Appendix F-1

Project Specific Water Quality Management Plan

KHR Associates

December 6, 2024

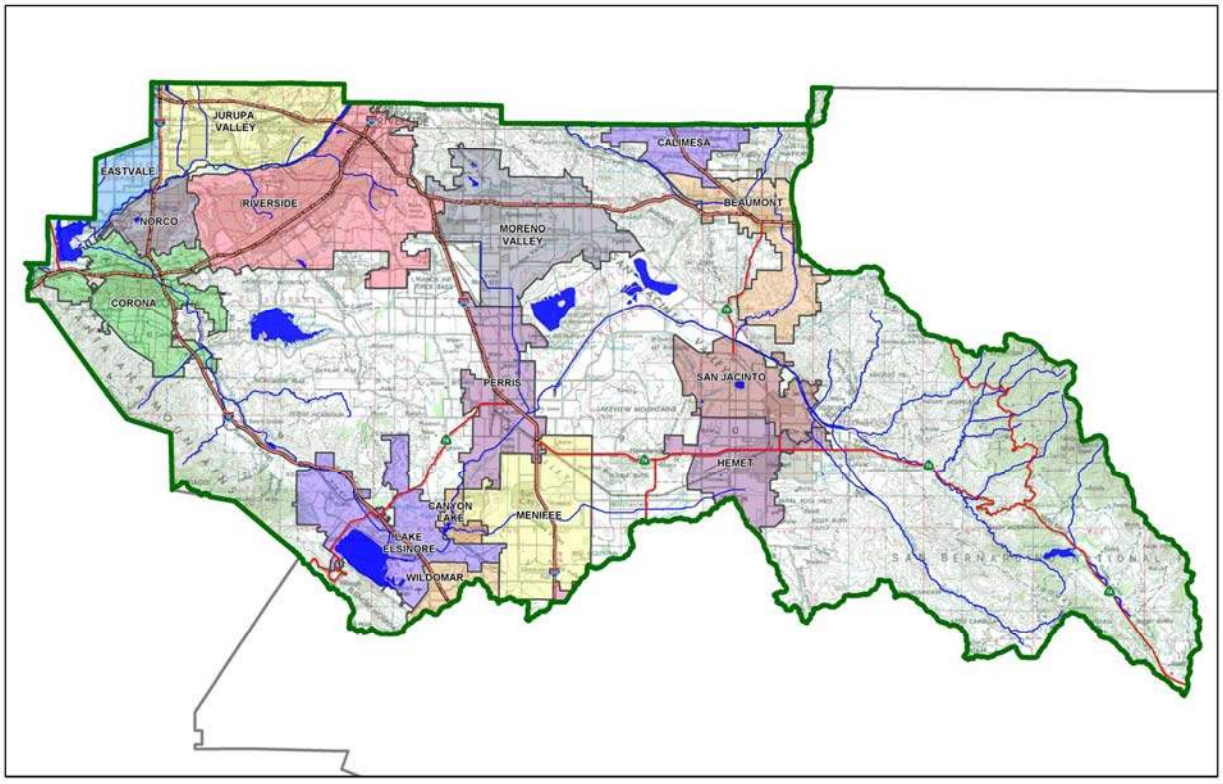
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: **Iron Lofts – 3093 MISSION INN AVENUE**

Public Works No: GP-2023-00581

Design Review/Case No: PR-2023-001469



☒ **Preliminary**
☐ **Final**

Original Date Prepared: December 9, 2022

Revision Date(s): June 20, 2023; November 27, 2023; August 9, 2024; December 6, 2024

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

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OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Iron Lofts, LLC by KHR Associates for the Iron Lofts - South project.

This WQMP is intended to comply with the requirements of the City of Riverside for A 300 unit mixed-use development, Planning Case No. PR-2023-001469 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Riverside Water Quality Ordinance (Municipal Code Section 14.12.315).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature	December 6, 2024 Date
Darrin Olson / Iron Lofts, LLC Owner's Printed Name	President Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature	December 6, 2024 Date
James H. Kawamura Preparer's Printed Name	President Preparer's Title/Position

Preparer's Licensure: Registered Civil Engineer No. C30560
Exp. 3/31/26

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Section A: Project and Site Information

The proposed development involves the construction of approximately 6.94 acres (302,137 sf.) for 300 residential dwelling units within a 4-story, 295 unit apartment building (72,883 square feet) and a 2-story, 5 unit townhome building (5,525 square feet) with attached 2 car garages (totaling 10 parking spots) with a parking lot that contains 294 carport parking stalls and 84 open parking stalls, along with repurposing a 4,912 square foot historic building for amenity purposes. There will be approximately 83,320 square feet of building area, 45,289 square feet of landscaping, 89,339 square feet of surface parking area, 48,781 square feet of carports, 156 square feet of trash enclosure, 2,073 square feet for a dog park, 2,283 square feet of decomposed granite, 29,586 square feet of hardscape, and 1,310 square feet of pool/spa area. The DCV drains to an Aqua-Swirl for pre-treatment prior to detention by a solid walled CMP and infiltration by a means of drywells.

PROJECT INFORMATION		
Type of Project:	Mixed-Use Residential	
Planning Area:	Ward 2	
Community Name:	Eastside	
Development Name:	Iron Lofts - South	
PROJECT LOCATION		
Latitude & Longitude (DMS): 33D 58M 50S N, 117D 21M 53S W Project Watershed and Sub-Watershed: Santa Ana; Santa Ana River, Reach 3 APN(s): 211-071-001, 002, 004, 005, 023, 024; 211-072-001, 002, 004, 020, 021, 022 Map Book and Page No.: Book 6, Page 48		
PROJECT CHARACTERISTICS		
Proposed or Potential Land Use(s)	Mixed-Use Residential	
Proposed or Potential SIC Code(s)	6513, 5399	
Area of Impervious Project Footprint (SF)	256,848 sf.	
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	251,936 sf.	
Does the project consist of offsite road improvements?	☒ Y	☐ N
Does the project propose to construct unpaved roads?	☐ Y	☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y	☒ N
EXISTING SITE CHARACTERISTICS		
Total area of existing Impervious Surfaces within the project limits (SF)	223,088 sf.	
Is the project located within any MSHCP Criteria Cell?	☐ Y	☒ N
If so, identify the Cell number:	N/A	
Are there any natural hydrologic features on the project site?	☐ Y	☒ N
Is a Geotechnical Report attached?	☒ Y	☐ N
If no Geotech Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	N/A	
What is the Water Quality Design Storm Depth for the project?	0.60	

A.1 Maps and Site Plans

Appendix 1 includes a map of the local vicinity and existing site. In addition, WQMP Site Plan, located in Appendix 1, includes the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Downspouts
- Impervious Surfaces
- Standard Labeling

A.2 Receiving Waters

In order of upstream to downstream, the receiving waters that the project site is tributary to are as follows. A map of the receiving waters is included in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	Hydrologic Unit	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Santa Ana River, Reach 3	801.21	Copper, Lead, Indicator Bacteria	AGR, GWR, REC1, REC2, WARM, WILD, RARE	Approximately 15 miles

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*		
City of Riverside Conditional Use Permit	☒ Y	☐ N
City of Riverside Design Review	☒ Y	☐ N
City of Riverside Building Permit	☒ Y	☐ N
City of Riverside Grading Permit	☒ Y	☐ N
City of Riverside Construction Permit	☒ Y	☐ N

Section B: Optimize Site Utilization (LID Principles)

Site Optimization

Does the project identify and preserve existing drainage patterns? If so, how? If not, why?

The proposed development will match as close to possible existing drainage paths and minimize usage of inlets. For the most part, drainage will occur over impervious surfaces.

Does the project identify and protect existing vegetation? If so, how? If not, why?

Although vacant, the site does not have any existing vegetation or sensitive areas to protect.

Does the project identify and preserve natural infiltration capacity? If so, how? If not, why?

The geotechnical report has shown that the underlying soils are good for infiltration and therefore, impervious surfaces will be collected by the onsite drainage system that directs the stormwater to an underground detention tank for infiltration by drywells.

Does the project identify and minimize impervious area? If so, how? If not, why?

The nature of the developments limits the potential to minimize impervious areas. Landscaping will be utilized around the buildings and parking lots as well as used within the parking lots to the maximum extent practical. Drive aisles, parking stalls and sidewalks will be designed to the minimum widths allowed.

Does the project identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Walkways within portions of the site will drain to adjacent landscaping. Due to anticipated soil conditions, including collapsible soils, runoff will not be dispersed to adjacent pervious areas. The geotechnical evaluation recommends landscaping not be planned within 10 feet of the buildings unless impermeable liners underlie the landscaping, and that roof drainage be collected and conducted away from the buildings. The project will be using drywells to infiltrate the stormwater design volume.

Section C: Delineate Drainage Management Areas (DMAs)

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
1A	Landscape	24,357	D
1B	Roof (Building, Carport, Trash Enclosure)	61,934	D
1C	Walk/Turf	21,520	D
1D	Asphalt	44,125	D
2A	Landscape	20,932	D
2B	Roof (Building, Carport)	70,323	D
2C	Walk/Water Features	13,732	D
2D	Asphalt	45,214	D

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
N/A			

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4 =	Required Retention Depth (inches)
		[A]	[B]		[C]	[D]
N/A						

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]
N/A							

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
1A	DW1A
1B	DW1B
1C	DW1C
1D	DW1D
2A	DW2A
2B	DW2B
2C	DW2C
2D	DW2D

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (ref: Chapter 2.4.4 of the WQMP Guidance Document)? ☐ Y ☒ N

Geotechnical Report

A Geotechnical Report is required by the City of Riverside to confirm present and past site characteristics that may affect the use of Infiltration BMPs, see Appendix 3.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: DMAs 1 & 2 have rates less and more than 1.6 inches/hour.		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	X	
Describe here: According to GPI's Geotechnical Feasibility Evaluation, soils are anticipated to be moderately collapsible. The evaluation states an infiltration setback beyond the typical distance of 10-feet from buildings should be anticipated. The report also states that the on-site soils are severely corrosive to metal. The detention tank is surrounded by washed stone and then wrapped by geotextile to prevent the soil from contacting the pipe.		

Infiltration rates at end of drywells will have infiltration rates that exceeds 1.6 inches per hour.

D.2 Harvest and Use Assessment

The following conditions apply*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verified with the City of Riverside).

☒ The Design Capture Volume will be addressed using Infiltration Only BMPs. (Harvest and Use BMPs are still encouraged, but are not required as the Design Capture Volume will be infiltrated or evapotranspired).

☐ None of the above.

Harvest and Use BMPs need not be assessed for the site.

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: 1.04 AC

Type of Landscaping (Conservation Design or Active Turf): Conservation Design

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 5.90 AC

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

The project EIATIA factor: 0.79 (Conservation); 0.47 (Active Turf)

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: 4.66 AC (conservation); 2.77 AC (Active Turf)

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
2.77 AC	1.04 AC

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

For the project, the following applies:

☐ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

☒ None of the above.

D.4 Feasibility Assessment Summaries

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
1A	☒	☐	☐	☐	☐
1B	☒	☐	☐	☐	☐
1C	☒	☐	☐	☐	☐
1D	☒	☐	☐	☐	☐
2A	☒	☐	☐	☐	☐
2B	☒	☐	☐	☐	☐
2C	☒	☐	☐	☐	☐
2D	☒	☐	☐	☐	☐

LID BMPs are feasible for all project DMAs.

D.5 LID BMP Sizing

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *DW 1A, DW 1B, DW 1C, DW 1D*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)* [E]	*Design Capture Volume, V_{BMP} (cubic feet)* [F]	*Proposed Volume on Plans (cubic feet)* [G]
1A	*24,357*	*Landscaping*	*0.1*	*0.11*	*2,690.4*			
1B	*61,934*	*Roof*	*1*	*0.89*	*55,245.1*			
1C	*21,520*	*Walk*	*1*	*0.89*	*19,195.8*			
1D	*44,125*	*Asphalt*	*1*	*0.89*	*39,359.5*			
	151,936				116,490.8	0.6	5,824.5	***5,875***

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A of the WQMP Guidance Document
[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here* *DW 2A, DW 2B, DW 2C, DW 2D*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)* [E]	*Design Capture Volume, V_{BMP} (cubic feet)* [F]	*Proposed Volume on Plans (cubic feet)* [G]
2A	*20,932*	*Landscaping*	*0.1*	*0.11*	*2,312.1*			
2B	*70,323*	*Roof*	*1*	*0.89*	*62,728.1*			
2C	*13,732*	*Walk*	*1*	*0.89*	*12,248.9*			
2D	*45,214*	*Asphalt*	*1*	*0.89*	*40,330.9*			
	150,201				117,620	0.6	5,881	***5,909***

[B], [C] are obtained from Section 2.3.1 of the WQMP Guidance Document
[E] is obtained from Exhibit A of the WQMP Guidance Document
[G] is obtained from LID BMP design procedure sheet, placed in Appendix 6

Solid walled corrugated metal pipe will be used to detain the DCV (Design Capture Volume) and drywells will infiltrate the DCV within the required drawdown time of 48 hours. See Appendix 6 for the calculations.

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to confirmation of LID waiver approval by the Regional Board). For the project, the following applies:

☒ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Regional Board and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

The project does not create a Hydrologic Condition of Concern, meeting the criteria for HCOC Exemption as shown below:

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

Results included in Table F.1 below and hydrologic analysis included in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration			
Flow (CFS)			
Volume (Cubic Feet)			
Volume Infiltrated			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (Prado Dam, Santa Ana River) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

F.2 HCOC Mitigation

As an alternative to the HCOC Exemption Criteria above, HCOC criteria is considered mitigated if the project meets one of the following conditions, as indicated:

☐ a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

☐ b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

☐ c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

☒ d. None of the above.

Section G: Source Control BMPs

The following table identifies the potential sources of runoff pollutants for this project and specifies how they are addressed through permanent controls and operational BMPs:

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
On-site storm drain inlets	Location of inlets shown on WQMP Exhibit. Mark all inlets with the words "Only Rain Down the Storm Drain" or similar.	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage Systems Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com. Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
Interior floor drains and elevator shaft sump pumps	Interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.	Inspect and maintain drains to prevent blockages and overflow.
Need for future indoor & structural pest control	Pests will be kept out of buildings using barriers, screens and caulking.	Provide Integrated Pest Management information to owners, lessees, and operators.
Landscape/Outdoor Pesticide Use	Location of native trees shown on WQMP Exhibit. Stormwater treatment facility shown on WQMP Exhibit. Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides	Maintain landscaping using minimum or no pesticides. Provide IPM information to new owners, lessees and operators. See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/.

	that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	
Pools, spas, ponds, decorative fountains, and other water features	Plumb to sewer in accordance with local requirements. If draining to landscaped area, remove any chemicals and debris before slowly discharging to landscaping.	See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/.
Refuse areas	Location of refuse areas shown on WQMP Exhibit. Signs will be posted on or near dumpster stating "Do not dump hazardous materials here" or similar. Any doors to trash area and bin lids will be kept closed. Bins will be emptied weekly.	Receptacles will be inspected weekly and repaired/replaced when leaking. Bin lids are to remain closed and refuse area will be maintained daily. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
Vehicle and Equipment Cleaning	Vehicle and equipment cleaning will not be allowed on-site.	Lease agreement shall state that vehicle and equipment cleaning is prohibited on-site. See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com.
Vehicle / Equipment Repair and Maintenance	Vehicle and equipment repair and maintenance will not be allowed on-site.	No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids,

		hazardous materials, or rinse water from parts cleaning into stormwater. No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building. Leaking vehicle fluids shall be contained or drained from vehicle immediately. No person shall leave unattended drip parts or other open containers containing vehicle fluids, unless such containers are in use or in an area of secondary containment.
Miscellaneous Drain or Wash Water or Other Sources: Boiler drain lines; Condensate drain lines; Rooftop equipment; Drainage sumps; Roofing, gutters, and trim; Other sources	Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.	
Plazas, sidewalks, and parking lots		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into

		the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)	Latitude / Longitude
DW 1A – DW 1D	Drywell, Aqua-Swirl, CMP	Preliminary Storm Drain Plan	33.979589,-117.364986
DW 2A – DW 2D	Drywell, Aqua-Swirl, CMP	Preliminary Storm Drain Plan	33.980343, -117.364394

Section I: Operation, Maintenance and Funding

As required by the City of Riverside, the following Operation, Maintenance and Funding details are provided as summarized:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred.
3. An outline of general maintenance requirements for the Stormwater BMPs selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance.

See Appendix 9 for a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on site, and an agreement assigning responsibility for maintenance and providing for inspections and certification.

Maintenance Mechanism: Covenant & Agreement, Funding for the on-going operation and maintenace of post-construction BMPs is the responsibility of Iron Lofts, LLC (the property owner).

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

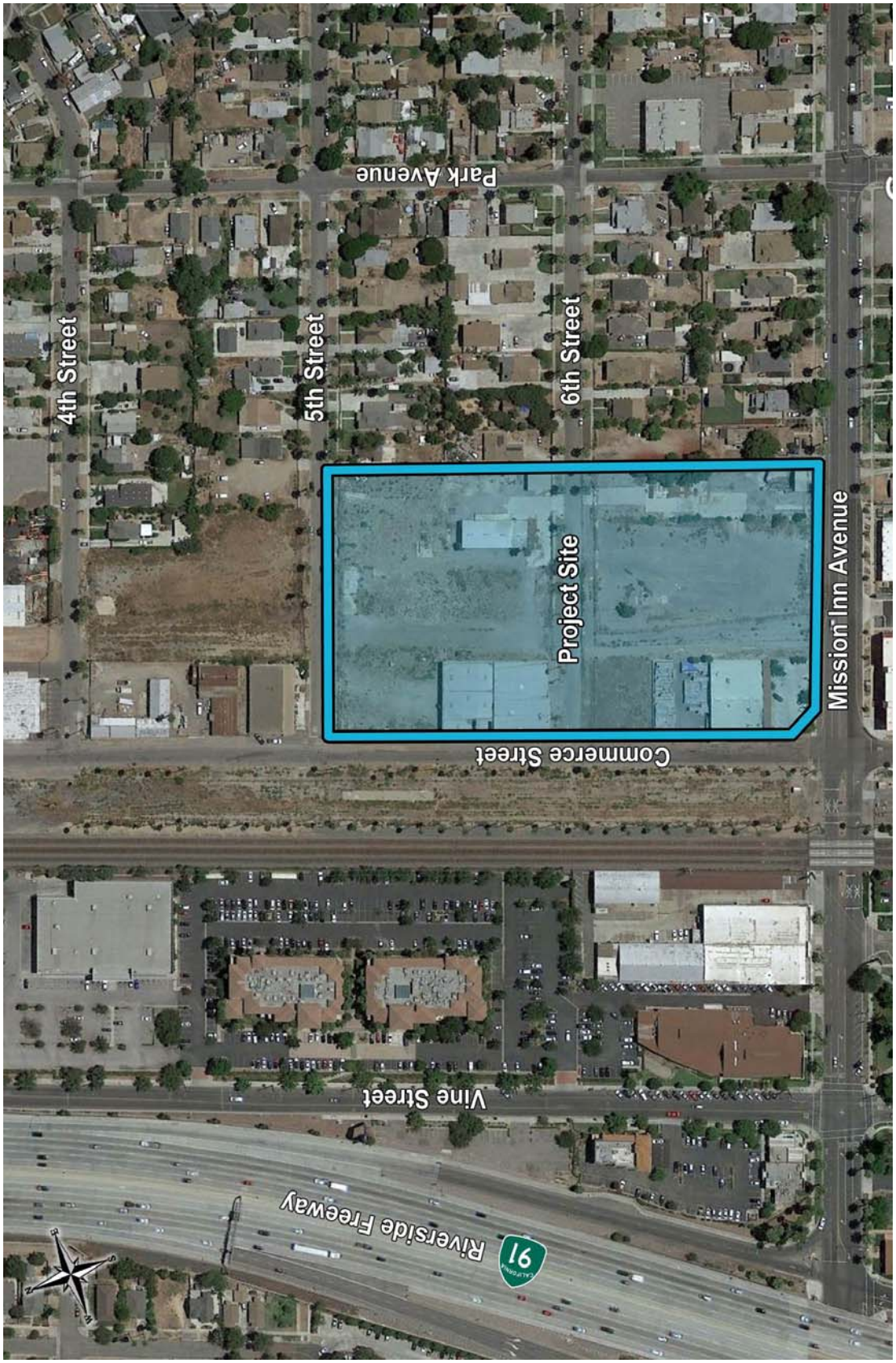
☐ Y ☒ N

Operation and Maintenance Plan and Maintenance Mechanism is included in Appendix 9. Educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

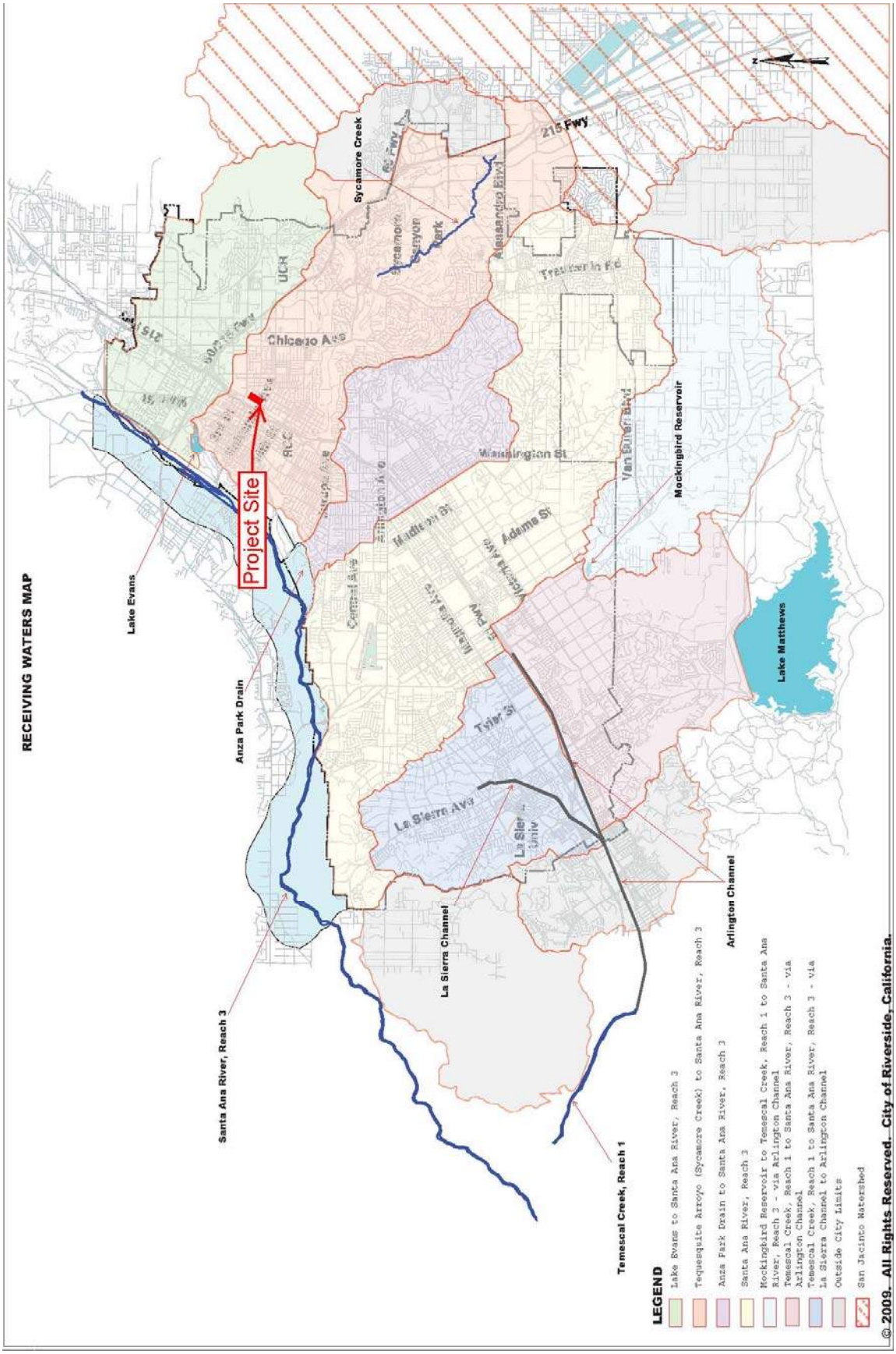
Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

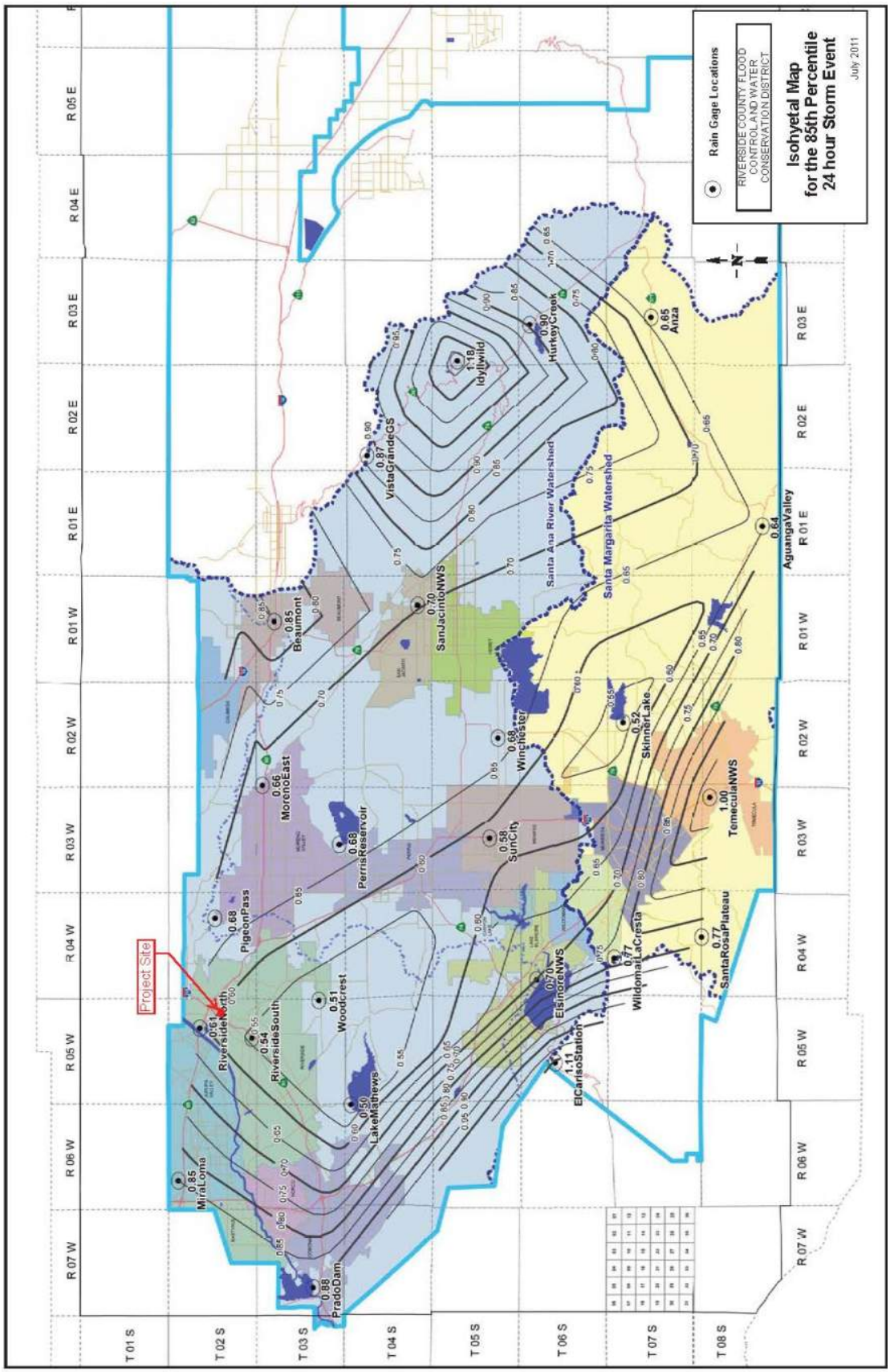
Location Map



Receiving Waters Map



85th Percentile Isohyetal Map



DMA SUMMARY

DMA DESIGNATION	SURFACE TYPE	IMPERVIOUS AREA (SF)	PERVIOUS AREA (SF)	TOTAL AREA (SF)	DESIGN VBMP (CF)	DESIGN FLOW RATE (CFS)	TREATMENT BMP TYPE	BMP VOLUME (CF)	PRETREATMENT TYPE/MODEL/ FLOW RATE	DRAWDOWN TIME (HRS)
1	LANDSCAPING	–	24,357	24,357						
	ROOF/CARPORT	61,934	–	61,934						
	WALK/TURF	21,520	–	21,520						
	ASPHALT	44,125	–	44,125			DETENTION (8'X90' CMP)		AQUA-SWIRL #AS-2	
TOTAL	A, B, C, D	127,579	24,357	151,936	5,825	0.50	INFILTRATION (4 DRYWELLS)	5,875	1.1 CFS	44.98
2	LANDSCAPING	–	20,932	20,932						
	ROOF/CARPORT	70,323	–	70,323						
	WALK/TURF	13,732	–	13,732						
	ASPHALT	45,214	–	45,214			DETENTION (6'X156' CMP)		AQUA-SWIRL #AS-2	
TOTAL	A, B, C, D	129,269	20,894	150,201	5,881	0.50	INFILTRATION (4 DRYWELLS)	5,909	1.1 CFS	43.51

