

# <u>Concept Construction Management Plan,</u> <u>Traffic Control Plan, and Pedestrian</u> <u>Protection Plan</u>

# Hudson Pacific Properties HPP 10950

10950 Washington Blvd.

**Culver City, California 90232** 



Prepared by

**KPRS Construction Services Inc.** 

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#### 1. Introduction

#### 1.1. Purpose

The purpose of this Concept Construction Management Plan is to forecast how the general contractor's project management team will implement and perform its site management responsibilities during construction of HPP 10950 Washington Blvd. (the Project).

This plan will describe the anticipated scope and schedule for the Project's construction to provide a guide for an efficient and coordinated construction process as well as provide information to the public about the Project's objectives and activity on and off site.

#### 1.2. Scope

This Construction Management Plan will:

- Anticipate how the project management team will meet construction requirements.
- Define the objectives and goals of the Project's construction phase.
- Define constraints to the construction phase and project in general.
- Detail proposed strategies for construction control as well as resource and site management.

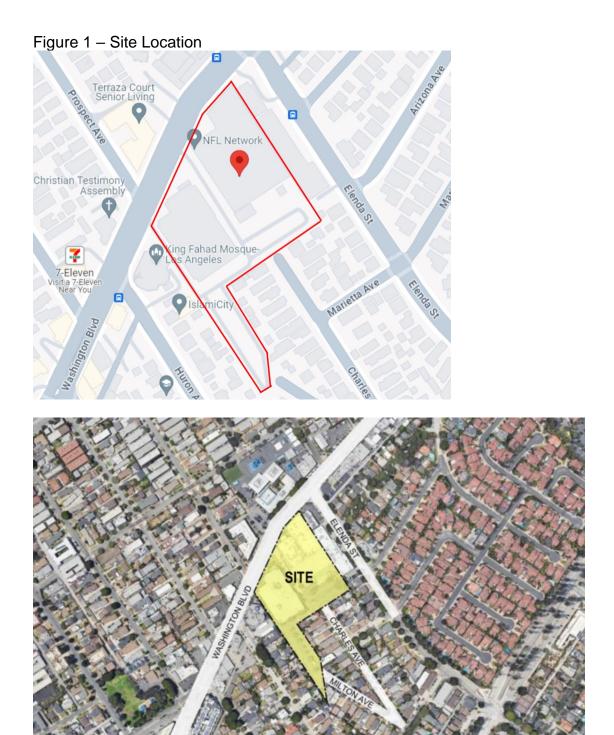
#### 1.3. Program

The proposed program will require the construction of:

- 1 level of subterranean shoring for 1 story on grade Type1-A parking.
- 5 stories of Type-VA apartments over 1 story type IA residential, commercial, and parking.
- 502,657 square feet of total net floor area, including 508 residential units.
- The Project will include amenity rooms, gyms, outdoor courtyards, and a residential lobby and leasing space.
- The project includes accessory parking, bicycle parking, elevators, equipment rooms and trash services room.

#### 1.4. Site Location

The Project is located at 10950 Washington Blvd. with Washington being the project's west border and is further bounded by Elenda Street to the north, and Huron Ave to the south with Charles Street dead ending to the project's east side. A site map is provided in figure 1.



-End Section 1-

### 2. Construction Management

#### 2.1. External Considerations

The major constraints of the project are:

- Maintaining smooth vehicular and pedestrian traffic flow with minimal disruptions to the surrounding streets.
- Minimizing impact on neighbors and collaborating with neighboring businesses for peak conditions.
- Coordination with utility companies for street work to minimize impacts from construction processes on community.

At mobilization, the construction team will:

- Begin implementation of construction activities communication plan prior to and through construction.
- Placement of a project office, site accommodation and facilities.
- Implement an offsite parking plan for construction workers. This will occur during the concrete structure build duration. After concrete, the workers will park on site.
- Confirm the locations of existing services and obtain all necessary permits and approvals.
- Arrange for the installation of temporary services —power, water, and sewer to serve the project during construction.
- Strategically locate designated trash areas to be efficiently hauled by an approved hauler.

#### 2.2. Anticipated Approvals

Permits that will be required for the project construction phase will include, but may not be limited to:

- Demolition Onsite / Offsite
- Street Improvements
- Grading / Excavation
- Shoring
- Building
- Electrical
- Landscape
- Traffic Control
- Mechanical
- Plumbing
- Utility Plans
- Elevators
- Fire Sprinklers
- Metal Steel Stairs
- Fire Alarm & ERRCS

Before any lane closures and/or other temporary modifications to traffic are implemented, further approvals will be required from Culver City Public Works Traffic Management Division and/or other pertinent city departments.

These items might include, but will not be limited to:

- Traffic control plan including, but not limited to vehicular, bicycle, and pedestrian traffic routing.
- Off-site civil work
- After hours applications

#### 2.3. Site Security

The site will be secured using appropriate 6' tall fences with privacy green screens along Washington Blvd. and other property line boundaries. The site and perimeter area will be equipped with 24-hour camera video surveillance with online access by site personnel. Entry will be controlled and will be limited to approved personnel and equipment. The site will be secure after hours. All workers and visitors to the site will be required to sign in and sign out at the site office.

#### 2.4. Public/Worker Safety

All site staff and subcontractors will be required to complete a site-specific safety orientation before beginning work on site. The orientation will cover topics such as health, safety, and onsite construction practice standards. Specific items may include, but will not be limited to, job site safety requirements, time and location of regular site safety meetings, site access, emergency evacuation procedures, location of first aid facilities, location of amenities, site hours, material handling, noise and dust policies and environmental management.

The general contractor will employ a safety engineer who will review contractor and subcontractor Safety Management Plans. Also, will make regular site visits to audit the safety program of the site construction staff as well as the subcontractors. Site construction staff will perform daily safety checks to ensure daily compliance with Cal/OSHA and any other relevant safety standards.

All site staff and subcontractors will be required to follow the latest federal, state, and local health and safety construction safety guidelines.

#### 2.4.1. Temporary Construction Fencing

Temporary site fencing will be installed around the perimeter of the site. (Refer to Exhibit A) The fence will be a six-foot chain link with a green wind screen. Fencing will include secured gated access for construction access only. The fencing installation will be subject to Culver City approval.

Where an impact from material handling and/or construction planning is anticipated, stakeholders and authorities will be consulted before implementation.

#### 2.4.2. Pedestrian Detours

The Washington Blvd. sidewalk will be closed during construction, reference exhibit B. Pedestrians will be rerouted to the opposite side of the street on Washington Blvd. using existing crosswalks at the corner of Washington Blvd and Elenda St. as well as the corner of Tilden Ave. and Washington Blvd. Pedestrians will be rerouted to the opposite side of the street using the existing crosswalks. Adequate signage will be provided for re- directing pedestrians as required.

#### 2.5. General Onsite Administration

The general contractor project construction team will maintain an onsite office. The project construction team will be responsible for implementing and enforcing the construction management plan and all other site procedures and policies.

#### 2.5.1. Construction Hours

**General Construction** 

For the majority of the work, the Project will comply with Culver City's allowable construction hours of: 8:00 a.m. to 8:00 p.m. Mondays through Fridays, 9:00 a.m. to 7:00 p.m. Saturdays, and10:00 a.m. to 7:00 p.m. Sundays

In an effort to reduce the durations of earthwork hauling and concrete operations, the project will seek approval for a 7:00 a.m. start time Monday through Friday for these activities. The early start time for these activities will reduce the impacts of traffic and noise resulting from heavy trucking traffic.

#### **Lane Closures**

- It is proposed to close the sidewalk, parking lane, adjoining the site on Washington Blvd. for the duration of the project. A formal traffic control plan will be engineered and submitted for approval.
- The intent is not to be an impediment with the lane closures on any of the city's main arterial streets, as best as possible except for special occasions such as concrete pour days, and tower crane erection/dismantle workdays.
- Changes to the traffic control plans will be coordinated in advance with the city.
- The Site Logistics Plan shows from the start of construction to completion of construction. The exhibits will summarize the closure required for demolition, shoring, concrete pours, mass excavation and tower crane erection/dismantle.
- Every effort will be made to minimize the need for any additional lane closure that are not listed above. Should lane closures be required, neighbors will be notified via the email notification system set up at the commencement of construction and city approval will be obtained in advance.

#### 2.5.2. Hoisting

- During the excavation and shoring phase of the project, most of the hoisting materials will be done with mobile cranes located on the closed sidewalk and parking lane or within the site fencing areas. There will be occasional need for cranes to extend beyond the limits of the site fencing for hoisting in this phase in a safe manner.
- After the excavation phase, a tower crane may be placed inside the project footprint. Deliveries will be unloaded with the tower crane as much as possible, using the closed parking lane.
- If any hoisting is required after the removal of the tower crane, mobile cranes will be located on the closed sidewalk and at times of one lane traffic closures.

#### 2.5.3. Demolition

A waste company will be selected who diverts all demolition and construction debris to a facility that manages mixed materials for recycling off site. It is the goal to exceed a total percentage of 50% for all materials recycled. The specific facilities where all the debris is transported will be provided when the demolition and trash hauling subcontractors are selected prior to work being performed.

### 3. Construction Methodology

#### 3.1. Demolition, Shoring and Excavation (180 days)

The site is currently two commercial properties and associated parking lots.

Existing utility services within the site will be located and either capped if redundant or modified if used as temporary services for construction.

Demolition is expected to take 180 workdays with impact to traffic from debris hauling occurring over the course of 150 days with an estimated 4 truckloads being hauled each day.

During this phase, the Washington Blvd. sidewalk public right of-way will be impacted by the project. Only demolition within the property lines will occur. The only item in the public right-of-way that will be removed during this phase are the street trees.

Trucks will enter the site from Washington. and move to a designated loading area where they will be loaded with material before exiting on Washington Blvd. Where required, curb ramps will be placed at entry/exit points to mitigate damage to curbs. Flag men will be stationed at entry and exit points to ensure safety.



Figure 2 – Existing Structures

During excavation, a shoring system will be required to support the garage walls. Shoring will begin with placement of soldier piles along the garage perimeter. This process is estimated to take about 50 days. Lagging spanning between soldier piles will be placed in coordination with the excavation of the site. As the site is excavated, there will be a need to provide bracing to further support the shoring system.

The project will require the excavation of an average of 13 Ft of earth below street level with an expected period of 50 days. Dirt hauling is anticipated to occur over 40 nonconsecutive days within the 60-day excavation period. Dirt hauling will occur

Monday through Friday 9:00 AM through 4:00 PM per City Standards. Trucks will enter and exit the site from Washington Blvd. Where required, curb ramps will be placed at entry/exit points to mitigate damage to curbs. Flag men will be stationed at entry and exit points to ensure safety. The proposed truck haul route is attached, as exhibit G.

#### 3.2. Subterranean Work (120 Days)

To facilitate its future construction, it is anticipated the installation of a tower crane within the building core. Reference exhibit E for approximate location of tower crane. The tower crane will be erected as soon as the area it is to be located has been excavated. The crane will assist in various tasks that would allow for material off-loading on Washinton Blvd. These tasks will include but are not limited to the installation of concrete and concrete reinforcement materials where it may otherwise be uneconomical to be done by other means and the movement of material into the site for subterranean level work. As excavation is completed, in-ground services will be installed followed by preparation of the ground to receive the structural foundation that will be cast in concrete.

We propose for three (3) truck—mounted concrete boom pumps to be staged on Washington Blvd. and one (1) on both Charles Ave. and Milton Ave. on non-consecutive days for placement of the garage concrete structure, its subsequent topping slab and for upper-level decks. The upper basement levels will be cast in zones, so that multiple work fronts will be created.

#### 3.3. Elevated Concrete Construction (270 Days)

The concrete construction of the project will encompass one subterranean parking level, one level of above grade parking and commercial space. The period required to complete the concrete portions of the project is anticipated to take approximately 270 workdays total.

