Kimley»Horn

May 24, 2019

City of Aurora
Public Works Department
15151 E. Alameda Parkway
Suite 3200
Aurora, CO 80012

Attn: Brianna Medema
Project Engineer

Re: Ferguson Market Distribution – Prologis Park 70
Northwest Quadrant of I-70 and E-470 Interchange
Traffic Study Letter
Aurora, Colorado

Dear Ms. Medema:

This traffic study letter documents a trip generation comparison to identify conformance with the original traffic impact study for the proposed Ferguson Market Distribution Center proposed within Prologis Park 70 in Aurora, Colorado. The Ferguson Market Distribution project is planned to be constructed in two phases. The first phase of construction is proposed to include a 449,280 square foot warehouse building. Full buildout will consist of an additional 168,480 square feet of warehouse space proposed as a future building expansion as well as an additional separate warehouse building consisting of 168,480 square feet. The proposed distribution center will ultimately consist of two buildings totaling 786,240 square feet of warehouse space and is located along the south side of 19th Avenue between Picadilly Road and E-470. A site plan is attached. This traffic study identifies the amount of traffic associated with both Phase 1 and full buildout of this proposed project.

The purpose of this letter is to provide a trip generation comparison for the proposed Ferguson Market Distribution Center to determine the amount of traffic attributable to the proposed project. Regional access to Ferguson Market Distribution is provided by Interstate 70 (I-70) and E-470. Primary access is provided by Colfax Avenue and Smith Road. Direct access is provided by two driveways to be located along the south side of 19th Avenue between Picadilly Road and E-470.

This development area was studied within the “Prologis Park 70 Distribution Center Revised Traffic Impact Study Addendum”, completed by Langan in March 2017 (2017 Langan study). The trip generation of the proposed Ferguson Market Distribution project is compared with the trip generation for the applicable uses evaluated as part of the original traffic study. The 2017 Langan traffic impact study provided an update to a previous study completed by Kimley-Horn and Associates, Inc., dated September 23, 2003 (2003 Kimley-Horn study). The 2017 Langan study assumed a new density plan by the developer which consisted of 3,486,267 square feet of warehousing space compared to 4,320,000 square feet of warehousing space assumed in the 2003 Kimley-Horn study. This new square footage is 833,733 less than what was originally studied and approved in the 2003 Kimley-Horn study.

This reduction of 833,733 square feet in addition to the 1,015,740 square feet of warehousing space proposed in the 2017 Langan study was analyzed to calculate the remaining approved trip generation estimates for the overall Prologis Park 70 project area. It was determined that 2,470,527 square feet of warehousing space remained under the current density plan.

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Report*[1] published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. Trip generation estimates for the remaining 2,470,527 square feet of warehouse land use as calculated in the 2017 Langan study were based on the approved warehouse land use trip generation rates as used in the 2003 Kimley-Horn study. The proposed Ferguson Market Distribution Center trip generation will be compared to the trip generation of the remaining warehouse space presented in the 2017 Langan study. Applicable trip generation calculations and report documentation from the 2017 Langan study are attached.

The total 2,470,527 square-foot area for the entire Prologis Park 70 distribution center development within the original 2017 Langan study was anticipated to generate 16,058 daily weekday trips with 791 trips occurring during the morning peak hour and 544 trips occurring during the afternoon peak hour.

The total land area for the Ferguson Market Distribution Center project is planned on approximately 53-acres. The proposed project is planned for a proportion of the overall Prologis Park 70 Distribution Center development area of 284 acres that was considered within the previous study. The currently proposed project site area was prorated for the development area to identify the applicable amount of project traffic for this proposed site based on the size compared to the overall Prologis Park 70 Distribution Center area. This equates to approximately 19.0 percent (53 acres / 284 acres) of the original traffic generated for the entire distribution center project site. Further, these adjusted trip values were compared to the trip generation of the proposed 786,240 square foot proposed Ferguson Market Distribution.

The ITE Trip Generation, 10th Edition (most current edition) regression equations for warehousing (ITE Code 150) land use were used for the currently proposed project. The following table summarizes the anticipated trip generation for the proposed 786,240 square foot Ferguson Market Distribution project (trip generation calculations are attached) compared to the expected trip generation for the overall warehousing land use previously studied in the 2017 Langan study (prorated by 19.0 percent as calculated).

