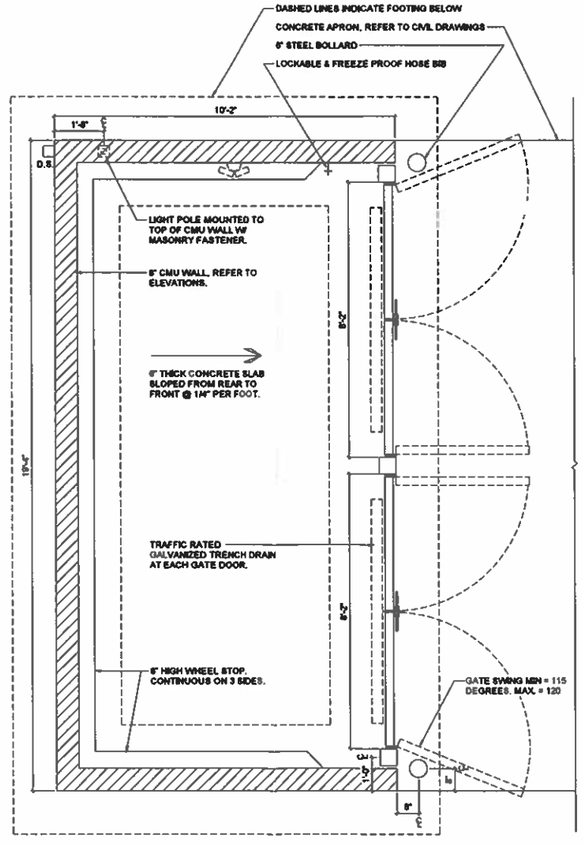
1. THE INTERIOR WALL SURFACES OF THE TRASH ENCLOSURE ARE TO BE SMOOTH, SEALED, AND WASHABLE. APPLY ONE COAT OEPOXY FILLER / SEALER AND ONE COAT GLOSS POLYURETHANE.
2. RUNNING BOND INTEGRAL CMU COLOR TO MATCH BUILDING.

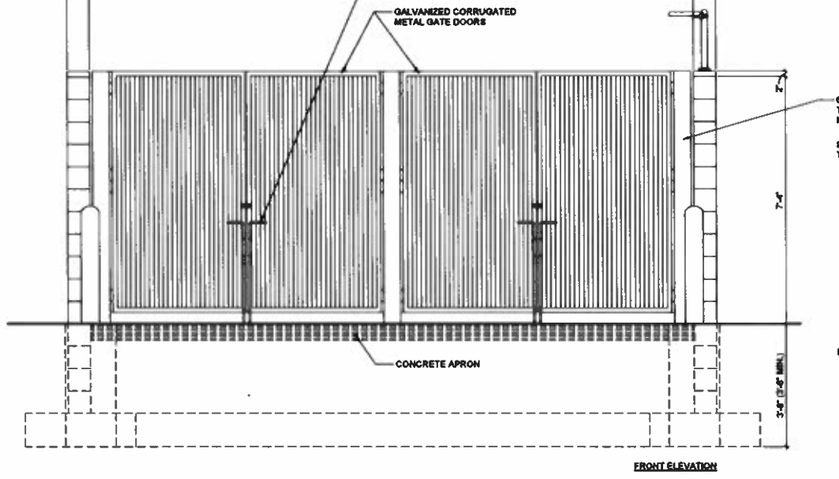


REAR ELEVATION

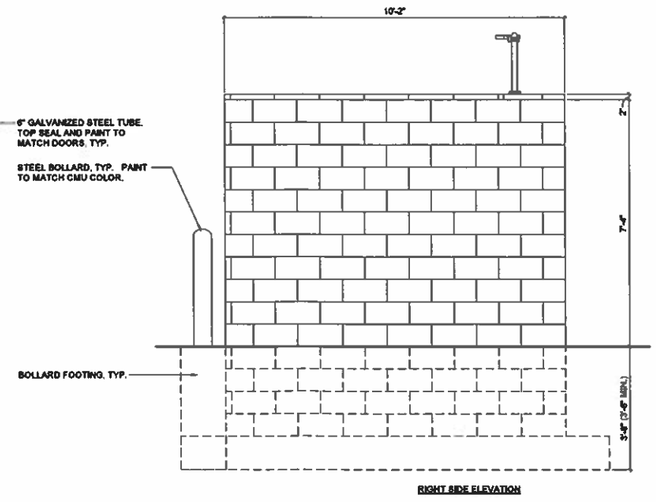


LEFT SIDE ELEVATION





FRONT ELEVATION



RIGHT SIDE ELEVATION

2 ELEVATION TRASH ENCLOSURE
1/2" = 1'-0"

1 PLAN TRASH ENCLOSURE
1/2" = 1'-0"

1/2" 1'-0"
0 2" 3" 4" 6"

STATE OF OHIO
REGISTERED ARCHITECT
CHARLES A GRAY
15351

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3680 Embassy Parkway
Fairlawn, OH 44333
mpg-architects.com

TRASH ENCLOSURE PLAN & ELEVATIONS

PROJECT #: 20320
DATE: SEPTEMBER 15, 2020

STARBUCKS NORTH RIDGEVILLE

32435 COOK ROAD
NORTH RIDGEVILLE, OHIO 44039

A3.0
3 OF 3

TMS Engineers, Inc.

Traffic Impact Study

Proposed Starbucks
North Ridgeville, Ohio

October 26, 2020

Prepared for:
Osborne Capital Group
7670 Tyler Boulevard
Mentor, Ohio 44060

TRAFFIC IMPACT STUDY

Proposed Starbucks
North Ridgeville, Ohio

October 26, 2020

Prepared For:

Osborne Capital Group
7670 Tyler Boulevard
Mentor, Ohio 44060

Prepared By:

TMS Engineers, Inc.
2112 Case Parkway South
Unit #7
Twinsburg, Ohio 44087

REGISTERED ENGINEER NO. E56982
CERTIFICATION NO. 2234

"This document was prepared consistent with local agency requirements and/or applicable guidelines contained in this report."

Table of Contents

Executive Summary ..... vi-vii

Chapter 1 Introduction 1-7

1.1 Purpose of the Report 1

1.2 Study Objectives 4

1.3 Intersection Capacity & Level of Service 5

1.4 Intersection Turn Lanes 7

Chapter 2 Area Conditions 8-15

2.1 Transportation Network Study Area 8

2.2 Traffic 14

Chapter 3 Projected Traffic Conditions 16-33

3.1 Site Traffic 16

3.2 Non-Site Traffic 25

3.3 Future Traffic 29

Chapter 4 Traffic Analysis 34-48

4.1 Capacity and LOS at Study Area Intersections 34

4.2 Comparative Analysis 39

4.3 Capacity and LOS at Development Access Intersection 43

4.4 Auxiliary Turning Lane Warrant Analysis 45

4.5 Turn Lane Analysis 46

4.6 Improvements to Accommodate Study Area Traffic 47

Chapter 5 Conclusions 49-51

Appendices

Appendix A - ODOT Turn Lane Design Criteria

Appendix B - Traffic Count Data

Appendix C - Trip Generation Data

Appendix D - Growth Rate Calculations

Appendix E - Peak Hour to Design Hour Factors

Appendix F - No-Build Capacity Analysis Worksheets - 2021

Appendix G - No-Build Capacity Analysis Worksheets With Improvements - 2021

Appendix H - No-Build Capacity Analysis Worksheets - 2031

Appendix I - Build Capacity Analysis Worksheets - 2021

Appendix J - Build Capacity Analysis Worksheets - 2031

Appendix K - Build Driveway Capacity Analysis Worksheets - 2021

Appendix L - Build Driveway Capacity Analysis Worksheets - 2031

Appendix M - Turn Lane Warrant Analysis

Appendix N - Drive-Through Queue Generation Report

List of Figures

Figure 1.1 Location Map 2

Figure 1.2 Site Plan 3

Figure 2.1 Aerial View 9

Figure 2.2 Functional Classification Aerial 11

Figure 2.3 Existing Lane Use & Traffic Control 13

Figure 2.4 Existing Weekday Peak Hour Traffic Volumes 15

Figure 3.1 New Generated Traffic Distribution 20

Figure 3.2 Pass-by Generated Traffic Distribution 21

Figure 3.3 New Generated Traffic 23

Figure 3.4 Pass-by Generated Traffic 24

Figure 3.5 2021 No-Build Weekday Traffic Volumes 30

Figure 3.6 2031 No-Build Weekday Traffic Volumes 31

Figure 3.7 2031 Build Weekday Traffic Volumes 32

Figure 3.8 2031 Build Weekday Traffic Volumes 33

Figure 4.1 Recommended Lane Use and Traffic Control 48

List of Tables

Table-1.1 Intersection LOS 5
Table-2.1 Functional Classification 8
Table-2.2 Roadway Characteristics 10
Table-2.3 AM Peak Hour Traffic Volumes 14
Table-2.4 PM Peak Hour Traffic Volumes 14
Table-3.1 ITE Land Use Codes 16
Table-3.2 AM Peak Hour Pass-by Rates 17
Table-3.3 PM Peak Hour Pass-by Rates 17
Table-3.4 Net Trip Generation 18
Table-3.5 AM New Trip Origins & Destinations 19
Table-3.6 PM New Trip Origins & Destinations 19
Table-3.7 Growth Rates & Factors 26
Table-3.8 Peak Hour to Design Hour Factors 26
Table-4.1 2021 Levels-of-Service (No-Build Conditions) 34
Table-4.2 2021 Levels-of-Service (No-Build Conditions - Improved) 35
Table-4.3 2031 Levels-of-Service (No-Build Conditions) 36
Table-4.4 2021 Levels-of-Service (Build Conditions) 37
Table-4.5 2031 Levels-of-Service (Build Conditions) 38
Table-4.6 2021 No-Build Conditions vs Build Scenario (AM Peak Hour Comparison) 39
Table-4.7 2021 No-Build Conditions vs Build Scenario (PM Peak Hour Comparison) 40
Table-4.8 2031 No-Build Conditions vs Build Scenario (AM Peak Hour Comparison) 41
Table-4.9 2031 No-Build Conditions vs Build Scenario (PM Peak Hour Comparison) 42
Table-4.10 2021 Access Levels-of-Service (Build Conditions) 43

List of Tables - Continued

Table-4.11 2031 Access Levels-of-Service (Build Conditions) 44

Table-4.12 Turn Lane Warrants - Proposed Unsignalized Access Driveway 45

Executive Summary

This traffic impact study has been prepared at the request of Osborne Capital Group for a proposed Starbucks. The project site is located on the southwest corner of the Lorain Road and Lear Nagle / Cook Road intersection in the City of North Ridgeville, Ohio. **Figure 1.1, Page 2** shows the proposed location of the development.

The development is expected to consist of the following land uses:

2,226 Square Coffee Shop (Starbucks)

The Starbucks is proposed to have one full access driveway onto Cook Road. The driveway will be located on the southern edge of the site in order to provide the maximum distance from the Lorain Road / Lear Nagle intersection. A site plan illustrating the proposed location of the site's access driveway can be seen in **Figure 1.2, Page 3**.

The year 2021 will be analyzed for the Opening Year of the Starbucks. The year 2031 will be analyzed as the design year for the ten year conditions.

From the collected traffic data, the weekday AM peak hour of traffic was determined to be 7:15 AM to 8:15 AM. The weekday PM peak hour of traffic was found to be 4:45 PM to 5:45 PM.

The proposed Starbucks is expected to generate the following hourly traffic volumes during the peak period as shown in the table below:

ITE TRIP GENERATION			TRIP ENDS			
ITE CODE	DESCRIPTION	SIZE (Sq, Ft.)	Weekday AM Peak Hour of Generator (Enter/Exit)		Weekday PM Peak Hour of Generator (Enter/Exit)	
937	Coffee/Donut Shop w/Drive-Through	2,226	101	97	48	49
Pass-By Trips (AM- 49%/ PM-50%)			50	48	24	25
TOTAL NEW TRIPS			**51**	**49**	**24**	**24**
			100		**48**	

Recommended Improvements to Serve Future Conditions without the Development

The capacity analyses of the westbound and northbound movements at the Lorain Road and Lear Nagle Road / Cook Road intersection was calculated to be at an level-of-service E during the PM peak hour under the 2021 No-Build conditions. It was determined that the eastbound left-turn movement should be allowed to turn left during the permissive green ball rather then only during the protected turn arrow which is currently being used. There does not appear to be a sight distance restriction which would require a protected only turn restriction; however, the intersection should be further reviewed if a know crash hazard exists which prompted the use of a protected eastbound left-turn arrow.

Recommended Improvements to Mitigate the Traffic Associated with the Development

The additional traffic generated by the proposed Starbucks was determined to not cause a degradation to the LOS at the Lorain Road and Lear Nagle Road / Cook Road intersection. No signal or geometric improvements are recommended at the Lorain Road and Lear Nagle Road / Cook Road intersection in the future Build scenario.

Development Access Recommendations

The following lane use and traffic control are recommended to accommodate the 2021 and 2031 site generated (Build) traffic at the development access location on Cook Road:

Cook Road & Site Drive

- The proposed driveway should be constructed as per the site plan with a single entrance and exiting lane.
- Install stop sign control on the eastbound approach of the driveway.

Conclusion

Based upon the results of the analysis in this study and the corresponding recommendations, it can be seen that the development traffic can be accommodated without adversely impacting the area roadway network.

Chapter 1
Introduction

1.1 Purpose of Report

This traffic impact study has been prepared at the request of Osborne Capital Group for a proposed Starbucks. The project site is located on the southwest corner of the Lorain Road and Lear Nagle / Cook Road intersection in the City of North Ridgeville, Ohio. **Figure 1.1, Page 2** shows the proposed location of the development.

The development is expected to consist of the following land uses:

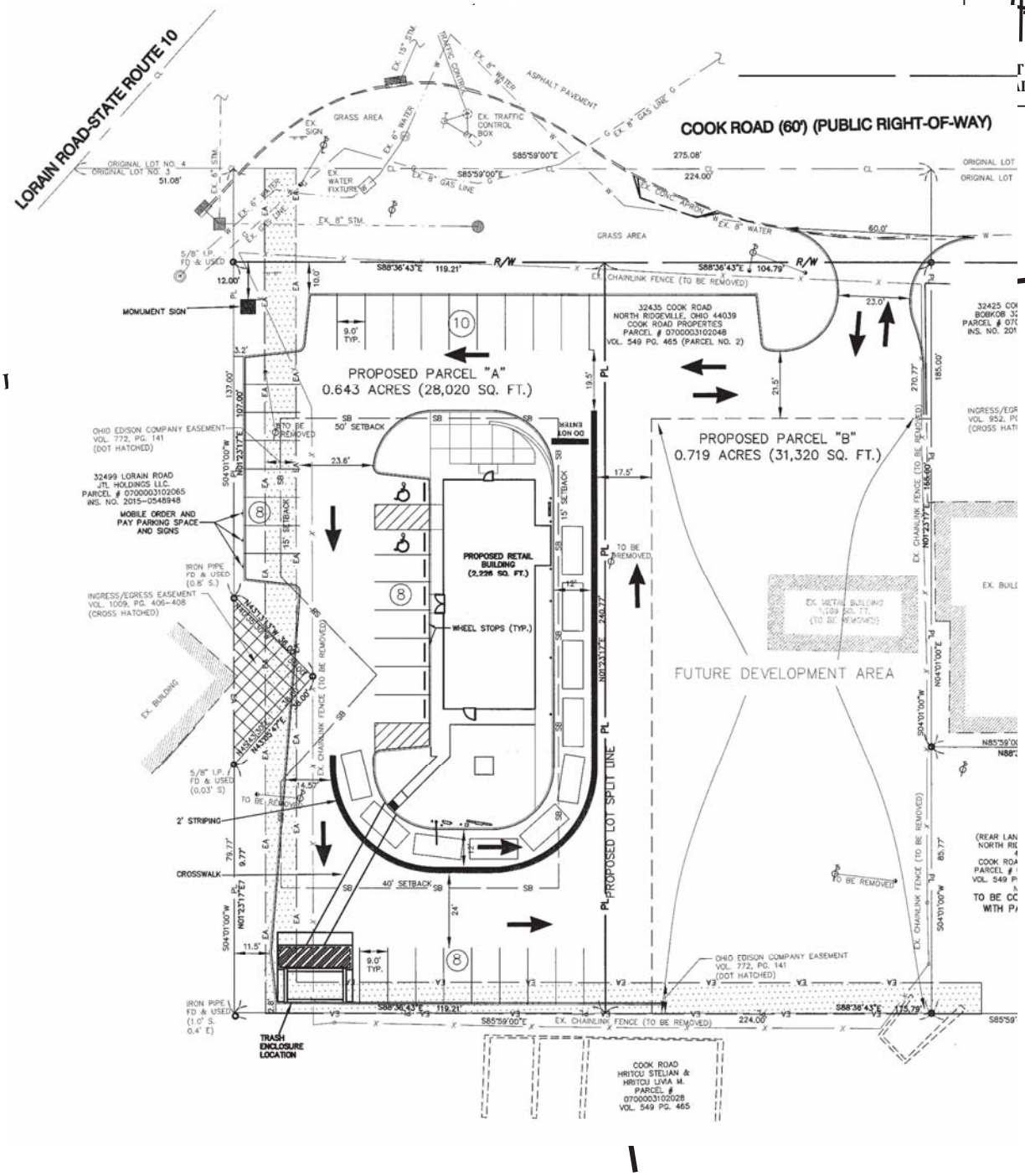
2,226 Square Coffee Shop (Starbucks)

Figure 1.2, Page 3 shows the proposed site plan for the development.

The Starbucks is proposed to have one full access driveway onto Cook Road. The driveway will be located on the southern edge of the site in order to provide the maximum distance from the Lorain Road / Lear Nagle intersection. A site plan illustrating the proposed location of the site's access driveway can be seen in **Figure 1.2, Page 3**.

The study will analyze 2021 as the opening year of the Starbucks.

TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	**Starbucks** **North Ridgeville, Ohio** **Traffic Impact Study**	**Location Map**	**Figure 1.1** **Page 2**



TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	**Starbucks** **North Ridgeville, Ohio** **Traffic Impact Study**	**Site Plan**	**Figure 1.2** **Page 3**

1.2 Study Objectives

This study is structured for the following purposes;

- to adequately assess the traffic impacts associated with the proposed development and identify the level of off-site access and traffic,
- to provide a comprehensive study which evaluates and documents the traffic impacts and off-site improvements, where warranted,
- and to provide a technically sound basis to identify mitigation requirements to off-site traffic impacts.

This study documents the methodologies, findings and conclusions of the analysis, including the basis for all assumptions, traffic parameters utilized and conclusions reached.

The traffic impacts will be determined by comparing the existing intersection levels-of-service before the construction of the proposed development to the anticipated levels-of-service after the development is completed. Levels-of-service for the study area and access roadway intersections will be calculated using the computerized version of the Transportation Research Board's **Highway Capacity Manual 6TH Edition (HCS7, Release 7.9)**.

The justification for any changes in the intersections will be determined by comparing data collected of the existing traffic conditions to the criteria established by the **Ohio Manual of Uniform Traffic Control Devices** and professional engineering judgment from an on-site field review.

Intersection geometric design guidelines will be based in the information and procedures found in the Ohio Department of Transportation's **Location & Design Manual, Volume 1**. The left and right turn lane warrants discussed in Section 401-6 will be used in addition to the capacity analyses to determine the need for deceleration and exclusive turn lanes at the unsignalized site access location.

1.3 Intersection Capacity & Levels-of-Service

Intersection capacity analyses will be performed at the proposed site driveways using the procedures outlined in the computerized version of the Transportation Research Board's **Highway Capacity Manual 6TH Edition (HCS7, Release 7.9)**.

The **HCM** is the most widely used document in the transportation industry. It contains set of methodologies and application procedures for evaluating the capacity and quality of service of various transportation facilities. The **HCM** is built from more than 60 years of research work and represents a body of expert transportation consensus.

The capacity analysis procedures provide a calculated "average vehicle delay", which is based on traffic volumes, number of lanes, type of traffic control, channelization, grade, and percentage of large vehicles in the traffic stream at each intersection. The average delay calculated at an intersection is then assigned a "grade" or level of service (LOS) ranging from LOS A, the best, to LOS F, the worst based upon driver expectation. The intersection LOS "grades" as defined by the Transportation Research Board are as follows:

Table 1.1 Intersection LOS

LOS	UNSIGNALIZED AVERAGE DELAY PER VEHICLE (sec)	SIGNALIZED AVERAGE DELAY PER VEHICLE (sec)
A	≤ 10.0	≤ 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	20.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	> 50	> 80

The capacity analysis procedures and the resulting level-of-service grades and delays are a recognized traffic engineering standard for measuring the efficiency of intersection operations by such organizations as the Institute of Transportation Engineers, American Association of State Highway and Transportation Officials, and the Ohio Department of Transportation.

In most cases, a level-of-service D is considered the maximum delay threshold in an urbanized setting after which improvements should be investigated to determine if the delay can be reduced to a level of D or better. The capacity analyses will determine if there are any locations, approaches or movements in which the delay exceeds the level-of-service D. The analyses will also be utilized to compare expected conditions between the No-Build and Build scenarios in order to determine the impacts of the development.

It should be noted that any values shown in the HCS analysis summary sheets that are displayed in red indicate that the movement is expected to experience a queue length which exceeds the existing length of the turn lane. These instances will be identified and recommendations for improvement will be made.

1.4 Intersection Turn Lanes

Turn Lane Warrants

The ODOT **Location and Design Manual, Volume 1** and the **State Highway Access Management Manual** describes the need for auxiliary turn lanes at unsignalized intersections. The the Auxiliary Lane Graphs found in Section 401-6 of the **Location and Design Manual, Volume 1** are used in the determination. This applies to the free-flow approaches at unsignalized intersections. Section 401.6.3 of the ODOT **Location and Design Manual** states that:

"To determine the number and use of left (right) turn lanes, intersection capacity analysis procedures of the current edition of the Highway Capacity Manual should be used. For unsignalized intersections, left (right) turn lanes may also be needed if they meet warrants provided in Figures 401-5(6)a, b, c and d. The warrants apply only to the free-flow approach of the unsignalized intersection."

It is the intent of this report to evaluate the need for exclusive deceleration and turn lanes at the proposed access location on Cook Road using the auxiliary lane graphs.

Turn Lane Length

Turn lanes proposed at the access driveway locations will be analyzed to determine the necessary turn lane storage length in accordance with the procedure found in the Ohio Department of Transportation's **Location and Design Manual, Volume 1**, Section 401. The ODOT criteria and procedures are furnished in **Appendix A**.

It should be noted that the recommended maximum length is 800 feet for a right turn lane and 600 feet for a left turn lane, however if the calculated turn lane length is lower than these values, the maximum length will not be applicable.

Chapter 2
Area Conditions

2.1 Transportation Network Study Area

The study area for the proposed development includes the proposed development and access locations as previously shown in **Figures 1.1 - 1.2**. An aerial view of the of the study area can be seen in **Figure 2.1 Page 9**.

Functional Classification

The Ohio Department of Transportation functionally classifies roadways to help define a roadway's characteristics as well as identify roadways that are eligible for federal funds. Functional classification is the grouping of roads, streets, and highways in a hierarchy based on the type of highway service they provide. Generally, streets and highways perform two types of service. They provide either traffic mobility or land access and can be ranked in terms of the proportion of service they provide.

The functional classification as determined by ODOT will be used in this report to apply growth and design hour factors to the study area roadways for use in forecasting the future traffic volumes in the study area. These factors are determined using data, guidelines, and methodology supplied by ODOT. These methods and the corresponding data are based on the roadways assigned functional classification. The ODOT methods for forecasting future traffic volumes are a recognized traffic engineering standard.

Roadways that are not listed as having a functional classification can be assigned into one of two categories. The first category is a local roadway and the second category is that of an access drive.

TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	Starbucks North Ridgeville, Ohio Traffic Impact Study	Study Area Aerial View	Figure 2.1
			Page 9

The ODOT functional classification of the roadways in the study area can currently be seen on ODOT's TIMS website at the following web address:

https://gis.dot.state.oh.us/tims/map

The following table lists the study area roadways that have an assigned functional classification as determined by ODOT and local government entities.

Table 2.1 Functional Classification

ROADWAY	AREA	FC #	CLASSIFICATION
Lorain Road	Urban	4	Minor Arterial
Lear Nagle Road	Urban	5	Major Collector
Cook Road	Urban	5	Major Collector

Figure 2.2, Page 11 illustrates the section of the functional classification map for the study area.

Roadway & Intersection Characteristics

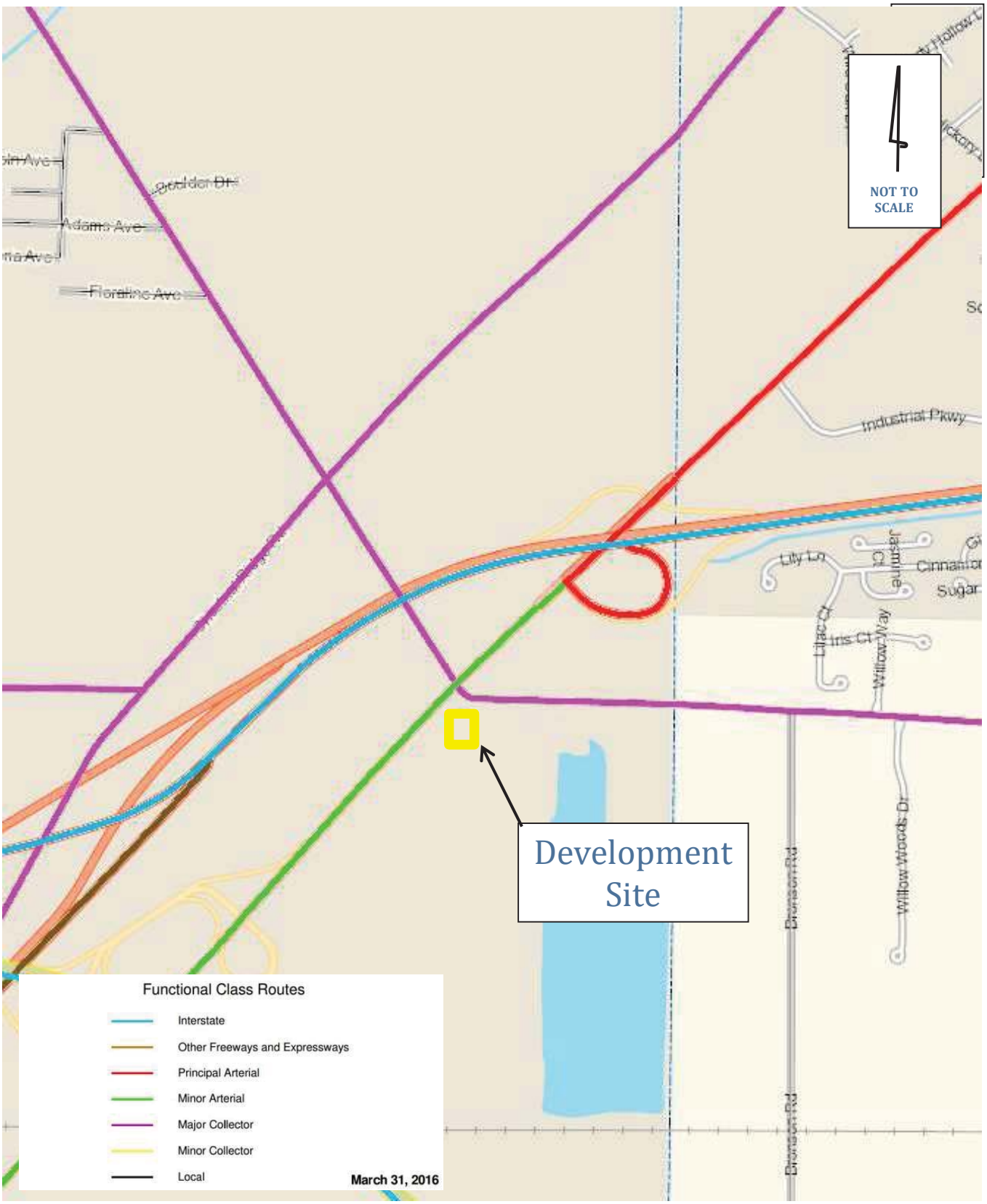
The following table details the primary characteristics of the study area roadways:

Table 2.2 Roadway Characteristics

ROADWAY	# OF LANES	ORIENTATION	SPEED LIMIT (MPH)	ADT* (VPD)
Lorain Road	5-6	East - West**	35	16,400
Lear Nagle Road	3-4	North - South	35	16,500
Cook Road	2-3	North-South	35	5,600

*** 2020 Collected Traffic Data/Rounded to nearest 100**

****Lorain Road will be considered an EB / WB Roadway in this study**



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The following section details the lane use and traffic control at the locations under study for this report.

Lorain Road & Lear Nagle Road / Cook Road

Lear Nagle Road North Approach
- 2 Exclusive Left Turn Lanes
- 1 Shared Through & Right Turn Lane

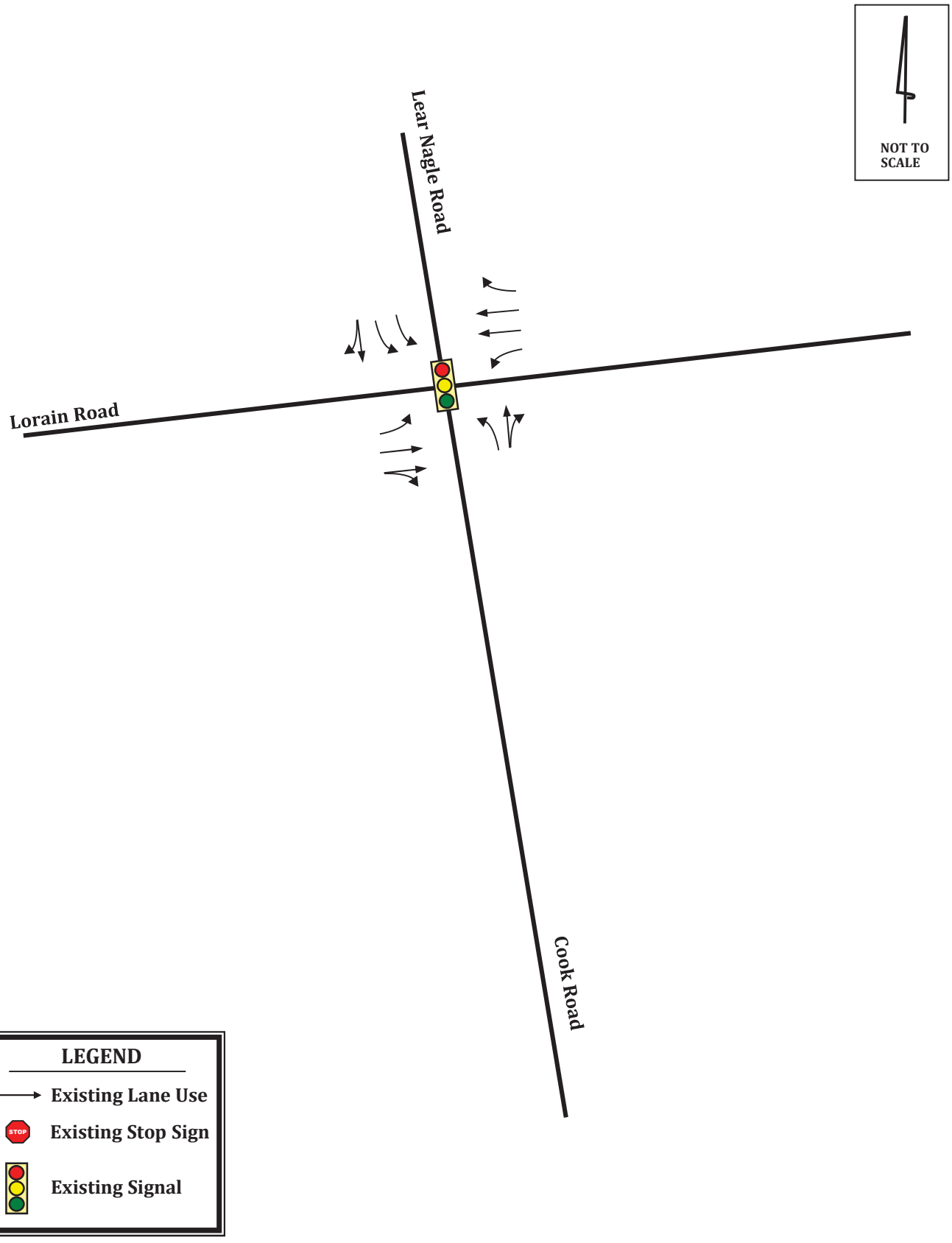
Cook Road South Approach
- 1 Exclusive Left Turn Lane
- 1 Shared Through & Right Turn Lane

Lorain Road East Approach
- 1 Exclusive Left Turn Lane
- 2 Exclusive Through Lane
- 1 Exclusive Right Turn Lane

Lorain Road West Approach
- 1 Exclusive Left Turn Lane
- 1 Exclusive Through Lane
- 1 Shared Through & Right Turn Lane

The intersection is controlled by a traffic signal. The left turn movements on the westbound and northbound approaches can be made when the left turn arrow allows the movement (protected movement) or during the green ball indication when there is a gap in the opposing through traffic (permissive movement). The southbound left-turns can only be made during a protected turn arrow due to the dual left-turn lanes. The eastbound left-turns can only be made during a protected left-turn arrow. There is a protected movement (arrow indication) for the westbound right turn that allows traffic to turn when the southbound left protected arrow is on.

Figure 2.3, Page 13 shows the existing lane use and traffic control conditions in the study area. These will be considered the existing base conditions for this report.



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2.2 Traffic

Weekday turning movement counts were performed at the following locations:

1. Lorain Road & Lear Nagle Road / Cook Road

The traffic count was performed on Tuesday, October 6, 2020. The weekday traffic count was conducted in fifteen (15) minute intervals between the hours of 7 AM - 10 AM, 11 AM - 1 PM, and 4 PM - 7 PM, then hourly totals were calculated. Cars, trucks, buses, pedestrians and bicyclists were recorded during these time periods. Copies of the intersection turn movement counts are included in **Appendix B**.

The following tables detail a breakdown of the hourly volumes during the AM and PM hours that were determined to experience the highest traffic volumes. The data shown in the tables will be used in the determination of the AM and PM peak hours for the study area intersections.

Table 2.3 AM Peak Hour Traffic Volumes

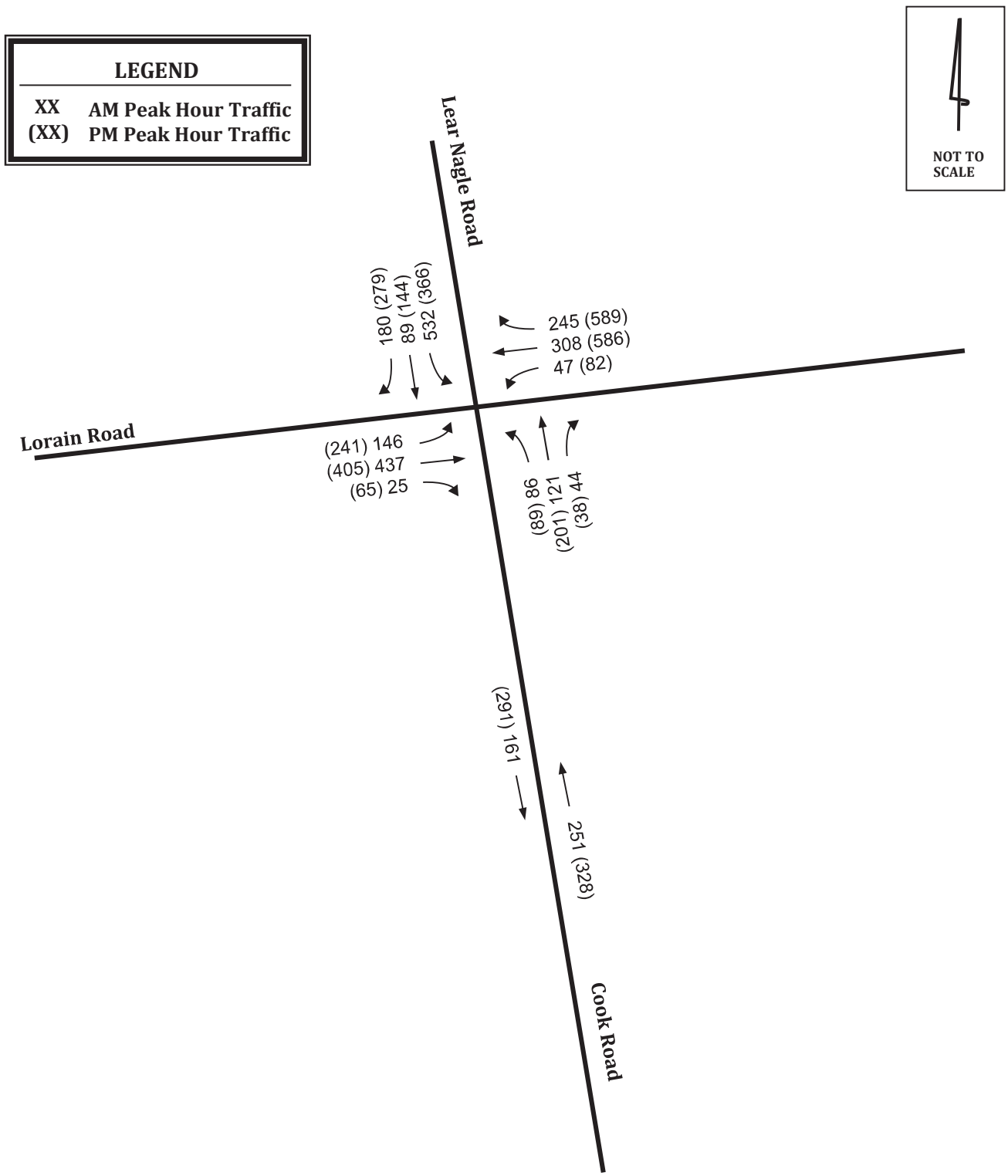
INTERSECTION	COUNT DATE	TOTAL ENTERING VOLUME (Vehicles per Hour)				
		7:00-8:00	7:15-8:15	7:30-8:30	7:45-8:45	8:00-9:00
Lorain & Lear Nagle	10/6/2020	2226	2260	2200	2083	1906

Table 2.4 PM Peak Hour Traffic Volumes

INTERSECTION	COUNT DATE	TOTAL ENTERING VOLUME (Vehicles per Hour)				
		4:00-5:00	4:15-5:15	4:30-5:30	4:45-5:45	5:00-6:00
Lorain & Lear Nagle	10/6/2020	2653	2791	2986	3086	3030

From the collected traffic data, the weekday AM peak hour of traffic was determined to be 7:15 AM to 8:15 AM. The weekday PM peak hour of traffic was found to be 4:45 PM to 5:45 PM. These periods will be to used forecast expected and future traffic volumes since they reflect the period of the highest volume of traffic flow for the study area roadways.

The existing AM and PM peak hour traffic volumes are shown in **Figure 2.4, Page 15**.



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Chapter 3
Projected Traffic Conditions

3.1 Site Traffic

Trip Generation

Calculating future total driveway trips requires an estimate of the traffic generated by the proposed development. The most widely accepted method of determining the amount of traffic that the proposed development will generate is to compare the proposed land use with existing facilities of the same use. The Institute of Transportation Engineers (ITE) has prepared a manual titled "**Trip Generation Manual**", which is a compilation of similar traffic generation studies to aide in making such a comparison. The most recent update of this manual is the 10TH edition and was utilized for this study.

The following table details the development land use from the site plan (**Figure 1.2**) and the corresponding ITE land use that will be used to forecast the site generated traffic volumes for the Build conditions:

Table 3.1 ITE Land Use Codes

SITE PLAN DESCRIPTION	SIZE	LAND USE	ITE CODE	ITE DESCRIPTION
Dunkin Donuts	2,226 sf	Services	937	Coffee / Donut Shop W/ Drive Through

Pass-by Trips

It should be noted that retail and services land use categories sometimes generate a different mixture of traffic than land uses such as residential homes and office facilities, which add all of the "new" traffic to the adjacent roadway system. Retail and service land uses also attract motorists from the existing passing flow of traffic. A portion of the estimated total generated trips are actually vehicles that are currently using the adjacent roadway system (i.e. motorists who are already on the road and stop by the coffee shop on the way home or to work). These vehicles are referred to as "Pass-by" trips.

The ITE **Trip Generation Handbook, Third Edition** provides pass-by rates for various land uses. To provide a conservative estimate, the average pass-by percentages will be used for purposes of this analysis. The Handbook does not provide any data for land use #937 - Coffee/Donut Shop with Drive Through Window. Data is provided for land use #934, Fast Food Restaurant w/ Drive Through. The average pass-by rate for #934 will be used for #937 due to the similar nature of the land use descriptions for each use.

The following table details the AM and PM peak hour pass-by rates for the fast food restaurant (and donut / coffee shop) uses.

Table 3.2 AM Peak Hour Pass-By Rates

LAND USE	ITE CODE	AM PEAK HOUR		
		LOWEST	HIGHEST	AVERAGE
Fast-Food Restaurant w/ Drive Through	934	32%	68%	**49%**

Table 3.3 PM Peak Hour Pass-By Rates

LAND USE	ITE CODE	PM PEAK HOUR		
		LOWEST	HIGHEST	AVERAGE
Fast-Food Restaurant w/ Drive Through	934	25%	71%	**50%**

Generated Trips

The following table details the development generated traffic volumes based on the previously described methods as outlined in the (ITE) **Trip Generation Handbook** and the assumptions for the peak hours. Copies of the trip generation worksheets can be seen in **Appendix C**.

Table 3.4 Net Trip Generation

ITE TRIP GENERATION			TRIP ENDS			
ITE CODE	DESCRIPTION	SIZE (Sq, Ft.)	Weekday AM Peak Hour of Generator (Enter/Exit)		Weekday PM Peak Hour of Generator (Enter/Exit)	
937	Coffee/Donut Shop w/Drive-Through	2,226	101	97	48	49
Pass-By Trips (AM- 49%/ PM-50%)			50	48	24	25
TOTAL NEW TRIPS			**51**	**49**	**24**	**24**
			100		**48**	

The ODOT **State Highway Access Management Manual** requires that ten year design hour traffic volumes be analyzed for a proposed development when the number of generated trips is below 500 in the peak hour. The proposed development is expected to generate a total of 198 driveway trips in the AM peak hour and a total of 97 driveway trips in the PM peak hour. The year 2031 will therefore be analyzed for the ten year design hour conditions.

Distribution of Generated Traffic

The directional distribution for the new and pass-by generated traffic is a function of the prevailing operating conditions on the existing roadways. The distribution pattern that was assumed is shown in the tables that follow and is based upon the existing traffic volumes on in the study area during the peak hours shown in **Figure 2.4**.

The following tables detail the distribution of the new and pass-by generated trips for the proposed coffee shop.

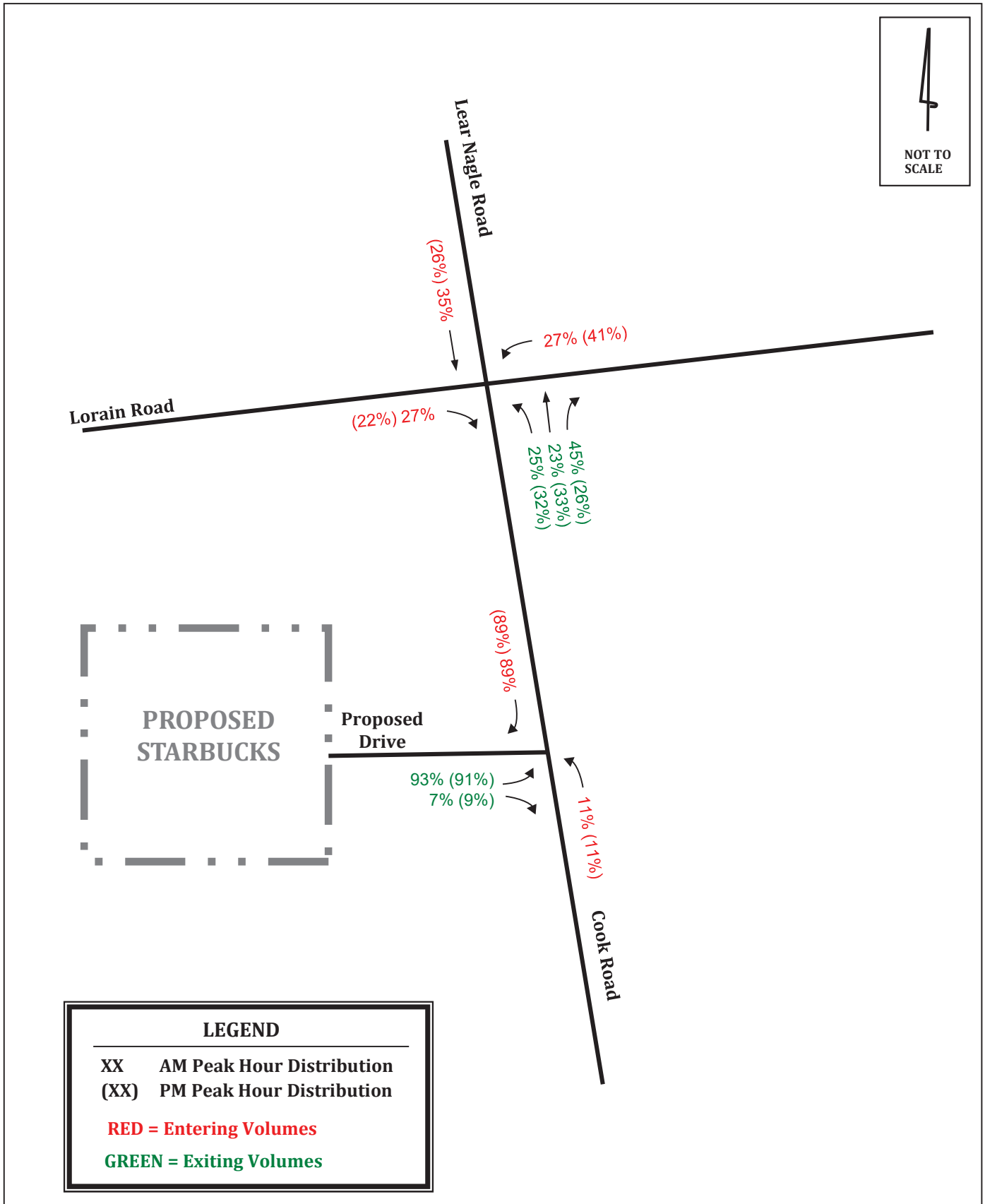
Table 3.5 AM New & Pass-By Trip Origins and Destinations

ORIGIN/ DESTINATION	ROUTE	FROM (ENTER)	% TOTAL	TO (EXIT)	% TOTAL
North	Lear Nagle Road	801	35%	512	23%
South	Cook Road	251	11%	161	7%
East	Lorain Road	600	27%	1013	45%
West	Lorain Road	608	27%	574	25%
	TOTALS	**2260**	**100%**	**2260**	**100%**

Table 3.6 PM New & Pass-By Trip Origins and Destinations

ORIGIN/ DESTINATION	ROUTE	FROM (ENTER)	% TOTAL	TO (EXIT)	% TOTAL
North	Lear Nagle Road	789	26%	1031	33%
South	Cook Road	328	11%	291	9%
East	Lorain Road	1257	41%	809	26%
West	Lorain Road	711	22%	954	32%
	TOTALS	**3085**	**100%**	**3085**	**100%**

The directional distribution for the new AM and PM peak hour generated traffic is shown graphically in **Figure 3.1, Page 20**. The directional distribution for the pass-by AM and PM peak hour generated traffic is shown graphically in **Figure 3.2, Page 21**.



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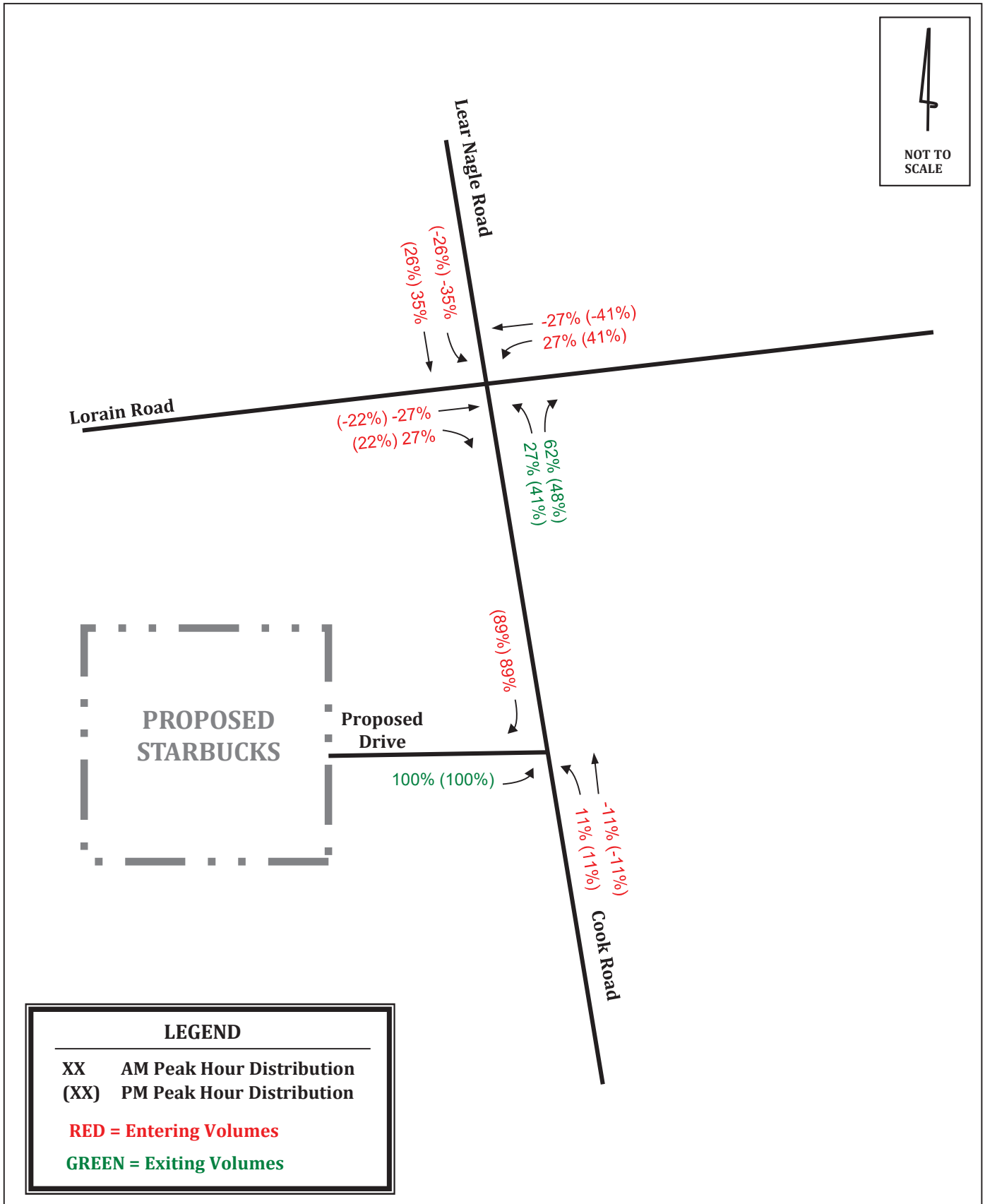

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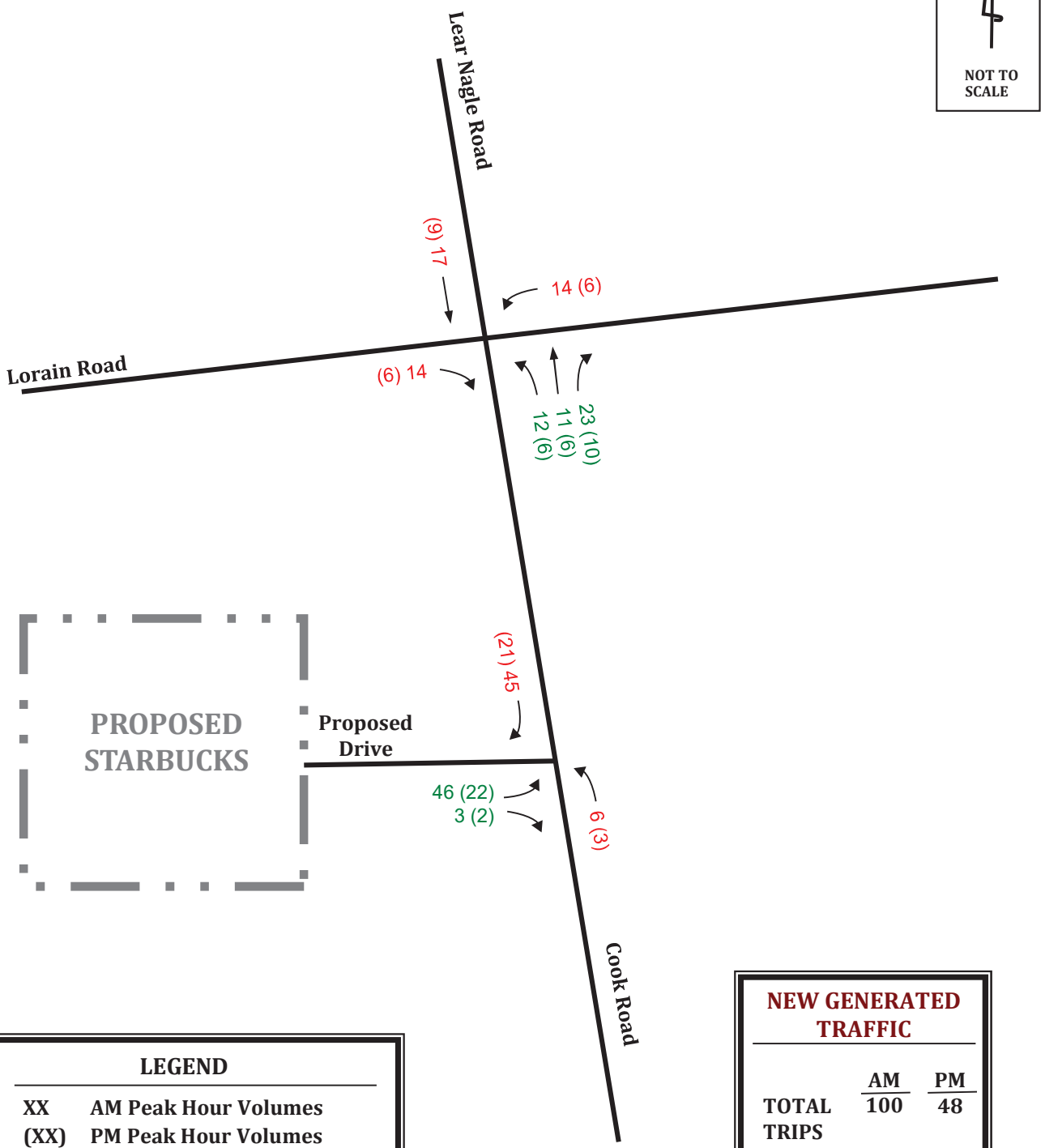
Assignment of Generated Traffic

Based upon the distribution patterns shown in **Figure 3.1 & 3.2**, the new and pass-by AM and PM peak generated traffic were assigned to the study intersections.

The assignments of the estimated new generated traffic for the proposed development are shown graphically in **Figure 3.3, Page 23.** The assignments of the estimated pass-by traffic are shown graphically in **Figure 3.4, Page 24.**



LEGEND

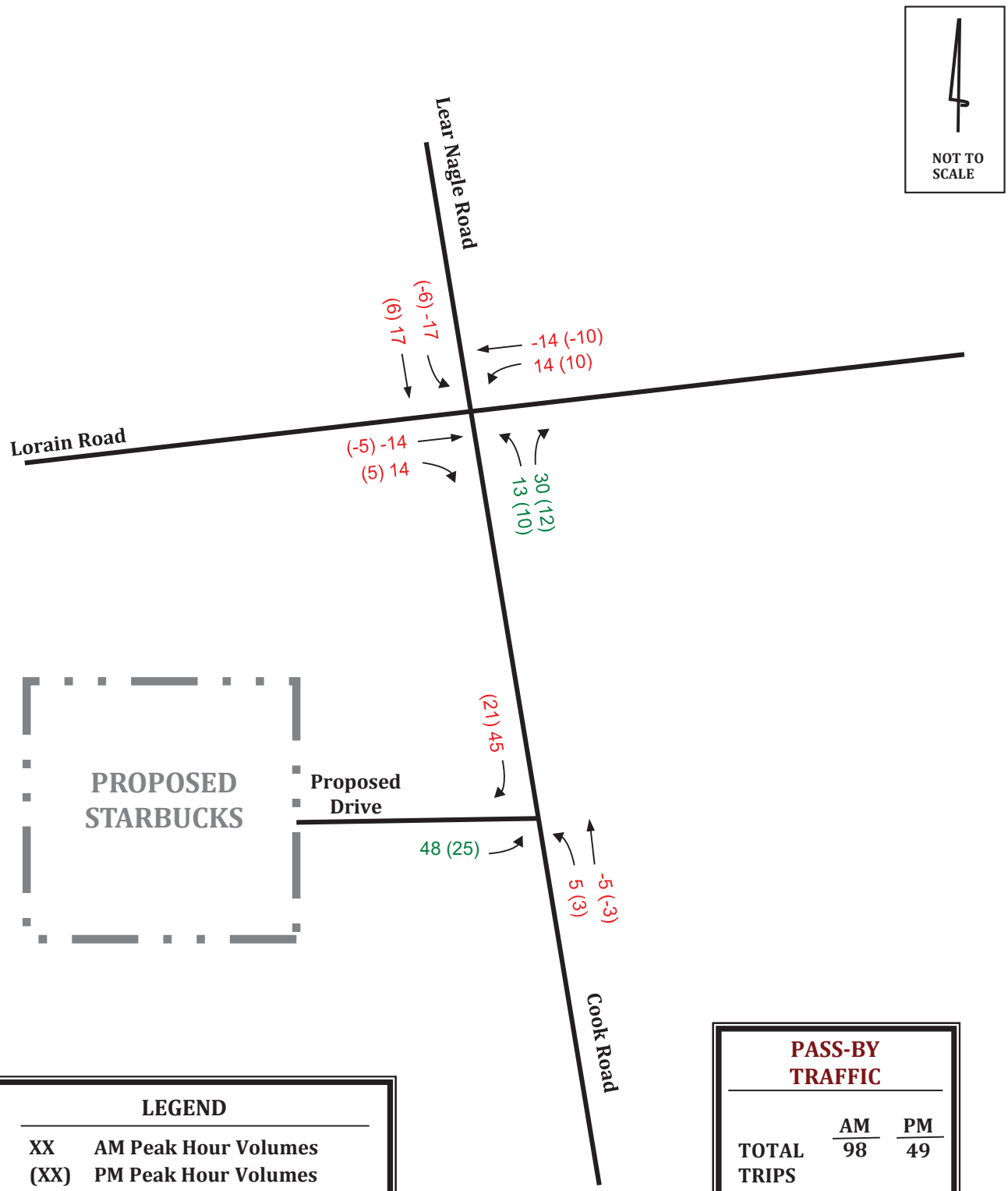
XX	AM Peak Hour Volumes
(XX)	PM Peak Hour Volumes

RED = Entering Volumes

GREEN = Exiting Volumes

NEW GENERATED TRAFFIC

	AM	PM
TOTAL TRIPS	100	48
ENTER	51	24
EXIT	49	24



LEGEND

XX	AM Peak Hour Volumes
(XX)	PM Peak Hour Volumes

RED = Entering Volumes

GREEN = Exiting Volumes

PASS-BY TRAFFIC

	AM	PM
TOTAL TRIPS	98	49
ENTER	50	24
EXIT	48	25

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Passby Trips

Figure 3.4

3.2 Non-Site Traffic

Background Traffic Growth

Design of new roadways or improvements to existing roadways should not usually be based on current traffic volumes alone, but should consider future traffic volumes expected to make use of the facilities. Roadways should be designed to accommodate the traffic volume that is likely to occur within the design life of the facility. In a practical sense, this design volume should be a value that can be estimated with reasonable accuracy. It is believed that the maximum design period is in the range of 15 to 24 years. Therefore, a period of twenty years is widely used as a basis for design for large projects. A period of ten years is currently specified by the Ohio Department of Transportation for smaller projects. Traffic cannot usually be forecasted accurately beyond this period on a specific facility because of probable changes in the general regional economy, population, and land development along the roadway.

The ODOT **Access Management Manual** requires that opening year and ten year design hour traffic volumes be analyzed for a proposed development when the number of generated trips is below 500 in the peak hour and a twenty year design for when trips exceed 500 in the peak hour.

Roadways, like those found in the study area, carry a significant amount of through traffic due to their functional characteristics. This through traffic component generally increases as regional growth occurs. Therefore, it is anticipated that existing traffic on the study area roadways will increase in future years.

Any recommended improvements for these intersections should adequately handle the transportation needs of the intersections for ten to twenty years from the opening of the project based upon sound engineering practice and the likelihood of traffic growth due to the functional characteristics of the roadways.

The years 2021 (Opening Year) and 2031 (Design Year) will be analyzed for the proposed coffee shop as the peak hour site generated traffic volumes are less then 500 trips. Therefore, it is necessary to estimate historical growth rates in order to establish the future traffic on the study area roadways due to non-site related conditions.

The ODOT Traffic Monitoring Management System (TMMS) was consulted to determine past historical trends on the study area roadways. The ODOT Traffic Monitoring Management System (TMMS) can be currently accessed at the following web address:

http://www.dot.state.oh.us/Divisions/Planning/TechServ/traffic/Pages/TMMS.aspx

The TMMS provided data at the following locations that were used to determine the study area growth rates:

1. Lorain Road SW of I-480 (Location ID 7247)

Based on the historical traffic data from the ODOT data, Lorain Road has shown a linear growth of 0.82% per year over the previous 15 years. There was no historic count data available for either Lear Nagle Road or Cook Road. The growth rate calculated for Lorain Road was applied to all roadways within the study area since this appears to be a conservative estimate of traffic growth in the area. A copy of the growth rate data can be seen in **Appendix D**. A linear growth rate was utilized to estimate non-site related traffic growth. These growth rates will be applied to the existing traffic volumes (**Figure 2.4**). The growth rate and factors for the study area roadways can be seen in the following table:

Table 3.7 - Growth Rates & Factors

ROADWAY	GROWTH RATE (Annual Growth)	2021 GROWTH FACTOR	2031 GROWTH FACTOR
Study Area Roadways	0.82%	1.0082	1.0902

Design Hour Traffic

The traffic patterns on any roadway typically show considerable variation in the traffic volumes experienced during the various hours of the day and in the hourly volumes experienced throughout the year. A key decision in the design process involves determining which of these hourly traffic volumes should be used as the basis for the design. It would be wasteful to predicate a design on the maximum peak hour traffic that occurs during the year and the use of the average hourly traffic would result in an inadequate design. The hourly traffic volumes used in a design should not be exceeded very often or by very much. However, the hourly traffic volumes should not be so high that traffic would rarely be sufficient to make full use of the designed facility.

Normal design policy in the State of Ohio is based upon a review of curves that depict the variation in hourly traffic volumes during the year. The Ohio Department of Transportation recommends using the 30TH highest hour as a design control for urban streets. There is typically very little difference between the volumes in this range. The Ohio Department of Transportation provides factors or a methodology to determine factors that are applied to counted daily traffic volumes to determine appropriate design hour traffic volumes.

Following guidelines set forth in the **ODOT State Highway Access Management Manual**, all analyses are required to examine the design hour volume for the adjacent roadway and peak hour traffic volume of the proposed development. The **Ohio Traffic Forecasting Manual** will be used to determined peak hour factors for the study area roadways. The design hour volumes are determined by multiplying the AM and PM peak hour volumes by the appropriate factors from the ODOT Peak Hour to Design Hour Factor Report based on the functional classification of the roadway, the day of the week and the month that the traffic data was collected. A copy of the ODOT's Peak Hour to Design Hour Factor Report can be seen in **Appendix E**. The following table details the design hour factors for the study area roadways.

Table 3.8 - Peak Hour to Design Hour Factors

ROADWAY	AREA	FUNCTIONAL CLASSIFICATION	MONTH	DAY	DHV FACTOR
Lorain Road	Urban	Minor Arterial	October	Tuesday	1.10
Lear Nagle Road	Urban	Major Collector	October	Tuesday	1.10
Cook Road	Urban	Major Collector	October	Tuesday	1.10

Peak Hour Factors

The intersection peak hour factor (PHF) is used to convert the hourly traffic volume into the flow rate that represents the busiest 15 minutes of the peak hour. The PHF is the sum of the traffic entering the intersection during the peak hour divided by four times the highest 15 minute volume during the peak hour. A PHF of 1 indicates that the traffic volume in each 15 minute volume is the same and therefore traffic flow is consistent throughout the hour. A lower PHF indicates a more variable traffic flow and that traffic volume has a spike during the peak 15 minute interval.

The ODOT **Location and Design Manual, Volume 1** (Figure 401-14a) provides guidance to use the HCS default peak hour factor (0.92), however a lower value may be required for sites where peaked traffic is expected so surge, such as near a school or a church, or factory.

The default value of 0.92 will be used for all No-Build and Build capacity analyses in this report.

3.3 Future Traffic

No-Build Condition

In order to estimate the future traffic considering non-project traffic conditions, the previously discussed calculation of design hour factors and growth rates for each movement were applied to the 2020 traffic volumes shown in **Figure 2.4**.

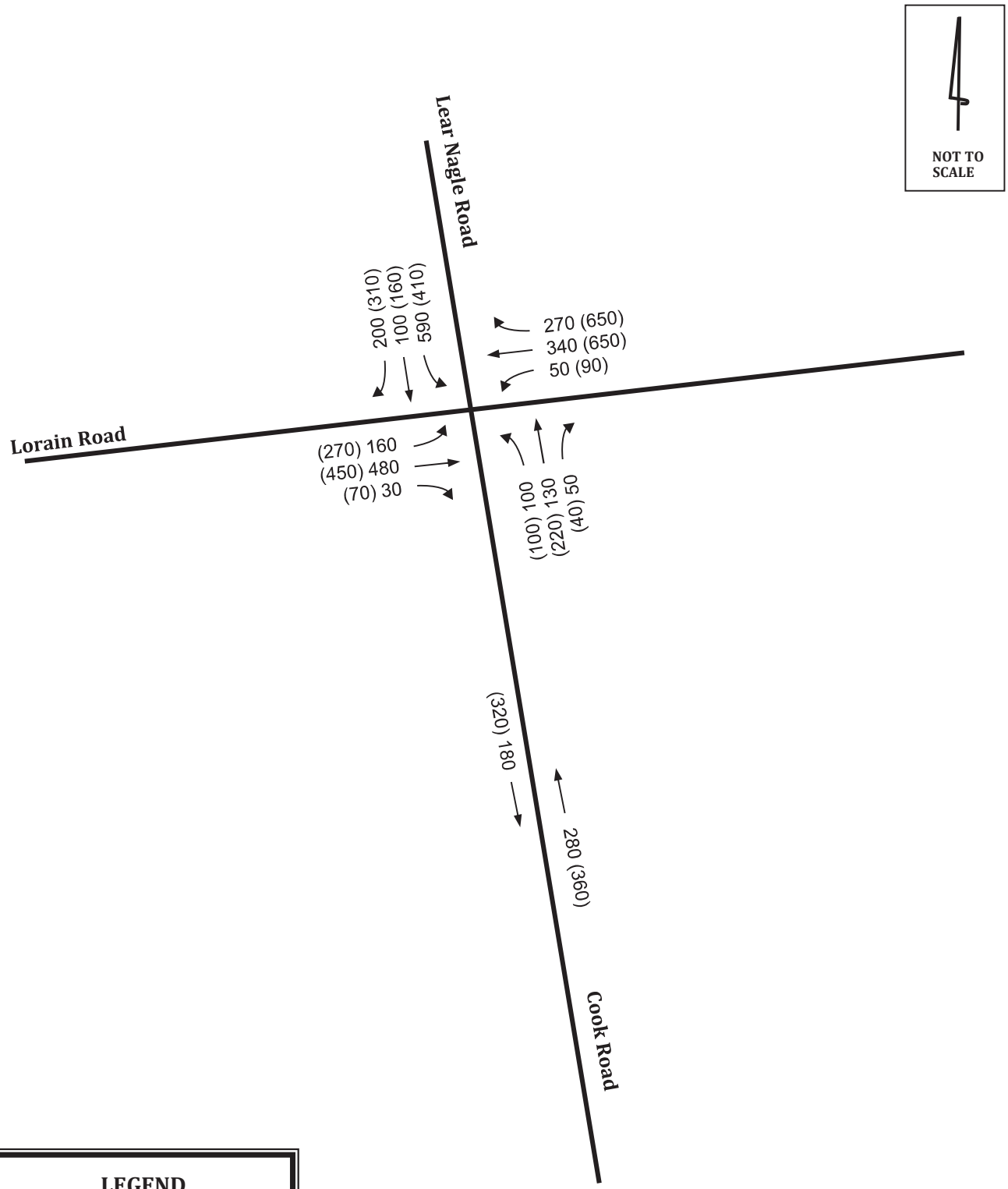
The estimated 2021 and 2031 No-Build traffic volumes for the study area are shown graphically in **Figures 3.5 and 3.6, Pages 30 and 31**. This traffic is the expected traffic if the proposed development **is not** constructed, the **"No-Build"** condition.

The No-Build traffic volumes have been rounded to the nearest 10 to adhere to preferred ODOT practices.

Build Condition

In order to estimate the future traffic considering project traffic conditions, the sum of the 2021 and 2031 No-Build volumes, shown in **Figures 3.5 and 3.6**, were added to the new and pass-by generated traffic (**Figures 3.3 & 3.4**) to equal the future Build peak hour volumes.

The estimated 2021 and 2031 Build traffic volumes for the study area are shown graphically in **Figures 3.7 and 3.8, Pages 32 and 33** for the proposed development. These traffic volumes are the expected volumes if the proposed development **is** constructed, or the **"Build"** condition.



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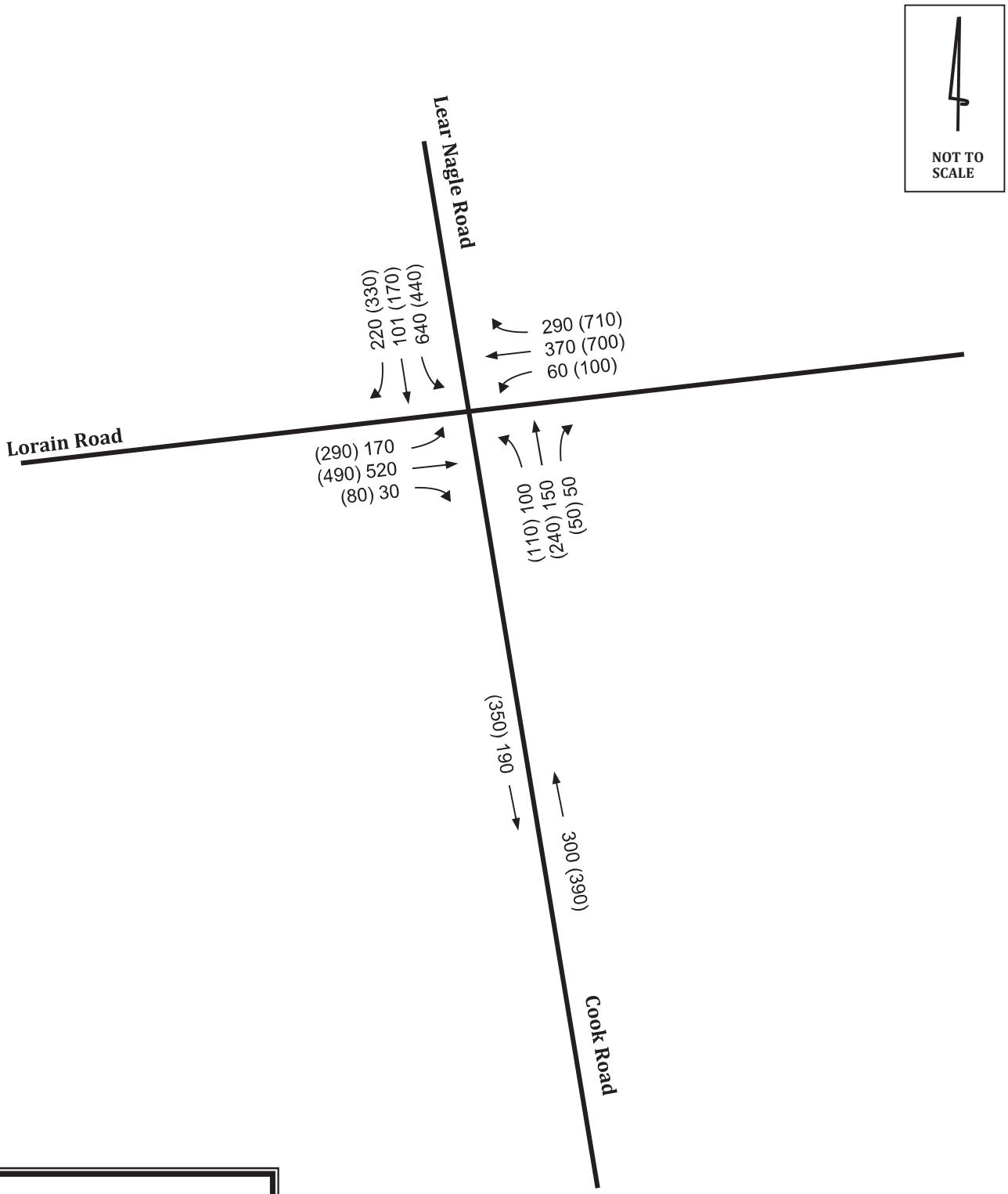

LEGEND	
XX	AM Peak Hour Traffic
(XX)	PM Peak Hour Traffic

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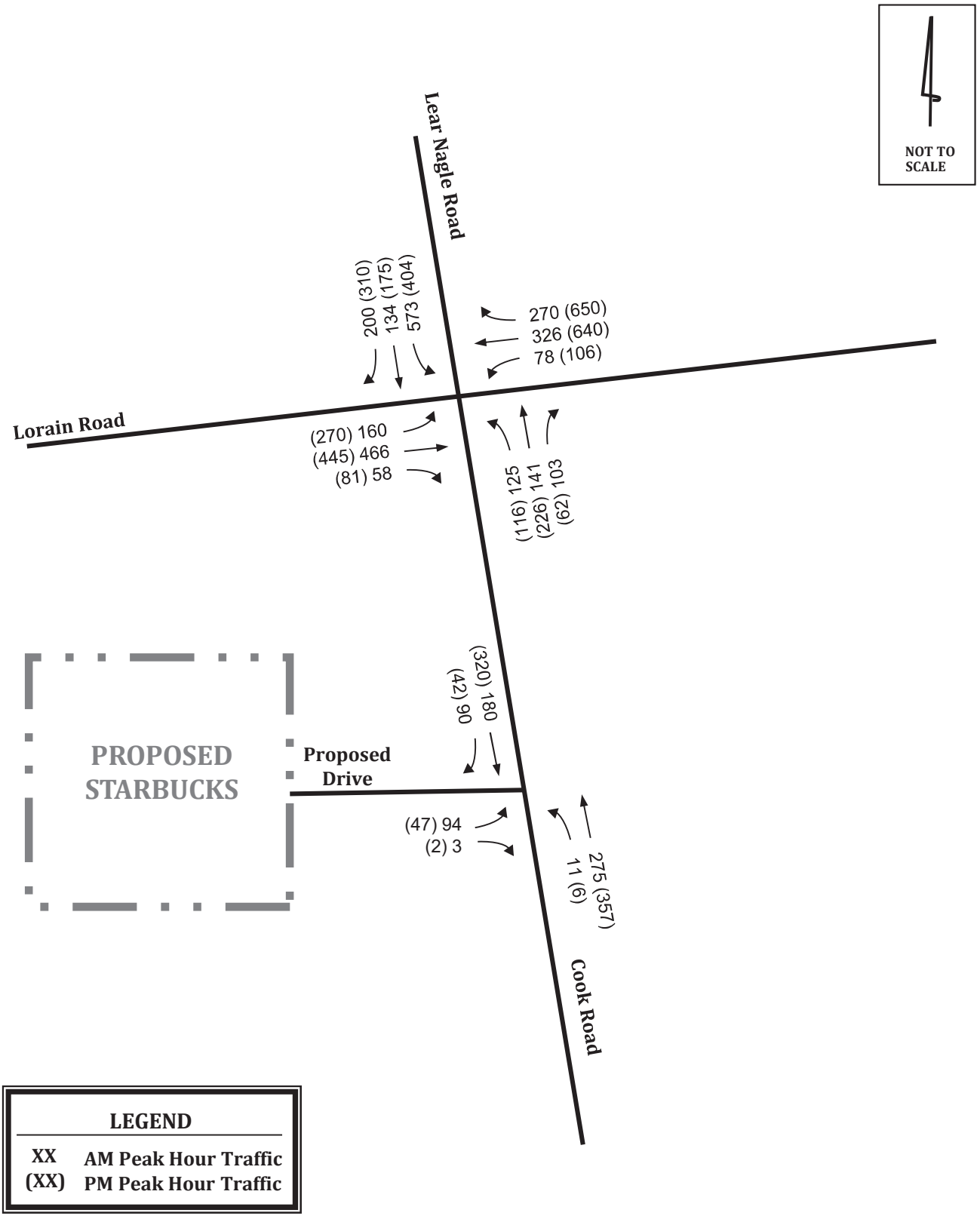
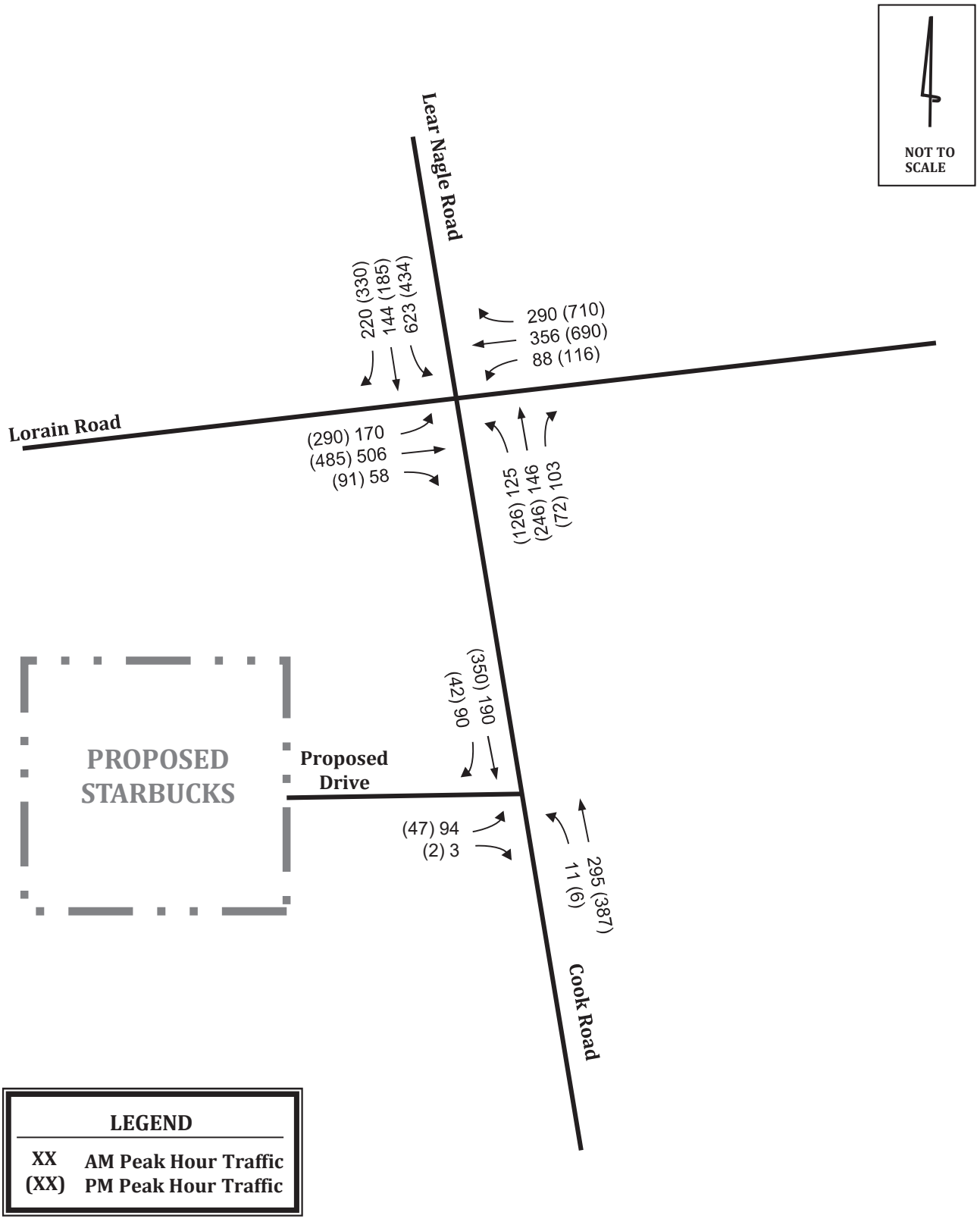


TMS Engineers, Inc. 2112 Case Parkway S., Unit 7, Twinsburg, Ohio 44087 www.TMSEngineers.com	Starbucks North Ridgeville, Ohio Traffic Impact Study	2021 Build Weekday Traffic Volumes	Figure 3.7 Page 32


NOT TO SCALE
Lear Nagle Road
Lorain Road
Cook Road
Proposed Drive
PROPOSED STARBUCKS
220 (330)
144 (185)
623 (434)
290 (710)
356 (690)
88 (116)
(290) 170
(485) 506
(91) 58
(126) 125
(246) 146
(72) 103
(350) 190
(42) 90
(47) 94
(2) 3
295 (387)
11 (6)
LEGEND
XX AM Peak Hour Traffic
(XX) PM Peak Hour Traffic

Chapter 4
Traffic Analysis

4.1 Capacity and LOS at Study Area Intersections

No-Build Conditions - 2021 Capacity Analysis

Analyses were performed for the projected 2021 opening day conditions under the No-Build scenario. These analyses will be used to compare to the conditions expected under the Build scenario. The capacity analyses assumed that the signal timing would be optimized to balance critical lane delays at the signalized intersection. The traffic volumes used in the analyses can be seen in **Figure 3.5**. Copies of the capacity worksheets are included in **Appendix F.** The results of the Year 2021 No-Build analyses are shown in the following table:

Table 4.1 - 2021 Levels-of-Service
(No Build Conditions)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Lorain & Lear Nagle / Cook	Traffic Signal	Intersection	D (38.8)	D (47.2)
		Eastbound	D (39.0)	D (42.7)
		Westbound	C (34.9)	D (47.5)
		Northbound	D (36.4)	D (43.9)
		Southbound	D (42.0)	D (52.1)

(XX.X) = Average vehicle delay in seconds per vehicle

The capacity of the signalized intersection of Lorain Road and Lear Nagle / Cook Road was calculated to be at an level-of-service D during the AM and PM peak hour under the 2021 No-Build conditions. However, the eastbound left and westbound through movements were determined to operate at LOS E in the PM Peak hour. Certain future improvements were tested with further capacity analyses in order to determine what mitigation would be necessary to improve the levels-of-service at the study area intersection. It was determined that the eastbound left-turn movement should be allowed to turn left during the permissive green ball rather then only during the protected turn arrow which is currently being used. There does not appear to be a sight distance restriction which would require a protected only turn restriction.

The table below shows the capacity analysis results of the study intersection with the phasing modification which would allow eastbound left-turning vehicles the option to turn left when a permissive green ball is present. All subsequent analyses will assume the eastbound left-turn phasing has been modified. Copies of the capacity worksheets for the intersection are included in **Appendix G**.

Table 4.2 - 2021 Levels-of-Service
(No Build Conditions - Improved)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Lorain & Lear Nagle / Cook	Traffic Signal	Intersection	D (37.2)	D (39.8)
		Eastbound	C (33.1)	D (38.0)
		Westbound	C (34.9)	C (34.7)
		Northbound	D (36.4)	D (43.6)
		Southbound	D (42.0)	D (46.6)

(XX.X) = Average vehicle delay in seconds per vehicle

Allowing permissive left-turns in the eastbound direction was shown to reduce the anticipated level of service on all movements to an acceptable LOS D. This modification to the eastbound left-turn phasing would be necessary without the construction of the proposed Starbucks.

No-Build Conditions - 2031 Capacity Analysis

Analyses were performed for the projected 2031 design year conditions under the No-Build scenario. These analyses will be used to compare to the conditions expected under the Build scenario. This analysis assumes that the improvements recommended for the 2021 No-Build scenario have been constructed and present in 2031. The capacity analyses assumed again that the signal timing would be optimized to balance critical lane delays at the signalized intersection as in the 2021 No-Build scenario. The traffic volumes used in this analysis can be seen in **Figure 3.6**. Copies of the capacity worksheets are included in **Appendix H.** The results of the Year 2031 No-Build analyses are shown in the following table:

Table 4.3 2031 Levels-of-Service
(No Build Conditions)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Lorain & Lear Nagle / Cook	Traffic Signal	Intersection	D (39.0)	D (44.2)
		Eastbound	C (33.9)	D (41.7)
		Westbound	D (35.4)	D (40.7)
		Northbound	D (37.2)	D (46.4)
		Southbound	D (45.8)	D (50.1)

(XX.X) = Average vehicle delay in seconds per vehicle

The capacity of the signalized intersection of Lorain Road and Lear Nagle Road / Cook Road is expected to operate at LOS D in both peak hours in 2031. None of the movements at the intersection are expected to operate at LOS E or F.

Build Condition - 2021 Capacity Analysis

Analyses were performed for the projected 2021 opening day Build conditions. This analysis assumes that the phasing changes recommended for the 2021 No-Build scenario were constructed and present in build scenario. The capacity analyses assumed that the signal timing would be optimized to balance critical lane delays at the signalized intersection. The traffic volumes used in this analysis can be seen in **Figure 3.7**. Copies of the capacity worksheets are included in **Appendix I**. The results of the 2021 Build analyses are shown in the following tables:

Table 4.4 2021 Levels-of-Service
(Build Conditions)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Lorain & Lear Nagle / Cook	Traffic Signal	Intersection	C (34.9)	D (40.6)
		Eastbound	C (33.4)	D (37.8)
		Westbound	C (34.6)	C (34.3)
		Northbound	D (40.0)	D (48.0)
		Southbound	C (33.8)	D (48.2)

(XX.X) = Average vehicle delay in seconds per vehicle

The capacity of the signalized intersection of Lorain Road and Lear Nagle Road / Cook Road intersection is expected to be at an acceptable level-of-service D or better during the AM and PM peak hours under the 2021 Build conditions. The generated traffic did not cause a degradation to the intersection or any of the movements. No additional roadway improvements are recommended in the Year 2021 Build scenario.

