Land Use Permit Application

X Site Plan Review	____Lot Line Adjustment	_____Partition	_____Subdivision
____Conditional Use	____Variance	_____Map Amendment	_____Text Amendment
____Annexation	____Vacation	_____Other, specify Site Plan Review	

Please complete the following application. If any pertinent required information or material is missing or incomplete, the application will not be considered complete for further processing. If you have any questions about filling out this application, please contact staff at Lowell City Hall, phone (541) 937-2157, 107 East Third, Lowell.

List all Assessor's Map and Tax Lot numbers of the property included in the request.

Map# 19-01-11-33-06502 Lot # 06502

Map# _____ Lot # _____

Map# _____ Lot # _____

Street Address (if applicable): Near address 484/570 N Moss St. Lowell, OR. 97452

Area of Request (square feet/acres): 1.52 AC (Proposed Parcel A Commercial 1.14 AC / R-3 Multifamily Parcel B .38 AC)

Existing Zoning: PL Public Lands

Existing Use of the Property: PL Public Lands

Proposed Use of the Property 1.52 AC (Proposed Parcel A Commercial 1.14 AC / R-3 Multifamily Parcel B .38 AC)

Pre-application Conference Held: No _____ Yes Request If so, Date _____

Submittal Requirements:

X 1. Copy of deed showing ownership or purchase contract with property legal description.

X 2. Site Plan/Tentative Plan with, as a minimum, all required information. Submit one copy of all plans11X17 or smaller; 12 copies of all plans larger than 11x17. (See attached checklist for required information)

X 3. Applicant's Statement: Explain the request in as much detail as possible. Provide all information that will help the decision makers evaluate the application, including addressing each of the decision criteria for the requested land use action.

_____ 4. Other submittals required by the City or provided by the applicant. Please List.

a. _____ b. _____

c. _____ d. _____

e. _____ f. _____

_____ 5. Filing Fee: Amount Due: NO FEE FOR PRE-APP MEETING.

By signing, the undersigned certifies that he/she has read and understood the submittal requirements outlined, and that he/she understands that incomplete applications may cause delay in processing the application. I (We), the undersigned, acknowledge that the information supplied in this application is complete and accurate to the best of my (our) knowledge. I (We) also acknowledge that if the total cost to the City to process this application exceeds 125% of the application fee, we will be required to reimburse the City for those additional costs in accordance with Ordinance 228.

PROPERTY OWNER

Name (print): H &H DIXIE DR. LLC. Phone: _____

Address: 13215 SE MILL PLAIN BLVD STE. C-8 #529

City/State/Zip: Vancouver WA, 98684

Signature: _____

APPLICANT, If Different

Name (print): Oregon Architecture Inc. Mark Mckechnie, AIA Phone: 541-772-4372 CELL 541-778-9989

Company/Organization: Oregon Architecture Inc.

Address: 132 West Main St. SUITE 101

City/State/Zip: Medford OR. 97501

Signature: Mark McKechnie

E-mail (if applicable): Mark@OregonArchitecture.biz

APPLICANTS REPRESENTATIVE, if applicable

Name (print): Raj Mehta Phone: 541-801-7366

Company/Organization: Oregon Architecture Inc.

Address: 132 West Main St. SUITE 101

City/State/Zip: Medford OR. 97501

E-mail (if applicable): Raj@oregonarchitecture.biz

For City Use. Application Number _____

Date Submitted: _____ Received by: _____ Fee Receipt # _____

Date Application Complete: _____ Reviewed by: _____

Date of Hearing: _____ Date of Decision _____ Date of Notice of Decision _____

APPLICATION SITE PLAN REQUIREMENTS CHECKLIST
Lowell Land Development Code, Section 2.140

Applications for land divisions or land use requests that require a site plan shall submit the site plan on 8 1/2 x 11 inch or 11 x 17 inch black/white reproducible sheets for copying and distribution. Larger drawings may be required for presentation and City review. Drawings shall be drawn to scale. The scale to be used shall be in any multiple of 1 inch equals 10 feet (1" = 20', 1" = 30". 1' = 100', etc.) and may be increased or decreased as necessary to fit the sheet size. The Application and site plan shall show clearly and with full dimensioning the following information, as applicable, for all existing and proposed development. It is understood that some of the requested information may not apply to every application.

X The names of the owner(s) and applicant, if different.

X The property address or geographic location and the Assessor Map number and Tax Lot number.

X The date, scale and northpoint.

X A vicinity map showing properties within the notification area and roads. An Assessor Map, with all adjacent properties, is adequate.

X Lot dimensions.

X The location, size, height and uses for all existing and proposed buildings.

X Yards, open space and landscaping.

X Walls and fences: location, height and materials.

X Off-street parking: location, number of spaces, dimensions of parking area and internal circulation patterns.

X Access: pedestrian, vehicular, service, points of ingress and egress.

X Signs: location, size, height and means of illumination.

X Loading: location, dimension, number of spaces, internal circulation.

X Lighting: location and general nature, hooding devices.

_____ Street dedication and improvements.

_____ Special site features including existing and proposed grades and trees, and plantings to be preserved and removed.

_____ Water systems, drainage systems, sewage disposal systems and utilities.

_____ Drainage ways, water courses, flood plain and wetlands.

_____ The number of people that will occupy the site including family members, employees or customers.

_____ The number of generated trips per day from each mode of travel by type: employees, customers, shipping, receiving, etc.

_____ Time of operation, where appropriate. Including hours of operation, days of the week and number of work shifts.

_____ Specifications of the type and extent of emissions, potential hazards or nuisance characteristics generated by the proposed use. The applicant shall accurately specify the extent of emissions and nuisance characteristics relative to the proposed use. Misrepresentation or omission of required data shall be grounds for denial or termination of a Certificate of Occupancy.

Uses which possess nuisance characteristics or those potentially detrimental to the public health, safety and general welfare of the community including, but not limited to; noise, water quality, vibration, smoke, odor, fumes, dust, heat, glare or electromagnetic interference, may require additional safeguards or conditions of use as required by the Planning Commission or City Council.

All uses shall meet all applicable standards and regulations of the Oregon State Board of Health, the Oregon Department of Environmental Quality, and any other public agency having appropriate regulatory jurisdiction. City approval of a land use application shall be conditional upon evidence being submitted to the City indicating that the proposed activity has been approved by all appropriate regulatory agencies.

_____ Such other data as may be necessary to permit the deciding authority to make the required findings.

NOTE: Additional information may be required after further review in order to adequately address the required criteria of approval.

KITTELSON & ASSOCIATES
851 SW 6th Avenue, Suite 600
Portland, OR 97204
P 503.228.5230

Technical Memorandum

June 24, 2022

Project# 27926.0

To: Shashi Bajracharya, Lane County Traffic Engineer
Lane County
3050 N Delta Highway
Eugene, OR 97408

From: Matt Bell, Matt Bell, Wayne Kittelson, P.E.

CC: David Sommer, Oregon Architecture

RE: Lowell Dollar General - Traffic Impact Analysis

INTRODUCTION

H & H Northwest Companies is proposing to develop the 1.53-acre site located on the east side N Moss Street in Lowell, Oregon. Figure 1 illustrates the site vicinity map. The proposed develop plan includes a 12,480 square foot Dollar General and six multi-family residential homes. Access to the Dollar General will be provided by two new driveways on the east side of N Moss Street and access to the multi-family homes will be provided by an existing driveway to the north. Figure 2 illustrates the conceptual site plan. Construction of the proposed development is expected to occur in two phases. The phase 1 Dollar General is expected to begin in 2022 with full build-out and occupancy in 2023. The build-out year for the phase 2 multi-family homes is not known at this time but for the purposes of the study, will be assumed to occur in 2023 as well.

The results of this study indicate that the proposed development can be constructed while maintaining acceptable traffic operations at the site driveways, assuming provision of the recommended mitigation measures. The recommended mitigation measures include:

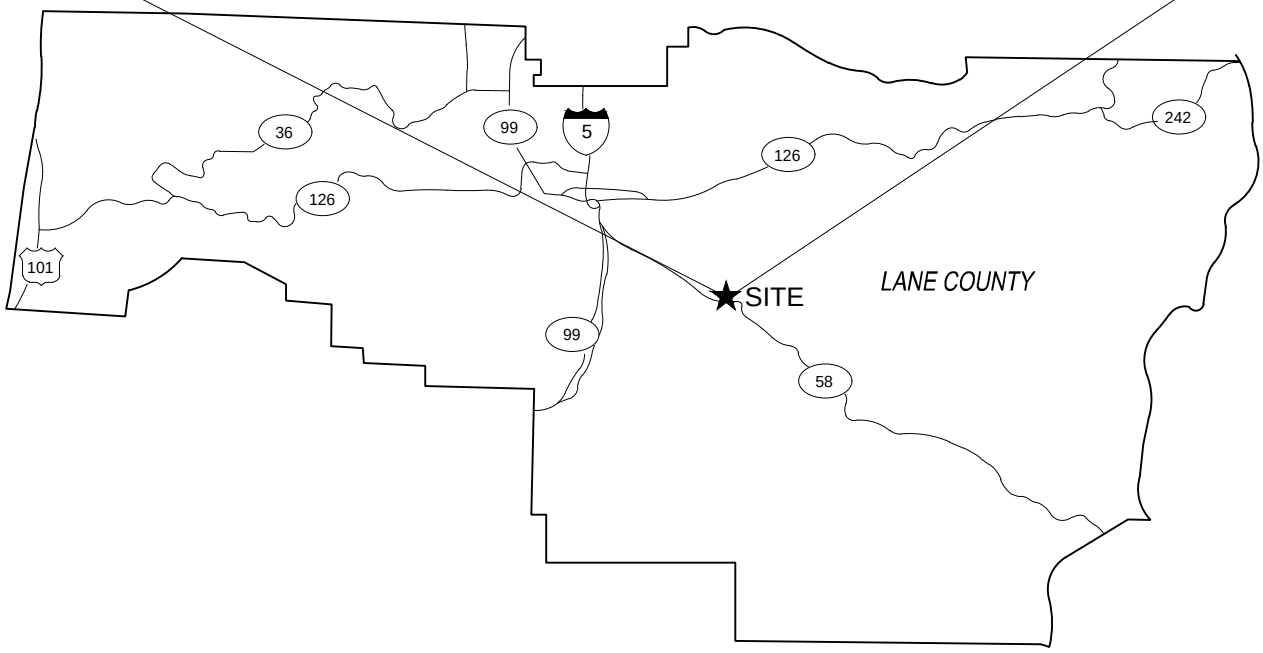
- Landscaping, above ground utilities, and signing should be located and maintained along the site frontage in a manner that preserves adequate intersection sight distance for turning movements onto N Moss Street.
- Provide sufficient right-of-way along the site frontage to accommodate the optimum pavement width per Lane County Road Standards.

Additional details of the study methodology, findings, and recommendations are provided herein.

Scope of the Report

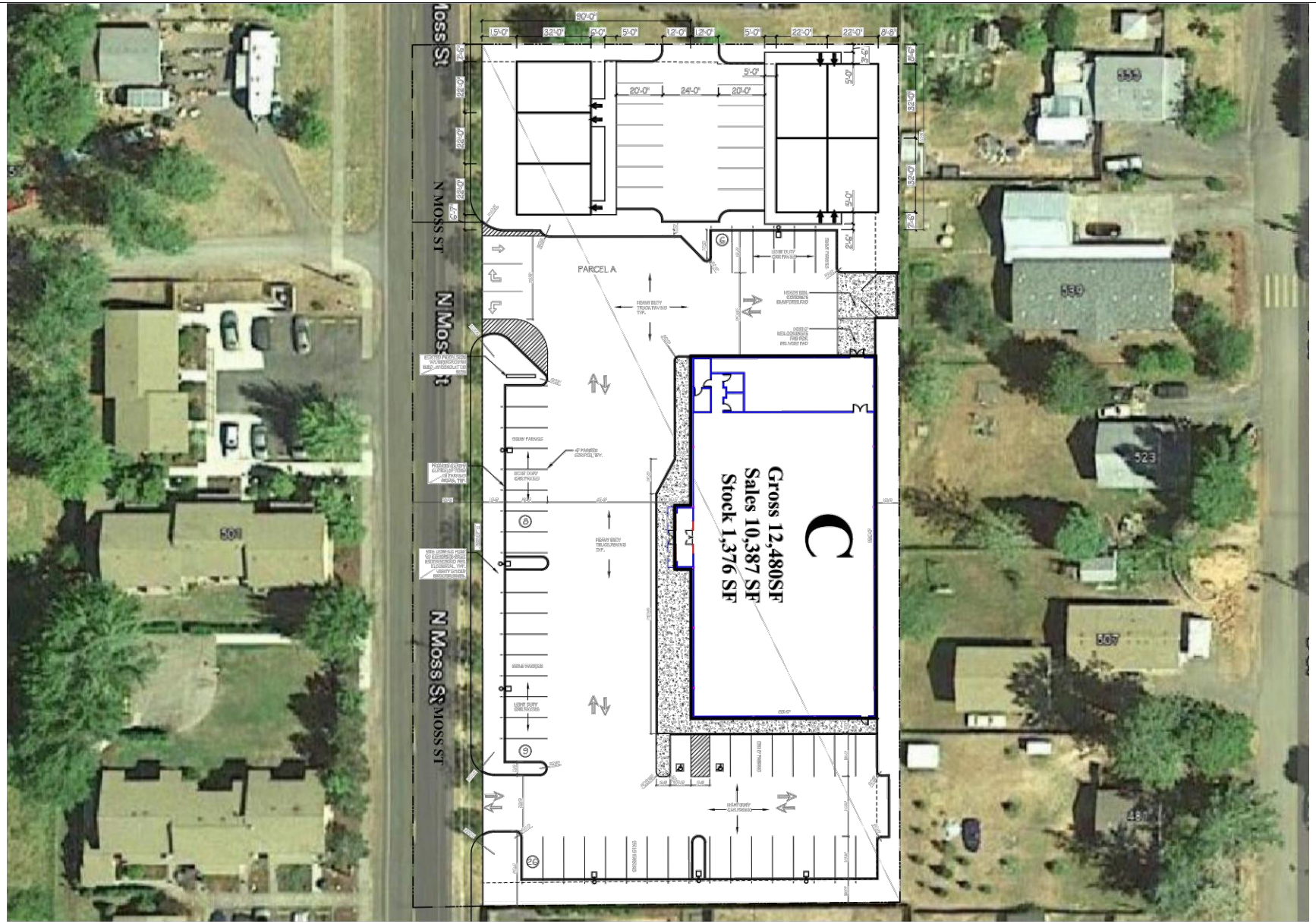
This report documents the transportation-related impacts associated with the proposed development. The scope of this report was developed based on guidance provided by Lane County staff in their letter dated March 29, 2022. Per the letter, operational analyses were performed at the following site driveways:

1. N Moss Street/North Driveway
2. N Moss Street/South Driveway



Site Vicinity Map
Lowell, Oregon

Figure
1



RECEIVED FROM _____ : (05/18/2022)

Preliminary Site Plan
Lowell, Oregon

Figure
2

KITTELSON & ASSOCIATES

This report evaluates these transportation issues:

- Existing land-use and transportation-system conditions within the site vicinity during the weekday AM and PM peak hours;
- Year 2023 background traffic conditions within the site vicinity during the weekday AM and PM peak hours;
- Trip generation and distribution estimates for the proposed development;
- Year 2023 total traffic conditions (with full build-out of the proposed development) at the site driveways during the weekday AM and PM peak hours;
- Horizon year 2028 total traffic conditions (with full build-out of the proposed development) at the site driveways during the weekday AM and PM peak hours, and;
- On-site access and circulation

Operational Standards

Traffic operations at the site driveways were evaluated based on the operational standards identified in the Lane County Transportation System Plan (TSP, Reference 1). Per Table 6-6 of the TSP, two-way stop and yield controlled intersections inside the urban growth boundary (UGB) of an incorporated city must operate at level of service (LOS) E or better with a volume-to-capacity (v/c) ratio of 0.95 or lower during the average weekday peak hour.

Analysis Tools and Methodology

All analyses described in this report were performed in accordance with the procedures stated in the *Highway Capacity Manual, 6th Edition* (HCM, Reference 2). Synchro was used to conduct the analysis. Synchro is a software tool that provides operational analysis in accordance with HCM methodologies.

All analyses used the peak 15-minute flow rates that occurred during the weekday morning and evening peak hours. Using the peak 15-minute flow rates ensures that this analysis is based on a reasonable worst-case scenario.

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current physical and operational characteristics of roadways within the study area. These conditions will be compared with future conditions later in this report.

Site Conditions and Adjacent Land Uses

The proposed development site is located within the Lowell city limits and UGB, it is zoned Public Lands (PL), and it is undeveloped. Adjacent land uses include additional Public Lands (PL) to the north, Single-Family Residential (R1) to the east, and Multi-Family Residential (R3) to the south and west per the *City of Lowell Zoning District Map* (Reference 3).

Development of the proposed Dollar General and multi-family residential homes will require a zone change and comprehensive plan amendment from Public Lands (PL) to Commercial District (C1) and Multi-Family Residential (R-3). Per discussions with County staff, the traffic impact analysis does NOT need to address state or local approval criteria for the zone change or comprehensive plan amendment.

Transportation Facilities

Table 1 summarizes the characteristics of roadways within the site vicinity.

Table 1: Existing Transportation Facilities

Roadway	Functional Classification [1]	Number of Lanes	Posted Speed (mph)	Sidewalks	Bicycle Lanes	On-Street Parking
N Moss Street	Major Collector	2	35	Partial	No	No

[1] Per the Lane County Transportation System Plan (TSP – Reference 1)

Roadway Facilities

N Moss Street is located on the west side of the proposed development site. N Moss Street connects the site to N Shore Drive to the south and Place Road to the north. N Shore Drive connects N Moss Street to Pioneer Street which connects with OR 58 (Willamette Highway) to the south. OR 58 connects the site to several nearby communities including the City of Eugene to the northwest. Figure 3 illustrates the existing lane configurations and traffic control devices at the site driveways.

Pedestrian and Bicycle Facilities

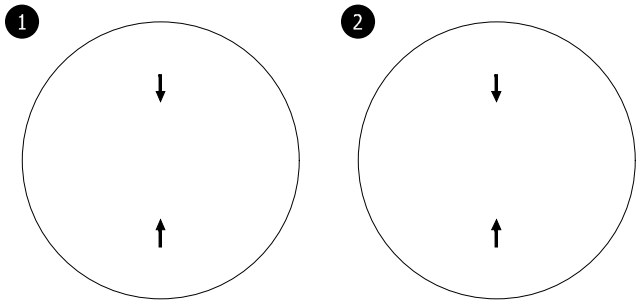
Continuous sidewalks are provided on the west side of N Moss Street and on the north and/or south sides of several side streets. Continuous shoulders are also provided on both sides of N Moss Street.

Transit Facilities

Local transit service is provided in the site vicinity by Lane Transit District (LTD). Route 92 – Lowell/LCC provides service between Eugene Station and Lowell via OR-58. Service is provided Monday through Saturday with one morning and evening trip departing from Eugene Station and two morning and one evening trip departing from Lowell. No service is provided on Sunday. The closest stop is located approximately ½ mile from the site at S Moss Street between Shore Line Drive and Main Street.

Traffic Volumes

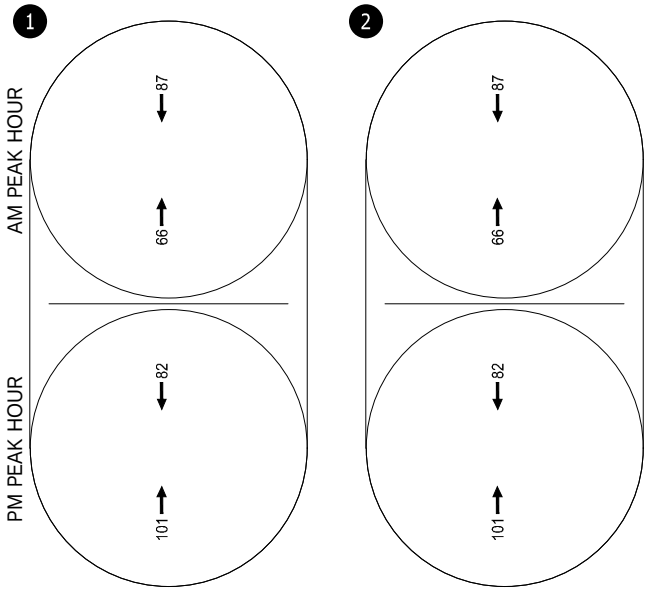
Traffic counts were conducted on N Moss Street over a 24-hour period in June 2022. The counts were conducted on a typical mid-week day while local schools were in session. The morning and evening peak hours were found to occur from 7:15 to 8:15 AM and 3:00 to 4:00 PM, respectively. Figure 4 shows the existing traffic volumes at the site driveways during the weekday AM and PM peak hours. *Appendix "A" contains the traffic count worksheets.*



- STOP SIGN - EXISTING LANE CONFIGURATION

Existing Lane Configurations & Traffic Control Devices
Lowell, Oregon

Figure 3



Existing Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
4

Traffic Safety

The crash history of N Moss Street was reviewed to identify potential safety issues that could impact access to the proposed development. Based on data obtained from the Oregon Department of Transportation (ODOT) for the five-year period from January 1, 2016 through December 31, 2020, no crashes were reported on N Moss Street between 4th Street and 6th Street over the five-year period.

TRAFFIC IMPACT ANALYSIS

The traffic impact analysis identifies how the site driveways will operate in the year the proposed development is expected to be fully built, 2023. The impact of traffic generated by the proposed development was examined as follows:

- Developments and transportation improvements planned in the site vicinity were identified and reviewed in coordination with County staff.
- Year 2023 background traffic conditions were analyzed at the site driveways during weekday AM and PM peak hours.
- Site-generated trips were estimated for the proposed development.
- A trip distribution pattern was developed for the proposed development, and the site-generated trips were distributed to the study area roadways and assigned to the site driveways.
- Year 2023 total traffic conditions were analyzed at the site driveways during the weekday AM and PM peak hours, assuming full build-out and occupancy of the proposed development.
- Horizon year 2028 total traffic conditions were analyzed at the site driveways during the weekday AM and PM peak hours, assuming full build-out and occupancy of the proposed development.
- On-site circulation issues and site-access operations were evaluated.

Year 2023 Background Traffic Conditions

The year 2023 background traffic conditions analysis identifies how the site driveways will operate in the year the proposed development is expected to be complete. This analysis includes traffic attributed to planned developments and general growth in the region but does not include traffic from the proposed development.

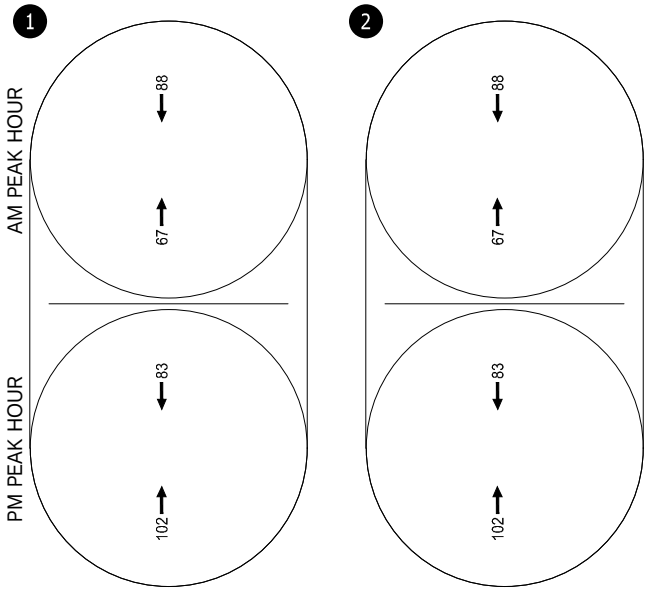
Planned Developments and Transportation Improvements

No planned developments or transportation improvements are expected to be complete within the site vicinity prior to full build-out and occupancy of the proposed development. However, sufficient right-of-way should be provided along the site frontage to accommodate the optimum pavement width per Lane County Road Standards.

Traffic Volumes

The growth rate used in this analysis was determined based on information provide in the Lane County TSP. Per the TSP, traffic volumes in Lowell are expected to increase by less than 1% per year throughout the planning horizon. Therefore, a 1% annual growth rate was used to provide a conservative analysis.

Ultimately, the year 2023 background traffic volumes were developed for N Moss Street by applying a 1% growth rate (1% per year for 1 year) to the existing traffic volumes shown in Figure 4. Figure 5 illustrates the year 2023 background traffic volumes during the weekday AM and PM peak hours.



Year 2023 Background Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
5

Proposed Development Plan

The proposed development plan includes a 12,480 square-foot Dollar General and six multi-family residential homes. Access to the Dollar General will be provided by two new driveways on the east side of N Moss Street and access to the multi-family homes will be provided by an existing driveway to the north. Figure 6 illustrates the proposed lane configurations and traffic control devices at the site driveways. Construction of the proposed development is expected to occur in two phases. The phase 1 Dollar General is expected to begin in 2022 with full build-out and occupancy in 2023. The build-out year for the phase 2 multi-family homes is not known at this time but for the purposes of the study, will be assumed to occur in 2023 as well.

Trip Generation

A trip generation estimate was prepared for the proposed development based on information provided in the standard reference, *Trip General Manual, 11th Edition,* published by the Institute of Transportation Engineers (ITE, Reference 4). ITE land use code 814 (Variety Store) was used to represent the Dollar General and ITE land use code 215 (single-family attached housing) was used to represent the multi-family homes. Table 2 summarizes the estimates for the daily, weekday AM and weekday PM peak hours.

Table 2: Trip Generation Estimate

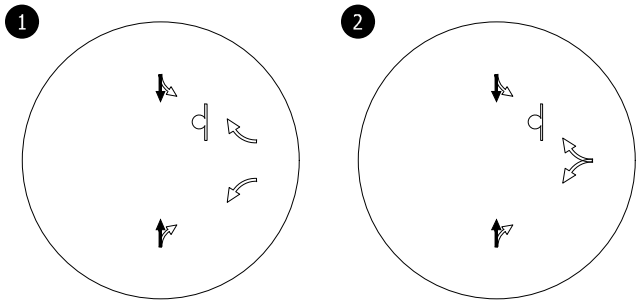
Land Use	ITE Code	Size	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Dollar General	814	12,480 sq ft	794	38	21	17	84	43	41
Multi-Family Homes	215	6 units	43	3	1	2	3	2	1
		Total	**837**	**41**	**22**	**19**	**87**	**45**	**42**

Site Trip Distribution/Trip Assignment

The site-generated trips shown in Table 2 were distributed onto the study area roadways based on a review of existing traffic patterns and the location of major trip origins and destinations in the Lowell area. Figure 7 illustrates the estimated trip distribution pattern within the site vicinity and the assignment of site-generated trips at the site driveways.

Year 2023 Total Traffic Conditions

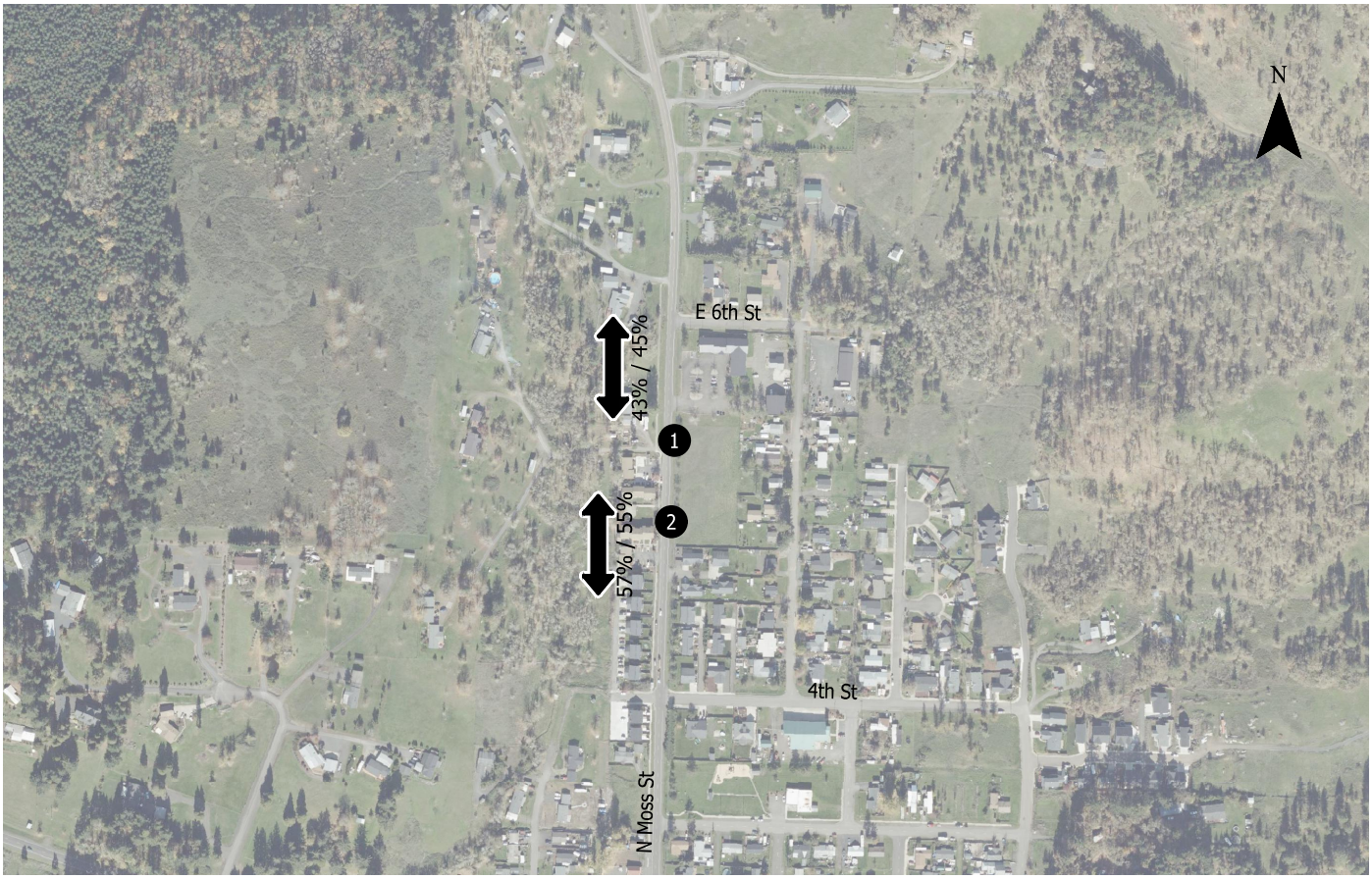
The year 2023 total traffic conditions analysis forecasts how the site driveways will operate with traffic generated by full build-out and occupancy of the proposed development. The year 2023 background traffic volumes shown in Figure 5 were added to the site-generated traffic shown in Figure 7 to arrive at the year 2023 total traffic volumes that are shown in Figure 8.

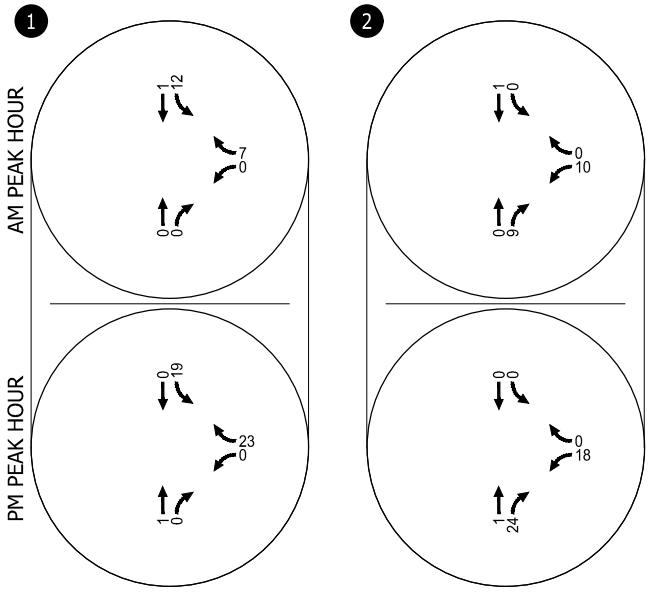


- EXISTING LANE CONFIGURATION
- PROPOSED LANE CONFIGURATION
- PROPOSED STOP SIGN

Proposed Lane Configurations
& Traffic Control Devices
Lowell, Oregon

Figure
6

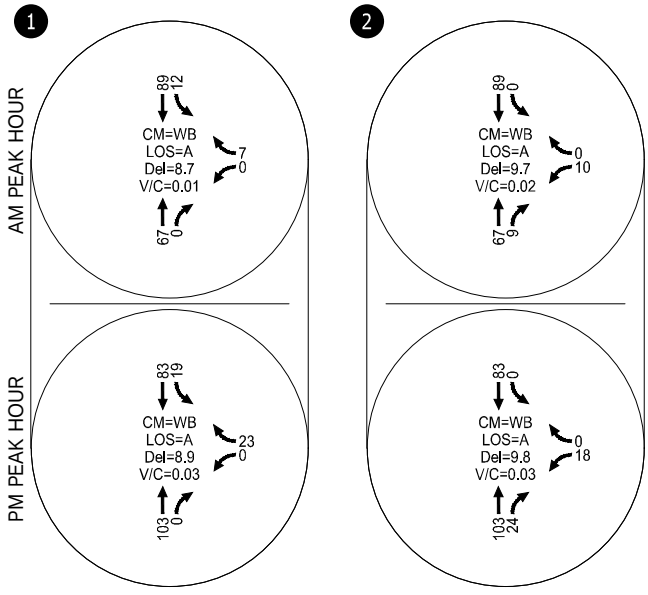




↔ XX% - TRIP DISTRIBUTION (AM/PM)

Estimated Trip Distribution Pattern and Site-Generated Trips
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure 7



CM = CRITICAL MOVEMENT
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE
Del = CRITICAL MOVEMENT CONTROL DELAY
V/C = CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO

Year 2023 Total Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
8

Traffic Operations

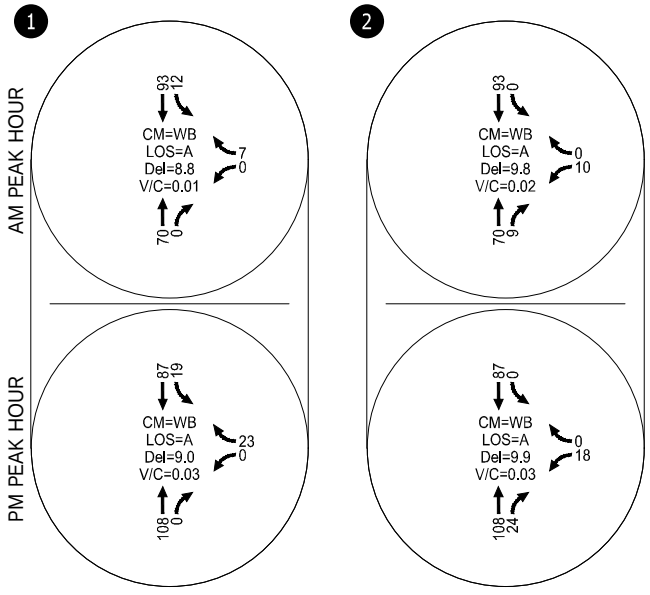
The weekday AM and PM peak hour turning movement volumes shown in Figure 8 were used to conduct an operational analysis at the site driveways. Figure 8 summarizes the results of the year 2023 total traffic conditions analysis for the weekday AM and PM peak hours, respectively. As shown, the site driveways are expected to operate acceptably during the weekday AM and PM peak hours. *Appendix "B" contains the year 2023 total traffic conditions worksheets.*

Horizon Year 2028 Total Traffic Conditions

The horizon year 2028 total traffic conditions analysis forecasts how the study area's transportation system will operation five years beyond full build-out and occupancy of the proposed development. The horizon year 2028 total traffic volumes were developed by applying a 5% growth rate (1% per year for 5 years) to the existing traffic volumes shown in Figure 4 and by adding the site-generated traffic shown in Figure 7 to arrive at the horizon year 2028 total traffic volumes that are shown in Figure 9.