DRYWELL SUMMARY

DRYWELL DESIGNATION	DEPTH FROM RIM TO INVERT (FT)	SLURRY DEPTH (FT)	SETTLING CHAMBER DEPTH (FT)	TOTAL INFILTRATION DEPTH (FT)	TOTAL DRYWELL DEPTH (FT)
1A	15.83	15.83	23.28	57.45	73.28
1B	16.32	16.32	23.77	57.45	73.77
1C	17.22	17.22	24.7	57.45	74.67
1D	17.55	17.55	25	57.45	75
DESIGN #s	17.55	17.55	25	57.45	75
2A	14.89	14.89	24.67	59.78	74.67
2B	15.06	15.06	24.84	59.78	74.84
2C	15.22	15.22	25	59.78	75
2D	14.76	14.76	24.54	59.78	74.54
DESIGN #s	15.22	15.22	25	59.78	75

OWNER

IRON LOFTS, LLC
1201 DOVE STREET–SUITE 520
NEWPORT BEACH, CALIFORNIA 92660
ATTN.: DARRIN OLSON
PHONE NO.: (949) 975–1122

APN

211–071–001, 002, 004, 005, 023, 024;
211–072–001, 002, 004, 020, 021, 022;

LEGEND

DESCRIPTION	SYMBOL	DMA NAME
SD–12 & SC–41: PERMEABLE AREA (LANDSCAPE AREA)		#A
SC–41: IMPERMEABLE ROOF SURFACES		#B
SD–32 & SC–34: TRASH ENCLOSURE		#B
SC–41: IMPERMEABLE HARDSCAPE AREA		#C
POOL/WATER FEATURE		#C
SC–43: IMPERMEABLE VEHICULAR SURFACE		#D
SC–44: PROPOSED PRIVATE STORM DRAIN		
PROPOSED STORM DRAIN JUNCTION STRUCTURE		
PROPOSED MAXWELL IV DRYWELL		
PROPOSED AQUA–SWIRL		
SD–13 & SC–44: PROPOSED DROP INLET/CATCH BASIN WITH STENCILING		
LID BMP IDENTIFIER	#	
LID BMP DRAINAGE AREA BOUNDARY		
DMA # DMA AREA	#.##AC	

*DMA NAME USES LID BMP IDENTIFIER OF THE SPECIFIC BMP DRAINAGE AREA WITH THE LETTER CORRESPONDING TO THE SURFACE TYPE.

SITE INFORMATION

TOTAL PROPERTY AREA:	302,137 SF (6.94 AC)
IMPERVIOUS AREA & %:	256,848 SF (5.90 AC) 85%
PERVIOUS AREA & %:	45,289 SF (1.04 AC) 15%
TOTAL DESIGN CAPTURE VOLUME (DCV):	11,706 CF
TOTAL SWQDF:	1.0 CFS
DISTURBED AREA:	297,225 SF (6.82 AC)
UNDISTURBED AREA (HISTORIC BUILDINGS):	4,912 SF (0.11 AC)

0 20 40 80 120

SCALE: 1"=40' DATE: 12/06/2024

IRON LOFTS

IRON LOFTS, LLC

PRELIMINARY WQMP SITE PLAN

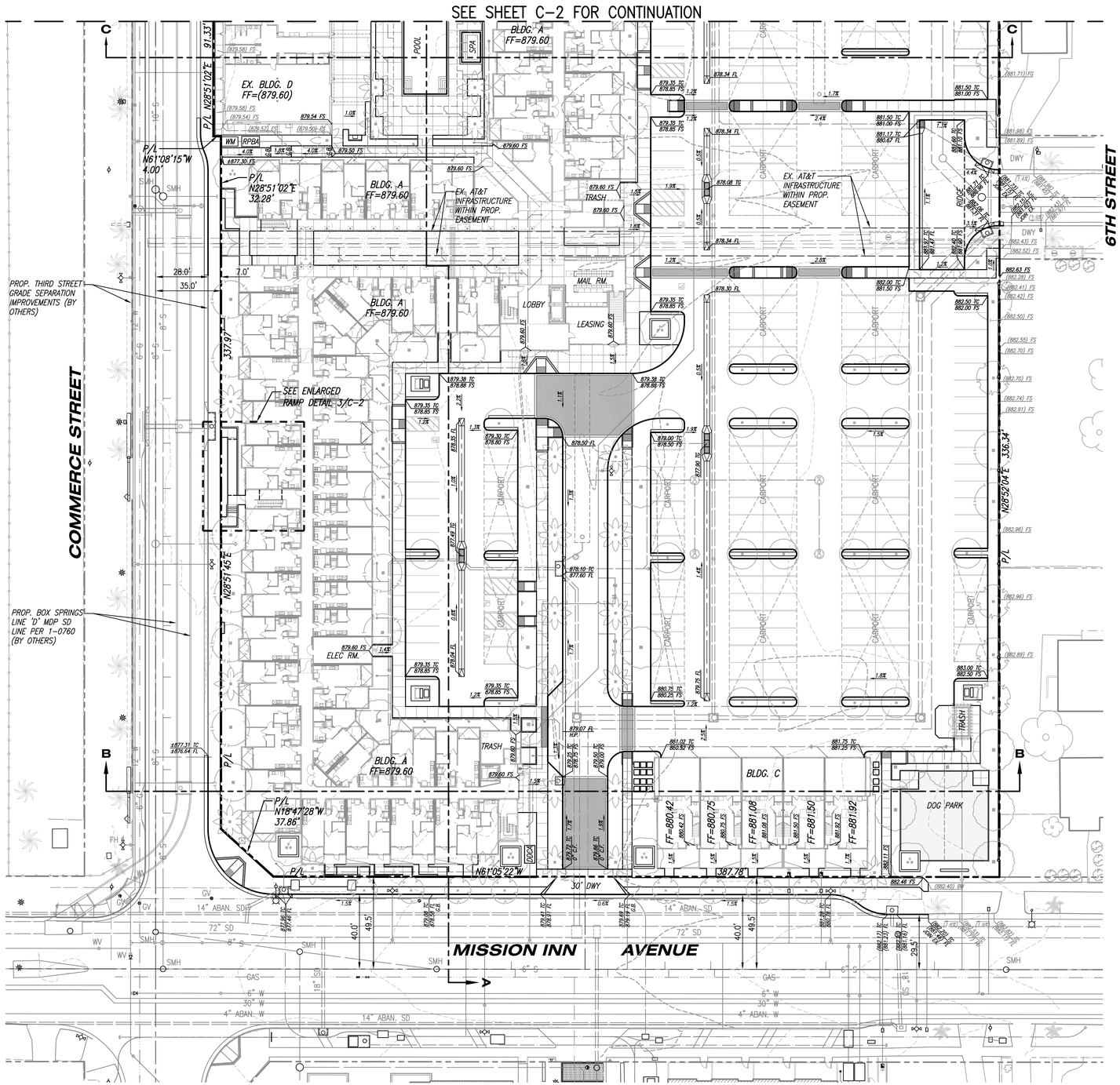
RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614

R:\Realm\Realm-Riverside-Iron Lofts\Documents\WQMP\Entitlement\APPENDIX 1 - WQMP-SITE-PLAN.dwg Dec 06, 2024 - 9:58am

Appendix 2: Construction Plans

Grading and Drainage Plans



EARTHWORK QUANTITY ESTIMATE

CUT/EXPORT (REMEDIATION)	20,000 CY
FILL/IMPORT	10,000 CY

FORESTRY NOTES

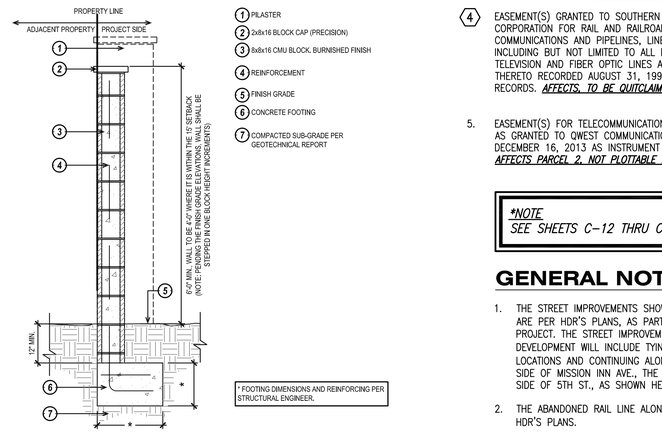
1. PROTECT IN PLACE EXISTING STREET TREES IN PUBLIC RIGHT-OF-WAY ALONG MISSION INN AVE. (WASHINGTONIA FILIFERA).
2. IF EXISTING STREET TREES ARE FOUND BY TREE INSPECTOR AT TIME OF SCHEDULED SITE INSPECTION (AFTER FINE GRADING AND HARDSCAPE INSTALLATION IS COMPLETE) TO BE MISSING, DEAD, DAMAGED, OR IN POOR CONDITION, THEY WILL BE REQUIRED TO BE REMOVED AND REPLACED WITH 24" BOX SIZE TREES TO TREE INSPECTOR'S SPECIFICATIONS. PLANTING, STAKING, IRRIGATION, AND ROOT BARRIERS TO LANDSCAPE & FORESTRY SPECIFICATIONS.
3. PLANT IN PUBLIC RIGHT-OF-WAY, 24" BOX SIZE CELTIS SINENSIS ALONG MISSION INN AVE., LOPHESTEMON CONFERTUS (BRISBANE BOX) ALONG COMMERCE ST., AND MAGNOLIA GRANDIFLORA (ST. MARY) ALONG 5TH ST. AT TYPICAL SPACING 25' O.C.
4. PRIOR TO ANY PLANTING, TREE INSPECTOR TO DETERMINE PRECISE LOCATIONS AT TIME OF SCHEDULED SITE INSPECTION AFTER FINE GRADING AND HARDSCAPE INSTALLATION IS COMPLETE. PLANTING, STAKING, IRRIGATION, AND ROOT BARRIERS TO LANDSCAPE & FORESTRY SPECIFICATIONS.

BENCHMARK

INDEX 6647 PAGE 42 DATED JANUARY 20, 2005

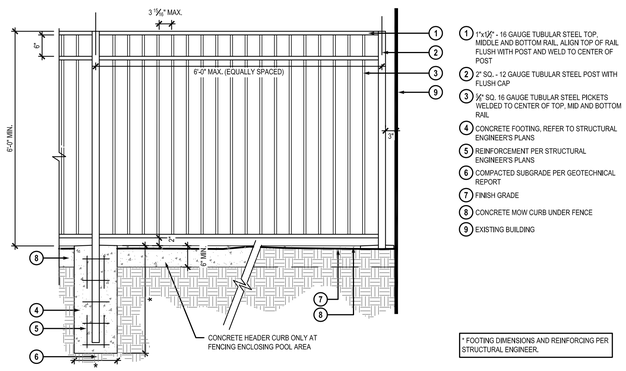
FOUND PK NAIL AND CITY SURVEYOR TAG IN WESTERLY END OF CATCH BASIN ON THE SOUTHERLY SIDE OF UNIVERSITY AVENUE, 95'± EASTERLY OF CENTERLINE OF PARK AVENUE.

ELEVATION: 891.353 FEET



1 - PERIMETER AND POOL CMU WALL

SCALE: NONE



2 - PERIMETER AND POOL FENCE

SCALE: NONE

LOT AREA

PROPOSED LOT 1: 302,137 S.F. (6.94 ACRES)

LEGAL DESCRIPTION

LOTS 1, 2, 3, 4, 5, 6, 7, 22 THROUGH 37 IN BLOCK 6 OF WHITES ADDITION, IN THE CITY OF RIVERSIDE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 6, PAGE 48 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY.

LOTS 1, 2, 3 THROUGH 7, INCLUSIVE, 22 THROUGH 37 INCLUSIVE, IN BLOCK 8 OF WHITE'S ADDITION, IN THE CITY OF RIVERSIDE, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 6, PAGE 48 OF MAPS, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA.

EASEMENTS

1. EASEMENT(S) FOR INGRESS, EGRESS AD PARKING PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, GRANTED TO SOUTHERN PACIFIC COMPANY RECORDED MARCH 13, 1928 IN BOOK 755, PAGE 184 OF DEEDS.

   THE EXACT LOCATION AND EXTENT OF SAID EASEMENT IS NOT DISCLOSED OF RECORD. *NO MENTIONED EASEMENTS WITHIN SAID DOCUMENT, DOES NOT AFFECT.*

2. EASEMENT(S) FOR RIVERSIDE WATER COMPANY CONSTRUCTION AND MAINTENANCE OF ALL NECESSARY WATER DITCHES, PIPES, FLUMES AND APPARATUS FOR THE PURPOSES OF IRRIGATION AND DOMESTIC USE RECORDED IN BOOK 42, PAGES 294 AND 296, OF DEEDS, SAN BERNARDINO COUNTY RECORDS.
   THE EXACT LOCATION IS UNDETERMINED FROM RECORD, DOCUMENT ILLEGIBLE.

3. EASEMENT(S) GRANTED TO SOUTHERN PACIFIC TRANSPORTATION COMPANY, A DELAWARE CORPORATION FOR RAILROAD PURPOSES AS RESERVED IN A DOCUMENT RECORDED DECEMBER 17, 1985 AS INSTRUMENT NO. 283346, OF OFFICIAL RECORDS.

   AFFECTS: OVER, ACROSS AND UPON THE NORTHWESTERLY 15.00 FEET OF SAID LOTS 4 AND 25. *AFFECTS, TO BE QUITCLAIMED.*

4. EASEMENT(S) GRANTED TO SOUTHERN PACIFIC TRANSPORTATION COMPANY, A DELAWARE CORPORATION FOR RAIL AND RAILROAD RELATED EQUIPMENT FACILITIES AND COMMUNICATIONS AND PIPELINES, LINES AND FACILITIES OF EVERY KIND AND NATURE INCLUDING BUT NOT LIMITED TO ALL EXISTING FACILITIES, TELEPHONE, TELEGRAPH, TELEVISION AND FIBER OPTIC LINES AND RELATED EQUIPMENT AND RIGHTS INCIDENTAL THERETO RECORDED AUGUST 31, 1990 AS INSTRUMENT NO. 326250, OF OFFICIAL RECORDS. *AFFECTS, TO BE QUITCLAIMED.*

5. EASEMENT(S) FOR TELECOMMUNICATIONS PURPOSE(S) AND RIGHTS INCIDENTAL THERETO, AS GRANTED TO QWEST COMMUNICATIONS COMPANY, LLC IN A DOCUMENT RECORDED DECEMBER 16, 2013 AS INSTRUMENT NO. 2013-0581753 OF OFFICIAL RECORDS. *AFFECTS PARCEL 2, NOT PLOTTABLE PER RECORD, TO BE QUITCLAIMED.*

NOTE
SEE SHEETS C-12 THRU C-14 FOR SITE SECTIONS.

GENERAL NOTES

1. THE STREET IMPROVEMENTS SHOWN HEREON ALONG COMMERCE ST. AND 5TH ST. ARE PER HDR'S PLANS, AS PART OF THE CITY'S THIRD STREET GRADE SEPARATION PROJECT. THE STREET IMPROVEMENT SCOPE OF WORK FOR THE IRON LOFTS DEVELOPMENT WILL INCLUDE TYING INTO HDR'S STREET IMPROVEMENTS AT KEY LOCATIONS AND CONTINUING ALONG THE IRON LOFTS' FRONTAGES ALONG THE NORTH SIDE OF MISSION INN AVE., THE EAST SIDE OF COMMERCE ST., AND THE SOUTH SIDE OF 5TH ST., AS SHOWN HEREON.
2. THE ABANDONED RAIL LINE ALONG COMMERCE ST. SHALL ALSO BE REMOVED PER HDR'S PLANS.

0 15 30 60 90

SCALE: 1"=30' DATE: 12/06/24

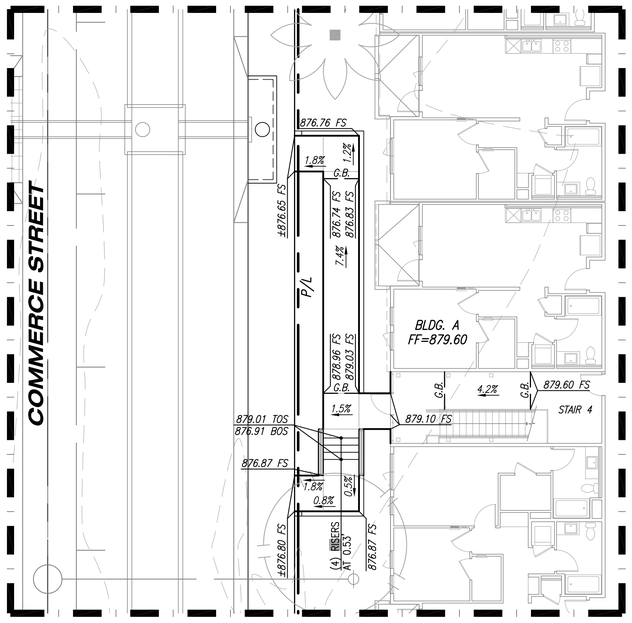
IRON LOFTS

IRON LOFTS, LLC

C-1: PRELIMINARY GRADING PLAN

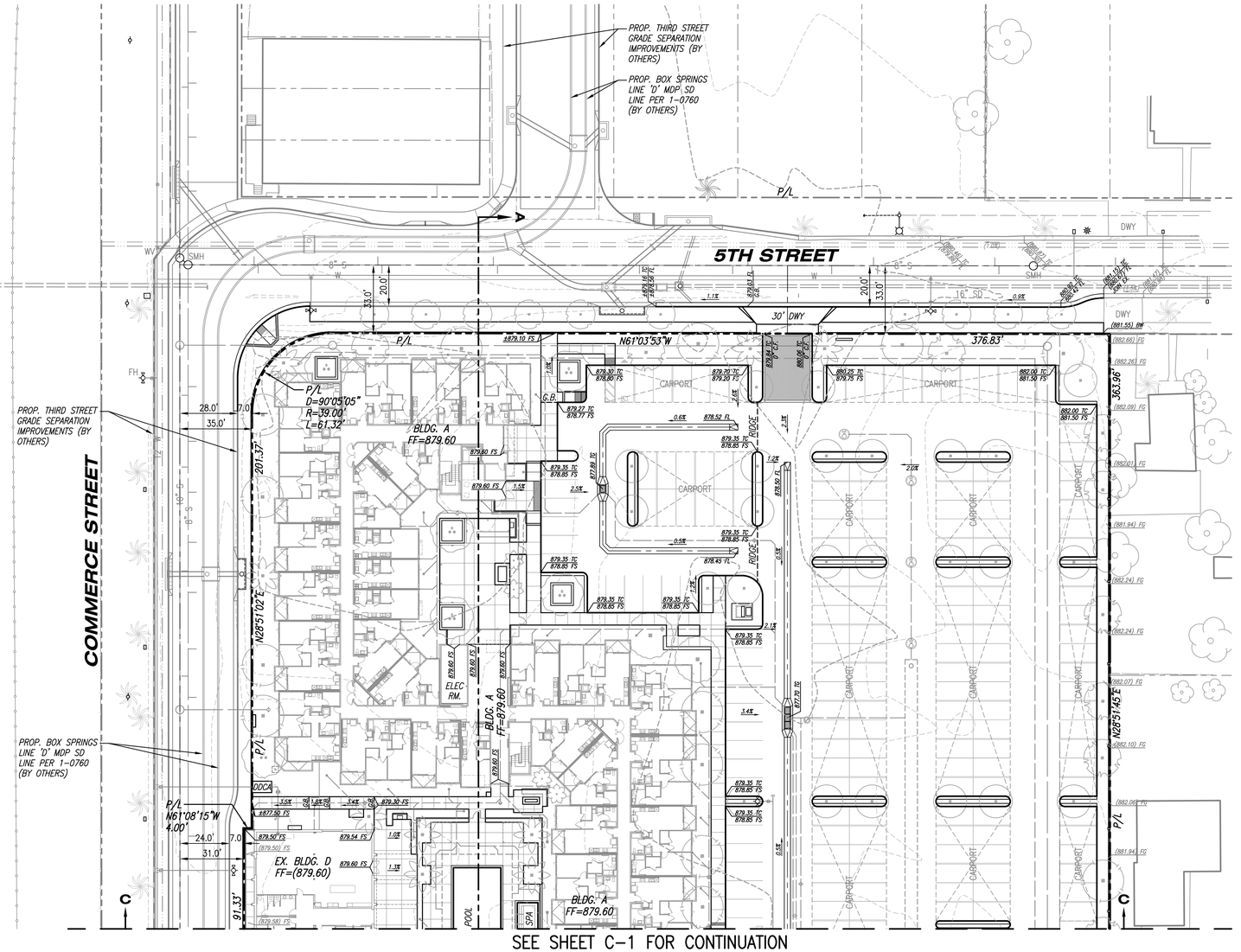
RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614



3 - ENLARGED RAMP DETAIL

SEE SHEET C-1
SCALE: 1"=10'



SEE SHEET C-1 FOR CONTINUATION

GENERAL NOTES

1. THE STREET IMPROVEMENTS SHOWN HEREON ALONG COMMERCE ST. AND 5TH ST. ARE PER HDR'S PLANS, AS PART OF THE CITY'S THIRD STREET GRADE SEPARATION PROJECT. THE STREET IMPROVEMENT SCOPE OF WORK FOR THE IRON LOFTS DEVELOPMENT WILL INCLUDE TYING INTO HDR'S STREET IMPROVEMENTS AT KEY LOCATIONS AND CONTINUING ALONG THE IRON LOFTS' FRONTAGES ALONG THE NORTH SIDE OF MISSION INN AVE., THE EAST SIDE OF COMMERCE ST., AND THE SOUTH SIDE OF 5TH ST., AS SHOWN HEREON.
2. THE ABANDONED RAIL LINE ALONG COMMERCE ST. SHALL ALSO BE REMOVED PER HDR'S PLANS.

*NOTE
SEE SHEETS C-12 THRU C-14 FOR SITE SECTIONS.

0 15 30 60 90

SCALE: 1"=30' DATE: 12/06/24

IRON LOFTS

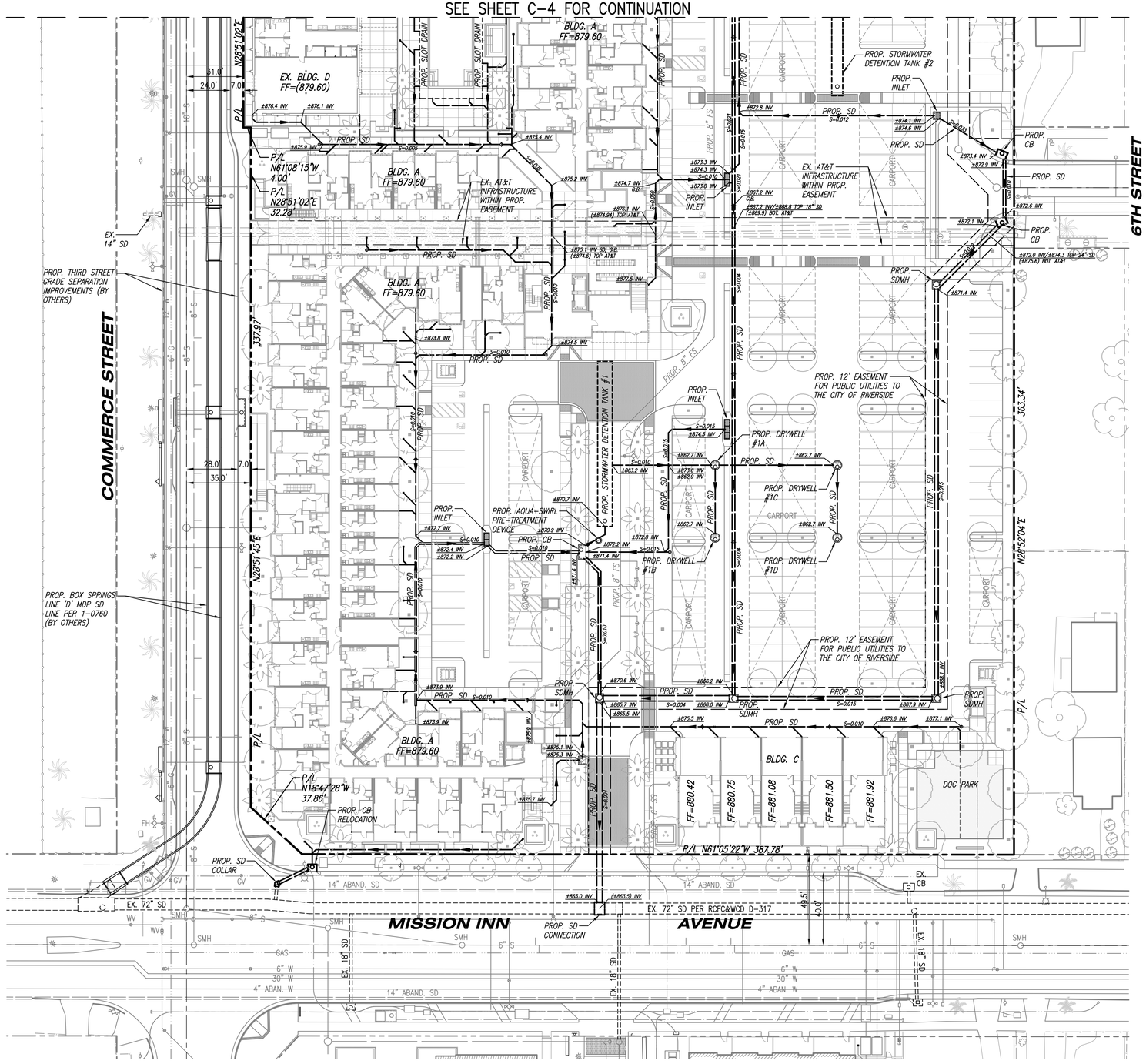
IRON LOFTS, LLC

C-2: PRELIMINARY GRADING PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614

SEE SHEET C-4 FOR CONTINUATION



NOTE

THE PROPOSED STORM DRAIN CONNECTION TO THE EXISTING 72" STORM DRAIN LINE IN MISSION INN AVE. REQUIRES AN ENCROACHMENT PERMIT AND IS CONTINGENT UPON RCFC AND WATER CONSERVATION DISTRICT APPROVAL.