Included within this time is the assembly of shoring to support formwork; construction/assembly of the required formwork for floor slabs, columns, and walls; placement of steel reinforcement for those structural components; and the placement and finishing of concrete.

Concrete placement is expected to occur over 240 nonconsecutive days within the 270-day concrete construction period. Construction material deliveries will occur during normal working hours, specifically approved under a separate permit. Flag men will be stationed at entry and exit points to ensure safety. The concrete trades will be supported by, but not limited to, a tower crane for lifting materials and equipment, a truck- mounted concrete boom pump to place concrete, and perimeter guardrail systems to provide fall protection.

#### 3.4. Building Enclosure (380 Days)

The glass enclosure for the commercial spaces will be erected as soon as practical to commence sealing floors so that finishes and fit out, can commence. The above apartment structure will consist of four (4) levels of wood frame and some structural steel. The wood framed walls are intended to be built off or on site and delivered to the site where they will be loaded by the tower crane to the appropriate locations. The unloading of trucks and the truck queuing area will be per the exhibit. It is anticipated

that the wood framing will take approximately 160 workdays. The building envelope will consist of membrane roofing and waterproof system below stucco, veneer cladding and panel siding. There will be aluminum framed store fronts at communal areas and composite windows/doors at residential units. The building will also be completed with waterproof decks and various ornamental railings. Most of this work will occur simultaneously with interior finish work.

#### 3.5. Mechanical, Electrical, Plumbing and Finishes (350 Days)

Once the roof has been installed, installation of MEP will begin. Once MEP rough installation is complete insulation and drywall will be installed, followed by painting and all other finishes. All finishes will be included as part of this construction scope, there will be no finishes for the building operator to construct. It is anticipated that MEP and finishes will take 350 days to complete.

#### 3.6. Site Work (75 Days)

Site work will include landscaping, pavers, site concrete and other exterior hardscapes. Site work will occur simultaneously with Interior finish work. Site work is anticipated to take 75 days after the buildings scaffolding is removed.

#### 3.7. Construction Sequence and Planning

As the design of this project progresses and scope is further defined, a preliminary construction schedule will be created that may require this Construction Management Plan to be revised. Based on the current design the following is a tentative schedule for the major construction phases:

Demolition, Shoring & Excavation: Estimated Start Date – Estimated End Duration – 6 months

Subterranean Work: Estimated Start Date – Estimated End Duration – 4 months

Foundation and Elevated Concrete: Estimated Start Date – Estimated End Duration – 9 months

MEP and Finishes: Estimated Start Date – End Date Duration – 9 months

Building Envelope and Site Work: Estimated Start Date – End Date Duration – 9 months

Estimate Completion: End date / Duration Months

-End of Section 3-

#### 4. Environmental

#### 4.1. General

This section will identify proposed methods that will be used to mitigate the impacts of noise, vibration, and air quality in the vicinity of the development.

#### 4.2. Noise and Vibration Management

All subcontractors will be responsible for managing noise and vibration in accordance with their project specific Management Plans. Some mitigating measures may include, but not be limited to:

Documentation of major noise-generating construction equipment and its noise levels requiring all construction equipment to be operated with an exhaust muffle and sound control devices that meet or exceed those provided on the original equipment. Requiring proper maintenance of construction equipment to minimize noise emissions. Requiring stationary source equipment to be located the greatest distance as possible from residential areas.

Requiring construction workers to be respectful of the surrounding neighborhood and keep non-construction related noise to a minimum prior to, during, and after allowed construction hours.

After hours work may be required for specific tasks to minimize impacts to pedestrians, vehicular traffic or in the interest of safety. Proposed work to occur outside of normal working hours include the following:

- Foundation and elevated concrete
- Tower crane erection and dismantling
- Manlift erection and dismantling
- Scaffolding erection and dismantling
- Offsite improvements

In cases where after hour's work will be required, consultation with pertinent Culver City departments will occur prior to and works being scheduled. Businesses and surrounding residents will be given notification via email of the proposed after-hours work prior to the start of said work including details of the work to be performed with an anticipated time required to undertake each activity. There is not anticipated to be a significant vibration generated by the construction that might impact adjoining properties.

#### 4.3. Dust Management and Erosion control

Dust and erosion control measures will be implemented as required and will comply with SCAQMD and Culver City regulations for controlling fugitive dust and erosion. Measures that may be employed include:

Site Perimeter: Erection of a temporary 6-foot-high chain link fence with attached windscreen at the site's perimeter. The fence will be moved and maintained as needed throughout the course of the project.

Demolition: All trucks removing demolition materials from site will be loaded within the site perimeter and will be required to cover loads as deemed necessary for dust control.

Excavation: Rumble strips at truck entry/exit ways, watering down working of stockpiles and surfaces as required, covering of stocks while minimizing piling of material, and use of street sweepers to maintain adjacent roadways.

Construction: Maintain an elevated level of housekeeping to minimize likelihood of windblown dust.

-End of Section 4-

#### 5. Exhibits

**Exhibit A – Temporary Construction Fencing** 

Exhibit B - Pedestrian Pre-Construction

Exhibit B.1 – Pedestrian Detour

Exhibit C - Site Logistics (Demolition/Grading)

Exhibit D - Site Logistics (Shoring)

Exhibit E – Site Logistics (Tower Crane & Fixed Placement Booms)

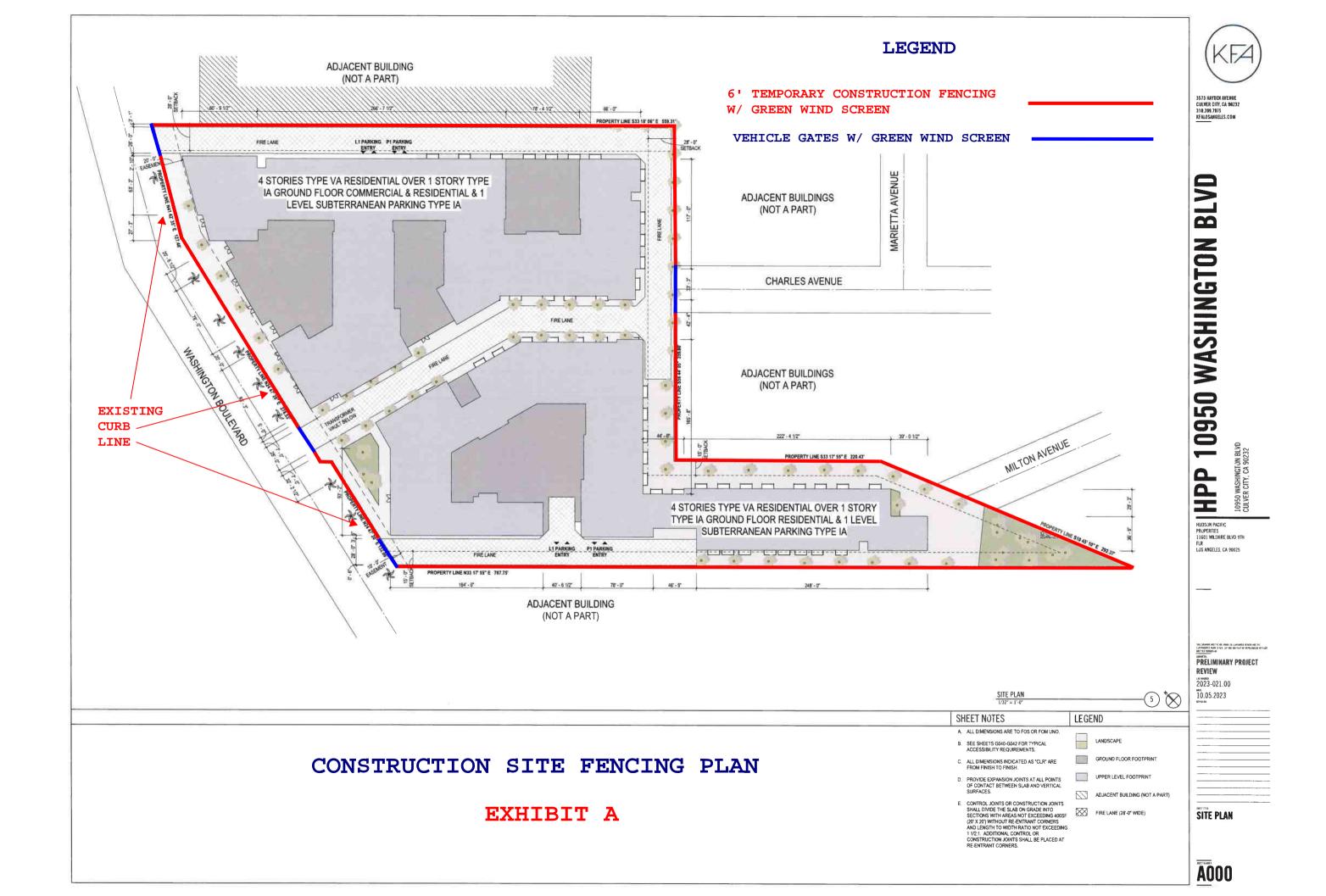
**Exhibit F – Site Logistics (Framing)** 

Exhibit G – Truck Haul Route (Demolition/Grading/Material Delivery)

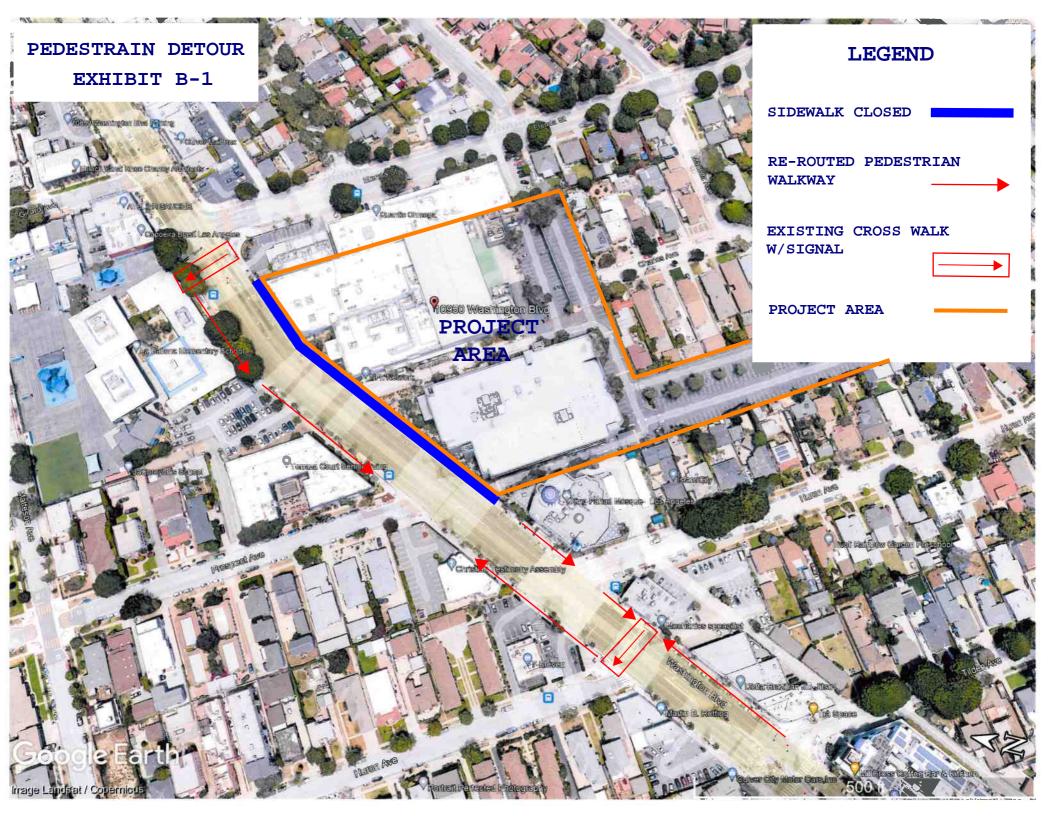
Exhibit H – Site Logistics Plan (Post Framing/Finishes)