Traffic Operations

The weekday AM and PM peak hour turning movement volumes shown in Figure 9 were used to conduct an operational analysis at the site driveways. Figure 9 summarizes the results of the horizon year 2028 total traffic conditions analysis. As shown, the site driveways are forecast to operate acceptably during the weekday AM and PM peak hours. *Appendix "C" contains the horizon year 2028 total traffic conditions worksheets.*



CM = CRITICAL MOVEMENT
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE
Del = CRITICAL MOVEMENT CONTROL DELAY
V/C = CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO

Horizon Year 2028 Total Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
9

SITE-ACCESS OPERATIONS

As indicated above, access to the proposed Dollar General will be provided by two new driveways on the east side of N Moss Street and access to the multi-family homes will be provided by an existing driveway to the north. Also indicated above, the two new driveways are expected to operate acceptably under year 2023 and horizon year 2028 total traffic conditions. The following summarizes additional operational characteristics of the new site driveways.

Queuing Analysis

A queuing analysis was conducted at the site driveways under year 2023 and horizon year 2028 total traffic conditions. Table 3 summarizes the results of the analysis and identifies 95th percentile queues for each movement. The 95th percentile queues are rounded to the nearest 25-feet, or one vehicle length.

Table 3: Queuing Analysis

Driveway	Approach	Movement	Year 2023 Total Traffic Conditions		Year 2028 Total Traffic Conditions	
			AM	PM	AM	PM
N Moss Street/ North Driveway	Northbound	Thru/Right	0	0	0	0
	Southbound	Thru/Left	0	0	0	0
	Westbound	Right	<25 ft	<25 ft	<25 ft	<25 ft
		Left	<25 ft	<25 ft	<25 ft	<25 ft
N Moss Street/ South Driveway	Northbound	Thru/Right	0	0	0	0
	Southbound	Thru/Left	0	0	0	0
	Westbound	Left/Right	<25 ft	<25 ft	<25 ft	<25 ft

Turn Lane Analysis

The need for southbound left-turn and northbound right-turn lanes was evaluated at the site driveways based on the turn lane criteria provided in the ODOT analysis procedures manual (APM, Reference 5). Based on the criteria, year 2023 and horizon year 2028 total traffic volumes are not expected to meet the minimum thresholds to require separate left- or right-turn lanes at the site driveways. *Appendix "D" contains the left- and right-turn lane warrant worksheets.*

Sight-Distance Evaluation

Sight distance requirements were determined for the site driveways based on 85th percentile speeds along N Moss Street and information in the American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on the Geometric Design of Highways and Streets (a.k.a. "The Greenbook")*. The traffic counts indicate that the 85th percentile speed along N Moss Street is approximately 44 miles per hour (mph). According to AASHTO, the minimum intersection site distance at the site driveways is approximately 485 feet and the minimum stopping site distance along N Moss Street is 347 feet.

N Moss Street is relatively flat and straight with the site vicinity and there are no vertical or horizontal curves, vegetation, or other impediments that limit sight distance. Therefore, sight distance at the proposed driveways is expected to be sufficient. Landscaping, above ground utilities, and signing should be located and maintained along the site frontage in a manner thar preserves adequate sight distance for turning movements onto N Moss Street.

Access Spacing

Per the Lane County TSP, the minimum private access spacing standards on N Moss Street (a major collector with a posted speed limit of 35 mph) is 220 feet. As indicated by the preliminary site plan shown in Figure 2, the proposed site driveways are spaced at approximately 225 feet (measured centerline to centerline). Therefore, the site driveways meet Lane County access spacing standards.

FINDINGS AND RECOMMENDATIONS

The results of this study indicate that the proposed development can be constructed while maintaining acceptable traffic operations at the site driveways. Key findings of this analysis and our recommendations are discussed below.

Findings

- The site driveways are expected to operate acceptably with the proposed development.
- A review of historical crash data did not reveal any trends or patterns that require mitigation associated with the proposed development.
- Vehicle queues are expected to be less than one vehicle entering and exiting the site.
- Separate left and right turn lanes are not warranted at the site driveways.
- Site distance is expected to be sufficient at the site driveways.
- The site driveways meet Lane County's access spacing standards.

Recommendations

- Landscaping, above ground utilities, and signing should be located and maintained along the site frontage in a manner that preserves adequate intersection sight distance for turning movements onto N Moss Street.
- Provide sufficient right-of-way along the site frontage to accommodate the optimum pavement width per Lane County Road Standards.

REFERENCES

1. Lane County. *Lane County Transportation System Plan*.
2. Transportation Research Board. Highway Capacity Manual, 6th Edition. 2016.
3. City of Lowell. *City of Lowell Zoning District Map*. 2012.
4. Institute of Transportation Engineers. *Trip Generation Manual, 11th Edition*. September 2017.
5. Oregon Department of Transportation (ODOT). *Analysis Procedures Manual, Version 2*. June 2022.

APPENDIX

A. Traffic Counts
B. Year 2023 Total Traffic Conditions Worksheets
C. Horizon Year 2028 Total Traffic Conditions Worksheets
D. Turn Lane Warrants

KITTELSON & ASSOCIATES
851 SW 6th Avenue, Suite 600
Portland, OR 97204
P 503.228.5230

Technical Memorandum

September 22, 2022

Project# 27926.0

To: Shashi Bajracharya, Lane County Traffic Engineer
Lane County
3050 N Delta Highway
Eugene, OR 97408

From: Matt Bell, Matt Bell, Wayne Kittelson, P.E.

CC: David Sommer, Oregon Architecture

RE: Lowell Dollar General - Traffic Impact Analysis

INTRODUCTION

H & H Northwest Companies is proposing to develop the 1.53-acre site located on the east side N Moss Street in Lowell, Oregon. Figure 1 illustrates the site vicinity map. The proposed develop plan includes a 12,480 square foot Dollar General and six multi-family residential homes. Access to the Dollar General will be provided by two new driveways on the east side of N Moss Street and access to the multi-family homes will be provided by an existing driveway to the north. Figure 2 illustrates the conceptual site plan. Construction of the proposed development is expected to occur in two phases. The phase 1 Dollar General is expected to begin in 2022 with full build-out and occupancy in 2023. The build-out year for the phase 2 multi-family homes is not known at this time but for the purposes of the study, will be assumed to occur in 2023 as well.

The results of this study indicate that the proposed development can be constructed while maintaining acceptable traffic operations at the site driveways, assuming provision of the recommended mitigation measures. The recommended mitigation measures include:

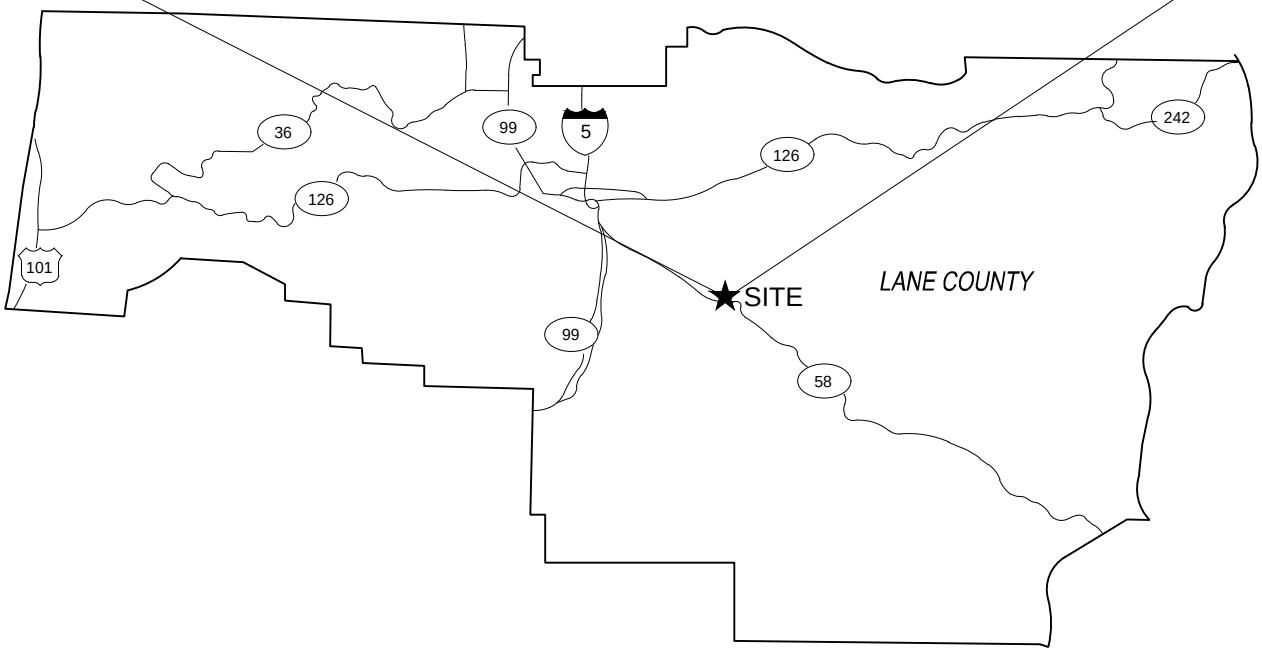
- Landscaping, above ground utilities, and signing should be located and maintained along the site frontage in a manner that preserves adequate intersection sight distance for turning movements onto N Moss Street.
- Provide sufficient right-of-way along the site frontage to accommodate the optimum pavement width per Lane County Road Standards.

Additional details of the study methodology, findings, and recommendations are provided herein.

Scope of the Report

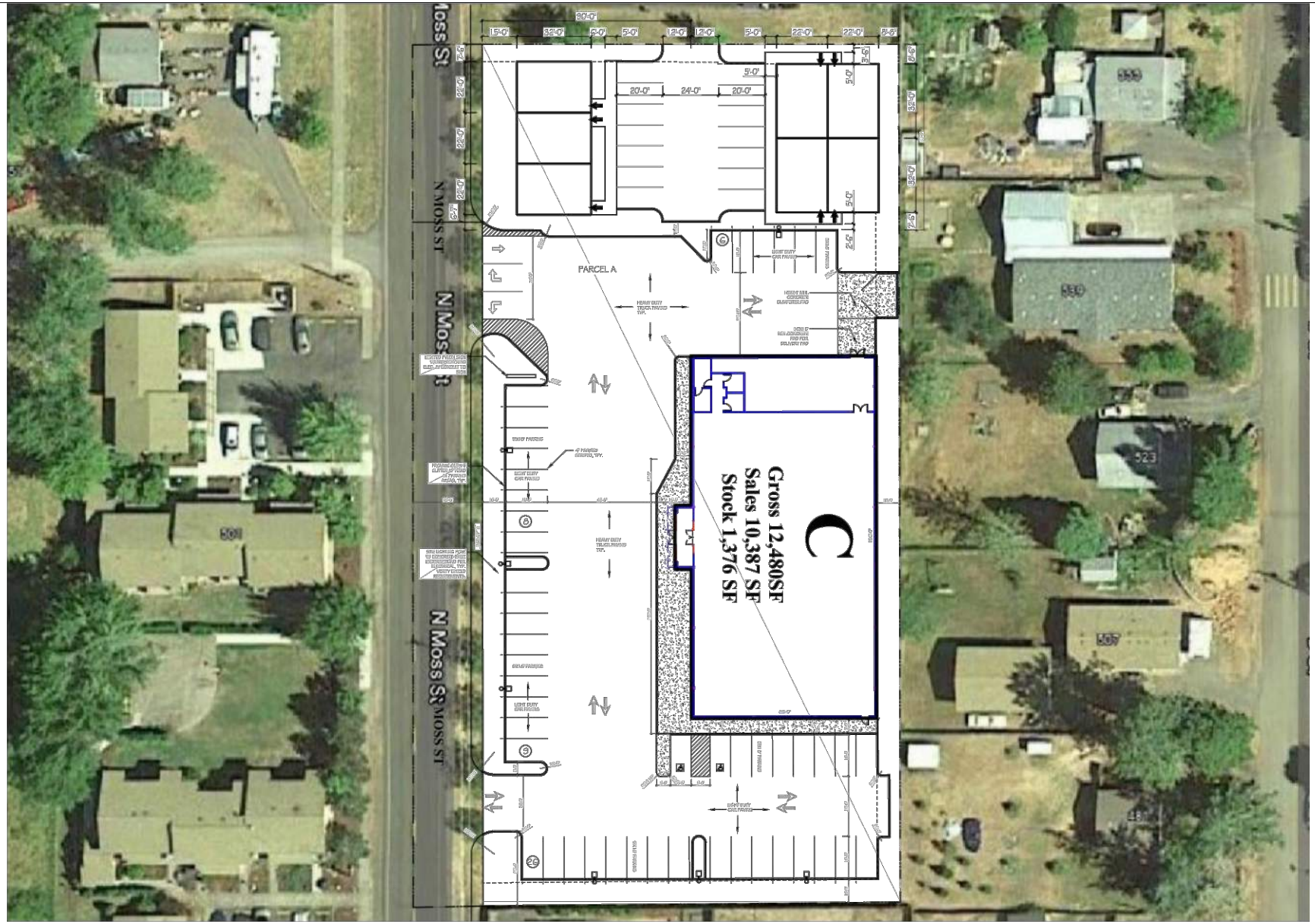
This report documents the transportation-related impacts associated with the proposed development. The scope of this report was developed based on guidance provided by Lane County staff in their letter dated March 29, 2022. Per the letter, operational analyses were performed at the following site driveways:

1. N Moss Street/North Driveway
2. N Moss Street/South Driveway



Site Vicinity Map
Lowell, Oregon

Figure
1



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Preliminary Site Plan
Lowell, Oregon

Figure
2

KITTELSON & ASSOCIATES

This report evaluates these transportation issues:

- Existing land-use and transportation-system conditions within the site vicinity during the weekday AM and PM peak hours;
- Year 2023 background traffic conditions within the site vicinity during the weekday AM and PM peak hours;
- Trip generation and distribution estimates for the proposed development;
- Year 2023 total traffic conditions (with full build-out of the proposed development) at the site driveways during the weekday AM and PM peak hours;
- Horizon year 2028 total traffic conditions (with full build-out of the proposed development) at the site driveways during the weekday AM and PM peak hours, and;
- On-site access and circulation

Operational Standards

Traffic operations at the site driveways were evaluated based on the operational standards identified in the Lane County Transportation System Plan (TSP, Reference 1). Per Table 6-6 of the TSP, two-way stop and yield controlled intersections inside the urban growth boundary (UGB) of an incorporated city must operate at level of service (LOS) E or better with a volume-to-capacity (v/c) ratio of 0.95 or lower during the average weekday peak hour.

Analysis Tools and Methodology

All analyses described in this report were performed in accordance with the procedures stated in the *Highway Capacity Manual, 6th Edition* (HCM, Reference 2). Synchro was used to conduct the analysis. Synchro is a software tool that provides operational analysis in accordance with HCM methodologies.

All analyses used the peak 15-minute flow rates that occurred during the weekday morning and evening peak hours. Using the peak 15-minute flow rates ensures that this analysis is based on a reasonable worst-case scenario.

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current physical and operational characteristics of roadways within the study area. These conditions will be compared with future conditions later in this report.

Site Conditions and Adjacent Land Uses

The proposed development site is located within the Lowell city limits and UGB, it is zoned Public Lands (PL), and it is undeveloped. Adjacent land uses include additional Public Lands (PL) to the north, Single-Family Residential (R1) to the east, and Multi-Family Residential (R3) to the south and west per the *City of Lowell Zoning District Map* (Reference 3).

Development of the proposed Dollar General and multi-family residential homes will require a zone change and comprehensive plan amendment from Public Lands (PL) to Commercial District (C1) and Multi-Family Residential (R-3). Per discussions with County staff, the traffic impact analysis does NOT need to address state or local approval criteria for the zone change or comprehensive plan amendment.

Transportation Facilities

Table 1 summarizes the characteristics of roadways within the site vicinity.

Table 1: Existing Transportation Facilities

Roadway	Functional Classification [1]	Number of Lanes	Posted Speed (mph)	Sidewalks	Bicycle Lanes	On-Street Parking
N Moss Street	Major Collector	2	35	Partial	No	No

[1] Per the Lane County Transportation System Plan (TSP – Reference 1)

Roadway Facilities

N Moss Street is located on the west side of the proposed development site. N Moss Street connects the site to N Shore Drive to the south and Place Road to the north. N Shore Drive connects N Moss Street to Pioneer Street which connects with OR 58 (Willamette Highway) to the south. OR 58 connects the site to several nearby communities including the City of Eugene to the northwest. Figure 3 illustrates the existing lane configurations and traffic control devices at the site driveways.

Pedestrian and Bicycle Facilities

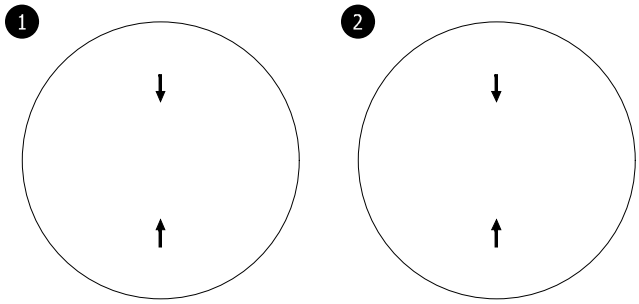
Continuous sidewalks are provided on the west side of N Moss Street and on the north and/or south sides of several side streets. Continuous shoulders are also provided on both sides of N Moss Street.

Transit Facilities

Local transit service is provided in the site vicinity by Lane Transit District (LTD). Route 92 – Lowell/LCC provides service between Eugene Station and Lowell via OR-58. Service is provided Monday through Saturday with one morning and evening trip departing from Eugene Station and two morning and one evening trip departing from Lowell. No service is provided on Sunday. The closest stop is located approximately ½ mile from the site at S Moss Street between Shore Line Drive and Main Street.

Traffic Volumes

Traffic counts were conducted on N Moss Street over a 24-hour period in June 2022. The counts were conducted on a typical mid-week day while local schools were in session. The morning and evening peak hours were found to occur from 7:15 to 8:15 AM and 3:00 to 4:00 PM, respectively. Figure 4 shows the existing traffic volumes at the site driveways during the weekday AM and PM peak hours. *Appendix "A" contains the traffic count worksheets.*



- STOP SIGN - EXISTING LANE CONFIGURATION

Existing Lane Configurations & Traffic Control Devices
Lowell, Oregon

Figure 3

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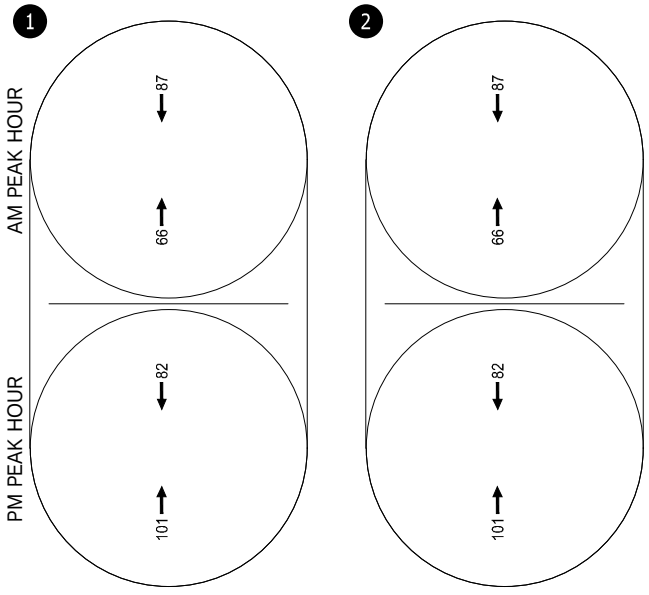


Existing Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
4

Traffic Safety

The crash history of N Moss Street was reviewed to identify potential safety issues that could impact access to the proposed development. Based on data obtained from the Oregon Department of Transportation (ODOT) for the five-year period from January 1, 2016 through December 31, 2020, no crashes were reported on N Moss Street between 4th Street and 6th Street over the five-year period.

TRAFFIC IMPACT ANALYSIS

The traffic impact analysis identifies how the site driveways will operate in the year the proposed development is expected to be fully built, 2023. The impact of traffic generated by the proposed development was examined as follows:

- Developments and transportation improvements planned in the site vicinity were identified and reviewed in coordination with County staff.
- Year 2023 background traffic conditions were analyzed at the site driveways during weekday AM and PM peak hours.
- Site-generated trips were estimated for the proposed development.
- A trip distribution pattern was developed for the proposed development, and the site-generated trips were distributed to the study area roadways and assigned to the site driveways.
- Year 2023 total traffic conditions were analyzed at the site driveways during the weekday AM and PM peak hours, assuming full build-out and occupancy of the proposed development.
- Horizon year 2028 total traffic conditions were analyzed at the site driveways during the weekday AM and PM peak hours, assuming full build-out and occupancy of the proposed development.
- On-site circulation issues and site-access operations were evaluated.

Year 2023 Background Traffic Conditions

The year 2023 background traffic conditions analysis identifies how the site driveways will operate in the year the proposed development is expected to be complete. This analysis includes traffic attributed to planned developments and general growth in the region but does not include traffic from the proposed development.

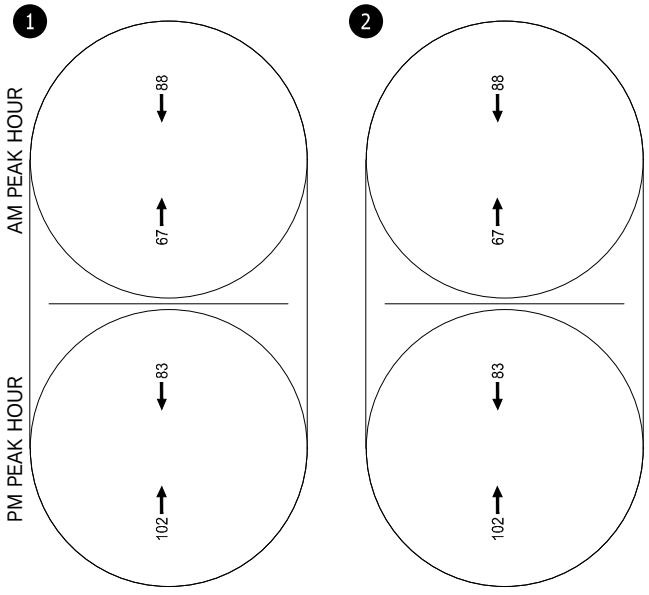
Planned Developments and Transportation Improvements

No planned developments or transportation improvements are expected to be complete within the site vicinity prior to full build-out and occupancy of the proposed development. However, sufficient right-of-way should be provided along the site frontage to accommodate the optimum pavement width per Lane County Road Standards.

Traffic Volumes

The growth rate used in this analysis was determined based on information provide in the Lane County TSP. Per the TSP, traffic volumes in Lowell are expected to increase by less than 1% per year throughout the planning horizon. Therefore, a 1% annual growth rate was used to provide a conservative analysis.

Ultimately, the year 2023 background traffic volumes were developed for N Moss Street by applying a 1% growth rate (1% per year for 1 year) to the existing traffic volumes shown in Figure 4. Figure 5 illustrates the year 2023 background traffic volumes during the weekday AM and PM peak hours.



Year 2023 Background Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
5

Proposed Development Plan

The proposed development plan includes a 12,480 square-foot Dollar General and six multi-family residential homes. Access to the Dollar General will be provided by two new driveways on the east side of N Moss Street and access to the multi-family homes will be provided by an existing driveway to the north. Figure 6 illustrates the proposed lane configurations and traffic control devices at the site driveways. Construction of the proposed development is expected to occur in two phases. The phase 1 Dollar General is expected to begin in 2022 with full build-out and occupancy in 2023. The build-out year for the phase 2 multi-family homes is not known at this time but for the purposes of the study, will be assumed to occur in 2023 as well.

Trip Generation

A trip generation estimate was prepared for the proposed development based on information provided in the standard reference, *Trip General Manual, 11th Edition,* published by the Institute of Transportation Engineers (ITE, Reference 4). ITE land use code 814 (Variety Store) was used to represent the Dollar General and ITE land use code 215 (single-family attached housing) was used to represent the multi-family homes. Table 2 summarizes the estimates for the daily, weekday AM and weekday PM peak hours.

Table 2: Trip Generation Estimate

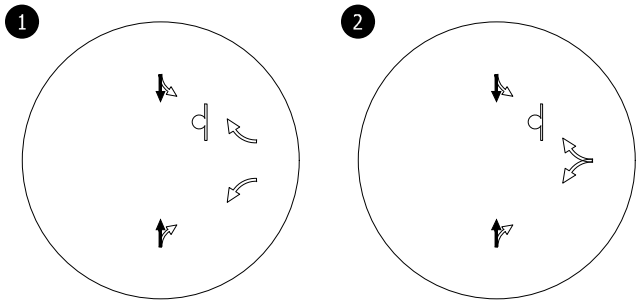
Land Use	ITE Code	Size	Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour		
				Total	In	Out	Total	In	Out
Dollar General	814	12,480 sq ft	794	38	21	17	84	43	41
Multi-Family Homes	215	6 units	43	3	1	2	3	2	1
		Total	**837**	**41**	**22**	**19**	**87**	**45**	**42**

Site Trip Distribution/Trip Assignment

The site-generated trips shown in Table 2 were distributed onto the study area roadways based on a review of existing traffic patterns and the location of major trip origins and destinations in the Lowell area. Figure 7 illustrates the estimated trip distribution pattern within the site vicinity and the assignment of site-generated trips at the site driveways.

Year 2023 Total Traffic Conditions

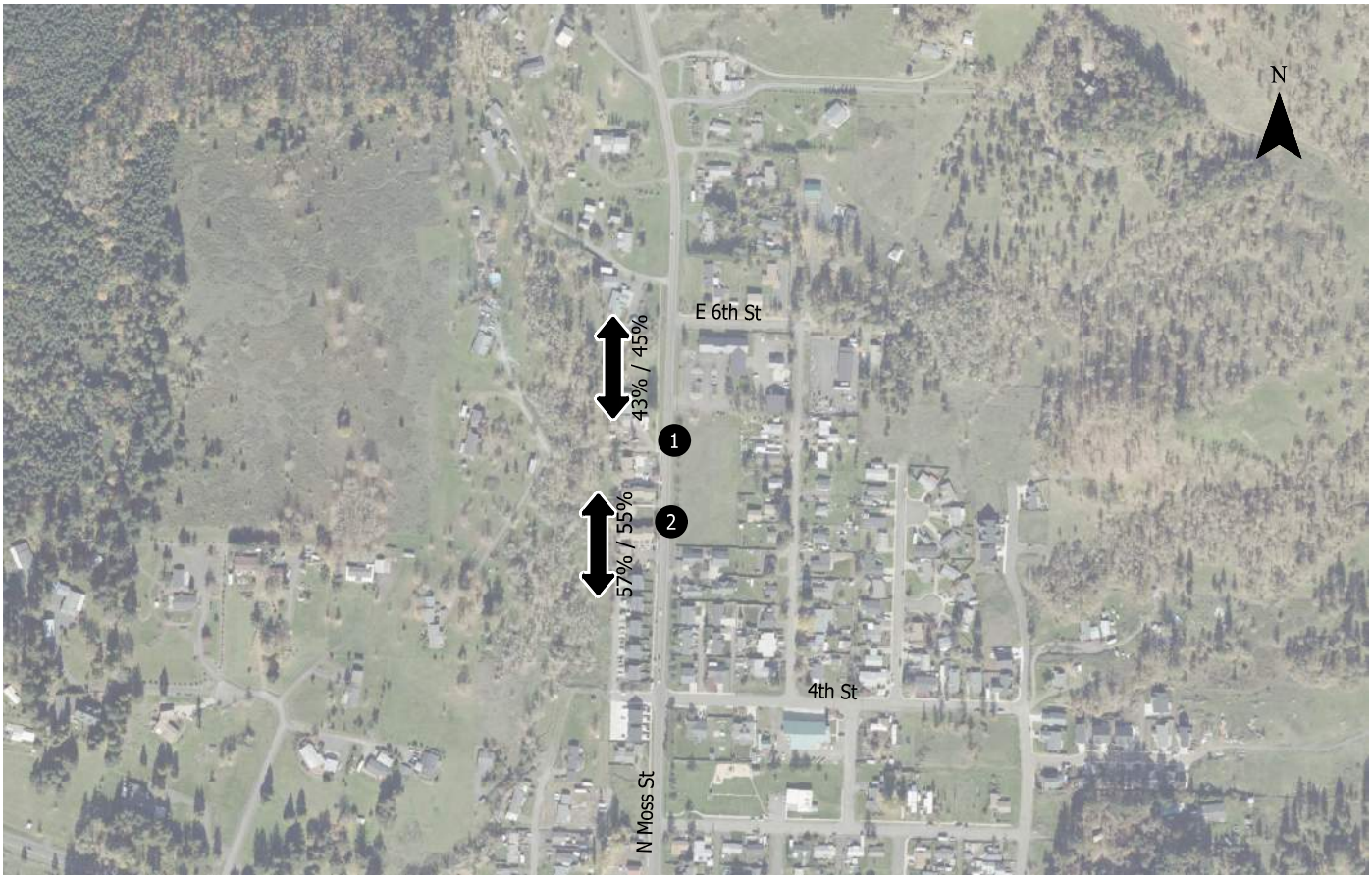
The year 2023 total traffic conditions analysis forecasts how the site driveways will operate with traffic generated by full build-out and occupancy of the proposed development. The year 2023 background traffic volumes shown in Figure 5 were added to the site-generated traffic shown in Figure 7 to arrive at the year 2023 total traffic volumes that are shown in Figure 8.

