

TRAFFIC GENERATION STUDY
CONSOLIDATED READY MIX
162 N. ASPAN AVENUE
AZUSA, CALIFORNIA



Prepared for
Consolidated Ready Mix, LLC
162 N. Aspan Avenue
Azusa, CA 91702
Attn.: Mr. Rondell Fletcher, President
Tel: 562-335-7400
Email: rondell@consolidatedrm.com



Prepared by
Traffic Design, Inc.
862 Canterbury Ln
San Dimas, CA 91773
Tel: 626-826-7560
Under the Supervision of:
M. Yunus Rahi, Ph.D, P.E, T.E
Registered Civil and Traffic Engineer

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PREPARER'S CERTIFICATION

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This is to certify that the above titled traffic study has been prepared under the supervision of M. Yunus Rahi, Ph.D, P.E, T.E, a Professional Civil and Traffic Engineer, registered in the State of California.





M. Yunus Rahi, Ph.D, P.E, T.E
Registration #: C-59183, TR-1726

12-12-2018
Date

Professional Engineer's Stamp

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INTRODUCTION

The purpose of this traffic analysis is to determine existing 24-hour average daily traffic (ADT) volumes as well as peak hour traffic volumes to be generated by the operation of Consolidated Ready Mix located at 162 N. Aspan Avenue in the City of Azusa, California.

Figure 1 shows an aerial view of the project site and the vicinity.

The site is accessed from the north or south via a driveway on Aspan Avenue. Due to the nature of the operation of the business, trucks will travel between the site and the Foothill Freeway (I-210) to carry and deliver materials to its customers.

Figure 2 shows the circulation system of the surrounding area.

1st Street is part of the City's designated truck route. The project related truck traffic will utilize the following routes to and from the site:

- Trucks coming to the site using eastbound Foothill Freeway will travel to Vernon Avenue exit ramp to 3rd Street, then either 1) turn right on 3rd Street, turn left on Aspan Avenue, and finally enter the site by turning left into the driveway, or 2) turn left on 3rd Street, turn right on Vernon Avenue, turn right on 1st Street, turn right on Aspan Avenue, and finally enter the site by turning right into the driveway.
- Trucks coming to the site using westbound Foothill Freeway will travel to Vernon Avenue exit ramp to Vernon Avenue, turn left on Vernon Avenue, then either 1) turn right on 3rd Street, turn left on Aspan Avenue, and finally enter the site by turning left into the driveway, or 2) turn right on 1st Street, turn right on Aspan Avenue, and finally enter the site by turning right into the driveway.
- Trucks leaving the site to destinations using eastbound Foothill Freeway will either 1) exit the site by making a right turn on Aspan Avenue, then turn right on 3rd Street to Vernon Avenue, and finally travel straight onto the I-210 eastbound on-ramp, or 2) exit the site by making a left turn on Aspan Avenue, then turn left on 1st Street to Vernon Avenue, turn left on Vernon Avenue, and finally turn right onto the I-210 eastbound on-ramp.