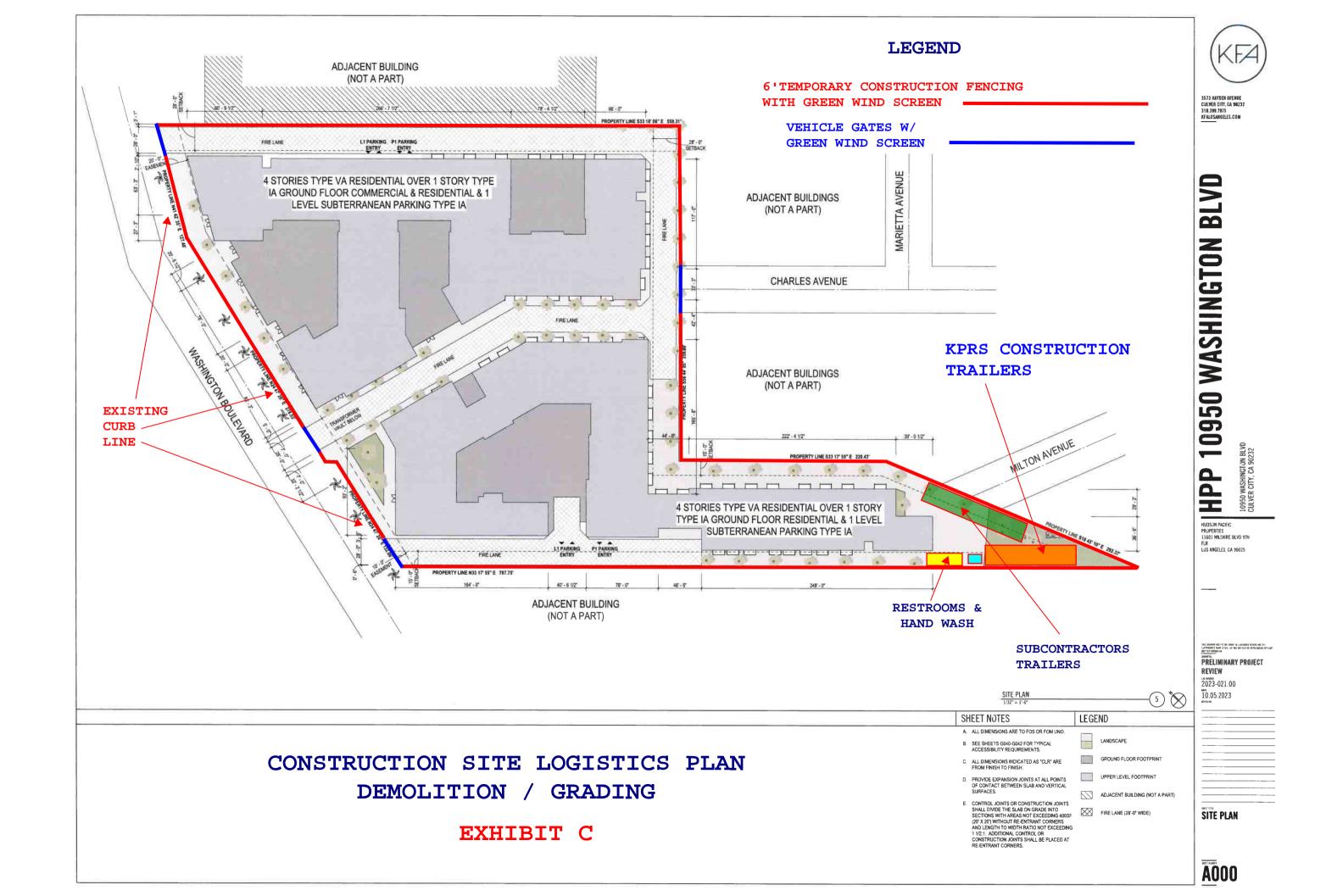
#### Attachment

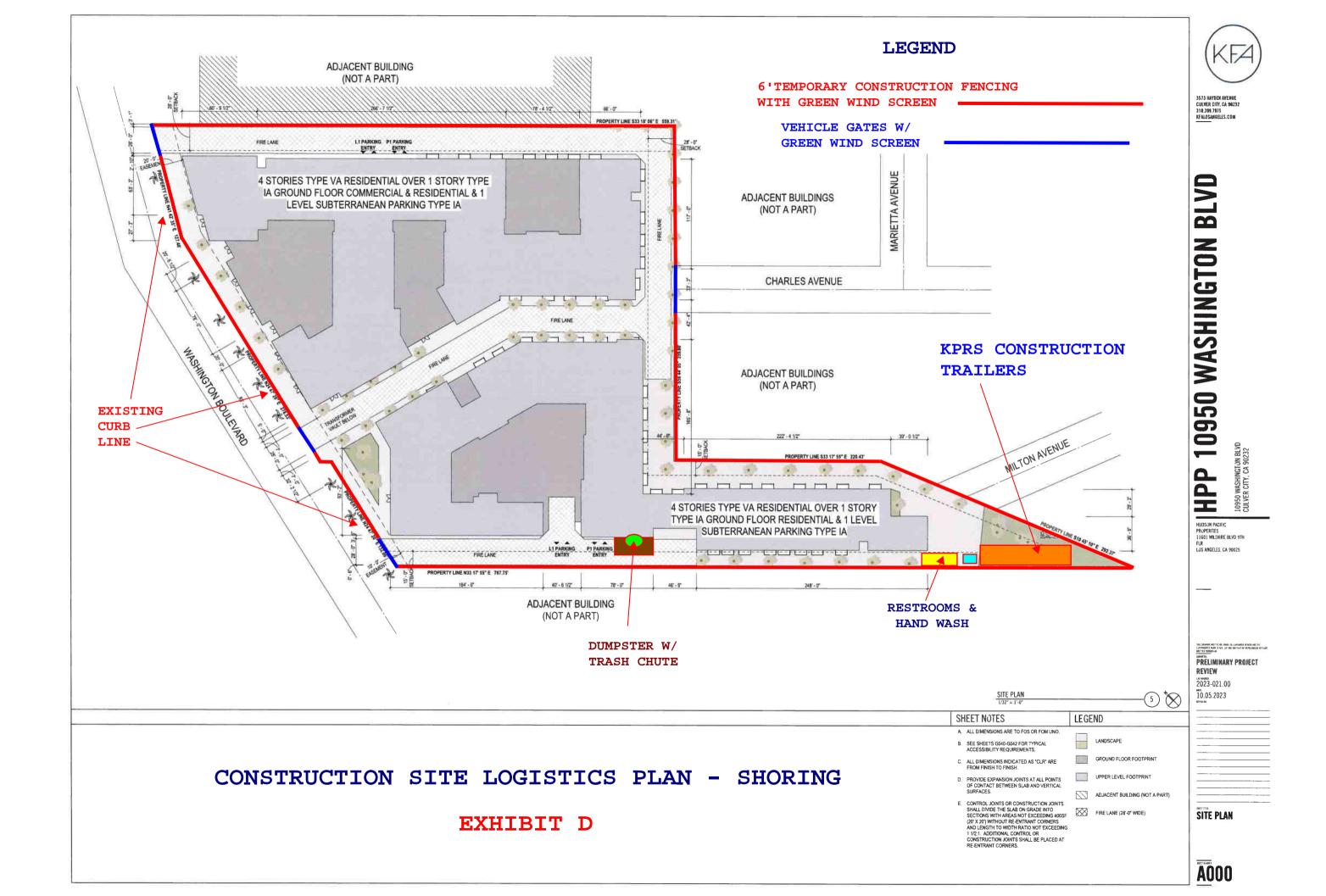
- 1. Construction Personnel Hoist Specifications
- 2. Crane Specifications