Build Condition - 2031 Capacity Analysis

Analyses were performed for the projected 2031 design year conditions under the Build scenario. The analysis also assumes that the phasing changes recommended for the 2021 No-Build scenario were constructed and present in 2031 Build scenario. This analysis will be used to determine the future levels-of-service at the study intersections under the anticipated build conditions. The traffic volumes used in this analysis can be seen in **Figure 3.8**. Copies of the capacity worksheets are included in **Appendix J**. The capacity analyses assumed that the signal timing would be optimized to balance critical lane delays at the signalized intersection. The results of the 2031 Build analyses are shown in the following table:

Table 4.5 2031 Levels-of-Service
(Build Conditions)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Lorain & Lear Nagle / Cook	Traffic Signal	Intersection	D (38.9)	D (45.4)
		Eastbound	C (34.3)	D (41.4)
		Westbound	D (35.0)	D (40.5)
		Northbound	D (40.5)	D (51.0)
		Southbound	D (44.2)	D (53.0)

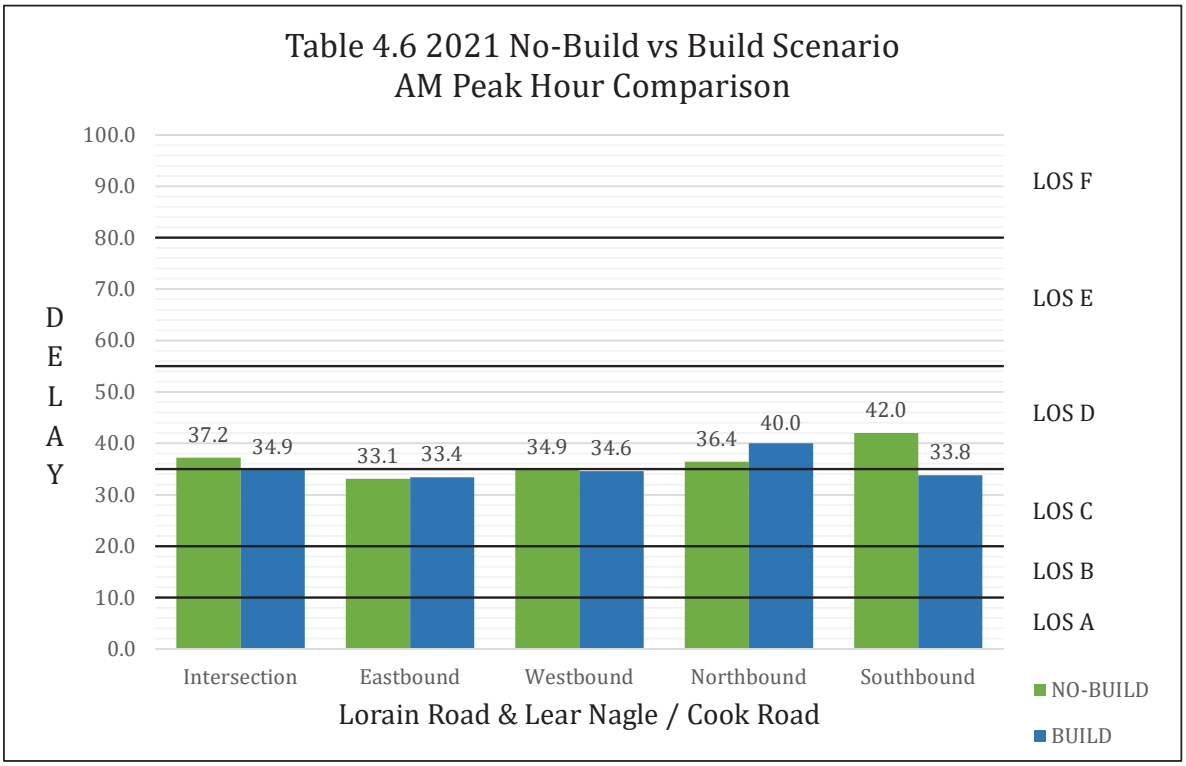
(XX.X) = Average vehicle delay in seconds per vehicle

The capacity of the signalized intersection of Lorain Road and Lear Nagle Road / Cook Road intersection is expected to be at an acceptable level-of-service D or better during the AM and PM peak hours under the 2031 Build conditions. The generated traffic did not cause a degradation to the intersection or any of the movements. No additional roadway improvements are recommended in the Year 2031 Build scenario.

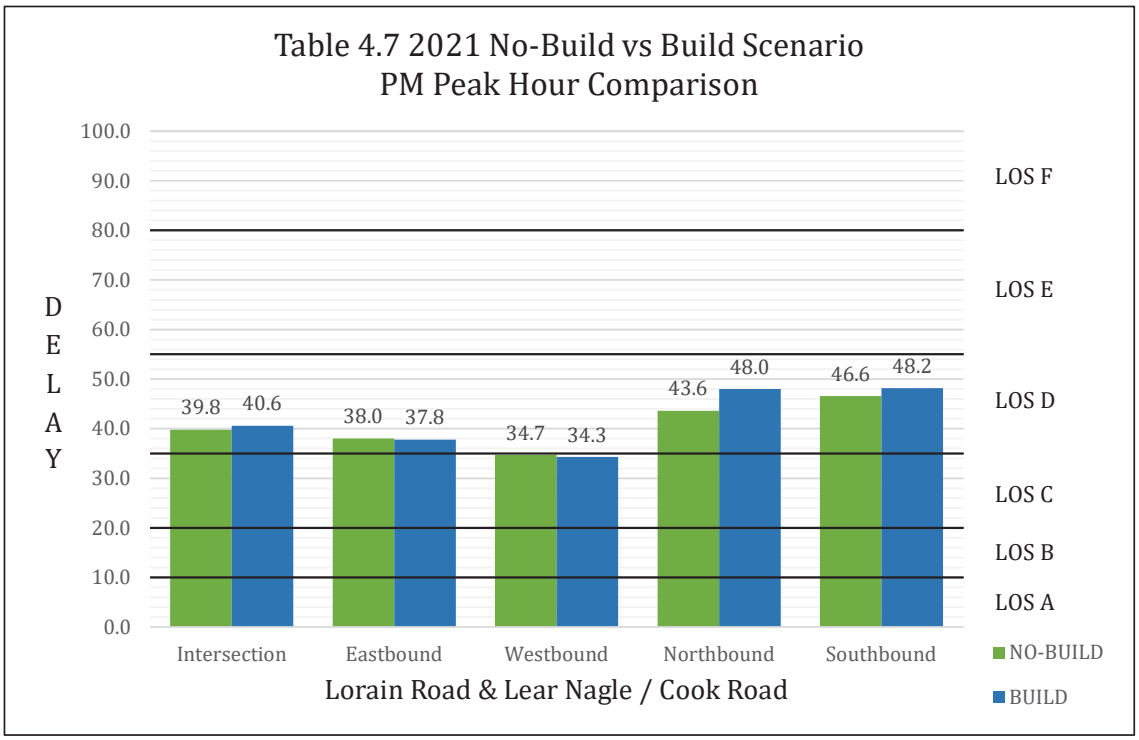
4.2 Comparative Analysis

A comparison was performed to show the incremental effects on the capacity of the Lorain Road and Lear Nagle / Cook Road intersection due to the development of the proposed Starbucks.

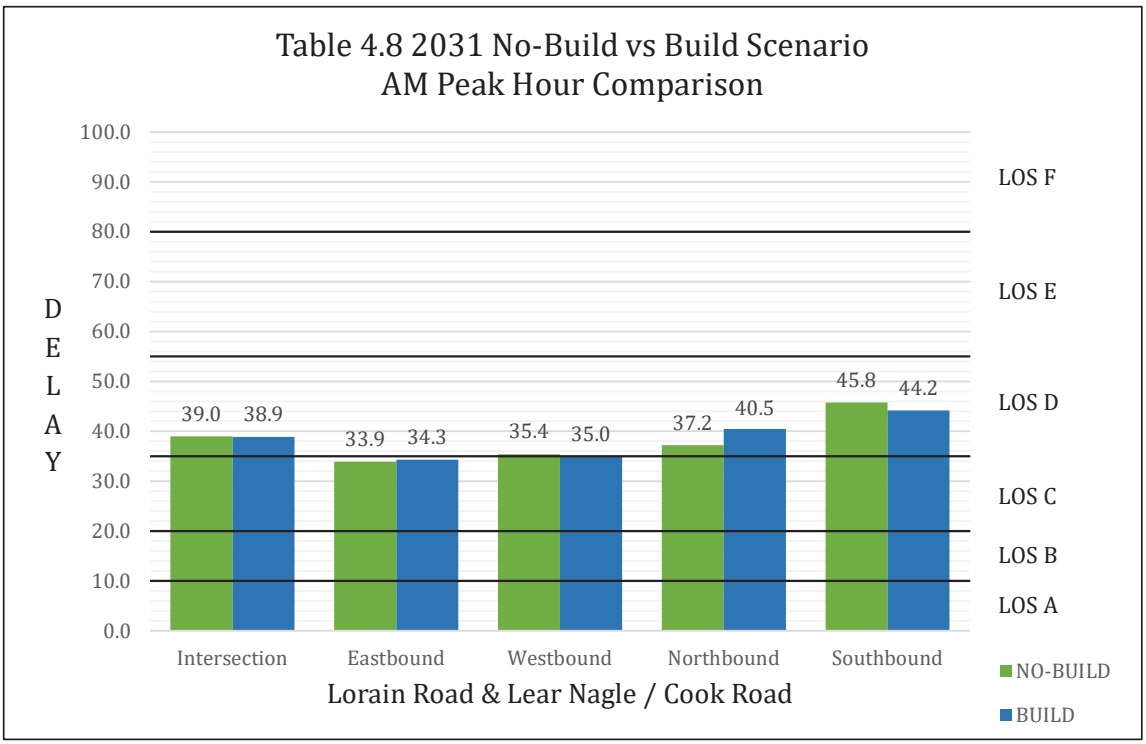
A comparison of the 2021 No-Build vs Build conditions for the AM peak hour indicates the overall intersection and approach levels-of-service are expected to not degrade with the addition of the development generated traffic under the 2021 AM peak hour conditions. The generated volumes from the proposed Starbucks are expected to increase delay by at most 3.6 seconds in the AM Peak Hour. The overall intersection and the southbound movement is expected to improve due to the reassignment of traffic from the over-capacity left-turn lanes to the under-capacity through movement. The graphical results of the comparison analysis can be seen below.



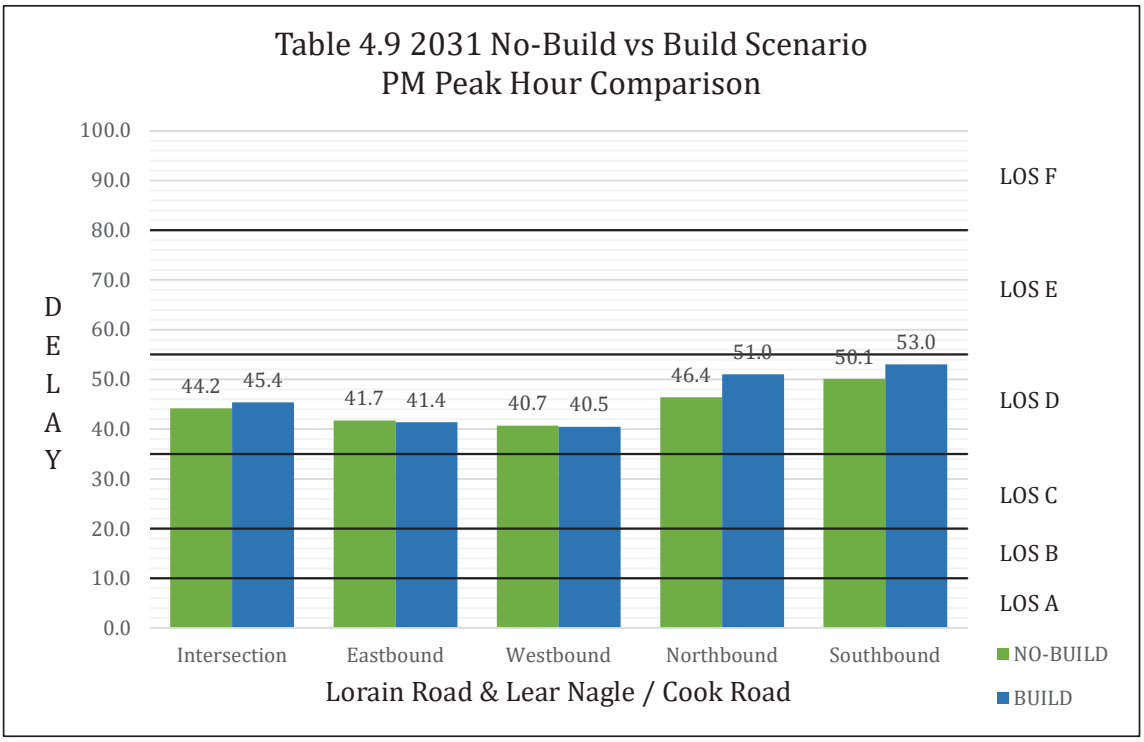
A comparison of the 2021 No-Build vs Build conditions for the PM peak hour indicates the overall intersection and approach levels-of-service are expected to remain unchanged with the addition of the development generated traffic under the 2021 PM peak hour conditions. The generated volumes from the proposed Starbucks is expected to increase delay by at most 4.4 seconds in the PM Peak Hour. The graphical results of the comparison analysis can be seen below.



A comparison of the 2031 No-Build vs Build conditions for the AM peak hour indicates the overall intersection and approach levels-of-service are expected to not degrade to an acceptable LOS with the addition of the development generated traffic under the 2031 AM peak hour conditions. The generated volumes from the proposed Starbucks is expected to increase delay by at most 3.3 seconds in the AM Peak Hour. The overall intersection, westbound and the southbound movement is expected to improve due to the reassignment of traffic caused by pass-by traffic detouring to the site. The graphical results of the comparison analysis can be seen on the next page.



A comparison of the 2031 No-Build vs Build conditions for the PM peak hour indicates the overall intersection and approach levels-of-service are expected to remain unchanged with the addition of the development generated traffic under the 2031 PM peak hour conditions. The generated volumes from the proposed Starbucks is expected to increase delay by at most 4.6 seconds in the PM Peak Hour. The graphical results of the comparison analysis can be seen on the next page.



4.3 Capacity & LOS at Development Access Intersection

Capacity analyses were performed for the site driveway on Cook Road using the procedures outlined in the computerized version of the Transportation Research Board's **Highway Capacity Manual 6TH Edition (HCS7, Release 7.85)**.

Build Condition - 2021 Capacity Analysis

Analyses were performed for the projected 2021 opening day conditions under the Build scenario to determine the future level-of-service at the site driveway onto Cook Road. The results of the 2021 Build analyses are shown in the following table. Copies of the capacity worksheets are included in **Appendix K**.

Table 4.10 2021 Levels-of-Service
(Build Conditions - Proposed Driveway)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Cook Road & Site Driveway	Stop Sign	Northbound Left	A (7.9)	A (8.1)
		Eastbound	B (14.4)	C (16.3)

(XX.X) = Average vehicle delay in seconds per vehicle

The movements at the proposed site driveways are expected to operate with levels-of-service C or better during the AM and PM peak hours. No improvements or modifications are recommended at the site driveway.

Build Condition - 2031 Capacity Analysis

Analyses were performed for the projected 2031 opening day conditions under the Build scenario to determine the future level-of-service at the site driveway onto Cook Road. The results of the 2031 Build analyses are shown in the following table. Copies of the capacity worksheets are included in **Appendix L**.

Table 4.11 2031 Levels-of-Service
(Build Conditions - Proposed Driveway)

LOCATION	TRAFFIC CONTROL	MOVEMENT	AM PEAK LOS (DELAY)	PM PEAK LOS (DELAY)
Cook Road & Site Driveway	Stop Sign	Northbound Left	A (7.9)	A (8.2)
		Eastbound	B (15.0)	C (17.5)

(XX.X) = Average vehicle delay in seconds per vehicle

The movements at the proposed site driveways are expected to operate with levels-of-service C or better during the AM and PM peak hours. No improvements or modifications are recommended at the site driveway.

4.4 Auxiliary Turning Lane Warrant Analysis

The ODOT **Location and Design Manual, Volume 1** and the **Access Management Manual** recommends that the need for auxiliary turn lanes at unsignalized intersections on state routes to be determined by using the Auxiliary Lane Graphs found in Section 401-6 of the **Location and Design Manual, Volume 1**. This recommendation is made for the free-flow approaches at unsignalized intersections. Section 401.6.3 of the ODOT **Location and Design Manual** states that:

"To determine the number and use of left/right turn lanes, intersection capacity analysis procedures of the current edition of the Highway Capacity Manual should be used. For unsignalized intersections, left/right turn lanes may also be needed if they meet warrants provided in Figures 401-6a, b, c and d. The warrants apply only to the free-flow approach of the unsignalized intersection."

The need for an exclusive turn lanes at the access driveway on Cook Road was based on a two-lane roadway with a posted speed limit of 35 miles per hour. The following table shows the results of the analysis of the need for the exclusive turn lanes at the proposed access driveway on Cook Road. Copies of the ODOT turn lane warrant graphs can be seen in **Appendix M**.

Table 4.12 Turning Lane Warrants
Proposed Cook Road Unsignalized Access Driveway

TURN LANE & LOCATION	Year 2021 AM	Year 2021 PM	Year 2031 AM	Year 2031 PM
Cook Road SB Right Turn Lane @ Site Drive	No	No	No	No
Cook Road NB Left Turn Lane @ Site Drive	No	No	No	No

The results of the turn lane analyses indicate that an exclusive northbound left turn lane on Cook Road at the Starbucks drive *is not* warranted under the expected 2021 and 2031 Build conditions. A southbound right turn deceleration lane was also found not to be justified for either 2021 or 2031 Build conditions.

4.5 Drive-Through Queue Analysis

The City of North Ridgeville has expressed concern that the queue from the proposed Starbuck's drive-thru may back up and block traffic on Cook Road or even Lorain Road. This type of queue back-up blockage has been occurring at other similar drive-thru sites within the City and they do not want this occurring at the proposed Starbucks.

The **Drive-Through Queue Generation** report published by Countingcars.com (dated February 2012) was utilized to estimate the average and maximum queue which could be expected at the proposed Starbucks drive-thru. The generation report was developed based on the monitoring of six existing sites and utilizing similar data sets marked as statistically significant in the ITE Trip Generation Manual. A copy of the Drive-Through Queue Generation report is shown in **Appendix N**.

The Drive-Thru Queue report states coffee shops produce the longest maximum queue of any drive-thru land uses which were studied and the maximum queues occur in the AM Peak hours. Table 3.3 of that report states the average maximum queue is approximately 11 vehicles with the 85th percentile queue being 13 vehicles. The data suggests that a coffee shop with drive-through should be able to accommodate at least 260 feet of vehicle stacking. The current site plan of the proposed Starbucks is showing approximately 500 feet of available storage (25 cars) before motorists are expected to queue onto Cook Road . Based on this information, no modifications to the site plan are necessary to increase the available stacking distance for the proposed drive-thru.

It should be noted that queuing is not only a function of demand, but also customer service. The training and experience of the staff who service the drive-thru will have an impact on the maximum stacking for the site. The proposed Starbucks may initially have a longer queue then expected due to the inexperience of the staff but the queue should gradually decrease as the employees get additional experience.

4.6 Improvements to Accommodate Study Area Traffic

The capacity analyses of the westbound and northbound movements at the Lorain Road and Lear Nagle Road / Cook Road intersection was calculated to be at an level-of-service E during the PM peak hour under the 2021 No-Build conditions. It was determined that the eastbound left-turn movement should be allowed to turn left during the permissive green ball rather then only during the protected turn arrow which is currently being used. There does not appear to be a sight distance restriction which would require a protected only turn restriction; however, the intersection should be further reviewed if a known crash hazard exists which prompted the use of a protected eastbound left-turn arrow.

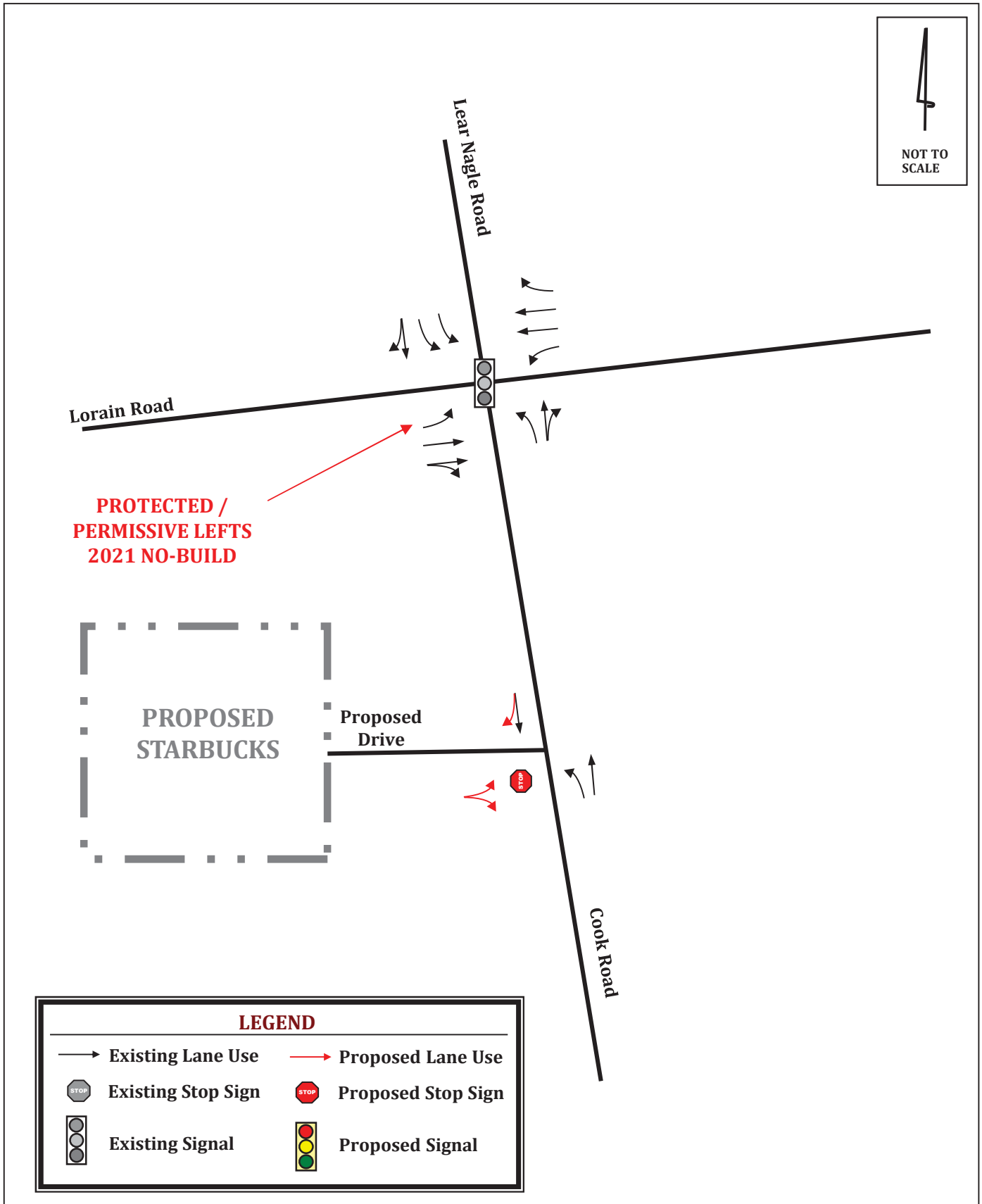
The additional traffic generated by the proposed Starbucks was determined to not cause a degradation to the LOS at the Lorain Road and Lear Nagle Road / Cook Road intersection. No signal or geometric improvements are recommended at the Lorain Road and Lear Nagle Road / Cook Road intersection in the future Build scenario.

The following lane use and traffic control are recommended to accommodate the 2021 and 2031 site generated (Build) traffic at the development access location on Cook Road:

Cook Road & Site Drive

- The proposed driveway should be constructed as per the site plan with a single entrance and exiting lane.
- Install stop sign control on the eastbound approach of the driveway.

The recommended lane use and traffic control for the study area to accommodate the proposed development can be seen in **Figure 4.1, Page 48**.


NOT TO SCALE
Lear Nagle Road
Lorain Road
PROTECTED / PERMISSIVE LEFTS 2021 NO-BUILD
PROPOSED STARBUCKS
Proposed Drive
STOP
Cook Road
LEGEND
Existing Lane Use
Proposed Lane Use
Existing Stop Sign
Proposed Stop Sign
Existing Signal
Proposed Signal

Chapter 5
Conclusions

Based on the results of the analyses, we offer the following conclusions and recommendations:

5.1 This traffic impact study has been prepared at the request of Osborne Capital Group for a proposed Starbucks. The project site is located on the southwest corner of the Lorain Road and Lear Nagle / Cook Road intersection in the City of North Ridgeville, Ohio. **Figure 1.1, Page 2** shows the proposed location of the development.

5.2 The development is expected to consist of the following land uses:

2,226 Square Coffee Shop (Starbucks)

5.3 The Starbucks is proposed to have one full access driveway onto Cook Road. The driveway will be located on the southern edge of the site in order to provide the maximum distance from the Lorain Road / Lear Nagle intersection. A site plan illustrating the proposed location of the site's access driveway can be seen in **Figure 1.2, Page 3**.

5.4 The year 2021 will be analyzed for the Opening Year of the Starbucks. The year 2031 will be analyzed as the design year for the ten year conditions.

5.5 From the collected traffic data, the weekday AM peak hour of traffic was determined to be 7:15 AM to 8:15 AM. The weekday PM peak hour of traffic was found to be 4:45 PM to 5:45 PM. These periods will be to forecast expected and future traffic volumes since they reflect the period of the highest volume of traffic flow for the study area roadways.

5.6 The proposed coffee shop is expected to generate the hourly traffic volumes during the peak periods as shown in the table on the following page:

ITE TRIP GENERATION			TRIP ENDS			
ITE CODE	DESCRIPTION	SIZE (Sq, Ft.)	Weekday AM Peak Hour of Generator (Enter/Exit)		Weekday PM Peak Hour of Generator (Enter/Exit)	
937	Coffee/Donut Shop w/Drive-Through	2,226	101	97	48	49
Pass-By Trips (AM- 49%/ PM-50%)			50	48	24	25
TOTAL NEW TRIPS			**51**	**49**	**24**	**24**
			100		**48**	

5.7 The capacity analyses of the westbound and northbound movements at the Lorain Road and Lear Nagle Road / Cook Road intersection was calculated to be at an level-of-service E during the PM peak hour under the 2021 No-Build conditions. It was determined that the eastbound left-turn movement should be allowed to turn left during the permissive green ball rather then only during the protected turn arrow which is currently being used. There does not appear to be a sight distance restriction which would require a protected only turn restriction; however, the intersection should be further reviewed if a know crash hazard exists which prompted the use of a protected eastbound left-turn arrow.

5.8 The additional traffic generated by the proposed Starbucks was determined to not cause a degradation to the LOS at the Lorain Road and Lear Nagle Road / Cook Road intersection. No signal or geometric improvements are recommended at the Lorain Road and Lear Nagle Road / Cook Road intersection in the future Build scenario.

5.9 The following lane use and traffic control are recommended to accommodate the 2021 and 2031 site generated (Build) traffic at the development access location on Cook Road:

Cook Road & Site Drive

- The proposed driveway should be constructed as per the site plan with a single entrance and exiting lane.
- Install stop sign control on the eastbound approach of the driveway.

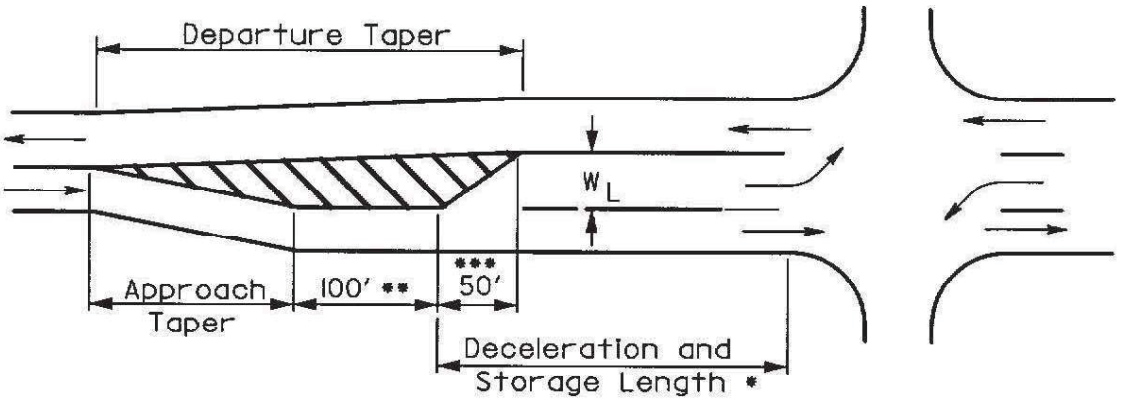
5.10 Based upon the results of the analysis in this study and the corresponding recommendations, it can be seen that the development traffic can be accommodated without adversely impacting the area roadway network.

Appendix A
ODOT Turn Lane Design Criteria

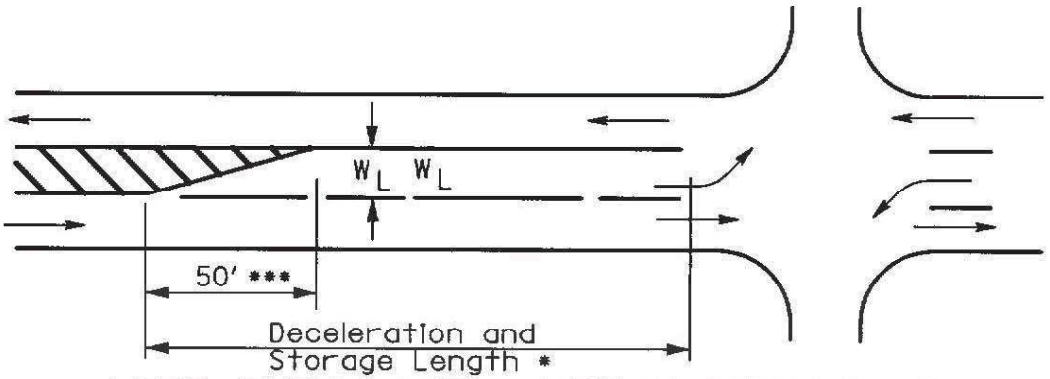
TURNING LANE DESIGN

401-7E

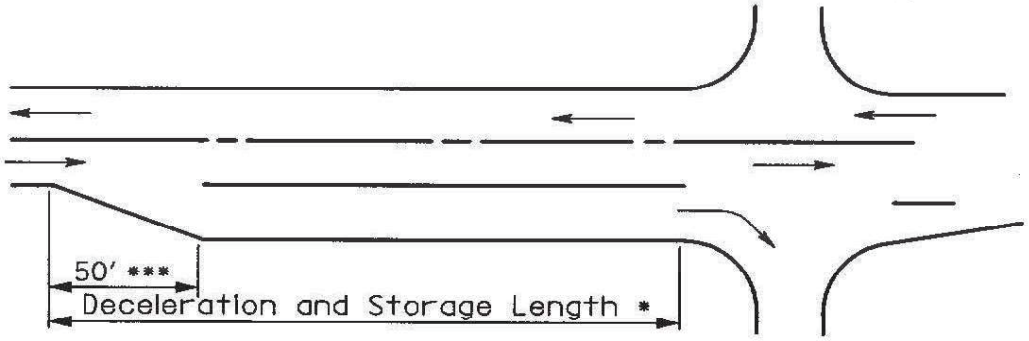
REFERENCE SECTIONS
401.6.1, 401.6.3



LEFT TURN LANE - NO MEDIAN OR MEDIAN WIDTH < W_L



LEFT TURN LANE - MEDIAN WIDTH >= W_L



RIGHT TURN LANE

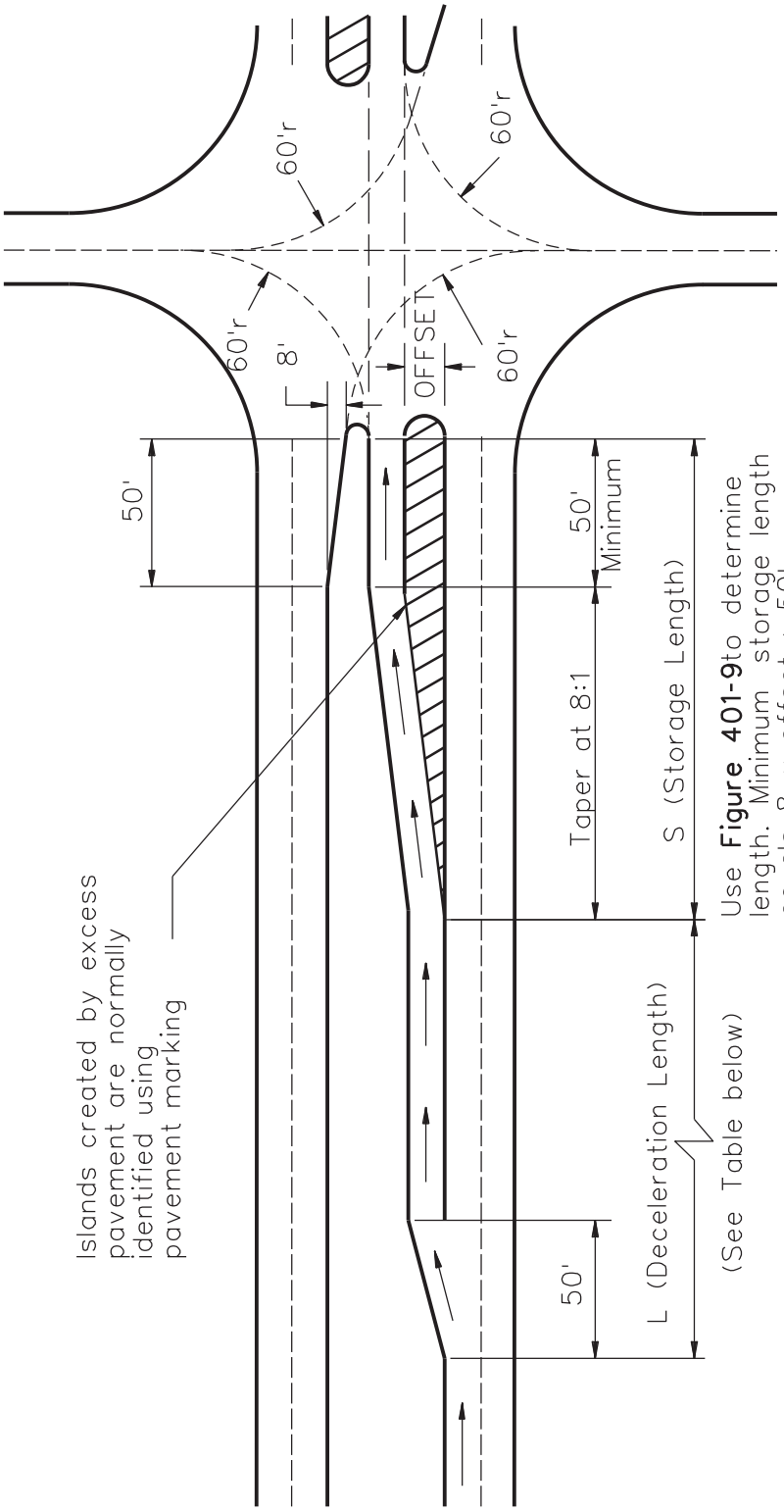
- * See **Figures 401-9 and 401-10** to copmpute length.
- ** May be reduced or eliminated in urban areas if intersection spacing or storage is constraining
- *** Diverging taper

W_L = Turn Lane Width

OFFSET LEFT TURN LANE

401-8E

REFERENCE SECTIONS
401.6.1, 401.6.3



Design Speed	L
40 mph	125'
45 mph	175'
50 mph	225'
55 mph	285'
60 mph	345'
65 mph	**405'**

BASIS FOR COMPUTING LENGTH OF TURN LANES

401-9E

REFERENCE SECTIONS
401.6.1, 401.6.3

Type of Traffic Control	Design Speed		
	30-35	40-65	
	Turn Demand Volume		
	All	Low*	High
Signalized	A	** B or C	** B or C
Unsignalized Stopped Crossroad	A	A	A
Unsignalized Through Road	A	B	** B or C

*Low is considered 10% or less of approach traffic volume
**Whichever is greater

CONDITION A	STORAGE ONLY
Length = 50' (diverging taper) + Storage Length (Figure 401-10)	

CONDITION B	HIGH SPEED DECELERATION ONLY
Design Speed	Length (including 50' Diverging Taper)
40	125
45	175
50	225
55	285
60	345
65	405

CONDITION C	MODERATE SPEED DECELERATION AND STORAGE
Design Speed	Length (including 50' Diverging Taper)
40	115 + Storage Length (Figure 401-10)
45	125 "
50	145 "
55	165 "
60	185 "
65	205 "

For explanation, see Turn Lane Design Example

STORAGE LENGTH AT INTERSECTIONS

401-10E

REFERENCE SECTIONS
401.6.1, 401.6.3

* AVERAGE NO. OF VEHICLES/CYCLE	REQUIRED LENGTH (FT.)	* AVERAGE NO. OF VEHICLES/CYCLE	REQUIRED LENGTH (FT.)
1	50	17	600
2	100	18	625
3	150	19	650
4	175	20	675
5	200	21	725
6	250	22	750
7	275	23	775
8	325	24	800
9	350	25	825
10	375	30	975
11	400	35	1125
12	450	40	1250
13	475	45	1400
14	500	50	1550
15	525	55	1700
16	550	60	1850

$$\text{* AVERAGE VEHICLES PER CYCLE} = \frac{\text{DHV (TURNING LANE)}}{\text{CYCLES/HOUR}}$$

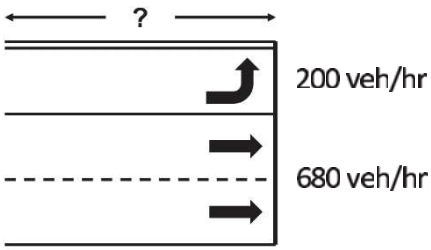
IF CYCLES ARE UNKNOWN ASSUME:

UNSIGNALIZED OR 2 PHASE = 60 CYCLES/HOUR
3 PHASE = 40 CYCLES/HOUR
4 PHASE = 30 CYCLES/HOUR

Example - Turn Lane Design Using Figures 401-9 and 401-10

Problem
Calculate the length of an exclusive left turn lane.

Traffic Control: **Signalized**
Design Speed: **55 mph**
Cycle Length: **90 sec**



Determine Storage and Turn Lane Lengths

$$\text{Turn Lane Demand (High/Low)} = \frac{200 \text{ veh/hr}}{200 \text{ veh/hr} + 680 \text{ veh/hr}} = 23\% = \textbf{High Demand}$$

Refer to the matrix in **Figure 401-9**.

For Signalized, 55 mph, High Demand, use Method B or C, whichever is greater.

Method B – For 55 mph, a **285'** turn lane length is required (235' storage + 50' taper).

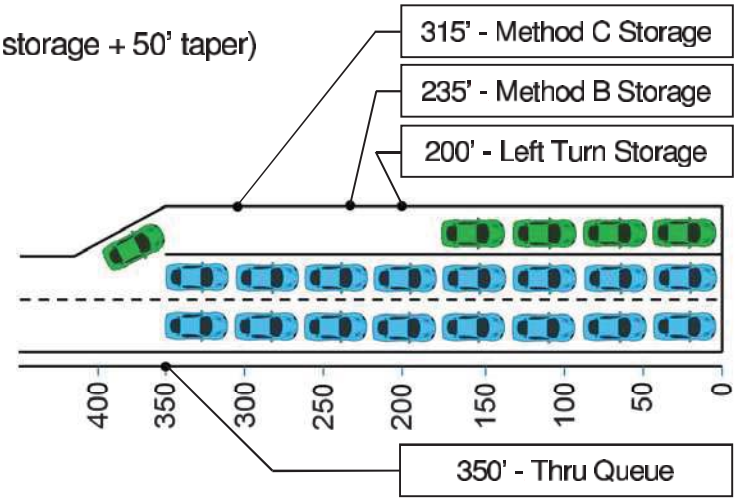
Method C – For 55 mph, 165' + calculated storage length in **Figure 401-10**.

$$\text{Average Vehicles per Cycle} = \frac{(200 \text{ veh/hr}) * (90 \text{ sec/cyc})}{3600 \text{ sec/hr}} = 5 \text{ veh/cyc} \rightarrow 200'$$

Total Length = 165' + 200' = **365'** (315' storage + 50' taper)

Method C = **365'** > Method B = **285'**

Use Method C



Check Length for Thru-Block

Refer to **Figure 401-10** to calculate thru lane(s) queue distance.

680 veh/hr / 2 lanes = 340 veh/hr/ln

$$\text{Average Vehicles per Cycle} = \frac{(340 \text{ veh/hr/ln}) * (90 \text{ sec/cyc})}{3600 \text{ sec/hr}} = 9 \text{ veh/cyc/ln} \rightarrow \textbf{350 ft/ln}$$

Thru Block = **350'** > Method C Storage = **315'** → **Turn Lane Blocked**

Use **350'** storage + **50'** taper = **400' Turn Lane Length**

Appendix B
Traffic Count Data

VEHICULAR TRAFFIC COUNT SUMMARY

Municipality: North Ridgeville **At Intersection of:** Lorain Road **and** Lear Nagle Road / Cook Road

Date: 10/6/2020 **Day:** Tue. **Comments:** **Project:** 20-102

Weather: Clear **Recorder(s):** GFA & JMC **Data entry by:** JJO **Date entered:** Oct. 7, 2020 ain Rd & Lear Nagle Rd + Cook Rd 100(

TIME BEGINS	Lear Nagle Rd. FROM NORTH						Cook Rd. FROM SOUTH						TOTAL NORTH SOUTH	Lorain Rd. FROM EAST						Lorain Rd. FROM WEST						TOTAL EAST WEST	TOTAL ALL DIREC.	PEAK HOUR FACTOR			
	Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus		Left	Thru	Right	Total	Trk	Bus	Left	Thru	Right	Total	Trk	Bus			North	South	East	West
06:00																														
07:00	565	88	168	821	11	1	84	120	46	250	8	0	1071	39	284	223	546	22	1	139	444	26	609	33	0	1155	2226	0.925	0.893	0.822	0.880
08:00	416	74	166	656	20	1	53	84	32	169	6	0	825	38	289	218	545	30	1	161	357	28	546	45	3	1091	1916	0.863	0.828	0.960	0.904
09:00	330	69	151	550	24	0	63	82	29	174	7	0	724	31	251	208	490	51	0	117	293	33	443	50	0	933	1657	0.865	0.837	0.957	0.947
10:00																														
11:00	296	95	129	520	20	0	65	111	41	217	6	0	737	48	251	204	503	36	1	121	246	32	399	28	0	902	1639	0.802	0.753	0.918	0.838
12:00	339	106	165	610	29	0	78	127	31	236	6	0	846	48	290	223	561	39	0	144	294	55	493	26	1	1054	1900	0.953	0.894	0.871	0.906
1:00	305	108	154	567	22	0	77	112	19	208	10	0	775	46	302	262	610	33	0	137	274	36	447	24	0	1057	1832	0.951	0.825	0.852	0.972
2:00																														
3:00	380	122	202	704	25	3	77	104	15	196	6	0	900	63	456	438	957	38	2	178	293	57	528	19	3	1485	2385	0.936	0.875	0.779	0.971
4:00	365	126	209	700	23	0	77	153	33	263	2	1	963	70	478	518	1066	31	0	197	370	56	623	24	1	1689	2652	0.921	0.913	0.857	0.880
5:00	389	136	279	804	11	1	90	205	50	345	2	0	1149	82	560	547	1189	21	1	243	387	61	691	14	0	1880	3029	0.976	0.969	0.867	0.895
6:00																														
7:00																														
8:00																														
9:00																														
TOTALS	3385	924	1623	5932	185	6	664	1098	296	2058	53	1	7990	465	3161	2841	6467	301	6	1437	2958	384	4779	263	8	11246	19236				
ADT	5053	1379.2	2423	8854	3.2%		991	1639	442	3072	2.6%		11926	678	4610	4143	9431	4.7%		2096	4314	560	6969	5.7%		16400	28326				

N Leg Hourly Factor:	1.64	E Leg Hourly Factor:	1.64
S Leg Hourly Factor:	1.64	W leg Hourly Factor:	1.64
N Leg Monthly Factor:	0.91	E Leg Monthly Factor:	0.89
S Leg Monthly Factor:	0.91	W Leg Monthly Factor:	0.89

N Leg Combined Factor:	1.49	E Leg Combined Factor:	1.46
S Leg Combined Factor:	1.49	W Leg Combined Factor:	1.46

TMS ENGINEERS, INC.

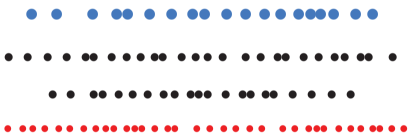
2112 Case Parkway South #7

Twinsburg, Ohio 44087

(330) 686-6402 FAX: (330) 686-6417

Figure #:

Page #:

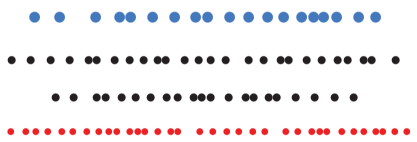


City: North Ridgeville
Intersection: Lorain Rd & Lear Nagle Rd
Counter: GFA & JMC
Day of the week: Tuesday

File Name : Lorain Rd & Lear Nagle Rd 100620
Site Code : 00000000
Start Date : 10/6/2020
Page No : 1

Groups Printed- cars - trucks - buses

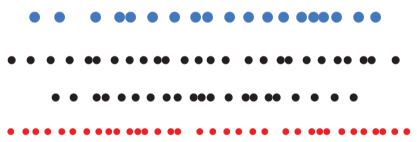
	LEAR NAGLE ROAD From North					LORAIN ROAD From East					COOK ROAD From South					LORAIN ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	27	13	146	0	186	31	52	5	0	88	9	26	15	0	50	9	103	30	0	142	466
07:15 AM	46	28	127	0	201	60	80	9	0	149	15	30	24	0	69	4	114	25	0	143	562
07:30 AM	59	21	142	0	222	61	71	11	0	143	12	39	19	0	70	6	112	33	0	151	586
07:45 AM	36	26	150	0	212	71	81	14	0	166	10	25	26	0	61	7	115	51	0	173	612
Total	168	88	565	0	821	223	284	39	0	546	46	120	84	0	250	26	444	139	0	609	2226
08:00 AM	39	14	113	0	166	53	76	13	0	142	7	27	17	0	51	8	96	37	0	141	500
08:15 AM	51	13	126	0	190	57	73	11	0	141	8	17	14	0	39	2	88	42	0	132	502
08:30 AM	41	20	101	0	162	55	58	7	0	120	8	17	11	0	36	7	99	45	0	151	469
08:45 AM	35	27	76	0	138	53	82	7	0	142	9	23	11	0	43	11	74	37	0	122	445
Total	166	74	416	0	656	218	289	38	0	545	32	84	53	0	169	28	357	161	0	546	1916
09:00 AM	45	22	92	0	159	57	62	7	0	126	3	17	17	0	37	5	74	31	0	110	432
09:15 AM	29	15	94	0	138	45	64	11	0	120	4	17	19	0	40	8	80	29	0	117	415
09:30 AM	41	12	71	0	124	57	64	7	1	129	8	25	12	0	45	8	71	30	0	109	407
09:45 AM	36	20	73	0	129	49	61	6	0	116	14	23	15	0	52	12	68	27	0	107	404
Total	151	69	330	0	550	208	251	31	1	491	29	82	63	0	174	33	293	117	0	443	1658



File Name : Lorain Rd & Lear Nagle Rd 100620
Site Code : 00000000
Start Date : 10/6/2020
Page No : 2

Groups Printed- cars - trucks - buses

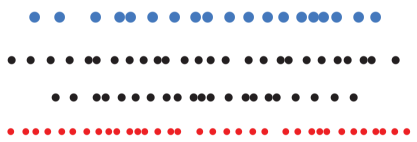
	LEAR NAGLE ROAD From North					LORAIN ROAD From East					COOK ROAD From South					LORAIN ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	28	24	67	0	119	36	65	8	0	109	8	33	15	0	56	6	62	34	0	102	386
11:15 AM	27	24	59	0	110	45	63	13	0	121	9	18	10	0	37	8	51	31	0	90	358
11:30 AM	39	28	95	0	162	53	68	15	0	136	12	21	19	0	52	10	78	31	0	119	469
11:45 AM	35	19	75	0	129	70	55	12	0	137	12	39	21	0	72	8	55	25	0	88	426
Total	129	95	296	0	520	204	251	48	0	503	41	111	65	0	217	32	246	121	0	399	1639
12:00 PM	39	29	92	1	161	44	81	14	0	139	5	29	16	0	50	14	63	37	0	114	464
12:15 PM	37	29	88	0	154	53	64	11	0	128	9	33	16	0	58	16	84	36	0	136	476
12:30 PM	44	26	74	0	144	59	63	11	0	133	10	35	17	0	62	13	79	40	0	132	471
12:45 PM	45	22	85	0	152	67	82	12	0	161	7	30	29	0	66	12	68	31	0	111	490
Total	165	106	339	1	611	223	290	48	0	561	31	127	78	0	236	55	294	144	0	493	1901
01:00 PM	47	25	77	0	149	65	64	13	0	142	7	37	19	0	63	6	64	44	0	114	468
01:15 PM	38	22	75	0	135	64	80	9	0	153	5	23	25	0	53	11	66	30	0	107	448



File Name : Lorain Rd & Lear Nagle Rd 100620
Site Code : 00000000
Start Date : 10/6/2020
Page No : 3

Groups Printed- cars - trucks - buses

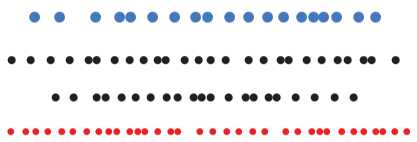
	LEAR NAGLE ROAD From North					LORAIN ROAD From East					COOK ROAD From South					LORAIN ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
01:30 PM	37	34	75	0	146	79	86	14	0	179	3	26	17	0	46	10	72	29	0	111	482
01:45 PM	32	27	78	0	137	54	72	10	0	136	4	26	16	0	46	9	72	34	0	115	434
Total	154	108	305	0	567	262	302	46	0	610	19	112	77	0	208	36	274	137	0	447	1832
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	59	22	91	0	172	88	88	11	0	187	6	27	21	0	54	11	87	38	0	136	549
03:15 PM	42	31	92	1	166	101	97	16	0	214	2	27	11	0	40	12	71	52	0	135	555
03:30 PM	48	31	100	0	179	102	139	8	0	249	3	16	27	0	46	17	73	40	0	130	604
03:45 PM	53	38	97	0	188	147	132	28	0	307	4	34	18	0	56	17	62	48	0	127	678
Total	202	122	380	1	705	438	456	63	0	957	15	104	77	0	196	57	293	178	0	528	2386
04:00 PM	48	30	91	0	169	112	119	12	0	243	8	41	22	1	72	17	94	46	0	157	641
04:15 PM	46	23	92	0	161	121	107	24	0	252	9	32	13	0	54	18	87	43	0	148	615
04:30 PM	53	32	95	0	180	132	112	16	0	260	8	38	20	0	66	5	87	49	0	141	647
04:45 PM	62	41	87	0	190	153	140	18	0	311	8	42	22	0	72	16	102	59	0	177	750
Total	209	126	365	0	700	518	478	70	0	1066	33	153	77	1	264	56	370	197	0	623	2653



File Name : Lorain Rd & Lear Nagle Rd 100620
Site Code : 00000000
Start Date : 10/6/2020
Page No : 4

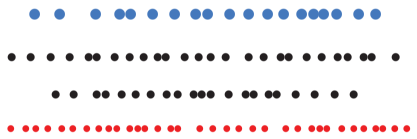
Groups Printed- cars - trucks - buses

	LEAR NAGLE ROAD From North					LORAIN ROAD From East					COOK ROAD From South					LORAIN ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
05:00 PM	70	34	89	0	193	132	157	21	0	310	14	56	13	0	83	22	108	63	0	193	779
05:15 PM	76	33	97	0	206	167	158	18	0	343	8	56	24	0	88	13	106	54	0	173	810
05:30 PM	71	36	93	0	200	137	131	25	0	293	8	47	30	0	85	14	89	65	1	169	747
05:45 PM	62	33	110	0	205	111	114	18	0	243	20	46	23	0	89	12	84	61	0	157	694
Total	279	136	389	0	804	547	560	82	0	1189	50	205	90	0	345	61	387	243	1	692	3030
Grand Total	1623	924	3385	2	5934	2841	3161	465	1	6468	296	1098	664	1	2059	384	2958	1437	1	4780	19241
Apprch %	27.4	15.6	57	0		43.9	48.9	7.2	0		14.4	53.3	32.2	0		8	61.9	30.1	0		
Total %	8.4	4.8	17.6	0	30.8	14.8	16.4	2.4	0	33.6	1.5	5.7	3.5	0	10.7	2	15.4	7.5	0	24.8	
cars	1558	906	3277	2	5743	2752	2971	437	1	6161	278	1075	651	0	2004	369	2778	1361	1	4509	18417
% cars	96	98.1	96.8	100	96.8	96.9	94	94	100	95.3	93.9	97.9	98	0	97.3	96.1	93.9	94.7	100	94.3	95.7
trucks	63	18	104	0	185	86	187	28	0	301	18	22	13	0	53	15	178	70	0	263	802
% trucks	3.9	1.9	3.1	0	3.1	3	5.9	6	0	4.7	6.1	2	2	0	2.6	3.9	6	4.9	0	5.5	4.2
buses	2	0	4	0	6	3	3	0	0	6	0	1	0	1	2	0	2	6	0	8	22
% buses	0.1	0	0.1	0	0.1	0.1	0.1	0	0	0.1	0	0.1	0	100	0.1	0	0.1	0.4	0	0.2	0.1



File Name : Lorain Rd & Lear Nagle Rd 100620
Site Code : 00000000
Start Date : 10/6/2020
Page No : 5

	LEAR NAGLE ROAD From North					LORAIN ROAD From East					COOK ROAD From South					LORAIN ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	46	**28**	127	0	201	60	80	9	0	149	**15**	30	24	0	69	4	114	25	0	143	562
07:30 AM	**59**	21	142	0	**222**	61	71	11	0	143	12	**39**	19	0	**70**	6	112	33	0	151	586
07:45 AM	36	26	**150**	0	212	**71**	**81**	**14**	0	**166**	10	25	**26**	0	61	7	**115**	**51**	0	**173**	**612**
08:00 AM	39	14	113	0	166	53	76	13	0	142	7	27	17	0	51	**8**	96	37	0	141	500
Total Volume	180	89	532	0	801	245	308	47	0	600	44	121	86	0	251	25	437	146	0	608	2260
% App. Total	22.5	11.1	66.4	0		40.8	51.3	7.8	0		17.5	48.2	34.3	0		4.1	71.9	24	0		
PHF	.763	.795	.887	.000	.902	.863	.951	.839	.000	.904	.733	.776	.827	.000	.896	.781	.950	.716	.000	.879	.923
cars	172	87	527	0	786	239	293	45	0	577	43	115	85	0	243	23	410	138	0	571	2177
% cars	95.6	97.8	99.1	0	98.1	97.6	95.1	95.7	0	96.2	97.7	95.0	98.8	0	96.8	92.0	93.8	94.5	0	93.9	96.3
trucks	7	2	4	0	13	6	15	2	0	23	1	6	1	0	8	2	27	8	0	37	81
% trucks	3.9	2.2	0.8	0	1.6	2.4	4.9	4.3	0	3.8	2.3	5.0	1.2	0	3.2	8.0	6.2	5.5	0	6.1	3.6
buses	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
% buses	0.6	0	0.2	0	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1



File Name : Lorain Rd & Lear Nagle Rd 100620
Site Code : 00000000
Start Date : 10/6/2020
Page No : 6

	LEAR NAGLE ROAD From North					LORAIN ROAD From East					COOK ROAD From South					LORAIN ROAD From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	62	**41**	87	0	190	153	140	18	0	311	8	42	22	0	72	16	102	59	0	177	750
05:00 PM	70	34	89	0	193	132	157	21	0	310	**14**	**56**	13	0	83	**22**	**108**	63	0	**193**	779
05:15 PM	**76**	33	**97**	0	**206**	**167**	**158**	18	0	**343**	8	56	24	0	**88**	13	106	54	0	173	**810**
05:30 PM	71	36	93	0	200	137	131	**25**	0	293	8	47	**30**	0	85	14	89	**65**	**1**	169	747
Total Volume	279	144	366	0	789	589	586	82	0	1257	38	201	89	0	328	65	405	241	1	712	3086
% App. Total	35.4	18.3	46.4	0		46.9	46.6	6.5	0		11.6	61.3	27.1	0		9.1	56.9	33.8	0.1		
PHF	.918	.878	.943	.000	.958	.882	.927	.820	.000	.916	.679	.897	.742	.000	.932	.739	.938	.927	.250	.922	.952
cars	273	142	358	0	773	587	565	82	0	1234	38	199	88	0	325	65	385	236	1	687	3019
% cars	97.8	98.6	97.8	0	98.0	99.7	96.4	100	0	98.2	100	99.0	98.9	0	99.1	100	95.1	97.9	100	96.5	97.8
trucks	6	2	7	0	15	2	20	0	0	22	0	1	1	0	2	0	19	5	0	24	63
% trucks	2.2	1.4	1.9	0	1.9	0.3	3.4	0	0	1.8	0	0.5	1.1	0	0.6	0	4.7	2.1	0	3.4	2.0
buses	0	0	1	0	1	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	4
% buses	0	0	0.3	0	0.1	0	0.2	0	0	0.1	0	0.5	0	0	0.3	0	0.2	0	0	0.1	0.1

Appendix C
Trip Generation Data

Coffee/Donut Shop with Drive-Through Window

ITE Code = 937

Date: **9/17/2020**

Trip Generation based on: **1,000 Square Feet Gross Floor Area**

Size of Analysis Area: **2.226** **1,000 Sq Ft**

	Average Rate	Standard Deviation	Adjustment Factor	Driveway Volume
Average Weekday 2-way Volume	820.38	**	1.00	1826
Weekday Peak Hour of Adjacent Street Traffic				
7-9 AM Peak Hour Enter	45.38	0.00	1.00	101
7-9 AM Peak Hour Exit	43.61	0.00	1.00	97
7-9 AM Peak Hour Total	88.99	48.19	1.00	198
4-6 PM Peak Hour Enter	21.69	0.00	1.00	48
4-6 PM Peak Hour Exit	22.14	0.00	1.00	49
4-6 PM Peak Hour Total	43.38	18.88	1.00	97

***The above rates were calculated from the equations shown below:**

Average Weekday 2-way Volume: *Not Given – Use ITE Rates*

Peak Hour of Adjacent Street Traffic

7-9 AM Peak Hour Total: *Not Given – Use ITE Rates*

Enter	0.51
Exit	0.49

4-6 PM Peak Hour Total: *Not Given – Use ITE Rates*

Enter	0.50
Exit	0.50

Source: **Institute of Transportation Engineers**
Trip Generation Manual, 10th Edition, September 2017

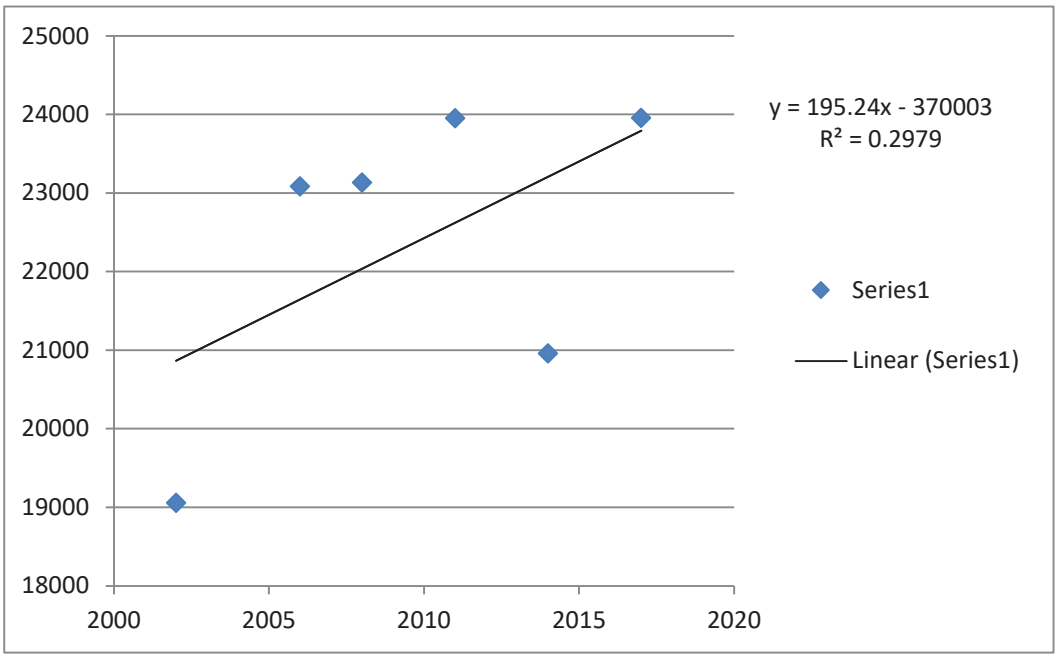
Appendix D
Growth Rate Calculations

LORAIN ROAD SW OF I-480 ID 7247 - COUNT DATA FROM ODOT WEBSITE

Year	*Volume*	*% Diff per Yr to Prev Yr Count*	*% Diff per Yr Since 2017*
2017	23963	4.77%	
2014	20963	-1.57%	4.77%
2011	23958	0.75%	0.00%
2008	23140	3.57%	0.40%
2006	23090	0.00%	0.34%
2002	19060		1.71%

AVG/YEAR Since 2002
1.715%

Coefficient (b) of Regression Equation:		**195.239**
Growth Rate =	b / Most Recent Count x 100%	
Growth Rate =	195.239 / 23963 X 100%	
Growth Rate =	**0.8148%**	



Appendix E
Peak Hour to Design Hour Charts

PEAK HOUR to DESIGN HOUR FACTORS

FUNCTIONAL CLASSIFICATION = 03, 04, 05u

(Urban Principal Arterial, Urban Minor Arterial, & Urban Minor Collector)

Day / Month	Monthly Average by Day-of-Week							
	WEEKDAY MON-THUR	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
January	1.20	1.72	1.22	1.21	1.20	1.17	1.15	1.56
February	1.17	1.63	1.19	1.16	1.17	1.16	1.11	1.48
March	1.15	1.57	1.16	1.16	1.16	1.13	1.11	1.45
April	1.11	1.52	1.13	1.12	1.09	1.09	1.06	1.41
May	1.08	1.44	1.10	1.09	1.08	1.06	1.04	1.35
June	1.14	1.51	1.16	1.15	1.14	1.11	1.09	1.39
July	1.16	1.54	1.19	1.17	1.15	1.15	1.13	1.44
August	1.13	1.51	1.15	1.14	1.13	1.11	1.08	1.40
September	1.12	1.53	1.15	1.11	1.12	1.09	1.04	1.40
October	1.10	1.53	1.13	1.10	1.10	1.08	1.05	1.40
November	1.13	1.56	1.16	1.12	1.13	1.11	1.06	1.48
December	1.13	1.58	1.14	1.13	1.12	1.12	1.09	1.44

peak hour volume * factor = design hour volume

source: year 2016, 2017, & 2018 Automatic Traffic Recorders (ATR) Data

ATR Stations:
2018: 21, 28, 123, 131, 134, 166, 169, 517, 523, 543, 544, 550, 565, 605, 765
2017: 21, 123, 523, 538, 543, 544, 550, 565, 605, 725, 765, 28, 134, 169, 517, 131, 166

Ohio Department of Transportation
Modeling & Forecasting Section
June 2019

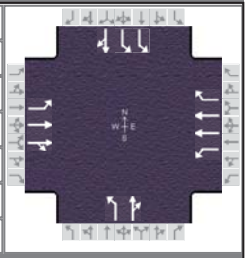
NOTE: These are NOT seasonal adjustment factors!!!

Note: Insufficient data exists to produce factors for functional classes 06 and 07 Urban.

Appendix F
No Build Capacity Analysis Worksheets - 2021

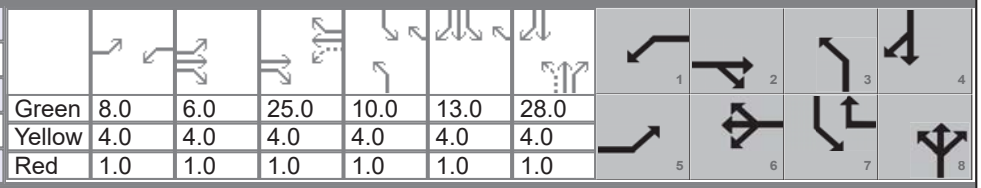
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	AM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	AM Peak NB.xus		
Project Description	Year 2021 - No-Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	160	480	30	50	340	270	100	130	50	590	100	200

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	6.0	25.0	10.0	13.0	28.0
Yellow	4.0	4.0	4.0	4.0	4.0	4.0
Red	1.0	1.0	1.0	1.0	1.0	1.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	24.0	41.0	13.0	30.0	15.0	33.0	33.0	51.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	13.3	17.4	4.8	13.3	7.4	13.5	23.1	20.1
Green Extension Time (g_e), s	0.1	0.6	0.0	2.1	0.0	1.0	0.9	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.07	1.00	0.89	0.06	1.00	0.00	0.38	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	174	280	275	54	370	196	109	196		641	326	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1773	1739	1738	1547	1767	1767		1716	1657	
Queue Service Time (g_s), s	11.3	15.3	15.4	2.8	11.3	9.7	5.4	11.5		21.1	18.1	
Cycle Queue Clearance Time (g_c), s	11.3	15.3	15.4	2.8	11.3	9.7	5.4	11.5		21.1	18.1	
Green Ratio (*g/C*)	0.16	0.30	0.30	0.28	0.21	0.44	0.32	0.23		0.23	0.38	
Capacity (*c*), veh/h	273	543	532	305	724	683	432	412		801	635	
Volume-to-Capacity Ratio (*X*)	0.637	0.515	0.517	0.178	0.510	0.286	0.251	0.474		0.801	0.513	
Back of Queue (*Q*), ft/ln (85 th percentile)	195.3	247.7	233	55.6	185.2	141	98.8	186.6		323.6	254.2	
Back of Queue (*Q*), veh/ln (85 th percentile)	7.5	9.5	9.3	2.1	7.1	5.4	3.9	7.3		12.6	9.9	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.39	0.00	0.00	0.20	0.00	0.26	0.44	0.00		0.59	0.00	
Uniform Delay (d_1), s/veh	47.3	34.8	34.8	32.7	42.1	21.4	29.9	39.7		43.4	28.4	
Incremental Delay (d_2), s/veh	3.7	0.4	0.4	0.1	0.3	0.1	0.1	0.3		5.4	0.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	51.0	35.1	35.2	32.8	42.3	21.5	30.0	40.0		48.8	28.7	
Level of Service (LOS)	D	D	D	C	D	C	C	D		D	C	
Approach Delay, s/veh / LOS	39.0	D		34.9	C		36.4	D		42.0	D	
Intersection Delay, s/veh / LOS	38.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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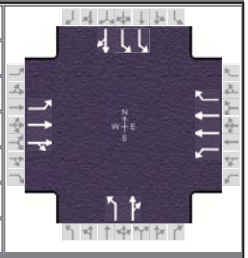
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	PM Peak NB.xus		
Project Description	Year 2021 - No-Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	270	450	70	90	650	650	100	220	40	410	160	310

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.0	8.0	27.0	8.0	9.0	27.0	1	2	3	4		
Yellow	4.0	4.0	4.0	4.0	4.0	4.0	5	6	7	8		
Red	1.0	1.0	1.0	1.0	1.0	1.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	2.0	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	29.0	45.0	16.0	32.0	13.0	32.0	27.0	46.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	21.7	17.3	6.9	29.0	7.6	19.3	16.6	37.2
Green Extension Time (g_e), s	0.2	1.8	0.0	0.0	0.0	0.2	0.6	0.8
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	0.90	0.26	1.00	1.00	1.00	0.19	0.77

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	293	288	277	98	707	467	109	283		446	511	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1726	1739	1738	1547	1767	1806		1716	1659	
Queue Service Time (g_s), s	19.7	15.1	15.3	4.9	23.7	27.0	5.6	17.3		14.6	35.2	
Cycle Queue Clearance Time (g_c), s	19.7	15.1	15.3	4.9	23.7	27.0	5.6	17.3		14.6	35.2	
Green Ratio (*g/C*)	0.37	0.33	0.33	0.32	0.22	0.41	0.29	0.22		0.18	0.34	
Capacity (*c*), veh/h	345	604	575	376	782	632	206	406		629	567	
Volume-to-Capacity Ratio (*X*)	0.851	0.477	0.481	0.261	0.903	0.740	0.528	0.696		0.708	0.901	
Back of Queue (*Q*), ft/ln (85 th percentile)	347.2	242.7	224.1	92	391.7	400.6	104.2	283.2		232.6	533.2	
Back of Queue (*Q*), veh/ln (85 th percentile)	13.3	9.3	9.0	3.5	15.1	15.4	4.1	11.1		9.1	20.8	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.69	0.00	0.00	0.33	0.00	0.73	0.46	0.00		0.42	0.00	
Uniform Delay (d_1), s/veh	46.3	31.7	31.8	29.8	45.2	30.1	34.6	42.7		46.0	37.6	
Incremental Delay (d_2), s/veh	17.2	0.2	0.2	0.1	13.5	4.1	1.3	4.3		3.1	17.2	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	63.5	31.9	32.0	29.9	58.7	34.2	35.9	47.0		49.1	54.7	
Level of Service (LOS)	E	C	C	C	E	C	D	D		D	D	
Approach Delay, s/veh / LOS	42.7	D		47.5	D		43.9	D		52.1	D	
Intersection Delay, s/veh / LOS	47.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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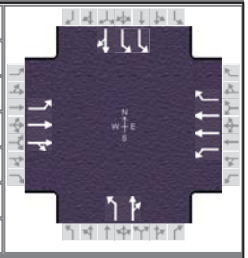
Appendix G
No Build Capacity Analysis Worksheets with Improvements - 2021

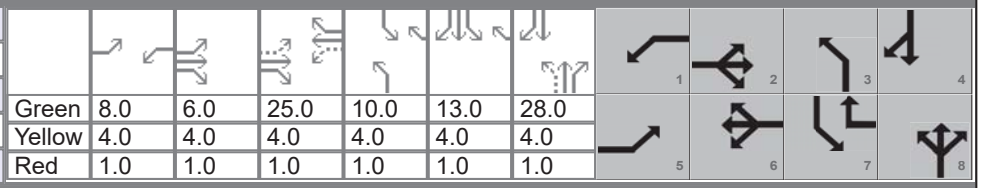
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	AM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	AM Peak NB_Improved.xus		
Project Description	Year 2021 - No-Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	160	480	30	50	340	270	100	130	50	590	100	200

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	6.0	25.0	10.0	13.0	28.0
Yellow	4.0	4.0	4.0	4.0	4.0	4.0
Red	1.0	1.0	1.0	1.0	1.0	1.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	24.0	41.0	13.0	30.0	15.0	33.0	33.0	51.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	10.3	17.4	4.8	13.3	7.4	13.5	23.1	20.1
Green Extension Time (g_e), s	0.2	0.6	0.0	2.1	0.0	1.0	0.9	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	1.00	0.89	0.06	1.00	0.00	0.38	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	174	280	275	54	370	196	109	196		641	326	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1773	1739	1738	1547	1767	1767		1716	1657	
Queue Service Time (g_s), s	8.3	15.3	15.4	2.8	11.3	9.7	5.4	11.5		21.1	18.1	
Cycle Queue Clearance Time (g_c), s	8.3	15.3	15.4	2.8	11.3	9.7	5.4	11.5		21.1	18.1	
Green Ratio (*g/C*)	0.38	0.30	0.30	0.28	0.21	0.44	0.32	0.23		0.23	0.38	
Capacity (*c*), veh/h	445	543	532	305	724	683	432	412		801	635	
Volume-to-Capacity Ratio (*X*)	0.391	0.515	0.517	0.178	0.510	0.286	0.251	0.474		0.801	0.513	
Back of Queue (*Q*), ft/ln (85 th percentile)	139.1	247.7	233	55.6	185.2	141	98.8	186.6		323.6	254.2	
Back of Queue (*Q*), veh/ln (85 th percentile)	5.3	9.5	9.3	2.1	7.1	5.4	3.9	7.3		12.6	9.9	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.28	0.00	0.00	0.20	0.00	0.26	0.44	0.00		0.59	0.00	
Uniform Delay (d_1), s/veh	26.3	34.8	34.8	32.7	42.1	21.4	29.9	39.7		43.4	28.4	
Incremental Delay (d_2), s/veh	0.2	0.4	0.4	0.1	0.3	0.1	0.1	0.3		5.4	0.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	26.5	35.1	35.2	32.8	42.3	21.5	30.0	40.0		48.8	28.7	
Level of Service (LOS)	C	D	D	C	D	C	C	D		D	C	
Approach Delay, s/veh / LOS	33.1	C		34.9	C		36.4	D		42.0	D	
Intersection Delay, s/veh / LOS	37.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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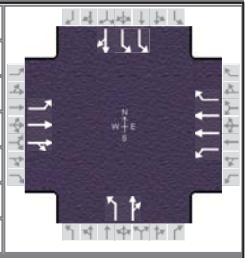
HCS7 Signalized Intersection Results Summary

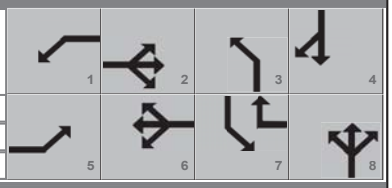
General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	PM Peak NB_Improved.xus		
Project Description	Year 2021 - No-Build - Improvements				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	270	450	70	90	650	650	100	220	40	410	160	310

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	13.0	3.0	33.0	8.0	11.0	27.0	
Yellow	4.0	0.0	4.0	4.0	4.0	4.0	
Red	1.0	0.0	1.0	1.0	1.0	1.0	



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	21.0	41.0	18.0	38.0	13.0	32.0	29.0	48.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	16.6	18.1	6.4	29.3	7.6	19.3	16.3	36.3
Green Extension Time (g_e), s	0.0	1.1	0.1	1.8	0.0	0.2	0.7	1.2
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	0.01	0.90	1.00	1.00	0.04	0.24

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	293	288	277	98	707	467	109	283		446	511	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1726	1739	1738	1547	1767	1806		1716	1659	
Queue Service Time (g_s), s	14.6	15.9	16.1	4.4	22.2	27.3	5.6	17.3		14.3	34.3	
Cycle Queue Clearance Time (g_c), s	14.6	15.9	16.1	4.4	22.2	27.3	5.6	17.3		14.3	34.3	
Green Ratio (*g/C*)	0.41	0.30	0.30	0.38	0.28	0.48	0.29	0.22		0.20	0.36	
Capacity (*c*), veh/h	355	543	518	372	956	735	227	406		686	594	
Volume-to-Capacity Ratio (*X*)	0.827	0.531	0.535	0.263	0.739	0.636	0.478	0.696		0.649	0.860	
Back of Queue (*Q*), ft/ln (85 th percentile)	263	255.8	236.6	83.7	336.2	343.1	102.9	283.2		224.7	498.7	
Back of Queue (*Q*), veh/ln (85 th percentile)	10.0	9.8	9.5	3.2	12.9	13.2	4.0	11.1		8.8	19.5	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.53	0.00	0.00	0.30	0.00	0.62	0.46	0.00		0.41	0.00	
Uniform Delay (d_1), s/veh	28.7	35.0	35.0	25.3	39.6	23.7	34.0	42.7		44.1	35.7	
Incremental Delay (d_2), s/veh	14.1	0.5	0.6	0.1	2.7	1.4	0.6	4.3		1.7	11.6	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	42.7	35.5	35.6	25.4	42.3	25.1	34.6	47.0		45.8	47.3	
Level of Service (LOS)	D	D	D	C	D	C	C	D		D	D	
Approach Delay, s/veh / LOS	38.0	D		34.7	C		43.6	D		46.6	D	
Intersection Delay, s/veh / LOS	39.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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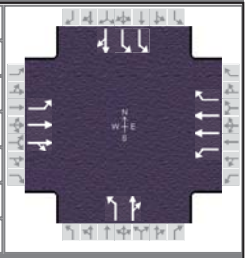
Appendix H
No Build Capacity Analysis Worksheets - 2031

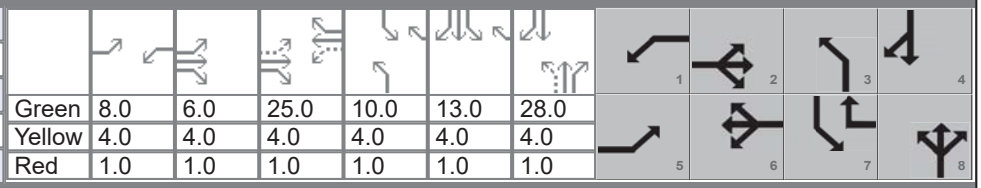
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	AM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	AM Peak NB.xus		
Project Description	Year 2031 - No-Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	170	520	30	60	370	290	100	150	50	640	101	220

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	6.0	25.0	10.0	13.0	28.0						
Yellow	4.0	4.0	4.0	4.0	4.0	4.0						
Red	1.0	1.0	1.0	1.0	1.0	1.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	24.0	41.0	13.0	30.0	15.0	33.0	33.0	51.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	10.9	18.8	5.4	14.4	7.4	14.8	25.4	21.8
Green Extension Time (g_e), s	0.2	0.1	0.0	2.2	0.0	1.0	0.6	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	1.00	1.00	0.11	1.00	0.01	1.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	185	301	296	65	402	217	109	217		696	349	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1776	1739	1738	1547	1767	1776		1716	1652	
Queue Service Time (g_s), s	8.9	16.8	16.8	3.4	12.4	11.0	5.4	12.8		23.4	19.8	
Cycle Queue Clearance Time (g_c), s	8.9	16.8	16.8	3.4	12.4	11.0	5.4	12.8		23.4	19.8	
Green Ratio (*g/C*)	0.38	0.30	0.30	0.28	0.21	0.44	0.32	0.23		0.23	0.38	
Capacity (*c*), veh/h	433	543	533	290	724	683	413	414		801	633	
Volume-to-Capacity Ratio (*X*)	0.427	0.555	0.556	0.225	0.555	0.318	0.263	0.525		0.869	0.551	
Back of Queue (*Q*), ft/ln (85 th percentile)	147.1	268.9	253.3	67.2	201.5	156	98.8	207.1		365.9	275	
Back of Queue (*Q*), veh/ln (85 th percentile)	5.6	10.3	10.1	2.6	7.8	6.0	3.9	8.1		14.3	10.7	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.29	0.00	0.00	0.24	0.00	0.28	0.44	0.00		0.67	0.00	
Uniform Delay (d_1), s/veh	26.6	35.3	35.3	33.0	42.5	21.8	29.9	40.2		44.2	28.9	
Incremental Delay (d_2), s/veh	0.2	0.7	0.8	0.1	0.6	0.1	0.1	0.6		9.7	0.6	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	26.9	36.0	36.1	33.2	43.1	21.9	30.0	40.8		53.9	29.5	
Level of Service (LOS)	C	D	D	C	D	C	C	D		D	C	
Approach Delay, s/veh / LOS	33.9	C		35.4	D		37.2	D		45.8	D	
Intersection Delay, s/veh / LOS	39.0						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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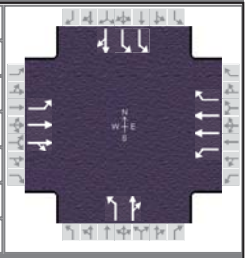
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2031	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	PM Peak NB.xus		
Project Description	Year 2031 - No-Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	290	490	80	100	700	710	110	240	50	440	170	330

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	13.0	31.0	7.0	11.0	28.0	0.0	1	2	3	4		
Yellow	4.0	4.0	4.0	4.0	4.0	0.0	5	6	7	8		
Red	1.0	1.0	1.0	1.0	1.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	23.0	41.0	18.0	36.0	12.0	33.0	28.0	49.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	17.4	19.9	7.1	33.0	8.2	21.5	17.7	39.0
Green Extension Time (g_e), s	0.0	0.0	0.1	0.0	0.0	0.0	0.6	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	0.03	1.00	1.00	1.00	0.22	0.52

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	315	317	303	109	761	511	120	315		478	543	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1722	1739	1738	1547	1767	1800		1716	1659	
Queue Service Time (g_s), s	15.4	17.8	17.9	5.1	24.9	31.0	6.2	19.5		15.7	37.0	
Cycle Queue Clearance Time (g_c), s	15.4	17.8	17.9	5.1	24.9	31.0	6.2	19.5		15.7	37.0	
Green Ratio (*g/C*)	0.42	0.30	0.30	0.37	0.26	0.45	0.29	0.23		0.19	0.37	
Capacity (*c*), veh/h	353	543	517	353	898	696	198	420		658	608	
Volume-to-Capacity Ratio (*X*)	0.892	0.583	0.586	0.308	0.847	0.734	0.603	0.751		0.727	0.894	
Back of Queue (*Q*), ft/ln (85 th percentile)	299.7	284.4	261.9	93.8	388.2	414.4	117	320.8		247.8	548	
Back of Queue (*Q*), veh/ln (85 th percentile)	11.4	10.9	10.5	3.6	14.9	15.9	4.6	12.5		9.7	21.4	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.60	0.00	0.00	0.34	0.00	0.75	0.52	0.00		0.45	0.00	
Uniform Delay (d_1), s/veh	28.5	35.6	35.7	26.8	42.3	27.1	34.9	42.8		45.6	35.8	
Incremental Delay (d_2), s/veh	23.0	1.1	1.2	0.2	7.2	3.5	3.6	6.6		3.5	15.2	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	51.5	36.7	36.9	26.9	49.5	30.6	38.5	49.4		49.1	51.0	
Level of Service (LOS)	D	D	D	C	D	C	D	D		D	D	
Approach Delay, s/veh / LOS	41.7	D		40.7	D		46.4	D		50.1	D	
Intersection Delay, s/veh / LOS	44.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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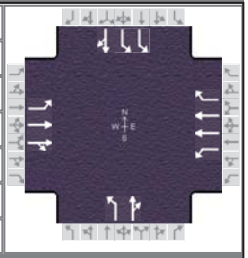
Appendix I
Build Capacity Analysis Worksheets - 2021

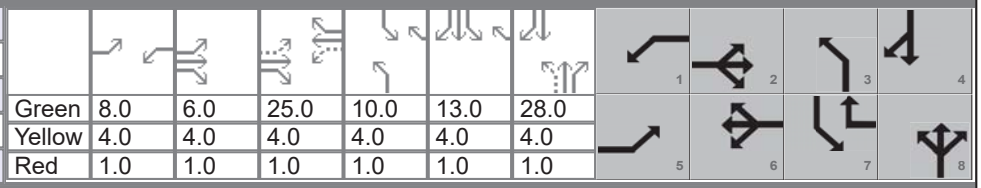
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	AM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	AM Peak Build.xus		
Project Description	Year 2021 - Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	160	466	58	78	326	270	125	141	103	273	134	200

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	6.0	25.0	10.0	13.0	28.0						
Yellow	4.0	4.0	4.0	4.0	4.0	4.0						
Red	1.0	1.0	1.0	1.0	1.0	1.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	24.0	41.0	13.0	30.0	15.0	33.0	33.0	51.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	10.3	18.1	6.5	12.8	8.8	18.7	10.7	22.5
Green Extension Time (g_e), s	0.2	0.3	0.0	2.1	0.0	1.0	0.6	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	1.00	1.00	0.05	1.00	0.05	0.00	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	174	289	280	85	354	196	136	265		297	363	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1741	1739	1738	1547	1767	1725		1716	1675	
Queue Service Time (g_s), s	8.3	16.0	16.1	4.5	10.8	9.7	6.8	16.7		8.7	20.5	
Cycle Queue Clearance Time (g_c), s	8.3	16.0	16.1	4.5	10.8	9.7	6.8	16.7		8.7	20.5	
Green Ratio (*g/C*)	0.38	0.30	0.30	0.28	0.21	0.44	0.32	0.23		0.23	0.38	
Capacity (*c*), veh/h	451	543	522	298	724	683	405	402		801	642	
Volume-to-Capacity Ratio (*X*)	0.386	0.533	0.536	0.284	0.489	0.286	0.335	0.659		0.371	0.565	
Back of Queue (*Q*), ft/ln (85 th percentile)	139.1	257.1	238.9	86.2	177.9	141	119.8	261.3		144.5	287	
Back of Queue (*Q*), veh/ln (85 th percentile)	5.3	9.8	9.6	3.3	6.8	5.4	4.7	10.2		5.6	11.2	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.28	0.00	0.00	0.31	0.00	0.26	0.53	0.00		0.26	0.00	
Uniform Delay (d_1), s/veh	26.2	35.0	35.0	33.4	41.9	21.4	30.4	41.7		38.6	29.1	
Incremental Delay (d_2), s/veh	0.2	0.5	0.6	0.2	0.2	0.1	0.2	3.2		0.1	0.7	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	26.4	35.5	35.6	33.6	42.1	21.5	30.6	44.8		38.7	29.9	
Level of Service (LOS)	C	D	D	C	D	C	C	D		D	C	
Approach Delay, s/veh / LOS	33.4	C		34.6	C		40.0	D		33.8	C	
Intersection Delay, s/veh / LOS	34.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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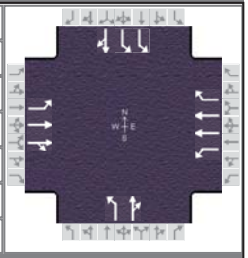
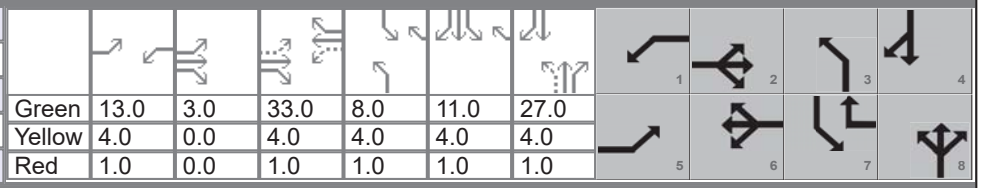
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	PM Peak NB.xus		
Project Description	Year 2021 - Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	270	445	81	106	640	650	116	226	62	404	175	310

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	13.0	3.0	33.0	8.0	11.0	27.0	
Yellow	4.0	0.0	4.0	4.0	4.0	4.0	
Red	1.0	0.0	1.0	1.0	1.0	1.0	

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	21.0	41.0	18.0	38.0	13.0	32.0	29.0	48.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	16.6	18.4	7.3	29.3	8.5	21.8	16.1	37.7
Green Extension Time (g_e), s	0.0	0.9	0.1	1.8	0.0	0.0	0.7	1.1
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	0.04	0.90	1.00	1.00	0.03	0.45

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	293	292	279	115	696	467	126	313		439	527	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1714	1739	1738	1547	1767	1786		1716	1664	
Queue Service Time (g_s), s	14.6	16.2	16.4	5.3	21.8	27.3	6.5	19.8		14.1	35.7	
Cycle Queue Clearance Time (g_c), s	14.6	16.2	16.4	5.3	21.8	27.3	6.5	19.8		14.1	35.7	
Green Ratio (*g/C*)	0.41	0.30	0.30	0.38	0.28	0.48	0.29	0.22		0.20	0.36	
Capacity (*c*), veh/h	358	543	514	369	956	735	216	402		686	596	
Volume-to-Capacity Ratio (*X*)	0.820	0.538	0.543	0.312	0.728	0.636	0.583	0.779		0.640	0.884	
Back of Queue (*Q*), ft/ln (85 th percentile)	260.6	260.1	239.1	96	329.6	343.1	120.9	328.1		221.2	529.4	
Back of Queue (*Q*), veh/ln (85 th percentile)	9.9	9.9	9.6	3.7	12.7	13.2	4.7	12.8		8.6	20.7	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.52	0.00	0.00	0.35	0.00	0.62	0.54	0.00		0.40	0.00	
Uniform Delay (d_1), s/veh	28.5	35.1	35.1	25.6	39.4	23.7	34.7	43.7		44.0	36.2	
Incremental Delay (d_2), s/veh	13.2	0.6	0.7	0.2	2.5	1.4	2.7	8.6		1.6	14.2	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	41.7	35.6	35.8	25.8	41.9	25.1	37.4	52.3		45.6	50.4	
Level of Service (LOS)	D	D	D	C	D	C	D	D		D	D	
Approach Delay, s/veh / LOS	37.8	D		34.3	C		48.0	D		48.2	D	
Intersection Delay, s/veh / LOS	40.6						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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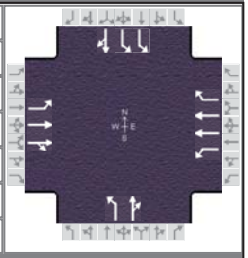
Appendix J
Build Capacity Analysis Worksheets - 2031

