

BUTTE REGIONAL TRANSIT OPERATIONS CENTER

BUTTE COUNTY ASSOCIATION OF GOVERNMENTS

SCHEMATIC DESIGN
MARCH 2014

TLCDARCHITECTURE





Bird's eye view of the project looking south.

The Butte Regional Transit Operations Center will provide administrative, operations, and maintenance facilities that will allow efficient operations for BCAG and the B-Line and accommodate future growth. The purpose of this document is to present the proposed design for this facility, and to provide insight into the numerous ideas and design concepts that were developed over a several-month long, collaborative programming and design process.

The project will serve a variety of uses including public functions, and seeks to be an exemplary public facility of which the community can be proud. Its design is inspired by regional features, forms and materials, with a straightforward, efficient, and functional approach that will serve the community for many years to come. It will be a model steward of the site by integrating environmental planning principles as well as implementing numerous sustainable strategies.

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BACKGROUND

The Butte County Association of Governments, or “BCAG”, is an association of all the local governments within Butte County. BCAG is responsible for development of federal and state transportation plans and programs that secure transportation funding for the region’s highways, transit, streets and roads, pedestrian and other transportation system improvements.

BCAG is also the administrative and policymaking agency for the region’s public transit service. Butte Regional Transit, better known as the “B-Line” is a modern, consolidated transit system providing urban and rural fixed route service, as well as paratransit service in accordance with the Americans with Disabilities Act (ADA). In addition, BCAG will be coordinating the new Butte Regional Conservation Plan that will provide a comprehensive and streamlined approach to Endangered Species Act permitting for transportation and land development activities countywide.

BCAG’s administrative offices are located in leased office space that is nearing capacity. BCAG’s B-Line transportation system, currently operated by Veolia Transportation, is located in an antiquated and severely undersized facility at Huss Lane in Chico that has been operating over capacity since even before the Butte Regional Transit system was formed.

The new Butte County Transit Operations Center will consolidate operations at the Huss Lane site, which will be expanded from approximately 2.2 to 9.5 acres. The existing facility will remain operational during construction, and then will be repurposed for both training and storage. The project as been programmed and designed to accommodate anticipated future growth.



Interior view of the existing bus maintenance building.



Existing B-Line administrative and maintenance facility.



Dispatch center, from tour of southern California bus operation facilities.

PROGRAMMING

In December of 2011 the firm of TLCD Architecture was hired to lead the project design team. Key members of the design team are Maintenance Design Group, which oversaw the programming process and will be involved with operational and equipment planning, and GHD, a multiple disciplinary engineering firm. NorthStar Engineering, Melton Design Group, and other local consultants are key members of the team.

To achieve an in-depth understanding of BCAG's needs for the project a detailed programming process was undertaken. Information was gathered through programming questionnaires, facility tours, staff interviews, data collection, observations, and other discussions. This approach, which included all stakeholders, provided the design team with valuable insight and direction in the design of the facilities.

Key members of BCAG and Veolia staff, along with members of the design team toured several recently constructed operations and maintenance facilities to gain a better understanding of contemporary bus operations facilities. The trip to Southern California included facility tours to Antelope Valley Transit Authority, Lancaster, Victor Valley Transit Authority, Hesperia, Foothill Transit, Pomona, and California Foothill Transit, Arcadia.

Following facility tours, completion of programming questionnaires, observations and data collection, a 2-day follow-up meeting with key stakeholders explored needs in detail. The information generated by this meeting resulted in a detailed programming document, which served as the basis of design for the project.

DESIGN OBJECTIVES

To help usher in the facilities for BCAG and B-Line it was deemed important to have objectives and a vision to contribute to the future growth of their responsibilities and to enhance the positive experience for employees. These objectives set out to guide the design of the new facilities.

Public & Customer Orientation: This project includes facilities that will be used by members of the public for meetings and events, and will be visited by customers. Its design should facilitate public use and enhance BCAG and the B-Line's reputation for customer service excellence.

Sustainability: BCAG and B-Line should act as a model steward of the site by integrating environmental planning principles and implementing sustainable strategies.

Design: The facility should exhibit a persistent design philosophy that is an appropriate reflection of the immediate and regional surroundings.

Innovation: The facilities should serve as a model that encourages integration of innovative approaches to design by embracing technology and creating versatile and adaptable spaces.

Flexibility: The facilities should be developed to promote flexibility in a manner that is financially responsible while at the same time accommodating both expected and unanticipated future needs of BCAG and B-Line.

Efficiency: A strong emphasis on efficiency is paramount in order to reduce both construction related and ongoing operational costs.

Communication: Consolidating BCAG and B-Line operations at one site should foster heightened communication between BCAG and B-Line to improve stewardship and awareness within the organization.

Comfortable, Productive Workplace Environment: There should be an emphasis on well-designed workplace environments, with access to views and natural light to promote employee productivity and satisfaction.

PROGRAMMING & DESIGN PROCESS

DESIGN WORK SESSIONS

Following the programming process, a series of multi-day design work sessions were held at BCAG's offices. Participants included key members of the design team, BCAG, Veolia, and local high school students. A detailed discussion of the design process along with the multiple conceptual drawings developed during the work session is documented in the Programming Report.

During the design process the programming was revisited in order to reduce the size and cost of the project. The 3 main buildings were each downsized but configured so that they could be enlarged in the future. A formal value engineering process then followed that carefully examined all costs, and resulted in the reduction of non-necessary items and the elimination of other costs, without compromising the functionality of the project.



Photos from design work sessions.

PROGRAMMING & DESIGN PROCESS

COLLABORATION WITH CHICO HIGH SCHOOL ITECH PROGRAM

A unique aspect of this project is a BCAG-initiated collaboration with the iTech program at Chico High School, a Butte County Office of Education Regional Occupational Program (ROP). This collaboration provides unique opportunities to high school students, in this instance the opportunity to learn Revit "Building Information Modeling" software in the context of a real world project.

Students are working parallel with the design team throughout the design process. Each school year, 3 or 4 high school seniors participate. The juniors who will participate the following year shadow them. In addition to attending programming and design workshops, students videoconference regularly with project team members at TLC D Architecture. Project team members also meet with students at their school periodically. To date iTech students have helped develop a Revit model, studied sunshading, and have produced renderings and 3D models.

This unique collaboration has gained the attention of the community. Ordinarily the design of a maintenance-oriented facility would occur out of the public eye. The involvement of iTech students has generated a great deal of community interest and has provided a unique connection between BCAG's operations and the community.



iTech students at work session.



Interior rendering of Maintenance building, by iTech students.



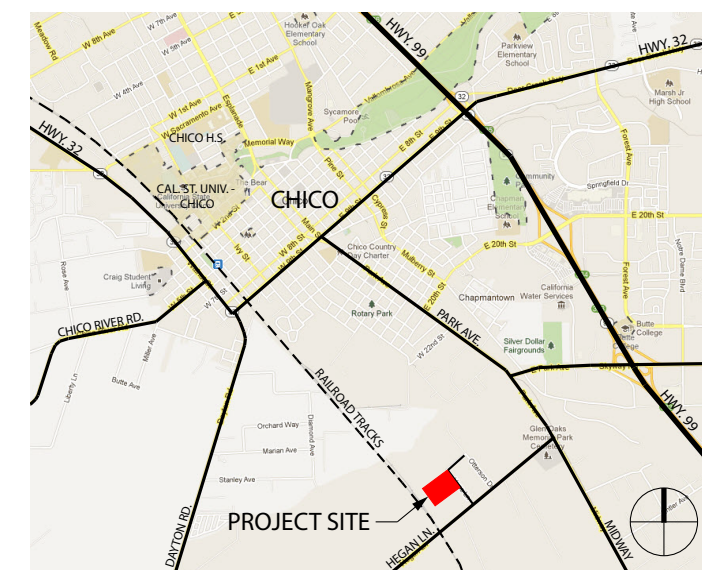
Rendered view of Maintenance building service pit, by iTech students.

PROJECT SETTING

The project site is located on the southern edge of Chico. The parcel lies within a business park that extends westward to the railroad tracks. Immediately across the tracks and visible from the site are orchards and other agricultural lands typical of the surrounding countryside, offering the opportunity for a compelling connection to the surrounding agrarian landscape. The project site is comprised of the existing B-Line facility and an adjacent undeveloped parcel.



Chico-area orchards (photograph by Anthony Dunn Photography).