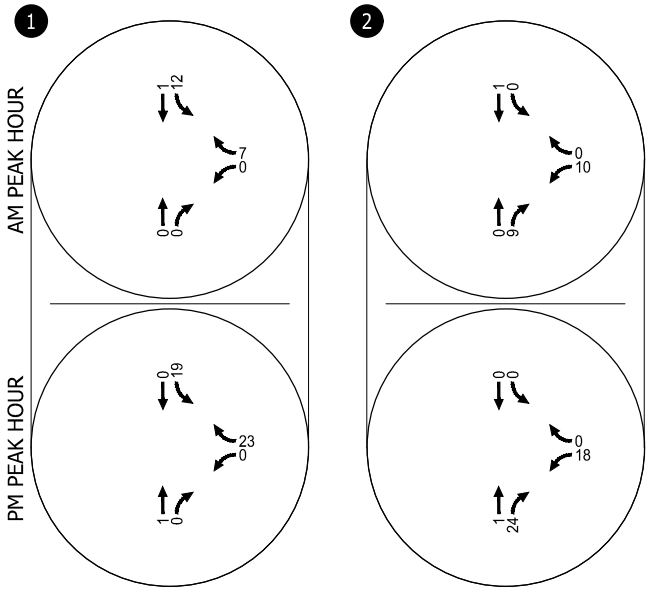


- EXISTING LANE CONFIGURATION
- PROPOSED LANE CONFIGURATION
- PROPOSED STOP SIGN

Proposed Lane Configurations
& Traffic Control Devices
Lowell, Oregon

Figure
6



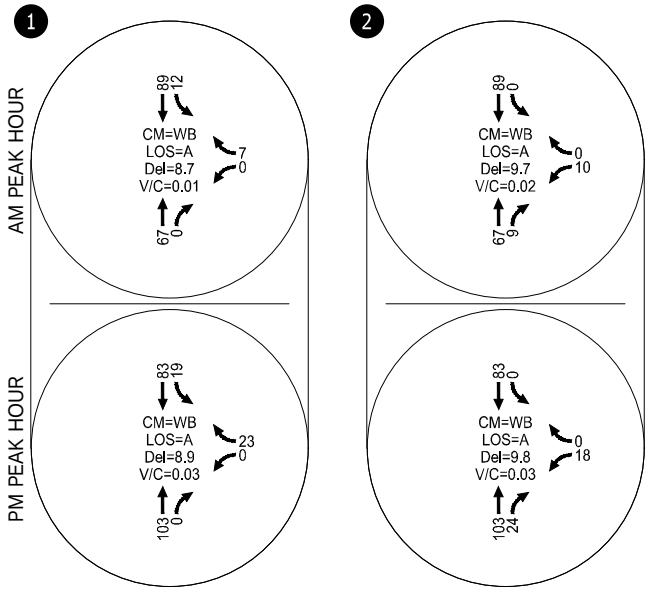


XX% - TRIP DISTRIBUTION (AM/PM)

Estimated Trip Distribution Pattern and Site-Generated Trips
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure 7

KITTELSON & ASSOCIATES



CM = CRITICAL MOVEMENT
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE
Del = CRITICAL MOVEMENT CONTROL DELAY
V/C = CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO

Year 2023 Total Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
8

Traffic Operations

The weekday AM and PM peak hour turning movement volumes shown in Figure 8 were used to conduct an operational analysis at the site driveways. Figure 8 summarizes the results of the year 2023 total traffic conditions analysis for the weekday AM and PM peak hours, respectively. As shown, the site driveways are expected to operate acceptably during the weekday AM and PM peak hours. *Appendix "B" contains the year 2023 total traffic conditions worksheets.*

Horizon Year 2028 Total Traffic Conditions

The horizon year 2028 total traffic conditions analysis forecasts how the study area's transportation system will operation five years beyond full build-out and occupancy of the proposed development. The horizon year 2028 total traffic volumes were developed by applying a 5% growth rate (1% per year for 5 years) to the existing traffic volumes shown in Figure 4 and by adding the site-generated traffic shown in Figure 7 to arrive at the horizon year 2028 total traffic volumes that are shown in Figure 9.

Traffic Operations

The weekday AM and PM peak hour turning movement volumes shown in Figure 9 were used to conduct an operational analysis at the site driveways. Figure 9 summarizes the results of the horizon year 2028 total traffic conditions analysis. As shown, the site driveways are forecast to operate acceptably during the weekday AM and PM peak hours. *Appendix "C" contains the horizon year 2028 total traffic conditions worksheets.*

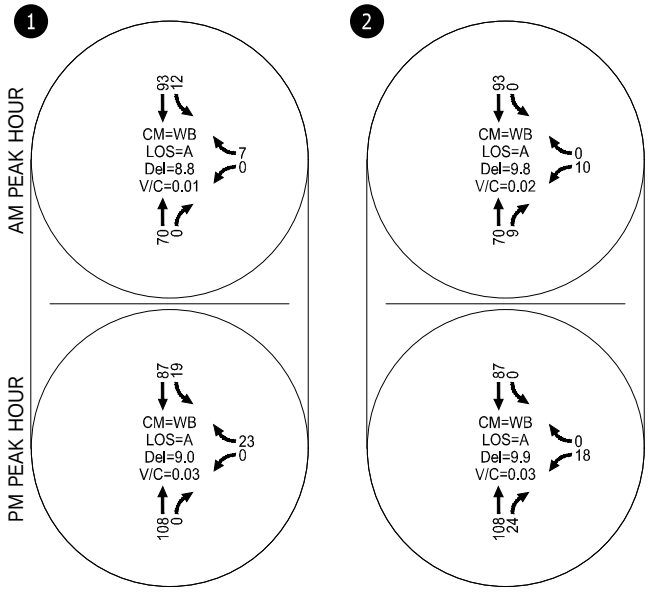
SITE-ACCESS OPERATIONS

As indicated above, access to the proposed Dollar General will be provided by two new driveways on the east side of N Moss Street and access to the proposed multi-family homes will be provided by an existing driveway to the north. Also indicated above, the two new driveways are expected to operate acceptably under year 2023 and horizon year 2028 total traffic conditions. The following summarizes additional information on site-access operations at the two new driveways.

Motor Vehicle Access

Motor vehicles are expected to use the two new driveways to access the site. The northernmost driveway is expected to be the primary point of access for vehicles traveling to/from the north, as well as for heavy vehicles (i.e., delivery trucks)[1]. The southernmost driveway is expected to be the primary point of access for vehicles traveling to/from the south. The southernmost driveway will also serve to separate vehicle traffic from heavy vehicle traffic during deliveries, as well as improve access and circulation throughout the site. Based on the proposed configuration of the two new driveways, turning movement conflicts are expected to be minimal.

[1] Additional information on heavy vehicle traffic (i.e., delivery trucks), including the frequency of deliveries, the types of delivery trucks, truck turning templates at the northernmost driveway, and potential strategies to ensure safe delivery operations is provided under separate cover.



CM = CRITICAL MOVEMENT
LOS = CRITICAL MOVEMENT LEVEL OF SERVICE
Del = CRITICAL MOVEMENT CONTROL DELAY
V/C = CRITICAL MOVEMENT VOLUME-TO-CAPACITY RATIO

Horizon Year 2028 Total Traffic Conditions
Weekday AM & PM Peak Hours
Lowell, Oregon

Figure
9

Queuing Analysis

A queuing analysis was conducted at the site driveways under year 2023 and horizon year 2028 total traffic conditions. Table 3 summarizes the results of the analysis and identifies 95th percentile queues for each movement. The 95th percentile queues are rounded to the nearest 25-feet, or one vehicle length. As shown below, motor vehicle queues are not expected to occur on N Moss Street.

Table 3: Queuing Analysis

Driveway	Approach	Movement	Year 2023 Total Traffic Conditions		Year 2028 Total Traffic Conditions	
			AM	PM	AM	PM
N Moss Street/ North Driveway	Northbound	Thru/Right	0	0	0	0
	Southbound	Thru/Left	0	0	0	0
	Westbound	Right	<25 ft	<25 ft	<25 ft	<25 ft
		Left	<25 ft	<25 ft	<25 ft	<25 ft
N Moss Street/ South Driveway	Northbound	Thru/Right	0	0	0	0
	Southbound	Thru/Left	0	0	0	0
	Westbound	Left/Right	<25 ft	<25 ft	<25 ft	<25 ft

Turn Lane Analysis

The need for southbound left-turn and northbound right-turn lanes was evaluated at the site driveways based on the turn lane criteria provided in the ODOT analysis procedures manual (APM, Reference 5). Based on the criteria, year 2023 and horizon year 2028 total traffic volumes are not expected to meet the minimum thresholds to require separate left- or right-turn lanes at the site driveways. *Appendix "D" contains the left- and right-turn lane warrant worksheets.*

Sight-Distance Evaluation

Sight distance requirements were determined for the site driveways based on 85th percentile speeds along N Moss Street and information in the American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on the Geometric Design of Highways and Streets (a.k.a. "The Greenbook")*. The traffic counts indicate that the 85th percentile speed along N Moss Street is approximately 44 miles per hour (mph). According to AASHTO, the minimum intersection site distance at the site driveways is approximately 485 feet and the minimum stopping site distance along N Moss Street is 347 feet.

N Moss Street is relatively flat and straight with the site vicinity and there are no vertical or horizontal curves, vegetation, or other impediments that limit sight distance. Therefore, sight distance at the proposed driveways is expected to be sufficient. Landscaping, above ground utilities, and signing should be located and maintained along the site frontage in a manner thar preserves adequate sight distance for turning movements onto N Moss Street.

Access Spacing

Per the Lane County TSP, the minimum private access spacing standards on N Moss Street (a major collector with a posted speed limit of 35 mph) is 220 feet. As indicated by the preliminary site plan shown in Figure 2, the proposed site driveways are spaced at approximately 225 feet (measured centerline to centerline). Therefore, the site driveways meet Lane County access spacing standards.

Based on the site-access operations information provided above, the two new driveways are expected to operate safely and efficiently. Therefore, no further mitigation measures are recommended in conjunction with the proposed Dollar general.

PEDESTRIAN ACCESS

National Cooperative Highway Research Program (NCHRP) Report 562 *Improving Pedestrian Safety at Unsignalized Crossings* (Reference 6) provides a methodology for determining the need for enhanced pedestrian crossings[2] based on a variety of factors, including traffic volumes, travel speeds, and pedestrian crossing activity. According to the methodology, a minimum of 14 pedestrian crossings are needed during the peak hour to support an enhanced pedestrian crossing along a facility with either a posted speed or an 85th percentile speed equal to or above 35 mph, such as N Moss Street.

Pedestrian crossing counts were conducted along N Moss Street adjacent to the proposed development site to assess the need for an enhanced pedestrian crossing. The counts were conducted on a typical midweek day in September 2022 during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak time periods. No pedestrians were observed to cross N Moss Street during any of the four hours when data was collected. Therefore, an enhanced pedestrian crossing is not supported by the NCHRP methodology under existing conditions.

Pedestrian crossings may increase within the site vicinity over time as development occurs and as additional pedestrian infrastructure is constructed (for example, sidewalks on the east side of Moss Street, crosswalks at the intersections with 2nd and 4th, etc.). Today, however, there are relatively few existing land uses on the west side of N Moss Street within the site vicinity as compared to the east side, and the few that do exist are not expected to generate enough pedestrian crossings during the peak hour to support an enhanced pedestrian crossing in the immediate vicinity of the proposed Dollar General store; this is because approximately half of the homes on the west side of N Moss Street would need to generate a pedestrian trip during the same peak hour on a day-after-day basis to establish the need for such a crossing).

Based on the pedestrian counts and an assessment of existing land uses within the site vicinity, an enhanced pedestrian crossing is not recommended on conjunction with the proposed Dollar General store. However, the County should continue to monitor pedestrian crossing activity and consider installing an enhanced pedestrian crossing when additional connecting pedestrian infrastructure has been installed nearby and when pedestrian activity in the immediate vicinity increases to a level necessary to support one.

[2] An example of an enhanced pedestrian crossing is a crossing with high visibility crosswalk pavement markings and signs with flashing beacons.

FINDINGS AND RECOMMENDATIONS

The results of this study indicate that the proposed development can be constructed while maintaining acceptable traffic operations at the site driveways. Key findings of this analysis and our recommendations are discussed below.

Findings

- The site driveways are expected to operate acceptably with the proposed development.
- A review of historical crash data did not reveal any trends or patterns in the site vicinity.
- Vehicle queues are expected to be less than one vehicle entering and exiting the site.
- Separate left and right turn lanes are not warranted at the site driveways.
- Site distance is expected to be sufficient at the site driveways.
- The site driveways meet Lane County's access spacing standards.
- The provision of two driveways will separate vehicle traffic from heavy vehicle traffic and improve access and circulation throughout the site.
- Based on the proposed configuration of the two driveways, turning movement conflicts are expected to be minimal.

Recommendations

- Landscaping, above ground utilities, and signing should be located and maintained along the site frontage in a manner that preserves adequate intersection sight distance for turning movements onto N Moss Street.
- Provide sufficient right-of-way along the site frontage to accommodate the optimum pavement width per Lane County Road Standards.

REFERENCES

1. Lane County. *Lane County Transportation System Plan*.
2. Transportation Research Board. Highway Capacity Manual, 6th Edition. 2016.
3. City of Lowell. *City of Lowell Zoning District Map*. 2012.
4. Institute of Transportation Engineers. *Trip Generation Manual, 11th Edition*. September 2017.
5. Oregon Department of Transportation (ODOT). *Analysis Procedures Manual, Version 2*. June 2022.
6. The National Cooperative Highway Research Program (NCHRP). *Report 562 Improving Pedestrian Safety at Unsignalized Crossings*. 2006.

APPENDIX

A. Traffic Counts
B. Year 2023 Total Traffic Conditions Worksheets
C. Horizon Year 2028 Total Traffic Conditions Worksheets
D. Turn Lane Warrants

Appendix A
Traffic Counts

Type of report: Tube Count - Volume Data

LOCATION: N Moss Street south of E 6th St
QC JOB #: 15840001
SPECIFIC LOCATION:
DIRECTION: NB, SB
CITY/STATE: Lowell, OR
DATE: Jun 9 2022 - Jun 9 2022

Start Time	Mon	Tue	Wed	Thu 9 Jun 22	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM				7		7			7	
01:00 AM				2		2			2	
02:00 AM				2		2			2	
03:00 AM				8		8			8	
04:00 AM				13		13			13	
05:00 AM				29		29			29	
06:00 AM				58		58			58	
07:00 AM				**123**		**123**			**123**	
08:00 AM				92		92			92	
09:00 AM				75		75			75	
10:00 AM				71		71			71	
11:00 AM				103		103			103	
12:00 PM				153		153			153	
01:00 PM				98		98			98	
02:00 PM				116		116			116	
03:00 PM				**183**		**183**			**183**	
04:00 PM				148		148			148	
05:00 PM				114		114			114	
06:00 PM				108		108			108	
07:00 PM				65		65			65	
08:00 PM				87		87			87	
09:00 PM				34		34			34	
10:00 PM				15		15			15	
11:00 PM				12		12			12	
Day Total				1716		1716			1716	
% Weekday Average				100%						
% Week Average				100%		100%				
AM Peak Volume				7:00 AM 123		7:00 AM 123			7:00 AM 123	
PM Peak Volume				3:00 PM 183		3:00 PM 183			3:00 PM 183	

Comments:

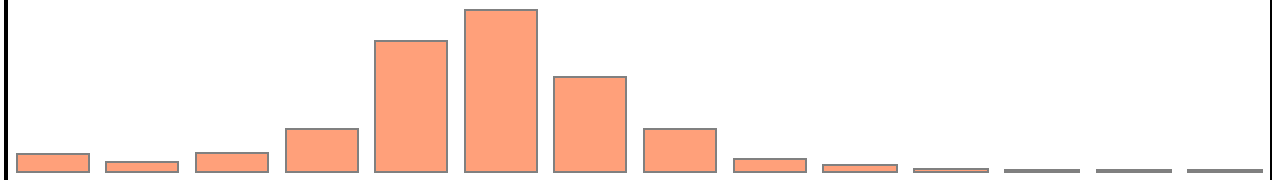
Report generated on 6/13/2022 4:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: N Moss Street south of E 6th St
QC JOB #: 15840001
SPECIFIC LOCATION:
DIRECTION: NB, SB
CITY/STATE: Lowell, OR
DATE: Jun 9 2022

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	0	0	3	3	1	0	0	0	0	0	0	0	7	31-40	6
01:00 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	31-40	2
02:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2	26-35	1
03:00 AM	0	1	2	0	1	1	1	2	0	0	0	0	0	0	8	16-25	3
04:00 AM	0	0	0	1	3	1	0	3	**4**	**1**	0	0	0	0	13	46-55	7
05:00 AM	0	0	1	4	7	8	6	1	2	0	0	0	0	0	29	31-40	15
06:00 AM	2	**2**	4	6	12	14	9	6	3	0	0	0	0	0	58	31-40	26
07:00 AM	1	1	**5**	8	24	**47**	**26**	**7**	4	0	0	0	0	0	**123**	36-45	73
08:00 AM	3	1	1	2	24	33	18	7	2	1	0	0	0	0	92	31-40	57
09:00 AM	2	1	5	8	20	22	12	3	2	0	0	0	0	0	75	31-40	42
10:00 AM	1	2	2	6	24	14	15	6	1	0	0	0	0	0	71	31-40	38
11:00 AM	**5**	1	3	**9**	**25**	34	19	6	1	0	0	0	0	0	103	31-40	59
12:00 PM	4	3	3	12	**46**	42	25	**18**	0	0	0	0	0	0	153	31-40	88
01:00 PM	2	2	3	13	26	34	12	5	0	1	0	0	0	0	98	31-40	60
02:00 PM	4	5	2	6	30	37	22	6	2	1	1	0	0	0	116	31-40	67
03:00 PM	**11**	**7**	**15**	**23**	40	47	31	8	1	0	0	0	0	0	**183**	31-40	87
04:00 PM	5	0	0	5	28	**50**	**34**	18	3	4	1	0	0	0	148	36-45	84
05:00 PM	2	1	3	7	25	38	15	15	**6**	2	0	0	0	0	114	31-40	63
06:00 PM	3	1	3	8	24	33	22	7	2	**5**	0	0	0	0	108	31-40	57
07:00 PM	2	0	1	3	14	25	10	4	1	2	2	0	**1**	0	65	31-40	39
08:00 PM	4	0	6	6	24	25	15	6	0	1	0	0	0	0	87	31-40	49
09:00 PM	1	1	0	5	11	3	2	3	4	0	**3**	0	1	0	34	26-35	16
10:00 PM	0	0	1	1	3	3	3	4	0	0	0	0	0	0	15	41-50	7
11:00 PM	1	0	0	2	2	1	2	0	2	2	0	0	0	0	12	26-35	4
Day Total	53	29	60	135	418	516	301	135	40	20	7	0	2	0	1716	31-40	934
Percent	3.1%	1.7%	3.5%	7.9%	24.4%	30.1%	17.5%	7.9%	2.3%	1.2%	0.4%	0%	0.1%	0%			
AM Peak	11:00 AM	6:00 AM	7:00 AM	11:00 AM	11:00 AM	7:00 AM	7:00 AM	7:00 AM	4:00 AM	4:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	7:00 AM		
Volume	5	2	5	9	25	47	26	7	4	1	0	0	0	0	123		
PM Peak	3:00 PM	3:00 PM	3:00 PM	3:00 PM	12:00 PM	4:00 PM	4:00 PM	12:00 PM	5:00 PM	6:00 PM	9:00 PM	12:00 PM	7:00 PM	12:00 PM	3:00 PM		
Volume	11	7	15	23	46	50	34	18	6	5	3	0	1	0	183		



Comments:

Report generated on 6/13/2022 4:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

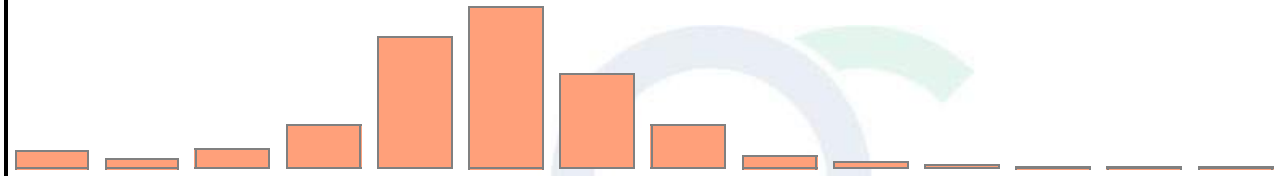
SUMMARY - Tube Count - Speed Data

LOCATION: N Moss Street south of E 6th St
SPECIFIC LOCATION:
CITY/STATE: Lowell, OR

QC JOB #: 15840001
DIRECTION: NB, SB
DATE: Jun 9 2022

Speed Range	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
Grand Total	53	29	60	135	418	516	301	135	40	20	7	0	2	0	1716	31-40	934
Percent	3.1%	1.7%	3.5%	7.9%	24.4%	30.1%	17.5%	7.9%	2.3%	1.2%	0.4%	0%	0.1%	0%			
Cumulative Percent	3.1%	4.8%	8.3%	16.1%	40.5%	70.6%	88.1%	96%	98.3%	99.5%	99.9%	99.9%	100%	100%			

ADT
1716



85th Percentile: 44 MPH
Mean Speed(Average): 36 MPH
Median: 36 MPH
Mode: 38 MPH

Comments:

Report generated on 6/13/2022 4:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Vehicle Classification Data

LOCATION: N Moss Street south of E 6th St
QC JOB #: 15840001
SPECIFIC LOCATION:
DIRECTION: NB, SB
CITY/STATE: Lowell, OR
DATE: Jun 9 2022

Start Time	Motorcycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
12:00 AM	0	4	1	0	2	0	0	0	0	0	0	0	0	0	7
01:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
02:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
03:00 AM	0	3	3	1	1	0	0	0	0	0	0	0	0	0	8
04:00 AM	0	5	2	0	6	0	0	0	0	0	0	0	0	0	13
05:00 AM	0	16	8	0	4	0	0	1	0	0	0	0	0	0	29
06:00 AM	0	23	16	1	12	0	**1**	3	0	0	0	0	0	2	58
07:00 AM	0	**70**	**30**	**3**	13	1	0	5	0	**1**	0	0	0	0	**123**
08:00 AM	0	48	24	0	7	**4**	0	6	0	0	0	0	0	**3**	92
09:00 AM	0	37	24	0	5	0	1	**7**	0	0	0	0	0	1	75
10:00 AM	0	34	20	0	15	0	0	2	0	0	0	0	0	0	71
11:00 AM	0	51	23	0	**19**	2	0	5	0	0	0	0	0	3	103
12:00 PM	**2**	78	41	0	20	1	0	7	**1**	0	0	0	0	3	153
01:00 PM	0	48	31	1	7	2	0	**8**	0	0	0	0	0	1	98
02:00 PM	0	59	33	1	13	0	0	6	0	**1**	0	0	0	3	116
03:00 PM	2	89	**47**	**5**	**22**	**3**	0	6	1	0	0	0	**1**	**7**	**183**
04:00 PM	2	**93**	36	0	8	0	0	4	0	0	0	0	0	5	148
05:00 PM	1	74	26	0	10	0	0	1	0	0	0	0	0	2	114
06:00 PM	2	72	21	0	7	0	0	3	0	0	0	0	0	3	108
07:00 PM	1	40	21	0	1	0	0	0	0	0	0	0	0	2	65
08:00 PM	0	60	16	0	6	0	0	1	0	0	0	0	0	4	87
09:00 PM	0	23	9	0	1	0	0	0	0	0	0	0	0	1	34
10:00 PM	0	11	2	0	2	0	0	0	0	0	0	0	0	0	15
11:00 PM	0	8	2	0	1	0	0	0	0	0	0	0	0	1	12
Day Total	10	948	436	12	184	13	2	65	2	2	0	0	1	41	1716
Percent	0.6%	55.2%	25.4%	0.7%	10.7%	0.8%	0.1%	3.8%	0.1%	0.1%	0%	0%	0.1%	2.4%	
ADT 1716															
AM Peak	12:00 AM	7:00 AM	7:00 AM	7:00 AM	11:00 AM	8:00 AM	6:00 AM	9:00 AM	12:00 AM	7:00 AM	12:00 AM	12:00 AM	12:00 AM	8:00 AM	7:00 AM
Volume	0	70	30	3	19	4	1	7	0	1	0	0	0	3	123
PM Peak	12:00 PM	4:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	12:00 PM	1:00 PM	12:00 PM	2:00 PM	12:00 PM	12:00 PM	3:00 PM	3:00 PM	3:00 PM
Volume	2	93	47	5	22	3	0	8	1	1	0	0	1	7	183

Comments:

Report generated on 6/13/2022 4:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Vehicle Classification Data

SUMMARY - Tube Count - Vehicle Classification Data

LOCATION: N Moss Street south of E 6th St
SPECIFIC LOCATION:
CITY/STATE: Lowell, OR

QC JOB #: 15840001
DIRECTION: NB, SB
DATE: Jun 9 2022

	Motorcycles	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axle Double	5 Axle Double	>6 Axle Double	<6 Axle Multi	6 Axle Multi	>6 Axle Multi	Not Classified	Total
Grand Total	10	948	436	12	184	13	2	65	2	2	0	0	1	41	1716
Percent	0.6%	55.2%	25.4%	0.7%	10.7%	0.8%	0.1%	3.8%	0.1%	0.1%	0%	0%	0.1%	2.4%	

ADT 1716

Comments:

Report generated on 6/13/2022 4:23 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Appendix B
Year 2023 Total Traffic Conditions Worksheets

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	67	0	12	89
Future Vol, veh/h	0	7	67	0	12	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	50	0	0	39
Mvmt Flow	0	9	91	0	16	120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	243	91	0	0	91	0
Stage 1	91	-	-	-	-	-
Stage 2	152	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	750	972	-	-	1517	-
Stage 1	938	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	742	972	-	-	1517	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.7	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	972	1517	-
HCM Lane V/C Ratio	-	-	-	0.01	0.011	-
HCM Control Delay (s)	-	-	0	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	0	67	9	0	89
Future Vol, veh/h	10	0	67	9	0	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	50	0	0	39
Mvmt Flow	14	0	91	12	0	120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	217	97	0	0	103	0
Stage 1	97	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	776	965	-	-	1502	-
Stage 1	932	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	776	965	-	-	1502	-
Mov Cap-2 Maneuver	776	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	910	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	776	1502	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	-	-	9.7	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	23	103	0	19	83
Future Vol, veh/h	0	23	103	0	19	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	36	0	0	60
Mvmt Flow	0	26	117	0	22	94

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	255	117	0	0	117	0
Stage 1	117	-	-	-	-	-
Stage 2	138	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	738	941	-	-	1484	-
Stage 1	913	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	726	941	-	-	1484	-
Mov Cap-2 Maneuver	726	-	-	-	-	-
Stage 1	913	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	1.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	941	1484	-
HCM Lane V/C Ratio	-	-	-	0.028	0.015	-
HCM Control Delay (s)	-	-	0	8.9	7.5	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	0	103	24	0	83
Future Vol, veh/h	18	0	103	24	0	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	36	0	0	60
Mvmt Flow	20	0	117	27	0	94

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	225	131	0	0	144	0
Stage 1	131	-	-	-	-	-
Stage 2	94	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	768	924	-	-	1451	-
Stage 1	900	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	768	924	-	-	1451	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	935	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	768	1451	-
HCM Lane V/C Ratio	-	-	0.027	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Appendix C
Horizon Year 2028 Total Traffic Conditions Worksheets

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	7	70	0	12	93
Future Vol, veh/h	0	7	70	0	12	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	50	0	0	39
Mvmt Flow	0	9	95	0	16	126

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	253	95	0	0	95	0
Stage 1	95	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	740	967	-	-	1512	-
Stage 1	934	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	732	967	-	-	1512	-
Mov Cap-2 Maneuver	732	-	-	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	865	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	967	1512	-
HCM Lane V/C Ratio	-	-	-	0.01	0.011	-
HCM Control Delay (s)	-	-	0	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	0	70	9	0	93
Future Vol, veh/h	10	0	70	9	0	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	0	50	0	0	39
Mvmt Flow	14	0	95	12	0	126

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	227	101	0	0	107	0
Stage 1	101	-	-	-	-	-
Stage 2	126	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	766	960	-	-	1497	-
Stage 1	928	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	766	960	-	-	1497	-
Mov Cap-2 Maneuver	766	-	-	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	905	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	766	1497	-
HCM Lane V/C Ratio	-	-	0.018	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	23	108	0	19	87
Future Vol, veh/h	0	23	108	0	19	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	36	0	0	60
Mvmt Flow	0	26	123	0	22	99

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	266	123	0	0	123	0
Stage 1	123	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	727	933	-	-	1477	-
Stage 1	907	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	715	933	-	-	1477	-
Mov Cap-2 Maneuver	715	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	875	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	933	1477	-
HCM Lane V/C Ratio	-	-	-	0.028	0.015	-
HCM Control Delay (s)	-	-	0	9	7.5	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	0	108	24	0	87
Future Vol, veh/h	18	0	108	24	0	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	36	0	0	60
Mvmt Flow	20	0	123	27	0	99

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	236	137	0	0	150	0
Stage 1	137	-	-	-	-	-
Stage 2	99	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	757	917	-	-	1444	-
Stage 1	895	-	-	-	-	-
Stage 2	930	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	757	917	-	-	1444	-
Mov Cap-2 Maneuver	757	-	-	-	-	-
Stage 1	895	-	-	-	-	-
Stage 2	930	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	757	1444	-
HCM Lane V/C Ratio	-	-	0.027	-	-
HCM Control Delay (s)	-	-	9.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Appendix D
Turn Lane Warrants

Left Turn Lane Evaluation Process

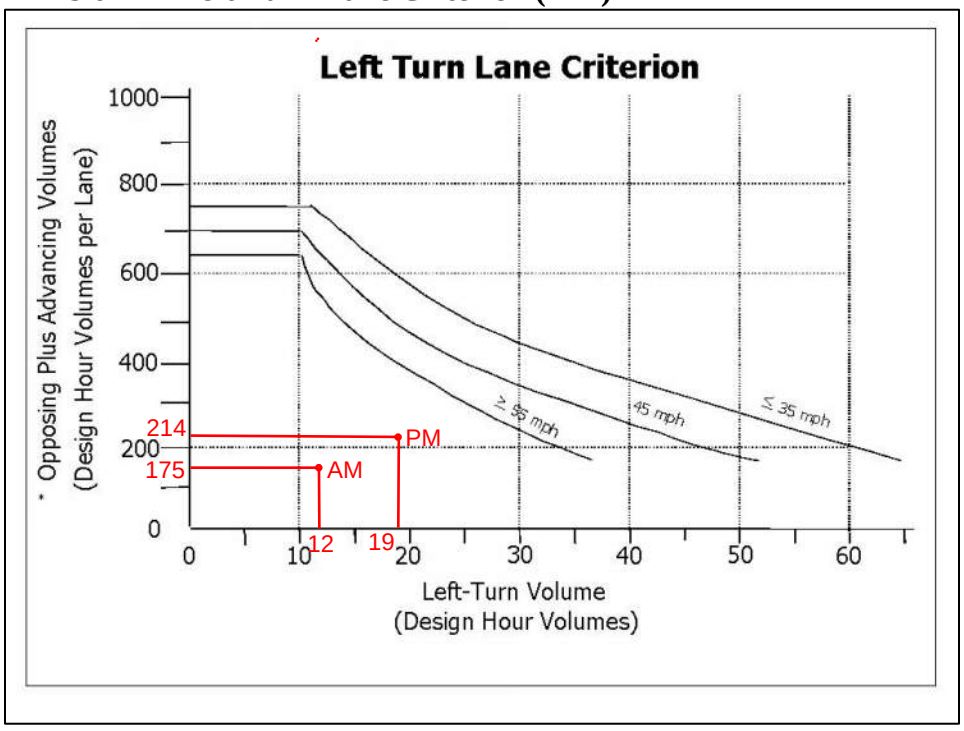
- A left turn lane should be installed, if criterion 1 (Volume) or 2 (Crash) or 3 (Special Cases) are met, unless a subsequent evaluation eliminate it as an option; and
- The Region Traffic Engineer must approve all proposed left turn lanes on state highways, regardless of funding source; and
- Left turn lane complies with Access Management Spacing Standards; and
- Left turn lane conforms to applicable local, regional and state plans.

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a left turn lane. The volume criterion is determined by the Texas Transportation Institute (TTI) curves in Exhibit 12-1.

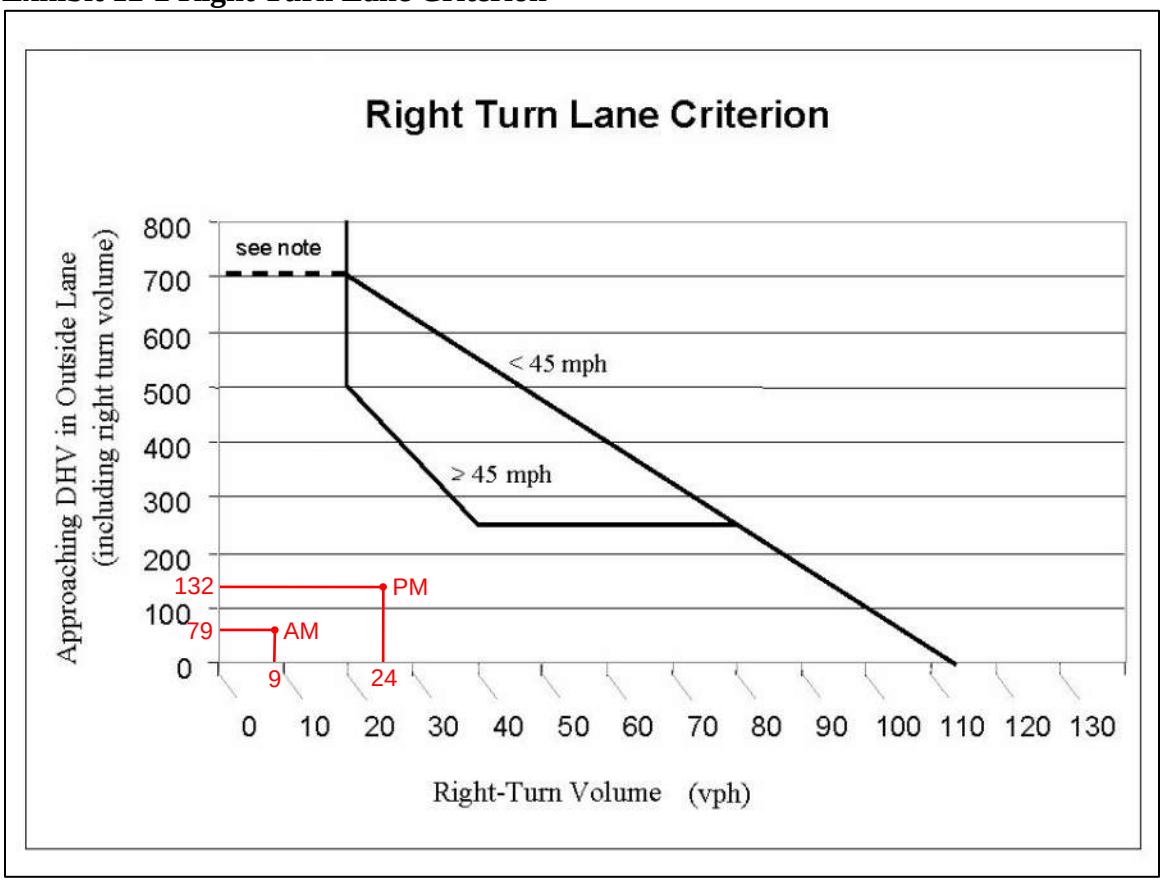
The criterion is not met from zero to ten left turn vehicles per hour, but indicates that careful consideration be given to installing a left turn lane due to the increased potential for rear-end collisions in the through lanes. While the turn volumes are low, the adverse safety and operations impacts may require installation of a left turn. The final determination will be based on a field study.