FIGURE 1: AERIAL VIEW OF THE SITE AND VICINITY

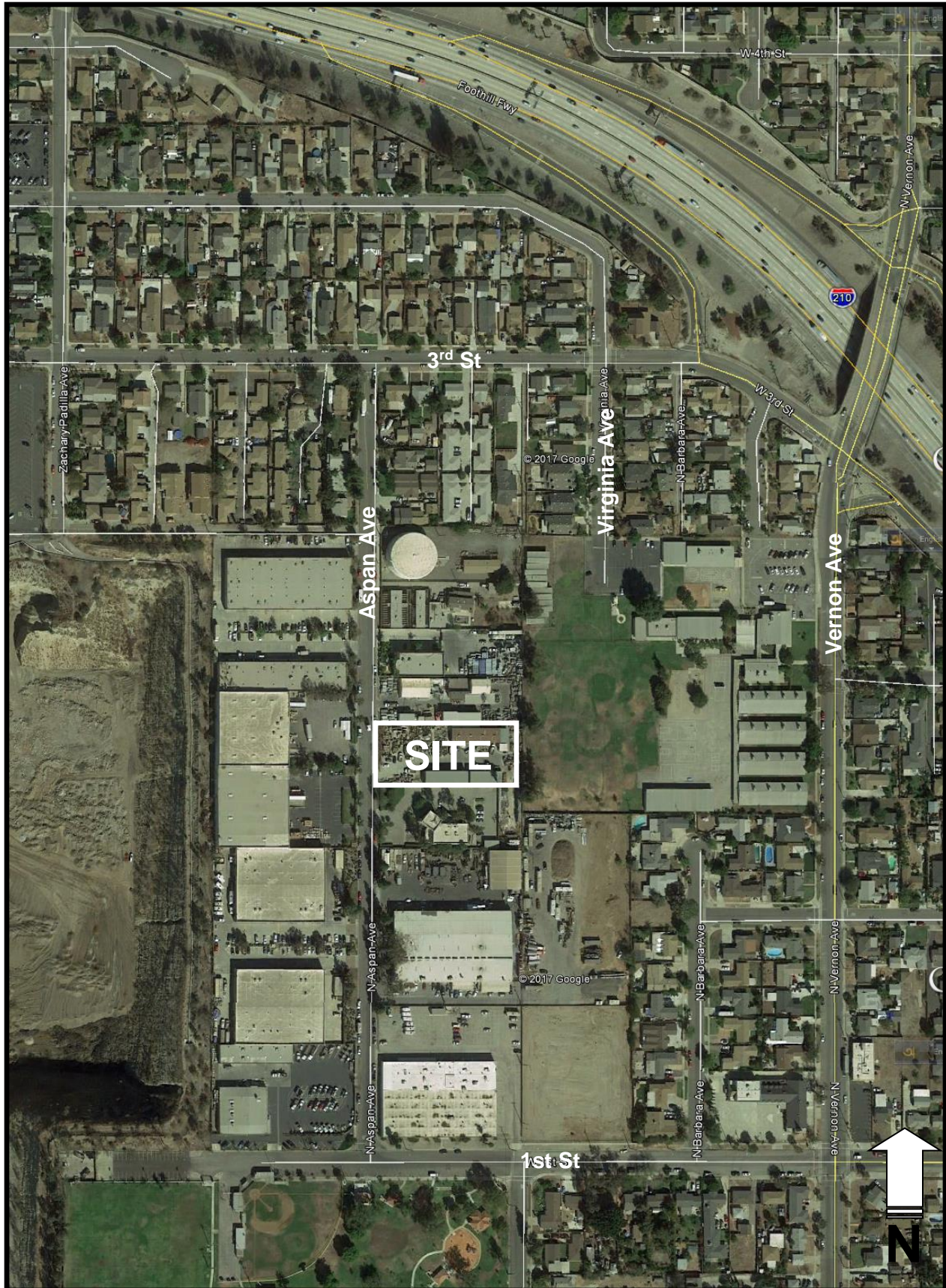
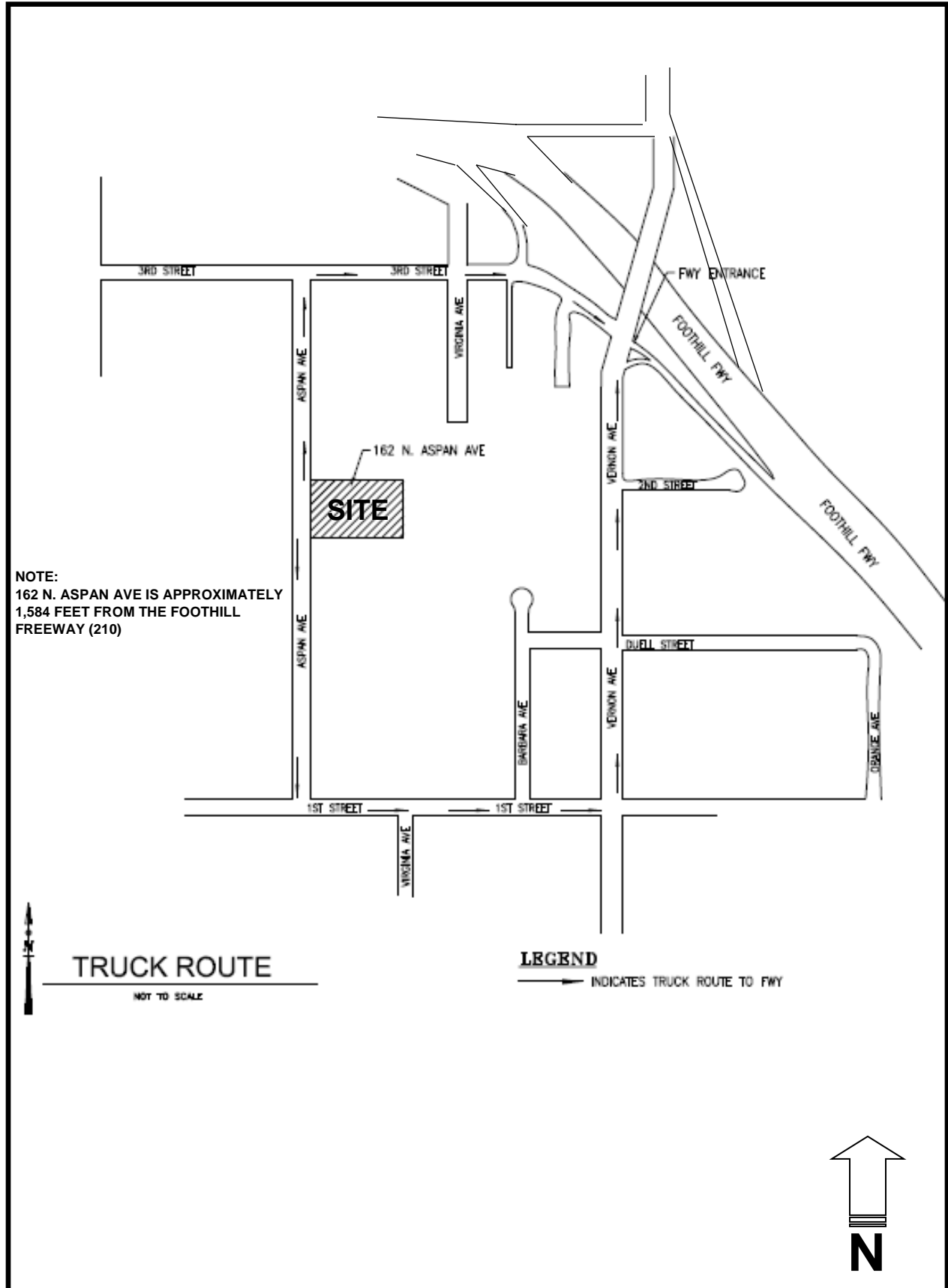