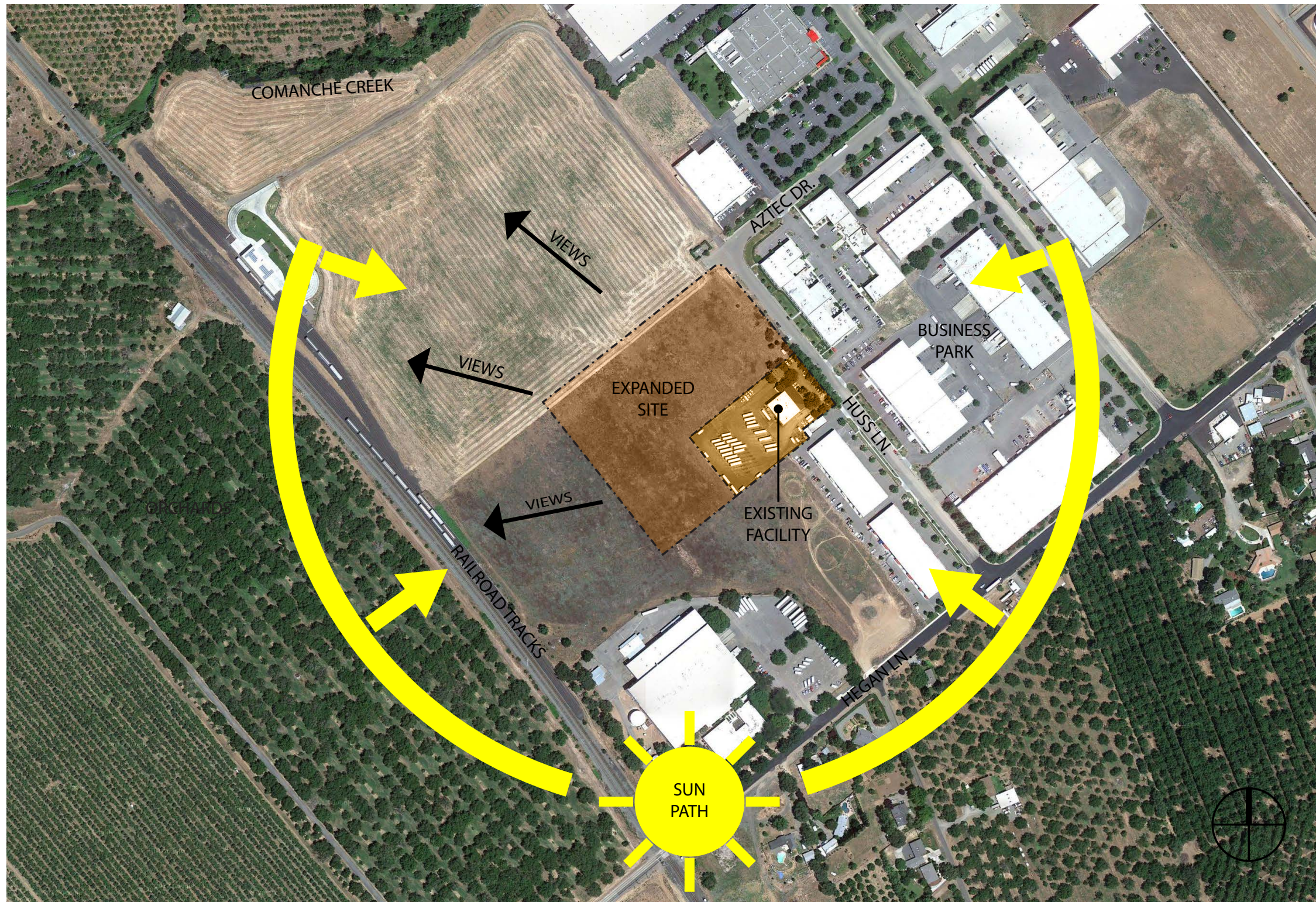


Location map (adapted from Google Maps).



Rural stone wall.

SITE ANALYSIS



Aerial view of project site and surroundings with site analysis. (adapted from Google Maps)

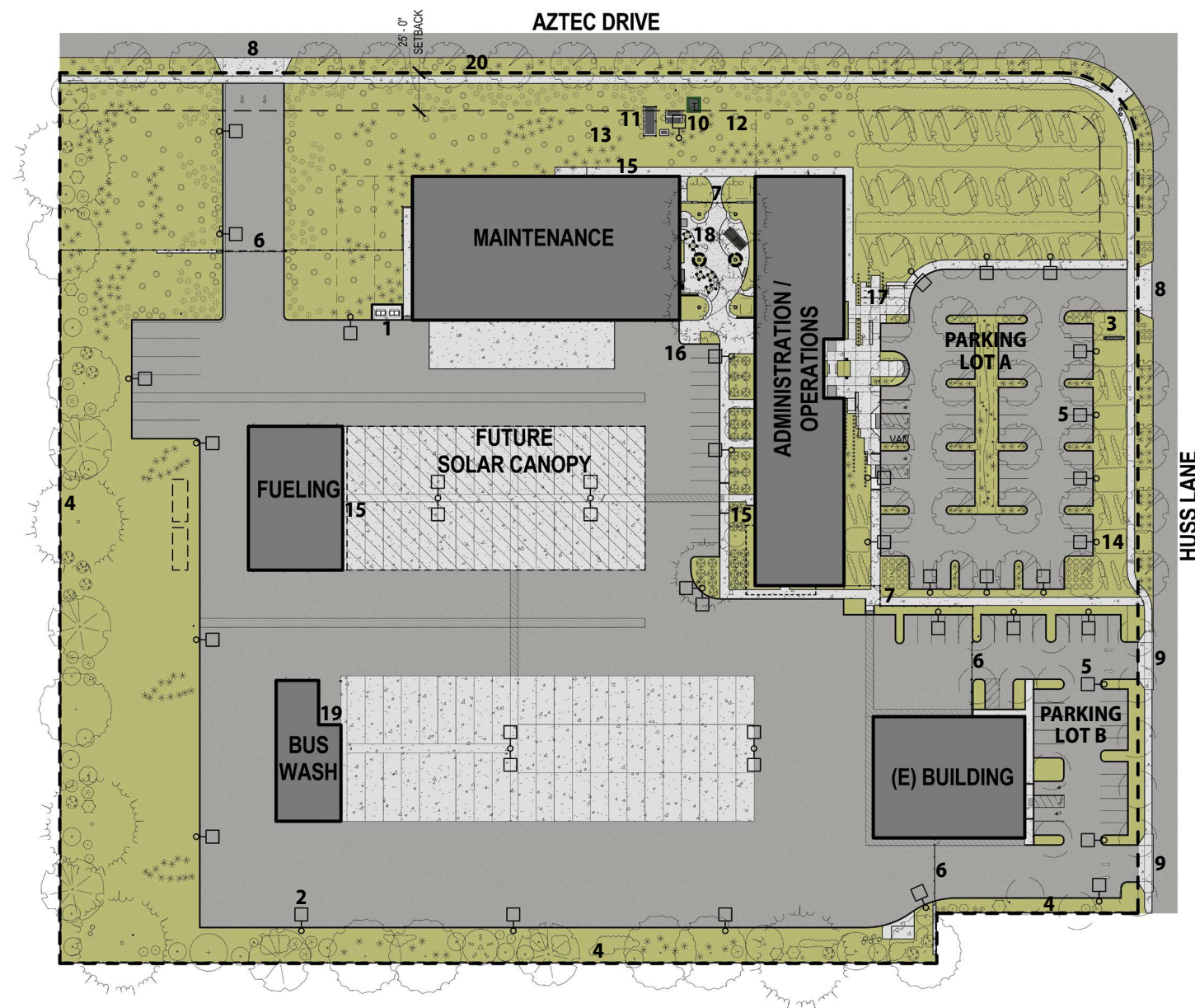
The site and business park are organized on an orthogonal grid that is oriented at approximately 45 degrees from the cardinal points of the compass. The site contains views to the nearby orchards and the riparian environment along Comanche Creek, offering the opportunity for a compelling connection to the surrounding agricultural environment. Aztec Drive will be extended as a part of this project, and storm drain and other off-site utilities will be installed.



View of site looking southwest, existing facility to the left.



View of current Huss Lane streetscape.