Exhibit 12-1 Left Turn Lane Criterion (TTI)



*(Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)
Opposing left turns are not counted as opposing volumes

Exhibit 12-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

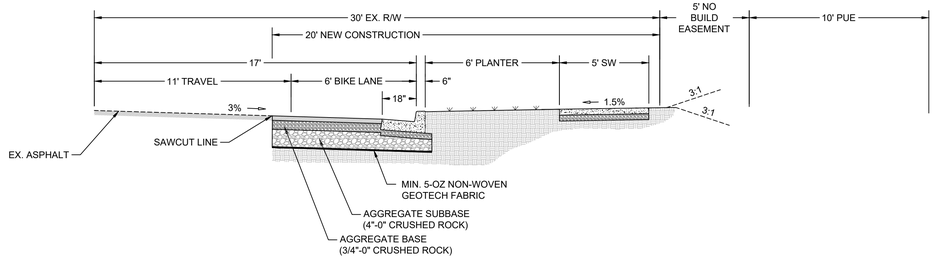
Criterion 2: Crash Experience

The crash experience criterion is satisfied when:

1. Adequate trial of other remedies with satisfactory observance and enforcement has failed to reduce the accident frequency; **and**
2. A history of crashes of the type susceptible to correction by a right turn lane; **and**
3. The safety benefits outweigh the associated improvements costs; **and**
4. The installation of the right turn lane minimizes impacts to the safety of vehicles, bicycles or pedestrians along the roadway.

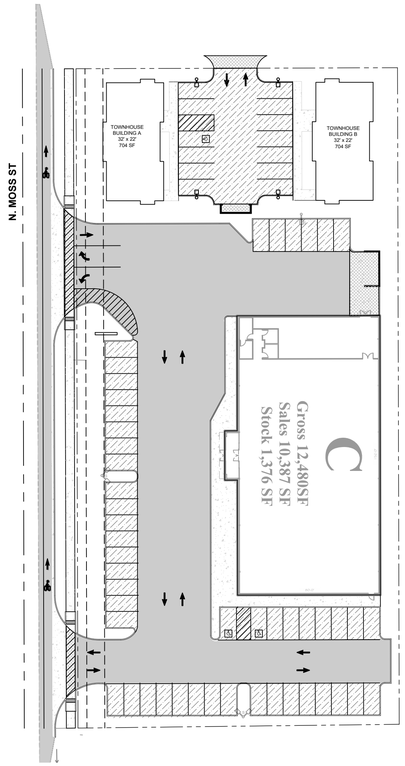
Criterion 3: Special Cases

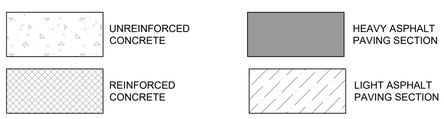
1. **Railroad Crossings**: If a railroad is parallel to the roadway and adversely affects right turns, a worst case scenario should be used in determining the storage requirements for the right turn lane design. The right turn lane storage length depends on the amount of time the roadway is closed, the expected number of vehicle arrivals and the location of the crossing or other obstruction. The analysis should consider all of the variables influencing the design of the right turn lane and may allow a design for conditions other than the worst case storage requirements, providing safety is not

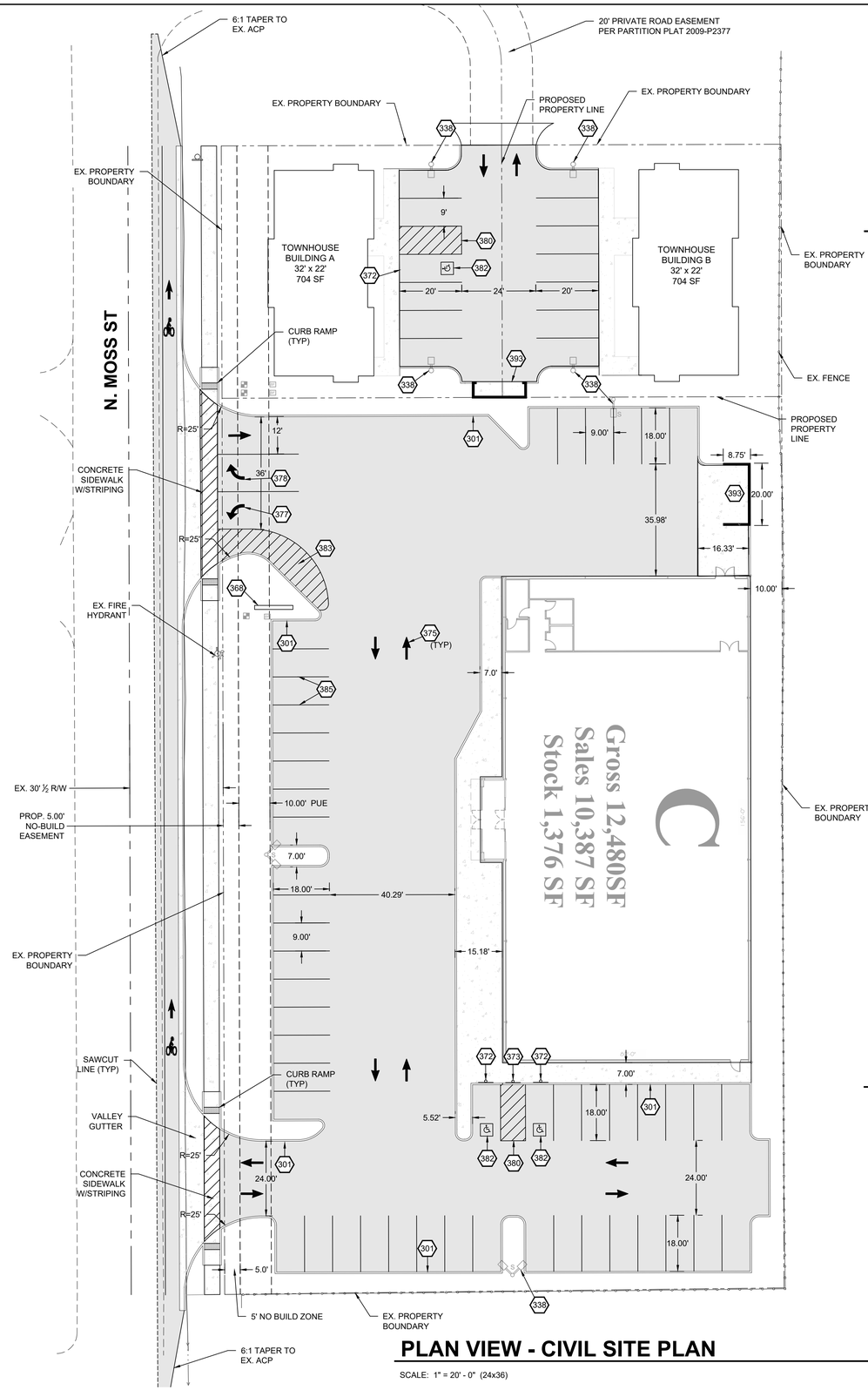


SECTION - N. MOSS STREET

SCALE: NTS — CITY OF LOWELL COMMERCIAL STREET WITH 5' NO BUILD EASEMENT







PLAN VIEW - CIVIL SITE PLAN

SCALE: 1" = 20' - 0" (24x36)

0 20 40
1" = 20'

GENERAL NOTES

1. ALL SIGN POSTS SHALL BE TELESPAR (2", 12 GAUGE).
2. ALL SIGNS WITHIN THE PUBLIC RIGHT OF WAY TO BE INSTALLED BY CITY FORCES. CONTRACTOR TO COORDINATE.
3. CONTRACTOR TO INSTALL ALL SIGNS ON PRIVATE PROPERTY.

KEYNOTES

301	STANDARD VERTICAL CURB.
315	PARALLEL CURB RAMP WITH TRUNCATED DOMES PER RD 920.
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325	FULLY LOWERED COMMERCIAL DRIVEWAY APPROACH
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383	4" WHITE STRIPING PER MUTCD STANDARDS
392	BIKE RACKS (SEE ARCH).
393	TRASH ENCLOSURE (SEE ARCH)

PARKING CALCULATIONS

TOTAL PROPOSED PARKING STALLS = 58 REGULAR STALLS, 3 ADA STALLS (2 VAN)

TOTAL: 61 PARKING STALLS

TO VERIFY SCALES 0" 1" BAR SHOULD MEASURE ONE INCH BY ONE SIXTEENTH INCH

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REGISTERED PROFESSIONAL ENGINEER
54425PE
OREGON
JAN. 13, 2004
TODD D. POWELL
EXPIRES: 12/31/22

H&H NW Companies, LLC.
RETAIL / REAL ESTATE / INVESTMENTS
13219 SE MILL PLAIN BLVD. STE C-8 #529 VANCOUVER WA. 98683
OFFICE: 503-984-1989

POWELL engineering + consulting
STRONG RELATIONSHIPS • INFINITE POSSIBILITIES

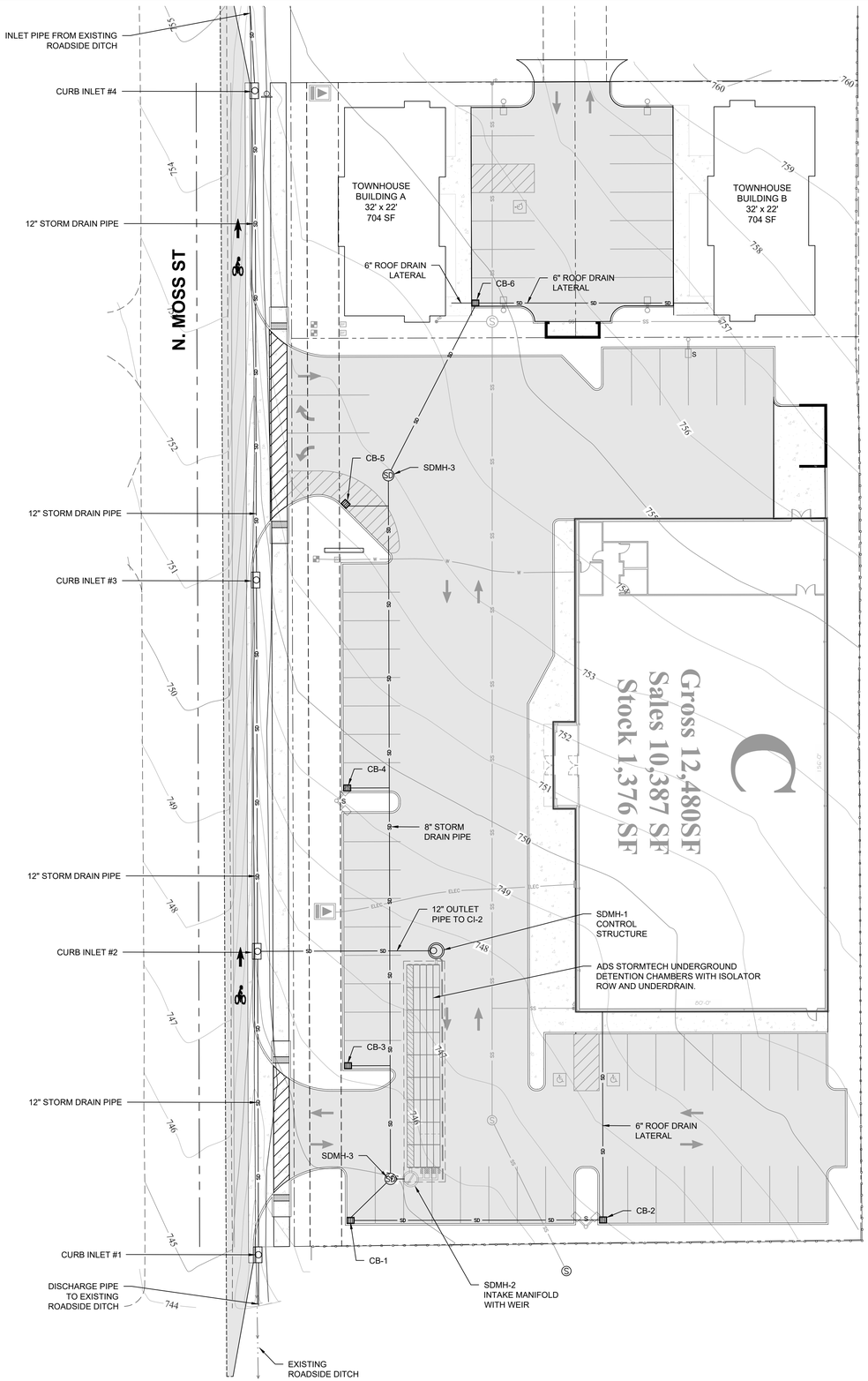
PROJECT DESCRIPTION: DOLLAR GENERAL®
RETAIL STORE
FOR: H & H NORTHWEST
PROJECT LOCATION: 566 N. Moss st. Lowell, Or. 97452
PARCEL: 1119S1W-6502

Approved for the Owner By: Date:

REVISIONS	BY

ISSUE:	LAND USE SET
ISSUE DATE:	08/10/22
DRAWN BY:	TDP
JOB NO.:	22-018

SHEET
C3.0
CIVIL SITE PLAN



PLAN VIEW - DRAINAGE PLAN

SCALE: 1" = 20' - 0" (24x36)

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58935PE
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JULY 13, 2004
TODD D. POWELL
EXPIRES: 12/31/22

H&H NW Companies, LLC.
RETAIL / REAL ESTATE / INVESTMENTS
13215 SE MILL PLAIN BLVD. STE C-8 #529 VANCOUVER WA. 98683
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RETAIL STORE
FOR: H & H NORTHWEST
PROJECT LOCATION:
NE N. Moss st. Lowell, Or 97452
PARCEL: 1119S1W-6502

Approved for the Owner By: Date:

REVISIONS	BY

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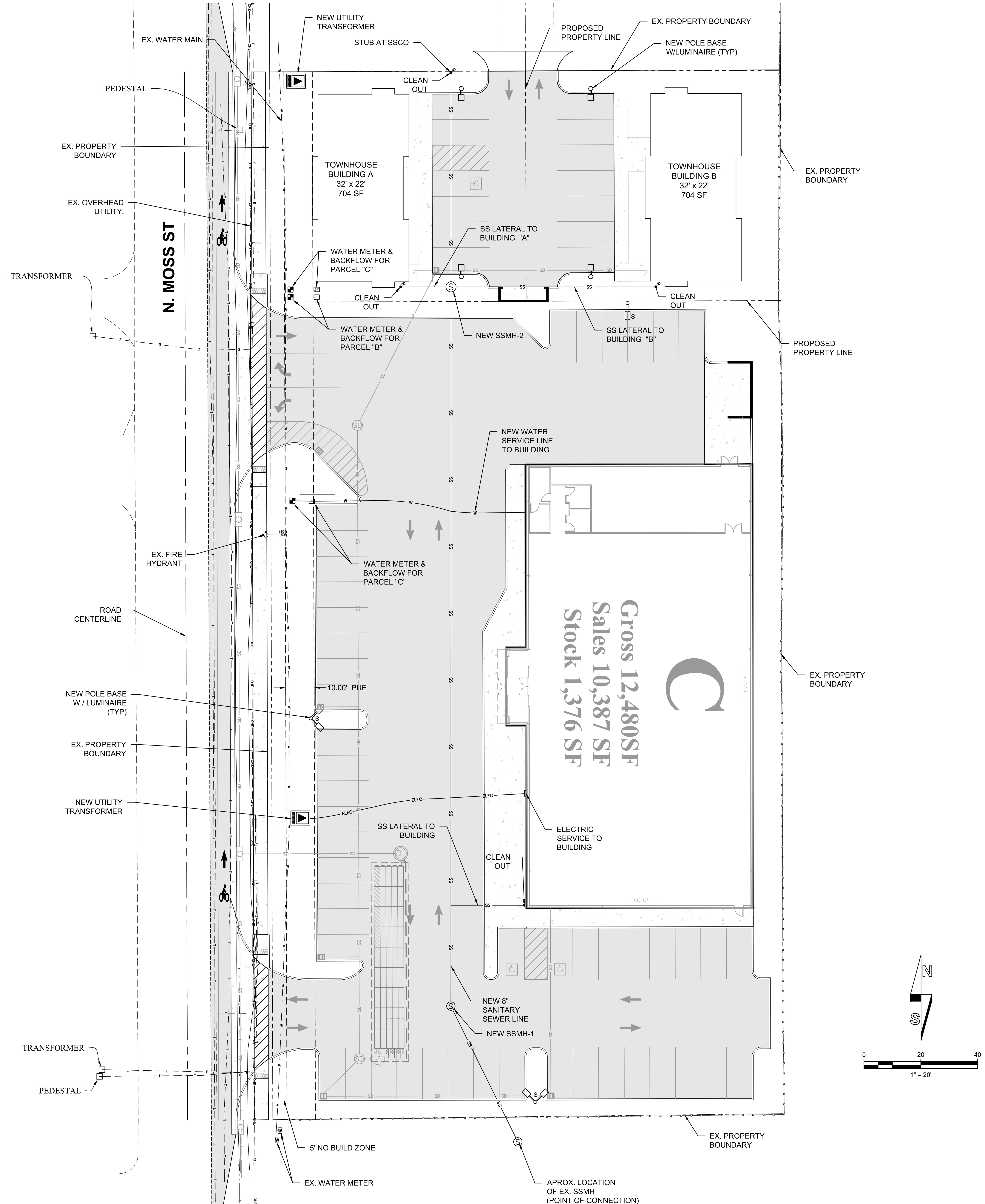
SHEET	C4.0

DRAINAGE PLAN



PLAN VIEW - UTILITY PLAN

SCALE: 1" = 20' - 0" (24x36)

0" 1"
TO VERIFY SCALES BAR SHOULD MEASURE ONE INCH BY ONE SIXTEENTH INCH

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JAN. 13, 2004
TODD D. POWELL
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H&H NW Companies, LLC.
RETAIL / REAL ESTATE / INVESTMENTS
13215 SE MILL PLAIN BLVD, STE C-8 #529 VANCOUVER WA. 98684
OFFICE: 503-984-1889

POWELL engineering + consulting
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DOLLAR GENERAL
RETAIL STORE
FOR: H & H NORTHWEST
PROJECT LOCATION:
N. Moss st. Lowell, Or 97452
PARCEL: 1119S1W-6502

Approved for the Owner By:	Date:
REVISIONS	BY

ISSUE:	LAND USE SET
ISSUE DATE:	08/10/22
DRAWN BY:	TDP
JOB NO.:	22-018

SHEET
C5.0
UTILITY PLAN

LETTER OF AUTHORIZATION

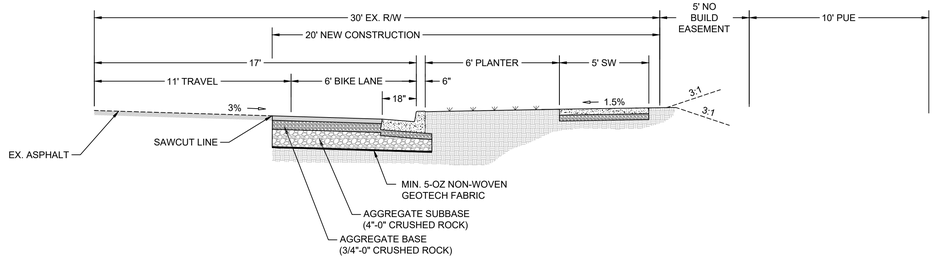
I, Bradley V. Hoffman, of H&H Northwest Companies, LLC being under contract to purchase the property located at 484/570 N Moss St. Lowell, OR. 97452 this 30 day of June, 20 22 grant unto Oregon Architecture LLC full and absolute authorization to execute and deliver (on my behalf) any and all documents necessary to apply for and secure permits in Medford, Oregon.

Email Address bradh@hhcompanies.com

Bradley V. Hoffman, Manager

Digitally signed by Bradley V. Hoffman, Manager
Date: 2022.04.08 11:23:30 -07'00'

Signature



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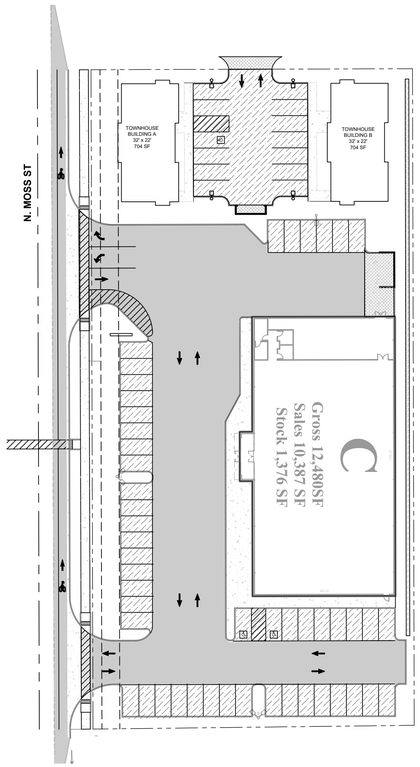

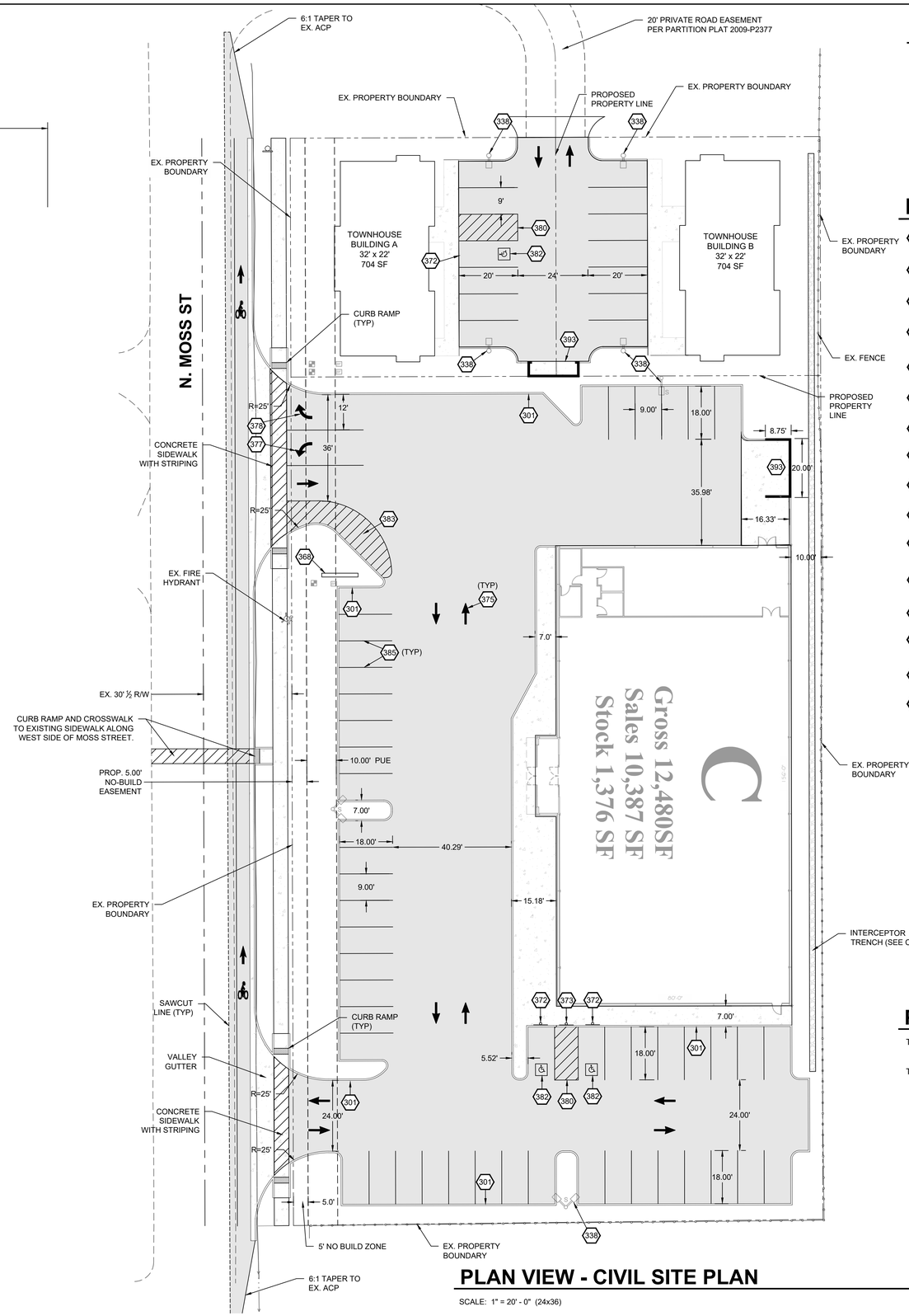

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PARKING CALCULATIONS

TOTAL PROPOSED PARKING STALLS =	58 REGULAR STALLS 3 ADA STALLS (2 VAN)
TOTAL:	61 PARKING STALLS

REGISTERED PROFESSIONAL ENGINEER
89425PE
OREGON
JAN. 13, 2004
TODD D. POWELL
EXPIRES: 12/31/22

H&H NW Companies, LLC.
RETAIL / REAL ESTATE / INVESTMENTS
13219 SE MILL PLAIN BLVD. STE C-8 #529 VANCOUVER WA. 98683
OFFICE: 503-984-1980

POWELL
engineering + consulting
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PROJECT DESCRIPTION:
DOLLAR GENERAL®
RETAIL STORE
FOR: H & H NORTHWEST

PROJECT LOCATION:
484 N. Moss st. Lowell, Or 97452
PARCEL: 1119S1W-6502

Approved for the Owner By: Date:

REVISIONS	BY

ISSUE:	LAND USE SET
ISSUE DATE:	08/31/22
DRAWN BY:	TDP
JOB NO.:	22-018
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C3.0
CIVIL SITE PLAN

TO VERIFY SCALES 0" 1" BAR SHOULD MEASURE ONE INCH BY ONE SIXTEENTH INCH

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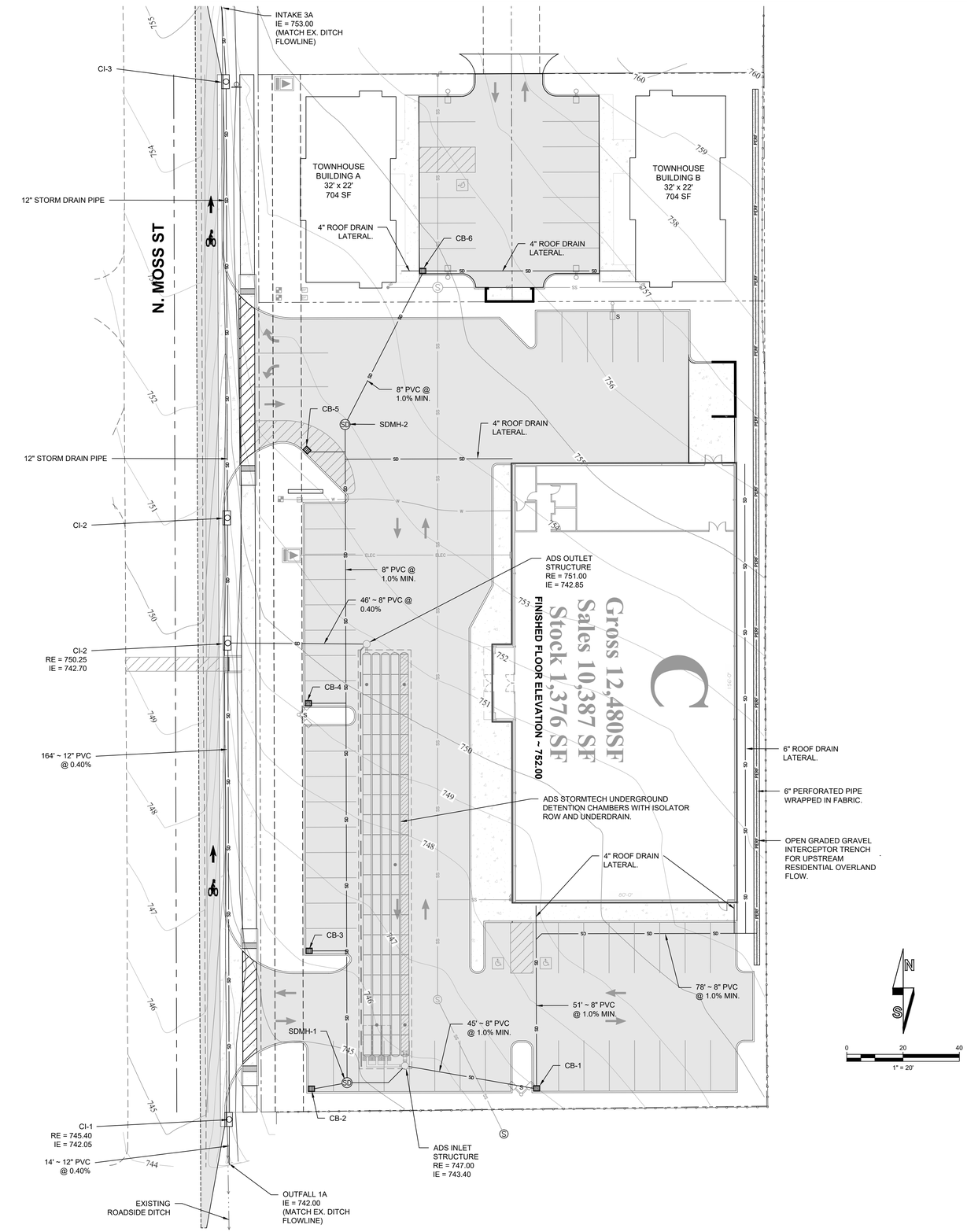


PLAN VIEW - DRAINAGE PLAN

SCALE: 1" = 20' - 0" (24x36)

TO VERIFY SCALES 0" 1" BAR SHOULD MEASURE ONE INCH BY ONE SIXTEENTH INCH

GENERAL NOTES

1. SEE PRELIMINARY STORMWATER MANAGEMENT REPORT, DATED 8-31-22, FOR ADDITIONAL INFORMATION AND RUNOFF CALCULATIONS FOR THE PROPOSED STORMWATER FACILITIES.
2. SEE BELOW PRELIMINARY SPECIFICATIONS FOR THE PROPOSED ADS STORMTECH SYSTEM.

ADS

User Inputs

Chamber Model:	SC-310
Outlet Control Structure:	Yes
Project Name:	Lowell Dollar General
Engineer:	Todd Powell
Project Location:	Oregon
Measurement Type:	Imperial
Required Storage Volume:	3200 cubic ft.
Stone Porosity:	35%
Stone Foundation Depth:	6 in.
Stone Above Chambers:	6 in.
Average Cover Over Chambers:	18 in.
Design Constraint Dimensions:	(20 ft. x 150 ft.)

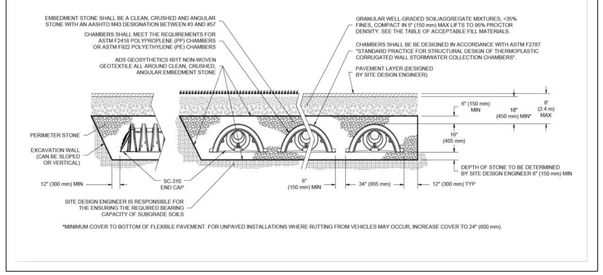
Results

System Volume and Bed Size

Installed Storage Volume:	3236.77 cubic ft.
Storage Volume Per Chamber:	14.70 cubic ft.
Number Of Chambers Required:	100
Number Of End Caps Required:	10
Chamber Rows:	5
Maximum Length:	148.85 ft.
Maximum Width:	18.77 ft.
Approx. Bed Size Required:	2793.39 square ft.