0 15 30 60 90

SCALE: 1"=30' DATE: 12/06/24

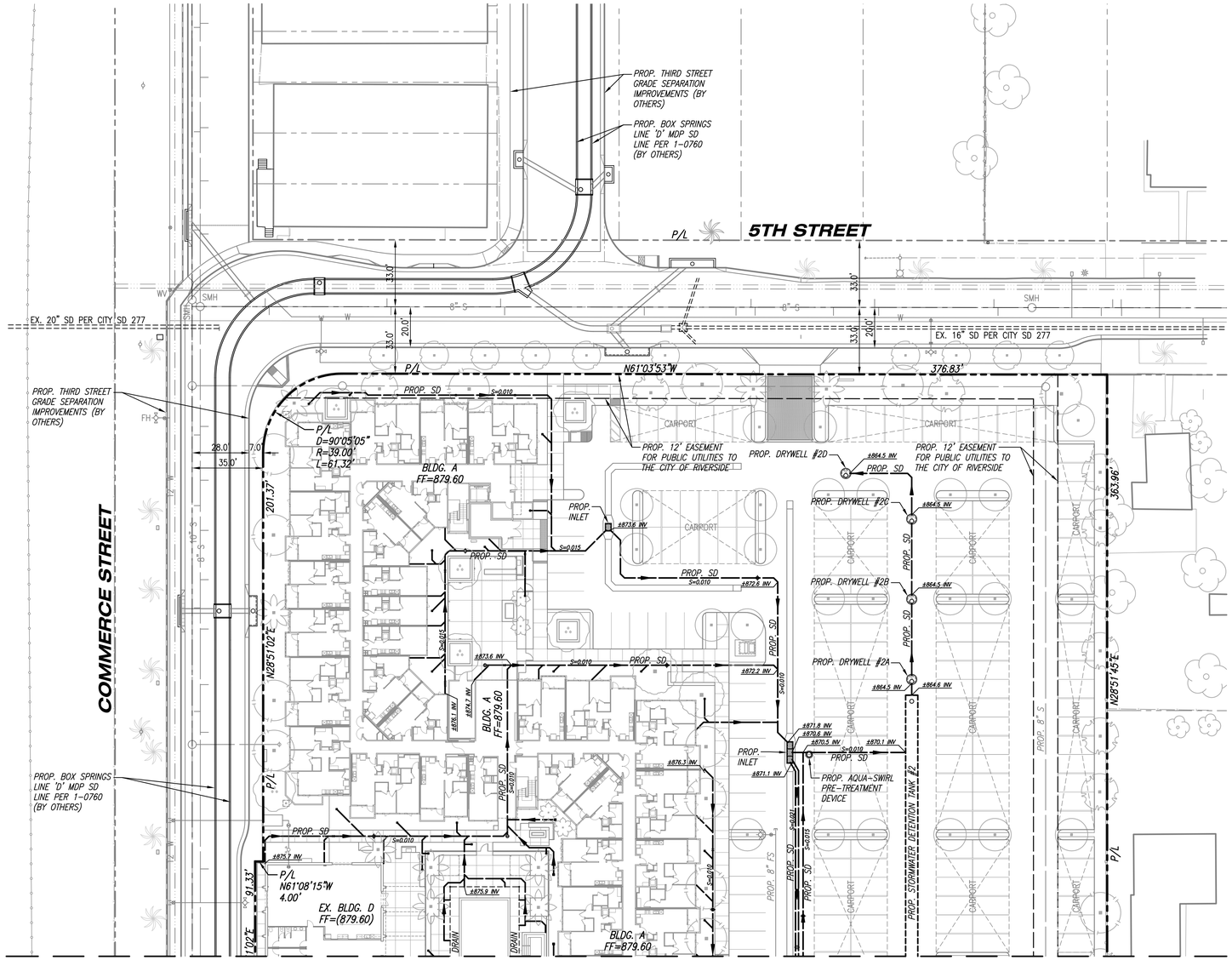
IRON LOFTS

IRON LOFTS, LLC

C-3: PRELIMINARY STORM DRAIN PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave, - Suite 200 Tel (949) 756-6440
Irvine, California 92614



SEE SHEET C-3 FOR CONTINUATION

0 15 30 60 90

SCALE: 1"=30' DATE: 12/06/24

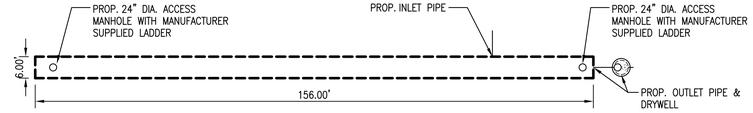
IRON LOFTS

IRON LOFTS, LLC

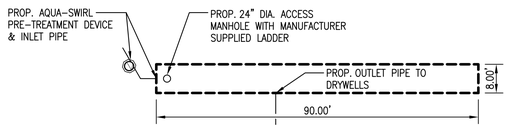
C-4: PRELIMINARY STORM DRAIN PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614



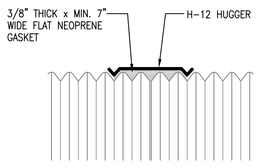
72" DIA. SOLID WALL CMP TANK (SYSTEM #2) TO HOLD A MINIMUM VOLUME OF 4,412 CF



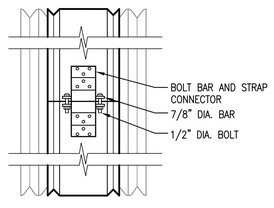
96" DIA. SOLID WALL CMP TANK (SYSTEM #1) TO HOLD A MINIMUM VOLUME OF 4,495 CF

HUGGER BAND GENERAL NOTES

1. REFER TO CONTECH BAND SELECTION GUIDE FOR BAND WIDTH, GAGE, AND FASTENER TYPES.
2. BANDS FOR PIPE-ARCH ARE THE SAME AS FOR EQUIVALENT DIAMETER ROUND PIPE.
3. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48" 1-PIECE
   54" THRU 96" 2-PIECE
   102" THRU 144" 3-PIECES
4. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.



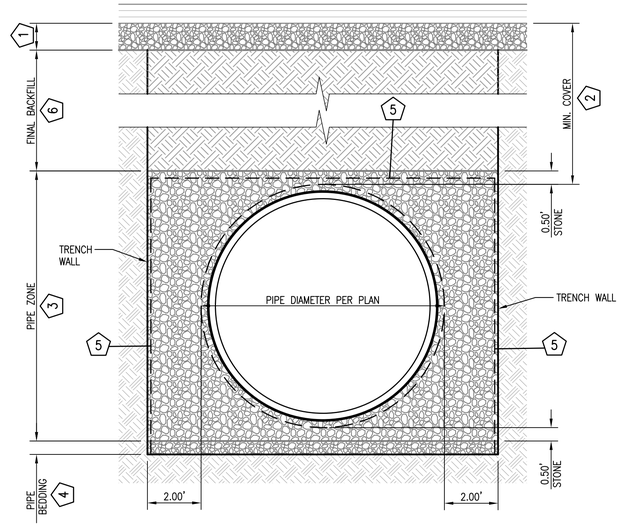
FLAT GASKET



HUGGER BAND CONNECTION DETAIL

UNDERGROUND DETENTION PIPE DETAILS

SCALE: NONE



TANK BACKFILL SECTION A-A

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

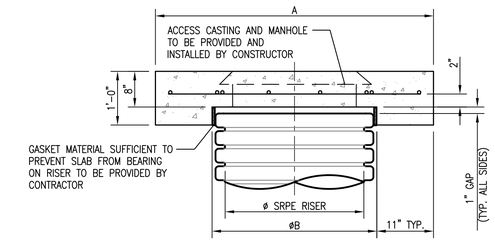
HANDLING AND ASSEMBLY

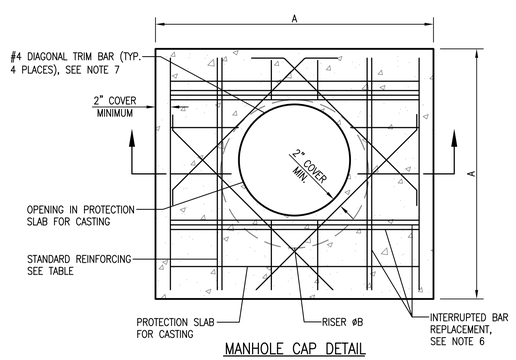
SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.





MANHOLE CAP DETAIL

FOUNDATION/BEDDING PREPARATION

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE SOILS ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, THE 4-6 INCHES OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL MATERIAL SHALL BE FREE-DRAINING ANGULAR WASHED STONE ¾"-2" PARTICLE SIZE. MATERIAL SHALL BE PLACED IN 8"-10" MAXIMUM LIFTS. MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL - SLICING, RODDING, AIR-TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE PROJECT ENGINEER OR HIS REPRESENTATIVE IS SATISFIED WITH THE LEVEL OF COMPACTION. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT, AND MAINTAINING BALANCED LOADING ON ALL PIPES IN THE SYSTEM, DURING ALL SUCH OPERATIONS.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.

KEY (X)

1. AGGREGATE ROAD BASE PER GRADING PLANS.
2. 12" MIN. FOR DIAMETERS THROUGH 96"; 18" MIN. FOR DIAMETERS FROM 102" TO 144"; 24" MIN. FROM 150" TO 192"; AND 30" MIN. FROM 198" TO 234", MEASURED TO TOP OF RIGID OR BOTTOM OF FLEXIBLE PAVEMENT.
3. FREE DRAINING ANGULAR WASHED STONE 3/4" TO 2" PARTICLE SIZE. DENSIFIED PER GEOTECHNICAL REPORT.
4. WELL GRADED GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE 4" TO 6" IN DEPTH.
5. CONTECH C-40 NON-WOVEN GEOTEXTILE REQUIRED, WRAPPING AROUND TOP AND SIDES OF TRENCH.
6. FINAL BACK FILL MATERIAL PLACED IN 8" LIFTS AND COMPACTED TO 90%. PER PROJECT SOILS REPORT, GRADING PLANS AND SPECIFICATIONS.

GENERAL NOTES

1. REFER TO CONTECH BAND SELECTION GUIDE FOR BAND WIDTH, GAGE, AND FASTENER TYPES.
2. BANDS FOR PIPE-ARCH ARE THE SAME AS FOR EQUIVALENT DIAMETER ROUND PIPE.
3. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   12" THRU 48" 1-PIECE
   54" THRU 96" 2-PIECES
   102" THRU 144" 3-PIECES
4. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
5. REROLLED ANNULAR END CORRUGATIONS ARE NORMALLY 2-2/3" X 1/2".
6. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

MANHOLE CAP NOTES

1. DESIGN IN ACCORDANCE WITH AASHTO, LATEST EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 PSI
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTIVE SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

REINFORCING TABLE

øSRPE RISER	A	ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	ø 4' 4' X 4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,110

** ASSUMED SOIL BEARING CAPACITY

DATE: 12/06/24

IRON LOFTS

IRON LOFTS, LLC

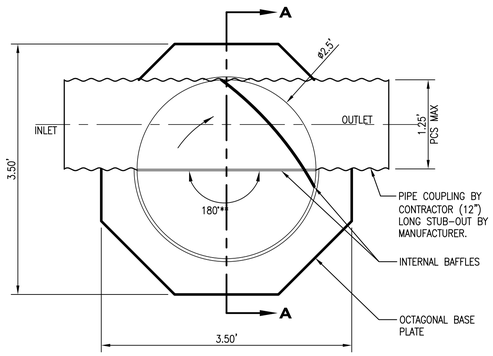
C-5: PRELIMINARY LID BMP DETAILS

RIVERSIDE, CALIFORNIA

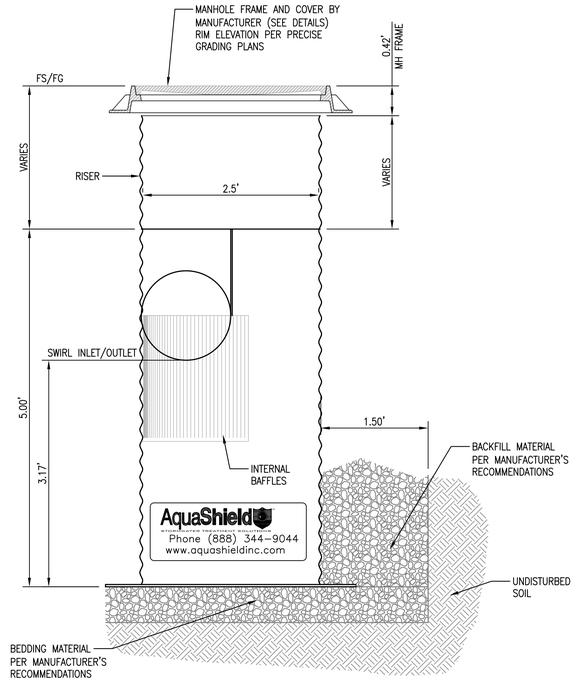
KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614

GENERAL NOTES

1. BACKFILL SHALL EXTEND AT LEAST 18 INCHES OUTWARD FROM SWIRL CONCENTRATOR AND FOR THE FULL HEIGHT OF THE SWIRL CONCENTRATOR (INCLUDING RISER) EXTENDING LATERALLY TO UNDISTURBED SOILS. (SEE MANHOLE DETAIL BELOW)
2. AS AN ALTERNATIVE, 42–INCH OD, HS–20/25 RATED PRECAST CONCRETE RINGS MAY BE SUBSTITUTED, 14–INCH THICKNESS MUST BE MAINTAINED.
3. SEE MANUFACTURER'S SPECIFICATIONS FOR ADDITIONAL INFORMATION.
4. SEE SITE PLAN FOR ACTUAL SYSTEM ORIENTATION, WHICH MAY VARY FROM 90°, 180°, OR CUSTOM ANGLES TO MEET SITE CONDITIONS.



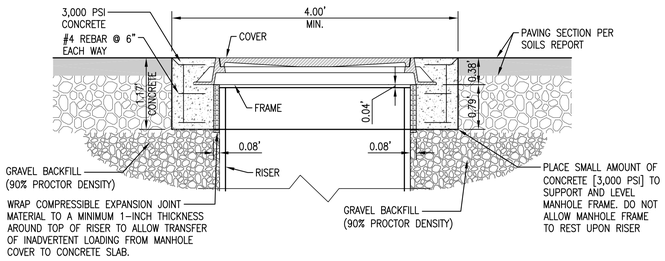
PLAN VIEW



SECTION A–A

NOTE

IF TRAFFIC LOADING (HS–25) IS REQUIRED OR ANTICIPATED, A 4–FOOT [1.22 M] DIAMETER, 14–INCH [356 MM] THICK REINFORCED CONCRETE PAD MUST BE PLACED OVER THE STORMWATER TREATMENT SYSTEM RISER TO SUPPORT AND LEVEL THE MANHOLE FRAME, AS SHOWN. THE TOP OF RISER PIPE MUST BE WRAPPED WITH COMPRESSIBLE EXPANSION JOINT MATERIAL TO A MINIMUM 1–INCH [25 MM] THICKNESS TO ALLOW TRANSFER OF WHEEL LOADS FROM MANHOLE COVER TO CONCRETE SLAB. MANHOLE COVER SHALL BEAR ON CONCRETE SLAB AND NOT ON RISER PIPE. THE CONCRETE SLAB SHALL HAVE A MINIMUM STRENGTH OF 3,000 PSI [20 MPA] AND BE REINFORCED WITH #4 [13 MM] REINFORCING STEEL AS SHOWN. MINIMUM COVER OVER REINFORCING STEEL SHALL BE 1–INCH [25 MM]. TOP OF MANHOLE COVER AND CONCRETE SLAB SHALL BE LEVEL WITH FINISH GRADE.



MANHOLE FRAME AND COVER DETAIL
FOR TRAFFIC AREAS ONLY

AQUA-SWIRL MODEL AS-2 BYP PCS

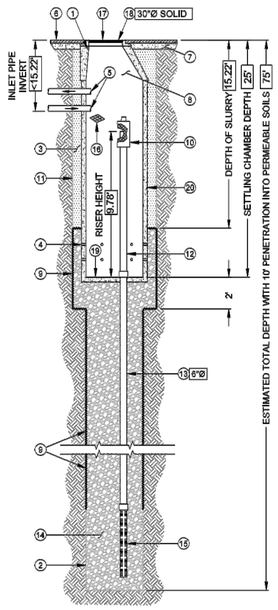
SCALE: NONE

The MaxWell® IV

DRAINAGE SYSTEM DETAILS AND SPECIFICATIONS

Iron Lofts - DMA 2

Riverside, CA



ITEM NUMBERS

1. **MANHOLE CONE -** MODIFIED FLAT BOTTOM.
2. **MIN 4' Ø DRILLED SHAFT.**
3. **STABILIZED BACKFILL -** TWO-SACK SLURRY MIX.
4. **6 PERFORATIONS MINIMUM PER FOOT, 2 ROWS MINIMUM.**
5. **INLET PIPE/OUTLET PIPE (BY OTHERS).** SEE SEPARATE PLAN FOR INVERT ELEVATIONS.
6. **GRADED BASIN OR PAVING** (BY OTHERS).
7. **COMPACTED BASE MATERIAL,** IF REQUIRED (BY OTHERS).
8. **FREEBOARD DEPTH VARIES** WITH INLET PIPE ELEVATION. INCREASE SETTLING CHAMBER DEPTH AS NEEDED TO MAINTAIN ALL INLET PIPE ELEVATIONS ABOVE RISER PIPE.
9. **NON-WOVEN GEOTEXTILE SLEEVE -** MIRAFI 140 NL. MIN. 6 FT Ø, HELD APPROX. 10 FEET OFF THE BOTTOM OF EXCAVATION.
10. **PUREFLO® DEBRIS SHIELD -** ROLLED 16 GA. STEEL X 24" LENGTH WITH VENTED ANTI-SIPHON AND INTERNAL 0.265" MAX. SWO FLATTENED EXPANDED STEEL SCREEN X 12" LENGTH. **FUSION BONDED EPOXY COATED.**
11. **MIN. 6' Ø DRILLED SHAFT.**
12. **RISER PIPE -** SCH. 40 PVC MATED TO DRAINAGE PIPE AT BASE SEAL.
13. **DRAINAGE PIPE -** ADS HIGHWAY GRADE OR SCH. 40 PVC WITH TRI-A COUPLER. SUSPEND PIPE DURING BACKFILL OPERATIONS. DIAMETER AS NOTED.
14. **ROCK -** WASHED, SIZED BETWEEN 3/8" AND 1-1/2".
15. **FLOFAST® DRAINAGE SCREEN -** SCH. 40 PVC 0.120" SLOTTED WELL SCREEN WITH MIN. 32 SLOTS PER ROW/FT. OVERALL LENGTH VARIES. UP TO 120" WITH TRI-B COUPLER.
16. **ABSORBENT -** HYDROPHOBIC PETROCHEMICAL SPONGE. MIN. 128 OZ. CAPACITY. TYPICAL. 2 PER CHAMBER.
17. **FABRIC SEAL -** U.V. RESISTANT GEOTEXTILE - **TO BE REMOVED BY CUSTOMER** AT PROJECT COMPLETION. GRATED ONLY.
18. **BOLTED RING & GRATE/COVER -** DIAMETER & TYPE AS SHOWN. CLEAN CAST IRON WITH WORDING "STORM WATER ONLY" IN RAISED LETTERS. BOLTED IN 2 LOCATIONS AND SECURE TO CONE WITH MORTAR. RIM ELEVATION ±0.02' OF PLANS.
19. **BASE SEAL -** CONCRETE SLURRY.
20. **PRE-CAST LINER -** 4000 PSI CONCRETE 48" ID. x 54" OD. CENTER IN HOLE AND ALIGN SECTIONS TO MAXIMIZE BEARING SURFACE.

Manufactured and Installed by

TorrentResources
A CRH COMPANY
An evolution of McGuckin Drilling
www.torrentresources.com

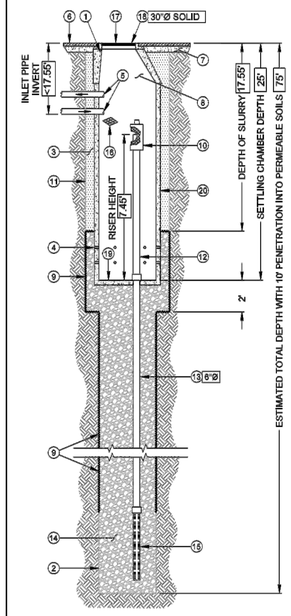
DRTYE.: IV-4-SS-CA	REVISED BY: NJT		
DRAWN ON: 07-20-23	REVISED DATE: 10-18-23	SCALE: N.T.S	

The MaxWell® IV

DRAINAGE SYSTEM DETAILS AND SPECIFICATIONS

Iron Lofts - DMA 1

Riverside, CA



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DRTYE.: IV-4-SS-CA	REVISED BY: NJT		
DRAWN ON: 07-20-23	REVISED DATE: 10-18-23	SCALE: N.T.S	

DRYWELL & DETENTION DESIGN CALCULATIONS

Drywell #2 (Combination of DW2A, DW2B, DW2C, DW2D)

Mitigation Volume, V_{BMP}:	5,881 C.F.	From BMP Design Worksheet
Infiltration Rate, $K_{sat,measured}$:	1.60 in/hr	Test Well W-10
Factor of Safety, FS:	3	
Number of Drywells; $DW_{quantity}$:	4 each	
DW Chamber ø:	4 feet	
DW Chamber Area, DWC_{Area}:	12.57 square feet per foot	
DW Chamber Volume, DWC_{Volume}:	12.57 cubic feet per foot	
$DW_{chamber,depth}$ (from invert down):	9.78 linear feet	
DW Rock Shaft ø:	4 feet	
DW Rock Shaft Area, DWR_{Area}:	12.57 square feet per foot	
DW Rock Shaft Volume, DWR_{Volume}:	12.57 cubic feet per foot	
$DW_{rock,depth}$:	50.00 linear feet	
$DW_{infiltration,depth}$:	59.78 linear feet	
DW Bottom Area, DWB_{Area}:	12.57 square feet per foot	
T (Maximum Drawdown Time):	48 hr	
CMP Diameter (detention):	6 feet	
CMP_{Volume}:	28.2 cubic feet per foot	
CMP_{Length}:	156 linear feet	

Determine Design Infiltration Rate: $K_{sat,design}$

$K_{sat,design} = K_{sat,measured} \div FS$

$K_{sat,design}$ = 0.53 in/hr 0.000012 ft/sec

Determine Minimum Infiltration Surface Area, A_{min}

$A_{min} = (V_{BMP} \times 12\ in/ft) \div (T \times K_{sat,design})$

A_{min} = 2,757 S.F.

Determine Infiltration Surface Area, A_{actual}

$A_{actual} = (DW_{infiltration,depth} \times DWR_{Area} + DWB_{Area}) \times DW_{quantity}$

A_{actual} = 3,059 S.F.

Determine Volume of Drywell, $V_{drywell}$

$V_{drywell} = (DWC_{Volume} \times DW_{chamber,depth}) + (DWR_{Volume} \times DW_{rock,depth} \times 0.40) \times DW_{quantity}$

$V_{drywell}$ = 1,497 C.F.

Determine Volume Remaining to Detain in CMP, V_{detain}

$V_{detain} = V_{BMP} - V_{drywell}$

V_{detain} = 4,384 C.F.

Determine CMP Detention Volume, $V_{CMP+detain}$

$V_{CMP,detain} = CMP_{Volume} \times CMP_{Length}$

$V_{CMP,detain}$ = 4,412 C.F.

Determine DW & CMP Volume, V_{design}

$V_{design} = V_{CMP,detain} + V_{drywell}$

V_{design} = 5,909 C.F.

Determine Drawdown Time, T_{actual}

$T_{actual} = (V_{design} \times 12\ in/ft) \div (A_{actual} \times K_{sat,design})$

T_{actual} = 43.51 hr

DRYWELL & DETENTION DESIGN CALCULATIONS

Drywell #1 (Combination of DW1A, DW1B, DW1C, DW1D)

Mitigation Volume, V_{BMP}:	5,825 C.F.	From BMP Design Worksheet
Infiltration Rate, $K_{sat,measured}$:	1.60 in/hr	Test Well W-9
Factor of Safety, FS:	3	
Number of Drywells; $DW_{quantity}$:	4 each	
DW Chamber ø:	4 feet	
DW Chamber Area, DWC_{Area}:	12.57 square feet per foot	
DW Chamber Volume, DWC_{Volume}:	12.57 cubic feet per foot	
$DW_{chamber,depth}$ (from invert down):	7.45 linear feet	
DW Rock Shaft ø:	4 feet	
DW Rock Shaft Area, DWR_{Area}:	12.57 square feet per foot	
DW Rock Shaft Volume, DWR_{Volume}:	12.57 cubic feet per foot	
$DW_{rock,depth}$:	50.00 linear feet	
$DW_{infiltration,depth}$:	57.45 linear feet	
DW Bottom Area, DWB_{Area}:	12.57 square feet per foot	
T (Maximum Drawdown Time):	48 hr	
CMP Diameter (detention):	6 feet	
CMP_{Volume}:	50.2 cubic feet per foot	
CMP_{Length}:	90 linear feet	

Determine Design Infiltration Rate: $K_{sat,design}$

$K_{sat,design} = K_{sat,measured} \div FS$

$K_{sat,design}$ = 0.53 in/hr 0.000012 ft/sec

Determine Minimum Infiltration Surface Area, A_{min}

$A_{min} = (V_{BMP} \times 12\ in/ft) \div (T \times K_{sat,design})$

A_{min} = 2,730 S.F.

Determine Infiltration Surface Area, A_{actual}

$A_{actual} = (DW_{infiltration,depth} \times DWR_{Area} + DWB_{Area}) \times DW_{quantity}$

A_{actual} = 2,939 S.F.

Determine Volume of Drywell, $V_{drywell}$

$V_{drywell} = (DWC_{Volume} \times DW_{chamber,depth}) + (DWR_{Volume} \times DW_{rock,depth} \times 0.40) \times DW_{quantity}$

$V_{drywell}$ = 1,380 C.F.

Determine Volume Remaining to Detain in CMP, V_{detain}

$V_{detain} = V_{BMP} - V_{drywell}$

V_{detain} = 4,445 C.F.

Determine CMP Detention Volume, $V_{CMP+detain}$

$V_{CMP,detain} = CMP_{Volume} \times CMP_{Length}$

$V_{CMP,detain}$ = 4,495 C.F.

Determine DW & CMP Volume, V_{design}

$V_{design} = V_{CMP,detain} + V_{drywell}$

V_{design} = 5,875 C.F.