SITE PLAN 

PARKING SUMMARY

Parking Lot A	58 (3 accessible)
Parking Lot B	49 (2 accessible)
B-Line Fleet	89

SITE COVERAGE SUMMARY

Buildings	45,106 sf	10.5%
Vehicular Hardscape	213,366 sf	49.8%
Pedestrian Hardscape	22,590 sf	5.3%
Landscape	147,730 sf	34.4%

SITE PLAN KEY

- | | |
|---|---|
| 1. 6' tall CMU trash/recycling enclosure | 11. Generator in metal wall panel enclosure |
| 2. 24' tall pole-mounted site light at bus yard, typ. | 12. Backflow preventor, double detector check valve |
| 3. 3' tall concrete and metal wall panel monument sign | 13. Gas meter |
| 4. 6' tall chain link security fence | 14. Backflow preventor |
| 5. 18' tall pole-mounted site light at parking area, typ. | 15. Compressor unit at grade |
| 6. 6' tall chain link rolling security gate | 16. (4) bike racks (2 bikes per rack) |
| 7. 6' tall architectural fence and gate | 17. (3) bike racks (2 bikes per rack) |
| 8. New commercial driveway | 18. Patio |
| 9. New commercial driveway at existing driveway location | 19. CMU wall alcove trash/recycling enclosure |
| 10. Transformer, main switchboard | 20. Property line, typ. |

SITE DESIGN CONCEPTS

A goal of this project is to reflect the character of the region. The regional landscape is to a large degree defined by walnut and almond orchards, and orchards are within immediate view of the site. In response, the project is designed around a grid of shade trees at the Huss and Aztec frontages that firmly place the project in its regional context. The orchard-like grid of trees provides several advantages including abundant shade at parking lots to mitigate the “heat island” effect. In lieu of traditional street trees the orchard is brought forward to both perimeter streets, strengthening this concept. The sidewalks have been moved inward, away from the street so that pedestrians may have the experience of walking through the orchard instead of past it. Though the Transit Operations Center draws its design inspiration from its broader regional context, the orthogonal grid and scale of the business park are respected and reinforced.

ADDRESSING THE CORNER

By their nature, transit facilities are divided into distinct public and private zones. This project purposefully places the public zone at the most important part of the site, the intersection of Huss Lane and Aztec Drive.

PUBLIC ARRIVAL AREAS

Tree canopies shade public and employee parking lots. Except at adjacent walkways, there are no curbs. Instead, consistent with BCAG’s role with conservation and the desire for a more sustainable, natural aesthetic, parking areas are treated as simply and minimally as possible with excess water draining directly to vegetated bioswales, unimpeded by curbs. Mid-height plantings screen vehicles. Low-profile LED light fixtures are unobtrusive and focus light only where needed.

VEHICULAR CIRCULATION

The project’s location at a corner site offers important advantages. It allows visitor and employee parking along separate streets, with employee parking out of view of arriving visitors. Busses will enter and exit from opposite corners of the site, minimizing on-site maneuvering. The Maintenance Building and fuelling and wash bays are strategically located to allow sequential fuelling, fare retrieval, and vehicle wash, before vehicles are parked. Public and employee parking lots each have street access independent of the bus yard and each other.

BUS YARD

The bus yard is removed as far as possible from the adjacent public streets. Along Huss it is screened from public view by buildings and by means of a slatted architectural fence, and by a slatted vinyl-coated chain link fence from the adjacent development to the south and west.

BICYCLE PARKING

Public and employee bicycle access to this site is considered a priority. Bike racks are provided near the entry of the Administration/Operations Buildings for visitors, and at the patio for employees. Both the Administration and Operations Buildings feature showers and locker facilities.



SYMBOL	BOTANICAL NAME / COMMON NAME	SIZE	QTY	REMARKS	WATER USE	DETAIL
TREES						
T-1	FRAXINUS SYLVATICA 'ASTIGATA' / DWAYCKE BEECH	1.5 GAL.	8	STANDARD. SEE DETAIL.	HIGH	9/1-2/10
T-2	ACER RUBRUM 'OCTOBER GLORY' / OCTOBER GLORY	1.5 GAL.	53	STANDARD. SEE DETAIL.	HIGH	9/1-2/10
T-3	FRAXINUS DIPETALA CALIFORNIA ASH	1.5 GAL.	3	STANDARD. SEE DETAIL.	MEDIUM	9/1-2/10
T-4	PLATANUS RACEMOSA CALIFORNIA SYCAMORE	1.5 GAL.	12	STANDARD. SEE DETAIL.	MEDIUM	9/1-2/10
	QUERCUS LOMATA / VALLEY OAK	1.5 GAL.	8	STANDARD. SEE DETAIL.	LOW	9/1-2/10
T-6	QUERCUS DOUGLASSI / BLUE OAK	1.5 GAL.	5	STANDARD. SEE DETAIL.	LOW	9/1-2/10
	EXISTING STREET			RETAIN AND PROTECT		
SHRUBS						
S-1	CERCIS OCCIDENTALIS WESTERN REDBUD	1 GAL.	22	MULTI-TRUNK. SEE DETAIL.	LOW	9/1-2/10
S-2	CHORONILLES + SUFFRUTA 'TEXAS SCARLET' / RED FLOWERING QUINCE	1 GAL.	22			9/1-2/10
S-3	Berberis thunbergii 'HELMOND PEARL' / JAPANESE BARBERRY	1 GAL.	315	PLANT @ 3" O.C.	MEDIUM	9/1-2/10
S-4	CORNUS STOLONIFERA 'HEDGEBOGGS GOLD' / REDTIGER DOGWOOD	1 GAL.	37		HIGH	9/1-2/10
S-5	CHAMAECRISTIS ACUTIFLORA 'CARL FORBSTER' / FEATHER REED GRASS	1 GAL.	-		MEDIUM	9/1-2/10
S-6	NOT USED	1 GAL.	-			
S-7	JUNCUS LISTATUS / COMMON RUSH	1 GAL.	22		HIGH	9/1-2/10
S-8	JUNCUS PATENS / SPREADING RUSH	1 GAL.	81		HIGH	9/1-2/10
S-9	CAREX BARBARA / SANTA-BARBARA SEDGE	1 GAL.	4		MEDIUM	9/1-2/10
S-10	HETEROMELES ARBUTIFOLIA / TOYON	1 GAL.	12		LOW	9/1-2/10
S-11	MAHONIA REPENS / CREEPING MAHONIA	1 GAL.	8		LOW	9/1-2/10
S-12	CALYCANTHUS OCCIDENTALIS / SPICEBUSH	1 GAL.	6		LOW	9/1-2/10
S-13	AKTOSTAPHYLOS UVIA-URSI 'WOOD'S COMPACTA' / BAYBERRY / HAZELBERRY	1 GAL.	15		LOW	9/1-2/10
S-14	RIBES SPECIOSUM / FLOWERING GOOSEBERRY	1 GAL.	24		LOW	9/1-2/10
S-15	ARCTICULUS CALIFORNICA / CALIFORNIA BUCKEYE	1 GAL.	2		LOW	9/1-2/10
S-16	MULLENBERGIA LINDEMAYERI TENI' / AUTUMN GLOW MULLEY	1 GAL.	215		LOW	9/1-2/10
S-17	MULLENBERGIA CAPILLARIS / PINK MULLEY	1 GAL.	136		MEDIUM	9/1-2/10
S-18	MULLENBERGIA RIGENS / DEER GRASS	1 GAL.	282		MEDIUM	9/1-2/10
GROUND COVER						
G-1	HIGH BERGATED HYDROSEED MIX	1 GAL.	PER AREA	SEE PLANTING NOTES FOR THIS SHEET		
G-2	EUCHORIS FORTUNEI 'COLORATUS' / BRIGHTLIPS	1 GAL.	PER AREA	PLANT @ 3" O.C.	MEDIUM	9/1-2/10
G-3	CAREX MICROBOWS 'ICE DANCE' / VARIEGATED SEDGE	1 GAL.	PER AREA	PLANT @ 1' O.C.	MEDIUM	9/1-2/10
G-6	TITHYSA LUTEOLA / BROADLEAF CATALPA	1 GAL.	PER AREA	PLANT @ 18" O.C.	LOW	9/1-2/10
VINES						
V-1	T.B.D.					
V-2	T.B.D.					
SYMBOLS						
(Symbol)	PLANT QUANTITY					
(Symbol)	PLANT TYPE					
PLANTING NOTES						
1. VERIFY EXACT LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.						
2. INSTALL A 2" LAYER WALK-ON BARK MULCH WITHIN THE TREE CIRCLE.						
3. PLANT QUANTITIES ARE FOR CONFORMANCE OF THE CONTRACTOR. CONTRACTOR TO CONFIRM EXACT NUMBER.						
4. PLANT MATERIALS SHALL BE BID ON THE BASIS OF SPECIES AND CONTAINER SIZE, NOT ON CONTAINER SIZE ALONE.						
5. REFER TO PLANS, DETAILS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.						
6. HYDRONLICH CALIFORNIA CENTRAL VALLEY WILDFLOWER MIX AVAILABLE FROM PACIFIC COAST SEED (925)273-4417. APPLY HYDRONLICH IN A SLURRY AT THE FOLLOWING RATES PER 1000 SQUARE FEET: 2 POUNDS HARD FESCUE, 1/2 POUND GAZDANA, AND 1/4 POUND LONGLARA MARITIMA, 50 POUNDS FREE MULCH, 2 POUNDS SEEDING MULCH BINDER, 10 POUNDS 16-20-0 FERTILIZER, 18 POUNDS BIOSOL FERTILIZER, AND ENOUGH WATER TO FORM A SLURRY. APPLY TO AREA FINISH GRADE AS PER SPECIFICATIONS AND ROLL WITH A 200 POUND ROLLER. CLEAN HYDROSEED IMMEDIATELY OFF ANY AREA OTHER THAN THOSE SPECIFIED ON PLANS. ALL HYDROSEED TO BE FULLY ESTABLISHED PRIOR TO THE STARTING OF THE MAINTENANCE PERIOD. ALL UNESTABLISHED AREAS TO BE RE-HYDRONLICHED.						