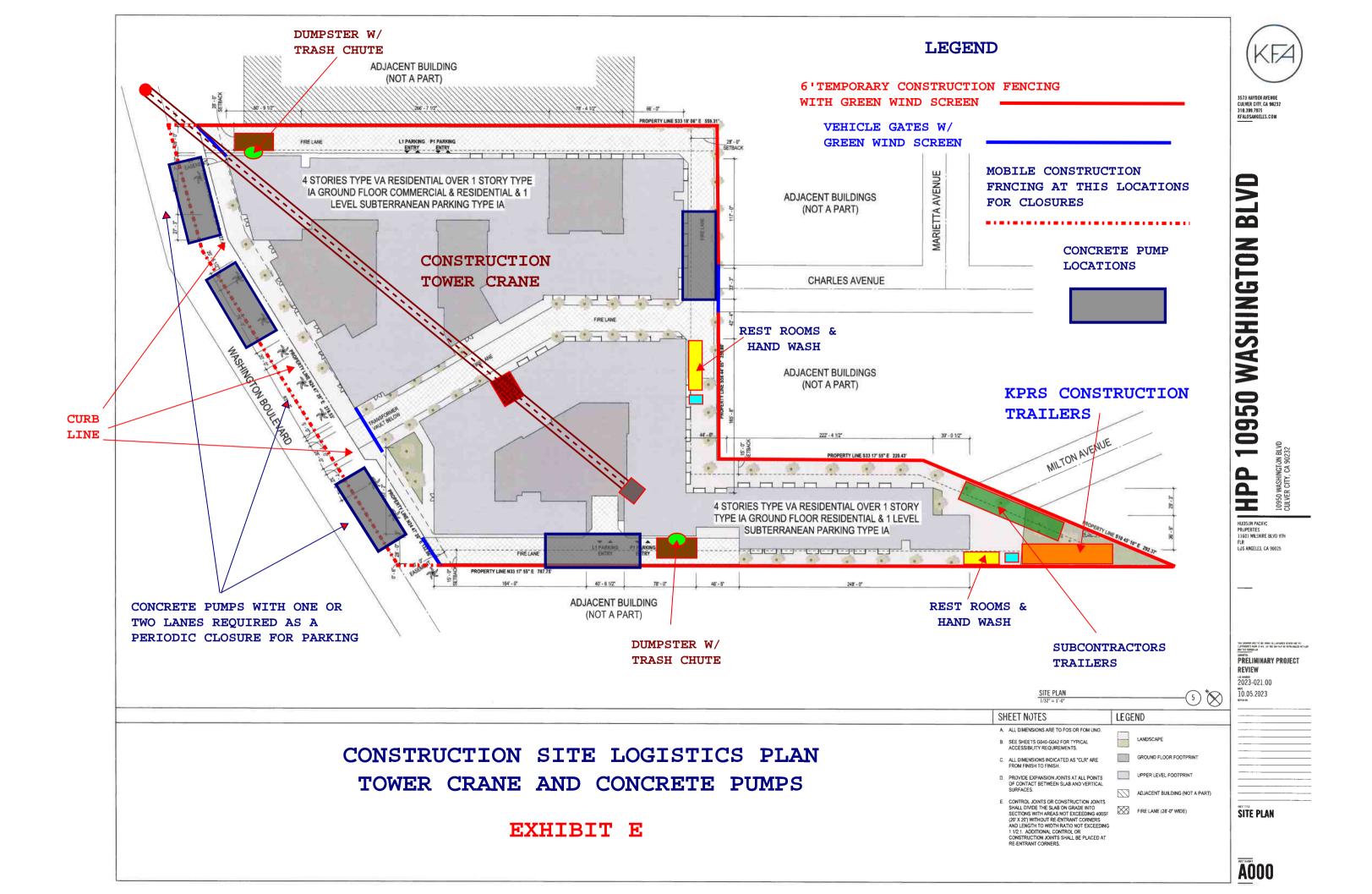


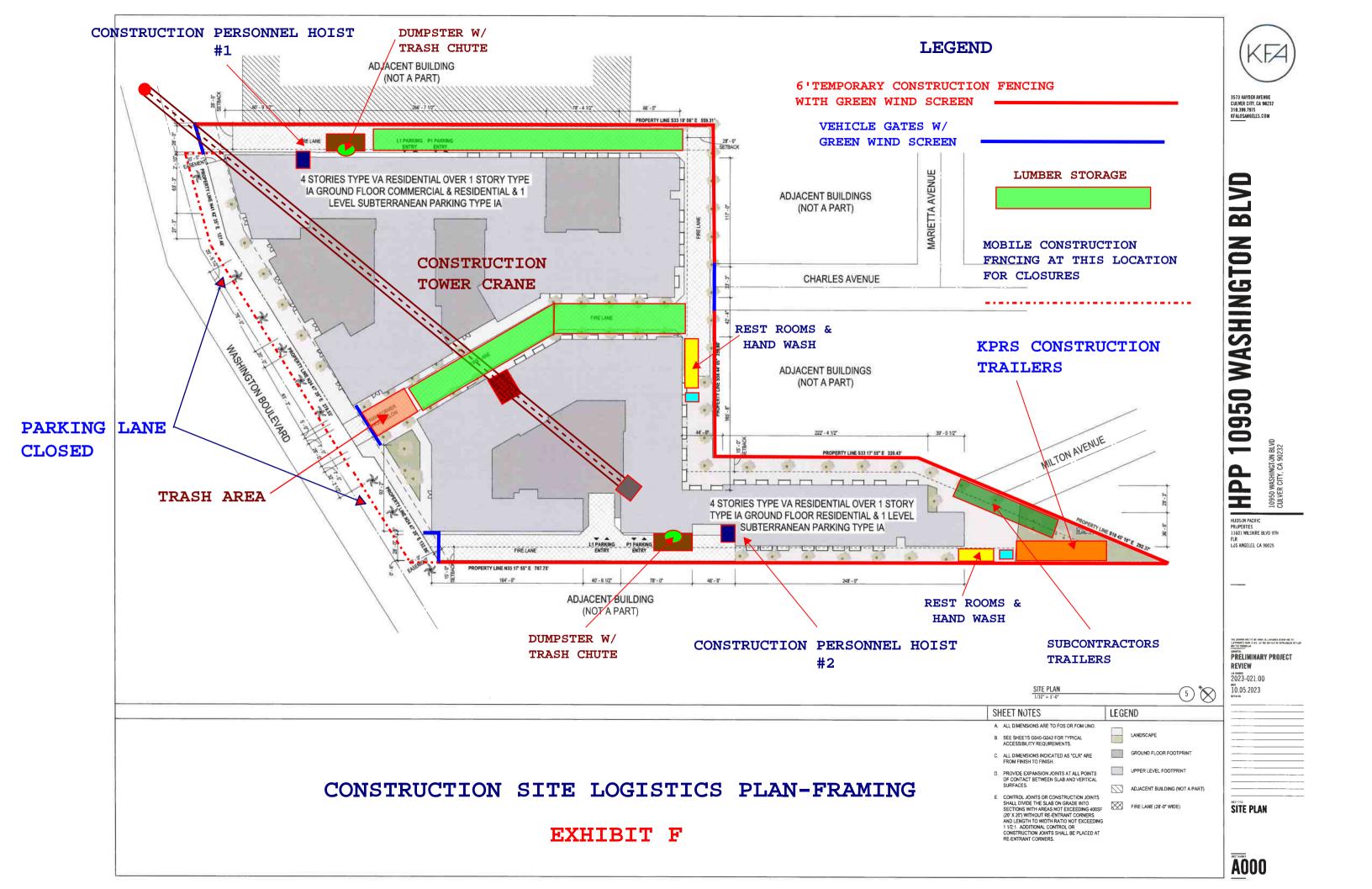


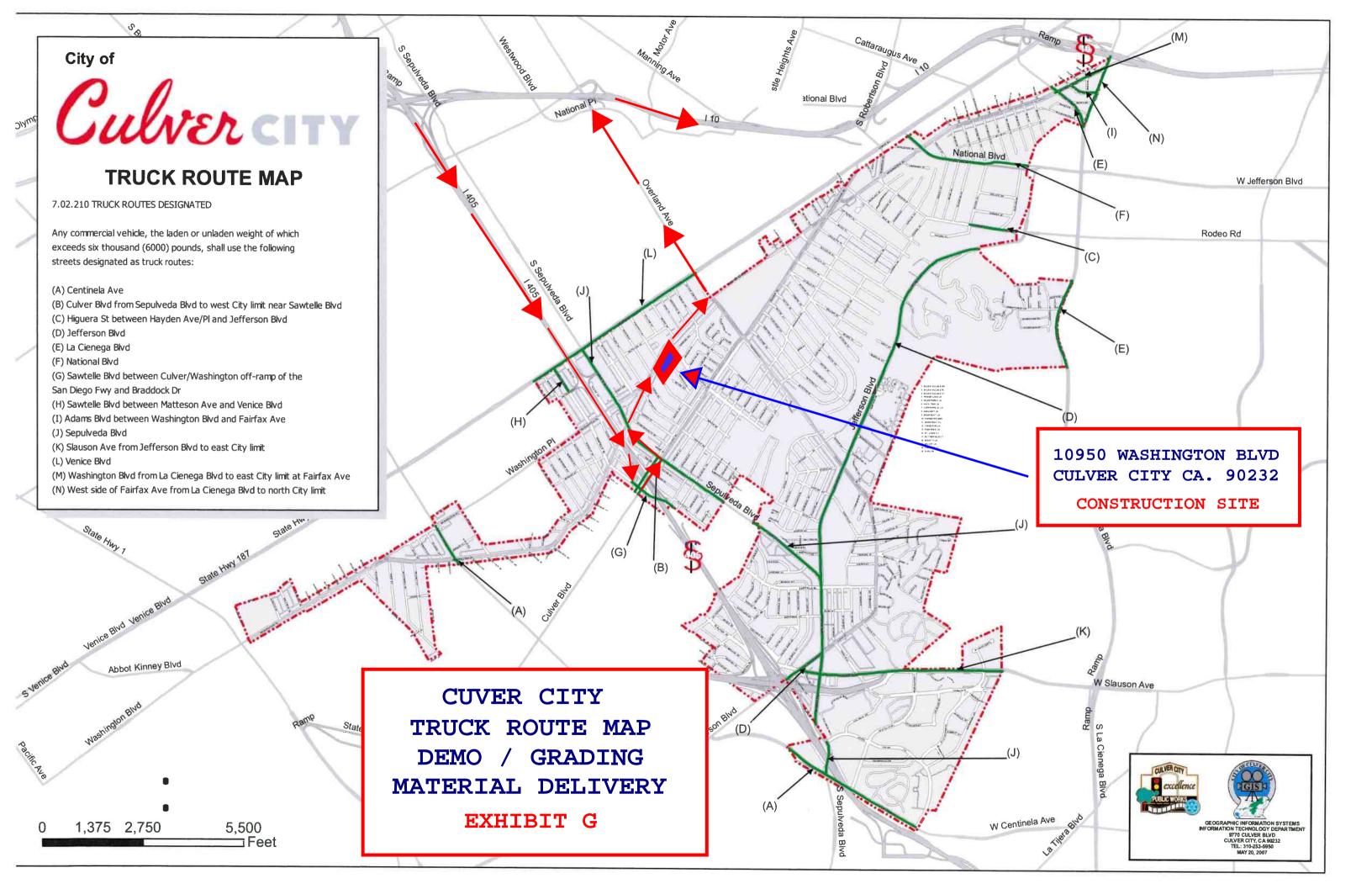


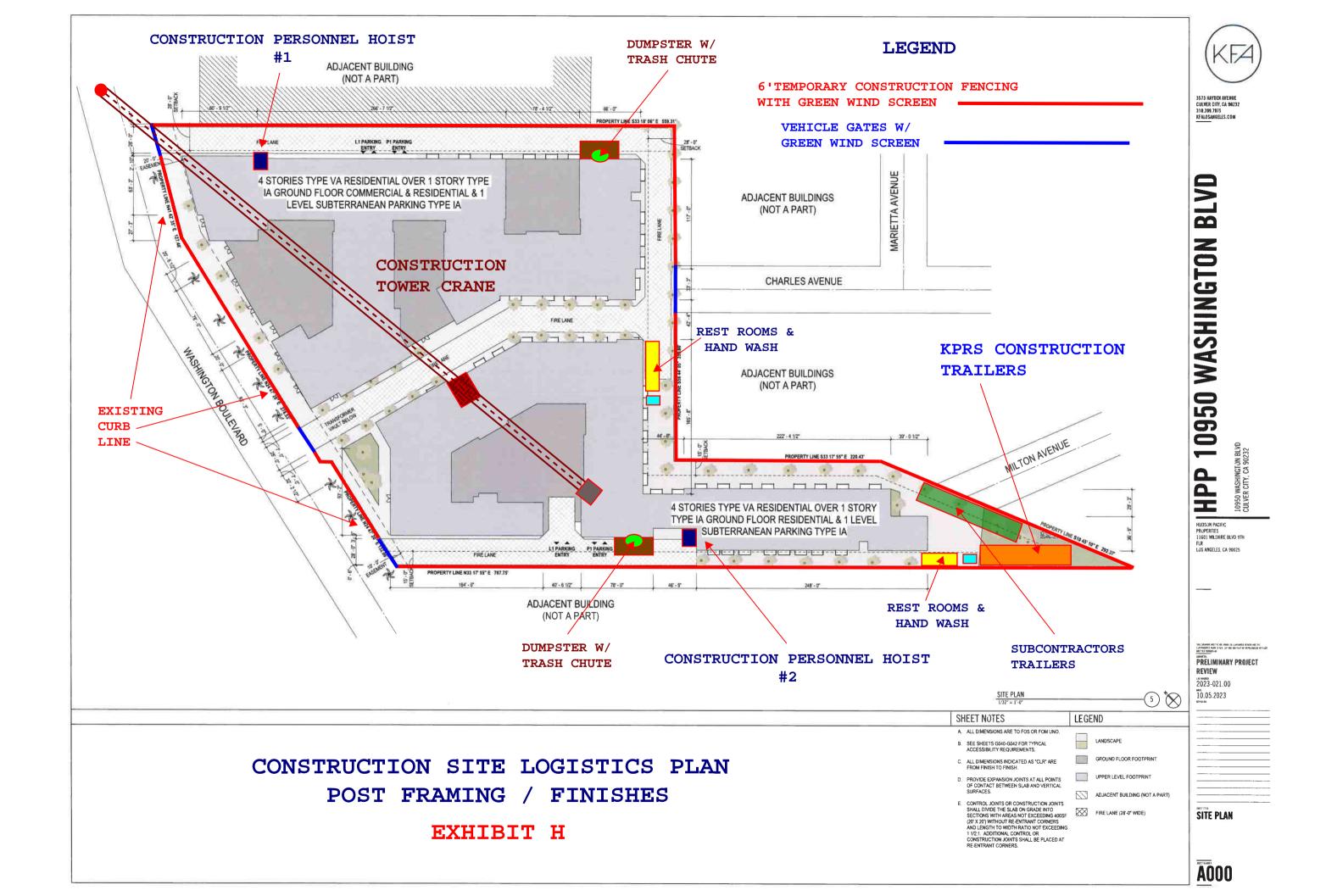












#### Technical Data - Scando 650 FC32/39I

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#### **GENERAL DATA**

Installation country

Regulation

ANSI A10.4

Hoist config no

C52 - Long car with two vertical gates

Drive unit

3-motor FC Capacity
7100 lbs.177 fpm

Other possible configurations

See general technical data sheet

#### PERFORMANCE

Payload capacity 7100 lbs

Max. lifting height (higher on req.) 655 ft 10.91"

