HISTORICAL/ARCHAEOLOGICAL RESOURCES SURVEY REPORT

CENTER STREET COMMERCE BUILDING PROJECT

APNs 246-040-027, 246-040-028, 246-070-002, and 246-070-017
City of Riverside, Riverside County, California

For Submittal to:

Planning Division
Community Development Department
City of Riverside
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Riverside, CA 92522

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June 15, 2015
CRM TECH Contract No. 2901

Title: Historical/Archaeological Resources Survey Report: Center Street Commerce Building Project, APNs 246-040-027, 246-040-028, 246-070-002, and 246-070-017, City of Riverside, Riverside County, California

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USGS Quadrangle: San Bernardino South, Calif., 7.5' quadrangle; T2S R5W, San Bernardino Baseline and Meridian; within the Rancho Jurupa (Stearns) land grant

Project Size: Approximately 15.63 acres

Keywords: Northeast Riverside; Phase I cultural resources survey; 3667 Placentia Lane; Site 33-006973; circa 1920s Spanish Eclectic-style single-family residence with a secondary residence, garage, metal barn, wooden shed, and animal hutch; no "historical resources" under CEQA provisions

MANAGEMENT SUMMARY

In March and April 2015, at the request of MIG/Hogle-Ireland, CRM TECH performed a cultural resources study on approximately 15.63 acres of mostly undeveloped land in the northeastern portion of the City of Riverside, Riverside County, California. The subject property of the study consists of Assessor's Parcel Nos. 246-040-027, 246-040-028, 246-070-002, and 246-070-017, located to the west of Orange Street and between Placentia Lane and Center Street, in a portion of the Rancho Jurupa (Stearns) land grant lying within T2S R5W, San Bernardino Baseline and Meridian.

The study is part of the environmental review process for the proposed construction of a 308,000-square-foot commercial building on the property, which will require the removal of all existing buildings and structures. The City of Riverside, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA) and the City's Cultural Resources Ordinance. The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any "historical resources," as defined by CEQA, that may exist in or around the project area. In order to identify such resources, CRM TECH conducted a cultural resources records search, pursued historical background research, contacted Native American representatives, and carried out a systematic field survey.

The results of these research procedures indicate that 33-006973, a previous recorded historic-period site in the California Historical Resources Inventory, is located within the project area. The site was first recorded in 1982 as a circa 1920s Spanish Eclectic-style single-family residence located at 3667 Placentia Lane. During this study, Site 33-006973 was expanded to include five other associated buildings. The site does not appear to meet any of the criteria for listing in the National Register of Historic Places or the California Register of Historical Resources, nor for local designation by the City of Riverside. Therefore, Site 33-006973 does not meet CEQA's definition of a "historical resource."

No other potential "historical resources" were encountered during the course of this study. Based on these findings, CRM TECH recommends to the City of Riverside a determination of *No Impact* regarding cultural resources. No further cultural resources investigation is recommended for the project unless development plans undergo such changes as to include areas not covered by this study. However, if buried cultural materials are encountered during earth-moving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

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INTRODUCTION

In March and April 2015, at the request of MIG/Hogle-Ireland, CRM TECH performed a cultural resources study on approximately 15.63 acres of mostly undeveloped land in the northeastern portion of the City of Riverside, Riverside County, California (Fig. 1). The subject property of the study consists of Assessor's Parcel Nos. (APN) 246-040-027, 246-040-028, 246-070-002, and 246-070-017, located to the west of Orange Street and between Placentia Lane and Center Street, in a portion of the Rancho Jurupa (Stearns) land grant lying within T2S R5W, San Bernardino Baseline and Meridian (Fig. 2).

The study is part of the environmental review process for the proposed construction of a 308,000-square-foot commercial building on the property (Fig. 3), which will require the removal of all existing buildings and structures. The City of Riverside, as the lead agency for the project, required the study in compliance with the California Environmental Quality Act (CEQA; PRC §21000, et seq.) and the City's Cultural Resources Ordinance (Title 20, Riverside Municipal Code). The purpose of the study is to provide the City with the necessary information and analysis to determine whether the proposed project would cause substantial adverse changes to any "historical resources," as defined by CEQA, that may exist in or around the project area.

In order to identify such resources, CRM TECH conducted a cultural resources records search, pursued historical background research, contacted Native American representatives, and carried out a systematic field survey. The following report is a complete account of the methods, results, and final conclusion of the study.

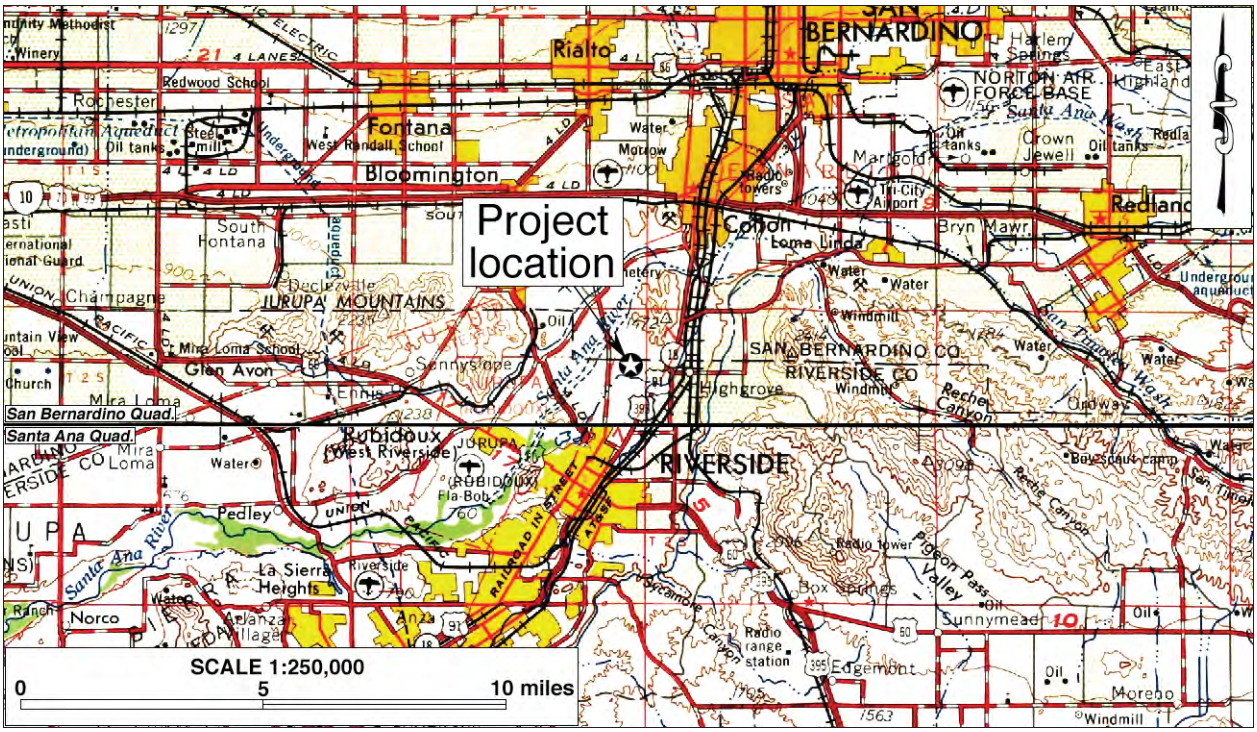


Figure 1. Project vicinity. (Based on USGS San Bernardino and Santa Ana, Calif., 1:250,000 quadrangles [USGS 1969; 1979])

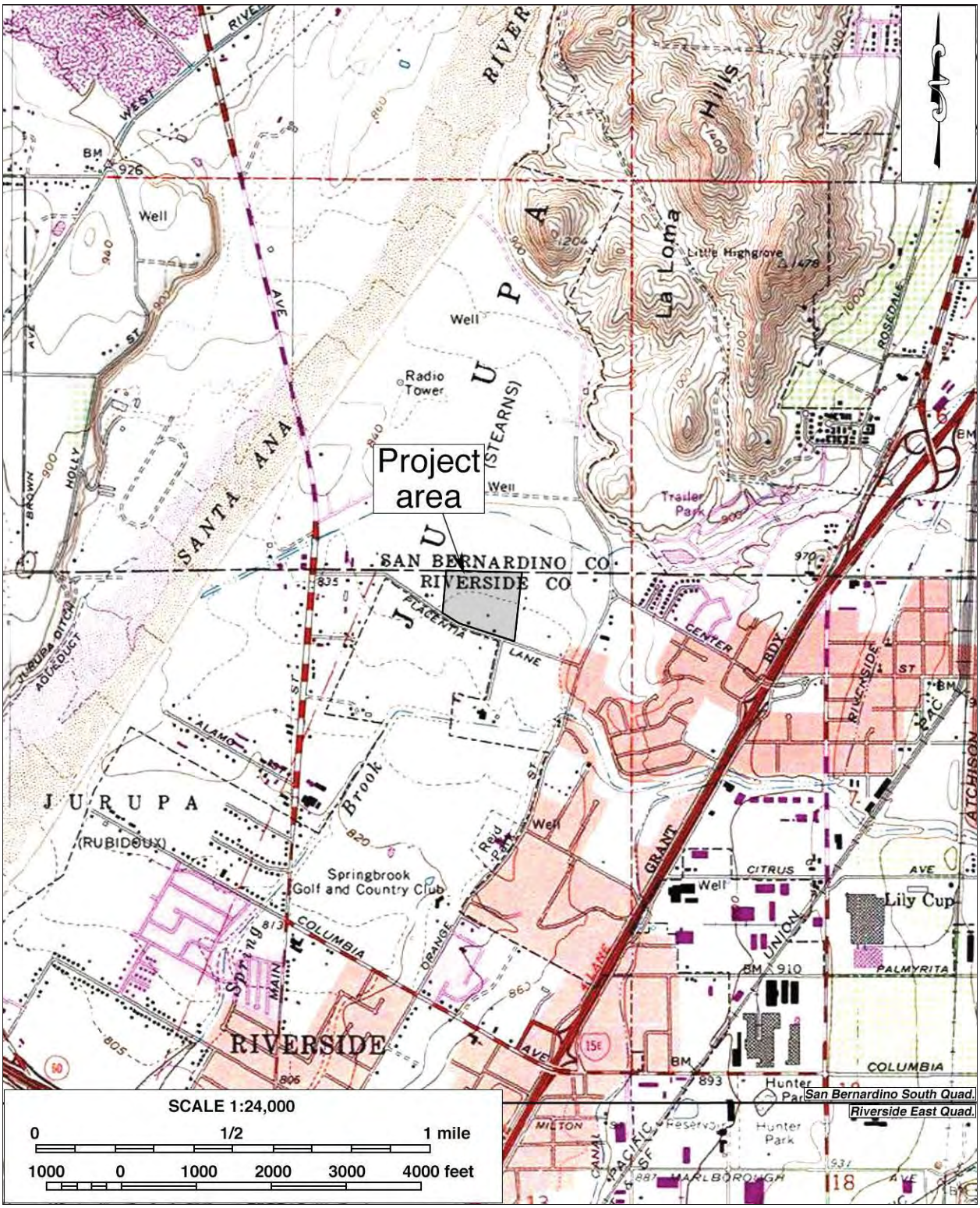


Figure 2. Project location. (Based on USGS Riverside East and San Bernardino South, Calif., 1:24,000 quadrangles [USGS 1980a; 1980b])

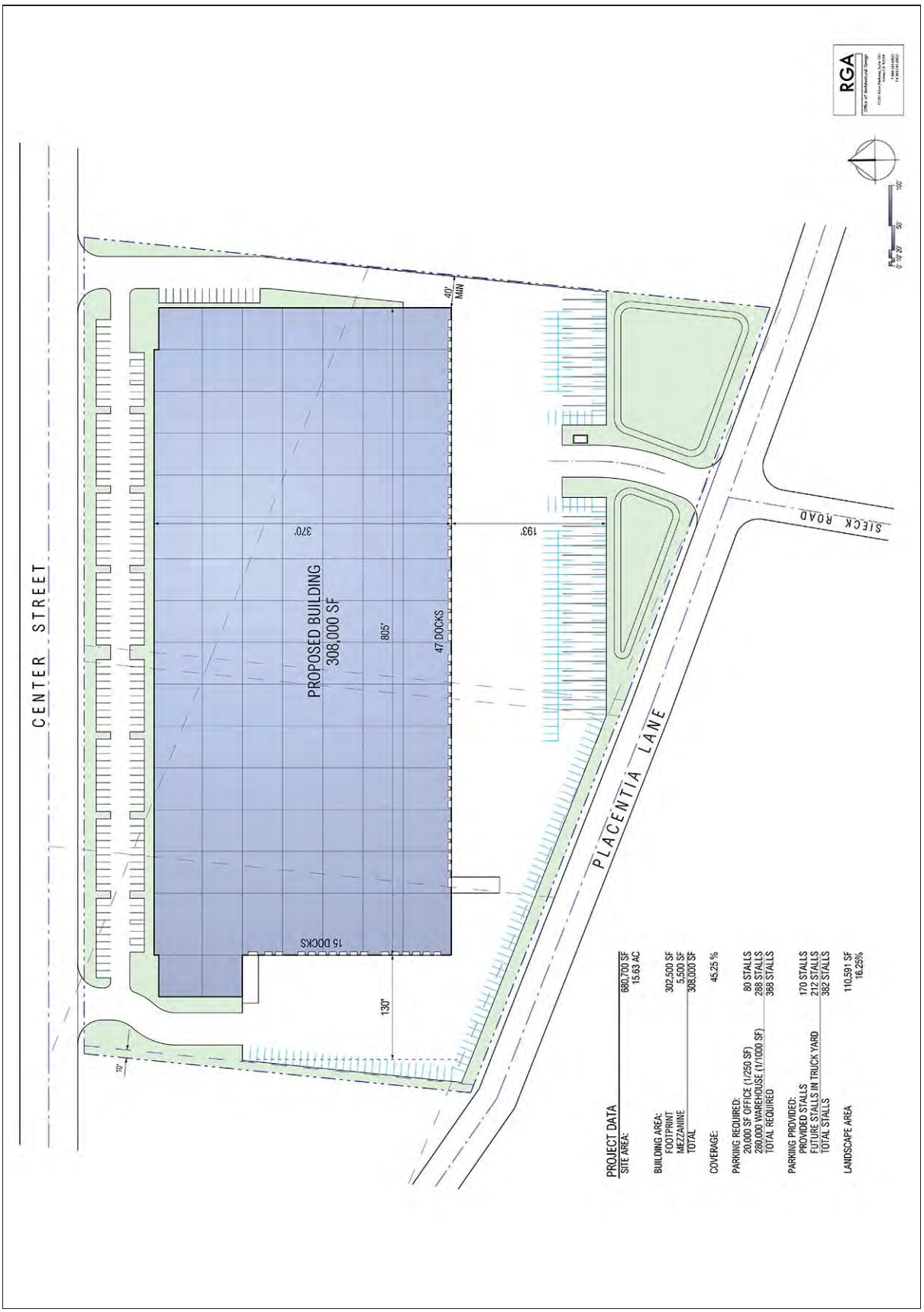


Figure 3. Project site plan.

SETTING

CURRENT NATURAL SETTING

The City of Riverside is situated within the Transverse Ranges geomorphic province, which features broad inland valleys separated by groups of rolling hills and rocky knolls. The province is surrounded by the Santa Ana Mountains on the southwest, the San Jacinto Mountains on the southeast, and the convergence of the San Gabriel and San Bernardino Mountain Ranges on the north. The prevailing Mediterranean climate is characterized by hot, dry summers and mild, wet winters.

The project is situated in a rural area on the northern edge of the city and in close proximity to the unincorporated community of Highgrove, bounded by Center Street on the north and Placentia Lane on the south. Adjacent land uses include a towing yard on the east, a materials storage yard on the north, a pumping station and a sports park on the south, and large stretches of vacant land on the west and the south. Several dilapidated structures are present on the southeast portion of the property, including two residences, a garage, a large metal barn, a small wooden shed, and a partially collapsed animal hutch. The terrain is relatively level, with elevations ranging around 830-850 feet above mean sea level. Vegetation observed in the vicinity consisted of foxtails, sycamores, pepper trees, tumbleweeds, and small grasses and brush (Fig. 4).

CULTURAL SETTING

Prehistoric Context

It is widely acknowledged that human occupation in what is now the State of California began 8,000-12,000 years ago. In attempting to describe and understand the cultural processes that occurred in the ensuing years, archaeologists have developed chronological frameworks that endeavor to correlate the technological and cultural changes that are observable in archaeological records to distinct time periods. Unfortunately, none of these chronological frameworks has been widely accepted, and none has been developed specifically for the Inland Empire region, the nearest ones being for the Colorado Desert and Peninsular Ranges area (Warren 1984) and for the Mojave Desert (Warren and Crabtree 1986).

Figure 4. Overview of the project area, view to the south *(left)* and to the west (*right)*. (Photographs taken on March 12, 2015)

The development of an overall chronological framework for the region is hindered by the lack of distinct stratigraphic layers of cultural sequences that could be dated by absolute dating methods to provide reliable dates. Since results from archaeological investigations in this region have yet to be synthesized into an overall chronological framework, most archaeologists tend to follow a chronology adapted from a scheme developed by William J. Wallace in 1955 and modified by others (Wallace 1955; 1978; Warren 1968; Chartkoff and Chartkoff 1984; Moratto 1984). Although the beginning and ending dates of the different horizons or periods may vary, the general framework of prehistory in this region under this chronology consists of the following four periods:

- Early Hunting Stage (ca. 10000 BC-6000 BC), which was characterized by human reliance on big game animals, as evidenced by large, archaic-style projectile points and the relative lack of plant-processing artifacts;
- Millingstone Horizon (ca. 6000 BC-1000 AD), when plant foods and small game animals came to the forefront of subsistence strategy, and from which a large number of millingstones, especially well-made, deep-basin metates, were left;
- Late Prehistoric Period (ca. 1000-1500 AD), during which a more complex social organization, a more diversified subsistence base—as evidenced by smaller projectile points, expedient millingstones and, later, pottery—and regional cultures and tribal territories began to develop;
- Protohistoric Period (ca. 1500-1700s AD), which ushered in long-distance contact with Europeans, and thereby led to the Historic Period.

Ethnohistoric Context

The City of Riverside lies in an area where, at least during the Late Prehistoric and Protohistoric periods, the traditional territories of three Native American groups overlap: the Serrano of the San Bernardino Mountains, the Luiseño of the Perris-Elsinore region, and the Gabrielino of the San Gabriel Valley. Kroeber (1925:Plate 57) suggests that the Native Americans of the Riverside area were probably Luiseño, Reid (1968:8-9) states that they were Serrano, and Strong (1929:7-9, 275) claims that they were Gabrielino. In any case, there also occurred a late influx of Cahuilla during the 19th century (Bean 1978).

Whatever the linguistic affiliation, Native Americans in the Riverside area exhibited similar social organization and resource procurement strategies. Villages were based on clan or lineage groups. Their home/base sites are marked by midden deposits, often with bedrock mortar features. During their seasonal rounds to exploit plant resources, small groups would migrate within their traditional territory in search of specific plants and animals. Their gathering strategies often left behind signs of special use sites, usually grinding slicks on bedrock boulders, at the locations of the resources.

Historic Context

The present-day Riverside area received its first European visitors during the early and mid-1770s, shortly after the beginning of Spanish colonization of Alta California in 1769. After the establishment of Mission San Gabriel in 1771, the area became one of the mission's principal *rancherías*, known at the time as Jurupa. Despite these early contacts, no Europeans are known to have settled in the area until after the creation of the Rancho Jurupa land grant in 1838, during secularization of the mission system.

The land grant, which encompassed what is now the northern portion of the City of Riverside, including the project area, was awarded to Juan Bandini, who served as the administrator of Mission San Gabriel and all its lands at the time. Within a few years, Bandini divided his vast domain into two parts and sold them to two prominent Yankee-turned-*ranchéros*. As a result, after the annexation of Alta California by the United States in 1848, the original land grant was confirmed as two separate entities, the 6,750-acre Rancho Jurupa (Rubidoux) and the 25,519-acre Rancho Jurupa (Stearns). As mentioned above, the project area lies within the boundaries of Rancho Jurupa (Stearns).

The town of Riverside was founded in 1870 on portions of both Rancho Jurupa (Rubidoux) and Rancho Jurupa (Stearns), and incorporated as a city in 1883. Highgrove was initially conceived as Riverside Heights during the mid-1880s, but later became known by a host of other short-lived names, including Merrill, Citrus, and East Riverside, before the current name was finally adopted in 1897. Both communities owe much of their early growth to the successful introduction of the naval orange in Riverside in the mid-1870s, which quickly turned citrus fruits into the leading staple crop in southern California and propelled Riverside to the forefront of the citrus industry.

Historically, the project area is part of La Placita de los Trujillos ("the little village of the Trujillos"), the earliest community in what is now Riverside County. The village was founded in 1845 when a group of hispanicized Indian families from New Mexico, led by Lorenzo Trujillo, settled on land donated by Juan Bandini in exchange of protection from hostile Indian raiders. Later, La Placita and Agua Mansa, its twin community founded in 1846 on the opposite side of the Santa Ana River, became known collectively as San Salvador, after the name of the local Catholic parish, but were more commonly referred to by Anglo-American settlers' as Spanishtown. In 1862, both villages were destroyed by flood, and were subsequently rebuilt on higher ground.

By 1893, the young city of Riverside had grown into enough of a local political force to split itself from San Bernardino County, bringing the southern portions of Highgrove and La Placita into the newly created Riverside County. For much of the century since then, Highgrove has maintained its citrus-dominated economy and life-style on the rural periphery of the gradually urbanizing Riverside. La Placita, in the meantime, all but disappeared as a distinctive community, as its residents gradually moved away and its land eventually consolidated into a few larger ranches. During the recent decades, the forces of urbanization have irreversibly begun to transform the landscape in the vicinity of the project area, much as elsewhere throughout southern California.

RESEARCH METHODS

RECORDS SEARCH

On March 5 and 6, 2015, CRM TECH archaeologist Nina Gallardo (see App. 1 for qualifications) completed the records search at the Eastern Information Center (EIC), University of California, Riverside, and the Archaeological Information Center(AIC), San Bernardino County Museum, Redlands. The EIC and the AIC are the State of California's official repositories of cultural resources records for the Counties of Riverside and San Bernardino, respectively, and the dual-county records search was necessitated by the project location adjacent to the county line.

During the records search, Gallardo examined maps and records on file at the EIC and the AIC for previously identified cultural resources in or near the project area and existing cultural resources reports pertaining to the vicinity. Previously identified cultural resources include properties designated as California Historical Landmarks, Points of Historical Interest, Riverside or San Bernardino County Landmarks, as well as those listed in the National Register of Historic Places, the California Register of Historical Resources, or the California Historical Resources Inventory.

NATIVE AMERICAN PARTICIPATION

On March 5, 2015, CRM TECH submitted a written request to the State of California's Native American Heritage Commission for a records search in the commission's sacred lands file. Following the commission's recommendations, on March 18 CRM TECH further contacted a total of 26 tribal representatives in the region in writing to solicit local Native American input regarding any potential cultural resources concerns over the proposed project. The correspondences between CRM TECH and the Native American representatives are attached to this report in Appendix 2.

HISTORICAL RESEARCH

Historical background research for this study was conducted by CRM TECH historian/architectural historian Terri Jacquemain (see App. 1 for qualifications) on the basis of published literature in local and regional history and historic maps of the Riverside area. Among maps consulted for this study were the U.S. General Land Office's (GLO) land survey plat map dated 1873-1886 and the U.S. Geological Survey's (USGS) topographic maps dated 1901-1980. These maps are collected at the Science Library of the University of California, Riverside, and the California Desert District of the U.S. Bureau of Land Management, located in Moreno Valley.

After the identification of historic-era buildings in the project area, Jacquemain pursued more specific and in-depth research on the history of these buildings. Sources consulted during this phase of the research included primarily the archival records of the County of Riverside and the City of Riverside, particularly property tax assessment records, building safety records, cultural resources records maintained by the City, along with materials on file at the local history section of the Riverside Public Library, Central Branch.

FIELD SURVEY

On March 12, 2015, CRM TECH archaeologist Daniel Ballester (see App. 1 for qualifications) carried out the archaeological field survey of the project area. Most of the survey was completed at an intensive level by walking parallel north-south and east-west transects spaced 15 meters (approx. 50 feet) apart wherever possible. Areas of exceptionally dense vegetation were spot-checked. In this way, the ground surface in the project area was carefully examined for any evidence of human activities dating to the prehistoric or historic period (i.e., 45 years or older). Ground visibility was poor (0-50%) at the time of the survey due to dense vegetation growth on most of the property.

On March 30, Terri Jacquemain conducted a field inspection of all existing buildings in the project area and performed field recordation procedures on those that appeared to be more than 45 years old and retained at least a recognizable level of historical characteristics. In order to facilitate the proper

recordation and evaluation of the historic-period buildings, Jacquemain made detailed notations and preliminary photo-documentation of their structural and architectural characteristics and current conditions. The resulting field data were then compiled into the appropriate site record forms and submitted to the EIC for inclusion in the California Historical Resources Inventory.

RESULTS AND FINDINGS

RECORDS SEARCH

According to EIC and AIC records, the project area had not been surveyed systematically for cultural resources prior to this study, but was included in the scope of a large-scale archaeological sensitivity assessment in 2003. Based on background research and a reconnaissance-level field survey, that study concluded that undeveloped or sparsely developed land in the project vicinity–i.e., along the Santa Ana River–should be considered sensitive for archaeological resources from both the prehistoric and the historic periods (Doan et al. 2003:17).

Outside the project boundaries but within a one-mile radius, AIC and EIC records show more than 40 other previous studies covering various tracts of land and linear features. As a result of these and other similar studies in the vicinity, 7 prehistoric sites, 27 historic-period sites, 3 "pending" sites, and 5 isolates–i.e, localities with fewer than three artifacts–were previously identified within the scope of the records search. One of the historic-period sites, designated 33-006973, represents a residence at 3667 Placentia Lane, which is located within the project area on APN 246-070-002. Described as being "typical of smaller houses in the Mediterranean/Spanish Revival style," the residence was recorded in 1982 during a countywide cultural resources reconnaissance sponsored by the Riverside County Historical Commission (Newman 1982).

All of the prehistoric sites recorded within the one-mile radius consisted of bedrock-milling features clustered around the La Loma Hills, to the northeast of the project location. The historic-period sites, including the "pending" sites, comprised single-family residences, irrigation canals, wells, and refuse scatters. Of the five isolates, three were prehistoric groundstone artifacts and two were historic-period refuse items. Site 33-006973 will be discussed further below. None the other recorded cultural resources was located within or adjacent to the project area, and thus none of them requires further consideration during this study.

NATIVE AMERICAN PARTICIPATION

In response to CRM TECH's inquiry, the Native American Heritage Commission reports in a letter dated March 17, 2015, that the sacred lands record search identified no Native American cultural resources within the project area, but recommends that local Native American groups be contacted for further information. For that purpose, the commission provided a list of potential contacts in the region (see App. 2).

Upon receiving the NAHC's response, CRM TECH sent written requests for comments to all 23 individuals on the referral list and the organizations they represent (see App. 2). In addition, as referred by these tribal representatives or appropriate tribal government staff, the following individuals were also contacted:

- Rob Roy, Environmental Director, La Jolla Band of Luiseño Indians;
- Raymond Huaute, Cultural Resource Specialist, Morongo Band of Mission Indians;
- Jim McPherson, Manager, Culture Resources Department of the Rincon Band of Luiseño Indians.

As of this time, three of the tribal representatives contacted have provided written responses (see App. 2). In a letter dated March 23, 2015, Raymond Huaute states that the tribe is not aware of any cultural resources within the project boundaries, but requests the implementation of the tribe's "Standard Development Conditions" to ensure proper treatment of Native American cultural remains, including human remains, encountered during the project (see App. 2).

Shasta Gaughen, Tribal Historic Preservation Officer for the Pala Band of Mission Indians and Assistant Director of the Kupa Cultural Center, states in a letter dated March 25 that the Pala Band will defer to other tribes in closer proximity to the project area. Responding on behalf of the Pauma Band of Luiseño Indians by e-mail on March 31, Tribal Cultural Clerk Chris Devers states that the Pauma Band has no specific information on any cultural in the project vicinity, but recommends archaeological and Native American monitoring of all ground-disturbing activities during the project (see App. 2).

HISTORICAL RESEARCH

As mentioned above, La Placita de Los Trujillos, the community that the project location is traditionally considered a part of, was established in 1845, destroyed by flood in 1862, and subsequently rebuilt on higher ground. The re-born village of La Placita extended across both sides of the line between San Bernardino and Riverside Counties when the latter county was created in 1893 (Gunther 1984:285). In the 1890s, a total of 19 houses were known to be in the Riverside County portion of the village, mostly to the east of the project area and scattered along present-day Orange Street (County Assessor 1892-1895; Fig. 5). By 1905, however, the Spanish-speaking community of La Placita had lost much of its separate community character (Patterson 1996:357).

Archival records of the Riverside County Assessor's Office reveal that building first occurred in the project area around 1912, when owner Henry Camp was assessed $50 for improvements on APN 246-070-002, the only parcel in the project to have been taxed for improvement value (see Table 1). Newman (1982:1) estimates that the main residence on that parcel (Site 33-006973) was built in 1922, but a significant increase in improvement value between 1924 and 1926 suggests a more likely construction date in the mid-1920s, when the parcel was under the ownership of C.G. Martini (County Assessor 1921-1926). In any case, two buildings were known to be present at the location of Site 33-006973 on the north side of Placentia Lane by the mid-1930s, when Martha Milford was listed as the property owner (Fig. 6; Table 1).

Neither Martini nor Milford appears to have resided at this location, according to local directories. In fact, of the owners listed in Table 1, only three were found in local directories, namely Densmore, Field, and Martini, and among these only Densmore was listed as a resident at this address (Directory 1915-1926). The density of development in the La Placita area gradually increased during the ensuing decades, but despite being annexed by the City of Riverside in 1990, the rural character of the project vicinity has remained largely changed to the present time (Figs. 2, 7, 8).

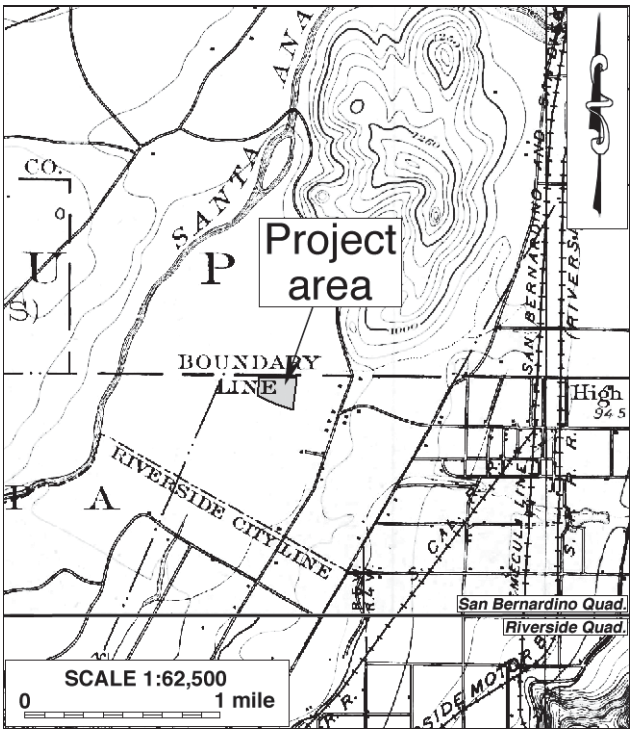


Figure 5. The project area and vicinity in 1893-1897. (Source: USGS 1901a; 1901b)

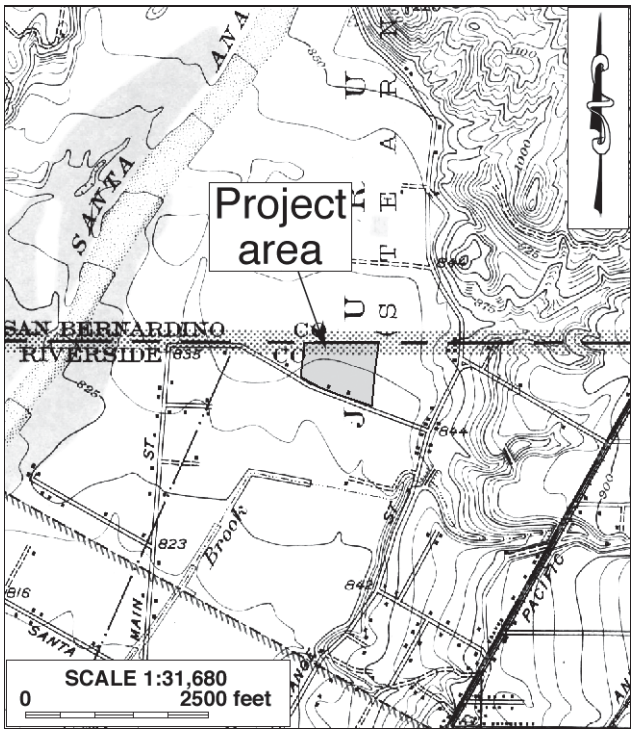


Figure 6. The project area and vicinity in 1936-1938. (Source: USGS 1943)

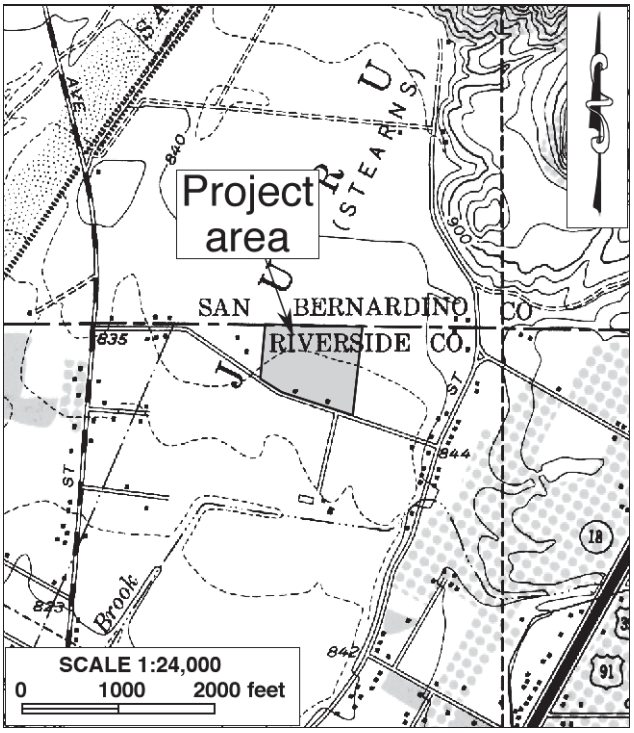


Figure 7. The project area and vicinity in 1952-1954. (Source: USGS 1954)

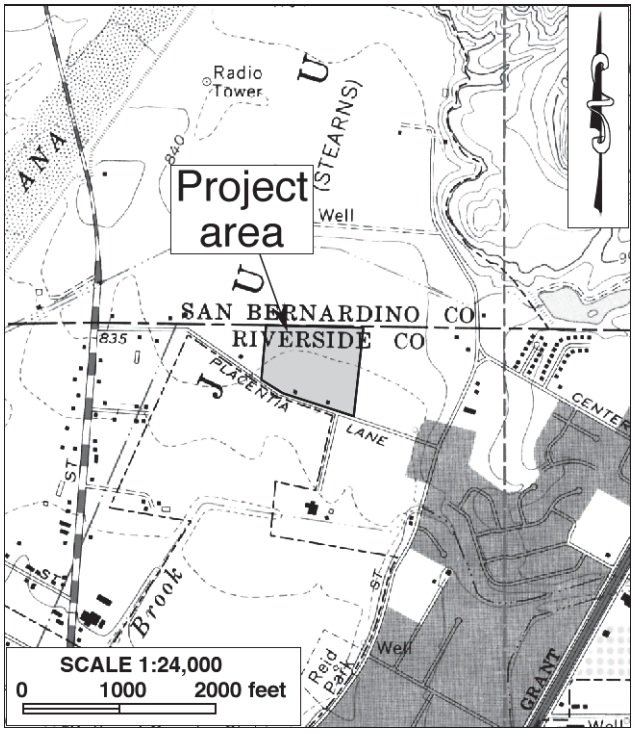


Figure 8. The project area and vicinity in 1966-1967. (Source: USGS 1967)

Table 1. Real Property Tax Assessment History for APN 246-070-002*			
Year	**Owner**	**Value of Land**	**Value of Improvements**
1907	Luz Atencio Trujillo	$90	$0
1908	J.C. Merritt	$90	$0
1909	Henry J. Camp	$90	$0
1910	Henry J. Camp	$120	$0
1911	Henry J. Camp	$120	$0
1912-1914	Henry J. Camp	$360	$50
1915	C.S. Densmore	$360	$50
1916	Nettie R. Stratten	$360	$50
1917-1920	Myrtle A. Field	$360	$80
1920	Roy P. Storie	$360	$80
1921-1922	Jose Palmerie (?)	$360	$80
1923	Robert J. McArthur	$360	$80
1924-1926	C.G. Martini	$360	$130-$660
1927-1928	David Forrest	$200	$660
1929	F.J. Tacharner	$280	$660
1930	J.P. Ramsey	$250	$660
1931	J.L. Dodson and L.I. Meyer	$250	$600.
1932-1944	Martha C. Milford	$200	$450-$660
1945	George J. and Irene Morgenstern	$300	$720
1946-1949	George J. Morgenstern and Cornelia A. Hill	$300	$1190-$1200-$2060
1950-1961	Robert J. Hanchett	$720	$2060-$2310

*Source: Riverside County Assessor's real property tax assessment records

FIELD SURVEY

The field survey of the project area confirmed that the building previously recorded as Site 33-006973, a 1920s-era Spanish Eclectic-style single-family residence, remains in existence in the project area at 3667 Placentia Lane. In 1982, Newman (1982:1) offered the following description of the residence:

> Sitting in the middle of farmland is this flat-roofed Mediterranean/Spanish Revival style house in fair condition. Two rooms in the front of the house project forward, each covered with a gable roof. The roofing is of red tiles. Arched windows enhance the appearance of this house.

Newman (1982:2) further noted that the residence had undergone major alterations and that it was accompanied by at least one shed. During the current field survey, this one-story stucco building was found to be suffering the effects of neglect, including boarded windows, crumbling stucco and concrete, missing roof tiles, and evidence of efflorescence stemming from rainwater runoff (Fig. 9). It is no longer occupied.