1 Institute of Transportation Engineers, *Trip Generation: An Information Report*, Tenth Edition, Washington DC, 2017.

Trip Generation Comparison
Prologis Park 70 (previous study) vs. Ferguson Market District (proposed)

USE AND SIZE	DAILY VEHICLE TRIPS	WEEKDAY VEHICLE TRIPS					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Previous Study – Prologis Park 70 Distribution Center							
Warehousing – 2,470,527 SF	*16,058*	*494*	*297*	*791*	*99*	*445*	*544*
Prorated to Site (19%)	3,050	94	56	150	19	84	103
Current Proposal – Ferguson Market Distribution							
Phase One Warehousing (ITE 150) – 449,280 SF	756	62	18	80	22	60	82
Full Buildout Warehousing (ITE 150) – 786,240 SF	1,288	92	28	120	33	89	122
Net Difference in Trips (Full Buildout)	***-1,762***	***-2***	***-28***	***-30***	***+14***	***+5***	***+19***

As summarized in the table, the currently proposed first phase of Ferguson Market Distribution is anticipated to generate 756 daily weekday trips with 80 trips occurring during morning peak hour and 82 trips occurring during the afternoon peak hour based on ITE equations and data. Full buildout of Ferguson Market Distribution within Prologis Park 70 is anticipated to generate 1,288 daily weekday trips with 120 trips occurring during morning peak hour and 122 trips occurring during the afternoon peak hour. Based on the original traffic study assuming an adjusted warehouse use development area, the proposed Ferguson Market Distribution within Prologis Park 70 is anticipated to generate traffic within the volume limits previously studied for the daily and morning peak hour. The afternoon peak hour traffic is anticipated to increase slightly. The change in use is anticipated to account for a decrease of approximately 1,762 daily trips and 30 fewer morning peak hour trips. An increase of approximately 19 afternoon trips may be expected than previously studied. Accounting for the overall Prologis Park 70 trip generation of 554 afternoon peak hour trips, this project is anticipated to increase traffic generated by the overall development area by only 3.5 percent during the weekday afternoon peak hour.

Based on the results of the trip generation comparison, full buildout development of the 786,240 square foot Ferguson Market Distribution Center should not change the results of the original traffic study as the adjacent public streets and surrounding area intersections are anticipated to successfully accommodate this project traffic volume. Therefore, the proposed Ferguson Market Distribution Center within Prologis Park 70 project is believed to be in traffic compliance with the original "Prologis Park 70 Distribution Center Revised Traffic Impact Study Addendum", completed by Langan in March 2017, which included this development area. It is believed that all potential traffic impacts with the proposed project have been previously addressed within the original traffic impact study. We believe no further traffic analysis is needed due to this proposal. If you have any questions or require anything further, please feel free to call me at (303) 228-2304.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Curtis D Rowe

Curtis D. Rowe, P.E., PTOE
Vice President

Kimley»Horn

Project	Ferguson market Distribution (Phase 1)				
Subject	Trip Generation for Warehousing				
Designed by	ACK	*Date*	May 24, 2019	*Job No.*	096373012
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Warehousing (150)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)
Gross Floor Area = 449,280
X = 449.3
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 69)

Average Weekday
T =0.12 (X) + 25.32
(T) = 0.12 * 449.28 + 25.32

Directional Distribution: 77% ent. 23% exit.
T = 80 Average Vehicle Trip Ends
62 entering 18 exiting

62 + 18 = 80

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 70)

Average Weekday
T =0.12 (X) + 27.82
(T) = 0.12 * 449.28 + 27.82

Directional Distribution: 27% ent. 73% exit.
T = 82 Average Vehicle Trip Ends
22 entering 60 exiting

22 + 60 = 82

Weekday (100 Series Page 68)

Average Weekday
T = 1.58 (X) + 45.54
(T) = 1.58 * 449.28 + 45.54

Directional Distribution: 50% entering, 50% exiting
T = 756 Average Vehicle Trip Ends
378 entering 378 exiting