Determine Drawdown Time, T_{actual}

$T_{actual} = (V_{design} \times 12\ in/ft) \div (A_{actual} \times K_{sat,design})$

T_{actual} = 44.98 hr

MAXWELL IV DRAINAGE SYSTEM (TORRENT RESOURCES)

SCALE: NONE

DATE: 12/06/24

IRON LOFTS

IRON LOFTS, LLC

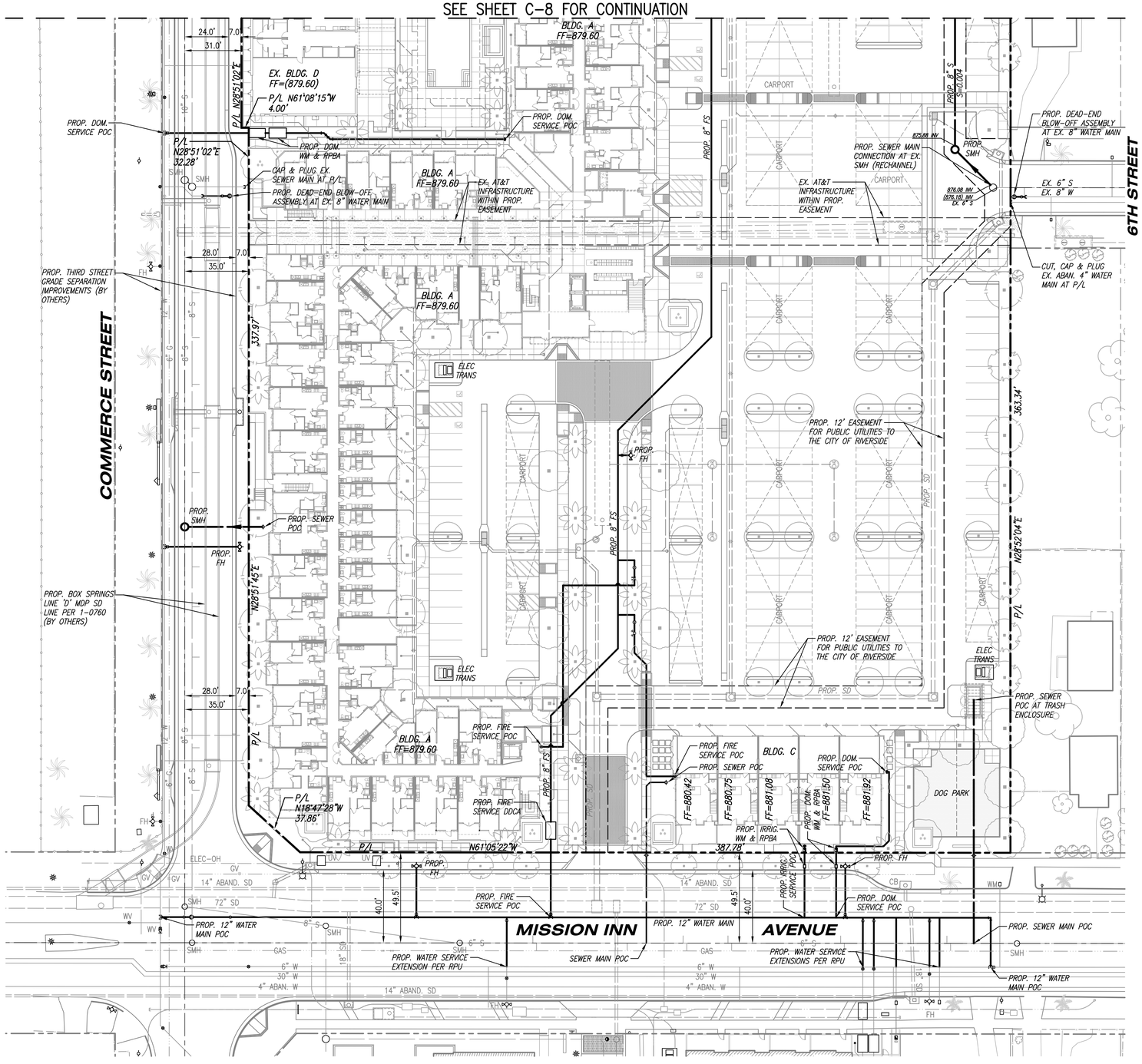
C-6: PRELIMINARY LID BMP DETAILS

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614

R:\Realm\Realm-Riverside-Iron Lofts\C6b\Preliminary\KRIL-05-06-STRM-DETL.dwg Dec 06, 2024 - 4:25pm

SEE SHEET C-8 FOR CONTINUATION



NOTES

1. VACATION OF 6TH ST. WILL REQUIRE THE ABANDONMENT OF THE EXISTING 8" WATER MAIN IN THE EXISTING STREET RIGHT OF WAY. ADDITIONAL ANALYSES WILL BE NEEDED TO DETERMINE IF THE ABANDONMENT OF THAT SECTION OF MAIN WILL TRIGGER ANY ADDITIONAL OFF-SITE UPGRADES OR THE NEED TO LOOP THE MAIN THROUGH AN EASEMENT WITHIN THE PROJECT.

2. THE 6" WATER MAIN IN MISSION INN AVE. REQUIRES UPGRADE TO 12" FROM COMMERCE ST. ACROSS THE PROJECT FRONTAGE AT A MINIMUM, AND POSSIBLY UP TO PARK AVE. DEPENDING ON REQUIRED FIRE FLOW VOLUME AND IMPACTS FROM POTENTIAL ABANDONMENT OF THE 6TH ST. WATER MAIN.

0 15 30 60 90

SCALE: 1"=30' DATE: 12/06/24

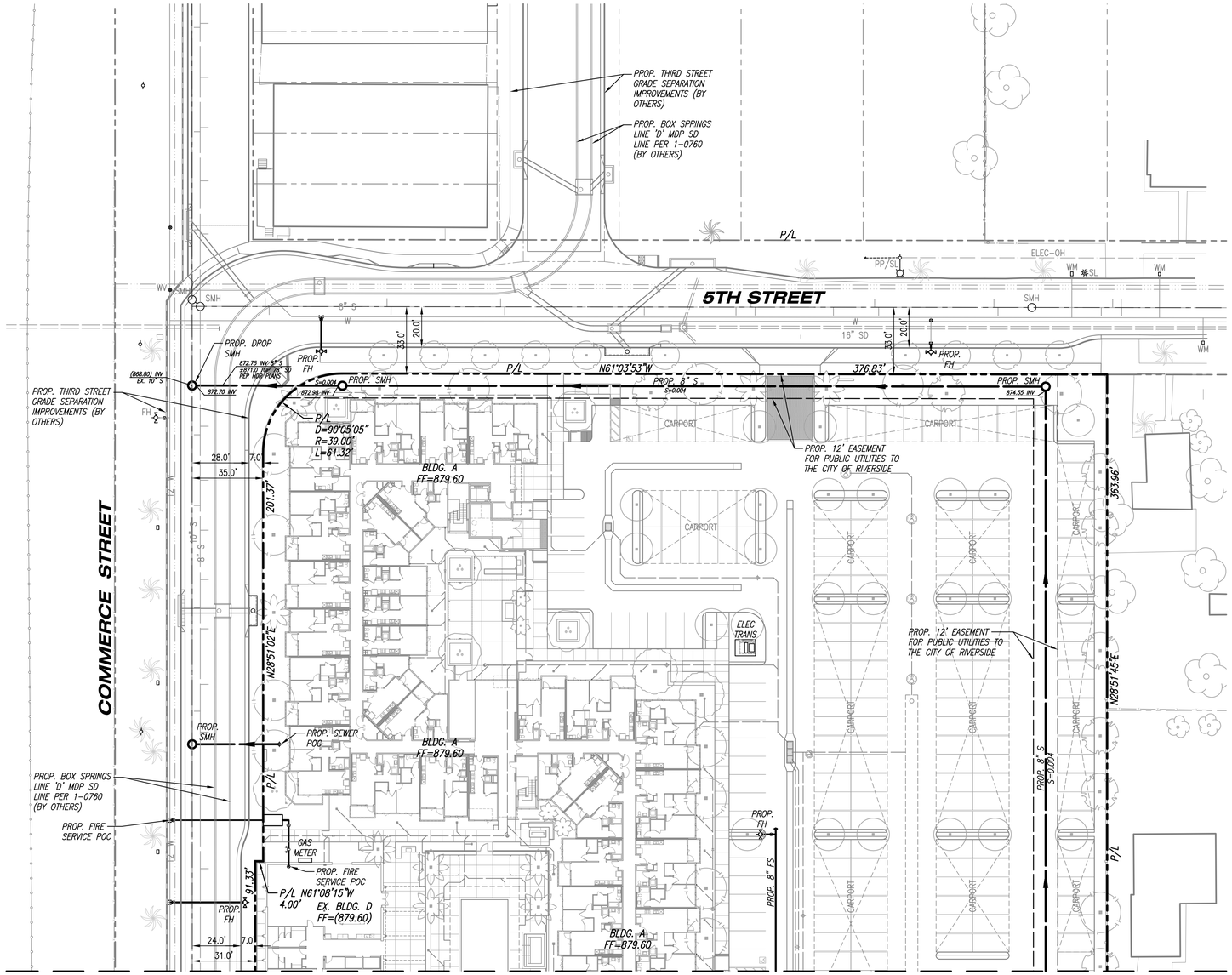
IRON LOFTS

IRON LOFTS, LLC

C-7: PRELIMINARY WET UTILITY PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614



SEE SHEET C-7 FOR CONTINUATION

0 15 30 60 90

SCALE: 1"=30' DATE: 12/06/24

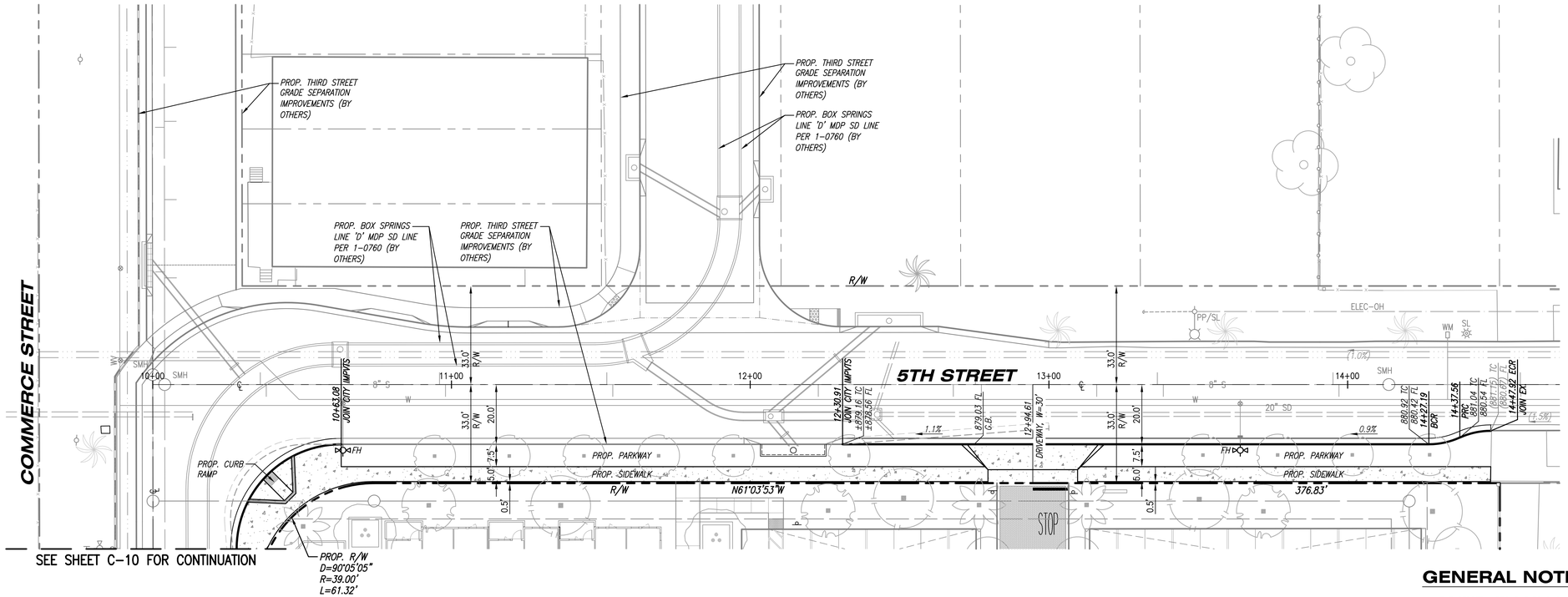
IRON LOFTS

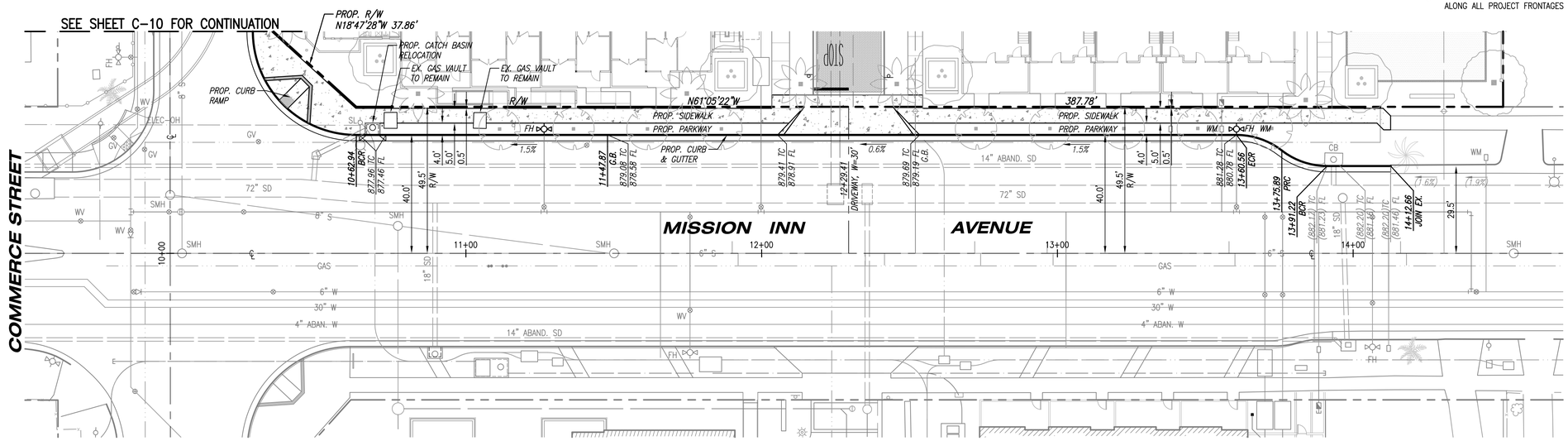
IRON LOFTS, LLC

C-8: PRELIMINARY WET UTILITY PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614





GENERAL NOTES

1. THE STREET IMPROVEMENTS SHOWN HEREON ALONG COMMERCE ST. AND 5TH ST. ARE PER HDR'S PLANS, AS PART OF THE CITY'S THIRD STREET GRADE SEPARATION PROJECT. THE STREET IMPROVEMENT SCOPE OF WORK FOR THE IRON LOFTS DEVELOPMENT WILL INCLUDE TYING INTO HDR'S STREET IMPROVEMENTS AT KEY LOCATIONS AND CONTINUING ALONG THE IRON LOFTS' FRONTAGES ALONG THE NORTH SIDE OF MISSION INN AVE., THE EAST SIDE OF COMMERCE ST., AND THE SOUTH SIDE OF 5TH ST., AS SHOWN HEREON.
2. THE ABANDONED RAIL LINE ALONG COMMERCE ST. SHALL ALSO BE REMOVED PER HDR'S PLANS.
3. REHABILITATION OF EXISTING PAVEMENT TO A MINIMUM OF STREET CENTERLINE ALONG ALL PROJECT FRONTAGES TO PUBLIC WORKS SPECIFICATIONS.

0 10 20 40 60

SCALE: 1"=20' DATE: 12/06/24

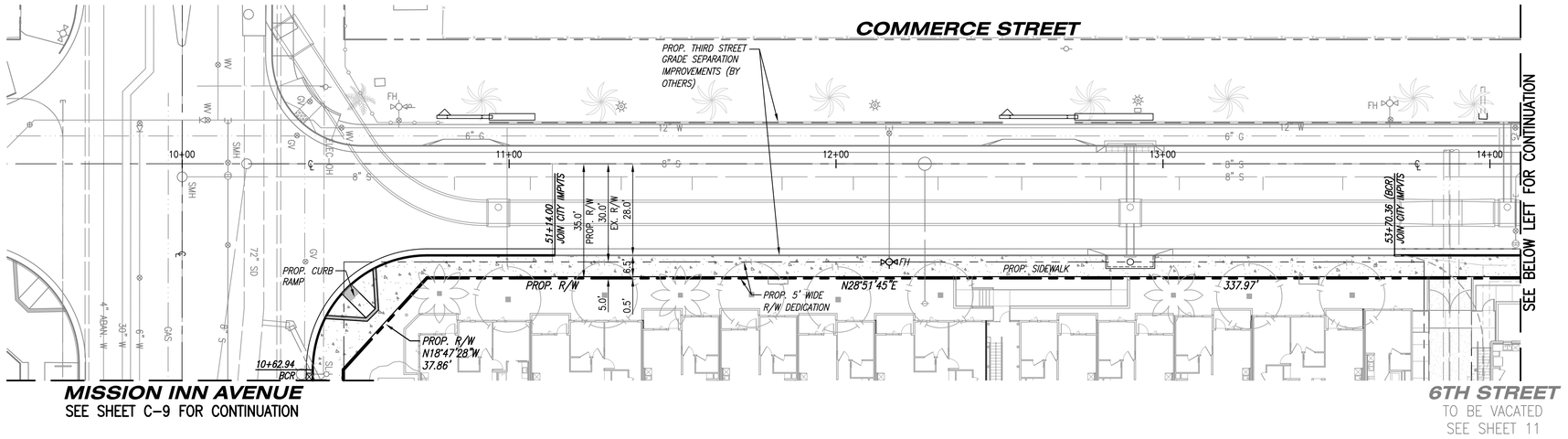
IRON LOFTS

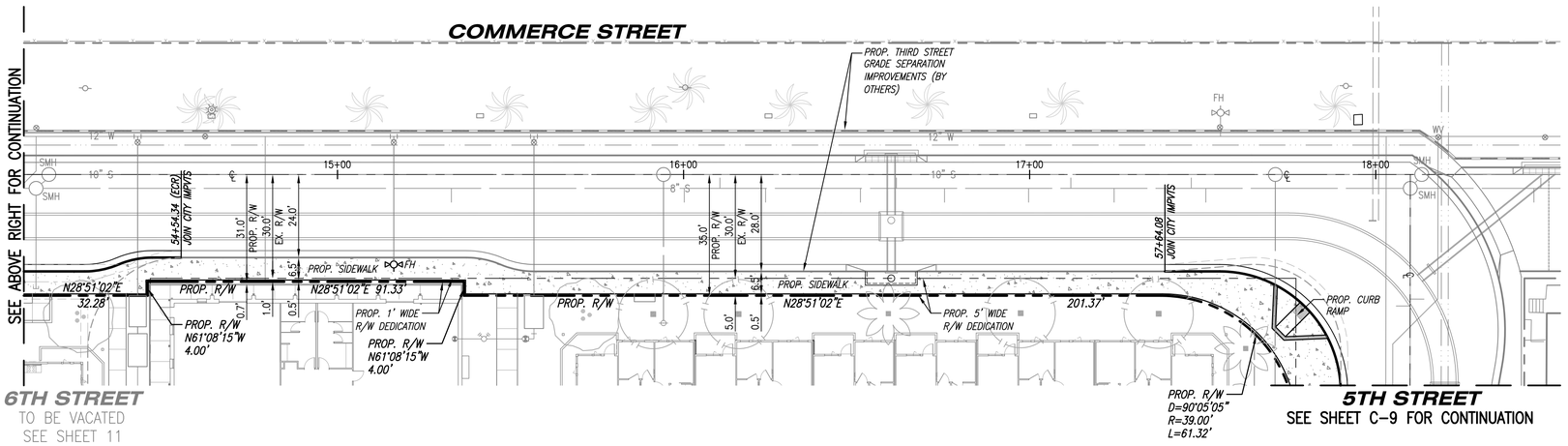
IRON LOFTS, LLC

C-9: PRELIMINARY STREET PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614





GENERAL NOTES

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2. THE ABANDONED RAIL LINE ALONG COMMERCE ST. SHALL ALSO BE REMOVED PER HDR'S PLANS.
3. REHABILITATION OF EXISTING PAVEMENT TO A MINIMUM OF STREET CENTERLINE ALONG ALL PROJECT FRONTAGES TO PUBLIC WORKS SPECIFICATIONS.

0 10 20 40 60

SCALE: 1"=20' DATE: 12/06/24

IRON LOFTS

IRON LOFTS, LLC

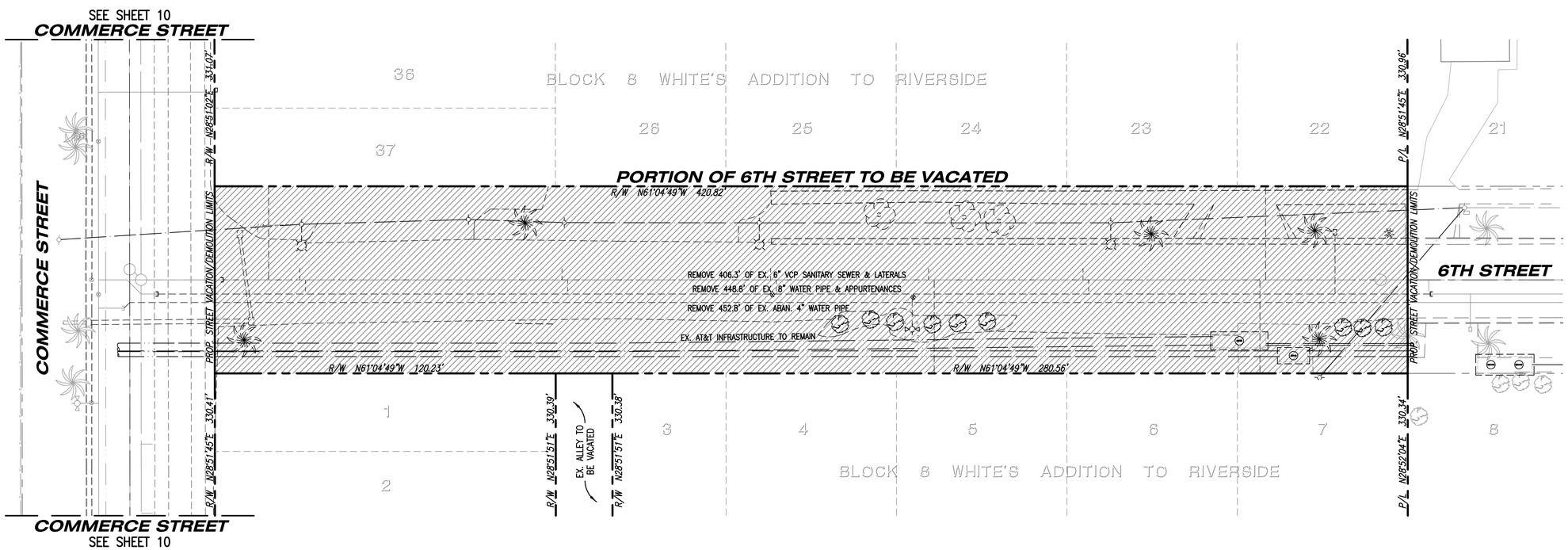
C-10: PRELIMINARY STREET PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614

NOTES

1. ALL EXISTING IMPROVEMENTS (I.E., HARDSCAPE, LANDSCAPE, UTILITIES, ETC.) WITHIN THAT PORTION OF 6TH STREET TO BE VACATED SHALL BE DEMOLISHED AND REMOVED.
2. ALL EXISTING OVERHEAD POWER LINES ALONG THAT PORTION OF 6TH STREET TO BE VACATED SHALL BE UNDERGROUNDED.