System Components

Amount Of Stone Required:	187 cubic yards
Volume Of Excavation (Not Including Fill):	242 cubic yards
Total Non-woven Geotextile Required:	850 square yards
Woven Geotextile Required (excluding Isolator Row):	17 square yards
Woven Geotextile Required (Isolator Row):	77 square yards
Total Woven Geotextile Required:	94 square yards



REGISTERED PROFESSIONAL ENGINEER
56425PE
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JAN. 13, 2004
TODD D. POWELL
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H&H NW Companies, LLC.
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PROJECT LOCATION:
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PARCEL:
1119S1W-6502

Approved for the Owner By: Date:

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DRAINAGE PLAN

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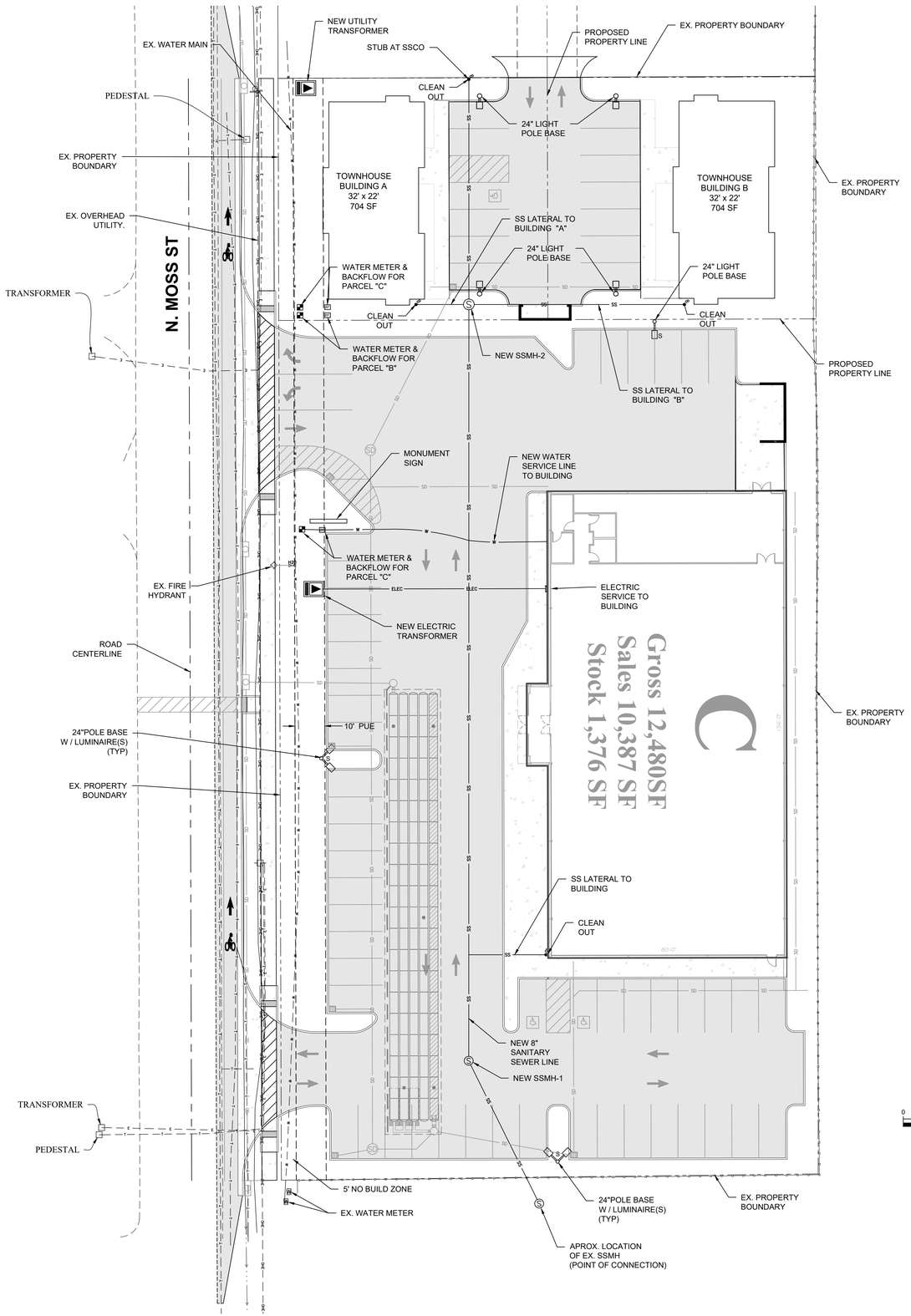

PLAN VIEW - UTILITY PLAN

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EXTERIOR LIGHTING NOTES

SECTION 9.529 EXTERIOR LIGHTING

Exterior lighting should be provided in parking lots and may be provided elsewhere. All exterior lighting shall be designed and installed to the following standards:

(a) Uplighting is prohibited. Externally lit signs, displays, building and aesthetic lighting must be lit from the top and shine downward. The only exception to this requirement is for lighting of a flag pole. The lighting must be shielded to prevent direct glare and/or light trespass. The lighting must also be contained to the target area.
(b) All exterior lights shall be designed, located, installed and directed in such a manner as to prevent glare across the property lines.
(c) All exterior building lighting for security or aesthetics will be full cut-off or shielded type, not allowing any upward distribution of light.
(d) For purposes of this subsection:
(1) "Glare" means light that causes annoyance, discomfort, or loss of visual performance and ability.
(2) "Uplighting" means any light source that distributes illumination above a 90 degree horizontal plane.
(e) Pre-existing non-conforming lighting may be required to be brought into compliance upon a determination by the City Administrator that such non-conforming lighting is a nuisance.

REGISTERED PROFESSIONAL ENGINEER
56758PE
OREGON
JULY 13, 2004
TODD D. POWELL
EXPIRES: 12/31/22

H&H NW Companies, LLC.
RETAIL / REAL ESTATE / INVESTMENTS
13215 SE MILL PLAIN BLVD. STE C-8 #529 VANCOUVER WA. 98683
OFFICE: 503-984-1989

POWELL engineering + consulting
STRONG RELATIONSHIPS • INFINITE POSSIBILITIES

PROJECT DESCRIPTION:
DOLLAR GENERAL®
RETAIL STORE
FOR: H & H NORTHWEST
PROJECT LOCATION:
4N1 N. Moss st. Lowell, Or 97452
PARCEL:
1119S1W-6502

Approved for the Owner By: Date:

REVISIONS	BY

ISSUE:	LAND USE SET
ISSUE DATE:	08/31/22
DRAWN BY:	TDP
JOB NO.:	22-018
SHEET	

C5.0
UTILITY PLAN

POWELL
engineering
+ consulting

221 N. Central Ave., PMB 221
Medford, OR 97501
(mailing address)

(t) 541.613.0723

powellengineeringconsulting.com

STRONG RELATIONSHIPS • INFINITE POSSIBILITIES

PRELIMINARY
STORMWATER MANAGEMENT REPORT

Lowell Dollar General

484 and 570 N. Moss Street
Lowell, OR 97452
Map 19-1W-11-BC, Tax Lot 6502

August 31, 2022

Prepared For:
Oregon Architecture
132 W. Main Street
Medford, OR 97501

Prepared By:
Todd D. Powell, P.E.

TABLE OF CONTENTS

Description	Page
Introduction	1
Existing Conditions	1
Developed Conditions	2

Appendix

Drainage Basin Map
Drainage Calculations
25-year Storm
ADS Stormtech Details

INTRODUCTION

The subject property is currently undeveloped and is located between 484 and 570 N. Moss Street in the City of Lowell, Oregon.

The proposed development is to build a 12,480 square foot Dollar General store (Phase 1) and two new multi-family residential buildings (Phase 2) with associated parking and landscaping on the 1.5-acre site.

Civil related site improvements include design and installation of new utility laterals to serve the proposed buildings, grading plan, stormwater management plan and connection to downstream facilities, erosion control plan, vehicular circulation and parking plan, and accessible routes.

Per City of Lowell, a stormwater management report is required to show that detention will be provided for any re-developed areas. In this case, detention will be shown for the proposed new asphalt and rooftop impervious areas. Further discussion and design methodology is included as a part of this report.

Additionally, as a part of the City permit requirements, an Operations and Maintenance Manual will be required for all the new and existing stormwater facilities. This O&M Manual will be submitted to the City in a separate document following Land Use Approval and is not a part of this report.

EXISTING CONDITIONS

The 1.50-acre property is currently undeveloped. There are also 1.18 acres of developed single family residential homes adjacent and upstream from the subject property along the adjacent northeast property line. Runoff from this upstream basin is included in the calculations in this report.

The area of redevelopment is moderately sloped with existing slopes to the southwest at approximately 4%-6%. Existing runoff is calculated using the Santa Barbara Urban Hydrograph Method with a Type 1A storm distribution. Precipitation data is from the City of Lowell Stormwater Master Plan with a 25-year rainfall amount of 5”.

An analysis of the existing drainage basins are as follows:

Existing Onsite Drainage Basin (EX BSN ONSITE):

- Area of redevelopment = 1.20 acres (tributary to detention)
- Runoff Curve Number = 80; Time of Concentration = 14.30 min.
- 25-year Peak Flow = 0.751 cfs

Existing Upstream Offsite Drainage Basin (UPSTREAM BSN):

- Area = 1.18 acres
- Runoff Curve Number = 91; Time of Concentration = 15 min.
- 25-year Peak Flow = 1.079 cfs

Combined Existing Basin Hydrographs (EX BSN ONSITE + UPSTREAM BSN):

- 25-year Peak Flow = 1.831 cfs

DEVELOPED CONDITIONS

The proposed development is to build a 12,480 square foot Dollar General store (Phase 1) and two new multi-family residential buildings (Phase 2) with associated parking and landscaping on the 1.5-acre site.

Stormwater Detention for downstream erosion control will be achieved through an ADS SC-310 Stormtech Chamber System with Isolator Row for treatment. This system is specified in detail in the appendix to this report.

Flow control calculations have been completed for the entire onsite redevelopment basin, assuming a pre-developed runoff curve number of 80. The offsite upstream basin is also collected and routed through the detention system as bypass runoff. Therefore, the matching release rate of the detention system shall be equal to or less than the combined existing basin hydrographs of the EX BSN ONSITE + UPSTREAM BSN which equals 1.831 cfs.

Developed runoff is calculated using the Santa Barbara Urban Hydrograph Method with a Type 1A storm distribution. Precipitation data is also from the City of Lowell Stormwater Master Plan with a 25-year rainfall amount of 5-inches in a 24-hour period. There is one drainage basin associated with the underground detention system. This basin is identified as “DEV BSN ONSITE” and includes the new asphalt, concrete, and rooftop impervious areas. This basin is further described below:

Onsite Redeveloped Basin (DEV BSN ONSITE):

- Area = 1.20 acres (tributary to detention)
- Runoff Curve Number = 98
- Time of Concentration = 5 min.
- 25-year Undetained Peak Flow = 1.417 cfs
- 25-year Allowable Release Rate = 1.831 cfs (EX BSN ONSITE + UPSTREAM BSN)
- 25-year Combined Flow to ADS System = 2.463 cfs (DEV BSN ONSITE + UPSTREAM BSN)
- 25-year Detained Release from ADS System = 1.723 cfs < 1.831 cfs =>> **OK**

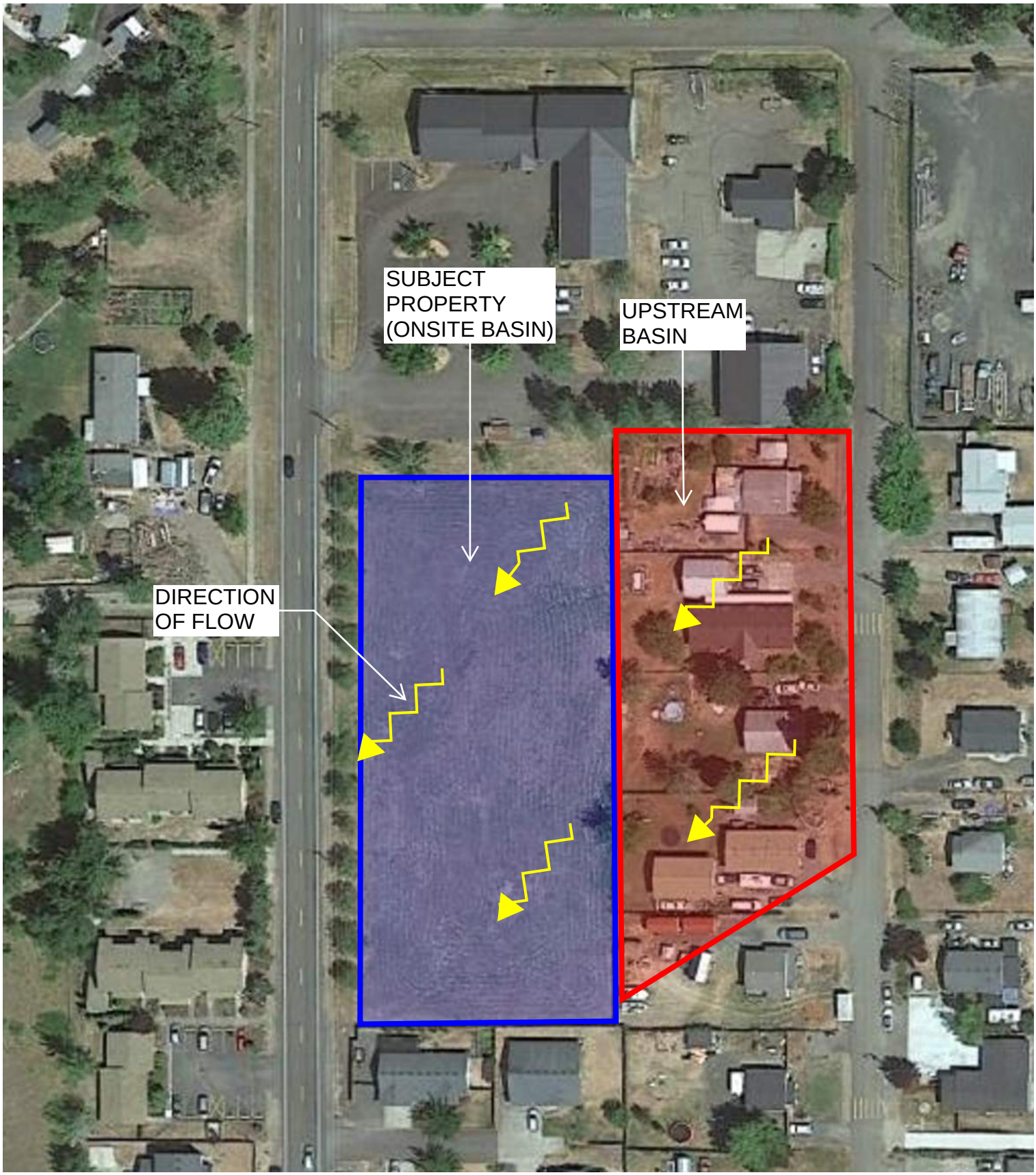
Therefore, to match the pre-development 25-year peak flow of 1.831 cfs, the proposed ADS Stormtech Chamber System for downstream erosion control shall be sized as follows:

- Required total storage volume = 3,247 cubic feet (incl. rock storage)
- Bottom of Rock Elevation = 742.85. Slope = 0%
- 25-year Water Surface Elevation = 744.56
- 8” Pipe Outflow with no orifice.

Further design calculations are provided below in the Appendix to this report.

DRAINAGE BASIN MAP

DRAINAGE BASIN MAP



DRAINAGE CALCULATIONS

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220829 Lowell DG DRN CALCS.gpw

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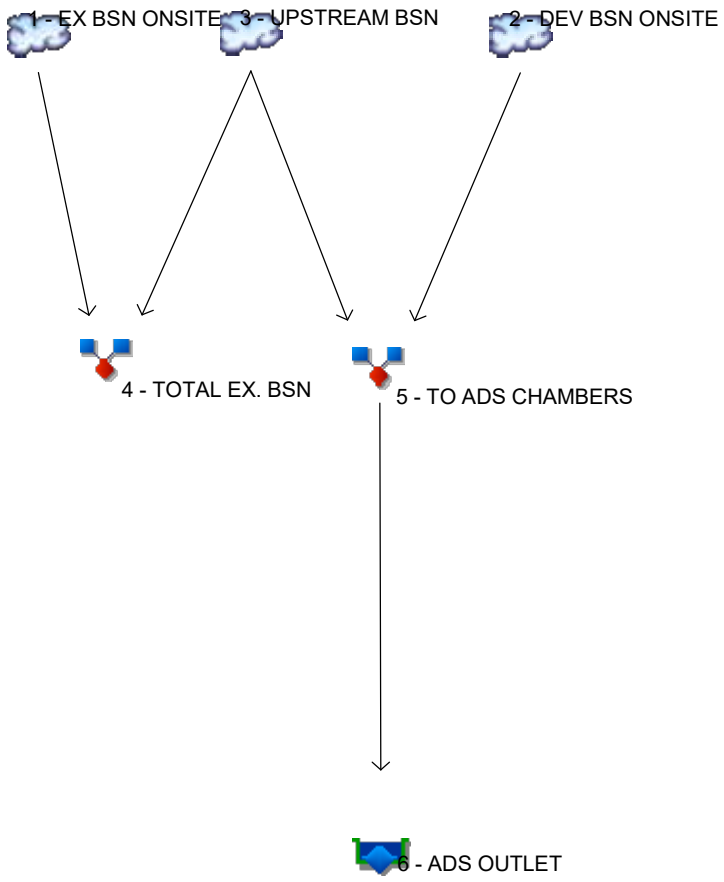
Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SBUH Runoff	EX BSN ONSITE
2	SBUH Runoff	DEV BSN ONSITE
3	SBUH Runoff	UPSTREAM BSN
4	Combine	TOTAL EX. BSN
5	Combine	TO ADS CHAMBERS
6	Reservoir	ADS OUTLET

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SBUH Runoff	------	-------	-------	-------	-------	-------	0.751	-------	-------	EX BSN ONSITE
2	SBUH Runoff	------	-------	-------	-------	-------	-------	1.417	-------	-------	DEV BSN ONSITE
3	SBUH Runoff	------	-------	-------	-------	-------	-------	1.079	-------	-------	UPSTREAM BSN
4	Combine	1, 3	-------	-------	-------	-------	-------	1.831	-------	-------	TOTAL EX. BSN
5	Combine	2, 3,	-------	-------	-------	-------	-------	2.463	-------	-------	TO ADS CHAMBERS
6	Reservoir	5	-------	-------	-------	-------	-------	1.723	-------	-------	ADS OUTLET

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2022

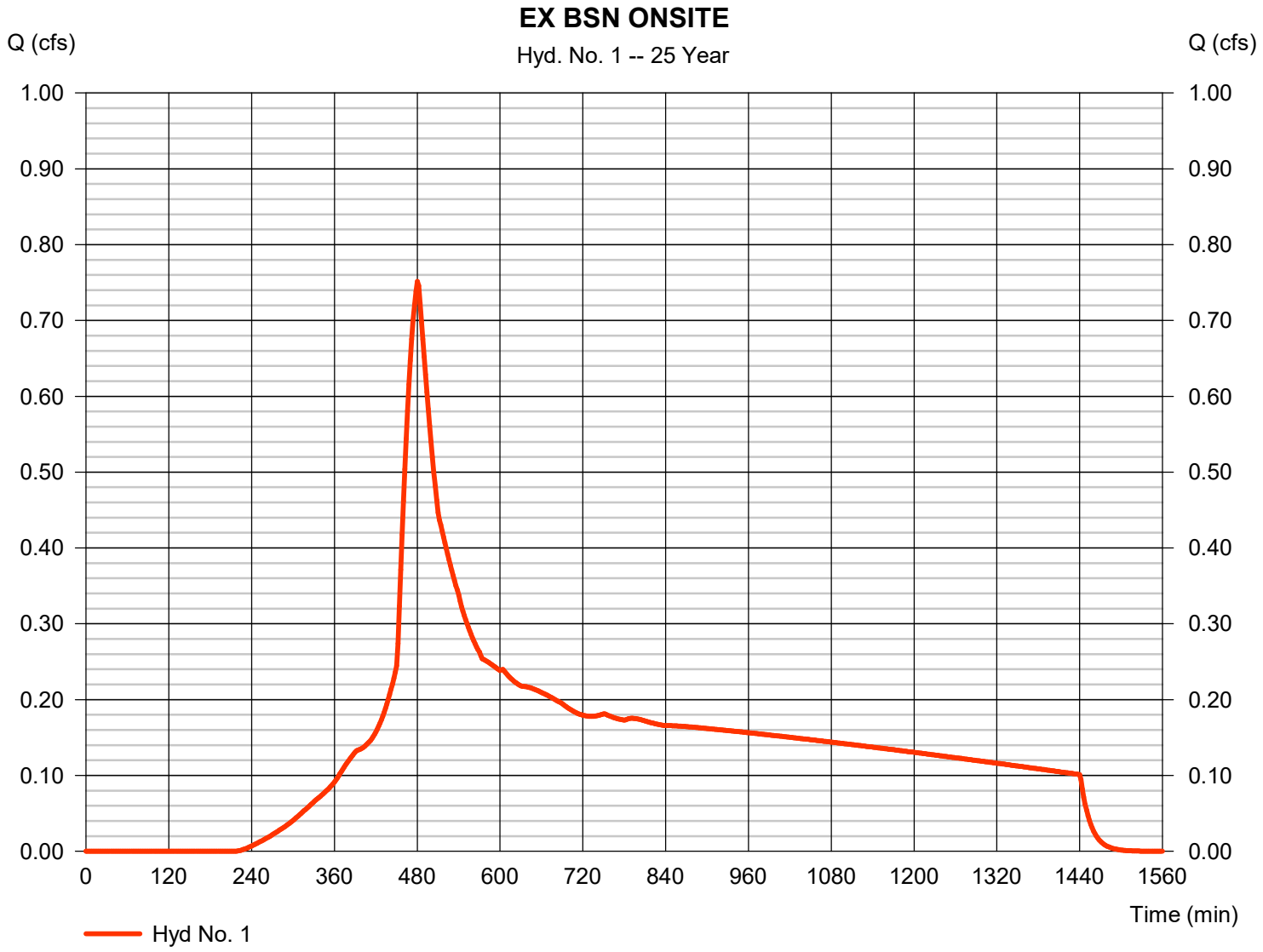
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SBUH Runoff	0.751	2	480	12,601	------	------	------	EX BSN ONSITE
2	SBUH Runoff	1.417	2	474	20,748	------	------	------	DEV BSN ONSITE
3	SBUH Runoff	1.079	2	480	17,057	------	------	------	UPSTREAM BSN
4	Combine	1.831	2	480	29,658	1, 3	------	------	TOTAL EX. BSN
5	Combine	2.463	2	478	37,805	2, 3,	------	------	TO ADS CHAMBERS
6	Reservoir	1.723	2	492	37,796	5	744.56	2,683	ADS OUTLET

Hydrograph Report

Hyd. No. 1

EX BSN ONSITE

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.751 cfs
Storm frequency	=	25 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	12,601 cuft
Drainage area	=	1.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	5.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 1

EX BSN ONSITE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 2.00		0.00		0.00		
Land slope (%)	= 4.00		0.00		0.00		
Travel Time (min)	**= 12.99**	**+**	**0.00**	**+**	**0.00**	**=**	**12.99**
Shallow Concentrated Flow							
Flow length (ft)	= 250.00		0.00		0.00		
Watercourse slope (%)	= 4.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.23		0.00		0.00		
Travel Time (min)	**= 1.29**	**+**	**0.00**	**+**	**0.00**	**=**	**1.29**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

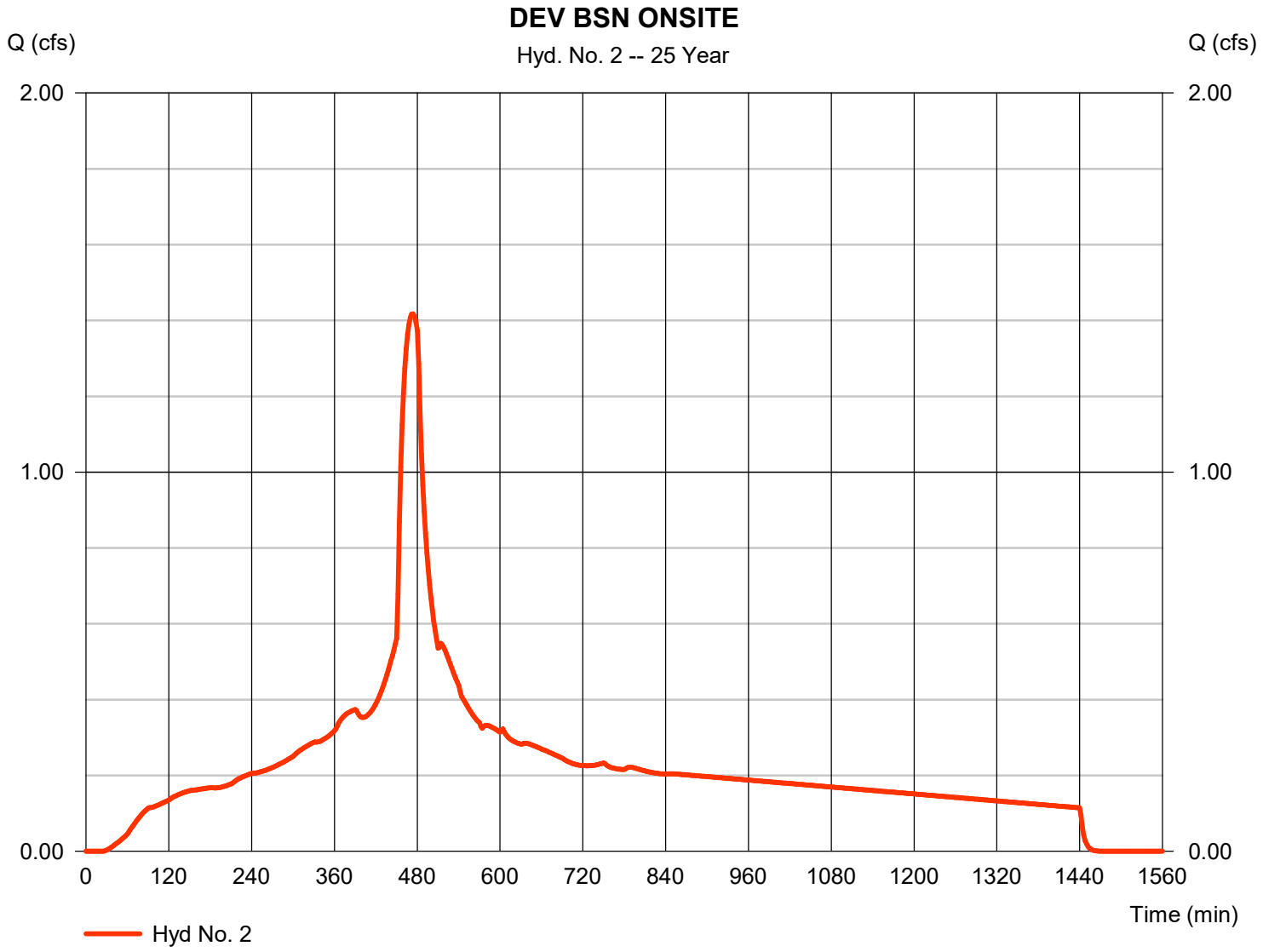
Total Travel Time, Tc ..... 14.30 min

Hydrograph Report

Hyd. No. 2

DEV BSN ONSITE

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.417 cfs
Storm frequency	=	25 yrs	Time to peak	=	474 min
Time interval	=	2 min	Hyd. volume	=	20,748 cuft
Drainage area	=	1.200 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	5.00 min
Total precip.	=	5.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

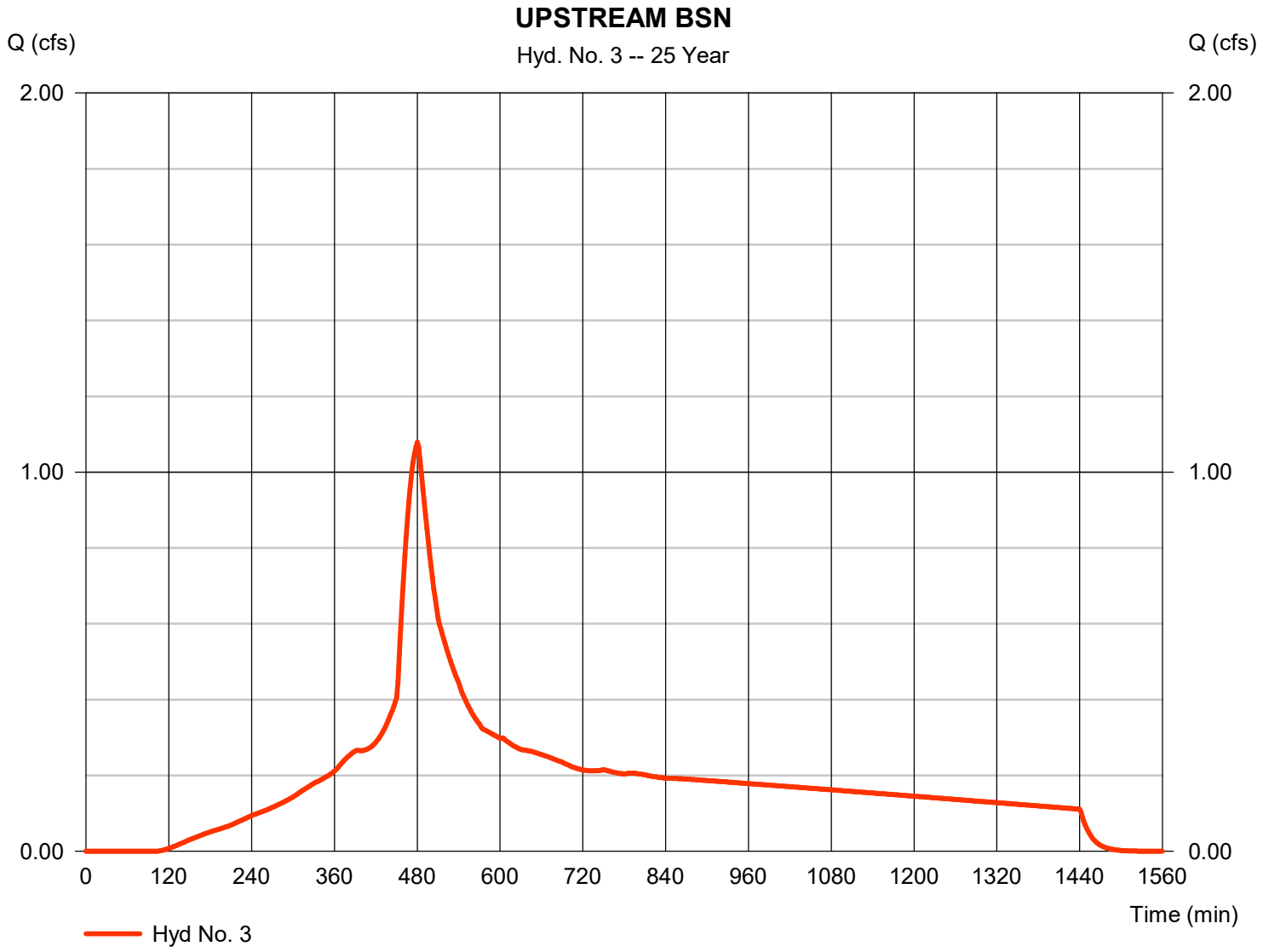


Hydrograph Report

Hyd. No. 3

UPSTREAM BSN

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.079 cfs
Storm frequency	=	25 yrs	Time to peak	=	480 min
Time interval	=	2 min	Hyd. volume	=	17,057 cuft
Drainage area	=	1.180 ac	Curve number	=	91
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.00 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

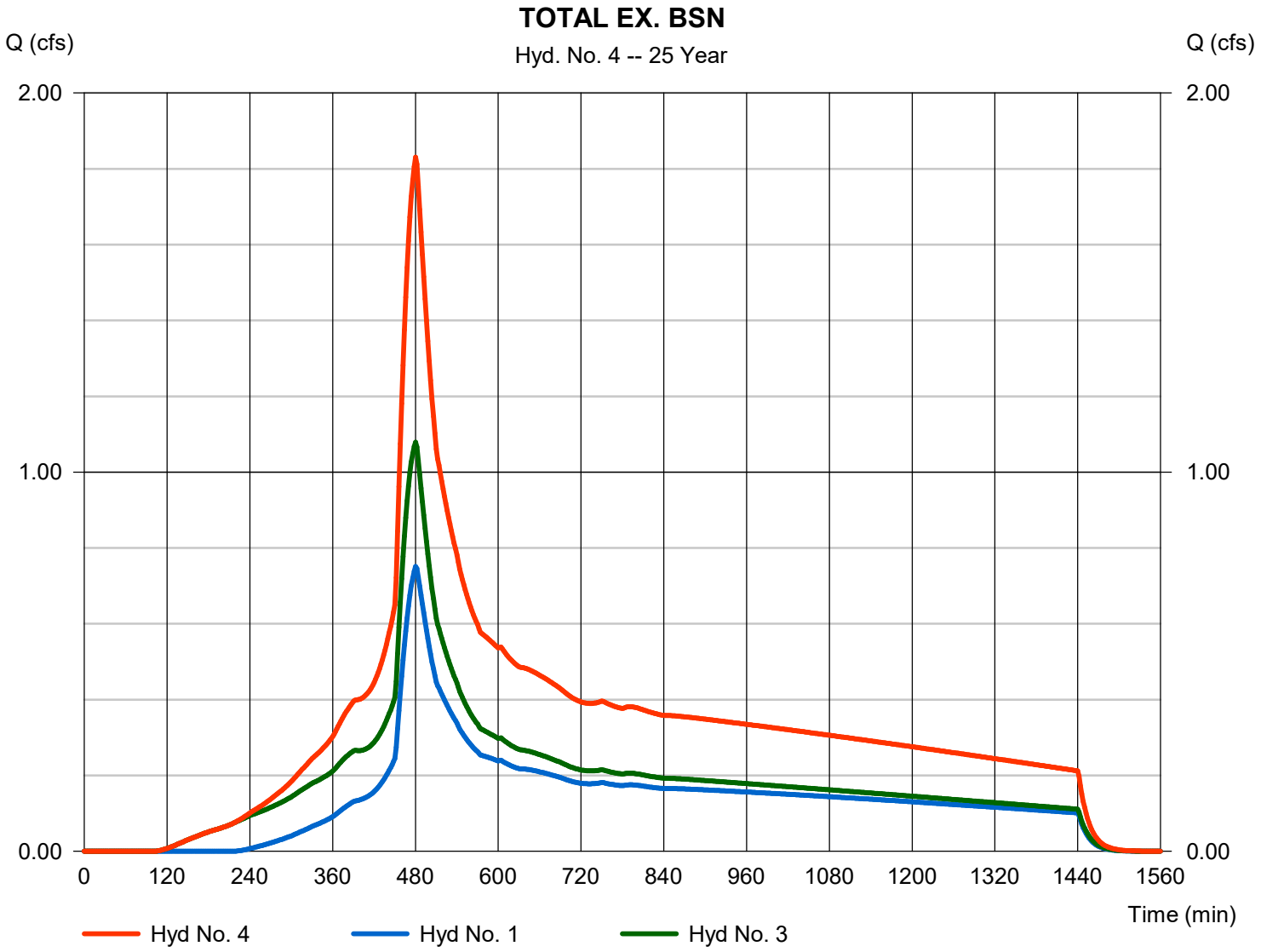


Hydrograph Report

Hyd. No. 4

TOTAL EX. BSN

Hydrograph type	= Combine	Peak discharge	= 1.831 cfs
Storm frequency	= 25 yrs	Time to peak	= 480 min
Time interval	= 2 min	Hyd. volume	= 29,658 cuft
Inflow hyds.	= 1, 3	Contrib. drain. area	= 2.380 ac