LANDSCAPE CONCEPTS

The dominant geometry of the orchard tree grid will be a defining visual component of this project. The orchard, referencing the region's agricultural landscape is the starting point for the landscape concept, with other landscape features and materials designed and selected in support of this concept. Rectangular groupings of plantings recall center-of-orchard row crop plantings. Existing Sycamores along Huss are considered an amenity and most have been retained. The landscape concept will be powerful and apparent. It is rooted in the fabric of the region, is appropriate to the orthogonal grid of the business park, and will clearly denote this project as a public and community facility, readily distinguishable from the nearby business enterprises.

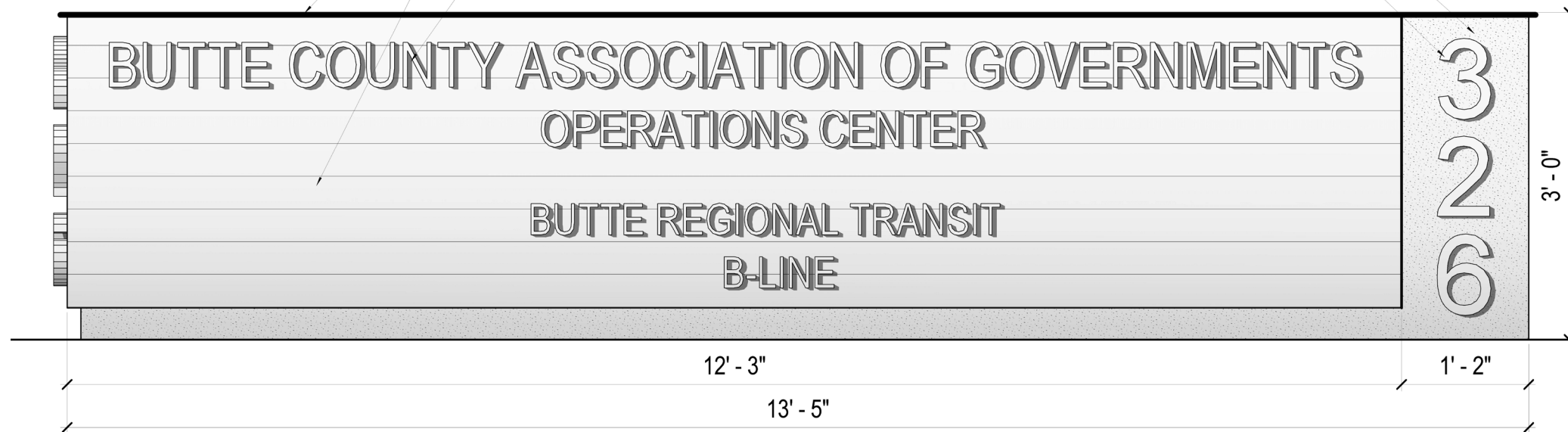
SOCIAL SPACES

The entry plaza and recessed entry denotes arrival to the Administration/Operations Building. A patio between this and the Maintenance buildings is designed to create social spaces, for both casual and organized events.

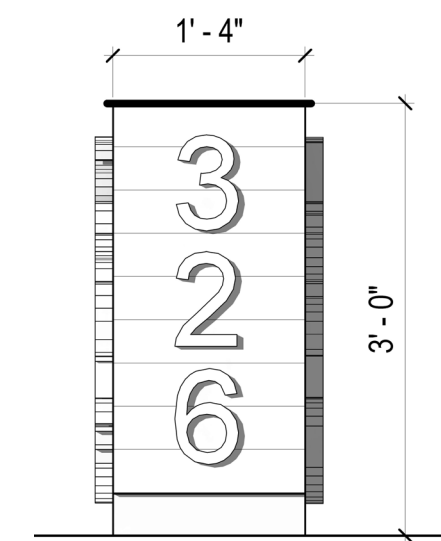
NATURAL, NATIVE PERIMETER ZONE

The perimeter of the bus yard serves important functional, recreational, and aesthetic roles. Bioswales will filter the large volume of storm water from the yard. Plantings along this 20-foot perimeter area help screen the project and are naturalistic, primarily of native species such as those along nearby Comanche Creek.

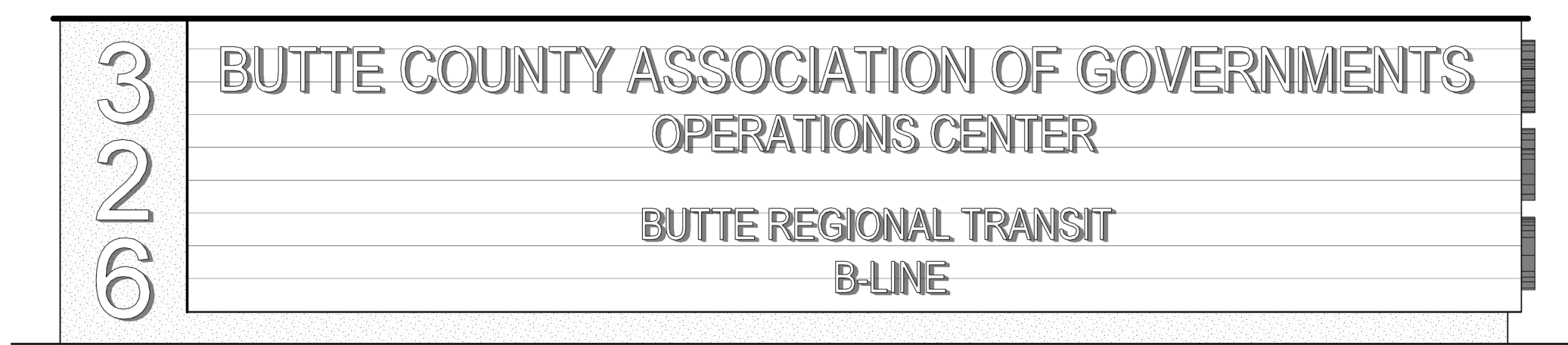
- 1/4" S.S. CAP PLATE
- METAL WALL PANEL TO MATCH ADMINISTRATION / OPERATIONS BUILDING SIDING
- CONCRETE END CAP AND BASE, INTEGRAL STAINED.
- RAISED ALUMINUM LETTERS, UPLIGHT FROM LANDSCAPE LIGHTING



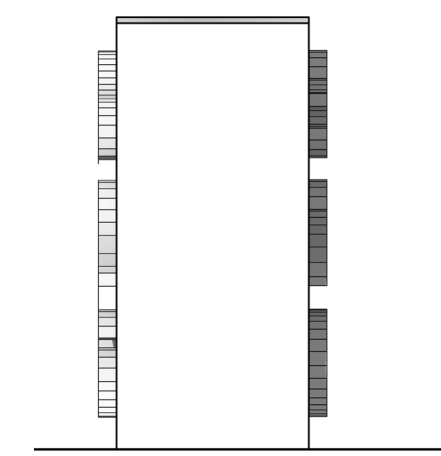
MONUMENT SIGN - NORTH ELEVATION



MONUMENT SIGN - EAST ELEVATION



MONUMENT SIGN - SOUTH ELEVATION



MONUMENT SIGN - WEST ELEVATION

ARCHITECTURAL EXPRESSION

By its nature this project has distinct “public” and “private” zones. The Administration/Operations Building and adjacent parking lot lie squarely in the public zone. The Maintenance Building, Wash Bay, Fueling Island, and future Solar Shade Canopy are located within the bus yard and have clearly defined utilitarian functions. The Administration/Operations Building mediates the public and private zones, and physically separates them. The design of each building reflects its specific function as well as its unique relationship to the public and private zones, but within the context of a cohesive architectural expression.