Located behind the main residence were a garage of the same design and constructed of similar materials, along with a secondary residence (Fig. 9). The secondary residence is a wood-framed, single-story building of vernacular character, featuring stucco walls, steel-framed windows, and a medium-pitched front-gable roof sheathed with composition sheet. This building appears to remain occupied. Three ancillary buildings are located to the west of the two residences and the garage, including a large metal barn, a small wooden shed, and a partially collapsed animal hutch (Fig. 9). All of the buildings are in a dilapidated condition.

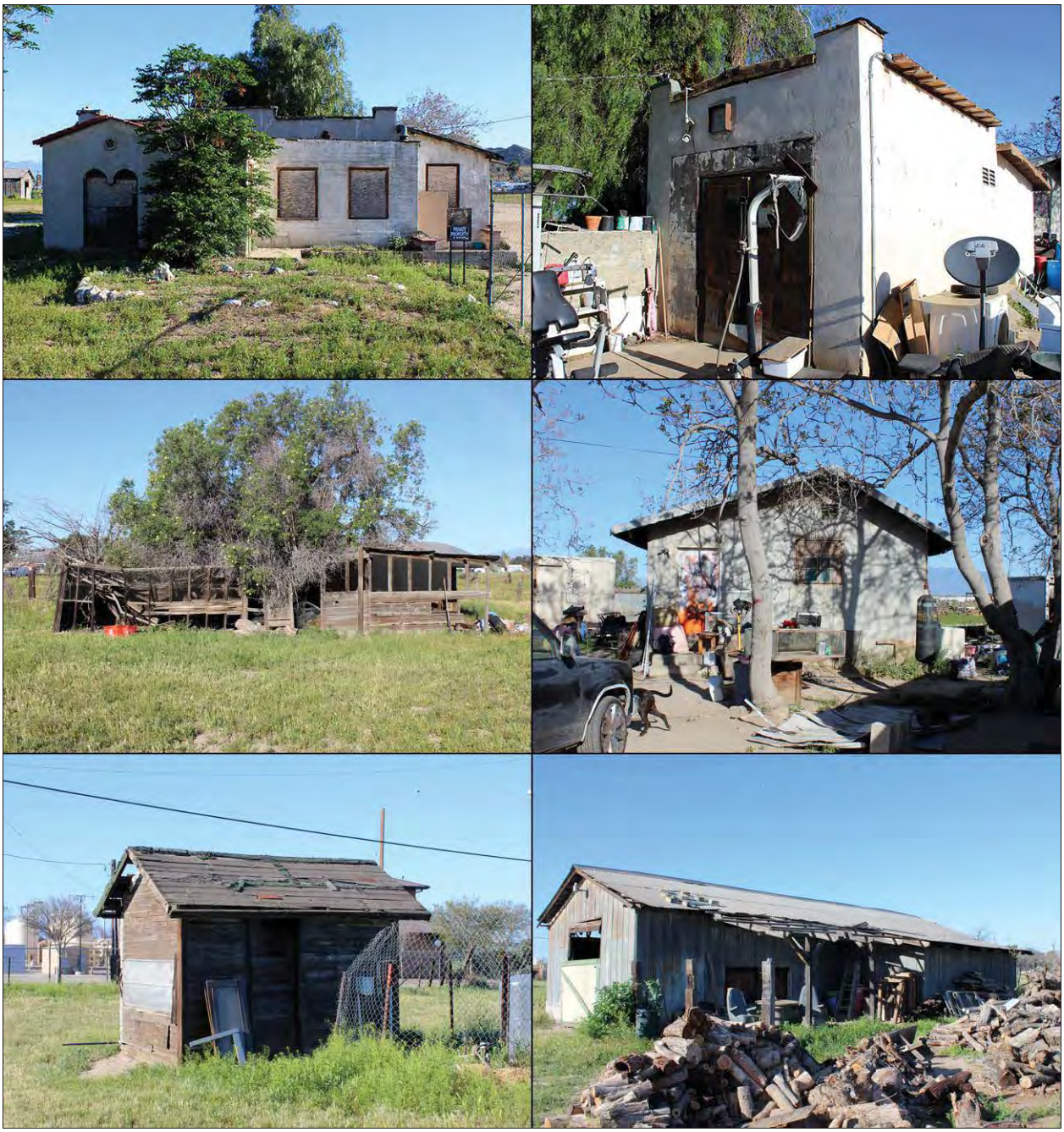


Figure 9. Buildings at Site 33-006973. *Clockwise from top left*: main residence, garage, secondary residence, metal barn, wooden shed, and animal hutch. (Photographs taken on March 12 and 30, 2015)

All six buildings in this group are situated on APN 246-070-002. Since they all appear to be at least 45 years old and share a common property history, Site 33-06973 was expanded to include the five newly recorded buildings (see App. 3). No other buildings, structures, objects, sites, features, or artifact deposits more than 45 years of age were encountered within the project boundaries. Site 33-006973, therefore, represents the only potential "historical resource" in the project area that requires evaluation under CEQA and the City ordinance.

MANAGEMENT CONSIDERATIONS

The purpose of this study is to identify any cultural resources within or adjacent to the project area, and to assist the City of Riverside in determining whether such resources meet the official definition of "historical resources," as provided in the California Public Resources Code, in particular CEQA.

DEFINITION

According to PRC §5020.1(j), "'historical resource' includes, but is not limited to, any object, building, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California." More specifically, CEQA guidelines state that the term "historical resources" applies to any such resources listed in or determined to be eligible for listing in the California Register of Historical Resources, included in a local register of historical resources, or determined to be historically significant by the Lead Agency (Title 14 CCR §15064.5(a)(1)-(3)).

Regarding the proper criteria of historical significance, CEQA guidelines mandate that "generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources" (Title 14 CCR §15064.5(a)(3)). A resource may be listed in the California Register if it meets any of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
(2) Is associated with the lives of persons important in our past.
(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
(4) Has yielded, or may be likely to yield, information important in prehistory or history. (PRC §5024.1(c))

A local register of historical resources, as defined by PRC §5020.1(k), "means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution." For individual properties within the City of Riverside, the City's Cultural Resources Ordinance provides two categories of historical significance designation, "Landmarks" and "Structures or Resources of Merit," the criteria for which are outlined in Riverside Municipal Code §20.50.010(T) and §20.50.010(DD), respectively. A "Landmark," according to the ordinance:

> means any Improvement or Natural Feature that is an exceptional example of a historical, archaeological, cultural, architectural, community, aesthetic or artistic heritage of the City, retains a high degree of integrity, and:
> 1. Exemplifies or reflects special elements of the City's cultural, social, economic, political, aesthetic, engineering, architectural, or natural history;
> 2. Is identified with persons or events significant in local, state or national history;
> 3. Embodies distinctive characteristics of a style, type, period or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship;
> 4. Represents the work of a notable builder, designer, or architect, or important creative individual;

5. Embodies elements that possess high artistic values or represents a significant structural or architectural achievement or innovation;
6. Reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes, or distinctive examples of park or community planning, or cultural landscape;
7. Is one of the last remaining examples in the City, region, State, or nation possessing distinguishing characteristics of an architectural or historical type or specimen; or
8. Has yielded or may be likely to yield, information important in history or prehistory. (RMC §20.50.010(T))

For the status of "Structure or Resource of Merit," the ordinance set forth the definition and criteria as follows:

> "Structure or Resource of Merit" means any Improvement or Natural Feature which contributes to the broader understanding of the historical, archaeological, cultural, architectural, community, aesthetic or artistic heritage of the City, retains sufficient integrity, and:
> 1. Has a unique location or singular physical characteristics or is a view or vista representing an established and familiar visual feature of a neighborhood community or of the City;
> 2. Is an example of a type of building which was once common but is now rare in its neighborhood, community or area;
> 3. Is connected with a business or use which was once common but is now rare;
> 4. A Cultural Resource that could be eligible under Landmark Criteria no longer exhibiting a high level of integrity, however, retaining sufficient integrity to convey significance under one or more of the Landmark Criteria;
> 5. Has yielded or may be likely to yield, information important in history or prehistory; or
> 6. An improvement or resource that no longer exhibits the high degree of integrity sufficient for Landmark designation, yet still retains sufficient integrity under one or more of the Landmark criteria to convey cultural resource significance as a Structure or Resource of Merit. (RMC §20.50.010(DD))

In addition, City of Riverside policies also require potential "historical resources" identified within the City's jurisdiction to be evaluated for listing in the National Register of Historic Places. The eligibility for inclusion in the National Register is determined by applying the Secretary of the Interior's criteria, developed by the National Park Service as per provision of the National Historic Preservation Act, which are essentially identical to the California Register criteria. Federal regulations provide the National Register criteria as follows:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
> (b) that are associated with the lives of persons significant in our past; or
> (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
> (d) that have yielded, or may be likely to yield, information important in prehistory or history. (36 CFR 60.4)

Pursuant to these regulatory guidelines, the potential significance of Site 33-006973 is evaluated against the criteria for the National Register, the California Register, and local designation.

SITE EVALUATION

Site 33-006973, as re-recorded during this study, consists of a mid-1920s Spanish Eclectic-style single-family residence and five associated buildings, including a secondary residence, a garage, a metal barn, a wooden shed, and an animal hutch. All of the buildings have been altered to some extent, but they still exhibit a recognizable level of historical characteristics.

The construction of these buildings postdates the era when the area retained an independent community identity as the Spanish-speaking village of La Placita, or "Spanishtown," and is more closely associated with a time when the area underwent a prolonged period of slow, agrarian growth as a sparsely populated outskirt of Riverside. The buildings at Site 33-006973 belong to property types reflective of this episode in local history and retain sufficient historic integrity to relate to that period, but they do not demonstrate a particularly close or important association with this pattern of events, or with any other established historic themes.

The historical background research has not identified any persons or specific events of recognized historic significance in close association with these buildings, nor has any prominent architect, designer, or builder been identified in their construction history. In terms of architectural or aesthetic merits, these buildings represent designs and building practices that are common among properties of similar types and vintages, and none of them constitutes an important example of any style, type, period, region, or method of construction, nor do they embody any particular architectural ideals or artistic pursuits.

Based on these considerations, and in light of the criteria listed above, the present study concludes that Site 33-006973 does not appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources, or for local designation by the City of Riverside. Therefore, it does not meet the definition of a "historical resource," as provided by CEQA and associated regulations.

CONCLUSION AND RECOMMENDATIONS

CEQA establishes that "a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (PRC §21084.1). "Substantial adverse change," according to PRC §5020.1(q), "means demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired."

In summary of the research results outlined above, Site 33-006973, consisting of a circa 1920s residence with five associated buildings, has been identified within the project area, but it does not appear to qualify as a "historical resource," as defined by CEQA. No archaeological sites or other potential "historical resources" were encountered throughout the course of the study. In light of these findings, CRM TECH presents the following recommendations to the City of Riverside:

- No historical resources exist within or adjacent to the project area, and thus the project as currently proposed will not cause a substantial adverse change to any known historical resources.

- Because of the lack of indication for potentially significant subsurface cultural remains, archaeological monitoring does not appear necessary during the proposed project.
- No further cultural resources investigation is necessary for the proposed project unless development plans undergo such changes as to include areas not covered by this study.
- If buried cultural materials are discovered during any earth-moving operations associated with the project, all work in that area should be halted or diverted until a qualified archaeologist can evaluate the nature and significance of the finds.

REFERENCES

Bean, Lowell John
1978 Cahuilla. In *Handbook of North American Indians*, Vol. 8: *California*, edited by Robert F. Heizer; pp. 575-587. Smithsonian Institution, Washington, D.C.

Chartkoff, Joseph L., and Kerry Kona Chartkoff
1984 *The Archaeology of California*. Stanford University Press, Palo Alto, California.

County Assessor, Riverside
1892-1895 Real property tax assessment records, Book 5, Map 16. Microfiches on file, Riverside County Assessor's Office, Riverside.
1921-1926 Real property tax assessment records, Book 6, Map 13. Microfiches on file, Riverside County Assessor's Office, Riverside.

Directory
1915-1926 Riverside City and County Directory. Microfiches on file, Local History Collection, Riverside Public Library, Central Branch, Riverside.

Doan, Uyen K., Michael Hogan, and Bai "Tom" Tang
2003 Archaeological Sensitivity Assessment: Hunter Park Redevelopment Plan Amendment, City of Riverside, Riverside County, California. On file, Eastern Information Center, University of California, Riverside.

Gunther, Jane Davies
1984 *Riverside County, California, Place Names: Their Origins and Their Stories*. Jane Davies Gunther, Riverside, California.

Kroeber, Alfred L.
1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Government Printing Office, Washington, D.C.

Moratto, Michael J. (ed.)
1984 *California Archaeology*. Academic Press, Orlando, Florida.

Newman, Thelma
1982 California Historical Resources Inventory site record, 33-006793. On file, Eastern Information Center, University of California, Riverside.

Patterson, Tom
1996 *A Colony for California*. The Museum Press, Riverside, California.

Strong, William Duncan
1929 *Aboriginal Society in Southern California*. University of California Publications in American Archaeology and Ethnology, Vol. 26. Reprinted by Malki Museum Press, Banning, California, 1972.

USGS (United States Geological Survey, U.S. Department of the Interior)
1901a Map: Riverside, Calif. (15', 1:62,500); surveyed in 1897.
1901b Map: San Bernardino, Calif. (15', 1:62,500); surveyed in 1893-1894.
1943 Map: Colton, Calif. (1:31,680); surveyed in 1936-1938.
1954 Map: San Bernardino South, Calif. (7.5', 1:24,000); aerial photographs taken in 1952, field-checked in 1954.
1967 Map: San Bernardino South, Calif. (7.5', 1:24,000); 1954 edition photorevised in 1966, field-checked in 1967.
1969 Map: San Bernardino, Calif. (1:250,000); 1958 edition revised.
1979 Map: Santa Ana, Calif. (1:250,000); 1959 edition revised.

1980a Map: Riverside East, Calif. (7.5', 1:24,000); 1967 edition photorevised in 1978.
1980b Map: San Bernardino South, Calif. (7.5', 1:24,000); 1967 edition photorevised in 1979.

Wallace, William J.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Archaeology* 11(3):214-230.
1978 Post-Pleistocene Archeology, 9,000 to 2,000 BC. In *Handbook of North American Indians*; Vol. 8, *California*, edited by Robert F. Heizer; pp. 25-36. Smithsonian Institution, Washington, D.C.

Warren, Claude N.
1968 Cultural Traditions and Ecological Adaptations on the Southern California Coast. In *Archaic Prehistory in Western United States*, edited by Cynthia Irwin-Williams; pp. 1-14. Eastern New Mexico University Contributions in Anthropology 1(3). Portales, New Mexico.
1984 The Desert Region. In *California Archaeology*, edited by Michael J. Moratto, pp. 339-430. Academic Press, Orlando, Florida.

Warren, Claude N., and Robert H. Crabtree
1986 Prehistory of the Southwestern Area. In *Handbook of North American Indians*, Vol. 11: *Great Basin*, edited by Warren L. D'Azevedo; pp. 183-193. Smithsonian Institution, Washington, D.C.

APPENDIX 1:
PERSONNEL QUALIFICATIONS

PRINCIPAL INVESTIGATOR/HISTORIAN
Bai "Tom" Tang, M.A.

Education

1988-1993	Graduate Program in Public History/Historic Preservation, UC Riverside.
1987	M.A., American History, Yale University, New Haven, Connecticut.
1982	B.A., History, Northwestern University, Xi'an, China.
2000	"Introduction to Section 106 Review," presented by the Advisory Council on Historic Preservation and the University of Nevada, Reno.
1994	"Assessing the Significance of Historic Archaeological Sites," presented by the Historic Preservation Program, University of Nevada, Reno.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1993-2002	Project Historian/Architectural Historian, CRM TECH, Riverside, California.
1993-1997	Project Historian, Greenwood and Associates, Pacific Palisades, California.
1991-1993	Project Historian, Archaeological Research Unit, UC Riverside.
1990	Intern Researcher, California State Office of Historic Preservation, Sacramento.
1990-1992	Teaching Assistant, History of Modern World, UC Riverside.
1988-1993	Research Assistant, American Social History, UC Riverside.
1985-1988	Research Assistant, Modern Chinese History, Yale University.
1985-1986	Teaching Assistant, Modern Chinese History, Yale University.
1982-1985	Lecturer, History, Xi'an Foreign Languages Institute, Xi'an, China.

Honors and Awards

1988-1990	University of California Graduate Fellowship, UC Riverside.
1985-1987	Yale University Fellowship, Yale University Graduate School.
1980, 1981	President's Honor List, Northwestern University, Xi'an, China.

Cultural Resources Management Reports

Preliminary Analyses and Recommendations Regarding California's Cultural Resources Inventory System (With Special Reference to Condition 14 of NPS 1990 Program Review Report). California State Office of Historic Preservation working paper, Sacramento, September 1990.

Numerous cultural resources management reports with the Archaeological Research Unit, Greenwood and Associates, and CRM TECH, since October 1991.

PRINCIPAL INVESTIGATOR/ARCHAEOLOGIST
Michael Hogan, Ph.D., RPA*

Education

1991	Ph.D., Anthropology, University of California, Riverside.
1981	B.S., Anthropology, University of California, Riverside; with honors.
1980-1981	Education Abroad Program, Lima, Peru.
2002	Section 106—National Historic Preservation Act: Federal Law at the Local Level. UCLA Extension Course #888.
2002	"Recognizing Historic Artifacts," workshop presented by Richard Norwood, Historical Archaeologist.
2002	"Wending Your Way through the Regulatory Maze," symposium presented by the Association of Environmental Professionals.
1992	"Southern California Ceramics Workshop," presented by Jerry Schaefer.
1992	"Historic Artifact Workshop," presented by Anne Duffield-Stoll.

Professional Experience

2002-	Principal Investigator, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist/Field Director, CRM TECH, Riverside.
1996-1998	Project Director and Ethnographer, Statistical Research, Inc., Redlands.
1992-1998	Assistant Research Anthropologist, University of California, Riverside
1992-1995	Project Director, Archaeological Research Unit, U. C. Riverside.
1993-1994	Adjunct Professor, Riverside Community College, Mt. San Jacinto College, U.C. Riverside, Chapman University, and San Bernardino Valley College.
1991-1992	Crew Chief, Archaeological Research Unit, U. C. Riverside.
1984-1998	Archaeological Technician, Field Director, and Project Director for various southern California cultural resources management firms.

Research Interests

Cultural Resource Management, Southern Californian Archaeology, Settlement and Exchange Patterns, Specialization and Stratification, Culture Change, Native American Culture, Cultural Diversity.

Cultural Resources Management Reports

Author and co-author of, contributor to, and principal investigator for numerous cultural resources management study reports since 1986.

Memberships

* Register of Professional Archaeologists; Society for American Archaeology; Society for California Archaeology; Pacific Coast Archaeological Society; Coachella Valley Archaeological Society.

PROJECT HISTORIAN/ARCHITECTURAL HISTORIAN
Terri Jacquemain, M.A.

Education

2004 M.A., Public History and Historic Resource Management, University of California, Riverside.
- M.A. thesis: Managing Cultural Outreach, Public Affairs and Tribal Policies of the Cabazon Band of Mission Indians, Indio, California; internship served as interim Public Information Officer, Cabazon Band of Mission Indians, June-October, 2002.

2002 B.S., Anthropology, University of California, Riverside.
2001 Archaeological Field School, University of California, Riverside.
1991 A.A., Riverside Community College, Norco Campus.

Professional Experience

2003- Historian/Architectural Historian/Report Writer, CRM TECH, Riverside/ Colton, California.
- Author/co-author of legally defensible cultural resources reports for CEQA and NHPA Section 106;
- Historic context development, historical/archival research, oral historical interviews, consultation with local communities and historical organizations;
- Historic building surveys and recordation, research in architectural history; architectural description

2002-2003 Teaching Assistant, Religious Studies Department, University of California, Riverside.
2002 Interim Public Information Officer, Cabazon Band of Mission Indians.
2000 Administrative Assistant, Native American Student Programs, University of California, Riverside.
1997-2000 Reporter, *Inland Valley Daily Bulletin*, Ontario, California.
1991-1997 Reporter, *The Press-Enterprise*, Riverside, California.

Membership

California Preservation Foundation.

PROJECT ARCHAEOLOGIST
Daniel Ballester, M.S.

Education

2013	M.S., Geographic Information System (GIS), University of Redlands, California.
1998	B.A., Anthropology, California State University, San Bernardino.
1997	Archaeological Field School, University of Las Vegas and University of California, Riverside.
1994	University of Puerto Rico, Rio Piedras, Puerto Rico.
2007	Certificate in Geographic Information Systems (GIS), California State University, San Bernardino.
2002	"Historic Archaeology Workshop," presented by Richard Norwood, Base Archaeologist, Edwards Air Force Base; presented at CRM TECH, Riverside, California.

Professional Experience

2002-	Field Director/GIS Specialist, CRM TECH, Riverside/Colton, California.
1999-2002	Project Archaeologist, CRM TECH, Riverside, California.
1998-1999	Field Crew, K.E.A. Environmental, San Diego, California.
1998	Field Crew, A.S.M. Affiliates, Encinitas, California.
1998	Field Crew, Archaeological Research Unit, University of California, Riverside.

PROJECT ARCHAEOLOGIST
Nina Gallardo, B.A.

Education

2004	B.A., Anthropology/Law and Society, University of California, Riverside.

Professional Experience

2004-	Project Archaeologist, CRM TECH, Riverside/Colton, California.

Honors and Awards

2000-2002	Dean's Honors List, University of California, Riverside.

APPENDIX 2

CORRESPONDENCE WITH NATIVE AMERICAN REPRESENTATIVES*

* A total of 26 local Native American representatives were contacted; a sample letter is included in this report.

SACRED LANDS FILE & NATIVE AMERICAN CONTACTS LIST REQUEST

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Project: 308K Placentia Lane Warehouse (CRM TECH Contract No. 2901)

County: Riverside

USGS Quadrangle Name: Riverside East and San Bernardino South, Calif.

Township 2 South **Range** 5 West SB **BM; Section(s)** 12 (projected)

Company/Firm/Agency: CRM TECH

Contact Person: Nina Gallardo

Street Address: 1016 E. Cooley Drive, Suite A/B

City: Colton, CA **Zip:** 92324

Phone: (909) 824-6400 **Fax:** (909) 824-6405

Email: ngallardo@crmtech.us

Project Description: The primary component of the project is to construct a 308,000-square-foot warehouse. The project area is located to the southeast of the intersection of Center Street and Placentia Lane, in the City of Riverside, Riverside County, California.

March 5, 2015

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

March 17, 2015

Nina Gallardo
CRM Tech
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Sent by Fax: (909) 824-6405
Number of Pages: 4

Re: 308K Placentia Lane Warehouse (CRM TECH Contract No. 2901), Riverside County.

Dear Ms. Gallardo,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 373-3712.

Sincerely,

Katy Sanchez

Katy Sanchez
Associate Government Program Analyst

Native American Contact List
Riverside County
March 17, 2015

Pala Band of Mission Indians
Shasta Gaughen, PhD, THPO
PMB 50, 35008 Pala-Temecula Luiseno
Pala , CA 92059 Cupeno
sgaughen@palatribe.com
(760) 891-3515

(760) 742-3189 Fax

Pauma & Yuima Reservation
Randall Majel, Chairperson
P.O. Box 369 Luiseno
Pauma Valley CA 92061
(760) 742-1289 ext 317

(760) 742-3422 Fax

Pechanga Band of Mission Indians
Paul Macarro, Cultural Resources Manager
P.O. Box 1477 Luiseno
Temecula , CA 92593
pmacarro@pechanga-nsn.gov
(951) 770-8100

(951) 506-9491 Fax

Rincon Band of Mission Indians
Vincent Whipple, Tribal Historic Pres. Officer
1 West Tribal Road Luiseno
Valley Center, CA 92082
vwhipple@rincontribe.org
(760) 297-2635

(760) 297-2639 Fax

San Manuel Band of Mission Indians
Lynn Valbuena, Chairwoman
26569 Community Center Serrano
Highland , CA 92346
(909) 864-8933

(909) 864-3370 Fax

Soboba Band of Mission Indians
Rosemary Morillo, Chairperson; Attn: Carrie Garcia
P.O. Box 487 Luiseno
San Jacinto , CA 92581
carrieg@soboba-nsn.gov
(951) 654-2765

(951) 654-4198 Fax

Morongo Band of Mission Indians
Denisa Torres, Cultural Resources Manager
12700 Pumarra Road Cahuilla
Banning , CA 92220 Serrano
dtorres@morongo-nsn.gov
(951) 572-6004 Fax

San Manuel Band of Mission Indians
Daniel McCarthy, M.S.., Director-CRM Dept.
26569 Community Center Drive Serrano
Highland , CA 92346
dmccarthy@sanmanuel-nsn.gov
(909) 864-8933 Ext 3248

(909) 862-5152 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed 308K Placentia Lane Warehouse (CRM TECH Contract No. 2901), Riverside County.

Native American Contact List
Riverside County
March 17, 2015

Pauma Valley Band of Luiseño Indians
Bennae Calac
P.O. Box 369 Luiseno
Pauma Valley CA 92061
bennaecalac@aol.com
(760) 617-2872

(760) 742-3422 Fax

Pauma & Yuima
ATTN: EPA
P.O. Box 369 Luiseno
Pauma Valley CA 92061
kymberli_peters@yahoo.com
(760) 742-1289

(760) 742-3422 Fax

Rincon Band of Mission Indians
Bo Mazzetti, Chairperson
1 West Tribal Road Luiseno
Valley Center, CA 92082
bomazzetti@aol.com
(760) 749-1051

(760) 749-8901 Fax

San Luis Rey Band of Mission Indians
Tribal Council
1889 Sunset Drive Luiseno
Vista , CA 92081
cjmojado@slrmissionindians.org
(760) 724-8505

(760) 724-2172 Fax

San Luis Rey Band of Mission Indians
Cultural Department
1889 Sunset Drive Luiseno
Vista , CA 92081 Cupeno
cjmojado@slrmissionindians.org
(760) 724-8505

(760) 724-2172 Fax

Kupa Cultural Center (Pala Band)
Shasta Gaughen, Assistant Director
PMB 50, 35008 Pala-Temecula Luiseno
Pala , CA 92059
sgaughen@palatribe.com
(760) 891-3515

(760) 742-4543 Fax

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad Cahuilla
Banning , CA 92220 Serrano
(951) 849-8807
(951) 755-5200
(951) 922-8146 Fax

Pechanga Band of Mission Indians
Mark Macarro, Chairperson
P.O. Box 1477 Luiseno
Temecula , CA 92593
mgoodhart@pechanga-nsn.
(951) 770-6100

(951) 695-1778 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed 308K Placentia Lane Warehouse (CRM TECH Contract No. 2901), Riverside County.

Native American Contact List
Riverside County
March 17, 2015

William J. Pink
48310 Pechanga Road Luiseno
Temecula , CA 92592
wjpink@hotmail.com
(909) 936-1216
Prefers e-mail contact

La Jolla Band of Mission Indians
Lavonne Peck, Chairwoman
22000 Highway 76 Luiseno
Pauma Valley CA 92061
Rob.roy@lajolla-nsn.gov
(760) 742-3771

(760) 742-1704 Fax

Serrano Nation of Mission Indians
Goldie Walker, Chairwoman
P.O. Box 343 Serrano
Patton , CA 92369

(909) 528-9027
(909) 528-9032

Pauma & Yuima Reservation
Charles Devers, Cultural Committee
P.O. Box 369 Luiseno
Pauma Valley CA 92061
(760) 742-1289

(760) 742-3422 Fax

Pechanga Cultural Resources Department
Anna Hoover, Cultural Analyst
P.O. Box 2183 Luiseño
Temecula , CA 92593
ahoover@pechanga-nsn.gov
(951) 770-8104

(951) 694-0446 Fax

Ernest H. Siva
Morongo Band of Mission Indians Tribal Elder
9570 Mias Canyon Road Serrano
Banning , CA 92220 Cahuilla
siva@dishmail.net
(951) 849-4676

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Luiseno
San Jacinto , CA 92581
jontiveros@soboba-nsn.gov
(951) 663-5279
(951) 654-5544, ext 4137
(951) 654-4198 Fax

Pala Band of Mission Indians
Robert H. Smith, Chairperson
PMB 50, 35008 Pala-Temecula Luiseno
Pala , CA 92059 Cupeno
dhuss@palatribe.com
(760) 891-3500

(760) 742-3189 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting locative Americans with regard to cultural resources for the proposed 308K Placentia Lane Warehouse (CRM TECH Contract No. 2901), Riverside County.

March 18, 2015

Bennae Calac, Tribal Council Member
Pauma Valley Band of Luiseño Indians
P. O. Box 369
Pauma Valley, CA 92061

RE: 308K Placentia Lane Warehouse Project
Approximately 16 Acres in the City of Riverside
Riverside County, California
CRM TECH Contract #2901

Dear Ms. Calac:

MIG/Hogle-Ireland Inc. will be conducting environmental studies under CEQA for the 308K Placentia Lane Warehouse Project in the City of Riverside, Riverside County, California. The project area encompasses approximately 16 acres of mostly undeveloped land in APNs 246-040-027, 246-040-028, 246-070-002, and 246-070-017, located north of the intersection of Placentia Lane and Sieck Road.

The proposed project entails the construction of a 308,000-square-foot warehouse, 5,500-square-foot mezzanine, 388 parking stalls, and 47 docks. The accompanying map, based on the USGS Riverside East and San Bernardino South, Calif., 7.5' quadrangles, depict the location of the project area within the Rancho Jurupa (Sterns) land grant, T2S R5W, SBBM. CRM TECH has been hired to conduct a cultural resource study, including the Native American scoping, for this project.

According to records on file at the Eastern Information Center and the San Bernardino Archaeological Information Center, there is one known historic site within the boundaries of the project area. Site 33-006973 consists of a Mediterranean/Spanish Revival style house with associated structures, built in circa 1922, and is located at 3667 Placentia Lane, in the southeast portion of the project area.

Outside the project boundaries but within a one-mile radius, AIC and EIC records indicate that seven prehistoric sites, 27 historic-period sites, five isolates, and three pending sites were previously identified. All of the prehistoric sites consist of bedrock-milling features and are clustered to the northeast around the La Loma Hills. The historic-period sites recorded within the scope of the records search include canals, wells, single-family residences, and refuse scatters. A systematic field survey of the project area on March 12, 2015, confirmed the presence of the buildings at Site 33-006973, but no other potential historical/archaeological resources were encountered.

In a letter dated March 17, 2015, the Native American Heritage Commission reports that the sacred lands record search identified no Native American cultural resources within the project area, but recommends that local Native American groups be contacted for further information. Therefore, as part of the cultural resources study for this project, I am writing to request your input on potential Native American cultural resources in or near the project area.

Please respond at your earliest convenience if you have any specific knowledge of sacred/religious sites or other sites of Native American traditional cultural value within or near the project area that need to be taken into consideration as part of the cultural resources investigation. Any information or concerns may be forwarded to CRM TECH by telephone, e-mail, facsimile, or standard mail. Requests for documentation or information we cannot provide will be forwarded to our client and/or the lead agency, which is the City of Riverside for CEQA-compliance purposes. We would also like to clarify that CRM TECH, as the cultural resources consultant for the project, is not the appropriate entity to initiate government-to-government consultations. Thank you for the time and effort in addressing this important matter.

Respectfully,

Nina Gallardo
CRM TECH
Email: ngallardo@crmtech.us

Encl.: project area ma

Morongo Band of Mission Indians

Cultural Heritage Program
12700 Pumarra Road, Banning, CA 92220
Phone (951)755-5025
Fax (951)572-6004

Date: March 23, 2015

Re: 308K Placentia Lane Warehouse Project
CRM TECH Contract #2901

Dear Nina Gallardo,

Thank you for contacting the Morongo Band of Mission Indians regarding the above referenced project(s). The tribe greatly appreciates the opportunity to comment on the project. After reviewing our records and consulting with our tribal elders and cultural experts, we would like to respectfully offer the following comments and/or recommendations:

___ The project is outside of the Tribe's current reservation boundaries and is not within an area considered to be a traditional use area or one in which the Tribe has cultural ties (i.e. Cahuilla or Serrano Territory). We recommend contacting the appropriate tribes who have cultural affiliation to the project area. We have no further comments at this time.

_X_ The project is outside of the Tribe's current reservation boundaries but within in an area considered to be a traditional use area or one in which the Tribe has cultural ties (i.e. Cahuilla or Serrano Territory). At this time, we are not aware of any cultural resources on the property; however, that is not to say there is nothing present. At this time, we ask that you impose specific conditions regarding all cultural and/or archaeological resources and buried cultural materials on any development plans or entitlement applications (see Standard Development Conditions attachment).

___ The project is outside of the Tribe's current reservation boundaries but within in an area considered to be a traditional use area or one in which the Tribe has cultural ties (i.e. Cahuilla or Serrano Territory). At this time we ask that you impose specific conditions regarding all cultural and/or archaeological resources and buried cultural materials on any development plans or entitlement applications (see Standard Development Conditions attachment). Furthermore, we would like to formally request the following:

1. A thorough records search be conducted by contacting one of the CHRIS (California Historical Resources Information System) Archaeological Information Centers and have a copy of the search results be provided to the tribe.

2. A comprehensive cultural survey be conducted of the proposed project property and any APE's (Areas of Potential Effect) within the property. We would also like to request that a tribal monitor be present during the cultural survey and that a copy of the results be provided to the tribe as soon as it can be made available.

3. Morongo would like to request that our tribal monitors be present during any test excavations or subsequent ground disturbing activities during the construction phase of the project.

___ The project is located with the current boundaries of the Morongo Band of Mission Indians Reservation. Please contact the Morongo Band of Mission Indians planning department for further details.

Once again, the Morongo Band of Mission Indians appreciates the opportunity to comment on this project. Please be aware that receipt of this letter does not constitute "meaningful" tribal consultation nor does it conclude the consultation process. This letter is merely intended to initiate consultation between the tribe and lead agency, which may be followed up with additional emails, phone calls or face-to-face consultation if deemed necessary. If you should have any further questions with regard to this matter, please do not hesitate to contact me at your convenience.

Very truly yours,

Raymond Huaute
Cultural Resource Specialist
Morongo Band of Mission Indians
Email: rhuaute@morongo-nsn.gov
Phone: (951) 755-5025

MORONGO BAND OF MISSION INDIANS

A SOVEREIGN NATION

Standard Development Conditions

The Morongo Band of Mission Indians asks that you impose specific conditions regarding cultural and/or archaeological resources and buried cultural materials on any development plans or entitlement applications as follows:

1. If human remains are encountered during grading and other construction excavation, work in the immediate vicinity shall cease and the County Coroner shall be contacted pursuant to State Health and Safety Code §7050.5.

2. In the event that Native American cultural resources are discovered during project development/construction, all work in the immediate vicinity of the find shall cease and a qualified archaeologist meeting Secretary of Interior standards shall be hired to assess the find. Work on the overall project may continue during this assessment period.

    a. If significant Native American cultural resources are discovered, for which a Treatment Plan must be prepared, the developer or his archaeologist shall contact the Morongo Band of Mission Indians.

    b. If requested by the Tribe[1], the developer or the project archaeologist shall, in good faith, consult on the discovery and its disposition (e.g. avoidance, preservation, return of artifacts to tribe, etc.).

[1] The Morongo Band of Mission Indians realizes that there may be additional tribes claiming cultural affiliation to the area; however, Morongo can only speak for itself. The Tribe has no objection if the archaeologist wishes to consult with other tribes and if the city wishes to revise the condition to recognize other tribes.

PALA TRIBAL HISTORIC PRESERVATION OFFICE

PMB 50, 35008 Pala Temecula Road
Pala, CA 92059
760-891-3510 Office | 760-742-3189 Fax

PALA THPO

March 25, 2015

Nina Gallardo
CRM Tech
1016 E. Cooley Drive, Suite A/B
Colton, CA 92324

Re: 308K Placentia Lane Warehouse Project- CRM Tech Contract #2901

Dear Mrs. Gallardo:

The Pala Band of Mission Indians Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of Robert Smith, Tribal Chairman.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized Pala Indian Reservation. The project is also beyond the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Therefore, we have no objection to the continuation of project activities as currently planned and we defer to the wishes of Tribes in closer proximity to the project area.

We appreciate involvement with your initiative and look forward to working with you on future efforts. If you have questions or need additional information, please do not hesitate to contact me by telephone at 760-891-3515 or by e-mail at sgaughen@palatribe.com.

Sincerely,

Shasta C. Gaughen, PhD
Tribal Historic Preservation Officer
Pala Band of Mission Indians

ATTENTION: THE PALA TRIBAL HISTORIC PRESERVATION OFFICE IS RESPONSIBLE FOR ALL REQUESTS FOR CONSULTATION. PLEASE ADDRESS CORRESPONDENCE TO **SHASTA C. GAUGHEN** AT THE ABOVE ADDRESS. IT IS NOT NECESSARY TO ALSO SEND NOTICES TO PALA TRIBAL CHAIRMAN ROBERT SMITH.

From: Cultural <Cultural@pauma-nsn.gov>
Sent: Tuesday, March 31, 2015 10:42 AM
To: Nina Gallardo
Cc: Dixon, Patti; Jeremy Zagarella
Subject: RE: NA Scoping Letter for the 308K Placentia Lane Warehouse Project, City of Riverside, Riverside County (CRM TECH #2901)

Ms. Gallardo,

The Pauma Band of Luiseno Indians has received the hard copy of the 308K Placentia Lane Warehouse Project. We are unaware of any site specific cultural sites or resources on the proposed project property. With the information you provided, we would urge the developer to have an archaeologist and Native monitor onsite for all ground disturbing activities. If there are any questions, please contact us.