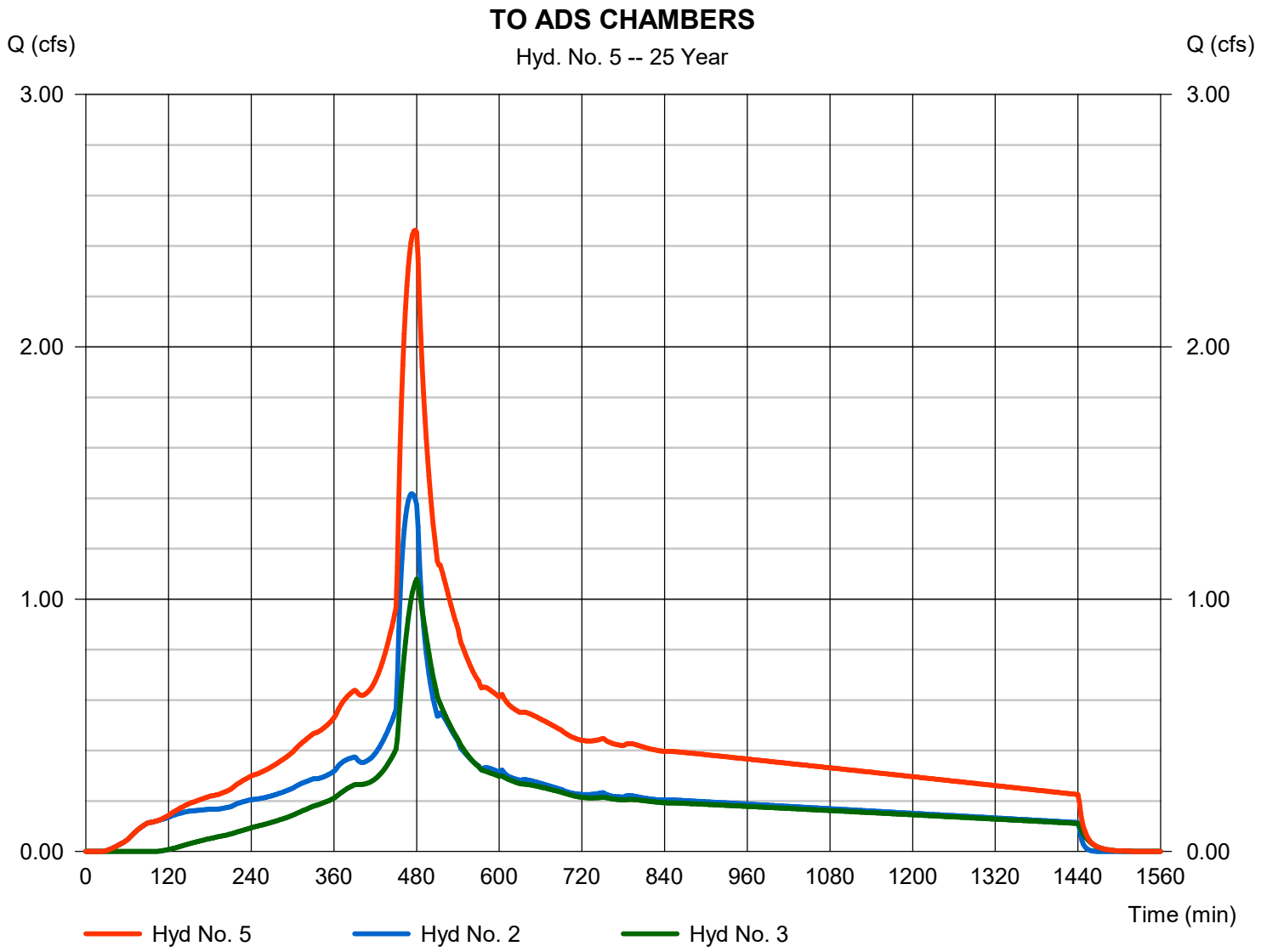


Hydrograph Report

Hyd. No. 5

TO ADS CHAMBERS

Hydrograph type	= Combine	Peak discharge	= 2.463 cfs
Storm frequency	= 25 yrs	Time to peak	= 478 min
Time interval	= 2 min	Hyd. volume	= 37,805 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 2.380 ac



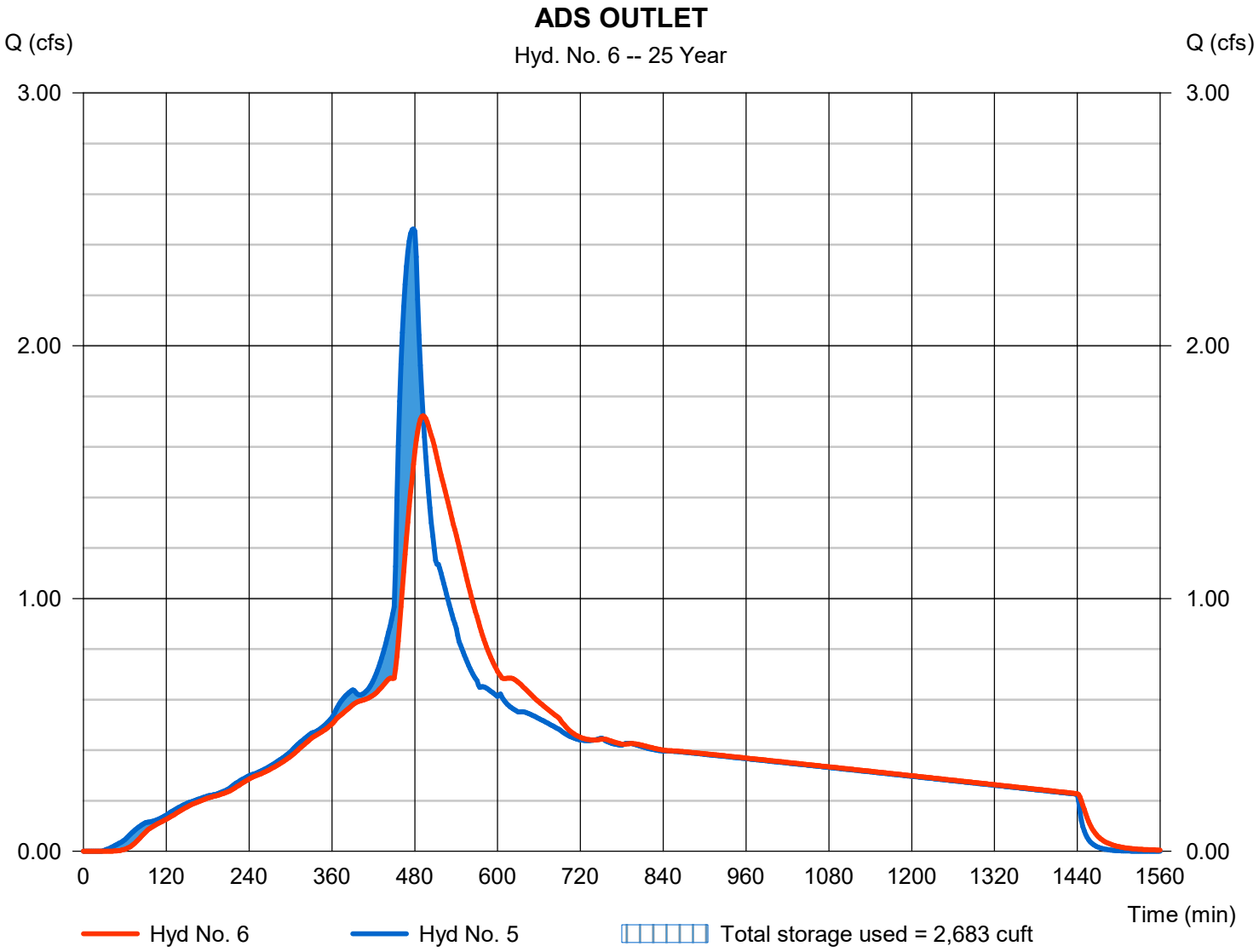
Hydrograph Report

Hyd. No. 6

ADS OUTLET

Hydrograph type	=	Reservoir	Peak discharge	=	1.723 cfs
Storm frequency	=	25 yrs	Time to peak	=	492 min
Time interval	=	2 min	Hyd. volume	=	37,796 cuft
Inflow hyd. No.	=	5 - TO ADS CHAMBERS	Max. Elevation	=	744.56 ft
Reservoir name	=	ADS CHAMBERS	Max. Storage	=	2,683 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - ADS CHAMBERS

Pond Data

UG Chambers -Invert elev. = 743.35 ft, Rise x Span = 1.33 x 2.83 ft, Barrel Len = 700.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement -Invert elev. = 742.85 ft, Width = 3.33 ft, Height = 2.33 ft, Voids = 35.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	742.85	n/a	0	0
0.23	743.08	n/a	190	190
0.47	743.32	n/a	190	380
0.70	743.55	n/a	445	826
0.93	743.78	n/a	481	1,307
1.17	744.02	n/a	463	1,770
1.40	744.25	n/a	432	2,202
1.63	744.48	n/a	383	2,585
1.86	744.71	n/a	281	2,866
2.10	744.95	n/a	190	3,057
2.33	745.18	n/a	190	3,247

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 8.00	0.00	0.00	0.00
Span (in)	= 8.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 742.85	0.00	0.00	0.00
Length (ft)	= 46.00	0.00	0.00	0.00
Slope (%)	= 0.40	0.00	0.00	n/a
N-Value	= .011	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	742.85	0.00	---	---	---	---	---	---	---	---	---	0.000
0.23	190	743.08	0.18 ic	---	---	---	---	---	---	---	---	---	0.179
0.47	380	743.32	0.53 oc	---	---	---	---	---	---	---	---	---	0.527
0.70	826	743.55	0.72 oc	---	---	---	---	---	---	---	---	---	0.723
0.93	1,307	743.78	1.04 oc	---	---	---	---	---	---	---	---	---	1.042
1.17	1,770	744.02	1.28 oc	---	---	---	---	---	---	---	---	---	1.283
1.40	2,202	744.25	1.49 oc	---	---	---	---	---	---	---	---	---	1.487
1.63	2,585	744.48	1.66 oc	---	---	---	---	---	---	---	---	---	1.665
1.86	2,866	744.71	1.83 oc	---	---	---	---	---	---	---	---	---	1.826
2.10	3,057	744.95	1.97 oc	---	---	---	---	---	---	---	---	---	1.974
2.33	3,247	745.18	2.11 oc	---	---	---	---	---	---	---	---	---	2.112

ADS STORMTECH UNDERGROUND DETENTION SYSTEM

User Inputs

Chamber Model:	SC-310
Outlet Control Structure:	Yes
Project Name:	Lowell Dollar General
Engineer:	Todd Powell
Project Location:	Oregon
Measurement Type:	Imperial
Required Storage Volume:	3200 cubic ft.
Stone Porosity:	35%
Stone Foundation Depth:	6 in.
Stone Above Chambers:	6 in.
Average Cover Over Chambers:	18 in.
Design Constraint Dimensions:	(20 ft. x 150 ft.)

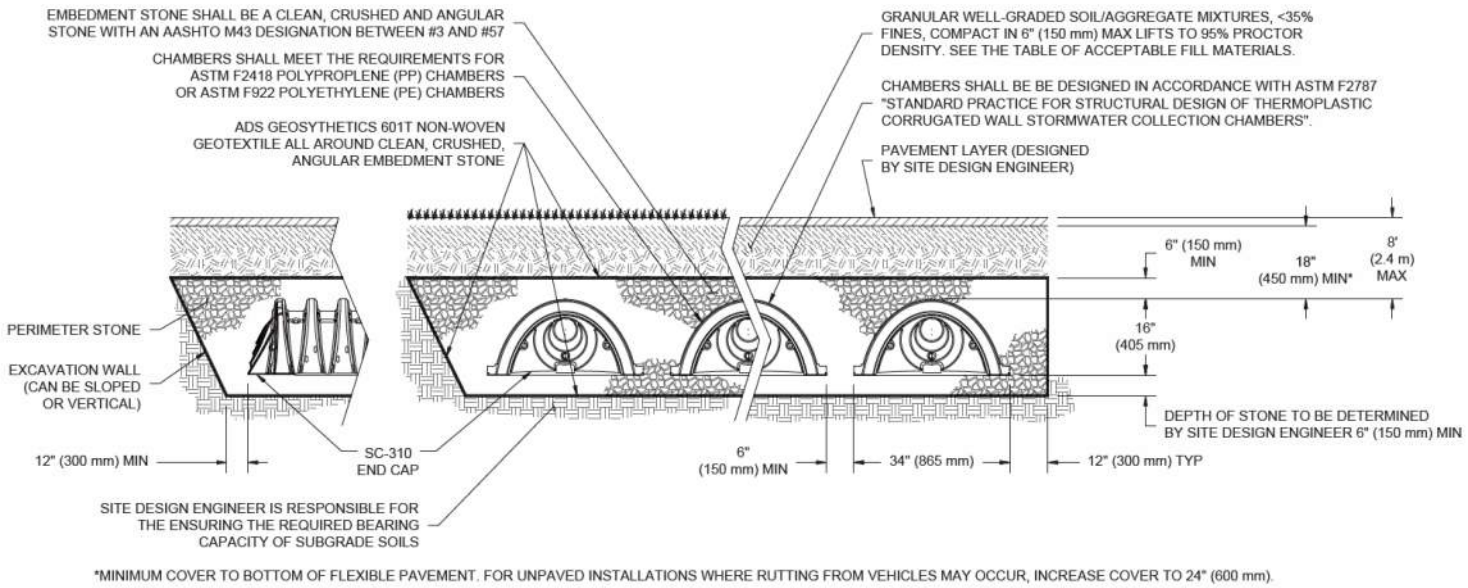
Results

System Volume and Bed Size

Installed Storage Volume:	3236.77 cubic ft.
Storage Volume Per Chamber:	14.70 cubic ft.
Number Of Chambers Required:	100
Number Of End Caps Required:	10
Chamber Rows:	5
Maximum Length:	148.85 ft.
Maximum Width:	18.77 ft.
Approx. Bed Size Required:	2793.39 square ft.

System Components

Amount Of Stone Required:	187 cubic yards
Volume Of Excavation (Not Including Fill):	242 cubic yards
Total Non-woven Geotextile Required:	850 square yards
Woven Geotextile Required (excluding Isolator Row):	17 square yards
Woven Geotextile Required (Isolator Row):	77 square yards
Total Woven Geotextile Required:	94 square yards



PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER	
ADS SALES REP	
PROJECT NO.	

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

LOWELL DOLLAR GENERAL

LOWELL, OR

SC-310 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-310.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE OR POLYETHYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2922 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310 SYSTEM

1. STORMTECH SC-310 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

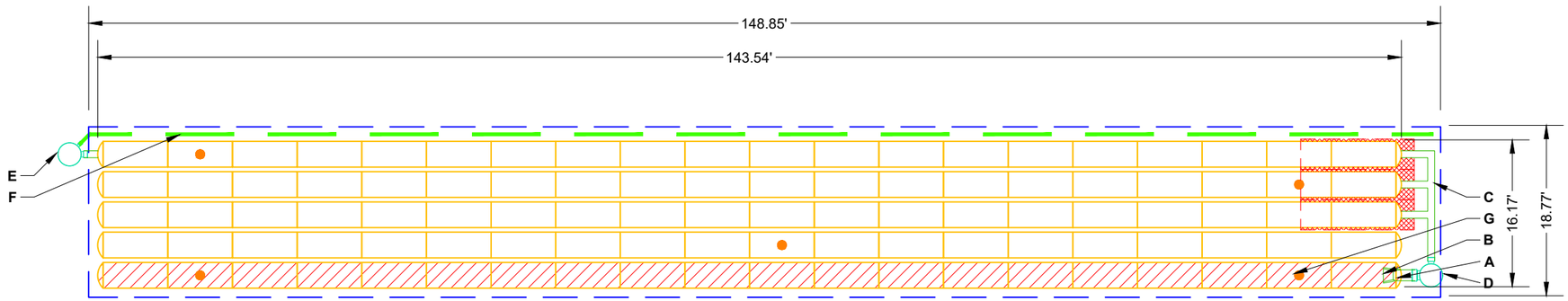
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT		PROPOSED ELEVATIONS	
100	STORMTECH SC-310 CHAMBERS	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	752.68
10	STORMTECH SC-310 END CAPS	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	746.68
6	STONE ABOVE (in)	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	746.18
6	STONE BELOW (in)	MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	746.18
35	STONE VOID	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	746.18
3241	INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED) (COVER STONE INCLUDED) (BASE STONE INCLUDED)	TOP OF STONE:	745.18
		TOP OF SC-310 CHAMBER:	744.68
		8" x 8" TOP MANIFOLD INVERT:	743.64
		12" ISOLATOR ROW PLUS INVERT:	743.43
2793	SYSTEM AREA (SF)	8" BOTTOM CONNECTION INVERT:	743.40
335.2	SYSTEM PERIMETER (ft)	BOTTOM OF SC-310 CHAMBER:	743.35
		UNDERDRAIN INVERT:	742.85
		BOTTOM OF STONE:	742.85

*INVERT ABOVE BASE OF CHAMBER

PART TYPE	ITEM ON LAYOUT	DESCRIPTION	INVERT*	MAX FLOW
PREFABRICATED EZ END CAP	A	12" BOTTOM PREFABRICATED EZ END CAP, PART#: SC310ECEZ / TYP OF ALL 12" BOTTOM CONNECTIONS AND ISOLATOR PLUS ROWS	0.90"	
FLAMP	B	INSTALL FLAMP ON 12" ACCESS PIPE / PART#: SC31012RAMP		
MANIFOLD	C	8" x 8" TOP MANIFOLD, MOLDED FITTINGS	3.50"	
NYLOPLAST (INLET W/ ISO PLUS ROW)	D	30" DIAMETER (24.00" SUMP MIN)		2.3 CFS IN
NYLOPLAST (OUTLET)	E	30" DIAMETER (DESIGN BY ENGINEER)		0.7 CFS OUT
UNDERDRAIN	F	4" ADS N-12 DUAL WALL PERFORATED HDPE UNDERDRAIN		
INSPECTION PORT	G	4" SEE DETAIL (TYP 5 PLACES)		



ISOLATOR ROW PLUS
(SEE DETAIL)

PLACE MINIMUM 12.50' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

BED LIMITS

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH NOTE #6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- **NOT FOR CONSTRUCTION:** THIS LAYOUT IS FOR DIMENSIONAL PURPOSES ONLY TO PROVE CONCEPT & THE REQUIRED STORAGE VOLUME CAN BE ACHIEVED ON SITE.

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DATE	DRW	CHK	DESCRIPTION

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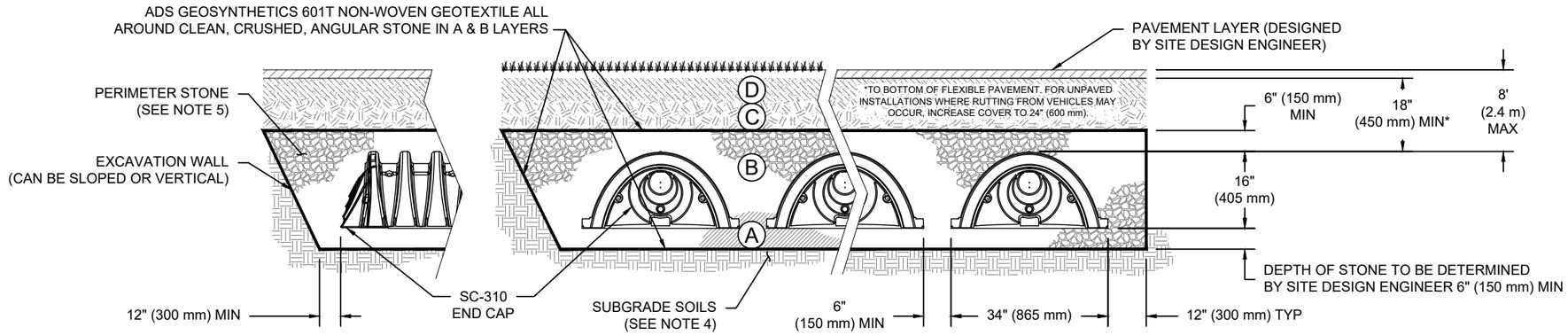
HILLIARD, OH 43026
1-800-733-7473

0 15' 30'

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2922 (POLETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 400 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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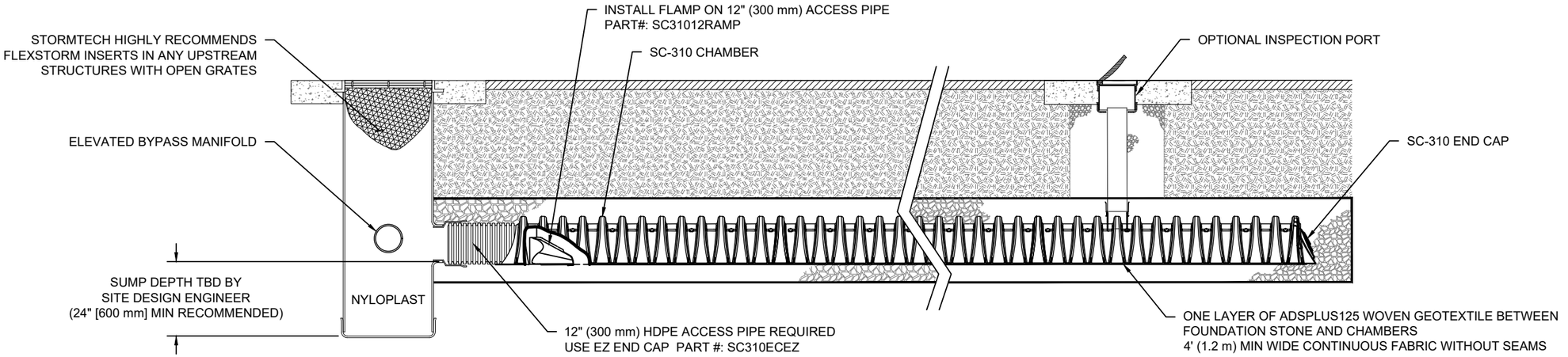


SC-310 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

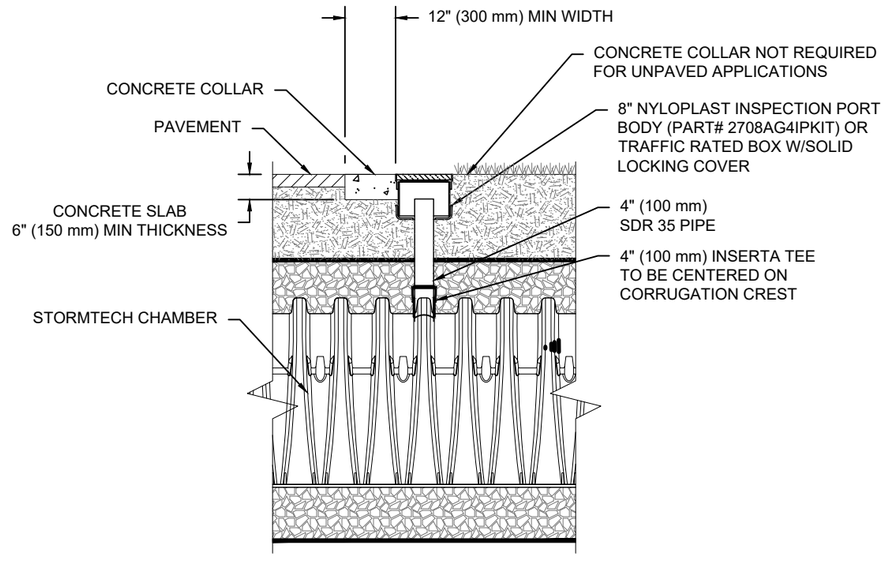
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION CREST.

4" PVC INSPECTION PORT DETAIL
(SC SERIES CHAMBER)
NTS

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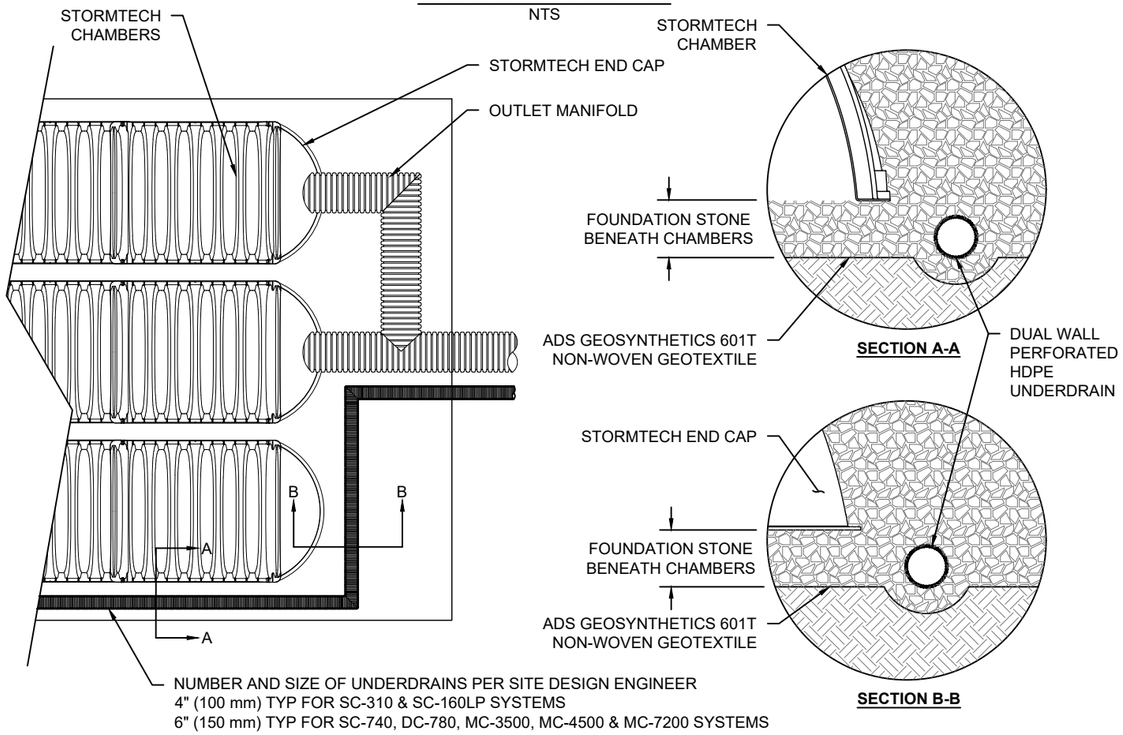
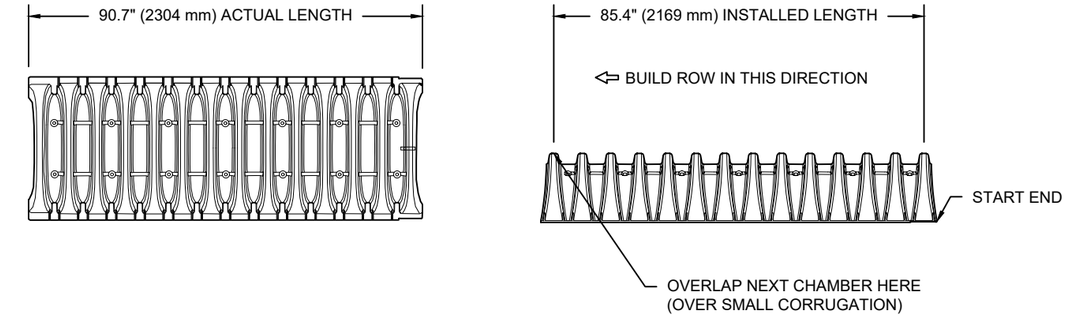
UNDERDRAIN DETAIL

NTS



SC-310 TECHNICAL SPECIFICATION

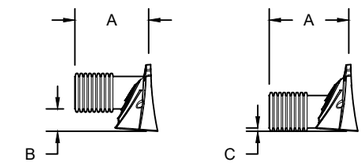
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUB AT BOTTOM OF END CAP WITH FLAMP END WITH "BR"
PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310ECEZ*	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310ECEZ ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310ECEZ THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

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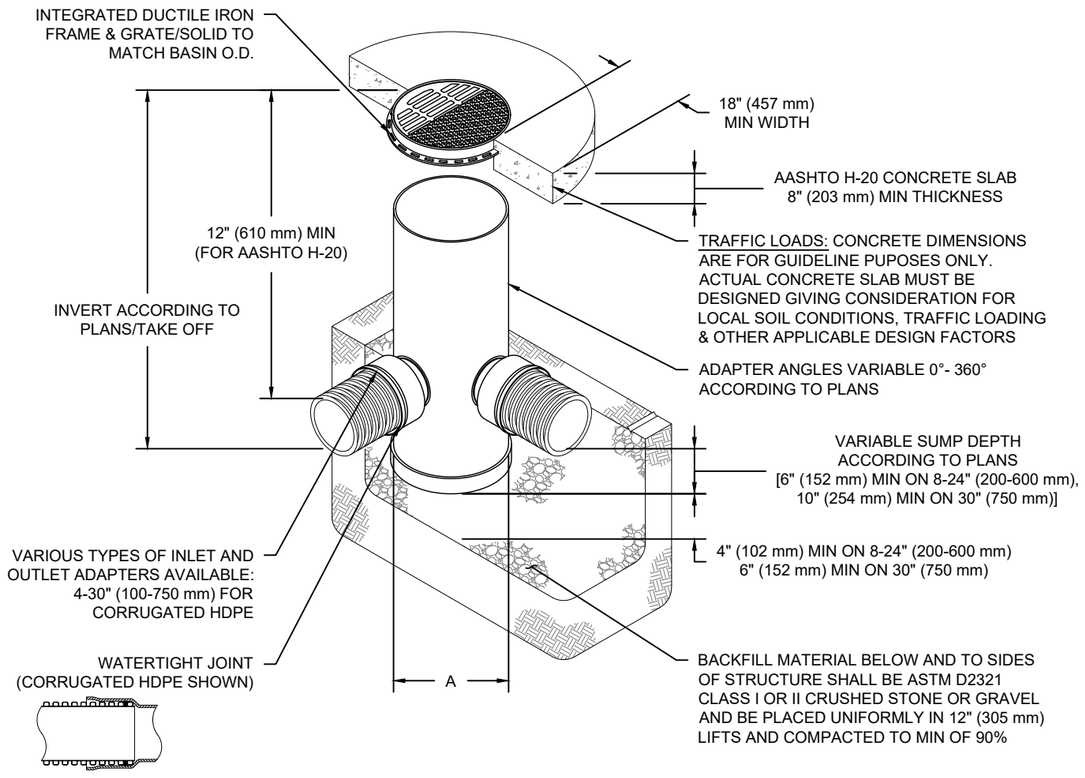
NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