378 + 378 = 756

Kimley»Horn

Project	Ferguson market Distribution (Full Buildout)				
Subject	Trip Generation for Warehousing				
Designed by	ACK	*Date*	May 24, 2019	*Job No.*	096373012
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 10th Edition, Fitted Curve Equations

Land Use Code - Warehousing (150)

Independant Variable - 1000 Square Feet Gross Floor Feet (X)
Gross Floor Area = 786,240
X = 786.2
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 69)

Average Weekday
T =0.12 (X) + 25.32
(T) = 0.12 * 786.24 + 25.32

Directional Distribution: 77% ent. 23% exit.
T = 120 Average Vehicle Trip Ends
92 entering 28 exiting

92 + 28 = 120

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 70)

Average Weekday
T =0.12 (X) + 27.82
(T) = 0.12 * 786.24 + 27.82

Directional Distribution: 27% ent. 73% exit.
T = 122 Average Vehicle Trip Ends
33 entering 89 exiting

33 + 89 = 122

Weekday (100 Series Page 68)

Average Weekday
T = 1.58 (X) + 45.54
(T) = 1.58 * 786.24 + 45.54

Directional Distribution: 50% entering, 50% exiting
T = 1288 Average Vehicle Trip Ends
644 entering 644 exiting

644 + 644 = 1288

TRAFFIC IMPACT STUDY

For

Prologis Park 70
Distribution Center
City of Aurora
Adams County, Colorado

Prepared For:

Prologis
4545 Airport Way
Denver, CO 80239

Prepared By:

Langan Engineering & Environmental Services, Inc.
989 Lenox Drive
Suite 124
Lawrenceville, NJ 08648
NJ Certificate of Authorization No: 24GA27996400

Richard Burrow, P.E.
P.E. License No. 0050315

Alan W. Lothian

Revised 31 March 2017
Revised 25 January 2017
18 November 2016
100581601

PROPOSED CONDITIONS

Site-Generated Trips

The overall development was originally approved for 4,320,000 sf of warehouse space. The trip generation estimates for the original approval are summarized in Table 2. As per the 2003 traffic studies, the trip generation was determined based on the calculated rates (Appendix C page C3) for an existing Prologis warehouse facility located in Denver, Colorado. The data collected at the existing Prologis facility is contained in Appendix C on pages C4 – C12. According to the 2003 addendum study, the rates were approved by both the City of Aurora and CDOT for this project and were therefore used in place of standard ITE (Institute of Transportation Engineers) trip generation rates.

The rates and calculations in Table 2 below are summarized in Appendix C on page C3. The trip generation estimates in Table 2 were used as the full buildout traffic generation for the EastGate Industrial Warehouse in the September 23, 2003 addendum traffic study. The traffic generation estimates below included both trucks and passenger cars. The 2003 traffic study did not have a vehicle breakdown of the trips. However based on information from page C12 the approximate truck percentage would be 20% of the traffic generation in Table 2.

Table 2 – Trip Generation Estimates – Original Approval (4,320,000 sf)

Use	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Rate	*6.5*	*0.2*	*0.12*	*0.32*	*0.04*	*0.18*	*0.22*
4,320,000sf	28,080	864	518	1,382	173	778	951

For the 1,015,740 sf proposed distribution center, located within the overall development, we prepared trip generation estimates based on tenant-specific projected operations. The specific projected operations information was provided by the proposed tenant of the 1,015,740 sf distribution center and is separate from the Prologis rates on page C3.

The proposed distribution center trip generation estimates are based on operations during the anticipated peak operating season (November – December). During other times of the year the trip generation would be significantly less (approximately 40 percent), as shown in the following table. Table 3 summarizes the trip generation estimates for the distribution center during the weekday morning and evening peak hours during both the peak and non-peak operating seasons. The tenant-specific data is contained in Appendix C on pages C1 and C2.

Table 3 – Future Trip Generation Estimates – Proposed 1,015,740 sf Warehouse

Use	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Peak Operating Season (November – December)							
Passenger Cars*	3,532	752	8	760	802	802	1,604
Trucks*	336	5	8	13	27	22	49
Total	**3,868**	**757**	**16**	**773**	**829**	**824**	**1,653**
Non-Peak Operating Season							
Passenger Cars*	2,122	454	4	458	484	484	968
Trucks*	178	4	4	8	8	9	17
Total	**2,300**	**458**	**8**	**466**	**492**	**493**	**985**
Trip Difference							
Difference	**1,568**	**299**	**8**	**307**	**337**	**331**	**668**

*Based on Tenant specific data.