Thank you,

Chris Devers
Cultural Clerk
Pauma Band of Luiseno Indians

APPENDIX 3

CALIFORNIA HISTORICAL RESOURCES INVENTORY
SITE RECORD FORMS, 33-006973

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

Ser. No. 33-2501-51.
HABS ___ HAER ___ NR 6 SHL ___ Loc ___
UTM: A 462360/3763930 B ___
C ___ D ___

IDENTIFICATION

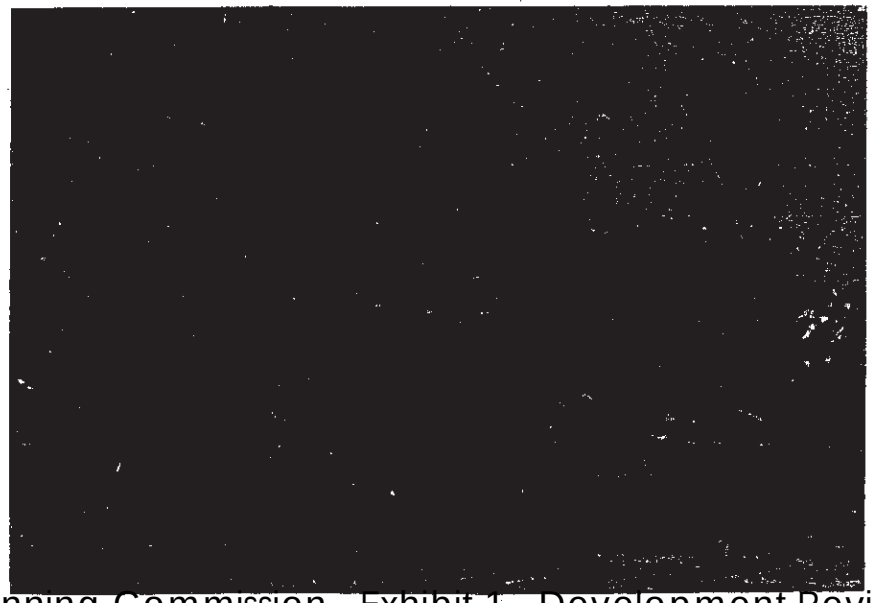
1. Common name: None 33-6973
2. Historic name: None
3. Street or rural address: 3667 Placentia Lane
   City Highgrove Zip 92501 County Riverside
4. Parcel number: 246-070-002-5
5. Present Owner: Robert J. Hanchett Address: P.O. Box 5577
   City Riverside Zip 92517 Ownership is: Public ___ Private X
6. Present Use: Residential Original use: Residential

DESCRIPTION

7a. Architectural style: Mediterranean/Spanish Rv.

7b. Briefly describe the present *physical description* of the site or structure and describe any major alterations from its original condition:

Sitting in the middle of farm land is this flat-roofed Mediterranean/ Spanish Revival style house in fair condition. Two rooms in the front of the house project forward, each covered with a gable roof. The roofing is of red tiles. Arched windows enhance the appearance of this home.



8. Construction date:
   Estimated 1922 Factual ___
9. Architect ___
10. Builder ___
11. Approx. property size (in feet)
    Frontage 526' Depth 521'
    or approx. acreage 6.00 acres
12. Date(s) of enclosed photograph(s)
    January 18, 1982

3-67-09-09

DPR

13. Condition: Excellent ___ Good ___ Fair X Deteriorated ___ No longer in existence ___

14. Alterations: Major

33-6973

15. Surroundings: (Check more than one if necessary) Open land ___ Scattered buildings X Densely built-up ___
Residential ___ Industrial ___ Commercial ___ Other: Agricultural

16. Threats to site: None known X Private development ___ Zoning ___ Vandalism ___
Public Works project ___ Other: ___

17. Is the structure: On its original site? X Moved? ___ Unknown? ___

18. Related features: Shed

SIGNIFICANCE

19. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site.)

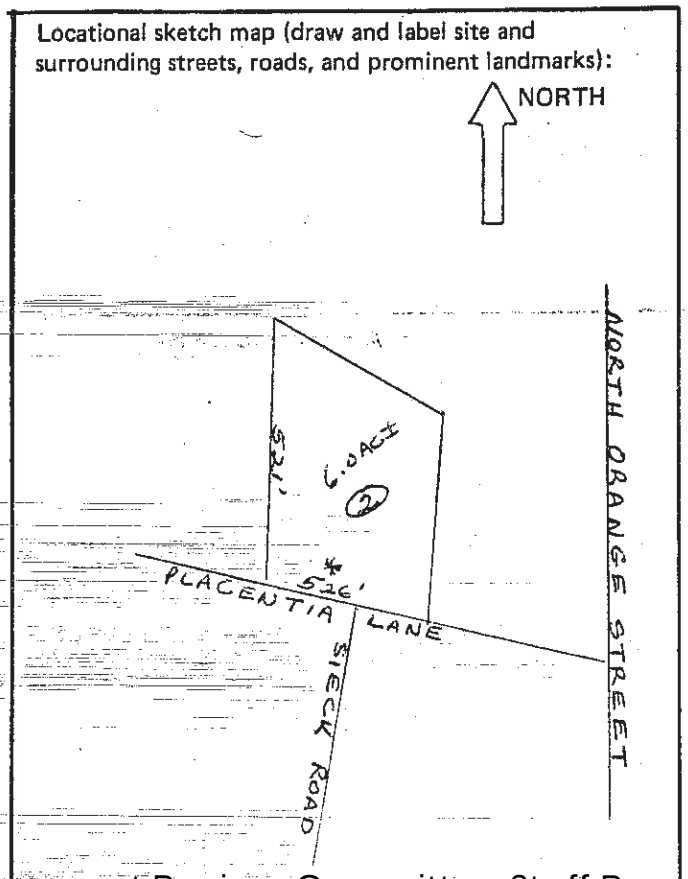
This home is typical of smaller houses in the Mediterranean/Spanish Revival style.

20. Main theme of the historic resource: (If more than one is checked, number in order of importance.)
Architecture X Arts & Leisure ___
Economic/Industrial ___ Exploration/Settlement ___
Government ___ Military ___
Religion ___ Social/Education ___

21. Sources (List books, documents, surveys, personal interviews and their dates).

22. Date form prepared June 18, 1982
By (name) Thelma Newman
Organization Riv. Co. Historical Comm.
Address: 4600 Crestmore Rd.
City Rubidoux Zip 92519
Phone: (714) 787-2551

Locational sketch map (draw and label site and surrounding streets, roads, and prominent landmarks):



Recorded by: Terri Jacquemain
***Date:** March 30, 2015 ___ Continuation √ Update

During a field inspection on March 30, 2015, the residence recorded in 1982 at Site 33-006973 was found to be suffering the effects of neglect, including boarded windows, crumbling stucco and concrete, missing roof tiles, and evidence of efflorescence stemming from rainwater runoff. It is no longer occupied. Noted behind the residence were a garage of the same design and constructed of similar materials, along with a secondary residence. The secondary residence is a wood-framed, single-story building of vernacular character, featuring stucco walls, steel-framed windows, and a medium-pitched front-gable roof sheathed with composition sheet. This building appears to remain occupied. Three ancillary buildings are located to the west of the two residences and the garage, including a large metal barn, a small wooden shed, and a partially collapsed animal hutch. All of the buildings are in a dilapidated condition. All six buildings in this group are situated on APN 246-070-002. Since they all appear to be at least 45 years old and share a common property history, Site 33-06973 was expanded to include the five newly recorded buildings.

Archival records of the Riverside County Assessor's Office reveal building first occurred on APN 246-070-002 around 1912, when owner Henry Camp was assessed $50 for improvements (see Table 1). The 1982 site record estimates that the main residence was built in 1922, but a significant increase in improvement value between 1924 and 1926 suggests a more likely construction date in the mid-1920s, when the parcel was under the ownership of C.G. Martini. In any case, two buildings were known to be present at this location by the mid-1930s, when Martha Milford was listed as the property owner. Neither Martini nor Milford appears to have resided at this location, according to local directories. In fact, of the owners listed in Table 1, only three were found in local directories, namely Densmore, Field, and Martini, and among these only Densmore was listed as a resident at this address.

Table 1. Real Property Tax Assessment History for APN 246-070-002*

Year	Owner	Value of Land	Value of Improvements
1907	Luz Atencio Trujillo	$90	$0
1908	J.C. Merritt	$90	$0
1909	Henry J. Camp	$90	$0
1910	Henry J. Camp	$120	$0
1911	Henry J. Camp	$120	$0
1912-1914	Henry J. Camp	$360	$50
1915	C.S. Densmore	$360	$50
1916	Nettie R. Stratten	$360	$50
1917-1920	Myrtle A. Field	$360	$80
1920	Roy P. Storie	$360	$80
1921-1922	Jose Palmerie(?)	$360	$80
1923	Robert J. McArthur	$360	$80
1924-1926	C.G. Martini	$360	$130-$660
1927-1928	David Forrest	$200	$660
1929	F.J. Tacharner	$280	$660
1930	J.P. Ramsey	$250	$660
1931	J.L. Dodson & L.I. Meyer	$250	$600.
1932-1944	Martha C. Milford	$200	$450-$660
1945	George J. & Irene Morgenstern	$300	$720
1946-1949	George J. Morgenstern & Cornelia A. Hill	$300	$1190-$1200-$2060
1950-1961	Robert J. Hanchett	$720	$2060-$2310

*Source: Riverside County Assessor

Recorded by: Terri Jacquemain
*Date: March 30, 2015 Continuation √ Update

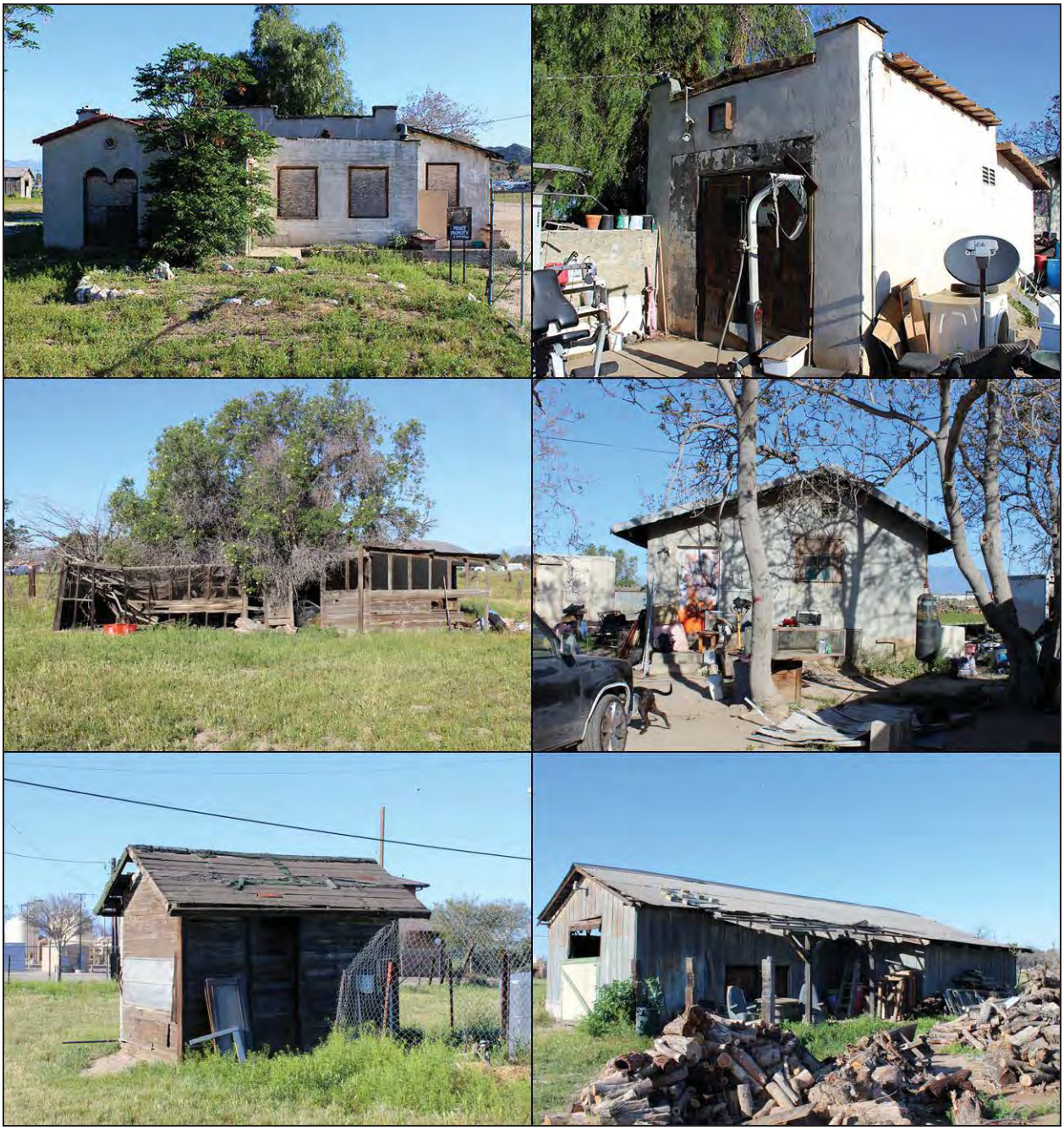
The construction of these buildings postdates the era when the area retained an independent community identity as the Spanish-speaking village of La Placita, or "Spanishtown," and is more closely associated with a time when the area underwent a prolonged period of slow, agrarian growth as a sparsely populated outskirt of Riverside. The buildings at Site 33-006973 belong to property types reflective of this episode in local history and retain sufficient historic integrity to relate to that period, but they do not demonstrate a particularly close or important association with this pattern of events, or with any other established historic themes.

The historical background research has not identified any persons or specific events of recognized historic significance in close association with these buildings, nor has any prominent architect, designer, or builder been identified in their construction history. In terms of architectural or aesthetic merits, these buildings represent designs and building practices that are common among properties of similar types and vintages, and none of them constitutes an important example of any style, type, period, region, or method of construction, nor do they embody any particular architectural ideals or artistic pursuits.

Based on these considerations, and in light of the criteria listed above, the present study concludes that Site 33-006973 does not appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources, or for local designation by the City of Riverside.

Report Citation:

Bai "Tom" Tang, Terri Jacquemain, and Daniel Ballester
2015 Historical/Archaeological Resources Survey Report: Placentia Lane Warehouse Project, APNs 246-040-027, 246-040-028, 246-070-002, and 246-070-017, City of Riverside, Riverside County, California.



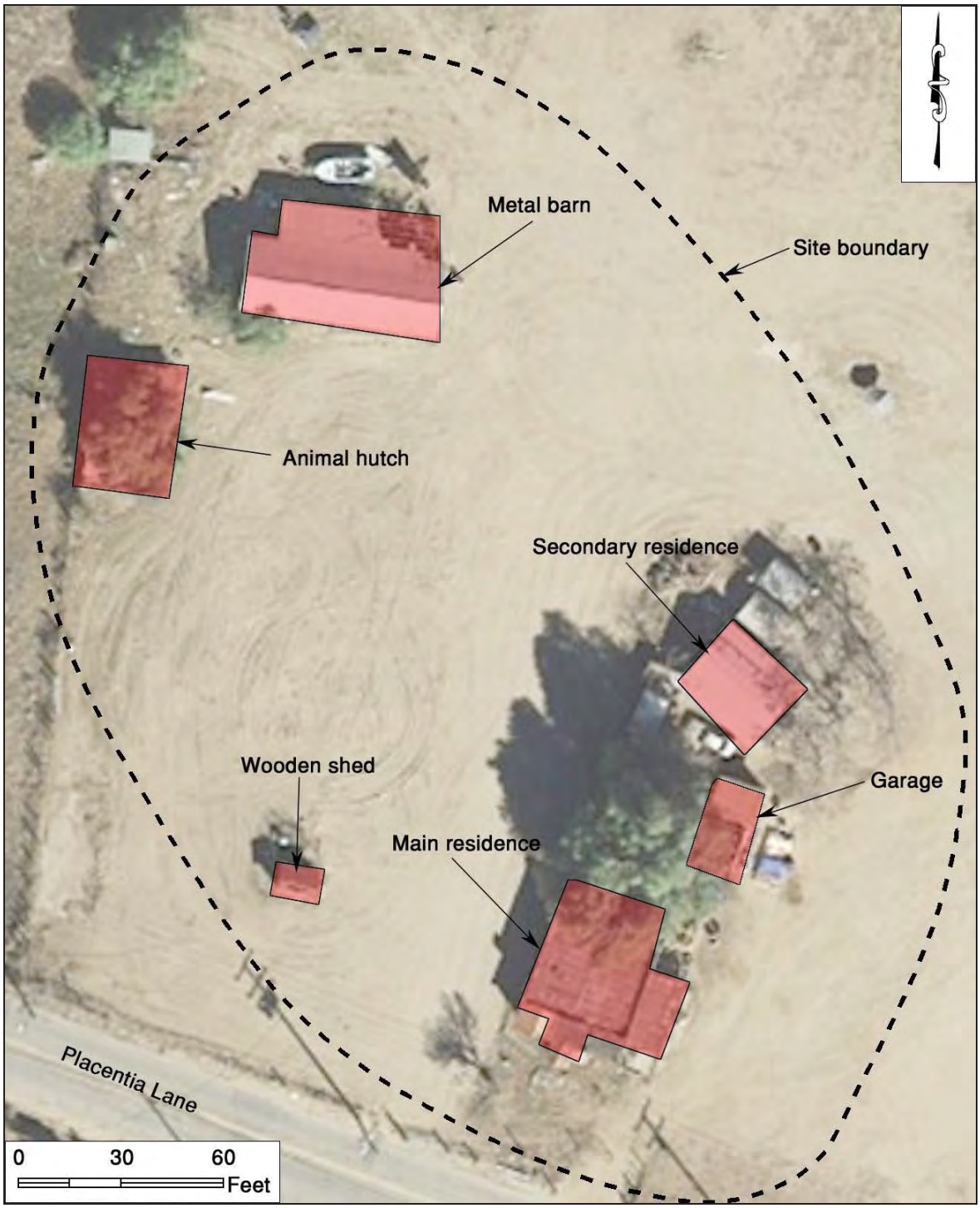
Buildings at Site 33-006973. *Clockwise from top left*: main residence, garage, secondary residence, metal barn, wooden shed, and animal hutch. (Photographs taken on March 12 and 30, 2015)

State of California--The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # 33-006973 (update)
HRI #
Trinomial

Page 4 of 4 **Resource name or #** (Assigned by recorder)

Recorded by: Terri Jacquemain
***Date:** March 30, 2015 ___ Continuation √ Update



Site Sketch map

DPR 523L (1/95) ***Required information**

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Geotechnical Engineering Investigation

Proposed Industrial Warehouse Development
Southeast Corner of Placentia Lane and Center Street
Riverside, California

Transition Properties L.P.
P.O. Box 1010
Blue Jay, California 92317

Attn.: Mr. Art Day

Project Number 17745-14
November 21, 2014

NorCal Engineering

Soils and Geotechnical Consultants
10641 Humbolt Street Los Alamitos, CA 90720
(562) 799-9469 Fax (562) 799-9459

November 21, 2014 Project Number 17745-14

Transition Properties L.P.
P.O. Box 1010
Blue Jay, California 92317

Attn.: Mr. Art Day

RE: **Geotechnical Engineering Investigation** - Proposed Industrial Warehouse Development - Located at the Southeast Corner of Placentia Lane and Center Street, in the City of Riverside, California

Dear Mr. Day:

Pursuant to your request, this firm has performed a Geotechnical Engineering Investigation in accordance with your authorization of our proposal dated July 10, 2014 for the above referenced project. The purpose of this investigation is to evaluate the subsurface conditions of the subject site and to provide recommendations for the proposed industrial warehouse development.

d

The scope of work included the following: 1) site reconnaissance; 2) subsurface geotechnical exploration and sampling; 3) laboratory testing; 4) engineering analysis of field and laboratory data; 5) and preparation of a geotechnical engineering report. It is the opinion of this firm that the proposed development is feasible from a geotechnical standpoint provided that the recommendations presented in this report are followed in the design and construction of the project.

1.0 Project Description

It is proposed to construct an industrial warehouse development consisting of a concrete tilt-up building totaling 308,000 square feet on the 15.63-acre subject property as shown on the attached Site Plan. The proposed concrete tilt-up building will be supported by a conventional slab-on-grade foundation system with perimeter-spread footings and isolated interior footings. Other improvements will consist of new concrete and/or asphalt pavement and hardscape. It is assumed that the proposed grading for the development will include minor cut and fill procedures. Final building plans shall be reviewed by this firm prior to submittal for city approval to determine the need for any additional study and revised recommendations pertinent to the proposed development, if necessary.

2.0 Site Description

The subject property is located at the southeast corner of Placentia Lane and Center Street, in the City of Riverside. The generally rectangular-shaped parcel is elongated in an east to west direction with topography of the relatively level property descending gradually from north to south on the order of a few feet. A majority of the site is currently undeveloped land covered with a low growth of vegetation cover consisting of natural grasses and weeds. The southeast corner of the site is occupied by a single family residence.

3.0 Site Exploration

The investigation consisted of the placement of eleven (11) subsurface exploratory trenches by a backhoe to depths ranging from 5 to 15 feet and (1) subsurface exploratory boring by a truckmounted hollowstem auger to a depth of 50 feet below current ground elevations. The explorations were visually classified and logged by a field engineer with locations of the subsurface explorations shown on the attached Site Plan. The exploratory excavations revealed the existing earth materials to consist of a disturbed top soil/fill and natural soil. A detailed description of the subsurface conditions are listed on the excavation logs in Appendix A.

Fill: A fill/disturbed soil classifying as brown, fine grained, silty SAND was encountered across the site and ranged in depth from 1 to 2 feet. These soils were noted to be loose and damp.

Natural: An undisturbed alluvium soil classifying as a brown, fine to medium grained, silty SAND was encountered beneath the upper surface soils. These native soils were observed to be medium dense and damp to moist. Deeper soils consisted of a light brown, fine to coarse grained, gravelly SAND, which were noted to be medium dense to dense and damp.

The overall engineering characteristics of the earth material were relatively uniform with each excavation. Groundwater was encountered at a depth of 31 feet below ground surface and some caving occurred in the deeper cohesionless soils.

4.0 Laboratory Tests

Relatively undisturbed samples of the subsurface soils were obtained to perform laboratory testing and analysis for direct shear, consolidation tests, and to determine in-place moisture/densities. These relatively undisturbed ring samples were obtained by driving a thin-walled steel sampler lined with one inch long brass rings with an inside diameter of 2.42 inches into the undisturbed soils.

Standard penetration tests were obtained by driving a steel sampler unlined with an inside diameter of 1.5 inches into the soils. This standard penetrometer sampler was driven a total of eighteen inches with blow counts tallied every six inches. Blow count data is given on the Boring Logs in Appendix A.

Bulk bag samples were obtained in the upper soils for expansion index tests and maximum density tests. Wall loadings on the order of 4,000 lbs./lin.ft. and maximum compression loads on the order of 100 kips were utilized for testing and design purposes. All test results are included in Appendix B, unless otherwise noted.

4.1 **Field moisture content** (ASTM: D 2216) and the dry density of the ring samples were determined in the laboratory. This data is listed on the logs of explorations.

4.2 **Maximum density tests** (ASTM: D-1557-07) were performed on typical samples of the upper soils. Results of these tests are shown on Table I.

4.3 **Expansion index tests** (ASTM: D 4829-07) were performed on remolded samples of the upper soils. Results of these tests are provided on Table II.

4.4 **Corrosion tests** consisting of sulfate, pH, resistivity and chloride analysis to determine potential corrosive effects of soils on concrete and underground utilities were performed in the laboratory. Test results are provided on Table III.

4.5 **R-Value test** per California Test Method 301 was performed on a representative sample, which may be anticipated to be near subgrade to determine pavement design. Result provided within pavement section design section of report.

4.6 **Direct shear tests** (ASTM: D-3080) were performed on undisturbed and disturbed samples of the subsurface soils. The test is performed under saturated conditions at loads of 1,000 lbs./sq.ft., 2,000 lbs./sq.ft., and 3,000 lbs./sq.ft. with results shown on Plates A and B.

4.7 **Consolidation tests** (ASTM: D-2435) were performed on undisturbed samples to determine the differential and total settlement which may be anticipated based upon the proposed loads. Water was added to the samples at a surcharge of one KSF and the settlement curves are plotted on Plates C to F.

5.0 Seismicity Evaluation

The proposed development lies just outside of the Alquist Priolo Special Studies Zone and the potential for damage due to direct fault rupture is considered very remote. The site is located in an area of high regional seismicity and the San Jacinto fault is located approximately 6 kilometers from the site. Ground shaking originating from earthquakes along other active faults in the region is expected to induce lower horizontal accelerations due to smaller anticipated earthquakes and/or greater distances to other faults.

The seismic design of the project has been updated to the latest 2010 ASCE 7-10 (with July 2013 errata) standards and the mapped seismic ground motions were provided by using the Java based program available from the United States Geological Survey (USGS) website: http://geohazards.usgs.gov/designmaps/us/application.php. The earthquake design parameters are in accordance with the 2013 California Building Code (CBC) and are listed below.

Seismic Design Parameters

Site Location	Latitude	34.019°
	Longitude	-117.356°
Site Class		D
Maximum Spectral Response Acceleration	S_S	1.524g
	S_1	0.657g
Adjusted Maximum Acceleration	S_{MS}	1.524g
	S_{M1}	0.985g
Design Spectral Response Acceleration Parameters	S_{DS}	1.016g
	S_{D1}	0.657g

6.0 Liquefaction Evaluation

The site is expected to experience ground shaking and earthquake activity that is typical of Southern California area. It is during severe ground shaking that loose, granular soils below the groundwater table can liquefy. A review of the exploratory boring log and the laboratory test results on selected soil samples obtained indicate the following soil classifications, field blowcounts and amounts of fines passing through the No. 200 sieve.

Field Blowcount and Gradation Data

Location	Classification	Blowcounts (blows/ft)	Relative Density	% Passing No. 200 Sieve
B-1 @ 5'	SM	10	Medium Dense	32
B-1 @ 10'	SM	7	Medium Dense	22
B-1 @ 15'	SM	23	Dense	12
B-1 @ 20'	SW	28	Dense	7
B-1 @ 25'	SM	32	Dense	18
B-1 @ 30'	SW	33	Dense	5
B-1 @ 35'	SW	35	Dense	4
B-1 @ 40'	SW	32	Dense	9
B-1 @ 45'	SM	34	Dense	17
B-1 @ 50'	SW	40	Dense	8

Our analysis indicates the potential for liquefaction at this site is considered to be low, due to the very dense granular soils below a historic groundwater depth of 30 feet, based on review of ground water maps of the Upper Santa Ana River Basin. (Carson and Matti, 1982). Seismic-induced settlements would be less than one inch and should occur rather uniformly across the site. Differential settlements from a nearby magnitude 6.7 earthquake would be one-half inch over a 100 feet (horizontal) distance in the building pad area. Thus, the design of the proposed construction in conformance with the latest Building Code provisions for earthquake design is expected to provide mitigation of ground shaking hazards that are typical to Southern California.

7.0 Conclusions and Recommendations

Based upon our evaluations, the proposed development is acceptable from a geotechnical engineering standpoint. By following the recommendations and guidelines set forth in our report, the structures will be safe from excessive settlements under the anticipated design loadings and conditions. The proposed development shall meet all requirements of the City Building Ordinance and will not impose any adverse effect on existing adjacent structures.

The following recommendations are based upon geotechnical conditions encountered in our field investigation and laboratory data. Therefore, these surface and subsurface conditions could vary across the site. Variations in these conditions may not become evident until the commencement of grading operations and any unusual conditions which may be encountered in the course of the project development may require the need for additional study and revised recommendations.

It is recommended that site inspections be performed by a representative of this firm during all grading and construction of the development to verify the findings and recommendations documented in this report. The following sections present a discussion of geotechnical related requirements for specific design recommendations of different aspects of the project.

7.1 Site Grading Recommendations

Any vegetation shall be removed and hauled from proposed grading areas prior to the start of grading operations. Existing vegetation shall not be mixed or disced into the soils. Any removed soils may be reutilized as compacted fill once any deleterious material or oversized materials (in excess of eight inches) is removed. Grading operations shall be performed in accordance with the attached "Specifications for Compacted Fill Operations".

7.1.1 Removal and Recompaction Recommendations

All upper fill/disturbed soils (about 1 to 2 feet) shall be removed to competent native material, the exposed surface scarified to a depth of six inches, brought to within 2% of optimum moisture content and compacted to a minimum of 90% of the laboratory standard (ASTM: D-1557-07) prior to placement of any additional compacted fill soils, foundations, slabs-on-grade and pavement. Grading shall extend a minimum of five horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

It is possible that isolated areas of undiscovered fill, not described in this report are present on site. If found, these areas should be treated as discussed earlier. A diligent search shall also be conducted during grading operations in an effort to uncover any underground structures, irrigation or utility lines. If encountered, these structures and lines shall be either removed or properly abandoned prior to the proposed construction.

Any imported fill material should be preferably soil similar to the upper soils encountered at the subject site. All soils shall be approved by this firm prior to importing at the site and will be subjected to additional laboratory testing to assure concurrence with the recommendations stated in this report.

Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase. Adequate drainage away from the structures, pavement and slopes should be provided at all times.

If placement of slabs-on-grade and pavement is not completed immediately upon completion of grading operations, additional testing and grading of the areas may be necessary prior to continuation of construction operations. Likewise, if adverse weather conditions occur which may damage the subgrade soils, additional assessment by the geotechnical engineer as to the suitability of the supporting soils may be needed.

7.1.2 Fill Blanket Recommendations

Due to the potential for differential settlement of foundations placed on compacted fill and the medium dense native materials, it is recommended that all foundations be underlain by a uniform compacted fill blanket at least two feet in thickness. This fill blanket shall extend a minimum of five horizontal feet outside the edges of foundations or equidistant to the depth of fill placed, whichever is greater.

7.2 **Shrinkage and Subsidence**

Results of our in-place density tests reveal that the soil shrinkage will be on the order of 10 to 15% due to excavation and recompaction, based upon the assumption that the fill is compacted to 92% of the maximum dry density per ASTM standards. Subsidence should be 0.2 feet due to earthwork operations. The volume change does not include any allowance for vegetation or organic stripping, removal of subsurface improvements or topographic approximations.

Although these values are only approximate, they represent our best estimate of lost yardage, which will likely occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field testing using the actual equipment and grading techniques should be conducted.

7.3 **Temporary Excavations**

Temporary unsurcharged excavations in the existing site materials less than 4 feet high may be made at a vertical gradient unless cohesionless soils are encountered. In areas where soils with little or no binder are encountered, where adverse geological conditions are exposed, or where excavations are adjacent to existing structures, shoring, slot-cutting, or flatter excavations may be required. The temporary cut slope gradients given do not preclude local raveling and sloughing. All excavations shall be made in accordance with the requirements of CAL-OSHA and other public agencies having jurisdiction. Care should be taken to provide or maintain adequate lateral support for all adjacent improvements and structures at all times during the grading operations and construction phase.

7.4 **Foundation Design**

All foundations may be designed utilizing the following safe bearing capacities for an embedded depth of 18 inches into approved fill materials with the corresponding widths:

Allowable Safe Bearing Capacity (psf)

Width (ft)	Continuous Foundation	Isolated Foundation
1.5	2000	2500
2.0	2050	2550
4.0	2300	2800
6.0	2500	3000

The bearing value may be increased by 500 psf for each additional foot of depth in excess of the 18-inch minimum depth, up to a maximum of 4,000 psf. A one third increase may be used when considering short term loading and seismic forces. Any foundations located along the property lines or where lateral overexcavation is not possible may utilize a safe bearing capacity of 1,500 psf. A representative of this firm shall inspect all foundation excavations prior to pouring concrete.

7.5 **Settlement Analysis**

Resultant pressure curves for the consolidation tests are shown on Plates C to F. Computations utilizing these curves and the recommended safe bearing capacities reveal that the foundations will experience settlements on the order of 3/4 inch and differential settlements of less than 1/4 inch.

7.6 **Lateral Resistance**

The following values may be utilized in resisting lateral loads imposed on the structure. Requirements of the California Building Code should be adhered to when the coefficient of friction and passive pressures are combined.

Coefficient of Friction – 0.40

Equivalent Passive Fluid Pressure = 250 lbs./cu.ft.

Maximum Passive Pressure = 2,500 lbs./cu.ft.

The passive pressure recommendations are valid only for approved compacted fill soils.

7.7 **Retaining Wall Design Parameters**

Active earth pressures against retaining wall will be equal to the pressures developed by the following fluid densities. These values are for **granular backfill material** placed behind the walls at various ground slopes above the walls.

Surface Slope of Retained Materials (Horizontal to Vertical)	Equivalent Fluid Density (lb./cu.ft.)
Level	30
5 to 1	35
4 to 1	38
3 to 1	40
2 to 1	45

Any applicable short-term construction surcharges and seismic forces should be added to the above lateral pressure values. A backfill zone of non-expansive material shall consist of a wedge beginning a minimum of one horizontal foot from the base of the wall extending upward at an inclination no less than 1/4 to 1 (horizontal to vertical). All walls shall be waterproofed as needed and protected from hydrostatic pressure by a reliable permanent subdrain system.

7.8 **Slab Design**

All concrete slabs-on-grade shall be at least four inches in office and six inches in warehouse and placed on approved subgrade soils. Additional reinforcement requirements and an increase in thickness of the slabs-on-grade may be necessary based upon soils expansion potential and proposed loading conditions in the structures and should be evaluated further by the project engineers and/or architect.

A vapor retarder should be utilized in areas which would be sensitive to the infiltration of moisture. This retarder shall meet requirements of ASTM E 96, *Water Vapor Transmission of Materials* and ASTM E 1745, *Standard Specification for Water Vapor Retarders used in Contact with Soil or Granular Fill Under Concrete Slabs.* The vapor retarder shall be installed in accordance with procedures stated in ASTM E 1643, *Standard practice for Installation of Water Vapor Retarders used in Contact with Earth or Granular Fill Under Concrete Slabs.*

The moisture retarder may be placed directly upon approved subgrade soils conditioned to optimum moisture levels, although one to two inches of sand beneath the membrane is desirable. The subgrade upon which the retarder is placed shall be smooth and free of rocks, gravel or other protrusions which may damage the retarder. Use of sand above the retarder is under the purview of the structural engineer; if sand is used over the retarder, it should be placed in a dry condition.

7.9 Pavement Section Design

The table below provides a preliminary pavement design based upon an R-Value of 47 for the proposed pavement areas. Final pavement design may need to be based on R-Value testing of the subgrade soils near the conclusion of rough grading to assure that these soils are consistent with those assumed in this preliminary design.

Type of Traffic	Traffic Index	Asphaltic Concrete (in)	Base Material (in)
Automobile Parking and Drive Circulation Areas	4.0/5.0	3.0	4.0
Heavy Truck Access Areas (GVW < 90,000 lbs.; 5 axle)	7.0	4.0	8.0

All concrete slabs to be utilized for pavement shall be a minimum of six inches in thickness and placed on approved subgrade soils. In addition, the above recommendations are based upon estimated traffic loads. Client should submit anticipated traffic loadings, when available, so that pavement sections may be reviewed to determine adequacy to support these loads.

All pavement areas shall have positive drainage toward an approved outlet from the site. Drain lines behind curbs and/or adjacent to landscape areas should be considered by client and the appropriate design engineers to prevent water from infiltrating beneath pavement. If such infiltration occurs, damage to pavement, curbs and flow lines, especially on sites with expansive soils, may occur during the life of the project.

Any approved base material shall consist of a Class II aggregate or equivalent and should be compacted to a minimum of 95% relative compaction. All pavement materials shall conform to the requirements set forth by the City of Riverside. The base material and asphaltic concrete should be tested prior to delivery to the site and during placement to determine conformance with the project specifications. A pavement engineer shall designate the specific asphalt mix design to meet the required project specifications.

7.10 Utility Trench and Excavation Backfill

Trenches from installation of utility lines and other excavations may be backfilled with on-site soils or approved imported soils compacted to a minimum of 90% relative compaction. All utility lines shall be properly bedded with clean sand having a sand equivalency rating of 30 (SE > 30) or more. This bedding material shall be thoroughly water jetted around the pipe structure prior to placement of compacted backfill soils.

7.11 Corrosion Design Criteria

Representative samples of the surficial soils, typical of the subgrade soils expected to be encountered within foundation excavations and underground utilities were tested for corrosion potential. Representative samples of the surficial soils, typical of the subgrade soils expected to be encountered within foundation excavations and underground utilities were tested for corrosion potential.

The minimum resistivity value obtained for the samples tested is representative of an environment that may be severely corrosive to metals. The soil pH value was considered mildly acidic and may not have a significant effect on soil corrosivity. Consideration should be given to corrosion protection systems for buried metal such as protective coatings, wrappings or the use of PVC where permitted by local building codes.

According to Table 4.3.1, ACI 318 Building Code and Commentary, these contents revealed negligible levels of sulfate exposure. Therefore, a Type II cement according to latest CBC specifications may be utilized for building foundations at this time. Additional sulfate tests shall be performed at the completion of site grading to assure that these soils are consistent with the recommendations stated in this design. Sulfate test results may be found on the attached Table III.

7.12 Expansive Soil

If any expansive soils are encountered, special attention should be given to the project design and maintenance. The attached *Expansive Soil Guidelines* should be reviewed by the engineers, architects, owner, maintenance personnel and other interested parties and considered during the design of the project and future property maintenance.

8.0 Closure

The recommendations and conclusions contained in this report are based upon the soil conditions uncovered in our test excavations. No warranty of the soil condition between our excavations is implied. NorCal Engineering should be notified for possible further recommendations if unexpected to unfavorable conditions are encountered during construction phase. It is the responsibility of the owner to ensure that all information within this report is submitted to the Architect and appropriate Engineers for the project. This firm should have the opportunity to review the final plans to verify that all our recommendations are incorporated. This report and all conclusions are subject to the review of the controlling authorities for the project.

A preconstruction conference should be held between the developer, general contractor, grading contractor, city inspector, architect, and soil engineer to clarify any questions relating to the grading operations and subsequent construction. Our representative should be present during the grading operations and construction phase to certify that such recommendations are complied within the field.

This geotechnical investigation has been conducted in a manner consistent with the level of care and skill exercised by members of our profession currently practicing under similar conditions in the Southern California area. No other warranty, expressed or implied is made.

We appreciate this opportunity to be of service to you. If you have any further questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
NORCAL ENGINEERING

Keith D. Tucker
Project Engineer
R.G.E. 841

REGISTERED PROFESSIONAL ENGINEER
KEITH D. TUCKER
No. 841
Exp. 12/31/14
GEOTECHNICAL
STATE OF CALIFORNIA

Scott D. Spensiero
Project Manager

SPECIFICATIONS FOR PLACEMENT OF COMPACTED FILL

Excavation

Any existing low-density soils and/or saturated soils shall be removed to competent natural soil under the inspection of the Soils Engineering Firm. After the exposed surface has been cleansed of debris and/or vegetation, it shall be scarified until it is uniform in consistency, brought to the proper moisture content and compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557). In any area where a transition between fill and native soil or between bedrock and soil are encountered or other areas as required in this report, additional excavation beneath foundations and slabs will be necessary in order to provide uniform support and avoid differential settlement of the structure. Verification of elevations during this work and all grading operations will be the responsibility of the owner or his designated representative and not NorCal Engineering.