No of persons 35

No of buffers/hoist 3 pcs

Safety device 9099255-SUB (HS)

Safety device SUB no 1212

#### **CAR DIMENSIONS**

 Internal width
 4 ft 11.03"

 Internal length
 12 ft 9.48"

 External length
 13 ft 2.2"

 Internal height
 7 ft 6.51"

 Door opening height
 6 ft 6.7"

 Min shaft width
 8 ft 6.32"

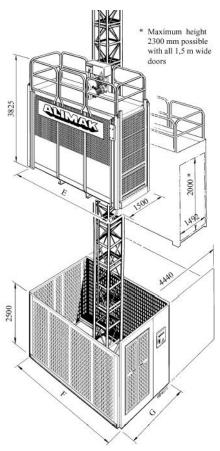
 Min shaft length
 13 ft 10.07"

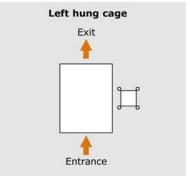
#### **ELECTRICAL DATA**

480 V Voltage supply 60 Hz Frequency Power supply fuses 100 A 56 / 65 kVA Power consumption Starting current 77 / 90 A Hoist voltage 480 V Motor power 3x11 kW Cable guiding system Cable trolley, sep ctrl cable

#### TRANSPORT DIMENSIONS AND WEIGHTS

Car weight (incl drive unit, excl cable) 5300 lbs Drive unit weight 1900 lbs Base unit weight (singel) 7800 lbs Mast section weight, one rack 260 lbs Mast section weight, two racks 294 lbs Mast section length 4 ft 11.34" Base unit length 14 ft 5.16" Base unit width 8 ft 4.35" Base unit height (excl machinery) 10 ft 1.99" Mast length for hoist 11 ft 2.59"





(double wheels)

#### **Foundation**

The hoist can be installed on a gravel bed, a concrete slab or in some cases a foundation pit is required.

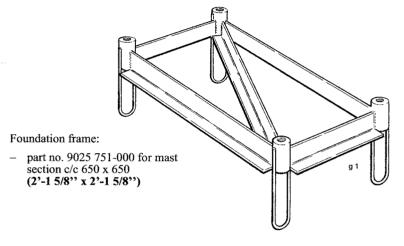
What way to go depends on the circumstances and the National hoist regulations.

#### Concrete slab

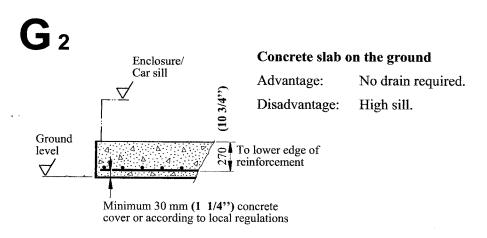
A concrete slab is to be made according to the following instructions, and according to the actual model of hoist.

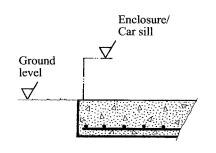
It is important that the mounting holes of the foundation frame are brought in level with the completed concrete surface, and that the concrete is vibrated thoroughly – especially around the foundation frame.

It is also important that the finished surface is plane and horizontal.



The foundation may be made in any of the following ways, depending upon the finished concrete level compared with the ground level.





#### Concrete slab level with the ground

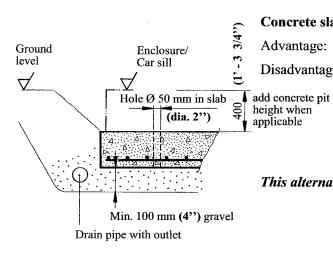
Advantage:

No drain required.

Disadvantage:

Sill.

A concrete slab level with the ground is the most common type of foundation. A ramp up to the level of the sill is usually made of fill, wood or steel.



#### Concrete slab below ground level

Advantage:

No sill between ground level and hoist car.

Disadvantage:

Corrosion if water remains on the foundation

and does not drain.

This alternative requires draining.



IMPORTANT: Please note that the foundation must always be isolated, or the surrounding soil prevented from freezing, if there is a risk of frost heave.

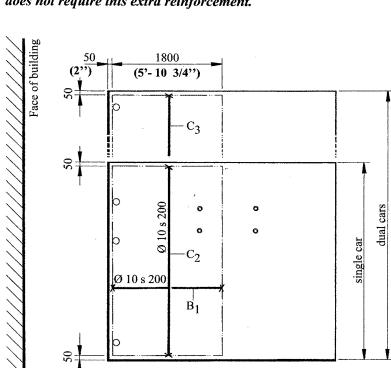
#### Extra reinforcement of concrete slab

#### - for hoist with landing equipment on vertical pipe support

The concrete slab must have additional reinforcement in order to carry the extra load due to the vertical pipes, landing equipment and the extra load, due to the landings (people, buggies, materials, etc).

The extra reinforcement is only necessary within the areas shown in the picture below. The layer of reinforcement should be placed 20 mm (.8 in.) below the upper edge of the slab.

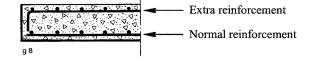
Note that a concrete slab which forms part of a foundation pit does not require this extra reinforcement.



#### Cross-section of concrete slab

 $B_1$ 

 $C_2$ 



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single car

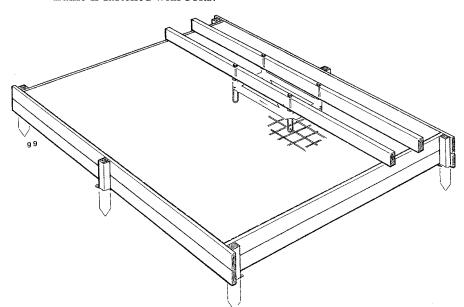
dual cars

 $C_3$ 

G<sub>4</sub>

#### Formwork and fixing of foundation frame

This is done by means of crossbeams, to which the foundation frame is fastened with bolts.



#### Conversion table:

Ø 10 mm  $\approx$  dia. 3/8 in. Ø 16 mm  $\approx$  dia. 5/8 in.

 s 140 mm
  $\approx$  5 1/2 in.

 s 170 mm
  $\approx$  6 1/2 in.

 s 180 mm
  $\approx$  7 in.

 s 190 mm
  $\approx$  7 1/2 in.

 s 200 mm
  $\approx$  8 in.

 s 210 mm
  $\approx$  8 5/8 in.

 s 230 mm
  $\approx$  9 in.

 s 250 mm
  $\approx$  10 in.

 $s 280 mm \approx 11$ 

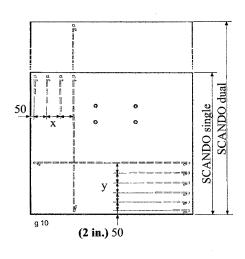
 $s 300 \text{ mm} \approx 12$ 

in.

in.

#### Reinforcement for concrete slab

Reinforcement bar quality: minimum KS 400 (Yield strength = 390 N/mm<sup>2</sup> or **56550 psi**)



Lifting height lowe	r than	150 m	(500 ft).	150 – 250 m (	500 – 820 ft.)		
Car dimension		Reinfor	rcement	Reinforcement			
meter		X	y	<u> </u>	y		
Single car							
1.5 x 3.2	Ø1	0 s 300	Ø16 s 300	Ø10 s 230	Ø16 s 210		
1.5 x 3.9	Ø1	0 s 250	Ø16 s 180	Ø10 s 180	Ø16 s 140		
1.5 x 4.6	Ø1	0 s 250	Ø16 s 180	Ø10 s 180	Ø16 s 140		
Dual cars							
1.5 x 3.2	Ø1	6 s 250	Ø16 s 250	Ø16 s 180	Ø16 s 180		
1.5 x 3.9	Ø1	6 s 300	Ø16 s 300	Ø16 s 220	Ø16 s 220		
1.5 x 4.6	Øl	6 s 300	Ø16 s 300	Ø16 s 220	Ø16 s 220		

#### Concrete quality:

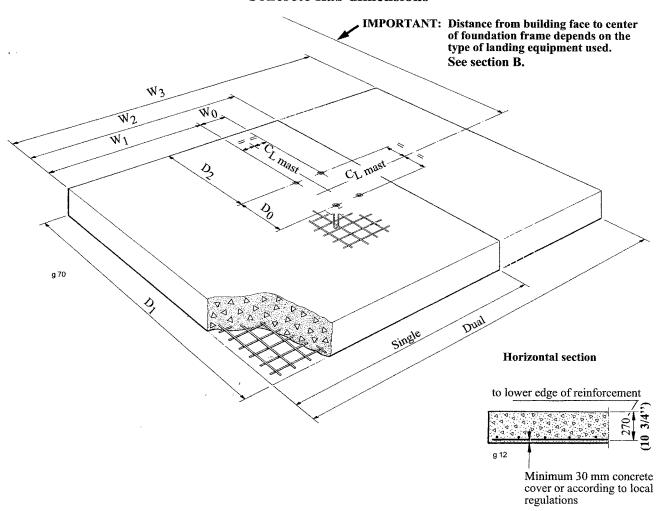
minimum K 25 (25 N/mm<sup>2</sup> or 3625 psi) at 28 days.

The concrete must reach 70% of the required compressive strength before the installation of the hoist may start.

This is usually obtained 7 days after placing the concrete. If a shorter time is needed, higher strength concrete may be used.

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#### Concrete slab dimensions



Car dimension	D <sub>0</sub>	D <sub>1</sub>	D <sub>2</sub>	W <sub>0</sub>	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	Concrete
meter	mm	mm	mm	mm	mm	mm	mm	volume m³
Single car								
1.5 x 3.2	960	3950	1495	380	2035	2800	_	3.32
(4'-11" x 10'-6')	(3'-1 3/4'')	(12'-11 1/2")	(4'-10 3/4'')	(1'-3'')	(6'- 8'')	(9'- 2 1/4'')		(4.34 cu.yds)
1.5 x 3.9	960	4650	1845	380	2035	2800	_	3.91
(4'-11" x 12'-9 1/2")	(3'-1 3/4'')	(15'- 3'')	(6'- 0 3/4'')	(1'-3'')	(6'- 8'')	(9'- 2 1/4'')		(5.11 cu.yds)
1.5 x 4.6	960	5350	2195	380	2035	2800	_	4.50
(4'-11" x 15'-1")	(3'-1 3/4'')	(17'- 6 3/4'')	( <b>7'- 2 1/2'')</b>	(1'-3'')	(6'- 8'')	(9'- 2 1/4'')	<del>-</del>	(5.88 cu.yds)
Dual cars						,		
1.5 x 3.2	960	3950	1495	380	2035		4530	5.37
(4'-11'' x 10'-6')	(3'-1 3/4'')	(12'-11 1/2")	(4'-10 3/4'')	(1'-3'')	(6'-8'')	- (14	- 10 1/4	''') (6.83 cu.yds)
1.5 x 3.9	960	4650	1845	380	2035	-	4530	6.32
(4'-11" x 12'-9 1/2")	(3'-1 3/4'')	(15'- 3'')	(6'- 0 3/4'')	(1'-3'')	(6'- 8'')	- (14	'- 10 1/4	''') (7.02 cu.yds)
1.5 x 4.6	960	5350	2195	380	2035		4530	7.27
(4'-11" x 15'-1")	(3'-1 3/4'')	(17'- 6 3/4'')	(7'- 2 1/2")	(1'-3'')	(6'- 8'')	- (14	- <b>10</b> 1/4	(9.51 cu.yds)

#### Components for attachments of enclosure

For the attachment of the enclosure on the foundation we recommend to use expansion bolts.

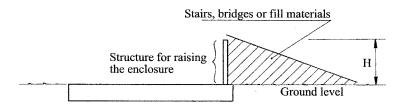
Please note that these items are not furnished with the hoist.