LOWELL DOLLAR GENERAL
LOWELL, OR

DATE: | DRAWN: TP
PROJECT #: | CHECKED: N/A

DATE	DRW	CHK	DESCRIPTION

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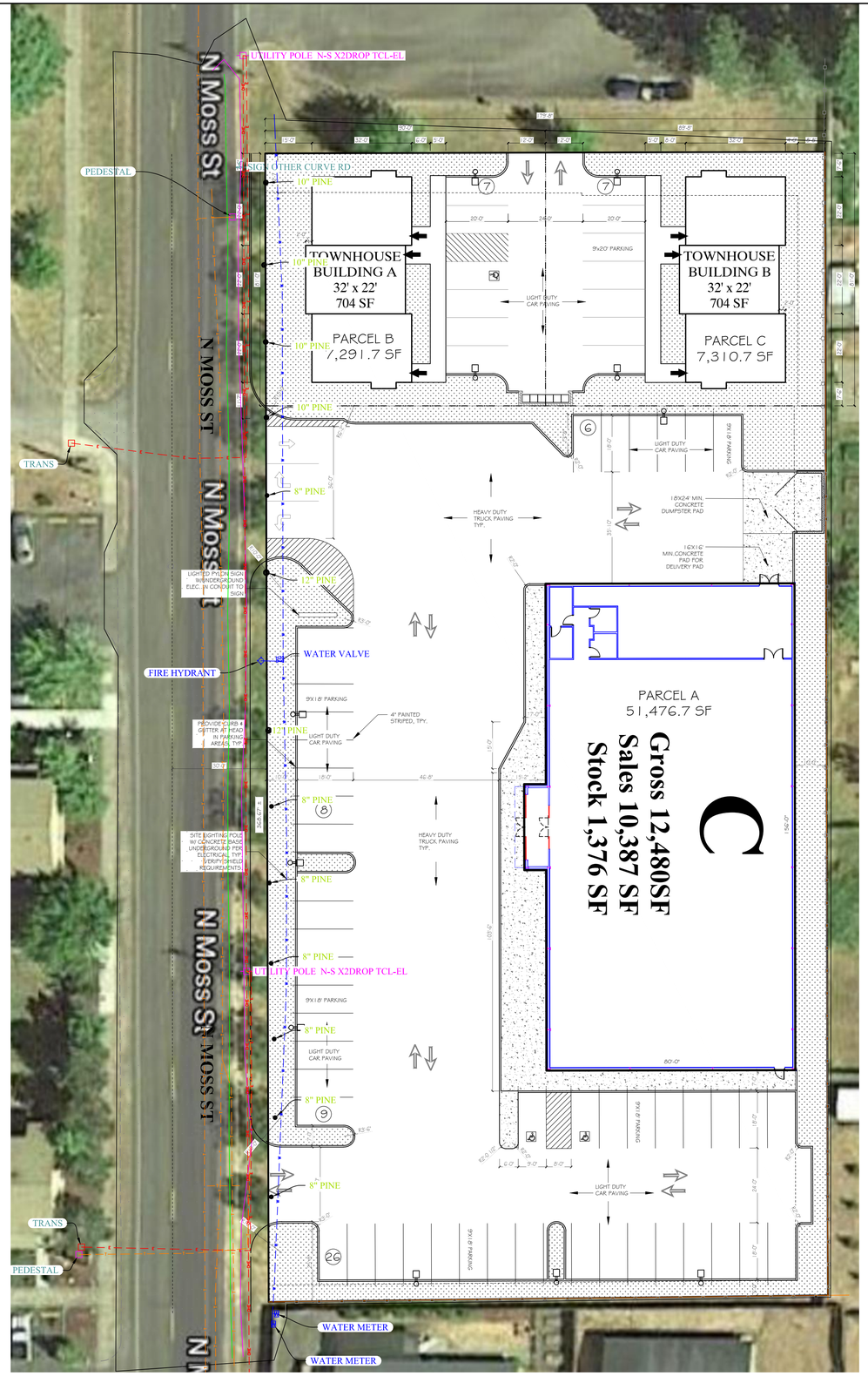


1 SCHEMATIC SITE PLAN

SCALE: 1" = 20'-0"

TO VERIFY SCALES 0" 1" BAR SHOULD MEASURE ONE INCH BY ONE SIXTEENTH INCH

N

FOR SPAC

REGISTERED ARCHITECT
STATE OF OREGON
Mark McKechnie
Medford, Oregon
4666

OREGON ARCHITECTURE, INC.
132 W. Main Street, Suite 101
Medford, Oregon 97501
PH. 541 772-4372 | OREGONARCHITECTURE.BIZ

PROJECT DESCRIPTION:
LOWELL DG HOUSING

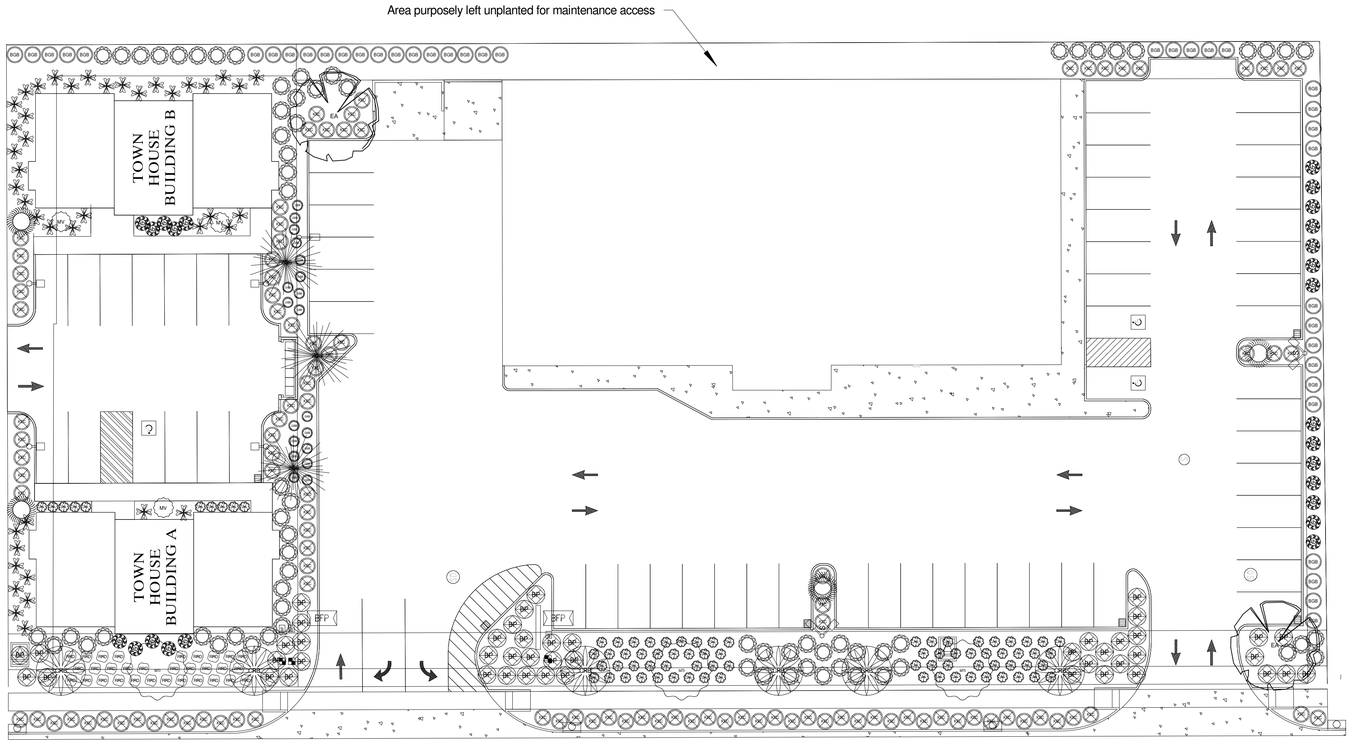
PROJECT LOCATION:
NW N Moss St, Lowell, OR 97452

PARCEL: --

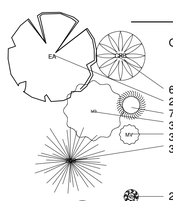
Approved for the Owner By: Date:

REVISIONS	BY

PLOT DATE: 06/08/22
ISSUE DATE:
DRAWN BY: M. MORGAN
JOB NO.: 4669
SHEET
001
SCHEMATIC SITE PLAN



PLANT LIST

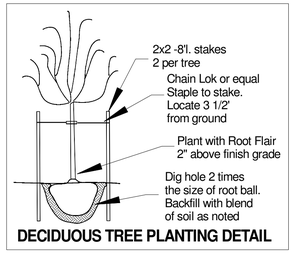


Quantity	Common Name	Botanical Name	Size
	Trees		
6	Cherry, Royal Burgundy	Prunus serrullata 'Royal Burgundy'	1 1/2"
2	Elm, Accolade	Ulmus x 'Morton (Accolade™)	1 1/2"
7	Hornbeam, Frans Fontaine	Carpinus betulus Frans Fontaine	1 1/2"
3	Maple, Trident	Acer buergeranum	1 1/2"
3	Maple, Vine	Acer circinatum	4-5'
3	Zelkova, City Sprite	Zelkova serrata 'City Sprite'	1 1/2"
	Shrubs		
24	Abelia, Kaleidoscope	Abelia 'Kaleicoscope	2g
39	Boxwood, Green Beauty	Buxus microphylla japonica 'Green Beauty'	2g
70	Laurel, Otto Luyken	Prunus laurocerasus 'Otto Luyken'	2g
80	Pieris, Little Heath	Pieris japonica 'Little Heath'	2g
42	Viburnum, David	Viburnum davidii	2g
	Ground Cover / Grasses		
48	Broom, Pilosa	Genista pilosa	1g
19	Grass, Burgundy Bunny	Pennisetum alopecuroides 'Burgundy Bunny'	1g
108	Kinnikinnick, Emerald Carpet	Arctostaphylos uva-ursi 'Emerald Carpet'	1g
31	Rose, Red Drift	Rosa 'Meigalpio'	1g

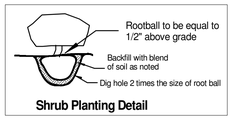
All Planting are Low/Moderate to Moderate Water Needs

PLANTING

1. Plant material to be provided in accordance with species, sizes and quantities indicated below. Substitutions based on list provided may be made as applicable. Remaining substitutions to be made with the approval of landscape architect.
2. No planting to proceed until irrigation system is fully functioning in the area to be planted.
3. All plant holes to be dug 2 times the volume of their root ball size. Backfill shall consist of 1/3 organic mulch, 2/3 native soil, micorrhizae supplement and 16-16-16 fertilizer as follows.
   1gal 1oz
   3-5gal 2oz
   larger 4oz
4. Plant upright and face to give best appearance or relationship to plants, structures and predominant viewing angle. Trees are to be planted so as to be straight up and down without the assistance of staking. Staking is solely for support against outside forces.
5. Loosen and remove twine binding and burlap from around top of each root ball. Scarify root balls of plants exhibiting a root bound condition, being careful not to damage the root balls integrity. Stake and guy trees immediately after this work.
6. Place and compact backfill soil mixture carefully to avoid injury to roots, and fill all voids.
7. When hole is 2/3 filled with soil, completely soak and allow water to soak away at least two times or more, as necessary to completely water individual plants.
8. Guarantee plant materials and related workmanship of installation, beginning after written acceptance of work, for one year.
   A. Replace plant material not surviving or in poor condition during guarantee period.
   B. Perform all replacement work in accordance with original specifications at no additional cost to Owner.
   C. Damage or loss of plant materials due to vandalism, freezing or acts of neglect by others, is exempt from Contractor's replacement responsibility.



DECIDUOUS TREE PLANTING DETAIL



Shrub Planting Detail

GENERAL CONSTRUCTION NOTES

COORDINATION WITH THE EXCAVATING CONTRACTOR,
GENERAL CONTRACTOR AND CIVIL PLANS IS IMPERATIVE.

1. General preparation of site to include:
   A. Eradication of weeds through the certified application of herbicides, allowing adequate time for kill.
   B. Removal, from site, of all existing surface rock and/or debris in planting beds.
2. All shrub beds to be finish raked to a smooth condition prior to mulching.
3. Medium dark mulch to be placed in all shrub beds to a depth of 3"
4. INCLUDE 365 DAYS OF MAINTENANCE from the day of acceptance. Including but not limited to:
   A. Maintain planting area in a healthy, weed free condition through a minimum of weekly visits.
   B. Replace any material showing signs of stress.
   C. Monitor irrigation for correct timing.
   D. Provide owner with complete list of instructions for continued care at the end of the maintenance period.
5. Plan is diagrammatic and measurements should be confirmed on-site. Any changes are the responsibility of the contractor to co-ordinate with the owners representative.

IRRIGATION

1. An automatic irrigation system to be provided for all plant materials areas following the specifications outlined on these plans and in accordance with industry standards. System is intended to perform at 10 gpm and 50 psi. Confirm on-site before proceeding.
2. All materials are to be new and in original condition.
3. Install an approved double check valve per local and state requirements.
4. Place manual drain valves as needed at low points in mainline to insure complete drainage during winter shut down.
5. Mainline should be located in area with least conflict with surrounding utilities. Mainline location on plan for ease of interpretation
6. Control wires, 14ga minimum, to be located below all piping in any ditch
   Any wire splices are to be located in a minimum of a 10" round valve box
   Power control wires to be red, common to be white
   Tape bundled wire together every 5' before placing in ditch.
7. All drip zones to use PVC laterals to locate a point of connection in each individual planting bed.
8. Shrub areas to be irrigated by drip irrigation
   A. All surface drip tubing to be 1/2" poly tubing. Tubing ends to have removable caps. Tubing to buried a minimum of 3-5" and held down every 5' with J-stakes.
   B. Rain Bird XB-10 Emitters to be placed at the outside edge of root zones of plants at the following rate
   1-2g plants 2- 1GPH emitters placed on opposite sides of root ball
   3-5g. plants 3- 1GPH emitters placed on opposite sides of root ball
   Larger material 5- 1GPH emitters spaced equally around perimeter of root ball
   C. All Drip zones to include a 150 mesh filter and 30psi pressure regulator
9. Sizing of pipe for lateral lines to be based on GPM used by each and any individual line. For purposes of counting cumulative GPM use the appropriate manufacturers specification charts based on 50 PSI. Size pipe as noted with standard PVC friction loss charts with no more than 5.0 feet per second velocity. No PVC pipe to be smaller than 1" nominal size.
10. Layout of pipe on plan is diagrammatic and for purposes of clarity. Actual layout determined on-site and will often include multiple pipes in one trench. Wires are to be lowest in trenches followed by mainline piping and finally latera piping.
11. All lateral pipe shall be SCH40 and 1" minimum.
12. Hunter control clock to be mounted on exterior surface of building. Power wiring to be installed by a Certified Electrician.
13. Sleeving to be provided under all hardscapes by general contractor for irrigation purposes.
14. Contractor responsible for any and all safety, security of materials and damage caused by the contactor to existing facilities during the course of installation.
15. Irrigation system to be guaranteed against defective material or workmanship for one year from the date of final acceptance. Damage or loss due to vandalism, freezing or acts of neglect by others, is exempt from Contractor's replacement responsibility after completion and acceptance of installation.
16. Provide owner with an accurate as-built locating all valves, wire splices, main line and any sleeving.

BFP Backflow device 3/4" Wilkins 950-XLT
Double check valve assembly.

GRADING

1. Co-ordinate with general contractor removal of debris 1 1/2" or larger and the removal of compacted rock and gravel in all planting areas in order to achieve planting areas where the sub-grade consists 12" of viable soil as determined by the Approved Testing .Sub-grading to consist of grading native soil previously stored on site to a smooth even grade, no undulation greater than plus or minus 1" within any 10 lineal feet of distance. It may be required to add clean fill to achieve sub-grade consisting of viable soil depending on available retained native soil.
2. Sub-grade to be 6" below finish grade.
3. Placement of any soil to be done in coordination with suitable weather condition so as to prevent damage to soil structure caused by over saturation of water.
4. General contractor responsible to provide a sub-grade within 6" of finish grade in shrub areas. All sub-grades to be adequately firm without being overly compacted.
5. Landscaper to place 6" of compacted (6"loose) clean topsoil to achieve finish grade in all areas. Imported topsoil shall be 10%-70% Sand, 20%-90% silt, and 5%-25% clay; free of alkali, nematodes, harmful chemicals, debris, waste materials, rocks over I" in diameter, and noxious weeds. Place a 3" lift, till to blend with native soil and then place remaining 3" lift. Additional top soil may be necessary depending on available native soil.
6. Finish grade in shrub areas to be a smooth even grade mounded 3" high in the middle of beds and ending 3" below surrounding areas. All finish grading to promote positive drainage away from structures and to be done in such a way as to eliminate puddling or collection of water.
7. Landscape contractor responsible for addressing any drainage problems encountered during the course of construction, with Owners Representative.
8. SEE CIVIL DRAWINGS FOR ADDITIONAL GRADING

LANDSCAPE PLAN

0 10 20 40 60 80

Scale 1" = 20'

TO VERIFY SCALES 0" 1" BAR SHOULD MEASURE ONE INCH BY ONE SIXTEENTH INCH

REGISTERED LANDSCAPE ARCHITECT
528
Thomas A Madara
OREGON
05/09/03

Madara Design Inc
Landscape Architecture, Design & Consultation
2994 Wells Fargo Rd
Central Point, Or 97502
541-664-7055
madaradesign@yahoo.com

OREGON ARCHITECTURE Inc

LOWELL DG HOUSING

Project Lt Location: 484 / 570 N Moss St., Lowell, Or 97542
Proiect DesDescription: PARCEL: -

Approved for the Owner By: Date:

REVISIONS	BY

PLOT DATE:
ISSUE DATE: 08/12/2022
DRAWN BY: TM
JOB NO.: 4669
SHEET

L.1

PRELIMINARY SITE PLAN REVIEW		CITY,STATE - STREET: 484/570 N MOSS ST, LOWELL, OR-97452	DATE: 08/05/22	SITE PLAN A0.1
PROTOTYPE: 'C'	DEVELOPER	DESIGNER		
BLDG/SALES SF: 12,480SF/ 10,387SF	COMPANY: H & H NORTHWEST COMPANIES	COMPANY: OREGON ARCHITECTURE INC.		
ACREAGE: 1.14 A (49,456.2 SF)	NAME: KEVIN HEPNER	NAME: M. MORGAN		
PARKING SPACES: 50 (INCLUDING 2 ACC.)	PHONE #: (503) 810-6108	PHONE #: (541) 772-4372		

PROJECT DATA

SITE AREA:

PARCEL A:49,456.2 SF (1.14 AC)
(1119S1W-6502)
APN: 6502

PARKING:

PER GENERAL RETAIL USES - ONE (1) OFF-STREET PARKING SPACE PER 300 SF OF SALE AREA,

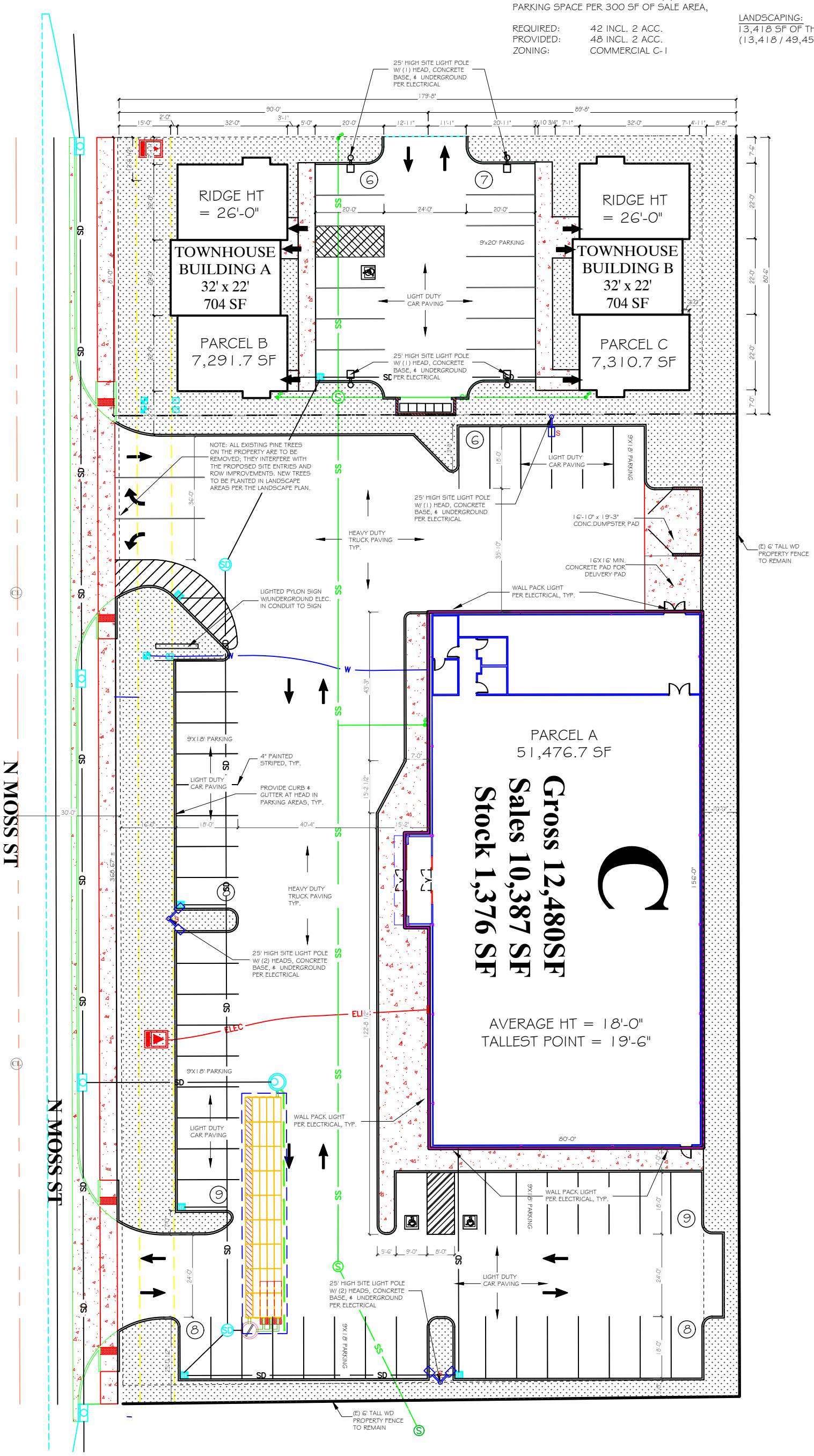
REQUIRED: 42 INCL. 2 ACC.
PROVIDED: 48 INCL. 2 ACC.
ZONING: COMMERCIAL C-1

SETBACK:

PER CITY OF LOWELL ORDINANCE LAND DEVELOPMENT CODE SECTION 9.412 - d - (6) - A-C

FRONT: 10 FEET FROM PROPERTY LINE
SIDE: 10 FEET ABUTTING RESIDENTIAL
REAR: 10 FEET ABUTTING RESIDENTIAL

LANDSCAPING:
13,418 SF OF THE SITE
(13,418 / 49,456.2) x 100% = 27 % OF SITE



SCALE: 1"=30'-0"

RELEASE DATE
7/1/22

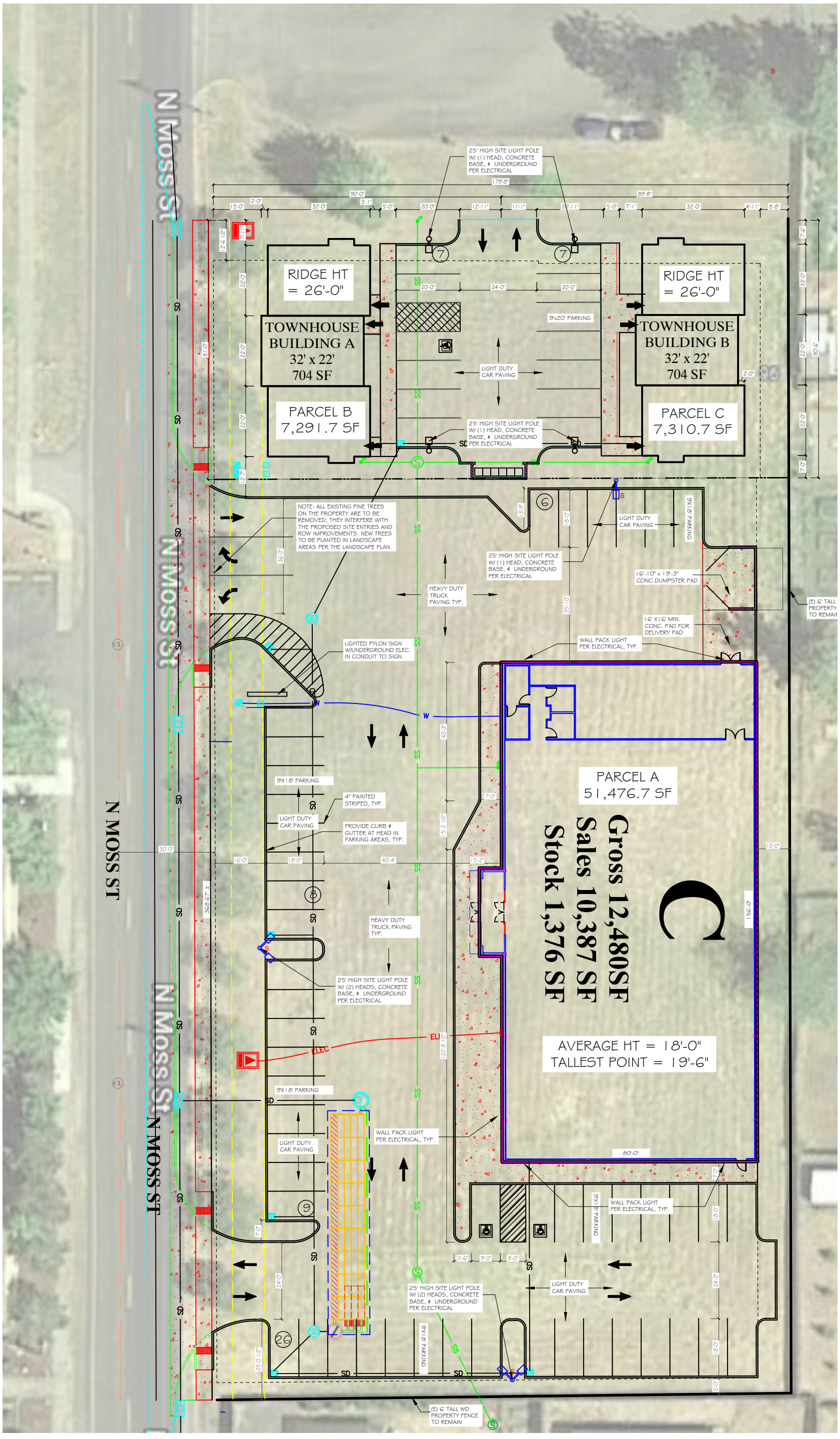
PRELIMINARY SITE PLAN REVIEW

CITY,STATE - STREET: **484/570 N MOSS ST, LOWELL, OR-97452**

PROTOTYPE: 'C'	DEVELOPER	DESIGNER	DATE: 08/05/22
BLDG/SALES SF: 12,480SF/ 10,387SF	COMPANY: H & H NORTHWEST COMPANIES	COMPANY: OREGON ARCHITECTURE INC.	
ACREAGE: 1.14 A (49,456.2 SF)	NAME: KEVIN HEPNER	NAME: M. MORGAN	
PARKING SPACES: 50 (INCLUDING 2 ACC.)	PHONE #: (503) 810-6108	PHONE #: (541) 772-4372	

AERIAL PLAN

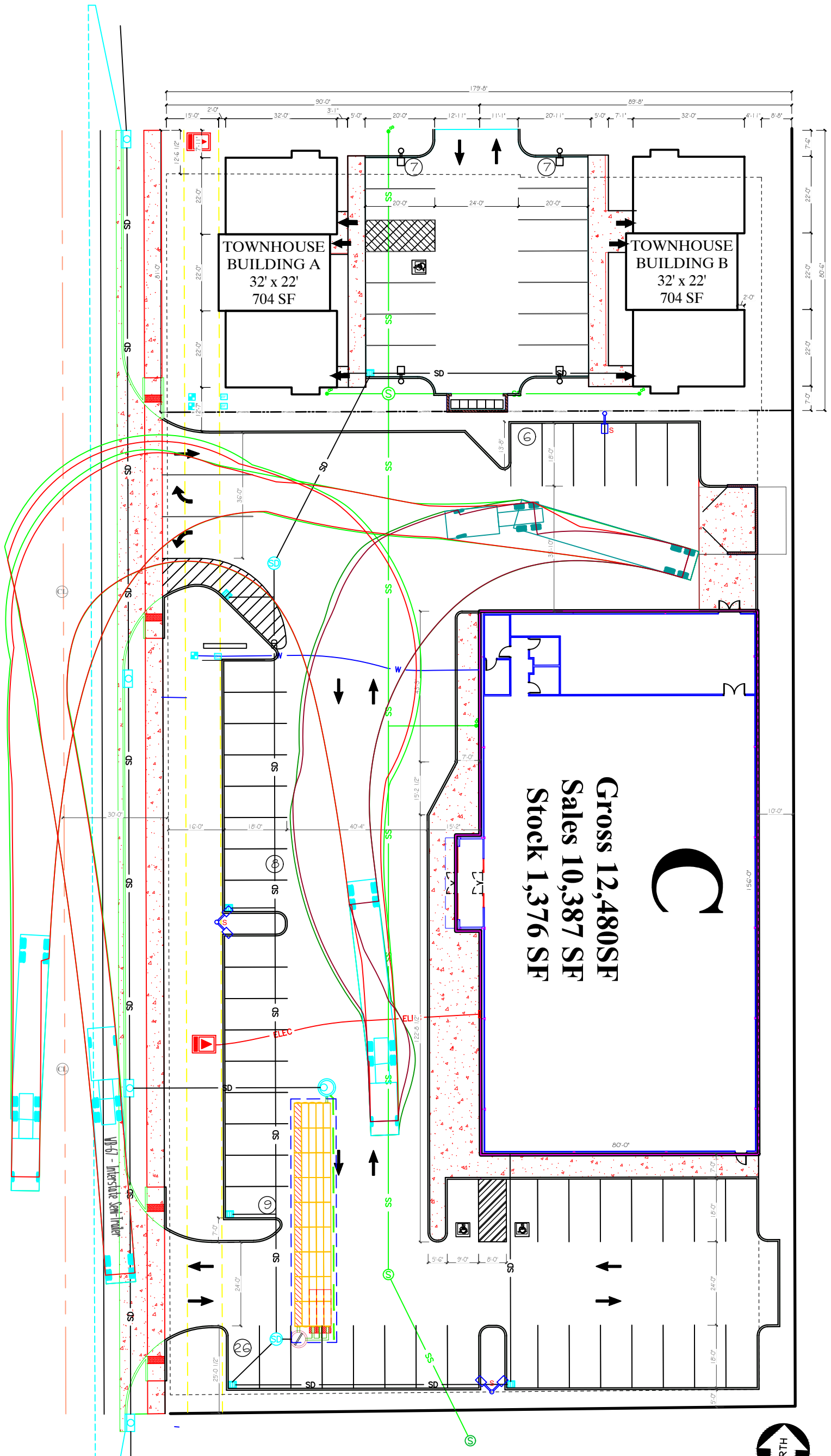
A0.2



SCALE: 1"=30'-0"

RELEASE DATE

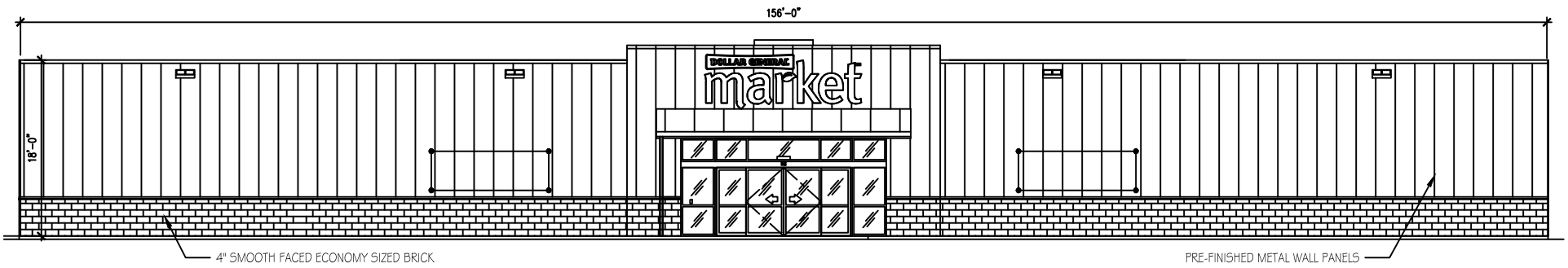
PRELIMINARY SITE PLAN REVIEW		CITY,STATE - STREET: 484/570 N MOSS ST, LOWELL, OR-97452	DATE:	TRUCK PATH
PROTOTYPE: 'C'	DEVELOPER	DESIGNER	08/05/22	A0.3
BLDG/SALES SF: 12,480SF/ 10,387SF	COMPANY: H & H NORTHWEST COMPANIES	COMPANY: OREGON ARCHITECTURE INC.		
ACREAGE: 1.14 A (49,456.2 SF)	NAME: KEVIN HEPNER	NAME: M. MORGAN		
PARKING SPACES: 50 (INCLUDING 2 ACC.)	PHONE #: (503) 810-6108	PHONE #: (541) 772-4372		



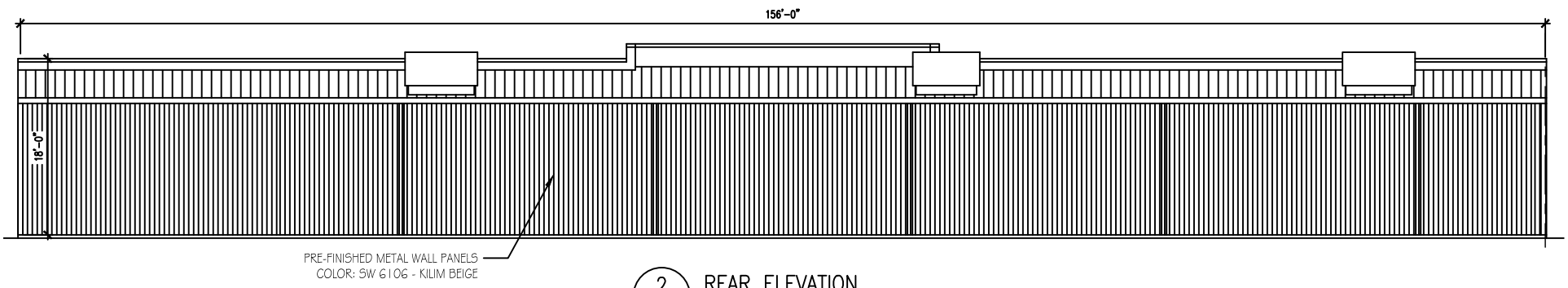
SCALE: 1"=30'-0"