Material For Fill

The on-site soils or approved import soils may be utilized for the compacted fill provided they are free of any deleterious materials and shall not contain any rocks, brick, asphaltic concrete, concrete or other hard materials greater than eight inches in maximum dimensions. Any import soil must be approved by the Soils Engineering firm a minimum of 24 hours prior to importation of site.

Placement of Compacted Fill Soils

The approved fill soils shall be placed in layers not excess of six inches in thickness. Each lift shall be uniform in thickness and thoroughly blended. The fill soils shall be brought to within 2% of the optimum moisture content, unless otherwise specified by the Soils Engineering firm. Each lift shall be compacted to a minimum of 90% relative compaction (in accordance with ASTM: D-1557) and approved prior to the placement of the next layer of soil. Compaction tests shall be obtained at the discretion of the Soils Engineering firm but to a minimum of one test for every 500 cubic yards placed and/or for every 2 feet of compacted fill placed.

The minimum relative compaction shall be obtained in accordance with accepted methods in the construction industry. The final grade of the structural areas shall be in a dense and smooth condition prior to placement of slabs-on-grade or pavement areas. No fill soils shall be placed, spread or compacted during unfavorable weather conditions. When the grading is interrupted by heavy rains, compaction operations shall not be resumed until approved by the Soils Engineering firm.

Grading Observations

The controlling governmental agencies should be notified prior to commencement of any grading operations. This firm recommends that the grading operations be conducted under the observation of a Soils Engineering firm as deemed necessary. A 24 hour notice must be provided to this firm prior to the time of our initial inspection.

Observation shall include the clearing and grubbing operations to assure that all unsuitable materials have been properly removed; approve the exposed subgrade in areas to receive fill and in areas where excavation has resulted in the desired finished grade and designate areas of overexcavation; and perform field compaction tests to determine relative compaction achieved during fill placement. In addition, all foundation excavations shall be observed by the Soils Engineering firm to confirm that appropriate bearing materials are present at the design grades and recommend any modifications to construct footings.

Expansive Soil Guidelines

The following expansive soil guidelines are provided for your project. The intent of these guidelines is to inform you, the client, of the importance of proper design and maintenance of projects supported on expansive soils. ***You, as the owner or other interested party, should be warned that you have a duty to provide the information contained in the soil report including these guidelines to your design engineers, architects, landscapers and other design parties in order to enable them to provide a design that takes into consideration expansive soils.***

In addition, you should provide the soil report with these guidelines to any property manager, lessee, property purchaser or other interested party that will have or assume the responsibility of maintaining the development in the future.

Expansive soils are fine-grained silts and clays which are subject to swelling and contracting. The amount of this swelling and contracting is subject to the amount of fine-grained clay materials present in the soils and the amount of moisture either introduced or extracted from the soils. Expansive soils are divided into five categories ranging from "very low" to "very high". Expansion indices are assigned to each classification and are included in the laboratory testing section of this report. *If the expansion index of the soils on your site, as stated in this report, is 21 or higher, you have expansive soils.* The classifications of expansive soils are as follows:

Classification of Expansive Soil*

Expansion Index	Potential Expansion
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
Above 130	Very High

*From Table 18A-I-B of California Building Code (1988)

When expansive soils are compacted during site grading operations, care is taken to place the materials at or slightly above optimum moisture levels and perform proper compaction operations. Any subsequent excessive wetting and/or drying of expansive soils will cause the soil materials to expand and/or contract. These actions are likely to cause distress of foundations, structures, slabs-on-grade, sidewalks and pavement over the life of the structure. ***It is therefore imperative that even after construction of improvements, the moisture contents are maintained at relatively constant levels, allowing neither excessive wetting or drying of soils.***

Evidence of excessive wetting of expansive soils may be seen in concrete slabs, both interior and exterior. Slabs may lift at construction joints producing a trip hazard or may crack from the pressure of soil expansion. Wet clays in foundation areas may result in lifting of the structure causing difficulty in the opening and closing of doors and windows, as well as cracking in exterior and interior wall surfaces. In extreme wetting of soils to depth, settlement of the structure may eventually result. Excessive wetting of soils in landscape areas adjacent to concrete or asphaltic pavement areas may also result in expansion of soils beneath pavement and resultant distress to the pavement surface.

Excessive drying of expansive soils is initially evidenced by cracking in the surface of the soils due to contraction. Settlement of structures and on-grade slabs may also eventually result along with problems in the operation of doors and windows.

Projects located in areas of expansive clay soils will be subject to more movement and "hairline" cracking of walls and slabs than similar projects situated on non-expansive sandy soils. There are, however, measures that developers and property owners may take to reduce the amount of movement over the life the development. The following guidelines are provided to assist you in both design and maintenance of projects on expansive soils:

- Drainage away from structures and pavement is essential to prevent excessive wetting of expansive soils. Grades of at least 3% should be designed and maintained to allow flow of irrigation and rain water to approved drainage devices or to the street. Any "ponding" of water adjacent to buildings, slabs and pavement after rains is evidence of poor drainage; the installation of drainage devices or regrading of the area may be required to assure proper drainage. Installation of rain gutters is also recommended to control the introduction of moisture next to buildings. Gutters should discharge into a drainage device or onto pavement which drains to roadways.

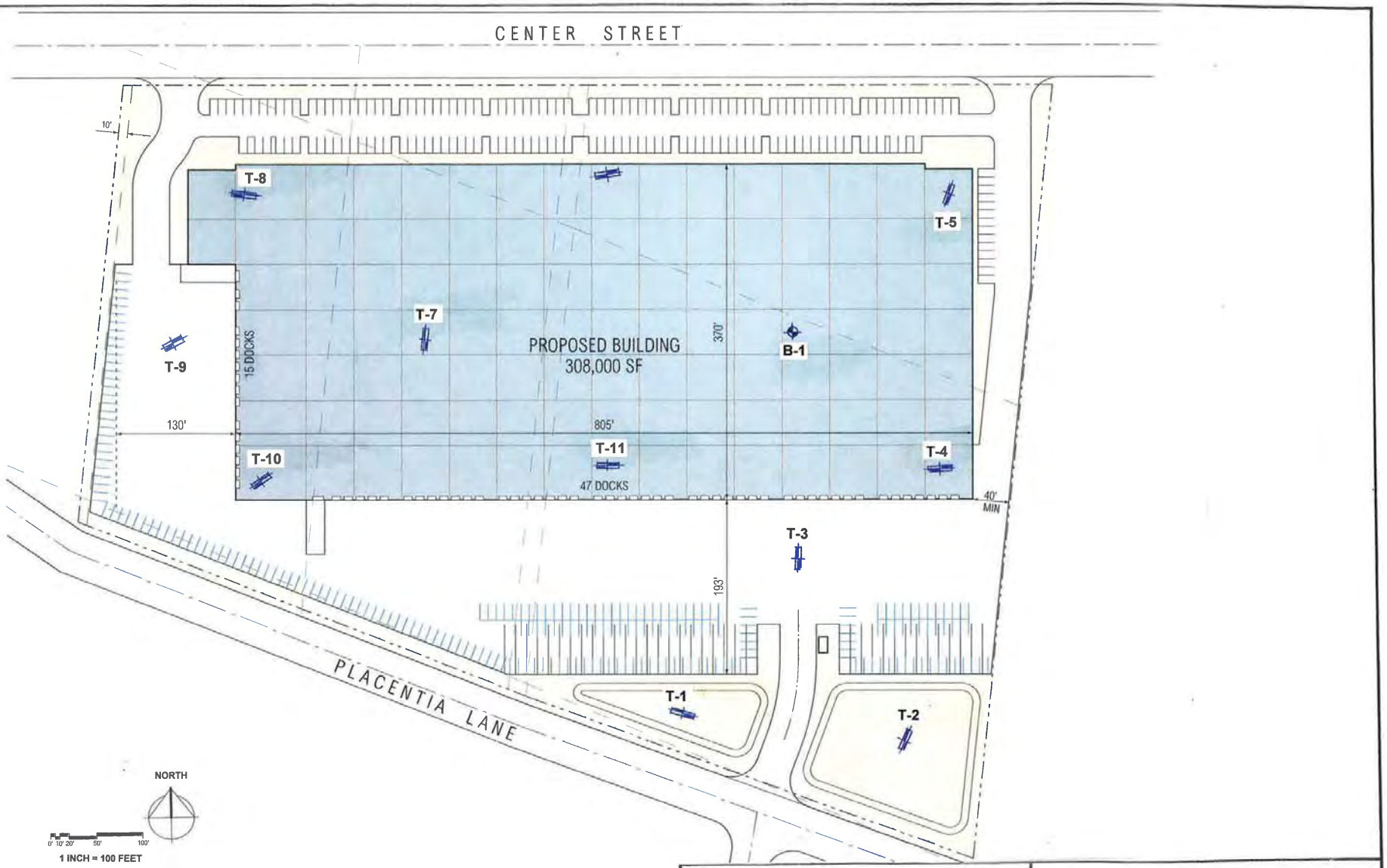
- Irrigation should be strictly controlled around building foundations, slabs and pavement and may need to be adjusted depending upon season. This control is essential to maintain a relatively uniform moisture content in the expansive soils and to prevent swelling and contracting. Over-watering adjacent to improvements may result in damage to those improvements. NorCal Engineering makes no specific recommendations regarding landscape irrigation schedules.

- Planting schemes for landscaping around structures and pavement should be analyzed carefully. Plants (including sod) requiring high amounts of water may result in excessive wetting of soils. Trees and large shrubs may actually extract moisture from the expansive soils, thus causing contraction of the fine-grained soils.

- Thickened edges on exterior slabs will assist in keeping excessive moisture from entering directly beneath the concrete. A six-inch thick or greater deepened edge on slabs may be considered. Underlying interior and exterior slabs with 6 to 12 inches or more of non-expansive soils and providing presaturation of the underlying clayey soils as recommended in the soil report will improve the overall performance of on-grade slabs.

- Increase the amount of steel reinforcing in concrete slabs, foundations and other structures to resist the forces of expansive soils. The precise amount of reinforcing should be determined by the appropriate design engineers and/or architects.

- Recommendations of the soil report should always be followed in the development of the project. Any recommendations regarding presaturation of the upper subgrade soils in slab areas should be performed in the field and verified by the Soil Engineer.



NorCal Engineering
SOILS AND GEOTECHNICAL CONSULTANTS

PROJECT 17745-14 | DATE NOVEMBER 2014

SITE PLAN

List of Appendices

(in order of appearance)

Appendix A - Log of Excavations

- Log of Boring B-1
- Log of Trenches T-1 to T-11

- **Appendix B - Laboratory Tests**
- Table I - Maximum Dry Density
- Table II – Expansion
- Table III - Corrosion

- Plates A and B - Direct Shear
- Plates C to F – Consolidation

Appendix A

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL, SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS — MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINE (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

UNIFIED SOIL CLASSIFICATION SYSTEM

KEY:

- Indicates 2.5-inch Inside Diameter. Ring Sample.
- Indicates 2-inch OD Split Spoon Sample (SPT).
- Indicates Shelby Tube Sample.
- Indicates No Recovery.
- Indicates SPT with 140# Hammer 30 in. Drop.
- Indicates Bulk Sample.
- Indicates Small Bag Sample.
- Indicates Non-Standard
- Indicates Core Run.

COMPONENT PROPORTIONS

DESCRIPTIVE TERMS	RANGE OF PROPORTION
Trace	1 - 5%
Few	5 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5mm) to No. 200 (0.074mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
DAMP	Some perceptible moisture; below optimum
MOIST	No visible water; near optimum moisture content
WET	Visible free water, usually soil is below water table.

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N -VALUE

COHESIONLESS SOILS		COHESIVE SOILS		
Density	N (blows/ft)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	Very Soft	0 to 2	< 250
Loose	4 to 10	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	Very Stiff	15 to 30	2000 - 4000
		Hard	over 30	> 4000

Transition Partners, L.P. 17745-14	Log of Boring B-1
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: 31'
Drilling Method: Simco 2800HS	
Hammer Weight: 140 lbs	Drop: 30"
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, damp					
		NATURAL Silty (fine grained) SAND Brown, medium dense, damp to moist					
5			⊠	4/5/5	2.7		32
10			⊠	3/3/4	10.0		22
		Gravelly (fine to coarse grained) SAND Light brown, medium dense to dense, wet; slightly silty					
15			⊠	10/11/12	3.6		12
20			⊠	11/13/15	7.1		7
25			⊠	13/15/18	8.2		18
30		Groundwater @ 31' bgs	⊠	12/13/20	4.8		5
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\17745-14.log Date: 11/19/2014

NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Boring B-1
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: 31'
Drilling Method: Simco 2800HS	
Hammer Weight: 140 lbs	Drop: 30"
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
35		Gravelly (fine to coarse grained) SAND Light brown, medium dense to dense, wet; slightly silty		15/17/18	16.9		4
40				11/15/17	19.2		9
45				14/15/19	25.7		17
50				16/18/22	21.7		8
		Groundwater @ 31' bgs Boring completed at depth of 51.5'					
55							
60							
65							
70							

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NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-1
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine grained) SAND Brown, medium dense, damp					
5		Boring completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

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NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-2
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine grained) SAND Brown, medium dense, damp					
5							
		Gravelly (fine to coarse grained) SAND Light brown, medium dense, damp					
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

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NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-3
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	% Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine to medium grained) SAND Brown to light brown, medium dense, damp					
5		Boring completed at depth of 5'					
10							
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CiviliTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\17745-14.log Date: 11/19/2014

NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-4
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets	■		2.1	97.4	
		NATURAL Silty (fine grained) SAND Brown, medium dense, slightly damp	▽				
5		Silty (fine to medium grained) SAND Light brown, medium dense, damp; slightly silty	■		1.6	101.2	
		Silty (fine grained) SAND Brown, medium dense, moist					
10		Boring completed at depth of 10'	■		9.8	96.3	
15							
20							
25							
30							
35							

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Transition Partners, L.P. 17745-14	Log of Trench T-5
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine grained) SAND Brown, medium dense, damp					
5		Silty (fine to medium grained) SAND Light brown, medium dense, damp; slightly silty	■		5.4	100.8	
10			■		5.9	103.7	
15		Boring completed at depth of 15'	■		3.6	104.8	
20							
25							
30							
35							

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\17745-14.log Date: 11/19/2014

NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-6
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine grained) SAND Brown, medium dense, damp	■		3.7	99.1	
5		Gravelly (medium to coarse grained) SAND Light brown, medium dense, slightly damp; slightly silty					
			■		1.7	101.7	
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\17745-14.log Date: 11/19/2014

NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-7
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

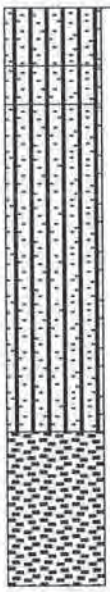
Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine to medium grained) SAND Brown to light brown, medium dense, damp	■		3.1	102.2	
5			■		2.7	104.0	
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

GWT not encountered

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\PROJECT\17745-14.log Date: 11/19/2014

NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-8
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	



Depth (feet)	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0	FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets	■		2.6	98.8	
	NATURAL Silty (fine grained) SAND Brown, medium dense, damp					
5	Silty (fine to medium grained) SAND Light brown, medium dense, damp	■		1.4	105.7	
10		■		2.5	97.1	
	Gravelly (fine to coarse grained) SAND Light brown, medium dense, damp; slightly silty with occasional cobbles					
15	Boring completed at depth of 15'	■		2.5	108.1	
20						
25						
30						
35						

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Transition Partners, L.P. 17745-14	Log of Trench T-9
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine to medium grained) SAND Brown, medium dense, damp					
5		Boring completed at depth of 7'					
10							
15							
20							
25							
30							
35							

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Transition Partners, L.P. 17745-14	Log of Trench T-10
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples: Type	Samples: Blow Counts	Laboratory: Moisture	Laboratory: Dry Density	Laboratory: % Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine to medium grained) SAND Brown, medium dense, damp	■		1.9	97.7	
5		GWT not encountered					
		Gravelly (fine to coarse grained) SAND Light brown, medium dense, damp; slightly silty	■		2.2	101.1	
10		Boring completed at depth of 10'					
15							
20							
25							
30							
35							

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NorCal Engineering

Transition Partners, L.P. 17745-14	Log of Trench T-11
Boring Location: Placentia & Center, Riverside	
Date of Drilling: 11/6/14	Groundwater Depth: None Encountered
Drilling Method: Backhoe	
Hammer Weight:	Drop:
Surface Elevation: Not Measured	

Depth (feet)	Lith-ology	Material Description	Samples		Laboratory		
			Type	Blow Counts	Moisture	Dry Density	% Passing 200 Sieve
0		FILL Silty (fine grained) SAND Brown, loose, dry; with occasional gravel and rootlets					
		NATURAL Silty (fine grained) SAND Brown, medium dense, damp	■		1.7	102.5	
5		GWT not encountered Boring completed at depth of 5'					
			■		1.4	109.0	
10							
15							
20							
25							
30							
35							

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Appendix B

TABLE I
MAXIMUM DENSITY TESTS

Sample	Classification	Optimum Moisture	Maximum Dry Density (lbs./cu.ft.)
T-4 @ 2'	Silty SAND	11.0	123.0
T-8 @ 2'	Silty SAND	10.0	120.0

TABLE II
EXPANSION INDEX TESTS

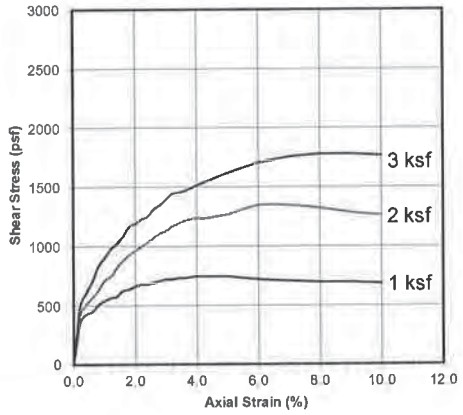
Soil Type	Classification	Expansion Index
T-4 @ 2'	Silty SAND	7
T-8 @ 2'	Silty SAND	3

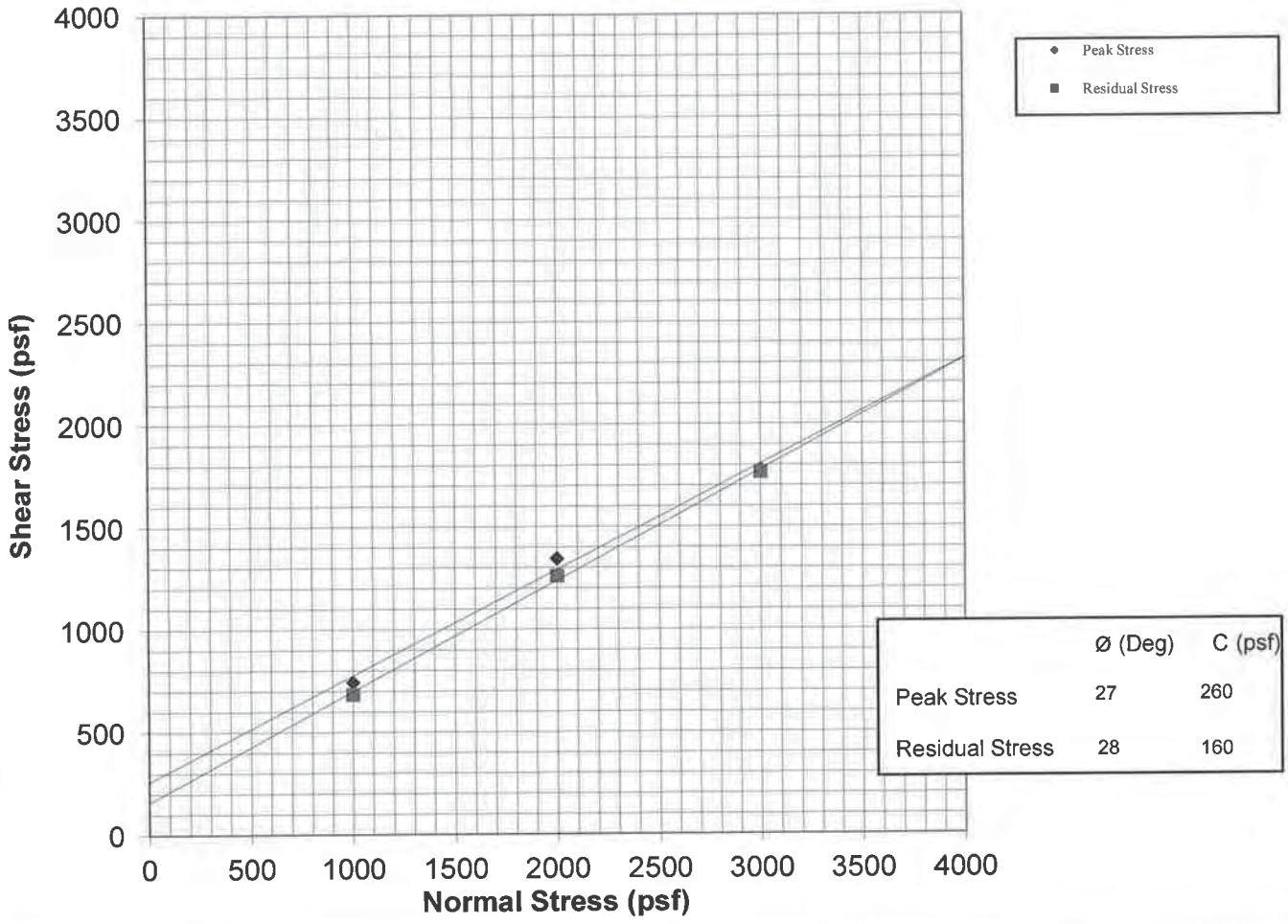
TABLE III
CORROSION TESTS

Sample	pH	Electrical Resistivity (ohm-cm)	Sulfate (%)	Chloride (ppm)
T-4 @ 2'	6.7	1,397	0.006	254
T-8 @ 2'	6.7	1,986	0.008	213

ND denotes not detected
% by weight
ppm – mg/kg

Sample No.		T4@2'		
Sample Type:		Undisturbed/Saturated		
Soil Description:		Silty Fine-Medium Grained Sand w/ Some Small Gravel		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	744	1344	1776
Displacement	(in)	0.100	0.150	0.200
Residual Stress	(psf)	684	1260	1764
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	98.7	98.7	98.7
In Situ Water Content	(%)	1.8	1.8	1.8
Saturated Water Content	(%)	26.3	26.3	26.3
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Deg)	C (psf)
Peak Stress	27	260
Residual Stress	28	160

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SOILS AND GEOTECHNICAL CONSULTANTS

Transition Properties, LP

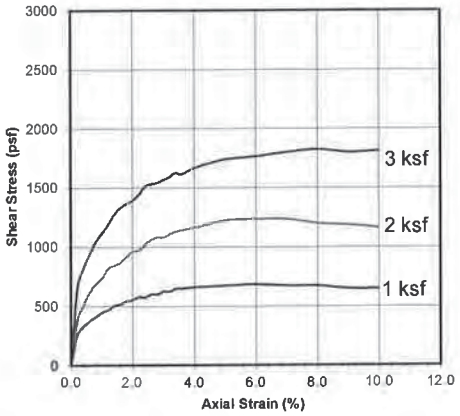
PROJECT NUMBER: 17745-14 DATE: 11/21/2014

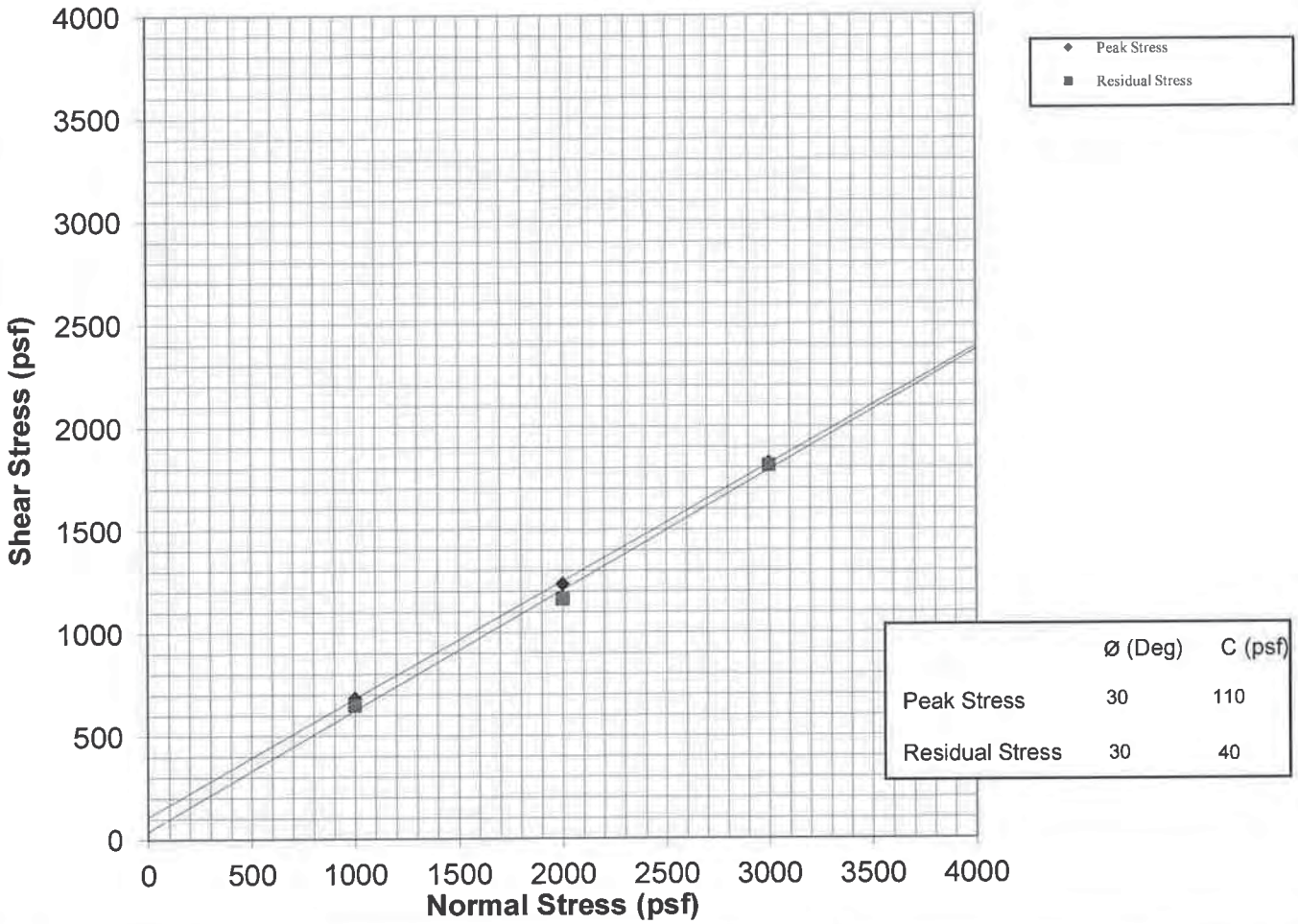
DIRECT SHEAR TEST

ASTM D3080

Plate A

Sample No.		T8@2'		
Sample Type:		Undisturbed/Saturated		
Soil Description:		Silty Fine-Medium Grained Sand		
		1	2	3
Normal Stress	(psf)	1000	2000	3000
Peak Stress	(psf)	684	1236	1824
Displacement	(in.)	0.150	0.150	0.200
Residual Stress	(psf)	648	1164	1812
Displacement	(in.)	0.250	0.250	0.250
In Situ Dry Density	(pcf)	98.8	98.8	98.8
In Situ Water Content	(%)	2.6	2.6	2.6
Saturated Water Content	(%)	26.1	26.1	26.1
Strain Rate	(in/min)	0.020	0.020	0.020





	Ø (Deg)	C (psf)
Peak Stress	30	110
Residual Stress	30	40

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Transition Properties, LP

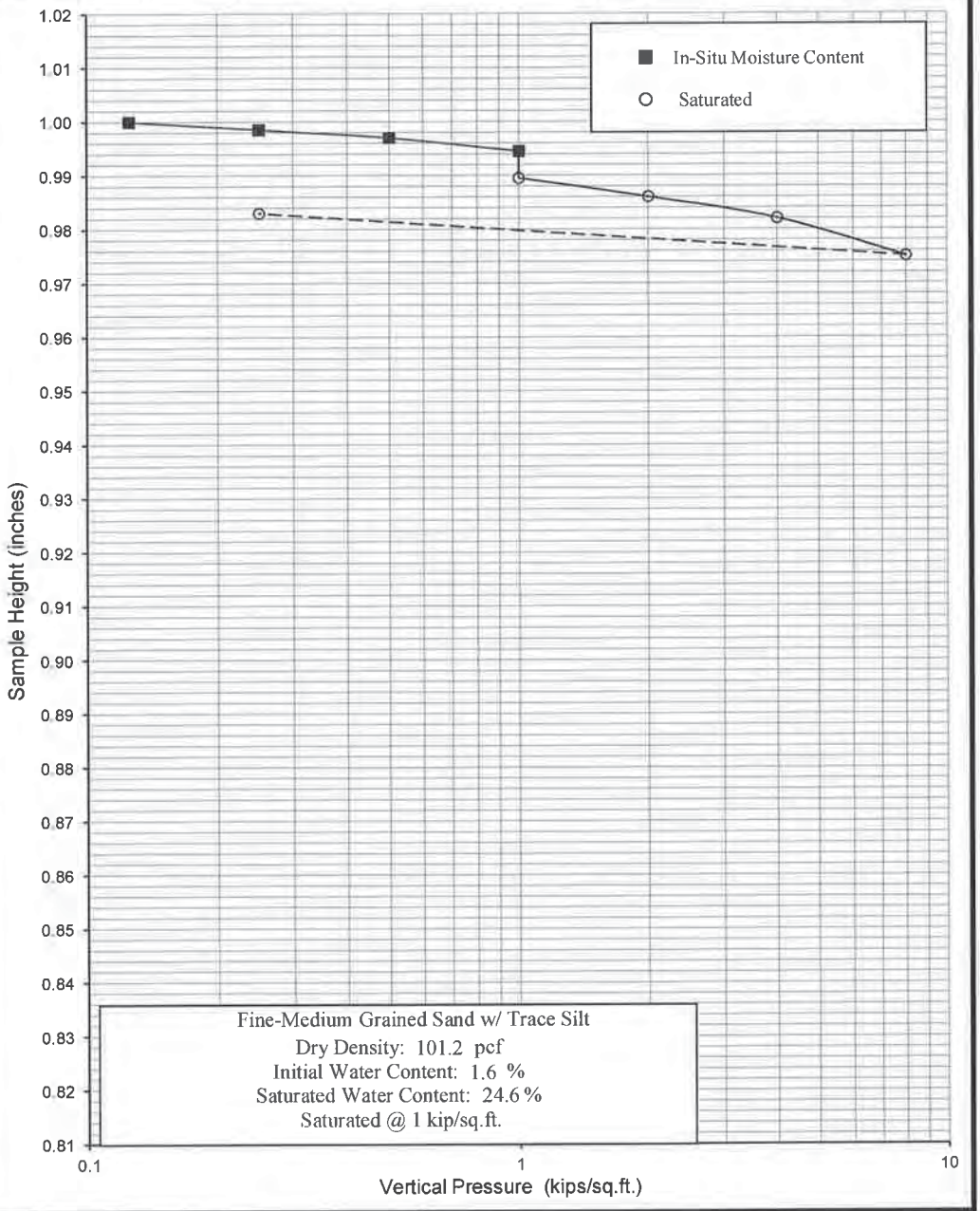
PROJECT NUMBER: 17745-14 DATE: 11/21/2014

DIRECT SHEAR TEST
ASTM D3080
Plate B

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9985	0.2	
0.5	0.9970	0.3	
1	0.9945	0.6	
1	0.9895	1.1	Saturated
2	0.9860	1.4	
4	0.9820	1.8	
8	0.9750	2.5	
0.25	0.9830	1.7	

Date Tested:	**11/18/2014**
Sample:	**T4**
Depth:	**5'**

Sample No.	T4	Depth	5'	Date	11/21/2014



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SOILS AND GEOTECHNICAL CONSULTANTS

Transition Properties, LP

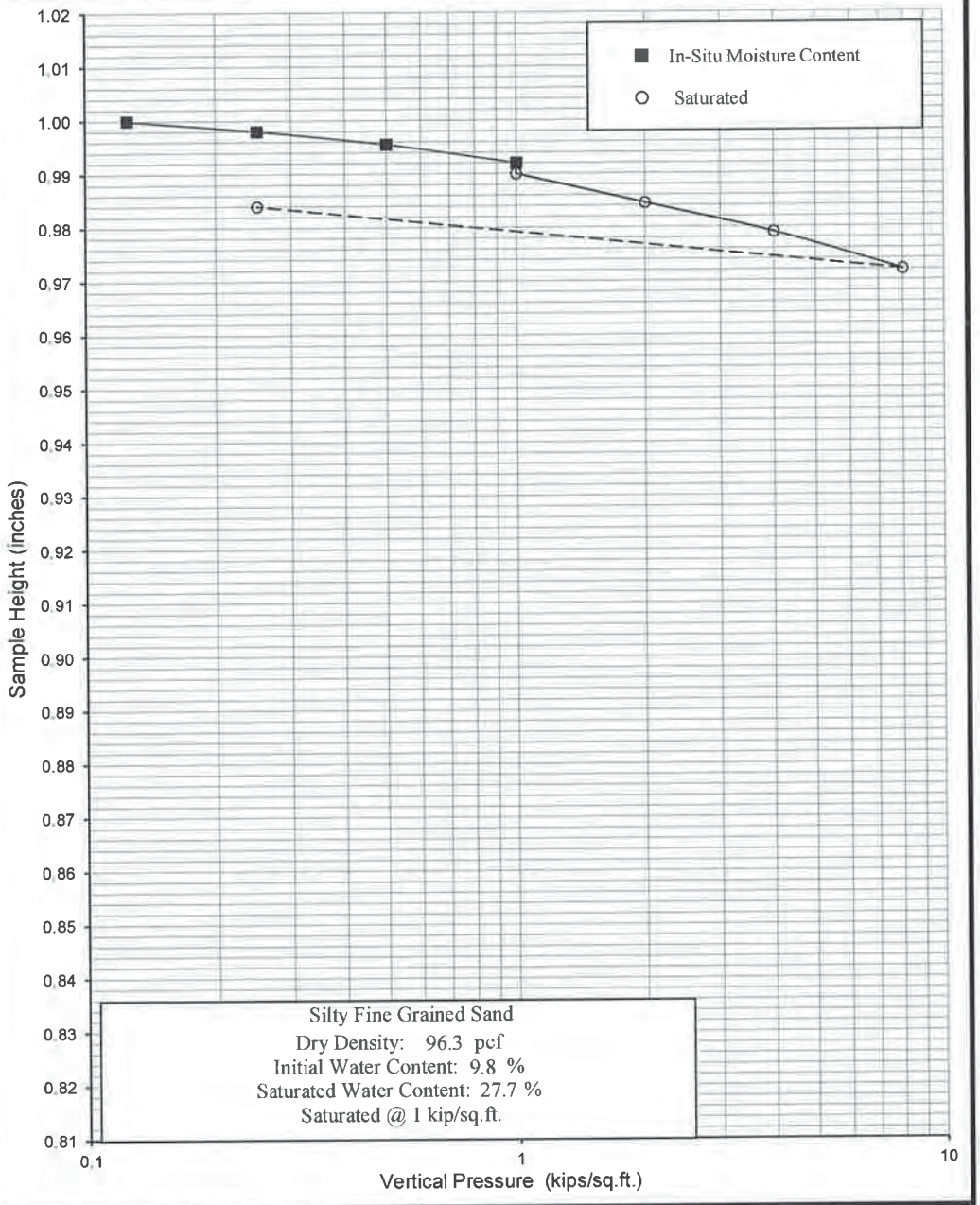
PROJECT NUMBER: 17745-14 DATE: 11/21/2014

CONSOLIDATION TEST
ASTM D2435
Plate C

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9980	0.2	
0.5	0.9955	0.4	
1	0.9920	0.8	
1	0.9900	1.0	Saturated
2	0.9845	1.6	
4	0.9790	2.1	
8	0.9720	2.8	
0.25	0.9840	1.6	

Date Tested:	**11/18/2014**
Sample:	**T4**
Depth:	**10'**

Sample No.	T4	Depth	10'	Date	11/21/2014



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SOILS AND GEOTECHNICAL CONSULTANTS