Unlike the Prologis data (Appendix C page C12) that suggests 20% heavy vehicles during the peak roadway hours (7:00 AM to 9:00 AM; 4:00 PM to 6:00 PM) the tenant-specific data, during peak season operations, has approximately 2% heavy vehicles generated during the peak roadway hours.

Taking into account the trip generation estimates of the original approval, and both operating seasons of the proposed 1,015,740 sf distribution center, the remaining trip generation of the original approval is as follows in Table 4.

Table 4 – Trip Generation Estimates – Remaining Approved

Use	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Peak Operating Season (November – December)							
4,320,000sf	28,080	864	518	1,382	173	778	951
1,015,740sf Proposed	- 3,868	- 757	- 16	- 773	- 829	- 824	- 1,653
Total	**24,212**	**107**	**502**	**609**	**- 656**	**- 46**	**- 702**
Non-Peak Operating Season							
4,320,000sf	28,080	864	518	1,382	173	778	951
1,015,740sf Proposed	- 2,300	- 458	- 8	- 466	- 492	- 493	- 985
Total	**25,780**	**406**	**510**	**916**	**- 319**	**285**	**- 34**

Based on the most recent density plan provided by Prologis, the overall development has potential for a total of 3,486,267 sf of warehouse space inclusive of the proposed 1,015,740 sf distribution center, which is approximately 833,733 sf less than what was originally approved. The single tenant building is proposed to occupy 1,015,740 sf of the overall square footage; therefore, the remaining square footage of the current density plan is 2,470,527 sf. To date only roadway construction has occurred within the overall development and no building construction has yet to occur. The trip generation estimates for the 2,470,527 sf of warehouse

space, calculated based on the rates used in the 2003 traffic studies and shown on page C3, is summarized in Table 5. The calculations are also shown on page C3 in Appendix C.

Table 5 – Trip Generation Estimates (2,470,527 sf)

Use	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Rate	*6.5*	*0.2*	*0.12*	*0.32*	*0.04*	*0.18*	*0.22*
2,470,527sf	16,058	494	297	791	99	445	544

The trip generation estimates, as shown in Table 5, for the remaining 2,470,527 sf were included as an approved development in the calculation of the background growth in the 2036 traffic volume projections. To be consistent with the information from the 2003 traffic studies we did not do a vehicle type breakdown of the remaining 2,470,527 sf warehouse space since the addendum study rates (Appendix C page C3) are based on overall vehicles. However based on information from page C12 the approximate truck percentage would be 20% of the traffic generation in Table 5.