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SCALE: 1"=20' DATE: 12/06/24

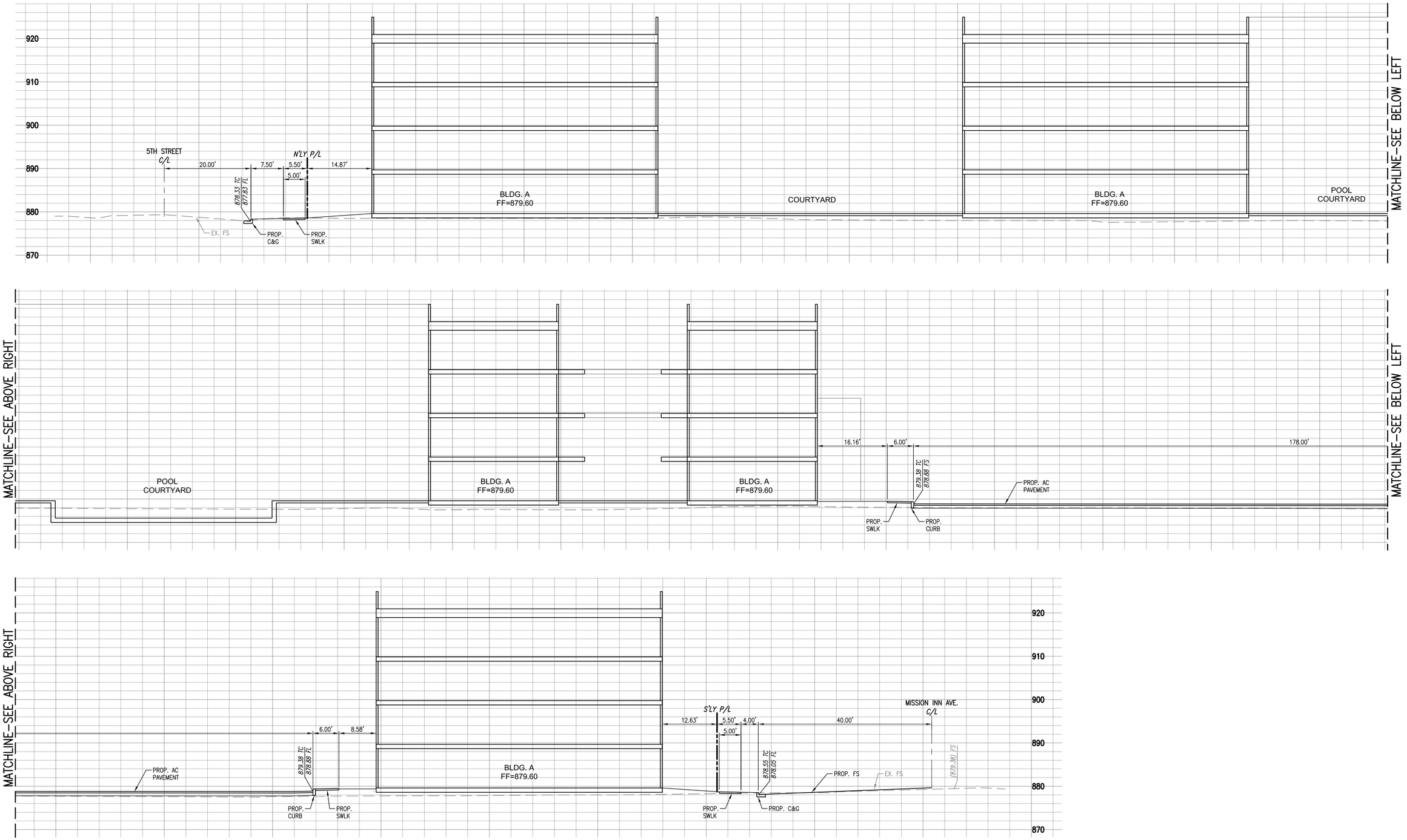
IRON LOFTS

IRON LOFTS, LLC

C-11: PRELIMINARY 6TH STREET VACATION & DEMOLITION PLAN

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614



SECTION "A-A"

HORIZONTAL: 1"=10'
VERTICAL: 1"=10'

DATE: 12/06/24

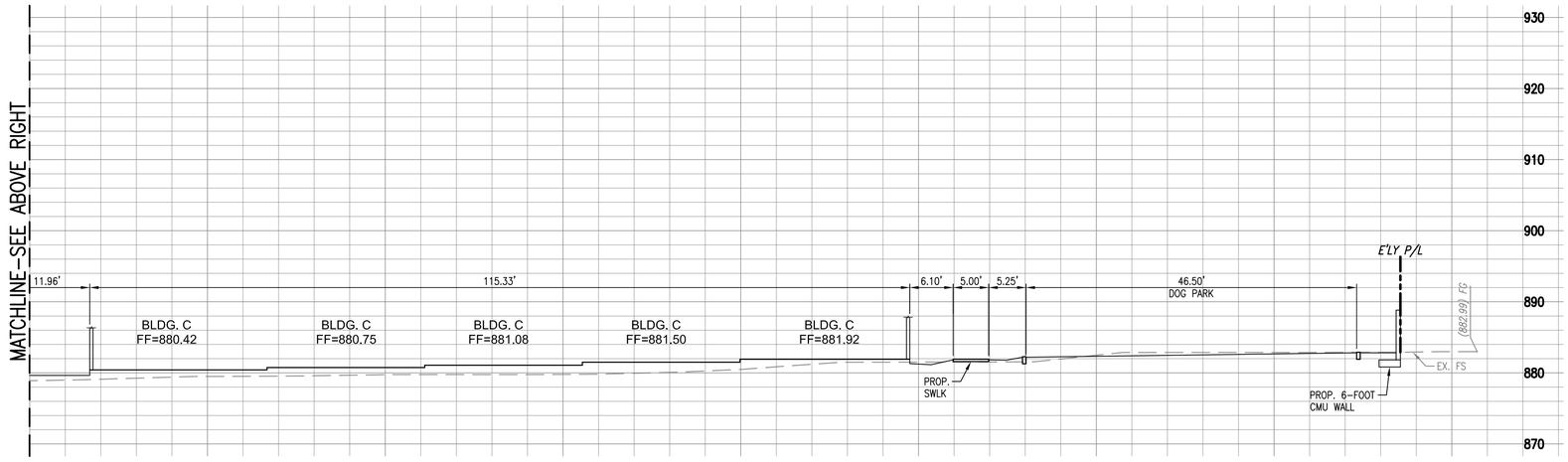
IRON LOFTS

IRON LOFTS, LLC

C-12: PRELIMINARY SITE SECTIONS

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614



SECTION "B-B"

HORIZONTAL: 1"=10'
VERTICAL: 1"=10'

DATE: 12/06/24

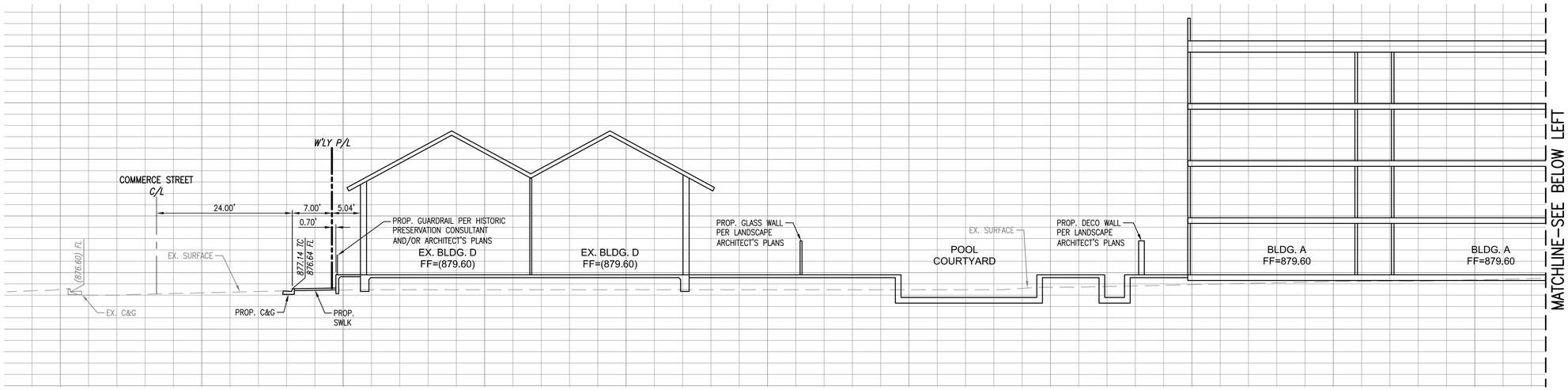
IRON LOFTS

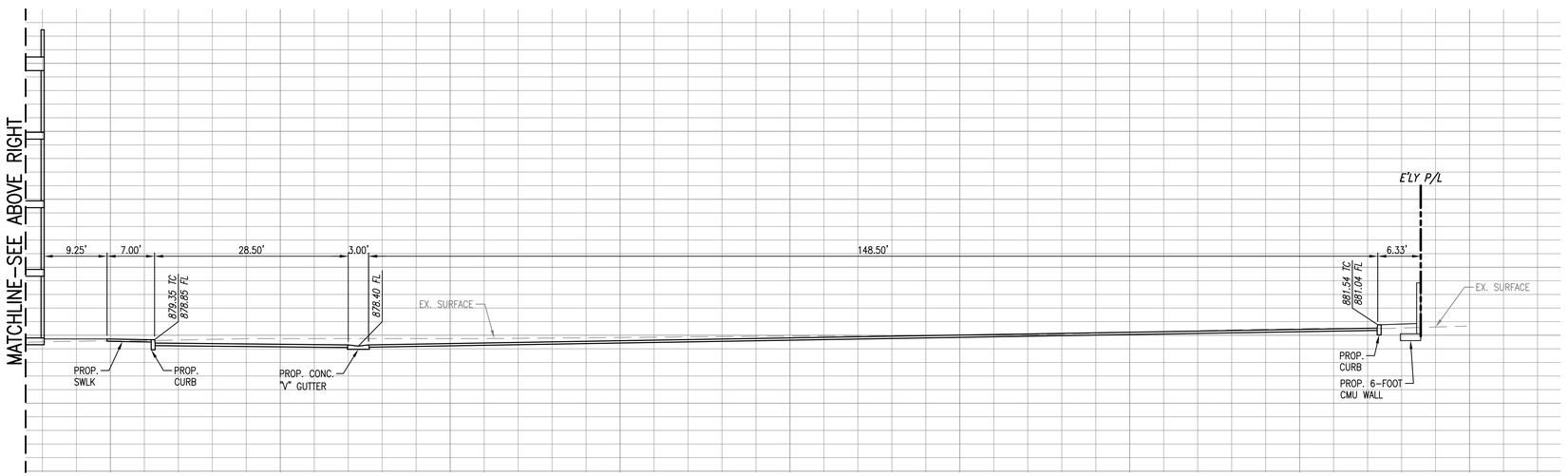
IRON LOFTS, LLC

C-13: PRELIMINARY SITE SECTIONS

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614





SECTION "C-C"

HORIZONTAL: 1"=10'
VERTICAL: 1"=10'

DATE: 12/06/24

IRON LOFTS

IRON LOFTS, LLC

C-14: PRELIMINARY SITE SECTIONS

RIVERSIDE, CALIFORNIA

KHR ASSOCIATES
CONSULTING ENGINEERS/SURVEYORS/PLANNERS
17530 Von Karman Ave. - Suite 200 Tel (949) 756-6440
Irvine, California 92614

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GEOTECHNICAL PROFESSIONALS INC.

April 11, 2023
(Revised June 16, 2023)

Iron Lofts, LLC
c/o REALM
1201 Dove Street
Newport Beach, CA 92660

Attention: Mr. Todd Cadwell

Subject: Infiltration Study
Proposed Residential Development – Iron Lofts
NEC Mission Inn Avenue and Commerce Street
Riverside, California
GPI Project No. 3044.1I

Dear Mr. Cadwell:

This report presents the results of field exploration and infiltration testing performed by Geotechnical Professionals Inc. (GPI) for the design of stormwater infiltration systems at the subject site. This report supplements our Geotechnical Investigation (GPI, 2023) report dated February 1, 2023. The testing was performed in general accordance with the Riverside County – Low Impact Development BMP Design Handbook (Riverside, 2011) and our proposal dated March 16, 2023.

This report was revised to include additional field exploration and infiltration testing for the proposed dry well systems at the site.

PROJECT DESCRIPTION

We understand that you propose to construct a new apartment development that will include infrastructure to facilitate the infiltration of stormwater. Based on preliminary information provided by the Project Civil Engineer, KHR Associates, stormwater at the site will be infiltrated into the subsurface soils using a perforated CMP system on Site 2 (North Site), and either a perforated CMP system or dry well system on Site 1 (South Site). The infiltration systems will be located in the parking areas on the south side of the apartment buildings. The CMP infiltration chambers are planned to be founded at depths approximately 12 feet, and the dry wells are planned to be founded at least 30 feet below existing grades. The locations of the proposed stormwater systems are shown on the attached Figure 1, Site Plan.

5736 Corporate Avenue • Cypress, CA 90630 • (714) 220-2211 , FAX (714) 220-2122

SCOPE OF SERVICES

Our scope of services consisted of subsurface explorations, field infiltration testing, laboratory testing, engineering analysis and the preparation of this report.

The subsurface conditions at the site near the proposed stormwater infiltration systems were investigated by drilling and sampling five hollow stem auger borings (B-8 to B-12) to depths of approximately 23½ to 61 feet below existing grades. The infiltration characteristics of the subsurface soils near the invert depth of the proposed systems were investigated by installing 6 infiltration test wells (W-1 to W-6) at depths of approximately 12 feet, and 4 test wells (W-7 to W-10) at depths of approximately 50 feet below existing grades. The approximate locations of the subsurface explorations and infiltration tests are shown in Figure 1. A description of the field procedures and logs of the explorations are presented in Appendix A.

Laboratory soil tests were performed on select representative samples as an aid in soil classification and to evaluate the engineering properties of the soils. The limited geotechnical laboratory testing program included determinations of moisture content and dry density, and grain size analyses. Laboratory testing procedures and results are summarized in Appendix B.

SUBSURFACE CONDITIONS

The soils encountered in our explorations near the invert depths of the proposed systems consisted of predominately layered silty sands and sandy silts with limited lenses of clayey sands and clayey silts at depths between approximately 30 and 61 feet below existing grades. In general, the soils were predominately slightly moist to moist within the upper 20 feet and moist to very moist between 30 feet and the depths explored. The soils were predominately loose to medium dense and stiff to very stiff to the depths explored.

Groundwater was not encountered in our explorations to depths of 61 feet below existing grades in our recent explorations at the site. Groundwater was reported by others (GSI 2020) to be greater than 100 feet below existing grade in 2009 at a nearby property.

INFILTRATION TESTING

We performed ten infiltration tests to evaluate the infiltration characteristics for the proposed systems. The infiltration testing and construction of the wells were performed in general accordance with the County of Riverside Department of Environmental Health Guidelines (Riverside, 2011).

The test wells were constructed with 2-inch diameter slotted pipe in boreholes excavated using an 8-inch diameter hollow stem auger. The annular space between the perforated casing and the borehole was loosely filled with ¾-inch diameter gravel.

Each test well was presoaked by placing at least 5 gallons of water into the test hole and waiting for the water to fully drain. Testing was performed the same day as the presoaking process. After pre-soaking, each test was evaluated by our field engineer to confirm the tests met the County's sandy soil criteria (6 inches of water seeps away in less than 25

minutes). The test wells were then repeatedly filled to a predetermined target depth above the bottom and the water level drop and duration of each drop were recorded.

The measured infiltration rates were calculated using the drop in water level over the test increment time. The last reading for each well was used to determine the measured infiltration rate, expressed in inches per hour and is provided below:

Tests for CMP Units

Basin	Test Well	Approximate Depth of Well Tested (feet)	Measured Infiltration Rate (inches/hour)
Site 1	W-1	11.8	1.0
	W-2	11.7	0.7
	W-3	11.8	0.8
	W-4	11.6	1.3
Site 2	W-5	11.4	2.4
	W-6	11.6	6.8

Tests for Dry Wells

Basin	Test Well	Approximate Depth of Well Tested (feet)	Measured Infiltration Rate (inches/hour)
Site 1	W-7	45-50	1.3
	W-8	40-50	1.5
	W-9	45-50	1.6
	W-10	40-50	1.6

CONCLUSIONS AND RECOMMENDATIONS

The soils encountered in our explorations generally appear to be layered and have moderately favorable stormwater infiltration characteristics.

The rates shown on the tables above may be applied to the soils from 10 feet to 20 feet below existing grades for the shallow CMP units and from 35 to 55 feet below existing grades for the dry wells and at the locations tested. If rates outside of these depths or at alternative locations are required, GPI should be contacted to provide additional testing and/or recommendations.

Our subsurface investigations disclosed loose to medium dense sandy soils at depths between 12 and 40 feet below the existing grades. When saturated, these loose sandy soils have the potential to settle if subject to significant seismic forces. Due to the loose soils described above, we recommend the stormwater infiltration be set back at least 30 feet from building foundations.

Standard of practice is to set back stormwater infiltration at least 10 feet horizontally beyond the edge of proposed foundations and property lines, and at least 10 feet vertically below floor slabs.

It should be noted that the volume of water applied during our testing was relatively low as compared to the planned stormwater system. The Civil Engineer should evaluate the feasibility of subsurface infiltration using the rates provided.

It should be noted that these infiltration rates are for clean, clear water and do not include effects of sediment, fines, dissolved solids or other debris, as these materials will significantly reduce the infiltration rates of the subsurface soils. Prior to infiltration, water should be cleaned of sediment or other deleterious materials to help reduce the potential for clogging and reduced infiltration rates. Maintenance of the stormwater system should be performed on a regular basis as recommended by the system designer or manufacturer. These issues should be considered when selecting the reduction factors in the design of the system.

LIMITATIONS

The report, exploration logs, and other materials resulting from GPI's efforts were prepared exclusively for use by Iron Lofts, LLC and their consultants in designing the proposed development. The report is not suitable for a project other than the currently proposed development.

Soil deposits may vary in type, strength, and many other important properties between points of exploration due to non-uniformity of the geologic formations or to man-made cut and fill operations. While we cannot evaluate the consistency of the properties of materials in areas not explored, the conclusions drawn in this report are based on the assumption that the data obtained in the field and laboratory are reasonably representative of field conditions and are conducive to interpolation and extrapolation.

Furthermore, our recommendations were developed with the assumption that a proper level of field observation and construction review will be provided during grading, excavation, and construction by GPI. If field conditions during construction appear to be different than is indicated in this report, we should be notified immediately so that we may assess the impact of such conditions on our recommendations. If construction phase services are performed by others, they must accept full responsibility for geotechnical aspects of the project, including this report.

Our investigation and evaluations were performed using generally accepted engineering approaches and principles available at this time and the degree of care and skill ordinarily exercised under similar circumstances by reputable Geotechnical Engineers practicing in this area. No other representation, either express or implied, is included or intended in our report.

Respectfully submitted,
Geotechnical Professionals Inc.

Patrick I.F. McGervey, P.E.
Project Engineer

Donald A. Cords, G.E.
Principal

Enclosures: References
Figure 1 - Site Plan
Appendix A - Exploratory Borings
Appendix B - Laboratory Testing

Distribution: Addressee (email)

REFERENCES

California Department of Water Resources, Water Data Library, http://www.water.ca.gov/waterdatalibrary/

Riverside County, Department of Public Works (2011), "Appendix VII – Infiltration Rate Evaluation Protocol and Factor of Safety Recommendations," dated May 19, 2011.

Geotechnical Professionals Inc (GPI, 2014) "Report of Geotechnical Investigation, Proposed Residential Development – Iron Lofts, SEC Mission Inn Avenue and Commerce Street, Riverside California" Project No. 3044.1I Dated February 1, 2023

COMMERCE STREET

MISSION INN AVENUE

BUILDING A

EXISTING BUILDING D

POOL

129'-10"

87'-2"

70'-3"

BUILDING A

BUILDING B

84 PARKING SPACES

81'-8"

BUILDING C

EXISTING BUILDING E

400 PARKING SPACES

6TH STREET

5TH STREET

4TH STREET

B-1 B-2 B-3 B-4 B-5 B-6 B-7 B-8 B-9 B-10 B-11 B-12

C-1 C-2 C-3 C-4 C-5 C-6

W-1 W-2 W-3 W-4 W-5 W-6 W-7 W-8 W-9 W-10

EXPLANATION

- B-9 — APPROXIMATE LOCATION AND NUMBER OF EXPLORATORY BORING
- W-10 — APPROXIMATE LOCATION OF INFILTRATION WELL
- B-7 — APPROXIMATE LOCATION AND NUMBER OF PREVIOUS EXPLORATORY BORING (GPI, 2023)
- C-6 — APPROXIMATE LOCATION AND NUMBER OF CONE PENETRATION TEST (GPI, 2023)

N

0 80 160 FEET

BASE MAP REPRODUCED FROM CONCEPT DESIGN PREPARED BY KTGY ARCHITECTURE AND PLANNING.: DATED 09/23/2021

GPI GEOTECHNICAL PROFESSIONALS, INC.

IRON LOFTS

GPI PROJECT NO.: 3044.1I | SCALE: 1" = 80'

SITE PLAN

FIGURE 1

APPENDIX A

APPENDIX A

EXPLORATORY BORINGS

The subsurface conditions at the site were investigated by drilling and sampling five exploratory borings. The borings were advanced to depths of 23½ to 61 feet below the existing ground surface. The locations of the explorations are shown on the Site Plan, Figure 1.

The exploratory borings were drilled using truck-mounted hollow-stem auger drill equipment. Relatively undisturbed samples were obtained using a brass-ring lined sampler (ASTM D3550). The brass-rings have an inside diameter of 2.42 inches. The ring samples were driven into the soil by a 140-pound hammer dropping 30 inches. The number of blows needed to drive the sampler into the soil was recorded as the penetration resistance.

At selected locations, disturbed samples were obtained using a split-spoon sampler by means of the Standard Penetration Test (SPT, ASTM D 6066). The spoon sampler was driven into the soil by a 140-pound hammer dropping 30 inches, employing the “free-fall” hammer described above. After an initial seating drive of 6 inches, the number of blows needed to drive the sampler into the soil a depth of 12 inches was recorded as the penetration resistance. These values are the raw uncorrected blow counts.

The field explorations for the investigation were performed under the continuous technical supervision of GPI's representative, who visually inspected the site, maintained detailed logs of the borings, classified the soils encountered, and obtained relatively undisturbed samples for examination and laboratory testing. The soils encountered in the borings were classified in the field and through further examination in the laboratory in accordance with the Unified Soils Classification System. Detailed logs of the borings are presented in Figures A-1 to A-5 in this appendix.

Upon completion, the borings and infiltration wells were backfilled using bentonite slurry to the ground surface. The soil cuttings were separated and stockpiled on plastic sheets, and labeled.

The borings were laid out in the field by measuring from existing site features. Ground surface elevations at the exploration locations were estimated from the preliminary grading plan by KHR Associates and should be considered approximate.

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	*DESCRIPTION OF SUBSURFACE MATERIALS* This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	ELEVATION (FEET)
				0	**SILTY SAND (SM)** brown, dry, with gravel	875
				5		870
14.3		17	S	10	**SANDY SILT (ML)** brown, moist, very stiff	
11.2		11	S			865
9.7		8	S	15	**SILTY SAND (SM)** brown, moist, loose	
1.7		14	S		**SAND (SP)** light brown, dry, medium dense	860
8.0		16	S	20	**SILTY SAND (SM)** brown, moist, medium dense	
12.4	101	10	D		@ 22.5 feet, loose	855
					Total Depth 23.5 feet Proposed Basin #1	

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 4-3-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-8

FIGURE A-1

	MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	*DESCRIPTION OF SUBSURFACE MATERIALS* This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	ELEVATION (FEET)
					0	**SILTY SAND (SM)** brown, dry, with gravel	880
					5		875
	4.2		18	S	10	**SAND WITH SILT (SP-SM)** light brown, slightly moist, medium dense	
	15.3		26	S		**SANDY SILT (ML)** brown, very moist, very stiff	870
	11.0		17	S	15	@ 15 feet, moist	
	11.8		8	S		**SILTY SAND (SM)** brown, moist, loose	865
	12.8		7	S	20	**SANDY SILT (ML)** brown, moist, firm	
	15.7	102	15	D		@ 22.5 feet, very moist, stiff	860
						Total Depth 23.5 feet Proposed Basin #2	

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 4-3-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-9

FIGURE A-2

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	*DESCRIPTION OF SUBSURFACE MATERIALS* This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	ELEVATION (FEET)
				0	**SILTY SAND (SM)** reddish brown, slightly moist	880
				5		875
6.4		27	S	10	**SILTY SAND (SM)** reddish brown, slightly moist, dense	870
3.2		22	S		@ 12.5 feet, dry	
8.1		50/5"	S	15	**SANDY SILT (ML)** brown, slightly moist, hard	865
9.4		50/5"	S		**SILTY SAND (SM)** reddish brown, moist, dense	
10.8		41	S	20		860
6.9	108	50/6"	D		@ 22.5 feet, slightly moist, very dense	
					Total Depth 23.5 feet Proposed Basin #3	

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 4-3-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-10

FIGURE A-3

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
					0 to 30 feet not sampled	875
				5		
						870
				10		
						865
				15		
						860
				20		
						855
				25		
						850
24.0		14	S	30	**CLAYEY SAND (SC)** brown, very moist, stiff, trace clay	
						845
15.9		14	S	35	**SANDY SILT (ML)** brown, very moist, stiff	
						840

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 5-31-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-11

FIGURE A-4

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	*DESCRIPTION OF SUBSURFACE MATERIALS*	ELEVATION (FEET)
					This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
10.1	109	48	D	40	**SILTY SAND (SM)** brown, moist, dense	
2.6		14	S		**SAND WITH SILT (SP-SM)** brown, dry, medium dense	835
17.6					**SANDY SILT (ML)** brown, very moist, stiff	
19.3		20	S	45	@ 45 feet, very stiff	
3.5					**SAND WITH SILT (SP-SM)** brown, slightly moist, medium dense	
5.5		23	S		**SILTY SAND (SM)** brown, slightly moist, medium dense, coarse grained	830
6.1	120	50	D	50	@ 50 feet, dense	
11.3		25	S		@ 52.5 feet, moist, medium dense	825
21.9		16	S	55	**CLAYEY SILT (ML)** brown, very moist, very stiff	
12.6		21	S		**SILTY SAND (SM)** brown, moist, medium dense	820
16.0	112	23	D	60	**CLAYEY SILT (ML)** orange brown, moist, very stiff	
					Total Depth 61 feet Proposed Basin 1	

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 5-31-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-11

FIGURE A-4

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	DESCRIPTION OF SUBSURFACE MATERIALS	ELEVATION (FEET)
				0	This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
					0 to 30 feet not sampled	880
				5		875
				10		870
				15		865
				20		860
				25		855
9.4		14	S	30	**SILTY SAND (SM)** brown, moist, medium dense	850
7.0		50/6"	S	35	@ 35 feet, white and orange brown, slightly moist, very dense, coarse grained	845

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 5-31-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-12

FIGURE A-5

MOISTURE (%)	DRY DENSITY (PCF)	PENETRATION RESISTANCE (BLOWS/FOOT)	SAMPLE TYPE	DEPTH (FEET)	*DESCRIPTION OF SUBSURFACE MATERIALS*	ELEVATION (FEET)
					This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	
5.6	116	58	D	40	**SILTY SAND (SM)** orange brown, slightly moist, dense	
10.2		48	S			840
14.3		38	S	45	@ 45 feet, very moist	
32.9					**CLAYEY SILT (ML)** yellow brown, wet, hard	
18.5		42	S		**SANDY SILT (ML)** orange brown, wet, hard	835
17.5	107	72/11"	D	50	@ 50 feet, very moist	
6.7		58	S		**SILTY SAND (SM)** brown, slightly moist, very dense	830
6.1		50/6"	S	55		
27.6					**SILT (ML)** yellow brown, wet, hard	
23.0		46	S		**CLAYEY SILT (ML)** brown, very moist, hard	825
19.2	96			60		
8.6	105	50/6"	D		**SILTY SAND (SM)** orange brown, moist, very dense	
					Total Depth 61 feet	
					Proposed Basin 2	

SAMPLE TYPES
- C Rock Core
- S Standard Split Spoon
- D Drive Sample
- B Bulk Sample
- T Tube Sample

DATE DRILLED: 5-31-23

EQUIPMENT USED: 8 " HOLLOW STEM AUGER

GROUNDWATER LEVEL (ft): NOT ENCOUNTERED

GPI

PROJECT NO.: 3044.1I

IRON LOFTS

LOG OF BORING NO. B-12

FIGURE A-5

APPENDIX B

APPENDIX B

LABORATORY TESTS

INTRODUCTION

Representative undisturbed soil samples and bulk samples were carefully packaged in the field and sealed to prevent moisture loss. The samples were then transported to our Cypress office for examination and testing assignments. Laboratory tests were performed on selected representative samples as an aid in classifying the soils and to evaluate the physical properties of the soils affecting foundation design and construction procedures. Detailed descriptions of the laboratory tests are presented below under the appropriate test headings. Test results are presented in the figures that follow.

MOISTURE CONTENT AND DRY DENSITY

Moisture content and dry density were determined from the soil samples. The samples were first trimmed to obtain volume and wet weight and then dried in accordance with ASTM D2216. After drying, the weight of each sample was measured, and moisture content and dry density were calculated. Moisture content and dry density values are presented on the boring logs in Appendix A.

GRAIN SIZE DISTRIBUTION

Selected soil samples were dried, weighed, soaked in water until individual soil particles were separated, and then washed on the No. 200 sieve. That portion of the material retained on the No. 200 sieve was oven-dried and weighed to determine the percentage of the material passing the No. 200 sieve. The percentages passing the No. 200 sieve are tabulated below.

BORING NO.	DEPTH (ft)	SOIL DESCRIPTION	PERCENT PASSING No. 200 SIEVE
B-8	15	Silty Sand (SM)	41
B-9	15	Sandy Silt (ML)	52
B-10	17.5	Silty Sand (SM)	34
B-10	20	Silty Sand (SM)	34
B-11	35	Sandy Silt (ML)	60
B-11	43	Sandy Silt (ML)	67
B-11	58	Silty Sand (SM)	46
B-12	40	Silty Sand (SM)	18
B-12	50	Sandy Silt (ML)	51

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

A Phase 1 Environmental Site Assessment was performed for the subject property. A portion of the 2,488 page document is located within this Appendix.

HILLMANN
CONSULTING

PHASE I ENVIRONMENTAL SITE ASSESSMENT

2992, 2008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue
Riverside, California 92507

Prepared For:

Iron Lofts LLC
1201 Dove Street, Suite 520
Newport Beach, California 92660

September 21, 2021

Hillmann Project Number C3-8655

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HILLMANN
CONSULTING

September 21, 2021

Mr. Todd Cadwell
Iron Lofts LLC
1201 Dove Street, Suite 520
Newport Beach, California 92660

RE: Phase I Environmental Site Assessment
2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue
Riverside, California 92507
Hillmann Project No: C3-8655

Dear Mr. Cadwell:

Hillmann Consulting LLC is pleased to provide the results of our Phase I Environmental Site Assessment of the above referenced property. This assessment was performed in general accordance with the scope and limitations of ASTM Practice E1527-13, which is the latest version of the E1527 standard published by the ASTM.