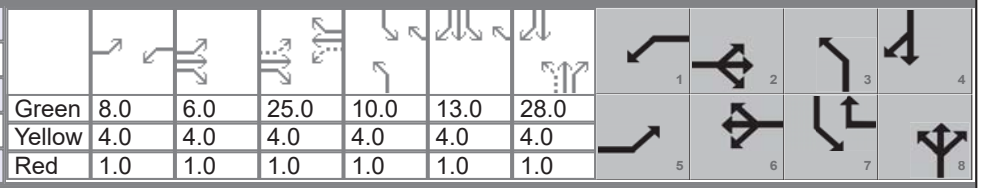
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	AM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2021	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	AM Peak NB.xus		
Project Description	Year 2031 - Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	170	506	58	88	356	290	125	146	103	623	144	220

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	8.0	6.0	25.0	10.0	13.0	28.0						
Yellow	4.0	4.0	4.0	4.0	4.0	4.0						
Red	1.0	1.0	1.0	1.0	1.0	1.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	24.0	41.0	13.0	30.0	15.0	33.0	33.0	51.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	10.9	19.5	7.1	13.9	8.8	19.1	24.6	24.9
Green Extension Time (g_e), s	0.2	0.0	0.0	2.3	0.0	1.1	0.7	0.0
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.01	1.00	1.00	0.10	1.00	0.07	0.87	1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	185	311	302	96	387	217	136	271		677	396	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1745	1739	1738	1547	1767	1727		1716	1673	
Queue Service Time (g_s), s	8.9	17.4	17.5	5.1	11.9	11.0	6.8	17.1		22.6	22.9	
Cycle Queue Clearance Time (g_c), s	8.9	17.4	17.5	5.1	11.9	11.0	6.8	17.1		22.6	22.9	
Green Ratio (*g/C*)	0.38	0.30	0.30	0.28	0.21	0.44	0.32	0.23		0.23	0.38	
Capacity (*c*), veh/h	438	543	524	284	724	683	379	403		801	641	
Volume-to-Capacity Ratio (*X*)	0.421	0.573	0.576	0.337	0.534	0.318	0.358	0.672		0.846	0.617	
Back of Queue (*Q*), ft/ln (85 th percentile)	147.1	279.1	259.6	95.5	193.8	156	119.9	267.9		350.4	318.7	
Back of Queue (*Q*), veh/ln (85 th percentile)	5.6	10.7	10.4	3.7	7.5	6.0	4.7	10.5		13.7	12.4	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.29	0.00	0.00	0.35	0.00	0.28	0.53	0.00		0.64	0.00	
Uniform Delay (d_1), s/veh	26.5	35.5	35.5	33.7	42.3	21.8	30.6	41.8		43.9	29.9	
Incremental Delay (d_2), s/veh	0.2	1.0	1.0	0.3	0.4	0.1	0.2	3.5		7.9	1.3	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	26.8	36.5	36.6	34.0	42.7	21.9	30.8	45.4		51.9	31.2	
Level of Service (LOS)	C	D	D	C	D	C	C	D		D	C	
Approach Delay, s/veh / LOS	34.3	C		35.0	D		40.5	D		44.2	D	
Intersection Delay, s/veh / LOS	38.9						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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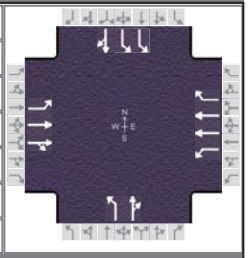
HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TMS Engineers, Inc.			Duration, h	0.250
Analyst	AJP	Analysis Date	10/20/2020	Area Type	Other
Jurisdiction	North Ridgeville	Time Period	PM Peak	PHF	0.92
Urban Street	Lorain Road	Analysis Year	2031	Analysis Period	1> 7:00
Intersection	Lorain Road & Lear Nag…	File Name	PM Peak Build.xus		
Project Description	Year 2031 - Build				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	290	485	91	116	690	710	126	246	72	434	185	330

Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	13.0	31.0	7.0	10.0	29.0	0.0	1	2	3	4		
Yellow	4.0	4.0	4.0	4.0	4.0	0.0	5	6	7	8		
Red	1.0	1.0	1.0	1.0	1.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	3.0	1.1	4.0	2.0	4.0
Phase Duration, s	23.0	41.0	18.0	36.0	12.0	34.0	27.0	49.0
Change Period, ($Y+R_c$), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Allow Headway (*MAH*), s	3.1	3.1	3.1	3.1	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	17.4	20.2	7.9	33.0	9.0	23.9	17.6	40.5
Green Extension Time (g_e), s	0.0	0.0	0.1	0.0	0.0	0.0	0.6	0.9
Phase Call Probability	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Out Probability	1.00	1.00	0.09	1.00	1.00	1.00	0.41	0.91

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	315	321	305	126	750	511	137	346		472	560	
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1725	1811	1711	1739	1738	1547	1767	1783		1716	1664	
Queue Service Time (g_s), s	15.4	18.1	18.2	5.9	24.5	31.0	7.0	21.9		15.6	38.5	
Cycle Queue Clearance Time (g_c), s	15.4	18.1	18.2	5.9	24.5	31.0	7.0	21.9		15.6	38.5	
Green Ratio (*g/C*)	0.42	0.30	0.30	0.37	0.26	0.44	0.30	0.24		0.18	0.37	
Capacity (*c*), veh/h	356	543	513	351	898	683	187	431		629	610	
Volume-to-Capacity Ratio (*X*)	0.885	0.590	0.595	0.359	0.835	0.748	0.731	0.802		0.750	0.918	
Back of Queue (*Q*), ft/ln (85 th percentile)	296.1	288.6	264.8	106.5	380	423.2	143.4	360.4		249	583.1	
Back of Queue (*Q*), veh/ln (85 th percentile)	11.3	11.0	10.6	4.1	14.6	16.3	5.6	14.1		9.7	22.8	
Queue Storage Ratio (*RQ*) (85 th percentile)	0.59	0.00	0.00	0.39	0.00	0.77	0.64	0.00		0.45	0.00	
Uniform Delay (d_1), s/veh	28.4	35.7	35.8	27.1	42.1	27.9	35.2	42.8		46.4	36.3	
Incremental Delay (d_2), s/veh	21.6	1.2	1.3	0.2	6.5	4.0	12.0	9.7		4.5	18.6	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (*d*), s/veh	50.0	36.9	37.1	27.3	48.6	32.0	47.2	52.5		50.8	54.9	
Level of Service (LOS)	D	D	D	C	D	C	D	D		D	D	
Approach Delay, s/veh / LOS	41.4	D		40.5	D		51.0	D		53.0	D	
Intersection Delay, s/veh / LOS	45.4						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS								
Bicycle LOS Score / LOS								

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Appendix K
Build Driveway Capacity Analysis Worksheets - 2021

HCS7 Two-Way Stop-Control Report

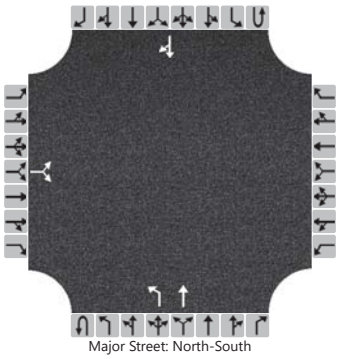
General Information

Analyst	AJP
Agency/Co.	TMS Engineers, Inc.
Date Performed	10/20/2020
Analysis Year	2021
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Build

Site Information

Intersection	Cook Road & Site Drive
Jurisdiction	North Ridgeville
East/West Street	Site Drive
North/South Street	Cook Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		94		3						11	275				180	90
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			105							12						
Capacity, c (veh/h)			486							1268						
v/c Ratio			0.22							0.01						
95% Queue Length, Q_{95} (veh)			0.8							0.0						
Control Delay (s/veh)			14.4							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		14.4								0.3						
Approach LOS		B														

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HCS7 Two-Way Stop-Control Report

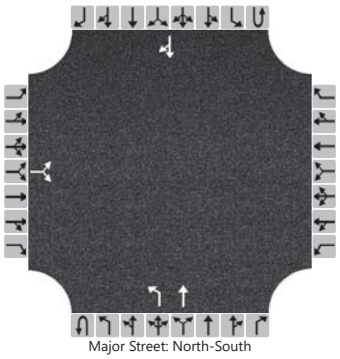
General Information

Analyst	AJP
Agency/Co.	TMS Engineers, Inc.
Date Performed	10/20/2020
Analysis Year	2021
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Build

Site Information

Intersection	Cook Road & Site Drive
Jurisdiction	North Ridgeville
East/West Street	Site Drive
North/South Street	Cook Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		47		2						6	357				320	42
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			53							7						
Capacity, c (veh/h)			373							1165						
v/c Ratio			0.14							0.01						
95% Queue Length, Q_{95} (veh)			0.5							0.0						
Control Delay (s/veh)			16.3							8.1						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)		16.3								0.1						
Approach LOS		C														

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Appendix L
Build Driveway Capacity Analysis Worksheets - 2031

HCS7 Two-Way Stop-Control Report

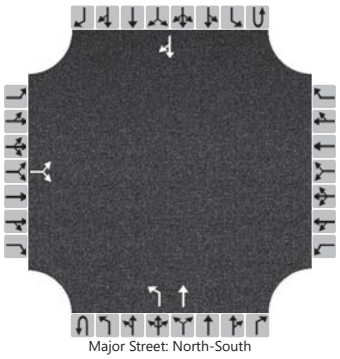
General Information

Analyst	AJP
Agency/Co.	TMS Engineers, Inc.
Date Performed	10/20/2020
Analysis Year	2031
Time Analyzed	AM Peak
Intersection Orientation	North-South
Project Description	Build

Site Information

Intersection	Cook Road & Site Drive
Jurisdiction	North Ridgeville
East/West Street	Site Drive
North/South Street	Cook Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		94		3						11	295				190	90
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			105							12						
Capacity, c (veh/h)			465							1256						
v/c Ratio			0.23							0.01						
95% Queue Length, Q_{95} (veh)			0.9							0.0						
Control Delay (s/veh)			15.0							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		15.0								0.3						
Approach LOS		B														

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HCS7 Two-Way Stop-Control Report

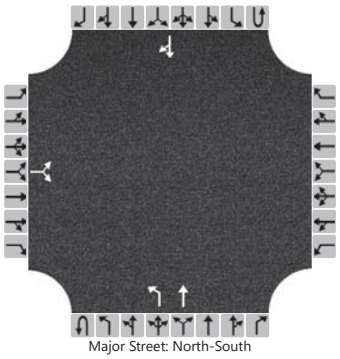
General Information

Analyst	AJP
Agency/Co.	TMS Engineers, Inc.
Date Performed	10/20/2020
Analysis Year	2031
Time Analyzed	PM Peak
Intersection Orientation	North-South
Project Description	Build

Site Information

Intersection	Cook Road & Site Drive
Jurisdiction	North Ridgeville
East/West Street	Site Drive
North/South Street	Cook Road
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	1	1	0	0	0	1	0
Configuration			LR							L	T					TR
Volume (veh/h)		47		2						6	387				350	42
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			53							7						
Capacity, c (veh/h)			342							1133						
v/c Ratio			0.16							0.01						
95% Queue Length, Q_{95} (veh)			0.5							0.0						
Control Delay (s/veh)			17.5							8.2						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)		17.5								0.1						
Approach LOS		C														

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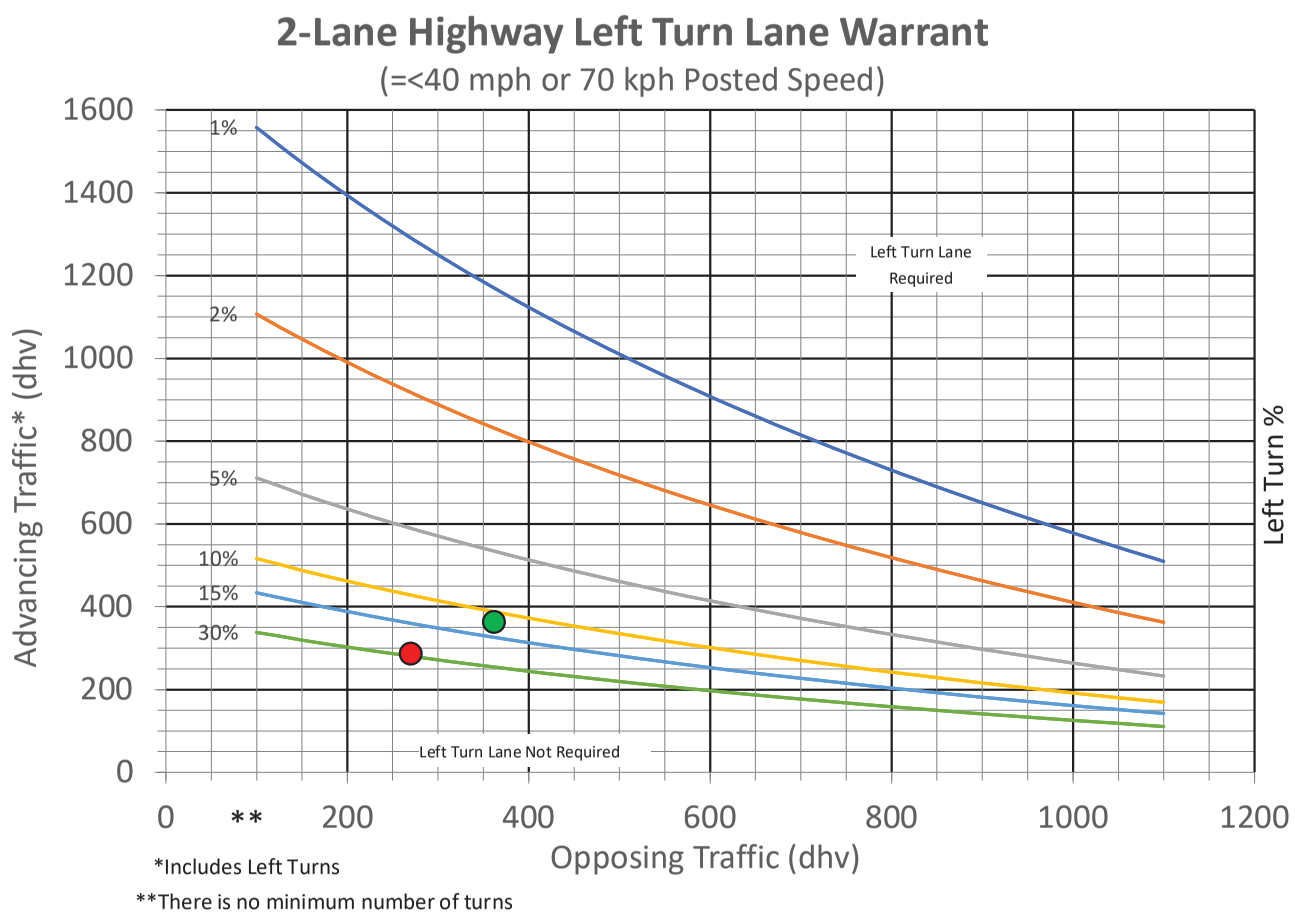
Appendix M
Turn Lane Warrant Analysis

Cook Road & Site Drive

2021 BUILD **WARRANT IS NOT MET**



*Includes Left Turns

**There is no minimum number of turns

TIME	NORTHBOUND		SOUTHBOUND		ADVANCING	OPPOSING	LT%	WARRANT?
	LEFT	THRU	THRU	RIGHT				
AM	11	275	180	90	286	270	3.8%	NO
PM	6	357	320	42	363	362	1.7%	NO

2-LANE LEFT TURN LANE WARRANT (LOW SPEED)

401-5aM

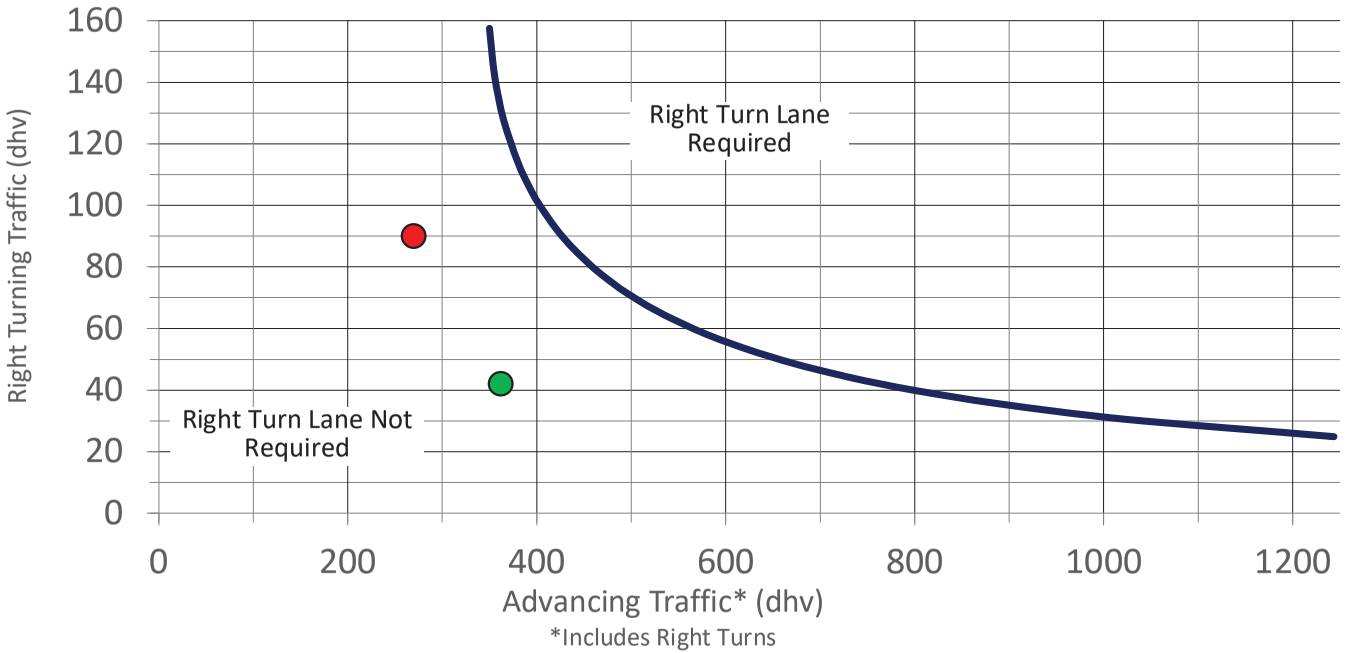
REFERENCE SECTION 401.6.1

Cook Road & Site Drive

2021 BUILD **WARRANT IS NOT MET**

2-Lane Highway Right Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



*Includes Right Turns

TIME	SOUTHBOUND			WARRANT?
	THRU	5	ADVANCING	
AM	180	90	270	NO
PM	320	42	362	NO

10	160	240	2
21	360	270	5

2-LANE RIGHT TURN LANE WARRANT (LOW SPEED)

401-6aM

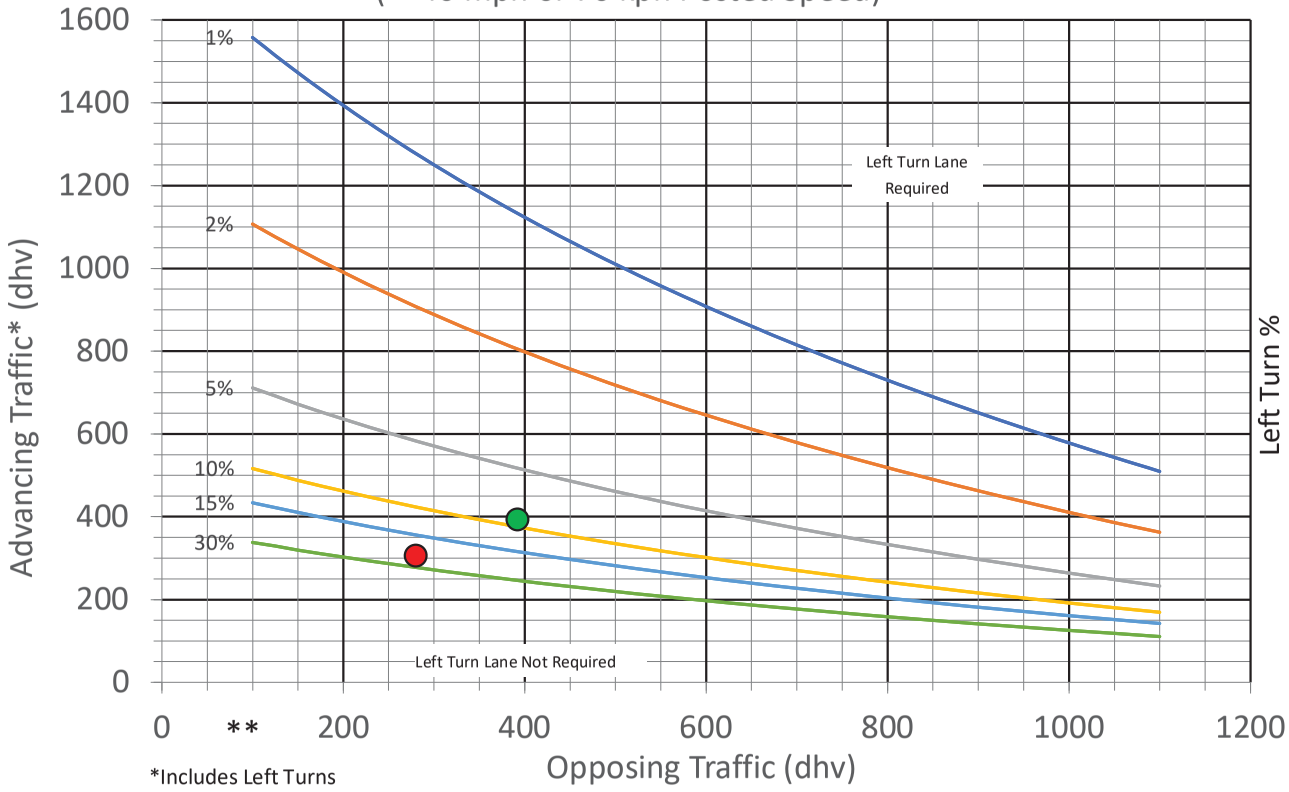
REFERENCE SECTION 401.6.3

Cook Road & Site Drive

2031 BUILD **WARRANT IS NOT MET**

2-Lane Highway Left Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



*Includes Left Turns

**There is no minimum number of turns

TIME	NORTHBOUND		SOUTHBOUND		ADVANCING	OPPOSING	LT%	WARRANT?
	LEFT	THRU	THRU	RIGHT				
AM	11	295	190	90	306	280	3.6%	NO
PM	6	387	350	42	393	392	1.5%	NO

2-LANE LEFT TURN LANE WARRANT (LOW SPEED)

401-5aM

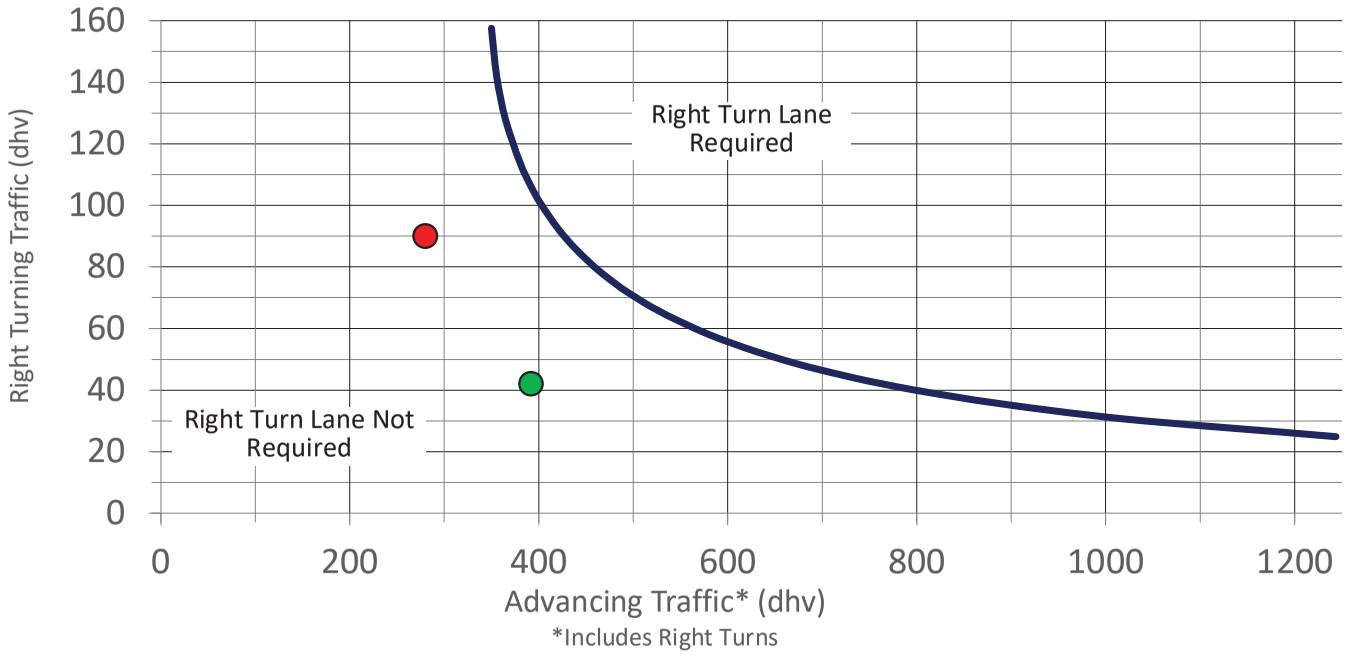
REFERENCE SECTION 401.6.1

Cook Road & Site Drive

2031 BUILD WARRANT IS NOT MET

2-Lane Highway Right Turn Lane Warrant

(=<40 mph or 70 kph Posted Speed)



*Includes Right Turns

TIME	SOUTHBOUND			WARRANT?
	THRU	5	ADVANCING	
AM	190	90	280	NO
PM	350	42	392	NO

10	160	240	2
21	360	270	5

2-LANE RIGHT TURN LANE WARRANT (LOW SPEED)

401-6aM

REFERENCE SECTION 401.6.3

Appendix N
Drive-Thru Queue Generation Report

COUNTINGcars.com

Drive-Through Queue Generation

Mike Spack, PE, PTOE, Max Moreland, EIT, Lindsay de Leeuw, Nate Hood

1.0 Introduction

This report provides queuing data for businesses with drive-through services. It is intended to be an aid for site designers and reviewers, similar to the Institute of Transportation Engineers' *Trip Generation* and *Parking Generation* reports. The data presentation is modeled on the *Parking Generation* report and data is provided based on at least six sites, similar to data sets marked as statistically significant in *Trip Generation*.

Businesses with drive-through lanes are very common in the United States and having data that gives usage information for drive-through lanes will assist designers as well as cities in determining the appropriate amount of storage needed for proposed drive-through businesses. Data for drive-through queues was published by the ITE Technical Council Committee 5D-10 in 1995 based on information collected between the late 1960's and the 1990's. A paper was also published in 2009 by Mark Stuecheli, PTP giving updated information for bank and coffee shop drive-through lanes. The results from the 2009 study are incorporated into this paper (thank you Mark for your assistance).

2.0 Data Collection

Data was collected using COUNTcam video recording systems at a total of 30 drive-through locations in Minneapolis, MN and several surrounding suburbs between 2010 and 2012 (26 of the 30 videos were recorded in February of 2012, which should represent peak usage in the cold Minnesota winter). Videos of drive-through lanes were collected at banks, car washes, coffee shops, fast food restaurants and pharmacies. A total of six locations were selected for each of the five different land uses. Each location was recorded for between one and five days where the majority of locations were recorded for two consecutive days. The days of the week that each video was recorded on varies.

The 24-hour videos were watched at high speeds with the PC-TAS counting software and maximum queues throughout the day were noted. Most of the COUNTcams were set up such that the entire queue lane could be seen, but at a few locations the drive-through lanes wrapped around the building in a way that the entire queue length would not be able to be seen. For these situations, the COUNTcams were set up so that the ordering window and back of the queue could be seen and it was noted how many vehicles could fit between the ordering window and the front of the queue. For drive-through locations with multiple lanes, the number of lanes was noted but the maximum queue is defined as the sum of the queues at each lane for any given point in time, not the queue per lane. This approach provides overall demand, which may assist designers in determining how many drive through lanes are appropriate in addition to determining how long they should be.

Once the maximum queue for each day at each location was determined, the data was compiled and statistics for each land use were calculated. The average maximum queue, standard deviation, coefficient of variation, range, 85th percentile and 33rd percentile were calculated for each land use.

Data for drive-through coffee shops and banks from the Kansas City, Kansas metropolitan area was published in the 2009 paper New Drive-Through Stacking Information for Banks and Coffee Shops by Mark Stuecheli. This data is included in the analysis.

3.0 Data Analysis

Based on the peak queue lengths, it is apparent that each land use will require a different minimum drive through stacking distance. The results for each land use can be found below. The peak queue lengths for each location, broken down by land use and day of the week, can be found in the Appendix.

3.1 Banks

Data collection was done at six banks with drive-through services (including one credit union) in August 2011 and February 2012. Twelve days of data were collected. The banks were located in the cities of Minneapolis, Robbinsdale and St. Louis Park, MN.

All of the locations had a lane with a drive-through ATM and at least two other lanes. Though service times may differ for ATM lanes compared to the regular lanes, the maximum queues were counted together. This is because based upon what was observed, vehicles would occasionally switch the lane they were in. For example, a vehicle waiting in the ATM line with a queue of three vehicles may move over to a regular line with a queue of only one vehicle. Much of what can be done at the bank's drive-through lane can also be accomplished at that bank's ATM and vice versa. Vehicles being served were counted as being in the queue.

Nine days of data from the Kansas City, Kansas area is also included. This data does not factor in vehicles in ATM lanes.

Table 3.1 – Drive-Through Bank Maximum Queue Statistics

	Minnesota Data	Minnesota + Kansas Data
Number of Data Points	12	21
Average Maximum Queue (Vehicles)	5.83	5.76
Standard Deviation (Vehicles)	1.85	2.21
Coefficient of Variation	32%	38%
Range (Vehicles)	3 to 8	1 to 10
85th Percentile (Vehicles)	8.00	8.00
33rd Percentile (Vehicles)	5.00	5.00

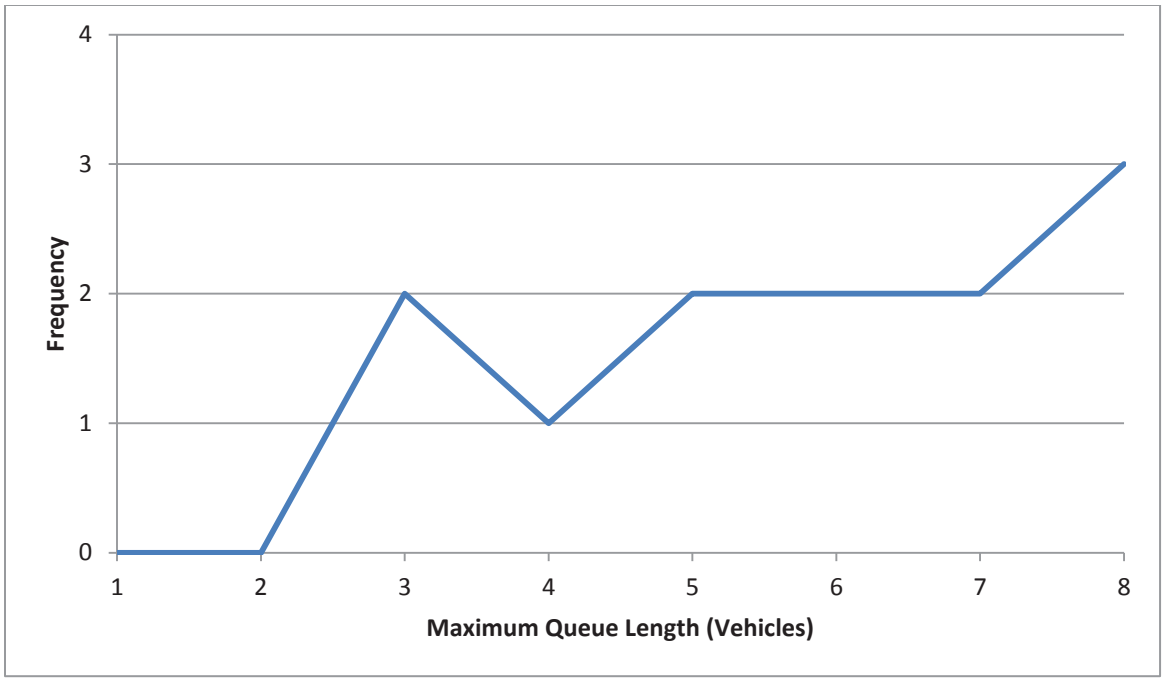


Figure 3.1.1 – Drive-Through Bank Maximum Queue Frequency – Minnesota Data

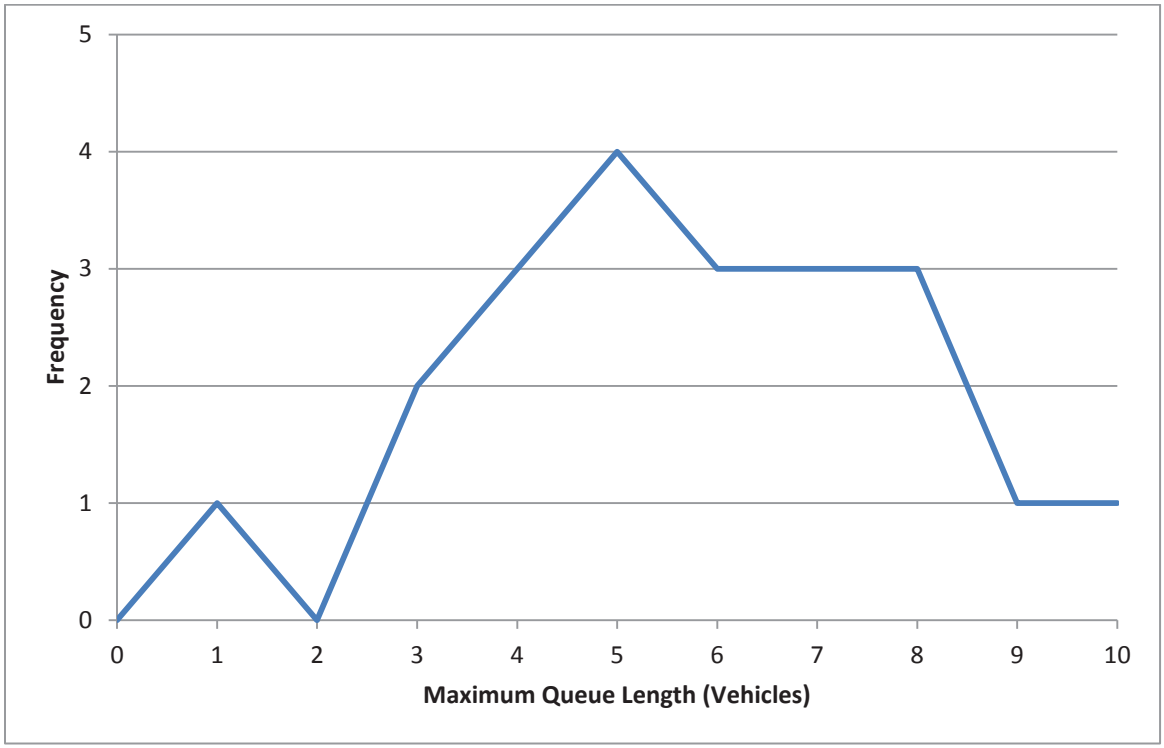


Figure 3.1.2 – Drive-Through Bank Maximum Queue Frequency – Minnesota + Kansas Data

The data for Kansas banks was collected between 4:30pm and 6:00pm. While many of the maximum queues for the data collected in Minnesota were between these times, maximum queues occurred between 8:30am and 5:30pm so it is possible that some of the Kansas data does not capture the actual maximum queues for the day.

The number of available lanes at banks, not including the ATM lane, ranged from two to seven lanes (though the most open at one time was five lanes). Even though plenty of lanes were available, cars often stacked at the lane closest to the building, thus additional lanes may not result in shorter queues. With an 85th percentile maximum queue of eight vehicles, the data suggests that banks with drive-through lanes should be able to accommodate 160 feet of vehicle stacking.

3.2 Car Washes

Data collection was done at six car washes with drive-through services (including one full-service car wash) in February 2012. Twelve days of data were collected. The car washes were located in the cities of Falcon Heights, Hopkins, Minneapolis, Roseville and St. Louis Park, MN. Five of the six car washes (excluding the full-service car wash) were located at gas stations. Only the vehicles waiting in line were counted; vehicles being washed were not added to the queue.

Table 3.2 – Drive-Through Car Wash Maximum Queue Statistics

Number of Data Points	**12**
Average Maximum Queue (Vehicles)	**4.42**
Standard Deviation (Vehicles)	**2.31**
Coefficient of Variation	**52%**
Range (Vehicles)	**1 to 10**
85th Percentile (Vehicles)	**6.20**
33rd Percentile (Vehicles)	**3.00**

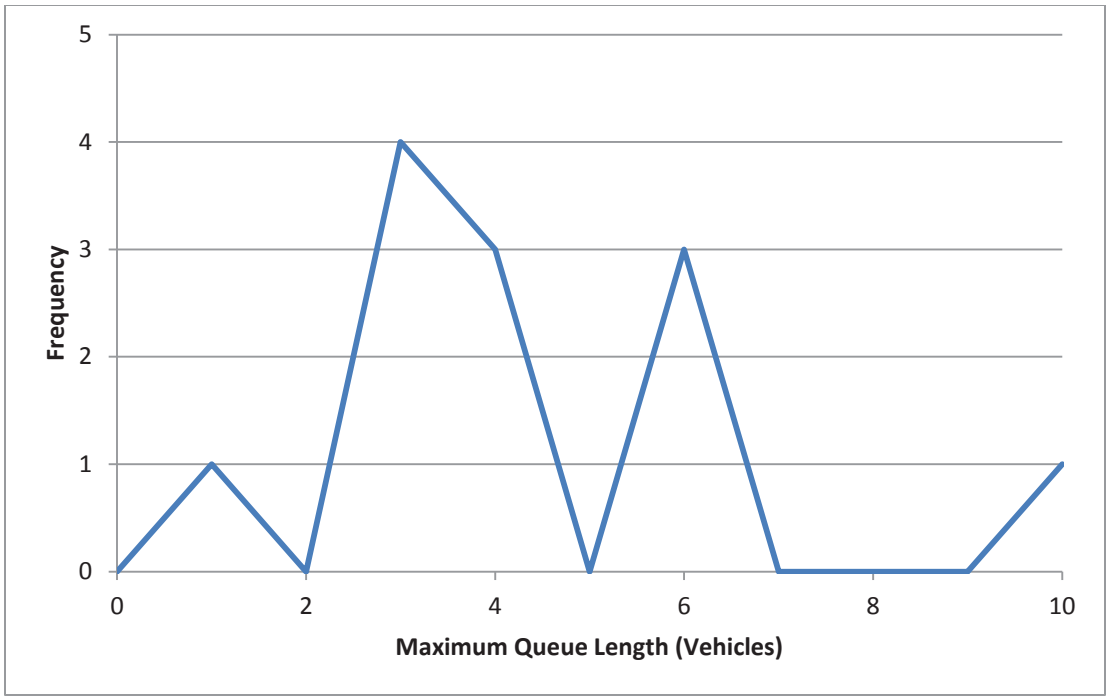


Figure 3.2 – Drive-Through Car Wash Maximum Queue Frequency

Two of the car washes had two lanes while the other four were one lane car washes. The full-service car wash had two lanes and also produced the highest maximum queue of 10 vehicles. The maximum queues for car washes were spread throughout the afternoon from 12:30pm to 8:30pm. With an 85th percentile maximum queue of more than six vehicles, the data suggests that car washes with drive-through lanes should be able to accommodate 140 feet of vehicle stacking throughout the day.

3.3 Coffee Shops

Data collection was done at six coffee shops with drive-through services in November 2010, August 2011 and February 2012. Fourteen days of data were collected. The coffee shops were located in the cities of Edina, Hopkins, Minneapolis, Roseville and St. Louis Park, MN. Vehicles being served were counted as being in the queue. Twelve days of data from the Kansas City, Kansas area is also included.

Table 3.3 – Drive-Through Coffee Shop Maximum Queue Statistics

	Minnesota Data	Minnesota + Kansas Data
Number of Data Points	14	26
Average Maximum Queue (Vehicles)	11.00	10.23
Standard Deviation (Vehicles)	2.25	2.76
Coefficient of Variation	20%	27%
Range (Vehicles)	7 to 16	3 to 16
85th Percentile (Vehicles)	13.50	13.00
33rd Percentile (Vehicles)	10.00	9.91

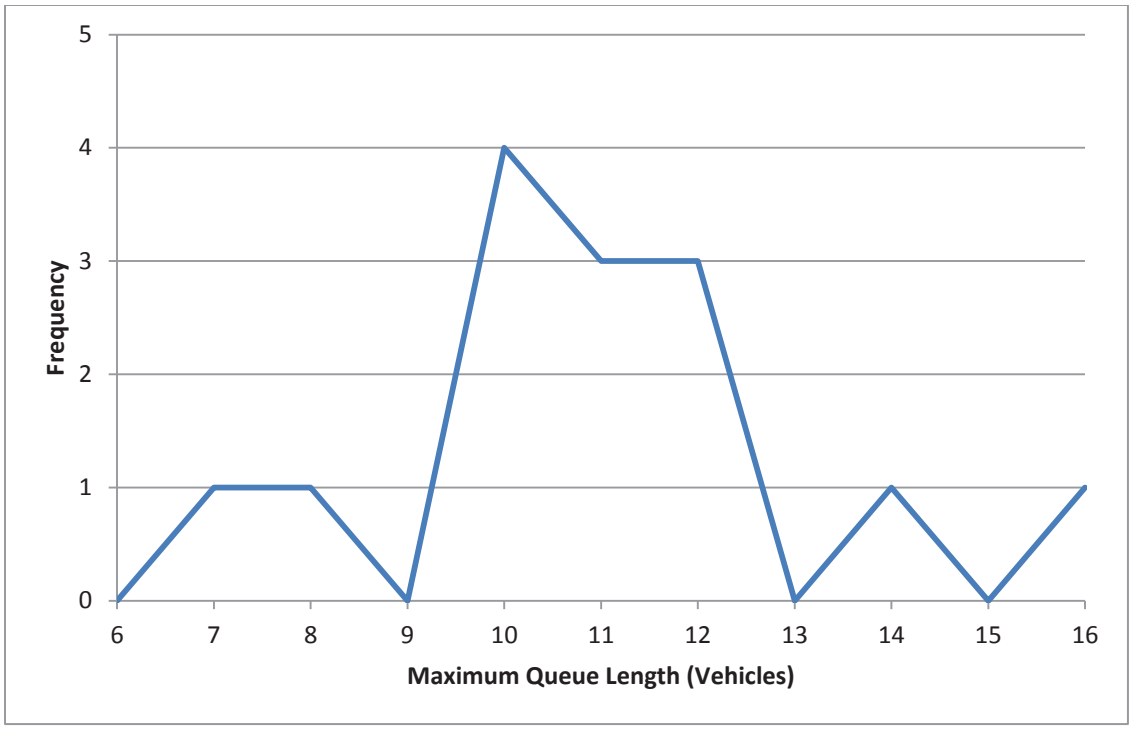


Figure 3.3.1 – Drive-Through Coffee Shop Maximum Queue Frequency – Minnesota Data

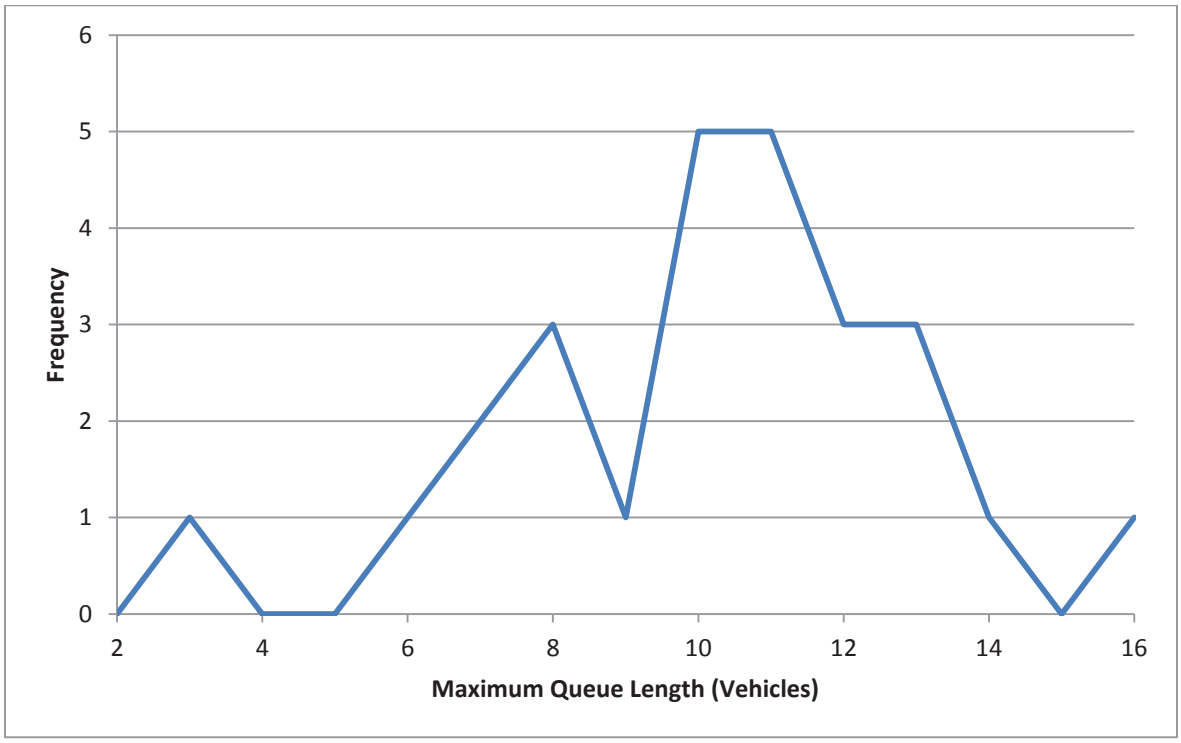


Figure 3.3.2 – Drive-Through Coffee Shop Maximum Queue Frequency – MN + KS Data

Coffee shops produced the longest maximum queues of any of the land uses in this study with all of the maximum queues occurring in the morning. In four of the six cases, the queues spilled out of the parking lot and into the street. These spillovers would typically only happen once or twice a day and last only a few minutes, however, one location had stacking into the street for about 15 minutes in addition to multiple periods of several minutes where cars would queue in the street.

With an 85th percentile maximum queue of 13 vehicles, the data suggests that coffee shops with drive-through lanes should be able to accommodate at least 260 feet of vehicle stacking during morning hours.

3.4 Fast Food Restaurants

Data collection was done at six fast food restaurants with drive-through services in August 2011 and February 2012. Fourteen days of data were collected. The restaurants were located in the cities of Golden Valley, Hopkins, Minneapolis and St. Louis Park, MN. Vehicles being served were counted as being in the queue.

Table 3.4 – Drive-Through Fast Food Restaurant Maximum Queue Statistics

Number of Data Points	**14**
Average Maximum Queue (Vehicles)	**8.50**
Standard Deviation (Vehicles)	**2.68**
Coefficient of Variation	**32%**
Range (Vehicles)	**5-13**
85th Percentile (Vehicles)	**12.00**
33rd Percentile (Vehicles)	**7.90**

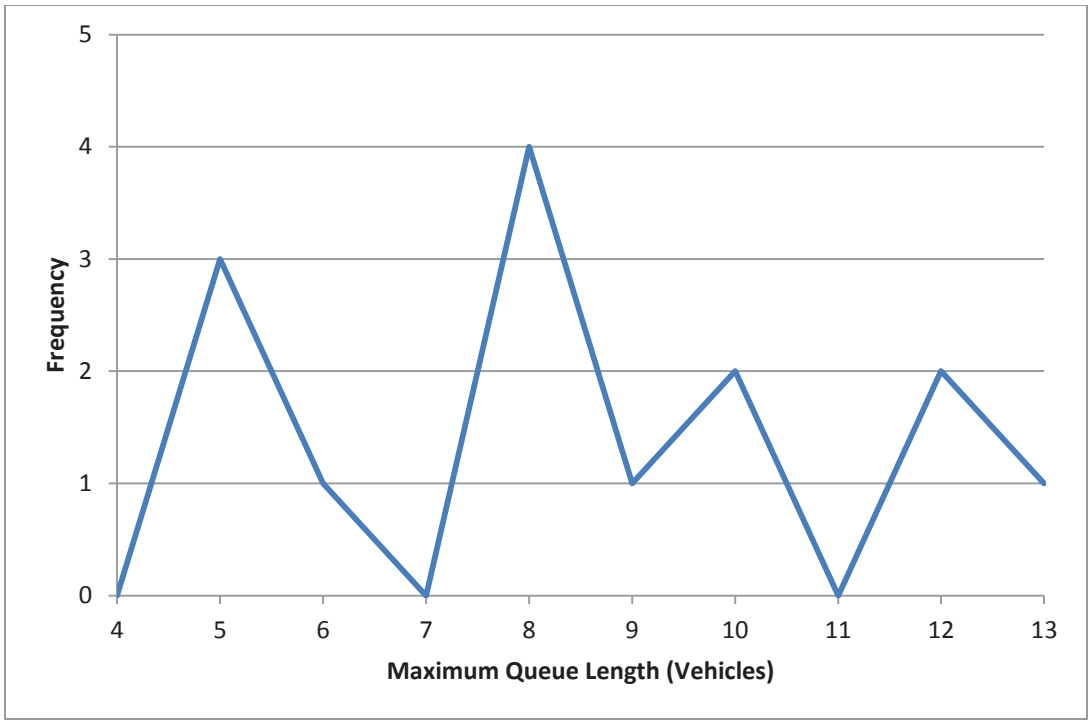


Figure 3.4 – Drive-Through Fast Food Restaurant Maximum Queue Frequency

The maximum queues for fast food restaurants were spread throughout the day from 8:00am to 10:00pm. With an 85th percentile maximum queue of 12 vehicles, the data suggests that fast food restaurants with drive-through lanes should be able to accommodate 240 feet of vehicle stacking throughout the day.

3.5 Pharmacies

Data collection was done at six pharmacies with drive-through services in February 2012. Twelve days of data were collected. The pharmacies were located in the cities of Hopkins, Minneapolis, New Hope and Robbinsdale, MN. Vehicles being served were counted as being in the queue.

Table 3.5 – Drive-Through Pharmacy Maximum Queue Statistics

Number of Data Points	**12**
Average Maximum Queue (Vehicles)	**2.92**
Standard Deviation (Vehicles)	**1.16**
Coefficient of Variation	**40%**
Range (Vehicles)	**1-5**
85th Percentile (Vehicles)	**4.05**
33rd Percentile (Vehicles)	**2.00**

Figure 3.5 – Drive-Through Pharmacy Maximum Queue Frequency

The maximum queues for pharmacies were spread throughout the day from 8:00am to 10:00pm. With an 85th percentile maximum queue of more than 4 vehicles, the data suggests that pharmacies with drive-through lanes should be able to accommodate 100 feet of vehicle stacking throughout the day.

4.0 Conclusions

The 85th percentile maximum queue lengths for each land use are: 160 feet for banks (eight vehicles), 140 feet for car washes (seven vehicles), 260 feet for coffee shops (13 vehicles), 240 feet for fast food restaurants (12 vehicles) and 100 feet for pharmacies (five vehicles).

While some of the locations observed have an excess of space dedicated to drive-through lanes (i.e. some banks and pharmacies), others could occasionally use additional space for drive-through lanes (i.e. coffee shops in the morning).

Fast food restaurants and coffee shops have the longest maximum queues of the five land uses observed. Coffee shops have a tendency for the morning queues to build so long that they spill out onto the street, though, as is expected, their afternoon and evening queues are minimal. Fast food restaurants also have large queues, but they tended to have enough dedicated space that stacking did not go beyond the designated queuing area.

The data collected for this paper along with the data from the papers by Mark Stuecheli and the ITE Technical Committee 5D-10 (see Appendix for both of these) will hopefully provide useful data for traffic engineers and others trying to analyze drive-through queuing storage areas.

5.0 Labor Savings of the COUNTkit

Deploying people in the field to perform this data collection would not have been feasible. Using the COUNTcam video system made it possible to observe the drive through lanes 24 hours a day and the PC-TAS software made the data reduction practical. One location was recorded in November 2010 for 6 hours, three locations were recorded in August 2011 for a total of 202 hours and 26 locations were recorded in February 2012 for a total of 1012 hours. These 1220 hours of video were counted with a total of 120 hours of labor, meaning the videos were watched at approximately 10x speed. Installation of a COUNTcam takes approximately 10 minutes and retrieval takes approximately 5 minutes. This whole project was completed in approximately 3 weeks.

6.0 References

1. Stuecheli, M. (2009). New Drive-Through Stacking Information for Banks and Coffee Shops. *ITE 2009 Annual Meeting and Exhibit.* Print.
2. ITE Technical Committee 5D-10. "Queuing Areas for Drive-Thru Facilities." *ITE Journal* (May 1995): 38-42. Print.
3. Institute of Transportation Engineers. *Parking Generation.* 4th ed. Washington, DC: Institute of Transportation Engineers, 2010. Print.
4. Institute of Transportation Engineers. *Trip Generation.* 8th ed. Washington, DC: Institute of Transportation Engineers, 2008. Print.

7.0 Appendix

A – Day of Week Maximum Queues
B – New Drive-Through Stacking Information for Banks and Coffee Shops
C – ITE Technical Committee 5D-10: Queuing Areas for Drive-Thru Facilities
D – Drive-Through Data Forms

Appendix A

Day of Week Maximum Queues

		Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Fast Food	Arby's				5	5		
	Burger King	6	12				10	8
	McDonald's				12	13		
	McDonald's				9	8		
	Taco Bell				10	8		
	White Castle				8	5		
Car Wash	BP				6	6		
	BP			1	3			
	BP			4	3			
	Holiday				3	4		
	Mister Car Wash				10	6		
	Mobil				4	3		
Coffee	Caribou				11	10		
	Caribou	7	10	12			12	8
	Starbucks				14	16		
	Starbucks				10	11		
	Starbucks			10	12			
	Starbucks				11			
Bank	Citizens Independent Bank			5	5			
	SharePoint Credit Union				3	3		
	TCF	4					8	8
	US Bank				7	7		
	Wells Fargo			8	6			
	Wells Fargo			6				
Pharmacy	CVS			1	2			
	CVS			4	4			
	CVS			2	2			
	Walgreens				4	5		
	Walgreens			3	3			
	Walgreens			3	2			

Appendix B

New Drive-Through Stacking Information for Banks and Coffee Shops

Mark Stuecheli, PTP

Abstract

This paper provides updated queuing information for drive-in banks and new queuing data for coffee shops with drive-through lanes. The data is presented in a format similar to that used in the report for **ITE Technical Council Committee 5D-10**, originally published in 1995.

Significant changes have occurred in the way that bank patrons conduct business with their banks. In recognition of those changes, ITE has adjusted the trip generation information included in the Eighth Edition of **Trip Generation, an ITE Informational Report** to include only data collected since 2000, and the revised trip generation totals are significantly lower than in previous editions. Clearly, the reduced trip generation figures indicate a reduction in bank drive-through business. This report summarizes queuing information included in counts taken in the Kansas City metropolitan area.

In the last few years coffee shops with drive-through lanes have become prevalent throughout the country. Because those businesses were uncommon when the 1995 report was prepared, no data was gathered for those operations. This paper contains information on counts taken at those establishments, once again in the Kansas City metropolitan area.

Based on the count data, recommendations are included for the minimum amount of stacking distance to require for the two types of drive-through businesses that were studied.

Background

ITE Technical Council Committee 5D-10 was formed in 1987 to produce a database of queuing information for various types of drive-through lanes. The report of the findings of the Committee, published in the May 1995 **ITE Journal**, included information on the characteristics of drive-through lane stacking for fast-food restaurants, drive-in banks, car washes, day care centers and dry cleaners. The counts that were included in the Committee report were conducted from the late 1960s through the late 1980s in a limited number of mid-western, southern and eastern states.

As a former member of that Committee, and having submitted drive-through counts for the effort, I am in a position to make some observations about the change in drive-through usage.

Appendix B

This paper analyzes two types of drive-through operations – one that is greatly modified and another that is new since the original report was published. First, significant changes have occurred in the ways that bank patrons conduct business with their financial institutions. On-line banking, direct deposit and the wide usage of ATMs have resulted in greatly reduced trip generation totals for drive-in banks. In recognition of that fact, ITE adjusted the trip generation information for drive-in banks in the Eighth Edition of **Trip Generation, an ITE Informational Report,** to include only data collected since 2000. The trip generation rates during the p.m. peak hour for the newer data are about 44% lower than rates in the Seventh Edition.

The amount of stacking provided for bank drive-through lanes often has a critical impact on the potential site design alternatives for proposed bank properties. If the information included in the 1995 Report were to be used as the basis for establishing stacking requirements, a large area would need to be allocated to the drive-through lanes. On tight sites, that limitation could preclude developing an acceptable layout.

Clearly, the major drop in trip generation rates indicates that fewer customers are using drive-through lanes. That reduction in drive-through usage has an impact on queue lengths and other operational characteristics observed at those facilities. This paper includes updated information on queuing in bank drive-through lanes based on counts taken in the City of Overland Park, Kansas, a suburban community of 171,000 residents in the Kansas City metropolitan area.

The second area of analysis in this paper pertains to observed queuing characteristics for coffee shops with drive-through lanes. In the last few years, drive-through coffee shops have become common throughout the country. Because those businesses were an insignificant factor when the report for **ITE Technical Council Committee 5D-10** was completed, no counts were conducted for that land use category. This paper contains data on queuing for coffee shops with drive-through lanes, based on counts conducted predominantly in the Kansas suburbs of the Kansas City metropolitan area.

As is the case for drive-in banks, the length of stacking required for a site has a major impact on potential site layouts. If a relatively short stacking distance is permitted, the lanes can be fit into very restricted sites or be more easily retrofitted to work with existing buildings. But if more queuing occurs than is provided for in a dedicated lane, the flow of traffic within a parking lot can be seriously restricted by that excess queue. In the worst case, if the drive-through stacking is located close to a public street and the excess queue extends into or near the street, the operation of the adjoining public street may be negatively impacted.

Appendix B

Drive-In Banks

Counts were conducted at ten suburban drive-in banks located throughout Overland Park in the fall of 2008 and the spring of 2009. Both established locations and sites that were relatively new were counted, although all banks had been open for business for at least one year. All but one location had drive-through ATMs. Based on the results of counts taken at a single bank location during a mid-week lunch hour, a mid-week p.m. peak hour, a Friday lunch hour, and a Friday p.m. peak hour; the maximum queue lengths occurred during the Friday p.m. peak hour. Therefore, all counts used in the study were conducted during the Friday p.m. peak hour time period.

The counting process involved noting the maximum per lane and total queues for the drive-through lanes at each location in fifteen minute increments, along with collecting information on the stacking of any drive-through ATM. In all cases the vehicles in the service positions were included in the counts. Where possible, the volumes of vehicles entering and exiting the parking lot also were tabulated. As a way to evaluate the frequency of various maximum queue lengths, the total queue lengths were noted at five minute intervals.

The queuing data was analyzed in ways similar to the methods used in the 1995 Report. Table 1 lists the observed frequency of maximum queue lengths per lane. Figure 1 plots the per lane maximum queue lengths using both the 2009 data and the data that was presented in 1995 (please note that the 1995 data involved fifteen counts, compared to the ten counts in the 2009 data). Figure 2 plots the probability that the queue lengths per lane will not exceed a given maximum queue length, once again presenting both 2009 and 1995 data.

Table 1 – Drive-In Bank 2009 Maximum Queue Length Per Lane

Queue Length	Frequency	Cumulative Frequency	P(q≤N)
0	0	0	0.00
1	1	1	.10
2	4	5	.50
3	4	9	.90
4	1	10	1.00

Note: P(q≤N) indicates probability, based on sample, of queue length of “q” not exceeding length “N”

Appendix B

Figure 1 – Drive-In Bank 1995 And 2009 Maximum Queue Length Per Lane Data Plot

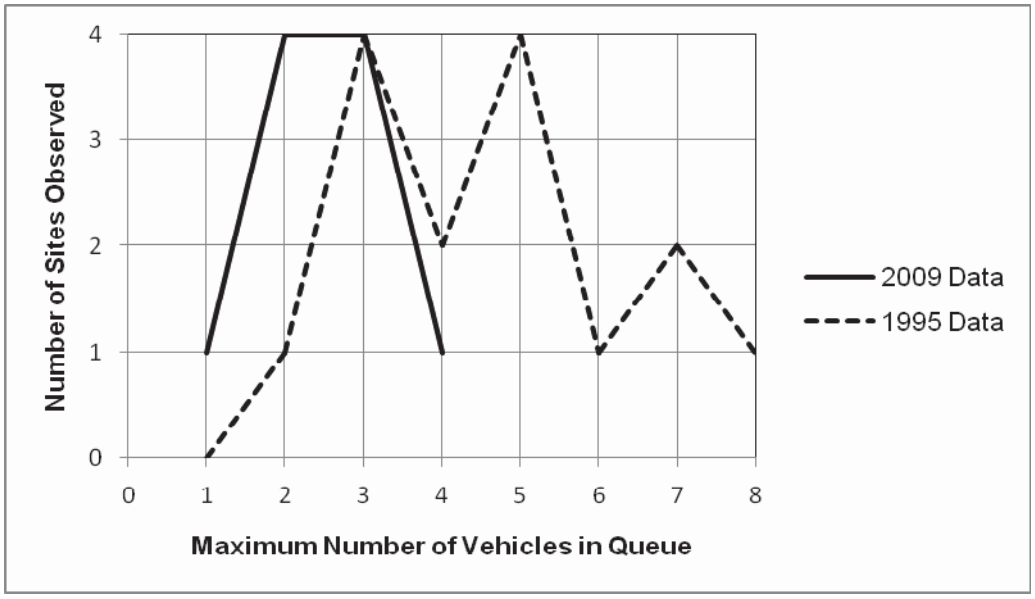
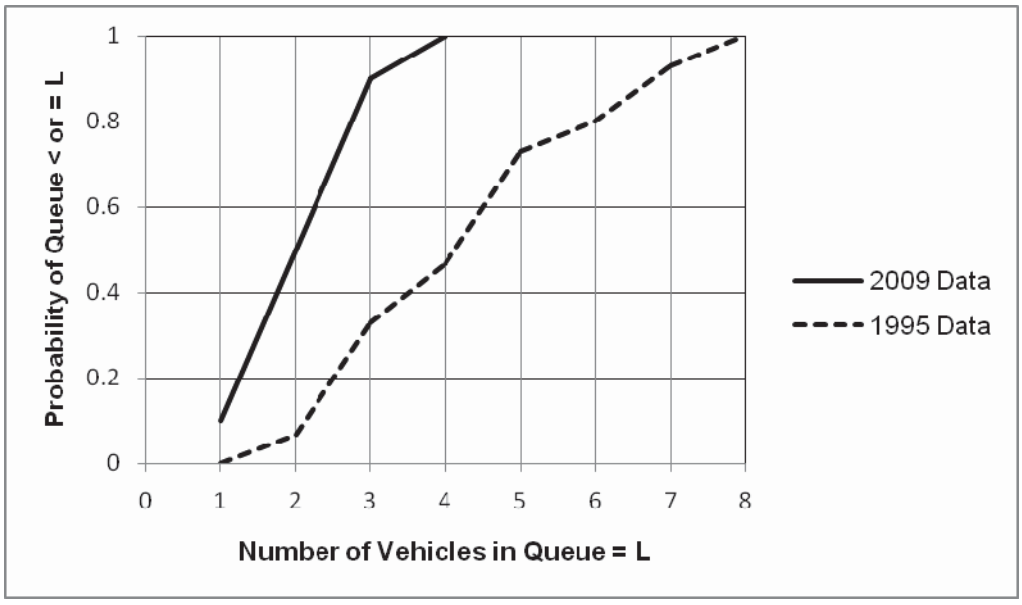


Figure 2 – Drive-In Bank 1995 And 2009 Cumulative Maximum Queue Length Per Lane Data Plot



The differences between the 1995 Report data (as noted earlier, actually based on counts conducted from the late 1960s to the late 1980s) and the 2009 counts are dramatic. The maximum per-lane queue lengths in the current counts were half what they were in the 1995 data.

An attempt was made to determine if such factors as adjoining major street traffic volumes or the size of the building could predict the queuing results, but no correlation was found.

Observations

Some banks, especially those that have been in operation for several years, have a surplus of drive-through lanes and stacking area. That is because those sites were designed to accommodate the much higher demands that existed many years ago. Consequently, they often open only a portion of the available lanes.

In one case, for a main office bank location where it was possible to make a direct comparison between a count conducted in 1988 and a new count in 2008 (actually taken almost precisely 20 years apart), the difference was dramatic. The p.m. peak hour drive-through volumes for the 2008 count were 65% lower than the 1988 count, a much greater drop than would have been indicated by the reduced ITE trip generation figures discussed earlier. The maximum total number of vehicles queued and the maximum queue lengths per lane were correspondingly lower, dropping from 29 to 8 and 7 to 3, respectively. The demographics and development characteristics of the surrounding area have changed little since 1988 and the bank has continued as a stable operation. Considering all of those factors, it is reasonable to assume that the differences are associated with changes in customers' banking habits.

The one incidence of a four car per lane maximum stack was a single occurrence that lasted for only a few minutes. Based on that information, it is reasonable to consider the practical maximum required queue length to be three vehicles.

The maximum queue lengths for ATMS ranged from two to five vehicles. Only one location experienced the longer queue lengths and only for a short time period. All other locations had maximum queue lengths of three vehicles or less.

Coffee Shops With Drive-Through Lanes

Counts were conducted in the fall of 2008 and the spring of 2009 at twelve coffee shops located in the Kansas suburbs of Merriam, Olathe and Overland Park in the Kansas City metropolitan area and also in suburban Kansas City, Missouri. All but two of the establishments were situated in free-standing buildings, and several were located within shopping centers. Three were drive-through-only operations and the remaining nine were full-service locations that included both drive-through lanes and inside seating facilities. Because this type of use is busiest in the morning peak hour, all counts were completed during that time period.

Similar to the process used for drive-in banks, the counting process involved noting the maximum number of vehicles queued in the drive-through lane at each location for fifteen minute increments. As was done for the drive-in bank counts, the vehicle in the

service position was included in the counts. Information on the number of vehicles entering and leaving the parking lot was collected for full-service operations (drive-through-only locations did not have any parking activity). The queuing information was tabulated for both the total length of queue and for the number of vehicles behind the menu board. The observed queue length was noted at five minute intervals as a way to evaluate the frequency of various queue lengths.

Once again, the queuing data was analyzed in ways similar to the methods used in the 1995 Report. Table 2 lists the observed frequency of maximum queue lengths. Figure 3 plots the per-lane maximum queue lengths and Figure 4 plots the probability that the queue will not exceed a given maximum queue length.

Table 2 – Coffee Shop With Drive-Through Maximum Queue Length

Queue Length	Frequency	Cumulative Frequency	P(q≤N)
0	0	0	0.00
1	0	0	0.00
2	0	0	0.00
3	1	1	.08
4	0	1	.08
5	0	1	.08
6	1	2	.17
7	1	3	.25
8	2	5	.42
9	1	6	.50
10	1	7	.58
11	2	9	.75
12	0	9	.75
13	3	12	1.00

Note: P(q≤N) indicates probability, based on sample, of queue length of “q” not exceeding length “N”

Figure 3 – Coffee Shop With Drive-Through Maximum Queue Length Data Plot

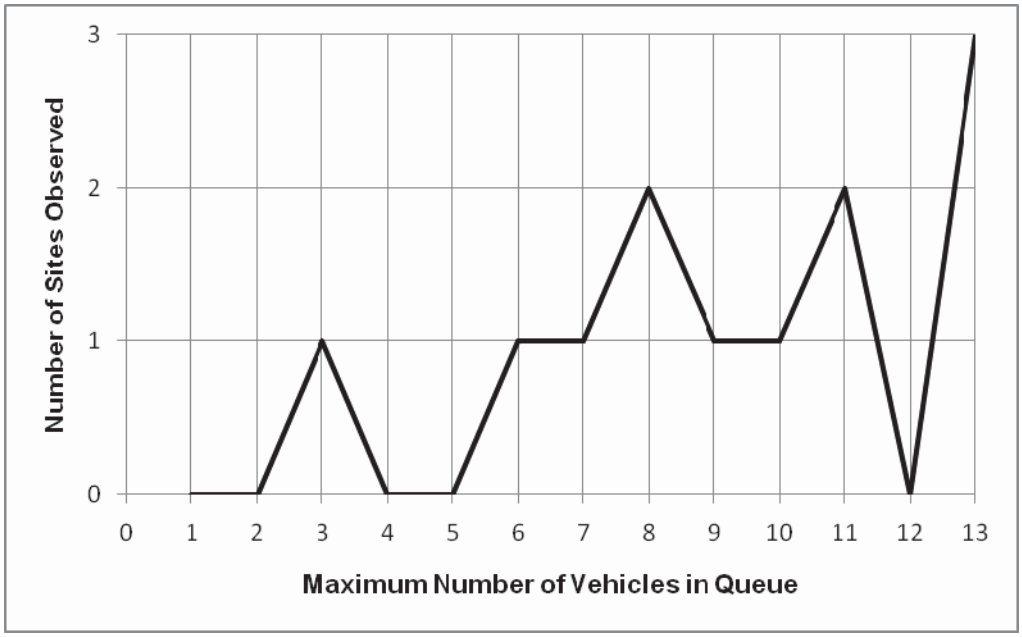
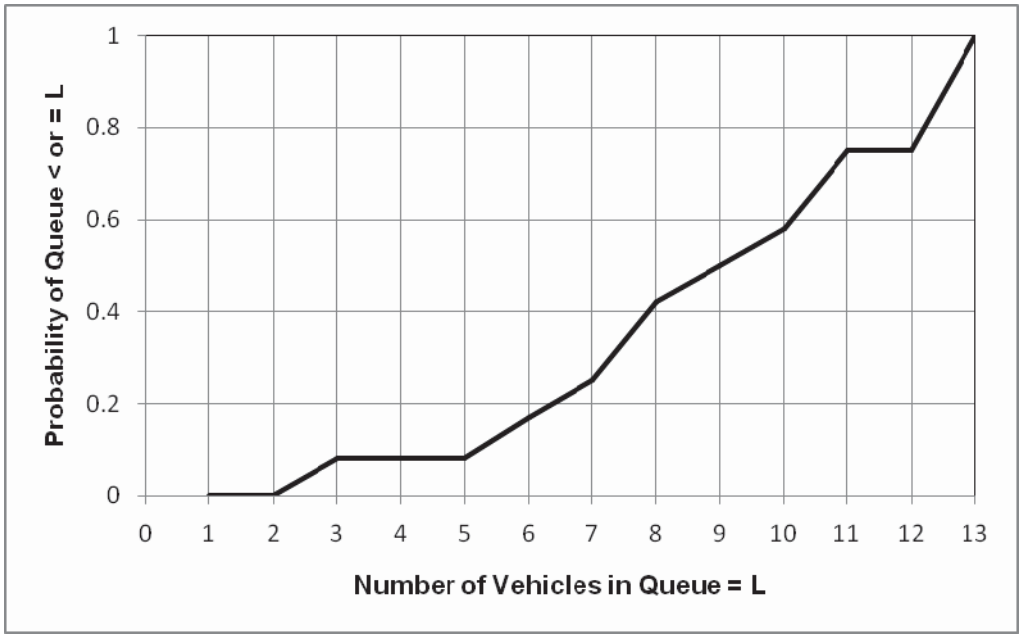


Figure 4 – Coffee Shop With Drive-Through Cumulative Maximum Queue Length Data Plot



Appendix B

The total trip generation figures were compared to the a.m. peak hour ITE rates for Land Use Code 937, Coffee/Donut Shop with Drive-Through Window, and Land Use Code 938, Coffee/Donut Shop with Drive-Through Window and No Indoor Seating. The observed counts generally fell within the range of counts included in those categories, although two of the rates for the No Indoor Seating category exceeded the published range. No correlation was found between the adjoining major street traffic volumes or the size of the building and either the queuing or the trip generation results.

Observations

Several of the drive-through lanes were under-designed for the usage that was observed and queues spilled-out into parking lot circulation areas. In most cases the excess stacking did not result in disruptions of the operations of surrounding uses, since most other businesses were not open in the early morning. But for those sites where the end of the drive-through lane extended into the coffee shop parking lot, the excess queue often disrupted the movements of drivers who were trying to enter or exit parking spaces or the site itself.

One interesting facet of the data is that the three lowest observed maximum queue lengths were for the drive-through-only locations. The highest observed queue length for those operations was seven vehicles, which occurred only once at one location and only for a very short period of time. A six vehicle maximum stack was a more common occurrence.

The data shows that the volume of drive-through traffic and, therefore, the required stacking distance, is higher for full-service coffee shops than for drive-through-only operations. When total trip generation (both drive-through business and customers who park and walk in) is factored in, the full-service coffee shops did, on average, about two and one-half times the business of drive-through-only facilities. Since all of the full-service operations were Starbucks locations, it may be possible to apply the results of those counts to other proposed suburban Starbucks locations elsewhere in the country.

Total vehicular stacking available for a drive-through lane is an important consideration, but the location of the menu board relative to the pick-up window also impacts the efficiency of a drive-through lane operation. If the spacing is too short, stacking behind the pick-up window will extend into the menu board area, delaying ordering for those farther back in the line. In the counts conducted for this study, the pick-up window to menu board available stacking distances ranged from two to five vehicles.

The operation with the two car stack between the pick-up window and menu board regularly resulted in delays for drivers waiting to order at the menu board. The location with a five car stack rarely experienced delays for those ordering. Based on field observations, if an unlimited amount of stacking were available at a proposed site, the five car spacing would be ideal. Realizing that space for stacking nearly always is limited, an acceptable alternative would be the four car spacing.

Conclusions

Drive-in bank usage has dropped dramatically, as illustrated in the data provided in this report. Consequently, a reduced amount of stacking is required. That reduced area for drive-through stacking can provide more flexibility in the design of bank sites, allowing for development on smaller sites or the provision of increased landscaped areas.

Based on the data that was gathered, the City of Overland Park has reduced its previous requirement for a minimum five car stack per lane to a three car stack (a distance of 60 feet per lane, assuming average vehicle spacing to be 20 feet). That design should be sufficient to accommodate virtually all situations. Vehicular stacking requirements for ATMs have been established, also at a minimum of three car lengths.

Coffee shop drive-through lanes are most heavily used during the morning peak period, and therefore it is important to design sites to accommodate that peak demand. The following recommended minimum stacking lengths should be appropriate in most cases. The only exceptions would be situations in which excess queuing could impact a nearby street or major drive, in which case a more conservative approach should be taken.

Based on the data that was gathered for drive-through-only operations, it appears reasonable to require that a dedicated drive-through lane be provided with a stack of 120 feet – enough to handle six vehicles. That should be sufficient to accommodate nearly all vehicles that are likely to arrive during the morning peak hour time period.

For full service establishments, a 220-foot long drive-through lane, providing eleven cars of total storage, should be adequate to handle the vast majority of the drive-through lane volumes that might be encountered. In those cases where more than eleven vehicles were counted, the duration of the extreme queue lasted for only a few minutes. For the most efficient operation, the distance between the pick-up window and menu board should be at least 80 feet to accommodate four vehicles.

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Queuing Areas For Drive-Thru Facilities

BY ITE TECHNICAL COUNCIL COMMITTEE 5D-10

ITE Technical Council Committee 5D-10 was formed to collect and analyze basic information that may be used to estimate and evaluate lengths of automobile queues at drive-thru facilities. In addition to fulfilling this objective, this Informational Report constitutes a starting point for compiling a database for drive-thru facility queue length information.

Introduction

When faced with the need to evaluate the future impacts of a planned development, the transportation engineer often employs some form of analogy, estimating the future impacts of as-yet unbuilt development by using the attributes of existing land uses having a similar nature. For instance, the engineer may refer to published trip generation rates, derived from observations made at existing developments, to obtain a figure by which to estimate volumes that will occur at the proposed development.

J. L. Gattis, P.E., was Chair of Technical Council Committee 5D-10. He is an Assistant Professor in the Department of Civil Engineering at the University of Arkansas in Fayetteville, Ark. He is a Member of ITE.

Many types of businesses (such as fast-food restaurants, banks and cleaners) utilize drive-thru systems. A similar form of drive-thru operation can be found at sites where passenger pick-up operations occur (such as parents picking up schoolchildren). These drive-thru systems are comprised of a server position (often at a service "window"), and vehicle queuing space in advance

QUEUING DATA SHEET

1.	Type of Service Provided	_____
2.	Day(s) of Week	Sun Mon Tue Wed Thu Fri Sat
3.	Time(s) of Day	_____
4.	Type of Area	CBD ☐ Surburban ☐ Rural ☐
5.	Competition in Area (For Same Services)	High ☐ Medium ☐ Low ☐
6.	Service Rate Measured (Per Window or Aisle or Lane)	_____ Vehicles/Time
7.	Arrival Rate Measured (Per Window or Aisle or Lane)	Avg ____ Max ____ Vehicles/Time
8.	Uniformity Rating	_____ (1 - 10)
9.	Capacity of Queue Storage Area	_____ (Vehicles)
10.	Measured Average Queue	_____ (Vehicles)
11.	Measured Maximum Queue	_____ (Vehicles)
12.	Excess Demand Volume	_____ (Vehicles)
13.	Excess Demand Frequency	_____
14.	Size Sample or Length of Count Data	_____
15.	Narrative Description of Service	_____

Figure 1. Data gathering form used in survey.

of the service position, for waiting in line as those ahead are served first.

When attempting to project lengths of automobile queues at proposed drive-thru facilities, the municipal or private consulting engineers may not find available data by which a projection can be made. While such data may be known by larger business chains that have drive-thru operations, the data do not seem to be generally available to the average traffic engineer trying to size or evaluate automobile queue storage area. True, some publications present results of queuing studies or equations for estimating queue lengths based on known system arrival and service rates.[1-4] But the proposed-site arrival and service rates may be unknown, and the proposed system may not possess attributes (such as negative exponential service time rates) needed for certain equations to properly predict queue lengths.

Drive-thru facilities are perceived as time-savers; as a convenience to the physically challenged, elderly and parents with young children; and as a way to avoid going out into inclement weather. Due to vehicle idling while in line, drive-thru facilities may also be viewed as causing unnecessary fuel consumption and air pollution. The popularity of drive-thru services creates a need to evaluate the queuing capacities of the varied drive-thru facilities. This report provides some basic drive-thru facility queue length information. It is hoped that the database will continue to grow, so that a comprehensive analytical tool may be available for the transportation professional.

Methods

The queue length data gathering form shown in Figure 1 was distributed to committee members in November 1987. The form was accompanied by specific user-instructions to ensure uniformity of procedures and compatibility of results.

Completed forms were returned to the committee chair and data were cataloged by land-use type. The maximum observed queue lengths and the maximum observed queue length frequencies were compiled. Cumulative frequencies and the probability that queues would not exceed an absolute maximum were calculated and shown graphically.

Table 1. Ranges of Fast Food Queue Lengths by Food Type

Food Type	Maximum Queue Range (# in system)	Average Maximum Queue (# in system)	Studies
Donuts	4	4	2
Steak	4	4	2
Chicken	2–9	5	5
Fish	5	5	1
Sandwiches	5	5	1
Mexican	7	7	1
Roast Beef	6–8	7	2
Hamburgers	4–13	7	27

Table 2. Fast Food Queue Lengths

Maximum Queue Length (# in system)	Frequency	Cumulative Frequency	P(q≤N)
1	0	0	0.00
2	2	2	0.05
3	0	2	0.05
4	6	8	0.18
5	4	12	0.27
6	7	19	0.43
7	10	29	0.66
8	7	36	0.82
9	5	41	0.93
10	1	42	0.95
11	0	42	0.95
12	1	43	0.98
13	1	44	1.00

Note: P(q≤N) indicates probability, based on sample, of queue length "q" not exceeding length "N".

Findings

Within this report, data have been compiled for banks, car washes, day care facilities, dry cleaners and fast-food restaurants.

Fast Food

This category includes restaurants characterized by food being prepared in advance of, or shortly after, ordering; by high turnover for eat-in customers; and by long business hours. The ITE land-use codes (LUCs) for this use are LUC 834 (*Trip Generation*, 1991) and 836 (*Parking Generation*, 1987).

Forty-four fast-food restaurants were observed for this study. They ranged from those serving chicken to the hamburger chains. All sites were suburban locations. Queuing was observed mainly during the weekday mid-day peak from the 1970s through the 1990s, at sites in Florida, Kansas, Illinois, Minnesota, Montana, New Jersey, Oklahoma, Pennsylvania and Texas. All fast-food facilities observed for this study had a single-window drive-thru system. The industry is changing, with double- and even triple-window systems being utilized. Further information will be needed on queuing characteristics of these facilities.

The average observed service rate was 54 vehicles per hour (vph); the maximum rate was 108 vph. The maximum observed queue lengths (number of vehicles in line, including vehicle at service position) ranged from two to 13 vehicles (see Table 1). Where there was a menu-order board followed by a service window, the combined total of vehicles in both sequential lines was reported.

The restaurants featuring hamburgers had maximum queues in the upper part of the range. Table 2 shows the frequencies of the observed maximum queue lengths, as well as a probability of a queue of less than a given number

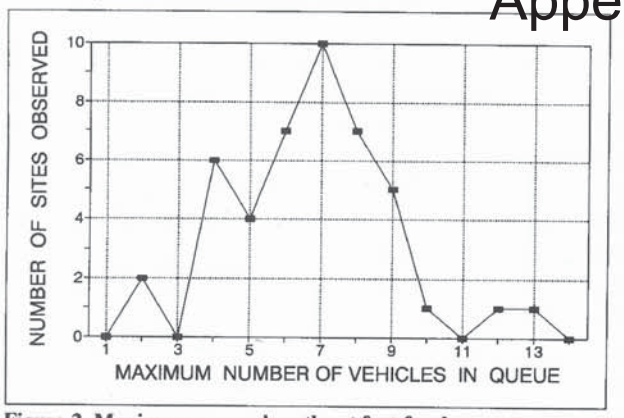

Figure 2. Maximum queue lengths at fast-food.

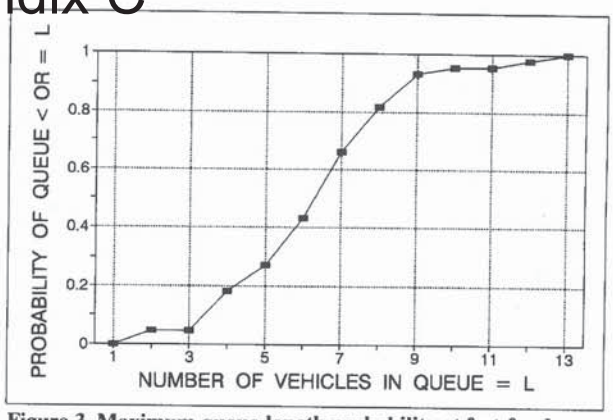

Figure 3. Maximum queue length probability at fast-food.

of vehicles. Figure 2 plots maximum queue length against the observed frequency of occurrence. Figure 3 depicts the probability that at any fast-food site, the queue will not exceed a given maximum queue length. From Table 2 or Figure 3, it can be seen that there was a 95 percent probability that the maximum queue at a site would be no more than 10 vehicles.

The maximum queues were evaluated against days of the week and were found to have no statistical relationship. Likewise, when evaluated against different levels of competition within the area and against service rates, there was no statistical relationship.

Bank

This category includes savings-and-loans with or without automatic teller machines (ATMs) and commercial banks with or without ATMs. Although there were historical differences between banks and savings-and-loans, they are now often indistinguishable to the public. The ITE land-use codes for this use are LUC 912 and 914 (*Trip Generation*, 1991) and LUC 912 (*Parking Generation*, 1987).

The studies analyzed were conducted from the late 1960s through the late 1980s; many were in Illinois, Minnesota, New Jersey and Texas. The size of the bank drive-thru facilities ranged from a minimum of one lane with one teller-window up to an institution with 10 lanes and four tellers.

Observed service rates for these institutions went up to a maximum of 35 vehicles per lane-hour. Maximum observed queues per lane ranged from two to eight vehicles. The maximum system queue lengths (all lanes combined) ranged from five to 29 vehicles. At two sites, it was observed that a queue length exceeding eight vehicles per lane was not tolerated by customers. When the queue length became excessive, customers would park and use walk-in facilities rather than the drive-thru. Thus the collected data reflect a maximum queue per lane of eight vehicles.

Table 3 shows the observed frequency of occurrence of maximum queue lengths per lane. Figure 4 plots the maximum number of vehicles per lane observed. On the basis of the studies received, there is a 100 percent probability that the queue length at a bank drive-thru facility will not exceed eight vehicles per lane, as Figure 5 shows.

Table 4 presents the maximum number of vehicles in an entire drive-thru system (all lanes combined) by ranges, along with the frequency of occurrence. This table shows that the most common maximum number-in-the-system at a bank drive-thru facility fell between six and 10 vehicles, as most observed facilities consisted of two lanes. Table 4 also

Table 3. Bank Queue Lengths

Queue Length	Maximum Queue Per Lane		P(q≤N)
	Frequency	Cumulative Frequency	
0	0	0	0.00
1	0	0	0.00
2	1	1	0.07
3	4	5	0.33
4	2	7	0.47
5	4	11	0.73
6	1	12	0.80
7	2	14	0.93
8	1	15	1.00

Note: P(q≤N) indicates probability, based on sample, of queue length "q" not exceeding length "N".

Table 4. Maximum Number of Vehicles in Bank System (All Lanes)

# in system	Frequency	Cumulative Frequency	P(q≤N)
0 – 5	2	2	0.13
6 – 10	6	8	0.53
11 – 15	3	11	0.73
16 – 20	2	13	0.87
21 – 25	1	14	0.93
26 – 30	1	15	1.00

Note: P(q≤N) indicates probability, based on sample, of queue length "q" not exceeding length "N".

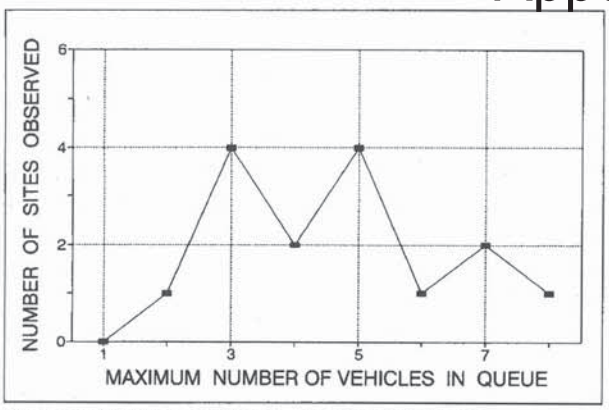

Figure 4. Maximum queue length per lane at bank.

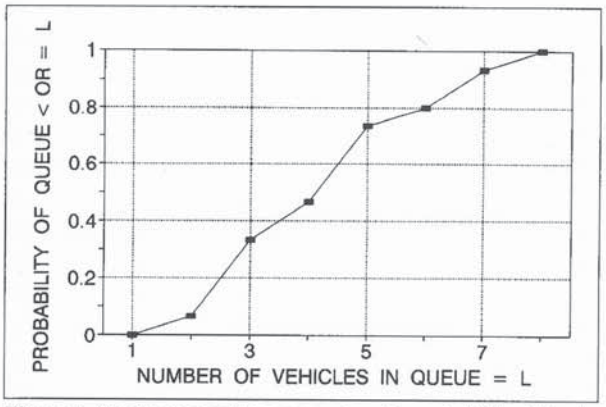

Figure 5. Maximum per lane queue length probability at bank.

gives the probability, based on the studies received, that the number of vehicles in the system will not exceed a certain range.

It should be noted that queuing lengths may be affected by time-of-day banking habits. There may be differences between the central city and a suburb. An area with a large proportion of retired persons may experience unique banking-time behaviors. In addition, the effects of banks incorporating ATMs into drive-thru aisles may also need to be investigated in future queuing studies.

Car Wash

This category includes full-service car washes (offering vacuuming and towel-drying services), exterior tunnel operation (vacuuming and towel drying not a part of the "in-line" operation, but may be offered at separate stations to the side), and self-service car washes (where customers pull into a wash bay, insert coins into a box, and proceed to wash). The ITE land-use code for these uses is LUC 847 (*Trip Generation*, 1991). This land use was not included in the 1987 *Parking Generation* report.