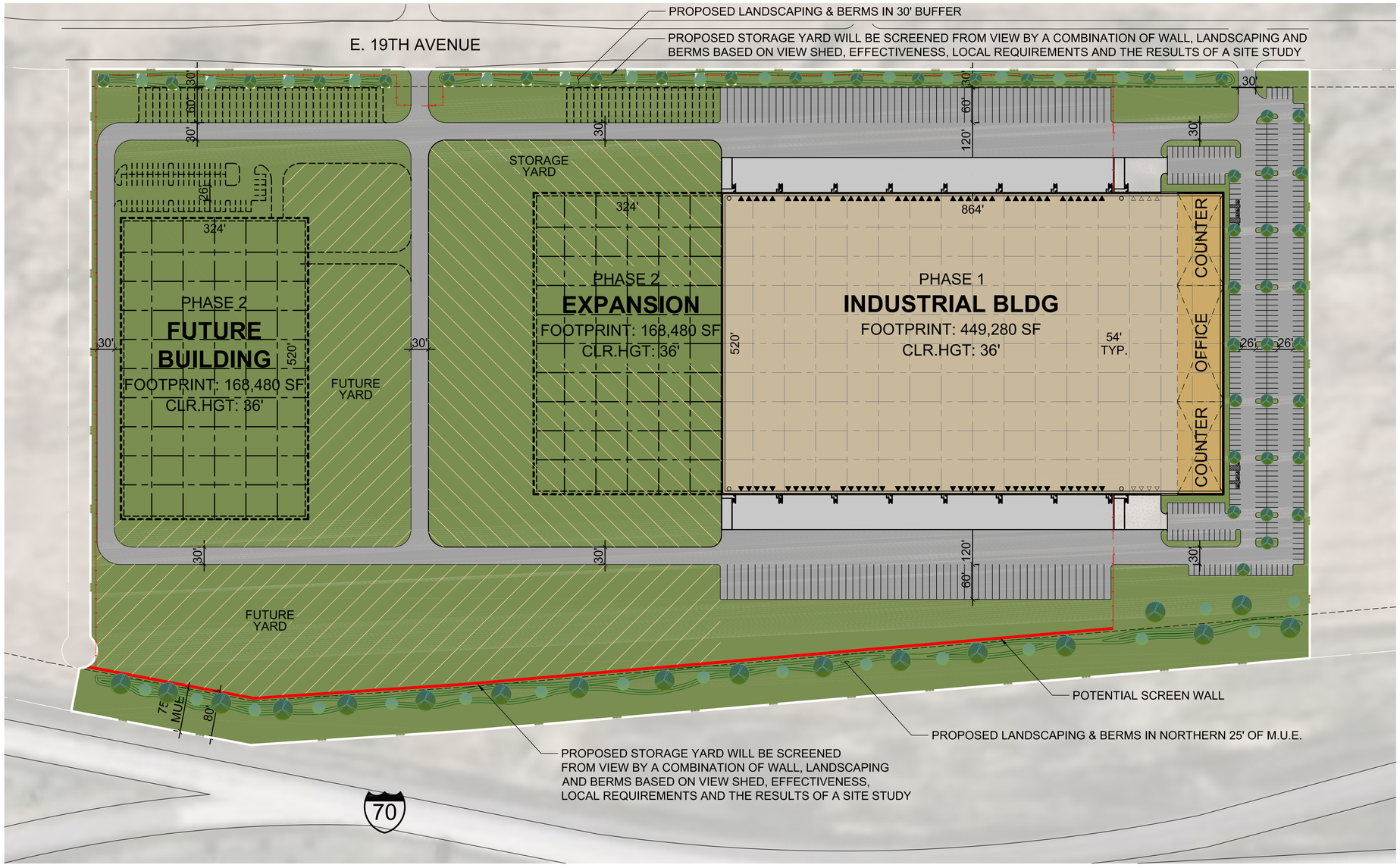
Trip Distribution

We determined the directional distribution of the site-generated trips based on existing and expected travel patterns in the study area, journey-to-work data, and a review of the prior distributions used in the 2003 traffic studies (Appendix F). To be conservative, and consistent with the 2003 traffic studies, we did not include the potential Picadilly Road or Harvest Road interchanges. Therefore, the trip distributions for both the 2018 and 2036 horizon years are the same. The directional distributions of site-generated trips are summarized in Table 6.

Table 6 – Trip Distribution

Direction (To/From)	Arrival	Departure
I-70 (East)	5%	5%
I-70 (West)	20%	20%
E-470 (North)	6%	6%
E-470 (South)	7%	19%
Gun Club Road (South)	22%	10%
Smith Road (West)	35%	35%
Picadilly Road (North)	5%	5%
Total	**100%**	**100%**

We assigned the site-generated traffic to the adjacent roadway system as per the above distributions. Figure 4 shows the arrival and departure distributions for both the short-term and long-term years. Figures 5 and 6 show the site-generated traffic for the passenger cars and trucks, respectively. Figure 7 shows the total site-generated traffic assigned to the roadway network.