We appreciate the opportunity to provide environmental due diligence services. If you have any questions concerning this report, or if we can assist you in any other matter, please contact our office at 714-634-9500.

Sincerely,

Hillmann Consulting, LLC

Stephen Bartlett
Senior Project Manager

David Rutherford
Quality Management Director

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List of Abbreviations/Acronyms

Hillmann may use the following abbreviations and acronyms for common terminology described in our report. Not all abbreviations or acronyms may be applicable to this report:

ACM	ï Asbestos Containing Material
AOC	ï Area of Concern
AST	ï Aboveground Storage Tank
ASTM	ï American Society for Testing Materials
BER	ï Business Environmental Risk
CEA	ï Classification Exception Area
CERCLA	ï Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	ï Comprehensive Environmental Response Compensation and Liability Information System
CESQG	ï Conditionally Exempt Small Quantity Generator
COC	ï Chemicals of Concern
CORRACTS	ï Corrective Action Sites
CREC	ï Controlled Recognized Environmental Condition
DNPL	ï Delisted National Priority List
DTSC	ï Department of Toxic Substances Control
ENG	ï Engineering
ERNS	ï Emergency Response Notification System
FDEP	ï Florida Department of Environmental Protection
FDNY	ï Fire Department, City of New York
FDOT	ï Florida Department of Transportation
FOI/FOIA/FOIL	ï Freedom of Information / Freedom of Information Act / Freedom of Information Letter
HVAC	ï Heating Ventilation & Air Conditioning
HREC	ï Historic Recognized Environmental Condition
IAQ	ï Indoor Air Quality
ISRA	ï Industrial Site Recovery Act
LBP	ï Lead-Based Paint
LQG	ï Large Quantity Generator
LTANK	ï Leaking Storage Tank
LUST	ï Leaking Underground Storage Tank
MassDEP	ï Massachusetts Department of Environmental Protection
SDS/MSDS	ï Safety Data Sheet / Material Safety Data Sheet
NA	ï Not Applicable
NCDOH	ï Nassau County Department of Health
NFA	ï No Further Action
NFRAP	ï No Further Remedial Actions Planned
NJDEP	ï New Jersey Department of Environmental Protection
NPDES	ï National Pollutant Discharge Elimination System
NPL	ï National Priority List
NYCDEP	ï New York City Department of Environmental Protection
NYCDOB	ï New York City Department of Buildings
NYCOER	ï New York City Office of Environmental Remediation
NYSDEC	ï New York State Department of Environmental Conservation
OPRA	ï Open Public Records Act
PADEP	ï Pennsylvania Department of Environmental Protection
PAH	ï Polycyclic Aromatic Hydrocarbon
PCE	ï Perchloroethylene
RAO	ï Response Action Outcome
RCRA	ï Resource Conservation and Recovery Act
RCRIS	ï Resource Conservation and Recovery Information System
REC	ï Recognized Environmental Condition
RWQCB	ï Regional Water Quality Control Board
SCAQMD	ï South Coast Air Quality Management District
SCDHS	ï Suffolk County Department of Health Services
SDG	ï Significant Data Gap
SEMS	ï Superfund Enterprise Management System
SRP	ï Site Remediation Program
SQG	ï Small Quantity Generator
SVOC	ï Semi-Volatile Organic Compound
TCE	ï Trichloroethylene
TSDF	ï Treatment Storage and/or Disposal Facility
USEPA	ï United States Environmental Protection Agency
UST	ï Underground Storage Tank
VEC	ï Vapor Encroachment Condition
VOC	ï Volatile Organic Compound

1.0 FINDINGS, OPINIONS, AND CONCLUSIONS

Hillmann Consulting, LLC (Hillmann) performed a Phase I Environmental Site Assessment (ESA) of 2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue, Riverside, California (the Property). The assessment has been conducted in accordance with our contracted scope of work and the ASTM Standard Practice E1527-13 for Phase I Environmental Site Assessments and All Appropriate Inquiries (AAI) Final Rule 40 CFR Part 312. This section contains a summary of findings, opinions and conclusions made by this assessment. However, this section, alone, does not constitute the complete assessment. The report must be read in its entirety.

1.1 Summary of Project Details

Primary Street Address:	2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue				
City:	Riverside	**County:**	Riverside	**State:**	California
Tax ID/Parcel Number:	211-022-026, 211-022-027, 211-071-001, 211-071-002, 211-071-004, 211-071-005, 211-071-023, 211-071-024, 211-072-002, 211-072-004, 211-072-020, 211-072-021				
Property Owner:	Riverside Scrap Iron and Metal Corp.				
Zoning Designation:	M2 ï Industrial, Commercial, Residential				
Approx. Property Area:	6.89 acres				
Buildings/# of Floors	Two / two-story warehouse, burnt down office				
Approx. Building Area:	4,500 / 6,000 / 18,150				
Approx. Year Built:	1895 ï 1960				
Commercial Occupants:	None - vacant				
Current Use:	Vacant				
Prior Uses:	Scrap Metal Recycling				
Inspected By:	Ms. Shilpa Sunil				
Site Contact/Company:	Mr. Todd Cadwell				
Site Escort/Company:	Mr. Tony Thomas / Owner representative				
Inspection Date:	September 20, 2021				
Weather Conditions:	Sunny, 80 degrees F				

1.2 Findings Summary Table

Assessment Subject	No REC	REC	CREC	HREC	Rpt. Ref.
Property Regulatory Records Review:		X		X	4.3
Property Historical Records Review:		X			4.2
Bulk Petroleum Storage:				X	5.3
On-Site Operations:		X			5.3
On-Site Haz-Mat Storage/Use/Spills:		X			5.3
Transformers/Hydraulic Systems:	X				5.3
Waste Discharges:	X				5.3
Interviews:	X				6.0
Adjoining & Nearby Properties:	X				4.3 5.2
Prior Env. Reports/User Provided Info:		X			3.0
Data Gaps:	X				2.3

1.3 Findings, Opinions and Conclusions

1.3.1 Recognized Environmental Conditions

Hillmann has performed a Phase I Environmental Site Assessment in accordance with the scope and limitations of ASTM Practice E1527-13 of the Property as described in Section 2 of this report. Any additions to, exceptions to, or deletions from this practice are also described in Section 2 of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the Property, except for the following:

RECOGNIZED ENVIRONMENTAL CONDITIONS	
REC #1	Riverside Scrap Iron and Metal-2993 6th Street, was listed in numerous regulatory databases for site contamination resulting for the historic use as a scrap metal yard. This site is currently subject to a voluntary cleanup agreement with the DTSC to conduct further investigations and remediation. The contaminants of concern were indicated to include arsenic, lead, PCBs, poly-nuclear aromatic hydrocarbons, tetrachlorethylene and total petroleum hydrocarbons.
REC#2	The known contamination left in place after three (3) UST closures at 2993 6th Street, is considered to be a REC in connection with the Property.
REC #3	Hillmann observed several rails and wood ties within the former railroad right-of-way supporting the possibility that railroad ties may be present just below the surface soil. Railroad ties are known to be treated with oil-based and tar-based chemicals such as creosote, and railroad spurs are commonly treated with pesticides for weed control. The buried railroad line/spur is considered to be a REC in connection with the Property.
HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS	
HREC #1	Various UST closures at the Property have left contamination in place including a 10,000-gallon diesel UST at 3033 5th Street, analysis of soils beneath the tank indicated 62 mg/kg TPHd kept in place, which

	is below residential cleanup levels, and is therefore considered to be a HREC in connection with the Property. The closure of a reported 1,000-gallon UST at the southeast corner of the warehouse at 3596 Commerce Street with a known release, reported cleanup with regulatory closure is also considered to be a HREC in connection with the Property.
CONTROLLED RECOGNIZED ENVIRONMENTAL CONDITIONS	
	No CRECs were identified.
SIGNIFICANT DATA GAPS	
	No SDGs were identified.

1.3.2 REC Response Action Recommendations

The following table presents recommended response actions to the identified RECs for further investigation and/or corrective action:

REC RESPONSE ACTION SUMMARY TABLE	
REC	**Response Action**
REC #1, 2, 3	Complete the cleanup as laid out in the Remedial Action Plan prepared by GSI for the DTSC and seek out closure from appropriate regulatory agencies.
HREC #1	No response action recommended at this time.

1.3.3 Notable Environmental Conditions / De Minimis Conditions

The following environmental conditions were identified, but are not considered to be a REC in connection with the Property:

NOTABLE ENVIRONMENTAL CONDITIONS / DE MINIMIS CONDITIONS	
1.	The main business at the Property subject to this investigation is Riverside Scrap Iron and Metal Corporation covering all the parcels of interest. Multiple addresses are listed concurrently on the US Brownfields and FINDS databases. Additionally, multiple operations at the Property have been flagged on numerous environmental databases. Listings indicate that former underground storage tanks have left contaminants in place, ñOpen ï Assessment & Interim Remedial Action,ò and many potential contaminants of concern.
2.	Many of the adjoining properties, with the exception of some of the eastern adjoining residences, are identified on a range of environmental databases. Adjoining properties to the northeast, north-northwest, north-northeast, and north are identified on the US Brownfields database.

1.3.4 Environmental Professional Statement

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in Ä312.10 of 40 CFR 312. I have the specific qualifications based on education, training and experience to assess a *property* of the nature, history and setting of the subject *property*. I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

David Rutherford
Environmental Professional

1.4 Business Environmental Risks / Non-ASTM Scope

Hillmann has performed a limited review of the following potential Business Environmental Risks (BER), also known as ñNon-ASTM Scope concernsò, in accordance with the contracted scope of work scope for this assessment. The following is a summary of findings for applicable BERs. For a more detailed discussion of the findings and contracted scope of work, please see the referenced report section.

BUSINESS ENVIRONMENTAL RISKS / NON-ASTM SCOPE			
Subject	**Findings**	**Not Appl.**	**Rpt. Ref.**
Asbestos	Based on the building age, asbestos may be present. Interiors of the structures were not available for inspection at this time.		7.1
Lead Paint		X	7.2
Radon	Property is located in the USEPA radon designation Zone 2 or 'moderate risk' area for radon.		7.3
Mold / Microbial Damage	Hillmann did not observe any evidence of significant problems with moisture intrusion or mold/microbial growth at the Property. However, interiors of the structures were not available for inspection at this time.		7.4
NWI Wetlands	No mapped wetland areas were depicted at the Property.		7.5
Lead in Drinking Water	Potable water service at the Property is provided by the city of Riverside Public Utilities.		7.6

2.0 INTRODUCTION

2.1 Purpose and Scope

This assessment was conducted utilizing generally accepted Phase I ESA industry standards in accordance with the ASTM Standard Practice E1527-13. The ASTM describes these methodologies as representing good commercial and customary practice in the United States of America for conducting an environmental site assessment of a parcel of commercial real estate with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. As such, this practice is intended to permit a user to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner or bona fide prospective purchaser limitations on CERCLA liability (hereinafter, the ñlandowner liability protections,ò or ñLLPsò): that is, the practice that constitutes all appropriate inquiries into the previous ownership and uses the property consistent with good commercial and customary practice as defined at 42 U.S.C. Ä9601(35) (B). The primary goal of the processes established by ASTM E1527-13 is to identify *recognized environmental conditions* in connection with the Property.

The term *recognized environmental condition (REC)* is defined by the ASTM as the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to a release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

The ASTM has also defined the terms *historical recognized environmental conditions* and *controlled recognized environmental conditions* as two additional types of RECs. The term *historical recognized environmental condition (HREC)* is defined as a past release of any hazardous substances or petroleum products that has occurred in connection with the Property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the Property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls or engineering controls).

The term *controlled recognized environmental condition (CREC)* is defined as a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.

Conditions determined to be *"de minimis conditions"* are not considered to be RECs, HRECs or CRECs. *De minimis condition* is defined by the ASTM, ñé as a condition that generally does not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.ò

The chief components of this assessment are generally described as follows:

- A non-invasive visual reconnaissance of the Property and adjoining properties in accordance with ASTM guidelines for evidence of RECs.

- Interviews of past and present owners and occupants and state and local government officials, seeking information related to the potential presence of RECs at the Property.

- A review of standard physical record sources for available topographic, geologic and groundwater data.

- A review of standard historic record sources, such as fire insurance maps, city directories, aerial photographs, prior reports and interviews, etc., to determine prior uses of the Property from the present, back to the Propertyôs first developed use, or back to 1940, whichever is earlier.

- A review of standard environmental record sources including federal and state environmental databases, and additional environmental record sources, to identify potential regulatory concerns with the Property, adjoining properties and properties located within the surrounding area.

An evaluation of environmental or other regulatory compliance matters is excluded from the scope of this assessment.

These methodologies are described as representing good commercial and customary practice for conducting an Environmental Site Assessment of a property for the purpose of identifying recognized environmental conditions.

2.1.1 Business Environmental Risks/Non-ASTM Scope Considerations

In accordance with our contract agreement, Hillmann may have addressed the following potential environmental subject matters that are outside of the requirements of the ASTM E1527-13 standard:

Asbestos-Containing Materials (ACM): A cursory non-intrusive visual screening for the presence of suspect ACM within the accessed areas of buildings built prior to 1990 on the Property. It is emphasized that this cursory non-intrusive visual screening does not constitute an asbestos survey/inspection of the premises. An asbestos survey/inspection should be sought by the report User(s) if more certainty is desired regarding ACM and potential asbestos hazards at the Property. Furthermore, a review of regulatory compliance matters pertaining to asbestos is excluded from the scope of work.

Lead-Based Paint (LBP): A cursory non-intrusive visual screening of the condition of painted surfaces in the accessed areas of residential buildings/units built prior to 1980 on the Property. It is emphasized that this cursory non-intrusive visual screening does not constitute a comprehensive survey for LBP or potential lead hazards. A comprehensive inspection should be sought by the report User(s) if more certainty is desired regarding LBP at the Property. Furthermore, a review of regulatory compliance matters pertaining to lead-based paint is excluded from the scope of work.

USEPA Designated Radon Potential: Review of general non-site specific data published by the USEPA regarding the Radon Zone classification for the area of the Property.

Mold/Microbial Damage: A cursory non-intrusive visual screening within the accessed areas of buildings on the Property for evidence of systemic microbial problems, including visible mold

growth, water damaged building materials or musty odors. It is emphasized that this cursory non-intrusive visual screening does not constitute a comprehensive survey for moisture/mold/microbial damage. A more comprehensive inspection should be sought by the report User(s) if more certainty is desired regarding the potential for moisture/mold/microbial damages at the Property.

NWI Wetlands: Review of US Fish and Wildlife Service National Wetland Inventory digitized data of mapped wetlands as presented in the attached EDR Radius Map plus Geocheck Report.

It is emphasized that, regardless of the wetlands data obtained via the EDR Geocheck-Physical Setting Source Addendum, a delineation of regulated wetlands by a qualified professional would be warranted to determine the presence or absence of regulated wetlands at the Property.

Lead in Drinking Water: Review of the potential for elevated levels of lead in the drinking water by determining the source of the drinking water supply and a review of available testing or compliance data reports.

2.2 Property Location/Legal Description

Property location and legal description details are described as follows:

Primary Street Address:	2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue				
City:	Riverside	**County:**	Riverside	**State:**	California
Tax ID/Parcel Number:	211-022-026, 211-022-027, 211-071-001, 211-071-002, 211-071-004, 211-071-005, 211-071-023, 211-071-024, 211-072-002, 211-072-004, 211-072-020, 211-072-021				
Approx. Land Area:	6.89 acres				
Apprx. Latitude/Longitude:	North 40.7643790 degrees/West 73.9699910 degrees				
Additional Details (if appl.):	NA				
Property Owner:	Riverside Scrap Iron and Metal Corp.				
Zoning Designation:	M2 ï Industrial, Commercial, Residential				

2.3 Data Gaps

A *data gap* is defined by the ASTM as a lack of or inability to obtain information required by this practice despite good faith efforts by the environmental professional to gather such information. A data gap is only significant if other information and/or professional experience raises reasonable concerns involving the data gap and the ability to determine the presence or absence of recognized environmental conditions. The following table summarizes data gaps encountered during the assessment as well as a discussion of their significance.

Data Gap:	Significant (Yes/No)?	Discussion
Historical records data failure	No	The date and/or type of the first developed use of the Property was not documented. Record gaps exceeding five years were encountered; however, no significant site use changes are suspected during these intervals.
Response to agency records requests not received as of date of report.	No	Any additional information indicative of a REC will be forwarded upon receipt.

2.4 User Reliance

This report is for the exclusive use of the User(s) named on the front cover. No other party(ies) shall have any right to rely on the content of this report without first obtaining the consent of the original report User; and without obtaining written consent from Hillmann in the form of a letter of reliance or report recertification.

2.5 Significant Assumptions

The following significant assumptions are made:

- The site operations at the time of the site visit are assumed to reflect typical site conditions relative to potential environmental conditions and that no concealment of environmental conditions or releases by site owners or occupants has occurred. Likewise, it is assumed that no areas of the Property with potential environmental concerns or RECs were concealed or otherwise not reported, intentionally or unknowingly, by the Property owners/occupants and/or site escort at the time of the site visit.

- For the purpose of estimating the approximate direction of groundwater flow in the absence of site specific groundwater data, unless indicated otherwise, an assumption has been made that the gradient of groundwater flow follows the surface topography of the Property and immediate surrounding area.

2.6 General Limitations and Exceptions

2.6.1 Limitations

The report turnaround time specified by the contract agreement for this assessment may present a limitation to the availability of pertinent regulatory agency records. Such limitations, if encountered, are further specified in Section 4.4.

Significant limitations related to the condition or accessibility of the Property at the time of the site reconnaissance, if encountered, are reported in Section 5.1.

2.6.2 Other Exceptions or Deletions

No other exceptions or deletions from the ASTM Standard E1527-13 are reported.

2.6.3 Special Terms and Conditions

This Phase I Environmental Site Assessment has been prepared using reasonable efforts in each phase of its work to identify recognized environmental conditions associated with hazardous substances, wastes and petroleum products at the Property. Findings within this report are based on information collected from observations made on the day of the site reconnaissance and from reasonably ascertainable information obtained from governing public agencies and private sources.

This report is not definitive and should not be assumed to be a complete or specific definition of the conditions above or below grade. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, site development, redevelopment, or other construction purposes. No representation or warranty is made that the past or current operations at the Property are, or have been, in compliance with all applicable federal, state and local laws, regulations and codes.

Findings, conclusions and recommendations presented in this report are based on visual observations of the Property, interviews conducted, the records reviewed, information provided by the Client, and/or a review of readily available and supplied drawings and documents. Information obtained during the assessment, whether written, graphic or verbal, provided by the Property contact(s) or as shown on any documents reviewed or received from the Property contact, owner or agent, or government agency source; is assumed to be accurate except as specifically stated otherwise in this report. Independent verification of the accuracy or completeness of all information reviewed or received during the course of this assessment is not made and excluded from the scope of work for this assessment. No warranty or guarantee is made of the accuracy or completeness of information that was obtained from ostensibly knowledgeable individuals, regulatory agency representatives or other secondary sources.

Regardless of the findings stated in this report, Hillmann is not responsible for consequences or conditions arising from facts that were concealed, withheld or not fully disclosed at the time the assessment was conducted.

This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

The regulatory database report provided is based on an evaluation of the data collected and compiled by a contracted data research company. The regulatory research is designed to meet the requirements of ASTM Standard E 1527-13. Hillmann can neither warrant nor guarantee the accuracy or completeness of the information obtained from the regulatory database report provider during the course of this assessment.

Subsurface conditions may differ from the conditions implied by the surface observations and can only be reliably evaluated through intrusive techniques.

Reasonable efforts have been made during this assessment to identify aboveground and underground storage tanks and ancillary equipment. Reasonable efforts are limited to information gained from visual observation of largely unobstructed areas, recorded database information held in public record and available information gathered from interviews. Such methods may not identify

surficial and subsurface features that may have been hidden from view due to parked automobiles and other vehicles, snow cover, vegetative growth, pavement, construction or debris pile storage or incorrect information from sources.

No guarantee, explicit or implied, is made that the records pertaining to historical ownership or occupancy which were reviewed represent a comprehensive or precise delineation of past Property ownership or tenancy for legal purposes.

The ASTM E1527-13 standard states that recommendations are not required to be included in a Phase I ESA report; however, further that recommendations are an additional service that may be useful in the Userôs analysis of landowner liability protections or business environmental risks; and that the User should consider whether recommendations for additional inquiries or other services are desired.

The recommended response actions to the identified RECs presented in Section 1.3, if any, are not intended to represent the only course(s) of action to take; nor does it imply any opinion as to the timing of the action. Furthermore, it is emphasized that additional response actions may become warranted depending on the outcome of the initial action(s) taken. Hillmann advises that consultation with legal counsel familiar with environmental and real estate law may be beneficial to the decision making process for the type and timing of a response action to identified RECs, if any.

Due to the limited nature of our review of potential Business Environmental Risks, the User of the report should consider whether to take additional action(s) to further define, properly manage and/or mitigate potential BERs.

In the event of any conflict between the terms and conditions of this report and the terms and conditions of the consulting services agreement for this project, the consulting services agreement shall control.

3.0 USER PROVIDED INFORMATION

The term ñUserò is defined by ASTM as the party seeking to use Practice E1527 to complete an environmental site assessment of the Property; specifically, the entities named on the front cover to which the report has been addressed.

3.1 Prior Environmental Reports/Documentation

The following prior environmental reports/documentation was provided:

Phase I Environmental Site Assessment, 2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, 2993 Mission Inn Avenue, prepared by Hillmann Consulting and dated February 29, 2016. Hillmannôs previous Phase I also reviewed several prior Phase I and Phase II investigations. The Phase I report indicated the following:

"Recognized Environmental Conditions (RECs):

- *The known soil contamination, due to the former metal recycling operations, including PAHs, SVOCs, TPHs, PCBs, heavy metals, and VOCs, as set forth in multiple Phase II Subsurface Investigation Reports and Supplemental Phase II Subsurface Investigation Reports, is considered to be a REC in connection with the Property.*

- *The known contamination left in place after three (3) UST closures at 2993 6th Street, is considered to be a REC in connection with the Property.*

- *The history of industrial usage at the Property is considered to be a REC in connection with the Property.*

- *Hillmann observed two (2) 55-gallon drums with what appeared to be waste oil and three (3) additional drums which were full and unlabeled within the former equipment maintenance area of the warehouse building. Both sets of drums were stored in secondary containment. Hillmann observed thirteen (13) empty 55-gallon drums and one storing copper chips within the warehouse building. No leaking or staining was observed in the vicinity of any of the drums. Three (3) 5-gallon gas cans, five (5) 5-gallon diesel cans, and three (3) 5-gallon buckets of oil were observed in secondary containment within the warehouse. Additionally, Hillmann observed several oil pans which appeared to contain some amount of used oil, chemicals stored within a flammable safety cabinet and miscellaneous chemicals stored in the manufactured containers throughout the warehouse.*

- *Significant pavement staining was observed in the vicinity of the concrete posts where the balers were formerly mounted. In at least one area, the staining from the concrete baler pad continued onto bare soil. One large stain was observed on the concrete pad at the southern end of the former conveyor belt at the southwestern portion of the Property, just behind the former storage building. De minimis staining was observed on the pavement and soils throughout the Property.*

- *Regulatory database listings identify current and historic adjoining properties as a fertilizer facility, automobile and truck service stations, Standard Oil Co., and brownfields properties, are considered to be a REC in connection with the Property.*

- *Inaccessible areas including the bottoms of former scale pits, conveyor pit, and abandoned structure at 2993 Mission Inn Avenue are considered to be RECs in connection with the Property.*

- *Hillmann observed several rails and wood beams within the former railroad right-of-way supporting the possibility that railroad ties may be present just below the surface soil. Railroad ties are known to be treated with oil-based and tar-based chemicals such as creosote, and are considered to be a REC in connection with the Property.*

Controlled Recognized Environmental Conditions (CRECs):

- *No evidence of any CRECs in connection with the Property was identified.*

Historical Recognized Environmental Conditions (HRECs):

- *Closure of a 10,000-gallon diesel UST at 3033 5th Street, including analysis of soils beneath the tank at 62 mg/kg TPHd kept in place, is below residential cleanup levels and is considered to be a HREC in connection with the Property.*

- *The closure of a reported 1,000-gallon UST at the southeast corner of the warehouse at 3596 Commerce Street with a known release, reported cleanup with regulatory closure is considered to be a HREC in connection with the Property."*

Revised Remedial Action Plan, Riverside Scrap Iron & Metal, 2993 Sixth Street, Riverside, California 92507, DTSC Docket HAS-FY15/16-152; prepared by GSI Environmental, dated July 23, 2019, revised January 2, 2020. The Remedial Action Plan (RAP) objective was stated as, *"to remove soil impacted with COCs above residential criteria and dispose of it cost-effectively and safely. This will require a program of targeted removal followed by a broad Site-wide excavation plan. The off-Site residential areas will be excavated during the targeted on-Site excavation work and the impacted soil will be brought on-Site to be temporarily staged prior to off-Site disposal."* The detailed plans for the removal and off-site disposal of surficial soils to a depth of 1.0 to 2.5 feet over approximately 5.5 acres followed by soil confirmation sampling. The estimated volume of soil removal was 28,200 cubic yards, or 45,604 tons. The RAP indicated that a small portion of this mass is highly impacted and may be classified as hazardous waste.

3.2 User Questionnaire

Section 6 of the ASTM E1527-13 standard describes certain tasks required to be performed by the report User in order to qualify for landowner liability protections to CERCLA liability. To assist the report User to meet these requirements, the ASTM E1527-13 standard recommends a questionnaire of inquiries (User Questionnaire) specified in 40 CFR 312.25, 312.28, 312.29, 312.30, and 312.31 be provided to the original report User. A User Questionnaire has been provided to the report User; however, a completed questionnaire was not returned to Hillmann.

Question:	Yes/No:	Detail:
Environmental liens that are filed or recorded against the property: Did a search of recorded land title records identify any environmental liens filed or recorded against the property under federal, tribal, state or local law?	NR	*No Response*
Activity and use limitations that are in place on the property or that have been filed or recorded against the property:	NR	

Question:	Yes/No:	Detail:
Did a search of recorded land title records (or judicial records where appropriate, identify any AULs, such as engineering controls, land use restrictions or institutional controls that are in place at the property and/or have been filed or recorded against the property under federal, tribal, state or local law?		
Specialized knowledge or experience of the person seeking to qualify for the LLP: Do you have any specialized knowledge or experience related to the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business?	NR	
Relationship of the purchase price to the fair market value of the property if it were not contaminated: Does the purchase price being paid for this property reasonably reflect the fair market value of the property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property?	NR	
Commonly Known or Reasonably Ascertainable Information: Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example,		
-Do you know the past uses of the property?	NR	
-Do you know of specific chemicals that are present or were once present at the property?	NR	
-Do you know of spills or other chemical releases that have taken place at the property?	NR	
-Do you know of any environmental cleanups that have taken place at the property?	NR	
The degree of obviousness of the presence or likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation: Based on your knowledge and experience related to the property are there any obvious indicators that point to the presence or likely presence of releases at the property?	NR	
Litigation/Administrative Proceedings/Government Notices As the User of this ESA, do you have knowledge of (1) any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the property; (2) any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on or from the property; and (3) any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products.	NR	

NR-no response

3.3 Reason for Performing Phase I ESA

The User did not indicate the purpose of the assessment. In accordance with ASTM E1527-13, it is assumed that the Phase I ESA was being performed in order to qualify for landowner liability protection to CERCLA liability.