The studies analyzed were conducted from the late 1960s through the late 1980s in Kansas, Illinois, Montana, New Jersey and Texas. They included seven full service car washes, two exterior tunnel car washes, and nine self-service car washes. The number of self-service bays ranged from six to 14 per site. The self-service car washes typically had one or more parallel wash bays; the full-service car wash operations tended to have a single tunnel to serve customers.

Studies at the full-service car washes were made during winter or early spring months. Both full-service car washes consisted of a single tunnel. Observed service rates were 35 vph (maximum queue of nine vehicles) and 27 vph (maximum queue of 26 vehicles). At the site with a 26-vehicle queue, the queue extended off the site and onto an adjacent private street with light traffic volumes.

The self-service car wash studies were conducted on Saturday and Thursday, during late spring and/or summer months. Service rates at self-service car washes ranged from 4.1 vehicles per bay-hour to 5.4 vehicles per bay-hour. The average service rate was 4.77 vehicles per bay-hour. The maximum queue observed at two study sites was three vehicles, and at a third study site the maximum observed was one vehicle. No distinction was made as to whether these were maximum queues per bay or total maximum queues (per entire operation).

Day Care

This category includes facilities that provide a place for children during the day, often while parents are at work. After-school care may also be provided. The ITE land-use code is LUC 565 (*Trip Generation*, 1991). This land use was not included in the 1987 *Parking Generation* report.

Data were submitted for one day-care facility in Texas, during the evening peak hour. The facility had 99 children enrolled and 94 present the day the study was conducted. The day-care facility handled children age 2 through first grade. The facility was operated in a manner that required the parents to park their cars and go inside to get their children.

The hour service rate was 46 vehicles. A maximum of eight vehicles in

This is an Informational Report of the Institute of Transportation Engineers prepared by Technical Council Committee 5D-10. The information in this report has been obtained from experiences of transportation engineering professionals and research. ITE Informational Reports are prepared for informational purposes only and do not include Institute recommendations on which is the best course of action or the preferred application of the data.

Members of Technical Council Committee 5D-10 were J. L. Gattis, P.E. (M), Chair; Grant A. Bacchus, P. Eng. (F); Benedict G. Barkan (F); Robert R. Marvin, P.E. (M); Dale B. McKinney, P.E. (F); Robert A. Nelson, P.E. (F); Seyed M. Safavian (M); James M. Schoen (A); David K. Sorenson, P.E. (A); Mark J. Stuecheli (M); and Jack Wierzenski (A).

Members of the Technical Council Department 5 Standing Committee at the time of approval of this report were Dennis O'Malley (F), Chair; Carol H. Walters, P.E. (M), Assistant Chair; Robert D. McMillen, P.E. (FL); Wamahdri W. Williams (A); and Donald J. Galloway, P.E. (F). Brian S. Bochner, P.E. (F), was the Chair of Technical Council, and John M. Mason, P.E. (F), was the Assistant Chair.

Table 5. Summary of Observed Queue Distances at Drive-Thru Facilities

	Near-maximum number of queued vehicles observed in system (does not include vehicle at service position)	*Lane Length needed to store near-maximum queue (does not include) vehicle at service position)*
Fast-Food (Hamburger)	10 – 1 = 9	60 m (198 feet)
Bank	8 – 1 = 7	47 m (154 feet)
Car Wash (self-service)	3 – 1 = 2	13 m (44 feet)
Day Care	10 – 1 = 9	can store in parallel
Dry Cleaner	3 – 1 = 2	13 m (44 feet)

5 minutes (if sustained, equivalent to 96 vph) were observed; a 20-minute period had 28 vehicles (84 per hour). The maximum number of waiting vehicles was 10 vehicles.

VanWinkle and Kinton reported the results of 29 field studies at day-care establishments in Tennessee. Their findings are in the July 1994 *ITE Journal*.[8]

Dry Cleaners

This category includes facilities that clean clothing and other fabrics that should not be laundered. Often a walk-up window is present. No information is provide for this land use in either the ITE 1991 *Trip Generation* report or the ITE 1987 *Parking Generation* report.

One study was conducted at a dry cleaner with drive-thru facilities in Montana during a weekday p.m. peak period. An average service rate of 41 vph was measured at the single window. The observed maximum queue was three vehicles long. Forty-five percent of the customers used the drive-thru facility.

Conclusions

Table 5 summarizes the observed maximum or near-maximum observed queue lengths, and also lists the stacking distance needed to accommodate these observed queues, based on a front bumper-to-front bumper space occupied length of 22 feet (ft) per vehicle. This 22 ft may not be the exact space that vehicles occupy, but a value ranging from 20 ft to 25 ft seems appropriate for many situations. Because only one day-care facility was observed, and because parents picking up children may park in parallel or in a lot instead of in a single-file line, no stacking length was calculated for this land use.

Due to a change of committee personnel during the course of the data-gathering effort, some of the original forms submitted by committee members are not available. There are some apparent errors in the tables. For instance, the number of studies tallied in Table 1 is 41, while the number in Table 2 is 44. It is not known whether three studies were not included in Table 1, or whether there was double counting in Table 2. The unavailability of the original data forms makes it impossible to recheck the numbers.

The size of this drive-thru facility queuing characteristic database was limited. There is a need to accumulate and analyze more drive-thru queuing system data, so transportation engineers and site planners can be better informed. Additional observations of service rates are also needed in order to determine relationships between service rates and queue lengths, and to evaluate long-term trends in service rates. Finally, investigations of the amount of space occupied per vehicle within a queue are needed so that engineers will have the ability to project not only the number of vehicles that will be in the maximum queue for a given site, but also the queue storage length required for a site.

When collecting queuing data, the recorder should clearly indicate whether the number of vehicles recorded includes or excludes the vehicle(s) in the service position (that is, at the window). The data record must indicate which numbers are for a single queuing line and which totals are for the entire system of multiple queuing lines. An observer should also note instances of arriving vehicles balking or refusing to enter a queue due to excessive length, and how many vehicles were in the queue when the next arrival balked.

Other types of drive-thru operations that could be studied include those at credit unions, funeral homes, gas stations (either gas only, full-service, self-service, or a combination with convenience stores or car washes), libraries, liquor stores, movie theater ticket booths, parking lots and garages (either pick-up ticket or pay, or key, tag, or card), post offices, pre-schools, baby-sitting or school combinations, lower grade schools, stadium ticket sales machines, truck stops and places of worship.

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Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	912
Land Use/Building Type*:	Drive-in Bank

Name of Business:	Citizens Independent Bank
Address:	3700 W Broadway Ave
City:	Robbinsdale
State:	MN
Zip Code:	55422

Date(s)	February 7-8, 2012 (Tuesday-Wednesday)

Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description	4 Lanes + 1 ATM Lane

Gross Floor Area (estimated)	6300

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**5**	**3:36pm**
Wednesday	**5**	**2:37pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	912
Land Use/Building Type:	Drive-in Bank
Name of Business:	SharePoint Credit Union
Address:	3670 Aquila Ave S
City:	St. Louis Park
State:	MN
Zip Code:	55426
Date(s)	February 1-2, 2012 (Wednesday-Thursday)
Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)	High	
	Suburban CBD	Medium	X
	Rural	Low	
	Not Given		

Drive-Through Description :	2 Lanes + 1 ATM Lane
Gross Floor Area (estimated)	7,850 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**3**	**3:28pm**
Thursday	**3**	**8:51am, 10:37am**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	912
Land Use/Building Type:	Drive-in Bank
Name of Business:	TCF Bank
Address:	8020 Highway 7
City:	St. Louis Park
State:	MN
Zip Code:	55426
Date(s)	August 5-7, 2011 (Friday-Sunday)
Weather Conditions	High 84-88 °F and Clear

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	5 Lanes + 1 ATM Lane
Gross Floor Area (estimated)	6,000 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday	**4**	**5:18pm**
Monday		
Tuesday		
Wednesday		
Thursday		
Friday	**8**	**12:20pm, 2:20pm**
Saturday	**8**	**11:40am**

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	912
Land Use/Building Type:	Drive-in Bank
Name of Business:	US Bank
Address:	4000 W Broadway Ave
City:	Robbinsdale
State:	MN
Zip Code:	55422
Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	3 Lanes + 1 ATM Lane
Gross Floor Area (estimated)	21,550 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**7**	**4:47pm, 5:04pm**
Wednesday	**7**	**3:00pm, 5:26pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	912
Land Use/Building Type:	Drive-in Bank

Name of Business:	Wells Fargo
Address:	425 E Hennepin Ave
City:	Minneapolis
State:	MN
Zip Code:	55414

Date(s)	February 7, 2012 (Tuesday)

Weather Conditions	High 32 °F and Clear

Location Within Area (select one):	
CBD	
Urban (non-CBD)	X
Suburban (non-CBD)	
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	X
Low	

Drive-Through Description :	4 Lanes + 1 ATM Lane

Gross Floor Area (estimated)	12,000 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**6**	**1:18pm**
Wednesday		
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	912
Land Use/Building Type:	Drive-in Bank

Name of Business:	Wells Fargo
Address:	2329 Central Ave NE
City:	Minneapolis
State:	MN
Zip Code:	55418

Date(s)	February 7-8, 2012 (Tuesday-Wednesday)

Weather Conditions	High 32 °F and Clear

Location Within Area (select one):	
CBD	
Urban (non-CBD)	X
Suburban (non-CBD)	
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	X
Low	

Drive-Through Description :	7 Lanes (4-5 Lanes were open at various points) + 1 ATM Lane

Gross Floor Area (estimated)	20,125 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**8**	**4:41pm**
Wednesday	**6**	**11:27am, 1:48pm, 2:23pm, 4:32pm, 5:25pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	948
Land Use/Building Type:	Automated Car Wash

Name of Business:	BP
Address:	3012 Excelsior Blvd
City:	Minneapolis
State:	MN
Zip Code:	55416

Date(s)	February 1-2, 2012, (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):	
CBD	
Urban (non-CBD)	X
Suburban (non-CBD)	
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	
Low	X

Drive-Through Description :	1 Lane. Only counted the vehicles waiting in line, not the vehicles currently being washed.

Gross Floor Area (estimated)	3,375 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**6**	**3:08pm**
Thursday	**6**	**3:07pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	948
Land Use/Building Type:	Automated Car Wash

Name of Business:	BP
Address:	2441 Fariview Ave N
City:	Roseville
State:	MN
Zip Code:	55113

Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)	High	
	Suburban CBD	Medium	
	Rural	Low	X
	Not Given		

Drive-Through Description :	1 Lane. Only counted the vehicles waiting in line, not the vehicles currently being washed.
Gross Floor Area (estimated)	3,150 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**1**	**12:58pm**
Wednesday	**3**	**2:53pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	948
Land Use/Building Type:	Automated Car Wash

Name of Business:	BP
Address:	1691 Snelling Ave N
City:	Falcon Heights
State:	MN
Zip Code:	55113

Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):	
CBD	
Urban (non-CBD)	
Suburban (non-CBD)	X
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	
Low	X

Drive-Through Description :	1 Lane. Only counted the vehicles waiting in line, not the vehicles currently being washed.
Gross Floor Area (estimated)	1,500 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**4**	**1:48pm**
Wednesday	**3**	**4:29pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	948
Land Use/Building Type:	Automated Car Wash

Name of Business:	Holiday Gas Station Carwash
Address:	5430 Minnetonka Blvd
City:	St. Louis Park
State:	MN
Zip Code:	55416

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	
	Low	X

Drive-Through Description :	1 Lane. Only counted the vehicles waiting in line, not the vehicles currently being washed.

Gross Floor Area (estimated)	3,000 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**3**	**12:37pm, 1:50pm, 3:43pm, 4:41pm, 5:10pm, 7:04pm, 7:30pm**
Thursday	**4**	**2:38pm, 4:20pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	948
Land Use/Building Type:	Automated Car Wash

Name of Business:	Mister Car Wash
Address:	8650 Highway 7
City:	St. Louis Park
State:	MN
Zip Code:	55426

Date(s)	February 1-2, 2011 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):	
CBD	
Urban (non-CBD)	
Suburban (non-CBD)	X
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	
Low	X

Drive-Through Description :	2 Lanes, Full Service Wash, only vehicles in line were counted, not the vehicles being washed.

Gross Floor Area (estimated)	8,250 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**10**	**1:03pm**
Thursday	**6**	**4:02pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	948
Land Use/Building Type:	Automated Car Wash
Name of Business:	Mobil Car Wash
Address:	3864 Hopkins Crossroad
City:	Minnetonka
State:	MN
Zip Code:	55305
Date(s)	February 1-2, 2012 (Wednesday-Thursday)
Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)	High	
	Suburban CBD	Medium	
	Rural	Low	X
	Not Given		

Drive-Through Description :	2 lanes. Only vehicles in line were counted, not vehicles being washed.
Gross Floor Area (estimated)	1,225 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**4**	**6:03pm**
Thursday	**3**	**4:37pm, 6:28pm, 7:39pm, 7:51pm, 8:04pm, 8:23pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	937
Land Use/Building Type:	Coffee/Donut Shop w/ Drive Thru

Name of Business:	Caribou Coffee
Address:	4745 Cedar Ave S
City:	Minneapolis
State:	MN
Zip Code:	55407

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):	
CBD	
Urban (non-CBD)	X
Suburban (non-CBD)	
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	X
Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	1,950 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**11**	**8:50am**
Thursday	**10**	**7:57am**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	937
Land Use/Building Type:	Coffee/Donut Shop w/ Drive Thru

Name of Business:	Caribou Coffee
Address:	5330 Cedar Lake Rd
City:	St. Louis Park
State:	MN
Zip Code:	55416

Date(s)	August 5-9, 2011 (Friday-Tuesday)

Weather Conditions	High 82-88 °F and Clear

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	3,600 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday	**7**	**9:39am, 9:41am**
Monday	**10**	**8:39am**
Tuesday	**12**	**9:26am**
Wednesday		
Thursday		
Friday	**12**	**8:12am**
Saturday	**8**	**8:52am, 10:24am**

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	937
Land Use/Building Type:	Coffee/Donut Shop w/ Drive Thru

Name of Business:	Starbucks
Address:	5121 Gus Young Lane
City:	Edina
State:	MN
Zip Code:	55436

Date(s)	February 7-8, 2012 (Tuesday-Wednesday)

Weather Conditions	High 32 °F and Clear

Location Within Area (select one):	
CBD	
Urban (non-CBD)	
Suburban (non-CBD)	X
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	
Low	X

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	3,000 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**14**	**7:22am, 7:49am**
Thursday	**16**	**8:56am**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	937
Land Use/Building Type:	Coffee/Donut Shop w/ Drive Thru

Name of Business:	Starbucks
Address:	1505 Highway 7
City:	Hopkins
State:	MN
Zip Code:	55305

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	1 Lane, Queuing Went Out Onto the Street

Gross Floor Area (estimated)	1,800 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**10**	**7:42am, 8:41am, 8:59am**
Thursday	**11**	**7:33am**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	937
Land Use/Building Type:	Coffee/Donut Shop w/ Drive Thru

Name of Business:	Starbucks
Address:	4201 Minnetonka Blvd
City:	St. Louis Park
State:	MN
Zip Code:	55416

Date(s)	November 3, 2010 (Wednesday)
Weather Conditions	High 56 °F and Clear

Location Within Area (select one):	
CBD	
Urban (non-CBD)	
Suburban (non-CBD)	X
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	X
Low	

Drive-Through Description :	1 Lane, Queue Lengths Recorded at 5 min Intervals
Gross Floor Area (estimated)	2,550 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**11**	**8:45am**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	937
Land Use/Building Type:	Coffee/Donut Shop w/ Drive Thru

Name of Business:	Starbucks
Address:	2305 Fairview Ave
City:	Roseville
State:	MN
Zip Code:	55113

Date(s)	February 7-8, 2012 (Tuesday-Wednesday)

Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	1,500 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**10**	**8:09am**
Wednesday	**12**	**7:57am**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	934
Land Use/Building Type:	Fast Food with Drive Thru

Name of Business:	Arby's
Address:	1116 W Lake St
City:	Minneapolis
State:	MN
Zip Code:	55408

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):	
CBD	
Urban (non-CBD)	X
Suburban (non-CBD)	
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	X
Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	3,000 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**5**	**6:04pm**
Thursday	**5**	**6:55pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	934
Land Use/Building Type:	Fast Food with Drive Thru

Name of Business:	Burger King
Address:	6660 Wayzata Blvd
City:	Golden Valley
State:	Minnesota
Zip Code:	55426

Date(s)	August 5-8, 2011

Weather Conditions	High 82-88 °F and Clear

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	3,300 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday	**6**	**4:30pm**
Monday	**12**	**12:10pm**
Tuesday		
Wednesday		
Thursday		
Friday	**10**	**12:12pm**
Saturday	**8**	**9:38pm**

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	934
Land Use/Building Type:	Fast Food with Drive Thru

Name of Business:	McDonald's
Address:	5200 Excelsior Blvd
City:	St. Louis Park
State:	MN
Zip Code:	55416

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	2 Order Stations

Gross Floor Area (estimated)	3,600 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**12**	**11:46am**
Thursday	**13**	**12:23pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	934
Land Use/Building Type:	Fast Food with Drive Thru

Name of Business:	McDonald's
Address:	2929 Hennepin Ave S
City:	Minneapolis
State:	MN
Zip Code:	55408

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):	
CBD	
Urban (non-CBD)	X
Suburban (non-CBD)	
Suburban CBD	
Rural	
Not Given	

Competition Within Area (select one):	
High	
Medium	X
Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	3,825 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**9**	**8:48am**
Thursday	**8**	**8:54am**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	934
Land Use/Building Type:	Fast Food with Drive Thru

Name of Business:	Taco Bell
Address:	819 Cambridge St
City:	Hopkins
State:	MN
Zip Code:	55343

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	2,500 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**10**	**12:26pm**
Thursday	**8**	**12:17pm, 6:57pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	934
Land Use/Building Type:	Fast Food with Drive Thru

Name of Business:	White Castle
Address:	1111 Cambridge St
City:	Hopkins
State:	MN
Zip Code:	55343

Date(s)	February 1-2, 2012 (Wednesday-Thursday)

Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		
	CBD	
	Urban (non-CBD)	
	Suburban (non-CBD)	X
	Suburban CBD	
	Rural	
	Not Given	

Competition Within Area (select one):		
	High	
	Medium	X
	Low	

Drive-Through Description :	1 Lane

Gross Floor Area (estimated)	1,750 sq. ft

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**8**	**5:26pm**
Thursday	**5**	**8:13am, 12:10pm, 1:25pm, 3:22pm, 8:54pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	881
Land Use/Building Type:	Pharmacy/Drugstore w/ Drive-Thru
Name of Business:	CVS Pharmacy
Address:	Medicine Lake Rd & Winnetka Ave
City:	New Hope
State:	MN
Zip Code:	55427
Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		Competition Within Area (select one):	
CBD		High	X
Urban (non-CBD)		Medium	
Suburban (non-CBD)	X	Low	
Suburban CBD			
Rural			
Not Given			

Drive-Through Description :	2 Lanes
Gross Floor Area (estimated)	18, 700 sq. ft.

	Maximum Queue	Time Max Queue Occurred
Sunday		
Monday		
Tuesday	**1**	**13 times**
Wednesday	**2**	**5:55pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	881
Land Use/Building Type:	Pharmacy/Drugstore w/ Drive-Thru
Name of Business:	CVS
Address:	2426 W Broadway Ave
City:	Minneapolis
State:	MN
Zip Code:	55411
Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)	High	
	Suburban CBD	Medium	X
	Rural	Low	
	Not Given		

Drive-Through Description :	2 Lanes
Gross Floor Area (estimated)	14,200 sq. ft

	Maximum Queue	Time(s) Max Queue Occurred
Sunday		
Monday		
Tuesday	**4**	**5:28pm**
Wednesday	**4**	**6:38pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	881
Land Use/Building Type:	Pharmacy/Drugstore w/ Drive-Thru
Name of Business:	CVS
Address:	3655 Central Ave NE
City:	Minneapolis
State:	MN
Zip Code:	55418
Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
X	Urban (non-CBD)	High	
	Suburban (non-CBD)	Medium	X
	Suburban CBD	Low	
	Rural		
	Not Given		

Drive-Through Description :	2 Lanes
Gross Floor Area (estimated)	14,200 sq. ft

	Maximum Queue	Time(s) Max Queue Occurred
Sunday		
Monday		
Tuesday	**2**	**1:57pm, 3:35pm, 5:48pm, 6:07pm, 7:10pm**
Wednesday	**2**	**3:03pm, 3:52pm, 4:07pm, 4:46pm, 5:12pm, 5:20pm, 6:43pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	881
Land Use/Building Type:	Pharmacy/Drugstore w/ Drive-Thru
Name of Business:	Walgreens
Address:	540 Blake Rd N
City:	Hopkins
State:	MN
Zip Code:	55343
Date(s)	February 1-2, 2012 (Wednesday-Thursday)
Weather Conditions	High 32-36 °F and Fog

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)		High
	Suburban CBD	X	Medium
	Rural		Low
	Not Given		

Drive-Through Description :	2 Lanes
Gross Floor Area (estimated)	14,375 sq. ft

	Maximum Queue	Time(s) Max Queue Occurred
Sunday		
Monday		
Tuesday		
Wednesday	**4**	**2:33pm, 3:31pm, 4:46pm, 4:57pm, 5:28pm, 6:26pm, 6:38pm, 8:20pm, 9:20pm**
Thursday	**5**	**4:30pm, 4:52pm, 5:56pm, 6:00pm**
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	881
Land Use/Building Type:	Pharmacy/Drugstore w/ Drive-Thru
Name of Business:	Walgreens
Address:	4200 Winnetka Ave N
City:	New Hope
State:	MN
Zip Code:	55428
Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)	High	X
	Suburban CBD	Medium	
	Rural	Low	
	Not Given		

Drive-Through Description :	2 Lanes
Gross Floor Area (estimated)	16675 sq. ft.

	Maximum Queue	Time(s) Max Queue Occurred
Sunday		
Monday		
Tuesday	**3**	**4:03pm**
Wednesday	**3**	**8:34am, 4:04pm, 4:51pm**
Thursday		
Friday		
Saturday		

Appendix D

Drive-Through Queuing Data Form

ITE Land Use Code:	881
Land Use/Building Type:	Pharmacy/Drugstore w/ Drive-Thru
Name of Business:	Walgreens
Address:	4100 W Broadway Ave
City:	Robbinsdale
State:	MN
Zip Code:	55422
Date(s)	February 7-8, 2012 (Tuesday-Wednesday)
Weather Conditions	High 32 °F and Clear

Location Within Area (select one):		Competition Within Area (select one):	
	CBD		
	Urban (non-CBD)		
X	Suburban (non-CBD)	High	X
	Suburban CBD	Medium	
	Rural	Low	
	Not Given		

Drive-Through Description :	1 Lane
Gross Floor Area (estimated)	14,400 sq. ft.

	Maximum Queue	Time(s) Max Queue Occurred
Sunday		
Monday		
Tuesday	**3**	**4:49pm**
Wednesday	**2**	**12:49pm**
Thursday		
Friday		
Saturday		

Engineering Fee Paid: $ 4,440.00
Receipt No.: 144588
☐ Cash ☑ Check – Check No.: 00121613
(See attached for description of fees.)

Planning Commission & Bldg. Admin. Fees: $ 308.00
Receipt No.:
☐ Cash ☒ Check – Check No.: 00121612
(See attached for description of fees.)

RECEIVED
OCT 0 5 2020

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION
REQUEST FOR ACTION

Received: _____ Date Released to Planning Commission: _____

Date of Planning Commission Meeting: 11/10/2020 *(Unless otherwise notified.)*

APPLICANT INFORMATION AND REQUEST

APPLICANT: K. Hovnanian Meadow Lakes, LLC
COMPANY NAME: Same
ADDRESS: 3296 Columbia Rd
CITY / STATE: Richfield, OH ZIP: 44286
PHONE NO.: 440-570-4446
SIGNATURE:
EMAIL ADDRESS: tshafer@khov.com

PROPERTY OWNER: K. Hovnanian Meadow Lakes, LLC
ADDRESS: 3296 Columbia Rd.
CITY / STATE: Richfield, OH ZIP: 44286
PHONE NO.: 440-570-4446
SIGNATURE:
(Owner's original signature must be submitted with application.)

Please provide an email address, fax number or mailing address to send Administrative comments in advance of the meeting.

LOCATION OF PROPERTY/ADDRESS: White Feather Ave. North
PERMANENT PARCEL NO.: 0700033122003 **ZONING OF PROPERTY:** PCD
ZONING OF ADJACENT PROPERTY TO: NORTH PCD **EAST** R1 **SOUTH** B2 **WEST** PCD
DESCRIPTION OF REQUEST: Approval of Final Plat of Phase 18 of the Meadow Lakes Subdivision

Have the Planning Commission or Board of Zoning and Building Appeals considered any prior request concerning this property? **Yes** ☒ **No** ☐

If yes, list dates and nature of each: Approval of Preliminary Plat & Partial Plat of this parcel recorded on 4/6/20

On the attached form, list the current record title owners(s) adjacent to the property of request. Include on this list the record title owner(s) name(s), permanent parcel number(s) and mailing address(es). Adjacent properties shall include those properties bordering to the north, south, east, west, across a street from the property involved and those properties meeting corners of the property involved.

In the event of property transfers, the applicant shall be responsible for providing an updated list of current adjacent record title owner(s) to the office of the Clerk of Council twenty-five days prior to the date of any public hearing when the applicant will appear on the agenda.

PLANNING COMMISSION USE ONLY: ☐ APPROVED ☐ DISAPPROVED

All approvals are conditional until applicant fully meets the requirements of applicable City ordinances enforced by the Chief Building Official, City Engineer, Fire Department and Police Department with respect to safety and design.

☐ Board of Building & Zoning Appeals Approval Required
☐ Conditions as set forth by the Commission on this date are: _____

Date: _____ Signature: _____
(Presiding Officer at Meeting)

Return completed form to Building Dept., 7307 Avon Belden Road, North Ridgeville, Ohio, 44039 after Commission action.

TO BE FILLED OUT BY APPLICANT

I, CHARLES J. VANNOY, JR. _____
(Print Name) *(Signature)*

verify that the following are the names, mailing addresses and permanent parcel numbers of the current record title owners adjacent to the property of request for:

Applicant: K. HOVNANIAN MEADOW LAKES, LLC

Owner: K. HOVNANIAN MEADOW LAKES, LLS

Project Address: _____

THE FOLLOWING INFORMATION MAY BE OBTAINED AT THE LORAIN COUNTY AUDITOR'S OFFICE, ADMINISTRATION BUILDING, 226 MIDDLE AVENUE, ELYRIA, OHIO 44035.
PHONE: 440-329-5207 WEBSITE: WWW.LORAINCOUNTY.COM/AUDITOR

	ADJACENT PROPERTY OWNER / ADDRESS	PARCEL NUMBER
1	RIDGE MINERALS, LLC CENTER RIDGE RD. NORTH RIDGEVILLE, OH 44039	07000 33 101 028
2		07000 33 10) 035
3		07000 33 10) 032
4	37265 AMBERWAY NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO LLC.	07000 33 12 3001
5	37270 AMBERWAY NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000 33 11 9042
6	37257 WHITE FEATHER AVE. NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000 33 11 9006
7	37268 WHITE FEATHER AVE. NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000 33 12 2002
8	6911 HATCHING WAY NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO LLC.	07000 33 12 2001
9	6912 HATCHING WAY NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000 33 11 8051
10	37304 WHITE FEATHER AVE. NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000 33 11 8049

SEE REVERSE SIDE FOR ADDITIONAL LISTINGS.

OFFICE USE ONLY

CBO Verification By: _____ Date / Time Stamp:

BZA / PC Verification By: _____

	ADJACENT PROPERTY OWNER/ADDRESS	PARCEL NUMBER
11	37316 WHITE FEATHER AVE. NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000331180 48
12	37328 WHITE FEATHER AVE. NORTH RIDGEVILLE, OH 44039 K. HOVNANIAN OF OHIO, LLC	07000331180 47
13	K. HOVNANIAN MEADOW LAKES, LLC REAR LAND NORTH RIDGEVILLE, OH 44039 "BLOCK DDDDDDD"	07000331170 25
14	K. HOVNANIAN MEADOW LAKES, LLC REAR LAND NORTH RIDGEVILLE, OH 44039 "BLOCK CCCCCCC"	07000331170 24
15	K. HOVNANIAN MEADOW LAKES, LLC REAR LAND NORTH RIDGEVILLE, OH 44039 "BLOCK BBBBBBB"	07000331200 01
16	37307 AMBER WAY K. HOVNANIAN OF OHIO LLC	07000331030 47
17	37325 AMBER WAY K. HOVNANIAN OF OHIO LLC	07000331030 48
18	37343 AMBER WAY K HOVNANIAN OF OHIO LLC	07000331030 49
19	37355 AMBER WAY K. HOVNANIAN OF OHIO LLC	07000331030 50
20	37367 AMBER WAY K. HOVNANIAN OF OHIO LLC	07000331030 51
21		
22		
23		
24		
25		
26		

PLEASE COPY THIS PAGE FOR ADDITIONAL LISTINGS OF ADJACENT PROPERTY OWNERS.

SUBDIVISION: MEADOW LAKES PHASE 1B

DATE: 10/5/20

FINAL PLAT APPROVAL: §1224.02

The following item(s) (do, does, does not) conform with the requirements of the North Ridgeville City Subdivision Regulations. Those items not conforming are explained on the final page.

	Included	Not Included	Item
1	X		Application with names of adjacent parcel owners, parcel numbers and addresses: §1210.04
2	X		Preliminary plan approval on (date): 4/6/20 §1224.05(b)(2)
3	X		Subdivision plat drawn to scale of not less than 100 feet to the inch. If more than 2 sheets, an index sheet of same dimensions must be filed with the entire subdivision on 1 sheet with all areas shown on other sheets indicated. Drawings shall be held to a minimum of 18 inches by 24 inches and a maximum of 24 inches by 36 inches outside dimensions; and must be drawn using India ink: §1224.02(a)
4	X		The final plan shows boundary lines of the area being subdivided in heavy lines with accurate distances and bearings, including original lot, township, corporations and county lines and road center lines: §1224.02(a)(1)
5	X		The final plan shows property lines of all proposed streets with their widths, names, bearings and existing sanitary and storm sewers, water mains, culverts and other underground structures within the tract and adjacent thereto: §1224.02(a)(2)
6	X		The final plan shows the accurate boundary lines of all grounds for public use and the acreage of the same: §1224.02(a)(3)
7	X		The final plan shows all common boundary corners of all adjoining lands and adjacent streets with their widths and names, the names of adjoining subdivisions and the name of record owners of adjoining parcels of unplatted land: §1224.02(a)(4)
8	X		The final plan shows all lot lines with as many bearings as necessary to describe each line and a system for identification of lots, blocks and other areas: §1224.02(a)(5)
9	X		The final plan shows easements for public uses, services or utilities and their dimensions: §1224.02(a)(6)
10	X		The final plan shows all dimensions, linear and angular, boundary locations, lots, streets, easements and areas for public or private uses, expressed in decimals of a foot and the number of acres of each reserve, park, playground and other public areas: §1224.02(a)(7)
11	X		The final plan shows the radii and chords, points of tangency, control angles for all curvilinear street center lines and radii for all rounded corners: §1224.02(a)(8)
12	X		The final plans shows all arcs, chords lengths, bearings of chords and points of tangency of the property lines of the curvilinear lines: §1224.02(a)(9)
13	X		The name of the subdivision and a description of the property subdivided, showing its location and extent, points of compass, scale of plan, dedication of streets and other public open spaces, and he names of the owner and subdivider, together with the appropriate evidence of ownership of the subdivision: §1224.02(a)(10)

	Included	Not Included	Item
14	X		Certification by a surveyor, licensed or registered in the state, to the effect that the plan represents a survey made by him/her in which the traverse of the exterior boundaries of the tract and of each block, when computed from field measurements of the ground, closed within a limit of error of 1 foot to 10,000 feet of the perimeter before balancing the survey, and that all the required survey monuments are correctly shown thereon and that those which are necessary for construction of improvements are in place on the site, with any remaining survey monuments to be properly placed upon the completion of construction: §1224.02(a)(11)
15	X		Proper acknowledgement of consent of the plat by all parties having any record, legal right, title or interest in the property: §1224.02(a)(13)
16	X		Building setback lines with dimensions to be shown on plan: §1224.02(a)(14)
17	X		A copy of the preliminary title report: §1224.02
18	X		A copy of improvement plans, if any, along with a subdivider's agreement, construction drawings, title sheet, plan view and profile view, engineering details, estimates of quantities and materials: §1228.01(a) through (h)
19	X		10 copies of the subdivision plat: §1224.05(b)(2)A
20	X		A copy of the certificate from City Engineer that all improvements have been installed or a performance agreement and bond have been filed to secure the construction: §1224.05(b)(2)A 1 and 2

PLEASE NOTE THAT THIS CHECK LIST DOES NOT SUPERSEDE CITY ORDINANCES. PLEASE MAKE SURE YOU UNDERSTAND WHAT IS REQUIRED TO BE SUBMITTED TO PLANNING COMMISSION. THE APPLICATION MAY NOT BE ACCEPTED BY PLANNING COMMISSION IF ALL REQUIRED INFORMATION, PURSUANT TO CITY ORDINANCES, IS NOT SUBMITTED WITH THE APPLICATION.

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS	
Name of Applicant:	K. Hovnanian Meadow Lakes, LLC
Name of Owner:	K. Hovnanian Meadow Lakes, LLC
Date Submitted for Consideration:	10-05-20
Date to Return to Planning Commission:	10-15-20
Regarding: Meadow Lakes Subdivision No. 18 – Final Plat	

RECOMMENDATIONS:

1. Meadow lakes Subdivision No. 18 has 47 cluster lots on 15.0391 acres with a density of 3.1215 (47 lots divided by 15.0391 acres = 3.125 density). Density is compliance is determined at the final phase of Meadow Lakes Subdivision.
2. Meadow Lakes Subdivision No. 18 has305 open space (4.6509 open space acres divided by 15.0391 total acres = 0.30). Open space compliance will be determined at final phase of Meadow Lakes Subdivision.
3. Sublot 1617 and 1634 second front yard setback shall be minimum 20 feet.
4. All else appears code compliant.

(use additional sheets if necessary)

Department Head Signature & Title: CBO

Form prepared by the Office of the Clerk of Council 6-30-99. Amended 12-13-2005.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter. (Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS

Name of Applicant:	K. Hovnanian Meadows Lakes, LLC 3296 Columbia Rd, Richfield, OH
Name of Owner:	Same
Date of Planning Commission Meeting:	Tuesday, November 10, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 29, 2020

Regarding: Final plat approval of Phase 18 of the Meadow Lakes Subdivision; located at White Feather Ave. North, in a PCD District

Permanent Parcel No. 07-00-033-122-003

Recommendations:

(Use additional sheets if necessary.)

Department Head Signature: _____ **Title:** Safety-Service Director

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

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CITY OF NORTH RIDGEVILLE PLANNING COMMISSION RECOMMENDATIONS

Name of Applicant:	K. Hovnanian Meadows Lakes, LLC 3296 Columbia Rd, Richfield, OH
Name of Owner:	Same
Date of Planning Commission Meeting:	Tuesday, November 10, 2020
Date to Return to Deputy Clerk of Council:	Thursday, October 29, 2020

Regarding: Final plat approval of Phase 18 of the Meadow Lakes Subdivision; located at White Feather Ave. North, in a PCD District

Permanent Parcel No. 07-00-033-122-003

Recommendations:

1. Since the streets are public streets, Ordinance 3862-2002 applies. The City is required to install all traffic control devices in new subdivisions and charge the developer for same.
2. Street lighting is required per CNRO Section 1226.15.
3. Detailed improvement plans and stormwater management calcluations have been approved by the Engineering Department.

(Use additional sheets if necessary.)

Department Head Signature: Daniel Rodriguez **Title:** City Engineer

Form prepared by the Office of the Clerk of Council 06-30-1999. Amended 05-30-2019.

Comments and recommendations by Administrative Officers, if any, shall be forwarded to the Commission Secretary not later than five (5) business days prior to the Commission meeting at which action is scheduled to be taken on the matter.
(Planning Commission By-Laws, Article V, Section 3)

Comments received after the deadline will be distributed to the Members the night of the meeting.

MEADOW LAKES SUBDIVISION NO. 18

SITUATED IN THE CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN AND STATE OF OHIO
AND KNOWN AS BEING PART OF ORIGINAL RIDGEVILLE TOWNSHIP LOT 33

OWNERS CERTIFICATION AND ACCEPTANCE:

SITUATED IN THE CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN, STATE OF OHIO, AND BEING PART OF ORIGINAL RIDGEVILLE TOWNSHIP LOT 33, CONTAINING 34.6163ACRES, ALL OF WHICH LIE IN ORIGINAL RIDGEVILLE TOWNSHIP LOT 33.

THE UNDERSIGNED OWNER, K. HOVNANIAN MEADOW LAKES, LLC, HEREBY CERTIFIES THAT THIS PLAT CORRECTLY REPRESENTS MEADOW LAKES SUBDIVISION NO. 18, A SUBDIVISION OF SUBLOTS 1595 TO 1641 INCLUSIVE, AND DOES HEREBY ACCEPT THIS PLAT OF THE SAME AND DEDICATES FOREVER TO PUBLIC USE AS SUCH, ALL OR PARTS OF THE STREETS AND EASEMENTS SHOWN HEREIN AND NOT HERETOFORE DEDICATED.

THE UNDERSIGNED FURTHER AGREES THAT ANY USE OR IMPROVEMENTS MADE ON THIS LAND SHALL BE IN CONFORMITY WITH ALL EXISTING PLATTING, HEALTH OR OTHER LAWFUL RULES AND REGULATIONS INCLUDING THE APPLICABLE OFF-STREET PARKING AND LOADING REQUIREMENTS OF THE CITY OF NORTH RIDGEVILLE, OHIO, FOR THE BENEFIT OF THEMSELVES AND ALL OTHER SUBSEQUENT PARTIES TAKING TITLE FROM, UNDER OR THROUGH THE UNDERSIGNED.

THE DIMENSIONS OF THE SUBLOTS AND STREETS ARE SHOWN ON THE PLAT IN FEET AND DECIMAL PARTS THEREOF. EASEMENTS ARE RESERVED WHERE INDICATED ON THE PLAT FOR PUBLIC UTILITY PURPOSES ABOVE AND BENEATH THE SURFACE OF THE GROUND.

K. HOVNANIAN MEADOW LAKES, LLC

_____
BY CHUCK VANNOY

REGIONAL PRESIDENT

NOTARY:

STATE OF OHIO
COUNTY OF _____

BEFORE ME, A NOTARY PUBLIC, IN AND FOR SAID COUNTY AND STATE DID PERSONALLY APPEAR THE ABOVE SIGNED OFFICER OF, K. HOVNANIAN OF OHIO, LLC, WHO ACKNOWLEDGED THE SIGNING OF THIS PLAT TO BE THEIR FREE ACT AND DEED BOTH INDIVIDUALLY AND AS SAID OFFICER.

IN WITNESS THEREOF I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL

THIS _____ DAY OF _____, _____.

_____
NOTARY PUBLIC

MY COMMISSION EXPIRES: _____

ACREAGE SUMMARY:

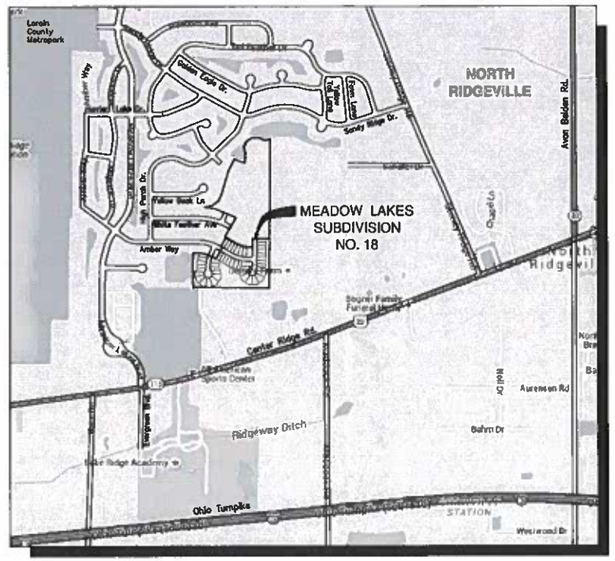
SUBLOTS 1495 THROUGH 1594

SUBLOTS 1595 TO 1641	8.3270 Ac.
RIGHT-OF-WAY	2.0612 Ac.
BLOCK 'AAAAAAA'	4.4382 Ac.
BLOCK 'BBBBBBB'	0.2127 Ac.
REMAINDER '18A' MEADOW LAKES NO. 18	19.5772 Ac.
TOTAL	34.6163 Ac.

GRAND TOTAL MEADOW LAKES SUBDIVISION NO. 18 = 34.6163 Ac.

DRAINAGE EASEMENTS:

K. HOVNANIAN MEADOW LAKES, LLC, THE OWNER OF THE WITHIN PLATTED LAND DOES HEREBY GRANT UNTO THE MEADOW LAKES SUBDIVISION HOMEOWNERS ASSOCIATION PRESENT AND FUTURE RESPONSIBILITY FOR "DRAINAGE EASEMENTS" AS SHOWN HEREON, OUTSIDE OF THE PUBLIC WAY, INCLUDING BUT NOT LIMITED TO GRADING, DRAINAGE, DRAINAGE PIPING AND DRAINAGE STRUCTURES AND IN ACCORDANCE WITH THE RECORD DESCRIPTION OF COVENANTS, CONDITIONS, RESTRICTIONS AND RESERVATION OF EASEMENTS FOR MEADOW LAKES HOMEOWNERS ASSOCIATION, AS MAY BE AMENDED FROM TIME TO TIME.



VICINITY MAP
NOT TO SCALE

INDEX OF SHEETS:

1 ... COVER SHEET
2 ... OVERALL
3 ... SUBLOTS 1595 THROUGH 1609
4 ... SUBLOTS 1610 THROUGH 1617
SUBLOTS 1626 THROUGH 1641
5 ... SUBLOTS 1617 THROUGH 1628

LOT NUMBERS:

MEADOW LAKES SUBDIVISION NO. 18
CONTAINS 47 LOTS NUMBERED 1595 TO 1641 INCLUSIVE

UTILITY EASEMENTS:

THE OWNER OF THE WITHIN PLATTED LAND DOES HEREBY GRANT UNTO UTILITIES SPECIFICALLY INCLUDING BUT NOT LIMITED TO:

THE CITY OF NORTH RIDGEVILLE, OHIO EDISON, WINDSTREAM ENGINEERING, TIME WARNER CABLE, THE CITY OF AVON LAKE UTILITIES AND COLUMBIA GAS, THEIR SUCCESSORS AND ASSIGNS (HEREIN AFTER REFERRED TO AS THE GRANTEES) A PERMANENT RIGHT-OF-WAY AND EASEMENT TWELVE (12) FEET IN WIDTH, UNDER, OVER AND THROUGH ALL SUBLOTS AND ALL LANDS OWNED BY THE GRANTOR, SHOWN HEREON AND PARALLEL WITH AND CONTIGUOUS TO THE PUBLIC THOROUGHFARES, AND ALSO UPON LANDS AS DEPICTED HEREON TO CONSTRUCT, PLACE, OPERATE, MAINTAIN, REPAIR, RECONSTRUCT, RELOCATE, RENEW, SUPPLEMENT OR REMOVE SUCH UNDERGROUND ELECTRIC AND COMMUNICATIONS CABLES, DUCTS, CONDUITS, PIPES, SURFACE OR BELOW GROUND MOUNTED TRANSFORMERS AND PEDESTALS, CONCRETE PADS AND OTHER FACILITIES AS ARE DEEMED NECESSARY OR CONVENIENT BY THE GRANTEES FOR DISTRIBUTING, TRANSPORTING, AND TRANSMITTING ELECTRICITY, GAS SERVICE AND COMMUNICATION SIGNALS FOR PUBLIC AND PRIVATE USE AT SUCH LOCATION AS THE GRANTEES MAY DETERMINE UPON, WITHIN AND ACROSS SAID EASEMENT PREMISES. SAID EASEMENT RIGHTS SHALL INCLUDE THE RIGHT, WITHOUT LIABILITY THEREFORE, TO REMOVE TREES AND LANDSCAPING, INCLUDING LAWNS WITHIN AND WITHOUT SAID EASEMENT PREMISES WHICH MAY INTERFERE WITH THE INSTALLATION, MAINTENANCE, REPAIR OR OPERATION OF SAID ELECTRIC, GAS SERVICE AND COMMUNICATIONS FACILITIES THE RIGHT TO INSTALL, REPAIR, AUGMENT AND MAINTAIN SERVICE CABLES AND PIPE LINES OUTSIDE THE ABOVE DESCRIBED EASEMENT PREMISES OR THE RIGHT OF ACCESS, INGRESS AND EGRESS TO AND FROM ANY OF THE WITHIN DESCRIBED PREMISES FOR EXERCISING ANY OF THE PROPOSES OF THE RIGHT-OF-WAY AND EASEMENT GRANT.

THE PROPOSED 20 FOOT WIDE STORM SEWER EASEMENTS ARE DEDICATED TO THE CITY OF NORTH RIDGEVILLE FOR EMERGENCY PURPOSES FOR MAINTENANCE OF THE STORM SEWER SYSTEM.

GRANTOR / OWNER / DEVELOPER:

K. HOVNANIAN MEADOW LAKES, LLC

FORMERLY KNOWN AS K. HOVNANIAN OSTER HOMES, LLC
AS PER OHIO SECRETARY OF STATE DOC. NUMBER 201613700624

OHIO DIVISION
3298 COLUMBIA ROAD
RICHFIELD, OH 44286
PHONE: 440.985.7325
CONTACT: CHRIS BROWN

APPROVALS:

CITY ENGINEER:

THIS PLAT IS APPROVED BY THE CITY ENGINEER OF THE CITY OF NORTH RIDGEVILLE

THIS _____ DAY OF _____, _____.

_____
CITY ENGINEER

CITY COUNCIL:

THIS PLAT IS APPROVED BY THE COUNCIL OF THE CITY OF NORTH RIDGEVILLE

THIS _____ DAY OF _____, _____.

_____
MAYOR

PLANNING COMMISSION:

THIS PLAT IS APPROVED BY THE PLANNING COMMISSION OF THE CITY OF NORTH RIDGEVILLE

THIS _____ DAY OF _____, _____.

_____
CITY PLANNING COMMISSION CHAIRPERSON
(OR RESPONSIBLE OFFICIAL)

SURVEYOR'S NOTE:

THIS SURVEY HAS BEEN PERFORMED WITHOUT BENEFIT OF A TITLE REPORT AND MAY NOT SHOW ALL EASEMENTS OR OTHER ENCUMBRANCES THAT AFFECT THE SUBJECT PROPERTY.

SURVEYOR'S CERTIFICATION:

THIS IS TO CERTIFY THAT, AT THE REQUEST OF THE OWNER, I HAVE SURVEYED AND PLATTED MEADOW LAKES SUBDIVISION NO. 18, AS SHOWN HEREON AND CONTAINING 34.6163 ACRES OF LAND IN ORIGINAL RIDGEVILLE TOWNSHIP LOT 33 IN THE CITY OF NORTH RIDGEVILLE, LORAIN COUNTY, OHIO. AT ALL POINTS INDICATED AS "●", IRON PIN MONUMENTS HAVE OR WILL BE SET UPON COMPLETION OF CONSTRUCTION ACTIVITIES. BEARINGS ARE BASED ON STATE PLANE, OHIO NORTH, AND ARE SHOWN TO DENOTE ANGLES ONLY. DISTANCES ARE SHOWN IN FEET AND DECIMAL PARTS THEREOF. THE PLAN REPRESENTS A SURVEY PERFORMED IN SUCH A MANNER THAT THE LINEAR ERROR IN THE DISTANCE BETWEEN ANY TWO (2) POINTS DOES NOT EXCEED THE LIMITS OF ONE (1) FOOT TO TEN THOUSAND (10,000) FEET (ALLOWABLE LINEAR ERROR = REPORTED DISTANCE DIVIDED BY TEN THOUSAND) AS PER SECTION 4733-37 OF THE OHIO ADMINISTRATIVE CODE AND ADJACENT PROPERTY DESCRIPTIONS HAVE BEEN CONSIDERED IN PERFORMING THIS SURVEY. ALL OF WHICH I CERTIFY TO BE CORRECT TO THE BEST OF MY KNOWLEDGE.

_____
ALEX E. MARKS, P.S. 8616

_____
DATE

ATWELL, LLC
7100 E. PLEASANT VALLEY ROAD, SUITE 220
INDEPENDENCE, OHIO 44131
440.349.2000

STATE OF OHIO
ALEX E. MARKS
8616
REGISTERED
PROFESSIONAL SURVEYOR

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.

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330.656.2900 www.atwell-group.com
7100 E. PLEASANT VALLEY ROAD, SUITE 220
INDEPENDENCE, OH 44131
440.349.2000

ORIGINAL RIDGEVILLE TOWNSHIP
LOT 33
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES
SUBDIVISION NO. 18 PLAT
COVER SHEET

DATE: 07/01/2020

REVISIONS

DR. BTS | CH. MS
P.M. AM
BOOK N/A
JOB 18002341
SHEET NO. 1 of 5

CAD FILE: 18002341PL-01 PM18JUN20

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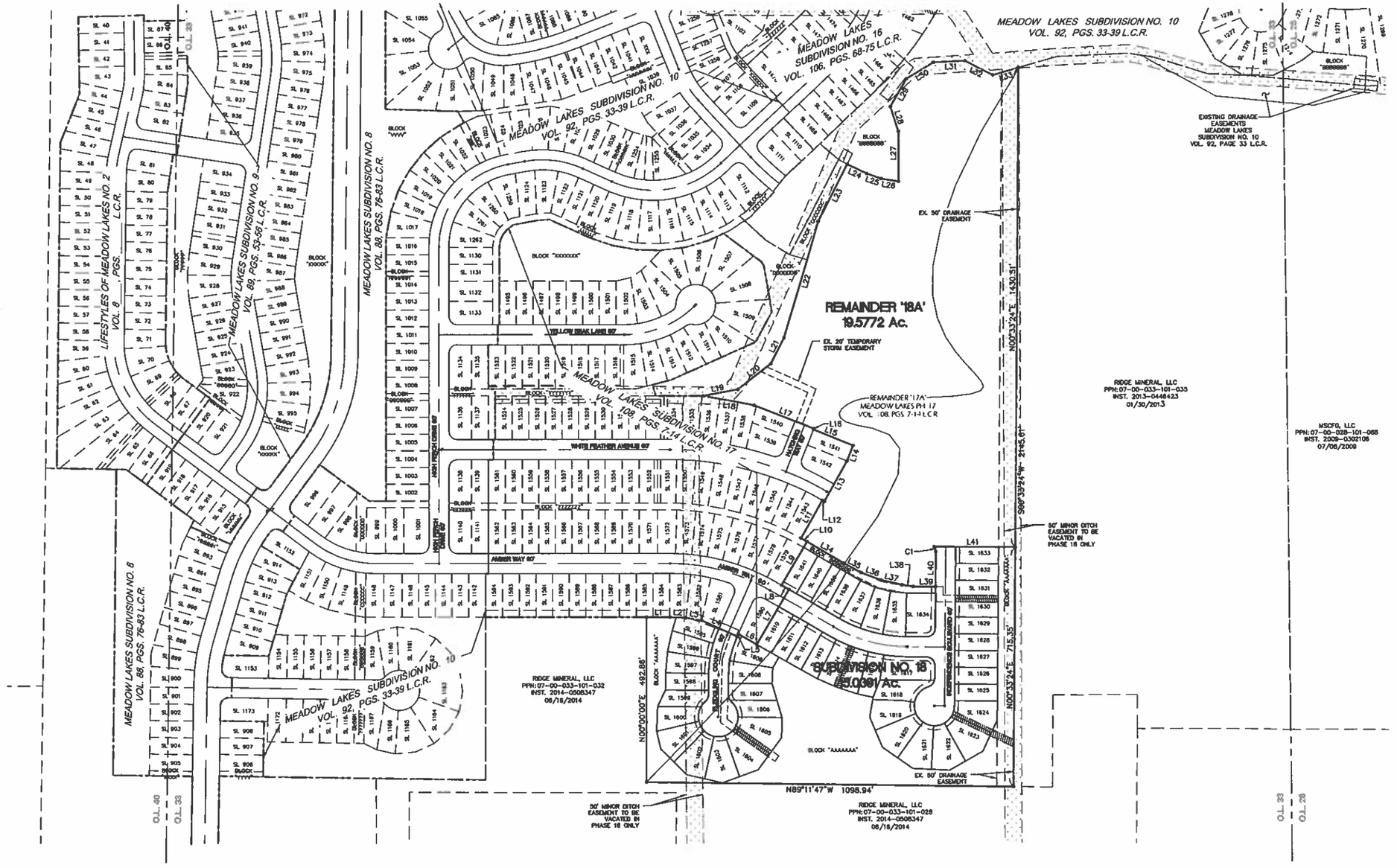

LEGEND

●	5/8" BY 30" STEEL PIN SET WITH CAP "ATWELL"	CALC.	CALCULATED
■	5/8" BY 30" STEEL PIN SET WITH CAP IN MONUMENT BOX	OBS.	OBSERVED
■	MONUMENT BOX FOUND & USED	REC.	RECORD
○ or ●F	MONUMENTATION FOUND AS NOTED AND SHOWN	S.F.	SQUARE FEET
-·-·-	CENTERLINE	AC.	ACRES
- - - -	BUILDING SETBACK LINE	VOL.	VOLUME
- - - -	UTILITY EASEMENT	PG.	PAGE
———	EXISTING PROPERTY LINE	℄	CENTERLINE
▨	PROPOSED EASEMENT	R/W	RIGHT OF WAY
		PPN	PERMANENT PARCEL NUMBER
		INST.	INSTRUMENT NUMBER

50' MINOR DITCH EASEMENT TO THE CITY OF NORTH RIDGEVILLE (ORD. 1150-76 PASSED 03-15-1976) (PORTIONS EXTINGUISHED/VACATED OR TO BE EXTINGUISHED/VACATED WITHIN SUBDIVISION LIMITS WHERE DRAINAGE IMPROVEMENTS ARE MADE AND AS INDICATED HEREON)

EXISTING 20' TEMPORARY STORM EASEMENT TO BE EXTINGUISHED/VACATED AS INDICATED HEREON

LINE TABLE		
LINE #	BEARING	LENGTH
L1	N90°00'00"E	69.42'
L2	S86°59'26"E	48.39'
L3	S80°41'09"E	48.35'
L4	S66°01'39"E	117.79'
L5	N23°58'21"E	8.12'
L6	S60°01'17"E	63.53'
L7	N29°58'43"E	190.00'
L8	N60°01'17"W	25.14'
L9	N29°58'43"E	150.00'
L10	N60°01'17"W	20.68'
L11	N29°58'43"E	130.00'

LINE TABLE		
LINE #	BEARING	LENGTH
L12	S60°01'17"E	7.03'
L13	N29°58'43"E	139.51'
L14	N21°40'47"E	50.00'
L15	N68°19'13"W	130.00'
L16	N21°40'47"E	2.76'
L17	N68°19'13"W	190.00'
L18	N79°40'35"W	156.04'
L19	N79°44'13"E	107.06'
L20	N51°59'45"E	124.29'
L21	N26°40'25"E	85.96'
L22	N16°31'22"E	361.80'

LINE TABLE		
LINE #	BEARING	LENGTH
L23	N27°36'16"E	192.81'
L24	S64°58'35"E	65.01'
L25	S70°10'57"E	45.94'
L26	S80°23'42"E	52.09'
L27	N0°02'12"W	150.00'
L28	N17°34'55"W	77.28'
L29	N29°42'15"E	95.00'
L30	N58°39'33"E	95.00'
L31	N87°36'51"E	95.00'
L32	S63°25'50"E	95.00'
L33	N74°05'27"E	79.49'

LINE TABLE		
LINE #	BEARING	LENGTH
L34	S60°01'17"E	129.32'
L35	S61°50'06"E	59.01'
L36	S69°10'05"E	63.89'
L37	S77°07'56"E	63.89'
L38	S81°06'51"E	33.49'
L39	S89°26'36"E	65.97'
L40	N0°33'24"E	105.00'
L41	S89°26'36"E	244.88'

CURVE TABLE						
CURVE #	LENGTH	RADIUS	DELTA	CHD. BEARING	CHORD	TANGENT
C1	15.88'	25.00'	36°23'27"	N17°38'20"W	15.61'	8.22'

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.

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440.340.2000

ORIGINAL RIDGEVILLE TOWNSHIP
LOT 33
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION NO. 18 PLAT
OVERALL

DATE 07/01/2020

REVISIONS

SCALE 0 75 150
1" = 150 FEET

DR. BTS CH. MS
P.M. AM
BOOK N/A
JOB 18002341
SHEET NO. 2 of 5

CAD FILE: 18002341PL-01 PH18.DWG

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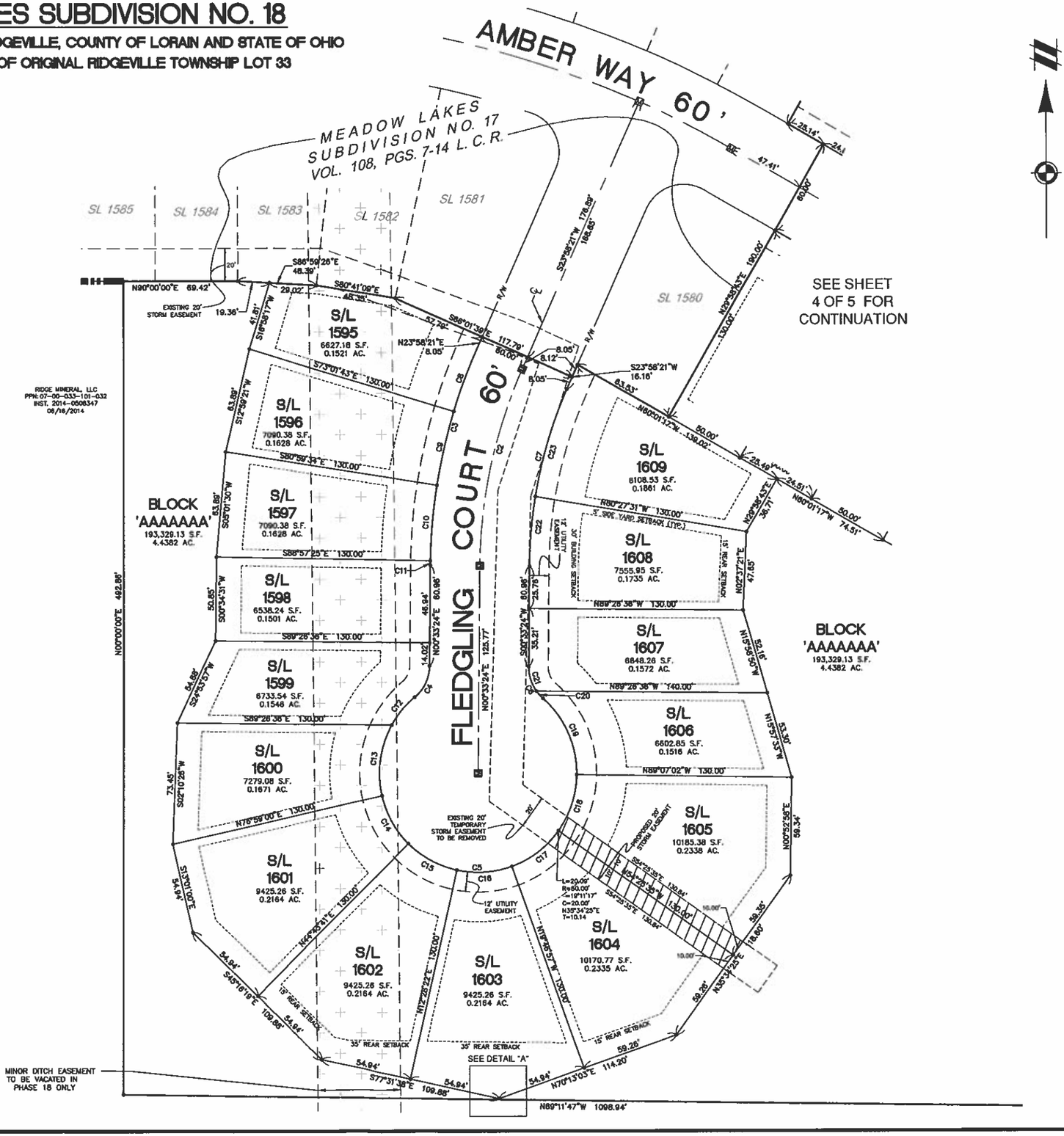
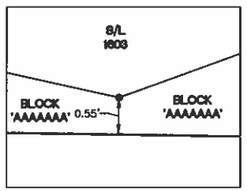
MEADOW LAKES SUBDIVISION NO. 18

SITUATED IN THE CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN AND STATE OF OHIO
AND KNOWN AS BEING PART OF ORIGINAL RIDGEVILLE TOWNSHIP LOT 33

CURVE TABLE						
CURVE #	LENGTH	RADIUS	DELTA	CHD. BEARING	CHORD	TANGENT
C2	122.61'	300.00'	23°24'58"	N12°15'52"E	121.75'	62.17'
C3	134.87'	330.00'	23°24'58"	N12°15'52"E	133.93'	68.39'
C4	21.68'	25.00'	49°40'47"	N25°23'47"E	21.00'	11.57'
C5	292.54'	60.00'	279°21'34"	N89°26'36"W	77.65'	50.92'
C6	21.68'	25.00'	49°40'47"	S24°17'00"E	21.00'	11.57'
C7	110.35'	270.00'	23°24'58"	S12°15'52"W	109.58'	55.95'
C8	40.32'	330.00'	7°00'04"	N20°28'19"E	40.30'	20.19'
C9	45.87'	330.00'	7°57'51"	N12°59'21"E	45.83'	22.97'
C10	45.87'	330.00'	7°57'51"	N5°01'30"E	45.83'	22.97'
C11	2.80'	330.00'	0°29'11"	N0°47'59"E	2.80'	1.40'
C12	21.95'	60.00'	20°57'48"	N39°45'17"E	21.83'	11.10'
C13	44.29'	60.00'	42°17'22"	N8°07'41"E	43.29'	23.21'
C14	33.78'	60.00'	32°15'19"	N29°08'39"W	33.33'	17.35'
C15	33.78'	60.00'	32°15'19"	N61°23'58"W	33.33'	17.35'
C16	33.78'	60.00'	32°15'19"	S86°20'43"W	33.33'	17.35'
C17	36.28'	60.00'	34°38'39"	S52°53'44"W	35.73'	18.71'
C18	36.33'	60.00'	34°41'26"	S18°13'42"W	35.78'	18.74'
C19	52.37'	60.00'	50°00'22"	S24°07'13"E	50.72'	27.98'
C20	5.85'	25.00'	13°24'09"	S42°25'19"E	5.83'	2.94'
C21	15.83'	25.00'	36°16'38"	S17°34'55"E	15.57'	8.19'
C22	42.34'	270.00'	8°59'06"	S5°02'56"W	42.30'	21.21'
C23	68.00'	270.00'	14°25'52"	S16°45'25"W	67.83'	34.18'





DETAIL "A"
SCALE 1" = 1'

SEE SHEET 2 FOR LEGEND

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

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ORIGINAL RIDGEVILLE TOWNSHIP
LOT 33
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION NO. 18 PLAT
SUBLOTS 1595 – 1609

DATE 07/01/2020

REVISIONS

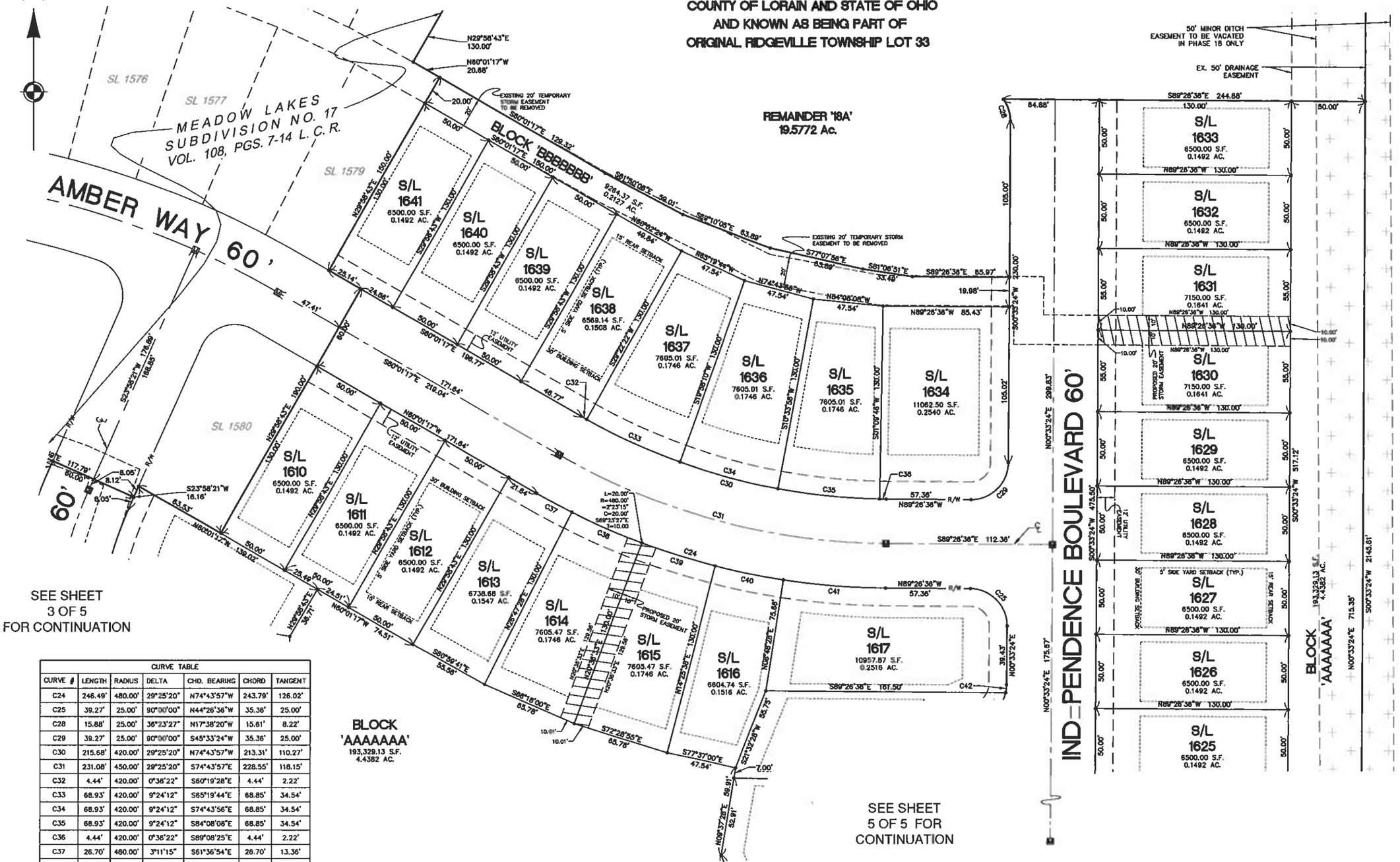
SCALE 0 15 30
1" = 30 FEET

DR. BTS | CH. MS
P.M. AM
BOOK N/A
JOB 18002341
SHEET NO. 3 of 5

CAD FILE: 18002341PL-01 PH18.DWG

MEADOW LAKES SUBDIVISION NO. 18

SITUATED IN THE CITY OF NORTH RIDGEVILLE,
COUNTY OF LORAIN AND STATE OF OHIO
AND KNOWN AS BEING PART OF
ORIGINAL RIDGEVILLE TOWNSHIP LOT 33



SEE SHEET 3 OF 5 FOR CONTINUATION

SEE SHEET 5 OF 5 FOR CONTINUATION

CURVE TABLE						
CURVE #	LENGTH	RADIUS	DELTA	CHD. BEARING	CHORD	TANGENT
C24	246.49'	480.00'	29°25'20"	N74°43'57"W	243.79'	126.02'
C25	39.27'	25.00'	90°00'00"	N44°26'36"W	35.36'	25.00'
C28	15.88'	25.00'	36°23'27"	N17°38'20"W	15.61'	8.22'
C29	39.27'	25.00'	90°00'00"	S45°33'24"W	35.36'	25.00'
C30	215.68'	420.00'	29°25'20"	N74°43'57"W	213.31'	110.27'
C31	231.08'	450.00'	29°25'20"	S74°43'57"E	228.55'	118.15'
C32	4.44'	420.00'	0°36'22"	S60°19'28"E	4.44'	2.22'
C33	68.93'	420.00'	9°24'12"	S65°19'44"E	68.85'	34.54'
C34	68.93'	420.00'	9°24'12"	S74°43'56"E	68.85'	34.54'
C35	68.93'	420.00'	9°24'12"	S84°08'08"E	68.85'	34.54'
C36	4.44'	420.00'	0°36'22"	S89°08'25"E	4.44'	2.22'
C37	26.70'	480.00'	3°11'15"	S61°36'54"E	26.70'	13.36'
C38	51.79'	480.00'	6°10'55"	S66°18'00"E	51.76'	25.92'
C39	51.79'	480.00'	6°10'55"	S72°28'55"E	51.76'	25.92'
C40	47.08'	480.00'	5°37'10"	S78°22'57"E	47.06'	23.56'
C41	69.12'	480.00'	8°15'04"	S85°19'04"E	69.06'	34.62'
C42	5.52'	25.00'	12°39'11"	S6°52'59"W	5.51'	2.77'

SEE SHEET 2 FOR LEGEND

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ORIGINAL RIDGEVILLE TOWNSHIP
LOT 33
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION NO. 18 PLAT
SUBLOTS 1610 – 1617
SUBLOTS 1626 – 1641

DATE 07/01/2020

REVISIONS

SCALE 0 15 30
1" = 30 FEET

DR. BTS | CH. MS
P.M. AM
BOOK N/A
JOB 18002341
SHEET NO. 4 of 5

CAD FILE: 18002341-PL-01 PH18.DWG

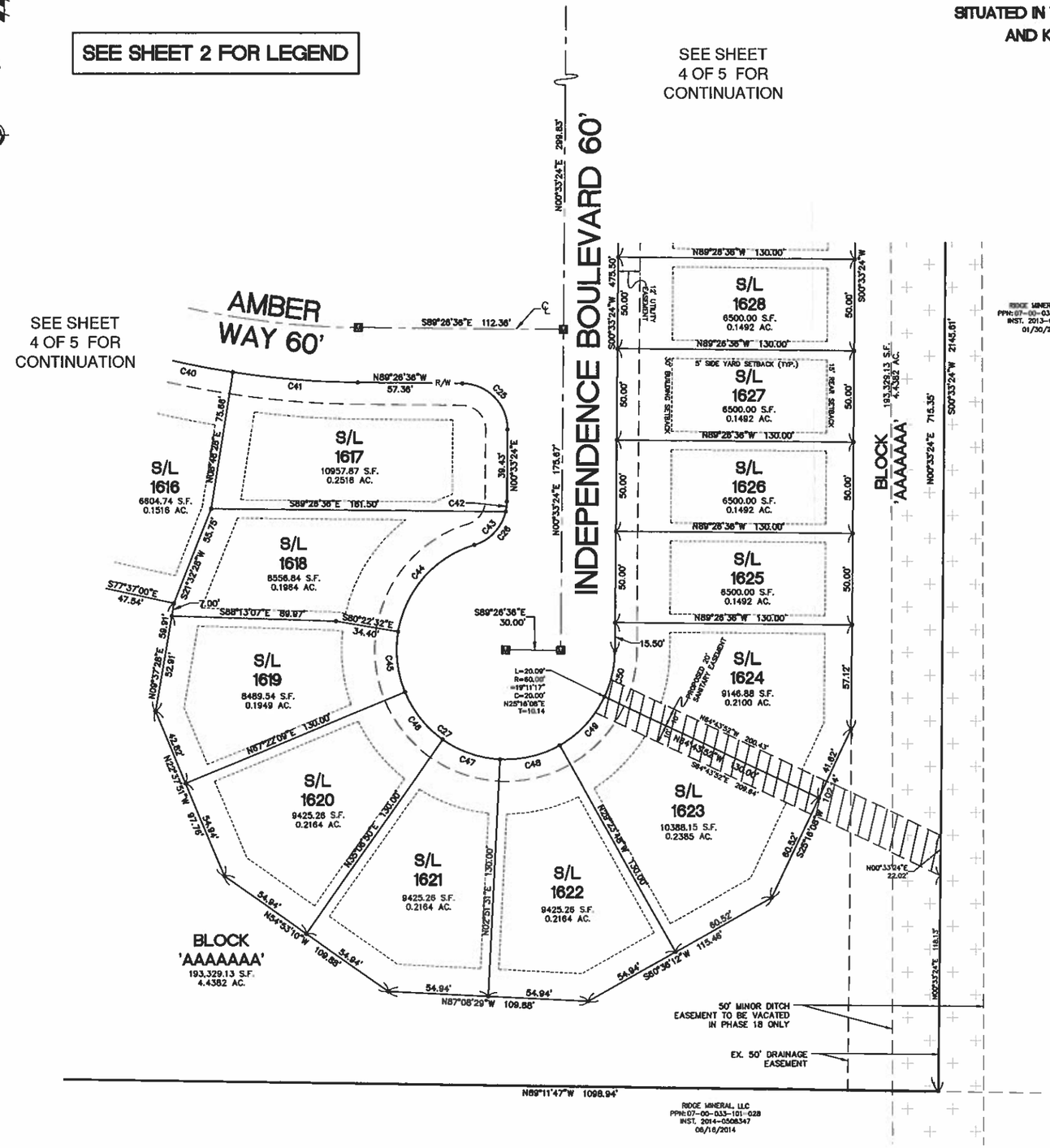
MEADOW LAKES SUBDIVISION NO. 18

SITUATED IN THE CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN AND STATE OF OHIO
AND KNOWN AS BEING PART OF ORIGINAL RIDGEVILLE TOWNSHIP LOT 33

SEE SHEET 2 FOR LEGEND

SEE SHEET 4 OF 5 FOR CONTINUATION

SEE SHEET 4 OF 5 FOR CONTINUATION



CURVE TABLE						
CURVE #	LENGTH	RADIUS	DELTA	CHD. BEARING	CHORD	TANGENT
C25	39.27'	25.00'	90°00'00"	N44°26'36"W	35.36'	25.00'
C26	31.81'	25.00'	72°53'43"	N37°00'15"E	29.70'	18.46'
C27	264.83'	60.00'	252°53'45"	N52°59'45"W	98.53'	81.24'
C40	47.08'	480.00'	5°37'10"	S76°22'57"E	47.06'	23.56'
C41	69.12'	480.00'	8°15'04"	S85°19'04"E	69.06'	34.62'
C42	5.52'	25.00'	12°39'11"	S6°52'59"W	5.51'	2.77'
C43	28.29'	25.00'	60°14'32"	S43°19'51"W	25.09'	14.50'
C44	68.84'	60.00'	63°49'39"	S41°32'17"W	63.44'	37.37'
C45	33.78'	60.00'	32°15'19"	S6°30'12"E	33.33'	17.35'
C46	33.78'	60.00'	32°15'19"	S38°45'31"E	33.33'	17.35'
C47	33.78'	60.00'	32°15'19"	S71°00'50"E	33.33'	17.35'
C48	33.78'	60.00'	32°15'19"	N76°43'52"E	33.33'	17.35'
C49	37.00'	60.00'	35°20'04"	N42°56'10"E	36.42'	19.11'
C50	25.88'	60.00'	24°42'46"	N12°54'45"E	25.68'	13.14'

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LOT 33
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES
SUBDIVISION NO. 18 PLAT
SUBLOTS 1617 – 1628

DATE 07/01/2020

REVISIONS

SCALE 0 15 30
1" = 30 FEET

DR. BTS | CH. MS
P.M. AM
BOOK N/A
JOB 18002341
SHEET NO. 5 of 5

CAD FILE: 18002341PL-01 PHASING

MEADOW LAKES SUBDIVISION #18

SINGLE FAMILY HOUSING DEVELOPMENT
CITY OF NORTH RIDGEVILLE, LORAIN COUNTY, OHIO
SANITARY CONSTRUCTION DRAWINGS

APPLICANT/OWNER
K. HOVNANIAN HOMES LLC
OHIO DIVISION
3296 COLUMBIA ROAD
RICHFIELD, OHIO 44286
(440) 985-7304 PHONE
CONTACT: CHRIS BROWN

ENGINEER/SURVEYOR/ECOLOGICAL
ATWELL , LLC
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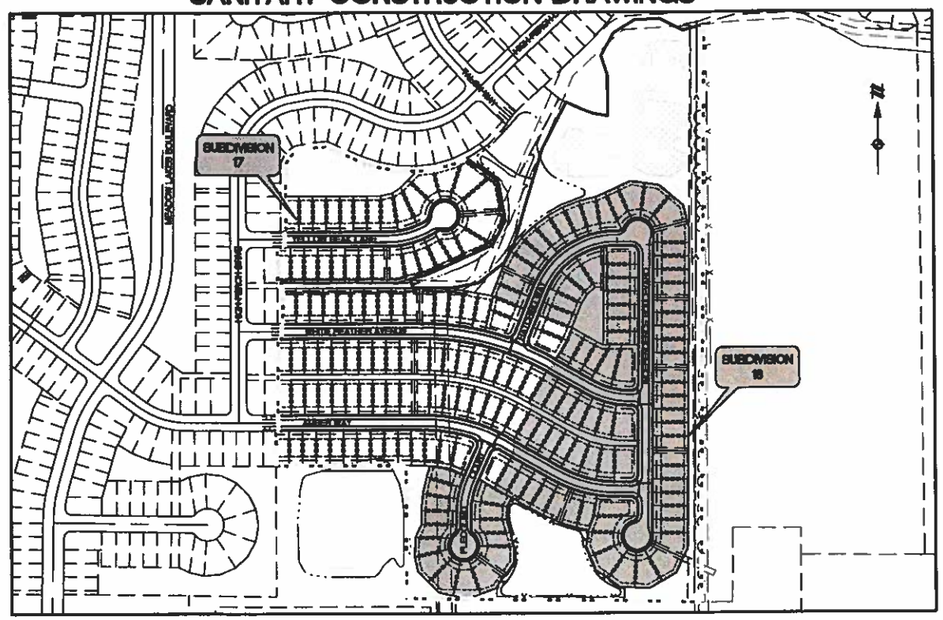
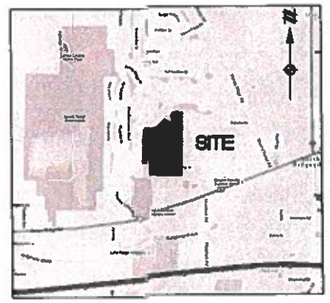
(440) 349-2028 FAX
CONTACT: TIMOTHY RUSSELL
EMAIL: TRUSSELL@ATWELL-GROUP.COM



AREA MAP
SCALE: 1" = 250'



VICINITY MAP
SCALE

UTILITIES OWNER

CITY OF NORTH RIDGEVILLE
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COLUMBIA GAS
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PHONE: (440) 891-2428
dsuren@nisource.com

LEGEND

- MEASURED BOUNDARY
- BOUNDARY TIE
- ADJACENT BOUNDARY
- EASEMENT
- FENCE
- STORM SEWER
- MANHOLE
- CATCH BASIN/INLET
- SANITARY SEWER
- C.O. CLEANOUT
- WATER MAIN
- HYDRANT
- SHUTOFF OR CURB BOX
- GATE VALVE IN BOX
- OHE OVERHEAD ELECTRIC
- UGE UNDERGROUND ELECTRIC
- GUY WIRE
- U.P. UTILITY POLE
- E ELECTRICAL BOX /METER
- UTE UNDERGROUND TELEPHONE
- GAS GAS
- GR GAS RISER
- T TELEPHONE BOX
- CURB AND GUTTER
- B BOLLARD
- SIGN
- GV GAS VALVE
- GM GAS METER
- W WATER METER
- C CALCULATED POINT
- F FOUND MONUMENT AS NOTED
- S SET 5/8" IRON PIN
- R RECORD
- M MEASURED
- C CALCULATED
- PPN PERMANENT PARCEL NUMBER
- 835 PROP. 5' CONTOUR
- 834 EXIST. 1' CONTOUR
- 835 EXIST. 5' CONTOUR
- 834 PROP. 1' CONTOUR
- PROP. STORM SEWER
- PROP. CATCH BASIN/INLET
- PROP. STORM MANHOLE
- PROP. STOP SIGN
- PROP. STREET SIGN

SITE DATA

RESIDENTIAL SUBDIVISION
198 SUBLOTS
53.91 ACRES

BENCHMARKS

NO.	DESCRIPTION	ELEVATION	NORTHING	EASTING
1	SANITARY MH RIM	716.73	628941.9449	2004368.2390
2	SANITARY MH RIM	713.91	628256.773	2004372.348

SHEET INDEX

SHEET NO.	DESCRIPTION
1.0	COVER SHEET
2.0	EXISTING CONDITIONS AND TOPOGRAPHIC SURVEY PLAN
3.0	GENERAL PLAN
3.1	UTILITY PLAN
4.0	GENERAL NOTES
4.1	GENERAL NOTES
6.0	STORMWATER POLLUTION PREVENTION PLAN
6.1	STORMWATER POLLUTION PREVENTION PLAN
6.2	STORMWATER POLLUTION PREVENTION PLAN
6.3	STORMWATER POLLUTION PREVENTION PLAN
7.0	SWP3 SPECIFICATIONS
7.1	SWP3 GENERAL NOTES
7.2	SWP3 DETAILS
7.3	SWP3 DETAILS
7.4	SWP3 DETAILS & OUTLET STRUCTURE SEDIMENT CONTROL DEVICE DETAILS
8.0	FINAL GRADING PLAN
8.1	FINAL GRADING PLAN
8.2	FINAL GRADING PLAN
8.3	FINAL GRADING PLAN
8.4	EXISTING POND AND OUTLET STRUCTURE MODIFICATIONS
9.4	WHITE FEATHER PLAN & PROFILE - (STA:11+00 TO 18+00)
9.6	AMBER WAY PLAN & PROFILE - (STA:8+00 TO 13+00)
9.7	AMBER WAY PLAN & PROFILE - (STA:13+00 TO 18+00)
9.8	HATCHING WAY PLAN & PROFILE - (STA:-0+50 TO 3+50)
9.9	HATCHING WAY PLAN & PROFILE - (STA:3+50 TO 8+00)
9.10	INDEPENDENCE BLVD PLAN & PROFILE - (STA:-0+50 TO 4+00)
9.11	INDEPENDENCE BLVD PLAN & PROFILE - (STA:4+00 TO 7+50)
9.12	INDEPENDENCE BLVD PLAN & PROFILE - (STA:7+50 TO 12+00)
9.13	FLEDGLING COURT PLAN & PROFILE - (STA:-0+50 TO 5+00)
9.14	AUXILIARY STORM PROFILES
9.15	AUXILIARY STORM PROFILES
9.16	AUXILIARY STORM PROFILES
9.17	AUXILIARY STORM PROFILES
11.0	TYPICAL STORM DETAILS
11.1	TYPICAL DETAILS
11.2	TYPICAL DETAILS
11.3	TYPICAL WATER DETAILS
11.4	TYPICAL WATER DETAILS & RETENTION POND DETAILS
11.5*	TYPICAL PAVEMENT DETAILS
11.6	TYPICAL DETAILS

*ROADWAY TYPICAL SECTION LOCATED ON SHEET 11.5

NOTES:

1. STREET LIGHTING REQUIRED TO BE INSTALLED BY THE DEVELOPER.
2. LANDSCAPING AND SIGNAGE REQUIREMENTS DELEGATED BY THE USACE PERMIT FOR THE RELOCATED DITCH WILL BEPERFORMED UNDER SEPARATE DOCUMENTATION. DEVELOPER RESPOSIBLE FOR WORK TO BE PERFORMED.
3. PRIOR TO BEGINNING CONSTRUCTION THE CONTRACTOR SHALL SUPPLY A SIGNED CONSTRUCTION SET ACKNOWEDGING THEIR RESPONSIBILITY TO FOLLOW THE SWPPP FOR THIS PROJECT

THE UNDERSIGNED HAS BEEN INFORMED AND UNDERSTANDS THEIR ROLE AND RESPONSIBILITY IN COMPLYING WITH THIS STORM WATER POLLUTION PREVENTION PLAN:

CONTRACTOR: _____
BY: _____ DATE: _____
CONTRACTOR: _____
BY: _____ DATE: _____
CONTRACTOR: _____
BY: _____ DATE: _____

STATE OF OHIO
TIMOTHY D. RUSSELL
E-82878
REGISTERED
PROFESSIONAL ENGINEER

SUBMITTED BY:

SUBMITTED BY ATWELL: _____ DATE: 04-14-2020
TIMOTHY D. RUSSELL, PE / RE ENGINEER NO. 82878

ENGINEERING APPROVALS:

EPA APPROVAL ONLY
City Engineer _____ Date 4-16-2020

APPROVED BY: _____ DATE: _____
NORTH RIDGEVILLE CITY ENGINEER

OHIO E.P.A:

WATER APPROVED BY O.E.P.A. LETTER DATED: 04-22-2019
PERMIT NUMBER: 12070-WS

SANITARY APPROVED BY O.E.P.A. LETTER DATED: _____
PERMIT NUMBER: _____

NPDES PERMIT APPROVAL DATE: 04-2-2018
PERMIT NUMBER: 3GC10010*AG

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

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INDEPENDENCE, OH 44131

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
COVER SHEET

DATE: JANUARY 11, 2019

APPR. CO. ISSUED
CITY SUBMITTAL NO. 2

REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 1.0

CAD FILE: 18002341-SUB-CV • PM: TJDRS

LEGEND

- MEASURED BOUNDARY
- BOUNDARY TIE
- ADJACENT BOUNDARY
- EASEMENT
- FENCE
- STORM SEWER
- MANHOLE
- CATCH BASIN/INLET
- SANITARY SEWER
- C.O. CLEANOUT
- WATER MAIN
- HYDRANT
- SHUTOFF OR CURB BOX
- GATE VALVE IN BOX
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- GUY WIRE
- U.P. UTILITY POLE
- ELECTRICAL BOX /METER
- UNDERGROUND TELEPHONE
- GAS
- GAS RISER
- TELEPHONE BOX
- CURB AND GUTTER
- BOLLARD
- SIGN
- GAS VALVE
- GAS METER
- WATER METER
- C CALCULATED POINT
- F FOUND MONUMENT AS NOTED
- S SET 5/8" IRON PIN
- R RECORD
- M MEASURED
- C CALCULATED
- PPN PERMANENT PARCEL NUMBER

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440.348.2000

BENCHMARKS

NO.	DESCRIPTION	ELEVATION	NORTHING	EASTING
1	SANITARY MH RIM	716.73	628941.9440	2094368.2390
2	SANITARY MH RIM	715.91	628256.773	2084372.243

NOTE:

1. EXISTING POND ELEVATIONS SHOWN ARE BASED ON DESIGN DRAWINGS PREPARED BY BRAMHALL AND PROVIDED BY K. HOVNANIAN.
2. PHASE 10 REFLECTED PER PLAN (NOT AS-BUILT) UNLESS OTHERWISE NOTED.

SECTION | TOWN | NORTH, RANGE | EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

EXISTING CONDITIONS AND TOPOGRAPHIC SURVEY PLAN

DATE: JANUARY 11, 2019

APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 40 80
1" = 80 FEET

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 2.0

CAD FILE: 18002341-02.0-EX - PM 18.DWG

HIGH PERCH DRIVE

MEADOW LAKES
SUBDIVISION NO. 10
VOL. 92, PAGE 33 L.C.R.