ARCHITECTURAL THEME SUPPORTS THE ORCHARD CONCEPT

The Administration/Operations Building, which is in proximity to the street, is constructed of modern materials that respond to the surrounding context. These materials as well as the building forms also reference the simple, agrarian, often-linear buildings found in the nearby agricultural landscape. Prefinished metal panels recall the region’s predominately metal agricultural buildings while providing a long-lasting, maintenance free, sustainable exterior skin. Sloped roofs are composition shingle. HVAC equipment is incorporated within the building envelopes.

NATURAL ILLUMINATION

Windows, including clerestories are a prominent feature of both buildings. Clerestories are located at building interiors and will allow a significant portion of the interior lighting to be natural.

BUILDING INTERIORS

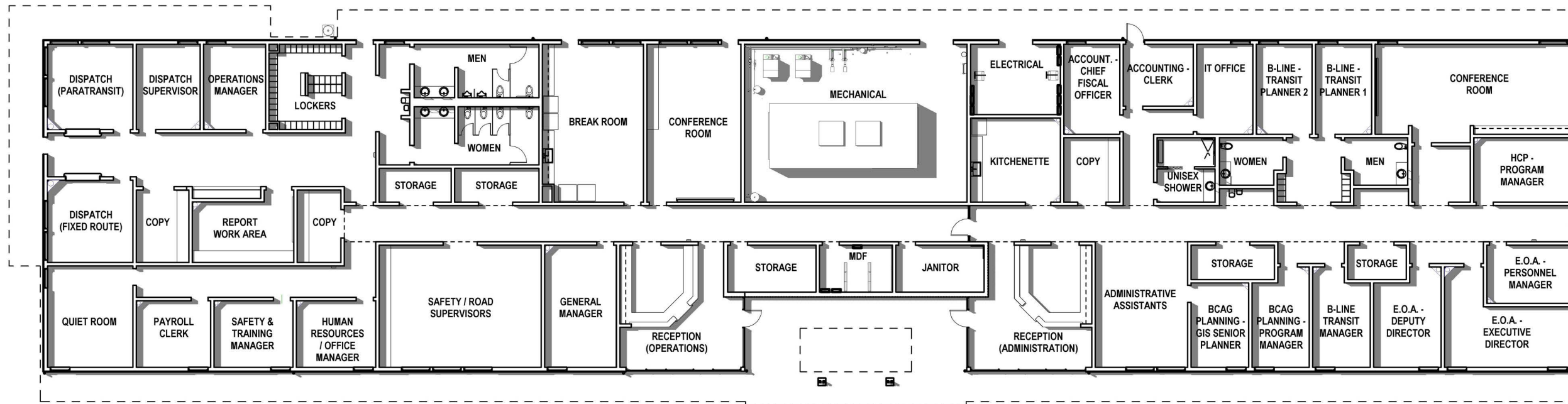
The interiors of the Administration/Operations Building are unified, with a higher level of finish at the lobbies and of the administration end of the building. Utilitarian materials such as polished concrete floors, and become elegant in the context of the overall sophisticated interior palate of materials and finishes. Polished concrete floors are found at public and main circulation areas, whereas carpet is typical at work areas.



Looking south along Aztec Drive, Administration / Operations Building at left, Maintenance Building at right



Administration / Operations Building entry



ADMINISTRATION / OPERATIONS BUILDING FLOOR PLAN



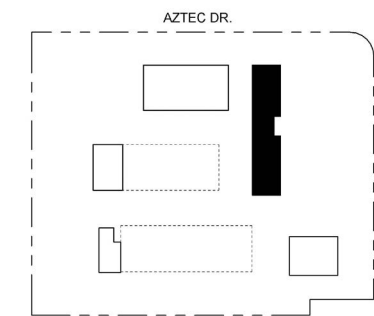
Gross Area: 15,349 sf Maximum Height: 26'-5"

ADMINISTRATION / OPERATIONS BUILDING

This is the one building that will receive public use by both customers and vendors. The lobby features adjacent lobbies, one for BCAG's administrative offices and another for the contractor that operates the B-Line system.

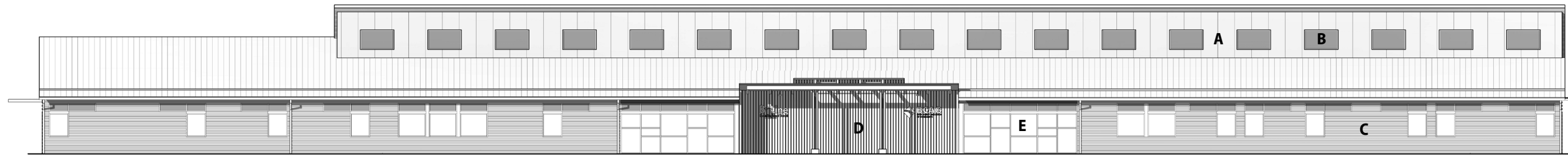
The administration end side of the building is a relatively straightforward office facility with all offices getting generous windows providing views and high windows with translucent glazing to take advantage of daylighting opportunities.

The operations end of the building is programmatically more complex, and to a large extent is related directly to the bus yard. After parking at the employee parking lot, bus drivers enter the building from the bus yard side into an area with a drivers break room, lockers, restrooms and other driver facilities. From here drivers proceed to either the fixed route or paratransit dispatch areas before heading outside to their vehicle. Dispatch rooms are strategically located at the corner of the building facing the bus yard in order to maximize surveillance of the yard.

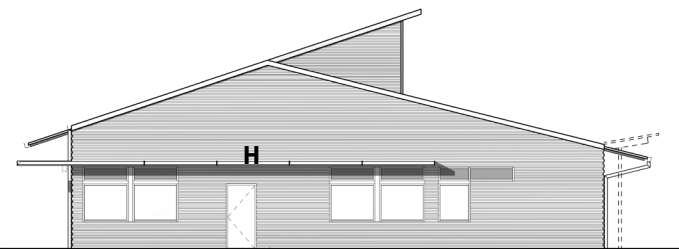


KEY PLAN





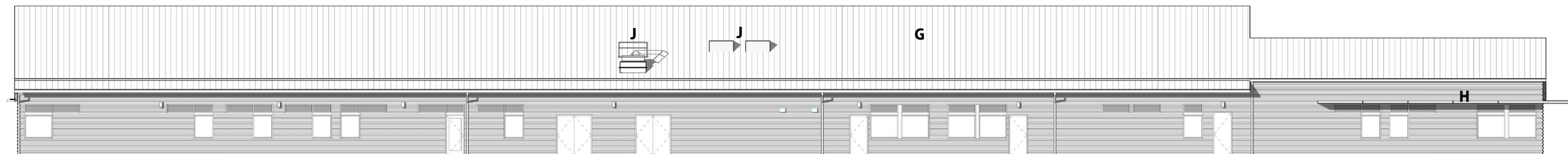
ADMINISTRATION / OPERATIONS BUILDING - EAST ELEVATION