FIGURE 2: SURROUNDING CIRCULATION SYSTEM



- Trucks leaving the site to destinations using westbound Foothill Freeway will either 1) exit the site by making a right turn on Aspan Avenue, then turn right on 3rd Street to Vernon Avenue, turn left on Vernon Avenue, and finally turn left onto the I-210 westbound on-ramp, or 2) exit the site by making a left turn on Aspan Avenue, then turn left on 1st Street to Vernon Avenue, turn left on Vernon Avenue, and finally turn left onto the I-210 westbound on-ramp.

The northbound and southbound trips not using I-210 are assumed to be negligible due to the proximity of freeway to the site and majority of trips being made by trucks.

PROJECT DESCRIPTION AND OPERATION

Consolidated Ready Mix is a dry material handling batch plant that utilizes an innovative way of mixing materials for concrete on-site and then transporting the mixed materials to the customer by concrete mixing trucks where concrete is produced on-route or at the delivery site. At the plant, sand, rock and cement will be weighed and delivered via a conveyor belt to one of the mixing trucks to be mixed in transit and delivered to designated sites for concrete production.

Unlike traditional on-site wet mix concrete plants, Consolidated Ready Mix is a dry mix plant (also known as transit mix plant) which weighs sand, gravel and cement in weigh batchers via digital or manual scales. All the materials are then discharged into a chute which in turn discharges into a truck. At the same time, water is either weighed or volumetrically metered and discharged through the same charging chute into the mixer truck. The ingredients are then mixed for a minimum of 70 to 100 revolutions during their transportation to the job site.