Transition Properties, LP

PROJECT NUMBER: 17745-14 DATE: 11/21/2014

CONSOLIDATION TEST

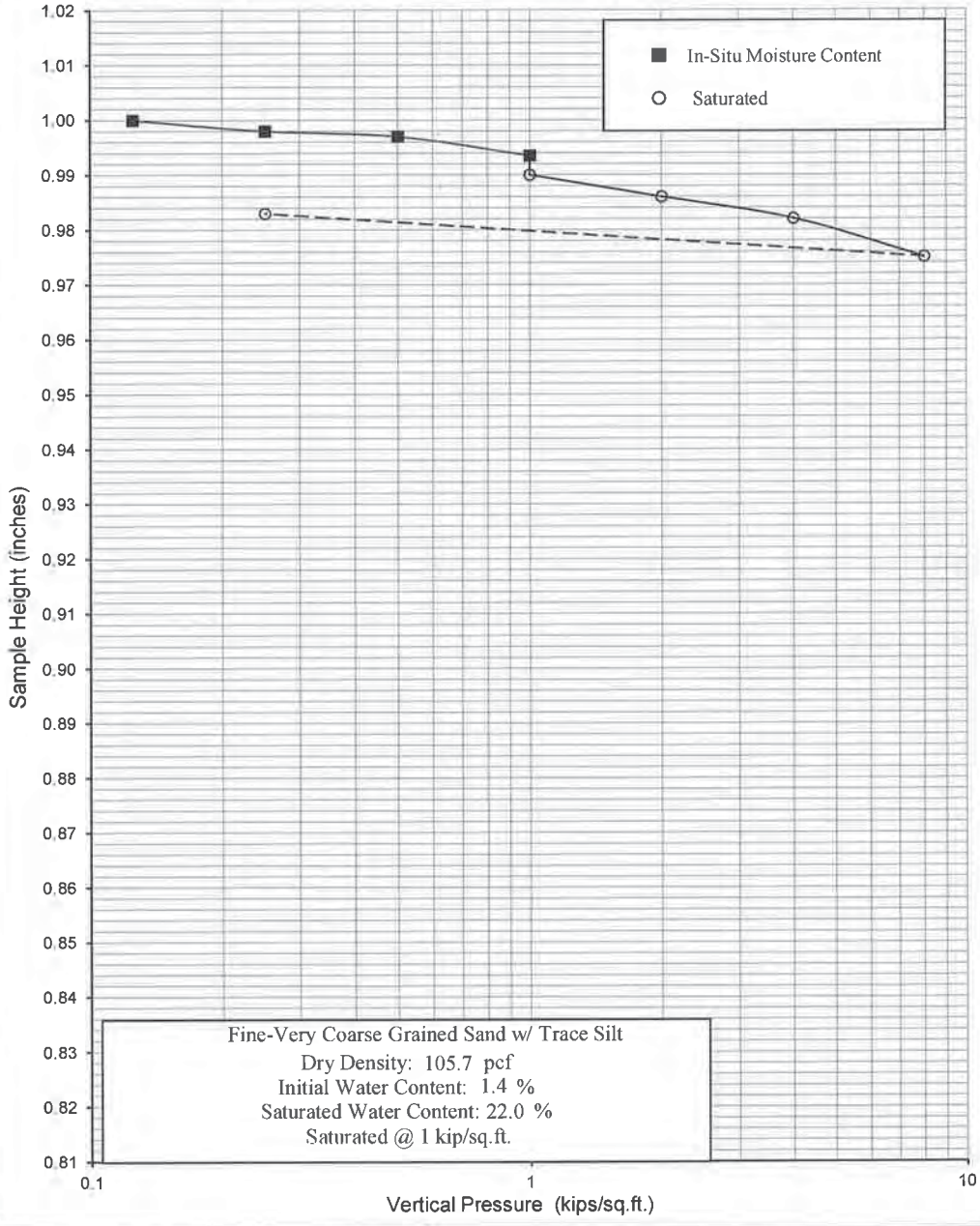
ASTM D2435

Plate D

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9980	0.2	
0.5	0.9970	0.3	
1	0.9935	0.6	
1	0.9900	1.0	
2	0.9860	1.4	
4	0.9820	1.8	
8	0.9750	2.5	
0.25	0.9830	1.7	Saturated

Sample No.	T8	Depth	5'	Date	11/21/2014

Date Tested: 11/19/2014
Sample: T8
Depth: 5'



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Transition Properties, LP

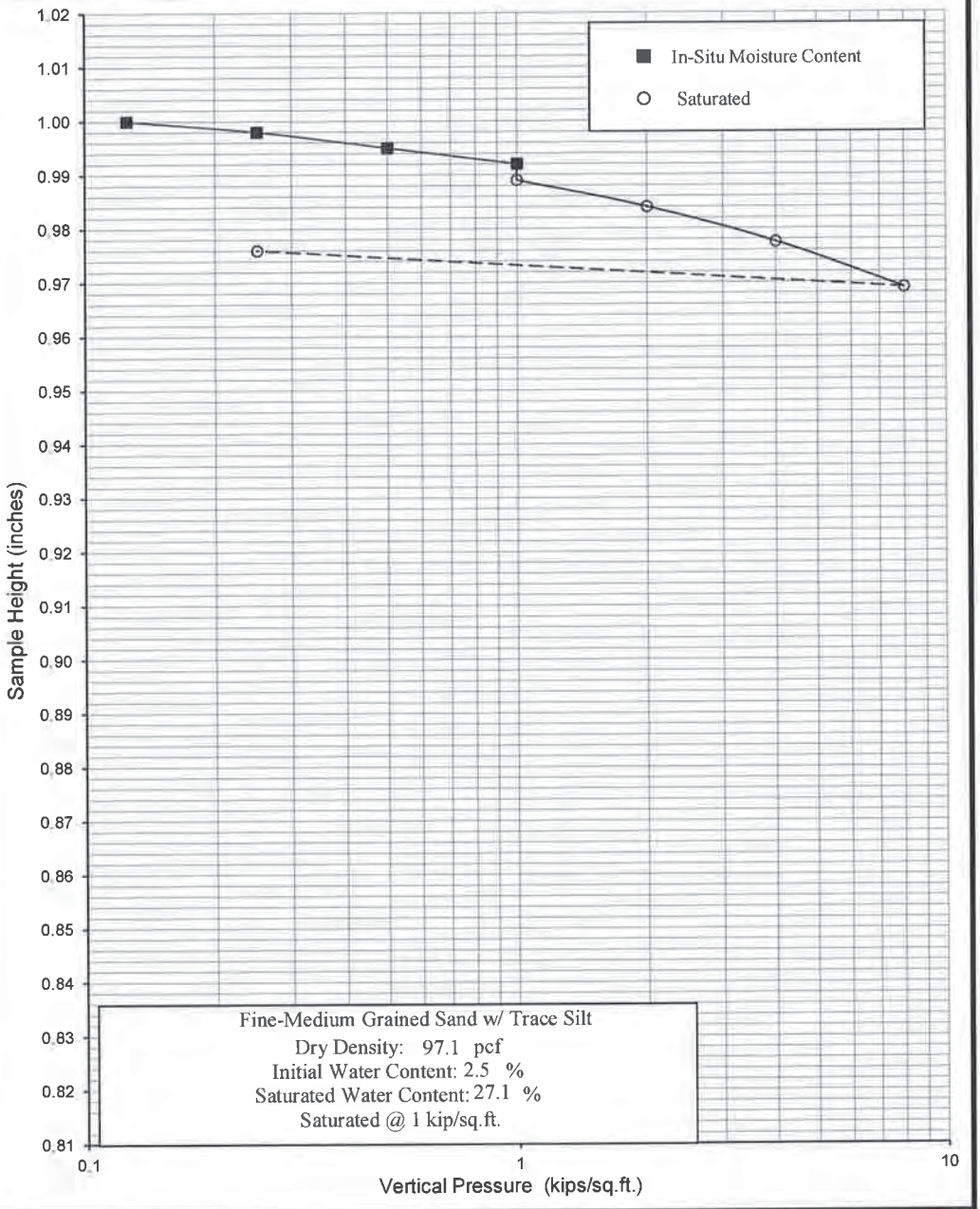
PROJECT NUMBER: 17745-14 DATE: 11/21/2014

CONSOLIDATION TEST
ASTM D2435
Plate E

Vertical Pressure (kips/sq.ft.)	Sample Height (inches)	Consolidation (percent)	
0.125	1.0000	0.0	
0.25	0.9980	0.2	
0.5	0.9950	0.5	
1	0.9920	0.8	
1	0.9890	1.1	Saturated
2	0.9840	1.6	
4	0.9775	2.3	
8	0.9690	3.1	
0.25	0.9760	2.4	

Sample No.	T8	Depth	10'	Date	11/21/2014

Date Tested: 11/19/2014
Sample: T8
Depth: 10'



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SOILS AND GEOTECHNICAL CONSULTANTS

Transition Properties, LP

PROJECT NUMBER: 17745-14 DATE: 11/21/2014

CONSOLIDATION TEST

ASTM D2435

Plate F

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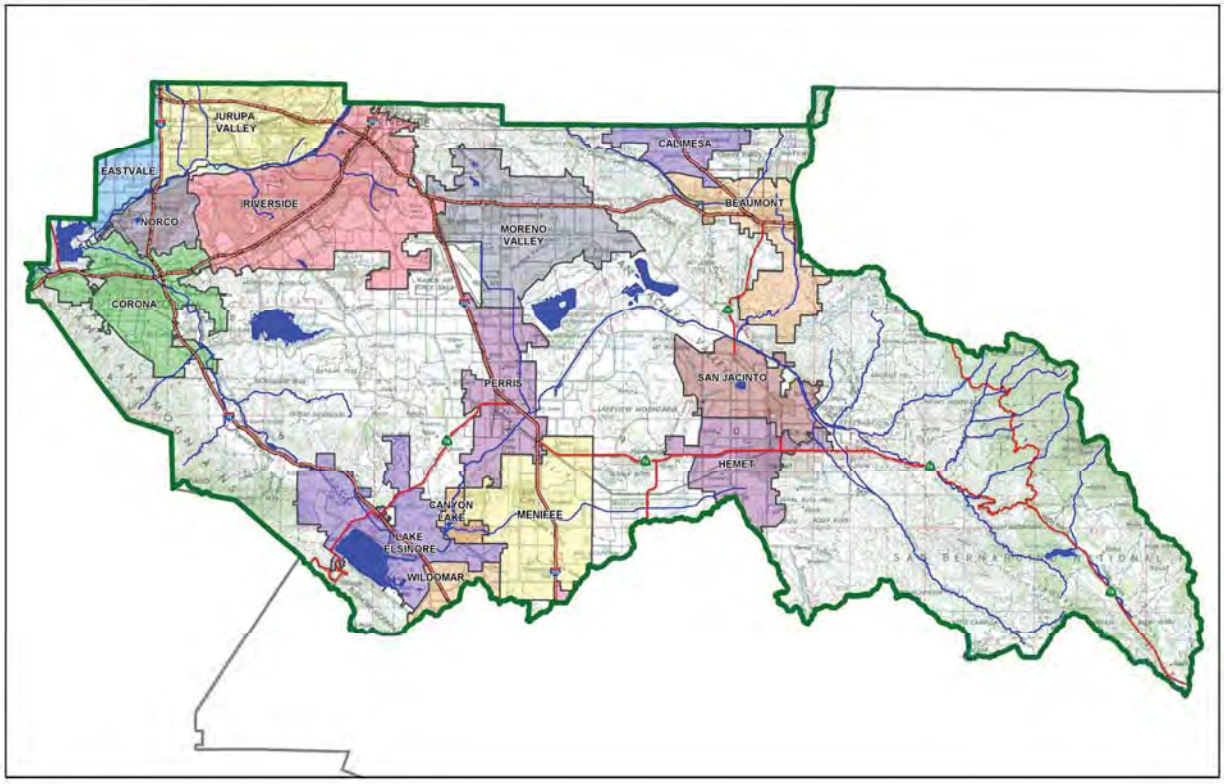
Project Specific Water Quality Management Plan

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

Project Title: Center Street Industrial Block

Public Works No: _____

Design Review/Case No: P14-1033



☒ **Preliminary**
☐ **Final**

Original Date Prepared: October 9, 2014

Revision Date(s): N/A

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

Contact Information:

Prepared for: Transition Properties
PO Box 1010 Blue Jay, CA 92317
ATTN: Art Day

Prepared by: Psomas
1500 Iowa Avenue, Suite 210
Riverside, CA 92507
Attn: Andrew Woodard, PE

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Transition Properties by Psomas. for the Center Street Industrial Block project.

This WQMP is intended to comply with the requirements of the City of Riverside for design review of the proposed 308,000 SF industrial complex, Planning Case No. P14-1033 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	Date
Owner's Printed Name	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	Date
Andrew Woodard, PE	Project Engineer
Preparer's Printed Name	Preparer's Title/Position

Preparer's Licensure:

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List of Tables

List of Appendices

Section A: Project and Site Information

This project is a proposal to build a new industrial building and adjoining parking lot on APNs 246-070-002, 017, 246-040-026, and 027. Stormwater from the site will be treated by an infiltration basin at the Southeast corner of the site.

PROJECT INFORMATION	
Type of Project:	Commercial warehouse
Planning Area:	Ward 1, City of Riverside, County of Riverside
Community Name:	Northside
Development Name:	Center Street Industrial Block
PROJECT LOCATION	
Latitude & Longitude (DMS): 34° 01' 07"N, 117° 21' 18"W	
Project Watershed and Sub-Watershed: Santa Ana; Santa Ana River, Reach 3	
APN(s): 246-070-002, 017, 246-040-026, and 027	
Map Book and Page No.: Book 1, Page 20 of Maps, Riverside County Records	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	Industrial Warehouse
Proposed or Potential SIC Code(s)	4225
Area of Impervious Project Footprint (SF)	582,839 SF
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	582,839 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)	0 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?	0.65 in

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, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

A.2 Receiving Waters

In order of upstream to downstream, the receiving waters the project site is tributary to are as follows:

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Lake Evans (801.27)	**None**	**REC1, REC2, WARM, COLD, WILD**	**Not a water body classified as RARE**
Santa Ana River, Reach 3 (801.21)	**Pathogens**	**AGR, GWR, REC1, REC2, WILD, WARM, RARE**	**2.5 Miles**
Prado Basin Management Zone (801.11)	None	REC1, REC2, WARM, WILD, RARE	19 Miles
Santa Ana River, Reach 2 (801.11)	None	AGR, GWR, REC1, REC2, WILD, WARM, RARE	21 Miles
Santa Ana River, Reach 1 (801.11)	None	REC1, REC2, WILD, WARM	Not a water body classified as RARE
Tidal Prism of Santa Ana River (to within 1000' of Victoria Street) and Newport Slough (801.11)	None	REC1, REC2, COMM, WILD, RARE, MAR	45 Miles
Pacific Ocean Nearshore Zone (801.11)	None	IND, NAV, REC1, REC2, COMM, WILD, RARE, SPWN, MAR, SHEL	49 Miles
Pacific Ocean Offshore Zone (---)	None	IND, NAV, REC1, REC2, COMM, WILD, RARE, SPWN, MAR	52 Miles

Note: Proximate receiving waters are identified in bold.

See Receiving Waters Diagram in Appendix 1

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?

Yes, this site strives to keep the drainage proceeding to the south westerly corner of the site, which is where the historical flows have always gone. In addition, there are historic tributary flows that are entering this site from the north westerly corner of the site in a concentrated manner. The existing drainage pattern included ponding on Center Street. The proposed site will included a 20 foot wide drainage easement to carry the offsite flows through the site and outlet into Placentia Lane.

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

No, the existing site is in a rural area and what little vegetation that is place does not lend itself to the development standards. New landscaping is proposed and will be integrated into the proposed parking lot and street adjacent landscaped areas.

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

Yes, the current infiltration capacity is comprised of the existing soils natural infiltration ability. The proposed site layout includes an infiltration basin that will serve to mimic and exceed the existing infiltration capacity.

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

Yes, landscaped areas are distributed equally throughout the parking lot and the south easterly corner of the site will serve as a landscaped infiltration basin.

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

Yes, the proposed building will have roof drains that are directed over proposed landscaped areas before being routed to the landscaped infiltration basin.

Section C: Delineate Drainage Management Areas (DMAs)

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)	Area (Sq. Ft.)	DMA Type
1-A	Concrete	5917	D
1-B	Landscape	51098	D
1-C	Roofs	303591	D
1-D	Asphalt	194632	D
1-E	Landscaped Infiltration Basin	20210	D
2-B	Natural Soil (C)	11745	A
3-A	Concrete	5355	D
3-B	Landscape	4308	D
3-D	Roofs	22992	D
3-E	Infiltration Trench	803	D
4-A	Concrete	7419	D
4-B	Landscape	9418	D
4-D	Roofs	30720	D
4-E	Infiltration Trench	925	D
5-F	Landscape	11647	A

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

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
2-B	11745	Natural Channel with Depressed Overflow Outlet	N/A
3-F	11647	Ornamental Landscape	Per approved Landscape Architects Plan

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)** [A]	**Storm Depth (inches)** [B]	**DMA Name / ID**	**[C] from Table C.4 =** [C]	**Required Retention Depth (inches)** [D]
1-E	Landscaped Infiltration Basin	20210	0.65	1-Total	455337.1	15.3
3-E	Infiltration Trench	803	0.65	3-Total	25761.5	21.5

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
4-E	Infiltration Trench	925	0.65	4-Total	35060.2	25.3

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

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

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet) [A]	Post-project surface type	Runoff factor [B]	Product [C] = [A] x [B]	DMA name /ID	Area (square feet) [D]	Ratio [C]/[D]
1-A	5917	Concrete	0.89	5278	1-E	20210	22.5:1*
1-B	51098	Landscape	0.11	5644.2			
1-C	303591	Roofs	0.89	270803.2			
1-D	194632	Asphalt	0.89	173611.7			
Total	**555238**	---	---	**455337.1**			
3-A	5355	Concrete	0.89	4776.7	3-E	803	32:1*
3-B	4308	Landscape	0.11	475.9			
3-D	22992	Asphalt	0.89	20508.9			
3-Total	**32655**	---	---	**25761.5**			

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]
4-A	7419	Concrete	0.89	6617.7	4-E	925	37.9:1*
4-B	9418	Landscape	0.11	1040.3			
4-D	30720	Asphalt	0.89	27402.2			
4-Total	**47557**	---	---	**35060.2**			

*Does not meet 2:1 Criteria, Area will drain to Type 'D' BMP.

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

DMA Name or ID	BMP Name or ID
1-E	1-All
3-E	2-All
4-E	3-All

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:		
…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:		

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.

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	
1-A	☒	☐	☐	☐	☐
1-B	☒	☐	☐	☐	☐
1-C	☒	☐	☐	☐	☐
1-D	☒	☐	☐	☐	☐
1-E	☒	☐	☐	☐	☐
2-B	☒	☐	☐	☐	☐

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	*DMA 1*		
	[A]		[B]	[C]	[A] x [C]			
1-A	5917	Concrete	*1*	*0.89*	5278	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1-B	51098	Landscape	*0.1*	*0.11*	5644.2			
1-C	303591	Roofs	*1*	*0.89*	270803.2			
1-D	194632	Asphalt	*1*	*0.89*	173611.7			
1-E	20210	Landscaped Infiltration Basin	*0.1*	*0.11*	*2232.4*			
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	575448				457569.5	0.65	24785	101050

[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

Table D.4 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	*DMA 2*		
	[A]		[B]	[C]	[A] x [C]			
2-B	*11745*	Natural Soil (C)	*0.3*	*0.23*	*2644.6*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	11745				2644.5	0.65	143.2	2500

[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

Table D.5 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	*DMA 3*		
	[A]		[B]	[C]	[A] x [C]			
3-A	5355	Concrete	*1*	*0.89*	4776.7	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
3-B	4308	Landscape	*0.1*	*0.11*	475.9			
3-D	22992	Asphalt	*1*	*0.89*	20508.9			
3-E	803	Infiltration Trench	*0.1*	*0.11*	*88.7*			
	$A_T = \Sigma[A]$				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	33458				25850.2	0.65	1400.2	1767

[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

Table D.6 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	*DMA 4*		
	[A]		[B]	[C]	[A] x [C]			
4-A	7419	Concrete	*1*	*0.89*	6617.7	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
4-B	9418	Landscape	*0.1*	*0.11*	1040.3			
4-D	30720	Asphalt	*1*	*0.89*	27402.2			
4-E	925	Infiltration Trench	*0.1*	*0.11*	*102.2*			
	$A_T = \Sigma[A]$				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{12}$	[G]
	48482				35162.4	0.65	1904.6	2035

[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

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	22.5	13	-42.2
Flow (CFS)	6.14	16.5	168.7
Volume (Cubic Feet)	12044	18728*	55.5

[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.

*Post-condition volume is less than the design capture volume of the infiltration basin.

HCOC EXEMPTION 3: All downstream conveyance channels 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 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.

Note: The HCOC mitigation is not applicable due to the project meeting the HCOC exemption criteria.

Section G: Source Control BMPs

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
D2. Landscape/ Outdoor Pesticide Use	-Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides 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.	-Maintain landscaping using minimum or no pesticides. See applicable operational BMPs in "What you should know for Landscape and Gardening" at http://rcflood.org/stormwater
G. Refuse areas	-Refuse area shall have a sign posted stating "Do not dump hazardous materials here" or similar.	- Sweep refuse area regularly to prevent accumulation of litter and debris.
M. Loading Docks	-Loading area shall have a roof overhang or door skirts (cowling) at each bay that enclose the end of the trailer.	-Move loaded and unloaded items indoors as soon as possible.
P. 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 wash water 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	Plan Sheet Number(s)	Latitude / Longitude
1-E	Infiltration Basin		34°01’01.0”N 117°21’13.0”W
2-B	Unlined Channel		34° 1'04.5"N 117°21'24.0"W
3-E	Infiltration Trench		34° 1'06"N 117°21'22.0"W
4-E	Infiltration Trench		34° 1'06"N 117°21'13.0"W

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**

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

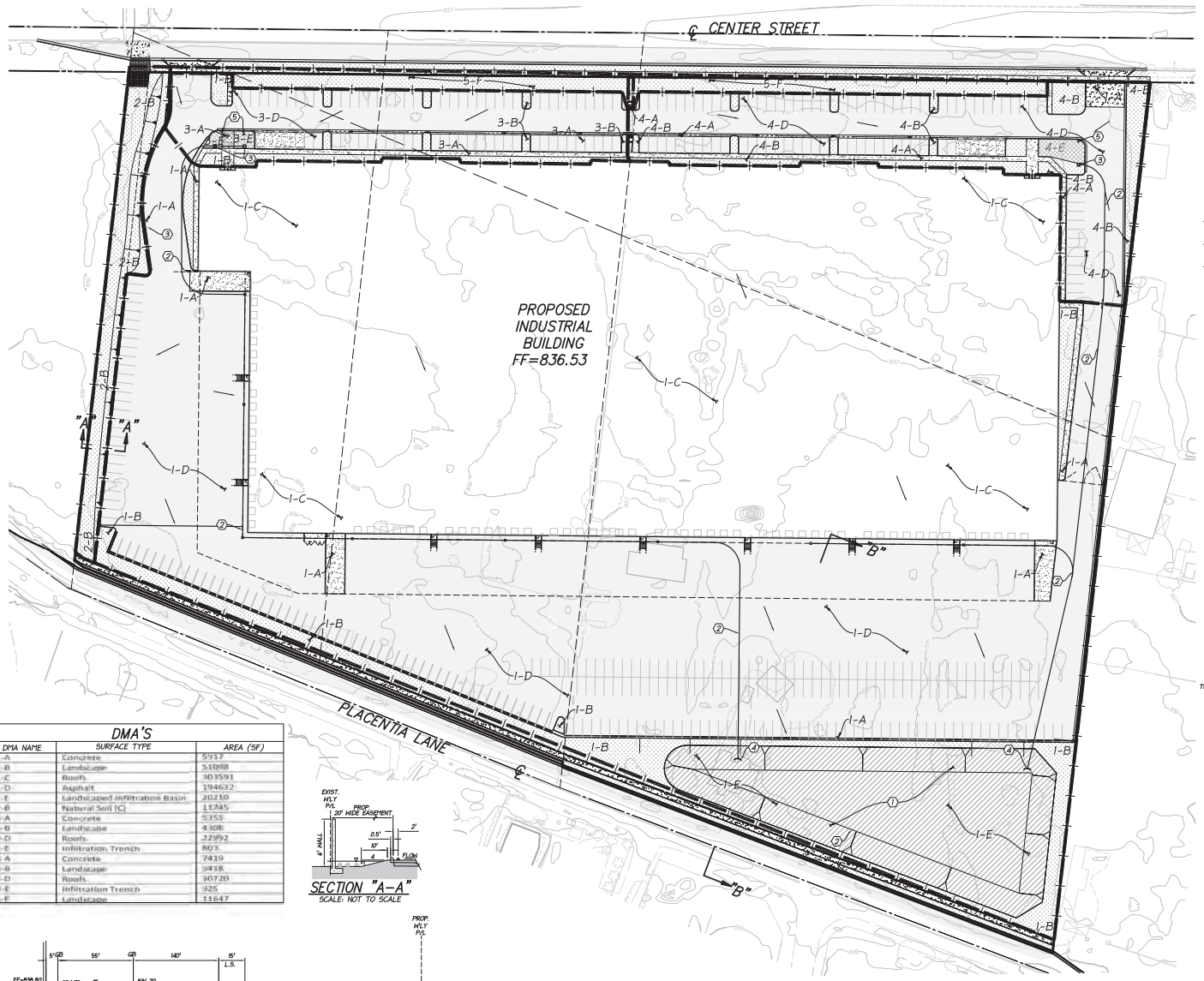
☐ Y ☒ N **Property Owner is Responsible**

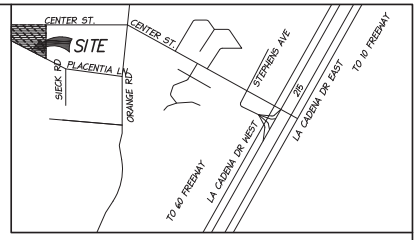
Operation and Maintenance Plan and Maintenance Mechanism are included in Appendix 9. Educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP are included in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

WQMP EXHIBIT
CITY OF RIVERSIDE
JULY 2015





VICINITY MAP

THOMAS GUIDE - PAGE 645, J-6 (2005 EDITION)
SECTION 12, TOWNSHIP 2 SOUTH RANGE 5 WEST
NOT TO SCALE

BMP LEGEND

1. PROPOSED INFILTRATION TRENCH PER DETAIL HEREON
2. PROPOSED HDPE STORM DRAIN PIPE
3. PROPOSED CATCH BASIN
4. PROPOSED HEADWALL AND FOREBAY
5. PROPOSED INFILTRATION TRENCH PER DETAIL HEREON

DIRECTION OF FLOW

PROPOSED DRAINAGE MANAGEMENT AREA BOUNDARY

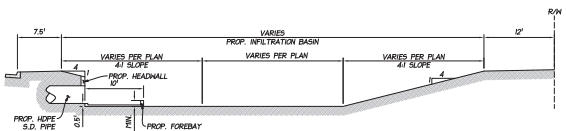
PROPOSED LANDSCAPED

CONCRETE SIDEWALK

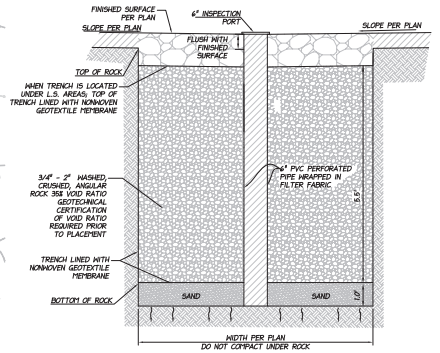
PROPOSED AC PAVING

LEGEND

	EXISTING PROPERTY LINE
	PROPOSED RIGHT OF WAY
	EXISTING RIGHT OF WAY
	EXISTING CENTERLINE
	PROPOSED CURB
	EXISTING CURB
	PROPOSED SIDEWALK
	EXISTING SIDEWALK
	EXISTING DIRT ROAD
	PROPOSED PARKING STRIPE
	EXISTING EASEMENT
	EXISTING CONTOUR MAJOR
	EXISTING CONTOUR MINOR
	EXISTING FENCE
	EXISTING BUILDING
	EXISTING CONCRETE
	EXISTING EDGE OF PAVEMENT
9" 9"	PROPOSED EDGE OF PAVEMENT
915	EXISTING CONTOUR ELEVATION
915	EXISTING SPOT ELEVATION
EP	EDGE OF PAVEMENT
R/W	RIGHT OF WAY
P/L	PROPERTY LINE
EXIST.	EXISTING
PROP.	PROPOSED
S.F.	SQUARE FEET
D/W	DRIVEWAY
S/W	SIDEWALK



DETAIL "A"
SCALE: 1"=10'



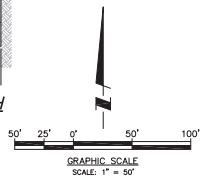
TYPICAL INFILTRATION TRENCH
NTS (PVT)

DMA'S

DMA NAME	SURFACE TYPE	AREA (SF)
1-A	Concrete	5937
1-B	Landscape	51098
1-C	Roofs	303591
1-D	Asphalt	194632
1-E	Landscaped Infiltration Basin	20210
2-B	Natural Soil (C)	11745
4-A	Concrete	5355
4-B	Landscape	4308
4-D	Roofs	22952
3-E	Infiltration Trench	803
4-A	Concrete	7419
4-B	Landscape	9418
4-D	Roofs	30720
4-E	Infiltration Trench	925
4-F	Landscape	11647

SECTION "A-A"
SCALE: NOT TO SCALE

SECTION "B-B"
SCALE: NOT TO SCALE



GRAPHIC SCALE
SCALE: 1" = 50'

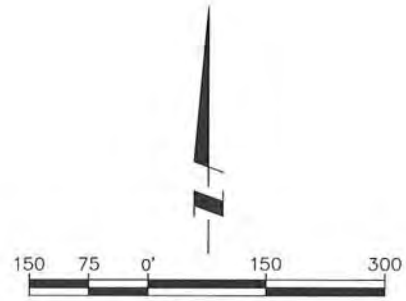
PREPARED BY:

PSOMAS
1500 IOWA AVENUE, SUITE 210
RIVERSIDE, CA 92507
(951) 787-8421 WWW.PSOMAS.COM

CITY OF RIVERSIDE
WQMP SITE PLAN
CENTER STREET

Planning Commission - Exhibit 1 - Development Review Committee - Exhibit 7 - CEQA Documents
Development Review Committee Staff Report

CENTER ST. INDUSTRIAL BLOCK
POST-DEVELOPMENT HYDROLOGY KEY MAP
CITY OF RIVERSIDE



LEGEND

DRAINAGE AREA DESIGNATION

DIRECTION OF FLOW

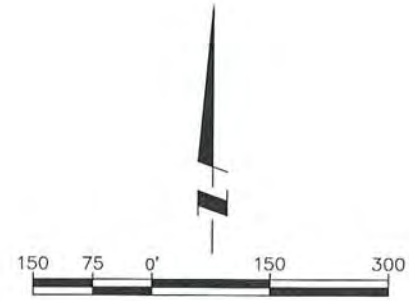
PREPARED BY:

PSOMAS
1500 IOWA AVENUE, SUITE 210
RIVERSIDE, CA 92507
(951) 787-8421 WWW.PSOMAS.COM

CITY OF RIVERSIDE
CENTER ST. INDUSTRIAL BLOCK
POST-DEVELOPMENT
HYDROLOGY KEY MAP

Drawing: G:\491.001\Drawings\Prelim\Hydrology\491001-POST_DEV_HYD.dwg Plotted By: andrew.woodard Layout: 11x17 L Last Saved: Tue Nov 25, 2014 - 11:32am Last Plotted: Thu Dec 04, 2014 - 10:39am

CENTER ST. INDUSTRIAL BLOCK
PRE-DEVELOPMENT HYDROLOGY KEY MAP
CITY OF RIVERSIDE



LEGEND

DRAINAGE AREA DESIGNATION

DIRECTION OF FLOW

PREPARED BY:

PSOMAS

1500 IOWA AVENUE, SUITE 210
RIVERSIDE, CA 92507
(951) 787-8421 WWW.PSOMAS.COM

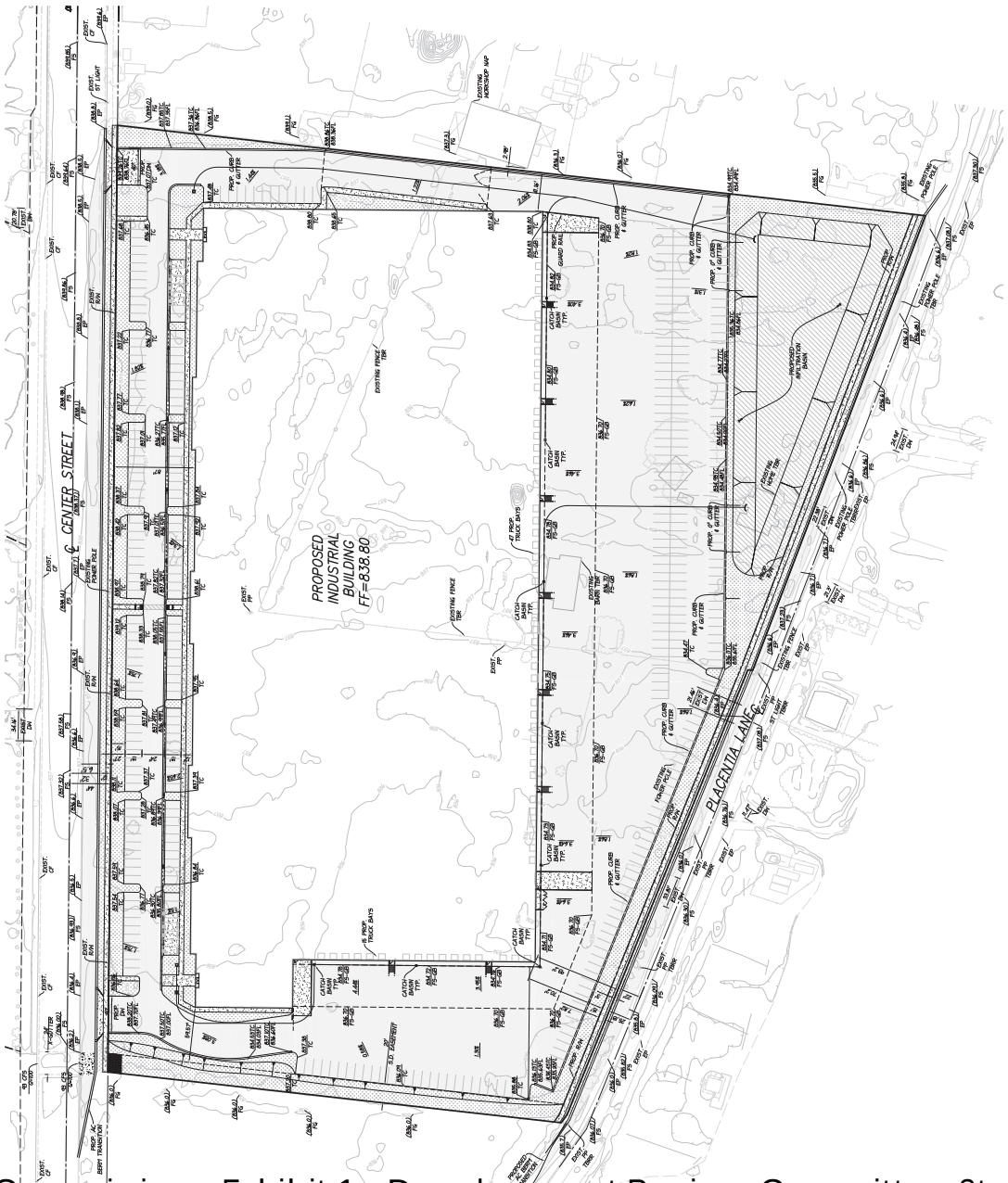
CITY OF RIVERSIDE
CENTER ST. INDUSTRIAL BLOCK
PRE-DEVELOPMENT
HYDROLOGY KEY MAP

Drawing: G:\491.001\Drawings\Prelim\Hydrology\491001-PRE_DEV_HYD.dwg Plotted By: andrew.woodard Layout: 11x17 L Last Saved: Tue Nov 25, 2014 - 11:19am Last Plotted: Thu Dec 04, 2014 - 10:40am

Yucaipa
Redlands
San Bernardino
Moreno Valley
Perris
Menifee
Center St
Lake Elsinore
Riverside
Fontana
Rancho Cucamonga
Corona
Rancho Santa Margarita
Mission Viejo
Pomona
West Covina
Santa Ana
Irvine
Orange
Costa Mesa
Anaheim
Huntington Beach
215
66
74
15
71
60
91
241
133
261
5
55
405
22
1
19.0 mi
© 2014 Google
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Data USGS
elev 1870 ft

Appendix 2: Construction Plans

Grading and Drainage Plans


CENTER STREET
PROPOSED INDUSTRIAL BUILDING FF=838.80
PLACENTIA LANE

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Appendix 4: Historical Site Conditions

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

N/A

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

N/A

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	Psomas	Date	7/9/2015
Designed by	AW	Case No	P14-1033
Company Project Number/Name	491.001		

BMP Identification

BMP NAME / ID: 1-E

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}= 0.65 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)
1-A	5917	Concrete or Asphalt	1	0.89	5278			
1-B	51098	Ornamental Landscaping	0.1	0.11	5644.2			
1-C	303591	Roofs	1	0.89	270803.2			
1-D	194632	Concrete or Asphalt	1	0.89	173611.7			
1-E	20210	Ornamental Landscaping	0.1	0.11	2232.4			
	575448	Total			457569.5	0.65	24785	101050

Notes:

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	Psomas	Date	7/9/2015
Designed by	AW	Case No	P14-1033
Company Project Number/Name	491.001		

BMP Identification

BMP NAME / ID: 2-E

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}= 0.65 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)*
2-B	*11745*	*Natural (C Soil)*	*0.3*	*0.23*	*2644.6*			
	11745	***Total***			**2644.6**	**0.65**	***143.2***	***2500***

Notes:

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	Psomas	Date	7/9/2015
Designed by	AW	Case No	P14-1033
Company Project Number/Name	491.001		

BMP Identification

BMP NAME / ID: 3-E

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}= 0.65 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)
3-A	5355	Concrete or Asphalt	1	0.89	4776.7			
3-B	4308	Ornamental Landscaping	0.1	0.11	475.9			
3-D	22992	Concrete or Asphalt	1	0.89	20508.9			
3-E	803	Ornamental Landscaping	0.1	0.11	88.7			
	33458	Total			25850.2	0.65	1400.2	1767

Notes:

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	Psomas	Date	7/9/2015
Designed by	AW	Case No	P14-1033
Company Project Number/Name	491.001		

BMP Identification

BMP NAME / ID: 4-E

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}= 0.65 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)*
4-A	*7419*	*Concrete or Asphalt*	*1*	*0.89*	*6617.7*			
4-B	*9418*	*Ornamental Landscaping*	*0.1*	*0.11*	*1040.3*			
4-D	*30720*	*Concrete or Asphalt*	*1*	*0.89*	*27402.2*			
4-E	*925*	*Ornamental Landscaping*	*0.1*	*0.11*	*102.2*			
	48482	***Total***			**35162.4**	**0.65**	**1904.6**	**2035**

Notes:

Infiltration Basin - Design Procedure (Rev. 03-2012)	BMP ID 1-E	Legend:	Required Entries / Calculated Cells
Company Name: Psomas			Date: 7/10/2015
Designed by: ACW			County/City Case No.: P14-1033

Design Volume

a) Tributary area (BMP subarea)	A_T =	13.2	acres
b) Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	24,709	ft^3

Maximum Depth

a) Infiltration rate	I =	10	in/hr
b) Factor of Safety (See Table 1, Appendix A: "Infiltration Testing" from this BMP Handbook)	FS =	12	
c) Calculate D_1 $D_1 = \frac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times FS}$	D_1 =	5.0	ft
d) Enter the depth of freeboard (at least 1 ft)		1	ft
e) Enter depth to historic high ground water (measured from **top** of basin)		31	ft
f) Enter depth to top of bedrock or impermeable layer (measured from **top** of basin)		100	ft
g) D_2 is the smaller of: Depth to groundwater - (10 ft + freeboard) and Depth to impermeable layer - (5 ft + freeboard)	D_2 =	20.0	ft
h) D_{MAX} is the smaller value of D_1 and D_2 but shall not exceed 5 feet	D_{MAX} =	5.0	ft

Basin Geometry

a) Basin side slopes (no steeper than 4:1)	z =	6	:1
b) Proposed basin depth (excluding freeboard)	d_B =	5	ft
c) Minimum bottom surface area of basin ($A_S = V_{BMP}/d_B$)	A_S =	4942	ft^2
d) Proposed Design Surface Area	A_D =	20210	ft^2

Forebay

a) Forebay volume (minimum 0.5% V_{BMP})	Volume =	124	ft^3
b) Forebay depth (height of berm/splashwall. 1 foot min.)	Depth =	1	ft
c) Forebay surface area (minimum)	Area =	124	ft^2
d) Full height notch-type weir	Width (W) =	10.0	in

Notes:

Infiltration Trench - Design Procedure	BMP ID 3-E	Legend:	Required Entries / Calculated Cells

Company Name:	Psomas	Date:	7/9/2015
Designed by:	AW	County/City Case No.:	P14-1033

Design Volume

Enter the area tributary to this feature, Max = 10 acres	A_t=	1	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	1,400	ft^3

Calculate Maximum Depth of the Reservoir Layer

Enter Infiltration rate	I =	10.0	in/hr
Enter Factor of Safety, FS (unitless)	FS =	5	
Obtain from Table 1, Appendix A: "Infiltration Testing" of this BMP Handbook			
	n =	40	%

Calculate D_1. $D_1 = \dfrac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times (n/100) \times FS}$ D_1 = 30.00 ft

Enter depth to historic high groundwater mark (measured from finished grade)		31	ft
Enter depth to top of bedrock or impermeable layer (measured from finished grade)		100	ft
D_2 is the smaller of:			
Depth to groundwater - 11 ft; & Depth to impermeable layer - 6 ft	D_2 =	20.0	ft
D_{MAX} is the smaller value of D_1 and D_2, must be less than or equal to 8 feet.	D_{MAX}=	8.0	ft

Trench Sizing

Enter proposed reservoir layer depth D_R, must be ≤ D_{MAX}	D_R =	5.50	ft

Calculate the design depth of water, d_W

Design $d_W = (D_R) \times (n/100)$ Design d_W= 2.20 ft

Minimum Surface Area, A_S $A_S = \dfrac{V_{BMP}}{d_W}$ A_S = 636 ft^2

Proposed Design Surface Area	A_D =	803	ft^2
Minimum Width = D_R + 1 foot pea gravel		6.50	ft
Sediment Control Provided? (Use pulldown)		Yes	
Geotechnical report attached? (Use pulldown)		Yes	

If the trench has been designed correctly, there should be no error messages on the spreadsheet.