ADMINISTRATION / OPERATIONS BUILDING - SOUTH ELEVATION



ADMINISTRATION / OPERATIONS BUILDING - NORTH ELEVATION



ADMINISTRATION / OPERATIONS BUILDING - WEST ELEVATION

NOTE

See renderings for proposed material and color selections

ELEVATION KEY

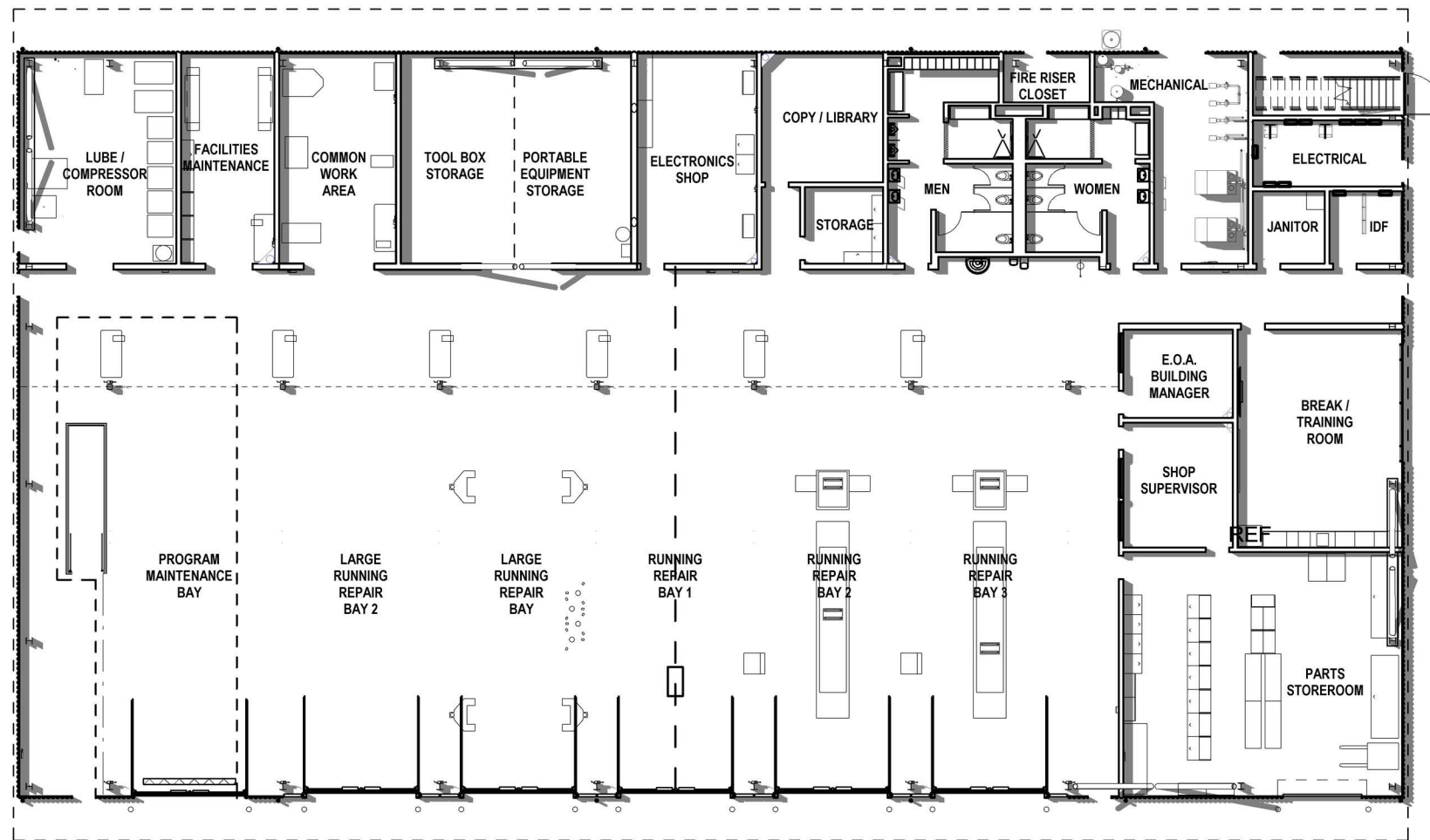
- A. Insulated metal panel wall system, smooth
- B. Light diffusing glazing
- C. Insulated metal panel wall system, horizontal ribbed
- D. Wood wall finish, vertical
- E. Storefront system
- F. Metal louver, to match metal wall panel
- G. Asphalt shingle, cool roof
- H. Steel sunshade
- I. Low-E glazing
- J. Roof access and mechanical equipment



Looking west at Maintenance Building

MAINTENANCE BUILDING

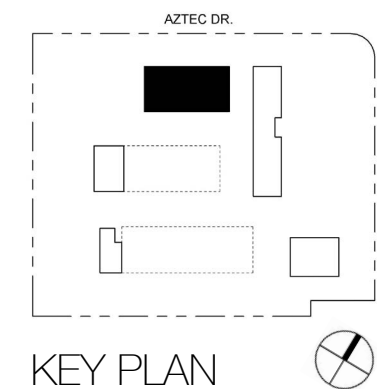
The Maintenance Building provides open, well-lit, thermally comfortable workspaces. The design of this building recognizes a growing body of “evidence-based design” that measurably demonstrates a direct correlation between the availability of natural illumination with worker satisfaction, productivity and reduced absenteeism. Daylight harvesting strategies including transparent door and wall panels, and clerestory windows will minimize the need for artificial illumination. Clear glazing, often reserved for higher walls of such facilities, is brought all the way to the floor to provide a direct visual connection to the exterior environment including from the break room to the employee patio. A substantial clerestory will bring natural light into the building interior. Mechanical equipment is located on an internal mezzanine and is not visible from the exterior.



MAINTENANCE BUILDING FLOOR PLAN



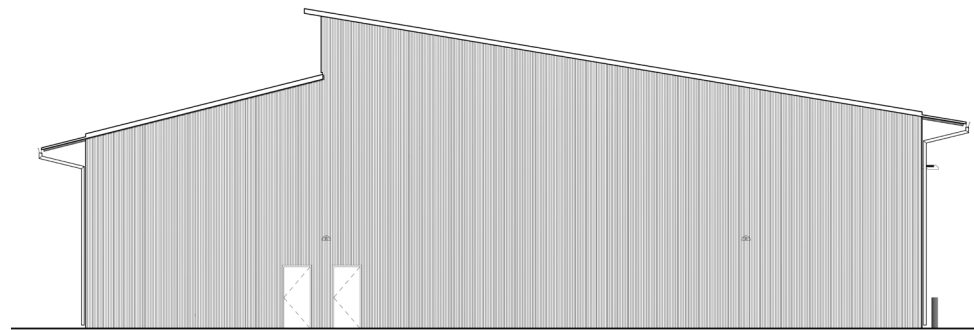
Gross Area: 16,768 sf Maximum Height: 36'-3"



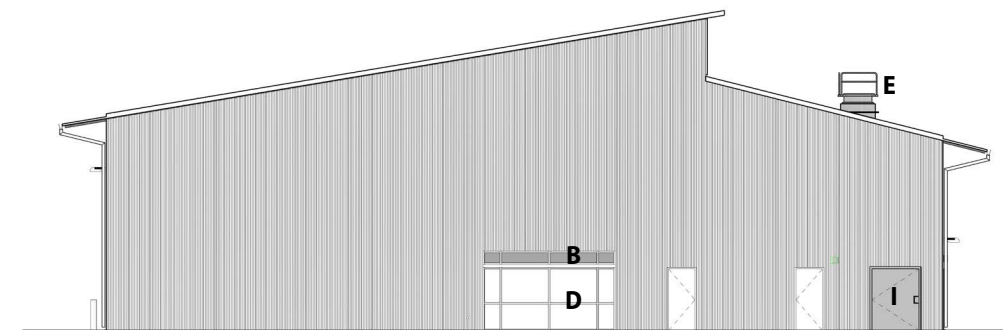
KEY PLAN



MAINTENANCE BUILDING - SOUTH ELEVATION



MAINTENANCE BUILDING - WEST ELEVATION



MAINTENANCE BUILDING - EAST ELEVATION



MAINTENANCE BUILDING - NORTH ELEVATION

NOTE

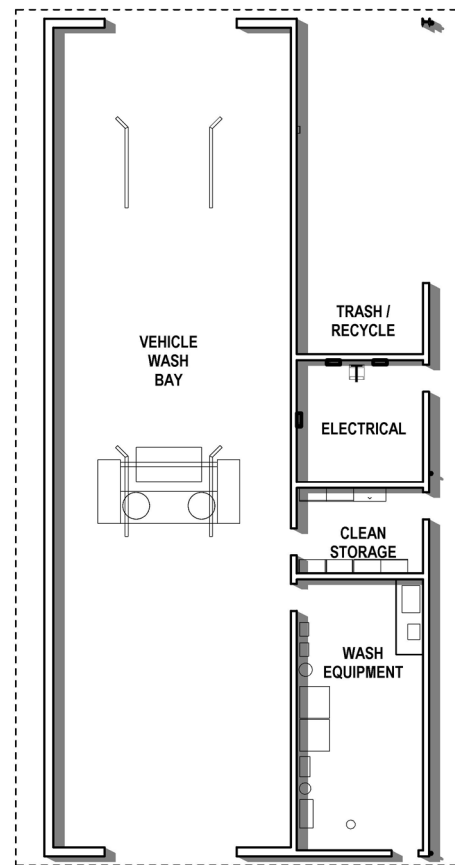
See renderings for proposed material and color selections