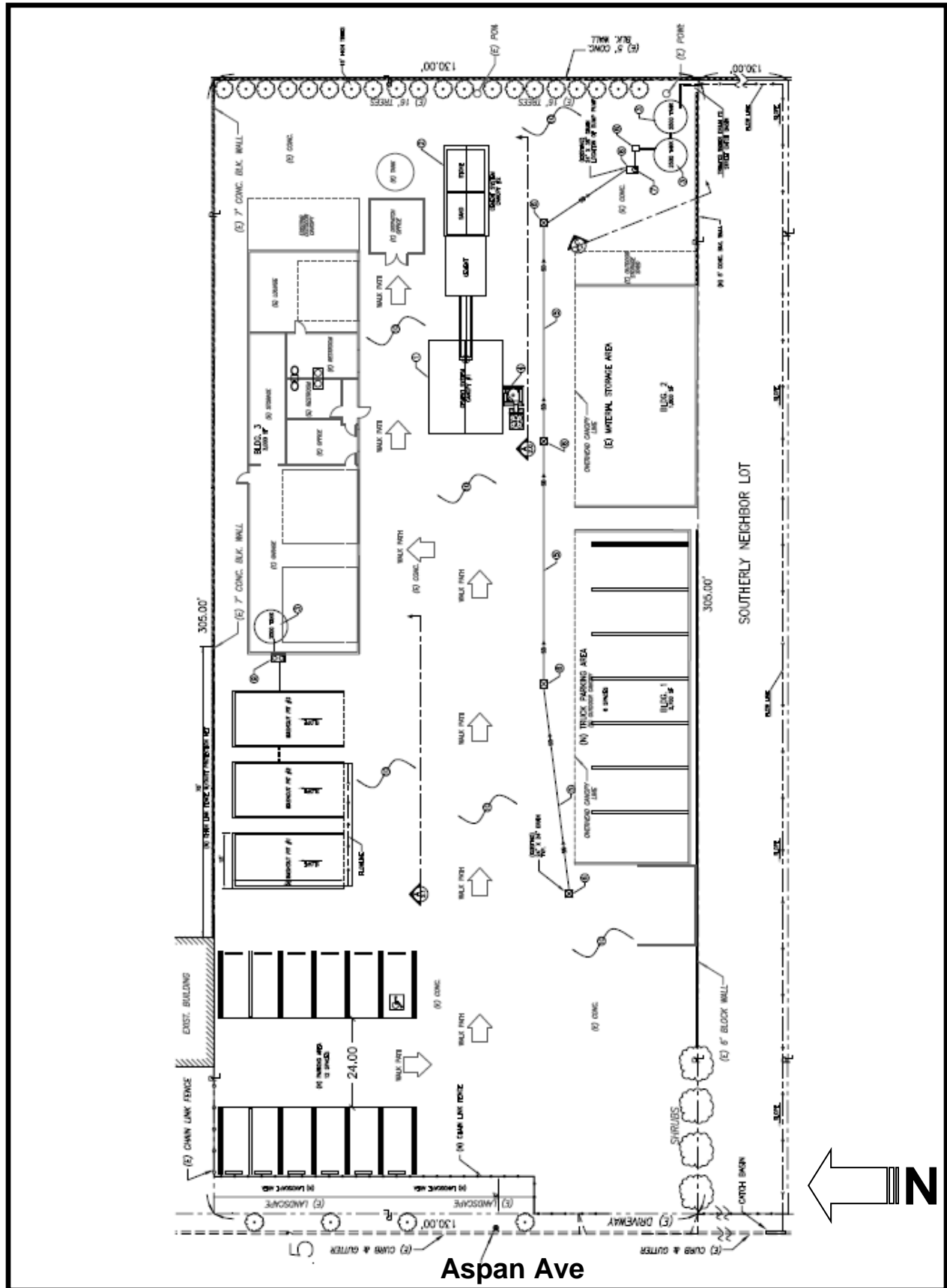
Consolidated Ready Mix operation will utilize a maximum of 7 cement mixer trucks, 1 dump truck and 1 semi-truck. The proposed use will have a maximum total of 9 employees working one shift seven days a week as follows: from 5:30 am to 4:30 pm Monday-Friday, from 5:30 am to 1:00 pm on Saturday, and from 7:00 am to 10:00 am on Sunday.

Figure 3 shows the site plan of Consolidated Ready Mix.