### When extra safety space is required under the hoist car at the bottom landing

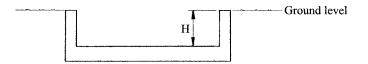
Some local hoist regulations require an extra safety space under the hoist car bottom landing. The same concrete slab as before can be used provided that the enclosure front is raised according to local hoist regulations.

See picture below.

H min. = 1060 mm (3'-53/4'')



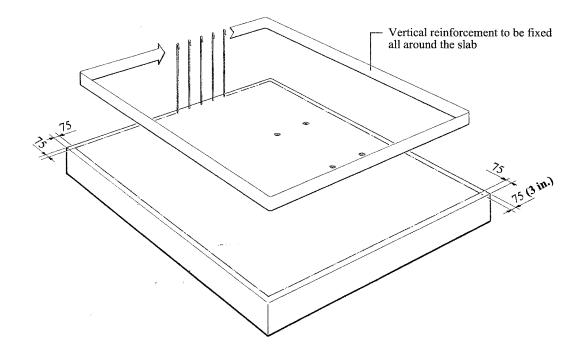
Alternatively a concrete pit can be made below ground level.



#### Foundation pit

The foundation pit is made as follows:

1. Make a concrete slab with additional vertical reinforcement for the pit walls, see figure. (Identical to one for a concrete slab level with the ground and for the hoist model in question).



2. When the base slab has cured, add the horizontal reinforcement, followed by formwork and completion of the walls of the foundation pit.

#### Concrete slab without foundation frame

In order to use a concrete slab without a foundation frame, the following requirements must be met:

- The procedures/specifications for preparing the concrete slab will be the same ones used for preparing a concrete slab with a foundation frame.
- The base frame must be attached with expansion bolts that can each withstand a pull-out force of at least:

Freestanding in service = 67 kN (15060 lbf.).

Freestanding during erection with load not exceeding allowable erection load = 51 kN (11465 lbf.).

The expansion bolts should be mounted in the holes normally used for attaching the base frame to the foundation frame.

- Installation is prohibited when wind speeds are in excess of 15 m/sec. (33 mph).
- The maximum height allowed for the first tie is 9 meters
   (30 ft) provided that the reduced allowable erection load
   1160 kg (2560 lbs.) is not exceeded.
- The type of installation must be approved by the local governing authorities.

#### Transportable foundation

In order to use a transportable steel foundation, the following requirements must be met:

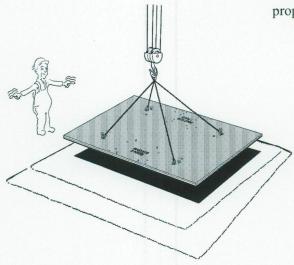
- The steel foundation must conform to all of Alimak's specifications. (These can be ordered separately from an Alimak representative).
- The type of installation must be approved by the local governing authorities.

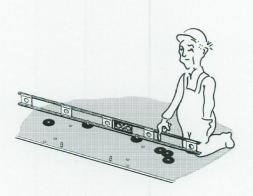


#### Optional prefabricated sheet steel foundation

#### Use of prefabricated sheet steel foundation

- Furnish a properly sized gravel bed where the base unit is to be installed.
- Level and compact the gravel bed.
   The gravel bed furnished should be of sufficient depth in order to preclude washout. Consideration shall be given to installing a plastic membrane below the gravel.
- Set the sheet steel plate onto the prepared gravel bed at its proper location.





- Using a spirit level to locate the highest level guide pin.
- From the highest level guide pin use shim washers or pair of slotted shims to level remaining pins.

G9

#### Load on foundation

#### The static load on the foundation consists of:

- The payload of the hoist (x 2 for dual cars).
- Base unit dead weight. [ For dual cars, add approx 2000 kg (4400 lbs.)].
- Counterweight if used (x 2 for dual cars).
- Hoist mast dead weight.
- Add 10% of the total for mast ties, power cable, and cable guiding devices.
- Add a further 25% of the total for vertical pipe support, if used.

#### The dynamic load on the foundation consists of:

 100% impact (or according to local regulations) on the payload and 2/3 of the base unit dead weight.

#### Example:

#### Static and dynamic load on the foundation (approx.)

Calculation of static load on the foundation for a dual car hoist SCANDO 650 DOL 22/32 with pipe support. Mast height 150 m (492 ft.), equivalent to 100 mast sections. Weights according to specifications in the data sheets.

Payload = 2200 kg (4850 lbs.)2200 kg (2 pcs.) 4400 kg 9700 lbs. Base unit dead weight = 2775 kg (6118 lbs.) + 2050 kg for the 2nd car 4825 kg 10637 lbs. Hoist mast 98 sections, 135 kg/each 12825 kg 28274 lbs. (298 lbs.) (2 sections included in the  $\Sigma = 22050 \text{ kg}$  48611 lbs. base unit) Mast ties and cable guides Add 10% load 2205 kg 4861 lbs.  $\Sigma = 24255 \text{ kg}$  53472 lbs. Vertical support and landing equipment. Add 25% load 6064 kg 13368 lbs.  $\Sigma = 30319 \text{ kg}$  66840 lbs Dynamic load approx. 2 x 2200 kg  $+2/3 \times (2775 + 2050)$ kg 7617 kg **16792 lbs.**  $\Sigma = 37936 \text{ kg}$  83632 lbs.  $37936 \times 9.81 = 372152 \text{ N}.$ In round figures = 372 kN (83632 lbs.)

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#### **Ground pressure**

Max. ground pressure under the concrete slabs is 0.15 MPa (21.75 psi) provided that the foundation has been reinforced and built up according to the given instructions.

Should the ground be able to stand higher pressures, it is possible to increase the load on the foundation. Please contact ALIMAK for information.

Examples of acceptable ground pressure according to SBN 1975 (Swedish Building Norms):

Moraine = 
$$0.4 - 1.0 \text{ MPa } (58 - 145 \text{ psi})$$

Fine sand = 
$$0.2 \text{ MPa}$$
 ( 29 psi)

### The ground pressure due to the installation is calculated according to the following formula:

 $P_{\rm V}$  is the sum of the static and the dynamic load and the dead weight of foundation in kN. Estimate approx. 24 kN/m³ for concrete.

See "Concrete slab dimensions" for D, W and concrete volume.

D x W is the concrete slab surface in m<sup>2</sup>.

$$\sigma_{ground}$$
 = ground pressure (MPa)

Single car hoist

without pipe support : 
$$\sigma_{ground} = \frac{2.3 \text{ x P}_{V}}{D_{1} \text{ x W}_{2} \text{ x 1000}}$$
 (MPa)

with pipe support : 
$$\sigma_{ground} = \frac{3.5 \text{ x P}_{V}}{D_{1} \text{ x W}_{2} \text{ x 1000}}$$
 (MPa)

Dual car hoist

without pipe support : 
$$\sigma_{ground} = \frac{P_V}{D_1 \times W_3 \times 1000}$$
 (MPa)

with pipe support : 
$$\sigma_{ground} = \frac{1.6 \text{ x P}_{v}}{D_{1} \text{ x W}_{3} \text{ x 1000}}$$
 (MPa)

$$(MPa \times 145 = psi)$$

#### Example:

Calculation of ground pressure for a twin car SCANDO 650 DOL 22/32 with vertical pipe support.

Static and dynamic load = 380 kN (according to example on previous page).

Concrete slab dimension is  $D_1 \times W_3 = 3950 \times 4530 \text{ mm}$  or 3.95  $\times$  4.53 meter and weight of concrete slab is 24 kN/m<sup>3</sup>  $\times$  5.37 m<sup>3</sup> = 129 kN.

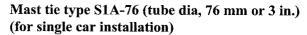
$$P_V = 380 + 129 \text{ kN} = 509 \text{ kN}$$

$$\sigma_{ground} = \frac{1.6 \text{ x P}_{v}}{D_{1} \text{ x W}_{3} \text{ x 1000}}$$
 (MPa)

$$\sigma_{\text{ground}} = \frac{1.6 \times 509}{3.95 \times 4.53 \times 1000} =$$

$$\sigma_{ground} = 0.045 \text{ MPa}$$
 (MPa x 145 = 6.60 psi)

H 14



The tie is telescopic variable in horizontal direction. The tie width **B** varies depending on the length of the tie selected.

The distance L between the wall and the mast center for this tie type is variable from a minimum of 1000 mm (3'- 3 1/4") to a maximum of 4900 mm (16'-1").

This mast tie may be inclined between  $\pm$  15° (270 mm/m or 3.35 in./ft.) from the horizontal.

Wall bracket part. no. 9100631-000.

 $mm \times 0.03937 = inches$ kN x 225 = pound force, lbf.

METRIC				
Mast tie Part No.	L <sub>min.</sub> mm	L <sub>max.</sub> * mm	B <sub>min.</sub> – B <sub>max.</sub>	P <sub>max</sub> In service / Out of serv.
9100635-170	min. 1000 -"-		500 - 850	72 kN 72 kN
		max. 1700	850 – - 1200	72 kN 72 kN
9100635-250	min. 1700 —"—		850 - - 1200	72 kN 72 kN
		max. 2500	1250 — — 1600	72 kN 72 kN
9100635-330	min. 2500 —"—		1250 - - 1600	72 kN 72 kN
		max. 3300 -"-	1650 — — 2000	43 kN 41 kN
9100635-410	min. 3300		1650 - - 2000	43 kN 41 kN
		max. 4100	2050 - - 2400	24 kN . 22 kN
9100635-490	min. 4100 -"-		2050 - - 2400	24 kN 22 kN
		max. 4900	2450 - 2800	13 kN 12 kN

\*Note: Wall bracket turned for installation towards face of structure will give additional 75 mm (3 in.).

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#### **Reaction forces**

Reaction forces can be calculated by using various formulas depending on the type of mast tie selected:

Values for Rx and Ry according to the following.

#### **Hoist in Service**

Overhang a Mast tie intervals b		12.0 12.0	0 m 0 m	10.5		9.0 9.0		7.5 7.5			) m ) m
		Rx kN	Ry kN	Rx kN	Ry kN	Rx kN	Ry kN	Rx kN	Ry kN	Rx kN	Ry kN
Car length 3.2 m, spe	eed 0.7 r	n/s or les	s, payloa	d capacit	y						
up to 260	00 kg	17.7	7.6	18.7	7.1	20.2	6.6	22.4	6.1	25.8	5.5
(If, a = b / 2)		14.9	4.7	·16.0	4.4	17.7	4.1	18.5	3.8	21.4	3.3
between 2601 – 320	00 kg	21.6	8.0	23.1	7.4	25.1	6.9	28.1	6.3	_	-
(If, a = b / 2		18.5	4.9	20.2	4.5	22.4	4.1	23.5	4.3	_	-
Car length 3.9 m, spo	eed 0.7 r	n/s or les	s, payloa	d capacit	y						
up to 240	00 kg	18.3	8.1	19.3	7.7	20.8	7.2	23.0	6.6	26.4	6.0
(If, a = b / 2)		15.3	5.1	16.5	4.8	18.1	4.5	18.9	4.1	21.6	3.6
between 2401 – 320	00 kg	22.6	8.3	24.1	7.7	26.3	7.1	29.5	6.5	_	-
(If, a = b / 2)		19.4	5.0	21.1	4.7	23.3	4.3	24.0	4.6	_	_

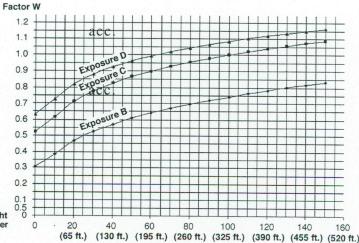
 $kN \times 225 = pound force, lbf.$ 

Overhang a		ft.		ft.		ft.	25		20	
Mast tie intervals b	4(	) ft.	35	ft.	30 ft.		25 ft.		20 ft.	
	Rx lbf.	Ry lbf.	Rx lbf.	Ry lbf.	Rx lbf.	Ry lbf.	Rx lbf.	Ry lbf.	Rx lbf.	Ry lbf.
Car length 10'- 6", spe	ed 135 fpm o	r less, pay	load cap	acity						
up to 5735	bs. 3982	1620	4207	1597	4545	1485	5040	1372	5805	1237
(If, a = b / 2)	3352	1057	3600	990	3982	9225	4162	855	4815	7425)
between 5736 – 7055	lbs. 4860	1800	5197	1665	5647	1552	6322	1417	-	-
( If, a = b / 2 (5276 - 6600	4162 (lbs)	1102	4545	1012	5040	922	5287	9675	-	- )
Car length 12'- 9", spe	ed 135 fpm or	less, pay	load capa	city						
up to 5290	bs. 4117	1822	4342	1732	4680	1620	5175	1485	5940	1350
(If, a = b / 2	3442	1147	3712	1080	4072	945	4252	922	4860	810)
between 5291 – 7055	lbs. 5085	1867	5422	1732	5917	1597	6637	1462	_	-
(If, a = b / 2)	4365	1125	4747	1057	5242	967	5400	1035	-	- )

#### **Hoist out of Service**

Rx = Rx acc. to table below x Factor w to diagram to the right.