YELLOW BEAK LANE

WHITE FEATHER AVENUE

HAWK WAY

INDEPENDENCE BLVD

PHASE 17

PHASE 18

AMBER WAY

FLEDGLING COURT

EX. POND
NORMAL WATER ELEV:710.50± (DESIGN)
100 YEAR WATER ELEV:711.70 (DESIGN)

EX. IRRIGATION POND
NORMAL WATER ELEV:710.50±

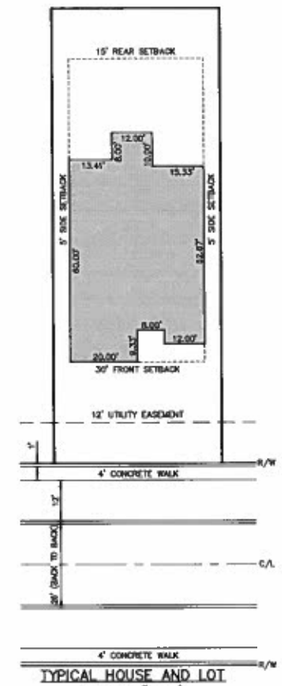
RIDGE MINERALS, LLC
PPN:07000331010 32

RIDGE MINERAL, LLC
PPN:07000331010 35
INST. 2013-0446423
01/30/2013

PR. POND
NORMAL WATER ELEV:710.50 (DESIGN)

3 RAIL VINYL FENCE
(SEE DETAIL THIS SHEET)

NOTE:
NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' STORM SEWER EASEMENTS.

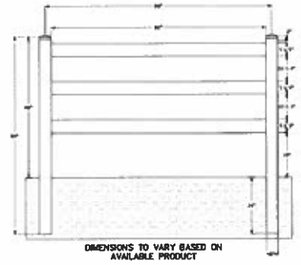


TYPICAL HOUSE AND LOT
SCALE: 1"=20'

LEGEND

- PR. CONC. (ROADWAY)
- PR. SIDEWALK (BY DEVELOPER)
- PR. SIDEWALK (BY HOME BUILDER)
- PR. DRIVEWAY (BY HOME BUILDER)
- ON-SITE POND

NOTES:
1. SEE SHEET 01 OF 08 - 08 OF 08 FOR MEADOW LAKES SUBDIVISION #17 PLAT.



DIMENSIONS TO VARY BASED ON AVAILABLE PRODUCT

3 RAIL VINYL FENCE DETAIL
NTS

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

GENERAL PLAN

DATE
JANUARY 11, 2019

APR 13 2020
OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 40 80
1" = 80 FEET

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 3.0

CAD FILE: 18002341-03.0-GP - PH 18.DWG

811
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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

UTILITY PLAN

DATE JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 40 80
1" = 80 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 3.1

CAD FILE: 18002341-03.1-UP - PH 18.DWG

CITY OF NORTH RIDGEVILLE
STANDARD GENERAL NOTES

GENERAL

1. ALL WORK AND MATERIALS SHALL MEET THE RULES, LAWS & CODES OF THE CITY OF NORTH RIDGEVILLE.

2. THE FOLLOWING UTILITIES MAY BE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

PAVEMENTS	CITY OF NORTH RIDGEVILLE	(440) 353-0842
STORM SEWERS	CITY OF NORTH RIDGEVILLE	(440) 353-0842
SANITARY SEWERS	CITY OF NORTH RIDGEVILLE	(440) 353-0842
WATERLINES	CITY OF NORTH RIDGEVILLE	(440) 353-0842
GAS-COLUMBIA GAS	DAN SUREN	(440) 891-2428
TELEPHONE-WINDSTREAM	GEOFF HAMM	(440) 328-4247
ELECTRIC-OHIO EDISON	MIKE ZANNI	(440) 326-3271
CABLE-SPECTRUM	RON HRIBAL	(440) 386-0418 (EXT. 625)
WATER TRANSMISSION	AVON LAKE MUNICIPAL UTILITIES	(440) 933-6228

THE CONTRACTOR SHALL VERIFY THE ABOVE INFORMATION WITH OUPS WHEN HE CONTACTS THEM BEFORE CONSTRUCTION BEGINS.

3. THE CONTRACTOR SHALL LOCATE ALL UTILITIES OR UNDERGROUND STRUCTURES PRIOR TO CONSTRUCTION AND NOTIFY EACH RESPECTIVE UTILITY OWNER FORTY-EIGHT (48) HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

4. WHERE IN ANY CASE THE PLANS AND SPECIFICATIONS DO NOT ENTIRELY COVER MATERIALS AND/OR WORKMANSHIP, THE "STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, CONSTRUCTION AND MATERIAL SPECIFICATIONS", CURRENT EDITION WILL APPLY. ODOT REFERENCES MAY BE INDICATED THROUGHOUT THE PLANS. MATERIAL AND WORKMANSHIP SHALL ALSO CONFORM TO THE SPECIFICATIONS, RULES AND ORDINANCES OF THE CITY OF NORTH RIDGEVILLE. WHERE CONFLICTS OCCUR IN THE ABOVE, THE CITY ENGINEER SHALL DETERMINE THE GOVERNING AUTHORITY. ANY DEFECTS IN THE CONSTRUCTION INCLUDING MATERIALS OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE CITY ENGINEER. REFERENCES THROUGHOUT THESE PLANS TO "THE ENGINEER" SHALL BE THE CITY ENGINEER.

5. ALL WORK SHALL BE DONE IN A SAFE MANNER AND AS A MINIMUM SHALL COMPLY WITH THE SPECIFIC SAFETY REQUIREMENTS OF THE OSHA AS DEFINED IN 29 CRF 1926.

6. AT LEAST FIVE DAYS PRIOR TO THE START OF ACTUAL CONSTRUCTION WORK, A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD AT THE DIRECTION OF THE CITY OF NORTH RIDGEVILLE ENGINEER AND APPROPRIATE CITY OFFICIALS, AND THE OWNER'S ENGINEER. THE CONTRACTOR OR HIS AUTHORIZED SUPERINTENDENT SHALL BE PRESENT, ALONG WITH ANY AND ALL PRIVATE UTILITY COMPANY REPRESENTATIVES. THIS MEETING WILL BE FOR COORDINATION AND PROCEDURE REVIEW PRIOR TO COMMENCING ANY PHYSICAL WORK.

7. THE CONTRACTOR SHALL NOT COMMENCE WITH ANY FORM OF CONSTRUCTION WITHOUT GIVING 24 HOUR NOTICE TO THE OFFICE OF THE CITY ENGINEER TO ARRANGE FOR INSPECTION. IF ANY CHANGE IN THE WORK SCHEDULE BECOMES NECESSARY, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE INSPECTOR TO AVOID UNNECESSARY INSPECTION COSTS. IF NO NOTIFICATION IS MADE IN REGARDS TO CANCELLATION OF WORK, THE CONTRACTOR WILL BE CHARGED A MINIMUM OF FOUR (4) HOURS.

8. THE CONTRACTOR SHALL SUPPLY ALL LABOR, MATERIAL, AND EQUIPMENT NECESSARY, SUCH AS CALCIUM CHLORIDE, WATER, OR A MOTORIZED DUST-FREE STREET SWEEPING DEVICE, AS DIRECTED BY THE ENGINEER, TO MAINTAIN ALL ROADWAYS BEING USED FOR ACCESS TO THE CONSTRUCTION SITE.

9. THE CONTRACTOR SHALL FURNISH AND MAINTAIN ALL NECESSARY SAFEGUARDS SUCH AS BARRICADES, SATISFACTORY BARRIERS, LIGHTING, FLAGMEN, TEMPORARY GUARDRAIL, AND SUCH OTHER TRAFFIC CONTROL DEVICES AS PROVIDED IN "ITEM 614 – MAINTAINING TRAFFIC" SO AS TO AVOID DAMAGE AND/OR INJURY TO VEHICLES AND PERSONS USING THE ROADWAY DURING CONSTRUCTION. ALL AREAS OF PAVEMENT REMOVAL WHICH HAVE NOT BEEN FULLY RESTORED SHALL BE PROTECTED WITH CONES OR DRUMS DURING DAYLIGHT HOURS. THESE AREAS SHALL BE PROTECTED WITH FLASHING BARRICADES OR DRUMS WITH STEADY BURNING LIGHTS AT NIGHT. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS AS TO THE PROPOSED WORK WITH MINIMUM HAZARD, DELAY, AND INCONVENIENCE TO THE MOTORISTS USING THE STREETS AFFECTED BY THE WORK DONE UNDER THE CONTRACT AND HE SHALL COORDINATE ALL CLOSING OF STREETS WITH THE CITY ENGINEER AND THE POLICE CHIEF OF THE CITY OF NORTH RIDGEVILLE.

10. ACCESS ROADS SHALL BE KEPT FREE OF MUD, DEBRIS, DIRT, ETC, AND SHALL BE CLEANED EVERY DAY AT THE END OF WORK OR MORE FREQUENTLY IF SO ORDERED BY THE CITY OF NORTH RIDGEVILLE.

11. THE CONTRACTOR AND ANY SUBCONTRACTOR SHALL HAVE A COMPETENT SUPERVISOR ON THE PROJECT AT ALL TIMES WHEN WORK IS BEING DONE.

12. NO SLAG OR OTHER SULFUROUS MATERIAL WILL BE USED ON THE PROJECT.

12. FOR RESIDENTIAL SUBDIVISIONS, THE TRAFFIC CONTROL SIGNS WILL BE ERECTED BY THE CITY OF NORTH RIDGEVILLE AND THE COST OF INSTALLATION WILL BE PAID BY THE DEVELOPER. THE INSTALLATION AND COST OF THE STREET NAME SIGNS AND STREET LIGHTS WILL BE DONE BY THE DEVELOPER AT HIS EXPENSE.

13. THE CITY ENGINEER SHALL BE NOTIFIED FORTY-EIGHT (48) HOURS PRIOR TO BEGINNING THE ACTUAL CONSTRUCTION.

EARTHWORK

1. ALL EXCAVATION AND FILL WORK SHALL BE DONE IN ACCORDANCE WITH ODOT CONSTRUCTION AND MATERIALS SPECIFICATIONS.

2. THE SUBGRADE IN THE STREET SHALL BE LEFT TWO INCHES HIGH FOR THE PAVEMENT CONTRACTOR TO TRIM DOWN TO FINAL GRADE. THE CONTRACTOR SHALL PROOF ROLL THE GRADE WITH A FULLY LOADED (MAXIMUM LEGAL WEIGHT) TRIAXLE DUMP TRUCK. ANY "SOFT" SPOTS SHALL BE REMOVED AND REPLACED WITH COMPACTED EARTH.

3. EARTHWORK SHALL BE DONE IN SUCH A FASHION AS TO NOT TRAP WATER DURING CONSTRUCTION.

4. TREE AND BRUSH CLEARING/DISPOSAL SHALL BE DONE IN A MANNER ACCEPTABLE TO THE CITY OF NORTH RIDGEVILLE.

5. ALL PAVEMENT AREAS SHALL HAVE ALL ORGANICS AND TOPSOIL REMOVED FROM THE AREA.

6. AT ALL TIMES DURING THE PROGRESS OF THE WORK AND UNTIL RELEASE OF THE CONTRACTOR FROM HIS GUARANTEE BY THE OWNER, THE CONTRACTOR SHALL MAINTAIN THE BACKFILLED TRENCHES AND OTHER EXCAVATIONS. IN PARTICULAR, THOSE TRENCHES OR EXCAVATIONS WHICH ARE WITHIN FIFTEEN (15) FEET OF THE EDGE OF PAVEMENT OR THE EDGE OF TRAVELED ROADWAYS, SHALL BE KEPT FILLED UP THE SAME LEVEL AS THE ADJACENT UNDISTURBED GROUND, ANY SETTLEMENT WHICH OCCURS DURING THIS PERIOD SHALL BE IMMEDIATELY FILLED IN TO PREVENT THE POSSIBILITY OF ACCIDENTS.

7. WHERE EXISTING SEWERS ARE ENCOUNTERED AND ARE INTERFERED WITH, FLOWS SHALL BE MAINTAINED. SEWAGE OR OTHER LIQUID MUST BE HANDLED BY THE CONTRACTOR EITHER BY CONNECTION INTO OTHER SEWERS (WITH THE APPROVAL OF THE CITY ENGINEER) OR BY TEMPORARY PUMPING TO A SATISFACTORY OUTLET. SEWAGE OR OTHER LIQUID SHALL NOT BE PUMPED, BAILED OR FLUMED OVER THE STREET.

9. BACKFILL SHALL INCLUDE THE MATERIAL PLACED ABOVE THE BEDDING AND SHALL CONSIST OF FINELY DIVIDED SOIL FREE FROM STONES, RUBBISH, LARGE CLUMPS OR OTHER HARMFUL DEBRIS. THE BACKFILL SHALL BE TAMPED IN SIX (6) INCH LAYERS.

10. BACKFILL WITHIN EXISTING OR PROPOSED PAVED OR STONE STREETS, ALLEYS, DRIVEWAYS, PARKING AREA AND PROPOSED SIDEWALKS, OR WITHIN FIVE (5) FEET OF THESE AREAS SHALL CONSIST OF A DURABLE GRAVEL OR CRUSHED STONE MEETING THE REQUIREMENTS OF ITEM 304 OF THE CURRENT ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE USE OF A 304 RECYCLED CONCRETE EQUIVALENT AND SLAG IS PROHIBITED. THE GRANULAR BACKFILL SHALL BE MECHANICALLY TAMPED IN SIX (6) INCH LAYERS SO THAT THE BACKFILL WILL HAVE A DENSITY EQUAL TO A MINIMUM OF 95% OF THAT POSSIBLE UNDER OPTIMUM MOISTURE CONTENT AS DETERMINED BY STANDARD PROCTOR TEST.

ROADWAY

1. ALL TREES AND BRUSH, AND ANY OTHER VEGETATION WITHIN THE LIMITS OF THIS PROJECT THAT INTERFERE WITH THE CONSTRUCTION SHALL BE REMOVED FROM THE SITE. STUMPS MAY BE GROUND OUT OR REMOVED FROM THE SITE.

2. ALL EARTHWORK SHALL HAVE INSPECTION AND TESTING AS DEEMED NECESSARY BY THE CITY OF NORTH RIDGEVILLE. SUCH INSPECTION WILL BE COORDINATED BY THE "CONTRACTOR", WHO SHALL USE A SOILS TESTING LABORATORY TO MAKE THE TESTS INCIDENTAL TO THE QUALITY CONTROL OF THE EARTHWORK OPERATION. SOIL TESTING AND CLASSIFICATION SHALL BE PERFORMED BY THE SOILS TESTING LABORATORY TO DETERMINE THE PROPER MOISTURE CONTENT AND SOIL DENSITY BEFORE BEGINNING EARTHWORK CONSTRUCTION. THE COST OF THIS INSPECTION AND TESTING WILL BE PAID BY THE CONTRACTOR, THE CONTRACTOR SHALL PRESENT HIS PLAN AND SCHEDULE FOR EARTHWORK OPERATIONS AT THE PRE-CONSTRUCTION CONFERENCE.

3. WHERE SOFT SUBGRADE IS ENCOUNTERED, DUE TO NO FAULT OR NEGLECT OF THE CONTRACTOR, IN WHICH SATISFACTORY STABILITY CANNOT BE OBTAINED BY MOISTURE CONTROL AND COMPACTION, THE UNSTABLE MATERIAL SHALL BE EXCAVATED TO THE DEPTH REQUIRED BY THE ENGINEER. BACKFILLING OF THESE EXCAVATED AREAS SHALL BE WITH EMBANKMENT MATERIAL FROM THE CONSTRUCTION PROJECT OR AGGREGATE BASE (ODOT ITEM 304) OR "AS DIRECTED BY THE ENGINEER."

4. CONCRETE WILL BE TESTED BY AN ODOT QUALIFIED LABORATORY DURING CONSTRUCTION FOR AIR ENTRAINMENT AND SLUMP. CONCRETE TEST CYLINDERS WILL BE PREPARED FOR EACH 50 YARDS OR FRACTION THEREOF. CONCRETE BEAMS MAY BE PREPARED AT THE CONTRACTOR'S OPTION. THE CONCRETE MIX DESIGN SHALL BE APPROVED BY THE SAME TESTING LABORATORY DESIGNATED TO PERFORM THE ON-SITE INSPECTION PRIOR TO CONSTRUCTION.

5. CONCRETE PAVEMENT CURING COMPOUND SHALL BE SILENCURE A FROM CHEMMASTERS, 300 EDWARDS ST., MADISON, OHIO, 44057.

6. IN AREAS OF HIGH GROUNDWATER OR WHERE SURFACE SEEPAGE HAS BEEN OBSERVED IT MAY BE NECESSARY TO CONSTRUCT DRAINS PERPENDICULAR TO THE PROPOSED PAVEMENT. THESE UNCLASSIFIED PIPE UNDERDRAINS, CONSTRUCTED IN ACCORDANCE WITH ODOT ITEM 605, SHALL BE 3 FEET BELOW PAVEMENT GRADE AND CONNECTED INTO THE APPROPRIATE STORM CONDUIT OR OUTLET. CONDUIT SHALL BE 6" DIAMETER PERFORATED PVC TYPE PS-48 PIPE CONFORMING TO ASTM F-758 OR 6" DIAMETER PERFORATED PSM POLYVINYL CHLORIDE (PVC) PIPE CONFORMING TO ASTM D-3034 SDR 35, WITH GEOTEXTILE DRAIN SLEEVE MEETING THE REQUIREMENTS OF ODOT 712.09, TYPE A, AND WITH NO. 8 STONE OR GRAVEL AGGREGATE.

UNDERGROUND INSTALLATIONS – GENERAL

1. THE VARIOUS UNDERGROUND INSTALLATION ITEMS SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL EXCAVATION, MATERIAL, LABOR, BEDDING, BACKFILL, COMPACTION, EQUIPMENT, UTILITY PROTECTION, MAINTENANCE OF ROADWAYS AND DRIVES UNTIL FINAL REPLACEMENT, PUMPING AND/OR DEWATERING, CONSTRUCTION AND REMOVAL OF ALL NECESSARY TRENCH PROTECTION AND ALL OTHER INCIDENTAL ITEMS NECESSARY TO INSTALL SUCH UTILITY. THE CONTRACTOR IS TO TOTALLY FAMILIARIZE HIMSELF WITH THE GROUND CONDITIONS THAT NOW DO OR MAY EXIST DURING THE CONSTRUCTION SO AS NOT TO ADVERSELY AFFECT THE INTEGRITY OF ANY UTILITY INSTALLATION OR STRUCTURE ON THE CONSTRUCTION SITE OR ADJACENT PROPERTIES.

2. ALL SANITARY SEWER AND STORM SEWER CONSTRUCTION SHALL CONFORM WITH ODOT ITEM 611.

3. ANY UNSUITABLE MATERIAL, MATERIAL NOT APPROVED BY THE ENGINEER FOR BACKFILL AND MATERIAL IN EXCESS OF THAT REQUIRED FOR BACKFILLING SHALL BE DISPOSED OF BY THE CONTRACTOR ON THE SITE.

4. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO PREVENT ANY CAVING OR SETTLING OF EXCAVATION OR TRENCH WALLS WHICH COULD ENDANGER THE SAFETY OF ANY PERSON ENGAGED IN THE WORK OR IN ANY WAY DAMAGE THE UNDERGROUND INSTALLATIONS OF ADJACENT UTILITY OR PROPERTY, OR DIMINISH THE TRENCH WIDTH NECESSARY FOR THE PROPER CONSTRUCTION OF THE UNDERGROUND INSTALLATION OR OTHERWISE INJURE OR DELAY THE WORK. THE TYPE AND AMOUNT OF SUCH PROTECTION, SUCH AS TRENCH BOXES, SHEETING, SHORING, OR BRACING SHALL BE CONSISTENT WITH THE DEPTH AND WIDTH OF EXCAVATION, THE COMPOSITION AND WATER CONTENT OF THE SOIL IN THE PROXIMITY OF STRUCTURES OR OTHER UTILITIES, THE VIBRATION FROM EQUIPMENT AND THE SPOIL PLACEMENT, AND SHALL BE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS.

5. IN ORDER TO REDUCE GROUND WATER SEEPAGE AND PROVIDE A STABLE TRENCH IT MAY BE NECESSARY TO DEWATER PRIOR TO EXCAVATION OF THE SEWER TRENCH AND/OR PROVIDE TEMPORARY SUMPS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ADJACENT STRUCTURES, PAVEMENTS, OR UTILITIES, OR LOSS OF PRIVATE WELL WATER RESULTING FROM DEWATERING, LOSS OF GROUND, HEAVE, TRENCH CONSTRUCTION, AND ANY OTHER CONSTRUCTION METHODS. THE CONTRACTOR SHALL PROTECT ALL EXISTING SEWERS AND UTILITIES THAT THE PROPOSED INSTALLATION CROSSES BY COMPACTING THE BACKFILL UNDER SUCH EXISTING FACILITIES OR SHALL PROTECT THE EXISTING FACILITY IN A MANNER AS APPROVED BY THE ENGINEER. IF SHEETING IS USED, IT MAY BE NECESSARY TO DRIVE THE SHEETING SEVERAL FEET BELOW THE BOTTOM OF THE PIPE. WHEN USING MOVABLE TRENCH SUPPORTS OR SHEETING, CARE MUST BE EXERCISED SO AS NOT TO DISTURB THE PIPE LOCATION, JOINTING OR BEDDING MATERIAL. IF STEEL SHEETING IS USED IT SHALL BE HELD IN PLACE BY LONGITUDINAL BEAMS AND CROSS BRACES OR STRUTS AS REQUIRED TO RESTRAIN THE TOP OF THE SHEETING. IF TIMBER SHEETING AND BRACING IS USED, IT MUST BE OF GOOD QUALITY AND OF HARDWOOD CONSTRUCTION. AFTER THE PIPE HAS BEEN INSTALLED AND THE BALANCE OF THE BEDDING MATERIAL HAS BEEN PLACED OVER THE PIPE, THE REMOVAL OF ANY TRENCH PROTECTION SHALL BE CAREFULLY CONTROLLED. THE CONTRACTOR SHALL DEMONSTRATE THAT THE REMOVAL OF THE TRENCH PROTECTION WILL NOT ADVERSELY AFFECT THE PIPE LOCATION AND BEDDING. IF SHEETING CANNOT BE REMOVED WITHOUT ADVERSELY AFFECTING THE PIPE AND BEDDING LOCATION, THE ENGINEER MAY ORDER THE SHEETING CUT OFF AT SOME POINT, AT LEAST ONE FOOT ABOVE THE TOP OF THE PIPE AND LEFT IN PLACE.

6. PRIOR TO ANY CONNECTION INTO AN EXISTING SEWER MANHOLE OR CONDUIT THE CONTRACTOR SHALL TAKE SUCH MEASURES AS NECESSARY, "AS APPROVED BY THE ENGINEER", (I.E. TEMPORARY PLUGS, SAND BAGS, ETC.) DURING THE COURSE OF THE CONSTRUCTION OF THE PROPOSED SEWERS, TO GUARD AGAINST ANY DRAINAGE FROM ENTERING THE EXISTING SYSTEM AND POSSIBLY CONTAMINATING SUCH SYSTEM WITH SILT.

7. WHERE THE PROPOSED IMPROVEMENTS CROSS EXISTING OR PROPOSED PAVEMENTS, INCLUDING A POINT FIVE (5) FEET BEYOND SUCH CROSSINGS, OR WHERE THE CONSTRUCTION METHODS USED BY THE CONTRACTOR RESULT IN THE TRENCH WALL BEING LESS THAN 3 FEET FROM THE EDGE OF THE PAVEMENT, THE ENTIRE TRENCH BACKFILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 8 INCHES IN THICKNESS WITH MECHANICAL TAMPERS MEETING NINETY-EIGHT (98) PERCENT OF MAXIMUM LABORATORY DRY WEIGHT.

8. THE LINE AND GRADE OF SEWER MAINS SHALL BE CONTROLLED DURING THE SEWER CONSTRUCTION BY USE OF AN APPROVED LASER DEVICE.

9. AT ALL STORM SEWER MAIN AND SANITARY SEWER MAIN INTERSECTIONS (CROSSINGS) WHEN PIPE CLEARANCE IS LESS THAN 18", THE LOWER PIPE SHALL BE ENCASED AND THE UPPER PIPE SHALL BE MONOLITHICALLY CRADLED IN 2500 PSI CONCRETE FOR THE WIDTH OF THE TRENCH. AT PIPE CROSSINGS GREATER THEN 18" THE BACKFILL BELOW THE UPPER PIPE SHALL BE COMPACTED IN PLACE TO THE SATISFACTION OF THE ENGINEER.

STORM SEWERS

1. STORM SEWER CONDUIT SHALL CONFORM TO THE FOLLOWING REQUIREMENTS: STORM CONDUIT BETWEEN STREET BASINS AND CONNECTING TO MANHOLE SHALL BE (A.) ONLY IF COVER IS LESS THAN OR EQUAL TO ONE FOOT MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE SUBGRADE, OR MAY BE (E.) IF COVER IS GREATER THAN ONE FOOT MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE SUBGRADE. ALL FOOTING DRAIN CONNECTIONS SHALL BE (B.) ONLY.

   A. REINFORCED CONCRETE PIPE ASTM C-76, "B" OR "C" WALL, 8 FOOT LENGTHS, WITH AN "O" RING CONFINED GASKET JOINT PER ASTM C-443: (A) 12" & LARGER DIA. CLASS IV.

   B. POLYVINYL CHLORIDE (PVC) ASTM D-3034 (SDR 35) (ODOT 707.45) WITH GASKET MATERIAL CONFORMING TO ASTM F-477 AND JOINTS PER ASTM D-3212 OR SOLVENT CEMENT JOINTS PER ASTM D-2564.

   C. PERMA-LOC (PVC) AASHTO SPECIFICATION IN M-304M (ODOT 707.43) WITH INTEGRAL BELL GASKET JOINTS IN ACCORDANCE WITH ASTM D-3212 AND INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.

   D. ULTRA-RIB (PVC) ASTM F 794 (ODOT 707.43) WITH INTEGRAL BELL AND SPIGOT JOINT IN ACCORDANCE WITH ASTM D-3212 AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

   E. SMOOTH INTERIOR, CORRUGATED, HIGH DENSITY POLYETHYLENE PIPE (HDPE) CONFORMING TO AASHTO SPECIFICATIONS M252 TYPE S AND M-294 TYPE S, (ODOT 707.33) ADS N-12, HANCOR HI-Q, OR APPROVED EQUAL. THE JOINTS SHALL BE SILT-TIGHT AND THE GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477 (NOT PRESSURE RATED), INSTALLED IN ACCORDANCE WITH ASTM D-3212 AND MANUFACTURER'S RECOMMENDATIONS.

2. OTHER OPTIONAL MATERIALS MAY BE USED WHEN APPROVED BY THE CITY ENGINEER.

3. UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ODOT ITEM 605. CONDUIT SHALL BE 6" DIAMETER PVC TYPE PS-48 PIPE CONFORMING TO ASTM F-758, OR 6" DIAMETER PSM POLYVINYLCHLORIDE (PVC) PIPE CONFORMING TO ASTM D-3034 SDR 35, WITH A GEOTEXTILE SLEEVE MEETING THE REQUIREMENTS OF ODOT ITEM 712.09, TYPE A, AND WITH THE GRANULAR MATERIAL BEING NO. 57 AGGREGATE (NO SLAG)

4. ROOF DRAINS ARE TO BE DISCHARGED ONTO SPLASH BLOCKS. NO CONNECTION TO STORM SEWER.

5. AT LEAST 60 DAYS PRIOR TO THE END OF THE PERIOD FOR WHICH IMPROVEMENTS ARE COVERED BY MAINTENANCE BONDS, THE DEVELOPER SHALL CLEAN AND VIDEO TAPE THE STORM SEWER, SANITARY SEWER AND MANHOLES, OR CAUSE THIS TO BE DONE BY A SUBCONTRACTOR OR BUILDER(S) WHO THE DEVELOPER HOLDS RESPONSIBLE PRIOR TO RELEASE OF THE MAINTENANCE BONDS COVERING THE IMPROVEMENTS. TWO (2) COPIES OF THE VIDEO TAPE(S) AND A WRITTEN REPORT OF THE RESULTS SHALL BE FURNISHED TO THE DEVELOPER AND THE CITY ENGINEER, BOTH THE TAPING AND THE WRITTEN REPORT SHALL BE DONE TO THE SATISFACTION OF THE DEVELOPER AND THE CITY ENGINEER OR THIER DESIGNEES. ANY AND ALL PROBLEMS DISCOVERED SHALL BE REMEDIATED WITHIN TEN (10) WORKING DAYS BY THE DEVELOPER OR BY THE PARTY THE DEVELOPER SHALL CAUSE TO REMEDIATE THE PROBLEMS, IF ANY

6. ALL MAIN LINE STORM SEWERS SHALL BE CLEANED AND VIDEOTAPED IMMEDIATELY AFTER CONSTRUCTION AND THE VIDEOTAPE SUBMITTED TO THE CITY ENGINEER FOR REVIEW AND APPROVAL. ALL DEFECTS SHALL BE PROMPTLY REPAIRED BY THE CONTRACTOR.

OCTOBER 1, 2008 -- REV. 5/11/09, 9/29/09, 12/7/09, 8/18/16

5/9/17, 6/28/17

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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 ANY PART OF THE CONTRACTOR'S WORK EXCEPT TO BE THE WORK OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

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SECTION
TOWN, NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

GENERAL NOTES

DATE JANUARY 11, 2019

APRIL 13, 2020
CITY SUBMITTAL NO. 2

REVISIONS

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CITY OF NORTH RIDGEVILLE
STANDARD GENERAL NOTES

SANITARY SEWERS

1. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER ARE PROHIBITED.

2. THE SANITARY SEWER SHALL PASS A LOW PRESSURE AIR TEST AND A 5% DEFLECTION TEST. THESE TESTS SHALL BE CONDUCTED BY A COMPETENT TESTER, PREFERABLY AN INDEPENDENT TESTING COMPANY.

   A. DEFLECTION TEST:

   IF PVC PIPE IS USED, THE DEFLECTION TEST WILL BE RUN NOT LESS THAN 30 DAYS NOR MORE THAN 45 DAYS AFTER THE FINAL AND FULL BACKFILL HAS BEEN PLACED. THE TEST IS REQUIRED ON ALL PVC PIPE. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY EQUIPMENT FOR THE DEFLECTION TESTING. ALL EQUIPMENT SHALL BE APPROVED BY THE CITY OF NORTH RIDGEVILLE PRIOR TO THE START OF TESTING. WHERE POSSIBLE, ELECTRONIC EQUIPMENT SHALL BE USED TO MEASURE AND RECORD THE DELFECTION IN THE FLEXIBLE PIPE. NO PIPE SHALL EXCEED A DEFLECTION OF FIVE PERCENT. IF SUCH EQUIPMENT IS NOT AVAILABLE, THE DEFLECTION TEST CAN BE RUN BY THE USE OF MANDRELS, HAVING A DIAMETER EQUAL TO NINETY-FIVE (95) PERCENT OF THE INSIDE DIAMETER OF THE PIPE, PULLED THROUGH THE SEWER WITHOUT MECHANICAL PULLING DEVICES. MANDRELS SHALL BE CONSTRUCTED WITH AT LEAST NINE EVENLY SPACED ARMS OR PRONGS. A METAL PROVING RING SHALL BE PROVIDED TO VERIFY THE ACCURACY OF THE MANDREL TO THE CITY ENGINEER. THE LENGTH OF THE MANDREL SHALL BE EIGHT INCHES FOR EIGHT INCH PIPE, TEN INCHES FOR TEN AND TWELVE INCH PIPE. IF ANY SECTION OF CONDUIT EXCEEDS THE DEFLECTION OF FIVE PERCENT, THE NECESSARY CORRECTIONS SHALL BE MADE. CONDUIT WHICH HAS DEFLECTED MORE THAN FIVE PERCENT MUST BE CORRECTED TO THE SATISFACTION OF THE CITY ENGINEER BY THE CONTRACTOR. THE PIPE SHALL BE MEASURED IN COMPLIANCE WITH ASTM D2122.

   B. THE LEAKAGE, EXFILTRATION, OR INFILTRATION SHALL NOT EXCEED 100 GALLONS PER INCH OF PIPE DIAMETER PER MILE PER DAY.

3. THE SANITARY SEWER MAIN AND ITS LATERALS SHALL BE PVC ASTM D3034, WITH GASKETED JOINTS MEETING ASTM D3212 SDR-35, UNLESS DEPTH OF COVER IS 15 FEET OR GREATER THEN USE ASTM D3034 SDR-26.

4. SANITARY MANHOLES SHALL BE PRECAST CONCRETE MEETING THE STANDARDS OF THE CITY OF NORTH RIDGEVILLE. THE MANHOLE SHALL BE FULLY INSPECTED AROUND ITS EXTERIOR BEFORE BACKFILLING. ANY SUSPECTED WEAK SPOTS, CRACKS, ETC. THAT MAY CAUSE A LEAK IN THE FUTURE SHALL BE PATCHED, SEALED, ETC. WITH WATERPROOFING MATERIALS. PARTICULAR ATTENTION SHALL BE PAID TO THE BARREL JOINTS, STEP LOCATIONS, LIFTING HOLES, AND THE JOINT BETWEEN THE GRADE RINGS AND THE CASTING. ALL MANHOLES SHALL BE VACUUM TESTED PER ASTM-C1244.

5. GRADE RINGS SHALL BE USED TO BRING ALL CASTING TO GRADE, MAXIMUM 11 INCHES.

6. IF THE CASTING IS DISTURBED AFTER IT IS INSTALLED IT SHALL BE COMPLETELY REMOVED, CLEANED, AND THEN REINSTALLED.

7. THE CONTRACTOR SHALL MARK ALL LATERAL LOCATIONS IN THE FIELD WITH A CONTINUOUS 4" X 4" WOODEN STAKE FROM INVERT TO 2'-6" ABOVE GRADE, PAINTED ORANGE OR RED.

8. "LOW-PRESSURE" AIR TESTING FOR PLASTIC PIPE SHALL BE PER ASTM-F1417.

9. ALL MAINLINE SANITARY SEWER SHALL BE VIDEO TAPED PER CITY ORDINANCE.

10. HORIZONTAL AND VERTICAL SEPARATION BETWEEN WATERLINE, STORM SEWERS, AND SANITARY SEWERS SHALL BE MAINTAINED AS FOLLOWS:

    A. A MINIMUM 10-FOOT HORIZONTAL SEPARATION (MEASURED OUT-TO-OUT CLEAR) BETWEEN THE PROPOSED WATERLINE AND THE STORM SEWER WILL BE MAINTAINED.

    B. A MINIMUM 10-FOOT HORIZONTAL SEPARATION (MEASURED OUT-TO-OUT CLEAR) BETWEEN THE PROPOSED WATERLINE AND THE SANITARY SEWER WILL BE MAINTAINED.

    C. A MINIMUM 18-INCH VERTICAL CLEARANCE (MEASURED OUT-TO-OUT CLEAR) BETWEEN THE PROPOSED WATERLINE AND THE SANITARY SEWER WILL BE MAINTAINED.

    D. A MINIMUM 18-INCH VERTICAL CLEARANCE (MEASURED OUT-TO-OUT CLEAR) BETWEEN THE PROPOSED WATERLINE AND THE STORM SEWER WILL BE MAINTAINED.

11. THE CONTRACTOR WILL COLOR FILM BOTH SANITARY AND STORM SEWERS TO VERIFY THAT THEY ARE FREE OF DEFECTS AND FOREIGN MATTER AND THAT THEY ARE TO THE PROPER ALIGNMENT PRIOR TO FORMAL ACCEPTANCE BY THE CITY OF NORTH RIDGEVILLE. THE INSPECTION AND TESTING SHALL BE DONE BY AN EXPERIENCED AND CERTIFIED FIRM ENGAGED IN THIS TYPE OF WORK, AS APPROVED BY THE CITY. WRITTEN REPORTS FOR ALL INSPECTION AND TESTING SHALL BE SUBMITTED TO THE OWNER AND THE CITY FOR APPROVAL. ALL SEWERS WILL BE FLUSHED AND HAVE A VCR TELEVISED INSPECTION IN ACCORDANCE WITH THE CITY OF NORTH RIDGEVILLE SPECIFICATIONS AFTER THE COMPLETION OF THE PAVEMENT CONSTRUCTION AND SEEDING OF THE DISTURBED AREAS, BUT PRIOR TO THE ISSUANCE OF BUILDING PERMITS. IF THE INSTALLATION FAILS TO MEET THE REQUIREMENTS OF THE TESTS AND INSPECTION, THE CONTRACTOR SHALL REPAIR OR REPLACE ALL DEFECTS AND RETEST AND RE-FILM THE INSTALLATION. THE CONTRACTOR SHALL NOTIFY THE CITY 48 HOURS BEFORE THE STORM AND SANITARY SEWERS ARE TELEVISED.

WATER SYSTEM

1. THE WATER SYSTEM SHALL BE CONSTRUCTED PER THE CITY OF NORTH RIDGEVILLE STANDARDS & REGULATIONS.

2. THE WATERLINE SHALL BE PVC MEETING THE REQUIREMENTS OF AWWA C900, OR C909, CLASS 150 PIPE CONFORMING TO DR18 OR DUCTILE IRON PIPE , CLASS 52, CEMENT LINED MEETING THE REQUIREMENTS OF ANSI A21.51 AND AWWA C-151.

3. A MINIMUM OF 35 PSI SHALL BE MAINTAINED TO THE CURB STOP DURING NORMAL OPERATING CONDITIONS. BOOSTER PUMPS ARE NOT PERMITTED ON SERVICE CONNECTIONS.

4. ALL FITTINGS FOR THE WATER MAIN SHALL BE RESTRAINED JOINT TYPE (MEGA-LUG) AND SHALL BE DUCTILE IRON MEETING AWWA C-153.

5. ALL BENDS OR TEES ON THE MAIN SHALL BE RESTRAINED JOINT TYPE (MEGA-LUG) AND BLOCKED WITH WOOD.

6. ALL DUCTILE IRON PIPE, CAST IRON FITTINGS AND HYDRANTS SHALL BE POLYWRAPPED ACCORDING TO AWWA C-105.. RESTRAIN TWO PIPE JOINTS EITHER SIDE OF TEE OR ELBOW IN ADDITION TO THRUST RESTRAINT.

7. ALL FITTINGS SHALL BE GIVEN A CEMENT MORTAR LINING AT THE POINT OF MANUFACTURE. THE LINING SHALL CONFORM TO ANSI A21.4, AWWA C-104 AND ALL SUBSEQUENT AMENDMENTS.

8. ALL FITTINGS SHALL BE DESIGNED FOR A WORKING PRESSURE OF NOT LESS THAN 150 PSI.

9. ALL VALVES AND HYDRANT FITTINGS MUST HAVE STAINLESS STEEL NUTS AND BOLTS. T-BOLTS AND NUTS FOR ALL MECHANICAL JOINTS MUST HAVE A BITUMASTIC COATING.

10. ALL PIPE SHALL BE GIVEN A CEMENT MORTAR LINING AT THE POINT OF MANUFACTURE. THE MORTAR LINING SHALL NOT BE LESS THAN 1/16 INCH IN THICKNESS AND CONFORM TO ANSI A21.4, AWWA C-104 AND ALL SUBSEQUENT AMENDMENTS.

11. ALL JOINTS SHALL BE MECHANICAL OR PUSH-ON TYPE. MECHANICAL JOINTS SHALL MEET THE REQUIREMENTS OF ANSI A21.11, AWWA C-111 AND ALL SUBSEQUENT AMENDMENTS. PUSH-ON JOINTS SHALL BE MADE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPE MANUFACTURER.

12. ALL HYDRANTS SHALL HAVE MECHANICAL TYPE JOINTS.

13. WHENEVER CHANGES IN LINE AND GRADE OF THE MAIN AS SHOWN ON THE DRAWINGS ARE NOT STANDARD FITTING DEFLECTIONS, THE CONTRACTOR WILL BE PERMITTED TO USE AN APPROVED COMBINATION OF STANDARD FITTINGS AND SMALL DEFLECTION OF THREE DEGREES PER JOINT IN THE ADJOINING LENGTHS OF PIPE (NOT TO EXCEED THE MANUFACTURER'S SPECIFICATIONS).

14. CLOSURE PIECES SHALL BE ACCURATELY MEASURED AND CUT, IN THE FIELD, AND INSTALLED USING SOLID TYPE LONG PATTERN SLEEVES AS SHOWN OR AS REQUIRED.

GATE VALVES

1. VALVES SHALL CONFORM IN ALL RESPECTS WITH AWWA C-500 OR C-509 AND WITH THE CITY OF NORTH RIDGEVILLE ENGINEERING DEPARTMENT SPECIFICATIONS.

2. ALL GATE VALVES THREE INCH AND LARGER SHALL HAVE A NON-RISING STEM, SHALL OPEN BY TURNING TO THE RIGHT, AND SHALL BE OPERATED BY A TWO-INCH SQUARE OPERATING NUT. NUTS SHALL HAVE AN ARROW AND THE WORD "OPEN" CAST THEREON TO INDICATE THE DIRECTION OF TURNING TO OPEN THE VALVE.

3. ALL GATE VALVES THREE-INCH TO 18 INCH IN SIZE SHALL BE OF RESILIENT WEDGE SEATED TYPE. THE VALVES SHALL HAVE RUBBER "O" RING PACKING SEALS AND MECHANICAL JOINT ENDS UNLESS OTHERWISE SPECIFIED OR APPROVED BY THE CITY ENGINEER. IF THE TOP OF THE OPERATING NUT IS MORE THAN 36 INCHES BELOW FINISHED GRADE, AN EXTENSION STEM SHALL BE PROVIDED TO PLACE THE OPERATING WRENCH NUT BETWEEN 24 AND 36 INCHES BELOW THE SURFACE.

4. ALL 20 AND 24 INCH GATE VALVES SHALL BE PROVIDED WITH A FOUR INCH BYPASS VALVE AND ALL 30 INCH TO 48 INCH VALVES INCLUSIVE SHALL BE PROVIDED WITH A SIX INCH BYPASS VALVE LOCATED BELOW THE CENTER OF THE VALVES.

5. ALL GATE VALVES 18 INCH AND UNDER SHALL BE CONSTRUCTED TO WORK VERTICALLY. GATE VALVES 20 INCH AND LARGER IN SIZE SHALL BE CONSTRUCTED TO WORK HORIZONTALLY.

6. ALL NUTS AND BOLTS SHALL BE STAINLESS STEEL.

BUTTERFLY VALVES

1. IN LIEU OF GATE VALVES, BUTTERFLY VALVES MAY BE USED ON 12 INCH AND LARGER MAINS.

2. ALL BUTTERFLY VALVES SHALL BE OF RUBBER-SEATED TIGHT-CLOSING TYPE. THEY SHALL MEET OR EXCEED PERFORMANCE REQUIREMENTS FOR WATER APPLICATIONS OF APPLICABLE RECOGNIZED STANDARDS SUCH AS AWWA C-504. ALL VALVES SHALL BE MUELLER BUTTERFLY VALVES OR AN APPROVED EQUAL.

3. BOTH VALVE ENDS SHALL BE MECHANICAL JOINT PER AWWA C-111. ACCESSORIES (BOLTS, GLANDS AND BASKETS) SHALL BE SUPPLIED BY THE VALVE MANUFACTURER.

4. ALL VALVES MUST USE FULL AWWA C-504, CLASS 150B VALVE SHAFT DIAMETER AND FULL CLASS 150B UNDERGROUND-SERVICE-OPERATOR TORQUE RATING THROUGHOUT ENTIRE TRAVEL, TO PROVIDE CAPABILITY FOR OPERATION IN EMERGENCY SERVICE.

5. VALVE BODY SHALL BE HIGH-STRENGTH CAST IRON ASTM A126, CLASS B WITH 18-8 TYPE 304 STAINLESS STEEL BODY SEAT. VALVE VANE SHALL BE HIGH STRENGTH CAST IRON ASTM A48 CLASS 40, HAVING RUBBER SEAT MECHANICALLY SECURED WITH AN INTEGRAL 18-8 STAINLESS STEEL CLAMP RING AND 18-8 STAINLESS STEEL SELF-LOCKING SCREWS.

6. RUBBER SEAT SHALL BE A FULL-CIRCLE 360 DREGEE SEAT NOT PENETRATED BY THE VALVE SHAFT. VALVE SHAFT SHALL BE ONE PIECE, EXTENDING FULL SIZE THROUGH THE ENTIRE SHAFT AND OPERATOR WITH NO NECK-DOWN, KEYWAYS OR HOLES TO WEAKEN IT. FOR 14 INCH AND LARGER, VALVE SHAFTS SHALL BE 18-8 STAINLESS STEEL STUB SHAFT DESIGN KEYED TO THE VANE WITH STAINLESS STEEL TAPER PINS.

7. VALVE OPERATOR SHALL BE OF THE TRAVELING-NUT TYPE, SEALED, GASKETED, AND LUBRICATED FOR UNDERGROUND SERVICE. IT SHALL BE CAPABLE OF WITHSTANDING AN OVERLOAD INPUT TORQUE OF 450 FT-LBS AT FULL-OPEN OR CLOSED POSITION WITHOUT DAMAGE TO THE VALVE OR VALVE OPERATOR. IT SHALL BE DESIGNED TO RESIST SUBMERGENCE IN WATER TO 25 FEET HEAD PRESSURE FOR UP TO 72 HOURS.

8. THE VALVE SHALL BE CAPABLE OF EASY CLOSURE BY ONE MAN USING A STANDARD VALVE KEY, EVEN UNDER EMERGENCY LINE-BREAK CONDITIONS AS SEVERE AS THOSE THAT WOULD CAUSE A VALVE MAXIMUM OPERATING TORQUE REQUIREMENT OF AS MUCH AS TWO TIMES AWWA CLASS 150B.

9. ALL VALVES SHALL BE TESTED, BUBBLE-TIGHT AIR-UNDER-WATER, BY THE MANUFACTURER AS FOLLOWS:

4" THROUGH 12"	175 PSI
14" AND UP	150 PSI

IN ADDITION A 300 PSI HYDROSTATIC TEST SHALL BE GIVEN TO THE ASSEMBLED VALVE. THIS 300 PSI PRESSURE SHALL ALSO BE APPLIED AGAINST THE FULLY CLOSED VANE OF EACH VALVE TO PROVE STRUCTURAL SOUNDNESS AND ASSURE COMPATIBILITY WITH FIELD LINE TEST PROCEDURES.

HYDROSTATIC TESTING

1. ALL WATER MAINS SHALL BE INSTALLED AND PRESSURE TESTED ACCORDING TO AWWA C-605, LATEST EDITION.

2. TESTING PLUGS OR CAPS SHALL BE FURNISHED AND INSTALLED FOR TESTING COMPLETED SECTIONS OF PIPE AND FITTINGS.

3. BEFORE THE TEST PRESSURE IS APPLIED, CARE SHALL BE TAKEN TO INSURE THE REMOVAL OF AIR IN THE LINE AT THE HIGH POINTS AND TO SEE THAT ALL CAPS, PLUGS AND EXPOSED PORTIONS OF THE LINE ARE SECURELY BRACED.

4. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY EQUIPMENT, GUAGES, TOOLS, AND LABOR TO PROPERLY CONDUCT THE TEST. ALL TESTING SHALL BE DONE UNDER THE DIRECTION OF THE CITY OF NORTH RIDGEVILLE ENGINEERING DEPARTMENT.

5. WATER FOR FILLING THE TEST SECTIONS WILL BE PROVIDED BY THE CITY OF NORTH RIDGEVILLE.

6. IF THE LEAKAGE TEST EXCEEDS THE MAXIMUM ALLOWED, THE CONTRACTOR SHALL LOCATE AND REPAIR THE LEAKS AND AGAIN TEST THE PIPE. THIS PROCESS SHALL BE CONTINUED UNTIL THE LEAKAGE IS WITHIN THE ACCEPTABLE LIMITS.

DISINFECTING MAINS

1. AFTER HYDROSTATIC TESTING, THE NEW LINE SHALL BE THOROUGHLY FLUSHED IN ACCORDANCE WITH AWWA C-651. THE MAIN SHALL BE FLUSHED THROUGH THE HYDRANTS, BLOWOFFS OR BY SOME OTHER APPROVED MEANS.

2. CHLORINE SHALL BE ADDED AT SUCH RATES AS TO GIVE A MINIMUM CHLORINE DOSAGE OF 50 PARTS PER MILLION AVAILABLE CHLORINE.

3. CHLORINE USED AS A DISINFECTING AGENT MAY BE EITHER LIQUID CHLORINE OR AN ANHYDROUS CALCIUM HYPOCHLORITE COMPOUND SUCH AS "HTH" OR AN APPROVED EQUAL. LIQUID CHLORINE SHALL BE APPLIED THROUGH A SUITABLE CHLORINE FEEDING MACHINE AND INJECTION NOZZLE. ANHYDROUS CALCIUM HYPOCHLORITE SHALL BE FED AS A SOLUTION USING A SUITABLE INJECTION PUMP.

4. FOLLOWING THE DISINFECTING PERIOD, THE LINE SHALL BE THOROUGHLY FLUSHED UNTIL THE REPLACEMENT WATER THROUGHOUT THE ENTIRE LENGTH OF THE LINE SHALL UPON TEST, BOTH CHEMICALLY AND BACTERIOLOGICALLY, BE PROVEN EQUAL TO THE QUALITY OF THE WATER IN THE EXISTING SYSTEM.

5. THE CITY OF NORTH RIDGEVILLE SERVICE DEPARTMENT WILL TEST THE WATER. THE CONTRACTOR IS RESPONSIBLE FOR THE TEST ARRANGEMENTS.

CURB CONNECTIONS

1. THE SIZE OF SERVICE CONNECTIONS SHALL BE THREE-QUARTER INCH (3/4") DIAMETER MINIMUM.

2. SERVICE CONNECTIONS SHALL BE K COPPER. ALTERNATIVELY, 200 PSI PLASTIC PIPE APPROVED FOR POTABLE WATER, WITH TRACER WIRE, MAY BE USED PROVIDED THE 50 FEET OF CONNECTION ADJACENT TO THE SERVED STRUCTURE IS K COPPER AND THE STRUCTURE SERVED IS MORE THAN 200 FEET FROM THE ROADWAY RIGHT OF WAY LINE.

3. FOR STRUCTURES GREATER THAN 200 FEET FROM THE CENTERLINE OF THE ROADWAY, A METER VAULT MUST BE PROVIDED NEAR THE RIGHT OF WAY LINE OF THE ROADWAY.

OCTOBER 1, 2008 REVISED 9/29/09, 2/19/10
7/22/14

ADDITIONAL SANITARY MAIN NOTES:
BEDDING FOR PIPE SHALL CONFORM TO ASTM D-2321.

ADDITIONAL WATER MAIN NOTES:
MAINTAIN A MINIMUM PRESSURE OF 20 PSI (140 KPA) AT GROUND LEVEL AT ALL POINTS IN THE DISTRIBUTION SYSTEM UNDER ALL CONDITIONS OF FLOW.

UNIFORM BEDDING FOR THE ENTIRE LENGTH OF PIPE WILL BE USED.

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

GENERAL NOTES

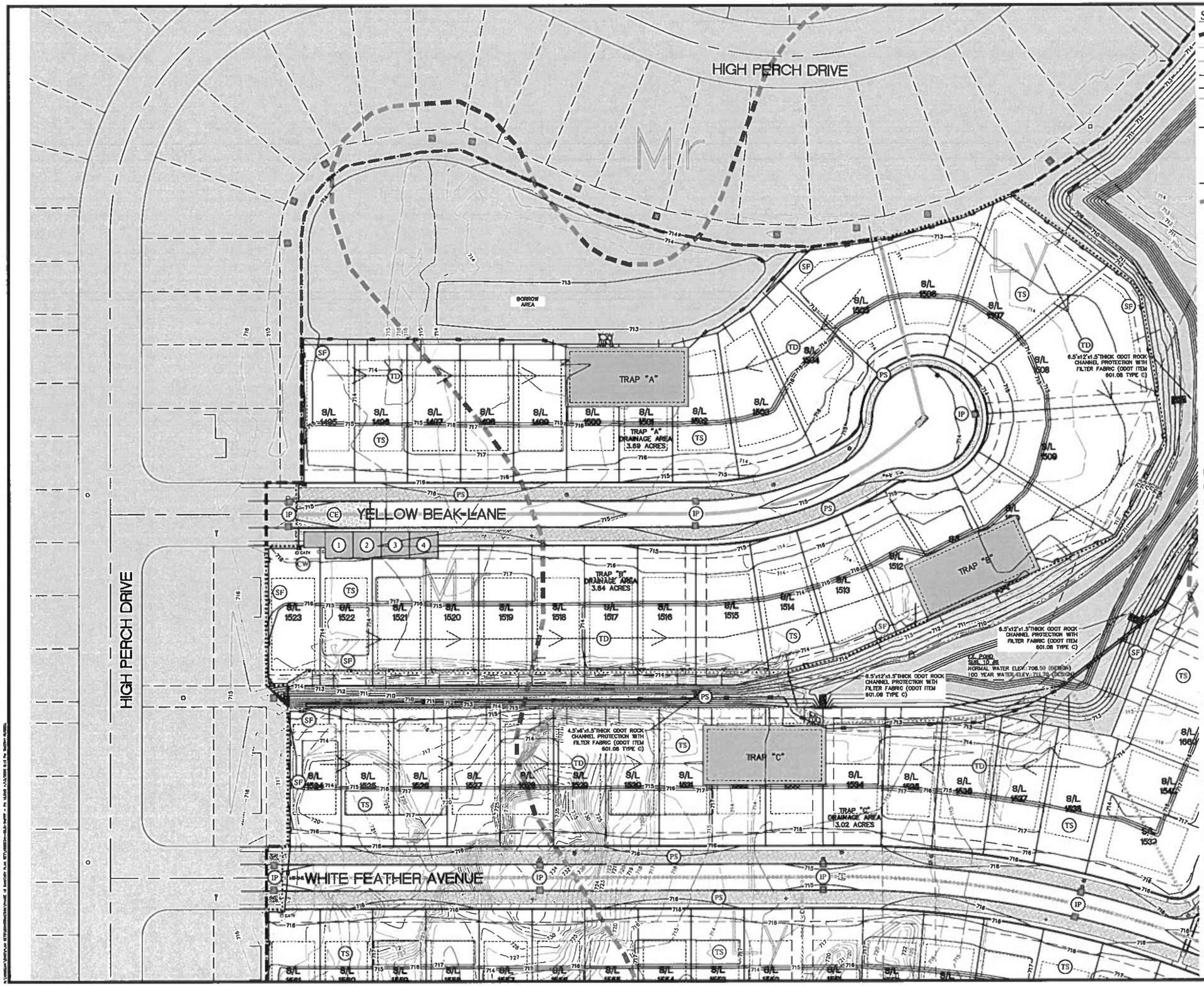
DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 1

REVISIONS

DR. TDR	CH. DH
P.M. DH	
BOOK	N/A
JOB	18002341
SHEET NO.	41

CAD FILE: 18002341-04.0-GN - PH 18.DWG



SWPPP LEGEND

- LIMITS OF DISTURBANCE
- 834 EXIST. 1' CONTOUR
- 835 EXIST. 5' CONTOUR
- 834 PROP. 1' CONTOUR
- 835 PROP. 5' CONTOUR
- EXIST. STORM SEWER
- EXIST. CATCH BASIN/INLET
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- PROP. CATCH BASIN/INLET
- PROP. STORM MANHOLE
- IP INLET PROTECTION
- SF SILT FENCE
- SOIL TYPES
- DRAINAGE AREA TO SILT TRAP
- TEMPORARY DIVERSION CHANNEL
- STOCKPILE AREA
- ORANGE CONSTRUCTION FENCE
- CW CONCRETE WASHOUT
- CE CONSTRUCTION ENTRANCE
- PS PERMANENT SEEDING
- TS TEMPORARY SEEDING
- TD TEMPORARY DIVERSION
- 1 DUMPSTER LOCATION
- 2 DESIGNATED AREA FOR MIXING, STORAGE OF FERTILIZER, LIME, MORTAR, ETC.
- 3 FUEL STORAGE AREA
- 4 DESIGNATED AREA FOR STORAGE/DISPOSAL OF SOLID, SANITARY, TOXIC WASTES, ETC.

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KEY MAP

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STORMWATER POLLUTION PREVENTION PLAN

DATE JANUARY 11, 2019

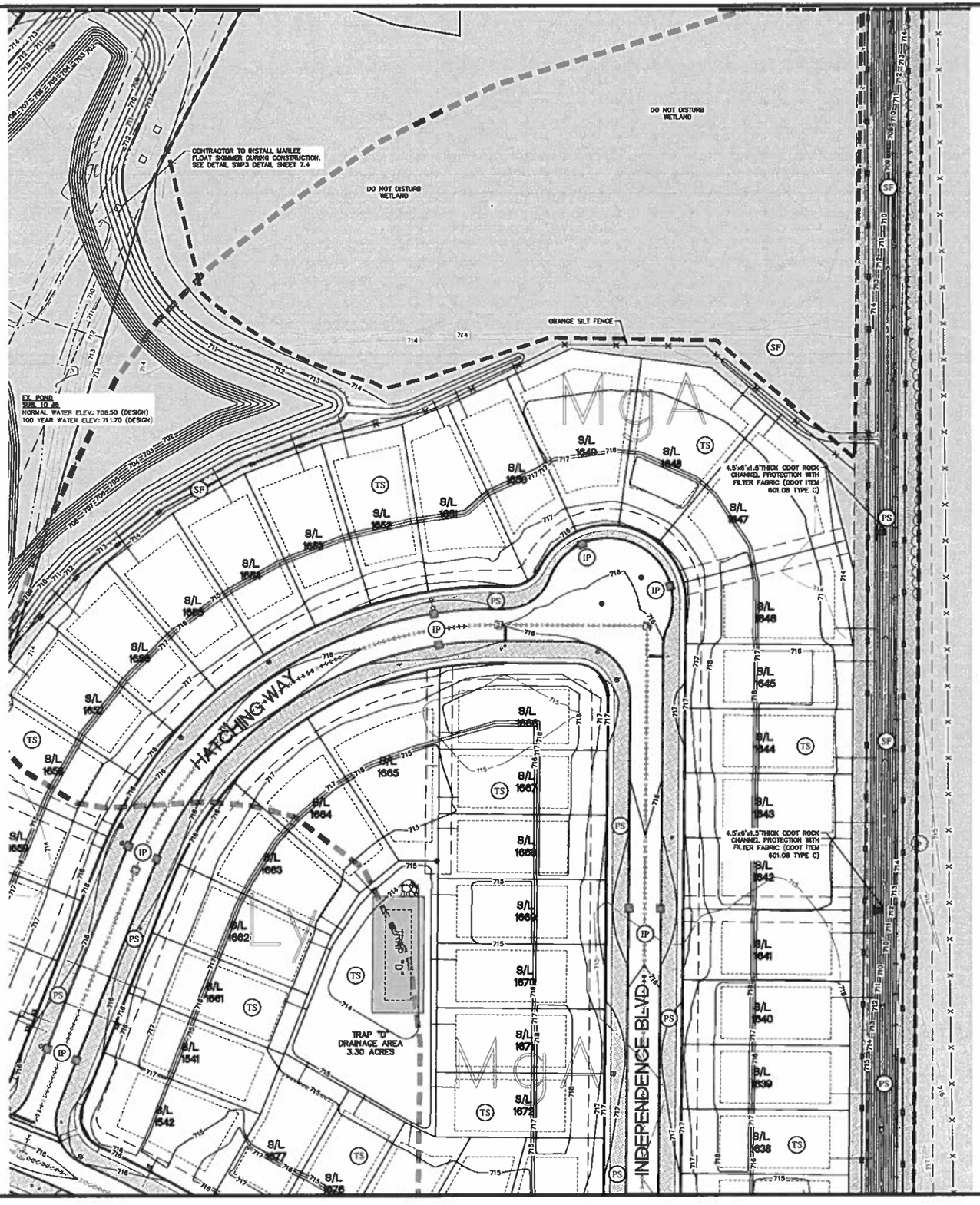
APRIL 13, 2020
OEPA SUBMITTAL NO. 2

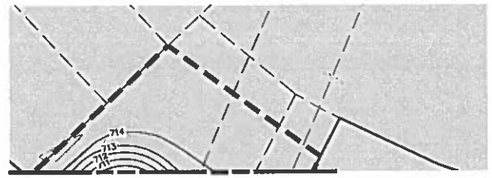
REVISIONS

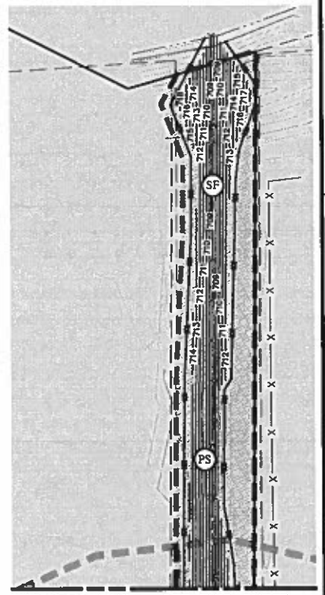
SCALE 0 20 40
1" = 40 FEET

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 6.0

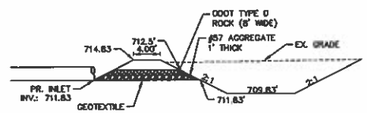
CAD FILE: 18002341-06.0-SWPPP - PH 18.DWG



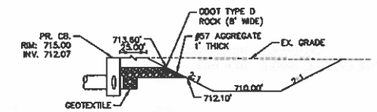




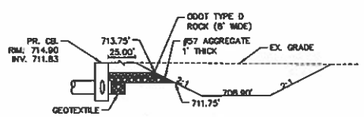
Sediment Trap Data					
Trap Number	D	E	F	G	H
A. Total Contributing Watershed (ac)	3.30	1.97	3.57	1.97	3.58
B. Disturbed Area (ac)	3.30	1.97	3.57	1.97	3.58
C. Req. Dewatering Volume (A x 1800 ft³/ac)	5,940	3,546	6,426	3,546	6,444
D. Req. Sediment Storage Zone Vol. (B * 1000	3,300	1,970	3,570	1,970	3,580
E. Total Required Capacity (C + D in ft³)	9,240	5,516	9,996	5,516	10,024
F. Dewatering Volume Provided (ft³/ac)	5,612	5,840	8,031	5,840	8,031
G. Sediment Storage Provided (ft³/ac)	3,568	2,330	3,804	2,330	3,804
Total Provided Capacity (ft³)	12,180	8,170	11,835	8,170	11,835
Average Bottom Length (L)	70	53	69	53	69
Average Bottom Width (W)	20	3	19	3	19
Flow L:W Ratio (2:1 min)	3.5:1	20:1	3.5:1	20:1	3.5:1
Bottom Elevation (max 4 ft sed-storage d)	709.83	708.90	710.00	708.90	710.00
Top of Embankment Elevation	N/A	N/A	N/A	N/A	N/A
Embankment Height (Max. 5 ft @ cl from grnd to top embankment)	3.0'	3.15'	2.90'	3.15'	2.90'
Embankment Side Slopes (Max 2:1)	2:1	2:1	2:1	2:1	2:1
Embankment Top Width (Min. 4 feet)	N/A	N/A	N/A	N/A	N/A
Crest of Spillway Elevation (At least 1.5' below embankment elev.)	714.83	714.90	715.00	714.90	715.00
Top of Sediment Storage Elevation (Base of stone outlet)	711.83	711.75	712.10	711.75	712.10



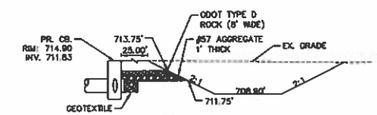
SEDIMENT TRAP D
SCALE 1" =10'



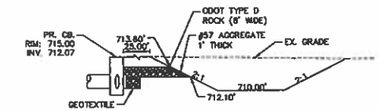
SEDIMENT TRAP F
SCALE 1" =10'



SEDIMENT TRAP E
SCALE 1" =10'



SEDIMENT TRAP G
SCALE 1" =10'



SEDIMENT TRAP H
SCALE 1" =10'

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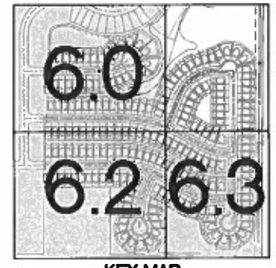

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STORMWATER POLLUTION PREVENTION PLAN

DATE
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APRIL 13, 2020
CITY SUBMITTAL NO. 3

REVISIONS

SCALE 0 20 40
1" = 40 FEET

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 6.1

CAD FILE: 18002341-SWPPP - PH 18.DWG

HIGH PERCH DRIVE

AMBER WAY

FLEDGLING COURT

TRAP "E"
DRAINAGE AREA
1.97 ACRES

TRAP "G"
DRAINAGE AREA
1.97 ACRES

TRAP "H"
DRAINAGE AREA
4.91 ACRES

TRAP "I"

EX. IRRIGATION POND
NORMAL WATER ELEV.: 710.50±

CONTRACTOR TO INSTALL MARLEE FLOAT SKIMMER DURING CONSTRUCTION. SEE DETAIL SWP3 DETAIL SHEET 7.4

6.5'x12'x1.5'THICK ODOT ROCK CHANNEL PROTECTION WITH FILTER FABRIC (ODOT ITEM 601.08 TYPE C)

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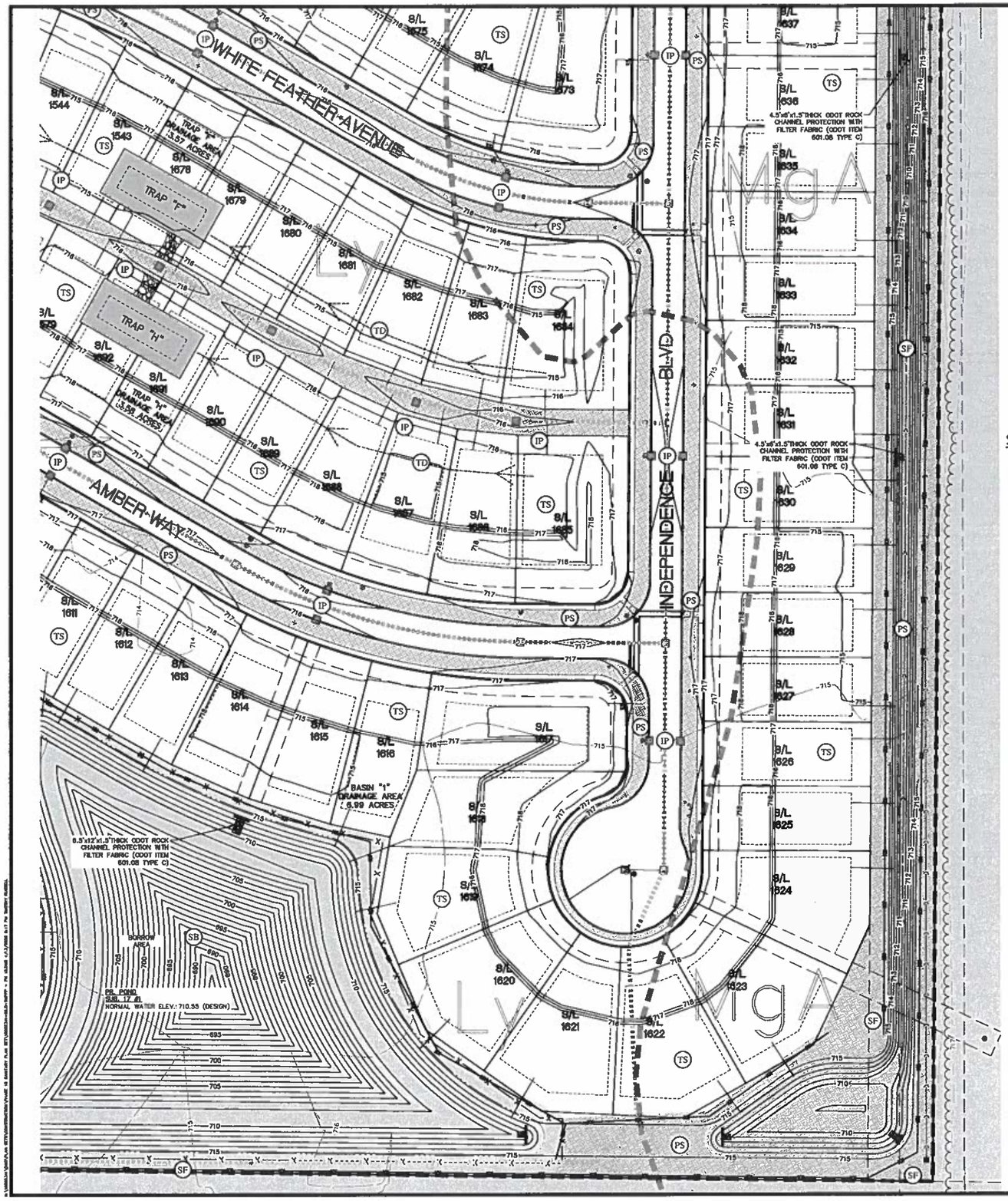
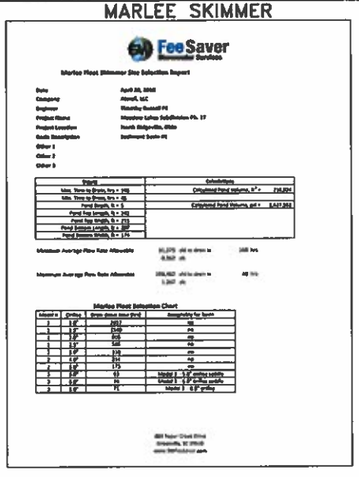


Sediment Basin & Post Construction Data Sheet				
Basin Reference Number				
A. Total Contributing Watershed (ac)	6.99			
B. Disturbed Area (ac)	6.99			
C. Req. Dewatering Volume (A x 1800 ft³/ac)	12,582			
D. Req. Sediment Storage Zone Vol. (B x 1000 ft³/ac)	6,990			
E. Total Required Capacity (C + D in ft³)	19,572			
F. Dewatering Volume Provided (ft³)	335,387			
G. Sediment Storage Provided (ft³)	638,852			
H. Total Storage Provided at Crest of Riser (ft³)	1,274,238			
Principal Spillway				
Req Principal Spillway Capacity (10 yr Attic storm) (cfs)	NA			
Principal Spillway Capacity Provided (cfs)	NA			
Diameter of Barrel (inches)	NA			
Diameter of Riser (inches)	NA			
Volume of Concrete To Prevent Riser Flotation (ft³)	NA			
Emergency Overland Outflow Type				
Drawdown Time (Hours Must exceed 48 hr drawdown)				
Mark selected outlet type (X)				
A * Fabridam Skimmer				
B * Dolphin-type Skimmer, MARLEE FLOAT SKIMMER	X			
Orifice size in inches	5.00"			
Stone pad provided at top of sediment storage (B.S.V.) *Skimmers shall have guide posts with wire for easy maintenance				
Sediment Clean Out Elevation (clearly marked in field)				
Pond Shape – 6.1 L:W for each inlet or outlet(s)	6:1			
Flow L:W Ratio (4:1 min)	6:1			
Baffles Provided (Yes or No)	NO			
Bottom Elevation	660.00			
Sediment Storage Zone Elevation	710.55			
Crest of Principal Spillway Elevation (Elev. 1ft below crest E. El.)	714.25			
Pond Depth at Riser (feet, ideally 3-5')	3.7'			
Top of Embankment Elevation	715.25			
Embankment Side Slopes (Max 2:1, combined 5:1)	2:1			
Embankment Top Width (If based on C/L Height, Min 8')	8'			
Emergency Spillway Elevation	713.00			
Emergency Spillway Discharge (25 yr 24 hr storm less Principal EL)				
Emergency Spillway Bottom Width	NA			
Emergency Spillway Lining (Vegetated, Riprap...)	VEG.			
Rock Outlet Protection (Size, gradation and quality of rock)	TYPE B			
Water Quality Volume	N/A			
Post Construction Orifice Size	N/A			
Post Construction Orifice Elevation	N/A			
Max Pond (Top of Wet Volume) Elevation	N/A			

Sediment Trap Data				
Trap Number	A	B	C	I
A. Total Contributing Watershed (ac)	3.69	3.84	3.02	4.81
B. Disturbed Area (ac)	3.69	3.84	3.02	4.81
C. Req. Dewatering Volume (A x 1800 ft³/ac)	6,642	6,912	5,436	8,658
D. Req. Sediment Storage Zone Vol. (B * 1000	3,690	3,840	3,020	4,810
E. Total Required Capacity (C + D in ft³)	10,332	10,752	8,456	13,748
F. Dewatering Volume Provided (ft³/ac)	7,536	7,536	7,536	8,495
G. Sediment Storage Provided (ft³/ac)	4,128	4,128	4,128	5,504
Total Provided Capacity (yd³)	11,664	11,664	11,664	14,999
Average Bottom Length (L)	108	108	108	108
Average Bottom Width (W)	48	48	48	48
Flow L:W Ratio (2:1 min)	2:1	2:1	2:1	2:1
Bottom Elevation (max 4 ft sed-storage d)	712.00	712.00	712.00	712.50
Top of Embankment Elevation	N/A	N/A	N/A	N/A
Embankment Height (Max. 5 ft @ c/l from grad to top embankment)	1.25'	1.25'	1.25'	1.50'
Embankment Side Slopes (Max 2:1)	2:1	2:1	2:1	2:1
Embankment Top Width (Min. 4 feet)	N/A	N/A	N/A	4'
Crest of Spillway Elevation (At least 1.5' below embankment elev.)	714.00	714.00	714.00	715.00
Top of Sediment Storage Elevation (Base of stone outlet)	712.75	712.75	712.75	713.50

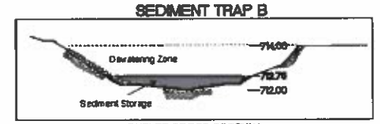
SKIMMER SIZING CALCULATIONS POND #1
MARLEE SKIMMER



SEDIMENT TRAP A

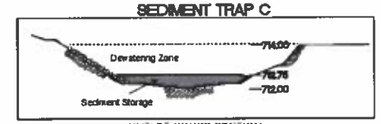
OUTLET CROSS-SECTION
(Not to Scale)

SEDIMENT TRAP B



OUTLET CROSS-SECTION
(Not to Scale)

SEDIMENT TRAP C



OUTLET CROSS-SECTION
(Not to Scale)

SEDIMENT TRAP I

OUTLET CROSS-SECTION
(Not to Scale)

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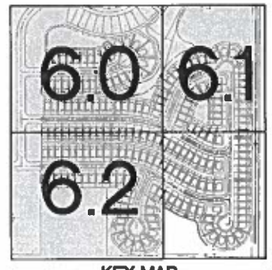
1. ALL GRADING ON THIS PLAN WITHIN THE RIGHT-OF-WAY IS FINAL GRADE ELEVATION.
2. EROSION CONTROL MATTING SHALL BE USED ON DITCH/CHANNEL SLOPES OF 3:1 OR STEEPER.



KEY MAP
N.T.S.

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.

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440.349.2000

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

STORMWATER POLLUTION PREVENTION PLAN

DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 3

REVISIONS

SCALE 0 20 40
1" = 40 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 6.3

CAD FILE: 18002341-06.0-SWPPP - PH 18.DWG

SITE DESCRIPTION

FACILITY NAME: MEADOW LAKES SUBDIVISION #17

NPDES PERMIT #: 3GC10010*AG

a. DESCRIBE THE NATURE AND TYPE OF CONSTRUCTION ACTIVITY: SITE IMPROVEMENTS FOR 198 SUBLOT RESIDENTIAL SUBDIVSION

b. TOTAL AREA OF THE SITE EXPECTED TO BE DISTURBED: 53.91 ACRES

c. PRE-DEVELOPED RUNOFF COEFFICIENT: c=0.36

POST-DEVELOPED RUNOFF COEFFICIENT: c=0.63

d. ESTIMATED IMPERVIOUS AREA AND % IMPERVIOUS AREA IN POST DEVELOPED STATE: AREA: 19.59 ACRES; 36%

e. EXISTING SOIL TYPES:

A: Ly – LURAY SILTY CLAY LOAM, 0 – 2% SLOPES 62 % of Site
B: MgA – MAHONING SILT LOAM, 0 – 2% SLOPES 25 % of Site
C: Mr – MINER SILTY CLAY LOAM, 0 – 2% SLOPES 13 % of Site

QUALITY OF STORMWATER DISCHARGING FROM THE CONSTRUCTION SITE: N/A

f. DESCRIBE PRIOR LAND USES: VACANT AREA

g. SEQUENCE OF MAJOR CONSTRUCTION OPERATIONS:

	START DAY	END DAY	SOIL EROSION CONTROL SEQUENCE OF CONSTRUCTION
MASS GRADING	1	1	CHECK CONDITION OF STONE CONSTRUCTION ENTRANCE, UPGRADE OR REPLACE AS NEEDED
	1	1	CHECK CONDITION OF SILT FENCE AND PROTECTIVE FENCING, UPGRADE OR REPLACE AS NEEDED
	2	10	INSTALL SEDIMENT TRAPS, TEMPORARY DIVERSIONS AND CHECK DAMS
	2	10	INSTALL STORM CULVERTS AND POCK CHECK DAMS
	5	20	MASS GRADING
	20	24	SEEDING AND MULCHING
SITE IMPROVEMENTS			
	1	1	CHECK CONDITION OF STONE CONSTRUCTION ENTRANCE, UPGRADE OR REPLACE AS NEEDED
	1	1	CHECK CONDITION OF SILT FENCE AND PROTECTIVE FENCING, UPGRADE OR REPLACE AS NEEDED
	1	1	CHECK CONDITION OF SEDIMENT TRAPS, TEMPORARY DIVERSIONS AND CHECK DAMS
			UPGRADE OR REPAIR AS NEEDED
	2	30	INSTALL SANITARY SEWER, WATER MAIN AND STORM SEWER AND INLET FILTERS.
	10	10	TRIM PAVEMENT AREAS TO SUBGRADE.
	11	14	INSTALL PAVEMENT AND BACK FILL CURBS. AFTER INSTALLATION OF PAVEMENT
			REPLACE STONE INLET FILTERS IN PAVED AREAS.
	30	40	TEMPORARY STABILIZATION OF AREAS THAT WILL NOT BE DISTURBED DURING DORMANT PERIOD
	120	150	FINISH GRADE, SEED AND MULCH ALL DISTURBED AREAS AND MAINTAIN TEMPORARY
			EROSION CONTROLS AS REQUIRED.
	150	160	UPON COMPLETION AND SITE STABILIZATION, REMOVE ACCUMULATED SEDIMENT AND DEBRIS
			FROM STORM SYSTEM AND REMOVE SOIL AND EROSION CONTROLS, MAINTAIN DURING HOME CONST.

h. RECEIVING WATER BODY OR STREAM: LICKORISH DITCH

i. DETAIL OF INDIVIDUAL LOT WITH SEDIMENT AND EROSION CONTROLS FOR CONSTRUCTION SITES WITH NO CENTRALIZED SEDIMENT CONTROLS (e.g. A SETTLING POND OR INLET PROTECTION) WHICH RECEIVES DRAINAGE FROM MULTIPLE LOTS: N/A

j. INCLUDE THE LOCATION OF AND DESCRIPTION OF STORM WATER DISCHARGES ASSOCIATED WITH DEDICATED ASPHALT AND/OR CONCRETE BATCH PLANTS COVERED BY THE NPDES CONSTRUCTION STORM WATER GENERAL PERMIT: N/A

k. NPDES PERMIT (SEE PERMIT NUMBER ABOVE)

l. DUTY TO INFORM CONTRACTORS AND SUBCONTRACTORS: (SEE FORM, THIS SHEET)

PERSON RESPONSIBLE FOR AUTHORIZING AND AMENDING SWP3: FRANK AMATO

ESTIMATED DATES OF CONSTRUCTION: 07/16/2019–11/30/2019

m. MODIFICATION LOG: (SEE FORM, THIS SHEET)

SWPPP GRADING & STABILIZATION ACTIVITIES LOG PAGE __

Project Name: MEADOW LAKES SUBDIVISION #17

Date Grading Activity Initiated	Description of Grading Activity and Location	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures are Initiated	Description of Stabilization Measures

NON-SEDIMENT POLLUTANT CONTROL NOTES

1. ANY AND ALL WASTE MATERIALS (SOLID, HAZARDOUS, TOXIC, CONTAMINATED SOILS, ETC) GENERATED AT THE SITE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE ALL APPLICABLE LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS. ON-SITE STORAGE CONTAINERS SHALL BE COVERED AND NOT LEAKING. IT IS PROHIBITED TO BURN, BURY OR POUR OUT ON THE GROUND OR INTO THE STORM SEWERS ANY SOLVENTS, PAINTS, GASOLINE, DIESEL FUEL, MOTOR OIL, HYDRAULIC FLUID, ANTIFREEZE, CURING COMPOUND, OR ANY OTHER TOXIC OR HAZORDOUS WASTES.

2. ALL CLEAN HARD FILL MUST BE FREE FROM CONTAMINATION.

3. ALL CLEAN CONSTRUCTION WASTES TO BE DISPOSED OF ON THE PROPERTY MUST BE DONE SO IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL RULES AND REGULATIONS.

4. ALL CONSTRUCTION AND DEMOLITION DEBRIS (C&DD) WASTE WILL BE DISPOSED OF IN AN OHIO EPA APPROVED C&DD LANDFILL AS REQUIRED BY OHIO REVISED CODE (ORC) 3714. NOTE: CONSTRUCTION DEBRIS MAY BE DISPOSED OF ON SITE, BUT DEMOLITION DEBRIS MUST BE DISPOSED OF IN AN OHIO EPA APPROVED LANDFILL. MATERIALS WHICH MAY CONTAIN ASBESTOS MUST COMPLY WITH AIR POLLUTION REGULATIONS (SEE OHIO ADMINISTRATIVE CODE 3745-20).

5. IF THE CONTRACTOR WILL UTILIZE AN ABOVE GROUND STORAGE TANK (AST) OF 660 GALLONS OR MORE, TOTAL ABOVE GROUND TANK STORAGE OF 1,330 GALLONS, OR BELOW GROUND STORAGE OF 42,000 GALLONS OF FUEL, HE SHALL SUBMIT A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN TO THE CITY FOR APPROVAL PRIOR TO CONSTRUCTION.

6. ALL CONTAMINATED SOILS MUST BE TREATED AND/OR DISPOSED IN OHIO EPA APPROVED SOLID WASTE MANAGEMENT FACILITIES OR HAZARDOUS WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES (TSDFS).

7. ALL AREAS OF CONTAMINATION SHALL BE COVERED WITH TARPS OR OTHER METHODS THAT PREVENT STORM WATER FROM COMING IN CONTACT WITH THE MATERIAL.

8. PETROLEUM BASED AND CONCRETE CURING COMPOUNDS MUST HAVE SPECIAL HANDLING PROCEDURES.

9. IN THE EVENT OF A LARGER RELEASE (25 OR MORE GALLONS) OF PETROLEUM WASTE, CONTRACTOR MUST CONTACT OHIO EPA (AT 1-800-282-9378), THE LOCAL FIRE DEPARTMENT, AND THE LOCAL EMERGENCY PLANNING COMMITTEE (LEPC) WITHIN 30 MINUTES OF A SPILL OF 25 OR MORE GALLONS.

10. OPEN BURNING IN AN UNRESTRICTED AREA IS LIMITED TO SCRAP LUMBER, WOODEN FENCE POSTS, AGRICULTURAL, LANDCLEARING, OR LANDSCAPE WASTES. CONTRACTOR IS RESPONSIBLE FOR VERIFYING LOCAL ORDINANCES, CONTACTING FIRE DEPARTMENTS AND OBTAINING PERMITS FOR OPEN BURNING.

11. DUST SUPPRESANTS SHALL BE USED IN CASES OF EXCESSIVE DUST. OIL MAY NOT BE USED AS A DUST SUPPRESANT. DUST SUPPRESANTS MUST NOT BE STORED NEAR CATCH BASINS OR OTHER DRAINAGE WAYS.

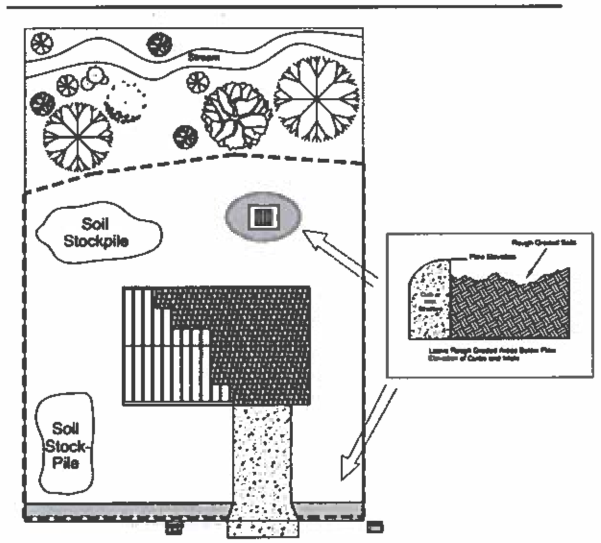
12. THE NPDES CONSTRUCTION STORM WATER GENERAL PERMIT ONLY AUTHORIZES THE DISCHARGE OF STORM WATER AND CERTAIN UNCONTAMINATED NON-STORM WATERS. THE DISCHARGE OF NON-STORM WATERS TO WATERS OF THE STATE MAY BE IN VIOLATION OF LOCAL, STATE, AND FEDERAL LAWS OR REGULATIONS. ALL PROCESS WASTEWATERS (EQUIPMENT WASHING, LEACHATE ASSOCIATED WITH ON-SITE WASTE DISPOSAL, AND CONCRETE WASHOUTS) SHALL BE COLLECTED AND DISPOSED OF PROPERLY.

13. WASH OUT OF CEMENT TRUCKS SHOULD OCCUR IN THE DESIGNATED AREA WHERE THE WASHING CAN COLLECT AND BE DISPOSED OF PROPERLY WHEN THEY HARDEN.

14. FUEL STORAGE TANKS SHOULD BE LOCATED IN DIKED AREAS AWAY FROM DRAINAGE CHANNELS . THE DIKED AREAS SHOULD HOLD A VOLUME AT LEAST 110% OF THE LARGEST TANK. THE DIKED AREAS ARE NOT NECESSARY IF CONTRACTOR USES SELF –CONTAINED SPILL PROOF TANKS.

Specifications for

Small Construction Site Controls



PLAN VIEW

- Temporary seeding and/or mulch applied to rough graded areas
- Construction Entrance gravel
- Rough grade areas to allow settling below grade elevation
- Storm Drain w/inlet protection
- Storm Drain without inlet protection
- Yard Drain w/ inlet protection
- Silt Fence
- Curb

CHAPTER 8 Pollution/Construction 15

SEDIMENT & EROSION CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES MUST CONFORM TO THE SPECIFICATION OF RAINWATER AND LAND DEVELOPMENT, OHIO STANDARDS FOR STORM WATER MANAGEMENT, LAND DEVELOPMENT AND URBAN STREAM.

2. CONSTRUCTION ACTIVITIES SHALL BE SCHEDULED SUCH THAT A MINIMUM AREA OF THE SITE IS DISTURBED AT A TIME. 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 OPERATIONS. CONTRACTOR SHALL REDUCE EFFECTS OF STORM WATER BY USING AND/OR MAINTAINING GRASSED SWALES, INFILTRATION STRUCTURES, OR WATER DIVERSIONS.

3. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.

4. CLEANUP WILL BE DONE IN A MANNER TO ENSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.

5. TEMPORARY SOIL STABILIZATION FOR ALL CONSTRUCTION ACTIVITIES (ANY DISTURBED AREAS THAT WILL BE DORMANT FOR MORE THAN 14 DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN 50 FEET OF A SURFACE WATER OF THE STATE) SHALL OCCUR WITHIN 7 DAYS OF THE MOST RECENT DISTURBANCE IF THE AREA WILL REMAIN IDLE LONGER THAN 14 DAYS. ANY DISTURBED AREA THAT IS NOT GOING TO BE WORKED FOR 14 DAYS OR MORE MUST BE SEEDED AND MULCHED BY NOVEMBER 1 OR MUST HAVE A DORMANT SEEDING OR MULCH COVER APPLIED BETWEEN NOVEMBER 1 AND MARCH. FOR RESIDENTIAL SUBDIVISIONS, DISTURBED AREAS MUST BE STABILIZED AT LEAST 7 DAYS PRIOR TO TRANSFER OF PERMIT COVERAGE FOR THE INDIVIDUAL LOT(S).

6. FOR ANY DISTURBED AREAS REMAINING DORMANT FOR OVER 14 DAYS WITHIN 50 FEET OF SURFACE WATER OF THE STATE AND NOT AT FINAL GRADE, TEMPORARY EROSION CONTROLS SHALL BE APPLIED WITHIN 2 DAYS.