The following operational schedules have been provided by Consolidated Ready Mix for the proposed operations on a typical weekday:

- Business office will open 7 days a week; on weekdays at 5:30 AM Monday through Friday; (on Saturdays at 5:30 AM and on Sundays at 7:00 AM).
- Business office will close at 4:30 PM Monday through Friday; (at 1:00 PM on Saturdays, 10:00 AM on Sundays).
- Truck drivers will start to arrive at 6:00 AM and leave at 7:00 PM on weekdays
- Trucks will load/operate from 6:30 AM to 7:00 PM.
- Trucks will load once every 15 minutes at the busiest time.
- The busiest truck departures will be between 7:00 AM and 9:30 AM Monday through Saturday.
- One supplies delivery truck will arrive once per day

FIGURE 3: PROJECT SITE PLAN



PROJECT TRIP GENERATION

From proposed operational schedule of Consolidated Ready Mix, hourly activities and ingress-egress of vehicles at the site has been detailed and shown in **Table 1**.

The hour-by-hour activities at the site has been detailed in Table 1 assuming the worst-case traffic generation scenario. The maximum capacity of the production equipment and parcel size dictate that the site can have a maximum of 7 mixer trucks including 4 existing mixer trucks. It should be noted that although the Consolidated Ready Mix production machine RMX-100 SP Semi Portable Batch Plant has a “100-Cubic Yards Per Hour Max Capacity”, it is impossible to produce 100 cubic yards per hour at the site due to the limitations of gravel, sand and cement storage spaces. The facility can have a maximum of 7 mixer trucks to load a total of 70 cubic yards (i.e., 10 cubic yards per truck) at its busiest operation time. Considering each loading will take 15 minutes, a maximum of 40 cubic yards can be produced and loaded per hour.

Table 2 shows a summary of trip generation estimates at the site. As shown in the table, on an average weekday a total of 148 passenger car equivalent (PCE) trips will be generated (74 inbound and 74 outbound). Nine full-time employees and 7 truck drivers will generate a total of 32 trips (16 inbound and 16 outbound) by cars. The trucks will generate a total of 58 truck trips per day (29 inbound and 29 outbound). Assuming 1 truck is equivalent to 2 passenger cars for traffic analysis purposes, a total of 116 PCE trips will be generated by trucks per day (58 inbound and 58 outbound).

During the AM peak hour (the busiest commuter hour between 7 AM and 9 AM), a maximum of 8 PCE trips will be generated (0 inbound and 8 outbound), i.e. 4 truck trips (0 inbound and 2 outbound).

During the PM peak hour (the busiest commuter hour between 4 PM and 6 PM), a maximum of 19 PCE trips will be generated (4 inbound and 15 outbound), i.e. 5 truck trips (2 inbound and 3 outbound) and 9 employees' car trips (0 inbound and 9 outbound).

TABLE 1: WORST-CASE INGRESS-EGRESS ACTIVITIES AT THE SITE

Assumptions:

Lot Capacity: 7 Mixer trucks (10 cubic yard per truck capacity), including 4 existing trucks

Loading Time per truck: 15 minutes (includes truck clean-up and mixture loading time)