Ry = Ry acc. to table below x Factor w to diagram to the right.



ASCE 7 - 02, Exposure B - D

Lifting height

(65 ft.) (130 ft.) (195 ft.) (260 ft.) (325 ft.) (390 ft.) (455 ft.) (520 ft.)

Overhang a Tie intervals b	12.0 m 12.0 m		10.5 m 10.5 m		9.0 m 9.0 m		7.5 m 7.5 m		6.0 m	
	Rx0 kN	Ry0 kN	Rx0 kN	Ry0 kN	Rx0 kN	Ry0 kN	Rx0 kN	Ry0 kN	Rx0 kN	Ry0 kN
Single car	23.6	23.6	20.6	20.6	17.7	17.7	14.7	14.7	11.8	11.8
a = b / 2 *	12.1	12.1	10.6	10.6	9.1	9.1	7.6	7.6	6.1	6.1
Dual cars	-	_	22.6	22.6	19.4	19.4	16.5	16.5	12.9	12.9
a = b / 2 *	_	_	11.6	11.6	10.0	10.0	8.6	8.6	6.6	6.6

IMPERIAL										
Overhang a				35 ft.		30 ft.		5 ft.	20 ft.	
Tie intervals b			35 ft.		30 ft.		25 ft.		20 ft.	
	Rx0 lbf.	Ry0 lbf.								
Single car	5310	5310	4635	4635	3982	3982	3307	3307	2655	2655
a = b / 2 *	2722	2722	2385	2385	2047	2047	1710	1710	1372	1372
Dual cars	-	-	5085	5085	4365	4365	3712	3712	2902	2902
a = b / 2 *	_	-	2610	2610	2250	2250	1935	1935	1485	1485

<sup>\*</sup> If overhang equal or less than half the tie distances the reaction forces in the remaining mast ties will ALWAYS be the same. They can never be less.

Values for distances above last mast tie larger than b/2 can be interpolated.



# **Contract Agreements / Change Orders**

- 1. A copy of the "For Approval" drawing set shall be returned to Maxim Crane Works, L.P. (Maxim) by the Customer prior to erection of the crane(s) with markups and revisions noted (if any). Written acceptance of the drawings must be received prior to crane erection. Requests for changes to the drawings within 30 days of erection or after written approval shall be subject to additional charges.
- 2. This drawing set is loaned to the recipient for confidential use only.

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### **Tower Crane Operations**

- In-service working conditions are restricted to wind speeds less than or equal to 45 mph per FEM 1.001 measured at the top of the crane. The permissible lifting wind speed shall be adjusted based on the load's exposed area including appropriate shape coefficients for the load being lifted. The crane load chart applies for loads whose exposed area is less than 9.8 square feet per ton of chart capacity. The permissible lifting wind speed shall be reduced for a load with an exposed wind area greater than this value. Consult the crane's Operating Manual for guidance. If wind speeds exceed 45 mph, the tower crane shall be placed out of operation and be allowed to weathervane 360 degrees in accordance with the operations manual.
- 2. For climbing cranes, the customer shall provide written as-built horizontal and vertical location of the centerline of the tower crane foundation within five (5) calendar days of concrete placement. The customer shall also provide the written as-built angle if the tower crane is skewed from a building grid line. For in and out of service working conditions see foundation detail drawings.
- 3. The customer shall verify the crane can safely operate and/or weathervane over adjacent property, existing buildings, power lines, streets, neighboring obstacles, etc. It is the customer's responsibility to obtain any required permits or easements.
- 4. The customer shall verify all dimensions and site conditions prior to starting work. Any deviations from this drawing set shall be brought to the immediate attention of Maxim Crane Works.
- 5. All hook heights are calculated from the top of the tower crane's foundation.
- 6. Consult the crane's operation manual for additional information necessary for safe operation of the tower crane.
- 7. For projects with multiple tower cranes, when slewing the upper crane, the hook block must be positioned to clear the lower crane.
- 8. Consult the crane's Operating Manual for the permissible working temperature.
- 9. Installation, operation, assembly, disassembly and maintenance shall be carried out in accordance with ASME B30.3. OSHA 1926 Subpart CC, local codes and manufacturer's requirements.

### **Emergency Weather Procedures**

- 1. For a storm with a predicted wind speed greater than the design wind speed shown on the Foundation or Tie-In Detail drawings, Maxim shall be contacted for proper procedures.
- 2. For a storm with a predicted wind speed not anticipated to exceed the design wind speed shown on Foundation or Tie-In Detail drawings, the standard procedures outlined in the operating manual are to be followed for taking the crane out of service. A partial list of items to be completed are:
  - Check & adjust weathervane operation,
  - Remove loose items from crane upper-works,
  - Remove signage from crane,
  - Tie electrical panel doors shut,
  - Check Counterweight security bars (if equipped),
  - Locate trolley to innermost position secured against stops,
  - Hook block assembly to be raised to uppermost position,
  - All rigging to be removed,
  - Check all tower connection bolts,
  - Check tie-in collars and ties.
  - Secure power cable at each tower section; and
  - Shut off power at base.
- 3. Once the storm has passed and prior to re-energizing, the crane shall be inspected by the operator. The following steps are to be performed:
  - Inspect foundation bolts,
  - Inspect tower sections and mounting bolts,
  - Check power cable connections,
  - Check motors and panels for water accumulation,
  - Energize the crane; and
  - Check functions and safeties for proper operation.

# Added Wind Area (Signs)

Added wind area (signage) must not affect the safe operation of the tower crane. If the operator is not able to safely control the crane for its normal intended operation, then the signage shall be removed. Additional surfaces exposed to the wind on the crane's structure may effect its stability. The creation of additional surfaces exposed to the wind on the counter-jib can prevent the crane from turning into the wind properly when it is out of service, or affect the crane's proper operation when in use. If a sign is to be placed on the crane, without the calculation of additional crane structural stresses, the guidelines below and those shown on Drawing X-3.1 shall be followed. Signs to be mounted hanging below the counterjib of the crane shall be approved by the manufacturer. Signs are not permitted on MR type cranes.

- Signs may be attached to any existing solid surface on the crane such as a counterweight provided the sign is not larger than the solid surface.
- 2. Signs constructed of solid wood, metal, or similar materials are not permitted.

If a sign is to be placed on the Wolffkran, without the calculation of additional crane structural stresses, the following guidelines shall be followed:

- 1. Signs must be no larger than a 6'-0" wide x 11'-0" tall banner.
- 2. One sign may be located each side of the counterweights. Attach the sign to the advertising plate provided.

# **Top Climbing**

The tower crane shall be oriented such that the jib is parallel to the face of the structure, other obstructions, or line of clearance for proper installation, climbing and dismantlement of the tower crane. See additional notes and details on the plan drawing(s) for proper orientation of base and tower sections.

### **Electrical Requirements**

- . The customer shall ensure power is available at the tower crane base prior to the scheduled erection date. The tower crane can not be erected without power.
- 2. A fused disconnect shall be provided at the base of the tower crane for power supply. Surge diverters may be installed at the site junction boxes to protect electrical equipment on the site.
- Tower must be grounded prior to erecting the tower crane by linking to a grounding rod with a grounding conductor in accordance with local building codes. It is recommended the grounding rod consist of a minimum of  $\frac{3}{4}$ " diameter galvanized steel or copper rod driven a minimum of 8'-0" into the ground. It is recommended the grounding conductor be a minimum of  $1\frac{13}{16}$ " wide and  $\frac{1}{8}$ " thick galvanized steel strip or a minimum AWG #4 copper cable. The grounding conductor shall be attached to the base tower section using a NEC approved clamp system. Do not drill or weld to the tower mast structure.
- 4. Provide 3 Phase, 60 Hz power supply plus ground. Provide 480 volts phase to phase, 277 volts each phase to ground, with 120° phase shift between phases.
- 5. The use of open delta transformers is prohibited.
- 6. Amperage requirements for the crane(s) may be found on Drawings X-3.

**WARNING:** Electrical installation and connection work must be completed by qualified persons, and must comply with all relevant local, state or provincial, and federal rules, regulations and codes. The tower crane's electrical system must be properly grounded prior to erecting the tower crane in order to protect personnel from danger of electrical shock. Failure to follow these instructions is dangerous and could lead to an accident resulting in property damage, serious injury or loss of life.



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Aero
SAN DIEGO, CA
STANDARD NOTES & CONDITIONS
---AADEMARK CONSTRUCTION

REV NOTE

Job #: T23-0066

Drw by: \_
Chk by: DMD

X-2

FOR APPROVAL

						•				
POW	JIREN	/IENT	PERMITTED ADVERTISING SIGNS							
	C.				Minimum Recommended	Maximum Area for Single		Maximum Area for Two Signs	_	Maximum Height of
MD485B.20	Nominal (kVA)	Peak (kVA)	Nominal (Amps)	Peak (Amps)	Generator Size (kW)	Sign (ft²)	< OR>	10.25	Distance (ft)	Sign (ft)
WID465B.20	180	n/a	256	288	300	94.2		53.8	14.8	n/a
Note: N/A indicates	the inform	not availa	ble.							

### Notes:

- 1. The foundation shall be designed in accordance with the recommendations from a site specific geotechnical report.
- 2. The included crane configuration(s) and out of service reactions meet the ASME B30.3-2016 specifications for "out of service" wind conditions. The "out of service" design wind speed was determined in accordance with ASCE 7, Figure 26.5-1B. The wind speed, used for these reactions, was 98 mph, which represents a nominal design 3-second wind gust at 33 feet above the ground surface for Exposure Category C. A factor of 0.85 was applied to the 700-year design wind speed of 115 mph, per ASCE 37-02, with the assumption the crane being used is considered a temporary structure used during a construction period of 2 years or less. The foundation reactions shown are service loads applied to the foundation for the freestanding condition. See tie-in drawings for out of service wind speeds after a tie-in is installed. For top climbing applications, the vertical load "V" shall be increased by the weight of each additional tower mast section added to the crane.
- 3. Calculations for the design of this crane foundation are based on a concrete with a specific weight of 150 pcf and a minimum compressive strength (ASTM C39) of 4,000 psi. All reinforcing steel to be ASTM A615 Grade 60 deformed bars unless otherwise noted.
- 4. Concrete shall reach the following strengths:

75% for Mast Erection

90% for Upper Erection

100% for Load Test & Operation

- 5. Foundations located within a 1.5H:1V slope of the toe of an excavation shall not be permitted. The customer shall verify that there are no underground structures, utilities or obstructions in the area of the proposed crane location(s).
- 6. For climbing cranes, the customer shall provide written as-built horizontal and vertical location of the centerline of the tower crane foundation within five (5) calendar days of concrete placement. The customer shall also provide the written as-built angle if the tower crane is skewed from a building grid line.
- 7. Installation, operation, assembly, disassembly and maintenance shall be carried out in accordance with ASME B30.3. OSHA 1926 Subpart CC, local codes and manufacturer's requirements.