7. FOR DISTURBED AREAS THAT WILL BE LEFT IDLE OVER WINTER, TEMPORARY EROSION CONTROLS SHALL BE APPLIED PRIOR TO ONSET OF WINTER.

8. TRENCHES FOR UNDERGROUND UTILITY LINE AND PIPES SHALL BE TEMPORARILY STABILIZED WITHIN 7 DAYS IF THEY ARE TO REMAIN INACTIVE FOR 14 DAYS. TRENCH DEWATERING DEVICES (DANDY BAGS – SEE DETAIL SHEET) SHALL DISCHARGE IN A MANNER THAT FILTERS SOIL-LADEN WATER BEFORE DISCHARGING IT TO A RECEIVING DRAINAGE DITCH OR POND. IF SEEDING, MULCHING OR OTHER EROSION AND SEDIMENT CONTROL MEASURES WERE PREVIOUSLY INSTALLED; THESE PROTECTIVE MEASURES SHALL BE REINSTALLED. PIPELINES WITH JOINTS THAT ALLOW A MANUFACTURED LENGTH OF PIPE TO BE PLACED IN THE TRENCH WITH THE PIPE JOINT ASSEMBLED/MADE IN THE TRENCH REQUIRE AN OPEN PIPELINE TRENCH THAT IS ONLY SLIGHTLY LONGER THAN THE LENGTH OF PIPE BEING INSTALLED. THE TOTAL LENGTH OF EXCAVATED TRENCH OPEN AT ANY TIME SHOULD NOT BE THE GREATER THAN THE TOTAL LENGTH OF PIPELINE/UTILITY THAT CAN BE PLACED IN THE TRENCH AND BACK-FILLED IN ONE WORKING DAY. NO MORE THAN 50 LINEAL FEET OF OPEN TRENCH SHOULD EXIST WHEN PIPELINE/UTILITY LINE INSTALLATION CEASES AT THE END OF THE WORK DAY.

9. SOIL STOCKPILES SHALL BE STABILIZED OR PROTECTED TO PREVENT SOIL LOSS.

10. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING. FURTHER, SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT STABILIZATION IS COMPLETE, AT WHICH TIME TEMPORARY MEASURES WILL BE REMOVED. PERMANENT VEGETATION IS A GROUND COVER DENSE ENOUGH TO COVER 80% OF THE SOIL SURFACE AND MATURE ENOUGH TO SURVIVE WINTER WEATHER CONDITIONS.

9. SILT FENCE TO BE 2' MINIMUM FROM PROPERTY LINES IN AREAS WHERE WORK IS NEAR ADJACENT PROPERTIES.

10. HAUL ROUTES– THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANUP OF ANY MUD, DIRT, OR DEBRIS DEPOSITED ON HAUL ROADS AS A RESULT OF HIS OPERATIONS. SOIL SHALL BE REMOVED FROM ROADS AND PAVED SURFACES AT THE END OF EACH DAY IN SUCH A MANNER THAT DOES NOT CREATE OFF-SITE SEDIMENTATION IN ORDER TO ENSURE SAFETY AND ABATE OFF-SITE SOIL LOSS. COLLECTED SEDIMENTS SHALL BE PLACED IN A STABLE LOCATION ON SITE OR TAKEN OFF-SITE TO A STABLE LOCATION. CONTRACTOR SHALL USE STATE ROUTES (AND SHORTEST DISTANCE NON-STATE ROUTES) FOR PROJECT HAUL ROUTE.

11. FOR DISTURBED AREAS OVER 50 FEET AWAY FROM A SURFACE WATER OF THE STATE REMAINING DORMANT FOR OVER 14 DAYS, TEMPORARY EROSION CONTROLS SHALL BE APPLIED WITHIN 7 DAYS.

12. FOR DISTURBED AREAS WITHIN 50 FEET OF A SURFACE WATER OF THE STATE, AT FINAL GRADE, PERMANENT EROSION CONTROLS SHALL BE APPLIED WITHIN 2 DAYS OF REACHING FINAL GRADE.

13. FOR DISTURBED AREAS REMAINING DORMANT FOR OVER 1 YEAR OR AT FINAL GRADE, PERMANENT EROSION CONTROLS SHALL BE APPLIED WITHIN 7 DAYS.

14. SEDIMENT CONTROL DEVICES SHALL BE IMPLEMENTED FOR ALL AREAS REMAINING DISTURBED FOR OVER 14 DAYS.

15. SEDIMENT CONTROLS SHALL BE INSTALLED/IMPLEMENTED WITHIN 7 DAYS OF GRUBBING ACTIVITIES.

16. THE SEDIMENT STORAGE ZONE OF THE SILT TRAPS AND BASINS SHALL BE CLEANED OUT WHEN THE SILT OCCUPIES 40 PERCENT OF THE SEDIMENT STORAGE ZONE (APPROXIMATELY ONE-HALF OF THE SEDIMENT STORAGE ZONE DEPTH).

17. ALL SILT TRAPS AND SEDIMENTATION BASINS SHALL BE SURROUNDED BY ORANGE CONSTRUCTION FENCING.

SWPPP Amendment Log for Construction

Project Name: MEADOW LAKES SUBDIVISION #17

Location: CITY OF NORTH RIDGEVILLE

Date: ______

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared By: Names(s) & Title

WATER QUALITY STRUCTURE MAINTENANCE

SEDIMENTS BASINS WILL BE CLEARED AND CLEANED OF DEBRIS PER OHIO DSWR STORMWATER MANUAL TABLE 2.6.3 TYPICAL MAINTENANCE ACTIVITIES FOR WATER QUALITY PONDS (BELOW).

Table 2.6.3 Typical Maintenance Activities For Water Quality Ponds (USEPA) Adapted from WMI, 1997 and SMRC

Schedule	Activity
Monthly	Mow embankment and clean trash and debris from outlet structure. Address any accumulation of hydrocarbons.
Annually	Inspect embankment and outlet structure for damage and proper flow. Remove woody vegetation and fix any eroding areas. Monitor sediment accumulations in forebay and main pool.
Semi-Annually	Inspect wetland areas for invasive plants.
3-7 years	Remove Sediment from forebays.
15-20 years	Monitor sediment accumulations in the main pool and clean as pond becomes eutrophic or pool volume is reduced significantly.

SILT FENCE SHALL BE MAINTAINED PER CITY OF NORTH RIDGEVILLE SWP-18.
MEADOW LAKES HOMEOWNERS ASSOCIATION WILL BE RESPONSIBLE FOR ONGOING MAINTENANCE OF ALL WATER QUALITY STRUCTURES.
ANNUAL INSPECTION REPORTS TO BE PREPARED BY A REGISTERED ENGINEER, WILL BE PROVIDED BY THE HOMEOWNERS' ASSOCIATION TO THE CITY OF NORTH RIDGEVILLE ENGINEERING DEPARTMENT.

Duty to Inform Contractors and Subcontractors

The permittee (representative that obtains a Construction General Permit from Ohio EPA) shall inform all contractors and subcontractors not otherwise defined as "operators" in Part VII of Ohio EPA's Construction General Permit (OHC000002 and/or OHC000003), who will be involved in the implementation of the Storm Water Pollution Prevention Plan (SWP3), of the terms and conditions of the general construction permit. Furthermore, the permittee shall maintain this document containing the signatures of all contractors and subcontractors involved in the implementation of the SWP3 as proof acknowledging that they reviewed and understand the conditions and responsibilities of the SWP3, including all: (i) erosion controls; (ii) sediment controls; (iii) non-sediment pollutant controls; and (iv) post-construction controls (Ohio EPA's Construction General Permit).

In accordance with the National Pollutant Discharge Elimination System (NPDES) rules and Ohio EPA's Construction General Permit, these signatures are required to be provided prior to commencement of work at

____
(Permitted facility name)

The permittee has reviewed the conditions of the SWP3 with me and explained my responsibilities with regards to the above referenced construction activity in accordance with Ohio EPA's Construction General Permit.

Contractor/Subcontractor	Company	Date

INSPECTIONS

1. WEEKLY INSPECTIONS OF BMPS ARE REQUIRED AS WELL AS AN INSPECTION WITHIN 24 HOURS AFTER EVERY RAIN EVENT OF 0.5 INCHES WITHIN A 24 HOUR PERIOD.

2. IF THE SITE WILL BE DORMANT FOR A LONG PERIOD, IT'S STABILIZED, AND LESS FREQUENT INSPECTIONS ARE DESIRED, A WAIVER REQUEST SHALL BE SUBMITTED TO OEPA FOR A REDUCTION TO WEEKLY INSPECTIONS.

3. ONLY "QUALIFIED INSPECTION PERSONNEL" WILL PERFORM THE INSPECTIONS (CPESC, CESSWI OR P.E.).

4. AN INSPECTION CHECKLIST WILL BE COMPLETED AND SIGNED BY THE INSPECTOR AFTER EVERY INSPECTION.

5. INSPECTION RECORDS WILL BE KEPT FOR 3 YEARS AFTER TERMINATION OF CONSTRUCTION ACTIVITIES.

6. FOR BMPS THAT REQUIRE REPAIR OR MAINTENANCE, NON-SEDIMENT POND BMPS SHALL BE REPAIRED WITHIN 3 DAYS OF INSPECTION AND SEDIMENT PONDS SHALL BE REPAIRED OR CLEANED OUT WITHIN 10 DAYS OF INSPECTION.

7. IN THE CASE THAT A BMP DOES NOT MEET THE INTENDED FUNCTION, A NEW BMP WILL BE INSTALLED WITHIN 10 DAYS OF THE INSPECTION.

8. IF ANY BMP REQUIRED FOR INSTALLATION BY THE SWP3 IS MISSING, THE MISSING BMPS SHALL BE INSTALLED WITHIN 10 DAYS OF THE INSPECTION.

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.

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

SWP3 SPECIFICATIONS

DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

DR.	TDR	CH.	DH
P.M.	DH		
BOOK	N/A		
JOB	18002341		
SHEET NO.	7.0		

CAD FILE: 18002341-07 - SWPPP DT - PH 18.DWG

CITY OF NORTH RIDGEVILLE
SWP3 STANDARD GENERAL NOTES

GENERAL EROSION AND SEDIMENT CONTROL NOTES:
EROSION CONTROL SHALL CONSIST OF TEMPORARY CONTROL MEASURES AS DETAILED ON THE PLANS OR ORDERED BY THE GOVERNING AGENCY DURING THE LIFE OF THE CONTRACT TO CONTROL SOIL EROSION AND SEDIMENTATION THROUGH USE OF EROSION CONTROL BEST MANAGEMENT PRACTICES (BMP'S).

TEMPORARY EROSION AND SEDIMENT CONTROL ITEMS, THE LOCATION AND SIZE OF WHICH ARE DETAILED ON THE PLANS, SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF ANY CLEARING OR EARTHWORK OPERATIONS. CONDITIONS THAT DEVELOP DURING CONSTRUCTION THAT WERE NOT FORESEEN DURING DESIGN STAGE; THAT REQUIRE ADDITIONAL OR MODIFIED TEMPORARY OR PERMANENT BMP'S SHALL BE APPROVED BY THE CITY ENGINEER AND REFLECTED ON THE REVISED SWP3.

SEDIMENT PONDS, SEDIMENT TRAPS, AND PERIMETER SEDIMENT CONTROLS, SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING AND WITHIN 7 DAYS FROM THE START OF GRUBBING. THEY SHALL CONTINUE TO FUNCTION UNTIL DISTURBED AREAS ARE RE-ESTABLISHED WITH TEMPORARY VEGETATION. NO SEDIMENT CONTROLS SHALL BE PLACED IN A STREAM.

TRENCH DEWATERING OR GROUND WATER, WHICH CONTAINS SEDIMENT SHALL PASS THROUGH A SEDIMENT SETTLING POND OR EQUALLY EFFECTIVE SEDIMENT CONTROL DEVICE. ALTERNATIVES MAY INCLUDE DEWATERING INTO SUMP PIT, FILTER BAG OR EXISTING VEGETATED UPSLOPE AREA. SEDIMENT LADEN WATER SHALL NOT BE DISCHARGED TO STREAMS OR THE STORM SEWER SYSTEM.

THE SWP3, NOTES AND DETAILED DRAWINGS ARE INTENDED TO SERVE AS BASIC GUIDELINES. ALL EROSION CONTROL PRACTICES SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE ODNR RAINWATER AND LAND DEVELOPMENT MANUAL.

ADDITIONAL EROSION CONTROL BMP'S MAY BE MANDATED BY THE GOVERNING AGENCY AT ANY TIME DURING THIS PROJECT AS UNFORSEEN SITUATIONS MAY ARISE THAT WARRANT FURTHER EROSION AND SEDIMENT CONTROL PRACTICES.

CLEARING AND GRUBBING
LIMITS OF CLEARING AND GRADING SHALL BE CLEARLY MARKED ON THE SITE WITH SIGNAGE, FLAGGING AND/OR ORANGE CONSTRUCTION FENCING.

THE CONTRACTOR SHALL LIMIT THE SURFACE AREA OF ERODIBLE EARTH MATERIAL EXPOSED BY EXCAVATION, BORROW, AND FILL OPERATIONS AND PROVIDE IMMEDIATE PERMANENT OR TEMPORARY CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT STREAMS OR OTHER WATER COURSES, LAKES, PONDS, WETLANDS OR OTHER AREAS OF WATER IMPOUNDMENT.

CONSTRUCTION ENTRANCE
A STONED CONSTRUCTION ENTRANCE SHALL BE INSTALLED FOR ALL INGRESS & EGRESS TO THE SITE. THE MINIMUM DIMENSIONS OF THE DRIVE SHALL BE 20 FT. WIDE AND 50 FT. LONG. THE STONE SHALL BE 6 INCHES DEEP WITH AN UNDERLAIN GEOTEXTILE FABRIC. THE DRIVE SHALL BE INSTALLED PRIOR TO ANY CLEARING AND GRUBBING. SEDIMENTS SHALL BE REMOVED FROM THE ROADWAYS DAILY.

STABILIZATION

PERMANENT AND TEMPORARY STABILIZATION ARE DEFINED IN PART VII OF THE OEPA AUTHORIZATION FOR FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

OHIO EPA PERMIT NO. OH000003 EFFECTIVE DATE 4/21/08 – EXPIRATION DATE 4/20/13 DISTURBED AREAS MUST BE STABILIZED AS SPECIFIED IN THE FOLLOWING TABLES BELOW:

TABLE 1: PERMANENT STABILIZATION

AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROL
ANY AREA THAT WILL LIE DORMANT FOR ONE YEAR OR MORE	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE
ANY AREA WITHIN 50 FT. OF A STREAM AND AT FINAL GRADE	WITHIN TWO DAYS OF REACHING FINAL GRADE
ANY OTHER AREAS AT FINAL GRADE	WITHIN SEVEN DAYS OF REACHING FINAL GRADE WITHIN THAT AREA

TEMPORARY SEEDING
SEEDING AREAS SHALL BE INSPECTED AND WHERE THE SEED HAS NOT PRODUCED 80% COVER SHALL BE RESEEDED AS NECESSARY BY THE CONTRACTOR. AREAS SHALL BE STABILIZED WITH STRAW MULCH WHEN CONDITIONS PROHIBIT SEEDING.

STRAW MULCHING SHALL BE APPLIED AT A RATE 2-3 STANDARD 45 LB. BALES PER 1000 SQ.FT. OF DISTURBED AREA OR 2 TONS PER ACRE. ALL HYDROSEEDING MUST BE STRAW MULCHED ACCORDING TO THE ABOVE SPECIFICATIONS UNLESS IT IS WATERED WEEKLY.

ALL DETENTION PONDS, RETENTION PONDS, WATER QUALITY STRUCTURES, SEDIMENT PONDS, SEDIMENT TRAPS, EARTHEN DIVERSIONS OR EMBANKMENTS SHALL BE SEEDED AND STRAW MULCHED WITHIN 7 DAYS OF COMPLETED CONSTRUCTION.

TABLE 2: TEMPORARY STABILIZATION

AREA REQUIRING TEMPORARY STABILIZATION	TIME FRAME TO APPLY EROSION CONTROL
ANY DISTURBED AREAS WITHIN 50 FT. OF A STREAM AND NOT AT FINAL GRADE	WITHIN TWO DAYS OF THE MOST RECENT DISTURBANCE IF THE AREA WILL REMAIN IDLE FOR MORE THAN 14 DAYS
FOR ALL CONSTRUCTION ACTIVITIES, ANY DISTURBED AREAS THAT WILL BE DORMANT FOR MORE THAN 21 DAYS BUT LESS THAN ONE YEAR, AND NOT WITHIN 50 FT. OF STREAM	WITHIN SEVEN DAYS OF THE MOST RECENT DISTURBANCE WITHIN THE AREA FOR RESIDENTIAL SUBDIVISIONS, DISTURBED AREAS MUST BE STABILIZED AT LEAST SEVEN DAYS PRIOR TO TRANSFER OF PERMIT COVERAGE FOR THE INDIVIDUAL LOT(S)
DISTURBED AREAS THAT WILL BE IDLE OVER WINTER	PRIOR TO ONSET OF WINTER WEATHER (NOV.1) STRAW MULCH 2 TO 3 BALES PER 1000 SQ.FT. AND OR 2 TONS PER ACRE.

PERMANENT STABILIZATION OF CONVEYANCE CHANNELS
OPERATORS SHALL UNDERTAKE SPECIAL MEASURES TO STABILIZE CHANNELS AND OUTFALLS AND PREVENT EROSIVE FLOWS. MEASURES MAY INCLUDE SEEDING, DORMANT SEEDING (AS DEFINED IN THE LATEST EDITION OF "ODNR RAINWATER AND LAND DEVELOPMENT MANUAL"), MULCHING, EROSION CONTROL MATTING, SODDING, RIPRAP NATURAL CHANNEL DESIGN WITH BIO ENGINEERING TECHNIQUES OR ROCK CHECK DAMS.

SOIL TRANSPORT ONTO PUBLIC ROADS
WHERE SOIL IS TRANSPORTED ONTO PUBLIC ROAD SURFACES, THE ROADS SHALL BE CLEANED THOROUGHLY BY EITHER SWEEPING OR SCRAPING AT THE END OF EACH WORK DAY OR MORE FREQUENTLY, IN ORDER TO ENSURE PUBLIC SAFETY. STREET WASHING SHALL NOT BE PERMITTED.

ERODIBLE MATERIAL RAMPS IN STREETS TO ENABLE EQUIPMENT TO CROSS CURBS SHALL BE PROPERLY REMOVED IMMEDIATELY AFTER USE.

SILT FENCE & DIVERSIONS
SHEET FLOW RUNOFF FROM DENUDED AREAS SHALL BE INTERCEPTED BY SILT FENCE OR DIVERSIONS TO PROTECT ADJACENT PROPERTIES AND WATER RESOURCES FROM SEDIMENT TRANSPORTED VIA SHEET FLOW. WHERE INTENDED TO PROVIDE SEDIMENT CONTROL, SILT FENCES SHALL BE PLACED ON A LEVEL CONTOUR. THE EPA PERMIT No. OHC000003 DOES NOT PRECLUDE THE USE OF OTHER SEDIMENT BARRIERS DESIGNED TO CONTROL SHEET FLOW RUNOFF. SILT FENCE IS NOT PERMITTED TO BE USED FOR CONTROLLING CONCENTRATED SURFACEWATER FLOW (ONLY SHEET FLOW). STORMWATER DIVERSION PRACTICES SHALL BE USED TO KEEP RUNOFF AWAY FROM DISTURBED AREAS AND STEEP SLOPES WHERE PRACTICAL. SUCH DEVICES, WHICH INCLUDE SWALES, DIKES OR BERMS, MAY RECEIVE FROM AREAS UP TO 10 ACRES.

INLET PROTECTION
INLET PROTECTION IS MANDATORY.

NON-SEDIMENT POLLUTANTS CONTROLS
NO SOLID (OTHER THAN SEDIMENT) OR LIQUID WASTE, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED IN STORMWATER RUNOFF. ALL NECESSARY BMP'S MUST BE IMPLEMENTED TO PREVENT THE DISCHARGE OF NON-SEDIMENT POLLUTANTS TO THE DRAINAGE SYSTEM OF THE SITE OR SURFACE WATERS OF THE STATE. UNDER NO CIRCUMSTANCE SHALL CONCRETE TRUCKS WASH OUT DIRECTLY INTO A DRAINAGE CHANNEL, STORM SEWER OR SURFACE WATERS OF THE STATE. NO EXPOSURE OF STORMWATER TO WASTE MATERIALS IS RECOMMENDED.

TRENCH AND GROUND WATER CONTROL
THERE SHALL BE NO TURBID DISCHARGES TO SURFACE WATERS OF THE STATE RESULTING FROM DEWATERING ACTIVITIES. IF TRENCH OR GROUND WATERS CONTAIN SEDIMENT, IT MUST PASS THROUGH A SEDIMENT SETTLING POND OR OTHER EQUALLY EFFECTIVE SEDIMENT CONTROL DEVICE, PRIOR TO BEING DISCHARGED FROM THE CONSTRUCTION SITE. ALTERNATIVELY, SEDIMENT MAY BE REMOVED BY SETTLING IN PLACE OR DEWATERING INTO A SUMP PIT, FILTER BAG OR COMPARABLE PRACTICE. GROUND WATER DEWATERING WHICH DOES NOT CONTAIN SEDIMENT OR OTHER POLLUTANTS ARE NOT REQUIRED TO BE TREATED PRIOR TO DISCHARGE, HOWEVER, CARE MUST BE TAKEN WHEN DISCHARGING GROUND WATER TO ENSURE THAT IT DOES NOT BECOME POLLUTANT-LADEN BY TRAVERSING OVER DISTURBED SOILS OR OTHER POLLUTANT SOURCES.

MAINTENANCE
ALL TEMPORARY AND PERMANENT CONTROL PRACTICES SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ENSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED IN A FUNCTIONAL CONDITION UNTIL ALL UP SLOPE AREAS THEY CONTROL ARE PERMANENTLY STABILIZED. THE CONTRACTOR SHALL COMPLY WITH THE MAINTENANCE SCHEDULE INCLUDED IN THE APPROVED PLANS FOR THE PROPOSED EROSION CONTROLS. A WRITTEN DOCUMENT CONTAINING THE SIGNATURES OF ALL CONTRACTORS AND SUB-CONTRACTORS INVOLVED IN THE IMPLEMENTATION OF THE BMP'S MUST BE MAINTAINED AS PROOF ACKNOWLEDGING THAT THEY REVIEWED AND UNDERSTAND THE CONDITIONS AND RESPONSIBILITIES OF THE SWP3.

INSPECTION
ALL STORMWATER CONTROLS ON THE SITE ARE INSPECTED AT LEAST ONCE EVERY SEVEN CALANDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN ONE-HALF INCH OF RAIN PER 24 HOUR PERIOD. A WRITTEN RECORD DOCUMENTATING THE RESULTS OF THESE INSPECTIONS MUST BE CREATED AND MAINTAINED WITH THE SWP3. DISTURBED AREAS AND AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE EROSION AND SEDIMENT CONTROL MEASURES IDENTIFIED IN THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THOSE ARE OPERATING CORRECTLY. DISCHARGE LOCATIONS SHALL BE INSPECTED TO ASCERTAIN WHETHER EROSION AND SEDIMENT CONTROL MEASURES ARE EFFECTIVE IN PREVENTING SIGNIFICANT IMPACTS TO THE RECEIVING WATERS. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE VEHICLE TRACKING.

WASTE DISPOSAL
CONTAINERS (e.g., DUMPSTERS, DRUMS) SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS, TRASH, HAZARDOUS OR PETROLEUM WASTES. ALL CONTAINERS MUST BE COVERED AND LEAK-PROOF. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THE PERTINENT MATERIAL.

CLEAN HARD FILL
BRICKS, HARDENING CONCRETE, AND SOIL WASTE SHALL BE FREE FROM CONTAMINATION WHICH MAY LEACH CONSTITUENTS TO WATERS OF THE STATE. CLEAN CONSTRUCTION WASTES THAT WILL BE DISPOSED INTO THE PROPERTY, SHALL BE SUBJECT TO ANY LOCAL PROHIBITIONS FROM THIS TYPE OF DISPOSAL.

CONSTRUCTION & DEMOLITION DEBRIS
ALL CONSTRUCTION & DEMOLITION DEBRIS (C&DD) WASTE SHALL BE DISPOSED OF IN AN OHIO EPA APPROVED C&DD LANDFILL AS REQUIRED BY OHIO REVISED CODE (ORC) 3714. CONSTRUCTION DEBRIS MAY BE DISPOSED OF ON-SITE, BUT DEMOLITION DEBRIS MUST BE DISPOSED IN A OHIO EPA APPROVED LANDFILL. ALSO, MATERIALS WHICH CONTAIN ASBESTOS MUST COMPLY WITH AIR POLLUTION REGULATIONS (SEE OHIO ADMINISTRATIVE CODE (OAC) 3745-20).

CONSTRUCTION CHEMICAL COMPOUNDS
AREA SHALL BE DESIGNATED FOR MIXING OR STORAGE OF COMPOUNDS SUCH AS FERTILIZERS, LIME ASPHALT, OR CONCRETE. THESE DESIGNATED AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS, OR OTHER STORMWATER DRAINAGE AREA.

EQUIPMENT FUELING & MAINTENANCE
EQUIPMENT FUELING & MAINTENANCE SHALL BE IN DESIGNATED AREAS ONLY.

A SPILL PREVENTION CONTROL AND COUNTERMEASURES
A SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN MUST BE DEVELOPED FOR SITES WITH ONE ABOVE-GROUND STORAGE TANK OF 660 GALLONS OR MORE, TOTAL ABOVE-GROUND STORAGE OF 1,320 GALLONS, OR BELOW-GROUND STORAGE OF 4,200 GALLONS OF FUEL.

CONCRETE WASH WATER
ALL DESIGNATED CONCRETE WASHOUT AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS, OR OTHER STORMWATER DRAINAGE AREAS.

CONTAMINATED SOILS
ALL CONTAMINATED SOIL MUST BE TREATED AND/OR DISPOSED IN OHIO EPA APPROVED SOLID WASTE MANAGEMENT FACILITIES OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITIES (TSDFs).

SPILL REPORTING REQUIREMENTS
THE CONTRACTOR SHALL CONTACT THE OHIO EPA AT 800-282-9378 AND THE LOCAL FIRE DEPARTMENT IN THE EVENT OF A PETROLEUM SPILL (>25 GALLONS) OR THE PRESENCE OF SHEEN.

OPEN BURNING
OPEN BURNING IS NOT PERMITTED.

DUST CONTROLS/SUPPRESSANTS
USED OIL MAY NOT BE USED AS A DUST SUPPRESSANT. NO DUST SUPPRESSANT SHALL BE APPLIED NEAR CATCH BASINS, STORM SEWERS OR OTHER DRAINAGE WAYS.

STREAM CROSSINGS
STREAM CROSSINGS SHALL BE CONSTRUCTED ENTIRELY OF STONE, ROCK, OR CLEAN RECYCLED CONCRETE. SOIL OR EARTHEN MATERIAL MAY NOT BE USED. A 20 FT. STONE APRON ON EITHER SIDE OF THE STREAM SHALL BE CONSTRUCTED TO PREVENT LOCALIZED SEDIMENTATION. THE CHANNELBED AND BANKS SHALL BE RESTORED, AND ALL DISTURBED AREAS OF THE BANK WITHIN 50 FT. OF THE STREAM SHALL BE STABILIZED WITH SEED AND STRAW MULCH WITHIN 2 DAYS OF THE DISTURBANCE.

PERMITS

THIS SITE IS COVERED UNDER OHIO EPA CONSTRUCTION GENERAL PERMIT #_____

THIS SITE IS COVERED UNDER OPEA / ARMY 401 /404 PERMIT #_____

STRUCTURAL BMP'S
PERMANENT BMP'S FOR POST CONSTRUCTION TREATMENT OF STORMWATER (CONVERSION OF SEDIMENT LAND TO STORMWATER POND) SHALL NOT BE INSTALLED UNTIL 80% OF THE DISTURBED AREA IS STABILIZED.

SEEDING AND MULCHING
SEDIMENT CONTROL SHALL BE ACCOMPLISHED BY SEEDING AND MULCHING IMMEDIATELY UPON COMPLETION OF EXCAVATION OR FILL AND FINISHED GRADING IN ACCORDANCE WITH ITEM 659 OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER. THE FOLLOWING PRO-MIXTURE SHALL BE USED FOR SEEDING: 3-21 CERTIFIED KENTUCKY BLUE GRASS - 35% PENNLAWN FESCUE - 25% MANHATTEN II RYEGRASS - 40% FERTILIZER - 10#/1000 S.F. (12-12-12) MULCH - STRAW - 2 TONS/ACRE RESTORATION OF ALL DISTURBED AREAS SHALL IMMEDIATELY FOLLOW EXCAVATION AND GRADING OPERATIONS. DELAY IN RESTORATION SHALL NECESSITATE TEMPORARY EROSION CONTROL MEASURES APPROVED BY THE ENGINEER AND AT THE CONTRACTOR'S COST.

RIPARIAN BUFFERS

THE RIPARIAN BUFFER (SETBACK) FOR ALL MAJOR AND MINOR DITCHES SHALL BE MARKED IN THE FIELD WITH ORANGE CONSTRUCTION FENCING BY THE CONSTRUCTION SITE OPERATOR PRIOR TO ANY EARTH DISTURBING ACTIVITIES.

ENFORCEMENT

ALL DEVELOPMENT SITES ARE SUBJECT TO INSPECTIONS BY THE CITY OF NORTH RIDGEVILLE AUTHORIZED AGENT(S) UNDER THE DIRECTION OF THE A LICENSED PROFESSIONAL ENGINEER TO ENSURE COMPLIANCE WITH THE APPROVED SITE DEVELOPMENT PLAN OR SWM PLAN.

IF IT IS FOUND THAT THE OPERATIONS ARE BEING CONDUCTED IN VIOLATION OF THE APPROVED SITE DEVELOPMENT PLAN AND SWM PLAN, A STOP-WORK ORDER MY BE ISSUED BY THE CITY OF NORTH RIDGEVILLE UNTIL THE IDENTIFIED VIOLATIONS CEASE.

AFTER ISSUANCE OF A STOP-WORK ORDER PROVIDED IN THE PARAGRAPH ABOVE, BUT BEFORE THE IMPOSITION OF ANY FINES, THE APPLICANT SHALL HAVE TWO (2) BUSINESS DAYS TO REQUEST A MEETING WITH THE CITY LAW DIRECTOR AND THE CITY ENGINEER TO SHOW CAUSE WHY THE WORK SHOULD NOT BE STOPPED.

FOLLOWING THE ISSUANCE OF A STOP-WORK ORDER, THE CITY OF NORTH RIDGEVILLE SHALL DETERMINE IF AND WHEN THE DEVELOPMENT MAY PROCEED. ANY DETERMINATION BY THE CITY OF NORTH RIDGEVILLE PURSUANT TO THIS SECTION IS A FINAL ORDER FOR THE PURPOSE OF JUDICIAL REVIEW.

VIOLATIONS

THE CITY OF NORTH RIDGEVILLE SHALL NOTIFY THE STORM WATER PERMITTEE OF ANY VIOLATIONS OBSERVED IN WRITING. SAID NOTICE SHALL INDICATE THE EXACT NATURE OF THE VIOLATIONS AND OTHER SPECIFIC CORRECTIONS WHICH ARE REQUIRED.

THE PERMITTEE SHALL COMPLY WITH THE TIMELINE FOR CORRECTIONS SPECIFIED BELOW. TIMELINE EXTENSIONS FOR ADVERSE WEATHER CONDITIONS MAY BE GRANTED UPON APPROVAL OF THE CITY ENGINEER.

NATURE OF VIOLATION:	NUMBER OF DAYS FROM INSPECTION TO CORRECT FUNCTIONING OF CONTROL PRACTICE:
SILT FENCE	WITHIN THREE (3) DAYS
OUTLET CONTROL STRUCTURE	WITHIN THREE (3) DAYS
TEMPORARY OR PERMANENT STABILIZATION WITHIN 50' OF DRAINAGE CHANNELS	WITHIN THREE (3) DAYS
TEMPORARY OR PERMANENT STABILIZATION FOR ALL OTHER DISTURBED AREAS	WITHIN THREE (3) DAYS
STABILIZED CONSTRUCTION ENTRANCE	WITHIN THREE (3) DAYS
PUMPING SEDIMENT-LADEN DISCHARGE INTO DRAINAGE CHANNEL	IMMEDIATELY UPON NOTICE
SEDIMENT SETTLING POND	WITHIN TEN (10) DAYS
ANY OTHER CONTROL PRACTICE NOT ADDRESSED IN THIS TABLE	WITHIN THREE (3) DAYS

PENALTIES SUBSEQUENT TO ISSUANCE OF STOP-WORK ORDER

SUBSEQUENT TO ISSUANCE OF A STOP-WORK ORDER, PENALTIES MAY BE IMPOSED ACCORDING TO THE CITY OF NORTH RIDGEVILLE CODIFIED ORDINANCE 1056.08(G)(1)(A), 1056.08(G)(1)(B) OR 1056.08(G)(1)(C).

REV. 11/22/16 OCTOBER 1, 2008

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.

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440.349.2000

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

SWP3 GENERAL NOTES

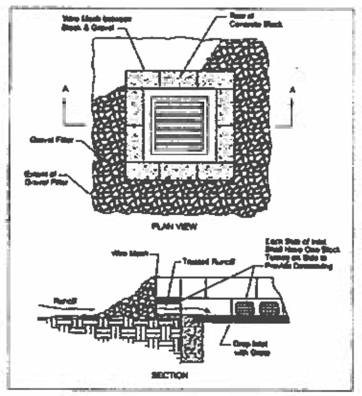
DATE JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 7.1

CAD FILE: 18002341-07 - SWPPP 07 - PH 1.DWG

Specifications
for
Block and Gravel Drop Inlet Filter



1. Place 4-inch by 8-inch by 12-inch concrete blocks [illegible]
2. Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the block cores. [illegible]
3. Two-inch stone should be piled against the wire to the top of the block border, as shown below.
4. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, pull stone away from the blocks, clean and/or replace.

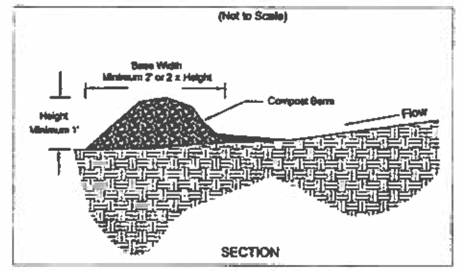
INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING
BLOCK AND GRAVEL DROP INLET FILTER
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-23
CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Filter Berm

(Not to Scale)



1. Materials – Compost used for filter berms [illegible]
2. Installation – Filter berms will be placed on a level line across slopes, [illegible]

Filter berms are not to be used in concentrated flow situations or in runoff channels.

3. Maintenance – Inspect filter berms after each significant rain, [illegible]

Remove sediments collected at the base of the filter berms when they reach 1/3 of the exposed height of the practice.

Where the filter berm deteriorates or fails it will be, it will be repaired or replaced with a more effective alternative.

4. Removal – Filter berms no longer needed will be dispersed on site in a manner that will facilitate seeding.

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING
FILTER BERM
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-24
CITY OF NORTH RIDGEVILLE, ENGINEER

Concrete Washout Areas

Installation:

1. Concrete wash water shall not be allowed to flow to streams, ditches, storm drains, or any other water conveyance and washout pits shall be situated a minimum of fifty (50) feet from them.
2. Field tile or other subsurface drainage structures within 10 ft. of the sump shall be cut and plugged.
3. Ensure a stable path is provided for concrete trucks to reach the washout area.
4. A highly visible sign that reads "Concrete Washout Area" shall be erected adjacent to the washout pit.
5. Surface runoff generated from upslope areas shall be diverted away from below-grade washout pits so as not to flow into them.
6. A single centralized washout area may be utilized for multiple sublots.

Maintenance:

7. The washout pit must be inspected frequently to ensure the liner is intact.
8. Once 75% of the original volume of the washout pit is filled or if the liner is torn, the material must be removed and properly disposed of once it is completely hardened. Once the hardened concrete is removed, the liner must be replaced (if torn). A new pit must be constructed if the original structure is no longer suitable.

Removal:

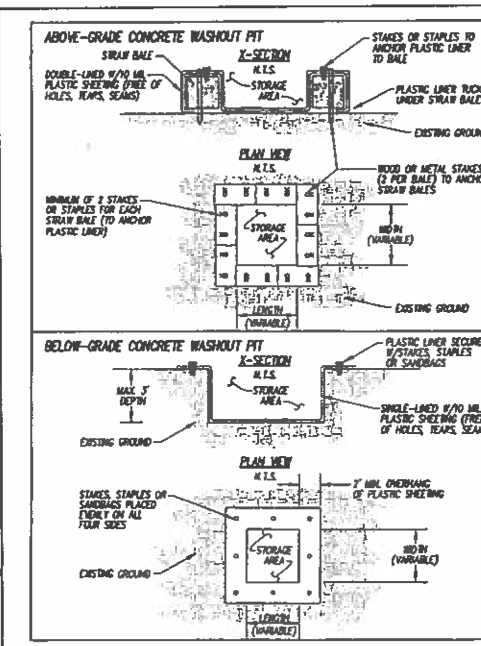
9. Once the washout pit is no longer needed, ensure all washout material has completely hardened, then remove and properly dispose of all materials. If straw bales were used, they can be spread as mulch.
10. Prefabricated containers specifically designed for concrete washout collection may be used subject to prior approval by the Community Engineer. Follow the manufacturer's suggestions for installation, maintenance and removal procedures.

Sizing of Concrete Washout Pits

Below-grade (3-ft depth)		
# of concrete trucks expected to be washed out on site*	Width (ft)	Length (ft)
2-3	3	3
4-5	4	4
6-7	5	5
8-10	6	6
11-14	7	7

Above-grade (2-ft depth)		
# of concrete trucks expected to be washed out on site*	Width (ft)	Length (ft)
2	3	3
3-4	4	4
5-6	5	5
7-8	6	6
9-11	7	7
12-15	8	8

*For small projects using a maximum of only one truckload of concrete or utilizing on-site mixing, rinsing of equipment may take place on the lot without a pit, provided it can be done a minimum of fifty (50) feet away from any water conveyances.

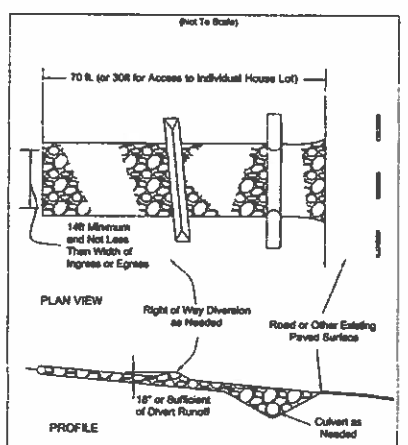


REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING
CONCRETE WASHOUT
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-33
CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Construction Entrance

(Not To Scale)



Specifications
for
Construction Entrance

1. Stone Size—ODOT # 2 (1.5-2.5 inch) stone shall be used, or recycled concrete equivalent.
2. Length—The Construction entrance shall be as long as required to stabilize high traffic areas but not less than 70 ft. (exception: apply 30 ft. minimum to single residence lots).
3. Thickness - The stone layer shall be at least 6 inches thick for light duty entrances or at least 10 inches for heavy duty use.
4. Width - The entrance shall be at least 14 feet wide, but not less than the full width of points where ingress or egress occurs.
5. Geotextile - A geotextile shall be laid over the entire area prior to placing stone. It shall be composed of strong rot-proof polymeric fibers and meet the following specifications:

Figure 7.4.1

Geotextile Specification for Construction Entrance	
Minimum Tensile Strength	200 lbs.
Minimum Puncture Strength	80 psi.
Minimum Tear Strength	50 lbs.
Minimum Burst Strength	320 psi.
Minimum Elongation	20%
Equivalent Opening Size	EOS < 0.6 mm.
Permittivity	1 x 10-3 cm/sec.

6. Timing—The construction entrance shall be installed as soon as is practicable before major grading activities.
7. Culvert - A pipe or culvert shall be constructed under the entrance if needed to prevent surface water from flowing across the entrance or to prevent runoff from being directed out onto paved surfaces.
8. Water Bar - A water bar shall be constructed as part of the construction entrance if needed to prevent surface runoff from flowing the length of the construction entrance and out onto paved surfaces.
9. Maintenance - Top dressing of additional stone shall be applied as conditions demand. Mud spilled, dropped, washed or tracked onto public roads, or any surface where runoff is not checked by sediment controls, shall be removed immediately. Removal shall be accomplished by scraping or sweeping.
10. Construction entrances shall not be relied upon to remove mud from vehicles and prevent off-site tracking. Vehicles that enter and leave the construction-site shall be restricted from muddy areas.
11. Removal—the entrance shall remain in place until the disturbed area is stabilized or replaced with a permanent roadway or entrance.

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING
CONSTRUCTION ENTRANCE
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-27
CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Dust Control

1. Vegetative Cover and/mulch – Apply temporary or permanent seeding and mulch to areas that will remain idle for over 21 days. [illegible]
2. Watering – Spray site with water until the surface is wet [illegible]
3. Spray-On Adhesives – Apply adhesive according to the following table or manufacturers' instructions.
4. Stone – Graded roadways and other suitable areas will be stabilized using crushed stone or coarse gravel as soon as practicable after reaching an interim or final grade. [illegible]
5. Barriers – Existing windbreak vegetation shall be marked and preserved. [illegible]
6. Calcium Chloride – This chemical may be applied by mechanical spreader as loose, dry granules or flakes at a rate that keeps the surface moist but not so high as to cause water pollution or plant damage. [illegible]
7. Operation and Maintenance – When Temporary Dust Control measures are used; repetitive treatment should be applied as needed to accomplish control.

Street Cleaning - Paved areas that have accumulated sediment from construction should be cleaned daily, or as needed, utilizing a street sweeper or bucket -type endloader or scraper.

Table 7.5.1 Adhesives for Dust Control

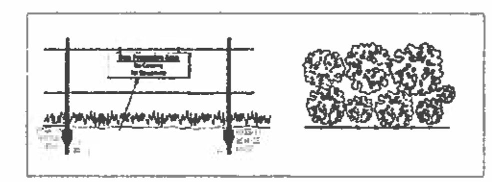
Adhesive	Water Dilution (Adhesive: Water)	Nozzle Type	Application Rate Gal./Ac.
Latex Emulsion	12.5:1	Fine	235
Resin in Water Acrylic Emulsion (Non-traffic)	4:1	Fine	300
Acrylic Emulsion (Non-traffic)	7:1	Coarse	450
Acrylic Emulsion (Traffic)	3.5:1	Coarse	350

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING
DUST CONTROL
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-29
CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Tree and Natural Area Preservation



1. Tree and natural area preservation shall be fenced prior to beginning clearing operations.
2. Fence materials shall be metal fence posts with two strands of high tensile wire, plastic fence or snow fence.
3. Signage shall clearly identify the tree and natural preservation area and state that no clearing or equipment is allowed within it.
4. Fence shall be placed as shown on plans and beyond the drip line or canopy of trees to be protected.
5. If any clearing is done around specimen trees it shall be done by cutting at ground level with hand held tools and shall not be grubbed or pulled out. No clearing shall be done in buffer strips or other preserved forested areas.
6. If any clearing is done around specimen trees it shall be done by cutting at ground level with hand held tools and shall not be grubbed or pulled out. No clearing shall be done in buffer strips or other preserved forested areas.
7. No filling or stockpiling of materials shall occur within the tree protection area, including deposition of sediment.

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING
TREE AND NATURAL AREA PRESERVATION
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-26
CITY OF NORTH RIDGEVILLE, ENGINEER

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

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
SWP3 DETAILS

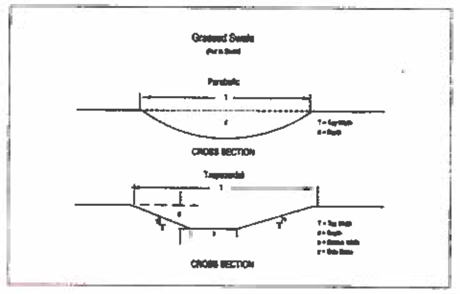
DATE
JANUARY 11, 2019
APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO.
72

CAD FILE: 18002341-07 - SWPPP DT - PH 18.DWG

Specifications
for
Grassed Swale



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INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

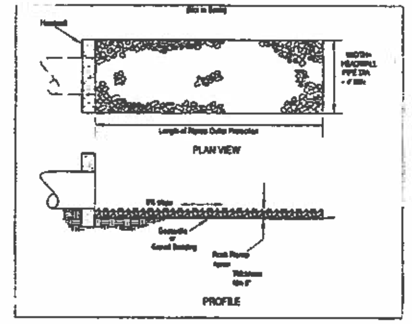
CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

GRASSED SWALE

SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-3

CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Rock Outlet Protection



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INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

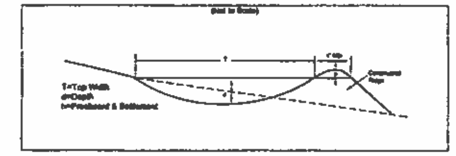
CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

ROCK OUTLET PROTECTION

SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-7

CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Diversion



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INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

DIVERSION

SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-8

CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
De-Watering

[illegible]

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

DE-WATERING

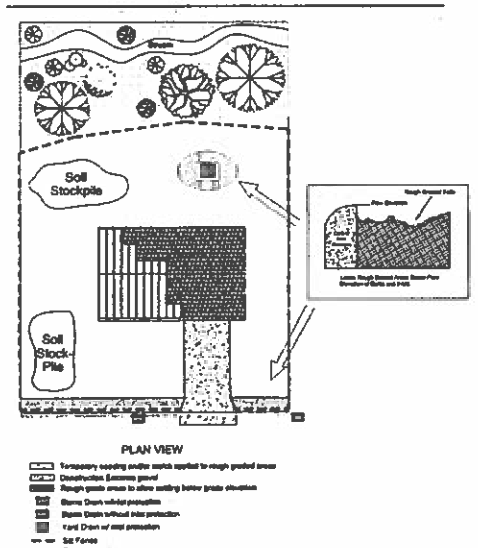
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-15

CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Small Construction Site Controls

[illegible]

Specifications
for
Small Construction Site Controls



INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

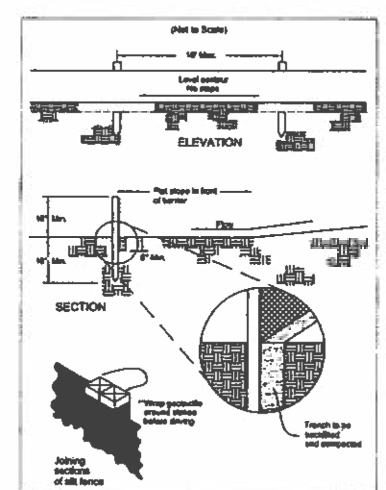
CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

SMALL CONSTRUCTION SITE CONTROLS

SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-32

CITY OF NORTH RIDGEVILLE, ENGINEER

Specifications
for
Silt Fence



Specifications
for
Silt Fence

[illegible]

2. Silt fence fabric – See chart below

FABRIC PROPERTIES	VALUES	TEST METHOD
Minimum Tensile Strength	120 lbs. (535 N)	ASTM D 4632
Maximum Elongation at 60 lbs	50%	ASTM D 4632
Minimum Puncture Strength	50 lbs (220 N)	ASTM D 4833
Minimum Tear Strength	40 lbs (180 N)	ASTM D 4533
Apparent Opening Size	≤ 0.84 mm	ASTM D 4751
Minimum Permittivity	1X10-2 sec -1	ASTM D 4491
UV Exposure Strength Retention	70%	ASTM G 4355

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

SILT FENCE

SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB
SWP-18

CITY OF NORTH RIDGEVILLE, ENGINEER

811
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LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
SWP3 DETAILS

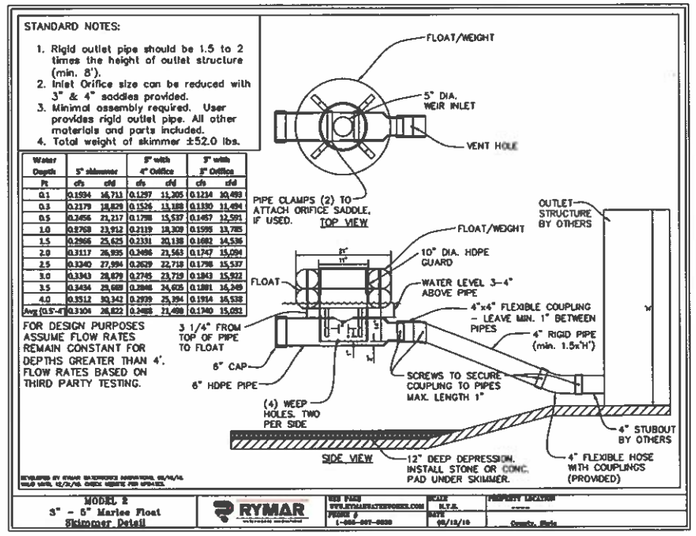
DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

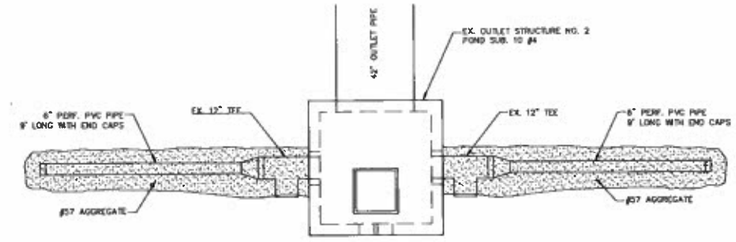
REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO.
73

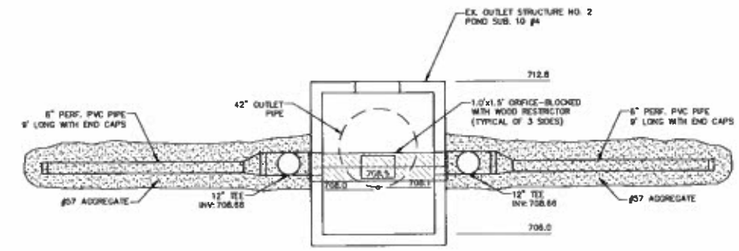
CAD FILE: 18002341-07 - SWPPP DT - PH 18.DWG



Water Depth	3" skimmer		3" with 4" Orifice		3" with 3" Orifice	
Ft	cfs	cfd	cfs	cfd	cfs	cfd
0.1	0.1934	16,711	0.1297	11,205	0.1234	10,493
0.3	0.2179	18,829	0.1526	13,188	0.1330	11,494
0.5	0.2456	21,217	0.1798	15,537	0.1457	12,591
1.0	0.2763	23,912	0.2119	18,309	0.1595	13,785
1.5	0.2966	25,625	0.2331	20,138	0.1682	14,536
2.0	0.3117	26,935	0.2496	21,563	0.1747	15,094
2.5	0.3240	27,994	0.2629	22,718	0.1798	15,537
3.0	0.3343	28,879	0.2745	23,719	0.1843	15,922
3.5	0.3434	29,668	0.2848	24,605	0.1881	16,249
4.0	0.3512	30,342	0.2939	25,394	0.1914	16,538
Avg (0.5'-4')	0.3304	28,822	0.2688	21,498	0.1740	15,032



EX. OUTLET STRUCTURE NO. 2, POND SUB. 10 #4
PLAN VIEW
NOT TO SCALE

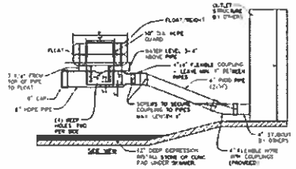


EX. OUTLET STRUCTURE NO. 2, POND SUB. 10 #4
CROSS-SECTION VIEW
NOT TO SCALE

POND SUB. 10 #4 SEDIMENT CONTROL DEVICE DETAILS

RYMAR
WATERWORKS INNOVATIONS

Model #2 | 3", 4" & 5"
Marlee Float™ Skimmer Cut Sheet/Installation Instructions



1. Model 2: 3" - 5" Marlee Float Skimmer is to be attached to a 4" rigid pipe (Schedule 40 PVC for construction/temporary applications or HDPE for permanent applications). Rigid pipe should be 1.5 times the height of the outlet structure (H), minimum of 8'. For ponds requiring a pipe length greater than 16' additional weight may be required to counteract buoyancy.

2. 4" Rigid pipe to be attached to 4" pipe stubbed out of outlet structure or through dam. Flexible pipe with couplings to attach 4" rigid pipe to 4" PVC or HDPE stub out is provided. If stubout is material other than Schedule 40 PVC or HDPE an alternate coupling may be required.

3. When attaching rigid pipe to skimmer coupling make sure to leave at least 1' space in coupling between pipes to allow for sufficient flexibility.

4. Basin should have a +/- 12" depression (skimmer pit) to effectively drain pond. It is preferable to line bottom of skimmer pit with stone, riprap or concrete. Water may remain in bottom of skimmer pit. It is recommended to slope basin at minimum 1% grade to skimmer pit.

5. Skimmer is shipped fully assembled. User attaches flexible couplings to rigid pipe and stubout from outlet structure. Securely tighten pipe clamps and install two screws (provided) through each connection to minimize twisting.

6. During installation take care to position skimmer in upright position with floats level. Also verify that vent hole in flexible coupling is rotated to top of pipe.

7. 3" and 4" Orifice saddle is provided to convert standard 5" orifice. Center hole in saddle over 5" hole and secure using two pipe clamps provided.

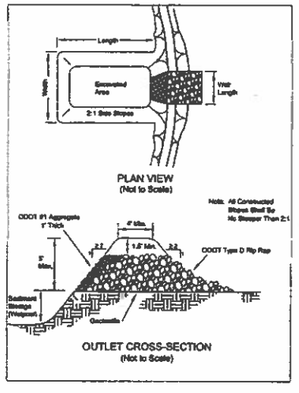
8. Add maintenance rope, if required. Tie to skimmer and affix to outlet structure or post on bank. Insure sufficient rope so skimmer flotation is not restricted.

9. Flow rates are provided with details. Design engineer to select skimmer size as required to meet local requirements.

10. For technical support and/or assistance with installation, visit our website at www.rymarwaterworks.com or call 855.697.9333.

803 Roper Creek Drive Greenville, SC 29615
855.697.9333 www.rymarwaterworks.com info@rymarwaterworks.com

Specifications for **Sediment Trap**



Specifications for **Sediment Traps**

1. Work shall consist of the installation, maintenance and removal of all sediment traps at the locations designated on the drawings.
2. Sediment traps shall be constructed in the dimensions specified on the drawings and operational prior to upslope land disturbance.
3. The area beneath the embankment shall be cleared, grubbed and stripped of vegetation to a maximum depth of six (6) inches. The peat shall be stored as needed to facilitate sediment cleanout.
4. Fill used for the embankment shall be evaluated to ensure its suitability and it must be free of roots or other woody vegetation, large rocks, organics or other objectionable materials. Fill material shall be placed in six (6) inch lifts and shall be compacted by traversing with a track-mounted or other approved compaction equipment. Fill height shall be increased five (5) percent to allow for structure/foundation settlement. Construction shall not be permitted if either the rainfall or compaction surface is frozen.
5. The maximum height of embankment shall be five (5) feet. All cut and fill slopes shall be 2:1 (49%) or flatter.
6. A minimum storage volume below the crest of the outlet of 67 yd³ for every acre of contributing drainage area shall be achieved at each location noted on the drawings with additional sediment storage volume provided below this elevation.
7. Temporary seeding shall be established and maintained over the useful life of the practice.
8. The outlet for the sediment trap structure shall be constructed to the dimensions shown on the drawings.
9. The outlet shall be constructed using the material specified on the drawings. Where geotextile is used, all overlaps shall be a minimum of two (2) feet or as specified by the manufacturer, whichever is greater. All overlaps shall be made with the upper most layer placed last. Geotextile shall be keyed in at least 6" on the upstream side of the outlet.
10. Warning signs and safety fence shall be placed around the traps and maintained over the life of the practice.
11. After all sediment-producing areas have been permanently stabilized, the structure and all accumulated sediment shall be removed. Stable earth materials shall be placed in the sediment trap area and compacted. The area shall be graded to blend in with adjoining land surfaces and have positive drainage. The area shall be immediately seeded.

INFORMATION OBTAINED FROM THE 2006 EDITION OF THE STATE OF OHIO'S "RAINWATER AND LAND DEVELOPMENT MANUAL".

Rev No.	Chkd	By	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

SEDIMENT TRAPS

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRWN BY: JAB/TEB | SWP-17

CITY OF NORTH RIDGEVILLE, ENGINEER

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SECTION
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CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

SWP3 DETAILS & OUTLET STRUCTURE SEDIMENT CONTROL DEVICE DETAILS

DATE JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 3

REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 7.4

CAD FILE: 18002341-07 - SWPPP DT - PH 18.DWG

X:\18002341\PLAN SETS\CONSTRUCTION PHASE 18 SANITARY PLAN SETS\18002341-07 - SWPPP DT - PH 18.DWG 4/13/2020 8:43 AM Timothy Bushell

HIGH PERCH DRIVE

YELLOW BEAK LANE

WHITE FEATHER AVENUE

HIGH PERCH DRIVE

BORROW AREA

LEGEND

PROPOSED SWALE	
RW	RIGHT OF WAY
H.P.	HIGH POINT
F.F.	FINISH FLOOR
F.G.	FINISH GRADE AT HOUSE (GAR. F.F. – 0.33')

NOTES:
1. SEE SHEETS C8.0–C8.16 FOR STORM SEWER PROFILES.
2. EACH SUBLOT SHALL HAVE A 6" PVC STORM LATERAL TIE SUMP PUMP INTO THIS LATERAL (SEE SUMP PUMP CONNECTION DETAIL, SHEET C11.1). DURING CONSTRUCTION OF THE SUBDIVISION AND PRIOR TO HOME CONSTRUCTION, THESE LATERALS WILL SERVE AS DRAINAGE FOR THE HOLDOWN AREA OF THE HOUSE. LATERALS SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND SHALL BE CONSTRUCTED PER THE DETAIL SHOWN ON THE MASS GRADING PLAN SECTION.
3. PER CITY ORDINANCE 1468.08 DOWNSPOUTS SHALL DRAIN ONTO SPLASH BLOCKS.
4. SUBLOTS WITH STORM CONNECTIONS DIRECTLY TO PONDS SHALL HAVE AN INVERT ELEVATION AT OR ABOVE THE 100YR ELEVATION FOR THAT POND.
5. EROSION CONTROL MATTING SHALL BE USED ON DITCH/CHANNEL SLOPES OF 3:1 OR STEEPER.
6. SEE SHEETS C10.4 AND C10.5 FOR HEADWALL DETAILS.

*NOTE:
LATERAL TO BE INSTALLED BY THE HOME BUILDER DURING HOME CONSTRUCTION.

KEY MAP
N.T.S.

8.1
8.2 8.3

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
FINAL GRADING PLAN

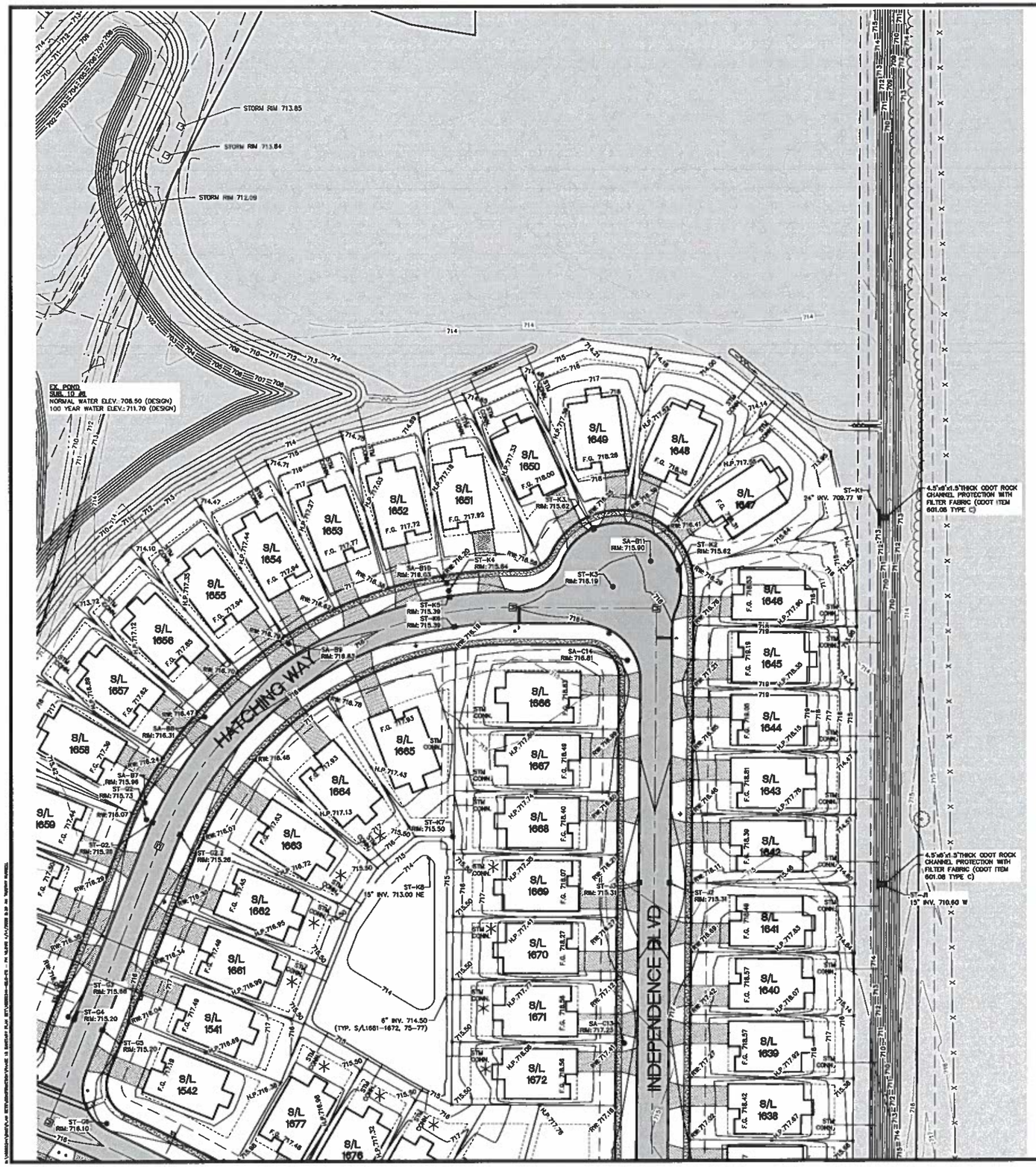
DATE: JANUARY 11, 2019

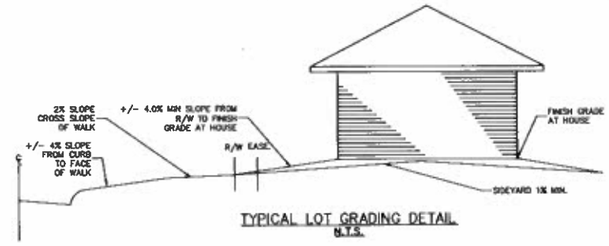
REVISIONS

SCALE 0 20 40
1" = 40 FEET

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 8.0

CAD FILE: 18002341-C8.0-FG - PH 1.DWG

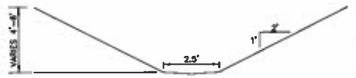




TYPICAL LOT GRADING DETAIL
N.T.S.

SL #	House FF	Garage FF	Bsmnt FF	Top Footer	Bottom Footer	Drive Slope
1495	719.37	717.37	710.70	710.37	709.70	5.20%
1496	719.62	717.62	710.95	710.62	709.95	5.20%
1497	719.84	717.84	711.17	710.84	710.17	5.10%
1498	719.84	717.84	711.17	710.84	710.17	4.90%
1499	719.72	717.72	711.05	710.72	710.05	5.30%
1500	719.37	717.37	710.70	710.37	709.70	5.30%
1501	719.01	717.01	710.34	710.01	709.34	5.30%
1502	718.88	716.88	710.21	709.88	709.21	5.70%
1503	719.16	717.16	710.49	710.16	709.49	5.00%
1504	719.16	717.16	710.49	710.16	709.49	4.40%
1505	718.64	716.64	709.97	709.64	708.97	5.00%
1506	718.17	716.17	709.50	709.17	708.50	5.00%
1507	718.45	716.45	709.78	709.45	708.78	6.40%
1508	718.09	716.09	709.42	709.09	708.42	5.70%
1509	718.09	716.09	709.42	709.09	708.42	5.50%
1510	718.10	716.10	709.43	709.10	708.43	4.90%
1511	718.77	716.77	710.10	709.77	709.10	4.30%
1512	719.03	717.03	710.36	710.03	709.36	5.00%
1513	719.09	717.09	710.42	710.09	709.42	4.90%
1514	719.09	717.09	710.42	710.09	709.42	5.00%
1515	718.83	716.83	710.16	709.83	709.16	5.20%
1516	718.90	716.90	710.23	709.90	709.23	5.30%
1517	719.25	717.25	710.58	710.25	709.58	5.30%
1518	719.61	717.61	710.94	710.61	709.94	5.30%
1519	719.85	717.85	711.18	710.85	710.18	5.10%
1520	719.85	717.85	711.18	710.85	710.18	5.00%
1521	719.71	717.71	711.04	710.71	710.04	5.20%
1522	719.46	717.46	710.79	710.46	709.79	5.20%
1523	718.85	716.85	710.18	709.85	709.18	6.50%
1524	719.45	717.45	710.78	710.45	709.78	5.20%
1525	719.70	717.70	711.03	710.70	710.03	5.10%
1526	719.70	717.70	711.03	710.70	710.03	4.90%
1527	719.63	717.63	710.96	710.63	709.96	5.20%
1528	719.38	717.38	710.71	710.38	709.71	5.10%
1529	719.51	717.51	710.84	710.51	709.84	5.20%
1530	719.72	717.72	711.05	710.72	710.05	5.30%
1531	719.72	717.72	711.05	710.72	710.05	4.90%
1532	719.63	717.63	710.96	710.63	709.96	5.20%
1533	719.38	717.38	710.71	710.38	709.71	5.20%
1534	719.48	717.48	710.81	710.48	709.81	5.40%
1535	719.89	717.89	711.22	710.89	710.22	5.20%
1536	719.89	717.89	711.22	710.89	710.22	4.90%
1537	719.78	717.78	711.11	710.78	710.11	5.20%
1538	719.55	717.55	710.88	710.55	709.88	5.20%
1539	719.46	717.46	710.79	710.46	709.79	4.70%
1540	719.83	717.83	711.16	710.83	710.16	5.20%
1541	719.82	717.82	711.15	710.82	710.15	5.30%
1542	719.52	717.52	710.85	710.52	709.85	4.80%
1543	719.71	717.71	711.04	710.71	710.04	5.40%
1544	720.15	718.15	711.48	711.15	710.48	5.40%
1545	720.15	718.15	711.48	711.15	710.48	4.80%
1546	720.01	718.01	711.34	711.01	710.34	5.50%
1547	719.47	717.47	710.80	710.47	709.80	5.20%
1548	719.73	717.73	711.06	710.73	710.06	5.20%
1549	719.88	717.88	711.21	710.88	710.21	4.80%
1550	719.88	717.88	711.21	710.88	710.21	5.40%
1551	719.33	717.33	710.66	710.33	709.66	5.30%
1552	719.48	717.48	710.81	710.48	709.81	5.20%
1553	719.70	717.70	711.03	710.70	710.03	5.10%
1554	719.70	717.70	711.03	710.70	710.03	4.90%
1555	719.66	717.66	710.99	710.66	709.99	5.20%
1556	719.41	717.41	710.74	710.41	709.74	5.20%
1557	719.48	717.48	710.81	710.48	709.81	5.30%
1558	719.70	717.70	711.03	710.70	710.03	5.10%
1559	719.70	717.70	711.03	710.70	710.03	4.90%
1560	719.62	717.62	710.95	710.62	709.95	5.10%
1561	719.57	717.57	710.90	710.57	709.90	5.90%
1562	719.78	717.78	711.11	710.78	710.11	5.50%
1563	719.94	717.94	711.27	710.94	710.27	5.20%
1564	720.14	718.14	711.47	711.14	710.47	5.00%
1565	720.14	718.14	711.47	711.14	710.47	4.90%
1566	720.06	718.06	711.39	711.06	710.39	5.20%
1567	719.81	717.81	711.14	710.81	710.14	5.20%
1568	719.80	717.80	711.13	710.80	710.13	5.30%
1569	720.20	718.20	711.53	711.20	710.53	5.30%
1570	720.54	718.54	711.87	711.54	710.87	5.20%
1571	720.54	718.54	711.87	711.54	710.87	4.80%
1572	720.48	718.48	711.81	711.48	710.81	5.30%
1573	720.21	718.21	711.54	711.21	710.54	5.10%
1574	720.21	718.21	711.54	711.21	710.54	5.20%
1575	720.67	718.67	712.00	711.67	711.00	5.40%
1576	721.13	719.13	712.46	712.13	711.46	5.40%
1577	721.52	719.52	712.85	712.52	711.85	5.20%
1578	721.52	719.52	712.85	712.52	711.85	4.90%
1579	721.28	719.28	712.61	712.28	711.61	5.50%
1580	720.54	718.54	711.87	711.54	710.87	4.00%

REARYARD SWALE DETAIL
N.T.S.



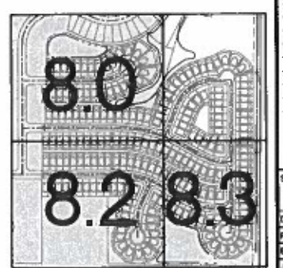
DITCH DETAIL
N.T.S.

LEGEND

	PROPOSED SWALE
RW	RIGHT OF WAY
H.P.	HIGH POINT
F.F.	FINISH FLOOR
F.G.	FINISH GRADE AT HOUSE (GAR. F.F. – 0.33')

NOTES:
1. SEE SHEETS C8.0–C8.16 FOR STORM SEWER PROFILES.
2. EACH SUBLOT SHALL HAVE A 6" PVC STORM LATERAL. THE SUMP PUMP INTO THIS LATERAL (SEE SUMP PUMP CONNECTION DETAIL, SHEET C11.1). DURING CONSTRUCTION OF THE SUBDIVISION AND PRIOR TO HOME CONSTRUCTION, THESE LATERALS WILL SERVE AS DRAINAGE FOR THE HOLDDOWN AREA OF THE HOUSE. LATERALS SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND SHALL BE CONSTRUCTED PER THE DETAIL SHOWN ON THE MASS GRADING PLAN SECTION.
3. PER CITY ORDINANCE 1468.06 DOWNSPOUTS SHALL DRAIN ONTO SPLASH BLOCKS.
4. SUBLOTS WITH STORM CONNECTIONS DIRECTLY TO PONDS SHALL HAVE AN INVERT ELEVATION AT OR ABOVE THE 100YR ELEVATION FOR THAT POND.
5. EROSION CONTROL MATTING SHALL BE USED ON DITCH/CHANNEL SLOPES OF 3:1 OR STEEPER.
6. SEE SHEETS C10.4 AND C10.5 FOR HEADWALL DETAILS.

*NOTE:
LATERAL TO BE INSTALLED BY THE HOME BUILDER DURING HOME CONSTRUCTION.



KEY MAP
N.T.S.

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 RESPONSIBLE FOR ANY CONSTRUCTION SITE SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY ADJACENT STRUCTURES, OR OF ANY OTHER PERSONS.

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866.850.4000 www.atwell-group.com
7100 E. PLEASANT VALLEY ROAD, SUITE 220
INDEPENDENCE, OH 44131
440.546.2000

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

FINAL GRADING PLAN

DATE
JANUARY 11, 2019

APRIL 13, 2020
PER ARMSTRONG NO. 2

REVISIONS

SCALE 0 20 40
1" = 40 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 8.1

CAD FILE: 18002341-08.0-FG - FH 18.DWG

HIGH PERCH DRIVE

AMBER WAY

ELEDGLING COURT

EX. IRRIGATION POND
NORMAL WATER ELEV: 710.50±

SEE SHEET 9.17 FOR POND BANK CROSS-SECTION

SANITARY RIM 715.90

SANITARY RIM 716.04

STORM RIM 714.53

CATV

24" INV. 711.02 NW

6.5'x12'x1.5'THICK ODOT ROCK CHANNEL PROTECTION WITH FILTER FABRIC (ODOT ITEM 601.08 TYPE C)

LEGEND

	PROPOSED SWALE
RW	RIGHT OF WAY
H.P.	HIGH POINT
F.F.	FINISH FLOOR
F.G.	FINISH GRADE AT HOUSE (GAR. F.F. – 0.33')

NOTES:
1. SEE SHEETS C8.0–C8.16 FOR STORM SEWER PROFILES.
2. EACH SUBLOT SHALL HAVE A 6" PVC STORM LATERAL. THE SUMP PUMP INTO THIS LATERAL (SEE SUMP PUMP CONNECTION DETAIL, SHEET C11.1). DURING CONSTRUCTION OF THE SUBDIVISION AND PRIOR TO HOME CONSTRUCTION, THESE LATERALS WILL SERVE AS DRAINAGE FOR THE HOLDOWN AREA OF THE HOUSE. LATERALS SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND SHALL BE CONSTRUCTED PER THE DETAIL SHOWN ON THE MASS GRADING PLAN SECTION.
3. PER CITY ORDINANCE 1466.06 DOWNSPOUTS SHALL DRAIN ONTO SPLASH BLOCKS.
4. SUBLOTS WITH STORM CONNECTIONS DIRECTLY TO PONDS SHALL HAVE AN INVERT ELEVATION AT OR ABOVE THE 100YR ELEVATION FOR THAT POND.
5. EROSION CONTROL MATTING SHALL BE USED ON DITCH/CHANNEL SLOPES OF 3:1 OR STEEPER.
6. SEE SHEETS C10.4 AND C10.5 FOR HEADWALL DETAILS.

REARYARD SWALE DETAIL
N.T.S.

KEY MAP
N.T.S.

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

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NOTICE:
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INDEPENDENCE, OH 44131
440.349.2000

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

FINAL GRADING PLAN

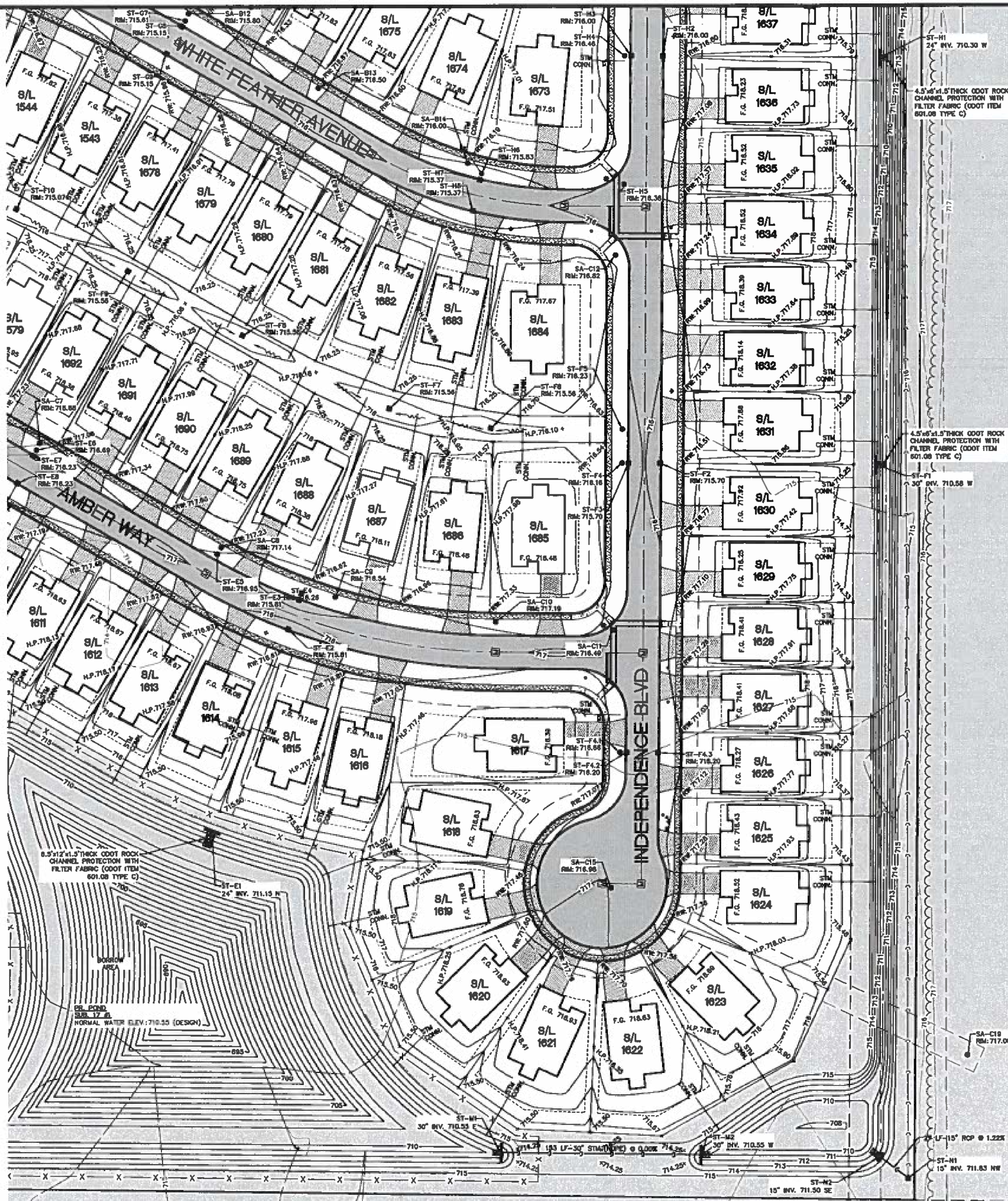
DATE JANUARY 11, 2019

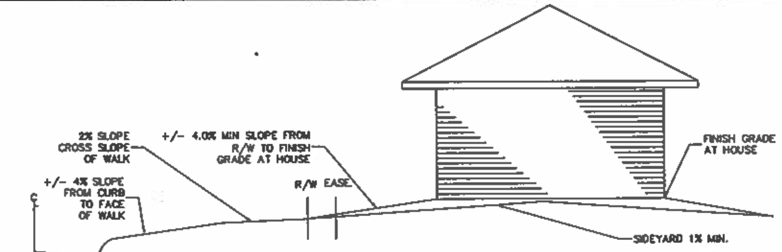
APRIL 15, 2020
CITY SUBMITTAL NO. 3

REVISIONS

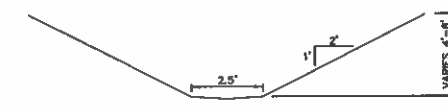
SCALE 0 20 40
1" = 40 FEET
DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 8.2

CAD FILE: 18002341-C8LO-FG - PH 1&5.DWG

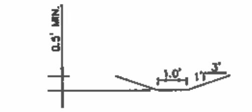




TYPICAL LOT GRADING DETAIL
N.T.S.



DITCH DETAIL
N.T.S.



REARYARD SWALE DETAIL
N.T.S.

SL #	House FF	Garage FF	Bsmnt FF	Top Footer	Bottom Footer	Drive Slope
1581	720.61	718.61	711.94	711.61	710.94	4.00%
1582	720.45	718.45	711.78	711.45	710.78	5.70%
1583	720.29	718.29	711.62	711.29	710.62	5.20%
1584	720.54	718.54	711.87	711.54	710.87	5.20%
1585	720.54	718.54	711.87	711.54	710.87	4.80%
1586	720.50	718.50	711.83	711.50	710.83	5.20%
1587	720.13	718.13	711.46	711.13	710.46	5.30%
1588	719.73	717.73	711.06	710.73	710.06	5.20%
1589	719.85	717.85	711.18	710.85	710.18	5.20%
1590	720.09	718.09	711.42	711.09	710.42	5.20%
1591	720.12	718.12	711.45	711.12	710.45	4.90%
1592	720.12	718.12	711.45	711.12	710.45	5.10%
1593	719.89	717.89	711.22	710.89	710.22	5.20%
1594	719.85	717.85	711.18	710.85	710.18	5.90%
1595	720.72	718.72	712.05	711.72	711.05	5.20%
1596	720.93	718.93	712.26	711.93	711.26	5.10%
1597	721.12	719.12	712.45	712.12	711.45	5.10%
1598	721.12	719.12	712.45	712.12	711.45	4.90%
1599	721.01	719.01	712.34	712.01	711.34	3.20%
1600	720.40	718.40	711.73	711.40	710.73	5.30%
1601	720.15	718.15	711.48	711.15	710.48	5.10%
1602	719.97	717.97	711.30	710.97	710.30	5.10%
1603	719.78	717.78	711.11	710.78	710.11	5.10%
1604	719.60	717.60	710.93	710.60	709.93	5.10%
1605	719.76	717.76	711.09	710.76	710.09	5.20%
1606	720.45	718.45	711.78	711.45	710.78	4.40%
1607	721.12	719.12	712.45	712.12	711.45	3.80%
1608	721.12	719.12	712.45	712.12	711.45	4.90%
1609	720.92	718.92	712.25	711.92	711.25	5.50%
1610	720.67	718.67	712.00	711.67	711.00	5.20%
1611	720.96	718.96	712.29	711.96	711.29	5.20%
1612	721.00	719.00	712.33	712.00	711.33	4.70%
1613	721.00	719.00	712.33	712.00	711.33	5.40%
1614	720.41	718.41	711.74	711.41	710.74	5.40%
1615	720.29	718.29	711.62	711.29	710.62	5.20%
1616	720.51	718.51	711.84	711.51	710.84	5.10%
1617	720.72	718.72	712.05	711.72	711.05	5.60%
1618	720.96	718.96	712.29	711.96	711.29	5.20%
1619	721.11	719.11	712.44	712.11	711.44	5.10%
1620	721.26	719.26	712.59	712.26	711.59	5.10%
1621	721.26	719.26	712.59	712.26	711.59	5.00%
1622	721.16	719.16	712.49	712.16	711.49	5.00%
1623	721.02	719.02	712.35	712.02	711.35	5.10%
1624	720.85	718.85	712.18	711.85	711.18	5.10%
1625	720.76	718.76	712.09	711.76	711.09	4.90%
1626	720.60	718.60	711.93	711.60	710.93	5.20%
1627	720.74	718.74	712.07	711.74	711.07	5.10%
1628	720.74	718.74	712.07	711.74	711.07	4.90%
1629	720.58	718.58	711.91	711.58	710.91	5.30%
1630	720.25	718.25	711.58	711.25	710.58	5.30%
1631	720.21	718.21	711.54	711.21	710.54	5.20%
1632	720.47	718.47	711.80	711.47	710.80	5.20%
1633	720.72	718.72	712.05	711.72	711.05	5.20%
1634	720.85	718.85	712.18	711.85	711.18	4.90%
1635	720.85	718.85	712.18	711.85	711.18	5.10%
1636	720.56	718.56	711.89	711.56	710.89	5.30%
1637	720.50	718.50	711.83	711.50	710.83	5.20%
1638	720.75	718.75	712.08	711.75	711.08	5.20%
1639	720.90	718.90	712.23	711.90	711.23	4.90%
1640	720.90	718.90	712.23	711.90	711.23	5.30%
1641	720.82	718.82	712.15	711.82	711.15	8.00%
1642	720.72	718.72	712.05	711.72	711.05	8.50%
1643	721.14	719.14	712.47	712.14	711.47	8.00%
1644	721.38	719.38	712.71	712.38	711.71	7.50%
1645	721.52	719.52	712.85	712.52	711.85	8.00%
1646	720.86	718.86	712.19	711.86	711.19	7.50%
1647	720.64	718.64	711.97	711.64	710.97	7.50%
1648	720.68	718.68	712.01	711.68	711.01	7.50%
1649	720.59	718.59	711.92	711.59	710.92	7.50%
1650	720.33	718.33	711.66	711.33	710.66	6.70%
1651	720.25	718.25	711.58	711.25	710.58	6.50%
1652	720.05	718.05	711.38	711.05	710.38	5.80%
1653	720.10	718.10	711.43	711.10	710.43	5.20%
1654	720.27	718.27	711.60	711.27	710.60	5.00%
1655	720.27	718.27	711.60	711.27	710.60	4.90%
1656	720.18	718.18	711.51	711.18	710.51	5.10%
1657	719.95	717.95	711.28	710.95	710.28	5.20%
1658	719.72	717.72	711.05	710.72	710.05	5.20%
1659	719.77	717.77	711.10	710.77	710.10	5.30%

LEGEND

(swale symbol)	PROPOSED SWALE
RW	RIGHT OF WAY
H.P.	HIGH POINT
F.F.	FINISH FLOOR
F.G.	FINISH GRADE AT HOUSE (GAR. F.F. – 0.33')

NOTES:
1. SEE SHEETS C9.0–C9.16 FOR STORM SEWER PROFILES.
2. EACH SUBLOT SHALL HAVE A 6" PVC STORM LATERAL. TIE SUMP PUMP INTO THIS LATERAL (SEE SUMP PUMP CONNECTION DETAIL, SHEET C11.1). DURING CONSTRUCTION OF THE SUBDIVISION AND PRIOR TO HOME CONSTRUCTION, THESE LATERALS WILL SERVE AS DRAINAGE FOR THE HOLDDOWN AREA OF THE HOUSE. LATERALS SHALL BE CONSTRUCTED AS SHOWN ON THESE PLANS AND SHALL BE CONSTRUCTED PER THE DETAIL SHOWN ON THE MASS GRADING PLAN SECTION.
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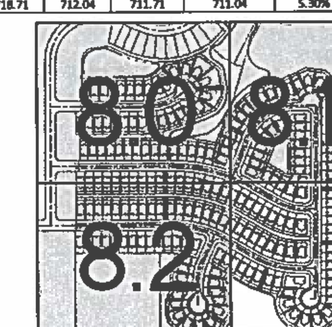
6. SEE SHEETS C10.4 AND C10.5 FOR HEADWALL DETAILS.

SL #	House FF	Garage FF	Bsmnt FF	Top Footer	Bottom Footer	Drive Slope
1660	719.83	717.83	711.16	710.83	710.16	4.80%
1661	719.82	717.82	711.15	710.82	710.15	4.80%
1662	719.78	717.78	711.11	710.78	710.11	5.30%
1663	719.96	717.96	711.29	710.96	710.29	5.50%
1664	720.26	718.26	711.59	711.26	710.59	5.00%
1665	720.26	718.26	711.59	711.26	710.59	5.60%
1666	721.16	719.16	712.49	712.16	711.49	6.50%
1667	720.82	718.82	712.15	711.82	711.15	6.50%
1668	720.73	718.73	712.06	711.73	711.06	7.50%
1669	720.40	718.40	711.73	711.40	710.73	7.50%
1670	720.60	718.60	711.93	711.60	710.93	5.90%
1671	720.89	718.89	712.22	711.89	711.22	4.80%
1672	720.89	718.89	712.22	711.89	711.22	5.20%
1673	719.84	717.84	711.17	710.84	710.17	4.70%
1674	720.16	718.16	711.49	711.16	710.49	5.80%
1675	720.16	718.16	711.49	711.16	710.49	4.90%
1676	720.15	718.15	711.48	711.15	710.48	5.20%
1677	719.81	717.81	711.14	710.81	710.14	5.40%
1678	719.74	717.74	711.07	710.74	710.07	5.30%
1679	720.12	718.12	711.45	711.12	710.45	5.20%
1680	720.12	718.12	711.45	711.12	710.45	4.80%
1681	720.11	718.11	711.44	711.11	710.44	5.20%
1682	719.89	717.89	711.22	710.89	710.22	5.10%
1683	719.72	717.72	711.05	710.72	710.05	5.10%
1684	720.00	718.00	711.33	711.00	710.33	5.00%
1685	720.81	718.81	712.14	711.81	711.14	4.20%
1686	720.81	718.81	712.14	711.81	711.14	5.40%
1687	720.44	718.44	711.77	711.44	710.77	5.40%
1688	720.71	718.71	712.04	711.71	711.04	6.00%
1689	721.08	719.08	712.41	712.08	711.41	5.00%
1690	721.08	719.08	712.41	712.08	711.41	5.10%
1691	720.82	718.82	712.15	711.82	711.15	5.20%
1692	720.71	718.71	712.04	711.71	711.04	5.30%



KEY MAP
N.T.S.