Infiltration Trench - Design Procedure	BMP ID 4-E	Legend:	Required Entries / Calculated Cells

Company Name:	Psomas	Date:	7/9/2015
Designed by:	AW	County/City Case No.:	P14-1033

Design Volume

Enter the area tributary to this feature, Max = 10 acres — A_t = 1 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook — V_{BMP} = 1,905 ft^3

Calculate Maximum Depth of the Reservoir Layer

Enter Infiltration rate — I = 10.0 in/hr

Enter Factor of Safety, FS (unitless) — FS = 5

Obtain from Table 1, Appendix A: "Infiltration Testing" of this BMP Handbook

n = 40 %

Calculate D_1. $D_1 = \dfrac{I\ (in/hr) \times 72\ hrs}{12\ (in/ft) \times (n/100) \times FS}$ — D_1 = 30.00 ft

Enter depth to historic high groundwater mark (measured from finished grade) — 31 ft

Enter depth to top of bedrock or impermeable layer (measured from finished grade) — 100 ft

D_2 is the smaller of:

Depth to groundwater - 11 ft; & Depth to impermeable layer - 6 ft — D_2 = 20.0 ft

D_{MAX} is the smaller value of D_1 and D_2, must be less than or equal to 8 feet. — D_{MAX} = 8.0 ft

Trench Sizing

Enter proposed reservoir layer depth D_R, must be ≤ D_{MAX} — D_R = 5.50 ft

Calculate the design depth of water, d_W

Design $d_W = (D_R) \times (n/100)$ — Design d_W = 2.20 ft

Minimum Surface Area, A_S $A_S = \dfrac{V_{BMP}}{d_W}$ — A_S = 866 ft^2

Proposed Design Surface Area — A_D = 925 ft^2

Minimum Width = D_R + 1 foot pea gravel — 6.50 ft

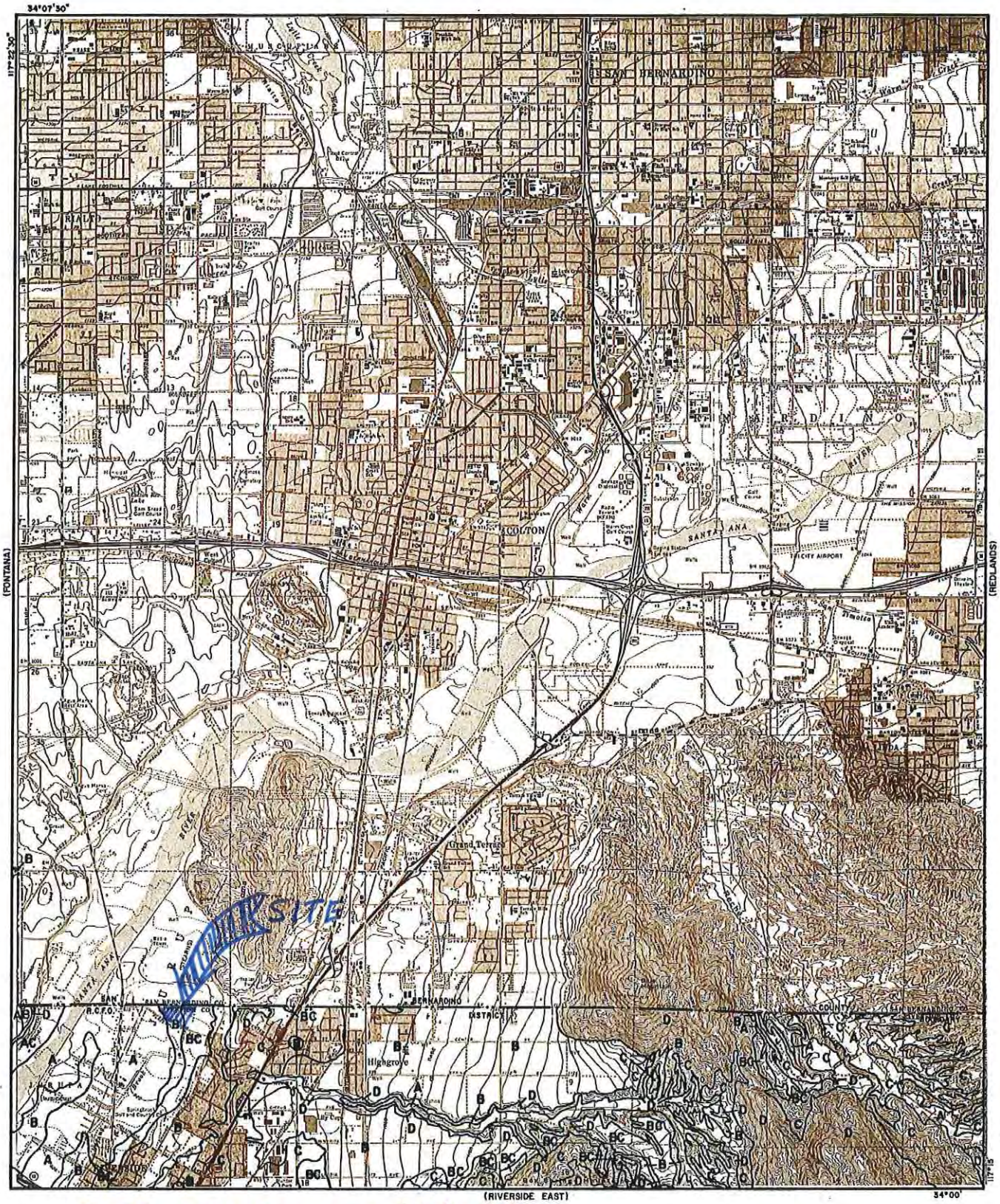
Sediment Control Provided? (Use pulldown)

Geotechnical report attached? (Use pulldown)

If the trench has been designed correctly, there should be no error messages on the spreadsheet.

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern



SITE LOCATED ON "B" SOIL

LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

HYDROLOGY MANUAL

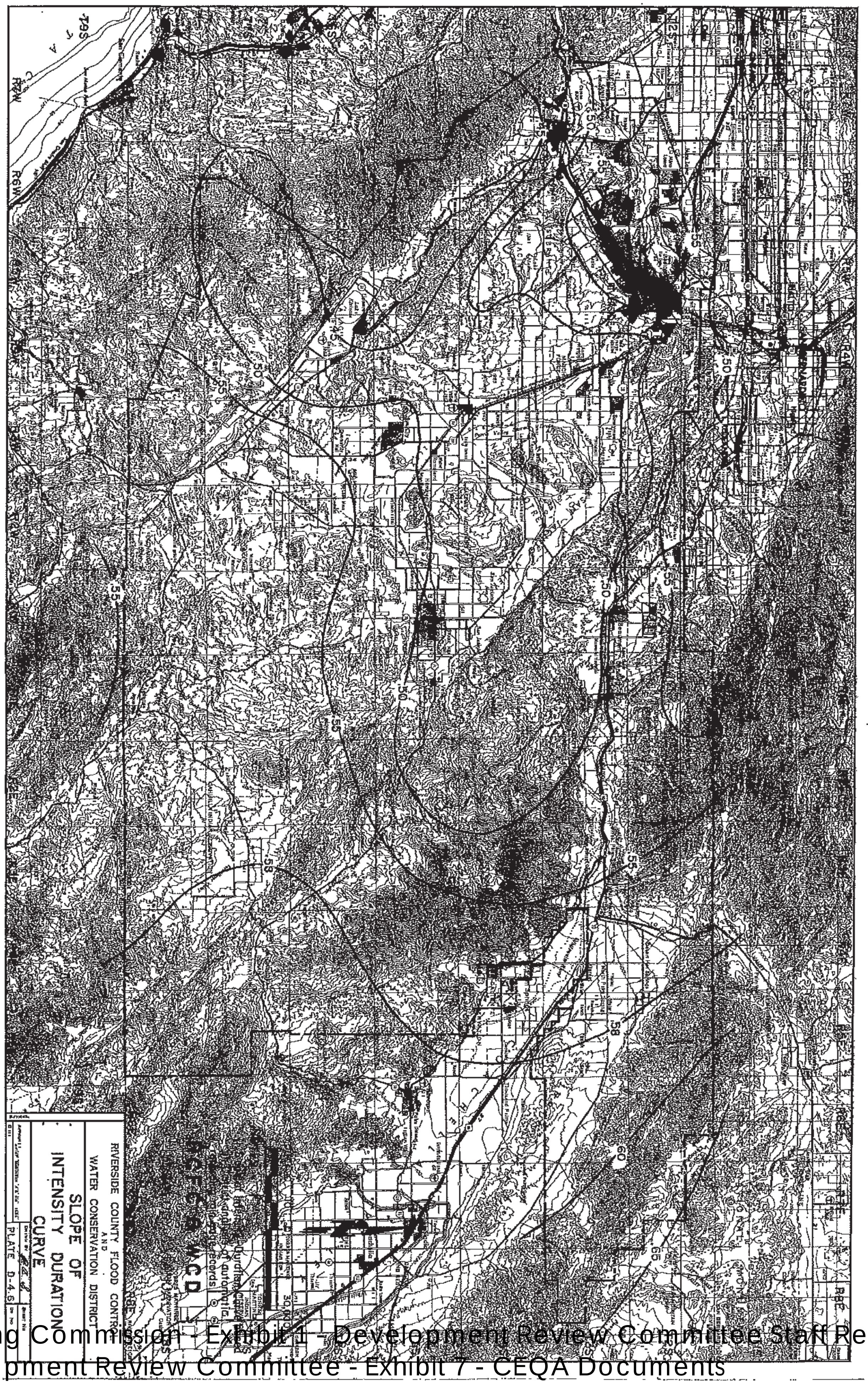
N

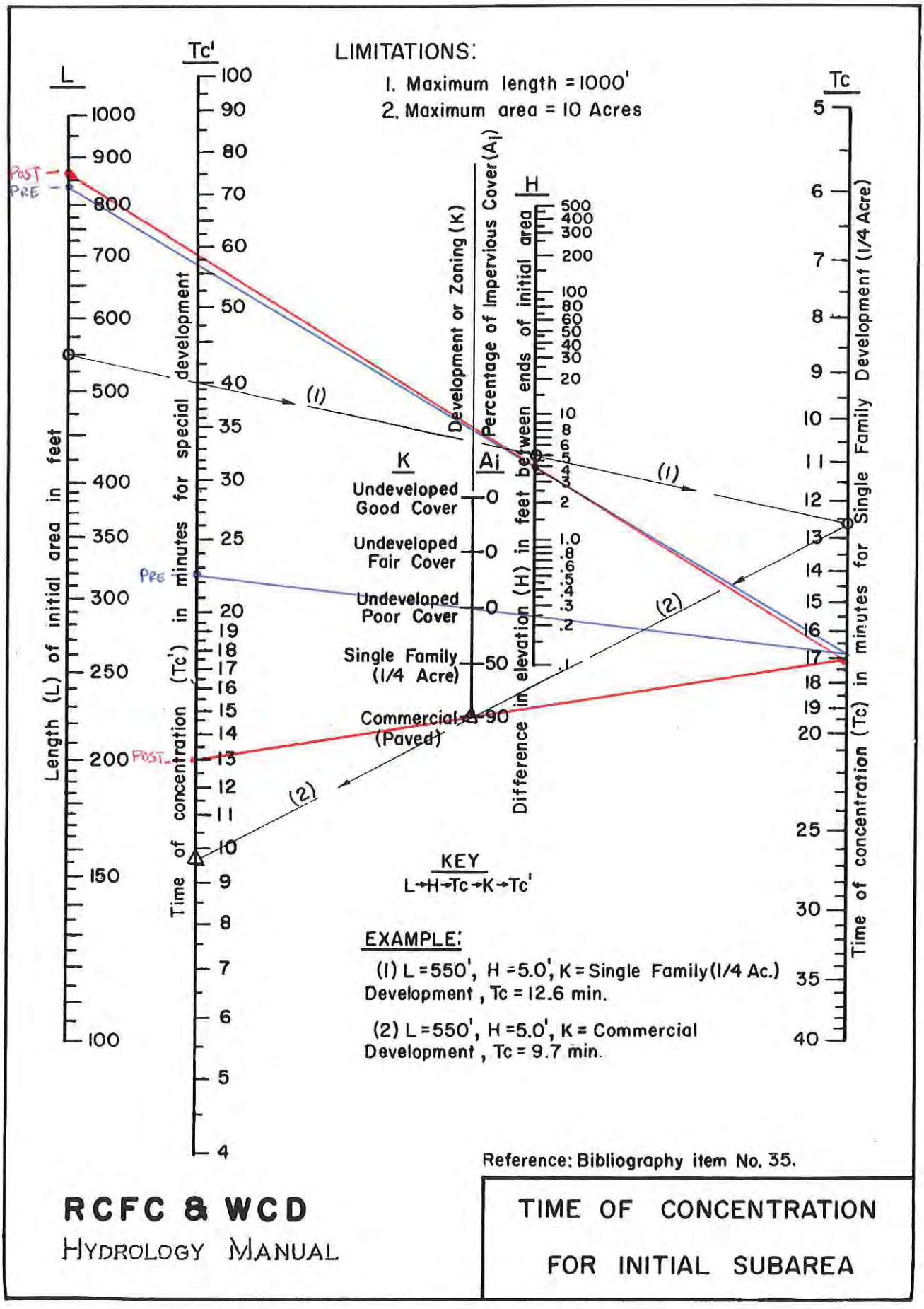
0 FEET 5000

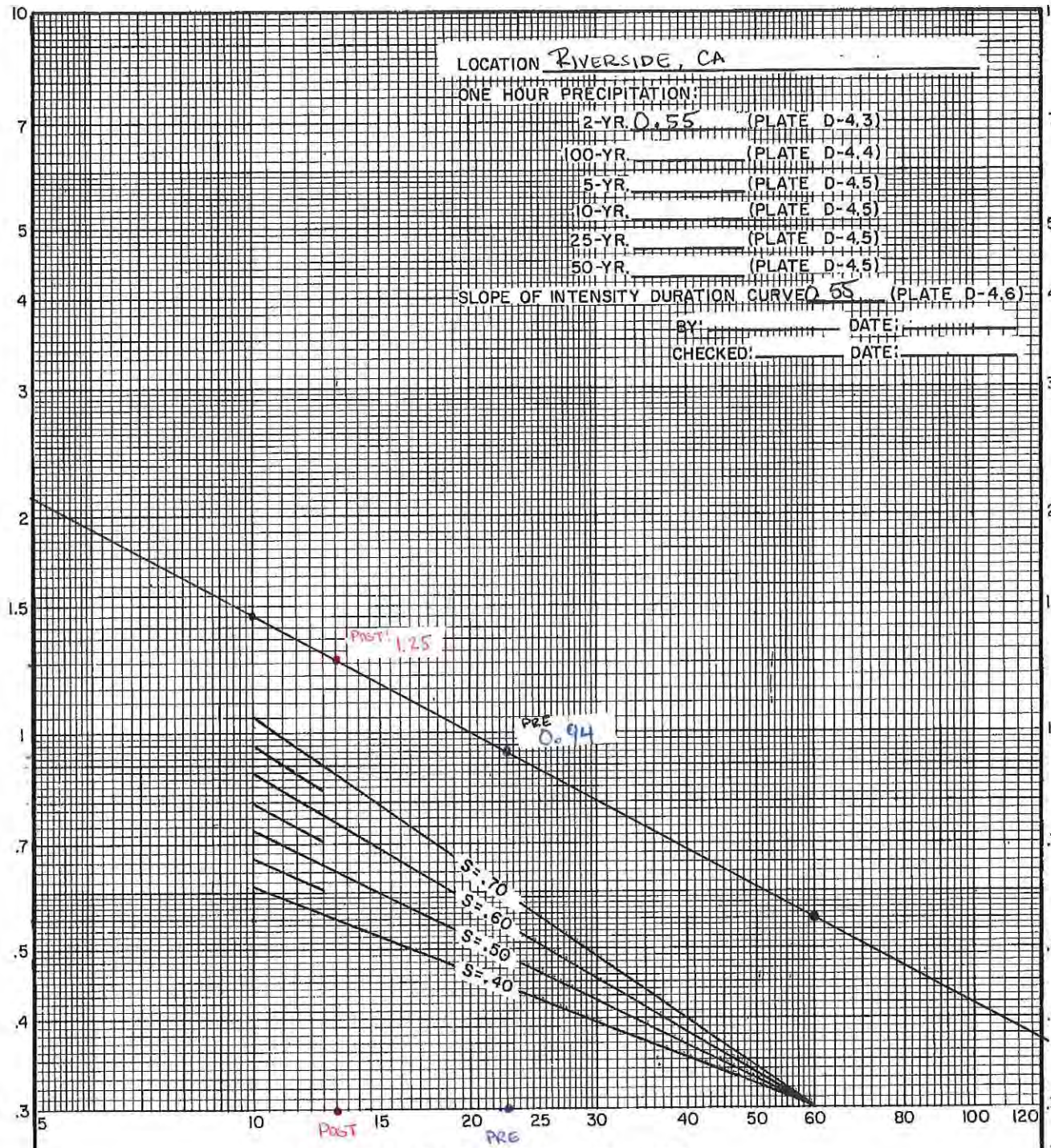
HYDROLOGIC SOILS GROUP MAP FOR SAN BERNARDINO—SOUTH

PLATE C-1.04

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.3
NOAA Atlas 2, Volume VI, 1973
RCFC & WCD


RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SLOPE OF
INTENSITY DURATION
CURVE
PLATE D-4.6


LIMITATIONS:
1. Maximum length = 1000'
2. Maximum area = 10 Acres
L
Tc'
Tc
Length (L) of initial area in feet
Time of concentration (Tc') in minutes for special development
Time of concentration (Tc) in minutes for Single Family Development (1/4 Acre)
Development or Zoning (K)
Percentage of Impervious Cover (Ai)
H
Difference in elevation (H) in feet between ends of initial area
K
Ai
Undeveloped Good Cover
Undeveloped Fair Cover
Undeveloped Poor Cover
Single Family (1/4 Acre)
Commercial (Paved)
POST
PRE
(1)
(2)
KEY
L→H→Tc→K→Tc'
EXAMPLE:
(1) L = 550', H = 5.0', K = Single Family (1/4 Ac.) Development, Tc = 12.6 min.
(2) L = 550', H = 5.0', K = Commercial Development, Tc = 9.7 min.
Reference: Bibliography item No. 35.
RCFC & WCD
HYDROLOGY MANUAL
TIME OF CONCENTRATION
FOR INITIAL SUBAREA
PLATE D-3



RCFC & WCD
HYDROLOGY MANUAL

INTENSITY — DURATION
CURVES
CALCULATION SHEET

PLATE D-4.7

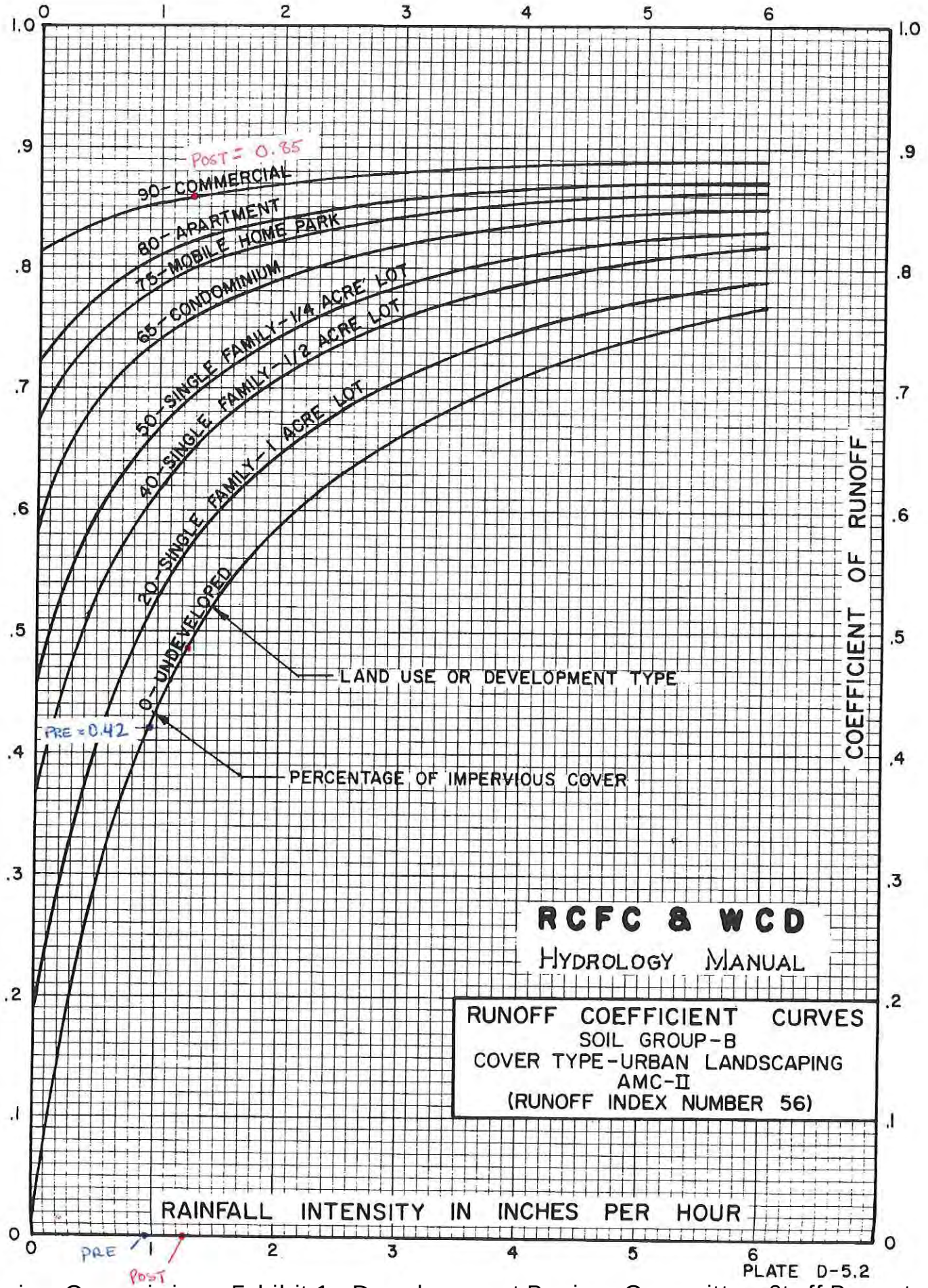

POST = 0.85
90- COMMERCIAL
80- APARTMENT
75- MOBILE HOME PARK
65- CONDOMINIUM
50- SINGLE FAMILY - 1/4 ACRE LOT
40- SINGLE FAMILY - 1/2 ACRE LOT
20- SINGLE FAMILY - 1 ACRE LOT
0- UNDEVELOPED
PRE = 0.42
LAND USE OR DEVELOPMENT TYPE
PERCENTAGE OF IMPERVIOUS COVER
COEFFICIENT OF RUNOFF
RCFC & WCD
HYDROLOGY MANUAL
RUNOFF COEFFICIENT CURVES
SOIL GROUP-B
COVER TYPE-URBAN LANDSCAPING
AMC-II
(RUNOFF INDEX NUMBER 56)
RAINFALL INTENSITY IN INCHES PER HOUR
PRE
POST
0 1 2 3 4 5 6
1.0 .9 .8 .7 .6 .5 .4 .3 .2 .1 0

PLATE D-5.2

RCFC & WCD HYDROLOGY MANUAL
RATIONAL METHOD CALCULATION FORM

Sheet No. ___ of ___ Sheets

PROJECT _____

Calculated by _____ DATE

FREQUENCY 2yr · 1Hr

Checked by _____ DATE

DRAINAGE AREA	Soil & Development	A Acres	I in/hr.	C	ΔQ CFS	Σ Q CFS	SLOPE	SECTION	v FPS	L FT.	T MIN.	Σ T	REMARKS
PRE	UNDEVELOPED	15.55	0.94	0.42	6.14					840	22.5		
POST	COMMERCIAL	15.55	1.25	0.85	16.52					960	13		

Planning Commission - Exhibit 1 - Development Review Committee Staff Report
Development Review Committee - Exhibit 7 - CEQA Documents

PLATE D-2

WO 454.001

HYDROGRAPH FOR SMALL AREAS

Tc= 22.5

2 Year Pre

Q=C*I*A C= 0.42 I= 0.94 A= 15.55 6.13914

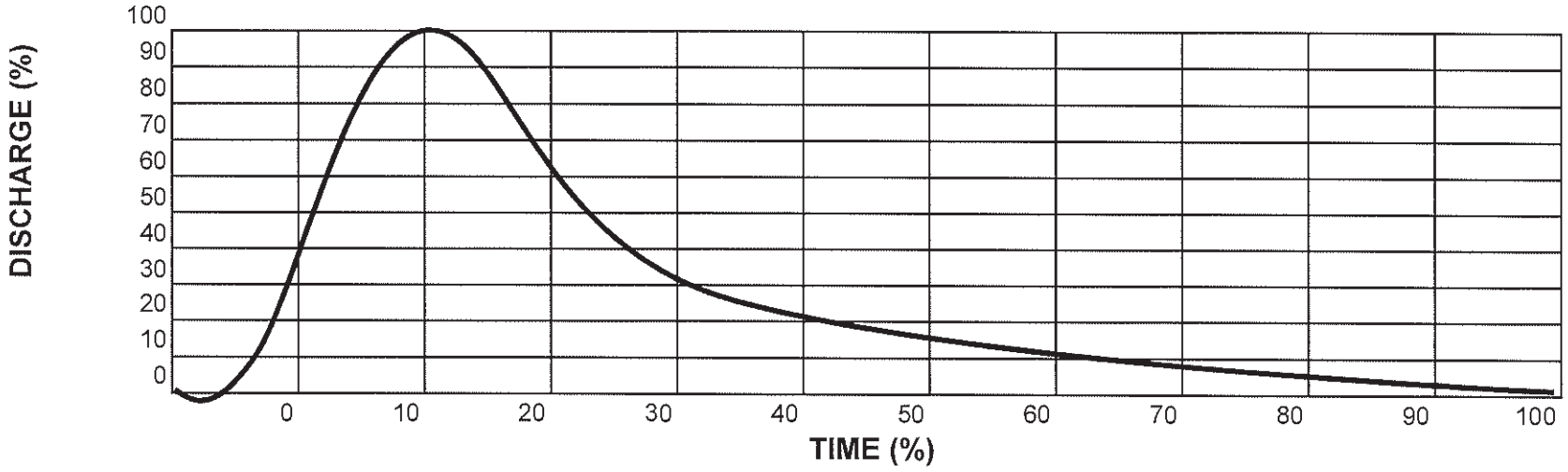
Total Time=Tc*5*60 Tc= 22.5 x 5 x 60 = 6750

Scale Factor= 1 sq. cm = Q/10 x Time/20

0.613914 x 337.5 = 207.196 CF/Sq CM

207.196 x 58.13 = 12044 CF

58.13 is a constant to convert area under the curve to cubic feet



WO 454.001

HYDROGRAPH FOR SMALL AREAS

Tc= 13

2 Year Post

Q=C*I*A C= 0.85 I= 1.25 A= 15.55 16.52188

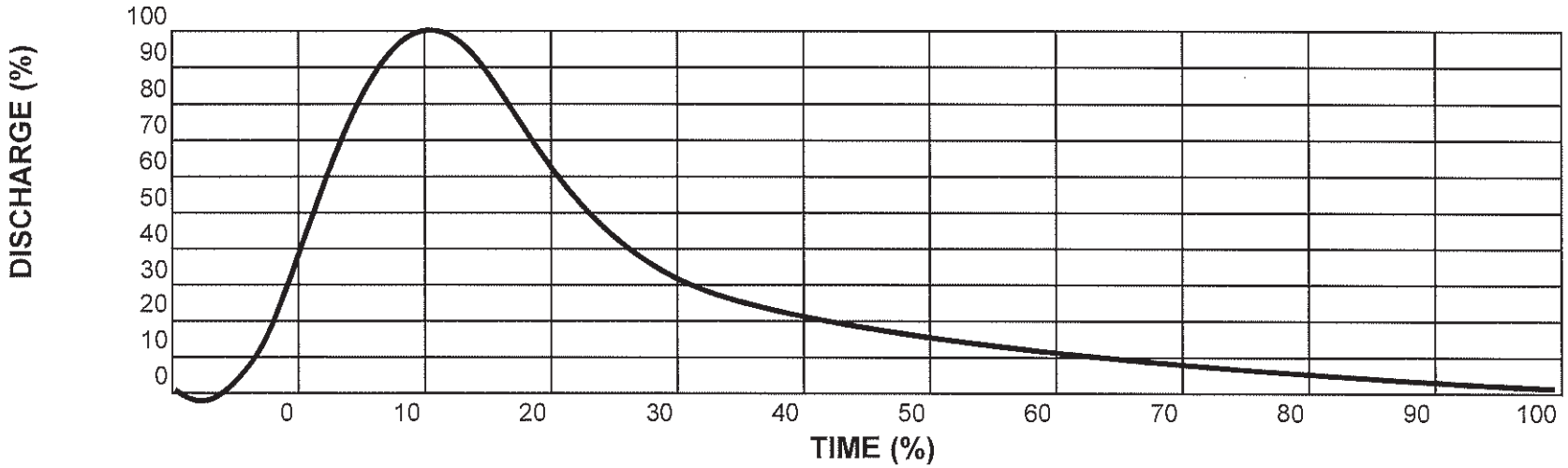
Total Time=Tc*5*60 Tc= 13 x 5 x 60 = 3900

Scale Factor= 1 sq. cm = Q/10 x Time/20

1.652188 x 195 = 322.1766 CF/Sq CM

322.1766 x 58.13 = 18728 CF

58.13 is a constant to convert area under the curve to cubic feet



Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Educational Materials included with this WQMP are the following:

1. "A citizen's guide to understanding Stormwater" from EPA 833-B-00-002.
2. Stormwater pollution what you should know for "Outdoor Cleaning Activities and Non-point Source Discharges" from CRFC
3. "Tips for a healthy pet and healthier environment" from CRFC.
4. CASQA Handouts

    SD-10 Site Design & Landscape Planning

    SD-11 Roof Runoff Controls

    SD-12 Efficient Irrigation

    SD-13 Storm Drain Signage

    SC-10 Non-Stormwater Discharges

    SC-41 Building and Grounds Maintenance

    SC-43 Parking/Storage Area Maintenance

    SC-44 Drainage System Maintenance

    TC-11 Infiltration Basin

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Center Street Commerce Building
Noise Study

February 2016 (13432)

Prepared for:

Transition Properties, LP
PO Box 1010
Blue Jay, California 92317

Prepared by:

MIG
1500 Iowa Avenue, Suite 110
Riverside, California 92507

This document is formatted for double-sided printing to conserve natural resources.

Center Street Commerce Building

Noise Study

February 2016

City of Riverside, California

Table of Contents

Tables

Figures

Exhibits

Appendix

Construction-related and operational noise impacts were modeled and analyzed for the proposed building located at 3667 Placentia Lane in the City of Riverside, California. This noise impact analysis contains documentation of existing noise levels as well as analysis of the impacts generated by project operation and traffic and analysis of vibration impacts. This report analyzes the project's consistency with applicable federal, State, and local regulations. The results of this report find construction-related and operational noise levels are consistent with applicable regulations.

1.1 Project Description

The project includes the development of a 308,000-square foot building located at 3667 Placentia Lane in the City of Riverside, California. The project includes 382 parking stalls, 62 trailer docks, and 110,591 square feet of landscaping.

1.2 Construction-Related Noise

Temporary noise increases will be greatest during the demolition phase. The model indicates that the use of construction equipment such as excavators, dozers, and concrete saws could expose the use located approximately 421 feet to the south of the center of the project site to a combined noise level of 71.1 dBA $L_{max.}$ Construction equipment could expose the use located 640 feet south, the industrial use located 510 feet east, and the park located 544 feet from the center of the project site to a combined noise level of 67.4 dBA L_{max}, 69.4 dBA L_{max}, and 68.8 dBA L_{max}, respectively. A noise level of 70 dBA is allowable at surrounding industrial uses and a noise level of 65 dBA is allowable at public recreation facilities. Construction activity could result in noise levels in excess of the allowable noise levels at the industrial use to the south and the public recreation use to the south of the project site. With incorporation of the Mitigation Measures N-1 and N-2, described herein, no substantial impacts will occur.

1.3 Operational Noise

The increase in vehicular traffic on area roadways will not result in noise levels exceeding the 65 dBA exterior noise standard established by the City of Colton to the north. The exterior noise levels under the Without and With project scenarios exceed allowable exterior noise levels at the residential uses to the northwest, northeast, and southeast of the project site. However, the project does not cause the exterior noise levels to exceed the 55 dBA residential threshold for receptors that are currently below the allowable noise levels. In addition, the proposed project will not result in a noticeable increase in noise levels. Therefore, no substantial impacts will occur.

1.4 Vibration

Based on the threshold criteria established by the Federal Transit Administration (FTA) and the California Department of Transportation (Caltrans), vibration from use of heavy construction equipment to construct the proposed project would be below the thresholds to cause damage to nearby structures and result in less than *barely perceptible* vibration at the receptors analyzed in the report. Therefore, no substantial impacts will occur.

1.5 Airport Noise

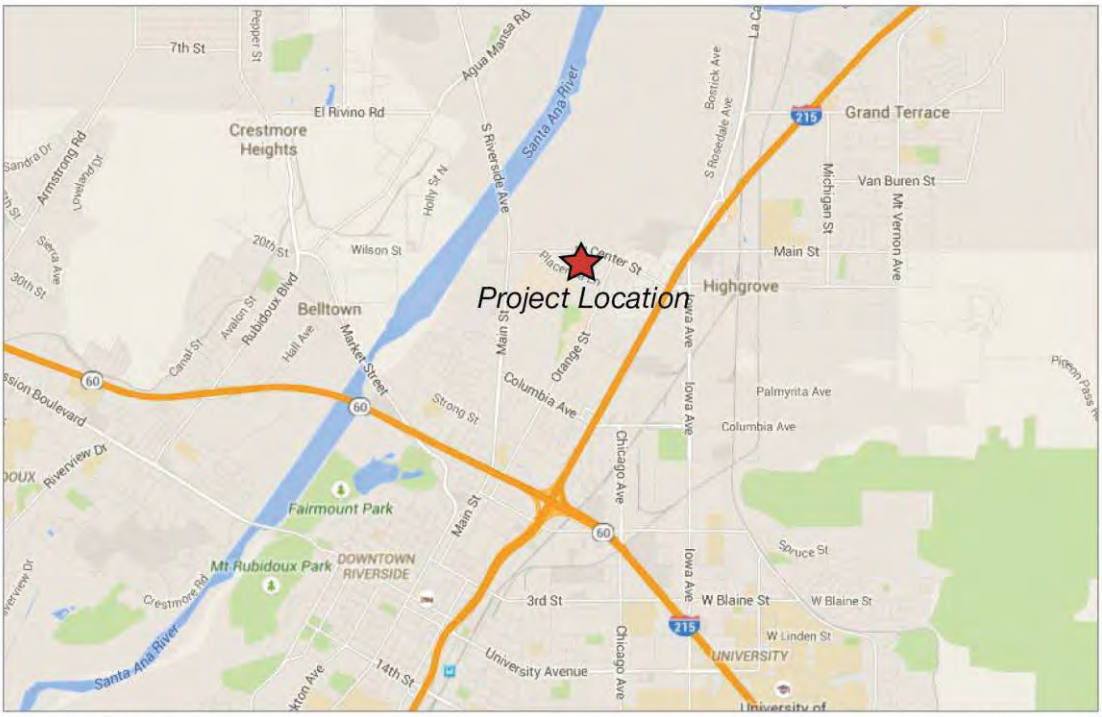
The project site is not located with two miles of a public or private use airport or helipad. Therefore, no substantial impacts will occur.