Truck's load delivery and return to plant time: 2.5 hours

Trucks stay overnight on site on at parking spaces

5-6 AM:	IN = 9 Cars	OUT = 0 Cars
9 employees arrive between 5 and 5:30 to start shift at 5:30 AM		
6-7 AM:	IN = 7 cars	OUT = 1 truck (Truck #1)
7 truck drivers arrive with their own cars at the site between 6:00 and 7:00		
Truck #1 loads on-site from 6:30 to 6:45, Truck #2 from 6:45 to 7:00		
Truck #1 leaves with load for 2.5-hour (delivery and return) at 6:45		
7-8 AM:	IN = 0 trucks	OUT = 4 trucks (Truck #2, 3, 4, 5)
Truck #3, 4, 5, 6 start loading on-site at 7:00, 7:15, 7:30 and 7:45 on-site		
Truck #2, 3, 4 and 5 leave with loads for 2.5-hour (delivery and return) at 7:00, 7:15, 7:30 and 7:45		
8-9 AM:	IN = 0 trucks	OUT = 2 trucks (Truck #6 and 7)
Truck #7 starts loading on-site at 8:00		
Truck #6 and 7 leave with loads for 2.5-hour (delivery and return) at 8:00 and 8:15		
9-10 AM:	IN = 3 trucks (Truck #1, 2 and 3)	OUT = 2 trucks (Truck #1 and 2)
Truck #1, 2 and 3 return after 2.5-hour (delivery and return) at 9:15, 9:30 and 9:45		
Truck #1, 2 and 3 start loading on-site at 9:15, 9:30 and 9:45		
Truck #1 and 2 leave with loads for 2.5-hour (delivery and return) at 9:30 and 9:45		
10-11 AM:	IN = 4 trucks (Truck #4, 5, 6 and 7)	OUT = 4 trucks (Truck #3, 4, 5 and 6)
Truck #4, 5, 6 and 7 return after 2.5-hour (delivery and return) at 10:00, 10:15, 10:30 and 10:45		
Truck #4, 5, 6 and 7 start loading on-site at 10:00, 10:15, 10:30 and 10:45		
Truck #3, 4, 5 and 6 leave with loads for 2.5-hour (delivery and return) at 10:00, 10:15, 10:30 and 10:45		
11-12 PM:	IN = 0 truck	OUT = 1 truck (Truck #7)
Truck #7 leaves with load for 2.5-hour (delivery and return) at 11:00		
12-1 PM:	IN = 4 trucks (Truck #1, 2, 3 and 4)	OUT = 3 trucks (Truck #1, 2 and 3)
Truck #1, 2, 3 and 4 return after 2.5-hour (delivery and return) at 12:00, 12:15, 12:30 and 12:45		
Truck #1, 2, 3 and 4 start loading on-site at 12:00, 12:15, 12:30 and 12:45		
Truck #1, 2 and 3 leave with loads for 2.5-hour (delivery and return) at 12:15, 12:30 and 12:45		
1-2 PM:	IN = 3 trucks (Truck #5, 6 and 7)	OUT = 4 trucks (Truck #4, 5, 6 and 7)
Truck #5, 6 and 7 return after 2.5-hour (delivery and return) at 1:00, 1:15 and 1:30		
Truck #5, 6 and 7 start loading on-site at 1:00, 1:15 and 1:30		
Truck #4, 5, 6 and 7 leave with loads for 2.5-hour (delivery and return) at 1:00, 1:15, 1:30 and 1:45		

(Continued to Next Page...)

TABLE 1: WORST-CASE INGRESS-EGRESS ACTIVITIES AT THE SITE (CONTD..)

2-3 PM:	IN = 1 truck (Truck #1)	OUT = 0 truck
Truck #1 returns after 2.5-hour (delivery and return) at 2:45		
Truck #1 starts loading on-site at 2:45		
3-4 PM:	IN = 4 trucks (Truck #2, 3, 4 and 5)	OUT = 4 trucks (Truck #1, 2, 3 and 4)
Truck #2, 3, 4 and 5 return after 2.5-hour (delivery and return) at 3:00, 3:15, 3:30 and 3:45		
Truck #2, 3, 4 and 5 start loading on-site at 3:00, 3:15, 3:30 and 3:45		
Truck #1, 2, 3 and 4 leave with loads for 2.5-hour (delivery and return) at 3:00, 3:15, 3:30 and 3:45		
4-5 PM:	IN = 2 trucks (Truck #6 and 7)	OUT = 3 trucks (Truck #5, 6 and 7), 9 cars
Truck #6 and 7 return after 2.5-hour (delivery and return) at 4:00 and 4:15		
Truck #6 and 7 start loading on-site at 4:00 and 4:15		
Truck #5, 6 and 7 leave with loads for 2.5-hour (delivery and return) at 4:00, 4:15 and 4:30		
9 employees leave between 4:30 and 5:00		
5-6 PM:	IN = 2 trucks (Truck #1 and 2)	OUT = 1 car
Truck #1 and 2 return after 2.5-hour (delivery and return) at 5:30 and 5:45		
Truck #1 stays on-site after clean-up; the driver leaves for the day at 5:45		
6-7 PM:	IN = 4 trucks (Truck #3, 4, 5 and 6)	OUT = 4 cars
Truck #3, 4, 5 and 6 return after 2.5-hour (delivery and return) at 6:00, 6:15, 6:30 and 6:45		
Truck #2, 3, 4 and 5 stay on-site after clean-up; the 4 drivers leave at 6:00, 6:15, 6:30 and 6:45		
7-8 PM:	IN = 1 truck (Truck #7)	OUT = 2 cars
Truck #7 returns after 2.5-hour (delivery and return) at 7:00;		
Truck #6 and 7 stay on-site after clean-up; the 2 drivers leave at 7:00 and 7:15		