Know what's below. Call before you dig.

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SECTION | TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

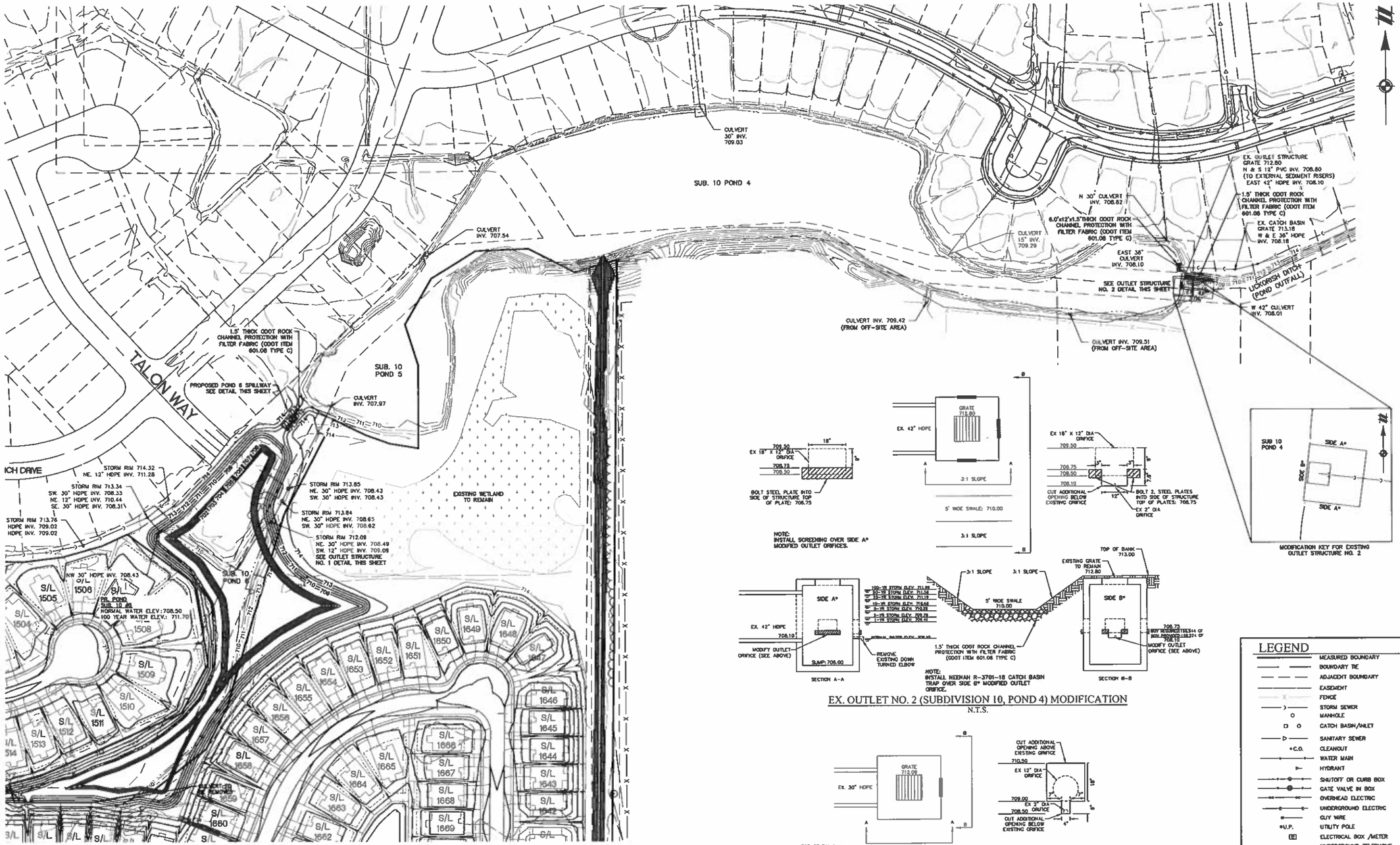
FINAL GRADING PLAN

DATE JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

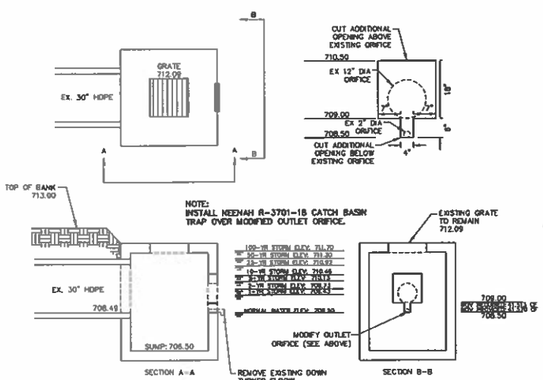
SCALE 0 20 40
1" = 40 FEET
DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 8.3

CAD FILE: 18002341–08.0–FG – PH 18.DWG



EX. OUTLET NO. 2 (SUBDIVISION 10, POND 4) MODIFICATION
N.T.S.

PROP. SPILLWAY (SUBDIVISION 10, POND 6)
N.T.S.



EX. OUTLET NO. 1 (SUBDIVISION 10, POND 6) MODIFICATION
N.T.S.

BENCHMARKS				
NO.	DESCRIPTION	ELEVATION	NORTHING	EASTING
1	SANITARY MH RIM	715.73	628941.9440	2094368.2390
2	SANITARY MH RIM	715.91	628256.773	2094372.243

LEGEND

- MEASURED BOUNDARY
- BOUNDARY TIE
- ADJACENT BOUNDARY
- EASEMENT
- FENCE
- STORM SEWER
- MANHOLE
- CATCH BASIN/INLET
- SANITARY SEWER
- CLEANOUT
- WATER MAIN
- HYDRANT
- SHUTOFF OR CURB BOX
- GATE VALVE IN BOX
- OVERHEAD ELECTRIC
- UNDERGROUND ELECTRIC
- GUY WIRE
- UTILITY POLE
- ELECTRICAL BOX /METER
- UNDERGROUND TELEPHONE
- GAS
- GAS RISER
- TELEPHONE BOX
- CURB AND GUTTER
- BOLLARD
- SIGN
- GAS VALVE
- GAS METER
- WATER METER
- CALCULATED POINT
- FOUND MONUMENT AS NOTED
- SET 5/8" IRON PIN
- RECORD
- MEASURED
- CALCULATED
- PERMANENT PARCEL NUMBER

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SECTION
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CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

EXISTING POND AND OUTLET STRUCTURE MODIFICATIONS

DATE
JANUARY 11, 2019

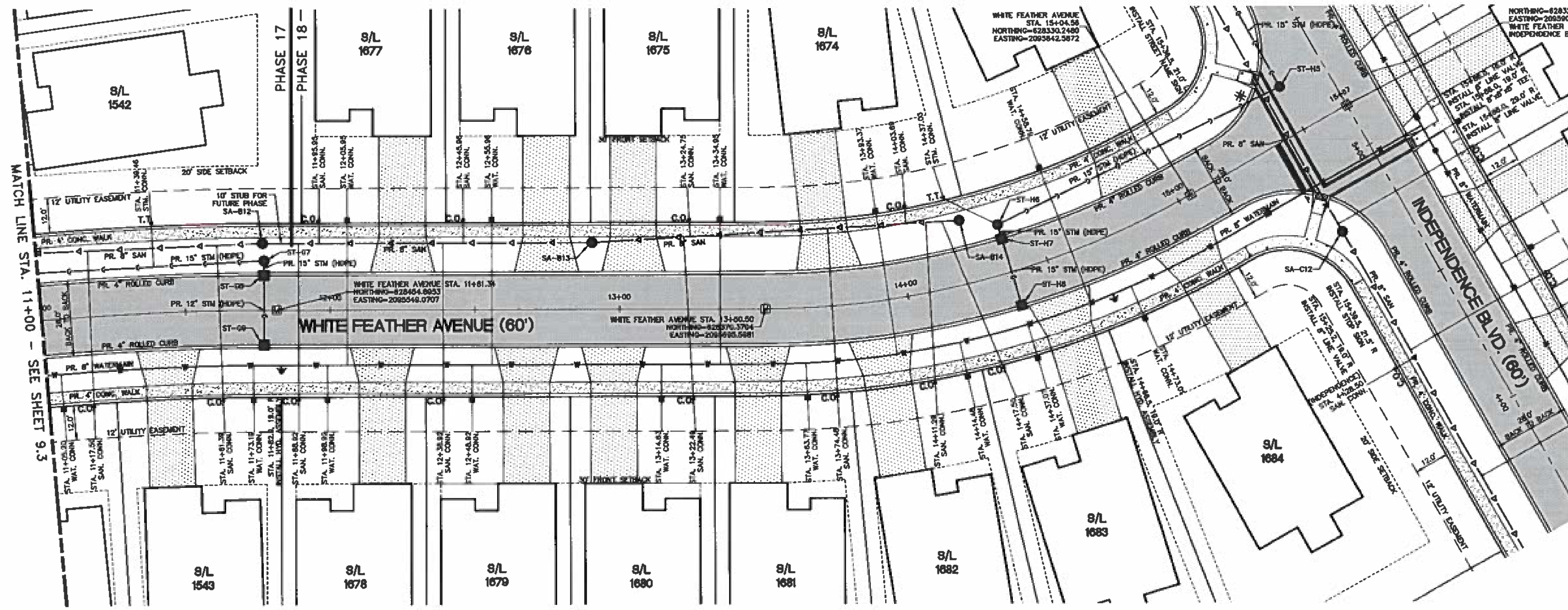
APRIL 13, 2020
OEPA SUBMITTAL NO. 3

REVISIONS

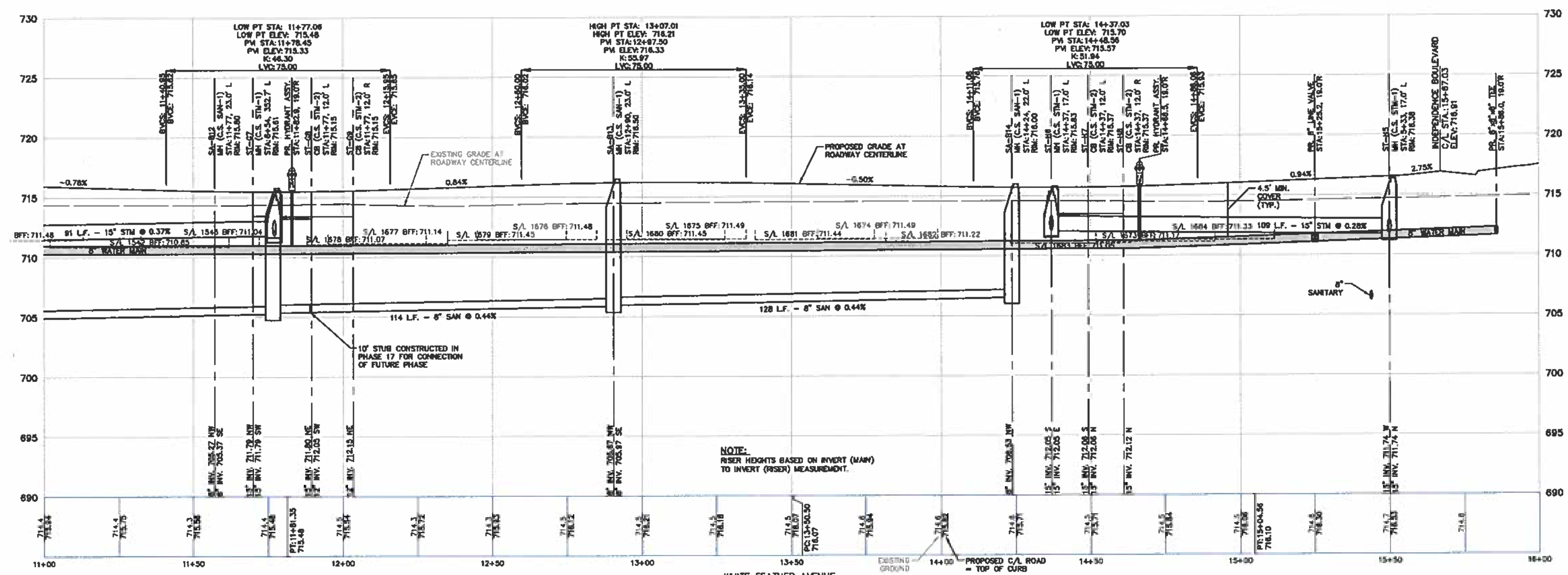
SCALE 0 40 80
1" = 80 FEET

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 8.4

CAD FILE: 18002341-GR-DRAINAGE - PH 18.DWG



PLAN – WHITE FEATHER AVENUE
SCALE: 1"=20'



WHITE FEATHER AVENUE
VERT: 1"=5'
HORZ: 1"=20'

- •T.T. = STORM SEWER CLEANOUT
- •C.O. = SANITARY SEWER CLEANOUT
- ■ = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 8" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 6" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-8.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. IF LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS.
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

WHITE FEATHER PLAN & PROFILE
STA. 11+00 TO STA. 16+00

DATE JANUARY 11, 2019

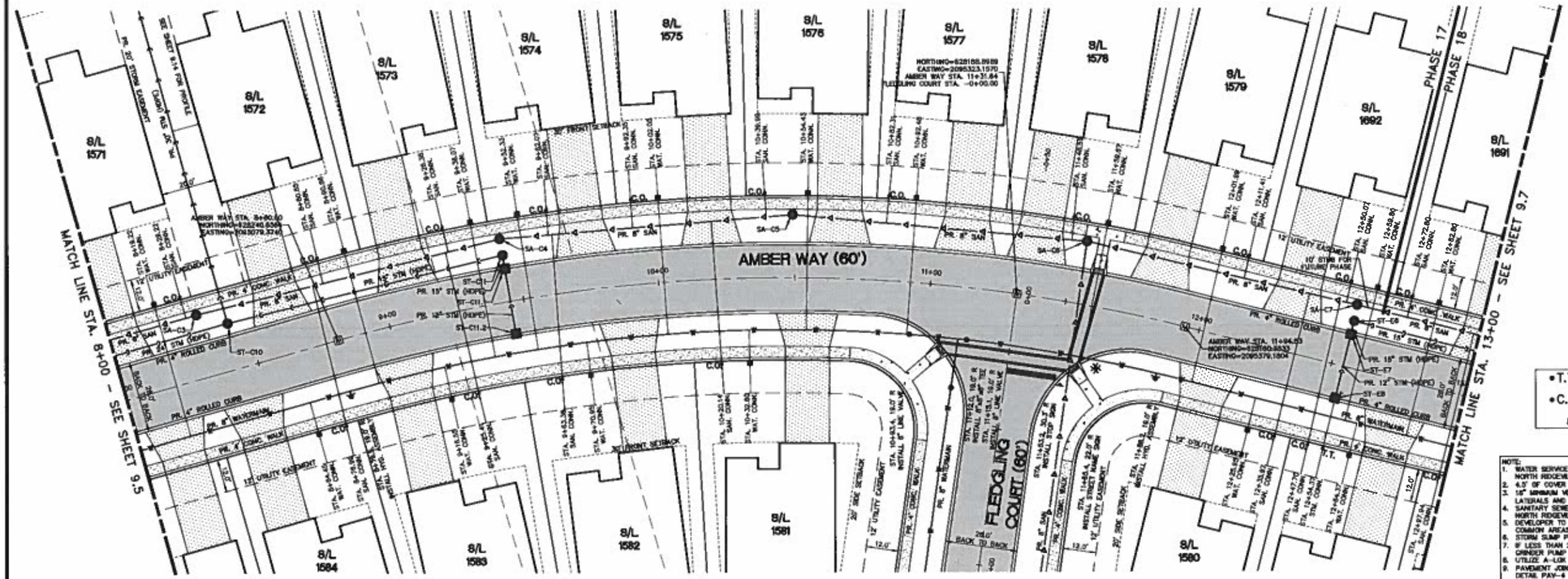
APRIL 13, 2020
OEPA SUBMITTAL NO. 1

REVISIONS

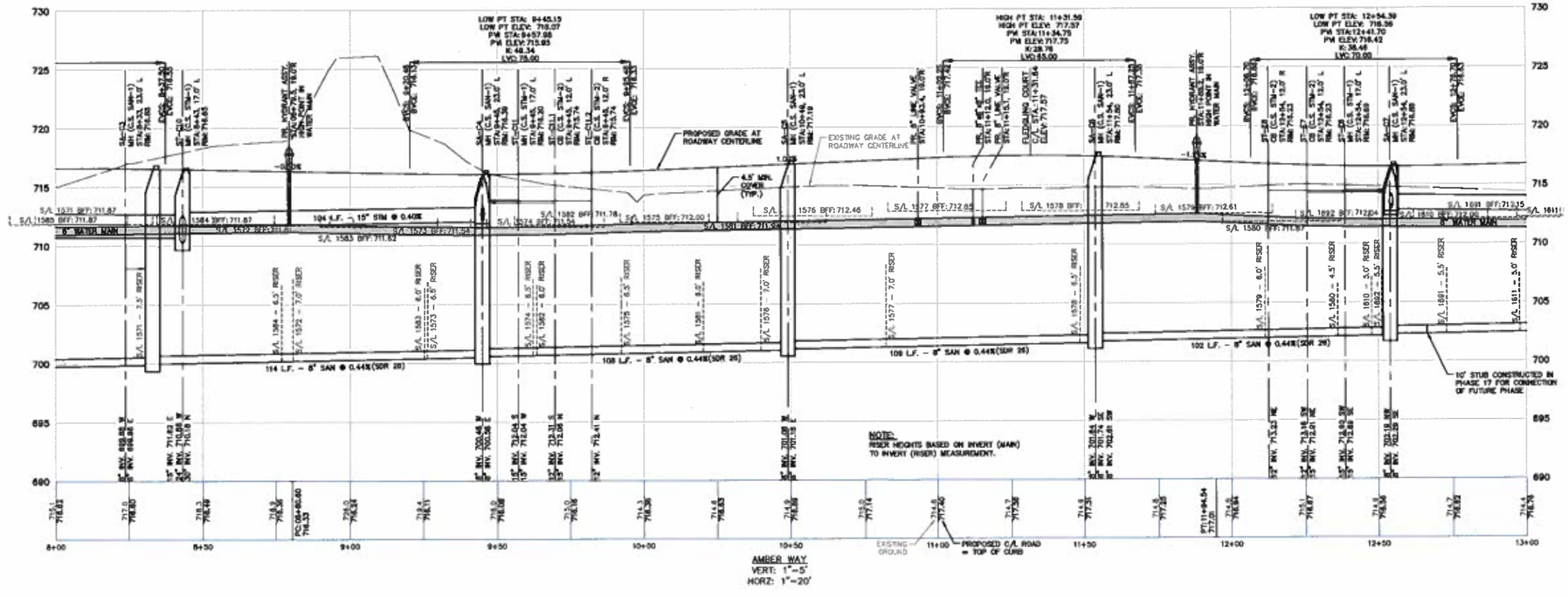
SCALE 0 10 20
1" = 20 FEET

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.4

CAD FILE: 18002341-09.4 PP (WHITE FEATHER).DWG



PLAN – AMBER WAY
SCALE: 1"=20'



AMBER WAY
VERT: 1"=5'
HORZ: 1"=20'

- T.T. = STORM SEWER CLEANOUT
- C.O. = SANITARY SEWER CLEANOUT
- = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 8" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 8" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-6.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. 8" LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. CONTRACTION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

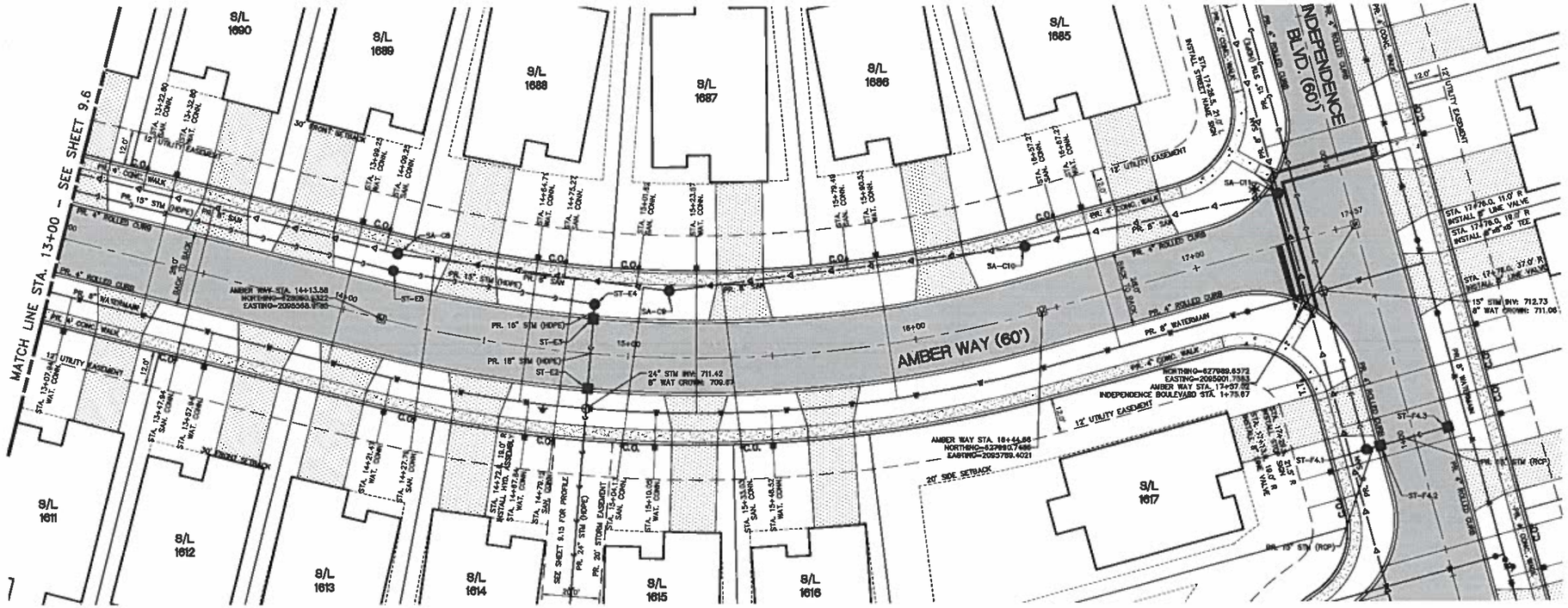
AMBER WAY PLAN & PROFILE
STA. 8+00 TO STA. 13+00

DATE: JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.6

CAD FILE: 18002341-09.6 PP (AMBER WAY) – PH 18.DWG



PLAN – AMBER WAY
SCALE: 1"=20'

- T.T. = STORM SEWER CLEANOUT
- C.O. = SANITARY SEWER CLEANOUT
- = WATER SERVICE BOX

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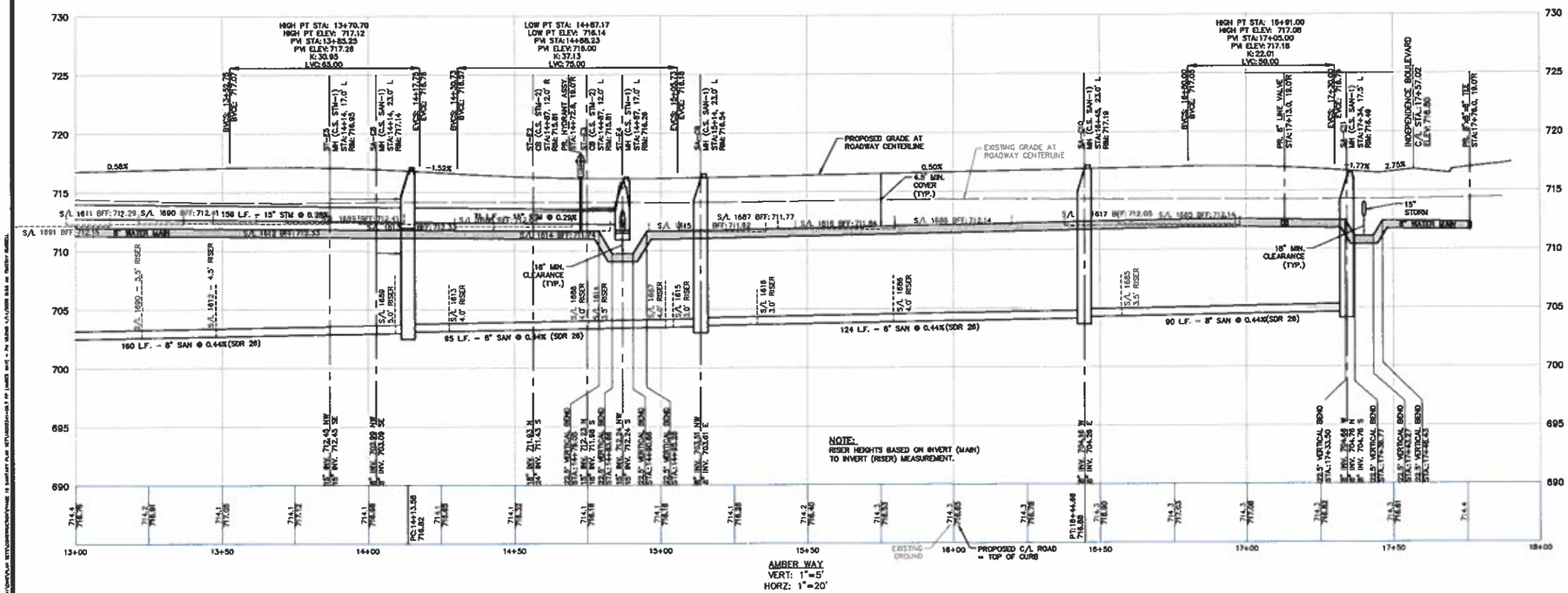
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-6.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. IF LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.



AMBER WAY
VERT: 1"=5'
HORZ: 1"=20'

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

AMBER WAY PLAN & PROFILE
STA. 13+00 TO STA. 18+00

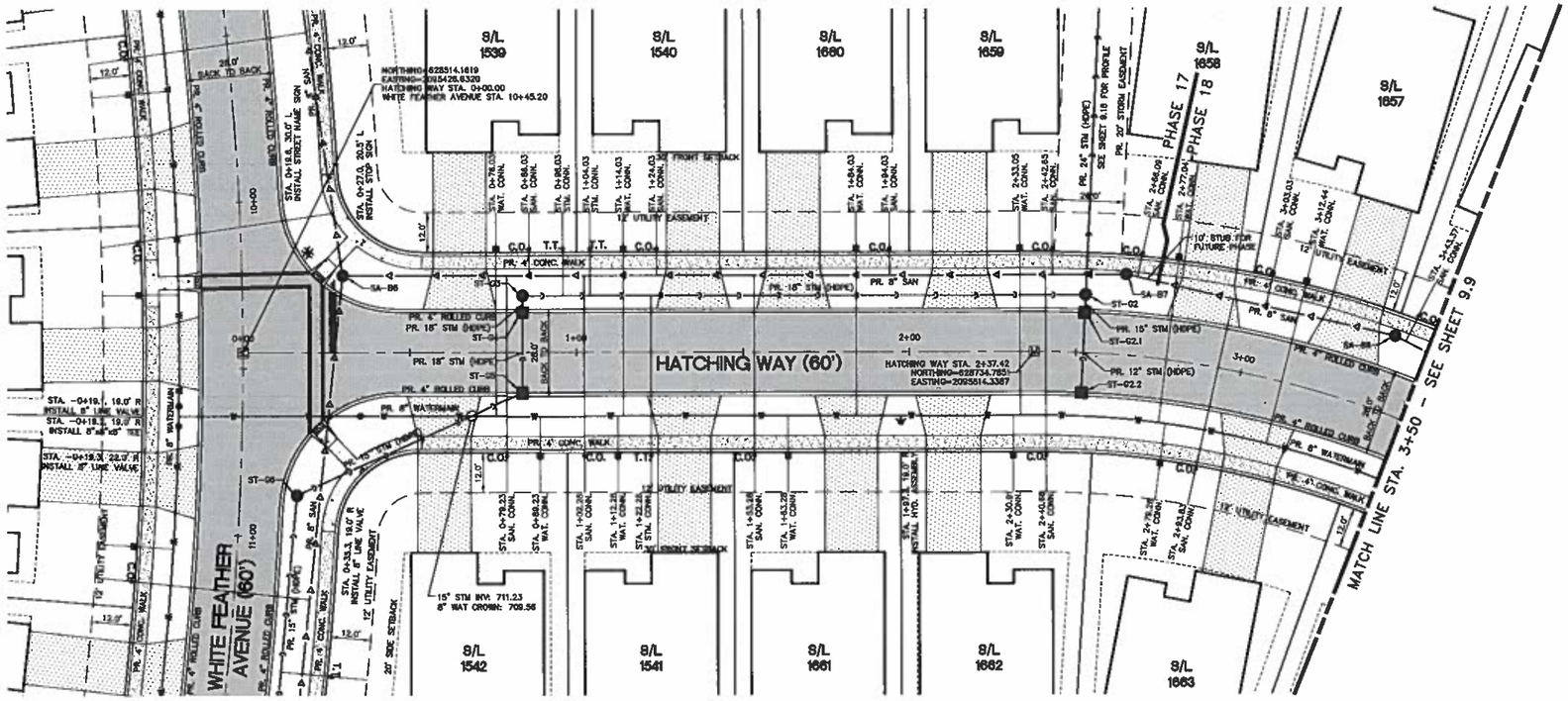
DATE JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

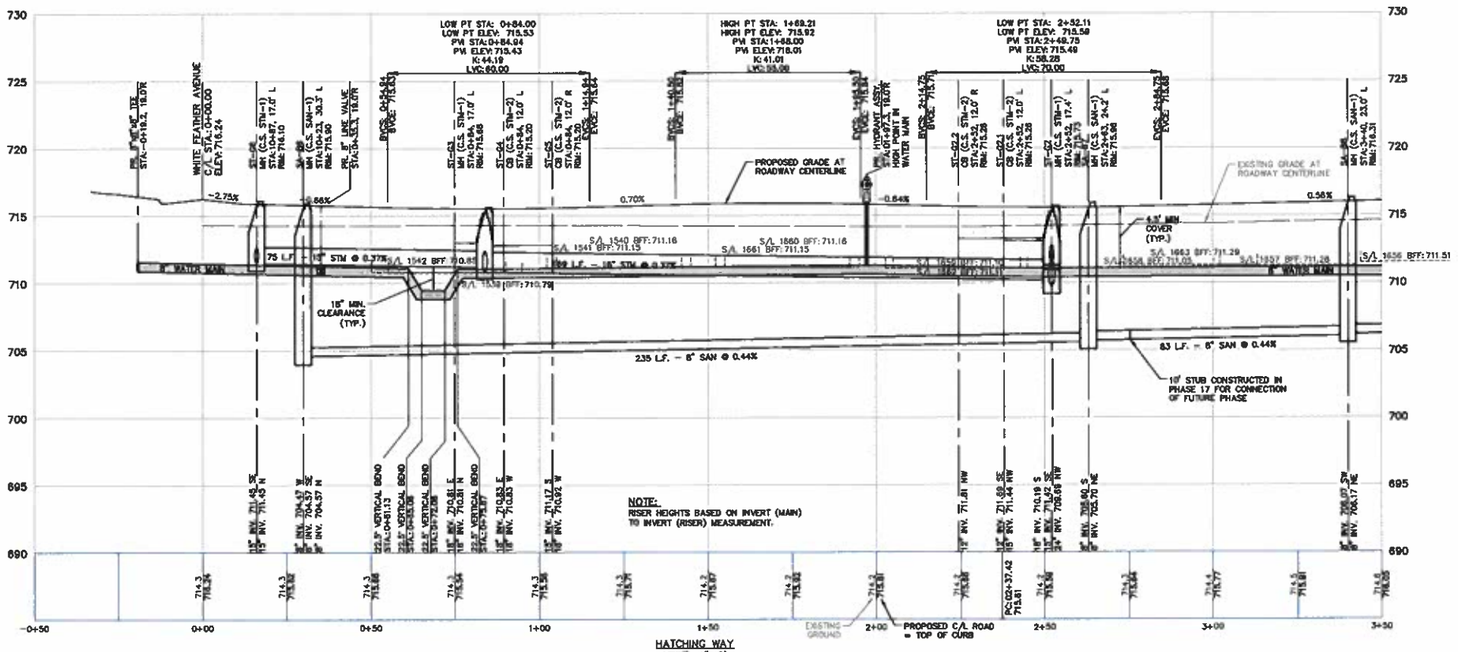
REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.7

CAD FILE: 18002341-09.7 PP (AMBER WAY) - PH 1.DWG



PLAN – HATCHING WAY
SCALE: 1"=20'



HATCHING WAY
VERT: 1"=5'
HORZ: 1"=20'

- T.T. = STORM SEWER CLEANOUT
- C.O. = SANITARY SEWER CLEANOUT
- = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 6" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 8" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-8.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. IF LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.

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LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

HATCHING WAY PLAN & PROFILE
STA. -0+50 TO STA. 3+50

DATE JANUARY 11, 2019

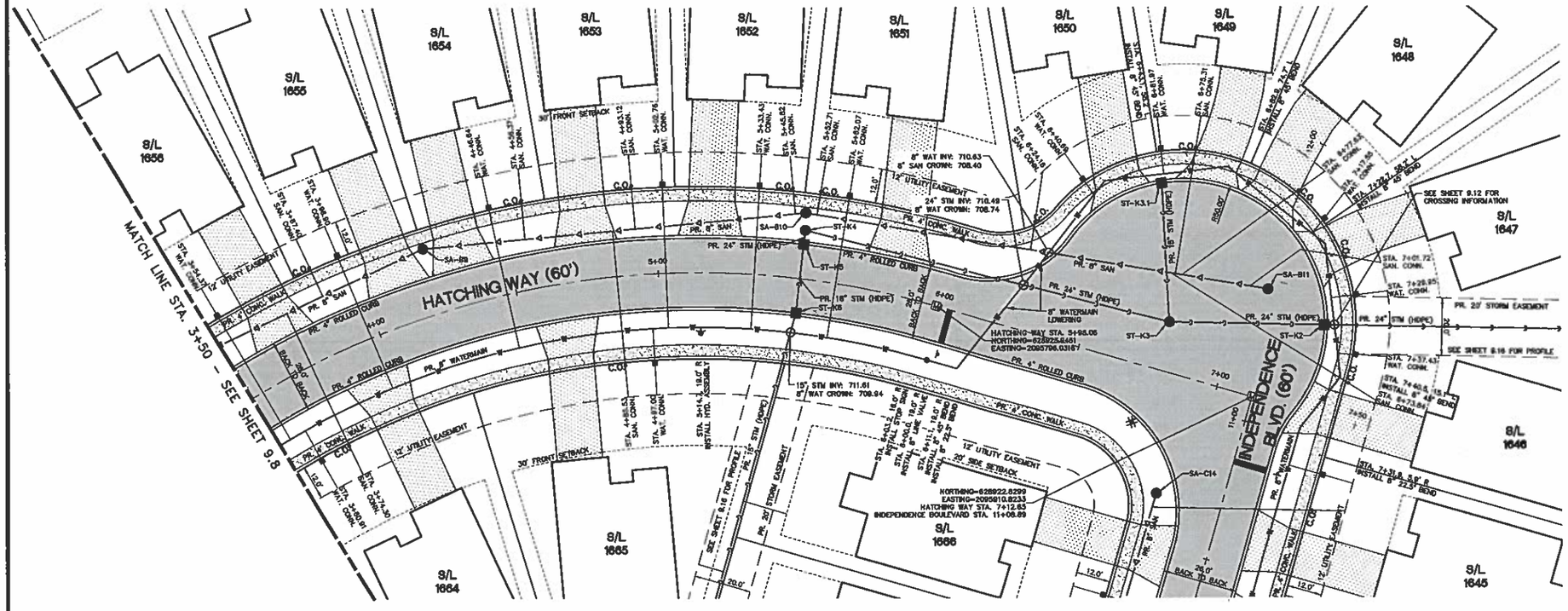
APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

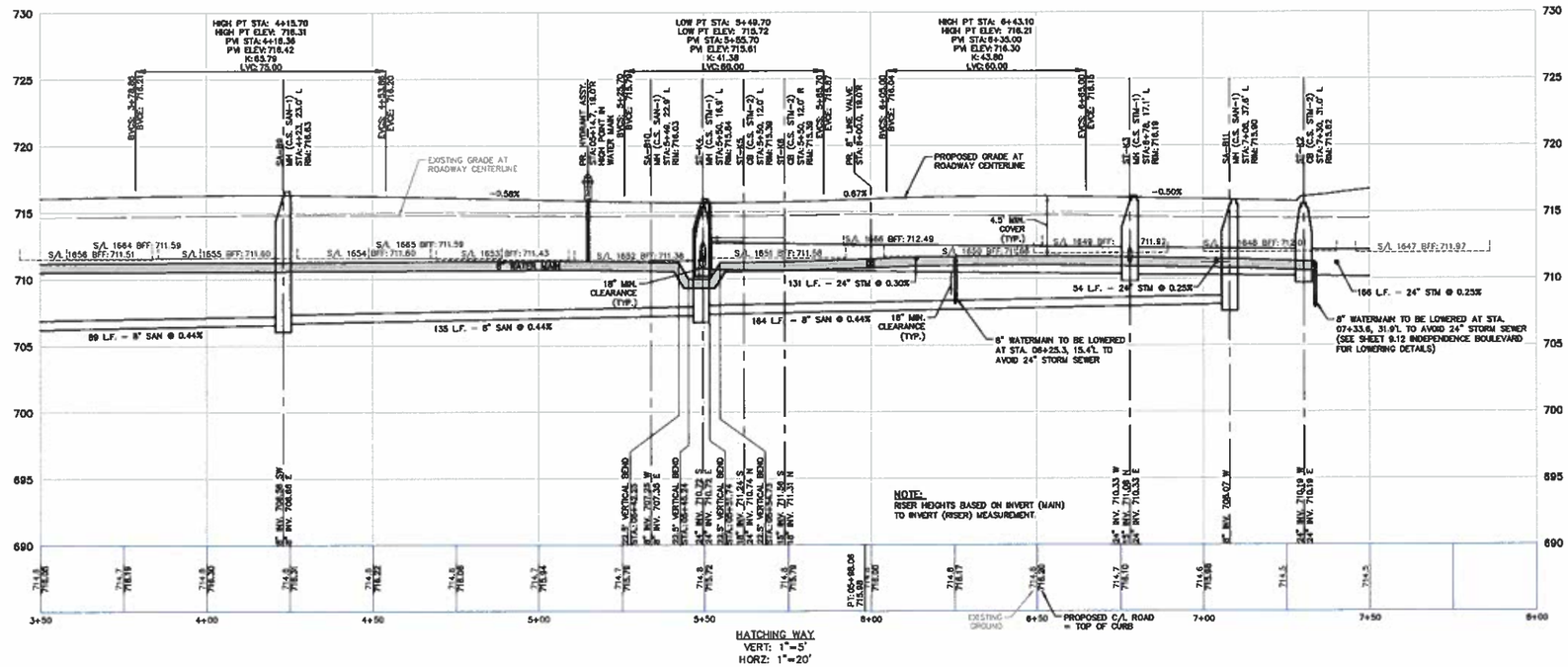
SCALE 0 10 20
1" = 20 FEET

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.8

CAD FILE: 18002341-09.8 PP (HATCHING WAY) - PH 18.DWG



PLAN - HATCHING WAY
SCALE: 1"=20'



HATCHING WAY
VERT: 1"=5'
HORZ: 1"=20'

- C.O. = SANITARY SEWER CLEANOUT
- ■ = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
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4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-8.
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6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. 8' LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.

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

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NOTICE:
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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT: K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

HATCHING WAY PLAN & PROFILE
STA. 3+50 TO STA. 8+00

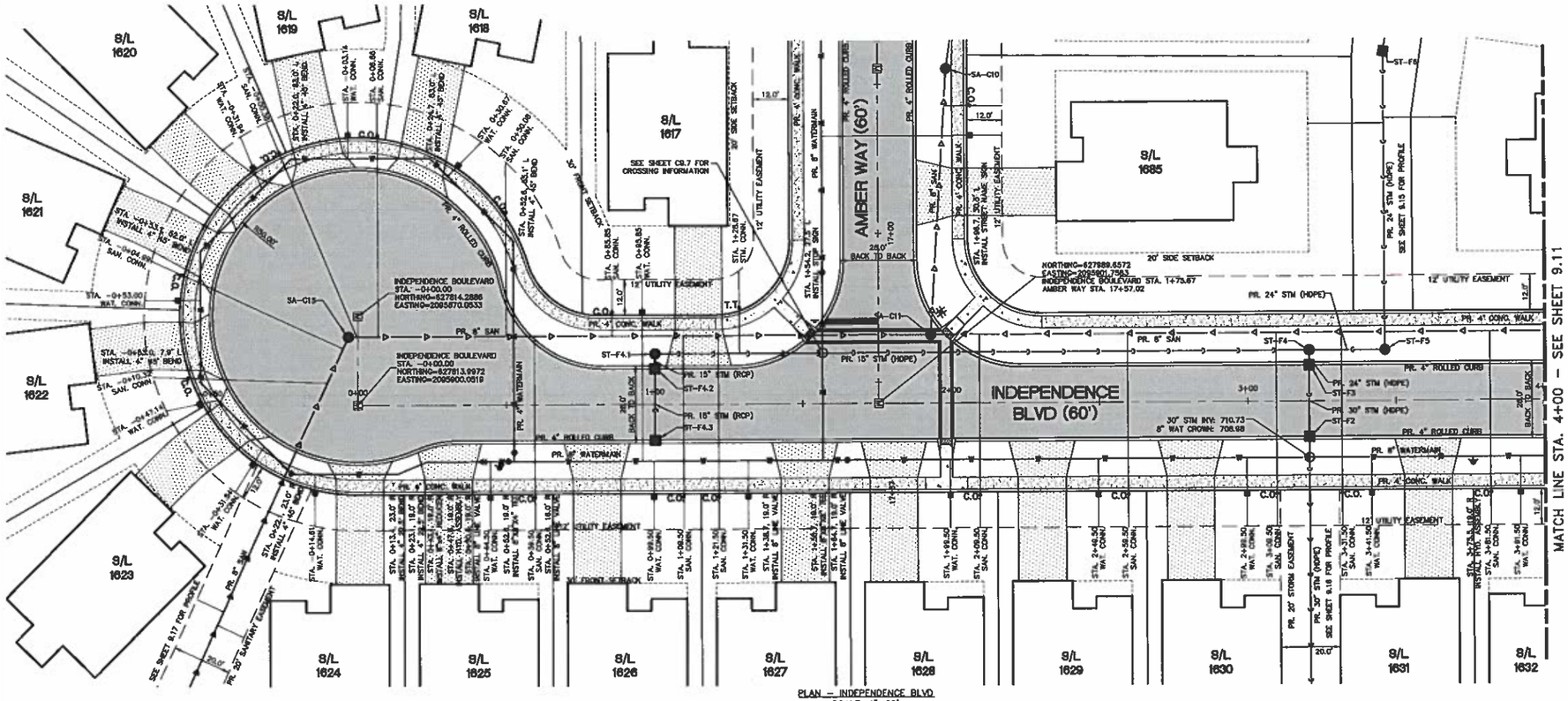
DATE: JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

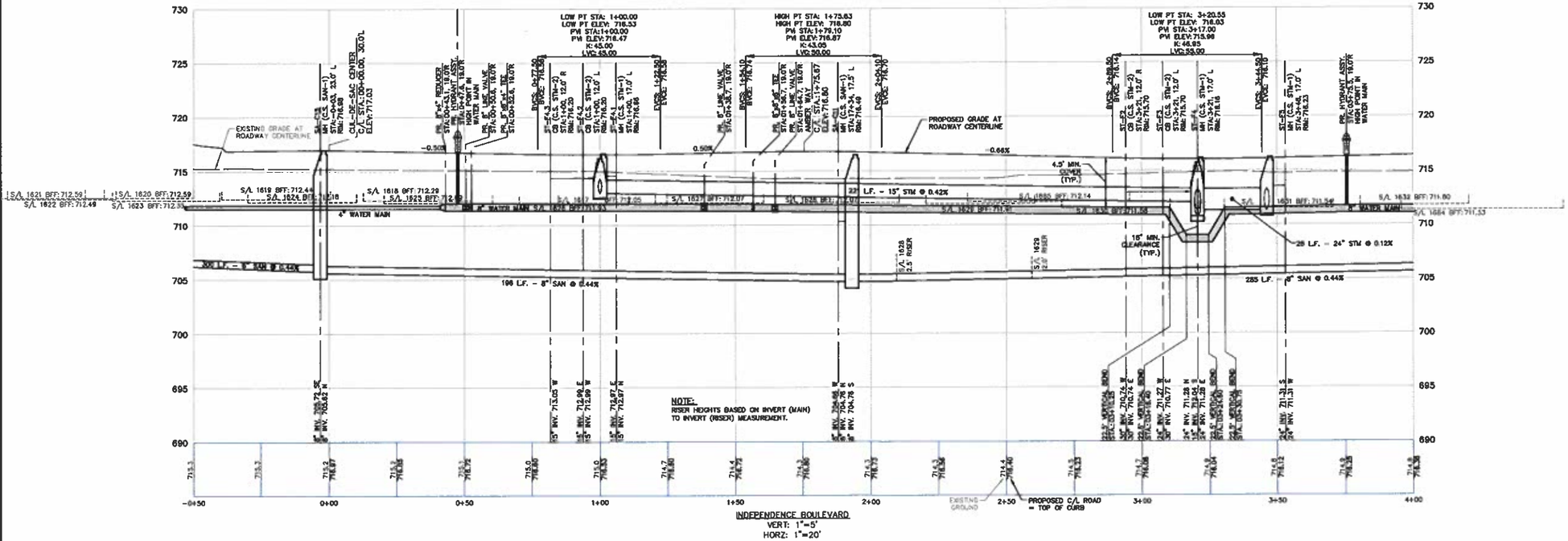
SCALE 1" = 20 FEET (0, 10, 20)
DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.9

CAD FILE: 18002341-09.9 PP (HATCHING WAY) - PH 18.DWG



PLAN – INDEPENDENCE BLVD
SCALE: 1"=20'

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 8" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 8" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-8.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. 8' LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.



INDEPENDENCE BOULEVARD
VERT: 1"=5'
HORZ: 1"=20'

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

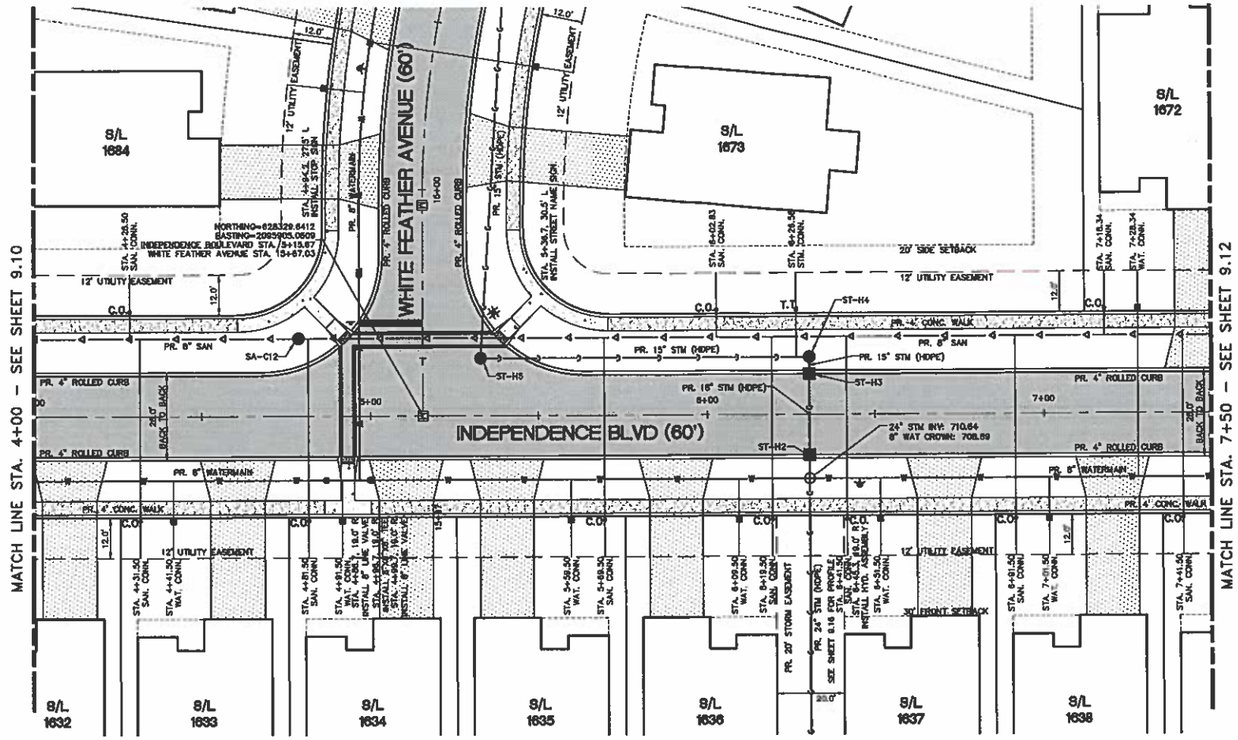
CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
INDEPENDENCE BLVD
PLAN & PROFILE
STA. -0+50 TO STA. 4+00

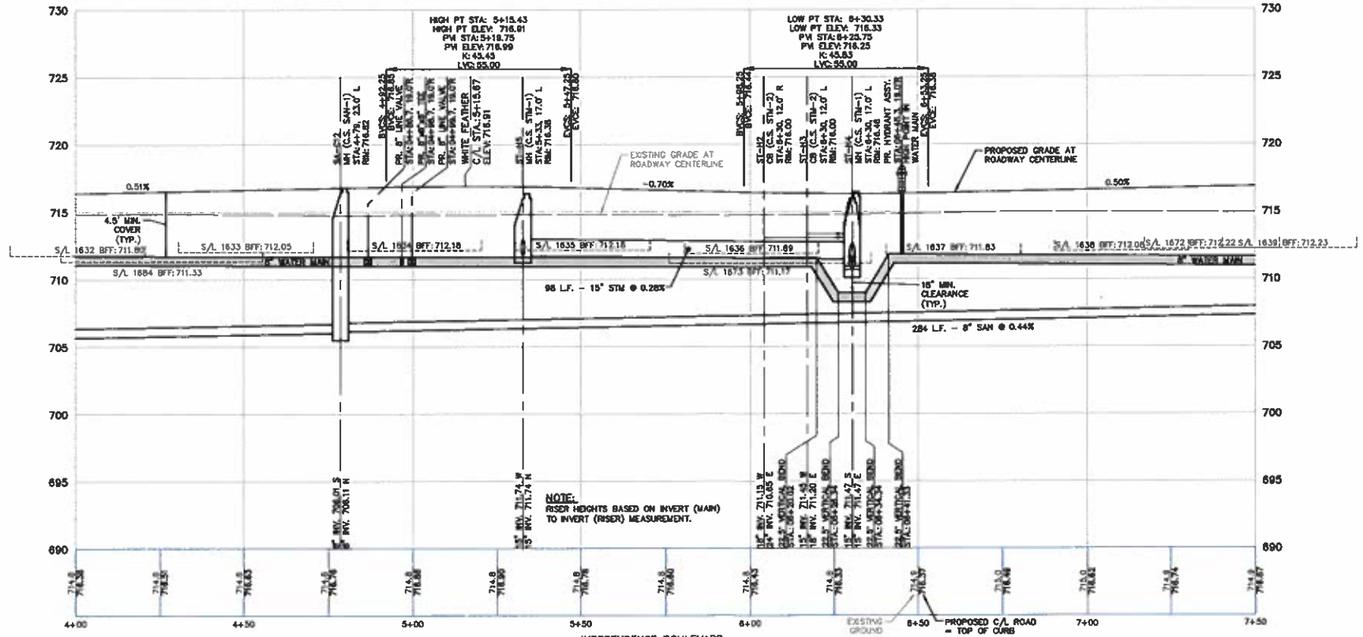
DATE: JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.10

CAD FILE: 18002341-09.10 PP (INDEPENDENCE BLVD) - PH 1.DWG





- ●T.T. = STORM SEWER CLEANOUT
- ●C.O. = SANITARY SEWER CLEANOUT
- ■ = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 8" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 6" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-8.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. IF LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.

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SECTION
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CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

INDEPENDENCE BLVD
PLAN & PROFILE
STA. 4+00 TO STA. 7+50

DATE JANUARY 11, 2019

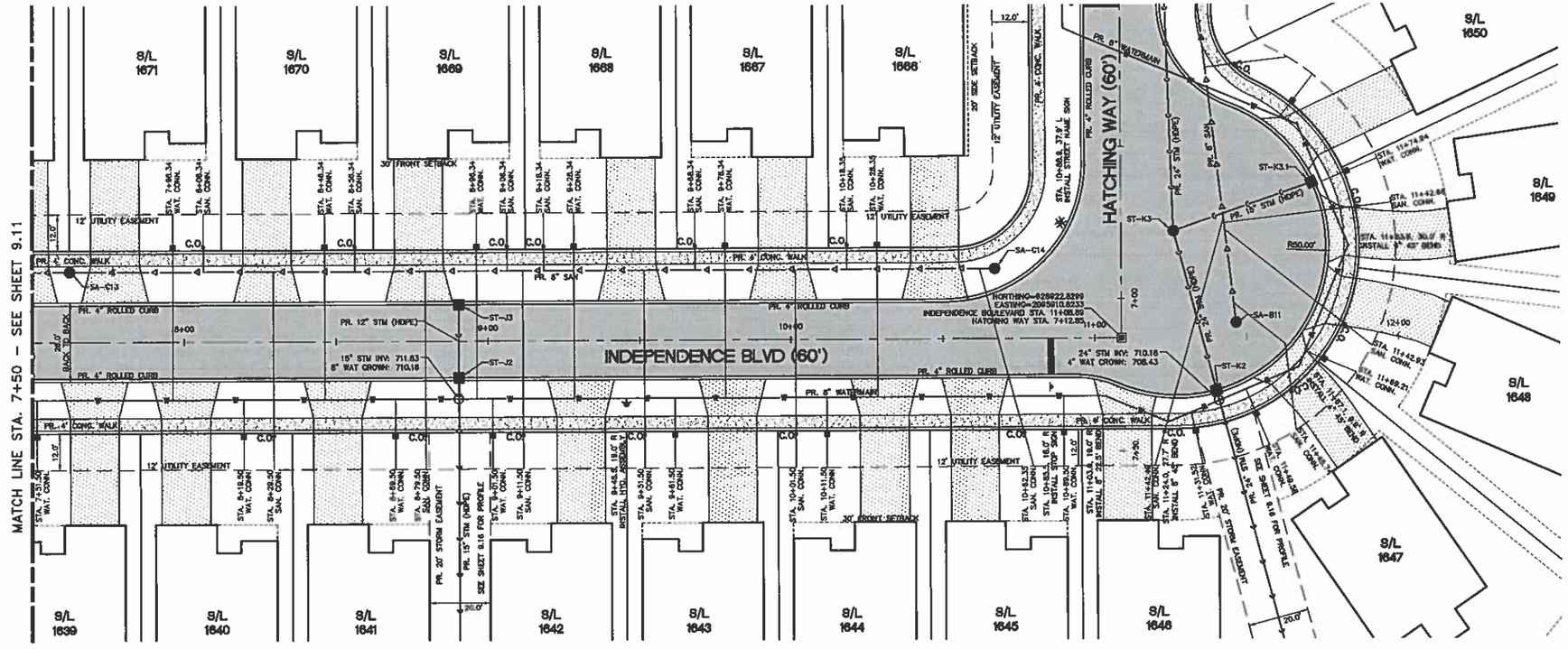
APRIL 13, 2020
CITY SUBMITTAL NO. 2

REVISIONS

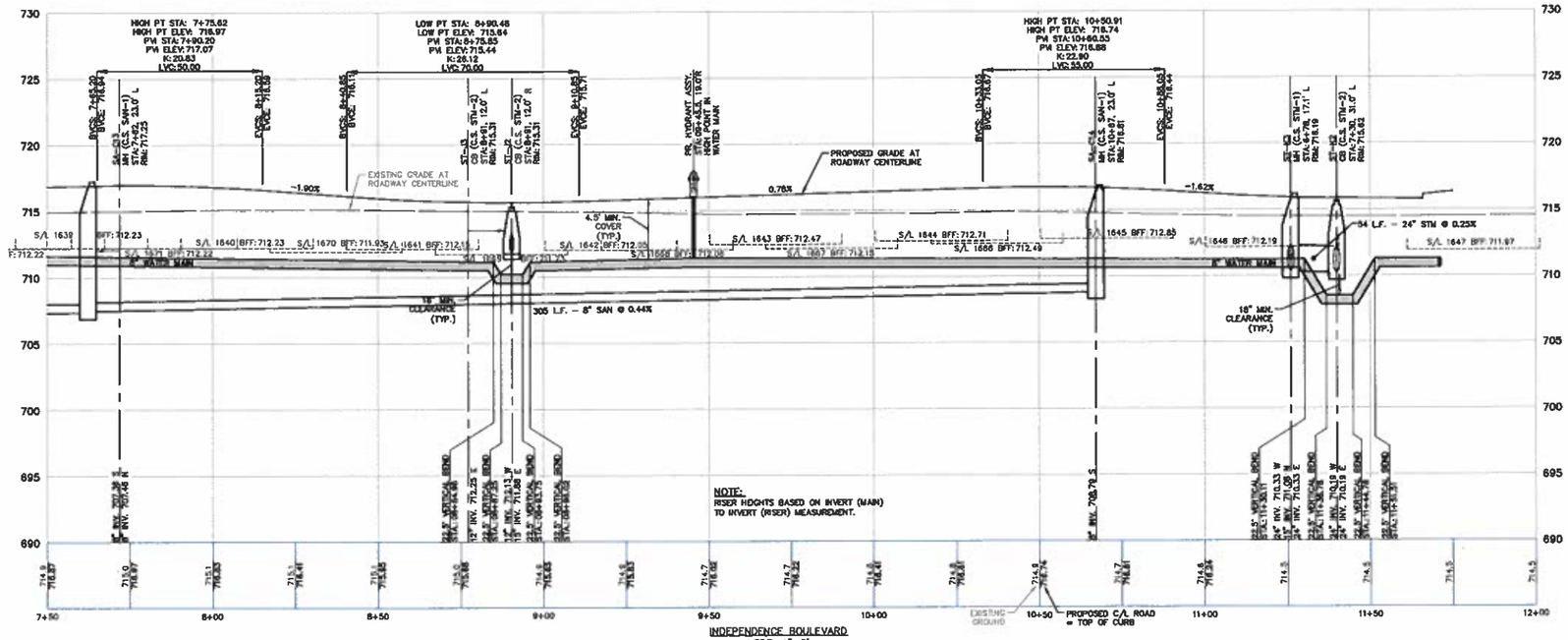
SCALE 0 10 20
1" = 20 FEET

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.11

CAD FILE: 18002341-09.11 PP (INDEPENDENCE BLVD) – PH 1.dwg



PLAN – INDEPENDENCE BLVD
SCALE: 1"=20'



INDEPENDENCE BOULEVARD
VERT: 1"=5'
HORZ: 1"=20'

- C.O. = SANITARY SEWER CLEANOUT
- ■ = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 8" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 8" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-8.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. 9' LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN. GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

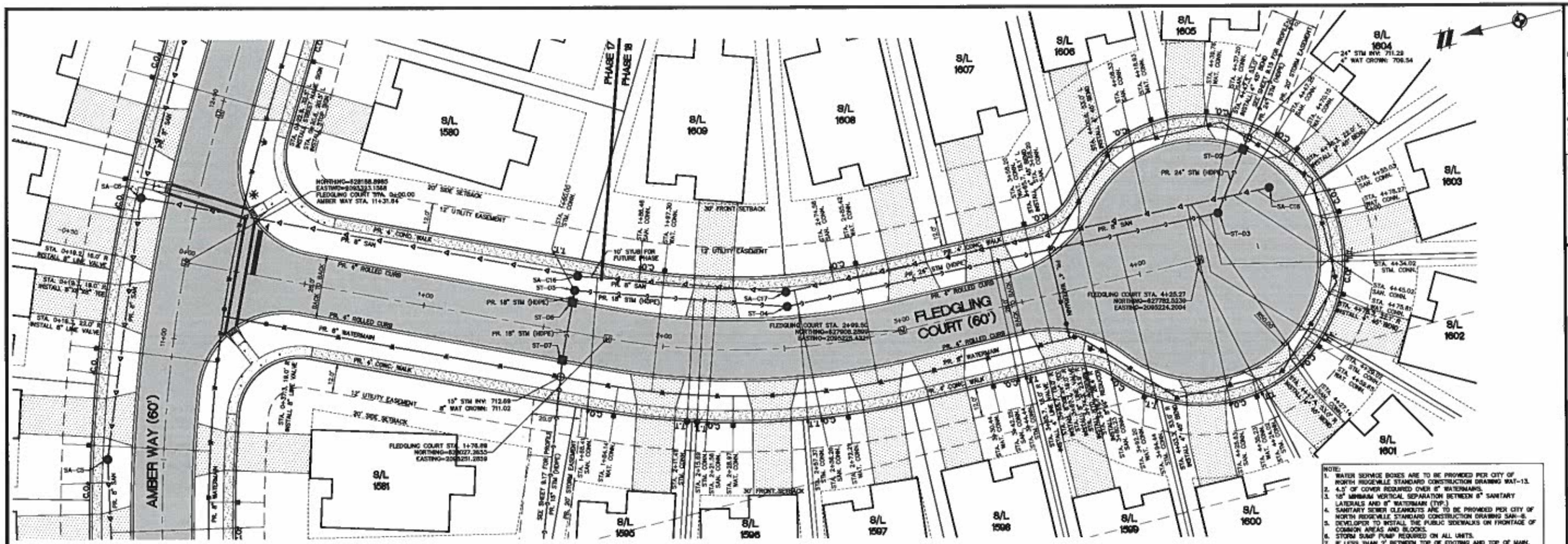
CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
INDEPENDENCE BLVD
PLAN & PROFILE
STA. 7+50 TO STA. 12+00

DATE JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.12

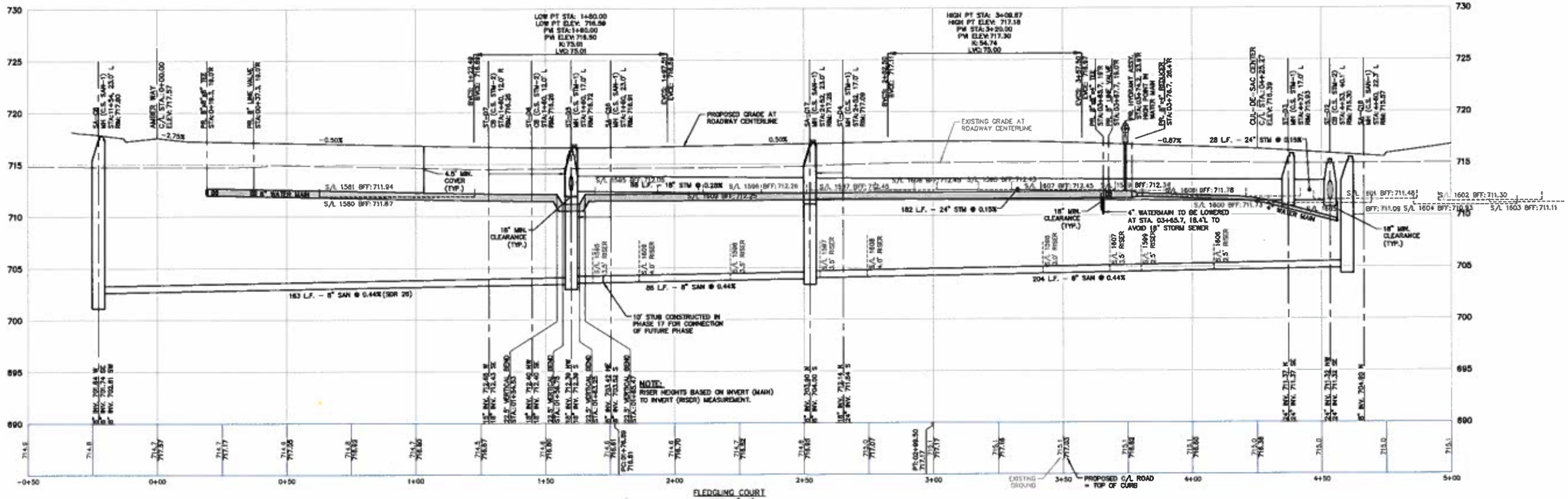
CAD FILE: 18002341-C8.12 PP (INDEPENDENCE BLVD) – PH 1 ELDWG



PLAN – FLEDGLING COURT
SCALE: 1"=20'

- T.T. = STORM SEWER CLEANOUT
- C.O. = SANITARY SEWER CLEANOUT
- = WATER SERVICE BOX

NOTE:
1. WATER SERVICE BOXES ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING WAT-13.
2. 4.5' OF COVER REQUIRED OVER 8" WATERMAINS.
3. 18" MINIMUM VERTICAL SEPARATION BETWEEN 8" SANITARY LATERALS AND 8" WATERMAIN (TYP.)
4. SANITARY SEWER CLEANOUTS ARE TO BE PROVIDED PER CITY OF NORTH RIDGEVILLE STANDARD CONSTRUCTION DRAWING SAN-16.
5. DEVELOPER TO INSTALL THE PUBLIC SIDEWALKS ON FRONTAGE OF COMMON AREAS AND BLOCKS.
6. STORM SUMP PUMP REQUIRED ON ALL UNITS.
7. IF LESS THAN 2' BETWEEN TOP OF FOOTING AND TOP OF MAIN, GRINDER PUMP IS REQUIRED.
8. UTILIZE A-LOK MANHOLE TO PIPE CONNECTIONS
9. PAVEMENT JOINTS TO HAVE A MAXIMUM SPACING OF 15' SEE DETAIL PAV-4 FOR JOINT REQUIREMENTS.
10. EXPANSION JOINTS TO BE INSTALLED BETWEEN CONCRETE DRIVES AND CURBS DURING DRIVEWAY CONSTRUCTION.
11. SANITARY SEWERS AT A DEPTH OF 15' OR GREATER SHALL BE SDR 26.
12. NO FENCES, SHEDS OR OTHER APPURTENANCES SHALL BE CONSTRUCTED IN THE 20' WIDE STORM SEWER EASEMENTS.



FLEDGLING COURT
VERT: 1"=5'
HORZ: 1"=20'

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

FLEDGLING COURT PLAN & PROFILE
STA. -0+50 TO STA. 5+00

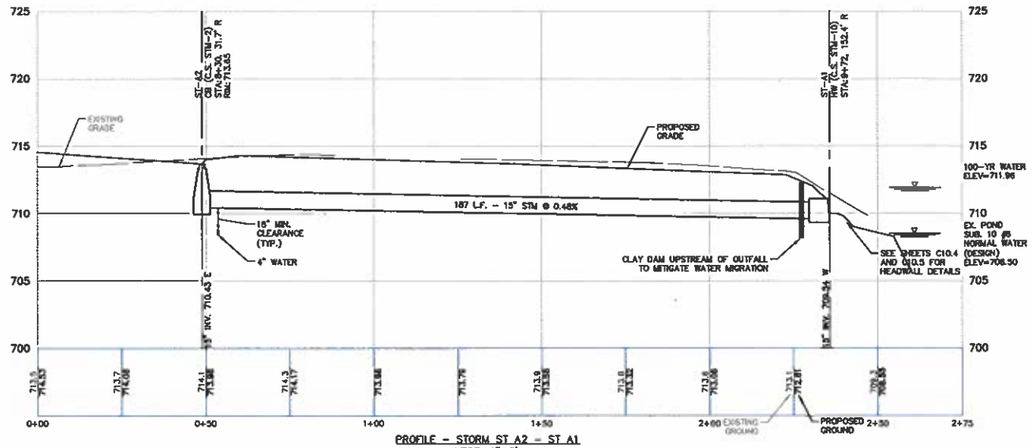
DATE
JANUARY 11, 2019

APRIL 15, 2020
CITY SUBMITTAL NO. 3

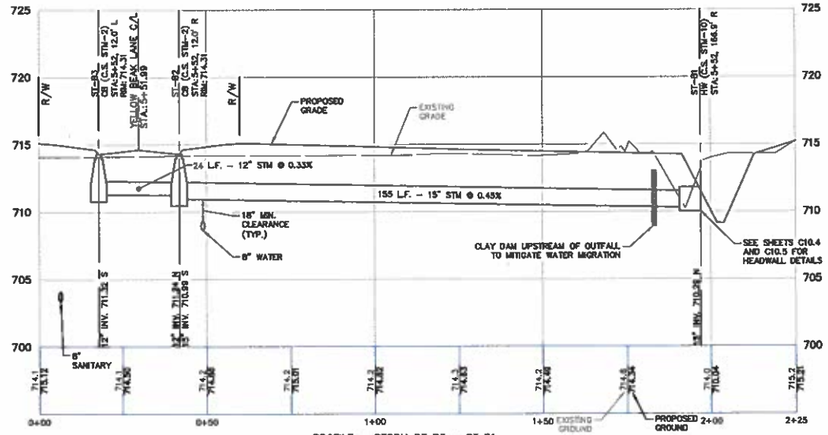
REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.13

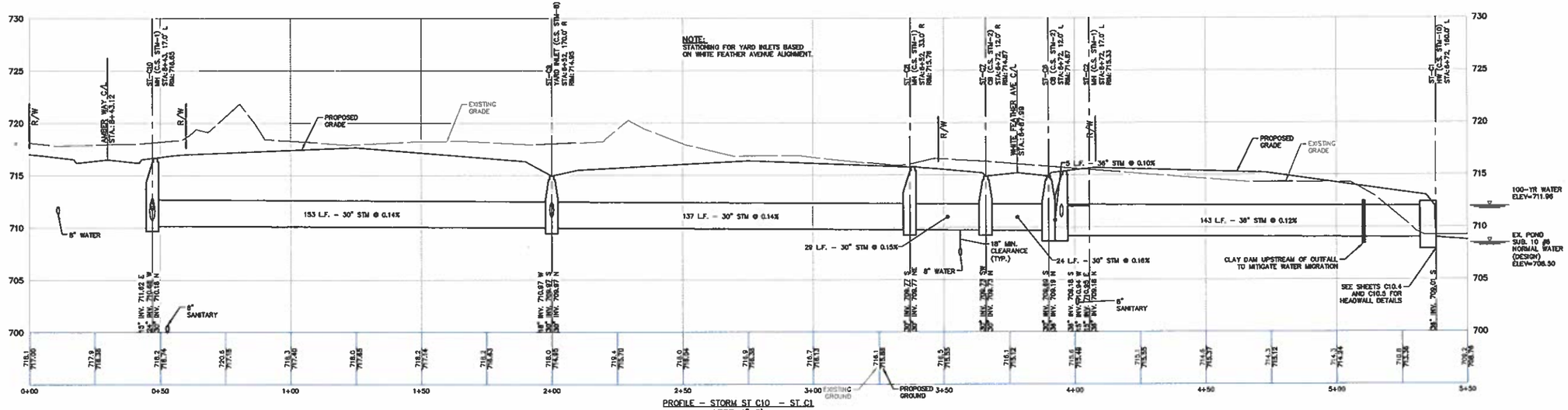
CAD FILE: 18002341-09.13 PP (FLEDGLING COURT) - PH 18.DWG



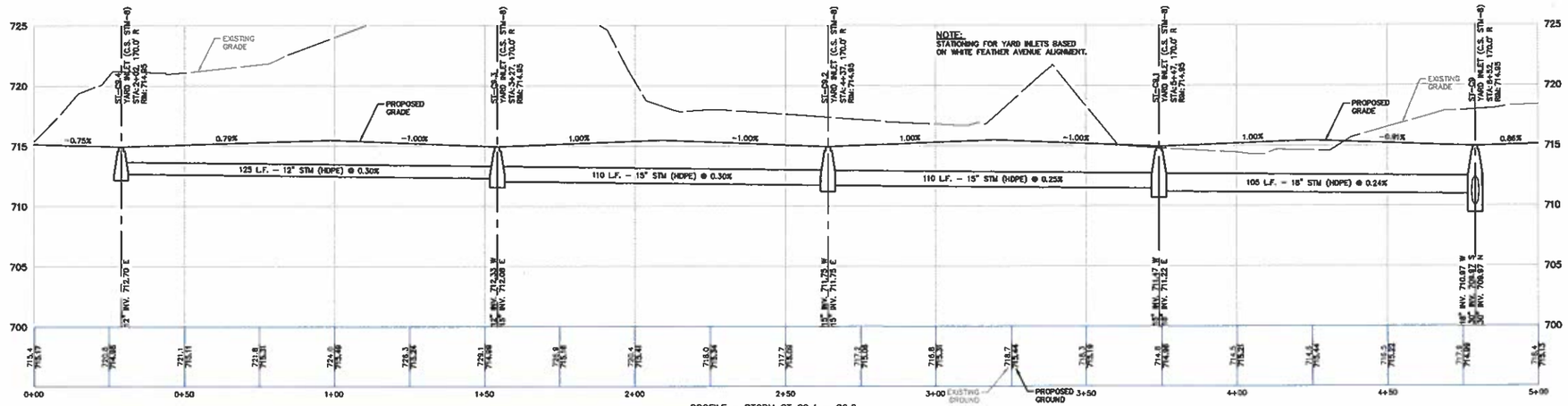
PROFILE – STORM ST A2 – ST A1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE – STORM ST B3 – ST B1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE – STORM ST C10 – ST C1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE – STORM ST C9.4 – C9.0
VERT: 1"=5'
HORZ: 1"=20'

811
Know what's below. Call before you dig.
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SECTION | TOWN | NORTH, RANGE | EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

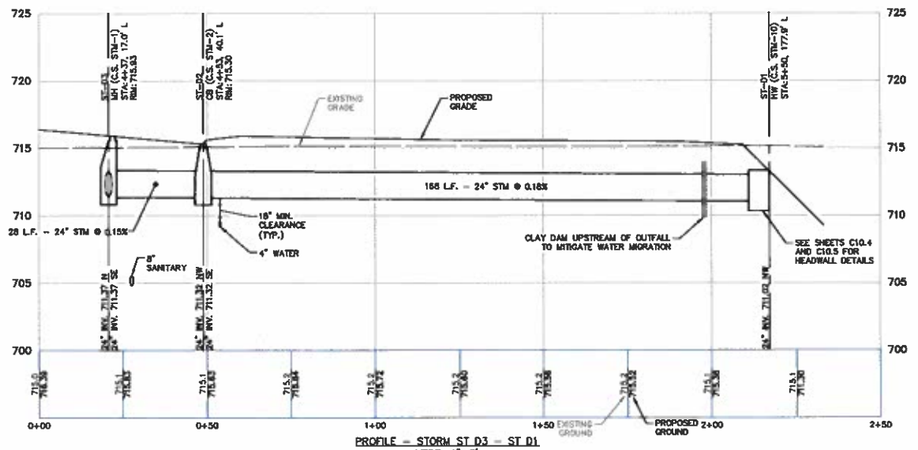
CLIENT: K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
AUXILIARY STORM PROFILES

DATE: JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 3

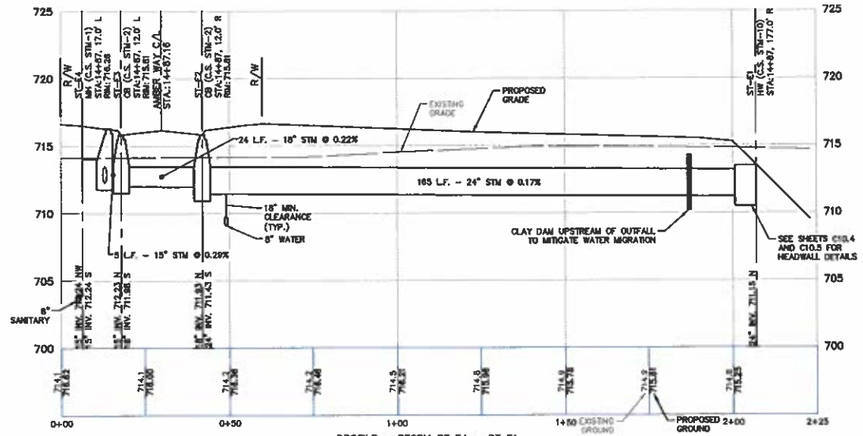
REVISIONS

SCALE: 1" = 20 FEET
DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.14

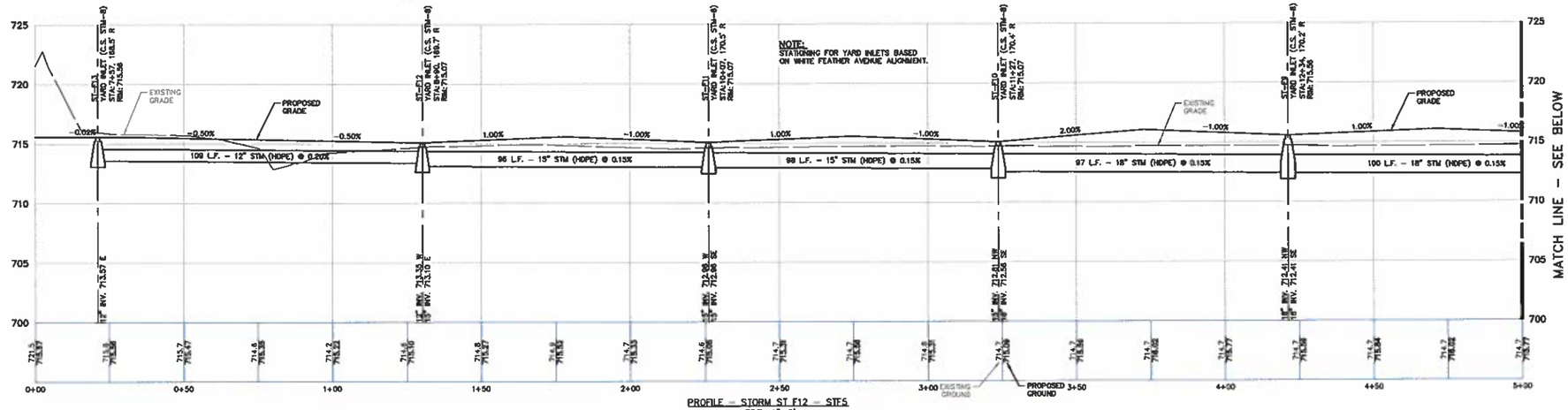
CAD FILE: 18002341-08.14 PP (AUX) - PH 18.DWG



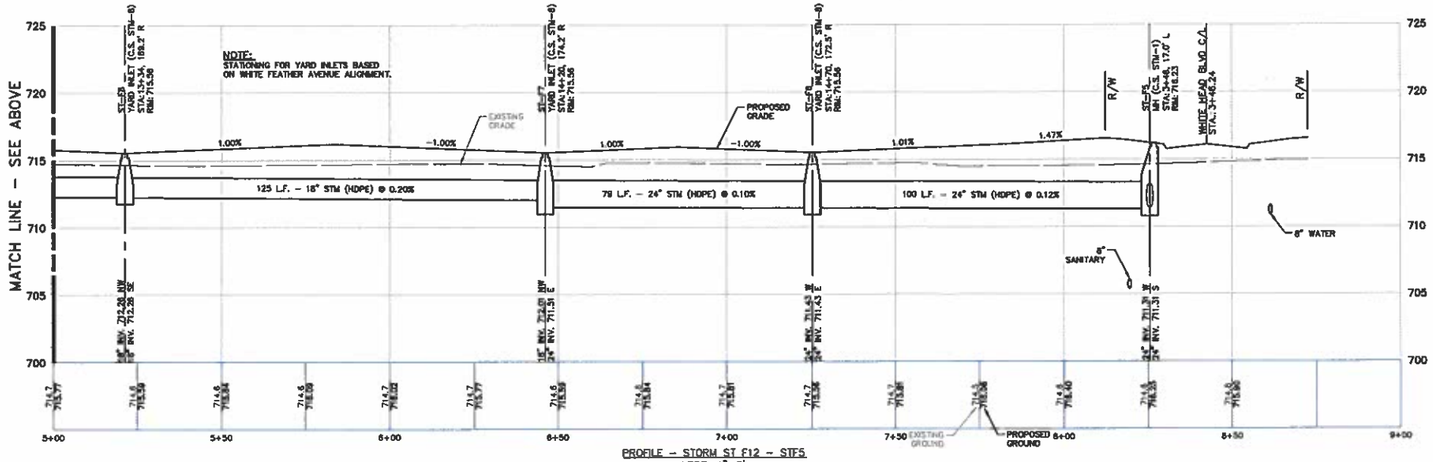
PROFILE - STORM ST D3 - ST D1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE - STORM ST E4 - ST E1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE - STORM ST F12 - ST F5
VERT: 1"=5'
HORZ: 1"=20'



PROFILE - STORM ST F12 - ST F5
VERT: 1"=5'
HORZ: 1"=20'

811
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440.349.2000

SECTION
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CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

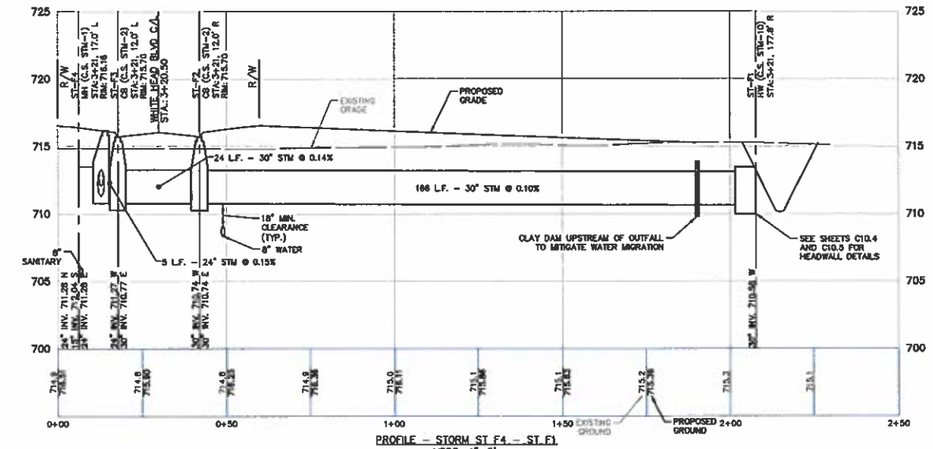
CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
AUXILIARY STORM PROFILES

DATE JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

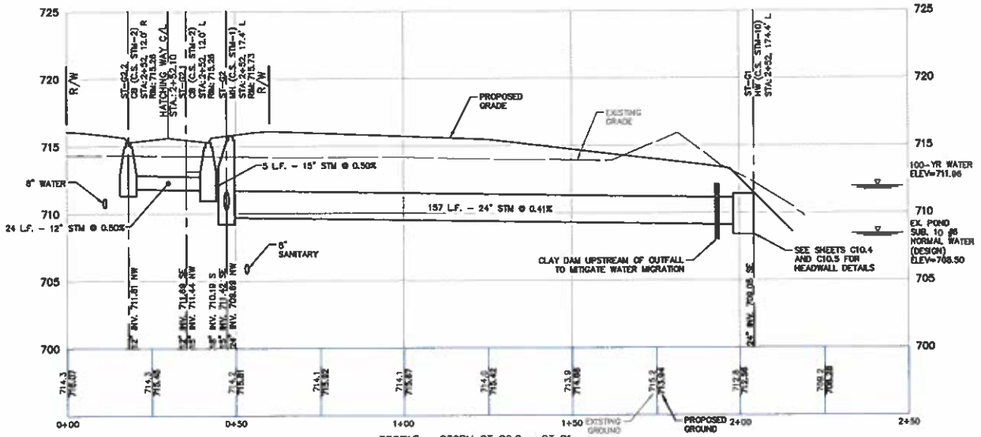
REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.15

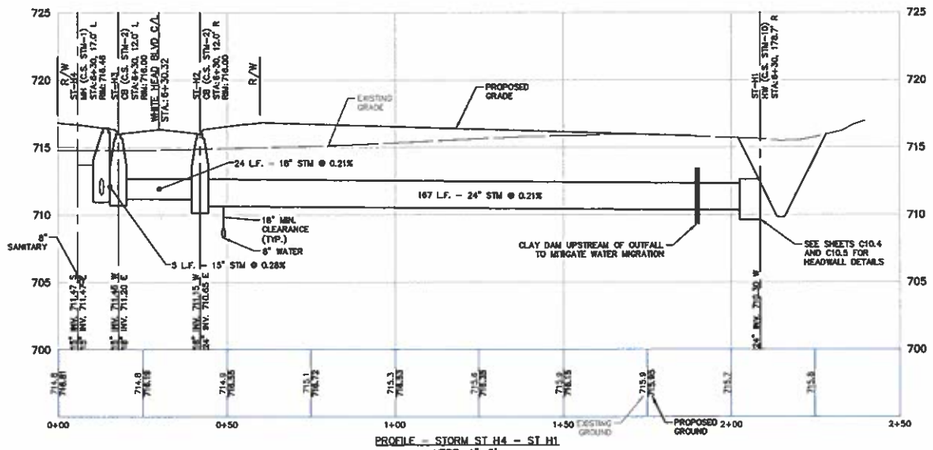
CAD FILE: 18002341-09.15 PP (AUX) - PH 18.0780



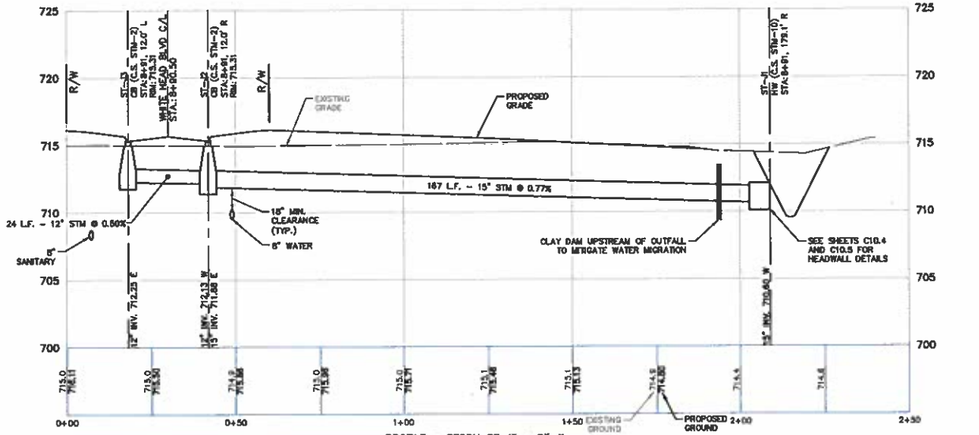
PROFILE - STORM ST F4 - ST F1
VERT: 1"=5'
HORZ: 1"=20'



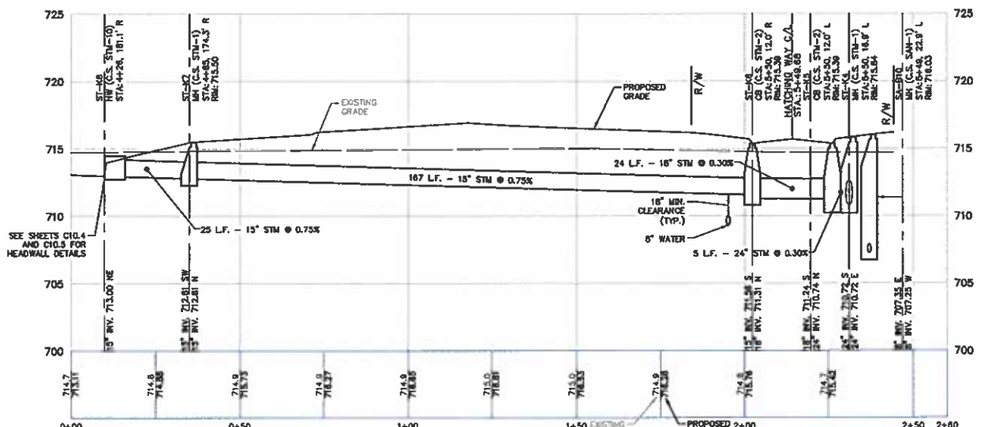
PROFILE - STORM ST G2.2 - ST G1
VERT: 1"=5'
HORZ: 1"=20'



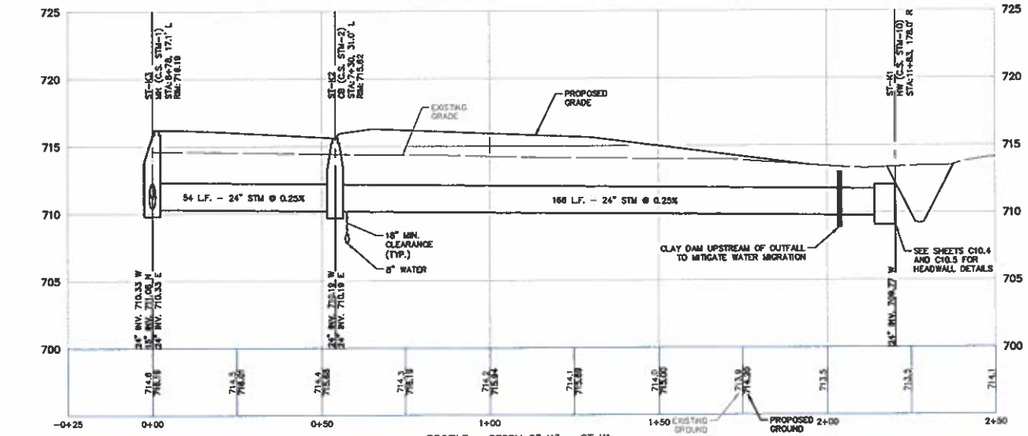
PROFILE - STORM ST H4 - ST H1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE - STORM ST J3 - ST J1
VERT: 1"=5'
HORZ: 1"=20'



PROFILE - STORM ST K8 - ST K4
VERT: 1"=5'
HORZ: 1"=20'



PROFILE - STORM ST K3 - ST K1
VERT: 1"=5'
HORZ: 1"=20'

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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE PLANS ARE APPROXIMATE 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:
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INDEPENDENCE, OH 44131
866.850.4200 www.atwell-group.com
440.349.2000

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

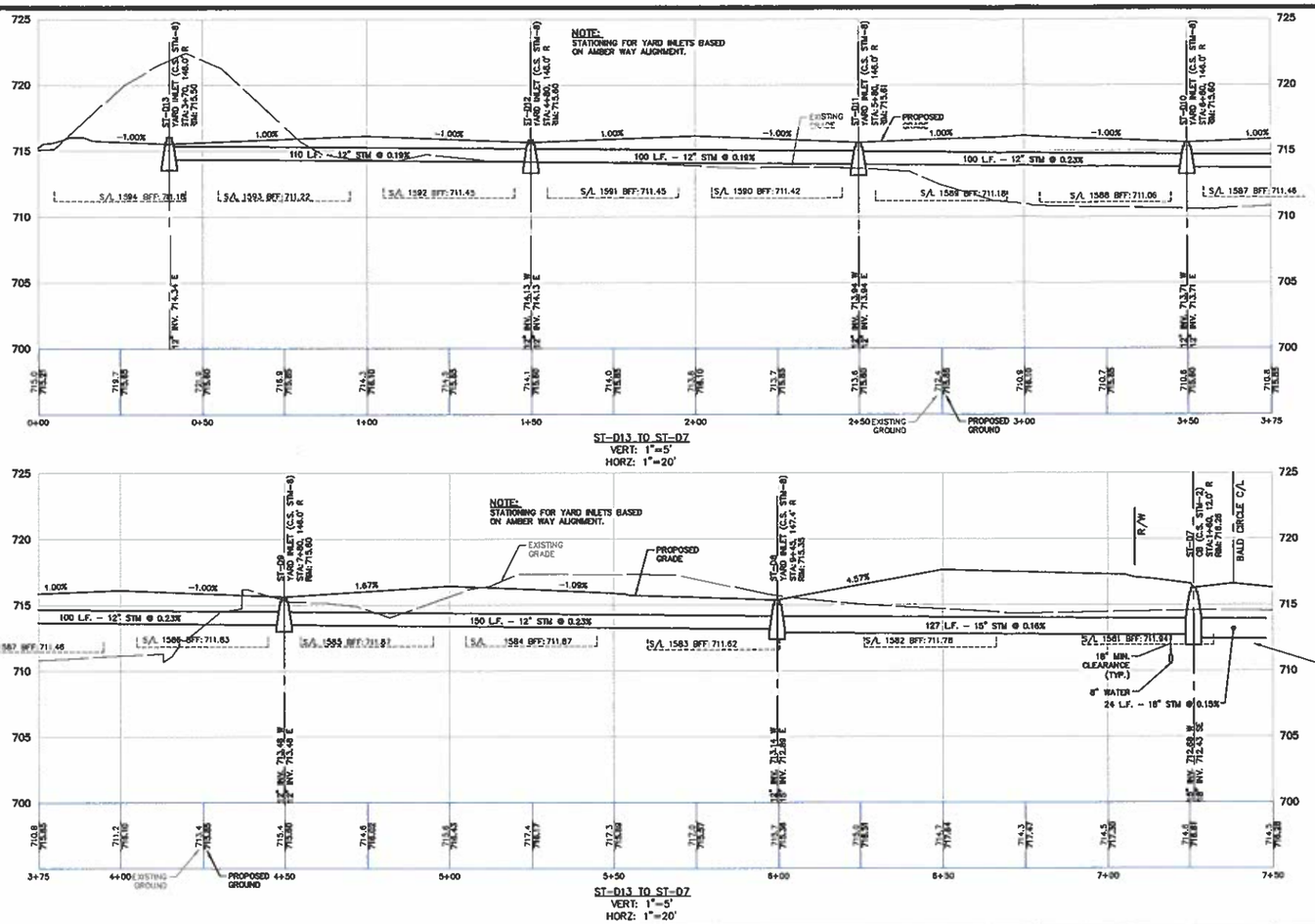
CLIENT K. HOVANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
AUXILIARY STORM PROFILES

DATE JANUARY 11, 2019
APRIL 13, 2020
GEA RESUBMITTAL NO. 2

REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.16

CAD FILE: 18002341-08.16 PP (AUX) - PH 18.DWG



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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON DATA OBTAINED FROM THE RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, FROM MEASUREMENTS MADE IN THE FIELD. 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.