1.6 Mitigation Measures

The following mitigation measures are required to ensure that project-related short- and long-term noise levels are consistent with applicable federal, State, and local regulations.

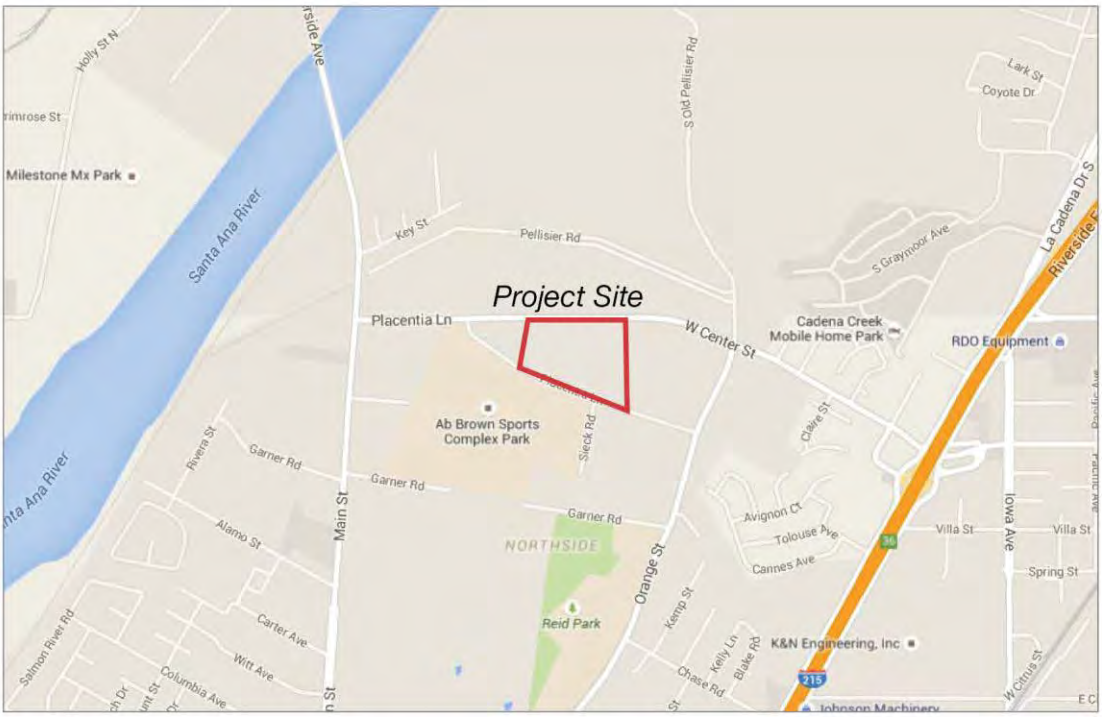
N-1 Limit construction activities to the hours of 7:00 AM to 7:00 PM Monday through Friday and the hours of 8:00 AM to 5:00 PM on Saturdays. Construction activity shall be prohibited on Sundays and federal holidays. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections.

N-2 Prior to issuance of grading permits, the Applicant shall submit a mitigation plan prepared by a qualified engineer or other acoustical expert for review and approval by the Planning Division that identifies noise control measures that achieve a minimum 10 dBA reduction in construction-related noise levels. The mitigation plan may include use of sound curtains, engineered equipment controls, or other methods. Noise control requirements shall be noted on project construction drawings and verified by the Building Department during standard inspection procedures.



Source: Google Maps, 2015

Regional



Source: Google Maps, 2015

Vicinity

Not to Scale

Exhibit 1 Regional and Vicinity Map

Center Street Commerce Building Project
6550 Center Street, Riverside, California

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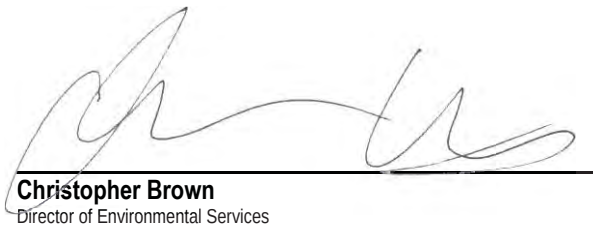
This report includes modeling and analysis of construction- and operation-related noise generated from the proposed project on surrounding land uses. Vibration effects and airport noise are also discussed herein. The project includes construction of a 308,000-square foot building on 15.63 acres in the City of Riverside, California.

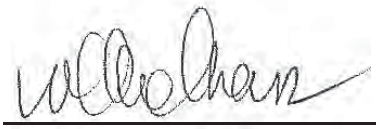
This report has been prepared utilizing project-specific characteristics where available. In those instances where project-specific data is not available, the analysis has been supplemented by model defaults or other standardized sources of comparable data. In any case where non-project defaults or other data have been used, a "worst-case" scenario was developed to ensure a conservative estimate of noise impacts.

This report has been prepared for use by the Lead Agency to assess potential project-related noise impacts to the environment in compliance with federal, State, or local guidelines, particularly with respect to the noise issues identified in Appendix G of the State CEQA Guidelines. This report does not make determinations of significance pursuant to CEQA because such determinations are required to be made solely in the purview of the Lead Agency.

This report has been prepared by Christopher Brown (Director of Environmental Services) and Olivia Chan (Associate Analyst II) of MIG, Inc. under contract to Transition Properties, LP.



Christopher Brown
Director of Environmental Services



Olivia Chan
Associate Analyst II

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3.1 Defining Noise

"Sound" is a vibratory disturbance created by a moving or vibrating source and is capable of being detected. "Noise" is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment.

THE PRODUCTION OF SOUND

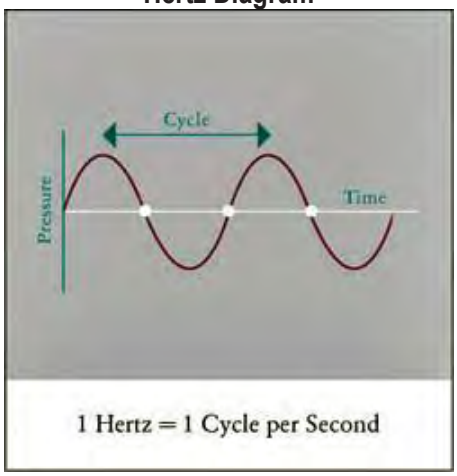
Sound has three properties: amplitude and amplitude variation of the acoustical wave (loudness), frequency (pitch), and duration of the noise. Despite the ability to measure sound, human perceptibility is subjective, and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

MEASURING SOUND

Sound pressure levels are described in logarithmic units of ratios of sound pressures to a reference pressure, squared. These units are called bels. To provide a finer description of sound, a bel is subdivided into 10 decibels, abbreviated dB. Since decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. For example, if one automobile produces a sound pressure level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB. In fact, they would combine to produce 73 dB. This same principle can be applied to other traffic quantities as well. In other words, doubling the traffic volume on a street or the speed of the traffic will increase the traffic noise level by three dB. Conversely, halving the traffic volume or speed will reduce the traffic noise level by three dB. A three dB change in sound is the beginning at which humans generally notice a *barely perceptible* change in sound and a five dB change is generally *readily perceptible.*[1]

Sound pressure level alone is not a reliable indicator of loudness. The frequency or pitch of a sound also has a substantial effect on how humans will respond. While the intensity of the sound is a purely physical quantity, the loudness or human response depends on the characteristics of the human ear. Human hearing is limited not only to the range of audible frequencies but also in the way it perceives the sound pressure level in that range. In general, the healthy human ear is most sensitive to sounds between 1,000 Hertz (Hz) and 5,000 Hz, and perceives both higher and lower frequency sounds of the same magnitude with less intensity. Hertz is a unit of frequency that defines any periodic event. In the case of sound pressure, a Hertz defines one cycle of a sound wave per second (see Figure 1, Hertz Diagram). To approximate the frequency response of the human ear, a series of sound pressure level adjustments is usually applied to the sound measured by a sound level meter.

Figure 1
Hertz Diagram



STANDARDS FOR NOISE EQUIVALENT

Noise consists of pitch, loudness, and duration; therefore, a variety of methods for measuring noise have been developed. According to the California General Plan Guidelines for Noise Elements, the following are common metrics for measuring noise:[2]

L_{eq} (Equivalent Energy Noise Level): The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over given sample periods. L_{eq} is typically computed over 1-, 8-, and 24-hour sample periods.

CNEL (Community Noise Equivalent Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 PM to 10:00 PM and after addition of ten decibels to sound levels in the night from 10:00 PM to 7:00 AM.

L_{dn} (Day-Night Average Level): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of ten decibels to sound levels in the night after 10:00 PM and before 7:00 AM.

CNEL and L_{dn} are utilized for describing ambient noise levels because they account for all noise sources over an extended period of time and account for the heightened sensitivity of people to noise during the night. L_{eq} is better utilized for describing specific and consistent sources because of the shorter reference period.

Federal and State agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. The State Department of Aeronautics and the California Commission on Housing and Community Development have adopted the community noise equivalent level (CNEL).

3.2 Vibration and Groundborne Noise

Vibration is the movement of mass over time. It is described in terms of frequency and amplitude and unlike sound; there is no standard way of measuring and reporting amplitude. Vibration can be described in units of velocity (inches per second) or discussed in decibel (dB) units in order to compress the range of numbers required to describe vibration. Vibration impacts to buildings are generally discussed in terms of peak particle velocity (PPV) that describes particle movement over time (in terms of physical displacement of mass). For purposes of this analysis, PPV will be used to describe all vibration for ease of reading and comparison. Vibration can impact people, structures, and sensitive equipment.[3] The primary concern related to vibration and people is the potential to annoy those working and residing in the area. Vibration with high enough amplitudes can damage structures (such as crack plaster or destroy windows). Groundborne vibration can also disrupt the use of sensitive medical and scientific instruments such as electron microscopes. Common sources of vibration within communities include construction activities and railroads.

Groundborne vibration generated by construction projects is usually highest during pile driving, rock blasting, soil compacting, jack hammering, and demolition-related activities. Next to pile driving, grading activity has the greatest potential for vibration impacts if large bulldozers, large trucks, or other heavy equipment are used.

4.1 Sensitive Receptors

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, and residential uses make up the majority of these areas. The proposed facility is located in a generally industrial area with industrial uses to the north and east, vacant land to the west, and open space/park use to the south. There are residential uses approximately 0.14 miles to the southeast of the project site. There are no schools located within a quarter mile of the project site. Exhibit 2 (Radius Map) identifies existing development in the project vicinity based on assessor's parcel data.

4.2 Existing Noise Levels

Short-term noise measurements at the project site were conducted to identify the ambient noise in the project vicinity. An American National Standards Institute (ANSI Section SI4 1979, Type 1) Larson Davis model LxT sound level meter was used to monitor existing ambient noise levels in the project area. The noise meter was programmed in "slow" mode to record noise levels in A-weighted form. The microphone height was set at five feet. Two 10-minute daytime noise measurements were taken between 9.48 AM and 10:12 AM on Tuesday, April 7, 2015.

Ambient noise levels ranged from 58.7 to 66.9 dBA CNEL. Ambient noise levels are a composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location. Measurement locations are shown in Exhibit 3 (Noise Measurement Locations). Ambient noise levels are presented in Table 1 (Ambient Noise Levels) and measurement output data is included as Appendix A.

Vehicular traffic along Center Street and Placentia Lane was the dominant noise source at measurement location 001 and truck traffic entering and exiting the industrial use at the south end of Sieck Road was the dominant noise source at measurement location 002.

Table 1
Ambient Noise Levels

Location	Time Period	Measurement Period	Description	Existing Ambient Noise Levels (dBA CNEL)
001	9:48 AM – 9:58 AM	10 Minutes	Northern property boundary on the south side of Center Street	66.9
002	10:02 AM – 10:12 AM	10 Minutes	Southwestern corner of Placentia Lane and Sieck Road	58.7

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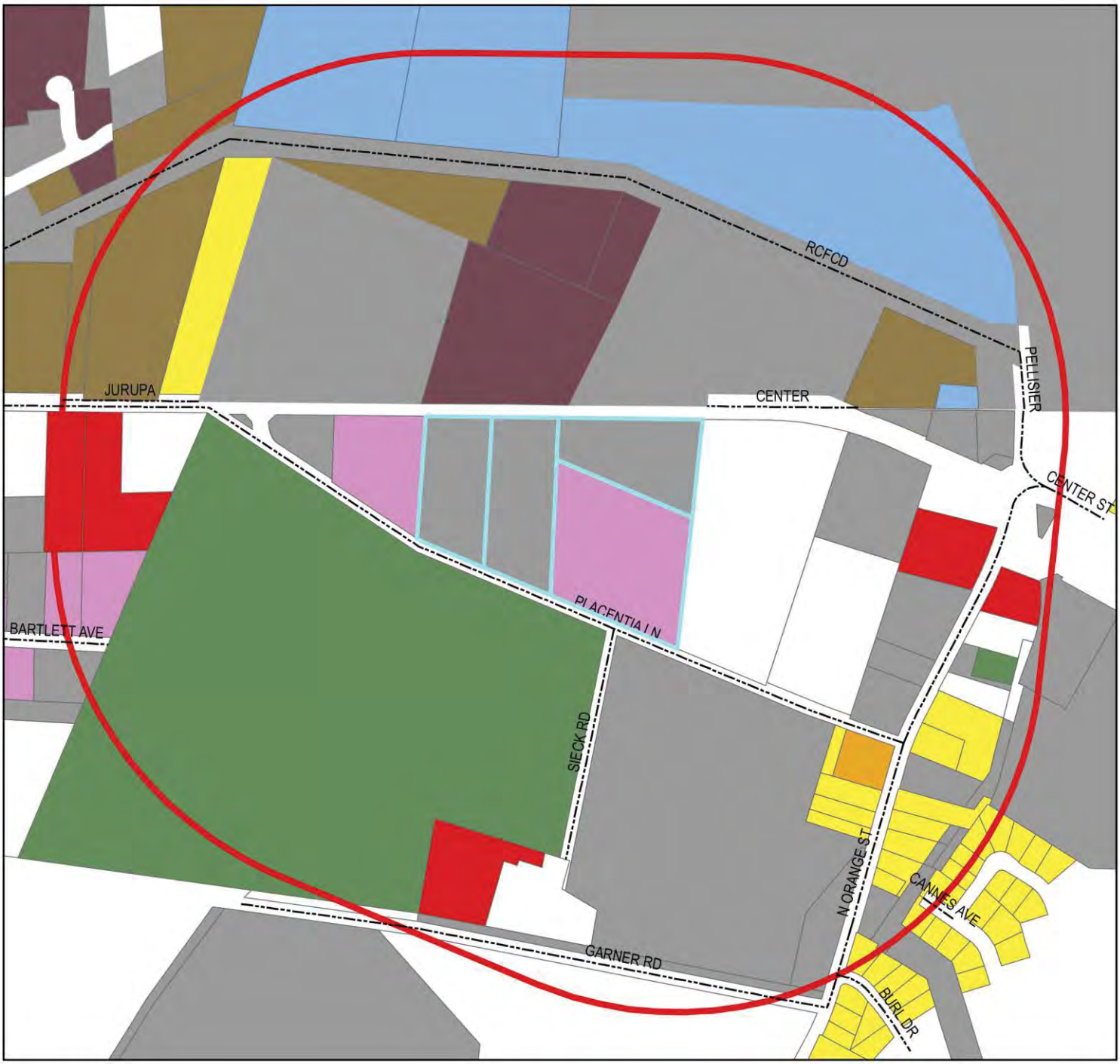

Legend

- Project Site
- 0.25 Mile Radius

Land Uses

- Unknown
- Vacant
- Commercial
- Storage
- Light Industrial
- Residential Use in Commercial Zone
- Single Family Residential
- Multi-Family Residential
- Miscellaneous Structures
- Electric Power Transmissions

0 0.03 0.06 0.12 0.18 0.24 Miles

N

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Exhibit 3 Noise Measurement Locations

Center Street Commerce Building Project
6550 Center Street, Riverside, California

Source: Google Earth, 2015

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5.1 Federal Regulations

FEDERAL NOISE CONTROL ACT OF 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the L_{dn} should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In addition, the Levels of Environmental Noise identified five dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA L_{dn} (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more localized levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated federal agencies, allowing more individualized control for specific issues by designated federal, State, and local government agencies.

FEDERAL TRANSIT ADMINISTRATION

The Federal Transit Administration (FTA) has developed methodology and significance criteria to evaluate incremental noise impacts from surface transportation modes (i.e., on road motor vehicles and trains) as presented in Transit Noise Impact and Vibration Assessment (FTA Guidelines). These incremental noise impact criteria are based on EPA findings and subsequent studies of annoyance in communities affected by transportation noise. The FTA extended the EPA's five dBA incremental impact criterion to higher ambient levels. As baseline ambient levels increase, smaller and smaller increments are allowed to limit expected increases in community annoyance. For example, in residential areas with a baseline ambient noise level of 50 dBA CNEL, a less-than-five dBA increase in noise levels would produce a minimal increase in community annoyance levels, while at 70 dBA CNEL, only one dBA increase could be accommodated before a significant annoyance increase would occur.

VIBRATION STANDARDS

The FTA provides guidelines for maximum-acceptable vibration criteria for different types of land uses. Groundborne vibration and noise levels associated with various types of construction equipment and activities are summarized in Table 2 (Reference Vibration Source Amplitudes for Construction Equipment). Table 3 (Groundborne Vibration and Noise Impact Criteria) shows the Federal Transit Administration's maximum acceptable vibration standard for human annoyance in residences where people normally sleep is 80 VdB (less than 70 vibration events per day).

Table 2
Reference Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV at 25 ft (in/sec) at 25 Feet	Approximate Vibration Level (VL) at 25 Feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 (upper range)	105
	0.170 (typical)	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
Slurry wall	0.017 in rock	75
Vibratory roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Notes: PPV is the peak particle velocity. Pile driver amplitude varies greatly based on equipment type and size.
Source: Federal Transit Administration. Transit Noise and Vibration Impact Assessment. 2006.

Table 3
Groundborne Vibration and Noise Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB)		Groundborne Noise Impact Levels (dBA)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior vibrations	65 VdB[3]	65 VdB[3]	N/A	N/A
Category 2: Residences and buildings where people normally sleep	72 VdB	80 VdB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use	75 VdB	83 VdB	40 dBA	48 dBA

1 *Frequent Events – more than 70 vibration events per day*
2 *Infrequent Events – fewer than 70 vibration events per day*
3 *This criterion limit is based on levels that are acceptable for more moderately sensitive equipment such as optical microscopes.*
Source: United States Department of Transportation, Federal Transit Administration, Transit Noise and Vibration Assessment, 1995

The FTA and Caltrans have compiled the data from numerous studies related to vibration and have developed standards for human perception and building damage. The FTA's maximum acceptable vibration standard for human annoyance is 78 VdB at nearby vibration-sensitive land uses.[4] The Caltrans maximum vibration level standard is 0.2 in/sec PPV for the prevention of structural damage to typical residential buildings.[5]

5.2 State Regulations

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

CEQA requires lead agencies to consider noise impacts. Under CEQA, lead agencies are directed to assess conformance to locally established noise standards or other agencies' noise standards; measure and identify the potentially significant exposure of people to or generation of excessive noise levels; measure and identify potentially significant permanent or temporary increase in ambient noise levels; and measure and identify potentially significant impacts associated with air traffic.

CALIFORNIA NOISE CONTROL ACT OF 1973

Sections 46000-46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, find that excessive noise is a serious hazard to public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the State to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

CALIFORNIA NOISE INSULATION STANDARDS (CCR TITLE 24)

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for multi-family residential buildings (Title 24, Part 2, California Code of Regulations). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a residential building or structure is proposed to be located near an existing or adopted freeway route, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source, and where such noise source or sources create an exterior CNEL (or L_{dn}) of 60 dBA or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or L_{dn}) of 45 dBA or below [California's Title 24 Noise Standards, Chap. 2-35].

STATE OF CALIFORNIA GENERAL PLAN GUIDELINES 2003

Though not adopted by law, the State of California General Plan Guidelines 2003, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of development relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., L_{dn} or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally acceptable" ranges include conditions calling for detailed acoustical study or construction mitigation to reduce interior exposure levels prior to the construction or operation of the building under the listed exposure levels.

CALIFORNIA DEPARTMENT OF TRANSPORTATION

According to the Caltrans vibration manual, large bulldozers, vibratory rollers (used to compact earth), and loaded trucks utilized during grading activities can produce vibration, and depending on the level of vibration, could cause annoyance at uses within the project vicinity or damage structures. Caltrans has developed a screening tool to determine of vibration from construction equipment is substantial enough to impact surrounding uses.

The Caltrans vibration manual establishes thresholds for vibration impacts on buildings and humans. These thresholds are summarized in Tables 4 (Vibration Damage Potential Threshold Criteria) and 5 (Vibration Annoyance Potential Threshold Criteria).

Table 4
Vibration Damage Potential Threshold Criteria

Structural Integrity	Maximum PPV (in/sec)	
	Transient	Continuous
Historic and some older buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial and commercial structures	2.00	0.50
Source: Caltrans 2013		

Table 5
Vibration Annoyance Potential Threshold Criteria

Human Response	PPV Threshold (in/sec)	
	Transient	Continuous
Barely perceptible	0.035	0.012
Distinctly perceptible	0.24	0.035
Strongly perceptible	0.90	0.10
Severely perceptible	2.00	0.40
Source: Caltrans 2013		

5.3 Local Regulations

CITY OF RIVERSIDE MUNICIPAL CODE

The City of Riverside Municipal Code, under Chapter 4.25 (Nuisance Exterior Sound Level limits) Section 7.25.010 (Exterior Sound Level Limits), provides the local government ordinance relative to community noise level exposure, guidelines, and regulations.

Exterior Noise Standards

Table 7.25.010A (Exterior Noise Standards) of the Municipal Code includes exterior noise standards for daytime and nighttime noise levels for each land use category. Exterior noise levels shall not exceed 55 dBA between the hours of 7:00 AM and 10:00 PM for residential use or 70 dBA for surrounding industrial uses and 65 dBA for public recreation facilities and commercial use at any time of day.

Construction Noise Levels

Pursuant to Section 7.35.010 (General Noise Regulations), the operation or causing of any tools or equipment used in construction, drilling, repair, alteration, grading, or demolition work between the hours of 7:00 PM and 7:00 AM on Monday through Friday, between 5:00 PM and 8:00 AM on Saturdays, or any time on Sundays and federal holidays that creates a noise disturbance across residential or commercial property line or at any time exceeds the maximum permitted noise level for the underlying land use category is prohibited.

CITY OF COLTON MUNICIPAL CODE

Pursuant to Section 18.42.040 (Noise) of the Colton Municipal Code, the maximum sound level radiated by any use, when measured at the boundary line of the property of which is sound is generated, shall not be obnoxious and shall not exceed 65 dBA.

Vibration

Pursuant to Section 18.42.050 (Vibration) of the Colton Municipal Code, ground vibration shall not be generated by equipment other than motor vehicles, trains, or by temporary construction or demolition, which is perceptible by the average person at or beyond the lot line of the property containing such activities.

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The thresholds identified in Appendix G of the State CEQA Guidelines, as implemented by the City of Riverside, have been utilized to assess the significance of the potential environmental effects of the project.

6.1 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project could result in potentially significant impacts related to noise if it results in:

A. Exposure of persons or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
B. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
C. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
D. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
E. For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels.
F. For a project within a vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

To assess construction impacts, a worst-case construction scenario was modeled using the Federal Highway Administration's Roadway Construction Noise Model (RCNM). Modeling parameters and output are provided in Appendix B. RCNM utilizes standard noise emission levels for different types of equipment and includes utilization percentage, impact, and shielding parameters.

To assess current and opening year traffic noise levels, vehicle trips associated with surrounding roadways were modeled utilizing the SoundPLAN software. SoundPLAN is a three-dimensional noise modeling software that accounts for the shielding and reflective effects associated with intervening topography and nearby buildings.

6.2 Consistency with Applicable Standards

CONSTRUCTION NOISE LEVELS

Construction noise levels were estimated for nearby receptors using the FHWA Roadway Construction Noise Model (RCNM). See Exhibit 4 (Receptors - Construction) for receptor locations. Temporary noise increases will be greatest during the demolition phase. The model indicates that the use of construction equipment such as excavators, dozers, and concrete saws could expose the industrial use located approximately 421 feet to the south of the center of the project site to a combined noise level of 71.1 dBA $L_{max.}$ Construction equipment could expose the industrial use located 640 feet south, the industrial use located 510 feet east, and the park located 544 feet from the center of the project site to a combined noise level of 67.4 dBA L_{max}, 69.4 dBA L_{max}, and 68.8 dBA L_{max}, respectively. Within the City of Riverside, a noise level of 70 dBA is allowable at surrounding industrial uses and a noise level of 65 dBA is allowable at public recreation facilities. To the north of the project site is the City of Colton. Within the City of Colton, the maximum allowable noise level is 65 dBA. Construction activity could result in noise levels in excess of the allowable noise levels at the industrial use to the south, the public recreation use to the south, and the industrial use to the north of the project site. Therefore, Mitigation Measures N-1 and N-2 have been incorporated to reduce the impact to neighboring uses during construction.

Per Section 7.35.10 (General Noise Regulations) of the Riverside Municipal Code, construction activities occurring between the hours of 7:00 PM and 7:00 AM on Mondays through Fridays, between 5:00 PM and 8:00 AM on Saturdays, and any time on Sundays and federal holidays are prohibited. Mitigation Measure N-1 limits construction activity to the hours of 7:00 AM and 7:00 PM Monday through Friday and the hours of 8:00 AM and 5:00 PM on Saturdays. Due to the

time limitations on construction activity, surrounding employees and park users will be exposed to limited construction noise. Because noise levels during construction activities are anticipated to exceed the City's exterior noise standards, mitigation measures will be necessary to minimize noise levels at nearby receptors. Mitigation Measure N-2 will be incorporated to minimize noise associated with general construction activities. Mitigation Measure N-2 requires preparation of a construction noise reduction plan to reduce temporary noise impacts by a minimum of 10 dBA which is a feasible performance standard based on available technology. Engineered controls include retrofitting equipment with improved exhaust and intake muffling, disengaging equipment fans, and installation of sound panels around equipment engines. These types of controls can achieve noise level reductions of approximately 10 dBA.[6] [7] Implementation of Mitigation Measure N-2 will reduce temporary noise impacts by a minimum of 10 dBA, resulting in a maximum construction noise level of 61.1 dBA at the project site and 58.8 dBA at the park located to the south of the project site. Therefore, with implementation of Mitigation Measures N-1 and N-2, construction noise will feasibly be reduced to unsubstantial levels.

OPERATIONAL NOISE LEVELS

The City of Riverside Municipal Code sets an allowable exterior noise level for industrial uses at 70 dBA CNEL, 65 dBA CNEL for public recreational facilities and office/commercial use, 60 dBA for community support uses, and 55 dBA for residential use. The City of Colton sets an allowable noise level of 65 dBA CNEL. Ambient noise at the project site would generally be defined by traffic on Center Street, Placentia Lane, and operational noise from neighboring industrial uses. A substantial increase in ambient noise is an increase that is *barely perceptible* (3 dBA). Operationally, the proposed project will result in periodic landscaping and other occasional noise generating activities. These activities are common in urban uses and do not represent a substantial increase in periodic noise in consideration that the project site is located in an industrialized area. Traffic noise from vehicular traffic generated by the proposed project was projected using SoundPLAN software was based on estimated trip generation and distribution provided by Kunzman Associates, Inc.[8]

Noise levels at the single family homes to the east and west, the industrial uses to the north and east, and the commercial use to the east were calculated (see Appendix C for output data) and projected at the ground floor (see Exhibit 6 (Receptors – Traffic Noise). The 2017 Opening Year Without and With Project traffic noise levels during the peak hour at neighboring uses are summarized in Table 6 (Opening Year 2017 Peak Hour Roadway Noise Levels). Opening Year Without and With Project exterior noise levels will be within the allowable exterior noise levels established by the City of Colton for the northern industrial use and within the established City of Riverside exterior noise standard for the industrial and commercial uses to the east and the residential use to the southeast of the project site on the east side of Orange Street. The exterior noise levels under the Without and With Project scenarios exceed allowable exterior noise levels at the residential uses to the northeast, southeast, and northwest of the project site. However, the project does not cause the exterior noise levels to exceed the 55 dBA residential threshold for receptors that are currently below the allowable noise levels. In addition, traffic noise levels will not increase more than 3 dBA as a result of the proposed project as shown in Table 6. Therefore, no significant impacts will result.

Table 6
Opening Year 2017 Peak Hour Roadway Noise Levels

Receptors	Without Project dBA CNEL		With Project dBA CNEL		Difference (AM / PM)	Significant? (AM / PM)
	AM	PM	AM	PM		
1 – Industrial (N)	57.0	57.8	58.2	58.8	+1.2 / +1.0	No / No
2 – Industrial (E)	61.3	62.3	63.3	64.1	+2.0 / +1.8	No / No
3 – Single Family Residential (NE)	**57.9**	**59.4**	**59.7**	**60.8**	+1.8 / +1.4	No / No
4 – Commercial (E)	57.4	58.2	58.2	59.0	+0.8 / +0.8	No / No
5 – Single Family Residential (SE)	53.3	54.0	53.6	54.4	+0.3 / +0.4	No / No
6 – Single Family Residential (SE)	**60.7**	**61.4**	**60.9**	**61.8**	+0.2 / +0.4	No / No
7 – Single Family Residential (NW)	**60.2**	**61.1**	**60.9**	**61.8**	+0.7 / +0.7	No / No
Bolded *noise levels exceed 55 dBA exterior threshold for residential uses.*						

6.3 Vibration Impacts

CONSTRUCTION VIBRATION

Construction activities that use vibratory rollers and bulldozers are repetitive sources of vibration; therefore, the *continuous* threshold is used. Industrial uses are located to the north and east of the project site. As a worst case scenario, the *historic and some older buildings* threshold is used. Based on the threshold criteria summarized in Tables 4 and 5, vibration from use of heavy construction equipment for the proposed project would be below the thresholds to cause damage to nearby structures and result in less than *barely perceptible* vibration at the four receptors shown in Table 7 (Distances to Vibration Receptors) and Table 8 (Construction Vibration Impacts).

Table 7
Distances to Vibration Receptors

Receptors	Distance from Center of Project Site (ft)
1 – Industrial (N)	640
2 – Industrial (E)	510
3 – Industrial (S)	421
4 – Park (S)	544

Construction of the project does not require rock blasting, pile driving, or the use of a jack hammer, but will use a vibratory roller, and large bulldozer, and loaded trucks. All of the receptors will experience less than *barely perceptible* vibration from construction of the proposed project. Furthermore, these construction activities will be limited to the hours of 7:00 AM to 7:00 PM Mondays through Friday and the hours of 8:00 AM to 5:00 PM on Saturdays. With regard to long-term operational impacts, activities associated with the project will not result in any vibration-related impacts to adjacent or on-site properties.

Table 8
Construction Vibration Impacts

Receptors	Equipment	PPVref	Distance (feet)	PPV
1 – Single Family Home (NE)	Vibratory Roller	0.21	640	0.0031
2 – Storage Facility (N)	Vibratory Roller	0.21	510	0.0042
3 – Single Family Home (E)	Vibratory Roller	0.21	421	0.0053
4 – Single Family Home (E)	Vibratory Roller	0.21	544	0.0038
1 – Single Family Home (NE)	Large Bulldozer	0.089	640	0.0013
2 – Storage Facility (N)	Large Bulldozer	0.089	510	0.0018
3 – Single Family Home (E)	Large Bulldozer	0.089	421	0.0023
4 – Single Family Home (E)	Large Bulldozer	0.089	544	0.0016
1 – Single Family Home (NE)	Loaded Truck	0.076	640	0.0011
2 – Storage Facility (N)	Loaded Truck	0.076	510	0.0015
3 – Single Family Home (E)	Loaded Truck	0.076	421	0.0019
4 – Single Family Home (E)	Loaded Truck	0.076	544	0.0014

OPERATIONAL VIBRATION

Operation of the proposed project will include heavy-duty truck traffic along Center Street. According to the Federal Transit Administration, it is unusual for vibration from sources such as trucks to be perceptible.[9] However, according to Caltrans heavy trucks can impart groundborne vibration when the pavement is not smooth.[10] Therefore, to provide a worst case analysis, potential building damage due to project operation has been analyzed. Currently, there is concern regarding impacts to the Adobe structure located north of Center Street to the west of Orange Street (APN 246-082-002) due to heavy trucks traveling along Center Street.

The structure is located approximately 88 feet from the centerline of the nearest lane on Center Street. According to Caltrans, the highest truck traffic vibrations generated on freeway shoulders is 2.0 PPV mm/sec (0.079 PPV in/sec). At 88 feet, the vibration level reaching the Adobe structure is 0.015 PPV. According to project trip generation as estimated by Kunzman Associates, the proposed project is anticipated to generate 64 heavy-duty trucks per day, with a maximum of five heavy-duty trucks during the PM peak hour. Although truck trips will occur periodically, the *continuous* threshold has been utilized to provide a worst case analysis. Based on the Caltrans threshold for *historic and some old buildings* as summarized in Table 4, heavy truck traffic on Center Street will not result in structure damage due to operation-related groundborne vibration. The Caltrans Transportation and Construction Vibration Guidance Manual also provides alternative thresholds, as summarized in Table 9 (Vibration Criteria for Buildings).

Table 9
Vibration Criteria for Buildings

Criteria	Building Type	Continuous Threshold PPV (in/sec)
Swiss Association of Standardization	Class IV: Construction very sensitive to vibration; objects of historic interest	0.12
Konan	Historic and Sensitive Buildings	0.12
AASHTO	Historic Sites or other critical locations	0.10
Source: Caltrans 2013		

As shown in Table 9, periodic heavy truck traffic occurring along Center Street will not exceed vibration criteria for structural damage to historic and sensitive buildings. In addition, According to the Whiffen vibration criteria for continuous vibration, vibration levels of 0.006 – 0.019 are unlikely to cause damage to buildings of any type. The 0.015 PPV resulting from heavy truck traffic will be within this continuous threshold. Therefore, no substantial impact will result.

6.4 Airport Noise

The project site is located with two miles of a public or private use airport or helipad. Therefore, no substantial impacts will occur.

Exhibit 4 Receptors - Construction

Center Street Commerce Building Project
6550 Center Street, Riverside, California

Source: Google Earth, 2015

http://www.migcom.com • 951-787-9222

MIG Hogle-Ireland

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Exhibit 5 Receptors - Traffic Noise

Center Street Commerce Building Project
6550 Center Street, Riverside, California

Source: Google Earth, 2015

http://www.migcom.com • 951-787-9222

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The following mitigation measures are required to ensure that project-related noise levels will not exceed established thresholds.

N-1 Limit construction activities to the hours of 7:00 AM to 7:00 PM Monday through Friday and the hours of 8:00 AM to 5:00 PM on Saturdays. Construction activity shall be prohibited on Sundays and federal holidays. This mitigation measure must be implemented throughout construction and may be periodically monitored by the Planning Director or designee during routine inspections.

N-2 Prior to issuance of grading permits, the Applicant shall submit a mitigation plan prepared by a qualified engineer or other acoustical expert for review and approval by the Planning Division that identifies noise control measures that achieve a minimum 10 dBA reduction in construction-related noise levels. The mitigation plan may include use of sound curtains, engineered equipment controls, or other methods. Noise control requirements shall be noted on project construction drawings and verified by the Building Department during standard inspection procedures.

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1 California Department of Transportation. Basics of Highway Noise: Technical Noise Supplement. November 2009.