ELEVATION KEY

- A. Asphalt shingle, cool roof
- B. Light diffusing glazing
- C. Low-E glazing
- D. Storefront system
- E. Roof access and mechanical equipment
- F. Metal louver, to match metal wall panel
- G. Insulated metal panel wall system, smooth
- H. Insulated metal panel wall system, vertical ribbed
- I. Perforated panel gate
- J. Overhead coiling door to match metal wall panels
- K. 6' tall CMU trash/recycling enclosure

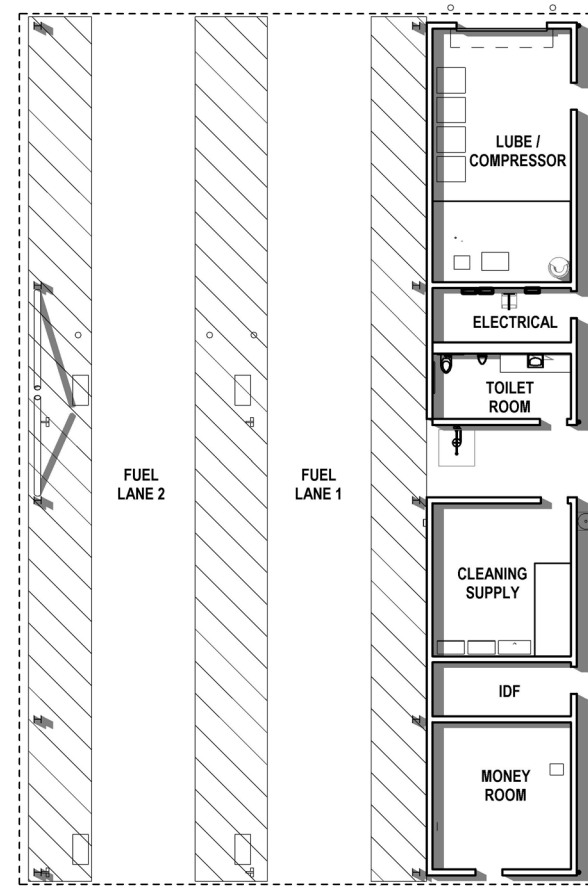


Looking southeast from the patio between the Maintenance Building and the Administration / Operations Building



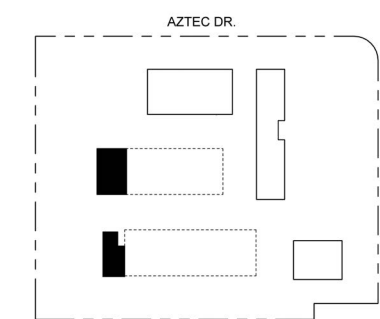
BUS WASH BUILDING FLOOR PLAN

Gross Area: 3,422 sf Maximum Height: 24'-6"



FUELING BUILDING FLOOR PLAN

Gross Area: 1,578 sf Maximum Height: 24'-6"



KEY PLAN



BUS WASH BUILDING AND FUELING BUILDING

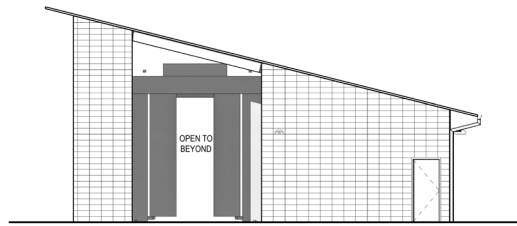
The facilities that are dedicated to the maintenance of the bus fleet are utilitarian, but elegantly express their functions and continue the architectural vocabulary of the Administration and Operations Buildings. These structures are clad with the similar materials as the other buildings. However, because there is no need to conceal interior conduits the prefinished metal panels here are attached directly to girts bolted to the building structure, eliminating the expense of metal stud walls. Concrete block will be utilized to protect the lower portions of walls of the Maintenance Building, and more extensively at the Bus Wash Building and Fueling Building.

FUTURE SOLAR SHADE CANOPY

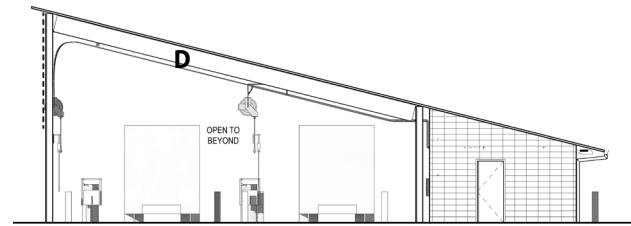
A future Solar Shade Canopy in the bus yard will allow a significant percentage of the bus fleet to be shaded from the hot summer sun. The trash enclosure is located within the bus yard, out of view from the street.

EXISTING BUILDING

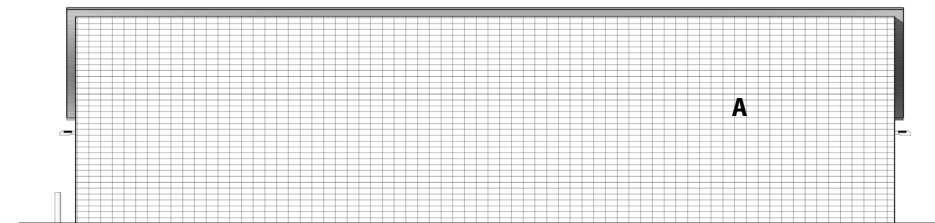
The existing building will be repurposed. The front area that currently accommodates offices will be reused as a training facility for bus drivers. The larger, rear space that currently is used to maintain buses will be reused, primarily as a storage facility and bus maintenance activities such as detailing. Exterior building finishes will be changed to the extent possible to match those of the new facilities.



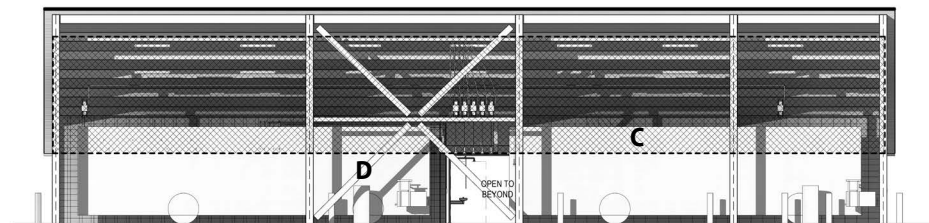
BUS WASH BUILDING - SOUTH ELEVATION



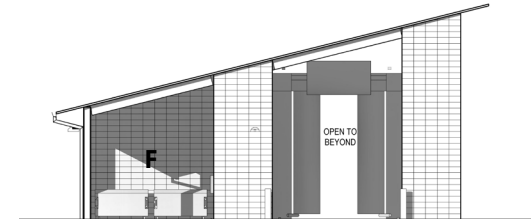
FUELING BUILDING - SOUTH ELEVATION



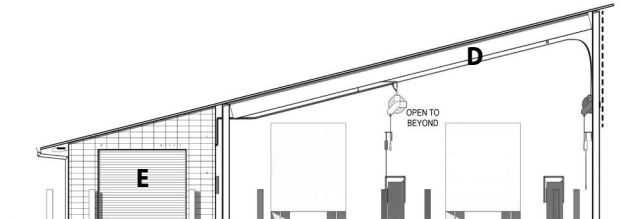
BUS WASH BUILDING - WEST ELEVATION



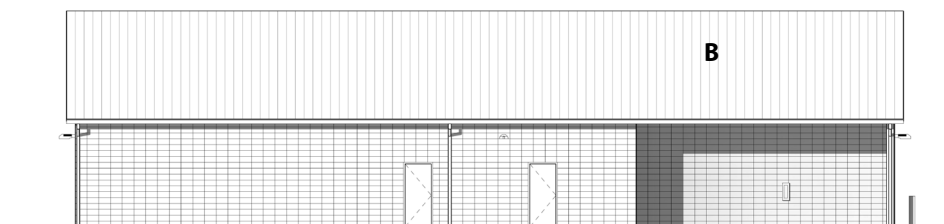
FUELING BUILDING - WEST ELEVATION



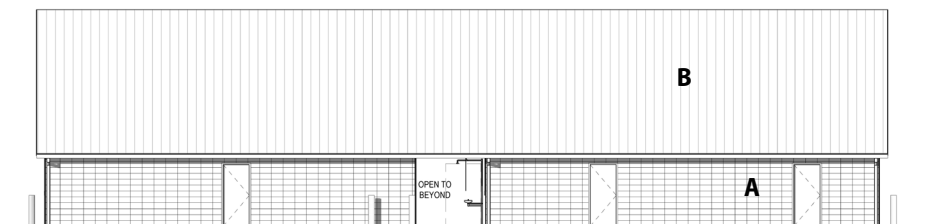
BUS WASH BUILDING - NORTH ELEVATION



FUELING BUILDING - NORTH ELEVATION



BUS WASH BUILDING - EAST ELEVATION



FUELING BUILDING - EAST ELEVATION

NOTE

See renderings for proposed material and color selections

ELEVATION KEY

- A. CMU wall system
- B. Asphalt shingle, cool roof
- C. Perforated panel sunshade
- D. Exposed steel framing
- E. Overhead coiling door to match metal wall panels
- F. Trash/recycling area