4.0 RECORDS REVIEW

4.1 Physical Setting Sources

The following physical setting sources were reviewed:

Source	Discussion
USGS 7.5 minute Topographic Map Data: (EDR Geocheck-Physical Setting Source Addendum)	The Property lies at an elevation of approximately 880 feet above mean sea level. An interpretation of topographic contour lines as well as a review of the EDR Geocheck-General Topographic Gradient suggested terrain sloping downward towards the west-northwest. The closest down gradient water body is the Riverside Canal, located approximately 194 feet to the west-northwest.
USDA SCS Soil Data: (EDR Geocheck-Physical Setting Source Addendum)	The soil type at the Property is classified as ñArlingtonò. This soil type is described as fine sandy loam that are moderately well and well drained with moderately coarse textures.
Geologic Data: (EDR Geocheck-Physical Setting Source Addendum)	The geologic formation in the vicinity of the Property is described as plutonic and intrusive rocks of the Mesozoic Era, Cretaceous System, and Cretaceous Granitic Rocks Series.
Prior Env. Reports: (Section 3.1)	No additional relevant site specific geologic data was noted from a review of the prior environmental reports listed in Section 3.1.
Additional Sources/ Data:	No additional physical setting sources or data was obtained.
Groundwater Flow Discussion:	Based on a review of the above information as well as observation of the site, the direction of shallow groundwater flow at the site is inferred to be towards the west-northwest.
NWI Wetlands Data: (EDR Geocheck-Physical Setting Source Addendum)	No NWI mapped wetlands areas were depicted at the Property.

4.2 Historical Use – Property and Adjoining Properties

Research has been conducted in an attempt to develop a history of the previous uses of the property and surrounding area, in order to help identify the likelihood of past uses having led to RECs in connection with the property. Standard historical sources have been sought in an attempt to document the past uses of the Property as far back as it can be shown that the Property contained structures; or from the time the Property was first used for residential, agricultural, commercial, industrial or governmental purposes.

4.2.1 Fire Insurance Maps

A Certified Sanborn Map Report was obtained from EDR for a review of published historic fire insurance maps for the Property and surrounding area. The following is a summary of site uses and notable details depicted by the available maps:

Year(s)	Prop/Adj	Depicted Use(s)	Notable Details
1887	**Property:**	Not depicted	Not depicted
	Adjoining:	Not depicted	Not depicted
1888, 1891	**Property:**	Not depicted	Not depicted
	Adjoining:	Industrial	Fruit Packing Warehouse
1895	**Property:**	Industrial, dwelling	Cox Feed and Fuel Co.

Year(s)	Prop/Adj	Depicted Use(s)	Notable Details
	Adjoining:	Residential, Industrial	Fruit Packing Warehouse, Riverside Barley Mills, Standard Oil Co. Warehouse, Railroad
1908	**Property:**	Residential, Industrial	Orange Packing Warehouse, Sutherland Fruit Co., Riverside Heights Orange Growers Association Packing Warehouse, Railroad
	Adjoining:	Residential, Industrial	Fruit Packing Warehouses, Standard Oil Co. Warehouse, Railroad
1950, 1952, 1953, 1954, 1955	**Property:**	Residential, Industrial	Shell Oil Co. Warehouse and oil tanks, Tractor and Equipment Storage, Lernerôs Riverside Grain Milling Co., Riverside Heights Orange Growers Association Packing Warehouse, Andrew Bros. Riverside Growers Inc., Bottling Works, Railroad
	Adjoining:	Residential, Industrial	Standard Oil Co. Warehouse, Hansen and Gully Lumber Yard, Feed Grinding Warehouse, Westbrook Co. Furniture, National Orange Company Packing House, Sheet Metal Works
1957, 1958, 1959, 1960, 1961, 1962	**Property:**	Residential, Industrial	Shell Oil Co. Warehouse, Tractor and Equipment Storage, Lernerôs Riverside Grain Milling Co., Drugs Warehouse, Building Supplies Warehouse, Railroad
	Adjoining:	Residential, Industrial	Standard Oil Co. Warehouse, Hansen and Gully Lumber Yard, Feed Grinding Warehouse, Westbrook Co. Furniture, National Orange Company Packing House, Sheet Metal Works
1965, 1968, 1969	**Property:**	Residential, Industrial, Scrap Metal Storage Yard	Tractor and Equipment Storage, Lernerôs Riverside Grain Milling Co., Drugs Warehouse, Building Supplies Warehouse, Railroad, Scrap Metal Storage Yard
	Adjoining:	Residential, Industrial	Standard Oil Co. Warehouse, Feed Grinding Warehouse, Westbrook Co. Furniture, National Orange Company Packing House, Sheet Metal Works

A copy of the Certified Sanborn Map Report is attached in Appendix D.

4.2.2 City Directories

An EDR City Directory Abstract report was reviewed for data of former occupants of the Propertyôs street address. The following is a generalized summary of the findings of city directory research for past occupants of the Property.

Property	
Use(s) / Occupant(s):	**Years**
Keen Lillian, Frederick Clifton Ruth, Hazen CEO, Riverside Scrap Iron & Metal	1960
El Dorado Marble & Granite	2008

The EDR City Directory Abstract report was also reviewed for listings of historic occupants of the adjoining properties. The following is a general summary of listings of historic adjoining property occupants:

Adjoining Properties	
Use and/or Occupant(s)	**Years**
Standard Oil Co.	1945 ï 1966
Riverside Heights Orange Growers Association, Star Milling Co	1951 ï 1960
Bransford Auto Trim, Wreckers, Reliable Auto, Tuggy Radio Lab, Precision Saw Works, Valley Feed Mills	1930 ï 1939
National Orange Company	1955 ï 2001
Various Industrial sites	1930 ï 2001

A copy of the EDR City Directory report is attached in Appendix D.

4.2.3 Historical Topographic Maps

Historical topographic maps of the Property and vicinity obtained from an EDR Historical Topographic Map report (as attached in Appendix D) have been reviewed. The following interpretation of land usage was made by review of the maps:

Year(s)	Summary	
1901	**Property:**	Several small structures
	Adjoining:	Several small structures
1942	**Property:**	Large warehouse style structures, railroad
	Adjoining:	Large warehouse style structures, railroad
1947, 1953	**Property:**	Shaded to denote general urban development, railroad
	Adjoining:	Shaded to denote general urban development, railroad
1967, 1980	**Property:**	Shaded to denote general urban development, large warehouse structures, railroad
	Adjoining:	Shaded to denote general urban development, large warehouse structures, railroad
2012	**Property:**	No building development depicted on the topographic map
	Adjoining:	No building development depicted on the topographic map

4.2.4 Historical Aerial Photographs

Historical aerial photographs of the Property and vicinity obtained from an EDR Aerial Photo Decade Package report, as attached in Appendix D, were reviewed. The following interpretation of land usage was made by review of the aerial photographs:

Year(s)	Summary of Interpretation	
1931, 1938, 1949, 1953, 1959	**Property:**	Residential homes, industrial warehouses, railroad
	Adjoining:	Residential homes, industrial warehouses
1966, 1968, 1975, 1978, 1985, 1989, 1990, 1994, 2002, 2006, 2009, 2012	**Property:**	Industrial warehouses, junk/scrapyards, railroad
	Adjoining:	Residential homes, industrial warehouses
2016	**Property:**	Industrial warehouses
	Adjoining:	Residential homes, industrial warehouses

4.2.5 EDR High-Risk Historical Records

The EDR Radius MapÊ report, which is discussed in greater detail in Section 4.3, provided a search of proprietary databases of potential historical high-risk uses at or in the vicinity of the Property. These databases include EDR Historic Cleaners ï a database of property addresses with records of historical occupancy by suspected cleaners businesses; EDR Historic Auto ï a database of property addresses with records of historical occupancy by potential automotive gas/filling stations and repair facilities; and EDR MGP- a database of sites historically occupied by manufactured gas plants and related facilities.

EDR Database	On-site Listings:	Adjoining/Off-Site Listings
Historic Cleaners: (on-site/adjoining only)	None	None
Historic Auto: (on-site/adjoining only)	None	None
MGP: (1-mile distance)	None	None

4.2.6 Petroleum/Natural Gas Well Review

The historical record sources and the California Geologic Energy Management Division (CalGEM) online mapping application were reviewed for records of historic petroleum and/or natural gas wells at the Property. No record of any historical petroleum/natural gas wells at or adjoining the Property was identified.

4.2.7 Additional Historical Data

Where applicable, the following additional pertinent historical data was obtained:

Interviews/Anecdotal:	No additional pertinent historical data was obtained.
Local Gov't Records:	No additional pertinent historical data was obtained.
Prior Env. Reports: (Section 3.1)	Prior environmental reports reviewed as part of this assessment, as detailed in Section 3.1, did not provide additional pertinent detail of historical site usage.
Site Observations:	Indications of historic uses of the Property or adjoining properties were not observed during the site reconnaissance.
Other Sources:	No additional pertinent historical data was obtained.

4.2.8 Summary of Identified Historic Uses

The following table presents a summary of the types and approximate date ranges of identified prior uses of the Property:

Property	
Date Range	**Use**
1895 to 1962	Industrial including Shell Oil Warehouse, Fruit Packing Warehouses, and Feed Warehouses. Several residences also present. Railroad runs through Property.
1965 to 2012	Industrial including Riverside Scrap Metal. Railroad runs through Property.
2016 to Present	Vacant

The following table presents a summary of the types of identified prior uses of the adjoining properties:

Adjoining Properties	
Date Range	**Use**
1895 to Present	Residential to the east, industrial to the north, south, and west

4.2.9 Historical Records Data Failure

The ASTM E1527-13 standard defines data failure as a failure to achieve the ASTM specified historical research objectives after reviewing the standard historical sources that are reasonably ascertainable and likely to be useful. The objective is to identify all obvious uses of the property from the present, back to the propertyôs first developed use, or back to 1940, whichever is earlier. Furthermore, records of historic use/conditions should be sought in intervals no less than approximately five years, unless the property conditions appear unchanged over a longer interval.

Objective	Met?	Detail	Significant?
First developed use/date determined?	Yes	The first developed use of the Property was a feed and fuel warehouse built circa 1895.	NA
Record sources at 5-year intervals back to 1940 or first developed use?	No	Historical record gaps exceeding five years were encountered. However, significant site-use changes or undiscovered site uses appear unlikely to have occurred during the record gaps.	No
All obvious prior uses identified?	Yes	See Section 4.2.8.	NA

Please refer to Section 2.3 for additional discussion of data gaps and their significance to the findings of the assessment.

4.2.10 Historic Uses REC Discussion

The review of historical records indicated evidence of the following potential RECs in connection with the Property:

The Property appears to have been utilized largely with various industrial uses which include a scrap metal recycler and a Shell Oil Warehouse with various petroleum storage tanks. Due to the age and duration of these industrial uses, and the contamination identified by previous Phase II work, the historic usage of the Property is considered to be a REC.

4.3 Standard Environmental Record Sources

A regulatory database report, titled EDR Radius MapÊ Report, prepared by Environmental Data Resources of Shelton, CT was obtained and reviewed. The report provided a search of standard environmental record sources for listings of the Property, adjoining properties and sites within the surrounding area; and has been reviewed for the purpose of identifying listings suggesting a potential impact to the Property due to presence or migration of hazardous substances and/or petroleum products. Additional descriptions of the meaning and significance of the regulatory databases can be found in the regulatory database report in Appendix E. The EDR Radius MapÊ

Report provided a search of the following database categories in accordance with the requirements of the ASTM Standard E1527-13:

Regulatory Database	Search Distance
Fed. National Priorities List (NPL/a.k.a. ñSuperfundò sites) & Proposed NPL	1-mile
Fed. Delisted NPL	İ -mile
Fed. Superfund Enterprise Management System (SEMS; formerly CERCLIS)	İ -mile
Fed. SEMS-ARCHIVE (formerly known as CERCLIS NFRAP)	İ -mile
Fed. RCRA Corrective Action Sites (CORRACTS)	1-mile
Fed. RCRA Transport/Storage/Disposal (TSD) sites	İ -mile
Fed. RCRA Generators (LQG, SGQ & CESQG)	Site & Adjoining
Fed. Institutional Control/Engineering Control (IC/EC) Registries	Site only
Fed. Emergency Response Notification System (ERNS)	Site only
State/Tribal Hazardous Waste Sites (SHWS)	1-mile
State/Tribal Landfill and/or Solid Waste Disposal (LF/SWF)	İ -mile
State/Tribal Leaking Storage Tanks	İ -mile
State/Tribal Registered Storage Tanks	Site & Adjoining
State/Tribal IC/EC Registries	Site
State/Tribal Voluntary Cleanup Sites	İ -mile
State/Tribal Brownfields	İ -mile
Additional Federal, State, Tribal and Local Environmental Databases	Variable

Reported distances for adjoining listings discussed in Section 4.3.4, if applicable, are approximate and indicative of the presence of a public roadway or right-of-way between the adjoining site and Property.

The reported gradients indicated where applicable in Sections 4.3.4 and 4.3.5 have been estimated based on a number of factors including but not necessarily limited to field observation, review of topographic maps, database listing details and/or site specific geo-technical data.

4.3.1 Supplemental Database Listings

The regulatory database report was also reviewed for listings on supplemental databases, in addition to the Standard Environmental Record Sources. Any property or adjoining property listings on such databases of significant concern, if identified, is discussed in Sections 4.3.3 and 4.3.4. Otherwise, none of the other supplemental database listings identified by the regulatory database report are considered to be a REC in connection with the Property.

4.3.2 Limited Tier I Vapor Encroachment Screening

Limited analysis of the details of on-site, adjoining and vicinity database sites was conducted to identify potential sources of sub-surface vapor encroachment. This review was based on elements of the ASTM ñStandard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactionsò (ASTM E 2600-15); and also on elements of ñMethodology for Identifying the Area of Concern Around a Property Potentially Impacted by Vapor Migration from Nearby Contaminated Sourcesò (Buonicore, 2011-S-103-AWMA). Vicinity database sites pertaining to non-petroleum product releases within 1,760 feet of the Property in the up-gradient direction, 365

feet of the Property in the cross gradient direction and 100 feet of the Property in the down gradient direction; and vicinity database sites pertaining to petroleum product releases within 528 feet of the Property in the up-gradient direction, 165 feet of the Property in the cross gradient direction and 100 feet of the Property in the down gradient direction were reviewed to identify active contamination sites with the potential to affect subsurface vapor conditions at the subject property. The potential for vapor encroachment was considered in assessing whether or not a REC exists in connection with the Property when reviewing applicable sites within those distances.

Regulatory database sites with active petroleum or non-petroleum releases that are considered to constitute a vapor encroachment condition (VEC) to the Property, if any, are identified and discussed in Sections 4.3.3, 4.3.4 and 4.3.5.

4.3.3 Property Listings

The following listings of the Property were identified:

The main business at the Property subject to this investigation is Riverside Scrap Iron and Metal Corporation and covers all the parcels of interest. Multiple addresses are listed concurrently on the US Brownfields and FINDS databases. Below is a summary of the pertinent details extracted from the listings and condensed into one category:

Name/Address:	3008-3032 6th Street / 3008 5th Street / 6th and Commerce Streets / 4th and Commerce Streets / 2993 7th Street
Database(s):	FINDS, BROWNFIELDS
Data Discussion:	Seven (7) US Brownfields are described at the Property over various addresses and associated with Riverside Scrap Iron and Metal Corporation. None of the listings provide details about the types of contaminants reported at the Property. The ACRES Property IDôs are: 15980, 15979. 15985, 15983, 15984, and 15982 respectively. The FINDS database listings provide the following Registry ID #ôs: 110038693606, 110038693599, 110038693651, 110038693633, and 110038693642 in order of the above listed addresses.
REC Discussion:	Based on the details provided above, a REC in connection with the Property has been identified.
VEC Discussion:	Based on the available data, a VEC exists.

Name/Address:	Riverside Scrap Iron and Metal Corporation / 2993 6th Street, 3033 5th Street, 2992 5th Street
Database(s):	SWEEPS UST, CA FID UST, HIST UST, UST, LUST, CHMIRS, LUST, SLIC, WDS, CIWQS, AST, HWTS, HAZNET, Envirostor, VCP
Data Discussion:	The SWEEPS UST listing indicates four underground tanks at the Property. Four (4) tanks are listed as ñActiveò with an active date as 11-18-1992. One tank is 8,000-gallons and stores diesel and the three other tanks are 100-gallons with unknown contents. The CA FID UST listing indicates a status of ñActive.ò Riverside Scrap Iron & Metal, 3033 5th St. The Historic UST listing describes an 8,000-gallon diesel tank with a stock inventory and visual leak detection system.ò The second Historic UST listing indicates a total of three (3) tanks were formerly registered to the metal scrap processor. The tank system includes a 550-gallon regular product tank and two (2) unknown size and content underground tanks. The listing provides a facility ID (#648) and a latitude/longitude but no additional pertinent details. The LUST listing identifies the case type as ñsoil onlyò and the status as ñClosed/action completed.ò The CHMIRS listing describes a spill of 2-gallons of hydrochloric acid onto the roadway which caused a vapor cloud. The incident date is reported as 5/4/2000 and the incident was contained by the Riverside City Fire Department. Additionally, the listing describes three 30-gallon containers of xylene abandoned and not leaking at the address on 5/3/2000. The date completed is ñnot reportedò for the second CHMIRS incident. The second LUST listing indicates a status ñCompleted ï Case Closedò as of 10/03/2000. Gasoline is listed as a potential contaminant of

	concern affecting soil. The listing also specified that MTBE was not tested. The SLIC listing indicates a facility status of ñOpen ï Assessment & Interim Remedial Actionò as of 02/27/2014. Potential contaminants of concern are listed as PCE, PCBs, Arsenic, Lead, PAHs, and TPH. The NPDES listing describes that Riverside Scrap Iron & Metal, an industrial facility, operated up until 09/01/2015 with a scrap metal permit discharging into the municipal storm water system. The WDS listing describes the Riverside Scrap Iron & Metal business as a Category C facility that does not utilize a waste treatment system. The facility has a minor threat to water quality. The facility has a permit for a 2,000-gallon above-ground tank. No additional details are provided. The HWTS listing indicates that the site is on the Hazardous Waste Tracking System. The HAZNET listings indicates that various hazardous materials have been generated and disposed of from the Property. The Envirostor indicates an ñActiveò status as of 04/25/2016. The site type is noted as voluntary cleanup. Hillmann reviewed documents available on Envirostor which indicated that a final RAP had been submitted and approved, however, Hillmann also noted letters indicating the termination of the voluntary cleanup agreement due to the current ownerôs apparent unwillingness to complete the RAP. The CIWQS listing indicates that the Property is on the California Integrated Water Quality System database with no other pertinent information.
REC Discussion:	Based on the details provided above, a REC in connection with the Property has been identified.
VEC Discussion:	Based on the available data, a VEC exists.

Name/Address:	Inland Frame and Design / 3596 Commerce Street
Database(s):	LUST, HIST CORTESE, LUST
Data Discussion:	Two LUST listings for the same case number were indicated with a status of ñCompleted ï Case Closedò as of 07/17/1995. The potential contaminant of concern is identified as gasoline potentially affecting soil. A No Further Action Letter (#RCDEH0717) was issued on 07/17/1995 after remediation processes of excavation and soil vapor extraction (SVE) system were implemented. The HIST CORTESE listing provides a regulatory ID (083302339T) but no additional pertinent information. The second LUST listing describes the same case (Global ID #T0606500340) and adds a leak and MTBE was detected during a tank closure on 7/29/1993. A vapor extraction method was utilized to abate the contamination.
REC Discussion:	Based on the details provided above, a HREC in connection with the Property has been identified.
VEC Discussion:	Based on the available data, a VEC is not suspected.

4.3.4 Adjoining Property Listings

The following adjoining property listings were identified. Reported distances, where applicable, are approximate and indicative of the presence of a public roadway or right-of-way between the adjoining site and Property. The reported gradient has been estimated based on a number of factors including but not necessarily limited to field observation, review of topographic maps, database listing details and/or site specific geo-technical data.

Several adjoining sites are identified on the US Brownfields database, no pertinent information is provided by these listings.

Name/Address:	West Coast Wire and Steel / 3120 Fifth Street				
Database(s):	LUST, HIST CORTESE, LUST, HIST UST				
Distance in feet:	20	**Direction:**	NNW	**Gradient:**	Down
Data Discussion:	The 1st LUST listing indicates a ñCompleted ï Case Closedò status as of 03/06/1990. MTBE was not required to be tested by the local agency. The potential contaminant of concern was identified as gasoline, which potentially affected only soil at the site. The HIST CORTESE listing provides no pertinent information. The 2nd listing identified the case type as ñSoil onlyò				

	and a facility status of closed/action completed The Historic UST listing identified two former tanks at the site, a 2,000-gallon diesel tank and a 1,000-gallon unleaded tank.
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.
VEC Discussion:	Based on the available data, a VEC is not suspected.

Name/Address:	National Orange Packing Co. / 3604 Commerce St				
Database(s):	HIST UST, EMI, HIST UST				
Distance in feet:	72	**Direction:**	WSW	**Gradient:**	Cross
Data Discussion:	One HIST UST listing identified a 560-gallon tank storing an unspecified product. The EMI listing lists that five tons of total organic hydrocarbon gases and four tons of reactive organic gases were emitted and monitoring by the South Coast AQMD in 1987. The other HIST UST listing describes the above-mentioned tank.				
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.				
VEC Discussion:	Based on the available data, a VEC is not suspected.				

Name/Address:	Tilden Coil Constructors Inc. / 3460 Commerce				
Database(s):	RCRA-SQG, FINDS				
Distance in feet:	226	**Direction:**	NNE	**Gradient:**	Cross
Data Discussion:	The RCRA-SQG lists the operation as a small quantity generator with no violations found. The FINDS database lists the business on the Resource Conservation and Recovery Act program and the US EPA Assessment, Cleanup, and Redevelopment Exchange System.				
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.				
VEC Discussion:	Based on the available data, a VEC is not suspected.				

Name/Address:	Purgero Company Unit 158 / 2622 3rd St				
Database(s):	RCRA-SQG, FINDS				
Distance in feet:	226	**Direction:**	NNE	**Gradient:**	Cross
Data Discussion:	The RCRA-SQG lists the operation as a small quantity generator with no violations found. The FINDS database lists the business on the Resource Conservation and Recovery Act program and the US EPA Assessment, Cleanup, and Redevelopment Exchange System.				
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.				
VEC Discussion:	Based on the available data, a VEC is not suspected.				

Name/Address:	Riverside Fertilizer Works / 2622 3rd Street				
Database(s):	ENVIROSTOR, AST, SEMS-Archive				
Distance in feet:	226	**Direction:**	NNE	**Gradient:**	Cross
Data Discussion:	The listing indicates a status of ñInactive ï Needs Evaluationò as of 03/06/2006. The site did not qualify for the NPL. Past use of the 1.36-acre property as retail created a potential of perchlorate contamination affecting ñother and soil mediaò. The AST listing indicated permits for 22,500 total gallons of aboveground storage at the address under the business Western Farm Service Branch. The CERCLIS listing described that the site did not qualify for the NPL but no additional pertinent details were provided.				
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.				
VEC Discussion:	Based on the available data, a VEC is not suspected.				

4.3.5 ASTM Search Distance Findings

The following is a discussion of non-adjoining sites identified as located within the ASTM specified search distance surrounding the Property. In order to keep this discussion informative and concise, discussion(s) is/are provided of the listed site(s) for each database category that appears most likely to impact the Property based on distance, area topography and/or regulatory status. Listings of sites

within the applicable search distances not specifically discussed below were reviewed and concluded not to be RECs in connection with the Property or VECs based on various factors including distance, area topography, known or inferred groundwater flow direction and/or regulatory status. Listings for the following databases, if identified, have been discussed above in Sections 4.3.3 and 4.3.4: Registered Storage Tanks, Federal RCRA Generators, Federal and State EC/IC, ERNS. A copy of the full regulatory database report, including available details of all listed sites, is included in Appendix E.

Federal NPL				**# of sites:**	1	**Search Distance:**	1-mile
Notable Listing:	Alark at 2777 Main Street						
Distance in feet:	2,921	**Direction:**	NNW	**Gradient:**	Down		
Data Discussion:	The listing indicates that the site is currently on the Final NPL. Groundwater is contaminated around the site with hexavalent chromium, the contaminant plume does not appear to extend under the current Property.						
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.						
VEC Discussion:	Based on the available data, a VEC is not suspected.						

Federal Delisted NPL				**# of sites:**	0	**Search Distance:**	1-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal SEMS				**# of sites:**	0	**Search Distance:**	İ -mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal SEMS-ARCHIVE				**# of sites:**	1	**Search Distance:**	İ -mile
Notable Listing:	See Section 4.3.4.						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:	The SEMS-Archive listing is discussed in Section 4.3.4.						
REC Discussion:							
VEC Discussion:							

Federal CORRACTS				**# of sites:**	0	**Search Distance:**	1-mile
Notable Listing:	None						
Distance in feet:		**Direction:**		**Gradient:**			
Data Discussion:							
REC Discussion:							
VEC Discussion:							

Federal RCRA-TSD		**# of sites:**	0	**Search Distance:**	İ -mile
Notable Listing:	None				

Distance in feet:		**Direction:**		**Gradient:**	
Data Discussion:					
REC Discussion:					
VEC Discussion:					

State HAZARDOUS WASTE SITE			**# of sites:**	16	**Search Distance:**	1-mile
Notable Listing:	Weiland and Company at 3491 Commerce					
Distance in feet:	168	**Direction:**	N	**Gradient:**	Down/Cross	
Data Discussion:	The listing indicates an inactive status as of 03/06/2006. No further pertinent information is provided.					
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.					
VEC Discussion:	Based on the available data, a VEC is not suspected.					

State SOLID WASTE FACILITY/LANDFILL			**# of sites:**	0	**Search Distance:**	Ì -mile
Notable Listing:	None					
Distance in feet:		**Direction:**		**Gradient:**		
Data Discussion:						
REC Discussion:						
VEC Discussion:						

State LEAKING STORAGE TANKS			**# of sites:**	27	**Search Distance:**	Ì -mile
Notable Listing:	Kenõs Arco at 2871 University Avenue					
Distance in feet:	648	**Direction:**	SSE	**Gradient:**	Up	
Data Discussion:	The listing indicates a status of ñCompleted ï Case Closedò as of 06/24/2011. Soils and groundwater, were impacted with gasoline at the site, however, only limited groundwater contamination was observed.					
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.					
VEC Discussion:	Based on the available data, a VEC is not suspected.					

State VOLUNTARY CLEANUP SITES			**# of sites:**	3	**Search Distance:**	Ì -mile
Notable Listing:	So Cal Gas/Riverside MGP at 10th Street and Howard					
Distance in feet:	1,293	**Direction:**	SSW	**Gradient:**	Cross	
Data Discussion:	The listing indicates a status of ñCertified O&M ï Land Use Restrictions Onlyò as of 07/29/2013. Soils at the site were impacted with various contaminants due to the historic usage as a manufactured gas plant.					
REC Discussion:	Based on the details provided above, a REC is not suspected in connection with the Property.					
VEC Discussion:	Based on the available data, a VEC is not suspected.					