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

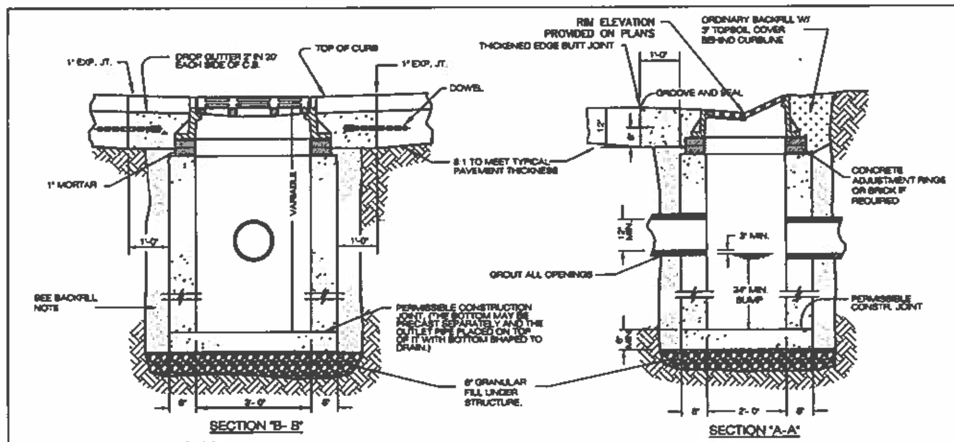
AUXILIARY STORM PROFILES

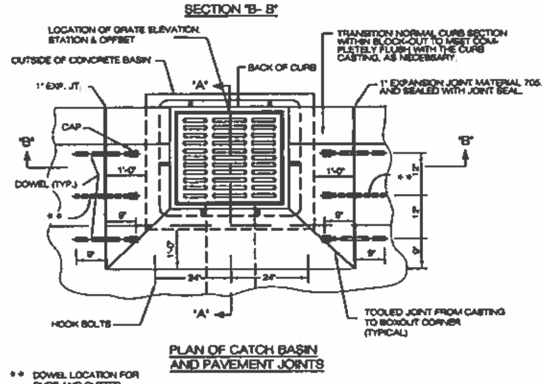
DATE JANUARY 11, 2019
APRIL 13, 2020 OEPA SUBMITTAL NO. 2

REVISIONS

SCALE 0 10 20
1" = 20 FEET
DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 9.17

CAD FILE: 18002341-08.17 PP (AUX) - PH 1&2.DWG





****Note:****

RESIDENTIAL PAVEMENT T = 8" (1"x 18" Long Dia. Dowel)
INDUSTRIAL PAVEMENT T = 9" (1¼"x 18" Long Dia. Dowel)

Notes:

Backfill for all structures within the limits of the pavement shall be ODOT Item 304 Aggregate Base or Low Strength Mortar Backfill, TYPE 2 per current O.D.O.T. Construction and Material Specifications, except as modified herein.

The use of Foundry Sand or Slag is strictly prohibited.

Curb Drains Installed shall be stubbed out 1' past the limits of excavation with solid pipe.

A Sump Catch Basin is required at last Catch Basin location before entering storm sewer main.

The following text shall be cast into the top of the grate: "DUMP NO WASTE" and "DRAINS TO WATERWAY"

Text shall be printed in bold, capital letters with a minimum height of 0.5". "WATERWAY" may be substituted with "STREAM", "RIVER", "LAKE", etc. Actual placement and logo may vary per manufacturer.

NOTES

CASTINGS SHALL MINIMALLY MEET THE REQUIREMENTS OF 604-711.12, A.S.T.M. A 48, CLASS 35 GRAY IRON OR 711.13 DUCTILE IRON. AFTER ACCEPTANCE, EXPOSED PARTS OF CURB CASTING TO BE THOROUGHLY CLEANED AND GIVEN ONE COAT OF ASPHALT VARNISH OR COAL TAR PITCH PAINT, AT THE SITE.

TOTAL MINIMUM ASSEMBLY WEIGHT = 600 LBS. SUBJECT TO THE ABOVE, THE FOLLOWING OR APPROVED EQUAL CASTINGS ARE ACCEPTED: NEENAH No. R-3501-TR OR 3501-TL OR EAST JORDAN 7495 W/ M1, M2 OR M4 GRATE, WHICHEVER IS APPROPRIATE.

BEARING AREAS OF FRAME AND GRATE SHALL BE SO FITTED AND FINISHED AS TO PROVIDE A FIRM AND EVEN SEAT FOR ALL PORTIONS OF THE GRATE IN THE FRAME. NO PROJECTIONS SHALL EXIST ON BEARING AREAS OF EITHER CASTING AND THE GRATE SHALL SEAT IN ITS FRAME WITHOUT ROCKING. EACH FRAME AND GRATE SHALL BE FITTED, MATCHED AND MARKED BEFORE DELIVERY TO THE PROJECT.

DOWELS: FOUR (4) 1"x18" DOWELS ARE REQUIRED FOR CONCRETE PAVEMENT OR GUTTER BLOCKOUT.

BRICK OR CONCRETE BLOCK SIDE WALLS, WHEN USED IN LIEU OF PRECAST CONCRETE, SHALL BE EIGHT (8) INCHES NOMINAL THICKNESS.

PRECAST CONSTRUCTION IS PERMITTED, (EXCEPT FOR THE BLOCK-OUT PAVEMENT) AND CONCRETE SHALL MEET THE REQUIREMENTS OF 706.13 WITH SIX PLUS OR MINUS TWO PERCENT (6±2%) AIR VOID CONTENT IN THE HARDENED CONCRETE. PRECAST WALLS SHALL HAVE A MINIMUM THICKNESS OF SIX (6) INCHES AND REINFORCING SHALL BE SUFFICIENT TO PERMIT SHIPPING AND PLACEMENT WITHOUT DAMAGE.

PRECAST CATCH BASIN: A PRECAST CONCRETE CHAMBER MAY BE USED. THE WALL THICKNESS SHALL BE A MINIMUM OF 6". REINFORCING STEEL SHALL BE USED IN ALL CASES. No. 3 BARS SHALL BE USED WHERE THE WALL HEIGHT FROM THE TOP OF THE WALL TO BOTTOM OF SLAB IS 3 FEET OR LESS AND No. 4 BARS SHALL BE USED WHEN THE WALL HEIGHT EXCEEDS 3 FEET. SHOP DRAWINGS SHALL BE REQUIRED IF PRECAST CONCRETE STRUCTURE IS USED.

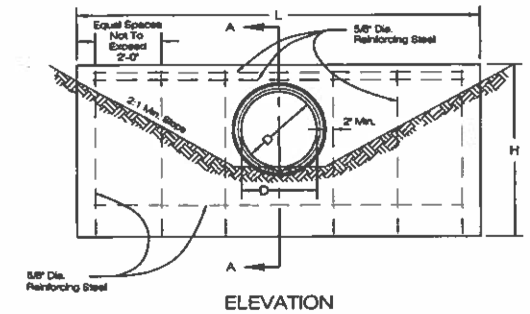
BLOCKOUT: WHERE ONE SIDE OF THE BLOCKOUT IS LOCATED AT A TRANSVERSE PAVEMENT JOINT THE TRANVERSE PAVEMENT JOINT SHALL BE THICKENED AND CONTINUED IN KIND WITHIN THE LIMITS OF THE BLOCKOUT EXCEPT AS DESCRIBED ABOVE, BLOCKOUTS SHALL BE LOCATED NO CLOSER THAN FIVE (5) FEET FROM A TRANSVERSE PAVEMENT JOINT. WHERE THE SPECIFIED CATCH BASIN WORK REQUIRES THE CONSTRUC- TION/RECONSTRUCTION OF BLOCKOUTS IN EXISTING PAVEMENT, THE BLOCKOUTS SHALL CONFORM, AS CLOSELY AS POSSIBLE, TO THE DE- TAILS SHOWN HEREON EXCEPT THAT THE DOWELS SHALL BE PLACED/ REPLACED IN ACCORDANCE WITH THE "SECTION-TYPE X" JOINT, PER O.D.O.T. CONSTRUCTION DRAWING BP-2.3C. (SECTION-TYPE Y" JOINT WHERE BLOCKOUT JOINT IS AT A EXISTING CONTRACTION OR HINGE JOINT LOCATION.) A CLASS "C" CONCRETE APRON, THE SIZE OF THE TWO (2) FOOT GUTTER BLOCKOUT, SHALL BE CAST IN PLACE IN FLEXIBLE PAVEMENT AND NO DOWELS ARE REQUIRED.

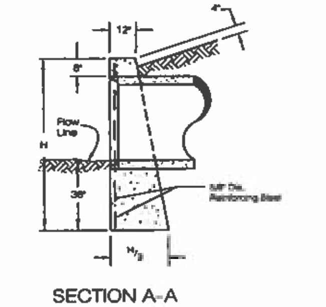
REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CATCH BASIN MOUNTABLE CURB

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 DRWN BY: JAB/TEB
STM-2





DIMENSIONS			QUANTITIES ONE HEADWALL	
DIAMETER	H	L	CONCRETE CU. YDS.	REINFORCING STEEL LBS.
15"	5'-2"	7'-0"	1.7	41
18"	5'-5"	8'-4"	2.2	57
21"	5'-8"	9'-8"	2.8	62
24"	5'-11"	11'-0"	3.3	69
30"	6'-5"	13'-8"	4.7	92
36"	7'-0"	16'-4"	6.5	105

L CIRCULAR SECTIONS = 6D + 4t
L ELLIPTICAL OR PIPE ARCH = 4R + 4t + S
H CIRCULAR SECTIONS = D + t + 44"
H ELLIPTICAL OR PIPE ARCH = R + t + 44"

D = DIAMETER OF PIPE
R = RISE OF PIPE
S = SPAN OF PIPE
t = THICKNESS OF BARREL
L = LENGTH OF HEADWALL
H = HEIGHT OF HEADWALL

NOTES

No. 1 headwall, where required, will be provided for nonskewed culverts having a diameter or rise of 36" or less.

Concrete shall be class "C".

Reinforcing steel bars shall be 5/8" round.

Dimension and quantities are shown for circular sections only. It will be necessary to determine dimensions for the No. 1 headwall required for other pipe shapes in accordance with the equations listed on this drawing.

Full height headwalls are required for all pipes.

Chamfer all exposed corners 3/4 of an inch.

Foundation. Where the soil borings indicate a bearing capacity of less than 2600 pounds per square foot, it will be necessary to increase the width of the base.

For headwall outlet protection, see STM-13.

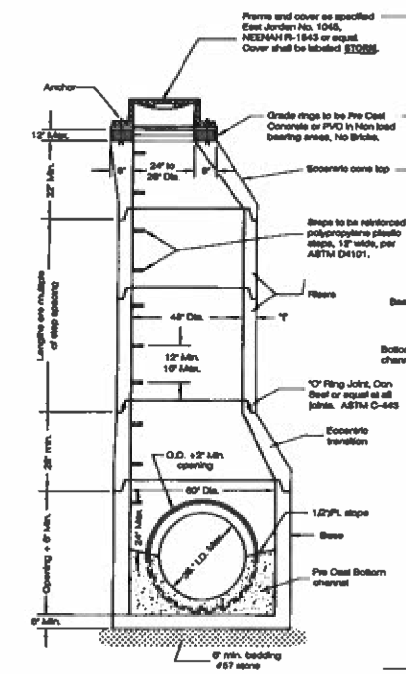
All cast in place headwalls shall have a cement wash.

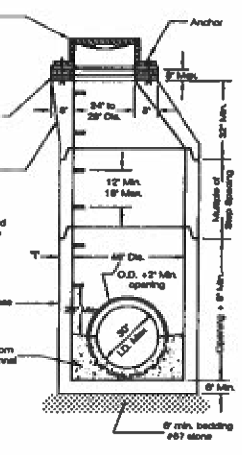
REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

STANDARD
No. 1 HEADWALL

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 DRWN BY: JAB/TEB
STM-10

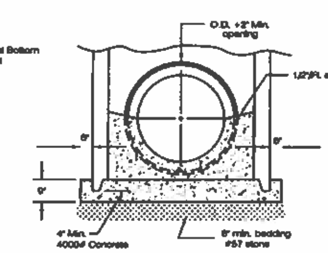




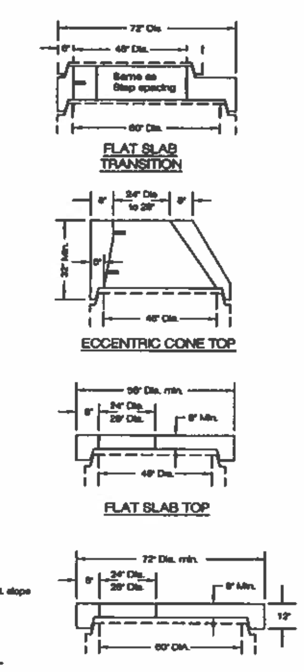
48" BASE FOR PRECAST 30" AND SMALLER PIPE

48" - 96" BASE FOR PRECAST

Base I.D.	Min 'T'	Max. Pipe Size
48"	5"	30"
60"	5"	36"
72"	6"	48"
84"	7"	54"
90"	7-1/2"	60"
96"	8"	60"



DOGHOUSE CONSTRUCTION



NOTES

Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

TOP AND TRANSITION (or reducer) Sections may be either eccentric cone, or flat slab.

BASES for manholes are shown with monolithic floor and riser which may be cast in one or two operations. A permissible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipe shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete precast in the base or by field construction. Bases may also be poured in place. All inlets and outlets are to be identified.

OPENINGS IN RISER SECTIONS for 18" and smaller inlet pipes shall be prefabricated.

MATERIALS for bases and other precast sections, including reinforcement not specified hereon, shall comply with the specifications.

LANDING PLATFORMS, as shown on the Landing Details shall be installed in manholes that are over 28 feet deep to the invert with maximum vertical spacing of 20 feet.

PRECAST MANHOLE shall conform to the requirements of ASTM C-478. Concrete shall be 4000# P.S.I.

SEAL lift holes with approved concrete plugs and bit.

ANCHORS ½" dia. Allthread with washers and hex nut (Min 4). Lead anchor secured into the eccentric cone top.

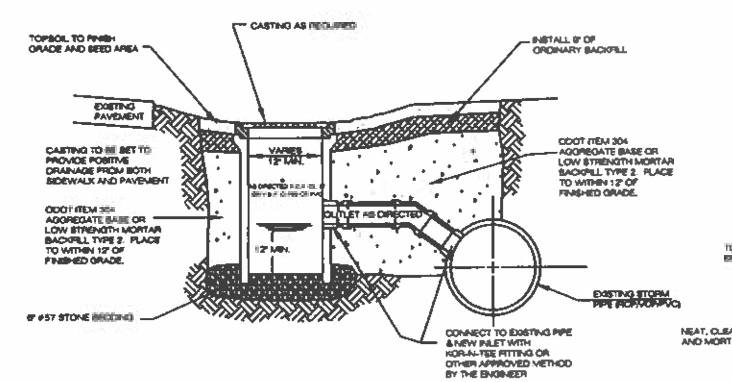
CASTINGS for manholes shall be cleaned and painted in field with one coat of asphalt varnish or coal tar pitch paint.

1	12/09	CB	MANHOLE STEP SPECIFICATION
REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

PRECAST CONCRETE MANHOLE

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 DRWN BY: JAB/TEB
STM-1



ROADSIDE INLET

Notes:

Backfill for all structures within 5' of the pavement shall be ODOT Item 304 Aggregate Base or Low Strength Mortar Backfill, TYPE 2 per current O.D.O.T. Construction and Material Specifications, except as modified herein.

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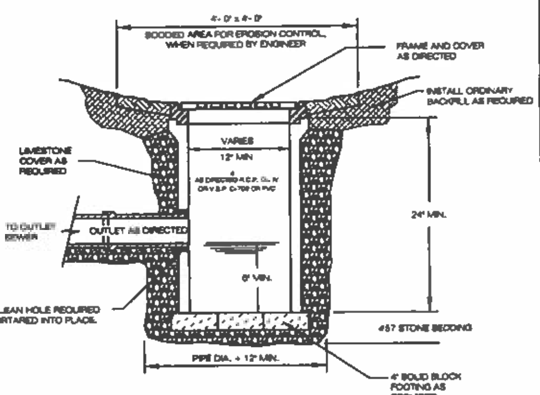

YARD INLET
GENERAL AREA

* PIPE SIZE AS DIRECTED BY THE ENGINEER (MINIMUM 12")

IF NECESSARY, BICYCLE SAFE GRATE SHALL BE SPECIFIED IN THE PLANS.

CATALOG No.				
*	**	*	**	
EAST JORDAN	EAST JORDAN	NEENAH	NEENAH	PIPE SIZE
6532	6012	R-4340-H	R-4030-12	12"
6533	6015	R-4340-G	R-4030-15	15"
6534	6018	R-4340-F1	R-4030-18	18"
6536	6024M1	R-4340-F	R-4030-24	24"

OTHER CASTINGS ACCEPTED UPON APPROVAL OF THE CITY ENGINEER
* INDICATES DOMED OR BEEHIVE GRATE CATALOG No.
** INDICATES FLAT GRATE CATALOG No.

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

ROADSIDE & YARD INLET DETAILS

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 DRWN BY: JAB/TEB
STM-8

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

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SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

TYPICAL STORM DETAILS

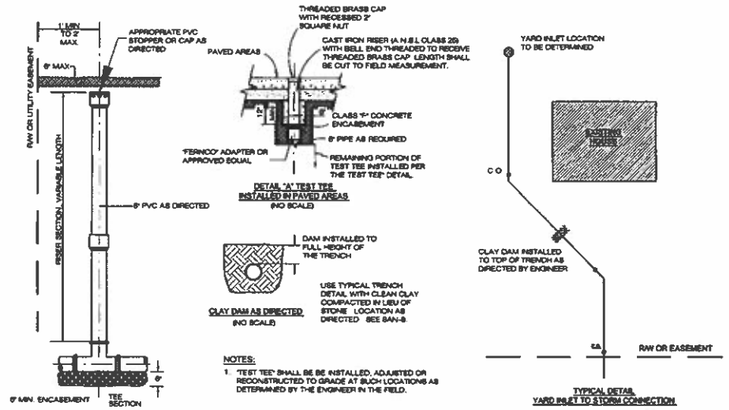
DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

DR. TDR CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO.
11.0

CAD FILE: 18002341-11.0 - DT - PH 18.DWG



GENERAL NOTES:

1) ALL PIPE SHALL BE POLYVINYL CHLORIDE (PVC) SDR 35 ASTM D-3034, UNLESS OTHERWISE DIRECTED.

2) ALL BENDS OF 90° OR MORE WILL REQUIRE A CLEANOUT WITHIN (2) TWO FEET OF THE FITTING.

3) PIPE BEDDING AND COVER SHALL BE AS PER THE CITY STANDARD FOR TYPICAL TRENCH DETAILS.

4) A CLEANOUT IS REQUIRED FOR ALL STORM AND SANITARY SEWER CONNECTIONS AT THE R/W OR THE UTILITY EASEMENT.

5) FOR ALL CONNECTIONS LONGER THAN 75' A CLEANOUT WILL BE REQUIRED AT EVERY 75' FOOT INCREMENT OR BEND

6) THE CONTRACTOR SHALL DEWATER THE TRENCH BY PUMP AND SHALL NOT DRAIN GROUND WATER INTO ANY SANITARY SEWER. DISCHARGE INTO STORM SEWER WILL BE PERMITTED ONLY IF METHOD OF DISCHARGE IS APPROVED AND OBSERVED BY THE CITY OF NORTH RIDGEVILLE REPRESENTATIVE

SEPTIC CONVERSIONS:

1) A CLEANOUT IS REQUIRED AT THE FACE OF THE EXISTING STRUCTURE WHERE THE NEW CONNECTION IS ATTACHED TO THE OLD DISCHARGE LINE AND NO CLEANOUT IS ACCESSIBLE IN THE STRUCTURE.

2) FERNCO ADAPTERS ARE TO BE USED FOR CAST IRON OR CLAY PIPE WHERE A GASKETED CONNECTION WILL NOT WORK.

3) SEPTIC TANK SHALL BE REMOVED OR CRUSHED IN PLACE IN ACCORDANCE WITH THE LORAIN COUNTY GENERAL HEALTH DISTRICT REQUIREMENTS.

4) NEW PIPE ALIGNMENT WILL NOT BE PERMITTED TO CROSS OVER THE ABANDONED SEPTIC TANK FOOTPRINT

5) ALL DISCHARGE LINES FROM THE ABANDONED SEPTIC SYSTEMS ARE TO INCLUDE A CLEANOUT AS DIRECTED BY THE ENGINEER

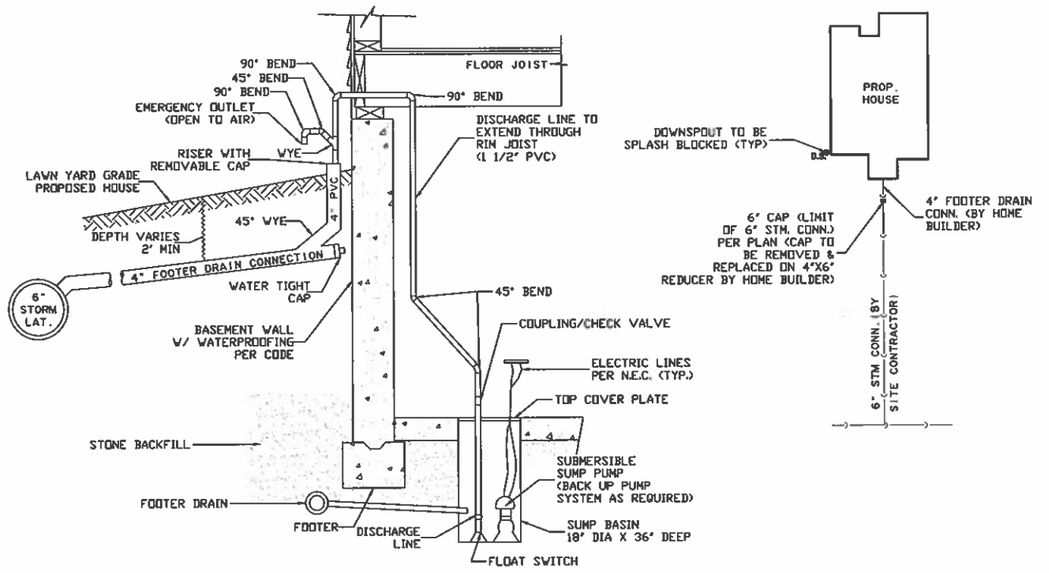
Larry D. Griffith
CITY OF NORTH RIDGEVILLE, ENGINEER

REV'NS	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

6" STORM & SANITARY SERVICE DETAILS

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRWN BY: JAB/TEB | SAN-10



SUMP PUMP CONNECTION DETAIL
NO SCALE

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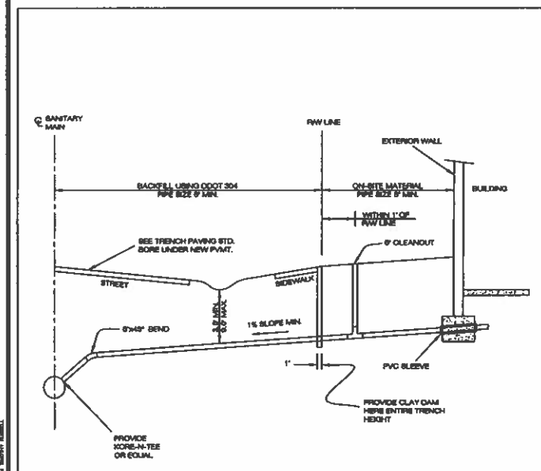


NOTES:
ALL PIPE SHALL BE PVC ASTM D 3034, SDR 35 WITH "O"-RING JOINTS PER ASTM 3212.
BELL ENDS SHALL BE FACED UPSTREAM.
PIPE EMBEDMENT: ODOT #57 4" BELOW PIPE TO 1 FOOT ABOVE TOP OF PIPE, FULL WIDTH OF TRENCH.
BACKFILL: ODOT NO. 304 (ABOVE PIPE EMBEDMENT)
PROVIDE GASKETED PLUG IN SANITARY SEWER CONNECTION AT R/W LINE IF CONNECTION IS NOT TO BE USED IMMEDIATELY.
EMPLOY PROPER TRENCH SAFETY PER LATEST OSHA STANDARDS.

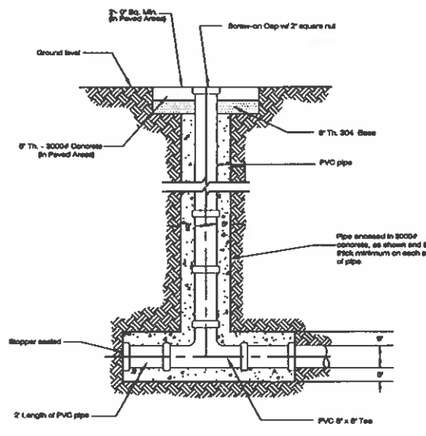
REV'NS	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

SANITARY SERVICE CONNECTION

Larry D. Griffith
CITY OF NORTH RIDGEVILLE, ENGINEER

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRWN BY: JAB/TEB | SAN-8



8" Cleanout shall be used for 8" sewers and larger. Smaller size sewers and lamp holes shall have same size pipe.

REV'NS	DATE	BY	DESCRIPTION
1	10/01/08	CB	Screw-on Cap

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CLEANOUT DETAIL

Larry D. Griffith
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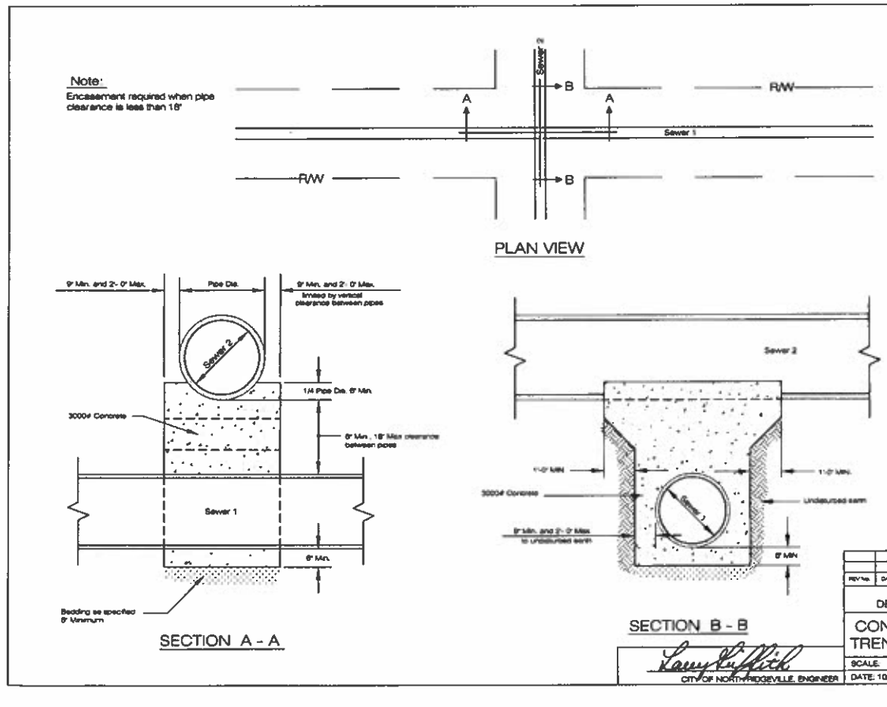
SCALE: NOT TO SCALE | DATE: 10/01/08 | DRWN BY: JAB/TEB | SAN-9



REV'NS	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CONCRETE ENCASEMENT TRENCH CROSSING DETAIL

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SCALE: NOT TO SCALE | DATE: 10/01/08 | DRWN BY: JAB/TEB | SAN-11

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
TYPICAL DETAILS

DATE JANUARY 11, 2019

APRIL 13, 2020 OEA SUBMITTAL NO. 3

REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 11.1

CAD FILE: 18002341-11.0 - 01 - PH 18.DWG

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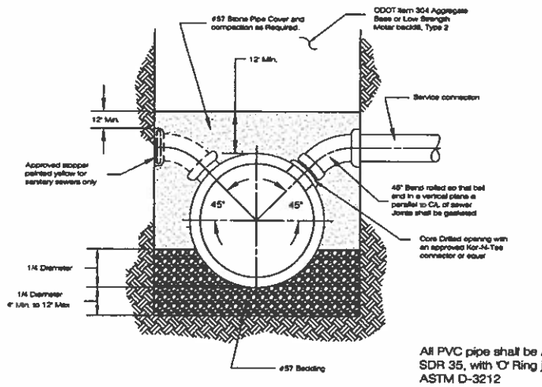


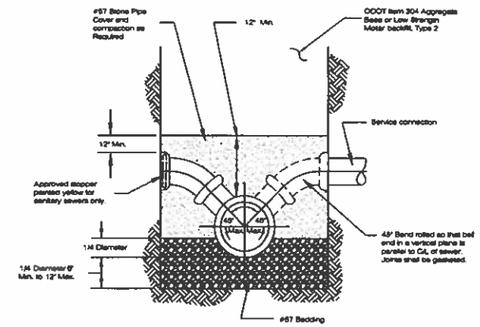
TYPICAL CORE AND TEE DETAIL
(USE ON EXISTING MAINS)

All PVC pipe shall be ASTM 3034 SDR 35, with 'O' Ring joints per ASTM D-3212

NOTES: Provide gasketed plug in sanitary sewer connection at R/W line if connection is not to be used immediately.

Employ proper trench saftey per latest OSHA Standards.

Bell ends are to be placed upstream.



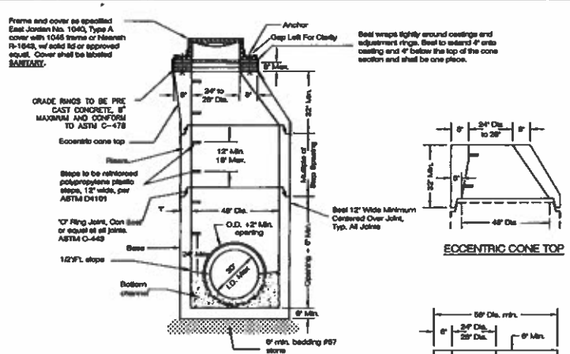
TYPICAL Y-BRANCH DETAIL

REV No.	DATE	BY	DESCRIPTION
			CITY OF NORTH RIDGEVILLE, OHIO
			DEPARTMENT OF ENGINEERING

SANITARY SERVICE CONNECTION DETAILS

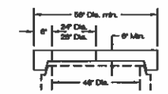
SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | SAN-5

Larry Tuffich
CITY OF NORTH RIDGEVILLE, ENGINEER



48" BASE FOR PRECAST 30" AND SMALLER PIPE

ECCENTRIC CONE TOP



FLAT SLAB TOP

NOTES

Sections of the precast manhole shall be cast and assembled with either slip tongue or slip groove ends up. Lift holes may be provided in each section for handling.

TOP AND TRANSITION (or reduced) Sections may be either eccentric cone or flat slab.

BASES for manholes are shown with monolithic floor and riser which may be cast in one or two operations. A permissible alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipe shall be provided, either when the unit is cast or later, to meet project requirements. Bottom channels may be formed of concrete precast in the base or by field construction. Bases may also be poured in place. All inlets and outlets are to be identified.

OPENINGS IN RISER SECTIONS for 18" and smaller inlet pipes shall be prefabricated. Flexible connections shall be provided for sanitary and combined sewers.

JOINT SEAL between precast manhole sections on sewers shall be resilient and flexible gasket joints per ASTM C-443 or latest edition.

The manhole seal at the top of the manhole (casting, adjustment rings, etc.) shall be a "WRAPIDSEAL" heat shrinkable seal manufactured by Canusa-CPS or approved equal.

All other joints shall be sealed with CONSEAL CS159 butyl sealant manufactured by Concrete Sealants, Inc. or an approved equal.

A watertight flexible sleeve "KOR-N-SEAL", "PRESS WEDGE" or equal to be provided at all connections between manholes and pipes and shall meet the requirements of ASTM C-923.

MATERIALS for bases and other precast sections, including reinforcement not specified hereon, shall comply with the specifications.

LANDING PLATFORMS as shown on the Landing Details shall be installed in manholes that are over 28 feet deep to the invert with maximum vertical spacing of 20 feet.

PRECAST MANHOLE shall conform to the requirements of ASTM C-478. Concrete shall be 4000# P.S.I.

SEAL lift holes with approved concrete plugs and bit.

ANCHORS ¾" dia. Attimead with washers and hex nut (Min 4). Lead anchor secured into the eccentric cone top.

CASTINGS for manholes shall be cleaned and painted in field with one coat of asphalt varnish or coal tar pitch paint.

Sanitary Manholes

Castings in pavement shall have a solid lid and gasket.

Manhole Testing: All sanitary manholes shall be vacuum tested per ASTM C 1244.

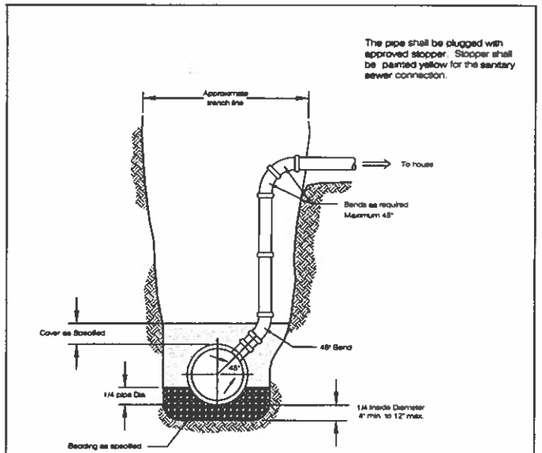
Precast collars and/or bricks for height adjustments to manholes must meet ASTM C-32.

Larry Tuffich
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION
1	12/08	CB	STEP SPECIFICATION
			CITY OF NORTH RIDGEVILLE, OHIO
			DEPARTMENT OF ENGINEERING

PRECAST CONCRETE MANHOLE

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | SAN-1



Note:

Bedding and Backfill shall meet the requirements of the City Standard Construction Drawing "Sanitary Service Connection Details".

When using PVC for construction, all portions of the riser shall be ASTM 3034 SDR 35 unless otherwise directed by the Engineer.

REV No.	DATE	BY	DESCRIPTION
			CITY OF NORTH RIDGEVILLE, OHIO
			DEPARTMENT OF ENGINEERING

STANDARD RISER DETAIL

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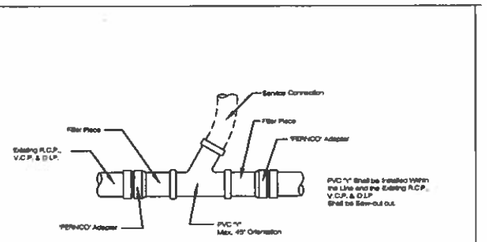
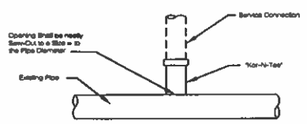
CITY OF NORTH RIDGEVILLE, ENGINEER



DETAIL FOR R.C.P., V.C.P. & D.I.P.

MAY ONLY BE USED WITH THE WRITTEN PERMISSION OF THE CITY ENGINEER



DETAIL FOR ALL PIPE

REV No.	DATE	BY	DESCRIPTION
			CITY OF NORTH RIDGEVILLE, OHIO
			DEPARTMENT OF ENGINEERING

PIPE TAPPING DETAIL

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | SAN-12

Larry Tuffich
CITY OF NORTH RIDGEVILLE, ENGINEER

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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:
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SECTION
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CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
TYPICAL DETAILS

DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 11.2

CAD FILE: 18002341-11.0 - 07 - PH 18.DWG

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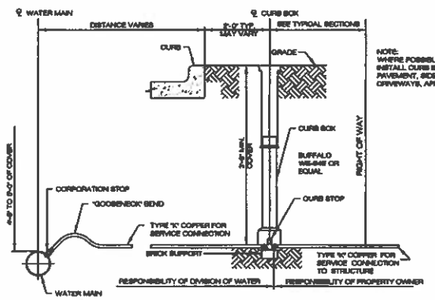

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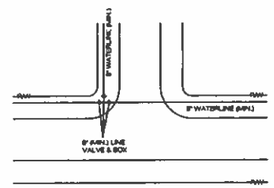
REV No.	DATE	BY	DESCRIPTION
1	3/07		Cover

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

1" SERVICE CONNECTION

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-13



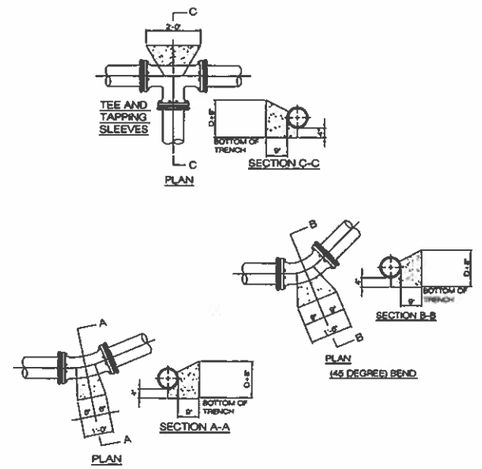
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

SHUTOFF VALVE LOCATIONS AT "T" INTERSECTIONS

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-12



1. ALL DIMENSIONS SHOWN HEREON ARE MINIMUM.
THRUST BLOCK SHALL BE POURED TO UNDISTURBED EARTH.
2. ALL CONCRETE FOR THRUST BLOCKS SHALL BE CLASS "C" HAVING 4,000 PSI 28 DAY COMPRESSIVE STRENGTH.
3. DO NOT COVER BOLTS WITH CONCRETE ON MECHANICAL JOINTS.
4. USE FORMS WHEN POURING CONCRETE TO MAINTAIN SHAPE AND DIMENSIONS OF THRUST BLOCKS.
5. MEGA-LUGS ARE AN ACCEPTABLE OPTION

CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

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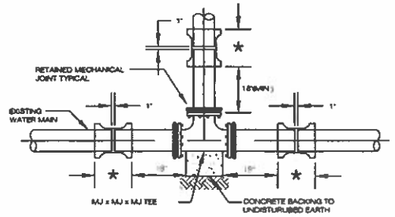
THRUST BLOCK DETAIL

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-7



1. * CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS
2. COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS, TWO (2) FOLLOWER GLANDS, WO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS, AND SUFFICIENT TRACHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS
3. MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).
4. THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE Note 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS
5. ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-99, CLASS 'C', METHOD 'B'

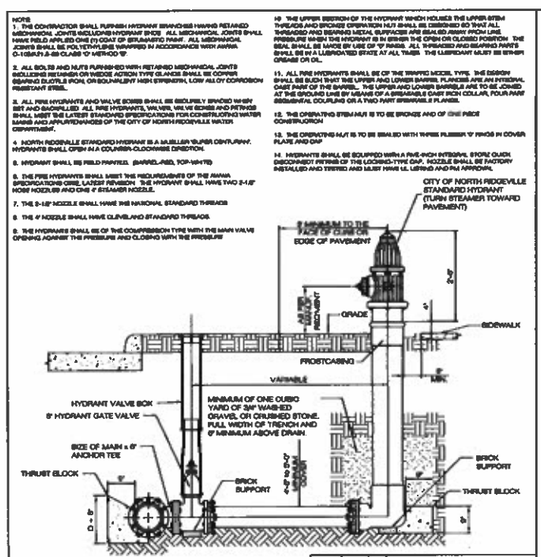
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CUT-IN TEE DETAIL

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-8



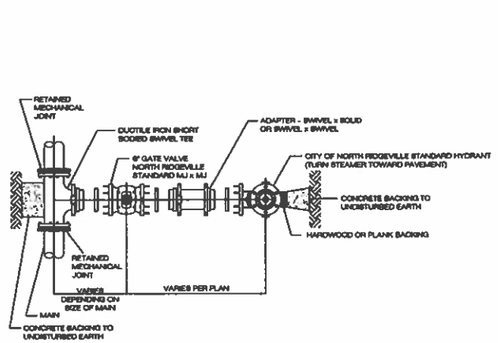
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION
1	3/07		Cover

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

GENERAL HYDRANT

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-1



NOTE:
1. THE CONTRACTOR SHALL FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-105/A21.5-99 CLASS 'C' METHOD 'B'.
2. ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.

CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
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HYDRANT TYPE A

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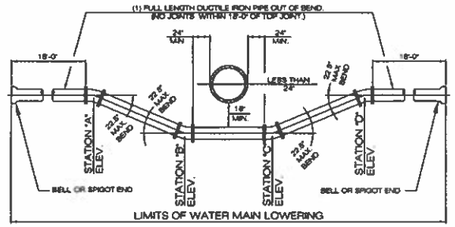


NOTE
1. WATER MAIN SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PUSH-ON JOINT PIPE WITH RETAINED MECHANICAL JOINT DUCTILE IRON CLASS 350, CEMENT LINED RETAINED MECHANICAL JOINT FITTINGS.
2. WHERE DEPTH OF LOWERING REQUIRES AN INTERMEDIATE JOINT BETWEEN STATIONS "A" & "B" AND/OR "C" & "D" THE ENTIRE LOADING SHALL BE MADE WITH DUCTILE IRON, MINIMUM CLASS 52 CEMENT LINED PIPE AND DUCTILE IRON CLASS 350, CEMENT LINED FITTINGS ALL HAVING BOLTLESS RESTRAINED PUSH-ON JOINTS, TYPE I.
3. WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRE AN INTERMEDIATE JOINT ONLY BETWEEN STATIONS "B" & "C", AND PIPE JOINTS ARE AS INDICATED IN NOTE "1" ABOVE, THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE I.
4. WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT ONLY BETWEEN "B" & "C" AND PIPE JOINTS ARE AS INDICATED IN NOTE "2" ABOVE, THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE I.

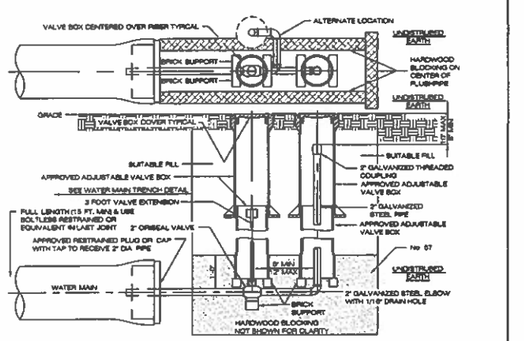
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

WATER MAIN LOWERING

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-9



CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

TYPICAL FLUSHING ASSEMBLY

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | WAT-10

811
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440.349.2000

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

TYPICAL WATER DETAILS

DATE
JANUARY 11, 2019

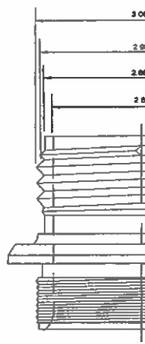
APRIL 13, 2020
OEPA SUBMITTAL NO. 3

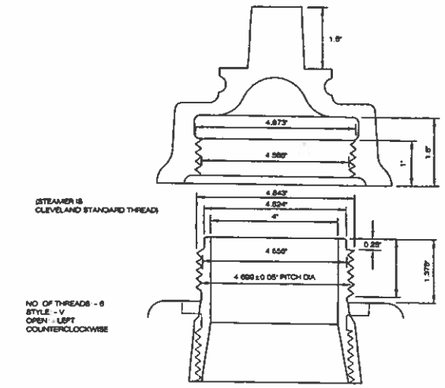
REVISIONS

SECTION
TOWN
NORTH, RANGE
EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

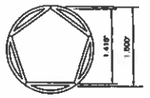
DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 16002341
SHEET NO. 11.3

CAD FILE: 16002341-11.0 - DT - PH 10.DWG



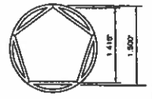


HOSE AND STEAMER NOZZLE AND CAP



NATIONAL STANDARD
PENTAGONAL OPERATING NUT.

(2-1/2 IS NATIONAL
STANDARD THREAD
HOSE NOZZLES 2 9" THREADS
3-1/16" O.D. 7-1/2 THREADS
PER INCH



NATIONAL STANDARD
PENTAGONAL OPERATING NUT

Larry Liffick
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

2-1/2" HOSE NOZZLE
HYDRANT CONNECTION

SCALE: NOT TO SCALE | DRAWN BY: JAB/TEB | DATE: 10/01/08 | WAT-5

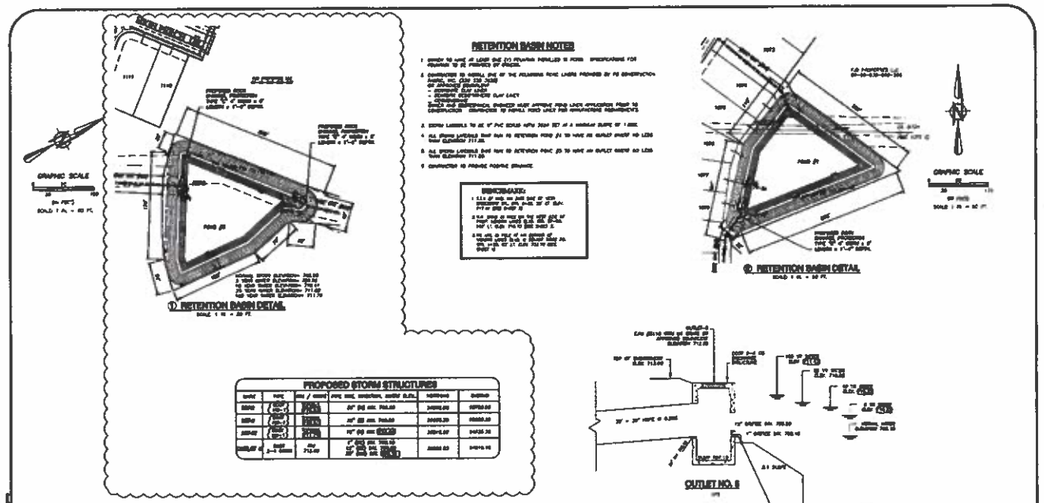
Larry Liffick
CITY OF NORTH RIDGEVILLE, ENGINEER

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

4" PUMPER NOZZLE
HYDRANT CONNECTION

SCALE: NOT TO SCALE | DRAWN BY: JAB/TEB | DATE: 10/01/08 | WAT-6



NOTE

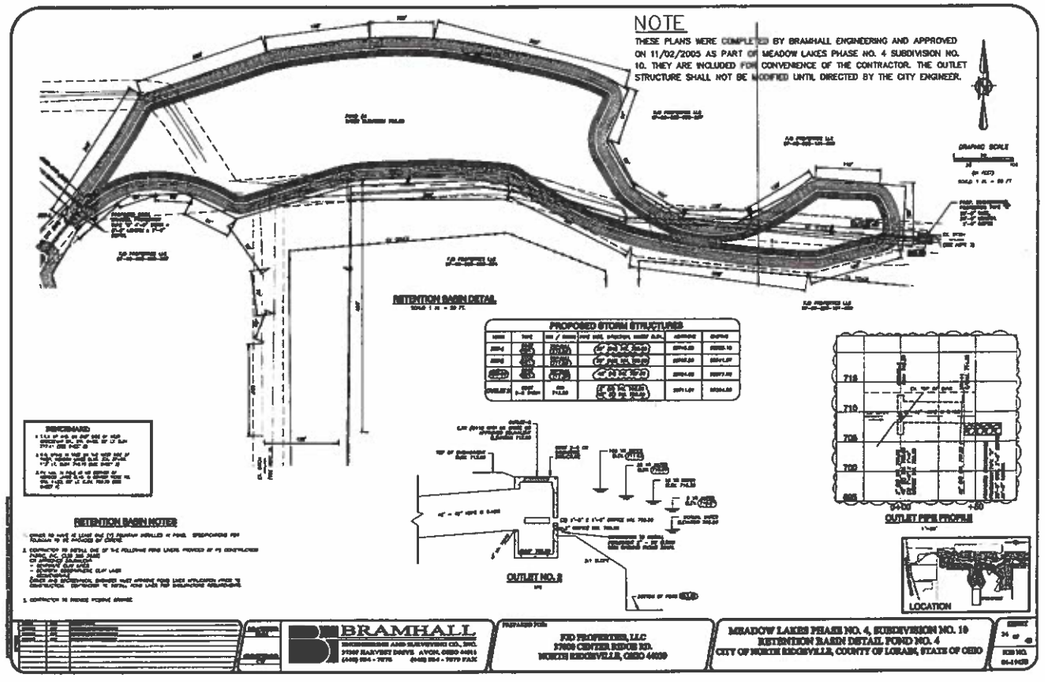
THESE PLANS WERE COMPLETED BY BRAMHALL ENGINEERING AND APPROVED ON 11/02/2005 AS PART OF MEADOW LAKES PHASE NO. 4 SUBDIVISION NO. 10. THEY ARE INCLUDED FOR CONVENIENCE OF THE CONTRACTOR. THE OUTLET STRUCTURE SHALL NOT BE MODIFIED UNTIL DIRECTED BY THE CITY ENGINEER.

BRAMHALL
ENGINEERING AND SURVEYING CO., INC.
37001 HARVEST DRIVE AVON, OHIO 44011
(440) 934 - 7070 (440) 934 - 7079 FAX

PREPARED FOR:
FID PROPERTIES, LLC
37000 CENTER RIDGE RD.
NORTH RIDGEVILLE, OHIO 44039

MEADOW LAKES PHASE NO. 4, SUBDIVISION NO. 10
RETENTION BASIN DETAIL POND NOS. 1 & 5
CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN, STATE OF OHIO

JOB NO. 04-019B



NOTE

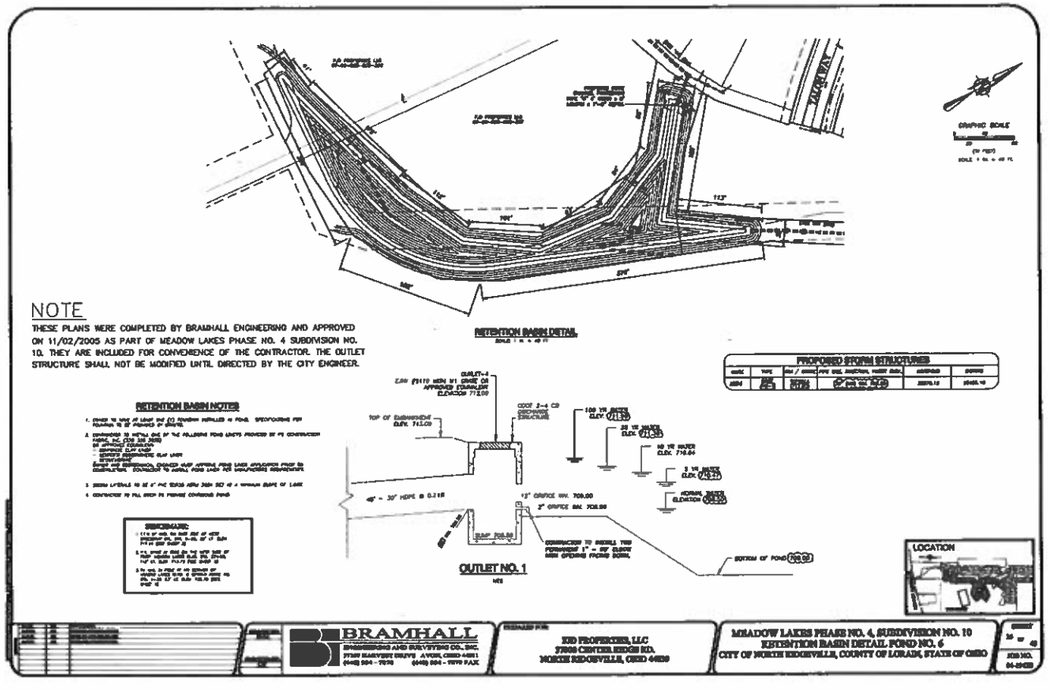
THESE PLANS WERE COMPLETED BY BRAMHALL ENGINEERING AND APPROVED ON 11/02/2005 AS PART OF MEADOW LAKES PHASE NO. 4 SUBDIVISION NO. 10. THEY ARE INCLUDED FOR CONVENIENCE OF THE CONTRACTOR. THE OUTLET STRUCTURE SHALL NOT BE MODIFIED UNTIL DIRECTED BY THE CITY ENGINEER.

BRAMHALL
ENGINEERING AND SURVEYING CO., INC.
37001 HARVEST DRIVE AVON, OHIO 44011
(440) 934 - 7070 (440) 934 - 7079 FAX

PREPARED FOR:
FID PROPERTIES, LLC
37000 CENTER RIDGE RD.
NORTH RIDGEVILLE, OHIO 44039

MEADOW LAKES PHASE NO. 4, SUBDIVISION NO. 10
RETENTION BASIN DETAIL POND NO. 4
CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN, STATE OF OHIO

JOB NO. 04-019B



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THESE PLANS WERE COMPLETED BY BRAMHALL ENGINEERING AND APPROVED ON 11/02/2005 AS PART OF MEADOW LAKES PHASE NO. 4 SUBDIVISION NO. 10. THEY ARE INCLUDED FOR CONVENIENCE OF THE CONTRACTOR. THE OUTLET STRUCTURE SHALL NOT BE MODIFIED UNTIL DIRECTED BY THE CITY ENGINEER.

BRAMHALL
ENGINEERING AND SURVEYING CO., INC.
37001 HARVEST DRIVE AVON, OHIO 44011
(440) 934 - 7070 (440) 934 - 7079 FAX

PREPARED FOR:
FID PROPERTIES, LLC
37000 CENTER RIDGE RD.
NORTH RIDGEVILLE, OHIO 44039

MEADOW LAKES PHASE NO. 4, SUBDIVISION NO. 10
RETENTION BASIN DETAIL POND NO. 6
CITY OF NORTH RIDGEVILLE, COUNTY OF LORAIN, STATE OF OHIO

JOB NO. 04-019B

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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES AND STRUCTURES SHOWN ON THIS PLAN ARE BASED ON RECORDS SUPPLIED TO THE ENGINEER 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.

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INDEPENDENCE, OH 44131
440.349.2000

SECTION
TOWN NORTH, RANGE EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

TYPICAL WATER DETAILS & RETENTION POND DETAILS

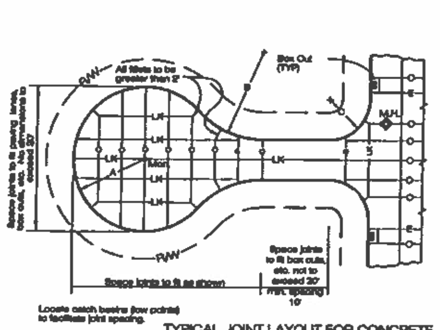
DATE
JANUARY 11, 2019

APRIL 13, 2020
EPA SUBMITTAL NO. 2

REVISIONS

DR. TDR	CH. DH
P.M. DH	
BOOK N/A	
JOB 18002341	
SHEET NO. 11.4	

CAD FILE: 18002341-11.0 - DT - PH FILDING



TYPICAL JOINT LAYOUT FOR CONCRETE CUL-DE-SAC & INTERSECTION PAVEMENT

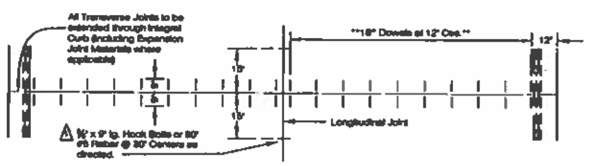
JOINT LEGEND

- C Control Joint
- E Expansion Joint (Sleeper Slab)
- LK Longitudinal Key Joint
- T Thickened Edge
- P Pressure Relief Joint
- S Sleeper Slab Expansion Joint

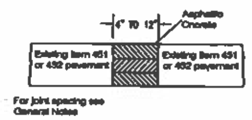
Use Longitudinal Key Joints, without hook Bolts around all manholes.

All catch basins and manholes shall be separated from the pavement and curb by Boxing Out.

SCHEDULE OF DIMENSIONS		
	INDUSTRIAL	RESIDENTIAL
A	60.00'	50.00'
B	30.00' MIN.	40.00' MIN.
C	65.00'	35.00'



TYPICAL SECTION OF PAVEMENT



PRESSURE RELIEF JOINT

GENERAL NOTES:

All material and workmanship shall conform to the latest local & Ohio Department of Transportation Construction and Material Specifications.

Opening of pavement to traffic to be determined by a 600 P.S.I. beam test (job site curing) or 4000 P.S.I. cylinder test (28 days).

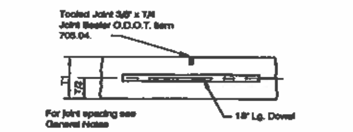
One core or cylinder to be taken for each 500 S.Y. of pavement.

All work to be performed under full time inspection by local representative.

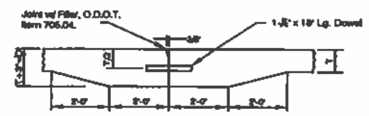
All dowels, hook bolts or rebar are to be epoxy coated.

Transverse Joint Spacing
7" Item 452 Concrete Pavement - 14 Lin. Ft. (Maximum)
9" Item 452 Concrete Pavement - 18 Lin. Ft. (Maximum)

Pressure Relief Joint
Pressure relief joints are to be placed at the location directed by the City Engineer. The pressure relief joint shall have an underdrain installed according to applicable ODOT stand Drawings.

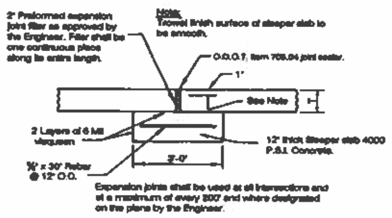


CONTROL JOINT



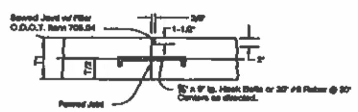
TK - THICKENED EDGE JOINT

To be used at all intersections and at all points where new pavement abuts existing pavement. Dowel bar not required when abutting full depth asphalt roadways.



Expansion joints shall be used at all intersections and at a maximum of every 200' and where designated on the plans by the Engineer.

EXPANSION JOINT
(SLEEPER SLAB)



LONGITUDINAL KEY JOINT

Note:

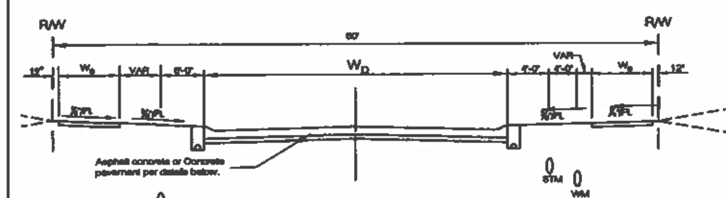
RESIDENTIAL PAVEMENT T = 8" (1" Dia. Dowel)
INDUSTRIAL PAVEMENT T = 9" (1¼" Dia. Dowel)

2	7-13-16	CB	EXPANSION JOINT SPACING
REV No.	DATE	BY	DESCRIPTION

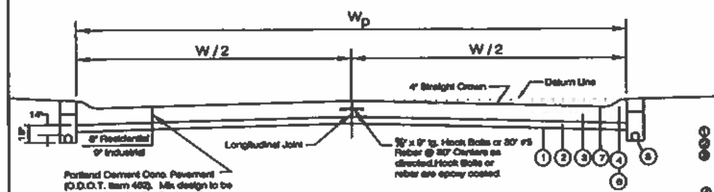
CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CONCRETE PAVEMENT STANDARDS

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB | PAV-4

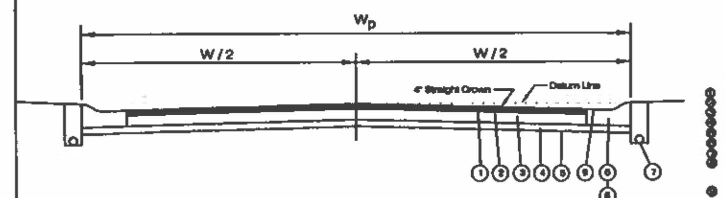


TYPICAL SECTION OF R/W



TYPICAL SECTION OF CONCRETE PAVEMENT

USE FOR MEADOW LAKES PHASE 15 PAVEMENT CONSTRUCTION



TYPICAL SECTION OF ASPHALT CONCRETE PAVEMENT

MINIMUM PAVEMENT WIDTHS (W_p)

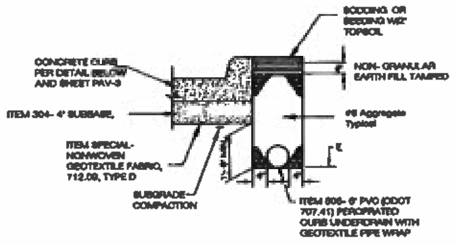
- 24' PRIVATE RESIDENTIAL
- 24' PUBLIC, LIGHT TRAFFIC (UP TO 25 SUBLOTS)
- 26' PUBLIC, MEDIUM TRAFFIC (> 25 SUBLOTS)
- 28' PRIVATE, COMMERCIAL AND INDUSTRIAL
- 28' PUBLIC, COLLECTORS AND ARTERIALS
- 30' PUBLIC, COMMERCIAL AND INDUSTRIAL

LEGEND

1. ODOT ITEM 204 - SUBGRADE COMPACTION
2. ODOT ITEM 304 - AGGREGATE BASE, 4" TH MIN.
3. ODOT ITEM 452 - NON-REINFORCED CONCRETE PAVEMENT THICKNESS 8" MIN. RESIDENTIAL THICKNESS 9" MIN COMMERCIAL INDUSTRIAL
4. ODOT ITEM 609 - TYPE 6 CONCRETE CURB
5. ODOT ITEM 605 - 6" UNDERDRAIN
6. ODOT ITEM 609 - TYPE 2 CONCRETE CURB FOR ARTERIALS, COLLECTORS, COMMERCIAL AND INDUSTRIAL
7. SPECIAL - "SILENCURE" CURING AND SEALING COMPOUND PRODUCED BY CHEMMASTERS 300 EDWARDS STREET, MADISON, OHIO WWW.CHEMMASTERS.NET APPLICATION RATE OF 150 SQ. FT. PER GALLON.

LEGEND

1. ODOT ITEM 448 - ASPHALT SURFACE COURSE, 1.5" TH MIN.
2. ODOT ITEM 448 - ASPHALT INTERMEDIATE COURSE, 2" TH MIN.
3. ODOT ITEM 301 - BITUMINOUS AGGREGATE BASE, 6" TH MIN.
4. ODOT ITEM 304 - AGGREGATE BASE, 4" TH MIN.
5. ODOT ITEM 204 - SUBGRADE COMPACTION
6. ODOT ITEM 609 - TYPE 6 CONCRETE CURB AND GUTTER
7. ODOT ITEM 605 - 6" UNDERDRAIN
8. ODOT ITEM 609 - TYPE 2 CONCRETE CURB FOR ARTERIALS, COLLECTORS, COMMERCIAL AND INDUSTRIAL
9. SPECIAL - "SILENCURE A" CURING AND SEALING COMPOUND PRODUCED BY CHEMMASTERS 300 EDWARDS STREET, MADISON, OHIO WWW.CHEMMASTERS.NET



SHALLOW PIPE UNDERDRAIN WITH FABRIC WRAP

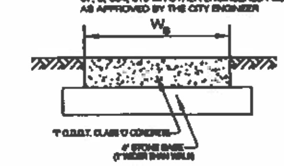
SIDEWALK MINIMUM THICKNESS (T)

- 4" NORMAL SIDEWALK
- 6" RESIDENTIAL DRIVES
- 8" COMMERCIAL AND INDUSTRIAL DRIVES

SIDEWALK MINIMUM WIDTHS (W_s)

- 3.0' R/W LESS THAN 50' WIDE
- 4.0' R/W WIDTH 50' TO 60' WIDE
- 5.0' R/W EXCEEDS 60'

STONE BASE SHALL CONSIST OF ODOT #57, 67, 8, 304, 310 OR OTHER ENGINEERED FILL AS APPROVED BY THE CITY ENGINEER



SIDEWALK DETAIL

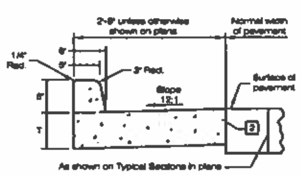
No Scale

3		CB	UNDERDRAIN SIZE
1		CB	CURING COMPOUND
REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

PAVEMENT & RIGHT-OF-WAY STANDARDS

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB | PAV-1



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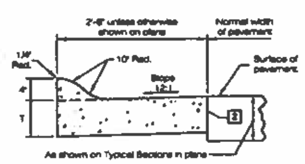

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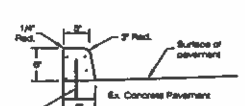
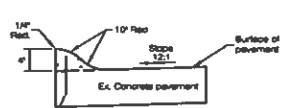


TYPE 2-A



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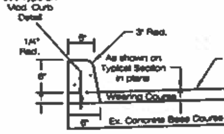

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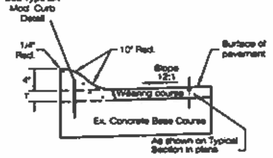
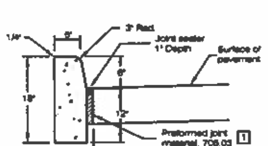


TYPE 3-B



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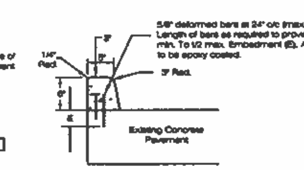
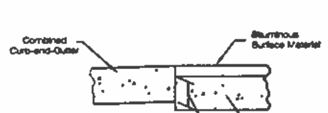


TYPE 2-A MODIFIED



NOTES

GENERAL: This drawing shows alternate types of curb that may be used on various types of pavement. Typical section of project shows the type to be used, also the thickness of the edge of the pavement or the edge of the curb and gutter section.

JOINTS: One inch expansion joint shall extend up to the top of the curb and shall be constructed in the curb and gutter section in such a manner that the joint seal will extend the full width of the gutter and into the curb face a sufficient distance to seal the joint to an elevation of at least 2" above the flow line of the gutter. Dowel bars shall be used in the curb and gutter section at expansion joints which are identical with the joints in the pavement. All joints shall be constructed perpendicular to the edge of the curb and to the surface of the pavement.
Transverse expansion joint material shall meet the requirements of Item 705.03

GUTTER PLATE THICKNESS: Thickness of the gutter plate "T" shall be 8" unless otherwise shown on the plans.

TOLERANCES in the dimensions are as follows:
Curbs: -1/32" to +1/4", Gutters 0 to +1/2".

LEGEND

[1] Expansion joint material and joint sealer is not required for that portion of the curb which is adjacent to a flexible type pavement. Both materials are required as detailed for the full height of rigid pavement and concrete bases.

[2] Butt joints shall be provided between combined curb-and-gutter and new or existing rigid pavements, with tie bars or hook bolts provided at intervals of 3 feet. See PAV-7 for details of tie bars and hook bolts.

[3] Curbs monolithic with pavement for proposed concrete pavement.

If the combined curb-and-gutter adjoins a new rigid base or an existing rigid base or pavement that is to be surfaced with bituminous material, a butt joint shall also be provided. However, tie bars or hook bolts shall be omitted when the vertical overlap ("V" in detail below) between the curb-and-gutter and rigid pavement is less than 7 inches.

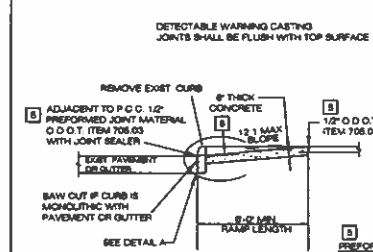
For Types 2-A, 2-B, 3-A and 3-B, the existing concrete shall receive an application of epoxy adhesive conforming to AASHTO designation of M235-73 Class I.

REV No.	DATE	BY	DESCRIPTION

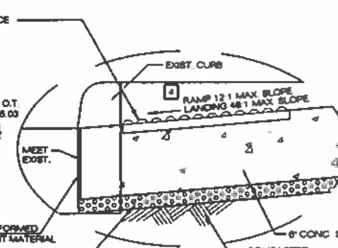
CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CONCRETE CURBS & CURB & GUTTER

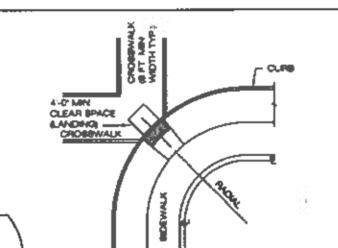
CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB | PAV-3



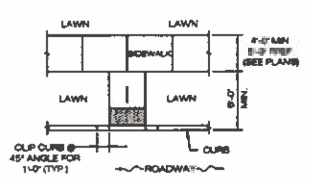
SECTION A-A
EXISTING WALK DETAIL



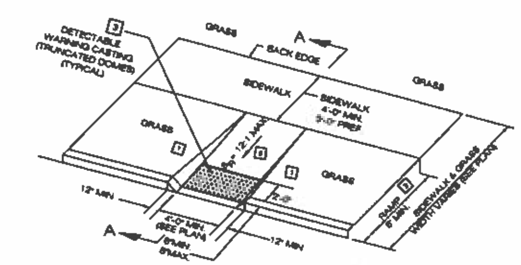
DETAIL A



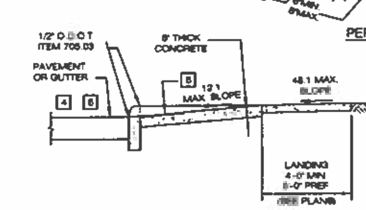
DESIGN "A" PERPENDICULAR RAMP
(SEE CURB RAMP DETAILS THIS SHEET FOR ADDITIONAL REQUIREMENTS)



PERPENDICULAR RAMP W/O FLARES
(SEE CURB RAMP DETAILS THIS SHEET FOR ADDITIONAL REQUIREMENTS)



PERPENDICULAR CURB RAMP DETAIL



SECTION A-A NORMAL DETAIL

DETAIL NOTES

[1] FLARED SIDES ARE NOT REQUIRED WHERE THE EDGES OF A CURB RAMP ARE PROTECTED BY LANDSCAPING OR OTHER BARRIERS AND WHEELCHAIR OR PEDESTRIAN TRAVEL DOES NOT OCCUR ACROSS THE EDGE OF THE CURB RAMP HOWEVER, IF FLARED SIDES ARE USED IN AREAS OF CROSS TRAVEL, THE MINIMUM SLOPE SHALL BE 10:1 WITH A LANDING AND 12:1 WITHOUT A DEFINED LANDING.

[2] THE SLOPE OF THE RAMP TOWARD THE CURB IS REQUIRED TO BE 12:1 (0.0833) OR LESS, RELATIVE TO THE HORIZONTAL, UNLESS APPROVED IN WRITING BY THE ENGINEER.

[3] THE MINIMUM LENGTH OF A PERPENDICULAR RAMP IS 6' FROM THE BACK OF A 6" CURB AND MAY BE INCREASED WHERE FEASIBLE TO OBTAIN A FLATTER RAMP SLOPE OR TO BETTER BLEND WITH THE WALK CONFIGURATION.

[4] DETECTABLE WARNING CASTINGS SHALL CONSIST OF A SURFACE OF TRUNCATED DOMES ALIGNED ON A SQUARE GRID, IN THE PREDOMINANT DIRECTION OF TRAVEL, EXTENDING A DISTANCE OF 24" FROM THE BACK OF CURB AND SPANNING THE ENTIRE WIDTH OF THE RAMP OPENING.

[5] DETECTABLE WARNING CASTING SHALL BE 48" WIDE AND 24" DEEP (2 EA. 2 X 2 CASTINGS)

[6] DETECTABLE WARNING CASTING SHALL BE EAST JORDON IRON WORKS, PRODUCT NO. 00700641, CATALOG NO. 7005PL6, HEAVY DUTY

[7] TEXTURE SHALL BE OBTAINED BY COURSE BROOMING TRANSVERSE TO THE RAMP SLOPES AND SHALL BE ROUGHER THAN THE ADJACENT WALK. (DOES NOT APPLY TO TRUNCATED DOMES)

[8] JOINTS SHALL BE PROVIDED IN THE CURB RAMP AS EXTENSIONS OF THE WALK JOINTS. A 0.5" ODOT ITEM 705.03 PREFORMED JOINT MATERIAL SHALL BE PROVIDED AROUND THE EDGE OF RAMPS BUILT IN EXISTING CONCRETE WALK. LINES SHOWN IN THIS DRAWING INDICATE THE RAMP EDGE AND SLOPE CHANGES AND ARE NOT NECESSARILY JOINT LINES.

REV No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

CURB RAMP

CITY OF NORTH RIDGEVILLE, ENGINEER
SCALE: NOT TO SCALE
DATE: 10/01/08 | DRWN BY: JAB/TEB | PAV-9

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

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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.

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SECTION | TOWN | NORTH, RANGE | EAST
CITY OF NORTH RIDGEVILLE
LORAIN COUNTY, OHIO

CLIENT
K. HOVNANIAN HOMES LLC

MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS

TYPICAL PAVEMENT DETAILS

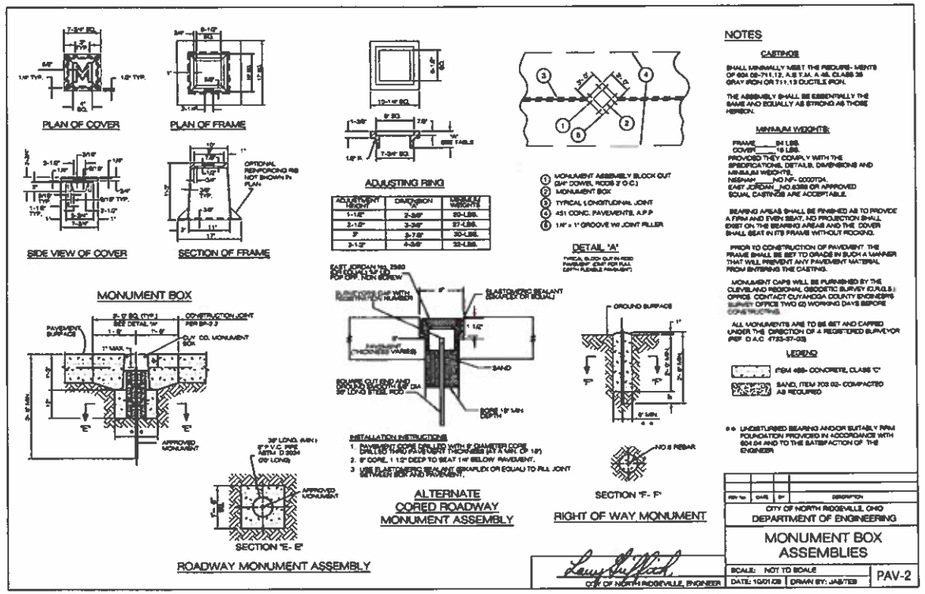
DATE
JANUARY 11, 2019

APRIL 13, 2020
OEPA SUBMITTAL NO. 2

REVISIONS

DR. TDR | CH. DH
P.M. DH
BOOK N/A
JOB 18002341
SHEET NO. 11.5

CAD FILE: 18002341-11.0 - DT - PH 18.DWG



NOTES

CASTINGS

SHALL MINIMALLY MEET THE REQUIREMENTS OF ODOT 735-711.12, A.S.T.M. A-48, CLASS 35 GRAY IRON OR 711.13 DUCTILE IRON.

THE ASSEMBLY SHALL BE ESSENTIALLY THE SAME AND EQUALLY AS STRONG AS THOSE HEREON.

MINIMUM WEIGHTS:

FRAME ____ 84 LBS.
COVER ____ 19 LBS.

PROVIDED THEY COMPLY WITH THE SPECIFICATIONS, DETAILS, DIMENSIONS AND MINIMUM WEIGHTS.
NEENAH ____ NO NF- 0200724.
EAST JORDAN ____ NO.8299 OR APPROVED EQUAL CASTINGS ARE ACCEPTABLE.

BEARING AREAS SHALL BE FINISHED AS TO PROVIDE A FIRM AND EVEN SEAT. NO PROJECTION SHALL EXIST ON THE BEARING AREAS AND THE COVER SHALL SEAT IN IT'S FRAME WITHOUT ROCKING.

PRIOR TO CONSTRUCTION OF PAVEMENT, THE FRAME SHALL BE SET TO GRADE IN SUCH A MANNER THAT WILL PREVENT ANY PAVEMENT MATERIAL FROM ENTERING THE CASTING.

MONUMENT CAPS WILL BE FURNISHED BY THE CUYAHOGA REGIONAL GEODETIC SURVEY (CUYAGS) OFFICE. CONTACT CUYAHOGA COUNTY ENGINEER'S SURVEY OFFICE TWO (2) WORKING DAYS BEFORE CONSTRUCTING.

ALL MONUMENTS ARE TO BE SET AND CAPPED UNDER THE DIRECTION OF A REGISTERED SURVEYOR (REF O.A.C. 4733-37-03)

LEGEND

ITEM 499- CONCRETE, CLASS 'C'

SAND, ITEM 703.02- COMPACTED AS REQUIRED

** UNDISTURBED BEARING AND/OR SUITABLY RAM FOUNDATION PROVIDED IN ACCORDANCE WITH 604.04 AND TO THE SATISFACTION OF THE ENGINEER

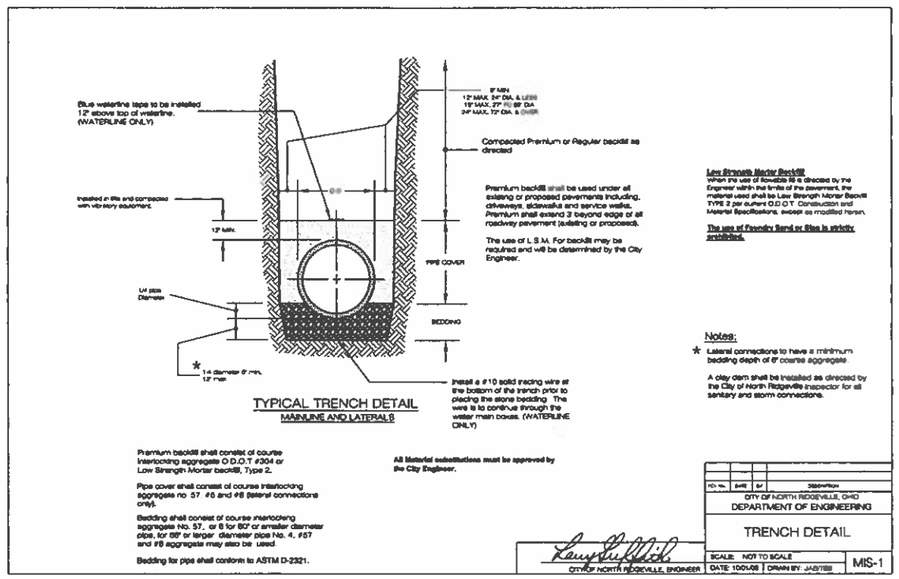
REV. No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

MONUMENT BOX ASSEMBLIES

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | PAV-2

CITY OF NORTH RIDGEVILLE, ENGINEER



TYPICAL TRENCH DETAIL
MAINLINE AND LATERALS

Low Strength Mortar Backfill
When the use of flowable fill is directed by the Engineer within the limits of the pavement, the material used shall be Low Strength Mortar Backfill TYPE 2 per current O.D.O.T. Construction and Material Specifications, except as modified herein.

The use of Foundry Sand or Silica is strictly prohibited.

Notes:
★ Lateral connections to have a minimum bedding depth of 6" coarse aggregate.

A clay dam shall be installed as directed by the City of North Ridgeville inspector for all sanitary and storm connections.

Premium backfill shall consist of course interlocking aggregate O.D.O.T #304 or Low Strength Mortar backfill, Type 2.

Pipe cover shall consist of course interlocking aggregate no. 57, #8 and #8 (lateral connections only).

Bedding shall consist of course interlocking aggregate No. 57, or 8 for 80" or smaller diameter pipe, for 88" or larger diameter pipe No. 4, #57 and #8 aggregate may also be used.

Bedding for pipe shall conform to ASTM D-2321.

All Material substitutions must be approved by the City Engineer.

REV. No.	DATE	BY	DESCRIPTION

CITY OF NORTH RIDGEVILLE, OHIO
DEPARTMENT OF ENGINEERING

TRENCH DETAIL

SCALE: NOT TO SCALE | DATE: 10/01/08 | DRAWN BY: JAB/TEB | MIS-1

CITY OF NORTH RIDGEVILLE, ENGINEER

Rev. 8/20/2014

STREET SIGN STANDARDS

STREET NAME SIGN SUPPORTS: SUPPORTS FOR DOUBLE-FACED STREET NAME SIGNS SHALL BE 2-3/8 INCH DIAMETER POSTS MADE OF NEW HOT-DIPPED GALVANIZED STEEL PIPE. ALL SUPPORTS SHALL BE EMBEDDED IN CONCRETE CONFORMING TO ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS ITEM 499 CLASS C. SUPPORTS SHALL BE CONCRETED IN A HOLE WITH A MINIMUM DEPTH OF THREE (3) FEET AND A DIAMETER OF TEN (10) INCHES. THE POST SHALL PROJECT A MINIMUM OF NINE (9) FEET ABOVE GROUND TO THE BOTTOM OF THE SIGN FACE.

STREET NAME SIGN SHEETING: THERE SHALL BE TWO (2) SIGN FACES ON EACH SIGN BLANK-ONE ON EACH SIDE, UNLESS OTHERWISE APPROVED. ALL SHEETING SHALL BE ODOT TYPE H DIAMOND GRADE TO PROVIDE HIGH RETROREFLECTIVITY PER THE 2007 (OR CURRENT) FEDERAL HIGHWAY ADMINISTRATION AND FEDERAL MUTCD REQUIREMENTS.

LETTERING SHALL BE UPPER AND LOWER CASE AND A MINIMUM OF SIX (6) INCHES IN HEIGHT. THE MINIMUM SIGN HEIGHT IS NINE (9) INCHES. LETTERING SHALL BE UPPER AND LOWER CASE AND A MINIMUM OF FOUR (4) INCHES IN HEIGHT ON LOCAL STREETS WITH A MINIMUM SIGN HEIGHT OF SIX (6) INCHES.

LETTERING SHALL BE WHITE ON A GREEN BACKGROUND.

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CLIENT K. HOVNANIAN HOMES LLC
MEADOW LAKES SUBDIVISION #18
SANITARY CONSTRUCTION PLANS
TYPICAL DETAILS

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REVISIONS

DR. TDR | CH. DH
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BOOK N/A
JOB 18002341
SHEET NO. 18

CAD FILE: 18002341-11.0 - DT - PH 18.DWG

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