TABLE 2: TRIP GENERATION BY CONSOLIDATED READY MIX ON A WEEKDAY

Operation Hour	Employee Cars		Trucks		Trucks in PCE*		Total PCE*	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
5:00-6:00 AM	9				0	0	9	0
6:00-7:00 AM	7		0	1	0	2	7	2
7:00-8:00 AM			0	4	0	8	0	8
8:00-9:00 AM			0	2	0	4	0	4
9:00-10:00 AM			3	2	6	4	6	4
10:00-11:00 AM			4	4	8	8	8	8
11:00-12:00 PM			1**	2**	2	4	2	4
12:00-1:00 PM			4	3	8	6	8	6
1:00-2:00 PM			3	4	6	8	6	8
2:00-3:00 PM			1	0	2	0	2	0
3:00-4:00 PM			4	4	8	8	8	8
4:00-5:00 PM		9	2	3	4	6	4	15
5:00-6:00 PM		1	2	0	4	0	4	1
6:00-7:00 PM		4	4	0	8	0	8	4
7:00-8:00 PM		2	1	0	2	0	2	2
Total Per Day	16	16	29	29	58	58	74	74

*PCE is Passenger Car Equivalent of trucks. For concrete trucks, 1 truck is assumed to be equivalent to 2 passenger cars in traffic analysis

** Between 11:00 AM and 12:00 PM, 1 truck leaves after 15-minute loading as activity slows down after 11:00 AM. During the same time, 1 supply delivery truck also arrive and leave after delivery

Notes and Assumptions:

- All 9 (nine) employees arrive between 5:00 AM and 5:30 AM to start shift at 5:30 AM
- All 9 (nine) employees leave between 4:30 PM and 5:00 PM after completing shift at 4:30 PM
- All 7 truck drivers arrive between 6:00 AM and 6:30 AM to begin loading the mixer trucks at 6:30 AM
- During the busiest activity hours between 6:30 AM – 11:00 AM, each truck loads for 15 minutes and leaves the site after loading; therefore, first truck leaves after 6:45 AM, second truck leaves after 7:00 AM, third truck leaves after 7:15 AM, and so forth
- Trucks are assumed to take 2.5 hours between leaving the site and returning for the next load
- Truck drivers start to leave for the day at 5:45 PM after clean-up and returns next morning
- The last truck driver leaves at 7:15 PM after clean-up and returns next morning
- All 7 mixer trucks, 1 dump truck and 1 semi-truck stay overnight at the parking on-site after clean-up and resume operations next morning

CONCLUSIONS

Consolidated Ready Mix, located at 162 N. Aspan Avenue in the City of Azusa, California is a dry material handling batch plant that utilizes an innovative way of mixing materials for concrete on-site and then transporting the mixed materials to the customer by concrete mixing trucks where concrete is produced on-route or at the delivery site. At the plant, sand, rock and cement will be weighed and delivered via a conveyor belt to one of the mixing trucks to be mixed in transit and delivered to designated sites for concrete production.

Based on the plant's proposed operational schedule and with a maximum of 7 mixer truck capacity, it has been determined that on an average weekday, an estimated total of 148 passenger car equivalent (PCE) trips will be generated (74 inbound and 74 outbound). Nine full-time employees and 7 truck drivers will generate a total of 32 trips (16 inbound and 16 outbound) by cars. The trucks will generate a total of 58 truck trips per day (29 inbound and 29 outbound). Assuming 1 truck is equivalent to 2 passenger cars for traffic analysis purposes, a total of 116 PCE trips will be generated by trucks per day (58 inbound and 58 outbound).

During the AM peak hour (the busiest commuter hour between 7 AM and 9 AM), a maximum of 8 PCE trips will be generated (0 inbound and 8 outbound), i.e. 4 truck trips (0 inbound and 2 outbound).

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