19'-8<sup>1</sup><sub>4</sub>" SQ. SYSTEM

Potain MD485

**ZX6830** 



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Maxim Crane Works.

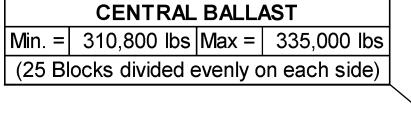
CA ACTIONS

Aero SAN DIEGO FOUNDATION RE

CONSTRUCTION

REV NOTE

X-3.1

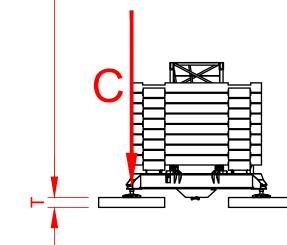


T23   Drw by: RW
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Elevation View

### **PROCEDURE**

- 1. Install four foundation blocks. Ensure the blocks are level within  $\frac{1}{8}$ ".
- 2. Confirm correct orientation of the mast section with the plan view.
- 3. Set cross frame assembly level using shims if required. Shims shall be the same dimension as the corner plate and drilled for bolt holes (if needed) as shown in Detail A.
- Cross frame shall be set plumb / level prior to fastening the cross frame to the foundation blocks. The tower mast shall be erected plumb to within a tolerance of 1:500 (0.96 inches in 40 feet).
- 5. Place central ballast.
- 6. Erect the crane in accordance with the manufacturer's recommendations.



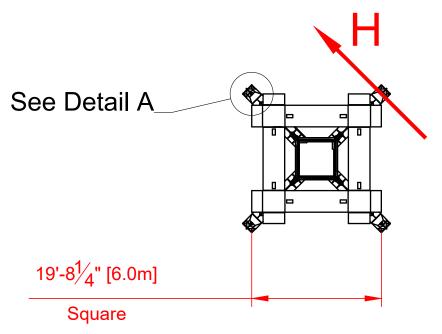
### **FOOTING REACTION NOMENCLATURE**

Mo: OVERTURNING MOMENT

HORIZONTAL FORCE

VERTICAL FORCES

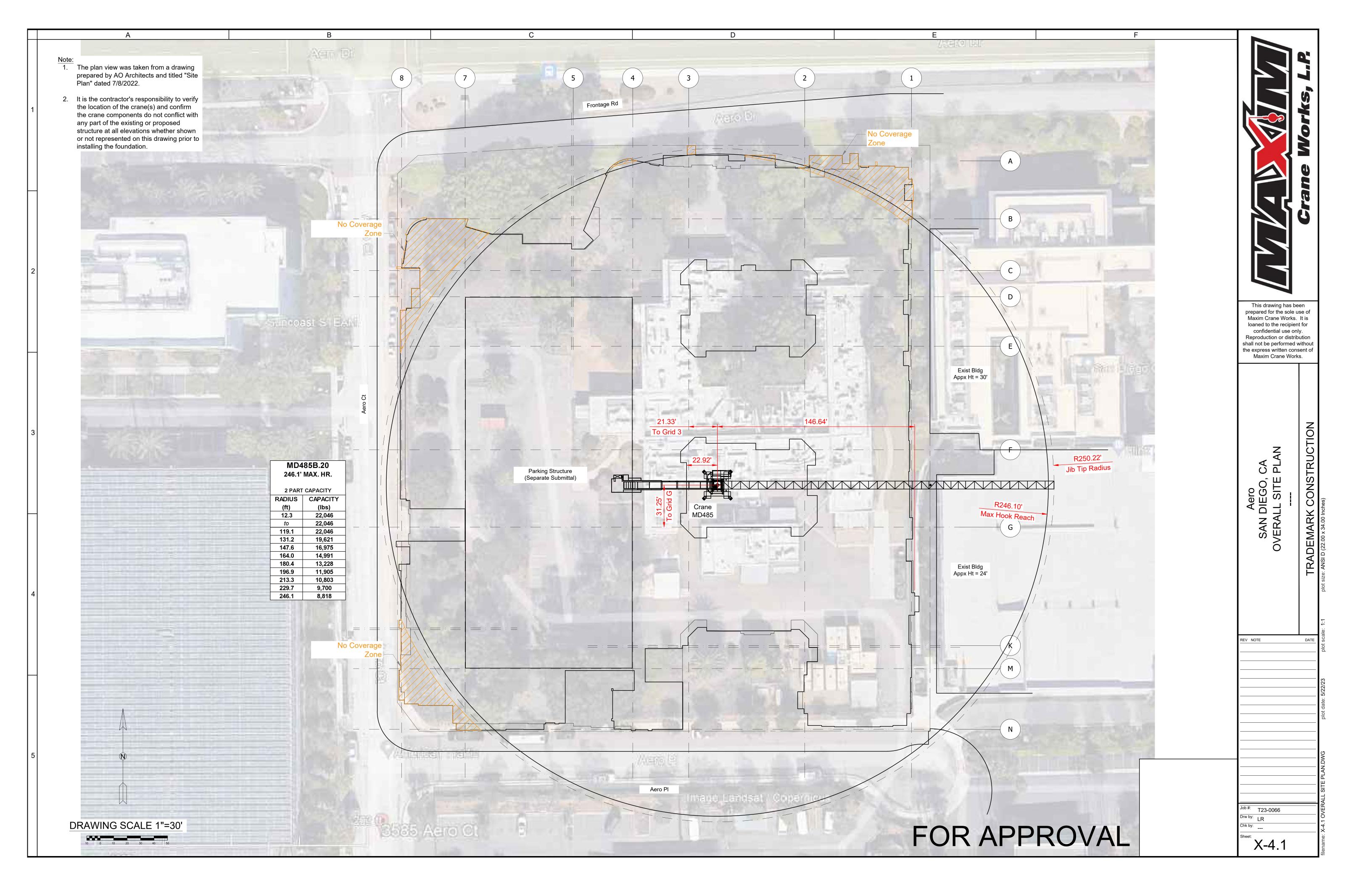
SLEWING MOMENT

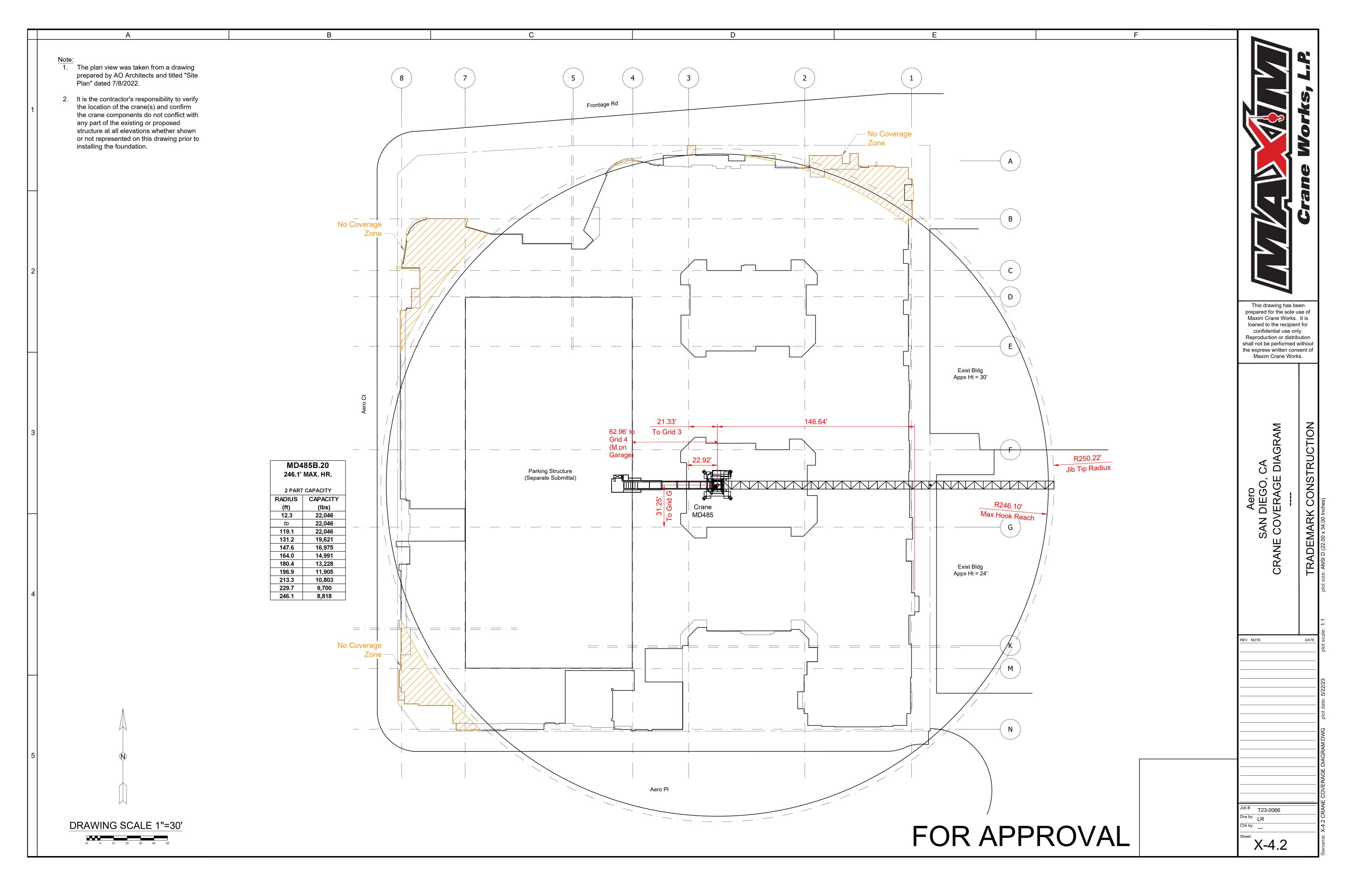


#### **REACTION FORCES** In Service (max wind speed: 45 mph) **Out of Service** Maximum Corner Load C (kips) = Maximum Corner Load C (kips) = 293 Horizontal Force / Corner H (kips) = 27 Horizontal Force / Corner H (kips) =

	FO	UNDATION S	PECIFICATION	NS					
Allowable Soil			Rebar Size a	nd Spacing	Weight of 1				
Bearing	W (ft)	T (ft)	Bottom	Тор	Pad (kips)				
DESIGNED BY OTHERS									







Notes: 1. In-service working conditions are restricted to wind speeds less than or equal to 45 mph per FEM 1.001 measured at the top of the crane. See General Notes for guidance on permissible wind speed for lifting loads with exposed area greater than 9.8 square feet per ton of chart capacity. If wind speeds exceed 45 mph, the tower crane shall be placed out of operation and be allowed to weathervane 360 degrees in accordance with the operations manual. 2. The Contractor is responsible for verifying all job site dimensions and shall report any discrepancies to the Tower Crane Division of Maxim Crane Works prior to commencing with the installation. 3. The elevation view was taken from a drawing prepared by X and titled "X" dated X X, X. 4. The top of foundation elevation to be confirmed by This drawing has been the contractor. prepared for the sole use of Maxim Crane Works. It is loaned to the recipient for confidential use only. Reproduction or distribution shall not be performed without the express written consent of Maxim Crane Works. Aero SAN DIEGO, CA INITIAL ELEVATION 7th Flr 5th Flr 3rd Flr 1st Flr 146.64' BO Mats To Be Verified ZX6830 Crossframe (7) KR849A Towers DRAWING SCALE 1"=20' FOR APPROVAL X-5.1