State BROWNFIELD SITES			**# of sites:**	0	**Search Distance:**	Ì -mile
Notable Listing:						
Distance in feet:		**Direction:**		**Gradient:**		
Data Discussion:						
REC Discussion:						
VEC Discussion:						

UNMAPPED/ORPHAN LIST SITES	
	Hillmann has also reviewed a list of unmapped sites (a.k.a. ñOrphan Listò sites) indicated by the database report. Unmapped sites that were identified as falling within an applicable specific search distance or warranting discussion have either been discussed in the preceding tables or are detailed below:
Notable Listings:	None

4.4 Additional Environmental Record Sources

Requests have been submitted to local, municipal and state agencies for pertinent records pertaining to the Property, particularly with regard to potential environmental concerns such as petroleum storage tanks, storage and usage of hazardous substances and petroleum products, and/or known or suspected environmental contamination. Where applicable, internet research of government environmental regulatory databases was also conducted, as well as a general cursory internet search of the Property address, for information indicative of a REC. The following table summarizes the findings of the research:

Source	Type of Request	Outcome
CA DTSC (Envirostor)	FOI request	A response was received providing the following pertinent records: Response indicated that records were available on the HWTS database and the Envirostor database. Hillmann reviewed records on the Envirostor database on work conducted on the site since Hillmann last conducted work on the site in 2017.
Fire Prevention/Marshall	FOI request	No response was received prior to report issuance.
Building/Code Enforcement.	FOI request	A response was received providing the following pertinent records: Correspondence between planning department and developer
South Coast Air Quality Management District (SCAQMD)	FOI request	A response was received providing the following pertinent records: Records related to emissions and equipment for Riverside Scrap Metal were reviewed.

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

The site reconnaissance consisted of visual and/or physical observations of the Property and improvements, adjoining properties as viewed from the Property boundaries and the surrounding area based on visual observations from adjoining public thoroughfares. Building exteriors were observed at ground level, unless otherwise indicated. Where applicable, representative areas of building interiors were accessed and observed to the extent they were made safely accessible with the cooperation of the site escort.

Site Inspection Personnel:	Ms. Shilpa Sunil
Property Escort/Company:	Mr. Tony Thomas / Owner representative
Inspection Date:	September 20, 2021
Weather Conditions:	Sunny 80 degrees F

5.1.1 Significant Inaccessible Areas

The following significant areas of the Property were not accessed at the time of the site visit:

The interior of the structure at 3596 Commerce Street was inaccessible as the building has been sealed due to structural and safety concerns. According to Mr. Thomas, the building was a former Sunkist packaging warehouse and has been unoccupied over the years.

Hillmann observed former concrete pits that were used as scales. At the time of the assessment the pits were covered with steel plates.

5.1.2 Significant Limiting Site Conditions

No significant limiting site conditions were noted at the time of the site reconnaissance.

5.2 General Site Setting

5.2.1 Site and Vicinity Characteristics

Abutting Roadways:	Main Street to the north; East 5th Street to the west
Current Property Use:	Vacant
Evidence of Past Property Uses:	None observed.
Evidence of Past Adjoining Property Uses:	None observed.
Surrounding Area Uses:	Residential, railway, vacant lots, and industrial warehouses

5.2.2 Current Adjoining Property Uses

Dir	Street Address	Description
N	33 East 61st Street	Residential apartments, with street level restaurant
NE	540 Park Avenue	Loews Regency Hotel, parking garage, restaurants, hair salon & spa
E	38 & 40 East 61st Street	Sothebyôs International Realty, residential condominiums
S	35-39 East 61st Street	Residential apartments, with street level commercial occupancy including a nail salon and spa

No visual observations indicative of a potential environmental concern were noted on the adjoining properties.

5.2.3 Topographic Characteristics

Terrain:	Flat to gently sloping
Direction of Downward Slope:	Towards the north-northwest
On-site Water Bodies:	None observed
Other Significant Features:	None observed

5.2.4 General Description of Structures

Buildings/# of Floors	Two/ two-story warehouse, burnt down office
Approx. Building Area:	4,500 / 6,000 / 18,150
Approx. Year Built:	1900
Ancillary Structures:	None observed
Sources of Heating & Cooling:	NA
Potable Water/Sewage Disposal:	No potable water or sewer services were present at the Property.

5.3 Interior & Exterior Observations

5.3.1 Storage/Usage of Hazardous Substances and Petroleum Products

The following hazardous substances and petroleum products were observed to be stored and used by property occupants:

Occupant	Substance	Qty/Container Type	Storage Conditions
NA	No significant storage or use noted		

5.3.2 Drums

No hazardous substance or petroleum product drums were noted on the Property.

5.3.3 Unidentified Substance Containers

No unidentified substance containers suspected of containing hazardous substance or petroleum product were noted on the Property.

5.3.4 Other Hazardous Substances/Petroleum Products

No other containers of hazardous substances or petroleum products were noted on the Property.

5.3.5 Bulk Petroleum/Hazardous Material Storage Tanks

The following storage tanks for bulk petroleum or hazardous material storage were identified or reported to be present; or are suspected to be present based on visual observations:

AST/ UST	Product	Capacity	Construction	Year Installed	Status	Location/Notes
(none)						

While no visual evidence of a UST was noted, considering the history of development at the Property, the potential presence of abandoned USTs and/or associated buried piping at the Property cannot be ruled out.

5.3.6 PCBs in Oil Filled Electrical/Hydraulic Equipment

The existing site improvements were established prior to the ban of PCBs in 1979. The following oil-filled electrical/hydraulic equipment was identified at the Property:

Several pole mount utility owned transformers were observed along 5th Street, 6th Street and Mission Inn Avenue. No leaking or staining was observed in the vicinity of the transformers.

5.3.7 Odors

No strong, pungent or noxious odors were noted at the Property.

5.3.8 Pools of Liquid

No standing water or pools of liquid likely to contain hazardous substances or petroleum products were noted at the Property.

5.3.9 Interior Stains or Corrosion

Hillmann did not have access into the on-site structures to inspect for interior stains or corrosion.

5.3.10 Interior Drains/Sumps

Hillmann did not have access into the on-site structures to inspect for the presence of floor drains.

5.3.11 Exterior Pits/Ponds/Lagoons

No exterior pits, ponds or lagoons was identified on the Property in connection with waste treatment or disposal.

5.3.12 Stained Soil, Pavement/Stressed Vegetation

No stained soil, pavement or stressed vegetation was observed at the Property.

5.3.13 On-Site Solid Waste Disposal/Fill Material

The following evidence of on-site solid waste dumping/disposal was observed:

Stockpile of demolished building materials and scrap metal was observed on the 2993 Mission Inn Avenue and 2993 6th Street parcels. Trash and debris were scattered around the entirety of the Property. Several soil stockpiles were observed along 2993 6th Street and on vacant parcel 211-022-027. Mr. Thomas reported the soil stockpiles were native to the Property. No other evidence of unauthorized on-site solid waste dumping or unknown fill material was noted at the Property.

5.3.14 Waste Water

Sanitary sewage generated at the Property is discharged via a connection to the local public sewer system.

Storm water runoff at the Property is discharged off-site to local streams/drainage systems via overland flow and catch basins.

No additional waste water discharges were identified at the Property.

5.3.15 Septic Systems

No septic systems were identified at the Property.

5.3.16 Wells

No potable, monitoring or other groundwater wells were identified at the Property.

5.3.17 Railroad Spurs

The following railroad spurs were noted on the Property: Hillmann observed several rails and wood ties within the former railroad right-of-way supporting the possibility that railroad ties may be present just below the surface soil. Railroad spurs were observed on the northwest portion of the parcel-211-071-023 just below the surface soil. The former railroad spurs were used to service the

former packaging warehouse located at 3596 Commerce Street. Former railroad spurs were observed along Commerce Street. Railroad ties are known to be treated with oil-based and tar-based chemicals such as creosote, and railroad spurs are commonly treated with pesticides for weed control. The buried railroad line/spur is considered to be a REC in connection with the Property.

6.0 INTERVIEWS

6.1 Interviews with Past and Present Owners and Occupants

Subject	Name/Affiliation	Summary
Property Owner / Representative	Mr. Todd Cadwell	Mr. Cadwell completed an environmental questionnaire and was interviewed during the site inspection. Pertinent information from the interview and questionnaire, where applicable, has been referenced in various sections of this report.
Property Occupants	Mr. Tony Thomas	Property was unoccupied. Mr. Thomas was interviewed at the time of the assessment. Reported the former structures were fire damaged.
Past Owners, Occupants, Operators	Not applicable	Past owners/occupants of the Property were not available for interview at the time of the assessment.
Owners/Occupants of Adjoining or Nearby Properties	Not applicable	The Property was not an abandoned property with evidence of unauthorized uses or uncontrolled access; therefore, interviews with adjoining or nearby property owners or occupants were not conducted.

6.2 Interviews with State and/or Local Government Officials

Written and on-line requests for environmental records of the Property from State and Local governmental agencies are detailed in Section 4.4.

7.0 BUSINESS ENVIRONMENTAL RISKS

In accordance with the contract agreement for this assessment, Hillmann has performed cursory reviews of several potential Business Environmental Risks (also known as ñNon-Scope Considerationsò). The ASTM E1527-13 standard defines the term business environmental risk (BER) as, *"a risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to those environmental issues required to be investigated in this practice."*

7.1 Asbestos-Containing Material (ACM)

The contracted scope of work included a cursory visual screening of the accessed portions of buildings at the Property built prior to 1990 for suspect asbestos containing materials (ACM). The information provided in this section, where applicable, is limited to identification of potential suspect materials in the readily accessible and observed areas of the building, and their general condition. This is not intended to be a comprehensive survey for the presence of ACM, and no testing has been conducted.

Based on building age, ACM may be present, however, interiors of the structures were not available for inspection at the time of the site visit due to safety concerns.

7.2 Lead-Based Paint

The contracted scope of work included a cursory visual screening of the condition of painted surfaces in the accessed areas of residential buildings/units built prior to 1980. This is not intended to constitute a comprehensive survey for LBP or potential lead hazards, and no testing has been conducted.

No residential buildings built prior to 1980 were present at the Property.

7.3 Radon

Data compiled by the USEPA, as summarized by the regulatory database report, indicated that the Property is located in an area classified as Zone 2 or 'moderate risk' area for radon. Radon testing was not included in the scope of this assessment.

7.4 Mold/Microbial Damage

As per the contracted scope of work, Hillmann conducted a cursory visual screening of the accessed areas of the building for evidence of significant damage to building materials and finishes as result of moisture intrusion and/or mold/microbial growth.

Interiors of the structures were not available for inspection for mold/microbial damages at the time of the site visit due to safety concerns.

7.5 NWI Mapped Wetlands

As indicated in the Physical Setting Source table of Section 4.1, no NWI mapped wetlands areas were depicted at the Property by the EDR Geocheck-Physical Setting Source Addendum (attached in Appendic E).

The scope of work for this assessment excludes a visual determination of regulated wetlands at the Property. It is emphasized that, regardless of the wetlands data obtained via the EDR Geocheck-Physical Setting Source Addendum, a delineation of regulated wetlands by a qualified professional would be warranted to determine the presence or absence of regulated wetlands at the Property.

7.6 Lead in Drinking Water

The scope of work for this assessment included a review of the potential for elevated levels of lead in drinking water by determining the source of the drinking water supply and a review of available compliance or testing data.

Potable water service at the Property is provided by a utility connection with the City of Riverside Public Utilities. A recently published water quality report from the utility indicated compliance with USEPA water quality standards for lead in drinking water. A copy of the report has been attached in Appendix F.

8.0 REFERENCES

ASTM E1527-13-Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process; ASTM International, 2013

ASTM E12600-15-Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transaction, ASTM International, 2015

EDR Radius Map Report with GeoCheck™, Environmental Data Resources, 2021

EDR City Directory Abstract Report, Environmental Data Resources, 2021

EDR Sanborn Map Report, Environmental Data Resources, 2021

Methodology for Identifying the Area of Concern Around a Property Potentially Impacted by Vapor Migration from Nearby Contaminated Sources; A. Buonicore, 2011

Phase I Environmental Site Assessment, 2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, 2993 Mission Inn Avenue, Hillmann Consulting, February 29, 2016

Revised Remedial Action Plan, Riverside Scrap Iron & Metal, 2993 Sixth Street, Riverside, California 92507, DTSC Docket HAS-FY15/16-152; GSI Environmental, July 23, 2019, revised January 2, 2020

9.0 APPENDICES

Appendix A	Site Diagram / Vicinity Map
Appendix B	Site Photographs
Appendix C	Questionnaires / User Provided Information
Appendix D	Historical Records Documentation
Appendix E	Regulatory Records Documentation
Appendix F	Other Documents / Lab Results
Appendix G	Project Personnel Qualifications

APPENDIX A

MAPS / DIAGRAMS

HILLMANN CONSULTING

Figure 1: Site Vicinity Map

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue
Riverside, California

N

SCALE: (NOT TO SCALE)

PROJECT No.: C3-8655

HILLMANN CONSULTING

Figure 2: Site Diagram

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue
Riverside, California

N

SCALE: (NOT TO SCALE)

PROJECT No.: C3-8655

APPENDIX B

SITE PHOTOGRAPHS

SITE PHOTOGRAPHS

View of 2993 Mission Inn Avenue looking south

View of former building pads

View of the Property looking west

View of concrete pits - former scale with metal plates

View of the Property looking northwest

View of the building on the southeast portion of the Property

PHASE I ESA - SITE PHOTOGRAPHS

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce,
& 2993 Mission Inn Avenue,
Riverside, California

Project No.:	C3-8655

HILLMANN
CONSULTING

SITE PHOTOGRAPHS

Interior view of the building on southeast portion of the Property

View of the portion of the building collapsed due to recent fire

View of former elevator shaft

View of 3596 Commerce Street and 2993 6th Street

View of building material debris, scrap metal, and former concrete pit scale

View of canopy area to the east – 2993 6th Street parcel

PHASE I ESA - SITE PHOTOGRAPHS

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue,
Riverside, California

Project No.:	C3-8655

HILLMANN CONSULTING

SITE PHOTOGRAPHS

View of former concrete pads for former bailer and cranes on the 2993 6th Street parcel

View of remains of the former structure on the 2993 6th Street parcel

View of the northern portion of the Property

Railroad spurs to the north west side of the Property observed along parcel 211071023

View of trash dumpster

View of former packaging warehouse – 3596 Commerce Street- sealed

PHASE I ESA - SITE PHOTOGRAPHS

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue,
Riverside, California

Project No.:	C3-8655

HILLMANN CONSULTING

SITE PHOTOGRAPHS

View of the Property from the southwest corner

View of the Property from the southern corner

View of adjoining property across 4th Street

View of adjoining properties to the north west along 5th Street

View of adjoining property to the east along 6th Street

View of pole mount transformer

PHASE I ESA - SITE PHOTOGRAPHS

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce,
& 2993 Mission Inn Avenue,
Riverside, California

Project No.:	C3-8655

HILLMANN
CONSULTING

SITE PHOTOGRAPHS

View of former rail road spurs along Commerce Street

View of property looking north -211-022-027 parcel

PHASE I ESA - SITE PHOTOGRAPHS

2992, 3008 5th Street, 2993 6th Street, 3596 Commerce, & 2993 Mission Inn Avenue,
Riverside, California

Project No.:	C3-8655

HILLMANN CONSULTING

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Not Applicable.

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend:	
	Required Entries
	Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name KHR Associates | Date 8/2/2024

Designed by James H. Kawamura | Case No

Company Project Number/Name Iron Lofts

BMP Identification

BMP NAME / ID DW 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.60 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1A	*24,357*	*Ornamental Landscaping*	*0.1*	*0.11*	*2690.4*			
1B	*61,934*	*Roofs*	*1*	*0.89*	*55245.1*			
1C	*21,520*	*Concrete or Asphalt*	*1*	*0.89*	*19195.8*			
1D	*44,125*	*Concrete or Asphalt*	*1*	*0.89*	*39359.5*			
	151936	***Total***			**116490.8**	**0.60**	***5824.5***	***5,875***

Notes:

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: KHR Associates — Date: 8/2/2024

Designed by: James H. Kawamura — Case No:

Company Project Number/Name: Iron Lofts

BMP Identification

BMP NAME / ID: DW 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Rainfall Intensity (in/hr)	Design Flow Rate (cfs)	Proposed Flow Rate (cfs)
DMAs	1A	24,357	Ornamental Landscaping	0.1	0.11	2690.4			
	1B	61,934	Roofs	1	0.892	55245.1			
	1C	21,520	Concrete or Asphalt	1	0.892	19195.8			
	1D	44,125	Concrete or Asphalt	1	0.892	39359.5			
		151936	Total			116490.8	0.20	0.5	1.1

Notes:

DRYWELL & DETENTION DESIGN CALCULATIONS

Drywell #1 (Combination of DW1A, DW1B, DW1C, DW1D)

Mitigation Volume, V_{BMP}:	5,825	C.F.	From BMP Design Worksheet
Infiltration Rate, $K_{sat,measured}$:	1.60	in/hr	Test Well W-9
Factor of Safety, FS:	3		
Number of Drywells; $DW_{quantity}$:	4	each	
DW Chamber ø:	4	feet	
DW Chamber Area, DWC_{Area}:	12.57	square feet per foot	
DW Chamber Volume, DWC_{Volume}:	12.57	cubic feet per foot	
$DW_{chamber,depth}$ (from invert down):	7.45	linear feet	
DW Rock Shaft ø:	4	feet	
DW Rock Shaft Area, DWR_{Area}:	12.57	square feet per foot	
DW Rock Shaft Volume, DWR_{Volume}:	12.57	cubic feet per foot	
$DW_{rock,depth}$:	50.00	linear feet	
$DW_{infiltration,depth}$:	57.45	linear feet	
DW Bottom Area, DWB_{Area}:	12.57	square feet per foot	
T (Maximum Drawdown Time):	48	hr	
CMP Diameter (detention):	8	feet	
CMP_{Volume}:	50.2	cubic feet per foot	
CMP_{Length}:	90	linear feet	

Determine Design Infiltration Rate; $K_{sat,design}$

$K_{sat,design} = K_{sat,measured} \div FS$

$K_{sat,design}$ = 0.53 in/hr 0.000012 ft/sec

Determine Minimum Infiltration Surface Area, A_{min}

$A_{min} = (V_{BMP} \times 12\ in/ft) \div (T \times K_{sat,design})$

A_{min} = 2,730 S.F.

Determine Infiltration Surface Area, A_{actual}

$A_{actual} = (DW_{infiltration,depth} \times DWR_{Area} + DWB_{Area}) \times DW_{quantity}$

A_{actual} = 2,939 S.F.

Determine Volume of Drywell, $V_{drywell}$

$V_{drywell} = (DWC_{Volume} \times DW_{chamber,depth}) + (DWR_{Volume} \times DW_{rock,depth} \times 0.40) \times DW_{quantity}$

$V_{drywell}$ = 1,380 C.F.

Determine Volume Remaining to Detain in CMP, V_{detain}

$V_{detain} = V_{BMP} - V_{drywell}$

V_{detain} = 4,445 C.F.

Determine CMP Detention Volume, $V_{CMP,detain}$

$V_{CMP,detain} = CMP_{Volume} \times CMP_{Length}$

$V_{CMP,detain}$ = 4,495 C.F.

Determine DW & CMP Volume, V_{design}

$V_{design} = V_{CMP,detain} + V_{drywell}$

V_{design} = 5,875 C.F.

Determine Drawdown Time, T_{actual}

$T_{actual} = (V_{design} \times 12\ in/ft) \div (A_{actual} \times K_{sat,design})$

T_{actual} = 44.98 hr

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: KHR Associates — Date: 8/2/2024

Designed by: James H. Kawamura — Case No:

Company Project Number/Name: Iron Lofts

BMP Identification

BMP NAME / ID: DW 2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.60 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Storm Depth (in)	Design Capture Volume, V_{BMP} (cubic feet)	Proposed Volume on Plans (cubic feet)
2A	20,932	Ornamental Landscaping	0.1	0.11	2312.1			
2B	70,323	Roofs	1	0.89	62728.1			
2C	13,732	Concrete or Asphalt	1	0.89	12248.9			
2D	45,214	Concrete or Asphalt	1	0.89	40330.9			
	150201	Total			117620	0.60	5881	5,909

Notes:

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: KHR Associates — Date: 8/2/2024

Designed by: James H. Kawamura — Case No:

Company Project Number/Name: Iron Lofts

BMP Identification

BMP NAME / ID: DW 2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Rainfall Intensity (in/hr)	Design Flow Rate (cfs)	Proposed Flow Rate (cfs)
DMAs	2A	20,932	Ornamental Landscaping	0.1	0.11	2312.1			
	2B	70,323	Roofs	1	0.892	62728.1			
	2C	13,732	Concrete or Asphalt	1	0.892	12248.9			
	2D	45,214	Concrete or Asphalt	1	0.892	40330.9			
		150201	Total			117620	0.20	0.5	1.1

Notes:

DRYWELL & DETENTION DESIGN CALCULATIONS

Drywell #2 (Combination of DW2A, DW2B, DW2C, DW2D)

Mitigation Volume, V_{BMP}:	5,881	C.F.	From BMP Design Worksheet
Infiltration Rate, $K_{sat,measured}$:	1.60	in/hr	Test Well W-10
Factor of Safety, FS:	3		
Number of Drywells; $DW_{quantity}$:	4	each	
DW Chamber ø:	4	feet	
DW Chamber Area, DWC_{Area}:	12.57	square feet per foot	
DW Chamber Volume, DWC_{Volume}:	12.57	cubic feet per foot	
$DW_{chamber,depth}$ (from invert down):	9.78	linear feet	
DW Rock Shaft ø:	4	feet	
DW Rock Shaft Area, DWR_{Area}:	12.57	square feet per foot	
DW Rock Shaft Volume, DWR_{Volume}:	12.57	cubic feet per foot	
$DW_{rock,depth}$:	50.00	linear feet	
$DW_{infiltration,depth}$:	59.78	linear feet	
DW Bottom Area, DWB_{Area}:	12.57	square feet per foot	
T (Maximum Drawdown Time):	48	hr	
CMP Diameter (detention):	6	feet	
CMP_{Volume}:	28.2	cubic feet per foot	
CMP_{Length}:	156	linear feet	

Determine Design Infiltration Rate; $K_{sat,design}$

$K_{sat,design} = K_{sat,measured} \div FS$

$K_{sat,design}$ = 0.53 in/hr 0.000012 ft/sec

Determine Minimum Infiltration Surface Area, A_{min}

$A_{min} = (V_{BMP} \times 12\ in/ft) \div (T \times K_{sat,design})$

A_{min} = 2,757 S.F.

Determine Infiltration Surface Area, A_{actual}

$A_{actual} = (DW_{infiltration,depth} \times DWR_{Area} + DWB_{Area}) \times DW_{quantity}$

A_{actual} = 3,056 S.F.

Determine Volume of Drywell, $V_{drywell}$

$V_{drywell} = (DWC_{Volume} \times DW_{chamber,depth}) + (DWR_{Volume} \times DW_{rock,depth} \times 0.40) \times DW_{quantity}$

$V_{drywell}$ = 1,497 C.F.

Determine Volume Remaining to Detain in CMP, V_{detain}

$V_{detain} = V_{BMP} - V_{drywell}$

V_{detain} = 4,384 C.F.

Determine CMP Detention Volume, $V_{CMP,detain}$

$V_{CMP,detain} = CMP_{Volume} \times CMP_{Length}$

$V_{CMP,detain}$ = 4,412 C.F.

Determine DW & CMP Volume, V_{design}

$V_{design} = V_{CMP,detain} + V_{drywell}$

V_{design} = 5,909 C.F.

Determine Drawdown Time, T_{actual}

$T_{actual} = (V_{design} \times 12\ in/ft) \div (A_{actual} \times K_{sat,design})$

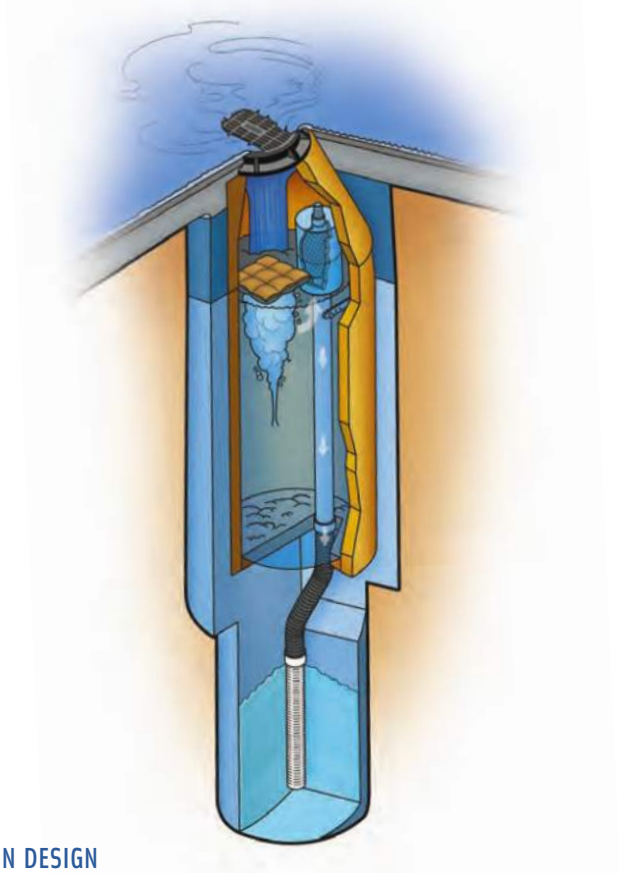
T_{actual} = 43.51 hr

MaxWell® IV DRAINAGE SYSTEM

Product Information and Design Features

TORRENT® RESOURCES

The ***MaxWell® IV,*** as manufactured and installed exclusively by Torrent Resources Incorporated, is the industry standard for draining landscaped developments and paved areas. This patented system incorporates the latest refinements in pre-treatment technology.



PROVEN DESIGN

Since 1974, nearly 65,000 MaxWell® Systems have proven their value as a cost-effective solution in a wide variety of drainage applications. They are accepted by state and municipal agencies and are a standard detail in numerous drainage manuals.

ADVANCED PRE-TREATMENT

Industry research, together with Torrent Resources' own experience, have shown that initial storm drainage flows have the greatest impact on system performance. This "first flush" occurs during the first few minutes of runoff, and carries the majority of sediment and debris. This results in the need for effective processing of runoff from landscaped and paved surfaces. In the ***MaxWell® IV,*** preliminary treatment is provided through collection and separation in a deep, large-volume chamber where silt and other heavy particles settle to the bottom. The standard MaxWell IV System has over 1,500 gallons of capacity to contain sediment and debris carried by incoming water. Floating trash, paper, pavement oil, etc. are effectively stopped by the **PureFlo®** Debris Shield on top of the overflow pipe. Water is drained from the system by rising up to the top of the overflow pipe and under the Debris Shield. The solid metal shields are equipped with an internal screen to filter suspended matter and are vented to prevent siphoning of floating surface debris. The drainage assembly returns the cleaned water into the surrounding soil through the **FloFast®** Drainage Screen.

ABSORBENT TECHNOLOGY

The MaxWell IV settling chamber is equipped with an absorbent sponge to provide prompt removal of pavement oils. These floating pillow-like devices are 100% water repellent and literally wick petrochemical compounds from the water. Each sponge has a capacity of up to 128 ounces to accommodate effective, long-term treatment. The absorbent is completely inert and will safely remove runoff constituents down to rainbow sheens that are typically no more than one molecule thick.

SECURITY FEATURES

MaxWell IV Systems include bolted, theft-deterrent, cast iron gratings and covers as standard security features. Special inset castings that are resistant to loosening from accidental impact are available for use in landscaped applications. Machined mating surfaces and "Storm Water Only" wording are standard.

THE MAXWELL FIVE-YEAR WARRANTY

Innovative engineering, quality materials and exacting construction are standard with every MaxWell System designed, manufactured and installed by Torrent Resources Incorporated. The MaxWell Drainage System Warranty is the best in the industry and guarantees against failures due to workmanship or materials for a period of five years from date of completion.

Manufactured and Installed Exclusively by Torrent Resources Incorporated

Please see reverse side for additional information

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