2 California Governor's Office of Planning and Research. General Plan Guidelines. 2003

3 California Department of Transportation. Transportation- and Construction-Induced Vibration Guidance Manual. June 2004

4 Federal Transit Administration. *Transit Noise and Vibration Impact Assessment.* 2006

5 California Department of Transportation. *Transportation and Construction Vibration Guidance Manual. Division of Environmental Analysis. September 2013*

6 United States Bureau of Mines. Mining Machinery Noise Control Guidelines. 1983

7 United States Bureau of Mines. Noise Abatement Techniques for Construction Equipment. August 1979

8 Kunzman Associates, Inc. Center Street Warehouse Project Traffic Impact Analysis. January 19, 2016

9 Federal Transit Administration. Transit Noise and Vibration Impact Assessment. May 2006

10 California Department of Transportation, Transportation and Construction Vibration Guidance Manual, September 2013

Appendix A Noise Measurement Data

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Appendix B Construction Noise and Vibration Output Data

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Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2015
Case Description: 1 Demolition

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	640	0
Excavator	No	40		80.7	640	0
Excavator	No	40		80.7	640	0
Dozer	No	40		81.7	640	0
Dozer	No	40		81.7	640	0
Concrete Saw	No	20		89.6	640	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw		67.4	60.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	67.4	64.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	510	0
Excavator	No	40		80.7	510	0
Excavator	No	40		80.7	510	0
Dozer	No	40		81.7	510	0
Dozer	No	40		81.7	510	0
Concrete Saw	No	20		89.6	510	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		60.5	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60.5	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60.5	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw		69.4	62.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	69.4	66.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	421	0
Excavator	No	40		80.7	421	0
Excavator	No	40		80.7	421	0
Dozer	No	40		81.7	421	0
Dozer	No	40		81.7	421	0
Concrete Saw	No	20		89.6	421	0

		Results													
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw		71.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	71.1	67.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Park (S)	Industrial	65	65	65

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Excavator	No	40		80.7	544	0
Excavator	No	40		80.7	544	0
Excavator	No	40		80.7	544	0
Dozer	No	40		81.7	544	0
Dozer	No	40		81.7	544	0
Concrete Saw	No	20		89.6	544	0

		Results													
		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		60	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		60.9	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		60.9	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Saw		68.8	61.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	68.8	65.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2015
Case Description: 2 Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		640	0
Tractor	No	40	84		640	0
Backhoe	No	40		77.6	640	0
Backhoe	No	40		77.6	640	0
Dozer	No	40		81.7	640	0
Dozer	No	40		81.7	640	0
Dozer	No	40		81.7	640	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	61.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	61.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	61.9	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		510	0
Tractor	No	40	84		510	0
Backhoe	No	40		77.6	510	0
Backhoe	No	40		77.6	510	0
Dozer	No	40		81.7	510	0
Dozer	No	40		81.7	510	0
Dozer	No	40		81.7	510	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.8	66.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		421	0
Tractor	No	40	84		421	0
Backhoe	No	40		77.6	421	0
Backhoe	No	40		77.6	421	0
Dozer	No	40		81.7	421	0
Dozer	No	40		81.7	421	0
Dozer	No	40		81.7	421	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	65.5	67.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Park (S)	Industrial	65	65	65

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84		544	0
Tractor	No	40	84		544	0
Backhoe	No	40		77.6	544	0
Backhoe	No	40		77.6	544	0
Dozer	No	40		81.7	544	0
Dozer	No	40		81.7	544	0
Dozer	No	40		81.7	544	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	56.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	56.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	60.9	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	60.9	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	60.9	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.3	65.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2015
Case Description: 3 Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	640	0
Tractor	No	40	84		640	0
Backhoe	No	40		77.6	640	0
Grader	No	40	85		640	0
Excavator	No	40		80.7	640	0
Excavator	No	40		80.7	640	0
Scraper	No	40		83.6	640	0
Scraper	No	40		83.6	640	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		59.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		61.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		62.9	58.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		58.6	54.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		61.4	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.9	65.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	510	0
Tractor	No	40	84		510	0
Backhoe	No	40		77.6	510	0
Grader	No	40	85		510	0
Excavator	No	40		80.7	510	0
Excavator	No	40		80.7	510	0
Scraper	No	40		83.6	510	0
Scraper	No	40		83.6	510	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		61.5	57.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		64.8	60.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60.5	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60.5	56.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		63.4	59.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		63.4	59.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	64.8	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	421	0
Tractor	No	40	84		421	0
Backhoe	No	40		77.6	421	0
Grader	No	40	85		421	0
Excavator	No	40		80.7	421	0
Excavator	No	40		80.7	421	0
Scraper	No	40		83.6	421	0
Scraper	No	40		83.6	421	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		66.5	62.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		65.1	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		65.1	61.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.5	69.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Park (S)	Industrial	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	544	0
Tractor	No	40	84		544	0
Backhoe	No	40		77.6	544	0
Grader	No	40	85		544	0
Excavator	No	40		80.7	544	0
Excavator	No	40		80.7	544	0
Scraper	No	40		83.6	544	0
Scraper	No	40		83.6	544	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		60.9	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		56.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		64.3	60.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		60	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		62.8	58.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper		62.8	58.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	64.3	66.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2015
Case Description: 4 Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	640	0
All Other Equipment > 5 HP	No	50	85		640	0
All Other Equipment > 5 HP	No	50	85		640	0
All Other Equipment > 5 HP	No	50	85		640	0
Tractor	No	40	84		640	0
Backhoe	No	40		77.6	640	0
Backhoe	No	40		77.6	640	0
Welder / Torch	No	40		74	640	0
Generator	No	50		80.6	640	0

Equipment	Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	58.4	50.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.9	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.9	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	62.9	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	61.9	57.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	55.4	51.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	51.9	47.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	58.5	55.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	62.9	66.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	510	0
All Other Equipment > 5 HP	No	50	85		510	0
All Other Equipment > 5 HP	No	50	85		510	0
All Other Equipment > 5 HP	No	50	85		510	0
Tractor	No	40	84		510	0
Backhoe	No	40		77.6	510	0
Backhoe	No	40		77.6	510	0
Welder / Torch	No	40		74	510	0
Generator	No	50		80.6	510	0

Equipment	Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	60.4	52.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	64.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	64.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	64.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	53.8	49.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	60.5	57.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.8	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	421	0
All Other Equipment > 5 HP	No	50	85		421	0
All Other Equipment > 5 HP	No	50	85		421	0
All Other Equipment > 5 HP	No	50	85		421	0
Tractor	No	40	84		421	0
Backhoe	No	40		77.6	421	0
Backhoe	No	40		77.6	421	0
Welder / Torch	No	40		74	421	0
Generator	No	50		80.6	421	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		62	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		66.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		66.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		66.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		55.5	51.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.5	70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Park (S)	Industrial	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	544	0
All Other Equipment > 5 HP	No	50	85		544	0
All Other Equipment > 5 HP	No	50	85		544	0
All Other Equipment > 5 HP	No	50	85		544	0
Tractor	No	40	84		544	0
Backhoe	No	40		77.6	544	0
Backhoe	No	40		77.6	544	0
Welder / Torch	No	40		74	544	0
Generator	No	50		80.6	544	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		59.8	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		64.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		64.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		64.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		56.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe		56.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		53.3	49.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		59.9	56.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	64.3	67.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2015
Case Description: 5 Architectural Coating

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	640	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	55.5	51.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	55.5	51.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	510	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	57.5	53.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	57.5	53.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	421	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)	59.2	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.2	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Park (S)	Industrial	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	544	0

Results

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		56.9	53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	56.9	53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 6/4/2015
Case Description: 6 Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (N)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	640	0
Paver	No	50		77.2	640	0
Roller	No	20		80	640	0
Roller	No	20		80	640	0
All Other Equipment > 5 HP	No	50	85		640	0
All Other Equipment > 5 HP	No	50	85		640	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		55.1	52.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		55.1	52.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		57.9	50.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		57.9	50.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.9	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		62.9	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.9	64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial (E)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	510	0
Paver	No	50		77.2	510	0
Roller	No	20		80	510	0
Roller	No	20		80	510	0
All Other Equipment > 5 HP	No	50	85		510	0
All Other Equipment > 5 HP	No	50	85		510	0

Results

		Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		60.4	52.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver		64.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		64.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		64.8	61.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		63.8	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		57.4	53.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	64.8	68.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Industrial (S)	Industrial	70	70	70

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	421	0
Paver	No	50		77.2	421	0
Roller	No	20		80	421	0
Roller	No	20		80	421	0
All Other Equipment > 5 HP	No	50	85		421	0
All Other Equipment > 5 HP	No	50	85		421	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	62	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	66.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	66.5	63.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	66.5	70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Park (S)	Industrial	65	65	65

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	544	0
Paver	No	50		77.2	544	0
Roller	No	20		80	544	0
Roller	No	20		80	544	0
All Other Equipment > 5 HP	No	50	85		544	0
All Other Equipment > 5 HP	No	50	85		544	0

Results

	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	59.8	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	64.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	64.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	64.3	61.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	63.3	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	56.8	52.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.3	67.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Center Street Warehouse

Receptors	Distance (ft)
1 – Industrial (N)	640
2 – Industrial (E)	510
3 – Industrial (S)	421
4 – Park (S)	544

Equipment	PPVref	D	n	Eref	Eequip	PPV
Vibratory Roller	0.21	640	1.3			0.0031
Vibratory Roller	0.21	510	1.3			0.0042
Vibratory Roller	0.21	421	1.3			0.0053
Vibratory Roller	0.21	544	1.3			0.0038
Large Bulldozer	0.089	640	1.3			0.0013
Large Bulldozer	0.089	510	1.3			0.0018
Large Bulldozer	0.089	421	1.3			0.0023
Large Bulldozer	0.089	544	1.3			0.0016
Loaded Truck	0.076	640	1.3			0.0011
Loaded Truck	0.076	510	1.3			0.0015
Loaded Truck	0.076	421	1.3			0.0019
Loaded Truck	0.076	544	1.3			0.0014

Table

Equipment	PPVref	Distance	PPV
Vibratory Roller	0.21	640	0.0031
Vibratory Roller	0.21	510	0.0042
Vibratory Roller	0.21	421	0.0053
Vibratory Roller	0.21	544	0.0038
Large Bulldozer	0.089	640	0.0013
Large Bulldozer	0.089	510	0.0018
Large Bulldozer	0.089	421	0.0023
Large Bulldozer	0.089	544	0.0016
Loaded Truck	0.076	640	0.0011
Loaded Truck	0.076	510	0.0015
Loaded Truck	0.076	421	0.0019
Loaded Truck	0.076	544	0.0014

Appendix C SoundPLAN Output Data

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Center Street
Opening Year 2017 Without Project
Road

Stationing km	ADT Veh/24h	Traffic values Vehicles type	Vehicle name	AM Veh/h	PM Veh/h	Speed km/h	Control device	Constr. Speed km/h	Affect. veh. %	Road surface	Gradient Min / Max %
Center Street (EB)		Traffic direction:	In entry direction								
0+000	4288	Total	-	132	272	-	none	-	-	Average (of DGAC and PCC)	0
0+000	4288	Automobiles	-	90	187	56	none	-	-	Average (of DGAC and PCC)	0
0+000	4288	Medium trucks	-	34	70	56	none	-	-	Average (of DGAC and PCC)	0
0+000	4288	Heavy trucks	-	7	13	56	none	-	-	Average (of DGAC and PCC)	0
0+000	4288	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+000	4288	Motorcycles	-	1	2	56	none	-	-	Average (of DGAC and PCC)	0
0+000	4288	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Total	-	166	283	-	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Automobiles	-	114	194	56	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Medium trucks	-	43	73	56	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Heavy trucks	-	8	14	56	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Motorcycles	-	1	2	56	none	-	-	Average (of DGAC and PCC)	0
0+544	4920	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Total	-	166	283	-	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Automobiles	-	114	194	56	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Medium trucks	-	43	73	56	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Heavy trucks	-	8	14	56	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Motorcycles	-	1	2	56	none	-	-	Average (of DGAC and PCC)	0
0+794	4920	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Total	-	166	283	-	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Automobiles	-	114	194	56	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Medium trucks	-	43	73	56	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Heavy trucks	-	8	14	56	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Motorcycles	-	1	2	56	none	-	-	Average (of DGAC and PCC)	0
0+948	4920	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+184	6720	Total	-	206	428	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	6720	Automobiles	-	141	294	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	6720	Medium trucks	-	53	110	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	6720	Heavy trucks	-	10	21	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	6720	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	6720	Motorcycles	-	2	3	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	6720	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+253	6720	Total	-	206	428	-	none	-	-	Average (of DGAC and PCC)	0
1+253	6720	Automobiles	-	141	294	56	none	-	-	Average (of DGAC and PCC)	0
1+253	6720	Medium trucks	-	53	110	56	none	-	-	Average (of DGAC and PCC)	0
1+253	6720	Heavy trucks	-	10	21	56	none	-	-	Average (of DGAC and PCC)	0
1+253	6720	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+253	6720	Motorcycles	-	2	3	56	none	-	-	Average (of DGAC and PCC)	0
1+253	6720	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+516	-						-	-	-	-	-
Orange Street SB		Traffic direction:	In entry direction								
0+893	1904	Total	-	74	90	-	none	-	-	Average (of DGAC and PCC)	0

0+893	1904	Automobiles	-	50	61	56	none	-	-	Average (of DGAC and PCC)		0
0+893	1904	Medium trucks	-	19	23	56	none	-	-	Average (of DGAC and PCC)		0
0+893	1904	Heavy trucks	-	4	5	56	none	-	-	Average (of DGAC and PCC)		0
0+893	1904	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
0+893	1904	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
0+893	1904	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Total	-	74	90	-	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Automobiles	-	50	61	56	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Medium trucks	-	19	23	56	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Heavy trucks	-	4	5	56	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
1+072	1904	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+450	-						-	-	-	-	-	
Center Street WB		Traffic direction:	In entry direction									
0+893	4192	Total	-	190	144	-	none	-	-	Average (of DGAC and PCC)		0
0+893	4192	Automobiles	-	130	99	56	none	-	-	Average (of DGAC and PCC)		0
0+893	4192	Medium trucks	-	49	37	56	none	-	-	Average (of DGAC and PCC)		0
0+893	4192	Heavy trucks	-	10	7	56	none	-	-	Average (of DGAC and PCC)		0
0+893	4192	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
0+893	4192	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
0+893	4192	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+228	4192	Total	-	190	144	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	4192	Automobiles	-	130	99	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	4192	Medium trucks	-	49	37	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	4192	Heavy trucks	-	10	7	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	4192	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	4192	Motorcycles	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	4192	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+427	4192	Total	-	190	144	-	none	-	-	Average (of DGAC and PCC)		0
1+427	4192	Automobiles	-	130	99	56	none	-	-	Average (of DGAC and PCC)		0
1+427	4192	Medium trucks	-	49	37	56	none	-	-	Average (of DGAC and PCC)		0
1+427	4192	Heavy trucks	-	10	7	56	none	-	-	Average (of DGAC and PCC)		0
1+427	4192	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+427	4192	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
1+427	4192	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Total	-	190	146	-	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Automobiles	-	130	100	56	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Medium trucks	-	49	38	56	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Heavy trucks	-	10	7	56	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
1+603	4208	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Total	-	190	146	-	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Automobiles	-	130	100	56	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Medium trucks	-	49	38	56	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Heavy trucks	-	10	7	56	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
1+873	4208	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
2+414	-						-	-	-	-	-	
0+000	4208	Total	-	190	146	-	Stop sign	0	-	Average (of DGAC and PCC)		0
0+000	4208	Automobiles	-	130	100	56	Stop sign	0	-	Average (of DGAC and PCC)		0

0+000	4208	Medium trucks	-	49	38	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
0+000	4208	Heavy trucks	-	10	7	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
0+000	4208	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0		
0+000	4208	Motorcycles	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
0+000	4208	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0		
Orange Street NB	Traffic direction:	In entry direction											
0+893	360	Total	-	16	13	-	none	-	-	Average (of DGAC and PCC)	0		
0+893	360	Automobiles	-	10	8	56	none	-	-	Average (of DGAC and PCC)	0		
0+893	360	Medium trucks	-	4	3	56	none	-	-	Average (of DGAC and PCC)	0		
0+893	360	Heavy trucks	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0		
0+893	360	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
0+893	360	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0		
0+893	360	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+331	360	Total	-	16	13	-	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+331	360	Automobiles	-	10	8	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+331	360	Medium trucks	-	4	3	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+331	360	Heavy trucks	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+331	360	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+331	360	Motorcycles	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+331	360	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0		
1+450	-						-	-	-	-	-		
0+000	360	Total	-	16	13	-	none	-	-	Average (of DGAC and PCC)	0		
0+000	360	Automobiles	-	10	8	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	360	Medium trucks	-	4	3	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	360	Heavy trucks	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	360	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
0+000	360	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	360	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
Main Street NB	Traffic direction:	In entry direction											
1+023	21400	Total	-	877	921	-	none	-	-	Average (of DGAC and PCC)	0		
1+023	21400	Automobiles	-	604	634	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	21400	Medium trucks	-	226	237	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	21400	Heavy trucks	-	42	45	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	21400	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+023	21400	Motorcycles	-	5	5	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	21400	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+559	-						-	-	-	-	-		
0+000	21400	Total	-	877	921	-	none	-	-	Average (of DGAC and PCC)	0		
0+000	21400	Automobiles	-	604	634	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	21400	Medium trucks	-	226	237	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	21400	Heavy trucks	-	42	45	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	21400	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
0+000	21400	Motorcycles	-	5	5	56	none	-	-	Average (of DGAC and PCC)	0		
0+000	21400	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
Main Street NB1	Traffic direction:	In entry direction											
1+023	19608	Total	-	740	971	-	none	-	-	Average (of DGAC and PCC)	0		
1+023	19608	Automobiles	-	509	669	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19608	Medium trucks	-	191	250	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19608	Heavy trucks	-	36	47	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19608	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+023	19608	Motorcycles	-	4	5	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19608	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+560	-						-	-	-	-	-		

Center Street
Opening Year 2017 Without Project
Receivers

No.	Receiver name	Floor	Level AM	Level PM
			dB(A)	
1	1 Industrial (N)	GF	57.0	57.8
2	2 Industrial (E)	GF	61.3	62.3
3	3 Single Family Residential (NE)	GF	57.9	59.4
4	4 Commercial (EE)	GF	57.4	58.2
5	5 Single Family Home (SE)	GF	53.3	54.0
6	6 Single Family Home (SE)	GF	60.7	61.4
7	7 Single Family Home (NW)	GF	60.2	61.1

Center Street
Opening Year 2017 Without Project
Contributions

Source name			Level AM	Level PM
			dB(A)	
1 Industrial (N)	GF		57.0	57.8
Center Street (EB)			53.5	55.8
Center Street WB			54.4	53.2
Main Street NB			34.8	35.0
Main Street NB1			34.0	35.2
Orange Street NB			23.7	23.3
Orange Street SB			29.8	30.7
2 Industrial (E)	GF		61.3	62.3
Center Street (EB)			58.4	60.8
Center Street WB			58.1	56.8
Main Street NB			33.1	33.3
Main Street NB1			32.3	33.5
Orange Street NB			27.7	27.4
Orange Street SB			33.9	34.8
3 Single Family Residential (NE)		GF	57.9	59.4
Center Street (EB)			54.8	58.0
Center Street WB			54.8	53.5
Main Street NB			29.0	29.2
Main Street NB1			28.2	29.4
Orange Street NB			34.6	34.1
Orange Street SB			40.6	41.4
4 Commercial (EE)	GF		57.4	58.2
Center Street (EB)			49.6	52.4
Center Street WB			49.8	48.4
Main Street NB			30.0	30.2
Main Street NB1			29.2	30.4
Orange Street NB			48.3	47.6
Orange Street SB			54.7	55.6
5 Single Family Home (SE)		GF	53.3	54.0
Center Street (EB)			39.0	41.8
Center Street WB			39.3	37.9
Main Street NB			30.1	30.3
Main Street NB1			29.3	30.5
Orange Street NB			46.3	45.7
Orange Street SB			51.9	52.7
6 Single Family Home (SE)		GF	60.7	61.4

Center Street (EB)		38.3	41.1
Center Street WB		38.7	37.3
Main Street NB		30.4	30.6
Main Street NB1		29.6	30.8
Orange Street NB		51.8	51.1
Orange Street SB		60.1	60.9
7 Single Family Home (NW)	GF	60.2	61.1
Center Street (EB)		55.9	58.9
Center Street WB		57.6	56.4
Main Street NB		45.8	46.0
Main Street NB1		45.0	46.2
Orange Street NB		17.8	17.2
Orange Street SB		23.7	24.6

Center Street
Opening Year 2017 Without Project
Receiver Spectra

No.	Name	Time slice	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1 kHz	2 kHz	2 kHz	2 kHz	3 kHz	4 kHz	5 kHz	6 kHz	8 kHz	10 kHz
1	1 Industrial (N)	AM	30.3	35.8	39.4	41.5	42.9	44.2	45	45	44.5	44.2	45.1	46.2	45.9	46.6	45.3	44.9	43.4	42.9	42.9	41.4	39.6	36.7	34	30.3
1	1 Industrial (N)	PM	30.9	36.5	40	42.1	43.5	44.8	45.7	45.7	45.3	45	45.9	46.9	46.6	47.2	46	45.8	44.3	43.7	43.7	42.2	40.4	37.6	34.8	31.2
2	2 Industrial (E)	AM	32.6	38.2	41.8	43.9	45.3	46.7	47.7	48	48.7	48.9	50.1	51.5	50.9	51.3	50	49.6	48.7	47.8	46.8	44.8	42.2	40.3	37.7	34.3
2	2 Industrial (E)	PM	33.7	39.3	42.8	44.9	46.4	47.8	48.8	49.1	49.9	49.8	51.1	52.9	52.1	52.2	50.7	50.3	49.4	48.5	47.6	45.7	43.1	41.2	38.6	35.1
3	3 Single Family Residential (NE)	AM	30.9	36.5	40	42.1	43.6	44.9	45.8	45.8	45.5	45.2	46.2	47.2	46.8	47.6	46.4	45.8	44.4	43.8	43.7	41.9	40.4	37.5	34.8	31.2
3	3 Single Family Residential (NE)	PM	32.2	37.8	41.3	43.4	44.9	46.2	47.1	47.3	46.9	46.8	47.7	48.5	48.3	49	47.9	47.5	46.1	45.3	45.2	43.3	41.8	39.1	36.4	32.8
4	4 Commercial (EE)	AM	30.2	35.7	39.3	41.4	42.8	44.2	45.1	45.1	45.2	44.6	45.6	47.4	46.7	46.9	45.4	45.1	44.1	43.6	42.9	41.3	39.1	36.5	33.7	30.2
4	4 Commercial (EE)	PM	31.1	36.6	40.2	42.3	43.7	45.1	46	46	46	45.4	46.4	48.1	47.5	47.7	46.1	45.9	44.9	44.4	43.7	42.1	40.1	37.4	34.6	31
5	5 Single Family Home (SE)	AM	26.4	31.8	35.3	37.5	38.9	40.3	41.2	40.8	40.6	40.6	41.7	42.3	41.9	42.7	41.6	40.9	40.1	39.8	39.8	38.3	36.5	33.8	31.1	27.5
5	5 Single Family Home (SE)	PM	27	32.5	36	38.1	39.6	41	41.8	41.3	41.1	41.2	42.3	42.8	42.5	43.3	42.3	41.6	40.8	40.5	40.6	39	37.2	34.6	31.8	28.2
6	6 Single Family Home (SE)	AM	30.4	35.9	39.4	41.6	43.1	44.7	46	47.5	47.7	49.3	51.2	51.5	50.7	51.1	49.9	48.8	47.7	45.7	44.3	42.1	41.1	38.5	35.8	32.4
6	6 Single Family Home (SE)	PM	31.1	36.6	40.2	42.3	43.8	45.4	46.7	48.2	48.4	50	51.9	52.2	51.4	51.8	50.6	49.5	48.4	46.4	45	42.9	41.9	39.2	36.6	33.1
7	7 Single Family Home (NW)	AM	32.5	38	41.6	43.7	45.1	46.4	47.3	47	47.5	47.6	48.8	49.9	49.5	50.1	48.4	47.7	47.2	46.5	46.4	44.7	42.3	39.9	37.2	33.7
7	7 Single Family Home (NW)	PM	33.3	38.8	42.4	44.5	45.9	47.2	48.1	48	48.3	48.6	49.8	50.6	50.2	51.1	49.6	49	48.4	47.7	47.5	45.7	43.3	40.9	38.2	34.7

Center Street
Opening Year With Project
Road

Stationing km	ADT Veh/24h	Traffic values Vehicles type	Vehicle name	AM Veh/h	PM Veh/h	Speed km/h	Control device	Constr. Speed km/h	Affect. veh. %	Road surface	Gradient Min / Max %
Center Street (EB)		Traffic direction:	In entry direction								
0+000	5360	Total	-	186	298	-	none	-	-	Average (of DGAC and PCC)	0
0+000	5360	Automobiles	-	128	205	56	none	-	-	Average (of DGAC and PCC)	0
0+000	5360	Medium trucks	-	48	77	56	none	-	-	Average (of DGAC and PCC)	0
0+000	5360	Heavy trucks	-	9	14	56	none	-	-	Average (of DGAC and PCC)	0
0+000	5360	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+000	5360	Motorcycles	-	1	2	56	none	-	-	Average (of DGAC and PCC)	0
0+000	5360	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Total	-	201	344	-	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Automobiles	-	138	236	56	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Medium trucks	-	52	89	56	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Heavy trucks	-	10	17	56	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Motorcycles	-	1	2	56	none	-	-	Average (of DGAC and PCC)	0
0+544	5968	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Total	-	217	431	-	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Automobiles	-	148	296	56	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Medium trucks	-	56	111	56	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Heavy trucks	-	11	21	56	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Motorcycles	-	2	3	56	none	-	-	Average (of DGAC and PCC)	0
0+794	6920	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Total	-	217	431	-	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Automobiles	-	148	296	56	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Medium trucks	-	56	111	56	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Heavy trucks	-	11	21	56	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Motorcycles	-	2	3	56	none	-	-	Average (of DGAC and PCC)	0
0+948	6920	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+184	8536	Total	-	252	563	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	8536	Automobiles	-	173	388	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	8536	Medium trucks	-	65	145	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	8536	Heavy trucks	-	12	27	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	8536	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	8536	Motorcycles	-	2	3	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+184	8536	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+253	8536	Total	-	252	563	-	none	-	-	Average (of DGAC and PCC)	0
1+253	8536	Automobiles	-	173	388	56	none	-	-	Average (of DGAC and PCC)	0
1+253	8536	Medium trucks	-	65	145	56	none	-	-	Average (of DGAC and PCC)	0
1+253	8536	Heavy trucks	-	12	27	56	none	-	-	Average (of DGAC and PCC)	0
1+253	8536	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+253	8536	Motorcycles	-	2	3	56	none	-	-	Average (of DGAC and PCC)	0
1+253	8536	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+516	-						-	-	-	-	-
Orange Street SB		Traffic direction:	In entry direction								
0+893	2048	Total	-	78	100	-	none	-	-	Average (of DGAC and PCC)	0

0+893	2048	Automobiles	-	53	68	56	none	-	-	Average (of DGAC and PCC)		0
0+893	2048	Medium trucks	-	20	26	56	none	-	-	Average (of DGAC and PCC)		0
0+893	2048	Heavy trucks	-	4	5	56	none	-	-	Average (of DGAC and PCC)		0
0+893	2048	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
0+893	2048	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
0+893	2048	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+017	2048	Total	-	78	100	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+017	2048	Automobiles	-	53	68	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+017	2048	Medium trucks	-	20	26	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+017	2048	Heavy trucks	-	4	5	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+017	2048	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+017	2048	Motorcycles	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+017	2048	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+072	2048	Total	-	78	100	-	none	-	-	Average (of DGAC and PCC)		0
1+072	2048	Automobiles	-	53	68	56	none	-	-	Average (of DGAC and PCC)		0
1+072	2048	Medium trucks	-	20	26	56	none	-	-	Average (of DGAC and PCC)		0
1+072	2048	Heavy trucks	-	4	5	56	none	-	-	Average (of DGAC and PCC)		0
1+072	2048	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+072	2048	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)		0
1+072	2048	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+450	-						-	-	-	-	-	
Center Street WB		Traffic direction:	In entry direction									
0+893	6128	Total	-	269	228	-	none	-	-	Average (of DGAC and PCC)		0
0+893	6128	Automobiles	-	154	156	56	none	-	-	Average (of DGAC and PCC)		0
0+893	6128	Medium trucks	-	95	59	56	none	-	-	Average (of DGAC and PCC)		0
0+893	6128	Heavy trucks	-	18	11	56	none	-	-	Average (of DGAC and PCC)		0
0+893	6128	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
0+893	6128	Motorcycles	-	2	2	56	none	-	-	Average (of DGAC and PCC)		0
0+893	6128	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+228	7728	Total	-	369	228	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	7728	Automobiles	-	254	156	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	7728	Medium trucks	-	95	59	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	7728	Heavy trucks	-	18	11	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	7728	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	7728	Motorcycles	-	2	2	56	Stop sign	0	-	Average (of DGAC and PCC)		0
1+228	7728	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)		0
1+427	7728	Total	-	369	228	-	none	-	-	Average (of DGAC and PCC)		0
1+427	7728	Automobiles	-	254	156	56	none	-	-	Average (of DGAC and PCC)		0
1+427	7728	Medium trucks	-	95	59	56	none	-	-	Average (of DGAC and PCC)		0
1+427	7728	Heavy trucks	-	18	11	56	none	-	-	Average (of DGAC and PCC)		0
1+427	7728	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+427	7728	Motorcycles	-	2	2	56	none	-	-	Average (of DGAC and PCC)		0
1+427	7728	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Total	-	260	191	-	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Automobiles	-	178	131	56	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Medium trucks	-	67	49	56	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Heavy trucks	-	13	10	56	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Motorcycles	-	2	1	56	none	-	-	Average (of DGAC and PCC)		0
1+603	5688	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)		0
1+873	4840	Total	-	206	193	-	none	-	-	Average (of DGAC and PCC)		0
1+873	4840	Automobiles	-	141	132	56	none	-	-	Average (of DGAC and PCC)		0
1+873	4840	Medium trucks	-	53	50	56	none	-	-	Average (of DGAC and PCC)		0

1+873	4840	Heavy trucks	-	10	10	56	none	-	-	Average (of DGAC and PCC)	0
1+873	4840	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+873	4840	Motorcycles	-	2	1	56	none	-	-	Average (of DGAC and PCC)	0
1+873	4840	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
2+414	-						-	-	-	-	-
0+000	4840	Total	-	206	193	-	Stop sign	0	-	Average (of DGAC and PCC)	0
0+000	4840	Automobiles	-	141	132	56	Stop sign	0	-	Average (of DGAC and PCC)	0
0+000	4840	Medium trucks	-	53	50	56	Stop sign	0	-	Average (of DGAC and PCC)	0
0+000	4840	Heavy trucks	-	10	10	56	Stop sign	0	-	Average (of DGAC and PCC)	0
0+000	4840	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
0+000	4840	Motorcycles	-	2	1	56	Stop sign	0	-	Average (of DGAC and PCC)	0
0+000	4840	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
Orange Street NB		Traffic direction:	In entry direction								
0+893	360	Total	-	16	13	-	none	-	-	Average (of DGAC and PCC)	0
0+893	360	Automobiles	-	10	8	56	none	-	-	Average (of DGAC and PCC)	0
0+893	360	Medium trucks	-	4	3	56	none	-	-	Average (of DGAC and PCC)	0
0+893	360	Heavy trucks	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0
0+893	360	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+893	360	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0
0+893	360	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+331	360	Total	-	16	13	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+331	360	Automobiles	-	10	8	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+331	360	Medium trucks	-	4	3	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+331	360	Heavy trucks	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+331	360	Buses	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+331	360	Motorcycles	-	1	1	56	Stop sign	0	-	Average (of DGAC and PCC)	0
1+331	360	Auxiliary Vehicle	-	-	-	-	Stop sign	0	-	Average (of DGAC and PCC)	0
1+450	-						-	-	-	-	-
0+000	360	Total	-	16	13	-	none	-	-	Average (of DGAC and PCC)	0
0+000	360	Automobiles	-	10	8	56	none	-	-	Average (of DGAC and PCC)	0
0+000	360	Medium trucks	-	4	3	56	none	-	-	Average (of DGAC and PCC)	0
0+000	360	Heavy trucks	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0
0+000	360	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+000	360	Motorcycles	-	1	1	56	none	-	-	Average (of DGAC and PCC)	0
0+000	360	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
Main Street NB		Traffic direction:	In entry direction								
1+023	21728	Total	-	885	946	-	none	-	-	Average (of DGAC and PCC)	0
1+023	21728	Automobiles	-	609	651	56	none	-	-	Average (of DGAC and PCC)	0
1+023	21728	Medium trucks	-	228	244	56	none	-	-	Average (of DGAC and PCC)	0
1+023	21728	Heavy trucks	-	43	46	56	none	-	-	Average (of DGAC and PCC)	0
1+023	21728	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+023	21728	Motorcycles	-	5	5	56	none	-	-	Average (of DGAC and PCC)	0
1+023	21728	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
1+559	-						-	-	-	-	-
0+000	21728	Total	-	885	946	-	none	-	-	Average (of DGAC and PCC)	0
0+000	21728	Automobiles	-	609	651	56	none	-	-	Average (of DGAC and PCC)	0
0+000	21728	Medium trucks	-	228	244	56	none	-	-	Average (of DGAC and PCC)	0
0+000	21728	Heavy trucks	-	43	46	56	none	-	-	Average (of DGAC and PCC)	0
0+000	21728	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
0+000	21728	Motorcycles	-	5	5	56	none	-	-	Average (of DGAC and PCC)	0
0+000	21728	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0
Main Street NB1		Traffic direction:	In entry direction								
1+023	19880	Total	-	746	993	-	none	-	-	Average (of DGAC and PCC)	0

1+023	19880	Automobiles	-	514	684	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19880	Medium trucks	-	192	256	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19880	Heavy trucks	-	36	48	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19880	Buses	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+023	19880	Motorcycles	-	4	5	56	none	-	-	Average (of DGAC and PCC)	0		
1+023	19880	Auxiliary Vehicle	-	-	-	-	none	-	-	Average (of DGAC and PCC)	0		
1+560	-						-	-	-	-	-		

Center Street
Opening Year 2017 With Project
Receivers

No.	Receiver name	Floor	Level AM	Level PM
			dB(A)	
1	1 Industrial (N)	GF	58.2	58.8
2	2 Industrial (E)	GF	63.3	64.1
3	3 Single Family Residential (NE)	GF	59.7	60.8
4	4 Commercial (EE)	GF	58.2	59.0
5	5 Single Family Home (SE)	GF	53.6	54.4
6	6 Single Family Home (SE)	GF	60.9	61.8
7	7 Single Family Home (NW)	GF	60.9	61.8

Center Street
Opening Year 2017 With Project
Contributions

Source name			Level AM	Level PM
			dB(A)	
1 Industrial (N)	GF		58.2	58.8
Center Street (EB)			54.4	56.8
Center Street WB			55.8	54.5
Main Street NB			34.9	35.2
Main Street NB1			34.1	35.3
Orange Street NB			23.7	23.3
Orange Street SB			29.9	30.9
2 Industrial (E)	GF		63.3	64.1
Center Street (EB)			59.7	62.6
Center Street WB			60.8	58.7
Main Street NB			33.1	33.4
Main Street NB1			32.3	33.6
Orange Street NB			27.7	27.4
Orange Street SB			34.0	35.0
3 Single Family Residential (NE)		GF	59.7	60.8
Center Street (EB)			55.7	59.1
Center Street WB			57.3	55.5
Main Street NB			29.0	29.3
Main Street NB1			28.3	29.5
Orange Street NB			34.6	34.1
Orange Street SB			40.7	41.7
4 Commercial (EE)	GF		58.2	59.0
Center Street (EB)			50.7	53.9
Center Street WB			52.4	50.4
Main Street NB			30.0	30.3
Main Street NB1			29.2	30.5
Orange Street NB			48.3	47.6
Orange Street SB			54.9	55.9
5 Single Family Home (SE)		GF	53.6	54.4
Center Street (EB)			40.0	43.1
Center Street WB			41.7	39.8
Main Street NB			30.1	30.4
Main Street NB1			29.3	30.6
Orange Street NB			46.3	45.7
Orange Street SB			52.0	53.1
6 Single Family Home (SE)		GF	60.9	61.8

Center Street (EB)		39.4	42.4
Center Street WB		41.0	39.2
Main Street NB		30.4	30.7
Main Street NB1		29.6	30.9
Orange Street NB		51.8	51.1
Orange Street SB		60.2	61.3
7 Single Family Home (NW)	GF	60.9	61.8
Center Street (EB)		57.2	59.3
Center Street WB		57.9	57.7
Main Street NB		45.8	46.1
Main Street NB1		45.0	46.3
Orange Street NB		17.8	17.2
Orange Street SB		23.9	24.9

Center Street
Opening Year 2017 With Project
Receiver Spectra

No.	Name	Time slice	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1 kHz	2 kHz	2 kHz	2 kHz	3 kHz	4 kHz	5 kHz	6 kHz	8 kHz	10 kHz
1	1 Industrial (N)	AM	31.5	37	40.6	42.7	44.1	45.4	46.3	46.2	45.7	45.4	46.3	47.4	47	47.8	46.5	46.1	44.6	44	44	42.6	40.7	37.8	35.1	31.5
1	1 Industrial (N)	PM	32	37.5	41.1	43.2	44.6	45.9	46.8	46.8	46.3	46	47	47.9	47.6	48.2	47.1	46.8	45.4	44.7	44.8	43.3	41.4	38.6	35.9	32.2
2	2 Industrial (E)	AM	34.5	40.1	43.6	45.8	47.2	48.6	49.6	50	50.7	50.9	52.1	53.3	52.8	53.4	52.1	51.7	50.9	49.9	48.9	46.8	44.2	42.3	39.7	36.3
2	2 Industrial (E)	PM	35.5	41	44.6	46.7	48.2	49.5	50.6	50.9	51.7	51.7	52.9	54.7	53.9	54.1	52.5	52.2	51.2	50.3	49.4	47.4	44.9	43	40.3	37
3	3 Single Family Residential (NE)	AM	32.7	38.2	41.7	43.8	45.3	46.6	47.6	47.6	47.2	47	47.9	49	48.5	49.3	48	47.4	46	45.5	45.3	43.6	42.1	39.1	36.4	32.8
3	3 Single Family Residential (NE)	PM	33.6	39.2	42.7	44.8	46.3	47.6	48.5	48.6	48.3	48.2	49.1	50	49.7	50.4	49.3	48.8	47.5	46.7	46.5	44.7	43.2	40.4	37.7	34.2
4	4 Commercial (EE)	AM	31.3	36.8	40.3	42.4	43.9	45.2	46.1	46.1	45.9	45.3	46.2	48	47.3	47.7	46.2	46	45	44.5	43.8	42.2	40	37.3	34.5	30.9
4	4 Commercial (EE)	PM	32.1	37.7	41.2	43.3	44.7	46.1	46.9	46.9	46.7	46.1	47	48.8	48.1	48.5	47	46.8	45.8	45.3	44.5	43	40.9	38.2	35.4	31.8
5	5 Single Family Home (SE)	AM	26.9	32.3	35.8	37.9	39.4	40.7	41.5	41	40.8	40.8	41.9	42.4	42.1	42.9	41.8	41.1	40.4	40.1	40.2	38.8	37	34.3	31.6	27.9
5	5 Single Family Home (SE)	PM	27.6	33.1	36.6	38.7	40.2	41.5	42.3	41.7	41.5	41.5	42.6	43.1	42.8	43.6	42.6	42	41.2	41	41.1	39.6	37.7	35.1	32.3	28.7
6	6 Single Family Home (SE)	AM	30.6	36.1	39.7	41.8	43.4	44.9	46.2	47.6	47.8	49.4	51.4	51.7	50.9	51.3	50.1	49	47.9	45.9	44.5	42.4	41.4	38.7	36.1	32.6
6	6 Single Family Home (SE)	PM	31.5	37	40.6	42.7	44.3	45.8	47	48.4	48.6	50.3	52.3	52.6	51.8	52.2	51	49.9	48.7	46.8	45.3	43.2	42.3	39.6	36.9	33.5
7	7 Single Family Home (NW)	AM	33.1	38.7	42.2	44.3	45.7	47	47.9	47.8	48.2	48.4	49.5	50.5	50.2	50.9	49.2	48.5	47.9	47.2	47	45.3	42.9	40.5	37.8	34.4
7	7 Single Family Home (NW)	PM	33.9	39.5	43.1	45.1	46.6	47.9	48.8	48.7	49.1	49.3	50.5	51.3	51	51.8	50.3	49.6	49	48.3	48.1	46.3	43.9	41.5	38.9	35.4

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