LEED 2009 for New Construction and Major Renovations		Project Checklist		Campus Credits Claimed		BCAG Regional Transit Maintenance Facility - MAINT BUILDING		3/6/2014		
13 4 Sustainable Sites		Possible Points: 26				Materials and Resources, Continued				
A,C	Y	Prereq 1	Construction Activity Pollution Prevention			A	1	Credit 4	Recycled Content	1 to 2
-		Credit 1	Site Selection	1		A	1	Credit 5	Regional Materials	1 to 2
-		Credit 2	Development Density and Community Connectivity	5				Credit 6	Rapidly Renewable Materials	1
-		Credit 3	Brownfield Redevelopment	1		A	1	Credit 7	Certified Wood	1
A	6	Credit 4.1	Alternative Transportation—Public Transportation Access	6		10 4 Indoor Environmental Quality				
A	1	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1		Possible Points: 15				
A	3	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3		M	Y	Prereq 1	Minimum Indoor Air Quality Performance	
C	2	Credit 4.4	Alternative Transportation—Parking Capacity	2		A	Y	Prereq 2	Environmental Tobacco Smoke (ETS) Control	
-		Credit 5.1	Site Development—Protect or Restore Habitat	1		M	1	Credit 1	Outdoor Air Delivery Monitoring	1
-		Credit 5.2	Site Development—Maximize Open Space	1		M	1	Credit 2	Increased Ventilation	1
C	1	Credit 6.1	Stormwater Design—Quantity Control	1		M	1	Credit 3.1	Construction IAQ Management Plan—During Construction	1
C	1	Credit 6.2	Stormwater Design—Quality Control	1		M	1	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
C	1	Credit 7.1	Heat Island Effect—Non-roof	1		A	1	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
A	1	Credit 7.2	Heat Island Effect—Roof	1		A	1	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
E	1	Credit 8	Light Pollution Reduction	1		A	1	Credit 4.3	Low-Emitting Materials—Flooring Systems	1
						A	1	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
6 Water Efficiency		Possible Points: 10				A,M	1	Credit 5	Indoor Chemical and Pollutant Source Control	1
M	Y	Prereq 1	Water Use Reduction—20% Reduction			E	1	Credit 6.1	Controllability of Systems—Lighting	1
LS	2	Credit 1	Water Efficient Landscaping	2 to 4		M	1	Credit 6.2	Controllability of Systems—Thermal Comfort	1
-		Credit 2	Innovative Wastewater Technologies	2		M	1	Credit 7.1	Thermal Comfort—Design	1
M	4	Credit 3	Water Use Reduction	2 to 4		M		Credit 7.2	Thermal Comfort—Verification	1
						A	1	Credit 8.1	Daylight and Views—Daylight	1
						A	1	Credit 8.2	Daylight and Views—Views	1
19 2 Energy and Atmosphere		Possible Points: 35				1 3 Innovation and Design Process		Possible Points: 6		
M	Y	Prereq 1	Fundamental Commissioning of Building Energy Systems			C	1	Credit 1.1	Innovation in Design: TDL - TIRE DERIVED AGGREGATE	1
M,E	Y	Prereq 2	Minimum Energy Performance			E	1	Credit 1.2	Innovation in Design: LOW MERCURY LIGHTING	1
M	Y	Prereq 3	Fundamental Refrigerant Management			A	1	Credit 1.3	Innovation in Design: Public Education	1
M,E	19	Credit 1	Optimize Energy Performance	1 to 19				Credit 1.4	Innovation in Design: Specific Title	1
E		Credit 2	On-Site Renewable Energy	1 to 7				Credit 1.5	Innovation in Design: Specific Title	1
-		Credit 3	Enhanced Commissioning	2		M	1	Credit 2	LEED Accredited Professional	1
M	2	Credit 4	Enhanced Refrigerant Management	2		3 Regional Priority Credits				
M,E		Credit 5	Measurement and Verification	3		Possible Points: 4				
-		Credit 6	Green Power	2		A	1	Credit 1.1	Regional Priority: Public Transportation	1
5 Materials and Resources		Possible Points: 14				LS	1	Credit 1.2	Regional Priority: Water Efficient Landscaping	1
A	Y	Prereq 1	Storage and Collection of Recyclables			E		Credit 1.3	Regional Priority: On site renewable energy	1
-		Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3		M	1	Credit 1.4	Regional Priority: Water use reduction	1
-		Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1		57 13 Total				
A,C	2	Credit 2	Construction Waste Management	1 to 2		Possible Points: 110				
-		Credit 3	Materials Reuse	1 to 2		Certified 40 to 49 points		Silver 50 to 59 points		
						Gold 60 to 79 points		Platinum 80 to 110		

LEED scorecard. Preliminary values indicate the rating level likely to be achieved if the project pursues LEED certification.

This facility will be a model steward of the site by integrating environmental planning principles as well as implementing sustainable strategies in each of the buildings and throughout the site and landscape. This project approaches sustainability in an integrated manner. As an objective measure of sustainability a LEED scorecard has been developed, showing that this project could confidently be LEED certified, possibly at the “Silver” level.

While specific sustainable features have been discussed elsewhere in this document, the following overarching sustainability strategies are consistent across the project:

SOLAR ORIENTATION

The site sits at a nearly 45 degree angle to the points of the compass, creating challenges in achieving the objective of maximizing shading of building fenestration. In response, a variety of window shading techniques has been employed. These strategies have been carefully studied and refined in a 3D virtual environment with assistance from iTech students.

ENERGY EFFICIENCY

A combination of a well-insulated building envelope, sunshading, highly efficient mechanical systems, and displacement ventilation air distribution and radiant floors systems will assure buildings are highly-efficient, and well below California’s Title 24 requirements.

ON-SITE ELECTRICAL GENERATION

It is the intent of this project that at some point in the future substantially all of the facility’s electrical requirements be generated on-site by means of photovoltaic panels, with provisions for installation of additional panels in the future should the financial feasibility of doing so become realistic.

NATURAL LIGHTING & DAYLIGHT HARVESTING

Natural illumination, in addition to physiological benefits, allows lower levels of artificial illumination, which in turn results in reduced cooling loads and expenses. In addition to windows, translucent glazing at the clerestories at both of the new buildings allow for substantial natural lighting at the building interiors.

SUSTAINABLE INDOOR ENVIRONMENT

Perhaps the most significant of this project’s many sustainable features is its approach to heating and cooling interior spaces. Both of the main buildings will use Indirect/Direct Evaporative Cooling (IDEC), a highly efficient system that utilizes evaporative cooling, with only minimal conventional air-conditioning when required only on the hottest of days. The Administration/Operations Buildings will distribute this air by means of displacement ventilation, an approach that allows cost-effective, moderately conditioned air to be introduced at floor level and exhausted at ceilings for a highly efficient and healthy indoor environment. Heating at the Maintenance Building will be accomplished by a radiant floor slab system. Radiant heating creates a comfortable environment for workers without the expense of heating the entire volume of this space. Non-toxic interior materials will be used extensively, and wherever practical low maintenance finishes will be specified.

CONCLUSION

The design of this project is the result of an intense, collaborative effort by BCAG, Veolia, and the design team, in cooperation with iTech students, representatives of the City of Chico and others. Within the framework of a cohesive and persistent design philosophy that reflects the immediate and regional surroundings, the design addresses numerous programmatic, functional, and regulatory requirements. It provides a sustainable design with a focus on energy efficiency and minimal operational costs that will serve the citizens of Butte County for decades to come.



Looking north from the bus yard. Maintenance Building at left, Administration / Operations Building at right