DC

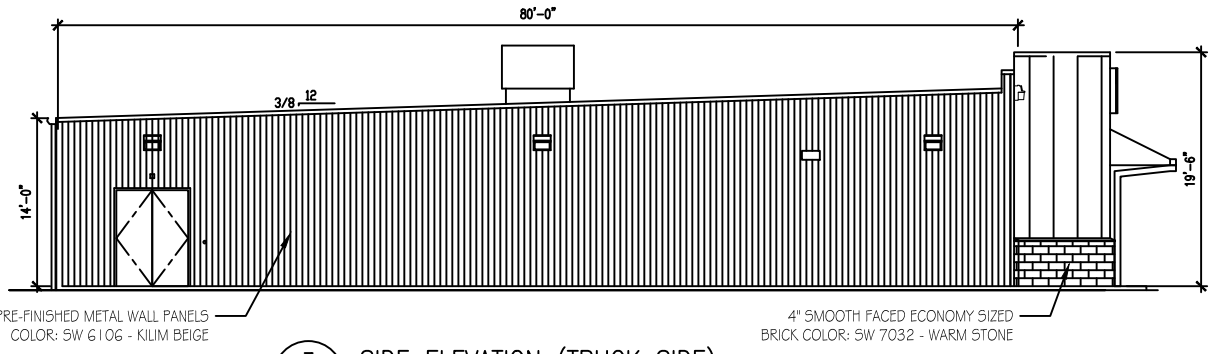
PRELIMINARY SITE PLAN REVIEW		CITY,STATE - STREET: 484/570 N MOSS ST, LOWELL, OR-97452	DATE: 08/05/22	ELEVATIONS A2.0
PROTOTYPE: 'C'	DEVELOPER	DESIGNER		
BLDG/SALES SF: 12,480SF/ 10,387SF	COMPANY: H & H NORTHWEST COMPANIES	COMPANY: OREGON ARCHITECTURE INC.		
ACREAGE: 1.14 A (49,456.2 SF)	NAME: KEVIN HEPNER	NAME: M. MORGAN		
PARKING SPACES: 50 (INCLUDING 2 ACC.)	PHONE #: (503) 810-6108	PHONE #: (541) 772-4372		



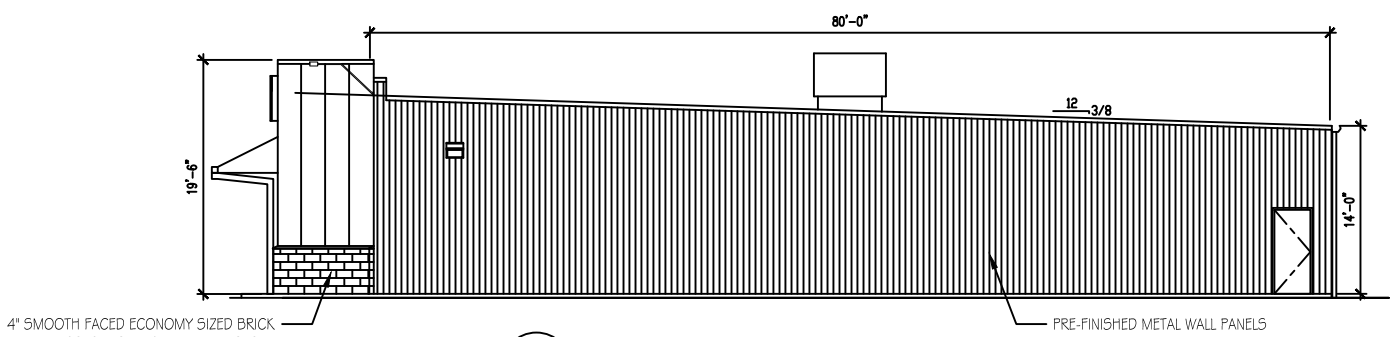
1 / A2.0 FRONT ELEVATION
SCALE: 1/16" = 1'-0"



2 / A2.0 REAR ELEVATION
SCALE: 1/16" = 1'-0"



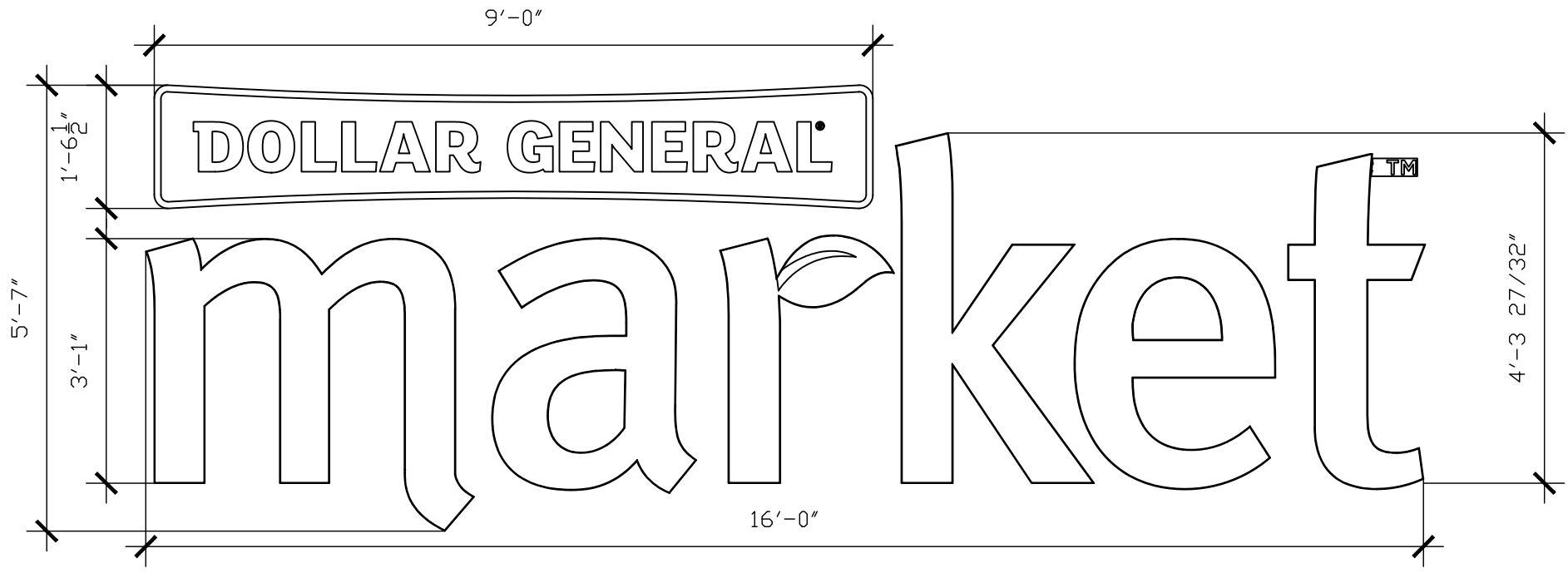
3 / A2.0 SIDE ELEVATION (TRUCK SIDE)
SCALE: 1/16" = 1'-0"

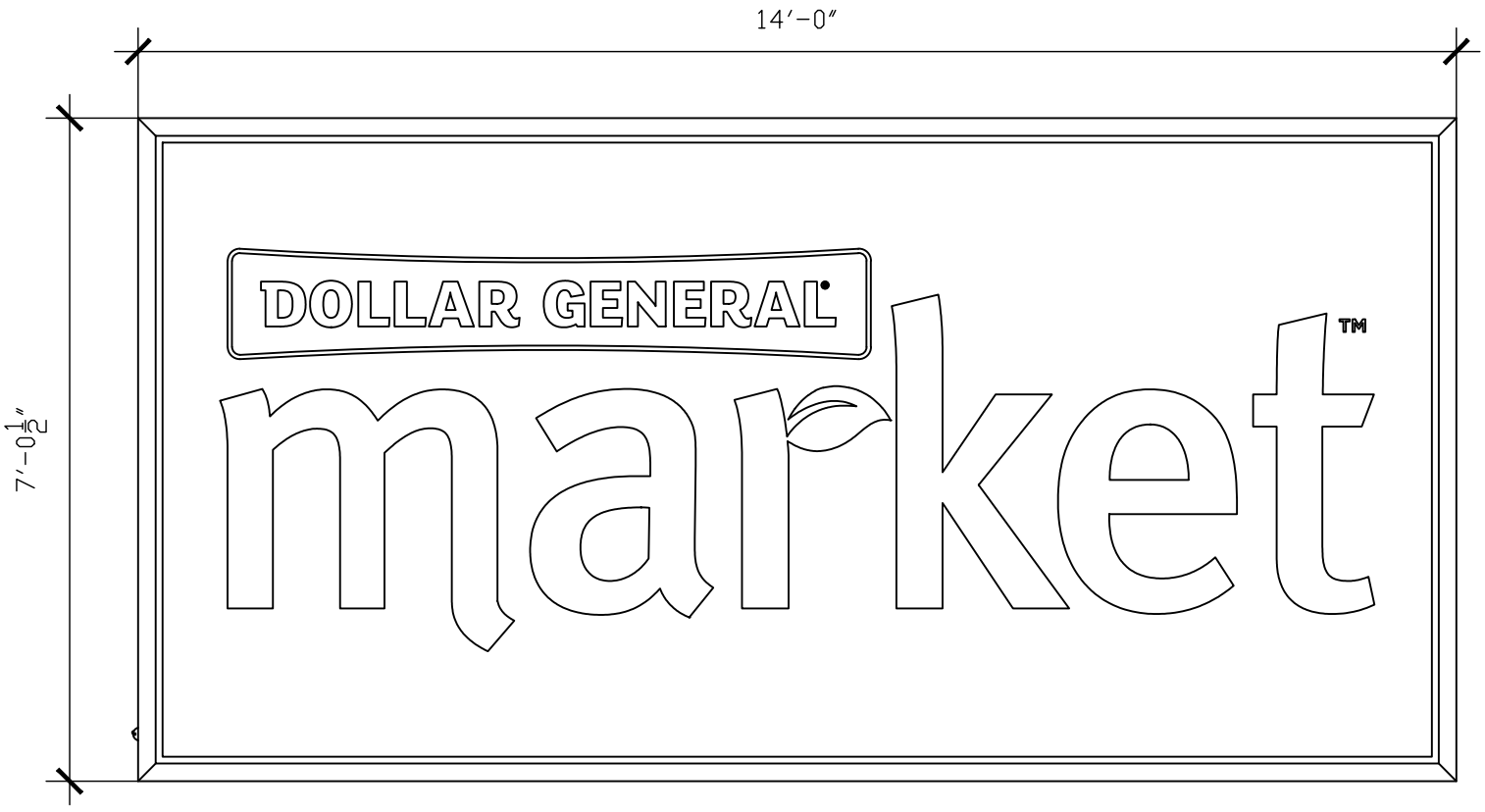


4 / A2.0 SIDE ELEVATION
SCALE: 1/16" = 1'-0"

RELEASE DATE

PRELIMINARY SITE PLAN REVIEW		CITY,STATE - STREET: 484/570 N MOSS ST, LOWELL, OR-97452	DATE: 08/05/22	SIGNAGE A2.1
PROTOTYPE: 'C'	DEVELOPER	DESIGNER		
BLDG/SALES SF: 12,480SF/ 10,387SF	COMPANY: H & H NORTHWEST COMPANIES	COMPANY: OREGON ARCHITECTURE INC.		
ACREAGE: 1.14 A (49,456.2 SF)	NAME: KEVIN HEPNER	NAME: M. MORGAN		
PARKING SPACES: 50 (INCLUDING 2 ACC.)	PHONE #: (503) 810-6108	PHONE #: (541) 772-4372		





THIS IS THE PRIMARY PYLON SIGN
FOR ALL LOCATIONS.

SIGN SPECIFICATIONS

1. BUILDING SIGNS: PROVIDE CONDUIT AND WIRE FROM ELECTRICAL PANEL TO THE SIGN CANOPY. THE CONDUIT IS TO BE 1" AND HAVE ONE SET OF 10/2 WIRE WITH GROUND. BUILDING CANOPY MUST BE SUFFICIENTLY BUILT TO SUPPORT THE DOLLAR GENERAL SIGN OF UP TO 1400 LBS.

2. PYLON SIGNS: PROVIDE CONDUIT FROM ELECTRICAL PANEL TO LOCATION OF THE PYLON SIGN BASE. BURY CONDUIT UNDER PARKING AREA. THE CONDUIT IS TO BE 1" AND HAVE ONE SET OF 10/2 WIRE WITH GROUND.

3. FINAL ELECTRICAL CONNECTIONS FOR SIGN SHALL BE THE SIGN VENDORS RESPONSIBILITY SINCE THE 'J' BOX AND WIRES ARE IN PLACE.

4. CONFIRM SIGN SPECIFICATIONS WITH DOLLAR GENERAL.

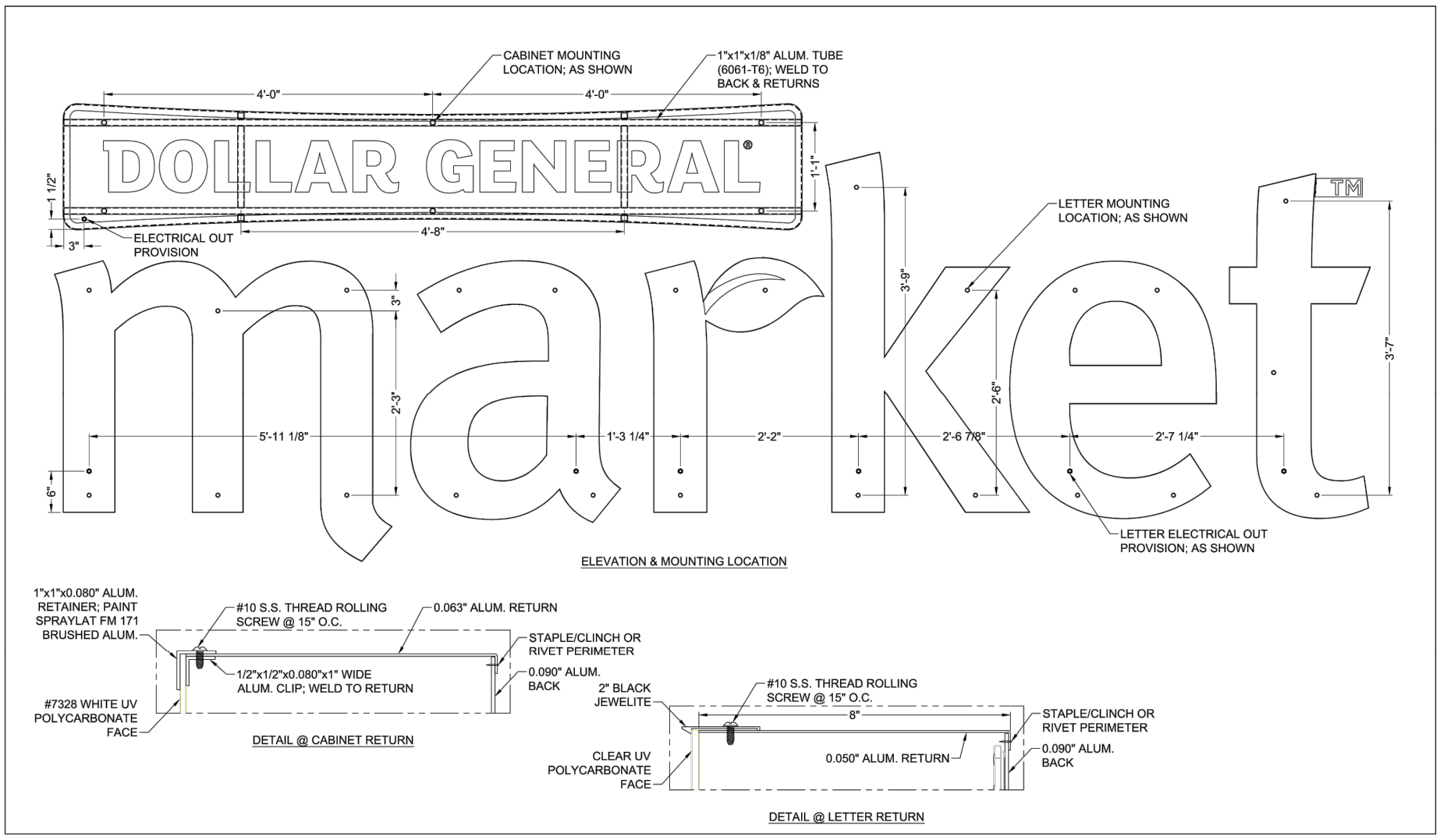
5. SEE SHEET A8 FOR SIGN CONNECTION DETAILS.

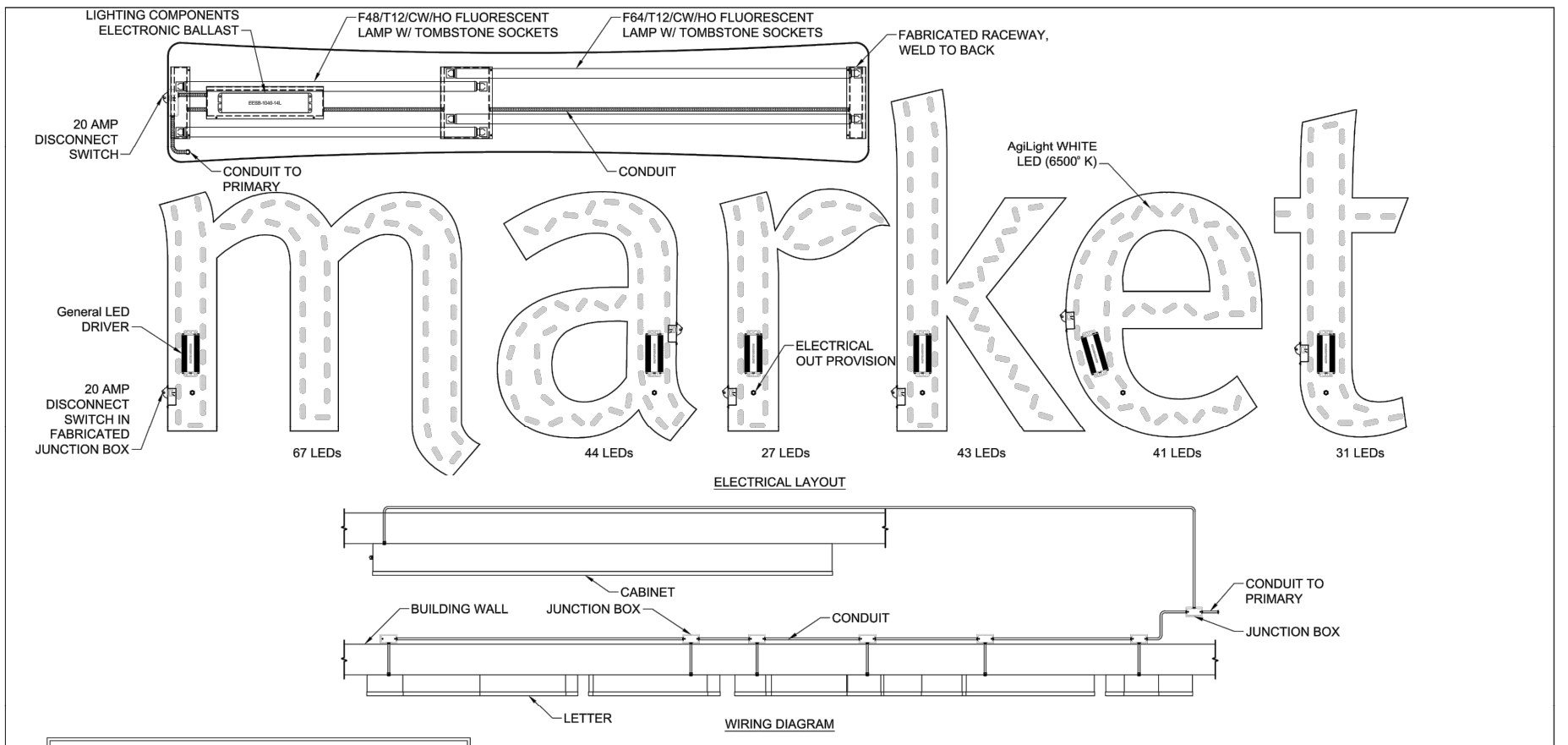
6. PYLON SIGN CABINETS TO CLEAR 15' FROM GRADE AND EDGE SHALL BE LOCATED NO CLOSER THAN 10' TO ANY OVERHEAD UTILITY LINES.

1 / A2.1 SIGN ELEVATIONS
1/2" = 1'-0"

RELEASE DATE

PRELIMINARY SITE PLAN REVIEW		CITY,STATE - STREET: 484/570 N MOSS ST, LOWELL, OR-97452	DATE: 08/05/22	SIGNAGE DETAILS A2.2
PROTOTYPE: 'C'	DEVELOPER	DESIGNER		
BLDG/SALES SF: 12,480SF/ 10,387SF	COMPANY: H & H NORTHWEST COMPANIES	COMPANY: OREGON ARCHITECTURE INC.		
ACREAGE: 1.14 A (49,456.2 SF)	NAME: KEVIN HEPNER	NAME: M. MORGAN		
PARKING SPACES: 50 (INCLUDING 2 ACC.)	PHONE #: (503) 810-6108	PHONE #: (541) 772-4372		





ELECTRICAL REQUIREMENTS:

LAMPS: (2) F64/T12/CW/HO FLUORESCENT LAMP
(2) F48/T12/CW/HO FLUORESCENT LAMP
BALLAST: (1) LIGHTING COMPONENTS EESB-1040-14L @ 2.4 AMPS
LED: (253) AgiLight LS-CORE-45K-G1 WHITE (6500° K)
DRIVER: (6) General LED PS12-60W-100-277V @ 0.8 AMPS
TOTAL LOAD: 7.2A @ 120VAC
CIRCUITS: (1) 20 AMP REQUIRED

120 LEDs MAX. PER DRIVER

1 / A2.1 SIGN CONNECTION DETAILS
NTS

RELEASE DATE

July 15, 2022

Mark Mckechnie, AIA
Raj Mehta
Oregon Architecture
132 West Main Street, Suite 101
Medford, OR 97501

H & H Dixie DR. LLC.
13215 SE Mill Plain Blvd Ste C-8 #529
Vancouver, WA 98684

RE: Application for Site Plan Review **(LU 2022 06)** for a Dollar General Store.

Dear Mr. Mehta & Mr. Mckechnie:

On June 29, 2922, you submitted an application for site plan review for a 12,480 square foot retail store located at Map and Tax Lot 19-01-11-33-06502.

The first step in the application process is reviewing your application to make sure that it is complete. It is critical that we have enough information regarding your application to formulate a recommendation to the Planning Commission. Your application for site plan review is deemed **"incomplete."** Below is a list of items required.

- ***Section 9.204 Application Site Plan.***
  Staff is able to obtain much of the information required for an application site plan from the sheets provided. However, please provide a response for each of the elements described below. If it is not applicable, please indicate so.

  - *(f) The location, size, height and uses for all existing and proposed buildings.*
    - The location and size of proposed buildings is shown, but heights are missing. Please include heights of the retail store and townhomes. If available, please include a mock-up of what the proposed main Dollar General store will look like.
      - RESPONSE: SEE A0.1 AND A2.0.

  - *(h) walls and fences: location, height and materials.*
    - Please indicate the wall materials and color scheme of the exterior building walls. Please indicate location, materials and height of all proposed fences.
    - Please note: the site is located adjacent to a residential district; therefore the maximum building height is 30 feet.
      - RESPONSE: SEE A0.1 AND A2.0.

  - *(i) Access: pedestrian, vehicular, service points ofingress and egress.*
    - Staff point out a general observation about concern for pedestrian safety when crossing North Moss street to reach the townhomes and retail store. No action required of applicant at this time. This should be evaluated in the TIA (also see Lane County's comments.)

- RESPONSE: SEE THE TIA REPORT.

- o *(k) Signs: location, size, height and means o{illumination.*
  - Staff do not see any plans related to signage. Please submit the location, size, height and means of illumination of all proposed signs. If available, submit a mock-up of the proposed main Dollar General store sign.
    - RESPONSE: SEE A0.1 AND A2.0 FOR SIGNAGE LOCATIONS AND SEE A2.1 AND A2.2 FOR SIGNAGE DETAILS.

- o ***(m) Lighting: location and general nature, hooding** devices*.
  - Staff do not see a preliminary lighting plan submitted. Please submit. Include height and illustration or example of the types of lighting devices proposed.
    - Refer to Section 9.529 Exterior Lighting for lighting standards.
      - RESPONSE: LIGHTING SHOWN ON A0.1.

- o ***(n) Street dedication and improvements.***
  - Lane County will require half-street improvements. See Lane County's comments and requirements contained herein.
    - RESPONSE: SEE UPDATED CIVIL PLANS.

- o *(o) Special site features including existing and proposed grades and trees, and **plantings to be preserved and removed.***
  - On the site plan staff see several pine trees denoted of varying height or width. Are these existing trees to remain? Please list and describe any other special site features.
    - RESPONSE: EXISTING PINES TREES ALONG N MOSS STREET TO BE REMOVED TO ALLOW FOR FRONTAGE AND ROW INPROVEMENTS. NEW TREES PROPOSED PER THE LANDSCAPE PLAN. FOR EXISTING AND PROPOSED GRADES SEE THE TOPOGRAPHIC SURVEY.

- ***Section 9.528 Landscaping.***
  - Please submit a preliminary landscaping plan in accordance with the provisions of Section 9.528.
  - (d) Parking Areas:
    - Please include the landscaping to be located in the parking lot. The parking lot shall contain a minimum of 5 percent of landscaping and trees. Show the percentage calculation on the landscape plan.
      - RESPONSE: SEE LANDSCAPE CALCULATION AT THE TOP OF SHEET A0.1.
  - (e) Service Facilities:
    - Show the landscaping and enclosure proposed for the dumpster pad. It shall be screened from public view and landscaped.
      - RESPONSE: SEE REVISED LANDSCAPE PLAN.
      - o Also please note: the dumpster pad protrudes into the rear yard setback. The rear yard setback shall be 10 feet. Please update site plan to show new location of dumpster pad outside of the rear yard setback.
        - RESPONSE: DUMPSTER AND PAD MOVED OUT

OG THE 10' SETBACK. THE DUMPSTER IS TO BE SCREENED FROM VIEW BY A CMU ENCLOSURE ON 3 SIDES AND A LOCKED GATE ON THE FRONT.

- ***Section 9.513 Parking.***
  - (6) All parking areas, except those in conjunction with a single family or two-family dwelling, shall have adequate drainage to dispose of the run-off generated by the impervious surface area of the parking area. On-site collection of drainage water shall not allow sheet flow of water onto sidewalks, public right-of-way or abutting prope1iy and shall detain out-flow velocities to that of undeveloped land. On-site drainage must be approved by the City.
    - Please prepare a drainage plan showing how and where water will drain to on the site. The City Engineer raised drainage as an issue at the pre-app meeting. The materials submitted do not address drainage at all. See the attached comment from the City Engineer.
      - RESPONSE: SEE UPDATED CIVIL PLANS.
  - (a)(8) All off-street parking areas within or abutting residential districts or uses shall be provided with a sight-obscuring fence, wall or hedge as approved by the City to minimize disturbances to adjacent residents.
    - Please show how the parking lot will meet this requirement. Please submit fencing and sigh-obscuring plans for review. Existing residential districts and dwellings located immediately south and east of the subject property.
      - RESPONSE: SEE FENCE CALLED OUT ON ARCHITECTURAL SITE PLAN.
  - (a)(9) A plan, drawn to scale, indicating how the off-street parking requirements are to be fulfilled, shall accompany all requests for City approval or Building Permit.
    - The site plan provided generally does a good job of showing the features of the proposed parking lot but could be improved by detailing some of the missing elements are outlined in this letter, including landscaping.
      - RESPONSE: SEE UPDATED CIVIL PLANS FOR PARKING AND LANDSCAPE PLAN FOR PROPOSED LANDSCAPING.
  - G) Off-street parking spaces shall be required as defined in Section 9.514. Fractional space requirements shall be counted as a whole. Based on a gross square footage of 12,480, 42 off-street parking spaces. Please show precisely how many off-street parking spaces are proposed.
    - RESPONSE: SEE PARKING CALCULATION AT THE TOP OF A0.1, 48 SPACES PROVIDED FOR THE DOLLAR GENERAL PORTION OF THE SITE.

- ***Section 9.706 Multiple-Family Standards.***
  - (a) Access shall be from a designated arterial or collector street
    - The site plan does not adequately show how the multiple-family dwellings will get their legal access. Access must be from a designated arterial or collector street. Also see Lane County's comments

regarding access.
- RESPONSE SEE A0.1 AND ENTRY FROM N MOSS ST.

- Please show how fire trucks can quickly and safely ingress and egress from the dwellings.
  - RESPONSE SEE A0.1 AND ENTRY FROM N MOSS ST.

- (c) On-site bicycle storage facilities, bicycle paths and pedestrian ways shall be provided for developments exceeding six dwelling units.
  - RESPONSE: N/A - ONLY 6 DWELLING UNITS PROPOSED.
- (t) Additional landscaping or screening on the property boundary may be required to mitigate potential adverse impacts on adjacent properties.
  - A landscaping plan, specific to the multiple-family development should be submitted to show how landscaping and screening will occur between adjacent properties. Include locations of fences, including heights, materials and color.
    - SEE REVISED LANDSCAPE PLAN.

- ***Additional Comments for Governmental Agencies***
  - The City Engineer's comments raised at the pre-app meeting are not addressed, which mostly deal with drainage. The City is expecting submittal of a drainage plan prepared by a civil engineer.
  - Lane County Transpo11ation has several concerns that have not been addressed.
    - Lane County is requiring a TIA that has yet to be submitted. Below are the major items Lane County would like addressed but please refer to the scope attached for the complete list of TIA requirements (attached hereto)
    - An evaluation of the number of trips this development would generate from both n011hbound and southbound and what mitigation efforts will need to be taken to prevent congestion and/or queuing.
    - In accordance with LC 15.137, only one intersecting access onto collectors is allowed. We require data supporting the need for two accesses to serve both the Dollar General and housing development.
    - Projections of pedestrian traffic and the connectivity from the sidewalks on the west side of N Moss St.
      - RESPONSE: SEE TIA REPORT.
- Please provided updated site plans/civil drawings of the development demonstrating the following items.
  - Lane County is requiring ½ street improvements as well (not including on-street parking), please see diagram below for Lane County standards from Lane Code 15.710.
  - Ensure all on-site development is occurring outside of the planned right-of-way of 70' [LC 15.070 (l)(c)(cc)]. This is unclear based on the plat provided.
  - Detail the existing conditions of the easement that will be providing access to the housing development.
    - RESPONSE: SEE UPDATED CIVIL PLANS AND ARCHITECTURAL SITE PLAN.

Please see the included form for you to fill out and return. This form makes the City aware of your intentions with respect to responding to the incompleteness items.

As indicated to you on June 30 via email, there are three total land use requests being sought for the proposed development. You have asked the City to combine them into one application and process them concmTently. The City will accommodate your request. All three applications will follow the same timeline and land use approval process. Below staff will provide a quick update on each application and its status:

(1) LU 2022 01 -Request for Zone Change. This application is complete, but since all applications are being processed together, the City will wait until all three applications are complete to begin the noticing and scheduling of the required public hearings. Staff will be issuing a formal letter of completeness for this application.

(2) LU 2022 06-Request for Site Review. Deemed incomplete on July 15, 2022.

(3) LU 2022 04-Request for Tentative Partition. The City will be issuing a completeness determination on this application shortly. The City is in receipt of a Tentative Plat prepared by EGR & Associates.

Sincerely,

Henry Hearley
Associate Planner
Lane Council of Governments

CC
City of Lowell
Civil West Engineering
Lane County Transportation Planning
Lowell Fire Department

Enc:
City Engineer Comments
Lane County Transportation Comments
Completeness Form
Partition Plat 2009-P2377.

September 22, 2022

Mark McKechnie, AIA
Raj Mehta, AIA
Oregon Architecture
132 West Main Street, Suite 101
Medford, OR 97501

H & H Dixie DR. LLC.
13215 SE Mill Plain Blvd Ste C-8 #529
Vancouver, WA 98684

RE: Application for Site Plan Review (**LU 2022 06**) for a Dollar General Store.

Dear Mr. Mehta & Mr. Mckechnie:

On August 12, 2022, you submitted the requested incompleteness items for Site Plan Review for a property located at Map and Tax Lot 19-01-11-33-06502.

Thank you for the submittal of the requested materials. LU 2022-06 has been deemed complete for processing. The date of completeness is August 12, 2022. At your request, all land use applications (LU 2022 01, and LU 2022 04) will be processed concurrently and on the same timeline.

Acceptance as a complete application does not involve determining if the application is approvable based on the applicable approval criteria.

You have granted the City a 60-day extension to the timeline requirements for processing a land use application. Based a completeness date of August 12, 2022, the date by which the City must take final action on the application is February 8, 2023.

The City of Lowell Planning Commission has selected **November 16, 2022**, as the date in which they will hear your applications. The Planning Commission's recommendation for a decision will be forwarded on the City Council. The City Council will hold a public hearing and hear your proposal on **December 6, 2022**.

Notice to adjacent properties will be sent in accordance with the Lowell Development Code.

Sincerely,

Henry Hearley
Associate Planner
Lane Council of Governments

CC
City of Lowell
Civil West Engineering
Lane County Transportation Planning
Lowell Fire Department