PROJECT DATA:

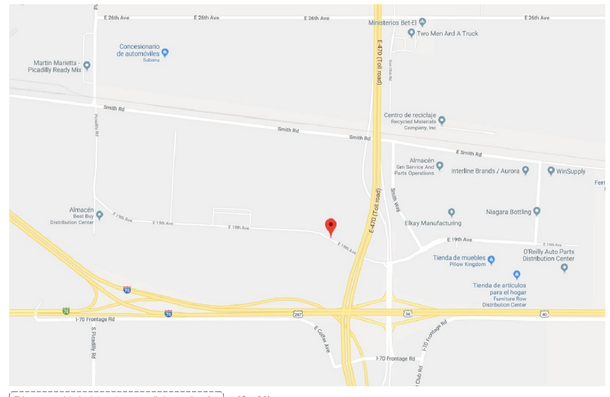
PHASE 1:		
GROSS:		52.84 AC
		2,301,574 SF
INDUSTRIAL BUILDING		449,280 SF
YARD:	@ 15%	352,242 SF
TOTAL FOOTPRINT:		801,522 SF
BUILDING USE:		
WAREHOUSE		407,680 SF
COUNTER		25,600 SF
OFFICE		16,000 SF
COVERAGE:		
GROSS:		35%
PARKING REQUIRED:		
WAREHOUSE	1/2000 SF	204 STALLS
COUNTER	1/300 SF	86 STALLS
OFFICE	1/300 SF	53 STALLS
TOTAL		343 STALLS
PARKING PROVIDED:		
AUTO:		355 STALLS
		@0.44/1000 SF
REQ. ACCESSIBLE		*8 STALLS*
TRAILER:		112 STALLS
TRUCK DOCKS:		
INDUSTRIAL BUILDING		
▲ DOCK-HIGH DOORS		82
△ 24" DOCK DOOR		8
○ GRADE-LEVEL DOORS		4
PHASE 2:		
GROSS:		52.84 AC
		2,301,574 SF
BUILDING FOOTPRINT:		
INDUSTRIAL BUILDING		449,280 SF
PHASE 2		
EXPANSION		168,480 SF
FUTURE BUILDING		168,480 SF
FUTURE YARD:	@ 23%	522,557 SF
TOTAL FOOTPRINT:		1,308,797 SF
BUILDING USE:		
WAREHOUSE		407,680 SF
COUNTER		25,600 SF
OFFICE		16,000 SF
COVERAGE:		
GROSS:		57%
PARKING REQUIRED:		
WAREHOUSE	1/2000 SF	204 STALLS
COUNTER	1/300 SF	86 STALLS
OFFICE	1/300 SF	53 STALLS
TOTAL		343 STALLS
PARKING PROVIDED:		
AUTO:		355 STALLS
FUTURE PARKING		65 STALLS
		@0.27/1000 SF
REQ. ACCESSIBLE		*8 STALLS*
TRAILER:		112 STALLS
FUTURE TRAILER		57 STALLS
TRUCK DOCKS:		
INDUSTRIAL BUILDING		
▲ DOCK-HIGH DOORS		82
△ 24" DOCK DOORS		8
○ GRADE-LEVEL DOORS		4

DEVELOPMENT STANDARDS:

ZONING:	E-470
MAX. F.A.R.:	n/a
MAX. COVERAGE:	n/a
MAX. HEIGHT:	60 FT
BUILDING SETBACKS:	
FRONT:	n/a
SIDE:	n/a
REAR:	n/a
LANDSCAPE SETBACKS:	
FRONT:	n/a
SIDE:	n/a
REAR:	n/a
LANDSCAPE REQ.:	[1]
OFF-STREET PARKING:	
STANDARD:	9X19
COMPACT:	n/a
COMPACT %:	n/a
DRIVE AISLE:	23 FT
FIRE LANE:	26 FT
OVERHANG:	n/a
TREE WELL:	8 FT
REQ. PARKING RATIO BY USE:	
WAREHOUSE:	1/2000 SF
OFFICE:	1/300 SF

NOTES:

1 Development shall be organized and designed to protect, appropriately use, or enhance the following types of natural resources and features. This shall be accomplished by including such features in common landscaped areas or dedicated open space, by allowing construction in these areas sensitive to the protection of these features, or by mitigating impacts. If possible, these features shall be connected or integrated with similar features on adjacent lands.



This conceptual design is based upon a preliminary review of entitlement requirements and on unverified and possibly incomplete site and/or building information, and is intended merely to assist in exploring how the project might be developed.

1" = 80'

0 40 80 160 400

NORTH

scheme: 1

Conceptual Site Plan

E 19th Ave & I-70 Frontage Rd
Denver, Colorado

WARE MALCOMB

DCS19-4023-00
02.26.2019

SHEET
1